GNMANTv2 Antenna

Product Highlights

- Multiband Reception including L-Band correction services
- Integrated surge protection
- Ground terminal for effective equipotential bonding
- Narrowband frontend filter for protecting out-of-band signals, e.g. LTE / 5G
- Very low noise preamp (typically < 2.0 dB)
- Low axial ratio (typically < 2.0 dB)
- Tight phase center variation
- High-gain LNA (typically 37 dB)
- ESD circuit protection (15 kV)
- Consistent performance with supply voltages from 3.6 V to 5 V DC
- IP65 rating
- REACH & RoHS-compliant

High-Performance GNSS Multi-Band Antenna Engineered for Time, Frequency, and Phase Synchronization

Meinberg's GNMANTv2 is a multi-GNSS, multi-band antenna that is engineered and manufactured entirely by Meinberg from the ground up to ensure optimum performance for timing & synchronization applications.

The GNMANTv2 provides dual-band reception with excellent reception of all GNSS constellations (GPS, GLONASS, Galileo, BeiDou), encompassing almost all GNSS services in these systems. Additionally, the antenna supports reception of augmentation systems, including SBAS, EGNOS, Fugro AtomiChron®, and QZSS. The GNMANTv2 also features a dedicated narrowband frontend filter for effective rejection of out-of-band signals and a very low-noise preamp, allowing for maximum signal quality with minimal interference. Integrated surge protection helps to protect the antenna from damage from surge voltages and indirect lightning strikes.

Housed in an injection-molded ABS IP65 plastic case with Meinberg's distinctive waterproof 'mushroom' design and specified for operating conditions from -70 °C to +85 °C, the GNMANTv2's construction helps it to withstand the rigors of outdoor use in even the most challenging weather conditions.

The GNMANTv2 is optimized for use with Meinberg's GNS, GNM, and GXL clock technologies, including LANTIME, IMS, and microSync time servers, as well as Meinberg's standalone multi-GNSS receivers.

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Physical Specifications

Housing	ABS Plastic
Weight	1.4 kg (3.1 lbs), including mounting kit

Connection

Connector Type	Type-N, female
Nominal Impedance	50 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 1.5 : 1
Grounding	M8 threaded bolt and hex nut for use with corresponding ring lug

Electrical Specifications

Input Voltage	3.6 V to 5.5 V DC (via antenna cable)
Current Draw (Nominal)	30 mA @ 5 V
Power Consumption (Typical)	150 mW @ 25°C (77 °F)

Reception and Signal Properties

Max. Base Antenna Input Power (Continuous)	< 18 dBm @ 85°C (185 °F)
Amplification Antenna input to RF output	Lower Band: 35 dB +/- 2 dB Upper Band: 37 dB +/- 2 dB
Polarization	Right-handed, circular (RHCP)
Nominal Impedance	50 Ω
VSWR Output	Typically: ≤ 1.5:1 Maximum: 1.8:1
Noise Figure	<2 dB
P1dB Input	-40 dBm
Antenna Pattern	Vertical 3dB aperture angle < 100° Max. horizontal deviation from the ideal circle max. 1 dB

Clock Compatibility

The GNMANTv2 is compatible with all standard Meinberg satellite receivers GNS, GXL and GNM, except GPS receiver.

Optional Accessories

- Coaxial Cable [1]
- Inline Amplifier (INA-20, INA-30) [2]

[1] Alternative lengths of up to 70 m with the required cable (see Section "**Cable Requirements**") are available.

[2] The INA-20 and INA-30 inline amplifiers are typically only required to extend GNSS signal transmission routes beyond the specified 70 m limit. Additional Speedfoam 240 HFJ coaxial cables are required to link the inline amplifiers. Please consult the datasheet of the Inline Amplifier for more information on which inline amplifier you may need for your configuration.

Cable Requirements

Supported Cables	Speedfoam 240HFJ (max. length 70 m)

Environmental Conditions

Recommendations for continuous operation.

