


Time Synchronization

Product Catalog -vol.4-

- 
- GNSS Timing Modules
 - GNSS Disciplined Oscillators (GNSSDO)
 - GNSS Reference - Rack mount & Portable
 - GNSS Antennas
 - GNSS Accessories

GNSS Timing Receiver Modules

World's highest stability, <4.5 ns (1 σ), lowest degradation of stability in harsh environments



Model GT-100

- Full-featured highly robust, dual band (L1 and L5)
- GPS, GLONASS, Galileo, Beidou, NavIC, QZSS, SBAS
- Programmable frequency clock outputs synchronized with UTC
- Clock input
- 1PPS stability: < 4.5nsec (1 σ)
- 1PPS accuracy vs UTC: < 40 ns
- TRAIM, DSS Multipath Mitigation, Anti-Jamming and Anti-Spoofing



Model GT-9001

- Single-frequency band with excellent cost performance
- GPS, GLONASS, Galileo, Beidou, QZSS, SBAS
- Programmable frequency clock outputs synchronized with UTC
- Clock input
- 1PPS stability: < 4.5nsec (1 σ)
- 1PPS accuracy vs UTC: < 40 ns
- TRAIM, DSS Multipath Mitigation, Anti-Jamming and Anti-Spoofing



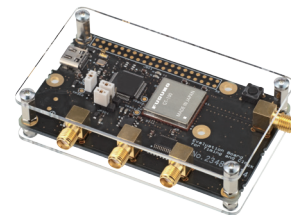
Model GT-90

- Single-frequency band with excellent cost performance
- GPS, GLONASS, Galileo, Beidou, QZSS, SBAS
- 1PPS stability: < 4.5 nsec (1 σ)
- 1PPS accuracy vs UTC: < 40 ns
- TRAIM, DSS Multipath Mitigation, Anti-Jamming and Anti-Spoofing

GT-100 GT-9001 GT-90

Grade	GT-100	GT-9001	GT-90
Timing	●	●	●
GNSS			
GPS, QZSS, SBAS	●	●	●
GLONASS, Galileo, Beidou	●	●	●
NavIC	●		
Frequency bands			
L1	●	●	●
L5	●		
Interface			
UART	●	●	●
Power supply			
Voltage	3.3V	3.3V	3.3V
Features			
Time pulse output (1PPS)	●*	●*	●*
1PPS Stability (1 σ)	< 4.5ns		
Accuracy (vs UTC)	< \pm 40ns		
1PPS resolution	< \pm 0.2ns		
PRTC-A & B compliance	●	●	●
Clock output	●*	●*	
Holdover	●	●	
Clock Input	1PPS or frequency		
Multi-path mitigation (DSS)	●	●	●
Advanced Anti-jamming	●	●	●
Anti-spoofing	●	●	●
T-RAIM	●	●	●
Secure boot	●	●	●
Secure firmware update	●	●	●

*GT-100/GT-9001/GT-90 delivers accurate 1PPS synchronized with UTC. GT-100/GT-9001 also includes three output clock signals. The three outputs can be arbitrarily assigned to 1PPS and clock.



Model **VN-100T**

Evaluation Kit for **GT-100**

Model **VN-9001T**

Evaluation Kit for **GT-9001**

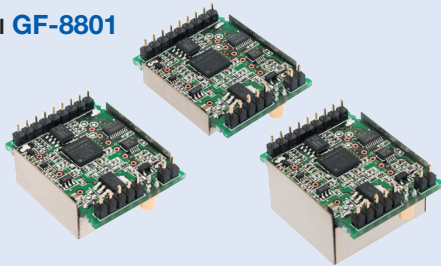
Model **VN-90T**

Evaluation Kit for **GT-90**

(GNSS Antenna and monitoring software included)

GNSS Disciplined Oscillators (GNSSDO)

Model **GF-8801**

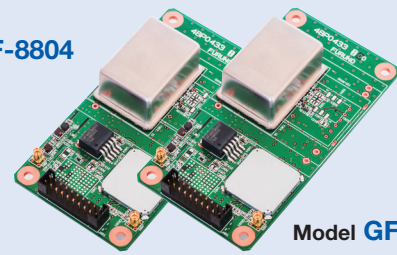


Model **GF-8802**

Model **GF-8803**

- Ultra-small form factor, atomic level frequency stability, 24h holdover (other than GF-8801)
- Embedded multi-GNSS receiver, OCXO (TCXO on GF-8801), LDO regulator & antenna detection circuit
- Generate accurate, robust UTC time and 1PPS
- 10MHz synchronized with 1PPS

Model **GF-8804**



Model **GF-8805**

- Superb performance for time servers, communications systems, 5G, broadcast systems
- 24-hour holdover performance comparable to Rubidium - 1.5µs/24 hours (GF-8805)
- Embedded multi-GNSS receiver, high quality OCXO, LDO regulator & antenna detection circuit
- Generate accurate, robust UTC time and 1PPS
- 10MHz synchronized with 1PPS

