

## Product Overview

The OSA 5410 is a small, efficient and cost-effective synchronization distribution and assurance device that brings the power of Syncjack™ to any network. No longer must archaic legacy synchronous links be maintained for timing. Instead, timing can be easily distributed and assured throughout a network over existing packet infrastructure. Timing performance is continuously monitored, in service, and alarmed if needed. A valuable new service is made available to Ethernet wholesalers and mobile operators: the ability to write and bill to service level agreements on timing or to assure timing with mobile network operators.

## Product Details

Offering unique flexibility, the OSA 5410 supports delivery and assurance of synchronization utilizing Synchronous Ethernet and IEEE 1588v2 Precision Time Protocol (PTP). It has a built-in GNSS receiver and Grandmaster Clock capability that can be used as measurement reference for Syncjack™ tools as well as an alternative timing source for frequency, phase and time-of-day delivery. With its thorough IEEE 1588v2 PTP implementation, the OSA 5410 can be configured to operate in Slave, Boundary and Master Clock mode to enable highly accurate clock recovery. An internal Stratum-3E clock is capable of holdover to support remote site, head-end and feeder applications. The OSA 5410 synchronization distribution and assurance device utilizes the following Syncjack™ functions and tools.

## Syncjack™ Functions

Syncjack™ is a comprehensive technology for timing distribution, monitoring and timing service assurance. The monitoring and timing service assurance functions include three main functionalities: Clock Accuracy, Clock Analysis and PTP Network Analysis. Syncjack™ Clock Accuracy measures the frequency and phase accuracy of clocks relative to a synchronization reference, which can be internal, external, recovered or originating from a GNSS signal. Syncjack™ continuously performs Clock Analysis, including frequency and phase accuracy of the PTP packet domain, even when a synchronization reference is unavailable. Syncjack™ also continuously performs PTP Network Analysis, including monitoring and testing of the PTP communication path.



## Syncjack™ Monitoring and Assurance Tools

The OSA 5410 uses four Syncjack™ tools: Clock Probe, PTP Clock Probe, PTP Network Probe and Slave Probe. The Clock Probe is used to measure frequency and phase accuracy of a physical clock source based on TE, TIE and MTIE. The PTP Clock Probe is used for PTP clock analysis calculating TE, TIE and MTIE by using timestamps embedded in PTP messages. PTP Network Probe is used for network analysis of the PTP message transport. Slave Probe is a default tool used for slave clock performance monitoring.

## Features & Benefits

- Syncjack™ technology for timing distribution, monitoring and testing
- Brings Synchronous Ethernet and IEEE 1588v2 support to networks
- Built-in GNSS receiver and Grandmaster Clock functionality
- Configurable to operate in Slave, Boundary and Master Clock mode
- Precise clock accuracy measurements and enhanced statistics gathering with external, internal or even no reference
- Operates in Passive Probe, Active Probe and Testing mode
- New revenue from delivery of SLA-based synchronization services

## Technical Information

### Access Capacity

- One 10/100/1000BaseT or 100/1000BaseX (SFP) port

### Network Interface

- One 10/100/1000BaseT or 100/1000BaseX (SFP) port

### Synchronization Interfaces

- ITU-T G.8261/G.8262/G.8264 Synchronous Ethernet
- BITS-in and BITS-out
- PPS in/out, PPS in
- Time-of-Day (ToD)
- CLK in/out, CLK in
- Antenna in for embedded GNSS receiver

### Mode of Operation

- Fully compatible with ITU-T G.8265.1 frequency delivery profile
- Fully compatible with ITU-T G.8275.1 time/phase delivery profile (Full Timing Support)
- Designed to support ITU-T G.8275.2 time/phase delivery profile (Assisted Partial Timing Support)

### Syncjack™ Monitoring and Assurance Tools

- Clock Accuracy for up to 2 Clock Probes – computing TE, TIE and MTIE of physical clocks
  - Calculation of TE, TIE and MTIE between physical source and reference signals
  - Programmable source and reference signals including SyncE, BITS, 1PPS, GPS and 10M
- Clock Analysis for up to 4 PTP Clock Probes – packet TE, TIE and MTIE
  - Calculation of packet TE, TIE and MTIE between physical reference signal and timestamps within the PTP packets
  - Support for Active and Passive Probe mode
  - Programmable reference signals including SyncE, BITS, 1PPS, GPS and 10M
- PTP Network Analysis including PTP Network Probe
  - Packet Delay and Packet Delay Variation performance statistics
  - Delay asymmetry
  - Network usability statistics (FPP based on G.8261.1)
  - Packet Loss statistics
  - Programmable reference signals including SyncE, BITS, 1PPS, GPS and 10M

### Synchronization Delivery Functions

- 1588v2 Slave Ordinary Clock
- 1588v2 Slave Boundary Clock
- 1588v2 Grandmaster Clock with PTP client capacity up to 16 clients at 128pps or 32 clients at 64pps

### Low-Touch Provisioning

- DHCP/BOOTP auto-configuration
- Text-based configuration files
- TFTP for configuration file copy

### Management and Security

#### Local Management

- Serial connector (RJ45) using CLI
- Local LAN port (RJ45) using CLI, SNMP and Web GUI interfaces
- 3G/LTE USB interface

#### Remote Management

- Maintains in-band VLAN and MAC-based management tunnels
- Fully interoperable with FSP 150CM, FSP 150EG-X and FSP 150CC products
- FSP Sync Manager for end-to-end synchronization domain management

#### Management Protocols

- Telnet, SSH (v1/v2), HTTP/HTTPS, SNMP (v1/v2c/v3)

#### Secure Administration

- Configuration database backup and restore
- System software download via FTP, HTTPS, SFTP or SCP (dual flash banks)
- Remote authentication via RADIUS/TACACS
- SNMPv3 with authentication and encryption
- Access Control List (ACL)

#### IP Routing

- DHCP, RIPv2 and static routes, ARP cache access control

#### System Logging

- Alarm log, audit log and security log

### Regulatory and Standards Compliance

- ITU-T G.8261, G.8262, G.8264, G.703, G.781
- ITU-T G.8272
- ITU-T G.8265.1
- IEEE 1588v2 (PTP), 802.1Q (VLAN), 802.1ad, 802.1p (Priority)
- RFC 2863 (IF-MIB), RFC 2865 (RADIUS), RFC 2819 (RMON)
- ANSI C84.1-1989
- ETSI 300 132-2, BTNR2511, ETS 300-019, ETS 300-019-2-[1,2,3], ETS 300-753
- Safety IEC/UL/EN 60950, 21CFR1040.10, EN 60825, EN 50371, EN 300-386, EN 50160, IEC 60320/C14
- EMI EN 300-386, GR-1089-CORE, ETS 300-132, FCC Part 15, Class A, Industry Canada

### Environmental

- Dimensions: 1U ½ 19" compact chassis, 220mm x 44mm x 212mm / 8.7" x 1.75" x 8.4" (W x H x D), ETSI-compliant
- Operating temperature: -40 to +65°C (hardened environment)
- Storage temperature: -40 to +70°C (GR-63-CORE)
- Humidity: 5 to 95%, B1 (non-condensing)
- Integrated PSU: 110/240 VAC, -48 to -72VDC or +24 to +30VDC with over-voltage and over-current protection
- Maximum power consumption: 13 Watts



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