

## OSA 6500B PRC

Primary Reference Clock

TELECOM NETWORKS

DIGITAL BROADCASTING

TIME & FREQUENCY



### Synchronization significantly impacts network performance.

The global demand for telecommunications is increasing at an incredible pace resulting in networks becoming more and more sophisticated. The same is true for synchronization elements as they are fundamental to any telecommunications network.

The quality and precision of clocking equipment has a significant impact on a network's performance. Digital networks require a reliable supply of accurate and stable synchronization.

Precision, Stability, Innovation, Support

## Primary Reference Clock

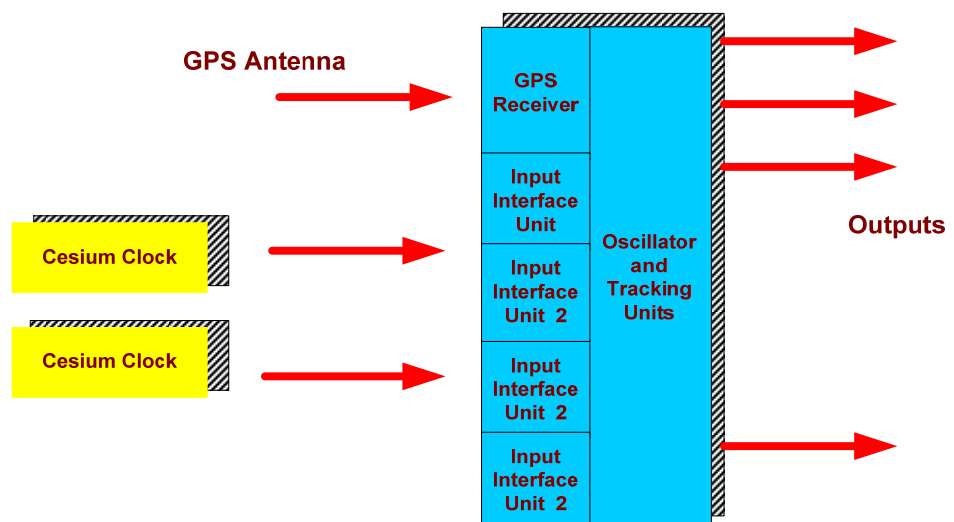
### Highlights

- Managed PRC with interface to SyncView™
- One or more Cesium primary references
- Exceeds G.811, ETSI and Telcordia requirements
- UTC traceability from integrated GPS Receiver
- User definable priority table
- $\pm 5 \times 10^{-12}$  accuracy
- Single site or distributed configurations
- 112 or more outputs
- Input qualification of references with MTIE & TDEV
- SSM handling

The ITU-T Recommendation G.811 states that a PRC provides the reference signal for the synchronization of other clocks within a network. The long-term accuracy of the PRC should be maintained at one part in  $10^{11}$  or better with verification to Co-ordinated Universal Time (UTC). The synchronization reference frequency is usually generated by Primary Reference Clocks (PRCs) and distributed through the network.

The availability requirements of SDH based networks entails the use of multiple-site PRC systems.

### Architecture



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### Flexible Approach

A PRC may be an autonomous clock, alternatively, it can be a non-autonomous clock that is locked to UTC-derived signals. In either case, the requirements for long-term accuracy and short-term stability still apply.

Oscilloquartz PRCs comprise atomic Cesium clocks and/or GPS receivers as reference frequency sources. As the availability of synchronization is crucial for the network, PRCs are implemented with redundant reference sources.

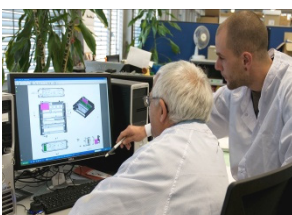
Most networks are synchronized by decentralised PRCs to achieve protection against failures affecting a complete site. Today's PRCs need to provide a flexible approach that allows the PRC to evolve as the network grows, have a reliable and resilient architecture and interface with a management platform that can manage the entire synchronization network.

### Achieves Objectives

The OSA 6500B achieves the objectives required for distributed and stand-alone PRCs especially when the system is controlled by the Oscilloquartz SyncView™ **Plus** synchronization management system.

A typical 6500B rack comprises Cesium and GPS references, a synchronization element, output distribution, alarms, management and power supplies.

At the core of the OSA 6500B is an OSA 5548B Stand Alone Synchronization Element (SASE) that handles many of the system's primary functions. This reduces the cost of conventional PRC configurations and provides greater management capability.



## Primary Reference Clock

The OSA 6500B can be equipped with up to three Cesium primary references, such as the OSA 5585B PRS. This ensures full compliance with the long term stability requirements of ITU-T, ETSI or Telcordia. The OSA 5585B's long life beam tube has an ten year warranty to minimise maintenance.

An optional integrated GPS Receiver provides UTC traceable reference. Selection of the references uses a priority table, in either automatic, manual or forced mode. Remote control is available via the management interfaces.

The selected reference is applied to redundant channels containing the high stability oscillators which provide references in holdover mode. Switching and phase alignment is automatic.

Output phase coherence is maintained well below  $1/8$  UI, typically  $< 15\text{ns}$ , in the event of any switching operation to minimise phase variations in the network.

