

# OSA 5581C GPS

## Synchronisation Receiver



- ▶ Fully redundant GPS receiver + sync distributor in a single box.
- ▶ Highly flexible : up to 64 outputs or up to 24 re-timing channels or a combination of both.
- ▶ ITU-T G.811 Reference when locked to GPS.
- ▶ ITU-T G.812 Reference when locked on auxiliary input or when in holdover.
- ▶ Stratum 1 NTP Reference (FRC1305)
- ▶ Fully manageable, both locally (RS-232) and remotely (10BaseT Ethernet) via SyncView™ synchronisation management software.
- ▶ High quality holdover capability : Compliant to G.812 (I,II,V,VI) SSU.
- ▶ Input signals : Up to two GPS modules with two external sync inputs.
- ▶ Re-timing function : Re-timing of both E1 and T1 traffic carrying signals.
- ▶ Output signals : 2.048Mbit/s (E1), 1.544 Mbit/s (T1), 64/8 Kbit/s Composite Clock, 2.048/5/10 MHz.
- ▶ Output protection : Protected (1:1) and unprotected mode.
- ▶ Output connectors : Wide choice of connectors in both balanced and unbalanced configuration.
- ▶ Synchronisation Status Message (SSM)
- ▶ Time distribution: NTP (RFC1305) on IRIG-B

The leading partner for your  
synchronisation needs

## General Information

Telecom networks which are out of synchronisation often suffer from bit errors and slow transmission rates. Without precise timing, transmissions can lose some information during transport, particularly in the realm of optical transport data network and broadband systems. As new standards emerge in the world of mobile telecommunications and digital broadcasting, the high quality of the synchronisation signal becomes increasingly important for cellular operators and media centres.



## Overview

The OSA 5581C GPS is a GPS synchronisation receiver and distributor specially designed to eliminate these problems.

All critical parts in the OSA 5581C GPS, including the GPS input & holdover unit, can be duplicated to ensure high availability.

## Input & Holdover

The OSA 5581C GPS can be equipped with **dual redundant GPS input & holdover modules** to provide unparalleled reliability. Each module features one GPS receiver and one auxiliary input reference accepting E1 or T1 signals or an auto detected frequency (1.544, 2.048, 5 or 10 MHz).

Thanks to its modularity, the equipment can also be configured with only one GPS input & holdover module for lower cost applications; upgrading to a fully-redundant dual channel solution at a later stage is made possible by simply inserting the necessary modules in their respective slots. In cases where all GPS signals and external sync inputs are lost, the internal oscillator enters into holdover mode to deliver both frequency and time-of-day information autonomously.

In holdover mode, the frequency output shows a frequency drift better than  $1 \times 10^{-10}$  / day (OCXO) or  $5 \times 10^{-11}$  / month (Rb).

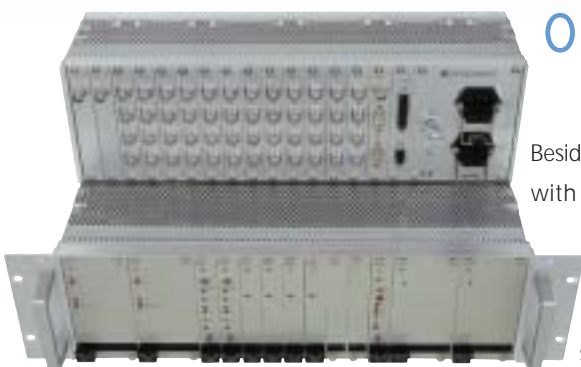


## Output and Re-timing

Besides featuring a top-quality GPS receiver with holdover capability, the OSA 5581C GPS provides also, in the same box, synchronisation distribution and/or re-timing, avoiding the need for separate equipment (and additional

management connections).

It can provide **up to 64 output synchronisation signals** of telecom formats (E1, T1, and/or various frequencies), **up to 24 E1/T1 re-timing channels** or a combination of outputs, re-timing, and SSM.



# Timecode

The OSA 5581C GPS can be fitted with an **NTP module to obtain a Stratum 1 NTP server** providing accurate, GPS-referenced time information on IP networks, and further taking advantage of the existing dual redundant GPS reference. To add NTP functionality you just have to fit an NTP module in your OSA 5581C GPS :

compare this elegant approach with the burden of installing another separate GPS receiver with its expensive GPS antenna and cabling; moreover, you also benefit of a high quality oscillator in case of GPS failure. Besides NTP, other timing protocols can be made available on request.

