OSA 5565 STS

Wander Measurement Equipment for Telecom Applications

Introduction

Synchronization forms a vital part of any digital telecom network. A well maintained synchronization backbone minimises network errors, thus increases network efficiency. The result is a higher quality of service and a greater use of capacity.

Synchronization issues are quite often addressed reactively only when problems have occurred. The introduction of more stringent industry standards has led to the need for greater control of synchronization. For network operators this involves proactively monitoring the performance of synchronization signals to identify potential problems.

For equipment manufacturers, this means testing their equipment to ensure conformance with design objectives and with standards.

Traditionally, assessing the quality of synchronization has been a tedious process because of the unavailability of appropriate test equipment.

The OSA 5565 STS Synchronization Test Set is a fully portable equipment for accurate high-resolution measurement of telecom synchronization signals. It is in full compliance with the ITU-T O.172 recommendation for wander measuring equipment.

The OSA 5565 STS is compact, lightweight and it is operational 15min. after power up.

Moreover, thanks to the internal high stability Rubidium oscillator, it can perform most measurements without the need of an external reference.

For higher precision measurements, the OSA 5565 STS can also be connected to an external reference source such as a Cesium clock or a high stability GPS receiver.

Typical Applications

Figure 1 below shows a typical application for the OSA 5565 STS, where the synchronization output from a public switch equipment is tested against a known synchronization reference. The calculations are carried out by the WinSTS software and the results are displayed as graphs which can be compared with relevant international standards. For more specific analysis of the result, all data from the OSA 5565 STS can be examined in table form.

The WinSTS software is delivered with every OSA 5565 STS equipment. The WinSTS, which runs under Windows® operating system, provides local control of the equipment. WinSTS also automatically computes the necessary calculations in order to display performance graphs like MTIE, TDEV, and MADEV. These graphs can be evaluated against relevant templates derived from standards (ITU, ETSI, Telcordia) or user-defined templates.

All WinSTS data can be stored locally. They can also be exported to other Windows applications.

Main Functions

Displays measurements graphs in real time (also during the measurement).

The OSA 5565 STS accepts a variety of input signals for reference and/or calibration.

These are:

- Frequency input: range from 0.064 MHz to 16.384 MHz in steps of 8kHz
- 10 MHz (dedicated reference)
- E1 / 2.048 Mb/s
- T1 / 1.544 Mb/s

The reference signal from the Rubidium clock can be retrieved as an output signal. Available reference formats are:

- 2.048 MHz
- 10.000 MHz

Accessories

The OSA 5565 STS is delivered with a set of accessories that enhances its measurement capabilities and enables connection with a wide range of signals. The following accessories are supplied as standards with the OSA 5565 STS equipment:

- Passive coupler for in-line measurements on traffic links
- Various connecting devices, attenuator and impedance adapter
- WinSTS Software
- Operating Manual in English
- Accessory kit containing AC cord and a set of fuses
- Measurement templates

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OSA 5565 STS

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Typical Characteristics

Internal reference

- Type : Rubidium
- Frequency : 10 MHz
- Reference frequ. adj. : range $5 \times 10^{-9} \pm 20\%$, res.$1.22 \times 10^{-12}$
- Stability, long term : 4×10^{-11} / month
- Stability, long term : 3×10^{-11} at 1 second
  1×10^{-11} at 10 seconds
  3×10^{-12} at 100 seconds
- Stability, vs temp. : 2×10^{-10} ($\pm 0°$ to $\pm 60°C$)
- Retrace : $< 2 \times 10^{-11}$ 48 hours off and 1 hour on

External reference input

- Frequency : 10 MHz
- Connector : BNC

Measurement

- Minimum Sampling period τ_0 : 12.5 ms
- Max. measurement period T : limited by RAM installed on PC.
- Resolution : 100 ps
- Max. measurement range : ± 100 µs (with recycling)

Environment

- Magnetic field
  sensibility: X & Y axis : $< 2 \times 10^{-11}$/Gauss,
  Z axis : $< 1 \times 10^{-10}$/Gauss
- Operational Temp : 0°C to +45°C
- Storage Temp : -20°C to +50°C
- Humidity : < 95% non-condensing
- EMC : Meets EN50081-1, EN50082-1.
- Safety : Meets EN 61010-1 (1993)/A2 (1995).

Input signals

- 1 x Various frequencies:
  (64kHz-16.384 MHz, steps of 8kHZ)
- 1 x (2.048 Mb/s or 1.544 Mb/s)

Output signals

- 1 x 10 MHz, 2,2V pp 50Ω
- 2 x 2.048 MHz according to G.703.13

Technical

- Voltage : 115 VAC ± 15% 60 Hz or 230 VAC ± 15% 50 Hz
- Power consumption: 40 W (50 W during Warm-up: 15 min.)
- Dimension : 145x275x400 mm (HxWxD)
- Weight : 7.5 kg

PC hardware requirement (minimum)

- Processor : Intel Pentium (100 MHz)
- RAM : 16MB
- HD : 6MB
- Storage : @1 Mb for 1s. sampling rate measurement during 15 hours.
- Drivers : CD-Rom drive
- Display : VGA
- Ports : 1xSerial port (RS-232C)
- Operating system : MS-Windows 98/NT 4.0/2000/XP

Associated software, WinSTS:

Calculates MTIE, $\Delta f/f$, ADEV, MADEV, and TDEV. Displays measurement graphs against templates.
Contains templates derived from relevant ITU, ETSI, Bellcore as well as user-defined

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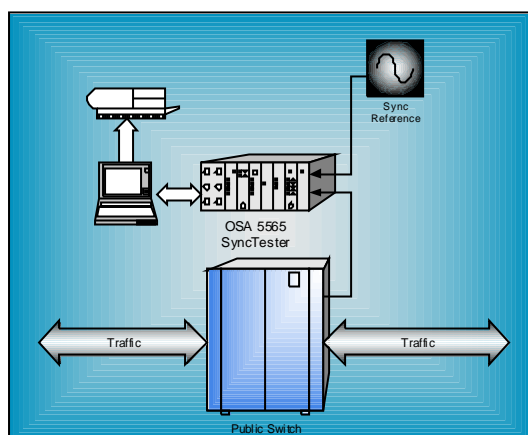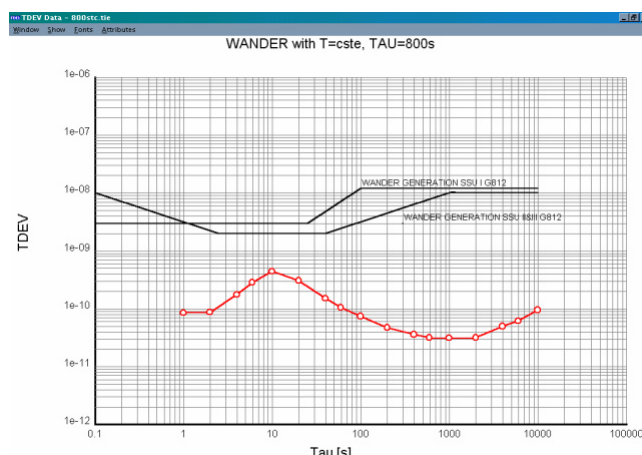**Figure 1: Typical application for the OSA 5565**

Figure 2 : Example of graph window from the WinSTS software while measuring the OSA 5533C SDU.

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