

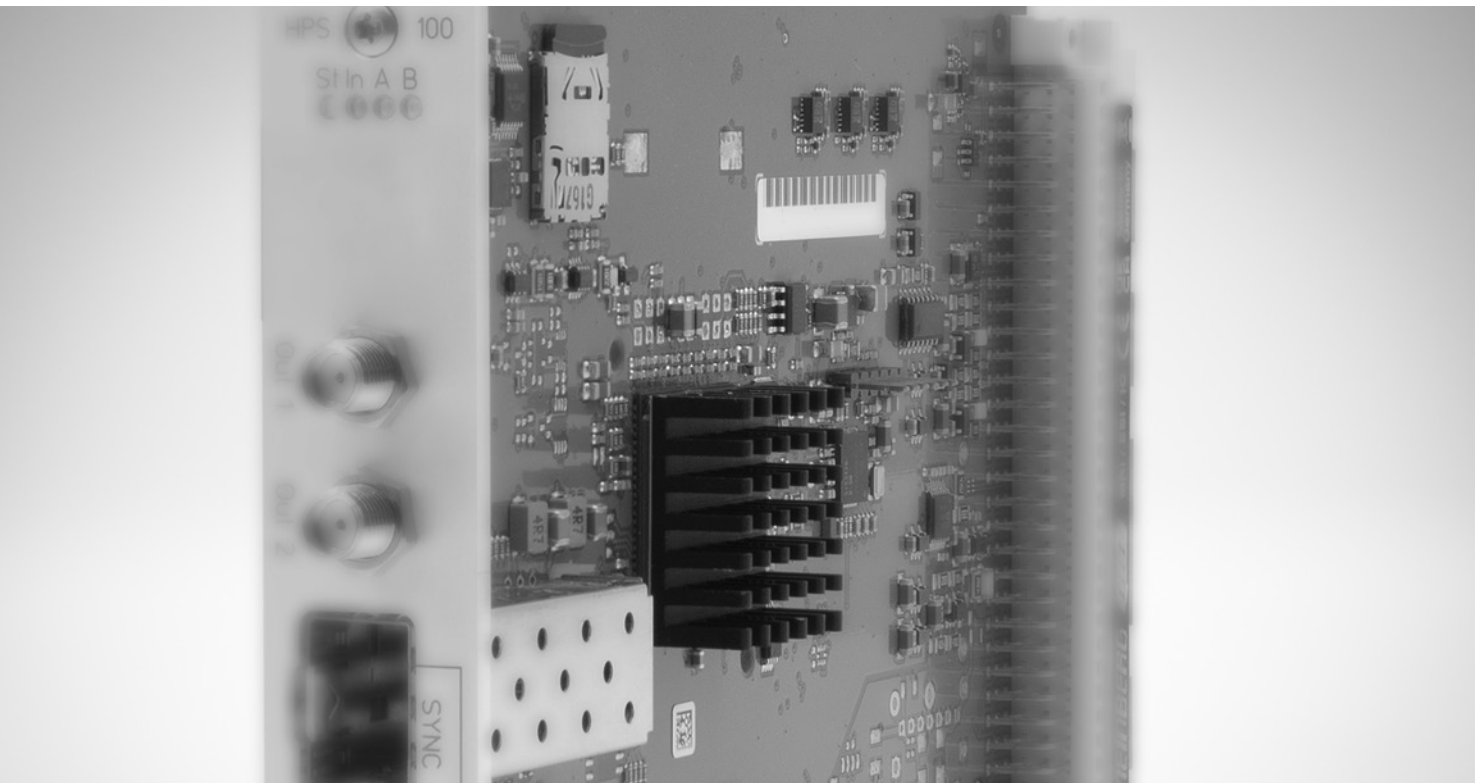
# IMS HPS100

**PTP / SyncE / Hardware NTP Interface  
with Dedicated Dual-Core CPU**



The IMS-HPS100 module for Meinberg's line of Intelligent Modular Synchronization (IMS) systems provides hardware-level NTP & PTP synchronization as well as a physical-layer frequency reference via support for Synchronous Ethernet (SyncE).

Meinberg's IMS-HPS100 is a reliable, powerful, and cost-effective solution for top-of-the-line synchronization performance. Featuring a dedicated dual-core CPU and a combination SFP/RJ45 network port, the IMS-HPS100 delivers time with 8 ns accuracy to up to 2048 unicast clients. With full support for PTPv1, PTPv2, and PTPv2.1 and numerous industrial PTPv2 profiles, the IMS-HPS100 is the optimum solution for the most sophisticated industrial synchronization needs and the most demanding timing specifications.



## Key Features

- Designed for Meinberg's [IMS Platform](#)
- High-Performance Dual-Core CPU
- Gigabit Ethernet SFP/RJ45 Combo Port
- 8ns Time Stamp Accuracy
- 1-Step or 2-Step Master/Slave Operation
- Multi-Profile Support (Default, Power, Telecom, SMPTE)
- Up to 2048 PTP Clients (128 Sync / Delay Requests per Second)
- SyncE - Synchronous Ethernet
- 2x SMA Outputs for 1 PPS, 10 MHz, or 2.048 MHz

# Industry-Leading IEEE 1588 PTP Performance

There is no solution on the market that offers this level of performance and flexibility. Meinberg’s IMS-HPS100 module features a dedicated 825 MHz dual-core processor on a Cortex A9 SOC and a Gigabit Ethernet combination SFP/RJ45 port to deliver top-level performance, allowing for accuracy of up to 8 nanoseconds and reliable one-step operation.

The IMS-HPS100 supports PTPv1, PTPv2, and PTPv2 with both master and slave operation, along with an extensive range of PTP profiles specified by a variety of industrial standards in the broadcasting & media, power generation, telecommunication, and other industries. With five Performance Levels available, you can scale your timing infrastructure investment to your synchronization requirements. The module’s monitoring functionality enables extensive reporting to allow you to optimize your timing accuracy.

