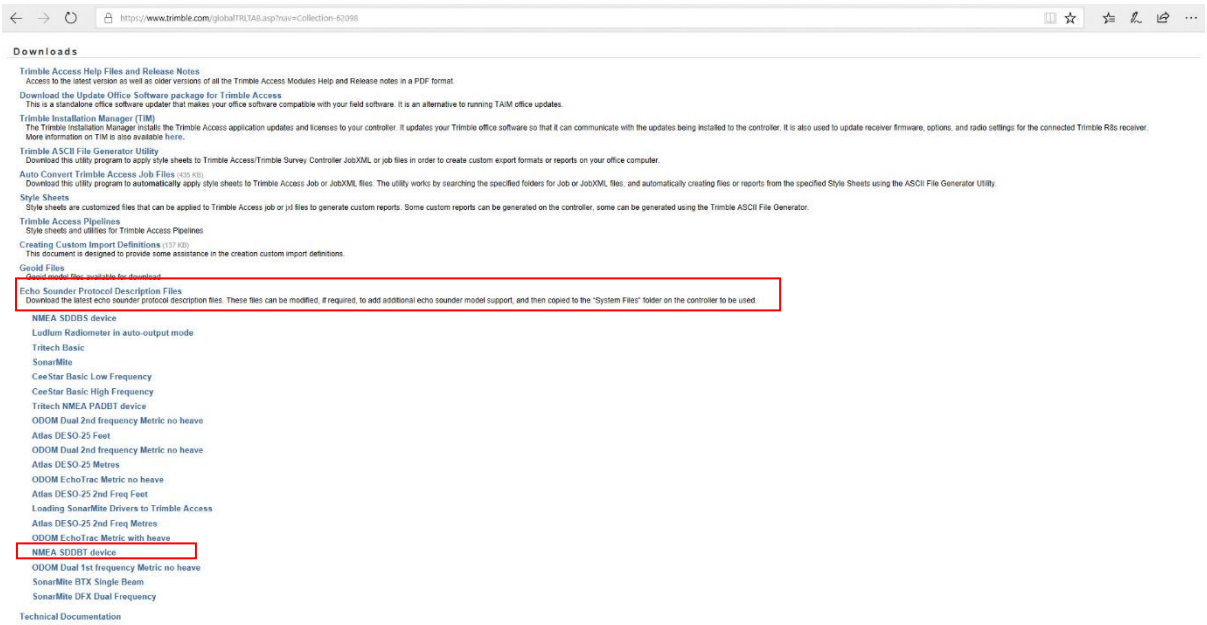
Using the CEE LINE™ Echo Sounder with Trimble Access or Geometius' BathySurvey App on the TSC3 Data Collector.

The CEE HydroSystems CEE LINE™ is a super-rugged echo sounder system that brings hydrographic grade, non-recreational transducers and advanced control unit processors to entry level hydrographic surveying using GNSS data collectors. The CEE LINE™ is powered by the data collector through a USB connection and data are transferred over a COM data link with a single cable. With a 10Hz data rate, 5x faster than competing units, sounding accuracy is increased and bottom tracking is maintained even into very shallow water. The CEE LINE™ is by definition "PLUG AND PLAY". No charging, no batteries, no Bluetooth pairing and no headaches. This article describes the basic procedures to use the CEE LINE™ with the Trimble TSC3.

