GT-9001

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Timing Multi-GNSS Receiver Module

Highly precise time & ultra-low jitter 1pps synchronized with UTC

- The world's highest level of stability under open sky <4.5ns (1σ)
- Single-frequency band positioning system with excellent cost performance
- World's lowest accuracy degradation in harsh urban multipath environments
- Delivers high stability 1PPS synchronized with UTC and programmable clocks on three channels

The GT-9001 is a Multi-GNSS receiver module for time synchronization that delivers high-stability, and high-resolution time pulse (1PPS) and programmable clocks. 1PPS achieves the time stability of less than 4.5ns (1σ), which is required for 5G mobile base stations, using single-frequency band reception. GT-9001 clock outputs can be set as required to 10MHz, 2.048MHz, 19.2MHz, and 30.72MHz or other frequencies which are commonly used in wireless communications. This shortens time-to-market and increases the customer's competitiveness by reducing component count.

The GT-9001 also performs well not only in ideal environments with open skies, but also in urban areas with mixed multi-paths. Our proprietary Dynamic Satellite Selection™* technology (DSS), which appropriately chooses only the high-quality satellite signals, minimizes degradation of time stability. This makes the GT-9001 ideal for 5G mobile base stations and precise PTP grand master clocks to be installed in urban areas.

** a new satellite signal selection algorithm developed by NTT*

GT-9001 supports short term holdover, which maintains constant performance even if GNSS satellite signals are interrupted for a short period of time. It is equipped with anti-jamming and anti-spoofing functions to ensure safe and secure use in critical infrastructure systems.

The main applications of GT-9001 include 5G mobile base stations, police radios, emergency services radio systems, train radios, and time servers. Furuno's GNSS receivers for time synchronization, which contribute to strengthening the customer's competitiveness, are also deployed in the latest 5G mobile base stations. GT-9001's sophisticated built-in security including secure boot and secure firmware update ensures maximum protection against tampering.

	GT-9001
Grade	
Timing	●
GNSS	
GPS+QZSS/SBAS	●
GLONASS	●
Galileo	●
BeiDou	●
Frequency band	
L1	●
Interfaces	
UART	●
Features	
Time pulse output (1PPS)	●
Clock output	●
Multipath resistant	● (DSS)
Anti-jamming	●
Anti-spoofing	●
Secure boot	●
Secure FW update	●
Power supply	
Power-supply voltage	3.3V

FURUNO

GNSS Timing Module

Model	GT-9001
	
GNSS Reception Capability	GPS L1C/A, GLONASS L1OF, Galileo E1B/E1C,BeiDou B1I /B1C, QZSS L1C/A, SBAS L1C/A
GNSS Concurrent Reception	32 channels
Sensitivity *1	Acquisition: >: ≧ -147 dBm Tracking : ≧ -165 dBm
ITU-T Recommendation	Compliant with G.8272 PRTC-A , G.8272 PRTC-B *5
1PPS Stability *2	< 4.5 ns (1σ)
1PPS Accuracy *2	< ±40 ns (vs UTC)
1PPS Resolution	±0.2 ns
TTFF (Typical)*3	Hot Start: 2 sec (Typ), Cold Start: 35 sec (Typ)
Clock Configurable Range	1 MHz ～ 40 MHz
Clock Output	Stability : < 0.5ppb (1σ) Short Term Stability (Root Allan variance (=1s)) : < 5 x 10^{-10} Long Term Stability (24h average) : < ± 1 x 10^{-12}
Operating Temperature	-40℃ ～ +85℃
Supply Voltage	DC 3.3 V
Power Consumption *4	55mA
Package	47Pin LCC (Leadless Chip Carrier) 18.0mm x 17.8mm x 3.11mm
Interfaces	UART, Time Pulse (1PPS), Clock, External clock input
Protocol	PFEC (NMEA 0183 Ver4.11)
Security	Secure boot, Secure FW update
Function	Anti Jamming (8CW), Multipath Mitigation (Dynamic Satellite Selection™), Anti-Spoofing , T-RAIM Holdover, Antenna Detection Circuit.

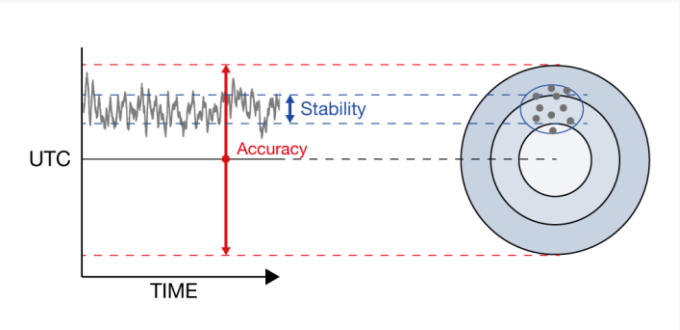
*1 Measurement environment using GNSS simulator *2 Open sky *3 Measurement platform with recommended active antenna
*4 Tracking Satellite outdoor *5 Compliant with TDEV (Time Deviation)/MTIE (Max Time Interval Error)

Evaluation Kit

Evaluation kit for GT-9001.
The Evaluation Kit can supply power and communicate with USB interface.

FEATURES
- 5VDC Power supply through USB bus power
- Serial communication through USB
- 1PPS/Clock output from the SMA connectors
- SMA antenna connection
- Outer size is (w) 86mm x (D) 51mm x (H) 21mm
- Weight is about 65g
- Accessories are USB cable, Multi-GNSS Antenna and CD ROM containing the Communication Software and the documentations

Defining accuracy and stability



Accuracy refers to the maximum error deviation from UTC true value.
Stability refers to the degree of variation from accuracy over a period of time.
* FURUNO defines accuracy on the basis of UTC (vs UTC).

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GNSS receiver homepage :
https://www.furuno.com/en/gnss/
Product documentation :
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