The OSA 6500B can be installed with a reduced configuration and later expanded into more complex network.

## User Choice

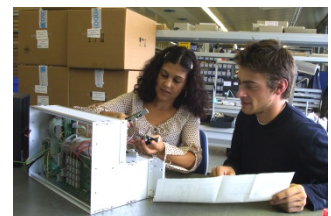
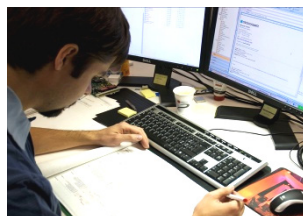
### High Output Capacity

The OSA 6500B delivers up to 112 unprotected or 64 protected outputs or other combinations to suit individual requirements. Output capacity can be increased to several hundreds of outputs by adding OSA 5530B expansion sub-racks.

### Wide range of output interface

Several output interface modules are available each with 16 outputs. Interface types include 2.048 Mbit/s, 2.048 MHz, 1.544 Mbit/s, 5 and 10 MHz.

All outputs can be squelched individually. The 2.048 and 1.544 Mbit/s modules include provisions for SSM handling. Output squelching and SSM are configurable by the user via the management interfaces.



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### Alarms and Monitoring

The OSA 6500B provides comprehensive alarm reporting and remote monitoring capabilities. An alarm panel displays urgent and non-urgent alarms. Monitoring and control are provided by a local management port. The interface allows the user to configure the system as well as to receive spontaneous events and alarms with date and time stamp.

### Remote Management

An Embedded System Manager (ESM) ensures effective management of the OSA 6500B by providing extensive management capabilities.

It provides a gateway to Oscilloquartz's central management system, SyncView™ *Plus* and Local Manager.

Dedicated Ethernet communication ports provide direct connection to the management system without the need for additional mediation devices.

This platform enables full management capabilities, including spontaneous alarm reporting, equipment configuration, equipment's physical view, alarm and event log, real time calculation of MTIE & TDEV curves, security and many other functions.

ESM has no impact on the overall equipment reliability. Internal rearrangements and critical decisions are always made automatically by the equipment itself, without intervention of the ESM module.

### SyncView™ *Plus*



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### Decentralised PRCs

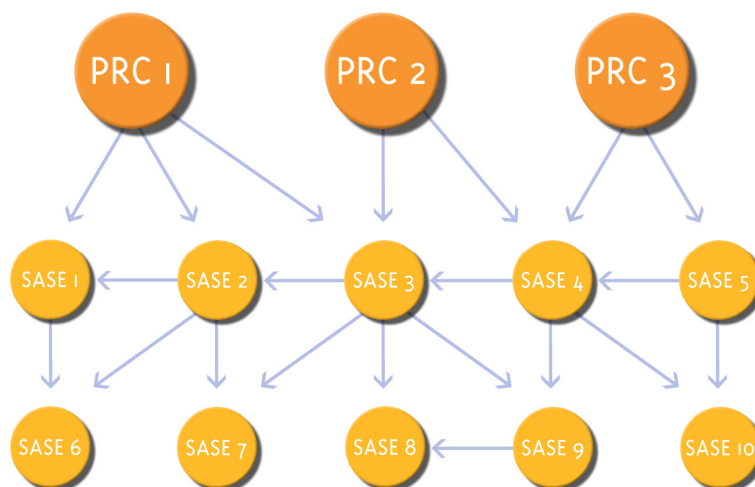
Many telecom operators opt for a decentralised PRC arrangement especially in large countries, complex networks or where network security is of paramount importance. The network is synchronized by several PRCs, which are at different geographical sites, to protect against site failures. This ensures a higher degree of reliability as the nodes receive references from at least two sources which are routed over separate paths.

In a PDH environment, references from one PRC are provided to the other using dedicated 2.048 Mbit/s lines. System status and control uses the status bits in the 2.048 Mbit/s links.

In an SDH network synchronization is carried from the PRC to the SASE/SSU using the STM-N signals.

Normally one of the PRCs is declared master. The network and stand-by PRC derive their references from the master. In the event of a failure the system will automatically change over to ensure continuous synchronization.

The OSA 6500B when combined with the SyncView™ **Plus** Management System achieves the objective of a distributed PRC arrangement.





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Applications

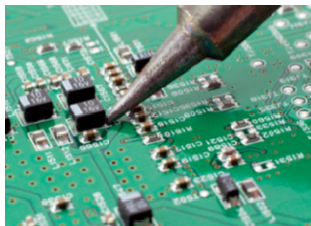
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EQUIPMENT MANUFACTURING



TIME & FREQUENCY



TIME DISTRIBUTION



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POWER & UTILITIES



## Primary Reference Clock

### Oscilloquartz SA: European leader of time & frequency synchronization

We are a Swiss private company. We design, manufacture and maintain the most precise frequency sources and synchronization systems supplied to industries like Telecommunication integrators, Network operators, Transportation, Metrology, Energy and utilities. Our products are Swiss made with competitive prices. We have customers in more than 120 countries worldwide.

We will bring to you the expert knowledge you are missing for your ongoing and future projects, as well as our support. You will benefit from our long standing experience and proven expertise in Network Synchronization. We will assist you in solving all critical issues related to network synchronization.

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