



## Meinberg Radio Clocks

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## TCR170PEX: IRIG Time Code Receiver and Generator for Computers (PCI Express)

The TCR170PEX receives [1][IRIG-A/B or AFNOR time codes](#) and can be used for synchronizing the system time of its host PC. The IRIG 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.

### Important Note

This product is no longer available and may have been replaced by a newer product. We will, of course, continue to provide support for units that have already been purchased and are still in use. Please contact our [2][Sales Department](#) for further details.

This product has been discontinued and has been replaced with: [3]

### Key Features

- Generation of IRIG-B or AFNOR 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 or AFNOR
- 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 TCR170PEX has been designed to receive and to generate IRIG and AFNOR 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 or AFNOR 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 TCR170PEX 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 TCR170PEX can generate time codes in IRIG-B or AFNOR 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 TCR170PEX 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](mailto: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 TCR170PEX 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

<b>Status Indicators</b>	2 status LEDs for indication of: detection of a correct code, synchronisation of the internal timing and holdover mode
<b>Input signal</b>	Modulated IRIG A/B, IEEE1344 or AFNOR signal, input insulated by transformer, input impedance 50 ohm, 600 ohm or 5 kohm selectable by jumper unmodulated (DC level shift) IRIG A/B, IEEE1344 or AFNOR signal, input insulated by photocoupler
<b>Accuracy free run</b>	$\pm 1 \cdot 10^{-8}$ if the decoder was synchronous for at least 1 h
<b>IRIG Time Code Input</b>	IRIG - A132/A133, A002/A003, B122/B123, B002/B003, B126/B127, B006/B007, IEEE 1344, AFNOR NFS 87-500 and C37.118 (other codes on request)
<b>Frequency Outputs</b>	Frequency synthesizer 1/8 Hz up to 10 MHz (TTL, sine 1,5Vrms)
<b>Pulse Outputs</b>	Three programmable pulse outputs, TTL level Channel 0 also with RS232 level
<b>Precision of timebase</b>	$\pm 5$ $\mu$ sec referred to IRIG-reference marker
<b>Interface</b>	Two independant serial RS232 interfaces
<b>Serial Time String Output</b>	Baudrate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 baud Framing: 7E2, 8N1, 8E1, 8N2 Output string: 32 ASCII characters with date, time and status information
<b>Statusbyte</b>	Information about holdover mode, synchronisation since last reset and the validity of the RTC data.
<b>Supported Timecode Formats</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 Functions segment</p> <p><b>C37.118:</b> Like IEEE1344 - with inverted 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>Output signal</b>	Modulated IRIG-B or AFNOR signal, 3 Vpp (high) and 1 Vpp (low) into 50 ohm unmodulated (DC Level Shift) IRIG-B or AFNOR signal, TTL into 50 ohm and RS-422, active high or active low selectable by jumper

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<b>Time-Trigger inputs</b>	Triggered by falling TTL slope Time of trigger event readable via computer slot or optional second RS232-interface
<b>Electrical Connectors</b>	Female BNC-connectors male 9-pole D-Sub connector
<b>Computer interface</b>	Single lane (x1) PCI Express (PCIe) Interface PCI Express r1.0a compatible
<b>Backup Battery Type</b>	When main power supply fails, hardware clock runs free on quartz basis, life time of lithium battery min. 10 years
<b>Board type</b>	Standard height board (101 x 150 mm)
<b>Supported Temperature</b>	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
<b>Supported Humidity</b>	Max. 85 % (non-condensing) at 40 °C
<b>Warranty</b>	Three-year warranty
<b>Options</b>	- Optical input and/or output for time codes, ST connector for GI 50/125µm or GI 62,5/125µm gradient fibre - OCXO LQ/MQ/HQ (specifications look at [4] <a href="#">oscillator options</a> ) for higher accuracy in holdover mode
<b>RoHS Status of Product</b>	This product is fully RoHS-compliant.
<b>WEEE Status of Product</b>	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.

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## Manual

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

## Links:

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

[2] <mailto:sales@meinberg.de>

[3] <https://www.meinbergglobal.com/english/products/tcr180pex.htm>

[4] <https://www.meinbergglobal.com/english/specs/gpsopt.htm>

[5] <https://www.meinbergglobal.com/download/docs/manuals/english/tcr170pex.pdf>