GPS170PCI: GPS Clock for Computers (PCI/PCI-X Bus)

The Meinberg GPS170PCI slot card is the professional solution to your standalone computer synchronization requirements. Its various outputs like IRIG, serial time string or 1PPS can be used to provide synchronization to other devices. A powerful but easy to use API enables you to integrate a highly accurate time base in your own software and the two independent capture inputs add hardware timestamping of external events to your measurement application.

Key Features

- PCI LOCAL BUS interface,
  3.3V or 5V, 33MHz or 66MHz,
  PCI-X compatible
- 2 time trigger inputs
- Pulses per second and per minute
- RS232 interface
- IRIG-B/AFNOR time code outputs and NEW:3 programmable TTL outputs
- Plug and Play
- DCF77-simulation
- Antenna connected with up to 300m of standard coaxial cable RG58
- NEW: Configurable time scale (UTC/local, GPS time, TAI)
- DC-insulated antenna circuit
- Driver software for all popular operating systems
- Flash-EPROM with bootstrap loader
- Including [1]GPS antenna, 20m standard cable and manual on USB key

Description

The GPS170PCI has been designed to synchronize the system time of computers with PCI/PCI-X bus interface and to provide an API (Application Programming Interface) which allows you to read the time with great accuracy and precision from within your own application.

The IRIG output of the GPS170PCI can be used to synchronize IRIG time code receivers. Using TCR167PCI slot cards provides a convenient solution to synchronize more than one standalone (non-networked) computer system - eliminating the need of deploying several GPS antennas.

The drivers package for **Windows** contains a time adjustment service which runs in the background and adjusts the Windows system time continously and smoothly. A monitor program is also included which lets the user check the status of the device and the time adjustment service, and can be used to modify configurable parameters.

The driver package for **Linux** contains a kernel driver which allows the board to be used as a reference time source for the NTP daemon which is shipped with most Linux distributions. This also turns the computer into a NTP time server which can also provide accurate time to other NTP clients on the network. Some command line tools can be used to setup configurable parameters and monitor the status of the board.

Additional drivers packages are available for **DOS**, **Novell NetWare**, and **OS/2**. At the bottom of this page there's a link to the download area.

The device's serial port can be used to update the card's firmware. Additionally it can be connected to the serial port of a computer to use the card as reference time source under operating systems where a serial time string is supported, e.g. by NTP, but no kernel device driver is available.

If you are going to use the GPS170PCI in your own applications, please use our software development kit which shows how to access the card from within your software.

All drivers and SDKs 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

Type of receiver	6 channel GPS C/A-code receiver
Type of antenna	Remote powered [2]GPS antenna/converter unit, up to 300m distance to antenna with RG58 and up to 700m distance with RG213 cable
Status info	Fail-LED shows that the internal timing has not been synchronized or that a system error occurred Lock-LED shows that the calculation of the position has been achieved after reset
Synchronization time	Max. 1 minute in normal operation mode, approx. 12 minutes after a cold start (discharged buffer battery)
Frequency outputs	Frequency output 10 MHz, TTL level
Pulse outputs	3 Programmable TTL outputs, channels 0 and 1 per default configured as Pulse per second (TTL, RS232 level) and pulse per minute (TTL), pulse duration: 200 msec Channel 2 default configuration: DCF77 compatible pulses (TTL level), pulse width: 100/200 msec
Accuracy of pulse outputs	< ± 250ns
Interface	Single serial RS232 interface
Data format PC interface	Binary, byte serial (compatible with Meinberg DCF77 Slot Card PCI511)
Data format of interfaces	Baudrate: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud data format: 7N2, 7E1, 7E2, 8E1, 8N1, 8N2 Time telegram: [3]Meinberg Standard-Telegram, SAT, Uni Erlangen (NTP), SPA, NMEA0183 (RMC) or [4]capture-telegramm
Unmodulated time code output	DCLS, TTL into 50 ohm (active high or active low)
Modulated time code output	IRIG AM sine wave signal: 3Vpp (MARK), 1Vpp (SPACE) into 50 ohm
Generated time codes	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 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 AFNOR: Code according to NFS-87500, 100pps, AM sine wave signal, 1kHz carrier, BCD time of year, complete date, SBS time of day
Time-Trigger inputs	Resolution: 100 nsec, triggered by falling TTL slope Time of trigger event readable via computer slot or optional second RS232-interface

