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# SyncBox/PTPv2: PTP/IEEE 1588 Slave Clock

The Meinberg SyncBox/PTPv2 simplifies a migration towards PTP/IEEE 1588-2008 by providing a wide range of legacy time synchronization outputs. It is synchronized by a PTP Grandmaster and can be used as a time source for equipment that requires IRIG, PPS, 10MHz or E1 telecom carrier signals.

## Key Features

- IEEE 1588-2008 (PTP V2) compatible ordinary clock
- Supported Protocols: IPv4, PTP/IEEE 1588-2008, DHCP, HTTP, HTTPS, FTP, SFTP, SSH, SCP, TELNET
- PPS and 10MHz Outputs
- Generates several different modulated (AM) and unmodulated (DCLS) IRIG time code signals

## Description

The GNU/Linux operating system of the SyncBox/PTPv2 SBC (Single Board Computer) has been optimized to ensure a high level of security and reliability.

The configuration of the system can be done by using a standard web browser to access the straightforward html interface. Alternatively a text based and menu driven setup utility can be started from the shell prompt after logging into the unit via Telnet or SSH. The security-related features of the SyncBox satisfy highest demands.

Additionally the whole Syncbox configuration can be done by using encrypted channels (e.g. SSH, HTTPS). Every unused/unneeded protocol can be disabled in order to reduce possible points of attack.

The PTP/IEEE 1588-2008 implementation of the SyncBox is fully compliant to the IEEE 1588 V2 standard and therefore provides PTP management messages as well.

The SyncBox/PTP is equipped with a high precision oscillator "OCXO HQ" (look at oscillator options for details).

## Characteristics

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| **Control elements** | Serial Terminal Interface (RS232) for initial configuration, Status LEDs |
| **Status info** | 6 Status LEDs:<br><br>* System State (Ready)<br>* Outputs enabled<br>* PTP packet sent<br>* PTP packet received<br>* Link 100Mbit/s<br>* Link 10MBit/s |
| **Frequency outputs** | 10 MHz via BNC-Connector TTL 50 Ohm Accuracy is depending on oscillator (standard: OCXO HQ), see [1]oscillator list |
| **Pulse outputs** | Pulse Per Second (PPS) via BNC connector (TTL level), pulse width 200ms |
| **Accuracy of pulse outputs** | +/- 100 ns (relative to the used IEEE 1588 Grandmaster Clock, after initial synchronization phase) |
| **Interface** | Single serial RS232 interface |
| **Optional Output Signals** | MC housing type only - additional Telecom Signals [2](LIU):<br><br>* 2048 kHz (E1-mode)<br>G.703, 75 ohm, unbalanced, G.703, 120 ohm, balanced<br><br>* 2.048 Mbps (E1-mode)<br>75 ohm , unbalanced<br>120 ohm , balanced |
| **Unmodulated time code output** | DCLS, TTL into 50 Ohm via female BNC connector, active high |
| **Modulated time code output** | IRIG AM sine wave signal via female BNC connector:<br>3Vpp (MARK), 1Vpp (SPACE) into 50 Ohm |
| **Generated time codes** | IRIG B002: 100pps, DCLS signal, no carrier, BCD time of year<br>IRIG B122: 100pps, AM sine wave signal, 1 kHz carrier, BCD time of year<br>IRIG B003: 100pps, DCLS signal, no carrier, BCD time of year, SBS time of day<br>IRIG B123: 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day<br>IEEE1344: 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<br>AFNOR: Code according to NFS-87500, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, complete date, SBS time of day |

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| **Network Interface** | 1 x 10/100 MBit with RJ45, IEEE 1588 (PTPv2) |
| **Power supply** | Standard: 100-240 VDC / 100-240 VAC<br>(also available in different DC variants) |
| **Power consumption** | 15W |
| **Single-Board-Computer** | ARM compatible 500Mhz CPU, 256 MB RAM |
| **Operating System of the SBC** | Linux with nano kernel (incl. PPSkit) |
| **Network protocols OSI Layer 4 (transport layer)** | TCP, UDP |
| **Network protocols OSI Layer 7 (application layer)** | TELNET, SSH, HTTP, HTTPS |
| **Internet Protocol (IP)** | IP v4 |
| **Network Autoconfiguration Support** | Dynamic Host Configuration Protocol - DHCP (RFC 2131) |
| **Precision Time Protocol (IEEE 1588)** | PTP/ IEEE 1588-2008 including<br>* Network Protocols:<br>- UDP/IPv4 (Layer 3) (Multicast/Unicast)<br>- IEEE 802.3 (Layer 2) (Multicast)<br>* Delay Mechanisms:<br>- End-to-End (Multicast/Unicast)<br>- Peer-to-Peer (Multicast)<br>* PTP Management Messages for monitoring and configuration |
| **Hypertext Transfer Protocol (HTTP)** | HTTP/HTTPS (RC 2616) |
| **Secure Shell (SSH)** | SSH v1.3, SSH v1.5, SSH v2 (OpenSSH) |

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| **Telnet** | Telnet (RFC 854-RFC 861) |
| **Form Factor** | **HS:** Fischer aluminium housing for DIN mounting rail<br>(Height: 120mm, Width:135mm, Depth: 200mm)<br><br>**MC:** Compact slimline chassis, 1U/63HP (335mm wide x 43mm high x 250mm deep) |
| **Ambient temperature** | 0 ... 50°C / 32 ... 122°F |
| **Humidity** | Max. 85% |
| **Scope of supply** | SyncBox, power cable, USB Flash Drive with manual and Meinberg software |
| **Technical Support** | Meinberg offers free lifetime technical support via telephone or e-mail. |
| **Warranty** | Three-Year Warranty |
| **Firmware Updates** | Firmware is field-upgradeable, updates can be installed directly at the unit or via a remote network connection.<br>Software updates are provided free of charge, for the lifetime of your Meinberg product. |
| **RoHS-Status of the product** | This product is fully RoHS compliant |
| **WEEE status of the product** | 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. |

**Manual**

The english manual is available as a PDF file: [3]Download (PDF)

**Links:**

[1] http://www.meinberg.de/english/specs/gpsopt.htm
[2] http://www.meinberg.de/english/products/
[3] http://www.meinberg.de/download/docs/manuals/english/xhs_syncbox_v2.pdf