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SSU-2000 TECHNICAL DATA

KEY SYSTEM SPECIFICATIONS		
Architecture Capability	<div><div></div> Main unit modules: 2 clock, 1 comm, 9 mixed input/output</div> <div><div></div> Output expansion shelves: Up to 4,14 modules/shelf, 280 outputs/shelf</div>	
GPS Performance	Compliant with Stratum 1 PRS (Primary Reference Source) per ANSI T1.101-1994, ITU-T G.811, Bellcore GR-2830/1244-CORE, and ETS 300 462-6	
Clock Performance	Compliant with clock levels per ANSI T1.101-1994 & 1997 draft, ITU-T G.812, Bellcore GR-378/1244-CORE, and ETS 300 462-4	
Sync Status Messaging (SSM)	Compliant with SSM specification per T1X1.3 TR33, ANSI T1.101-1997 draft, ITU-T G.704, and Bellcore GR-253-CORE	
Network Time Protocol (NTP)	Compliant with RFC 1305 (V3); only available with GPS module(s)	
Communications & Management	3x EIA-232 and 1x Ethernet ports, supporting interactive ASCII, TL1 and SNMP	
Redundancy	User configurable	
Event Log	Stores up to 500 events from any system faults, user interventions, and system actions. Events are time & date stamped to less than 1 msec.	
INPUT		
Slot	9	
Port	1 or 3 ports/module, reference or monitoring capability	
Type	DS1, E1, 1 MHz, 1.544 MHz, 2.048 MHz - G.703/13, 5 MHz, 10 MHz (user settable)	
GPS	Up to 2, occupies 1 input slot per GPS	
Sync Status Messaging (SSM)	Fully supported per above-listed standards	
Selection Mode	Priority, SSM, Performance Mask	
RealTime ^{Plus} ™ CPU	Intelligent software for real-time MTIE, TDEV and TIE performance monitoring	
PERFORMANCE MEASUREMENT		
Resolution	1 ns	
Sampling Rate	40 Hz	
MTIE	Exceeds the latest ANSI, ITU-T and Bellcore standards	
TDEV	Exceeds the latest ANSI, ITU-T and Bellcore standards	
CLOCK		
Holdover Type	<div><div></div> Stratum 2E Rubidium^{Plus}™</div> <div><div></div> Stratum 3E Quartz^{Plus}™</div>	
Control	DDS (Direct Digital Synthesis) technology for cost-effective calibration-free operation	
OUTPUT		
Slot	Main unit: 9 single or redundant Expansion shelf: 14 single or redundant	
Port	20 ports/module for DS/E1, 6 ports/module for analog, and 2 in-&-out ports/module for retimed DS1/E1	
Type	DS1, E1, 1 MHz, 1.544 MHz, 2.048 MHz - G.703/13, 5 MHz, Composite Clock	
Sync Status Messaging (SSM)	Fully supported per above-listed standards	
Main Unit Port	Up to 180 outputs with 20 ports/modules	
Max. Capacity	Up to 1120 outputs, 4 expansion shelves, 280 ports/shelf	
COMMUNICATION & MANAGEMENT		
Communication Port	<div><div></div> 3x EIA-232</div> <div><div></div> 1x Ethernet, 10 Base-T, TCP/IP</div>	
Management Interface	<div><div></div> Simple fault, visual & contact closures</div> <div><div></div> Embedded Interactive ASCII</div> <div><div></div> Embedded TL1</div> <div><div></div> Embedded SNMP (optional)</div>	
Local Management	Windows GUI-based Local Management Terminal	
ENVIRONMENTAL		
Power (Vdc)	-40.5 to -75	
Size (HxWxD)	19.7"x18.9"x9" (500x480x229mm) or 19.7"x20.9"x9" (500x530x229mm) with rack ears	
Weight (max.)	26.7lbs (12.1kg) main unit, 22.3lbs (10.1kg) for each expansion unit	

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NETSYNC^{Plus}® SSU-2000



INTELLIGENT NEBS-COMPLIANT SYNC SUPPLY UNIT

Cost-Effective Stratum 1/2E/3E Network Synchronization Solutions
For Advanced Network/Transit/Access/Local Offices

