TCG 01-G
GNSS Clock

The TCG 01-G is a highly accurate, full featured Global Navigation Satellite System (GNSS) clock trusted and proven for use in electricity protection and control systems. The TCG 01-G supports IEEE 1588v2 and conforms to IEC 61850.

Key Features

- References GPS and GLONASS networks
- Multi-level password protection
- Independently isolated outputs
- Isolated power supply
- High power line drivers
- Low noise characteristics due to balanced pair distribution
- UTC and LST with user defined DST options
- Remote configuration over Ethernet
- Configuration Security
- Enhanced security and encryption that exceeds NERC CIP requirements
- Remote firmware upgrades

The TCG 01-G can reference signals from either or both the GPS and GLONASS satellite networks. The clock synchronizes multiple IEDs (Intelligent Electronic Devices) within a network, including protection relays and remote telemetry units, and provides time-stamps to all electronic data being generated by the IEDs.

Supports

- IEEE 1588-2008
  - IEEE C37.238-2011 Power Profile
  - IEEE C37.238-2017 Power Profile
  - ITU-T G.8265.1 Telecom Profile (Slave only)
  - ITU-T G.8275.1 Telecom Profile (Full)
  - IEC 61850-9-3 Power Utility profile
- DC IRIG-B or Modified Manchester
- AM IRIG-B (Modulated)
- Serial Strings
- User defined pulses
- DCF77 Simulated time code
- NTPv3, NTPv4, SNTP
- Event Recording

WORLD WIDE WARRANTY 10 YEARS

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2019

Physical

(W) 160 mm x (D) 155 mm x (H) 40 mm, 0.8 kg, 1U 19” rack mount bracket accessory included IP40 (Ingress Protection rating)

Front Panel

The TCG 01-G has a 2-line x 16 character FSTN LCD display and two LEDs indicating multiple statuses, including:

- Sync Status
- Satellite acquisition mode
- Alarm
- Display mode button

GNSS Receiver

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

Frequency:

1598 MHz

Sensitivity:

- Acquisition: -148 dBm
- Tracking: -160 dBm

Oscillator – TCXO

Holdover characteristics operating at 25C:

- TCXO 1PPS drifts 0.55 ms over a 24 hour period.
- Drift rate: 7 ppb per second

Inputs and Outputs

2 x independently programmable outputs, either:

- TTL 0 - 5 V, 150 mA (BNC or 2-pin)
- RS422 ± 5V differential, 50-unit loads (2-pin)
- HV switch MOSFET 250V 100 mA (2-pin)
- Fiber TX (62.5/ 125 µm, λ 820 nm), compatible with multi-mode fiber (ST Fiber connectors)
- Minimum optical power -22.8dBm, if using Tekron ITR, typical optical power budget 6.6dB

Timing accuracy: <100 ns to UTC

1 x RS232/ RS422 serial port, DCE wired (DB9)

- RS232: Signals are +/- 9 V, 10 mA.
- Serial time messages can be configured to be output at 1200, 2400,4800, 9600, 19200 and 38400 baud. Programmable pulse or IRIG-B available on pin 1.

Timing accuracy of RS232/ RS422 port:

- Serial Message: <1 bit time typical to UTC
- Pulse/ or IRIG-B time code: <1.5 µs to UTC

1 x AM IRIG-B, 8 Vpp, 120 ohm (BNC)
Timing accuracy: <2 µs to UTC

2 x Event recording inputs/ DC IRIG-B inputs (2 pin) Input rating: 5 V, 7 mA (10 V, 20 mA also accepted) Timing accuracy <100 ns.
Minimum threshold voltage: 4.15V

1 x Antenna fail alarm (2 pin - Form A contact) Contact rating: 200 V, 150 mA DC or 150 V, 100 mA AC

1 x Sync relay (2 pin - Form A contact) Contact rating: 200 V, 150 mA DC or 150 V, 100 mA AC

1 x SMA Female Antenna Connector

- 5V DC @ 50mA antenna power supply
- 50Ω Impedance

1 x RJ45 10/100 Mbps UTP connector

- Timestamping accuracy: <100 ns to UTC (NTP/SNTP + PTP)
- Protocols Supported: ARP, UDP, ICMP, TFTP, DHCP, VLAN.
- Auto MDIX
- Auto Negotiate

Back Panel:

Fiber IRIG-B Input Option

- ST Fiber (62.5/12.5µm λ 820nm)
- Minimum guaranteed optical power threshold -24dBm
- if using Tekron ITR, typical optical power budget 6.6dB

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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- Sales Freephone: (Australia) 1800 506 311
- Sales Freephone: (North America) 1800 256 2309

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

Programmable Outputs

- IRIG-B (B00x / B22x) time code with selectable C37.118.1 and AFNOR S87-500 extensions
- DCF77 time code, 1 kHz square wave
- User defined pulse sequences:
  Repetition rates from 20 ms to 24 hours
  Offsets and durations from 10 ms to 24 hours

Serial Strings

- NMEA-0183 ZDA
- NMEA-0183 RMC
- IRIG J-17
- Tekron A - H (Eight protocols for plug and play compatibility with a wide range of equipment).

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 & privatized via USM
- Syslog (RFC-3164 & 5424 varieties)

Environment and Electrical

Power Supply: L=14-36 Vdc (2 pin)
M=20-75 Vdc (2 pin)
H=90 -300 Vdc (2 pin)

- Power drain: 6W max
- Operating temperature: -10 to 65°C
- Humidity: To 95% RH (non-condensing)
- Isolation:
  Outputs to base unit: 2.5 kV
  Power supply to I/O: 3.5 kV