

TTM 01-G

Compact Substation Clock

The TTM 01-G is a reliable and accurate GPS and GLONASS clock with sub-microsecond timing, used to synchronize Intelligent Electronic Devices (IEDs) in the power industry and other industries where precise and reliable timing is required.

As with all Tekron clocks, the TTM 01-G has electrically isolated outputs providing an extra layer of protection to all connected IEDs.

Key Features

- Supports GPS and GLONASS
- 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
- Configuration Security

Supports

- DC IRIG-B (Un-modulated, DCLS)
- AM IRIG-B (Modulated)
- Serial Strings
- User defined pulses
- Modified Manchester
- NTP/ SNTP (IEC 61850)
- PTP (IEEE 1588 v2)
- DCF77
- Fiber output option



Physical

- UL94-V0 polycarbonate flame retardant DIN-rail mount case with IP40 (Ingress Protection rating).
- (W) 72 mm x (D) 60 mm x (H) 90 mm, 0.2 Kg
- Rising clamp terminals: Wire size (max): 1.5 mm \varnothing

LED Indicators

- Sync Status
- Antenna/cable fault
- Satellite acquisition mode

Environment and Electrical

Power supply: L = 14-36 Vdc
M = 20-75 Vdc
H = 90-300 Vdc

Power Drain: 4 W max

Operating temperature:
-10 to +65°C

Humidity: To 95%
non-condensing

Isolation

Power to
Antenna: 1kV
Power to I/O: 3.5 kV
Between TTL
outputs A+B: 2.5



Standard Outputs

TTL

1 x TTL programmable output, 2-pin, 0-5 V, 150 mA

Fiber

1 x Fiber programmable output, 62.5/ 125 μ m, λ 820 nm, compatible with multi-mode fiber

Additional Outputs

In addition to the standard output, one of the following output options are also available for the TTM 01-G

TTL

1 x TTL programmable output, 2-pin, 0-5 V, 150 mA

Or AM IRIG-B

1 x AM IRIG-B output, 2-pin, 9 Vpp, 120 ohm

Or Serial Strings

1 x RS232 level serial strings output

Alarm Output

Isolated contacts (AC Rated) capable of switching up to 300V at 100mA

Ethernet Output

- 1 x RJ45 10/100 Ethernet UTP connector
- Or 1 x ST multi-mode fiber Ethernet available

Protocols Supported:

ARP, UDP, ICMP, TFTP, DHCP, SNMP v1, v2c, v3

General

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

NTP

Stratum-1 NTP & SNTP time server, Multicast & Broadcast server capability, Optional MD5 authentication
Timing accuracy: <100 ns to UTC

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) supports
 - USM authentication methods: MD5, SHA
 - USM privacy methods: DES, AES
 - USM MIB support

GNSS Receiver

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

- Frequency: 1598Mhz
- Constellation: GPS + GLONASS
- Sensitivity:
 - Acquisition: -148 dBm
 - Tracking: -160 dBm
 - Antenna Supply: 5Vdc up to 100mA
 - Antenna Impedance: 50 Ω

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

Optional Accessories

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

Refer to tekron.com for full technical specifications.

About Tekron

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

Contact Us

www.tekron.com

Phone: +64 4 566 7722

Sales Freephone: (Australia)
1800 608 572

Sales Freephone: (North America)
1800 256 2309

Ethernet Output Continued

Notifications

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

IEEE 1588 v2 (PTP) Support

As per Ethernet Output section plus: -

- PTP (IEEE1588) v2 operation
- GrandMaster (GNSS) or ordinary clock functions
- Profile selection:
 - Default
 - C37.238 Power Profile (full support)
 - Telecom Profile (slave only)
- 1-step tx, 1-step/ 2-step rx
- Layer 2 or Layer 3 mapping
- Peer to Peer and End to End delay support
- Typical timing accuracy (single sub-net) <100 ns

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

Daylight and local time configuration using either rule based or fixed date methods. Allows equipment checks prior to full installation and adjustable hold-over in case of poor GNSS coverage. Adjustments to compensate for installation parameters such as antenna cable delay.

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 10ms; timing accuracy is 100 ns

Serial Strings

- NMEA-0183 ZDA
- NMEA-0183 RMC
- IRIG J-17
- Tekron A - G (7 protocols for easy interoperability).