

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 (e.g., GNSS, 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 time code output. Constructed to order with an integrated receiver clock specially engineered for optimum synchronization performance, this model features an "TCXO" type oscillator as standard. For superior holdover performance during GPS signal loss you can choose an "OCXO" type oscillator (OCXO-SQ, -HQ or -DHQ).

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 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 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.

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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 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

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)

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 (B1I), and GLONASS (L1OF) satellite constellations. Requires a supported L1 antenna.
GNM	184-channel multi-band, multi-GNSS receiver for reception of signals from the GPS (L1 C/A and L2 bands), Galileo (E1-B/C and E5b bands), BeiDou (B1I and B2I bands), and GLONASS (L1OF and L2OF bands) constellations. Requires a Meinberg GNSS Multi-Band Antenna.
TCR	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	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.
MSF	Long-wave receiver for reception of signals from the MSF long-wave-transmitter in Anthorn, UK. Requires a Meinberg AW02-60 antenna.

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

“TCXO” Type Oscillator

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:

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 M320 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.

Support & Compliance

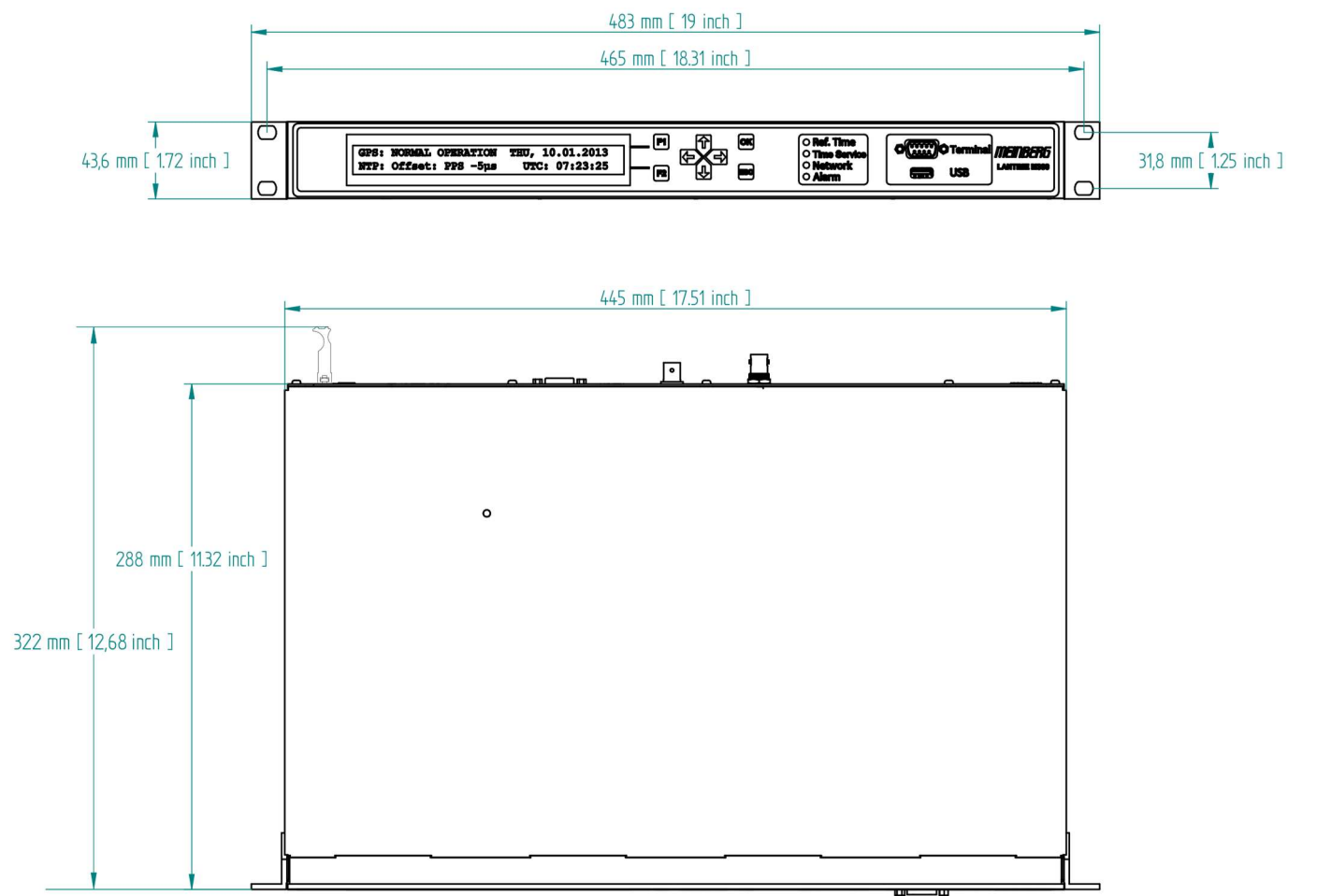
Technical Support	Free lifetime support via telephone and email, including firmware updates
Warranty	Three-year warranty, extendable upon request
Firmware Updates	Firmware is field-upgradable; updates can be installed from a connected USB storage medium, via the Web Interface (upload via a web browser), 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

- | Printed setup guide explaining the basic setup process and antenna installation.
- | Two sets of two-part power cables (5-pin MSTB to IEC 60320 C14 cable, IEC 60320 C13 cable to local mains plug) or 5-pin MSTB connectors for assembly of a suitable power cable for DC power sources.
- | 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*.

