XL-GPS

Time and Frequency Receiver

KEY FEATURES

- 12 Channel GPS Receiver with TRAIM
- Accurate to 30 Nanoseconds RMS to UTC (USNO)
- Frequency Accuracy to 1x10-12 (long term)
- IRIG B Time Code Output
- 1PPS, Selectable Pulse Rates, and Alarm Outputs
- Ethernet Network Port (10/100 BaseT)
- SNMP with Enterprise MIB
- Telnet and Serial Port (RS-232/422) for Monitoring and Control
- Vacuum Fluorescent Display and Keypad
- Network Time Server Option Supports NTP
- Expansion Module Option with 4 Configurable Outputs
- Programmable Pulse Output Option
- Time Interval/Event Timing Option
- Frequency Measurement Option
- Remote Software Upgrades

The XL-GPS Time and Frequency Receiver is a high performance instrument that generates precise time and frequency signals referenced to Coordinated Universal Time (UTC). This high value, networked managed device is an excellent solution for test and measurement, central timing systems, process automation, range timing systems and power industry applications.

At the core of the XL-GPS is Symmetricom's advanced XLi technology which assures ultra-accurate and reliable performance. The XL-GPS offers cost-effective functionality and ease-of-use where the XLi offers modularity and extensibility through multiple option slots and modules.

A robust 12 channel GPS satellite receiver provides a high accuracy UTC reference to 30 nanoseconds RMS UTC(USNO) with excellent long term frequency stability (less than 1x10-12). Time Receiver Autonomous Integrity Monitoring (TRAIM) protects against faulty satellite signals. An ovenized oscillator option improves short-term stability and holdover performance.

A variety of standard time and frequency outputs include a one pulse-per-second (1PPS), IRIG B time code (AM & DC), programmable pulse rates up to 10 MPPS, and an alarm output. A Programmable Pulse Output (PPO) option generates a synchronized "trigger pulse" at a specific time of day. An optional Expansion Module provides four, user configurable outputs to fan out signals.

The front panel display provides operators with "at-a-glance" system status. Monitoring and control is via serial port (RS-232/422) and network (telnet, SNMP) with password protection. Telnet and SNMP interfaces can be selectively disabled.

The versatile XL-GPS supports analysis of 1, 5, 10 MHz frequencies via the Frequency Measurement (FM) option. Precise event time tagging and time interval measurements to 5 nanosecond resolution are supported via the Time Interval/Event Timing (TI/ET) option. The Network Time Server (NTS) option enables the unit as a Stratum 1 Network Time Protocol (NTP) server to synchronize networked computers and devices.

The XL-GPS modular architecture is easily maintained and extended in the field. Software updates are remotely administered. The plug-and-play option bay allows extension of the XL-GPS hardware functionality with the optional Expansion Module and future option modules in the field. The GPS timing interface is also modular which facilitates future upgrade to alternate Global Navigation Satellite Systems (GNSS), such as Galileo, when available.

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XL-GPS Specifications

GPS RECEIVER

- Receiver input: 1575.42 MHz L1 C/A code. Coarse acquisition. Position accuracy: typical 10 m RMS tracking 4 satellites.

- Tracking: 12 parallel channels. Multi satellite ensembling with TRAIM.

- Acquisition time: Cold start <20 min. (typical)

- 1 PPS output accuracy: UTC(USNO): ±30 nS RMS 100 ns peak (without S/A 99%).

- Frequency output accuracy: 1×10^{-12} @ 1 day

- Frequency/timing Allan Deviation stability:

TCXO (std)	OCXO (optional)
1×10^{-9} @ 1 sec	1×10^{-10} @ 1 sec
2×10^{-10} @ 1000 sec	1×10^{-10} @ 1000 sec
1×10^{-12} @ 1 day	1×10^{-12} @ 1 day

- Stability when not tracking satellites: TCXO: 5×10^{-7} (0°C to 50°C) typical
OCXO: 1×10^{-8} (0°C to 50°C) typical

TIME CODE GENERATOR

- Code out: IRIG B

OSCILLATOR

- Standard oscillator: VCTCXO
- Optional oscillator: OCXO

STANDARD INPUT/OUTPUT SIGNALS

- Eight standard I/Os

  Two for control and monitoring: Serial and Ethernet port.
  Six for signals: 1 PPS out, time code out, rate out, open collector alarm out, optional Time Interval/Event Timing input, optional Frequency Measure input (all with BNC female connector).
  I/Os are configurable via the keypad/display, RS232/422, and the standard network port.

- RS-232/422: User selectable up to 19200 bps
Connector: Male 9-pin D subminiature

- Network interface: Standard 10/100 base-T RJ-45 8-pin connector. Protocols: Telnet and SNMP for the user interface, FTP (for firmware upgrades), and optional NTP and SNTP server

- 1 PPS: Pulse width: 20 µs (±1µs) on the rising edge on time, TTL levels into 50Ω, BNC female connector.

- Code out: Default is IRIG-B AM
Format: AM or DC code IRIG-B.
AM Code: 3 Vp-p, into 50Ω ±10%, ratio (AM): 3:1.
DC Code: TTL into 50Ω
Connector: BNC female

- Rate out: Default: 10 MPPS. Rate: 1 PPS, 10 PPS, 100 PPS, 1kPPS, 10kPPS, 100kPPS, 1 MPPS, 5 MPPS, and 10 MPPS. Duty cycle: 50% and 60/40%. Amplitude: TTL levels into 50Ω
Connector: BNC female

- Alarm: Open collector. Max 25V/50 mA.
Connector: BNC female

MECHANICAL/ENVIRONMENTAL

- Time and frequency system

  Power: Voltage: 90–260 Vac
  Frequency: 47–63 Hz
  Connector: IEC 320
  Size: 1U: 1.75" x 17.1" x 15.35" (4.44 cm x 43.4 cm x 38.9 cm) Standard 19" (48.26 cm) EIA rack system, hardware included.
  Operating temperature: 0°C to +50°C (+32°F to +122°F)
  Storage temperature: –55°C to +85°C (–67°F to +185°F)
  Humidity: 95%, non-condensing
  Display: Graphics (120 X 16) vacuum fluorescent display. One line for time and day of year (TOD). Two-line alpha-numeric display for status messages and user input.
  Keypad: Includes: numeric 0–9, left, right, up, down, CLR, Enter, time key, status key and menu key.

- Antenna

  Size: 3" Dia. x 3" H (7.62 cm x 7.62 cm)
  Input: BNC female to GPS receiver. TNC on antenna
  Power: +12 Vdc
  Operating temperature: –55°C to +85°C (–67°F to +185°F)
  Storage temperature: –55°C to +85°C (–67°F to +185°F)
  Humidity: 95%, non-condensing
  Certification: UL, FCC, CE, and C-UL

OPTIONS

(See Options datasheet for complete details.)

- Network Time Server (on standard network port)
- Expansion Module
- Alarm Relay (requires Expansion Module)
- Oscillator Upgrade: OCXO
- Frequency Measurement (FM)
- Time Interval/Event Timing (TI/ET)
- Programmable Pulse Output (PPO)
- Extended cable lengths (75'-1500')
- GPS In-line amplifier for extended cable runs up to 300' (91 m)
- GPS Antenna down/up converter for long cable runs up to 1500' (457 m)
- Antenna splitter kit
- Lightning arrestor

XL-GPS Rear View (with Expansion Module)