



Versatility and Reliability meet High-Performance

Meinberg's microSync^{RX} is a versatile and feature-rich synchronization device that offers a high level of efficiency and flexibility. This innovative, multipurpose synchronization solution provides a variety of outstanding features within a 19 inch rack-mount case design.

Key features include four Gigabit Ethernet interfaces, multiple programmable output signals and several configurational options like Programmable Pulses (TTL), 10 MHz, 10 MHz sine, Time Code AM (IRIG, AFNOR) and Frequency Synthesizer (0.1 Hz to 10 MHz).

The microSync^{RX} is not only suitable as a high-performance NTP server, it can also be used as a PTP grandmaster in a large variety of industry applications thanks to our meinbergOS firmware, supporting most PTP profiles. It can be managed and monitored using the meinbergOS web interface.

In addition to the selection of preconfigured inputs and outputs, each series offers the option of choosing between different GNSS receivers, oscillators, an additional OLED display with rotary knob and redundant AC and/or DC power supplies.

Product Highlights

- | Powerful IEEE 1588 / PTP Time Server
- | High-Performance NTP Server (NTP & SNTP v2, v3, v4)
- | Different Oscillator Options for Advanced Holdover Performance
- | Optional OLED Display with Rotary Knob
- | Redundant Power Supply Configurations
- | meinbergOS WebUI for Configuration and Status Monitoring
- | Three-year Manufacturer's Warranty
- | Unlimited Technical Support Including Firmware Updates

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If you need further information, please reach out to our sales team

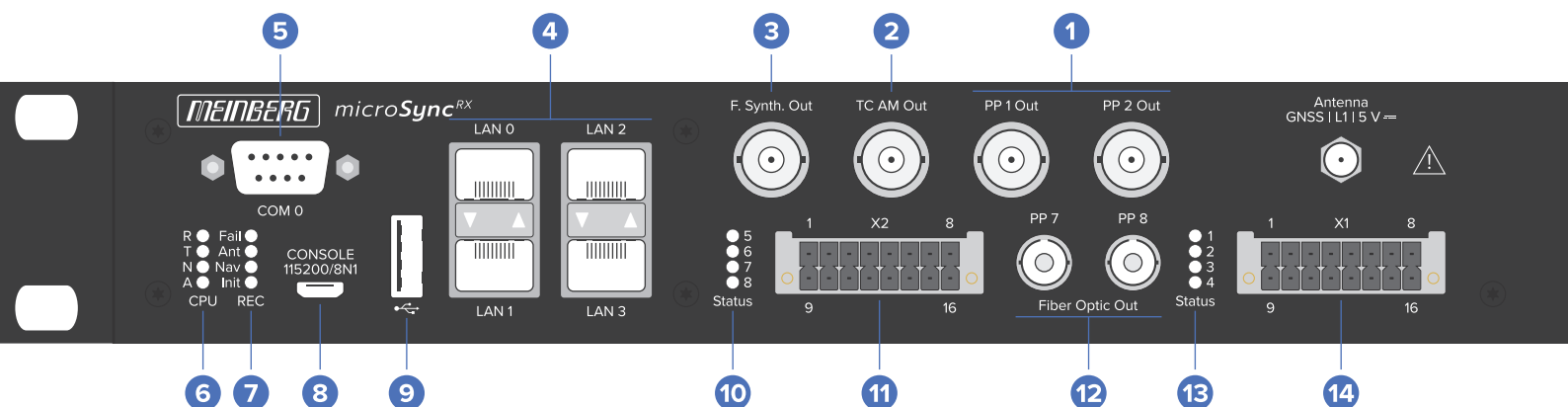
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Connectors

10 Series & 20 Series (Display)



1 Programmable Pulse Outputs

SIGNAL OUTPUT	SIGNAL LEVEL	PULSE OUTPUTS	ACCURACY	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	≤ 50 ns	BNC, female

