

# NTS 03-G+ GNSS Clock

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



## Key Features

- References GPS and GLONASS networks
- Multi-level password protection
- Isolated singular or dual power supplies
- High power line drivers
- Low noise characteristics due to balanced pair distribution
- UTC and LST with user defined DST options
- Master/ Slave function
- Up to 9 outputs
- Supports IEC61850
- Enhanced Security and encryption that exceed NERC CIP requirements
- Remote configuration and firmware upgrades
- OCXO/Atomic options

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 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.

## Supports

- DC IRIG-B or Modified Manchester
- Fiber IRIG-B
- AM IRIG-B (Modulated)
- IEEE C37.118.1 extensions
- User defined pulses (including 1PPS)
- 100BASEFX Fiber (62.5/ 125  $\mu\text{m}$ ,  $\lambda$  1300 nm)
- PTP (IEEE 1588v2) – from IEEE 61850\*
- NTP/SNTP\*
- SNMP v1, v2c, v3

\*Some optional features may incur extra costs

## Physical

- 19" rack mount 1U high
- (W) 430 mm x (D) 270 mm x (H) 45 mm,
- 2.0 kg
- IP40 (Ingress Protection rating)

## Front Panel

2 line x 16 character FSTN LCD display and two LEDs indicating multiple statuses, including:

- Sync Status
- Antenna cable fault
- Satellite acquisition mode

Display mode button

USB Configuration Port (Type B)

## GNSS Receiver

L1, C/ A code, 32 Channel Parallel-tracking receiver, GPS and GLONASS

### Sensitivity:

Acquisition: -155 dBm

Tracking: -160 dBm

## Oscillator Options

Select your holdover needs:

### TCXO (25°C)

<±100 µs/4 hours (24 hours aging)

<±0.6 ms/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)

\*\*not compatible with Fiber Ethernet on 4 or 6 port options

### Rubidium (25°C)

±1 µs/24 hours (7 days aging)

±3 µs/72 hours (7 days aging)

±10 µs/7 days (7 days aging)

## 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 (C37.238-2011, C37.238-2017)
- Telecom Profile support (Slave only - ITU G. 8265.1)
- Telecom Profile support (Master/Slave - ITU G. 8275.1)
- Power Utility Profile (IEC 61850-9-3)
- 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/SNTP

### 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)

## Optional Accessories

### Physical

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

## Environment and Electrical

### Power Supply

- M = 20 - 75 VDC (2 pin)
- H= 90 - 300 VDC (2 pin)
- I = 85 - 250 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)

## 3 Port Option



3x 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

- 1x IRIG-B Input: DC IRIG-B (Un-modulated, DCLS)
- Signals: Extensions C37.118.1

### Characteristics

RS422: -7V to +12V (common mode range)  
1/8 unit load (150 k  $\Omega$ )  
Built in 120  $\Omega$  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 to UTC

### Characteristics

RS422: Can drive up to 50 unit loads  
Open circuit:  $\pm 3.3$  V  
Loaded:  $\pm 1$  V @ 80 mA

### Plus

#### 4x 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)

## Configuration Software

Windows based configuration software is available for download on the Tekron website. 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 hold-over times to increase reliability in the case of poor GNSS coverage. Adjustments to compensate for installation parameters such as delay of GNSS signal through antenna cable.

## Contact Us

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Note:

The quickest and most effective method to request a quote is through the online quote request form on the Tekron website.

\*Some optional features may incur extra costs

## 6 Port Option



3x 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 pair (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

4x 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

BNC: 5V TTL, 150 mA (with current sense)  
ST Fiber: TX (62.5/125  $\mu$ m,  $\lambda$  820 nm), compatible with multi-mode fiber

## Plus

2x 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: DCLS: <100ns to UTC  
AM: <2 $\mu$ s to UTC

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