Specifications

This TPS product is a 50-channel GPS receiver integrated with an internal computer and Windows Mobile6.0 operating system with touch screen, a digital camera, a Bluetooth® wireless technology module, celler module(option),an electronic compass, and an SD card slot. The portable design and product integration allows this device to be a fully-functional, productive tool at any job.

Performance specifications assume a minimum of 6 GPS satellites above 15 degrees in elevation and adherence to the procedures recommended in this manual.

In areas of high multipath, during periods of large PDOP, and during periods of increased ionospheric activity, performance may degrade.

Use robust checking procedures in areas of extreme multipath or under dense foliage.

GRS Specifications

The following sections provide specifications for the GRS and its internal components.

General Details

GRS General Specifications table lists the receiver's general specifications.

Table B-1. GRS General Specifications

Physical	
Enclosure	ABS
Color	Topcon Yellow and Topcon Grey
Dimensions	D: 213 x W: 93 x H: 46mm
Weight	0.77 kg
Antenna	Internal
Battery	Internal, rechargeable/replaceable Backup, replaceable
Controller	Integrated; uses Windows Mobile 6.0 operating system

Keys (buttons)	Three keys:
	    Power – On/Off
	    ENT – applies settings, numerical values, and records points; shows
	      Windows Start menu
	    ESC – exits from the current screen or function

LEDs	Three LEDs:
	    Bluetooth – indicates Bluetooth wireless technology connection status
	    Power – indicates charge level
	    Cell Phone modem-connection status

Environment	
Operating temperature	-20 C° to +50 C° with batteries -10 C° to +50 C° using camera
Storage temperature	-30 C° to +60 C° with batteries
Waterproof	IP66 at closing all connector caps.
Power	
Internal battery	Li-ion, 2500 mAh, 7.4 V ; repeatable

Operating time (Back light OFF, L1 GPS mode)	No less than 3.5 hours with GPS and cell phone use. No less than 5 hours with GPS use. No less than 8 hours without GPS and cell phone. Supply from Holder (without Radio modem operates) No less than 10 hours with GPS and cell phone use.
External power	1 port Contact Pin: From the battery Holder.
Input voltage	12 V DC (for charge battery)
Consumption	5.3W while in simultaneous use of WM, GPS and GSM
Battery charger	Connect the AC adaptor to charge the power port. Available run charge when connected to a portable external power source.
Charging time	5 hours for full charge. (Use standard accessory AC/DC adaptor)
On-board	Backup battery for timekeeping; replaceable button-type battery; 8–10 years normal operation
Connectors and Slot	
Serial port	1 port for communication with the GMS+ board (port A); small connector
USB port	1 port for Windows CE; type B mini ver 1.1; connect to PC using ActiveSync
External power port	1 port; DC Jack type A; for connecting the AC adaptor or external battery
External antenna connector	Lemo FLS.00.250 connector 3VDC output to external antenna
SD card slot	1 slot for memory storage and I/O
Contact Pins (To Holder and Cable)	These are contact 12 pins on the back of GRS. TX, RX, RTS, CTS (GPS port-D), PPS, EVENT, LoBAT, HolderDetc, GMSXDetec, PW, GND, Spare GPS board Port-D: 232C level Bound rate: 460800, 230400, 115200(Default), 57600, 38400, 19200, 9600, 4800, 2400, 1200, 600, 300 Length: 7,8(Default) Stop bit: 1(Default), 2 Parity: None (Default), Odd, Even Power Pin (For only Radio/Battery holder.)

Communication	
Serial port	Port A of GPS+ board Baud rate = 460800, 230400, 115200, 2400, 1200, 600, 300 Flow control = RTC/CTS Length= 7, 8 (default) Stop bit= 1 (default, 2 Parity= None (default), Odd, Even
Bluetooth	Version: Bluetooth standard 1.2; Class 2; Profile: SPP, DUP Multiple connection capability (4 ports)
Wireless LAN	802.11b/g
USB	Version 1.1

Windows Mobile6.0	
Processor	Intel PXA320
Processor speed	806MHz
Operating System	Microsoft Windows Mobile 6.0

Digital Camera	
Pixel	2.0M (UXGA...1600x1200)
Sensor element	1/4 inches color C-MOS sensor

Compass	
Type	Magnet resistive sensor
Accuracy	±10 divisions

LCD Display	
Size	640x480 VGA (portrait) 3.7 inch color TFT transmissive type
Backlight	LED
Touch screen	Resistive touch screen; passive

Audio	

Speaker	Mono
Microphone	Mono
Memory	
Internal memory	ＤＤＲ２ SDRAM 256MB
External memory	Via SD card slot

GPS Details

GPS Board Specifications lists the GPS board's general specifications.

Table B-2. GPS Board Specifications

Tracking Specifications	
Tracked Signals	GPS/GLONASS L1/L2 C/A Code & Carrier, GPS L2C SBAS (WAAS/EGNOS/MSAS)
Receiver Type	G - GPS L1 GD – GPS L1/L2 GGD - GPS/GLONASS L1/L2
Standard Channels	72 channels
Cold Start Warm Start Reacquisition	< 30 sec < 10 sec < 1 sec
Survey Accuracy	
Static	L1 (1Sigma) H: 3mm + 0.8ppm (x baseline length) V: 4mm + 1.0ppm (x baseline length) L1+L2: H: 3mm + 0.5ppm (x baseline length) V: 5mm + 0.5ppm (x baseline length)
PP Kinematic	L1: (1Sigma) H: 10mm + 1ppm (x baseline length) V: 15mm + 1ppm (x baseline length)
DGPS	Real time/Post processing: 0.5m (1Sigma)
RTK	(1Sigma) H: 10mm + 1ppm V: 15mm + 1ppm

Other (GPS)	
Real time data format	RTCM 2.3, 3.0; CMR, CMR+; TPS
NMEA	NMEA 2.2, 2.3, 3.0
Output rate	Up to 10Hz

Connector Specifications

The GRS has one antenna connector for radio transmission/reception and three port connectors for power and data upload/download.

Serial Connector

The serial connector (Serial RS23) is a sealed receptacle, 5 pin, port. This connector is configured as port A of the internal GPS receiver.
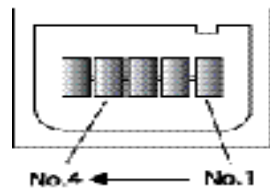


Figure B-1. Serial RS232 Connector

Serial Pin Specifications   gives the serial port's pin specifications.

Table B-3. Serial Pin Specifications

Number	Signal Name	Dir	Details
1	TXD	O	Clear to send
2	RXD	I	Request to send
3	GND	-	Signal ground
4	GND	-	Signal ground
5			Not used

USB Connector

Rimmed in yellow, the USB connector is a sealed receptacle, 4 pin TPS cable connector (USB
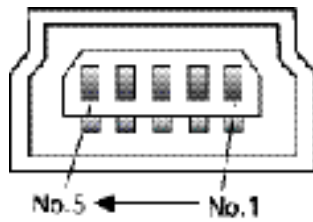
Connector).

Figure B-2. USB Connector for GGD Options

USB Specifications   gives the USB connector specifications.

Table B-4. USB Specifications

Number	Signal Name	Dir	Details
1	VDD	P	Bus power input
2	V-	I/O	Data minus
3	V+	I/O	Data plus
4			Not used
	GND	-	Ground