

MSI PC/104 Embedded PC Series

MSI-P602 Trimble Lassen iQ GPS & Digital I/O Card

FEATURES

- ◆ Supports NMEA 0183, TSIP, TAIP, DGPS protocols.
- ◆ Aided GPS through TSIP.
- ◆ 12-channel simultaneous operation.
- ◆ Dual sensitivity modes with automatic switching.
- ◆ Antenna open and short circuit detection and protection.
- ◆ Full-duplex serial port for navigation and control.
- ◆ Differential GPS capability through secondary serial port.
- ◆ Active antenna with 5 meter (16.5 ft.) cable.
- ◆ TTL digital I/O port with 4 inputs and 4 outputs.
- ◆ Jumper selectable address and interrupt options.
- ◆ Operating temperature range -40° C to 85° C.
- ◆ One-year warranty from date of shipment.

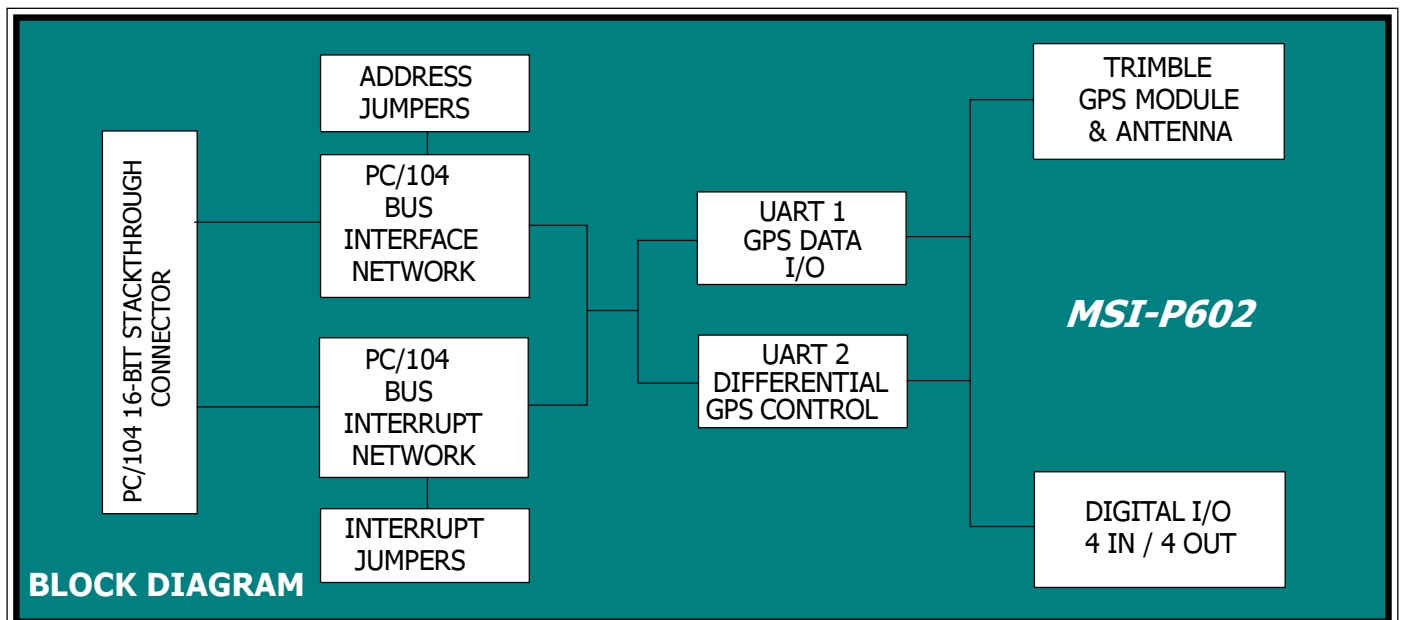
DESCRIPTION

The MSI-P602 is a low cost, high performance global positioning system which uses the Trimble Lassen iQ module. It provides 12-channel GPS functionality that is fully compatible with Trimble's popular Lassen SQ module using Trimble's FirstGPS® architecture which delivers complete position, velocity and time (PVT) solutions for the host application. It features two



GPS signal sensitivity modes: Standard and Enhanced. With Enhanced mode enabled, the module automatically switches to higher sensitivity when satellite signals are weak. The module also supports TSIP download of critical startup information for fast acquisition. This aided GPS (A-GPS) startup provides hot start performance for each power-up. The module supports the four most popular protocols: DGPS (RTCM), TSIP (Trimble Standard Interface Protocol), TAIP (Trimble ASCII Interface Protocol) and NMEA 0183 with an MTBF (mean time

(cont.)



between failures) figure of 60 years.

