Overall Architecture

- 5548C 200 outputs: ETSI 12U/19" 6U main shelf: 8 inputs + 2 GPS receivers
- 5548C 60 outputs: ETSI 6U/19" 3U main shelf: 4 inputs + 2 GPS receivers
- Up to 4 Expansion Shelves per main shelf, 200 outputs each for 1000 outputs total (dedicated redundant communication bus between master and expansion shelves).
- Remote shelves are also connected, using E1 in order to propagate correctly the SSM (E1 signal).
- All cards can be protected 1:1

Inputs

- Up to 8 line inputs in 6U SSU (4 in mini SSU), optionally 1:1 protected, 4 inputs/ module
- Input types: E1, 2.048 MHz, 5 MHz, 10 MHz individually SW-selectable
- Up to 2 GPS inputs, active L1 antenna, 1575.42 MHz
- E1 inputs can be terminated, "terminated –75Ω" or bridged (high impedance, 1KΩ)

Input Selection:

- SSM value
- Priority table
- Performance Threshold Mask
- Manual selection

Tracking and Holdover:

- DDS-based Tracking & Holdover functionality
- G.811 PRC reference with embedded GPS (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)

Outputs:

- 20 outputs per module (2 groups of 10)
- Up to 200, optionally 1:1 protected, on 5548C SSU 12U
- Output type configurable by group of 10 outputs
- E1, 2.048 MHz, 5 MHz, 10 MHz, 1 PPS

Time Code Outputs:

- Up to 10 TCU (Time Code Unit) modules on SSU
- NTP (RFC 1305), SNTP v4 (RFC 2030)
- IRIG-B, AM-coded and DC level shift
- Each time distribution card occupies one main output slot

Standards compliance:

- IETF RFC 2030 (SNTP v4), RFC 1305 (NTP)
- ITU-T G.703, G.811, G.812, G.704, G.781
- ETSI EN 300 462-6, -4
- CE approved

For T1 version, please refer to product OSA 5548C TSG

Re-timing:

- Re-timing modules use same slots as main output modules
- 8 E1 traffic carrying signals per module
- Up to 80 re-timed E1 signals on SSU
- Configurable alarm thresholds in slips per hour/day/week
- Traffic protection with by-pass relay

Management:

- Status LED's on front panel
- Contact relay alarm closures (2x3 N.O. or N.C. contacts)
- Electrical alarm collection inputs(10),specific user-defined alarm messages
- Local RS-232C port, TL1 protocol on front and rear panels
- Remote 100BaseT
- Remote Management via OSA SyncView NG
- Synchronisation Network Management software supporting full FCAPS capability

Performance Measurement:

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

Expansion Shelves:

- Up to 200 outputs per shelf, optional 1:1 protection
- Up to 4 Expansion Shelves for a total of 1000 outputs per node
- Dedicated redundant communication bus between master and expansion shelves

Power:

- 5548C SSU: -48 VDC power (-40 to -60 VDC)
- 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:

- 5548C SSU: (HxWxD)
  - ETSI/12U rack: 532x535x240 mm
  - 19"/6U rack: 266x483x265 mm
- 5548C mini SSU: (HxWxD)
  - ETSI/6U rack: 266x535x240 mm
  - 19"/3U rack: 133x483x265 mm

