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GNS183PEX: GPS/GLONASS/Galileo/BeiDou Clock for Desktop and Server PCs (PCIe Low-Profile Board)

The GNS183PEX is a 72-channel satellite receiver & clock based on Meinberg's GNSS technology in a PCI Express low-profile card form factor. This PC clock has been developed from the ground up specifically for time & frequency applications. The GNS183PEX is designed to receiver the U.S. Global Positioning System (GPS), the European Galileo system, the Chinese BeiDou constellation, and the Russian GLONASS system, enabling accurate synchronization of your PC's clock and generation of high-precision, high-accuracy time & frequency signals anywhere in the world.

This PCI Express card is ideal for providing your server or workstation PC with high-accuracy time, allowing any existing PC to operate as a Stratum 1 NTP server - ideal when you lack space for a separate time server in your server rack.

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
- Allows direct transmission routes of up to 150 m when using Ultraflex H2010 coaxial cable
- Configurable time scale (UTC/local, GPS time, TAI)
- Driver software for all popular operating systems
- Possible usage in mobile applications

Description

The GNS183PEX 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 GNS183PEX, including serial time strings and programmable signals (including pulse-per-second and pulse-per-minute signals).

The GNS183PEX is shipped with a standard slot bracket with recesses for the antenna BNC connector, the AM timecode output BNC connector (TC AM) 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 GNS183PEX 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.

Constellation ReceptionThe integrated GNSS receiver requires an external antenna. The GNS183PEX can be configured to process signals from the GPS, Galileo, BeiDou, and GLONASS constellations. These configuration options allow the user to specify if only one of these constellations or a combination of up to three of the systems should be used:

* GPS
* GLONASS
* BeiDou
* GPS + GLONASS
* GPS + BeiDou
* Galileo
* GPS + Galileo
* Galileo + GLONASS
* Galileo + BeiDou
* GPS + Galileo + GLONASS
* GPS + Galileo + BeiDou

How It Works

The GNS183PEX 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	**Combined GPS / Galileo / GLONASS / BeiDou receiver** * Number of channels: 72 * Frequency band: L1 * Standard Precision (GNSS)
Status Indicators	**Status info by 4 LED light indicators (2mm light pipes)** * Init - blue: while the receiver passes through the initialization phase * Nav Solved - green: positioning successfully * Ant Fail - red: antenna faulty or not connected * Fail - red: time is not synchronized
Type of Antenna	[1]GNMANTv2: Dual-Band Multi-Frequency Antenna for GPS, Galileo, GLONASS and BeiDou reception
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, RS-232 level), pulse duration: 200 msec Channel 1: Pulse per minute (TTL), pulse duration: 200 msec Channel 2: DCF77 compatible pulses (TTL), 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
Electrical Connectors	SMA connector for antenna BNC female connector for modulated timecode 9 pin sub D male connector (with standard bracket)
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/gnss-multi-band-antenna.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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