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Field Time Sync Generator Model TB-1



Just connect to your usual instrument.

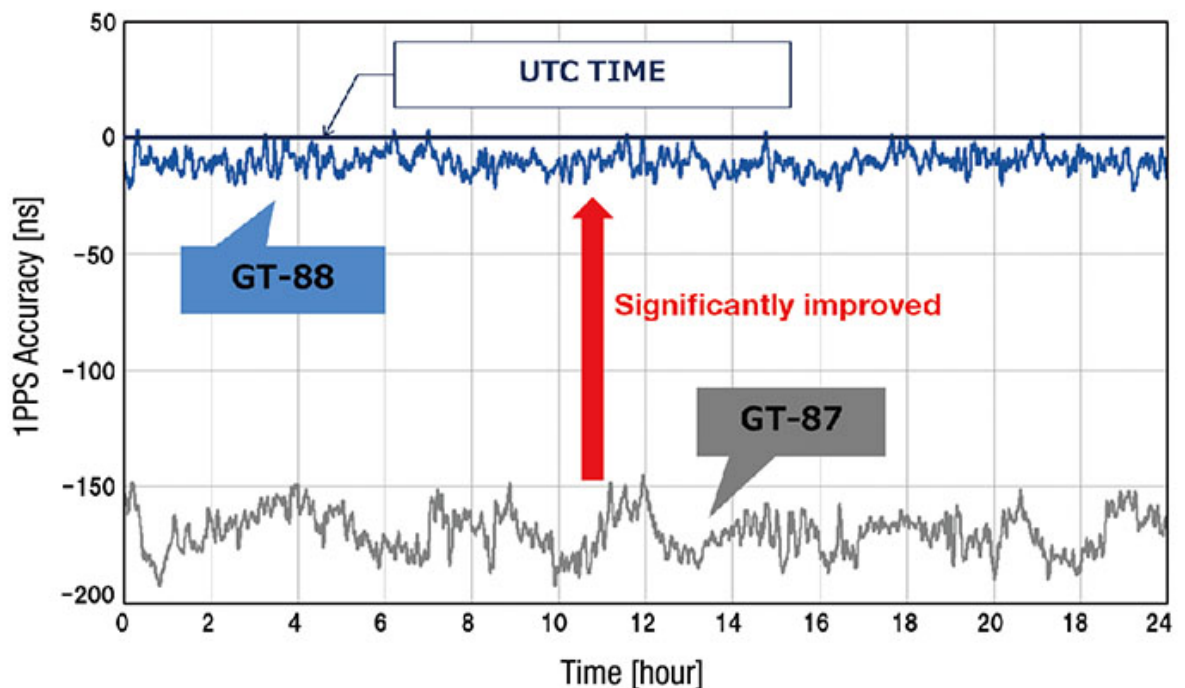
Light, fast, accurate! Palm sized “Atomic Clock”

With an embedded high precision OCXO, TB-1 is designed as a portable GNSS reference signal generator for RF system maintenance and R&D in the field. It provides a 1 pulse per second (1PPS) and a 10MHz reference frequency, both synchronized with UTC, which can be used in digital broadcast, 5G and V2X system field testing for time synchronization and frequency measurement purposes.

- **.Multipath mitigation**

TB-1 internal GNSS receiver includes the Dynamic Satellite Selection™ algorithm* which minimizes deterioration of time synchronization performance by choosing only the high quality satellite signals.

* A new satellite signal selection algorithm developed by NTT.



2.Active anti-jamming (interference wave)

If TB-1 internal GNSS receiver is subjected to jamming signals, it can mitigate their negative impact and prevent a GNSS signal loss or failure. This anti-jamming function can also help investigate the sources of jamming signals by reporting frequencies and power levels of the jamming signals.

3.Active anti-spoofing

Malicious spoofing signals intentionally mislead the position and timing calculation of GNSS receivers. Therefore TB-1 internal GNSS receiver is designed to detect and cancel such effects and protect the system from spoofing attack.

4.Holdover - Mitigation against loss of GNSS signals

In case of a GNSS signal reception interruption, due to external factors such as for example an antenna failure, TB-1 will continue to provide an accurate and stable 1PPS and 10MHz reference frequency for a holdover period of time.

- In case TB-1 GNSS receiver position calculation is interrupted, it will predict and correct the oscillator performance through its exclusive disciplining technology.
- TB-1 presents an excellent cost performance as a replacement for atomic oscillators.

• Android™ app

TB-1 GNSS satellite reception can be checked and TB-1 settings can be managed on an Android™ smartphone or tablet via the Furuno TB-1 app.

- **Power supply via USB**

TB-1 has two Type-C connectors, one for data communication (also available for power supply) and one for power supply only.

Specifications

GENERAL

On-board Oscillator

OCXO

GNSS Reception Capability

GPS L1C/A, GLONASS L1OF, Galileo E1B/E1C, QZSS L1C/A, QZSS L1S, SBAS L1C/A

Time to Lock

< 5 min

10MHz Output (Lock State)

Allan variance: $< 5 \times 10^{-11}$ (@ $\tau = 1$ s)
Long term stability (24h average): $< 1 \times 10^{-12}$
Output level: 6.5 dBm sine-wave
Impedance: 50 Ω

1PPS Output (Lock State)

Accuracy: < 40 ns
Stability: < 4.5 ns (1σ) , Compliant with PRTC-A / PRTC-B
Output Level: 3.3 V (LVCMOS)
UTC Synchronization Edge: Rising (default. Software configurable)

1PPS Output (Holdover)

Long term: $< \pm 1.5 \mu\text{s}/2\text{h}$, $< \pm 50 \mu\text{s}/24\text{h}$
Short term: $< \pm 3 \mu\text{s}/1\text{h}$ (typ)

Power supply

Port: DATA USB
Power, Electric current: DC 5 V, 2 A
Antenna terminal with superimposed DC voltage: 3.3 V

Operating Temperature

-40 °C to 85 °C

Operating humidity

Max 85 %RH

Outer Size

141.0 mm × 36.0 mm × 60.0 mm (Excluding the protruding SMA connectors)

Weight

255 g approx. (TB-1 unit only)

Interfaces

GNSS Antenna: SMA
10 MHz: SMA
1 PPS: SMA
POWER USB: USB Type-C
DATA USB: USB Type-C

Communication interface

Port: DATA USB
Communication speed: Full Speed
Control and monitoring: Android™ app

LED

LOCK, ALARM, POWER

Accessories

Accessories (included in the carrying case):

TB-1 unit, active multi-GNSS patch antenna (5 m cable), USB cable (2 pcs.), and manual

*Please prepare your own AC adapter or mobile battery.

Interconnection Diagram

● Connection examples
(as an external reference for measuring instruments)



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