



MANUAL

GPS Antenna

Antenna / Converter Unit

26th November 2015

Meinberg Radio Clocks GmbH & Co. KG

Table of Contents

1	Safety Hints Antenna	1
2	Meinberg GPS Antenna/Converter Unit	2
2.1	Mounting the GPS Antenna	4
2.1.1	Example:	4
2.1.2	Antenna Assembly with Surge Voltage Protection	5
2.1.3	Antenna Short-Circuit	6
2.2	MBG S-PRO - Technical Specifications	7
2.2.1	MBG S-PRO - Physical Dimensions	9
2.2.2	Installation and Grounding	9
2.3	Features of GOAL	10

1 Safety Hints Antenna



WARNING!
DANGER TO LIFE BY ELECTRICAL SHOCK!

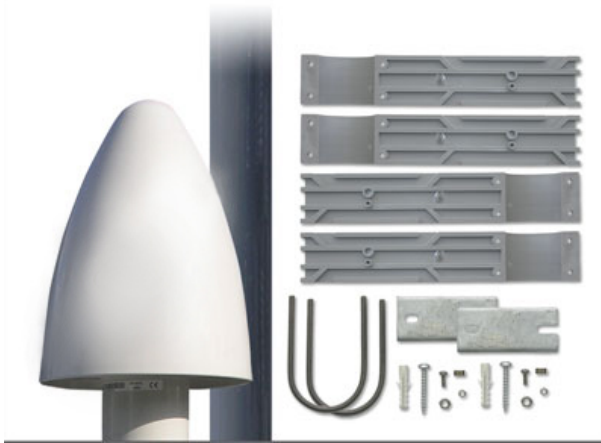
Make sure to comply with the occupational health and safety standards when installing the antenna. Never work without a proper fall protection device!

Do not carry out any installation or maintenance work on the antenna system or cabling when there is a potential risk of lightning.

Surge Voltage Protector

Due to extremely high currents associated with lightning no surge protection device can provide absolute safety from the impacts caused by lightning!

2 Meinberg GPS Antenna/Converter Unit



- Antenna/Converter Unit
- Preformed Cable
- Holder for Wall Mounting
- Clamps for Pole Mounting
- Optional: Voltage Protector

Antenna: Antenna/converter unit with remote power supply

Length of cable: Refer to chapter "Mounting the Antenna"

Antenna
Input GPS: Antenna circuit 1000 V DC insulated

Receiver Input
Frequency: 1575.42 MHz (L1)

