GT-88

GT-87

Timing Multi-GNSS Receiver Module

Ideal for harsh environments such as urban areas

- World-class time performance in open sky <4.5ns(1σ)
- Cost-effective single-band positioning system
- Dedicated GNSS receiver module for time synchronization with the lowest performance degradation in harsh urban environments

GT-88 is a Multi-GNSS receiver that outputs high-stability and high-accuracy time pulse (1PPS).
By improving carrier smoothing, optimizing the combination of used satellites, and significantly improving the position estimation algorithm, we achieve a single-band 1PPS stability of less than 4.5ns (1σ). Since costly multi-band receivers and multi-band antennas are not required, the total cost can be greatly reduced.

GT-88 delivers excellent performance not only in ideal environments with open skies, but also in urban areas with multipath. Our advanced "Dynamic Satellite Selection™*" (DSS) algorithm appropriately selects and uses high-quality satellite signals and minimizes the degradation of time stability. Ideal for mobile base stations and PTP grand master clocks installed in urban areas.
* a new satellite signal selection algorithm developed by NTT

Jamming and spoofing are anticipated problems that may occur after a system with a built-in GNSS receiver for time synchronization is put into operation. GT-88 has countermeasure functions against these threats and can be used safely and securely in critical infrastructure applications.

The main applications of GT-88 include 5G mobile base stations, police radios, emergency services radio systems, train radios, and time servers. Furuno's GT series is also installed in seismographs in Japan, an earthquake-prone country.

Outputs configurable frequency from 10Hz to 40MHz compliant with G.8272 PRTC-A.
* Pin-compatible with GT-87, a long-selling GNSS receiver for time synchronization.

Model: GT-88

	GT-87	GT-88
Grade		
Timing	●	●
GNSS		
GPS+QZSS/SBAS	●	●
GLONASS	●	●
Galileo		●
Frequency band		
L1	●	●
Interfaces		
UART, Time Pulse (1PPS), Clock	●	●
Features		
Time pulse output (1PPS)	●	●
Multipath resistant	●	● (DSS™)
Anti-jamming	●	●
Anti-spoofing		●
T-RAIM	●	●
Holdover	-	-
Power supply		
Power-supply voltage	3.3V	3.3V

FURUNO

GNSS Timing Modules

FURUNO

Model	GT-87	GT-88
GNSS Reception Capability	GPS L1C/A, GLONASS L1OF, QZSS L1C/A, SBAS L1C/A	GPS L1C/A, GLONASS L1OF, Galileo E1B/E1C, QZSS L1C/A, QZSS L1S, SBAS L1C/A
GNSS Concurrent Reception	26 channels	32 channels
Sensitivity *1	GPS/ Tracking: > -162 dBm, Acquisition: > -148 dBm GLONASS/ Tracking: > -158 dBm, Acquisition: > -144 dBm Galileo *3/ Tracking: > -146 dBm, Acquisition: > -136 dBm QZSS/ Tracking: > -147 dBm, Acquisition: > -131 dBm	
ITU-T Recommendation	-	Compliant with G.8272 PRTC-A * 4
1PPS Stability *2	< 15 ns (1σ)	< 4.5 ns (1σ)
1PPS Accuracy *2	-	< ±40 ns (vs UTC)
1PPS resolution	±1.75 ns	
TTFF *1	Hot Start: <5 sec, Cold Start: <35 sec	
Clock Configurable Range	4 kHz to 40 MHz	10 Hz to 40 MHz
Operating Temperature	-40℃ to +85℃	
Supply Voltage	DC 3.3 V	
Power Consumption *5	< 62 mA	< 68 mA
Package	24Pin LCC (Leadless Chip Carrier), 12.2 mm x 16.0 mm x 2.8 mm	
Interfaces	UART, Time Pulse (1PPS), Clock	
Protocol	eSIP (NMEA 0183 Standard Ver 4.10)	
Function	Anti-Jamming (8CW), Multipath Mitigation *6, Anti-Spoofing *3, T-RAIM	

*1 Measurement platform with recommended active antenna
*2 Open sky
*3 GT-88 only
*4 Compliant with TDEV/MTIE
*5 85℃ when tracking
*6 GT-88 has the Dynamic Satellite Selection™ while the GT-87 has a high performance conventional multipath mitigation algorithm.

Evaluation Kit

An evaluation kit that can be used simply by connecting the GNSS antenna and power source.

**FEATURES** : 5VDC Power supply through USB bus power

•Serial communication through USB
•1PPS output from the SMA connectors
•SMA antenna connection
•Outer size is (w) 110mm x (D) 112mm x (H) 30mm
•Weight is about 260g
•Accessories are USB cable, Multi-GNSS Antenna and CD ROM containing the Communication Software, the USB driver and the documentations

Recommended antenna

In combination with the recommended antenna (AU-217), the GT-8x series performs perfectly. AU-217 has high noise immunity and IP67 environmental resistance.

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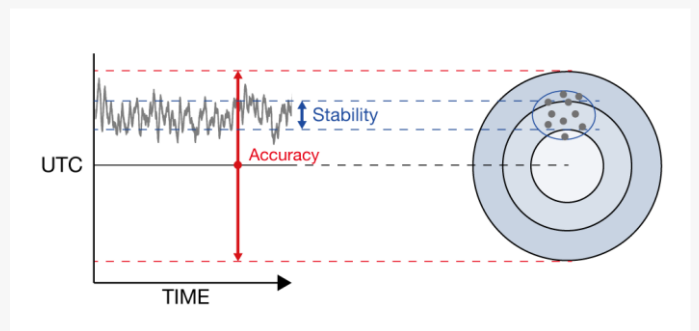
Accuracy refers to the maximum error deviation from UTC true value.
Stability refers to the degree of variation from accuracy over a period of time.
* FURUNO defines accuracy on the basis of UTC (vs UTC).

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