Using the CEE-LINE™ with the Trimble TSC7 Data Collector.

The Trimble TSC7 is an ideal data collection device to use with the CEE-LINE echo sounder, which is primarily designed for basic acquisition projects using GNSS collection hardware and software. The TSC7 runs a full Windows operating system allowing a convenient USB data / power connection and the ability to run the CEE LINE CONNECT setup utility to configure the echo sounder. This document explains the cabling, driver, and software configuration required for the CEE-LINE echo sounder to function with both the Survey Controller and Access programs on the Trimble TSC7 data connector.

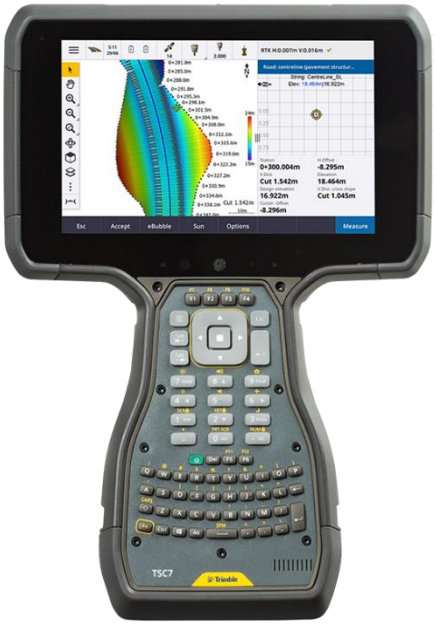


Figure 1 - Trimble TSC7 data collector

CEE-LINE Connection Options

There are three different methods for connecting the CEE-LINE to the Trimble TSC7:

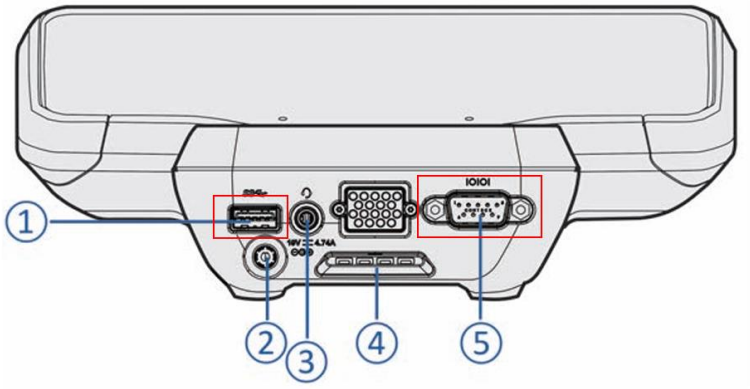
1. “Smart” USB cable (see Figure 2). This has a USB Type A connector at one end and the CEE-LINE 12-pin LEMO connector at the other. When this cable is used the CEE-LINE (and therefore the transducer too) is powered from the TSC7 battery via the Type A USB port. This option requires the FTDI device driver software, but this should already be installed on the TSC7.
2. USB power “combo” RS-232 cable (see Figure 3). This has a DB9 RS-232 connector with a USB Type A connector at one end and the CEE-LINE 12-pin LEMO connector at the other. When this cable is used the CEE-LINE (and therefore the transducer

too) is powered from the TSC7 battery via the Type A USB port. This option does not make use of the FTDI device driver as it uses the existing COM port.

3. External power RS-232 cable with separate power connections. This has a DB9 RS-232 connector and a pair of black/red power connections at one end and the CEE-LINE 12- pin LEMO connector at the other. When this cable is used the CEE-LINE is powered by a separate 4.5–24 VDC power supply. This cable is NOT typically supplied with the CEE-LINE.

Figure 1 - "Smart" USB cable

Figure 2 - Combo cable



1	USB Connector	4	Device Mount Hook
2	Charging Port	5	DB9 / RS232 Serial Connector
3	Audio Jack		Note - An alternate boot is also available, with 2 USB ports instead of 1 USB port / 1 Serial port.

