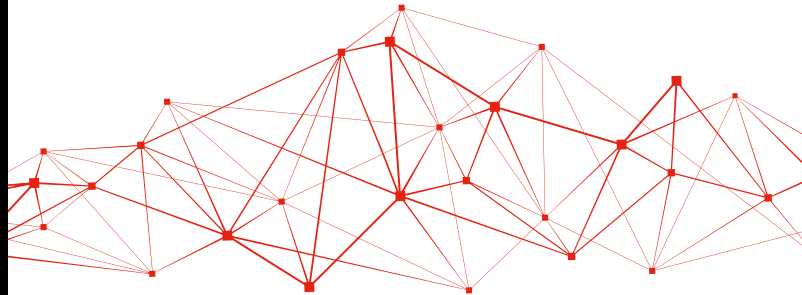




ERICSSON

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Kathrein Mobile Communication – now part of Ericsson

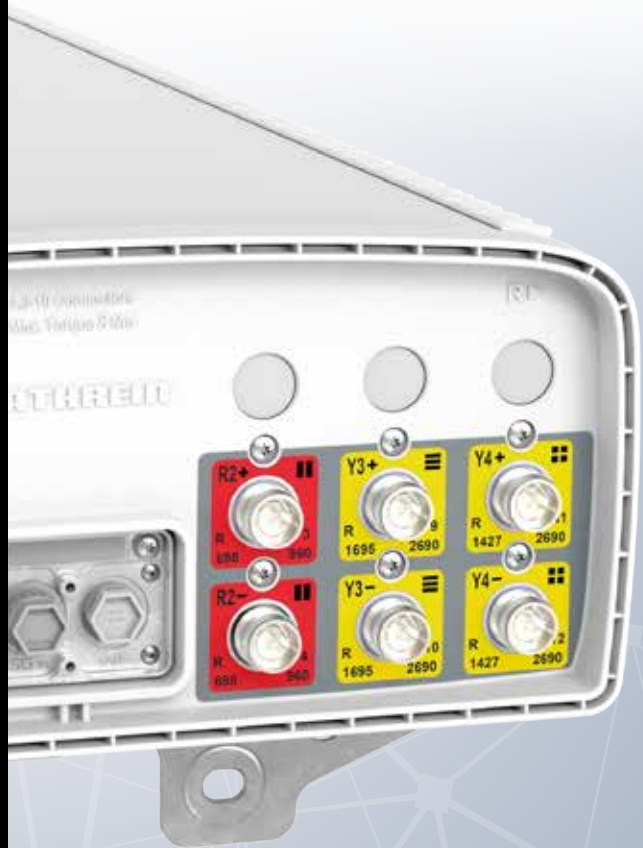
As of 1. October 2019 the new company data are as follows:

Ericsson Antenna Technology Germany GmbH
Klepperstraße 26
83026 Rosenheim, Germany

VAT Reg. No.: DE 324 954 029
Tax ID No.: 103/5725/3930

www.kathrein.com

Read more at:
ericsson.com/en/networks/kathrein



KATHREIN

KATHREIN

Kathrein Mobile Communication - now part of Ericsson

Mobile communication means being available anywhere and anytime, using media and having Internet access. Mobile network operators face the challenge of reliably providing needed capacities for the enormous data volumes.

Kathrein Mobile Communication is the perfect partner for this task. Our systems and solutions are future-proof, offer low Total Cost of Ownership and ensure highly reliable data transmission. We supply all major network suppliers as well as renowned network operators. Close

collaboration with our customers enables us to optimise our systems and solutions on a continuous basis and to also realise specific requirements. Our intensive research and development activities pave the way for innovative technologies that set standards worldwide.

The additional expertise brought by the acquisition of Kathrein's antenna and filter business will broaden the Ericsson Radio System offering, which is vital for the introduction of 5G.

Find out more about us at www.kathrein.com and www.ericsson.com/en/networks/kathrein

Catalogue Issue 01/2020

All data published in previous catalogue issues hereby become invalid.

We reserve the right to make alterations in accordance with the requirements of our customers.

For up-to-date or additional data please check the latest data sheets on our website: www.kathrein.com

Please also visit our website for new product releases which are not part of this catalogue.

Please also see additional information on inside back cover.



Our quality assurance system and our environmental management system apply to the entire company and are certified by TÜV according to EN ISO 9001 and EN ISO 14001.



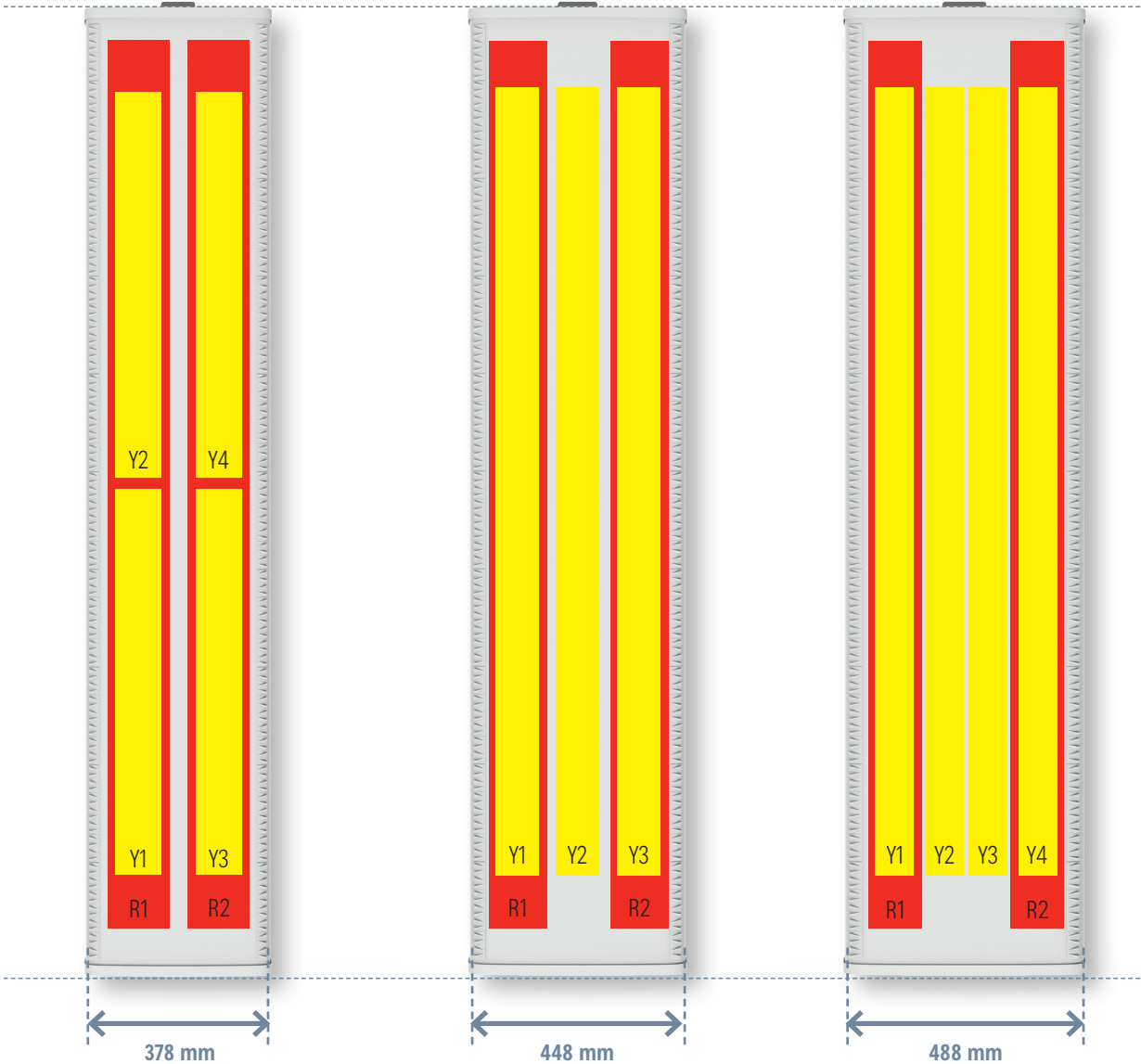
Our products are compliant to the EU Directive RoHS as well as to other environmentally relevant regulations (e.g. REACH).

Technology Promotion

New Platform Architecture

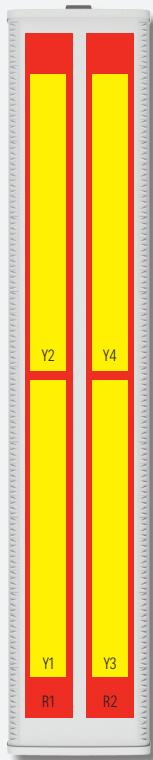
> New Multi-band Platform in 3 Ultra-compact Width Dimensions

- Best-in-class form factor for multi-band antennas (for 378 platform)
 - Market leading width for parallel lowbands
 - ~30% improved maximum wind load*
 - ~25% lower weight*
- Improved manufacturability
 - Significantly reduced amount of components per antenna
 - High level of automation and process stability
 - Sustainably high antenna quality and PIM performance
- Faster industrialization of antenna variants



* Exemplarily applicable for 800372991 vs. 80010991

378 Platform – World’s Smallest Antenna with Side-by-Side Lowband Arrays



800372991

12-Port Hexaband 2L4H	R1, R2	Y1, Y3	Y2, Y4
Frequency range [MHz]	698–960	1695–2690	1427–2690
Dual polarisation	✓	✓	✓
Gain [dBi]	15.5	15.9	16.3
Horizontal HPBW [°]	60	65	65
Vertical HPBW [°]	11.0	10.0	10.0
Tilt range [°]	2.5–11.5	2–12	2–12
Port-to-port isolation [dB]	> 25	> 28	> 28
PIM 2 x 43 dBm [dBc]	< -153		
Size L/W/D [mm]	1978/378/164		

Frequency Range [MHz]	Array	Connector/ Ports
698–960	R1	1–2
698–960	R2	3–4
1695–2690	Y1	5–6
1427–2690	Y2	7–8
1695–2690	Y3	9–10
1427–2690	Y4	11–12

Correlation table

➤ 12-Port Hexaband 2L4H, 800372991

Features

- Revolutionary width reduction from 508 mm to 378 mm
- 2 ultra broadband highband arrays (1427–2690 MHz)
- Market-leading width for parallel lowbands
- First antenna in ultra compact platform worldwide

Functions

- Wind load and weight reduction
- L-band for supplemental downlink
- All bands with independent electrical downtilt
- Use of two separate arrays for 700/800/900 MHz
- Optimal side lobe behaviour through advanced dipole feeding concept

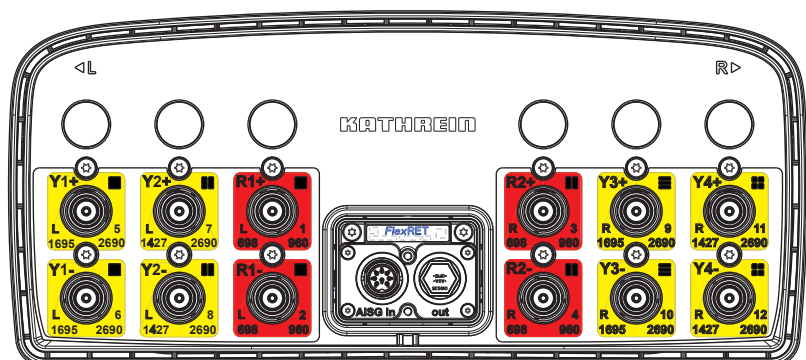
Benefits

- Reduced tower rental costs thanks to:
 - 25% less weight (compared to current platform) – TCO
 - 30% less wind load (compared to current platform) – TCO
- Relaxed tower construction (statics benefit) – TCO
- Increased data throughput at no additional antenna cost
- Ultra broadband dipole ready for L-band use
- Guarantees optimal network performance by avoiding intermodulation products caused by frequency combination of 700/800/900 MHz
- 12 ports (4 x 698–960 MHz, 4 x 1427–2690 MHz, 4 x 1695–2690 MHz)

Site preparation for 5G technology

- Reduces the number of antennas in the field: Existing installations with fewer ports will be replaced by antennas with a higher number of bands and the same form factor
- Fewer antennas and lower wind load allow the installation of additional 5G devices

Layout of interface



2G–5G Hybrid Antenna

Hybrid Passive and Active Antenna System

> Innovative Antenna System for 2G, 3G, 4G, 5G

- Cell sites are often space constrained, making it challenging, if not impossible, to deploy additional hardware, in particular, antennas
- Kathrein Mobile Communication is introducing this innovative antenna system aimed at overcoming these issues, while ensuring the delivery of next generation mobile services
- This new, high-performance antenna system seamlessly integrates a multi-band passive antenna and a massive MIMO active antenna into a single unit

> Ready for 5G All-in-One

Features

- Three separate field-replaceable products, which can be integrated on site into a single physical antenna:
 - Passive multi-band antenna
 - Mechanical Integration Kit (MIK)
 - mMIMO active antenna system
- Available for all Kathrein Mobile Communication 448, 488 platform antennas
- Designed to carry various massive MIMO radios
- Fulfills typical overall maximum height requirements

Functions

- Innovative antenna system combining various mobile radio standards and technologies
 - State-of-the-art passive multi-band antenna technology with integrated 4 x 4 MIMO support
 - Latest 5G mMIMO technology

Benefits

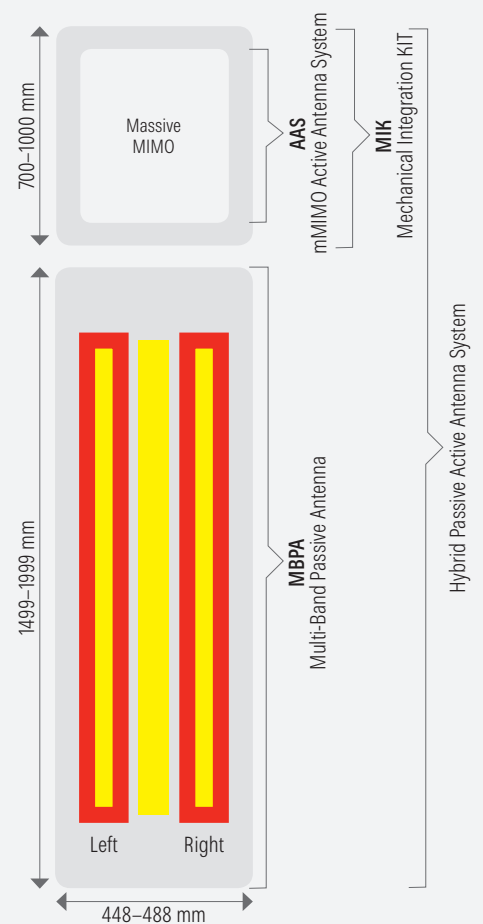
- Flexible and modular deployment, easy installation
- Existing antenna sites can be easily upgraded to 5G
- Optimal cost-benefit ratio
- Improved visual appearance

Three installation options

1. Stand-alone MBPA
2. MBPA with empty MIK; can be installed post installation of option 1
3. MBPA, MIK and mMIMO; can be installed post installation of option 1 or 2



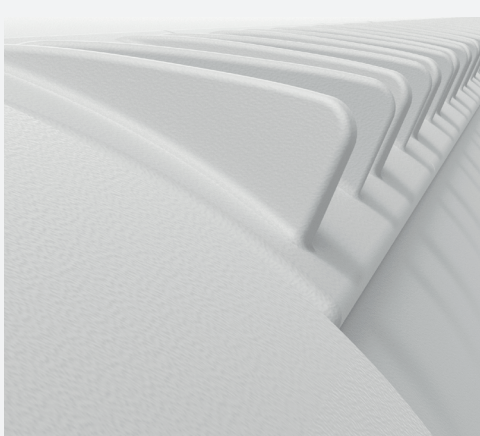
Create a modular "single box" to hide mMIMO on top



Flexible installation concept

New Approach to Wind Load Reduction

Vortex Generators (VGs)

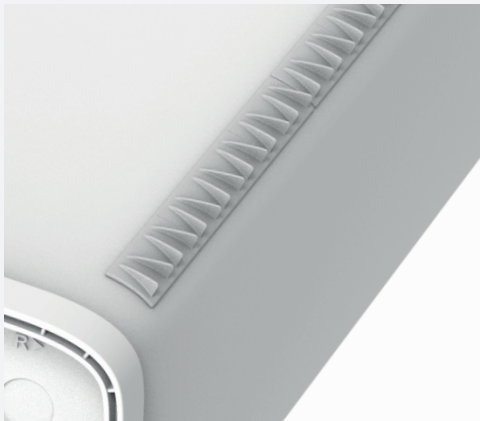


Features

- New approach to wind load reduction
- First ever usage of vortex generators for antennas
- Possible for all new Kathrein Mobile Communication antenna platforms
- Approved in three different wind tunnels
- Approved for all wind speeds

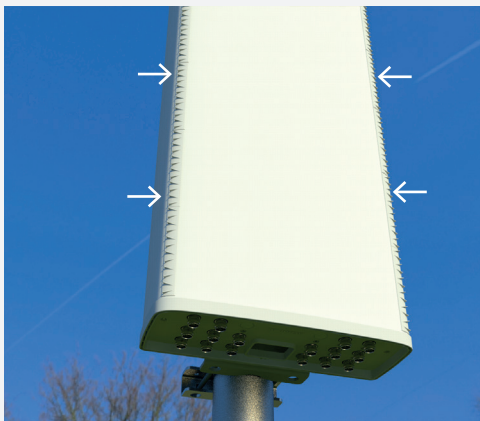
Functions

- Affects the wind flow around the antenna
- Wind flow is directed closer to the antenna
- Reduces drastically the frontal wind load
- No risk of extreme lift effects



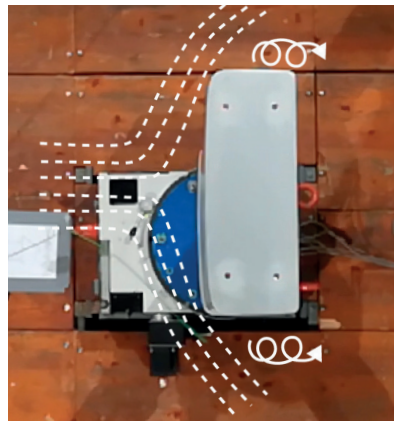
Benefits

- Relaxed tower construction (statics benefit)
- Easier to implement antennas in existing sites
- Less operating expenses
- Best installation space to wind load ratio

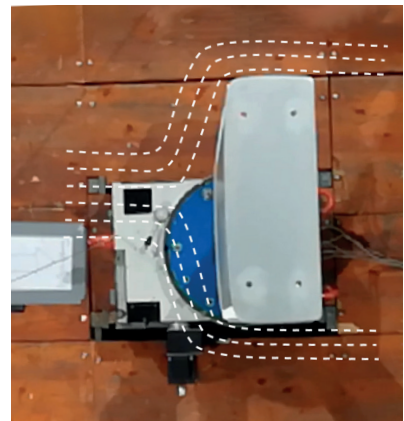


Vortex Generators (VGs)

➤ Visualisation of the Streamlines in the Wind Tunnel



Without VGs



With VGs

New Approach to Wind Load Reduction

Vortex Generators (VGs)

> Wind Tunnel Tests

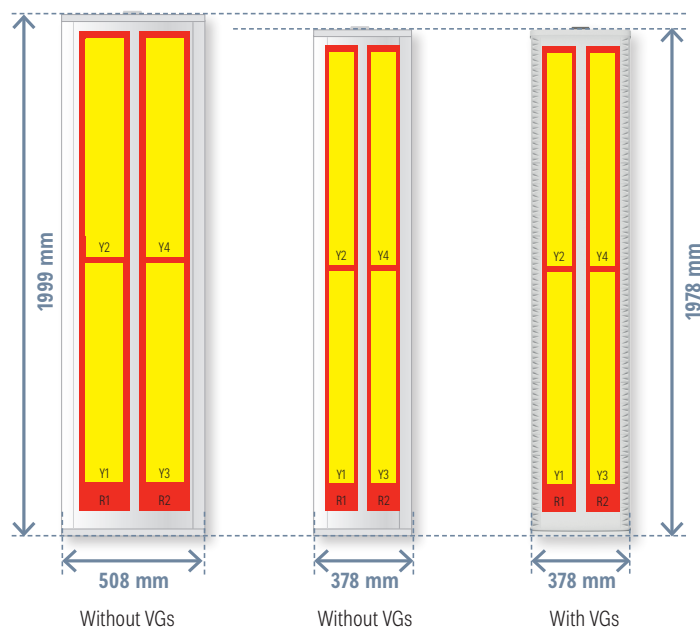
- Measured values
- Accepted by civil engineers and authorities
- All wind directions can be measured
- Results can be used for validation

> Comparison Between Different Antenna Designs and the Impact on Wind Loads

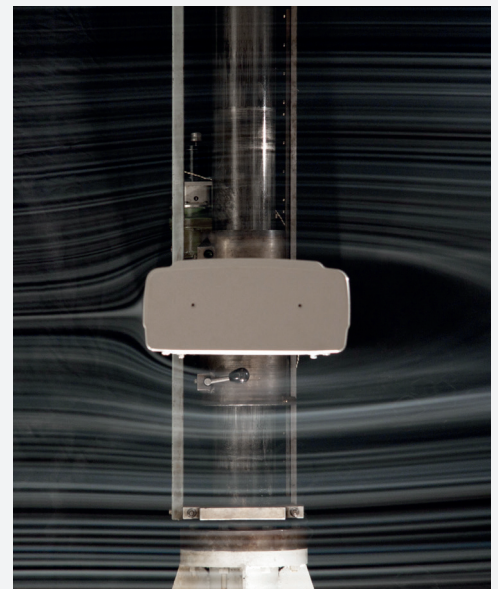
Advantages with new antennas:

- Smaller antenna design → less installation space
- Reduced wind loads
- Optimized profile for best performance

> Tower Loading Improvement



	80010991 Wind load at 150 km/h	Wind load at 150 km/h	800372991 Wind load at 150 km/h
Frontal	1130 N	875 N	465 N (~ -60%)
Maximal	1140 N	875 N	815 N (~ -28%)
Weight	48.7 kg	37 kg	37 kg (~ -25%)



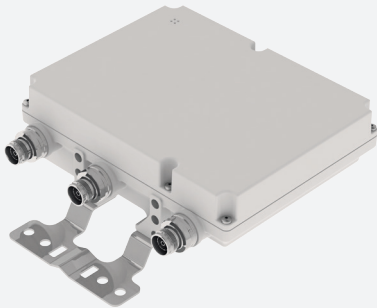
Wind tunnel tests

Detailed information about the methodology and findings about wind loads can be found online in the White Paper "Base Station Antennas – Reliable Wind Load Calculation".
www.kathrein.com → Support → Technical Documents
 → Windload



Antenna Line Devices

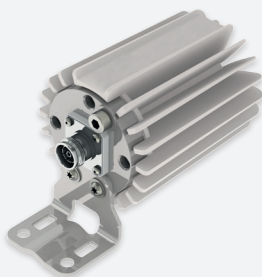
Boxes Between Antenna and Radio – Disposable or Essential?



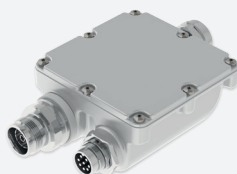
Multi-band Combiner



Multi-band TMAs w/o RF-bypass



50-ohm Load



Smart Bias Tee

An operator's daily challenge is increasing capacity and coverage of mobile communication sites to quench the thirst for data in a highly competitive environment. But why still use Antenna Line Devices (ALDs), when multi-band Remote Radio Units and Active Antenna Solutions are already available?

Mobile communication operators have invested a fortune over the last few years to establish a mobile communication infrastructure as we have it today. For increasing the existing performance to cope with future requirements, there are in principle two options: build up completely new sites in a kind of green field approach or upgrade existing sites.

At first sight, green field approach has a certain charm, as it opens up the possibility to solely use the latest technology with best data rates and energy efficiency. But realistically it would cost another fortune with an undesirably high period for amortization in times of massively decreasing revenue per data unit. Therefore upgrading existing sites by adding new spectrum and technology is the more reasonable approach for most operators. And this is where Antenna Line Devices come into play.

Space is limited everywhere — but especially on top of the mast. Installation of additional radios to add new frequency bands or apply 4T4R/2T2R instead of SISO can in most cases better be realized ground based. Multi-band Combiners allow an efficient use of existing feeder cables or minimizing the number of necessary new feeders. When installing RRUs near the antenna, combiners can be used to feed-in this new signal to the antenna. In case of poor RX-sensitivity of legacy sites, TMAs are used to overcome this weakness and improve performance of the existing infrastructure. This minimizes the necessary investment and downtime of the network compared to the installation of new RRUs.

There's no one-fits-all upgrade solution, since the existing infrastructure varies very much from operator to operator. Kathrein Mobile Communication offers a broad ALD portfolio with approximately 400 products that covers most use cases in the frequency range from 698 to 2690 MHz. This broad ALD portfolio assures the availability of the specific product necessary for a specific use case.

High reliability and robustness of our ALDs in combination with excellent PIM performance help to decrease the total cost of ownership when installing ALDs.

To learn more about Kathrein Mobile Communication's ALD portfolio, please visit our website www.kathrein.com.

Base Station Antennas

LB (Lowband) ≤ 960 MHz
HB (Highband) > 960 MHz

> XPol	2 Ports	1 LB 1 HB 1 LB 1 HB	2 Ports
	4 Ports	2 LB 1 LB 1 HB 2 HB 2 x 3.5 GHz	4 Ports
	6 Ports	1 LB 2 HB 2 LB 1 HB 3 HB	6 Ports
	8 Ports	1 LB 3 HB 2 LB 2 HB 4 HB 4 HB TDD Antenna	8 Ports
	10 Ports	1 LB 4 HB 2 LB 3 HB	10 Ports
	12 Ports	2 LB 4 HB	12 Ports
	14 Ports 16 Ports	2 LB 5 HB 2 LB 6 HB 3 LB 5 HB	14 + 16 Ports
> Small Cell and Special Design		Small Cell	
> VPol		VPol	
> Omni		Omni	
> RET	RCU, Control Devices, Site Sharing, Accessories	RET	
> Electrical Accessories	Splitters, Tappers	Electr. Acc.	
> Mounting Accessories	Hardware, Tools, Protection Caps	Mounting	

Summary of Antenna Types, RET-Products and Accessories

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
731...		800101..		80010697	90 + 91	800109..	
731651	306	80010123v03	56 + 57	80010698	92 + 93	80010901	40 + 41
				80010699	94 + 95	80010902	42 + 43
732...		800102..				80010922	66 + 67
732327	312	80010235	266	800107..		80010964	134 – 136
		80010291v02	76 + 77	80010715	46 + 47	80010965	137 – 139
734...		80010292v03	78 + 79	80010728	146 + 147	80010966	140 – 142
734360	327			80010753	261	80010991	206 – 209
734361	327	800103..		80010761	28	80010992	214 – 217
734362	327	80010305v02	25	80010767	104 + 105		
734363	327	80010306v02	26	80010768	106 + 107		
734364	327	80010368	269	80010769	108 + 109	80011...	
734365	327	80010378	32	80010798	184 – 186	80011867	116 + 117
				80010799	190 – 192	80011868	118 + 119
736...						80011877	220 + 221
736347	275	800104..		800108..		80011878	222 + 223
		80010431	277	80010817	45	80011891	157 – 159
737...		80010456v02	24	80010825	129 – 131	80011898	193 – 195
737978	313			80010826	132 + 133	80011965	171 – 173
		800106..		80010828v01	271		
738...		80010606v01	62 + 63	80010843	264		
738546	306	80010621v02	30	80010846	276	8002...	
738908	331	80010647v01	44	80010864	84 + 85	80020100	258
		80010651	31	80010865	86 + 87	80020125	265
742...		80010652	61	80010866	88 + 89	80020126	235
742033	320	80010656	64 + 65	80010867	110 + 111	80020448	270
742034	320	80010664	50 + 51	80010868	112 + 113	80020622	59 + 60
742113	323	80010665v01	52 + 53	80010869	114 + 115	80020711	260
742192v02	268	80010666v01	54 + 55	80010875	160 + 161	80020727	96 + 97
742226v01	48 + 49	80010678	27	80010887	37	80020799	187 – 189
		80010681	29	80010888	38	80020872	101 – 103
782...		80010682	58	80010889	39	80020892	168 – 170
78211293	335	80010691v01	80 + 81	80010891	162 – 164	80020899	199 – 201
78211297	335	80010692v01	82 + 83	80010898	196 – 198	800250911	148 – 150

Summary of Antenna Types, RET-Products and Accessories

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
8003...		84040600	330	85010101	311	86010105	297
800372965	120 – 122	84040601	330	85010102	321	86010129	334
800372991	202 – 205	84040602	330	85010103	326	86010131	296
800372992	210 – 213	84040603	330	85010104	322	86010136	298
				85010108	326	86010137	298
8004...		845...		85010110	315	86010138	298
800442001	229 – 231	84510864	70 + 71	85010111	308	86010148v01	282
800442004	174 – 176	84510865	72 + 73	85010205	259	86010150	300
800442008	224 – 228	84510866	74 + 75	85010212	306	86010151	300
		84510891	154 – 156	85010213v01	329	86010152	300
816...		84510892	165 – 167	85010217	328	86010153v01	283
81610014	335	84510965	143 + 145	85010512	317	86010154	288
				85010513	317	86010155	289
840...		850...				86010157	332 + 333
84010555	238 + 239	85010002	306	860...		86010158	285
84010556	238 + 239	85010003	306	86010002	292	86010160	301
84010557	240 + 241	85010004	335	86010007	287	86010162	290
84010558	240 + 241	85010009	314	86010008	287	86010163	291
84010564	262 + 263	85010014	318	86010009	287	86010165	284
84010601	251 – 253	85010015	318	86010010	287	86020136	299
84010601G	254 – 257	85010016	318	86010011	287	86020137	299
84010602	251 – 253	85010017	318	86010012	287	86020138	299
84010602G	254 – 257	85010058	320	86010013	287	86020160	301
84010603	248 – 250	85010059	320	86010014	287		
84010603-O44	245 – 247	85010060	322	86010015	287	K7...	
84010604	248 – 250	85010061	322	86010029	287	K738192	274
84010604-O44	245 – 247	85010075	324	86010030	293	K742263	320
84010623-O44	242 – 244	85010076	324	86010031	294	K742317	320
84010624-O44	242 – 244	85010080	287	86010032	287		
84010793	236 + 237	85010087	325	86010033	287		
84010794	236 + 237	85010096	309	86010046	286		
840370799	180 – 183	85010097	310	86010054	287		
840370964	123 – 125	85010098	319	86010101	297		
840370966	126 – 128	85010099	316	86010103	297		





According to AISG, the frequencies shall be marked like shown in the following table. The upper edge of the frequency range is used to select the colour code.

Frequency Range / MHz Defined by AISG	Frequency Range / MHz Examples	Colour	Colour Code Abbreviation
380–1000	617–746	Red	R
	698–960	Red	R
	698–894	Red	R
	790–960	Red	R
1001–1700	1427–1518	Green	G
1701–2300	1350–2200	Blue	B
	1710–1880	Blue	B
	1710–2180	Blue	B
	1920–2170	Blue	B
2301–3000	2490–2690	Yellow	Y
	1695–2690	Yellow	Y
	1427–2690	Yellow	Y
3001–5000	3300–3800	Purple	P
	3550–4200	Purple	P
5001–6000	5150–5925	Orange	O

In line with this, we have invented a system in order to better illustrate the physical design of our antennas. Based on the AISG colour coding, every antenna system is displayed corresponding to its frequency range. Each system is additionally marked by its colour code abbreviation as well as an identification number (e.g. “R1” for the first lowband system) called “Array ID”. For multi-array antennas, also the position marking is indicated as stipulated by AISG (“left” / “right” / “center”).





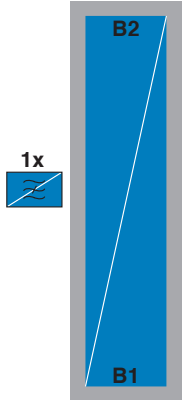
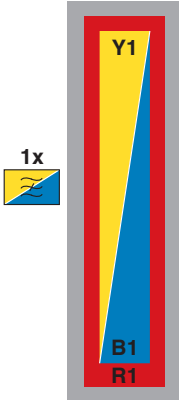
The respective symbols are displayed on each type index of panel antennas in the catalogue.

In case an ultra-broadband dipole array is used for two or three independent system, internal filters can be used in order to divide the bands. Those filters are illustrated by the following symbols:

<p>1. Filter Lowband</p> <p>e.g. 790–862 / 880–960 MHz or 698–803 / 824–960 MHz</p>		<p>2. Filter Highband 1</p> <p>1710–1880 / 1920–2170 MHz</p>	
<p>3. Filter Highband 2</p> <p>1710–2170 / 2490–2690 MHz</p>		<p>4. Filter L-Band</p> <p>1427–1518 / 1695–2180 MHz</p>	

Colour Coding and Antenna Symbols

Some examples shall demonstrate the symbolic antenna illustration:

<p>1. 2-Port Antenna</p> <p>1 Lowband Array</p> <p>e.g. 698–960 or 790–960 MHz</p>		<p>2. 4-Port Antenna</p> <p>1 Lowband / 1 Highband Array interleaved</p> <p>e.g. 698–960 / 1710–2690 or 790–960 / 1710–2690 MHz</p>	
<p>3. 6-Port Antenna</p> <p>3 Highbands side-by-side (“multi-array”)</p> <p>e.g. 3 x 1710–2690 MHz</p>		<p>4. 6-Port Antenna</p> <p>1 Lowband Array interleaved with 2 Highband Arrays, Highband stacked</p> <p>e.g. 698–960 / 2 x 1710–2690 MHz</p>	
<p>5. 4-Port Antenna</p> <p>2 Highbands filtered</p> <p>e.g. 1710–1880 / 1920–2170 MHz</p>		<p>6. 6-Port Antenna</p> <p>1 Lowband interleaved with 2 filtered Highbands</p> <p>e.g. 790–960 / 1710–2170 / 2490–2690 MHz</p>	

Configuration Type A



80010305v02
80010306v02
80010456v02

Configuration Type B



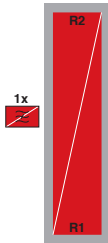
80010378
80010606v01

Configuration Type C



80010621v02
80010651
80010656
80010678
80010681
80010761
80010843
80020125
80020711

Configuration Type D



80010887
80010888
80010889

Configuration Type E



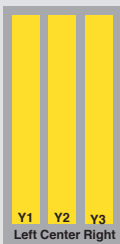
80010647v01
80010817
80010901
80010902

Configuration Type F



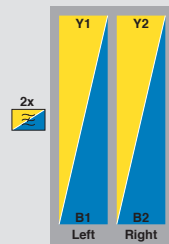
80010652
80010682
80020622

Configuration Type J



80020727

Configuration Type K



80010728

Configuration Type L



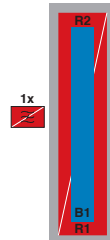
742226v01
80010123v03

Configuration Type M



80010664
80010665v01
80010666v01
80010715
80010753

Configuration Type N



80010697
80010698
80010699

Configuration Type P



80010291v02
80010292v03

Configuration Type R



80010691v01
80010692v01

Configuration Type S



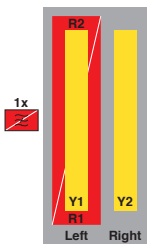
80010864
80010865
80010866

Configuration Type T



80010825
80010826

Configuration Type W



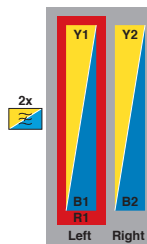
80010767
80010768
80010769
80010867
80010868
80010869
80011867
80011868

Configuration Type X



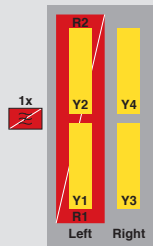
80010891
80011891
80020892

Configuration Type Y



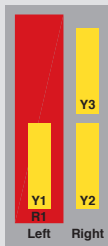
80010875

Configuration Type Z



80010798
80010799
80010898
80011898
80020799
80020899

Configuration Type AA



80020872

Configuration Type AB



80010964
80010965
80010966
800372965
840370964
840370966
84510965

Configuration Type AG



80010991
80010992
800372991
800372992
840370799

Configuration Type AH



84510892

Configuration Type AI



80011965

Configuration Type AJ



80011877
80011878

Configuration Type AK



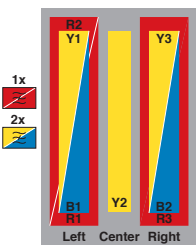
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84510866

Configuration Type AL



84510891

Configuration Type AM



800442001

Configuration Type AN



80010922

Configuration Type AO



800250911

Configuration Type AP



800442004

Configuration Type AQ



800442008

Antenna Designs:

Antenna Families / RET-system

Distinguishing Features

KATHREIN

Design	Compact size and elegant design are the distinguishing features of the Kathrein Mobile Communication antenna families.
Radome	The radomes cover the internal antenna components. The fiberglass material guarantees optimum performance regarding stability, strength, UV resistance, painting and weather protection. The colour of the radome of outdoor panel antennas is similar to RAL 7035.
Environmental influences	Kathrein Mobile Communication antenna designs are based on fundamental engineering knowledge and also on our decades of practical experience, during which the various constructions and materials used have proved their outstanding reliability.
Environmental conditions	Kathrein Mobile Communication cellular antennas are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E. The antennas exceed this standard regarding the following items: <ul style="list-style-type: none">- Low temperature: -55 °C- High temperature (dry): +60 °C
Environmental tests	Kathrein Mobile Communication antennas are designed according to the specifications as defined in ETS 300 019-2-4. The homogenous design of the Kathrein Mobile Communication antenna families uses identical modules and materials. Extensive tests have been performed on typical samples and modules. The vibration test has been adapted relating to frequency and acceleration to the conditions of mast mounted antennas.
Impedance	Standard Impedance for all products is 50 Ω unless otherwise stated.
Great variety of half-power beam width, gain values, electrical downtilt	According to the antenna type selected, customers can choose from different half-power beam widths, gain values and electrical downtilts for panel antennas. Downtilts are either fixed or adjustable and controlled by remote electrical tilt system (RET).
Low intermodulation products (typ. <-153 dBc)	With many years of experience in the construction of antennas and intensive research into the effects of intermodulation, we offer optimized material and technology used for antennas (the given value refers to 3rd order products measured with 2 carriers of 20 W each).
Excellent tracking	Tracking states the symmetry between the +45° and -45° polarized horizontal pattern. Bad tracking values lead to interferences in the network and reduced diversity performance. The Kathrein Mobile Communication special Tracking compensation reduces the average value measured at ±60° to < 2-3 dB.

Antenna Designs:

Antenna Families / RET-system

Distinguishing Features

Multi-array design

Besides standard single array antennas, Kathrein Mobile Communication designs antennas providing multiple antenna arrays in one radome. These multi-array antennas do not only supply a future-proof multiplicity of diverse frequency bands for various technologies, but are also well-prepared for different MIMO applications. The Kathrein Mobile Communication portfolio contains a high variety of design solutions like interleaved and side-by-side antenna types or combinations of both as well as filter realizations.

Multi-functional installation hardware

Depending on the type, the antennas are equipped with up to 2 attachment points. For mast-mounting, brackets and mechanical downtilt kits are available. To assist the installation technicians in aligning the panels, an azimuth adjustment tool can be supplied (see Mechanical Accessories).

MTBF Statement

Traditionally, passive components like antennas cannot be well calculated due to the lack of a sufficient number of components in the MTBF library. Unfortunately, this constraint results in a very inaccurate calculation. Thus, such results are technically questionable and unrealistic. In essence, antennas are made out of mechanical parts that do not show any failure rates. Only available failure rates can be calculated into an MTBF value. Consequently such components cannot be listed in any MTBF library.

Remote Electrical Tilt System AISG Compliancy

Kathrein Mobile Communication hereby states that RET devices, as far as the functionality and features are described within the AISG / 3GPP standard, are compliant with the standard.

NGMN-P-BASTA

All antennas which are measured according to the specifications given in NGMN-P-BASTA White Paper Version 9.6/10.0 are clearly marked in the data sheet. Kathrein Mobile Communication is changing over more and more data sheets to NGMN-P-BASTA. The latest data sheets can be found on our website.

RET RFID Functionality

Kathrein Mobile Communication's latest Remote Control Unit (RCU) is equipped with an internal RFID reader. Most of our antennas are equipped with RFID tags in their spindles. With this, all relevant antenna data can automatically be read out by the RCU. Further information as well as an up-to-date list of the antennas can be found on our website. The according data sheets are marked by an RFID sign.

4.3-10 Connectors

Partly, Kathrein Mobile Communication's latest products are equipped with 4.3-10 connectors.

The advantages of this connector are:

- Reduced dimensions on the bottom plate for more installation space
- Improved PIM stability and performance
- Easier installation, lower tightening torque

The universal 4.3-10 jack can be used with 3 different connector types (screw type, push-pull type and hand screw type).

Downtilting of Antennas with external RCU: Downtilt Possibilities

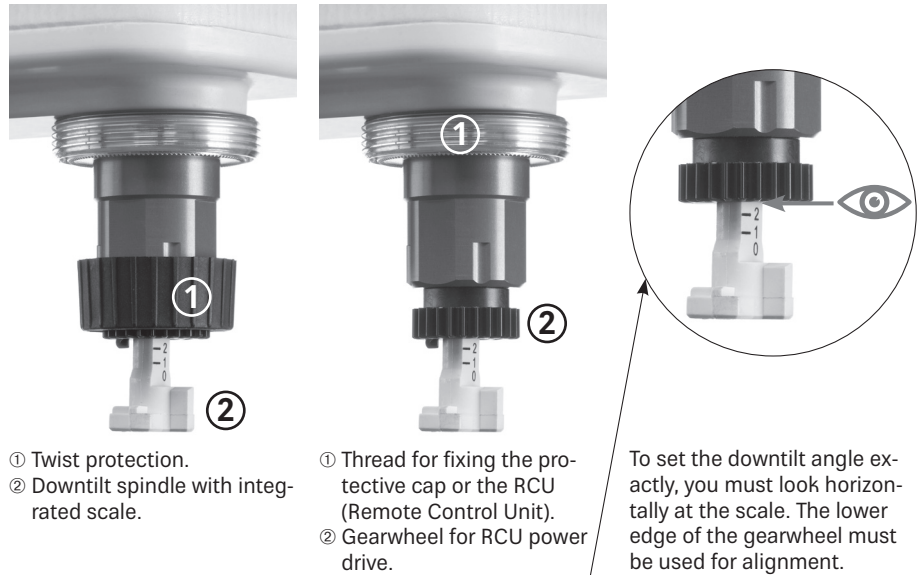
KATHREIN

Mechanical downtilt

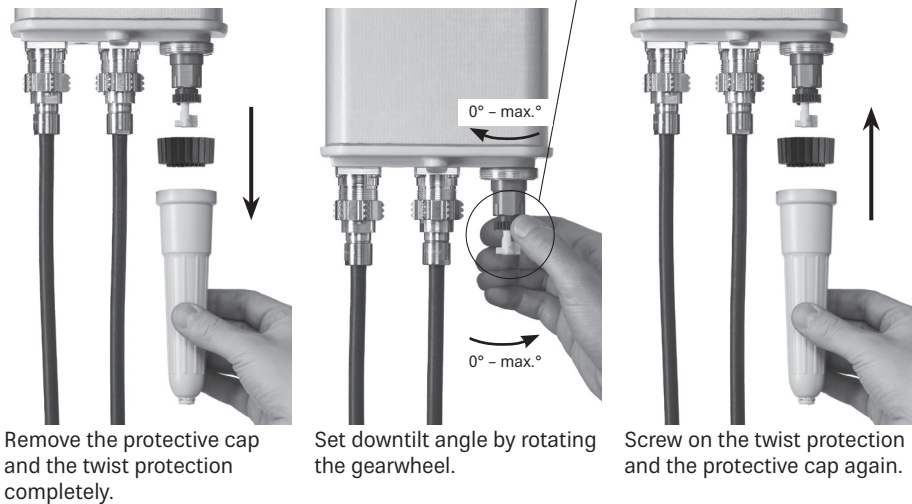
For further technical information please see "Mechanical Accessories", page 305.

Electrical downtilt

Description of the adjustment mechanism (protective cap removed):



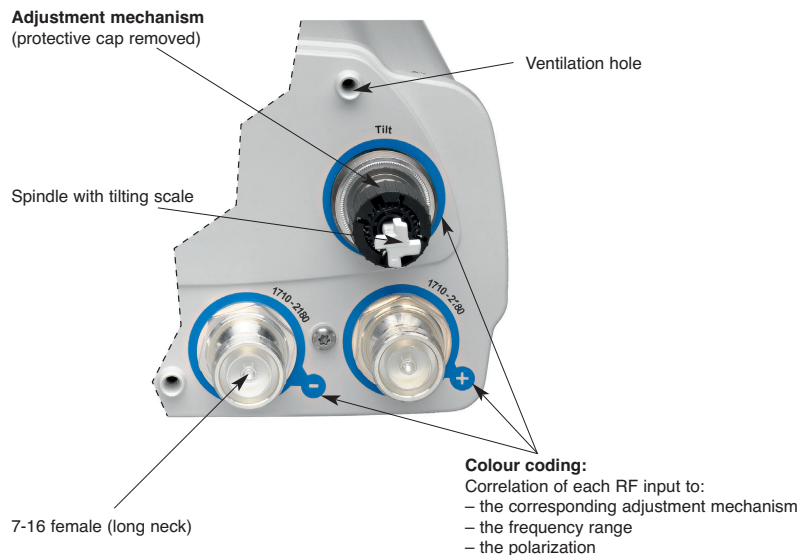
Manual adjustment procedure:



Remote Electrical Tilt (RET)

For further technical information please see "RET", pages 280 and 281.

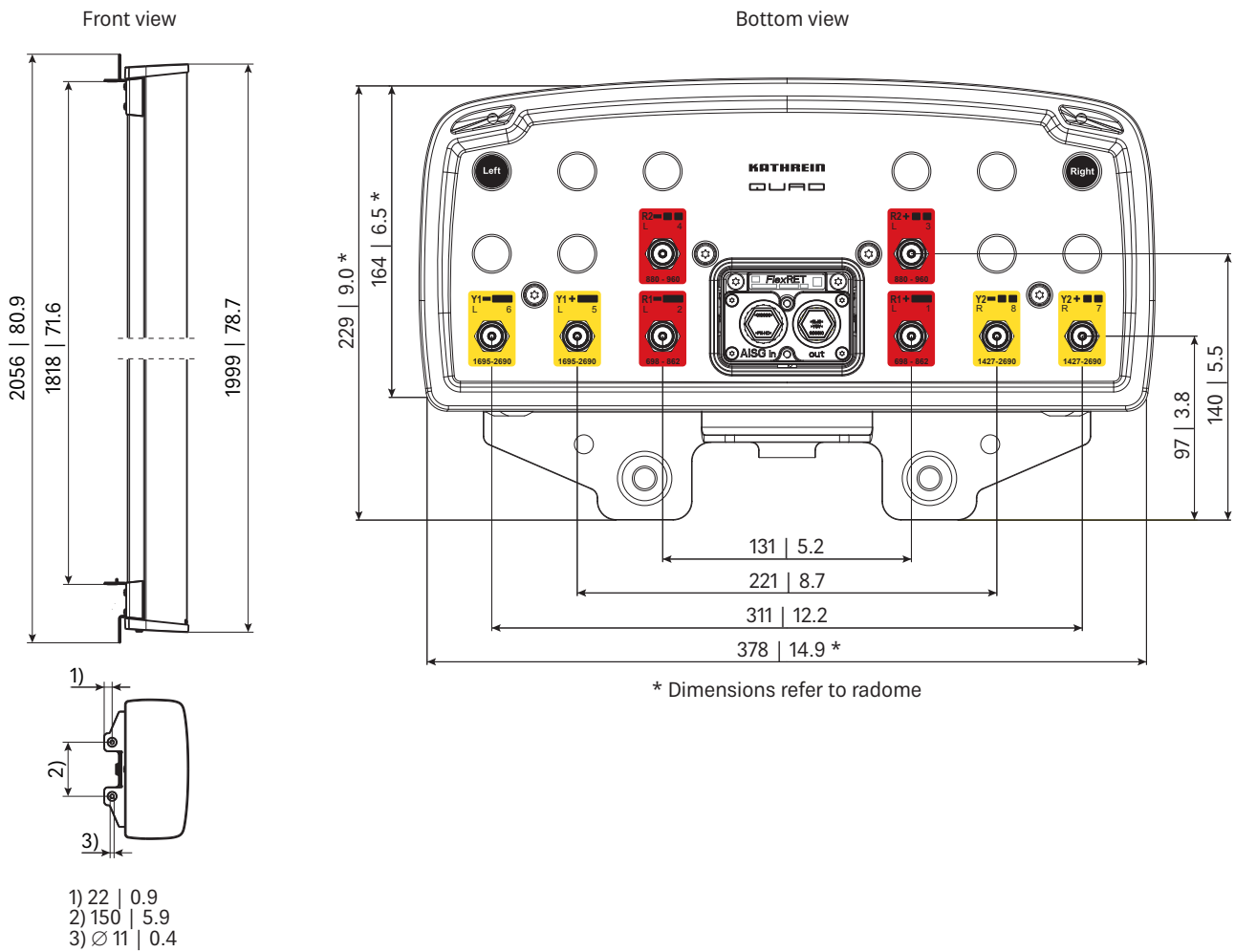
Description of bottom end cap (exemplary picture):



Antenna dimensions and detailed connector position can be found on our current data sheets. Please refer to the information on our latest data sheets which are available on our website:

www.kathrein.com

An example is shown below of how the antenna dimensions are displayed on our data sheets:



All dimensions in mm | inches

Catalogue 2020 → Alterations to the Catalogue of 2019

KATHREIN

Not longer in the catalogue 2020	Comments / Replacement
8-Port	
80040064	
80040066	
Small Cell	
80010713	
80010714	
80010745	
80010746	
80010775	
80010776	
RET (Remote Electrical Tilt)	
86010156	86010158
Mechanical Accessories	
85010008	85010009

Please note: New type numbers in the catalogue 2020 are shown and coloured in the respective register of the different antenna families.

All phased-out types will be available on request until end of 2020 unless otherwise announced.
According information can be found on our website: www.kathrein.com.

All phase-out dates which were already communicated during 2019 remain valid. This list is a general overview which shows the differences in the 2020 catalogue as compared to the 2019 version.

8-Port Antenna 2LB/2HB 1.4m 65° | 698-803 14dBi | 824-960 14.5dBi | 2x1695-2690 18dBi

Number of Ports	8
Frequency Range(s)	698-803 MHz 824-960 MHz 1695-2690 MHz
Length	1.4m
Horizontal Half-power Beam Width(s)	65°
Frequency Range in MHz and Gain Value	698-803 MHz 14dBi 824-960 MHz 14.5dBi 1695-2690 MHz 18dBi

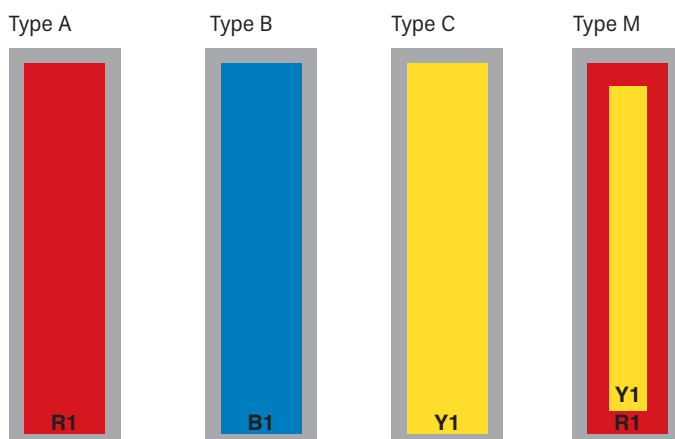
Summary – Directional Antennas

2 Ports

Dual Polarization $\pm 45^\circ$

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)					
1 x Lowband										
2-Port Antenna	790–960	30°	20.5dBi	0.5°–10°T	80010456v02	2254	7-16, rearside	24	A	
2-Port Antenna	790–960	65°	17.5dBi	0°–8°T	80010305v02	2254	7-16, rearside	25	A	
2-Port Antenna	790–960	65°	17.5dBi	0.5°–9.5°T	80010306v02	2574	7-16, bottom	26	A	
1 x Highband										
2-Port Antenna	1695–2690	35°	19.5dBi	2°–10°T	80010678	1272	7-16, bottom	27	C	
2-Port Antenna	1710–2690	65°	9.5dBi	0°T	80020711	155	4.3-10, bottom or top	260	C	
2-Port Antenna	1710–2690	65°	12dBi	4°T	80010761	278	7-16, bottom	28	C	
2-Port Antenna	1710–2690	65°	16.5dBi	0°–12°T	80010681	851	7-16, bottom	29	C	
2-Port Antenna	1710–2690	65°	18dBi	2°–14°T	ESLS	80010621v02	1452	7-16, bottom	30	C
2-Port Antenna	1710–2690	65°	19dBi	0°–6°T	80010651	1670	7-16, bottom	31	C	
2-Port Antenna	1710–2200	62°	21.2dBi	0°–6°T	HE	80010378	2548	7-16, bottom	32	B
1 x Lowband 1 x Highband										
2-Port Antenna	790–960 1710–2690	C	65° 65°	8dBi 9dBi	0°T 0°T	80010753	334	7-16, bottom	261	M

1) Configuration Types – further details on page 12–15.



Abbreviations:
 ESLS: Enhanced Side Lobe Suppression (above or below horizon)
 HE: High Efficiency (Antennas with high gain compared to length)
 C: Integrated Combiner

2-Port Antenna

R1

Frequency Range

790-960

HPBW

30°

KATHREIN

2-Port Antenna LB 2.3m 30° | 790-960 20.5dBi



Type No.		80010456v02		
Lowband		R1		
		790-960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Gain at 0° T	dBi	2 x 20.0	2 x 20.2	2 x 20.5
Horizontal Pattern:				
Half-power beam width	°	33	32	30
Front-to-back ratio, copolar	dB	> 28	> 29	> 30
Cross polar ratio Maindirection	0° dB	Typically: 25	Typically: 23	Typically: 20
Tracking, Avg.	dB	2.5		
Squint	°	±2.0		
Vertical Pattern:				
Half-power beam width	°	9.1	8.8	8.5
Electrical tilt	°	0.5 – 10, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0.5 ... 5 ... 10 > 16 ... 13 ... 13	0.5 ... 5 ... 10 > 18 ... 18 ... 17	0.5 ... 5 ... 10 > 18 ... 16 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Rearside	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1415 318 Maximal: 1555 350
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2254 / 576 / 99 88.7 / 22.7 / 3.9
Category of mounting hardware	H (Heavy)	
Weight	kg lb	22 / 24 (clamps incl.) 28.5 / 52.9 (clamps incl.)
Packing size	mm inches	2500 x 600 x 150 98.4 x 23.6 x 5.9
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

2-Port Antenna

R1

Frequency Range

790-960

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna LB 2.3m 65° | 790-960 17.5dBi



Type No.		80010305v02		
Lowband		R1		
		790-960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	16.8 ... 17.0 ... 16.7	16.9 ... 17.1 ... 16.9	17.2 ... 17.4 ... 17.0
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	69	67	65
Front-to-back ratio, copolar	dB	> 25	> 25	> 25
Cross polar ratio				
Main direction	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	Typically: > 10	Typically: > 10	Typically: > 10
Tracking, Avg.	dB	0.5		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	9.1	8.8	8.5
Electrical tilt	°	0–8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 2 ... 4 ... 8 18 ... 18 ... 18 ... 16	0 ... 2 ... 4 ... 8 18 ... 18 ... 18 ... 16	0 ... 2 ... 4 ... 8 20 ... 18 ... 17 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		800 (at 50 °C ambient temperature)		

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Rearside	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 770 173 Maximal: 845 190
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2254 / 259 / 99 88.7 / 10.2 / 3.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	11.5 / 13.5 (clamps incl.) 25.4 / 29.8 (clamps incl.)
Packing size	mm inches	2536 x 272 x 147 99.8 x 10.7 x 3.9
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

R1

Frequency Range

790-960

HPBW

65°

KATHREIN

2-Port Antenna LB 2.6m 65° | 790-960 17.5dBi



Type No.	80010306v02			
Lowband	R1			
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	17.1	17.2	17.4
Gain over all Tilts	dBi	17.1 ± 0.4	17.2 ± 0.2	17.4 ± 0.2
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.7	68 ± 1.6	65 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 22
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 23
Cross Polar Discrimination over Sector	dB	> 12.5	> 12.5	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.9 ± 0.4	7.8 ± 0.3	7.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.5 – 9.5		
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18
Cross Polar Isolation	dB	> 30		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	2 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 895 201 Maximal: 980 220
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2574 / 259 / 99 101.3 / 10.2 / 3.9
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	14.0 / 16.2 (clamps incl.) 30.9 / 35.7 (clamps incl.)
Packing Size	mm inches	2876 / 272 / 127 113.2 / 10.7 / 5.0
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

2-Port Antenna

Y1

Frequency Range

1695–2690

HPBW

35°

KATHREIN

2 Ports

2-Port Antenna HB 1.3m 35° | 1695–2690 19.5dBi



Type No.		80010678				
Highband		Y1, connector 1-2				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	18.6	19.2	19.4	19.8	19.6
Gain over all Tilts	dBi	18.5 ± 0.4	19.1 ± 0.3	19.4 ± 0.3	19.7 ± 0.5	19.5 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	43 ± 3.1	39 ± 1.7	38 ± 1.3	36 ± 0.7	33 ± 0.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 21	> 23	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 21	> 20	> 11
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 16.5	> 13.0	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.5	7.3 ± 0.2	7.1 ± 0.3	6.4 ± 0.3	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 21	> 22	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 19	> 19	> 18	> 14
Cross Polar Isolation	dB	> 28				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	400 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	2 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 410 92 Maximal: 450 101
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1272 / 235 / 69 50.1 / 9.3 / 2.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	9.2 / 11.4 (clamps incl.) 20.3 / 25.1 (clamps incl.)
Packing Size	mm inches	1617 / 257 / 103 63.7 / 10.1 / 4.1
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

Y1

Frequency Range

1710–2690

HPBW

65°

KATHREIN

2-Port Antenna HB 0.3m 65° | 1710–2690 12dBi

Type No.		80010761			
Highband		Y1			
		1710–2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	11	11.5	12.2	12.7
Horizontal Pattern:					
Half-power beam width	°	67	65	60	58
Front-to-back ratio, copolar	dB	> 30	> 28	> 28	> 27
Cross polar ratio					
Main direction	0°	Typically: > 20	Typically: > 20	Typically: > 20	Typically: > 20
Sector	±60°	> 8	> 8	> 8	> 8
Vertical Pattern:					
Half-power beam width	°	36	31	25	25
Electrical tilt	°	3, fixed	3, fixed	4, fixed	4, fixed
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 28			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			



Mechanical specifications

Input		2 x 7-16 female	
Connector position		Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	55 12
		Maximal:	55 12
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	278 / 154 / 69 10.9 / 6.1 / 2.7	
Category of mounting hardware		L (Light)	
Weight	kg lb	1.8 (tension bands incl.) 4.0 (tension bands incl.)	
Packing size	mm inches	375 x 172 x 92 14.8 x 6.8 x 39.1	
Scope of supply		Panel and 1 unit of tension bands for 45 – 125 mm 1.8 – 4.9 inches diameter	

2-Port Antenna

Y1

Frequency Range

1710-2690

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna HB 0.9m 65° | 1710-2690 16.5dBi



Type No.		80010681			
Highband		Y1			
		1710-2690			
Frequency range	MHz	1710 - 1990	1920 - 2200	2200 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain at 0° tilt	dBi	15.5	16.3	16.7	16.7
Horizontal Pattern:					
Half-power beam width	°	67	64	60	60
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 23	> 23
Cross polar ratio	0°	Typically: 25	Typically: 28	Typically: 28	Typically: 28
Sector	±60°	> 10	> 8	> 8	> 11
Vertical Pattern:					
Half-power beam width	°	10.8	9.9	8.8	8.4
Electrical tilt	°	0-12, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 6 ... 12 ≥ 12 ... 13 ... 15	0 ... 6 ... 12 ≥ 13 ... 14 ... 15	0 ... 6 ... 12 ≥ 13 ... 14 ... 16	0 ... 6 ... 12 ≥ 15 ... 15 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	250 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 140 31 Maximal: 155 35
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	851 / 155 / 70 33.5 / 6.1 / 2.8
Category of mounting hardware	L (Light)	
Weight	kg lb	5 / 5.2 (clamps incl.) 11.0 / 11.5 (clamps incl.)
Packing size	mm inches	1146 x 172 x 92 45.1 x 6.8 x 3.6
Scope of supply	Panel and 1 unit of tension bands for 45 - 125 mm 1.8 - 4.9 inches diameter	

2-Port Antenna Y1
Frequency Range 1710–2690
HPBW 65°

KATHREIN

2-Port Antenna HB 1.5 m 65° | 1710–2690 18dBi ESLs



Type No.		80010621v02			
Highband		Y1			
		1710–2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	17.4 ... 17.6 ... 17.5	17.9 ... 18.2 ... 18.1	18.4 ... 18.5 ... 18.5	18.5 ... 19.0 ... 18.5
Tilt	°	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
Horizontal Pattern:					
Half-power beam width	°	68	63	59	58
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25	> 25
Cross polar ratio	0°	Typically: 25	Typically: 24	Typically: 25	Typically: 25
Sector	±60°	> 10	> 10	> 10	> 10
Tracking, Avg.	dB	1.5			
Vertical Pattern:					
Half-power beam width	°°	6.7	6.0	5.3	5.0
Electrical tilt		2–14, continuously adjustable			
Sidelobe suppression	°T	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
– for first sidelobe above main beam	dB	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18
– within 0°–20° sector above horizon	dB	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 14
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. effective power per port	W	250 (at 50 °C ambient temperature)			
Max. effective power for the antenna		500 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 250 57 Maximal: 275 62
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1452 / 154 / 70 57.2 / 6.0 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	6.5 / 8.5 (clamps incl.) 4.3 / 18.7 (clamps incl.)
Packing size	mm inches	1725 x 172 x 92 7.9 x 6.8 x 3.6
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

Y1

Frequency Range

1710–2690

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna HB 1.7m 65° | 1710–2690 19dBi



Type No.		80010651			
Highband		Y1			
		1710–2690			
Frequency range	MHz	1710 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain at 0° tilt	dB	18.5	19.0	19.4	19.5
Horizontal Pattern:					
Half-power beam width	°	67	63	60	58
Front-to-back ratio (180°±30°)	dB	> 28	> 28	> 25	> 25
Cross polar ratio	0°	Typically: 25	Typically: 25	Typically: 25	Typically: 28
Sector	±60°	> 10	> 10	> 10	> 10
Tracking, Avg.	dB	1.5			
Squint	°	±3			
Vertical Pattern:					
Half-power beam width	°	5.4	4.9	4.3	4.0
Electrical tilt	°	0–6, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 ≥ 18 ... 18 ... 17	0 ... 3 ... 6 ≥ 18 ... 18 ... 16	0 ... 3 ... 6 ≥ 18 ... 18 ... 16	0 ... 3 ... 6 ≥ 18 ... 18 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. power per input	W	300 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 295 66 Maximal: 325 73
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1670 / 155 / 70 65.7 / 6.1 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	7 / 9.2 (clamps incl.) 15.4 / 20.3 (clamps incl.)
Packing size	mm inches	1934 x 172 x 92 76.1 x 6.8 x 3.6
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna B1
Frequency Range 1710–2200
HPBW 62°

KATHREIN

2-Port Antenna HB 2.5m 62° | 1710–2200 21.2dBi

Type No.		80010378		
Highband		B1		
		1710–2200		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 20.6	2 x 21.1	2 x 21.2
Horizontal Pattern:				
Half-power beam width	°	65	62	60
Front-to-back ratio (180°±30°)	dB	> 30	> 28	> 28
Cross polar ratio	0°	25	23	23
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	1.0		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	3.7	3.5	3.3
Electrical tilt	°	0–6, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 18 ... 18 ... 17	0 ... 3 ... 6 18 ... 17 ... 17	0 ... 3 ... 6 17 ... 17 ... 17
Null-fill at 0° tilt	dB	20	20	20
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	300 (at 50 °C ambient temperature)		



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 485 109 Maximal: 535 120
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2548 / 155 / 89 100.3 / 6.1 / 3.5
Category of mounting hardware	M (Medium)	
Weight	kg lb	13 / 15 (clamps incl.) 28.7 / 33.1 (clamps incl.)
Packing size	mm inches	2816 x 173 x 113 110.9 x 6.8 x 4.4
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

Summary – Directional Antennas

4 Ports

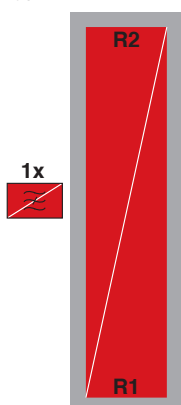
Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband									
4-Port Antenna	698–862	65°	14.5dBi	2°–16°T	80010887	1459	4.3-10, bottom	37	D
	880–960	65°	15dBi	2°–16°T					
4-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80010888	1999	4.3-10, bottom	38	D
	880–960	65°	16dBi	2°–12°T					
4-Port Antenna	698–862	65°	16.5dBi	1°–10°T	80010889	2438	4.3-10, bottom	39	D
	880–960	65°	17dBi	1°–10°T					
4-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80010901	1999	4.3-10, bottom	40 + 41	E
	698–960	65°	15.5dBi	2°–12°T					
4-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010902	2438	4.3-10, bottom	42 + 43	E
	698–960	65°	16.5dBi	1°–10°T					
4-Port Antenna	790–960	65°	17.5dBi	0°–8°T	80010647v01	2254	7-16, rearside	44	E
	790–960	65°	17.5dBi	0°–8°T					
4-Port Antenna	790–960	90°	16dBi	0°–8°T	80010817	2631	7-16, bottom	45	E
	790–960	90°	16dBi	0°–8°T					

1) Configuration Types – further details on page 12–15.

Type D



Type E



Summary – Directional Antennas

4 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband 1 x Highband									
4-Port Antenna	698–960 1695–2690	65° 65°	10.5dBi 13.5dBi	2°T 2°T	80010715	603	4.3-10, bottom	46 + 47	M
4-Port Antenna	790–960 1710–2170	65° 60°	12dBi 14dBi	0°T 0°T	742226v01	579	7-16, bottom or top	48 + 49	L
4-Port Antenna	790–960 1710–2690	65° 65°	15dBi 17.5dBi	0°–16°T 2°–10°T	80010664	1403	7-16, bottom	50 + 51	M
4-Port Antenna	790–960 1710–2690	65° 65°	16dBi 18.5dBi	0°–10°T 2°–8°T	80010665v01	1997	7-16, bottom	52 + 53	M
4-Port Antenna	698–960 1710–2690	65° 65°	17dBi 18.5dBi	1.5°–10°T 2°–8°T	80010666v01	2622	7-16, bottom	54 + 55	M
4-Port Antenna	790–960 1710–2180	90° 90°	16.5dBi 18dBi	0.5°–7°T 0°–6°T	80010123v03	2635	7-16, bottom	56 + 57	L

4 Ports

1) Configuration Types – further details on page 12–15.

Type L



Type M



Summary – Directional Antennas

4 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)
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2 x Highband

4-Port Antenna	1710–2690	65°	16.5dBi	0°–12°T	80010682	855	7-16, bottom	58	F
	1710–2690	65°	16.5dBi	0°–12°T					
4-Port Antenna	1695–2690	65°	18dBi	2°–14°T	80020622	1471	4.3-10, bottom	59 + 60	F
	1695–2690	65°	18dBi	2°–14°T					
4-Port Antenna	1710–2690	65°	19dBi	0°–10°T	80010652	1668	7-16, bottom	61	F
	1710–2690	65°	19dBi	0°–10°T					

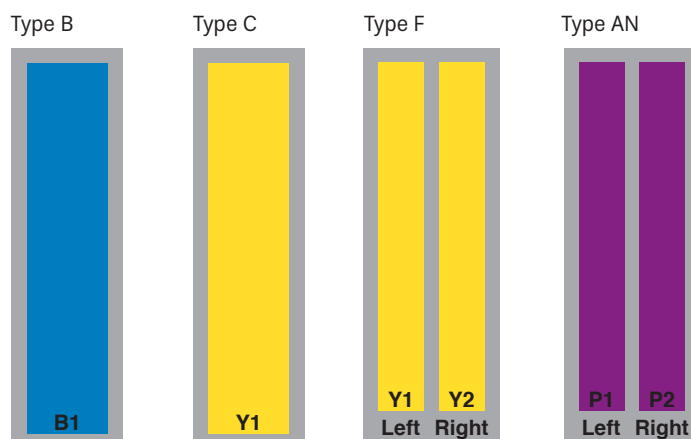
2 x Highband Special Design

4-Port MicroCell	1695–2690	85°	7.5dBi	0°T	80010843	526	4.3-10, bottom and top	264	C/C
	1695–2690	85°	7.5dBi	0°T					
4-Port Dual-Beam	1710–2200	45° (–30°)	19.5dBi	0°–10°T	80010606v01	1314	7-16, bottom	62 + 63	B/B
	1710–2200	45° (+30°)	19.5dBi	0°–10°T					
4-Port Dual-Beam	1695–2690	35° (–30°)	19.5dBi	2°–10°T	80010656	1254	7-16, bottom	64 + 65	C/C
	1695–2690	35° (+30°)	19.5dBi	2°–10°T					

2 x 3.5 GHz

4-Port Antenna	3300–3800	65°	17.5dBi	2°–12°T	80010922	970	4.3-10, bottom	66 + 67	AN
	3300–3800	65°	17.5dBi						

1) Configuration Types – further details on page 12–15.



Abbreviations:
ESLS: Enhanced Side Lobe Suppression
(above or below horizon)

4-Port Antenna

R1	R2
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KATHREIN

Frequency Range

698-862	880-960
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HPBW

65°	65°
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4-Port Antenna 2LB 1.5 m 65° | 698-862 14.5dBi | 880-960 15dBi



FlexRET

Type No.		80010887		
Lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	14.2	14.6	15.0
Gain over all Tilts	dBi	14.1 ± 0.5	14.5 ± 0.6	14.8 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.7	62 ± 3.6	61 ± 1.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	14.6 ± 1.5	13.2 ± 0.7	12.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0
Tilt Accuracy	°	< 0.7	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 14	> 14
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2)		> 28 (R2 // R1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



4 Ports

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1459 / 377 / 169 57.4 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	22.0 / 24.2 (clamps incl.) 48.5 / 53.4 (clamps incl.)
Packing Size	mm inches	1620 / 397 / 212 63.8 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698-862 **880-960**

HPBW

65° **65°**

4-Port Antenna 2LB 2.0m 65° | 698-862 15.5 dBi | 880-960 16dBi



FlexRET

Type No.		80010888		
Lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	15.5	15.9	16.4
Gain over all Tilts	dBi	15.4 ± 0.5	15.8 ± 0.3	16.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.7	63 ± 1.0	61 ± 1.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 24	> 26	> 23
Vertical Pattern:				
Elevation Beamwidth	°	10.7 ± 0.7	10.0 ± 0.5	9.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 20	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 20	> 19
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2)		> 28 (R2 // R1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	28.2 / 32.7 (clamps incl.) 62.2 / 72.1 (clamps incl.)
Packing Size	mm inches	2200 / 412 / 255 86.6 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and 1 unit of clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698-862 **880-960**

HPBW

65° **65°**

4-Port Antenna 2LB 2.4m 65° | 698-862 16.5dBi | 880-960 17dBi



FlexRET

Type No.		80010889		
Lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	16.1	16.7	17.4
Gain over all Tilts	dBi	16.1 ± 0.5	16.7 ± 0.4	17.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	65 ± 2.2	62 ± 1.5	59 ± 1.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 23	> 25
Cross Polar Discrimination at Boresight	dB	> 25	> 25	> 23
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	8.9 ± 0.7	8.0 ± 0.6	7.3 ± 0.6
Electrical Downtilt continuously adjustable	°	1.0 – 10.0		1.0 – 10.0
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 15	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 30 (R1 // R2)		> 30 (R2 // R1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1140 256 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 378 / 164 96.0 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	33.9 / 38.4 (clamps incl.) 74.7 / 84.7 (clamps incl.)
Packing Size	mm inches	2640 / 412 / 255 103.9 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698-960 **698-960**

HPBW

65° **65°**

4-Port Antenna 2LB 2.0m 65° | 2x698-960 15.5dBi



FlexRET

Type No.		80010901			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.5	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

80010901

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Cross Polar Discrimination over Sector	dB	> 8.0	> 12.5	> 13.0	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	38.3 / 42.8 (clamps incl.) 84.4 / 94.4 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna Frequency Range HPBW

R1	R2
698-960	698-960
65°	65°

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4-Port Antenna 2LB 2.4m 65° | 2x698-960 16.5dBi



FlexRET

Type No.		80010902			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.6 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 10.0	> 9.5	> 10.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.8 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010902

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.5	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.5	> 10.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 0.5	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	9.9 ± 0.7	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1400 315 Maximal: 1405 316
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 508 / 175 96.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	47.0 / 52.0 (clamps incl.) 103.6 / 114.6 (clamps incl.)
Packing Size	mm inches	2635 / 542 / 268 103.7 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and 1 unit of clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna Frequency Range HPBW

R1	R2
790-960	790-960
65°	65°

KATHREIN



4-Port Antenna 2LB 2.3m 65° | 2x790-960 17.5dBi

Type No.	80010647v01			
Lowbands	R1; R2			
	790-960			
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	16.9 ... 17.1 ... 17.0	17.0 ... 17.2 ... 17.1	17.3 ... 17.4 ... 17.1
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	66	65	64
Front-to-back ratio, copolar	dB	> 27	> 27	> 27
Cross polar ratio	dB			
Main direction	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	Typically: > 10	Typically: > 10	Typically: > 10
Tracking, Avg.	dB	1.0		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	9.1	9.0	8.5
Electrical tilt	°	0-8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	°T dB	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	400 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	1415 318
		Maximal:	1555 350
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2254 / 576 / 99 88.7 / 22.7 / 3.9	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	24 / 26 (clamps incl.) 52.9 / 57.3 (clamps incl.)	
Packing size	mm inches	2500 x 600 x 150 98.4 x 23.6 x 5.9	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

790-960 **790-960**

HPBW

90° **90°**

4-Port Antenna 2LB 2.6m 90° | 2x790-960 16dBi



Type No.		80010817		
Lowbands		R1; R2		
		790-960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain (dBi)	dBi	15.4 ... 15.4 ... 15.0	15.7 ... 15.7 ... 15.4	16.0 ... 16.1 ... 15.9
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	93	90	87
Front-to-back ratio (180°±0°)	dB	> 24	> 24	> 25
Front-to-back ratio (180°±30°)	dB	> 20	> 21	> 22
Cross polar ratio	0°	Typically: 20	Typically: 20	Typically: 18
Sector	±60°	> 10	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	7.4	7.2	6.9
Electrical tilt	°	0–8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 4 ... 8 ≥ 17 ... 17 ... 15	0 ... 4 ... 8 ≥ 17 ... 17 ... 15	0 ... 4 ... 8 ≥ 17 ... 17 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	Intrasystem: > 27, Intersystem: > 27		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		1200 (at 50 °C ambient temperature)		



4 Ports

Mechanical specifications		
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 840 189 Maximal: 925 208
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2631 / 374 / 106 103.6 / 14.7 / 4.2
Category of mounting hardware	H (Heavy)	
Weight	kg lb	23 / 25 (clamps incl.) 50.7 / 55.1 (clamps incl.)
Packing size	mm inches	3055 x 133 x 388 120.0 x 5.2 x 15.3
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1	Y1
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KATHREIN

Frequency Range

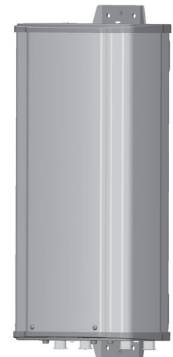
698-960	1695-2690
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HPBW

65°	65°
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4-Port Antenna LB/HB 0.6m 65° | 698-960 10.5dBi | 1695-2690 13.5dBi

Type No.		80010715		
Lowband		R1, connector 1-2		
		698-960		
Frequency range	MHz	698 - 824 MHz	824 - 894 MHz	880 - 960 MHz
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	10.1	10.6	10.7
Horizontal Pattern:				
Half-power beam width	°	70	69	69
Front-to-back ratio Total power, ± 30°	dB	> 23	> 25	> 25
Cross polar ratio Maindirection Sector	0° ±60° dB	Typically: 25 > 8	Typically: 28 > 10	Typically: 28 > 10
Vertical Pattern:				
Half-power beam width	°	40	36	35
Electrical tilt	°	2, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 27, typ. > 30	> 30	> 28, typ. > 30
Isolation: Intersystem	dB	> 26, typ. > 30 (R1 // Y1)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna		400 (at 50 °C ambient temperature)		



80010715

Highband		Y1, connector 3-4				
		1695-2690				
Frequency range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2200 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	13.1	13.7	13.7	13.8	13.6
Horizontal Pattern:						
Half-power beam width	°	62	55	55	55	68
Front-to-back ratio Total power, ± 30°	dB	> 26	> 27	> 27	> 27	> 25
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: 25 > 10	28 > 10	28 > 10	25 > 10	28 > 10
Vertical Pattern:						
Half-power beam width	°	17.6	16.7	15.9	14.5	12.4
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation: Intrasystem	dB	> 26, typ. > 31			> 30, typ. > 31	
Isolation: Intersystem	dB	> 30 (Y1 // R1)				
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)				
Max. effective power per port Max. effective power for the antenna	W	200 (at 50 °C ambient temperature) 400 (at 50 °C ambient temperature)				
Total power for the antenna	W	800 (at 50 °C ambient temperature)				

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector position	Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 110 25 Maximal: 170 38
Max. wind velocity	km/h mph	241 150
Height/width/depth	mm inches	603 / 300 / 152 23.7 / 11.8 / 6.0
Category of mounting hardware	M (Medium)	
Weight	kg lb	8.5 / 10.7 (clamps incl.) 18.7 / 23.6 (clamps incl.)
Packing size	mm inches	845 x 325 x 193 33.3 x 12.8 x 7.6
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range

790-960 **1710-2170**

HPBW

65° **60°**

4-Port Antenna LB/HB 0.6m 65°/60° | 790-960 12dBi | 1710-2170 14dBi

Type No.		742226v01		
Lowband		R1		
		790-960		
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 11.1	2 x 11.4	2 x 11.8
Horizontal Pattern:				
Half-power beam width		68	67	65
Front-to-back ratio (180°±30°)	dB	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60° dB	Typically: 25 > 10	Typically: 25 > 10	Typically: 25 > 10
Tracking, Avg.	dB	1.0		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	34	33	30
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2170 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		



742226v01

Highband		B1		
		1710-2170		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 12.8	2 x 13.3	2 x 13.6
Horizontal Pattern:				
Half-power beam width	°	66	60	60
Front-to-back ratio (180°±30°)	dB	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: 16 > 10	dB Typically: 18 > 10	dB Typically: 20 > 10
Tracking, Avg.	dB	0.5		
Squint	°	±1.5		
Vertical Pattern:				
Half-power beam width	°	20	18	17.5
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2170 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	200 (at 50 °C ambient temperature)		

Mechanical specifications			
Input		4 x 7-16 female	
Connector position		Bottom or top	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	125 28
		Maximal:	135 30
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	579 / 262 / 139 22.8 / 10.3 / 5.5	
Category of mounting hardware		M (Medium)	
Weight	kg lb	7.5 / 9.5 (clamps incl.) 16.5 / 20.9 (clamps incl.)	
Packing size	mm inches	756 x 282 x 172 29.8 x 11.1 x 6.8	
Scope of supply		Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

* Inverted mounting:
Connector position top: Change drain hole screw.

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

790-960 **1710-2690**

HPBW

65° **65°**

4-Port Antenna LB/HB 1.4m 65° | 790-960 15dBi | 1710-2690 17.5dBi



Type No.		80010664		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	14.5 ... 14.4 ... 14.2	14.6 ... 14.5 ... 14.3	14.8 ... 14.6 ... 14.4
Tilt	°	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 8 ... 16
Horizontal Pattern:				
Half-power beam width	°	69	68	67
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio				
Maindirection	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	> 10	> 9	> 8
Vertical Pattern:				
Half-power beam width	°	16.5	16.0	15.5
Electrical tilt	°	0-16, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	° T dB	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 15 ... 15 ... 14
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 30 (698-960 // 1710-2690 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	300 (at 50 °C ambient temperature)		
Max. effective power for the antenna		600 (at 50 °C ambient temperature)		



80010664

Highband		Y1, connector 3-4				
		1710-2690				
Frequency range	MHz	1710 - 1880	1850 - 1990	1920 - 2170	2300 - 2400	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.2 ... 17.3 ... 16.8	17.4 ... 17.4 ... 16.9	17.6 ... 17.7 ... 17.0	17.0 ... 16.8 ... 16.0	17.2 ... 17.3 ... 16.7
Tilt	°	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10
Horizontal Pattern:						
Half-power beam width	°	63	64	66	73	65
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 28	> 29	> 26	> 25
Cross polar ratio	dB	Typically: 18	20	20	23	23
Main direction	0°	> 9	> 10	> 10	> 10	> 8
Sector	±60°					
Vertical Pattern:						
Half-power beam width	°	6.2	5.8	5.6	5.4	4.8
Electrical tilt	°	2 - 10, continuously adjustable				
Sidelobe suppression for first sidelobe above main beam	°T dB	2 ... 6 ... 10 14 ... 15 ... 16	2 ... 6 ... 10 14 ... 15 ... 17	2 ... 6 ... 10 15 ... 16 ... 17	2 ... 6 ... 10 17 ... 18 ... 18	2 ... 6 ... 10 15 ... 17 ... 18
Impedance	Ω	50				
VSWR		< 1.5				
Isolation: Intrasystem	dB	> 28				> 30
Isolation: Intersystem	dB	> 30 (790-960 // 1710-2690 MHz)				
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)				
Max. effective power per port	W	200 (at 50 °C ambient temperature)				
Max. effective power for the antenna		400 (at 50 °C ambient temperature)				

Mechanical specifications		
Input	4 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 260 58 Maximal: 415 93
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	1403 / 300 / 152 55.2 / 11.8 / 6.0
Category of mounting hardware	M (Medium)	
Weight	kg lb	18 / 20 (clamps incl.) 39.7 / 44.1 (clamps incl.)
Packing size	mm inches	1726 x 322 x 190 68.0 x 12.7 x 7.5
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

790-960 **1710-2690**

HPBW

65° **65°**

4-Port Antenna LB/HB 2.0m 65° | 790-960 16dBi | 1710-2690 18.5dBi



Type No.		80010665v01		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.1	16.2	16.2
Gain over all Tilts	dBi	15.9 ± 0.3	16.1 ± 0.2	16.1 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 0.9	68 ± 1.2	67 ± 0.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 20
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.0	> 11.0
Vertical Pattern:				
Elevation Beamwidth	°	10.1 ± 0.4	9.9 ± 0.3	9.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 18	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 18	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R1 // Y1)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010665v01

Highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.2	18.5	18.8	18.8	18.7
Gain over all Tilts	dBi	18.1 ± 0.5	18.4 ± 0.2	18.7 ± 0.5	18.7 ± 0.6	18.5 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.4	63 ± 2.7	61 ± 3.6	62 ± 5.7	64 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 27	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 14	> 19	> 20	> 18	> 20
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 10.0	> 10.0	> 11.5
Vertical Pattern:						
Elevation Beamwidth	°	5.0 ± 0.3	4.7 ± 0.2	4.4 ± 0.3	3.8 ± 0.2	3.5 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 8.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (R1 // Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	24.0 / 26.2 (clamps incl.) 52.9 / 57.8 (clamps incl.)
Packing Size	mm inches	2316 / 322 / 190 91.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

698-960 **1710-2690**

HPBW

65° **65°**

4-Port Antenna LB/HB 2.6m 65° | 698-960 17dBi | 1710-2690 18.5dBi



Type No.		80010666v01			
Lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.0	16.6	16.9	17.1
Gain over all Tilts	dBi	16.0 ± 0.5	16.5 ± 0.4	16.8 ± 0.4	17.0 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	68 ± 1.0	68 ± 0.9	67 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 23	> 22	> 22	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.5	> 9.5	> 8.5
Vertical Pattern:					
Elevation Beamwidth	°	8.4 ± 0.7	7.7 ± 0.4	7.5 ± 0.4	7.0 ± 0.3
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010666v01

Highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.0	18.5	18.8	18.6	19.0
Gain over all Tilts	dBi	18.0 ± 0.4	18.5 ± 0.4	18.7 ± 0.4	18.5 ± 0.7	18.8 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.4	62 ± 2.9	62 ± 2.2	60 ± 4.8	60 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 27	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 18	> 20	> 16	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 11.0	> 11.0	> 10.0	> 9.5
Vertical Pattern:						
Elevation Beamwidth	°	5.0 ± 0.4	4.7 ± 0.2	4.4 ± 0.4	3.9 ± 0.2	3.5 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 8.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 20	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 16	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (R1 // Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 530 119 Maximal: 845 190
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2622 / 300 / 152 103.2 / 11.8 / 6.0
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	26.5 / 28.7 (clamps incl.) 58.4 / 63.3 (clamps incl.)
Packing Size	mm inches	2951 / 322 / 190 116.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range

790-960 **1710-2180**

HPBW

90° **90°**

4-Port Antenna LB/HB 2.6m 90° | 790-960 16.5dBi | 1710-2180 18dBi



Type No.		80010123v03		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	16.1 ... 16.2 ... 16.1	16.3 ... 16.4 ... 16.3	16.5 ... 16.6 ... 16.5
Tilt	°	0.5 ... 4 ... 7	0.5 ... 4 ... 7	0.5 ... 4 ... 7
Horizontal Pattern:				
Half-power beam width	°	86	86	86
Front-to-back ratio, copolar	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction		18	18	20
Sector	dB	> 10	> 10	> 13
		avg. 16	avg. 16	avg. 19
Tracking, Avg.	dB	0.5		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	7.3	7.2	6.9
Electrical tilt	°	0.5-7, continuously adjustable		
Min. sidelobe supression for first sidelobe above main beam	°T dB	0.5 ... 4 ... 7 15 ... 14 ... 14	0.5 ... 4 ... 7 15 ... 14 ... 14	0.5 ... 4 ... 7 15 ... 14 ... 15
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		
Total power		1000 (at 50 °C ambient temperature)		



80010123v03

Highband		B1, connector 3-4		
		1710-2180		
Frequency range	MHz	1710 - 1880	1850 - 1990	1920 - 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.8 ... 17.7 ... 17.4	18.0 ... 17.9 ... 17.4	17.9 ... 17.8 ... 17.3
Tilt	°	0 ... 3 ... 6	0 ... 3 ... 6	0 ... 3 ... 6
Horizontal Pattern:				
Half-power beam width	°	84	85	88
Front-to-back ratio (180°±30°)	dB	> 23	> 23	> 23
Cross polar ratio Maindirection Sector	0° ±60° ±60°	Typically: 16 > 10 avg. 16	Typically: 16 > 12 avg. 17	Typically: 15 > 10 avg. 18
Tracking, Avg.	dB	0.5		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	4.8	4.5	4.2
Electrical tilt	°	0-6, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 18 ... 17 ... 16	0 ... 3 ... 6 18 ... 17 ... 17	0 ... 3 ... 6 18 ... 16 ... 17
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		
Total power		500 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	4 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment Mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	680 153
		Maximal:	750 169
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	2635 / 262 / 149 103.7 / 10.3 / 5.9	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	33.0 / 35.0 (clamps incl.) 72.8 / 77.2 (clamps incl.)	
Packing size	mm inches	2966 x 282 x 182 116.8 x 11.1 x 7.2	
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna

Y1 Y2

KATHREIN

Frequency Range 1710-2690 1710-2690

HPBW 65° 65°

4-Port Antenna 2 HB 0.9m 65° | 2x1710-2690 16.5dBi



Type No.		80010682			
Highband		Y1; Y2			
		1710-2690			
Frequency range	MHz	1710 - 1990	1920 - 2200	2200 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain at 0° tilt	dBi	15.8	16.2	16.6	16.7
Horizontal Pattern:					
Half-power beam width	°	65	64	60	61
Front-to-back ratio, copolar	dB	> 30	> 30	> 30	> 28
Cross polar ratio	0°	Typically: 25	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	> 8	> 8	> 10	> 10
Vertical Pattern:					
Half-power beam width	°	11	10	9	8.7
Electrical tilt	°	0-12, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	°T	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12
	dB	≥ 12 ... 13 ... 15	≥ 13 ... 14 ... 16	≥ 13 ... 15 ... 16	≥ 15 ... 15 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. eff. power per port	W	200 (at 50 °C ambient temperature)			
Max. eff. power for the antenna		600 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 345 78 Maximal: 380 85
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	855 / 315 / 71 33.7 / 12.4 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	11 / 13.2 (clamps incl.) 24.3 / 29.1 (clamps incl.)
Packing size	mm inches	1146 x 337 x 112 45.1 x 13.3 x 4.4
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

Y1 **Y2**

KATHREIN

Frequency Range **1695-2690** **1695-2690**

HPBW **65°** **65°**

4-Port Antenna 2HB 1.5m 65° | 2x1695-2690 18dBi ESLS



Type No.		80020622			
Left side, highband		Y1, connector 1-2			
		1695-2690			
Frequency Range	MHz	1695 – 1880	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	18.0	18.6	18.8
Gain over all Tilts	dBi	17.3 ± 0.4	17.9 ± 0.4	18.3 ± 0.4	18.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 3.2	63 ± 2.6	60 ± 3.5	56 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 26	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 18
Cross Polar Discrimination over Sector	dB	> 12.5	> 10.0	> 9.5	> 13.0
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.5	6.1 ± 0.5	5.2 ± 0.3	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 20	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 17	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (Y1 // Y2)			
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y1	W	500 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Data sheet continued on next page.

80020622

Right side, highband		Y2, connector 3-4 1695-2690			
Frequency Range	MHz	1695 – 1880	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.2	17.9	18.6	18.9
Gain over all Tilts	dBi	17.1 ± 0.4	17.8 ± 0.5	18.4 ± 0.4	18.7 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	68 ± 3.8	64 ± 4.1	59 ± 2.6	55 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 19
Cross Polar Discrimination over Sector	dB	> 13.5	> 11.0	> 9.5	> 12.0
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.4	6.0 ± 0.5	5.2 ± 0.3	4.8 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 17	> 17	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (Y2 // Y1)			
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y2	W	500 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	-45, +45
Max. Effective Power for the Antenna	W	700 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 565 127 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1471 / 275 / 86 57.9 / 10.8 / 3.4
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	13.0 / 15.2 (clamps incl.) 28.7 / 33.5 (clamps incl.)
Packing Size	mm inches	1791 / 298 / 119 70.5 / 11.7 / 4.7
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

Y1 Y2

KATHREIN

Frequency Range

1710-2690 1710-2690

HPBW

65° 65°

4-Port Antenna 2HB 1.7m 65° | 2x1710-2690 19dBi



Type No.		80010652			
Highbands		Y1; Y2			
		1710-2690			
Frequency range	MHz	1710 - 1990	1920 - 2200	2200 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	18.2 ... 18.4 ... 18.0	18.7 ... 18.9 ... 18.4	18.8 ... 19.0 ... 18.3	18.7 ... 19.0 ... 18.3
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:					
Half-power beam width	°	65	65	62	65
Front-to-back ratio, copolar	dB	> 30	> 26	> 28	> 26
Cross polar ratio	0°	Typically: 22	Typically: 22	Typically: 22	Typically: 20
Sector	±60°	> 10	> 10	> 10	> 10
Vertical Pattern:					
Half-power beam width	°	5.5	5.0	4.3	4.0
Electrical tilt	°	0-10, continuously adjustable			
Sidelobe suppression	° T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
for first sidelobe above main beam	dB	≥ 18 ... 16 ... 15	≥ 18 ... 16 ... 15	≥ 18 ... 16 ... 15	≥ 18 ... 15 ... 15
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. effective power per port	W	250 (at 50 °C ambient temperature)			
Max. effective power for the antenna		500 (at 50 °C ambient temperature)			



4 Ports

Mechanical specifications		
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 705 158 Maximal: 775 174
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1668 / 315 / 71 65.7 / 12.4 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	17 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing size	mm inches	1961 x 337 x 112 77.2 x 14.8 x 4.4
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Dual-Beam B1 B2
Frequency Range 1710-2200 1710-2200
HPBW 45° 45°

KATHREIN

4-Port Dual-Beam Antenna 2HB 1.3m 45° | 1710-2200 19.5dBi



Type No.		80010606v01		
Left side, highband		B1, connector 1-2		
		1710-2200		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Gain at mid Tilt	dBi	19.0	19.1	19.4
Gain over all Tilts	dBi	18.9 ± 0.2	19.0 ± 0.2	19.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	47 ± 1.1	46 ± 1.1	44 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 26
Cross Polar Discrimination over Sector	dB	> 9.0	> 8.5	> 10.5
Azimuth Beam Squint	°	-0.5 ± 1.2	0.0 ± 1.2	0.0 ± 0.9
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.2 ± 0.1	7.0 ± 0.1	6.7 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 22	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // B2)		
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010606v01

Right side, highband		B2, connector 3-4		
		1710-2200		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Gain at mid Tilt	dBi	19.0	19.1	19.4
Gain over all Tilts	dBi	18.9 ± 0.2	19.0 ± 0.2	19.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	48 ± 1.6	47 ± 1.5	44 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 26	> 26
Cross Polar Discrimination over Sector	dB	> 9.0	> 9.5	> 10.0
Azimuth Beam Squint	°	0.0 ± 1.4	0.5 ± 1.2	1.0 ± 0.8
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.2 ± 0.1	7.0 ± 0.1	6.7 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 22	> 20
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // B2)		
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)		
Max. Effective Power Ports B2	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 385 87 Maximal: 420 94
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1314 / 381 / 151 51.7 / 15.0 / 5.9
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	19.0 / 21.2 (clamps incl.) 41.9 / 46.7 (clamps incl.)
Packing Size	mm inches	1696 / 402 / 172 66.8 / 15.8 / 6.8
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Dual-Beam Y1 Y2
Frequency Range 1695-2690 1695-2690
HPBW 35° 35°

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4-Port Dual-Beam Antenna 2HB 1.3m 35° | 2x 1695-2690 19.5dBi



Type No.		80010656				
Left side, highband		Y1, connector 1-2				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2170	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	18.7	19.2	19.5	19.7	19.5
Gain over all Tilts	dBi	18.6 ± 0.5	19.1 ± 0.3	19.4 ± 0.4	19.6 ± 0.5	19.4 ± 1.1
Horizontal Pattern:						
Azimuth Beamwidth	°	41 ± 1.8	38 ± 1.7	37 ± 1.2	36 ± 2.0	33 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 23	> 24	> 23
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 17.0	> 13.5	> 8.0
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.6	7.4 ± 0.2	7.1 ± 0.3	6.4 ± 0.4	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 10.0				
Tilt Accuracy	°	< 0.5	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 19	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010656

Right side, highband		Y2, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.6	19.1	19.4	19.7	19.6
Gain over all Tilts	dBi	18.5 ± 0.5	19.0 ± 0.5	19.3 ± 0.5	19.6 ± 0.6	19.5 ± 1.0
Horizontal Pattern:						
Azimuth Beamwidth	°	41 ± 1.9	38 ± 2.3	37 ± 1.3	35 ± 1.0	33 ± 1.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 22	> 25	> 23
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 17.0	> 13.5	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.6	7.4 ± 0.3	7.1 ± 0.4	6.4 ± 0.4	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.7	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 20	> 20	> 19	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 430 97 Maximal: 465 105
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1254 / 381 / 151 49.4 / 15.0 / 5.9
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	17.0 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing Size	mm inches	1696 / 402 / 172 66.8 / 15.8 / 6.8
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

P1 **P2**

KATHREIN

Frequency Range **3300-3800** **3300-3800**

HPBW **65°** **65°**

4-Port Antenna 2x3300-3800 1.0m 65° | 2x3300-3800 17.5dBi



Type No.		80010922	
Left side, highband		P1, connector 1-2	
		3300-3800	
Frequency Range	MHz	3300 – 3590	3600 – 3800
Gain at mid Tilt	dBi	17.5	17.6
Gain over all Tilts	dBi	17.3 ± 0.4	17.4 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	66 ± 4.6	63 ± 4.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 21
Cross Polar Discrimination over Sector	dB	> 12.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	6.0 ± 0.3	5.6 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0 (P1 + P2 simultaneously)	
Tilt Accuracy	°	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 24	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18
Cross Polar Isolation	dB	> 25, typ. > 28	
Port to Port Isolation	dB	> 27, typ. > 30 (P1 // P2)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Ports P1	W	300 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010922

Right side, highband		P2, connector 3-4	
		3300-3800	
Frequency Range	MHz	3300 – 3590	3600 – 3800
Gain at mid Tilt	dBi	17.5	17.8
Gain over all Tilts	dBi	17.3 ± 0.5	17.6 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	67 ± 3.8	63 ± 4.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 12.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	5.9 ± 0.4	5.6 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0 (P1 + P2 simultaneously)	
Tilt Accuracy	°	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 22	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 17
Cross Polar Isolation	dB	> 25, typ. > 28	
Port to Port Isolation	dB	> 27, typ. > 30 (P2 // P1)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Ports P2	W	300 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	400 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 235 53 Maximal: 255 57
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	970 / 179 / 76 38.2 / 7.0 / 3.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	5.4 / 7.6 (clamps incl.) 11.9 / 16.7 (clamps incl.)
Packing Size	mm inches	1320 / 190 / 95 52.0 / 7.5 / 3.7
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

Summary – Directional Antennas

6 Ports

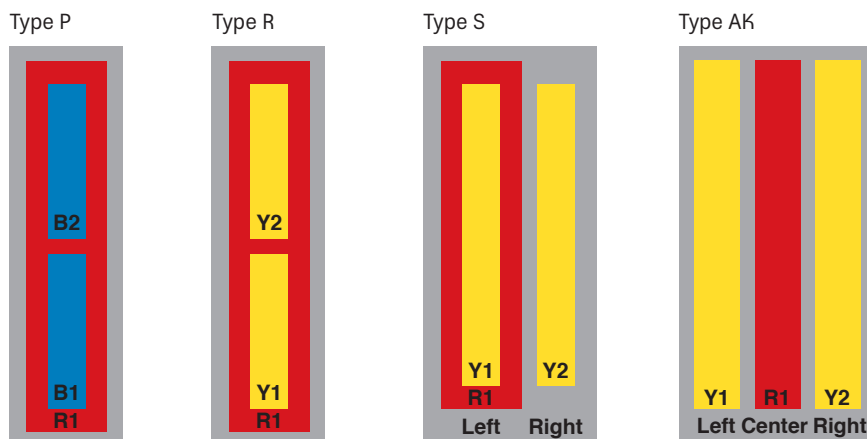
Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband 2 x Highband									
6-Port Antenna	698–960	65°	13.5dBi	2°–16°T	84510864	1412	4.3-10, bottom	70	AK
	1695–2690	65°	17.5dBi	2°–12°T				+	
	1695–2690	65°	17.5dBi	2°–12°T				71	
6-Port Antenna	698–960	65°	15dBi	2°–12°T	84510865	1885	4.3-10, bottom	72	AK
	1695–2690	65°	17.5dBi	2°–12°T				+	
	1695–2690	65°	17.5dBi	2°–12°T				73	
6-Port Antenna	698–960	65°	16.5dBi	1°–10°T	84510866	2697	4.3-10, bottom	74	AK
	1695–2690	65°	18dBi	2°–12°T				+	
	1695–2690	65°	18dBi	2°–12°T				75	
6-Port Antenna	790–960	65°	16.5dBi	2°–14°T	80010291v02	2058	7-16, bottom	76	P
	1710–2180	65°	16.5dBi	0°–14°T				+	
	1710–2180	65°	16.5dBi	0°–14°T				77	
6-Port Antenna	790–960	65°	17.5dBi	2°–10°T	80010292v03	2598	7-16, bottom	78	P
	1710–2180	65°	17.5dBi	0°–10°T				+	
	1710–2180	65°	17dBi	0°–10°T				79	
6-Port Antenna	698–960	65°	16dBi	1°–12°T	80010691v01	1997	7-16, bottom	80	R
	1710–2690	65°	16dBi	2°–12°T				+	
	1710–2690	65°	16dBi	2°–12°T				81	
6-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80010692v01	2622	7-16, bottom	82	R
	1710–2690	65°	17dBi	0°–10°T				+	
	1710–2690	65°	17dBi	2°–10°T				83	
6-Port Antenna	698–960	65°	14.5dBi	2°–16°T	80010864	1402	7-16, bottom	84	S
	1695–2690	65°	17.5dBi	2.5°–12°T				+	
	1695–2690	65°	18dBi	2.5°–12°T				85	
6-Port Antenna	698–960	65°	16dBi	2°–12°T	80010865	1921	7-16, bottom	86	S
	1695–2690	65°	18dBi	2.5°–12°T				+	
	1695–2690	65°	18dBi	2.5°–12°T				87	
6-Port Antenna	698–960	65°	17dBi	1°–10°T	80010866	2441	7-16, bottom	88	S
	1695–2690	65°	18dBi	2.5°–12°T				+	
	1695–2690	65°	18dBi	2.5°–12°T				89	

New or changed product

1) Configuration Types – further details on page 12–15.



Summary – Directional Antennas

6 Ports

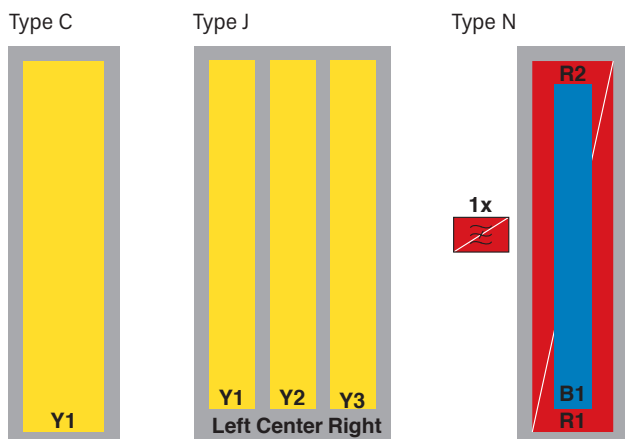
Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 1 x Highband									
6-Port Antenna	790–862	65°	14dBi	0°–14°T	80010697	1332	7-16, bottom	90 +	N
	880–960	65°	14dBi	0°–14°T					
	1710–2180	65°	17dBi	0°–8°T					
6-Port Antenna	790–862	65°	15.5dBi	0°–10°T	80010698	1932	7-16, bottom	92 +	N
	880–960	65°	16dBi	0°–10°T					
	1710–2180	65°	18.5dBi	0°–6°T					
6-Port Antenna	790–862	65°	16.5dBi	0°–7°T	80010699	2532	7-16, bottom	94 +	N
	880–960	65°	17dBi	0°–7°T					
	1710–2180	65°	18.5dBi	0°–6°T					
3 x Highband									
6-Port Antenna	1710–2690	65°	18dBi	2°–14°T	80020727	1475	4.3-10, bottom	96 +	J
	1710–2690	65°	18dBi	2°–14°T					
	1710–2690	65°	18dBi	2°–14°T					
3 x Highband Special Design									
6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi	0°T	80020125	691	4.3-10, bottom	265	C/C/C

6 Ports

1) Configuration Types – further details on page 12–15.



6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 1.4m 65° | 698-960 13.5dBi | 2x1695-2690 17.5dBi



Integrated RET



Type No.		84510864			
Center, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.3	13.7	13.9	13.9
Gain over all Tilts	dBi	13.2 ± 0.4	13.7 ± 0.3	13.8 ± 0.2	13.8 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	72 ± 1.9	70 ± 1.8	69 ± 2.5	68 ± 1.4
Front-to-Back Ratio, Total Power, ±30°	dB	> 25	> 26	> 26	> 25
Cross Polar Discrimination at Boresight	dB	19	19	18	16
Cross Polar Discrimination over Sector	dB	13.1	11.4	10.9	8.4
Azimuth Beam Port-to-Port Tracking	dB	3.0	2.0	2.0	1.5
Vertical Pattern:					
Elevation Beamwidth	°	18.2 ± 1.7	16.2 ± 1.1	15.6 ± 0.8	14.5 ± 1.0
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 0.9	< 0.7	< 0.7	< 0.8
First Upper Side Lobe Suppression	dB	> 16	> 18	> 19	> 18
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	200 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	300 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, highband		Y1, connector 3-4					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2305 – 2360	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.2	17.5	17.3	17.2	17.8
Gain over all Tilts	dBi	16.8 ± 0.6	17.1 ± 0.7	17.3 ± 0.9	17.3 ± 0.8	17.2 ± 0.7	17.7 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	63 ± 5.3	61 ± 2.8	60 ± 3.2	65 ± 3.9	65 ± 3.5	62 ± 2.8
Front-to-Back Ratio, Total Power, ±30°	dB	> 27	> 25	> 23	> 27	> 27	> 26
Cross Polar Discrimination at Boresight	dB	26	25	19	18	18	20
Cross Polar Discrimination over Sector	dB	8.3	9.1	7.8	8.4	6.9	5.5
Azimuth Beam Port-to-Port Tracking	dB	2.0	2.5	4.5	2.5	3.0	2.0
Vertical Pattern:							
Elevation Beamwidth	°	7.4 ± 0.5	6.9 ± 0.3	6.5 ± 0.4	5.7 ± 0.3	5.7 ± 0.4	5.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.6	< 0.7	< 0.7	< 0.8	< 0.7	< 0.8
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28					
Port to Port Isolation	dB	> 28 (Y1 // R1) > 28 (Y1 // Y2)					
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)					
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

84510864

Right side, highband		Y2, connector 5-6					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2305 – 2360	2500 – 2690
Gain at mid Tilt	dBi	17.0	17.2	17.4	17.3	17.2	17.8
Gain over all Tilts	dBi	16.9 ± 0.6	17.1 ± 0.7	17.3 ± 0.8	17.3 ± 0.8	17.2 ± 0.7	17.7 ± 1.0
Horizontal Pattern:							
Azimuth Beamwidth	°	62 ± 4.9	61 ± 2.9	61 ± 3.7	66 ± 2.7	66 ± 2.2	62 ± 2.9
Front-to-Back Ratio, Total Power, ±30°	dB	> 26	> 25	> 24	> 26	> 26	> 26
Cross Polar Discrimination at Boresight	dB	25	25	19	19	19	19
Cross Polar Discrimination over Sector	dB	9.3	9.6	6.8	7.2	5.7	6.1
Azimuth Beam Port-to-Port Tracking	dB	2.0	3.0	3.5	3.0	3.0	2.0
Vertical Pattern:							
Elevation Beamwidth	°	7.4 ± 0.5	6.9 ± 0.4	6.5 ± 0.4	5.7 ± 0.3	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°						
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.6	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 18	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28					
Port to Port Isolation	dB	> 28 (Y2 // R1) > 28 (Y2 // Y1)					
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)					
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	600 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	6 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 595 134 Maximal: 595 134
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1412 / 353 / 164 55.6 / 13.9 / 6.5
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	22 / 24.2 (clamps incl.) 48.5 / 53.4 (clamps incl.)
Packing Size	mm inches	1625 / 377 / 210 63.9 / 14.8 / 8.3
Scope of Supply	Panel, integrated RET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1 **Y1** **Y2**

KATHREIN

Frequency Range

698-960 **1695-2690** **1695-2690**

Dual Polarization

65° **65°** **65°**

6-Port Antenna LB/2HB 1.9m 65° | 698-960 15dBi | 2x1695-2690 17.5dBi



Integrated RET

Type No.		84510865			
Center, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.6	15.0	15.2	15.3
Gain over all Tilts	dBi	14.6 ± 0.4	15.0 ± 0.3	15.2 ± 0.3	15.2 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.3	68 ± 2.1	67 ± 1.7	66 ± 1.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27	> 27
Vertical Pattern:					
Elevation Beamwidth	°	12.1 ± 0.9	11.0 ± 0.7	10.6 ± 0.5	10.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.5	< 0.6	< 1.0
First Upper Side Lobe Suppression	dB	> 17	> 16	> 16	> 18
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	300 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.



Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.0	17.3	17.5	17.4	17.8
Gain over all Tilts	dBi	16.9 ± 0.6	17.3 ± 0.5	17.5 ± 0.6	17.4 ± 0.7	17.7 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 4.3	61 ± 3.2	60 ± 3.3	64 ± 3.2	62 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 24	> 23	> 28	> 25
Vertical Pattern:						
Elevation Beamwidth	°	7.5 ± 0.4	7.0 ± 0.3	6.7 ± 0.5	5.8 ± 0.4	5.3 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 1.2	< 1.2	< 1.1	< 0.9	< 0.9
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	28 (Y1 // R1) 30 (Y1 // Y2)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

84510865

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.2	17.5	17.6	17.6	17.9
Gain over all Tilts	dBi	17.2 ± 0.8	17.5 ± 0.5	17.5 ± 0.6	17.5 ± 0.9	17.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 4.7	61 ± 3.6	60 ± 3.4	64 ± 3.3	62 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 27	> 25
Vertical Pattern:						
Elevation Beamwidth	°	7.5 ± 0.4	7.0 ± 0.4	6.6 ± 0.5	5.8 ± 0.3	5.3 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 1.1	< 1.1	< 0.9	< 0.8	< 0.9
First Upper Side Lobe Suppression	dB	> 19	> 21	> 20	> 18	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	28 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	-45, +45
Max. Effective Power for the Antenna	W	700 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	6 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 815 183 Maximal: 815 183
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1885 / 353 / 164 74.2 / 13.9 / 6.5
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	26.5 / 29.4 (clamps incl.) 58.4 / 64.8 (clamps incl.)
Packing Size	mm inches	2100 / 377 / 210 82.7 / 14.8 / 8.3
Scope of Supply	Panel, integrated RET and 2 units of clamps for 55-115 mm 2.2-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1695-2690	1695-2690
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Dual Polarization

65°	65°	65°
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6-Port Antenna LB/2HB 2.7m 65° | 698-960 16.5dBi | 2x1695-2690 18dBi



Integrated RET

Type No.		84510866			
Center, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.2	16.5	16.6	16.8
Gain over all Tilts	dBi	16.1 ± 0.6	16.5 ± 0.5	16.5 ± 0.5	16.7 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 2.0	66 ± 1.8	65 ± 2.3	63 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 28	> 28	> 28
Vertical Pattern:					
Elevation Beamwidth	°	8.3 ± 0.7	7.6 ± 0.3	7.4 ± 0.4	7.0 ± 0.3
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.7	< 0.8	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 16	> 16	> 17	> 18
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 28 dB (R1 // Y1, Y2)			
Max. Effective Power per Port	W	200 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	400 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.



Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.4	17.7	17.7	17.9
Gain over all Tilts	dBi	17.0 ± 0.7	17.4 ± 0.6	17.6 ± 0.9	17.5 ± 0.8	17.8 ± 0.8
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 4.7	60 ± 2.8	59 ± 3.4	62 ± 3.2	61 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 26	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.4 ± 0.3	6.1 ± 0.4	5.4 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 20	> 16	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 dB (Y1 // R1, Y2)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

84510866

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.6	17.8	17.7	17.9
Gain over all Tilts	dBi	17.2 ± 0.7	17.5 ± 0.7	17.7 ± 0.9	17.5 ± 0.8	17.8 ± 1.0
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 4.9	60 ± 3.1	58 ± 4.1	62 ± 2.3	61 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 24	> 26	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.4 ± 0.3	6.2 ± 0.5	5.4 ± 0.3	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 dB (Y2 // R1, Y1)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	-45, +45
Max. Effective Power for the Antenna	W	700 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	6 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1230 276 Maximal: 1230 276
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2697 / 353 / 164 106.2 / 13.9 / 6.5
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	32.0 / 33.5 (clamps incl.) 70.5 / 73.8 (clamps incl.)
Packing Size	mm inches	2910 / 377 / 210 114.6 / 14.8 / 8.3
Scope of Supply	Panel, integrated RET and 2 units of clamps for 55-115 mm 2.2-4.5 inches diameter	

6-Port Antenna

R1	B1	B2
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KATHREIN

Frequency Range

790-960	1710-2180	1710-2180
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 2.0m 65° | 790-960 16.5dBi | 2x1710-2180 16.5dBi



Type No.		80010291v02		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 866	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain:	dBi	16.2 ... 16.0 ... 15.7	16.3 ... 16.1 ... 15.8	16.4 ... 16.2 ... 15.8
Tilt	°	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
Horizontal Pattern:				
Half-power beam width	°	68	67	65
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	25	25	25
Sector	±60°	> 10	> 10	> 10
Tracking	dB	1.0		
Vertical Pattern:				
Half-power beam width	°	10	9.7	9.3
Electrical tilt	°	2-14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	2 ... 8 ... 14 17 ... 17 ... 15	2 ... 8 ... 14 17 ... 17 ... 16	2 ... 8 ... 14 17 ... 17 ... 16
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 35 (790-960 // 1710-2180 MHz) > 30 (1710-2180 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		



80010291v02

Highbands		B1, connector 3-4; B2, connector 5-6		
		1710-2180	1710-2180	
Frequency range	MHz	1710 - 1880	1850 - 1990	1920 - 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain:				
1710 - 2180 MHz	B1: dBi	15.9 ... 15.9 ... 15.5	16.2 ... 16.2 ... 15.7	16.3 ... 16.3 ... 15.8
1710 - 2180 MHz	B2: dBi	15.8 ... 15.8 ... 15.4	16.1 ... 16.1 ... 15.4	16.3 ... 16.2 ... 15.5
Tilt	°	0 ... 7 ... 14	0 ... 7 ... 14	0 ... 7 ... 14
Horizontal Pattern:				
Half-power beam width	°	65	64	60
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Maindirection	0°	18	19	20
Sector	±60°	> 10	> 10	> 10
Tracking		1.0		
Vertical Pattern:				
Half-power beam width	°	9.5	9	8.7
Electrical tilt	°	0 - 14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 7 ... 14 18 ... 17 ... 17	0 ... 7 ... 14 18 ... 17 ... 17	0 ... 7 ... 14 18 ... 17 ... 17
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 35 (790-960 // 1710-2180 MHz) > 30 (1710-2180 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		

Mechanical specifications		
Input	6 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	3 x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 515 115 Maximal: 565 127
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2058 / 262 / 149 81.0 / 10.3 / 5.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	27 / 29 (clamps incl.) 59.5 / 63.9 (clamps incl.)
Packing size	mm inches	2385 x 282 x 182 93.9 x 11.1 x 7.2
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	B1	B2
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KATHREIN

Frequency Range

790–960	1710–2180	1710–2180
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 2.6m 65° | 790–960 17.5dBi | 2x1710–2180 17.5dBi



Type No.		80010292v03		
Lowband		R1, connector 1–2		
		790–960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	17.1	17.3	17.4
Gain over all Tilts	dBi	17.0 ± 0.3	17.2 ± 0.3	17.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.1	68 ± 1.3	66 ± 1.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 28
Cross Polar Discrimination at Boresight	dB	> 25	> 25	> 27
Cross Polar Discrimination over Sector	dB	> 14.0	> 14.5	> 12.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.9 ± 0.3	7.6 ± 0.3	7.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 10.0		
Tilt Accuracy	°	< 0.1	< 0.1	< 0.2
First Upper Side Lobe Suppression	dB	> 14	> 15	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (R1 // B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Lower highband		B1, connector 3–4		
		1710–2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	17.2	17.3	17.3
Gain over all Tilts	dBi	17.1 ± 0.4	17.2 ± 0.3	17.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.6	62 ± 2.4	62 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 29	> 26
Cross Polar Discrimination at Boresight	dB	> 31	> 30	> 29
Cross Polar Discrimination over Sector	dB	> 12.0	> 12.5	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.0
Vertical Pattern:				
Elevation Beamwidth	°	7.6 ± 0.4	7.2 ± 0.5	6.8 ± 0.6
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.6	< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 14	> 17	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (B1 // R1, B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010292v03

Upper highband		B2, connector 5-6		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	16.7	16.8	17.0
Gain over all Tilts	dBi	16.5 ± 0.3	16.6 ± 0.3	16.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 3.1	63 ± 4.0	61 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 30	> 27
Cross Polar Discrimination at Boresight	dB	> 30	> 30	> 28
Cross Polar Discrimination over Sector	dB	> 14.5	> 14.0	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.6 ± 0.3	7.2 ± 0.4	6.9 ± 0.5
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.4	< 0.5	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (B2 // R1, B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B2	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 36
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 730 164
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2598 / 261 / 146 102.3 / 10.3 / 5.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	27.0 / 29.2 (clamps incl.) 59.5 / 64.3 (clamps incl.)
Packing Size	mm inches	2902 / 284 / 184 114.3 / 11.2 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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Frequency Range

698-960	1710-2690	1710-2690
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 2.0m 65° | 698-960 16dBi | 2x1710-2690 16dBi



Type No.	80010691v01				
Lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.3	15.6	15.9	16.2
Gain over all Tilts	dBi	15.2 ± 0.4	15.6 ± 0.3	15.8 ± 0.5	16.1 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	69 ± 1.1	68 ± 1.1	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 28
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.0	> 10.5	> 9.5
Vertical Pattern:					
Elevation Beamwidth	°	10.8 ± 0.9	10.1 ± 0.5	9.9 ± 0.7	9.2 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 12.0			
Tilt Accuracy	°	< 0.6	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 18	> 17	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 18	> 17	> 18
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 32 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Lower highband	Y1, connector 3-4					
	1710-2690					
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.4	15.8	15.8	15.3	16.3
Gain over all Tilts	dBi	15.4 ± 0.5	15.8 ± 0.3	15.8 ± 0.4	15.3 ± 0.7	16.2 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 5.8	61 ± 4.5	62 ± 2.9	64 ± 8.0	60 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 24	> 24	> 23
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 9.0	> 7.5	> 8.0
Vertical Pattern:						
Elevation Beamwidth	°	10.9 ± 0.8	10.0 ± 0.8	9.4 ± 0.8	8.4 ± 0.9	7.7 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.6	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 15	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 15	> 15	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 32 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010691v01

Upper highband		Y2, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.1	15.4	15.4	15.1	15.6
Gain over all Tilts	dBi	15.1 ± 0.5	15.4 ± 0.3	15.3 ± 0.4	15.1 ± 0.5	15.5 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	60 ± 6.1	60 ± 4.0	61 ± 4.4	62 ± 6.3	60 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 26	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.0	> 8.5	> 6.5	> 8.5
Vertical Pattern:						
Elevation Beamwidth	°	10.9 ± 0.7	10.2 ± 0.5	9.6 ± 0.8	8.4 ± 0.6	7.8 ± 0.7
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3	< 0.3	< 0.5
First Upper Side Lobe Suppression	dB	> 19	> 19	> 19	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 19	> 15	> 14	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 32 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 32
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	25.0 / 27.2 (clamps incl.) 55.1 / 60.0 (clamps incl.)
Packing Size	mm inches	2316 / 322 / 190 91.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna Frequency Range HPBW

R1	Y1	Y2
698-960	1710-2690	1710-2690
65°	65°	65°

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6-Port Antenna LB/2HB 2.6m 65° | 698-960 17dBi | 2x1710-2690 17dBi



Type No.	80010692v01				
Low band	R1, connector 1-2				
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.2	16.7	16.9	17.2
Gain over all Tilts	dBi	16.1 ± 0.5	16.7 ± 0.3	16.8 ± 0.3	17.1 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	68 ± 1.1	68 ± 0.9	66 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 23	> 23
Cross Polar Discrimination over Sector	dB	> 9.0	> 9.5	> 10.0	> 8.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7	8.0 ± 0.5	7.8 ± 0.4	7.2 ± 0.5
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Lower high band	Y1, connector 3-4					
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.7	16.8	16.8	17.1
Gain over all Tilts	dBi	16.5 ± 0.6	16.7 ± 0.3	16.6 ± 0.4	16.6 ± 0.9	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 3.8	63 ± 5.1	65 ± 3.6	59 ± 7.2	61 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 20	> 17	> 20
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 9.5	> 8.0	> 10.5
Vertical Pattern:						
Elevation Beamwidth	°	7.6 ± 0.4	7.5 ± 0.3	7.1 ± 0.6	6.1 ± 0.3	6.0 ± 0.2
Electrical Downtilt continuously adjustable	°	0.0 – 10.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.4	< 0.6	< 0.3
First Upper Side Lobe Suppression	dB	> 13	> 16	> 17	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010692v01

Upper high band		Y2, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.7	16.6	16.6	17.0
Gain over all Tilts	dBi	16.5 ± 0.5	16.6 ± 0.4	16.5 ± 0.3	16.4 ± 0.9	16.7 ± 0.8
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 3.7	64 ± 6.7	65 ± 5.5	63 ± 5.7	65 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 20	> 21	> 19	> 14
Cross Polar Discrimination over Sector	dB	> 6.0	> 9.5	> 9.5	> 7.0	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	6.5 ± 0.4	6.2 ± 0.2	6.0 ± 0.3	5.3 ± 0.3	4.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 20	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 32
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on ngmn-P-BASTA requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 530 119 Maximal: 845 190
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2622 / 300 / 152 103.2 / 11.8 / 6.0
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	31.0 / 33.2 (clamps incl.) 68.3 / 73.2 (clamps incl.)
Packing Size	mm inches	2951 / 322 / 190 116.2 / 12.7 / 7.5
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna Frequency Range HPBW

R1	Y1	Y2
698-960	1695-2690	1695-2690
65°	65°	65°

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6-Port Antenna LB/2HB 1.4m 65° | 698-960 14.5dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80010864			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.5	14.0	14.2	14.5
Gain over all Tilts	dBi	13.5 ± 0.3	14.0 ± 0.4	14.2 ± 0.3	14.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	72 ± 3.2	70 ± 2.7	68 ± 2.4	67 ± 2.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 24	> 22
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 7.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	17.4 ± 1.1	16.2 ± 1.1	15.7 ± 0.7	14.9 ± 0.8
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 0.6	< 0.8	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 16	> 16	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 22	> 20	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.6	17.2	17.6
Gain over all Tilts	dBi	17.2 ± 0.6	17.5 ± 0.3	17.5 ± 0.3	17.1 ± 0.4	17.5 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.0	62 ± 3.3	66 ± 6.8	64 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 28	> 26	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 23	> 18	> 15
Cross Polar Discrimination over Sector	dB	> 7.0	> 9.0	> 10.5	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 2.5	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	6.0 ± 0.5	5.3 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 18	> 19	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 14	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010864

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.2	17.5	17.8	18.2	18.3
Gain over all Tilts	dBi	17.2 ± 0.4	17.4 ± 0.3	17.7 ± 0.4	18.1 ± 0.3	18.1 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 2.4	63 ± 3.2	63 ± 2.9	61 ± 2.0	61 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 23	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 22	> 24	> 24	> 20	> 18
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.0	> 7.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.4	6.4 ± 0.4	5.5 ± 0.3	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 21	> 22	> 18	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 15	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 450 101 Maximal: 520 117
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1402 / 377 / 169 55.2 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	25.0 / 27.2 (clamps incl.) 55.1 / 59.9 (clamps incl.)
Packing Size	mm inches	1602 / 397 / 212 63.1 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 1.9m 65° | 698-960 16dBi | 2x1695-2690 18dBi



FlexRET



Type No.		80010865			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.2	15.7	15.9	16.2
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.3	15.8 ± 0.4	16.1 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 2.3	68 ± 2.1	67 ± 2.0	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 22	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.0	> 9.0	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	10.8 ± 1.1	9.8 ± 0.4	9.5 ± 0.6	8.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 17	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.7	17.9	17.6	18.1
Gain over all Tilts	dBi	17.2 ± 0.5	17.6 ± 0.3	17.7 ± 0.3	17.5 ± 0.5	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.2	62 ± 2.6	61 ± 2.4	63 ± 6.1	66 ± 6.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 26	> 23	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 24	> 18	> 15
Cross Polar Discrimination over Sector	dB	> 7.5	> 8.5	> 10.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.3	5.6 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 17	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 13	> 13	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010865

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.8	18.2	18.1
Gain over all Tilts	dBi	17.3 ± 0.3	17.5 ± 0.3	17.8 ± 0.4	18.1 ± 0.3	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 2.9	66 ± 2.8	66 ± 2.6	65 ± 1.8	68 ± 4.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 19	> 18	> 17	> 19
Cross Polar Discrimination over Sector	dB	> 10.5	> 15.0	> 14.5	> 10.0	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.5	5.6 ± 0.3	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 19	> 25	> 25	> 19	> 21
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 15	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	27.1 / 29.3 (clamps incl.) 59.7 / 64.6 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1695-2690	1710-2690
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HPBW

65°	65°	65°
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6-Port Antenna LB/2HB 2.4m 65° | 698-960 17dBi | 2x1695-2690 18dBi



FlexRET



Type No.		80010866			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 820	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3
Gain over all Tilts	dBi	16.2 ± 0.5	16.8 ± 0.4	17.0 ± 0.3	17.3 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 2.4	65 ± 1.4	65 ± 0.9	64 ± 1.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 24	> 25	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 6.5	> 7.0	> 9.0	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7	7.9 ± 0.5	7.6 ± 0.4	7.2 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 15	> 15	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.9	17.9	17.3	18.1
Gain over all Tilts	dBi	17.3 ± 0.5	17.8 ± 0.3	17.8 ± 0.3	17.2 ± 0.2	17.9 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.5	62 ± 3.0	62 ± 2.6	69 ± 4.9	63 ± 6.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 24	> 19	> 16
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.0	> 8.5	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 2.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.1	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 19	> 18	> 17	> 16	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 13	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010866

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.7	18.0	18.4	18.6
Gain over all Tilts	dBi	17.4 ± 0.3	17.6 ± 0.3	17.9 ± 0.5	18.3 ± 0.3	18.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.3	62 ± 2.0	61 ± 1.9	60 ± 1.7	58 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 25	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 21	> 16	> 16
Cross Polar Discrimination over Sector	dB	> 16.0	> 16.0	> 13.0	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.3	< 0.3	< 0.4	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 24	> 23	> 19	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 15	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 830 187 Maximal: 960 216
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2441 / 377 / 169 96.1 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	35.0 / 37.2 (clamps incl.) 77.1 / 81.9 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	R2	B1
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KATHREIN

Frequency Range

790-862	880-960	1710-2180
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HPBW

65°	65°	65°
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6-Port Antenna 2LB/HB 1.3m 65° | 790-862 14dBi | 880-960 14dBi | 1710-2180 17dBi



Type No.		80010697	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	13.8	14.1
Gain over all Tilts	dBi	13.7 ± 0.4	14.0 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.3	68 ± 1.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 22
Cross Polar Discrimination at Boresight	dB	> 23	> 20
Cross Polar Discrimination over Sector	dB	> 9.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	16.2 ± 0.7	15.0 ± 0.8
Electrical Downtilt continuously adjustable	°	0.0 - 14.0	0.0 - 14.0
Tilt Accuracy	°	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 16
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 38 (R1, R2 // B1) > 28 (R1 // R2)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	300 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1 + R2	W	700 (at 50 °C ambient temperature)	



Values based on NGMN-P-BASTA (version 9.6) requirements.

80010697

Highband		B1, connector 5-6		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	17.0	17.2	17.2
Gain over all Tilts	dBi	16.9 ± 0.4	17.0 ± 0.3	17.0 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	63 ± 5.6	61 ± 4.8	61 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 18	> 19	> 20
Cross Polar Discrimination over Sector	dB	> 8.5	> 9.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.4 ± 0.3	7.1 ± 0.3	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	0.0 – 8.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 19	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (R1, R2 // B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 245 55 Maximal: 395 89
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1332 / 300 / 152 52.4 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	21.0 / 23.2 (clamps incl.) 46.3 / 51.1 (clamps incl.)
Packing Size	mm inches	1641 / 322 / 190 64.6 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	R2	B1
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KATHREIN

Frequency Range

790-862	880-960	1710-2180
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HPBW

65°	65°	65°
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6-Port Antenna 2LB/HB 1.9m 65° | 790-862 15.5dBi | 880-960 16 dBi | 1710-2180 18.5dBi



Type No.		80010698	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	15.4	15.9
Gain over all Tilts	dBi	15.3 ± 0.2	15.8 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.3	67 ± 1.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27
Cross Polar Discrimination at Boresight	dB	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 14.0	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.0
Vertical Pattern:			
Elevation Beamwidth	°	11.3 ± 0.5	10.1 ± 0.6
Electrical Downtilt continuously adjustable	°	0.0 - 10.0	0.0 - 10.0
Tilt Accuracy	°	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 16
Cross Polar Isolation	dB	> 30	> 30
Port to Port Isolation	dB	> 38 (R1 // B1) > 28 (R1 // R2)	> 38 (R2 // B1) > 28 (R2 // R1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010698

Highband		B1, connector 5-6		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.7
Gain over all Tilts	dBi	18.5 ± 0.4	18.7 ± 0.3	18.6 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	63 ± 2.9	61 ± 3.1	60 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 29	> 26
Cross Polar Discrimination at Boresight	dB	> 28	> 29	> 28
Cross Polar Discrimination over Sector	dB	> 13.5	> 17.0	> 12.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 0.5	< 0.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.3	4.8 ± 0.2	4.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 17	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (B1 // R1, R2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 475 107 Maximal: 520 117
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1932 / 261 / 146 76.1 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	23.0 / 25.2 (clamps incl.) 50.7 / 55.5 (clamps incl.)
Packing Size	mm inches	2256 / 282 / 182 88.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	R2	B1
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KATHREIN

Frequency Range

790-862	880-960	1710-2180
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HPBW

65°	65°	65°
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6-Port Antenna 2LB/HB 2.5m 65° | 790-862 16.5dBi | 880-960 17dBi | 1710-2180 18.5dBi



Type No.		80010699	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	16.6	17.0
Gain over all Tilts	dBi	16.5 ± 0.2	16.9 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.1	66 ± 1.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 26	> 26
Cross Polar Discrimination over Sector	dB	> 13.0	> 14.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	8.0 ± 0.3	7.3 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 - 7.0	0.0 - 7.0
Tilt Accuracy	°	< 1.0	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 14
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 38 (R1, R2 // B1)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010699

Highband		B1, connector 5-6		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.5	18.7	18.7
Gain over all Tilts	dBi	18.4 ± 0.4	18.5 ± 0.3	18.5 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.4	61 ± 3.3	61 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 33	> 31	> 31
Cross Polar Discrimination over Sector	dB	> 13.5	> 15.0	> 13.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 0.5	< 0.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.2	4.8 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 18	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (B1 // R1, R2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 645 145 Maximal: 710 160
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2532 / 261 / 146 99.7 / 10.3 / 5.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	26.0 / 28.2 (clamps incl.) 57.3 / 62.1 (clamps incl.)
Packing Size	mm inches	2856 / 282 / 182 112.4 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

Y1	Y2	Y3
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KATHREIN

Frequency Range

1710-2690	1710-2690	1710-2690
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HPBW

65°	65°	65°
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6-Port Antenna 3HB 1.5 m 65° | 3x1710-2690 18dBi



FlexRET



Type No.		80020727				
Left system		Y1, connector 1-2				
		1710-2690				
Frequency Range	MHz	1710 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.6	18.2	18.3	18.5	18.5
Gain over all Tilts	dBi	17.5 ± 0.5	18.2 ± 0.3	18.2 ± 0.2	18.4 ± 0.4	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 4.3	64 ± 2.3	62 ± 2.3	59 ± 2.9	57 ± 3.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 24	> 24
Cross Polar Discrimination over Sector	dB	> 12.0	> 10.0	> 9.0	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.4 ± 0.3	6.1 ± 0.5	5.3 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 - 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 20	> 20	> 18	> 19
Cross Polar Isolation	dB	> 30				
Port to Port Isolation	dB	> 30 (Y1 // Y2, Y3)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	500 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Center system		Y2, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.3	17.8	18.0	18.1	18.0
Gain over all Tilts	dBi	17.2 ± 0.4	17.8 ± 0.4	17.9 ± 0.3	17.8 ± 0.5	17.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	68 ± 7.0	62 ± 4.9	61 ± 3.4	63 ± 2.5	59 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 25	> 24
Cross Polar Discrimination over Sector	dB	> 10.5	> 9.5	> 10.5	> 9.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.4	6.4 ± 0.3	6.1 ± 0.4	5.3 ± 0.2	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 - 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.4	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 24	> 22	> 22	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // Y1, Y3)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	500 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020727

Right system		Y3, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.6	18.2	18.3	18.5	18.6
Gain over all Tilts	dBi	17.6 ± 0.5	18.1 ± 0.3	18.2 ± 0.3	18.4 ± 0.5	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	68 ± 3.9	65 ± 2.3	64 ± 2.8	58 ± 4.2	57 ± 2.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 24	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 13.0	> 10.5	> 9.5	> 8.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.5	6.4 ± 0.3	6.1 ± 0.4	5.3 ± 0.2	4.8 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 - 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 19	> 23	> 23	> 21	> 21
Cross Polar Isolation	dB	> 30				
Port to Port Isolation	dB	> 30 (Y3 // Y1, Y2)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	500 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 755 170 Maximal: 830 187
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1475 / 378 / 103 58.1 / 14.9 / 4.1
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	18.0 / 20.2 (clamps incl.) 39.7 / 44.5 (clamps incl.)
Packing Size	mm inches	2000 / 549 / 120 78.7 / 21.6 / 4.7
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

Summary – Directional Antennas

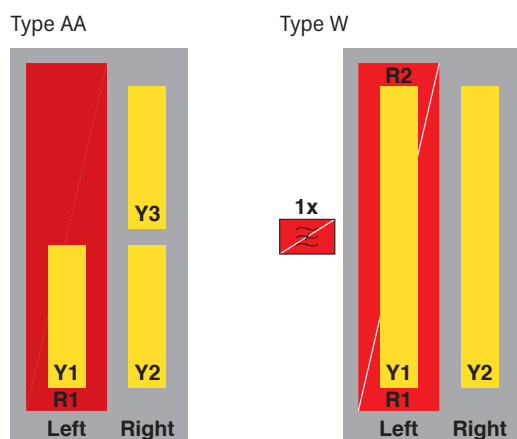
8 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband 3 x Highband									
8-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80020872	2693	4.3-10, bottom	101 – 103	AA
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
2 x Lowband 2 x Highband									
8-Port Antenna	698–803	65°	14dBi	2°–16°T	80010767	1448	4.3-10, bottom	104 + 105	W
	824–960	65°	14.5dBi	2°–16°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–803	65°	15dBi	2°–12°T	80010768	1910	4.3-10, bottom	106 + 107	W
	824–960	65°	16dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–803	65°	16dBi	1.5°–10°T	80010769	2429	4.3-10, bottom	108 + 109	W
	824–960	65°	17dBi	1.5°–10°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	14.5dBi	2°–16°T	80010867	1459	7-16, bottom	110 + 111	W
	880–960	65°	15dBi	2°–16°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	18.5dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80010868	1921	7-16, bottom	112 + 113	W
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	16.5dBi	1.5°–10°T	80010869	2441	7-16, bottom	114 + 115	W
	880–960	65°	17dBi	1.5°–10°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	14.5dBi	2°–16°T	80011867	1499	4.3-10, bottom	116 + 117	W
	880–960	65°	15dBi	2°–16°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1427–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80011868	1999	4.3-10, bottom	118 + 119	W
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1427–2690	65°	18dBi	2.5°–12°T					

1) Configuration Types – further details on page 12–15.



Summary – Directional Antennas 8 Ports Dual Polarization ±45°

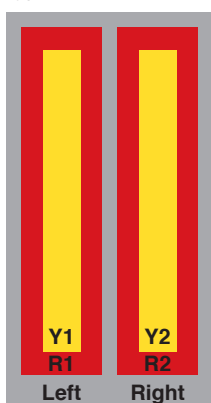
KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 2 x Highband									
8-Port Antenna	698–960	65°	15.4dBi	2.5°–11.5°T	800372965	1978	4.3-10, bottom	120	AB
	698–960	65°	15.4dBi	2.5°–11.5°T				–	
	1427–2690	65°	17.9dBi	2°–12°T				122	
	1427–2690	65°	17.9dBi	2°–12°T					
8-Port Antenna	698–894	65°	13dBi	4°–18°T	840370964	1214	4.3-10, bottom	123	AB
	698–894	65°	13dBi	4°–18°T				–	
	1695–2360	65°	17dBi	2.5°–12°T				125	
	1695–2360	65°	17dBi	2.5°–12°T					
8-Port Antenna	698–894	65°	15.5dBi	1°–10°T	840370966	2437	4.3-10, bottom	126	AB
	698–894	65°	15.5dBi	1°–10°T				–	
	1695–2360	60°	18dBi	2.5°–12°T				128	
	1695–2360	60°	18dBi	2.5°–12°T					
8-Port Antenna	790–960	65°	16dBi	0°–10°T	80010825	1934	7-16, bottom	129	T
	790–960	65°	16dBi	0°–10°T				–	
	1710–2180	60°	18.5dBi	0°–6°T				131	
	1710–2180	60°	18.5dBi	0°–6°T					
8-Port Antenna	790–960	65°	17dBi	0°–8°T	80010826	2399	7-16, bottom	132	T
	790–960	65°	17dBi	0°–8°T				+	
	1710–2180	60°	18.5dBi	0°–6°T				133	
	1710–2180	60°	18.5dBi	0°–6°T					
8-Port Antenna	698–960	65°	14dBi	2°–16°T	80010964	1499	4.3-10, bottom	134	AB
	698–960	65°	14dBi	2°–16°T				–	
	1695–2690	65°	17.5dBi	2.5°–12°T				136	
	1695–2690	65°	17.5dBi	2.5°–12°T					
8-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80010965	1999	4.3-10, bottom	137	AB
	698–960	65°	15.5dBi	2°–12°T				–	
	1695–2690	65°	18dBi	2.5°–12°T				139	
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010966	2438	4.3-10, bottom	140	AB
	698–960	65°	16.5dBi	1°–10°T				–	
	1695–2690	65°	18dBi	2.5°–12°T				142	
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–960	65°	15dBi	2°–12°T	84510965	1995	4.3-10, bottom	143	AB
	698–960	65°	15dBi	2°–12°T				–	
	1695–2690	65°	17dBi	2°–12°T				145	
	1695–2690	65°	17dBi	2°–12°T					

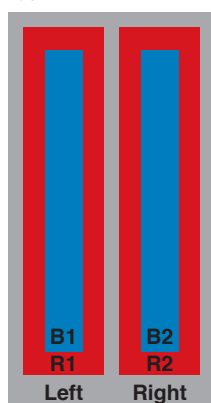
New or changed product

1) Configuration Types – further details on page 12–15.

Type AB



Type T



8 Ports

Summary – Directional Antennas

8 Ports

Dual Polarization $\pm 45^\circ$

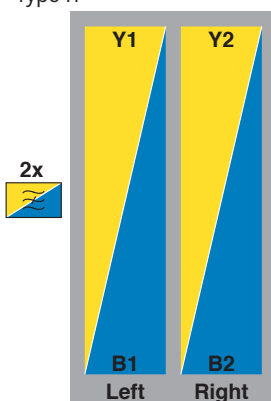
KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
4 x Highband									
8-Port Antenna	1710–2170	65°	17.5dBi	2°–11°T	80010728	1471	7-16, bottom	146 + 147	K
	1710–2170	65°	17.5dBi	2°–11°T					
	2490–2690	60°	18dBi	2°–14°T					
	2490–2690	60°	18dBi	2°–14°T					
4 x Highband TDD Antenna									
8+1-Port Antenna	3300–3800	90°	15.6dBi	2°–12°T	800250911	921	4.3-10, bottom	148 – 150	AO
	3300–3800	90°	15.5dBi	2°–12°T					
	3300–3800	90°	15.5dBi	2°–12°T					
	3300–3800	90°	15.6dBi	2°–12°T					

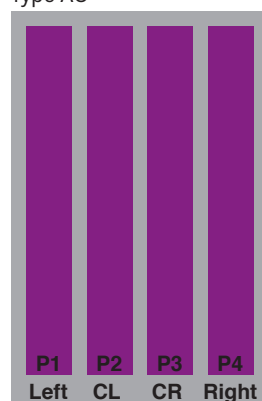
New or changed product

1) Configuration Types – further details on page 12–15.

Type K



Type AO



8-Port Antenna

R1	Y1	Y2	Y3
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KATHREIN

Frequency Range

698-960	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna LB/3HB 2.7m 65° | 698-960 17dBi | 3x1695-2690 18dBi



FlexRET

Type No.		80020872			
Lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3
Gain over all Tilts	dBi	16.3 ± 0.4	16.8 ± 0.3	17.0 ± 0.4	17.3 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 1.7	68 ± 1.7	68 ± 1.8	66 ± 1.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.4	7.6 ± 0.5	7.1 ± 0.4
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2, Y3)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



8 Ports

Lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.5	17.5	17.3	17.8
Gain over all Tilts	dBi	17.1 ± 0.5	17.4 ± 0.3	17.5 ± 0.4	17.3 ± 0.4	17.6 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.9	62 ± 2.8	62 ± 3.2	61 ± 6.6	63 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 21	> 23
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 11.5	> 9.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.5	6.4 ± 0.6	5.6 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 15	> 15	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // R1) > 30 (Y1 // Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80020872

Upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.2	18.4
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.2	17.8 ± 0.4	18.1 ± 0.3	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.0	66 ± 2.0	66 ± 1.5	66 ± 2.2	65 ± 4.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 23	> 22	> 25
Cross Polar Discrimination over Sector	dB	> 11.0	> 14.0	> 14.5	> 11.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 24	> 23	> 19	> 21
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R1) > 30 (Y2 // Y1, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.1	17.3	17.5	17.6
Gain over all Tilts	dBi	16.9 ± 0.3	17.1 ± 0.3	17.3 ± 0.4	17.4 ± 0.2	17.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.5	65 ± 1.5	65 ± 1.4	66 ± 1.7	66 ± 4.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 10.0	> 14.5	> 14.5	> 11.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 0.5	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.2 ± 0.4	6.7 ± 0.4	6.3 ± 0.5	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 20	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y3 // R1) > 30 (Y3 // Y1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020872

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	40.5 / 42.7 (clamps incl.) 89.3 / 94.1 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-803	824-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 1.4m 65° | 698-803 14dBi | 824-960 14.5dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80010767		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-803		824-960
Frequency Range	MHz	698 - 803		824 - 894 880 - 960
Gain at mid Tilt	dBi	13.9		14.7 14.8
Gain over all Tilts	dBi	13.8 ± 0.4		14.5 ± 0.5 14.6 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.7		62 ± 2.5 61 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 24 > 26
Cross Polar Discrimination at Boresight	dB	> 19		> 21 > 19
Cross Polar Discrimination over Sector	dB	> 7.5		> 6.0 > 6.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5		< 2.0 < 2.0
Vertical Pattern:				
Elevation Beamwidth	°	14.4 ± 1.1		12.6 ± 0.7 11.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0
Tilt Accuracy	°	< 0.7		< 0.7 < 0.6
First Upper Side Lobe Suppression	dB	> 14		> 14 > 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15		> 14 > 16
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1, Y2) > 30 (R2 // Y1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.1	17.5	17.4	17.0	17.7
Gain over all Tilts	dBi	17.0 ± 0.5	17.4 ± 0.3	17.4 ± 0.4	16.9 ± 0.4	17.6 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 2.1	62 ± 3.1	66 ± 6.0	62 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 25	> 18	> 17
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.5	> 10.5	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	6.0 ± 0.5	5.3 ± 0.4	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // Y2, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010767

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.4	18.6
Gain over all Tilts	dBi	17.3 ± 0.3	17.6 ± 0.2	17.9 ± 0.5	18.3 ± 0.4	18.4 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.9	62 ± 1.4	61 ± 1.5	59 ± 2.2	57 ± 3.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 25	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 25	> 24	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 15.5	> 17.0	> 14.5	> 7.5	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.4	6.5 ± 0.3	6.2 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 19	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R2) > 30 (Y2 // Y1, R1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1448 / 377 / 169 57.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	27.4 / 29.6 (clamps incl.) 60.4 / 65.3 (clamps incl.)
Packing Size	mm inches	1656 / 397 / 212 65.2 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-803	824-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 1.9m 65° | 698-803 15dBi | 824-960 16dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80010768		
Left side, lowbands		R1, connector 1-2	R2, connector 3-4	
		698-803	824-960	
Frequency Range	MHz	698 - 803	824 - 894	880 - 960
Gain at mid Tilt	dBi	15.2	15.8	16.1
Gain over all Tilts	dBi	15.1 ± 0.4	15.7 ± 0.4	16.0 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 1.6	63 ± 1.7	62 ± 2.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 24	> 24	> 23
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 6.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	10.7 ± 0.6	9.6 ± 0.4	9.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 12.0	2.0 - 12.0	
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 18
Cross Polar Isolation	dB	> 30	> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)	> 28 (R2 // R1) > 30 (R2 // Y1, Y2)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.3	17.8	17.9	17.6	18.3
Gain over all Tilts	dBi	17.3 ± 0.6	17.8 ± 0.3	17.8 ± 0.4	17.5 ± 0.5	18.2 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.9	60 ± 2.6	60 ± 2.1	65 ± 6.8	61 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 27	> 27	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 10.0	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.5	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010768

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	17.7	18.0	18.4	18.4
Gain over all Tilts	dBi	17.5 ± 0.3	17.7 ± 0.2	17.9 ± 0.5	18.3 ± 0.4	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 3.4	61 ± 1.4	61 ± 1.5	59 ± 2.6	58 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.0	> 7.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 2.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.3	6.6 ± 0.3	6.2 ± 0.5	5.5 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 17	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1910 / 377 / 169 75.2 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	35.0 / 37.2 (clamps incl.) 77.2 / 82.0 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-803	824-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 2.4m 65° | 698-803 16dBi | 824-960 17dBi | 2x1695-2690 18dBi

Type No.		80010769			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-960	
Frequency Range	MHz	698 - 803		824 - 894	880 - 960
Gain at mid Tilt	dBi	15.9		16.5	16.8
Gain over all Tilts	dBi	15.9 ± 0.5		16.5 ± 0.4	16.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 3.1		66 ± 1.6	64 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 25		> 27	> 25
Cross Polar Discrimination over Sector	dB	> 7		> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0		< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7		7.6 ± 0.3	7.2 ± 0.3
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0	
Tilt Accuracy	°	< 0.4		< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16		> 16	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15		> 16	> 18
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)			



FlexRET



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.3	17.8	17.9	17.5	18.2
Gain over all Tilts	dBi	17.2 ± 0.6	17.7 ± 0.3	17.8 ± 0.3	17.4 ± 0.4	18.1 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.8	61 ± 2.4	61 ± 2.1	66 ± 6.3	63 ± 6.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 27	> 26	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 8.0	> 9.5	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.5	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010769

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	17.8	18.0	18.4	18.5
Gain over all Tilts	dBi	17.5 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.3 ± 0.4	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 1.7	61 ± 1.4	60 ± 2.4	59 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 18	> 17
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.0	> 7.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.3	6.5 ± 0.3	6.2 ± 0.4	5.5 ± 0.5	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 18	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 825 185 Maximal: 955 215
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2429 / 377 / 169 95.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	40.0 / 42.2 (clamps incl.) 88.2 / 93.0 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-862	880-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 1.5m 65° | 698-862 14.5dBi | 880-960 15dBi | 2x1695-2690 18dBi



FlexRET



Type No.		80010867		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	14.0	14.5	14.9
Gain over all Tilts	dBi	13.9 ± 0.5	14.3 ± 0.5	14.7 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.7	63 ± 3.4	61 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 26
Cross Polar Discrimination at Boresight	dB	> 20	> 22	> 21
Cross Polar Discrimination over Sector	dB	> 7.0	> 6.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	14.6 ± 1.6	13.3 ± 0.7	11.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0
Tilt Accuracy	°	< 0.7	< 0.7	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 15	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1, Y2) > 30 (R2 // Y1)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2170	2300 - 2400	2500 - 2690
Gain at mid Tilt	dBi	17.2	17.6	17.5	17.1	17.7
Gain over all Tilts	dBi	17.1 ± 0.6	17.5 ± 0.3	17.5 ± 0.4	17.1 ± 0.4	17.6 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 2.1	62 ± 2.6	64 ± 7.0	62 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 25	> 20	> 18
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.0	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.5	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.5	6.4 ± 0.3	6.0 ± 0.5	5.3 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 19	> 16	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 14	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010867

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.4	17.7	18.0	18.5	18.6
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.3	17.9 ± 0.5	18.4 ± 0.4	18.5 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.4	62 ± 1.8	61 ± 1.5	59 ± 2.0	57 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 25	> 24	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 15.5	> 17.5	> 14.5	> 8.0	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.4	6.5 ± 0.3	6.2 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R2) > 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1459 / 377 / 169 57.4 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	28.5 / 30.7 (clamps incl.) 62.8 / 67.7 (clamps incl.)
Packing Size	mm inches	1658 / 397 / 212 65.3 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-862	880-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 1.9m 65° | 698-862 15.5dBi | 880-960 16dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80010868		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	15.0	15.4	15.9
Gain over all Tilts	dBi	14.9 ± 0.5	15.3 ± 0.5	15.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	71 ± 2.5	68 ± 2.5	66 ± 1.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	11.0 ± 0.9	10.0 ± 0.6	9.4 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 18	> 18
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.4	17.8	17.9	17.6	18.3
Gain over all Tilts	dBi	17.3 ± 0.5	17.7 ± 0.3	17.8 ± 0.3	17.5 ± 0.4	18.1 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.2	61 ± 3.0	60 ± 2.5	65 ± 5.0	61 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24	> 24
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.0	> 9.5	> 9.0	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 1.5	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 18	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010868

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.7	18.0	18.4	18.4
Gain over all Tilts	dBi	17.3 ± 0.4	17.6 ± 0.3	17.9 ± 0.4	18.3 ± 0.3	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.4	63 ± 3.2	62 ± 2.9	60 ± 2.0	60 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 24	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 15.5	> 14.5	> 13.0	> 7.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.4 ± 0.4	5.5 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 21	> 22	> 17	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 16	> 15	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	34.0 / 36.2 (clamps incl.) 75.0 / 79.8 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2
698-862	880-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 2.4m 65° | 698-862 16.5dBi | 880-960 17dBi | 2x1695-2690 18dBi



FlexRET



Type No.		80010869		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	16.0	16.4	17.0
Gain over all Tilts	dBi	15.9 ± 0.4	16.3 ± 0.4	16.9 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	68 ± 2.8	66 ± 2.2	64 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 6.5	> 7.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	8.7 ± 0.6	8.0 ± 0.5	7.2 ± 0.3
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 15	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 15	> 17
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.4	17.8	17.9	17.5	18.1
Gain over all Tilts	dBi	17.3 ± 0.5	17.8 ± 0.3	17.8 ± 0.3	17.4 ± 0.4	17.9 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.2	61 ± 2.8	61 ± 2.5	66 ± 5.1	63 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24	> 24
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.0	> 10.0	> 9.0	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 1.5	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 15	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010869

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.7	17.9	18.5	18.4
Gain over all Tilts	dBi	17.3 ± 0.4	17.7 ± 0.3	17.9 ± 0.4	18.4 ± 0.3	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.8	62 ± 2.9	62 ± 2.8	59 ± 2.3	60 ± 2.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.5	> 8.0	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.4 ± 0.4	5.5 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 21	> 22	> 18	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 16	> 15	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 830 187 Maximal: 960 216
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2441 / 377 / 169 96.1 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	37.4 / 39.6 (clamps incl.) 82.5 / 87.3 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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Frequency Range

698-862	880-960	1695-2690	1427-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 2LB/2HB 1.5m 65° | 698-862 14.5dBi | 880-960 15dBi | 1695-2690 18dBi | 1427-2690 18dBi



FlexRET

Type No.		80011867		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	791 - 862	880 - 960
Gain at mid Tilt	dBi	14.1	14.6	15.0
Gain over all Tilts	dBi	14.0 ± 0.4	14.4 ± 0.6	14.8 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	71 ± 3.7	67 ± 3.1	65 ± 4.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 25
Vertical Pattern:				
Elevation Beamwidth	°	14.3 ± 1.3	13.2 ± 0.9	11.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0
Tilt Accuracy	°	< 0.6	< 0.5	< 0.6
First Upper Side Lobe Suppression	dB	> 15	> 16	> 14
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.2	17.5	17.7	17.6	17.8
Gain over all Tilts	dBi	17.1 ± 0.5	17.5 ± 0.2	17.6 ± 0.4	17.5 ± 0.6	17.7 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.0	64 ± 3.1	62 ± 4.0	55 ± 4.1	59 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 28	> 28	> 26	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.3	6.4 ± 0.3	6.0 ± 0.5	5.2 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 19	> 19	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011867

Right side, highband		Y2, connector 7-8						
		1427-2690						
Frequency Range	MHz	1427 - 1496	1492 - 1518	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	16.3	16.5	17.3	17.7	17.9	17.9	18.2
Gain over all Tilts	dBi	16.3 ± 0.3	16.5 ± 0.2	17.3 ± 0.3	17.6 ± 0.3	17.9 ± 0.3	17.9 ± 0.4	18.0 ± 0.6
Horizontal Pattern:								
Azimuth Beamwidth	°	73 ± 6.0	67 ± 5.1	67 ± 4.5	66 ± 3.4	66 ± 2.8	68 ± 2.9	62 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 26	> 26	> 26	> 27	> 24
Vertical Pattern:								
Elevation Beamwidth	°	8.6 ± 0.3	8.6 ± 0.2	7.2 ± 0.4	6.7 ± 0.3	6.3 ± 0.5	5.6 ± 0.4	5.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 - 12.0						
Tilt Accuracy	°	< 0.4	< 0.4	< 0.6	< 0.6	< 0.6	< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 19	> 19	> 19	> 20	> 20	> 16	> 15
Cross Polar Isolation	dB	> 28						
Port to Port Isolation	dB	> 28 (Y2 // Y1) > 30 (Y2 // R1, R2)	> 30 (Y2 // R1, R2, Y1)					
Max. Effective Power per specified Band and Port	W	150 (at 50 °C ambient temperature)		200 (at 50 °C ambient temperature)			120 (at 50 °C ambient temperature)	
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)						
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)						

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

* not applicable for L-band

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 665 149
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 378 / 164 59.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	30.0 / 35.0 (clamps incl.) 66.1 / 77.1 (clamps incl.)
Packing Size	mm inches	1681 / 402 / 248 66.2 / 15.8 / 9.8
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1427-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 2LB/2HB 2.0m 65° | 698-862 15.5dBi | 880-960 16dBi | 1695-2690 18dBi | 1427-2690 18dBi



FlexRET



Type No.		80011868		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 – 806	791 – 862	880 – 960
Gain at mid Tilt	dBi	15.2	15.6	16.0
Gain over all Tilts	dBi	15.1 ± 0.5	15.6 ± 0.3	15.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.3	63 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 27
Vertical Pattern:				
Elevation Beamwidth	°	10.6 ± 0.7	9.7 ± 0.5	9.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		2.0 – 12.0
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19	> 21
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 19
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	18.0	18.2	17.9	18.2
Gain over all Tilts	dBi	17.3 ± 0.5	17.9 ± 0.4	18.1 ± 0.4	17.8 ± 0.4	18.1 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	62 ± 3.4	61 ± 2.6	59 ± 4.4	61 ± 6.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27	> 25	> 24	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.3	5.8 ± 0.3	5.5 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 17	> 16	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011868

Right side, highband		Y2, connector 7-8						
		1427-2690						
Frequency Range	MHz	1427 - 1496	1492 - 1518	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	16.3	16.5	17.3	17.7	17.9	17.9	18.2
Gain over all Tilts	dBi	16.3 ± 0.3	16.5 ± 0.2	17.3 ± 0.3	17.6 ± 0.3	17.9 ± 0.3	17.9 ± 0.4	18.0 ± 0.6
Horizontal Pattern:								
Azimuth Beamwidth	°	73 ± 6.0	67 ± 5.1	66 ± 4.8	66 ± 3.4	66 ± 2.8	68 ± 2.9	62 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 26	> 26	> 26	> 27	> 24
Vertical Pattern:								
Elevation Beamwidth	°	8.6 ± 0.3	8.6 ± 0.2	7.2 ± 0.4	6.7 ± 0.3	6.3 ± 0.5	5.6 ± 0.4	5.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 - 12.0						
Tilt Accuracy	°	< 0.4	< 0.4	< 0.6	< 0.6	< 0.6	< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 19	> 19	> 19	> 20	> 20	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 18	> 18	> 19	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28						
Port to Port Isolation	dB	> 28 (Y2 // Y1) > 30 (Y2 // R1, R2)	> 30 (Y2 // R1, R2, Y1)					
Max. Effective Power per specified Band and Port	W	150 (at 50 °C ambient temperature)		200 (at 50 °C ambient temperature)			120 (at 50 °C ambient temperature)	
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)						
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)						

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

* not applicable for L-band

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 204 Maximal: 905 204
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	36.0 / 41.0 (clamps incl.) 79.3 / 90.3 (clamps incl.)
Packing Size	mm inches	2200 / 383 / 255 86.6 / 15.1 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1427-2690	1427-2690
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HPBW

65°	65°	65°	65°
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■ Ultra compact width

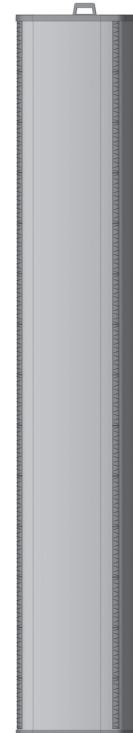


FlexRET

8-Port Antenna 2LB/2HB 2.0m 65° | 2x698-960 15.4dBi | 2x1427-2690 17.9dBi

Type No.	800372965				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.0	14.7	15.0	15.4
Gain over all Tilts	dBi	14.0 ± 0.4	14.7 ± 0.4	15.0 ± 0.4	15.4 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 5.7	58 ± 3.7	57 ± 3.3	53 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 18	> 20	> 22	> 21
Vertical Pattern:					
Elevation Beamwidth	°	11.8 ± 1.3	10.9 ± 0.6	10.7 ± 0.5	10.1 ± 0.7
Electrical Downtilt continuously adjustable	°	2.5 - 11.5			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 17	> 19	> 21
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 dB (R1 // R2, Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.



Right side, lowband	R2, connector 3-4				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.0	14.7	15.0	15.5
Gain over all Tilts	dBi	14.0 ± 0.4	14.7 ± 0.4	15.0 ± 0.5	15.5 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 4.8	59 ± 4.0	57 ± 3.3	53 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 19	> 20	> 21	> 21
Vertical Pattern:					
Elevation Beamwidth	°	11.8 ± 0.9	11.0 ± 0.6	10.8 ± 0.6	10.2 ± 0.9
Electrical Downtilt continuously adjustable	°	2.5 - 11.5			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 17	> 19	> 21
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 dB (R2 // R1, Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

800372965

Left side, highband		Y1, connector 5-6					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.6	17.9	17.9	17.6	17.7
Gain over all Tilts	dBi	16.9 ± 0.7	17.5 ± 0.6	17.7 ± 0.8	17.9 ± 0.8	17.5 ± 0.7	17.7 ± 0.7
Horizontal Pattern:							
Azimuth Beamwidth	°	63 ± 4.9	68 ± 3.8	68 ± 6.3	67 ± 4.9	67 ± 6.3	60 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 28	> 26	> 27	> 27	> 29
Vertical Pattern:							
Elevation Beamwidth	°	8.0 ± 0.4	6.9 ± 0.4	6.4 ± 0.3	6.2 ± 0.4	5.7 ± 0.3	5.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 20	> 21	> 19	> 19	> 19
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 dB (Y1 // R1, R2, Y2)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highband		Y2, connector 7-8					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.5	17.8	17.9	17.5	17.7
Gain over all Tilts	dBi	16.9 ± 0.6	17.5 ± 0.5	17.7 ± 0.8	17.9 ± 0.8	17.5 ± 0.6	17.6 ± 0.7
Horizontal Pattern:							
Azimuth Beamwidth	°	63 ± 4.0	68 ± 4.1	68 ± 3.9	66 ± 6.2	66 ± 6.4	60 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 26	> 27	> 26	> 27
Vertical Pattern:							
Elevation Beamwidth	°	7.9 ± 0.4	6.8 ± 0.4	6.4 ± 0.3	6.1 ± 0.4	5.6 ± 0.3	5.3 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 18	> 19	> 18	> 18	> 17
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 dB (Y2 // R1, R2, Y1)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

800372965

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.
* not applicable for L-band

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 465 105 Maximal: 815 183
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1978 / 378 / 164 77.9 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-Medium)	
Weight	kg lb	33.8 / 38.3 (clamps incl.) 74.5 / 84.4 (clamps incl.)
Packing Size	mm inches	2125 / 440 / 293 83.7 / 17.3 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

Frequency Range

HPBW

R1	R2	Y1	Y2
698-894	698-894	1695-2360	1695-2360
65°	65°	65°	65°

KATHREIN

Preliminary Issue

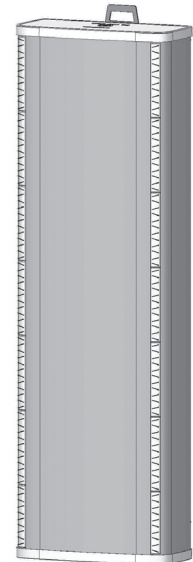
■ Ultra compact width



FlexRET

8-Port Antenna 2LB/2HB 4ft 65° | 2x698-894 13dBi | 2x1695-2360 17dBi

Type No.		840370964	
Left side, lowband		R1, connector 1-2	
		698-894	
Frequency Range	MHz	698 - 824	824 - 894
Gain at mid Tilt	dBi	12.3	12.9
Gain over all Tilts	dBi	12.3 ± 0.3	12.9 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	55 ± 4.2	53 ± 5.3
Front-to-Back Ratio, Co-Polar, ± 30°	dB	> 21	> 24
Cross Polar Discrimination over Sector	dB	5.0	8.0
Vertical Pattern:			
Elevation Beamwidth	°	19.0 ± 1.8	17.7 ± 1.4
Electrical Downtilt continuously adjustable	°	4.0 - 18.0	
Tilt Accuracy	°	< 1.8	< 1.4
First Upper Side Lobe Suppression	dB	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 21	> 19
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2) typically	
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1	W	600 (at 50 °C ambient temperature)	



8 Ports

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband		R2, connector 3-4	
		698-894	
Frequency Range	MHz	698 - 824	824 - 894
Gain at mid Tilt	dBi	12.2	13.1
Gain over all Tilts	dBi	12.1 ± 0.3	13.0 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	56 ± 4.7	51 ± 4.0
Front-to-Back Ratio, Co-Polar, ± 30°	dB	> 20	> 22
Cross Polar Discrimination over Sector	dB	4.5	6.0
Vertical Pattern:			
Elevation Beamwidth	°	19.0 ± 1.9	17.5 ± 1.1
Electrical Downtilt continuously adjustable	°	4.0 - 18.0	
Tilt Accuracy	°	< 1.5	< 1.1
First Upper Side Lobe Suppression	dB	> 16	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 21	> 23
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2) typically	
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)	
Max. Effective Power Ports R2	W	600 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

Left side, highband		Y1, connector 5-6			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.4	17.0	17.2	16.8
Gain over all Tilts	dBi	16.4 ± 0.6	16.9 ± 0.7	17.1 ± 0.8	16.8 ± 0.7
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 3.1	63 ± 6.2	61 ± 5.3	61 ± 6.0
Front-to-Back Ratio, Co-Polar, ± 30°	dB	> 29	> 29	> 29	> 31
Cross Polar Discrimination over Sector	dB	11.5	9.5	9.0	10.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.5	8.0 ± 0.4	7.6 ± 0.5	6.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 20	> 16	> 16	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 15	> 16	> 16
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 dB (Y1 // R1, R2, Y2)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highband		Y2, connector 7-8			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.3	16.9	17.1	17.1
Gain over all Tilts	dBi	16.3 ± 0.6	16.8 ± 0.6	17.0 ± 0.8	17.0 ± 0.8
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 3.8	65 ± 4.2	63 ± 5.6	61 ± 3.5
Front-to-Back Ratio, Co-Polar, ± 30°	dB	> 29	> 30	> 30	> 31
Cross Polar Discrimination over Sector	dB	13.0	13.5	12.5	11.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.6	7.9 ± 0.4	7.5 ± 0.5	6.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 15	> 15	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 15	> 15	> 15
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 dB (Y2 // R1, R2, Y1)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

840370964

Preliminary Issue

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 275 62 Maximal: 485 109
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1214 / 378 / 164 47.7 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-Medium)	
Weight	kg lb	24 / 29.0 (clamps incl.) 52.9 / 63.9 (clamps incl.)
Packing Size	mm inches	1360 / 440 / 293 53.6 / 17.3 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-894	698-894	1695-2360	1695-2360
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HPBW

65°	65°	65°	65°
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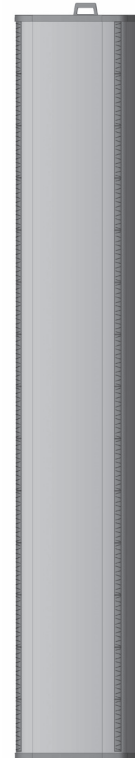
■ Ultra compact width



FlexRET

8-Port Antenna 2LB/2HB 8ft 65° | 2x698-894 15.5dBi | 2x1695-2360 18dBi

Type No.	840370966		
Left side, lowband		R1, connector 1-2	
		698-894	
Frequency Range	MHz	698 - 824	824 - 894
Gain at mid Tilt	dBi	14.8	15.9
Gain over all Tilts	dBi	14.8 ± 0.5	15.9 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	60 ± 4.4	56 ± 4.2
Front-to-Back Ratio, ± 30°	dB	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 22
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5
Vertical Pattern:			
Elevation Beamwidth	°	9.8 ± 0.6	8.8 ± 0.3
Electrical Downtilt continuously adjustable	°	1.0 - 10.0	
Tilt Accuracy	°	< 0.8	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 17
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2) typically	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)	



Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4	
		698-894	
Frequency Range	MHz	698 - 824	824 - 894
Gain at mid Tilt	dBi	14.8	15.8
Gain over all Tilts	dBi	14.8 ± 0.5	15.8 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	60 ± 4.5	57 ± 4.8
Front-to-Back Ratio, ± 30°	dB	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 11.0
Vertical Pattern:			
Elevation Beamwidth	°	9.8 ± 0.6	8.8 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 - 10.0	
Tilt Accuracy	°	< 0.8	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2) typically	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

840370966

Left side, highband		Y1, connector 5-6			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	17.8	18.1	18.3	18.3
Gain over all Tilts	dBi	17.7 ± 0.3	17.9 ± 0.4	18.2 ± 0.6	18.2 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 4.0	66 ± 4.2	63 ± 5.6	64 ± 4.0
Front-to-Back Ratio, ± 30°	dB	> 26	> 28	> 29	> 30
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 23	> 19
Cross Polar Discrimination over Sector	dB	> 11.5	> 12.5	> 9.5	> 8.5
Vertical Pattern:					
Elevation Beamwidth	°	6.0 ± 0.3	5.5 ± 0.3	5.2 ± 0.4	4.6 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 18	> 21	> 19	> 20
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y1 // R1, R2, Y2)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	17.7	18.2	18.3	18.4
Gain over all Tilts	dBi	17.7 ± 0.3	18.0 ± 0.4	18.2 ± 0.6	18.3 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 4.1	66 ± 4.0	63 ± 5.5	63 ± 4.3
Front-to-Back Ratio, ± 30°	dB	> 25	> 27	> 28	> 32
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 24	> 20
Cross Polar Discrimination over Sector	dB	> 12.0	> 12.5	> 8.5	> 9.0
Vertical Pattern:					
Elevation Beamwidth	°	6.0 ± 0.3	5.5 ± 0.3	5.2 ± 0.4	4.6 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 19	> 19
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y2 // R1, R2, Y1)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

840370966

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications			
Input	8 x 4.3-10 female		
Connector Position	bottom		
Adjustment Mechanism	FlexRET, continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	590 132
		Lateral:	485 109
		Maximal:	1035 233
Max. Wind Velocity	km/h mph	241 150	
Height / Width / Depth	mm inches	2437 / 378 / 164 96.0 / 14.9 / 6.5	
Category of Mounting Hardware	XM (X-medium)		
Weight	kg lb	39.3 / 43.8 (clamps incl.) 86.6 / 96.9 (clamps incl.)	
Packing Size	mm inches	2585 / 440 / 293 101.8 / 17.3 / 11.5	
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter		

8-Port Antenna

R1	R2	B1	B2
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KATHREIN

Frequency Range

790-960	790-960	1710-2180	1710-2180
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HPBW

65°	65°	60°	60°
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8-Port Antenna 2LB/2HB 1.9m 65°/60° | 2x790-960 16dBi | 2x1710-2180 18.5dBi



Type No.		80010825		
Left side, lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.0	16.1
Gain over all Tilts	dBi	15.6 ± 0.4	15.8 ± 0.4	15.9 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.2	64 ± 2.3	62 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 28	> 27
Cross Polar Discrimination at Boresight	dB	> 24	> 24	> 22
Cross Polar Discrimination over Sector	dB	> 11.5	> 10.5	> 10.0
Vertical Pattern:				
Elevation Beamwidth	°	11.2 ± 0.6	10.7 ± 0.7	10.0 ± 0.7
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 19	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R1 // R2, B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)		



8 Ports

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	15.9	16.1
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.3	15.9 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.1	65 ± 1.6	62 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27
Cross Polar Discrimination at Boresight	dB	> 28	> 26	> 25
Cross Polar Discrimination over Sector	dB	> 11.5	> 11.5	> 10.0
Vertical Pattern:				
Elevation Beamwidth	°	11.3 ± 0.6	10.8 ± 0.7	10.0 ± 0.7
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.3	< 0.2	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 20	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R2 // R1, B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010825

Left side, highband		B1, connector 5-6		
			1710-2180	
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.6
Gain over all Tilts	dBi	18.5 ± 0.3	18.7 ± 0.3	18.5 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	59 ± 2.4	57 ± 1.9	60 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 27	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 14.5	> 16.5	> 11.0
Vertical Pattern:				
Elevation Beamwidth	°	4.9 ± 0.2	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 17	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // R1, R2, B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B1	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		B2, connector 7-8		
			1710-2180	
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.5	18.8	18.8
Gain over all Tilts	dBi	18.4 ± 0.4	18.7 ± 0.3	18.6 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	60 ± 2.9	57 ± 2.2	59 ± 4.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 25	> 27	> 26
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.5	> 10.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.2	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 17	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B2 // R1, R2, B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Ports B2	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010825

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input		8 x 7-16 female
Connector Position		bottom
Adjustment Mechanism		4x, Position bottom continuously adjustable
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1230 277 Maximal: 1355 305
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1934 / 576 / 133 76.1 / 22.7 / 5.2
Category of Mounting Hardware		H (Heavy)
Weight	kg lb	32.0 / 34.2 (clamps incl.) 70.5 / 75.3 (clamps incl.)
Packing Size	mm inches	2202 / 634 / 159 86.7 / 25.0 / 6.3
Scope of Supply		Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter

8-Port Antenna

R1	R2	B1	B2
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KATHREIN

Frequency Range

790-960	790-960	1710-2180	1710-2180
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HPBW

65°	65°	60°	60°
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8-Port Antenna 2LB/2HB 2.4m 65°/60° | 2x790-960 17dBi | 2x1710-2180 18.5dBi



Type No.		80010826					
Lowbands		R1			R2		
		790-960			790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.6	16.8	16.7	16.5	16.8	16.8
Gain over all Tilts	dBi	16.5 ± 0.3	16.6 ± 0.2	16.6 ± 0.3	16.5 ± 0.4	16.6 ± 0.2	16.6 ± 0.3
Horizontal Pattern:							
Azimuth Beamwidth	°	65 ± 2.3	64 ± 2.0	62 ± 2.4	66 ± 2.8	64 ± 2.2	63 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 28	> 25	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 31	> 32	> 29	> 30	> 30	> 29
Cross Polar Discrimination over Sector	dB	> 15.0	> 13.5	> 12.0	> 15.0	> 14.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Vertical Pattern:							
Elevation Beamwidth	°	8.1 ± 0.3	7.9 ± 0.3	7.5 ± 0.3	8.0 ± 0.3	7.8 ± 0.3	7.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 8.0			0.0 – 8.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 16	> 17	> 16
Cross Polar Isolation	dB	> 30			> 30		
Port to Port Isolation	dB	> 30 (R1 // R2 // B1 // B2)			> 30 (R1 // R2 // B1 // B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



Highbands		B1			B2		
		1710-2180			1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.4	18.5	18.4	18.4	18.6	18.6
Gain over all Tilts	dBi	18.3 ± 0.3	18.4 ± 0.4	18.2 ± 0.5	18.3 ± 0.4	18.5 ± 0.5	18.4 ± 0.5
Horizontal Pattern:							
Azimuth Beamwidth	°	60 ± 2.4	57 ± 2.5	59 ± 3.4	60 ± 2.9	57 ± 2.1	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 25	> 24	> 25	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 28	> 28	> 24	> 28	> 27	> 24
Cross Polar Discrimination over Sector	dB	> 16.0	> 15.5	> 10.0	> 15.0	> 14.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.5	< 0.5	< 1.0	< 1.5
Vertical Pattern:							
Elevation Beamwidth	°	5.0 ± 0.3	4.7 ± 0.2	4.5 ± 0.4	5.0 ± 0.3	4.7 ± 0.2	4.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 6.0			0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 14	> 14	> 14	> 14	> 15	> 15
Cross Polar Isolation	dB	> 30			> 30		
Port to Port Isolation	dB	> 30 (R1 // R2 // B1 // B2)			> 30 (R1 // R2 // B1 // B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			250 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010826

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input		8 x 7-16 female
Connector Position		bottom
Adjustment Mechanism		4x, Position bottom continuously adjustable
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1550 348 Maximal: 1705 383
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2399 / 576 / 133 94.4 / 22.7 / 5.2
Category of Mounting Hardware		H (Heavy)
Weight	kg lb	39.0 / 41.2 (clamps incl.) 86.0 / 90.8 (clamps incl.)
Packing Size	mm inches	2576 / 600 / 170 101.4 / 23.6 / 6.7
Scope of Supply		Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 2LB/2HB 1.5m 65° | 2x 698-960 14dBi | 2x 1695-2690 17.5dBi



FlexRET

Type No.		80010964			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.6	14.2	14.3	14.6
Gain over all Tilts	dBi	13.6 ± 0.6	14.2 ± 0.3	14.3 ± 0.3	14.5 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	65 ± 4.2	63 ± 2.4	62 ± 2.4	59 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 25	> 25
Vertical Pattern:					
Elevation Beamwidth	°	17.8 ± 1.8	16.2 ± 1.0	15.8 ± 0.8	14.7 ± 1.1
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.8	< 0.8
First Upper Side Lobe Suppression	dB	> 17	> 16	> 15	> 15
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 26, typically 30 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	600 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.4	14.1	14.3	14.3
Gain over all Tilts	dBi	13.4 ± 0.5	14.0 ± 0.5	14.2 ± 0.3	14.3 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 5.6	62 ± 2.9	62 ± 2.9	60 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26	> 26
Vertical Pattern:					
Elevation Beamwidth	°	17.6 ± 1.5	16.1 ± 1.3	15.5 ± 0.7	14.6 ± 0.9
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 1.1	< 0.8	< 0.8	< 1.1
First Upper Side Lobe Suppression	dB	> 18	> 15	> 15	> 16
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 26, typically 30 (R2 // R1) > 30 (R2 // Y1) > 27, typically 30 (R2 // Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	600 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010964

Left side, highband		Y1, connector 5-6				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.3	17.5	17.7	17.2
Gain over all Tilts	dBi	16.9 ± 0.3	17.3 ± 0.4	17.4 ± 0.4	17.7 ± 0.8	17.1 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.0	63 ± 4.9	60 ± 4.5	54 ± 4.5	56 ± 8.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 25	> 27	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.3	6.4 ± 0.2	6.0 ± 0.5	5.2 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 14
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.8	17.2	17.3	17.6	17.0
Gain over all Tilts	dBi	16.8 ± 0.4	17.2 ± 0.5	17.2 ± 0.6	17.6 ± 0.9	17.0 ± 1.0
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 4.7	64 ± 6.7	61 ± 6.8	55 ± 6.0	54 ± 9.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 25	> 26	> 22
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.3	6.4 ± 0.3	6.0 ± 0.5	5.3 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 15	> 16	> 14
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010964

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 26
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 835 188 Maximal: 840 189
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 508 / 175 59.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	36.9 / 41.9 (clamps incl.) 81.4 / 92.4 (clamps incl.)
Packing Size	mm inches	1700 / 542 / 268 66.9 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 2LB/2HB 2.0m 65° | 2x698-960 15.5dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80010965			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



8 Ports

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010965

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	17.9	18.3	18.1	18.1
Gain over all Tilts	dBi	17.5 ± 0.4	17.8 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	18.0 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.1	65 ± 4.1	62 ± 7.2	56 ± 4.1	57 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.1	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 16	> 18	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	18.0	18.3	18.2	17.9
Gain over all Tilts	dBi	17.4 ± 0.4	17.8 ± 0.4	18.1 ± 0.6	18.0 ± 0.7	17.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.7	66 ± 4.7	62 ± 7.8	57 ± 3.8	59 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.4	5.9 ± 0.3	5.5 ± 0.5	4.8 ± 0.3	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 15	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010965

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	41.6 / 46.1 (clamps incl.) 91.7 / 101.6 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 2LB/2HB 2.4m 65° | 2x698-960 16.5dBi | 2x1695-2690 18dBi



FlexRET



Type No.		80010966			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.6 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 10.0	> 9.5	> 10.0	> 11.5
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.7 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.6	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.5	> 10.0	> 11.5
Vertical Pattern:					
Elevation Beamwidth	°	9.8 ± 0.6	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010966

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.6	18.0	18.3	18.1	17.9
Gain over all Tilts	dBi	17.5 ± 0.4	17.9 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	17.8 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.9	64 ± 5.0	62 ± 5.4	57 ± 5.7	61 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Cross Polar Discrimination over Sector	dB	> 8.5	> 11.5	> 10.0	> 7.5	> 9.0
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 17	> 19	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.5	17.9	18.2	18.3	18.1
Gain over all Tilts	dBi	17.4 ± 0.5	17.8 ± 0.4	18.0 ± 0.6	18.2 ± 0.6	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 3.0	66 ± 5.5	63 ± 6.9	56 ± 7.1	57 ± 7.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 9.5	> 11.0	> 10.0	> 9.5	> 10.5
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.6 ± 0.4	4.9 ± 0.4	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 19	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010966

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1400 315 Maximal: 1405 316
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 508 / 175 96.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	47.1 / 52.1 (clamps incl.) 103.8 / 114.9 (clamps incl.)
Packing Size	mm inches	2635 / 542 / 268 103.7 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

Frequency Range

HPBW

R1	R2	Y1	Y2
698-960	698-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Antenna 2LB/2HB 2.0m 65° | 2x698-960 15dBi | 2x1695-2690 17dBi



Integrated RET

Type No.		84510965			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.0	14.5	14.7	15.0
Gain over all Tilts	dBi	14.0 ± 0.5	14.6 ± 0.5	14.7 ± 0.3	15.0 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	72 ± 8.7	68 ± 8.1	66 ± 3.9	62 ± 4.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 23	> 24
Vertical Pattern:					
Elevation Beamwidth	°	11.8 ± 1.1	10.8 ± 0.6	10.5 ± 0.7	9.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.9	< 1.1	< 1.1	< 1.2
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 17
Cross Polar Isolation	dB	> 27			
Port to Port Isolation	dB	> 27 (R1 // R2, Y1, Y2)			
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	300 (at 40 °C ambient temperature)			



8 Ports

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	13.9	14.5	14.7	15.1
Gain over all Tilts	dBi	13.9 ± 0.4	14.5 ± 0.5	14.7 ± 0.4	15.0 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	73 ± 7.0	69 ± 4.4	67 ± 5.3	63 ± 5.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 23	> 23
Vertical Pattern:					
Elevation Beamwidth	°	11.8 ± 1.0	10.8 ± 0.7	10.5 ± 0.8	9.9 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.9	< 1.0	< 1.2	< 1.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 18
Cross Polar Isolation	dB	> 27			
Port to Port Isolation	dB	> 27 (R2 // R1, Y1, Y2)			
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)			
Max. Effective Power Ports R2	W	300 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.8	17.1	17.0	17.1	17.5
Gain over all Tilts	dBi	16.9 ± 0.7	17.1 ± 0.6	16.9 ± 0.8	17.0 ± 0.9	17.4 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 3.2	67 ± 3.0	65 ± 4.6	61 ± 6.2	60 ± 5.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 24	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.5	6.2 ± 0.3	5.9 ± 0.3	5.1 ± 0.2	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 16	> 16	> 19	> 16
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.7	16.9	16.8	16.7	17.4
Gain over all Tilts	dBi	16.7 ± 0.7	16.9 ± 0.7	16.8 ± 0.8	16.7 ± 0.9	17.2 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 3.3	67 ± 3.9	66 ± 4.8	61 ± 6.3	59 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 23	> 23	> 26
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.5	6.2 ± 0.3	5.9 ± 0.3	5.2 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 17	> 16	> 17	> 18
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	800 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1155 260 Maximal: 1270 286
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1987 / 448 / 164 78.2 / 17.6 / 6.5
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	33.7 / 36.8 (clamps incl.) 74.3 / 81.1 (clamps incl.)
Packing Size	mm inches	2193 / 468 / 205 86.3 / 18.4 / 8.1
Scope of Supply	Panel, integrated RET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

B1	B2	Y1	Y2
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Frequency Range

1710–2170	1710–2170	2490–2690	2490–2690
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HPBW

65°	65°	60°	60°
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8-Port Antenna 4HB 1.5m 65° | 2x1710–2170 17.5dBi | 2x2490–2690 18dBi



FlexRET



Type No.		80010728			
		B1, connector 1–2		Y1, connector 5–6	
		1710–2170		2490–2690	
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.8	17.8	18.1
Gain over all Tilts	dBi	17.2 ± 0.4	17.7 ± 0.3	17.7 ± 0.3	17.8 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.4	63 ± 3.1	56 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 25
Cross Polar Discrimination over Sector	dB	> 13.5	> 12.5	> 10.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	5.9 ± 0.5	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 11.0			2.0 – 14.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 17	> 16
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B1 // B2, Y1, Y2)		> 30 (Y1 // B1, B2, Y2)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports B1 + Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010728

		B2, connector 3-4			Y2, connector 7-8
		1710-2170			2490-2690
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.8	17.8	17.9
Gain over all Tilts	dBi	17.2 ± 0.4	17.7 ± 0.3	17.7 ± 0.2	17.6 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.8	64 ± 2.3	63 ± 3.1	56 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 26	> 23
Cross Polar Discrimination at Boresight	dB	> 21	> 21	> 21	> 23
Cross Polar Discrimination over Sector	dB	> 14.5	> 12.0	> 11.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.4	6.3 ± 0.3	6.0 ± 0.4	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 11.0			2.0 – 14.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 16	> 16
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B2 // B1, Y1, Y2)			> 30 (Y2 // B1, B2, Y1)
Max. Effective Power for Group of Ports 5+7 // 6+8	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports B2 + Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	700 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 570 128 Maximal: 625 141
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1471 / 275 / 103 57.9 / 10.8 / 4.1
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	17.0 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing Size	mm inches	1666 / 298 / 136 65.6 / 11.7 / 5.4
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8+1-Port Antenna P1 P2 P3 P4
Frequency Range 3300–3800 3300–3800 3300–3800 3300–3800
HPBW 90° 90° 90° 90°

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Preliminary Issue

8+1-Port Antenna 4HB 0.9m 90° | 4x3300–3800 15.6dBi



Integrated RET

Type No.		800250911		
Left side, highband		P1, connector 1–2		
		3300–3800		
Frequency Range	MHz	3300 – 3400	3400 – 3600	3600 – 3800
Gain at mid Tilt	dBi	14.9	15.3	15.6
Gain over all Tilts	dBi	14.9 ± 0.7	15.2 ± 0.7	15.3 ± 0.7
Horizontal Pattern:				
Azimuth Beamwidth	°	100 ± 2.7	96 ± 4.0	89 ± 11.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 17	> 17	> 16
Vertical Pattern:				
Elevation Beamwidth	°	6.1 ± 0.4	6.0 ± 0.5	5.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		
Tilt Accuracy	°	< 0.5	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 18	> 13
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 15	> 13
Cross Polar Isolation	dB	> 23		
Port to Port Isolation	dB	> 23 (P1 // P2 // P3 // P4)		
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)		
Max. Effective Power Ports P1	W	40 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 10.0) requirements.

Center left side, highband		P2, connector 3–4		
		3300–3800		
Frequency Range	MHz	3300 – 3400	3400 – 3600	3600 – 3800
Gain at mid Tilt	dBi	14.5	15.0	15.5
Gain over all Tilts	dBi	14.5 ± 0.6	14.9 ± 0.7	15.4 ± 0.6
Horizontal Pattern:				
Azimuth Beamwidth	°	106 ± 3.1	99 ± 5.7	88 ± 8.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 19	> 20	> 20
Vertical Pattern:				
Elevation Beamwidth	°	6.2 ± 0.4	6.1 ± 0.5	5.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		
Tilt Accuracy	°	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 13	> 17	> 13
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 12	> 14	> 13
Cross Polar Isolation	dB	> 23		
Port to Port Isolation	dB	> 23 (P1 // P2 // P3 // P4)		
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)		
Max. Effective Power Ports P2	W	40 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 10.0) requirements.

Center right side, highband		P3, connector 5-6		
		3300-3800		
Frequency Range	MHz	3300 – 3400	3400 – 3600	3600 – 3800
Gain at mid Tilt	dBi	14.5	15.0	15.5
Gain over all Tilts	dBi	14.6 ± 0.7	14.9 ± 0.8	15.4 ± 0.7
Horizontal Pattern:				
Azimuth Beamwidth	°	105 ± 4.4	98 ± 5.6	87 ± 9.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 19	> 19	> 20
Vertical Pattern:				
Elevation Beamwidth	°	6.2 ± 0.5	6.1 ± 0.5	5.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 13
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 15	> 14
Cross Polar Isolation	dB	> 23		
Port to Port Isolation	dB	> 23 (P1 // P2 // P3 // P4)		
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)		
Max. Effective Power Ports P3	W	40 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highband		P4, connector 7-8		
		3300-3800		
Frequency Range	MHz	3300 – 3400	3400 – 3600	3600 – 3800
Gain at mid Tilt	dBi	15.1	15.3	15.6
Gain over all Tilts	dBi	15.0 ± 0.7	15.2 ± 0.6	15.3 ± 0.7
Horizontal Pattern:				
Azimuth Beamwidth	°	99 ± 4.2	96 ± 4.4	90 ± 10.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 18	> 17	> 17
Vertical Pattern:				
Elevation Beamwidth	°	6.1 ± 0.4	6.0 ± 0.4	5.7 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 16	> 13
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 15	> 12
Cross Polar Isolation	dB	> 23		
Port to Port Isolation	dB	> 23 (P1 // P2 // P3 // P4)		
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)		
Max. Effective Power Ports P4	W	40 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

Broadcast Beam at mid Tilt				
Azimuth 3dB Beamwidth	°	80.9	74.5	66
Gain	dB	16.3	16.8	16.4
Gain roll-off at Sector Edge	dB	12.6	18	13
Cross Polar Ratio (0°)	dB	> 16.6	> 18	> 19
Front-to-back Ratio	dB	> 21	> 23	> 25
Service Beam at mid Tilt				
0° Direct Beam Gain	dB	21.2	21.3	21.8
0° Direction Beam Horizontal 3dB Beam Width	°	22.3	21.6	21.2
0° Direction Beam Horizontal SLS	dB	> 12.4	> 13	> 13
0° Direction Beam Cross polar Ratio	dB	> 17	>17.5	> 23.6
0° Direction Beam Front-to-Back Ratio	dB	> 23	> 22	> 23
Multi Beam at mid Tilt				
Horizontal 3dB Beam Width	°	tbd	tbd	tbd
Gain	dB	tbd	tbd	tbd

Calibration and electrical parameters			
Coupling factor between calibration port and each antenna port	dB		-26 ± 1
Max. amplitude tolerance from calibration port to input ports	dB		± 0.5
Max. Phase tolerance from calibration port to inports	°		± 10

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 23
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications			
Input	9 x 4.3-10 female		
Connector Position	bottom		
Adjustment Mechanism	Integrated RET, continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	340 76
		Maximal:	375 84
Max. Wind Velocity	km/h mph	241 150	
Height / Width / Depth	mm inches	921 / 275 / 103 36.3 / 10.8 / 4.1	
Category of Mounting Hardware	M (Medium)		
Weight	kg lb	5.8 / 8 (clamps incl.) 12.8 / 17.6 (clamps incl.)	
Packing Size	mm inches	1100 / 300 / 136 43.3 / 11.8 / 5.4	
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

Summary – Directional Antennas

10 Ports

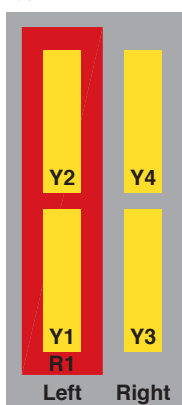
Dual Polarization $\pm 45^\circ$

KATHREIN

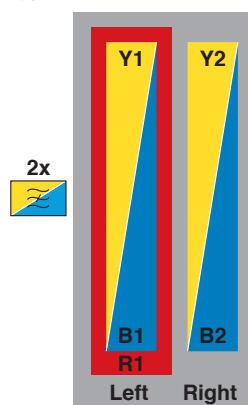
Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband 4 x Highband									
10-Port Antenna	698–960	65°	15.3dBi	2°–12°T	84510891	1995	4.3-10, bottom	154 – 156	AL
	1695–2690	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–12°T					
	1695–2690	65°	16.5dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–12°T					
10-Port Antenna	698–960	65°	16dBi	2°–12°T	80011891	1999	4.3-10, bottom	157 – 159	X
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1427–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
10-Port Antenna	698–960	65°	16dBi	2°–12°T	80010875	1921	7-16, bottom	160 + 161	Y
	1695–2180	65°	17.5dBi	2.5°–12°T					
	2490–2690	65°	17.5dBi	2.5°–12°T					
	1695–2180	65°	17.5dBi	2.5°–12°T					
	2490–2690	65°	18dBi	2.5°–12°T					
10-Port Antenna	698–960	65°	16dBi	2°–12°T	80010891	1995	4.3-10, bottom	162 – 164	X
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
10-Port Antenna	698–960	65°	16.5dBi	1°–10°T	84510892	2697	4.3-10, bottom	165 – 167	AH
	1695–2690	65°	17dBi	2°–12°T					
	1695–2690	65°	17dBi	2°–12°T					
	1695–2690	65°	17dBi	2°–12°T					
	1695–2690	65°	17dBi	2°–12°T					
10-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80020892	2693	4.3-10, bottom	168 – 170	X
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					

1) Configuration Types – further details on page 12–15.

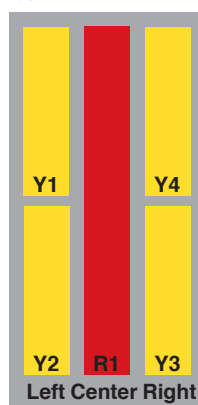
Type X



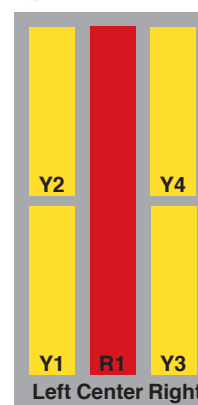
Type Y



Type AH



Type AL



Summary – Directional Antennas

10 Ports

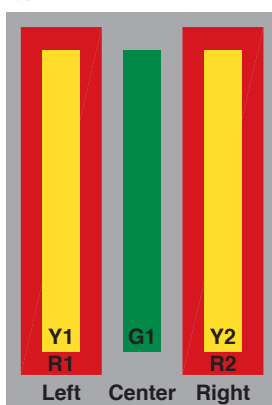
Dual Polarization $\pm 45^\circ$

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 3 x Highband									
10-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80011965	1999	4.3-10, bottom	171 – 173	AI
	698–960	65°	15.5dBi	2°–12°T					
	1427–1518	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
10-Port Antenna	698–960	65°	14.5dBi	2°–16°T	800442004	1478	4.3-10, bottom	174 – 176	AP
	698–960	65°	14.5dBi	2°–16°T					
	1427–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1427–2690	65°	17.5dBi	2.5°–12°T					

New or changed product

1) Configuration Types – further details on page 12–15.

Type AI



Type AP



10-Port Antenna Frequency Range HPBW

R1	Y1	Y2	Y3	Y4
698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 2.0m 65° | 698-960 15.3dBi | 4x1695-2690 16dBi



Integrated RET

Type No.	84510891				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain over all Tilts	dBi	14.8 ± 0.4	15.1 ± 0.4	15.3 ± 0.3	15.3 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	72 ± 1.9	70 ± 2.2	69 ± 2.0	68 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 27	> 27	> 26
Vertical Pattern:					
Elevation Beamwidth	°	11.5 ± 0.8	10.5 ± 0.5	10.2 ± 0.4	9.7 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 1	< 1	< 1	< 1
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 16
Cross Polar Isolation	dB	> 27			
Port to Port Isolation	dB	> 27 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	300 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.



Left side, lower highband	Y1, connector 3-4					
	1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.4	16.3 ± 0.5	16.5 ± 0.6	16.7 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.8	60 ± 2.7	59 ± 3.3	62 ± 3.6	63 ± 4.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 26	> 25
Vertical Pattern:						
Elevation Beamwidth	°	9.9 ± 0.7	8.9 ± 0.5	8.5 ± 0.5	7.5 ± 0.5	6.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.6	< 0.5	< 0.5	< 0.7	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 18	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 16	> 16	> 16
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

84510891

Left side, upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain over all Tilts	dBi	15.5 ± 0.5	16 ± 0.4	16.1 ± 0.6	16.2 ± 0.7	16.4 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 5.9	62 ± 3.9	59 ± 4.1	62 ± 4.8	64 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 26	> 26
Vertical Pattern:						
Elevation Beamwidth	°	10.0 ± 0.6	9.1 ± 0.5	8.6 ± 0.6	7.5 ± 0.4	6.7 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.7	< 0.9	< 0.9	< 1	< 0.6
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 15	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 15	> 14	> 16
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y2 // R1, Y1, Y3, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain over all Tilts	dBi	15.9 ± 0.6	16.1 ± 0.4	16.2 ± 0.6	16.5 ± 0.5	16.7 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.5	61 ± 3.0	60 ± 4.4	62 ± 3.2	63 ± 4.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 24	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.9 ± 0.7	8.9 ± 0.5	8.5 ± 0.6	7.4 ± 0.4	6.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.5	< 0.6	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 17	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 15	> 13	> 15
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y3 // R1, Y1, Y2, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y3	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

84510891

Right side, upper highband		Y4, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain over all Tilts	dBi	15.5 ± 0.7	16.0 ± 0.3	16.0 ± 0.5	16.0 ± 0.6	16.3 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.9	61 ± 3.2	60 ± 3.4	63 ± 4.1	64 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.3 ± 0.9	9.1 ± 0.5	8.7 ± 0.8	7.5 ± 0.4	6.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 1.1	< 1	< 1	< 0.6	< 0.7
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 17	> 14
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 15	> 15	> 15	> 14
Cross Polar Isolation	dB	> 27				
Port to Port Isolation	dB	> 27 (Y4 // R1, Y1, Y2, Y3)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y4	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	700 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 870 196 Maximal: 870 196
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 353 / 164 78.5 / 13.9 / 6.5
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	29 / 31.9 (clamps incl.) 63.9 / 70.3 (clamps incl.)
Packing Size	mm inches	2210 / 377 / 210 87.0 / 14.8 / 8.3
Scope of Supply	Panel, integrated RET and 2 units of clamps for 55-115 mm 2.2-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	Y1	Y2	Y3	Y4
698-960	1695-2690	1695-2690	1427-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 2.0m 65° | 698-960 16dBi | 3x1695-2690 16.5dBi | 1427-2690 16.5dBi



FlexRET

Type No.	80011891				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	15.9	16.1	16.3
Gain over all Tilts	dBi	15.4 ± 0.6	15.8 ± 0.6	16.0 ± 0.6	16.2 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.0	64 ± 2.7	62 ± 2.3	63 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 25	> 28
Vertical Pattern:					
Elevation Beamwidth	°	10.7 ± 0.6	9.9 ± 0.5	9.5 ± 0.4	9.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 18	> 22	> 21	> 19
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.



10 Ports

Left side, lower highband	Y1, connector 3-4					
	1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.2	15.8	15.9	15.6	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.5	15.8 ± 0.4	15.6 ± 0.6	16.3 ± 0.8
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 3.5	62 ± 2.9	64 ± 5.8	56 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.8 ± 0.9	10.2 ± 0.5	9.8 ± 0.8	8.5 ± 0.4	7.8 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 20	> 19	> 17	> 15
Cross Polar Isolation	dB	> 27, typically 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80011891

Left side, upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.7	16.0
Gain over all Tilts	dBi	15.9 ± 0.8	16.3 ± 0.7	16.2 ± 0.7	15.6 ± 0.5	15.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.4	57 ± 3.9	58 ± 5.6	62 ± 4.1	65 ± 7.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.4 ± 0.5	8.8 ± 0.4	8.3 ± 0.7	7.4 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 18	> 19	> 14
Cross Polar Isolation	dB	> 27, typically 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lower highband		Y3, connector 7-8						
		1427-2690						
Frequency Range	MHz	1427 – 1496	1492 – 1518	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	14.6	14.8	15.6	16.0	16.3	16.5	16.9
Gain over all Tilts	dBi	14.6 ± 0.3	14.8 ± 0.3	15.5 ± 0.5	15.9 ± 0.5	16.2 ± 0.6	16.4 ± 0.7	16.7 ± 0.9
Horizontal Pattern:								
Azimuth Beamwidth	°	72 ± 6.7	66 ± 8.0	66 ± 4.9	64 ± 5.1	65 ± 4.4	68 ± 2.3	61 ± 5.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 24	> 25	> 25	> 28	> 25
Vertical Pattern:								
Elevation Beamwidth	°	12.3 ± 0.6	12.5 ± 0.5	10.5 ± 0.6	9.8 ± 0.5	9.3 ± 0.7	8.1 ± 0.5	7.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 14.0						
Tilt Accuracy	°	< 0.7	< 0.7	< 0.6	< 0.3	< 0.3	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 15	> 16	> 17	> 18	> 19	> 14
Cross Polar Isolation	dB	> 27, typically 28						
Port to Port Isolation	dB	> 30 (Y3 // R1, Y1, Y2, Y4)						
Max. Effective Power per specified Band and Port	W	150 (at 50 °C ambient temperature)	200 (at 50 °C ambient temperature)				120 (at 50 °C ambient temperature)	
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)						
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)						

Values based on NGMN-P-BASTA (version 10.0) requirements.

80011891

Right side, upper highband		Y4, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.5	16.9	16.5
Gain over all Tilts	dBi	15.8 ± 0.6	16.1 ± 0.3	16.4 ± 0.5	16.8 ± 0.5	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.6	61 ± 2.1	58 ± 2.9	58 ± 3.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.1 ± 0.4	8.6 ± 0.5	7.7 ± 0.4	6.7 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Cross Polar Isolation	dB	> 27, typically 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	-45, +45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

* not applicable for L-band

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-Medium)	
Weight	kg lb	33.2 / 37.7 (clamps incl.) 73.2 / 83.1 (clamps incl.)
Packing Size	mm inches	2200 / 412 / 255 86.6 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	B1	Y1	B2	Y2
698-960	1695-2180	2490-2690	1695-2180	2490-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 1.9m 65° | 698-960 16dBi | 2x1695-2180 17.5dBi | 2x2490-2690 18dBi



FlexRET

Type No.		80010875			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.1	15.6	15.8	16.1
Gain over all Tilts	dBi	15.1 ± 0.5	15.6 ± 0.3	15.7 ± 0.4	16.0 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 2.0	67 ± 1.5	67 ± 1.3	65 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 21	> 21	> 21	> 20
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	11.0 ± 1.1	10.1 ± 0.4	9.8 ± 0.6	9.3 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 19	> 17	> 17
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // B1, Y1, B2, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highbands		B1, connector 3-4			Y1, connector 7-8
		1695-2180			2490-2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.7	17.8	17.6
Gain over all Tilts	dBi	17.2 ± 0.5	17.6 ± 0.3	17.7 ± 0.4	17.4 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.5	60 ± 2.9	58 ± 2.4	61 ± 4.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 25	> 17
Cross Polar Discrimination over Sector	dB	> 7.0	> 8.0	> 9.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	6.0 ± 0.4	5.5 ± 0.3	5.2 ± 0.4	4.1 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B1 // R1, Y1, B2, Y2)			> 30 (Y1 // R1, B1, B2, Y2)
Max. Effective Power for Group of Ports 3+7 // 4+8	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Ports B1 + Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010875

Right side, highbands		B2, connector 5-6			Y2, connector 9-10
		1695-2180			2490-2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.5	17.8	18.1
Gain over all Tilts	dBi	17.3 ± 0.3	17.5 ± 0.3	17.7 ± 0.5	18.0 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.2	61 ± 2.2	61 ± 2.1	58 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 14.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 0.5	< 0.5	< 3.0
Vertical Pattern:					
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.2 ± 0.5	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 18	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 14
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B2 // R1, B1, Y1, Y2)			> 30 (Y2 // R1, B1, Y1, B2)
Max. Effective Power for Group of Ports 5+9 // 6+10	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Ports B2 + Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	32.0 / 34.2 (clamps incl.) 70.5 / 75.3 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	Y1	Y2	Y3	Y4
698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 2.0m 65° | 698-960 16dBi | 4x1695-2690 16.5dBi



FlexRET

Type No.		80010891			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	15.9	16.0	16.3
Gain over all Tilts	dBi	15.4 ± 0.4	15.8 ± 0.3	15.9 ± 0.3	16.2 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.3	64 ± 1.6	64 ± 1.1	63 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26	> 28
Vertical Pattern:					
Elevation Beamwidth	°	10.6 ± 0.7	9.8 ± 0.5	9.5 ± 0.4	9.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 17	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 18	> 17
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y4) > 30 (R1 // Y1, Y2, Y3)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Left side, lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	58 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010891

Left side, upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.3	16.5	16.9	17.3	17.2
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.1	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010891

Right side, upper highband		Y4, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.9	16.5
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.8 ± 0.3	16.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	59 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.6 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	34.0 / 36.2 (clamps incl.) 74.9 / 79.7 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	Y1	Y2	Y3	Y4
698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 2.7m 65° | 698-960 16.5dBi | 4x1695-2690 17dBi



Integrated RET

Type No.		84510892			
Center, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.1	16.5	16.6	16.7
Gain over all Tilts	dBi	16.0 ± 0.5	16.4 ± 0.4	16.5 ± 0.3	16.6 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.9	68 ± 1.6	68 ± 1.2	67 ± 1.3
Front-to-Back Ratio, Total Power, ±30°	dB	> 25	> 27	> 27	> 27
Cross Polar Discrimination at Boresight	dB	> 20	> 19	> 19	> 18
Cross Polar Discrimination over Sector	dB	> 12	> 14	> 14	> 12
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	8.4 ± 0.7	7.6 ± 0.4	7.3 ± 0.4	6.9 ± 0.3
Electrical Downtilt continuously adjustable	°	1 – 10			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	200 (at 40 °C ambient temperature)			
Max. Effective Power Ports R1	W	400 (at 40 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



10 Ports

Left side, upper highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	17.0	17.2	16.8	17.2
Gain over all Tilts	dBi	16.6 ± 0.4	16.9 ± 0.4	17.0 ± 0.5	16.9 ± 0.5	17.1 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 4.0	60 ± 2.2	60 ± 4.4	65 ± 3.8	61 ± 3.1
Front-to-Back Ratio, Total Power, ±30°	dB	> 26	> 25	> 24	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 21	> 23	> 21	> 18	> 19
Cross Polar Discrimination over Sector	dB	> 10	> 9	> 8	> 10	> 6
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 3.0	< 4.0	< 3.0	< 3.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.3	6.4 ± 0.4	5.6 ± 0.3	5.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y1	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

84510892

Left side, lower highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.4	17.5	17.3	17.5
Gain over all Tilts	dBi	16.9 ± 0.4	17.3 ± 0.4	17.4 ± 0.5	17.3 ± 0.5	17.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 4.9	59 ± 3.0	59 ± 4.3	64 ± 4.6	62 ± 2.5
Front-to-Back Ratio, Total Power, ±30°	dB	> 25	> 25	> 24	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19	> 18	> 20
Cross Polar Discrimination over Sector	dB	> 10	> 9	> 8	> 9	> 7
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 3.5	< 2.5	< 3.0
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.6	6.8 ± 0.4	6.4 ± 0.6	5.5 ± 0.5	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 1.1	< 1.0	< 1.0	< 0.9	< 0.8
First Upper Side Lobe Suppression	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R1, Y1, Y3, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y2	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.1	17.5	17.5	17.2	17.4
Gain over all Tilts	dBi	17.1 ± 0.5	17.5 ± 0.4	17.4 ± 0.5	17.2 ± 0.5	17.4 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 4.4	58 ± 4.0	59 ± 5.7	64 ± 4.2	61 ± 2.6
Front-to-Back Ratio, Total Power, ±30°	dB	> 25	> 25	> 24	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 24	> 21	> 18	> 17	> 18
Cross Polar Discrimination over Sector	dB	> 12	> 9	> 8	> 9	> 6
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 4.0	< 2.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.6	6.8 ± 0.4	6.5 ± 0.6	5.6 ± 0.6	5.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y3 // R1, Y1, Y2, Y4)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y3	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

84510892

Right side, upper highband		Y4, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.8	17.2	17.3	16.9	17.2
Gain over all Tilts	dBi	16.8 ± 0.4	17.2 ± 0.4	17.2 ± 0.5	17.0 ± 0.5	17.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	60 ± 4.8	59 ± 2.9	60 ± 5.3	65 ± 3.5	61 ± 2.8
Front-to-Back Ratio, Total Power, ±30°	dB	> 26	> 25	> 24	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 21	> 20	> 19	> 17	> 19
Cross Polar Discrimination over Sector	dB	> 11	> 9	> 7	> 10	> 5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 4.5	< 2.5	< 3.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.6	6.8 ± 0.4	6.5 ± 0.5	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 1.1	< 1.0	< 1.0	< 0.8	< 0.8
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y4 // R1, Y1, Y2, Y3)				
Max. Effective Power per Port	W	175 (at 40 °C ambient temperature)				
Max. Effective Power Ports Y4	W	300 (at 40 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 40 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	Integrated RET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1230 276 Maximal: 1230 276
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2697 / 353 / 164 106.2 / 13.9 / 6.5
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	38.3 / 40.5 (clamps incl.) 84.4 / 89.3 (clamps incl.)
Packing Size	mm inches	2910 / 377 / 210 114.6 / 14.8 / 8.3
Scope of Supply	Panel, integrated RET and 2 units of clamps for 55-115 mm 2.2-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	Y1	Y2	Y3	Y4
698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna LB/4HB 2.7m 65° | 698-960 17dBi | 4x1695-2690 17.5dBi



FlexRET

Type No.		80020892			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3
Gain over all Tilts	dBi	16.3 ± 0.4	16.8 ± 0.3	17.0 ± 0.4	17.3 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 1.7	68 ± 1.7	68 ± 1.8	66 ± 1.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.4	7.6 ± 0.5	7.1 ± 0.4
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Left side, lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.1	17.5	17.5	17.3	17.8
Gain over all Tilts	dBi	17.1 ± 0.5	17.4 ± 0.3	17.5 ± 0.4	17.3 ± 0.4	17.6 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.9	62 ± 2.8	62 ± 3.2	61 ± 6.6	63 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 21	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 22	> 19	> 19
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 11.5	> 9.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.5	6.4 ± 0.6	5.6 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 15	> 15	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // R1) > 30 (Y1 // Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020892

Left side, upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	17.0	16.7	17.1
Gain over all Tilts	dBi	16.5 ± 0.5	16.8 ± 0.3	16.9 ± 0.4	16.6 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.9	62 ± 3.6	62 ± 4.1	64 ± 7.6	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 22	> 22
Cross Polar Discrimination at Boresight	dB	> 16	> 23	> 22	> 19	> 19
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 12.0	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R1) > 30 (Y2 // Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.2	18.4
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.2	17.8 ± 0.4	18.1 ± 0.3	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.0	66 ± 2.0	66 ± 1.5	66 ± 2.2	65 ± 4.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 23	> 22	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 18	> 16	> 18
Cross Polar Discrimination over Sector	dB	> 11.0	> 14.0	> 14.5	> 11.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 24	> 23	> 19	> 21
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y3 // R1) > 30 (Y3 // Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80020892

Right side, upper highband		Y4, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.1	17.3	17.5	17.6
Gain over all Tilts	dBi	16.9 ± 0.3	17.1 ± 0.3	17.3 ± 0.4	17.4 ± 0.2	17.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.5	65 ± 1.5	65 ± 1.4	66 ± 1.7	66 ± 4.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 19	> 18	> 16	> 18
Cross Polar Discrimination over Sector	dB	> 10.0	> 14.5	> 14.5	> 11.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 0.5	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.2 ± 0.4	6.7 ± 0.4	6.3 ± 0.5	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 20	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y4 // R1) > 30 (Y4 // Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	42.5 / 44.7 (clamps incl.) 93.7 / 98.5 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel and 2 units of clamps for 42-115 mm (1.7-4.5 inch) diameter	

10-Port Antenna Frequency Range HPBW

R1	R2	G1	Y1	Y2
698-960	698-960	1427-1518	1695-2690	1695-2690
65°	65°	65°	65°	65°

10-Port Antenna 2LB/3HB 2.0m 65° | 698-960 15.5dBi | 698-960 15.5dBi |
1427-1518 17dBi | 2x1695-2690 18dBi



FlexRET

Type No.		80011965			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.3	15.4	15.7
Gain over all Tilts	dBi	14.7 ± 0.6	15.3 ± 0.3	15.4 ± 0.3	15.6 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	61 ± 4.7	62 ± 3.7	63 ± 3.8	62 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 22	> 25	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.7 ± 0.9	10.9 ± 0.7	10.5 ± 0.5	10.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.8	< 0.8	< 0.6	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 14	> 14	> 13
Cross Polar Isolation	dB	> 29			
Port to Port Isolation	dB	> 26, typically 30 (R1 // R2, G1) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



10 Ports

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.3	15.6 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.2	61 ± 2.8	61 ± 2.6	60 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 22	> 25	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.4 ± 0.5	10.9 ± 0.6	10.5 ± 0.5	10.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.6	< 0.6	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 13	> 15	> 15	> 16
Cross Polar Isolation	dB	> 29			
Port to Port Isolation	dB	> 26, typically 30 (R2 // R1, G1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80011965

Center, highband		G1, connector 5-6	
		1427-1518	
Frequency Range	MHz	1427 – 1496	1492 – 1518
Gain at mid Tilt	dBi	16.9	17.3
Gain over all Tilts	dBi	16.9 ± 0.4	17.2 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	61 ± 9.6	55 ± 4.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27
Vertical Pattern:			
Elevation Beamwidth	°	7.9 ± 0.2	7.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0	
Tilt Accuracy	°	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 22
Cross Polar Isolation	dB	> 28	
Port to Port Isolation	dB	> 26, typically 30 (G1 // R1, R2, Y1, Y2)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Ports G1	W	300 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.4	17.7	18.0	17.7	17.9
Gain over all Tilts	dBi	17.3 ± 0.3	17.6 ± 0.5	17.9 ± 0.5	17.7 ± 0.5	17.8 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.9	66 ± 7.5	65 ± 7.7	58 ± 3.8	55 ± 4.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 28	> 26	> 26
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.4	5.5 ± 0.5	4.8 ± 0.3	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.6	< 0.6	< 0.6	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 19	> 17	> 15	> 13
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, G1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011965

Right side, highband		Y2, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.7	17.9	17.9	17.7
Gain over all Tilts	dBi	17.2 ± 0.4	17.6 ± 0.5	17.8 ± 0.5	17.8 ± 0.5	17.6 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 6.7	68 ± 8.7	67 ± 8.9	58 ± 4.3	56 ± 7.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.5	5.8 ± 0.4	5.5 ± 0.5	4.8 ± 0.3	4.3 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.6	< 0.6	< 0.6	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 20	> 17	> 18	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, G1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 26
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

* not applicable for L-band

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	46.3 / 50.8 (clamps incl.) 102.1 / 112.0 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3
698-960	698-960	1427-2690	1695-2690	1427-2690
65°	65°	65°	65°	65°

10-Port Antenna 2LB/3HB 1.5m 65° | 2x698-960 14.6dBi | 2x1427-2690 17.6dBi | 1695-2690 17.6dBi



FlexRET



Type No.		800442004			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.5	14.2	14.4	14.7
Gain over all Tilts	dBi	13.4 ± 0.5	14.2 ± 0.3	14.4 ± 0.3	14.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 7	58 ± 5	55 ± 5	52 ± 5
Total Power ±30°	dB	> 21	> 23	> 25	> 24
Vertical Pattern:					
Elevation Beamwidth	°	15.8 ± 1.6	14.7 ± 0.9	14.4 ± 0.9	13.6 ± 0.9
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.9	< 0.7	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 16
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2, Y3)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.5	14.1	14.3	14.6
Gain over all Tilts	dBi	13.4 ± 0.5	14.1 ± 0.4	14.3 ± 0.4	14.5 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 7	58 ± 6	56 ± 5	52 ± 6
Total Power ±30°	dB	> 21	> 24	> 25	> 24
Vertical Pattern:					
Elevation Beamwidth	°	15.8 ± 1.4	14.8 ± 0.8	14.5 ± 0.9	13.8 ± 0.9
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.9	< 0.7	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 16	> 17	> 15
Cross Polar Isolation	dB	>25			
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2, Y3)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, highband		Y1, connector 5-6					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.4	17.4	17.5	17.6	17.5	17.6
Gain over all Tilts	dBi	16.3 ± 0.3	17.4 ± 0.6	17.4 ± 0.7	17.5 ± 0.8	17.4 ± 0.8	17.5 ± 0.7
Horizontal Pattern:							
Azimuth Beamwidth	°	70 ± 3	65 ± 3	66 ± 4	63 ± 5	62 ± 5	58 ± 4
Total Power ±30°	dB	> 28	> 27	> 25	> 26	> 28	> 27
Vertical Pattern:							
Elevation Beamwidth	°	8.2 ± 0.3	6.9 ± 0.4	6.5 ± 0.2	6.2 ± 0.3	5.6 ± 0.2	5.2 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.5	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 19	> 19	> 20	> 19	> 23
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y1 // R1, R2, Y2, Y3)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Center, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.2	17.5	17.6	17.5
Gain over all Tilts	dBi	16.9 ± 0.6	17.2 ± 0.7	17.5 ± 0.7	17.6 ± 0.6	17.5 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	56 ± 5.5	57 ± 5	57 ± 4	61 ± 4	64 ± 3
Total Power ±30°	dB	> 28	> 27	> 28	> 28	> 30
Vertical Pattern:						
Elevation Beamwidth	°	8.9 ± 0.6	8.3 ± 0.5	7.8 ± 0.7	7.0 ± 0.4	6.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 17	> 19
Cross Polar Isolation	dB	> 25				
Port to Port Isolation	dB	> 25 (Y2 // R1, R2, Y1, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highband		Y3, connector 9-10					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.4	17.3	17.3	17.5	17.4	17.6
Gain over all Tilts	dBi	16.3 ± 0.3	17.3 ± 0.6	17.3 ± 0.7	17.4 ± 0.8	17.4 ± 0.7	17.5 ± 0.6
Horizontal Pattern:							
Azimuth Beamwidth	°	71 ± 4	66 ± 3	67 ± 4	65 ± 5	63 ± 5	59 ± 4
Total Power ±30°	dB	> 28	> 27	> 25	> 25	> 28	> 28
Vertical Pattern:							
Elevation Beamwidth	°	8.2 ± 0.3	7.0 ± 0.4	6.6 ± 0.3	6.2 ± 0.4	5.6 ± 0.2	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 19	> 19	> 19	> 21	> 23
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y3 // R1, R2, Y1, Y2)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

* not applicable for L-band

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 525 118 Maximal: 700 158
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 448 / 165 59.0 / 17.6 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	33 / 37.5 (clamps incl.) 72.8 / 82.7 (clamps incl.)
Packing Size	mm inches	1635 / 495 / 250 64.4 / 19.5 / 9.9
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

Summary – Directional Antennas

12 Ports

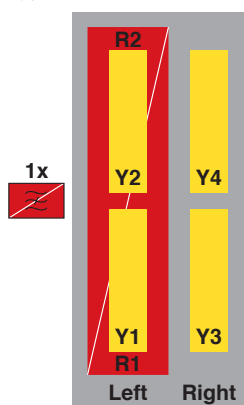
Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 4 x Highband									
12-Port Antenna	698–894	65°	15.5dBi	1°–10°T	840370799	2437	4.3-10, bottom	180 – 183	AG
	689–894	65°	15.5dBi	1°–10°T					
	1695–2360	65°	17dBi	2.5°–12°T					
	1695–2360	65°	17dBi	2.5°–12°T					
	1695–2360	65°	17dBi	2.5°–12°T					
	1695–2360	65°	17dBi	2.5°–12°T					
12-Port Antenna	698–803	65°	15dBi	2°–12°T	80010798	1995	4.3-10, bottom	184 – 186	Z
	824–894	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–806	65°	16dBi	1.5°–10°T	80020799	2438	4.3-10, bottom	187 – 189	Z
	824–894	65°	16.5dBi	1.5°–10°T					
	1695–2360	65°	17dBi	2.5°–12°T					
	1695–2360	65°	17dBi	2.5°–12°T					
	1695–2360	65°	17.5dBi	2.5°–12°T					
	1695–2360	65°	17dBi	2.5°–12°T					
12-Port Antenna	698–803	65°	16dBi	1.5°–10°T	80010799	2693	4.3-10, bottom	190 – 192	Z
	824–894	65°	17dBi	1.5°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
12-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80011898	1999	4.3-10, bottom	193 – 195	Z
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1427–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					

1) Configuration Types – further details on page 12–15.

