

Intelligent Modular Synchronization

Meinberg's IMS LANTIME family of products is a range of market-leading NTP, PTP, and signal synchronization solutions that combine maximum reliability and power with the optimum in flexibility and scalability.

For all your synchronization needs, from ensuring that every system clock in a public transportation network is running at precisely the same time, to monitoring power grid frequencies and being able to trace fluctuations down to the last nanosecond, Meinberg's IMS time servers can be customized and scaled up and down according to your industry needs.



The Synchronization Experts.

- Maximum flexibility so that you always have exactly the input and output synchronization signals you need for your application—boosting your efficiency.
- Hot-swappable modules allow you to adapt to changing needs on the fly, with practically no disruption to your processes.
- A variety of form factors to suit your specific space requirements and rack organization.
- Failsafe operation enabled by redundancy at multiple levels—from clock source to power supply.

Welcome to the World of IMS

The world of Intelligent Modular Synchronization is your oyster—IMS units offer the potential to connect a diversity of power sources, input sources, and output receivers. If you're reading this, then you're surely in need of the flexibility, power, and scalability only IMS can offer.

Every IMS product supports an extensive selection of plug-in modules designed to fulfill a variety of industrial applications, including power generation, audio & video content production, telecommunications, data centers, finance, production monitoring, traffic control, and more.

Modules are available to allow each IMS unit to receive and output external reference sources such as pulse-per-second or 10 MHz signals, measure signal accuracy, and also process industry-specific signals such as broadcasting and telecom line synchronization signals. Solutions also exist to analyze mains power line frequency and provide a reserve reference in the event that the primary clock signal is lost for any reason.

And modularity doesn't come at the cost of continuity or operational stability—almost every module can be hot-swapped while the system is up and running without disruption to your wider synchronization infrastructure—unscrew the module, pull it out, push in the new module, screw it back in, done!

Get in Touch

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The IMS Approach

While the IMS family of synchronization solutions varies greatly in terms of form factor, size, scalability, and installation options to fulfill a variety of different applications and purposes, they share a common interface system that allows each base unit to support Meinberg's extensive range of plug-in modules as fully as the individual form factor of the chassis allows. These modules can, for the most part, be hot-plugged or hot-swapped—installed or replaced while the unit is fully in operation with no or minimal disruption to service.

Each slot type is explained on the following pages with a brief overview of some of the modules available for each slot type.

IMS Slot Types

CLK: Reference Clock Module

The “Clock” slots host the primary timekeeping modules that form the basis of the IMS system’s synchronization activities. IMS systems are referred to as “Stratum 1” servers—servers directly connected to a Stratum 0 atomic clock source—and these modules are the reason behind this designation. They locate, interface with, and collect data directly from a number of different atomic clock sources. Modules are available for synchronization with GPS or other GNSS satellite systems, with a DCF77 PRC (pseudo-random code) signal, or with an IRIG time code signal.

SCU: Signal Changeover Unit

The “Signal Changeover Unit” slot is present in the M3000(S) and M4000 units. An SPT module is used for single-clock operation, while a Remote Switch Control module (RSC) is required when using two clock reference modules for redundant synchronization. The M1000(S) variant with two reference clock modules has the RSC module integrated inside the unit.

CPU: Central Processing Unit

The CPU module is the “brain” of the IMS system, essentially the mainboard of the server. It hosts the IMS unit’s processor, memory, basic Ethernet connectivity and flash storage memory, and acts as the web interface, FTP, Telnet, and SSH servers, and also as the configuration manager.

PWR: Power Supply Module

The “Power” slots are, as the name suggests, used to integrate the IMS system’s power supply units. These power every component in the unit, from the CPU core to the signal outputs, so that no additional power supply is necessary for individual modules. Meinberg offers both AC and DC power supplies, and each power supply is capable of providing 50 W of power. Depending on the IMS chassis chosen, you may have up to four PWR slots, and these can support any combination of AC and DC power supplies, allowing you to adapt to specific power draw and redundancy needs.

ACM: Active Cooling Module

The “Active Cooling Module” slot accommodates the chassis-specific fan module for the IMS LANTIME unit. The IMS LANTIME M500 does not support an ACM due to its compact dimensions and minimal heat output.

CES: Configurable Expansion Slot

The “Configurable Expansion Slot” is unique to the IMS LANTIME M500 and is used to provide additional synchronization outputs as well as an error relay connector.

MRI: Multi Reference Input

The “Multi-Reference Input” slots ordinarily host one of Meinberg’s MRI modules for applications where a reference clock other than a GPS/GNSS, DCF77, or IRIG time code source is required.

