MEINBERG
The Synchronization Experts.

microSync HR 100-Series

Compact Design Meets High-Performance

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.

The microSync HR is running meinbergOS, the all new firmware supporting most PTP profiles. This allows it to be used as NTP Server and PTP Grandmaster for different industry applications.

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.

The device is backed by Meinberg's three-year manufacturer's warranty and unlimited technical support, including firmware updates. It can be managed using the Meinberg Device Manager software which is available for Windows and Linux platforms.

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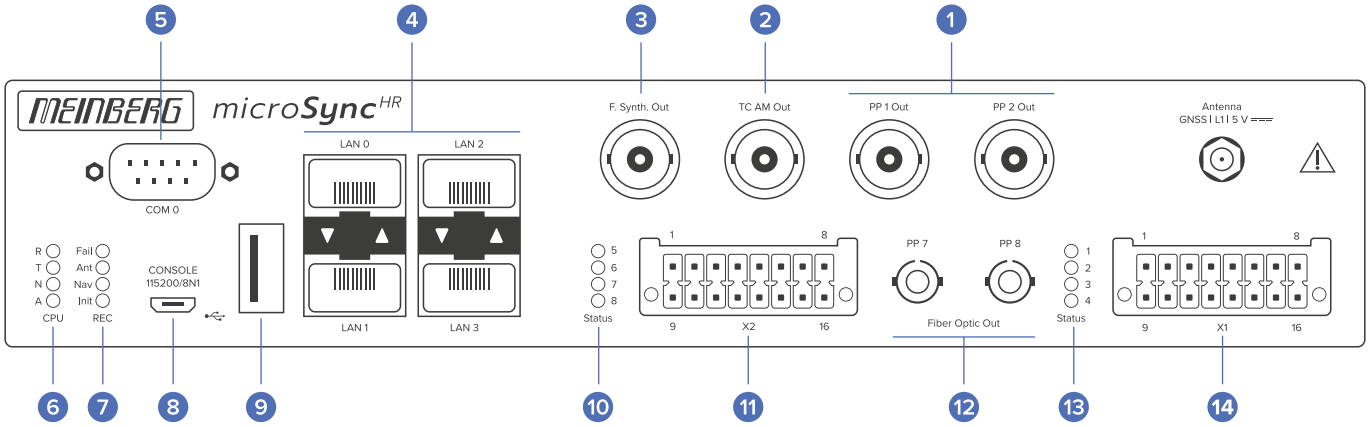
Product Highlights

- Powerful IEEE 1588 PTP Time Server incl. IEC/IEEE 61850-9-3 & IEEE C37.238
- High Performance (S)NTP Server
- Half-Rack Solution for a Space Efficient Design
- Different Oscillator Options for Advanced Holdover Performance
- Meinberg Device Manager for Configuration and Status Monitoring
- Three-year Manufacturer's Warranty
- Unlimited Technical Support Including Firmware Updates

Connectors



1 Programmable Pulse Outputs

SIGNAL OUTPUT	PULSE OUTPUTS	CONNECTION TYPE
Programmable Pulses, TTL into 50 Ω	▪ Pulse Per Second ▪ Pulse Per Minute ▪ Pulse Per Hour ▪ Cyclic Pulse ▪ Single Shot ▪ Timer ▪ Idle ▪ All Sync ▪ Time Sync ▪ Position OK ▪ DCF77 Marks ▪ Time Code DCLS ▪ Serial Time String ▪ Synthesizer Frequency ▪ PTTI 1PPS	BNC, female

2 Time Code AM (Modulated) Output

SIGNAL OUTPUT	SIGNAL LEVEL	GENERATED TIME CODES	CONNECTION TYPE
Unbalanced Sine Wave Signal	3 V_{pp} / 1 V_{pp} (MARK/SPACE) into 50 Ω	▪ IRIG B122 ▪ IRIG B123 ▪ IRIG B126 ▪ IRIG B127 ▪ IEEE 1344 ▪ IEEE C37.118 ▪ AFNOR	BNC, female

