

You've come a long way, Survey!



JAVAD

**Introducing Three New
Revolutionary Products**

Please visit WWW.JAVAD.COM for details.

We are introducing



1

**High precision
GPS+GLONASS+Galileo Antenna**

2

**Revolutionary, compact,
216-channel GNSS Receiver**



3 new revolutionary products!



3 Breakthrough, wide-screen, high-resolution handheld controller

- 3,5-inch display of 800x480 pixels
- Both touch screen and quick action buttons.
- LED's show battery level, charging status and sleep mode

Please see Triumph V.S. videos on www.javad.com



**External GNSS
antenna
External UHF
antenna
1PPS/Event
Ext. Freq In/Out**

- **3 connectors for mounting Triumph V.S. on tripods, monopods, poles and machines**
- **High resolution camera in the bottom**
- **2 speakers for audio and voice**
- **In office, you can use legs for putting on the table and better viewing.**



Home page.



Introducing you Triumph V.S.



3

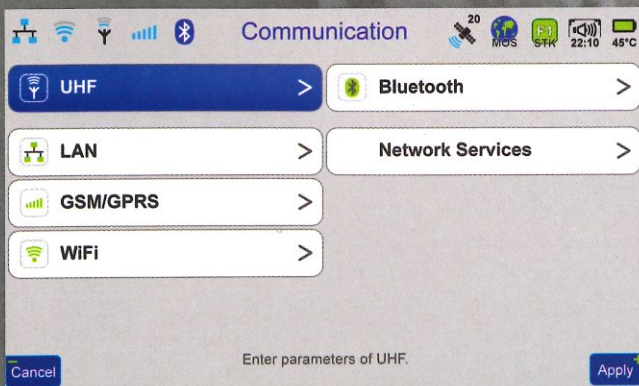
TRIUMPH V.S.

- “Action Screen” makes it a joy to perform all sorts of survey and GIS tasks easily in the field.

Satellites																	
SAT	EL	AZ	H	L1	P1	P2	L2C	L5	SAT	EL	AZ	H	L1	P1	P2	L2C	L5
GPS7	7	↓106	H	32	--	--	32	--	GLN11	11	↓96	H	40	39	26	26	--
GPS8	41	↓102	H	46	30	30	--	--	GLN13	54	↑298	H	45	44	42	43	--
GPS9	14	↑286	H	37	10	10	--	--	GLN14	6	↑284	H	34	31	36	36	--
GPS11	13	↑82	H	37	--	--	--	--	GLN21	34	↓40	H	48	47	44	45	--
GPS15	55	↑274	H	49	37	37	48	--	GLN22	48	↑114	H	48	48	47	49	--
GPS17	30	↑156	H	45	29	29	44	--	GLN23	14	↑162	H	43	41	37	40	--
GPS19	8	↓28	H	37	11	11	--	--	WA124	32	↑202	H	38	--	--	--	--
GPS26	46	↑298	H	37	--	--	--	--	WA126	27	↑196	H	34	--	--	--	--
GPS27	27	↑288	H	42	20	20	--	--									
GPS28	71	↓86	H	49	39	39	--	--									
GLN2	6	↓220	H	36	36	31	32	--									
GLN3	31	↓266	H	45	45	43	44	--									

GLN:GLONASS GLO:Galileo WA: WAAS EG: EGNOS EL:Elevation °: Rising v:Setting.
 AZ:Azimuth H:Healthy. L1, P1, P2, L2C, L5 are in db/Hz. GPS P1/P2 are codeless.

Satellites detail screen, which shows satellites names, azimuth, elevation angles, health status.



Set up all of communication channels of UHF, Bluetooth, LAN, GSM/GPRS, and WiFi.



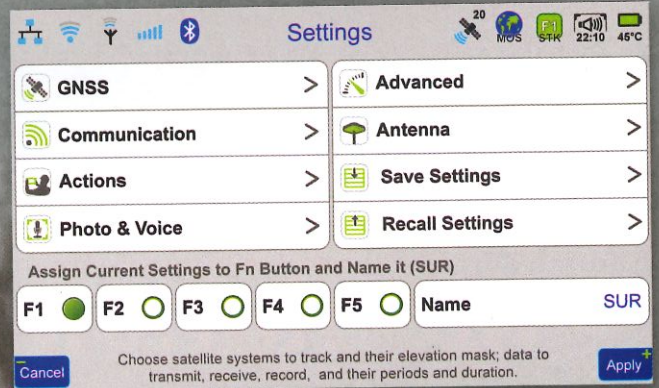
But these are not 3 separate devices!