2 Time Code AM (Modulated) Output

SIGNAL OUTPUT	SIGNAL LEVEL	GENERATED TIME CODES	ACCURACY	CONNECTION TYPE
Unbalanced Sinusoidal 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	≤ 2 μ s	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	ACCURACY	CONNECTION TYPE
Gigabit Ethernet (GbE), 10/100/1000 Mbit	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX, PTP capable Synchronous Ethernet: - Master and Slave Capability - Compliant to ITU-T G.8261, G.8262 and G.8264 - Ethernet Synchronization Messaging Channel (ESMC)	- NTP: $\leq 100 \mu\text{s}$ - PTP: $\leq 20 \text{ ns}$	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	ACCURACY
1	PP 5+	Programmable Pulse (Optocoupler Output, Collector)	
2	PP 5	Programmable Pulse (RS-422A)	≤100 ns
3	PP 5	Programmable Pulse (RS-422B)	≤100 ns
4	PP 6	Programmable Pulse (RS-422A)	≤100 ns
5	PP 6	Programmable Pulse (RS-422B)	≤100 ns
6	+TC DCLS In	Time Code DCLS (TTL, Isolated)	
7	+TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
8	–TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
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	ACCURACY	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	≤50 ns	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	—	Not Used
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	—	Not Used
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)



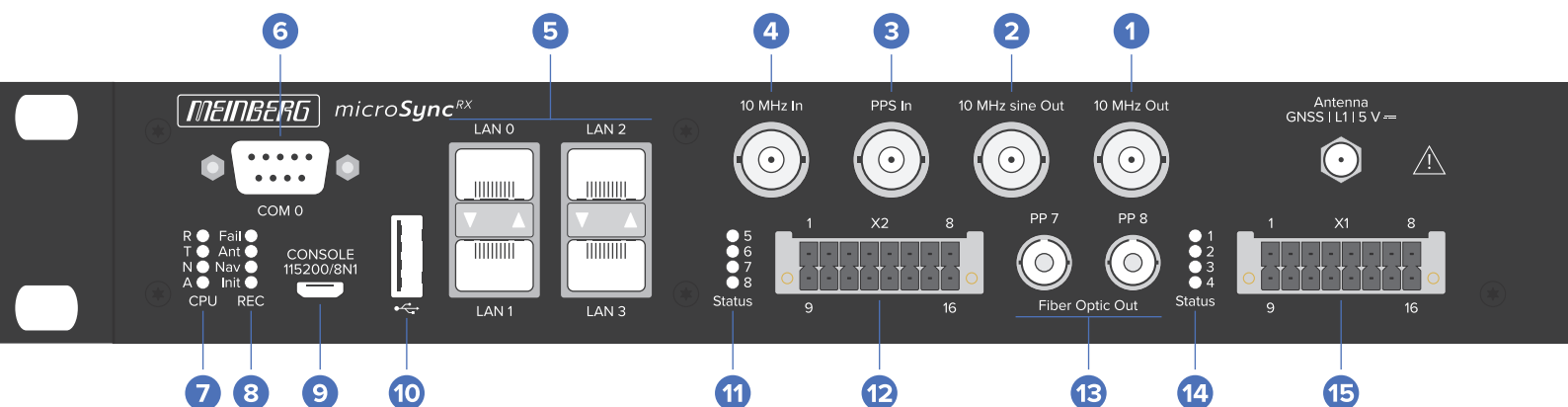
microSync[®] 10 series with redundant power supplies



microSync[®] 20 series (display) with redundant power supplies

Connectors

30 Series & 40 Series (Display)



1 10 MHz Output

SIGNAL OUTPUT	SIGNAL LEVEL	CONNECTION TYPE
10 MHz, TTL	TTL into 50 Ω	BNC, female

2 10 MHz sine Output

SIGNAL OUTPUT	SIGNAL LEVEL	CONNECTION TYPE
10 MHz Sinusoidal Signal	5 dBm $\pm$ 1 dBm into 50 Ω	BNC, female

3 PPS Input

SIGNAL INPUT	PULSE LENGTH	CONNECTION TYPE
Pulse per Second, TTL	$\geq 5 \mu$ s, active high	BNC, female

4 10 MHz Input

SIGNAL INPUT	SIGNAL LEVEL	CONNECTION TYPE
10 MHz Sinusoidal Signal / TTL	1.5 V _{pp} – 5 V _{pp}	BNC, female

5 LAN Network Interfaces

SIGNAL TYPE	LAN 0, 1	LAN 2, 3	ACCURACY	CONNECTION TYPE
Gigabit Ethernet (GbE), 10/100/1000 Mbit	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX, Master or Slave Mode Synchronous Ethernet: - Master and Slave Capability - Compliant to ITU-T G.8261, G.8262 and G.8264 - Ethernet Synchronization Messaging Channel (ESMC)	- NTP: $\leq 100 \mu\text{s}$ - PTP: $\leq 20 \text{ ns}$	SFP

