

microSync^{TRX} 19" Rackmount Systems



Product Highlights

- | A powerful Stratum 1 NTP/PTP time server
- | 1U chassis, specially constructed for installation in a 19" rack
- | Engineered to order with various receiver-clocks
- | OLED Display for fast initial start of operation and status monitoring
- | Different oscillator options for advanced holdover performance

Versatility and Reliability meet High-Performance

Meinberg's microSync^{TRX} time servers are versatile and feature-rich synchronization devices that offer a high level of efficiency and flexibility. These innovative, multipurpose synchronization solutions provide a variety of outstanding features within a 19" rackmounted chassis design. All microSync^{TRX} models feature an OLED display on front with a rotary controller for initial network configuration and local status monitoring.

Key features include four Gigabit Ethernet interfaces, multiple programmable output signals and several configurational options like 10 MHz Input (TTL/Sine), PPS Input (TTL) and Programmable Pulses Outputs (TTL).

The microSync^{TRX} is suitable not only as a capable PTP grandmaster but also as a high-performance NTP server, clock pulse generator and frequency reference, making it ideal for a variety of industry applications. The integrated meinbergOS firmware unites a sleek and user-friendly interface with power and versatility, with support for most PTP profiles and fine control over the system's operating parameters.

Equipped with a full version of the powerful, synchronization-centric meinbergOS operating system, the microSync^{TRX} 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 with performance level C (PL-C) |
| IEEE 1588-2008 Profiles | Default Profiles <ul style="list-style-type: none"> - Default E2E IEEE 1588-2008 - Default P2P IEEE 1588-2008 |
| | Power Profiles <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - DOCSIS 3.1 - SMPTE ST 2059-2 (including profile extensions) - AES67 Media - IEEE 802.1AS TSN/AVB |
| | Telecom Profiles <ul style="list-style-type: none"> - ITU-T G.8265.1 (including profile extensions) - ITU-T G.8275.1 (including profile extensions) - ITU-T G.8275.2 |
| | Automotive Profiles <ul style="list-style-type: none"> - AUTOSAR |
| SyncE Support | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - Multicast Master - Unicast Master - Multicast Slave - Unicast Slave - Multicast Auto (automated mode selection based on IEEE 1588 Best Master Clock Algorithm) |
| Other Features | <ul style="list-style-type: none"> - 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 (B1), 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

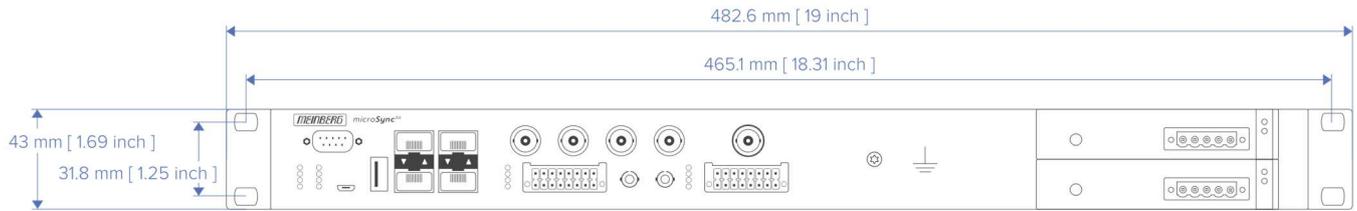
The microSync^{TRX} is shipped as standard with a “**OCXO SQ**” (temperature-controlled crystal oscillator), which provides excellent holdover performance if your server loses synchronization with its upstream reference for any reason. The microSync may also be shipped on request with a more powerful 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 |

