

# Oscilloquartz Time Scale System

## Key features

- Integrated time scale and timekeeping system
- Real-time monitoring and comparison
- Customizable and flexible design
- Variety of time dissemination options
- Traceability and compliance
- Advanced jamming and spoofing detection
- GNSS assurance tool
- Multi-source combiner with seamless holdover transition

## Overview

The **Oscilloquartz Time Scale System** is a fully integrated, highly customizable solution designed for precise timekeeping and UTC realization. Offering unparalleled accuracy, reliability and traceability, it meets the stringent requirements of national metrology institutes, telecommunications providers and scientific research facilities. The system also provides the flexibility to tailor solutions to meet the specific needs of each customer.

# Oscilloquartz Time Scale System

## System description

All signals from frequency sources are measured in real time, both in phase and frequency, and compared with each other:

- PCO is a phase comparator (from 5MHz to 100MHz inputs).
- TIC is a time interval counter.

The distributed signals are continuously monitored in real time for frequency and phase (outputs return measured).

A fully calibrated metrology GNSS receiver, including a geodetic antenna, ensures Precise Point Positioning (PPP).

A Linux computer collects all measurement results from the metrology GNSS receiver, TIC and PCO, ensuring all devices are properly configured and monitored.

- All results from real-time and post-processing measurements are displayed
- It generates a steering value in synchronization with UTC
- Data are stored and can be exported for analysis.
- Remote monitoring is enabled.

Reference generator with ultra-stable oscillator.

- The steering to UTC is performed here.
- Delivers 10MHz and 1PPS to the distribution units.

Distribution units split a single input signal into sixteen outputs for 10MHz and 1PPS signals.

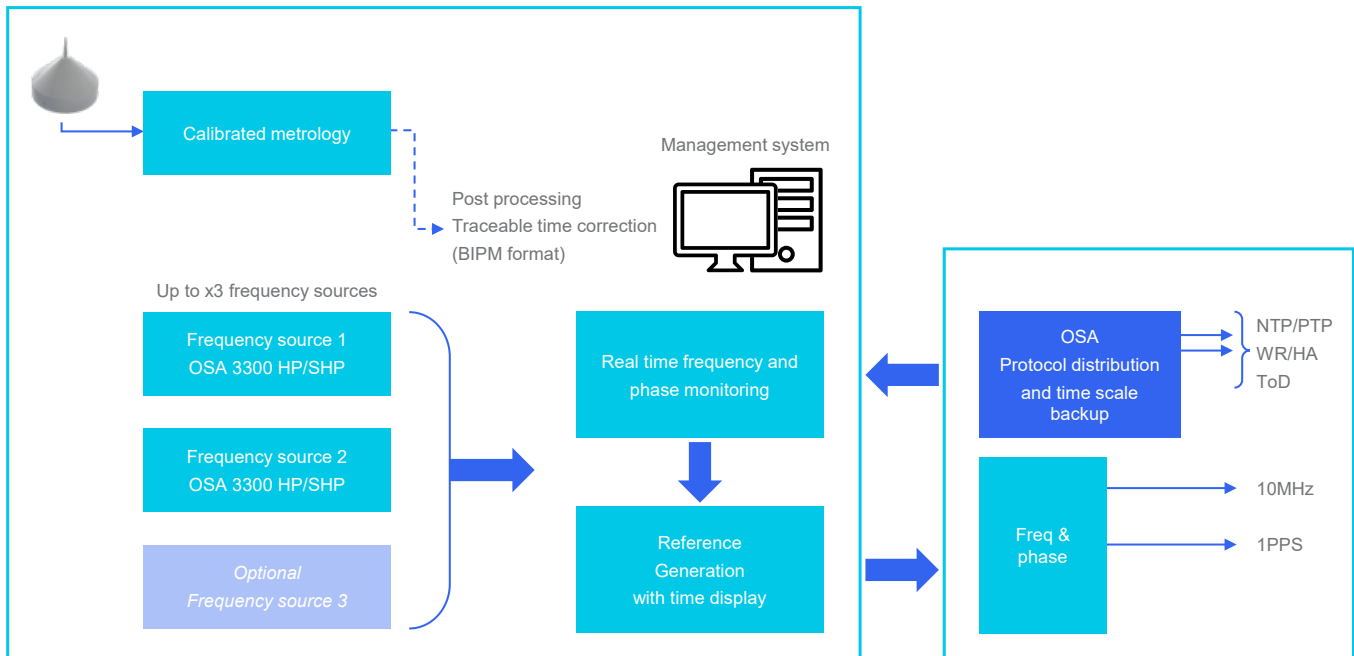
Additional units can be added in parallel to increase the number of outputs, with each expansion supporting up to 16 outputs.