Type Z



Type AG



Summary – Directional Antennas

12 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 4 x Highband									
12-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80010898	1995	4.3-10, bottom	196 – 198	Z
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–862	65°	16.5dBi	1.5°–10°T	80020899	2693	4.3-10, bottom	199 – 201	Z
	880–960	65°	17dBi	1.5°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
12-Port Antenna	698–960	65°	15dBi	2.5°–11.5°T	800372991	1978	4.3-10, bottom	202 – 205	AG
	689–960	65°	15dBi	2.5°–11.5°T					
	1695–2690	65°	16dBi	2°–12°T					
	1427–2690	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–12°T					
	1427–2690	65°	16dBi	2°–12°T					
12-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80010991	1999	4.3-10, bottom	206 – 209	AG
	698–960	65°	15.5dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–960	65°	16.4dBi	2.5°–10°T	800372992	2591	4.3-10, bottom	210 – 213	AG
	698–960	65°	16.4dBi	2.5°–10°T					
	1427–2690	65°	17.6dBi	2°–12°T					
	1695–2690	65°	16.8dBi	2°–12°T					
	1427–2690	65°	17.6dBi	2°–12°T					
	1695–2690	65°	16.8dBi	2°–12°T					
12-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010992	2671	4.3-10, bottom	214 – 217	AG
	698–960	65°	16.5dBi	1°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					

New or changed product

12 Ports

12-Port Antenna	R1	R2	Y1	Y2	Y3	Y4
Frequency Range	698-894	698-894	1695-2360	1695-2360	1695-2360	1695-2360
HPBW	65°	65°	65°	65°	65°	65°

■ Ultra compact width



FlexRET

12-Port Antenna 2LB/4HB 8ft 65° | 2x698-894 15.5dBi | 4x1695-2360 17dBi

Type No.		840370799	
Left side, lowband		R1, connector 1-2	
		698-894	
Frequency Range	MHz	698 – 824	824 – 894
Gain at mid Tilt	dBi	14.8	15.9
Gain over all Tilts	dBi	14.8 ± 0.5	15.9 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	60 ± 4.4	56 ± 4.2
Front-to-Back Ratio, ± 30°	dB	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 22
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5
Vertical Pattern:			
Elevation Beamwidth	°	9.8 ± 0.6	8.8 ± 0.3
Electrical Downtilt continuously adjustable	°	1.0 – 10.0	
Tilt Accuracy	°	< 0.8	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 17
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2, Y3, Y4) typically	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



Right side, lowband		R2, connector 3-4	
		698-894	
Frequency Range	MHz	698 – 824	824 – 894
Gain at mid Tilt	dBi	14.8	15.8
Gain over all Tilts	dBi	14.8 ± 0.5	15.8 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	60 ± 4.5	57 ± 4.8
Front-to-Back Ratio, ± 30°	dB	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 11.0
Vertical Pattern:			
Elevation Beamwidth	°	9.8 ± 0.6	8.8 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0	
Tilt Accuracy	°	< 0.8	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19
Cross Polar Isolation	dB	> 25 typically	
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2, Y3, Y4) typically	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

840370799

Left side, lower highband		Y1, connector 5-6			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.4	16.9	17.4	16.9
Gain over all Tilts	dBi	16.3 ± 0.5	16.8 ± 0.4	17.2 ± 0.5	17.0 ± 0.7
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 5.2	66 ± 2.7	63 ± 4.7	65 ± 8.1
Front-to-Back Ratio, ± 30°	dB	> 23	> 28	> 29	> 29
Cross Polar Discrimination at Boresight		> 14	> 17	> 20	> 16
Cross Polar Discrimination over Sector	dB	> 10.0	> 10.5	> 11.0	> 8.0
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.6	7.2 ± 0.4	6.8 ± 0.7	5.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.8	< 0.7	< 0.7	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 15	> 14
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y1 // R1, R2, Y2, Y3, Y4)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, upper highband		Y2, connector 7-8			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.1	16.6	17.0	16.7
Gain over all Tilts	dBi	16.0 ± 0.5	16.6 ± 0.4	16.9 ± 0.4	16.6 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 4.8	65 ± 3.1	63 ± 3.8	65 ± 6.3
Front-to-Back Ratio, ± 30°	dB	> 25	> 27	> 28	> 28
Cross Polar Discrimination at Boresight	dB	> 15	> 18	> 21	> 16
Cross Polar Discrimination over Sector	dB	> 10.5	> 11.0	> 11.0	> 7.5
Vertical Pattern:					
Elevation Beamwidth	°	7.8 ± 0.6	7.3 ± 0.4	6.9 ± 0.7	6.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 16	> 15	> 15
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y2 // R1, R2, Y1, Y3, Y4)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

840370799

Right side, lower highband		Y3, connector 9-10			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.5	17.0	17.4	16.9
Gain over all Tilts	dBi	16.5 ± 0.4	16.9 ± 0.4	17.3 ± 0.5	17.1 ± 0.8
Horizontal Pattern:					
Azimuth Beamwidth	°	65 ± 6.1	66 ± 3.3	63 ± 4.3	64 ± 6.4
Front-to-Back Ratio, ± 30°	dB	> 23	> 26	> 28	> 27
Cross Polar Discrimination at Boresight	dB	> 14	> 18	> 21	> 21
Cross Polar Discrimination over Sector	dB	> 10.5	> 10.5	> 10.5	> 8.5
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.5	7.2 ± 0.4	6.8 ± 0.7	6.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.6	< 0.4	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 14
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y3 // R1, R2, Y1, Y2, Y4)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y4, connector 11-12			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2305 – 2360
Gain at mid Tilt	dBi	16.3	16.7	17.0	16.7
Gain over all Tilts	dBi	16.2 ± 0.5	16.6 ± 0.5	16.9 ± 0.5	16.8 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 6.6	64 ± 4.6	63 ± 3.8	64 ± 5.0
Front-to-Back Ratio, ± 30°	dB	> 24	> 25	> 28	> 27
Cross Polar Discrimination at Boresight	dB	> 15	> 19	> 21	> 20
Cross Polar Discrimination over Sector	dB	> 10.5	> 11.5	> 12.0	> 9.0
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.6	7.2 ± 0.4	6.8 ± 0.7	6.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 15	> 14	> 14
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (Y4 // R1, R2, Y1, Y2, Y3)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

840370799

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications			
Input	12 x 4.3-10 female		
Connector Position	bottom		
Adjustment Mechanism	FlexRET, continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	590 132
		Lateral:	485 109
		Maximal:	1035 233
Max. Wind Velocity	km/h mph	241 150	
Height / Width / Depth	mm inches	2437 / 378 / 164 96.0 / 14.9 / 6.5	
Category of Mounting Hardware	XM (X-medium)		
Weight	kg lb	43.5 / 48 (clamps incl.) 95.9 / 105.9 (clamps incl.)	
Packing Size	mm inches	2585 / 440 / 293 101.8 / 17.3 / 11.5	
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter		

12-Port Antenna Dual Polarization HPBW

R1	R2	Y1	Y2	Y3	Y4
698-803	824-894	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.0m 65° | 698-803 15dBi | 824-894 16dBi | 4x1695-2690 16.5dBi



FlexRET



Type No.		80010798			
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-894	
Frequency Range	MHz	698 - 803		824 - 894	
Gain at mid Tilt	dBi	15.2		15.8	
Gain over all Tilts	dBi	15.1 ± 0.4		15.7 ± 0.4	
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 1.6		62 ± 1.7	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 26	
Cross Polar Discrimination at Boresight	dB	> 24		> 24	
Cross Polar Discrimination over Sector	dB	> 7.0		> 7.0	
Azimuth Beam Port-to-Port Tracking	dB	< 1.5		< 1.5	
Vertical Pattern:					
Elevation Beamwidth	°	10.7 ± 0.6		9.6 ± 0.4	
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0	
Tilt Accuracy	°	< 0.4		< 0.5	
First Upper Side Lobe Suppression	dB	> 16		> 18	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16		> 18	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1, Y4) > 30 (R2 // Y1, Y2, Y3)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2500 - 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	56 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 17	> 20	> 24	> 20	> 22
Cross Polar Discrimination over Sector	dB	> 6.5	> 10.0	> 10.0	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.0	< 2.0	< 2.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 - 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010798

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 15	> 15
Cross Polar Discrimination over Sector	dB	> 7.0	> 8.5	> 9.5	> 7.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.5	< 1.5	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.3	16.5	16.9	17.3	17.2
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.0	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 25	> 26	> 25	> 20	> 15
Cross Polar Discrimination over Sector	dB	> 16.0	> 16.0	> 14.5	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 2.0	< 3.5
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

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Right side, upper highband		Y4, connector 11-12				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.9	16.5
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.8 ± 0.3	16.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	58 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Cross Polar Discrimination at Boresight	dB	> 21	> 23	> 21	> 16	> 15
Cross Polar Discrimination over Sector	dB	> 13.5	> 14.5	> 12.5	> 6.5	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.5 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 18	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	37.0 / 39.2 (clamps incl.) 81.5 / 86.3 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-806	824-894	1695-2360	1695-2360	1695-2360	1695-2360
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.4m 65° | 698-806 16dBi | 824-894 16.5dBi |
4x1695-2360 17.5dBi



FlexRET



12 Ports

Type No.		80020799	
Lowbands		R1, connector 1-2	R2, connector 3-4
		698-806	824-894
Frequency Range	MHz	698 – 806	824 – 894
Gain at mid Tilt	dBi	15.8	16.5
Gain over all Tilts	dBi	15.8 ± 0.4	16.4 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	70.9 ± 1.8	67.8 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21.4	> 24.5
Cross Polar Discrimination at Boresight	dB	> 25.0	> 25.0
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	9.1 ± 0.6	7.9 ± 0.5
Electrical Downtilt continuously adjustable	°	1.5 – 10.0	1.5 – 10.0
Tilt Accuracy	°	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16.0	> 17.0
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15.0	> 16.0
Cross Polar Isolation	dB	> 25, typically 32.9	> 25, typically 36.8
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1// Y1, Y2, Y3, Y4)	> 28 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2360
Gain at mid Tilt	dBi	16.5	16.9	17.1	17.1
Gain over all Tilts	dBi	16.3 ± 0.5	16.8 ± 0.2	17.0 ± 0.4	17.0 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64.5 ± 3.3	63.8 ± 2.9	61.7 ± 5.6	59.4 ± 4.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21.4	> 22.0	> 22.5	> 21.0
Cross Polar Discrimination at Boresight	dB	> 16.0	> 21.0	> 22.5	> 19.5
Cross Polar Discrimination over Sector	dB	> 8.0	> 7.0	> 10.7	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.3	< 2.3	< 1.8	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.5	7.2 ± 0.4	6.8 ± 0.7	6.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 17.0	> 16.0	> 15.0	> 15.0
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13.0	> 13.0	> 13.0	> 13.0
Cross Polar Isolation	dB	> 25, typically 31.8			
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80020799

Left side, upper highband		Y2, connector 7-8			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2360
Gain at mid Tilt	dBi	16.2	16.8	16.9	16.9
Gain over all Tilts	dBi	16.1 ± 0.5	16.7 ± 0.3	16.8 ± 0.3	16.8 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63.6 ± 3.8	62.1 ± 3.0	60.9 ± 3.3	58.6 ± 5.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23.6	> 25.0	> 25.0	> 25.0
Cross Polar Discrimination at Boresight	dB	> 16.0	> 22.0	> 24.0	> 19.5
Cross Polar Discrimination over Sector	dB	> 8.5	> 11.5	> 13.4	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.1	< 2.2	< 1.9	< 2.2
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.6	7.1 ± 0.4	6.7 ± 0.6	6.0 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17.0	> 16.0	> 15.0	> 15.0
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13.0	> 13.0	> 13.0	> 13.0
Cross Polar Isolation	dB	> 25, typically 33.3			
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)			
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2360
Gain at mid Tilt	dBi	17.0	17.1	17.3	17.8
Gain over all Tilts	dBi	17.0 ± 0.2	17.1 ± 0.2	17.3 ± 0.3	17.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	65.8 ± 3.6	67.1 ± 2.8	67.4 ± 2.6	67.6 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25.0	> 25.0	> 25.0	> 25.0
Cross Polar Discrimination at Boresight	dB	> 18.2	> 17.9	> 17.7	> 20.9
Cross Polar Discrimination over Sector	dB	> 16.7	> 14.7	> 14.5	> 14.6
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5	< 1.4	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	8.3 ± 0.6	7.8 ± 0.4	7.3 ± 0.7	6.3 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 17.5	> 17.4	> 16.3	> 15.2
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16.7	> 16.6	> 16.2	> 15.1
Cross Polar Isolation	dB	> 25, typically 33.4			
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)			
Max. Effective Power per specified Band per Port	W	200 (at 50 °C ambient temperature)			120 (at 50 °C ambient temperature)
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020799

Right side, upper highband		Y4, connector 11-12			
		1695-2360			
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2360
Gain at mid Tilt	dBi	16.5	16.6	16.8	17.2
Gain over all Tilts	dBi	16.5 ± 0.3	16.6 ± 0.2	16.8 ± 0.3	17.2 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	65.6 ± 4.3	67.0 ± 2.4	67.5 ± 1.9	67.0 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25.0	> 25.0	> 25.0	> 25.0
Cross Polar Discrimination at Boresight	dB	> 17.2	> 16.6	> 16.2	> 16.5
Cross Polar Discrimination over Sector	dB	> 16.4	> 14.7	> 14.2	> 8.8
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	8.4 ± 0.5	7.9 ± 0.4	7.4 ± 0.7	6.7 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 15.9	> 15.7	> 15.2	> 15.0
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15.3	> 15.4	> 15.2	> 15.0
Cross Polar Isolation	dB	> 25, typically 34.7			
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)			
Max. Effective Power per specified Band per Port	W	200 (at 50 °C ambient temperature)			120 (at 50 °C ambient temperature)
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1140 256 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 378 / 164 96.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	46.5 / 51.5 (clamps incl.) 102.5 / 113.5 (clamps incl.)
Packing Size	mm inches	2640 / 412 / 255 103.9 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

12-Port Antenna Dual Polarization HPBW

R1	R2	Y1	Y2	Y3	Y4
698-803	824-894	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.7m 65° | 698-803 16dBi | 824-894 17dBi | 4x1695-2690 18dBi



FlexRET



Type No.		80010799			
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-894	
Frequency Range	MHz	698 - 803		824 - 894	
Gain at mid Tilt	dBi	15.9		16.5	
Gain over all Tilts	dBi	15.9 ± 0.5		16.5 ± 0.4	
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 3.1		66 ± 1.6	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 25	
Cross Polar Discrimination at Boresight	dB	> 25		> 27	
Cross Polar Discrimination over Sector	dB	> 6.5		> 8.5	
Azimuth Beam Port-to-Port Tracking	dB	< 2.0		< 2.0	
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7		7.6 ± 0.3	
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0	
Tilt Accuracy	°	< 0.4		< 0.2	
First Upper Side Lobe Suppression	dB	> 16		> 16	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15		> 16	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)	
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	16.9	17.2	17.3	16.7	17.2
Gain over all Tilts	dBi	16.8 ± 0.5	17.1 ± 0.3	17.2 ± 0.4	16.6 ± 0.4	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.6	62 ± 3.6	62 ± 4.2	64 ± 7.3	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 21	> 22
Cross Polar Discrimination at Boresight	dB	> 16	> 23	> 22	> 19	> 18
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 11.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 1.5	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 12	> 13	> 13	> 13	> 13
Cross Polar Isolation	dB	> 26 (1695 - 1710 MHz) > 28 (1710 - 2690 MHz)				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010799

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	16.9	16.3	16.9
Gain over all Tilts	dBi	16.5 ± 0.5	16.9 ± 0.4	16.9 ± 0.4	16.2 ± 0.3	16.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.6	63 ± 3.7	62 ± 2.9	66 ± 5.8	62 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 24	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 22	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 10.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.3	6.1 ± 0.5	5.5 ± 0.4	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 15	> 16	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 11	> 13	> 13	> 13	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.7	17.7	18.0	18.1	18.3
Gain over all Tilts	dBi	17.6 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.0 ± 0.3	18.1 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.5	62 ± 1.6	62 ± 1.5	61 ± 1.5	59 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 17	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.5	> 8.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 22	> 21	> 18	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 16	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010799

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.5	17.7	17.8	17.9
Gain over all Tilts	dBi	17.3 ± 0.3	17.4 ± 0.2	17.6 ± 0.4	17.7 ± 0.3	17.7 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.8	62 ± 1.8	61 ± 1.9	60 ± 1.8	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 25	> 24
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19	> 16	> 17
Cross Polar Discrimination over Sector	dB	> 16.0	> 17.0	> 14.5	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.7 ± 0.5	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 18	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 16	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	47 / 49.2 (clamps incl.) 103.6 / 108.5 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-862	880-960	1695-2690	1695-2690	1427-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.0m 65° | 698-862 15.5dBi | 880-960 16dBi |
3x1695-2690 16.5dBi | 1427-2690 16.5dBi



FlexRET

Type No.		80011898		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	791 - 862	880 - 960
Gain at mid Tilt	dBi	15.3	15.7	16.0
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.3	15.9 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.3	63 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 27
Vertical Pattern:				
Elevation Beamwidth	°	10.6 ± 0.7	9.7 ± 0.5	9.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19	> 21
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 27, typ. > 28 (R2 // Y1, Y4) > 30 (R2 // Y2, Y3)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.6	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	56 ± 6.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.7
Electrical Downtilt continuously adjustable	°	2.0 - 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 21	> 21	> 20	> 16	> 15
Cross Polar Isolation	dB	> 27, typ. 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80011898

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.9	56 ± 4.4	58 ± 5.9	62 ± 4.0	65 ± 8.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.6	8.7 ± 0.5	8.2 ± 0.8	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 19
Cross Polar Isolation	dB	> 27, typ. 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10						
		1427-2690						
Frequency Range	MHz	1427 – 1496	1492 – 1518	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	14.6	14.8	15.6	16.1	16.3	16.6	16.9
Gain over all Tilts	dBi	14.6 ± 0.3	14.8 ± 0.3	15.6 ± 0.4	16.0 ± 0.4	16.2 ± 0.4	16.4 ± 0.6	16.7 ± 0.8
Horizontal Pattern:								
Azimuth Beamwidth	°	72 ± 7.6	66 ± 8.8	66 ± 5.5	64 ± 5.7	65 ± 5.0	68 ± 2.7	61 ± 6.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 24	> 25	> 25	> 28	> 25
Vertical Pattern:								
Elevation Beamwidth	°	12.1 ± 0.7	12.3 ± 0.5	10.3 ± 0.8	9.7 ± 0.5	9.1 ± 0.8	7.9 ± 0.6	7.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0						
Tilt Accuracy	°	< 0.8	< 0.7	< 0.5	< 0.3	< 0.3	< 0.3	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 15	> 15	> 17	> 18	> 18	> 14
Cross Polar Isolation	dB	> 27, typ. 28						
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)						
Max. Effective Power per specified Band and Port	W	150 (at 50 °C ambient temperature)	200 (at 50 °C ambient temperature)				120 (at 50 °C ambient temperature)	
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)						
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)						

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011898

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.8	16.4
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.4	16.7 ± 0.3	16.2 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.9	62 ± 2.8	61 ± 2.6	58 ± 3.1	58 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.7	9.0 ± 0.6	8.5 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Cross Polar Isolation	dB	> 27, typ. 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27, typ. 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

* not applicable for L-band

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	36.3 / 40.8 (clamps incl.) 80.0 / 90.0 (clamps incl.)
Packing Size	mm inches	2200 / 412 / 255 86.6 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-862	880-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.0m 65° | 698-862 15.5dBi | 880-960 16dBi | 4x1695-2690 16.5dBi



FlexRET



Type No.		80010898				
Left side, lowbands		R1, connector 1-2		R2, connector 3-4		
		698-862		880-960		
Frequency Range	MHz	698 – 806	790 – 862	880 – 960		
Gain at mid Tilt	dBi	15.3	15.7	16.0		
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.4	15.9 ± 0.3		
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.3	63 ± 3.8		
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 27		
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.7	9.7 ± 0.5	9.1 ± 0.5		
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			2.0 – 12.0	
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4		
First Upper Side Lobe Suppression	dB	> 16	> 19	> 21		
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 18		
Cross Polar Isolation	dB	> 30			> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1, Y4) > 30 (R2 // Y1, Y2, Y3)		
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)				
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	56 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010898

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.2	16.5	16.9	17.3	17.1
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.0	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010898

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.8	16.4
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.7 ± 0.3	16.2 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	58 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.5 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 18	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	37.0 / 39.2 (clamps incl.) 81.6 / 86.4 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-862	880-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.7m 65° | 698-862 16.5dBi | 880-960 17dBi |
4x1695-2690 17.5dBi



FlexRET

Type No.		80020899		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	16.0	16.3	16.9
Gain over all Tilts	dBi	15.9 ± 0.3	16.2 ± 0.4	16.9 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	71 ± 2.5	70 ± 2.2	67 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.5	7.1 ± 0.4
Electrical Downtilt continuously adjustable	°	1.5 – 10.0		1.5 – 10.0
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 16	> 16
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



12 Ports

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.2	17.3	16.7	17.2
Gain over all Tilts	dBi	16.8 ± 0.4	17.1 ± 0.3	17.2 ± 0.4	16.6 ± 0.4	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.4	62 ± 3.6	62 ± 4.2	64 ± 7.3	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 21	> 22
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 22	> 19	> 18
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 11.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 1.5	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80020899

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	16.9	16.3	16.9
Gain over all Tilts	dBi	16.6 ± 0.5	16.9 ± 0.4	16.9 ± 0.4	16.2 ± 0.3	16.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.7	63 ± 3.7	62 ± 2.9	66 ± 5.8	62 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 24	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 22	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 10.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.3	6.1 ± 0.5	5.5 ± 0.4	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 15	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.7	17.7	18.0	18.1	18.3
Gain over all Tilts	dBi	17.6 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.0 ± 0.3	18.1 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.5	62 ± 1.6	62 ± 1.5	61 ± 1.5	59 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 17	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.5	> 8.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 22	> 21	> 18	> 22
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020899

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.7	17.8	17.9
Gain over all Tilts	dBi	17.3 ± 0.3	17.4 ± 0.2	17.6 ± 0.4	17.7 ± 0.3	17.7 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	62 ± 1.8	61 ± 1.9	60 ± 1.8	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 25	> 24
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19	> 16	> 17
Cross Polar Discrimination over Sector	dB	> 16.0	> 17.0	> 14.5	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.7 ± 0.5	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 24	> 23	> 18	> 23
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	46.5 / 48.7 (clamps incl.) 102.5 / 107.4 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna	R1	R2	Y1	Y2	Y3	Y4
Frequency Range	698-960	698-960	1695-2690	1427-2690	1695-2690	1427-2690
HPBW	65°	65°	65°	65°	65°	65°

■ Ultra compact width



FlexRET

12-Port Antenna 2LB/4HB 2.0m 65° | 2x698-960 15dBi | 2x1695-2690 16dBi | 2x1427-2690 16dBi

Type No.		800372991			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.0	14.7	15.0	15.4
Gain over all Tilts	dBi	14.0 ± 0.5	14.7 ± 0.4	15.0 ± 0.4	15.4 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 6.6	59 ± 4.5	57 ± 3.9	55 ± 5.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 23	> 21
Vertical Pattern:					
Elevation Beamwidth	°	11.8 ± 1.1	10.9 ± 0.7	10.7 ± 0.6	10.1 ± 0.8
Electrical Downtilt continuously adjustable	°	2.5 – 11.5			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 20	> 19	> 18
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.0	14.8	15.0	15.5
Gain over all Tilts	dBi	14.0 ± 0.5	14.7 ± 0.4	15.0 ± 0.4	15.4 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 6.8	59 ± 4.3	57 ± 3.9	55 ± 5.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 23	> 22
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 1.4	10.9 ± 0.6	10.7 ± 0.6	10.1 ± 0.7
Electrical Downtilt continuously adjustable	°	2.5 – 11.5			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 19	> 21	> 20	> 19
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

800372991

Left side, lower highband		Y1, connector 5-6					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690	
Gain at mid Tilt	dBi	15.5	15.7	15.9	15.6	15.8	
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.6	15.9 ± 0.6	15.6 ± 0.5	15.8 ± 0.5	
Horizontal Pattern:							
Azimuth Beamwidth	°	65 ± 3.5	65 ± 4.5	65 ± 5.0	63 ± 5.1	57 ± 5.3	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 26	> 26	> 28	
Vertical Pattern:							
Elevation Beamwidth	°	10.7 ± 0.6	10.2 ± 0.6	9.8 ± 0.5	8.9 ± 0.4	8.2 ± 0.5	
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.4	< 0.5	< 0.5	< 0.4	< 0.4	
First Upper Side Lobe Suppression	dB	> 16	> 16	> 17	> 22	> 18	
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 (Y1 // R1, R2, Y2, Y3, Y4)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, upper highband		Y2, connector 7-8					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.1	15.8	16.1	16.3	16.1	15.9
Gain over all Tilts	dBi	15.0 ± 0.4	15.7 ± 0.5	16.0 ± 0.6	16.3 ± 0.6	16.0 ± 0.9	15.8 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	63 ± 3.3	65 ± 4.1	66 ± 4.6	67 ± 4.4	67 ± 5.0	61 ± 6.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 25	> 28	> 26	> 28
Vertical Pattern:							
Elevation Beamwidth	°	11.6 ± 0.9	9.7 ± 0.6	9.1 ± 0.4	8.6 ± 0.6	7.8 ± 0.4	7.4 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.3	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 19	> 18	> 18	> 18	> 19
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 (Y2 // R1, R2, Y1, Y3, Y4)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

800372991

Right side, lower highband		Y3, connector 9-10					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690	
Gain at mid Tilt	dBi	15.5	15.9	15.9	15.6	15.8	
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.6	15.9 ± 0.5	15.6 ± 0.5	15.8 ± 0.6	
Horizontal Pattern:							
Azimuth Beamwidth	°	67 ± 4.5	65 ± 5.2	64 ± 4.9	64 ± 8.4	58 ± 5.4	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 25	> 24	> 26	
Vertical Pattern:							
Elevation Beamwidth	°	10.8 ± 0.7	10.2 ± 0.7	9.7 ± 0.7	8.8 ± 0.5	8.2 ± 0.5	
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.4	
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18	> 20	> 18	
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 (Y3 // R1, R2, Y1, Y2, Y4)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, upper highband		Y4, connector 11-12					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.0	15.8	16.1	16.4	16.0	15.9
Gain over all Tilts	dBi	15.0 ± 0.4	15.7 ± 0.5	16.0 ± 0.6	16.3 ± 0.6	16.0 ± 0.9	15.8 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	63 ± 3.3	67 ± 4.4	65 ± 3.3	66 ± 3.5	68 ± 6.2	61 ± 5.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 25	> 26	> 26	> 27
Vertical Pattern:							
Elevation Beamwidth	°	11.8 ± 0.7	9.8 ± 0.6	9.1 ± 0.4	8.6 ± 0.6	7.8 ± 0.4	7.4 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 18	> 18	> 17	> 16	> 18
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 28 (Y4 // R1, R2, Y1, Y2, Y3)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

800372991

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.
* not applicable for L-band

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 465 105 Maximal: 815 183
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1978 / 378 / 164 77.9 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-Medium)	
Weight	kg lb	37.0 / 41.5 (clamps incl.) 81.6 / 91.5 (clamps incl.)
Packing Size	mm inches	2125 / 440 / 293 83.7 / 17.3 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-960	698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.0m 65° | 2x698-960 15.5dBi | 4x1695-2690 16.5dBi



FlexRET



Type No.		80010991			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.5	15.4 ± 0.3	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.5	10.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.7	< 0.8	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 26 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.4	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.6	< 0.6	< 0.6	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 26 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010991

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.5	15.8	16.0	15.6	15.9
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.5	15.9 ± 0.5	15.6 ± 0.8	15.8 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	66 ± 6.1	63 ± 6.6	61 ± 7.6	58 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 21	> 23
Vertical Pattern:						
Elevation Beamwidth	°	10.7 ± 0.6	10.1 ± 0.5	9.5 ± 0.7	8.5 ± 0.6	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 21	> 21	> 20	> 20	> 18
Cross Polar Isolation	dB	> 26, typically > 30				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.0	16.3	16.6	16.4	16.1
Gain over all Tilts	dBi	15.9 ± 0.5	16.3 ± 0.6	16.5 ± 0.7	16.3 ± 0.9	16.0 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 6.6	62 ± 7.5	60 ± 7.3	57 ± 6.5	62 ± 8.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 25	> 26	> 23	> 24
Vertical Pattern:						
Elevation Beamwidth	°	9.3 ± 0.9	8.6 ± 0.4	8.2 ± 0.6	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	< 0.2	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 19	> 20	> 18	> 19
Cross Polar Isolation	dB	> 26, typically > 30				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010991

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.5	15.7	15.8	15.8	15.8
Gain over all Tilts	dBi	15.5 ± 0.5	15.7 ± 0.5	15.9 ± 0.6	15.7 ± 0.9	15.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.0	66 ± 7.8	65 ± 7.3	59 ± 8.0	60 ± 9.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 25	> 23	> 22
Vertical Pattern:						
Elevation Beamwidth	°	10.7 ± 0.7	10.0 ± 0.6	9.5 ± 0.8	8.5 ± 0.6	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 20	> 21	> 21	> 17	> 18
Cross Polar Isolation	dB	> 26, typically > 30				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.5	16.7	16.1
Gain over all Tilts	dBi	15.8 ± 0.5	16.1 ± 0.6	16.4 ± 0.7	16.6 ± 0.9	16.0 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 6.8	64 ± 7.8	61 ± 7.8	54 ± 6.7	64 ± 10.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 24	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.9	8.7 ± 0.5	8.2 ± 0.6	7.1 ± 0.3	6.8 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 20	> 20	> 20	> 17
Cross Polar Isolation	dB	> 26, typically > 30				
Port to Port Isolation	dB	>30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010991

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 26
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1300 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	48.7 / 53.7 (clamps incl.) 107.4 / 118.4 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel and 2 units of clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

12-Port Antenna	R1	R2	Y1	Y2	Y3	Y4
Frequency Range	698-960	698-960	1427-2690	1695-2690	1427-2690	1695-2690
HPBW	65°	65°	65°	65°	65°	65°

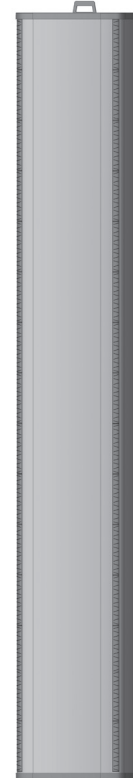
■ Ultra compact width



FlexRET

12-Port Antenna 2LB/4HB 2.6m 65° | 2x698-960 16.4dBi | 2x1427-2690 17.6dBi | 2x1695-2690 16.8dBi

Type No.	800372992				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.0	15.7	16.0	16.4
Gain over all Tilts	dBi	15.0 ± 0.6	15.7 ± 0.6	16.0 ± 0.5	16.4 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 4.5	60 ± 2.9	58 ± 3.7	55 ± 5.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 24	> 24
Vertical Pattern:					
Elevation Beamwidth	°	9.1 ± 0.7	8.6 ± 0.4	8.4 ± 0.5	7.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 10			
Tilt Accuracy	°	< 0.4	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 17	> 17	> 19
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband	R2, connector 3-4				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.0	15.7	16.0	16.4
Gain over all Tilts	dBi	15.0 ± 0.7	15.7 ± 0.6	16.0 ± 0.6	16.4 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 4.8	61 ± 3.6	59 ± 4.5	55 ± 4.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 24	> 25
Vertical Pattern:					
Elevation Beamwidth	°	9.0 ± 0.7	8.6 ± 0.4	8.3 ± 0.5	7.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 10			
Tilt Accuracy	°	< 0.4	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 18	> 18	> 20
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

800372992

Left side, lower highband		Y1, connector 5-6					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.3	17.1	17.5	17.6	17.2	17.2
Gain over all Tilts	dBi	16.2 ± 0.6	17.0 ± 0.5	17.4 ± 0.7	17.6 ± 0.8	17.1 ± 0.8	17.1 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	61 ± 5.1	64 ± 4.4	65 ± 4.1	63 ± 4.3	66 ± 4.9	59 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 25	> 25	> 27	> 26	> 28
Vertical Pattern:							
Elevation Beamwidth	°	8.9 ± 0.5	7.6 ± 0.5	7.1 ± 0.4	6.8 ± 0.5	6.3 ± 0.4	5.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 17	> 16	> 17	> 17	> 18
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y1 // R1, R2, Y2, Y3, Y4)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.4	16.8	16.8	16.6	16.6
Gain over all Tilts	dBi	16.4 ± 0.5	16.7 ± 0.6	16.8 ± 0.6	16.5 ± 0.6	16.5 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 4.5	64 ± 3.6	62 ± 4.4	64 ± 5.7	60 ± 5.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 28	> 27	> 27
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.6	7.2 ± 0.3	6.9 ± 0.5	6.3 ± 0.4	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 15	> 16	> 19	> 20
Cross Polar Isolation	dB	> 25				
Port to Port Isolation	dB	> 25 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

800372992

Right side, lower highband		Y3, connector 9-10					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.2	17.1	17.5	17.6	17.3	17.2
Gain over all Tilts	dBi	16.0 ± 0.6	17.0 ± 0.4	17.4 ± 0.7	17.6 ± 0.8	17.1 ± 0.7	17.1 ± 0.7
Horizontal Pattern:							
Azimuth Beamwidth	°	61 ± 6.1	65 ± 4.6	65 ± 4.4	63 ± 4.6	66 ± 4.8	59 ± 4.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 24	> 25	> 25	> 26	> 27
Vertical Pattern:							
Elevation Beamwidth	°	9.0 ± 0.4	7.7 ± 0.4	7.1 ± 0.4	6.8 ± 0.4	6.3 ± 0.4	5.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 17	> 17.0	> 18	> 17	> 18
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y3 // R1, R2, Y1, Y2, Y4)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.4	16.8	16.9	16.6	16.6
Gain over all Tilts	dBi	16.4 ± 0.4	16.7 ± 0.6	16.8 ± 0.7	16.5 ± 0.6	16.5 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.1	64 ± 4.5	61 ± 4.2	64 ± 5.4	60 ± 5.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 27	> 27	> 26
Vertical Pattern:						
Elevation Beamwidth	°	7.7 ± 0.6	7.2 ± 0.4	6.9 ± 0.5	6.3 ± 0.4	5.7 ± 0.5
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 21	> 19
Cross Polar Isolation	dB	> 25				
Port to Port Isolation	dB	> 25 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

800372992

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.
* not applicable for L-band

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 1110 249
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2591 / 378 / 164 102 / 14.9 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	47.0 / 51.5 (clamps incl.) 103.6 / 113.5 (clamps incl.)
Packing Size	mm inches	2739 / 440 / 293 107.8 / 17.3 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

12-Port Antenna Frequency Range HPBW

R1	R2	Y1	Y2	Y3	Y4
698-960	698-960	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 2LB/4HB 2.7m 65° | 2x698-960 16.5dBi | 4x1695-2690 17.5dBi



FlexRET



Type No.		80010992			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.7 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.7 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1 – 10			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 20
Cross Polar Isolation	dB	> 28, typically 30			
Port to Port Isolation	dB	> 27, typically 30 (R1 // R2, Y2) > 30 (R1 // Y1, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.5	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Vertical Pattern:					
Elevation Beamwidth	°	9.8 ± 0.6	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1 – 10			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 28, typically 30			
Port to Port Isolation	dB	> 27, typically 30 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010992

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.0	17.3	17.6	17.1	17.0
Gain over all Tilts	dBi	17.0 ± 0.4	17.3 ± 0.4	17.5 ± 0.5	17.0 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 4.9	63 ± 5.3	60 ± 6.0	60 ± 5.5	61 ± 7.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.3	6.9 ± 0.3	6.5 ± 0.5	5.8 ± 0.3	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 20	> 19	> 18	> 17
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y1	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.4	17.5	17.1	17.0
Gain over all Tilts	dBi	16.9 ± 0.6	17.3 ± 0.4	17.5 ± 0.5	17.1 ± 0.5	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.7	62 ± 5.4	60 ± 5.8	58 ± 4.6	60 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 26	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.3 ± 0.3	5.9 ± 0.5	5.2 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 15	> 15	> 15
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

80010992

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.3	17.7	17.3	16.9
Gain over all Tilts	dBi	17.0 ± 0.5	17.3 ± 0.5	17.6 ± 0.7	17.1 ± 0.5	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.0	64 ± 7.5	60 ± 9.1	56 ± 5.8	59 ± 8.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 22	> 22
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.4	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.2	5.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 16
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y3	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.4	17.6	17.2	17.1
Gain over all Tilts	dBi	17.0 ± 0.6	17.4 ± 0.4	17.5 ± 0.5	17.1 ± 0.5	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 5.2	61 ± 4.3	60 ± 4.7	57 ± 4.4	61 ± 6.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 26	> 26	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.3 ± 0.3	6.0 ± 0.5	5.2 ± 0.3	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 17
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Ports Y4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010992

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1300 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input		12 x 4.3-10 female
Connector Position		bottom
Adjustment Mechanism		FlexRET, continuously adjustable
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1545 347 Maximal: 1555 350
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2671 / 508 / 175 105.2 / 20.0 / 6.9
Category of Mounting Hardware		XH (X-Heavy)
Weight	kg lb	60.5 / 65.5 (clamps incl.) 133.3 / 144.3 (clamps incl.)
Packing Size	mm inches	2870 / 542 / 268 113.0 / 21.3 / 10.6
Scope of Supply		Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter

Summary – Directional Antennas

14 Ports

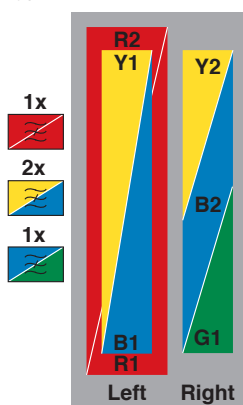
Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 5 x Highband									
14-Port Antenna	698–862	65°	14.5dBi	2°–16°T	8001877	1499	4.3-10, bottom	220 + 221	AJ
	880–960	65°	15dBi	2°–16°T					
	1710–2170	65°	17dBi	2.5°–12°T					
	2500–2690	65°	17dBi	2.5°–12°T					
	1427–1518	65°	16.5dBi	2.5°–12°T					
	1710–2170	65°	16.5dBi	2.5°–12°T					
2500–2690	65°	17dBi	2.5°–12°T						
14-Port Antenna	698–862	65°	15.5dBi	2°–12°T	8001878	1999	4.3-10, bottom	222 + 223	AJ
	880–960	65°	16dBi	2°–12°T					
	1710–2170	65°	17.5dBi	2.5°–12°T					
	2500–2690	65°	18dBi	2.5°–12°T					
	1427–1518	65°	16.5dBi	2.5°–12°T					
	1710–2170	65°	16.5dBi	2.5°–12°T					
2500–2690	65°	17dBi	2.5°–12°T						

1) Configuration Types – further details on page 12–15.

Type AJ



Summary – Directional Antennas

16 Ports

Dual Polarization $\pm 45^\circ$

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)
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2 x Lowband | 6 x Highband

16-Port Antenna	698–960	65°	15.6dBi	2.5°–11.5°T	800442008	1944	4.3-10, bottom	224 – 228	AQ
	698–960	65°	15.6dBi	2.5°–11.5°T					
	1695–2690	65°	15.9dBi	2°–12°T					
	1427–2690	65°	16.4dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–12°T					
	1695–2690	65°	15.9dBi	2°–12°T					
	1427–2690	65°	16.4dBi	2°–12°T					

3 x Lowband | 5 x Highband

16-Port Antenna	698–862	65°	15.1dBi	2°–12°T	800442001	1944	4.3-10, bottom	229 – 231	AM
	880–960	65°	15.4dBi	2°–12°T					
	698–960	65°	15.5dBi	2°–12°T					
	1427–2170	65°	17.1dBi	2.5°–12°T					
	1427–2170	65°	17.1dBi	2.5°–12°T					
	2500–2690	65°	17dBi	2.5°–12°T					
	1710–2690	65°	18.8dBi	2.5°–12°T					
	2500–2690	65°	17dBi	2.5°–12°T					

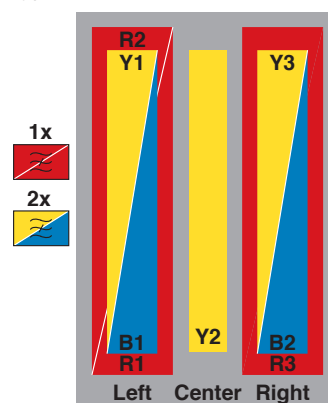
New or changed product

1) Configuration Types – further details on page 12–15.

Type AQ



Type AM



14-Port Antenna

R1	R2	B1	Y1	G1	B2	Y2
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Frequency Range

698-862	880-960	1710-2170	2500-2690	1427-1518	1710-2170	2500-2690
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HPBW

65°	65°	65°	65°	65°	65°	65°
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14-Port Antenna 2LB/5HB 1.5m 65° | 698-862 14.5dBi | 880-960 15dBi |
2x1710-2170 17dBi | 2x2500-2690 17dBi |
1427-1518 16.5dBi



FlexRET



Type No.		80011877			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-862		880-960	
Frequency Range	MHz	698 – 806	791 – 862	880 – 960	
Gain at mid Tilt	dBi	14.1	14.7	15.0	
Gain over all Tilts	dBi	14.0 ± 0.4	14.5 ± 0.5	14.8 ± 0.4	
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 4.1	67 ± 2.6	65 ± 3.2	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 22	> 25	
Vertical Pattern:					
Elevation Beamwidth	°	14.5 ± 1.4	13.1 ± 0.8	11.8 ± 0.7	
Electrical Downtilt continuously adjustable	°	2.0 – 16.0		2.0 – 16.0	
Tilt Accuracy	°	< 0.6	< 0.5	< 0.4	
First Upper Side Lobe Suppression	dB	> 15	> 16	> 16	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28, typically > 30 (R1 // R2) > 30 (R1 // Y1, Y2, B1, B2, G1)		> 28, typically > 30 (R1 // R2) > 30 (R2 // Y1, Y2, B1, B2, G1)	
Max. Effective Power Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highbands		B1, connector 7-8		Y1, connector 11-12	
		1710-2170		2500-2690	
Frequency Range	MHz	1710 – 1785 1805 – 1880	1920 – 1980 2110 – 2170	2500 – 2570 2620 – 2690	
Gain at mid Tilt	dBi	16.8	16.8	17.0	
Gain over all Tilts	dBi	16.7 ± 0.6	16.6 ± 0.5	16.6 ± 0.6	
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 7.5	61 ± 4.9	60 ± 6.8	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 28	
Vertical Pattern:					
Elevation Beamwidth	°	7.1 ± 0.5	6.4 ± 0.5	4.9 ± 0.4	
Electrical Downtilt continuously adjustable	°	2.5 – 12.0		2.5 – 12.0	
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	
First Upper Side Lobe Suppression	dB	> 18	> 21	> 15	
Cross Polar Isolation	dB	> 28		> 28	
Port to Port Isolation	dB	> 30 (B1 // R1, R2, B2, Y1, Y2)		> 30 (Y1 // R1, R2, G1, B1, B2, Y2)	
Max. Effective Power Group of Ports 7+11 // 8+12	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Ports B1 + Y1	W	300 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011877

Right side, highbands		G1, connector 5-6		B2, connector 9-10		Y2, connector 13-14
		1427-1518		1710-2170		2500-2690
Frequency Range	MHz	1427 - 1496	1492 - 1518	1710 - 1785 1805 - 1880	1920 - 1980 2110 - 2170	2500 - 2570 2620 - 2690
Gain at mid Tilt	dBi	16.1	16.3	16.6	16.5	17.2
Gain over all Tilts	dBi	16.1 ± 0.3	16.4 ± 0.3	16.5 ± 0.3	16.5 ± 0.3	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	72 ± 3.9	67 ± 5.4	66 ± 3.5	68 ± 2.6	61 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26	> 27	> 28
Vertical Pattern:						
Elevation Beamwidth	°	8.6 ± 0.4	8.6 ± 0.3	7.3 ± 0.4	6.4 ± 0.7	4.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				2.5 - 12.0
Tilt Accuracy	°	< 0.3	< 0.2	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 15	> 17	> 16	> 15
Cross Polar Isolation	dB	> 28		> 28		> 28
Port to Port Isolation	dB	> 30 (G1 // R1, R2, B1, B2, Y1, Y2)		> 30 (B2 // R1, R2, G1, B1, Y1, Y2)		> 30 (Y2 // R1, R2, G1, B1, B2, Y1)
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)		150 (at 50 °C ambient temperature)		120 (at 50 °C ambient temperature)
Max. Effective Power Group of Ports 5+9+13 // 6+10+14	W	150 (at 50 °C ambient temperature)				
Max. Effective Power Ports G1 + B2 + Y2	W	300 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.
* not applicable for L-band

Mechanical specifications		
Input	14 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 665 149
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 378 / 164 59.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	33.0 / 38.0 (clamps incl.) 72.7 / 83.7 (clamps incl.)
Packing Size	mm inches	1681 / 402 / 248 66.2 / 15.8 / 9.8
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

14-Port Antenna

R1	R2	B1	Y1	G1	B2	Y2
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Frequency Range

698-862	880-960	1710-2170	2500-2690	1427-1518	1710-2170	2500-2690
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HPBW

65°	65°	65°	65°	65°	65°	65°
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14-Port Antenna 2LB/5HB 2.0m 65° | 698-862 15.5dBi | 880-960 16dBi |
2x1710-2170 17dBi | 2x2500-2690 17.5dBi |
1427-1518 16.5dBi



FlexRET



Type No.		80011878				
Left side, lowbands		R1, connector 1-2		R2, connector 3-4		
		698-862		880-960		
Frequency Range	MHz	698 – 806	791 – 862	880 – 960		
Gain at mid Tilt	dBi	15.3	15.6	16.1		
Gain over all Tilts	dBi	15.3 ± 0.3	15.6 ± 0.3	16.0 ± 0.3		
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 1.4	64 ± 2.1	61 ± 3.4		
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26		
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.6	9.8 ± 0.5	9.0 ± 0.5		
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		2.0 – 12.0		
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3		
First Upper Side Lobe Suppression	dB	> 18	> 19	> 20		
Cross Polar Isolation	dB	> 30		> 30		
Port to Port Isolation	dB	> 28, typically > 30 (R1 // R2) > 30 (R1 // Y1, Y2, B1, B2, G1)		> 28, typically > 30 (R2 // R1) > 30 (R2 // Y1, Y2, B1, B2, G1)		
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)				
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highbands		B1, connector 7-8		Y1, connector 11-12	
		1710-2170		2500-2690	
Frequency Range	MHz	1710 – 1785 1805 – 1880	1920 – 1980 2110 – 2170	2500 – 2570 2620 – 2690	
Gain at mid Tilt	dBi	17.3	17.7	18.0	
Gain over all Tilts	dBi	17.2 ± 0.5	17.6 ± 0.4	17.8 ± 0.5	
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 4.1	61 ± 2.8	61 ± 8.3	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 24	
Vertical Pattern:					
Elevation Beamwidth	°	5.8 ± 0.5	5.1 ± 0.5	4.1 ± 0.3	
Electrical Downtilt continuously adjustable	°	2.5 – 12.0		2.5 – 12.0	
Tilt Accuracy	°	< 0.2	< 0.2	< 0.1	
First Upper Side Lobe Suppression	dB	> 19	> 17	> 18	
Cross Polar Isolation	dB	> 28		> 28	
Port to Port Isolation	dB	> 30 (B1 // R1, R2, B2, Y1, Y2) > 28, typically > 30 (B1 // G1)		> 30 (Y1 // R1, R2, G1, B1, B2, Y2)	
Max. Effective Power Group of Ports 7+11 // 8+12	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Ports B1 + Y1	W	300 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80011878

Right side, highbands		G1, connector 5-6		B2, connector 9-10		Y2, connector 13-14
		1427-1518		1710-2170		2500-2690
Frequency Range	MHz	1427 - 1496	1492 - 1518	1710 - 1785 1805 - 1880	1920 - 1980 2110 - 2170	2500 - 2570 2620 - 2690
Gain at mid Tilt	dBi	16.1	16.3	16.6	16.5	17.2
Gain over all Tilts	dBi	16.1 ± 0.3	16.4 ± 0.3	16.5 ± 0.3	16.5 ± 0.3	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	72 ± 3.9	67 ± 5.4	66 ± 3.5	68 ± 2.6	61 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26	> 27	> 28
Vertical Pattern:						
Elevation Beamwidth	°	8.6 ± 0.4	8.6 ± 0.3	7.3 ± 0.4	6.4 ± 0.7	4.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				2.5 - 12.0
Tilt Accuracy	°	< 0.3	< 0.2	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 15	> 17	> 16	> 15
Cross Polar Isolation	dB	> 28		> 28		> 28
Port to Port Isolation	dB	> 30 (G1 // R1, R2, B2, Y1, Y2) > 28, typically > 30 (G1 // B1)		> 30 (B2 // R1, R2, G1, B1, Y1, Y2)		> 30 (Y2 // R1, R2, G1, B1, B2, Y1)
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)		150 (at 50 °C ambient temperature)		120 (at 50 °C ambient temperature)
Max. Effective Power Group of Ports 5+9+13 // 6+10+14	W	150 (at 50 °C ambient temperature)				
Max. Effective Power Ports G1 + B2 + Y2	W	300 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

* not applicable for L-band

Mechanical specifications		
Input	14 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	41.0 / 46.0 (clamps incl.) 90.4 / 101.4 (clamps incl.)
Packing Size	mm inches	2200 / 383 / 255 86.6 / 15.1 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

The "Category of Mounting Hardware" will change to "XM"

16-Port Antenna

R1	R2	Y1	Y2	Y3	Y4	Y5	Y6
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Frequency Range

698-960	698-960	1695-2690	1427-2690	1695-2690	1695-2690	1695-2690	1427-2690
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HPBW

65°	65°	65°	65°	65°	65°	65°	65°
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16-Port Antenna 2LB/6HB 1.95m 65° | 2x698-960 15.6dBi | 2x1427-2690 16.4dBi | 2x1695-2690 15.9dBi | 2x1695-2690 16.0dBi



FlexRET

Type No.	800442008				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.3	15.1	15.3	15.6
Gain over all Tilts	dBi	14.3 ± 0.6	15.0 ± 0.5	15.3 ± 0.4	15.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	68 ± 6	64 ± 5	61 ± 5	55 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 21	> 22	> 22
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.9	11.2 ± 0.6	11.0 ± 0.5	10.4 ± 0.6
Electrical Downtilt continuously adjustable	°	2.5 - 11.5			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 18
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R1 // R2, Y1, Y2, Y3, Y4, Y5, Y6)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband	R2, connector 3-4				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.3	15.1	15.3	15.6
Gain over all Tilts	dBi	14.3 ± 0.6	15.0 ± 0.5	15.3 ± 0.4	15.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	68 ± 6	63 ± 5	60 ± 5	55 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 21	> 22	> 22
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.9	11.2 ± 0.6	11.0 ± 0.5	10.5 ± 0.6
Electrical Downtilt continuously adjustable	°	2.5 - 11.5			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 17
Cross Polar Isolation	dB	> 25			
Port to Port Isolation	dB	> 25 (R2 // R1, Y1, Y2, Y3, Y4, Y5, Y6)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, lower highband		Y1, connector 5-6					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690	
Gain at mid Tilt	dBi	15.3	15.6	15.9	15.6	15.8	
Gain over all Tilts	dBi	15.3 ± 0.5	15.5 ± 0.6	15.7 ± 0.6	15.5 ± 0.5	15.7 ± 0.5	
Horizontal Pattern:							
Azimuth Beamwidth	°	66 ± 4	64 ± 6	62 ± 6	58 ± 6	57 ± 6	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 25	> 25	
Vertical Pattern:							
Elevation Beamwidth	°	11.4 ± 0.8	10.5 ± 0.6	10.1 ± 1.0	9.0 ± 0.6	8.2 ± 0.5	
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
First Upper Side Lobe Suppression	dB	> 16	> 16	> 17	> 18	> 18	
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y1 // R1, R2, Y2, Y3, Y4, Y5, Y6)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Left side, upper highband		Y2, connector 7-8					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	14.6	15.7	16.1	16.4	15.9	15.8
Gain over all Tilts	dBi	14.6 ± 0.6	15.6 ± 0.5	15.9 ± 0.6	16.2 ± 0.7	15.8 ± 0.6	15.6 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	70 ± 4	66 ± 6	64 ± 5	62. ± 6	64 ± 5	60 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25	> 25
Vertical Pattern:							
Elevation Beamwidth	°	11.9 ± 0.6	10.1 ± 0.6	9.4 ± 0.5	8.9 ± 0.7	8.1 ± 0.4	7.5 ± 0.5
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 17	> 18	> 18	> 18	> 16
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y2 // R1, R2, Y1, Y3, Y4, Y5, Y6)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Center, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.2	15.6	15.8	16.0	15.8
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.4	15.8 ± 0.4	16.0 ± 0.4	15.7 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	55 ± 5	59 ± 4	60 ± 3	61 ± 6	66 ± 4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	12.9 ± 1.1	11.9 ± 0.6	11.3 ± 0.9	9.9 ± 0.4	9.3 ± 0.5
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18	> 18	> 17
Cross Polar Isolation	dB	> 25				
Port to Port Isolation	dB	> 25 (Y3 // R1, R2, Y1, Y2, Y4, Y5, Y6)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Center, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.5	15.8	16.0	16.0	15.6
Gain over all Tilts	dBi	15.5 ± 0.5	15.8 ± 0.4	16.0 ± 0.4	15.9 ± 0.4	15.6 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	55 ± 5	55 ± 5	56 ± 4	60 ± 8	66 ± 3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	12.2 ± 0.7	11.4 ± 0.5	10.9 ± 0.7	9.9 ± 0.5	9.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2 – 12				
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18	> 18	> 18
Cross Polar Isolation	dB	> 25				
Port to Port Isolation	dB	> 25 (Y4 // R1, R2, Y1, Y2, Y3, Y5, Y6)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lower highband		Y5, connector 13-14					
		1695-2690					
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690	
Gain at mid Tilt	dBi	15.3	15.6	15.9	15.6	15.8	
Gain over all Tilts	dBi	15.3 ± 0.5	15.5 ± 0.6	15.7 ± 0.6	15.5 ± 0.5	15.7 ± 0.5	
Horizontal Pattern:							
Azimuth Beamwidth	°	66 ± 4	64 ± 5	61 ± 5	62 ± 4	55 ± 5	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 25	> 25	
Vertical Pattern:							
Elevation Beamwidth	°	11.1 ± 0.8	10.3 ± 0.5	9.8 ± 0.8	8.7 ± 0.5	8.0 ± 0.5	
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
First Upper Side Lobe Suppression	dB	> 16	> 16	> 17	> 18	> 18	
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y5 // R1, R2, Y1, Y2, Y3, Y4, Y6)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, upper highband		Y6, connector 15-16					
		1427-2690					
Frequency Range	MHz	1427 – 1518	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	14.6	15.7	16.1	16.4	15.9	15.8
Gain over all Tilts	dBi	14.6 ± 0.5	15.6 ± 0.5	15.9 ± 0.6	16.2 ± 0.7	15.8 ± 0.6	15.6 ± 0.8
Horizontal Pattern:							
Azimuth Beamwidth	°	70 ± 4	66 ± 6	64 ± 5	62. ± 6	64 ± 5	60 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25	> 25
Vertical Pattern:							
Elevation Beamwidth	°	11.9 ± 0.6	11.1 ± 0.6	9.4 ± 0.5	8.9 ± 0.7	8.1 ± 0.4	7.5 ± 0.5
Electrical Downtilt continuously adjustable	°	2 – 12					
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 17	> 18	> 18	> 17	> 16
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (Y6 // R1, R2, Y1, Y2, Y3, Y4, Y5)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.
* not applicable for L-band

Mechanical specifications		
Input	16 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 690 155 Maximal: 925 208
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1944 / 448 / 165 76.5 / 17.6 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	45 / 49.5 (clamps incl.) 99.2 / 109.1 (clamps incl.)
Packing Size	mm inches	2095 / 510 / 293 82.5 / 20.1 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

16-Port Antenna

R1	R2	R3	B1	B2	Y1	Y2	Y3
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Frequency Range

698-862	880-960	698-960	1427-2170	1427-2170	2500-2690	1710-2690	2500-2690
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HPBW

65°	65°	65°	65°	65°	65°	65°	65°
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16-Port Antenna 3LB/5HB 1.9m 65° | 698-862 15.1dBi | 880-960 15.4dBi | 698-960 15.5dBi | 2x1427-2170 17.1dBi | 2x2500-2690 17dBi | 1710-2690 18.8dBi



FlexRET



Type No.		800442001					
Left side, lowbands		R1, connector 1-2			R2, connector 3-4		
		698-862			880-960		
Frequency Range	MHz	698 – 806	790 – 862	880 – 960			
Gain at mid Tilt	dBi	14.4	15.1	15.5			
Gain over all Tilts	dBi	14.4 ± 0.5	15.1 ± 0.6	15.4 ± 0.4			
Horizontal Pattern:							
Azimuth Beamwidth	°	66 ± 6.3	62 ± 4.4	62 ± 5.4			
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 23			
Vertical Pattern:							
Elevation Beamwidth	°	11.5 ± 0.9	10.8 ± 0.6	9.9 ± 0.4			
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			2.0 – 12.0		
Tilt Accuracy	°	< 0.5	< 0.6	< 0.4			
First Upper Side Lobe Suppression	dB	> 15	> 16	> 15			
Cross Polar Isolation	dB	> 25			> 25		
Port to Port Isolation	dB	> 25 (R1 // R2, R3) typically > 26, typically 30 (R1 // Y1, Y2, Y3, B1, B2)			> 25 (R2 // R1, R3) typically > 26, typically 30 (R2 // Y1, Y2, Y3, B1, B2)		
Max. Effective Power for Group of Ports 1+3 // 2+4	W	400 (at 50 °C ambient temperature)					
Max. Effective Power Ports R1 + R2	W	800 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, lowband		R3, connector 5-6					
		698-960					
Frequency Range	MHz	698 – 806	790 – 862	880 – 960			
Gain at mid Tilt	dBi	14.5	15.3	15.6			
Gain over all Tilts	dBi	14.5 ± 0.5	15.2 ± 0.6	15.5 ± 0.5			
Horizontal Pattern:							
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.8	61 ± 4.8			
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 20			
Vertical Pattern:							
Elevation Beamwidth	°	11.4 ± 0.9	10.8 ± 0.6	9.9 ± 0.6			
Electrical Downtilt continuously adjustable	°	2.0 – 12.0					
Tilt Accuracy	°	< 0.5	< 0.6	< 0.6			
First Upper Side Lobe Suppression	dB	> 17	> 18	> 17			
Cross Polar Isolation	dB	> 25					
Port to Port Isolation	dB	> 25 (R3 // R1, R2) typically > 26, typically 30 (R3 // Y1, Y2, Y3, B1, B2)					
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)					
Max. Effective Power Ports R3	W	800 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 10.0) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 305

800442001

Left side, highbands		B1, connector 7-8			Y1, connector 11-12
		1427-2170			2500-2690
Frequency Range	MHz	1427 – 1518	1710 – 1880	1920 – 2170	2500 – 2690
Gain at mid Tilt	dBi	15.6	17.0	17.3	17.2
Gain over all Tilts	dBi	15.5 ± 0.6	16.9 ± 0.6	17.1 ± 0.7	17.0 ± 0.7
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 3.5	63 ± 5.1	63 ± 4.8	57 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 26	> 25	> 27
Vertical Pattern:					
Elevation Beamwidth	°	7.7 ± 0.4	6.4 ± 0.3	5.8 ± 0.4	4.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.5	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 17	> 18	> 15
Cross Polar Isolation	dB	> 26			> 26
Port to Port Isolation	dB	> 26, typically 30 (B1 // R1, R2, R3, B2, Y1, Y2, Y3)			> 26, typically 30 (Y1 // R1, R2, R3, B1, B2, Y2, Y3)
Max. Effective Power for Group of Ports 7+11 // 8+12	W	180 (at 50 °C ambient temperature)			
Max. Effective Power Ports B1 + Y1	W	360 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

Right side, highbands		B2, connector 9-10			Y3, connector 15-16
		1427-2170			2500-2690
Frequency Range	MHz	1427 – 1518	1710 – 1880	1920 – 2170	2500 – 2690
Gain at mid Tilt	dBi	15.6	16.9	17.2	17.2
Gain over all Tilts	dBi	15.5 ± 0.7	16.8 ± 0.6	17.1 ± 0.7	17 ± 0.7
Horizontal Pattern:					
Azimuth Beamwidth	°	68 ± 4.7	63 ± 5.7	63 ± 5.5	56 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 26	> 25	> 27
Vertical Pattern:					
Elevation Beamwidth	°	7.8 ± 0.6	6.4 ± 0.3	5.8 ± 0.4	4.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.5	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 16	> 17	> 16
Cross Polar Isolation	dB	> 26			> 26
Port to Port Isolation	dB	> 26, typically 30 (B2 // R1, R2, R3, B1, Y1, Y2, Y3)			> 26, typically 30 (Y3 // R1, R2, R3, B1, B2, Y1, Y2)
Max. Effective Power for Group of Ports 9+15 // 10+16	W	180 (at 50 °C ambient temperature)			
Max. Effective Power Ports B2 + Y3	W	360 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 10.0) requirements.

800442001

Center, highband		Y2, connector 13-14		
		1710-2690		
Frequency Range	MHz	1710 – 1880	1920 – 2170	2500 – 2690
Gain at mid Tilt	dBi	17.6	18.3	19
Gain over all Tilts	dBi	17.5 ± 0.5	18.2 ± 0.8	18.8 ± 0.8
Horizontal Pattern:				
Azimuth Beamwidth	°	58 ± 6.1	58 ± 3.2	61 ± 2.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27	> 30
Vertical Pattern:				
Elevation Beamwidth	°	6.9 ± 0.4	6.4 ± 0.5	5.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0		
Tilt Accuracy	°	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 16	> 17
Cross Polar Isolation	dB	> 26		
Port to Port Isolation	dB	> 26 (Y2 // R1, R2, R3, B1, B2, Y1, Y3)		
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)		
Max. Effective Power Ports Y2	W	300 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 10.0) requirements.

Electrical specifications, all ports		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 25
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)*
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 10.0) requirements.

* not applicable for L-band

Mechanical specifications		
Input	16 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 690 155 Maximal: 925 208
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1944 / 448 / 165 76.5 / 17.6 / 6.5
Category of Mounting Hardware	XM (X-medium)	
Weight	kg lb	47 / 51.5 (clamps incl.) 108.0 / 116.9 (clamps incl.)
Packing Size	mm inches	2095 / 510 / 293 82.5 / 20.1 / 11.5
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

Summary – Small Cell Antennas Special Design Antennas

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page
Omnidirectional				
1-Port Omni	1695–2700	360°	2dBi 0°T	80010431 115 N, bottom or top 277
2-Port Omni Slimpole	1710–2690	360°	5dBi 0°T	80020126 691 4.3-10, bottom 235
4-Port Omni	698–894	C 360°	2.5dBi 0°T	84010793 626 4.3-10, bottom 236 + 237
	1695–2690	360°	6dBi 2°T	
	698–894	C 360°	2.5dBi 0°T	
	1695–2690	360°	6dBi 2°T	
10-Port Omni	1695–2690	360°	6.5dBi 0°T	84010555 626 4.3-10, bottom 238 + 239
	1695–2690	360°	6.5dBi 0°T	
	3550–3700	360°	6.5dBi 5°T	
	3550–3700	360°	6.5dBi 5°T	
	5150–5925	360°	5dBi 0°T	
14-Port Omni	698–894	360°	3.3dBi 0°T	84010557 626 4.3-10, bottom 240 + 241
	698–894	360°	3.3dBi 0°T	
	1695–2690	360°	6.7dBi 0°T	
	1695–2690	360°	6.7dBi 0°T	
	3550–3700	360°	5.8dBi 10°T	
	3550–3700	360°	5.8dBi 10°T	
	5150–5925	360°	4dBi 12°T	
18-Port Omni	698–894	360°	5.9dBi 0°T	84010623-044 626 4.3-10, bottom 242 – 244
	1695–2690	360°	9dBi 4°T	
	1695–2690	360°	9dBi 4°T	
	1695–2690	360°	9dBi 4°T	
	1695–2690	360°	9dBi 4°T	
	3400–4200	360°	6.8dBi 9°T	
	3400–4200	360°	6.8dBi 9°T	
	5150–5925	360°	5dBi 2°T	
	5150–5925	360°	5dBi 2°T	
	20-Port Omni	698–894	360°	
698–894		360°	3.5dBi 0°T	
1695–2690		360°	9dBi 4°T	
1695–2690		360°	9dBi 4°T	
1695–2690		360°	9dBi 4°T	
1695–2690		360°	9dBi 4°T	
3400–4200		360°	6.8dBi 9°T	
3400–4200		360°	6.8dBi 9°T	
5150–5925		360°	5dBi 2°T	
5150–5925		360°	5dBi 2°T	
20-Port Omni	698–894	360°	3.5dBi 0°T	84010603 626 4.3-10, bottom 248 – 250
	698–894	360°	3.5dBi 0°T	
	1695–2690	360°	9dBi 4°T	
	1695–2690	360°	9dBi 6°T	
	1695–2690	360°	9dBi 4°T	
	1695–2690	360°	9dBi 6°T	
	3400–4200	360°	6.8dBi 9°T	
	3400–4200	360°	6.8dBi 9°T	
	5150–5925	360°	5dBi 2°T	
	5150–5925	360°	5dBi 2°T	

New or changed product

Summary – Small Cell Antennas Special Design Antennas

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page			
Omnidirectional							
24-Port Omni	1695-2690	360°	9dBi 4°T	84010601 84010602	626	4.3-10, bottom	251 – 253
	1695-2690	360°	9dBi 6°T				
	1695-2690	360°	9dBi 4°T				
	1695-2690	360°	9dBi 4°T				
	1695-2690	360°	9dBi 6°T				
	1695-2690	360°	9dBi 4°T				
	3400-4200	360°	7dBi 8°T				
	3400-4200	360°	7dBi 8°T				
	3400-4200	360°	7dBi 8°T				
	3400-4200	360°	7dBi 8°T				
	5150-5925	360°	5dBi 0°T				
	5150-5925	360°	5dBi 0°T				
	24-Port Omni with GPS	1695-2690	360°				
1695-2690		360°	9dBi 6°T				
1695-2690		360°	9dBi 4°T				
1695-2690		360°	9dBi 4°T				
1695-2690		360°	9dBi 6°T				
1695-2690		360°	9dBi 4°T				
3400-4200		360°	7dBi 8°T				
3400-4200		360°	7dBi 8°T				
3400-4200		360°	7dBi 8°T				
3400-4200		360°	7dBi 8°T				
5150-5925		360°	5dBi 0°T				
5150-5925		360°	5dBi 0°T				

New or changed product

Summary – Small Cell Antennas Special Design Antennas

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page			
1-Sector							
1-Port LogPer	690–2690	67°	11dBi 0°T	742192v02	300	7-16, bottom	268
1-Port Antenna	1710–2180	12°	18.5dBi 0°T	80010368	299	7-16, side	269
1-Port Yagi	790–960	C 38°	14dBi 0°T	80010828v01	170	7-16, rearside	271
	1710–2170	28°	15.5dBi 0°T				
2-Port Inside Connect Antenna	1695–2690	75°	8dBi 0°T	80020100	121.5	4.3-10, back	258
Accessories Parts for 80020100				85010205			259
2-Port Antenna	1710–2690	65°	9.5dBi 0°T	80020711	155	4.3-10, bottom or top	260
2-Port Antenna	790–960	C 65°	8dBi 0°T	80010753	334	7-16, bottom	261
	1710–2690	65°	9dBi 0°T				
10-Port Antenna	1695–2690	65°	14dBi 3°–15°T	84010564	610	4.3-10, bottom	262 + 263
	1695–2690	65°	14dBi 3°–15°T				
	3550–3700	65°	11dBi 5.5°T				
	3550–3700	65°	11dBi 5.5°T				
	5150–5925	65°	5dBi 12°T				
2-Sector							
1-Port BiDir	694–960/1710–2690	65°	5dBi 0°T	80020448	428	4.3-10, bottom	270
4-Port MicroCell	1695–2690	85°	7.5dBi 0°T	80010843	526	4.3-10, bottom and top	264
	1695–2690	85°	7.5dBi 0°T				
Tri-Sector							
6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi 0°T	80020125	691	4.3-10, bottom	265
Street Connect							
2-Port Street Connect	1695–2690	360°	6dBi 0°T	80010235	∅ 375	4.3-10, bottom	266

Omni Slimpole Antenna Dual Polarization

1710-2690

KATHREIN

X

2-Port Omni Slimpole HB 0.7m 360° | 1710-2690 5dBi

Type No.		80020126			
		1710-2690			
Frequency range	MHz	1710 - 1990	1920 - 2170	2170 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 5	2 x 5	2 x 5	2 x 5
Horizontal Pattern:					
Half-power beam width		Omni	Omni	Omni	Omni
Deviation from circularity	dB	±1	±1	±1.5	±1.5
Vertical Pattern:					
Half-power beam width	°	42	40	36	33
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	100 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	2 x 4.3-10 female	
Connector position	Bottom	
Weight	kg lb	2.3 5.1
Wind load (at 150 km/h)	N lbf	50 11.2
Max. wind velocity	km/h mph	200 124
Mechanical interface	Flange connection 8 x M6 at a graduated diameter of 136 mm 5.4 inches. Evenness of the opposite surface: 0.5 mm 0.02 inches	
Packing size	mm inches	742 x 220 x 219 29.2 x 8.7 x 8.6
Height / diameter	mm inches	691 / 100 27.2 / 3.9

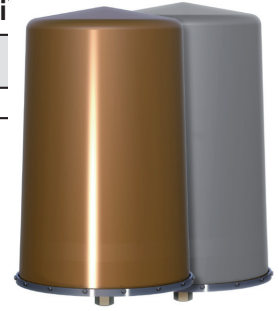
4-Port Omni Antenna R1 Y1 R2 Y2 **KATHREIN**

Frequency Range 698-894 1695-2690 698-894 1695-2690

HPBW 360° 360° 360° 360°

4-Port Omni Antenna 2LB/2HB 0.6m C 360° | 2x698-894 2.5dBi | 2x1695-2690 6dBi

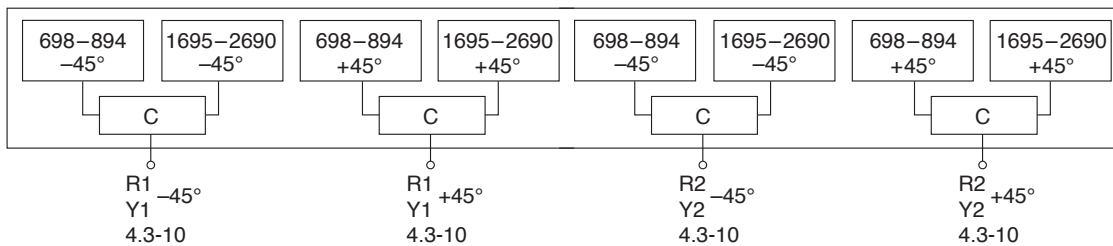
Type No.	84010793	84010794
Radome colour	Brown	Grey



Wideband		R1, Y1					
		698-894		1695-2690			
Frequency range	MHz	698 – 824	824 – 894	1695 – 2180	2200 – 2360	2490 – 2690	
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45	
Gain	dBi	2 x 2.2	2 x 2.8	2 x 5.7	2 x 6.1	2 x 6.4	
Horizontal Pattern:							
Half-power beam width	°	360 (with 1-8 dB nulls LB, 6-16dB nulls HB, typical)					
Vertical Pattern:							
Half-power beam width	°	80	74	29	27	24	
Electrical tilt	°	0, fixed	0, fixed	2, fixed	2, fixed	2, fixed	
Impedance	Ω	50					
VSWR		< 1.5	< 1.5	< 1.5	1.5	< 1.65	
Isolation	Intrasystem Intersystem	dB	> 23, typ. 27 > 25 (R1 // R2, Y1, Y2) > 25 (R2 // R1, Y1, Y2) > 27 (R2 // R1)	> 23, typ. 27 > 25 (R1 // R2, Y1, Y2) > 25 (R2 // R1, Y1, Y2) > 27 (R2 // R1)	> 23, typ. 27 > 25 (R1 // R2, Y1, Y2) > 25 (R2 // R1, Y1, Y2) > 27 (R2 // R1)	> 23, typ. 27 > 25 (R1 // R2, Y1, Y2) > 25 (R2 // R1, Y1, Y2) > 27 (R2 // R1)	> 20, typ. 24 > 22 (R1 // R2, Y1, Y2) > 22 (R2 // R1, Y1, Y2) > 24 (R2 // R1)
Intermodulation		dBc					
Max. power per input	W	100 (at 50 °C ambient temperature)					

84010793, 84010794

Wideband		R2, Y2				
		698-894		1695-2690		
Frequency range	MHz	698 – 824	824 – 894	1695 – 2180	2200 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 2.4	2 x 3.0	2 x 5.9	2 x 5.9	2 x 6.1
Horizontal Pattern:						
Half-power beam width	°	360 (with 1-8 dB nulls LB, 6-16 dB nulls HB, typical)				
Vertical Pattern:						
Half-power beam width	°	66	60	29	27	24
Electrical tilt	°	0, fixed	0, fixed	2, fixed	2, fixed	2, fixed
Impedance	Ω	50				
VSWR		< 1.5	< 1.5	< 1.5	1.5	< 1.65
Isolation	Intrasystem	> 23, typ. 27	> 23, typ. 27	> 23, typ. 27	> 23, typ. 27	> 20, typ. 24
	Intersystem	> 25 (R1 // R2, Y1, Y2)	> 25 (R1 // R2, Y1, Y2)	> 25 (R1 // R2, Y1, Y2)	> 25 (R1 // R2, Y1, Y2)	> 22 (R1 // R2, Y1, Y2)
		> 25 (R2 // R1, Y1, Y2)	> 25 (R2 // R1, Y1, Y2)	> 25 (R2 // R1, Y1, Y2)	> 25 (R2 // R1, Y1, Y2)	> 22 (R2 // R1, Y1, Y2)
		> 27 (R2 // R1)	> 27 (R2 // R1)	> 27 (R2 // R1)	> 27 (R2 // R1)	> 24 (R2 // R1)
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)				
Max. power per input	W	100 (at 50 °C ambient temperature)				



Mechanical specifications		
Input	4 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg	18.1
	lb	39.9
Wind load (at Rated Wind Speed: 150 km/h)	N	138
	lbf	32
Max. wind velocity	km/h	242
	mph	150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm	755 x 480 x 480
	inches	29.7 / 18.9 / 18.9
Height / diameter	mm	626 / 407
	inches	24.6 / 16

10-Port Omni Antenna

Y1	Y2	P1	P2	O1
----	----	----	----	----

Frequency Range

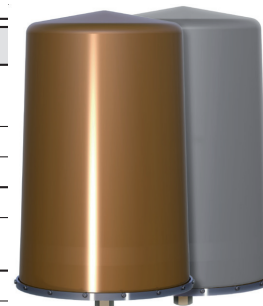
1695-2690	1695-2690	3550-3700	3550-3700	5150-5925
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HPBW

360°	360°	360°	360°	360°
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10-Port Omni Antenna 5HB 0.6m 360° | 2x1695-2690 6.5dBi | 2x3550-3700 6.5dBi | 5150-5925 5dBi

Type No.	84010555				84010556				
Radome colour	Brown				Grey				
Left side, lower highband		Y1							
		1695-2690							
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690				
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45				
Gain	dBi	5.4	6.1	6.9	7.2				
Horizontal Pattern:									
Half-power beam width	°	360 (with -7 dB null, typical)	360 (with -7 dB null, typical)	360 (with -8 dB null, typical)	360 (with -9 dB null, typical)				
Vertical Pattern:									
Half-power beam width	°	41	33	26	23				
Electrical tilt	°	0, fixed							
Impedance	Ω	50							
VSWR		< 1.5	< 1.5	< 1.5	< 1.65				
Isolation	Intrasystem Intersystem	dB	> 23 > 28	> 23 > 28	> 23 > 28	> 23 > 28			
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)							
Max. power per input	W	150 (at 50 °C ambient temperature)							



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, upper highband		Y2							
		1695-2690							
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690				
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45				
Gain	dBi	5.6	6.1	6.6	6.8				
Horizontal Pattern:									
Half-power beam width	°	360 (with -7 dB null, typical)	360 (with -7 dB null, typical)	360 (with -8 dB null, typical)	360 (with -9 dB null typical)				
Vertical Pattern:									
Half-power beam width	°	37	33	27	29				
Electrical tilt	°	0, fixed							
Impedance	Ω	50							
VSWR		< 1.5	< 1.5	< 1.5	< 1.65				
Isolation	Intrasystem Intersystem	dB	> 23 > 28	> 23 > 28	> 23 > 28	> 23 > 28			
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)							
Max. power per input	W	150 (at 50 °C ambient temperature)							

Values based on NGMN-P-BASTA (version 9.6) requirements.

84010555, 84010556

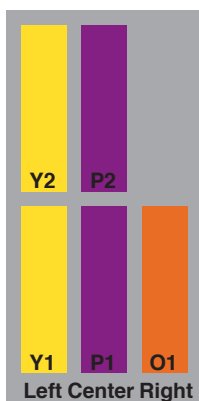
Center, highbands		P1		P2	
		3550-3700		3550-3700	
Frequency range	MHz	3550 – 3700		3550 – 3700	
Polarization	°	+45, -45		+45, -45	
Gain	dBi	6.8		7.0	
Horizontal Pattern:					
Half-power beam width	°	360 (with -12 dB null, typical)		360 (with -12 dB null, typical)	
Vertical Pattern:					
Half-power beam width	°	26		24	
Electrical tilt	°	5, fixed		5, fixed	
Impedance	Ω	50		50	
VSWR		< 1.5		< 1.5	
Isolation	Intrasystem Intersystem	dB		dB	
		> 25 > 28		> 25 > 28	
Intermodulation	dBc	N/A		50 Ω	
Max. power per input	W	100 (at 50 °C ambient temperature)		100 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		O1				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical / maximum)	dBi	5.0 / 6.0	5.0 / 6.0	4.7 / 6.0	4.8 / 6.0	4.3 / 6.0
Horizontal Pattern:						
Half-power beam width	°	360 (with -15 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	26	25	24	22	21
Electrical tilt	°	0, fixed				
Impedance	Ω	50				
VSWR		< 1.5	< 1.7	< 1.7	< 1.5	< 1.7
Isolation	Intrasystem Intersystem	dB				
		> 25 > 28				
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				
Max. input power*	W	.25	-	.25	1.0	-

Values based on NGMN-P-BASTA (version 9.6) requirements.

*To comply with EIRP restrictions for FCC Title 47 part 15 for fixed outdoor point to multi-point applications.



Mechanical specifications		
Input	10 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg lb	15.0 33.0
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16

14-Port Omni Antenna

R1-R2
Y1-Y2
P1-P2
O1

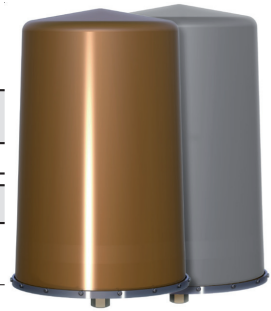
Frequency Range

698-894
1695-2690
3550-3700
5150-5925

HPBW

360°
360°
360°
360°

14-Port Omni Antenna 2LB/5HB 0.6m 360° | 2x698-894 3.3dBi |
 2x1695-2690 6.7dBi | 2x3550-3700 5.8dBi |
 5150-5925 4dBi



Type No.		84010557		84010558	
Radome colour		Brown		Grey	
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-894		698-894	
Frequency range	MHz	698 - 806	824 - 894	698 - 806	824 - 894
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 3.1 ± 0.4	2 x 3.5 ± 0.4	2 x 3.0 ± 0.5	2 x 3.6 ± 0.5
Horizontal Pattern:					
Half-power beam width	°	360 (with 1-5 dB null, typical)		360 (with 1-5 dB null, typical)	
Vertical Pattern:					
Half-power beam width	°	66 ± 6	57 ± 2	62 ± 4	60 ± 3
Electrical tilt	°	0, fixed		0, fixed	
Impedance	Ω	50		50	
VSWR		< 1.5		1.5	
Isolation	Intrasystem Intersystem	> 23 > 28 (R1 // Y1, Y2, P1, P2, O1) > 28 (R2 // Y1, Y2, P1, P2, O1) > 20 (R2 // R1)		> 23 > 28 (R1 // Y1, Y2, P1, P2, O1) > 28 (R2 // Y1, Y2, P1, P2, O1) > 20 (R2 // R1)	
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	125 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		Y1, connector 5-6			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	5.8 ± 0.2	6.8 ± 0.2	6.8 ± 0.2	7.2 ± 0.2
Horizontal Pattern:					
Half-power beam width	°	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	35 ± 2	26 ± 2	26 ± 1	25 ± 1
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	> 23 > 28	> 23 > 28	> 23 > 28	> 23 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		Y2, connector 7-8			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	5.8 ± 0.2	6.3 ± 0.5	7.2 ± 0.3	7.0 ± 0.2
Horizontal Pattern:					
Half-power beam width	°	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)	360 (with -10 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	34 ± 2	31 ± 2	25 ± 1	27 ± 1
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	> 23 > 28	> 23 > 28	> 23 > 28	> 23 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

84010557, 84010558

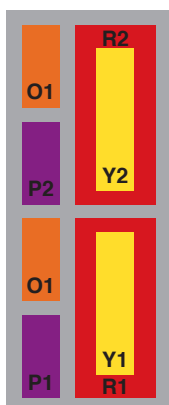
Highband		P1, connector 9-10		P2, connector 11-12	
		3550-3700		3550-3700	
Frequency range	MHz	3550 – 3700		3550 – 3700	
Polarization	°	+45, -45		+45, -45	
Gain	dBi	5.8 ± 0.1		5.8 ± 0.5	
Horizontal Pattern:					
Half-power beam width	°	360 (with -15 dB null, typical)		360 (with -15 dB null, typical)	
Vertical Pattern:					
Half-power beam width	°	27.5 ± 2.5		28 ± 0.5	
Electrical tilt	°	9 ± 1.5		11 ± 2	
Impedance	Ω	50		50	
VSWR		< 1.5		< 1.5	
Isolation	Intrasystem Intersystem	dB		dB	
		> 22 > 28		> 22 > 28	
Intermodulation	dBc	N/A		N/A	
Max. power per input	W	100 (at 50 °C ambient temperature)		100 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		O1, connector 13-14				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	4.2 ± 0.4	3.9 ± 0.7	3.9 ± 0.8	4.0 ± 0.7	3.9 ± 0.1
Horizontal Pattern:						
Half-power beam width	°	360 (with -15 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	32 ± 1	28 ± 1	27 ± 1	27 ± 9	32 ± 9
Electrical tilt	°	12 ± 5				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem Intersystem	dB				
		> 27 > 28				
Intermodulation	dBc	N/A				
Max. power per input	W	2 (at 50 °C ambient temperature)				
Max. input power per radio*	W	1	-	-	-	-

Values based on NGMN-P-BASTA (version 9.6) requirements.

* To comply with EIRP restrictions for FCC Title 47 part 15 for fixed outdoor point to multi-point applications



Mechanical specifications		
Input	14 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg lb	18 40
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16

18-Port Omni Antenna

R1 **Y1, Y2** **Y3, Y4** **P1, P2** **O1, O2**

Frequency Range

698-894 **1695-2690** **1695-2690** **3400-4200** **5150-5925**

HPBW

360° **360°** **360°** **360°** **360°**

18-Port Omni Antenna LB/8HB 0.6m 360° | 698-894 5.9dBi | 4x1695-2690 9dBi | 2x3400-4200 6.8dBi | 2x5150-5925 5dBi



Type No.	84010623-O44		84010624-O44	
Radome colour	Brown		Grey	
Lowband	R1, connector 1-2			
	698-894			
Frequency range	MHz	698-806	824-894	
Polarization	°	+45, -45	+45, -45	
Gain	dBi	5.2	5.8	
Horizontal Pattern:				
Half-power beam width	°	360 (with 10 dB nulls, typical)		
Vertical Pattern:				
Half-power beam width	°	31	25	
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation	Intrasystem Intersystem	dB		
		> 23, typ. 27 > 28 (R1 // Y1, Y2, Y3, Y4) > 20 (R2 // R1)		
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)		
Max. power per input	W	125 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		Y1, connector 3-4; Y2, connector 5-6			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2200	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.0	8.6	8.5	8.0
Horizontal Pattern:					
Half-power beam width	°	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	4, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB			
		> 25 > 22	> 25 > 26	> 25 > 26	> 25 > 26
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y1 & Y2 (four connectors) as one set of MIMO.

Highband		Y3, connector 7-8; Y4, connector 9-10			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2200	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.0	8.9	9.3	8.5
Horizontal Pattern:					
Half-power beam width	°	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	4, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB	> 25 > 27	> 25 > 28	> 25 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y3 & Y4 (four connectors) as one set of MIMO.

Highband		P1, connector 11-12; P2, connector 13-14	
		3400-4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, -45	+45, -45
Gain	dBi	6.5	6.5
Horizontal Pattern:			
Half-power beam width	°	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)
Vertical Pattern:			
Half-power beam width	°	28	23
Electrical tilt	°	10, fixed	8, fixed
Impedance	Ω	50	
VSWR		< 1.5	
Isolation	Intrasystem Intersystem	dB	> 23 > 25
Intermodulation	dBc	N/A	
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

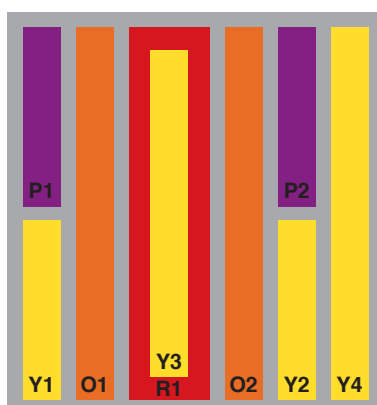
Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		O1, connector 15–16; O2, connector 17–18				
		5150–5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45	+45, –45
Gain (typical/maximum)	dBi	4.0 / 5.8	4.1 / 5.6	4.1 / 6.0	4.1 / 6.0	4.5 / 6.0
Horizontal Pattern:						
Half-power beam width	°	360 (with 25 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	20	20	19	16	16
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 25				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Maximum power to comply with ERP restrictions for FCC Title 47 und Part 15

U-NII Band		U-NII 1	U-NII 2A	U-NII 2C	U-NII 3
Frequency	MHz	5150–5250	5250–5350	5470–5725	5725–5850
Max. input powr per radio		1	0.25	0.25	1



Mechanical specifications		
Input	18 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg	21.8
	lb	48.0
Wind load (at Rated Wind Speed: 150 km/h)	N	138
	lbf	32
Max. wind velocity	km/h	242
	mph	150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm	755 x 480 x 480
	inches	29.7 / 18.9 / 18.9
Height / diameter	mm	626 / 407
	inches	24.6 / 16

20-Port Omni Antenna

R1, R2
Y1, Y3
Y2, Y4
P1, P2
O1, O2

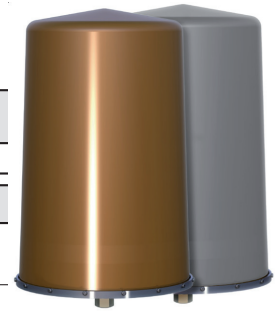
Frequency Range

698-894
1695-2690
1695-2690
3400-4200
5150-5925

HPBW

360°
360°
360°
360°
360°

20-Port Omni Antenna 2LB/8HB 0.6m 360° | 2x698-894 3.5dBi |
 4x1695-2690 9dBi | 2x3400-4200 6.8dBi |
 2x5150-5925 5dBi



Type No.		84010603-O44		84010604-O44	
Radome colour		Brown		Grey	
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-894		698-894	
Frequency range	MHz	698-806	824-894	698-806	824-894
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	3.5	3.7	3.8	3.8
Horizontal Pattern:					
Half-power beam width	°	360 (with 10 dB nulls, typical)		360 (with 10 dB nulls, typical)	
Vertical Pattern:					
Half-power beam width	°	68	63	68	60
Electrical tilt	°	0, fixed		0, fixed	
Impedance	Ω	50		50	
VSWR		< 1.5		1.5	
Isolation	Intrasystem Intersystem	dB		dB	
		> 23, typ. 27 > 28 (R1 // Y1, Y2, Y3, Y4) > 20 (R2 // R1)		> 23, typ. 27 > 28 (R1 // Y1, Y2, Y3, Y4) > 20 (R2 // R1)	
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	125 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		Y1, connector 5-6; Y2, connector 7-8			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2200	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.0	8.6	8.5	8.0
Horizontal Pattern:					
Half-power beam width	°	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	4, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB		dB	
		> 25 > 22		> 25 > 26	
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y1 & Y2 (four connectors) as one set of MIMO.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 330

Highband		Y3, connector 9-10; Y4, connector 11-12			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2200	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.0	8.9	9.3	8.5
Horizontal Pattern:					
Half-power beam width	°	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	4, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB	> 25 > 27	> 25 > 28	> 25 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y3 & Y4 (four connectors) as one set of MIMO.

Highband		P1, connector 13-14; P2, connector 15-16	
		3400-4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, -45	+45, -45
Gain	dBi	6.5	6.5
Horizontal Pattern:			
Half-power beam width	°	360 (with 25 dB null, typical)	
Vertical Pattern:			
Half-power beam width	°	28	23
Electrical tilt	°	10, fixed	8, fixed
Impedance	Ω	50	
VSWR		< 1.5	
Isolation	Intrasystem Intersystem	dB	> 23 > 25
Intermodulation	dBc	N/A	
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

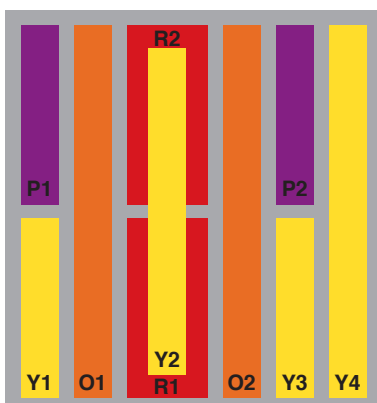
Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		O1, connector 17-18; O2, connector 19-20				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical/maximum)	dBi	4.0 / 5.8	4.1 / 5.6	4.1 / 6.0	4.1 / 6.0	4.5 / 6.0
Horizontal Pattern:						
Half-power beam width	°	360 (with 25 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	20	20	19	16	16
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 25				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Maximum power to comply with ERP restrictions for FCC Title 47 und Part 15

U-NII Band		U-NII 1	U-NII 2A	U-NII 2C	U-NII 3
Frequency	MHz	5150-5250	5250-5350	5470-5725	5725-5850
Max. input powr per radio		1	0.25	0.25	1



Mechanical specifications		
Input	20 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg	21.8
	lb	48.0
Wind load (at Rated Wind Speed: 150 km/h)	N	138
	lbf	32
Max. wind velocity	km/h	242
	mph	150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm	755 x 480 x 480
	inches	29.7 / 18.9 / 18.9
Height / diameter	mm	626 / 407
	inches	24.6 / 16

20-Port Omni Antenna

R1, R2
Y1, Y3
Y2, Y4
P1, P2
O1, O2

Frequency Range

698-894
1695-2690
1695-2690
3400-4200
5150-5925

HPBW

360°
360°
360°
360°
360°

20-Port Omni Antenna 2LB/8HB 0.6m 360° | 2x698-894 3.5dBi |
 4x1695-2690 9dBi | 2x3400-4200 6.8dBi |
 2x5150-5925 5dBi



Type No.		84010603		84010604	
Radome colour		Brown		Grey	
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-894		698-894	
Frequency range	MHz	698-806	824-894	698-806	824-894
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 3.5	2 x 3.7	2 x 3.8	2 x 3.8
Horizontal Pattern:					
Half-power beam width	°	360 (with 10 dB nulls, typical)		360 (with 10 dB nulls, typical)	
Vertical Pattern:					
Half-power beam width	°	68	63	68	60
Electrical tilt	°	0, fixed		0, fixed	
Impedance	Ω	50		50	
VSWR		< 1.5		1.5	
Isolation	Intrasystem Intersystem	dB		dB	
		> 23, typ. 27 > 28 (R1 // Y1, Y2, Y3, Y4) > 20 (R2 // R1)		> 23, typ. 27 > 28 (R1 // Y1, Y2, Y3, Y4) > 20 (R2 // R1)	
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	125 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		Y1, connector 5-6; Y3, connector 7-8			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2200	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.2	8.3	8.5	7.8
Horizontal Pattern:					
Half-power beam width	°	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)	360 (with 25 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	4, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB		dB	
		> 25 > 22		> 25 > 26	
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y1 & Y3 (four connectors) as one set of MIMO.

84010603, 84010604

Highband		Y2, connector 9-10; Y4, connector 11-12			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2200	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	7.8	8.3	8.6	8.3
Horizontal Pattern:					
Half-power beam width	°	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)	360 (with 20 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	18	16	14	12
Electrical tilt	°	6, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB	> 25 > 27	> 25 > 28	> 25 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y2 & Y4 (four connectors) as one set of MIMO.

Highband		P1, connector 13-14; P2, connector 15-16	
		3400-4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, -45	+45, -45
Gain	dBi	6.5	6.5
Horizontal Pattern:			
Half-power beam width	°	360 (with 25 dB null, typical)	
Vertical Pattern:			
Half-power beam width	°	28	23
Electrical tilt	°	10, fixed	8, fixed
Impedance	Ω	50	
VSWR		< 1.5	
Isolation	Intrasystem Intersystem	dB	> 23 > 25
Intermodulation	dBc	N/A	
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

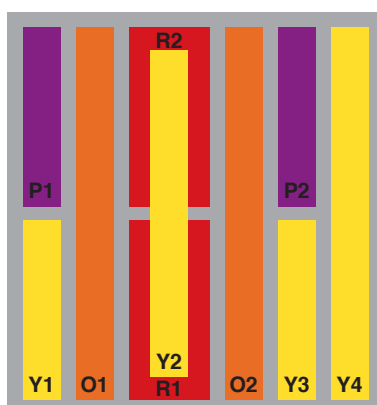
Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 330

84010603, 84010604

Highband		O1, connector 17-18; O2, connector 19-20				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical/maximum)	dBi	4.0 / 5.8	4.1 / 5.6	4.1 / 6.0	4.1 / 6.0	4.5 / 6.0
Horizontal Pattern:						
Half-power beam width	°	360 (with 25 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	20	20	19	16	16
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 25				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.



Mechanical specifications		
Input	20 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg	21.8
	lb	48.0
Wind load (at Rated Wind Speed: 150 km/h)	N	138
	lbf	32
Max. wind velocity	km/h	242
	mph	150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm	755 x 480 x 480
	inches	29.7 / 18.9 / 18.9
Height / diameter	mm	626 / 407
	inches	24.6 / 16

24-Port Omni Antenna

Y1, Y4
Y2, Y5
Y3, Y6
P1, P3
P2, P4
O1, O2

Frequency Range

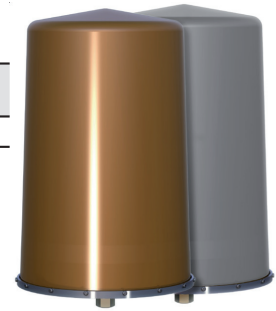
1695–2690
1695–2690
1695–2690
3400–4200
3400–4200
5150–5925

HPBW

360°
360°
360°
360°
360°
360°

24-Port Omni Antenna 12HB 0.6m 360° | 6x1695–2690 9dBi | 4x3400–4200 7dBi | 2x5150–5925 5dBi

Type No.	84010601	84010602
Radome colour	Brown	Grey



Highband		Y1, connector 1–2; Y4, connector 7–8			
		1695–2690			
Frequency range	MHz	1695 – 1850	1850 – 2220	2300 – 2360	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	7.8 ± 0.3	8.0 ± 0.1	8.5 ± 0.1	8.9 ± 0.3
Horizontal Pattern:					
Half-power beam width	°	360 (with –9 dB null, typical)	360 (with –10 dB null, typical)	360 (with –11 dB null, typical)	360 (with –14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	21 ± 1	18 ± 1	16 ± 1	14 ± 0
Electrical tilt	°	7 ± 1	6 ± 1	5 ± 1	3 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Isolation	dB	Intrasystem > 25	Intrasystem > 25	Intrasystem > 25	Intrasystem > 25
		Intersystem > 20	Intersystem > 20	Intersystem > 26	Intersystem > 25
Intermodulation	dBc	< –153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y1 & Y4 (four connectors) as one set of MIMO.

Highband		Y2, connector 3–4; Y5, connector 9–10			
		1695–2690			
Frequency range	MHz	1695 – 1850	1850 – 2220	2300 – 2360	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	7.8 ± 0.3	8.3 ± 0.2	8.9 ± 0.3	8.6 ± 0.2
Horizontal Pattern:					
Half-power beam width	°	360 (with –9 dB null, typical)	360 (with –10 dB null, typical)	360 (with –11 dB null, typical)	360 (with –14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	20 ± 1	18 ± 1	16 ± 1	14 ± 1
Electrical tilt	°	8 ± 1	7 ± 1	6 ± 1	4 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Isolation	dB	Intrasystem > 25	Intrasystem > 25	Intrasystem > 25	Intrasystem > 25
		Intersystem > 20	Intersystem > 20	Intersystem > 26	Intersystem > 25
Intermodulation	dBc	< –153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y2 & Y5 (four connectors) as one set of MIMO.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 330

84010601, 84010602

Highband		Y3, connector 5-6; Y6, connector 11-12			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2220	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	7.9 ± 0.4	8.1 ± 0.1	8.6 ± 0.4	8.3 ± 0.1
Horizontal Pattern:					
Half-power beam width	°	360 (with -9 dB null, typical)	360 (with -10 dB null, typical)	360 (with -11 dB null, typical)	360 (with -14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	20 ± 1	18 ± 1	15 ± 1	14 ± 1
Electrical tilt	°	8 ± 1	5 ± 1	5 ± 1	3 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.7
Isolation	Intrasystem Intersystem	dB	> 25 > 20	> 25 > 20	> 25 > 25
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y3 & Y6 (four connectors) as one set of MIMO.

Highband		P1, connector 13-14; P3, connector 17-18	
		3400-4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, -45	+45, -45
Gain	dBi	6.9 ± 0.2	7.0 ± 0.1
Horizontal Pattern:			
Half-power beam width	°	360 (with -15 dB null, typical)	360 (with -15 dB null, typical)
Vertical Pattern:			
Half-power beam width	°	22.5 ± 0.5	22.5 ± 1.5
Electrical tilt	°	9 ± 2	7 ± 2
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Isolation	Intrasystem Intersystem	dB	> 23 > 28
Intermodulation	dBc	N/A	N/A
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the P1 & P3 (four connectors) as one set of MIMO.

Highband		P2, connector 15-16; P4, connector 19-20	
		3400-4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, -45	+45, -45
Gain	dBi	7.0 ± 0.2	7.1 ± 0.3
Horizontal Pattern:			
Half-power beam width	°	360 (with -15 dB null, typical)	360 (with -15 dB null, typical)
Vertical Pattern:			
Half-power beam width	°	23 ± 1.5	23 ± 2
Electrical tilt	°	9 ± 2	7 ± 1
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Isolation	Intrasystem Intersystem	dB	> 23 > 28
Intermodulation	dBc	N/A	N/A
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

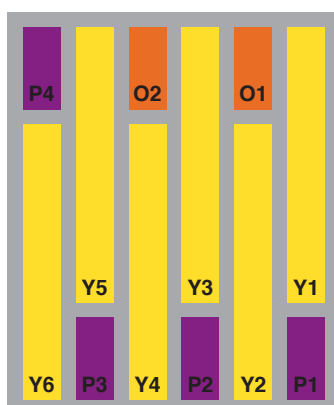
Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the P2 & P4 (four connectors) as one set of MIMO.

84010601, 84010602

Highband		O1, connector 21-22; O2, connector 23-24				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical/maximum)	dBi	4.9 / 5.9	4.8 / 5.2	5.0 / 5.6	4.9 / 5.5	4.4 / 4.9
Horizontal Pattern:						
Half-power beam width	°	360 (with -15 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	21 ± 0.5	19 ± 1	19 ± 0.5	20 ± 0.5	19 ± 1
Electrical tilt	°	0 ± 1				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 25				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.



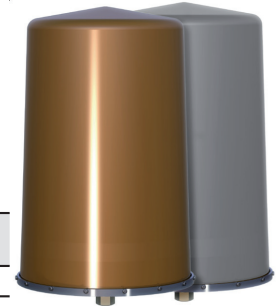
Mechanical specifications		
Input	24 x 4.3-10 connector female	
Connector position	Bottom	
Weight	kg	22.2
	lb	49.0
Wind load (at Rated Wind Speed: 150 km/h)	N	138
	lbf	32
Max. wind velocity	km/h	242
	mph	150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm	755 x 480 x 480
	inches	29.7 / 18.9 / 18.9
Height / diameter	mm	626 / 407
	inches	24.6 / 16

24-Port Omni Antenna	Y1, Y4	Y2, Y5	Y3, Y6	P1, P3	P2, P4	O1, O2
Frequency Range	1695-2690	1695-2690	1695-2690	3400-4200	3400-4200	5150-5925
HPBW	360°	360°	360°	360°	360°	360°

with GPS

24-Port Omni Antenna 12HB 0.6m 360° | 6x1695-2690 9dBi | 4x3400-4200 7dBi | 2x5150-5925 5dBi with GPS

Type No.	84010601G	84010602G
Radome colour	Brown	Grey



Highband		Y1, connector 1-2; Y4, connector 7-8			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	7.8 ± 0.3	8.0 ± 0.1	8.5 ± 0.1	8.9 ± 0.3
Horizontal Pattern:					
Half-power beam width	°	360 (with -9 dB null, typical)	360 (with -10 dB null, typical)	360 (with -11 dB null, typical)	360 (with -14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	21 ± 1	18 ± 1	16 ± 1	14 ± 0
Electrical tilt	°	7 ± 1	6 ± 1	5 ± 1	3 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Isolation	Intrasystem Intersystem	> 25 > 20	> 25 > 20	> 25 > 26	> 25 > 25
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y1 & Y4 (four connectors) as one set of MIMO.

Please note: This antenna is not RED certified for the use in Europe.

84010601G, 84010602G

Highband		Y2, connector 3-4; Y5, connector 9-10			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2220	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	7.8 ± 0.3	8.3 ± 0.2	8.9 ± 0.3	8.6 ± 0.2
Horizontal Pattern:					
Half-power beam width	°	360 (with -9 dB null, typical)	360 (with -10 dB null, typical)	360 (with -11 dB null, typical)	360 (with -14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	20 ± 1	18 ± 1	16 ± 1	14 ± 1
Electrical tilt	°	8 ± 1	7 ± 1	6 ± 1	4 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Isolation	Intrasystem Intersystem	dB	> 25 > 20	> 25 > 20	> 25 > 25
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y2 & Y5 (four connectors) as one set of MIMO.

Highband		Y3, connector 5-6; Y6, connector 11-12			
		1695-2690			
Frequency range	MHz	1695 – 1850	1850 – 2220	2300 – 2360	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	7.9 ± 0.4	8.1 ± 0.1	8.6 ± 0.4	8.3 ± 0.1
Horizontal Pattern:					
Half-power beam width	°	360 (with -9 dB null, typical)	360 (with -10 dB null, typical)	360 (with -11 dB null, typical)	360 (with -14 dB null, typical)
Vertical Pattern:					
Half-power beam width	°	20 ± 1	18 ± 1	15 ± 1	14 ± 1
Electrical tilt	°	8 ± 1	5 ± 1	5 ± 1	3 ± 1
Impedance	Ω	50			
VSWR		< 1.5	< 1.5	< 1.5	< 1.7
Isolation	Intrasystem Intersystem	dB	> 25 > 20	> 25 > 20	> 25 > 25
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the Y3 & Y6 (four connectors) as one set of MIMO.

8401061G, 84010602G

Highband		P1, connector 13–14; P3, connector 17–18	
		3400–4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, –45	+45, –45
Gain	dBi	6.9 ± 0.2	7.0 ± 0.1
Horizontal Pattern:			
Half-power beam width	°	360 (with –15 dB null, typical)	360 (with –15 dB null, typical)
Vertical Pattern:			
Half-power beam width	°	22.5 ± 0.5	22.5 ± 1.5
Electrical tilt	°	9 ± 2	7 ± 2
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Isolation	Intrasystem Intersystem	> 23 > 28	> 23 > 28
Intermodulation	dBc	N/A	N/A
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the P1 & P3 (four connectors) as one set of MIMO.

Highband		P2, connector 15–16; P4, connector 19–20	
		3400–4200	
Frequency range	MHz	3400 – 3700	3700 – 4200
Polarization	°	+45, –45	+45, –45
Gain	dBi	7.0 ± 0.2	7.1 ± 0.3
Horizontal Pattern:			
Half-power beam width	°	360 (with –15 dB null, typical)	360 (with –15 dB null, typical)
Vertical Pattern:			
Half-power beam width	°	23 ± 1.5	23 ± 2
Electrical tilt	°	9 ± 2	7 ± 1
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Isolation	Intrasystem Intersystem	> 23 > 28	> 23 > 28
Intermodulation	dBc	N/A	N/A
Max. power per input	W	100 (at 50 °C ambient temperature)	100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

To have better performance in 4X4 MIMO, Kathrein recommends that one uses the P2 & P4 (four connectors) as one set of MIMO.

8401061G, 84010602G

Highband		O1, connector 21-22; O2, connector 23-24				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical/maximum)	dBi	4.9 / 5.9	4.8 / 5.2	5.0 / 5.6	4.9 / 5.5	4.4 / 4.9
Horizontal Pattern:						
Half-power beam width	°	360 (with -15 dB null, typical)				
Vertical Pattern:						
Half-power beam width	°	21 ± 0.5	19 ± 1	19 ± 0.5	20 ± 0.5	19 ± 1
Electrical tilt	°	0 ± 1				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 25				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	50 (at 50 °C ambient temperature)				

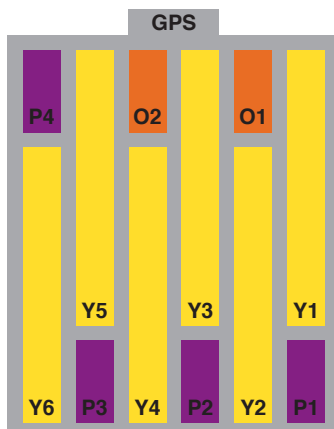
Values based on NGMN-P-BASTA (version 9.6) requirements.

Maximum power to comply with ERP restrictions for FCC Title 47 und Part 15

U-NII Band		U-NII 1	U-NII 2A	U-NII 2C	U-NII 3
Frequency	MHz	5150-5250	5250-5350	5470-5725	5725-5850
Max. input powr per radio		1	0.25	0.25	1

GPS specifications		
Frequency range	MHz	1575.42 ± 3
LNA gain	dB	29 typical
Pre-amp filtering	dB	-30 at ± 100 MHz
Polarization		Right-hand circular
H-plane beam width		Omni
E-plane half-power beam width	°	105
Connector		N female
DC power	Vdc	2.7-5.5, 6-11 mA Through N output connector
Temperature range	°C	-40 to + 85

Mechanical specifications		
Input		24 x 4.3-10 connector female
Connector position		Bottom
Weight	kg lb	22.2 49.0
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Mechanical interface		Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf-ft
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16



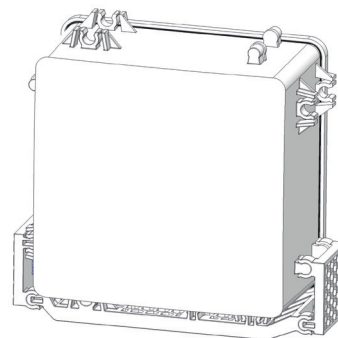
2-Port Kathrein Inside Connect Frequency Range Dual Polarization HPBW hor. Gain

Y1
1695–2690
X
75°
8dBi

KATHREIN

2-Port Kathrein Inside Connect HB 75° | 1695–2690 8dBi

Type No.	80020100	
Use Case	integration into enclosure (e. g. street furniture)	
Highband	Y1	
Frequency range	MHz	1695 – 2690
Polarization	°	+45, –45
Gain	dBi	max. 8
Horizontal Pattern:		
Half-power beam width	°	75 (±5)
Front-to-back ratio, copolar (180°±30°)	dB	typ. > 25
Cross polar ratio 0°	dB	typ. > 24
Cross polar ratio over sector ±60°	dB	> 10
Vertical Pattern:		
Half-power beam width	°	75 (±5)
Impedance	Ω	50
VSWR		< 1.9
Isolation, between ports	dB	> 25
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Max. power per input	W	40 (at 50 °C ambient temperature)
Max. power per antenna	W	40 (at 50 °C ambient temperature)



Material: Reflector: Aluminum.
Radome: PC, colour: White.

Mechanical specifications		
Input		2 x 4.3-10 female
Connector position		back
Operating temperature range	°C	-20 ... 70
Fire load	kWh	1.4
Fire protection		UL 94-V2
Height / width / depth incl. modular mounting parts	mm inches	121.5 / 124 / 74 4.8 / 4.9 / 2.9
Category of mounting hardware		see accessory parts and mounting options
Weight	kg lb	0.4 0.9
Packing size	mm inches	155 x 155 x 80 6.1 x 6.1 x 3.1
Protection class		IP 56
Scope of supply		Antenna and mounting parts: 1x 0107670, 2x 0107672
Mounting interface		Screw M6, max. screw head height: 6 mm 0.24 inches, max. screw head diameter: 13.5 mm 0.53 inches

Further mounting parts (please order separately)

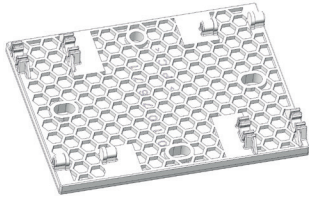
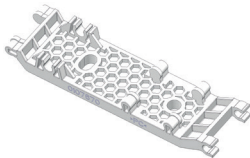
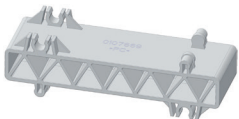
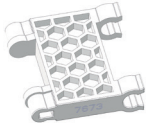
Type No.	Description
85010205	Package with mounting parts

Kathrein Inside Connect

Accessory parts 85010205 for 80020100

KATHREIN

Modular mounting parts package

Type No. of the package		85010205	
Modular mounting part	Part number	Number of pieces included	Function
	0107671	6 pcs.	Back to back installation, mounting and stabilization interface
	0107670	3 pcs.	Side by side / stacked installation, mounting and stabilization interface
	0107669	4 pcs.	High isolation spacer
	0107673	3 pcs.	Additional stabilization element

2-Port Antenna

Y1

Frequency Range

1710–2690

HPBW

65°

KATHREIN

2-Port Antenna HB 0.2m 65° | 1710–2690 9.5dBi

Type No.		80020711			
Highband		Y1			
		1710–2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	8.7	9.2	9.6	9.8
Horizontal Pattern:					
Half-power beam width	°	Approx. 67	Approx. 62	Approx. 55	Approx. 53
Front-to-back ratio, copolar (180°±30°)	dB	> 24	> 24	> 22	> 22
Cross polar ratio 0°	dB	Typically: 20	Typically: 20	Typically: 24	Typically: 24
Cross polar ratio sector corner ±60°	dB	> 10	> 9	> 8	> 8
Vertical Pattern:					
Half-power beam width	°	Approx. 66	Approx. 60	Approx. 55	Approx. 53
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 27			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. power per input	W	100 (at 50 °C ambient temperature)			
Max. power per antenna	W	150 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	2 x 4.3-10 female	
Connector position	Bottom or top	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 35 8 Maximal: 35 8
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	155 / 155 / 69 6.1 / 6.1 / 2.7
Category of mounting hardware	L (Light)	
Weight	kg lb	1.5 (tension bands incl.) 3.3 (tension bands incl.)
Packing size	mm inches	257 x 172 x 92 10.1 x 6.8 x 3.6
Scope of Supply	Panel and 1 unit of tension bands for 45–125 mm 1.8–4.9 inches diameter	

2-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

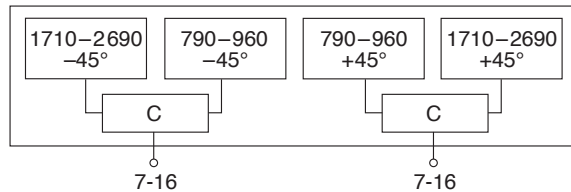
790-960 **1710-2690**

HPBW

65° **65°**

2-Port Antenna LB/HB 0.3m C 65° | 790-960 8dBi | 1710-2690 9dBi

Type No.		80010753						
		R1			Y1			
		790-960			1710-2690			
Frequency range	MHz	790 - 862	824 - 894	880 - 960	1710 - 1990	1920 - 2200	2200 - 2490	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	2 x 7.8	2 x 8.0	2 x 8.5	2 x 7.8	2 x 8.9	2 x 8.7	2 x 8.2
Horizontal Pattern:								
Half-power beam width	°	67			65	55	60	62
Front-to-back ratio	dB	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25
Cross polar ratio	dB	Typically: 15	Typically: 18	Typically: 20	Typically: 25	Typically: 25	Typically: 25	Typically: 25
Maindirection	0°	> 8	> 8	> 8	> 10	> 10	> 10	> 10
Sector	±60°							
Vertical Pattern:								
Half-power beam width	°	65			75	60	60	65
Impedance	Ω	50						
VSWR		< 1.5						
Isolation: Intrasystem	dB	> 30			> 30		> 27	> 25
Intermodulation IM3	dBc	< -150 dBc (2 x 43 dBm carrier)						
Max. effective power per port	W	200 (at 50 °C ambient temperature)			100 (at 50 °C ambient temperature)			
Max. effective power for the antenna	W	300 (at 50 °C ambient temperature)						



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 100 22 Maximal: 110 25
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	334 / 260 / 136 13.1 / 10.2 / 5.4
Category of mounting hardware	L (Light)	
Weight	kg lb	2.8 (tension bands incl.) 6.2 (tension bands incl.)
Packing size	mm inches	495 x 272 x 157 19.5 x 10.7 x 6.2
Scope of Supply	Panel and 1 unit of tension bands for 45-125 mm 1.8-4.9 inches diameter	

Small Cell

10-Port Antenna

Y1
Y2
P1
P2
O1

Frequency Range

1695-2690
1695-2690
3550-3700
3550-3700
5150-5925

HPBW

65°
65°
65°
65°
65°

10-Port Antenna 5HB 0.6m 65° | 2x1695-2690 14dBi | 2x3550-3700 11dBi | 5150-5925 5dBi



FlexRET

Type No.		84010564			
Highband		Y1, connector 1-2; Y2, connector 3-4			
		1695-2690			
Frequency range	MHz	1695 - 1850	1850 - 2220	2300 - 2360	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	13.1 ±0.4	14 ±0.4	14.2 ±0.8	14.6 ±0.8
Horizontal Pattern:					
Half-power beam width	°	73 ±2	61 ±2	53 ±2	48±2
Front-to-back ratio, total power, ± 30°	dB	24	26	29	27
Cross polar discrimination at Boresight (Typ)	dB	21	21.5	24.5	19
Vertical Pattern:					
Half-power beam width	°	18 ±1	17 ±1	16 ±2	15 ±2
Electrical tilt	°	3 - 15, continuously adjustable			
First upper sidelobe suppression	dB	16	21	20	20
Impedance	Ω	50 Ω			
VSWR		< 1.5	< 1.5	< 1.5	< 1.7
Isolation	Intrasystem Intersystem	dB	> 23 > 28	> 23 > 28	> 20 > 28
Intermodulation	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Highband		P1, connector 5-6; P2, connector 7-8	
		3550-3700	
Frequency range	MHz	3550 - 3700	
Polarization	°	+45, -45	
Gain	dBi	11 ±0.5	
Horizontal Pattern:			
Half-power beam width	°	65 ±7	
Vertical Pattern:			
Half-power beam width	°	27 ±2	
Electrical tilt	°	5.5 ±0.5, fixed	
Impedance	Ω	50 Ω	
VSWR		< 1.5	
Isolation	Intrasystem Intersystem	dB	> 25 > 28
Intermodulation	dBc	N/A	
Max. power per input	W	100 (at 50 °C ambient temperature)	

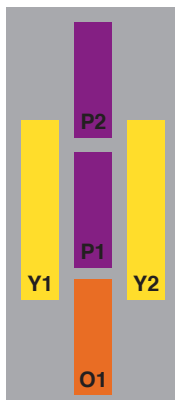
Values based on NGMN-P-BASTA (version 9.6) requirements.

84010564

Highband		O1, connector 9-10				
		5150-5925				
Frequency range	MHz	5150 – 5350	5350 – 5470	5470 – 5725	5725 – 5850	5850 – 5925
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain (typical/maximum)	dBi	5.3 / 5.84	5.0 / 5.31	5.3 / 5.81	5.3 / 5.81	5 / 5.48
Horizontal Pattern:						
Half-power beam width	°	45 ±7				
Vertical Pattern:						
Half-power beam width	°	32 ±4	35 ±4	30 ±2	21 ±2	23 ±2
Electrical tilt	°	12 ±6, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem	> 30				
	Intersystem					
Intermodulation	dBc	N/A				
Max. power per input	W	2 (at 50 °C ambient temperature)				
Max. input power per radio*	W	1	-	-	-	-

Values based on NGMN-P-BASTA (version 9.6) requirements.

