LANTIME M320

Product Highlights

| A powerful Stratum 1 NTP server capable of processing up to 15,000 requests per second

| Compact 1U chassis, specially constructed for installation in a 19" rack

| Engineered to order with a selection of reference receiver module options (GNSS and DCF77) and specified signal outputs for your application needs

High-Performance Time Server for Time & Frequency Synchronization

The LANTIME M320 is designed by Meinberg to offer superior NTP server performance and high-accuracy synchronization signal output. Constructed 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 M320 can support timing signals from any of the main satellite navigation systems in operation (GPS, Galileo, BeiDou, GLONASS), from a long-wave timing signal radio service (DCF77), or from an external time code generator.

Meinberg's custom Linux-based LANTIME OS, a slim & secure operating system developed specially for the needs of a time server, powers the LANTIME M320 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 LANTIME OS 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 (1.33GHz, 1 MB L2 cache, 3 W TDP)
Operating System	Custom LANTIME OS based on Linux 4.x LTS kernel
Main Memory	2GB 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 15,000 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

Oscillator Options

The LANTIME M320 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. The LANTIME M320 may also be shipped on request with a more powerful holdover solution; the options available and their performance metrics are listed below:

Type	Holdover Performance (1 Day)*	Holdover Performance (1 Year)*
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.

Operating Specifications

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

Chassis Specifications

Form Factor	1U / 87.5 HP
Dimensions	445 mm x 43 mm x 288 mm (17.51 in x 1.69 in x 11.32 in) [W x H x D]
Material	Sheet steel
IP Rating	IP30

Available Receiver Types

GPS Receiver*	12-channel L1 C/A code receiver for reception of signals from the GPS satellite constellation
GNS Receiver	72-channel receiver for reception of signals from the GPS (L1), Galileo (E1 B/C), BeiDou (B1I), and GLONASS (L1OF) satellite constellations
GNS-UC Receiver*	72-channel receiver for reception of signals from the GPS (L1 C/A code) and Galileo (E1 B/C) satellite constellations
TCR Receiver	Time code receiver for reception of DC level shift (pulse-width modulated) or AM (amplitude-modulated) time code signals in a wide variety of standardized formats
PZF Receiver	Long-wave receiver with quadrature demodulator for reception of signals from the DCF77 long-wave transmitter in Mainflingen, Germany
MSF Receiver	Long-wave receiver for reception of signals from the MSF long-wave-transmitter in Anthorn, UK

* These receivers require a Meinberg IF antenna (included with the system as standard)

The LANTIME M320 is also available as a receiverless "RDT" configuration (Remotely Disciplined Timeserver), which is synchronized via an external 1PPS and time string signal.

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 UI (upload via a web browser), or via the CLI (download from a server). LANTIME OS 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) RG 58 coaxial cable with pre-fitted connectors as standard*.

| Models with a GNS receiver clock include a multi-GNSS 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) Belden H155 coaxial cable with pre-fitted connectors as standard*.

| Models with a PZF receiver clock include an 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*.

| Models with an MSF receiver clock include an AW02-60 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.

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LANTIME M320 Display View

This illustration represents an example configuration (LANTIME M320/GPS. Should you require a data sheet for a specific LANTIME M320 configuration, please reach out to your Meinberg sales representative.
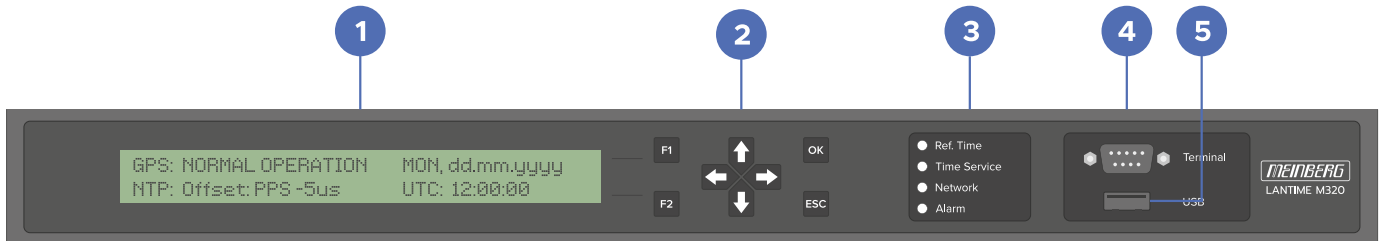
① LCD Panel

| 2 x 40 character backlit display for clarity even in low-light conditions.

| Status display (as shown above) indicates the status of the receiver clock, 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.

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.

