

Tekron Time Code Generator TCG 01-E



A GPS clock with superb timing accuracy

The TCG 01-E is a highly accurate, full featured GPS clock for use in electricity Distribution/Transmission and generation protection and control systems. The TCG 01-E conforms to IEC 61850.

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.

The TCG 01-e supports IEEE 1588 v2 (PTP).



TEKRON

www.tekroninternational.com

About Tekron

Tekron International is a leading developer of exceedingly accurate GPS clocks and time synchronization solutions for use in industrial applications.

Tekron GPS clocks are simple to install and use and are extremely rugged, attributes that are a prerequisite in the often extreme environments in which the clocks are installed.

Tekron GPS clocks have been installed in thousands of power stations & substations across the globe, where they prove invaluable in assisting power companies to operate efficiently, minimizing downtime and increasing the accuracy of control decisions.

With a Tekron GPS clock you can be confident that you can set it up and walk away.

Features

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

Master/ Slave function

Remote configuration over Ethernet

Supports

IEEE 1588 (PTP)

DC IRIG-B or Modified Manchester: TTL, RS232, RS422/ RS485, HV MOSFET

AM IRIG-B (Modulated)

Serial Strings

User defined pulses

DCF77

NTP/ SNTP (IEC 61850)

Event Recording

> TEKRON | TCG 01-E Datasheet

Physical

19" rack mount 1U high

(W) 160 mm x (D) 155 mm x (H) 40 mm, 0.8 Kg

IP40 (Ingress Protection rating)

Front panel display

The TCG 01-E 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
- Sync to IRIG-B
- IRIG-B available

GPS Receiver

L1, C/ A code, 12 Channel Parallel-tracking receiver

Frequency:	1575.42 MHz
Pulse accuracy:	15 ns
Sensitivity:	Acquisition -136 dBm Tracking -141 dBm
Acquisition:	Hot Start <18 s Warm Start <45 s Cold Start <50 s

Antenna

Physical

Conical shaped polycarbonate durable shell which minimizes snow and dust buildup.

Dimensions: 98 mm tall
90 mm diameter

Weight: 200 g

Specifications

Bandwidth:	1575.42 ± 1.023 MHz
Attenuation:	60 dB (typical) at 1575.42 ± 50 MHz
Gain:	38 dB 5 +/- 0.5 V (27 mA max)
Operating temperature:	-40 to 85° C

Antenna Cable

LMR240 ultra-flex low loss, high shielding antenna cable

Inputs & Outputs



Indicative configuration of back panel

2 x independently programmable outputs accurate to within 100ns of UTC, either:

- TTL 0-5 V, 150 mA (BNC or 2-pin)
- RS422 +/- 6 V, 50 loads (BNC or 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)

Plus:

1 x RS232 serial port, DCE wired, Signals are +/- 10 V, 15 mA. Serial time messages output at 9600 baud. Programmable pulse on pin 1 (DB9).

Timing accuracy of RS232 port:

Serial Message	<200 μs to UTC
Pulse/ or IRIG-B time code	<1.5 μs to UTC

Plus:

1 x AM IRIG-B 9 Vpp, 50 ohm (BNC)
Timing accuracy: <2 μs to UTC

Plus:

2 x digital inputs: 0-5 V TTL/CMOS external IRIG-B synchronization

Plus:

1 x Sync Status Relay with NC/NO contacts

Options

Network Time Server Port

1 x RJ45 UTP connector

100 Mbps

Timing accuracy: <200 ns to UTC

This UTP network interface option allows the TCG 01 to function as a Stratum 1 NTP/ SNTP Time Server.

Protocols Supported:

ARP, UDP, ICMP, TFTP, DHCP, SNMP, and BOOTP.

IEEE 1588 v2 support

As per Network Time Server above plus:-

PTP (IEEE1588) v2 operation

GrandMaster (GPS) or ordinary clock functions - determined via BMC algorithm

Profile selection: Default or Power

1-step tx, 1-step/ 2-step rx

Layer 2 or Layer 3 mapping

Peer to Peer and End to End delay support

Multicast operation

Typical ordinary clock PPS accuracy (single sub-net)
<250 ns

2 Channel Event recording

2 channel event recording with common return that may be driven by TTL logic levels.

Lightning protection kit

Polyphaser DGXZ+06NFNF-A Impulse Suppressor multi-strike weather proofed low throughput energy lightning arrester kit.

Antenna Mounting Bracket

Adjustable 500 mm mounting bracket.

Configuration software

Windows based configuration software is supplied on CD and is also available to be downloaded from the Tekron website. User adjustable options include:

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 GPS coverage.

Adjustments to compensate for installation parameters such as delay of GPS signal through antenna cable.

Programmable Outputs

IRIG-B (B00x / B22x) time code with selectable IEEE1344 and AFNOR S87-500 extensions

DCF77 time code

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 - F (Six protocols for plug and play compatibility with a wide range of equipment).

Environmental & Electrical

Power supply: L = 14-36 Vdc
M = 20-72 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

Between I/O: 5 kV

Request a quote

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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