

## Product Overview

The OSA 5331 PTP Grandmaster is a high-performance IEEE 1588-2008 (Version 2) standard compliant Grandmaster Clock for synchronization distribution over packet-based network infrastructure including IP, IP/MPLS, Carrier Ethernet, PON and DSL networks. Its carrier-class design provides high client capacity and a wide range of redundancy options to deliver scalable performance and maximum synchronization network availability. The OSA 5331 PTP Grandmaster is designed to deliver precise and reliable frequency, phase and time-of-day information in markets including telecommunications, media broadcast and power utility communications.

## Reliable Clock Performance

Reliable delivery of precise timing information has become increasingly critical in many applications building on distributed intelligence and processing. In order to meet this increasing industry trend, the OSA 5331 PTP Grandmaster supports a variety of timing input options. Its built-in GNSS receiver can operate with the two satellite systems GPS and GLONASS, feeding four powerful PTP engines for delivery of precise frequency, phase and time-of-day synchronization. Alternative auxiliary input interfaces including 10MHz, 2.048MHz or E1 as well as 1PPS and ToD guarantee maximum synchronization service protection and enable operation in locations without access to GNSS. Clock source auto-selection between GNSS and auxiliary input interfaces is supported based on quality level and priority settings.

## Superior Holdover Capability

The OSA 5331 PTP Grandmaster is equipped with an internal Quartz Crystal or Rubidium oscillator serving as a highly stable time base. The optional use of a precise oscillator provides improved timing stability during holdover periods when the input source is interrupted or not traceable for any reason. In addition, it assures that there is no impact on PTP client performance when failover occurs. Highly stable holdover in combination with redundant PTP Grandmaster output interfaces increases network timing precision by preventing PTP clients from re-acquiring synchronization from a different source in the network.



## Flexibility and Ease-of-Use

User configurable PTP Profiles are crucial for the interoperability with a wide selection of PTP slaves in a multi-vendor environment. Support for multiple standard PTP Profiles as defined by the ITU-T and the capability to flexibly configure key parameters make the OSA 5331 PTP Grandmaster the most versatile device for PTP Grandmaster applications. For simplified operations, the entire system including all configuration options can be managed locally or remotely by SyncView™ Plus, a carrier-class synchronization network management platform. A large alphanumeric LCD display on the front panel, status indicators and five segment buttons for easy status retrieval simplify operations for increased ease-of-use.

## Features & Benefits

- Dual IEEE 1588-2008 (Version 2) ports
- Four powerful PTP engines
- Electrical or optical ports
- GPS/GLONASS input source
- Frequency, phase and/or time-of-day auxiliary
- $\pm 100$ ns timing accuracy when locked to GNSS
- Highly stable internal Quartz Crystal or Rubidium oscillator
- Compact 19" or ETSI rack mountable chassis

## Technical Information

### GNSS Receiver

- GPS L1: 1575.42 MHz L1 C/A code (coarse acquisition)
- GLONASS L1: 1602.0 MHz for Fk=0

### Antenna Cables

- LMR-400: 20m, 60m and 120m with L/A
- Other lengths: upon request

### Holdover Performance

#### OCXO Double Oven Oscillator

- $1 \times 10^{-10}$ /day (ITU-T G.812 type I)
- 10 $\mu$ s/day

#### Rubidium Oscillator

- $< 1 \times 10^{-10}$ /month (ITU-T G.812 type II)
- 10 $\mu$ s/4–5 days

#### Locked to GNSS

- $< 1 \times 10^{-11}$  (ITU-T G.811)
- $< 50$ ns phase accuracy on 1PPS output

### Synchronization Output

- Frequency:  $1 \times 2.048$ MHz / E1 / T1 (BNC 75 $\Omega$ )  
 $1 \times E1 / T1$  (BNC 75 $\Omega$ )  
 $1 \times 10$ MHz sine (BNC 50 $\Omega$ )
- Phase:  $1 \times 1$ PPS (BNC 50 $\Omega$ )
- Time-of-Day:  $1 \times$  NMEA 0183 (RS232/RS422, RJ-45)

### Alternative Auxiliary Input

- Frequency:  $1 \times 10$  MHz / 2.048 MHz (BNC 75 $\Omega$ )  
 $1 \times E1 / T1$  (BNC 75 $\Omega$ )
- Phase:  $1 \times 1$ PPS (BNC 50 $\Omega$ )
- Time-of-Day:  $1 \times$  NMEA 0183  
(RS232/RS422, RJ-45/TIA/EIA-561)

### PTP Master Interface

- Protocol: IEEE 1588-2008 (Version 2)
- Electrical:  $1 \times 10/100/1000$ Base-T (RJ-45)
- Electrical/Optical:  $1 \times$  GbE (SFP)
- PTP Profile: User configurable
- IP Configuration: DHCP or fixed IP address
- Communication: Unicast, multicast or mixed
- TWTT method: 1-step or 2-step mode
- Compliance: 3rd-party PTP Slave
- PTP Time Accuracy:  $< 100$ ns when locked to GNSS

### Front Panel Indicators

- 40 x 2 character LCD – provides initial configuration
- 5-button keypad
- Status LED

### Management and User Interface

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

- HTTP web interface for configuration and monitoring
- SNMP v1, v2c and v3 enterprise MIB
- DHCP or fixed IP address
- Firmware upgrade
- SyncView™ Plus NMS compliant

#### 1 x Alarm Dry Contact

### Power Supply

- Dual DC power supply -40 to -60VDC
- Single external AC power supply 60 to 240VAC (47 to 63Hz)
- Power consumption: Warm-up  $< 30$ W, steady state  $< 25$  W

### Mechanical

- Size: 19" or 21" x 1U x 240mm (W x H x D)
- Weight:  $< 5$ kg typical

### Environmental Conditions

- Operating: 0°C to +50°C
- Storage: -40°C to +85°C
- Humidity: up to 95% non-condensing
- Safety: EN 60950-1
- EMC & ESD: EN 61000-6-2, EN 61000-6-4
- In operation: EN 300 019-1-3 Class 3.2 (-5°C to +45°C)



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