3 Frequency Synthesizer Output

SIGNAL OUTPUT	SIGNAL LEVEL	FREQUENCY OUTPUT	CONNECTION TYPE
Unbalanced Sinusoidal Signal	3 V_{PP} into 50 Ω	0.1 Hz to 10 MHz	BNC, female

4 LAN Network Interfaces

SIGNAL TYPE	LAN 0, 1	LAN 2, 3	CONNECTION TYPE
Gigabit Ethernet (GbE), 10/100/1000 Mbit	Management 10/100/1000 Mbit, RJ45 or 1000FX, SW-NTP capable	Management 10/100/1000 Mbit, RJ45 or 1000FX, PTP/HW-NTP capable	SFP

5 COM 0 Timestring

SIGNAL OUTPUT	ASSIGNMENT	CONNECTION TYPE
RS-232	▪ Pin 2: RxD (Receive) ▪ Pin 3: TxD (Transmit) ▪ Pin 5: GND (Ground)	9 pin D-SUB, male

6 Status Indicators CPU

R (RECEIVER)	T (TIME SERVICE)	N (NETWORK)	A (ALARM)
▪ **Blue:** Initialisation phase ▪ **Green:** The reference clock provides a valid time ▪ **Red:** The reference clock does not provide a valid time	▪ **Green:** NTP is synchronized to the reference clock, e.g. GNS ▪ **Red:** NTP is not synchronized or switched to the “local clock”	▪ **Green:** All monitored network interfaces are connected ▪ **Red:** At least one of the monitored network interfaces is faulty	▪ **Off:** No error ▪ **Red:** General error

7 Status Indicators REC

FAIL	ANT	NAV	INIT
▪ **Red:** No synchronization	▪ **Green:** Antenna connected and clock is synchronized ▪ **Red:** No synchronization resp. no antenna connected or short circuit on the antenna line	▪ **Green:** Positioning complete	▪ **Blue:** Initialisation phase ▪ **Green:** “Warmed up” - oscillator is adjusted

8 USB Terminal

SIGNAL TYPE	CONNECTION TYPE
USB-to-serial console	Micro-USB Type B

9 USB Host

SIGNAL TYPE	CONNECTION TYPE
USB connector management CPU	USB Type A

10 Status Indicators PP 5 – PP 8

Status indicators of the Programmable Pulses Out PP 5 to PP 8.

11 DMC X2 Terminal Connector

PIN	INPUT / OUTPUT	DESCRIPTION
1	PP 5+	Programmable Pulse (Optocoupler Output, Collector)
2	PP 5	Programmable Pulse (RS-422A)
3	PP 5	Programmable Pulse (RS-422B)
4	PP 6	Programmable Pulse (RS-422A)
5	PP 6	Programmable Pulse (RS-422B)
6	+TC DCLS In	Time Code DCLS (TTL, Isolated)
7	+TC DCLS Out	Time Code DCLS (TTL, Isolated)
8	–TC DCLS Out	Time Code DCLS (TTL, Isolated)
9	PP 5–	Programmable Pulse (Optocoupler Output, Emitter)
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	–TC DCLS In	Time Code DCLS (TTL, Isolated)
15	—	Not Used
16	—	Not Used

12 Programmable Pulse Outputs – Fiber Optic

SIGNAL OUTPUT	PULSE OUTPUTS	CONNECTION TYPE
Programmable Pulses, Fiber Optic, Multi Mode, 820 nm	▪ Pulse Per Second ▪ Pulse Per Minute ▪ Pulse Per Hour ▪ Cyclic Pulse ▪ Single Shot ▪ Timer ▪ Idle ▪ All Sync ▪ Time Sync ▪ Position OK ▪ DCF77 Marks ▪ Time Code DCLS ▪ Serial Time String ▪ Synthesizer Frequency ▪ PTTI 1PPS	ST

13 Status Indicators PP 1 – PP 4

Status indicators of the Programmable Pulses Out PP 1 to PP 4.