Local Oscillator
to Converter
Frequency: 10 MHz ¹

First IF
Frequency: 35.4 MHz ¹

Connector: female type-N

Protection
Class: IP66

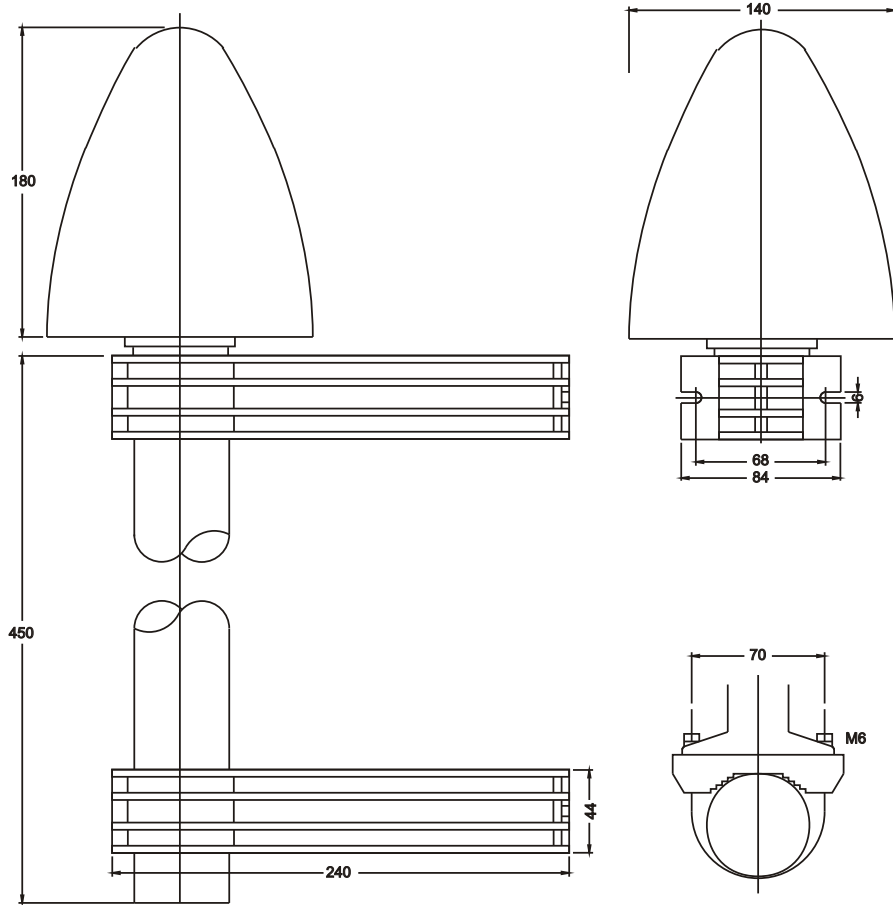
Ambient
Temperature: -40°C ... +65°C

Humidity: 95%

Weight: 420g (without accessories)

(1) these frequencies are transferred via the antenna cable.
Power Requirements: 12V ... 18V, 100mA (via antenna cable)

Physical Dimensions:



2.1 Mounting the GPS Antenna

The GPS satellites are not stationary, but circle round the globe with a period of about 12 hours. They can only be received if no building is in the line-of-sight from the antenna to the satellite, so the antenna/downconverter unit must be installed in a location that has as clear a view of the sky as possible. The best reception is achieved when the antenna has a free view of 8° angular elevation above the horizon. If this is not possible, the antenna should be installed with the clearest free view to the equator, because the satellite orbits are located between latitudes 55° North and 55° South. If this is not possible, you may experience difficulty receiving the four satellites necessary to complete the receiver's position solution.

The antenna/converter unit can be mounted on a wall, or on a pole up to 60 mm in diameter. A 50 cm plastic tube, two wall-mount brackets, and clamps for pole mounting are included. A standard RG58 coaxial cable should be used to connect the antenna/downconverter unit to the receiver. The maximum length of cable between antenna and receiver depends on the attenuation factor of the coaxial cable.

Up to four receivers can be run with one antenna/downconverter unit by using an optional antenna splitter. The total length of an antenna line from antenna to receiver must not be longer than the max. length shown in the table below. The position of the splitter in the antenna line does not matter.

The optional delivered MBG S-PRO protection kit can also be used for outdoor installation (degree of protection: IP55).

