



The Synchronization Experts.



## **MANUAL**

### **GPSANTv2**

#### **GPS L1/Galileo E1 Antenna**

July 24, 2023

Meinberg Funkuhren GmbH & Co. KG



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# 1 Imprint

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## 2 Change Log

Version	Date	Revision Notes
1.0	7/20/2023	Initial version

## 3 Copyright and Liability Exclusion

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You may also write to [techsupport@meinberg.de](mailto:techsupport@meinberg.de) to request an updated version at any time or provide feedback on errors or suggested improvements, which we are grateful to receive.

Meinberg reserves the right to make changes of any type to this document at any time as is necessary for the purpose of improving its products and services and ensuring compliance with applicable standards, laws & regulations.

## 4 Presentation Conventions in this Manual

### 4.1 Conventions for the Presentation of Critical Safety Warnings

Warnings are indicated with the following warning boxes, using the following signal words, colors, and symbols:



#### Caution!

This signal word indicates a hazard with a **low risk level**. Such a notice refers to a procedure or other action that may result in **minor injury** if not observed or if improperly performed.



#### Warning!

This signal word indicates a hazard with a **medium risk level**. Such a notice refers to a procedure or other action that may result in **serious injury** or even **death** if not observed or if improperly performed.



#### Danger!

This signal word indicates a hazard with a **high risk level**. Such a notice refers to a procedure or other action that will very likely result in **serious injury** or even **death** if not observed or if improperly performed.

### 4.2 Secondary Symbols Used in Safety Warnings

Some warning boxes may feature a secondary symbol that emphasizes the defining nature of a hazard or risk.



The presence of an "electrical hazard" symbol is indicative of a risk of electric shock or lightning strike.



The presence of a "fall hazard" symbol is indicative of a risk of falling when performing work at height.



This "laser hazard" symbol is indicative of a risk relating to laser radiation.

### 4.3 Conventions for the Presentation of Other Important Information

Beyond the above safety-related warning boxes, the following warning and information boxes are also used to indicate risks of product damage, data loss, and information security breaches, and also to provide general information for the sake of clarity, convenience, and optimum operation:



#### Important!

Warnings of risks of product damage, data loss, and also information security risks are indicated with this type of warning box.



#### Information:

Additional information that may be relevant for improving efficiency or avoiding confusion or misunderstandings is provided in this form.

### 4.4 Generally Applicable Symbols

The following symbols and pictograms are also used in a broader context in this manual and on the product.



The presence of the "ESD" symbol is indicative of a risk of product damage caused by electrostatic discharge.



Direct current (DC) (*symbol definition IEC 60417-5031*)



Alternating current (AC) (*symbol definition IEC 60417-5032*)



Ground connection (*symbol definition IEC 60417-5017*)



Protective earth connection (*symbol definition IEC 60417-5019*)



## 5 Important Safety Information



The safety information provided in this chapter as well as specific safety warnings provided at relevant points in this manual must be observed during every installation and operation procedure of the antenna, as well as its removal from service.

Any safety warnings affixed to the product itself must also be observed.

Any failure to observe this safety information, these safety warnings, and other safety-critical operating instructions in the product documentation, or any other improper usage of the product may result in unpredictable behavior from the product, and may result in injury or death.

Meinberg accepts no responsibility for injury or death arising from a failure to observe the safety information, warnings, and safety-critical instructions provided in the product documentation.

It is the responsibility of the operator to ensure that the product is safely and properly used.

Should you require additional assistance or advice on safety-related matters for your product, Meinberg's Technical Support team will be happy to assist you at any time. Simply send a mail to [techsupport@meinberg.de](mailto:techsupport@meinberg.de).

### 5.1 Appropriate Usage



**The device must only be used appropriately in accordance with the specifications of the product documentation!** Appropriate usage is defined exclusively by this manual as well as any other relevant documentation provided directly by Meinberg.

**Appropriate usage includes in particular compliance with specified limits!** The device's operating parameters must never exceed or fall below these limits!

## 5.2 Product Documentation

The information in this manual is intended for readers with an appropriate degree of safety awareness. The following are deemed to possess such an appropriate degree of safety awareness:

- skilled persons with a familiarity with relevant national safety standards and regulations,
- instructed persons having received suitable instruction from a skilled person on relevant national safety standards and regulations



If there is any safety information in the product documentation that you do not understand, **do not** continue with the set-up or operation of the device!

Read the product manual carefully and completely before you set the product up for use.

Safety standards and regulations change on a regular basis and Meinberg updates the corresponding safety information and warnings to reflect these changes. It is therefore recommended to visit the Meinberg website at <https://www.meinbergglobal.com> regularly to download up-to-date manuals.

Please keep all product documentation, including this manual, in a safe place in digital or printed format to ensure that it is always easily accessible.

Meinberg's Technical Support team is also always available at [techsupport@meinberg.de](mailto:techsupport@meinberg.de) if you require additional assistance or advice on safety aspects of your Meinberg GPSANTv2 antenna.

## 5.3 Safety during Installation



If the antenna is to be installed at height, only use equipment that has been tested and is suitable for reaching the location.

Always ensure that suitable personal protective equipment is worn when working at height!



Always ensure that health & safety standards are maintained!

Never work at height without a suitable and effective fall arrester!



Never mount, connect, disconnect, or dismantle an antenna while there is a risk of lightning strike!



Do not perform any work on antennas if it is not possible to maintain a safety distance from exposed power lines or electrical substations.

## 5.4 Electrical Safety



Never work on cables carrying a live current!

Never use cables or connectors that are visibly damaged or known to be defective! Faulty, defective, or improperly connected shielding, connectors, or cables present a risk of injury or death due to electric shock and may also constitute a fire hazard!

Before operating the device, check that all cables are in good order. Ensure in particular that the cables are undamaged (for example, kinks), that they are not wound too tightly around corners, and that no objects are placed on the cables.

Cables must be laid in such a way that they do not present a tripping hazard.

Never connect or disconnect power, data, or signal cables during a thunderstorm! Doing so presents a risk of injury or death, as cables and connectors may conduct very high voltages in the event of a lightning strike!

The device cables must be connected or disconnected in the order specified in the user documentation for the device. Connect all cables only while the device is de-energized before you connect the power supply.

Ensure that all plug connections are secure.

If the device malfunctions or requires servicing (for example, due to damage to the housing, power supply cable, or the ingress of liquids or objects), the power supply may be cut off. In this case, the device must be isolated immediately and physically from all power supplies! Electrical isolation must be performed and confirmed in accordance with the following procedure:

## 6 Important Product Information

### 6.1 CE Marking

This product bears the CE mark as is required to introduce the product into the EU Single Market.