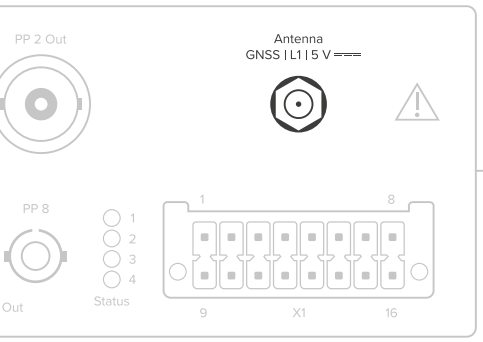
14 DMC X1 Terminal Connector

PIN	INPUT / OUTPUT	DESCRIPTION
1	–DC In	Negative Potential of Operating Voltage
2	—	Not Used
3	PP 1–	Programmable Pulse (Optocoupler Output, Emitter)
4	PP 2–	Programmable Pulse (Optocoupler Output, Emitter)
5	PP 3–	Programmable Pulse (Optocoupler Output, Emitter)
6	PP 4–	Programmable Pulse (Optocoupler Output, Emitter)
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 Pulse (Optocoupler Output, Collector)
12	PP 2+	Programmable Pulse (Optocoupler Output, Collector)
13	PP 3+	Programmable Pulse (Optocoupler Output, Collector)
14	PP 4+	Programmable Pulse (Optocoupler Output, Collector)
15	—	Not Used
16	REL-NC	Error/Relay (Normally Closed)

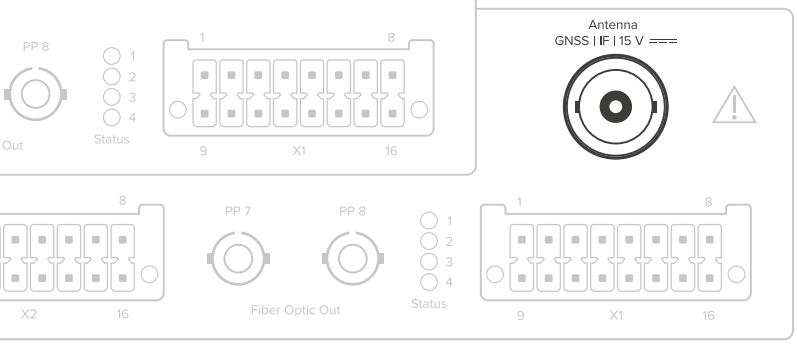
Configuration Options

Receiver Options

RECEIVER TYPE	SIGNAL TYPE	SUPPLY VOLTAGE	CONNECTION TYPE
GNS: L1 Multi-GNSS (GPS, GLONASS, Galileo, BeiDou), 72-Channel	L1/E1/B1 band	5 V DC	SMA
GPS: Meinberg GPS, 12-Channel	IF (Meinberg Antenna)	15 V DC	BNC
GNS-UC: Meinberg Multi-GNSS (GPS, Galileo)	IF (Meinberg Antenna)	15 V DC	BNC



*SMA Connector for **L1 Multi-GNSS Receiver***



*BNC Connector for **Meinberg GPS** or **Meinberg GNS-UC Antenna***

Oscillator Options

TYPE	HOLDOVER PERFORMANCE (1 DAY)	HOLDOVER PERFORMANCE (1 YEAR)
OCXO SQ	± 220 µs	± 4.7 s
OCXO MQ	± 65 µs	± 1.6 s
OCXO HQ	± 22 µs	± 788 ms
OCXO DHQ	± 4.5 µs	± 158 ms

For detailed oscillator specifications, please visit: www.mbg.link/osc

Power Supply

TYPE	NOMINAL VOLTAGE	VOLTAGE RANGE
DC	24–48 V DC	20–60 V DC

Scope of Delivery

QUANTITY	ITEM
1x	microSync^{HR} (incl. Mounting Brackets)
1x	Antenna, L1 Multi-GNSS or Meinberg GPS/GNS-UC *
1x	Antenna Cable, 20 m (65.62 ft), SMA or BNC connector *
1x	Antenna Mounting Kit *
2x	16 pin DMC Female Connector

** depending on configuration*

microSync^{HR} with Mouting Brackets

L1 Multi-GNSS Antenna or ...

