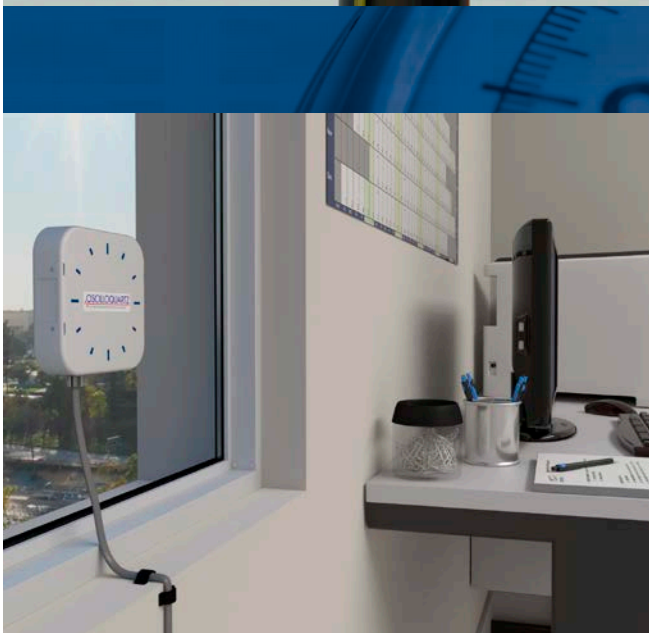


For maximum benefits, small cells need tight synchronization. With our OSA 5405 SyncReach™, this is easier than ever before. It features a unique dual antenna that enables it to deliver accurate and affordable small cell synchronization even in urban canyons.

A clear sky view is no longer essential for accurate and reliable GNSS-based synchronization. Our OSA 5405 can be deployed in deep urban canyons closer to where small cells are located. This avoids the archaic and expensive RF cable feeds of typical GNSS installations. Instead, the OSA 5405 uses cost-effective Ethernet cabling and offers both electrical and optical interfaces. Our OSA 5405 comes in two variants: the OSA 5405-O for outdoor installations on a wall or a pole; and the OSA 5405-I for indoor installations at windows or interior walls. Indoor- or outdoor-mounted, even at street level in deep urban canyons, our OSA 5405 offers unprecedented flexibility. And, with its dual GNSS receivers and PTP grandmaster, it delivers the accurate timing that small cells require.



### Your Benefits

#### ✓ Optimum Design for Small Cells

Compact, cost-effective design for indoor and outdoor applications close to small cells

#### ✓ No Clear Sky View Needed

Unique solution that uses the reflected (multipath) signal to achieve excellent synchronization performance even at street level

#### ✓ Unique Indoor Dual GNSS Antenna

Built-in dual GNSS receivers and antennas enabling PRTC and IEEE 1588v2 grandmaster

#### ✓ Simple Installation and Maintenance

Powered over Ethernet. No need for RF cables and no need to correct for cable delays

#### ✓ Compact and Green Design

Distribution of accurate timing with the smallest size and power footprint on the market

#### ✓ Operational Simplicity with Assurance

Powered by our Syncjack™ technology, the system offers comprehensive monitoring and service assurance

## High-Level Specifications

### OSA 5405 Series Highlights

- Cost-effective sync delivery
- Small form-factor PTP GM and GNSS receiver
- Robust design
- Combo fiber/copper Ethernet interface

### OSA 5405 Indoor

- Indoor cost-effective installation
- Enhanced indoor reception
- Optional external antenna input
- Small footprint for window- or wall-mounting

### OSA 5405 Outdoor

- Ruggedized outdoor housing for harsh environments
- Extended temperature range
- Excellent performance even at ground level
- Wall, pole and cabinet mount

### GNSS Receivers

- Dual 72-channel multi-GNSS
- Dual simultaneous GNSS frequencies
- GPS, GLONASS, BeiDou and GALILEO
- Dual receiver algorithm

