

# OSA 453X Series

## Highly Compact GPS and GPS-less Synchronisation Receivers and Re-Timers

The existing and emerging standards in the world of mobile telecommunications and digital broadcasting demand the highest quality of synchronisation. A proper timing signal therefore becomes more and more important for media centres as well as for cellular networks where location services such as E911 will have more importance.

Oscilloquartz has built the engine of its highly successful **OSA 5581C GPS-SR** into a single casing format complete with an integrated power supply (12V or 24V / 48V), so as to provide a flexible Time & Frequency solution to customers requesting a highly compact single input/output timing unit or needing a one traffic channel retiming unit.

The unique architecture of the **OSA 453X Series** is designed to maintain the strict CDMA holdover specifications. The **OSA 453X Series**

are also a natural choice as a synchronisation source for UMTS, WCDMA and cdmaOne, as well as GPRS, CDMA and TDMA base station and mobile switches. Their 1 PPS and 10MHz outputs make them ideal for synchronising DAB/DVB equipment.

**Common features:** All models provide standard 1 PPS, 10 MHz and TOD (Time Of Day) outputs referenced to UTC<sup>1</sup>. All models include a highly accurate oven-controlled oscillator, which filters the reference signal and provides a holdover quality comparable to that of an SSU in case of loss of external reference.

The **OSA 4530/1/2 GPS** are **GPS Receivers** providing E1/DS1/2.048 MHz outputs according to ITU-T G.703-X. Models 4531/2 also accept an auxiliary E1/DS1/MHz reference as a robust alternative to GPS.

The **OSA 4533/4 GPS** and **OSA 4535/6**

**RTM** are **Re-Timing Modules** that re-time one E1 or DS1 traffic signal. Models 4533/4 take GPS as reference, while 4535/6 smooth out timing impairments from the traffic signal and therefore need no external reference.

### Control software

All equipment of the OSA 453x series are manageable via the OSA Control and Monitoring (CM) software that gives full control on all their functionalities via an intuitive MS-Windows based graphical user interface. As an example, 4533/4/5/6 Re-timing Modules, together with the unit's operational state, allow to examine the number of slips counted during the last hour / day / week by the equipment.

All units feature an alarm relay contact which allows to activate a local or remote alarm system when no serial management link is available.

<sup>1</sup> When the system is locked on GPS, except models 4535/6 that are GPS-less

### Highlights :

- Economic, reliable and compact, in the standard 5" x 4" x 2" format
- Possibility for one auxiliary input: E1, DS1, or frequency (4531/2 models)
- Various output options: ITU-T G.703-X compliant E1 / DS1 / 2.048MHz
- Models with GPS can provide UTC-derived timing information through:
  - UTC-locked 1 PPS output
  - TOD compliant to NMEA0183
- Re-timing of one E1 / DS1 traffic signal
- Integrated high stability holdover functionality:
  - Frequency stability < 1 x 10<sup>-10</sup> / day (typical)
- ITU-T G.811 / ST1 compliant when locked to GPS
- ITU-T G.812 (I, V, VI) compliant holdover
- ITU-T G.812 (I, V, VI) filtering of auxiliary input

## OSA 453X Series



The leading partner for your  
synchronisation needs



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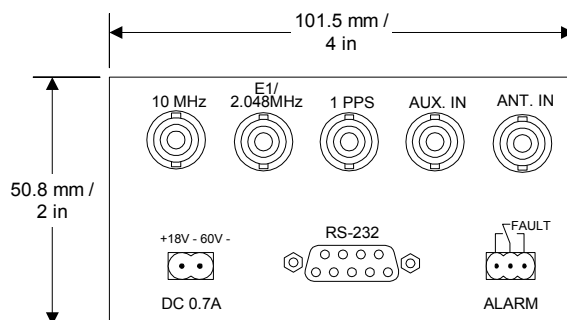
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# Technical specifications 453X

