

## TECHNICAL REFERENCE

### LANTIME M100 GPS

#### Railmount NTP Server

19th May 2016

Meinberg Radio Clocks GmbH & Co. KG



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# 1 Imprint

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Date: 2015-11-10

## 2 Safety Instructions for Building-in Equipment








This building-in equipment has been designed and tested in accordance with the requirements of Standard IEC60950-1 "Safety of Information Technology Equipment, including Electrical Business Equipment".

During installation of the building-in equipment in an end application (i.e. rack) additional requirements in accordance with Standard IEC60950-1 have to be taken into account.

- The building-in equipment is a class 1 - equipment and must be connected to an earthed outlet (TN Power System).
- The building-in equipment has been evaluated for use in office environment (pollution degree 2) and may be only used in this environment. For use in rooms with a higher pollution degree more stringent requirements are applicable.
- The building-in equipment may not be opened.
- Protection against fire must be assured in the end application.
- The ventilation opening may not be covered.
- The equipment/building-in equipment was evaluated for use in a maximum ambient temperature of 40°C.
- For safe operation the building-in equipment must be protected by max 16 A fuse in the power installation system.
- Disconnection of the equipment from mains is done by pulling the mains plug.



## 2.1 Used Symbols

Nr.	Symbol	Beschreibung / Description
1		IEC 60417-5031 Gleichstrom / <i>Direct current</i>
2		IEC 60417-5032 Wechselstrom / <i>Alternating current</i>
3		IEC 60417-5017 Erdungsanschluss / <i>Earth (ground) Terminal</i>
4		IEC 60417-5019 Schutzleiterklemme / <i>Protective Conductor Terminal</i>
5		Vorsicht, Risiko eines elektrischen Schlages / <i>Caution, possibility of electric shock</i>
6		ISO 7000-0434 Vorsicht, Risiko einer Gefahr / <i>Caution, Danger</i>
7		2002/96/EC Dieses Produkt fällt unter die B2B Kategorie. Zur Entsorgung muss es an den Hersteller übergeben werden.  <i>This product is handled as a B2B category product. In order to secure a WEEE compliant waste disposal it has to be returned to the manufacturer.</i>

### CE marking

This device follows the provisions of the directives 93/68/EEC



### 3 Global Information LANTIME M100/GPS

The LANTIME (Local Area Network Time Server) provides a high precision time base to a TCP/IP network (Stratum-1-Server). The NTP (Network Time Protocol) is used to synchronize all NTP clients with the reference. The several LANTIME variants differ from each other by the time reference and output configuration. A GPS or combined GPS/GLONASS receiver, a long wave receiver (like DCF77, MSF or WWVB) or an IRIG time code receiver can be integrated as an internal reference as well as a combination of these references (hybrid system). External references are also possible.

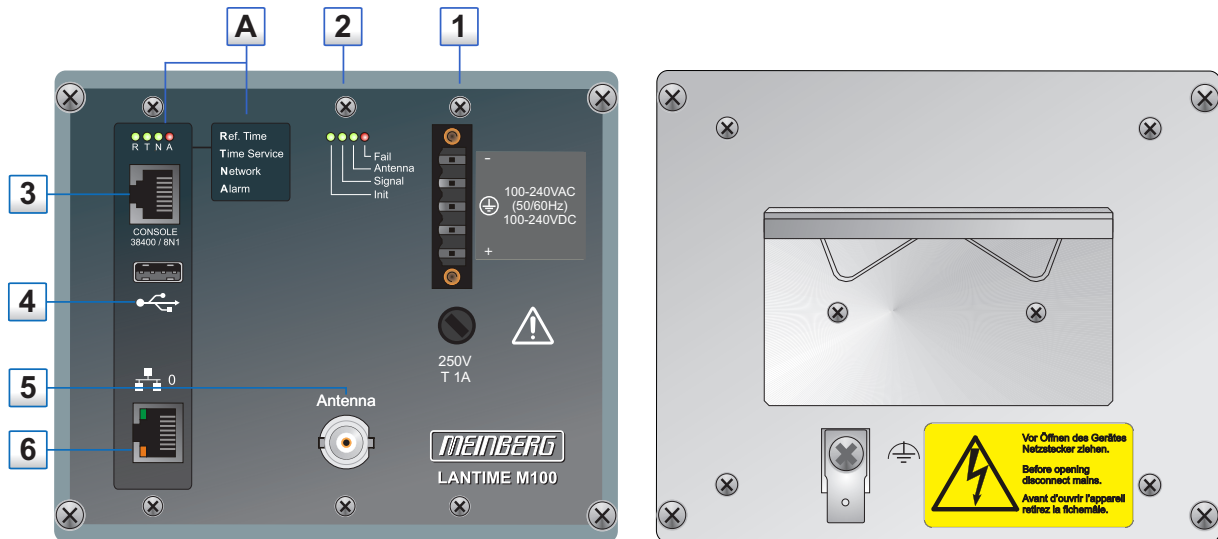
The LANTIME system is a set of equipment composed of an integrated GPS receiver, a single-board computer and a power supply, all installed in a metal 19 inch modular chassis and ready to operate. A simplified LINUX operating system is installed on the single-board computers flash disk. Eight push buttons and a display can be used to configure and monitor the time server.

