LANTIME M150

Product Highlights

| A powerful Stratum 1 NTP server capable of processing up to 25,000 requests per second

| Compact DIN/TS35 rail-mounted chassis, also suitable for desktop use

| Engineered to order with a selection of reference receiver module options (GNSS and DCF77)

| Available with an AC/DC or a "low DC" (20 V – 60 V) power supply unit to meet your specific needs

High-Performance NTP Time Server in a Compact Chassis

The LANTIME M150 is designed by Meinberg to offer superior NTP server performance in an industrial environment with a robust rail-mounted chassis. Built to order with a selection of signal receivers to enable you to synchronize your server to the remote timing signal that you trust most, the LANTIME M150 servers can be built to support timing signals from any of the main satellite navigation systems in operation (GPS, Galileo, BeiDou, GLONASS) or from a long-wave timing signal radio service (DCF77).

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 M150 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.

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

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 4,000 m / 13,123 ft (above sea level)

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 (included with system as standard). Recommended cable: RG58 (max. length 300 m), RG213 (max. length 700 m), H2010 Ultraflex (max. length 1100 m)
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 (included with system as standard). Recommended cable: RG58 (max. length 300 m), RG213 (max. length 700 m), H2010 Ultraflex (max. length 1100 m)
GNS	72-channel receiver for reception of signals from the GPS (L1 C/A code) and Galileo (E1 B/C) satellite constellations. Use of a Meinberg GNMANTv2 antenna recommended for full feature support (included with system as standard). Recommended cable: Speedfoam 240HFJ (max. length per segment 70 m, antenna line extendable with Meinberg INA-20 and INA-30 inline amplifiers)
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 (included with system as standard). Reception frequency: 77.5 kHz Recommended cable: RG58 (max. length 300 m)

"TCXO" Type Oscillator

The LANTIME M150 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	$\pm 2 \times 10^{-9}$ Hz where t = 1 second
10 MHz Frequency Accuracy (GNSS-Synchronized, 24 Hours)	$\pm 1 \times 10^{-11}$ Hz (± 0.1 mHz)
10 MHz Frequency Accuracy (after 24 Hours in Holdover)	$\pm 1 \times 10^{-7}$ Hz (± 1 Hz)
10 MHz Frequency Accuracy (after 1 Year in Holdover)	$\pm 1 \times 10^{-6}$ Hz (± 10 Hz)
Phase Drift (after 24 Hours in Holdover)*	± 4.3 ms
Phase Drift (after 7 Days in Holdover)*	± 128 ms
Phase Drift (after 30 Days in Holdover)*	± 1.1 s
Phase Drift (after 1 Year in Holdover)*	± 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	$\pm 1 \times 10^{-6}$ (−20 °C to 70 °C, −4 °F to 158 °F)

* Full holdover performance requires the oscillator to have been in operation for at least 30 days and the system GNSS-synchronized for 24 hours previously. One-year values are based on mathematical extrapolation and not on physical measurements.

Oscillator Options

The LANTIME M150 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 Holdover*	Phase Drift after 1 Year in Holdover*
TCXO	± 4.3 ms	± 16 s
OCXO SQ	± 65 µs	± 4.7 s
OCXO HQ	± 10 µs	± 788 ms

* Full holdover performance requires the oscillator to have been in operation for at least 30 days and the system GNSS-synchronized for 24 hours previously. One-year values are based on mathematical extrapolation and not on physical measurements.

Accessories Included

| Two-part power cable (5-pin MSTB to IEC 60320 C14 cable, IEC 60320 C13 cable to local mains plug) for connection to AC power source 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*.

* Meinberg also offers customized antenna cables to accommodate your specific installation requirements. Please reach out to your Meinberg Sales Representative for more information.

Support & Compliance

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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 European Union Waste of Electrical and Electronic Equipment Directive; the product falls under Category 6, "Small IT and Telecommunications Equipment". For disposal, it must 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.

LANTIME M150 Chassis
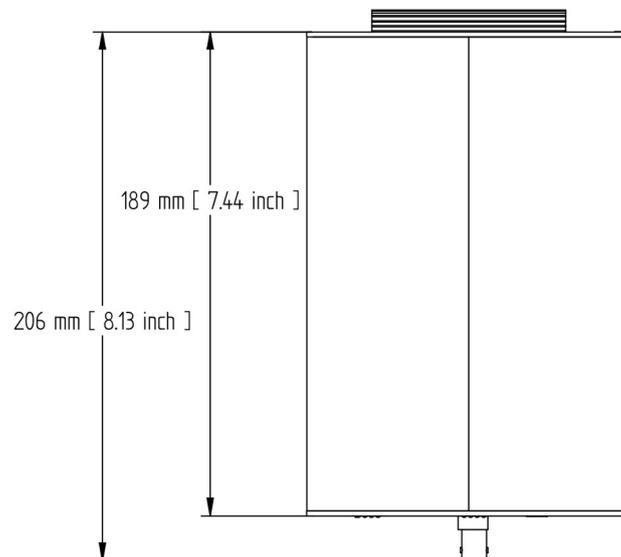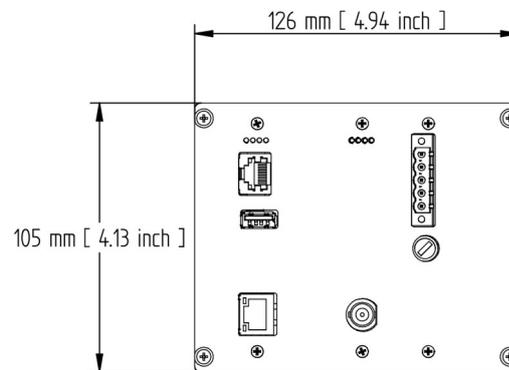
Chassis Specifications

