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WinSystems®

PC/104 MODULE

PCM-GPS
GPS Receiver with Optional Cellular Modem

FEATURES

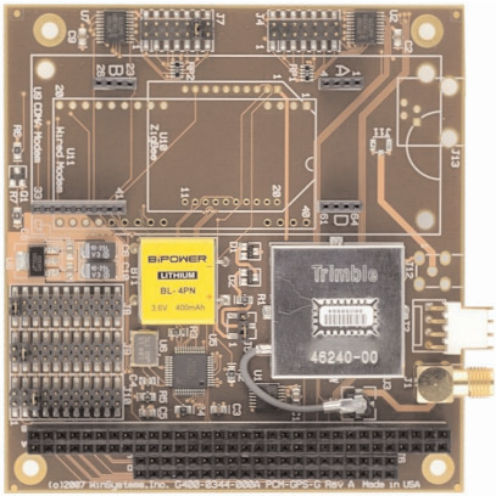
- PC/104-compatible GPS receiver board with optional cellular modem supported
- 12 channel simultaneous operation
- Dual sensitivity modes with automatic switching
- Lassen iQ GPS receiver module provides position, velocity, and time (PVT) data
- Supports TSIP, TAIP, and NMEA 0183 protocols
- Supports pulse output for accurate time standard
- External powered antenna connection via a standard SMA connector
- Antenna open and short circuit detection and protection
- Optional Cellular wireless support
  - Supports both GSM/GPRS and CDMA
  - Socket support Multitech wireless module
  - Recognizes the standard AT commands
  - Alarm management, phone book management, and Short Message Services (SMS)
- Programmable address and interrupt settings
- For use in transportation, utilities, security, and remote monitoring applications
- Battery on board for warm and hot start
- +5 volt only operation
- Small size: 3.6" x 3.8" (90 mm x 96 mm)
- Operating temperature: -40°C to +85°C

The PCM-GPS-G-0 is dual function PC/104-compatible module. It supports both a GPS receiver and a socket-based cellular modem. This board is ideal for both fixed and mobile applications that require navigation, tracking, data logging, and timing and/or communications functions. The PCM-GPS-G-0 will operate over the full industrial temperature range of -40° to +85° Centigrade

FUNCTIONAL CAPABILITY

GPS - This board uses a Trimble® Lassen® iQ GPS module. The module is shielded by a metal enclosure for protection. It is a continuous tracking, 12-channel GPS receiver operating in the L1 (1575.42 MHz) frequency range. This is a very low power GPS solution designed to provide complete position, velocity, and time (PVT) data using the most popular standard protocols: TSIP (Trimble Standard Interface Protocol), TAIP (Trimble ASCII Interface Protocol), and NMEA 0183. These protocols are compatible with most commercial navigation or map software packages.

The Lassen iQ module features two GPS signal sensitivity modes: Standard and Enhanced. With Enhanced mode enable, the module automatically switches to higher sensitivity when satellite signals are weak.



Extended Temperature

RoHS compliant

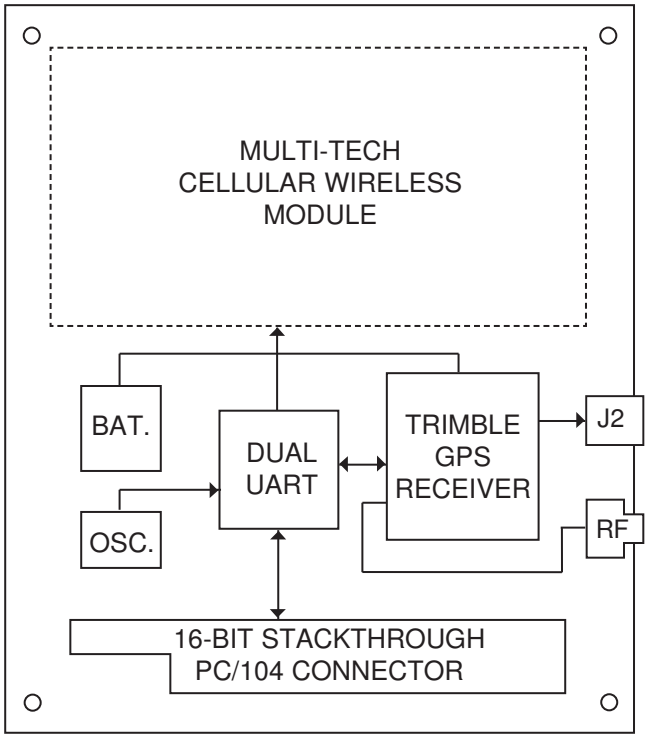
Acquisition - For autonomous operation in the Standard sensitivity mode, reacquisition is typically less than two seconds. For a hot start it is less than 13 seconds, a warm start less than 42 seconds, and a cold start less than 86 seconds (90%). A cold start requires no initialization. A warm start implies that last position, time, and almanac are saved in the battery. Hot start implies ephemeris was also saved.

