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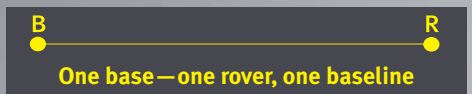
TRIUMPH-4X

TRIUMPH-4X is equivalent of 4 independent TRIUMPH-1 receivers packaged in the same small box. Furthermore, these 4 independent receivers are operating synchronously using the same local oscillator. A central processor coordinates internal activities of these four receivers as well as communications and data transmission with outside. **And all is done with a single TRIUMPH Chip inside. This is why it is neither heavy nor expensive.**

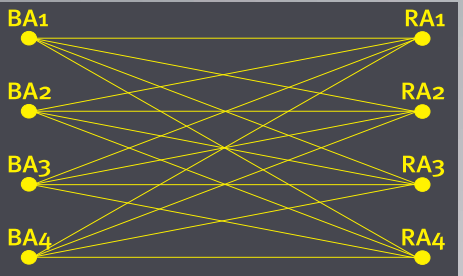
In a giant step forward along with introducing TRIUMPH-4X, we also introduce Cluster RTK, or 4x4 RTK, where sixteen baselines are processed in every single RTK measurement. For the first time in the history of GNSS, the power of survey techniques and network adjustments comes to RTK but without the burdens and complications. The operation is similar to conventional RTK. Surveyors and geodesists can now trust RTK measurements while improving accuracy, reliability and availability.

Now when we say 20 Hz RTK, we mean measuring 16 baselines of 8 points and performing equivalent of geodetic network adjustment on 16 baselines, removing outliers and providing reliable geodetic quality RTK solutions 20 times per second! One TRIUMPH-4X base and one rover results in a 16-baseline RTK system. While systematic and correlated errors can be removed in single RTK systems, the uncorrelated errors degrade the RTK accuracy. In TRIUMPH 4x4 systems the uncorrelated (random) errors are reduced significantly. This improved accuracy and reliability is especially important in critical applications like machine control.

4X4 ALL WILL DRIVE RTK!



One base—one rover, one baseline



4 base — 4 rover, 16 baselines

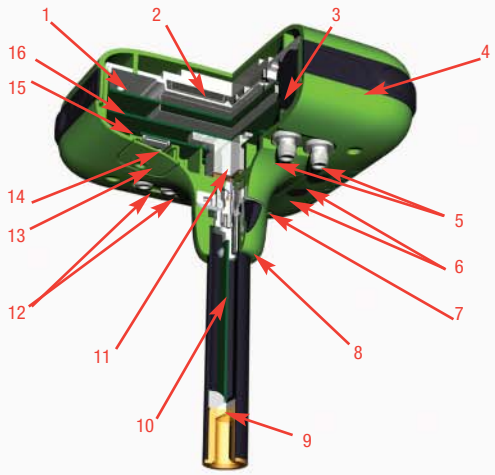
TRIUMPH-4X

Standard Configuration

- Memory 0 MB
- GPS L1/L2/L2C/L5
- Galileo E1/E5A
- RAIM
- Internal GNSS antenna
- Internal IMU
- MinPad Interface
- RS232 Serial Port (460.8 kbps)
- Rechargeable Li-Ion Battery

Optional Feature

- Update Rate 1 Hz, 5Hz, 10Hz & 20Hz
- RTK Rate 1 Hz, 5Hz, 10Hz & 20Hz
- Data Recording up to 2048MB
- Multi-Base Code Differential Rover
- Code Differential Base
- Advanced Multipath Reduction
- Up to 2 high Speed (460.8 kbps) RS232 Serial Ports
- USB port
- Internal GSM/GPRS/EDGE Module
- Internal UHF Modem
- Ethernet
- Bluetooth® Interface
- Wi-Fi (IEEE 802.11b/g)
- KFK WAAS/EGNOS (SBAS)



1. Ground Plane
2. Internal GNSS Antenna
3. Rechargeable Li-Ion Battery Pack
4. Guard Bumper
5. External GNSS Antenna Connectors
6. On/Off and Control Buttons and LEDs
7. Bluetooth / WiFi Antenna
8. Quick Realise with Lock
9. 5/8-11" Mounting Thread
10. Integrated UHF / GSM Antenna
11. IMU Unit
12. Communication and Power Ports
13. SIM Card Door
14. User Accessible SIM Card
15. GNSS Receiver and Power Board with on-board Memory
16. GNSS RF and Communication Board with on-board SIM Card

Specifications are subject to change without notice.

Description

Total 216 channels: all-in-view (GPS L1/L2/L2C/L5, Galileo E1/E5A, SBAS) integrated receiver, rugged plastic and magnesium housing complete with MinPad interface

Tracking Specification

Tracking Channels	4 x (GPS L1/L2/L2C/L5, Galileo E1/E5A, SBAS)
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: 0.6cm+1ppm * base_line_length Vertical : 0.9cm+1ppm * base_line_length
RTK (OTF) Accuracy	Horizontal: 0.6cm+1ppm * base_line_length Vertical : 0.9cm+1ppm * base_line_length
DGPS Accuracy	< 0.25 m Post Processing < 0.5 m Real Time
Angular accuracy	With external antennas and without IMU Heading: 0.3 / L [deg] Pitch and roll: 0.4 / L [deg], where L denotes between antennas separation in metres. With generic umbrella and without IMU Heading: 0.55 [deg] Pitch and roll: 0.75 [deg] With generic umbrella and IMU Pitch, roll, and heading: 0.3 [deg]
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
Operation Time	Up to 10 hours
External power input	+10 to +30 volts

GNSS Antenna Specifications

GNSS Antenna	Integrated
Antenna Type	Microstrip (Zero Centered)
Ground Plane	Antenna on a flat ground plane

Radio Specifications

GSM/GPRS/EDGE Module	Internal GSM/GPRS/EDGE quad-band module, GPRS/EDGE Class 10
UHF Radio Modem	Internal 406-470MHz radio transceiver, up to 38.4kbps
Base Power Output	1 Watt

IMU Specification

Gyroscope	3
Accelerometer	3

I/O

Communication Ports	2x serial (RS232) up to 460.8 kbps High speed USB 2.0 device port (480 Mbps) Full-duplex 10BASE-T/100BASE-TX Ethernet port Wi-Fi (IEEE 802.11b/g) Bluetooth V2.0+EDR Class 2 supporting SPP Slave and Master Profiles
Status Indicator	Six LEDs, two function keys (MinPad)

Memory & Recording

Internal Memory	Up to 2048MB of onboard non-removable memory for data storage
Raw Data Recording	Up to 20 times per second (20Hz)
Data Type	Code and Carrier from GPS L1, L2, L5, Galileo E1/E5A

Data Output

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

Environmental Specifications

Enclosure	Molded magnesium alloy and plastic, waterproof
Operating Temperature	-30° C to +55° C
Dimensions	W:178 mm x H:93 mm x D:178 mm
Weight	1850 g

JAVAD GNSS
www.javad.com
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