



# SIGMA

**for TRE-G2T, TRE-G3T, TRE-G3TAJT, Duo-G2,  
Duo-G2D, Duo-G3D, QUATTRO-G3D**

Sigma receivers' family is based on our TRIUMPH Technology implemented in our TRIUMPH Chip and is designed to meet all the needs of today's high precision GNSS satellite receiver market.

For the first time in the GNSS history we offer up to 100 Hz RTK. 216 channels of single or dual frequency GPS, Galileo and GLONASS in a small attractive, sturdy, and watertight box. Sigma contains either TRE-G2T, TRE-G3T, or TRE-G3TAJT, SigmaD contains Duo-G2, Duo-G2D, or Duo-G3D, and SigmaQ contains Quattro-G3D board.

With the ability to process GPS, Galileo and GLONASS, QZSS, Beidou signals as well as SBAS, the Sigma receivers work with optimum signal available creating the most reliable results, saving your time and money.

SigmaD and SigmaQ receivers process the dual frequency code and carrier data from two, or four antennas to determine the three orientation angles and three dimensional position.

Sigma can operate as a receiver for post-processing, as a Continuously Operating Reference Station (CORS) or portable base station for Real-time Kinematic (RTK) applications, and as a scientific station collecting information for special studies, such as ionosphere monitoring and the like.

## SIGMA. Universal standard GNSS receiver

SIGMA receiver includes TriPad (two LEDs, ON/OFF and function button), GSM/CDMA2000 module, UHF modem, Bluetooth and Ethernet capability, up to two serial ports, up to two event markers and 1PPS timing strobes, and rechargeable batteries.

## SIGMAD. Real-Time Heading

Usually, one needs two receivers interconnected through the serial ports. One of them is a moving base and another is a rover. SIGMAD combines both boards connected internally in one unit. SIGMAD is a powerful receiver for high accuracy applications, such as reference stations and CORS.

## SIGMAQ. Real-Time Attitude & Position calculation

The dual frequency code and carrier frequency data are processed to determine the three orientation angles and three-dimensional position up to 20 times per second.

SIGMAQ can also operate in the RTK or DGPS modes receiving differential corrections from an external base station to provide differentially corrected position and velocity.

### Standard Configuration

- GPS L1/L2/L2C, L5 (G2T, G3T, G3TAJT only)
- GLONASS L1/L2 (G3T, G-3TAJT(T), D-G3D, Q-G3D only)
- Update rate 1 Hz
- In-Band Interference Rejection (G3TAJT only)
- RAIM
- TriPad interface
- RS232 serial port (460.8 kbps)
- External GNSS Antenna TNC Female connector
- Li-Ion Battery pack

### Optional Features

- Galileo E1/E5A (G2T, G3T, G3TAJT)
- Galileo E5B (G3T only)
- GLONASS L3 (G3T only)
- QZSS
- Beidou B1
- Beidou B2 (G3T only)
- WAAS/EGNOS/MSAS (SBAS)
- Update rate 5Hz, 10Hz, 20Hz, 50Hz & 100Hz
- RTK rate 1 Hz, 5Hz, 10Hz, 20Hz, 50Hz & 100Hz
- Data recording up to 2048MB
- Multi-Base Code Differential Rover
- Code Differential Base
- Advanced Multipath Reduction
- Two event markers
- Two 1 PPS timing strobes
- 1 PPS level converter
- CAN port
- External Reference Frequency Input/Output
- External Reference Output Frequency converter
- IEEE1588 Master Clock (G3TAJT only)
- 2 high-speed RS232 serial ports
- High-speed RS232/RS422 serial port
- USB port
- Ethernet
- Bluetooth
- Internal 3.5G UMTS/HSPA Module
- Internal UHF Modem
- Internal GSM/GPRS Module
- Internal CDMA2000 Module
- WAAS/EGNOS/MSAS (SBAS)
- 2x External Power Inputs
- Mounting Bracket

