

LANTIME M250



Product Highlights

- | A powerful Stratum 1 NTP server capable of processing up to 25,000 requests per second
- | Compact 1U chassis for desktop use, adaptable for 19" rack installation (M2xx series rackmount unit required)
- | Engineered to order with a selection of reference receiver module options (e.g., GNSS, DCF77)

High-Performance Time Server for Time & Frequency Synchronization

The LANTIME M250 is designed by Meinberg to offer superior NTP server performance at a competitive price and is constructed to order with an integrated receiver clock specially engineered for optimum synchronization performance.

Meinberg's custom Linux-based LANTIME Operating System (LTOS), a slim & secure OS developed specially for the needs of a time server, powers the LANTIME M250 under the hood, providing access to all the security, network, and monitoring features that you could ever need from an enterprise-grade synchronization appliance.

The powerful Web UI enables you to quickly and easily configure and monitor your LANTIME device, while the CLI provides power users with unparalleled flexibility and efficiency. The comprehensive LTOS REST API provides a complete toolset for your network orchestration and automation needs, and SNMP support allows you to integrate your Meinberg systems into your existing network management system.

Meinberg Funkuhren GmbH & Co. KG
Lange Wand 9
31812 Bad Pyrmont, Germany

✉ sales@meinberg.de

🌐 www.meinbergglobal.com

Phone: +49 5281 9309-0

Meinberg USA Inc.

111 Santa Rosa Ave., Suite 401,
Santa Rosa, CA 95404, USA

✉ info@meinberg-usa.com

🌐 www.meinbergglobal.com

Phone: +1-877-PTP-1588



Basic System Specifications

Processor	Intel Atom E3805 dual-core SoM (1.33 GHz, 1 MB L2 cache, 3 W TDP)
Operating System	Custom LANTIME Operating System Firmware (LTOS) based on Linux 4.x LTS kernel
Main Memory	2 GB DDR3L onboard
Flash Disk	4 GB eMMC Flash

Monitoring & Alarms

Supported Protocols	SNMP v1, SNMP v2, SNMP v3
Notification Channels	Email (SMTP), syslog
Log Access	Logs can be viewed and downloaded in the Web Interface, downloaded via the FTP service, or accessed via the command line interface

NTP Support

NTP Protocols	NTP v2 (RFC 1119), NTP v3 (RFC 1305), NTP v4 (RFC 5905), SNTP v3 (RFC 1769), SNTP v4 (RFC 2030)
Security Features	Symmetric key-based authentication using MD5, SHA-1, or AES-128-CMAC hashes NTP v4 Autokey (private/public key pairs) NTS encryption (RFC 8915) for NTP v4 in unicast client mode
Performance	Up to 25,000 NTP requests per second

Management Interfaces

Network	Web Interface (HTTP/HTTPS TLS v1.3) SSH v2 (command line interface) Telnet (command line interface) REST API (HTTP/HTTPS TLS v1.3)
Serial Console	8P8C (“RJ45-like”) connector for serial terminal access
Local	Front display & function keys

“TCXO” Type Oscillator

The LANTIME M250 is shipped as standard with a “TCXO” (temperature-controlled crystal oscillator), which provides excellent holdover performance if your server loses synchronization with its upstream reference for any reason:

PPS Accuracy	< ±100 ns
Short-Term Frequency Stability at 10 MHz	± 2 × 10 ⁻⁹ Hz where t = 1 second
10 MHz Frequency Accuracy (GNSS-Synchronized, 24 Hours)	± 1 × 10 ⁻¹¹ Hz (± 0.1 mHz)
10 MHz Frequency Accuracy (after 24 Hours in Free-Run Mode)	± 1 × 10 ⁻⁷ Hz (± 1 Hz)
10 MHz Frequency Accuracy (after 1 Year in Free-Run Mode)	± 1 × 10 ⁻⁶ Hz (± 10 Hz)
Phase Drift (after 24 Hours in Free-Run Mode)*	± 4.3 ms
Phase Drift (after 7 Days in Free-Run Mode)*	± 128 ms
Phase Drift (after 30 Days in Free-Run Mode)*	± 1.1 s
Phase Drift (after 1 Year in Free-Run Mode)	± 16 s
Phase Noise	- 1 Hz: < -60 dBc/Hz - 10 Hz: < -90 dBc/Hz - 100 Hz: < -120 dBc/Hz - 1 kHz: < -130 dBc/Hz
Temperature-Dependent Drift	± 1 × 10 ⁻⁶ (-20 °C to 70 °C, -4 °F to 158 °F)

* Full holdover performance requires the system to have been synchronized for 24 hours previously.