### PTP Profiles & Operation Modes

- GM-supported profiles: IEEE 1588 2008 L3, ITU-T 8265.1 and ITU-T 8275.1
- All GM profiles supported simultaneously
- PTP and Sync-E inputs fallback options

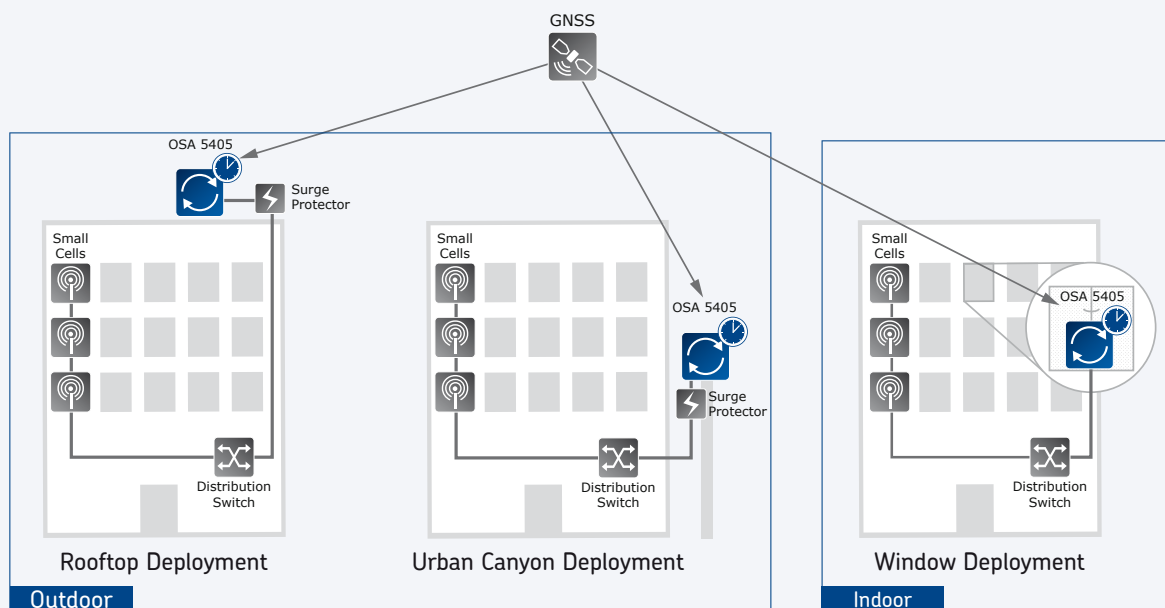
### Management

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

## Applications in Your Network

### Small Cells and Macro Cells Synchronization

- Unprecedented flexibility in positioning the GNSS antenna: rooftop, street-level and indoor options
- Simplified installation with single Ethernet cable rather than multiple RF feeds
- Highly precise GNSS-sourced synchronization with network-based PTP backup
- Efficient operation with comprehensive Syncjack™ assurance functions



For more information please visit us at [www.oscilloquartz.com](http://www.oscilloquartz.com)  
Data Sheet, version 09/2017

**OSCILLOQUARTZ**  
An ADVA Optical Networking Company

## PTP Features

- Full featured IEEE 1588-2008 PTP grandmaster, boundary and slave clocks
- 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
- Maintain PTP slaves list
- Fixed asymmetry compensation

## PTP Master Modes of Operation

- Up to 64 unicast slaves @ 128 pps
- ITU-T G.8265.1 & Telecom2008 frequency delivery profiles
- ITU-T G.8275.2 time/phase delivery profile (APTS & partial timing support)
- ITU-T G.8275.1 time/phase delivery profile (full timing support)
- IEEE1588v2 default PTP profiles over L3 (Annex D)
- PTP enterprise profile (Mixed IP multicast and unicast)
- Designed to support power and broadcast profiles (HW ready)
- Grandmaster simultaneous support for multiple profiles

