microSync^{HR} Half Rackmount Systems

Product Highlights

- A powerful Stratum 1 NTP/PTP time server
- 1U chassis, specially constructed for installation on desktop or in a 19” rack
- Engineered to order with various receiver-clocks
- Different oscillator options for advanced holdover performance

Compact and Powerful IEEE 1588 PTP Grandmaster and NTP Server

Meinberg’s microSync^{HR} is a compact and feature-rich synchronization device and offers a high level of efficiency and flexibility. It can be deployed in a large range of different industries and applications. This innovative, multipurpose synchronization solution offers a variety of outstanding features, many of which are also found in Meinberg’s IMS and LANTIME product families – all within a compact, space-efficient half-rack design.

Key features include four Gigabit Ethernet interfaces, multiple programmable output signals (two over Fiber Optical ST connectors) and several configurational output options like Programmable Pulses (TTL), Time Code AM (IRIG, AFNOR) and Frequency Synthesizer (0.1 Hz to 10 MHz) available via BNC. Furthermore, it allows the user to synchronize both NTP and PTP devices.

If it is required to synchronize devices which are not using a network-based synchronization solution, the microSync^{HR} provides a wide range of various electrical and optical connectors. The available sync signals include PPS/PPM/PPH, Time Code and RS-232/RS-422 serial time strings and more, depending on your configuration. The microSync^{HR} can be ordered with different GNSS receivers and oscillators. It offers optical or electrical network connections using SFP modules.

Equipped with a full version of the powerful, synchronization-centric meinbergOS operating system, the microSync^{HR} offers up all the security and flexibility that the microSync family is known for. These include the new features introduced in the latest meinbergOS versions, specifically LDAP, TACACS+, and RADIUS authentication, native PRP for NTP and PTP traffic, industry-specific network functionality such as IEC 61850 MMS support, detailed analysis features for GNSS reception and clock performance, and also a fully integrated version of Meinberg's PTP monitoring solution, PTP Track Hound.

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Basic System Specifications

Processor	Intel Cyclone V dual-core SoC
Operating System	Custom meinbergOS based on Linux 6.x LTS kernel

Supported Protocols

Network Protocols	IPv4, IPv6 DHCP, DHCPv6 DSCP IEEE 802.1q VLAN filtering/tagging IEEE 802.1p QOS SNMPv1/v2/v3 Remote Syslog Support (UDP)
NTP	NTPv3, NTPv4, SNTP
PTP IEEE-1588	PTPv2, PTPv1*
PRP	IEC 62439-3

* with performance level C only

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)
Performance	Up to 10,000 NTP requests per second
Accuracy	≤ 100 µs

Support for IEC 61850 Environments

MMS Server Support	meinbergOS >= 2024.12 incorporates new MMS server functionality that allows the microSync to communicate directly with other IEC 61850 devices and communicate various aspects of its current operating conditions to SCADA and HMI solutions in power systems.

Management Interfaces

Network	Web Interface (HTTP/HTTPS TLS v1.3) SSH v2 (command line interface) REST API (HTTP/HTTPS TLS v1.3)
Serial Console	Micro USB connector for serial terminal access
Local (Display Option)	OLED display with a rotary controller

PTP (IEEE 1588) Support

PTP Versions	PTPv2 (IEEE 1588-2008), PTPv1 from performance level C (PL-C)
IEEE 1588-2008 Profiles	**Default Profiles** - Default E2E IEEE 1588-2008 - Default P2P IEEE 1588-2008
	Power Profiles - IEEE C37.238-2011 (including profile extensions) - IEEE C37.238-2017 (including profile extensions) - IEC/IEEE 61850-9-3 Power Utility Profile (including profile extensions)
	Broadcast Profiles - DOCSIS 3.1 - SMPTE ST 2059-2 (including profile extensions) - AES67 Media - IEEE 802.1AS TSN/AVB
	Telecom Profiles - ITU-T G.8265.1 (including profile extensions) - ITU-T G.8275.1 (including profile extensions) - ITU-T G.8275.2
	Automotive Profiles - AUTOSAR
SyncE Support	- Compliant with ITU-T G.8261, G.8262 and G.8264 Ethernet synchronisation message channel (ESMC)
Packet Transmission Modes	Two-Step mode, One-Step mode
Clock Modes	- Multicast Master - Unicast Master - Multicast Slave - Unicast Slave - Multicast Auto (automated mode selection based on IEEE 1588 Best Master Clock Algorithm)
Other Features	- Hybrid Mode (Sync & Announce messages sent to multicast address, Delay Request & Delay Response messages sent as unicast) - Path Trace TLVs - Alternate Time Offset Indicator TLVs
Performance	Up to 65536 delay requests per second with performance level (PL-C)
Accuracy	≤ 20 ns

PTP Performance Levels

Your microSyncRX is provided with a license that provides one of three specified performance levels with the IEEE 1588 implementation in terms of the maximum number of unicast clients, PTPv1 support, and the maximum number of delay request messages per second. Please reach out to your Meinberg Sales Representative for more information.

