



Meinberg Radio Clocks

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LANTIME M400/GPS/PTP: PTPv2 / IEEE 1588-2008 Grandmaster Clock and NTP Time Server with integrated GPS radio clock

Network Time Server with GPS Reference Clock for Industrial Applications

The LANTIME M400/GPS/PTPv2 Time Server offers an unparalleled flexibility and versatility and provides accurate time to your network in a compact and full-featured DIN railmount package for industrial applications such as process control and industrial automation systems. The LANTIME M400 includes an LC-Display and keypad and an extremely broad range of available options.

The M400/GPS/PTPv2 synchronizes all PTPv2 / IEEE 1588-2008 compatible clients and systems either NTP- or SNTP-compatible and uses a built-in Meinberg GPS radio clock as its reference time source. A highly stable and precise oscillator is capable of bridging interferences or a temporary loss of reception.

Important Note

This product is no longer available and may have been replaced by a newer product. We will, of course, continue to provide support for units that have already been purchased and are still in use. Please contact our [1][Sales Department](#) for further details.

This product has been discontinued and has been replaced with: [2]

Key Features

- Synchronization of IEEE1588-2008 (PTPv2) compatible clients
- Supported PTP Profiles: - Default Profile (Multicast, Unicast or Hybrid) - ITU-T G.8265.1 Telecom Profile - IEEE C37.238-2011 Power Profile
- Synchronization of NTP and SNTP compatible clients
- Web-based status and configuration interface and console-based graphical configuration utility
- Supported networking protocols: IPv4, IPv6, HTTPS, HTTP, SSH, TELNET, SCP, SFTP, FTP, SYSLOG, SNMP
- Alert-Notification system of status change by Email, WinMail, SNMP or an external connected display
- Full support for SNMP v1, v2c und v3 with dedicated SNMP daemon for configuring/status monitoring

- of system using SNMP traps
- USB Port for installing firmware updates, locking frontpanel menu access and backup/restore of configuration and log files
- Included GPSANTv2 antenna uses downconverter technology to enable long transmission routes of up to 1100 m (1200 yards)

Description

Being a very stable IEEE 1588-2008 Grandmaster clock, the LANTIME M400/GPS/PTPv2 not only provides a highly accurate source of synchronization for PTP clients ("slaves" like the PTP270PEX), it additionally introduces the absolute time ("current time of day") to your PTP networks.

The PTP V2 multicast implementation of the LANTIME is fully compliant to the IEEE 1588-2008 standard and therefore provides PTP management messages as well.

The LANTIME M400/GPS/PTPv2 is available with GPS or an combined GPS / GLONASS receiver and can be customized with a lot of different options to deliver exactly the feature set that is required for a certain application/environment.

The ultra compact form factor enables this product to become the ideal time and frequency source in installations where every millimeter counts. It is available in two different sizes: the standard M400 chassis (105x189x146mm) with one option slot and the XL version (105x189x166mm) that offers an additional slot to provide even more outputs and interfaces. With up to 5 (M400) and up to 9 (nine!) Ethernet ports, this NTP appliance offers the world's highest port density.

The GNU/Linux operating system of the LANTIMEs SBC (Single Board Computer) has been optimized to ensure a high level of security and reliability.

As with most LANTIME M-Series models, a large LC-Display showing the state of the internal GPS receiver and the NTP/PTP subsystem is combined with three bicolor LEDs (green/red) that indicate the status of the three main components: Reference Time (GPS), Time Synchronization Service (NTP/PTP) and Network (Link status). A fourth red LED is labelled ALARM and can be configured to signal any event that is covered by the notification handling routines.

In order to configure the system, an extensive but straightforward html interface can be accessed with any HTML compatible browser. A text based and menu driven setup utility can alternatively be started from the shell prompt logging in to the unit via a serial console port, Telnet or SSH.

The security-related features of LANTIME time servers satisfy highest demands. The time synchronization data can be reliably signed and secured by symmetric keys (MD5) and the NTP autokey procedures. This protects the clients against manipulated time and man-in-the-middle attacks and allows them to verify that the NTP packets they received were sent by the LANTIME. Additionally the whole LANTIME configuration can be done by using encrypted channels (e.g. SSH, HTTPS or SNMPv3). Every unused/unneeded protocol can be disabled in order to reduce possible points of attack.

Integrating LANTIME time servers into an existing network management system is easy, due to the extensive SNMP interface, supporting SNMP versions V1, V2.c and V3. Besides the monitoring of all relevant system parameters (including operating system parameters, network interface statistics), it offers read-only access to detailed GPS and NTP status information and can be set up to allow to authenticated systems read-write access to the complete system configuration. In order to allow automatic/scripted recovery and control, a number of system functions are available via SNMP, too (e.g. rebooting the system).

LANTIME time servers are designed to be deployed in IPv6 networks, the NTP time synchronization as well as the configuration interfaces (Web-based, SSH and SNMP) comes with IPv6 support. You can assign several IPv6 addresses and the system supports automatic configuration by IPv6 autoconf.

The LANTIME M400 GPS is equipped with a high precision oscillator "OCXO HQ" (look at oscillator options for details). The oscillator determines the holdover characteristics (e.g. when a reference source signal like GPS is disturbed or jammed). For applications with higher stability/holdover requirements the "OCXO DHQ" oscillator option is available. You can choose this oscillator together with the XL housing type.

Because of its modular system architecture it is possible to equip a LANTIME M400 time server with a number of different reference time sources. Optionally several additional frequency-, serial string- and pulse outputs are available as well as power supplies for additional input voltage ranges.

In addition to the standard electrical interfaces a lot of output signals can be delivered on optical ports, too.