Electrical connectors	BNC female connector for antenna BNC female connector for modulated timecode 9 pin sub D male connector
Power supply	+5V, ca. 400mA +12V, ca. 170mA
Backup battery type	When main power supply fails, hardware clock runs free on quartz basis, almanac data is stored in RAM Life time of lithium battery min. 10 years
Board type	PCI card short (174,6 mm x 106,7 mm)
Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%

Options

  * Additional independent RS232 interface

  * Additional optical output for IRIG DCLS (instead of IRIG AM)

  * Oscillator upgrade OCXO-LQ (instead of TCXO) for extended Holdover capabilities (see [5]oscillator table for further details)

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: [6]Download (PDF)

Links:

[1] http://www.meinberg.de/english/products/gps-antenna-converter.htm
[2] http://www.meinbergglobal.com/english/products/gps-antenna-converter.htm
[3] http://www.meinberg.de/english/products/specs/timestr.htm
[4] http://www.meinberg.de/english/products/specs/capstr.htm
[5] http://www.meinberg.de/english/specs/gpsopt.htm
[6] http://www.meinberg.de/download/docs/manuals/english/gps170pci.pdf

PCI511: DCF77 PCI Computer Clock (PCI/PCI-X Bus)

The PCI511 is a DCF77 radio clock for synchronization of computers with a PCI or PCI-X slot. It receives the longwave radio time signal from the DCF77 sender located near Frankfurt/Main, Germany.

Key Features

- PCI LOCAL BUS interface,
  3.3V or 5V, 33MHz or 66MHz,
  PCI-X compatible
- Plug and play
- Pulses per second and per minute
- RS232 interface
- Receiver status LEDs
- Buffered hardware clock
- Configurable time zone
- Driver software for all popular operating systems

Description

The PCI511 has been designed for the reception of the DCF77 signal, the transfer of the time information to a computer with PCI (PCI-X) bus interface and the translation of the received codes into a serial telegram.

Because the radio clock PCI511 is composed as an universal board for computers with PCI bus, operation within 3.3V and 5V systems is possible.

The drivers package for **Windows** contains a time adjustment service which runs in the background and adjusts the Windows system time continously and smoothly. A monitor program is also included which lets the user check the status of the device and the time adjustment service, and can be used to modify configurable parameters.

The driver package for **Linux** contains a kernel driver which allows the board to be used as a reference time source for the NTP daemon which is shipped with most Linux distributions. This also turns the computer into a NTP time server which can also provide accurate time to other NTP clients on the network. Some command line tools can be used to setup configurable parameters and monitor the status of the board.

Additional drivers packages are available for **DOS**, **Novell NetWare**, and **OS/2**. At the bottom of this page there's a link to the download area.

The device's serial port can be used to update the card's firmware. Additionally it can be connected to the serial port of a computer to use the card as reference time source under operating systems where a serial time string is supported, e.g. by NTP, but no kernel device driver is available.

Characteristics

Type of receiver	Narrowband DCF77 quadrature receiver with automatic gain control, bandwidth: approx. 20Hz
Status info	RF Signal: Indicated by LED, antenna alignment enhanced by utility program Free running: Indicated by LED and utility program without RF signal the clock runs on quartz basis with an accuracy of $\pm 1\cdot 10\text{-}6$ (after 24 hours of synchronous operation) Modulation: Indicated by LED and utility program
Reception Control	Multiple check of received time telegram Plausibility control by using two complete time telegrams
Pulse outputs	Pulses per second (RS232/TTL level) and per minute (TTL level), pulse duration: 100 msec, active high
Interface	PCI LOCAL BUS (PCI), PCI-X compatible
Data format PC interface	[1]Binary, byte serial
Data format of interfaces	Baudrate: 300, 600, 1200, 2400, 4800, 9600 baud Framing: 7E2, 8N1, 8E1, 8N2 Output string: 32 ASCII characters with date, time and status information
Statusbyte	Informations about free running mode, daylight savings time and DST pre-switch anouncement, synchronization since last reset, GMT/UTC time and validity of the hardware clock data

Electrical connectors	9 pin sub D male connector BNC female connector
Computer interface	33MHz- or 66MHz-PCI BUS (PCI-X) 32 Bit/3.3V or 5V card slot
Backup battery type	In case of supply voltage failure the on-board RTC keeps the time based on XTAL for more than 150 hours (buffer capacitor) Optional: lithium backup battery (life time: 10 years)
Board type	PCI card short
Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%
Scope of supply	Scope of supply includes an active ferrite antenna [2]AI01 and 5m of RG174 coaxial cable with BNC connectors. Optional: [3]AW02 with RG58 and patch cord, other length of cable
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