A COMPANY OF THE SWATCH GROUP
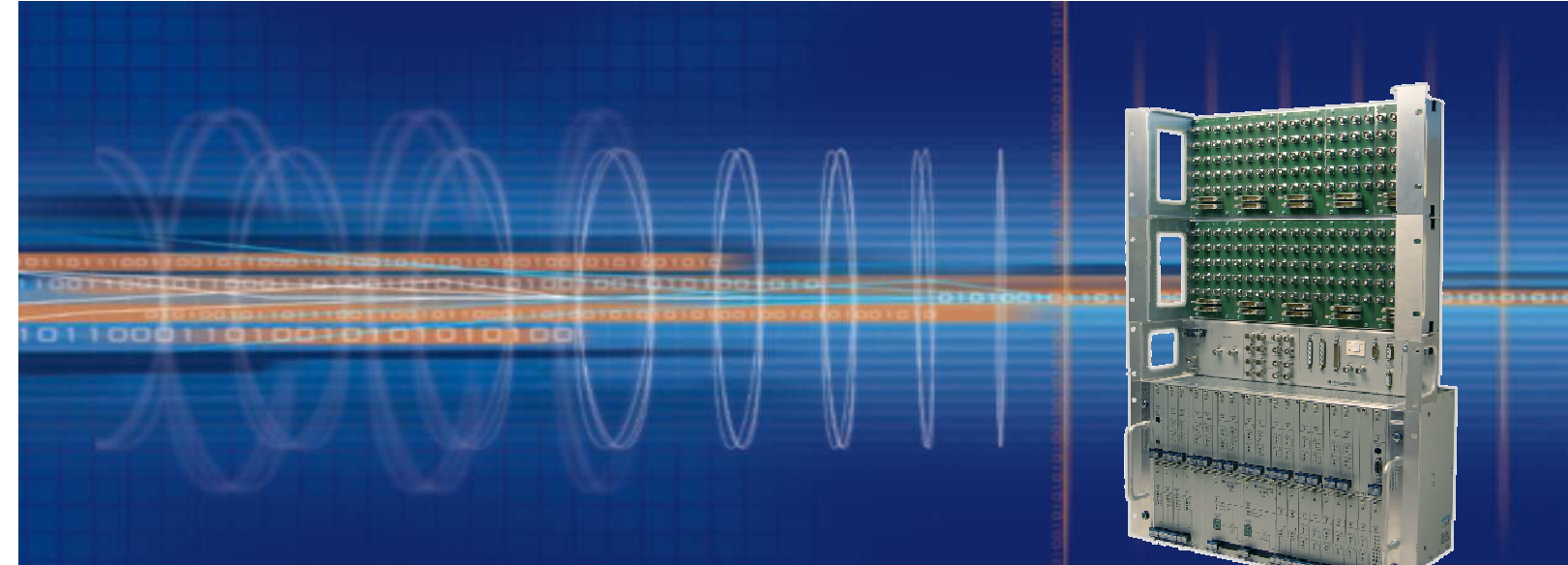
OSA 5548C SSU

SSU for SDH, SONET and Mobile Synchronisation

NGN ready

- Entirely new family of SSU with 3U and 6U 19" shelves, or 6U and 12U ETSI shelves
- Intuitive and modular architecture adapted to all telecom node sizes
- Extremely compact: up to 200 protected (1:1) outputs
- Single System (with 4 Expansions) allows from 20 up to 1000 protected outputs
- Unique design for Master and Expansion shelves
- G.811 PRC with optional GPS card(s) and G.812 Type I or II or III SSU holdovers
- Universal Output & Input card design
- SSM on complete system
- Manageable with intuitive Local and Remote Graphical User Interface
- Up to 80 re-timing channels
- Optional NTP and IRIG-B output modules

OSCILLOQUARTZ
SWATCH GROUP ELECTRONIC SYSTEMS

The leading partner for your synchronisation needs

OSCILLOQUARTZ
SWATCH GROUP ELECTRONIC SYSTEMS

Introduction

The OSA 5548C Synchronisation Supply Unit (SSU) is the latest breakthrough from Oscilloquartz, a pioneer in synchronisation of SDH/SONET and mobile networks. It is designed to provide telecom operators with reliable synchronisation, using the latest in hardware and software technologies. The 5548C system provides a scalable synchronisation solution ranging from 20 unprotected up to thousand of 1:1 protected outputs.

Unparalleled Flexibility

The 5548C can be a redundant G.811 PRC source with its two optional GPS cards, without changing the number of inputs and outputs. In addition to E1 and 2.048 MHz output cards, any of the main output slots can be equipped with NTP or IRIG-B Cards or with re-timing cards. With its complete and consistent family of 6U/12U ETSI with 200 outputs, 3U/6U ETSI with 60 outputs and expansions shelves, the 5548C is the SSU of choice when scalability and reduced spare parts inventory is required. This flexibility makes the 5548C the most versatile SSU in the marketplace.

Extreme Compactness

Each card is only 100 mm tall, contributing to a higher overall port/volume ratio, and therefore reducing the size of the 5548C shelf design to accommodate overcrowded Telecom Hub Rooms and Switching Center rack spaces.

