



Meinberg Radio Clocks

Lange Wand 9
31812 Bad Pyrmont, Germany
Phone: +49 (5281) 9309-0
Fax: +49 (5281) 9309-30
<http://www.meinberg.de>
info@meinberg.de

LANTIME M300/MRS: NTP Time Server synchronized by GPS/1PPS/10MHz/IRIG/NTP

The LANTIME M300/MRS (Multi Reference Source) NTP time server supports a broad range of reference time sources like GPS, 1PPS, 10MHz, IRIG time codes (both DCLS and AM) or upstream NTP servers. A highly stable and precise oscillator is capable of bridging interferences or a temporary loss of reception. In totally isolated networks without any available external reference signal, the MRS utilizes its OCXO HQ to maintain a stable time base. The time can therefore be manually set during initial configuration.

Key Features

- Accepts a large number of sync references: GPS, 1PPS, 10MHz, IRIG (DCLS and AM) and NTP
- Synchronization of NTP and SNTP compatible clients
- Web based status and configuration interface [1]([Demo](#)) 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 SNMP v1,v2,v3 support with own SNMP-daemon for status and configuration and SNMP Trap messages
- USB port for performing updates, lock front panel, and backup/restore configuration and log files.
- Two independant RJ-45 ethernet interfaces 10/100 MBit

Description

Meinberg LANTIME time server are used around the world to provide accurate time to networks of any size. The LANTIME M300/MRS is a very reliable and accurate time source for all systems either NTP- or SNTP-compatible and it uses a built-in ultra-stable oscillator as its primary reference time source.

The Meinberg MRS technology (Multi Reference Sources) enables you to utilize one or more time and frequency references in prioritized order defined by your individual requirements. The Intelligent Reference Switching Algorithm (IRSA) developed by Meinberg engineers ensures that switching from a highly accurate reference source (e.g. GPS) to a less accurate one (e.g. IRIG or NTP) is delayed as long as the internal ultra stable oscillator is capable of maintaining an accuracy level that is better than the one of the next available reference source in the priority list.

In lab environments the MRS technology offers a flexible solution to changing availability of different synchronization sources and for highly critical operative systems the possibility to use multiple independent sync references allows you to fulfill redundancy requirements of your network synchronization solution.

Another field of applications for MRS technology is the monitoring and measurement of synchronization sources, e.g. determining and logging the accuracy of an IRIG generator or a PPS source.

The MRS version of the LANTIME M300 comes with a high quality OXCO and is designed to act as a reliable time source in applications where no antenna can be installed. The internal OCXO-HQ can be fully disciplined by utilizing one or more remote NTP time servers or the other input sources. In installations where no source of time is available, the LANTIME M300 MRS can be run in a fully independent mode which requires setting the time manually during initial configuration. Such a free running MRS (i.e. without any available external reference like GPS or NTP) develops a maximum time error of less than one second per year.

All outputs of the M300, including PPS, 10MHz and the Sysplex Timer output are fully functional and stable with all possible references (NTP, GPS, 1PPS, 10MHz, IRIG or free running).

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

A large LC display shows the state of the internal GPS receiver and the NTP subsystem. Three LEDs (green/red) indicate the status of the three main components: Reference Time (GPS), Time Synchronization Service (NTP) 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.

The configuration of the system can be managed by using a standard web browser for accessing the extensive but straightforward html interface. Alternatively a text based and menu driven setup utility can be started from the shell prompt after logging into the unit via Telnet or SSH.

The security-related features of Meinberg LANTIME time servers satisfy the 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.

In order to support network management systems our LANTIME time servers offer an extensive SNMP interface, which can be accessed by SNMP V1, V2.c and V3. It allows the monitoring of all relevant system parameters (including operating system parameters, network interface statistics, detailed GPS and NTP status information as well as the complete system configuration) and can be used to alter the LANTIME configuration via SNMP set commands, too.

LANTIME time servers are designed to be deployed in IPv4, IPv6 and dual stack networks, the NTP time synchronization as well as the configuration interfaces (Web-based, SSH and SNMP) comes with full IPv6 support. You can assign several static IPv6 addresses and the system supports automatic configuration by IPv6 autoconf.

Please note that the GPS antenna is not included in the standard scope of delivery and has to be ordered separately, if

you are planning to use GPS as a synchronization source.