Supported Temperature Range (Operation)	-70 °C to 85 °C (-94 °F to 185 °F)
Supported Temperature Range (Storage)	-70 °C to 95 °C (-94 °F to 203 °F)
Relative Humidity (Operation)	Max. 95 % at 40 °C (104 °F), non-condensing
IP Rating	IP65

Supported Satellite Services and Frequencies

Satellite system	Frequency (in MHz)	Gain (in dBic)	Axial Ratio (in dB)
GPS / QZSS	L1 1575.42 MHz L2 1227.6 MHz L5 1176.45 MHz	4.9 3.5 0.6	< 1.0 < 1.5 < 1.5
GLONASS	G1 1602MHz G2 1246 MHz G3 1201 MHz	3.0 0.6 5.2	< 1.0 < 1.5 < 1.5
Galileo	E1 1575.42 MHz E5a 1176.45 MHz E5b 1207.14 MHz	4.9 0.6 5.2	< 1.0 < 1.6 < 1.6
BeiDou	B1 1575.42 MHz B2a 1176.45 MHz B2b 1207.14 MHz	4.9 0.6 0.6	< 1.0 < 1.6 < 1.6
L-Band Correction Service	1539 MHz –1559 MHz	3.3	< 1.0

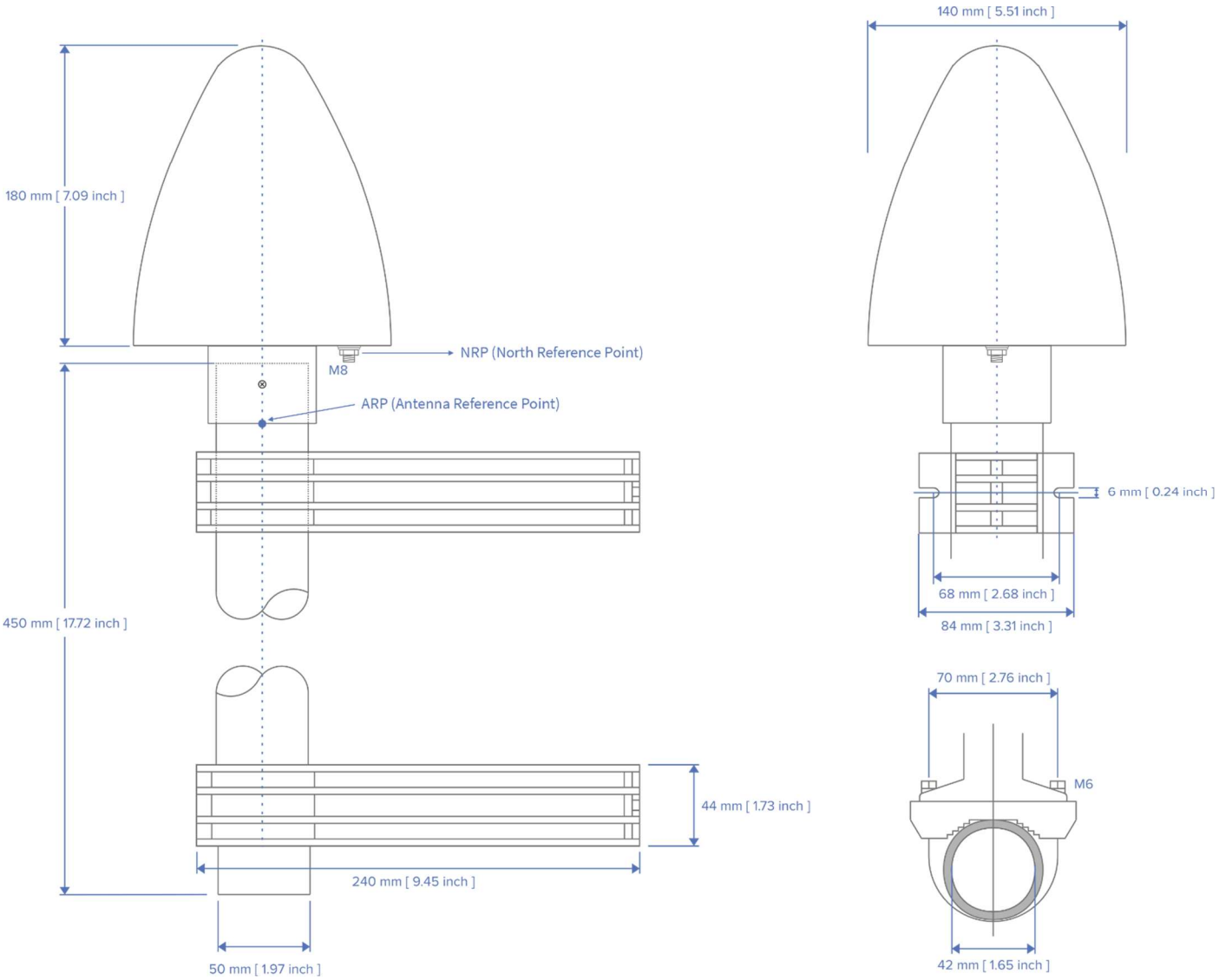
Out-of-Band Rejection

Band	Frequency Range (in MHz)	Out-of-Band Rejection
Lower Band	1160 MHz – 1255 MHz	> 60 dB @ < 960 MHz > 60 dB @ > 1427 MHz
Upper Band	1539 MHz – 1606 MHz	> 60 dB @ < 1463 MHz > 70 dB @ 1710–4700 MHz > 60 dB @ 4701–6000 MHz

