

microSync^{XS}



Product Highlights

- | A powerful and ultra-compact Stratum 1 NTP/PTP time server
- | 1U chassis, specially constructed for installation in a 19" rack
- | Engineered to order with a L1 Multi-GNSS 72 channel GNS receiver-clock
- | OLED display option for fast set-up and status monitoring
- | Different oscillator options for advanced holdover performance

microSync^{XS}: Compact, Powerful, and Cost-Effective

Meinberg's microSync^{XS} joins the microSync series with the most compact and cost-efficient microSync^{XS} to date—but with an impressive feature set to boast.

Like the larger microSync^{RX} and microSync^{HR}, the microSync^{XS} features two PTP-capable network ports operable either in timeTransmitter (Master) or timeReceiver (Slave) mode, allowing it to operate as a high-accuracy grandmaster, boundary clock, or ordinary clock. With full support for practically every published PTP profile, the microSync^{XS} is particularly ideal as an ultra-compact PTP Grandmaster solution. It also serves as a powerful NTP server and programmable clock signal generator, capable of producing pulse-per-second, 10 MHz frequency, 48 kHz word clock, DCLS timecode and more via three programmable pulse outputs. The microSync^{XS} is also available with an OLED front display and a rotary controller for initial network configuration and local status monitoring.

Equipped with a full version of the powerful, synchronization-centric meinbergOS operating system, the microSync^{XS} 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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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

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

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

PTP Performance Levels

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

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

* PTPv1 Mode selectable via meinbergOS Web Interface

Available Receiver Types

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

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

Oscillator Options

The microSync^{XS} 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

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	5,000 m (16,404 ft)
Atmospheric Pressure	540 to 1,600 hPa

Support & Compliance

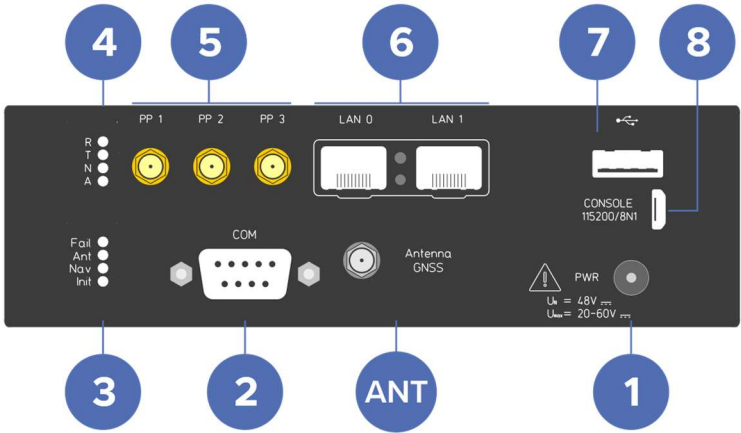
Technical Support	Free lifetime support via telephone and email, including firmware updates
Warranty	Three-year warranty, extendable upon request
Firmware Updates	Firmware is field-upgradable; updates can be installed via the Web Interface (upload via a web browser), or via the CLI (download from a server). meinbergOS allows you to install multiple firmware versions onto the device concurrently and select which one should be used when the system starts.
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

(Optional - only on order)

- | 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 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^{XS} Connector Side View



ANT

GNSS Antenna Connector Options

Antenna for GPS and GNS-UC Receiver	GPSANTv2 Antenna*
Connector Type	Bayonet Neill-Concelman (BNC) connector for coaxial cable
Input Impedance	50 Ω
Input Signal	35.4 MHz intermediate frequency
Power Supply	15 V, 100 mA to antenna via antenna cable
Supported Cable Length	Max. 300 m (RG 58) Max. 700 m (RG 213) Max. 1100 m (H2010 Ultraflex)

Antenna for GNS Receiver	GNMANTv2 Antenna*
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>

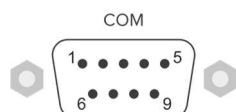
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Power Supply - microSync^{XS}

Connector Type	Barrel connector (right angle): (Ø 5.5/Ø 2.5) L10.5 mm
Polarity	Positive internal conductor
Nominal Voltage (U _N)	48 V DC
Rated Voltage Range (U _{max})	20 V – 60 V DC
Nominal Current (I _N)	1.25 A DC
Power Consumption (P _{max})	30 W
Max. Thermal Output (E _{therm})	102.36 BTU/h (108 kJ/h)

2 Serial Time String I/O

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



Connector Type	D-Sub 9, male
Supported Time Strings (Output)	Meinberg Standard (<i>Default</i>), Meinberg Capture, Meinberg GPS, SAT, NMEA RMC, NMEA GGA, NMEA ZDA, NMEA RMC GGA (<i>RMC followed by GGA</i>), NMEA GGA ZDA (<i>GGA followed by ZDA</i>), 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 (<i>Default</i>)
Framing Options	7N2, 7E1, 7E2, 8N1 (<i>Default</i>), 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

3 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.

4 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.

