OSCILLOQUARTZ
An ADVA Optical Networking Company

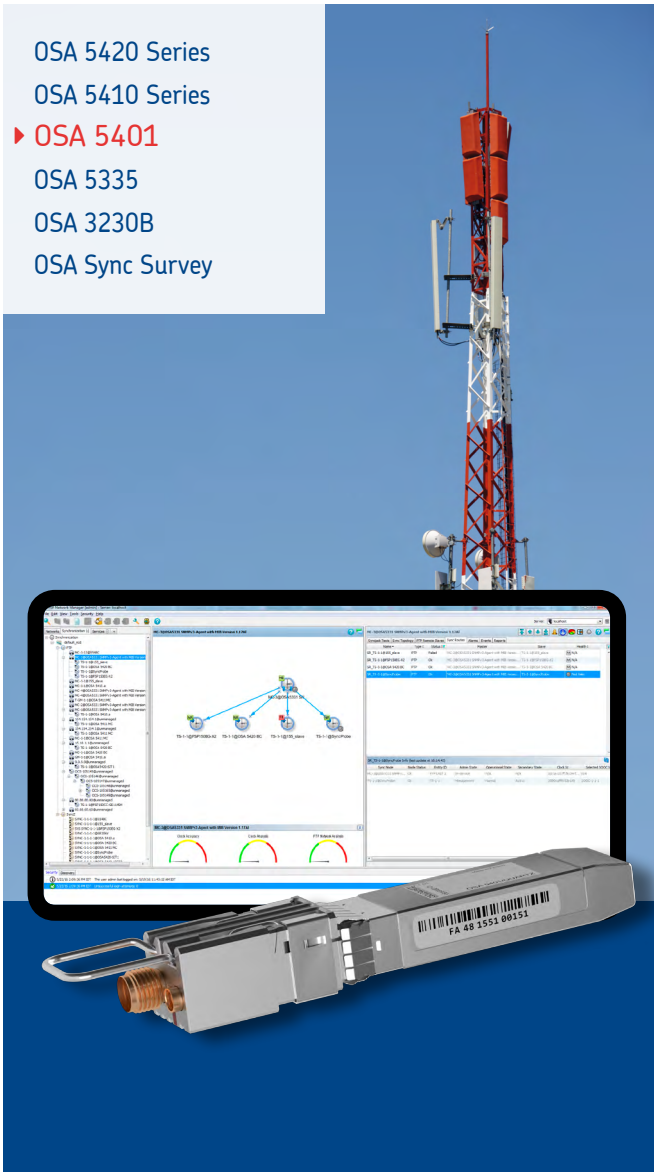
OSA 5401

SFP-Based PTP GM, Boundary and Slave Clock

Supporting higher data rates and increasing coverage challenges mobile network operators to pursue new avenues in radio access network synchronization. Air interface evolution and public small cells demand ultra-compact and cost-effective synchronization solutions for deployment deep in the radio access network.

Are you facing the challenge of synchronizing small cell base stations deployed in your radio access network? Do you have difficulties with synchronizing legacy 2G and 3G equipment when migrating your backhaul network from SONET/SDH to packet-based infrastructure? Our OSA 5401 Syncplug™ small-form factor pluggable (SFP) can help to enable precise synchronization in the most space-restrictive environments. Upgrading legacy systems with IEEE 1588v2 Precision Time Protocol (PTP) and Synchronous Ethernet functionality to support modern LTE-TDD and LTE-Advanced radio access network technology is no longer a challenge.

- OSA 5420 Series
- OSA 5410 Series
- OSA 5401
- OSA 5335
- OSA 3230B
- OSA Sync Survey



Your Benefits

ADVA Syncplug™ Technology

Distribution of highly accurate timing with smallest footprint on the market

Fully-Featured Freq. and Phase Enabler

Built-in GNSS receiver enabling PRTC and IEEE 1588v2 grandmaster (GM), boundary (BC) and slave clock (SC) functionality

Compatible

Compliant with SFP multi-source agreement (MSA) – no need for additional space and power

Extended Holdover Performance

Multiple fallback options to high-end Stratum 3E oscillator, SyncE and PTP in the event of GNSS outage

Increased System Design Flexibility

Enables decoupling of network element development from GNSS receiver implementation

Customizable

OEM product customization option for vendor branding

High-Level Specifications

OSA 5401 SyncPlug

- Small form-factor pluggable SFP
- Integrated GM/BC/slave and GNSS receiver
- Robust design
- Add-on plugs into hosting device