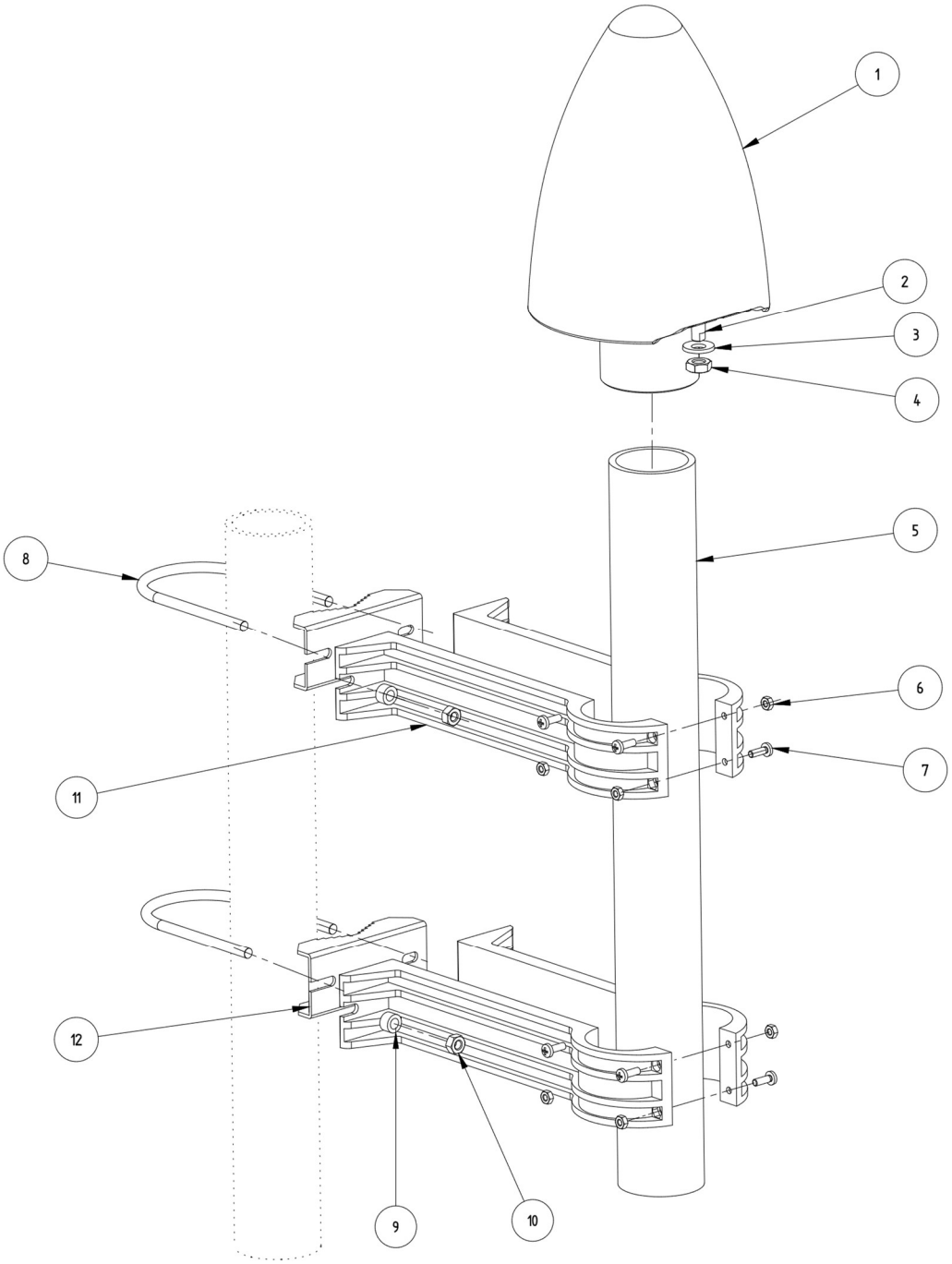
Comparison with Predecessor Model

	GNMANTv1 Antenna	GNMANTv2 Antenna
Supply Voltage	2.5 V DC…16 V DC	3.6 V DC…5.5 V DC
Current Draw	24 mA	30 mA
Lower Band	1160 MHz…1255 MHz	1166 MHz…1249 MHz
L-Band Correction Service	1539 MHz…1559 MHz	1539 MHz…1559 MHz
Upper Band	1539 MHz…1606 MHz	1525 MHz…1606 MHz
Gain (Typical)	37 dB	37 dB
Noise Figure (Typical)	2.5 dB	2.0 dB
Grounding Terminal	☐	☑
IEC 61000-4-5 Surge Immunity	☐	☑

Dimensions


140 mm [5.51 inch]
180 mm [7.09 inch]
NRP (North Reference Point)
M8
ARP (Antenna Reference Point)
6 mm [0.24 inch]
68 mm [2.68 inch]
84 mm [3.31 inch]
450 mm [17.72 inch]
70 mm [2.76 inch]
M6
44 mm [1.73 inch]
240 mm [9.45 inch]
50 mm [1.97 inch]
42 mm [1.65 inch]