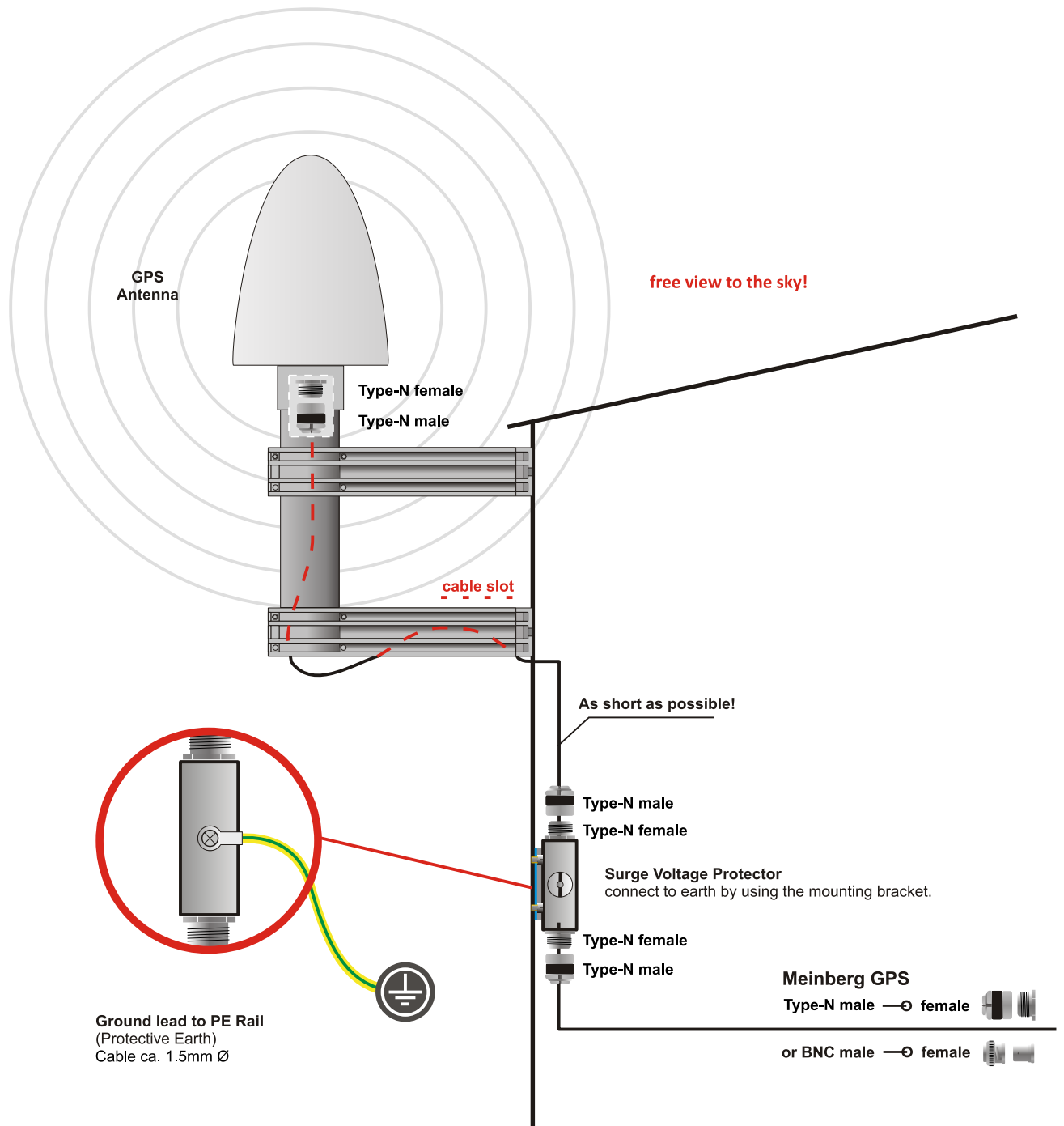
2.1.1 Example:

Type of cable	diameter Ø [mm]	Attenuation at 100MHz [dB]/100m	max length. [m]
RG58/CU	5mm	17	300 ⁽¹⁾
RG213	10.5mm	7	700 ⁽¹⁾

(1) This specifications are made for antenna/converter units produced after January, 2005
The values are typically ones; the exact ones are to find out from the data sheet of the used cable

2.1.2 Antenna Assembly with Surge Voltage Protection

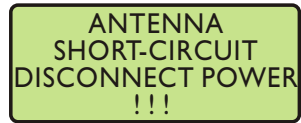
Optional a surge voltage protector for coaxial lines is available. The shield has to be connected to earth as short as possible by using the included mounting bracket. Normally you connect the antenna converter directly with the antenna cable to the system.



2.1.3 Antenna Short-Circuit

(systems with front display only)

In case of an antenna line short-circuit the following message appears in the display:

A rectangular box with a light green background and a black border. The text inside the box is centered and reads: ANTENNA SHORT-CIRCUIT DISCONNECT POWER !!!

ANTENNA
SHORT-CIRCUIT
DISCONNECT POWER
!!!