GF-8801 GF-8802 GF-8803

Grade	GF-8801	GF-8802	GF-8803
Timing	●	●	●
GNSS			
GPS, QZSS, SBAS	●	●	●
GLONASS	●	●	●
Galileo	●	●	●
Frequency bands			
L1	●	●	●
Interface			
UART	●	●	●
Features			
Time pulse output (1PPS)	●	●	●
1PPS Stability (1σ)	< 4.5ns	< 4.5ns	< 4.5ns
Accuracy (vs UTC)	< ± 40ns	< ± 40ns	< ± 40ns
PRTC-A compliance	●	●	●
PRTC-B compliance		●	●
10MHz output	●	●	●
Multi-path mitigation (DSS)	●	●	●
Anti-jamming	●	●	●
Anti-spoofing	●	●	●
T-RAIM	●	●	●
Holdover (1PPS, 24h)		< ± 50us	< ± 10us
Power supply			
Power supply voltage	3.7V	3.7V	3.7V

GF-8804 GF-8805

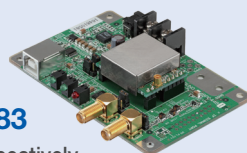
Grade	GF-8804	GF-8805
Timing	●	●
GNSS		
GPS, QZSS, SBAS	●	●
GLONASS	●	●
Galileo	●	●
Frequency bands		
L1	●	●
Interface		
UART	●	●
Features		
Time pulse output (1PPS)	●	●
1PPS Stability (1σ)	< 4.5ns	< 4.5ns
Accuracy (vs UTC)	< ± 40ns	< ± 40ns
PRTC-A compliance	●	●
PRTC-B compliance	●	●
10MHz output	●	●
Multi-path mitigation (DSS)	●	●
Anti-jamming	●	●
Anti-spoofing	●	●
T-RAIM	●	●
Holdover (1PPS, 24h)	< ± 5us	< ± 1.5us
Power supply		
Power supply voltage	5.5V	5.5V

Evaluation Kits

(GNSS Antenna and monitoring software included)

Model **VF-81/82/83**

For GF-8801/02/03 respectively



Model **VF-84/85**

For GF-8804/05 respectively



Field Time Sync Generator

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

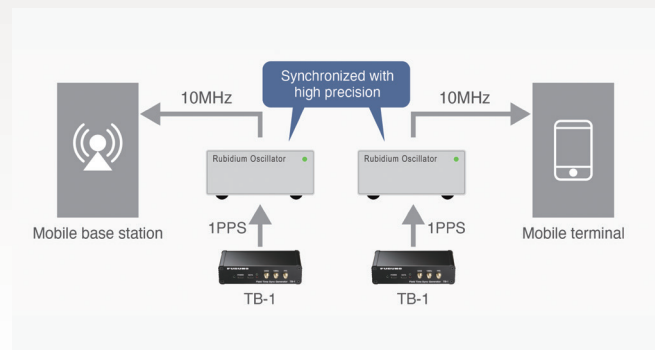


Model TB-1

- GNSS Time Sync Reference for fixed and portable applications
- Rack mount brackets for use as an external clock for telecoms & data centre systems
- Optional robust carry case with antenna, power and data cables
- Quick Start of about 5 minutes and reliable in various environments (urban canyons, in vicinities of tall buildings, indoors near windows, etc.)
- Highly stable 10MHz and accurate 1PPS output synchronized to UTC
 - G.8272 PRTC-B and PRTC-A compliant
 - 4.5ns (1 σ) using single band – Meet 5G required performance

With an embedded high precision OCXO, TB-1 provides a 1 pulse per second (1PPS) and a 10MHz reference frequency, both synchronized with UTC, ideal for time synchronization and frequency measurement purposes in Telecom networks, digital broadcasting, wireless/RF systems, V2X field testing.

TB-1 can be rack mounted for use as a timing reference in telecom networks, data centres and RF systems.



GNSS Timing Antennas & Accessories

Multi-GNSS Timing Antenna



Model AU-300
Single band antenna for excellent cost performance

Model AU-500
Dual band antenna for high robustness

- Single and dual-band antennas (L1/L5)
- Support for global and regional satellite systems
- High gain, low noise
- Ideal for time synchronisation applications
- Superior out of band filtering
- Integrated ground plane
- Built-in lightning protection – IEC 61000-4-5
- IP67, CE, FCC & RoHS 2 compliant

Coaxial lightning arrestor



Model TVA-03C
Model TVA-03V

- Protect against lightning damage
- TVA-03C supports direct lightning surges, and TVA-03V supports induced lightning surges.
- GPS (L1), GLONASS (L1), and Galileo(E1)