6 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

7 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

8 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

9 USB Terminal

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

10 USB Host

SIGNAL TYPE	CONNECTION TYPE
USB connector management CPU	USB Type A

11 Status Indicators PP 5 – PP 8

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

12 DMC X2 Terminal Connector

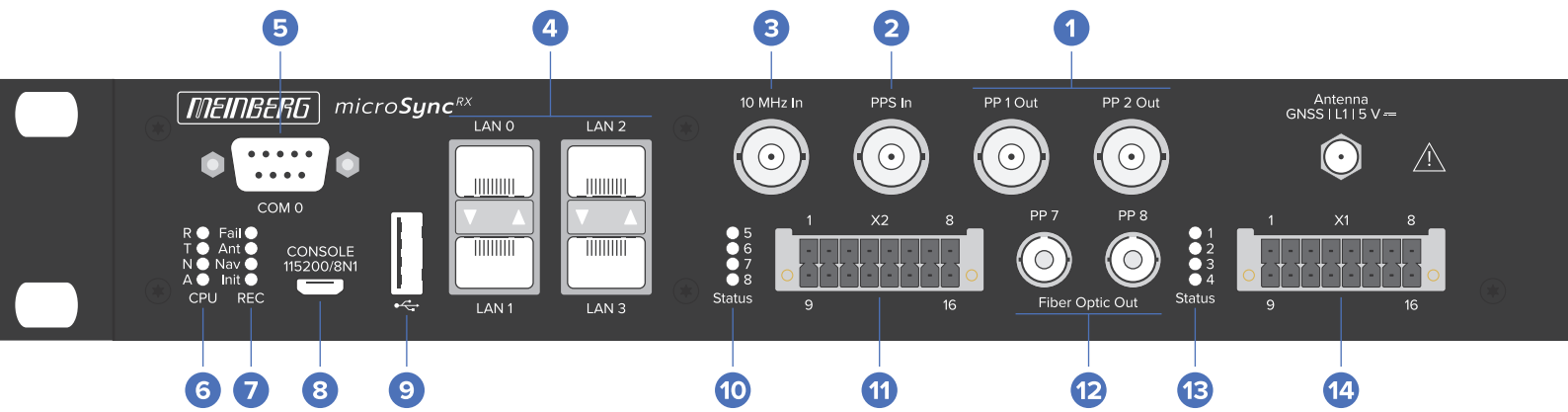
PIN	INPUT / OUTPUT	DESCRIPTION	ACCURACY
1	PP 5+	Programmable Pulse (Optocoupler Output, Collector)	
2	PP 5	Programmable Pulse (RS-422A)	≤100 ns
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4	PP 6	Programmable Pulse (RS-422A)	≤100 ns
5	PP 6	Programmable Pulse (RS-422B)	≤100 ns
6	+TC DCLS In	Time Code DCLS (TTL, Isolated)	
7	+TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
8	–TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
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	

13 Programmable Pulse Outputs – Fiber Optic

SIGNAL OUTPUT	PULSE OUTPUTS	ACCURACY	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	≤50 ns	ST

Connectors

31 Series & 41 Series (Display)



1 Programmable Pulse Outputs

SIGNAL OUTPUT	SIGNAL LEVEL	PULSE OUTPUTS	ACCURACY	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	≤50 ns	BNC, female

2 PPS Input

SIGNAL INPUT	PULSE LENGTH	CONNECTION TYPE
Pulse per Second, TTL	≥5μs, active high	BNC, female

3 10 MHz Input

SIGNAL INPUT	SIGNAL LEVEL	CONNECTION TYPE
10 MHz Sinusoidal Signal / TTL	1.5 V _{pp} – 5 V _{pp}	BNC, female

4 LAN Network Interfaces

SIGNAL TYPE	LAN 0, 1	LAN 2, 3	ACCURACY	CONNECTION TYPE
Gigabit Ethernet (GbE), 10/100/1000 Mbit	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX	Management / NTP 10/100/1000 Mbit, RJ45 or 1000FX, PTP capable Synchronous Ethernet: - Master and Slave Capability - Compliant to ITU-T G.8261, G.8262 and G.8264 - Ethernet Synchronization Messaging Channel (ESMC)	- NTP: $\leq 100 \mu\text{s}$ - PTP: $\leq 20 \text{ ns}$	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
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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	ACCURACY
1	PP 5+	Programmable Pulse (Optocoupler Output, Collector)	
2	PP 5	Programmable Pulse (RS-422A)	≤100 ns
3	PP 5	Programmable Pulse (RS-422B)	≤100 ns
4	PP 6	Programmable Pulse (RS-422A)	≤100 ns
5	PP 6	Programmable Pulse (RS-422B)	≤100 ns
6	+TC DCLS In	Time Code DCLS (TTL, Isolated)	
7	+TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
8	–TCA DCLS Out	Time Code Amplified DCLS (TTL, Isolated), TTL active high 250 mA, short-circuit-proof	≤50 ns
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