Form Factor	DIN/TS35 Railmounted Chassis
Dimensions (Only Chassis) [W x H x D]	126 mm x 105 mm x 189 mm (4.96 in x 4.14 in x 7.44 in)
Dimensions (including Connectors & Handles) [W x H x D]	126 mm x 105 mm x 206 mm (4.96 in x 4.14 in x 8.11 in)
Material	Aluminum (Extruded Section)
IP Rating	IP30

LANTIME M150 Front View

The illustration below represents the example configuration **LANTIME M150/GPS**. The actual appearance and functionality of different configurations may vary depending on the installed clock-receiver.
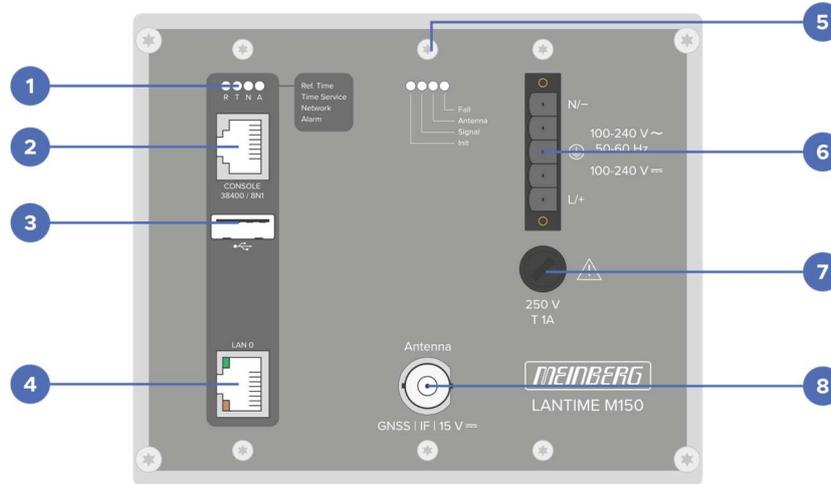
① System Status LEDs

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

"A" LED	Advises of a general system fault that requires attention.
"N" LED	Shows whether there is a valid link-up on the network interface.
"T" LED	If lit, the internal NTP service of the server is synchronized with the reference clock.
"R" LED	Indicates whether the reference clock is providing a valid timebase.

③ 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

② 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 M150 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., 8P8C to USB, Cisco/Yost wiring standard).

④ Network Interfaces

Network Interfaces	RJ45 10/1000BASE-T interface (Gigabit Ethernet) with link status LEDs
Network Protocols	IPv4 (with DHCP support), IPv6 (with DHCPv6 and Autoconf support)
Network Services	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

The Synchronization Experts.

5 Receiver Clock Status LEDs

"Fail" LED	When lit, this reveals if that clock is having problems with synchronization.
"Antenna" LED	Indicates no functional connection to the antenna or that there is a short-circuit in the connection with the antenna.
"Signal" LED	Shows the state of the geopositioning process.
"Init" LED	Provides an indication of initialization state of the clock and onboard oscillator.

6 Power Supply

Connector Type	5-pin MSTB female connector
Nominal Voltage Range (U_N)	100 V – 240 V AC / 100 V – 240 V DC
Rated Voltage Range (U_{max})	90 V – 264 V AC / 100 V – 250 V DC
Nominal Current (I_N)	0.4 A (AC)
Nominal Frequencies (f_N)	50 Hz – 60 Hz
Rated Frequency Range (f_{max})	47 Hz – 63 Hz
Maximum Power (P_{max})	40 W
Max. Thermal Output (E_{therm})	144.00 kJ/h (136.49 BTU/h)

7 Replaceable Fuse

Fuse Standard	IEC 60127 (5 x 20 mm)
Rated Voltage	250 V
Rated Current	1 A
Fuse Type	Slow-blow

8 GPS Antenna Input

The specifications of the antenna and its connector are dependent on the selected clock receiver. This example features a GPS receiver.

Antenna	GPSANTv2*
Connector Type	Bayonet Neill-Concelman (BNC) connector for coaxial cable
Input Impedance	50 Ω
Input Signal	35.4 MHz intermediate frequency
Power Supply	15 V, 100 mA to antenna via antenna cable
Supported Cable Length	Max. 300 m (RG 58) Max. 700 m (RG 213) Max. 1100 m (H2010 Ultraflex)

∗ For more detailed information on the GPSANTv2 antenna, request a copy of the Meinberg GPSANTv2 data sheet from your Meinberg Sales Representative, or download it directly from the Meinberg website:

http://mbg.link/gpsant