



## Meinberg Radio Clocks

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## SyncBox/N2X: Converts NTP or IEEE-1588 to IRIG, 10MHz, PPS, DCF77 and serial time telegrams

[1]

The SyncBox/N2X operates as an IEEE-1588 multicast slave clock or NTP client in a PTP / NTP network and with its interfaces this converter can synchronize many different systems. Our IEEE-1588 Grandmaster or LANTIME NTP Server, such the LANTIME M600, can be used as a reliable time source.

### Key Features

- The following output signals are available: PPO (PPS, PPM, PPH, TC DCLS, DCF77 Marks) 10 MHZ serial time string (Meinberg, Uni Erlangen, NMEA) Option: TC AM Frequenz Synth. sine
- IEEE 1588-2008 (PTP V2) compatible ordinary clock
- Serial COM port for initial configuration and time telegrams
- Supported Protocols: IPv4, NTP, PTP / IEEE 1588-2008, DHCP
- Signal outputs with fiber optical ST connectors available
- Generates several different modulated (AM) and unmodulated (DCLS) IRIG time code signals
- Option: N2X chassis with clamp for 35mm railmount
- 10/100Base-T Ethernet interface - Power over Ethernet option available on request
- Configuration and monitoring with Meinberg Device Manager Software "mbgdevman"

## Description

The Meinberg SyncBox N2X is synchronized by a PTP Grandmaster or by a NTP Server and can be used as a time source for equipment that requires IRIG AM, Freq.Synth/sine, PPO (PPS, PPM, PPH, IRIG DCLS, Cyclic Pulses, Single Shot, Timer, DCF77 Mark, Time Sync, Freq. Synth./TTL, Time Slots) or serial time string for synchronization. Optionally, the following output configurations are available:

- \* 3 x PPO via BNC Out 1 - Out 3

- \* 2 x PPO via BNC Out 1 / Out 2 and TC AM Out 3

- \* PPO Out 1, Freq. Synth/sine Out 2, TC AM Out 3

- \* Instead of three BNC connectors, the SyncBox N2X can also be equipped with three photomos outputs: 3 x PPOs with 2-pin sockets (DFK2),

- \* or with 3 x ST - fiber optical female connectors

The configuration and monitoring of the system can be done with our Meinberg Device Manager Software (mbgdevman).

The current setup file can be downloaded [here](#).

In order to support network management systems the SyncBox offers an extensive SNMP interface, which can be accessed by SNMP V1. It allows the monitoring of all relevant system parameters (including operating system parameters, network interface statistics, detailed NTP status information as well as the complete system configuration) and can be used to alter the SyncBox configuration via SNMP set commands, too.

The used PTP stack implementation is fully compatible to all IEEE 1588 PTPv2 - systems and supports PTP management messages.

The SyncBox N2X is equipped with a high precision oscillator ""TCXO". The oscillator determines the long-term stability in holdover mode, ie when the synchronization with the time source is disturbed. Oscillator update to OCXO-HQ is possible.

## Characteristics

<b>Available Output Signals</b>	PPO (PPS, PPM, PPH, TC DCLS, DCF77 Marks), TC AM, serial timestring (Meinberg, Uni Erlangen, NMEA) and Frequency Synth. sine
<b>Control elements</b>	MBGMON via RS232 serial interface or network connector (RJ45 jack)
<b>Status info</b>	<p>4 Status LEDs:</p> <ul style="list-style-type: none"> <li>* <b>ST - State</b> blue: during initialisation green: normal operation</li> <li>* <b>IN - Input</b> red: no network connected (network recognition requires a few minutes after connecting) yellow: signal is available but not synchron green (blink): Control by input signal, internal clock is synchronized but not accurate green: Oscillator has warmed up, the internal clock runs accurate</li> <li>* <b>SP - Speed</b> out: no cable connection yellow: 10 Mbit green: 100 Mbit</li> <li>* <b>LI - Link Activity</b> out: no cable connection yellow (blink): if network traffic and 10 Mbit grün (blink): if network traffic and 100 Mbit</li> </ul>
<b>Accuracy of pulse outputs</b>	<p><b>PTP:</b> +/- 100 ns (relative to the used IEEE 1588 Grandmaster Clock, after initial synchronization phase) <b>NTP:</b> +/- 1 ms (relative to NTP when using a local time server)</p> <p>* <i>after warm-up period</i></p>
<b>Interface</b>	Single serial RS232 interface
<b>Unmodulated time code output</b>	DCLS, TTL into 50 Ohm (PWM-DC Signal) via BNC female connector, high active or via FO connector (Fiber Optical)
<b>Modulated time code output</b>	Optional IRIG AM sine wave signal via female BNC connector (Out 3): 3Vpp (MARK), 1Vpp (SPACE) into 50 Ohm
<b>Generated time codes</b>	<p><b>IRIG B002:</b> 100pps, DCLS signal, no carrier, BCD time of year <b>IRIG B122:</b> 100pps, AM sine wave signal, 1 kHz carrier, BCD time of year <b>IRIG B003:</b> 100pps, DCLS signal, no carrier, BCD time of year, SBS time of day <b>IRIG B123:</b> 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day <b>IRIG B006:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, Year <b>IRIG B126:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year <b>IRIG B007:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, Year, SBS time-of-day <b>IRIG B127:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year, SBS time-of-day <b>IEEE1344:</b> Code according to IEEE1344-1995, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day, IEEE1344 expansion for date, time zone, daylight saving and leap second in Control Funktions Segment</p>