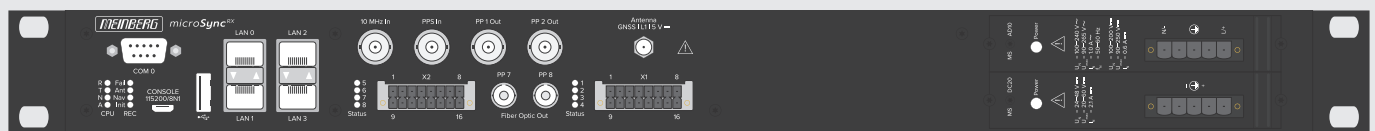
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Programmable Pulses, Fiber Optic, Multi Mode, 820 nm	▪ Pulse Per Second ▪ Pulse Per Minute ▪ Pulse Per Hour ▪ Cyclic Pulse ▪ Single Shot ▪ Timer ▪ Idle ▪ All Sync ▪ Time Sync ▪ Position OK ▪ DCF77 Marks ▪ Time Code DCLS ▪ Serial Time String ▪ Synthesizer Frequency ▪ PTTI 1PPS	≤50 ns	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	—	Not Used
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	—	Not Used
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)



microSync[®] 31 series with redundant power supplies



microSync[®] 41 series (display) with redundant power supplies

Configuration Options

The configuration options can be applied to all microSync^{RX} models without a display (10, 30 and 31 series) and with a display (20, 40 and 41 series).

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), 72-Channel	IF (Meinberg Antenna)	15 V DC	BNC

Oscillator Options

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

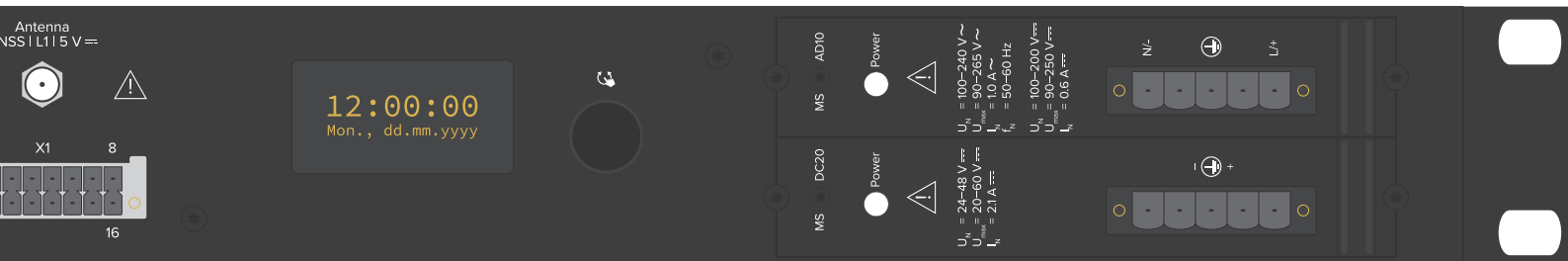
For detailed oscillator specifications, please visit: www.mbg.link/osc

Display Unit

TYPE	FUNCTIONS	INDICATION
OLED Display	System Administration: - IP Address - Netmask - Gateway - DHCP	- Time and Date - Status of Synchronization Source: OK, SYNC, ASYNC - Firmware Version - Model and Serial Number

Power Supplies

TYPE	NOMINAL VOLTAGE RANGE (U_N)	MAXIMUM VOLTAGE RANGE (U_{MAX})	MAXIMUM POWER CONSUMPTION (P_{MAX})
AD	100–240 V AC, 50–60 Hz / 100–200 V DC	90–265 V AC, 47–63 Hz / 90–250 V DC	50 W
DC	24–48 V DC	20–60 V DC	50 W



microSync^{RX} with OLED display unit and redundant AC and DC power supply configuration

Scope of Delivery

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

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

² Depending on configuration

Optional Expansions – SFP Modules

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

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 BO05C13610D	1000 BASE-LX SFP 1310 nm single mode	Duplex LC	10,000 m