Characteristics

Type of receiver	6 channel GPS C/A-code receiver
Type of antenna	Remote powered [2] GPS antenna/converter unit , up to 300m distance to antenna with RG58 and up to 700m distance with RG213 cable
Display	LC-display, 2 x 40 characters, with backlight
Control elements	Eight push buttons to set up basic network parameters and to change receiver settings
Status info	Four bicolor LEDs showing status of: <ul style="list-style-type: none"> - reference time - time service - network - alarm
Input signal	1x GPS Antenna Input 1x PPS in 1x 10MHz in 1x IRIG DCLS in 1x IRIG AM in
Pulse Synchronization Input Signals	1 Pulse Per Second, TTL (BNC)
Frequency inputs	1x 10 MHz, TTL 50 Ohm (BNC)
IRIG Time Code Input	IRIG-B123, B122, B003, B002, B006, B007, B126, B127, IEEE 1344 and AFNOR NFS 87-500
Frequency outputs	10 MHz via BNC-Connector TTL 50 Ohm Accuracy is depending on oscillator (standard: OCXO HQ), see [3] oscillator list
Pulse outputs	Pulse Per Second (PPS), TTL level, pulse width: 200ms
Accuracy of pulse outputs	< ±100ns (OCXO HQ, OCXO DHQ)
Interface	Two independent serial RS232-interfaces, menu configurable
Data format of interfaces	Baudrate: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud data format: 7N2, 7E1, 7E2, 8E1, 8N1, 8N2 Time telegram: [4] Meinberg Standard-Telegram , SAT, Uni Erlangen (NTP), SPA, NMEA0183 (RMC), COMPUTIME or [5] capture-telegramm
Alarm output	Synchronous state of the module, relay output (changeover contact)
Network Interface	2 x 10/100 MBit with RJ45
Power supply	85-264VAC (50/60Hz)
Universal Serial Bus (USB) Ports	1x USB Port in front panel: <ul style="list-style-type: none"> - install firmware upgrades - backup and restore configuration files - copy security keys - lock/unlock front keys

Supported Time String Formats	Meinberg Standard Timestring, Uni Erlangen Timestring, SYSPLEX Timer, NMEA, Computime, ABB-SPA, SAT, Arbiter
Single-Board-Computer	i386 compatible 500Mhz CPU, 256 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 (incl. SFTP, SCP), HTTP, HTTPS, SYSLOG, SNMP
Internet Protocol (IP)	IP v4, IP v6
Network Autoconfiguration Support	IPv4: Dynamic Host Configuration Protocol - DHCP (RFC 2131) IPv6: Autoconfiguration Networking - AUTOCONF
Network Time Protocol (NTP)	NTP v2 (RFC 1119), NTP v3 (RFC 1305), NTP v4 (no RFC) SNTP v3 (RFC 1769), SNTP v4 (RFC 2030) MD5 Authentication and Autokey Key Management
Time Protocol (TIME)	Time Protocol (RFC 868)
Daytime Protocol (DAYTIME)	Daytime Protocol (RFC 867)
IEC 61850	Synchronization of IEC 61850 compliant devices by 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)
Power consumption	20W
Form Factor	Three different variants are available, standard version is: 19" module case, height: 44.5mm (1U), width: 483mm (84HP), depth: 350mm (Pic. middle) optional available: /TGP: 19" desktop case, height: 157mm (3U), width: 257mm (42HP), depth: 316mm (Pic. top) /BGT: 19" module case, height: 132mm (3U), width: 483mm (84HP), depth: 260mm (Pic. bottom)
Ambient temperature	0 ... 50°C / 32 ... 122°F

Humidity	Max. 85%
Scope of supply	Time Server, power cable, printed Quick-Start manual (detailed reference manual is stored as a PDF file inside the unit and can be downloaded, read and printed with a webbrowser)
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 at 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 the product	This product is fully RoHS compliant
WEEE status of the product	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. 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.
Additional Information	Additional information about the Meinberg LANTIME family of NTP time servers and other LANTIME models can be found on the [6] LANTIME NTP Time Server Family Page

Manual

The english manual is available as a PDF file: [7][Download \(PDF\)](#)

Links:

[1] <http://www.meinberg.de/cgi-bin/main.cgi>

[2] <http://www.meinberg.de/english/products/gpsant.htm>

[3] <http://www.meinberg.de/english/specs/gpsopt.htm>

[4] <http://www.meinberg.de/english/products/./specs/timestr.htm>

[5] <http://www.meinberg.de/english/products/./specs/capstr.htm>

[6] <http://www.meinberg.de/english/products/./ntp-time-server.htm>

[7] http://www.meinberg.de/download/docs/manuals/english/m300_mrs.pdf