The use of this mark is a declaration that the product is compliant with all requirements of the EU directives effective and applicable as at the time of manufacture of the product. These directives are listed in the EU Declaration of Conformity, appended to this manual as Chapter 12.

### 6.2 UKCA Marking

This product bears the British UKCA mark as is required to introduce the product into the United Kingdom (excluding Northern Ireland, where the CE marking remains valid).



The use of this mark is a declaration that the product is in conformity with all requirements of the UK statutory instruments applicable and effective as at the time of manufacture of the product. These statutory instruments are listed in the UK Declaration of Conformity, appended to this manual as Chapter 13.

## 6.3 Disposal

### Disposal of Packaging Materials



The packaging materials that we use are fully recyclable:

Material	Use for	Disposal
Polystyrene	Packaging frame/filling material (e.g., polystyrene peanuts)	Recycling Depot
PE-LD (Low-density polyethylene)	Accessories packaging, bubble wrap	Recycling Depot
Cardboard	Shipping packaging, accessories packaging	Paper Recycling

For information on the proper disposal of packaging materials in your specific country, please inquire with your local waste disposal company or authority.

### Disposal of the Device



This product falls under the labeling obligations of the Waste Electrical and Electronic Equipment Directive 2012/19/EU ("*WEEE Directive*") and thus bears this WEEE symbol. The presence of this symbol indicates that this electronic product may only be disposed of in accordance with the following provisions.



#### Important!

Do not dispose of the product via the household waste. Inquire with your local waste disposal company or authority on how to best dispose of the product if necessary.

This product is considered to be a "B2B" product for the purposes of the WEEE Directive and is also classified as "IT and Telecommunications Equipment" in accordance with Annex I of the Directive.

It can be returned to Meinberg for disposal. In this case, the shipping costs are to be borne by the customer, while Meinberg will cover the costs for disposal. If you wish for Meinberg to handle disposal for you, please get in touch with us. Otherwise, please use the return and collection systems provided within your country to ensure that your device is disposed of in a compliant fashion to protect the environment and conserve valuable resources.

## 7 Introduction

This manual is provided to assist you with the installation and proper connection of your Meinberg GPSANTv2.

Meinberg's GPSANTv2 is a professional-grade single-band antenna for the reception of GPS or Galileo satellite messages (time information and satellite status) on the GPS L1 and Galileo E1 transmission band of 1575.42 MHz. This makes it suitable for connection to a Meinberg GPS or GNS-UC reference clock to receive GPS L1 C/A code or Galileo E1 Open Service messages.

This latest-generation antenna is constructed to minimize interference caused by ground reflections, and thanks to its vertical beam width of around 98 degrees, is less susceptible to jamming attacks. The integrated surge protector, constructed in accordance with IEC 61000-4-5 Level 4, protects the antenna from indirect surge sources such as lightning strikes.

The antenna is integrated into Meinberg's characteristic plastic casing, providing the internal electronics with reliable protection against adverse conditions, including rainwater, snow, and other potentially harmful elements.

### How It Works

Each satellite transmits all necessary navigation and system data over the carrier frequency. The conversion unit integrated into the antenna converts the high-frequency phase-modulated spread spectrum signal received from the GNSS satellites into a lower intermediate frequency (IF) of 35.4 MHz. The connected Meinberg receiver processes the data received on this frequency to enable the position of the antenna to be determined (requiring at least four satellites to be found) and the exact time to be determined, which in turn allows your clock to be synchronized.

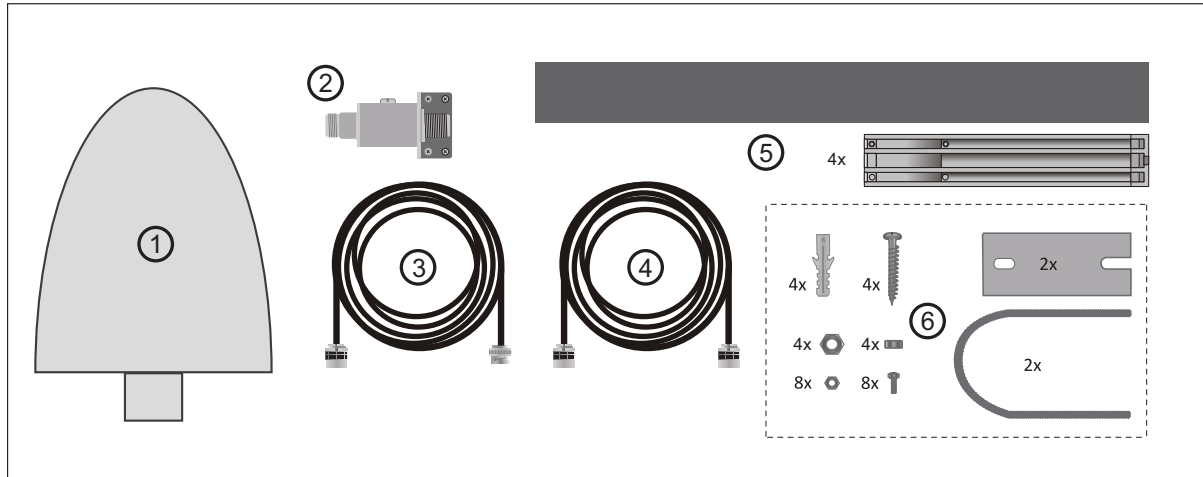
The antenna is connected to the reference clock using ordinary coaxial cable (such as RG58), and even longer cable transmission distances can be traversed without the need for an additional amplifier.

### Manual Revisions

Meinberg products are subject to ongoing development even after their market release, with new features and enhancements added on a regular basis. Meinberg also revises its product manuals to account for these feature updates.

## 8 Before You Start

### 8.1 Contents of Delivery



A delivery of a Meinberg GPSANTv2 antenna includes the following:

1. GPSANTv2 antenna
2. MBG S-PRO surge protector (optional)
3. RG58C/U antenna cable (optional)
4. Coaxial cable for surge protector (optional)
5. Tube mount and clips for Meinberg GPSANTv2 antenna
6. Mounting kit for Meinberg GPSANTv2 antenna

Unpack the GPSANTv2-Antenna and all accessories carefully and check the contents of the delivery against the enclosed packing list to ensure that no parts are missing. If any of the listed items are missing, please contact our Sales Department at [sales@meinberg.de](mailto:sales@meinberg.de).

Check that the product has not been damaged in transit. If the product is damaged or fails to operate upon installation, please contact Meinberg immediately. Only the recipient (the person or company receiving the system) may file claims or complaints against the forwarder for damage caused in transit.

Meinberg recommends that you keep the original packaging materials in case the product needs to be shipped or transported again at a later date.

## 9 Antenna Installation

The following chapters explain how to select a suitable location for your antenna, how to fit the antenna, and how to implement effective surge protection for your antenna installation.