Oscillator Options

The LANTIME M250 may also be shipped on request with a more powerful holdover solution; the options available and a comparison of their performance relative to the TCXO oscillator are listed below:

Type	Phase Drift after 24 Hours in Free-Run Mode*	Phase Drift after 1 Year in Free-Run Mode*
TCXO	± 4.3 ms	± 16 s
OCXO SQ	± 65 µs	± 4.7 s
OCXO HQ	± 10 µs	± 788 ms
OCXO DHQ	± 4.5 µs	± 158 ms

* Full holdover performance requires the system to have been synchronized for 24 hours previously.

Available Receiver Types

GPS*	12-channel L1 C/A code receiver for reception of signals from the GPS satellite constellation. Requires a Meinberg GPSANTv2 antenna.
GNS-UC*	72-channel receiver for reception of signals from the GPS (L1 C/A code) and Galileo (E1 B/C) satellite constellations. Requires a Meinberg GPSANTv2 antenna.
GNS	72-channel multi-GNSS receiver for reception of signals from the GPS (L1), Galileo (E1 B/C), BeiDou (B1), and GLONASS (L1OF) satellite constellations. Requires a supported L1 antenna.
PZF	Long-wave receiver with quadrature demodulator for reception of signals from the DCF77 long-wave transmitter in Mainflingen, Germany. Requires a Meinberg AW02 or AI01 antenna.

* These receivers require the use of a Meinberg GPSANTv2 antenna (included with the system as standard).

Operating Specifications

Acoustic Noise Emissions	0 dB(A)
Operating Temperature	0 °C to 50 °C (32 °F to 122 °F)
Storage Temperature	-20 °C to 70 °C (-4 °F to 158 °F)
Relative Humidity	Max. 95 % at 40 °C (104 °F), non-condensing
Operating Altitude	Max. 4000 m / 13123 ft (above sea level)