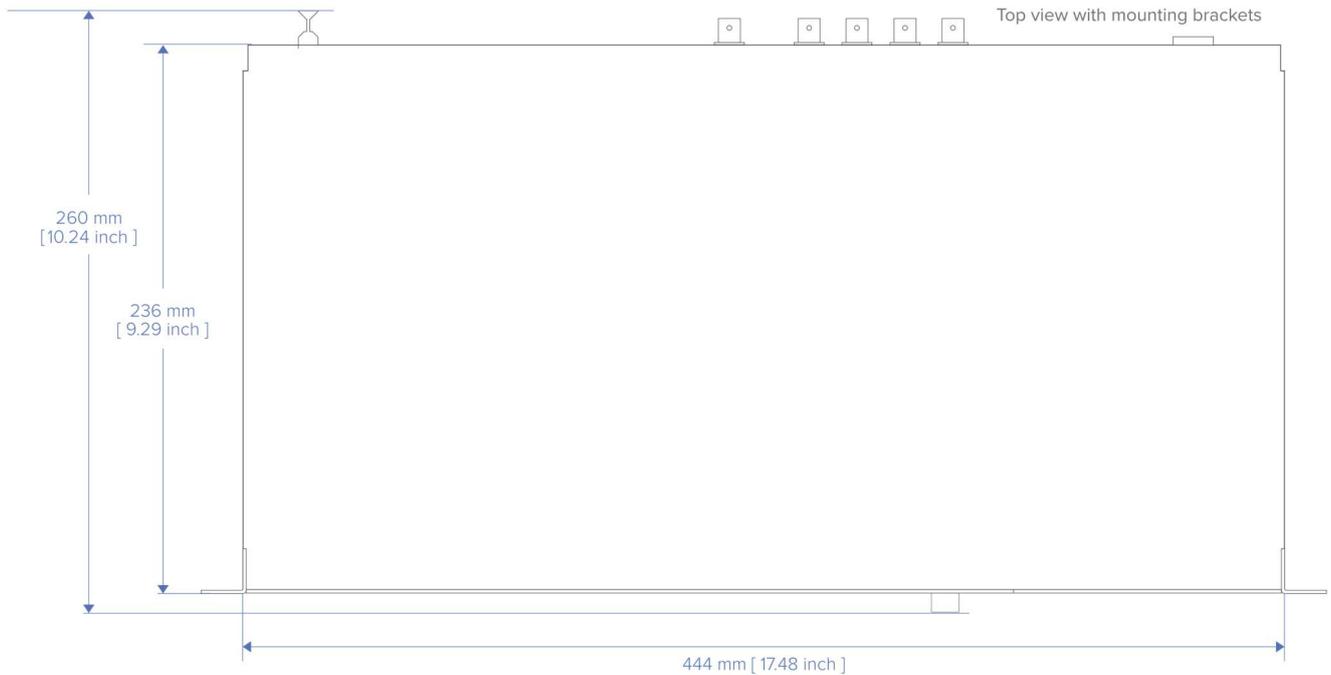
Mechanical Data

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

microSync^{TRX} Physical Dimensions



Front view with mounting brackets



Top view with mounting brackets

Support

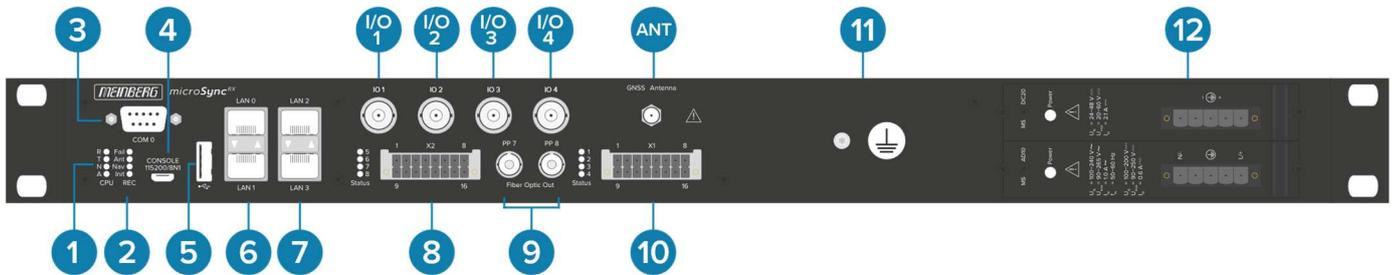
| | |
|--------------------------|--|
| Technical Support | Free lifetime support via telephone and email, including firmware updates |
| Warranty | Three-year warranty, extendable upon request |
| Firmware Updates | Firmware is field-upgradable; updates can be installed via the Web Interface (upload 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

- | Two-part power cable (5-pin MSTB to IEC 60320 C14 cable, IEC 60320 C13 cable to local mains plug) or 5-pin MSTB connector for assembly of a suitable power cable for DC power sources.
 - | Printed setup guide explaining the basic setup process and antenna installation.
 - | 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^{TRX} Input/Output Connectors & Interfaces

This illustration represents an example configuration of an microSync^{TRX} rackmount system that provides an approximate indication of the general location of the various connectors on a given microSync^{TRX}. 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^{TRX} system configuration, please reach out to your Meinberg sales representative.