5 Programmable Pulse Outputs 1-3

Connector Type	SMA, female (for shielded coaxial cable)
Signal Level	TTL, 2.5 V _p with 50 Ω load (unbalanced)
Accuracy	≤ 50 ns
Supported Modes*	- Idle - Timer - Single Shot - Cyclic Pulse - Pulse Per Second, Minute, Hour - DCF77 Marks - Position OK - Time Sync - All Sync - DCLS Time Code - Serial Time String - DCF77-like M59 - Synthesizer Frequency - PTTI 1 PPS - 1 MHz Frequency - 5 MHz Frequency - 10 MHz Frequency - 48 kHz Frequency

6 Network Interfaces (LAN0 & LAN1)

Network Interfaces	2x SFP 1000BASE, PTP master & slave capable
Network Protocols	- IPv4 (with DHCP support) - IPv6 (with DHCPv6 and Autoconf support)
Network Services	- HTTP(S) for web interface and REST API access - FTP for access to log files and uploading firmware updates - SSH for command line access - SNMP for monitoring
Other Networking Features	- Full Parallel Redundancy Protocol (PRP) support as Doubly Attached Node, including for PTP and NTP - TACACS+/Radius/LDAP Auth, IEC 61850 MMS - Support for network link aggregation ("bonding") with multiple modes for load balancing or link redundancy

7 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"

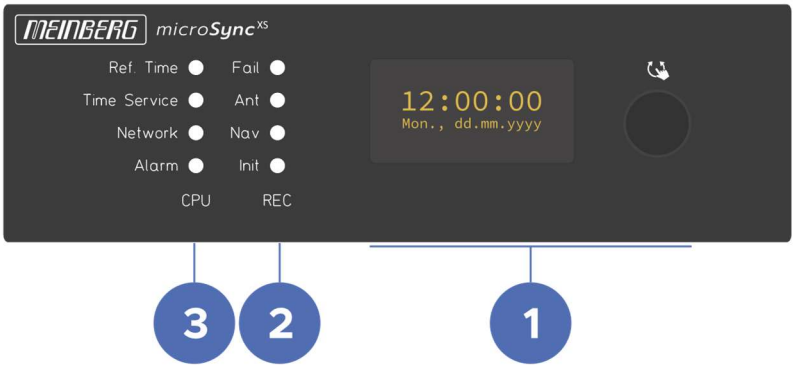
8 Serial Console Port (Terminal Access)

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.

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

microSync^{XS} - Display Side View



1 OLED Panel with Dial Control

The optional front OLED panel of a microSync^{XS} 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.

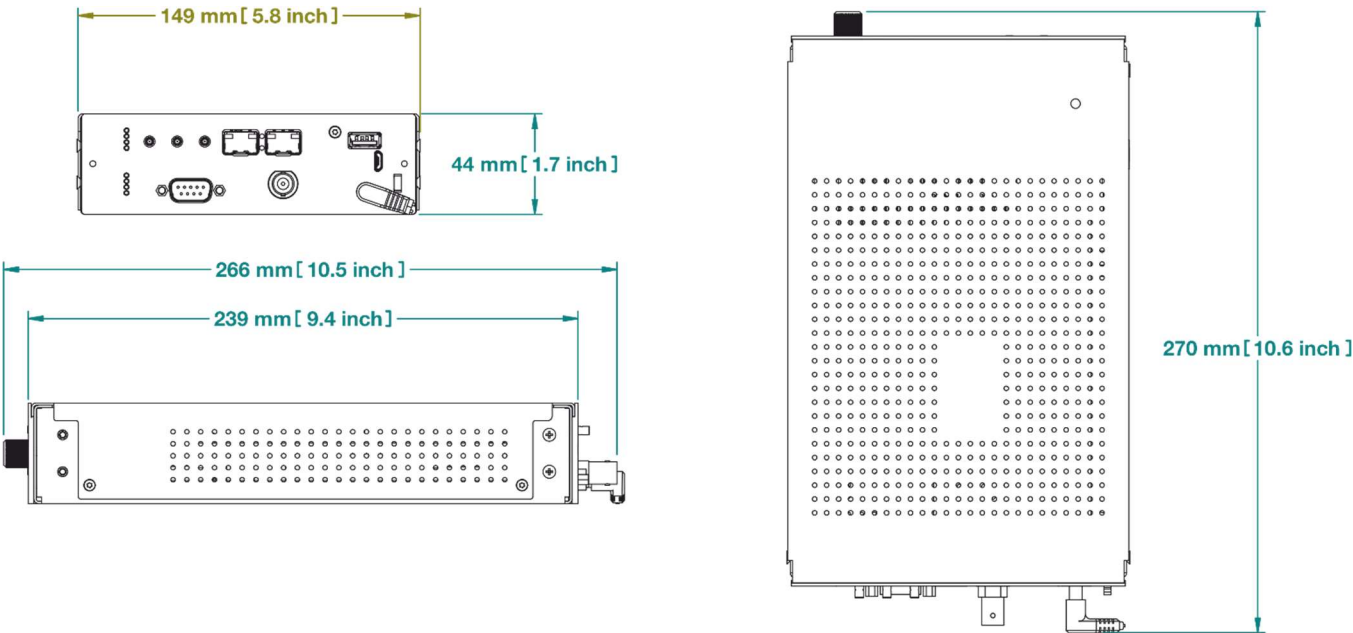
3 On-Board CPU Status LEDs

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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Dimensions of microSync^{XS}

