



# DELTA

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

Delta 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. Delta contains either TRE-G2T, TRE-G3T, or TRE-G3TAJT, DeltaD contains Duo-G2, Duo-G2D, or Duo-G3D, and DeltaQ contains Quattro-G3D board.

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

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

Delta 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.

## DELTA. Universal standard GNSS receiver

Multi-purpose DELTA receiver - joint venture for geophysical studies, dam operations, surveying, mapping, monitoring, etc.

## DELTA D. 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. DELTAD combines both boards connected internally in one unit.

## DELTA Q. Real-Time Attitude and 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.

DELTAQ 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-3TAJ(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

### Optional Features

- Galileo E1/E5A (G2T, G3T, G3TAJT)
- Galileo E5B (G3T only)
- GLONASS L3 (G3T only)
- QZSS
- Compass B1
- Compass 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)
- Up to 3 high-speed RS232 serial ports
- High-speed RS232/RS422 serial port
- USB port
- Ethernet
- WAAS/EGNOS/MSAS (SBAS)

| Features/Receiver Type       | Delta   |     |                            | DeltaD                |                             |     | DeltaQ |
|------------------------------|---|-----|----------------------------|-----------------------|-----------------------------|-----|--------|
|                              | 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)                | √   | √   | √                          | -                     | -                           | -   | -      |
| Compass B1                   | √   | √   | √                          | √                     | √                           | √   | √      |
| Compass B2                   | -   | √   | -                          | -                     | -                           | -   | -      |
| SBAS L1                      | √   | √   | √                          | √                     | √                           | √   | √      |
| SBAS L5                      | √   | √   | √                          | -                     | -                           | -   | -      |
| Size, mm (WxHxD)             | 109 x 35 x 141/max 160 with connectors  |     |                            |                       |                             |     |        |
| Weight, g                    | 394   | 401 | 414                        | 518                   | 595                         |     |        |
| Autonomous Accuracy          | <2m   |     |                            |                       |                             |     |        |
| Static, Fast Static Accuracy | Horizontal: 0.3 cm + 0.1 ppm * base_line_length*<br>Vertical: 0.35 cm + 0.4 ppm * base_line_length* |     |                            |                       |                             |     |        |
| Kinematic Accuracy           | Horizontal: 1 cm + 1 ppm * base_line_length<br>Vertical: 1.5 cm + 1.5 ppm * base_line_length        |     |                            |                       |                             |     |        |
| RTK (OTF) Accuracy           | Horizontal: 1 cm + 1 ppm * base_line_length<br>Vertical: 1.5 cm + 1.5 ppm * base_line_length        |     |                            |                       |                             |     |        |
| Real-time heading accuracy   | -   |     |                            | ~ 0.004/L [rad] RMS** |                             |     |        |
| Roll/Pitch                   | -   |     |                            | ~0.008/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<br>RTK+heading |                       | up to 20 Hz<br>RTK+attitude |     |        |
| Cold start, Warm start       | <35 s, <5 s   |     |                            |                       |                             |     |        |
| Reacquisition                | <1 s  |     |                            |                       |                             |     |        |
| IBIR                         | -   | √   | -                          | -                     | -                           |     |        |
| External Reference Frequency | √   |     | -                          |                       | √                           |     |        |
| RS232                        | 3   |     |                            |                       |                             |     |        |
| RS232/RS422                  | 1   |     |                            |                       |                             |     |        |
| USB                          | 1   |     |                            |                       |                             |     |        |
| Ethernet                     | 1   |     |                            |                       |                             |     |        |
| CAN                          | 1   |     |                            |                       |                             |     |        |
| IRIG                         | 1   |     |                            |                       |                             |     |        |
| Event Marker                 | 2   |     |                            |                       |                             |     |        |
| IEEE1588 Master Clock        | -   | √   | -                          |                       | -                           |     |        |
| 1PPS                         | 2   |     |                            |                       |                             |     |        |
| Battery                      | -   |     |                            |                       |                             |     |        |
| Input Voltage                | +4.5 to +35 volts   |     |                            | +6.0 to +35 volts     |                             |     |        |
| TriPad                       | Two buttons, two LEDs   |     |                            |                       |                             |     |        |
| On-board flash               | 2048 MB   |     |                            |                       |                             |     |        |
| Enclosure                    | Aluminum extrusion, waterproof IP66   |     |                            |                       |                             |     |        |
| Operation temperature        | -40° C to +80° 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]

Specifications are subject to change without notice



**JAVAD GNSS**  
[www.javad.com](http://www.javad.com)

Rev.2.1 February 26, 2013