CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

GPS16X-HVS

GPS Receiver with Integrated Antenna

Position and Time

Precision time synchronization

Overview

The GPS16X-HVS is a global positioning system (GPS) receiver that provides position, velocity, and timing information. Campbell Scientific configures the GPS16X-HVS and modifies its cable so that the receiver can more easily interface with our data loggers.

Benefits and Features

- Supports real-time WAAS or RTCM corrections for accuracy of 3 to 5 m
- Attaches directly to a CR300-series, CR6, or CR1000X, regardless of functionality
- Connects directly to a CR800, CR850, CR1000, or CR3000 datalogger when PPP time-synchronizing functionality is not used.
- Processes data from up to 12 satellites depending on the number of satellites viewable above the horizon
- Allows the data logger clock to be set to the highly accurate GPS time
- Configured by Campbell Scientific to output RMC and GGA data strings at 38400 bps
- Extremely accurate timing pulse (PPS) can be used to synchronize time between the data logger and other instruments

Detailed Description

The GPS16X-HVS, manufactured by Garmin International, consists of a receiver and an integrated antenna. It receives signals from orbiting Global Positioning System (GPS) satellites and then uses the signals to calculate position and velocity. The GPS16X-HVS also provides a highly accurate one-pulse-per-second (PPS) output for precise timing measurements.

Default settings are typically used. The default settings and options are changed using GPS16 software, which is available, at no charge, from the Garmin website (www.garmin.com).

Additional hardware is required to connect the GPS16X-HVS to the computer running the GPS16 software (see Ordering Information for more information).

By default, the instruction expects the GPS unit to be set up at 38400 baud, outputting the GPRMC and GPGGA sentences once per second. The data logger expects the start of the second to coincide with the rising edge of the PPS signal. If there is no PPS signal or if the required sentences come out at

less than once per second, the data logger will not update its clock.

GPS units with lower baud rates can be used with the GPS instruction, but the baud rate has to be set for the relevant Com port it is to be connected to either in the data logger settings or by including a SetStatus command after the BeginProg instruction in the program (for example, SetStatus("BaudrateCOM4",19200)). Baud rates below 2400 bps will not work, as the GPS unit will not be able to transmit the two GPS sentences once per second reliably. Similar problems can be encountered even at higher baud rates if too many optional GPS strings are selected to be output.

Specifications

Receiver	WAAS enabled. 12 parallel channel GPS receiver continuously tracks and uses up to 12 satellites (up to 11 with PPS active) to compute and update the position.
Update Rate	Factory set to 1 s between updates. (Programmable from 1 to 900 s.)
PPS Output	1 Hz pulse; 1 µs accuracy (Width factory set to 100 ms.)
Baud Rate	Factory set to 38400 bps.
Operating Temperature Range	-30° to +80°C
Storage Temperature Range	-40° to +80°C
Operating Voltage Range	8 to 40 Vdc
Current Drain	65 mA active (@ 12 Vdc)
Velocity Accuracy	0.1 knot RMS steady state
Cable Length	4.57 m (15 ft)
Diameter	9.1 cm (3.58 in.)
Height	4.2 cm (1.65 in.)
Weight	332 g (12 oz)

Position Accuracy (95% typical)

GPS Standard Positioning Service (SPS)	< 15 m
DGPS (USCG/RTCM) Correction	3 to 5 m
DGPS (WAAS) Correction	< 3 m

Acquisition Times

Reacquisition	< 2 s
Hot	~1 s (all data known)
Warm	~38 s (initial position, time and almanac known, ephemeris unknown)
Cold	~45 s