Performance Level	Max. Unicast Clients	Max. Delay Req./s (Multicast/Hybrid Mode)	PTP Versions
PL-A	8	1024	PTPv2
PL-B	256	32768	PTPv2
PL-C	512	65536	PTPv1*, PTPv2

* PTPv1 Mode selectable via meinbergOS Web Interface

Available Receiver Types

GPS Receiver*	12-channel L1 C/A code receiver for reception of signals from the GPS satellite constellation
GNS Receiver	72-channel receiver for reception of signals from the GPS (L1), Galileo (E1 B/C), BeiDou (B1I), and GLONASS (L1OF) satellite constellations
GNS-UC Receiver*	72-channel receiver for reception of signals from the GPS (L1 C/A code) and Galileo (E1 B/C) satellite constellations

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

Operating Specifications

Acoustic Noise Emissions	0 dB(A)
Operating Temperature	-20 °C to 55 °C (-4 °F to 131 °F)
Storage Temperature	-30 °C to 70 °C (-22 °F to 158 °F)
Relative Humidity	Max. 95 % at 40 °C (104 °F), non-condensing
Operating Altitude	4,000 m (13,123 ft) above sea level
Atmospheric Pressure	615 to 1,600 hPa

Oscillator Options

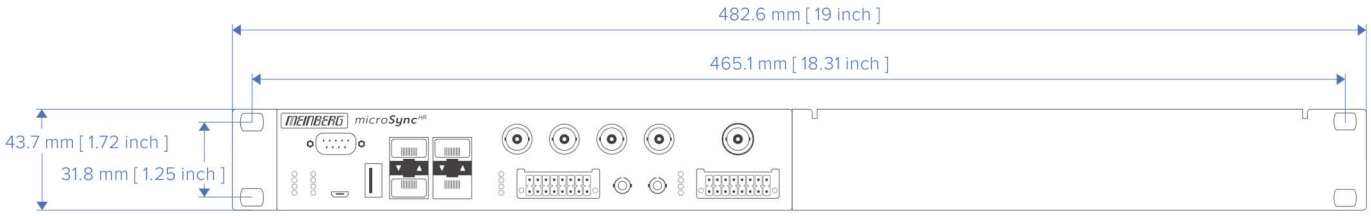
The microSyncRX is shipped as standard with a "**OCXO SQ**" (temperature-controlled crystal oscillator), which provides excellent holdover performance if your server loses synchronization with its upstream reference for any reason. The microSync may also be shipped on request with a more powerful holdover solution; the options available and their performance metrics are listed below:

Type	Holdover Performance (1 Day) *	Holdover Performance (1 Year) *
OCXO SQ	± 65 µs	± 4.7 s
OCXO HQ	± 10 µs	± 788 ms
OCXO DHQ	± 4.5 µs	± 158 ms

