



The NTS 03-G Plus is a fully customizable satellite reference clock. It meets the demanding precision and reliability requirements of the Power, Telecommunications and Enterprise sectors.

Multiple Ethernet ports support advanced PTP and NTP time synchronization solutions, while the high drive IRIG-B option delivers legacy device interoperability. This ruggedized platform brings ultimate reliability through optional fiber optic Ethernet and IRIG-B ports, extended holdover through Rubidium and OCXO oscillator options, and time sync redundancy through Parallel Redundancy Protocol (PRP) support.

Enhanced security is delivered through fully encrypted and authenticated configuration access. Multiple user accounts are supported with configurable access control. Independently addressable and logically isolated Ethernet ports allow multiple networks to be connected to the same clock without compromising the network security. SNMPv3 and built-in NTP amplification attack immunity coupled with IRIG-B and PTP support makes the NTS 03-G Plus a versatile synchronization solution.

KEY FEATURES

- PRP Support
- up to 45000 NTP Requests/Second (6 port, 7500 per port)
- References GPS & GLONASS networks
- OCXO/Rubidium options
- NTP/SNTP
- PTP (IEEE 1588v2) Master/Slave function
- Enhanced security and encryption that exceeds NERC CIP requirements
- Optional second PSU for redundancy
- Up to 6 high power IRIG-B or pulse drivers
- 3, 4 or 6 independent Ethernet ports
- Configurable timezone settings
- Remote configuration over Ethernet
- Remote firmware upgrades
- Configuration encryption and security
- Isolated power supply

SUPPORTS

- DC IRIG-B or Modified Manchester
- Fiber IRIG-B
- AM IRIG-B (Modulated)
- IEEE C37.118.1 extensions
- User defined pulses (including 1 PPS)
- 100BASEFX Fiber (62.5/ 125 μm , λ 1300 nm)
- PTP (IEEE 1588v2)
- NTP/ SNTP
- SNMP v1, v2c & v3

PHYSICAL

- Dimensions: 430 mm x 270 mm x 45 mm (WxDxH)
 - Weight: 2.0 kg
 - 1U 19" rack mount
 - IP40 (Ingress Protection rating)
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FRONT PANEL

- 2-line x 16 character FSTN LCD display
 - 2 LEDs indicating multiple statuses, including:
 - Sync Status
 - Antenna cable fault
 - Satellite acquisition mode
 - Display mode button
 - USB configuration port (Type B)
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GNSS RECEIVER

- L1, C/A code, 32 Channel Parallel-tracking receiver
- Constellations: GPS and GLONASS
Acquisition sensitivity: -155 dBm
Tracking sensitivity: -160 dBm
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OSCILLATOR OPTIONS

Select your holdover needs:

TCXO (25 °C)

- <±100us/4 hours (24-hours aging)
- <±0.6ms/24 hours (24-hours aging)

OCXO (25 °C)

- ± 5 µs/8 hours (48-hours aging)
- ±10 µs/18 hours (48-hours aging)
- ±10 µs /24 hours (7-days aging)

Rubidium (25 °C)

- ±1 µs/24 hours (7 days aging)
 - ±3 µs/72 hours (7 days aging)
 - ±10 µs/7 days (7-days aging)
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NETWORK PROTOCOLS

General

- DHCP auto-configuration with fallback to ARP tested link-local address
- VLAN packet tagging
- Auto-MDIX
- Auto-negotiate

PTP (IEEE 1588v2)

- One or Two Step operation
- End-to-End, Peer-to-Peer or manual delay calculations
- Layer 2 (Ethernet) or Layer 3 (UDP) transport
- Slave only mode
- Default Profile support
- Power Profile support (C37.238)
- Telecom Profile support (Slave only - ITU G. 8265.1)
- Telecom Profile support (Master/Slave - ITU G. 8275.1)
- C37.238 TLV supported
- Alternate Time Offset TLV supported with automatic or manual offset
- C37.238 SNMP MIB supported

NTP

- Stratum-1 NTP & SNTP time server
- Multicast & Broadcast server capability
- Optional MD5 authentication
- Supports NTP v1, v2, v3, v4

PRP

- IEC 62439-3 (2016)
- Redundant master clock
- Fast failover slave
- Supports up to two PRP pairs
- PTP (IEEE 1588v2) Default & Power Profiles
- NTP not available over PRP

SNMP

- v1, v2c & v3 support can be independently enabled
- Configurable v1, v2c community names & security groups
- Fully configurable via SNMP
- v3 User-based Security Module (USM) support
- USM authentication methods: MD5, SHA
- USM privacy methods: DES, AES
- USM MIB support

Notifications

- SNMP trap generation v1, v2c & v3
 - SNMPv3 traps can be authenticated & privatised via USM
 - Syslog (RFC-3164 & 5424 varieties)
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3 PORT OPTION

- 3 x Network Time Server ports

Characteristics:

- Copper: RJ45 10/100 BASE-T Ethernet
- Fiber: ST multi-mode fiber 100 BASE-FX Ethernet (available on Eth2 or Eth3)

