

# SIGMAD

**for Duo-G2, Duo-G2D, DUo-G3D**

Dual frequency satellite-based two-antenna system SigmaD is based on our TRIUMPH Technology implemented in our TRIUMPH Chip. SigmaD receiver can be used in positioning applications where a single antenna is not sufficient to observe satellites in all orientations and positions: in machine navigation and control in road construction, precise agriculture, other land, aerial, and marine applications. SigmaD is a powerful receiver for high accuracy applications, such as reference stations and CORS. The dual frequency code and carrier data from two antennas are processed to determine the three orientation angles and three dimensional position up to 50 times per second.

216 channels of single or dual frequency GPS and Galileo in a small attractive, sturdy, and watertight box, which contains either Duo-G2, Duo-G2D, or Duo-G3D board.

The on-board power supply on SIGMA receiver accepts any voltage from +10 to +30 volts and delivers clean filtered voltage where needed. This eliminates the risk of power contamination (ripples) that can be created when clean power is generated elsewhere and delivered to the board via cables. SIGMA receiver also includes TriPad (two LEDs, ON/OFF and function button), GSM/CDMA2000 module, UHF/VHF modem, and batteries. In addition, the receiver comes with large amount of flash for data storage.

The CAN interface in SIGMA receiver is provided complete with all associated hardware and firmware, not just the CAN bus. The same is true with all the serial RS232/RS422 ports in our receiver. Simply stated, additional functions are not needed to incorporate any of our SIGMA Receiver in most applications.

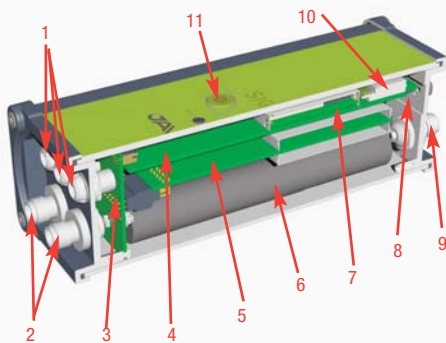
In addition to timing strobe and event marker, the SIGMA receiver includes the option of complete IRIG timing system.

## Standard Configuration

- Memory 0 MB
- GPS L1/L2
- Galileo E1
- GLONASS L1/L2 (G3D only)
- RAIM
- TriPad Interface
- RS232 Serial Port (460.8 kbps)
- 2x External GNSS Antenna TNC Female connector
- Rechargeable Li-Ion Batteries

## Optional Feature

- Update Rate 1 Hz, 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
- In-Band Interference Rejection
- Two Event Markers
- Two 1 PPS timing strobes
- CAN 2.0 port
- Up to 3 high speed (460.8 kbps) RS232 Serial Ports
- High speed RS422 serial port (up to 460.8 kbps)
- USB port
- Ethernet (with ODU to RJ45 adapter)
- Bluetooth® Interface
- Internal UHF/VHF Modem
- Internal GSM/GPRS/EDGE Module
- Internal CDMA2000 Module
- External UHF/VHF, GSM/CDMA2000, Bluetooth Antenna Connectors
- KFK WAAS/EGNOS (SBAS)
- 2x External Power Inputs
- Mounting Bracket



1. Communication and Power Ports
2. External GNSS Antenna Connectors
3. GNSS Interconnect Board
4. GNSS Power and Communication Board with on-board SIM/UIM-card
5. GNSS Receiver with on-board Memory
6. Rechargeable Li-Ion Battery Pack
7. UHF/VHF Modem
8. SIM/UIM Card Holder
9. External UHF/VHF, GSM/CDMA2000, Bluetooth Antenna Connectors
10. GSM/CDMA2000 Modem
11. On/Off Button

Specifications are subject to change without notice.

## Description

Total 216 channels: all-in-view (GPS L1/L2, Galileo E1, SBAS) integrated receiver, rugged aluminum housing complete with TriPad interface

### Tracking Specification

Tracking Channels	
SigmaD-G2	2x (GPS L1, 2x Galileo E1, SBAS)
SigmaD-G2D	2x (GPS L1/L2, 2x Galileo E1, SBAS)
SigmaD-G3D	2x (GPS L1/L2, 2x Galileo E1, SBAS)+ 1x (GLONASS L1/L2)
Signals Tracked	L1/L2 C/A and P Code & Carrier

### Performance Specifications

Autonomous	<2 m
Static, Fast Static Accuracy	Horizontal: 0.3 cm + 0.5 ppm * base_line_length Vertical: 0.5 cm + 0.5 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
DGPS Accuracy	< 0.25 m Post Processing, < 0.5 m Real Time
Real time attitude accuracy	Heading ~ 0.004/L [rad] RMS, where L is the antenna separation in [m]
Cold Start	<35 seconds
Warm Start	<5 seconds
Reacquisition	<1 second

### Power Specification

Battery	Two internal Li-Ion batteries (7.4 V, 4.4 Ah each) with internal charger
Operating Time	Up to 15 hours
External power input	2, 1 - primary, 1 - secondary port(s)
Input Voltage	+10 to +30 volts

### GNSS Antenna Specifications

GNSS Antenna	External
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### Radio Specifications

GSM/GPRS Module	Internal GSM/GPRS/EDGE quad-band module, GPRS/EDGE 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

### I/O

External Power port	2 ports Up to 3 serial (RS232) up to 460.8 kbps High speed RS422 serial port (up to 460.8 Kbps) High speed USB 2.0 device port (480 Mbps) Full-duplex 10BASE-T/100BASE-TX Ethernet port (with ODU to RJ45 adapter) Bluetooth V1.2 Class 2 supporting SPP Slave Profile; CAN
Communication Ports	
Other I/O Signals	External Reference Frequency input 2x 1 PPS synchronized; 2x Event Marker; IRIG
Status Indicator	Two LEDs, two function keys (TriPad)

### Memory & Recording

Internal Memory	Up to 2048MB of onboard non-removable memory for data storage
Raw Data Recording	Up to 100 times per second (100Hz)
Data Type	Code and Carrier from GPS L1/Galileo E1 (D-G2); GPS L1/L2/Galileo E1 (D-G2D)

### Data Output

Real time data outputs	RTCM SC104 versions 2.x and 3.x Input/Output; CMR; JPS
ASCII Output	NMEA 0183 versions 2.x and 3.0 Output
Output Rate	Code and Carrier

### Environmental Specifications

Enclosure	Aluminum extrusion, waterproof IP 67
Operating Temperature	-35° C to +75° C *
Storage Temperature	-40° C to +85° C **
Humidity	100% condensing
Shock	Survives a 1 m drop onto hard surface
Dimensions	W: 132 mm x H: 61 mm x D: 190 mm
Weight G2, G2D	1290 g
G3D	1310 g

\* 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°



## JAVAD GNSS

[www.javad.com](http://www.javad.com)

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