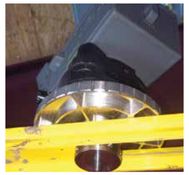
Javad gets a Blue Ribbon for best invert measuring device I've ever used.

No total Station I've seen can do this the way the JMate does. The offset camera/vertical action hasn't been done before and I see huge advantages.

I've measured many inverts in my career. Anyone who says they can measure them to the hundreths with a sh*t stick (pipe mic or not) (handheld laser or not) is full of it. Today I measured the most accurate inverts I ever have. Relative accuracy of a mm or two at most on elevation. Yes the inverts were recessed. I'm embarrassed to tell you folks what I measured with the sh*t stick a few weeks ago and thought it was good. It wasnt, matter a fact it put the sh*t flowing uphill. A tenth or two, sometimes it matters , sometimes it doesn't. JMate gets an A+ plus for this task.

This is the setup I should have used today.

Aluminum 4 ft level, the Jmate top plate and 3/8 3/8 adapter. Quick and Easy. I would have had a better view too.



FR

TRIUMPH-3

The new TRIUMPH-3 receiver inherits the best features of our famous TRIUMPH-1M.

Based on our new third generation TRIUMPH chip enclosed in a rugged magnesium alloy housing.

The TRIUMPH-3 receiver can operate as a portable base station for Real-time Kinematic (RTK) applications or as a receiver for post-processing, and as a scientific station collecting information for individual studies, such as ionosphere monitoring and the like.

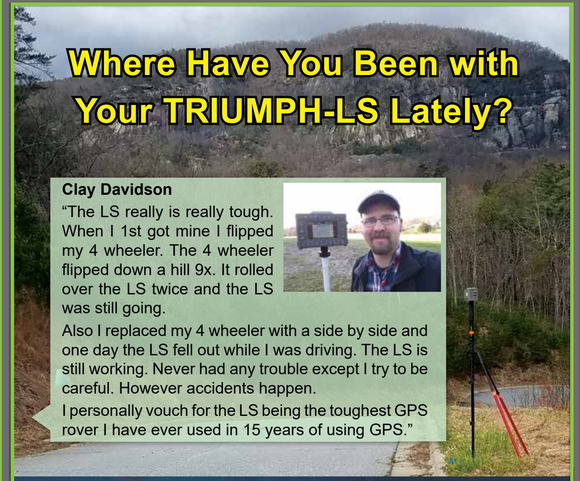
It includes options for all of the software and hardware features required to perform a wide variety of tasks.

- UHF/Spread Spectrum Radio
- 4G/LTE module
- Wi-Fi 5 GHz and 2.4 GHz (802.11 a, b, g, n, d, e, i)
- Dual-mode Bluetooth and Bluetooth LE
- Full-duplex 10BASE-T/100Base-TX Ethernet port
- High Speed USB 2.0 Host (480 Mbps)
- High Speed USB 2.0 Device (480 Mbps)
- High Capacity microSD Card (microSDHC) up to 128GB Class 10;
- "Lift & Tilt"
- J-Mobile interface

Ideal as a base station

Back

JAVAD
www.javad.com



Front

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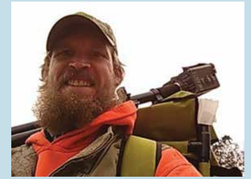


Adam Plumley, PLS

I probably won't be carrying a sh*t stick with me anymore. Notice the red dot on top of the pipe.

FL

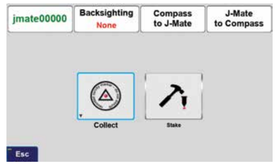
Introduction to J-Mate

Let's set the record straight: J-Mate is not a total-station. **J-Mate and TRIUMPH-LS together** make the **"Total Solution"** which is a combination of GNSS, encoder and laser range measurements that **together do a lot more than a total station**. For long distances you use GNSS and for short distances (maximum of 100 meters) you use the J-Mate along with the TRIUMPH-LS. Together they provide RTK level accuracy (few centimeters) in ranges **from zero to infinity**.

As with the TRIUMPH-LS, with the J-Mate we also provide software improvement updates regularly and free of charge. Download the J-Mate update in your TRIUMPH-LS and then inject it to the J-Mate. The J-Mate SSID will be in this format JMatexxx, where xxx is your J-Mate's serial number. After a Wi-Fi connection is established, click the J-Mate icon and then click Setup. When you are prompted to connect to the J-Mate, click yes and then follow the remaining prompts.

Connecting the TRIUMPH-LS to the J-Mate

TRIUMPH-LS communicates with the J-Mate through Wi-Fi. Turn on both the TRIUMPH-LS and the J-Mate. Click the Wi-Fi icon on the TRIUMPH-LS Home screen to connect to the J-Mate, much the same way as you connect TRIUMPH-LS to your Wi-Fi access point.



After connection, click the J-Mate icon on the TRIUMPH-LS Home screen and then J-Mate/ Collect/Next to get familiar with the Main J-Mate screen.

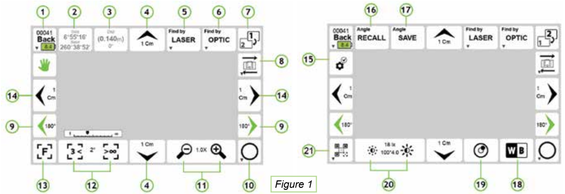


Figure 1

Measure angles between two points:

Aim at the first point and click button **"2"** of Fig. 1. Then Aim to the second point and click this button again. You will see the horizontal angles between the two points. You can save the measured angles in clip boards and use it elsewhere when you need.

