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IMS - LANTIME M1000: Modular Synchronization Server for Communication Networks

Versatile Phase and Frequency Synchronization for Telecommunication Networks [1]

The Meinberg LANTIME M1000 is an intelligent, modular synchronization solution in a 1RU form factor. Its flexible, modular design allows it to perform as both a Primary Reference Clock (PRC) and a Primary Reference Time Clock (PRTC), as well as fulfill many other roles in a synchronization concept for telecommunication networks.

Depending on its modular configuration, the M1000 can be enabled as a "mini-SSU/BITS," an Edge Grandmaster Clock, or a highly scalable core Grandmaster - synchronizing thousands of base stations or CPE devices like Femtocell Access Points, Broadband SUs or Home Gateways. Meinberg's market-leading IMS network time synchronization modules support all PTP telecom profiles, such as ITU-T G.8265.1, ITU-T G.8275.1 and ITU-T G.8275.2 as well as Synchronous Ethernet and Hardware NTP with 8ns timestamp accuracy via a Gigabit Ethernet interface.

Key Features

- System footprint optimized for physical space
- Synchronization of NTP and SNTP compatible clients
- Web-based status and configuration interface and console-based graphical configuration utility
- IMS - Intelligent Modular System platform
- Up to 4 PTP (IEEE 1588-2008) modules
- Redundant power and receiver option (eg GPS / GLONASS combination)
- Hot Plug
- Flexible module combinations based on end-user application
- Meinberg's LANTIME time server is available with a variety of additional output options: IRIG Time Code, frequency synthesizer and programmable pulse outputs illustrate some of the many expansion options for your NTP server
- Up to 16 additional LAN ports

Description

Flexible, Scalable, Future-Proof
Clock, Phase or Time of Day? The LANTIME M1000 delivers all three forms of synchronization, supporting all protocols and interfaces commonly used in telecommunication environments. Besides PTP, NTP and Synchronous Ethernet the M1000 can provide 2048 kHz / 2.048MBit/s / 1.544MBit/s on a broad spectrum of physical connectors (RJ45, D-SUB, BNC) and a wide range of interface types (framed/unframed, balanced/120Ohm and unbalanced/75 Ohm). Capitalizing on its modularity, each M1000 can be tailored to its intended purpose; if end-user requirements change in the future, the M1000 can be modified in the field, with outstanding hotplug and hotswap capabilities enabling performance upgrades or additional/different interfaces.

Available clock modules for the IMS platform accept a large number of reference sources, including GNSS signals (GPS, GLONASS, Beidou), long wave radio signals such as DCF77, or wired electrical/optical references such as 1PPS or, 10 MHz. Dedicated input modules add E1/T1 sync input interfaces with full SSM/BOC support; PTP, SyncE and NTP can be configured for use as sync references as well. Different oscillator options allow end-users to upgrade the M1000's holdover performance; in the event of temporary loss of all sync references, the M1000 ensures continuity by providing sync to the application/service until reference signals are restored.

The standard M1000 is equipped with a front panel featuring a 4x16 LC display, menu buttons, a USB port and a serial console port. The M1000S version incorporates all module slots and connectors on the front panel, designed for wall mountor rack mount that may require limited access. The M1000S has no display or menu buttons, offering a streamlined, cost-effective option.

The First Choice for All Network Environments
Meinberg's M1000 is an ideal solution for synchronizing mobile base stations for both FDD- and TDD-based radio access networks. Carrier Ethernet/Metro Ethernet environments, as well as broadband access and PDH/SDH communication networks can be synchronized with this ultra-flexible device. This industry-leading PTP platform is optimized to meet the needs of today's 2G/3G/4G mobile networks. The M1000 is also ideally suited for migration of existing network infrastructure, enabling highly accurate, precise microsecond-level phase synchronization technologies, such as LTE-Advanced and WiMAX-TDD.

Combining different synchronization interfaces in a single device provides a powerful synchronization solution for migrating Circuit Switched to Packet Switched Networks (Next Generation Networks/NGN). The modularity of the IMS platform allows upgrades to the performance and feature set of the M1000 without having to power down the device. New sync technologies can be added by simply replacing or adding a module, without having to qualify or purchase a completely new device. As a result, the M1000 is one of the most scalable, flexible and cost-effective synchronization devices on the market and an ideal fit for telecommunication networks.

Redundancy and Quality Enable Outstanding Reliability
The M1000 can be deployed with fully redundant power supplies, rather than redundant power input connectors sharing a single internal power supply. The system may also optionally include redundant clock and output modules. Coupled with available holdover performance upgrades, this provides robustness and mission -critical reliability that protects services and applications in the most rigorous computing environments. For system operators, the M1000 becomes the life insurance for cell phone networks, digital radio and wired communication infrastructures.

Scalable PTP and NTP Server for Networks and Applications of All Sizes
With up to 25,000 NTP requests per second, the M1000's CPU module is capable of delivering time synchronization to hundreds and thousands of network clients. It supports the following protocols: IPv4, IPv6, NTP / SNTP (v2, v3, v4), PRP (IEC 62439-3), HTTP (S), SSH, Telnet, SNMP (v1, v2, v3), FTP, SFTP, and DHCP/DHCPv6 . Up to 99 logical network interfaces can be set up (99 IPv4 and 99 IPv6 addresses and 99 VLAN IDs).