### 9.1 Selecting the Antenna Location

There are essentially two ways the GPSANTv2 can be installed using the accessories included:

1. Mounted on a pole
2. Mounted on a wall

In either case, the location must be selected to ensure that the view of the sky is not obstructed in any direction (see Fig .1) in order to ensure that enough satellites can be received.

To ensure that your antenna has the best 360° view possible, Meinberg recommends mounting the antenna on a roof on a suitable metal pole (see Fig. 1, antenna on right). If this is not possible, the antenna may be mounted on the wall of a building, but must be high enough above the edge of the roof (see Fig. 1, antenna on left).

This prevents the line of sight between the antenna and the satellites from being partially or fully obstructed and limits the impact of GNSS signal reflections from other surfaces such as house walls.

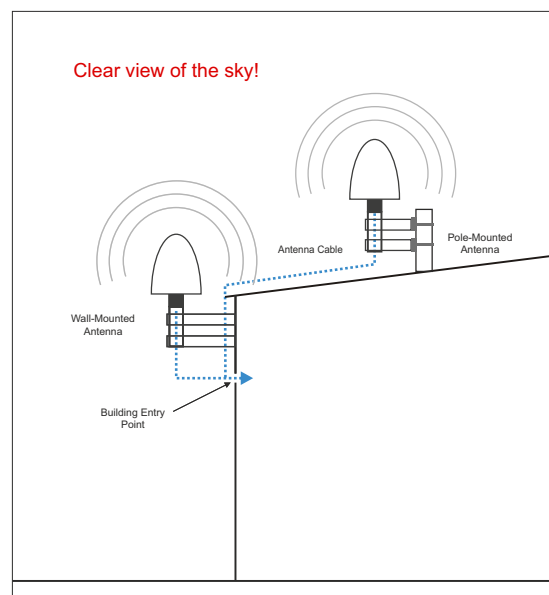
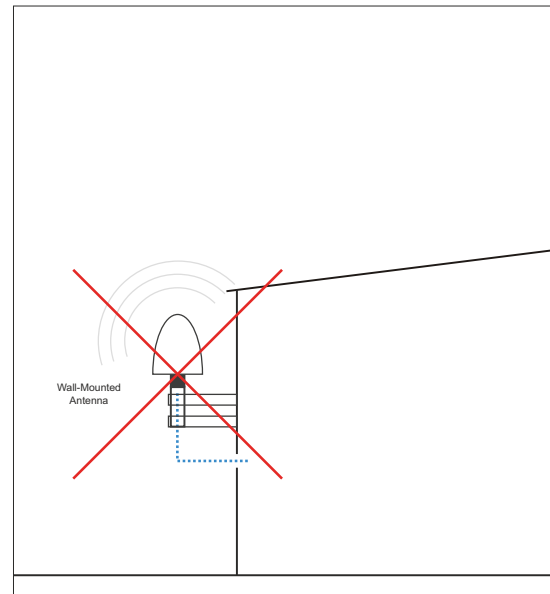


Fig. 1: Ideal Positioning



If there is a solid obstacle (a building or part of a building) in the line of sight between the antenna and each of the satellites (see Fig. 2), it is likely that the satellite signals will be partially or fully obstructed or reflected signals will cause interference, causing problems with signal reception.



*Fig. 2: Poor positioning of a wall-mounted antenna*

#### Other Installation Criteria for Optimum Operation:

- Vertical installation of antenna (see Fig. 1)
- At least 50 cm (1.5 ft) distance to other antennas



#### Information:

Problems may arise with the synchronization of your Meinberg time server if these conditions are not met, as four satellites must be located to calculate the exact position.

## 9.2 Installation of the Antenna

Please read the following safety information carefully before installing the antenna and ensure that it is observed during the installation.



### Danger!

Do not mount the antenna without an effective fall arrester!

**Danger of death from falling!**

- Ensure that you work safely when installing antennas!
- Never work without an effective fall arrester!



### Danger!

Do not work on the antenna system during thunderstorms!

**Danger of death from electric shock!**

- Do not carry out any work on the antenna system or the antenna cable if there is a risk of lightning strike.
- Do not carry out any work on the antenna system if it is not possible to maintain the prescribed safe distance to exposed lines and electrical substations.

Mount the GPSANTv2 (as shown in Fig. 3) at a distance of at least 50 cm to other antennas using the mounting kit provided, either onto a vertical pole of no more than 60 mm diameter or directly onto a wall.