If this message appears the clock has to be disconnected from the mains and the defect eliminated. After that the clock can be powered-up again. The antenna supply voltage must be 15V_{DC} .

2.2 MBG S-PRO - Technical Specifications

Attachment plug with replaceable gas discharge tube for coaxial signal interfaces. Connection: N connector female/female. The MBG S-PRO set includes a surge voltage protector (Phoenix CN-UB-280DC-BB), a pre-assembled coax cable and a mounting bracket.

The surge voltage protector for coaxial lines has to be installed in the antenna line. The shield has to be connected to earth as short as possible. CN-UB-280DC-BB is equipped with two type-N female connectors. It has no dedicated input/output polarity or preferred mounting orientation.



Phoenix CN-UB-280DC-BB

Features:

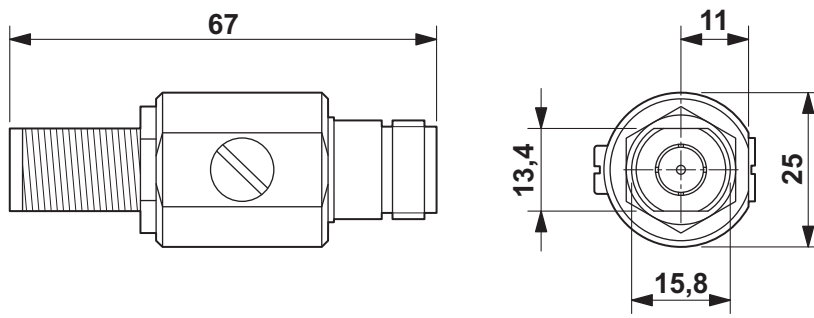
- High RF Performance
- Multiple Strike Capability
- 20 kA Surge Protection
- Bi-directional Protection
- Rugged and Waterproof

Mounting type	Connection-specific intermediate plugging	
Type	Attachment plug	
Direction of action	Line-Shield/Earth Ground	
Maximum continuous operating voltage	UC (wire-ground)	280 V DC 195 V AC
Nominal current	IN	5 A (25 °C)
Operating effective current	IC at UC	$\leq 1 \mu\text{A}$
Nominal discharge current	In (8/20) μs (Core-Earth)	20 kA
Nennableitstoßstrom	In (8/20) μs (Core-Shield)	20 kA
Total surge current	(8/20) μs	20 kA
Total surge current	(10/350) μs	2,5 kA

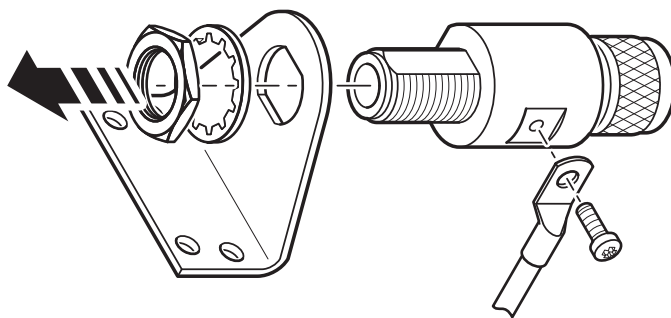
Max. discharge current	$I_{max} (8/20)\mu s$ maximum (Core-Shield)	20 kA
Nominal pulse current	$I_{an} (10/1000)\mu s$ (Core-Shield)	100 A
Impulse discharge current	$(10/350) \mu s$, peak value I_{imp}	2,5 kA
Output voltage limitation	at 1 kV/ μs (Core-Earth) spike	≤ 900 V
Output voltage limitation	at 1 kV/ μs (Core-Earth) spike	≤ 900 V
Response time	t_A (Core-Earth)	≤ 100 ns
Response time	t_A (Core-GND)	≤ 100 ns
Input attenuation	aE, asym.	typ. 0.1 dB (≤ 1.2 GHz) typ. 0.2 dB (≤ 2.2 GHz)
Cut-off frequency	f_g (3 dB), asym. (shield) in 50 Ohm system	> 3 GHz
Standing wave ratio	SWR in a 50 Ω system	typ. 1.1 (≤ 2 GHz)
Permissible HF power	P_{max} at VSWR = xx (50 ohm system)	700 W (VSWR = 1.1) 200 W (VSWR = ∞)
Capacity	(Core-Earth)	typ. 1,5 pF
Capacity	asymmetrical (shield)	typ. 1,5 pF
Surge current resistance	(conductor-ground)	C1 - 1 kV/500 A C2 - 10 kV/5 kA C3 - 100 A D1 - 2,5 kA
Ambient temperature	(operation)	-40 °C ... 80 °C
Degree of protection	IP55	
Housing material	Nickel-plated brass Color nickel	
Dimensions	Height 25 mm, Width 25 mm, Depth 67 mm	
Connection data	IN OUT	N-Connector 50 Ohm N-Connector Buchse N-Connector Buchse
Standards/regulations	IEC 61643-21	