The card provides two serial ports for processing the GPS data. The primary port gives TSIP input and output data at a default BAUD rate of 9600. This port is also selectable for the TAIP protocol. The secondary port provides DGPS (RTCM) input and NMEA output at a default BAUD rate of 4800. Software selectable NMEA protocols using the secondary serial port are GGA (default), GLL, GSA, GSV, RMC, VTG (default) and ZDA. Baud rates are selectable from 2400 to 38,400. The DGPS protocol is RTCM SC-104.

The serial ports are standard IBM PC compatible UARTs. The primary port is jumper selectable for COM1 or COM3 and an optional 16-bit offset address. Similarly, the secondary port is selectable at COM2 or COM4 and an optional 16-bit offset address.

A time mark of 1 PPS is available as an interrupt or as input into modem status line DCD of the secondary UART for synchronizing events. The primary and secondary UART interrupts are also provided for allowing interrupt processing of GPS data. Interrupts are jumper selectable for IRQ3 thru IRQ7 and IRQ9.

Four TTL level digital inputs are provided by status lines CTS and DSR of the primary and secondary UARTs. Four TTL level outputs are provided by OUT1 and OUT2 of these UARTs.

The card is supplied with an active antenna having a 5 meter (16.5 ft.) cable and a spacer kit. A sample test program is supplied that illustrates programming of the UARTs for the various protocols and data transfer rates. Operates from -40° to 85° C.

SPECIFICATIONS

PC/104	8-bit, stackthrough
GPS Receiver	
Frequency	L1, 1575.42 MHz
C/A Code	
Channels	12, continuous tracking

GPS Accuracy	
Horizontal	< 5 meters (50%), < 8 meters (90%)
Altitude	< 10 meters (50%), < 16 meters (90%)
Velocity	0.06 meters/sec
PPS (static)	+/- 50 nanoseconds

GPS Acquisition Rate

Autonomous Operation in Standard Sensitivity Mode	
Re-acquisition	< 2 seconds (90%)
Hot Start	< 10 seconds (50%), < 13 seconds (90%)
Warm Start	< 38 seconds (50%), < 42 seconds (90%)
Cold Start	< 50 seconds (50%), < 84 seconds (90%)

Cold Start requires no initialization. Warm start implies last position, time and almanac are saved by backup power. Hot start implies ephemeris also saved.

GPS Dynamic Condition

Altitude	18,000 m (60,000 ft.) max
Velocity	515 m/sec (1000 knots) max

Either limit may be exceeded, but not both.

GPS Protocols

TSIP	
TAIP	
NMEA 0183 v3.0	GGA, VTG, GLL, ZDA, GSA, GSV and RMC
RTCM SC-104	

GPS Antenna

Active	with 5m (16.5 ft) cable
Model	Compact Magnetic Mount with SMA connector

Digital I/O Port

4 Input	TTL level (Inverted)
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4 Output TTL level (Inverted)

Serial Ports

Primary TSIP bi-directional
(jumper selectable as COM1, COM3 or offset)

Secondary NMEA 0183 Output
 RTCM SC-104 V2.1 Input
(jumper selectable as COM2, COM4 or offset)

Interrupts

Sources 1 PPS, primary and second-
 ary UARTs using tri-state
 drivers

IRQs IRQ3 thru IRQ7 and
 IRQ9

Option Jumpers .025" square posts, 0.1" grid

Digital I/O Connector 3M 30316-5002

Electrical & Environmental

+5V @ 70 mA typical, continuous mode

+5V @ 45 mA typical, power save mode

-40° to 80° C



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