

# PTP80 Elite-Q GrandMaster Clock

The PTP80 Elite-Q 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 Elite-Qs can be utilised for load sharing resilience and increased support.



PTP80 Elite-Q has more PTP elements than the PTP80 Elite or the PTP80-D, meaning up to 640 PTP clients can be synchronised @ 16 packets per second

## Features

- Advanced hardware-generated timestamps
- Internal disciplined oscillator provides continued stability if synchronisation source interrupted
- Multiple PTP elements enables synchronisation of a large range of PTP clients
- 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 Head-end Antenna
- Multiple alternative inputs available

The PTP80 Elite-Q 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.



# PTP80 Elite-Q 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 200 PTP Clients @ 64 packets/s  
320 PTP Clients @ 32 packets/s  
640 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 with 15m 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-Q 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 <sup>-11</sup>	5x10 <sup>-12</sup>	3x10 <sup>-12</sup>	1x10 <sup>-11</sup>	1x10 <sup>-11</sup>	3x10 <sup>-12</sup>	1x10 <sup>-12</sup>	<8 µs	2x10 <sup>-9</sup>	<4x10 <sup>-9</sup>
2	Rubidium	7x10 <sup>-12</sup>	3x10 <sup>-11</sup>	8x10 <sup>-12</sup>	3x10 <sup>-12</sup>	3x10 <sup>-12</sup>	2x10 <sup>-12</sup>	8x10 <sup>-13</sup>	<1 µs	<1.0x10 <sup>-11</sup>	<1.5x10 <sup>-11</sup>



# PTP80 Elite-Q 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

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 requirements 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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