LANTIME M3000
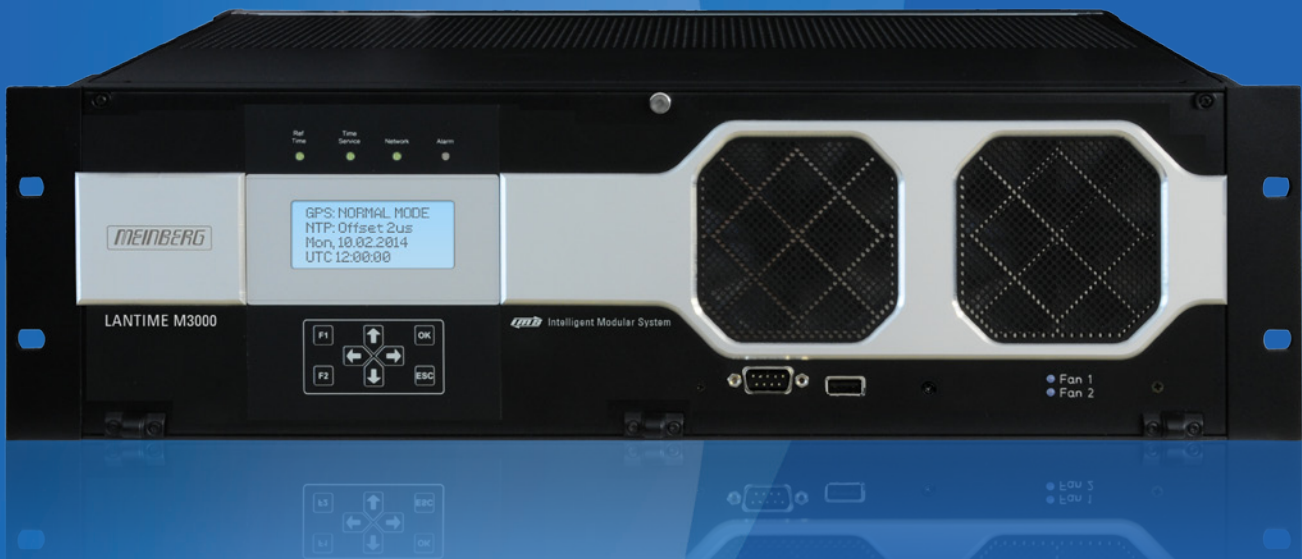
IMS Intelligent Modular Synchronization

The Ultra-Versatile Platform for Your Time and Frequency Synchronization Applications

All IMS Modules will report their status to the LAN-CPU and are easily replaceable in the field. The management CPU can automatically apply the configuration of a replaced card to a newly inserted replacement module. New or removed CLK and I/O modules will be recognized automatically.

PWR – Power Supply Options

IMS-PWR AD10:	100-240 V AC/DC, 50 W
IMS-PWR DC20:	20-72 V DC, 50 W

- Power supply modules indicate operational status to CPU.
- Redundant configuration possible.
- All power supplies are operating in load sharing mode.

CLK – Clock and central timing modules

IMS-GPS: GPS C/A-code receiver (12 channels)
Antenna/Converter System (IF 35.4 MHz)
Max. Cable lengths: 300m (RG58), 700m (RG213)

IMS-GLN: Combined GPS/GLONASS receiver (32 channels)
Antenna: GPS/GLONASS L1
Max. Cable length: 100m (H155 low loss)

Accuracy of pulse outputs for IMS-GPS and IMS-GLN:
< ±100 ns to UTC (TCXO, OCXO LQ)
< ±50 ns to UTC (OCXO-SQ, -MQ, -HQ, -DHQ)

IMS-PZF: DCF77 Correlation Receiver
Accuracy of pulse outputs:
< ±50 µs to UTC

Redundant clock configurations possible (requires switch card RSC).

SCU – Signal Changeover Unit

IMS-RSC: Redundant Switching of timing signals coming from the IMS-CLK modules. High availability of basic timing signals used for all I/O modules (1-PPS, 10 MHz, TOD). Seamless switching of 2.048kHz signals for telecom applications.

IMS-SPT: Signal Path Through (passive card used in non-redundant systems forwarding all signals from the clock).