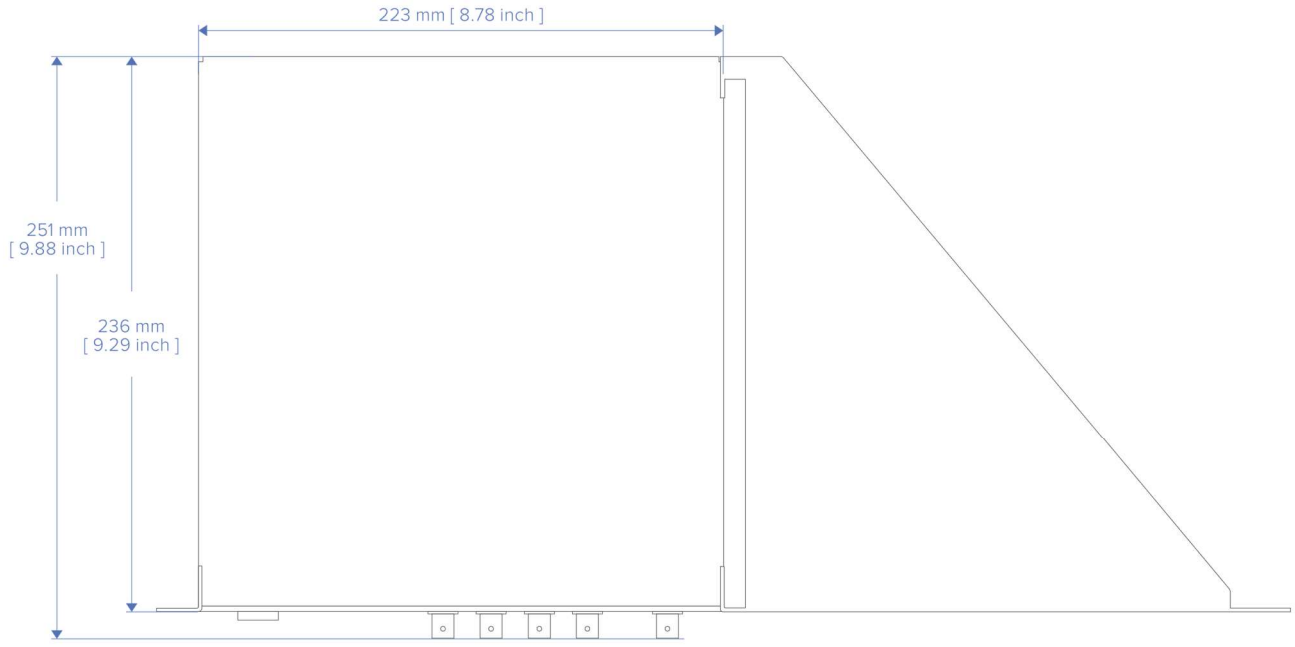
Mechanical Data

Housing Type	9.5" (Half-Rack), 1U
Housing Material	Steel
Weight (incl. Mounting Brackets)	2.2 kg (4.85 lbs)

microSync^{HR} Physical Dimensions



Front view with mounting brackets



Top view with mounting brackets

Support

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 via the Web Interface (upload via a web browser), or via the CLI (download from a server). meinbergOS allows you to install multiple firmware versions onto the device concurrently and select which one should be used when the system starts.

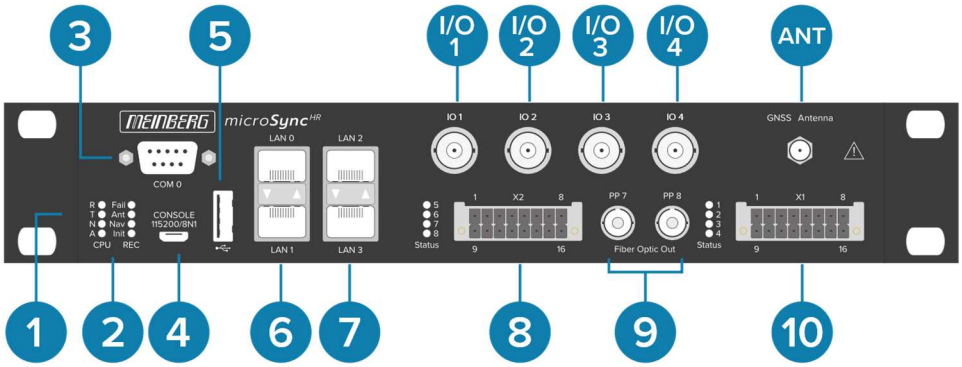
Accessories Included

- Models with a GPS or GNS-UC clock receiver include a 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*.
- Models with a GNS receiver clock include a Meinberg GNMANTv2 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) Speedfoam 240HFJ coaxial cable with pre-fitted connectors as standard*.

* Meinberg also offers customized antenna cables, antenna signal distribution solutions, and surge protectors to accommodate your specific installation requirements. Please reach out to your Meinberg Sales Representative for more information.

microSync^{HR} Input/Output Connectors & Interfaces

This illustration represents an example configuration of an microSync^{HR} rackmount system that provides an approximate indication of the general location of the various connectors on a given microSync^{HR}. Please note that the exact location of specific connectors may vary depending on the specific configuration ordered. Should you require a data sheet for a specific microSync^{HR} system configuration, please reach out to your Meinberg sales representative.