## Typical Applications

- GPS-based synchronisation for cellular networks like UMTS, GPRS and CDMA
- GPS-based and GPS-less re-timing of traffic signals for mobile base stations
- Synchronization of DAB and DVB equipment
- Specialised ATM and LAN/WAN sync requirements
- Sync sources for test equipment and instruments
- Power utilities and public services

	GPS Antenna	E1/Freq.	DST1/Freq.	1 PPS	10 MHz	E1 / 2MHz	DST1 / 2MHz	E1 Traffic	DST1 traffic	NMEA 0183
4530	✓			✓	✓					✓
4531	✓	✓		✓	✓	✓				✓
4532	✓		✓	✓	✓		✓			✓
4533	✓			✓	✓			✓		✓
4534	✓			✓	✓				✓	✓
4535		✓		✓	✓			✓		
4536			✓	✓	✓				✓	
	Input			Output				ReTime	Tod	



Example of connectors position (4531 GPS)

### Performance when locked to GPS-signal:

- G.703-x outputs compliant to ITU-T G.811/ST1
- 1 PPS accuracy: < 100 ns pp (at constant temp.)  
< 150 ns pp (at variable temperature, -5°C to +55°C)
- ADEV < 10<sup>-12</sup> (10'000 seconds)

### Environmental characteristics (OSA 453x GPS-SB):

- Operational: -5°C to +55°C
- Storage: -40°C to +85°C
- Humidity: 95% non-condensing
- CE mark: EN50081/ EN50082 / EN60950
- Constructed for working under harsh conditions, as described in ETS 300-019-2-3.2
- Physical (HxWxD): 50,8mm(2")x101.5mm(4")x127.0mm(5")

### Output signals specifications:

- 1 PPS: 200ms width, < 20ns rise time, 2.5 Vpp/50 Ω
- 10 MHz: 1 Vrms sine, 50 Ω
- 2.048 MHz: Compliant with ITU-T G.703-13
- E1: Compliant with ITU-T G.703-9
- DS1: Compliant with ITU-T G.703-5

### Antenna data (other active antennas possible):

- Frequency: L1 (1'575 MHz)
- Polarization: Right-Hand Circular Polarization
- VSWR: 2:1
- Gain: 35 dB (nominal)
- Noise: 2.75 dB (nominal)
- Pass-band width: 50 MHz
- Azimuth: 360° (omni-directional)
- Elevation: 0° to 90° (hemispherical)
- Power supply: +5V DC (±10 %)
- Consumption: 22 mA (nominal)
- Operational: -40°C to +85°C
- Storage: -55°C to +100°C
- Vibration: 0.04 g<sup>2</sup>/Hz (10 Hz to 500 Hz)  
0.03 g<sup>2</sup>/Hz (501 Hz to 850 Hz)  
0.02 g<sup>2</sup>/Hz (851 Hz to 1'200 Hz)
- Shock: 40 gram
- Humidity: 95 % non-condensing
- Salt Fog: Mil.Std. 202F, Method 101D Cond. B
- Waterproof: Submersion to 1 meter
- Dimensions : Ø77.3mm(3.04"), H:74.6mm(2.94")
- Weight : 100 grams

### Connectors:

- BNC for 4530/4531/4533/4535
- Sub-D 9 pins on 4532/4534/4536

### Power Supply:

- 9-18 VDC or 18-60 VDC
- Optional 96-260 VAC external power supply

### Management:

- RS -232C on DB9 connector
- 1 alarm relay contact
- TOD (Time-Of-Day) output compliant to NMEA0183
- GUI-based Configuration and Monitoring software

### Hold-Over performances:

- Long term stability : 1x10<sup>-10</sup>/day, 2x10<sup>-8</sup>/year
- Frequency stability: 6x10<sup>-10</sup> pp (-5°C to +55°C)

### Antenna Cables (connectors included):

- 20 meters (RG58)
- 60 meters (RG213)
- 120 meters (2x60 meters RG213, with line amplifier)

Oscilloquartz SA reserves the right to change all specifications contained herein at any time without prior notice.

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