* To comply with EIRP restrictions for FCC Title 47 part 15 for fixed outdoor point to multi-point applications



Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 835 188 Maximal: 840 189
Max. Wind Velocity	km/h mph	242 150
Height / Width / Depth	mm inches	610 / 378 / 169 24.0 / 14.9 / 6.7
Category of Mounting Hardware	XM (X-Medium)	
Weight	kg lb	12.7 28.0
Packing Size	mm inches	813 / 397 / 212 32.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Micro Cell Antenna 1695-2690 1695-2690

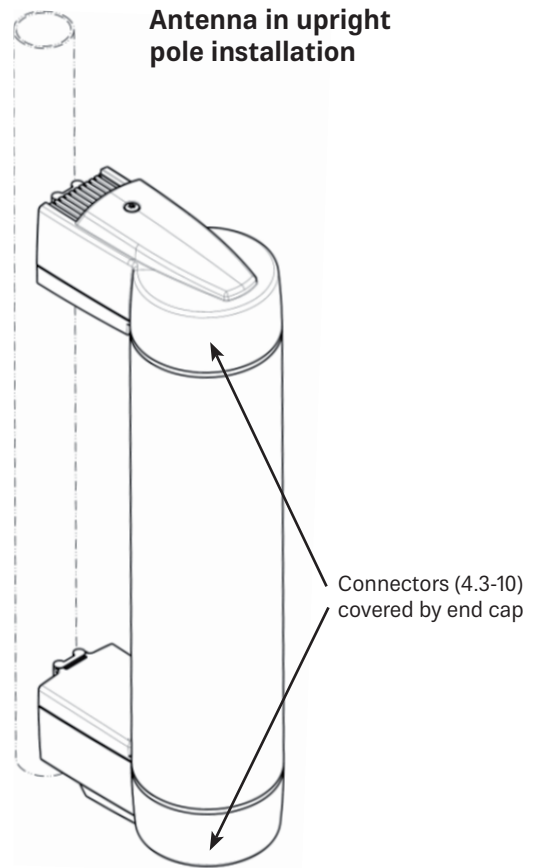
Dual Polarization X X

HPBW 85° 85°

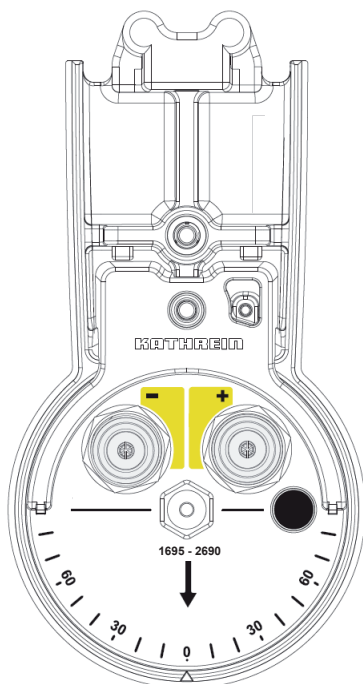
KATHREIN

4-Port Micro Cell Antenna 2HB 0.5m 85° | 2x1695-2690 7.5dBi

Type No.		80010843
Use case		Flexible Indoor Coverage Flexible Street Level Micro Cell Coverage Not for Macro Site Installation Pole and wall mounting
Electrical data		Per sector
		1695-2690
Frequency range	MHz	1695 – 2690
Polarization	°	+45, -45
Gain	dBi	7.5
Horizontal Pattern:		
Half-power beam width	°	85
Cross polar ratio	0° 60° dB	≥ 18 typ. ≥ 8 typ.
Vertical Pattern:		
Half-power beam width	°	80
Electrical tilt (upright installation)	°	0, fixed
Impedance	Ω	50 Ω
VSWR		1695-1710 MHz: < 1.6 1710-2200 MHz: < 1.5 2200-2690 MHz: < 1.6
Isolation, between all ports	dB	≥ 25 (Intra- / Intersystem)
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)
Max. power per input	W	50 (at 50 °C ambient temperature)



Top view / connector view



Mechanical specifications		
Input		4 x 4.3-10 female (2 x top, 2 x bottom, covered by end cap)
Adjustment mechanism		Two continuously rotatable antenna modules (radiator and reflector) within the radome (set by hand)
Tilt adjustment mechanism (installation at right angle)		Set by hand Continuously for each sector (0° ... 360°)
Azimuth adjustment mechanism (upright installation)		Set by hand Continuously for each sector (0° ... 360°)
IP Protection class		IP65
Wind load (at 150 km/h)	N lbf	25 5.6
Max. wind velocity	km/h mph	160 99.4
Feeder cables		Max. ¼" High Flex (bending radius ≤ 25 mm ≤ 1.0 inches) push pull and handscrew type, angular connector required
Allowed diameter of mounting pole	mm inches	≥ 40 ≥ 1.6
Max. distance wall/pole when mounted	mm inches	190 7.5
Height / diameter	mm inches	526 / 100 20.7 / 3.9
Category of mounting hardware		L (Light)
Weight	kg lb	2.0 4.4
Packing size	mm inches	547 / 242 / 174 21.5 / 9.5 / 6.9

Tri-Sector Slimpole Antenna

0°

120°

240°

KATHREIN

Frequency Range

1710-2690

1710-2690

1710-2690

Dual Polarization

X

X

X

HPBW

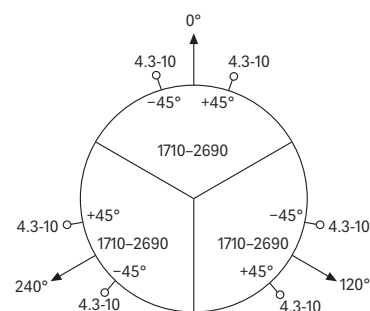
80°

80°

80°

6-Port Tri-Sector Slimpole HB 0.7m 80° | 1710-2690 10dBi

Type No.		80020125				Electrical datas per sector
		1710-2690				
Frequency range	MHz	1710 - 1990	1920 - 2170	2170 - 2490	2490 - 2690	
Polarization		+45, -45	+45, -45	+45, -45	+45, -45	
Gain	dBi	2 x 9.5	2 x 10	2 x 10.5	2 x 11	
Horizontal Pattern:						
Half-power beam width	°	80	78	75	73	
Front-to-back ratio, copolar	dB	> 30	> 28	> 28	> 27	
Cross polar ratio	dB	Typically: 20	Typically: 20	Typically: 20	Typically: 20	
Main direction	0°	> 10	> 10	> 10	> 10	
Sector	±60°					
Vertical Pattern:						
Half-power beam width	°	44	42	35	31	
Electrical tilt	°	0, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation, between ports	dB	> 25				
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)				
Max. power per input	W	100 (at 50 °C ambient temperature)				



Mechanical specifications		
Input	6 x 4.3-10 female	
Connector position	Bottom	
Weight	kg lb	2.3 5.1
Wind load (at 150 km/h)	N lbf	50 11.2
Max. wind velocity	km/h mph	200 124
Mechanical interface	Flange connection 8 x M6 at a graduated diameter of 136 mm 5.4 inches. Evenness of the opposite surface: 0.5 mm 0.02 inches	
Packing size	mm inches	742 x 220 x 219 29.2 x 8.7 x 8.6
Height / diameter	mm inches	691 / 100 27.2 / 3.9

Small Cell

Street Connect 2-Port Antenna Frequency Range Dual Polarization HPBW

Y1

1695-2690

WV

360°

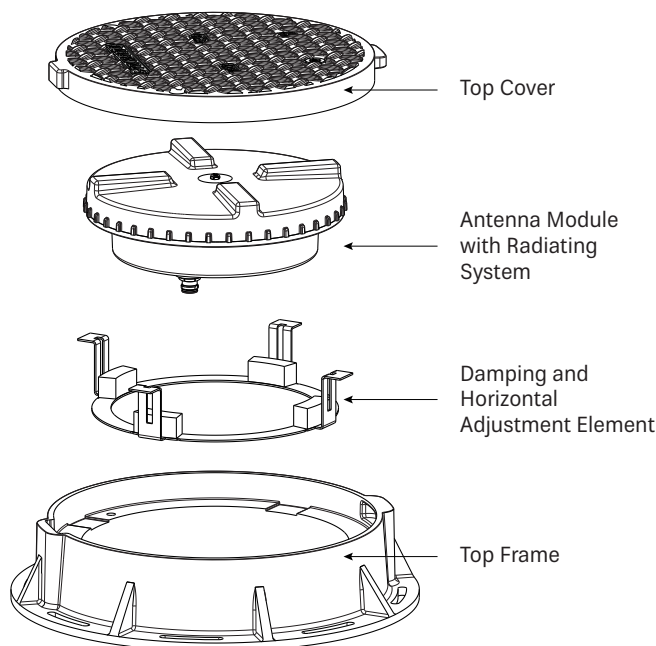
KATHREIN

2-Port Street Connect HB 360° | 1695-2690 6dBi

Type No.		80010235				
Use Case		In-Ground Installation, High traffic urban areas				
High band		Y1, connector 1-2				
		1695 - 2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2200	2300 - 2490	2490 - 2690
Max. Gain (Free Space)	dBi	7.3	7.4	7.3	5.7	7.1
Horizontal Pattern		Quasi Omni Max. Deviation from Circularity ±6 dB	Quasi Omni Max. Deviation from Circularity ±6 dB	Quasi Omni Max. Deviation from Circularity ±5 dB	Quasi Omni Max. Deviation from Circularity ±5 dB	Quasi Omni Max. Deviation from Circularity ±6 dB
Vertical Pattern		Four main lobes above ground level	Four main lobes above ground level	Six main lobes above ground level	Four main lobes above ground level	Four main lobes above ground level
Isolation (Port 1 // Port 2)	dB	1695-2300 MHz: > 20 2300-2690 MHz: > 25				
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)				

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.7
Return Loss	dB	> 11.7
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization		Dual Vertical
Max. Effective Power for the Antenna	W	40 (at 50 °C ambient temperature)

Mechanical specifications		
Input	2 x 4.3-10 female	
Connector Position	Bottom	
Adjustment Mechanism	Set by hand, 9° steps	
Feeder Cables	Push Pull type connector	
Top Cover	mm	375 / 32
Diameter / Height	inches	14.8 / 1.3
Top Frame Outer / Inner Diameter / Height	mm	480 / 315 / 100
	inches	18.9 / 12.4 / 3.9
Antenna Modul	mm	310 / 136
Diameter / Height	inches	12.2 / 5.4
Weight	kg	3.2
Antenna Module	lb	7.1
Weight	kg	13.6
Complete System	lb	30.0
IP Protection Class	IP 68 (with appropriate feeder cable connector)	
Max. Load Top Cover	kN	50 (without permanent deformation, according EN 124 - Class D400)



Mounting:

Follow the installation guidelines for Polieco Kio D400 / EN 124 top cover and frame. Feeder cable to be installed strain-relieved. Maximum force 5 N per cable. Avoid mounting locations where obstructions may have impact on the antenna performance, e.g. parking cars. Recommended tightening torque for the cover screws (2x): 50 Nm.

Attention: Please follow the mounting and instruction guidelines carefully. Liability cannot be assumed for damages as a result of unsatisfactory fitting and installation, improper putting into service, incorrect operation and maintenance, as well as any alterations or modifications carried out by the operator and accessory parts by the customer.

Remark:

All electrical values are stated for the complete system with top frame and cover.

Summary – Directional Antennas

VPol

690...2690 MHz

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page				
Vertical Polarization								
1-Port LogPer	690–2690	67°	11dBi	0°T	742192v02	300	7-16, bottom	268
1-Port Antenna	1710–2180	12°	18.5dBi	0°T	80010368	299	7-16, side	269
1-Port BiDir	694–960/1710–2690	65°	5dBi	0°T	80020448	428	4.3-10, bottom	270
1-Port Yagi	790–960	C 38°	14dBi	0°T	80010828v01	170	7-16, rearside	271
	1710–2170	28°	15.5dBi	0°T				

1-Port LogPer Antenna Vertical Polarization Half-power Beam Width

690-2690

V

67°

KATHREIN

1-Port LogPer Antenna 690-2690 67° 11dBi

Type No.		742192v02					
Frequency range	MHz	690 – 880	880 – 960	960 – 1695	1695 – 2200	2200 – 2490	2490 – 2690
VSWR		< 1.6	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Gain	dBi	10.1	10.6	11.0	11.0	11.0	11.0
Impedance	Ω	50	50	50	50	50	50
Polarization		Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Front-to-back ratio	db	> 25	> 25	> 25	> 25	> 22	> 25
Half-power beam width	°	horizontal	64	57	53	47	45
		vertical	54	53	50	48	46
Intermodulation IM3 (2 x 43 dBm carrier)	dBc	< -150	< -150	< -150	< -150	< -150	< -150
Max. power	W	300	300	250	200	170	150
Total power	W	500 (at 50 °C ambient temperature)					



Mechanical specifications			
Input	1 x 7-16 female		
Connector position	Bottom		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal	20 4
		Lateral	210 47
		Rearside	30 7
Max. wind velocity	km/h mph	241 150	
Height / width / depth	mm inches	300 / 155 / 785 11.8 / 6.1 / 30.9	
Weight	kg lb	5.5 12.1	
Packing size	mm inches	360 x 175 x 1000 14.2 x 6.9 x 39.4	

1-Port Antenna Vertical Polarization HPBW

1710-2180

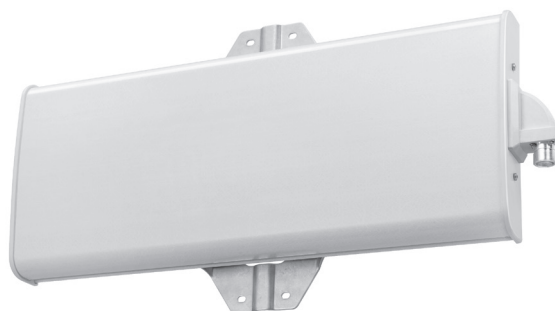
V

12°

KATHREIN

1-Port Antenna HB 0.3m 12° | 1710-2180 18.5dBi

Type No.		80010368		
		1710-2180		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Polarization		Vertical	Vertical	Vertical
Gain	dBi	18.1	18.4	18.7
Horizontal Pattern:				
Half-power beam width	°	13.3	12.8	12
Front-to-back ratio (180°±30°)	dB	> 30	> 30	> 30
Sidelobe suppression	dB	> 18	> 18	> 17
Vertical Pattern:				
Half-power beam width	°	37	36	36
Electrical tilt	°	0, fixed		
Sidelobe suppression for first sidelobe above main beam	dB	> 18	> 18	> 18
Impedance	Ω	50		
VSWR		< 1.5		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	300 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	1 x 7-16 female		
Connector position	Side (see picture)		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 250	56
		Maximal: 275	62
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	299 / 743 / 69 11.8 / 29.3 / 2.7	
Weight	kg lb	9 19.8	
Packing size	mm inches	442 x 852 x 124 17.4 x 33.5 x 4.9	

1-Port BiDir Antenna Vertical Polarization HPBW

694-960/1710-2690

V

65°

KATHREIN

1-Port Bi-Directional Antenna LB/HB 0.4m 65° | 694-960/1710-2690 5dBi

Type No.		80020448	
Input		1 x 4.3-10 female	
Frequency range	MHz	694 - 960, 1710 - 2690	
VSWR		694-960 MHz:	< 2.0
		1710-2690 MHz:	< 1.7
Gain	dBi	694-806 MHz:	5.0
		806-960 MHz:	5.5
		171-2690 MHz:	6.5
Impedance	Ω	50	
Polarization		Vertical	
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)	
Max. power (total)	W	200 (at 50 °C ambient temperature)	
Weight	kg lb	1.1 2.4	
Wind load (at 150 km/h)	N lbf	Frontal:	30 6.7
		Lateral:	70 15.7
		Rearside:	35 7.9
Max. wind velocity	km/h mph	200 124	
Packing size	mm inches	450 x 205 x 110 17.7 x 8.1 x 4.3	
Height/width/depth	mm inches	428 / 180 / 79 16.9 / 7.1 / 3.1	
Fire load	kWh	4.46	



Material:	Radiator: Tin-plated copper. Reflector: Weather-proof aluminum. Radome: High impact plastic, color: Grey. All screws and nuts: Stainless steel.
Mounting:	Wall mounting: No additional mounting kit needed. For pipe mast mounting use clamps listed below (order separately).
Ice protection:	The radiating system is protected by the radome. Due to its very sturdy construction, the antenna remains operational even under icy conditions.
Grounding:	All metal parts of the antenna as well as the inner conductor are DC grounded.

**1-Port Yagi Antenna
Dual Polarization
HPBW
Gain
Integrated Combiner**

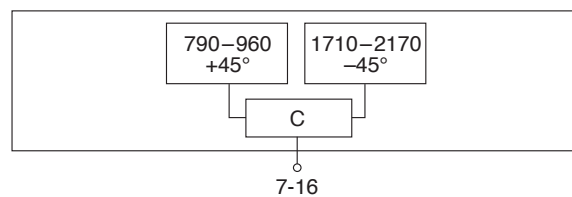
790-960	1710-2170
+45°	-45°
38°	28°
14dBi	15.5dBi
C	

KATHREIN

1-Port Yagi Antenna LB/HB 1.1m C 38°/28° | /790-960 14dBi | /1710-2170 15.5dBi

Type No.		80010828v01			
		790-960		1710-2170	
Frequency range	MHz	790 – 870	870 – 960	1710 – 1880	1920 – 2170
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Gain (average)	dBi	13	14	13	15.5
Impedance	Ω	50	50	50	50
Polarization	°	+45	+45	-45	-45
Front-to-back ratio	dB	≥ 25	≥ 25	≥ 27	≥ 27
Half-power beam width (avg.)	°	38	32	28	22
		horizontal	38	32	28
Max. power	W	85 (at 50 °C ambient temperature)		15 (at 50 °C ambient temperature)	
Integrated combiner		The insertion loss is included in the given antenna gain values.			

Please note: This antenna is suitable for tunnel applications.



Mechanical specifications		
Input		1 x 7-16 female
Connector position		Rearside
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	200 45
Max. wind velocity	km/h mph	215 134
Dimensions	mm inches	1184 / ∅ 170 46.6 / ∅ 6.7
Weight	kg lb	6 / 10 (clamps incl.) 13.2 / 22.0 (clamps incl.)
Packing size	mm inches	1350 x 260 x 220 53.1 x 10.2 x 8.7

VPOI

Summary – Omnidirectional Antennas

VPol

694...2700 MHz

KATHREIN

Type	Type No.	Connector female	Height [mm]	Remarks	Page			
Lowband								
1-Port Omni	806–894	360°	11dBi 0°T	K738192	7-16	3237		274
1-Port Omni	870–960	360°	11dBi 0°T	736347	7-16	3033		275
Lowband Highband								
1-Port Omni	694–960/1695–2700	360°	2dBi 0°T	80010846	N	202	indoor/outdoor	276
Highband								
1-Port Omni	1695–2700	360°	2dBi 0°T	80010431	N	115	indoor/outdoor	277

1-Port Omni Antenna Vertical Polarization

806-894

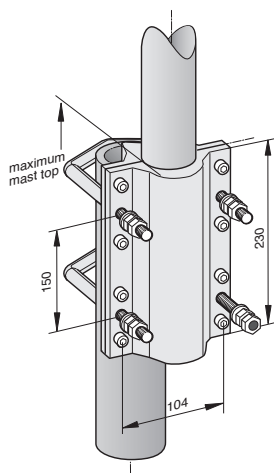
V

KATHREIN

1-Port Omni Antenna LB 3.2m 360° | 806-894 11dB*i*

Type No.		K738192
Frequency range	MHz	806 - 894
Polarization		Vertical
Gain	dBi	11
Impedance	Ω	50
VSWR		< 1.5
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Max. power	W	500 (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50-94 mm | 2.0-3.7 inches diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
- Material:** Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.
- Grounding** All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded. The inner conductor is capacitively coupled.
- Lightning protection:** The antenna is designed to withstand a lightning current of up to 150 kA (impulse: 10/350 μ s), according to IEC 62305 parts 1-4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm² copper.



Mechanical specifications

Input		7-16 female
Connector position		Bottom
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	230 52
Max. wind velocity	km/h	180
	mph	112
Height	mm	3237
	inches	127.4
Radome diameter	mm	51
	inches	2.0
Weight	kg	8.5
	lb	18.7
Packing size	mm	3516 x 148 x 112
	inches	138.4 x 5.8 x 4.4

1-Port Omni Antenna Vertical Polarization

870-960

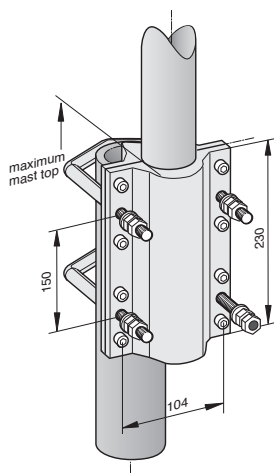
V

KATHREIN

1-Port Omni Antenna LB 3.0m 360° | 870-960 11dBi

Type No.		736347
Frequency range	MHz	870 – 960 MHz
Polarization		Vertical
Gain	dBi	11 dBi
Impedance	Ω	50
VSWR		< 1.5
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Max. power	W	500 (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50-94 mm | 2.0-3.7 inches diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
- Material:** Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.
- Anti-static protection:** All metal parts of the antenna as well as the supplied clamp attachment are grounded. The inner conductor is capacitively coupled.
- Lightning protection:** The antenna is designed to withstand a lightning current of up to 150 kA (impulse: 10/350 μ s), according to IEC 62305 parts 1-4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm² copper.



Mechanical specifications

Input		7-16 female
Connector position		Bottom
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	210 47
Max. wind velocity	km/h	200
	mph	124
Height	mm	3033
	inches	119.4
Radome diameter	mm	51
	inches	2.0
Weight	kg	8.0
	lb	17.6
Packing size	mm	3316 x 148 x 112
	inches	130.6 x 5.8 x 4.4

1-Port Omni Antenna Vertical Polarization Indoor and outdoor use

694-960/1695-2700

V

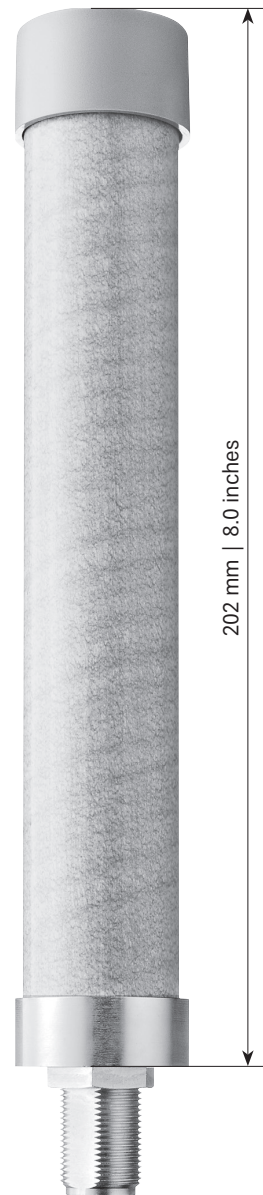
KATHREIN

1-Port Omni Antenna LB/HB 0.2m 360° | 694-960/1695-2700 2dBi

Type No.	80010846			
Input	1 x N female			
Connector position	Bottom or top			
Frequency range	MHz	694 - 960 / 1695 - 2700		
VSWR	MHz	694 - 864 < 2.0	864 - 894 < 2.2	894 - 960 < 2.5
				1695 - 2700 < 2.0
Gain	dBi	2		
Impedance	Ω	50		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Polarization		Vertical		
Max. power	W	50 (at 50 °C ambient temperature)		
Weight	g lb	210 0.46		
Wind load (at 150 km/h)	N lbf	6 1.3		
Radome diameter	mm inches	30 1.2		
Height	mm inches	202 8.0		
Fire load	kWh	0.2		

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm | 0.6 inches diameter) to surfaces of max. 10 mm | 0.4 inches thickness.



1-Port Omni Antenna Vertical Polarization Indoor and outdoor use

1695-2700

V

KATHREIN

1-Port Omni Antenna HB 0.1m 360° | 1695-2700 2dBi

Type No.	80010431	
Input	1 x N female	
Connector position	Bottom or top	
Frequency range	MHz	1695 - 2700
VSWR	< 1.8	
Gain	dBi	2
Impedance	Ω	50
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Polarization	Vertical	
Max. power	W	50 (at 50 °C ambient temperature)
Weight	g	150
	lb	0.33
Radome diameter	mm	20
	inches	0.8
Height	mm	115
	inches	4.5
Fire load	kWh	0.07

- Material:** Radiator: Brass.
Radome: Fiberglass, color: White.
- Mounting:** One hole mounting (16 mm | 0.6 inches diameter) to surfaces of max. 10 mm | 0.4 inches thickness.
- Grounding:** All metal parts of the antenna and the mounting kit are DC grounded. The inner conductor is not DC grounded.



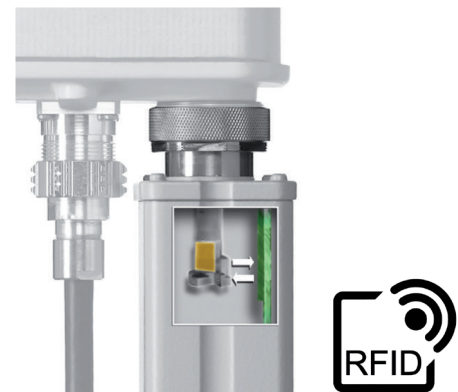
Type		Type No.	Page
Remote Electrical Tilt System			
General Information			280
Data Sheets of RET Components			
Slimline Remote Control Unit (RCU)		86010148v01	282
FlexRET Module		86010153v01	283
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New or changed product

Functionality of Different RET Technologies

RCU with RFID Feature

- External RCU 86010148v01 includes a RFID reader
- Antenna spindles are equipped with RFID tags
- The antenna specific data is stored on this tag:
 - ⇒ Type number
 - ⇒ Serial number
 - ⇒ Configuration File
- With power on, the data is read out automatically from the tag by the RCU
- List of all updated antennas on our website: www.kathrein.com/en/support/technical-documents/rfid-spindle/



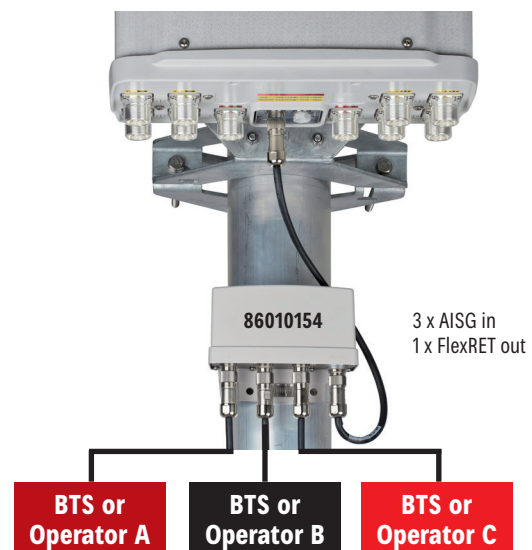
FlexRET

- Integrated RET module inside the antenna (86010153v01 or 86010165)
- Pre-configured with the antenna specific parameters:
 - ⇒ Type number
 - ⇒ Serial number
 - ⇒ Configuration file
- Calibrated ex-factory
- The FlexRET module is exchangeable
 - ⇒ Automatic data transfer in case of exchange with internal RFID tag
 - ⇒ Only calibration is necessary
- Daisy chain possibility with FlexRET antennas and / or external RCUs
- Same module for all antennas
- SingleRET or MultiRET selection possible
- Array allocation possible with special Site Sharing Adapter or Gender Adapter / Port Extender



Site Sharing Adapter

- Needed whenever the AISG control of a FlexRET antenna shall be performed by a higher number of base stations (BTS)
- 2 different realizations available
 - ⇒ 3-way Site Sharing Adapter: Type no. 86010154 – FlexRET control with up to 3 BTS
 - ⇒ 6-way Site Sharing Adapter: Type no. 86010155 – FlexRET control with up to 6 BTS
- Daisy chaining of up to 3 FlexRET antennas
- Additional ALDs can be mounted prior to the Site Sharing Adapter
- Flexible allocation of antenna arrays to the different BTS units using a special software application via PC
- Each BTS can act independently
- Individual password protection of configuration possible
- Configuration can be sent to the Site Sharing Adapter with every AISG control device (BTS or e.g. Kathrein ALC)



Functionality of Different RET Technologies

Gender Adapter (86010162)

- Can be used if 2 base stations (BTS) are interconnected to one common FlexRET antenna
- Mounted on the FlexRET output of the module
- Converts the AISG output to an AISG input
- The allocation of the antenna arrays can easily be performed during the commissioning process via the BTS or flexible allocation of antenna arrays to the different BTS units using a special software application via PC



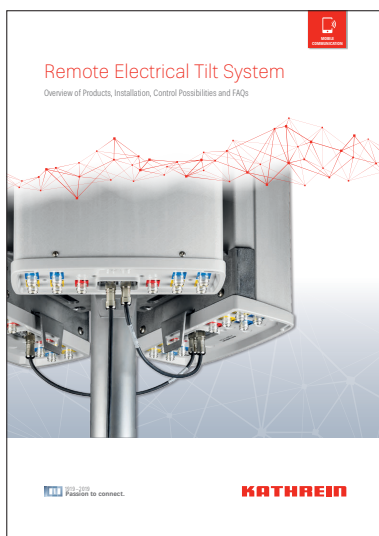
Port Extender (86010163)

- Can be used if 2 BTS are interconnected to common FlexRET antennas in daisy chain
- Mounted on the FlexRET module by 2 screws
- Converts 1 FlexRET input and output to 2 FlexRET inputs and outputs
- Daisy chaining with further FlexRET antennas and / or external RCUs
- The allocation of the antenna arrays can easily be performed during the commissioning process via the BTS or flexible allocation of antenna arrays to the different BTS units using a special software application via PC



Manuals for all our AISG control devices and for the Site Sharing Adapter as well as the corresponding software downloads can be found on our website in the section Support "Technical Documents" respectively "Driver and Software".

For details of the RET system please also see Kathrein's RET brochure.



Kathrein Mobile Communication's overall RET system works in accordance with the AISG (Antenna Interface Standards Group) standard and 3GPP (3rd Generation Partnership Project).

Remote Control Unit (RCU) for Kathrein base station antennas with adjustable electrical down-tilt and appropriate mechanical interface.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Compact size
- Prepared for automatic configuration and calibration
- Daisy Chain feasibility
- Suitable for operation under outdoor conditions



Type No.		86010148v01
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory ¹⁾		3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 1, pin 6)
Power consumption	W	< 1 (stand by); < 10 (motor activated)
Connectors ^{2) 3)}		2 x 8 pin connector according to IEC 60130-9; according to AISG Daisy chain in: male; Daisy chain out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	sec	40 (typically, depending on antenna type)
Adjustment cycles		> 50,000
Temperature range	°C	-40 ... +60
Protection class		IP 24
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)
Housing material		Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	kg lbs	0.5 0.99
Packing size	mm inches	245 x 93 x 102 9.6 x 3.6 x 4
Dimensions (H x W x D)	mm inches	177.5 x 59.5 x 49.5 7.0 x 2.3 x 1.9



¹⁾ The protocol of the logical interface can be switched from 3GPP/AISG 2.0 AISG 1.1 to with a vendor specific command. Start-up operation of the RCU is only possible in a RET system supporting 3GPP/AISG 2.0!

The protocol can also be changed as follows: 3GPP to AISG 1.1: Enter "AISG1" into the additional data field "Installer's ID" and perform a layer 2 reset or a power reset. AISG 1.1 to 3 GPP: Enter "3GPP" into the additional data field "Installer's ID" and perform a layer 7 reset or a power reset. After switching the protocol any other information can be entered into the "Installer's ID" field.

Please note:

If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the RCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

²⁾ The tightening torque for fixing the connector must be 1.0–1.5 Nm. The connector should be tightened by hand or using the torque screwdriver (85010080) as described in the connecting cable data sheet (85010007, ...)

³⁾ The RCU gets the information stored in the antenna after power on automatically if a corresponding antenna is used. In this case, it is not necessary to configure the RCU manually.

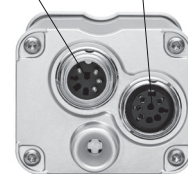
- Standards:
- EN 60950-1 (Safety)
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission)
 - EN 55024 (Immunity)
 - ETS 300019-1-4 (Environmental)
 - UL 60950-1; 1st edition

EU-RED Hereby, Kathrein SE declares that the radio equipment type 86010148v01 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.kathrein.com>

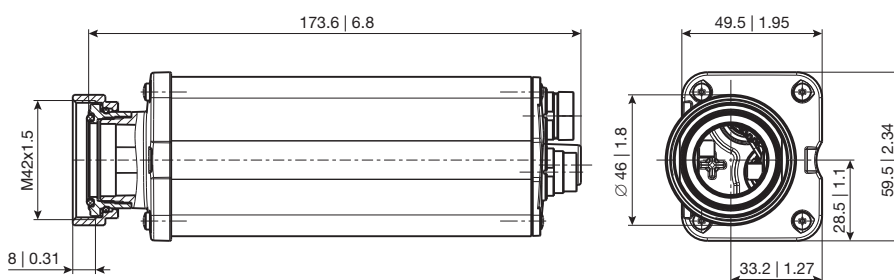
Certification: CE, FCC

Scope of supply: Remote Control Unit, Assembly paste

Daisy chain in (male) Daisy chain out (female)



Bottom view of RCU



All dimensions in mm | inches

A flexible, integrated solution for adjusting the electrical downtilt of Kathrein FlexRET antennas.

- Compliant to 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Two way antenna sharing feasibility
- Daisy Chain feasibility
- Pre-configured



Type No.		86010153v01
Protocols		compliant to 3GPP/AISG 2.0
Logical interface ex factory		3GPP/AISG 2.0
Operates as		Single RETs or Multi RET
Ex factory		Single RETs
Input voltage range	V	10 ... 30 (pin 6)
Power consumption	W	Typically < 1; < 10 (motor activated)
Connectors		2 x 8 pin connector according to IEC 60130-9; according to AISG-C 485 Daisy chain in: male; Daisy chain out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	sec	40 (typically, depending on antenna type)
Adjustment cycles		> 50,000
Temperature range	°C	-40 ... +60
Protection class		IP 24 (installed)
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Housing material		Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	g lb	350 0.77
Packing size (H x W x D)	mm inches	245 x 93 x 102 9.6 x 3.6 x 4
Dimensions (H x W x D)	mm inches	142 x 71 x 51 5.6 x 2.8 x 2



Please note:

If the Primary which controls the FlexRET system does not support the default ex-factory interface setting, then the FlexRET must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

If the FlexRET of an antenna has to be replaced, the FlexRET gets the information stored in the antenna after power on automatically. It is not necessary to configure the FlexRET manually.

- Standards:
- EN 60950-1 (Safety)
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission)
 - EN 55024 (Immunity)
 - ETS 300019-1-4 (Environmental)
 - UL 60950-1; 1st edition

EU-RED: Hereby, KATHREIN SE declares that the radio equipment type 86010153v01 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.kathrein.com>

Certification: CE, FCC

Scope of supply: FlexRET

Optional: **Site Sharing Adapter** (86010154 or 86010155) to create independent logical interfaces at one antenna or site. Makes it possible to operate with more than one independent Node B.

Gender Adapter (86010162) to convert the AISG out (female) to an AISG in (male) port in order to operate one FlexRet with exactly 2 BTS.
Detailed information is given in the data sheet of the Gender Adapter.

Port Extender (86010163) to convert the existing AISG input and output in order to operate FlexRet with exactly 2 BTS while maintaining the daisy chain capability.
Detailed information is given in the data sheet of the Port Extender.

Please note:

In general, the addressing of the FlexRET is automatically performed. Only in case the FlexRET is manually addressed, the serial number has to be extended by the corresponding colour coding extension (e.g. CSG351234-R1). The respective information can be found on the site documentation which is included in the scope of supply.

All FlexRET antennas are equipped with this module. The module does not need to be ordered separately.

RET

A flexible, integrated solution for adjusting the electrical downtilt of Kathrein FlexRET antennas.

- Compliant to 3GPP / AISG 2.0 – AISG 3 ready
- Single RETs or Multi RET displayed
- Individual user-specific configuration possible:
 - Antenna sharing-assignment of certain RET-submits to RET-ports
 - Antenna tilt consolidations for RET control of several arrays by one RET-submit
- Daisy Chain feasibility
- Pre-configured



Type No.		86010165
Protocols		compliant to 3GPP / AISG 2.0 – AISG 3 ready
Logical interface ex factory		3GPP / AISG 2.0
Operates as		Single RETs or Multi RET
Ex factory		Single RETs
Input voltage range	V	10 ... 30 (pin 6)
Power consumption	W	Typically < 1; < 10 (motor activated)
Connectors		2 x 8 pin connector according to IEC 60130-9; according to AISG-C 485 Daisy chain in: male; Daisy chain out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	sec	40 (typically, depending on antenna type)
Adjustment cycles		> 50,000
Temperature range	°C	-40 ... +60
Protection class		IP 24 (installed)
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Housing material		Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	g lb	350 0.77
Packing size (H x W x D)	mm inches	245 x 93 x 102 9.6 x 3.6 x 4
Dimensions (H x W x D)	mm inches	142 x 71 x 51 5.6 x 2.8 x 2



This device is not compatible to antennas with FlexRET 86010153 or 86010153v01. These FlexRET devices can not be replaced by 86010165.

Non-observance can damage the antenna and the RET device.

Please note:

If the Primary which controls the FlexRET system does not support the default ex-factory interface setting, then the FlexRET must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

The FlexRET needs to be powered by a LPS (Limited Power Source, Class: P2) according to IEC/EN 62368-1.

If the FlexRET of an antenna has to be replaced, the FlexRET gets the information stored in the antenna after power on automatically. It is not necessary to configure the FlexRET manually.

- Standards:
- EN 62368-1 (Safety)
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - ETSI EN 301489-1 (EMI)
 - ETSI EN 301489-3 (EMI)
 - ETS 300019-1-4 (Environmental)
 - ETSI EN 300330 (Radio equipment)
 - EN 50364 (Health)

EU-RED: Hereby, KATHREIN SE declares that the radio equipment type 86010165 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.kathrein.com>

Certification: CE, FCC

Scope of supply: FlexRET

Optional: **Site Sharing Adapter** (86010154 or 86010155) to create independent logical interfaces at one antenna or site. Makes it possible to operate with more than one independent Node B. Operation in AISG 2.0 mode only.

Gender Adapter (86010162) to convert the AISG out (female) to an AISG in (male) port in order to operate one FlexRet with exactly 2 BTS.
Detailed information is given in the data sheet of the Gender Adapter.

Port Extender (86010163) to convert the existing AISG input and output in order to operate FlexRet with exactly 2 BTS while maintaining the daisy chain capability.
Detailed information is given in the data sheet of the Port Extender.

Please note:

In general, the addressing of the FlexRET is automatically performed. Only in case the FlexRET is manually addressed, the serial number has to be extended by the corresponding colour coding extension (e.g. CSG351234-R1). The respective information can be found on the site documentation which is included in the scope of supply.

Antenna Line Configurator (ALC) For Antenna Line Devices (ALD)

KATHREIN

- Supports AISG 2 / AISG 3
- HDLC-logging feature

- High-resolution display
- New Browser-interface



Antenna Line Configurator

Type No.	86010158
Connector* to RCU/TMA	1 x 8-pin connector according to IEC 60130-9, female, conforming to AISG RF-connector (SMB male)
Input voltage of ALC	24 V DC
Display	High-resolution display, sunlight visible
Tiltsensor	Measuring range $\pm 80^\circ$, accuracy $\pm 1^\circ$
Output voltage to RCU's/TMA's	AISG female pin 6: 24 \pm 1 V DC RF-plug: 24 \pm 1 V DC
Output power (power supply to RCU's/TMA's)	RF-plug + AISG female pin 6 \leq 15 W
Current monitoring measurement level	AISG female pin 6, RF-plug: 10 – 650 mA
Over-current protection	AISG female pin 6, RF-plug: < 650 mA
Interface to RCU/TMA	RS 485 / power supply / RF connector (SMB male)
Protocol to RCU/TMA	HDLC hex-coded command set, conforming to 3GPP / AISG 2 and AISG 3
Interface	W-LAN (802.11g), USB 2.0
Max. number of RCU's/TMA's	9/1 pcs., depending on system configuration and length of control cable
Max. length of control cable	200 m / 9 RCU's (in daisy chain configuration) 150 m / 6 RCU's (in splitter configuration)
Internal memory	512 MB
Weight	1 kg 2.2 lb
Protection class	IP 54
Temperature range (operating)	-20 ... +45 °C ambient temperature
Temperature range (charging)	10 ... +40 °C ambient temperature
Dimensions (H x W x D)	265 x 102 x 37 mm 10.4 x 4.0 x 1.5 inches
Packing size	405 x 290 x 105 mm 15.9 x 11.4 x 4.1 inches
Power supply	LiPo-battery (16.6 V, > 1850 mAh)



* Tightening torque for fixing the connector must be 0.5-1.0 Nm ('hand-tightened').
The connector should be tightened by hand only!

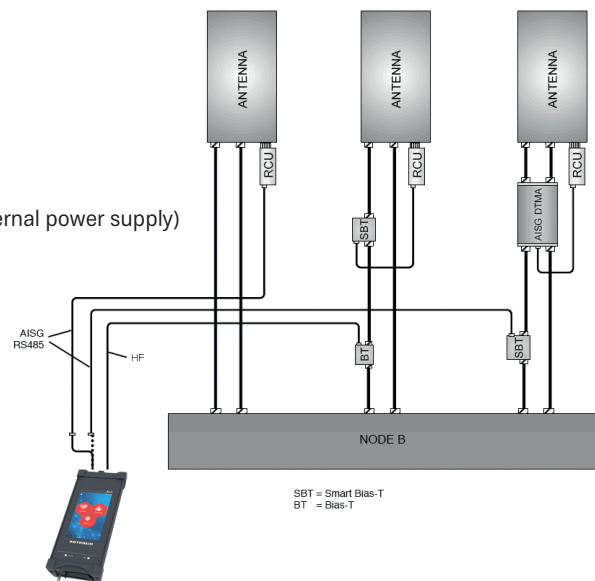
Please Note:

The user manual can be downloaded from our website www.kathrein.com/en/support/drivers-software/

Certificate: CE
FCC
UL (for external power adapter)

Standards: EN 60950-22
EN 62368-1
EN 62479
EN 50581
ETSI EN 301489-1
ETSI EN 301489-17
ETSI EN 300328 2.1.1

Scope of supply: ALC
Charging device (can also be used as external power supply)
USB cable
RET cable
HF cable (SMB / 7-16)
Transport case
Screen cover



RET

Portable Control Adapter (PCA) For Antenna Line Devices (ALD)

KATHREIN



Portable Control Adapter

Type No.		86010046	
Connector * to RCU/TMA		1 x 8-pin connector according to IEC 60130-9, female, conforming to AISG RF-connector (SMB male)	
Input voltage of PCA	V DC	24	
Output voltage to RCU's/TMA's	V DC	AISG female pin 6 (24 V DC): 24 ±10% AISG female pin 1 (12 V DC): 14 ±7% RF male (at 24 V DC): 24 ±10% *** RF male (at 12 V DC): 14 ±7% ***	
Output power (power supply to RCU's/TMA's)	W	AISG female pin 6 (24 V DC) without load on pin 1 (12 V DC) and on RF-plug: ≤ 60 AISG female Pin 1 (12 V DC) with max. 30 W load on pin 6 (24 V DC) and/or on RF plug: ≤ 30	
Current monitoring measurement level	mA	Per branch (12 V, 24 V, RF): 10 – 2500	
Over-current protection		Per branch (12 V, 24 V, RF): < 2500	
Interface to RCU/TMA		RS 485 / power supply / RF connector (SMB male)	
Protocol to RCU/TMA		HDLC hex-coded command set, conforming to AISG 1.1 and 3GPP / AISG 2.0	
Interface to PC		USB 1.1/2.0	
Max. number of RCU's/TMA's		27/3 pcs., depending on system configuration and length of control cable	
Max. length of control cable	m ft	9 RCU's (in daisy chain configuration): 200 656.17 6 RCU's (in splitter configuration): 150 492.13	
Weight	g lb	535 1.2 (incl. external power adapter)	
Temperature range	°C	0 ... +55 ambient temperature	
Height x width x depth	mm inches	40 x 95 x 160 1.57 x 3.74 x 6.29	
External power supply **		Input: 90 – 264 V AC, 47 – 63 Hz 24 V DC / 3.0 A	

* Tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened').

The connector should be tightened by hand only!

** If powered via AISG-interface, no external power supply is required.

*** Switchable with software

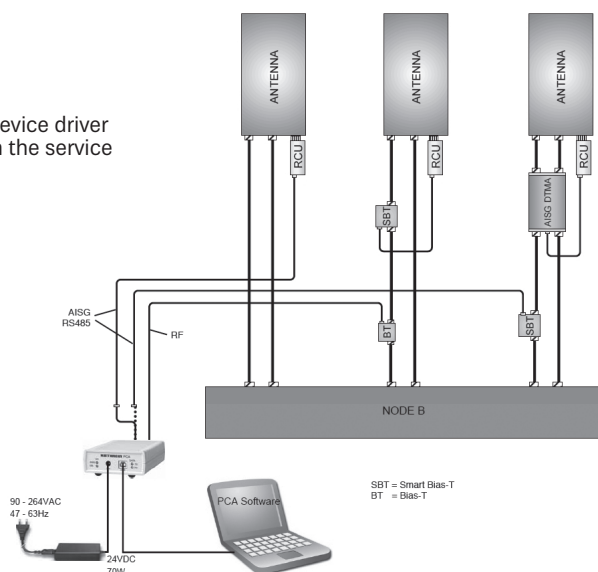
Certificate: CE
FCC part 15 class B
UL (for external power adapter)

Standards: EN 60950-1
EN 55022
EN 55024

System requirements for PCA Software: Windows XP, Win7, Win8, Win10

Scope of supply: PCA
External power supply (24 V DC / 70 W)
USB cable
AC power cable
Installation guide

Please note: The latest PCA application software, the device driver and PCA manual can be downloaded from the service portal under www.kathrein.com



SBT = Smart Bias-T
BT = Bias-T

Connecting Cable For Remote Electrical Tilt (RET) System

KATHREIN

For indoor and outdoor use



RET Cable for power supply and control

Type No.	86010007 ...
Connectors	2 x 8 pin connector according IEC 60130-9, female/male
Tightening torque for fixing the connectors	1.0 – 1.5 Nm (The connector should be tightened by hand or by special torque screwdriver)
Construction	Screen 1x twisted pair 100 Ω/1 MHz 2x power supply, 1x ground AWM style 20317 I/II A/B + 20549 + 20233
Rated current	4 A (power supply) (at 50 °C air temperature)
Temperature range	-40 °C to +80 °C, (fixed position)
Protection class	IP 67 (connected)
Cable diameter	8 mm
Flammability	VL 1581 VW-1 CSA FT 1
Colour	Black, similar to RAL 9005

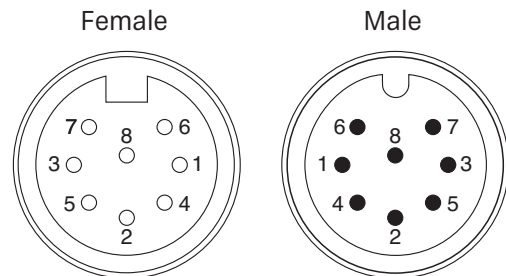


Minimum bending radius: One time 60 mm, several times 120 mm.

The male and female connectors of all Kathrein RET products are compatible components which are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E.

Control Cable

Length	Type No.
0.5 m	86010054
1 m	86010007
2 m	86010008
3 m	86010029
5 m	86010009
10 m	86010010
20 m	86010032
25 m	86010011
40 m	86010012
50 m	86010033
60 m	86010013
80 m	86010014
100 m	86010015



PIN assignment according AISG:

- 1 +13 V DC (+12 V DC nominal)
- 2 not connected
- 3 RS485 B
- 4 not connected
- 5 RS485 A
- 6 +29 V DC (+24 V DC nominal)
- 7 DC Return
- 8 not connected



Optional:

Torque screwdriver for AISG connecting cable (order no. 85010080).
With the torque screwdriver, Kathrein connecting cables can be easily fixed with the recommended torque of 1 Nm.



Old style connector:
Torque screwdriver not usable



New style connector:
Torque screwdriver usable

3-way

Operate a FlexRET system with up to three independent primaries.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Selectable arrangement of arrays
- Possible for up to three FlexRETs (daisy chain)



Type No.		86010154	
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0	
Logical interface ex factory		3GPP/AISG 2.0	
Input voltage range	V	10 ... 30 (pin 1, pin 6)	
Power consumption	W	< 3 (stand by); < 12 (motor activated)	
Connectors		4 x 8 pin connector according to IEC 60130-9; according to AISG In: male; Out: female	
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP	
Temperature range	°C	-40 ... +60	
Protection class		IP 54 (installed)	
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)	
Max. cable length (Site Sharing Adapter to last FlexRET Antenna)	m ft	150 492	
Housing material		Cover: Aluminum die cast coated	
Weight	g lb	650 1.4 lb	
Packing size	mm inches	160 x 250 x 100 6.3 x 9.8 x 3.9 inches	
Dimensions (H x W x D)	mm inches	123 x 166 x 62 4.8 x 6.5 x 2.4	



Please note:

The Site Sharing Adapter can exclusively be used with FlexRET antennas. The FlexRET output of the Site Sharing Adapter needs to be directly connected to the FlexRET antenna. For selecting the arrangement of the antenna arrays, a separate software application is available.

The Site Sharing Adapter expands the AISG interface of max. three FlexRETs up to three AISG interfaces for three independent AISG primaries. The alignment of antenna arrays can be configured individually.

Only FlexRET devices from firmware version FW_V02.01.00 are suitable for operation with the Site Sharing Adapter.

- The firmware version can be queried through the AISG command "get information".
- The latest firmware version for FlexRET can be downloaded from the Kathrein website.
- FlexRET Antennas with firmware version FW_V02.00.XX must be updated before the initial setup of the Site Sharing Adapter. The FlexRET device will not be detected otherwise.
- A firmware update can be performed with a corresponding primary (e.g. Node B) or Controller (e.g. Kathrein ALC, -PCA, -CCU).

Standby power for Site Sharing Adapter and FlexRET system is taken by the BTS with the highest DC input voltage. When the motor is in operation, the electrical power is allocated fairly to the base stations, according to the individual input. The Site Sharing Adapter can not be used in combination with an AISG splitter (e.g. 86010002). For the connection of the Site Sharing Adapter and the FlexRETs, a standard AISG cable shall be used.

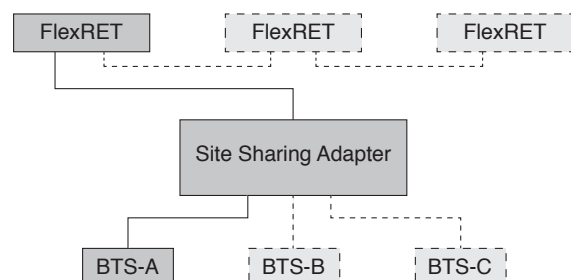
The latest configuration software and the manual with detailed configuration information are provided via our customer portal on www.kathrein.com

Additional earthing may be needed depending on the used installation. Please follow the guidelines given in the manual.

- Standards:
- EN 60950-1 (Safety),
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission),
 - EN 55024 (Immunity),
 - ETS 300019-1-4 (Environmental),
 - UL 60950-1; 1st edition

Certification: CE, FCC

Scope of supply: Site Sharing Adapter, tension band



6-way

Operate a FlexRET system with up to six independent primaries.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Selectable arrangement of arrays
- Possible for up to three FlexRETs (daisy chain)



Type No.		86010155	
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0	
Logical interface ex factory		3GPP/AISG 2.0	
Input voltage range	V	10 ... 30 (pin 1, pin 6)	
Power consumption	W	< 3 (stand by); < 12 (motor activated)	
Connectors		7 x 8 pin connector according to IEC 60130-9; according to AISG In: male; Out: female	
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Protection class		IP 54 (installed)	
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)	
Max. cable length (Site Sharing Adapter to last FlexRET Antenna)	m ft	150 492	
Housing material		Cover: Aluminum die cast coated	
Weight	g lb	1350 3.0 lb	
Packing size	mm inches	195 x 360 x 110 7.68 x 14.17 x 4.33	
Dimensions (H x W x D)	mm inches	156 x 265 x 65 6.14 x 10.43 x 2.56	



Please note:

The Site Sharing Adapter can exclusively be used with FlexRET antennas. The FlexRET output of the Site Sharing Adapter needs to be directly connected to the FlexRET antenna. For selecting the arrangement of the antenna arrays, a separate software application is available. The Site Sharing Adapter expands the AISG interface of max. three FlexRETs up to three AISG interfaces for six independent AISG primaries. The alignment of antenna arrays can be configured individually.

Only FlexRET devices from firmware version FW_V02.01.00 are suitable for operation with the Site Sharing Adapter.

- The firmware version can be queried through the AISG command "get information".
- The latest firmware version for FlexRET can be downloaded from the Kathrein website.
- FlexRET Antennas with firmware version FW_V02.00.XX must be updated before the initial setup of the Site Sharing Adapter. The FlexRET device will not be detected otherwise.
- A firmware update can be performed with a corresponding primary (e.g. Node B) or Controller (e.g. Kathrein ALC, -PCA, -CCU).

When the motor is in operation, the electrical power is allocated fairly to the base stations, according to the individual input. The Site Sharing Adapter can not be used in combination with an AISG splitter (e.g. 86010002). For the connection of the Site Sharing Adapter and the FlexRETs, a standard AISG cable shall be used.

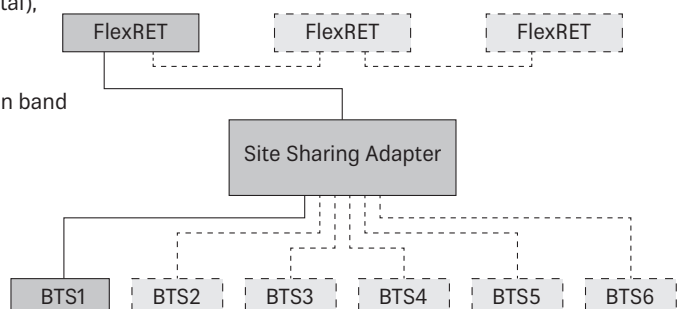
The latest configuration software and the manual with detailed configuration information are provided via our customer portal on www.kathrein.com

Additional earthing may be needed depending on the used installation. Please follow the guidelines given in the manual.

- Standards:
- EN 60950-1 (Safety),
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission),
 - EN 55024 (Immunity),
 - ETS 300019-1-4 (Environmental),
 - UL 60950-1; 1st edition

Certification: CE, FCC

Scope of supply: Site Sharing Adapter, tension band



RET

Converts the AISG out (female) to an AISG in (male) port in order to operate the FlexRET with two BTS.
Only for FlexRET 86010153v01.



Type No.		86010162
Protocols		compliant to 3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 6)
Connectors		1 x 8 pin connector (male) according to IEC 60130-9; according to AISG C485 1 x 8 pin connector (female) according to IEC 60130-9; according to AISG C485 Female mates with FlexRET
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Temperature range	°C	-40 ... +60
Protection class		IP 67 (installed)
Surge current capability		AISG interface (each pin) in combination with FlexRET 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Housing material		Connector shell: Zinc die cast Ni plated; Contacts: Ag plated
Weight	g lb	45 0.099
Packing size (H x W x D)	mm inches	43 x 20 x 20 1.7 x 0.78 x 0.78
Dimensions (H x W x D)	mm inches	43 x 20 x 20 1.7 x 0.78 x 0.78

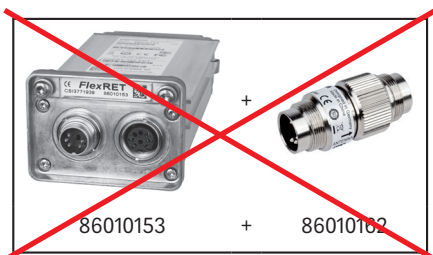
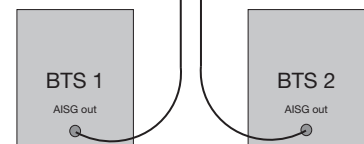
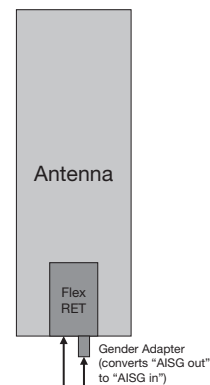


Standards: EN 60950-1 (Safety)
EN 60950-22 (Safety - Equipment installed outdoor)
ETS 300019-1-4 (Environmental)
UL 60950-1; 1st edition

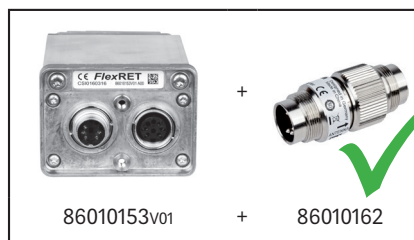
Certification: CE

Scope of supply: Gender Adapter

Notice: The Gender Adapter is solely to be used in combination with the FlexRET module 86010153v01. A combination with other modules, especially with the FlexRET module 86010153, must be avoided since this could lead to unexpected behaviour in the FlexRET module and could cause overvoltage in the primary power supply.
For avoidance of doubt, the combination with any other module, with exception of the FlexRET module 86010153v01, could lead to a damage. In no event will Kathrein, its affiliates and/or subsidiaries be liable for direct, incidental, consequential, special, indirect damages arising from or relating to the combination with another module except FlexRET module 86010153v01. These limitations will apply even if Kathrein has been advised of the possibility of such damages and whether such damages are foreseeable or not.



In combination with 86010153:
Gender Adapter is not usable.



In combination with 86010153v01:
Gender Adapter can be used.

Port Extender allows daisy chaining of FlexRET 86010153v01 when the FlexRET operates with two BTS. G-in and G-out is converting the AISG-out (female) of FlexRET to an AISG-in while maintaining the daisy chain capability on this port. Only for FlexRET 86010153v01.



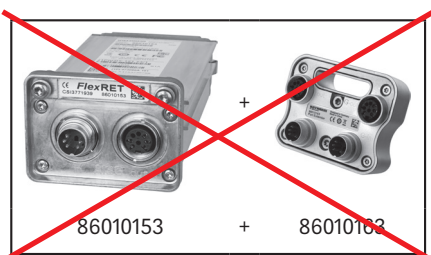
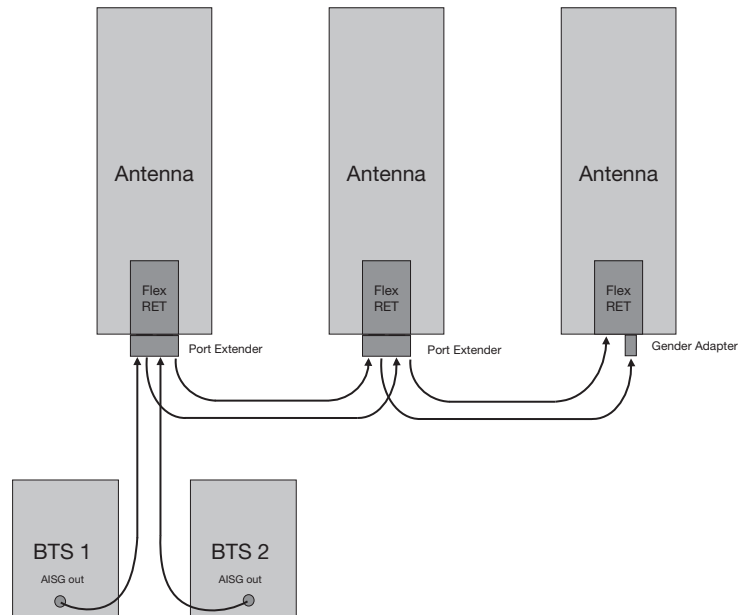
Type No.		86010163
Protocols		compliant to 3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 6)
Connectors		4 x 8 pin connector according to IEC 60130-9; according to AISG C485 Daisy chain in: male; Daisy chain out: female Daisy chain G-in: male; Daisy chain G-out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Temperature range	°C	-40 ... +60
Protection class		IP 67 (installed)
Surge current capability		AISG interface (each pin) in combination with FlexRET 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Weight	g lb	160 0.35
Packing size (H x W x D)	mm inches	90 x 70 x 70 3.5 x 2.8 x 2.8
Dimensions (H x W x D)	mm inches	44.5 x 81 x 62 1.8 x 3.2 x 2.4



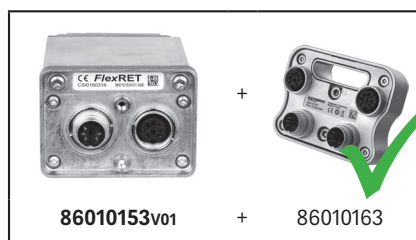
Standards: EN 60950-1 (Safety)
EN 60950-22 (Safety - Equipment installed outdoor)
ETS 300019-1-4 (Environmental)
UL 60950-1; 1st edition

Certification: CE
Scope of supply: Port Extender

Notice:
The Port Extender is solely to be used in combination with the FlexRET module 86010153v01. A combination with other modules, especially with the FlexRET module 86010153, must be avoided since this could lead to unexpected behaviour in the FlexRET module and could cause overvoltage in the primary power supply. For avoidance of doubt, the combination with any other module, with exception of the FlexRET module 86010153v01, could lead to a damage. In no event will Kathrein, its affiliates and/or subsidiaries be liable for direct, incidental, consequential, special, indirect damages arising from or relating to the combination with another module except FlexRET module 86010153v01. These limitations will apply even if Kathrein has been advised of the possibility of such damages and whether such damages are foreseeable or not.



In combination with 86010153:
Port Extender is not usable.



In combination with **86010153v01**:
Port Extender can be used.

DC-Power and Signal Splitter For Remote Electrical Tilt (RET) Indoor and Outdoor Use

KATHREIN

AISG compliant device for splitting of DC-power and control signals from one input to three outputs.

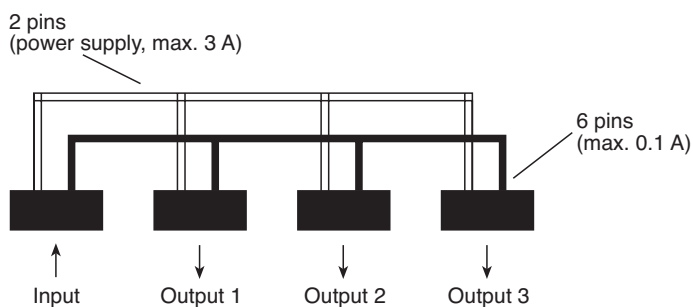


3-way Splitter for RET

Type No.	86010002
Connectors ¹⁾	4 x 8 pin connector according IEC 60130-9, 1 x male, 3 x female
Rated current (power supply)	3 A (at 50 °C)
Max. voltage	60 V
Protection class	IP 65
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

¹⁾ The tightening torque for fixing the connector must be 1.0–1.5 Nm ("hand-tightened").

- Material:** Connector plate: Aluminum.
Cap: Plastic.
- Mounting:** Mast mounting (50–145 mm diameter) by clamp.
Wall mounting by screws (not supplied).
- Note:** **Connectors must be situated at the bottom. No inverted mounting possible.**
- Scope of supply:** 3-way Splitter
Clamp (50...145 mm)



Lightning Protection Device (LPD) For Remote Electrical Tilt (RET) Indoor and Outdoor Use

KATHREIN

The device is designed for lightning protection of control cables carrying partial lightning currents up to 25 kA (shield) and 2.5 kA (inner conductor), according IEC 61643-1, IEC 61312-3. Each pin is protected individually.



Lightning Protection Device for RET

Type No.	86010030
Connectors ¹⁾	2 x 8 pin connector according IEC 60130-9, input: male, output: female
SPD-Type	8 x bipolar gas tube
Max. impuls current	25 kA (housing, shield) (10/350 µs) inner conductors: 2.5 kA/pin (10/350 µs)
Max. dynamic overvoltage at spark gap (1 kV/µs)	< 700 V
Static overvoltage (100 V/s)	< 100 V
Grounding	Via mounting plate / clamps at metallic surfaces or via separate cable, min. cross-section 5 mm ² Cu (screw M6)
Max. operation current	4 A at 50 °C
Max. operation voltage	60 V
Protection class	IP 55
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

¹⁾ The tightening torque for fixing the connector must be 1.0–1.5 Nm ("hand-tightened").

Material: Connector plate: Aluminum.
Cap: Plastic.

Mounting: Mast mounting (50–145 mm diameter) by clamp.
Wall mounting by screws (not supplied).

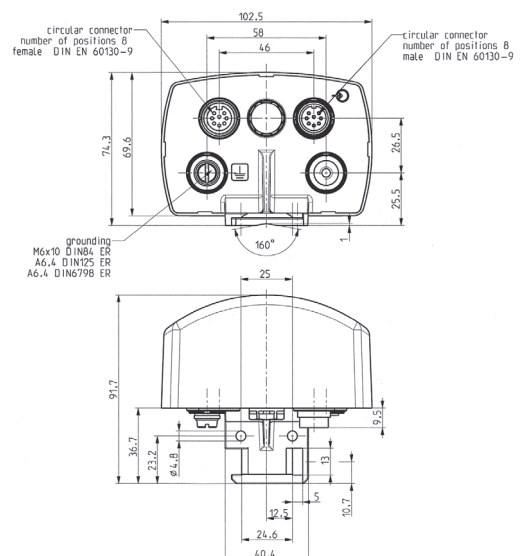
Note: **No decoupling elements are integrated. The coordination with additional LPD's (device input) should be checked according to IEC 61312.**

Grounding of the device via the mounting plate at metallic surfaces or via additional grounding cable (not included in the delivery extend).

Connectors must be situated at the bottom. No inverted mounting possible.

Important: A control cable with a minimum length of 2 meters is required between Lightning Protection Device and Central Control Unit at the BTS to achieve the required decoupling.

Scope of supply: Lightning Protection Device
Clamp (50...145 mm)



RET

Earthing Clamp For Power Supply and Control Cable For Remote Control Unit (RCU)

KATHREIN

The clamp is designed for lightning protection of control cables according to EN 50164-1

Earthing clamp for RCU power supply and signal cable

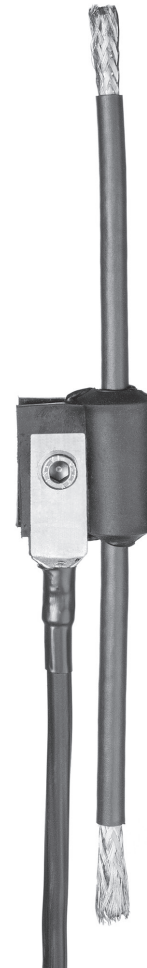
Type No.	86010031
Max. lightning current	20 kA (pulse 10/350 µsec)
Contact resistance	< 3 mΩ
Protection class	IP 68
Grounding	Via stranded grounding wire, 16 mm ² , length 0.5 m, one end terminated with cable eye (10 mm lug)
Packing size	Plastic bag: 210 mm x 210 mm
Weight	160 g

Material:
 Body: Stainless steel with vulcanized Ethylene-Propylene-Caoutchouc
 Screw: Stainless steel
 Skin: Copper alloy
 Grounding wire: Copper

Note:
 The earthing clamp is suitable only for the Kathrein Power Supply and Signal Cables,
 Type No. 86010007 to 86010015, 86010029,
 86010032, 86010033, 86010054 to 86010060 or
 shielded cables with

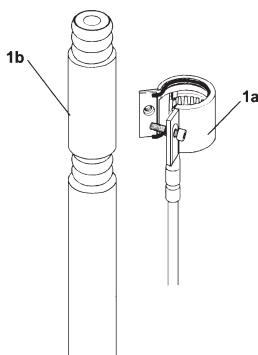
- shield diameter 6.1 mm
- jacket diameter 7.8 mm ±0.3 mm

The kit contains:
 1 x Grounding kit body incl. Butyl sealing rope covered with paper
 1 x Screw M6 DIN 912
 1 x Grounding wire



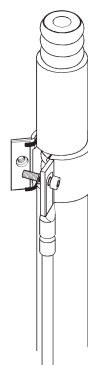
Mounting instructions:

This instruction is written for qualified and experienced personnel. Please read it carefully before starting work. Any liability or responsibility for the result of improper or unsafe installation is disclaimed!

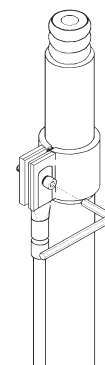


Attention!
 Install grounding kit only where the cable runs straight.

Fig. 1a Preassembled grounding kit.
Fig. 1b Clean the plastic jacket at the desired grounding point and cut out a strip of 15 mm with aid of a suitable stripping tool.



Remove covering paper from Butyl sealing. Wrap the grounding kit body around the cable and align it.



Tighten the screw (> 6 Nm)

Summary – Electrical Accessories

380...3800 MHz

KATHREIN

Type	Type No.	Frequency range	Remark	Max. power	Connector female	Page
------	----------	-----------------	--------	------------	------------------	------

Splitters

2-way Splitter 380–3800	86010131	380–3800 MHz	Indoor/Outdoor	700 W	7-16	296
2-way Splitter 694–3800	86010101	694–3800 MHz	Indoor/Outdoor	700 W	7-16	297
3-way Splitter 694–3800	86010103	694–3800 MHz	Indoor/Outdoor	700 W	7-16	297
4-way Splitter 694–3800	86010105	694–3800 MHz	Indoor/Outdoor	700 W	7-16	297

Tappers

2-way Tapper 694–2700	7.0/1.0 dB	86010136	694 – 2700 MHz	Indoor	100 W	N	298
2-way Tapper 694–2700	7.0/1.0 dB	86020136	694 – 2700 MHz	Indoor/Outdoor	100 W	4.3-10	299
2-way Tapper 694–2700	10.4/0.4 dB	86010137	694 – 2700 MHz	Indoor	100 W	N	298
2-way Tapper 694–2700	10.4/0.4 dB	86020137	694 – 2700 MHz	Indoor/Outdoor	100 W	4.3-10	299
2-way Tapper 694–2700	15.1/0.1 dB	86010138	694 – 2700 MHz	Indoor	100 W	N	298
2-way Tapper 694–2700	15.1/0.1 dB	86020138	694 – 2700 MHz	Indoor/Outdoor	100 W	4.3-10	299
2-way Tapper 694–2700	7.0/1.0 dB	86010150	694–2700 MHz	Indoor/Outdoor	500 W	7-16	300
2-way Tapper 694–2700	10.5/0.5 dB	86010151	694–2700 MHz	Indoor/Outdoor	500 W	7-16	300
2-way Tapper 694–2700	15.3/0.3 dB	86010152	694–2700 MHz	Indoor/Outdoor	500 W	7-16	300

Continuously adjustable ratio

Multi-band Tapper 380–960/1695–2700/ 3400–3800/4920–5920 5.0–20.0dB	86010160	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz	Indoor/Outdoor	100 W	N	301
Multi-band Tapper 380–960/1695–2700/ 3400–3800/4920–5920 5.0–20.0dB	86020160	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz	Indoor/Outdoor	100 W	4.3-10	301

Low-loss Power Splitters Multi-band

380-3800

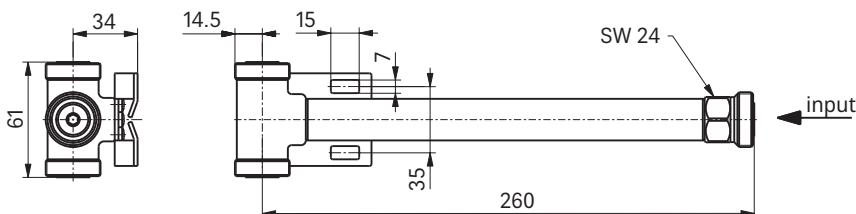
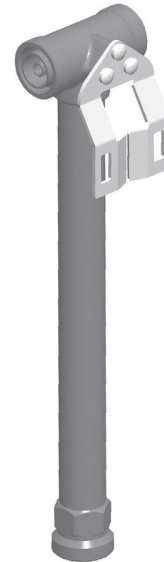
KATHREIN

For indoor and outdoor use.

2-way Splitter 380-3800

Type No.	86010131
Connector	7-16 female
Max. power (at 50 °C ambient temperature)	700 W
For connecting ... antennas	2
Frequency range	380 – 3800 MHz
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Impedance	50 Ω
Insertion loss	< 0.05 dB
Weight	870 g
Packing size	300 x 75 x 75 mm

- Material: Brass. Surface treatment: CuSnZn3
- Mounting: Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).
- DC capability: DC transmission between all terminations (suitable for remote power supply systems).
- Environmental conditions: ETS 300 019-1-4 class 4.1 E
- Low temperature: -55 °C
- High temperature (dry): +60 °C
IP 65



Clamps (order separately) Please note that packing quantity is 2 pcs

Type No.	Description	Remarks
734360	1 tension band	Mast: 34-60 mm diameter
734361	1 tension band	Mast: 60-80 mm diameter
734362	1 tension band	Mast: 80-100 mm diameter
734363	1 tension band	Mast: 100-120 mm diameter
734364	1 tension band	Mast: 120-140 mm diameter
734365	1 tension band	Mast: 45-125 mm diameter



734364

Low-loss Power Splitters Multi-band

694-3800

KATHREIN

For indoor and outdoor use.

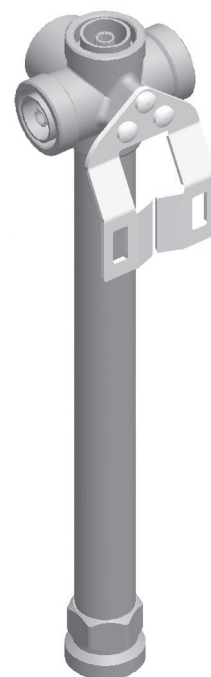
2-way Splitter 694-3800

3-way Splitter 694-3800

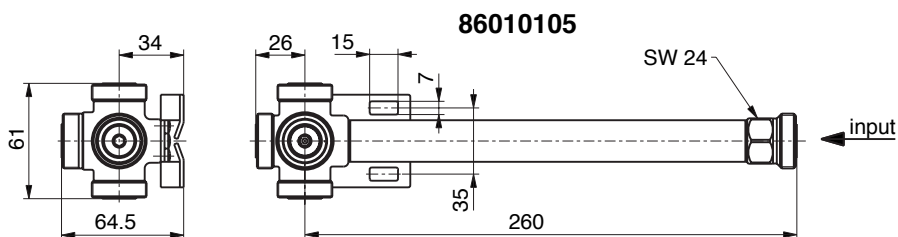
4-way Splitter 694-3800

Type No.	86010101	86010103	86010105
Connector (female)	7-16	7-16	7-16
Max. power (at 50 °C ambient temperature)	700 W	700 W	700 W
For connecting ... antennas	2	3	4
Frequency range	694 – 3800 MHz		
VSWR	694 – 894 MHz: < 1.32 790 – 3800 MHz: < 1.15		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Impedance	50 Ω		
Insertion loss	< 0.05 dB		
Weight	870 g	900 g	960 g
Packing size	300 x 75 x 75 mm		

- Material: Brass. Surface treatment: CuSnZn3
- Mounting: Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).
- DC capability: DC transmission between all terminations (suitable for remote power supply systems).
- Environmental conditions: ETS 300 019-1-4 class 4.1 E
- Low temperature: -55 °C
- High temperature (dry): +60 °C
IP 65



86010105



Clamps (order separately)

Please note that packing quantity is 2 pcs

Type No.	Description	Remarks
734360	1 tension band	Mast: 34-60 mm diameter
734361	1 tension band	Mast: 60-80 mm diameter
734362	1 tension band	Mast: 80-100 mm diameter
734363	1 tension band	Mast: 100-120 mm diameter
734364	1 tension band	Mast: 120-140 mm diameter
734365	1 tension band	Mast: 45-125 mm diameter



734364

Low-loss Power Tappers Multi-band

694-2700

KATHREIN

For indoor use.

2-way Tapper 694-2700 7.0/1.0dB
 2-way Tapper 694-2700 10.4/0.4dB
 2-way Tapper 694-2700 15.1/0.1dB


Type No.		86010136	86010137	86010138
Frequency range	MHz	694 - 2700 MHz		
Tap Loss				
Input ↔ P ₁	dB	-1.0	-0.4	-0.1
Input ↔ P ₂		-7.0	-10.4	-15.1
For connecting ... antennas		2		
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR		694-790 MHz: < 2.0 790-2500 MHz: < 1.5 2500-2700 MHz: < 2.0		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	100 (at 50 °C ambient temperature)		
Connectors		N female		
Weight	g lb	500 1.1		
Profile cross-section	mm inches	25 x 25 1.0 x 1.0		
Packing size	mm inches	267 x 95 x 111 10.5 x 3.7 x 4.4		
Max. size	mm inches	244 / 64 / 25 9.6 / 2.5 / 1.0		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.
P₂ is coupled capacitively.

Environmental conditions: IP 52



Input 

Low-loss Power Tappers Multi-band

694-2700

KATHREIN

For indoor and outdoor use.

2-way Tapper 694-2700 7.0/1.0dB
2-way Tapper 694-2700 10.4/0.4dB
2-way Tapper 694-2700 15.1/0.1dB

Type No.		86020136	86020137	86020138
Frequency range	MHz	694 - 2700 MHz		
Tap Loss				
Input ↔ P ₁	dB	-1.0	-0.4	-0.1
Input ↔ P ₂		-7.0	-10.4	-15.1
For connecting ... antennas		2		
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR		694-790 MHz: < 2.0 790-2500 MHz: < 1.5 2500-2700 MHz: < 2.0		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	100 (at 50 °C ambient temperature)		
Connectors		4.3-10 female		
Weight	g lb	500 1.1		
Profile cross-section	mm inches	25 x 25 1.0 x 1.0		
Packing size	mm inches	253 x 73 x 92 10.0 x 2.9 x 3.6		
Max. size	mm inches	247 / 66 / 25 9.7 / 2.6 / 1.0		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.
P₂ is coupled capacitively.

Environmental conditions: IP 65



Low-loss Power Tappers Multi-band

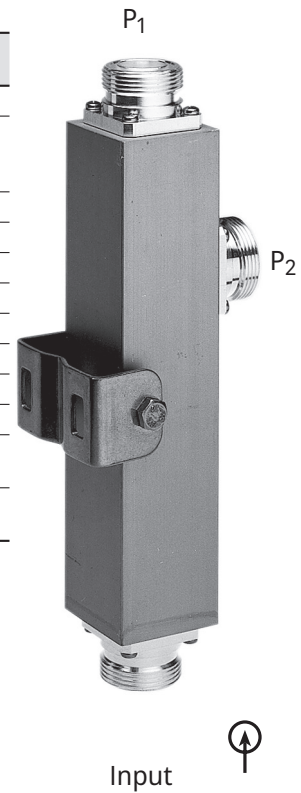
694-2700

KATHREIN

For indoor and outdoor use.

2-way Tapper 694-2700 7.0 /1.0dB
 2-way Tapper 694-2700 10.5/0.5dB
 2-way Tapper 694-2700 15.3/0.3dB

Type No.		86010150	86010151	86010152
Frequency range	MHz	694 - 2700		
Tap Loss				
Input ↔ P ₁	dB	-1.0	-0.5	-0.3
Input ↔ P ₂		-7.0	-10.5	-15.3
For connecting ... antennas		2		
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR		694 - 2700 MHz: < 1.5		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		
Connector		7-16 female		
Weight	kg lb	1.3 2.9		
Packing size	mm inches	310 x 93 x 112 12.2 x 3.7 x 4.4		
Max. size	mm inches	244 / 90 / 55 9.6 x 3.5 x 2.2		



Material: Housing: Aluminum.
 Inner conductor: Brass.

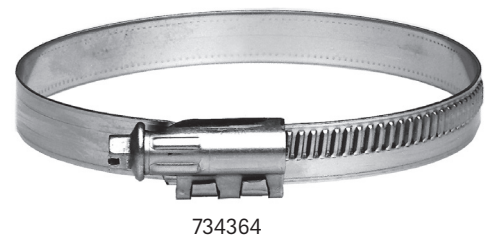
DC capability: DC transmission only between input and port P₁.
 P₂ is coupled capacitively.

Mounting: Bracked for wall mounting included in the scope
 of supply.
 For pipe mast mounting use clamps listed below
 (order separately).

Environmental conditions: IP 65

Clamps (order separately) Please note that packing quantity is 2 pcs

Type No.	Description	Remarks
734360	1 tension band	Mast: 34-60 mm diameter
734361	1 tension band	Mast: 60-80 mm diameter
734362	1 tension band	Mast: 80-100 mm diameter
734363	1 tension band	Mast: 100-120 mm diameter
734364	1 tension band	Mast: 120-140 mm diameter
734365	1 tension band	Mast: 45-125 mm diameter



Multi-band Low-loss Power Tapper

380-960/1695-2700/3400-3800/4920-5920

KATHREIN

Continuously Adjustable Splitting Ratio

5.0 dB – 20.0 dB

For indoor and outdoor use.

2-way Tapper 380-960/1695-2700/3400-3800/4920-5920

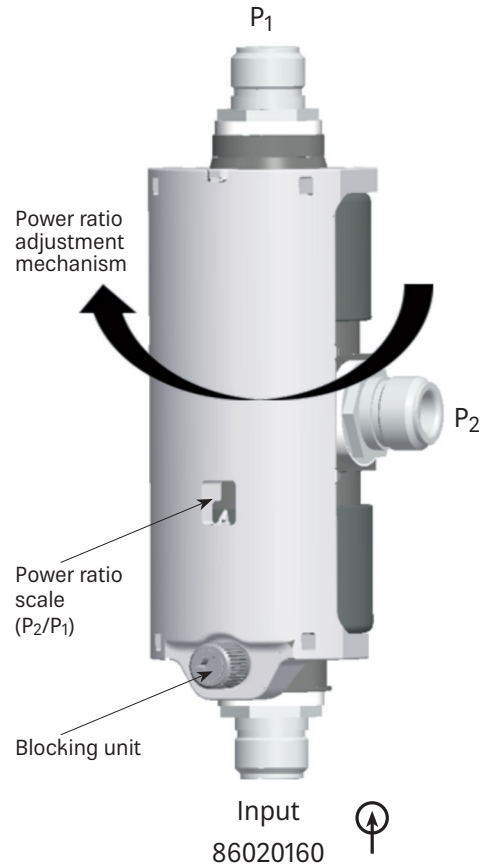
Type No.		86020160	86010160
Frequency range	MHz	380 – 960 1695 – 2700 3400 – 3800 4920 – 5920	
Power ratio between outputs (P ₂ / P ₁)	dB	-5 to -20 continuously adjustable	
For connecting ... antennas		2	
Insertion loss	dB	380 – 960 MHz: < 0.2 1695 – 2700 MHz: < 0.2 3400 – 3800 MHz: < 0.5 4920 – 5920 MHz: < 0.7	
Impedance	Ω	50	
VSWR		380 – 960 MHz: < 1.5 1695 – 2700 MHz: < 1.5 3400 – 3800 MHz: < 1.7 4920 – 5920 MHz: < 1.7	
Intermodulation IM3	dBc	380 – 960 MHz: < -150 (2 x 43 dBm carrier) 1695 – 2700 MHz: < -150 (2 x 43 dBm carrier) 3400 – 3800 MHz: < -150 (2 x 43 dBm carrier) 4920 – 5920 MHz: not relevant	
Max. power	W	100 (at 50 °C ambient temperature)	
Connector		4.3-10 female	N female
Weight	kg lb	0.4 0.9	0.5 1.1
Environmental conditions		Indoor, outdoor use	
Protection class		IP 65	
Profile diameter	mm inches	50 2.0	
Packing size	mm inches	225 x 80 x 62 8.9 x 5.0 x 2.4	190 x 80 x 60 7.5 x 5.0 x 2.4
Max. size (including connectors)	mm inches	160 / 63 / 52 6.3 / 2.5 / 2.0	160 / 70 / 55 6.3 / 2.8 / 2.2

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.

Splitting table (typical values)

P ₂ / P ₁ [dB]	Splitting ratio P ₁ / P ₂	Splitting attenuation	
		P ₁ / P _{Input} [dB]	P ₂ / P _{Input} [dB]
-5	3.2	-1.30	-6.30
-6	4.0	-1.05	-7.05
-7	5.0	-0.85	-7.85
-8	6.3	-0.70	-8.70
-9	8.0	-0.60	-9.60
-10	10.0	-0.50	-10.50
-11	12.6	-0.40	-11.40
-12	15.8	-0.35	-12.35
-13	20.0	-0.25	-13.25
-14	25.1	-0.20	-14.20
-15	31.6	-0.15	-15.15
-16	39.8	-0.14	-16.14
-17	50.1	-0.12	-17.12
-18	63.1	-0.11	-18.11
-19	79.4	-0.10	-19.10
-20	100.0	-0.09	-20.09

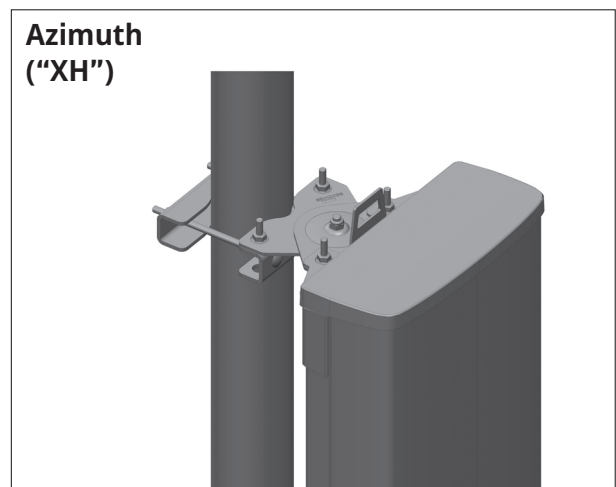
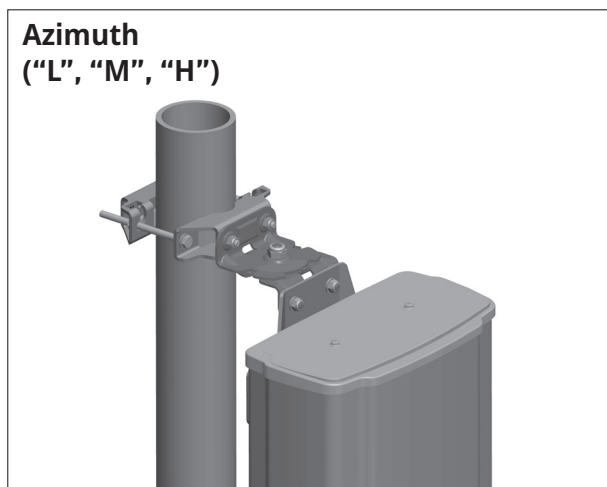
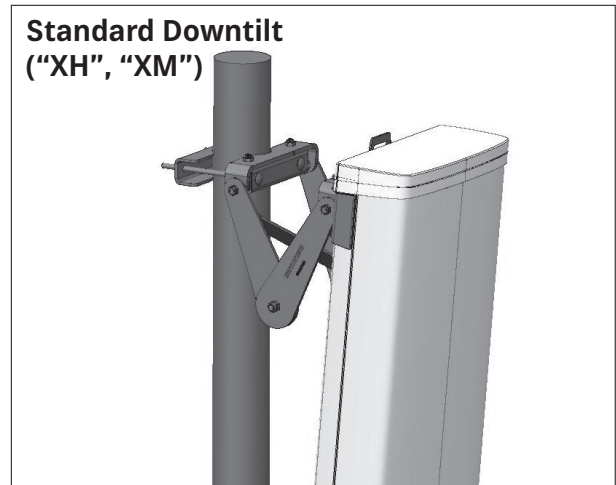
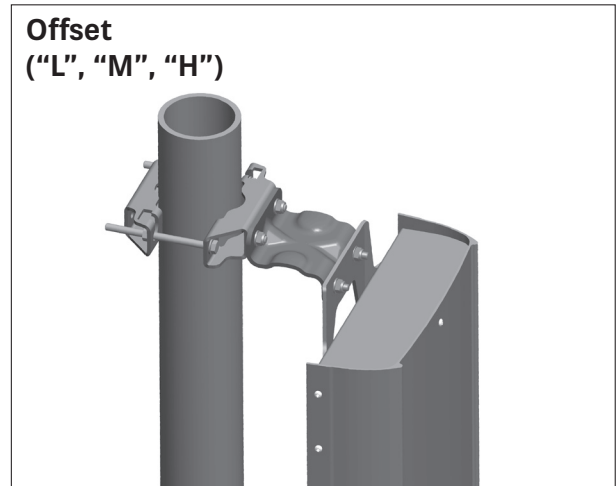
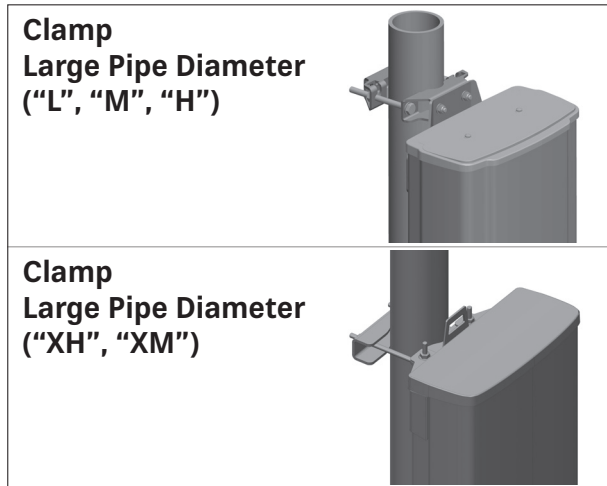


Summary – Mounting Accessories Clamps, Downtilt Kits ...

KATHREIN

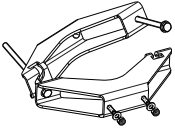
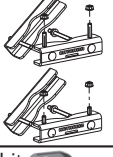


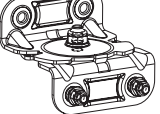

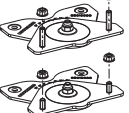
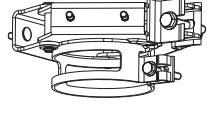

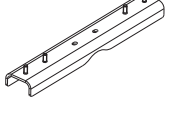

	Page
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Downtilt kit “L” and “M”	313
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The hereinafter referred to “wind load category L - M - H - XM - XH” correspond to the defined “category of mounting hardware” given in the respective data sheets.



Product Line of Mounting Parts

KATHREIN

Type	Windload Classification	Pole Diameter in mm	Type No.	Remark	Page	
Clamp 	light / medium	∅ 28–60	731651		306	
		∅ 42–115	738546			
	light / medium / heavy	∅ 55–115	85010212			
		∅ 110–220	85010002			
		∅ 210–380	85010003			
Clamp 	XM (X-medium)	∅ 55–115	85010111	308		
	XH (X-heavy)	∅ 55–115	85010096	309		
	XH (X-heavy)	∅ 110–220	85010097	310		
	XH (X-heavy)	∅ 210–380	85010101	311		
Downtilt kit 	light		732327	312		
	light / medium		737978	313		
	heavy		85010009	314		
Downtilt kit 	XM (X-medium)		85010110	315		
	XH (X-heavy)		85010099	316		
Azimuth Adjustment Kit 	light / medium		85010014	Pole mounting adjustment angle ±30° (additional clamp needed)	318	
	heavy		85010015			
Azimuth Adjustment Kit 	light / medium		85010016	Wall mounting adjustment angle ±30°	318	
	heavy		85010017			
Azimuth Adjustment Kit 	X-heavy		85010098		319	
3 Sector Clamp 	light / medium	∅ 88.9	K742263		320	
		∅ 88.9	K742317			
		∅ 114.3	742033			
		∅ 139.7	742034			
	heavy	∅ 114.3	85010058			
		∅ 139.7	85010059			
X-heavy	∅ 114.3	85010102	321			
Offset 	light / medium		85010060	Clearance between pole and antenna (additional clamp needed)	322	
	heavy		85010061			
	X-heavy		85010104			
2x Panel Mounting Kit 	light / medium	max. Panel width 160		742113	Additional clamp needed	
		max. Panel width 325		85010075		324
	heavy	max. Panel width 377		85010076		325
		X-heavy	∅ 110–220	max. Panel width 378		85010087
	∅ 210–380		85010103			326
			85010108			
Tension Band 	light	∅ 34–60	734360	Please note: Only usable without downtilt kit	327	
		∅ 60–80	734361			
		∅ 80–100	734362			
		∅ 100–120	734363			
		∅ 120–140	734364			
		∅ 45–125	734365			

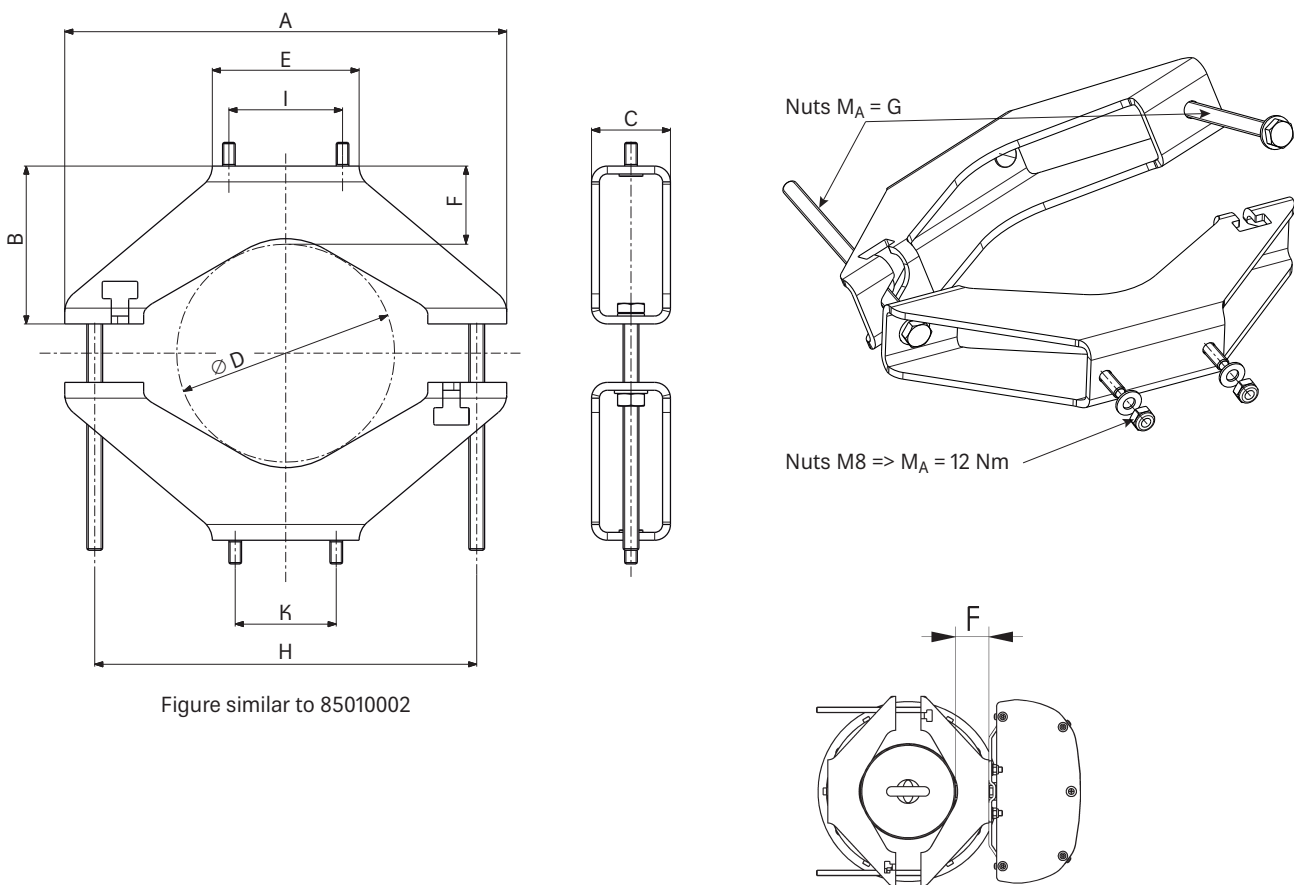
New or changed product

Mounting Hardware Clamps (Wind Load Category “L”, “M” and “H”)

KATHREIN

Clamps

Type No.	731651	738546	85010212	85010002	85010003
Suitable for mast diameter	28–60 mm	42–115 mm	55–115 mm	110–220 mm	210–380 mm
Antenna – mast distance F	25–28 mm	20–26 mm	30–34 mm	47–55 mm	48–68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp	1 clamp
Material – Clamp	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel
– Screws	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Stainless steel/ Stainless steel
– Nuts	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight	0.8 kg	1.1 kg	1.6 kg	2.7 kg	4.8 kg



Type No.	A	B	C	D	E	F	G	H	I	K
731651	116 mm	40 mm	40 mm	28–60 mm	93 mm	25–28 mm	20 Nm	84 mm	–	64 mm
738546	152 mm	40 mm	40 mm	42–115 mm	93 mm	20–26 mm	25 Nm	125 mm	72 mm	64 mm
85010212	174 mm	50 mm	50 mm	55–115 mm	104 mm	30–34 mm	35 Nm	126 mm	72 mm	–
85010002	280 mm	100 mm	50 mm	110–220 mm	93 mm	47–55 mm	35 Nm	240 mm	72 mm	64 mm
85010003	442 mm	150 mm	50 mm	210–380 mm	150 mm	48–68 mm	35 Nm	392 mm	72 mm	64 mm

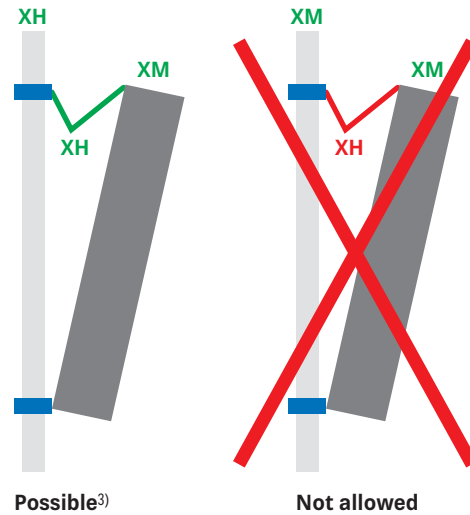
**Please note: Kathrein does not recommend to use counter nuts.
The additional nuts supplied are only meant as spares.**

Category of Mounting Hardware for Selected Antennas Changes from “XH” → “XM”

The “Category of Mounting Hardware” will change from “XH” to “XM”.
On the respective catalogue page you will also find a note.

Type	Page
Antennas to be changed to “XM”	
80011867	116 + 117
80011868	118 + 119
80010964	134 – 136
80010991	206 – 209
80011877	220 + 221
80011878	222 + 223
Antennas already changed to “XM”	
80010888	38
80010889	39
80010901	40 + 41
80010965	137 – 139
80011965	171 – 173
80011898	193 – 195

Configuration examples:



Possible combinations of mounting hardware “XM” and “XH”

	85010111 Clamp 55–115 “XM”	85010096 Clamp 55–115 “XH”	85010110 Downtilt Kit “XM”	85010099 Downtilt Kit “XH”	85010102 3-Sector Clamp Kit “XH”	85010104 Offset “XH”	85010098 Azimuth Adjust- ment “XH”	85010103 85010108 2x Panel Mount- ing Kit “XH”
85010111 Clamp 55–115 “XM”	—	—	✓	✗	—	✗	✗	—
85010096 Clamp 55–115 “XH”	—	—	✓	✓	—	✓	✓	—
85010110 Downtilt Kit “XM”	✓	✓	—	—	✓ ²⁾	✗	✗	✓
85010099 Downtilt Kit “XH”	✗	✓	—	—	✓ ²⁾	✗	✗	✓
85010102 3-Sector Clamp Kit “XH”	—	—	✓ ²⁾	✓ ²⁾	—	✓ ²⁾	✓ ²⁾	✗
85010104 Offset “XH”	✗	✓	✗	✗	✓ ²⁾	—	✗	✗
85010098 Azimuth Adjustment “XH”	✗	✓	✗	✗	✗	✗	—	✗
85010103 85010108 2x Panel Mounting Kit “XH”	—	—	✓	✓	✗	✗	✗	—
“XM” Antenna 378	✓	✓	✓	✓	✓	✓ ³⁾	✓ ³⁾	✓
“XM” Antenna 508	✓	✓	✓	✓	✓ ¹⁾	✓ ³⁾	✓ ³⁾	✗
“XH” Antenna 378	✗	✓	✗	✓	✓	✓	✓	✓
“XH” Antenna 508	✗	✓	✗	✓	✓ ¹⁾	✓	✓	✗

✓ OK

✗ Not allowed

1) Only possible in combination with 3x Offset “XH”

2) The use of Downtilt kit “XM” / “XH” in combination with Offset “XH” / Azimuth Adjustment “XH” is strictly forbidden

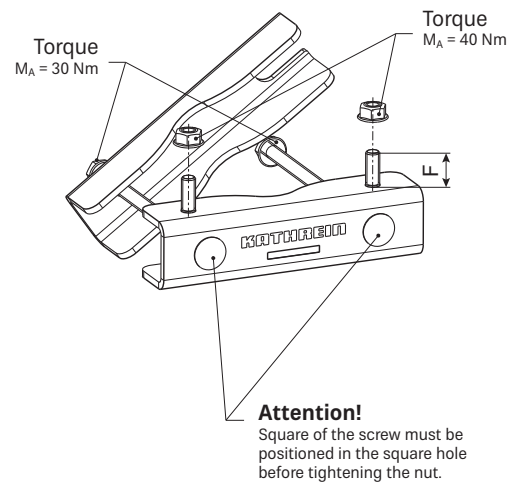
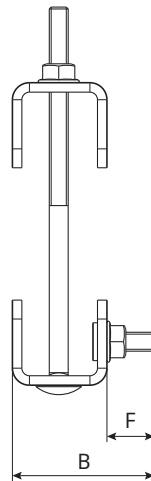
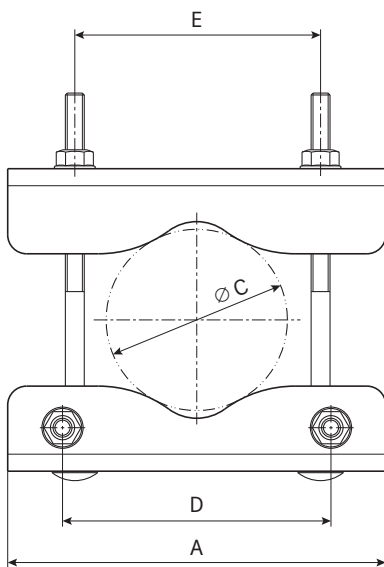
3) With Clamp “XH” / Accessories “XH” / Antenna “XM”

Mounting Hardware Clamps (Wind Load Category "XM")

KATHREIN

Clamps 55-115mm XM

Type No.		85010111
Suitable for mast diameter	mm inches	55 - 115 2.2 - 4.5
Scope of supply		2 x clamps
Material - Clamp - Screws - Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	4.5 9.9



	A	B	C	D	E	F
mm	200	75	55 - 115	142	130	(25)
inches	7.9	2.9	2.2 - 4.5	5.6	5.1	(1)

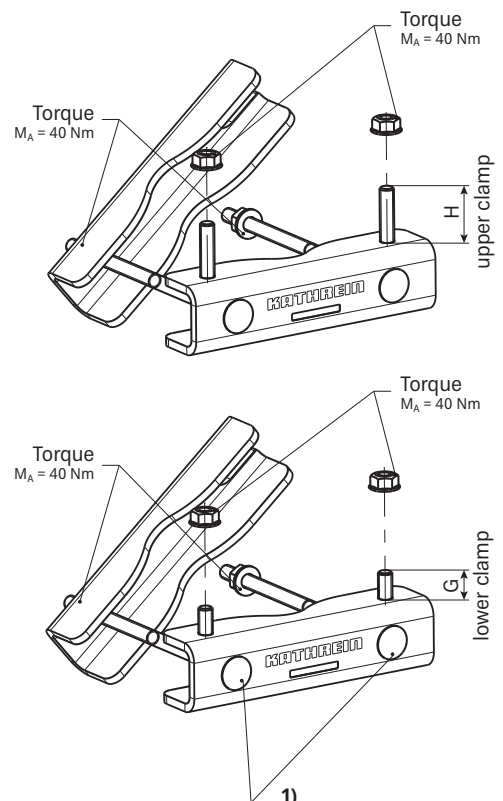
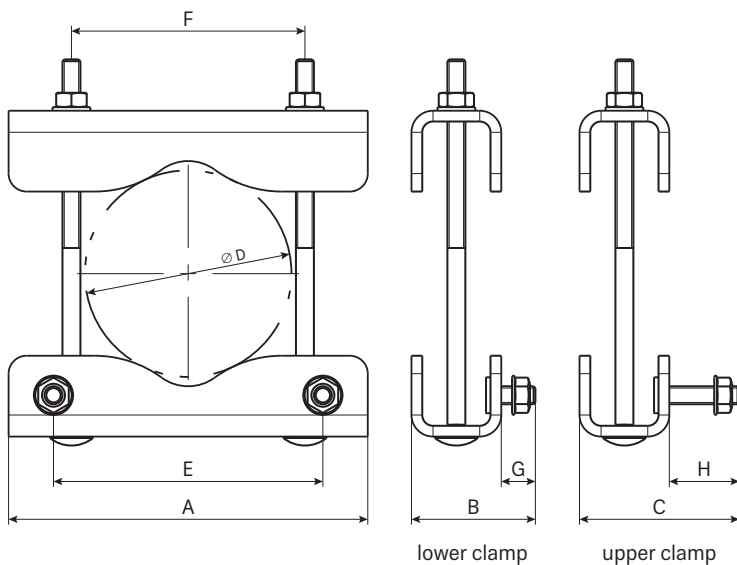
Please note: Kathrein does not recommend to use counter nuts.

Mounting Hardware Clamp (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010096
Suitable for mast diameter	mm inches	55 - 115 2.2 - 4.5
Scope of supply		1 x lower clamp 1 x upper clamp
Material - Clamp - Screws - Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	5.0 11.0



- 1)
Attention!
Square of the screw must be positioned in the square hole before tightening the nut.
2)
All nuts have the same wrench size 17.

	A	B	C	D	E	F	G	H
mm	200	69	89	55 - 115	150	130	(19)	(39)
inches	7.9	2.7	3.5	2.2 - 4.5	5.9	5.1	(0.7)	(1.5)

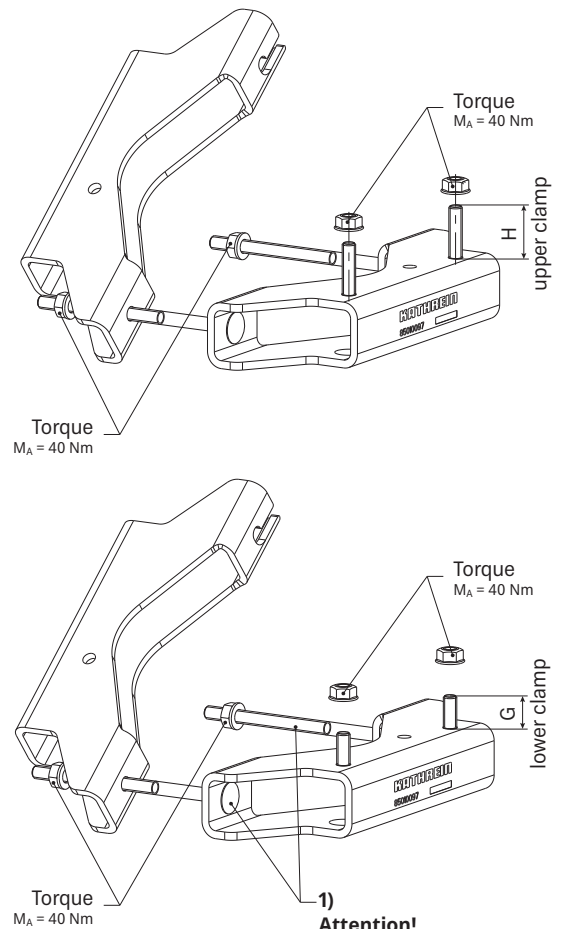
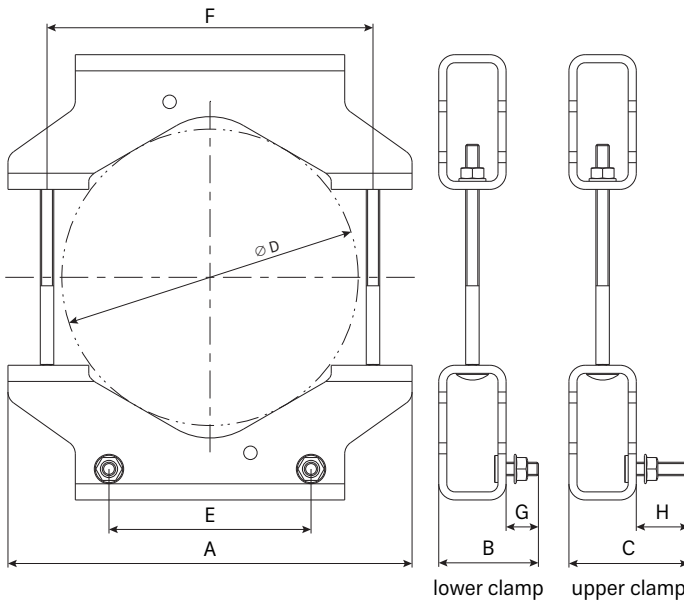
Please note: Kathrein does not recommend to use counter nuts.

Mounting Hardware Clamp (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010097
Suitable for mast diameter	mm inches	110 – 220 4.3 – 8.7
Scope of supply		1 x lower clamp 1 x upper clamp
Material – Clamp – Screws – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	9.4 20.7



1)
Attention!
Square of the screw must be positioned in the square hole before tightening the nut.
2)
All nuts have the same wrench size 17.

	A	B	C	D	E	F	G	H
mm	300	69	89	110 – 220	150	242	(19)	(39)
inches	11.8	2.7	3.5	4.3 – 8.7	5.9	9.5	(0.7)	(1.5)

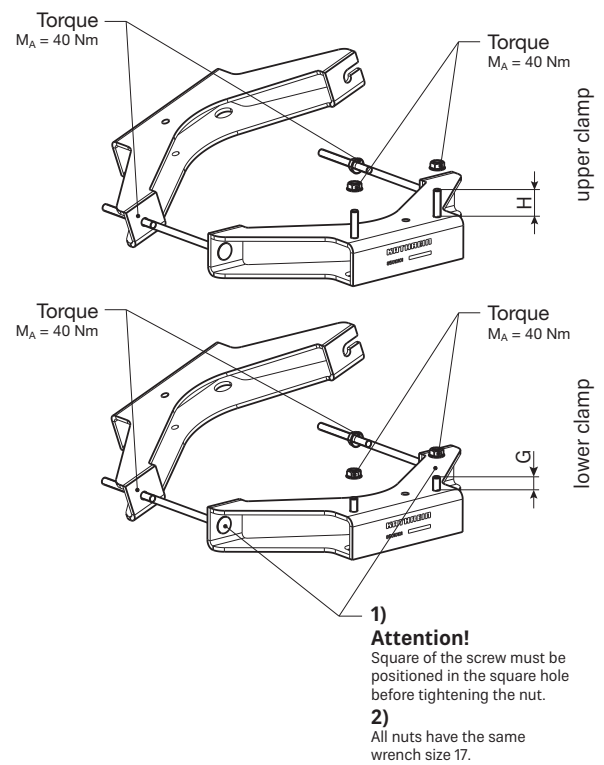
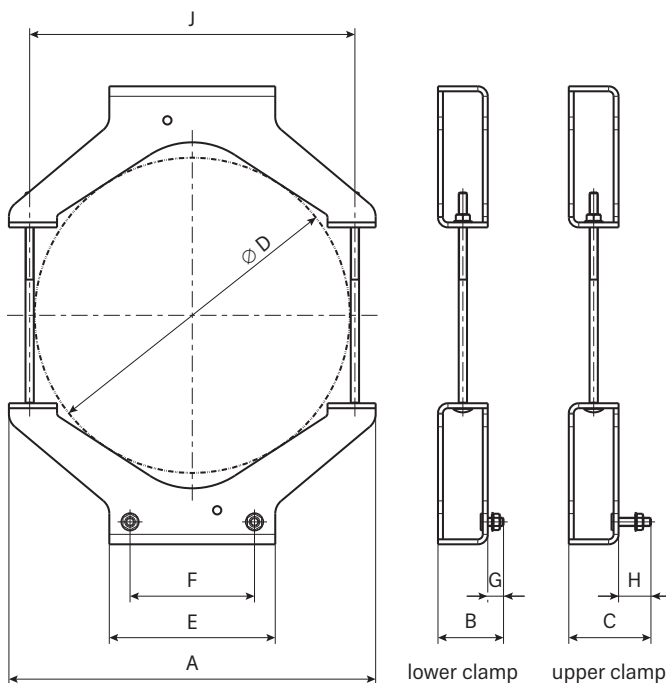
Please note: Kathrein does not recommend to use counter nuts.