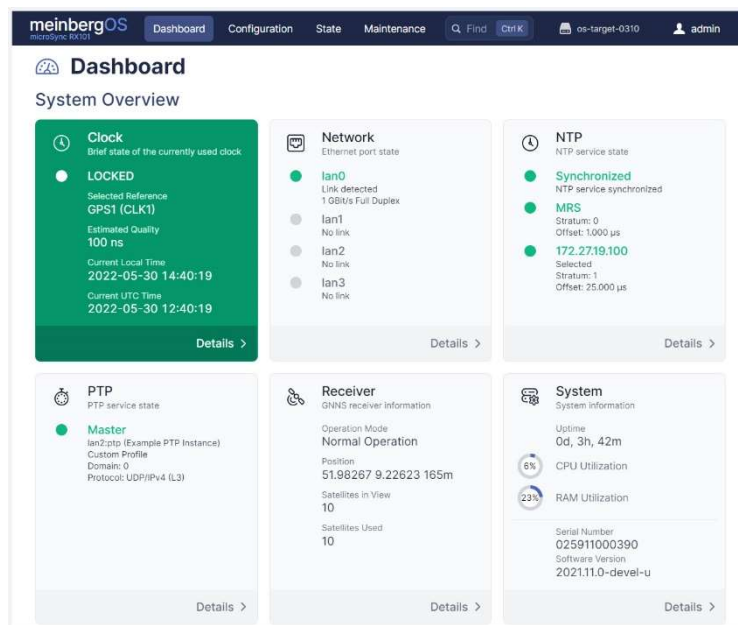


Chassis Specifications

Form Factor	One-third of 19" rack unit
Material	Sheet Steel
IP Rating	IP30

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

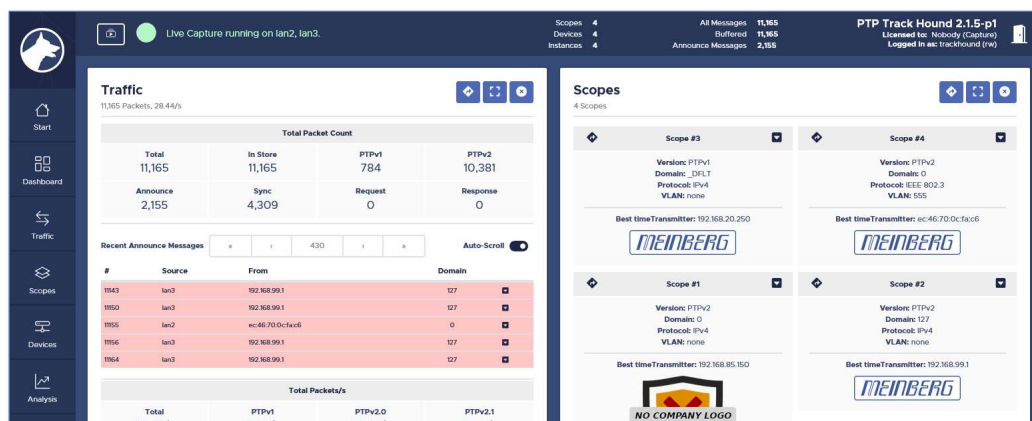
Firmware Management

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
- | PPS Input
- | Serial Time String + PPS
- | Black Burst Input
- | Clock Input
- | LTC – Linear Time Code Input
- | PTP
- | NTP

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.

Order Codes

microSync^{XS} 100

Oscillator	Order Code
With SQ Oscillator	03400265
With HQ Oscillator	03400266

microSync^{XS} 101

Oscillator	Order Code
With SQ Oscillator	03400262
With HQ Oscillator	03400263

microSync^{XS} 102

Oscillator	Order Code
With SQ Oscillator	03400268
With HQ Oscillator	03400269

microSync^{XS} 200 *

Oscillator	Order Code
With SQ Oscillator	03400274
With HQ Oscillator	03400275

microSync^{XS} 201 *

Oscillator	Order Code
With SQ Oscillator	03400271
With HQ Oscillator	03400272

* with OLED front display

Optional Accessories

Power Supply	Order Code
Desktop Power Supply	00263091

Antenna	Order Codes
GNMANT - GNSS multi band antenna incl. mounting kit	00260905
GPSANTv2 – antenna/converter unit incl. mounting kit	00265555

Antenna Cable	
GNMANTv2 max. 70 m (Speedfoam 240HFJ)	Various lengths available. Please contact Meinberg Sales or your authorized Meinberg distributor for more information.
GPSANTv2 max. 300 m (RG58) max. 700 m (RG213) max. 1100 m (H2010 Ultraflex)	
	The maximum cable runs can be realized without amplification.

Bracket Sets	Order Codes
For 1 System	03400241
For 2 Systems**	03400253
For 3 Systems**	03400254

Adapter	Order Code
2-pin Terminal to Barrel Connector for DC adapter	00263092

** for mounting two or three microSync^{XS} side by side in a standard 19inch rack