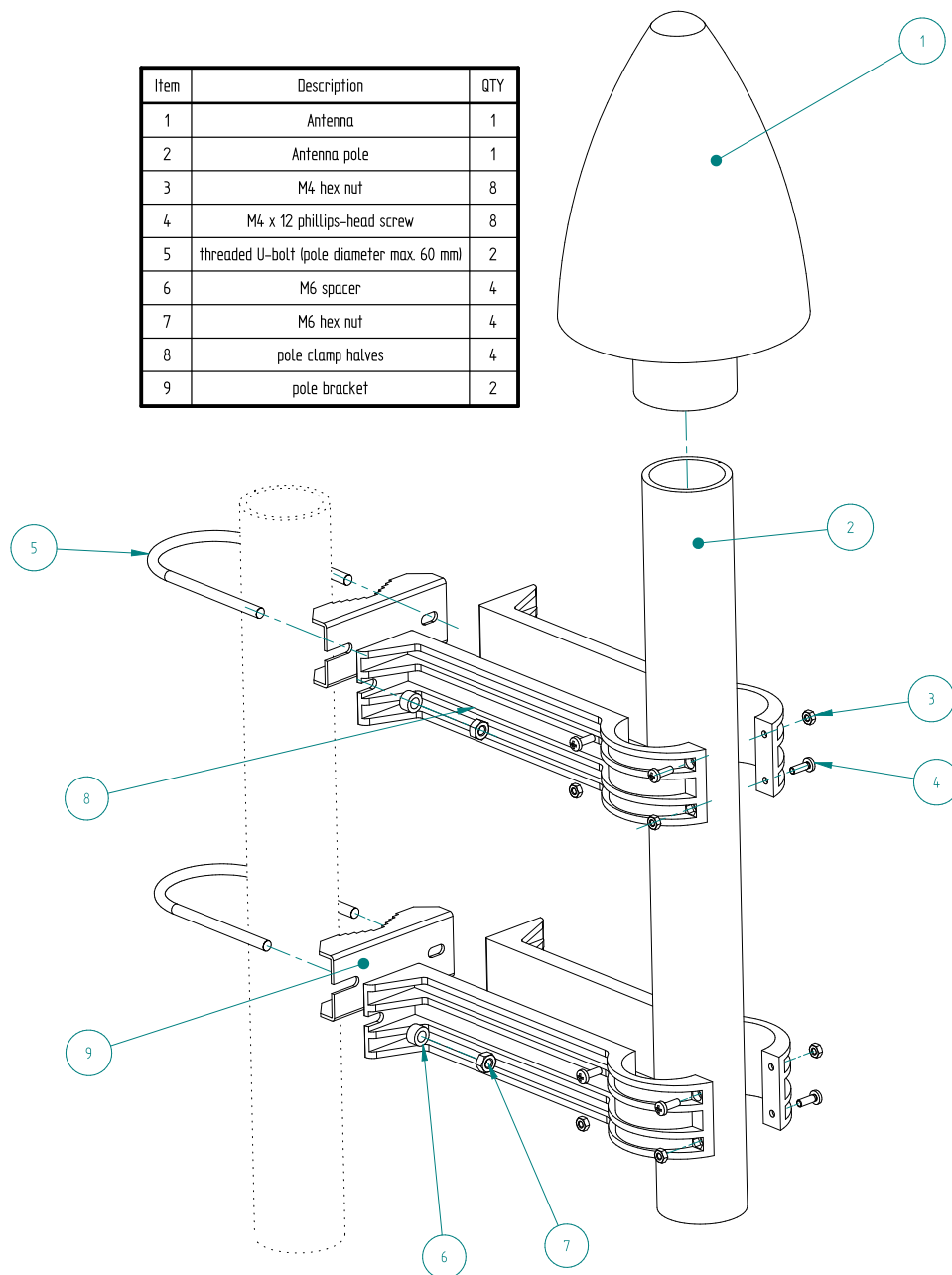


Fig. 3: Mounting a GPSANTv2 antenna onto a pole

Fig. 3 illustrates the mounting of a GPSANTv2 on a pole by way of example. When mounting the antenna on a wall, the four wall plugs and M6x45 screws should be used to mount the two halves of the pole clamp (Fig. 3, Pos. 9) using the provided screw slits.

The next chapter explains how the antenna cable should be laid.

## 9.3 Antenna Cable

### Selecting the Appropriate Cable

Meinberg provides suitable cable types with its antennas and these are ordered together with the antenna to match the length you need from your antenna to your Meinberg reference clock. The route to be covered for your antenna installation should be determined and the appropriate cable type selected accordingly before confirming your order.

The cable is shipped with both ends fitted with the appropriate connectors as standard, although the cable can also be shipped without any pre-fitted connectors if so requested.

The table below shows the specifications of the supported cable types for the transmission of the 35 MHz intermediate frequency:

Cable Type	RG58C/U	RG213	H2010 (Ultraflex)
Signal Propagation Time at 35 MHz	503.6	509.61	387.45
Attenuation at 35 MHz (dB/100 m)	8.48	3.46	2.29
DC Resistance (Ohm/100 m)	5.3	1.0	1.24
Cable Diameter (mm)	5	10.3	7.3
Max. Cable Length (m)	300	700	1100

Tab. 1: Specifications of Cable Types Recommended by Meinberg

\* The propagation times are specified on the basis of 100 m cable; these values can be used as a reference to calculate the propagation time of any other arbitrary length of cable.



#### Important!

Please avoid using a mixture of different cable types for your antenna installation. This should be taken into consideration in particular when purchasing additional cable, for example to extend an existing cable installation.

## Laying the Antenna Cable

When laying the antenna cable, ensure that the specified maximum cable length is not exceeded. This length will depend on the selected cable type and its attenuation factor.

If the specified maximum length is exceeded, correct transmission of the synchronization data and thus proper synchronization of the reference clock can no longer be guaranteed.

Lay the coaxial cable from the antenna to the point of entry into the building as shown in Figures 5 and 6 in the chapter "[Surge Protection and Grounding](#)". Like any other metallic object in the antenna installation (antenna and pole), the antenna cable must be integrated into the grounding infrastructure of the building and also connected to the other metallic objects.



### Caution!

When laying the antenna cable, ensure that sufficient distance is maintained from live cables (such as high-voltage power lines), as these can cause severe interference and compromise the quality of the antenna signal significantly. Surges in power lines (caused, for example, by lightning strike) can generate induced voltages in a nearby antenna cable and damage your system.

### Further Points to Consider when Laying Antenna Cable:

- The minimum bend radius of the cable must be observed.<sup>1</sup>
- Any kinking, crushing, or other damage to the external insulation must be avoided.
- Any damage or contamination of the coaxial connectors must be avoided.

<sup>1</sup> The bend radius is the radius at which a cable can be bent without sustaining damage (including kinks).

The next chapter "[Surge Protection and Grounding](#)" explains how to implement effective surge protection for an antenna installation.

## Compensating for Signal Propagation Time

### LANTIME OS-based Systems

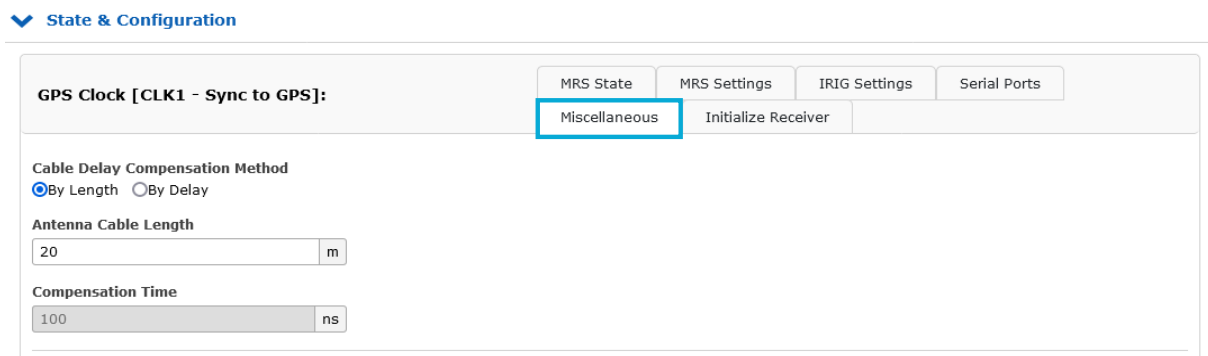
The propagation of the signal from the antenna to the receiver (reference clock) can incur a certain delay. This delay can be compensated for in the LANTIME Web Interface.

To do this, log into the Web Interface of your LANTIME system and proceed as follows:

1. Open the menu "Clock" → "State & Configuration".
2. Select the corresponding clock module.
3. Click on the "Miscellaneous" tab.
4. Select the compensation method and enter the appropriate value.

If you are using standard RG58 or RG213 cable, the length of the cable can be simply entered in meters by selecting "By Length". This will provide a reliable, automatically calculated offset based on the known specifications of standard RG58 and RG213 cable.

