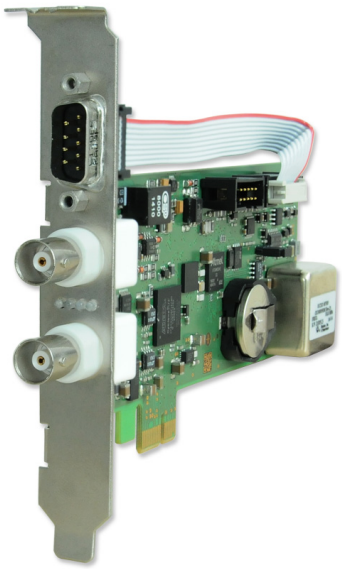

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TCR180PEX: IRIG Time Code Receiver and Generator for Computers (PCI Express)

The TCR180PEX receives [1]IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 time codes and can be used for synchronizing the system time of its host PC. The output of this card can generate an IRIG signal for other IRIG time code readers. The output format is independent from the incoming IRIG signal - a perfect solution to your IRIG conversion requirements.

Key Features

- Generation of IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 time codes
- 2 time-trigger-inputs
- PCI Express Interface
- Plug and play
- Programmable Pulse Outputs
- Memory Mapped I/O time reads for high access rates
- 2 RS-232 interfaces
- Status LEDs
- Reception of time code formats IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500
- Configurable time zone
- Driver software for all popular operating systems
- Optional optical input and/or output for time codes
- DDS frequency synthesizer

Description

The board TCR180PEX has been designed to receive and to generate IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 time codes.

It is used in applications like data acquisition, standalone computer time synchronization (for systems without a network connection or higher accuracy requirements) or as an IRIG converter device.

Receiver:The module provides two input channels for decoding of modulated and unmodulated time codes in IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 format. The receiver's automatic gain control (AGC) allows the reception of modulated IRIG signals within an amplitude range from 600 mVpp to 8 Vpp. In addition, the TCR180PEX provides an optocoupler input for decoding unmodulated codes with TTL- or RS-422 level for example. **The board can be delivered with an optical input for unmodulated codes optionally.**

The decoded date and time can be read via the PCI Express interface and is also transmitted via the board's RS-232 port. A buffered real time clock keeps time and date after power down.

Generator:The board TCR180PEX can generate time codes in IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 format. These signals are provided as modulated (3 Vpp/1 Vpp into 50 ohm) and unmodulated (TTL into 50 ohm and RS-422) time codes. **An optical output for unmodulated codes is available on request.**

The independent configuration of the time code and its offset to UTC of the receiver and the generator allows the use of TCR180PEX for time code conversion applications.

The **Windows** driver package includes a time synchronization service which runs in the background and adjusts the Windows system time continuously and invisibly. This package also includes a monitor program to enable the user to check the status of the device and time adjustment service. If the monitor program is run with administrator rights, it can also be used to modify configurable parameters.

The **Linux** and **FreeBSD** driver packages include a kernel driver which allows the product to be used as a reference time source for the NTP daemon included in most Unix-like operating systems. This also allows the computer to be used as an NTP time server to provide accurate time to NTP clients on the network. Some command line tools can be used to modify configurable parameters and monitor the status of the clock in use.
Please contact Meinberg's Support Team for more information on using the card with other operating systems: techsupport@meinberg.de.

The device's serial port is not required for operation but can be used to update the card's firmware, or to provide another computer with the current time via a serial time string.

If you are going to use the TCR180PEX in your own applications, please download our software development kit which contains libraries and sample code and shows how to access the card from within your software.

All drivers and API sample source code can be downloaded free of charges from our website and we are happy to assist you if you face any difficulties in using the Meinberg driver API in your software development process.