<b>Generated time codes</b>	<p><b>IRIG B002:</b> 100pps, DCLS signal, no carrier, BCD time of year</p> <p><b>IRIG B122:</b> 100pps, AM sine wave signal, 1 kHz carrier, BCD time of year</p> <p><b>IRIG B003:</b> 100pps, DCLS signal, no carrier, BCD time of year, SBS time of day</p> <p><b>IRIG B123:</b> 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day</p> <p><b>IRIG B006:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, Year</p> <p><b>IRIG B126:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year</p> <p><b>IRIG B007:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, Year, SBS time-of-day</p> <p><b>IRIG B127:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year, SBS time-of-day</p> <p><b>IEEE1344:</b> Code according to IEEE1344-1995, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day, IEEE1344 expansion for date, time zone, daylight saving and leap second in Control Funktionen Segment</p> <p><b>C37.118:</b> Like IEEE1344 - with turned sign bit for UTC-Offset</p> <p><b>AFNOR:</b> Code according to NFS-87500, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, complete date, SBS time of day</p>
<b>Network Interface</b>	RJ-45 Network Connection 10/100 MBit
<b>Power supply</b>	20-60 V DC; Option: PoE (Power over Ethernet - IEEE802.3af compliant), 36-60 V DC
<b>Power consumption</b>	5W
<b>Network protocols OSI Layer 7 (application layer)</b>	SNMP V1 - Monitoring of system parameters
<b>Network Time Protocol (NTP)</b>	<ul style="list-style-type: none"> <li>* Bis zu sieben konfigurierbare externe NTP Zeitserver</li> <li>* Min. and max. Polling Intervall (8s)</li> </ul>
<b>Precision Time Protocol (IEEE 1588)</b>	<ul style="list-style-type: none"> <li>* UDP/IPv4 (L3) or IEEE802.3 (L2) Multicast</li> <li>* E2E, E2E Hybrid or P2P Delay Mechanism</li> <li>* PTP Subdomains (0-255)</li> <li>* Power Profile compatible</li> </ul>
<b>Form Factor</b>	Aluminium Desktop Case TUG 05 160 L MS (like GOAL / DOAL). Physical Dimensions: 105 mm x 45 mm x 160mm (W x H x D)

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<b>Ambient temperature</b>	0 ... 50°C / 32 ... 122°F
<b>Humidity</b>	Max. 85%
<b>Scope of supply</b>	SyncBox, 5-pin DFK clamp (DC power supply only), USB Flash Drive with manual and Meinberg software.
<b>Technical Support</b>	Meinberg offers free lifetime technical support via telephone or e-mail.
<b>Warranty</b>	Three-Year Warranty
<b>Firmware Updates</b>	Firmware is field-upgradeable, updates can be installed directly at the unit via serial connection and with MBGFLASH tool. Software updates are provided free of charge, for the lifetime of your Meinberg product.
<b>RoHS-Status of the product</b>	This product is fully RoHS compliant
<b>WEEE status of the product</b>	This product is handled as a B2B category product. In order to secure a WEEE compliant waste disposal it has to be returned to the manufacturer. Any transportation expenses for returning this product (at its end of life) have to be incurred by the end user, whereas Meinberg will bear the costs for the waste disposal itself.

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#### Manual

The english manual is available as a PDF file: [2][Download \(PDF\)](#)

#### Links:

[1] <https://www.meinbergglobal.com/english/products/>

[2] [https://www.meinbergglobal.com/download/docs/manuals/english/syncbox\\_n2x.pdf](https://www.meinbergglobal.com/download/docs/manuals/english/syncbox_n2x.pdf)