SFP Form Factor

- Power consumption < 1.5W
- Extended operating temp range
- MSA compliant
- Zero footprint

PTP Functionalities

- Configurable as GM, BC, slave clock and APTS
- GM supported profiles: IEEE 1588 2008 L3, ITU-T 8265.1 and ITU-T IEEE 8275.1
- All GM profiles are supported simultaneously

Timing Accuracy

- +/-100nsec from UTC
- G.8272/G.8273.1 compliant PRTC
- G.811 compliant PRC
- G.8262/G.8264 Sync-E

Management

- In-band management
- Remote and secured CLI-Telnet & SSH
- Separate management & PTP IP address
- Managed by ADVA NMS

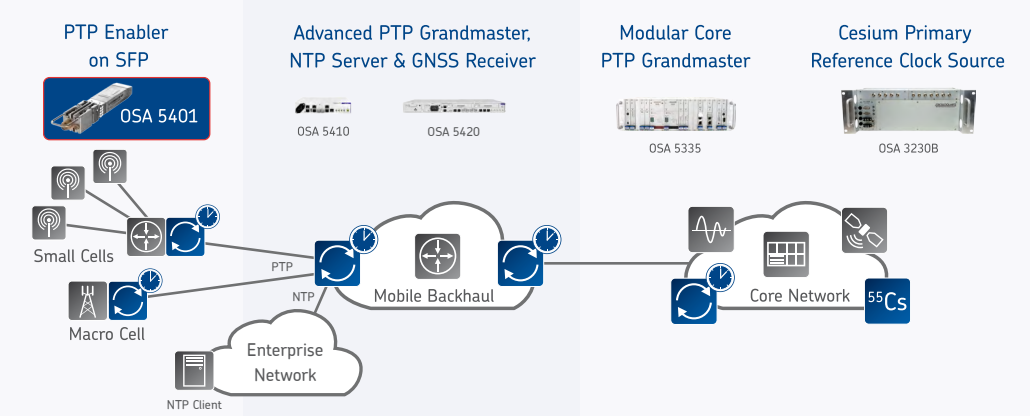
Built-in GNSS Receiver

- 72-channel multi-GNSS
- Enhanced timing features
- Dual-frequency GNSS
- GPS, GLONASS, BeiDou
- Galileo (HW ready)

Applications in Your Network

Radio Access Network Synchronization

- Upgrade of aggregation switches for delivering precise frequency and phase synchronization via Layer 2 PTP, Layer 3 PTP and SyncE
- Additional timing resiliency and GNSS jamming protection at the radio base station side
- GNSS receiver upgrade for small cells and legacy 2G/3G radio base station equipment
- PTP boundary and slave clock enabler to existing network elements such as switches and microwaves
- Low-touch provisioning and extended operating temperature range for maximum deployment flexibility and simplified operations



For more information please visit us at www.oscilloquartz.com
Data Sheet, version 10/2016

OSCILLOQUARTZ
An ADVA Optical Networking Company

Main Applications

- 1588v2 PTP grandmaster, boundary and slave clocks
- PTP to Sync-E and Sync-E to PTP conversion
- GNSS receiver operating as PRTC and PRC

PTP Master Modes of Operation

- Fully compatible with ITU-T G.8265.1 frequency delivery profiles and Telecom2008 phase delivery extensions
- Fully compatible with ITU-T G.8275.1 time/phase delivery profile (full timing support)
- Fully compatible with IEEE1588v2 default PTP profiles over L3 (Annex D)
- Designed to support ITU-T G.8275.2 time/phase delivery profile (assisted partial timing support) as well as power and enterprise profiles

PTP Slave Modes of Operation

- Fully compatible with ITU-T G.8265.1 frequency delivery profiles and Telecom2008 phase delivery extensions
- 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) as well as default, power and enterprise profiles

PTP Features

- Full featured IEEE 1588-2008 PTP grandmaster, boundary and slave clocks
- ITU-T G.8265.1 (IP/unicast) Telecom profile for frequency and time distribution
- ITU-T G.8275.1 (Eth/multicast) Telecom profile frequency and time distribution
- Grandmaster simultaneous support for multiple profiles
- Assisted partial timing support (APTS) – PTP input to backup GNSS outage over network with partial/no timing support
- 1-step clock
- Dedicated or common IP PTP interface
- VLAN (IEEE 802.1Q) or untagged
- Sync-E input to PTP output (frequency) conversion