After the network connection has been established the time server can also be configured and monitored remotely from a workstation via TELNET or FTP. An integrated web server enables access to the LANTIME by using an ordinary web browser.





## 5 M100 - Front connectors



### A.

#### "Ref. Time"

green: the reference clock (e.g. build-in GPS) provides a valid time  
 red: the reference clock does not provide a valid time

#### "Time Service"

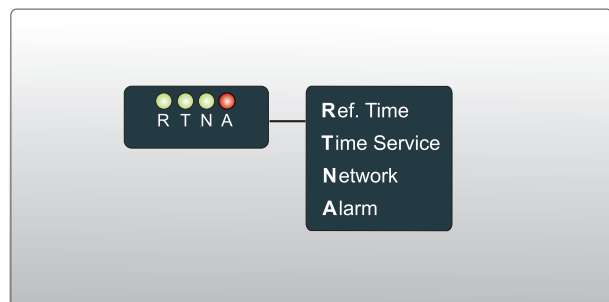
green: NTP is synchronized to the reference clock, e.g. GPS  
 red: NTP is not synchronized or switched to the "local clock"

#### "Network"

green: all monitored network interfaces are connected ("Link up")  
 red: at least one of the monitored network interfaces is faulty

#### "Alarm"

off: no error  
 red: general error



## 5.1 Power connect

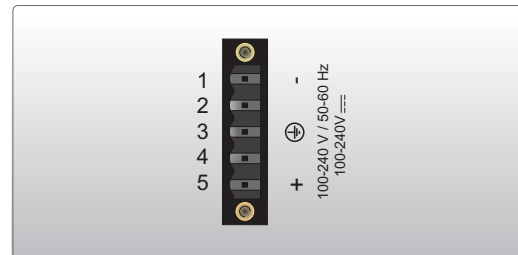
**Input Voltage Range:** 100-240 V AC, 50 – 60Hz  
100-240 V DC

**Input Current:** 0,5 A<sub>max</sub>

**Input Fuse:** 250 V / 1 A, SlowBlow

**Connector:** 5pin. DFK

**Pin Assignment:**  
1: VCC -  
2: not connected  
3: GND (Ground)  
4: not connected  
5: VCC +



## 5.2 Status LEDs

### Init

blue: Initialisation phase

green: "warmed up" – oscillator is adjusted

### Signal

green: positioning complete

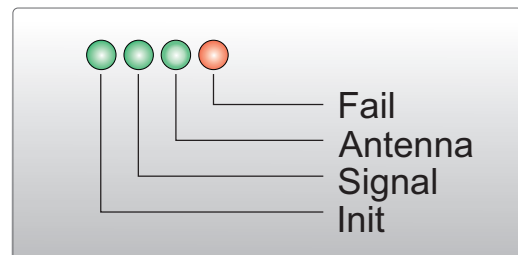
### Antenna

red: no synchronization resp. no antenna connected or short circuit on the antenna line

green: antenna connected and clock is synchronized

### Fail

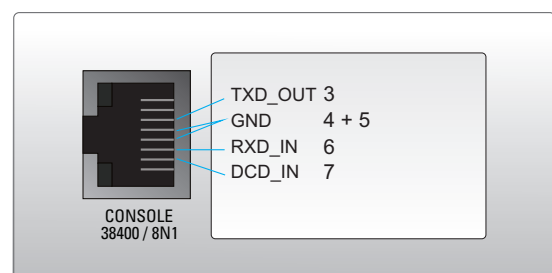
red: no synchronization



## 5.3 Terminal

To connect a serial terminal (according to the device model), use the RJ45 connector of the LAN-CPU. Via the serial terminal connection it is possible to configure parameters with a command line interface. You have to use a CAB-CONSOLE-RJ45 cable to establish a connection to your PC or Laptop computer. You can use e.g. the standard Hyperterminal program shipped with your Windows operating system. Configure your terminal program with 38400 Baud, 8 Databits, no parity and 1 Stopbit. The terminal emulation have to set to VT100. After connecting to the timeserver there will be displayed the login message (press RETURN for first connection:

(default user: root; password: timeserver).