External
Power
USB
USB
Ethernet

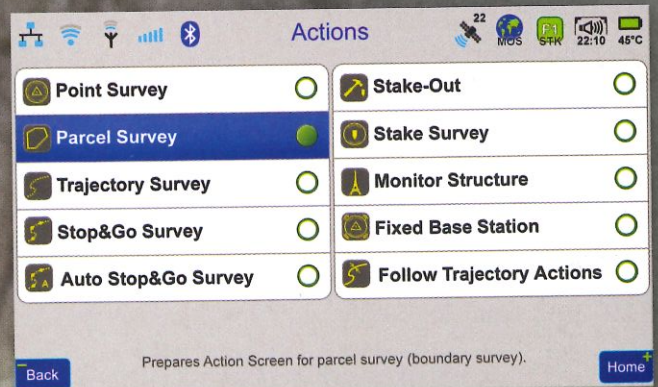


2

- 3 mega pixel camera
- High capacity, removable, rechargeable battery pack

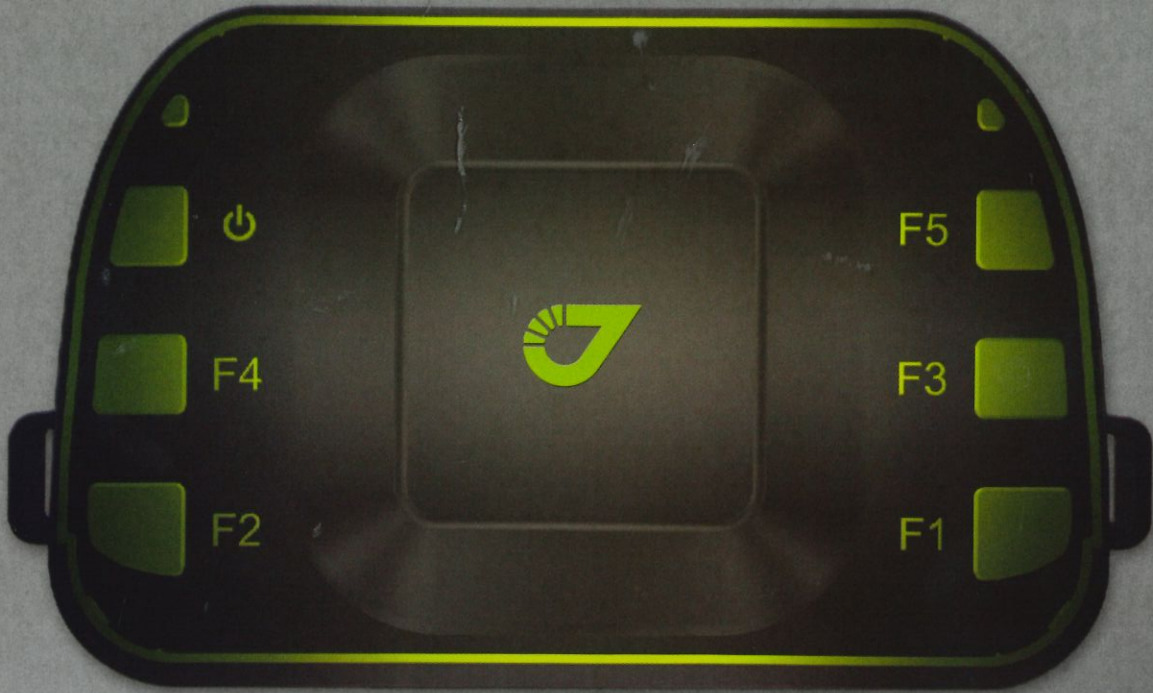


Access to program the operation of the receiver for variety of applications.



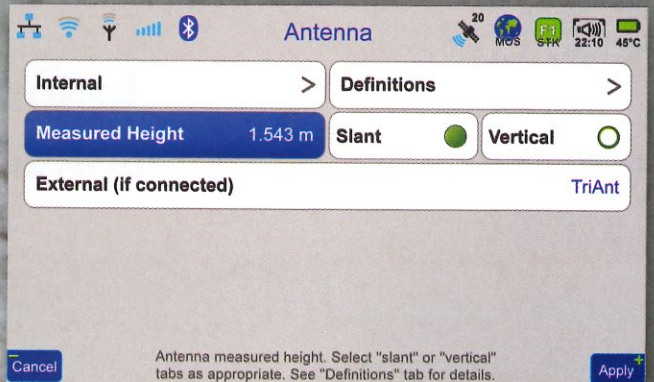
The selection prepares it's Action screen to do the job accurate, fast and easy.