Mounting Hardware Clamp (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010101
Suitable for mast diameter	mm inches	210 – 380 8.27 – 14.96
Scope of supply		1 x upper clamp 1 x lower clamp
Material – Clamp – Screws – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	14.6 32.2



	A	B	C	D	E	F	G	H	J
mm	442	79	99	210 – 380	200	150	19	39	392
inches	17.4	3.1	3.9	8.27 – 14.96	7.87	5.9	0.75	1.54	15.43

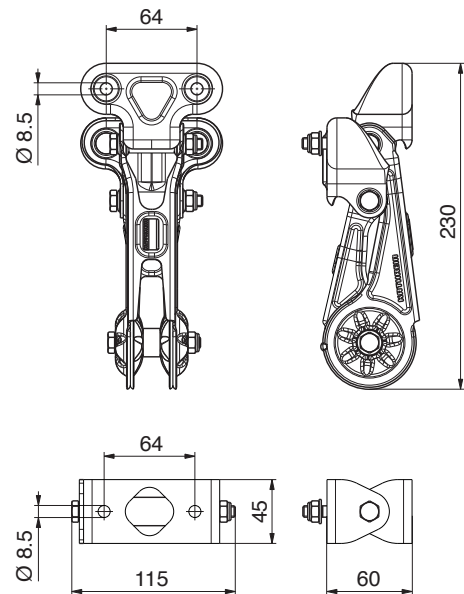
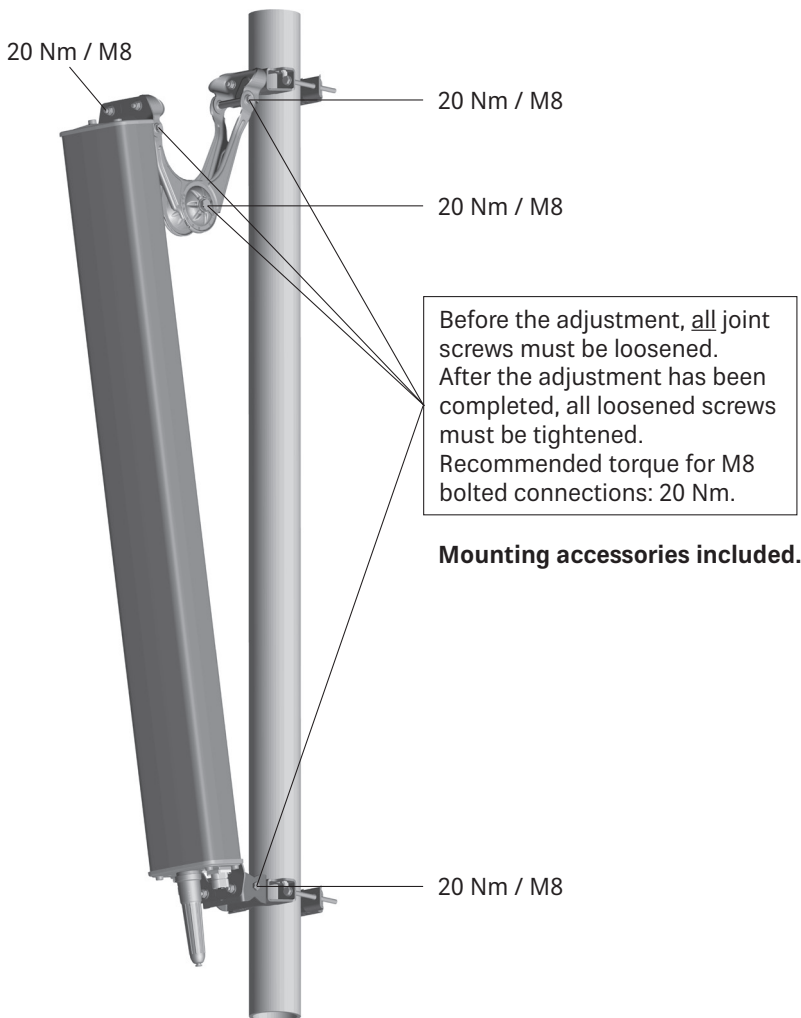
Please note: Kathrein does not recommend to use counter nuts.

Standard Downtilt kit for Panel Antennas (Wind Load Category "L")

KATHREIN

Downtilt kit

Type No.	732327
Preferred range of use	- Panel antennas with attached mounting plates - Downtilt kit without scale for universal use
Weight	1.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts / washers	Stainless steel



Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 42 mm.

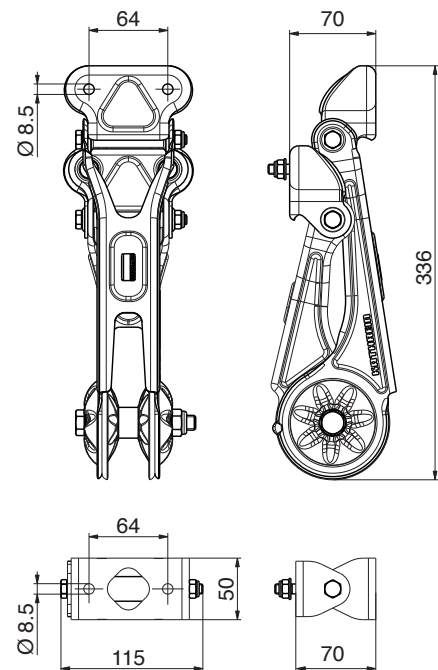
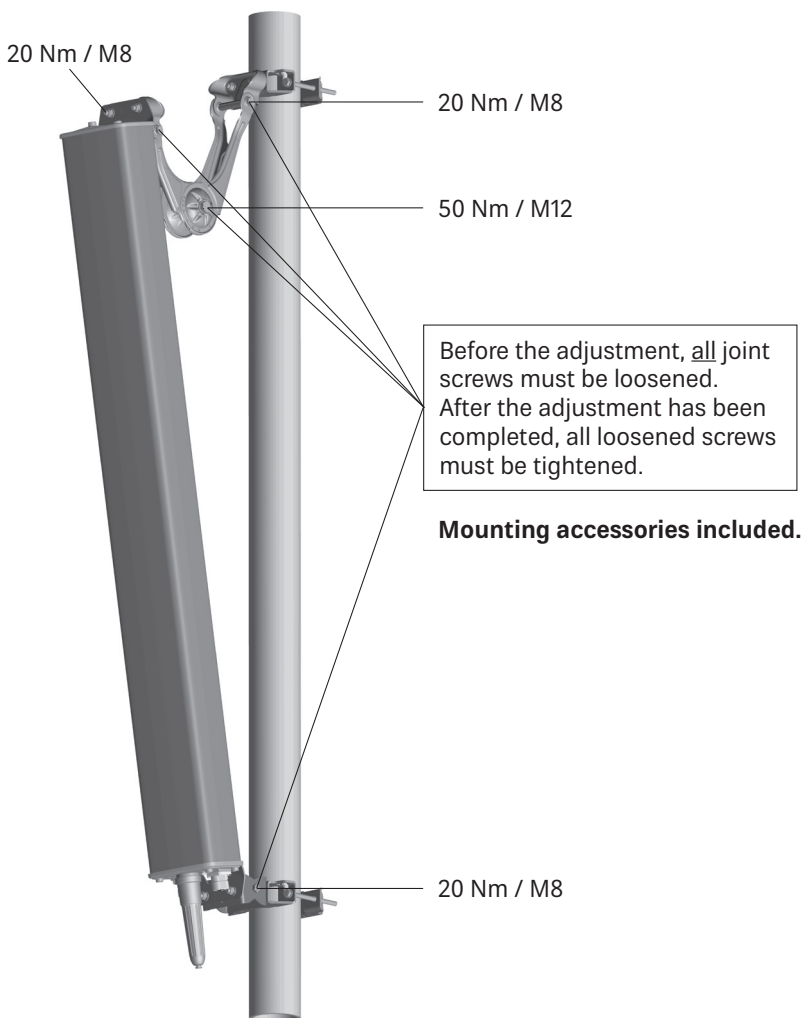
Use the downtilt kit together with the clamps as described in the antenna datasheet.

Standard Downtilt kit for Panel Antennas (Wind Load Category “L” and “M”)

KATHREIN

Downtilt kit

Type No.	737978
Preferred range of use	- Panel antennas with attached mounting plates - Downtilt kit without scale for universal use
Weight	2.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts / washers	Stainless steel



Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 70 mm.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

Standard Downtilt kit for Panel Antennas (Wind Load Category “H”)

KATHREIN

Special downtilt kit for Panel antennas with wind load category “H”.

Downtilt kit

Type No.		85010009	
Preferred range of use		– Panel antennas with attached mounting plates – Downtilt kit without scale for universal use	
Weight	kg	4.4	
	lb	9.7	
Material		Hot-dip galvanized steel	
Screws		Hot-dip galvanized steel / stainless steel	
Nuts		Stainless steel	

Attention: The downtilt kit is not to be used together with azimuth kits or offsets.

Recommended mast clamps:

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
738546	1 clamp	42–115 1.7–4.5	1.1 2.4	2
85010212	1 clamp	55–115 2.2–4.5	1.6 3.5	2
85010002	1 clamp	110–220 4.3–8.7	2.7 6.0	2
85010003	1 clamp	210–380 8.3–14.9	4.8 10.6	2

Recommended torque for bolted connections:

Screw size		Torque
M8	Nm	20
M10	Nm	50
M12	Nm	85

Maximum acceptable load:

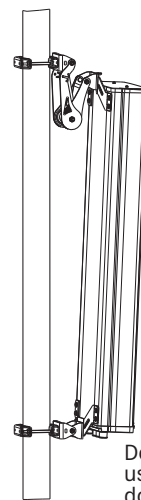
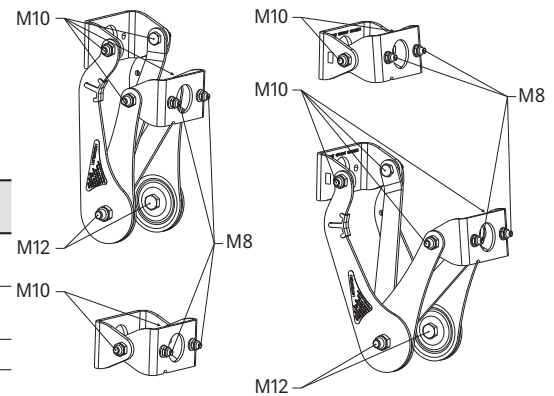
Frontal wind load	N lbf	< 5000 1124
Lateral wind load	N lbf	< 1300 292

Instructions to adjust the required downtilt angle are given in the antenna datasheet or on the rearside of the antenna.

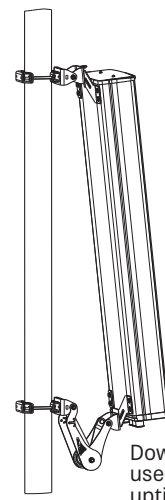
Mounting this downtilt kit enlarges the spacing between mast and antenna by a minimum of 100 mm | 3.9 inches.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

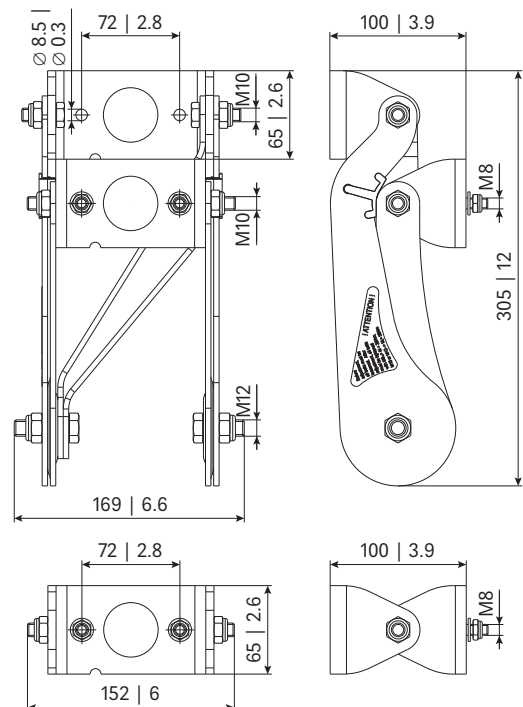
The downtilt kit can also be used for uptilting the antenna.



Downtilt kit used for downtilt



Downtilt kit used for uptilt



All dimensions in mm | inches

Standard Downtilt kit for Panel Antennas (Wind Load Category “XM”)

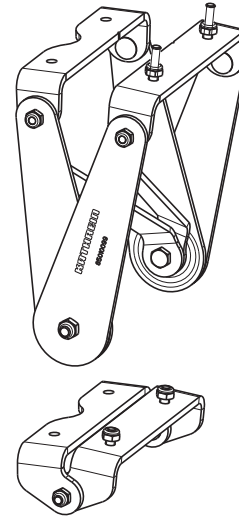
KATHREIN

Special downtilt kit for Panel antennas with wind load category “XM”.

Downtilt kit XM

Type No.		85010110	
Preferred range of use		– Panel antennas with attached mounting plates – Downtilt kit without scale for universal use	
Weight	kg lb	8.5 18.7	
Material	Hot-dip galvanized steel		
Screws	Hot-dip galvanized steel		
Nuts	Stainless steel		

Attention: The downtilt kit is not to be used together with azimuth kits or offsets.



Recommended mast clamps:

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
85010111	2 clamps	55 – 115 2.2 – 4.5	4.5 9.9	1
85010097	2 clamps	110 – 220 4.3 – 8.7	9.7 20.7	1

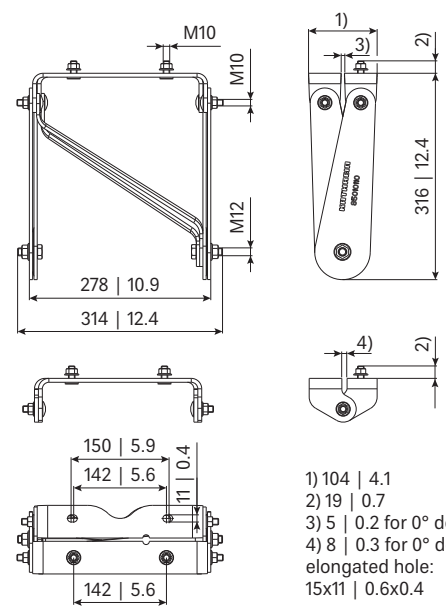
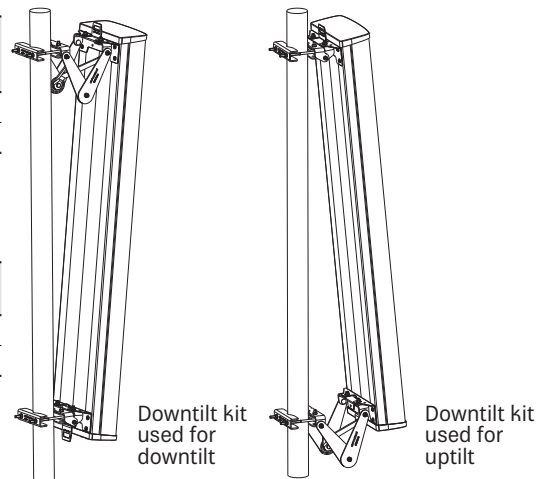
Recommended torque for bolted connections:

Screw size		Torque
M10	Nm	50
M12	Nm	85

Instructions to adjust the required downtilt angle are given in the antenna datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by a minimum of 59 mm | 2.3 inches.

Use the downtilt kit together with the clamps as described in the antenna datasheet.



- 1) 104 | 4.1
- 2) 19 | 0.7
- 3) 5 | 0.2 for 0° downtilt
- 4) 8 | 0.3 for 0° downtilt
- elongated hole:
15x11 | 0.6x0.4

All dimensions in mm | inches

Standard Downtilt kit for Panel Antennas (Wind Load Category “XH”)

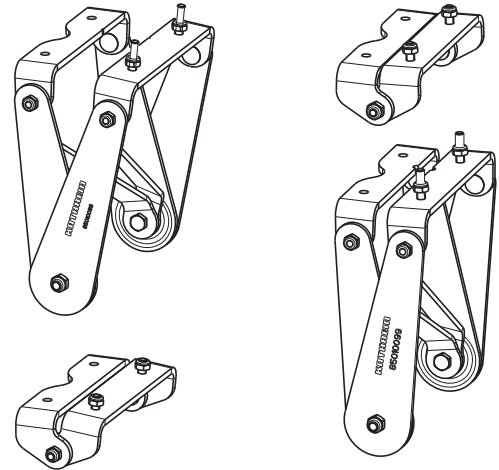
KATHREIN

Special downtilt kit for Panel antennas with wind load category “XH”.

Downtilt kit

Type No.		85010099
Preferred range of use		- Panel antennas with attached mounting plates - Downtilt kit without scale for universal use
Weight	kg lb	10.6 23.4
Material	Hot-dip galvanized steel	
Screws	Hot-dip galvanized steel	
Nuts	Stainless steel	

Attention: The downtilt kit is not to be used together with azimuth kits or offsets.

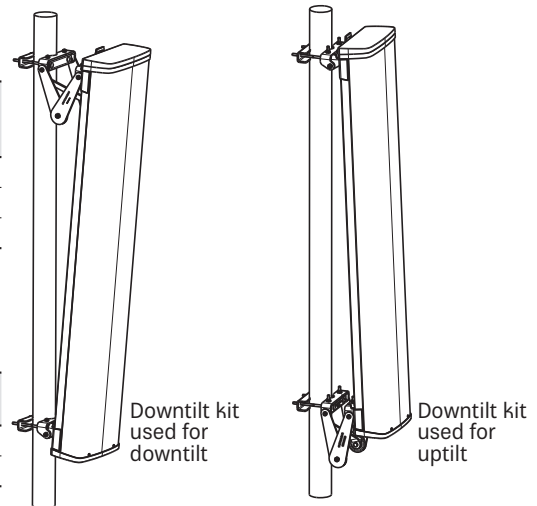


Recommended mast clamps:

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
85010096	2 clamps	55-115 2.2-4.5	5.0 11.0	1
85010097	2 clamps	110-220 4.3-8.7	9.7 20.7	1
85010101	2 clamps	210-380 8.3-14.9	14.6 32.2	1

Recommended torque for all bolted connections:

Screw size		Torque
M10	Nm	50
M12	Nm	85



Maximum acceptable load:

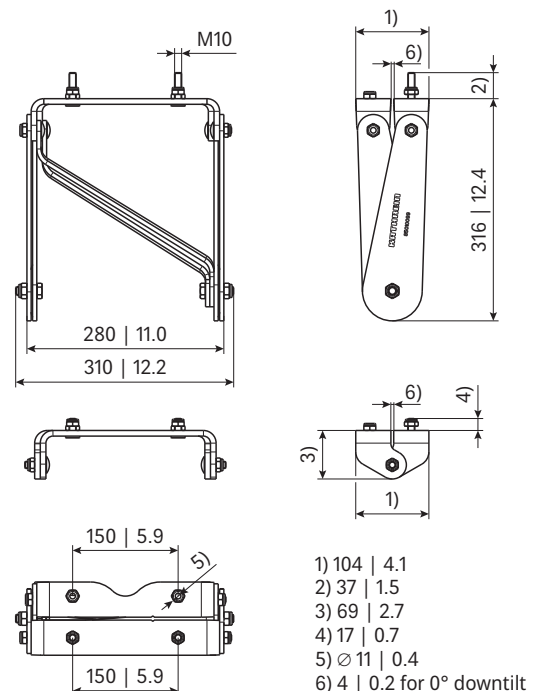
Frontal wind load	N lbf	< 6000 2348.9
Lateral wind load	N lbf	< 1950 438.4

Instructions to adjust the required downtilt angle are given in the antenna datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by a minimum of 59 mm | 2.3 inches.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

The downtilt kit can also be used for uptilting the antenna with an angle up to max. 2.5°.



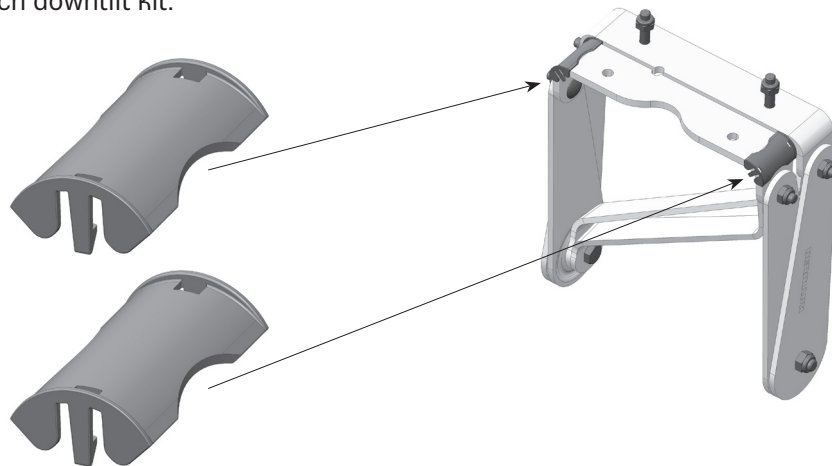
All dimensions in mm | inches

Mounting Hardware

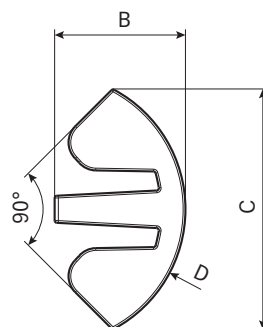
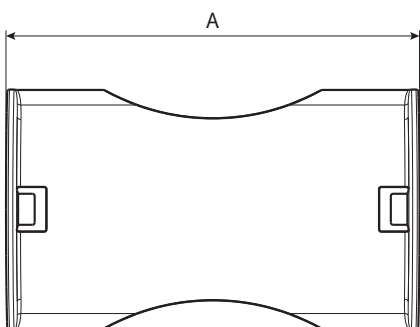
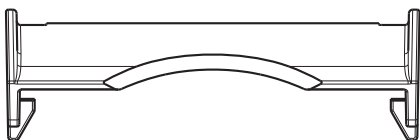
Spacer for Downtilt Kit

(Wind Load Category “XM” and “XH”)

- Plastic spacer to ease mounting of the Downtilt Kit XH 85010099 and XM 85010110 in “no-downtilt” position (0°), only.
- For downtilt positions > 0°, no spacer is needed. If spacers have been attached anyway, they have to be removed.
- High performance plastic with exceptional UV-stability.
- Snap-on design for easy assembly prior mounting the downtilt kit.
- Two spacers necessary for each downtilt kit.



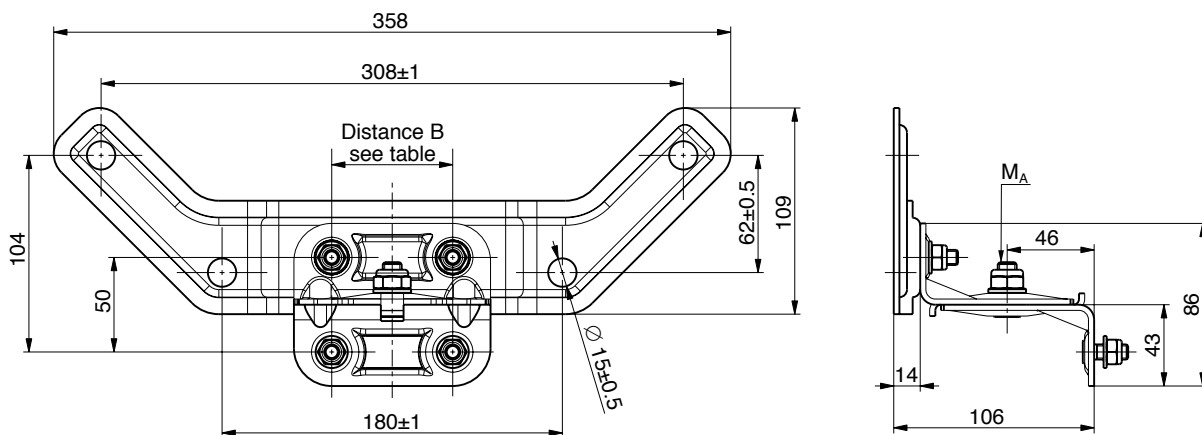
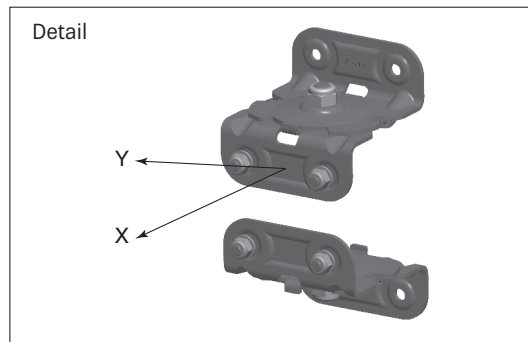
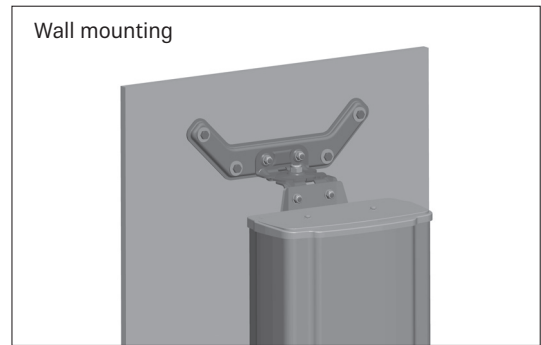
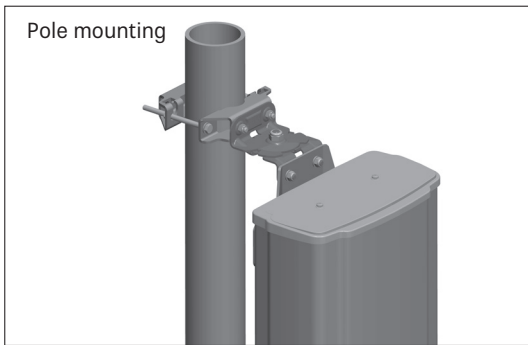
Type No.	Description	Packing unit
85010512	Spacer for Downtilt Kit XH 85010099	50 pcs.
85010513	Spacer for Downtilt Kit XM 85010110	50 pcs.



		85010512	85010513
A	mm inches	54.7 2.2	54.7 2.2
B	mm inches	17.3 0.7	15.3 0.6
C	mm inches	31.8 1.3	29.0 1.1
D	mm inches	R 19.5 R 0.8	R 17.5 R 0.7

Mounting Hardware Azimuth Adjustment Kits (Wind Load Category “L”, “M” and “H”)

KATHREIN



The azimuth adjustment kit for pole mounting can be mounted with all suitable clamps, 3-Sector clamps and 2x Panel mounting kits (with the latter only as an interface between mounting kit and antenna).

Type No.	85010014	85010015	85010016	85010017
Suitable for	pole mounting		wall mounting	
Number of pieces	2 brackets	2 brackets	2 brackets	2 brackets
Distance between screws [B]	64 mm	72 mm	64 mm	72 mm
Angular range	± 30°		± 30°	
Weight / kit	approx. 1260 g	approx. 1260 g	approx. 2500 g	approx. 2500 g
Supplied mounting accessories	all screws		Screws and dowels for wall fastening are not supplied, they must be chosen by installer according to on-site requirements.	
Materials	Parts are hot-dip galvanized steel; Captive nuts are stainless steel			
Max. permissible static load / kit				
- X direction	2150 N	5100 N	2150 N	5100 N
- Y direction	760 N	1350 N	760 N	1350 N

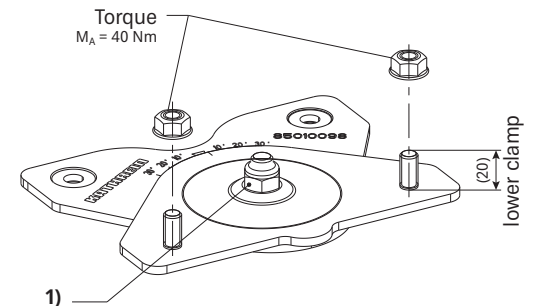
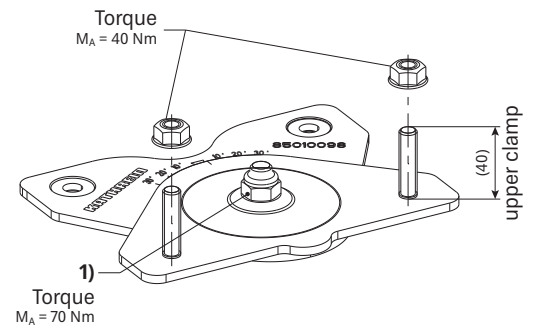
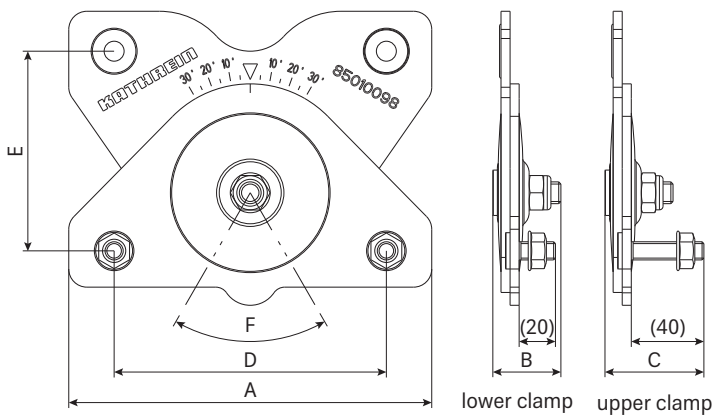
**Recommended torque: Screws M6: 8 Nm; Screws M8: 20 Nm; MoS₂ greased.
Minimum torque MA: 30 Nm; MoS₂ greased**

Mounting Hardware Azimuth Adjustment (Wind Load Category "XH")

KATHREIN

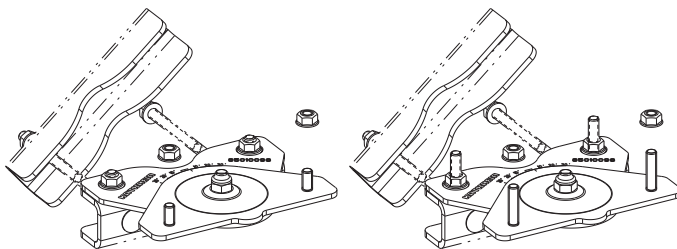
Clamp

Type No.		85010098
Scope of supply		1 x lower clamp 1 x upper clamp
Material – Clamp – Bolts – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg	3.3
	lb	7.3



1) Attention!

Do not remove the self-locking nut.
For the azimuth adjustment range loosen only the self-locking nut (one or two rotations) and afterwards tighten it with a torque $M_A = 70 \text{ Nm}$.



	A	B	C	D	E	F
mm	200	37.5	54.5	150	110	$\pm 30^\circ$
inches	7.9	1.48	2.15	5.9	4.3	

Please note:
Kathrein does not recommend to use counter nuts.

Mounting Hardware

3 Sector Clamp Kit

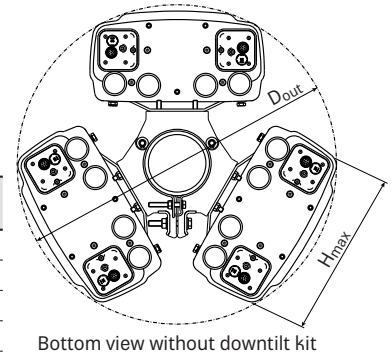
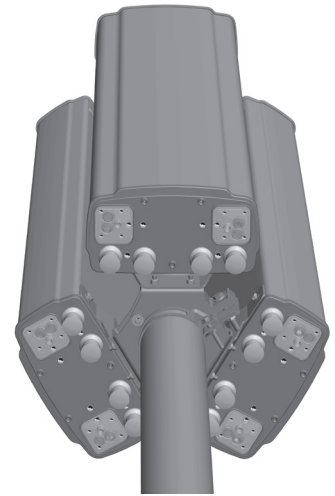
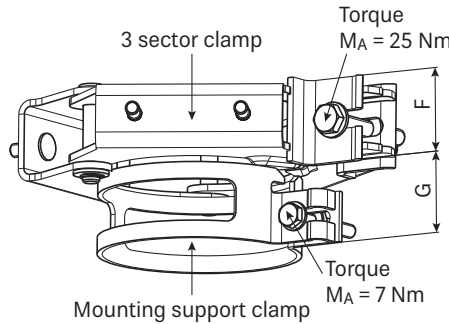
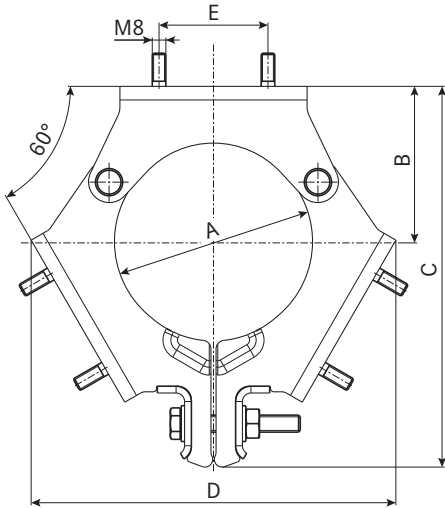
(Wind Load Category “L”, “M” and “H”)

KATHREIN

- Slim and unobstrusive design.
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width less than 400 mm | 15.7 inches (H_{max}).

Please note:

Panels with connector position “Rearside” fit only with downtilt kit, azimuth adjustment kit or offset mounted in-between.



Type No.	A	B	C	D	E	F	G	H _{max}	Weight kg lb
K742263	88.9 3.5	65 2.6	180 7.1	168 6.6	64 2.5	50 2.0	45 1.8	280 11.0	4 8.8
K742317	88.9 3.5	88 3.5	213 8.4	199 7.8	64 2.5	50 2.0	45 1.8	361 14.2	4 8.8
742033	114.3 4.5	92 3.6	217 8.5	207 8.1	64 2.5	50 2.0	45 1.8	377 14.8	4 8.8
742034	139.7 5.5	100 3.9	236 9.3	228 9.0	64 2.5	50 2.0	45 1.8	400 15.7	4 8.8
85010058	114.3 4.5	92 3.6	217 8.5	207 8.1	72 2.8	50 2.0	45 1.8	377 14.8	4 8.8
85010059	139.7 5.5	100 3.9	236 9.3	228 9.0	72 2.8	50 2.0	45 1.8	400 15.7	4 8.8

All dimensions in mm | inches.
D_{out} is determined by mounted components.

3 Sector Clamp Kit (Antenna Wind load Category “L” and “M”)

Type No.	K742263	K742317	742033	742034
Angle between antennas	120°	120°	120°	120°
Suitable for mast diameter	88.9 mm 3.5 inches	88.9 mm 3.5 inches	114.3 mm 4.5 inches	139.7 mm 5.5 inches
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel

3 Sector Clamp Kit (Antenna Wind load Category “H”)

Type No.	85010058	85010059
Angle between antennas	120°	120°
Suitable for mast diameter	114.3 mm 4.5 inches	139.7 mm 5.5 inches
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel

Mounting Hardware

3 Sector Clamp Kit

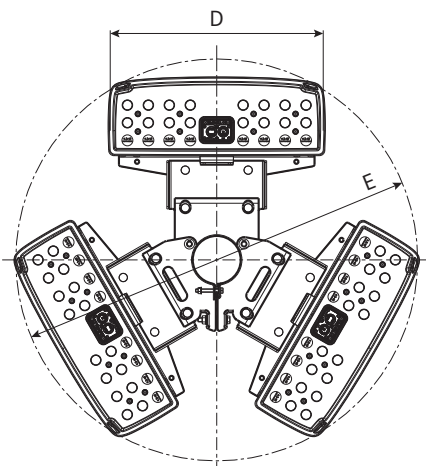
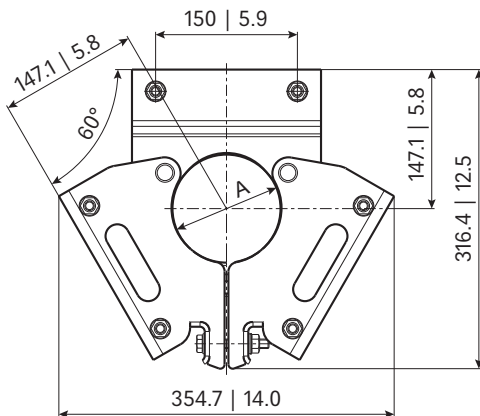
(Wind Load Category "XH")

KATHREIN

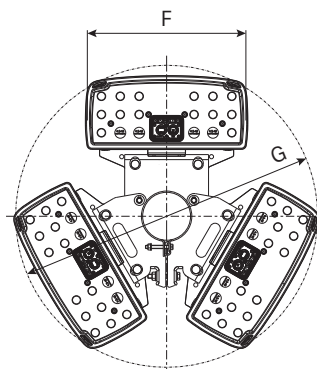
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width of 508 mm | 20.0 inches (H_{max}).

3 Sector Clamp Kit (Antenna Wind load Category "XH")

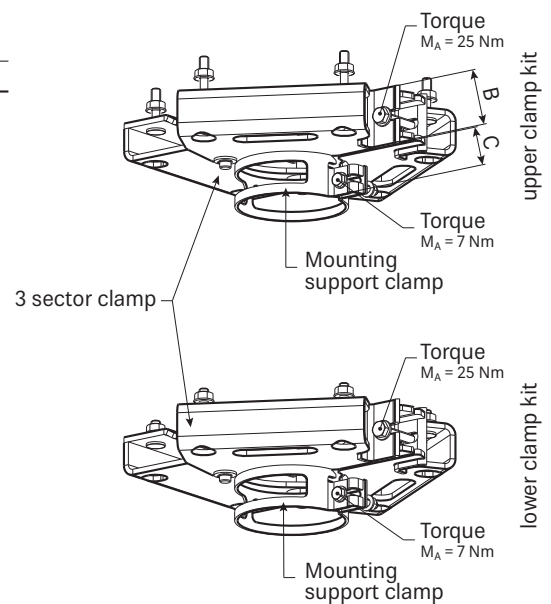
Type No.	85010102	
Angle between antennas	°	120
Suitable for mast diameter	mm	114.3
	inches	4.5
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	
Material	Hot-dip galvanized steel Aluminum Hot-dip galvanized steel Stainless steel	
Weight	kg lb	14.5 31.9



Bottom view with offset



Bottom view without offset



Dimensions	mm	inches
A	∅ 114.3	∅ 4.5
B	62	2.4
C	45	1.8
D	max. 508	max. 20.0
E	∅ 959	∅ 37.8
F	max. 378	max. 14.9
G	∅ 720.3	∅ 28.4

All dimensions in mm | inches

Please note:

Antennas with an antenna housing width 508 mm | 20.0 inches are only suitable in combination with offset 85010104 or downtilt kit 85010099.

A simultaneous combination of downtilt kit and offset is not permitted.

Possible accessories

85010104	Offset
85010099	Downtilt kit

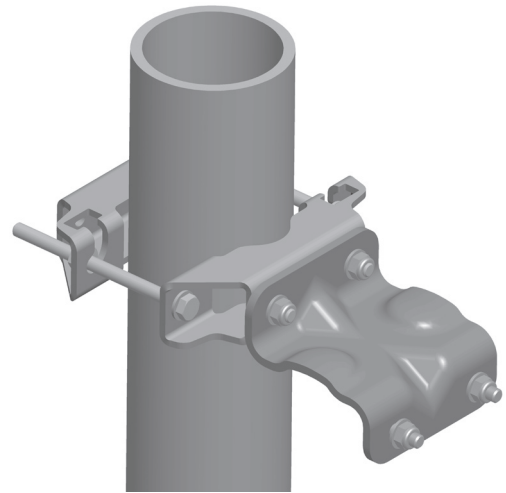
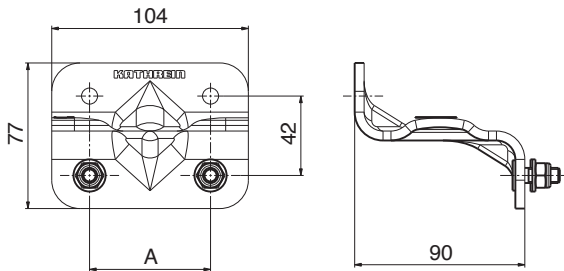
Mounting Hardware Offset for Panel Antennas (Wind Load Category "L", "M", "H" and "XH")

KATHREIN

Type No.	85010060	85010061
Wind load category	"L" and "M"	"H"
Quantity needed per antenna	2 x spacer	
Material: - spacer - nuts	Hot-dip galvanized steel Stainless steel	
Dimension "A"	64 mm	72 mm
Weight	0.65 kg	
Scope of supply	1 x spacer, Fitting accessories	

Recommended torque for M8 bolted connections: 20 Nm

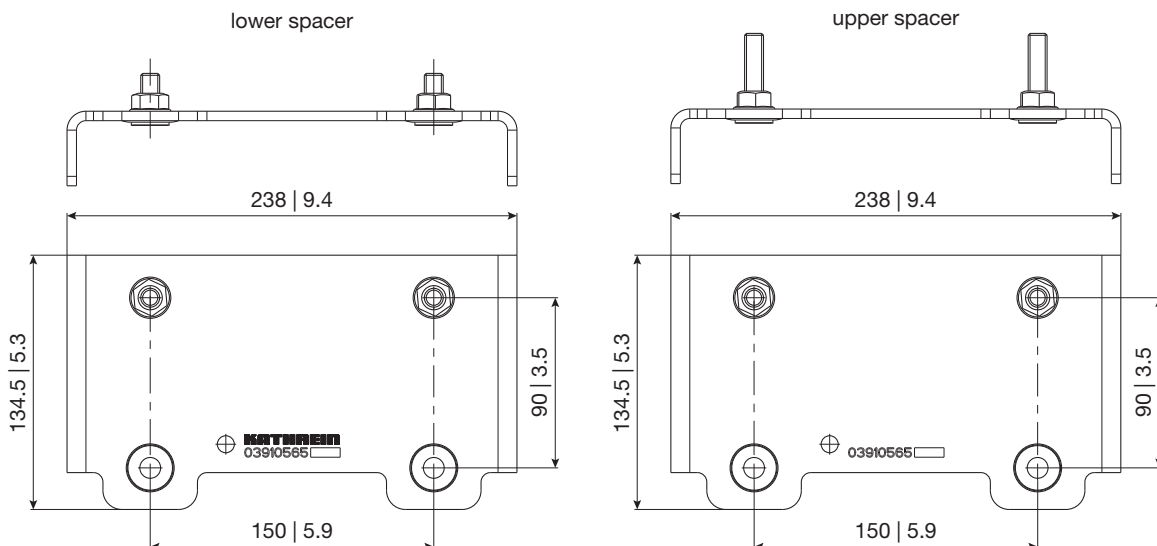
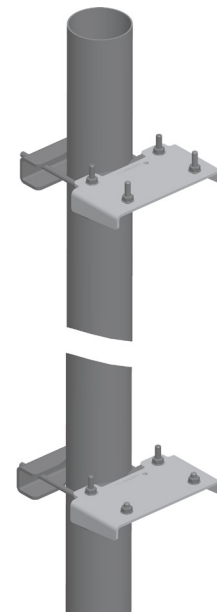
Please use the offset in combination with clamps corresponding to the pole diameter.



Type No.	85010104	
Wind load category	"XH"	
Quantity needed per antenna	1x spacer kit	
Material: - spacer - nuts	Hot-dip galvanized steel Hot-dip galvanized steel	
Weight	kg lb	2.88 6.35
Scope of supply	2 x spacer, Fitting accessories	

Recommended torque for M10 bolted connections: 40 Nm

Please use the offset in combination with clamps corresponding to the pole diameter.



All dimensions in mm | inches

Panel Accessories

2 x Panel Mounting Kit (Wind Load Category “L” and “M”)

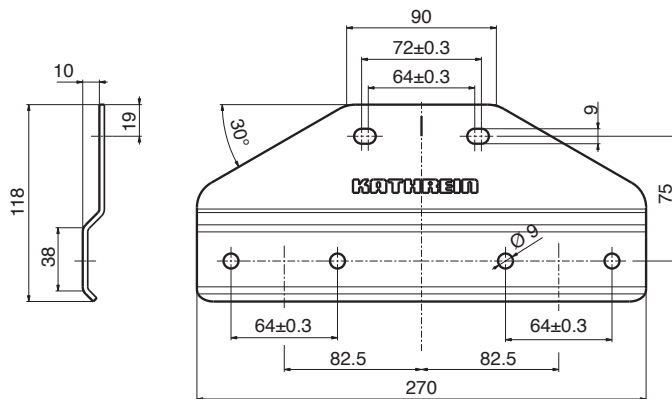
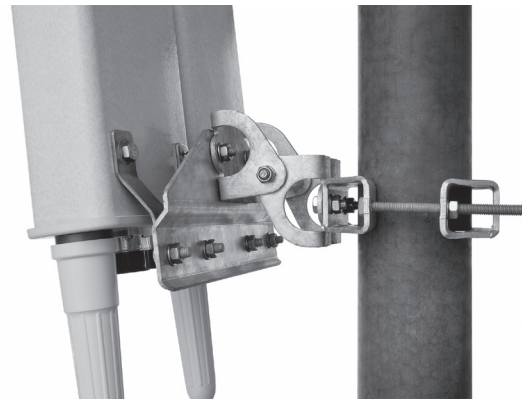
KATHREIN

Use this mounting kit only for Panels with a maximum width of 160 mm.
Wind load category: L (Light) or M (Medium)

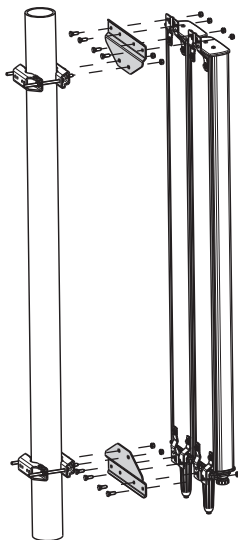
2 x Panel Mounting Kit

Type No.	742113
Contents	2 x brackets and mounting accessories
Material: - Clamp and screws - Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 1.6 kg

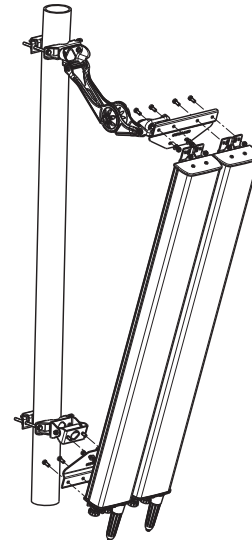
Recommended torque for M8 bolted connections: 20 Nm



Configuration without mechanical downtilt



Configuration with mechanical downtilt



Use the 2 x Panel Mounting Kit together with the following mounting accessories

Type No.	Description	Remarks	Weight approx.	Units per antenna
731651	1 clamp	Mast: 28 - 60 mm diameter	0.8 kg	2
738546	1 clamp	Mast: 42 - 115 mm diameter	1.1 kg	2
85010002	1 clamp	Mast: 110 - 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 - 380 mm diameter	4.8 kg	2
85010060	1 offset	in combination with the clamps	1.3 kg	2
737978	1 downtilt kit	Downtilt angle: depending on antenna height	2.3 kg	1

For a three sector panel arrangement, use the mounting kit type no. 742113 together with the three sector clamp K742317, 742033 or 742034. Three sector clamp K742263 does not match.

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

2 x Panel Mounting Kit

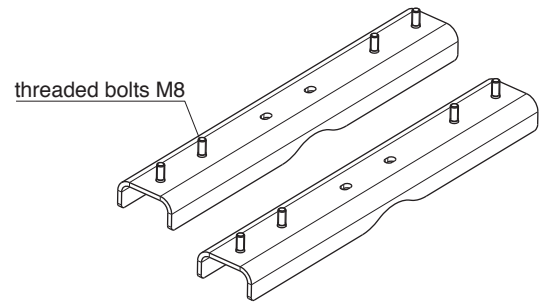
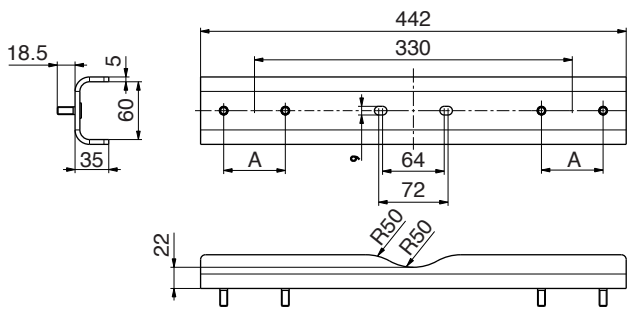
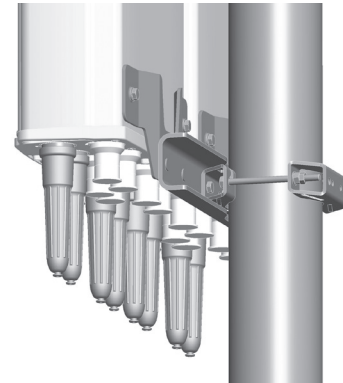
KATHREIN

(Wind Load Category "L", "M" and "H")

Use this mounting kit for Panels with a maximum width of 325 mm.

Type No.	85010075	85010076
Contents	2 x brackets and mounting accessories	
Material: - Clamp and screws - Nuts and washers	Hot-dip galvanized steel Stainless steel	
Weight	Approx. 3.3 kg	
Hole distance "A"	64 mm	72 mm
Windload category (Antenna)	"L" and "M"	"H"

Recommended torque for M8 bolted connections: 20 Nm



Configuration <i>without</i> mechanical downtilt	Configuration <i>with</i> mechanical downtilt

Mounting Accessories (order separately)

Clamps (only the listed clamps are allowed!)

Type No.	Description	Remarks	Weight approx.	Units per mounting kit
85010002	1 clamp	Mast: 110 - 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 - 380 mm diameter	4.8 kg	2
85010060	1 offset		1.3 kg	4
85010061	1 offset		1.3 kg	4

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

2 x Panel Mounting Kit

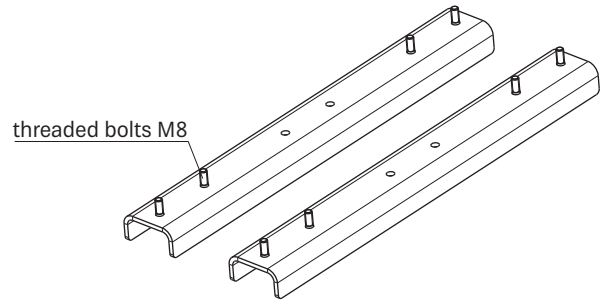
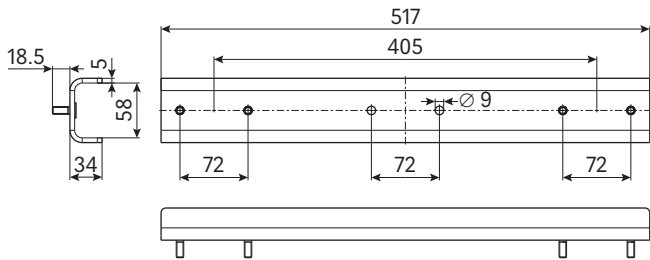
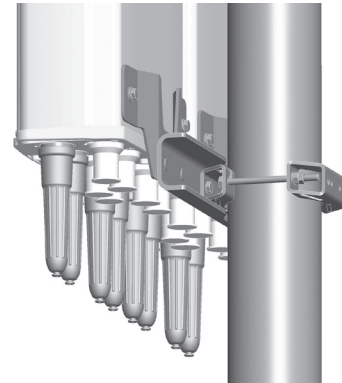
KATHREIN

(Wind Load Category "H")

Use this mounting kit for Panels with a maximum width of 377 mm.

Type No.	85010087
Contents	2 x brackets and mounting accessories
Material: - Clamp and screws - Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 3.3 kg
Hole distance	72 mm
Windload category (Antenna)	"H"

Recommended torque for M8 bolted connections: 20 Nm



Configuration without mechanical downtilt	Configuration with mechanical downtilt

Mounting Accessories (order separately)

Clamps (only the listed clamps are allowed!)

Type No.	Description	Remarks	Weight approx.	Units per mounting kit
85010212	1 clamp	Mast: 55-115 diameter	1.6 kg	2
85010002	1 clamp	Mast: 110-220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210-380 mm diameter	4.8 kg	2
85010008	Downtilt kit		4.3 kg	2

The downtilt kit can not be used in combination with any offset (85010060 and 85010061).

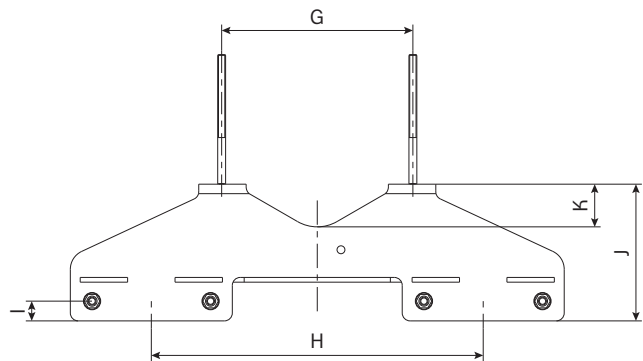
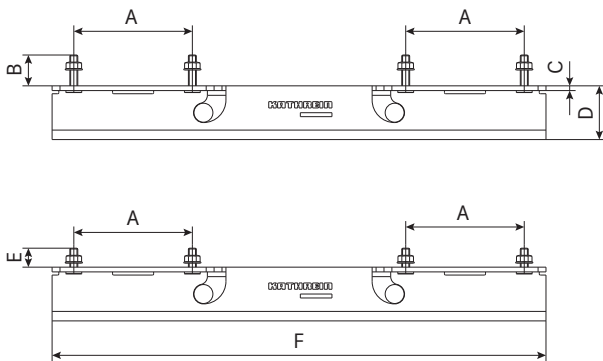
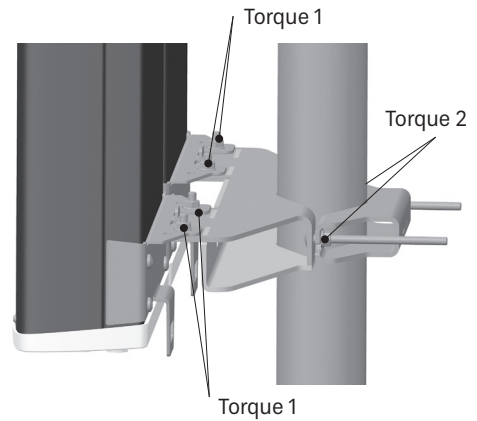
2 x Panel Mounting Kit

KATHREIN

(Wind Load Category "XH")

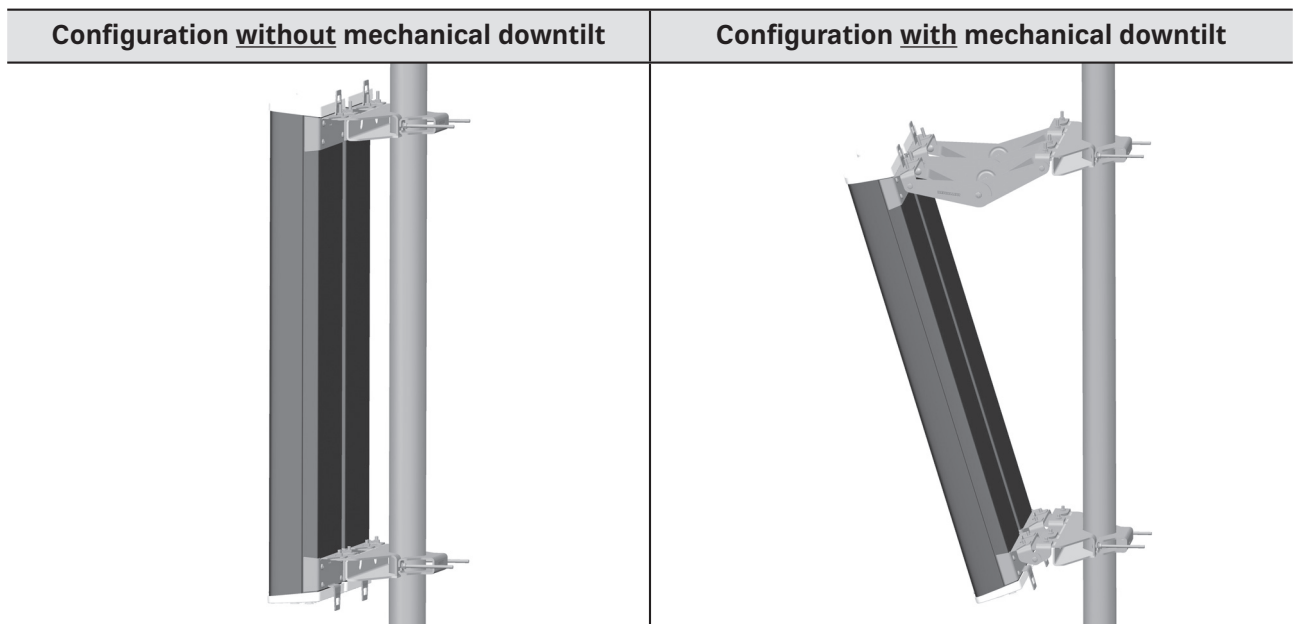
Use this mounting kit for Panels with a maximum width of 378 mm | 14.9 inches

Type No.		85010103	85010108
Contents		2 x clamps and mounting accessories	
Material: – Clamp and screws – Nuts and washers		Hot-dip galvanized steel Stainless steel	
Weight	kg lb	20.5 45.2	27.5 60.6
Suitable for mast Ø	mm inches	110 – 220 4.3 – 8.7	210 – 380 8.3 – 15.0
Torque M _A	1	Nm	40
Torque M _A	2	Nm	40
Windload category (Antenna)		"XH"	



Type		A	B	C	D	E	F	G	H	I	J	K
85010103	mm	150	39	6	68	24	625	242	420	25	173	54
	inches	5.91	1.54	0.24	2.68	0.84	24.61	9.53	16.54	0.98	6.81	2.13
85010108	mm	150	39	6	68	24	625	392	420	25	221	102
	inches	5.91	1.54	0.24	2.68	0.84	24.61	14.43	16.54	0.98	8.7	4.02

Please note: Kathrein does not recommend to use counter nuts.

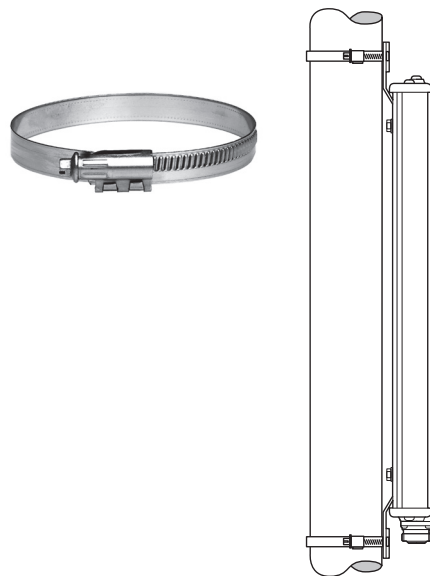


Type No.	Description	Weight approx. kg lb	Units per mounting kit
85010099	1 downtilt kit	10.6 23.4	2

Mounting Hardware Tension Band for Panel Antennas (Wind Load Category “L”)

KATHREIN

Type No.		734360	734361	734362	734363	734364	734365
Suitable for mast diameter	mm inches	34-60 1.3-2.4	60-80 2.4-3.1	80-100 3.1-3.9	100-120 3.9-4.7	120-140 4.7-5.5	45-125 1.8-4.9
Material		Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight (approx.)	kg	0.06	0.07	0.08	0.09	0.11	0.08
	lb	0.13	0.15	0.18	0.20	0.24	0.18
Contents		2 pcs	2 pcs	2 pcs	2 pcs	2 pcs	2 pcs



**Please note:
Only usable without downtilt kit!**

Massive MIMO Active Antenna Integration KIT for 448 Platform Antennas (MIK)

KATHREIN

Preliminary Issue

Type No.		85010217	
Preferred range of use		- Integration of massive MIMO active antenna with a 448 platform antenna - Panel antennas with attached mounting plates	
Weight	kg lb	14.3 31.5	without windshield 17.2 37.9 with windshield

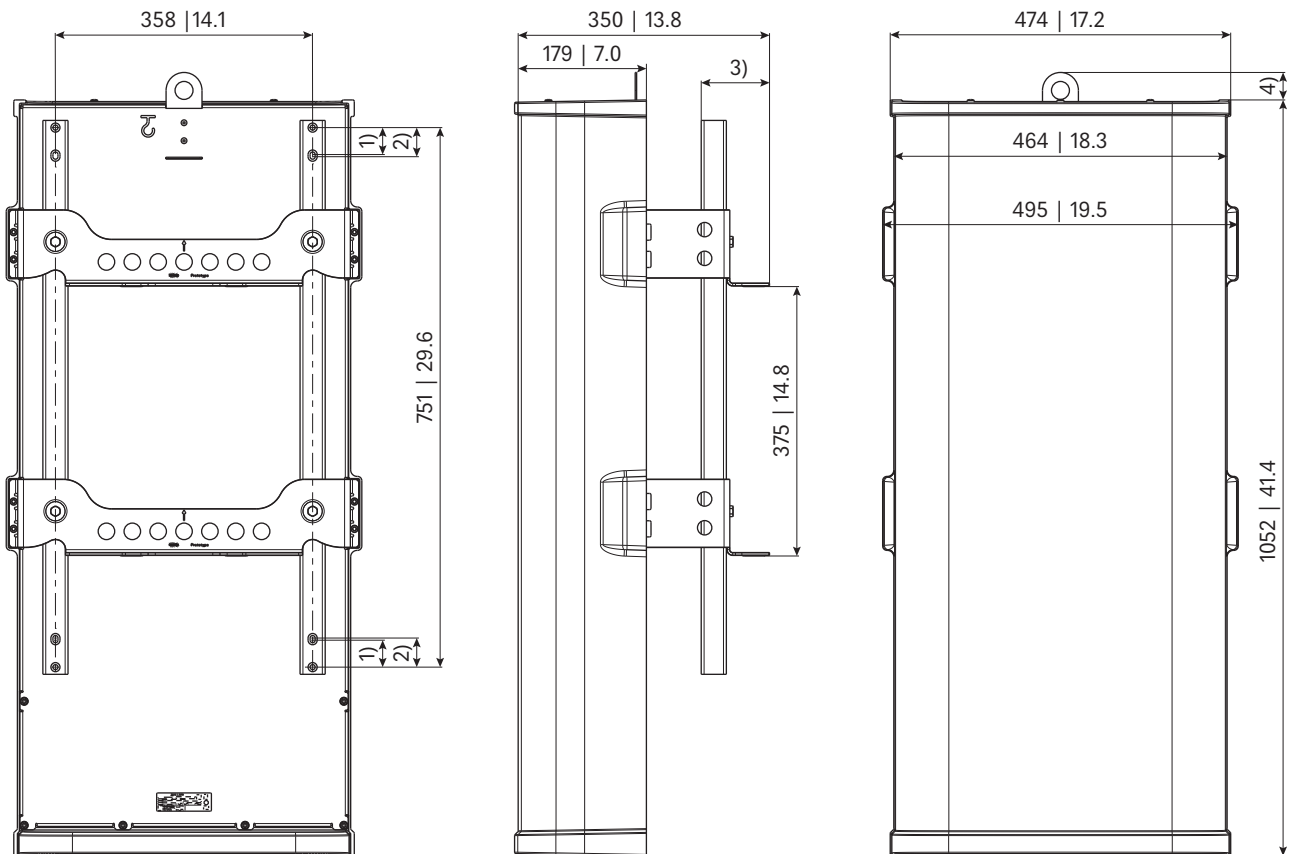
Attention: This MIK is only compatible to 448 platform antennas

Scope of supply

MIK	Radome and windshield (for installation without active antenna) or with Ericsson AIR 6488
Brackets	
Clamps	85010111
Spacer	Spacer for passive antenna to get aligned with MIK

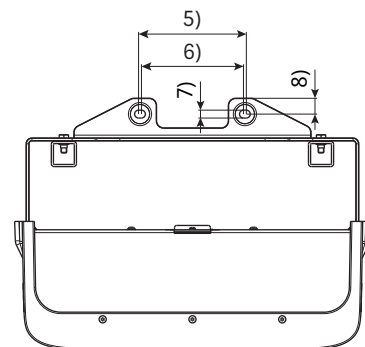
Accessories

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
85010097	2 clamps	110-220 4.3-8.7	9.7 20.7	1



- 1) 38 | 1.5
- 2) 41 | 1.6
- 3) 95 | 3.7
- 4) 38 | 1.5
- 5) 150 | 5.9
- 6) 142 | 5.6
- 7) 11 | 0.4
- 8) 22 | 0.9

All dimensions in mm | inches



Mechanical Integration Kit (MIK) for Nokia mMIMO Active Antennas (MAA) and 448 Platform Antennas

KATHREIN

Preliminary Issue

Type No.	85010213v01	
Preferred range of use	- Integration of massive MIMO active (MAA) antenna with a 448 platform antenna - Panel antennas with attached mounting plates	
MAA Compatibility	For MIK compatible MAA's, please refer to Nokia MAA data sheets	
Weight	kg lb	13 28.7 without windshield 16 35.3 with windshield

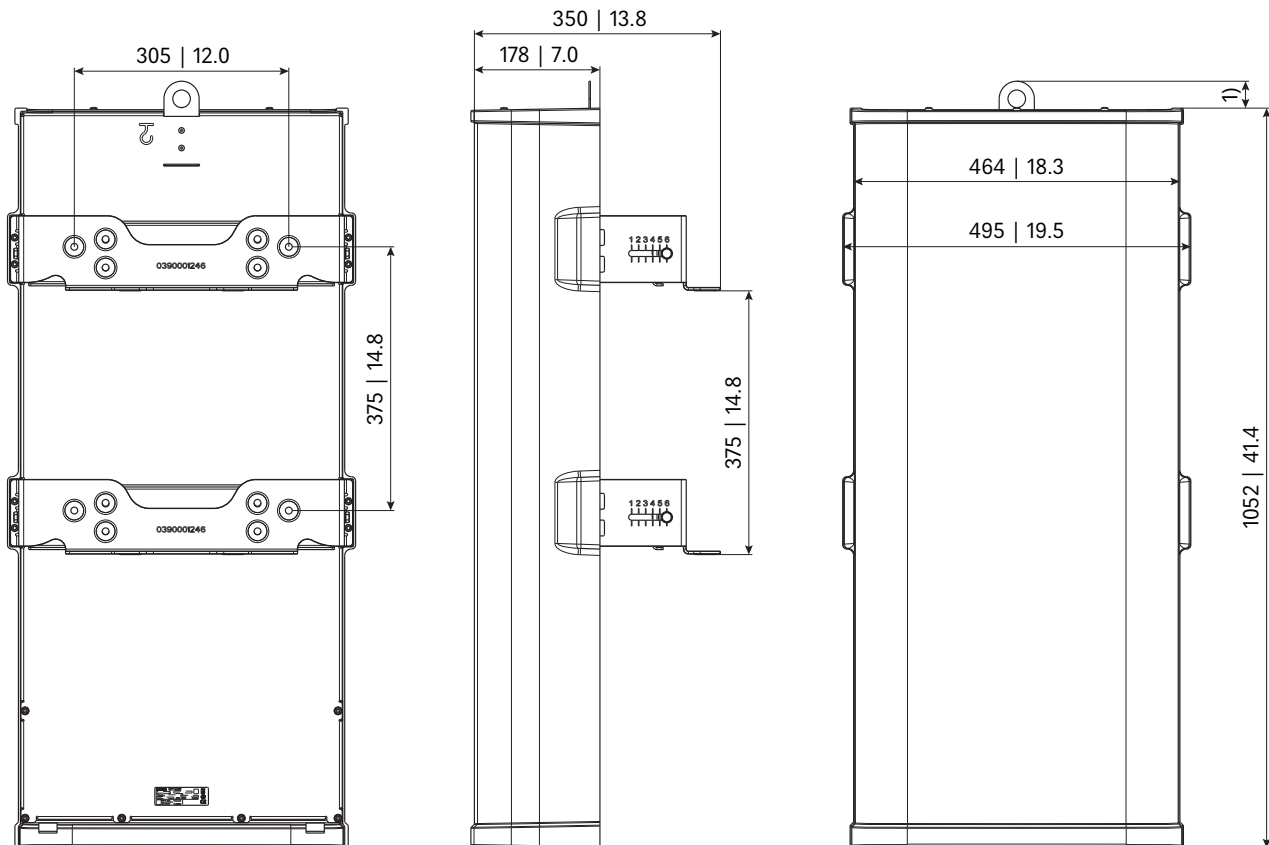
Attention: This MIK is only compatible to 448 platform antennas

Scope of supply

MIK	Radome and windshield (for installation without active antenna) or with Nokia MAA
Brackets	
Clamps	85010111
Spacer	Spacer for passive antenna to get aligned with MIK

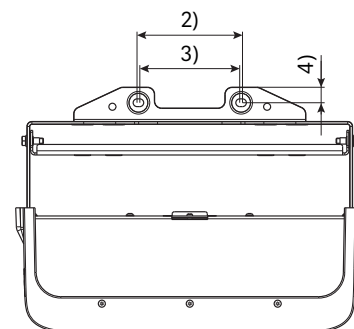
Accessories

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
85010097	2 clamps	110-220 4.3-8.7	9.7 20.7	1



- 1) 38 | 1.5
- 2) 150 | 5.9
- 3) 142 | 5.6
- 4) 22 | 0.9

All dimensions in mm | inches



Kathrein Mobile Communication offers a series of pole mounting kits for Kathrein Mobile Communication canister antennas. Mounting kits are available to secure Kathrein Mobile Communication antennas to the top of existing wood, metal, or concrete poles. These mounts are engineered to support these 2' tall, multi-band antennas in extreme environments. Depending on the type of pole the antenna is being mounted to, the Kathrein Mobile Communication pole mount kits come in two different colours (brown or grey).

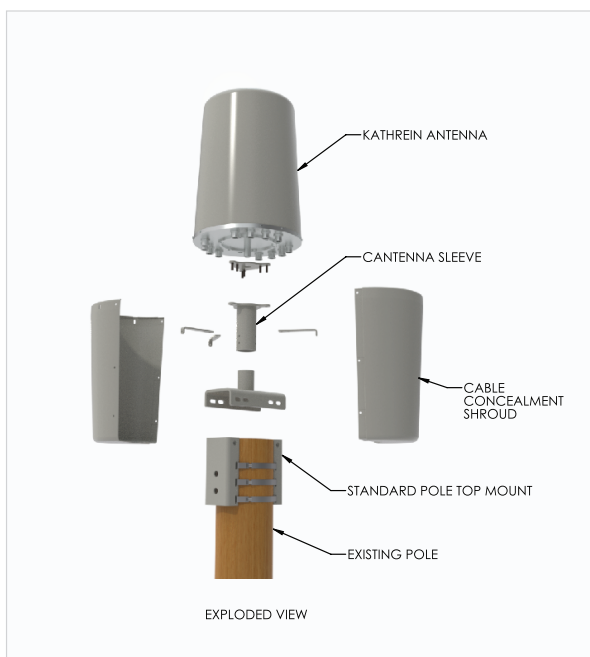
Type Number	Colour	Pole Diameter
84040600	Brown	Standard
84040601	Grey	Standard

Standard Pole Diameter is defined as 5.00" to 8.37"

Type Number	Colour	Pole Diameter
84040602	Brown	Wide
84040603	Grey	Wide

Wide Pole Diameter is defined as 5.25" to 14.12"

Standard Size Pole



Wide Diameter Pole



All kits include the pole top mount brackets, antenna sleeve, and cable concealment shroud.

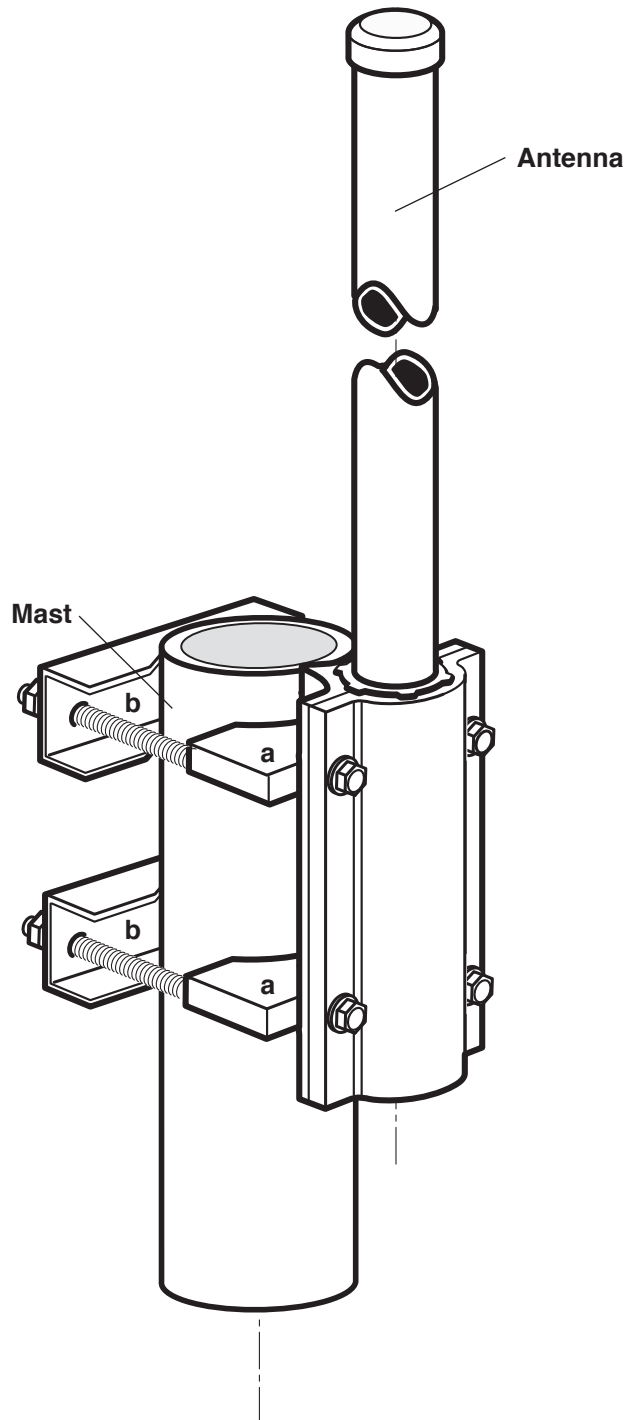
Kathrein Mobile Communication recommends using the standard pole top mount when possible due to the decreased shroud and mount size. The smaller size provides for better aesthetics.

Side-mounting Clamp Omnidirectional Antennas Large Pipe

KATHREIN

Type No. 738908

For masts of 94-125 mm diameter



GPS based Azimuth Adjustment tool to azimuth base station antennas in the field.

- Compatible to all Panel Antennas
- Easy to adapt onto an Antenna
- Compact size
- No cabling necessary

Type No.	86010157
GPS Sensor Specification	
Receiver Type	L1, C/A code, with carrier Phase smoothing
Channels	Two 12-channel, parallel tracking
SBAS Tracking	2-channel, parallel tracking
Used Geodetic System	WGS 84
Update Rate	10 Hz (10 measurement values per sec.)
Horizontal Accuracy	< 1.0 m 95% confidence (DGPS ¹⁾ < 2.5 m 95% confidence
Heading Accuracy ²⁾	± 0.8° (rms)
Tilt Accuracy ³⁾	± 0.25°
Orthometric Height Accuracy ⁴⁾	± 1 m (rms)
First start	max. 12 min. (primary initialisation of almanac)
Cold Start	< 60 s (no almanac or RTC)
Warm Start	< 20 s typical (almanac or RTC)
Heading Fix	< 10 s typical (valid position)
Interface	W-LAN (802.11); RS 232 (optional)
Power Supply	LiPo-Battery (14.8 V, 2200 mAh)
Input Voltage	18 – 28 VDC
Power Consumption	5 W nominal; 36 W charging mode
Protection class	IP 54
Operating Temperature	-10 °C to +50 °C
Storage Temperature	-10 °C to +60 °C
Charging Temperature	0 °C to +35 °C
Certifications	FCC; CE
Dimensions (L x W x H)	580 (900 deployed) x 116 x 65 mm
Weight	3.1 kg



¹⁾ Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity and use of SBAS.

²⁾ Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity.

³⁾ After calibration.

⁴⁾ Based on a 40 second time constant.

Tablet Specification	
Model	MioWork™ L 135
Display	10.1" 1280x800 WXGA with digitizer 650nits
Touch Panel	Capacitive multi-touch panel
Platform	TI OMAP 4470 1.5GHz
OS	Android™ 5.1
Memory	1GB RAM/16GB ROM
Expansion	User accessible MicroSD up to 32GB SDHC
Wireless Interface	NFC HF RFID: Type A (ISO/IEC1443 A) & Type B (ISO/IEC1443 B), ISO/IEC 15693, MIFARE 1k/4K, Felica® (Reader/Card mode)
	Wireless WAN data (3.5G) UMTS/HSPA 800/850/900/1700/1900/2100 MHz GSM 850/900/1800/1900 MHz, GPRS/EDGE Class12
	WiFi 802.11 a/b/g/n (with WPA and WPA2 Security, WiFi VPN; WiFi Direct)
	Bluetooth® 4.0 BLE
	GPS
Sensors	Accelerometer (auto rotation); eCompass; ambient light; vibration and temperature
BCR	1D/2D: Code CR8000
Camera	Front 1.2M front focus; Rear: 5M autofocus with flash LED
Physical Interface	Micro USB-B 2.0; USB Type A 2.0 (host and client)
	SIM card slot x1
	MicroSD slot
	10 pogo pin connector
	Built-in mic; built-in speaker; headset jack 3.5mm
	Power DC-jack
Buttons	Power; reset; volume up/down; programmable hotkeys x4
Battery	6720 mAH Lithium-Ion battery (rechargeable) – Battery life up to 8 hours
Environment	IP67 and 1.2m drop resistant to plywood (MIL-STD-810G)
	-10°C ~ +50°C operating, -20°C ~ +70°C storage (excl. LCM, battery, camera)
	Humidity: 0 ~ 90%, Non-Condense
	Altitude: Operating: 0 ~ 10,000 ft (3000 m)
Certification	CE/CB, BQB, IP67
Weight	980 g
Dimensions (L x W x H)	276.7 x 200 x 19.6 mm



similar images

Please note:

The installation team must be properly qualified and also be familiar with the relevant national safety regulations! Non-observance of these instructions may damage or destroy the devices. Death or severe injuries may occur!

The details given in the product documentation must be carefully followed during the installation and operation of the GPS Azimuth Adjustment Tool (read the product documentation thoroughly before connecting the GPS Azimuth Adjustment Tool to the power supply). The Adobe Reader for displaying PDF files is not installed ex works. The current version can be downloaded at www.adobe.com.

Antenna Monitoring Unit AMU

KATHREIN

GPS/GLONASS based Antenna Monitoring Unit to monitor base station antennas in the field.

- Compatible to all panel antennas
- Easy to adapt onto an antenna
- Hardware prepared for AISG 3.0
- Compact size
- BTS time sync via GPS clock

Antenna Monitoring Unit AMU

Type No.		86010129
Monitoring Unit		
Receiver Type		L1, C/A code
Channels		72 channel, GPS and GLONASS parallel tracking
Used Geodetic System		WGS 84
Horizontal Accuracy	m	± 10
Azimuth Accuracy*	°	1.7 (rms)
Tilt- Roll Accuracy*	°	± 2
Altitude Accuracy*	m	± 10
First start (after installation)	h	3 – 12
Connector		2 x 8 pin connector according to IEC 60130-9; according to AISG C485; Daisy chain in: male; Daisy chain out: female
Hardware Interfaces		RS 485 A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Input Voltage Range	V	10...30 DC (pin 6)
Power Consumption	W	< 2
Protocols		AISG 2.0
Protection Class		IP 65
Environmental Temperature Range	°C	-40 – +55
Lightning Protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)
BTS Time Sync		
Frequency Range	MHz	1572 – 1608 (GPS and GLONASS)
LNA Gain	dB	27 ± 3
Noise Figure	dB	Typ. 3
Supply Voltage	V	4 – 6 V DC
DC Current	mA	< 80
Non-destruction Supply Voltage	V	-32 ... +32 V DC
Lightning Protection	kA	2.5 (10/350 µs) 8 (8/20 µs)
Connector		SMA female
Housing Material		ALU, ASA
Weight	kg lb	1.6 3.5
Packing Size	mm inches	400 x 190 x 136 15.7 x 7.5 x 5.4
Dimensions (H x W x D)	mm inches	65.8 x 355.7 x 143.2 2.6 x 14.0 x 5.6
Scope of Supply		
AMU		1 pc.
Adapter Plate		1 pc.



* Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity and use of SBAS.

Please note: Please follow the user manual for installation and operating details. The AMU needs to be powered by a LPS (Limited Power Source, Class: PS2) according to IEC/EN 62368-1.

Standards: IEC/EN 62368-1 (Safety),
EN 60950-22 (Safety – Equipment installed outdoor),
EN 55024 (Immunity),
ETS 300019-1-4 class 4.1 and 4.2 H (Environmental).

EU-RED: Hereby, KATHREIN SE declares that the radio equipment type 86010129 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.kathrein.com>

Certification: CE, FCC

Protection Caps IP 68 for 7-16 Female Connectors

Technical Data

Type No.		81610014
Material		ABS PC
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-30 ... +95
Weight	g	3
	lb	0.007
Height	mm	16
	inches	0.63
Diameter	mm	32
	inches	1.26
Quantity per pack	pcs	100



Technical Data

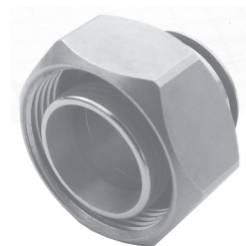
Type No.		78211293
Material		Brass, silver-plated
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-65 ... +165
Weight	g	60
	lb	0.132
Height	mm	22
	inches	0.87
Diameter	mm	32
	inches	1.26



Protection Caps IP 68 for 4.3-10 Female Connectors

Technical Data

Type No.		78211297
Material		Metal
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-55 ... +90
Weight	g	27.9
	lb	0.062
Height	mm	17.3
	inches	0.68
Diameter	mm	24.8
	inches	0.97
Max. torque tightening	Nm	5



Protection Caps for RET Spindle

85010004

Packing unit: 5 pieces



Antenna Line Products

> Multi-Band Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Multi-Band Combiners

> Same-Band Combiners and Hybrid Combiners

Band-Pass Filters
Hybrid Combiners
3 dB Couplers
Same-Band Combiners

Same-Band and Hybrid Combiners

> System Components and Accessories

Smart Bias Tees
DC-Stops
Attenuators
50 Ω Loads
Clamp Sets

System Components and Accessories

> DTMA's

DTMA's

Not longer in the catalogue 2020	Comments / Replacement
Multi-Band Combiners	
Dual-Band Combiners	
78211830	78211790
78211831	78211791
78211832	78211792
78211833	78211793
78211834	78211794
78211835	78211795
78211836	78211796
78211837	78211797
78211837V01	78211797V01
78211837V02	78211797V02
78211838	78211798
78211838V01	78211798V01
78211838V02	78211798V02
Same-Band and Hybrid Combiners	
Hybrid Combiners / 3 dB Couplers	
78210534	78210536
78210525	78210527
DTMAs	
78210510V43	78210512V43
78210511V43	78210512V43

Please note: New type numbers in the catalogue 2020 are shown and coloured in the respective register of the different product families.

All phased-out types will be available on request until end of 2020 unless otherwise announced. According information can be found on our website.

All phase-out dates which were already communicated during 2019 remain valid. This list is a general overview which shows the differences in the 2020 catalogue as compared to the 2019 version.

Summary of Filter, Combiner and Amplifier Types

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
728..		78210536	423	78210701	387	782109..	
728954	349	78210581V43	470	78210702	387	78210936	427, 428
		78210583V43	471	78210703	387	78210970V43	360
731..		78210587	486, 487	78210704	387	78210971V43	360
731651	451	78210587V02	486, 487	78210705	387	78210972V43	360
		78210588	488, 489	78210707	388	78210973V43	360
734..		78210588V02	488, 489	78210707V01	388	78210974V43	360
734360	451	78210588V03	488, 489	78210707V02	388	78210975V43	360
734361	451			78210708	388	78210977V43	361
734362	451	782106..		78210708V01	388	78210977V44	361
734363	451	78210620V43	371	78210708V02	388	78210977V45	361
734364	451	78210621V43	371	78210770	383	78210978V43	361
734365	451	78210622V43	371	78210771	383	78210978V44	361
		78210623V43	371	78210778V01	384	78210978V45	361
738..		78210624V43	371	78210780	399	78210979V43	362
738546	451	78210625V43	371	78210781	399	78210990V43	472, 473
		78210626V43	372	78210788V01	400	78210990V44	472, 473
782102..		78210627V43	373			78210990V46	472, 473
78210264	350	78210627V44	373	782108..			
78210279	370	78210627V45	373	78210850V01	438	782110..	
		78210628V43	373	78210863V04	460, 461	78211000	439
782104..		78210628V44	373	78210864V04	460, 461	78211055	440 - 442
78210430V43	464	78210628V45	373	78210872V01	459	78211056	440 - 442
78210473	448	78210660	366	78210877V01	462	78211065	440 - 442
78210475	449	78210660V43	368	78210880	385	78211066	440 - 442
78210484	446	78210661	366	78210881	385		
78210495V43	465	78210661V43	368	78210882	385	782111..	
		78210662	366	78210883	385	78211107	474, 475
782105..		78210662V43	368	78210884	385	78211107V02	474, 475
78210500	419	78210663	366	78210885	385	78211107V03	474, 475
78210506	420	78210663V43	368	78210887	386	78211144	422
78210507	421	78210664	366	78210887V01	386	78211175	478, 485
78210512V43	466, 467	78210664V43	368	78210887V02	386	78211175V02	478, 485
78210512V44	466, 467	78210665	366	78210888	386	78211175V03	478, 481
78210512V46	466, 467	78210665V43	368	78210888V01	386	78211176	480, 481
78210517V43	468, 469	78210669	367	78210888V02	386	78211176V02	480, 481
78210517V44	468, 469	78210669V43	369	78210891	450	78211176V03	480, 481
78210517V46	468, 469			78210892	450	78211180	351
78210524	424	782107..		78210893	450	78211180V43	352
78210527	425	78210700	387	78210894	450	78211181	351

Summary of Filter, Combiner and Amplifier Types

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

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78211181V43	352	78211341	410	78211455	393	78211497V01	392
78211182	351	78211342	410	78211457	394	78211497V02	392
78211182V43	352	78211343	410	78211457V01	394	78211498	392
78211183	351	78211347	411	78211457V02	394	78211498V01	392
78211183V43	352	78211347V01	411	78211458	394	78211498V02	392
		78211347V02	411	78211458V01	394		
782112..		78211348	411	78211458V02	394		
78211228V01	433	78211348V01	411	78211460	363	782115..	
78211228V03	434	78211348V02	411	78211461	363	78211530	377
78211230	429, 430			78211462	363	78211531	377
78211235	431, 432	782114..		78211463	363	78211532	377
78211245V43	476	78211400V43	408	78211464	363	78211533	377
78211275V43	463	78211401V43	408	78211465	363	78211534	377
78211280V43	353	78211402V43	408	78211466	364	78211535	377
78211281V43	353	78211403V43	408	78211467	365	78211536	378
78211282V43	353	78211404V43	408	78211467V01	365	78211537	379
78211283V43	353	78211405V43	408	78211467V02	365	78211537V01	379
78211284V43	353	78211407V43	409	78211468	365	78211537V02	379
78211285V43	353	78211407V44	409	78211468V01	365	78211538	379
78211287V43	354	78211407V45	409	78211468V02	365	78211538V01	379
78211287V44	354	78211408V43	409	78211470	357	78211538V02	379
78211287V45	354	78211408V44	409	78211471	357	78211560	395
78211288V43	354	78211408V45	409	78211472	357	78211561	395
78211288V44	354	78211430V43	355	78211473	357	78211562	395
78211288V45	354	78211431V43	355	78211474	357	78211563	395
78211297	336	78211432V43	355	78211475	357	78211564	395
		78211433V43	355	78211476	358	78211565	395
782113..		78211434V43	355	78211477	359	78211567	396
78211330V43	477	78211435V43	355	78211477V01	359	78211567V01	396
78211332	482, 483	78211437V43	356	78211477V02	359	78211567V02	396
78211332V02	482, 483	78211437V44	356	78211478	359	78211568	396
78211332V03	482, 483	78211437V45	356	78211478V01	359	78211568V01	396
78211333	482, 483	78211438V43	356	78211478V02	359	78211568V02	396
78211333V02	482, 483	78211438V44	356	78211490	391	78211570	397
78211334	484, 485	78211438V45	356	78211491	391	78211571	397
78211334V02	484, 485	78211450	393	78211492	391	78211572	397
78211334V03	484, 485	78211451	393	78211493	391	78211573	397
78211335	484, 485	78211452	393	78211494	391	78211574	397
78211335V02	484, 485	78211453	393	78211495	391	78211575	397
78211340	410	78211454	393	78211497	392	78211577	398

Summary of Filter, Combiner and Amplifier Types

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

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78211577V01	398	78211692	405	78211827V01	390	793..	
78211577V02	398	78211693	405	78211827V02	390	793554	426
78211578	398	78211694	405	78211828	390		
78211578V01	398	78211695	405	78211828V01	390	850..	
78211578V02	398	78211696	406	78211828V02	390	85010002	451
78211580	412	78211697	407	78211847	418	85010003	451
78211581	412	78211697V01	407				
78211582	412	78211697V02	407	782119..			
78211583	412	78211698	407	78211910	490, 491		
78211584	412	78211698V01	407	78211910V02	490, 491		
78211585	412	78211698V02	407	78211912	492, 493		
78211587	413			78211912V02	492, 493		
78211587V01	413	782117..		78211920	401		
78211587V02	413	78211760	447	78211921	401		
78211588	413	78211761	447	78211922	401		
78211588V01	413	78211762	447	78211923	401		
78211588V02	413	78211763	447	78211924	401		
78211589	414	78211790	380	78211925	401		
78211592	443 - 445	78211791	380	78211927	402		
78211593	443 - 445	78211792	380	78211927V01	402		
78211596	443 - 445	78211793	380	78211927V02	402		
78211597	443 - 445	78211794	380	78211928	402		
		78211795	380	78211928V01	402		
		78211796	381	78211928V02	402		
782116..		78211797	382	78211930	403		
78211620	374	78211797V01	382	78211931	403		
78211621	374	78211797V02	382	78211932	403		
78211622	374	78211798	382	78211933	403		
78211623	374	78211798V01	382	78211934	403		
78211624	374	78211798V02	382	78211935	403		
78211625	374			78211937	404		
78211626	375			78211937V01	404		
78211627	376	782118..		78211937V02	404		
78211627V01	376	78211820	389	78211938	404		
78211627V02	376	78211821	389	78211938V01	404		
78211628	376	78211822	389	78211938V02	404		
78211628V01	376	78211823	389				
78211628V02	376	78211824	389	784..			
78211690	405	78211825	389	78410367	446		
78211691	405	78211827	390				

> **Multi-Band Combiners**

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Summary of Multi-Band Combiner Types

KATHREIN

Frequency Combinations for Dual-, Triple- and Quad-Band Combiners

Dual-Band Combiners:					
Type No.	Frequency [MHz]		Connector Type (female)	Combiner Type	Page
728954	68 - 470	870 - 960	N		349
78210264	50 - 2200	2400 - 2500	N		350
78211180 ... -183	690 - 2180	2400 - 2700	7-16		351
78211180V43 ... -183V43	690 - 2180	2400 - 2700	4.3-10		352
78211280V43 ... -285V43	698 - 806	824 - 960	4.3-10		353
78211287V43 ... -288V45	698 - 806	824 - 960	4.3-10	Auto-sense	354
78211430V43 ... -435V43	694 - 862	880 - 960	4.3-10		355
78211437V43 ... -438V45	694 - 862	880 - 960	4.3-10	Auto-sense	356
78211470 ... -475	703 - 788	791 - 960	4.3-10		357
78211476	703 - 788	791 - 960	4.3-10	Cross-Bypass	358
78211477 ... -478V02	703 - 788	791 - 960	4.3-10	Auto-sense	359
78210970V43 ... -975V43	790 - 862	880 - 960	4.3-10		360
78210977V43 ... -978V45	790 - 862	880 - 960	4.3-10	Auto-sense	361
78210979V43	790 - 862	880 - 960	4.3-10	Cross-Bypass	362
78211460 ... -465	380 - 960	1427 - 3800	4.3-10		363
78211466	380 - 960	1427 - 3800	4.3-10	Cross-Bypass	364
782111467 ... -468V02	380 - 960	1427 - 3800	4.3-10	Auto-sense	365
78210660 ... -665	470 - 960	1695 - 2700	7-16		366
78210669	470 - 960	1695 - 2700	7-16	Cross-Bypass	367
78210660V43 ... -665V43	470 - 960	1695 - 2700	4.3-10		368
78210669V43	470 - 960	1695 - 2700	4.3-10	Cross-Bypass	369
78210279	790 - 1880	1920 - 2170	7-16		370
78210620V43 ... -625V43	1710 - 1880	1920 - 2200	4.3-10		371
78210626V43	1710 - 1880	1920 - 2200	4.3-10	Cross-Bypass	372
78210627V43 ... -628V45	1710 - 1880	1920 - 2200	4.3-10	Auto-sense	373
78211620 ... -625	1427 - 1880	1920 - 2690	4.3-10		374
78211626	1427 - 1880	1920 - 2690	4.3-10	Cross-Bypass	375
78211627 ... -628V02	1427 - 1880	1920 - 2690	4.3-10	Auto-sense	376
78211530 ... -535	1427 - 1518	1710 - 2690	4.3-10		377
78211536	1427 - 1518	1710 - 2690	4.3-10	Cross-Bypass	378
78211537 ... -538V02	1427 - 1518	1710 - 2690	4.3-10	Auto-sense	379
78211790 ... -795	1427 - 2200	2300 - 2690	4.3-10		380
78211796	1427 - 2200	2300 - 2690	4.3-10	Cross-Bypass	381
78211797 ... -98V02	1427 - 2200	2300 - 2690	4.3-10	Auto-sense	382
78210770 ... -771	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000	7-16		383
78210778V01	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000	7-16	Auto-sense	384

New Product

Summary of Multi-Band Combiner Types

KATHREIN

Frequency Combinations for Dual-, Triple- and Quad-Band Combiners

Triple-Band Combiners:

Type No.	Frequency [MHz]				Connector Type (female)	Combiner Type	Page
78210880 ... -885	703 - 788	791 - 862	880 - 960		4.3-10		385
78210887 ... -888V02	703 - 788	791 - 862	880 - 960		4.3-10	Auto-Sense	386
78210700 ... -705	690 - 806	824 - 960	1427 - 3800		4.3-10		387
78210707 ... -708V02	690 - 806	824 - 960	1427 - 3800		4.3-10	Auto-Sense	388
78211820 ... -825	690 - 862	880 - 960	1427 - 3800		4.3-10		389
78211827 ... -828V02	690 - 862	880 - 960	1427 - 3800		4.3-10	Auto-Sense	390
78211490 ... -495	703 - 788	791 - 960	1427 - 3800		4.3-10		391
78211497 ... -498V02	703 - 788	791 - 960	1427 - 3800		4.3-10	Auto-Sense	392
78211450 ... -455	380 - 960	1427 - 2200	2300 - 2690		4.3-10		393
78211457 ... -458V02	380 - 960	1427 - 2200	2300 - 2690		4.3-10	Auto-Sense	394
78211560 ... -565	380 - 960	1427 - 1880	1920 - 2690		4.3-10		395
78211567 ... -568V02	380 - 960	1427 - 1880	1920 - 2690		4.3-10	Auto-Sense	396
78211570 ... -575	380 - 960	1427 - 1518	1710 - 2690		4.3-10		397
78211577 ... -578V02	380 - 960	1427 - 1518	1710 - 2690		4.3-10	Auto-Sense	398
78210780 ... -781	380 - 960	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000		7-16		399
78210788V01	380 - 960	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000		7-16	Auto-Sense	400
78211920 ... -925	1427 - 1518	1695 - 1880	1920 - 2690		4.3-10		401
78211927 ... -928V02	1427 - 1518	1695 - 1880	1920 - 2690		4.3-10	Auto-Sense	402
78211930 ... -935	1427 - 1518	1695 - 2200	2300 - 2690		4.3-10		403
78211937 ... 938V02	1427 - 1518	1695 - 2200	2300 - 2690		4.3-10	Auto-Sense	404
78211690 ... - 695	1427 - 1880	1920 - 2360	2496 - 2690		4.3-10		405
78211696	1427 - 1880	1920 - 2360	2496 - 2690		4.3-10	Cross-Bypass	406
78211697 ... -698V02	1427 - 1880	1920 - 2360	2496 - 2690		4.3-10	Auto-Sense	407
78211400V43 ... -405V43	1710 - 1880	1920 - 2170	2300 - 2700		4.3-10		408
78211407V43 ... -408V45	1710 - 1880	1920 - 2170	2300 - 2700		4.3-10	Auto-Sense	409

Quad-Band Combiners:

Type No.	Frequency [MHz]				Connector Type (female)	Combiner Type	Page
78211340 ... -343	690 - 862	880 - 960	1427 - 1880	1920 - 2690	4.3-10		410
78211347 ... -348V02	690 - 862	880 - 960	1427 - 1880	1920 - 2690	4.3-10	Auto-Sense	411
78211580 ... -585	380 - 960	1427 - 1880	1920 - 2200	2300 - 2690	4.3-10		412
78211587 ... -588V02	380 - 960	1427 - 1880	1920 - 2200	2300 - 2690	4.3-10	Auto-Sense	413
78211589	380 - 960	1427 - 1880	1920 - 2200	2300 - 2690	4.3-10	Cross-Bypass	414

Auto-Sense Combiners Functionality & Benefits

In order to enable the control of ALDs¹⁾ when deploying standard multi-band combiners in mobile communication networks, such combiners are fitted with integrated DC/AISG bypass circuits. Depending on the application, different bypass configurations are available. The correct bypass combination needs to be selected in order to ensure the proper control and configuration of the ALDs.

With Kathrein Mobile Communication Auto-Sense Combiners the correct bypass is detected automatically, thereby enabling safe and easy deployment in universal applications.

How does it work?

Two different modes

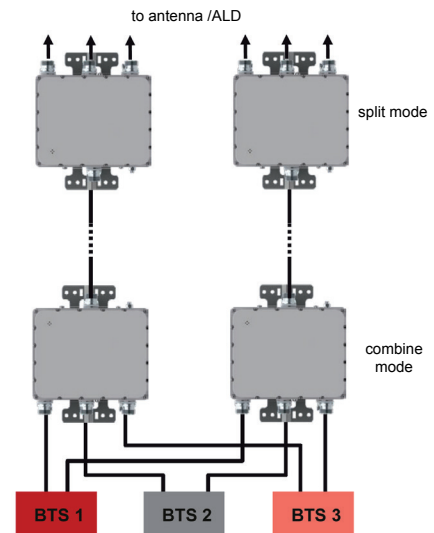
Kathrein Mobile Communication Auto-Sense Combiners automatically switch into the appropriate mode by checking the DC voltage on all ports.

Split mode: close to the antenna

- Kathrein Mobile Communication Combiners detect if an ALD (DC load) or an antenna (short circuit) is connected to a port and therefore bypass or block the DC/AISG signal.
- LEDs for each port indicate if DC is bypassed or not.

Combine mode: close to the BTS

- Automatic detection of DC voltage on one or more input ports. DC/AISG signal is bypassed to connected ALDs according to three different functional preconfigurations.
- In combine mode, LEDs show if DC is connected to a port and which DC/AISG signal is put through to the common port.

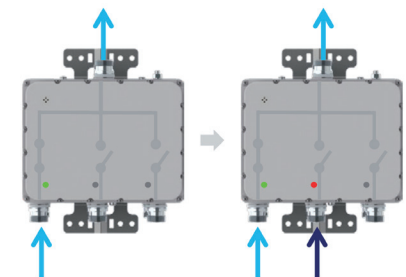


Three different functional preconfigurations

Kathrein Mobile Communication Auto-Sense Combiners are available in three variants with different preconfigured functions.

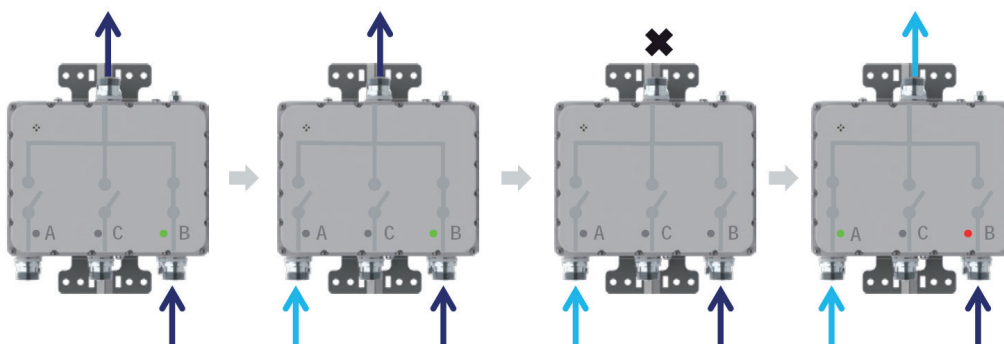
First In – First Out function

- The first BTS which supplies DC voltage at any input port is bypassed to the common port, other DC/AISG signals will be ignored and blocked.
- After installation, LED lights help to adjust the system by indicating the bypass situation.



Priority Controlled function

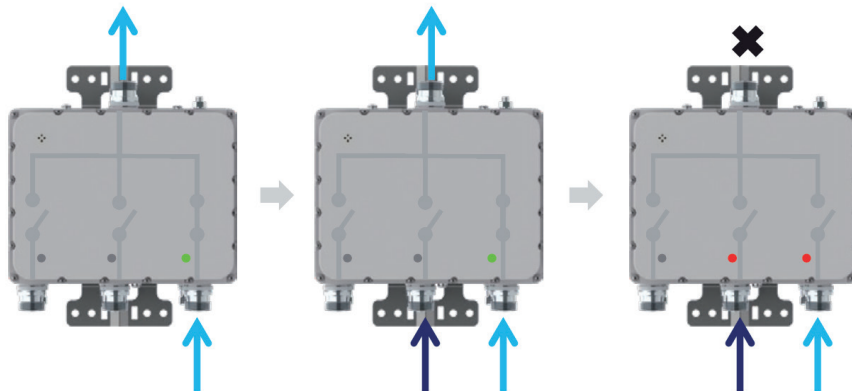
- The combiner detects all ports that are supplied with DC and bypasses the AISG/DC signal with the highest priority according to a preprogrammed priority table setting. (For detailed information on the preset priorities of each combiner, please check the latest datasheets on our website.)
- During the detection phase, LED lights indicate which port/signal is bypassed and which ones are blocked. If a new base station is connected during this phase, the combiner automatically switches the DC/AISG bypass to this port if the priority is higher than the one of the currently bypassed port.



¹⁾ ALD = Antenna Line Device

Exclusive User function

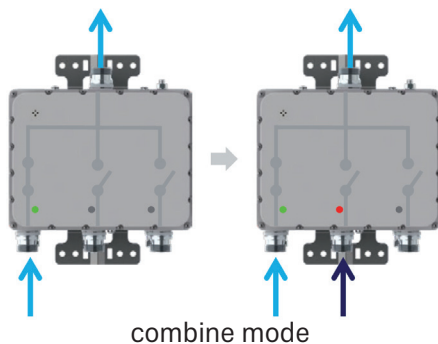
- If the Exclusive User function is set in the combiner, the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port.
- If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port. The DC/AISG functionality at the common port will be disabled and the LEDs start blinking in red until only one DC/AISG signal is connected.



Benefits & features

▪ LED status indication

Installation mistakes can be easily revealed as LEDs for each port indicate if DC is bypassed or not and even if the DC is blocked.



Green LED light indicates that this is the port / DC signal that is bypassed to the common port.

Red light indicates that this port would also be supplied with a DC/AISG signal, but the signal is blocked.

No light indicates that no DC has been detected on this port.

▪ Simplification

Kathrein Mobile Communication Auto-Sense Combiners can be used for split and combine applications – one type for all DC bypass situations. As soon as DC is connected to the combiner, the combiner will detect its role in the system and automatically adjust the behavior accordingly.

▪ Savings and efficiency

The multi usability of Kathrein Mobile Communication Auto-Sense Combiners helps to reduce stock, ordering logistics and number of parts. No external DC stops are required either.

For more detailed information please see our functional description of Auto-Sense Combiners on our website.