These modules are used to process incoming pulse-per-second and 10 MHz frequency signals as well as IRIG time codes delivered using DC level shifting (DCLS) or over a carrier wave using amplitude modulation.

All ESI and I/O modules can operate in MRI slots.

ESI: External Synchronization Input

The “Extended Synchronization Input” Slots host the special-purpose input modules used for processing industry-specific signals such as E1 and T1 sync signals employed in telecommunications engineering.

All I/O modules can operate in ESI slots.

I/O: Input/Output Module

The I/O slots support a variety of general-purpose and industry-specific input receivers, output generators, and other expansion modules to serve a wide variety of application needs.

These include network expansion modules to provide additional Ethernet connectivity, programmable I/O modules for both receiving and generating PPS and 10 MHz signals, video synchronization signal receivers and generators for broadcasting applications, frequency deviation monitors for power line monitoring, receivers and generators for reference signals used in telecommunications engineering, and much more.

Learn more

Visit our website to learn more about our modules:

[OUR CPU MODULES >](#)

[OUR REFERENCE CLOCK MODULES >](#)

[OUR POWER SUPPLY MODULES >](#)

[OUR INPUT MODULES >](#)

[OUR OUTPUT MODULES >](#)

Module Overview

REFERENCE CLOCK MODULES

| | |
|------------|------------------------------------------------------------------------------------------------------|
| IMS-GPS | GPS receiver |
| IMS-GNS | GNSS (GPS/GLONASS/Galileo/BeiDou) receiver |
| IMS-GNS-UC | GPS and Galileo receiver with up-converter for Meinberg GPS antenna/converter units |
| IMS-GNM | Multi-Band GNSS (GPS/GLONASS/Galileo/BeiDou) receiver |
| IMS-PZF | DCF77 correlation receiver, support for pseudo-random noise (PRN) |
| IMS-TCR | Time code receiver and generator, support for IRIG A/B/G, AFNOR, IEEE 1344 and C37.118 input signals |

SIGNAL CHANGEOVER MODULES

Available for IMS LANTIME M3000(S) & M4000 only.

| | |
|---------|------------------------------------------------------------------------------------|
| IMS-SPT | For single-clock operation |
| IMS-RSC | For redundant two-clock operation, providing automatic and manual clock switching. |

CPU MODULE

| | |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU-C15G2 | Intel Atom™ E-Series Dual-Core 1.33 GHz processor, 2 GB RAM onboard, 1 MB second-level cache memory, 4 GB flash storage, Gigabit Ethernet (1000BASE-T), 1 USB 2.0 port, up to 25,000 NTP requests per second |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

POWER SUPPLY MODULES

| | |
|----------|----------------------------------------------------|
| PWR-AD10 | 100–240 V AC, 50–60 Hz / 100–200 V DC, 50 W output |
| PWR-DC20 | 20–60 V DC, 50 W output |

CONFIGURABLE EXPANSION MODULES

Available for IMS LANTIME M500 only.

| | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| CES-1000 | Expansion module with error relay connector |
| CES-1011 | Expansion module with error relay connector and additional BNC outputs for providing pulse-per-second and 10 MHz signals over coaxial cable |

MULTI REFERENCE INPUT MODULES (EXAMPLES)

All ESI and I/O modules can operate in MRI slots.

| | |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IMS-MRI | Input module for AM and DCLS time codes, as well as 10 MHz and PPS signals |
| IMS-VSI | Input module for providing an IMS clock module with a video reference signal, with support for Bi-Level Sync (Black & Burst), VITC, LTC, Word Clock, and PPS signals |

EXTERNAL SYNCHRONIZATION INPUT MODULE (EXAMPLE)

All I/O modules can operate in ESI slots.

| | |
|---------|------------------------------------------------------------------------------------------------------------------------------|
| IMS-ESI | Input module for PPS signals, adjustable-frequency sine-wave signals (1 kHz – 20 MHz), or framed G.703 E1 or T1 sync signals |
|---------|------------------------------------------------------------------------------------------------------------------------------|

