Product Overview

Our OSA 5548C Timing Signal Generator (TSG) is a scalable synchronization solution ranging anywhere from 20 unprotected outputs up to a thousand protected outputs by adding up to four expansion shelves to the core unit. Its ultra-compact footprint makes it ideal for telecom operators to provide scalable network synchronization in over-crowded exchanges. The OSA 5548C TSG's distributed intelligence message passing system eliminates single points of failure and guarantees reliable uptime. Core unit and expansion shelves share the same modules, minimizing overall administrative complexity and enabling reduced homologation activity.

Versatile Input and Output Interface Modules

Our OSA 5548C TSG comes with universal input modules accepting a wide range of input signals and is designed to reduce the amount of spares. Each input module can accept up to four signals, optionally protected by an identical, adjacent module. The architecture supports configurations ranging from four unprotected inputs up to eight protected inputs. The unique output module design of the OSA 5548C TSG provides 20 auto-configurable output interfaces. Ten universal output groups can be configured flexibly to support configurations ranging from 20 unprotected outputs up to 200 protected outputs on one shelf. Mixing of protected and unprotected outputs is supported. Our OSA 5548 TSG also supports input and output modules capable of terminating and generating T1 and E1 signals. In addition, the OSA 5548C TSG can be equipped with an NTP Stratum 1 server and high capacity IEEE 1588-2008 Version 2 PTP Grandmaster modules for accurate frequency and phase timing distribution over packet networks.

Flexible Input Selection

Optional GPS modules are available to meet Stratum 1 and G.8272 PRTC requirements without the need to install and manage external receivers or cesium primary reference clock sources. The synchronization distribution hierarchy can therefore be flattened, resulting in reduced overall provisioning, operations and maintenance costs. The active reference input can be selected based on SSM value, a priority table or performance threshold masks. Jitter and wander on the reference input are filtered by a high-quality oscillator and DDS technology utilizing rubidium or double oven quartz technology.

Management and Performance Assurance

Our network management software provides powerful fault, configuration, inventory, performance and security management of the OSA 5548C TSG through an intuitive graphical user interface either locally or from a remote location. Active inputs are constantly measured against the current output reference with 1ns resolution. MTIE, TDEV and Ym curves are compiled and used for input selection. Results can be compared to standard masks and trigger alarms when limits are exceeded. All results are forwarded to the network management system for display, user validation and storage. Local alarm indication is provided by means of an internal buzzer, electrical relay contacts and status LEDs on the front panel.

Features & Benefits

- Unique design of master, expansion and remote shelves

- Intuitive and modular architecture adapted to all telecom node sizes

- Stratum 1/ITU-T G.811 PRC with optional dual GPS cards and ITU-T G.812 Type I, II or III SSU holdover

- GR-2830 Primary Reference Source (PRS)

- Universal output and input module design

- ITU-T G.8272 Primary Reference Time Clock (PRTC)

- Fully manageable by TL1 and intuitive graphical user interface

- Optional NTP and PTP cards

- 1:1 protection for every module and function

Technical Information

Overall Architecture
- 5548C TSG 3U: four inputs + two GPS receivers, 60 outputs
- 5548C TSG 6U: eight inputs + two GPS receivers, 200 outputs
- All modules can be protected 1:1

Inputs
- Up to eight line inputs in OSA 5548C TSG 6U (four with TSG 3U), optionally 1:1 protected, four inputs per module
- Input types: DS1, CC, 5 MHz, 10 MHz individually SW-selectable
- Up to two GPS inputs, active L1 antenna, 1575.42 MHz
- DS1 inputs can be "terminated" (100 Ω), "DSX-Monitor Level" or "bridged" (high impedance, kΩ)
- Optional support for Mixed E1 and DS1 inputs

Input Selection
- SSM value
- Priority table
- Performance threshold mask
- Manual selection

Tracking and Holdover
- DDS-based tracking and holdover functionality
- Stratum 1 reference with embedded GPS or external cesium source
- Stratum 2-based on rubidium holdover < 2e-12/day (at 25°C)
- Stratum 3E-based on OCXO SC-P3 holdover < 1e-10/day (at 25°C)

Outputs
- 20 outputs per module (two groups of 10)
- Up to 60, optionally 1:1 protected on 5548C TSG 3U
- Up to 200, optionally 1:1 protected on 5548C TSG 6U
- Output type configurable by group of 10 outputs
- Optional support for Mixed E1 and DS1 outputs