Characteristics

Receiver Type	6 channel GPS C/A-code receiver
Status Indicators	Four bicolor LEDs indicating: <ul style="list-style-type: none"> - Reference time status - Time service status - Network link status - Alarm states
Type of Antenna	Included [3] GPSANTv2 antenna with innovative downconverter technology that allows transmission routes of up to 300 m using RG58 cable, 700 m using RG213 cable, and 1100 m using H2010 Ultraflex cable
Display	LC Display, 4 x 16 characters
Control Elements	Eight push buttons to set up basic network parameters and to change receiver settings
Frequency Outputs	10 MHz via female BNC connector, TTL into 50 Ohm Accuracy depends on oscillator (standard: OCXO-HQ), look at [4] oscillator options
Pulse Outputs	Pulse Per Second (PPS), TTL level, pulse width: 200 ms
Accuracy of Pulse Outputs	Depends on oscillator option: Note: OCXO DHQ in XL housing only!
Interface	Single serial RS-232 interface
Serial Time String Output	Baud rates: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud Data formats: 7N2, 7E1, 7E2, 7O1, 8E1, 8N1, 8O1 Time strings: [5] Meinberg Standard Time String , SAT, Uni Erlangen (NTP), SPA, RACAL, Sysplex, NMEA0183 (RMC, GGA, ZDA), Meinberg GPS, COMPUTIME, ION oder [6] Capture String
Alarm output	Synchronous state of the module, relay output (changeover contact)
Network Interface	1 x 10/100 MBit with RJ45 Option: up to 5 x 10/100 MBit with RJ45 (XL version) 1 x 10/100 MBit with RJ45, IEEE 1588 (PTPv2)

Universal Serial Bus (USB) Ports	1x USB Port: - install firmware upgrades - backup and restore configuration files - copy security keys - lock/unlock front keys
Power Consumption	30W
Operating Voltage	AC/DC power supply (standard) Rated voltage range: UN = 100-240 V AC (50-60 Hz) / 100-240 V DC Max. voltage range: Umax = 90-264 V AC (47-63 Hz) / 100-250 V DC Low DC (option): Rated voltage: UN = 48 V DC Max. voltage range: Umax = 20-60 V DC
Supported Time String Formats	Meinberg Standard Timestring, Uni Erlangen Timestring, SYSPLEX Timer, NMEA, Computime, ABB-SPA, SAT, Arbiter
Form Factor	Fischer aluminium housing for DIN mounting rail
CPU	i386 compatible 500Mhz CPU, 128 MB RAM
Operating System of the SBC	Linux with nano kernel (incl. PPSkit)
Network Protocols OSI Layer 4 (Transport Layer)	TCP, UDP
Network Protocols OSI Layer 7 (Application Layer)	Telnet, FTP, SSH (including SFTP, SCP), HTTP, HTTPS, syslog, SNMP
Internet Protocol (IP)	IPv4, IPv6
Network Autoconfiguration Support	IPv4: Dynamic Host Configuration Protocol - DHCP (RFC 2131) IPv6: Dynamic Host Configuration Protocol - DHCPv6 (RFC 3315) and Autoconfiguration Networking - AUTOCONF (RFC 2462)
Network Time Protocol (NTP)	NTP v2 (RFC 1119), NTP v3 (RFC 1305), NTP v4 (RFC 5905) SNTP v3 (RFC 1769), SNTP v4 (RFC 4330) MD5 Authentication and Autokey Key Management
Time Protocol (TIME)	Time Protocol (RFC 868)
IEC 61850	Synchronization of IEC 61850-compliant devices using SNTP
Hypertext Transfer Protocol (HTTP)	HTTP/HTTPS (RC 2616)

Secure Shell (SSH)	SSH v1.3, SSH v1.5, SSH v2 (OpenSSH)
Telnet	Telnet (RFC 854-RFC 861)
Simple Network Management Protocol (SNMP)	SNMPv1 (RFC 1157), SNMPv2c (RFC 1901-1908), SNMP v3 (RFC 3411-3418)
Physical Dimensions	Standard: 105 x 189 x 146 mm XL-Version: 105 x 189 x 166 mm
Supported Temperature	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
Supported Humidity	Max. 85 % (non-condensing) at 40 °C
Contents of Shipment	Included in delivery is our [3] GPS antenna incl. converter unit and 20 m GPS antenna cable (RG58).
Technical Support	Meinberg offers free lifetime technical support via telephone or e-mail.
Warranty	Three-year warranty
Firmware Updates	Firmware is field-upgradeable, updates can be installed directly from the unit or via a remote network connection. Software updates are provided free of charge for the lifetime of your Meinberg product.
RoHS Status of Product	This product is fully RoHS-compliant.
WEEE Status of Product	This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it can be returned to the manufacturer. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will bear the costs for the waste disposal itself.
Additional Information	Additional information about the Meinberg LANTIME family of NTP time servers and other LANTIME models can be found on the [7] LANTIME overview page .

Manual

The English manual is available as a PDF file: [8][Download \(PDF\)](#)

Links:

[1] <mailto:sales@meinberg.de>

[2] <https://www.meinbergglobal.com/english/products/ims-lantime-m500.htm>

[3] <https://www.meinbergglobal.com/english/products/gps-antenna-converter.htm>

[4] <https://www.meinbergglobal.com/english/specs/gpsopt.htm>

[5] <https://www.meinbergglobal.com/english/specs/timestr.htm>

[6] <https://www.meinbergglobal.com/english/specs/capstr.htm>

[7] <https://www.meinbergglobal.com/english/products/ntp-time-server.htm>

[8] https://www.meinbergglobal.com/download/docs/manuals/english/m400_gps-ptpv2.pdf