1 System Status LEDs

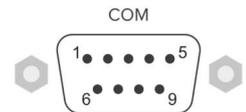
| | |
|-------------------------|--|
| R (Ref. Time) | Indicates whether the reference clock is providing a valid timebase. |
| T (Time Service) | If lit, the internal NTP service of the server is synchronized with the reference clock. |
| N (Network) | Shows whether there is a valid link-up on any of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

2 GNSS Receiver Status LEDs

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|--------------------|--|
| “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 Rx (Receive) |
| 3 | RS-232 Tx (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 | <ul style="list-style-type: none"> - IPv4 (with DHCP support) - IPv6 (with DHCPv6 and Autoconf support) |
| Network Services | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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 |

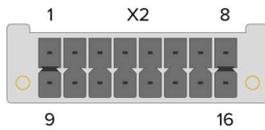
7 Network Interfaces (LAN2 & LAN3)

| | |
|----------------------------------|--|
| Network Interfaces | 2x SFP, PTP master & slave capable |
| Network Protocols | <ul style="list-style-type: none"> - IPv4 (with DHCP support) - IPv6 (with DHCPv6 and Autoconf support) |
| Network Services | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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 (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 |

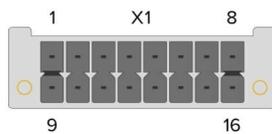
9 Programmable Pulse Output 7 & 8

| | |
|---------------------------|---|
| 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 | | Not Used |
| 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 | | Not Used |
| 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) |

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 μ s, Maximum 9 μ s |
| Switch-Off Time | Typically 10 μ s, Maximum 70 μ s |

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 (I_{max}) | 400 mA |
| Max. Power Load | 24 W |
| Response Time | Approx. 2 ms |

11 Grounding Terminal

The grounding terminal is provided for optionally grounding the chassis of the microSync. Note that the device is already grounded via the ground pin of the power connector.

12 AD10 Power Supply

| | |
|-------------------------------------|-------------------------------------|
| Connector Type | 5-pin MSTB female connector |
| Nominal Voltage Range (U_N) | 100 V – 240 V AC / 100 V – 200 V DC |
| Rated Voltage Range (U_{max}) | 90 V – 265 V AC / 90 V – 250 V DC |
| Nominal Current (I_N) | 1.0 A (AC) / 0.6 A (DC) |
| Nominal Frequencies (f_N) | 50 Hz – 60 Hz |
| Rated Frequency Range (f_{max}) | 47 Hz – 63 Hz |
| Power Consumption (P_{max}) | 50 W |
| Max. Thermal Output (E_{therm}) | 180.00 kJ/h (170.61 BTU/h) |

DC20 Power Supply

| | |
|-------------------------------------|-----------------------------|
| Connector Type | 5-pin MSTB female connector |
| Nominal Voltage Range (U_N) | 24 V – 48 V DC |
| Rated Voltage Range (U_{max}) | 20 V – 60 V DC |
| Nominal Current (I_N) | 2.1 A DC |
| Power Consumption (P_{max}) | 50 W |
| Max. Thermal Output (E_{therm}) | 180.00 kJ/h (170.61 BTU/h) |

Input/Output Options

Each microSync^{TRX} 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 ^{TRX} 20X | F. Synth. Out | TC AM Out | PP 1 Out | PP 2 Out |
| microSync ^{TRX} 21X | 10 MHz sine Out | TC AM Out | PP 1 Out | PP 2 Out |
| microSync ^{TRX} 40X | 10 MHz In | PPS In | 10 MHz sine Out | 10 MHz Out |
| microSync ^{TRX} 41X | 10 MHz In | PPS In | PP 1 Out | PP 2 Out |
| microSync ^{TRX} 43X | 10 MHz In | PPS In | 10 MHz sine Out | PP 1 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 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 |

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 |

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 | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> 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 |

