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GPS183PEX: GPS-Synchronized Clock for Desktop and Server PCs (PCIe Low-Profile Board)

The GPS183PEX is a 12-channel satellite clock PCI Express card (low-profile) with Meinberg's GPS technology that has been developed from the ground up specifically for time and frequency synchronization purposes. The GPS183PEX is designed to receive signals from the U.S. Global Positioning System (GPS), allowing precise synchronization of your PC

Key Features

- PCI Express Interface
- 2 time trigger inputs
- Progr. Pulses (PPM, PPH, PPS, DCF77-SIM ...)
- Memory Mapped I/O time reads for high access rates
- RS-232 interface
- IRIG-B/AFNOR time code outputs
- Plug and Play
- DCF77 simulation
- Included GPSANTv2 antenna uses downconverter technology to enable long transmission routes of up to 1100 m (1200 yards) -- with Ultraflex H2010 cable
- Configurable time scale (UTC/local, GPS time, TAI)
- Driver software for all popular operating systems

Description

The GPS183PEX features not only a BNC connector for amplitude-modulated timecode (TC AM) output, four status LEDs, but also a 9-pin D-Sub male connector with outputs for time signals generated by the GPS183PEX, including serial time strings and programmable signals (including pulse-per-second and pulse-per-minute signals).

The GPS183PEX is shipped with a standard slot bracket with recesses the antenna BNC connector, the AM timecode output BNC connector and the four status LEDs. This bracket also features an integrated D-Sub 9 male connector for outputting serial time strings and programmable signals.

The GPS183PEX also includes a 'low-profile' slot bracket which can be used to replace the standard bracket for installation of the GPS183PEX in low-profile chassis form factors such as 1U rack servers. When using the low-profile bracket, the signals that would otherwise be output via the D-Sub connector are instead output via a box header mounted on the board itself.

How It WorksThe GPS183PEX PCI Express card is a relatively self-contained clock system, comprising a receiver, an oscillator, an output driver, and a custom FPGA-based processor that handles reference signal decoding, management I/O, and signal generation.

The PCI Express interface serves three primary purposes: communication of management data between the GPS183PEX card and the host PC, communication of time data from the card to the host PC to allow the host PC

Characteristics

Receiver Type	12 channel GPS C/A-code receiver
Status Indicators	**Status indicated by 4 LEDs** * **Fail:** Clock synchronization state * **Ant:** Antenna connection state * **Nav:** GNSS geolocation state * **Init:** Initialization of module firmware and communication with Computer
Type of Antenna	Included [1]GPSANTv2 antenna with innovative downconverter technology that allows transmission routes of up to 300 m using RG58 cable, 700 m using RG213 cable, and 1100 m using H2010 Ultraflex cable
Synchronization Time	Max. 1 minute in normal operating conditions Max. 25 minutes (average 12 minutes) upon first initialization or in the absence of saved satellite data

Pulse Outputs	3 Programmable TTL outputs, per default configured as: Channel 0: Pulse per second (TTL, RS232 level), pulse duration: 200 msec Channel 1: Pulse per minute (TTL), pulse duration: 200 msec Channel 2: DCF77 compatible pulses (TTL level), pulse width: 100/200 msec
Accuracy of Pulse Outputs	Depends on oscillator option: Standard: TCXO
Interface	Single serial RS-232 interface
Serial Time String Output	Baud Rate: 300, 600, 1200, 2400, 4800, 9600, 19200 baud Framing: 7N2, 7E1, 7E2, 8E1, 8N1, 8N2 Time Strings: [2]Meinberg Standard (Default), [3]Meinberg Capture, Meinberg GPS, SAT, NMEA RMC, NMEA GGA, NMEA ZDA, NMEA RMC GGA (RMC followed by GGA), NMEA GGA ZDA (GGA followed by ZDA), Uni Erlangen, Computime, Sysplex 1, SPA, RACAL, ION, ION Blanked, IRIG-J-1x, 6021, Freelance
Status Byte	Information about free-run state, Daylight Saving Time, DST pre-switch announcement, synchronization since last reset, GMT/UTC time, validity of the hardware clock data
DCLS Timecode Output	DCLS, TTL with 50 Ohm load (active high or active low)
AM Timecode Output	AM timecode sine-wave signal: 3Vpp (MARK), 1Vpp (SPACE) with 50 Ohm load
Supported Timecode Formats	**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, year **IRIG B126:** 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year **IRIG B007:** 100 pps, DCLS Signal, no carrier, BCD time-of-year, year, SBS time-of-day **IRIG B127:** 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, 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 Functions segment **C37.118:** Like IEEE1344 - with inverted 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
Time Trigger Inputs	Resolution: 100 ns, triggered by falling TTL edge Time of trigger events readable via API call or serial port
Electrical Connectors	BNC female connector for antenna BNC female connector for AM timecode 9-pin D-Sub male connector

PC Interface	Single-lane (x1) PCI Express (PCIe) Interface PCI Express r1.0a compatible
Backup Battery Type	Upon loss of power supply to card, the hardware clock runs independently using the on-board quartz oscillator. Almanac data remains stored in battery-backed RAM Life time of lithium battery min. 10 years
Board Type	Low-profile card (68.90 mm x 150 mm)
Supported Temperature	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
Supported Humidity	Max. 85 % at 30 °C (86 °F), non-condensing
Warranty	Three-year warranty
Options	Upgrade from **TCXO** oscillator to **OCXO SQ** or **OCXO HQ** for advanced holdover performance Refer to [4]Oscillator Comparison Table for further details
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/products/gps-antenna-converter.htm
[2] https://www.meinbergglobal.com/english/products/specs/timestr.htm
[3] https://www.meinbergglobal.com/english/products/specs/capstr.htm
[4] https://www.meinbergglobal.com/english/specs/gpsopt.htm
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