## PTP Slave Modes of Operation

- ITU-T G.8265.1 & Telecom2008 frequency delivery profiles
- ITU-T G.8275.2 time/phase delivery profile (APTS & partial timing support)
- ITU-T G.8275.1 time/phase delivery profile (full timing support)
- IEEE1588v2 default PTP profiles over L3 (Annex D)
- PTP enterprise profile (Mixed IP multicast and unicast)
- Designed to support power and broadcast profiles (HW ready)

## Syncjack™ Monitoring and Assurance Tools

- Clock Accuracy for up to two Clock Probes – computing TE, TIE and MTIE of physical clocks
  - Calculation TE/TIE between physical source and reference signals
  - Programmable source and reference signals including SyncE, GNSS, PTP recovered clock.
  - TE/TIE raw data collection and export to server
- Clock Analysis for up to two PTP Clock Probes – packet TE/TIE
  - Calculation of packet TE/TIE between physical reference signal and timestamps within the PTP packets

- Programmable reference signals including SyncE and GNSS
- TE/TIE raw data collection and export to server

## Ethernet Interfaces

- Hardware-based timestamping
- One combo 1000BaseT (copper) or 1000BaseX (SFP - fiber) port
- Fiber port support SM/MM colored/non-colored SFP and single fiber SFP

## Synchronous Ethernet (Sync-E)

- Compliant to the relevant sections of ITU-T G.8261/ G.8262/G.8264
- Supported on ingress and egress
- Ethernet synchronization message channel (ESMC)
- Sync-E input for time holdover during GNSS outage

## GNSS

- Dual-, independent 72-channel multi-GNSS engines and antennas
- Concurrent GNSS (triple frequency)
- Supports single satellite timing modes
  - Survey fixed location
  - Configurable fixed location
- Navigation mode
- Configurable satellites SNR and elevation masks
- GPS/QZSS L1 C/A and GLONASS L10F, BeiDou B1
- Supported modes: GPS/ GLONASS/ BeiDou/ GALILEO/GPS+ GLONASS/GPS+ BeiDou/ GPS+GALILEO
- HW ready to support (software update required)
  - SBAS L1 C/A: WAAS, EGNOS, MSAS

## External Antenna (OSA 5405-I)

- User-configurable antenna cable delay compensation
- Voltage to antenna +3.3VDC
- Antenna connector SMA-F (50 ohms)

## 1PPS/CLK Out (OSA 5405-I)

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

## Internal Oscillator

- OCXO Stratum 3E

## Indications

- GNSS operation, general fault indication and network status LEDs

## 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
- Backup and restore
- Multi-Level user Access
- SNMP v2/v3 including authentication and encryption
- Alarms, inventory and traps reporting to NMS
- Managed 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, G.8275.2
- IEEE 1588v2 (PTP)

### Power Consumption

- Max power consumption 6W (including SFP)
- IEEE 802.3at type 1 powered device
- PoE class 2 (low power)

### Mechanical

- 5405-I:
  - Size: 105mm (W) x 105mm (H) x 25mm (D)
  - Weight: 220g
- 5405-O:
  - Size : 107mm (W) x 142 mm (H) x 32 mm (D)
  - Weight: 490g

### Environmental

- 5405-I:
  - Operating temperature: -25 to +65°C
  - Storage temperature : -40 to +70°C (GR-63-CORE, ETS 300 019-1-1)
  - Humidity: 5 to 95% (non-condensing)
- 5405-O:
  - Enclosure sealing: IEC 60529 IP65
  - Operating temperature: -40 to +70°C
  - Storage temperature : -40 to +70°C (GR-63-CORE, ETS 300 019-1-1)
  - Humidity: < 5% to 100% condensing (GR-3108-CORE Class 2,3,4, ETSI EN300 019-1-3.3, 3.4,

4.1E, 4.2H)

### Installation

- Indoor: window-mount or wall-mount
- Outdoor: wall-mount or pole-mount on roof or cabinet

### Optional Accessories

- PoE injector
- SM or MM SFPs
- 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, lightning protector and mounting kit
- Lightning protector (for 5405-O)