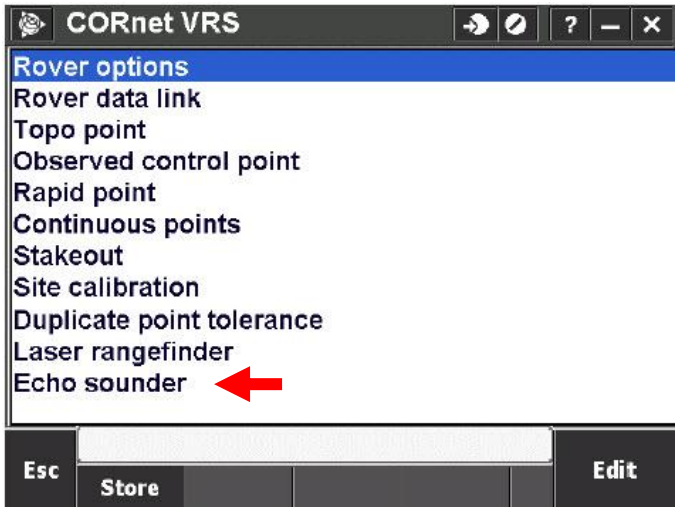
OPTION 1 - Using Trimble Access

Echo sounder support is added to the TSC3 by copying the "echo sounder protocol description file" to the "System Files" folder on the controller. The download page can be found HERE. It is recommended that the "Generic NMEA" option is used, with a SDDBT (depth below transducer) standard output message selected in the CEE LINE. This is the factory default output. Note that the CEE LINE can be configured to output any standard industry format, for single or dual frequency operation. The CEE STAR format should not be used.

The Trimble download page is shown below:

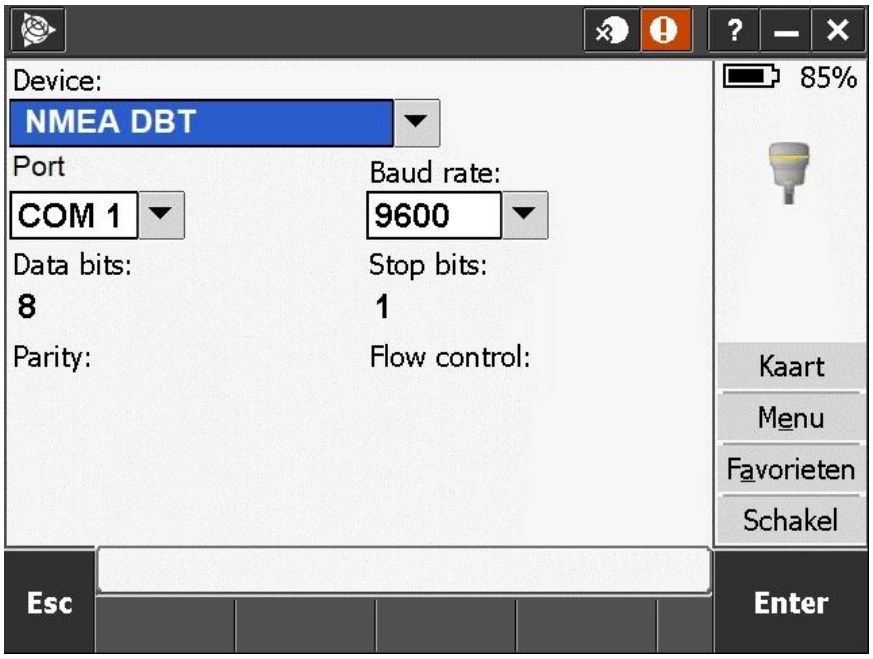


The correct Survey Style is then configured for the project. Within the Survey Style menu, "Echo sounder" will be listed as an option. The Echo sounder field / EDIT should be selected to configure the interface for the device.

