

microSync 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 microSyncRX and microSyncTRX 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. Some microSyncRX models and all microSyncTRX models feature an OLED display with a rotary controller for initial network configuration and local status monitoring.

The microSyncTRX 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.

The various microSyncRX and microSyncTRX models differ in terms of the input and outputs available and the choice of GNSS receiver, from a basic GPS-only receiver to a fully-featured multi-GNSS solution that supports all four of the main GNSS constellations.

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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

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 15,000 NTP requests per second

Management Interfaces

Network	Web Interface (HTTP/HTTPS TLS v1.3) SSH v2 (command line interface) Telnet (command line interface) REST API (HTTP/HTTPS TLS v1.3)
Serial Console	8P8C (“RJ45-like”) connector for serial terminal access
Local	Front display & function keys

PTP (IEEE1588) Support

PTP Versions	PTPv2 (IEEE1588-2008)
IEEE1588-2008 Profiles	<ul style="list-style-type: none"> - Default E2E IEEE1588-2008 Profile - Default P2P IEEE1588-2008 Profile - Power IEEE C37.238-2011 (including profile extensions) - Power IEEE C37.238-2017 (including profile extensions) - Utility IEC 61850-9-3 (including profile extensions) - Telecom ITU-T G.8265.1 (including profile extensions) - Telecom ITU-T G.8275.1 (including profile extensions) - Telecom ITU-T G.8275.2 - DOCSIS 3.1 - SMPTE ST 2059-2 (including profile extensions) - AES67 Media
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 IEEE1588 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

PTP Performance Levels

microSynics are provided with a license that allows a specific performance level to be achieved with the IEEE1588 implementation. There are three Performance Levels available. Please reach out to your Meinberg Sales Representative for more information.

Performance Level	Max. Unicast Clients	Max. Delay Requests per Second / Hybrid Mode
PL-A	8	1024
PL-B	256	32768
PL-C	512	65536

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

Oscillator Options

The 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 LANTIME M320 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

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	5 % to 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

Chassis Specifications

Form Factor	1U / 87.5 HP(1.75 inches / 44.45 mm)
Dimensions (Only Chassis) [W x H x D]	444 mm x 43 mm x 263 mm (17.49 in x 1.69 in x 9.29 in)
Material	Sheet steel
IP Rating	IP30

Support & Compliance

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 from a connected USB storage medium, via the Web Interface (upload via a web browser), or via the CLI (download from a server). LANTIME OS allows you to install multiple firmware versions onto the device concurrently and select which one should be used when the system starts.
Conformity Declarations	CE, UKCA
RoHS Compliance	The product is fully RoHS-compliant.
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.

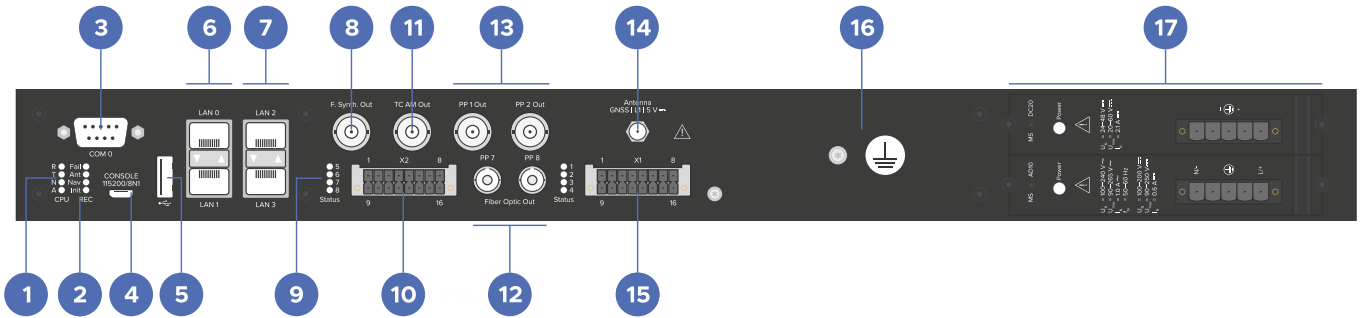
Accessories Included

- | 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 multi-GNSS 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) Belden H155 coaxial cable with pre-fitted connectors as standard*.

* Meinberg also offers customized antenna cables to accommodate your specific installation requirements. Please reach out to your Meinberg Sales Representative for more information

microSync 19” Rear Panel View

This illustration represents an example configuration of an microSync 19” 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 19” system configuration, please reach out to your Meinberg sales representative.



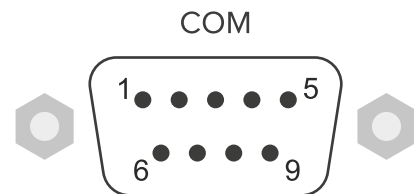
1 System Status LEDs

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-pin, 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

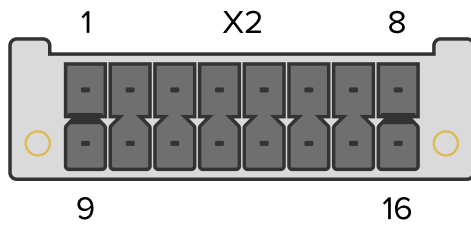
8 Frequency Synthesizer Output

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

9 Programmable Pulse Status LEDs

These LEDs indicate the output status of the eight programmable pulse output channels.