③ Status LEDs

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

④ Serial Console Port (Terminal Access)

The serial console port is a standard RS-232 interface with a D-Sub 9 male connector that can be used to establish a direct serial connection (38400 baud, 8N1 framing) between the LANTIME M320 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).
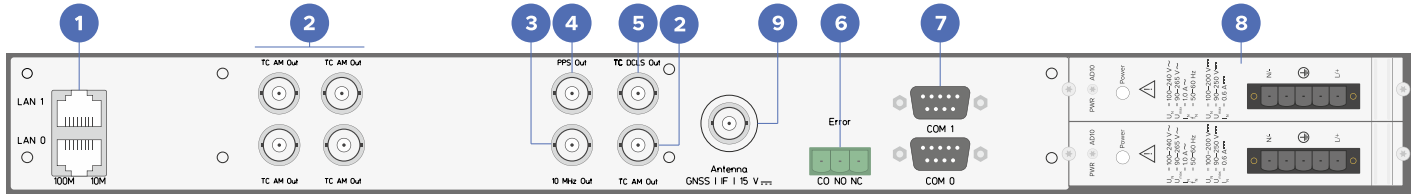
⑤ USB Interface

This USB interface can be used for:

| saving a backup of the LANTIME OS 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 log files (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

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LANTIME M320 Connector View

This illustration represents an example configuration (LANTIME M320/GPS/TC-5-1/AD10-AD10) that provides an approximate indication of the general location of the various connectors on a given LANTIME M320. Please note that the exact location of specific connectors may vary depending on the specific configuration ordered. Should you require a data sheet for a specific LANTIME M320 configuration, please reach out to your Meinberg sales representative.

1 Network Interfaces

Network Interfaces	2x, 4x or 6x RJ45 10/100-BASE-T interface (Fast 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
Other Networking Features	Full Parallel Redundancy Protocol (PRP) support as Doubly Attached Node Support for network link aggregation ("bonding") with multiple modes for load balancing or link redundancy

2 AM Time Code Outputs

Output Signal	Sine wave signal, unbalanced, amplitude modulated
Signal Level	3 V_{pp} / 1 V_{pp} (MARK/SPACE) with 50 Ω load
Carrier Frequency	1 kHz
Connector Type	BNC, female (for shielded coaxial cable)
Supported Time Code Formats	IRIG-B (B122, B123, B126, B127), AFNOR NF S87-500, IEEE1344, C37.118

3 10 MHz Output

Output Signal	10 MHz frequency
Signal Level	TTL pulse, 2.5 V_p with 50 Ω load
Connector Type	BNC, female, for shielded coaxial cable

4 Pulse Per Second Output

Output Signal	Pulse per second (PPS)
Signal Level	TTL pulse, active high, 2.5 V_p with 50 Ω load
Pulse Length	200 ms
Connector Type	BNC, female (for shielded coaxial cable)

5 DCLS Time Code Output

Output Signal	DC level shift time code, pulse-width modulated
Signal Level	TTL pulse, active high, 2.5 V_p with 50 Ω load
Connector Type	BNC, female, for shielded coaxial cable
Supported Time Code Formats	IRIG-B (B002, B003, B006, B007), AFNOR NF S87-500, IEEE1344, C37.118

6 Error Relay

Max. Switching Voltage	125 V DC 140 V AC
Max. Switching Current	1 A
Max. Switching Power	30 W DC 60 VA AC
UL/CSA Switching Power	0.46 A / 140 V AC 0.46 A / 65 V DC 1 A / 30 V DC
Response Time	Approx. 2 ms

7 Time String Outputs (RS-232)

Data Transmission Method	Serial
Baud Rate	19200 (default)
Framing	8N1 (default)
Pinout	Pin 2: TxD Pin 3: RxD Pin 5: GND
Connector Type	D-Sub 9-pin
Cable Type	RS-232 null modem cable

8 Redundant Power Supplies

Connector Type	5-pin MSTB female connector Two-part power supply cable (5-pin MSTB connector to IEC 60320 C14, IEC 60320 C13 to local mains) provided for AC mains power supply 5-pin MSTB male connector supplied for assembly of cable for DC power supply
Voltage Range	AC/DC power supply unit: 100–240 V AC (50–60 Hz), 100–200 V DC "Low DC" power supply unit: 20–60 V DC (rated), 48 V (nominal)
Power Consumption	30 W maximum, typical consumption is configuration dependent

9 Antenna Connector

The specifications of the antenna and its connector are dependent on the selected clock receiver. The illustration represents a LANTIME M320 fitted with a GPS receiver and may differ on other models.

GPS Receiver	- Connector: BNC female or Type-N female - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m), RG213 (max. 700 m) - 15 V output (for powering Meinberg GPS IF antenna system)
GNS-UC Receiver:	- Connector: BNC female or Type-N female - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m), RG213 (max. 700 m) - 15 V output (for powering Meinberg GPS IF antenna system)
GNS Receiver	- Connector: SMA female - Termination impedance: 50 Ω - Recommended cable: Belden H155 (max. 70 m) - 5 V output (for powering antenna)
PZF Receiver	- 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)
MSF Receiver	- Connector: BNC female - Reception frequency: 60 kHz - Termination impedance: 50 Ω - Recommended cable: RG58 (max. 300 m) - 5 V output (for powering Meinberg AW02-60 antenna system)
TCR Receiver	- Connector: 2x BNC female (1x DCLS, 1x AM time code) - Nominal input voltage: 5 V DC - Max. input current: 60 mA - Termination impedance: 220 Ω