CPU – NTP and Management Module

IMS-C051F: 500 MHz, 1 x 10/100BASE-T Fast Ethernet Port
NTP Server: 10.000 NTP req/s
Protocols: SNMP, SSH, Telnet, DHCP,
IPv4, IPv6, 802.1q, RADIUS, TACACS+
Management user interface via web interface or CLI

MRI – Multiple Reference Input

IMS-MRI: Basic reference input signals (BNC)
- 1PPS
- 10 MHz
- IRIG-AM (B, AFNOR, IEEE1344 / C37.118)
- IRIG-DCLS (B, AFNOR, IEEE1344 / C37.118)

ESI – Extended Synchronization Interface

IMS-ESI: Extended reference input signals
- 1PPS, BNC
- var. frequencies (1kHz-10MHz) unframed, BNC
- var. frequencies (1kHz-10MHz) unframed, RJ45
- BITS E1/T1 framed, RJ45
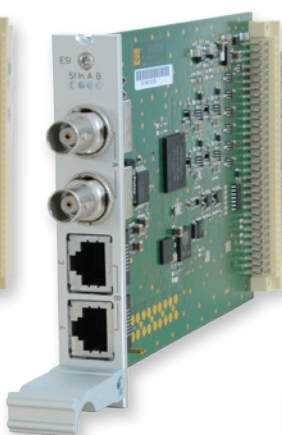

PWR
AC / DC
Power Supplies

CLK
Clock Module
GPS, GLONASS, PZF

RSC
Switch Card for
seamless Signal Changeover

MRI
Reference Input
IRIG, 1PPS, 10MHz

ESI
2MHz, 2MBit/s Reference
variable frequency Input

CPU
Management &
NTP Module

TSU
PTP / SyncE /
Hardware NTP Interface

LNE – LAN Network Expansion

IMS-LNE: Additional network ports for NTP and management.
LNE-GbE: 4x 10/100/1000BASE-T Gigabit RJ45 Ports.

TSU – PTP / SyncE / Hardware NTP Interface

IMS-TSU-GbE: Gigabit Ethernet (RJ45 / SFP Combo Port).
10 ns time stamp resolution
1-Step/2-step clock
IEEE 1588v2 multi profile support:
- Default 1588v2 profile
- ITU-T G.8265 and G.8275 Telecom profiles
- IEEE C.37.238-2011 Power Profile
- SMPTE ST 2059-2 Broadcast Profile
Layer 2 / Layer 3 / IPv4 / IPv6
E2E/P2P
Synchronous Ethernet In/Out
(ITU-T G.8261, G.8262, G.8264 ESMC)
Carrier Grade NTP (10 ns time stamp resolution)

LNO – Low Noise Option

IMS-LNO: 10 MHz sine wave outputs (low phase noise).
Integrated PLL and low phase noise oscillator (OCXO-MQ/HQ).

SCG – Studio Clock Generator

IMS-SCG: Word Clock frequencies for professional Audio Equipment.
- programmble word clock rates: 24Hz – 24,576MHz
- default rates: 44,1kHz, 48 kHz, 88,2 kHz, 96 kHz
- 4x BNC (2.5V TTL into 50Ω)

VSG – Studio Clock Generator

- synchronized by an external 10MHz signal
- Bi-Level Sync (black burst)
- Tri-Level Sync
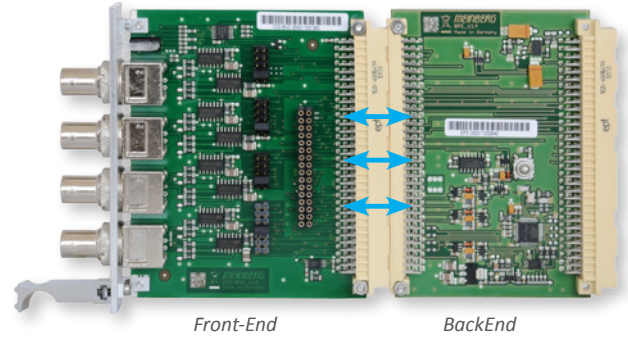
LIU – Line Interface Unit

IMS-LIU: E1/T1-generator available with 4 or 8 outputs.

Clock Outputs:
2.048 MHz (E1-mode) or 1.544 MHz (T1-mode), G.703, 75 Ohm, unbalanced or
2.048 MHz (E1-mode) or 1.544 MHz (T1-mode), G.703, 120 Ohm, balanced.

BITS - framed outputs with SSM/BOC support:
2.048 Mbps (E1-mode) or 1.544 Mbps (T1-mode), 75 Ohm, unbalanced or
2.048 Mbps (E1-mode) or 1.544 Mbps (T1-mode), 120 Ohm, balanced.

Front-End   *BackEnd*

CPE – Configurable Port Expansion

This module consists of a half-size standard controller card (Back-End) and a dockable port expander card (Front-End), allowing a large variety of available and programmable output signals and physical connectors, including various electrical and optical interfaces.

IMS-CPE available Signals:
- 1PPS, 10MHz
- Time Codes: IRIG A/B/E/G/AFNOR/IEEE1344/C37.118/NASA36/XR3 AM and DCLS
- Frequency Synthesizer (sine-wave + TTL)
- Programmable Pulses: 1PPS, 1PPM, 1PPH, Timer, Single Shot,
- Cyclic Pulses, DCF77 Mark, Sync Status
- Serial Timestrings (RS232 or RS422 / 485)

BPE – Basic Port Expansion

Back-End uses unmodified standard signals provided by a backplane.