Alternatively, a fixed offset can be entered in nanoseconds by selecting "By Delay". This may be necessary if you are using a different type of coaxial cable (in which case, the delay is calculated based on the data provided in the data sheet of your cable) and/or you wish to apply an offset based on your own delay measurements.



State & Configuration

GPS Clock [CLK1 - Sync to GPS]:

MRS State MRS Settings IRIG Settings Serial Ports

Miscellaneous Initialize Receiver

Cable Delay Compensation Method

☒ By Length ☐ By Delay

Antenna Cable Length

20 m

Compensation Time

100 ns

Fig. 4.1: "Clock" menu in LANTIME OS Web Interface

## meinbergOS-Based Systems

The propagation of the signal from the antenna to the receiver (reference clock) can incur a certain delay. This delay can be compensated for in the meinbergOS Web Interface by entering a fixed offset in nanoseconds under "Bias".

Configuration > References

### References

State → Save

#### Sources

Supported reference sources. API /configuration/references/sources

*You can change the source prioritization by reordering the sources listed below. To change the relative priority of a source drag it to the desired location.*

**GPS1 (CLK1)** Collapse

- ☒ **Enabled** Specify, whether this reference shall be used for synchronization
- Bias** 0 ns
- Precision** 0 ns
- ☒ **Quantify** Enable/Disable quantification of the reference source
- Quantifier** 0
- ☐ **Auto-Bias Master** Allow the source to operate as zero asymmetry master
- ☒ **Is Trusted Source** Allow the source to be used as a trusted source for spoofing detection
- ☐ **Use Trusted Source** Use a trusted source for consistency check and spoofing detection

Fig. 4.2: "References" menu in meinbergOS Web Interface

## 9.4 Surge Protection and Grounding

The greatest risk to an antenna installation and the electronic devices connected to it is exposure to lightning strikes. An indirect lightning strike in the vicinity of the antenna or coaxial cable can induce significant surge voltages in the coaxial cable. This induced surge voltage can then be passed to the antenna and to the building interior, which can damage or even destroy both your antenna and your Meinberg system.

This is why antennas and antenna cables must always be integrated into a building's equipotential bonding infrastructure (Fig. 5, Item 5) as part of an effective lightning protection strategy to ensure that voltages induced by lightning strikes directly on or indirectly near the antenna are redirected safely to ground.



### Warning!

Surge protection and lightning protection systems may only be installed by persons with suitable electrical installation expertise.

## Surge Protection

VDE 0185-305 (IEC 62305) (relating to buildings with lightning protection systems) and VDE 0855-1 (IEC 60728-11) (addressing bonding strategies and the grounding of antenna installations in buildings with no external lightning protection system) are the lightning protection standards applicable to antenna installations on a building. Antennas must generally be integrated into a building's lightning protection system or bonding infrastructure.

If the antenna represents the highest point of a building or pole, the lightning protection strategy should incorporate a safe zone (safe angle  $\alpha$ , Fig. 5 and 6), formed by a lightning rod positioned above the antenna. This increases the likelihood of lightning being 'caught' by the lightning rod, allowing surge currents to be safely passed from the lightning rod along a grounding conductor to ground.

The pole itself is connected to the bonding infrastructure. Any metallic objects in the antenna installation, such as the pole and antenna, or the shielding of the antenna cable, must be connected together.

## Meinbergs GPSANTv2

Meinberg's new-generation "GPSANTv2" antenna features integrated surge protection in accordance with IEC 61000-4-5 Level 4 to reliably shield the antenna against surge voltages.

However, in order to preserve the safety of the building and to protect your Meinberg system, Meinberg recommends the use of the MBG-S-PRO surge protector, which is addressed in more detail later in this chapter.



The drawings below illustrate how a GPSANTv2 can be installed in accordance with the above conditions on a pole (e.g. antenna pole) or building roof.