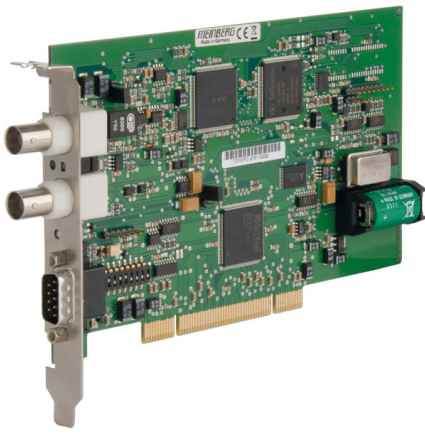The english manual is available as a PDF file: [4]Download (PDF)

Links:

[1] http://www.meinberg.de/english/specs/timepack.htm
[2] http://www.meinberg.de/english/products/dcf77-indoor-antenna.htm
[3] http://www.meinberg.de/english/products/dcf77-outdoor-antenna.htm
[4] http://www.meinberg.de/download/docs/manuals/english/pci511.pdf

Meinberg Radio Clocks
Lange Wand 9
31812 Bad Pyrmont, Germany
Phone: +49 (5281) 9309-0
Fax: +49 (5281) 9309-30
http://www.meinberg.de
info@meinberg.de

TCR167PCI: IRIG Time Code Receiver and Generator for Computers (PCI/PCI-X bus)

The TCR167PCI 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.

Key Features

-   Generation of IRIG-B or AFNOR time codes
-   2 time-trigger-inputs
-   2 TTL inputs for status information
-   PCI LOCAL BUS interface,
    3.3V or 5V, 33MHz or 66MHz,
    PCI-X compatible
-   Plug and play
-   Pulses per second and per minute
-   RS232 interface
-   Status LEDs
-   Reception of time code formats IRIG A/B or AFNOR
-   Configurabel time zone
-   Driver software for all popular operating systems
-   Optional optical input and/or output for time codes
-   Optional DDS frequency synthesizer

Description

The board TCR167PCI has been designed to receive and to generate IRIG and AFNOR time codes.

It is used in applications like data aquisition, 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 TCR167PCI 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/PCI-X bus 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 TCR167PCI 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 TCR167PCI for time code conversion applications.

The drivers package for **Windows** contains a time adjustment service which runs in the background and adjusts the Windows system time continously and smoothly. A monitor program is also included which lets the user check the status of the device and the time adjustment service, and can be used to modify configurable parameters.

The driver package for **Linux** contains a kernel driver which allows the board to be used as a reference time source for the NTP daemon which is shipped with most Linux distributions. This also turns the computer into a NTP time server which can also provide accurate time to other NTP clients on the network. Some command line tools can be used to setup configurable parameters and monitor the status of the board.

Additional drivers packages are available for **DOS**, **Novell NetWare**, and **OS/2**. At the bottom of this page there's a link to the download area.

The device's serial port can be used to update the card's firmware. Additionally it can be connected to the serial port of a computer to use the card as reference time source under operating systems where a serial time string is supported, e.g. by NTP, but no kernel device driver is available.If you are going to use the TCR167PCI in your own applications, please download our SDK which 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 info	2 status LEDs for indication of: detection of a correct code, synchronization of the internal timing and holdover mode
Input signal	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
Accuracy free run	±1·10E-8 if the decoder was synchronous for at least 1 h
IRIG Time Code Input	IRIG-A133, A132, A003, A002, B123, B122, B003, B002, IEEE1344 and AFNOR NFS 87-500 (other codes on request)
Pulse outputs	Pulses per second (RS-232/TTL level) and per minute (TTL level), pulse duration 200 msec
Precision of timebase	±5 µsec referred to IRIG-reference marker
Interface	Single serial RS232 interface
Data format PC interface	[2]Binary, byte serial
Data format of interfaces	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
Statusbyte	Information about holdover mode, synchronization since last reset and the validity of the RTC data.
Generated time codes	IRIG-B123, B122, B003, B002, IEEE1344 and AFNOR NFS 87-500 (other codes on request)
Output signal	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
Time-Trigger inputs	Triggered by falling TTL slope Time of trigger event readable via computer slot or optional second RS232-interface
Status inputs	2 status inputs, TTL level, readable via PCI/PCI-X bus
Electrical connectors	Female BNC-connectors male 9-pole D-Sub connector
Computer interface	33MHz- or 66MHz-PCI BUS (PCI-X) 32 Bit/3.3V or 5V card slot
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	PCI card short (174,6 mm x 106,7 mm)

Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%
Options	- Optical input and/or output for time codes, ST connector for GI 50/125µm or GI 62,5/125µm gradient fibre - DDS frequency synthesizer 1/8 Hz up to 10 MHz, TTL into 50 ohm, sinewave 1.5 Vrms - OCXO LQ (specifications look at [3]oscillator options) for higher accuracy in holdover mode
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

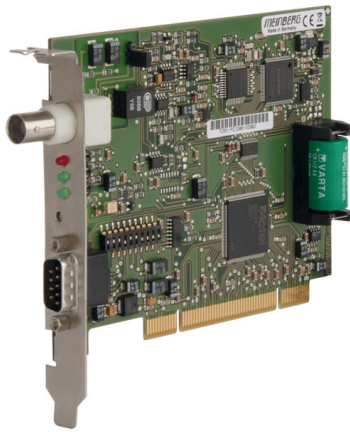The english manual is available as a PDF file: [4]Download (PDF)

Links:

[1] http://www.meinberg.de/english/products/info/irig.htm
[2] http://www.meinberg.de/english/specs/timepack.htm
[3] http://www.meinberg.de/english/specs/gpsopt.htm
[4] http://www.meinberg.de/download/docs/manuals/english/tcr167pci.pdf

Meinberg Radio Clocks
Lange Wand 9
31812 Bad Pyrmont, Germany
Phone: +49 (5281) 9309-0
Fax: +49 (5281) 9309-30
http://www.meinberg.de
info@meinberg.de

TCR511PCI: IRIG Time Code Receiver for Computers (PCI/PCI-X bus)

The TCR511PCI receivesIRIG-A/B or AFNOR time codes and uses them to synchronize the system time of the host PC. The easy-to-use Meinberg API enables you to access this stable and accurate time base and its status information from within your own applications.

Key Features

- PCI LOCAL BUS interface,
  3.3V or 5V, 33MHz or 66MHz,
  PCI-X compatible
- Plug and play
- RS232 interface
- Status LEDs
- Reception of time code formats IRIG A/B or AFNOR
- Configurabel time zone
- Driver software for all popular operating systems

Description

The board TCR511PCI has been designed to receive different IRIG-A/B and AFNOR codes. The decoded date and time can be read via the PCI/PCI-X bus interface and is also transmitted via the board's RS-232 port.

The receiver's automatic gain control (AGC) allows the reception of modulated IRIG signals within an amplitude range from 600mVpp to 8Vpp. In addition, the TCR511PCI provides an optocoupler input for decoding unmodulated codes with TTL- or RS485-level for example. A buffered real time clock keeps time and date after power down.

If you are going to use the TCR511PCI in your own applications, please ask for our sample application which shows how to access the card from within your software.

All drivers and the API sample sourcecode 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.

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The device's serial port can be used to update the card's firmware. Additionally it can be connected to the serial port of a computer to use the card as reference time source under operating systems where a serial time string is supported, e.g. by NTP, but no kernel device driver is available.

Characteristics

Status info	3 status LEDs for indication of: detection of a correct code, synchronization of the internal timing and holdover mode
Input signal	Modulated IRIG A/B or AFNOR signal, input insulated by transformer, input impedance 600 ohm (optional 50 ohm) unmodulated (DC level shift) IRIG A/B or AFNOR signal, input insulated by photocoupler
Accuracy free run	±1·10E-6 if the decoder was synchronous for at least 1 h
IRIG Time Code Input	IRIG-A133, A132, A003, A002, B123, B122, B003, B002 and AFNOR NFS 87-500 (other codes on request)
Pulse outputs	Pulses per second (RS232/TTL level) and per minute (TTL level), pulse duration 200 msec
Precision of timebase	±5 µsec referred to IRIG-reference marker
Interface	Single serial RS232 interface
Data format PC interface	[1]Binary, byte serial
Data format of interfaces	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
Statusbyte	Information about holdover mode, synchronization since last reset and the validity of the RTC data.
Electrical connectors	9 pin sub D male connector BNC female connector
Computer interface	33MHz- or 66MHz-PCI BUS (PCI-X) 32 Bit/3.3V or 5V card slot
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	PCI card short
Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%
RoHS-Status of the product	This product is fully RoHS compliant
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Manual

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Links:

[1] http://www.meinberg.de/english/specs/timepack.htm

[2] http://www.meinberg.de/download/docs/manuals/english/tcr511pci.pdf