- ✓ **Technology:** RealTime^{Plus}™ Monitoring, SmarTime^{Plus}™ Switchover, SmartHoldover^{Plus}™
- ✓ **Performance:** Meeting Stratum 1/G.811 for 2 Weeks during Holdover with Rubidium^{Plus}™ Clock
- ✓ **Primary Reference Source:** 2x GPS^{Plus}™
- ✓ **Input:** 27x DS1/E1, 1/1.544/2.048/5/10 MHz, Monitoring
- ✓ **SynClock^{Plus}™:** 2x Stratum 2E Rubidium^{Plus}™ and/or Stratum 3E Quartz^{Plus}™
- ✓ **Output:** 160-1120x DS1/E1, NTP
- ✓ **Communications:** 1x Ethernet (10 Base-T), 3x EIA-232 Ports
- ✓ **Management:** AutoReconfig^{Plus}™, SNMP, Interactive ASCII, TL1, Local Windows Manager



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INTELLIGENT NETWORK/TRANSIT/ACCESS/LOCAL OFFICE SYNCHRONIZATION SOLUTIONS



INTELLIGENT NETSYNC^{PLUS} SUPPLY UNIT

The SSU-2000 is an intelligent, fully manageable Synchronization Supply Unit or Timing Signal Generator. Designed in a NEBS-compliant package, it utilizes the latest hardware and software integration technologies. It is used for telecom network operators to generate and distribute superior synchronization signals for advanced network services.

KEY SSU-2000 BENEFITS

Solution
<ul style="list-style-type: none">✓ Cost-effective solution✓ Full long-term investment protection✓ Fully scalable✓ Fully manageable
Architecture
<ul style="list-style-type: none">✓ Intelligent architecture✓ Configurable as a Sync Distributor Unit when no clock is used✓ RealTime^{Plus}™ performance-monitoring technology✓ SmartTime^{Plus}™ switchover technology✓ SmartHoldover^{Plus}™ technology when GPS and input references are lost✓ AutoReconfig^{Plus}™ to-previous-settings technology✓ Reference pass-through capability if clocks fail✓ Software downloadable✓ No transient on redundant input switchover✓ Seamless integration of future requirements
Input
<ul style="list-style-type: none">✓ DS1/E1✓ 1/1.544/2.048/5/10 MHz (user settable)✓ Up to 27 inputs for monitoring or references✓ Embedded Sync Status Messaging (SSM) for self-healing networks✓ Integrated performance measurements (MTIE, TDEV, error rates) on all inputs
GPS
<ul style="list-style-type: none">✓ Integrated single or dual GPS^{Plus}™ references

SynClock
<ul style="list-style-type: none">✓ Integrated Rubidium^{Plus}™ and/or Quartz^{Plus}™ Clocks
Output
<ul style="list-style-type: none">✓ DS1/E1✓ Composite Clock (CC)✓ Up to 160 1:1 protected (main unit)✓ Up to 1120 1:1 protected add-ons (4 expansion units)✓ Embedded Sync Status Messaging (SSM) for self-healing networks✓ TOD through NTP✓ NTP through the Ethernet port
Communications/Management
<ul style="list-style-type: none">✓ 3x EIA-232 ports✓ 1x Ethernet (10 base-T) port✓ Embedded interactive ASCII interface✓ Embedded TL1 interface✓ Embedded SNMP interface
Standards
<ul style="list-style-type: none">✓ Compliance with the latest and evolving industry standards

INDUSTRY STANDARDS COMPLIANCE

The SSU-2000 is designed to meet the latest and evolving industry standards, including ANSI, Telcordia, ITU-T, ETSI and CE/AS.

POWERFUL NETSYNC^{PLUS} ARCHITECTURE

The SSU-2000 architecture is designed to accept intelligent functional modules in a flexible, fully redundant approach to seamlessly satisfy future requirements.

Up to 160 1:1 protected outputs are available in the main unit.
Up to 1120 1:1 protected additional outputs are available through 4 expansion shelves, providing a capacity of 280 1:1 protected outputs per shelf.