### Antenna Installation without Insulated Lightning Rod System

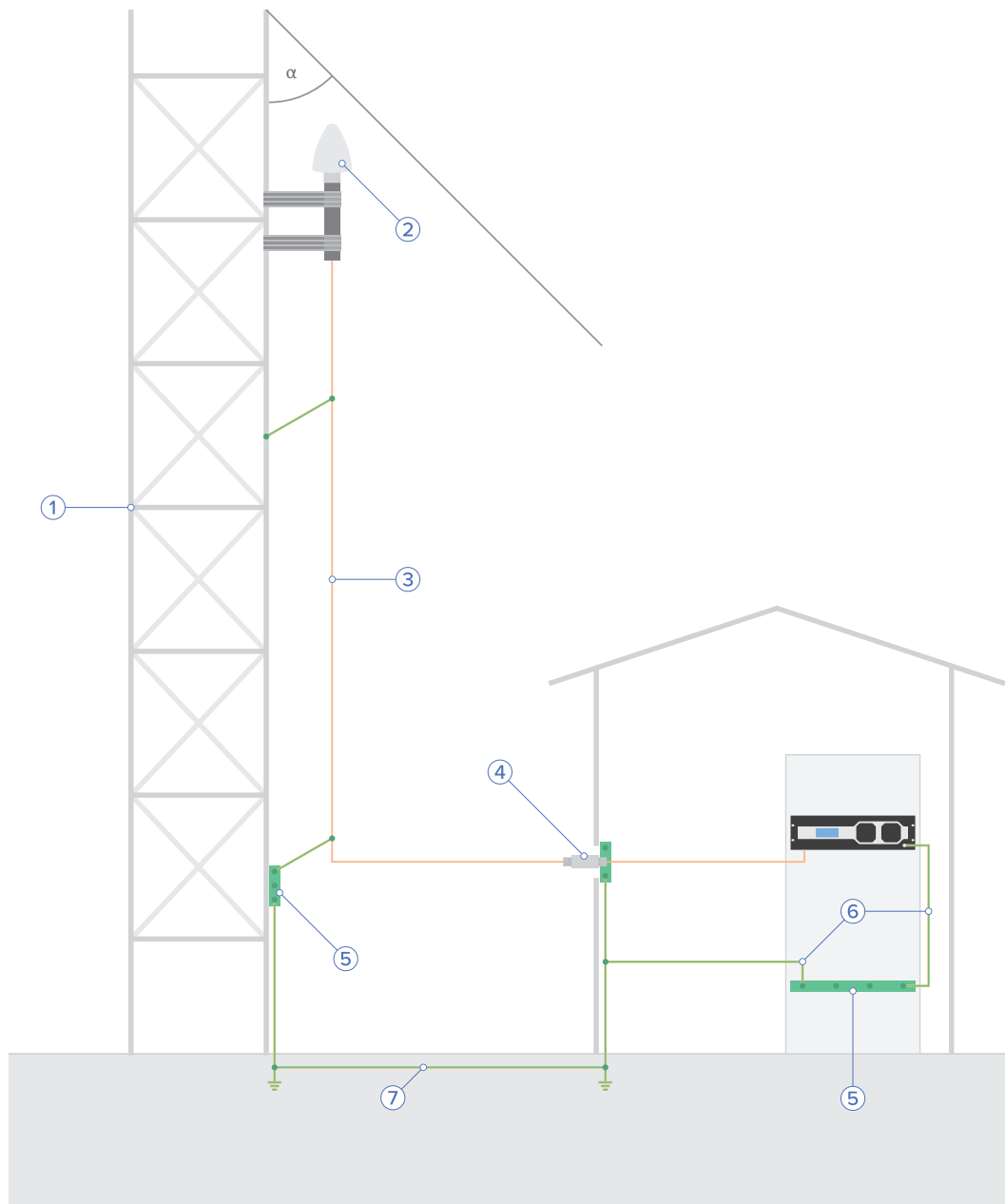


Fig. 5: Installation on a Pole

- 1 Antenna Pole
- 2 GPSANTv2 Antenna
- 3 Antenna Cable
- 4 MBG S-PRO Surge Protector
- 5 Bonding Conductor
- 6 Bonding Bar
- 7 Foundation Electrode
- α Safety Zone

## Antenna Installation with Insulated Lightning Rod System

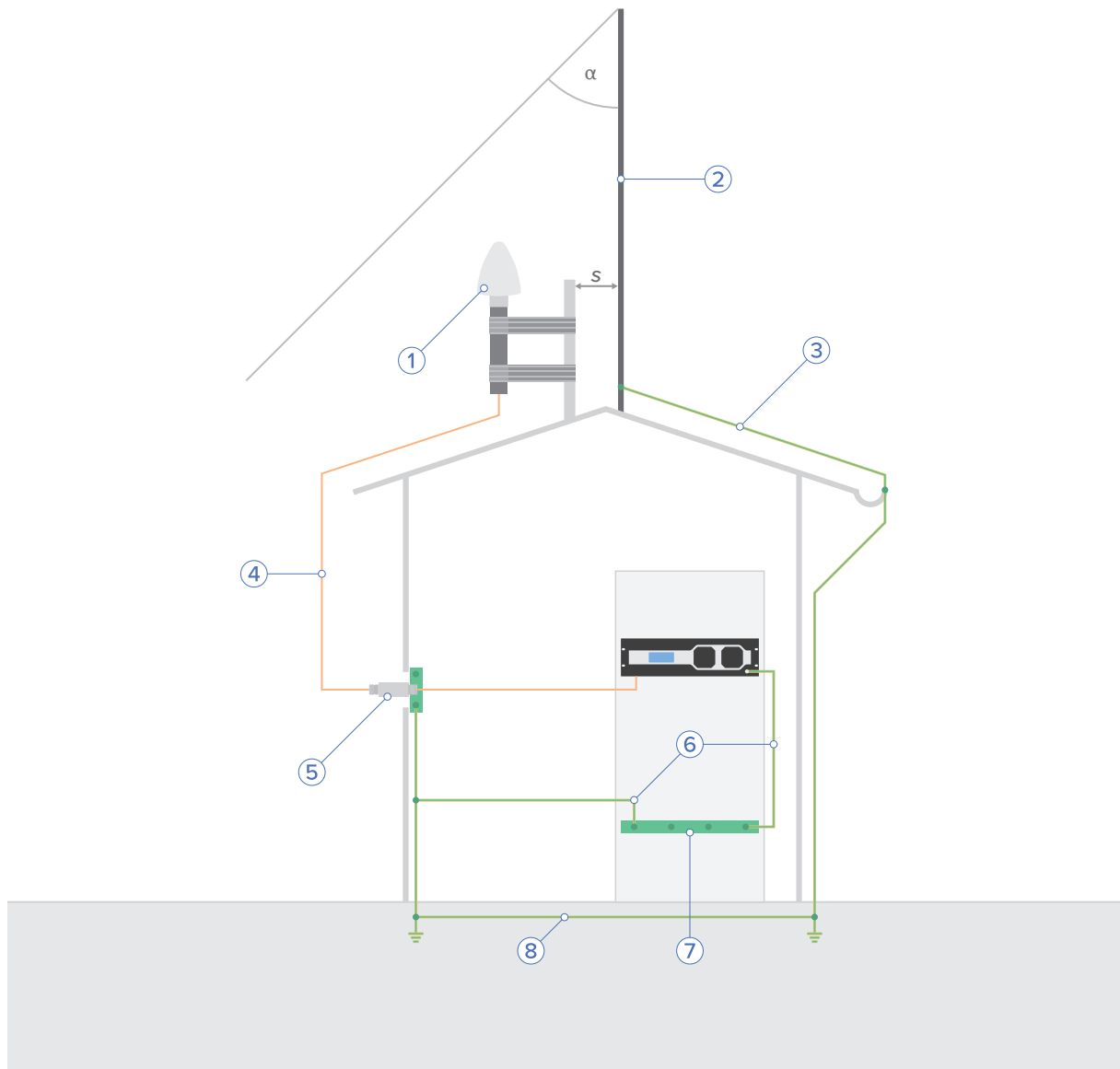


Fig. 6: Roof Installation

- 1 GPSANTv2-Antenne
- 2 Lightning Rod
- 3 Lightning Rod Conductor
- 4 Antenna Cable
- 5 MBG S-PRO Surge Protector
- 6 Bonding Conductor
- 7 Bonding Bar
- 8 Foundation Electrode
- α. Safety Zone
- s. Safe Distance (between lightning rod and antenna installation)

## MBG S-PRO Surge Protector



### Information:

The surge protector and suitable coaxial cable are not included as standard with the GPSANTv2, but can be ordered as an optional accessory.

## Construction

The MBG-S-PRO is a surge protector (Phoenix CN-UB-280DC-BB) for coaxial connections. It is patched directly into the antenna line and consists of a replaceable gas discharge tube that redirects the energy from the cable shielding to the ground potential when ignited.

## Installation Conditions

To protect the building from possible surge voltages, the MBG-S-PRO is installed at the point of entry of the antenna cable into the building. The MBG-S-PRO must be shielded against water spray and water jets, either by means of a suitable enclosure (IP65) or a protected location.

### Ideal Installation Conditions:

- Installation at the point of entry of the antenna cable into the building
- Ground conductor cable from surge protector to bonding bar as short as possible

## Installation and Connection

This surge protector has no dedicated input or output polarity and therefore has no preferred installation orientation. It features Type-N female connectors at both ends.