Assembly - Pole Mount

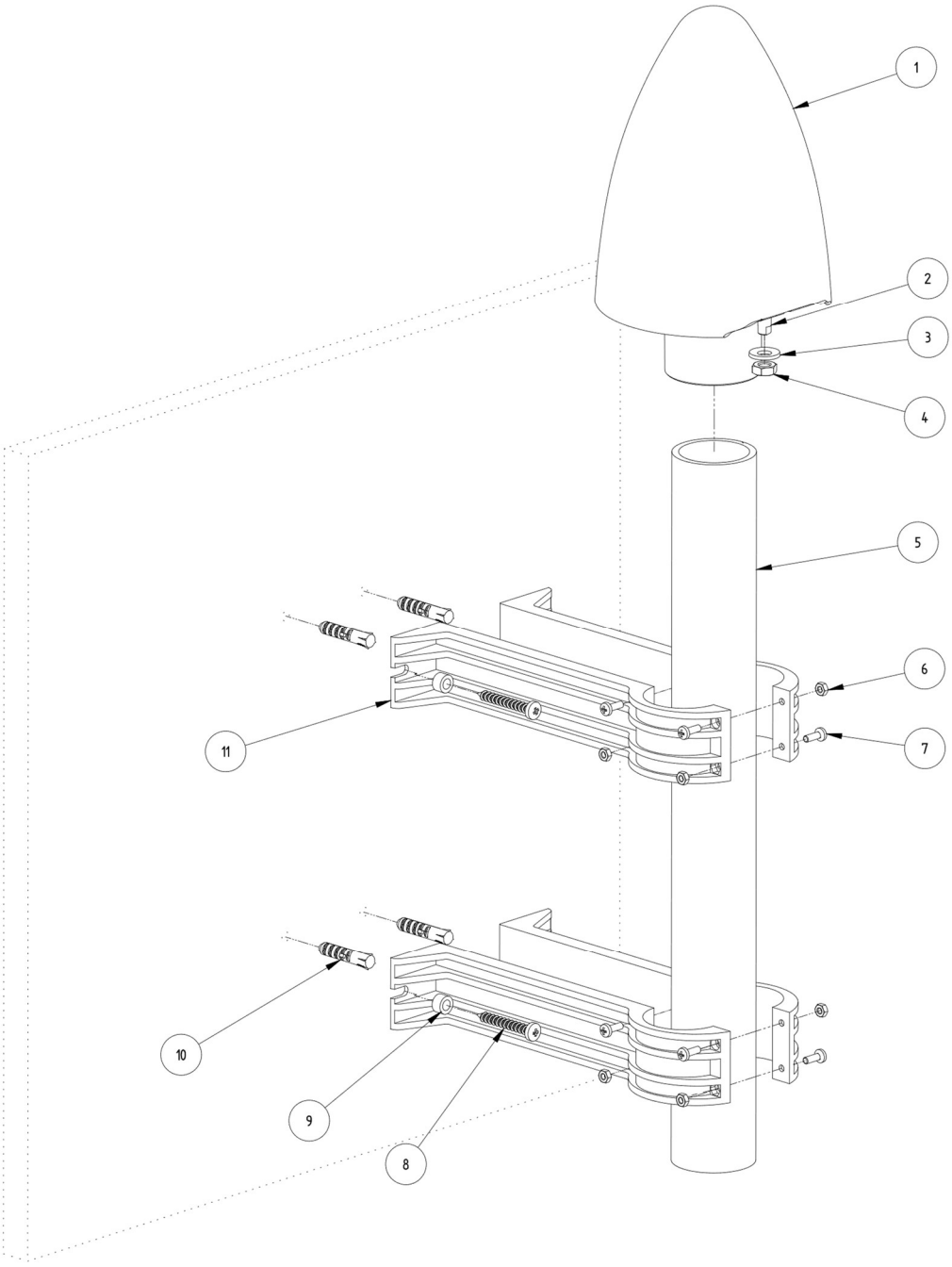


Antenna mounting kit for mast mounting, comprising:

Item	Description	Qty
1	Antenna	1
2	M8 grounding stud	1
3	Safety washer	1
4	M8 hex nut	1
5	Antenna pole	1
6	M4 hex nut	8

Item	Description	Qty
7	M4 x 12 phillips-head screw	8
