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PTP GrandMaster Clock

The PTP80 Grandmaster Clock generates and distributes precisely synchronized time across Ethernet networks.



Features

- Uses Precision Time Protocol (PTP) to IEEE-1588 v2
- Distributes time to remote PTP clients and slaves over a network
- Multiple PTP80's can be utilized for load sharing resilience and increased support
- Advanced hardware-generated timestamps
- GPS input source with multiple alternative inputs available
- Internal disciplined oscillator continues to provide stability if input source interrupted
- Rubidium or Quartz Oscillators
- Choice of auxiliary outputs include 1PPS & 10MHz, E1/T1 and optional IRIG-B
- Customizable outputs
- OEM Board design also available providing Equipment Manufacturers with a fast track PTP implementation.
- 19 inch 1U high rack mountable chassis

The PTP80 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

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System 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 Slave Network Time Client
- Interoperability with 3rd Party PTP Clients
- Front Panel has a large alphanumeric LCD, status indicator and 5-segment button for visual status and minimal configuration

The PTP80 Grandmaster allows for extremely precise synchronization of networks. An absolute timing accuracy of better than 100 nanoseconds to UTC can be achieved using this protocol as it uses hardware-generated timestamps. This provides significant improvements on the accuracy of network-distributed time over legacy Network Time Protocol (NTP) servers.

The PTP80 uses an internal oscillator (OCXO as standard, factory upgradeable to Rubidium) disciplined by an integral GPS receiver as a highly stable time base. The use of precision oscillator options provides improved stability in holdover mode if the input source is interrupted for any reason.

The front panel has a large alphanumeric LCD, status indicator and 5-segment button for easy status and minimal configuration. The main configuration and monitoring is through a secondary network port providing web access. A range of additional output options are available, including serial, pulse, timecode and frequency - please contact our sales support team for more information.

PTP80 Grandmaster Clock Specifications

GENERAL

Internal oscillator: Rubidium or OCXO
Network timing client: PTP (IEEE1588v2)
Communications : RS-232 (RJ45)
Ethernet 10/100Base-T (RJ45)
PTP Gigabit Operation
Unicast / Multicast Operation
Best Master Algorithm (BMC) according to IEEE1588v2
ITU-T G.8261 compliant

FREQUENCY / TIMING ACCURACY

Frequency/timing accuracy (Locked to GPS)
Frequency: Better than 10ppb possible (Network Dependent)
Timing: Better than 100ns possible (Network Dependent)
Holdover accuracy Rubidium
Holdover Frequency $1 \cdot 10^{-11}$ per °C
Time Holdover 10µs over 5 days at 25°C
Holdover accuracy OCXO
Holdover Frequency $1 \cdot 10^{-10}$ per °C
Time Holdover 10µs over 1 day at 25°C
Oscillator Options
Please consult factory with requirement, options include ITU-T G.812 / 813

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PTP80 Grandmaster Clock Specifications

PTP80 INPUTS

GPS Antenna

1575MHz L1

50 Ohm BNC Socket

The PTP80 is supplied with our Weatherproof High Performance GPS Antenna which includes a 35db preamplifier and dual band pass filters.

Alternative Inputs

GLONASS Antenna Option

E1/T1

2048kHz

10MHz

Frequency Input

1PPS Input

Time of Day Serial Message RS232

Customer Special Requests / Options – consult factory

PTP80 PTP OUTPUTS

PTP: IEEE 1588v2

Four Logical Outputs

Connector: RJ45 10/100/1000Base-T

SFP 1000Base-X

PTP80 AUXILIARY OUTPUTS

Number of Auxiliary Outputs: 6

E1/T1

Number of E1 outputs: 1

Transmit bit rate: 2.048 Mbps (G.703)

Line encoding: HDB3

Framing: G.704 without CRC4, G.704 with CRC4 with or without SSM support

Connector: BNC 75 ohm Unbalanced RJ48, 120 ohm (option or use balun)

T1 option available

Frequency Output

Number of 10MHz outputs: 1

10MHz sinusoidal phase aligned +/- 100ns of 1PPS output

1Vrms into a 50 ohm load

Connector: BNC 50 ohm

1PPS Output

Number of 1PPS outputs: 1

-2.5Vpp +/- 0.1Vpp into a 50ohm load

0.1Vpp into a 50 ohm load

Connector: BNC socket grounded 50 ohm

Time of Day Serial Message RS232

NMEA GPRMC message format.

9600 baud, 1 stop bit and no parity

SyncE (Option)

25MHz Clock

Connector: BNC 50 ohm

Customer Special Requests / Options

Please contact factory with your requirements

COMPLIANCE

CE

RoHS

Consult factory with requirement for your country / application

EMISSIONS / IMMUNITY

EN6100

Consult factory with requirement for your country / application

PERFORMANCE

Support up to 320 PTP Clients @ 32 packets/s

640 PTP Clients @ 16 packets/s

Multiple Configurations available according to Client support required
Configure according Acceptable Master Table for multiple units providing increased levels of PTP Client support and load sharing resilience.

PHYSICAL

19" x 1U x 200mm ETSI Rack Fixings

Weight 3kg typical depending on configuration

Options – OEM Board Designed to Customer's Specification

POWER

DC Version: -48V Dual Input (-40 to -72V Range)

AC Version: 60 – 240V AC 47 to 63Hz

ENVIRONMENTAL SPECIFICATIONS

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)

MANAGEMENT

40 x 2 Character LCD Display

5 Button Keypad

Local management: RS-232, RJ-45 port

Remote management: HTML, RJ-45 port (10/100Base-T) Web browser

SNMPv1 (RFC 1157)

SNMPv3 (RFC 2271) next release

TL1 (GR-831-CORE)

NMS: Time and Frequency NMS

OSS Integration

ALARMS

40 x 2 Character LCD Display

Web Browser

Dry Contact Single Pole Changeover

SECURITY

System Administrator Password

Protection 4 Users Configurable Next

Release

4 Sessions (across all management ports)

Lock to incoming IP Address

PROTOCOLS

ANSI T1.101

DHCP

GR-1244

HTTP (RFC 2616)

IEEE 802.3

IPv4

ITU G.812, G.813, G.823, G.824, G.703, G.704

PTPv2 (IEEE 1588)

SNMP v1 (RFC 1157)

SNMP v3 (RFC 2271)

TL1 (GR-831-CORE)

Telnet (RFC 854)

FTP (RFC 959)