IMS-BPE available signals:
- 1PPS, 10 MHz square-wave
- 2.048 MHz square-wave
- IRIG DCLS+AM (B, AFNOR, IEEE1344 / C37.118)
- Programmable Pulses provided by clock module

REL – Relay

Error relay contact module for error indication of clock faults.

IMS-REL: 3x DFK Connectors (3-pin CO/NO/NC) for error indication of CLK-1, CLK-2 and RSC (redundant system).

ACM – Active Cooling Module

The optional Active Cooling Module allows installation of the M3000 in non-A/C environments or in a rack setup in which the passive cooling concept cannot work reliably. All M3000 units can be equipped with an ACM cartridge in the field, if required. The ACM module allows a hot-plug replacement without the need to power down the system.

LNE
Network
Expansion Card

LIU
E1/T1
Generator

BPE
Basic Port
Expansion

KEY FEATURES

- IMS - Intelligent Modular Synchronization platform
- Hot swapping, field-replaceable modules
- Arbitrary combinations of modules
- Optimized space usage
- Active cooling option
- Redundant power and reference sources (e.g. GPS)
- Web based management for all modules
- Up to 40 additional LAN ports
- Up to 10 PTP (IEEE 1588-2008) modules
- Various types of I/O modules
- Rubidium option via external chassis

INPUT SIGNAL OPTIONS

GNSS: GPS, GLONASS
Radio Signal: DCF77 - PZF correlation receiver
Time Codes: IRIG AM, IRIG DCLS
Serial String: RS232 TOD+PPS
Pulses: 1PPS
Frequencies: variable frequencies (1kHz - 10MHz)
BITS / Clock: E1|T1 (framed) / 2.048|1.544 MHz (unframed)
Network: NTP, IEEE1588v2, Synchronous Ethernet

All available input signals can be configured to be used within the Meinberg MRS (Multi-Reference Sources) concept. The inputs are integrated into the Meinberg IRSA (Intelligent Reference Selection Algorithm) technology which allows user-defined prioritization of inputs and automatic reference fail-over control.

PWR

Four PWR slots are available for high power requirements and optional triple redundancy configurations. Different models are available supporting wide range AC and/or various DC voltage range.

CLK

Reference clock module slot which holds either a GPS, GLONASS or PZF receiver including the main oscillator. The clock module provides standard backplane signals like 1PPS, 10 MHz and a serial time string. Up to two CLK slots can operate per backplane.

Usable Modules:
IMS-GPS: GPS Receiver
IMS-GLN: GPS/GLONASS Receiver
IMS-PZF: DCF77 Correlation Receiver

SCU

Optional Switch Module, required when using redundant clocks. Automatic, remote controlled or manual changeover of signal sources, seamless changeover of 2.048 MHz reference signals for redundant telecom applications.

CPU

Holds a CPU module which acts as the main chassis controller and provides web interface and other management services as well as NTP. The IMS platform supports one CPU slot per backplane.

ESI (Extended Synchronization Interface)

Usable Modules:
IMS-ESI: Extended reference input signals (1PPS, var. frequencies, E1/T1)
IMS-TSU: IEEE1588v2 Input/Output, Synchronous Ethernet (Output only), NTP (Output).

Slot ESI1: Input signals are directly connected to CLK1
Slot ESI2: Input signals are directly connected to CLK2 (redundant)
Output signals are available from both clocks (switched)

All IO modules can operate in ESI slots.

MRI

Usable Modules:
IMS-MRI: Standard reference input signals (1PPS, 10 Mhz, IRIG-AM, IRIG-DCLS)
IMS-ESI: Extended reference input signals (1PPS, var. frequencies, E1/T1)
IMS-TSU: IEEE1588v2 Input/Output, Synchronous Ethernet Input/Output, NTP (Output)

Slot MRI1: Input signals are directly connected to CLK1
Slot MRI2: Input signals are directly connected to CLK2 (redundant)
Output signals are available from both clocks (switched)

All ESI and IO modules can operate in MRI slots.

IO

Usable Modules:
IMS-TSU: PTP / SyncE / Hardware NTP Interface
IMS-BPE: Basic Port Expansion
IMS-CPE: Configurable Port Expansion
IMS-LIU: Line Interface Unit (E1/T1 Telecom Signals)
IMS-LNO: 1MHz sine Low Noise Option
IMS-LNE: LAN network expansion
IMS-SCG: Studio Clock Generator (Audio)
IMS-VSG: Video Sync. Generator
IMS-REL: Relay contact module (Error Out)
IMS-FDM: Frequency deviation monitor for power line networks