ANT

GNSS Antenna Connector Options

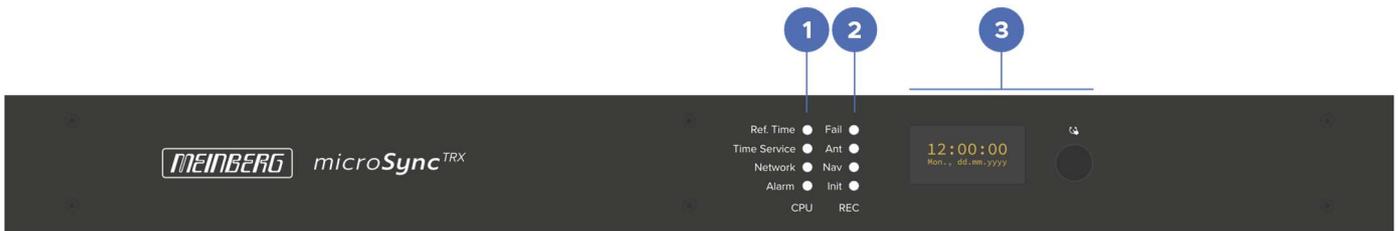
| | |
|--|--|
| Antenna for GPS and GNS-UC Receiver | GPSANTv2* |
| Connector Type | Bayonet Neill-Concelman (BNC) connector for coaxial cable |
| Input Impedance | 50 Ω |
| Input Signal | 35.4 MHz intermediate frequency |
| Power Supply | 15 V, 100 mA to antenna via antenna cable |
| Supported Cable Length | <ul style="list-style-type: none"> 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>

microSync^{TRX} Display Side View



1 System Status LEDs

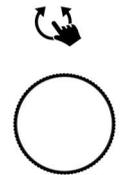
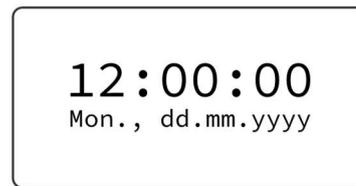
| | |
|-------------------------|--|
| R (Ref. Time) | Indicates whether the reference clock is providing a valid timebase. |
| T (Time Service) | If lit, the internal NTP service of the server is synchronized with the reference clock. |
| N (Network) | Shows whether there is a valid link-up on any of 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 OLED Panel with Dial Control

The front OLED panel of the microSync^{TRX} can be used to display basic service information such as software and firmware versions, the current synchronization state of the reference clock, the current time & date, and the network configuration. In conjunction with the dial control, it can also be used to modify the network configuration of the network port LAN0 to allow a device to access it over the network for management purposes.



microSync^{TRX} model variants with OLED display:

- microSync^{TRX} 20X
- microSync^{TRX} 21X
- microSync^{TRX} 40X
- microSync^{TRX} 41X
- microSync^{TRX} 42X

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 gn, 2 sweeps, 3 axes 10–150 Hz, 2 gn, 40 sweeps, 3 axes |
| IEC 60255-21-2 | Shock ¹ Class 2 | 10 gn, 11 ms, ±3 shocks, 3 axes 30 gn, 11 ms, ±3 shocks, 3 axes 20 gn, 16 ms, ±1000 shocks, 3 axes |
| IEC 60255-21-3 | Seismic ^{1,2} Class 2 | 4-35 Hz, 1 gn, 1 sweep, hor. axes 4-35 Hz, 2 gn, 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:

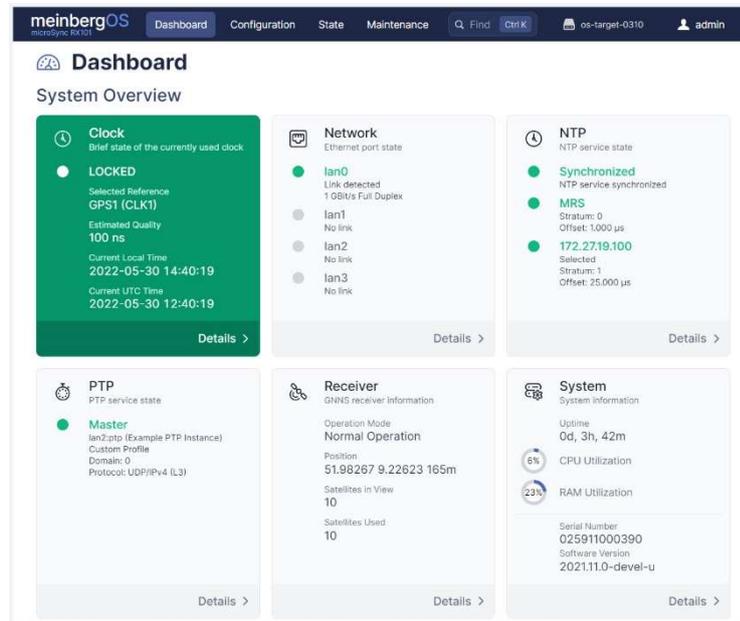
| | | |
|----------------|--|---|
| IEC 61000-4-2 | Immunity test to electrostatic discharges | ±6 kV contact discharge ±8 kV air discharge |
| IEC 61000-4-3 | Immunity test to radiated, radio-frequency, electromagnetic fields | 10 V/m |
| IEC 61000-4-4 | Immunity test to electrical fast transients (Burst) | ±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 UN |
| 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 IECCE. |
| 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

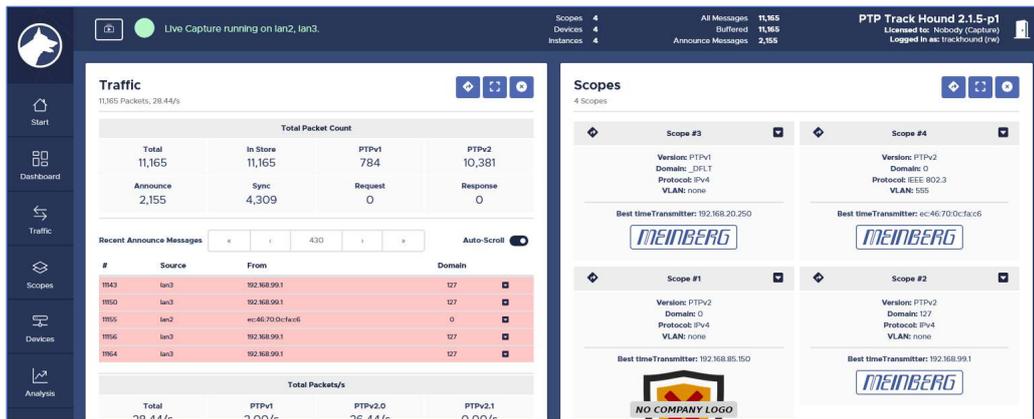
Firmware Management

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) 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.

Model Code

| | Model Code | | | | | | Description |
|--|------------|----|---|-------|------|------|--|
| | AAA | 11 | 2 | BB(B) | CC33 | DD44 | |
| Housing Type | TRX | | | | | | 19" Rack-Mount, 1U with OLED Display on Front |
| Series | | 20 | | | | | PP1-PP2 Out, TC-AM Out, F.Synth Out, BNC female |
| | | 21 | | | | | PP1-PP2 Out, TC-AM Out, 10 MHz Sine Out, BNC female |
| | | 40 | | | | | 10 MHz Out, 10 MHz Sine Out, PPS In, 10 MHz In, BNC female |
| | | 41 | | | | | PP1-PP2 Out, PPS In, 10 MHz In, BNC female |
| | | 43 | | | | | PP1 Out, 10 MHz Sine 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 GPS/Galileo, 72-Channel |
| Oscillator | | | | SQ | | | OCXO SQ |
| | | | | HQ | | | OCXO HQ |
| | | | | DHQ | | | OCXO DHQ |
| Power Supply | | | | | AD10 | | U _N : 100–240 V AC, 50–60 Hz / 100–200 V DC U _{max} : 90–265 V AC, 47–63 Hz / 90–250 V DC |
| | | | | | DC20 | | U _N : 24–48 V DC U _{max} : 20–60 V DC |
| Power Supply (Redundant Configuration) | | | | | | AD10 | U _N : 100–240 V AC, 50–60 Hz / 100–200 V DC U _{max} : 90–265 V AC, 47–63 Hz / 90–250 V DC |
| | | | | | | DC20 | U _N : 24–48 V DC U _{max} : 20–60 V DC |