1 System Status LEDs

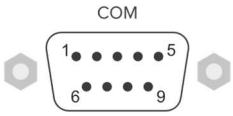
R (Ref. Time)	Indicates whether the reference clock is providing a valid timebase.
T (Time Service)	If lit, the internal NTP service of the server is synchronized with the reference clock.
N (Network)	Shows whether there is a valid link-up on any of the configured network interfaces.
A (Alarm)	Advises of a general system fault that requires attention.

2 GNSS Receiver Status LEDs

“Fail” LED	When lit, this reveals if that clock is having problems with synchronization.
“Ant.” LED	Indicates no functional connection to the antenna or that there is a short-circuit in the connection with the antenna.
“Nav.” LED	Shows the state of the geopositioning process.
“Init.” LED	Provides an indication of initialization state of the clock and onboard oscillator.

3 Serial Time String I/O

Pin	Function
1	PPS Input
2	RS-232 RxD (Receive)
3	RS-232 TxD (Transmit)
5	GND (Ground)



Connector Type	D-Sub 9, male
Supported Time Strings (Output)	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
Supported Time Strings (Input)	Meinberg Standard, NMEA RMC, NMEA ZDA, Uni Erlangen
Baud Rates	300, 600, 1200, 2400, 4800, 9600, 19200 *(Default)*
Framing Options	7N2, 7E1, 7E2, 8N1 (Default), 8N2, 8E1, 8O1
Supported Cable Type	Standard RS-232 (female) for time string output Modified RS-232 cable (female) with PPS signal on Pin 1 for synchronization with external time string + PPS signal

4 Serial Console Port (Terminal Access)

The serial console port is a standard USB interface with a Micro USB Type B female connector that can be used to establish a direct serial connection (115200 baud, 8N1 framing) between the microSync and any device running suitable terminal software (e.g., a laptop) for direct command line access. The connection can be established using any suitable USB Type A to Micro USB Type B cable.

5 USB Interface

This USB interface can be used for:

- saving a backup of the meinbergOS configuration to an external storage medium (such as a USB flash drive) and restoring this backup (or copying a standard configuration between multiple microSync servers)
- creating a backup of logfiles
- performing a local factory reset using a specially prepared “USB key”

6 Network Interfaces (LAN0 & LAN1)

Network Interfaces	2x SFP, not PTP capable
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

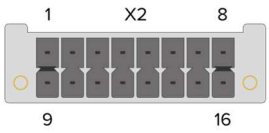
7 Network Interfaces (LAN2 & LAN3)

Network Interfaces	2x SFP, PTP master & slave capable
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, including for PTP and NTP - Support for network link aggregation (“bonding”) with multiple modes for load balancing or link redundancy

Supported SFP Modules

Type	Mode	Connector Type	Max. Connection Length
FS SFP-GE-T	10/100/1000BASE-T SFP Copper	RJ45	100 m
BlueOptics	1000BASE-SX SFP, 850 nm multi mode	Duplex LC	100 m
BlueOptics	1000 BASE-LX SFP, BO05C13610D 1310 nm single mode	Duplex LC	10,000 m

8 DMC X2 Terminal Connector



Connector Type	DMC 16-pin, Male

Pin	Function		Accuracy
1	PP 5+	Programmable Signal (Optocoupler)	
2	PP 5	Programmable Signal (RS422A)	≤100 ns
3	PP 5	Programmable Signal (RS422B)	≤100 ns
4	PP 6	Programmable Signal (RS422A)	≤100 ns
5	PP 6	Programmable Signal (RS422B)	≤100 ns
6	+ TC In	DCLS Timecode (TTL, isolated)	
7	+ TCA* Out	DCLS Timecode (TTL, isolated)	≤50 ns
8	- TCA Out	DCLS Timecode (TTL, isolated) TTL active high 250 mA, short-circuit proof	≤50 ns
9	PP 5-	Programmable Signal (Optocoupler)	
10	GND	Ground	
11	GND	Ground	
12	GND	Ground	
13	GND	Ground	
14	- TC In	DCLS Timecode (TTL, isolated)	
15		Not used	
16		Not used	

* TCA = Time Code Amplified, DCLS output with large output current

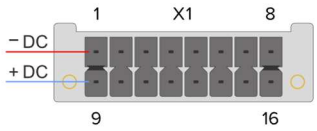
Optocoupler Specifications – Pin 1 + 9

Max. Switching Voltage (UCE)	55 V DC
Max. Switching Current (IC)	50 mA
Max. Power Loss	150 mW
Switch-On Time	Typically 5 µs, Maximum 9 µs
Switch-Off Time	Typically 10 µs, Maximum 70 µs