8	Threaded U-bolt (pole diameter max. 60 mm)	2
9	M6 spacer	4
10	M6 hex nut	4
11	Pole clamp halves	4
12	Pole bracket	2

Assembly - Wall Mount



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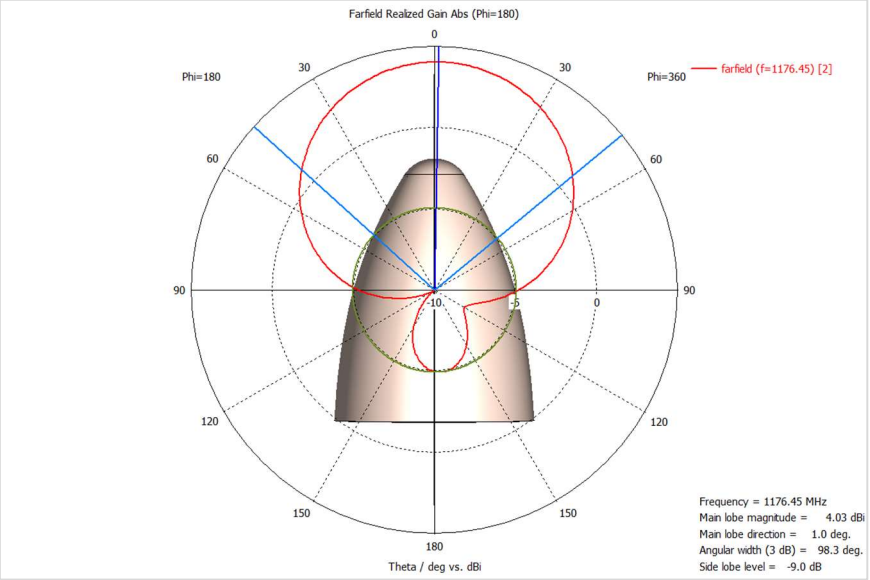
1	Antenna	1
2	M8 grounding stud	1
3	Safety washer	1
4	M8 hex nut	1
5	Antenna pole	1
6	M4 hex nut	8