### Installation

1. Fit the surge protector to the supplied mounting bracket as shown in the illustration.

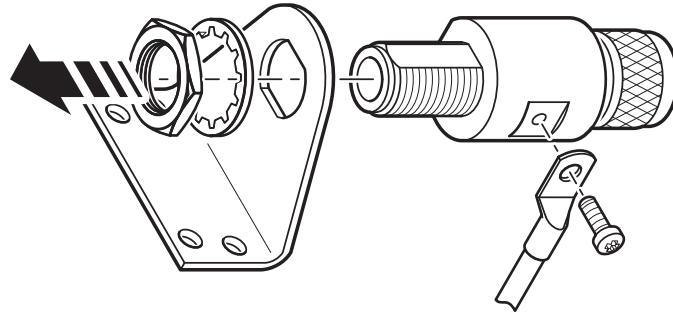


Fig. 7: Installation of the surge protector

2. Connect the MBG-S-PRO to a bonding bar using a ground conductor cable that is as short as possible. It is also important for the bonding connection of the surge protector to be connected to the same bonding bar as the connected Meinberg system to prevent destructive potential differences.
3. Connect the coaxial cable from the antenna to one of the surge protector connectors, then connect the other surge protector connector to the coaxial cable leading to the Meinberg reference clock.



### Caution!

Please refer to the document "**Technical Specifications: MBG-S-PRO Surge Protector**" in the appendix as well as the manufacturer's data sheet for detailed installation instructions and technical specifications for the surge protector.

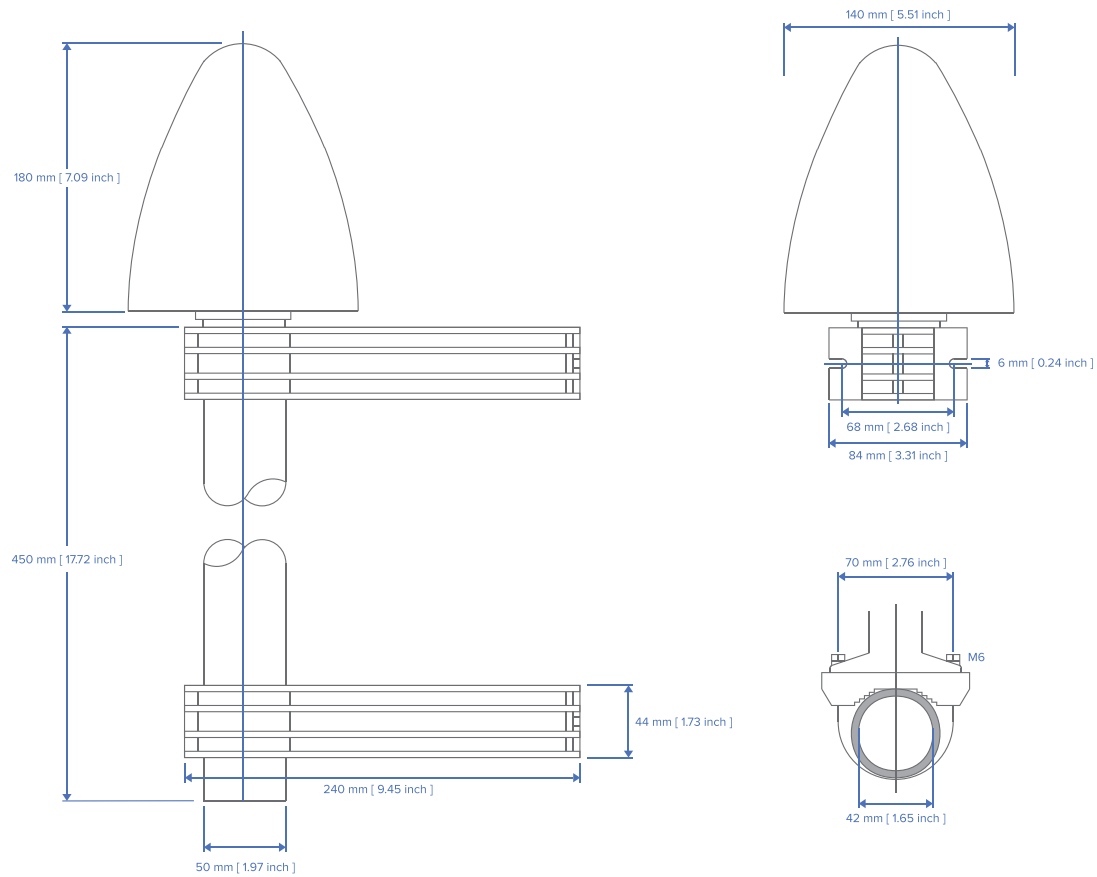
#### Data Sheet (Download):

[https://www.meinberg.de/download/docs/shortinfo/german/cn-ub-280dc-bb\\_pc.pdf](https://www.meinberg.de/download/docs/shortinfo/german/cn-ub-280dc-bb_pc.pdf)

# 10 Technical Appendix

## 10.1 Technical Specifications: GPSANTv2 Antenna

Physical Dimensions:



## Specifications:

Power Supply:	15 V, 100 mA (provided via antenna cable)
Reception Frequency:	1575.42 MHz (GPS L1/Galileo E1 Band)
Bandwidth:	9 MHz
Frequencies:	Mixing Frequency: 10 MHz Intermediate Frequency: 35.4 MHz
Element Gain:	Typically 5.0 dBic at zenith
Polarization:	Right-Hand Circular Polarization
Axial Ratio:	$\leq 3$ dB at zenith
Nominal Impedance:	50 $\Omega$
VSWR:	$\leq 1.5 : 1$
Conversion Gain:	56 dB $\pm$ 3 dB
Out-of-Band Rejection:	$\geq 70$ dB @ 1555 MHz $\geq 55$ dB @ 1595 MHz
Noise Figure:	Typically 1.8 dB max. 3 dB @ +25 °C
Surge Protection:	Level 4 (per IEC 61000-4-5) Test Voltage: 4000 V Max. Peak Voltage @ 2 $\Omega$ : 2000 A
ESD Protection:	Level 4 (per IEC 61000-4-2) Contact Discharge: 8 kV Air Discharge: 15 kV
Connector Type:	Type-N Female
Housing Material:	ABS Plastic Case for Outdoor Installation
IP Rating:	IP65
Temperature Range:	-60 °C to +80 °C (-76 °F to 176 °F)
Weight:	1.4 kg (3.53 lbs), including mounting kit