Source: PHOENIXCONTACT.COM Surge Voltage Protector - CN-UB-280DC-BB

2.2.1 MBG S-PRO - Physical Dimensions



2.2.2 Installation and Grounding



2.3 Features of GOAL

GOAL is a GPS Optical Antenna Link set for connecting a Meinberg GPS antenna to a Meinberg GPS receiver via one optical multimode fiber. The module GOAL/R is to connect to the receiver's antenna input via a patch cable and can be assembled somewhere around. The module GOAL/A is to mount indoors, connected to the Meinberg antenna via a coaxial cable.

Both modules are linked to each other via a single G150/125 μ m or G162,5/125 μ m multimode gradient fiber.



This kind of connection provides several advantages:

- large antenna cable distances (up to 2000 mtrs.)
- no destructive overvoltage via the antenna cable
- no unintentional monitoring via optical fiber

The receiver-side module GOAL/R is supplied with power via the antenna input connector of the GPS receiver, therefore no external power supply is necessary. The module GOAL/A needs an external supply for operating and feeding the GPS antenna. Whenever the antenna is not connected, or a short circuit occurs on the antenna cable, this is shown by a status LED in the front panel. A second status LED shows that the 10MHz reference clock, coming from the GOAL/R, is received within a sufficient signal strength and therefore the FO link is working.

The GOAL system is suitable for all Meinberg GPS receivers (except GPS166!), also for the later extension of existing systems. When using the GOAL system together with the GPS signal converter GPSTGEN1575 it is to be noted that operation of connected GPS receivers from third-party manufacturers can not be guaranteed!

Physical Dimensions:

GOAL/A: 44mm x 105mm x 165mm (height x width x depth)

GOAL/R: 25mm x 25mm x 95mm (height x width x depth)

Konformitätserklärung

Declaration of Conformity

Doc ID: GPSANT-02092014

Hersteller
Manufacturer

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

erklärt in alleiniger Verantwortung, daß das Produkt
declares under its sole responsibility, that the product

Produktbezeichnung **GPSANT**
Product Designation

auf das sich diese Erklärung bezieht, mit den folgenden Normen übereinstimmt
to which this declaration relates is in conformity with the following standards

EN55022:2010, Class B	Limits and methods of measurement of radio interference characteristics of information technology equipment
EN55024:2010	Limits and methods of measurement of Immunity characteristics of information technology equipment
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

gemäß den Richtlinien 2004/108/EG (Elektromagnetische Verträglichkeit), 2006/95/EG (Niederspannungsrichtlinie), 2011/65/EU (Beschränkung der Verwendung bestimmter gefährlicher Stoffe) und 93/68/EWG (CE Kennzeichnung) sowie deren Ergänzungen.

following the provisions of the directives 2004/108/EC (electromagnetic compatibility), 2006/95/EC (low voltage directive), 2011/65/EU (restriction of the use of certain hazardous substances) and 93/68/EEC (CE marking) and its amendments.

Bad Pyrmont, den 02.09.2014



Günter Meinberg
Managing Director