The new HPS (High Performance Sync) family is Meinberg's latest module generation designed for the most demanding network time synchronization requirements. Each HPS module can serve time to up to 2,048 PTP Slaves at full rate (128 sync/128 delay req per second) or respond to 400,000 NTP requests per second. Each M1000 can hold up to four

HPS modules, enabling a performance increase to 4 x 400,000 NTP requests/second or 8,096 PTP Slaves (at full rate). As a part of the IMS family, the M1000 allows users to add or replace modules without having to shut down the system.

Powerful Management System
In addition to hot-plug/hot-swap capabilities, M1000 modules can be configured via the central web interface (provided by the CPU module). A powerful, fully scriptable CLI is also available and can be acccessed using a serial console port or remotely by using SSH. For the central management of multiple LANTIME devices with a NMS/EMS the M1000 supports SNMP v1, v2c and v3. Alarms and notifications are supported via eMail or SNMP traps. Two syslog servers can be specified and can be set-up to receive log entries either by UDP or TCP.

The M1000's front panel integrates the familiar LC-Display with 4x16 characters and the LANTIME menu panel with four arrow buttons plus four function buttons. This allows fast and intuitive on-site configuration of the system's most important parameters, including locking the front panel to block further menu access. When field service engineers require front panel access to quickly check status information, central management can disable the lock using the web interface.
Note: The M1000S variant does not have a display and menu buttons.

Active Cooling Module
The M1000's Active Cooling Module (ACM) enables its safe operation over the fully-specified temperature range. The ACM is easily field-replaceable and allows hot-plug replacement without the need to power down the unit. Its redundant fans help to ensure reliability, maintaining full cooling performance in case of a fan failure.

Available IMS modules

Characteristics

Supported Reference Signals

The following reference sources can be used to synchronize the system:

* **GPS** - Global Positioning System
* **GLONASS** - Russian GNSS
* **GALILEO** - European GNSS
* **BeiDou** - Chinese GNSS
* **PZF** - German DCF77 longwave radio signal
* **PTP/IEEE1588** - Precision Time Protocol
* **NTP** - Network Time Protocol
* **SyncE** - Synchronous Ethernet
* **Timecodes** - IRIG/AFNOR timecodes (AM/DCLS)
* **PPS** -Pulse Per Second
* **10MHz** - 10MHz reference frequency
* **2.048kHz** - 2.048kHz reference frequency
* **E1/T1** - Telecom Synchronization Input with full SSM/BOC support

The priority of all input signals can be freely configured in addition to a bias value and a precision level specification for each source.

Status Indicators	Four bicolor LEDs in the Front panel showing status of: - reference time - time service - network - alarm Rear status display for ACM (Active Cooling Module).
Display	LC Display, 4 x 16 characters
Control Elements	Eight push buttons to set up basic network parameters and to change system settings.
Frequency Outputs	Frequency Synthesizer for arbitrary frequencies between 0.125 Hz and 10 MHz, adjustable phase, output via external modules such as [2]IMS-BPE modules
Accuracy of Pulse Outputs	< ±50ns (OCXO SQ, OCXO MQ, OCXO HQ, OCXO DHQ)
Network Interface	**Base Chassis:** CPU-C05F1 1 x 10/100 MBit, RJ45 CPU-C15G2 1 x 100/1000BASE-T RJ45 1 x 1000BASE-T SFP **Network Expansion - LNE Options:** Up to 16 additional network interfaces (GbE Gigabit Support) with 10/100/1000 MBit

RJ45 connector or 1000BASE-T SFP (Multimode / Singlemode).

Universal Serial Bus (USB) Ports	1x USB port on front panel for: - installing firmware upgrades - performing backups and restoration of configuration files - copying security keys - locking & unlocking front buttons

Power Consumption	50W (max. 100W)
Operating Voltage	PWR-AD10: 100-240 V AC (50/60 Hz) / 100-200 V DC PWR-DC210: 10-36 V DC PWR-DC20: 20-60 V DC All PWR modules support redundant operation in chassis models with more than one PWR slot.
Form Factor	19 inch rackmount case, black 1U/84HE
Network Protocols OSI Layer 4 (Transport Layer)	TCP, UDP
Network Protocols OSI Layer 7 (Application Layer)	Telnet, FTP, SSH (including SFTP, SCP), HTTP, HTTPS, syslog, SNMP
Internet Protocol (IP)	IPv4, IPv6
Network Autoconfiguration Support	IPv4: Dynamic Host Configuration Protocol - DHCP (RFC 2131) IPv6: Dynamic Host Configuration Protocol - DHCPv6 (RFC 3315) and Autoconfiguration Networking - AUTOCONF (RFC 2462)
Network Time Protocol (NTP)	NTP v2 (RFC 1119), NTP v3 (RFC 1305), NTP v4 (RFC 5905) SNTP v3 (RFC 1769), SNTP v4 (RFC 4330) MD5 / SHA-1 Authentication and Autokey Key Management
Parallel Redundancy Protocol (PRP)	PRP (IEC 62439-3)
Time Protocol (TIME)	Time Protocol (RFC 868)
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)
Supported Temperature	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
Supported Humidity	Max. 85 % (non-condensing) at 40 °C
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 from 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 Product	This product is fully RoHS-compliant.
WEEE Status of Product	This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it can be returned to the manufacturer. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while 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 [3]LANTIME overview page .

Manual

There is no online manual available for this product.: [4]Contact us

Links:

[1] https://www.meinbergglobal.com/english/products/
[2] https://www.meinbergglobal.com/english/products/ims-output-modules.htm
[3] https://www.meinbergglobal.com/english/products/ntp-time-server.htm
[4] mailto:info@meinberg.de