## 5.4 USB Port

All devices of the LANTIME M-Series dispose a USB interface, which can be used to plug in a USB Stick. The USB Stick can be deployed for the following tasks:

- to lock the keys on the LC-Display, to prevent unauthorized access
- to save the LANTIME configuration
- to transfer the configuration between several LANTIMES
- to save log files



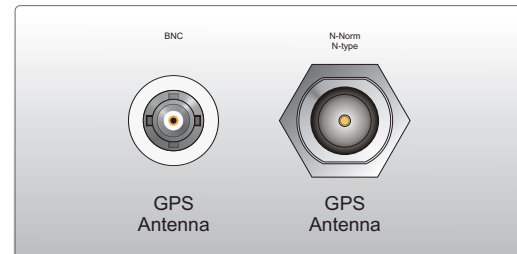
## 5.5 GPS Antenna

**Cable:** shielded coax

**Cable Length:** max. 300m to RG58,  
max. 700m to RG213

**Connector:** BNC female or N-type female

**Input GPS:** Antenna circuit  
1000 V DC insulated



**Local Oscillator to Converter Frequency:** 10 MHz <sup>1</sup>

**First IF Frequency:** 35.4 MHz <sup>1</sup>

<sup>1</sup>) these frequencies are transfered via the antenna cable.

**Power Requirements:** 12V ... 18V, 100mA (via antenna cable)

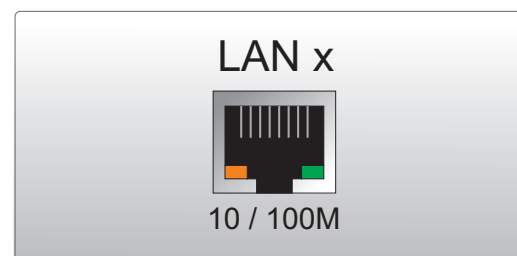
## 5.6 10/100base-T Ethernet (IEEE 803.2)

**Link Speed:** 10/100 MBit

**Connector Type:** 8P8C (RJ45)

**Cable:** CAT 5.0

**Duplex Modes:** Half/Full/Autonegotiaton



## 6 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  $8^\circ$  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  $55^\circ$  North and  $55^\circ$  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 GPS 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). However, we recommend an indoor installation, as short as possible after wall entering of the antenna cable, to minimize the risk of overvoltage damage by lightning for example.

