

PTP-80 Elite-S Grandmaster and Boundary Clock



The PTP80 Elite-S GrandMaster & Boundary Clock generates and distributes precisely synchronized time across packet networks. It uses Precision Time Protocol (PTP) to IEEE- 1588 v2 to distribute time to remote PTP clients and slaves over a network. Multiple PTP80 Elite-S units can be utilized for load sharing resilience and increased support. It is also capable of synchronizing to PTP offering further timing resilience.

Features

- Advanced hardware-generated timestamps
- Internal disciplined oscillator provides continued stability if synchronization source interrupted
- One PTP Grandmaster element enabling synchronization of a large range of PTP clients
- One PTP client element for synchronization from another Grandmaster clock
- Rubidium or Quartz Oscillators
- Multiple outputs include 1PPS & 10MHz, E1/T1 and IRIG-B
- OEM Board design also available providing Equipment Manufacturers with a fast track PTP implementation.

Input Synchronization Options

- GPS, GPS/GLONASS, GPS/BEIDOU(all via Active or Long Distance Antenna)
- IEEE1588V2 (PTP)
- Multiple alternative inputs available

The PTP80 Elite-S GrandMaster Clock incorporates hardware based time stamping, providing the highest level of timing and frequency over a broad range of wireline and wireless applications using Precision Time Protocol (PTP), described in the IEEE 1588-2008 version 2 standard.

Typical Applications Include:

- Telecommunications
 - LTE
 - Ethernet / IP Backhaul (Synchronization of Base Stations)
- WiMAX
- Broadcasting (Synchronization of DVB / DAB Transmitters)
- Power Utilities (Applications requiring Time of Day)
- Applications requiring Precise Timing delivered over a Packet Network
- High Frequency Trading (HFT) in Financial Services

Key Benefits

- Precise timing and synchronization over packet-based Networks
- Rapid migration to Ethernet / IP Backhaul in Mobile Networks
- Complete End to End PTP Solution with PTP8 Network Time Client
- Interoperability with 3rd Party PTP Clients
- Front panel has a large alphanumeric LCD, status indicator and 5-segment button for configuration.
- Comprehensive web browser for remote configuration and control.

PTP80 Elite-S Specifications

PTP Function

IEEE 1588 v2 compliant
 Ethernet 10/100/1000Base-T (1 x RJ45)
 Ethernet 1000Base-X (1 x SFP)

PTP Grandmaster Performance

Supports up to 50 PTP Clients @ 64 packets/s
 80 PTP Clients @ 32 packets/s
 128 PTP Clients @ 16 packets/s

Unicast / Multicast Operation

One step /two step operation

Configurable to Acceptance Master Table for multiple units providing increased levels of Client support and load sharing resilience.

Synchronization Source

GPS

C/A Code GPS Receiver (L1-1575MHz)
 High Performance Antenna with 15m cable (50Ω BNC)
 Tracking: 12 parallel channels with TRAIM
 Acquisition time: Cold start <5 min. (typical)

IEEE 1588v2 (PTP)

Capable of precision synchronization to received PTP packets.
 Unicast / Multicast Operation
 One step /two step operation

Alternative Synchronization Sources:

GPS/GLONASS or GPS/BEIDOU, IRIG-B (BNC 50Ω),
 E1/T1 (BNC 75Ω unbalanced), 10MHz / 1PPS input (BNC 50Ω), Time of Day Serial Message, RS232/RS422 (RJ45)

Outputs

1PPS Output

2.5Vpp +/- 0.1Vpp into a 50Ω load
 Connector: BNC 50Ω

10MHz Output

10MHz sinusoidal phase aligned +/- 100ns of 1PPS output
 1Vrms into a 50Ω load
 Connector: BNC 50Ω

E1/T1 Frequency Output

Transmit bit rate: 2.048Mbps
 Line encoding: HDB3
 Connector: BNC 75 Ω unbalanced / RJ48,120Ω option
 T1 option available

Time of Day Serial Message RS232/RS422

NMEA GPRMC message format
 Baud rate and communication attributes user selectable
 Connector: RJ45

NTP (V3 RFC 1305)

RJ45 10/100Base-T (via DCN port)
 Client system accuracy up to 1 millisecond

IRIG-B

Range of selectable outputs including
 IEEE1344 extension
 Connector: 50Ω BNC

Please consult factory for other available options

Timing / Frequency / Holdover Accuracy

1PPS: ±50ns peak to peak when locked to GPS, 30ns RMS
 ±1μs peak to peak when synchronized to PTP (network dependent)

PTP Timing: better than 1μs possible (network dependent)
 PTP Frequency: better than 10ppb possible (network dependent)

Management

Configurable via front panel display used with 5 Button Keypad

Remote management:

Web browser, accessible via 10/100Base-T, DCN port (RJ45), SNMPv1 (RFC 1157), SNMPv3 (RFC 2271) next release, Time & Frequency Solutions' Universal Clock Management System

Alarms

Alarms are notified via the following:

- SNMP
- Web Browser
- Front panel display
- Voltage Free Single Pole Changeover Relay

Security

Protection from unauthorized access available via System Administrator Password Protection

Protocols

ANSI T1.101, DHCP, GR-1244, HTTP (RFC 2616), IEEE 802.3, IPv4/IPv6 next release, ITU-T G.703, G.704, G.812, G.813, G.823, G.824, G8261, PTPv2 (IEEE 1588), SNMP v1 (RFC 1157), SNMP v3 (RFC 2271) next release, Telnet (RFC 854), FTP (RFC 959), VLAN, NTP (RFC 1305), SNMP (RFC 1769)

Product Standards/Compliance

Conforms to relevant sections of:

CE, RoHS, WEEE, EN61000

Please consult factory with requirement for your country/application

Physical

19" x 1U high x 200mm deep rack mount
 Weight 3kg typical, ETSI rack fixings
 Option - OEM board designed to customer specification

Power

AC: 95- 264VAC 47 to 63Hz
 DC: optional dual -48VDC input (-40 to -72VDC range)

Environmental

Operating Temperature: 0°C to +50°C (please contact factory for advice outside this range)
 Storage Temperature: -5°C to +60°C
 Humidity: up to 95% RH (non-condensing)

Oscillator		Stability Per °C	Performance while disciplined						Holdover Accuracy at constant temperature after loss of reference		
			Averaging Time						Time	Frequency	
Option	Description		1s	10s	100s	1000s	10000s	1day	1day	1day	3days
1	OCXO	1x10 ⁻¹¹	5x10 ⁻¹²	3x10 ⁻¹²	1x10 ⁻¹¹	1x10 ⁻¹¹	3x10 ⁻¹²	1x10 ⁻¹²	<8 μs	2x10 ⁻⁹	<4x10 ⁻⁹
2	Rubidium	7x10 ⁻¹²	3x10 ⁻¹¹	8x10 ⁻¹²	3x10 ⁻¹²	3x10 ⁻¹²	2x10 ⁻¹²	8x10 ⁻¹³	<1 μs	<1.0x10 ⁻¹¹	<1.5x10 ⁻¹¹