Telecom High–Capacity PTP Module (TCC PTP V2)
- Up to 1024 remote slave clients at 128 pkt/s per card
- SW licenses for 256, 512 and 1024 remote slaves (128 by default per line card)
- One- or two-step clock
- Singe-way or two-way time transfer
- G.8265.1 Telecom Profile compliant over IPv4 unicast
- G.8275.1 Telecom Profile compliant over Ethernet multicast
- Static and dynamic remote clients including unicast message negotiation
- Untagged and VLAN-tagged (IEEE 802.1Q customer-tagged)
- One combo Ethernet 100/1000BaseT or 100/1000BaseX (SFP) port
- Synchronous Ethernet (SyncE)
  – 100M/1G Ethernet egress interfaces for fiber (1G) and copper (100M/1G)
  – Compliant to the relevant sections – ITU-T G.8261/G.8262/ G.8264
  – Ethernet Synchronization Messages Channels (ESMC)
- Can be inserted in any of the output slots
- Optional 1:1 card protection

NTP Server Module (TCC NTP)
- NTP (RFC 1305), SNTP v4 (RFC 4330)
- Stratum 1 NTP server
- Configuration by DHCP or fixed IP
- 64 MD5 message digest algorithm
- Plug-and-play installation
- Can be inserted in any of the output slots

Standards Compliance
- ANSI T1.101 and T1.403
- Telcordia GR-2830/1244/378/253-CORE
- GR-2830, GR-1089 and GR-63 NEBS3, CE
- IETF RFC 2030 (SNTP v4), RFC 1305 (NTP)
- ITU-T G.703, G.811, G.812, G.704, G.78, G.8265.1, G.8275.1, G.8272
- ETSI EN 300 462-6, -4

Management
- Status LEDs on front panel
- Contact relay alarm closures (2x3 N.O. or N.C. contacts)
- Electrical alarm collection inputs (10)
- Specific user-definable alarm messages
- Local RS232C port, TL1 protocol on front and rear panels
- Remote 10/100BaseT
- SNMPv2/v3 & MIB
- Remote management via SyncView™Plus or FSP NM
- Synchronization network management software supporting full FCAPS capability

Performance Measurement
- Phase measurement on all inputs, GPS included
- 1ns resolution
- MTIE, TDEV, Ym curves computed locally
- User settable alarm thresholds

Power
- Dual -48VDC power input (-40 to -60VDC)
- Power consumption: max. 6A (master shelf)

Simplified Maintenance
- Universal input and universal output modules
- Upgrade of all modules via SW download/shelf release
- Dynamic inventory data accessible via management SW
- All module software included in the same system release

Mechanical
- OSA 5548C TSG 3U: 5.25" x 19" or 23'' x 9.7" (H x W x D)
- OSA 5548C TSG 6U: 10.5" x 19" or 23'' x 9.7" (H x W x D)

Product Overview

Our OSA 5548C Synchronization Supply Unit is a scalable synchronization solution ranging from 20 unprotected outputs up to 1,000 protected outputs by adding up to four expansion shelves to the core unit. Its ultra-compact footprint makes it ideal for telecom operators to provide scalable network synchronization in over-crowded exchanges. The distributed intelligence message passing system of our OSA 5548C SSU eliminates single points of failure and guarantees reliable uptime. Core unit and expansion shelves share the same modules, minimizing overall administrative complexity and enabling reduced homologation activity.

Versatile Input and Output Interface Modules

Our OSA 5548C SSU comes with universal input cards accepting a wide range of input signals and is designed to reduce the amount of spares. Each input card can accept up to four signals, optionally protected by an identical, adjacent card. The architecture supports configurations ranging from four unprotected inputs up to eight protected inputs. The unique output card design of our OSA 5548C SSU provides 20 software-configurable output interfaces. Ten universal output groups can be configured flexibly to support configurations ranging from 20 unprotected outputs up to 200 protected outputs on one shelf. Mixing of protected and unprotected outputs is supported. In addition, our OSA 5548C SSU can be equipped with high capacity IEEE 1588-2008 Version 2 PTP Grandmaster modules for accurate frequency and phase timing distribution over packet networks.

Flexible Input Selection

Optional GNSS modules supporting both GPS and GLONASS are available to meet ITU-T G.811 and G.8272 requirements without the need to install and manage external receivers or cesium primary reference clock sources. The synchronization distribution hierarchy can therefore be flattened, resulting in reduced overall provisioning, operations and maintenance costs. The active reference input can be selected based on SSM value, a priority table or performance threshold masks. Jitter and wander on the reference input are filtered by a high-quality oscillator and DDS technology utilizing rubidium or double oven quartz (OCXO) technology.

Management and Performance Assurance

Our network management software provides powerful fault, configuration, inventory, performance and security management of the OSA 5548C SSU through an intuitive graphical user interface either locally or from a remote location. Active inputs are constantly measured against the current output reference with 1ns resolution. MTIE, MRTIE, TDEV and Ym curves are compiled and used for input selection. Results can be compared to standard masks and trigger alarms when limits are exceeded. All results are forwarded to the network management software for display, user validation and storage. Local alarm indication is provided by means of an internal buzzer, electrical relay contacts and status LEDs on the front panel.

