The ultraprecise XL-DC provides the highest degree of time and frequency accuracy available in a GPS timing receiver. Standard outputs include a 1 PPS, analog IRIG B time code and serial I/O time strings. A major advantage of the XL-DC is its versatile and modular architecture. A wide range of time and frequency plug-in options allow the XL-DC to be customized for specific applications and easily upgraded at a later time.

TrueTime’s proprietary multisatellite ensembling techniques and RAIM provide very stable and precise timing outputs. Timing accuracy is less than 40 nanoseconds rms to UTC even during Selective Availability (SA). This superior oscillator disciplining to GPS enables internal oscillator accuracy to better than $1 \times 10^{-12}$. For applications requiring increased oscillator stability, the XL-DC can be upgraded to ovenized quartz or rubidium oscillators.

The XL-DC is available in three base configurations to meet varying requirements for keypad control and information displays. RS-232 control is standard on all units. Using the keypad or RS-232 port, users have control over a variety of time formats, configurations, and output options, including GPS and oscillator status and controls.

The highly modular backplane architecture supports multiple time and frequency output options to address specific needs. These plug-in output modules can be incorporated at any time and significantly increase the adaptability of the clock to changing application requirements. See the Options section for a list of currently supported options. The base models support up to four single-height plug-in modules. Using the optional 3.5” high chassis, it can accommodate up to ten single-height modules.

Remote control over the Internet or local network is easy using TrueTime’s Telnet network interface plug-in option. Using Telnet, users can remotely check the status and/or configure the XL-DC. Most operations possible via the RS-232 port are also possible via Telnet. The network interface option supports DHCP so that no user intervention is required for the XL-DC to be network ready. Password protection is provided to maintain secure access to the unit.
**Specifications XL-DC**

**RECEIVER/GENERAL**
- **Timing Accuracy UTC/USNO:** <40 ns rms (150 ns peak) with Selective Availability (SA) and tracking 8 satellites.*  
- **Receiver Input:** 1575 MHz L1 C/A code
- **Tracking:** Eight parallel channels. Multisatellite ensembling with system integrity monitoring.
- **Position Accuracy:** Latitude, longitude, and altitude within 10 meters, referenced to WGS84, after completion of 24-hour initialization position averaging.
- ** Acquisition Time:** Warm start (has ephemeris data and position) typically <2 minutes. Cold start typically less than 20 minutes.
- **Internal Oscillator:** 16.368 MHz VCTCXO  
  - **Accuracy:** <1x10⁻¹² when tracking satellites  
  - **Stability:** 1x10⁻¹⁰ at 1 second  
  - **Stability when Not Tracking Satellites:** 2x10⁻⁶ over 0°C to +50°C
- **Antenna:** L1 GPS, 40 dB gain. RG-59/U cable, 50' supplied; maximum cable length 150'. For longer cable runs, see Options.

**TIMING OUTPUTS**
- **1 PPS Output:** TTL into 50 ohms, rising edge on time. 20 microsecond pulse width. Rear panel BNC.
- **IRIG B Output:** 1 kHz amplitude modulated carrier. 3 Vpp high, into 600 ohms. Rear panel BNC. DC level shift format optionally available.
- **Serial I/O:** Bidirectional RS-232 port. Fixed protocol: 9600, 7, E, 1. DB9 connector. RS-422 optionally available.

**MECHANICAL/ENVIRONMENTAL**
- **Receiver:**  
  - **Power:** 95–260 Vac, 47 to 440 Hz, <15 watts  
  - **Size:** 1.75" x 17" x 10.38" (4.4 x 43.2 x 36.4 cm)  
  - **Operating Temperature:** 0°C to +50°C  
  - **Storage Temperature:** -40°C to +85°C  
  - **Humidity:** To 95%, noncondensing
- **Antenna:**  
  - **Size:** 2.625" x 1.5" (6.67 cm x 3.8 cm)  
  - **Operating Temperature:** -55°C to +85°C  
  - **Storage Temperature:** -55°C to +85°C  
  - **Humidity:** 100%, condensing
- **Certification:** UL, FCC, CE, C-UL, GPS WNRO, Year 2000  
  - Contact TrueTime for the certification of specific options.

*Specifications subject to change without notice.*

**XL-DC Configurations**

The XL-DC is available in three configurations, enabling you to select the best XL-DC for your requirements.

**SPECIFICATIONS XL-DC-600**
- This base model includes all standard features and a blank front panel with GPS lock-indicator LED and power switch.

**SPECIFICATIONS XL-DC-601**
- The XL-DC-601 includes all of the standard features of the Model XL-DC-600, plus the following:
  - **Alphanumeric Front Panel Display:** Initialization parameters, time of year, as well as alarm/status messages may be viewed on the 2-line, 32-character LCD.
  - **Keypad:** 0–9; up, down, left, and right arrows; CLR, FUNC/ENTR, TIME, STATUS, POSITION
  - **Serial I/O:** Full user-selectable RS-232 communication protocol up to 19200 baud.

**SPECIFICATIONS XL-DC-602**
- This model includes all of the standard features of the Model XL-DC-601, plus the following:
  - **Front Panel Time Display:** LCD type, 10 digits, 1 line. Default is time-of-year.
  - **Size:** 6.9" x 0.85" (17.53 x 2.16 cm).

**Options**

- Telecommunication Interface:  
  - Primary Reference Source 1.544 Mbps (T1) or 2.048 Mbps (E1), Status/Alarm
- 1, 5, 10 MHz Frequency Outputs
- Multiple Time Code Outputs
- Selectable Output Pulse Rates
- N.8 Data Rate Outputs
- Low Phase Noise Frequency Outputs
- Oscillator Upgrades
- External Oscillator Control
- Network Time Server
- Network Interface Card for Telnet Remote Control
- Frequency Measurement
- Time Interval/Event Timing
- Precision Time and Time Interval Interface (PTTI)
- Have Quick II
- Video Time Inserter
- Parallel BCD
- 3.5" height, 10 option bay chassis
- AC/DC Power Input: 95–260 Vac/18-36 Vdc; 95-260 Vac/36-72 Vdc; 110 or 220 Vac/10.5-32 Vdc
- IEEE-488 interface
- L1 GPS Antenna & Downconverter for long cable runs. Contact TrueTime for application-specific details.
- Fiber Optic Antenna Link (up to 2 km)
- Frequency and Time Deviation Monitoring
- Differential GPS Mode (RTCM-104): 3 to 5 meter positioning

* 100 ns peak without Selective Availability (SA) implemented.