## Synchronous Ethernet

Synchronous Ethernet—also known simply as “SyncE”—allows a high-accuracy clock (frequency) signal to be transferred along the physical layer (Layer 1) of a Ethernet connection, along with clock quality information (Synchronization Status Messages, SSM) transferred along the Ethernet layer (Layer 2). The IMS-HPS100 module can function as a SyncE master or slave concurrently with the PTP functionality.events Denial of Service attacks that are based on NTP traffic.

Due to the modular concept of the Meinberg IMS system, the traffic port of the HPS100 card is completely isolated from the rest of the time server platform functionality. From the network perspective, the management CPU of the LANTIME platform is physically seperated from the HPS100 module and is therefore also protected against any DoS attacks.

## Secure NTP Hardware Responder

The NTP Hardware Responder of the IMS-HPS100 is capable of responding to over 400,000 NTP requests per second. These requests are processed entirely in dedicated hardware—neither the base IMS system nor the dual-core CPU of the module’s SoC are involved. This provides not only unparalleled NTP performance but also an innovative level of security—the self-contained nature of the hardware NTP service means that any NTP-based Denial of Service attacks cannot affect the IMS LANTIME system’s core management CPU.

The IMS-HPS100 module also features an additional dedicated software-level NTP service that can be run on the module’s CPU—this too is isolated from the IMS LANTIME system’s core management CPU, is operable concurrently with the PTP instances, and can respond to over 15,000 NTP requests per second.

## Performance Level Options

| Performance Level | Unicast Clients | Delay Req/s<br>in Multicast/Hybrid Mode | NTP Req/s | PTPv1 | PTP Monitoring |
|-------------------|-----------------|-----------------------------------------|-----------|-------|----------------|
| PL-A              | 8               | 1024                                    | 1600      | No    | No             |
| PL-B              | 256             | 32768                                   | 51200     | No    | No             |
| PL-C              | 512             | 65536                                   | 102400    | Yes   | No             |
| PL-D              | 1024            | 131072                                  | 204800    | Yes   | Yes            |
| PL-E              | 2048            | 262144                                  | 409600    | Yes   | Yes            |

# Technical Specifications

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Profiles</b>             | <ul style="list-style-type: none"><li>— IEEE 1588v2 Default Profile</li><li>— IEEE 1588v1 (Option)</li><li>— Enterprise Profile</li><li>— IEC 61850-9-3 Power Profile</li><li>— IEEE C37.238-2011 Power Profile</li><li>— IEEE C37.238-2017 Power Profile</li><li>— ITU-T G.8265.1 Telecom Frequency Profile</li><li>— ITU-T G.8275.1 Telecom Phase / Time Profile (full timing support)</li><li>— ITU-T G.8275.2 Telecom Phase / Time Profile (partial timing support)</li><li>— SMPTE ST 2059-2 Broadcast Profile</li><li>— IEEE 802.1AS TSN/AVB Profile</li><li>— AES67 Media Profile</li><li>— DOCSIS 3.1</li></ul> |
| <b>PTP Modes</b>            | <ul style="list-style-type: none"><li>— Multicast/Unicast Layer 2 (IEEE 802.3)</li><li>— Multicast/Unicast Layer 3 (UDP IPv4/IPv6)</li><li>— Hybrid Mode</li><li>— E2E / P2P Delay Mechanisms</li><li>— Up to 128 messages / second per client</li></ul>                                                                                                                                                                                                                                                                                                                                                                |
| <b>NTP Mode</b>             | <ul style="list-style-type: none"><li>— NTP Server Mode (8 ns time stamp accuracy), NTP Hardware Responder (DoS protection, 400,000 req./s.)</li><li>— NTPD Software Service (15,000 req./s)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IEEE 1588 Clock Mode</b> | 1-Step, 2-Step for both Master and Slave operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Synchronous Ethernet</b> | <ul style="list-style-type: none"><li>— Master and Slave Capability</li><li>— Compliant with ITU-T G.8261, G.8262 and G.8264</li><li>— Ethernet Synchronization Messaging Channel (ESMC)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Network Protocols</b>    | <ul style="list-style-type: none"><li>— IPv4, IPv6</li><li>— DHCP, DHCPv6</li><li>— DSCP</li><li>— IEEE 802.1p &amp; 802.1q VLAN filtering/tagging</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Ethernet Interface</b>   | Combo Port: <ul style="list-style-type: none"><li>— 1 x 100/1000BASE-T RJ45</li><li>— 1 x GBIT SFP - Slot (Single &amp; Multi Mode)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Signal Outputs</b>       | 2x SMA (50 Ohm) connectors, configurable signals (generated by IMS clock module): <ul style="list-style-type: none"><li>— 1 PPS</li><li>— 10 MHz</li><li>— 2.048 kHz</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Time Stamp Accuracy</b>  | 8 ns                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# Get in Touch

Our Sales Team will be glad to assist you.

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## The Synchronization Experts.

A foremost innovator of the synchronization industry with longstanding roots in Bad Pyrmont, Germany, Meinberg is a family-owned company with over four decades of world-leading expertise in developing and manufacturing a range of high-end synchronization technology, including high-end PTP & NTP servers, receiver technology for satellite & radio synchronization signals, time code generators & readers, and an array of related accessories such as antennas, converters, and signal distribution systems.

With the Meinberg family of companies also encompassing our subsidiary Meinberg USA Inc. in Santa Rosa, California and embedded systems specialist Oregano Systems in Vienna, Austria, as well as a robust network of distribution & service partners in over 40 countries around the world, Meinberg's quality and expertise is never far away.

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