# Management

The OSA 5581C GPS is manageable in three different ways :

- Locally, through the RS-232 port using the OSA Local Manager for 5581C, a graphical, intuitive, windows-based application.
- Remotely, through the RS-232 port and modem connection, by using the same Local Manager coupled with the OSA Remote Access Manager software.
- Remotely, through TCP/IP connection to the network management centre, by using Oscilloquartz' professional Management System SyncView™.

# Applications

There are many applications for the OSA 5581C GPS: It is ideal as a **low cost ITU-T G.811 Primary Reference Clock**.

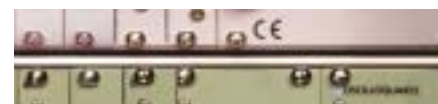
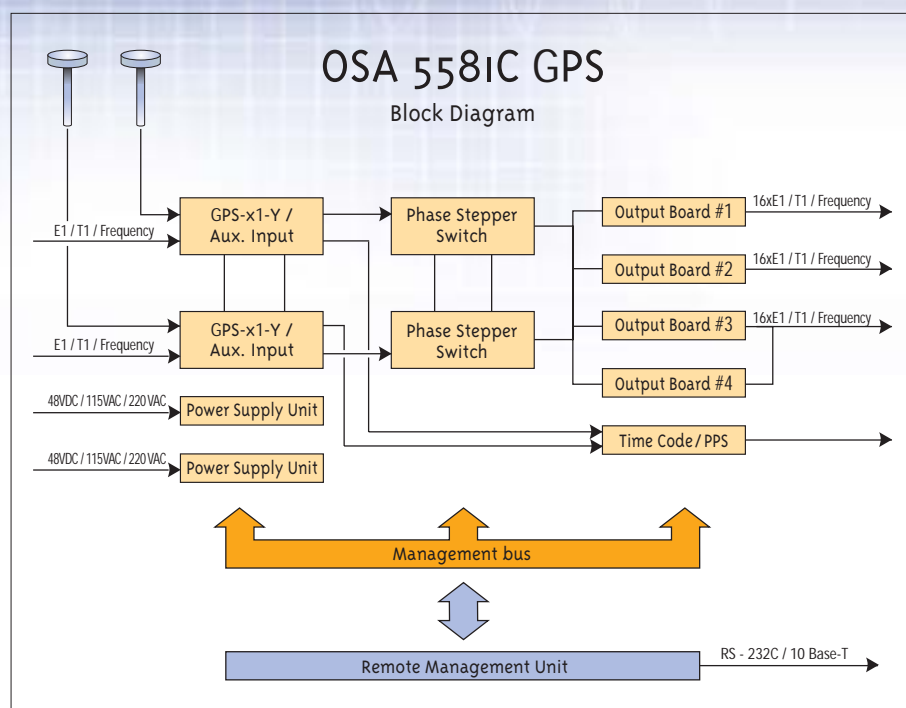
Its excellent internal oscillators attenuate the GPS-specific jitter & wander and deliver a frequency signal complying to ITU-T G.811, even under harsh temperature conditions.

A GPS receiver used as the central PRC of an SDH- or SONET-based synchronisation network is required to have a high availability for this applications, the **Dual GPS receiver configuration** is the appropriate solution .

**OSA 5581C GPS are also be used as a telecom node clocks** to synchronise networks based primarily on GPS as a means to distribute synchronisation. Node clocks distribute synchronisation to all telecom equipment in their building or node, e.g. ADMs and DXCs in SDH or SONET network, digital switches, ATM switches. ITU-T G.811 performance is a prerequisite in nodes with international switches.

A GPS-based synchronisation distribution does not require the same complex synchronisation distribution plan, as it is the case with conventional SDH- or SONET-based master/slave distribution. A distributed synchronisation plan architecture greatly simplifies the design and the maintenance of the synchronisation networks.

Some telecom equipments also require time-of-day information for e.g. billing and time-stamping. The OSA 5581C GPS provides all the necessary output time signals. The UTC-locked phase signal is useful in mobile networks, where base transceiver stations can be frame synchronised for better handover performances.



