



NETSYNC^{PLUS}® TSG-3800^{PLUS}



POWERFUL NETWORK TIMING SIGNAL GENERATOR

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

- ✓ *Input: Up to 12 DS1/E1, SSM, and more*
- ✓ *Input Monitoring: Integrated MTIE/TDEV/Frequency/Phase measurements*
- ✓ *SynClock^{Plus}™: Stratum 2E Rubidium^{Plus}™ & Stratum 3E Quartz^{Plus}™*
- ✓ *Performance: SmartHoldover^{Plus}™ technology*
- ✓ *Output: Up to 520 DS1/E1, SSM, CC, and more*



*The Best Investment Today
for Delivering Superior Telecom Services!*





BEST NETWORK/CENTRAL SYNCHRONIZATION

NETSYNC^{PLUS} SIGNAL GENERATOR

The TSG-3800^{Plus} is an intelligent Timing Signal Generator or Synchronization Supply Unit (SSU) using the latest timing integration technologies. It's designed for telecom network operators to generate superior and highly reliable synchronization signals for advanced network services.

KEY NETSYNC^{PLUS} BENEFITS

Solution

- ✓ Cost-effective solution
- ✓ Full long-term investment protection

Architecture

- ✓ Modular, flexible & redundant
- ✓ Hot swappable modules
- ✓ Low maintenance cost
- ✓ Reference pass-through capability if clocks fail
- ✓ SmartHoldover^{Plus}™ when GPS and DS1/E1 input references are lost
- ✓ <25 nsec transient on redundant clock switchover
- ✓ No transient on redundant input switchover
- ✓ No transient on redundant output switchover
- ✓ Seamless integration of future requirements

Input

- ✓ DS1/E1
- ✓ Embedded Sync Status Messaging (SSM) on DS1/E1 for self-healing networks
- ✓ 1/1.544/2.048/5/10 MHz
- ✓ Up to 12 inputs for references or monitoring (MTIE/TDEV/frequency/Phase data)

SynClock

- ✓ Stratum 2E/2/3E & Transit/Local
- ✓ Rubidium^{Plus}™
- ✓ Quartz^{Plus}™

Output

- ✓ Single or redundant DS1/E1
- ✓ Embedded Sync Status Messaging (SSM) on DS1/E1 for self-healing networks
- ✓ 1/1.544/2.048/5/10 MHz
- ✓ Composite Clock/8 KHz
- ✓ Retimed DS1/E1
- ✓ Output capacity: max. 400 outputs in two 19" units or 520 outputs in two 23" units

Communication/Management

- ✓ EIA-232/Ethernet port
- ✓ Embedded TL1 interface
- ✓ Interactive ASCII-based interface
- ✓ PC-based Q3/CMIP interface for powerful TMN management
- ✓ PC-based SNMP interface

Standards

- ✓ Compliance with the latest and new industry standards is guaranteed
- ✓ Compliance with critical EMC standards for interference protection

INDUSTRY STANDARDS COMPLIANCE

The TSG-3800^{Plus} is designed to meet the latest and evolving industry standards, including ITU-T, ETSI, EIA, ANSI, Telcordia/Bellcore, and AS/CE.

TSG-3800^{PLUS} NETSYNC^{PLUS} APPLICATIONS

The TSG-3800^{Plus} is designed to meet a broad range of requirements by simply changing the configuration of the unit.

The key applications are:

- Network TSG/SSU for large toll or tandem offices with digital switches, multiplexers, cross-connect systems, SONET/SDH, channel banks and ATM network elements
- Central office TSG/SSU
- Transit office TSG/SSU
- Local office TSG/SSU