10 DMC X2 Terminal Connector



Connector Type DMC 16-pin, male

Pin	Function	
1	PP 5+	Programmable pulse (optocoupler)
2	PP 5	Programmable pulse (RS422A)
3	PP 5	Programmable pulse (RS422B)
4	PP 6	Programmable pulse (RS422A)
5	PP 6	Programmable pulse (RS422B)
6	+ TC In	Time Code DCLS (TTL, isolated)
7	+ TCA* Out	Time Code DCLS (TTL, isolated)
8	- TCA Out	Time Code DCLS (TTL, isolated) TTL active high 250 mA, short circuit proof
9	PP 5-	Program. Pulse (optocoupler)
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	- TC In	Time Code DCLS (TTL, isolated)
15		Not used
16		Not used

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

Optocoupler Specifications – Pin 1 + 9

Switching Voltage (U_{CE})	max. 55 V DC
Switching Current (I_C)	max. 50 mA
Power Loss	max. 150 mW
Switch-on time	typ. 5 µs, max. 9 µs
Switch-off time	typ. 10 µs, max. 70 µs

11 AM Time Code Output

Connector Type	BNC, female (for shielded coaxial cable)
Output Signal	Sine wave signal, unbalanced, amplitude modulated
Signal Level	3 V _{pp} / 1 V _{pp} (MARK/SPACE) with 50 Ω load
Carrier Frequency	1 kHz
Supported Time Code Formats	IRIG-B (B122, B123, B126, B127), AFNOR NF S87-500, IEEE1344, C37.118

12 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
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

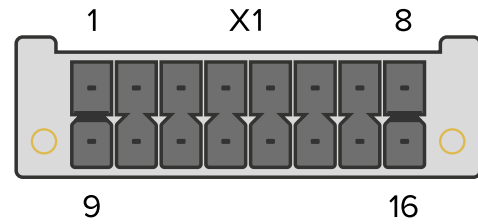
13 Programmable Pulse Output 1 & 2

Connector Type	BNC, female (for shielded coaxial cable)
Signal Level	TTL, 2.5 V _{pp} with 50 Ω load (unbalanced)
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

14 GNS Antenna Connector

Connector Type	SMA female
Termination	50 Ω
Recommended Cable	Belden H155 (max. 70 m)
Voltage Output	5 V

15 DMC X1 Terminal Connector



Connector Type	DMC 16-pin, male	
Pin	Function	
1		Not used
2		Not used
3	PP 1-	Programmable pulse
4	PP 2-	Programmable pulse
5	PP 3-	Programmable pulse
6	PP 4-	Programmable pulse
7	REL-NO	Error relay (normally open)
8	REL-CO	Error relay (common)
9		Not used
10		Not used
11	PP 1+	Programmable pulse
12	PP 2+	Programmable pulse
13	PP 3+	Programmable pulse
14	PP 4+	Programmable pulse
15		Not used
16	REL-NC	Error relay (normally closed)

Optocoupler Specifications – 3-6 & 11-14

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

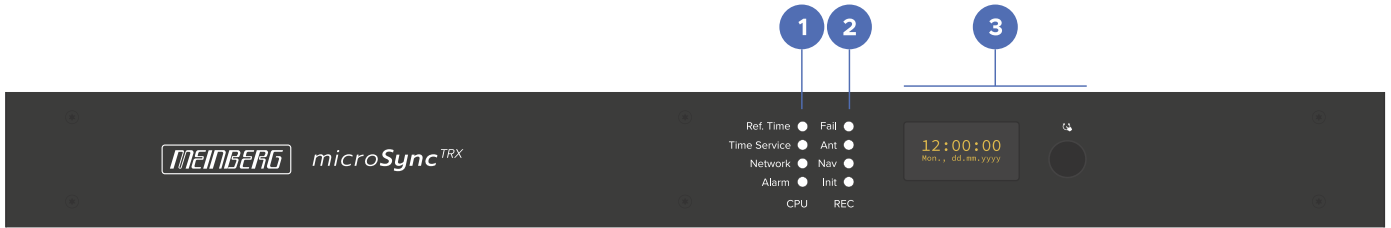
16 Grounding Terminal

The grounding terminal is used to additionally ground the chassis of the microSync.

17 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

microSync^{TRX} Display Side View



1 On-Board CPU 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.
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“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 19” Rackmount Systems 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.

Supported SFP Modules

Type	Mode	Connector Type	Max. Connection Length
Avago ABCU-5740RZ	Copper (1000BASE-T)	RJ45	100 m
Finisar FCLF8521P2BTL	Copper (1000BASE-T)	RJ45	100 m
Avago AFCT-5710PZ	Fiber-optic, single-mode (1000BASE-LX)	Duplex LC	10000 m
Finisar FTLF1318P3BTL	Fiber-optic, single-mode (1000BASE-LX)	Duplex LC	10000 m
Avago AFBR-5710PZ	Fiber-optic, multi-mode (1000BASE-SX)	Duplex LC	550 m (50/125 μ m) 275 m (62.5/125 μ m)
Finisar FTLF8524P3BNL	Fiber-optic, multi-mode (1000BASE-SX)	Duplex LC	300 m (62.5/125 μ m)