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

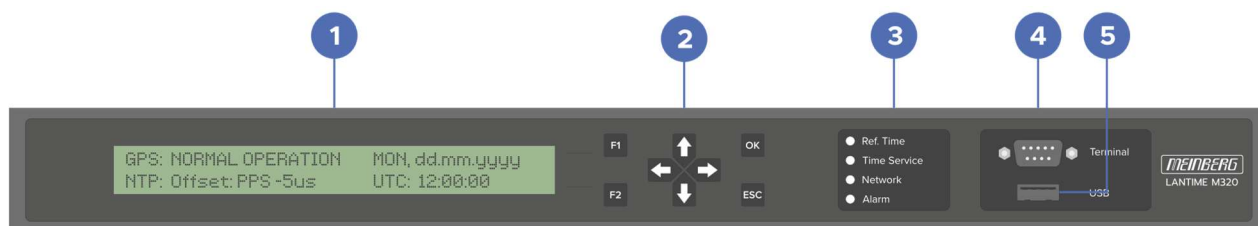
LANTIME M320 Chassis



Chassis Specifications

Form Factor	1U / 87.5 HP
Dimensions (Only Chassis) [W x H x D]	445 mm x 43 mm x 285 mm (17.53 in x 1.69 in x 11.22 in)
Dimensions (including Connectors & Handles) [W x H x D]	445 mm x 43 mm x 310 mm (17.53 in x 1.69 in x 12.21 in)
Material	Sheet steel
IP Rating	IP30

LANTIME M320 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 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).

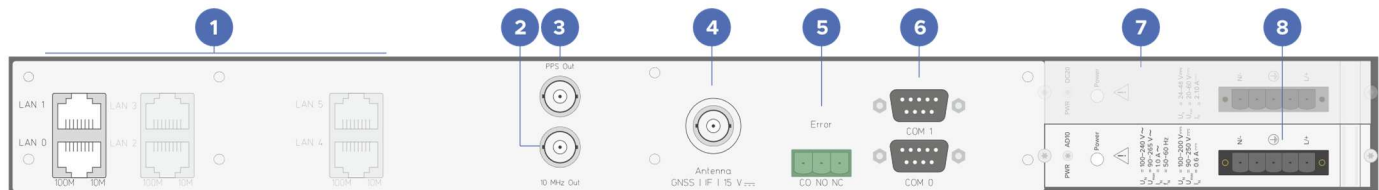
5 USB Interface

This USB interface can be used for:

- saving a backup of the 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

LANTIME M320 Connector View

The illustration below represents the configuration **LANTIME M320/GPS/AD10-DC20**. The actual appearance and functionality of different configurations may vary depending on the installed clock-receiver and specified I/O options.



1 Network Interfaces

Network Interfaces	2x RJ45 10/100-BASE-T interface (Fast Ethernet) with link status LEDs Additional Ethernet Interface configurations available as an option
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 10 MHz Output

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

3 Pulse-per-Second Output

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

4 GPS Antenna Input

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>

5 Error Relay

Connector Type	3-pin MSTB
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
Relay States	Normal Operation: CO & NO connected Error State: CO & NC connected

6 Time String Outputs (RS-232)

Connector Type	D-Sub 9-pin
Data Transmission Method	Serial
Baud Rate	19200 (Default), 9600, 4800, 2400, 1200, 600, 300
Framing	7N2, 7E1, 7E2, 8N1 (Default), 8N2, 8E1, 7O1, 7O2, 8O1, 8E2
Output String Support	Meinberg Standard (Default), Meinberg Capture, Meinberg GPS, SAT, NMEA RMC, NMEA GGA, NMEA ZDA, NMEA RMC GGA (RMC followed by GGA), NMEA GGA ZDA (GGA followed by ZDA), Uni Erlangen, Computime, Sysplex 1, SPA, RACAL, ION, ION Blanked, IRIG-J-1, 6021, Freelance
Pinout	Pin 2: TxD Pin 3: RxD Pin 5: GND

7 AD10 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 (P_{max})	50 W
Max. Thermal Output (E_{therm})	180.00 kJ/h (170.61 BTU/h)

8 DC20 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 DC
Maximum Power (P_{max})	50 W
Max. Thermal Output (E_{therm})	180.00 kJ/h (170.61 BTU/h)

Revision History

Note: This changelog encompasses all data sheets pertaining to the general product series to which the LANTIME M320 belongs and may contain information not relating to the specific model described by this data sheet.

Version (Date)	Changes
2023-03-01	Initial version
2023-03-22	Information on fiber-optic PPS and time string outputs (applicable models only)
2023-03-07	Modified “Management Interfaces” section Removed OCXO-MQ oscillator Added power consumption
2024-04-16	Dedicated cover sheet, moved information onto page 2 onwards
2024-05-13	Updated contact block on cover page to include Meinberg USA More detailed specifications for power supply modules
2024-08-22	Removed OCXO-LQ oscillator Corrected chassis depth measurement
2024-09-10	Added dedicated M320 chassis chapter with drawing Added link to further information about GPSANTv2 for GPS type reference clocks
2024-11-08	Expanded error relay section Expanded time string section Modified performance specifications of OCXO-HQ oscillator
2025-02-24	Changed references to “IF antenna” into “GPSANTv2 antenna” (GPS/GNS-UC models) Removed references to type N antenna connectors (GPS/GNS-UC models) Added additional dimensions reflecting connectors
2025-01-24	Expanded AD10 power module specifications Minor adjustments to intro text
2025-03-11	Layout adjustments
2025-10-10	Replaced references to legacy antenna and Belden H155 cable with GNMANTv2 (GNS models) Updated info on use of DC power supply (DC models) Tables now stylistically consistent Added GPSANTv2 intermediate frequency (GPS/GNS-UC models) More detailed specifications for oscillators Overhauled GPS antenna input specifications Added revision history