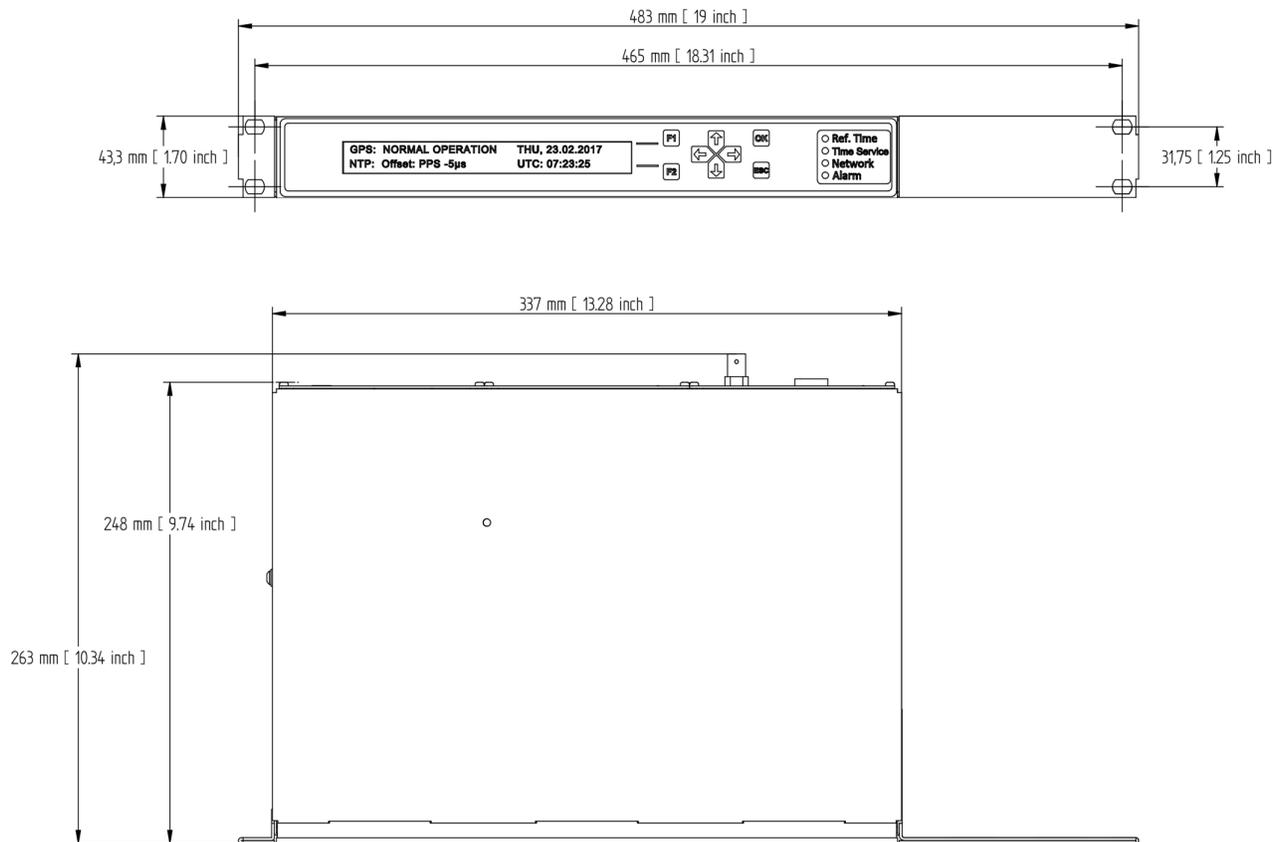
Support & Compliance

Technical Support	Free lifetime support via telephone and email, including firmware updates
Warranty	Three-year warranty, extendable upon request
Firmware Updates	Firmware is field-upgradable; updates can be installed from a connected USB storage medium, via the Web Interface (upload via a web browser), or via the CLI (download from a server). The LANTIME Operating System Firmware LTOS allows you to install multiple firmware versions onto the device concurrently and select which one should be used when the system starts.
Conformity Declarations	CE, UKCA
RoHS Compliance	The product is fully RoHS-compliant.
WEEE Status	The purchase of this product is considered to be a "B2B" transaction (non-household product) for the purposes of the EU Waste of Electrical and Electronic Equipment Directive; the product falls under Category 6, "Small IT and Telecommunications Equipment". For disposal, it can be returned to the manufacturer to ensure WEEE compliance. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will cover the costs for the waste disposal itself.

Accessories Included

- | Two-part power cable (5-pin MSTB to IEC 60320 C14 cable, IEC 60320 C13 cable to local mains plug) or 5-pin MSTB connector for assembly of a suitable power cable for DC power sources.
 - | Printed setup guide explaining the basic setup process and antenna installation.
 - | Models with a GPS or GNS-UC clock receiver include a Meinberg GPSANTv2 antenna for outdoor installation, a mounting kit containing all the accessories required to mount the antenna on a pole or wall, and a 20 m (65.6 ft) RG58 coaxial cable with pre-fitted connectors as standard*.
 - | Models with a GNS clock receiver include a Meinberg GNMANTv2 antenna for outdoor installation, a mounting kit containing all the accessories required to mount the antenna on a pole or wall, and a 20 m (65.6 ft) Speedfoam 240HFJ coaxial cable with pre-fitted connectors as standard*.
 - | Models with a PZF clock receiver include a Meinberg AW02 long-wave antenna, a mounting kit for outdoor installation, and a 10 m (32.8 ft) RG58 coaxial cable with pre-fitted connectors as standard*.
 - | A rackmount kit for installation in a standard 19" rack.
- * Meinberg also offers customized antenna cables to accommodate your specific installation requirements. Please reach out to your Meinberg Sales Representative for more information.