Expansion shelves are designed with redundant connections for reliable uptime.
Input signals are passed through in case of multiple internal failures, including clock.

INTELLIGENT NETSYNC^{PLUS} MODULES

Each SSU module has an integrated CPU with software for superior reliability, flexibility, and functionality. Modules can be removed or inserted while the unit is operating without any degradation of the output signals. Each module supports the management of critical, major, and minor alarms. Powerful management can be performed to and within each module through the communication module.

Input^{Plus} Module
The SSU accepts up to 3 input modules. Each input module is available with 1 or 3 ports. Input modules are fully user configurable through software to support the following signals:

- DS1/E1
- SSM quality
- 1 MHz (sine or square)
- 1.544 MHz (sine or square)
- 2.048 MHz (sine or square)
- 5 MHz (sine or square)
- 10 MHz (sine or square)

DS1/E1 input signals are passed through in case of internal clock failure.
Various input impedance panels are available to support the following balanced or unbalanced signal impedances:

- 50 ohms (sine)
- 75 ohms (DS1/E1)
- 100 ohms (DS1)
- 120 ohms (E1)
- 133 ohms (CC)
- High impedance for timing extraction only (bridging model)
- Specific panel/adaptor connection interfaces:
 - Wire wrap
 - COAX
 - DE-9

GPS^{Plus} Module
The SSU accepts single or dual GPS primary reference modules to meet Primary Reference Clock requirements, which provides the following key benefits:

- ✓ Flattens the number of levels in the sync distribution hierarchy
- ✓ Improves the overall performance of the network
- ✓ Lowers the overall OAM&P costs (Operation, Administration, Maintenance, and Provisioning).
- ✓ Single unit Primary Reference Source (PRS)
- ✓ Time Of Day (TOD) through the Network Time Protocol (NTP)

SynClock^{Plus} Module
The SSU accepts single or dual clocks. A selection of mixed SynClock^{Plus}™ technologies is available to meet specific Statum 2E/3E holdover requirements:

- Enhanced Rubidium^{Plus}™
- Enhanced Quartz^{Plus}™

SmartHoldover^{Plus}™
In case of loss of GPS and input references, the SSU uses intelligent software to provide enhanced output performance beyond the SynClock's holdover stability.

Output^{Plus} Module
The SSU's main unit accepts up to 8 output modules, providing 160 1:1 protected outputs. Up to 4 expansion shelves can be added, providing up to 1120 1:1 protected outputs. Various output modules are available to meet specific signal and interconnection requirements. The activation of the outputs ports are fully user controllable.

Comm^{Plus} Module
The SSU accepts a single communication module. Coupled with the GUI-based NetSync Manager or Local Management Terminal software, the communication module provides powerful fault, configuration, accounting/inventory, performance, security, and other optional management functions.

The communication module supports the following embedded management interfaces over EIA-232 and/or Ethernet ports:

- Interactive ASCII
- TL1
- SNMP (optional)
- NTP

NETSYNC^{PLUS} SERVICE FAMILY

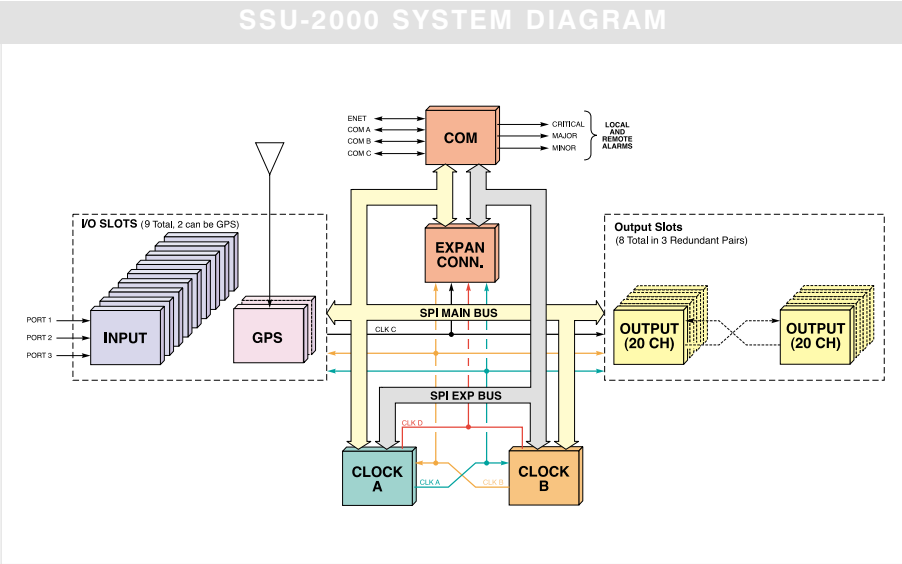
Extended NetSync services are provided to ensure our customer's success. Service programs include:

- Local 24-hour/day, 7-day/week support (phone, fax, email, web, and technician)
- Local inventory support
- NetSync design & planning
- NetSync installation
- NetSync commissioning & testing until acceptance
- NetSync maintenance

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Input
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GPS
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SynClock
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Input ^{Plus} Module
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Comm ^{Plus} Module
<p>The SSU accepts a single communication module. Coupled with the GUI-based NetSync Manager or Local Management Terminal software, the communication module provides powerful fault, configuration, accounting/inventory, performance, security, and other optional management functions.</p>

The communication module supports the following embedded management interfaces over EIA-232 and/or Ethernet ports:

- Interactive ASCII
- TL1
- SNMP (optional)
- NTP

NETSYNC^{PLUS} SERVICE FAMILY

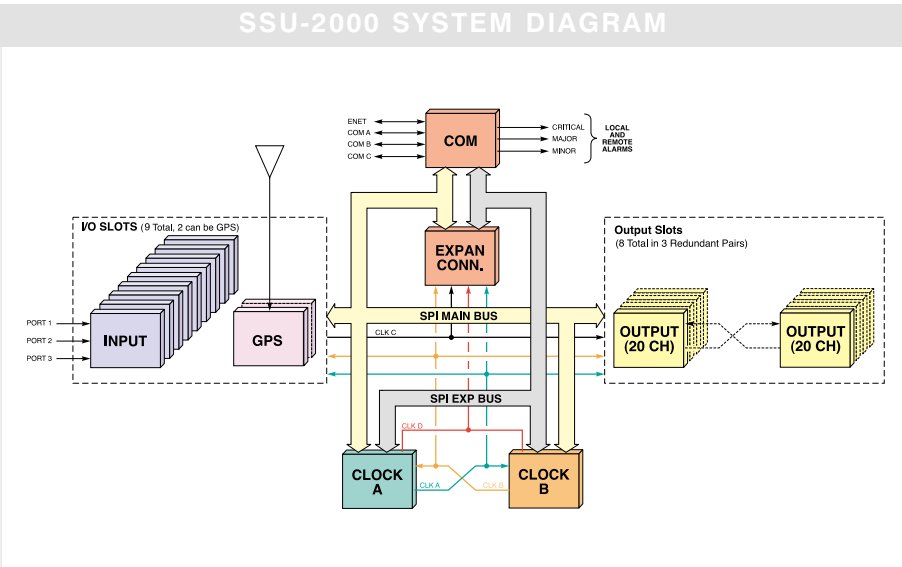
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Sampling Rate	40 Hz	
MTIE	Exceeds the latest ANSI, ITU-T and Bellcore standards	
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Holdover Type	<div><div></div> Stratum 2E Rubidium^{Plus}™</div> <div><div></div> Stratum 3E Quartz^{Plus}™</div>	
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Size (HxWxD)	19.7"x18.9"x9" (500x480x229mm) or 19.7"x20.9"x9" (500x530x229mm) with rack ears	
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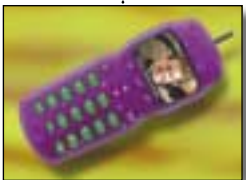
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- ✓ **Communications:** 1x Ethernet (10 Base-T), 3x EIA-232 Ports
- ✓ **Management:** AutoReconfig^{Plus}™, SNMP, Interactive ASCII, TL1, Local Windows Manager



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