



Meinberg Radio Clocks

Auf der Landwehr 22
31812 Bad Pyrmont, Germany
Phone: +49 (5281) 9309-0
Fax: +49 (5281) 9309-30
<http://www.meinberg.de>
info@meinberg.de

LANTIME M600/GPS: High End NTP Time Server with integrated GPS radio clock

The Meinberg LANTIME time server is used around the world to provide accurate time to networks of any size. It synchronizes all 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. The standard M600 model already offers a broad range of interfaces and can be customized to meet the special requirements of your application.

Key Features

- 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 in the front panel to perform updates, to authenticate, save configuration and log files.
- Antenna connected with up to 300m of standard coaxial cable RG58
- Four independant RJ-45 ethernet interfaces 10/100 MBit
- Optional expansions and/or configurations available: [2][Product Options](#)

Description

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 VF 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 done by using a standard web browser to access 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 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.

In order to support network management systems the 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 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 M600 GPS is equipped with high precision oscillator "OCXO LQ" (look at [\[3\]oscillator options](#) for details) as standard. The oscillator determines the holdover characteristics (e.g. when the GPS signal is disturbed or jammed). Oscillator options like "OCXO MQ", "OCXO HQ", "OCXO DHQ" and Rubidium are available to fulfill higher requirements.

Characteristics

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| Type of receiver | 6 channel GPS C/A-code receiver |
| 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) |
| Type of antenna | Remote powered [4] GPS antenna/converter unit , up to 300m distance to antenna with RG58 and up to 600m distance with RG213 cable |
| Display | Vacuum fluorescent graphic display (VFD), 256 x 64 dots |
| Control elements | Eight push buttons to set up basic network parameters and to change receiver settings |
| Status info | Four bicolor LEDs showing status of: - reference time - time service - network - alarm |
| Frequency outputs | 10 MHz via female BNC connector, TTL into 50 Ohm Synthesizer 1/8 Hz up to 10 MHz via female BNC connector, TTL into 50 Ohm Accuracy depends on oscillator (standard: OCXO LQ), look at [3] oscillator options |
| Pulse outputs | Pulse per second (PPS) and pulse per minute (PPM) via female BNC connectors, TTL into 50 Ohm, pulse width: 200msec, active high |
| Accuracy of pulse outputs | Depends on oscillator option: < ±100ns (OCXO MQ, 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: [5] Meinberg Standard-Telegram , SAT, Uni Erlangen (NTP), SPA, NMEA0183 (RMC), COMPUTIME or [6] capture-telegramm |
| Unmodulated time code output | TTL (DCLS) into 50 Ohm via female BNC connector, active high |
| Modulated time code output | IRIG AM sine wave signal via female BNC connector: 3Vpp (MARK), 1Vpp (SPACE) into 50 Ohm |
| Generated time codes | IRIG B002: 100pps, DCLS signal, no carrier, BCD time of year IRIG B122: 100pps, AM sine wave signal, 1 kHz carrier, BCD time of year IRIG B003: 100pps, DCLS signal, no carrier, BCD time of year, SBS time of day IRIG B123: 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day IEEE1344: Code according to IEEE1344-1995, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day, IEEE1344 expansion for date, time zone, daylight saving and leap second in Control Funktionen Segment AFNOR: Code according to NFS-87500, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, complete date, SBS time of day |

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| Alarm output | Synchronous state of the module, relay output (changeover contact) |
| Network Interface | 4 x 10/100 MBit with RJ45 |
| Universal Serial Bus (USB) Ports | 1x USB Port in front panel: - install firmware upgrades - backup and restore configuration files - copy security keys - lock/unlock front keys |
| 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 supply | 85-264VAC (50/60Hz) |
| Power consumption | 20W |
| Ambient temperature | 0 ... 50°C / 32 ... 122°F |

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| Humidity | Max. 85% |
| Scope of supply | Included in delivery is our [4] GPS antenna incl. converter unit , 20m GPS antenna cable (RG58) and a printed manual. |
| 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. |
| Options and Accessories | Optional add-ons and accessories: [2] Product Options |
| Additional Information | Additional information about the Meinberg LANTIME family of NTP time servers and other LANTIME models can be found on the [7] LANTIME NTP Time Server Family Page |

Manual

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

Links:

- [1] <http://www.meinberg.de/cgi-bin/main.cgi>
- [2] <http://www.meinberg.de/english/products/./lantime-m600-gps-options.htm>
- [3] <http://www.meinberg.de/english/products/./specs/gpsopt.htm>
- [4] <http://www.meinberg.de/english/products/gpsant.htm>
- [5] <http://www.meinberg.de/english/products/./specs/timestr.htm>
- [6] <http://www.meinberg.de/english/products/./specs/capstr.htm>
- [7] <http://www.meinberg.de/english/products/./ntp-time-server.htm>
- [8] http://www.meinberg.de/download/docs/manuals/english/m600_ptp.pdf