- Timing accuracy: <100 ns to UTC (NTP/SNTP/PTP)
- PRP: 1 pair (Eth2 with Eth3)

Plus:

- 1 x IRIG-B input: DC IRIG-B (Un-modulated, DCLS)
- Signals: Extensions C37.118.1
- Characteristics: RS422
 - 7 V to +12 V (common mode range)
 - 1/8 unit load (150 k Ω)
 - Built in 120 Ω for optional termination

Plus:

- 1 x Programmable output:
- Signals: DC IRIG-B (Un-modulated, DCLS)
- Extensions C37.118.1, AFNOR NF S87-500
- User defined pulses (1 to 1000 PPS)
- DCF77 simulation
- Timing accuracy: <100 ns of UTC
- Characteristics: RS422
 - Can drive upto 50 unit loads
 - Open circuit: ±3.3 V
 - Loaded: ±1V @ 80 mA

Plus:

- 4 x Alarm Relay Outputs

Alarm Types: Antenna, Sync, Power A and Power B

Relay outputs: Normally Open (Form A)
Solid State Relays
ESD protection ITU K.20/21
Contact rating: 275 VDC, 100 mA
Contact protection: 275 VDC, 0.5A (fused)

**6 PORT OPTION**

- 3 x additional Network Time Server ports

Characteristics:
Copper: RJ45 10/100 BASE-T Ethernet
Fiber: ST multi-mode fiber 100 BASE-FX Ethernet (available on Eth2 to Eth6)
Timing accuracy: <100 ns to UTC (NTP/SNTP/PTP)
PRP: 2 pairs (Eth2 with Eth3 & Eth5 with Eth6)

**4 PORT+ IRIG OPTION**

- 1x additional Network Time Server port

Characteristics:
Copper: RJ45 10/100 BASE-T Ethernet
Fiber: ST multi-mode fiber 100 BASE-FX Ethernet (available on Eth2 to Eth4)
Timing accuracy: <100 ns to UTC (NTP/SNTP/PTP)
PRP: 1 pair (Eth2 with Eth3)

Plus:

- 4 x Programmable output:

Signals: DC IRIG-B (Un-modulated, DCLS)
Extensions C37.118.1, AFNOR NF S87-500
User defined pulses (1 to 1000 PPS)
DCF77 simulation

Timing accuracy: <100 ns to UTC

Characteristics:
BNC: 5V TTL, 150 mA (with current sense)
ST Fiber: TX (62.5/ 125 μ m, λ 820 nm), compatible with multi-mode fiber

Plus:

- 2 x Programmable output:

Signals: DC IRIG-B (Un-modulated, DCLS)
Selectable AM IRIG-B (Modulated)
Extensions C37.118.1, AFNOR NF S87-500
User defined pulses (1 to 1000 PPS)
DCF77 simulation

Timing accuracy:

DC IRIG-B: <100 ns to UTC

AM IRIG-B: <2 μ s to UTC

Characteristics:

DC IRIG-B: 5V TTL, 150mA (BNC)

AM IRIG-B: 7.2Vpp 120 ohm output impedance (BNC)

OPTIONAL ACCESSORIES**Physical**

- GNSS antenna
- Antenna cable
- Adjustable antenna mount
- Lightning protection kit
- BNC-2PIN adapter

Refer to www.tekron.com for more technical specifications.

CONFIGURATION SOFTWARE

Windows-based configuration software is available for download on www.tekron.com.

Remote configuration over Ethernet includes the following user adjustable features:

- Multi-level access control
- Privacy & authentication methods equivalent to SNMP USM
- "Supervisor-mode" prevents non-approved changes
- Test mode
- Commissioning tool

Timing & Synchronization

Worldwide daylight savings and local time configuration using either rule based or fixed date methods. Options that allow equipment checks prior to full installation and adjustable holdover times to increase reliability in the case of poor GPS coverage. Adjustments to compensate for installation parameters such as delay of GPS signal through antenna cable.

ENVIRONMENT AND ELECTRICAL

Power supply*: M = 20 - 75 VDC (2 pin)
H = 90 - 300 VDC (2 pin)
I = 85 - 265 VAC (IEC 320 inlet)

Power Rating: 12W - 28W max (depending on order options)

Operating Temperature:
-10°C to +65°C
-10°C to +60°C (Rubidium)

Humidity: 10 to 95% RH (non-condensing)

* Redundant power supply available



ABOUT TEKRON

Tekron is a global leader in providing high precision GPS and atomic clock time keeping technologies and solutions that enable synchronization of advanced networks and services. Installed in over 70 countries, these solutions are used to provide critical timekeeping in national power grids, as well as civilian and military networks. Our customers are predominantly power utility network operators, telecom networks and enterprise industries such as banking and petroleum.

CONTACT US

Website:

www.tekron.com

Phone:

+64 4 566 7722

Australia Freephone:

1800 608 572

North America Freephone:

1800 256 2309

Sales Enquiries:

sales@tekron.com

Support Enquiries:

support@tekron.com



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