Time & Frequency Solutions

PTP80 Elite
GrandMaster Clock

The PTP80 Elite GrandMaster Clock generates and distributes precisely synchronised 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 Elites can be utilised for load sharing resilience and increased support.

PTP80 Elite is the enhanced version of the standard PTP80. Additional features for this model:

- SFP connection
- Gigabit Ethernet capability

Features

- Advanced hardware-generated timestamps
- Internal disciplined oscillator provides continued stability if synchronisation source interrupted
- 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 Synchronisation Options

- GPS
- GLONASS
- BEIDOU
- All via Active or Long Distance Antenna
- Multiple alternative inputs available

The PTP80 Elite 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:

- WiMAX
- Broadcasting (Synchronisation of DVB / DAB Transmitters)
- Power Utilities (Applications requiring Time of Day)
- Military Communications
- High Frequency Trading (HFT) in Financial Services
- Telecommunications
  - LTE
  - Ethernet / IP Backhaul (Synchronisation of Base Stations)

Key Benefits

- Precise timing and synchronisation 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.

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PTP80 Elite Specifications

PTP Function:

IEEE 1588 v2 compliant

Ethernet 10/100/1000Base-T (1 x RJ45)

Ethernet 1000Base-X (1 x SFP)

Unicast / Multicast Operation

One step /two step operation

PTP Performance

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

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

Synchronisation Source

C/A Code GPS Receiver (L1-1575MHz)

High Performance Antenna with15m cable (50Ω BNC)

• Tracking: 12 parallel channels with TRAIM

• Acquisition time: Cold start <5 min. (typical)

Alternative Synchronisation Sources:

GLONASS

BEIDOU

IRIG-B (BNC 50Ω)

E1/T1 (BNC 75Ω unbalanced)

10MHz / 1PPS input (BNC 50Ω)

Time of Day Serial Message RS232/RS422 (RJ45)

PTP80 Elite 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(V3rfc1305)**
  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 accuracy - ±50ns peak to peak when locked to GPS, 30ns RMS

Timing accuracy using PTP - better than 1µs possible (network dependent)

Frequency accuracy using PTP - better than 10ppb possible (network dependent)

Holdover accuracy - see table below

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	$<1.0x10^{-11}$	$<1.5x10^{-11}$

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PTP80 Elite Specifications *continued*

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:

1. SNMP
2. Web Browser
3. Front panel display
4. Voltage Free Single Pole Changeover Relay

Security

Protection from unauthorised 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

NTP (RFC 1305)

PTPv2 (IEEE 1588)

SNMP (RFC 1769)

SNMP v1 (RFC 1157)

SNMP v3 (RFC 2271) next release

Telnet (RFC 854)

FTP (RFC 959)

VLAN

Product Standards/Compliance

Conforms to relevent sections of:

CE

RoHS

WEEE

EN61000

Consult factory with requirement for your country/application

Physical

Dimensions:	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)

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