OSA 5405 Series

In-/outdoor GNSS antenna with integrated receiver, PTP GM and NTP server

From 4G and 5G mobile networks, through power utilities to modern broadcast services, mission-critical applications demand ultra-compact and cost-effective synchronization solutions for deployment deep in the network with minimal footprint and power consumption. With our OSA 5405 SyncReach™, this is easier than ever before. It features a unique dual GNSS antenna that enables it to deliver accurate synchronization even in urban canyons. Installation complexity and cost traditionally associated with the use of GNSS are reduced to a minimum.

Our OSA 5405, a smart GNSS antenna with integrated GNSS receiver and PTP/NTP stacks, can be deployed in deep urban canyons closer to where end applications that require tight synchronization, such as 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 on 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, PTP grandmaster and NTP server, it delivers the accurate timing that mission-critical applications require.

Your benefits

- ✅ **Unique indoor dual GNSS antenna**
  Built-in dual GNSS receivers and antennas enabling NTP and IEEE 1588v2 time servers

- ✅ **No clear sky view needed**
  Unique solution that uses the reflected (multipath) signal to achieve excellent synchronization performance even at street level

- ✅ **Advanced jamming and spoofing detection**
  Advanced jamming and spoofing detection on device and management levels

- ✅ **Simple installation and maintenance**
  Powered over Ethernet. No need for RF cables and no need to correct for cable delays

- ✅ **Operational simplicity with assurance**
  Powered by our Syncjack™ technology, the system offers comprehensive monitoring and service assurance

- ✅ **Compact and green design**
  Distribution of accurate timing with the smallest size and power footprint on the market

High-level specifications

OSA 5405 series highlights

- Cost-effective sync delivery
- Small form-factor PTP grandmaster, GNSS receiver and NTP server
- 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-, wall- or rack-mounting

OSA 5405 outdoor

- Ruggedized IP 66 compliant 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/L2 and ITU-T 8265.1 / 8275.1 / 8275.2 / Power / Broadcast / Enterprise
- PTP over IPv4 and IPv6 supported simultaneously
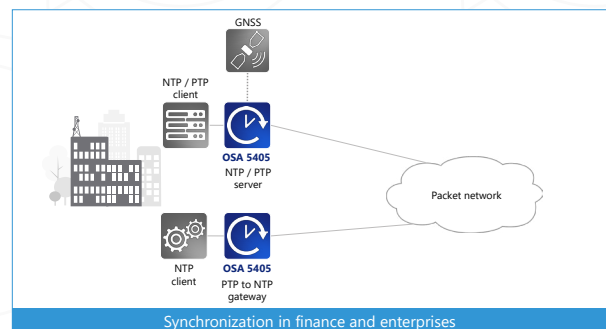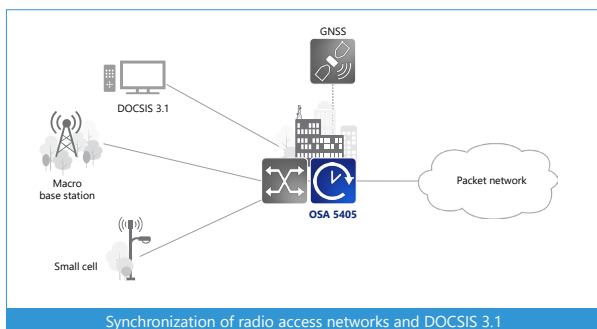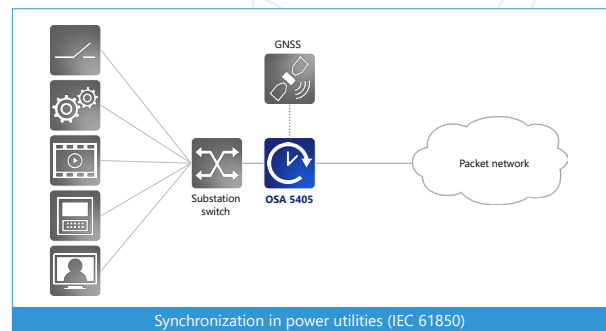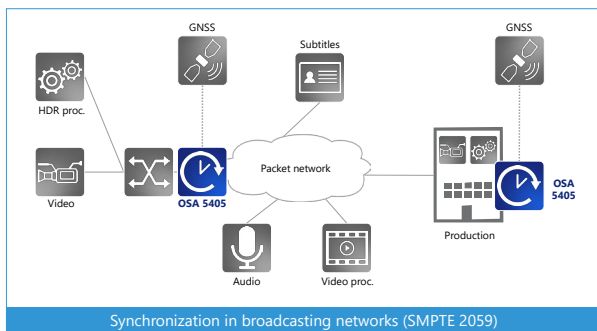- PTP and Sync-E inputs fallback options