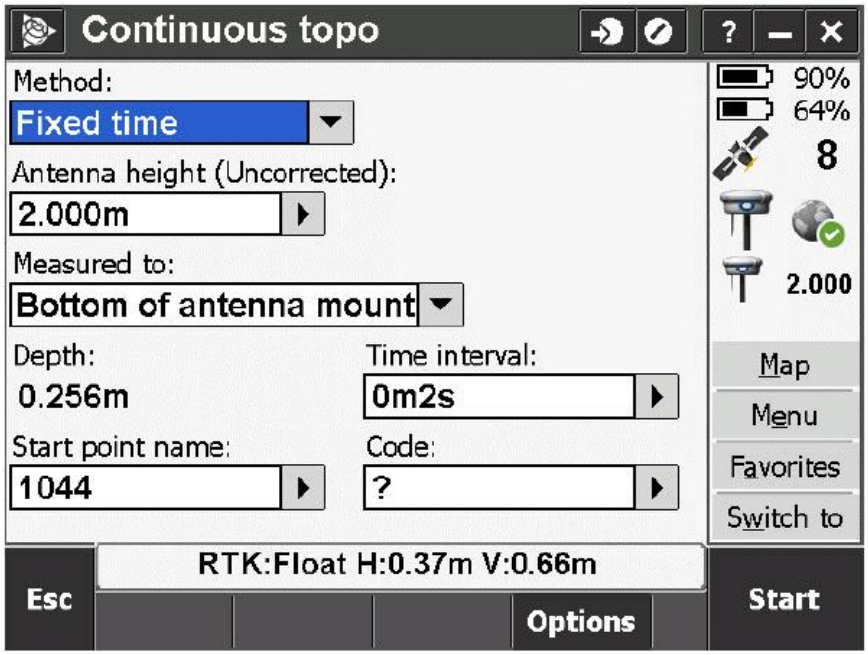


The echo sounder type is selected, in this case the echo sounder name is defined by the output data format. For the CEE LINE it is convenient to use NMEA SDDBT (NMEA Depth Below Transducer) generic device.

The CEE LINE “combo” USB / 9 pin power data cable is provided for the TSC3 data collectors, which sends the CEE LINE data output to the physical DB9 port of the TSC3 - always assigned as COM1. The simultaneous USB connection is only used for 5V power. The CEE LINE default baud rate is 9600 but is not fixed and may be changed inside the echo sounder, however there is no reason to change the baud rate away from 9600.



After the echo sounder is configured, the data collection method may be set up. Performing hydrographic surveys calls for a Continuous Topo measurement method usually based on a defined time interval (use the shortest possible). As the CEE LINE outputs data at 10Hz, there will be a depth measurement available every 0.1s.



The antenna height is the distance from the GNSS antenna to the bottom of the transducer. The static draft (distance from the water surface to the transducer face) should be measured and noted.

Note that the most recent depth value will be displayed if the connection is established but the resultant elevation WILL NOT be displayed. The depth and elevation may be exported from the data file at the end of the survey. It is recommended to use the style sheet which exports CSV data with depth and elevation in separate columns, for better data review and quality control.

Testing should always occur with the transducer in the water and a valid depth being output to ensure proper connectivity.

OPTION 2 – Using Geometius BathySurvey

The Geometius BathySurvey app is available for download from the Trimble dealer network and is designed to improve the user interface for hydrographic data collection when using an echo sounder such as the CEE LINE within the Trimble Access software suite. The benefits include:

- Full access to CEE LINE configuration options and settings from the TSC3
- View of real time sounding data on a scrolling depth chart
- Barcheck wizard for speed of sound calibration
- Echo sounder speed of sound and maximum depth entry during the survey

In Trimble Access – Survey Styles – Echo sounder, the following option should be selected. It is critical to ensure this is correct. No echo sounder related settings must be input within Access.

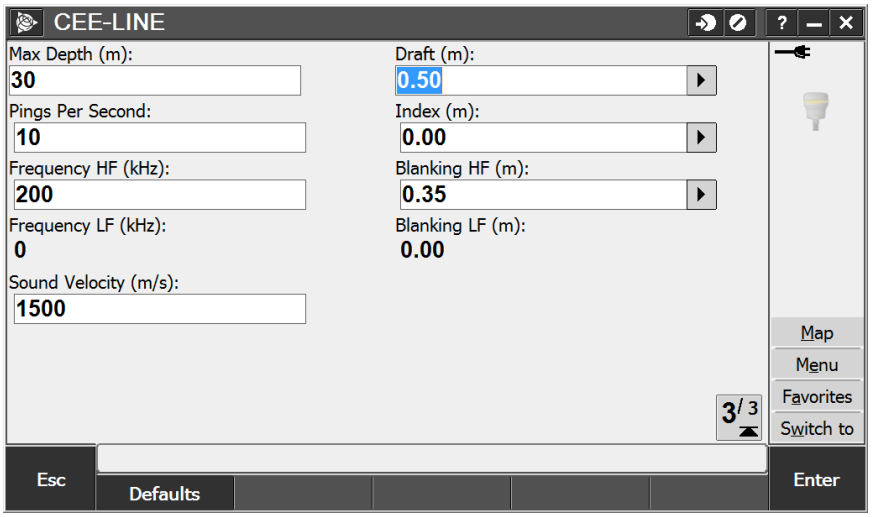
The device selection in BathySurvey is as follows:

The mode and TVG settings should be as follows. Log20 should NOT be used, as this results in excessive gain application. The AUTO bottom tracking will be the best selection in almost all cases. Only extremely shallow soundings with a hard, reflective bottom may improve on the “shallow” setting.