FLEXIBLE & REDUNDANT NETSYNC^{PLUS} ARCHITECTURE

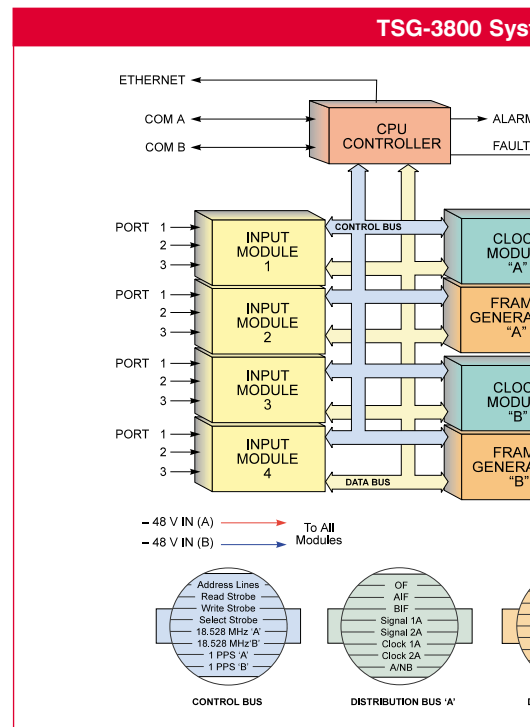
The TSG-3800^{Plus} architecture is designed to accept the following modules in a flexible approach to seamlessly satisfy future requirements:

- EMC-compliant modules
- Input module for reference or monitoring (max. 4 modules, each with 1 or 3 ports)
- CPU-Comm module

- Single or dual Rubidium^{Plus}™ or Quartz^{Plus}™ clock modules (in any combination)
- Single or dual frame generator modules
- Single or redundant output modules (max. 40 outputs in main 19" unit or 80 outputs in main 23" unit)
- Up to 2 expansion units: single or redundant output modules (max. 180 outputs in each 19" unit or 220 outputs in each 23" unit)

INTELLIGENT NETSYNC^{PLUS} MODULES

Each TSG module integrates the latest hardware and software technologies 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 through the communication interface.



TRANSIT/LOCAL/OFFICE SOLUTION



Input^{Plus} Module

This module can be configured to support any of the following input signals:

- E1 (G.703/9 or G.703/13)
- DS1 (D4/SF or ESF)
- SSM quality status on E1/DS1
- MTIE/TDEV data
- 1/1.544/2.048/5/10 MHz
- Composite Clock

Each port is user configurable to meet specific impedance requirements.

CPU-Comm^{Plus} Module

This module provides full control of the TSG-3800^{Plus} to the user. Coupled with the NetSync Manager Software, it provides powerful fault, configuration, accounting/inventory, performance, security, and other optional management functionality. It supports the following management interfaces:

- Two EIA-232 ports
- One Ethernet port (optional)
- Embedded TL1
- Interactive ASCII-based mode

- Remote software download
- PC-based TSM/Win32 for fault and performance management
- PC-based Q3/CMIP interface for powerful TMN management (optional)
- PC-based SNMP interface (optional)

SynClock^{Plus}™ Module

This module is available in different versions to meet specific holdover requirements. The following SynClock technologies are supported for Stratum 2E/2/3E and Transit/local offices:

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

SmartHoldover^{Plus}™

In case of loss of GPS and DS1/E1 input reference, the TSG-3800^{Plus} uses intelligent software to provide enhanced output performance beyond the SynClock's holdover stability.

FrameGen^{Plus} Module

This module can be configured to generate any of the following output signals:

- E1 (G.703/9 or G.703/13)
- DS1 (D4/SF or ESF)
- SSM quality status on E1/DS1
- 1.544/2.048 MHz
- Composite Clock/8 kHz

Output^{Plus} Module

Output modules are available to support the signal formats generated by the frame generator. In addition, TTL and RS-422 output formats are available at 8 kHz, 1.544 and 2.048 MHz. Analog output modules are also available to provide 1, 5, or 10 MHz sine waves.

Retiming^{Plus} Module

This retiming module or Timing Insertion Module (TIM) is used to retime a traffic-carrying DS1/E1 signal with the TSG's clock.

NETSYNC^{Plus} SERVICES FAMILY

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

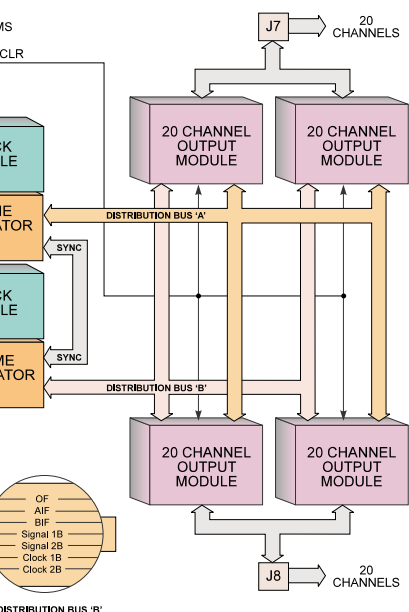
- ☐ Local 24-hour/day, 7-day/week support (phone, fax, email, web, and technician)
- ☐ Local inventory support
- ☐ NetSync design & planning
- ☐ NetSync installation
- ☐ NetSync commissioning & testing until acceptance
- ☐ NetSync maintenance