Accuracy - The horizontal accuracy is less than 8 meters (90%), altitude less than 16 meters (90%), and velocity 0.06m/sec. Pulse Per Second (PPS) is ±50 nanoseconds.

PPS Interface - The PPS output from the GPS module is buffered and wired to J2. Both a standard and inverted output is available at the connector. Also the PPS output is wired to a jumper header so that it can generate an interrupt on the PC/104 Bus IRQ input lines.

Antenna - WinSystems offers an optional embedded, ultra-compact, extended temperature, 3.3V active GPS antenna called the ANTENNA-MAGNETIC-G. It requires 13mA (max) current @ 3.3Vdc. It is very lightweight (20g typical) and has a cable length of 5 meters with a magnetic base for easy mounting. The cable is terminated with a SMA connector. The antenna is RoHS compliant.

The PCM-GPS-G-0's antenna input has open circuit and short circuit detection and protection.



PCM-GPS BLOCK DIAGRAM

Battery - Battery backup is included with an onboard 450 mAH battery to store data needed for warm and hot starts. The PCM-GPS-G-0 will also accept a remote battery via the onboard J2 connector.

Optional Cellular Modem - The board can be populated with a Multitech cellular wireless modem. This wireless module provides the controller, RF transceiver, and antenna interface in one small module. Designed for global use, they offer standards-based multi-band GSM/GPRS Class 10 and CDMA2000 1xRTT performance. It recognizes the AT command set for easy programming.

The PCM-GPS-G-0 is shipped with an empty socket so that a user can install the cellular modem and conduct the final system installation and activation at their site. Please note that the cellular modem's operational temperature range is typically -20° to +50° Centigrade.

PC/104 Interface - The PCM-GPS-G-0 is I/O mapped and requires 8 contiguous port addresses jumper selectable on any even 8-port boundary. Also interrupts are supported for the GPS data, cellular modem data, and GPS PPS timing functions.

Serial Controller - A 16C552-compatible UART converts the PC/104 signals into a serial asynchronous data stream needed for both the GPS receiver and optional cellular modem. Each channel has a 16 byte transmit and receive FIFO. This increases the service interval giving the external CPU additional time for other applications and reducing the overall UART interrupt servicing time. It will work with 7- or 8-bit characters and will handle 1 or 2 stop bits, even, odd, or no parity, false start bit detection, and automatic break detection.

Interrupts - Interrupts can be generated by each UART channel or the PPS output. All of them are routed to a separate jumper block on the board. The PCM-GPS-G-0 can select the IRQ line assignment on the PC/104 Bus on channels 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, or 15.

SPECIFICATIONS

Electrical

PC/104 Bus:	16-bit, stackthrough
Receiver:	L1 (1575.42) frequency, C/A code, 12-channel continuous tracking receiver
Protocol:	TSIP, TAIP, and NMEA 0183 v 3.0
Power:	+5V @ 50mA typical. GPS module only, add 20mA typical for Trimble magnetic mount antenna

Mechanical

Dimensions:	3.6" x 3.8" (90 mm x 96 mm)
Weight:	2.5 oz. (70.87 gm.)

Connectors

GPS:	50 ohm SMA with power for antenna
PC/104:	64-pin, 0.100" (32-pin double row) 40-pin, 0.100" (20-pin double row)
Jumpers:	0.020" square posts on 2 mm centers

Environmental

Operating Temperature: -40° to +85° Celsius
(without optional cellular modem installed)
Relative Humidity: 5% to 95% non-condensing

ORDERING INFORMATION

PCM-GPS-G-0	GPS receiver module without antenna has socket for cellular wireless modem
ANTENNA-MAGNETIC-1	Powered GPS antenna with magnetic mount attached to a 5 meter cable terminated in an SMA connector

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