Features/Receiver Type	Sigma			SigmaD			SigmaQ
	G2T	G3T	G3TAJT	G2	G2D	G3D	
Channels	216						
GPS C/A, P1	√	√	√	2	2	2	4
GPS L2C (L+M), P2	√	√	√	-	2	2	4
GPS L5 (I+Q)	√	√	√	-	-	-	-
Galileo E1 (B+C)	√	√	√	2	2	2	4
Galileo E5A (I+Q)	√	√	√	-	-	-	-
Galileo E5B (I+Q), AltBOC	-	√	-	-	-	-	-
GLONASS C/A, L2C, P1, P2	-	√	√	-	-	2	1
GLONASS L3 (I+Q)	-	√	-	-	-	-	-
QZSS C/A, L1 (I+Q), SAIF	√	√	√	2	2	2	1
QZSS L2C (L+M)	√	√	√	-	2	2	1
QZSS L5 (I+Q)	√	√	√	-	-	-	-
Beidou B1	√	√	√	√	√	√	√
Beidou B2	-	√	-	-	-	-	-
SBAS L1	√	√	√	√	√	√	√
SBAS L5	√	√	√	-	-	-	-
Size, mm (WxHxD)	32 x 61 x 190						
Weight, g	1270	1277		1290	1310	1330	
Autonomous Accuracy	<2m						
Static, Fast Static Accuracy	Horizontal: 0.3 cm + 0.1 ppm * base_line_length* Vertical: 0.35 cm + 0.4 ppm * base_line_length*						
Kinematic Accuracy	Horizontal: 1 cm + 1 ppm * base_line_length Vertical: 1.5 cm + 1.5 ppm * base_line_length						
RTK (OTF) Accuracy	Horizontal: 1 cm + 1 ppm * base_line_length Vertical: 1.5 cm + 1.5 ppm * base_line_length						
Real-time heading accuracy	-			~ 0.004/L [rad] RMS**			
Roll/Pitch	-			~0.0065/L [rad] RMS**			
DGPS Accuracy	< 0.25 m Post Processing, < 0.5 m Real Time						
Pos/ fix update rate	up to 100 Hz			up to 50 Hz RTK+heading		up to 20 Hz RTK+attitude	
Cold start, Warm start	<35 s, <5 s						
Reacquisition	<1 s						
IBIR	-	√		-			-
3.5G UMTS/HSPA Module	Global (850/1900/2100) /North America (850/1900/1700-2100AWS) / Europe (900/2100)						
GSM/GPRS/EDGE Module	Internal GSM/GPRS quad-band module, GPRS Class 10						
CDMA 2000 Module	Internal CDMA2000 dual band module 800/1900MHz						
UHF Radio Modem	Internal 360-470 MHz radio transceiver, up to 38.4 kbps						
VHF Radio Modem	Internal 138-174 MHz radio transceiver, up to 38.4 kbps						
Base Power Output	1 Watt						
External Reference Frequency	√			-			√
RS232	3						
RS232/RS422	1						
USB	1						
Ethernet	1						
Bluetooth	√						
CAN	1						
IRIG	1						
Event Marker	2						
IEEE1588 Master Clock	-			√			-
1PPS	2						
Battery	Two internal Li-Ion batteries (7.4 V, 5.8 Ah each)						
External power input	2, 1 - primary, 1 - secondary port						
Input Voltage	+10 to +30 volts						
TriPad	Two buttons, two LEDs						
On-board flash	2048 MB						
Enclosure	Aluminum extrusion, waterproof IP67						
Operation temperature	-40° C to +75° C***						
Storage temperature	-45° C to +85° C****						
GNSS Antenna	External						
Real-time Data Input/Output	JPS, RTCM SC104 v. 2.x and 3.x, CMR						
Real-time Data Output	NMEA 0183 v. 2.x and 3.0, BINEX						

\* For good observation conditions and proper length of observation session  
\*\* where L is the antenna separation in [m]  
\*\*\* The operating temperature range of Li-Ion batteries is -30 ° C to +55°  
\*\*\*\*The storage temperature of Li-Ion batteries is -20 ° C to +45°

Specifications are subject to change without notice