# Technical Specifications

## OSA 5581C GPS

### Synchronisation Receiver

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|---|--|
| <p><b>Physical dimensions ( HxWxD ) :</b></p> <ul style="list-style-type: none"> <li>➤ ETSI : 6U (266x535x240) mm</li> <li>➤ 19" : 3U (133x483x270) mm</li> </ul>   | <p><b>Re-timing :</b></p> <ul style="list-style-type: none"> <li>➤ Retiming of up to 24 traffic-carrying E1/T1 signals</li> </ul>  |
| <p><b>Power :</b></p> <p>Up to 2 power supplies in any combination of :</p> <ul style="list-style-type: none"> <li>➤ 36-60 VDC</li> <li>➤ 65-132 VAC</li> <li>➤ 150-265 VAC</li> </ul>  | <p><b>Input :</b></p> <ul style="list-style-type: none"> <li>➤ Up to 2 x GPS inputs</li> <li>➤ Up to 2 x auxiliary inputs (choice of) :             <ul style="list-style-type: none"> <li style="width: 50%;">• 2.048 MHz</li> <li style="width: 50%;">• 1 MHz</li> <li style="width: 50%;">• 2.048 Mbit/s (E1)</li> <li style="width: 50%;">• 1.544 MHz</li> <li style="width: 50%;">• 1.544 Mbit/s (T1)</li> <li style="width: 50%;">• 5 MHz</li> <li style="width: 50%;">• 64/8 Kbit/s (CC)</li> <li style="width: 50%;">• 10 MHz</li> </ul> </li> </ul> |
| <p><b>Time-code output :</b></p> <ul style="list-style-type: none"> <li>➤ Network Time Protocol (RFC 1305)</li> <li>➤ IRIG-B</li> </ul>   | <p><b>Oscillators, GPS input and holdover module :</b></p> <ul style="list-style-type: none"> <li>➤ GPS-x1-A : Rubidium</li> <li>➤ GPS-x1-B : Oven-controlled Oscillator OCXO</li> </ul>   |
| <p><b>Antenna cables :</b></p> <ul style="list-style-type: none"> <li>➤ ≤ 10m: RG213 (interconnection cable, included)</li> <li>➤ ≤ 20m: RG58</li> <li>➤ ≤ 60m: RG213</li> <li>➤ ≤ 120m: 2 x RG213 + line-amplifier</li> <li>➤ &gt; 120m: Contact your OSA representative</li> </ul>  | <p><b>Performance when locked to GPS signal :</b></p> <ul style="list-style-type: none"> <li>➤ 1 PPS within ±50 ns from UTC (peak-to-peak).</li> <li>➤ Sync output compliant to :             <ul style="list-style-type: none"> <li>• ITU-T G.811 Primary Reference Clock</li> <li>• Telcordia GR-2830-Core Stratum 1</li> </ul> </li> <li>➤ ADEV : &lt; 10E-12 (&lt; 20'000 seconds)</li> </ul>  |
| <p><b>Output signals :</b></p> <ul style="list-style-type: none"> <li>➤ 1 PPS, locked to UTC</li> <li>➤ Up to 64 (32 protected) outputs<sup>1</sup> selectable in groups of 16 among<sup>2</sup> :             <ul style="list-style-type: none"> <li style="width: 50%;">• 2.048 MHz</li> <li style="width: 50%;">• 64/8 Kbit/s (CC)</li> <li style="width: 50%;">• 2.048 Mbit/s (E1)</li> <li style="width: 50%;">• 5 MHz</li> <li style="width: 50%;">• 1.544 Mbit/s (T1)</li> <li style="width: 50%;">• 10 MHz.</li> </ul> </li> <li>➤ SSM</li> </ul> | <p><b>Holdover performance</b><br/>(with Rubidium-based GPS-x1-A input module) :</p> <ul style="list-style-type: none"> <li>➤ Long term stability : ±5E-11/month (after three months of continuous operation)<br/>±5E-10/year</li> <li>➤ Frequency stability : ±1E-10 pp (-5°C to +55°C)</li> </ul>  |
| <p><b>Management :</b></p> <ul style="list-style-type: none"> <li>➤ Local Manager through RS-232C connection</li> <li>➤ Remotely manageable through RS-232C + modem via RAM for Local Manager (see separate Remote Access Manager datasheet)</li> <li>➤ Remotely manageable through any IP network via the OSA SyncView™ Synchronisation Management System</li> </ul>   | <p><b>Holdover performance</b><br/>(with OCXO-based GPS-x1-B input module) :</p> <ul style="list-style-type: none"> <li>➤ Long term stability : ±1E-10/day (after 30 days of continuous operation)<br/>±2E-8/year</li> <li>➤ Frequency stability : ±6E-10 pp (-5°C to 55°C)</li> </ul>   |

<sup>1</sup> For certain types of connectors, max. no of outputs is 48

<sup>2</sup> E1 output cards cannot be mixed with T1 or CC output cards in the same equipment