9 Programmable Pulse Output 7 & 8

Connector Type	ST Connector, female (for shielded coaxial cable)
Output Type	Fibre Optic (FO)
Wavelength	850 nm (Multimode)
Output Power	typ. 15 µW
Type of Fibre Type	GI 50/125 µm or 62.5 µm graded-index fibre
Accuracy	- ≤50 ns
Supported Modes	- Idle - Timer - Single Shot - Cyclic Pulse - Pulse Per Second, Minute, Hour - DCF77 Marks - Position OK - Time Sync - All Sync - DCLS Time Code - Serial Time String - DCF77-like M59 - Synthesizer Frequency - PTTI 1 PPS - 1 MHz Frequency - 5 MHz Frequency - 10 MHz Frequency

10 DMC X1 Terminal Connector



Connector Type	DMC 16-Pin, Male

Pin	Function	
1	–DC In	Negative Potential of Operating Voltage
2		Not Used
3	PP 1-	Programmable Signal
4	PP 2-	Programmable Signal
5	PP 3-	Programmable Signal
6	PP 4-	Programmable Signal
7	REL-NO	Error Relay (Normally Open)
8	REL-CO	Error Relay (Common)
9	+DC In	Positive Potential of Operating Voltage
10		Not Used
11	PP 1+	Programmable Signal
12	PP 2+	Programmable Signal
13	PP 3+	Programmable Signal
14	PP 4+	Programmable Signal
15		Not Used
16	REL-NC	Error Relay (Normally Closed)

Power Supply – 1 & 9 (Input Parameter)

Nominal Voltage	U_N = 48 V DC
Max. Voltage Range	U_{max} = 20-60 V DC
Nominal Current	I_N = 0.63 A
Pin Assignment	Pin 1: – DC In Pin 9: +DC In

Optocoupler Specifications – 3-6 & 11-14

Max. Switching Voltage (U_{CE})	55 V DC
Max. Switching Current (I_C)	50 mA
Max. Power Loss	150 mW
Switch-On Time	Typically 5 µs, Maximum 9 µs
Switch-Off Time	Typically 10 µs, Maximum 70 µs

Error Relay – 7-8 & 16

The X1 connector features a 0 V (“dry”) contact that is controlled directly by the reference clock (GPS, GNS, GNS-UC). Normally, when the internal reference clock has been synchronized to its source (GPS, DCF77, or IRIG), this relay will switch to “NO” (Normally Open) mode. However, if there is a poor antenna signal or the device has been switched off, the relay will fall back to “NC” (Normally Closed) mode.

Max. Switching Voltage	60 V DC
Max. Switching Current (Imax)	400 mA
Max. Power Load	24 W
Response Time	Approx. 2 ms

Input/Output Options

Each microSync[HR] model has four BNC female connectors, which provide different input and output signals depending on the model variant.

	I/O 1	I/O 2	I/O 3	I/O 4
microSync[HR] 10X	F. Synth. Out	TC AM Out	PP 1 Out	PP 2 Out
microSync[HR] 30X	10 MHz In	PPS In	10 MHz sine Out	10 MHz Out
microSync[HR] 31X	10 MHz In	PPS In	PP 1 Out	PP 2 Out

F.Synth. Out

Connector Type	BNC, female (for shielded coaxial cable)
Output Signal	Unbalanced sine-wave signal
Supported Frequency Range	0.1 Hz to 10 MHz (configurable)
Signal Level	3 Vpp with 50 Ω load

10 MHz Out

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

10 MHz sine Out

Connector Type	BNC, female (for shielded coaxial cable)
Output Signal	10 MHz sine frequency
Signal Level	5 dBm +/- 1 dBm with 50 Ω load
Harmonic Frequencies	< –60 dBc
Spurious Frequencies	< –65 dBc
Phase Noise	< –115 dBc/Hz @ 10 Hz < –130 dBc/Hz @ 100 Hz < –140 dBc/Hz @ 1 KHz

PP 1 / PP 2 Out

Connector Type	BNC, female (for shielded coaxial cable)
Signal Level	TTL, 2.5 V_{pp} with 50 Ω load (unbalanced)
Accuracy	≤50 ns
Supported Modes	- Idle - Timer - Single Shot - Cyclic Pulse - Pulse Per Second, Minute, Hour - DCF77 Marks - Position OK - Time Sync - All Sync - DCLS Time Code - Serial Time String - DCF77-like M59 - Synthesizer Frequency - PTTI 1 PPS - 1 MHz Frequency - 5 MHz Frequency - 10 MHz Frequency

