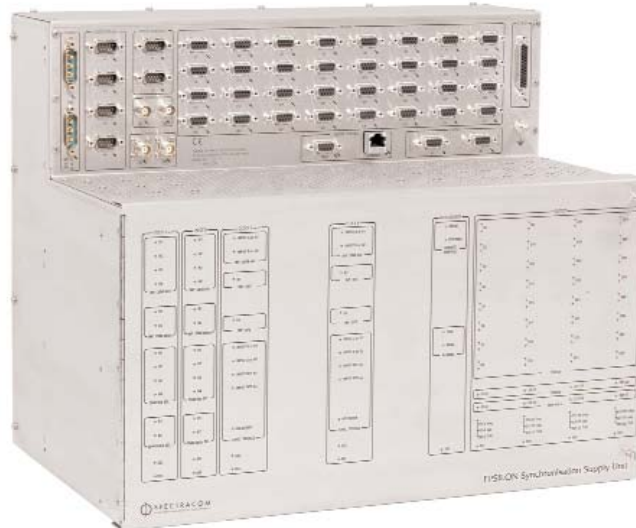


Epsilon Synchronization Supply Unit

Model ESSU



- **Cost-optimized network synchronization solution**
- **G.811/G.812 module**
- **Flexible**
- **Fully redundant**
- **Fully manageable**
- **Integrated Rubidium/OCXO**
- **GPS reference**
- **SNMP manageable**

The Epsilon Synchronization Supply Unit is a fully modular and flexible SSU which can be customized to provide the most cost-effective solution to all network synchronization requirements, from Primary Reference Clock to Central/Transit/Local nodes. Based on ITU-T G.811/G.812 and ETSI EN 300 462-4/6 recommendations, with distributed power supplies and redundant hot swappable modules, including one or two integrated GPS references, the Epsilon SSU provides the highest level of reliability and service availability.

The Epsilon SSU, with embedded SNMP protocol, is designed to be fully manageable at the network level by the EpSync Manager which ensures full central supervision and control of all synchronization links and devices through a high performance Graphical User Interface. The combination of Epsilon SSUs and EpSync Manager as a turnkey solution allows operators to reach the highest standard of quality of service for their telecom networks.

Optimized Configurations

Whether the purpose of the SSU is to build a Primary Reference Clock (PRC - G.811), or a Synchronization Transit Node (STN - G.812), or a Synchronization Local Node (SLN - Stratum 2/3E), the SSU configuration can be optimized to match exactly the application requirements with no extra cost for useless functions.

For instance, as shown in the block diagram, the simplest configuration can be built with only three modules for a cost-effective solution for simple Local Nodes with supervision capability:

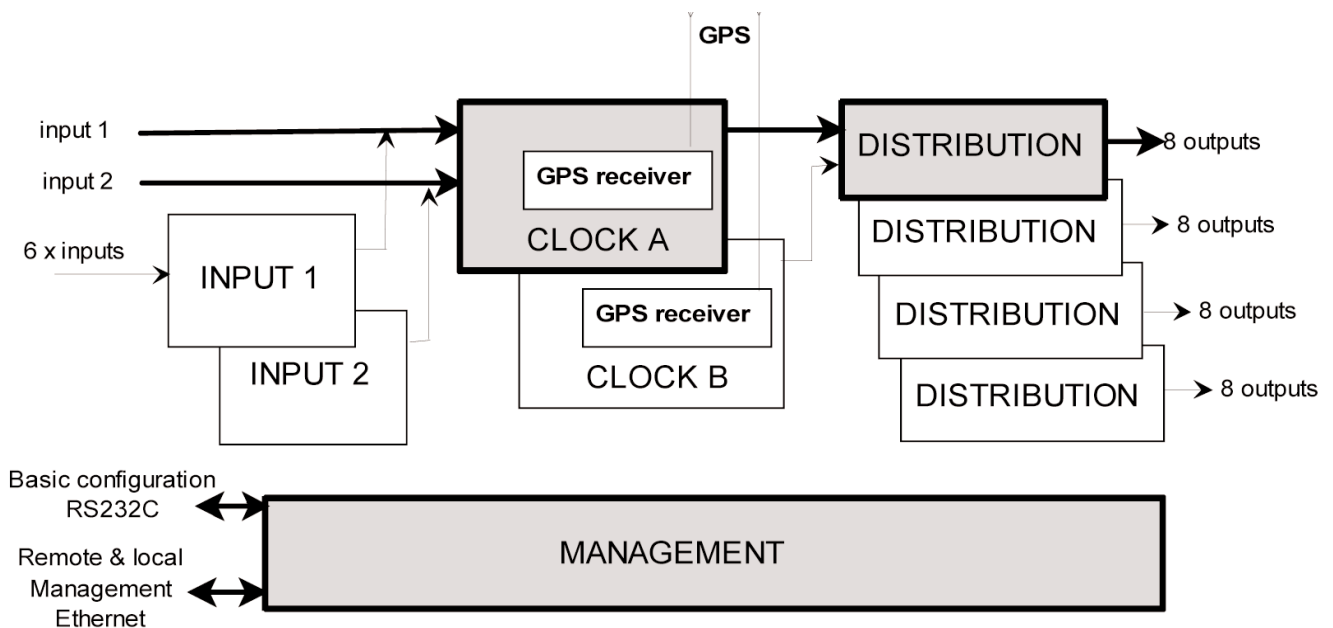
- 1 x Clock module with quartz oscillator
- 1 x Distribution Module
- Management Module