High Availability

All cards are intelligent and communicate with each other to implement a distributed intelligence message passing system. This approach ensures the absence of single points of failure and reliable uptime.

Simplified Maintenance

SSU and Expansion Shelves share the same cards; this reduces homologation activity, stock of spare parts as well as overall administrative complexity and results in reduced cost of ownership. All cards are easily reprogrammable via a simple software download.

Inputs

The 5548C SSU uses universal Input Cards (INC) designed to reduce spare counts. It accepts the following signals:

➢ E1 (G.703-9/G.704) with or without SSM
➢ 2.048 MHz (G.703-13)
➢ 5 and 10 MHz sine

Each INC accepts up to four signals and can be 1:1 protected with an adjacent identical card. 2 INC groups of 2 slots are available, giving flexibility from 4 unprotected inputs to 8 protected inputs. The universal input tile in the back of equipment includes 75Ω unbalanced on BNC or 120Ω balanced with a Balun adapter.

GPS Cards

Two GPS cards can be fitted to meet G.811 requirements without the need of installing and managing external receiver(s) or Cesium clock. This allows flexibility and the simplification of the sync plan by flattening the sync distribution hierarchy resulting in the reduction of the overall provisioning, operating and maintenance costs.

Input Selection

The active reference input is selected among the set of eligible input signals based on one of the following criteria:

➢ SSM value
➢ Priority table
➢ Performance Threshold mask
➢ User selection

Tracking & Holdover

This Clock card forms the beating heart of the OSA 5548C SSU. The input reference jitter and wander are filtered by a high quality oscillator and DDS technology. Two types of oscillator are available:

➢ Rubidium (Rb)
➢ Double Oven Quartz (OCXO)

Outputs

The 5548C SSU uses a universal Output Card (OUC) of 20 outputs, configurable by software (20 E1, 2.048 MHz or 10 E1 & 10 2.048MHz). Like all the other cards, OUC are separated in intuitive A and B slot. The 5548C SSU counts 10 groups of outputs, giving the flexibility from 20 unprotected outputs to 200 protected outputs on one shelf with the capability of having some outputs protected and some unprotected.

Output Connectors

The 5548C SSU provides maximum flexibility towards different interconnection requirements with its choice of modular tile sets:

➢ 20 x 120Ω balanced on sub-D
➢ 20 x 75Ω unbalanced on CEI 1.0/2.3 or SMA
➢ 10 x 75Ω unbalanced 10 x balanced on sub-D

Optional BNC connectors are available on a deported panel.

Expansion Shelves

Up to 4 expansion shelves can be chained to the main shelf for a total of 1000 outputs, optionally protected 1:1. Chaining of the expansion shelves is redundant in order to ensure maximum reliability.

Pass-through

In the case of removal or failure of both Clock cards, the pass-through feature insures distribution of synchronization on outputs. In this case synchronization is obtained from one input reference of the first INC's card group and distributed without filtering.

Management

The Management card (MAC) provides local and remote connectivity via a TL1 interface over RS-232C and TCP/IP. **Sync-View NG** Management software provides locally and remotely, powerful fault, configuration, accounting/inventory, performance and security management functions through an intuitive graphical user interface.

Local alarm information is provided as:

➢ Internal buzzer (audible)
➢ Relay contacts (electrical)
➢ Status LED's on front panel (visual)

Third party equipment can easily be managed through a set of 10 electrical alarm collection inputs. As a future option, the 5548C will also be manageable directly by SNMP with embedded agent.

Performance Measurement

All active inputs are constantly measured against the current output reference with 1 ns resolution. The local processing of performance data presents the data in a way that reduces network overhead for remote retrieval.

The computed MTIE, TDEV and Ym curves are:

➢ used internally for the input selection
➢ compared to standard masks to raise alarms if the curves are out of limits
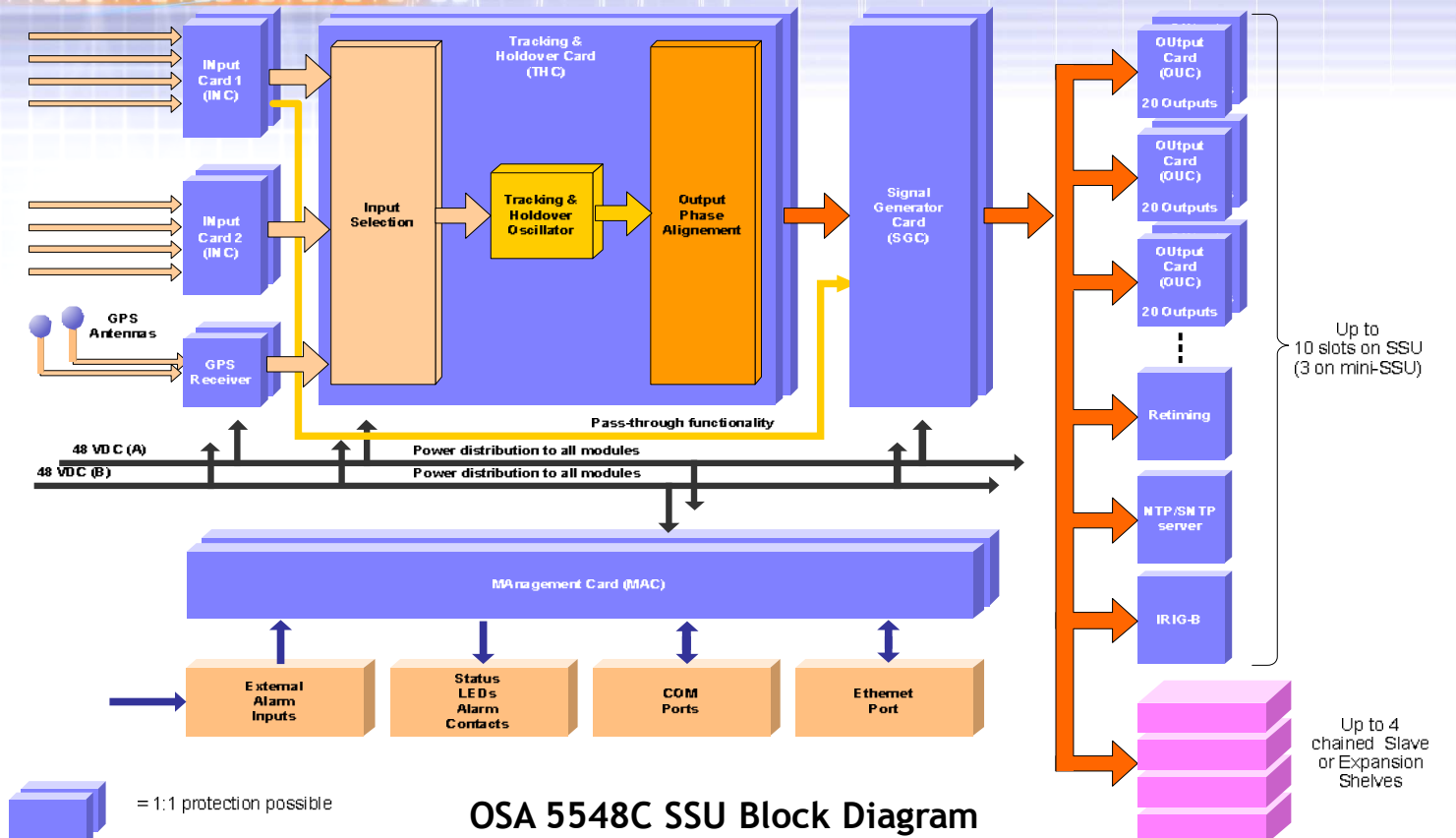➢ sent to the management station(s) for display, user validation and storage.

Timing Cards

Timing cards allow precise time distribution when at least one GPS card is installed. This is a major advantage compared to having to additionally install and manage an external receiver with its GPS antenna and cabling. Two kinds of Timing cards are available, the NTP card provides full NTP Stratum 1 server functionality on a separate 10 BaseT RJ-45 connector. The IRIG-B card provides four IRIG-B signals on BNC connectors. Timing cards can be fitted into any main output card slot.

Re-Timing

Each re-timing card provides 8 E1 re-timing channels and the card occupies only one output card slot.
Configurable alarm thresholds can be set via management software in terms of slips per hour/day/week. This allows continuous monitoring and immediate detection of synchronization problems on the incoming traffic signals and results in a higher Quality of Service.

OSA 5548C SSU Block Diagram