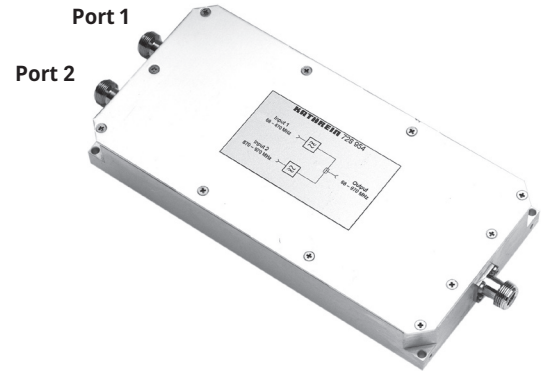
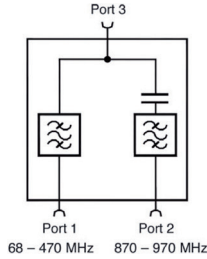
Dual-Band Combiner

KATHREIN

68 – 470 MHz

870 – 970 MHz

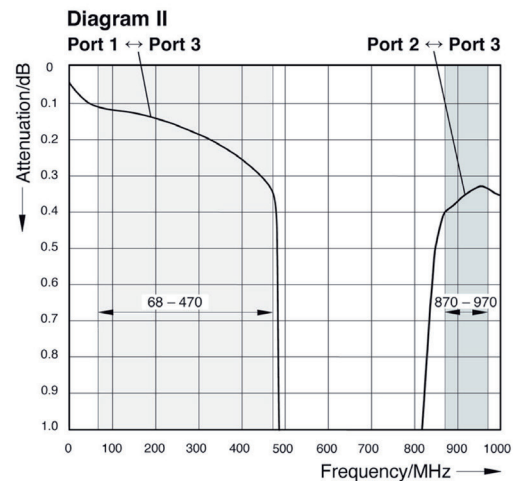
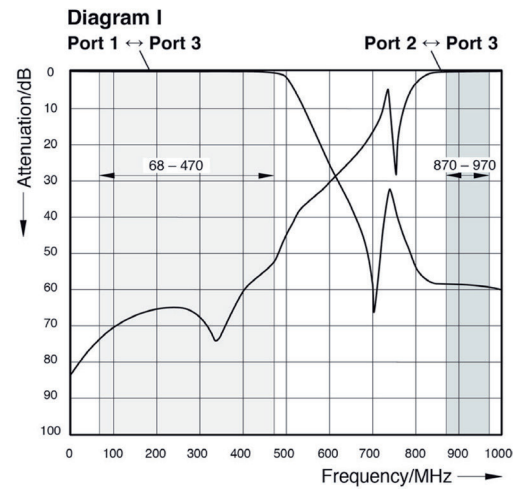
- Designed for inhouse multiband distribution network
- Enables feeder sharing
- DC by-pass between port 1 and port 3
- Built-in DC stop between port 2 and port 3



Technical Data

Type No.		728954
Pass band		
Band 1	MHz	68 – 470
Band 2	MHz	870 – 970
Insertion loss		
Port 1 ↔ Port 3	dB	< 0.5 (68 – 470 MHz)
Port 2 ↔ Port 3	dB	< 0.5 (870 – 970 MHz)
Isolation		
Port 1 ↔ Port 2	dB	> 45
VSWR		< 1.2
Impedance	Ω	50
Input power		
Band 1	W	< 50
Band 2	W	< 50
Temperature range	°C °F	-20 ... +70 -4 ... +158
Connectors		N female
Application		Indoor
DC transparency		
Port 1 ↔ Port 3	mA	By-pass (max. 2500)
Port 2 ↔ Port 3		Short circuited
Port 3 ↔ Port 2		Stop
Weight	kg lb	0.8 1.8
Packing size	mm in	285 x 55 x 125 11.2 x 2.2 x 4.9
Dimensions (w x h x d)	mm in	229 x 32 x 112 9.0 x 1.3 x 4.4 (without connectors)

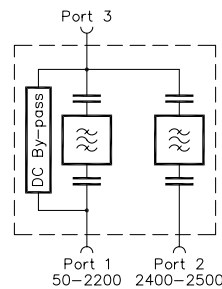
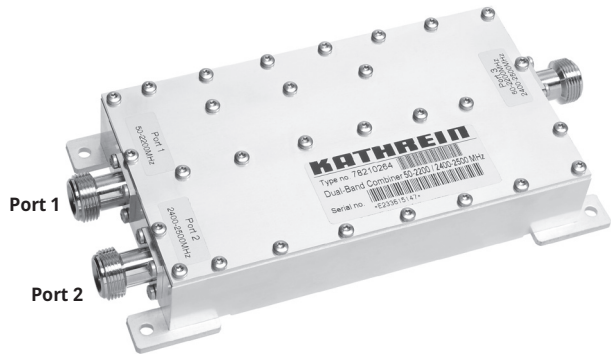
Typical Attenuation Curves



50 – 2200 MHz

2400 – 2500 MHz

- Designed for inhouse multiband distribution networks
- Enables feeder sharing
- DC by-pass between ports 1 and 3
- Built-in DC stop between port 2 and 3



Technical Data

Type No.	78210264	
Pass band		
Band 1	[MHz]	50 – 2200
Band 2	[MHz]	2400 – 2500
Insertion loss		
Port 1 ↔ Port 3	[dB]	< 0.1 (50 – 2200 MHz)
Port 2 ↔ Port 3	[dB]	< 0.2 (2400 – 2500 MHz)
Isolation		
Port 1 ↔ Port 2	[dB]	> 50 (50 – 2200 / 2400 – 2500 MHz)
VSWR		< 1.25 (50 – 2200 / 2400 – 2500 MHz)
Impedance	[Ω]	50
Input power		
Band 1	[W]	< 200
Band 2	[W]	< 200
Intermodulation products	[dBc]	< -150 dBc (3 rd order; with 2 x 20 W)
Temperature range	[°C °F]	-20 ... +55 -4 ... +131
Connectors		N female
Application		Indoor
Special features		Built-in DC stop between ports 2 and 3*
Mounting		With 4 screws (max. 4 mm diameter)
Weight	[kg lb]	0.47 1.0
Packing size	[mm in]	225 x 140 x 75 8.9 x 5.6 x 3.0
Dimensions (w x h x d)	[mm in]	86 x 30.4 x 181.4 3.4 x 1.2 x 7.1 (including connectors and mounting feet)

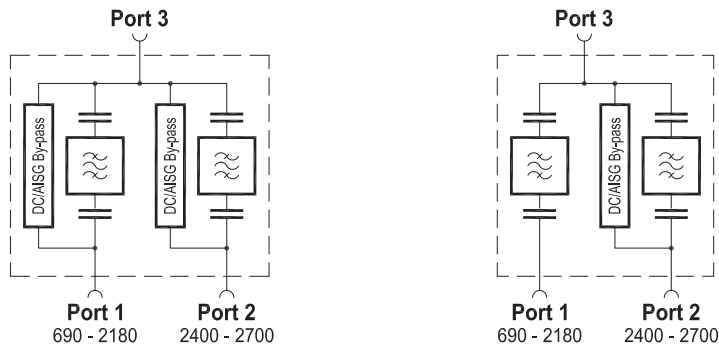
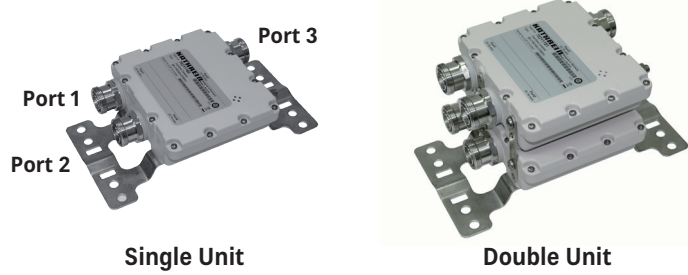
* DC by-pass between ports 1 and 3 (max. 2500 mA)

Dual-Band Combiner

KATHREIN

380 (690) – 2180 MHz **2400 – 2700 MHz**

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.		7821180 Single Unit	7821182 Single Unit
		7821181 Double Unit	7821183 Double Unit
Pass band Band 1	MHz	690 – 2180	
Band 2	MHz	2400 – 2700	
Insertion loss Port 1 ↔ Port 3	dB	< 0.2 (690 – 2180 MHz) typ. 0.1	
Port 2 ↔ Port 3	dB	< 0.15 (2400 – 2700 MHz) typ. 0.1	
Isolation Port 1 ↔ Port 2	dB	> 50 (690 – 2180 MHz), > 48 (2400 – 2700 MHz)	
VSWR		< 1.22 (690 – 2180 MHz) < 1.2 (2400 – 2700 MHz)	
Impedance	Ω	50	
Input power Band 1 / Band 2	W	< 500 / < 500	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -55 ... +60	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)
Port 2 ↔ Port 3	mA		
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 1.5 3.3 / Double Unit: 2.8 6.2	
Dimensions (w x h x d)	mm in	Single Unit: 141 x 119 x 48 5.6 x 4.7 x 1.9 / Double Unit: 141 x 119 x 99 5.6 x 4.7 x 3.9 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 266 x 196 x 130 10.5 x 7.7 x 5.1 / Double Unit: 266 x 196 x 180 10.5 x 7.7 x 7.1	

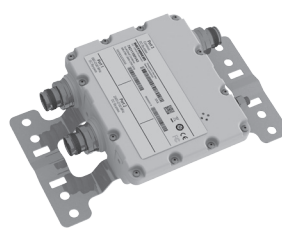
Dual-Band Combiner

KATHREIN

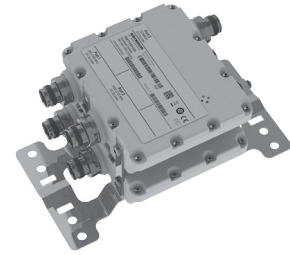
690 – 2180 MHz

2400 – 2700 MHz

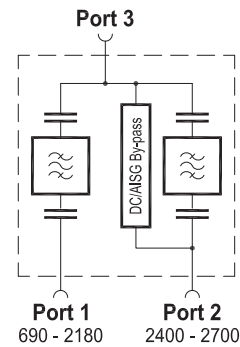
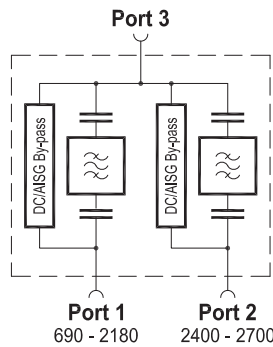
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.		78211180V43 Single Unit		78211182V43 Single Unit		
		78211181V43 Double Unit		78211183V43 Double Unit		
Pass band Band 1	MHz	690 – 2180				
Band 2	MHz	2400 – 2700				
Insertion loss Port 1 ↔ Port 3	dB	< 0.2 (690 – 2180 MHz) typ. 0.1				
Port 2 ↔ Port 3	dB	< 0.15 (2400 – 2700 MHz) typ. 0.1				
Isolation Port 1 ↔ Port 2	dB	> 50 (690 – 2180 MHz), > 48 (2400 – 2700 MHz)				
VSWR		< 1.22 (690 – 2180 MHz) < 1.2 (2400 – 2700 MHz)				
Impedance	Ω	50				
Input power Band 1 / Band 2	W	< 300 / < 300				
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)				
Temperature range	°C °F	-55 ... +60 -67 ... +140				
Connectors		4.3-10 female				
Application		Indoor or outdoor (IP 66)				
DC/AISG transparency Port 1 ↔ Port 3	mA	By-pass (max. 2500)		Stop		
Port 2 ↔ Port 3	mA					By-pass (max. 2500)
Lightning protection	kA	3, 10/350 μs pulse				
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set				
Weight	kg lb	Single Unit: 1.5 3.3 / Double Unit: 2.8 6.2				
Dimensions (w x h x d)	mm in	Single Unit: 141 x 119 x 48 5.6 x 4.7 x 1.9 / Double Unit: 141 x 119 x 99 5.6 x 4.7 x 3.9 (without connectors, without mounting brackets)				
Packing size	mm in	Single Unit: 266 x 196 x 130 10.5 x 7.7 x 5.1 / Double Unit: 266 x 196 x 180 10.5 x 7.7 x 7.1				

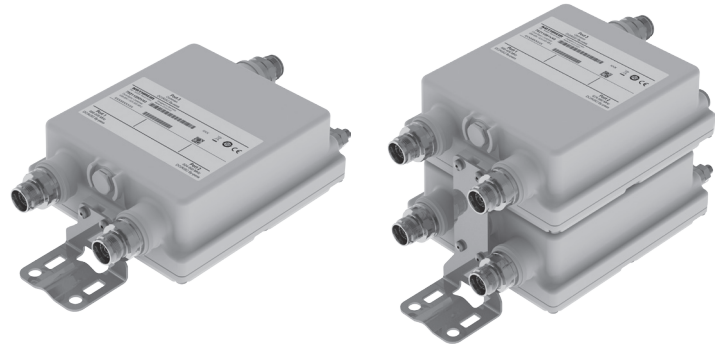
Dual-Band Combiner

KATHREIN

698 - 806 MHz

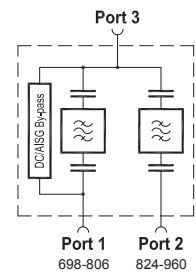
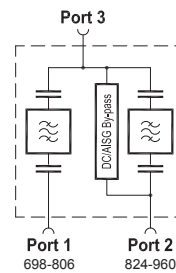
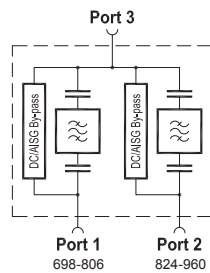
824 - 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78211280V43 Single Unit	78211282V43 Single Unit	78211284V43 Single Unit
		78211281V43 Double Unit	78211283V43 Double Unit	78211285V43 Double Unit
Pass band Band 1 Band 2	MHz MHz	698 – 806 824 – 960		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	dB dB	< 0.3 (698 – 796 MHz); < 0.5 (796 – 806 MHz); typically 0.18 (698-806 MHz) < 0.5 (824 – 834 MHz); < 0.3 (834 – 960 MHz), typically 0.18 (824-960 MHz)		
Isolation Port 1 ↔ Port 2	dB	> 50		
VSWR		< 1.2		
Impedance	Ω	50		
Input power Band 1 / Band 2	W	< 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	mA mA	By-pass (max. 2500) By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 2.4 5.3 / Double Unit: 4.8 10.6		
Dimensions (w x h x d)	mm in	Single Unit: 153 x 170.5 x 66.3 6.0 x 6.7 x 2.5 Double Unit: 153 x 170.5 x 137.3 6.0 x 6.7 x 5.2 (without connectors, without mounting brackets)		
Packing size	mm in	Single unit: 365 x 235 x 145 14.4 x 9.3 x 5.7 / Double unit: 365 x 235 x 210 14.4 x 9.3 x 8.9		

698 – 806 MHz

824 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

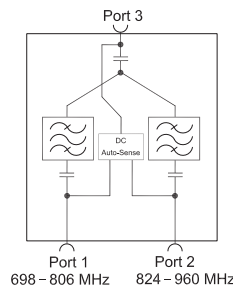
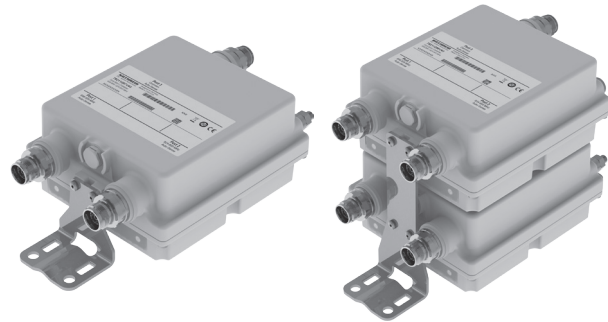
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



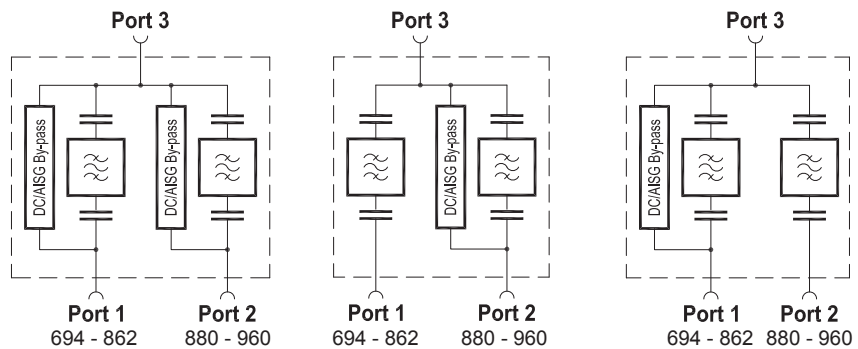
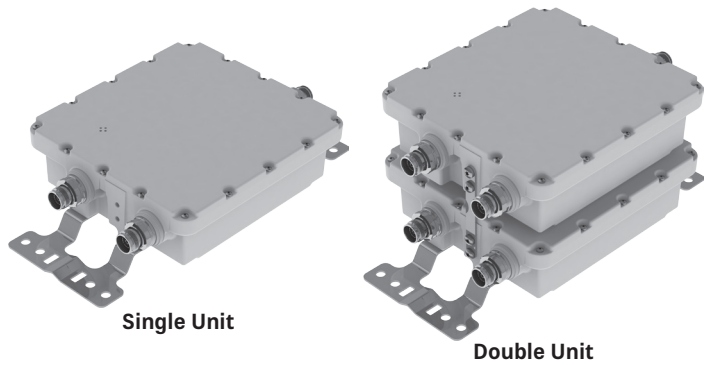
Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211287V43 78211287V44 78211287V45	78211288V43 78211288V44 78211288V45
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	698 – 806	
Band 2	MHz	824 – 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.3 (698 – 796 MHz); < 0.5 (796 – 806 MHz)	
Port 2 ↔ Port 3	dB	< 0.5 (824 – 834 MHz); < 0.3 (834 – 960 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50	
VSWR		< 1.2	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 3	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set	
Windload (at Rated Wind Speed: 150 km/h)	N lbf N lbf	Single Unit: 49 11.0 (frontal) Single Unit: 15 3.4 (lateral)	Double Unit: 49 11.0 (frontal) Double Unit: 40 9.0 (lateral)
Weight	kg lb	Single Unit: 2.5 5.5 / Double Unit: 5.0 11.0	
Dimensions (w x h x d)	mm in	Single Unit: 153 x 171 x 81 6.0 x 6.7 x 3.2 / Double Unit: 153 x 171 x 167 6.0 x 6.7 x 6.5 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 365 x 235 x 145 14.4 x 9.3 x 5.7 / Double Unit: 365 x 235 x 210 14.4 x 9.3 x 8.3	

694 - 862 MHz

880 - 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211430V43	78211432V43	78211434V43
		Single Unit	Single Unit	Single Unit
		78211431V43	78211433V43	78211435V43
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	694 - 862		
Band 2	MHz	880 - 960		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.4, typically 0.2 (694 - 862 MHz)		
Port 2 ↔ Port 3	dB	< 0.4, typically 0.2 (880 - 960 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 45 (694 - 862 MHz / 880 - 960 MHz)		
VSWR		< 1.25 (694 - 862 / 880 - 960 MHz)		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-55 ... +60 -67 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 3 6.6 / Double Unit: 6 13.2		
Dimensions (w x h x d)	mm in	Single Unit: 200 x 214 x 66 mm 7.9 x 8.4 x 2.6 Double Unit: 200 x 214 x 137 7.9 x 8.4 x 5.4 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 400 x 265 x 150 15.7 x 10.4 x 5.9 / Double Unit: 400 x 265 x 220 15.7 x 10.4 x 8.7		

694 – 862 MHz

880 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

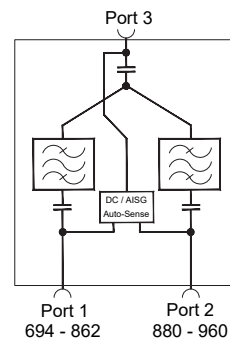
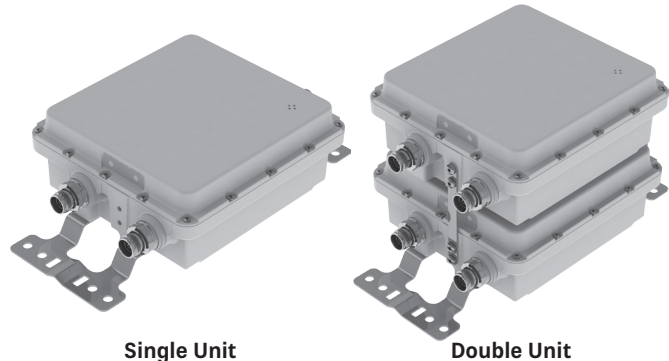
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



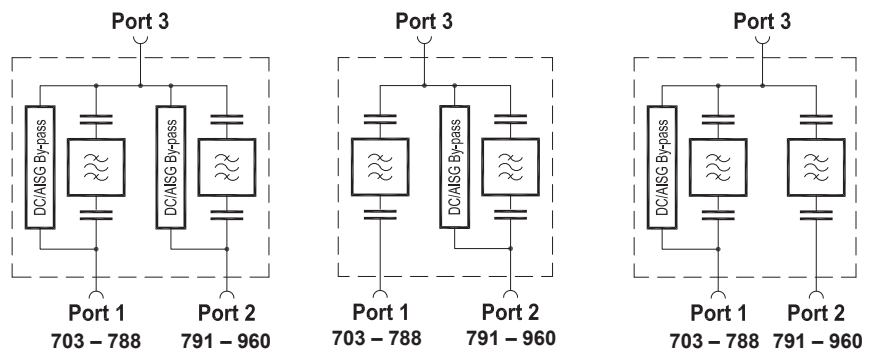
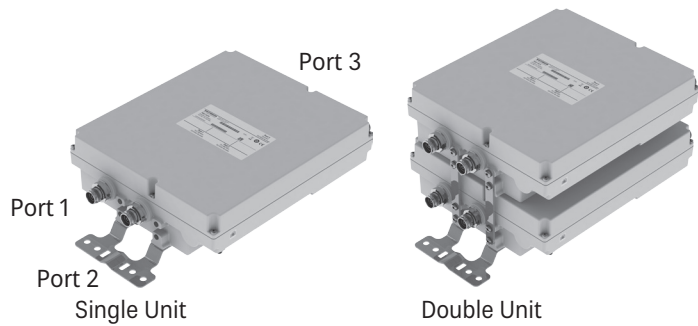
Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211437V43 78211437V44 78211437V45	78211438V43 78211438V44 78211438V45
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	694 – 862	
Band 2	MHz	880 – 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.4, typically 0.2 (694 – 862 MHz)	
Port 2 ↔ Port 3	dB	< 0.4, typically 0.2 (880 – 960 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 45 (694 – 862 MHz / 880 – 960 MHz)	
VSWR		< 1.25 (694 – 862 / 880 – 960 MHz)	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 3.2 7.1 / Double Unit: 6.4 14.1	
Dimensions (w x h x d)	mm in	Single Unit: 200 x 214 x 84 7.9 x 8.4 x 3.3 Double Unit: 200 x 214 x 173 7.9 x 8.4 x 6.8 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 395 x 260 x 163 15.6 x 10.2 x 6.4 / Double Unit: 395 x 260 x 253 15.6 x 10.2 x 10.0	

703 – 788 MHz

791 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211470	78211472	78211474
		Single Unit	Single Unit	Single Unit
		78211471	78211473	78211475
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	703 – 788		
Band 2	MHz	791 – 960		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.7 (703 – 785 MHz) / < 1.0 (785 – 787 MHz) / < 1.5 (787 – 788 MHz)		
Port 2 ↔ Port 3	dB	< 1.5 (791 – 793 MHz) / < 1.0 (793 – 800 MHz) / < 0.7 (800 – 960 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 40		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 200 / < 200		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. diameter 8 0.315) / Mast mounting: With additional clamp set		
Weight	kg lb	Single unit: 6.2 13.7 / Double unit: 12 26.5		
Dimensions (w x h x d)	mm in	Single unit: 258 x 301 x 88 10.2 x 11.9 x 3.5 / Double unit: 258 x 301 x 178 10.2 x 11.9 x 7.0 (without connectors, without mounting brackets)		
Packin size	mm in	Single unit: 477 x 334 x 175 18.8 x 13.1 x 6.9 / Double unit: 477 x 334 x 265 18.8 x 13.1 x 10.4		

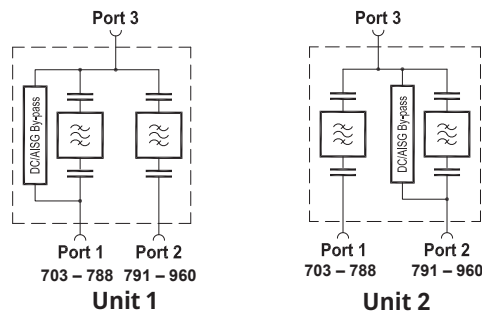
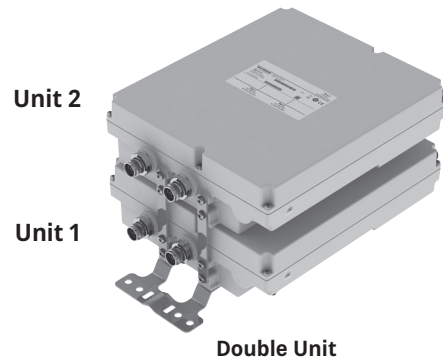
Dual-Band Combiner

KATHREIN

703 – 788 MHz

791 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211476 Double Unit	
Pass band			
Band 1	MHz	703 – 788	
Band 2	MHz	791 – 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.7 (703 – 785 MHz) / < 1.0 (785 – 787 MHz) / < 1.5 (787 – 788 MHz)	
Port 2 ↔ Port 3	dB	< 1.5 (791 – 793 MHz) / < 1.0 (793 – 800 MHz) / < 0.7 (800 – 960 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	4.6 10.1	
Dimensions (w x h x d)	mm in	258 x 301 x 178 10.2 x 11.9 x 7.0 (without connectors, without mounting brackets)	
Packing size	mm in	477 x 334 x 265 18.8 x 13.1 x 10.4	

703 – 788 MHz

791 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

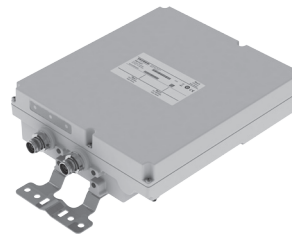
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

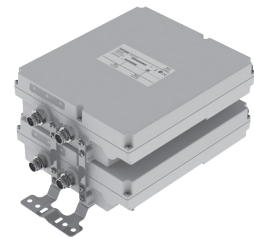
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPoI antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

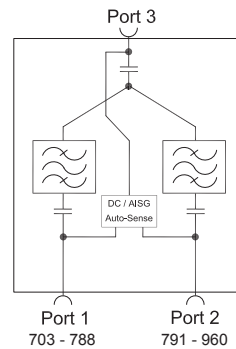
AUTO-SENSE



Single Unit



Double Unit



Technical Data

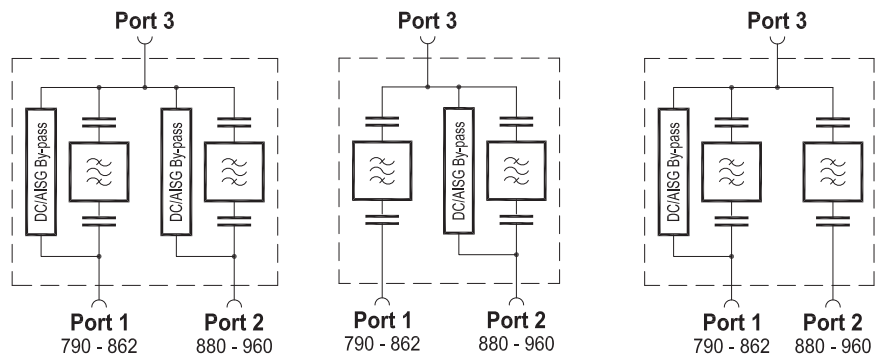
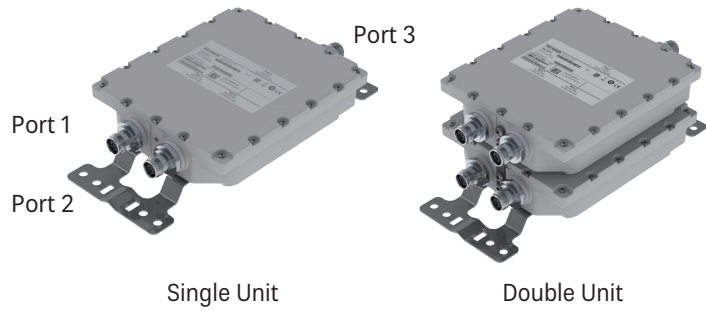
Type No. DC/AISG transparency			
1. First In - First Out Function			
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	703 – 788	
Band 2	MHz	791 – 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.7 (703 – 785 MHz) / < 1.0 (785 – 787 MHz) / < 1.5 (787 – 788 MHz)	
Port 2 ↔ Port 3	dB	< 1.5 (791 – 793 MHz) / < 1.0 (793 – 800 MHz) / < 0.7 (800 – 960 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 3	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 6.3 13.9 / Double Unit: 12.2 26.9	
Dimensions	mm in	Single Unit: 258 x 301 x 88 10.2 x 11.9 x 3.5 Double Unit: 258 x 301 x 178 10.2 x 11.9 x 7.0 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 477 x 334 x 175 18.8 x 13.1 x 6.9 Double Unit: 477 x 334 x 265 18.8 x 13.1 x 10.4	

Multi-Band Combiners

790 – 862 MHz

880 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78210970V43	78210972V43	78210974V43
		Single Unit	Single Unit	Single Unit
		78210971V43	78210973V43	78210975V43
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	790 – 862		
Band 2	MHz	880 – 960		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.4, typically 0.2 dB (790 – 862 MHz)		
Port 2 ↔ Port 3	dB	< 0.4, typically 0.2 dB (880 – 960 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 50 (790 - 862 MHz / 880 – 960 MHz)		
VSWR		< 1.25 (790 – 862 / 880 – 960 MHz)		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 200 / < 200		
Intermodulation products	dBc	< -160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 2.6 5.7 / Double Unit: 5.1 11.2		
Dimensions (w x h x d)	mm in	Single Unit: 177 x 52 x 209 7.0 x 2.0 x 8.2 / Double Unit: 177 x 108 x 209 7.0 x 4.3 x 8.2 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 392 x 272 x 139 15.4 x 10.7 x 5.5 / Double Unit: 392 x 272 x 189 15.4 x 10.7 x 7.4		

790 – 862 MHz

880 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

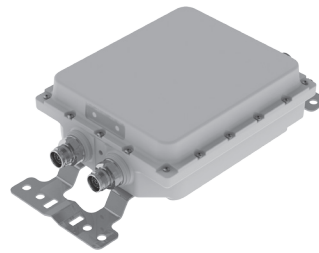
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

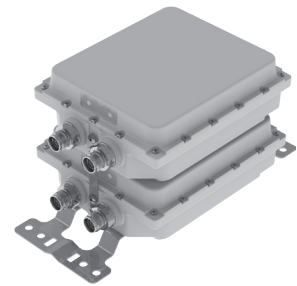
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPoL antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

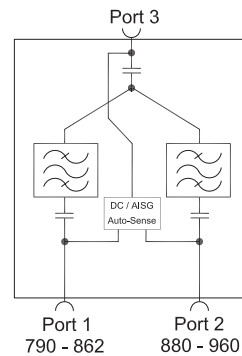
AUTO-SENSE



Single Unit



Double Unit



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78210977V43	78210978V43
2. Priority Controlled Function		78210977V44	78210978V44
3. Exclusive User Function		78210977V45	78210978V45
Unit		Single	Double
Pass band			
Band 1	MHz	790 – 862	
Band 2	MHz	880 – 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.4 (790 – 862 MHz)	
Port 2 ↔ Port 3	dB	< 0.4 (880 – 960 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 3	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 2.9 6.4 / Double Unit: 5.8 12.7	
Dimensions (w x h x d)	mm in	Single Unit: 177 x 70 x 209 7.0 x 2.8 x 8.2 / Double Unit: 177 x 146 x 209 7.0 x 5.7 x 8.2 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 392 x 272 x 139 15.4 x 10.7 x 5.5 / Double Unit: 392 x 272 x 189 15.4 x 10.7 x 7.4	

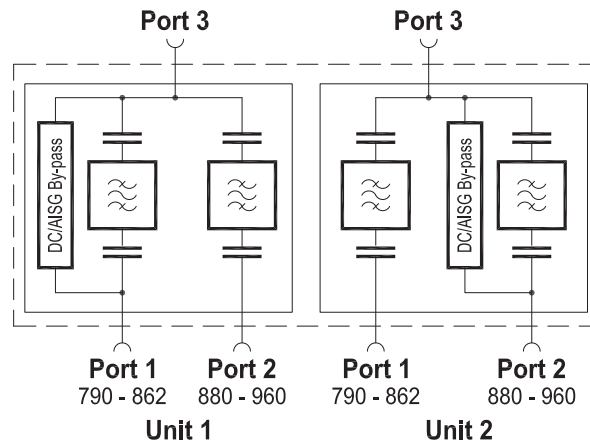
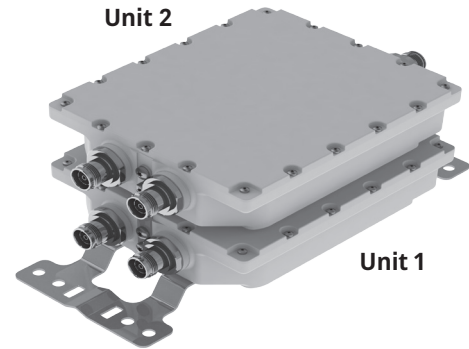
Dual-Band Combiner

KATHREIN

790 - 862 MHz

880 - 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



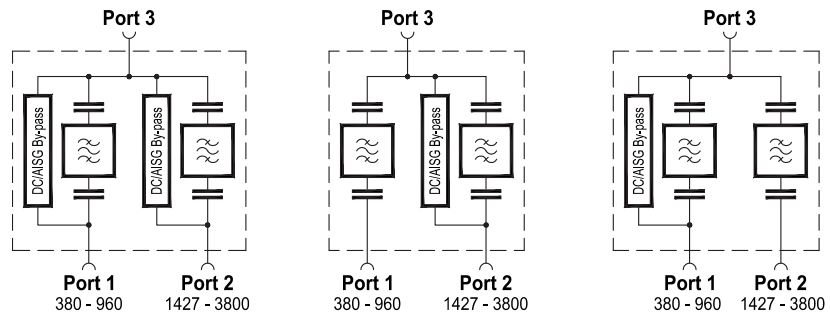
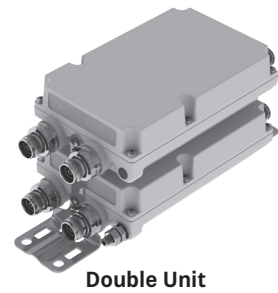
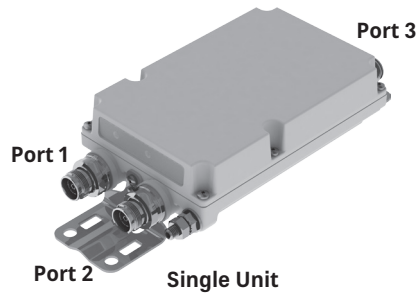
Technical Data

Type No.		78210979V43 Double Unit	
Pass band			
Band 1	MHz	790 - 862	
Band 2	MHz	880 - 960	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.4, typically 0.2 (790 - 862 MHz)	
Port 2 ↔ Port 3	dB	< 0.4, typically 0.2 (880 - 960 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50 dB (790 - 862 MHz / 880 - 960 MHz)	
VSWR		< 1.25 (790 - 862 / 880 - 960 MHz)	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Unit 2 Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	5.1 11.2	
Dimensions (w x h x d)	mm in	177.4 x 209.4 x 108.35 7.0 x 8.2 x 4.3 (without connectors, without mounting brackets)	
Packing size	mm in	392 x 272 x 189 15.4 x 10.7 x 7.4	

380 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



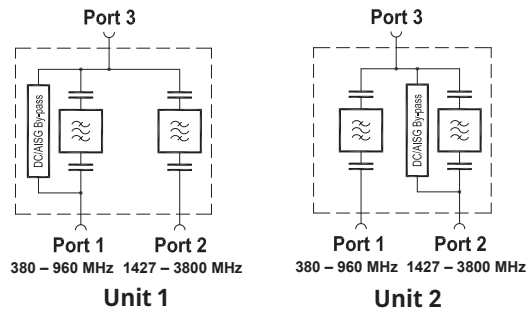
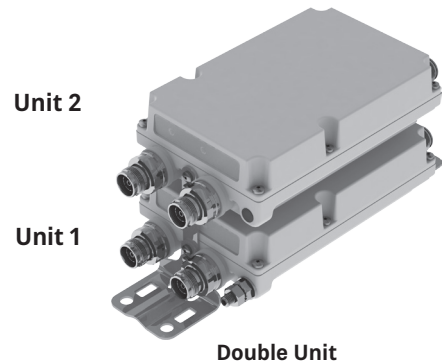
Technical Data

Type No.		78211460	78211462	78211464
		Single Unit	Single Unit	Single Unit
		78211461	78211463	78211465
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	380 – 960		
Band 2	MHz	1427 – 3800		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.2 (380 – 960 MHz)		
Port 2 ↔ Port 3	dB	< 0.2 (1427 – 3800 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 40		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 300 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 1.7 3.7 / Double Unit: 3.4 7.5		
Dimensions (w x h x d)	mm in	Single Unit: 183 x 117 x 55 7.2 x 4.6 x 2.2 Double Unit: 183 x 117 x 115 7.2 x 4.6 x 4.5 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 353 x 181 x 129 13.9 x 7.1 x 5.1 / Double Unit: 353 x 181 x 188 13.9 x 7.1 x 7.4		

380 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211466 Double Unit	
Pass band			
Band 1	MHz	380 – 960	
Band 2	MHz	1427 – 3800	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 3	dB	< 0.2 (1427 – 3800 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300 / < 200 (1427 - 2700 MHz); < 100 (2700 - 3800 MHz)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1	
Port 2 ↔ Port 3	mA	By-pass (max. 2500)	
		Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	3.4 7.5	
Dimensions (w x h x d)	mm in	183 x 117 x 115 7.2 x 4.6 x 4.5 (without connectors, without mounting brackets)	
Packing size	mm in	353 x 181 x 188 13.9 x 7.1 x 7.4	

380 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

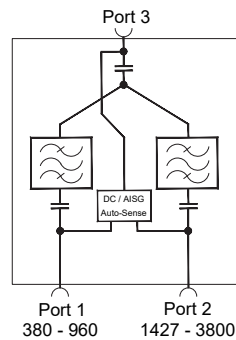
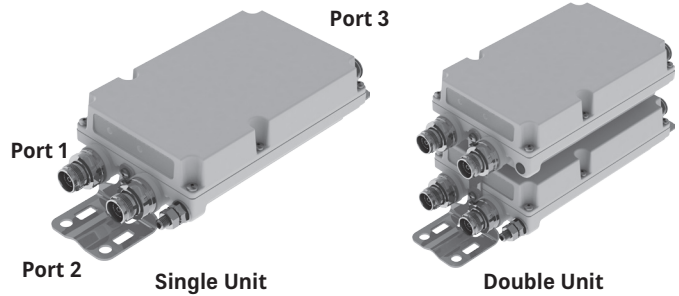
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



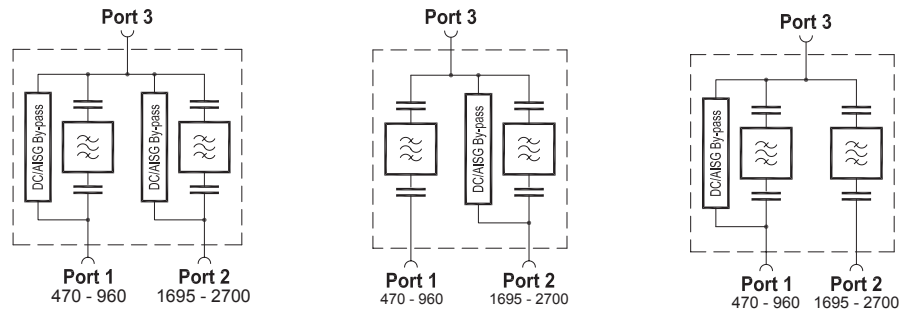
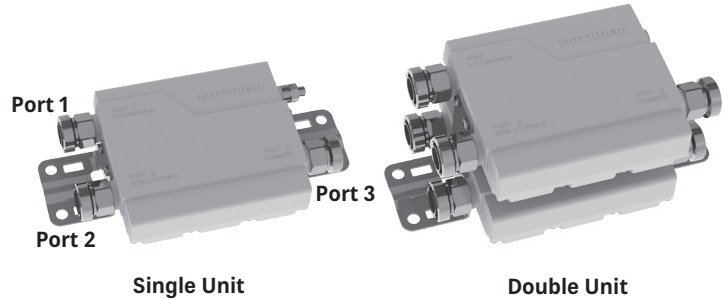
Technical Data

Type No. DC/AISG transparency		78211467 78211467V01 78211467V02		78211468 78211468V01 78211468V02	
Unit		Single		Double	
Pass band					
Band 1	MHz	380 – 960			
Band 2	MHz	1427 – 3800			
Insertion loss					
Port 1 ↔ Port 3	dB	< 0.2 (380 – 960 MHz)			
Port 2 ↔ Port 3	dB	< 0.2 (1427 – 3800 MHz)			
Isolation					
Port 1 ↔ Port 2	dB	> 40			
VSWR		< 1.25			
Impedance	Ω	50			
Input power					
Band 1 / Band 2	W	< 300 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)			
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)			
Temperature range	°C °F	-40 ... +60 -40 ... +140			
Connectors		4.3-10 female			
Application		Indoor or outdoor (IP 66)			
Lightning protection	kA	3, 10/350 μs pulse			
Wind load (at Rated Wind Speed 150 km/h 93 mph)	N lbf	frontal: 42 9 lateral: 11 2		frontal: 42 9 lateral: 31 7	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set			
Weight	kg lb	Single Unit: 1.7 3.7 / Double Unit: 3.4 7.5			
Dimensions (w x h x d)	mm in	Single Unit: 183 x 117 x 55 7.2 x 4.6 x 2.2; Double Unit: 183 x 117 x 115 7.2 x 4.6 x 4.5 (without connectors, without mounting brackets)			
Packing size	mm in	Single Unit: 353 x 181 x 129 13.9 x 7.1 x 5.1 / Double Unit: 353 x 181 x 188 13.9 x 7.1 x 7.4			

490 – 960 MHz

1695 – 2700 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



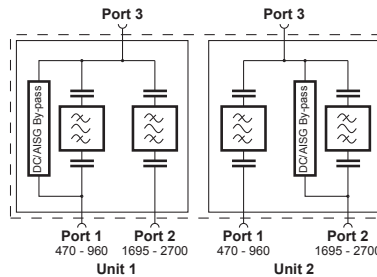
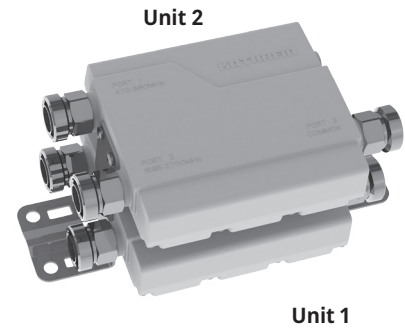
Technical Data

Type No.		78210660	78210662	78210664
		Single Unit	Single Unit	Single Unit
		78210661	78210663	78210665
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	470 – 960		
Band 2	MHz	1695 – 2700		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.1 (470 – 960 MHz)		
Port 2 ↔ Port 3	dB	< 0.1 (1695 – 2700 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 55 (470 – 960 MHz) / > 65 (1695 – 2700 MHz)		
VSWR		< 1.2 (470 – 960 MHz / 1695 – 2700 MHz)		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 650 / < 350		
Intermodulation products	dBc	< -160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-55 ... +60 -67 ... +140		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 1.2 2.6 / Double Unit: 2.4 5.3		
Dimensions (w x h x d)	mm in	Single Unit: 126 x 145 x 38 5.0 x 5.7 x 1.5 / Double Unit: 126 x 145 x 93 5.0 x 5.7 x 3.7 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 285 x 157 x 93 11.2 x 6.2 x 3.7 / Double Unit: 285 x 157 x 148 11.2 x 6.2 x 5.8		

490 – 960 MHz

1695 – 2700 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



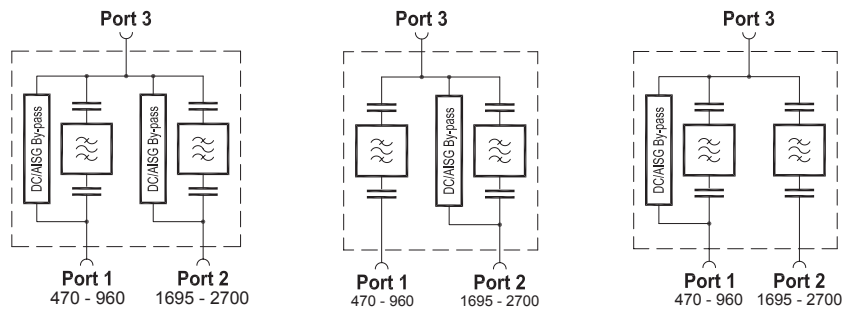
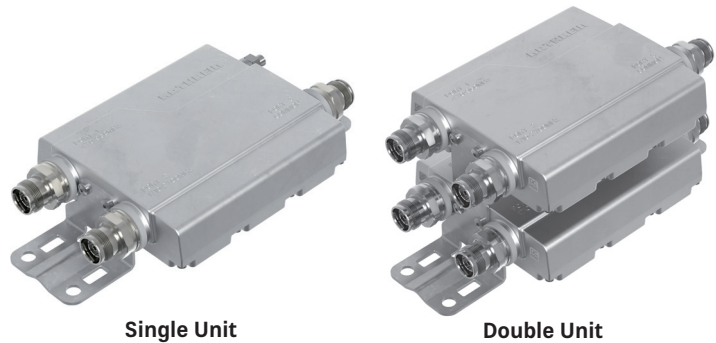
Technical Data

Type No.		78210669 Double Unit	
Pass band			
Band 1	MHz	470 – 960	
Band 2	MHz	1695 – 2700	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.1 (470 – 960 MHz)	
Port 2 ↔ Port 3	dB	< 0.1 (1695 – 2700 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 55 (470 – 960 MHz) / > 65 (1695 – 2700 MHz)	
VSWR (all ports)		< 1.2 (470 – 960 / 1695 – 2700 MHz)	
Impedance	Ω	50	
Input power			
Band 1	W	< 650	
Band 2	W	< 350	
Intermodulation products	dBc	< -160 (3 rd order with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Unit 2 Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	2.4 5.3	
Dimensions (w x h x d)	mm in	126 x 145 x 93 5.0 x 5,7 x 3.7 (without connectors, without mounting brackets)	
Packing size	mm in	285 x 157 x 148 11.2 x 6.2 x 5.8	

470 - 960 MHz

1695 - 2700 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



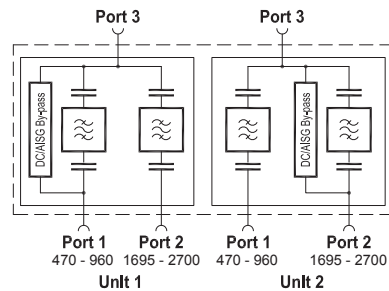
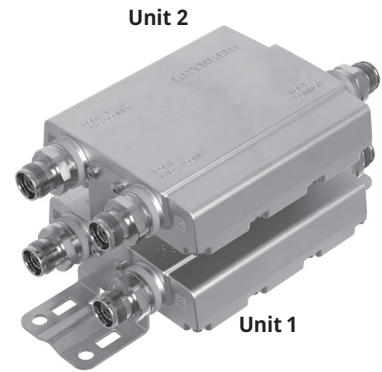
Technical Data

Type No.		78210660V43 Single Unit		78210662V43 Single Unit		78210664V43 Single Unit	
		78210661V43 Double Unit		78210663V43 Double Unit		78210665V43 Double Unit	
Pass band Band 1 Band 2	MHz MHz	470 - 960 1695 - 2700					
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	dB dB	< 0.1 (470 - 960 MHz) < 0.1 (1695 - 2700 MHz)					
Isolation Port 1 ↔ Port 2	dB	> 55 (470 - 960 MHz) / > 65 (1695 - 2700 MHz)					
VSWR		< 1.2 (470 - 960 MHz / 1695 - 2700 MHz)					
Impedance	Ω	50					
Input power Band 1 / Band 2	W	< 300 / < 300					
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)					
Temperature range	°C °F	-55 ... +60 -67 ... +140					
Connectors		4.3-10 female					
Application		Indoor or outdoor (IP 66)					
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	mA mA	By-pass (max. 2500) By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop			
Lightning protection	kA	3 , 10/350 ms pulse					
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set					
Weight	kg lb	Single Unit: 1.2 2.6 / Double Unit: 2.4 5.3					
Dimensions (w x h x d)	mm in	Single Unit: 126 x 145 x 38 5.0 x 5.7 x 1.5 / Double Unit: 126 x 145 x 93 5.0 x 5.7 x 3.7 (without connectors, without mounting brackets)					
Packing size	mm in	Single Unit: 285 x 157 x 93 11.2 x 6.2 x 3.7 / Double Unit: 285 x 157 x 148 11.2 x 6.2 x 5.8					

470 - 960 MHz

1695 - 2700 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



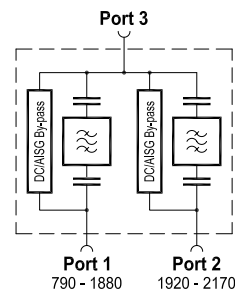
Technical Data

Type No.		78210669V43 Double Uninit	
Pass band			
Band 1	MHz	470 – 960	
Band 2	MHz	1695 – 2700	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.1 (470 – 960 MHz)	
Port 2 ↔ Port 3	dB	< 0.1 (1695 – 2700 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 55 (470 – 960 MHz) / > 65 (1695 – 2700 MHz)	
VSWR (all ports)		< 1.2 (470 – 960 / 1695 – 2700 MHz)	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	WW	< 300 / < 300	
Intermodulation products	dBc	< -160 (3 rd order with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	2.4 5.3	
Dimensions (w x h x d)	mm in	126 x 145 x 93 5.0 x 5.7 x 3.7 (without connectors, without mounting brackets)	
Packing size	mm in	285 x 157 x 148 11.2 x 6.2 x 5.8	

790 – 1880 MHz

1920 – 2170 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



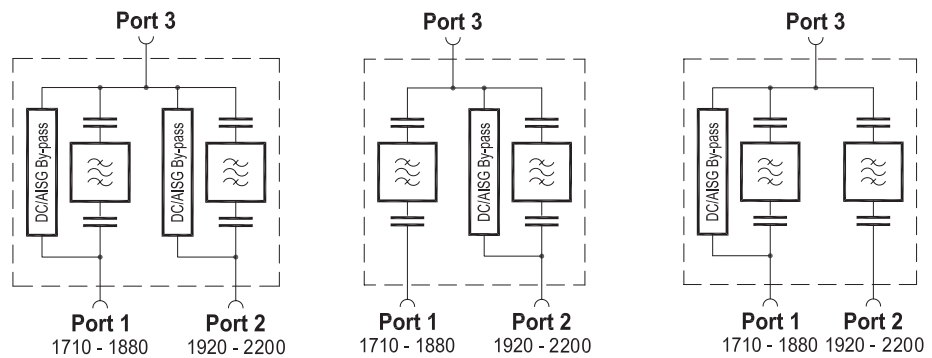
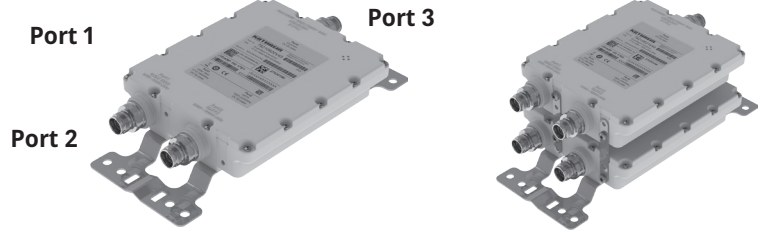
Technical Data

Type No.		78210279 Double Unit
Pass band Band 1 Band 2	MHz MHz	790 – 1880 1920 – 2170
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	dB dB	< 0.1, typically 0.05 (790 – 960 MHz) / < 0.4, typically 0.2 (1710 – 1880 MHz) < 0.4, typically 0.2 (1920 – 2170 MHz)
Isolation Port 1 ↔ Port 2	dB	> 55 (790 – 960 MHz) > 50 (1710 – 1880 MHz, 1920 – 1980 MHz, 2110 – 2170 MHz)
VSWR		< 1.2 (790 – 960 MHz) / < 1.25 (1710 – 1880 MHz) / < 1.2 (1920 – 2170 MHz)
Impedance	Ω	50
Input power Band 1 / Band 2	W	< 500 / < 500
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-55 ... +60 -67 ... +140
Connectors		7-16 female (long neck)
Application		Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	mA mA	By-pass (max. 2500 mA) By-pass (max. 2500 mA)
Lightning protection	kA	3, 10/350 μs pulse
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	kg lb	6.6 14.6
Dimensions (w x h x d)	mm in	130 x 270 x 99 5.1 x 10.6 x 3.9 (without connectors, without mounting brackets)
Packing size	mm in	207 x 437 x 214 8.1 x 17.2 x 8.4

1710 – 1880 MHz

1920 – 2200 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78210620V43	78210622V43	78210624V43
		Single Unit	Single Unit	Single Unit
		78210621V43	78210623V43	78210625V43
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1 (GSM 1800)	MHz	1710 – 1880		
Band 2 (UMTS)	MHz	1920 – 2200		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.3, typically 0.14 (1710 – 1880 MHz)		
Port 2 ↔ Port 3	dB	< 0.3, typically 0.12 (1920 – 2200 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 55 (1710 – 1880) / > 50 (1920 – 2200 MHz)		
VSWR		< 1.2 (1710 – 1880) / (1920 – 2200 MHz)		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 300 / < 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-55 ... +60 -67 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3 kA, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 2.2 4.9 Double Unit: 4.3 9.5		
Dimensions (w x h x d)	mm in	Single Unit: 163.5 x 195.3 x 46 6.4 x 7.7 x 1.8 (without connectors, without mounting brackets) Double Unit: 163.5 x 195.3 x 102 6.4 x 7.7 x 4.0 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 392 x 272 x 139 15.5 x 10.7 x 5.5 Double Unit: 392 x 272 x 189 15.5 x 10.7 x 7.4		

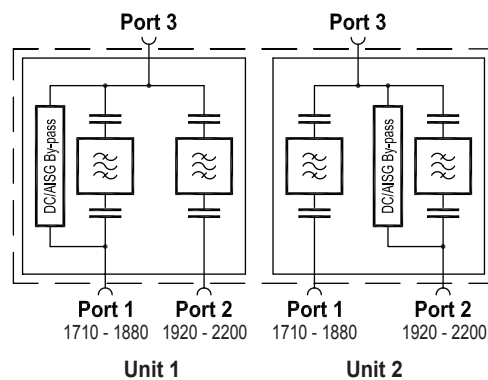
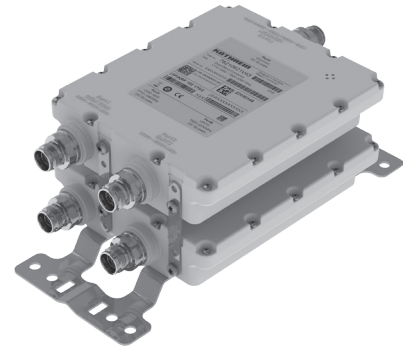
Dual-Band Combiner

KATHREIN

1710 – 1880 MHz

1920 – 2200 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection



Technical Data

Type No.		78210626V43 Double Unit	
Pass band Band 1 (GSM 1800)	MHz	1710 – 1880	
Band 2 (UMTS)	MHz	1920 – 2200	
Insertion loss Port 1 ↔ Port 3	dB	< 0.3 (1710 – 1880 MHz)	
Port 2 ↔ Port 3	dB	< 0.3 (1920 – 2200 MHz)	
Isolation Port 1 ↔ Port 2	dB	> 55 (1710 – 1880 MHz) / > 50 (1920 – 2200 MHz)	
VSWR		< 1.2 (1710 – 1880) / (1920 – 2200 MHz)	
Impedance	Ω	50	
Input power Band 1 / Band 2	W	< 300 / < 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	Unit 2 Stop
Port 2 ↔ Port 3	mA	Stop	By-pass (max. 2500)
Lightning protection		3 kA, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	4.3 9.5	
Dimensions (w x h x d)	mm in	164 x 195 x 102 6.4 x 7.7 x 4.0 (without connectors, without mounting brackets)	
Packing size	mm in	392 x 272 x 189 15.4 x 10.7 x 7.4	

1710 – 1880 MHz

1920 – 2200 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

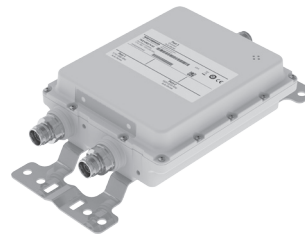
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

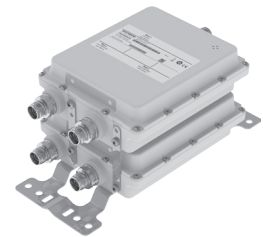
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

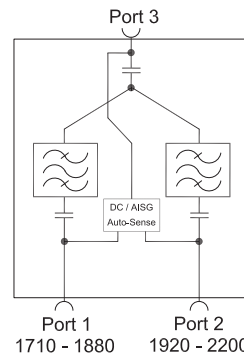
AUTO-SENSE



Single Unit



Double Unit



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78210627V43	78210628V43
2. Priority Controlled Function		78210627V44	78210628V44
3. Exclusive User Function		78210627V45	78210628V45
Unit		Single	Double
Pass band			
Band 1	MHz	1710 – 1880	
Band 2	MHz	1920 – 2200	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.3 (1710 – 1880 MHz)	
Port 2 ↔ Port 3	dB	< 0.3 (1920 – 2200 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 55 (1710 – 1880 MHz) / > 50 (1920 – 2200 MHz)	
VSWR		< 1.2	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300 / < 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Grounding		M8 stud	
Weight	kg lb	Single Unit: 2.4 5.3 / Double Unit: 4.8 10.5	
Dimensions (w x h x d)	mm in	Single Unit: 164 x 195 x 63 6.4 x 7.7 x 2.5 / Double Unit: 164 x 195 x 129 6.4 x 7.7 x 5.1 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 392 x 272 x 139 15.4 x 10.7 x 5.5 / Double Unit: 392 x 272 x 189 15.4 x 10.7 x 7.4	

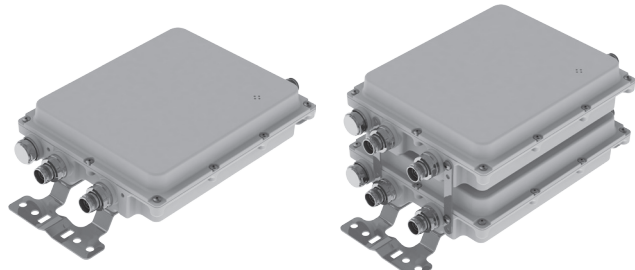
Dual-Band Combiner

KATHREIN

1427 – 1880 MHz

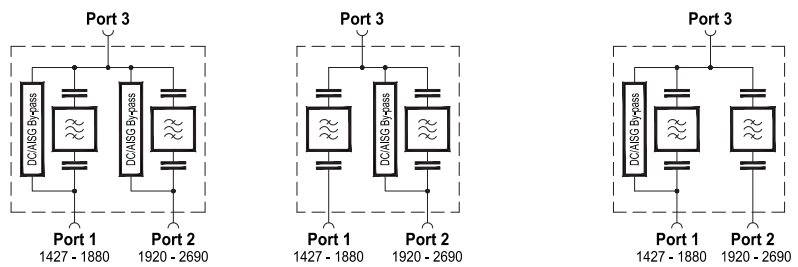
1920 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit

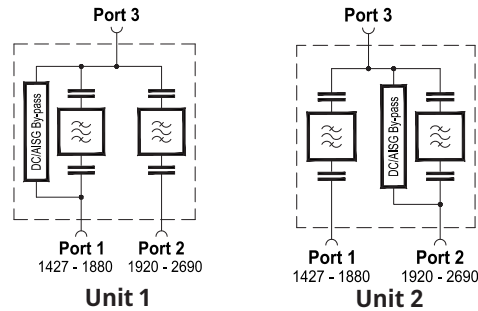
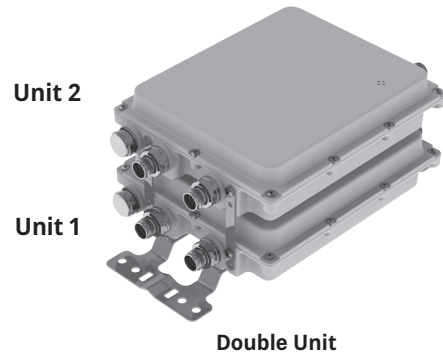


Technical Data

Type No.		78211620	78211622	78211624
		Single Unit	Single Unit	Single Unit
		78211621	78211623	78211625
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1 (GSM 1800)	MHz	1427 – 1880		
Band 2 (UMTS)	MHz	1920 – 2690		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.3 (1427 – 1880)		
Port 2 ↔ Port 3	dB	< 0.35 (1920 – 2690)		
Isolation	dB	> 40		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2 / Band 3	W	< 200 / < 200		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 / -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set		
Weight	kg lb	Single unit: Approx. 3.4 7.5 Double unit: Approx. 6.7 14.8		
Dimensions (w x h x d)	mm in	Single unit: Approx. 251 x 211 x 68 9.9 x 8.3 x 2.7 Double unit: Approx. 251 x 211 x 139 9.9 x 8.3 x 5.5 (without connectors, without mounting brackets)		
Packing size	mm in	Single unit: 439 x 289 x 160 17.3 x 11.4 x 6.3 Double unit: 439 x 289 x 230 17.3 x 11.4 x 9.1		

1427 – 1880 MHz **1920 – 2690 MHz**

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211626 Double Unit	
Pass band			
Band 1	MHz	1427 – 1880	
Band 2	MHz	1920 – 2690	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.3 (1427 – 1880 MHz)	
Port 2 ↔ Port 3	dB	< 0.35 (1920 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500) Stop	
Port 2 ↔ Port 3	mA		
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb	3.4 7.5	
Dimensions (w x h x d)	mm in	251 x 211 x 139 9.9 x 8.3 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in	439 x 289 x 230 17.3 x 11.4 x 9.1	

1427 – 1880 MHz

1920 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

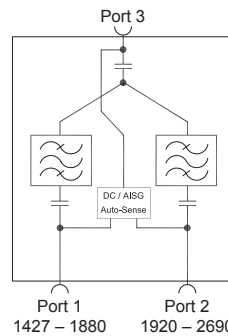
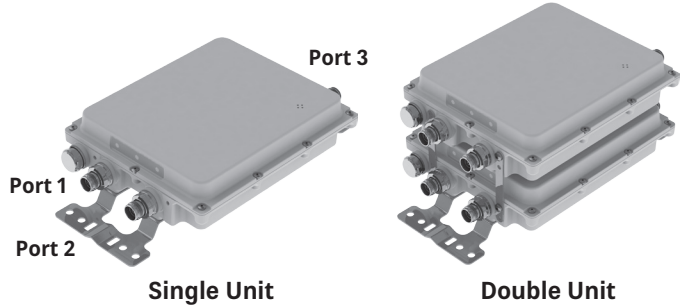
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE

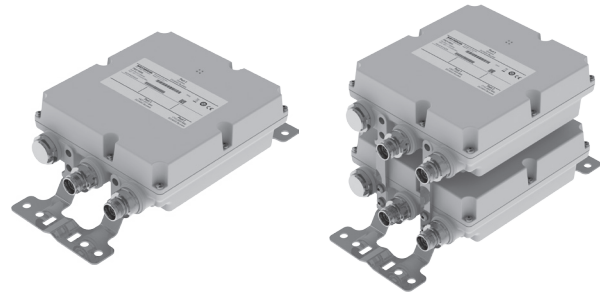


Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211627	78211628
2. Priority Controlled Function		78211627V01	78211628V01
3. Exclusive User Function		78211627V02	78211628V02
Unit		Single	Double
Pass band			
Band 1	MHz	1427 – 1880	
Band 2	MHz	1920 – 2690	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.3 (1427 – 1880 MHz) typ. 0.2 dB	
Port 2 ↔ Port 4	dB	< 0.35 (1920 – 2690 MHz) typ. 0.2 dB	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
Lightning protection	kA	3, 10/350 μs pulse	
DC/AISG transparency			
Port 1, 2 ↔ Port 3	mA	Auto-sense (max. 2000)	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 3.5 7.60 / Double unit: 6.8 15.0	
Dimensions (w x h x d)	mm in	Single Unit: 251 x 211 x 68 9.9 x 8.3 x 2.7 Double Unit: 251 x 211 x 139 9.9 x 8.3 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 439 x 289 x 160 17.3 x 11.4 x 6.3 Double Unit: 439 x 289 x 230 17.3 x 11.4 x 9.1	

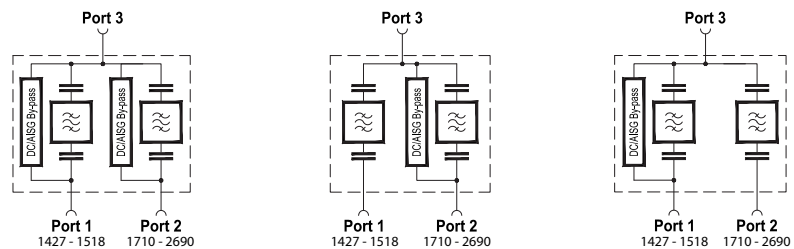
1427 – 1518 MHz **1710 – 2690 MHz**

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78211530 Single Unit		78211532 Single Unit		78211534 Single Unit	
		78211531 Double Unit		78211533 Double Unit		78211535 Double Unit	
Pass band							
Band 1	MHz	1427 – 1518					
Band 2	MHz	1710 – 2690					
Insertion loss							
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 1518)					
Port 2 ↔ Port 3	dB	< 0.3 (1710 – 2690)					
Isolation	dB	> 40					
VSWR		< 1.25					
Impedance	Ω	50					
Input power							
Band 1 / Band 2	W	< 200					
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)					
Temperature range	°C °F	-40 ... +60 -40 ... +140					
Connectors		4.3-10 female					
Application		Indoor or outdoor (IP 66)					
DC/AISG transparency							
Port 1 ↔ Port 3	mA	By-pass (max. 2500)		Stop By-pass (max. 2500)		By-pass (max. 2500) Stop	
Port 2 ↔ Port 3	mA						
Lightning protection	kA	3, 10/350 µs pulse					
Mounting		Wall mounting: With 4 screws (max. 8 0.315 [mm in] diameter) Mast mounting: With included clamp set					
Weight	kg lb	Single unit : 3.2 7.1 Double unit: 6.3 13.9					
Dimensions (w x h x d)	mm in	Single unit: 190 x 176 x 77 7.5 x 7.0 x 3.0 Double unit: 190 x 176 x 161 7.5 x 7.0 x 6.3 (without connectors, without mounting brackets)					
Packing size	mm in	Single unit: 375 x 245 x 160 14.8 x 9.7 x 6.3 Double unit: 375 x 245 x 245 14.8 x 9.7 x 9.7					

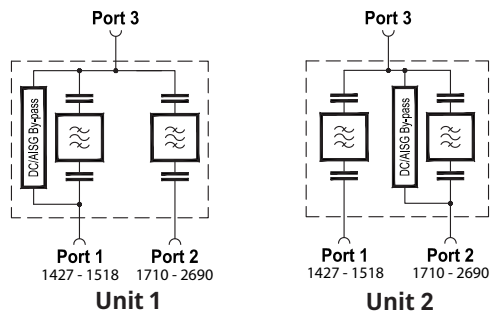
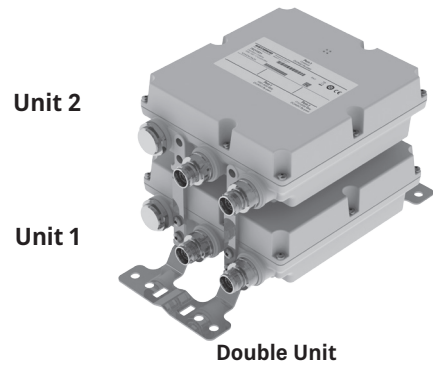
Dual-Band Combiner

KATHREIN

1427 – 1518 MHz

1710 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211536 Double Unit	
Pass band			
Band 1	MHz	1427 – 1518	
Band 2	MHz	1710 – 2690	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 1518 MHz)	
Port 2 ↔ Port 3	dB	< 0.3 (1710 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Unit 2 Stop By-pass (max. 2500)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb	6.3 13.9	
Dimensions (w x h x d)	mm in	190 x 176 x 161 7.5 x 6.9 x 6.3 (without connectors, without mounting brackets)	
Packing size	mm in	375 x 245 x 245 14.8 x 9.7 x 9.7	

clamps included

1427 – 1518 MHz

1710 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

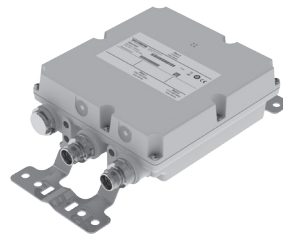
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

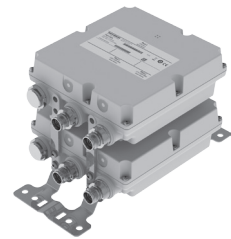
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

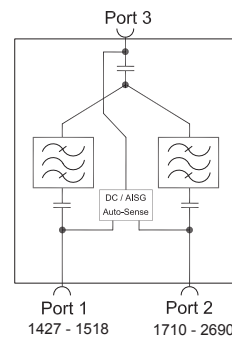
AUTO-SENSE



Single Unit



Double Unit



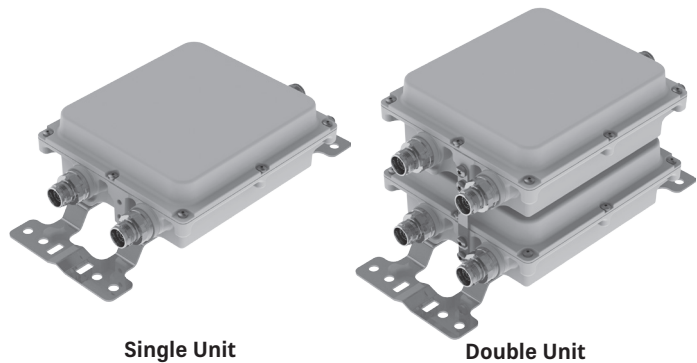
Technical Data

Type No. DC/AISG transparency		78211537 78211537V01 78211537V02	78211538 78211538V01 78211538V02
1. First In - First Out Function 2. Priority Controlled Function 3. Exclusive User Function		clamps included	
Unit		Single	Double
Pass band			
Band 1	MHz	1427 – 1518	
Band 2	MHz	1710 – 2690	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 1518)	
Port 2 ↔ Port 3]	dB	< 0.3 (1710 – 2690)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 [mm in] diameter) Mast mounting: With included clamp set	
Weight	kg lb	Single unit : 3.2 7.1 Double unit: 6.3 13.9	
Dimensions (w x h x d)	mm in	Single unit: 190 x 176 x 77 7.5 x 7.0 x 3.0 Double unit: 190 x 176 x 161 7.5 x 7.0 x 6.3 (without connectors, without mounting brackets)	
Packing size	mm in	Single unit: 375 x 245 x 160 14.8 x 9.7 x 6.3 Double unit: 375 x 245 x 245 14.8 x 9.7 x 9.7	

1427 – 2200 MHz

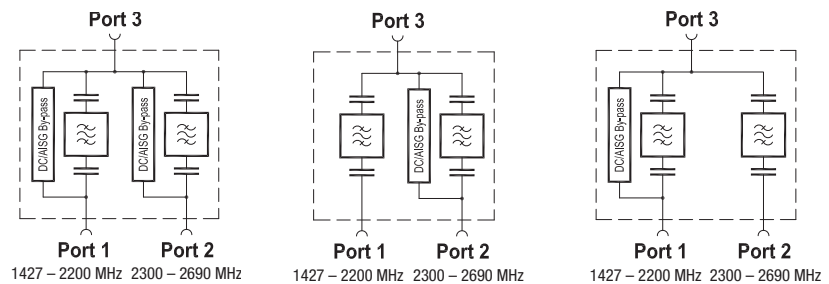
2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit

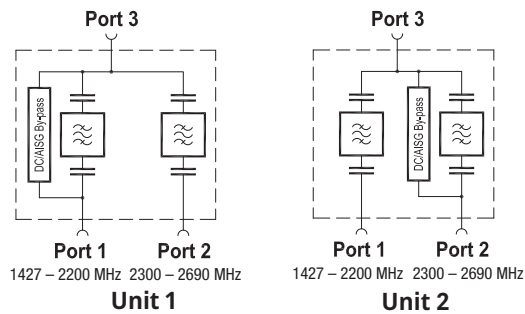
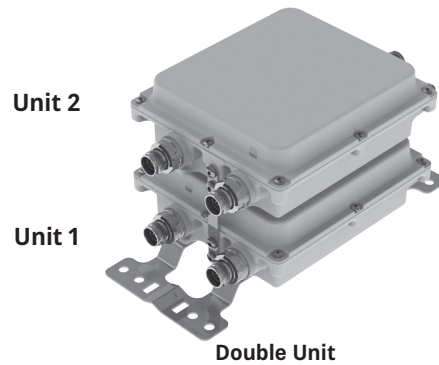


Technical Data

Type No.		78211790	78211792	78211794
		Single Unit	Single Unit	Single Unit
		78211791	78211793	78211795
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	1427 – 2200		
Band 2	MHz	2300 – 2690		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 2200 MHz)		
Port 2 ↔ Port 3	dB	< 0.2 (2300 – 2690 MHz)		
Isolation	dB	> 50		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-55 ... +60 -67 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With clamp set		
Weight	kg lb	Single Unit: 2.5 5.5 / Double Unit: 4.6 10.1		
Dimensions (w x h x d)	mm in	Single Unit: 192 x 172 x 68 7.6 x 6.8 x 2.7 Double Unit: 192 x 172 x 139 7.6 x 6.8 x 5.5 (without connectors, without mounting brackets)		
Packing size	mm in	Single Unit: 392 x 272 x 155 15.4 x 10.7 x 6.1 Double Unit: 392 x 272 x 220 15.4 x 10.7 x 8.7		

1427 – 2200 MHz 2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211796 Double Unit	
Pass band			
Band 1	MHz	1427 – 2200	
Band 2	MHz	2300 – 2690	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 2200 MHz)	
Port 2 ↔ Port 3	dB	< 0.2 (2300 – 2690 MHz)	
Isolation	dB	> 50	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1	
Port 2 ↔ Port 3	mA	By-pass (max. 2500)	
		Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb	4.6 10.1	
Dimensions (w x h x d)	mm in	192 x 172 x 139 7.6 x 6.8 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in	392 x 272 x 220 15.4 x 10.7 x 8.7	

1427 – 2200 MHz

2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

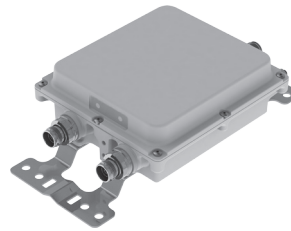
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

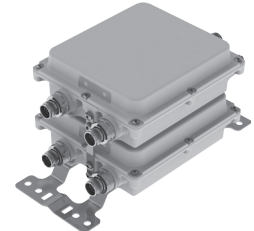
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall mounting
- Built-in lightning protection

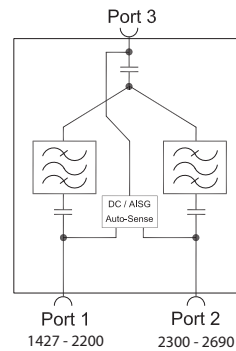
AUTO-SENSE



Single Unit



Double Unit



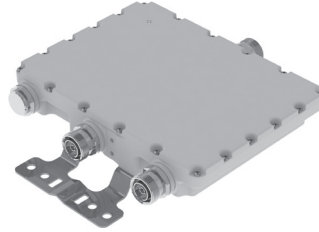
Technical Data

Type No. DC/AISG transparency		78211797 78211797V01 78211797V02	78211798 78211798V01 78211798V02
Unit		Single	Double
Pass band			
Band 1	MHz	1427 – 2200	
Band 2	MHz	2300 – 2690	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.2 (1427 – 2200 MHz)	
Port 2 ↔ Port 3	dB	< 0.2 (2300 – 2690 MHz)	
Isolation	dB	> 50	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port3	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port3	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 2.5 5.5 / Double Unit: 4.6 10.1	
Dimensions	mm in	Single Unit: 192 x 172 x 68 7.6 x 6.8 x 2.7 Double Unit: 192 x 172 x 139 7.6 x 6.8 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 392 x 272 x 155 15.4 x 10.7 x 6.1 Double Unit: 392 x 272 x 220 15.4 x 10.7 x 8.7	

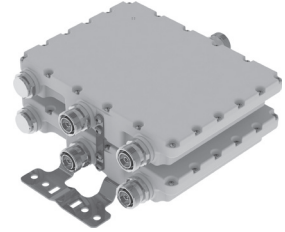
1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

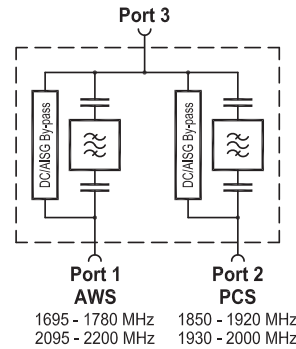
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.		78210770 Single unit	clamps included	78210771 Double unit
Pass band				
Band 1	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)		
Band 2	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)		
Port 2 ↔ Port 3	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 50		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Port 1 (AWS)	W	< 250		
Port 2 (PCS)	W	< 250		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C F°	-40 ... +60 -40 ... +140		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency	mA	By-pass between all ports (max. 2500)		
Lightning protection	kA	3, 10/350 µs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 2.9 6.39 / Double Unit: 5.7 12.57		
Dimensions (w x h x d)	mm in	Single Unit: 244 x 184.5 x 46 9.61 x 7.26 x 1.81 / Double Unit: 244 x 184.5 x 96.5 9.61 x 7.26 x 3.80 (without connectors, without mounting brackets)		

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

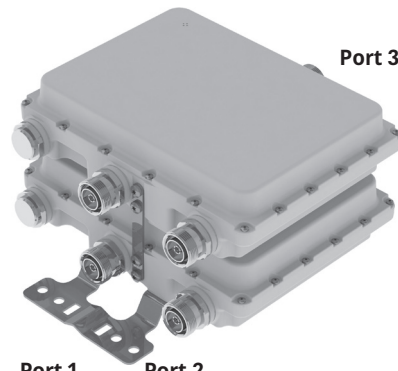
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

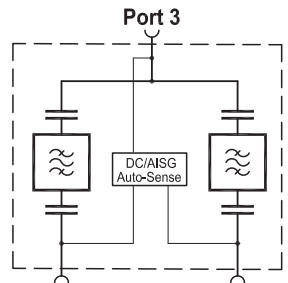
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Port 1 AWS
Port 2 PCS



Port 1 AWS
1695 - 1780 MHz
2095 - 2200 MHz
Port 2 PCS
1850 - 1920 MHz
1930 - 2000 MHz

Technical Data

Type No.		78210778v01		clamps included
		Double unit		
Pass band				
Band 1	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)		
Band 2	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)		
Port 2 ↔ Port 3	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 50		
VSWR		< 1.25		
Impedance	Ω	50		
Input power per Band	W	< 250 (operational) / < 500 (survival)		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	Auto-sense (max. 2000)		
Port 2 ↔ Port 3	mA	Auto-sense (max. 2000)		
DC supply	V DC	7 – 30		
Operating Current	mA	Typ. 6.5		
Voltage drop	V	< 0.15		
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set		
Weight	kg lb	6.1 13.45		
Dimensions (w x h x d)	mm in	244 x 185 x 130 9.6 x 7.3 x 5.1 (without connectors, without mounting brackets)		

Triple-Band Combiner

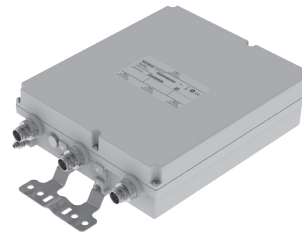
KATHREIN

703 – 788 MHz

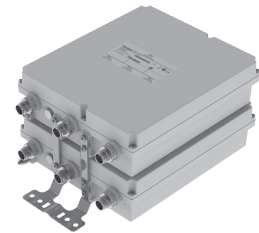
791 – 862 MHz

880 – 960 MHz

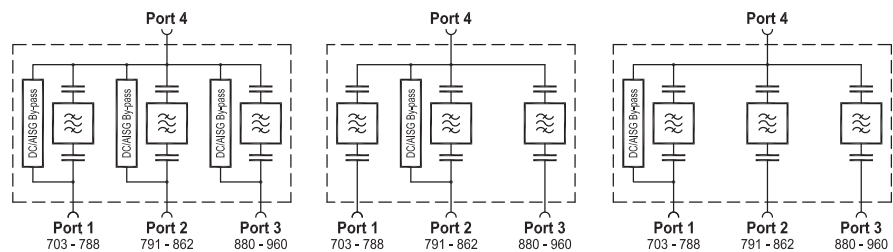
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.		78210880 Single Unit	78210882 Single Unit	78210884 Single Unit
		78210881 Double Unit	78210883 Double Unit	78210885 Double Unit
Pass band				
Band 1	MHz	703 – 788		
Band 2	MHz	791 – 862		
Band 3	MHz	880 – 960		
Insertion loss				
Port 1 ↔ Port 4	dB	< 0.5 (703 – 780) / < 1.0 (780 – 787) / < 1.5 (787 – 788)		
Port 2 ↔ Port 4	dB	< 1.5 (791 – 792) / < 1.0 (792 – 794) / < 0.5 (794 – 862)		
Port 3 ↔ Port 4	dB	< 0.5		
Isolation	dB	> 40		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +65 -40 ... +149		
Connectors		4.3-10 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 0.315 [mm in] diameter) Mast mounting: With additional clamp set		
Weight	kg lb	Single unit: 6 13.22 / Double unit: 11.9 26.24		
Packing size	mm in	Single Unit: 463 x 320 x 150 18.23 x 12.60 x 5.91 Double Unit: 463 x 320 x 240 18.23 x 12.60 x 9.45		
Dimensions (w x h x d)	mm in	Single Unit: 300 x 260 x 85 11.81 x 10.23 x 3.35 / Double Unit: 300 x 260 x 175 11.81 x 10.23 x 6.89 (without connectors, without mounting brackets)		

703 – 788 MHz

791 – 862 MHz

880 – 960 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

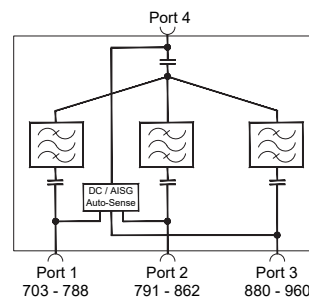
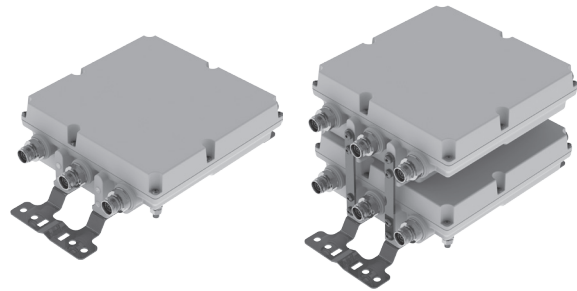
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78210887	78210888
2. Priority Controlled Function		78210887V01	78210888V01
3. Exclusive User Function		78210887V02	78210888V02
Unit		Single	Double
Pass band			
Band 1	MHz	703 – 788	
Band 2	MHz	791 – 862	
Band 3	MHz	880 – 960	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.5 (703 – 780) / < 1.0 (780 – 787) / < 1.5 (787 – 788)	
Port 2 ↔ Port 4	dB	< 1.5 (791 – 792) / < 1.0 (792 – 794) / < 0.5 (794 – 862)	
Port 3 ↔ Port 4	dB	< 0.5	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power	W		
Band 1 / Band 2 / Band 3		< 200 / < 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C	-40 ... +65	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm 0.315 in diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 6 13.2 / Double Unit: 11 26.2	
Dimensions (w x h x d)	mm in	Single Unit: 300 x 260 x 85 11.8 x 10.2 x 3.4 Double Unit: 300 x 260 x 175 11.8 x 10.2 x 6.9 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 477 x 334 x 175 18.8 x 13.1 x 6.9 Double Unit: 477 x 334 x 265 18.8 x 13.1 x 10.4	

Triple-Band Combiner

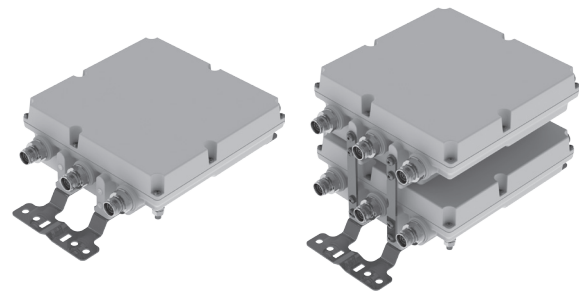
KATHREIN

690 – 806 MHz

824 – 960 MHz

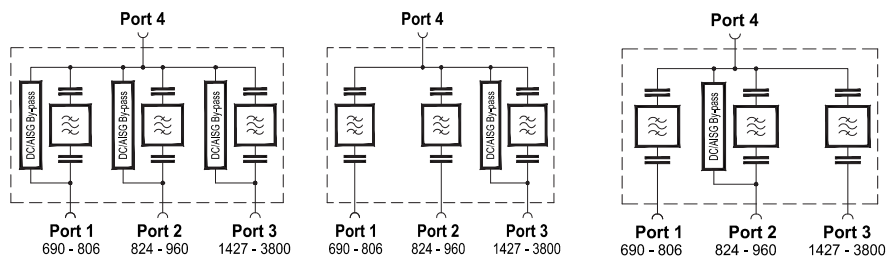
1427 – 3800 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78210700 Single Unit	78210702 Single Unit	78210704 Single Unit
		78210701 Double Unit	78210703 Double Unit	78210705 Double Unit
Pass band				
Band 1	MHz		690 – 806	
Band 2	MHz		824 – 960	
Band 3	MHz		1427 – 3800	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.5 (690 – 796 MHz); < 0.7 (796 – 806 MHz)	
Port 2 ↔ Port 4	dB		< 0.7 (824 – 834 MHz); < 0.5 (834 – 960 MHz)	
Port 3 ↔ Port 4	dB		< 0.15 (1427 – 3800 MHz)	
Isolation	dB		> 45	
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1 / Band 2 / Band 3	W		< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	Stop
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA		3, 10/350 μs pulse	
Mounting	mm in		Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb		Single Unit: 5 11.0 / Double Unit: 9.9 21.8	
Packing size	mm in		Single Unit: 405 x 295 x 170 16.0 x 11.6 x 6.7 Double Unit: 405 x 295 x 260 16.0 x 11.6 x 10.2	
Dimensions (w x h x d)	mm in		Single Unit: 222 x 222 x 87 8.7 x 8.7 x 3.4 Double Unit: 222 x 222 x 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)	

690 – 806 MHz

824 – 960 MHz

1427 – 3800 MHz

AUTO-SENSE

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

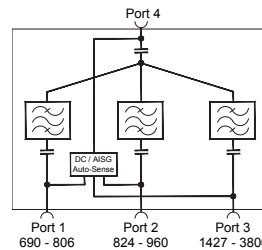
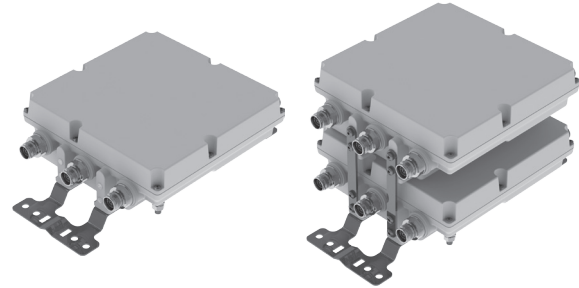
1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection



Technical Data

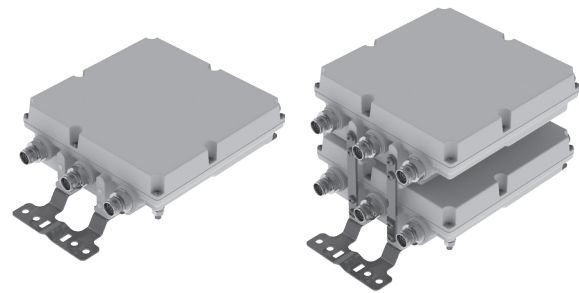
Type No. DC/AISG transparency			
1. First In - First Out Function		78210707 78210707V01 78210707V02	78210708 78210708V01 78210708V02
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	690 – 806	
Band 2	MHz	824 – 960	
Band 3	MHz	1427 – 3800	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.5 (690 – 796 MHz); < 0.7 (796 – 806 MHz)	
Port 2 ↔ Port 4	dB	< 0.7 (824 – 834 MHz); < 0.5 (834 – 960 MHz)	
Port 3 ↔ Port 4	dB	< 0.15 (1427 – 3800 MHz)	
Isolation	dB	> 45	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb	Single Unit: 5 11.0 / Double Unit: 9.9 21.8	
Dimensions (w x h x d)	mm in	Single Unit: 222 x 222 x 86.5 8.7 x 8.7 x 3.4 Double Unit: 222 x 222 x 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)	
Packing Size	mm in	Single Unit: 405 x 295 x 170 16.0 x 11.6 x 6.7 Double Unit: 405 x 295 x 260 16.0 x 11.6 x 10.2	

Triple-Band Combiner

KATHREIN

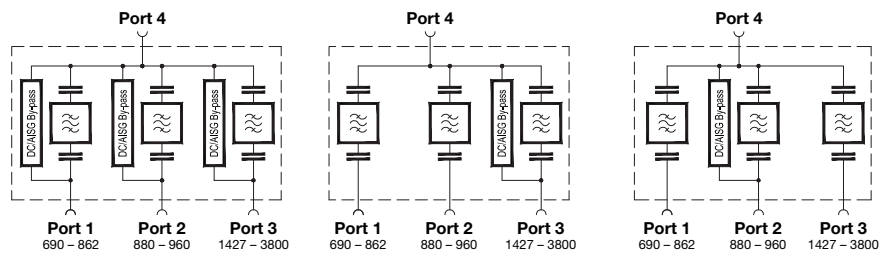
690 – 862 MHz 880 – 960 MHz 1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78211820 Single Unit	78211822 Single Unit	78211824 Single Unit
		78211821 Double Unit	78211823 Double Unit	78211825 Double Unit
Pass band				
Band 1	MHz		690 – 862	
Band 2	MHz		880 – 960	
Band 3	MHz		1427 – 3800	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.35 (690 - 852 MHz); < 0.6 (852 - 862 MHz)	
Port 2 ↔ Port 4	dB		< 0.6 (880 - 890 MHz); < 0.35 (890 - 960 MHz)	
Port 3 ↔ Port 4	dB		< 0.15 (1427 - 3800 MHz)	
Isolation				
Port 1	dB		> 50 (880 - 960 MHz); > 90 (1427 - 3800 MHz)	
Port 2	dB		> 60 (690 - 862 MHz); > 90 (1427 - 3800 MHz)	
Port 3	dB		> 65 (690 - 862 MHz); > 60 (880 - 960 MHz)	
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1 / Band 2 / Band 3	W		< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	Stop
Port 2 ↔ Port 4	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 3 ↔ Port 4	mA	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Lightning protection	kA		3, 10/350 μs pulse	
Mounting	mm in		Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb		Single Unit: 5 11.0 / Double Unit: 9.9 21.8	
Dimensions (w x h x d)	mm in		Single Unit: 222 x 222 x 86.5 8.7 x 8.7 x 3.4 Double Unit: 222 x 222 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)	
Packing size	mm in		Single Unit: 405 x 295 x 170 16.0 x 11.6 x 6.7 Double Unit: 405 x 295 x 260 16.0 x 11.6 x 10.2	

690 – 862 MHz

880 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

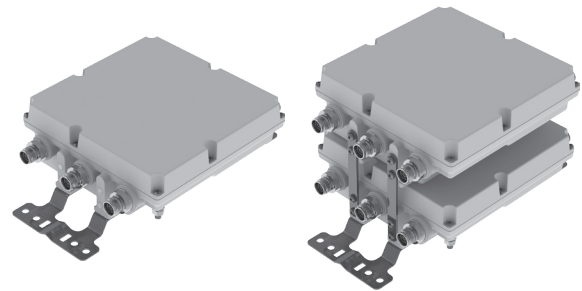
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

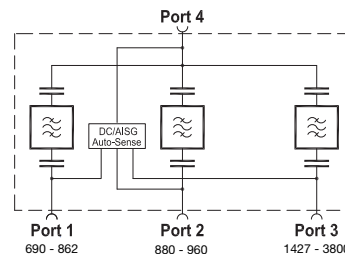
- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Single Unit

Double Unit



Technical Data

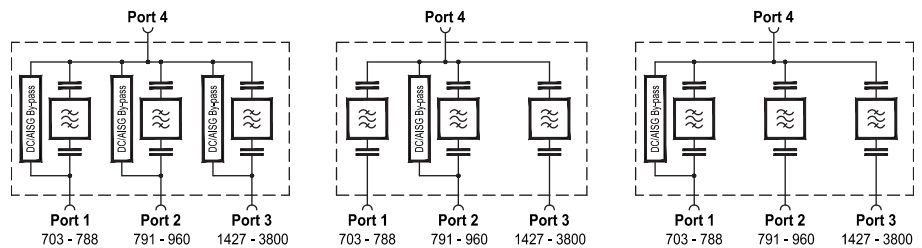
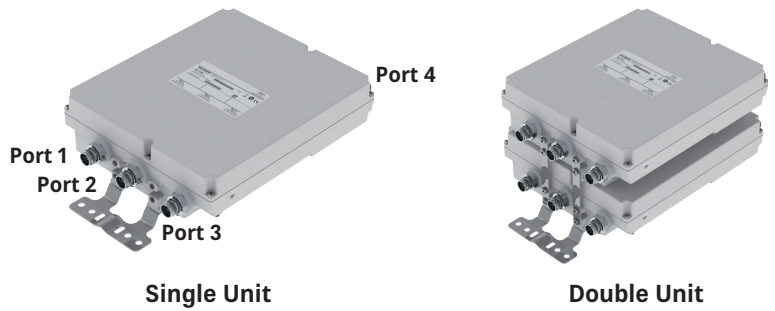
Type No. DC/AISG transparency		78211827 78211827V01 78211827V02	78211828 78211828V01 78211828V02
Unit		Single	Double
Pass band			
Band 1	MHz	690 – 862	
Band 2	MHz	880 – 960	
Band 3	MHz	1427 – 3800	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.4 (690 - 852 MHz); < 0.6 (852 - 862 MHz)	
Port 2 ↔ Port 4	dB	< 0.6 (880 - 890 MHz); < 0.4 (890 - 960 MHz)	
Port 3 ↔ Port 4	dB	< 0.15 (1427 - 3800 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 55 (690 - 862 MHz); > 50 (880 - 960 MHz)	
Port 1 ↔ Port 3	dB	> 65 (690 - 862 MHz); > 75 (1427 - 3800 MHz)	
Port 2 ↔ Port 3	dB	> 60 (880 - 960 MHz); > 75 (1427 - 3800 MHz)	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb	Single Unit: 5 11.0 / Double Unit: 9.9 21.8	
Dimensions (w x h x d)	mm in	Single Unit: 222 x 222 x 86.5 8.7 x 8.7 x 3.4; Double Unit: 222 x 222 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 405 x 295 x 170 16.0 x 11.6 x 6.7/ Double Unit: 405 x 295 x 260 16.0 x 11.6 x 10.3	

703 – 788 MHz

791 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211490	78211492	78211494
		Single Unit	Single Unit	Single Unit
		78211491	78211493	78211495
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz	703 – 788		
Band 2	MHz	791 – 960		
Band 3	MHz	1427 – 3800		
Insertion loss				
Port 1 ↔ Port 4	dB	< 0.7 (703 – 785 MHz) / < 1.0 (785 – 787 MHz) / < 1.5 (787 – 788 MHz)		
Port 2 ↔ Port 4	dB	< 1.5 (791 – 792 MHz) / < 1.0 (792 – 800 MHz) / < 0.7 (800 – 960 MHz)		
Port 3 ↔ Port 4	dB	< 0.2 (1427 – 3800 MHz)		
Isolation	dB	> 40		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)		
Intermodulation products	dBc	-160 (3 rd order; with 2 x 20 W)		
Temperature range	°C F°	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 6.2 13.7 / Double Unit: 12.0 26.5		
Dimensions (w x h x d)	mm in	Single unit: 258 x 301 x 88 10.2 x 11.9 x 3.5 Double unit: 258 x 301 x 178 10.2 x 11.9 x 7.0 (without connectors, without mounting brackets)		
Packing size	mm in	Single unit: 477 x 334 x 175 18.8 x 13.1 x 6.9 Double unit: 477 x 334 x 265 18.8 x 13.1 x 10.4		

703 – 788 MHz

791 – 960 MHz

1427 – 3800 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

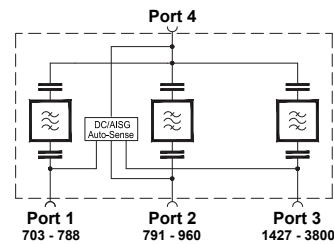
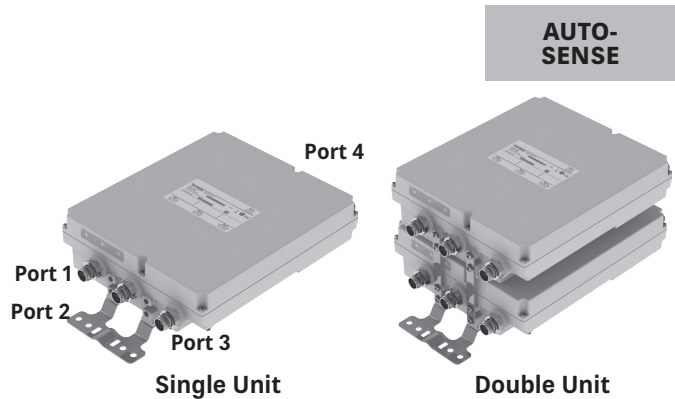
1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211497	78211498
2. Priority Controlled Function		78211497V01	78211498V01
3. Exclusive User Function		78211497V02	78211498V02
Unit		Single	Double
Pass band			
Band 1	MHz	703 – 788	
Band 2	MHz	791 – 960	
Band 3	MHz	1427 – 3800	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.7 (703 – 785 MHz) / < 1.0 (785 – 787 MHz) / < 1.5 (787 – 788 MHz)	
Port 2 ↔ Port 4	dB	< 1.5 (791 – 792 MHz) / < 1.0 (792 – 800 MHz) / < 0.7 (800 – 960 MHz)	
Port 3 ↔ Port 4	dB	< 0.2 (1427 – 3800 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power	W		
Band 1 / Band 2 / Band 3		< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 6.2 13.7 / Double unit: 12.0 26.5	
Dimensions (w x h x d)	mm in	Single Unit: 258 x 301 x 88 10.2 x 11.9 x 3.5 Double Unit: 258 x 301 x 178 10.2 x 11.9 x 7.0 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 477 x 334 x 175 18.8 x 13.1 x 6.9 Double Unit: 477 x 334 x 265 18.8 x 13.1 x 10.4	

Triple-Band Combiner

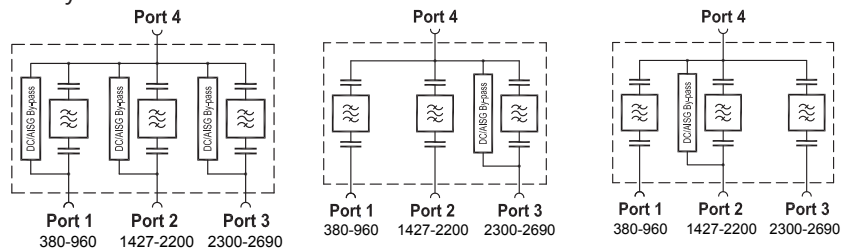
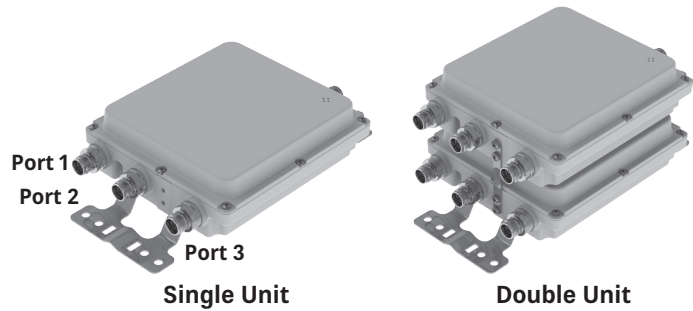
KATHREIN

380 – 960 MHz

1427 – 2200 MHz

2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211450	78211452	78211454
		Single Unit	Single Unit	Single Unit
		<i>clamps included</i>		
		78211451	78211453	78211455
		<i>clamps included</i>		Double Unit
Pass band				
Band 1	MHz	380 – 960		
Band 2	MHz	1427 – 2200		
Band 3	MHz	2300 – 2690		
Insertion loss				
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)		
Port 2 ↔ Port 4	dB	< 0.2 (1427 – 2200 MHz)		
Port 3 ↔ Port 4	dB	< 0.2 (2300 – 2690 MHz)		
Isolation	dB	> 50		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2 / Band 3	W	< 300 / < 200 / < 200		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/ISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	Stop
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set		
Weight	kg lb	Single unit: 3.5 7.7 / Double unit: 6.9 15.2		
Dimensions (w x h x d)	mm in	Single Unit: 215 x 197 x 68 8.5 x 7.8 x 2.7 Double Unit: 215 x 197 x 139 8.5 x 7.8 x 5.5 (without connectors, inclusive mounting brackets)		
Packing size	mm in	Single Unit: 392 x 272 x 165 15.4 x 10.7 x 6.5 Double Unit: 392 x 272 x 240 15.4 x 10.7 x 9.5		

380 – 960 MHz

1427 – 2200 MHz

2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

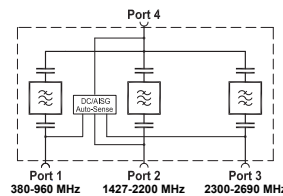
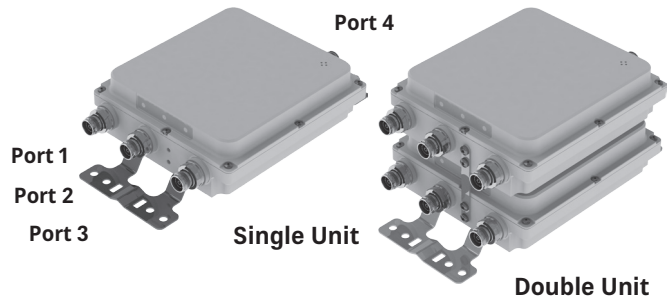
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE

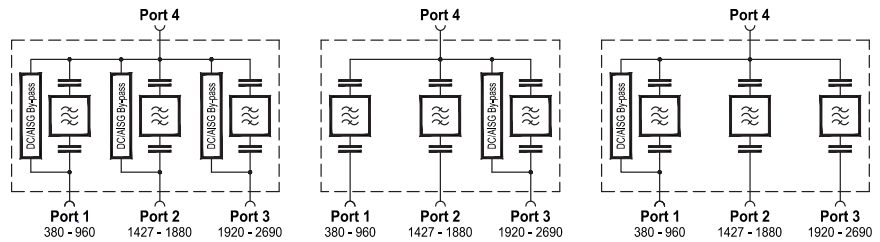
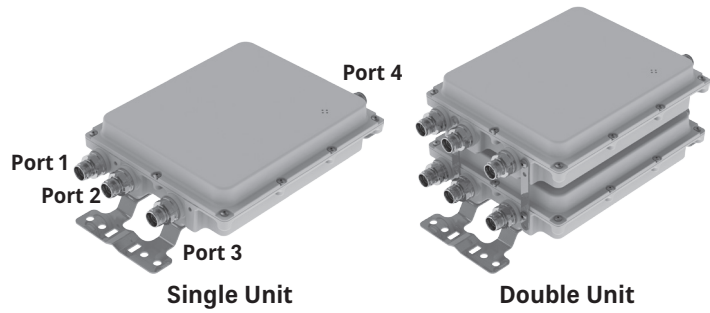


Technical Data

Type No. DC/AISG transparency		<div style="text-align: center;"> <p>78211457</p> <p>78211457V01</p> <p>78211457V02</p> </div> <div style="text-align: center; border: 1px solid black; padding: 2px; transform: rotate(-15deg); display: inline-block;"> clamps included </div> <div style="text-align: center;"> <p>78211458</p> <p>78211458V01</p> <p>78211458V02</p> </div>			
1. First In - First Out Function 2. Priority Controlled Function 3. Exclusive User Function					
Unit		Single		Double	
Pass band					
Band 1	MHz	380 – 960			
Band 2	MHz	1427 – 2200			
Band 3	MHz	2300 – 2690			
Insertion loss					
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)			
Port 2 ↔ Port 4	dB	< 0.2 (1427 – 2200 MHz)			
Port 3 ↔ Port 4	dB	< 0.2 (2300 – 2690 MHz)			
Isolation	dB	> 50			
VSWR		< 1.25			
Impedance	Ω	50			
Input power					
Band 1 / Band 2 / Band 3	W	< 300 / < 200 / < 200			
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150			
Temperature range	°C °F	-40 ... +60 -40 ... +140			
Connectors		4.3-10 female			
Application		Indoor or outdoor (IP 66)			
DC/AISG transparency					
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)			
Lightning protection	kA	3, 10/350 μs pulse			
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set			
Weight	kg lb	Single Unit: 3.7 8.2 / Double Unit: 7.2 15.9			
Dimensions (w x h x d)	mm in	Single Unit: 215 x 197 x 68 8.5 x 7.8 x 2.7 / Double Unit: 215 x 197 x 139 8.5 x 7.8 x 5.5 (without connectors, without mounting brackets)			
Packing Size	mm in	Single Unit: 392 x 272 x 165 15.4 x 10.7 x 6.5 Double Unit: 392 x 272 x 240 15.4 x 10.7 x 9.4			

380 – 960 MHz 1427 – 1880 MHz 1920 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211560 Single Unit	78211562 Single Unit	78211564 Single Unit
		78211561 Double Unit	78211563 Double Unit	78211565 Double Unit
Pass band				
Band 1	MHz		380 – 960	
Band 2	MHz		1427 – 1880	
Band 3	MHz		1920 – 2690	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	dB		< 0.3 (1427 – 1880 MHz)	
Port 3 ↔ Port 4	dB		< 0.35 (1920 – 2690 MHz)	
Isolation	dB		> 40	
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1 / Band 2 / Band 3	W		< 200 / < 200 / < 200	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150 < -160 (1427 – 2690 MHz, 3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 4	mA	By-pass (max. 2500)	Stop	Stop
Port 3 ↔ Port 4	mA	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Lightning protection	kA		3, 10/350 μs pulse	
Mounting	mm in		Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With clamp set	
Weight	kg lb		Single unit: 3.6 7.1 / Double unit: 7.0 15.4	
Dimensions (w x h x d)	mm in		Single Unit: 251 x 211 x 68 9.9 x 8.3 x 2.7 Double Unit: 251 x 211 x 139 9.9 x 8.3 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in		Single Unit: 439 x 289 x 160 17.3 x 11.4 x 6.3 Double Unit: 439 x 289 x 230 17.3 x 11.4 x 9.1	

380 – 960 MHz

1427 – 1880 MHz

1920 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

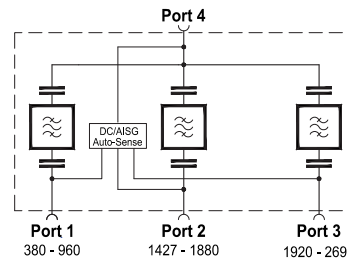
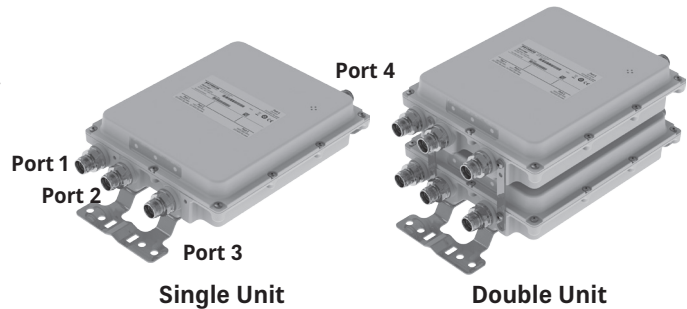
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE

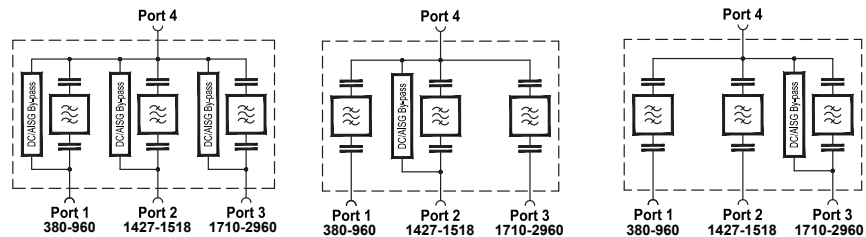
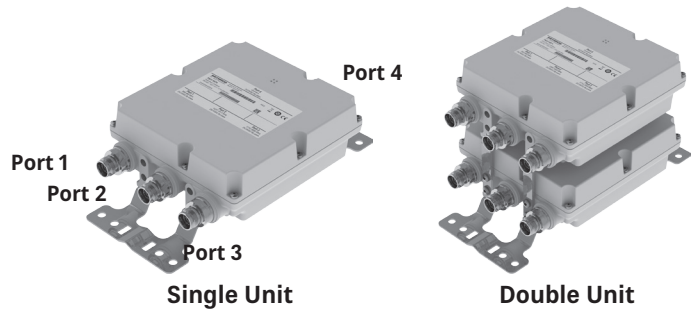


Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211567	78211568
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	380 – 960	
Band 2	MHz	1427 – 1880	
Band 3	MHz	1920 – 2690	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	dB	< 0.3 (1427 – 1880 MHz)	
Port 3 ↔ Port 4	dB	< 0.35 (1920 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power	W		
Band 1 / Band 2 / Band 3		< 200 / < 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 3.7 8.2 / Double unit: 7.1 15.7	
Dimensions (w x h x d)	mm in	Single Unit: 251 x 211 x 68 9.9 x 8.3 x 2.7 Double Unit: 251 x 211 x 139 9.9 x 8.3 x 5.5 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 439 x 289 x 160 17.3 x 11.4 x 6.3 Double Unit: 439 x 289 x 230 17.3 x 11.4 x 9.1	

380 – 960 MHz	1427 – 1518 MHz	1710 – 2690 MHz
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- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211570 Single Unit		78211572 Single Unit		78211574 Single Unit	
		78211571 Double Unit		78211573 Double Unit		78211575 Double Unit	
Pass band							
Band 1	MHz	380 – 960					
Band 2	MHz	1427 – 1518					
Band 3	MHz	1710 – 2690					
Insertion loss							
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)					
Port 2 ↔ Port 4	dB	< 0.2 (1427 – 1518 MHz)					
Port 3 ↔ Port 4	dB	< 0.3 (1710 – 2690 MHz)					
Isolation	dB	> 40					
VSWR		< 1.25					
Impedance	Ω	50					
Input power							
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200					
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)					
Temperature range	°C °F	-40 ... +60 -40 ... +140					
Connectors		4.3-10 female					
Application		Indoor or outdoor (IP 66)					
DC/AISG transparency							
Port 1 ↔ Port 4	mA	By-pass (max. 2500)		Stop		Stop	
Port 2 ↔ Port 4	mA	By-pass (max. 2500)		By-pass (max. 2500)		Stop	
Port 3 ↔ Port 4	mA	By-pass (max. 2500)		Stop		By-pass (max. 2500)	
Lightning protection	kA	3, 10/350 μs pulse					
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set					
Weight	kg lb	Single unit: 3.2 7.05 / Double unit: 6.3 13.89					
Dimensions (w x h x d)	mm in	Single Unit: 190 x 176 x 77 7.5 x 6.9 x 3.0 Double Unit: 190 x 176 x 161 7.5 x 6.9 x 6.3 (without connectors, without mounting brackets)					
Packing size	mm in	Single Unit: 375 x 245 x 160 14.76 x 9.65 x 6.30 Double Unit: 375 x 245 x 245 14.76 x 9.65 x 9.65					

380 – 960 MHz

1427 - 1518 MHz

1710 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

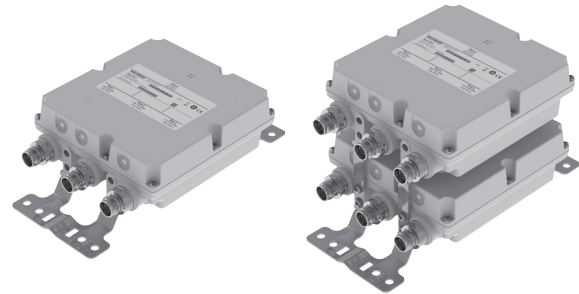
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

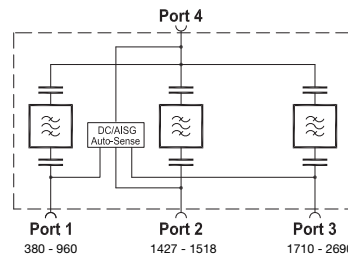
- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Single Unit

Double Unit



Technical Data

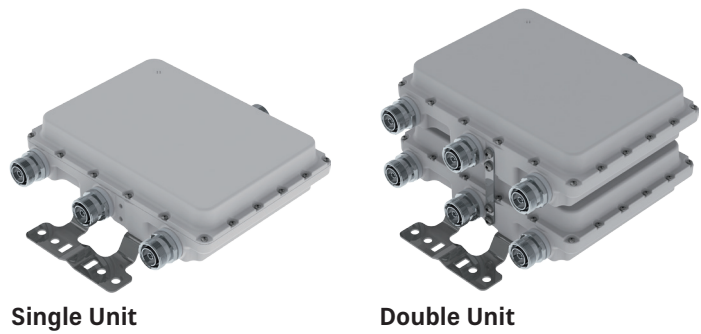
Type No. DC/AISG transparency			
1. First In - First Out Function		<p>78211577 78211577V01 78211577V02</p> <p>clamps included</p>	<p>78211578 78211578V01 78211578V02</p>
2. Priority Controlled Function			
3. Exclusive User Function			
Unit		Single	Double
Pass band			
Band 1	MHz	380 – 960	
Band 2	MHz	1427 – 1518	
Band 3	MHz	1710 – 2690	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	dB	< 0.2 (1427 – 1518 MHz)	
Port 3 ↔ Port 4	dB	< 0.3 (1710 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set	
Weight	kg lb	Single unit: 3.2 7.1 / Double unit: 6.3 13.9	
Dimensions (w x h x d)	mm in	Single Unit: 190 x 176 x 77 7.5 x 6.9 x 3.0 Double Unit: 190 x 176 x 161 7.5 x 6.9 x 6.3 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 375 x 245 x 160 14.8 x 9.7 x 6.3 Double Unit: 375 x 245 x 245 14.8 x 9.7 x 9.7	

Triple-Band Combiner

KATHREIN

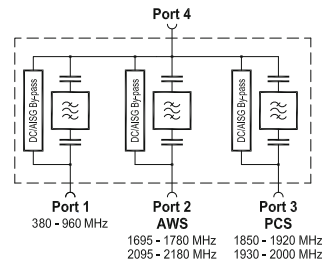
380 – 960 MHz **1695 – 1780 / 2095 – 2200 MHz** **1850 – 1920 / 1930 – 2000 MHz**

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78210780 Single unit	clamps included	78210781 Double unit
Pass band				
Band 1	MHz	380 – 960		
Band 2	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)		
Band 3	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)		
Insertion loss				
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)		
Port 2 ↔ Port 4	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)		
Port 3 ↔ Port 4	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)		
Isolation				
Port 1 ↔ Port 2	dB	> 50 (380 – 960 / 1695 – 1780 / 2095 – 2200 MHz)		
Port 1 ↔ Port 3	dB	> 50 (380 – 960 / 1850 – 1920 / 1930 – 2000 MHz)		
Port 2 ↔ Port 3	dB	> 50 (1695 – 1780 / 1850 – 1920 / 1930 – 2000 / 2095 – 2200 MHz)		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Port 1	W	< 250		
Port 2 (AWS)	W	< 250		
Port 3 (PCS)	W	< 250		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz < -150 dBc		
Temperature range	°C °F	-40 ... +60 -40 ... 140		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency	mA	By-pass between all ports (max. 2500)		
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set		
Weight	kg lb	Single Unit: 3 6.61 / Double Unit: 5.9 13.00		
Dimensions (w x h x d)	mm in	Single Unit: 244 x 185 x 46 9.6 x 7.3 x 1.8 / Double Unit: 244 x 185 x 97 9.6 x 7.3 x 3.8 (without connectors, without mounting brackets)		

380 – 960 MHz

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

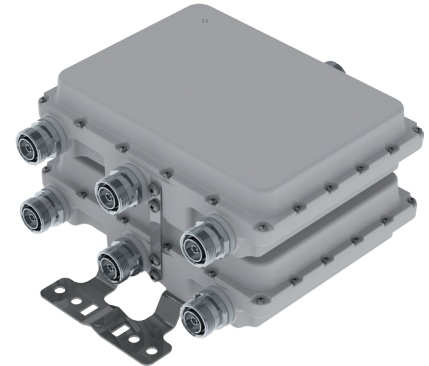
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

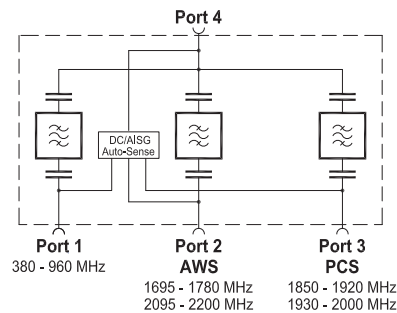
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Double Unit



Technical Data

Type No.		78210788v01 Double unit	
Pass band			
Band 1	MHz	380 – 960	
Band 2	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)	
Band 3	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)	
Port 3 ↔ Port 4	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50 (380 – 960 / 1695 – 1780 / 2095 – 2200 MHz)	
Port 1 ↔ Port 3	dB	> 50 (380 – 960 / 1850 – 1920 / 1930 – 2000 MHz)	
Port 2 ↔ Port 3	dB	> 50 (1695 – 1780 / 1850 – 1920 / 1930 – 2000 / 2095 – 2200 MHz)	
VSWR		< 1.25	
Impedance	Ω	50	
Input power per Band	W	< 250 (operational) / < 500 (survival)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	40 ... +60 -40 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb	6.3 13.9	
Dimensions (w x h x d)	mm in	244 x 185 x 130 9.6 x 7.3 x 5.1 (without connectors, without mounting brackets)	

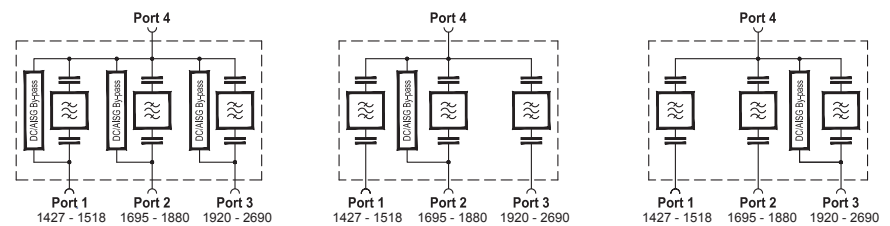
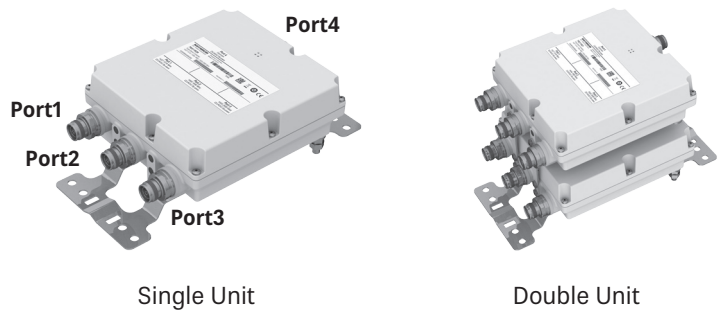
clamps included

Triple-Band Combiner

KATHREIN

- 1427 – 1518 MHz
- 1695 – 1880 MHz
- 1920 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211920	78211922	78211924
		Single Unit	Single Unit	Single Unit
		78211921	78211923	78211925
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz		1427 – 1518	
Band 2	MHz		1695 – 1880	
Band 3	MHz		1920 – 2690	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.2 (typ. 0.15)	
Port 2 ↔ Port 4	dB		< 0.3 (typ. 0.2)	
Port 3 ↔ Port 4	dB		< 0.4 (typ. 0.2)	
Isolation				
Port 1 ↔ Port 2	dB	> 40 (1427 – 1518 / 1695 – 1880 MHz)		
Port 1 ↔ Port 3	dB	> 45 (1427 – 1518 / 1920 – 2690 MHz)		
Port 2 ↔ Port 3	dB	> 45 (1695 – 1880 / 1920 – 2690 MHz)		
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1 / Band 2 / Band 3	W		< 200 / < 200 / < 200	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop By-pass (max. 2500) Stop	Stop Stop By-pass (max. 2500)
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA		3, 10/350 μs pulse	
Mounting			Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb		Single unit: 3.1 6.9 / Double unit: 6.3 13.8	
Dimensions (w x h x d)	mm in		Single unit: 190 x 176 x 82 7.5 x 6.9 x 3.2 Double unit: 190 x 176 x 167 7.5 x 6.9 x 6.6 (without connectors, without mounting brackets)	
Packing size	mm in		Single unit: 370 x 242 x 167 14.6 x 9.5 x 6.6 / Double unit: 370 x 242 x 252 14.6 x 9.5 x 9.9	