Please see Triumph V.S. videos on www.javad.com

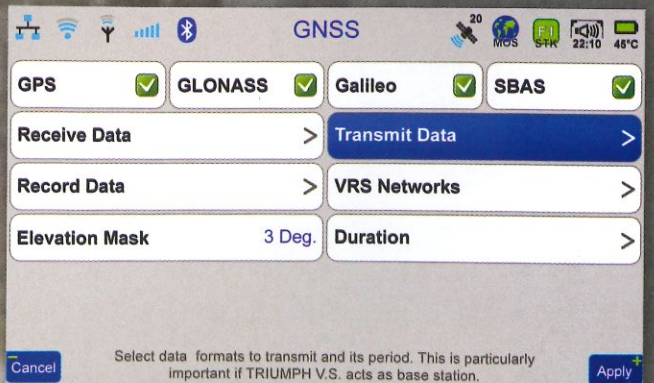


1

- A high precision all-frequencies GNSS antenna
- 5 quick access program buttons (F1 to F5)



Enter antenna height and specify the type of external antenna, if an external GNSS antenna is connected.



Program the receiver to act as a base station and transmit RTCM messages every second via Ethernet.



CONGO chooses JAVAD receivers...

We have primarily chosen the Javad Triumph receivers in late 2008 because they were the first (and at that time only) multi-frequency (L1/E1, L2, L5/E5b) and multi-constellation receivers (GPS, Galileo, GLONASS and SBAS) which offered GIOVE tracking support for general users. The Triumph technology offers a huge number of tracking channels, which puts no known restrictions on all-in-view tracking of all supported signals.

An important aspect that distinguishes the Triumph receivers from various other products is the availability of semi-codeless L1 P(Y) pseudorange and phase measurements in parallel to the corresponding L1 C/A code tracking. This appears important because it avoids problems with differential code biases when consistency with GPS clock products is important, e.g. in precise point positioning applications. Besides the legacy GPS signals and the L2C signals of the Block IIR-M satellites the receiver has demonstrated to properly track the new GPS L5 signal (both the PRN1 test signal, and, most recently, the new PRN25 signal of the first Block-IIR satellite; see <http://www.gpsworld.com/gnss-system/gps-modernization/news/gps-l5-the-real-stuff-10086>). With respect to Galileo, the receiver is ready to track the future Galileo signals due its full support of memory codes (not only the shift register codes used for Galileo). It presently supports tracking of GIOVE E1 Open Service signals (combined E1B/C including CBOC support) and the E5a (combined I/Q) signal. This enables ionosphere-free linear combinations of measurements and provides the basis for the generation of GIOVE orbit and clock information from CONGO data. While E5b and E5 AltBOC tracking is not supported by the present generation of Triumph receivers, E5a is considered to be fully sufficient for precision navigation and has the evident advantage of a common frequency with GPS. Also, many advantages of the AltBOC signal can only partly be materialized when combining the measurements with the lower grade E1 signals. For completeness, we note that the Triumph receivers support a total of four GLONASS signals on L1 and L2 as well as two SBAS signals (on L1 and L5). All of these aforementioned signals and constellations can be tracked concurrently in view of the large number of channels.

Concerning the measurement quality, the Triumph receivers offer a flexible choice of tracking loop bandwidths and smoothing options. These allow the user to optimally adapt the measurement generation to its specific needs (be it high dynamics aircraft or stationary geodetic reference stations). Most notably the receivers offer a superior multipath suppression technique that contributes to an excellent overall User Equipment Error (UEE). As a noteworthy example, the Triumph receivers successfully mitigates the impact of the satellite internal signal reflection of the PRN1 (SVN49) GPS satellite on all L1 and L2 signals. Here the reflected signals exhibit a path delay of only 10m which forms an extremely hard test case and underlines the high quality of the Triumph correlator design and multipass suppression technique. Overall, the Triumph receivers in the CONGO network showed a highly competitive tracking performance across all signals and constellations, which more than justifies their choice for a geodetic reference network.

As a side note, we may add that a Triumph receiver has also recently been proposed to fly as part of a European experiment on the International Space Station (ISS). Besides low noise, high quality measurements, the receiver has demonstrated a superior cold start time-to-first-fix of less than a minute in signal simulator tests under the extreme dynamic conditions of an Earth orbiting platform.

Even though a growing number of manufacturers is now offering alternative multi-constellation GNSS receivers, we believe that the Triumph receivers offer a highly competitive product (at an attractive price) which presently best fits the needs of our network. A highly responsive technical support and development team has furthermore contributed to continuously improve the receivers and to properly meet all user demands.

Regards and best wishes,
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