Figure 3 - TSC7 Connectors

CEE-LINE CONNECT Software

The CEE-LINE is configured using the CEE-LINE CONNECT software. The TSC7 is a Windows computer and therefore the CEE-LINE CONNECT software is supported. If CEE-LINE CONNECT it is not already installed on your TSC7, download the installer from the CEE HydroSystems website: https://ceehydrosystems.com/support/downloads/

Once this is installed on your TSC7, a shortcut to CEE-LINE CONNECT should appear on the TSC7's desktop.

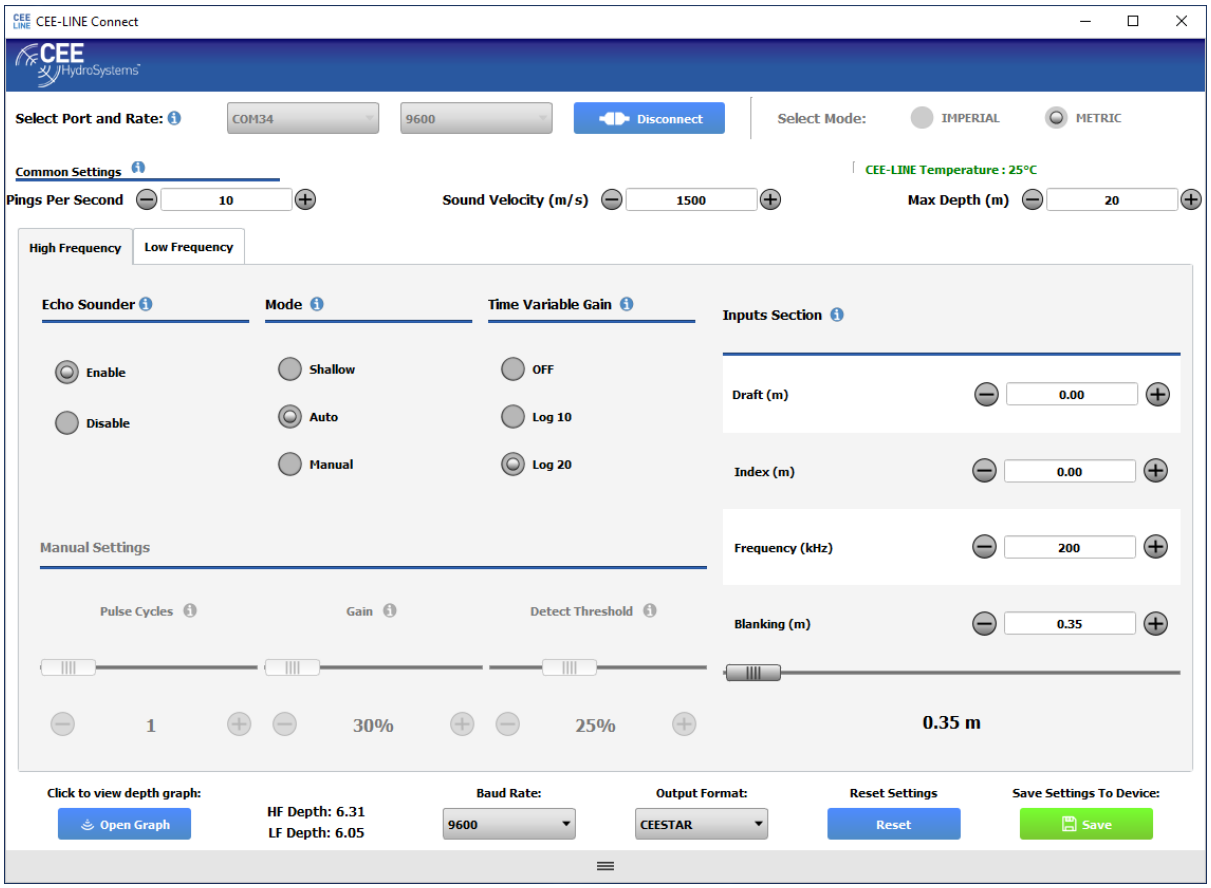


Figure 4 - CEE-LINE CONNECT utility interface.