TC AM Out

Connector Type	BNC, female, for shielded coaxial cable
Output Signal	Unbalanced Sinusoidal Signal
Signal Level	3 V_{pp} / 1 V_{pp} (MARK/SPACE) into 50 Ω
Accuracy	≤2 µs
Generated Time Codes	IRIG B122 IRIG B123 IRIG B126 IRIG B127 IEEE 1344 IEEE C37.118 AFNOR

PPS In

Connector Type	BNC, female (for shielded coaxial cable)
Input Signal	Pulse-per-second signal, TTL pulse
Expected Pulse	Min. 5 µs, active high

10 MHz In

Connector Type	BNC, female (for shielded coaxial cable)
Input Signal	Sine-wave signal (1.5 V_{pp} – 5.0 V_{pp}) or TTL pulse
Expected Pulse	Min. 5 µs, active high

GNSS Antenna Connector Options

Antenna for GPS and GNS-UC Receiver	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)

Antenna for GNS Receiver	GNMANTv2*
Connector Type	SMA female
Impedance	50 Ω
Recommended Cable	Speedfoam 240HFJ (max. 70 m / 230 ft)
Output Voltage	5 V DC (used to power antenna),
Output Current	max. 120 mA

* For more detailed information on the recommended antenna, request a copy of the manufacturer data sheet from your Meinberg Sales Representative, or download it directly from the Meinberg website:

http://www.mbg.link/gnss-antennas

Type Tests

Safety Tests

IEC 62368-1 Safety Requirements	Overvoltage Category	II
	Protection Class	1
	Degree of Pollution	2
IEC 60529	Protection Rating / IP Code	IP30

Environmental Tests

The tests were performed according to IEC 61850-3 referring to the following standards:

IEC 60068-2-1	Cold	–25 °C (–13 °F), 96 h –40 °C (–40 °F), 16 h
IEC 60068-2-2	Dry heat	60 °C (140 °F), 96 h 85 °C (185 °F), 16 h
IEC 60068-2-14	Change of temperature	–20 to 55 °C (–4 to 131 °F), 5 cycles, 1 °C (34 °F)/min
IEC 60068-2-30	Damp heat, cyclic (12 h + 12 h)	55 °C (131 °F), 97 % RH, 6 cycles
IEC 60068-2-78	Damp heat, steady state	40 °C (104 °F), 93 % RH, 240 h
IEC 60255-21-1	Vibration (sinusoidal) [1] Class 2	10–150 Hz, 1 g_n, 2 sweeps, 3 axes 10–150 Hz, 2 g_n, 40 sweeps, 3 axes
IEC 60255-21-2	Shock [1] Class 2	10 g_n, 11 ms, ±3 shocks, 3 axes 30 g_n, 11 ms, ±3 shocks, 3 axes 20 g_n, 16 ms, ±1000 shocks, 3 axes
IEC 60255-21-3	Seismic [1, 2] Class 2	4-35 Hz, 1 g_n, 1 sweep, hor. axes 4-35 Hz, 2 g_n, 1 sweep, ver. axis

[1] In order to withstand the tests for vibration, shock and seismic, special mounting brackets are optionally available.

[2] The frequency range deviates from the values required by the standard. In this test, a frequency range of 4-35 Hz instead of 1-35 Hz was used.

Electromagnetic Compatibility – Emission

CISPR 16-1-2 and CISPR 16-2-1	Conducted disturbance voltage measurements
CISPR 16-2-3	Radiated radio disturbance
CISPR 32	Conducted disturbance current measurements
FCC 47 CFR Part 15 **section 15.107 (b) [3]** **RSS-Gen Issue 4 section 8.8 [4]**	Conducted emission
FCC 47 CFR Part 15 **section 15.109 (b) [3]** **RSS-Gen Issue 4 section 8.9 [4]**	Radiated emission
ETSI EN 303 413	Standard for GNSS receiver

Electromagnetic Compatibility – Immunity

The tests were performed according to IEC 61000-6-5 and IEC 61850-3 referring to the following standards:

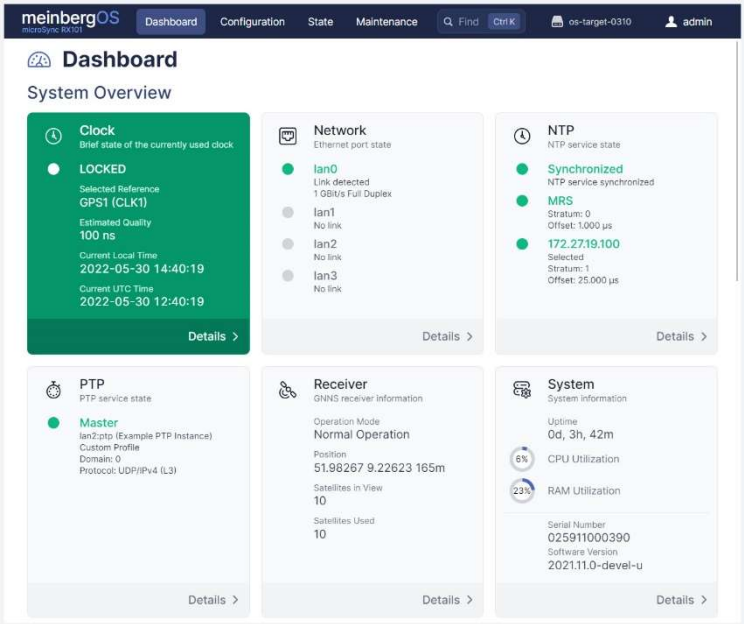
IEC 61000-4-2	Immunity test to electrostatic discharges	±6 kV contact discharge ±8 kV air discharge
IEC 61000-4-3	Immunity test to radiated, radio-frequency, electromagnetic fields	10 V/m
IEC 61000-4-4	Immunity test to electrical fast transients (Burst)	±4 kV, 100 kHz
IEC 61000-4-5	Immunity test to surges	up to ±1 kV line to line up to ±2 kV line to earth
IEC 61000-4-6	Immunity test to conducted disturbances, induced by radio-frequency fields	10 V
IEC 61000-4-8	Immunity test to power frequency magnetic fields	100 A/m continuous 1000 A/m at 1 s
IEC 61000-4-16	Immunity test to conducted, common mode disturbances	30 V continuous 300 V at 1 s
IEC 61000-4-17	Immunity test to ripple on d.c. input power ports	10 % of U_N
IEC 61000-4-18	Immunity test to damped oscillatory waves	±1 kV line to line ±2.5 kV line to earth
IEC 61000-4-29	Immunity test to voltage dips, short interruptions and voltage variations	ΔU 30 % for 100 ms ΔU 60 % for 100 ms ΔU 100 % for 50 ms

Compliance

ISO9001	The product is developed and manufactured in compliance with all relevant quality standards, which are defined by an ISO 9001-certified quality management system.
CE	The product has the CE mark and fulfils the basic requirements of the EU directives regarding safety, health and environmental protection, which confirms its conformity with European standards.
UKCA	The product has the UKCA (UK Conformity Assessed) mark and therefore meets the requirements of UK health and safety regulations, confirming its compliance with UK standards post-Brexit.
UL	The device complies with Underwriters Laboratories (UL) safety standards and has the UL mark, which indicates its compliance with the strict requirements for safety and performance in North America.
CB Scheme	The product is certified by the CB Scheme of IECEE.
FCC	The product complies with the requirements of the Federal Communications Commission (FCC) and has been certified accordingly
RoHS	The device complies with the requirements of the EU RoHS (Restriction of Hazardous Substances) Directive and is free from harmful substances such as lead, mercury, cadmium and other hazardous chemicals.
REACH	The product fulfills the requirements of the EU REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals) and does not contain any substances that violate this regulation.
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.

Configuration and Monitoring

From meinbergOS version 2022.05.1, a microSync system provides you with a comprehensive web interface with which you can carry out most configurations and status monitoring on your device.



- Access to the most important configuration options of the microSync system and monitoring of the system status
- The microSync system allows you to install firmware versions and archive old versions
- Automated updates of the web interface via a firmware update of the meinbergOS device