INPUT/OUTPUT MODULES (EXAMPLES)

| | |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IMS-BPE & IMS-CPE | Output port expander modules for AM and DCLS time codes (IRIG A/B/E/G, AFNOR, NASA 36-bit, IEEE C37.118, IEEE 1344), TTL signals (PPS, 10 MHz, 2,048 kHz, other programmable pulses), as well as serial time strings |
| IMS-FDM | Frequency deviation monitoring module for precise measurement of mains power line frequencies |
| IMS-HPS100 | Hardware-level NTP and PTP interface for IEEE 1588-compliant PTP, SyncE, and carrier-grade NTP |
| IMS-LIU | Line interface unit module for E1/T1 synchronization signal generation |
| IMS-LNE-GbE | Network expansion module providing four additional RJ45 Gigabit Ethernet ports |
| IMS-LNO | Generator module for sine-wave signals with low phase noise. Includes a dedicated processor for monitoring output signals and reporting status signals to the primary management system |
| IMS-PIO | Input/output module for PPS or 10 MHz TTL signals, primarily designed for comparing PPS signals from external signals against the internal reference clock |
| IMS-SCG | Generator module for word clock and AES11 synchronization signals in audio production applications |
| IMS-VSG | Video signal reference module for audiovisual production with support for Word Clock, Bi & Tri-Level Sync, LTC, and DARS signals |

IMS LANTIME M1000

Housed in a 19" 1RU rackmount chassis, the IMS LANTIME M1000 combines the power, reliability, and compact dimensions of Meinberg's standalone LANTIME servers with the flexibility and versatility of a customizable modular system.

It strikes a perfect balance between space economy and flexibility, taking up just a single rack unit while offering the scalability and flexibility needed to adapt to changing requirements with the integration of new technologies and new interfaces.

Key Features

- Modular design thanks to Meinberg's IMS platform in a compact chassis for space economy
- Hot-plugging support for modules enabling in-the-field replacement with minimal or no service disruption
- Redundancy for power sources and optionally also for clock sources
- Web Interface enables easy management of all modules
- Secure SSH/Telnet access available for expert administration
- Custom Meinberg LANTIME OS operating system with regular updates for maximum performance, maximum security, and ease of use
- RESTful API support to facilitate data acquisition and processing
- Supported by Meinberg's powerful mbgNMS Network Management System for unparalleled control and oversight



Front View
IMS LANTIME M1000



Rear View
IMS LANTIME M1000 with
sample configuration

IMS LANTIME M1000S

Meinberg also offers an alternative design of the IMS LANTIME M1000 in the form of the M1000S, a lower-cost model which omits the display and control panel on the front of the device. The M1000S is intended for use in racks where only one side is readily accessible and the local controls are unnecessary or inaccessible. This model is also powered by the fully featured LANTIME OS, which can be managed remotely using every remote interface provided by the M1000, and provides the same module slots as the M1000.

The M1000S is also available with the aforementioned redundant clock configuration.



Front View
IMS LANTIME M1000S with redundant clock configuration

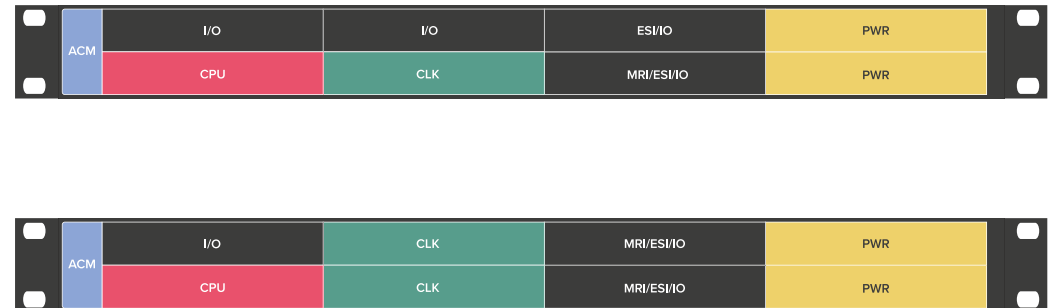
A Perfect Balance of Flexibility and Space Economy

The IMS LANTIME M1000 offers two power module slots, a reference clock slot to host the module for acquiring the reference clock signal (for example, GPS/GNSS, DCF77, IRIG time code), a Multi-Reference Input (MRI) slot for Standard Reference Input cards to provide access to redundant PPS, 10 MHz, and IRIG time code synchronization signal sources, and an Extended Synchronization Input (ESI) slot for industry-specific signal types.

The complete system is powered by Meinberg's actively maintained custom "LANTIME OS" operating system (LTOS), which provides secure Telnet/SSH access, an easy-to-use Web Interface, and a front panel with a display and function keys that enables monitoring and configuration to be performed directly from the device. Support for SNMP traps and configurable email notifications over SMTP makes remote monitoring even easier.

A variant of the M1000 is also available that replaces one of the I/O slots with a reference clock slot, allowing for the installation of two reference clock modules to ensure redundancy.

Slot Layout



Slot layout of the IMS LANTIME M1000(S) with a single (top) and redundant (bottom) reference clock configuration