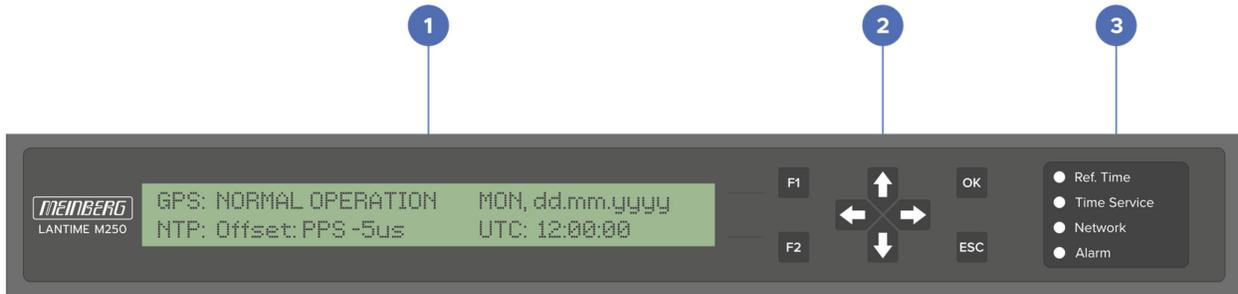
LANTIME M250 Chassis



Chassis Specifications

Form Factor	1U / 66 HP
Dimensions (Only Chassis) [W x H x D]	337 mm x 43.3 mm x 248 mm (13.27 in x 1.705 in x 9.77 in)
Dimensions (including Connectors & Handles) [W x H x D]	337 mm x 43.3 mm x 263 mm (13.27 in x 1.705 in x 10.36 in)
Material	Sheet steel
IP Rating	IP30

LANTIME M250 Display View



1 LCD Panel

- | 2 x 40 character backlit display for clarity even in low-light conditions.
- | Status display (as shown above) indicates the status of the clock receiver, the current date and time of the clock, and the current offset of the NTP server.
- | Provides status readouts and allows basic configuration processes to be performed using the front-panel function keys.
- | Shows alarms and alerts requiring user intervention.

3 Status LEDs

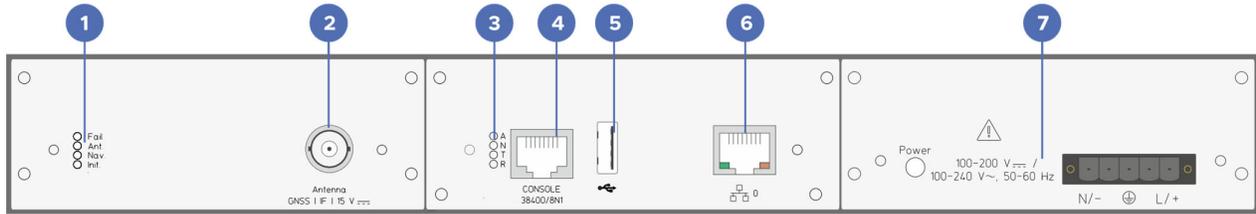
Ref. Time	Indicates whether the reference clock is providing a valid timebase.
Time Service	If lit, the internal NTP service of the server is synchronized with the reference clock.
Network	Shows whether there is a valid link-up on the network interface.
Alarm	Advises of a general system fault that requires attention.

2 Function Keys

“F1”, “F2”, “OK”, “ESC”, and arrow keys allow for local navigation of configuration menus and status readouts to enable many configuration processes to be performed directly from the device during installation.

LANTIME M250 Connector View

The illustration below represents the configuration **LANTIME M250/GPS/AD**. The actual appearance and functionality of different configurations may vary depending on the installed clock-receiver.



1 Receiver Clock Status LEDs

The specific LEDs will depend on whether the LANTIME M250 is equipped with a GNSS satellite receiver or a PZF long-wave receiver. The illustration represents a LANTIME M250 fitted with a GPS receiver and may differ with other models.

GNSS Satellite Receiver (Type GPS, GNS, GNS-UC)	
“Fail” LED	When lit, this reveals if that clock is having problems with synchronization.
“Ant.” LED	Indicates no functional connection to the antenna or that there is a short-circuit in the connection with the antenna.
“Nav.” LED	Shows the state of the geopositioning process.
“Init.” LED	Provides an indication of initialization state of the clock and onboard oscillator.