ONLINE DATA SUPPORT

Visit our web site today at www.datum.com for the latest information, including:

- ☐ NetSync application notes
- ☐ NetSync training
- ☐ NetSync seminar
- ☐ NetSync resources
- ☐ Q&A support
- ☐ Local and international NetSync experts

System Diagram



**KEY SYSTEM SPECIFICATIONS**

Clock Performance	Exceeds requirements of ANSI T1.101-1994 and 1997 Draft revision, ITU-T G.812, ITU-T G.823 Jitter/Wander, Bellcore GR-378-CORE and GR-1244-CORE
Sync Status Messages	Full SSM functionality and compatibility with T1X1.3 TR #33, ANSI T1.101 1997 Draft, ITU-T G.704, and Bellcore GR-253-CORE
Management	Advanced Synchronization Element/Network Management Functionality
Redundancy	All circuits affecting outputs are fully one-plus-one redundant for superior system reliability
Event Log	Stores up to 500 events including input and system faults, operator inputs, and system actions; time and date stamped to the nearest millisecond

COMMUNICATIONS

Ports	Two independent EIA-232 ports (for Craft Interface and Remote OS) and Ethernet 10 base-T port (optional)
Protocol	TL1 and interactive ASCII-based mode
PC-Based Management	Remote Software download TSM/Win 32 Manager (Fault & Performance) TMN Q3/CMIP Interface (optional) SNMP interface (optional)
Speed	EIA-232: Up to 19.2 Kbps (8-bit, no parity, 1 stop bit) Ethernet: 10 Mbps, 10 base-T
Alarm/Event	Critical, Major, and Minor through EIA-232 and Ethernet ports and front panel indicators; Critical/Major, Minor, and Audible through 2 sets of local and remote NO/NC relay contacts (1 Amp. resistive)

MEASUREMENTS

<i>All of the following performance monitoring measurements are performed continuously on each of the 12 input signals.</i>	
Resolution	1 ns
Sampling Rate	20 Hz
MTIE, Real Time	Most recent 50 values, 100, 1,000, 10,000 second periods
MTIE and TDEV Statistics	Calculations performed as a function of observation time over up to past 24 hours
Phase (TIE) Measurements	Most recent 100 values @ 1 second avg; 1000 values @ 100 second avg
Other Measurements	AIS, BPV, LOS, OOF, CRC errored and clear intervals
Control Value Reporting (each of 2 clocks)	Most recent 100 values @ 1 second avg; 1000 values @ 100 second avg

DISTRIBUTION CAPACITY

<i>Number of one-plus-one redundant outputs</i>	
Main Unit	2 module pairs (40 outputs) in 19" unit 4 module pairs (80 outputs) in 23" unit
Expansion Unit #1	9 module pairs (180 outputs) in 19" unit 11 module pairs (220 outputs) in 23" unit
Expansion Unit #2	9 module pairs (180 outputs) in 19" unit 11 module pairs (220 outputs) in 23" unit
Maximum Outputs	400 (in two 19" units) 520 (in two 23" units)

ENVIRONMENTAL

EMC Compliance	CE, FCC Part 15, Class A and CISPR 22 Class A (optional)
Operating Temperature Range	0 to 50 °C
Humidity	0 to 95%, non-condensing

POWER

Power	Redundant Inputs: 38 to 72 Vdc, 3.0 A (maximum) + 0.1 A/Dist. Module Either positive or negative ground
Connector	Terminal Block
Fuse Type/Rating	GMT-5A (4 fuses), integrated on isolated ground

PHYSICAL

Telecom Configuration	NEBS compliant
Height	10.47" (26.59 cm)
Depth	10.75" (27.30 cm)
Width	17.12" (43.48 cm), or 21.10" (53.59 cm)
Weight	20 lbs (9 kg)