

# GBX-PRO

## High Accuracy GPS/Beacon Receiver

### FEATURES

- Real-time sub-meter accuracy
- 12-Channel all-in-view GPS satellite tracking
- 5 Hz NMEA position update rates
- Dual channel beacon receiver
- State-of-the-art digital architecture
- 2-line by 16-character LCD display and 3-switch keypad
- GPS and beacon status information
- Fast satellite and beacon acquisition
- 1 PPS timing signal
- External RTCM input
- Global beacon listing
- Wide input voltage range
- Low power consumption
- Automatic and manual beacon modes
- Single "Smart" port for GPS and beacon receiver configuration



Combination GPS/Beacon Receiver

### Real-Time, Performance

The CSI GBX-PRO differential GPS receiver combines the performance of CSI's third generation digital beacon receiver technology with the proven Ashtech G-12 GPS Board™ in a single high performance package.

The GBX-PRO utilizes free GPS satellite and 300 kHz beacon signals to calculate differentially corrected 3D positions with a horizontal accuracy of less than one meter (95%). The internal beacon receiver supplies differential GPS corrections to the GPS engine in the RTCM SC-104 format. Various authorities around the world broadcast free differential correction information on radiobeacon transmissions that meet the stringent integrity and reliability requirements mandated by the International Association of Light House Authorities (IALA).

The GBX-PRO also provides the facility for correction input from an external RTCM source. The GBX includes a second differential input port so that external RTCM input does not interfere with bi-directional communications on the main serial port.

### Ease of Operation

The GBX-PRO receiver is designed with ease of operation in mind, incorporating a 2-line by 16-character LCD display and 3-switch keypad for configuration and operation of the internal beacon and GPS receivers. A "Smart" data port on the back panel provides access to both internal devices, through the same serial connector.

CSI's MGL-3 Combination GPS/Beacon Loop antenna simplifies installation by combining an L1 GPS patch antenna, ground plane, and an H-field beacon Loop antenna in one package. For added flexibility, you may use separate GPS and beacon antennas in conjunction with CSI's External Signal Combiner which converts two antenna outputs into a single input to the GBX-PRO.

### Advanced Beacon Receiver Technology

Advanced digital signal processing techniques are the mainstay of CSI's beacon receiver products. The GBX-PRO will operate reliably in the noisy environments characteristic of many DGPS installations.

The GBX-PRO is able to operate in automatic or manual beacon tune modes. In automatic mode, the two channels of the internal beacon receiver cooperatively construct and maintain a table composed of available radiobeacons in your area. The receiver automatically locks to the station with the highest quality signal.

### Configuration Software

CSI offers custom Windows 95® software for GPS and beacon receiver configuration and monitoring of receiver status. Data logging capability and a terminal interface are also included.

### Warranty

CSI is committed to supporting its products and offers a one-year warranty on parts and labor.

Contact us to discover how the GBX-PRO can meet the positioning requirements of your application.



# GBX-PRO – High Accuracy GPS/Beacon Receiver

## Optional GPS Features

- 10 Hz and 20 Hz position update rates
- R.A.I.M.
- Strobe Correlator™
- Geoidal height and magnetic declination
- Base station

## GPS Receiver Specifications

<b>Channels:</b>	12-Channel L1 C/A Code, carrier smoothed
<b>Horizontal Diff. Accuracy:</b>	< 1 m (95% confidence)
<b>Differential Input:</b>	RTCM SC-104
<b>Input/Output Messages:</b>	NMEA 0183
<b>Position Update Rate:</b>	up to 5 Hz
<b>Raw Data Output Rate:</b>	up to 2 Hz (code and carrier)
•	Please contact CSI for detailed Ashtech G-12 GPS™ specifications