## 10.2 Antenna Input: GPS Reference Clock

**Antenna Input:** Antenna Circuit, Galvanically Isolated

**Dielectric Strength:** 1000 V

**Receiver Type:** 12-Channel GPS Receiver

**Signal Support:** L1 C/A (1575.42 MHz)

**Mixing Frequency:** 10 MHz <sup>1</sup>  
(Reference Clock to Antenna)

**Intermediate Frequency:** 35.4 MHz <sup>1</sup>  
(Antenna to Reference Clock)

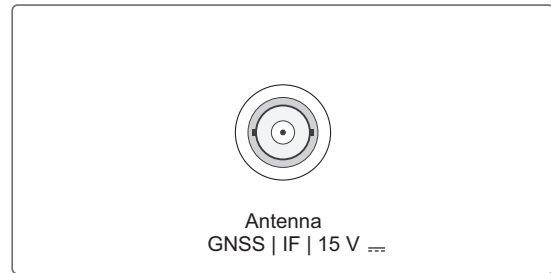
**Voltage Draw of Antenna:** 15 V (via Antenna Cable)

**Power Consumption of Antenna:** 100 mA (via Antenna Cable)

**Connection Type:** BNC Female

**Cable Type:** Coaxial Cable, Shielded

**Cable Length:** Max. 300 m (RG58)  
Max. 700 m (RG213)



<sup>1</sup> These frequencies are transferred via the antenna cable

### Danger!

Do not work on the antenna system during thunderstorms!

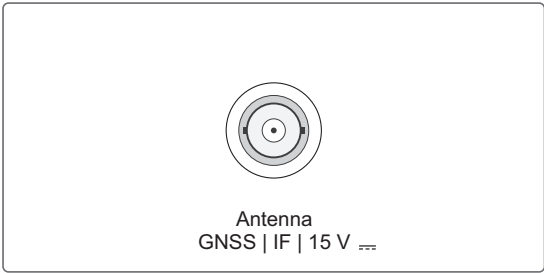
**Danger of death from electric shock!**

- Do not carry out any work on the antenna system or the antenna cable if there is a risk of lightning strike.
- Do not carry out any work on the antenna system if it is not possible to maintain the prescribed safe distance to exposed lines and electrical substations.



10.3 Antenna Input: GNS-UC Reference Clock

Antenna Input GNS-UC:	Antenna Circuit Galvanically Isolated
Dielectric Strength:	1000 V
Receiver Type:	72-Channel Receiver GPS/Galileo
Signal Support:	GPS: L1 C/A (1575.42 MHz) Galileo: E1-B/C (1575.42 MHz)
Mixing Frequency: (Reference Clock to Antenna)	10 MHz <sup>1</sup>
Intermediate Frequency: (Antenna to Reference Clock)	35.4 MHz <sup>1</sup>
Output Voltage:	15 V
Power Consumption of Antenna	100 mA (via antenna cable)
Connector Type:	BNC Female
Cable Type:	Coaxial Cable, Shielded
Cable Length:	Max. 300 m (RG58) Max. 700 m (RG213)



<sup>1</sup> These frequencies are transferred via the antenna cable



Danger!

Do not work on the antenna system during thunderstorms!

Danger of death from electric shock!

- Do not carry out any work on the antenna system or the antenna cable if there is a risk of lightning strike.
- Do not carry out any work on the antenna system if it is not possible to maintain the prescribed safe distance to exposed lines and electrical substations.



## 10.4 Antenna Short Circuit



### Information:

This information only applies to devices with a front display.

If the antenna line is short-circuited, LANTIME and IMS systems will display the following warning on the front panel.

Antenna Short-Circuit  
Disconnect Power!!!

If this message appears, the system must be switched off and the cause of the problem must be eliminated before the system can be switched back on.

The supply voltage for the antenna/converter unit is around 15 V DC at the antenna input.

## 10.5 Technical Specifications: MBG-S-PRO Surge Protector

The MBG S-PRO is a surge protector (Phoenix CN-UB-280DC-BB) for coaxial cable lines. It is designed to be installed on an antenna line and consists of a replaceable gas discharge tube that redirects energy from the cable's external voltage source to a ground potential. The ground connection should therefore be as short as possible.

The MBG S-PRO has no dedicated input/output polarity and no preferred installation orientation.



*Phoenix CN-UB-280DC-BB*

### Features:

- Excellent RF Performance
- Multiple Strike Capability
- 20 kA Surge Protection
- Bidirectional Protection

<b>Contents of Package:</b>	Surge Protector with Mounting Bracket and Accessories
<b>Product Type:</b>	Surge Protector for Transmission and Receiver Devices
<b>Construction:</b>	In-Line Breaker
<b>Connectors:</b>	Type-N Female/Type-N Female

The original product page of the supplier (see link) of the CN-UB-280DC-BB surge protector provides detailed specifications, as well as a variety of product-specific documents under the link below:

<https://www.phoenixcontact.com/online/portal/gb/?uri=pxc-oc-itemdetail:pid=2818850>

## 11 RoHS Conformity

### Conformity with EU Directive 2011/65/EU (RoHS)

We hereby declare that this product is compliant with the European Union Directive 2011/65/EU and its delegated directive 2015/863/EU "Restrictions of Hazardous Substances in Electrical and Electronic Equipment" and that no impermissible substances are present in our products pursuant to these Directives.

We warrant that our electrical and electronic products sold in the EU do not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs), bis(2-ethylhexyl)phthalat (DEHP), benzyl butyl phthalate (BBP), dibutyl phthalate (DBP), or diisobutyl phthalate (DIBP) above the legal limits.





# 13 Declaration of Conformity for Operation in the United Kingdom

## UK Declaration of Conformity

Doc ID: GPSANTv2-July 20, 2023

**Manufacturer**

Meinberg Funkuhren GmbH & Co. KG  
Lange Wand 9  
31812 Bad Pyrmont  
Germany

*declares that the product*

**Product Designation**

GPSANTv2

*to which this declaration relates, is in conformity with the following standards and provisions of the following regulations under British law:*

Radio Equipment Regulations 2017  
(as amended)  
SI 2017/1206

ETSI EN 303 413 V1.2.1 (2021-04)

Electromagnetic Compatibility  
Regulations 2016 (as amended)  
SI 2016/1091

ETSI EN 301 489-19 V2.1.1 (2019-04)  
ETSI EN 301 489-1 V2.2.3 (2019-11)  
EN IEC 61000-6-2:2019  
EN IEC 61000-6-3:2021  
EN 55035:2017/A11:2020  
EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

Electrical Equipment (Safety)  
Regulations 2016 (as amended)  
SI 2016/1101

EN IEC 62368-1:2020 + A11:2020

The Restriction of the Use of Certain  
Hazardous Substances in Electrical and  
Electronic Equipment Regulations 2012  
(as amended)  
SI 2012/3032

EN IEC 63000:2018

Bad Pyrmont, Germany, dated July 20, 2023

  
Stephan Meinberg  
Production Manager