TSC7 COM Port Identification

The CEE-LINE communicates with the TSC7 via one of its COM (serial) ports. As with any Windows computer, the full list of available COM ports can be seen using the Windows Device Manager program (example displays are shown in Figure 5 and Figure 6).

The appropriate COM port depends on the cable used to connect:

- The DB9 RS-232 port on the TSC7 is **always COM1** (see Figure 5),

- If the "Smart" USB cable is plugged in then it will generate an **arbitrary COM port number**, e.g. COM26 is shown in Figure 6. This number will always be the same every time the CEE-LINE is connected using the same cable. Switching to a different "Smart" USB cable will generate a new COM port number for the same CEE LINE device. When the "Smart" USB cable is unplugged, the COM port will disappear.

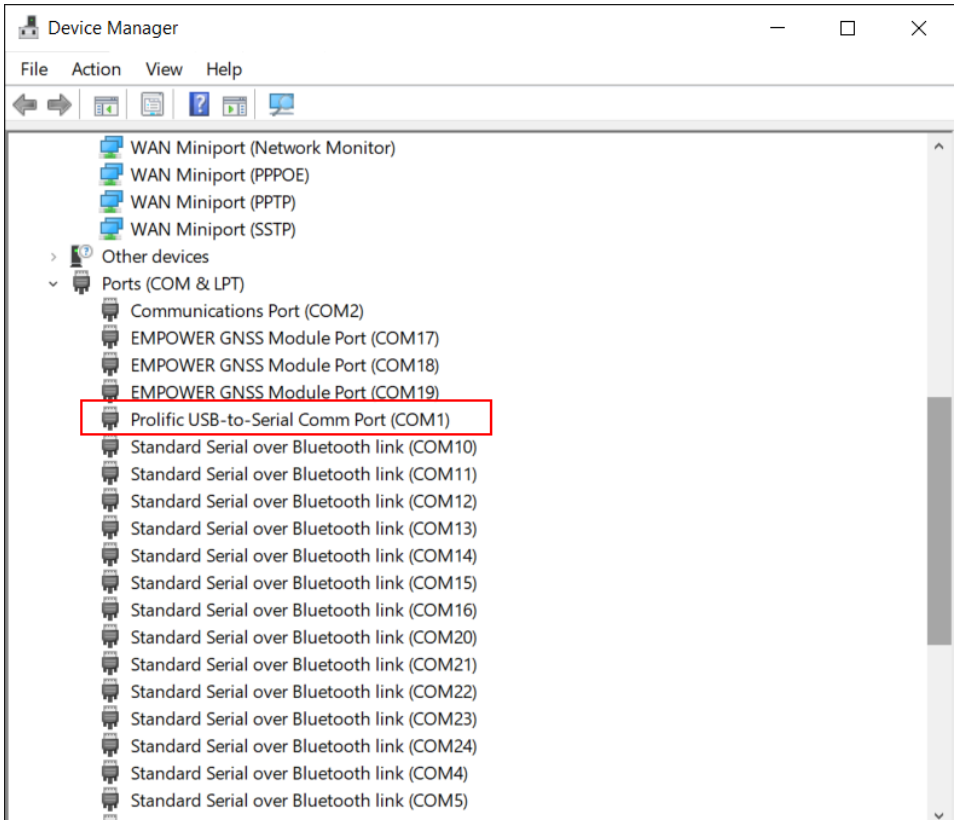


Figure 5 - Windows Device Manager (TSC7 RS-232 COM port highlighted).