### 6.1 Example:

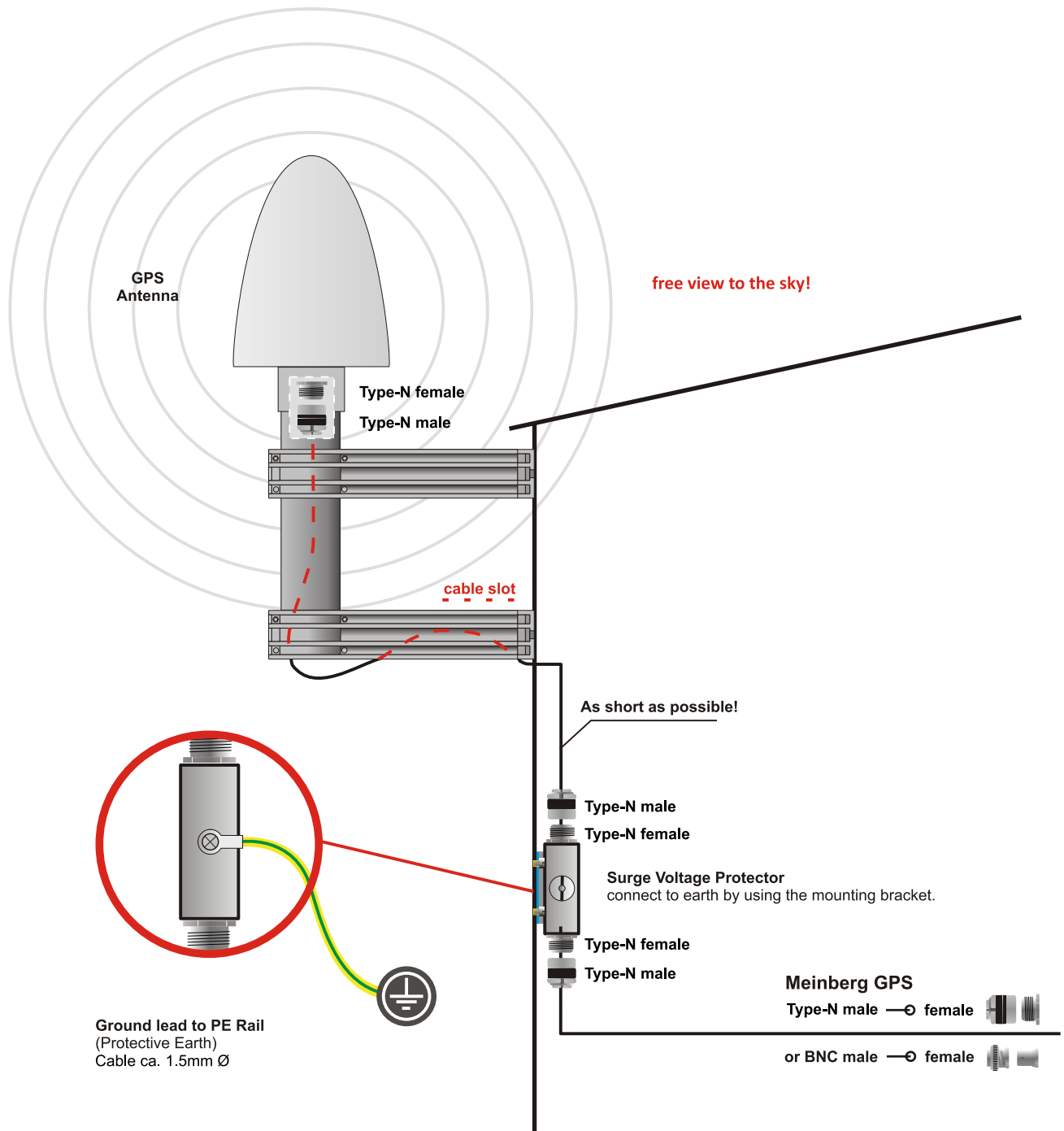
Type of cable	diameter Ø [mm]	Attenuation at 100MHz [dB]/100m	max lenght. [m]
RG58/CU	5mm	17	300 <sup>(1)</sup>
RG213	10.5mm	7	700 <sup>(1)</sup>

(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

## 6.2 Antenna Assembly with Surge Voltage Protection

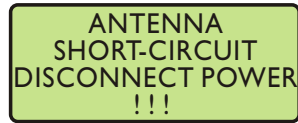
Optional a surge voltage protector for coaxial lines is available. The shield has to be connected to earth as short as possible by using the included mounting bracket. Normally you connect the antenna converter directly with the antenna cable to the system.



## 6.3 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 black border and a light green background. It contains the text "ANTENNA SHORT-CIRCUIT DISCONNECT POWER" in black, uppercase letters, followed by three exclamation marks "!!!".

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<sub>DC</sub> .

## 7 WEEE Compliance

### Compliance with EU Directive 2002/95/EC (RoHS)

We hereby declare that this product is conform to the European Directive 2002/95/EC, "Restrictions of Hazardous Substances in Electrical and Electronic Equipment". We ensure that electrical and electronic products sold in the EU do not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs) above the legal threshold.



### WEEE status of the product

This product is handled as a B2B (Business to Business) category product. In order to secure a WEEE compliant waste disposal it has to be returned to the manufacturer. Any transportation expenses for returning this product (at its end of life) have to be incurred by the end user, whereas Meinberg will bear the costs for the waste disposal itself.



## 8 Declaration of Conformity

### Konformitätserklärung

Doc ID: LANTIME M100/GPS-2015-11-10

**Hersteller**                                      Meinberg Funkuhren GmbH & Co. KG  
*Manufacturer*                                      Lange Wand 9, D-31812 Bad Pyrmont

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

**Produktbezeichnung**                      LANTIME M100/GPS  
*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 60950-1:2006                                      Safety of information technology equipment  
(+A11:2009 +A12:2011)

EN 50581:2012                                      Technical documentation for the assessment of electrical and electronic products  
with respect to the restriction of hazardous substances

gemäß den Richtlinien 2014/30/EU (Elektromagnetische Verträglichkeit), 2014/35/EU (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 2014/30/EU (electromagnetic compatibility), 2014/35/EU (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, 2015-11-10

  
Günter Meinberg  
Managing Director