DCF77 Long-Wave Receiver (Type PZF)	
“Init” LED	Indicates the initialization state of the clock and onboard oscillator.
“Field” LED	Indicates the detection of adequate DCF reception.
“Ant Fail” LED	Indicates problems with the antenna connection.
“Fail” LED	Indicates problems with clock synchronization.

2 Antenna Connector

The specifications of the antenna and its connector are dependent on the selected clock receiver. The illustration represents a LANTIME M250 fitted with a GPS receiver and may differ with other models.

GPS Receiver	<ul style="list-style-type: none"> - Connector: BNC female - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m), RG213 (max. 700 m) - 15 V output (for powering Meinberg GPSANTv2 antenna)
GNS-UC Receiver	<ul style="list-style-type: none"> - Connector: BNC female - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m), RG213 (max. 700 m) - 15 V output (for powering Meinberg GPSANTv2 antenna)
GNS Receiver	<ul style="list-style-type: none"> - Connector: SMA female - Termination impedance: 50 Ω - Recommended cable: Speedfoam 240HFJ (max. 70 m) - 5 V output (for powering GNMANTv2 antenna)
PZF Receiver	<ul style="list-style-type: none"> - Connector: BNC female - Reception frequency: 77.5 kHz - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m) - 5 V output (for powering Meinberg AW02 antenna system)

3 System Status LEDs

The status readouts provided by these LEDs are also provided by the corresponding LEDs on the display side of the device.

“A” LED	“Alarm” LED for indicating general system faults.
“N” LED	“Network” LED for indicating proper function or fault of network connections (“link-up state”).
“T” LED	“Time Service” LED for indicating synchronization status of NTP with reference clock.
“R” LED	“Reference Clock” LED for indicating proper function or fault state of reference clock.

4 Serial Console Port (Terminal Access)

The serial console port is a standard RS-232 interface with an 8P8C (“RJ45-like”) female connector that can be used to establish a direct serial connection (38400 baud, 8N1 framing) between the LANTIME M250 and any device running suitable terminal software (e.g., a laptop) for direct command line access.

The connection can be established using any suitable RS-232 cable or adapter (e.g., RJ45 to D-Sub 9, Yost wiring standard).

5 USB Interface

This USB interface can be used for:

- | saving a backup of the LTOS configuration to an external storage medium (such as a USB flash drive) and restoring this backup (or copying a standard configuration between multiple LANTIME servers)
- | creating a backup of logfiles (such as SyncMon logs)
- | loading and saving cryptographic certificates
- | creating a physical USB “security key” that can be used to enable and disable the local function keys on the device

6 Network Interface

Network Interface	1x RJ45 10/100/1000BASE-T interface (Gigabit Ethernet) with link status LEDs
Network IP Addressing	IPv4 (with DHCP support), IPv6 (with DHCPv6 and Autoconf support)
Network Services (Supported Protocols)	HTTP(S) for web interface and REST API access FTP for access to log files and uploading firmware updates Telnet and SSH for command line access SNMP for monitoring

7 “AD” Type Power Supply

Connector Type	5-pin MSTB female connector
Nominal Voltage Range (U_N)	100 V – 240 V AC / 100 V – 200 V DC
Rated Voltage Range (U_{max})	90 V – 265 V AC / 90 V – 250 V DC
Nominal Current (I_N)	1.0 A (AC) / 0.6 A (DC)
Nominal Frequencies (f_N)	50 Hz – 60 Hz
Rated Frequency Range (f_{max})	47 Hz – 63 Hz
Maximum Power Output (P_{max})	50 W
Maximum Thermal Output (E_{therm})	180.00 kJ/h (170.61 BTU/h)

“DC” Type Power Supply

Connector Type	5-pin MSTB female connector
Nominal Voltage Range (U_N)	24 V – 48 V DC
Rated Voltage Range (U_{max})	20 V – 60 V DC
Nominal Current (I_N)	2.1 A
Nominal Frequencies (f_N)	50 Hz – 60 Hz
Rated Frequency Range (f_{max})	47 Hz – 63 Hz
Maximum Power Output (P_{max})	50 W
Maximum Thermal Output (E_{therm})	180.00 kJ/h (170.61 BTU/h)