... Meinberg GPS/GNS-UC Antenna

Antenna Cable, SMA Connector or ...

... Antenna Cable, BNC Connector

Antenna Mounting Kit

DMC Female Connector

Optional Expansions

SFP Modules

Recommended and tested transceivers from other vendors which are available at additional costs.

RJ-45 TRIPLE SPEED 10/100/1000 BASE-T	SINGLE MODE 1000BASE-LX, 10KM, LC SFP, 1310 NM	MULTI MODE 1000BASE-SX, LC SFP, 850 NM
AVAGO ABCU-5740RZ	**AVAGO** AFCT-5710PZ	**AVAGO** AFBR-5710PZ
FINISAR FCLF8521P2BTL	**FINISAR** FTLF1318P3BTL	**FINISAR** FTLF8524P3BNL

Avago SFP Modules (RJ-45, Single Mode, Multi Mode)

Software Specifications

Protocols & Profiles

NETWORK PROTOCOLS	IEEE 1588 PROFILES
▪ IPv4, IPv6	▪ IEEE 1588v2 Default Profile, IEEE 1588v1 (optional)
▪ NTPv3, NTPv4	▪ IEEE C.37.238-2011 Power Profile
▪ PTPv2	▪ IEEE C.37.238-2017 Power Profile
▪ IEC 62439-3 (PRP)	▪ IEC/IEEE 61850-9-3 Power Utility Profile
▪ DHCP, DHCPv6	▪ Enterprise Profile
▪ DSCP	▪ ITU-T G.8265.1, ITU-T G.8275.1, ITU-T G.8275.2 Telecom Profiles
▪ IEEE 802.1q VLAN filtering/tagging	▪ SMPTE ST 2059-2 Broadcast Profile
▪ IEEE 802.1p QOS	▪ IEEE 802.1AS TSN/AVB Profile
▪ SNMPv1/v2/v3	▪ AES67 Media Profile
▪ Remote Syslog Support (UDP)	▪ DOCSIS 3.1

Management

User Management

The user management allows to create, manage and delete individual users. Thereby, each user can be given, or withdrawn individual write and read access for all configuration options, as well as read-only rights for status displays. Furthermore, users can be deactivated or added for a limited time. Password changes are also possible, as well as the option of periodically prompting the user to renew its password.

In addition, there are three available predefined role templates (admin, info, status) included that offer the user a preselection of access levels. Based on this, individual rights can be added or deleted. Moreover, management protocols like SNMP, Shell or mbgdevman can be enabled for each user account to limit access to the 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.

Meinberg Device Manager

The Meinberg Device Manager utility is a graphical desktop application that allows to configure Meinberg Devices over an encrypted network connection or a local USB or serial connection. A great advantage of the Meinberg Device Manager is that various devices can be configured and monitored simultaneously.

The Meinberg Device Manager for Windows can be used under Windows 7 and all newer versions. Supported Linux distributions include Ubuntu, Mint Linux, Debian, SUSE Linux, CentOS, and others.

The software is delivered on the USB stick included in the scope of delivery and does not have to be installed or copied on the PC. The Meinberg Device Manager can be started directly from the USB data carrier. The computer must be connected to the network in which the microSync system is connected.

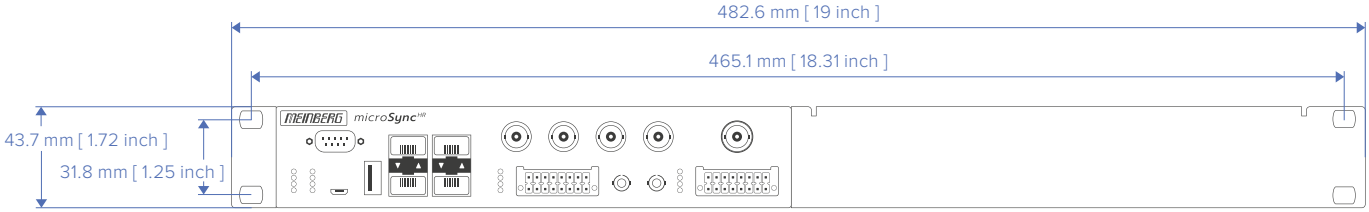
Otherwise the software is available for download on our website:

https://www.meinbergglobal.com/english/sw/mbg-devman.htm

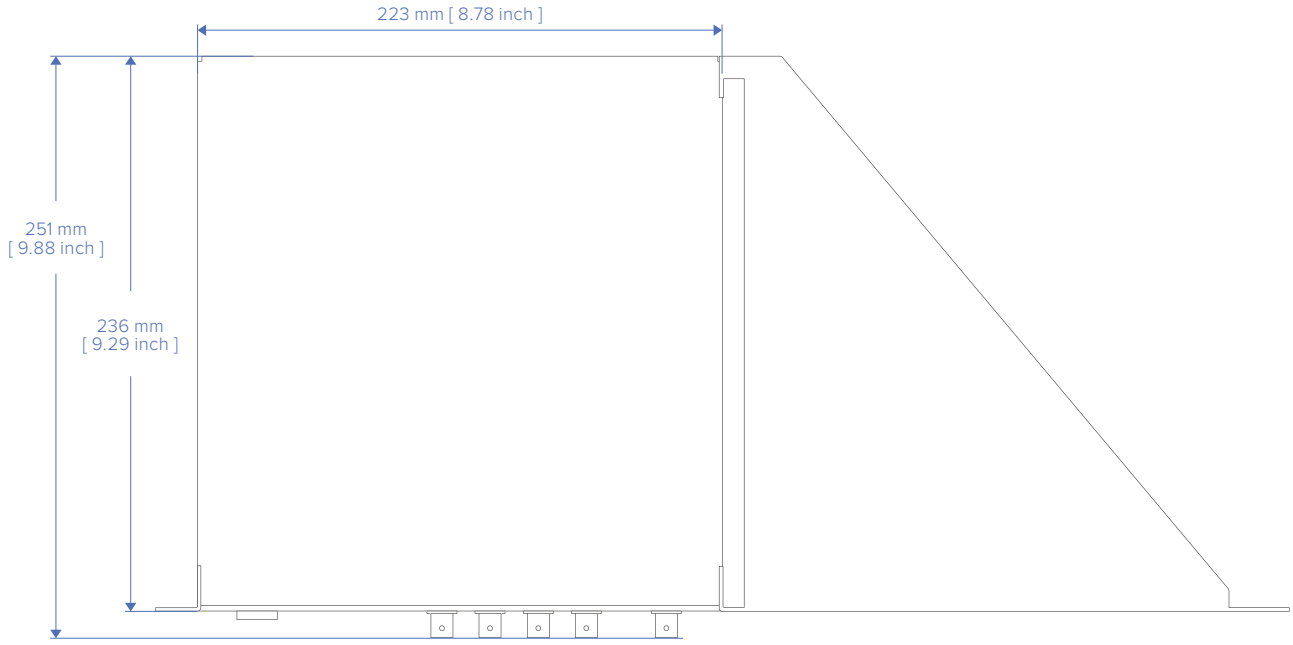
Meinberg Device Manager: Configuration Interface

Technical Specifications

Physical Dimensions



Front view with mounting brackets



Top view with mounting brackets

Mechanical Data

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

Environmental Requirements

Protection Rating / IP Code	IP30
Overvoltage Category	II
Protection Class	1
Degree of Pollution	2
Operating Temperature	–20 to 55 °C (–4 to 131 °F)
Storage Temperature	–30 to 70 °C (–22 to 158 °F)
Relative Humidity	5 to 95 % (non-condensing) at 40 °C (104 ° F)
Operating Altitude	up to 4,000 m (13,123 ft) above sea level
Atmospheric Pressure	615 to 1600 hPa

Compliance

CB Scheme	✓	**CSA**	✓
CE	✓	**WEEE**	✓
FCC	✓	**RoHS**	✓
UL	✓	**REACH**	✓

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