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GNS181PEX: Low Profile GPS / GLONASS / Galileo / BeiDou Clock (PCI Express)

The board GNS181PEX is designed as a low profile board for computers with PCI Express interface. The rear slot cover integrates the SMA antenna connector, a BNC connector for modulated time codes, a 9pin D-SUB male connector and four status LEDs (2mm light pipes). With this standard height bracket you can use the D-SUB connector for I/O signals like RS-232 - PPS and PPM and you can use this interface for firmware updates.

The GNS181PEX is delivered including a low profile bracket. You can mount this part instead of the standard bracket, to run the GNS181PEX in computers with smaller housing (e.g. 1U server).

The integrated GNSS receiver requires an external antenna. It can be configured to use GPS, Galileo, Beidou and GLONASS. The configuration allows the user to select one of these sources to be used exclusively or a combination with up to three of these sources:

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



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

Important Note

This product is no longer available. We will of course continue to provide support for units that have already been purchased and are still in use. Please contact our [1] Sales Team for further details.

This product has been discontinued and has been replaced with: [2]

Key Features

- PCI Express Interface
- 2 time trigger inputs
- Programmable Pulse Outputs Frequency Synthesizer and Time Code Mode
- 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
- Including 40 dB Multi GNSS L1 antenna, 20 m (65 ft) pre-assembled Belden H155 cable



Description

This PCI Express slot card is the best choice for adding a highly accurate time base to your servers or workstations. It can be used as a stratum 0 reference time source for NTP and transforms any machine into a Stratum 1 NTP server without consuming additional physical space in your server room.

The GNS181PEX comes with a truckload of features to enable software developers to overcome the timing limitations of COTS operating systems like Linux or Windows. The powerful and highly functional Meinberg API (Application Programming Interface) delivers an easy to use and portable way of accessing all Meinberg bus level timing devices, including ISA, PCI, PCI-X, PCI Express and USB time synchronization products.

Legacy interfaces like IRIG, 1PPS or serial time strings can be used to connect other equipment to the PCIe slot card and transfer the time base over dedicated cable connections to systems which cannot be synchronized via NTP or other network protocols.

The new Memory Mapped Access feature offers a fast, simple and efficient way of reading the current time with high precision.

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.

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.

Satellite receiver for mobile applications:

The GNSS timing board is designed for operating in mobile environments like cars, trains or airplanes. An optimized active GPS antenna RV-76 with 10 meters coax cable RG-58 for operation in mobile environment is still available.



Characteristics

Receiver Type	Combined GPS / Galileo / GLONASS / BeiDou receiver	
	* Number of channels: 72	
	* Frequency band: L1	
	* Standard Precision (GNSS)	
 Navigation Features	The satellite receiver can determine its position under the following conditions:	
Navigation Features	The sateline receiver can determine he position ander the following conditions.	
	* an acceleration of up to 5G	
	* a speed of up to 310 m/s	
	* an altitude of up to 18,000 meters	
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	Included 40 dB L1 [3]Multi-GNSS antenna ([4]Data Sheet)	
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	
Frequency Outputs	Frequency output 10 MHz, TTL level	
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	Baudrate: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud Data format: 7N2, 7E1, 7E2, 8E1, 8N1, 8N2 Time telegram: [5]Meinberg Standard-Telegram, SAT, Uni Erlangen (NTP), SPA, NMEA0183 (RMC) or [6]capture-telegramm
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	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 % (non-condensing) at 40 °C
Warranty	Three-year warranty
Options	Oscillator upgrade: OCXO-LQ, -SQ, -MQ or -HQ (instead of TCXO) for extended
	Holdover capabilities
	(see [7]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: [8] Download (PDF)

Links:

- [1] mailto:sales@meinberg.de
- [2] https://www.meinbergglobal.com/english/archive/gns183pex.htm
- [3] https://www.meinbergglobal.com/english/archive/gps-gln-l1-antenna.htm
- [4] https://www.meinbergglobal.com/english/products/
- [5] https://www.meinbergglobal.com/english/specs/timestr.htm
- [6] https://www.meinbergglobal.com/english/specs/capstr.htm
- [7] https://www.meinbergglobal.com/english/specs/gpsopt.htm
- [8] https://www.meinbergglobal.com/download/docs/manuals/english/gns181pex.pdf