## Beacon Receiver Specifications

<b>Channels:</b>	2 independent channels
<b>Frequency Range:</b>	283.5 to 325.0 kHz
<b>Channel Spacing:</b>	500 Hz
<b>MSK Bit Rates:</b>	50, 100, and 200 bps
<b>Cold Start Time:</b>	< 1 minute
<b>Warm Start Time:</b>	< 2 seconds
<b>Demodulation:</b>	Minimum shift keying
<b>Sensitivity:</b>	2.5 µV/m for 10 dB SNR
<b>Dynamic Range:</b>	100 dB
<b>Frequency Offset:</b>	± 5 Hz
<b>Adjacent Channel Rejection:</b>	60 dB @ $f_0 \pm 500$ Hz

## GBX-PRO Communications

<b>Interface Level:</b>	RS-232C
<b>Baud Rates:</b>	2400, 4800, 9600
<b>Correction Output Protocol:</b>	RTCM SC-104
<b>Input/Status Protocol:</b>	NMEA 0183
<b>Timing:</b>	1 PPS ± 190 ns

## GBX-PRO Environmental Specifications

<b>Operating Temperature:</b>	-30°C to +70°C
<b>Storage Temperature:</b>	-40°C to +80°C
<b>Humidity:</b>	95% non-condensing
<b>EMC:</b>	EN 60945, EN 50081-1, EN 50082-1 FCC: Part 15, sub-part J, class A digital device

## GBX-PRO Power Specifications

<b>Input Voltage:</b>	9 - 40 VDC
<b>Nominal Power:</b>	4.8 W
<b>Antenna Voltage Output:</b>	10 VDC (5 VDC optional)

## GBX-PRO Mechanical Specifications

<b>Dimensions:</b>	163 mm L x 125 mm W x 51 mm H (6.4" L x 4.9" W x 2.0" H)
<b>Weight:</b>	1.75 lb
<b>Display:</b>	2-line by 16-character LCD
<b>Keypad:</b>	3-key switch membrane
<b>Power Connector:</b>	2-pin circular locking
<b>Data Connector:</b>	DB9-S
<b>Antenna Connector:</b>	BNC-S

## GBX-PRO Operating Modes

<b>GBX-3 Mode (Default)</b>	GBX outputs GPS NMEA messages (Default Mode)
<b>MBX-3 Mode:</b>	GBX outputs RTCM for use by an external GPS receiver
<b>GBX-E Mode:</b>	Correction input from an external RTCM source

## Pin-Out, RS-232C

DB9 Pin #	Description
2	TXA, GBX NMEA 0183 output
3	RXA, GBX NMEA 0183 input
5	Signal return
8	RXB, external RTCM input
9	1 PPS output (TTL logic level, 75Ω)

## GBX-PRO Accessories

<b>Antenna:</b>	MGL-3
<b>Power Cables:</b>	Various
<b>Antenna Cables:</b>	Various
<b>Data Cables:</b>	Various
<b>CSI GPS Command Center:</b>	MS Windows 95® GPS control software
<b>CSI Beacon Command Center:</b>	MS Windows 95® beacon control software

## MGL-3 Combination Antenna

<b>Beacon Frequency Range:</b>	283.5 to 325.0 kHz
<b>Beacon LNA Gain:</b>	34 dB
<b>GPS Frequency Range:</b>	L1 (1575 MHz)
<b>GPS LNA Gain:</b>	30 dB
<b>Dimensions:</b>	128 mm square x 84 mm H (5.1" square x 3.3" H)
<b>Weight:</b>	0.45 kg (1.0 lb)
<b>Antenna Connector:</b>	TNC-S
<b>Enclosure:</b>	PVC plastic
<b>Mount:</b>	1-14-UNS-2B (marine std.)
<b>Input Voltage:</b>	4.9 to 13.0 VDC
<b>Input Current:</b>	50 to 60 mA
<b>Operating Temperature:</b>	-30°C to +70°C
<b>Storage Temperature:</b>	-40°C to +80°C
<b>Relative Humidity:</b>	100% condensing

## CSI Authorized Dealer



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