Ethernet Interface

- SFP or SFP+ 1000Base-X (MSA compliant)

1PPS/CLK out

- User configurable output: 1PPS/10MHz/2.048MHz
- RP-MMCX connector (50 ohms)

Synchronous Ethernet (Sync-E)

- Compliant to the relevant sections of ITU-T G.8261/G.8262/G.8264
- Supported on ingress and egress
- G.811 compliant Sync-E primary reference clock (PRC) when locked to GNSS
- Ethernet synchronization message channel (ESMC)
- Sync-E input for time holdover during GNSS outage
- PTP input to Sync-E output conversion

GNSS Receiver

- 72-channel multi-GNSS engine
- Concurrent GNSS (dual frequency)
- Supports single satellite timing modes
  - Survey fixed location
  - Configurable fixed location
- Supports navigation mode
- Configurable satellites SNR and elevation masks
- GPS/QZSS L1 C/A and GLONASS L10F, BeiDou B1
- Supported modes: GPS/GLONASS/BeiDou/GPS+ GLONASS/GPS+ BeiDou
- HW ready to support (software update required)
  - SBAS L1 C/A: WAAS, EGNOS, MSAS
  - Galileo
- User configurable antenna cable delay compensation
- Voltage to antenna +3.3VDC
- Antenna connector SMA-F (50 ohms)

Internal Oscillator

- OCXO Stratum 3E (20-55°C, ΔT=+/-20ºC)

Frequency Accuracy

- G.811 compliant PRC while locked to GNSS or in backup operation using Sync-E

Time and Phase Accuracy

- G.8272/G.8273.1 compliant PRTC (±100nsec from UTC, MTIE<100nsec) while locked to GNSS
- During GNSS outage: time holdover using a G.811 PRC/G.8272 PRTC Sync-E input
  - Traceable to G.811 PRC: TimeError <UTC +/-1µsec for 24 hrs
  - Traceable to G.8272 PRTC: TimeError <UTC +/- 1µsec for 72 hrs

Indications

- GNSS operation and general fault indication status LED

Management and Security

- In-band management (over PTP/Sync-E port)
- Remote CLI – Telnet & SSH (Secure Shell)
- Separate MGMT IP & PTP address
- VLAN and untagged
- System software download via TFTP & SCP (secure copy)
- Enable to disable each of the protocol via CLI
- Alarm log, audit log and security log
- Syslog
- Remote authentication via RADIUS
- SNMP v2/v3 including authentication and encryption
- Alarms and traps reporting to NMS
- Managed as a generic SNMP device by ADVA NMS (FSP NM)

Regulatory and Standards Compliance

- ITU-T G.8261, G.8262, G.8264
- ITU-T G.8272, G.811
- ITU-T G.8265.1, G.8275.1
- IEEE 1588v2 (PTP)
- ETSI EN 300 386 V1.6.1
- EN 55024
- EN 55022 Class-B
- AS/NZS CISPR 22
- FCC CFR 47 Part 15 Subpart B
- ANSI C63.4 Class-B
- IEC/EN 61000-3-2
- IEC/EN 61000-3-3
- IEC/EN 61000-4-2 (ESD): ±15 kV / ±8 kV (air/contact)
- IEC/EN 61000-4-3 (RI)
- IEC/EN 61000-4-4 (EFT): 1 kV / 50 A (5/50 ns)
- IEC/EN 61000-4-5 (Surge): 4KV (10/700 µs)
- IEC/EN 61000-4-6 (CI)
- EN 60950-1:+A11, +A12, +2 (SAFETY)
- ROHS 6 compliance

Environmental

- Operating temperature: -40 to +80°C (-104 to 176°F)
- Storage temperature : -40°C to +85°C (-104 to 185°F)
- Humidity: 5 to 95% (non-condensing)

Power Consumption

- Max power consumption <1.5W (T >20°C)
- Max power consumption <1.7W (T <20°C)

Optional Accessories

- GNSS (GPS/GLONASS/BEIDOU) antenna kits 10/20/60/120/150m (32.8ft/65.6ft/ 196.85ft/ 393.7ft/492.1ft), including indoor and outdoor cables, roof antenna, lighting protector and mounting kit
- Patch window antenna
- 1:2/1:4/1:8 GNSS (GPS/GLONASS) splitters
- RP-MMCX to BNC adapter cable