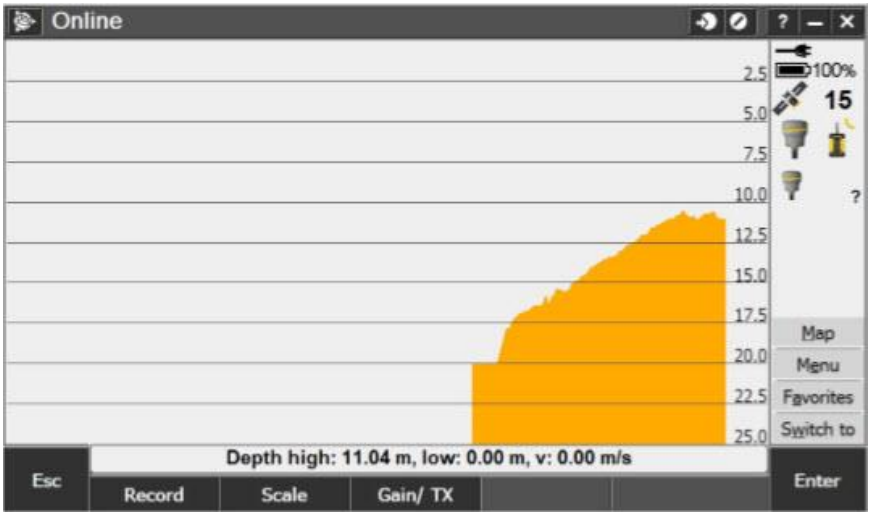
The maximum depth is a critical setting. If the depth soundings are deeper than the max depth, all data will be cut off and will not be recoverable. This setting can be changed during the survey using the BathySurvey app if it becomes clear that the depth is greater than expected.

!! Always ensure the maximum depth setting is greater than the anticipated survey depth !!

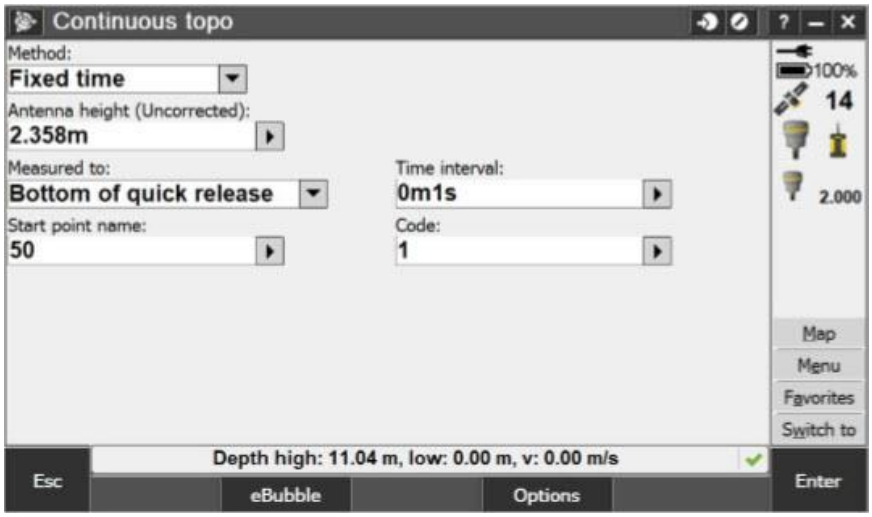
If the GNSS antenna offset to the transducer is entered, do not add draft. If the GNSS antenna offset is measured to the static waterline, add draft measured from the water surface to the lower face of the transducer. The blanking distance can be set at the minimum for most shallow water surveying. Ping rate should be 10Hz for highest precision.



After the configuration is complete, the online screen may be used to view the sounding detail.



Pressing “record” starts a continuous topo measurement.



The style sheet that must be used for data export from the BathySurvey data file is provided with the App. Do not use a standard Access Style Sheet.