1427 – 1518 MHz **1695 – 1880 MHz** **1920 – 2690 MHz**

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

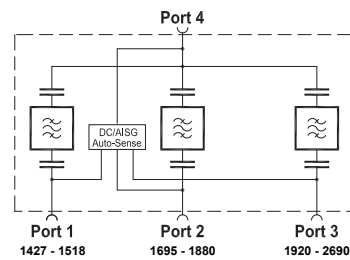
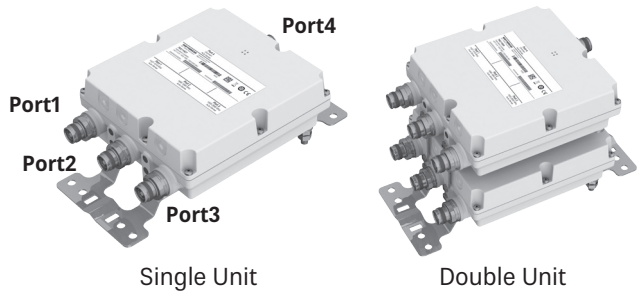
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

AUTO-SENSE



Technical Data

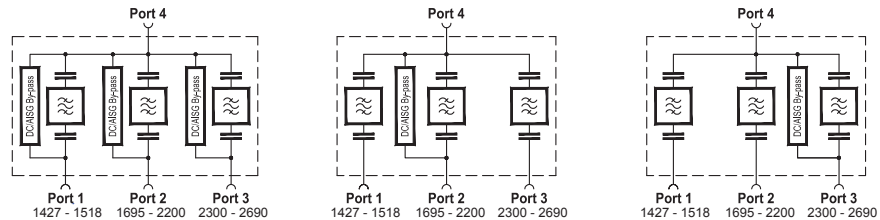
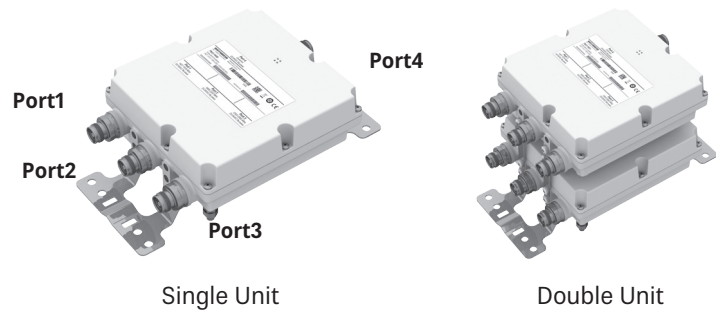
Type No. DC/AISG transparency		78211927 78211927V01 78211927V02		78211928 78211928V01 78211928V02	
Unit		Single		Double	
1. First In - First Out Function					
2. Priority Controlled Function					
3. Exclusive User Function					
Pass band					
Band 1	MHz	1427 – 1518			
Band 2	MHz	1695 – 1880			
Band 3	MHz	1920 – 2690			
Insertion loss					
Port 1 ↔ Port 4	dB	< 0.2 (typ. 0.15)			
Port 2 ↔ Port 4	dB	< 0.3 (typ. 0.2)			
Port 3 ↔ Port 4	dB	< 0.4 (typ. 0.2)			
Isolation					
Port 1 ↔ Port 2	dB	> 40 (1427 – 1518 / 1695 – 1880 MHz)			
Port 1 ↔ Port 3	dB	> 45 (1427 – 1518 / 1920 – 2690 MHz)			
Port 2 ↔ Port 3	dB	> 45 (1695 – 1880 / 1920 – 2690 MHz)			
VSWR				< 1.25	
Impedance	Ω			50	
Input power					
Band 1 / Band 2 / Band 3	W			< 200 / < 200 / < 200	
Intermodulation products	dBc			< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F			-40 ... +60 -40 ... +140	
Connectors				4.3-10 female	
Application				Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1, 2, 3 ↔ Port 4	mA			Auto-sense (max. 2000)	
Lightning protection	kA			3, 10/350 μs pulse	
Mounting				Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb			Single unit: 3.3 7.3 / Double unit: 6.4 14.1	
Dimensions (w x h x d)	mm in			Single unit: 190 x 176 x 82 7.5 x 6.9 x 3.2 Double unit: 190 x 176 x 167 7.5 x 6.9 x 6.6 (without connectors, without mounting brackets)	
Packing size	mm in			Single unit: 370 x 242 x 167 14.6 x 9.5 x 6.6 / Double unit: 370 x 242 x 252 14.6 x 9.5 x 9.9	

Triple-Band Combiner

KATHREIN

1427 – 1518 MHz 1695 – 2200 MHz 2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211930 Single Unit	78211932 Single Unit	78211934 Single Unit
		78211931 Double Unit	78211933 Double Unit	78211935 Double Unit
Pass band				
Band 1 (GSM/LTE1800)	MHz		1427 – 1518	
Band 2 (UMTS2100)	MHz		1695 – 2200	
Band 3 (2300 ... LTE2600)	MHz		2300 – 2690	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.2	
Port 2 ↔ Port 4	dB		< 0.4 (typ. 0.3 dB)	
Port 3 ↔ Port 4	dB		< 0.3 (typ. 0.2 dB)	
Isolation				
Port 1 ↔ Port 2	dB		> 50 (1427 – 1518 / 1695 – 2200 MHz)	
Port 1 ↔ Port 3	dB		> 50 (1427 – 1518 / 2300 – 2690 MHz)	
Port 2 ↔ Port 3	dB		> 45 (1695 – 2200 / 2300 – 2690 MHz)	
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1 / Band 2 / Band 3	W		< 200 / < 200 / < 200	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop	Stop
Port 2 ↔ Port 4	mA	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Port 3 ↔ Port 4	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Lightning protection	kA		3, 10/350 µs pulse	
Mounting			Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb		Single unit: 3.0 6.6 / Double unit: 6.0 13.2	
Dimensions (w x h x d)	mm in		Single unit: 190 x 176 x 82 7.5 x 6.9 x 3.2 Double unit: 190 x 176 x 168 7.5 x 6.9 x 6.6 (without connectors, without mounting brackets)	
Packing size	mm in		Single unit: 370 x 242 x 167 14.6 x 9.5 x 6.6 / Double unit: 370 x 242 x 252 14.6 x 9.5 x 9.9	

1427 – 1518 MHz 1695 – 2200 MHz 2300 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

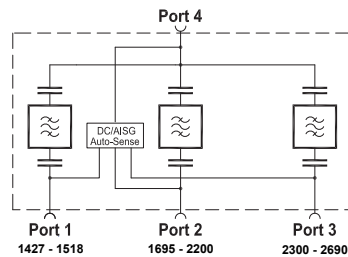
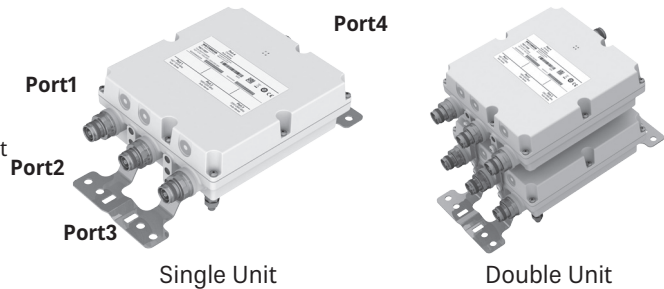
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

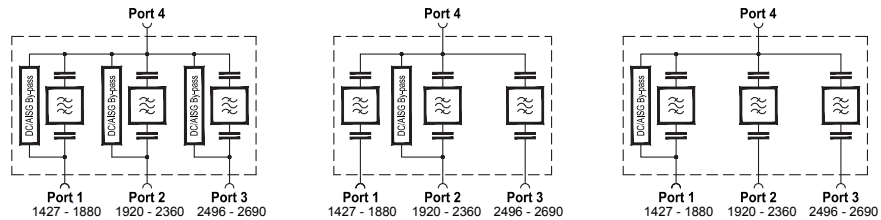
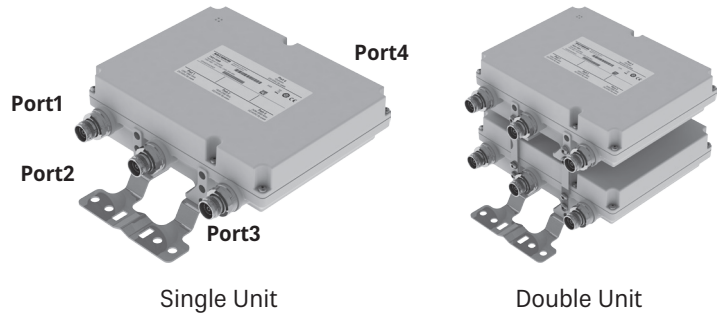


Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211937	78211938
2. Priority Controlled Function		78211937V01	78211938V01
3. Exclusive User Function		78211937V02	78211938V02
Unit		Single	Double
Pass band			
Band 1	MHz	1427 – 1518	
Band 2	MHz	1695 – 2200	
Band 3	MHz	2300 – 2690	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.2	
Port 2 ↔ Port 4	dB	< 0.4 (typ. 0.3 dB)	
Port 3 ↔ Port 4	dB	< 0.3 (typ. 0.2 dB)	
Isolation			
Port 1 ↔ Port 2	dB	> 50 (1427 – 1518 / 1695 – 2200 MHz)	
Port 1 ↔ Port 3	dB	> 50 (1427 – 1518 / 2300 – 2690 MHz)	
Port 2 ↔ Port 3	dB	> 45 (1695 – 2200 / 2300 – 2690 MHz)	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 3.0 6.6 / Double unit: 6.0 13.2	
Dimensions (w x h x d)	mm in	Single unit: 190 x 176 x 82 7.5 x 6.9 x 3.2 Double unit: 190 x 176 x 168 7.5 x 6.9 x 6.6 (without connectors, without mounting brackets)	
Packing size	mm in	Single unit: 370 x 242 x 167 14.6 x 9.5 x 6.6 / Double unit: 370 x 242 x 252 14.6 x 9.5 x 9.9	

1427 – 1880 MHz 1920 – 2360 MHz 2496 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211690	78211692	78211694
		Single Unit	Single Unit	Single Unit
		78211691	78211693	78211695
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1 (GSM/LTE1800)	MHz	1427 – 1880		
Band 2 (UMTS2100)	MHz	1920 – 2360		
Band 3 (2300 ... LTE2600)	MHz	2496 – 2690		
Insertion loss				
Port 1 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)		
Port 2 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)		
Port 3 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)		
Isolation				
Port 1 ↔ Port 2	dB	> 45 (1427 – 1880 / 1920 – 2360 MHz)		
Port 1 ↔ Port 3	dB	> 45 (1427 – 1880 / 2496 – 2690 MHz)		
Port 2 ↔ Port 3	dB	> 45 (1920 – 2360 / 2496 – 2690 MHz)		
VSWR		< 1.25		
Impedance	Ω	50		
Input power				
Band 1 / Band 2 / Band 3	W	< 150 / < 150 / < 150		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	Stop By-pass (max. 2500) Stop	By-pass (max. 2500) Stop Stop
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set		
Weight	kg lb	Single unit: 3.0 6.6 / Double unit: 6.0 13.2		
Dimensions (w x h x d)	mm in	Single unit: 225 x 176 x 75 8.9 x 6.9 x 3.0 Double unit: 225 x 176 x 156 8.9 x 6.9 x 6.1 (without connectors, without mounting brackets)		
Packing size	mm in	Single unit: 367 x 289 x 152 14.4 x 11.4 x 6.0 Double unit: 367 x 289 x 233 14.4 x 11.4 x 9.2		

Triple-Band Combiner

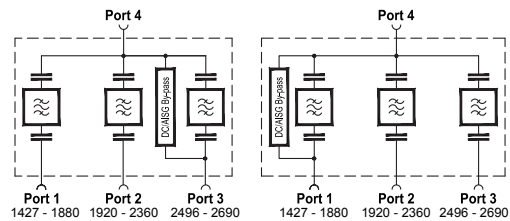
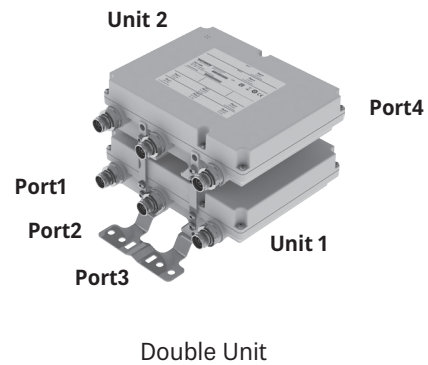
KATHREIN

1427 – 1880 MHz

1920 – 2360 MHz

2496 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211696 Double Unit	
Pass band			
Band 1 (GSM/LTE1800)	MHz		1427 – 1880
Band 2 (UMTS2100)	MHz		1920 – 2360
Band 3 (2300 ... LTE2600)	MHz		2496 – 2690
Insertion loss			
Port 1 ↔ Port 4	dB		< 0.5 (typ. 0.2 dB)
Port 2 ↔ Port 4	dB		< 0.5 (typ. 0.2 dB)
Port 3 ↔ Port 4	dB		< 0.5 (typ. 0.2 dB)
Isolation			
Port 1 ↔ Port 2	dB		> 45 (1427 – 1880 / 1920 – 2360 MHz)
Port 1 ↔ Port 3	dB		> 45 (1427 – 1880 / 2496 – 2690 MHz)
Port 2 ↔ Port 3	dB		> 45 (1920 – 2360 / 2496 – 2690 MHz)
VSWR			< 1.25
Impedance	Ω		50
Input power			
Band 1 / Band 2 / Band 3	W		< 150 / < 150 / < 150
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F		-40 ... +60 -40 ... +140
Connectors			4.3-10 female (long neck)
Application			Indoor or outdoor (IP 66)
DC/AISG transparency			
Port 1 ↔ Port 4	mA	Unit 1	Unit 2
Port 2 ↔ Port 4	mA	Stop	By-pass (max. 2500)
Port 3 ↔ Port 4	mA	Stop	Stop
		By-pass (max. 2500)	
Lightning protection	kA		3, 10/350 μs pulse
Mounting			Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	kg lb		6.0 13.2
Packing size	mm in		367 x 289 x 233 14.4 x 11.4 x 9.2
Dimensions (w x h x d)	mm in		225 x 176 x 156 8.9 x 6.9 x 6.1 (without connectors, without mounting brackets)

1427 – 1880 MHz	1920 – 2360 MHz	2496 – 2690 MHz
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- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

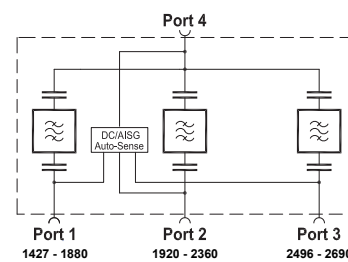
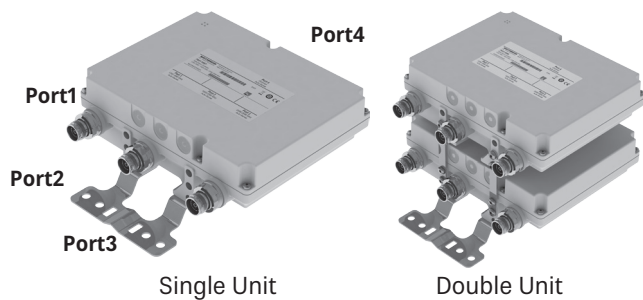
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

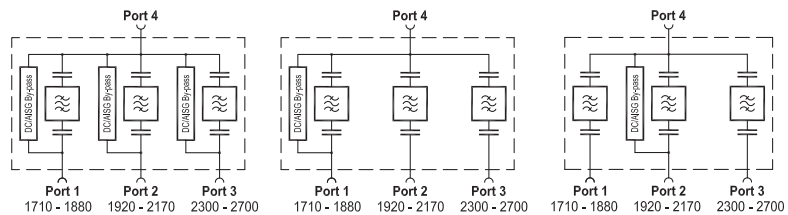
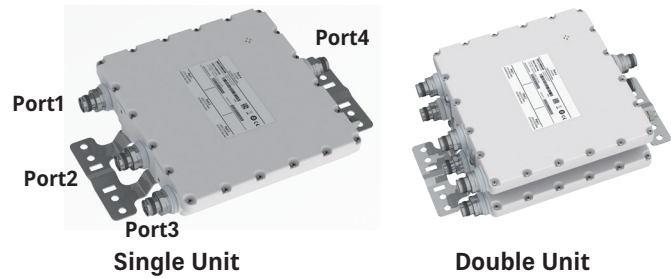
AUTO-SENSE


Technical Data

Type No.		
DC/AISG transparency		
1. First In - First Out Function	78211697	78211698
2. Priority Controlled Function	78211697V01	78211698V01
3. Exclusive User Function	78211697V02	78211698V02
Unit	Single	Double
Pass band		
Band 1	MHz	1427 – 1880
Band 2	MHz	1920 – 2360
Band 3	MHz	2496 – 2690
Insertion loss		
Port 1 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)
Port 2 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)
Port 3 ↔ Port 4	dB	< 0.5 (typ. 0.2 dB)
Isolation		
Port 1 ↔ Port 2	dB	> 45 (1427 – 1880 / 1920 – 2360 MHz)
Port 1 ↔ Port 3	dB	> 45 (1427 – 1880 / 2496 – 2690 MHz)
Port 2 ↔ Port 3	dB	> 45 (1920 – 2360 / 2496 – 2690 MHz)
VSWR	< 1.25	
Impedance	Ω	50
Input power		
Band 1 / Band 2 / Band 3	W	< 150 / < 150 / < 150
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +60 -40 ... +140
Connectors	4.3-10 female	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency		
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)
Lightning protection	kA	3, 10/350 µs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 3.0 6.6 / Double unit: 6.0 13.2
Dimensions (w x h x d)	mm in	Single unit: 225 x 176 x 75 8.9 x 6.9 x 3.0 Double unit: 225 x 176 x 156 8.9 x 6.9 x 6.1 (without connectors, without mounting brackets)
Packing size	mm in	Single unit: 367 x 289 x 152 14.4 x 11.4 x 6.0 / Double unit: 367 x 289 x 233 14.4 x 11.4 x 9.2

1710 – 1880 MHz 1920 – 2170 MHz 2300 – 2700 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211400V43	78211402V43	78211404V43
		Single Unit	Single Unit	Single Unit
		78211401V43	78211403V43	78211405V43
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1	MHz		1710 – 1880	
Band 2	MHz		1920 – 2170	
Band 3	MHz		2300 – 2700	
Insertion loss				
Port 1 ↔ Port 4	dB		< 0.3 (typ. 0.1)	
Port 2 ↔ Port 4	dB		< 0.3 (typ. 0.1)	
Port 3 ↔ Port 4	dB		< 0.3 (typ. 0.1)	
Isolation				
Port 1 ↔ Port 2	dB		> 50 (1710 – 1880 / 1920 – 2170 MHz)	
Port 1 ↔ Port 3	dB		> 50 (1710 – 1880 / 2300 – 2700 MHz)	
Port 2 ↔ Port 3	dB		> 50 (1920 – 2170 / 2300 – 2700 MHz)	
VSWR			< 1.25	
Impedance	Ω		50	
Input power	W			
Band 1 / Band 2 / Band 3			< 200 / < 200 / < 200	
Intermodulation products	dBc		< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F		-55 ... +60 -67 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 4	mA	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Port 2 ↔ Port 4	mA			
Port 3 ↔ Port 4	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. diameter [mm in] 8 0.315) Mast mounting: With additional clamp set		
Weight	kg lb	Single unit: 3.3 7.3 Double unit: 6.7 14.8		
Dimensions (w x h x d)	mm in	Single unit: 235 x 217 x 46 9.3 x 8.5 x 1.8 Double unit: 235 x 217 x 97 9.3 x 8.5 x 3.8 (without connectors, without mounting brackets)		
Packing size	mm in	Single unit: 405 x 325 x 155 15.9 x 12.8 x 6.1 Double unit: 405 x 325 x 205 15.9 x 12.8 x 8.1		

1710 – 1880 MHz **1920 – 2170 MHz** **2300 – 2700 MHz**

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

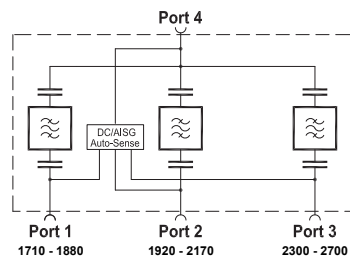
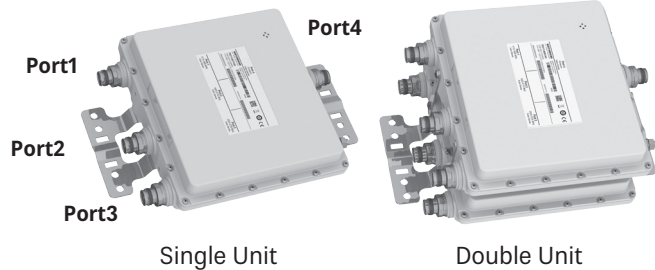
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPoL antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211407V43	78211408V43
2. Priority Controlled Function		78211407V44	78211408V44
3. Exclusive User Function		78211407V45	78211408V45
Unit		Single	Double
Pass band			
Band 1	MHz	1710 – 1880	
Band 2	MHz	1920 – 2170	
Band 3	MHz	2300 – 2700	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.3 (typ. 0.1 dB)	
Port 2 ↔ Port 4	dB	< 0.3 (typ. 0.1 dB)	
Port 3 ↔ Port 4	dB	< 0.3 (typ. 0.1 dB)	
Isolation			
Port 1 ↔ Port 2	dB	> 50 (1710 – 1880 / 1920 – 2170 MHz)	
Port 1 ↔ Port 3	dB	> 50 (1710 – 1880 / 2300 – 2700 MHz)	
Port 2 ↔ Port 3	dB	> 50 (1920 – 2170 / 2300 – 2700 MHz)	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3	W	< 200 / < 200 / < 200	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-55 ... +60 -67 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 µs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single unit: 3.4 7.5 / Double unit: 6.9 15.2	
Dimensions (w x h x d)	mm in	Single unit: 235 x 217 x 64 9.3 x 8.5 x 2.5 Double unit: 235 x 217 x 135 9.3 x 8.5 x 5.3 (without connectors, without mounting brackets)	
Packing size	mm in	Single unit: 404 x 324 x 175 15.9 x 12.8 x 6.9 / Double unit: 404 x 324 x 245 15.9 x 12.8 x 9.6	

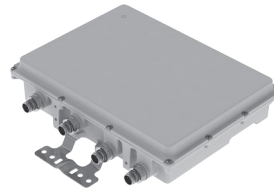
690 – 862 MHz

880 – 960 MHz

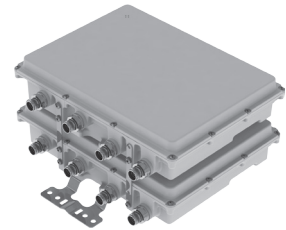
1427 – 1880 MHz

1920 – 2690 MHz

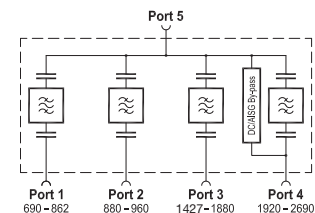
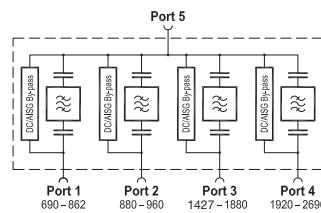
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.		78211340 Single Unit	78211342 Single Unit
		78211341 Double Unit	78211343 Double Unit
		clamps included	
Pass band			
Band 1	MHz	690 – 862	
Band 2	MHz	880 – 960	
Band 3	MHz	1427 – 1880	
Band 4	MHz	1920 – 2690	
Insertion loss			
Port 1 ↔ Port 5	dB	< 0.45, typ. 0.25 (690 – 862 MHz)	
Port 2 ↔ Port 5	dB	< 0.45, typ. 0.3 (880 – 960 MHz)	
Port 3 ↔ Port 5	dB	< 0.35, typ. 0.2 (1427 – 1880 MHz)	
Port 4 ↔ Port 5	dB	< 0.35, typ. 0.3 (1920 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3 / Band 4	W	< 200 / < 200 / < 200 / < 100	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 5]	mA	By-pass (max. 2500)	Stop Stop Stop By-pass (max. 2500)
Port 2 ↔ Port 5	mA		
Port 3 ↔ Port 5	mA		
Port 4 ↔ Port 5	mA		
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. diameter 8 0.315) / Mast mounting: With included clamp set	
Weight	kg lb	Single Unit: 6.7 14.6 / Double Unit: 13.3 29.3	
Dimensions (w x h x d)	mm in	Single Unit approx.: 358 x 271 x 84 14.1 x 10.7 x 3.3 Double Unit approx.: 358 x 271 x 172 14.1 x 10.7 x 6.8 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 460x 440 x 177 18.1 x 17.3 x 7.0 Double Unit: 460 x 440 x 265 18.1 x 17.3 x 10.4	

- 690 – 862 MHz
- 880 – 960 MHz
- 1427 – 1880 MHz
- 1920 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions (more details on next page):

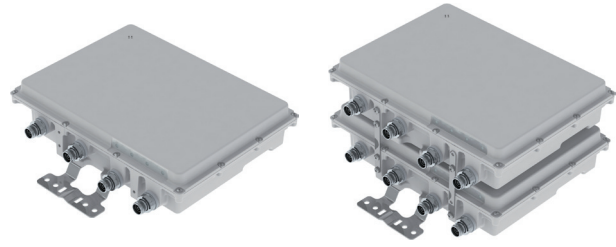
1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

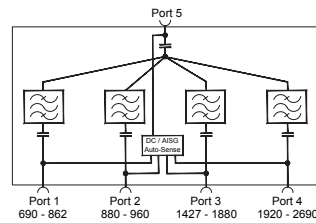
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection



**78211347
Single Unit**

**78211348
Double Unit**



Technical Data

Type No. DC/AISG transparency		78211347	78211348
1. First In - First Out Function 2. Priority Controlled Function 3. Exclusive User Function		78211347V01 78211347V02	78211348V01 78211348V02
Unit		Single	Double
Pass band			
Band 1	MHz	690 – 862	
Band 2	MHz	880 – 960	
Band 3	MHz	1427 – 1880	
Band 4	MHz	1920 – 2690	
Insertion loss			
Port 1 ↔ Port 5	dB	< 0.45, typ. 0.25 (690 – 862 MHz)	
Port 2 ↔ Port 5	dB	< 0.45, typ. 0.3 (880 – 960 MHz)	
Port 3 ↔ Port 5	dB	< 0.35, typ. 0.2 (1427 – 1880 MHz)	
Port 4 ↔ Port 5	dB	< 0.35, typ. 0.3 (1920 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3 / Band 4	W	< 200 / < 200 / < 200 / < 100	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1, 2, 3, 4 ↔ Port 5	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. diameter 8 0.315) Mast mounting: With included clamp set	
Weight	kg lb	Single Unit: 6.8 14.9 / Double Unit: 13.5 29.6	
Dimensions (w x h x d)	mm in	Single Unit: 358 x 271 x 84 14.1 x 10.7 x 3.3 Double Unit: 358 x 271 x 172 14.1 x 10.7 x 6.8 (without connectors, without mounting brackets)	
Packing size	mm in	Single Unit: 460 x 440 x 177 18.1 x 17.3 x 7.0 Double Unit: 460 x 440 x 265 18.1 x 17.3 x 10.4	

clamps included

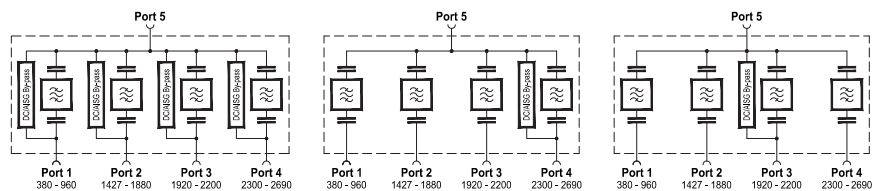
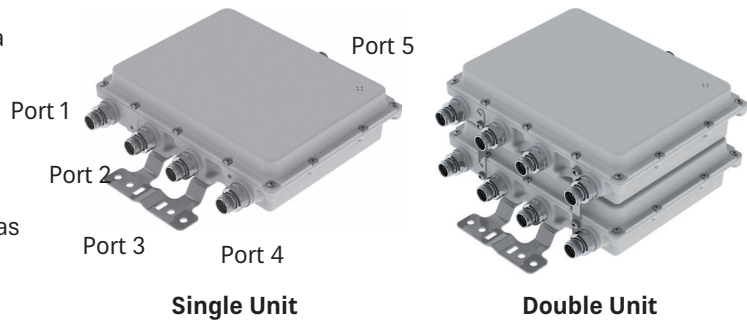
380 – 960 MHz

1427 – 1880 MHz

1920 – 2200 MHz

2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available as a single unit, or for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211580	78211582	78211584
		Single Unit	Single Unit	Single Unit
		78211581	78211583	78211585
		Double Unit	Double Unit	Double Unit
Pass band				
Band 1 (TETRA ... GSM 900)	MHz		380 – 960	
Band 2 (GSM 1800)	MHz		1427 – 1880	
Band 3 (UMTS)	MHz		1920 – 2200	
Band 4 (LTE 2600)	MHz		2300 – 2690	
Insertion loss				
Port 1 ↔ Port 5	dB		< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 5	dB		< 0.3 (1427 – 1880 MHz)	
Port 3 ↔ Port 5	dB		< 0.3 (1920 – 2200 MHz)	
Port 4 ↔ Port 5	dB		< 0.3 (2300 – 2690 MHz)	
Isolation	dB		> 40	
VSWR			< 1.25	
Impedance	Ω		50	
Input power				
Band 1/Band 2/Band 3/Band 4	W		< 200 / < 200 / < 200 / < 100	
Intermodulation products	dBc		< -160 (3rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150	
Temperature range	°C °F		-40 ... +60 -40 ... +140	
Connectors			4.3-10 female	
Application			Indoor or outdoor (IP 66)	
DC/AISG transparency				
Port 1 ↔ Port 5	mA	By-pass (max. 2500)	Stop	Stop
Port 2 ↔ Port 5	mA	By-pass (max. 2500)	Stop	Stop
Port 3 ↔ Port 5	mA	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 4 ↔ Port 5	mA	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Lightning protection	kA		3, 10/350 μs pulse	
Mounting	mm in		Wall mounting: With 4 screws (max.: 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb		Single unit: 3.9 8.6 / Double unit: 7.7 17.0	
Dimensions (w x h x d)	mm in		Single unit: 270 x 213 x 67 10.6 x 8.4 x 2.6 Double unit: 270 x 213 x 138 10.6 x 8.4 x 5.4 (without connectors, without mounting brackets)	
Packing size	mm in		Single unit: 394 x 339 x 160 15.5 x 13.3 x 6.3 Double unit: 394 x 339 x 230 15.5 x 13.3 x 9.1	

380 – 960 MHz	1427 – 1880 MHz	1920 – 2200 MHz	2300 – 2690 MHz
---------------	-----------------	-----------------	-----------------

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions:

1. First In - First Out Function
2. Priority Controlled Function
3. Exclusive User Function

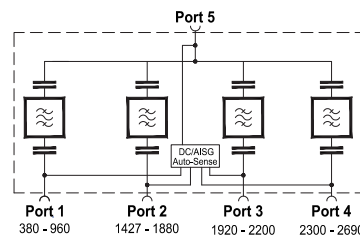
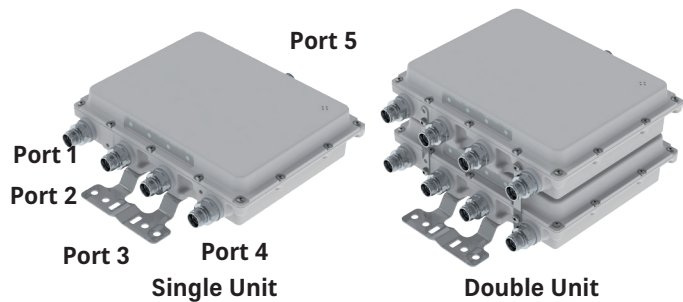
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Available as a single unit, or for XPol antennas as a double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection

AUTO-SENSE



Technical Data

Type No. DC/AISG transparency			
1. First In - First Out Function		78211587	78211588
2. Priority Controlled Function		78211587V01	78211588V01
3. Exclusive User Function		78211587V02	78211588V02
Unit		Single	Double
Pass band			
Band 1 (TETRA ... GSM 900)	MHz	380 – 960	
Band 2 (GSM 1800)	MHz	1427 – 1880	
Band 3 (UMTS)	MHz	1920 – 2200	
Band 4 (LTE 2600)	MHz	2300 – 2690	
Insertion loss			
Port 1 ↔ Port 5	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 5	dB	< 0.3 (1427 – 1880 MHz)	
Port 3 ↔ Port 5	dB	< 0.3 (1920 – 2200 MHz)	
Port 4 ↔ Port 5	dB	< 0.3 (2300 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1/Band 2/Band 3/Band 4	W	< 200 / < 200 / < 200 / < 100	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz: < -150	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency		Auto-sense (max. 2000)	
Port 1, 2, 3, 4 ↔ Port 5			
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max.: 8 0.315 diameter) / Mast mounting: With clamp set	
Weight	kg lb	Single unit: 4 8.8 / Double unit: 7.8 17.2	
Dimensions (w x h x d)	mm in	Single unit: 270 x 213 x 67 10.6 x 8.4 x 2.6 / Double unit: 270 x 213 x 138 10.6 x 8.4 x 5.4 (without connectors, without mounting brackets)	
Packing size	mm in	Single unit: 394 x 339 x 160 15.5 x 13.3 x 6.3 / Double unit: 394 x 339 x 230 15.5 x 13.3 x 9.1	

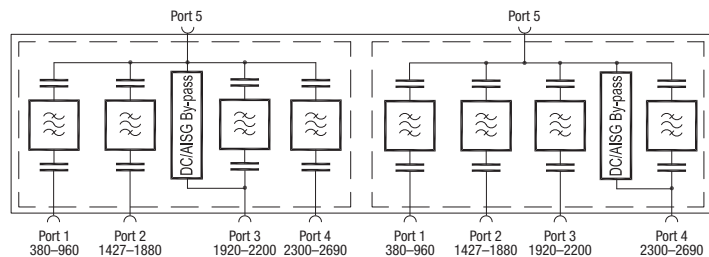
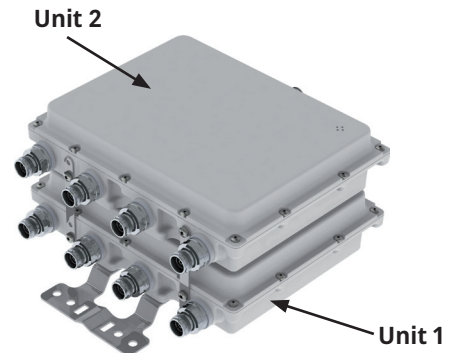
380 – 960 MHz

1427 – 1880 MHz

1920 – 2200 MHz

2300 – 2690 MHz

- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Very low insertion loss
- Enables feeder sharing
- Designed for co-siting purposes
- Available for XPol antennas as double unit
- Suitable for indoor and outdoor applications
- Wall or mast mounting
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78211589 Double Unit	
Pass band			
Band 1 (TETRA ... GSM 900)	MHz	380 – 960	
Band 2 (GSM 1800)	MHz	1427 – 1880	
Band 3 (UMTS)	MHz	1920 – 2200	
Band 4 (LTE 2600)	MHz	2300 – 2690	
Insertion loss			
Port 1 ↔ Port 5	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 5	dB	< 0.3 (1427 – 1880 MHz)	
Port 3 ↔ Port 5	dB	< 0.3 (1920 – 2200 MHz)	
Port 4 ↔ Port 5	dB	< 0.3 (2300 – 2690 MHz)	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power			
Band 1 / Band 2 / Band 3 / Band 4	W	< 200 / < 200 / < 200 / < 100	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W), except from TETRA 360 – 470 MHz: < -150	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 5	mA	Unit 1 Stop	Unit 2 Stop
Port 2 ↔ Port 5	mA	Stop	Stop
Port 3 ↔ Port 5	mA	By-pass (max. 2500)	Stop
Port 4 ↔ Port 5	mA	Stop	By-pass (max. 2500)
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	7.7 17.0	
Dimensions (w x h x d)	mm in	270 x 213 x 138 10.6 x 8.4 x 5.4 (without connectors, without mounting brackets)	
Packing size	mm in	394 x 339 x 230 15.5 x 13.3 x 9.1	

**> Same-Band Combiners
and Hybrid Combiners**

Band-Pass Filters

Hybrid Combiners

3 dB Couplers

Same-Band Combiners

Summary of Same-Band Combiner and Hybrid Combiner Types

Description	Type No.	Frequency range	Max. input power	Connector	Page
Band-Pass Filter	78211847	2575 – 2615 MHz	40 W at each port	4.3-10	418
Hybrid Combiner 2:1	78210500	791 – 960 MHz	60 W at each port	7-16	419
Hybrid Combiner 2:1	78210506	698 – 2690 MHz	150 W at each port	7-16	420
Hybrid Combiner 2:1	78210507	698 – 2690 MHz	60 W at each port	4.3-10	421
Hybrid Combiner 16:4	78211144	698 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz 2500 – 2690 MHz	50 W at each port	7-16	422
Hybrid Combiner 4:4	78210536	698 – 2690 MHz	150 W at each port	4.3-10	423
3-dB Coupler	78210524	698 – 2690 MHz	150 W at each port	7-16	424
3-dB Coupler	78210527	698 – 2690 MHz	150 W at each port	4.3-10	425
3-dB Coupler	793554	800 – 2200 MHz	300 W	7-16	426
Same-Band Combiner	78210936	880 – 960 MHz	100 W at each port	7-16	427, 428
Same-Band Combiner	78211230	1710 – 1880 MHz	100 W at each port	7-16	429, 430
Same-Band Combiner	78211235	1730 – 1880 MHz	100 W at each port	7-16	431, 432
Same-Band Combiner	78211228V01	2500 – 2690 MHz	100 W at each port	4.3-10	433
Same-Band Combiner	78211228V03	2500 – 2690 MHz	100 W at each port	4.3-10	434

Summary of Same-Band Combiner and Hybrid Combiner Types



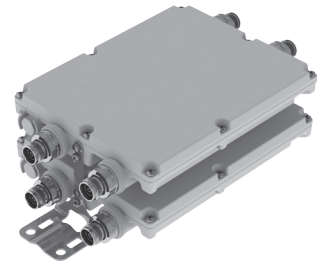
Frequency Combinations

Type No.	Frequency / MHz											
	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
Band Pass Filters												
78211847												
Same-Band Combiners												
78210936		880 - 960										
78211230						1710 - 1880						
78211235						1730 - 1880						
79211228V01											2500 - 2690	
78211228V03											2500 - 2690	
Hybrid Combiners / 3 dB Couplers												
78210500, 2:1 (2 x 60 W)		806 - 960										
78210506, 2:1 (2 x 150 W)						698 - 2690						
78210507, 2:1 (2 x 60 W)						698 - 2690						
78210536, 4:4 (4 x 150 W)						698 - 2690						
78210524, 2:2 (2 x 150 W)						698 - 2690						
78210527, 2:2 (2 x 150 W)						698 - 2690						
793554, 2:2						800 - 2200						
Hybrid Combiner Systems												
78211144, 16:4 (16 x 50 W)		806 - 960					1710 - 1880	1920 - 2170			2500 - 2690	

Band-pass Filter B 38 2575 - 2615 MHz

KATHREIN

- Band-pass Filter for Band 38 with Band 7 Suppression
- Suitable for indoor or outdoor applications
- Wall or mast mounting



Technical Data

Type No.		78211847 Double Unit
Pass band	MHz	2575 – 2615
Insertion loss	dB	< 1.4 (2575 – 2577 / 2613 – 2615 MHz)
	dB	<1.1 (2577 – 2580/ 2610 – 2613 MHz)
	dB	< 0.9 (2580 – 2610 MHz)
Stop band attenuation	dB	> 50 (< 2535 / > 2655 MHz)
	dB	> 40 (2535 – 2555 / 2635 – 2655 MHz)
	dB	> 35 (2555 – 2570/ 2620 – 2635 MHz)
VSWR		< 1.25 (2575 – 2615 MHz)
Impedance	Ω	50
Input power per port	W	< 40
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +60 -40 ... +140
Connectors		4.3-10
Application		Indoor or outdoor (IP66)
DC/AISG transparency	mA	By-pass (max. 2500)
Mounting		Mast mounting: with additional clamp set
Number of input/output ports		4x Input (BTS), 4x Output (ANT)
Weight	kg lb	6.0 13.2
Dimensions (w x h x d)	mm in	225 x 176 x 92 8.9 x 6.9 x 3.6 (without connectors, without mounting brackets)
Packing size	mm in	380 x 235 x 150 15.0 x 9.3 x 5.9

For more information about accessories please refer to page 437

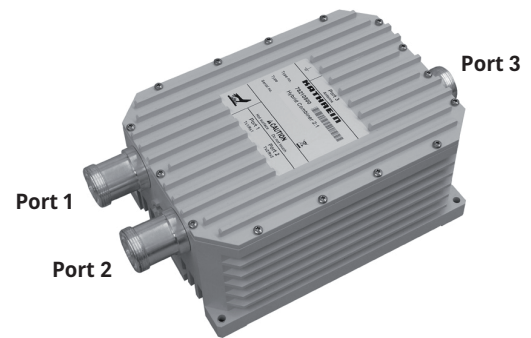
Hybrid Combiner 2:1

791 – 960 MHz

2 x 60 W

KATHREIN

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC by-pass between all ports
- External DC stop available as an accessory



Technical Data

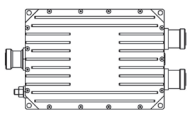
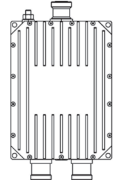
Type No.	78210500
Frequency range	791 - 960 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ± 0.5 dB
Port 2 ↔ Port 3	3.1 ± 0.5 dB
Port 1 ↔ Port 2	> 23 dB*
VSWR	< 1.15
Impedance	50 Ω
Input power	
Port 1	60 W
Port 2	60 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	By-pass between all ports (max. 2500 mA) AISG attenuation: 3 dB with external DC stop (see configuration examples) / 6 dB without external DC stop
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 199 x 97.5 mm (without connectors)

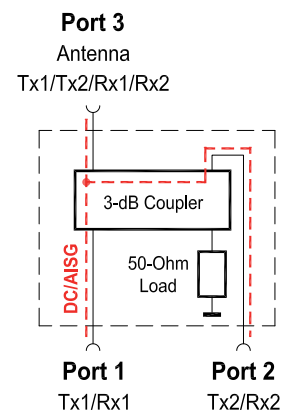
* Valid if all ports are terminated with 50-Ohm loads.

Note:

The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C). If mounted vertically and/or used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	60 W	70 W
+40 °C	70 W	80 W
+25 °C	75 W	85 W



Same-Band and Hybrid Combiners

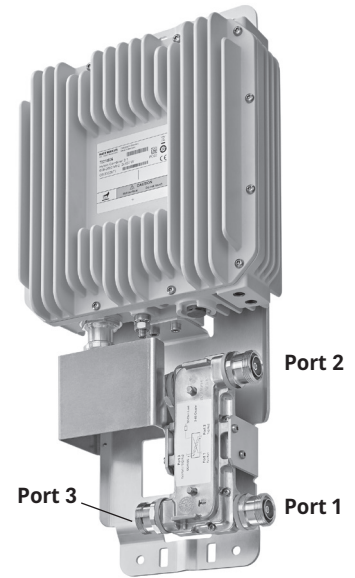
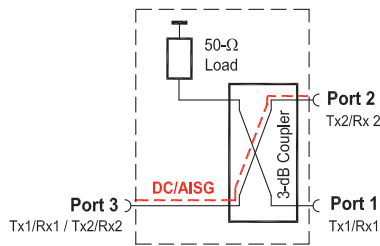
Hybrid Combiner 2 : 1

698 – 2690 MHz

2 x 150 W

KATHREIN

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- DC by-pass between port 2 and port 3



Technical Data



Type No.		78210506
Frequency range	MHz	698 – 2690
Attenuation		
Port 1 ↔ Port 3	dB	3 ± 0.6
Port 2 ↔ Port 3	dB	3 ± 0.6
Port 1 ↔ Port 2	dB	> 25*
VSWR (all ports)		< 1.12 (698 – 2690 MHz)
Impedance	Ω	50
Input power		
Port 1	W	< 150
Port 2	W	< 150
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +55 -40 ... +131
Connectors		7-16 female
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		
Port 1 ↔ Port 3		Stop
Port 2 ↔ Port 3	mA	By-pass (max. 2500)
Mounting	mm in	Wall mounting: With 4 screws (diameter max. 8 0.31) / Mast mounting: With additional clamp set
Weight	kg lb	8 17.6
Dimensions (w x h x d)	mm in	235 x 480 x 120 9.3x 18.9 x 4.7 (without connectors, without mounting brackets)
Packing size	mm in	545 x 280 x 190 21.5 x 11.0 x 7.5

* Valid if all ports are terminated with 50-Ohm loads.

Note:

The input power rating of 150 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	80 W	100 W
+40 °C	110 W	150 W
+25 °C	150 W	100 W

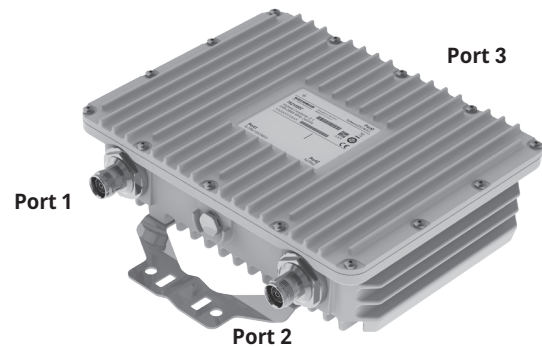
For more information about accessories please refer to page 437

Hybrid Combiner 2 : 1

698 – 2690 MHz

2 x 60 W

- With 4.3-10 connectors
- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC by-pass between port 1 and port 3



Technical Data

Type No.		78210507
Frequency range	MHz	698 – 2690
Attenuation		
Port 1 ↔ Port 3	dB	3.1 ± 0.5
Port 2 ↔ Port 3	dB	3.1 ± 0.5
Port 1 ↔ Port 2	dB	> 23*
VSWR (all ports)		< 1.2 (698 – 2170 MHz) / < 1.25 (2170 – 2690 MHz)
Impedance	Ω	50
Input power		
Port 1	W	< 60
Port 2	W	< 60
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +55 -40 ... +131
Connectors		4.3-10 female
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		
Port 1 ↔ Port 3		By-pass (max. 2500 mA) Stop
Port 2 ↔ Port 3		
Mounting	mm in	Wall mounting: With 4 screws (diameter max. 8 0.31) / Mast mounting: With additional clamp set
Weight	kg lb	4.3 9.5
Dimensions (w x h x d)	mm in	264 x 203 x 73 10.4 x 8.0 x 2.9 (without connectors, without mounting brackets)
Packing size	mm in	385 x 345 x 168 15.3 x 13.7 x 6.6

* Valid if all ports are terminated with 50-Ohm loads.

Note:

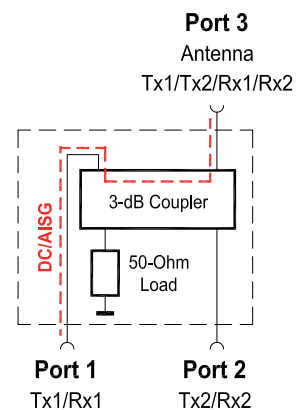
The input power rating of 150 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

If used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	55 W	60 W
+40 °C	70 W	75 W
+25 °C	80 W	85 W

For more information about accessories please refer to page 437

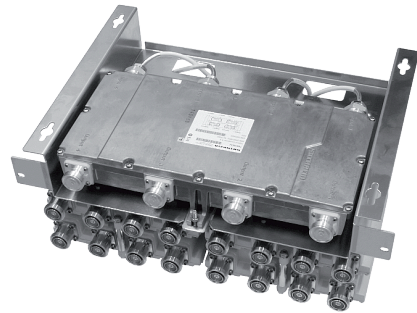


Hybrid Combiner System

16 : 4

KATHREIN

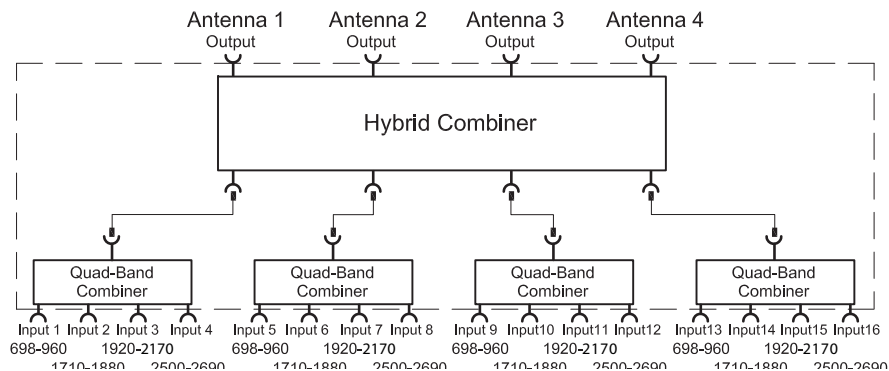
- Point of Interface (POI) for coverage solutions with passive Distributed Antenna Systems (DAS)
- Designed for the decoupled combining of 16 transmitter or receiver signals and distributing these signals evenly onto 4 antenna outputs.
- Suitable for indoor or outdoor applications
- External 50 Ohm loads available as an accessory



Technical Data

Type No.	78211144 16 : 4		
Frequency range			
Band 1	MHz		698 – 960
Band 2	MHz		1710 – 1880
Band 3	MHz		1920 – 2170
Band 4	MHz		2500 – 2690
Power distribution loss (excluding insertion loss) Input 1...8/12/16 ↔ Output 1...4	dB		Typically 6.5
Insertion loss Input 1...16 ↔ Output 1...4	dB		Typically 6.5
Isolation between input ports			
Same bands	dB		> 22 *)
Different bands	dB		> 50
VSWR (all ports)			< 1.5
Impedance	Ω		50
Input power at each input port	W		< 50
Intermodulation products	dBc		< -155 dBc (3 rd order; with 2 x 20 W)
Temperature range	°C °F		-40 ... +60 -40 ... +140
Connectors			7-16 female
Application			Indoor or Outdoor (IP 66)
Mounting			Wall mounting: With 4 screws (max. 6 mm diameter) / 19"-drawer
Weight	kg lb		21.5 47.4
Packing size (w x h x d)	mm in		570 x 272 x 584 22.4 x 10.7 x 23.0
Dimensions (w x h x d)	mm in		19" drawer x 187 x 374 7.4 x 14.7

* Valid if all ports are terminated with 50-Ohm loads



Note:

The use of fewer than 16 inputs or 4 outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein Mobile Communication type 78410367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein Mobile Communication low intermodulation type 78210475).

For more information about accessories please refer to page 437

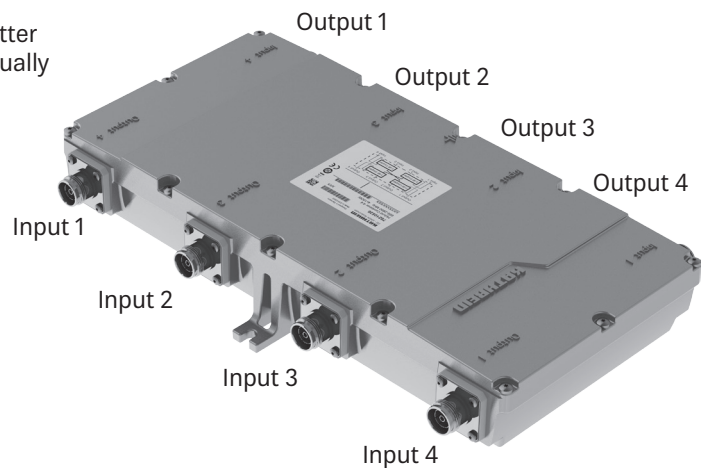
Hybrid Combiner 4:4

698 – 2690 MHz

4 x 150 W

KATHREIN

- Designed for the decoupled combining of 4 transmitter or receiver signals and distributing these signals equally onto 4 antenna outputs
- Suitable for indoor or outdoor applications
- DC/AISG By-pass
- External DC stop available as an accessory



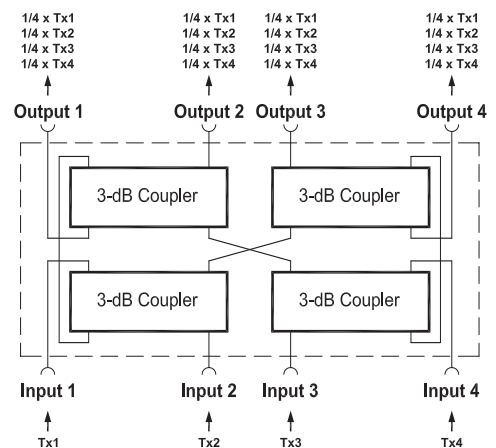
Technical Data

Type No.		78210536	
Frequency range	MHz	698 - 2690	
Insertion loss Input 1...4 ↔ Output 1...4	dB	0.35 ± 0.15	} Typically 6.3dB
Power distribution loss (excluding insertion loss) Input 1...4 ↔ Output 1...4	dB	6 ± 0.75	
Isolation Input 1...4 ↔ Input 1...4	dB	> 20 *	
	dB	> 20 *	
VSWR (all ports)		< 1.22 (698 - 2170 MHz) < 1.4, typ. 1.2 (2170 - 2690 MHz)	
Impedance	Ω	50	
Input power	W	< 150 at each input port	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 °C	
Connectors		4.3-10 female	
Application		Indoor or Outdoor (IP 66)	
DC/AISG transparency		By-pass (max. 2500 mA) between Input 1 ↔ Output 4 / Input 2 ↔ Output 2 / Input 3 ↔ Output 3 / Input 4 ↔ Output 1 External DC stop available as an accessory	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter)	
Weight	kg lb	4.5 9.9	
Dimensions (w x h x d)	mm in	376 x 65 x 224 14.8 x 2.6 x 8.8 (with connectors and mounting feet)	
Packing size	mm in	453 x 125 x 273 17.8 x 4.9 x 10.7	

* Valid if all ports are terminated with 50-Ohm loads

Note:

The use of fewer than 4 inputs or outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein Mobile Communication type 784 10484), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein Mobile Communication low-intermodulation type 78210473).

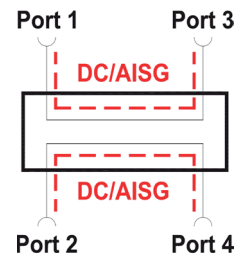
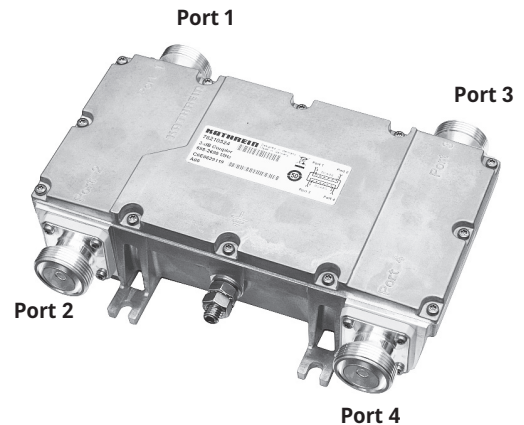


Same-Band and Hybrid Combiners

3 dB Coupler Hybrid Combiner 2 : 2 698 – 2690 MHz

KATHREIN

- Can be used for the decoupled combining of 2 transmitters onto a common antenna with frequency spacing as narrow as desired (3 dB loss) - see application example 1
- Can be used for the decoupled combining of 2 transmitters onto two antennas with frequency spacing as narrow as desired - see application example 2
- Can be used as a decoupled 2-way splitter - see application example 3
- Suitable for indoor or outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



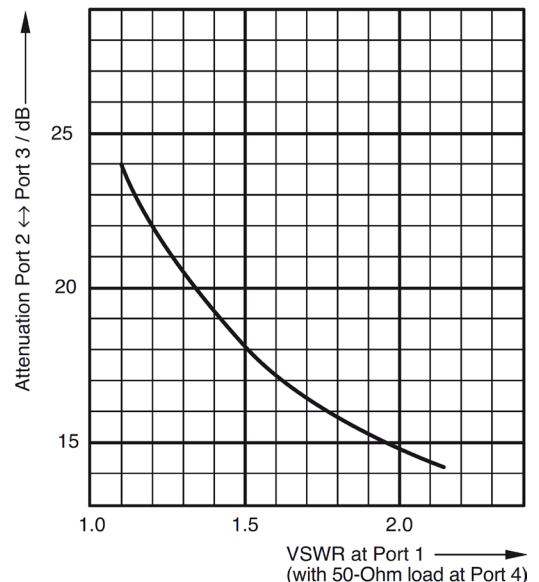
Technical Data

Type No.	78210524
Frequency range	698 - 2690 MHz
Attenuation	
Port 1 ↔ Port 2	3.1 ± 0.5 dB
Port 1 ↔ Port 3	3.1 ± 0.5 dB
Port 2 ↔ Port 3	See diagram
Directivity	> 20 dB
VSWR	< 1.25
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +70 °C
Connectors	7-16 female
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	By-pass between Port 1 ↔ Port 3 / Port 2 ↔ Port 4 (max. 2500 mA) External DC stop available as an accessory
Mounting	With 4 screws (max. 6.5 mm diameter)
Weight	1.5 kg
Packing size	268 x 115 x 203 mm
Dimensions (w x h x d)	205 x 60 x 104 mm (without connectors and mounting feet)

Note:
VSWR and attenuation values only valid if all ports are terminated with 50-Ohm loads.

Diagram

Typical attenuation Port 2 ↔ Port 3 vs. VSWR at Port 1

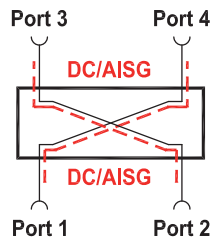
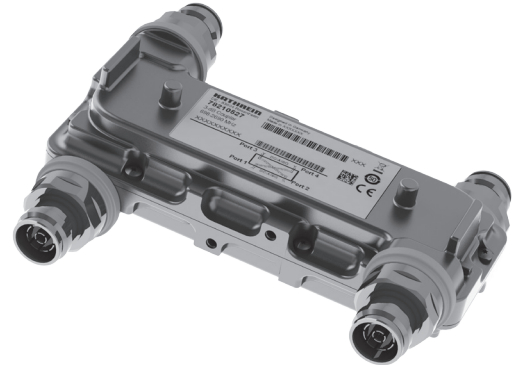


For more information about accessories please refer to page 437

3 dB Coupler Hybrid Combiner 2 : 2 698 – 2690 MHz

KATHREIN

- With 4.3-10 connectors
- Can be used for the decoupled combining of 2 transmitters onto a common antenna with frequency spacing as narrow as desired (3 dB loss)
- Can be used for the decoupled combining of 2 transmitters onto two antennas with frequency spacing as narrow as desired
- Can be used as a decoupled 2-way splitter
- Can be used as a frequency-independant 90° phase shifter (90° Hybrid)
- Suitable for indoor and outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



Technical Data

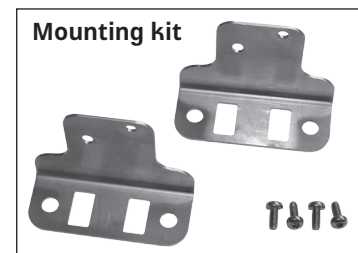
Type No.		78210527
Frequency range	MHz	698 – 2690
Attenuation		
Port 1 ↔ Port 3	dB	3 ±0.5
Port 1 ↔ Port 4	dB	3 ±0.5
Port 1 ↔ Port 2	dB	> 25
Directivity	dB	> 23
Return loss	dB	> 25
Impedance	Ω	50
Input power	W	< 150 at each input port
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +70 -40 ... +158
Connectors		4.3-10 female
Application		Indoor or outdoor (IP66)
DC/AISG transparency		By-pass between Port 1 ↔ Port 4 / Port 2 ↔ Port 3 (max. 2500 mA) External DC stop available as an accessory
Weight	kg lb	0.7 1.5
Dimensions (w x h x d)	mm in	158 x 55 x 60 6.22 x 2.17 x 2.36 (without connectors)

Note:

VSWR and attenuation values only valid if all ports are terminated with 50-Ohm-loads.

Accessories (order separately)

Type No.	Description
78211000	DC stop
78210473	50-Ohm load (80 W; 4.3-10 Connectors)
78210484	50-Ohm load (2 W)
78210526	Mounting kit



3 dB Coupler Hybrid Combiner 2:2 800 – 2200 MHz

KATHREIN

The 3-dB coupler can be used:

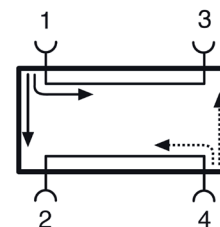
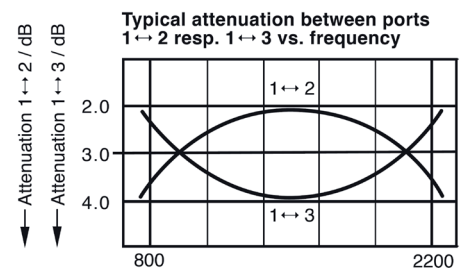
- as a decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
- for the decoupled combining of two receivers with frequency spacing as narrow as desired,
- for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
- as a frequency-independent 90° phase shifter,
- as a combiner component.

Function:

The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3. Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.



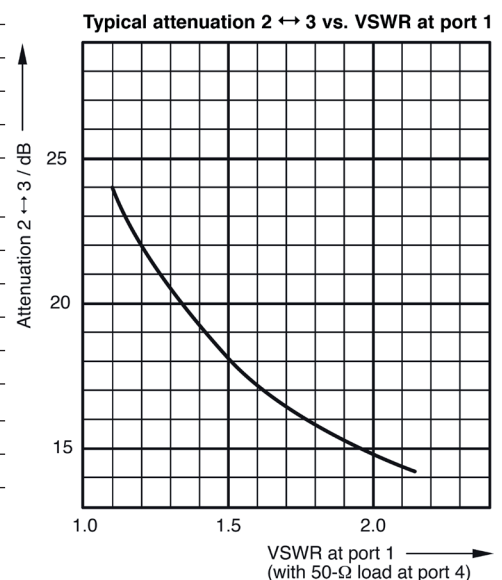
Diagram I



Technical Data

Type No.	793554
Frequency range	800 - 2200 MHz
Attenuation 1 ↔ 2 / ↔ 3	3 ±1.2 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 20 dB
VSWR	< 1.2
Impedance	50 Ω
Input power	< 300 W total power at two inputs, with max. 200 W at one input
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-30 ... +70 °C
Connectors	7-16 female
Application	Indoor and outdoor (IP66)
Mounting	With 2 screws (max. 5.5 mm diameter)
Weight	1.3 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	104.9 x 50.2 x 93.9 mm (including connectors)

Diagram II

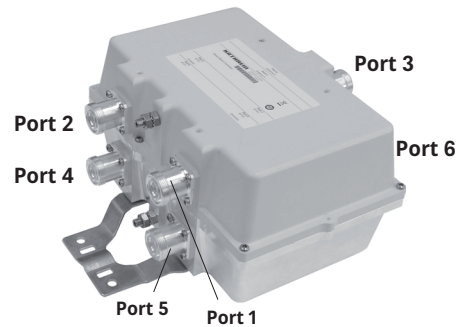


For more information about accessories please refer to page 437

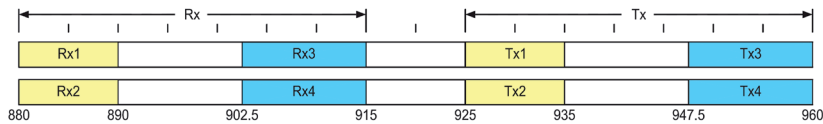
880 – 890 / 925 – 935 MHz

902.5 – 915 / 947.5 – 960 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG By-pass for DTMA supply



Tuning Diagram



Technical Data

Type No.	78210936
Pass band BTS 1 (GSM900 / Operator 1) BTS 2 (GSM900 / Operator 2)	Rx1/Rx2 = 880 - 890 MHz, Tx1/Tx2 = 925 - 935 MHz Rx3/Rx4 = 902.5 - 915 MHz, Tx3/Tx4 = 947.5 - 960 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.5 dB, typically 0.3 dB (880 - 890 MHz) / < 0.7 dB, typically 0.4 dB (925 - 935 MHz) < 0.7 dB, typically 0.5 dB (902.5 - 915 MHz) / < 0.5 dB, typically 0.3 dB (947.5 - 960 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (880 - 890 / 902.5 - 915 / 925 - 935 / 947.5 - 960 MHz)
VSWR	< 1.2 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	6.9 kg
Dimensions (w x h x d)	275 x 176 x 140 mm (without connectors, without mounting brackets)

880 – 890 / 925 – 935 MHz

902.5 – 915 / 947.5 – 960 MHz

Typical Attenuation Curves

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

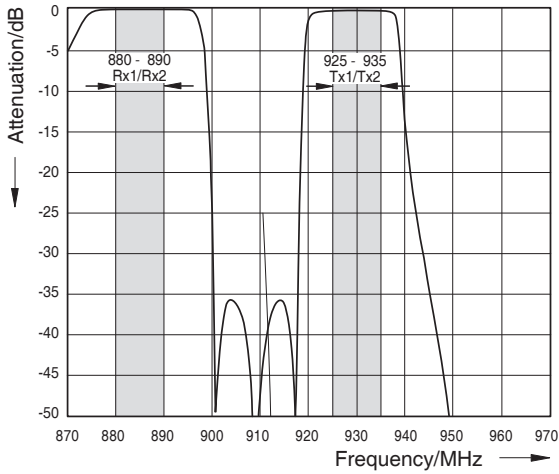
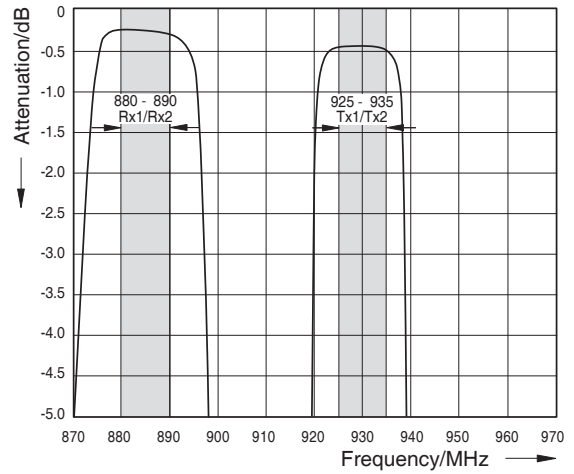


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (GSM 900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

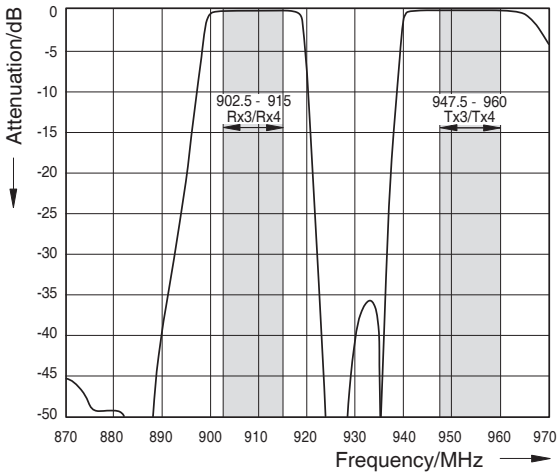
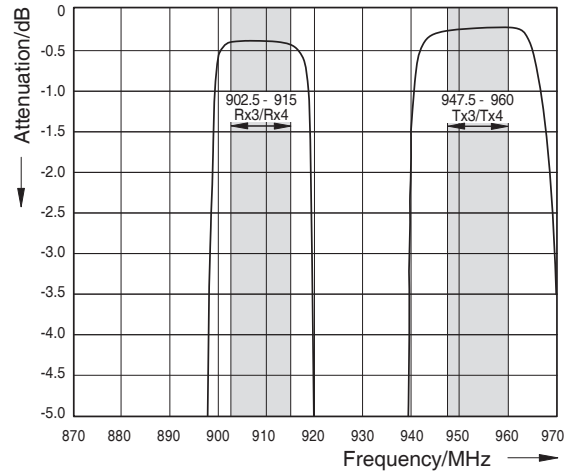
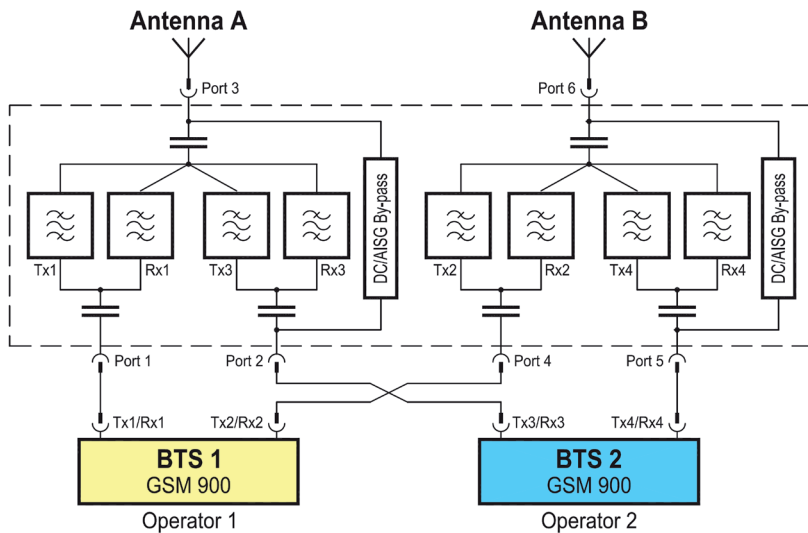


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



Block Diagram



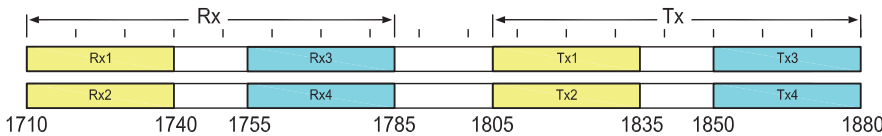
1710 – 1740 / 1805 – 1835 MHz

1755 – 1785 / 1850 – 1880 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



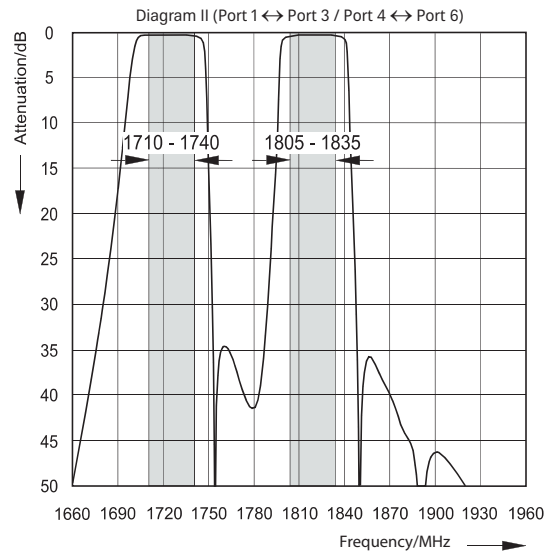
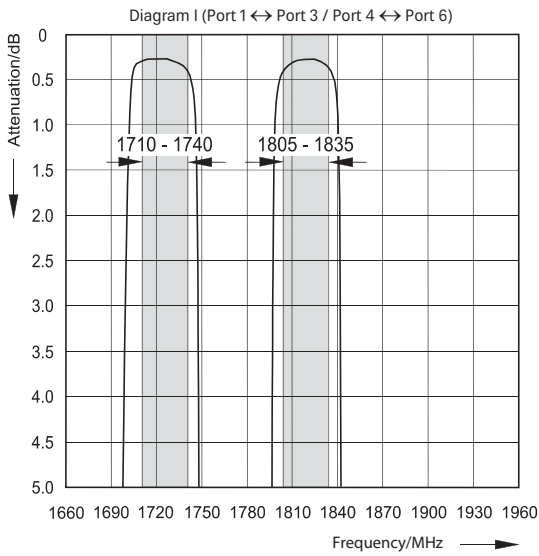
Technical Data

Type No.	78211230
Pass band BTS 1 (LTE/GSM1800 / Operator 1) BTS 2 (LTE/GSM1800 / Operator 2)	Rx1/Rx2 = 1710 – 1740 MHz, Tx1/Tx2 = 1805 – 1835 MHz Rx3/Rx4 = 1755 – 1785 MHz, Tx3/Tx4 = 1850 – 1880 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.6 dB (1710 - 1740 MHz) / < 0.5 dB (1805 - 1835 MHz) < 0.5 dB (1755 - 1785 MHz) / < 0.6 dB (1850 - 1880 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (1710 - 1740 / 1755 - 1785 / 1805 - 1835 / 1850 - 1880 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	5.5 kg
Dimensions (w x h x d)	250 x 193 x 101 mm (without connectors, without mounting brackets)
Packing size (w x h x d)	367 x 307 x 185 mm

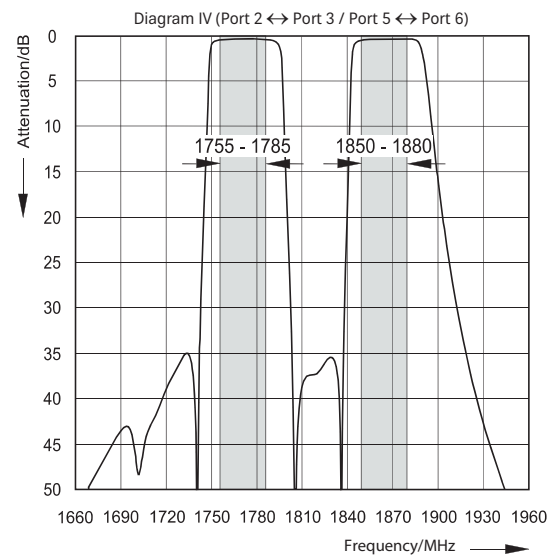
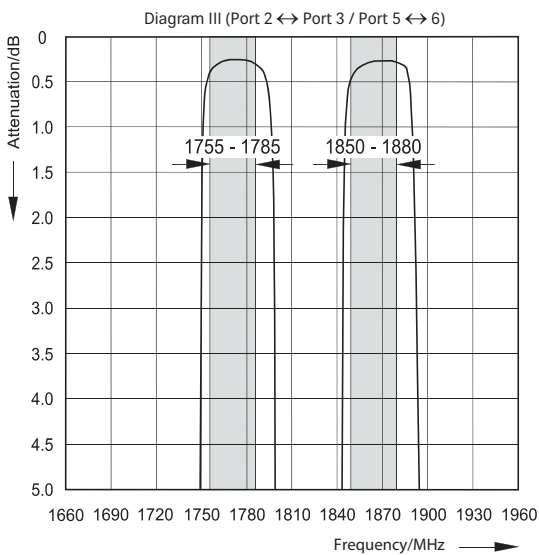
1710 - 1740 / 1805 - 1835 MHz

1755 - 1785 / 1850 - 1880 MHz

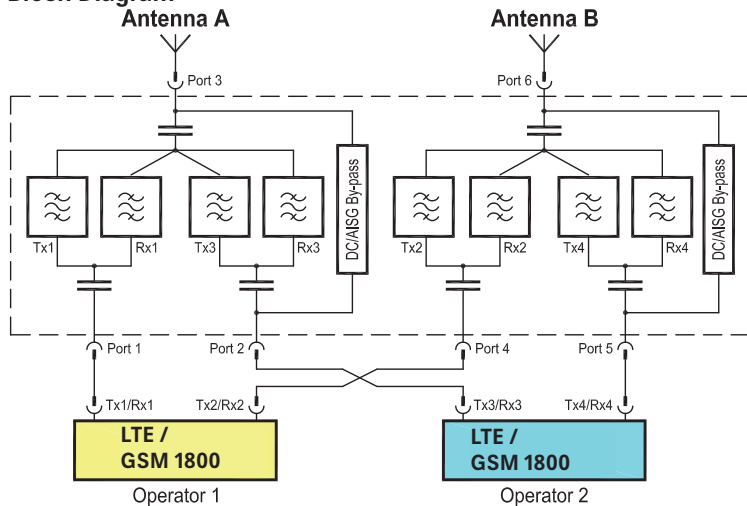
Typical Attenuation Curves BTS 1 (LTE/GSM 1800)



BTS 2 (LTE/GSM 1800)



Block Diagram



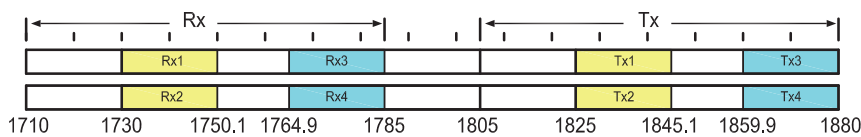
1730 – 1750 / 1825 – 1845 MHz

1765 – 1785 / 1860 – 1880 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Technical Data

Type No.	78211235
Pass band BTS 1 (LTE/GSM1800 / Operator 1) BTS 2 (LTE/GSM1800 / Operator 2)	Rx1/Rx2 = 1730 – 1750 MHz, Tx1/Tx2 = 1825 – 1845 MHz Rx3/Rx4 = 1765 – 1785 MHz, Tx3/Tx4 = 1860 – 1880 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.5 dB (1730 – 1750 MHz) / < 0.5 dB (1825 – 1845 MHz) < 0.5 dB (1765 – 1785 MHz) / < 0.5 dB (1860 – 1880 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (1730 – 1750 / 1765 – 1785 / 1825 – 1845 / 1860 – 1880 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	5.5 kg
Dimensions (w x h x d)	250 x 193 x 101 mm (without connectors, without mounting brackets)
Packing size (w x h x d)	367 x 307 x 185 mm

1730 - 1750 / 1825 - 1845 MHz

1765 - 1785 / 1860 - 1880 MHz

Typical Attenuation Curves

BTS 1 (LTE/GSM 1800)

Diagram 1

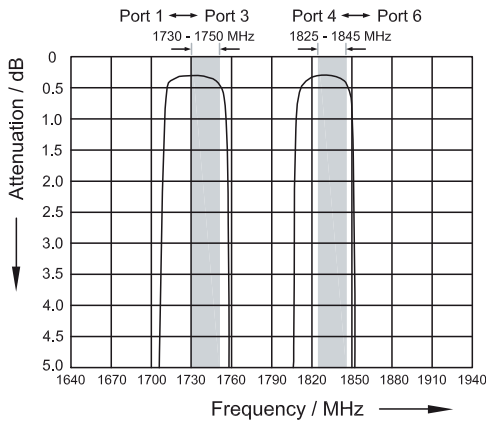
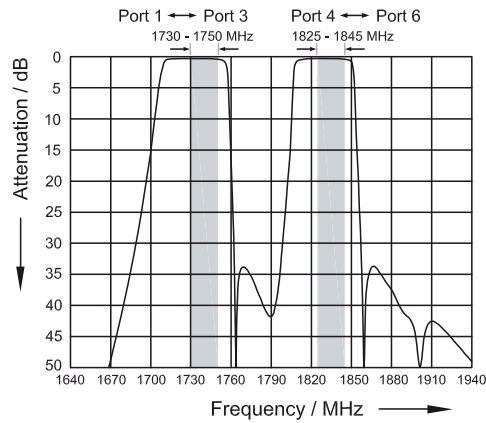


Diagram 2



BTS 2 (LTE/GSM 1800)

Diagram 3

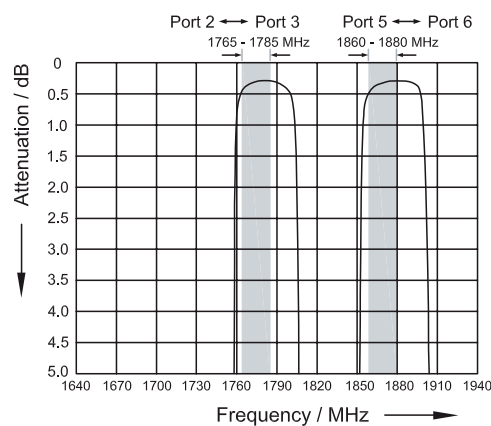
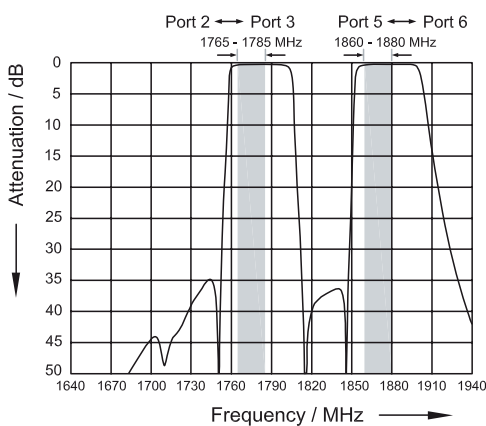
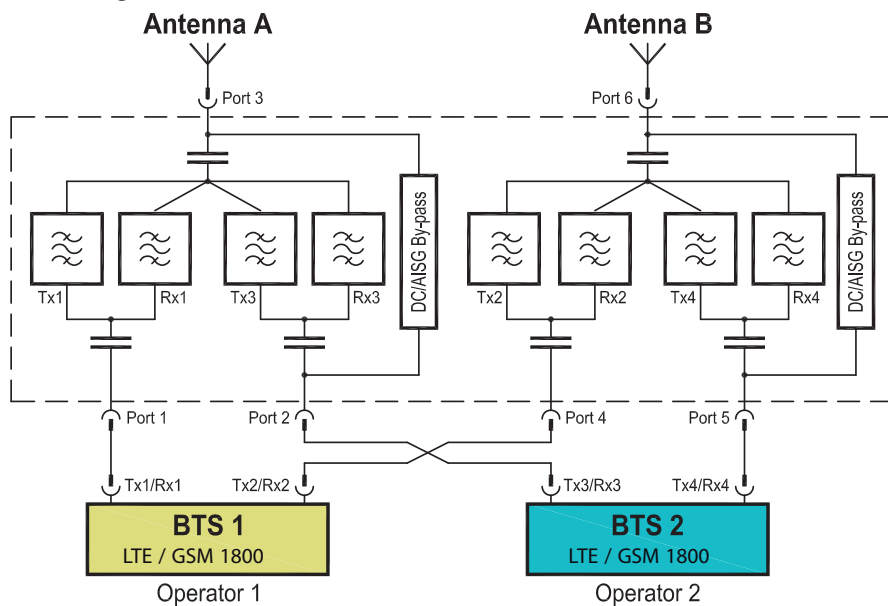


Diagram 4



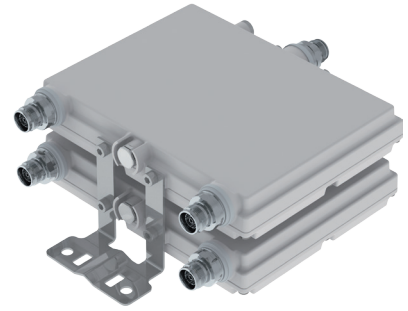
Block Diagram



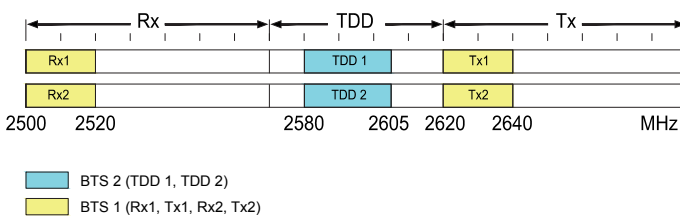
2500 - 2520 / 2620 - 2640 MHz

2580 - 2605 MHz

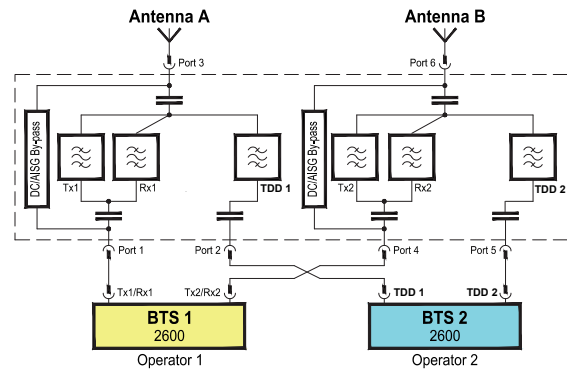
- Enables antenna and feeder sharing for two base stations in the same frequency band
- Low insertion loss over complete LTE 2600 / TDD 2600 bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Block Diagram



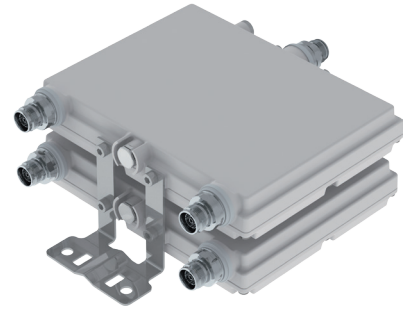
Technical Data

Type No.		78211228V01
Pass band BTS 1 (LTE 2600) BTS 2 (TDD 2600)	MHz MHz	Rx = 2500 - 2520 / Tx = 2620 - 2640 TDD = 2580 - 2605
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	dB dB	< 1.1 < 1.1
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	dB	> 35
VSWR		< 1.25 (pass bands)
Impedance	Ω	50
Input power	W	< 100
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +60 -40 ... +140
Connectors		4.3-10 female
Application		Indoor or outdoor (IP66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	mA	By-pass (max. 2500) Stop
Lightning protection	kA	3, 10/350 μs pulse
Mounting	mm in	Wall mounting: With 4 screws (diameter max. 8 0.315) / Mast mounting: With additional clamp set
Weight	kg lb	7 15.5
Dimensions (w x h x d)	mm in	225 x 176 x 88 8.9 x 6.9 x 3.5 (without connectors, without mounting brackets)
Packing size	mm in	345 x 305 x 165 13.6 x 12 x 6.5

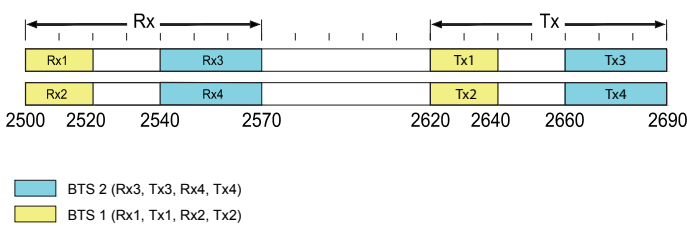
2500 – 2520 / 2620 – 2640 MHz

2540 – 2570 / 2660 – 2690 MHz

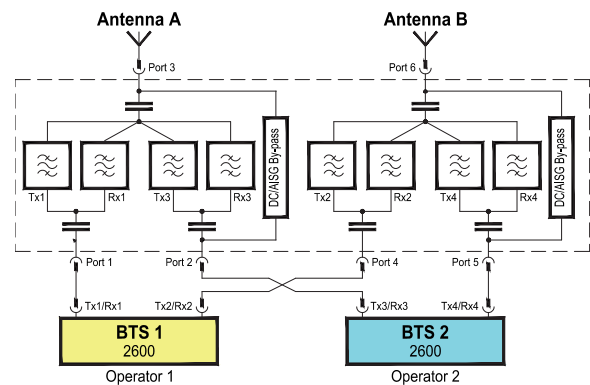
- Enables antenna and feeder sharing for two base stations in the same frequency band
- Low insertion loss over complete LTE 2600 bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Block Diagram



Technical Data

Type No.		78211228V03	
Pass band BTS 1 (LTE 2600) BTS 2 (LTE 2600)	MHz MHz	Rx = 2500 – 2520 / Tx = 2620 – 2640 Rx = 2540 – 2570 / Tx = 2660 – 2690	
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	dB dB	< 0.9 < 0.9	
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	dB	> 35	
VSWR		< 1.25 (pass bands)	
Impedance	Ω	50	
Input power Tx1 / Tx2 / Tx3 / Tx4	W	< 100 / < 100 / < 100 / < 100	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		4.3-10 female	
Application		Indoor or outdoor (IP66)	
DC/AISG transparency (factory switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	mA	Stop By-pass (max. 2500)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (diameter max. 8 0.315) / Mast mounting: With additional clamp set	
Weight	kg lb	7 15.5	
Dimensions (w x h x d)	mm in	225 x 176 x 88 8.9 x 6.9 x 3.5 (without connectors, without mounting brackets)	
Packing size	mm in	345 x 305 x 165 13.9 x 12 x 6.5	

 **System Components
and Accessories**

Smart Bias Tees

DC-Stops

Attenuators

50 Ω Loads

Clamp Sets

Summary of System Components and Accessories

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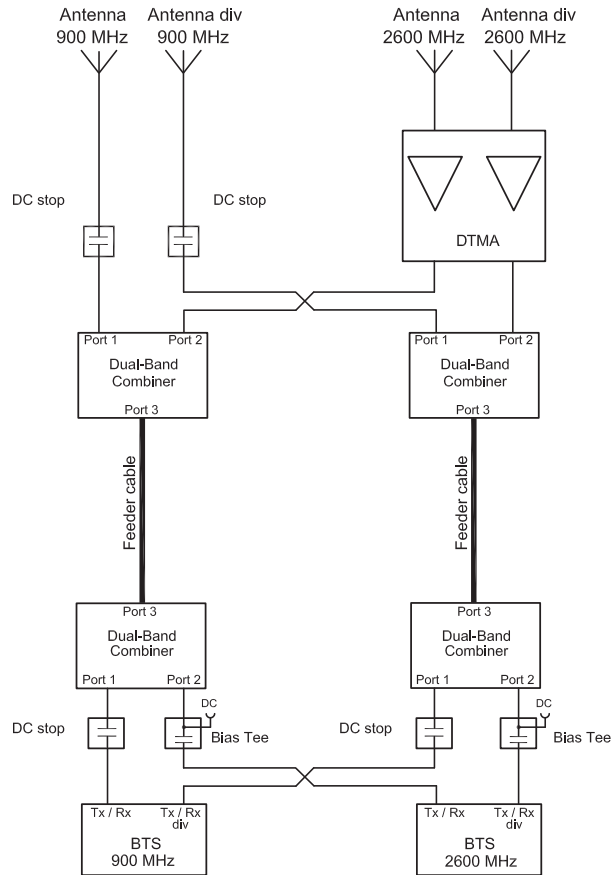
Description	Type No.	Frequency range	Connector Type	Max. input power	Page
DC Stop	78210850V01	250 – 2700 MHz	7-16	750 W	438
DC Stop	78211000	250 – 3800 MHz	4.3-10	500 / 300 W	439
Smart Bias Tee	78211055	617 – 2700 MHz	7-16	750 W	440 - 442
Smart Bias Tee	78211056	617 – 2700 MHz	7-16	750 W	440 - 442
Smart Bias Tee	78211065	617 – 2700 MHz	7-16	750 W	440 - 442
Smart Bias Tee	78211066	617 – 2700 MHz	7-16	750 W	440 - 442
Smart Bias Tee	78211592	617 – 2700 MHz	4.3-10	500 W	443 - 445
Smart Bias Tee	78211593	617 – 2700 MHz	4.3-10	500 W	443 - 445
Smart Bias Tee	78211596	617 – 2700 MHz	4.3-10	500 W	443 - 445
Smart Bias Tee	78211597	617 – 2700 MHz	4.3-10	500 W	443 - 445
50 Ω Load	78410367	0 – 4000 MHz	7-16 male	1.5 W	446
50 Ω Load	78210484	0 – 7500 MHz	4.3-10 male	2 W	446
50 Ω Load	78211760	690 – 5800 MHz	4.3-10 male	25 W	447
50 Ω Load	78211761	690 – 5800 MHz	4.3-10 female	25 W	447
50 Ω Load	78211762	690 – 5800 MHz	4.3-10 male	50 W	447
50 Ω Load	78211763	690 – 5800 MHz	4.3-10 female	50 W	447
50 Ω Load	78210473	380 – 5800 MHz	4.3-10 female	80 W	448
50 Ω Load	78210475	380 – 5800 MHz	7-16 female	150 W	449
Attenuator 3 dB	78210891	0 – 4000 MHz	4.3-10	15 W	450
Attenuator 6 dB	78210892	0 – 4000 MHz	4.3-10	15 W	450
Attenuator 10 dB	78210893	0 – 4000 MHz	4.3-10	15 W	450
Attenuator 20 dB	78210894	0 – 4000 MHz	4.3-10	15 W	450
Clamp Set	734360				451
Clamp Set	734361				451
Clamp Set	734362				451
Clamp Set	734363				451
Clamp Set	734364				451
Clamp Set	734365				451
Clamp Set	731651				451
Clamp Set	738546				451
Clamp Set	85010002				451
Clamp Set	85010003				451

DC Stop 250 – 2700 MHz

DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

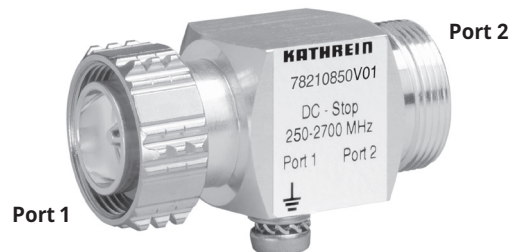


- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Isolation of AISG signals
- Suitable for indoor or outdoor applications



Technical Data

Type No.		78210850V01
Frequency range	MHz	250 - 2700
Insertion loss Port 1 ↔ Port 2	dB	< 0.1 (250 - 2700 MHz)
Isolation Port 1 ↔ Port 2	dB	DC Stop > 23 (AISG 2.176 MHz)
VSWR		< 1.5 (250 - 380 MHz) < 1.25 (380 - 690 MHz) < 1.1 (690 - 2700 MHz)
Impedance	Ω	50
Input power	W	< 750 (250 - 2700 MHz)
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +70 -40 ... +158
Connectors Port 1 Port 2		7-16 male 7-16 female
Application		Indoor or outdoor (IP 67)
Weight	kg lb	0.3 0.7
Dimensions (w x h x d)	mm in	70 x 40 x 32 2.8 x 1.6 x 1.3 (including connectors and earthing screw of 6 mm diameter)

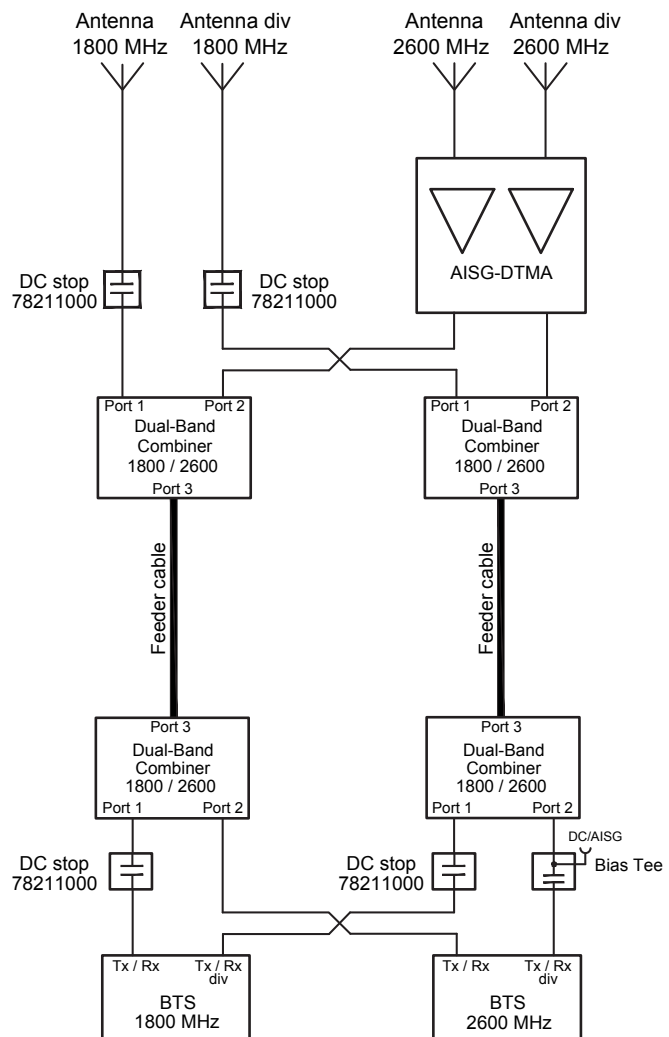


DC Stop

250 – 3800 MHz

DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Isolation of AISG signals
- Suitable for indoor or outdoor applications



Technical Data

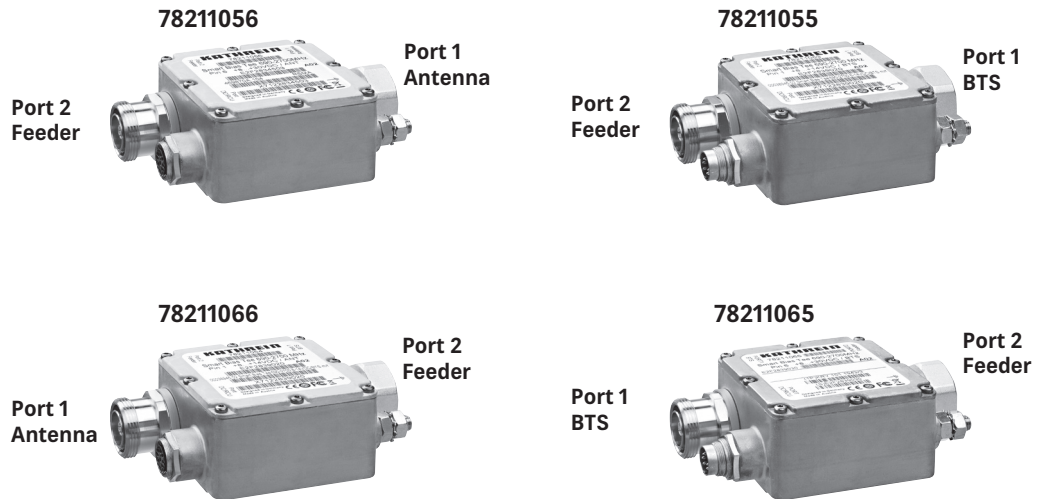
Type No.		78211000
Frequency range	MHz	250 - 3800
Insertion loss Port 1 ↔ Port 2	dB	< 0.1
Isolation Port 1 ↔ Port 2	dB	DC Stop > 23 (AISG 2.176 MHz)
VSWR		< 1.5 (250 - 380 MHz) < 1.25 (380 - 575 MHz) < 1.1 (575 - 3700 MHz) < 1.2 (3700 - 3800 MHz)
Impedance	Ω	50
Input power	W	< 500 (250 - 2700 MHz) < 300 (2700 - 3800 MHz)
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +70 -40 ... +158
Connectors Port 1 Port 2		4.3-10 male 4.3-10 female
Application		Indoor or outdoor (IP 67)
Weight	kg lb	0.2 0.44
Dimensions (w x Ø)	mm in	79 x 29 3.1 x 1.1 (including connectors)



Smart Bias Tee

617 – 2700 MHz

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Technical Data

Type No.		78211055 +8 ... +32 VDC / BTS	78211056 +8 ... +32 VDC / Antenna
Port 1: 7-16 male		BTS	Antenna
Port 2: 7-16 female		Feeder	Feeder
Type No.		78211065 +8 ... +32 VDC / BTS	78211066 +8 ... +32 VDC / Antenna
Port 1: 7-16 female		BTS	Antenna
Port 2: 7-16 male		Feeder	Feeder
Frequency range	MHz	617 – 2700	
Insertion loss Port 1 ↔ Port 2	dB	< 0.1 (617 – 2700 MHz)	
Isolation for DC and RCU signals Port 1 ↔ Port 2	dB	> 70	
Port 1 ↔ Port DC/RCU	dB	> 70	
Port 2 ↔ Port DC/RCU	dB	> 0	
VSWR		< 1.1 (617 – 2700 MHz)	
Impedance	Ω	50	
Input power Port 1 or Port 2	W	< 750 (617 – 2700 MHz)	
Port DC/RCU		< 2.5 A / +8 ... +32 VDC	
Power consumption	W	Typically 0.6 W	
Lightning protection	kA	3, 10/350 μs pulse	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Modem carrier frequency	MHz	2.176	
Application		Indoor or outdoor (IP 66)	
Weight	kg lb	0.8 1.8	
Dimensions (w x h x d)	mm in	81 x 81 x 46 3.2 x 3.2 x 1.8 (without connectors)	
Packing size (w x h x d)	mm in	167 x 102 x 86 6.6 x 4.0 x 3.4	

Smart Bias Tee

617 – 2700 MHz

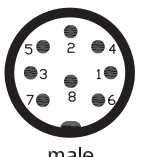
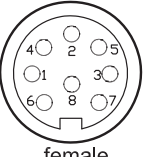
The **Smart Bias Tee** combines the performance of a standard Bias Tee with the function of an additional modem (AISG standard) in order to provide either DC voltage as well as remote control signals via an RF feeder cable to a TMA or RCU. The **Smart Bias Tee** provides low RF signal insertion loss from port 1 to port 2 and vice versa. The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

- **78211055, 78211065:**
+8 ... 32 VDC (DC on pin6) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211056, 78211066:**
+8 ... 32 VDC (DC on pin6) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)

Abbreviations:

RCU	=	Remote Control Unit for remote electrical control of antenna tilt
BTS	=	Base Transceiver Station
TMA	=	Tower Mounted Amplifier
AISG	=	Antenna Interface Standards Group
Port 1	=	Port for BTS or for Antenna
Port 2	=	Port for Feeder Cable
Port DC/RCU	=	Port for DC voltage and Remote Control Unit signals

Pin connections:

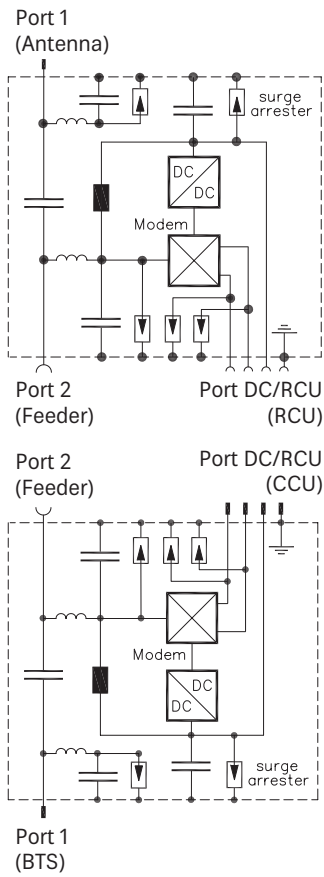
	782 11055	782 11056
	782 11065	782 11066
8-pin connector (IEC 60130-9)		
Pin 1	Not connected	Not connected
Pin 2	Not connected	Not connected
Pin 3	RS485-B	RS485-B
Pin 4	Not connected	Not connected
Pin 5	RS485-A	RS485-A
Pin 6	+8...+32 VDC in	+8...+32 VDC out
Pin 7	DC return (grounded)	DC return (grounded)
Pin 8	Not connected	Not connected

Smart Bias Tee 617 – 2700 MHz

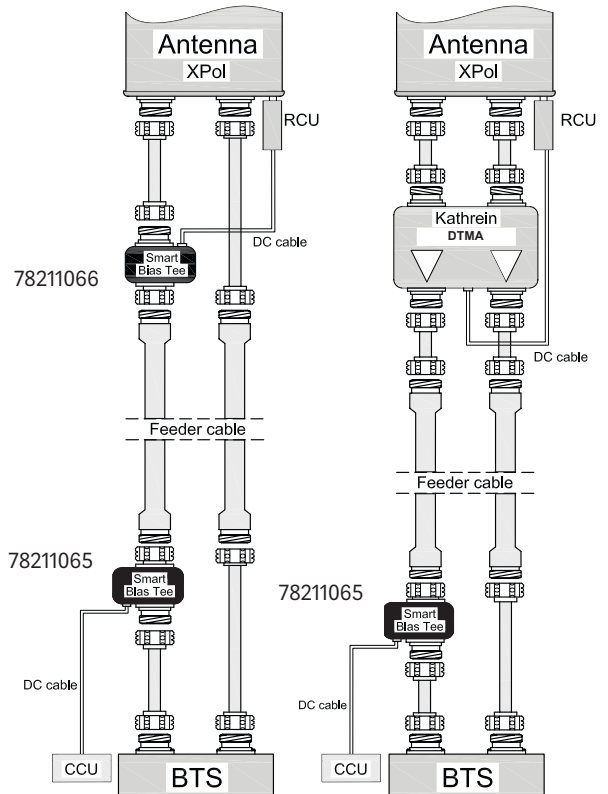
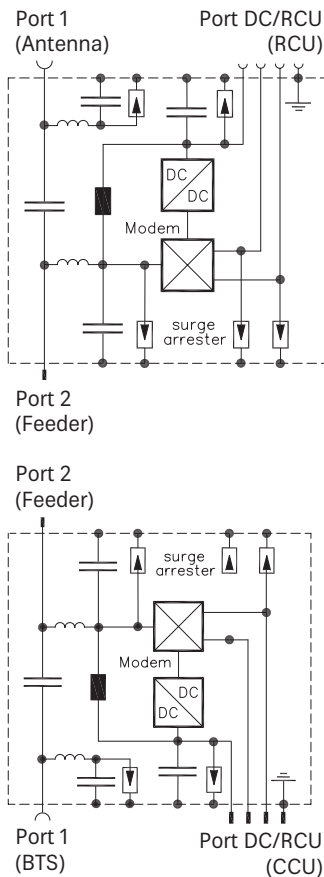
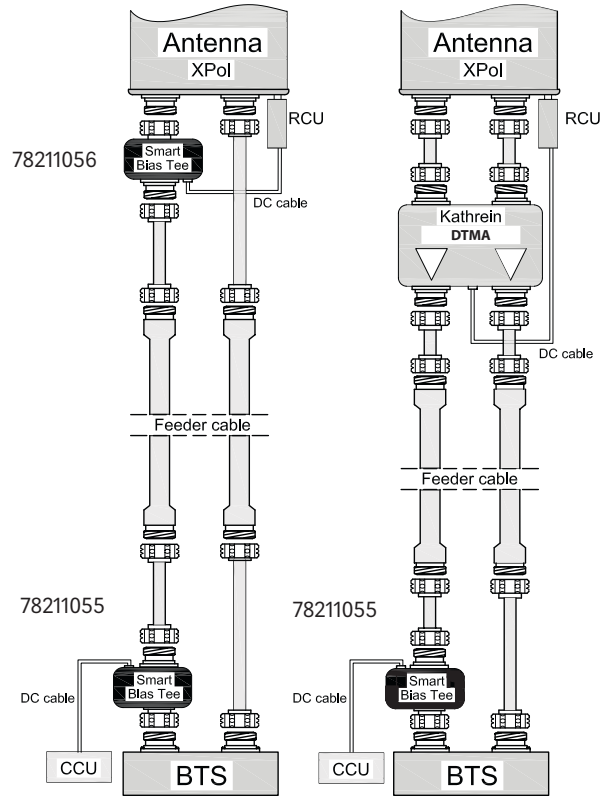
KATHREIN

78211055, -56, -65, -66

Block diagrams:



Application Examples:



Smart Bias Tee 617 – 2700 MHz

KATHREIN



Technical Data

Type No.	78211592 +8 ... +32 VDC / BTS		78211593 +8 ... +32 VDC / Antenna	
Port 1: 4.3-10 male	BTS		Antenna	
Port 2: 4.3-10 female	Feeder		Feeder	
Type No.	78211596 +8 ... +32 VDC / BTS		78211597 +8 ... +32 VDC / Antenna	
Port 1: 4.3-10 female	BTS		Antenna	
Port 2: 4.3-10 male	Feeder		Feeder	
Frequency range	MHz	690 - 2700		
Insertion loss Port 1 ↔ Port 2	dB	< 0.1 (690 - 2700 MHz)		
Isolation for DC and RCU signals Port 1 ↔ Port 2	dB	> 70 (DC), > 40 dB 2.176 MHz (AISG signal)		
Port 1 ↔ Port DC/RCU	dB	> 70		
Port 2 ↔ Port DC/RCU	dB	> 0		
VSWR		< 1.1 (690 - 2700 MHz)		
Impedance	Ω	50		
Input power Port 1 or Port 2	W	< 500 (690 - 2700 MHz)		
Port DC/RCU	A	< 2.5 / +8 ... +32 VDC		
Power consumption	W	Typically 0.6		
Lightning protection	kA	3, 10/350 μs pulse		
Intermodulation products	dBc	< - 160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Modem carrier frequency	MHz	2.176		
Application		Indoor or outdoor (IP 66)		
Weight	kg lb	0.5 1.1		
Dimensions (w x h x d)	mm in	81 x 81 x 42 3.2 x 3.2 x 1.6 (without connectors)		
Packing size (w x h x d)	mm in	167 x 102 x 86 6.6 x 4.0 x 3.4		

Smart Bias Tee

617 – 2700 MHz

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- **With 4.3-10 connectors**

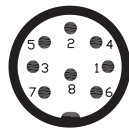
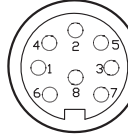
The **Smart Bias Tee** combines the performance of a standard Bias Tee with the function of an additional modem (AISG standard) in order to provide either DC voltage as well as remote control signals via an RF feeder cable to a TMA or RCU. The **Smart Bias Tee** provides low RF signal insertion loss from port 1 to port 2 and vice versa. The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

- **78211592, 78211596:**
+8 ... 32 VDC (DC on pin6) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211593, 78211597:**
+8 ... 32 VDC (DC on pin6) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)

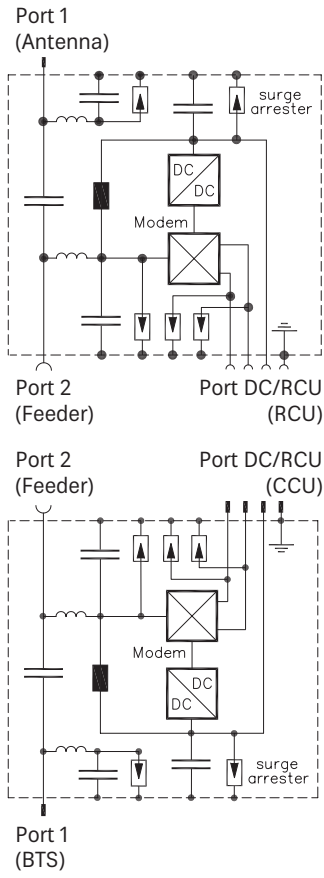
Abbreviations:

RCU	=	Remote Control Unit for remote electrical control of antenna tilt
BTS	=	Base Transceiver Station
TMA	=	Tower Mounted Amplifier
AISG	=	Antenna Interface Standards Group
Port 1	=	Port for BTS or for Antenna
Port 2	=	Port for Feeder Cable
Port DC/RCU	=	Port for DC voltage and Remote Control Unit signals

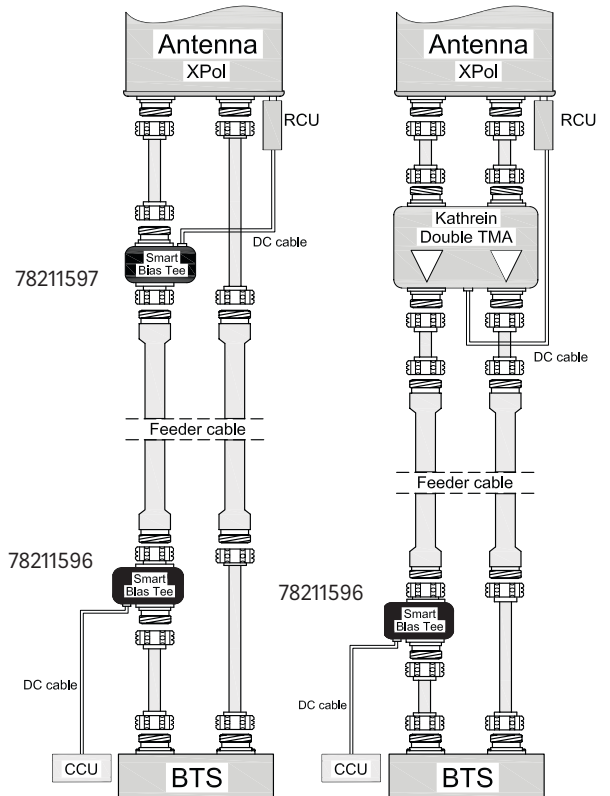
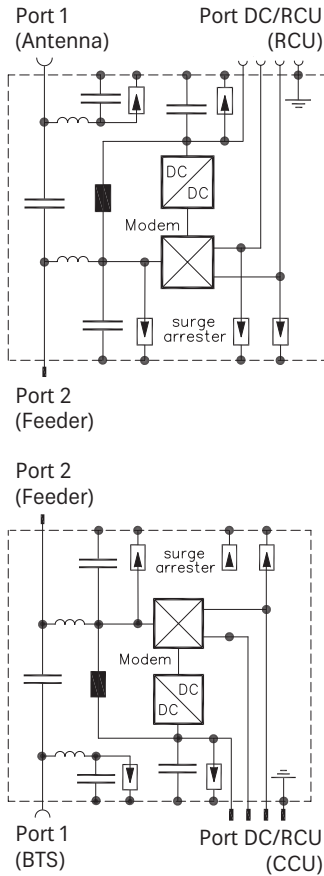
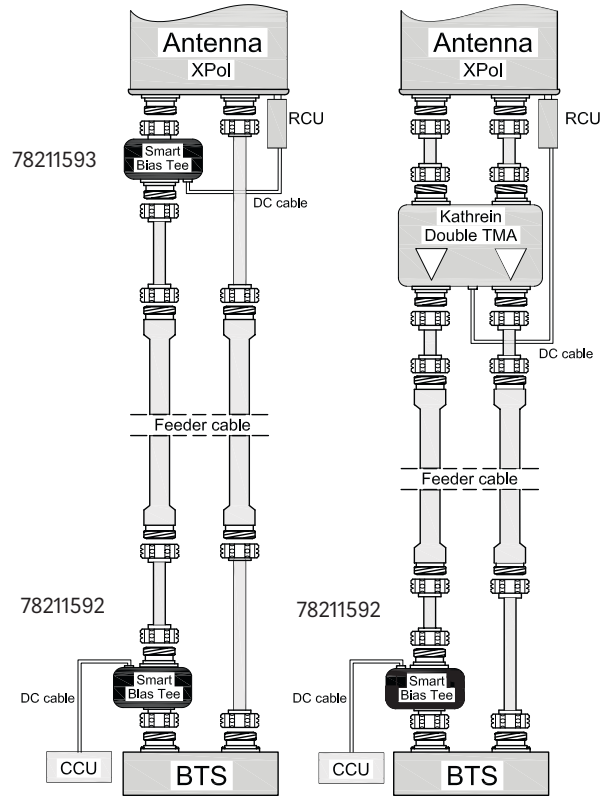
Pin connections:

	78211592 78211596	78211593 78211597
8-pin connector (IEC 60130-9)		
	male	female
Pin 1	Not connected	Not connected
Pin 2	Not connected	Not connected
Pin 3	RS485-B	RS485-B
Pin 4	Not connected	Not connected
Pin 5	RS485-A	RS485-A
Pin 6	+8...+32 VDC in	+8...+32 VDC out
Pin 7	DC return (grounded)	DC return (grounded)
Pin 8	Not connected	Not connected

Block diagrams:



Application Examples:



50-Ohm Load

0 ... 7500 MHz

1.5 / 2.0 W

KATHREIN

- Standard 50-Ohm terminations for small and medium power
- Suitable for terminating open ports on RF equipment for indoor and/or outdoor applications

1.5 Watt *

Type No.		78410367
Connector		7-16 male
Frequency range	MHz	0 - 4000
VSWR	0 - 2000 MHz	< 1.10
	2000 - 4000 MHz	< 1.30
Application		Indoor or outdoor (IP65)
Weight	g lb	120 0.26
Dimensions	mm in	40 / 32 diameter 1.6 / 1.3 diameter
Packing size	mm in	Approx. 50 x 90 x 100 2.0 x 3.5 x 3.9



78410367

2.0 Watt *

Type No.		78210484
Connector		4.3-10 male
Frequency range	MHz	0 - 7500
VSWR	0 - 1000 MHz	< 1.07
	1000 - 2500 MHz	< 1.11
	2500 - 7500 MHz	< 1.20
Application		Indoor or outdoor
Weight	g lb	70 0.15
Dimensions	mm in	30.5 / 26.7 diameter 1.2 / 1.1 diameter
Packing size	mm in	90 x 60 x 25 3.5 x 2.4 x 1.0



78210484

* Rated power at 40 °C ambient temperature. The max. power rating increases or decreases with falling or rising ambient temperature.