Distribution of network packet timing is achieved with the OSA 5422, OSA 5430 or OSA 5440. These support advanced protocols including NTP, PTP and White Rabbit/high availability (WR/HA), ensuring precise timing and synchronization. With market-leading jamming and spoofing detection capabilities, they offer unrivaled protection and reliability in demanding environments.

It can be also used as a backup to the Time Scale System for frequency and phase generation during prolonged GNSS outages when UTC traceability is lost and post-processing is interrupted.

We employ additional post-processing verification:

- The BIPM publishes Circular T (UTC) monthly and Rapid UTC report weekly.
- All national metrology institutes (NMIs) are traceable to UTC, and their UTC(k) realization results are reported in these publications.
- Our Time Scale System is traceable to the UTC(k) of an NMI.



# Oscilloquartz Time Scale System

## Key features

Integrated time scale and timekeeping system:

- Performs UTC realization using multiple frequency sources, including Cesium Masers and other high-stability oscillators.
- A calibrated metrology GNSS receiver ensures accurate post-processing measurements, providing traceability to UTC and enabling precise steering calculations.

Real-time monitoring and comparison:

- Continuously measures and compares signals from frequency sources in both phase and frequency using a phase comparator (PCO) and a time interval counter (TIC).
- Extends real-time monitoring to distributed signals, ensuring that both frequency and phase are consistently accurate.

Time dissemination:

- Supports the dissemination of time using protocols such as PTP, NTP and White Rabbit (WR).
- Supports the generation and submission of required reports like RINEX, CCGTTS and others.
- Integrates with global timekeeping efforts by providing data to BIPM's Circular T and Rapid UTC reports.

Traceability and compliance:

- The system is traceable to UTC(k) realizations and complies with BIPM reporting standards.

Advanced jamming and spoofing detection:

- The OSA 5422, OSA 5430 and OSA 5440 include robust jamming and spoofing detection capabilities, forming an integral part of our assured positioning, navigation and timing (aPNT) solution. The system uses multi-layered algorithms for real-time threat detection and mitigation, enhancing the resilience of our Time Scale System against disruptions.

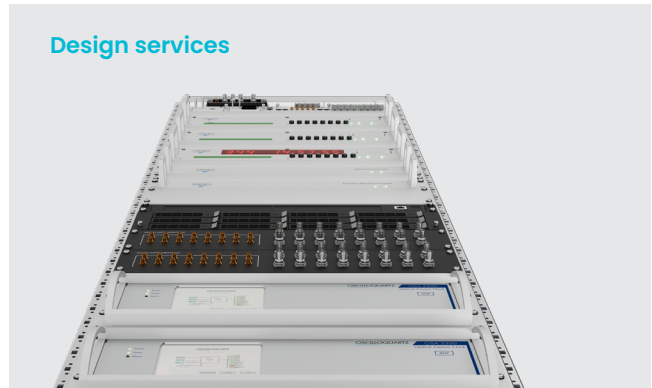
Multi-source combiner with seamless holdover transition:

- The system includes a multi-source combiner that allows for a seamless transition to an ultra-long holdover mode if the time scale's stability is compromised. In such cases, the system can switch to a precision holdover of 100 nanoseconds (ns) for up to 100 days, ensuring continuous and accurate timekeeping without interruption.

Customizable and flexible design:

- The system's modular design allows for customization based on specific customer needs, including the number and type of frequency sources (from 5MHz to 100MHz) and the level of GNSS resilience required.
- We work closely with our customers to understand their unique requirements, ensuring that our Time Scale System is tailored to their specific operational needs.

## Design services



Configurations can be adapted to customer requirements.

## Turnkey solution



Fully customizable system to meet specific requirements in metrology, defense and aerospace.