Antenna Mounting Kit for AU-500 & AU-300

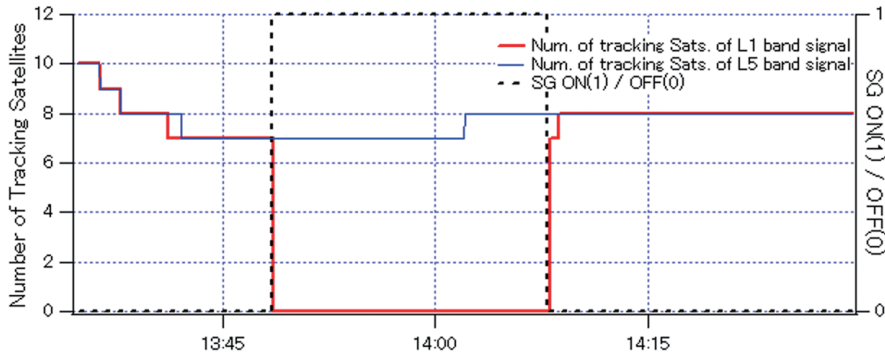


Model AFB-01

- Anodized aluminium Pipe
- Stainless steel clamp
- Pipe holding bracket

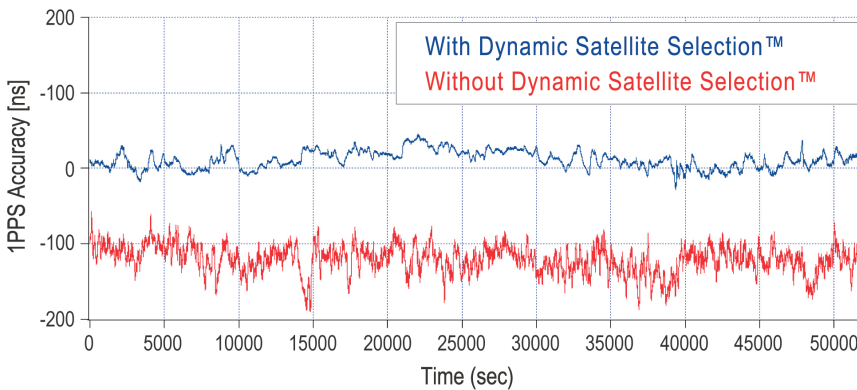
Unrivalled performance for 5G RAN, Time servers, Communication Systems

Robustness with dual-frequency band reception



A concern while operating critical infrastructure is interruption of GNSS signals. The dual-frequency positioning system of L1 and L5 allows the GT-100 to maintain proper time performance by covering one of the signals in the event of external interference (jamming) in a particular frequency band.

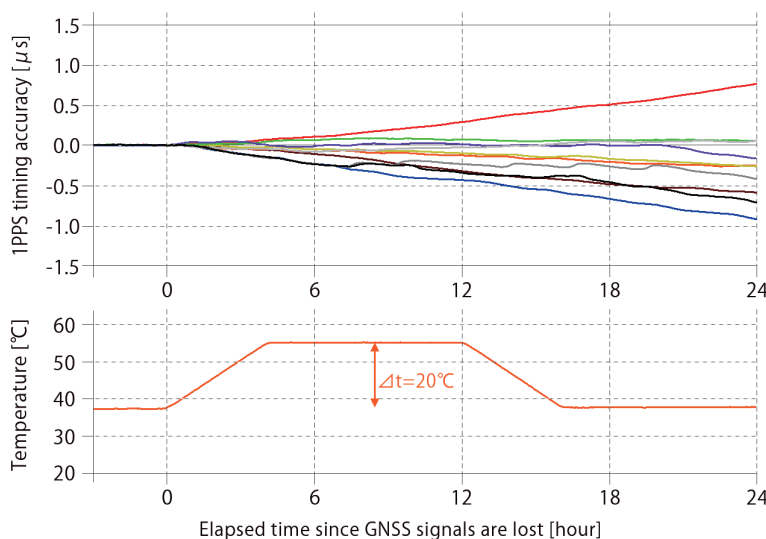
Excellent behavior in harsh environments



The proprietary “Dynamic Satellite Selection™” technology, which appropriately selects high-quality satellite signals even in urban areas where multipath signals are mixed, minimizes degradation of timing performance in poor reception environments. This technology can be used safely even at base stations installed in urban areas.

*Multipath resistance technology based on an algorithm devised by NTT

Industry-leading holdover performance (GF series)



Holdover function of GF-88 makes it possible to keep providing highly accurate timing signals even after satellite reception is lost, for example due to antenna failure or jamming issues. Furuno offers a wide range of GF-88 series products. The GF-8802 provides cost effective solutions and the GF-8805 provides industry-leading holdover time duration. The GF-88 series can also replace Rubidium oscillator as a clock source.

Unrivalled performance for 5G RAN, Time servers, Communication Systems

About Furuno

Founded in 1951, Furuno Electric Co is a worldwide leader in navigation and remote management technologies. The company's GNSS/GPS chips and modules support precision timing and positioning solutions. The products support all major navigation satellite constellations such as GPS, Galileo, BeiDou, GLONASS, QZSS and SBAS.



Superior Accuracy & Extremely High Stability



- Essential for critical infrastructure (time server, telecom networks, energy systems, data centres, financial trading, etc.)
- ITU-T G.8272 PRTC Compliance
- Meet 5G required performance

Highest Robustness in the Harshest Environments

- Excellent behaviour in urban canyons thanks to our advanced multipath mitigation (Dynamic Satellite Selection™) algorithm
- Superior Anti-Jamming and Anti-Spoofing Measures to protect against malicious attacks and maintain PNT integrity



Beware of similar products

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