50-Ohm Load

690 – 5800 MHz

25 W / 50 W

KATHREIN

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop



78211760, 78211761



78211762, 78211763

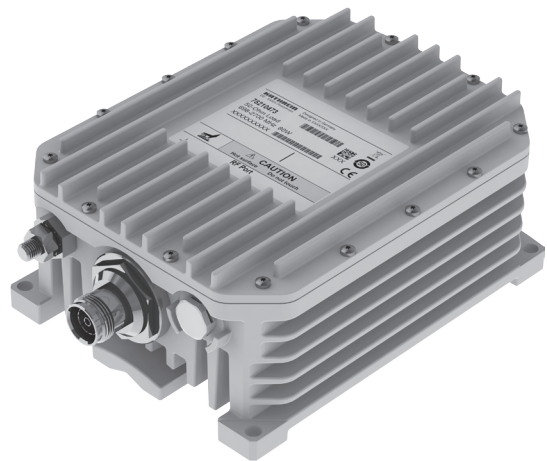
Type No.		78211760	78211761	78211762	78211763
Frequency range	MHz	690 – 5800 MHz			
VSWR		< 1.2			
Impedance	Ω	50			
Input power	W	25	25	50	50
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)			
Temperature range	°C °F	-40 ... +55 -40 ... +131			
Connector		4.3-10 male	4.3-10 female	4.3-10 male	4.3-10 female
Application		Indoor or outdoor (IP 66)			
DC/AISG transparency		Built-in DC stop AISG: Attenuation up to 3 dB when used in a network			
Mounting		Wall mounting: With 2 screws (max. 8.0 mm diameter)			
Weight	kg lb	1.0 2.2		1.2 2.6	
Dimensions	mm in	Ø 74 x 109 2.9 x 4.3		Ø 96 x 122 3.8 x 4.8	

50-Ohm Load

380 – 3800 MHz

80 W

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop



Technical Data

Type No.		78210473
Frequency range	MHz	380 – 3800
VSWR		< 1.2 (380 - 450 MHz) < 1.12 (450 - 3200 MHz) < 1.29 (3200 - 3800 MHz)
Impedance	Ω	50
Input power	W	< 80 (see table)
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +55 -40 ... +131
Connector		4.3-10 female
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		Built-in DC stop AISG: Attenuation up to 3 dB when used in a network
Mounting		Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional Clamp set (see data sheet)
Weight	kg lb	3.1 6.8
Dimensions (w x h x d)	mm in	144 x 216 x 79 5.7 x 8.5 x 3.1 (including connector)
Packing size	mm in	377 x 232 x 189 14.8 x 9.1 x 7.4

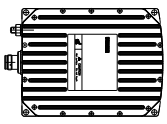
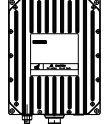
Note:

The RF port connector should always point downwards if mounted outdoors.

The input power rating of 80 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	50 W	60 W
+40 °C	70 W	80 W
+25 °C	90 W	100 W

For more information about accessories please refer to page 437

50-Ohm Load

380 – 5800 MHz

150 W

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop



Technical Data

Type No.		78210475
Frequency range	MHz	380 – 5800
VSWR		< 1.2 (380 - 450 MHz) < 1.12 (450 - 5000 MHz) < 1.25 (5000 - 5800 MHz)
Impedance	Ω	50
Input power	W	< 150
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)
Temperature range	°C °F	-40 ... +55 -40 ... +131
Connectors		7-16 female (long neck)
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		Built-in DC stop AISG: Attenuation up to 3 dB when used in a network
Mounting		Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set (see page 2)
Weight	kg lb	6 13.2
Dimensions (w x h x d)	mm in	235 x 235 x 107 9.3 x 9.3 x 4.2 (without connectors, without mounting brackets)
Packing size (w x h x d)	mm in	405 x 305 x 195 15.9 x 12.0 x 7.7

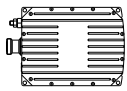
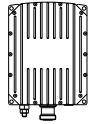
Note:

The RF port connector should always point downwards if mounted outdoors.

The input power rating of 150 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

Max. input power

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	80 W	100 W
+40 °C	110 W	150 W
+25 °C	150 W	180 W

For more information about accessories please refer to page 437

Attenuator

15 W

0 – 4000 MHz

KATHREIN

Air-Cooled attenuator for medium power rating

- Signal attenuation for test, measuring or tuning purposes
- Good matching over large frequency range
- Closed metall housing, very stable and RF proof
- Free choice of mounting position due to convection-cooling



Technical Data

Type No.		78210891	78210892	78210893	78210894
Attenuation	dB	3 ±0.3	6 ±0.3	10 ±0.3	20 ±0.3
Max. power	W	15	15	15	15
Frequency range	MHz	0 – 4000			
VSWR		< 1.15			
Impdance	Ω	50			
Connectors		4.3 – 10			
IP rating		IP65			
Application		Outdoor			
Weight	g lb	100 0.22			
Dimensions (L x diameter)	mm in	61 x 40 2.4 x 1.6			

Type No.	Clamp set suitable for mast diameter of
734360	34 - 60 mm
734361	60 - 80 mm
734362	80 - 100 mm
734363	100 - 120 mm
734364	120 - 140 mm
734365	45 - 125 mm



Clamps for ALDs with weight ≥ 10 kg

Type No.	731651	738546	85010002	85010003
Suitable for mast diameter	28–60 mm	42–115 mm	110–220 mm	210–380 mm
Antenna – mast distance F	25–28 mm	20–26 mm	47–55 mm	48–68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp
Material – Clamp	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel
– Screws	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Stainless steel/ Stainless steel
– Nuts	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight	0.8 kg	1.1 kg	2.7 kg	4.8 kg

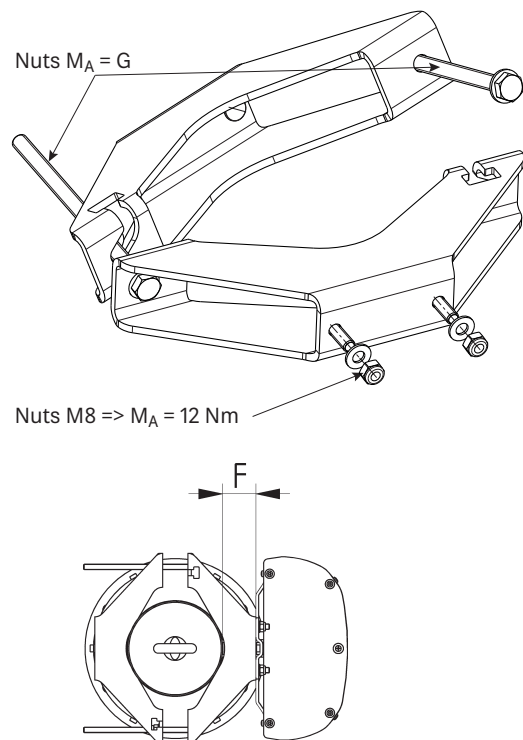
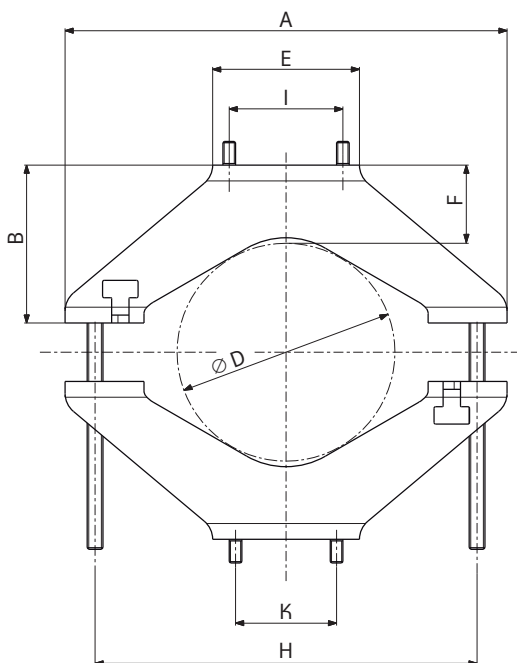


Figure similar to 85010002

Type No.	A	B	C	D	E	F	G	H	I	K
731651	116 mm	40 mm	40 mm	28–60 mm	93 mm	25–28 mm	20 Nm	84 mm	–	64 mm
738546	152 mm	40 mm	40 mm	42–115 mm	93 mm	20–26 mm	25 Nm	125 mm	72 mm	64 mm
85010002	280 mm	100 mm	50 mm	110–220 mm	93 mm	47–55 mm	35 Nm	240 mm	72 mm	64 mm
85010003	442 mm	150 mm	50 mm	210–380 mm	150 mm	48–68 mm	35 Nm	392 mm	72 mm	64 mm

DTMAs:

Description	Type No.	Frequency range	Connector type (female)	Gain	Page
DTMA-700-12-AISG-CWA	78210872V01	UL: 698 - 716 / DL: 728 - 746 MHz	7-16	12 dB	459
DTMA-1900-AWS4-12-AISG-CWA	78210863V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	460, 461
DTMA-1900-AWS4-12-AISG-CWA	78210864V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	460, 461
DTMA-AWS4-12-AISG-CWA	78210877V01	UL: 1695 - 1780 / DL: 2095 - 2200 MHz	7-16	12 dB	462
DTMA-700-12-AISG-CWA	78211275V43	UL: 703 - 748 / DL: 758 - 803 MHz	4.3-10	12 dB	463
DTMA-800-12-AISG	78210430V43	UL: 832 - 862 / DL: 791 - 821 MHz	4.3-10	12 dB	464
DTMA-800-900-12-AISG	78210512V43 78210512V44 78210512V46	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	4.3-10	12 dB	466, 467
DTMA-800-900-12-AISG-D	78210517V43 78210517V44 78210517V46	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	4.3-10	12 dB	468, 469
DTMA-900-12-AISG-CWA	78210495V43	UL: 880 - 915 / DL: 925 - 960 MHz	4.3-10	12 dB	465
DTMA-1800-12-AISG	78210581V43	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	4.3-10	12 dB	470
DTMA-1800-12-AISG-CWA	78210583V43	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	4.3-10	12 dB	471
DTMA-1800-UMTS-12-AISG-D	78210990V43 78210990V44 78210990V46	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	4.3-10	12 dB	472, 473
DTMA-1800-UMTS-BYPASS1500-12-AISG	78211107 78211107V02 78211107V03	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	4.3-10	12 dB	474, 475
DTMA-UMTS-12-AISG-CWA	78211245V43	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	4.3-10	12 dB	476
DTMA-UMTS-2600-12-AISG-D	78211175 78211175V02 78211175V03	UL: 1920 - 1980 / DL: 2110 - 2170 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	478, 479
DTMA-UMTS-2600-12-AISG	78211176 78211176V02 78211176V03	UL: 1920 - 1980 / DL: 2110 - 2170 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	480, 481
DTMA-1800-2600-12-AISG	78211332 78211332V02 78211332V03	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	482, 483
DTMA-1800-2600-12-AISG	78211333 78211333V02	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	482, 483
DTMA-1800-2600-12-AISG-D	78211334 78211334V02 78211334V03	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	484, 485
DTMA-1800-2600-12-AISG-D	78211335 78211335V02	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	484, 485
DTMA-2600-12-AISG	78211330V43	UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	477
DTMA-1800-2100-2600-BYP1500-12-AISG	78210587 78210587V02	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	486, 487
DTMA-1800-2100-2600-BYP1500-12-AISG-T	78210588 78210588V02 78210588V03	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	488, 489
DTMA-2100-2600-BYP1500-12-AISG	78211910 78211910V02	UL: 1920 - 1980 / DL: 2110 - 2170 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	490, 491
DTMA-1800-2600-BYP1500-12-AISG	78211912 78211912V02	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	492, 493

New Product UL = Uplink / DL = Downlink

Summary of DTMA Types

Frequency Combinations and Alarming overview

Frequency / Band	Lower 700 (B12)				APT 700 (B28)			DD 800 (B20)			GSM 900 (B8)			DCS 1800 (B3)			AWS4 (B66)			ePCC 1900 (B25)			UMTS 2100 (B1)			LTE 2600 (B7)				
	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA	RF-Bypass	AI5G*	Low CWA	High CWA		
Type No.	Connector Type	Housing Style	2 Antenna Ports	4 Antenna Ports	6 Antenna Ports																									
78210872V01	7-16	SU	•	•	•																									
78210863V04	4.3-10	SU	•	•	•																									
78210864V04	4.3-10	DU	•	•	•																									
78210877V01	7-16	SU																												
78211275V43	4.3-10	SU	•	•	•																									
78210430V43	4.3-10	SU	•	•	•																									
78210512V43/V44/V46	4.3-10	SU	•	•	•																									
78210517V43/V44/V46	4.3-10	SU	•	•	•																									
78210495V43	4.3-10	SU	•	•	•																									
78210581V43	4.3-10	SU	•	•	•																									
78210583V43	4.3-10	SU	•	•	•																									
78210990V43/V44/V46	4.3-10	SU	•	•	•																									
78211107V02/V03	4.3-10	SU	•	•	•																									
78211245V43	4.3-10	SU	•	•	•																									
78211175V02/V03	4.3-10	SU	•	•	•																									
78211176V02/V03	4.3-10	SU	•	•	•																									
78211332V02/V03	4.3-10	SU	•	•	•																									
78211333V02	4.3-10	DU	•	•	•																									
78211334V02/V03	4.3-10	SU	•	•	•																									
78211335V02	4.3-10	DU	•	•	•																									
78211330V43	4.3-10	SU	•	•	•																									
78210587V02	4.3-10	SU	•	•	•																									
78210588V02/V03	4.3-10	SU	•	•	•																									
78211910V02	4.3-10	SU	•	•	•																									
78211912V02	4.3-10	SU	•	•	•																									

• = default
 * = AIS62.0 (default) & AIS61.1 (optional)
 Low CWA (Current Window Alarm) = 1.70 - 200mA; High CWA (Current Window Alarm) = 230 - 295mA
 SU = Single Unit; DU = Double Unit

DTMA Modes

The communication between the base station (BTS) and the DTMA can vary depending on the BTS. To meet customers' needs, Kathrein Mobile Communication has incorporated different communication modes in the DTMA. **These modes are only of relevance if multi-band DTMA are used (i.e. more than one band is amplified within one DTMA).**

The correct mode of the DTMA needs to be selected based on the according BTS addressing behavior.

The modes can also be switched by inserting a vendor specific switching command into the AISG additional data field "Installation Date" via a software download file provided by Kathrein Mobile Communication. For further information, please contact your local Kathrein Mobile Communication support.

Existing Modes:

1. Single Band Mode

- In case the DTMA functionality is controlled by the BTS separately (i.e. each BTS controls one band)
- The DTMA behaves as two single TMAs, each BTS has the control over one TMA (2 AISG signal and DC paths)
- There is one address per band

2. Wide Band Mode

- In case one BTS controls the overall DTMA functionality
- There is one address for the complete DTMA
- In case a DTMA has 2 RET Ports, the information in both ports is redundant, meaning during the DTMA commissioning the installer can connect the RET cable on any of the ports.

3. Wide Band Mode - single ID

- In case one BTS controls the overall DTMA functionality
- There is one address per band
- The TMA has one single ID, independent which BTS-port is communicating; the lowest and highest frequency band of the TMA are chosen to create this ID
- In case a DTMA has 2 RET ports, the information on both ports is redundant, meaning during the DTMA commissioning the installer can connect the RET cable on any of the ports

Addressing of a Dual Band DTMA, example 78210517V4x (Dual Band DTMA for 800 + 900 MHz)

1. Single Band Mode (78210517V43)

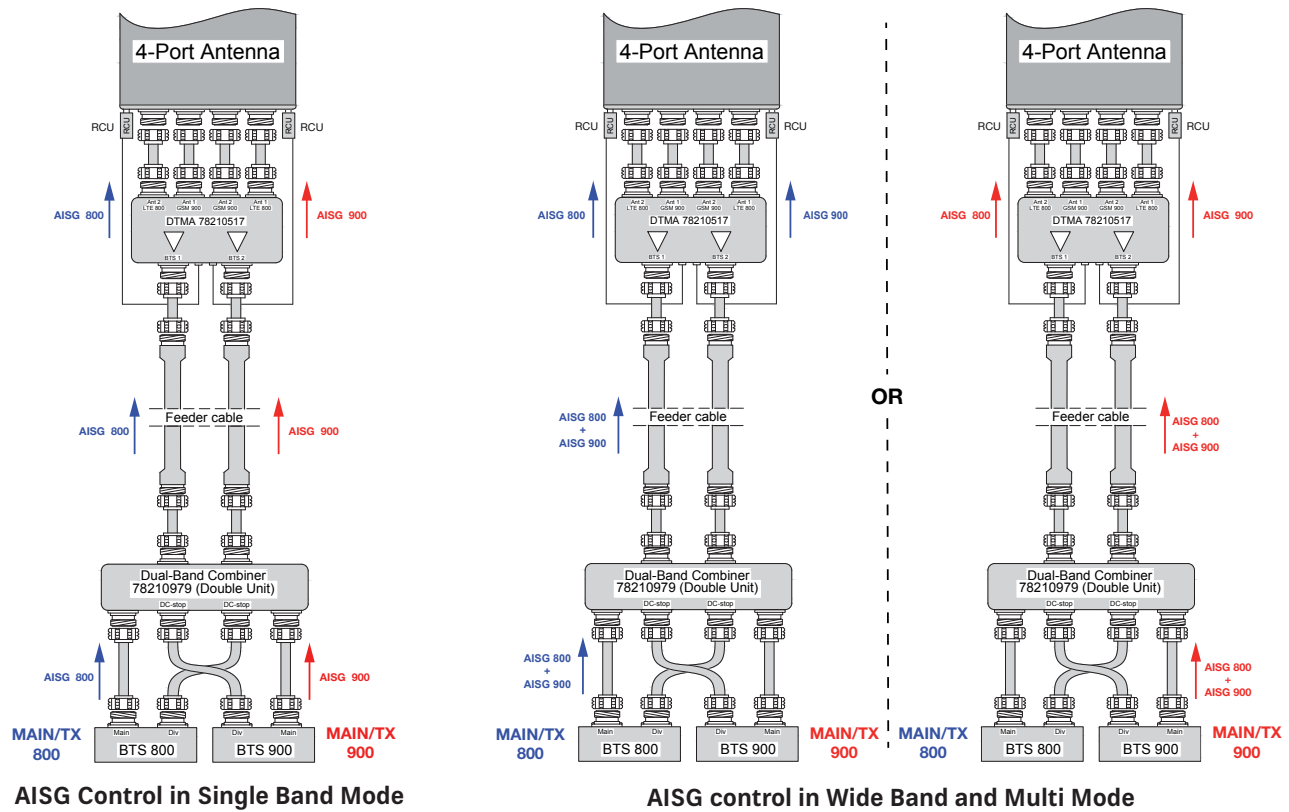
	BTS 1 (800)	BTS 2 (900)
AISG control	x	
Address	Serial Number + "_0.8"	Serial Number + "_0.9"

2. Wide Band Mode (78210517V44)

	BTS 1 (800)	BTS 2 (900)
AISG control	x	
Address	Serial Number + "_WBM_1"	
OR		
AISG control		x
Address		Serial Number + "_WBM_2"

3. Wide Band Mode - single ID (78210517V46)

	BTS 1 (800)	BTS 2 (900)
AISG control	x	
Address	Serial Number + "_0809"	
OR		
AISG control		x
Address		Serial Number + "_0809"



Addressing of a Triple Band DTMA, example 78210588 (Triple Band DTMA for 1800 + 2100 + 2600 MHz)

For one TMA only two addresses are available, therefore two frequency bands (1800 + 2100) are condensed.

1. Single Band Mode (78210588)

	BTS 1 (1800/2100)	BTS 2 (2600)
AISG control	X	
Address	Serial Number + "_1821"	Serial Number + "_26"

2. Wide Band Mode (78210588V02)

	BTS 1 (1800/2100)	BTS 2 (2600)
AISG control	X	
Address	Serial Number + "_WBM_1"	
OR		
AISG control		X
Address		Serial Number + "_WBM_2"

3. Wide Band Mode - single ID (78210588V03)

	BTS 1 (1800/2100)	BTS 2 (2600)
AISG control	X	
Address	Serial Number + "_1826"	
OR		
AISG control		X
Address		Serial Number + "_1826"

DTMA-700-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



- For lower SMH block A/B/C
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low Inrush Current
- ATSC attenuation



AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm

Technical Data

Type No.	78210872V01 DTMA-700-12-AISG-CWA	clamps included
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Tx Characteristics

Frequency range	MHz	728 – 746
Insertion loss	dB	Typically 0.45
Input power (per input)	kW	< 0.2 (+53 dBm)/1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

Rx Characteristics

Frequency range	MHz	698 – 716
Loss in bypass mode	dB	Typically 1.5 (DC OFF)
Return loss	dB	> 18 (DC ON) / > 16 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.6
3 rd order intercept point (OIP3)	dBm	Typically 25
ATSC attenuation	dB	> 30 (< 692 MHz)

Environmental Characteristics

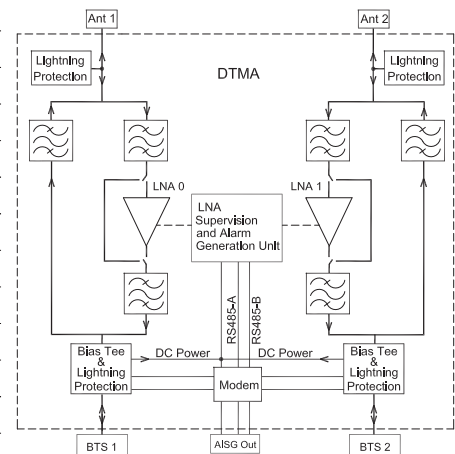
Operating temperature range	°C °F	-40 ... +65 -40 ... +149	
IP rating		IP67	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	

DC and Alarm Characteristics

		CWA Mode	AISG Mode
DC supply	V DC	10 – 19	10 – 30
Operating current	mA	90 – 130	Nom. 150 at 12 V
Alarm management	mA	170 – 200	AISG

Mechanical Characteristics

Material	Aluminium housing		
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set		
Weight	kg lb	8.0 17.6	
Dimensions (w x h x d)	mm in	220 x 220 x 126 8.7 x 8.7 x 5 (without connectors, without mounting brackets)	



For more information about accessories please refer to page 437

DTMA-1900-AWS4-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- Low Inrush Current
- Clamp Set 45 – 125 | 1.77 – 4.92 [mm | in] included

AISG = Antenna Interface Standards Group

CWA = Current Window Alarm

RET = Remote Electrical Tilt



78210863V04



78210864V04

Technical Data

Type No.	Single Unit	78210863V04 DTMA-1900-AWS4-12-AISG-CWA	clamps included
	Double Unit	78210864V04 DTMA-1900-AWS4-12-AISG-CWA	

1900/AWS Tx Characteristics

Frequency range	MHz	1930 – 2200
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.2 (+53 dBm) / 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

1900/AWS Rx Characteristics

Frequency range	MHz	1695 – 1915
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-1900-AWS4-12-AISG-CWA

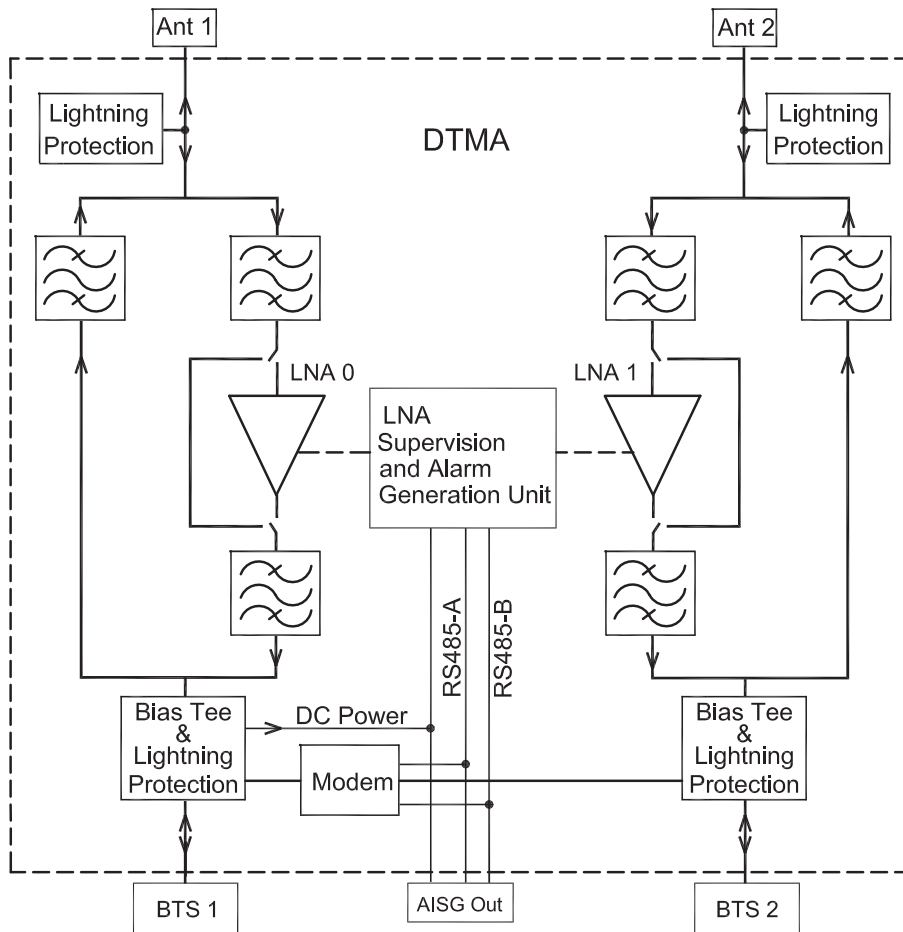
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V DC	10 – 19	10 – 30
Operating current	mA	120 – 150	Nom. 170 at 12 V
Alarm management	mA	180 – 200	AISG

Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set
Weight	kg lb	Single Unit: 7 16.1 / Double Unit: 15 32
Dimensions (w x h x d)	mm in	Single Unit: 220 x 220 x 83 8.7 x 8.7 x 3.3 Double Unit: 220 x 220 x 171 8.7 x 8.7 x 6.7 (without connectors, without mounting brackets)

Block Diagram



DTMA-AWS4-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Clamp Set 45 – 125 mm included
- **Low weight**

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm

Technical Data

Type No.	78210877V01 DTMA-AWS4-12-AISG-CWA
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clamps
included

Tx Characteristics

Frequency range	MHz	2095 – 2200
Insertion loss	dB	Typically 0.2
Input power (per input)	kW	< 0.1 (+50 dBm) CW / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

Rx Characteristics

Frequency range	MHz	1695 – 1780
Loss in by-pass mode	dB	Typically 2.0 (DC OFF)
Return loss	dB	> 18 (DC ON)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
3 rd order intercept point (OIP3)	dBm	Typically 30

Environmental Characteristics

Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3

DC and Alarm Characteristics

		CWA Mode	AISG Mode
DC supply	V	7 – 19	10 – 30
Operating current (without RET)	mA	80 – 120	Nom. 140 at 10 V Nom. 55 at 30 V
Alarm management	mA	170 – 200	AISG*

Mechanical Characteristics

Material		Aluminium housing
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set
Weight	kg lb	3 6.6
Dimensions (w x h x d)	mm in	138 x 191 x 71.6 5.4 x 7.5 x 2.8 (without connectors, without mounting brackets)
Packing size	mm in	217 x 397 x 170 8.5 x 15.6 x 6.7



For more information about accessories please refer to page 437

DTMA-700-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm

Technical Data

Type No.		78211275V43 DTMA-700-12-AISG-CWA	
Tx Characteristics			
Frequency range	MHz	758 – 803	
Insertion loss	dB	Typically 0.45	
Input power (per input)	W	< 100 (+50 dBm)	
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	
Rx Characteristics			
Frequency range	MHz	703 – 748	
Loss in bypass mode	dB	Typically 1.6 (DC OFF)	
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)	
Gain	dB	12 nominal	
Noise figure	dB	Typically 1.3	
3 rd order intercept point (OIP3)	dBm	Typically 25	
DVB-T attenuation	dB	> 30 (< 698 MHz)	
Environmental Characteristics			
Operating temperature range	°C F	-40 ... +65 -40 ... +149	
IP rating		IP67*	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 301 342-3	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V	9 – 19	9 – 30
Operating current per TMA	mA	80 – 130	Nom. 150 at 12 V
Alarm management	mA	170 – 200	AISG
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	mm in	Wall mounting: With 4 screws (max. diameter 8 0.31) Mast mounting: With additional clamp set	
Weight	kg lb	8.8 19.4	
Dimensions (w x h x d)	mm in	220 x 220 x 126 8.7 x 8.7 x 5.0 (without connectors, without mounting brackets)	

For more information about accessories please refer to page 437

DTMA-800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	78210430V43 DTMA-800-12-AISG	
Tx Characteristics		
Frequency range	MHz	791 – 821
Insertion loss	dB	Typically 0.25
Ripple	dB	< 0.3
Input power (per input)	W	< 100 (+50 dBm) CW
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
Rx Characteristics		
Frequency range	MHz	832 – 862
Loss in by-pass mode	dB	Typically 2.0
Return loss	dB	> 16 (DC ON)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.2
3 rd order intercept point (OIP3)	dBm	Typically 30
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	V	10 – 30
Operating current per DTMA (without RET)	mA mA	Nom. 155 at 10 V Nom. 60 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF RET	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	kg lb	6.2 13.7
Packing size	mm in	250 x 450 x 210 9.8 x 17.7 x 8.3
Dimensions (w x h x d)	mm in	176 x 247 x 104 6.9 x 9.7 x 4.1 (without connectors, without mounting brackets)



For more information about accessories please refer to page 437

DTMA-900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable
- CWA and AISG configuration



AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm

Technical Data

Type No.		78210495V43 DTMA-900-12-AISG-CWA	
Tx Characteristics			
Frequency range	MHz	925 - 960	
Insertion loss	dB	Typically 0.5	
Input power (per input)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak	
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	
Rx Characteristics			
Frequency range	MHz	880 - 915 MHz	
Loss in bypass mode	dB	Typically 1.8	
Return loss	dB	> 16 (DC ON) / > 12 (DC OFF)	
Gain	dB	12, nominal	
Noise figure	dB	Typically 1.5	
3 rd order intercept point (OIP3)	dBm	Typically 30	
Environmental Characteristics			
Operating temperature range	°C °F	-40 ... +55 -40 ... +131	
IP rating		IP67*	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V DC	9 - 19	10 - 30
Operating current per DTMA (without RET)	mA	80 - 120	Nom. 155 at 10 V Nom. 63 at 30 V
Alarm management		170 - 200 mA	AISG
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	6.2 13.7	
Packing size	mm in	270 x 495 x 190 10.6 x 19.5 x 7.5	
Dimensions (w x h x d)	mm in	185 x 265 x 105 7.3 x 10.4 x 4.1 (without connectors, without mounting brackets)	



For more information about accessories please refer to page 437

DTMA-800-900-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Wide-Band (configuration 1 ... 6) or Single-Band Mode (configuration 7,8 or 9)
- Built-in lightning protection



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt



Technical Data

Type No.	Single-Band Mode	78210512V43 DTMA-800-900-12-AISG
	Wide-Band Mode	78210512V44 DTMA-800-900-12-AISG
	Wide-Band Mode single ID	78210512V46 DTMA-800-900-12-AISG

800 MHz Tx Characteristics

Frequency range	MHz	791 - 821
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

800 MHz Rx Characteristics

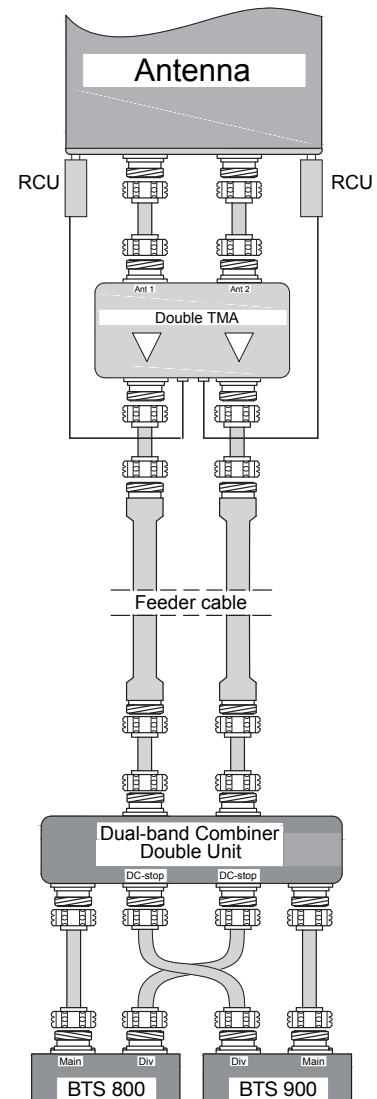
Frequency range	MHz	832 - 862
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 14 dB (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25

900 MHz Tx Characteristics

Frequency range	MHz	925 - 960
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.18 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

900 MHz Rx Characteristics

Frequency range	MHz	880 - 915
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 14 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25



For more information about accessories please refer to page 437

DTMA-800-900-12-AISG

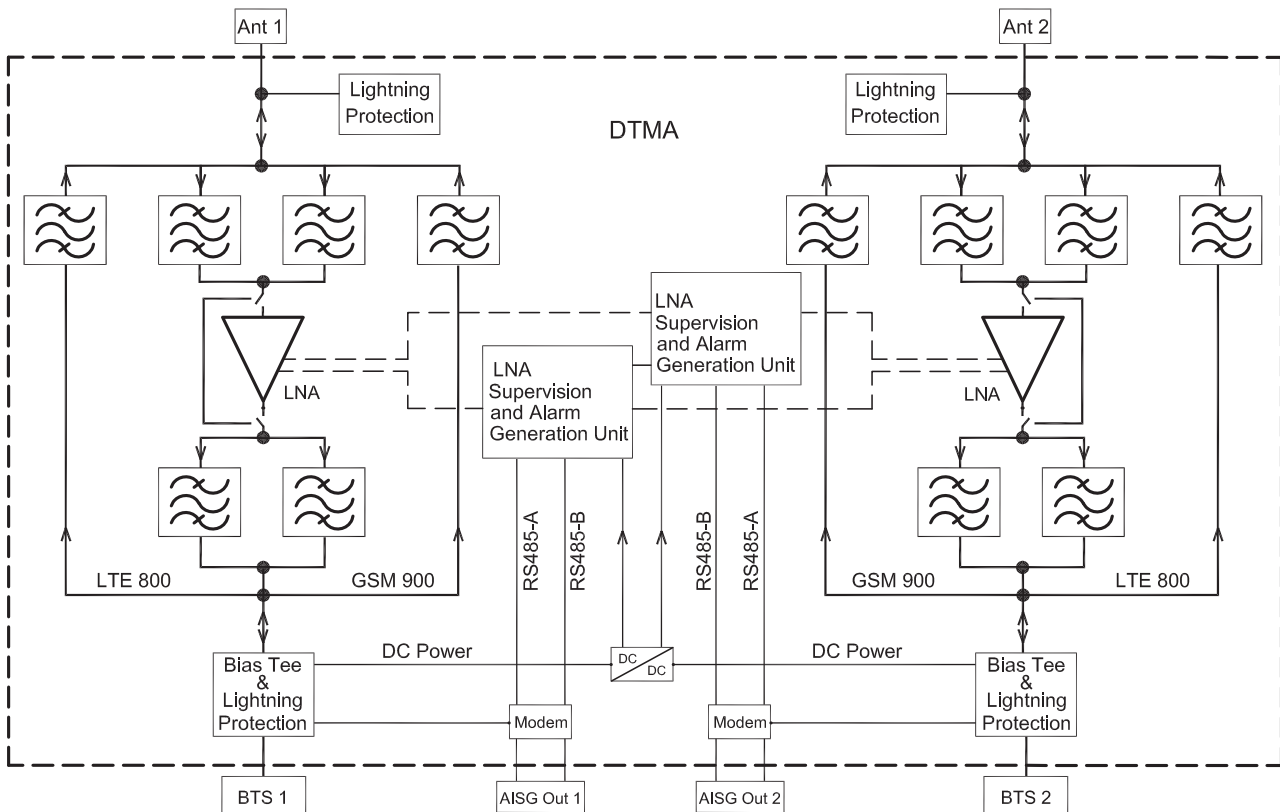
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
Lightning protection	kA	3, 10/350 µs pulse
DC and Alarm Characteristics		AISG Mode
DC supply	V DC	9 - 31
Operating current per DTMA (without RET)	mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3 - 10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	kg lb	11 24.3
Dimensions (w x h x d)	mm in	231 x 246 x 159 9.0 x 9.6 x 6.3 (without connectors, without mounting brackets)
Packing size	mm in	397 x 297 x 240 15.6 x 12.2 x 9.4

Block Diagram



DTMAS

DTMA-800-900-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



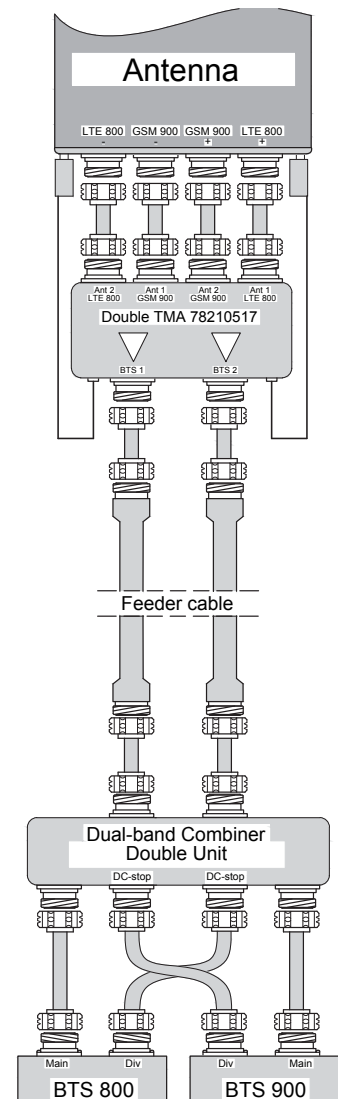
- Double unit for easy use with XXPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Multi-Band, Wide-Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- DC supply via BTS 1, BTS 2 or both
- Built-in lightning protection
- Low inrush current
- Auto-Select feature for Multi-Band and Wide-Band Mode

AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt



Technical Data

Type No.	Single-Band Mode	78210517V43 DTMA-800-900-12-AISG-D
	Wide-Band Mode	78210517V44 DTMA-800-900-12-AISG-D
	Wide-Band Mode single ID	78210517V46 DTMA-800-900-12-AISG-D
800 MHz Tx Characteristics		
Frequency range	MHz	791 – 821
Insertion loss	dB	Typically 0.4
Input power (per input)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -116 (2 Tx carriers at +43)
Return loss	dB	> 18
800 MHz Rx Characteristics		
Frequency range	MHz	832 – 862
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25
900 MHz Tx Characteristics		
Frequency range	MHz	925 – 960
Insertion loss	dB	Typically 0.4
Input power (per input)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -116 (2 Tx carriers at +43)
Return loss	dB	> 18
900 MHz Rx Characteristics		
Frequency range	MHz	880 – 915
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25



For more information about accessories please refer to page 437

DTMA-800-900-12-AISG-D

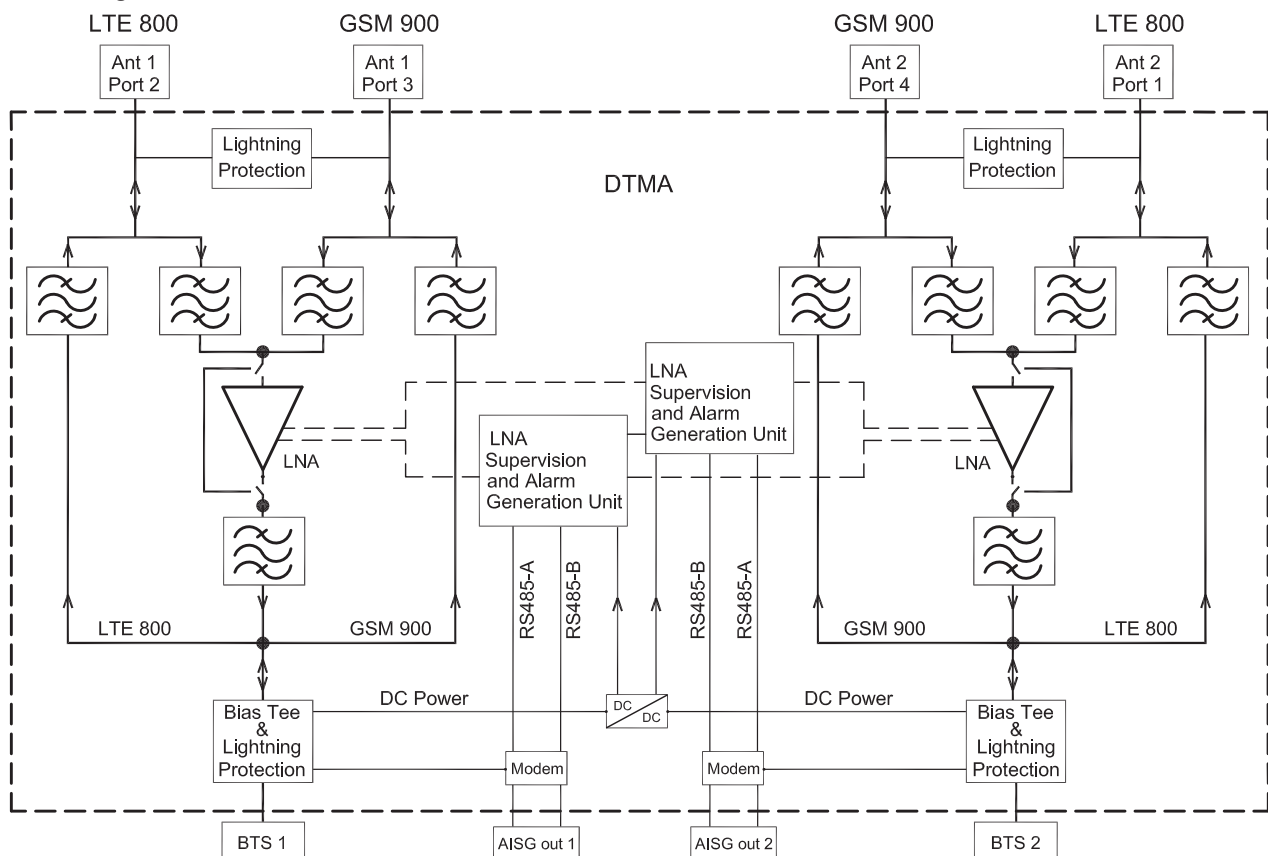
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
Lightning protection	kA	3, 10/350 µs pulse
DC and Alarm Characteristics		AISG Mode
DC supply	V DC	10 – 30
Operating current per DTMA (without RET)	mA	Nom. 190 at 10 V Nom. 70 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors RF AISG		4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 31 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm 0.315 diameter) Mast mounting: With additional clamps
Weight	kg lb	11 24.25
Packing size	mm in	440 x 380 x 255 17.3 x 15 x 10
Dimensions (w x h x d)	mm in	300 x 258 x 147 11.8 x 10.15 x 5.8 (without connectors, without mounting brackets)

Block Diagram



DTMAS

DTMA-1800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double units for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable



RET	=	Remote Electrical Tilt
AISG	=	Antenna Interface Standards Group

Technical Data

Type No.	78210581V43 DTMA-1800-12-AISG	
Tx Characteristics		
Frequency range	MHz	1805 - 1880
Insertion loss	dB	Typically 0.25
Input power (per input)	kW	< 0.2 (+53 dBm) CW / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
Rx Characteristics		
Frequency range	MHz	1710 - 1785
Loss in bypass mode	dB	Typically 1.7
Return loss	dB	> 16 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.0
3 rd order intercept point (OIP3)	dBm	Typically 30
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
AISG Mode		
DC supply	V	10 - 30
Operating current per DTMA (without RET)	mA	Nom. 130 at 10 V Nom. 50 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	kg lb	4 8.8
Packing size	mm in	235 x 405 x 175 9.3 x 15.9 x 6.9
Dimensions (w x h x d)	mm in	169 x 218 x 74 6.7 x 8.6 x 2.9 (without connectors, without mounting brackets)



For more information about accessories please refer to page 437

DTMA-1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **Compact line**
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable
- CWA and AISG configurations
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection



RET	=	Remote Electrical Tilt
AISG	=	Antenna Interface Standards Group
CWA	=	Current Window Alarm

Technical Data

Type No.	CWA alarm 170-200 mA	78210583V43 DTMA-1800-12-AISG-CWA	
Tx Characteristics			
Frequency range	MHz	1805 - 1880	
Insertion loss	dB	Typically 0.25 dB	
Input power (per input)	kW	< 0.2 (+53 dBm) CW / < 1.6 (+62 dBm) peak	
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	
Rx Characteristics			
Frequency range	MHz	1710 - 1785	
Loss in bypass mode	dB	Typically 1.7	
Return loss	dB	> 16 (DC ON) / > 12 (DC OFF)	
Gain	dB	12 nominal	
Noise figure	dB	Typically 1.0	
3 rd order intercept point (OIP3)	dBm	Typically 30	
Environmental Characteristics			
Operating temperature range	°C °F	-40 ... +65 -40 ... +149	
IP rating		IP67*	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	
DC and Alarm Characteristics		CWA	AISG Mode
DC supply	V	7 - 19	10 - 30
Operating current (without RET)	mA	80 - 120	Nom. 155 at 10 V Nom. 65 at 30 V
Alarm management		170-200 mA	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	4 8.8	
Dimensions (w x h x d)	mm in	218 x 169 x 74 8.6 x 6.7 x 2.9 (without connectors, without mounting brackets)	
Packing size	mm in	405 x 235 x 175 15.9 x 9.3 x 6.9	



DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- **Compact line**
- Double units for easy use with XXPOL antennas
- Supports AISG 1.1 and 2.0 (default)
- Supports Multi-Band, Wide Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- DC Supply via BTS 0, BTS 1 or both
- Auto-Select feature for Multi-Band and Wide-Band Mode
- Low inrush current

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt



Technical Data

Type No.	Single-Band Mode	78210990V43 DTMA-1800-UMTS-12-AISG-D
	Wide-Band Mode	78210990V44 DTMA-1800-UMTS-12-AISG-D
	Wide-Band Mode single ID	78210990V46 DTMA-1800-UMTS-12-AISG-D

Tx Characteristics

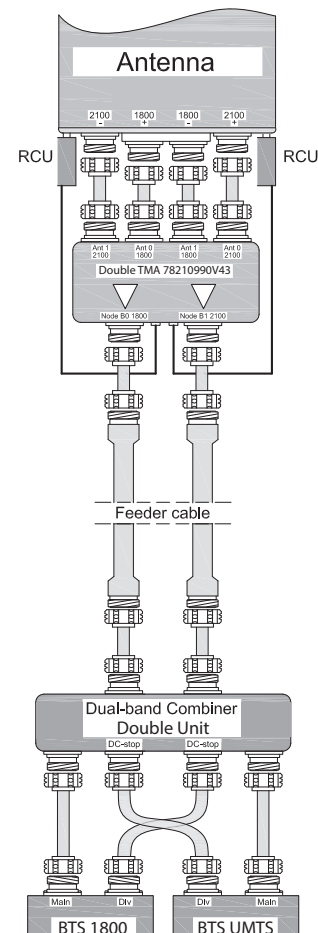
Frequency range	MHz	1805 – 1880	2110 – 2170
Insertion loss	dB	Typically 0.5	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm)/< 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	

Rx Characteristics

Frequency range	MHz	1710 – 1785	1920 – 1980
Return loss	dB	> 16 (DC ON) / > 12	
Loss in bypass mode	dB	Typically 2.3 (DC OFF)	
Gain	dB	nominal 12	
Noise figure	dB	Typically 1.4	
3 rd order intercept point (OIP3)	dBm	Typically 30	

Environmental Characteristics

Operating temperature range	°C °F	-40 ... +65 -40 ... +149	
IP rating		IP67	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	



For more information about accessories please refer to page 437

DTMA-1800-UMTS-12-AISG-D

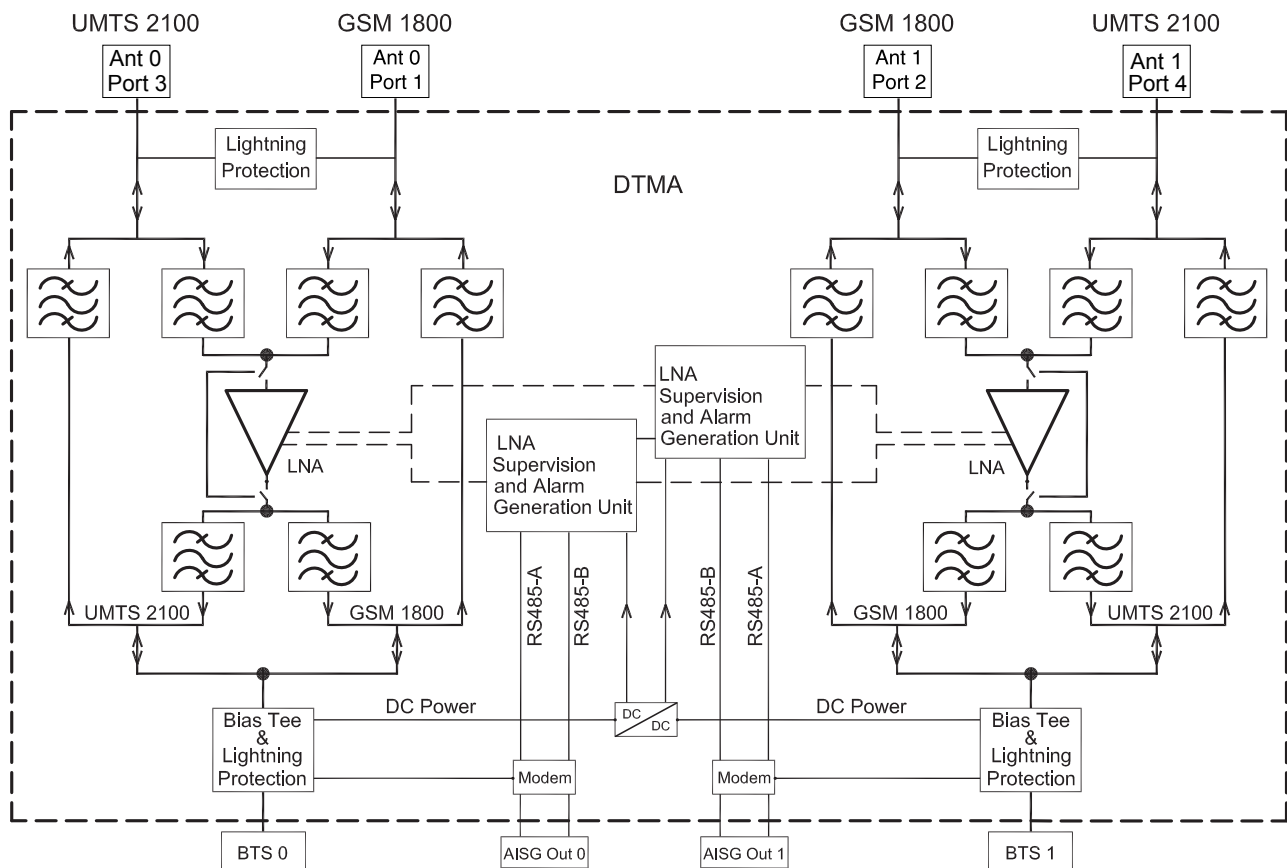
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



DC and Alarm Characteristics		
DC supply	V DC	10 – 30
Operating current per DTMA (without RET)	mA	Nom. 175 at 10 V
	mA	Nom. 65 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors RF AISG		4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamps
Weight	kg lb	6.5 14.4
Packing size	mm in	300 x 435 x 190 11.8 x 17.1 x 7.5
Dimensions (w x h x d)	mm in	220 x 220 x 83 8.7 x 8.7 x 3.3 (without connectors, without mounting brackets)

Block Diagram



DTMAS

DTMA-1800-UMTS-BYPASS1500-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- Double units for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide-Band (configuration 1.. 6) or Single-Band Mode (configuration 7, 8 or 9)
- DC Supply via BTS1, BTS2 or both
- Auto-Select feature for Multi-Band and Wide-Band Mode



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211107 DTMA-1800-UMTS-BYPASS1500-12-AISG
	Wide-Band Mode	78211107V02 DTMA-1800-UMTS-BYPASS1500-12-AISG
	Wide-Band Mode single ID	78211107V03 DTMA-1800-UMTS-BYPASS1500-12-AISG

1800 MHz Tx Characteristics

Frequency range	MHz	1805 – 1880
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

1800 MHz Rx Characteristics

Frequency range	MHz	1710 – 1785
Return loss	db	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 2.0 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

UMTS Tx Characteristics

Frequency range	MHz	2110 – 2170
Insertion loss	dB	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

UMTS Rx Characteristics

Frequency range	MHz	1920 – 1980
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 2.0 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-1800-UMTS-BYPASS1500-12-AISG

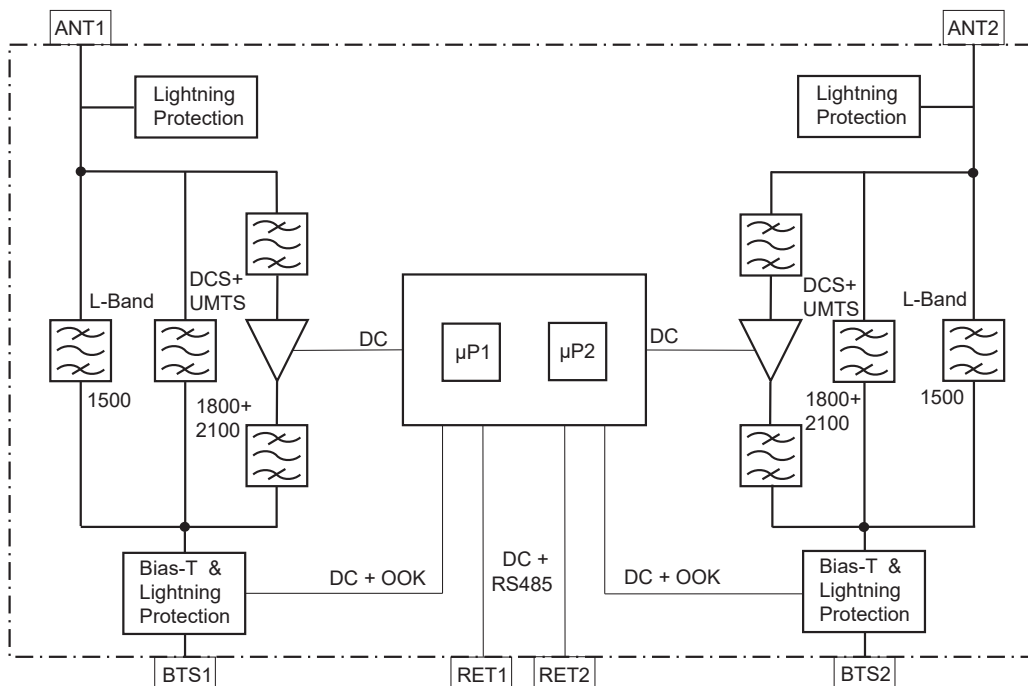
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



1427 - 1518 MHz Bypass Characteristics		
Frequency range	MHz	1427 - 1518
Insertion loss	dB	Typically 0.15
Input power	kW	< 0.1 (+50 dBm)
Intermodulation products	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	V	10 - 30
Operating current per DTMA (without RET)	mA	Nom. 175 @ 10 V Nom. 65 @ 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	4.3-10 female, 8-pin female, IEC 60130-9, (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting
Weight	kg lb	8.8 19.4
Dimensions (w x h x d)	mm in	290 x 235 x 94 / 11.4 x 9.3 x 3.7
Packing size	mm in	420 x 335 x 175 / 16.5 x 13.2 x 6.9

Block Diagram



DTMAS

DTMA-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- **Compact line**
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and 2.0 (default)
- AISG setting switchable as described on page 2
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- **Low weight**

AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.		78211245V43 DTMA-UMTS-12-AISG-CWA	
Tx Characteristics			
Frequency range	MHz	2110 - 2170	
Insertion loss	dB	Typically 0.2	
Ripple	dB	< 0.1	
Input power (per input)	kW	< 0.1 (+50 dBm) CW / < 1.6 (+62 dBm) peak	
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	
Rx Characteristics			
Frequency range	MHz	1920 - 1980	
Loss in by-pass mode	dB	Typically 2.0 (DC OFF)	
Return loss	dB	> 18 (DC ON)	
Gain	dB	Typically 12	
Noise figure	dB	Typically 1.4	
3 rd order intercept point (OIP3)	dBm	Typically 30	
Environmental Characteristics			
Operating temperature range	°C °F	-40 ... +65 -40 ... 149	
IP rating		IP67*	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V	7 - 19	10 - 30
Operating current (without RET)	mA	80 - 120	Nom. 130 at 10 V Nom. 50 at 30 V
Alarm management		170 - 200 mA	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	3 6.6	
Packing size	mm in	217 x 397 x 170 8.5 x 15.6 x 6.7	
Dimensions (w x h x d)	mm in	138 x 191 x 72 5.4 x 7.5 x 2.8 (without connectors, without mounting brackets)	



For more information about accessories please refer to page 437

DTMA-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- **Compact line**
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	78211330V43 DTMA-2600-12-AISG	
Tx Characteristics		
Frequency range	MHz	2620 - 2690
Insertion loss	dB	Typically 0.3
Input power (per input)	kW	< 0.1 (+50 dBm) CW / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
Rx Characteristics		
Frequency range	MHz	2500 - 2570
Loss in by-pass mode	dB	Typically 1.8
Return loss	dB	> 18 (DC ON)
Gain	dB	12, nominal
Noise figure	dB	Typically 1.6
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	V	10 - 30
Operating current per DTMA (without RET)	mA mA	Nom. 130 at 10 V DC Nom. 50 at 30 V DC
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	kg lb	3 6.6
Dimensions (w x h x d)	mm in	138 x 191 x 72 5.4 x 7.5 x 2.8 (without connectors, without mounting brackets)
Packing size	mm in	217 x 397 x 170 8.5 x 15.6 x 6.7



For more information about accessories please refer to page 437

DTMA-UMTS-2600-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XXPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports Multi-Band, Wide Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- Built-in lightning protection
- Supports AISG 1.1 and 2.0 (default)



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211175 DTMA-UMTS-2600-12-AISG-D
	Wide-Band Mode	78211175V02 DTMA-UMTS-2600-12-AISG-D
	Wide-Band Mode single ID	78211175V03 DTMA-UMTS-2600-12-AISG-D

Tx Characteristics

Frequency range	MHz	2110 - 2170	2620 - 2690
Insertion loss	dB	Typically 0.2	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak	
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	

Rx Characteristics

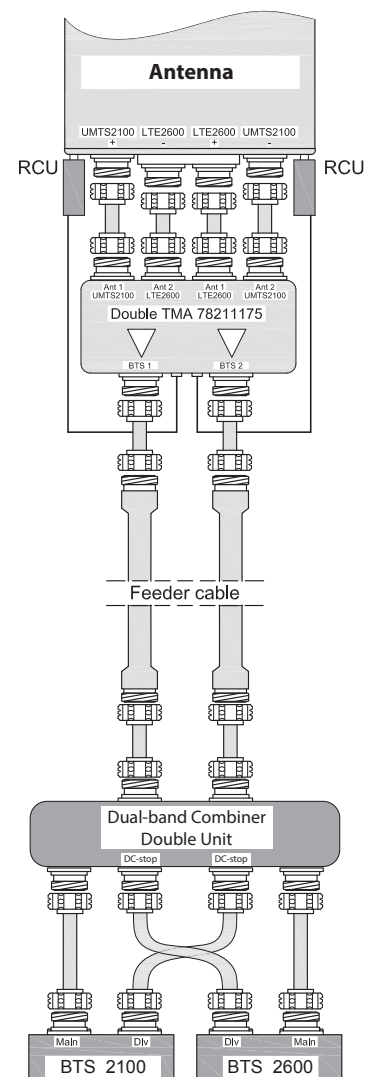
Frequency range	MHz	1920 - 1980	2500 - 2570
Loss in bypass mode	dB	Typically 1.5	Typically 1.8
Return loss	dB	> 18 (DC ON) / > 14 (DC OFF)	
Gain	dB	12 nominal	
Noise figure	dB	Typically 1.5	Typically 1.6
3 rd order intercept point (OIP3)	dBm	Typically 25	

Environmental Characteristics

Operating temperature range	°C °F	-40 ... +65 -40 ... 149
IP rating		IP67
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
Lightning protection	kA	3, 10/350 us pulse

DC and Alarm Characteristics

		AISG Mode
DC supply	V DC	10 - 30
Operating current	mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG



For more information about accessories please refer to page 437

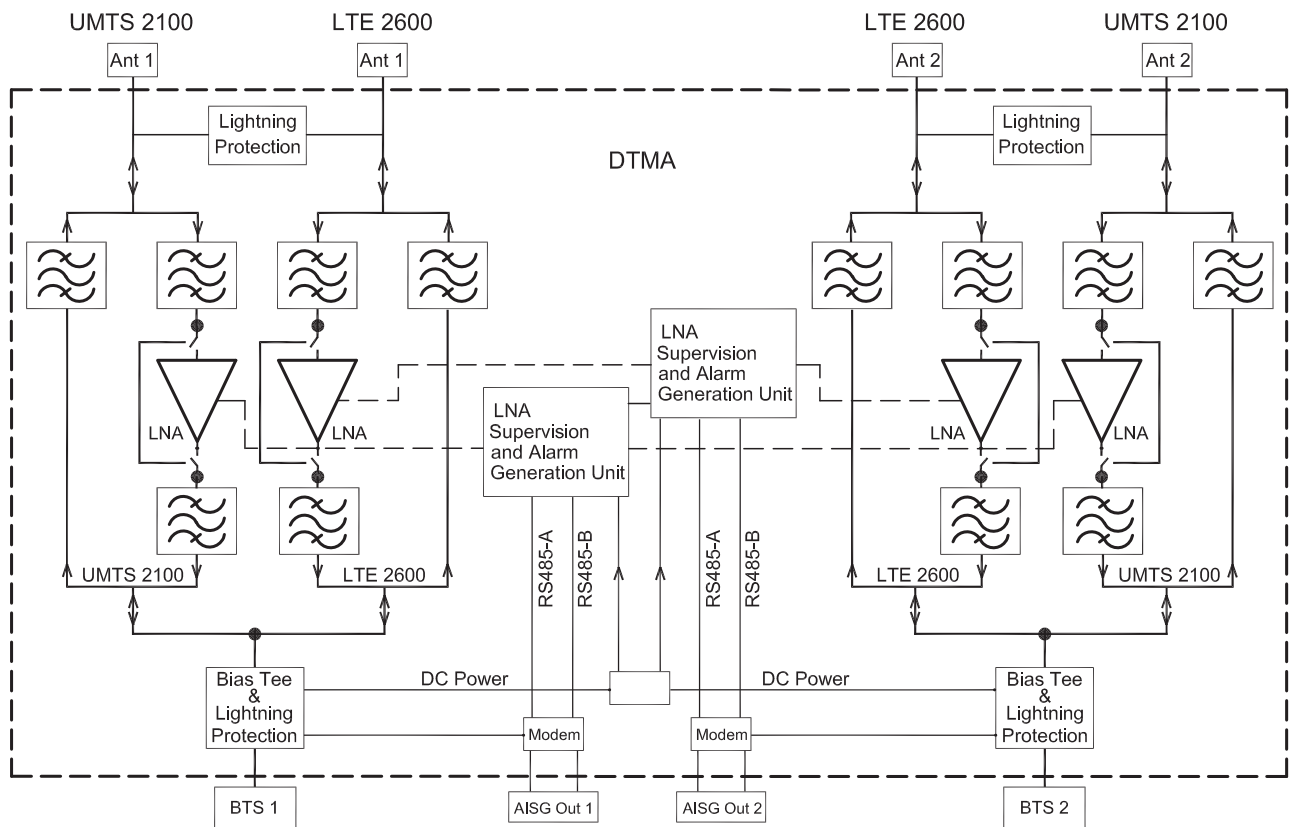
DTMA-UMTS-2600-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



Mechanical Characteristics	
Material	Aluminium housing
Connectors	RF AISG out
	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	kg lb
	6.5 14.3
Dimensions (w x h x d)	mm in
	220 x 220 x 83 8.7 x 8.7 x 3.3 (without connectors, without mounting brackets)
Packing size	mm in
	430 x 300 x 180 16.9 x 11.8 x 7.1

Block Diagram



DTMA-UMTS-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports Multi-Band, Wide Band (configuration 1 ... 6) and Single-Band (Configuration 7,8 or 9)
- Built-in lightning protection
- Supports AISG 1.1 and 2.0 (default)



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211176 DTMA-UMTS-2600-12-AISG	
	Wide-Band Mode	78211176V02 DTMA-UMTS-2600-12-AISG	
	Wide-Band Mode single ID	78211176V03 DTMA-UMTS-2600-12-AISG	

Tx Characteristics

Frequency range	MHz	2110 - 2170	2620 - 2690
Insertion loss	dB	Typically 0.2	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak	
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)	
Return loss	dB	> 18	

Rx Characteristics

Frequency range	MHz	1920 - 1980	2500 - 2570
Loss in bypass mode	dB	Typically 1.5	Typically 1.8
Return loss	dB	> 18 (DC ON) / > 14 (DC OFF)	
Gain	dB	12 nominal	
Noise figure	dB	Typically 1.5	Typically 1.6
3 rd order intercept point (OIP3)	dBm	Typically 25	

Environmental Characteristics

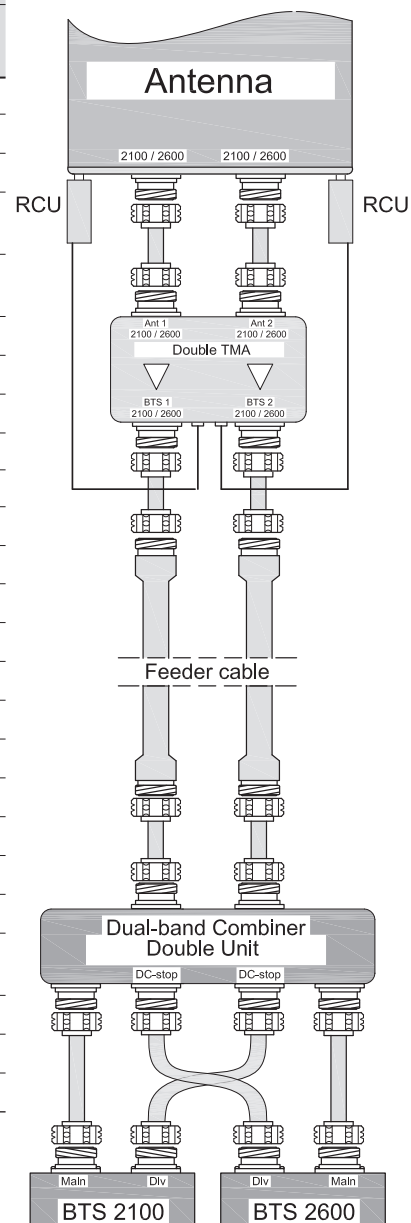
Operating temperature range	°C °F	-40 ... +65 -40 ... +149	
IP rating		IP67	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	
Lightning protection	kA	3, 10/350 us pulse	

DC and Alarm Characteristics

		AISG Mode	
DC supply	V	10 - 30 DC	
Operating current	mA	Nom. 300 at 10 V Nom. 100 at 30 V	
Alarm management		AISG*	

Mechanical Characteristics

Material	Aluminium housing		
Connectors	RF	4.3-10 female	
	AISG out	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)	



For more information about accessories please refer to page 437

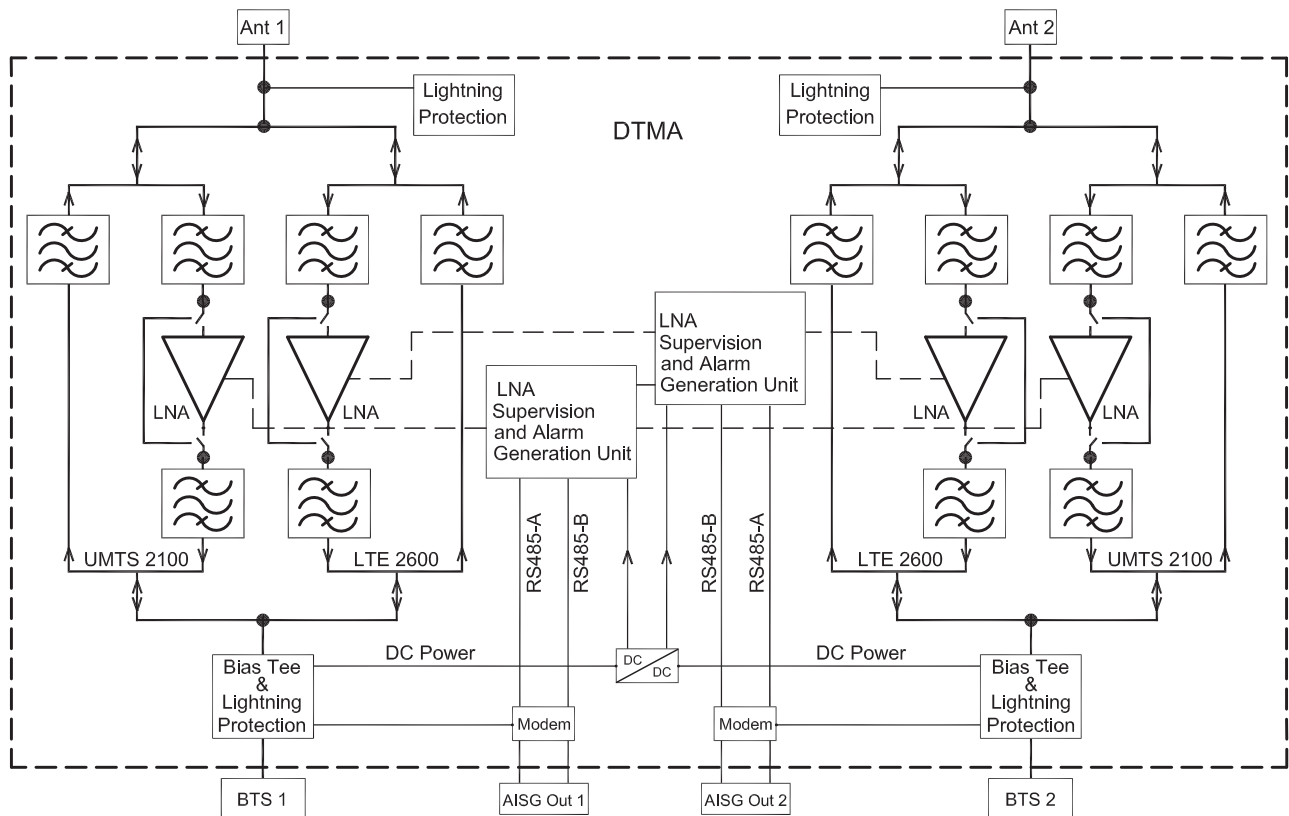
DTMA-UMTS-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	6.4 14.1
Dimensions (w x h x d)	mm in	220 x 220 x 83 8.7 x 8.7 x 3.3 (without connectors, without mounting brackets)
Packing size	mm in	430 x 300 x 180 16.9 x 11.8 x 7.1

Block Diagram



DTMA-1800-2600-12-AISG

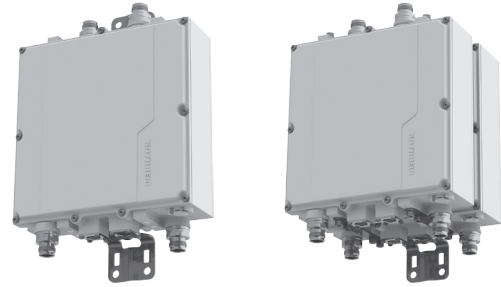
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- Stacked double units for use with 4 x 4 MIMO
- DC supply via BTS 1, BTS 2 or both

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt



Single Unit

Double Unit

Technical Data

Type No.	Single Unit Single-Band Mode	78211332 * DTMA-1800-2600-12-AISG
	Single Unit Wide-Band Mode	78211332V02 * DTMA-1800-2600-12-AISG
	Single Unit Wide-Band Mode single ID	78211332V03 * DTMA-1800-2600-12-AISG
	Double Unit Single-Band Mode	78211333 DTMA-1800-2600-12-AISG
	Double Unit Wide-Band Mode	78211333V02 DTMA-1800-2600-12-AISG

1800 MHz Tx Characteristics

Frequency range	MHz	1805 – 1880
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

1800 MHz Rx Characteristics

Frequency range	MHz	1710 – 1785
Loss in bypass mode	dB	Typically 2.5
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.8
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

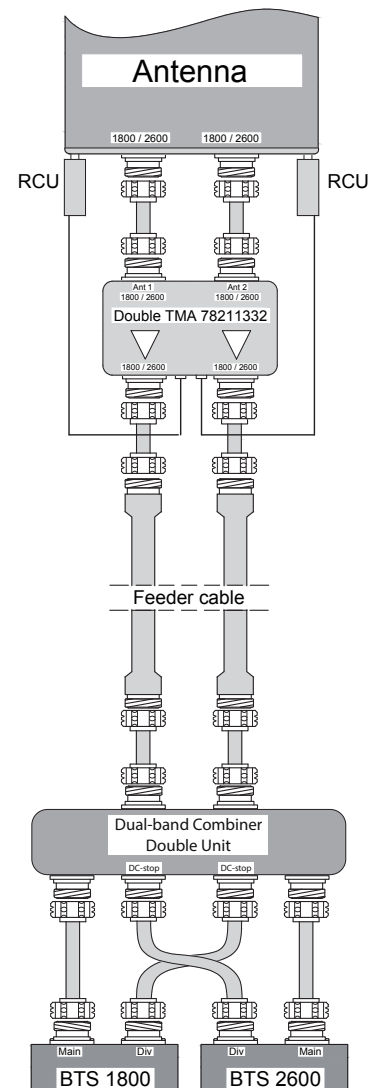
2600 MHz Tx Characteristics

Frequency range	MHz	2620 – 2690
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

2600 MHz Rx Characteristics

Frequency range	MHz	2500 – 2570
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)

* Clamps included in scope of supply



For more information about accessories please refer to page 437

DTMA-1800-2600-12-AISG

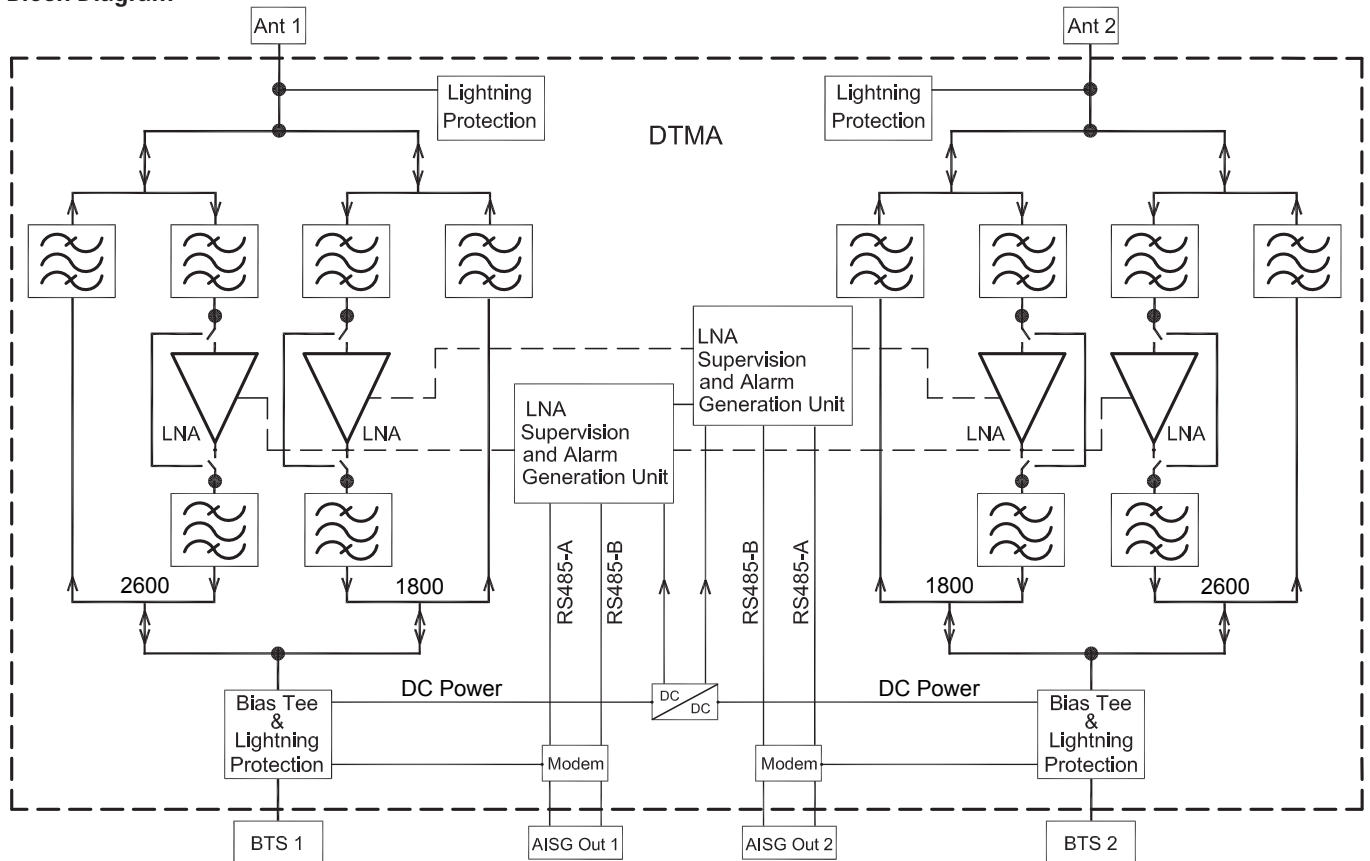
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
AISG Mode		
DC supply	V DC	10 – 30
Operating current (without RET)	mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (diameter max. 8 0.315) Mast mounting: With included clamp set
Weight	kg lb	Single Unit: 7.4 16.3 / Double Unit: 12.9 28.4
Dimensions (w x h x d)	mm in	Single Unit: 220 x 220 x 83 / 8.7 x 8.7 x 3.3 Double Unit: 220 x 220 x 170 / 8.7 x 8.7 x 6.7 (without connectors, without mounting brackets)

Block Diagram



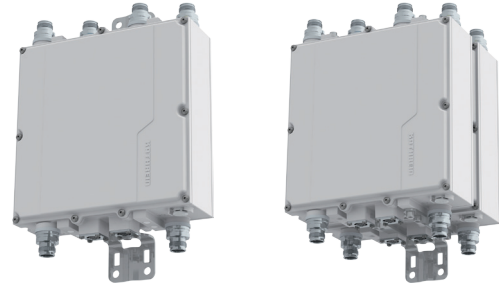
DTMAS

DTMA-1800-2600-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Multi-Band, Wide Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- DC supply via BTS1, BTS2 or both
- Stacked double units for use with 4x4 MIMO
- Built-in lightning protection



Single Unit

Double Unit

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	Single Unit Single-Band Mode	78211334 * DTMA-1800-2600-12-AISG-D
	Single Unit Wide-Band Mode	78211334V02 * DTMA-1800-2600-12-AISG-D
	Single Unit Wide-Band Mode single ID	78211334V03 * DTMA-1800-2600-12-AISG-D
	Double Unit Single-Band Mode	78211335 DTMA-1800-2600-12-AISG-D
	Double Unit Wide-Band Mode	78211335V02 DTMA-1800-2600-12-AISG-D

1800 MHz Tx Characteristics

Frequency range	MHz	1805 – 1880
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

1800 MHz Rx Characteristics

Frequency range	MHz	1710 – 1785
Loss in bypass mode	dB	Typically 2.5
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.8
Output 1-dB compression band	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

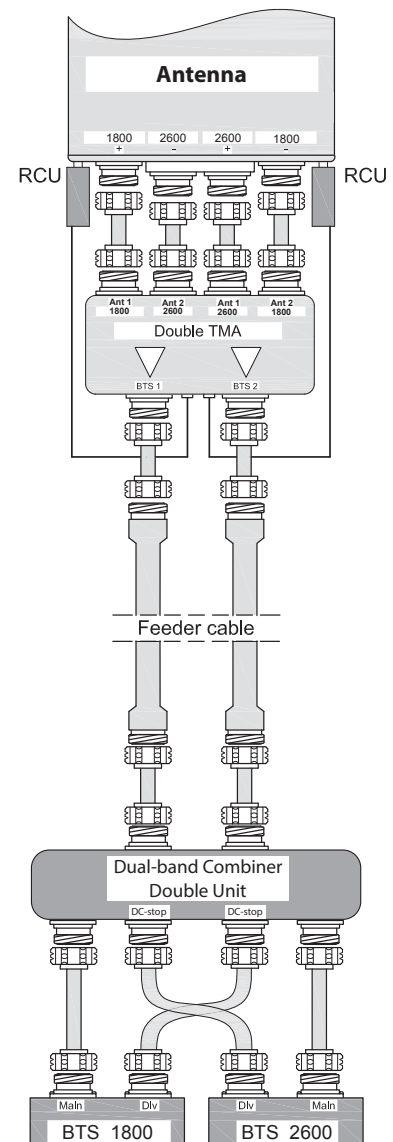
2600 MHz Tx Characteristics

Frequency range	MHz	2620 – 2690
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43)
Return loss	dB	> 18

2600 MHz Tx Characteristics

Frequency range	MHz	2500 – 2570
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)

* Clamps included in scope of supply



For more information about accessories please refer to page 437

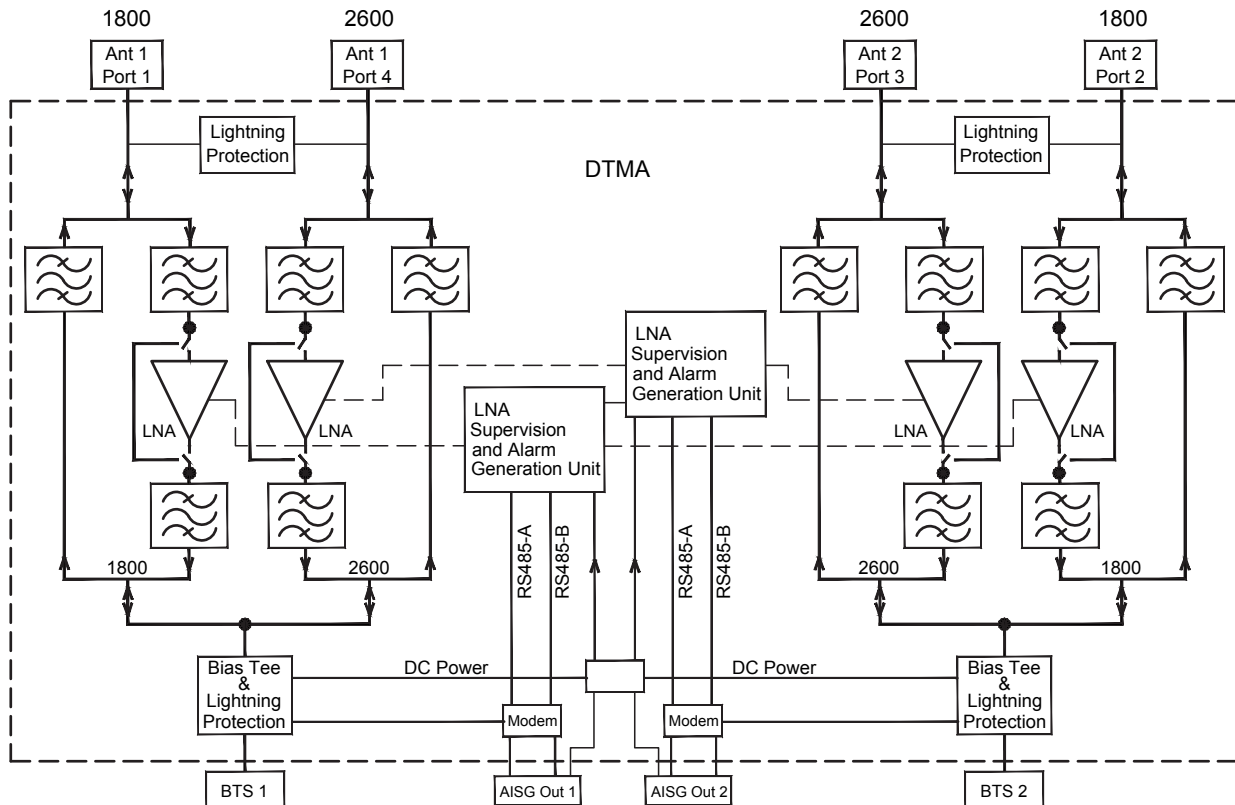
DTMA-1800-2600-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression band	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
AISG Mode		
DC supply	V DC	10 – 30
Operating current	mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set
Weight	kg lb	Single Unit: 7.5 16.5 / Double Unit: 13.1 28.9
Dimensions (w x h x d)	mm in	Single Unit: 220 x 220 x 80 8.7 x 8.7 x 3.2 Double Unit: 220 x 220 x 170 8.7 x 8.7 x 6.7 (without connectors, without mounting brackets)

Block Diagram



DTMA-1800-2100-2600-BYP1500-12-AISG

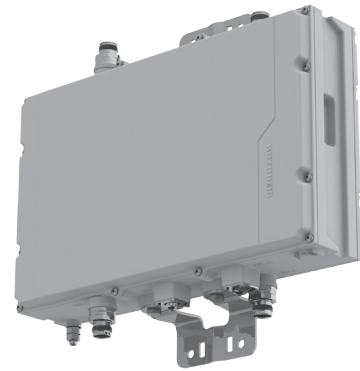
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Multi-Band, Wide-Band (conf. 1 ... 6) and Single-Band (conf. 7, 8, 9)
- Built-in lightning protection
- DC supply via BTS1, BTS2 or both
- Auto-select feature for Multi-Band or Wide-Band mode

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
BYP = RF-BYPass



Technical Data

Type No.	Single-Band Mode	78210587 DTMA-1800-2100-2600-BYP1500-12-AISG
	Wide-Band Mode	78210587V02 DTMA-1800-2100-2600-BYP1500-12-AISG

1800 MHz Tx Characteristics

Frequency range	MHz	1805 - 1880
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18

1800 MHz Rx Characteristics

Frequency range	MHz	1710 - 1785
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

2100 MHz Tx Characteristics

Frequency range	MHz	2110 - 2170
Insertion loss	dB	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18

2100 MHz Rx Characteristics

Frequency range	MHz	1920 - 1980
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure		Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-1800-2100-2600-BYP1500-12-AISG

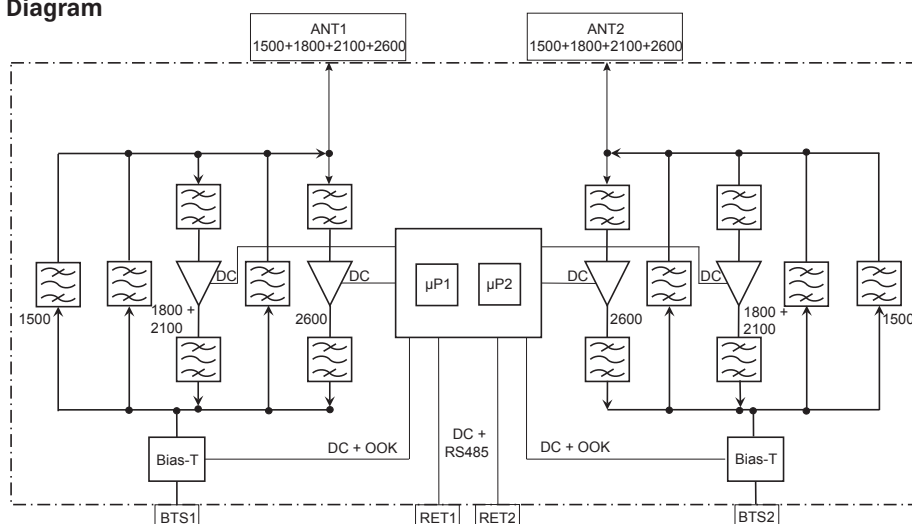
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



2600 MHz Tx Characteristics		
Frequency range	MHz	2620 - 2690
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
2600 MHz Rx Characteristics		
Frequency range	MHz	2500 - 2570
Loss in bypass mode	dB	Typically 1.8
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure		Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25
1427 - 1518 MHz Bypass Characteristics		
Frequency range	MHz	1427 - 1518
Insertion loss	dB	Typically 0.2
Input power	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
		AISG Mode
DC supply	V	10 - 30
Operating current (without RET)	mA	Nom. 400 at 10 V Nom. 150 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (diameter: max. 8 0.31) Mast mounting: With additional clamp set
Weight	kg lb	10 22.05
Dimensions (w x h x d)	mm in	377 x 235 x 95 14.8 x 9.3 x 3.7 (without connectors, without mounting brackets)

Block Diagram



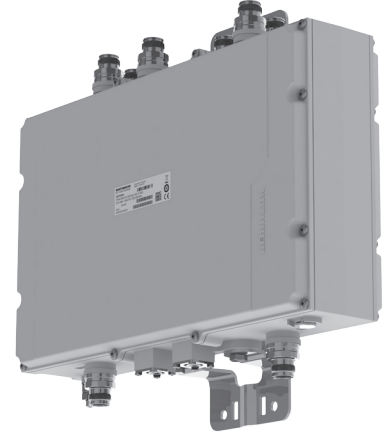
DTMA-1800-2100-2600-BYP1500-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Multi-Band, Wide-Band Mode (Configuration 1-6) and Single-Band Mode (Configuration 7, 8, 9)
- Built-in lightning protection
- DC supply via BTS1, BTS2 or both
- Auto-select feature for Multi-Band or Wide-Band Mode

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
BYP = RF-BYPass



Technical Data

Type No.	Single-Band Mode	78210588 DTMA-1800-2100-2600-BYP1500-12-AISG
	Wide-Band Mode	78210588V02 DTMA-1800-2100-2600-BYP1500-12-AISG
	Wide-Band Mode single ID	78210588V03 DTMA-1800-2100-2600-BYP1500-12-AISG

1800 MHz Tx Characteristics

Frequency range	MHz	1805 - 1880
Insertion loss	dB	Typically 0.6
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18

1800 MHz Rx Characteristics

Frequency range	MHz	1710 - 1785
Loss in bypass mode	dB	Typically 2.3
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

2100 MHz Tx Characteristics

Frequency range	MHz	2110 - 2170
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18

2100 MHz Rx Characteristics

Frequency range	MHz	1920 - 1980
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-1800-2100-2600-BYP1500-12-AISG

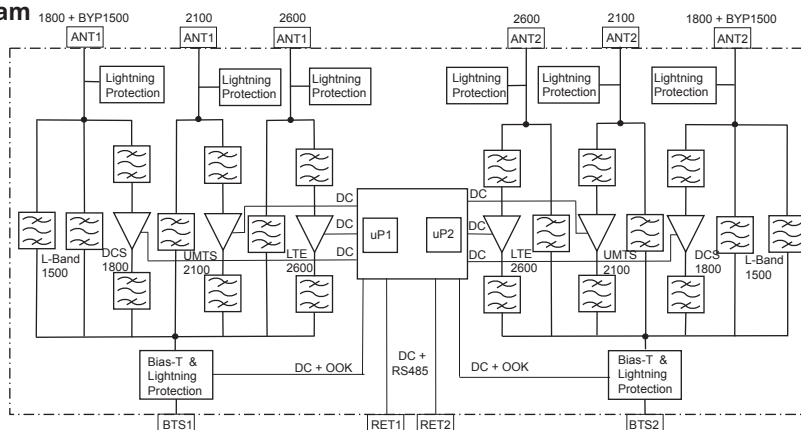
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



2600 MHz Tx Characteristics		
Frequency range	MHz	2620 - 2690
Insertion loss	dB	Typically 0.6
Input power (per input and frequency band)	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
2600 MHz Rx Characteristics		
Frequency range	MHz	2500 - 2570
Loss in bypass mode	dB	Typically 1.8
Return loss	dB	> 18 (DC ON) > 12 (DC OFF)
Gain	dB	12 nominal
Noise figure		Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25
1427 - 1518 MHz Bypass Characteristics		
Frequency range	MHz	1427 - 1518
Insertion loss	dB	Typically 0.25
Input power	kW	< 0.1 (+ 50 dBm) < 1.6 (+ 62 dBm) peak
Intermodulation products in Rx band	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
Environmental Characteristics		
Operating temperature range	°C F	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
AISG Mode		
DC supply	V	10 - 30
Operating current (without RET)	mA	Nom. 400 at 10 V Nom. 150 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (diameter: max. 8 0.31) Mast mounting: With additional clamp set
Weight	kg lb	12 26.5
Dimensions (w x h x d)	mm in	377 x 235 x 96 14.8 x 9.3 x 3.8 (without connectors, without mounting brackets)
Packing Size	mm in	420 x 420 x 175 16.5 x 16.5 x 6.9

Block Diagram



DTMA-UMTS-2600-BYPASS1500-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double units for easy use with XXPOL antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide-Band (configuration 1.. 6) or Single-Band Mode (configuration 7, 8 or 9)
- DC Supply via BTS1, BTS2 or both
- Auto-Select feature for Multi-Band and Wide-Band Mode



AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211910 DTMA-UMTS-2600-BYPASS1500-12-AISG
	Wide-Band Mode	78211910V02 DTMA-UMTS-2600-BYPASS1500-12-AISG

UMTS Tx Characteristics

Frequency range	MHz	2110 – 2170
Insertion loss	dB	Typically 0.3
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

UMTS Rx Characteristics

Frequency range	MHz	1920 – 1980
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 1.8 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

2600 MHz Tx Characteristics

Frequency range	MHz	2620 – 2690
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

2600 MHz Rx Characteristics

Frequency range	MHz	2500 – 2570
Return loss	db	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 2.0 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-UMTS-2600-BYPASS1500-12-AISG

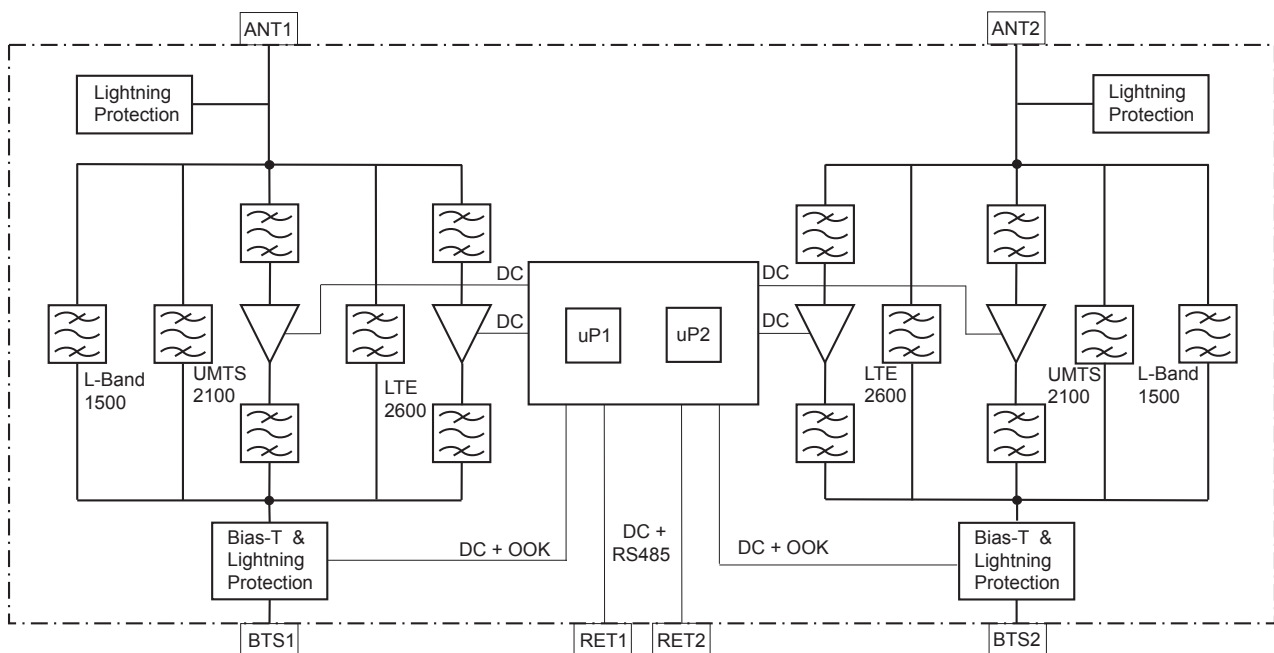
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



1427 - 1518 MHz Bypass Characteristics		
Frequency range	MHz	1427 – 1518
Insertion loss	dB	Typically 0.2
Input power	kW	< 0.1 (+50 dBm)
Intermodulation products	dBm	< - 117 (2 Tx carriers at + 43 dBm)
Return loss	dB	> 18
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	V	10 – 30
Operating current per DTMA (without RET)	mA mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting
Weight	kg lb	8.8 19.4
Dimensions (W x H x D)	mm in	290 x 235 x 94 11.4 x 9.3 x 3.7

Block diagram



DTMA-1800-2600-BYPASS1500-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double units for easy use with XXPOL antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide-Band (configuration 1.. 6) or Single-Band Mode (configuration 7, 8 or 9)
- DC Supply via BTS1, BTS2 or both
- Auto-Select feature for Multi-Band and Wide-Band Mode



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211912 DTMA-1800-2600-BYPASS1500-12-AISG
	Wide-Band Mode	78211912V02 DTMA-1800-2600-BYPASS1500-12-AISG

1800 Tx Characteristics

Frequency range	MHz	1805 – 1880
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

1800 Rx Characteristics

Frequency range	MHz	1710 – 1785
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 2.0 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

2600 MHz Tx Characteristics

Frequency range	MHz	2620 – 2690
Insertion loss	dB	Typically 0.4
Input power (per input and frequency band)	kW	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18

2600 MHz Rx Characteristics

Frequency range	MHz	2500 – 2570
Return loss	db	> 18 (DC ON) / > 12 (DC OFF)
Loss in bypass mode	dB	Typically 2.0 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.7
Output 1-dB compression point	dBm	> 10
3 rd order intercept point (OIP3)	dBm	Typically 25

For more information about accessories please refer to page 437

DTMA-1800-2600-BYPASS1500-12-AISG

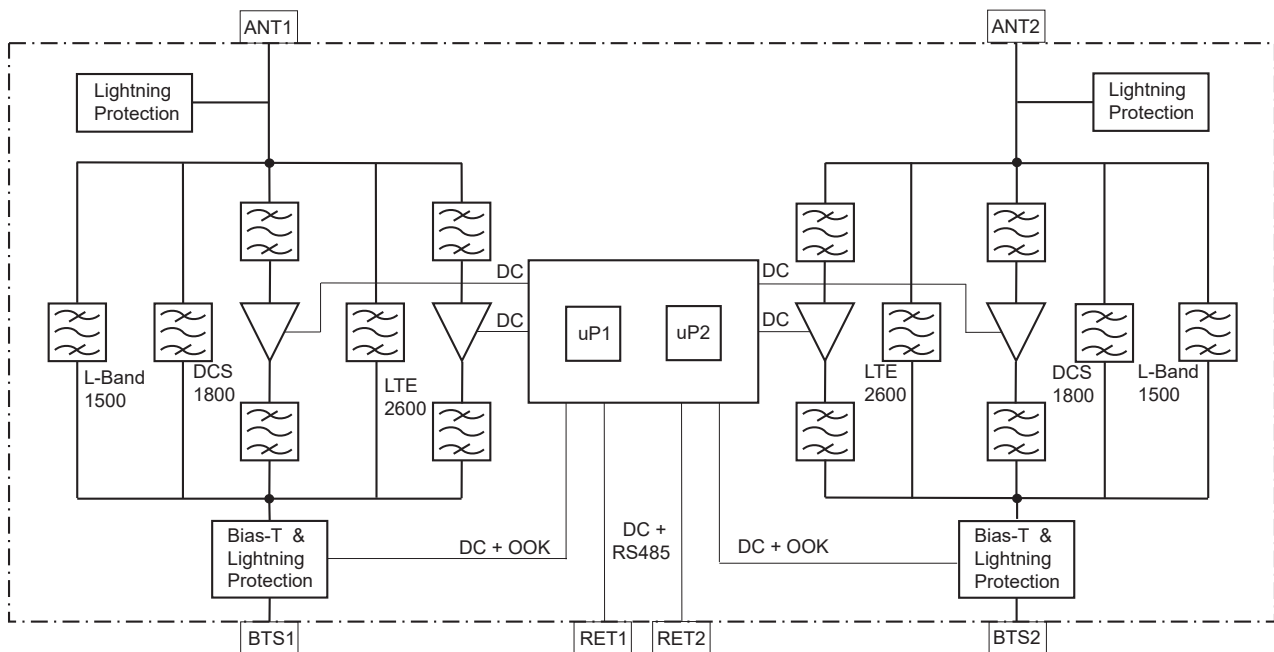
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



1427 - 1518 MHz Bypass Characteristics		
Frequency range	MHz	1427 - 1518
Insertion loss	dB	Typically 0.2
Input power	kW	< 0.1 (+50 dBm)
Intermodulation products	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
Environmental Characteristics		
Operating temperature range	°C °F	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	hours	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	V	10 - 30
Operating current per DTMA (without RET)	mA mA	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	4.3-10 female 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting
Weight	kg lb	8.8 19.4
Dimensions (W x H x D)	mm in	290 x 235 x 94 11.4 x 9.3 x 3.7

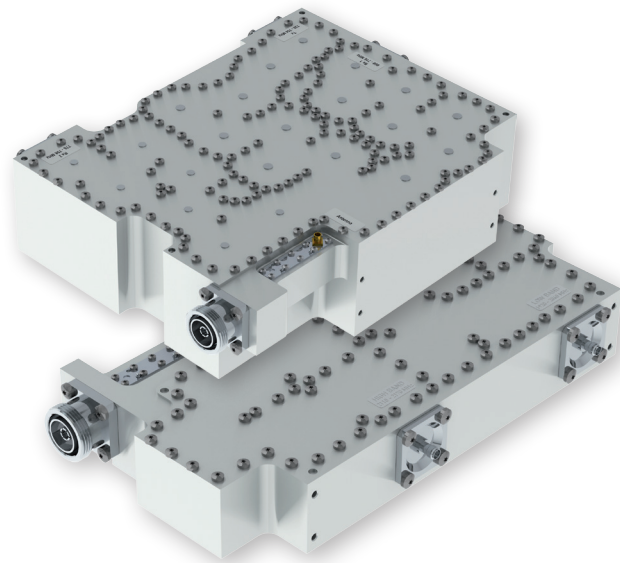
Block diagram



Passive Intermodulation Measuring Filter

> **Passive Intermodulation Measuring Filter**

With Integrated Directional Coupler



Introduction

Kathrein Mobile Communication passive intermodulation filters are specified to fulfil the PIM verification requirements of manufactured products. Thanks to their compact design, these filters can also be integrated into PIM measurement devices.

FEATURES

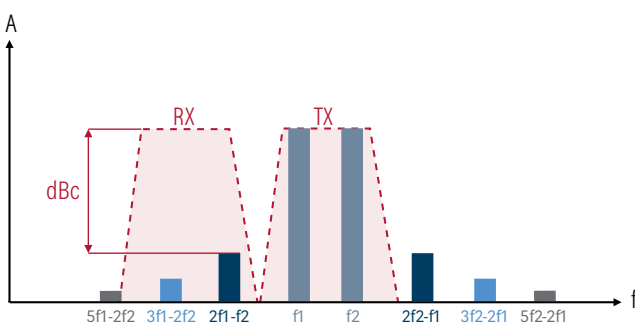
- High PIM performance (typical PIM 3rd order higher than the guaranteed specification)
- High isolation in DL path (typically -100 dB in almost all filters)
- Low insertion loss
- Compact filter dimensions with high electrical specifications
- Very well engineered resonator topology
- Integrated directional coupler in most of the measuring filters

Passive Intermodulation

Passive Intermodulation (PIM) is an unwanted signal generated at mathematical combinations by mixing of two or more RF signals in non-linear passive components, such as antennas, connectors or cables. If two carrier frequencies f_1 and f_2 are transmitted from a typical cell site, PIM signals can occur at the following frequencies:

$$f_{PIM} = m \cdot f_1 \text{ and } \pm n \cdot f_2$$

where 'm' and 'n' are positive integers and the sum of 'm' and 'n' is the product order. 3rd ($2f_1 - f_2$) order PIM products having the highest power level are considered the most interfering for the RX band. Usually PIM tests are performed for 3rd order products of the device under test (DUT) before deployment. Typically a maximum value of -117 dBm (small cell base station receiver sensitivity) is needed for most of the DUTs.



Specifications

3GPP Bands	Order No.	Frequency Range [MHz]	IM 3 rd Order [dBc]
Diplexers			
B1	A30053	1920–2060 / 2110–2170	< -178
	A30089*		< -172
B3	A169070	1710–1785 / 1805–1880	< -178
	A30100*		< -172
B5	A169210	824–851 / 869–896	< -178
	A30085*		< -172
B7	A30051	2445–2580 / 2620–2695	< -178
	A30102*		< -172
B8	A30086V02	880–915 / 925–960	< -172
B11, B21	A30105V03*	1427.9–1462.9 / 1475.9–1510.9	< -172
B20	A30088*	792–822 / 832–862	< -172
	A30058		< -172
B22 (3500)	A40010	3410–3484 / 3510–3594	< -175
B2, B4	A30101*	1710–1910 / 1930–2155	< -172
B68	A30055	698–730 / 745–793	< -175
B71	A30106	617–652 / 663–698	< -172
Triplexers			
B12, B13, B14	A30087V02	698–716 / 728–764 / 776–798	< -172

* with integrated directional coupler (50 dB)

For more information and the latest data sheets please visit our website www.kathrein.com

Calculation of Wind Loading on Kathrein Base Station Antennas

In general, the wind loading of antennas is determined based on the standard EN 1991-1-4. This European standard corresponds to the German standard DIN 1055-4.

Because of wind loading tests performed by an independent institute in 2016, in order to determine the data sheet values, Kathrein Mobile Communication uses a combination of wind tunnel test results as well as an approved adaption of the form factor within the scope of the standard.

The indicated values are the frontal and the maximum wind load of the antenna. Due to the latest determination methods, the wind load values are decreased. However, these values are still determined in accordance with the standard EN 1991-1-4. The mechanical design of the antennas remains unaffected.

A detailed description concerning this topic is provided in the White Paper "BASE STATION ANTENNAS – RELIABLE WIND LOAD CALCULATION" which is available on our website.

Please note

As a result of more stringent legal regulations and judgements regarding product liability, we are obliged to point out certain risks that may arise when products are used under extraordinary operating conditions. The mechanical design is based on the environmental conditions as stipulated in ETS 300 019-1-4.

The antennas may be used at locations where the anticipated peak wind velocity or gust wind speed lies within the maximum wind speed listed in the datasheet. We warrant the mechanical safety and electrical functionality under such conditions. The wind speeds are defined in accordance with the DIN, EN or TIA standards. This warranty makes allowance for the partial safety factors specified in those standards.

Extraordinary operating conditions, such as heavy icing or exceptional dynamic stress (e.g. strain caused by oscillating support structures), may result in the breakage of an antenna or even cause it to fall to the ground. These facts must be considered during the site planning process. The details given in our data sheets have to be followed carefully when installing the antennas and accessories.

It should be noted that the site-specific load acting on an antenna depends on the geographic location, the location-specific factors, the height over ground and how the antenna is mounted on the mast. The site structural engineer is in charge of the correct calculation and interpretation of the wind load at the antenna site.

Site planning and installation must be carried out by qualified and experienced staff. All relevant national safety regulations must be upheld and respected. Incorrect site planning, faulty installation, as well as interfering surroundings on site, may lead to deviations in the electrical parameters compared to those specified in the respective data sheets.

Sales Partners

An actual list of the Kathrein Mobile Communication International Sales Partners can be found on our website:

www.kathrein.com

For technical information, orders or catalogues please contact: mobilcom.eag@ericsson.com

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