Characteristics

Status Indicators	**Status info by 4 LED light indicators (2mm light pipes)** * Init - blue: while the receiver passes through the initialization phase * Data - green: correct time code detected * Tele - green: telegramm consistent * Fail - red: the internal timing is in holdover mode
Input signal	Modulated IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 signal, input insulated by transformer, input impedance 50 ohm, 600 ohm or 5 kohm selectable by jumper. Unmodulated (DC level shift) IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 signal, input insulated by photocoupler.
Accuracy free run	±1·E-8 if the decoder was synchronous for at least 1 h
IRIG Time Code Input	IRIG - A002/A132, A003/A133, A006/A136, A007/A137, B002/B122, B003/B123, B006/B126, B007/B127, G002/G142, G006/G146, IEEE 1344, AFNOR NFS 87-500 and IEEE C37.118 (other codes on request)
Frequency Outputs	Frequency synthesizer 1/8 Hz up to 10 MHz (TTL, sine 1,5Vrms)
Pulse Outputs	Three programmable pulse outputs, TTL level Channel 0 also with RS232 level
Precision of timebase	±250 nsec compared to IRIG reference marker Required accuracy of time code source: ±100ppm
Interface	Two independant serial RS232 interfaces
Serial Time String Output	Baud rate: 300 Bd...115200 Bd Data format: 7E2, 8N1, 8N2, 8E1, 7N2, 7E1, 801 Time telegram: [2]Meinberg Standard Time String , SAT, Uni Erlangen (NTP), SPA, RACAL, COMPUTIME, ION or [3]Capture String
Statusbyte	Information about holdover mode, synchronisation since last reset and the validity of the RTC data.
Supported Timecode Formats	**IRIG A002:** 1000pps, DCLS signal, no carrier, BCD time of year **IRIG A132:** 1000pps, AM sine wave signal, 10 kHz carrier, BCD time of year **IRIG A003:** 1000pps, DCLS signal, no carrier, BCD time of year, SBS time of day **IRIG A133:** 1000pps, AM sine wave signal, 10kHz carrier, BCD time of year, SBS time of day **IRIG A006:** 1000pps, DCLS signal, no carrier, BCD time of year, BCD year **IRIG A136:** 1000pps, AM sine wave signal, 10kHz carrier, BCD time of year, BCD year **IRIG A007:** 1000pps, DCLS signal, no carrier, BCD time of year, BCD year, SBS time-of-day **IRIG A137:** 1000pps, AM sine wave signal, 10kHz carrier, BCD time of year, BCD year, SBS time-of-day **IRIG B002:** 100pps, DCLS signal, no carrier, BCD time of year

IRIG B122: 100pps, AM sine wave signal, 1 kHz carrier, BCD time of year
IRIG B003: 100pps, DCLS signal, no carrier, BCD time of year, SBS time of day
IRIG B123: 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, SBS time of day
IRIG B006: 100 pps, DCLS Signal, no carrier, BCD time of year, BCD year
IRIG B126: 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time of year, BCD year
IRIG B007: 100 pps, DCLS Signal, no carrier, BCD time of year, BCD year, SBS time-of-day
IRIG B127: 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time of year, BCD year, SBS time-of-day
IRIG G002: 10000pps, DCLS Signal, no carrier, BCD time of year
IRIG G142: 10000pps, AM sine wave signal, 100 kHz carrier frequency, BCD time of year
IRIG G006: 10000pps, DCLS Signal, no carrier, BCD time of year, BCD year
IRIG G146: 10000pps, AM sine wave signal, 100 kHz carrier frequency, BCD time of year, BCD year
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
C37.118: Like IEEE1344 - with turned sign bit for UTC-Offset
AFNOR: Code according to NFS-87500, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, complete date, SBS time of day

Output signal	Modulated IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 signal, 3 Vpp (high) and 1 Vpp (low) into 50 ohm. Unmodulated (DC Level Shift) IRIG-A/B/G, IEEE 1344, IEEE C37.118 or AFNOR NF S87-500 signal, TTL into 50 ohm and RS-422, active high or active low selectable by jumper.

Time-Trigger inputs	Triggered by falling TTL slope Time of trigger event readable via computer slot or optional second RS232-interface
Electrical Connectors	Female BNC-connectors male 9-pole D-Sub connector
Computer interface	Single lane (x1) PCI Express (PCIe) Interface PCI Express r1.0a compatible
Backup Battery Type	When main power supply fails, hardware clock runs free on quartz basis, life time of lithium battery min. 10 years
Board type	Low Profile card (68,90 x 150 mm)
Supported Temperature	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
Supported Humidity	Max. 85 % (non-condensing) at 40 °C
Warranty	Three-year warranty
Options	* Optical input and/or output for time codes, ST connector for GI 50/125µm or GI 62,5/125µm gradient fibre * OCXO-LQ, -SQ, -MQ, -HQ (specifications look at [4]oscillator options) for higher accuracy in holdover mode
RoHS Status of Product	This product is fully RoHS-compliant.
WEEE Status of Product	This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it can be returned to the manufacturer. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will bear the costs for the waste disposal itself.

Manual

The English manual is available as a PDF file: [5]Download (PDF)

Links:

[1] https://www.meinbergglobal.com/english/info/irig.htm
[2] https://www.meinbergglobal.com/english/specs/timestr.htm
[3] https://www.meinbergglobal.com/english/specs/capstr.htm
[4] https://www.meinbergglobal.com/english/specs/gpsopt.htm
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