Taking a point

Aim at your target and click **"10"**. J-Mate will take 10 readings and average them. The average, RMS and spread of the ten readings are shown. Optionally, you can specify four points around the target point to be measured too, to ensure that you have aimed at the desired target. To specify the distance of the four points around the target, hold **"10"**.

Instantaneous angular and range measurements are shown in boxes **"2"** and **"3"** in Fig. 1.

Camera operation and settings

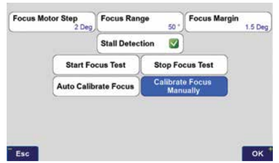
White balancing the J-Mate camera when the light setting changes: 1)Put a white paper in front of the J-Mate camera about few meters away, such that it covers at least half of the viewing angle of the camera. 2) Click **"18"** to start white balancing. It will take about 10 seconds to finish.

Zoom buttons: **"11"**

Contrast/Brightness buttons: **"20"**

Focus: use buttons **"12"** to focus manually. Click **"13"** for autofocus on the subject.

Occasionally you may need to calibrate the Focus motor. Click Setup **"15"** → "Focus" → "Auto Calibrate Focus" or "Calibrate Focus Manually". In Manual focus, 1)click "Rest Focus Calibration", 2) using **"12"** buttons, focus to infinity, 3) Click "Set Focus as Infinity".



Searching and finding objects by laser and Object types

Hold the Laser button (**"5"**) to see the setup screen for laser target selection and parameters. If you know the approximate distance to the target, click the check box and enter the distance and accuracy percentage. This will help J-Mate to ignore targets that are outside the range.

Horizontal and Vertical Limits are the limits that J-Mate will search around the starting point to find targets. In this example is 15 degrees on left and right, and 15 degrees up and down.

"Keep Fixed Height" check box, scans horizontally on fixed target height. You may rarely need to use this feature. It will reduce the scanning speed by a factor of 2.

In Target Selection screen, the following targets are defined:

- **J-Target** is a printed pattern glued to 166x166 mm plywood of about 25 mm thick. It can be attached to a 226x226 mm plywood of 10 mm which provides flaps around the pattern. Select check boxes related to Sides, Top and Bottom flaps, if they exist and you want J-Mate to consider the depth of the flap (about 25 mm).
- If the J-Target is not sitting on another object and its bottom boundary is clear, then check the box Measure to Bottom. If not checked, J-Mate will measure to the top and will come down half of the height to aim at center. This feature applies to other target types too.
- In laser scanning and finding, the pattern on the J-Target has no effect.

J-Target Custom: This option allows you to build your custom J-Target type.

TRIUMPH-LS Back: searching for an object similar to the back of TRIUMPH-LS.

Search Tube: Searches to find a tube with given diameter and height. If Measure to Bottom is not checked, it will go to the top of the tube and then come down half of the specified height, irrespective of the actual height of the tube.

Measure Tube: Searches for a tube that has the given width and then it measures the tube depth.

Corner identifies an abrupt change on a flat surface.

Snap: scans with the resolution given in "Step" and stops when range changes by "Edge Depth".

Scan: Scans according with the resolution given in "Step" and saves the scanned files if the box is checked. The scanned files can be viewed in the Main screen / Collected by User .

Selected objects and their parameters can be saved and recalled by **"Save"** button on this and **"Recall"** button of the previous screen.

Aiming at targets manually

You can find targets manually or automatically.

Backsight point and the Sun

Similar to using conventional total station, to use the J-Mate you need to first establish its accurate position and calibrate its vertical and horizontal encoders. Then proceed to shoot the unknown points. This is similar to using any total station, but we have improved and automated the process.

With J-Mate you can do these in three different ways as shown in the J-Mate screen of the TRIUMPH-LS. Via the J-Mate Backsight; One Point, Resect, and Astro-Seek icons.

If GNSS signals are available at the site, click the One Point icon.

This screen appears which guides you to determine the accurate positions of the Occupation Point and a Backsight Point to establish an azimuth and calibrate the J-Mate angular encoders.

The tripod is setup at the "Occupation Point" (OP). The J-Mate is secured on top of the tripod.

Next, TRIUMPH-LS is put on top of the J-Mate with its legs registered to the matching features on the J-Mate.

Next Use the RTK Survey feature of the TRIUMPH-LS to quickly determine the accurate location of the Occupation Point. You can use your own base station or any public RTN.

Next, slide the J-Target on top of the TRIUMPH-LS, lift it from the J-Mate and move to the "Backsight Point" (BP). The camera of the J-Mate will search the J-Target. The camera's view is visible from the TRIUMPH-LS screen, which mostly focuses on this J-Target. When at the Backsight Point, its accurate position is determined by the TRIUMPH-LS, and the Azimuth from the Occupation Point to the Backsight Point is determined, and the J-Mate is calibrated and ready for use.

After this calibration is complete, if the tripod is disturbed, the red LED on the front of the J-Mate will blink to show that re-calibration is required.

We can now replace the TRIUMPH-LS on top of the J-Mate at the Occupation Point and proceed to shooting as many "Target Points" as the job requires. From now on TRIUMPH-LS is used as a controller and you can hold in your hand too, but it is more convenient to put it on its place to have free hands.

If GNSS signals are not available at the Occupation Point, click the "Resect" icon to shoot two known points to establish its accurate position and calibrate its encoders. Then continue to shoot the unknown points.

Astro-Seek feature: Sun as the Backsight point!

We have added a new innovative feature to the J-Mate that it can automatically calibrate itself via its automatic Sun Seeking feature.

Attach the Sun filter to the camera of the J-Mate, click the "Astro-Seek" icon, set Occupation Point, and click the "Sun" icon in the screen which appears and J-Mate will scan and find the Sun, and use its position to calibrate the angular encoders automatically.

See details at **www.javad.com**