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GPS-PCI 2



Model GPS-PCI 2

Multi-Functional GPS Synchronized, Time and Frequency PCI Plug-in Card

- 1 microsecond accuracy to UTC
- GPS, IRIG-A or B or 1 PPS input
- PCI local bus operation
- IRIG-B and 1 PPS outputs
- 1 PPS to 1 MPPS rate synthesizer output
- 1, 5, 10 MPPS rate generator output
- External event input/interrupt
- Time compare input/interrupt
- Real time clock backup
- Windows control panel interface software
- Optional software development kit and drivers

The GPS-PCI 2 provides very precise time to the bus of a PCI-compatible host computer. Time is derived from the GPS satellite system with an accuracy of 1 microsecond to UTC. The GPS-PCI 2 is an ideal master clock solution for synchronizing one or more computers to the UTC time reference. Applications include time tagging processed data, test data reduction, and range instrument synchronization.

Time can also be derived from an IRIG-A or B time code input or the internal oscillator in the stand-alone generator mode. Synchronization to an external 1 PPS is also possible. The frequency of the internal oscillator is precisely disciplined to that of the external synchronization input.

Time, microseconds through years, and status information and position are supplied on demand over the 32-bit PCI bus. In addition to time and status, the GPS-PCI 2 provides a 1 PPS pulse rate, a programmable time-compare register, a programmable frequency pulse rate, an external event time capture, and an IRIG-B serial time code output.

Rear panel BNC connectors are used for the IRIG code input/output and the antenna input for the GPS. A rear panel mounted multipin connector contains the 1 PPS pulse rate output, the programmable pulse rate output, the external event input signal and the input/output connections for the RS-422 versions of the input/output IRIG time code. You can also configure the analog input code with various input impedance choices.

Information provided over the PCI bus includes time, status, antenna position and the time of occurrence of the external event. Interrupts generated by the programmable rate generator, the rate synthesizer, the occurrence of an external event input, and the time compare occurrence are also provided. Depending upon the operating mode, you can program the hours offset from UTC, leap second, year and daylight savings time. Year and leap second insertion are automatically provided when GPS mode is specified. An on-board, capacitor-powered clock maintains time during a power failure condition for up to 48 hours.

A TrueTime software development kit, SDK for PCI, is optionally available for Windows 95/98/NT/2000. The SDK includes a Windows NT/2000 kernel mode device driver, a Windows 95/98 VxD device driver, a DLL for accessing either of the drivers, and code examples. This TrueTime SDK is a tremendous time-saving tool for quickly integrating all of the features of the GPS-PCI 2 into an application program. Complete access to timing information, status, and control is easily available using the SDK. See the TrueTime SDK for PCI data sheet for complete specifications.

TRUETIME

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Specifications: GPS-PCI 2

GPS Synchronization Mode

Timing Accuracy: 1 microsecond to UTC (with SA)

Position Accuracy: 25 meters SEP (without SA)

Receiver Input: 1575 MHz L1 C/A code

Tracking: 8 parallel channels

Acquisition Time: Warm start (has ephemeris data and position) <3 minutes. Cold start <20 minutes.

UTC to Local Offset: User selectable in hours and minutes

Daylight Savings: User selectable, U.S. DST only.

Leap Second: User programmable for day of occurrence, automatic in GPS mode.

Antenna: L1 GPS, 40 dB gain. RG-59/U cable, 50' (15 m) supplied; maximum cable length 200' (61 m). For longer cable runs, see Options.

Synchronized Generator Mode

Analog Input Code: IRIG-A or B

Ratio: 2:1 to 5:1
Amplitude: 0.5 to 10 Vpp
Impedance: 50-600-10k ohms, selectable
Connector: BNC
Timing Accuracy: 3 microseconds

RS-422 Input Code: IRIG-A or B

Timing Accuracy: 1 microsecond
Connector: 9 pin D subminiature, selectable to BNC

Error Bypass: Factory set to three frames

External 1 PPS*: 1 microsecond timing accuracy (uses external event input port)

Stand-Alone Generator Mode

Allows the user to preset, start and stop the GPS-PCI 2 over the PCI bus.

General Specifications

IRIG-B Serial Code Output (Analog):

Amplitude: 3 Vpp into 600 ohms
Ratio: 3:1
Connector: BNC

IRIG-B Serial Code Output (RS-422):

Amplitude: RS-422 levels
Input Termination: Selectable, 120 ohms or none
Connector: 9 pin D subminiature, selectable to BNC

Oscillator:

Accuracy: 5×10^{-8} (when disciplined to IRIG code or GPS)
Stability: 2.5 PPM, 0˚C to +50˚C, unlocked

1 PPS Pulse Rate Output:

Amplitude: 0–5 Vdc**
Timing: Positive edge on time
Duty Cycle: 50%
Connector: 9 pin D subminiature, selectable to BNC

Programmable Pulse Rate Generator Output:

Rates: 1 PPS, 10 PPS, 100 PPS, 1 kPPS, 10 kPPS, 100 kPPS, 1 MPPS, 5MPPS, 10 MPPS
Outputs: Interrupt and pulse
Amplitude: 0–5 Vdc**
Connector: 9 pin D subminiature, selectable to BNC

Pulse Rate Synthesizer Output:

Rates: 1 PPS to 1 MPPS, step size 1 PPS
Outputs: Interrupt and pulse
Amplitude: 0–5 Vdc**
Connector: 9 pin D subminiature, selectable to BNC

External Event Time Capture:

Resolution: 100's ns–years
Output: Interrupt and time/event capture
Event Input: Selectable positive or negative edge of 2–5 Vdc pulse
Impedance: Approximately 2k ohms
Connector: 9 pin D subminiature

Time Compare Output:

Resolution: 100's ns–years
Outputs: Interrupt and pulse at compare time
Amplitude: 5 Vdc** on compare
Connector: 9 pin D subminiature

Mechanical/Environmental

Receiver:

Power: <5 W
Size: PCI 5 V short card
Operating Temperature: 0˚C to +50˚C
Storage Temperature: -17˚C to +85˚C
Humidity: To 95%, noncondensing

Antenna:

Size: 3" Dia. x 3" H (7.62 cm x 7.62 cm)
Weight: 0.55 lb. (0.25 kg)
Operating Temperature: -40°C to +70°C
Storage Temperature: -55°C to +85°C
Humidity: 100%, condensing

Certification: FCC, CE, UR

Real Time Clock: On-board, capacitor-powered clock maintains time during a power fail condition for up to 48 hours.

Software

The GPS-PCI 2 includes the TrueTime PCI_Panel application program for Windows 95/98/NT/2000. Using this program you can review the GPS-PCI 2 card status and adjust board configuration and output parameters. The program can also operate as a background task keeping the host computer clock synchronized the GPS-PCI 2 card.

Options

- *TrueTime Software Development Kit (SDK) for PCI for Windows 95/98/NT/2000*
- *GPS Antenna Down/Up Converter for long cable runs up to 1500' (457 m)*
- *Transformer Coupled Input Code (single-ended or balanced)*
- *Transformer Coupled Output Code (balanced)*

* When external 1 PPS is used as sync input, the external event is not available.
** 5 Vdc outputs have ACMOS levels.

Specifications subject to change without notice.

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