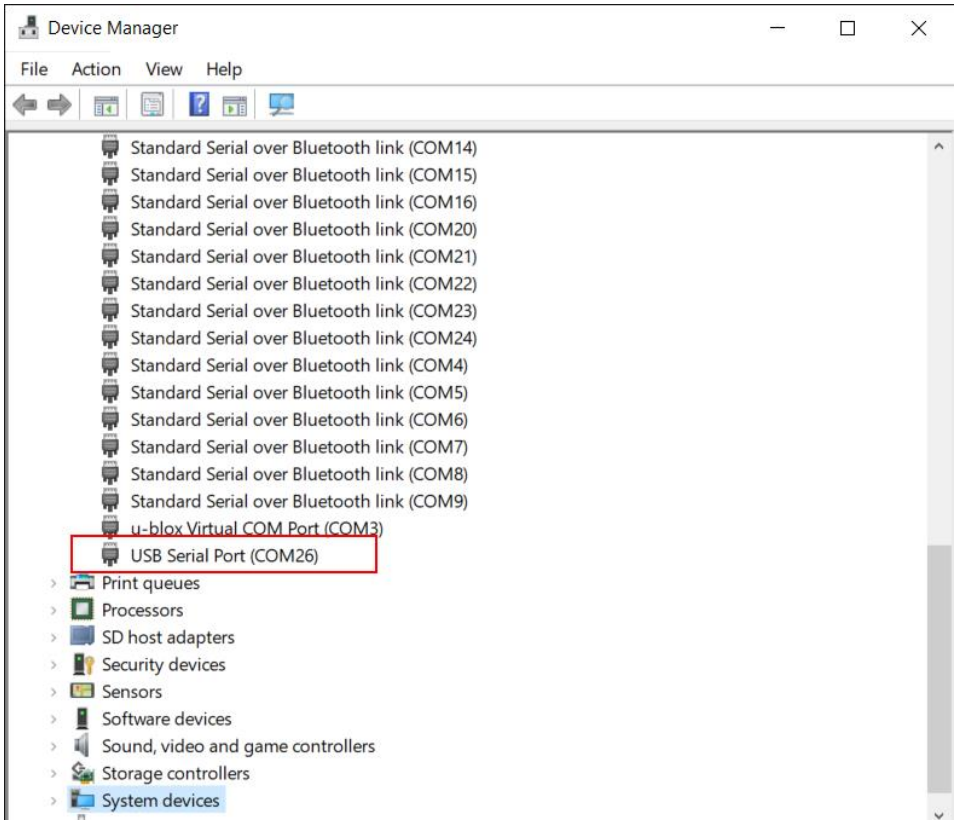


Figure 6 - Windows Device Manager ("Smart" USB cable highlighted).

CEE-LINE Configuration

The CEE-LINE is configured using CEE-LINE CONNECT software. CEE-LINE CONNECT cannot operate simultaneously with Trimble Access as the COM port cannot be shared.

You will need to disconnect from the CEE-LINE in CEE-LINE CONNECT to permit Trimble Access (or any software) to communicate with the CEE-LINE, and vice versa.

For Trimble Access to receive depth data generated by the CEE-LINE, the CEE-LINE's Output Format must be set to one of the following:

1. NMEA DBT (default output format)
2. CEESTAR

The CEESTAR format supports both CEE-LINE echosounder channels (high frequency and low frequency) whereas the NMEA DBT format only supports a single CEE-LINE channel (either high frequency or low frequency, whichever is enabled on the CEE-LINE).

The default baud rate is 9600bps but this may be changed. **The CEE LINE baud rate shown in CEE LINE CONNECT must match the value used on the TSC7 setup.**

With the Output Format and baud rate set, press on the green Save button. The new settings are now stored in the CEE-LINE's non-volatile memory.

The MAXIMUM DEPTH field is a hard limit. If the survey depth exceeds the maximum depth then there will be no data received. Be careful to properly set the maximum depth; expected survey depth plus 25-50% is a good rule. It is not recommended to input the largest permissible value, eg a 100m max depth for 20m surveys. Setting an appropriate maximum depth improves echo sounder performance.

The DRAFT will be added to the measured depth output. Ensure that DRAFT is set to zero as the antenna height distance from the base of the transducer to the GNSS is applied in Trimble Access.

Press on 'Disconnect' and close CEE LINE CONNECT before proceeding further.

Survey Style Configuration

Each Survey Style on the TSC7 that you intend on using with the CEE-LINE must have its echo sounder settings properly configured.

Start the Trimble Access program on the TSC7, open your Project and Job, go to Settings, and then Survey Styles.