Features & Benefits

- Latest generation of SSU with 6U, 19" or ETSI shelves

- Intuitive and modular architecture adapted to all telecom node sizes

- Expandable system to provide up to 1000 protected outputs

- ITU-T G.811 PRC with optional dual GPS and/or GLONASS cards and ITU-T G.812 Type I, II or III SSU holdover

- ITU-T G.8272 primary reference time clock (PRTC)

- Universal output and input card design

- Fully manageable with intuitive graphical user interface

- Optional PTP modules

- 1:1 protection for every card and function

Technical Information

OSA 5548C SSU-E200 – 200 outputs
- ETSI 6U main shelf: eight inputs plus two GLONASS/GPS receivers
- 20 output slots

OSA 5548C SSU-E60 – 60 outputs
- ETSI 6U/19" main shelf: four inputs plus two GLONASS/GPS receivers
- Six output slots

OSA 5548C Expansion Shelf
- Up to four expansion shelves per main shelf, 200 outputs each for 1000 outputs total (dedicated redundant communication bus between master and expansion shelves)

Inputs
- Up to eight line inputs in OSA 5548C SSU-E200 (four with SSU-E60), optionally 1:1 protected, four inputs module
- Input types: E1, 2.048 MHz, 5 MHz, 10 MHz individually SW-selectable
- Up to two GNSS inputs, active L1 antenna, 1575.42 MHz
- Two GNSS module types: GPS and GLONASS/GPS
- E1 inputs can be "terminated" (75Ω) or "bridged" (high impedance, kΩ)

Input Selection
- SSM value
- Priority table
- Performance threshold mask
- Manual selection

Tracking and Holdover
- DDS-based tracking and holdover functionality
- G.8272 PRTC when locked to GNSS
- G.811 PRC reference with embedded GNSS (or external cesium) source
- G.812 Type II SSU based on rubidium holdover < 5.0E-11/month (at 25°C)
- G.812 Type I & III SSU based on OCXO SC-P3 holdover < 1E-10/day (at 25°C)

Output Card (OUC)
- 20 outputs per module (two groups of 10)
- Up to 200, optionally 1:1 protected, on 5548C SSU SSU-E200
- Output type configurable by group of 10 outputs
- E1, 2.048 MHz

Universal Output Card (OUCU)
- 4x 10 MHz sine wave + 4x 1PPS square wave
- Optional Composite Clock

Telecom High-Capacity PTP Module (TCC PTP V2)
- Up to 1024 remote slave clients at 128 pkt/s per card
- SW licenses for 256, 512 and 1024 remote slaves (128 by default per TCC-PTPV2 card)
- One- or two-step clock
- Single way or two way time transfer
- G.8265.1 Telecom Profile compliant over IPv4 unicast
- G.8275.1 Telecom Profile compliant over Ethernet multicast
- Static and dynamic remote clients including unicast message negotiation
- Untagged and VLAN-tagged (IEEE 802.1Q customer-tagged)
- One combo Ethernet 100/1000BaseT or 100/1000BaseX (SFP) port

- Synchronous Ethernet (SyncE)
  - 100M/1G Ethernet egress interfaces for fiber (1G) and copper (100M/1G)
  - Compliant to the relevant sections – ITU-T G.8261/G.8262/G.8264
  - Ethernet synchronization message channels (ESMC)
- Can be inserted in any of the output slots
- Optional 1:1 card protection

Standards Compliance
- ITU-T G.703, G.811, G.812, G.704, G.781, G.8265.1, G.8275.1, G.8272
- ETSI EN 300 462-6, -4
- CE approved

Management
- Status LEDs on front panel
- Contact relay alarm closures (2x3 N.O. or N.C. contacts)
- Electrical alarm collection inputs (10)
- 2 x local RS232C ports, TL1 protocol on front and rear panels
- Remote 10/100BaseT
- SNMPv2/v3 & MIB
- Remote management via SyncView™ Plus or FSP NM
- Synchronization network management software supporting full FCAPS capability

Performance Measurement
- Phase measurement on all inputs, GLONASS/GPS included
- 1ns resolution
- MRTIE, MTIE, TDEV, Ym curves computed locally
- User settable, alarm thresholds

Expansion Shelves
- Up to 200 outputs per shelf, optional 1:1 protection
- Up to four expansion shelves for a total of 1,000 outputs
- Dedicated redundant communication bus between master and expansion shelves

Power
- Dual -48VDC power input (-40 to -60VDC)
- Power consumption: max. 220W (fully equipped) 200 outputs

Simplified Maintenance
- Universal input and universal output cards
- Upgrade of all cards via SW download/ shelf release
- Dynamic inventory data accessible via management SW
- All cards software included in the same system release

Mechanical
- OSA 5548C SSU-E200: 266 x 483 x 265mm (H x W x D)
- OSA 5548C SSU-E60: 266 x 535 x 240 mm (H x W x D)