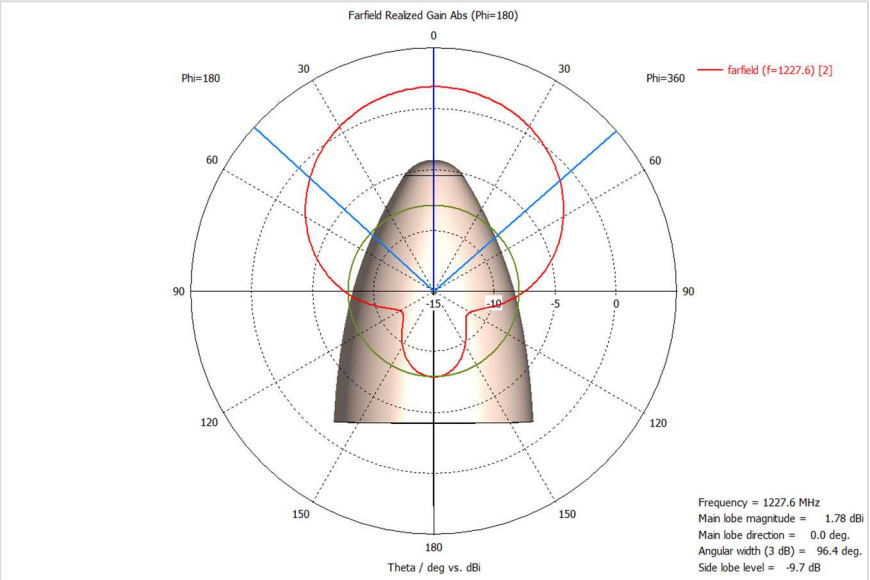
Item	Description	Qty
7	M4 x 12 phillips-head screw	8
8	6x 45 drywall screws	4
9	spacer washers	4
10	8 mm drywall plugs	4
11	Clamp halves	4

Farfield Directivity Pattern

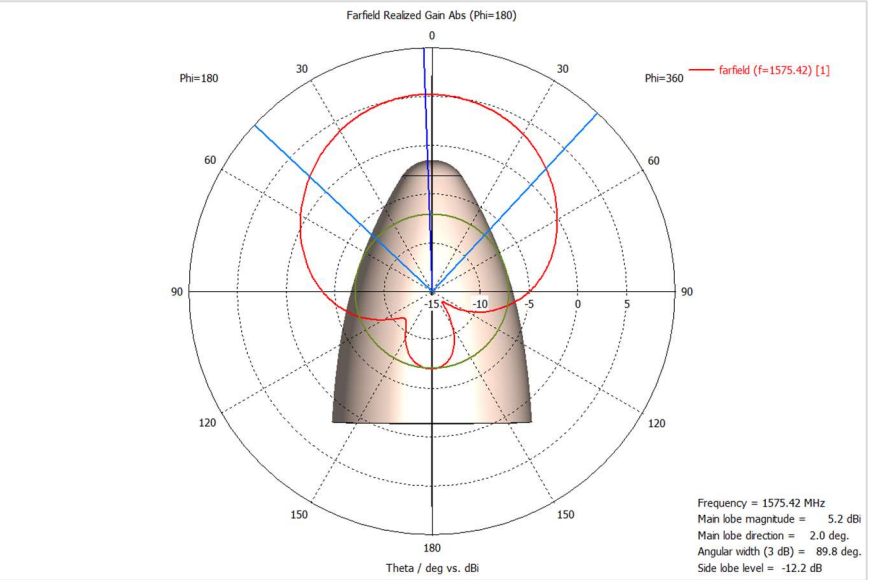
Reception pattern of the frequency 1176.45 MHz



Reception pattern of the frequency 1227.60 MHz



Reception pattern of the frequency 1575.42 MHz



Type Tests

Environmental Tests

The tests were performed according to IEC 61850-3 referring to the following standards:

IEC 60068-2-1	Cold	–70 °C (–94 °F), 16 h
IEC 60068-2-2	Dry heat	85 °C (185 °F), 16 h
IEC 60068-2-14	Change of temperature	–70 to 85 °C (–94 to 185 °F), 6 cycles, 3 °C (37,4 °F)/min
IEC 60068-2-30	Damp heat, cyclic (12 h + 12 h)	55 °C (131 °F), 97 % RH, 6 cycles
IEC 60068-2-78	Damp heat, steady state	40 °C (104 °F), 93 % RH, 240 h
IEC 60255-21-1	Vibration (sinusoidal) [1] Class 2	10–150 Hz, 1 g_n, 2 sweeps, 3 axes 10–150 Hz, 2 g_n, 40 sweeps, 3 axes
IEC 60255-21-2	Shock [1] Class 2	10 g_n, 11 ms, ±3 shocks, 3 axes 30 g_n, 11 ms, ±3 shocks, 3 axes 20 g_n, 16 ms, ±1000 shocks, 3 axes
IEC 60255-21-3	Seismic [1, 2] Class 2	4-35 Hz, 1 g_n, 1 sweep, hor. axes 4-35 Hz, 2 g_n, 1 sweep, ver. axis

[1] In order to withstand the tests for vibration, shock and seismic, special mounting brackets are optionally available.

[2] The frequency range deviates from the values required by the standard. In this test, a frequency range of 4-35 Hz instead of 1-35 Hz was used.

Electromagnetic Compatibility – Emission

CISPR 16-1-2 and CISPR 16-2-1	Conducted disturbance voltage measurements
CISPR 16-2-3	Radiated radio disturbance
CISPR 32	Conducted disturbance current measurements
FCC 47 CFR Part 15 section 15.107 (b) [3] RSS-Gen Issue 4 section 8.8 [4]	Conducted emission
FCC 47 CFR Part 15 section 15.109 (b) [3] RSS-Gen Issue 4 section 8.9 [4]	Radiated emission
ETSI EN 303 413	Standard for GNSS receiver

Electromagnetic Compatibility – Immunity

The tests were performed according to IEC 61000-6-5 and IEC 61850-3 referring to the following standards:

IEC 61000-4-2	Immunity test to electrostatic discharges (Level 4)	±8 kV contact discharge ±15 kV air discharge
IEC 61000-4-3	Immunity test to radiated, radio-frequency, electromagnetic fields	10 V/m
IEC 61000-4-4	Immunity test to electrical fast transients (Burst)	±4 kV, 100 kHz
IEC 61000-4-5	Immunity test to surges	up to ±4 kV line to earth
IEC 61000-4-6	Immunity test to conducted disturbances, induced by radio-frequency fields	10 V

Compliance

ISO 9001	The product is developed and manufactured in compliance with all relevant quality standards, which are defined by an ISO 9001-certified quality management system.
CE	The product has the CE mark and fulfils the basic requirements of the EU directives regarding safety, health and environmental protection, which confirms its conformity with European standards.
UKCA	The product has the UKCA (UK Conformity Assessed) mark and therefore meets the requirements of UK health and safety regulations, confirming its compliance with UK standards post-Brexit.
RoHS	The device complies with the requirements of the EU RoHS (Restriction of Hazardous Substances) Directive and is free from harmful substances such as lead, mercury, cadmium and other hazardous chemicals.
REACH	The product fulfills the requirements of the EU REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals) and does not contain any substances that violate this regulation.
WEEE Status	The purchase of this product is considered to be a “B2B” transaction (non-household product) for the purposes of the EU Waste of Electrical and Electronic Equipment Directive; the product falls under Category 6, “Small IT and Telecommunications Equipment”. For disposal, it can be returned to the manufacturer to ensure WEEE compliance. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will cover the costs for the waste disposal itself.

Support & Disposal

Technical Support	Free lifetime support via telephone and email, including firmware updates
Warranty	Three-year warranty, extendable upon request
WEEE Status	The purchase of this product is considered to be a “B2B” transaction (non-household product) for the purposes of the EU Waste of Electrical and Electronic Equipment Directive; the product falls under Category 6, “Small IT and Telecommunications Equipment”. For disposal, it can be returned to the manufacturer to ensure WEEE compliance. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will cover the costs for the waste disposal itself.