Performance Level Options

PERFORMANCE LEVEL	UNICAST CLIENTS	DELAY REQ./S IN MULTICAST / HYBRID MODE
PL-A	8	1024
PL-B	256	32768
PL-C	512	65536

Software Specifications

Protocols & Profiles

NETWORK PROTOCOLS	IEEE 1588 PROFILES
▪ IPv4, IPv6 ▪ NTPv3, NTPv4, SNTP ▪ PTPv2 ▪ PTPv1 (Performance Level C only - more details on page 11) ▪ IEC 62439-3 (PRP) ▪ DHCP, DHCPv6 ▪ DSCP ▪ IEEE 802.1q VLAN filtering/tagging ▪ IEEE 802.1p QOS ▪ SNMPv1/v2/v3 ▪ Remote Syslog Support (UDP)	▪ IEEE 1588v2 Default Profile ▪ IEEE C37.238-2011 Power Profile ▪ IEEE C37.238-2017 Power Profile ▪ IEC/IEEE 61850-9-3 Power Utility Profile ▪ Enterprise Profile ▪ ITU-T G.8265.1, ITU-T G.8275.1, ITU-T G.8275.2 Telecom Profiles ▪ SMPTE ST 2059-2 Broadcast Profile ▪ IEEE 802.1AS TSN/AVB Profile ▪ AES67 Media Profile ▪ 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.

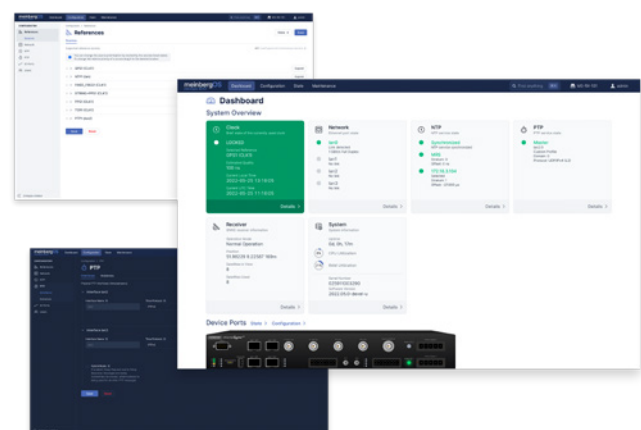
meinbergOS WebUI

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**

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.



meinbergOS WebUI - Configuration and Monitoring Interface

Jamming and Spoofing Detection

Our GNSS receivers GNS181 and GNS181-UC are able to receive multiple GNSS constellations in parallel. The GNS181-UC can receive GPS and Galileo signals whereas the GNS181 can additionally receive GLONASS and Beidou signals. These receiver types have implemented Jamming and Spoofing Detection technologies.

Anti-Jamming Technology

The detection of jamming attacks are based on active CW (continuous wave) interference detection and an on-board SAW band pass filter. In case a jamming event occurs where the GNSS satellites cannot be received anymore, the microSync will switch either seamlessly to the next available source in its priority list (e.g. IRIG-B or PTP) or falls back to its internal high quality OCXO which is available at different grades.

Anti-Spoofing Technology

Spoofing is a process whereby a malicious third party tries to control the reported position via a “fake” GNSS broadcast signal. This may result in the form of reporting incorrect position, velocity or time.

To combat against this, the receiver module includes spoofing detection measures to alert the system when signals appear to be suspicious.

The receiver combines a number of checks on the received signals looking for inconsistencies across several parameters. The spoofing detection feature monitors suspicious changes in the GNSS signal indicating external manipulation. The detection is successful when the signal is genuine first and when a transition to the spoofed signal is being observed. The algorithms rely on availability of signals from multiple GNSS constellations.

In case a spoofing attack is detected, the microSync system is notified by the receiver. The microSync system is then in a position to either switch to a different source or run on internal OCXO (available in firmware 2020.08.0 or higher).

Multiple Reference Sources

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

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.

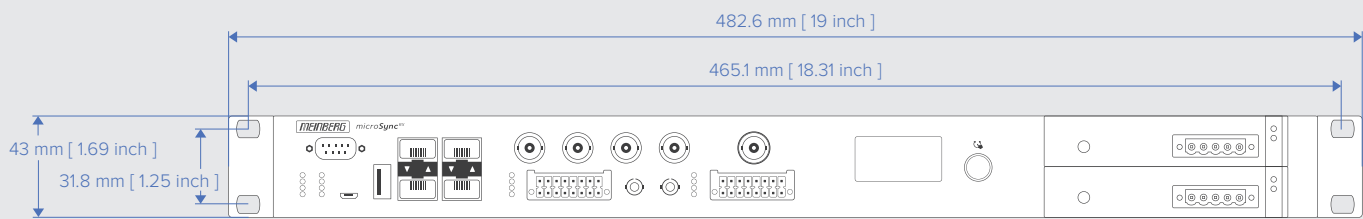
If the next selectable source has an offset that is $<10\ \mu\text{s}$ compared to the previous one the system will slowly adjust to this offset without causing a phase jump. If the offset is larger than $10\ \mu\text{s}$, the system will set the time immediately.