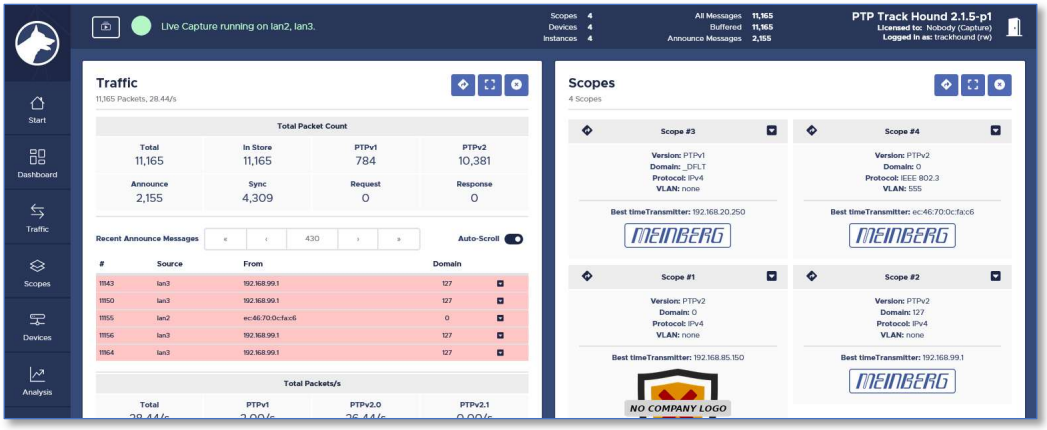
Firmware Management

The integrated firmware management of meinbergOS allows to install multiple firmware versions in parallel and choose which one to run. All integrated components and modules (e.g. the GPS receiver part) can be updated with the latest firmware if required.

Self-Diagnosis

The system continuously carries out background checks of various parameters such as system resources, port and receiver states. The user is notified when an incident occurs.

Integrated PTP Track Hound



PTP Track Hound is Meinberg's powerful PTP monitoring toolkit that provides a wealth of functions for monitoring PTP clock networks. These functions support both native PTP functions for measuring path delay and asymmetry and acquiring diagnostic data as well as a variety of proprietary extensions integrated in compliance with the IEEE 1588 standard.

meinbergOS >= *2024.12* features PTP Track Hound integrated into the firmware, allowing your microSync to operate as a PTP Track Hound monitoring station in its own right. The PTP Track Hound installation in the meinbergOS firmware is included and pre-activated as a Capture license, which means that in addition to evaluating PTP traffic locally via its own PTP-capable network interfaces, it can also forward traffic data to one or several central PTP Track Hound Professional instances for combined analysis. It is also possible to upgrade the license via the meinbergOS Web Interface to a Basic or Professional license to allow the microSync to serve as the central instance in its own right and benefit from additional features such as NetSync Monitor and Capture Time Offsets.

Further information on PTP Track Hound is available at **https://www.ptptrackhound.com**.

MRS - Multiple Reference Sources

The microSync system is able to handle input signals of Multiple Reference Sources (MRS) simultanously.

The following input signals can be used in a user-configurable order:

- GNSS
- IRIG-B
- Serial Time String + PPS
- PTP
- PPS (depending on model)
- 10 MHz (depending on model)
- NTP (firmware v.2020.08.0 and higher)

In case the signal which has the highest priority is lost, the system will switch to the next available source.

Intelligent Reference Selection Algorithm

In case that a master signal fails the Intelligent Reference Selection Algorithm (IRSA) takes care that the switching to the next reference signal in the priority list runs automatically and smoothly.

If the next selectable source has an offset that is <10 µs compared to the previous one the system will slowly adjust to this offset without causing a phase jump. If the offset is larger than 10µs, the system will set the time immediately.

In the event that the original source comes back, the system will again use that source for synchronization.

The IRSA also takes the highly stable holdover performance of the local oscillator into account. It ensures that switching from the superior reference signal to the less accurate one is delayed as long as the highly stable oscillator can provide better accuracy in holdover than the next available reference signal in the priority list.

Model Code

	Model Code					Description
	AA	11	2	BB(B)	CC33	
Housing Type	HR					9.5” Half-Rack, 1U
Series		10				PP1-PP2 Out, TC-AM Out, F.Synth Out, BNC female
		30				10 MHz Out, 10 MHz Sine Out, PPS In, 10 MHz In, BNC female
		31				PP1-PP2 Out, PPS In, 10 MHz In, BNC female
Receiver			0			GNS: L1 Multi-GNSS, 72-Channel
			1			GPS: Meinberg GPS, 12-Channel
			2			GNS-UC: Meinberg Multi-GNSS, 72-Channel
Oscillator				SQ		OCXO SQ
				HQ		OCXO HQ
				DHQ		OCXO DHQ
Power Supply						U_N: 24–48 V DC U_{max}: 20–60 V DC
					DC10	U_N: 24 V DC U_{max}: 10–36 V DC