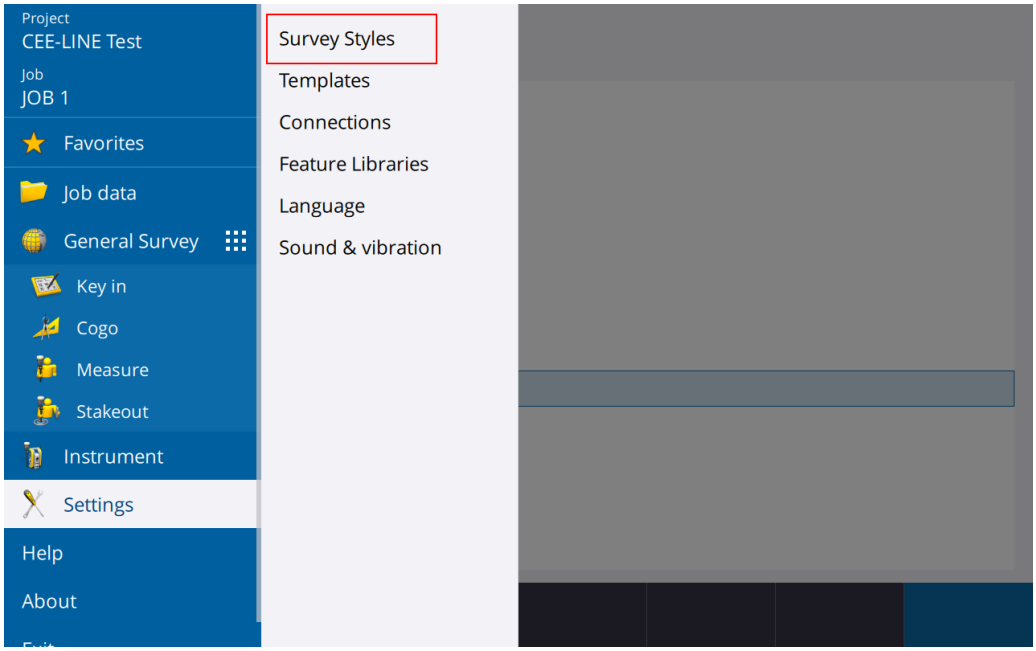


Figure 7 - Trimble Access Survey Styles Settings.

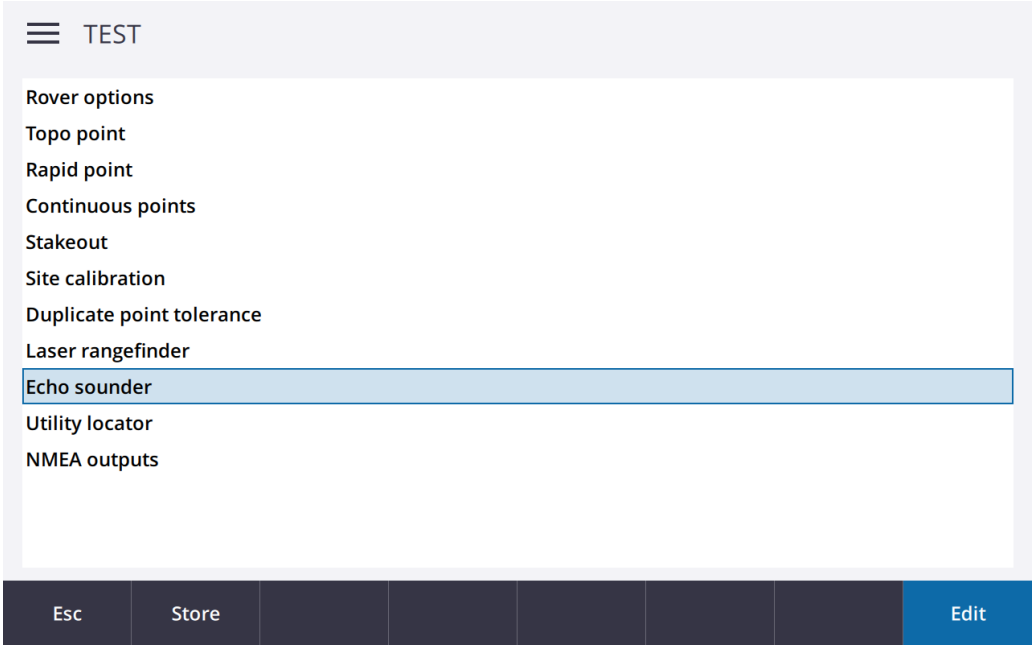


Figure 8 - Trimble Access Echo sounder settings.