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

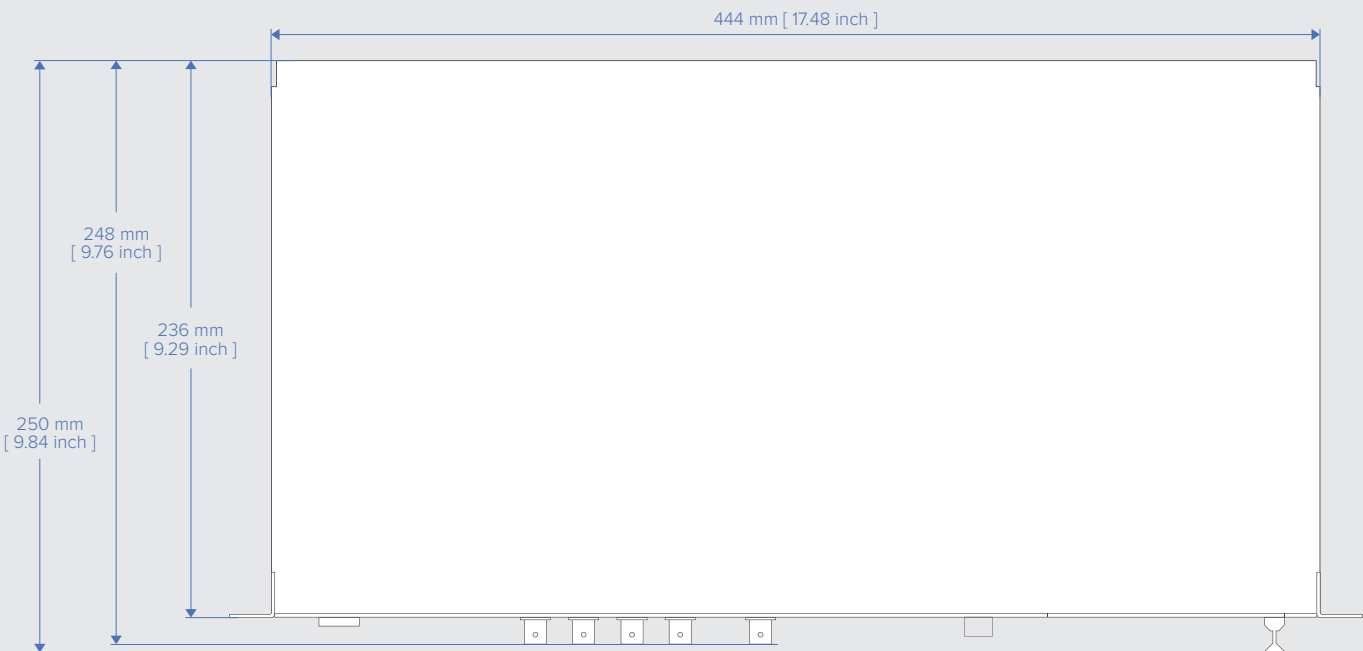
The IRSA also takes the highly stable holdover performance of the local oscillator into account. It ensures that switching from the superior reference signal to the less accurate one is delayed as long as the highly stable oscillator can provide better accuracy in holdover than the next available reference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

Technical Specifications

Physical Dimensions



Front view with mounting brackets



Top view with mounting brackets

Mechanical Data

Housing Type	19" (Full-Rack), 1U
Housing Material	Steel
Weight (incl. Mounting Brackets)	approx. 3.7 kg (8.16 lbs), depending on built in Power Supplies

Environmental Requirements

Recommendations for continuous operation.

Operating Temperature Range	–20 to 55 °C (–4 to 131 °F)
Storage Temperature Range	–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

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 ±2 kV line to line up to ±4 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 61000-4-11	Immunity tests to voltage dips, short interruptions and voltage variations	ΔU 30 % for 1 period ΔU 60 % for 50 periods ΔU 100 % for 5 periods ΔU 100 % for 50 periods
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

CB Scheme		CSA	
CE		WEEE	
FCC		RoHS	
UL		REACH	