Alternatively, a full configuration is simple to configure

- 2 x redundant Input Modules
- 2 x redundant Clock Modules both equipped with high quality Rubidium or OCXO oscillators and GPS receivers.
- 4 x Distribution Modules providing up to 32 outputs
- Management Module

FEATURES

- Up to 6 reference inputs, fully protected with monitoring, selection, filtering, tracking and holdover on redundant modules
- Input jitter & wander tolerances compliant with G.811/G.812 and ETSI EN 300462-4/6 recommendations
- Up to 32 outputs in main rack, 1 + 1 protected
- Optional extension unit for another set of outputs
- Output frequency stability per G.811 when locked
- Holdover stability (at 25°C):
 - PRC/Stratum 1/with Rubidium
 - Transit Node/Stratum 2E with OCXO
 - Transit Node/Stratum 2 with OCXO
 - Local Node/Stratum 3 with OCXO
- No phase hits when source switching
- Embedded Sync Status Message (SSM) on 2.048 Mbit/s outputs for self healing networks
- Built-in test and continuous monitoring of modules, signals and performance
- SSU status with reference and module selections displayed through front panel LEDs
- Alarm interface through relay closures, with Urgent and Non Urgent severity
- Local and remote management over IP with standard SNMP/FTP protocol through high data rate Ethernet port
- RS-232C interface or Telnet protocol with ANSI terminal emulation for maintenance and installation purposes
- Web UI option (web server function with HTML pages)
- Dual -36 Vdc to -72 Vdc supplies
- Power requirements: < 150 W
- ETSI ETS 300-119/ANSI standard rack modules
- 441 x 275 x 365 mm³ (W x D x H)
- Weight (full configuration): <15 kg



KEY : Basic modules Optional modules

Distribution Module	2 MHz Module	2 Mbit/s Module	T & F Module		
Output Type	G703 - § 13	E1 G703 - § 9 - G704	Time / Frequency		
Rate	2.048 MHz	2.048 Mbit/s	10 MHz	1 PPS	ToD
Impedance	75 Ω unbal or Ω 120 balanced	75 Ω unbal or Ω 120 balanced	50 Ω unbal	50 Ω unbal	Asynchronous RS-232C
Number of outputs/module	8	8	2	2	2
Number of modules in SSU rack	up to 4	up to 4	up to 4		
Number of modules in SSU rack with 2 outputs/ connector	up to 7	up to 7	up to 7		
Number of modules in extension rack	up to 4 (more on request)	up to 4 (more on request)	up to 4 (more on request)		

Application	PRC - G.811	Transit and local node - G.812 (G.811 when locked)	
Oscillator Type	Rubidium	Double Oven OCXO	High Performance OCXO
Stability "Hold Over" (@ 25° C)	$< \pm 5 \times 10^{-11}$ /month	1×10^{-10} /day	3×10^{-10} /day
Short term stability	$< \pm 1 \times 10^{-11}$ /day	$< \pm 1 \times 10^{-10}$ /100 sec	$< \pm 1 \times 10^{-10}$ /100 sec
Pulling range	$\pm 1.5 \times 10^{-8} \pm 20\%$	$< \pm 2 \times 10^{-8}$	$< \pm 3 \times 10^{-7}$
Switching over	< 10 ns	< 10 ns	< 10 ns
Accuracy in GPS tracking mode	$< \pm 1 \times 10^{-12}$ aver / 24 h	$< \pm 2 \times 10^{-12}$ aver / 24 h	$< \pm 2 \times 10^{-12}$ aver / 24 h

Synchronizing Source	G703 - § 13	E1 - G703 - § 9 - G704	Sine Wave	GPS
Rate	2.048 MHz	2.048 Mbit/s	10 MHz	1 PPS
Impedance	75 Ω unbal or 120 Ω balanced	75 Ω unbal or 120 Ω balanced	50 Ω unbalanced	
Number	4	2	2	2