

# GT-100

## Timing Multi-GNSS Receiver Module

Full-featured, highly robust model supporting dual frequency band

- Unrivalled performance for 5G RAN, Radio Systems, Time servers
- The world's highest stability <math><4.5\text{ns}</math> ( $1\sigma$ )
- Lowest degradation of stability in harsh urban environments
- Delivers high stability 1PPS synchronized with UTC and programmable clocks on three channels

The GT-100 is a Multi-GNSS receiver module for time synchronization that delivers high-stability, high-resolution time pulse (1PPS) and programmable clocks. 1PPS achieves the time stability of less than 4.5ns ( $1\sigma$ ), which is required by the most demanding applications such as 5G mobile base stations. GT-100 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. The user no longer needs to convert 1PPS to the desired frequency. This shortens time-to-market and increases the customer's competitiveness by reducing component count.

The GT-100 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-100 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*

Interruption of GNSS satellite signals is a major concern during operation of critical infrastructure systems.

GT-100 supports short term holdover, which maintains constant performance even if GNSS satellite signals are interrupted for a short period of time. Also, dual-frequency band positioning (L1 and L5) mitigates the effects of ionospheric delays caused by solar flares, etc.

Time stability of less than 4.5ns ( $1\sigma$ ) is achieved even when receiving only L1 or L5. GT-100 can operate only on L5 if L1 is jammed, or only on L1 if L5 is jammed. The main applications of GT-100 include 5G mobile base stations, police radios, emergency services radio systems, train radios, and time servers. Highly robust 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-100's sophisticated built-in security including secure boot and secure firmware update ensures maximum protection against tampering.



	GT-100	
Grade		
Timing	●	
GNSS		
GPS+QZSS/SBAS	●	
GLONASS	●	
Galileo	●	
BeiDou	●	
NavIC	●	
Frequency band		
L1, L5	●	
Interfaces		
UART	●	
Featured		
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	

Model	GT-100
	
GNSS Reception Capability (L1)	GPS L1C/A, GLONASS L1OF, Galileo E1B/E1C, BeiDou B1I /B1C, QZSS L1C/A, SBAS L1C/A
GNSS Reception Capability (L5)	GPS L5, Galileo E5a, BeiDou B2a, QZSS L5, NavIC L5
GNSS Concurrent Reception	62 channels
Sensitivity *1	Acquisition : $\geq -147$ dBm    Tracking : $\geq -165$ dBm
ITU-T Recommendation	Compliant with G.8272 PRTC-A , G.8272 PRTC-B *5
1PPS Stability *2	$< 4.5$ ns ( $1\sigma$ )
1PPS Accuracy *2	$< \pm 40$ ns (vs UTC)
1PPS Resolution	$\pm 0.2$ ns
TTFF (Typical)*3	Hot Start: 2 sec (Typ), Cold Start: 35 sec (Typ)
Clock Configurable Range	1 MHz $\sim$ 40 MHz
Clock Output	Stability : $< 0.5$ ppb ( $1\sigma$ ) Short Term Stability (Root Allan variance (=1s)) : $< 5 \times 10^{-10}$ Long Term Stability (24h average) : $< \pm 1 \times 10^{-12}$
Operating Temperature	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
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**

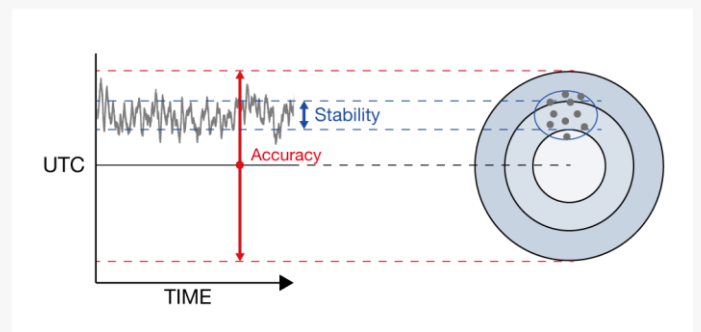
Evaluation kit for GT-100.  
 The Evaluation Kit can supply power and communicate with USB interface.



**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).