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LANTIME M400/GPS: Rail Mount NTP Time Server with GPS Clock

NTP Time Server with Reference Clock for Industrial Applications

The LANTIME M400 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 power generation, transmission and distribution (substation automation), process control and industrial automation systems. The successor to the LANTIME AHS and DHS models, the M400 includes an LC-Display and keypad and an extremely broad range of available options.

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 for installing firmware updates, locking frontpanel menu access and backup/restore of configuration and log files
- Antenna connected with up to 300m of standard coaxial cable RG58
- Up to 9 network interfaces

Description

The LANTIME M400 is available with a GPS, PZF(DCF77), MSF and WWVB receiver as well as an IRIG timecode reader 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 densitiy.

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 send 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 "TCXO" (look at [2]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 there are several oscillator options available.

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

Type of receiver	6 channel GPS C/A-code receiver
Type of antenna	Remote powered [3]GPS antenna/converter unit, up to 300m distance to antenna with RG58 and up to 700m distance with RG213 cable
Display	LC-display, 4 x 16 characters
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 Accuracy depends on oscillator (standard: TCXO), look at [2]oscillator options
Pulse outputs	Pulse Per Second (PPS), TTL level, pulse width: 200ms
Accuracy of pulse outputs	Depends on oscillator option: < ±100ns (OCXO MQ, OCXO HQ, OCXO DHQ, Rubidium)
Interface	Single serial RS232 interface
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
Physical dimensions	Standard: 105 x 189 x 146 mm XL-Version: 105 x 189 x 166 mm
Alarm output	Synchronous state of the module, relay output (changeover contact)
Network Interface	1 x 10/100 MBit with RJ45 (up to 8 additional LAN interfaces possible)
Power supply	Standard: 100-240 VDC / 100-240 VAC Optional: 19-72 VDC
Power consumption	30W
Universal Serial Bus (USB) Ports	1x USB Port: - 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)
Form Factor	Fischer aluminium housing for DIN mounting rail
Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%
Scope of supply	Included in delivery is our [3]GPS antenna incl. converter unit, 20m GPS antenna cable (RG58) and product documentation.
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/../specs/gpsopt.htm
[3] http://www.meinberg.de/english/products/gpsant.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/m400_gps.pdf