Set up the Echo sounder as shown in Figure 9. The selected Baud Rate setting must match that set in CEE-LINE CONNECT, which is 9600 bps by default. Ensure the “Data bits” field is set to 8, the Parity to “None” and the “Stop bits” to 1. The Controller Port must be set to COM1 if the communications with the CEE- LINE is via the DB9 RS-232 connector (Figure 2). If the “Smart” USB cable is used (Figure 1) then select the appropriate COM port as indicated on the device manager “Ports” list.

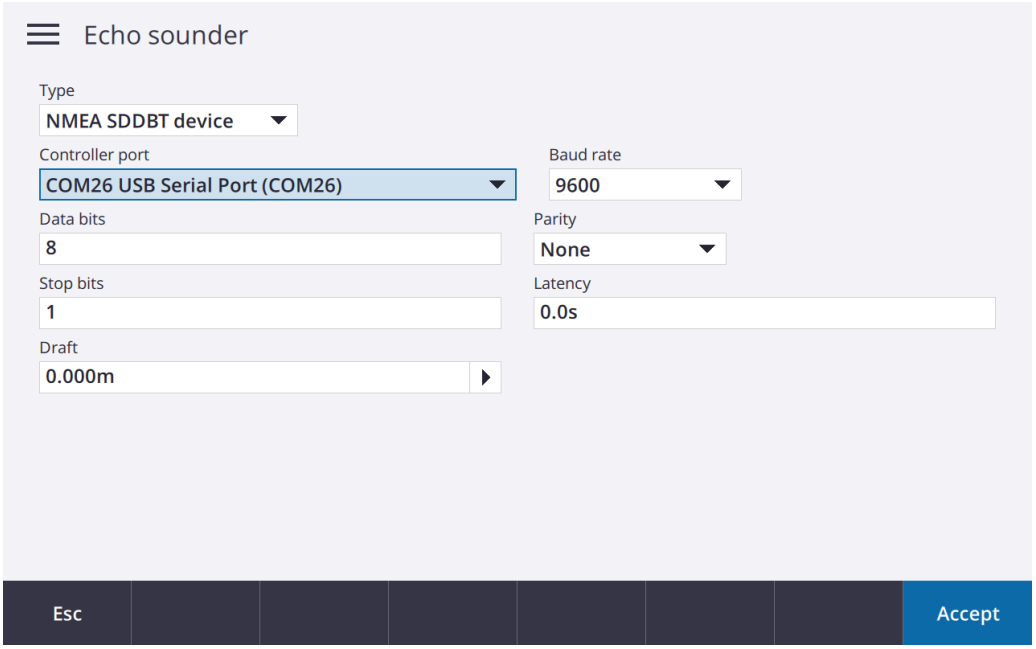


