LEADING SUBSTATION CLOCK

TCG 01-G

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

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.

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

SUPPORTS

- IEEE 1588 (PTP C37-238, Telecom Slave only profile)
- DC IRIG-B or Modified Manchester
- AM IRIG-B (Modulated)
- Serial Strings
- User defined pulses
- DCF77
- NTP/ SNTP (IEC 61850)
- Event Recording

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
- Antenna cable fault
- Satellite acquisition mode
- Display mode button
- Alarm

GNSS RECEIVER

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

Frequency:	1598 MHz
Sensitivity:	
Acquisition	-155 dBm
Tracking	-160 dBm

OSCILLATOR - TCXO

Holdover characteristics operating at 25 degrees C;
- TCXO 1PPS drifts 0.55 ms over a 24 hour period.
- Drift rate: 7 ppb per second

Front Panel

Back Panel

INPUTS AND OUTPUTS

2 x independently programmable outputs, either:

- TTL 0 - 5 V, 150 mA (BNC or 2-pin)
- RS422/RS485 +/- 5 V, 50 unit loads (2-pin)
- HV switch MOSFET 300 V 1 A (2-pin)
- Fiber TX (62.5/ 125 μm, λ 820 nm), compatible with multi-mode fiber (ST Fiber connectors)

Timing accuracy: <100 ns to UTC

Plus:
1 x RS232/ RS422 serial port, DCE wired (DB9)
RS232: Signals are +/- 9 V, 15 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
Pulse/or IRIG-B time code <1.5 μs to UTC

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

Plus:
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

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

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

Plus:
1 x RJ45 10/100 Mbps UTP connector
Timing stamp accuracy: <100 ns to UTC (NTP/SNTP + PTP)
Protocols Supported:
ARP, UDP, ICMP, TFTP, DHCP, SNMP v1, v2c & v3; VLAN.

OPTIONS

NTP

Stratum-1 NTP & SNTP time server
Multicast & Broadcast server capability
Optional MD5 authentication

IEEE 1588 v2 (PTP v2) Support

As per Network Time Server above plus:-
PTP (IEEE1588) v2 operation
GrandMaster (GNSS) or ordinary clock functions
Profile selection:
- Default
- C37.238 Power Profile (full support)
- Telecom Profile (slave only, ITU G.8265.1)
1-step tx, 1-step/ 2-step rx
Layer 2 or Layer 3 mapping
Peer to Peer and End to End delay support
Timing accuracy <100 ns

ENVIRONMENTAL AND ELECTRICAL

Power supply:	L = 14-36 Vdc
	M = 20-75 Vdc
	H= 90-300 Vdc
Power Drain:	6 W max
Operating temperature:	-10 to +65° C
Humidity:	To 95%
	non-condensing
Isolation	
Outputs to base unit:	2.5 kV
Power supply to I/O:	3.5 kV

OPTIONAL ACCESSORIES

Physical
- GNSS antenna
- Antenna cable
- Adjustable antenna mount
- Lightning protection kit

Refer to tekron.com for full techinical specifications.

CONFIGURATION SOFTWARE

Windows based configuration software is available to be downloaded from 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 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.

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
Resolution is 10 ms; timing accuracy is 100 ns

Serial Strings

NMEA-0183 ZDA
NMEA-0183 RMC
IRIG J-17
Tekron A - G (Seven 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 and C37.238 MIB Notifications
SNMP trap generation v1, v2c & v3
SNMPv3 traps can be authenticated & privatised via USM
Syslog (RFC-3164 & 5424 verities)

ABOUT TEKRON

Tekron is a leading developer of accurate GPS/GLONASS clocks and time synchronisation solutions for use in industrial applications.

WORLD WIDE WARRANTY
10 YEARS

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.

TEKRON
because timing is everything