



Meinberg Radio Clocks

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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 [\[2\]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 continuously 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.

In cooperation with Meinberg, the community developed a driver for **OpenBSD** ([\[3\]www.openbsd.org](#)) which is called mbg.

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 [1] 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: [4] Meinberg Standard-Telegram , SAT, Uni Erlangen (NTP), SPA, NMEA0183 (RMC) or [5] 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 Funktionen 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
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 [6][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: [7][Download \(PDF\)](#)

Links:

- [1] <http://www.meinberg.de/english/products/gpsant.htm>
- [2] <http://www.meinberg.de/english/products/tcr167pci.htm>
- [3] <http://www.openbsd.org>
- [4] <http://www.meinberg.de/english/products/./specs/timestr.htm>
- [5] <http://www.meinberg.de/english/products/./specs/capstr.htm>
- [6] <http://www.meinberg.de/english/products/./specs/gpsopt.htm>
- [7] <http://www.meinberg.de/download/docs/manuals/english/gps170pci.pdf>