Figure 9 - Survey Controller Echo Sounder Options

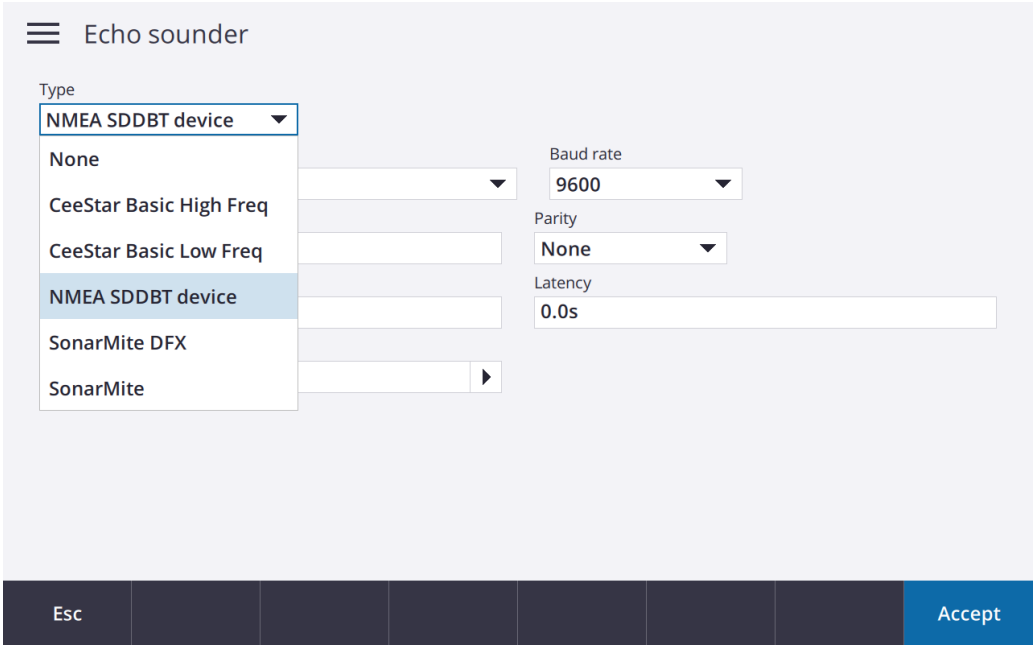


Figure 10 – Setting the Output Format (Type)

Set the Type field to the Output Format the CEE-LINE was configured for, usually NMEA SDDBT. Store the updated Survey Style “Accept" and escape from Configuration.

With the Echo sounder settings complete, Trimble Access will add the “Depth” field to the survey window when this Survey Style is used (Figure 11).

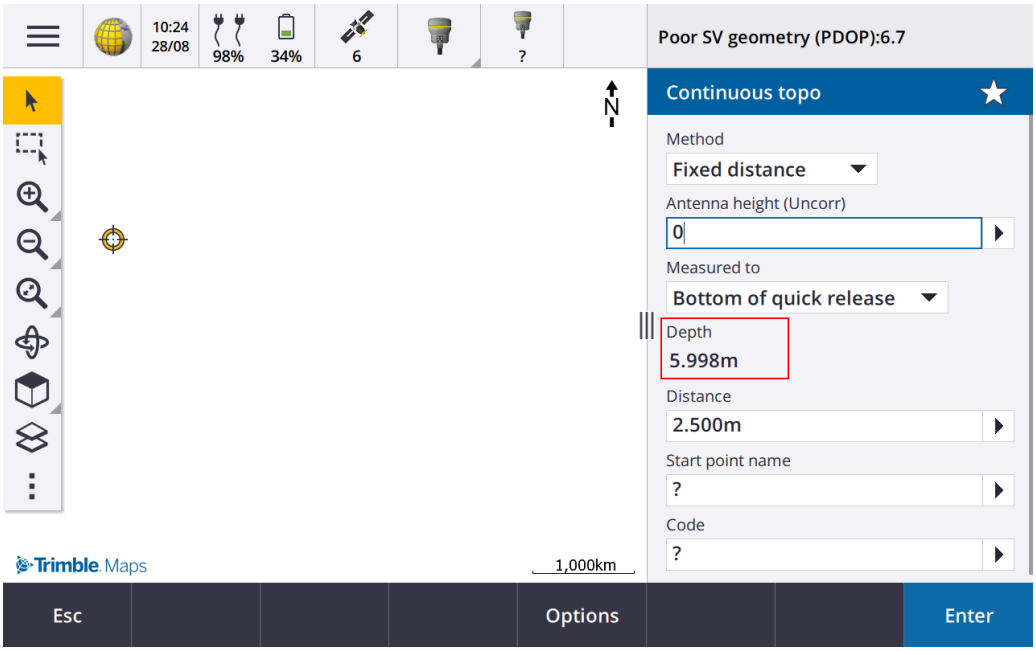


Figure 11 - Depth field in the continuous topo display.