Management

- In-band management over IPv4 and IPv6
- Remote and secure CLI-Telnet and SSH
- Separate management and PTP IP address
- Ensemble network management and control

Applications in your network

Highly precise GNSS-sourced synchronization with network-based PTP backup

- Radio access network synchronization including 3G, 4G, 5G (femtocells and small cells as well as macro cells)
- Cable networks (DOCSIS 3.1) and PON synchronization
- Modernized power utilities and media broadcast networks
- Time-as-a service into data center, financial, health and media networks

Synchronization in broadcasting networks (SMPTE 2059)

Synchronization in power utilities (IEC 61850)

Synchronization of radio access networks and DOCSIS 3.1

Synchronization in finance and enterprises

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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
- Conversion between PTP profiles
- Maintain PTP slaves list
- Fixed and dynamic asymmetry compensation

PTP master modes of operation

- PTP telecom profiles:
  - 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)
- PTP enterprise profile (Mixed IP multicast and unicast)
- PTP power and utilities profiles
  - IEC/IEEE 61850-9-3
  - IEEE C37.238-2011
  - IEEE C37.238-2017
- PTP Broadcast profiles:
  - SMPTE ST 2059-2
  - AES67 media profile
- IEEE1588v2 default PTP profiles over L3 (Annex D and E) and L2 (Annex F)
- Up to 64 unicast slaves @ 128 pps

PTP slave modes of operation

- PTP telecom profiles:
  - 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) and L2 (Annex F)
- PTP enterprise profile (Mixed IP multicast and unicast)
- Designed to support power and broadcast profiles (HW ready)

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

Syncjack™ monitoring and assurance tools

- Clock accuracy for up to two clock probes – computing TE and TIE 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

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
- Advanced spoofing and jamming detection on device level
- AI based spoofing and jamming detection based on NMS GNSS assurance
- GPS/QZSS L1 C/A and GLONASS L10F, BeiDou B1
- Supported modes: GPS/ GLONASS/ BeiDou/GALILEO/ GPS+ GLONASS/GPS+ BeiDou/GPS+GALILEO, GPS+SBAS (QZSS ,WAAS, EGNOS, MSAS)

NTP Server

- Smallest NTP server formfactor
- Security-hardened NTP server with Hardware-based responder
- Stratum 1 NTP server when locked to GNSS
- NTP v1, v2, v3 ,v4 and SNTP over IPv4 /IPv6
- Hardware-based timestamping
- Within +/–100nsec from UTC
- Hardware base DoS protection using NTP responder
- Up to 500,000 transactions per second
- Support PTP and NTP on same port
- PTP to NTP translation
- PTP backup in case of GNSS outage
- Stationary or moving platforms

Product specifications are subject to change without notice or obligation.

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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

Management and security
- In-band management (over PTP/Sync-E port)
- IPv4 and IPv6 supported
- Remote CLI - Telnet & SSH (Secure Shell)
- Separate MGMT IP & PTP address
- VLAN and untagged
- IGMP
- System software download via TFTP & SCP (secure copy)
- Enable to disable each of the protocol via CLI
- Alarm log
- Syslog
- Remote authentication via RADIUS
- Remote, secured backup and restore
- Remote, secured SW upgrade
- Low touch provisioning using configuration file
- Multi-Level user Access
- Access control list (ACL)
- Full management using SNMP v2/v3 including authentication and encryption
- Alarms, inventory and traps reporting to NMS
- Managed by ADVA Ensemble Controller and Ensemble Sync Director, including GNSS assurance toolkit

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
- IEC/IEEE 61850-9-3 , IEEE C37.238-2011/2017
- SMPTE ST 2059-2, AES67
- IEEE 1588 2008 (PTPv2)
- IEEE 1588v2 (PTP)
- RoHS compliance

Power consumption
- Max. power consumption: 3W (without SFP)
- IEEE 802.3at type 1 powered device
- PoE class 0

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, IP66
  - 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-, wall- or rack-mount
- Outdoor: wall-mount or pole-mount on roof or cabinet

Optional accessories
- PoE injector
- SM or MM SFPs
- GNSS (GPS/GLONASS/BeiDou/Galileo) 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
- Lightning protector (for 5405-O)
- Rack mounting option (OSA 5405-I with external antenna)

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