

BathySurvey App for Trimble Access

Quick Start Guide



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1 Introduction

BathySurvey is an application for Trimble Access developed by Geometius. The BathySurvey app adds support to the Trimble Access Software for survey-grade single beam echosounders.

The BathySurvey app combines data of recorded echosounder depths and positions measured with GNSS or Total Station.

The BathySurvey app supports the following echosounders:

- Echologger EU400
- Echologger EU D24
- CEE-LINE

The settings for the echosounders can be altered within the BathySurvey app. The BathySurvey app can also be used with any echosounder that support NMEA DBS or NMEA DBT output. In this case the echosounder settings cannot be altered within the BathySurvey app.

The BathySurvey app has a bar check wizard which can be used to calculate the sound velocity.

BathySurvey uses a stylesheet to export the recorded depths and positions to CSV.

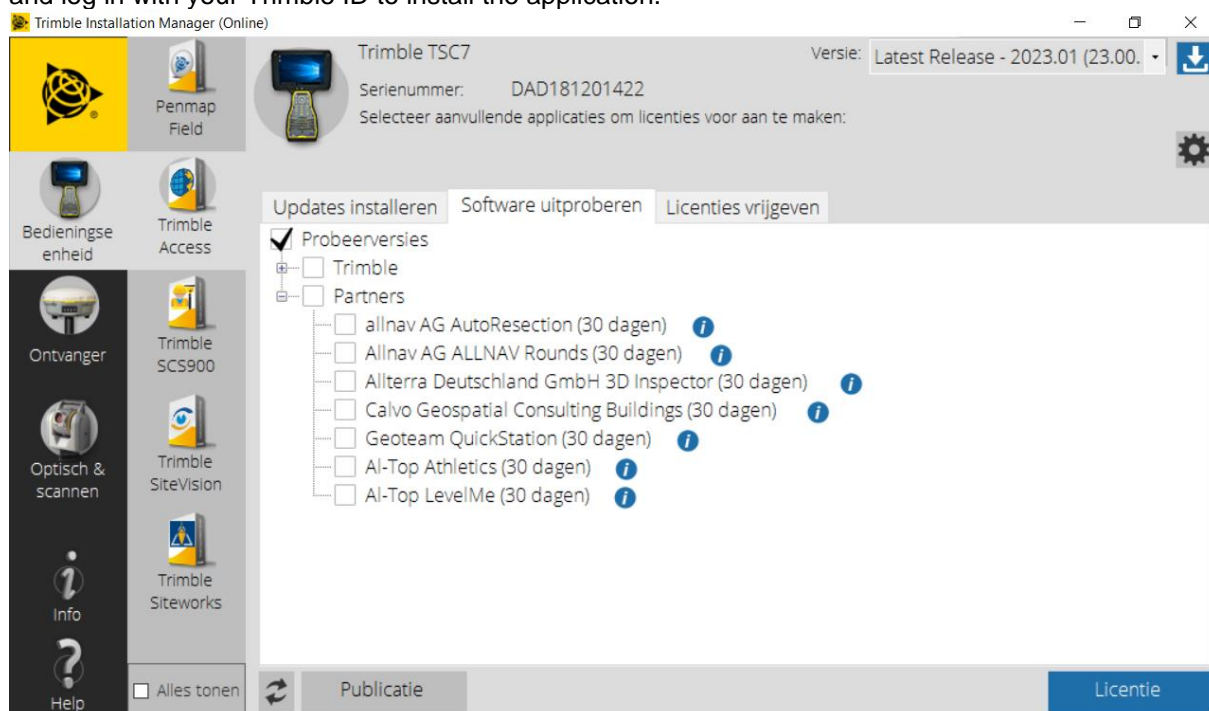
2 BathySurvey request and installation

Use Trimble Installation Manager to download BathySurvey. After installation the app will automatically appear in Trimble Access in the 'choose application' menu.

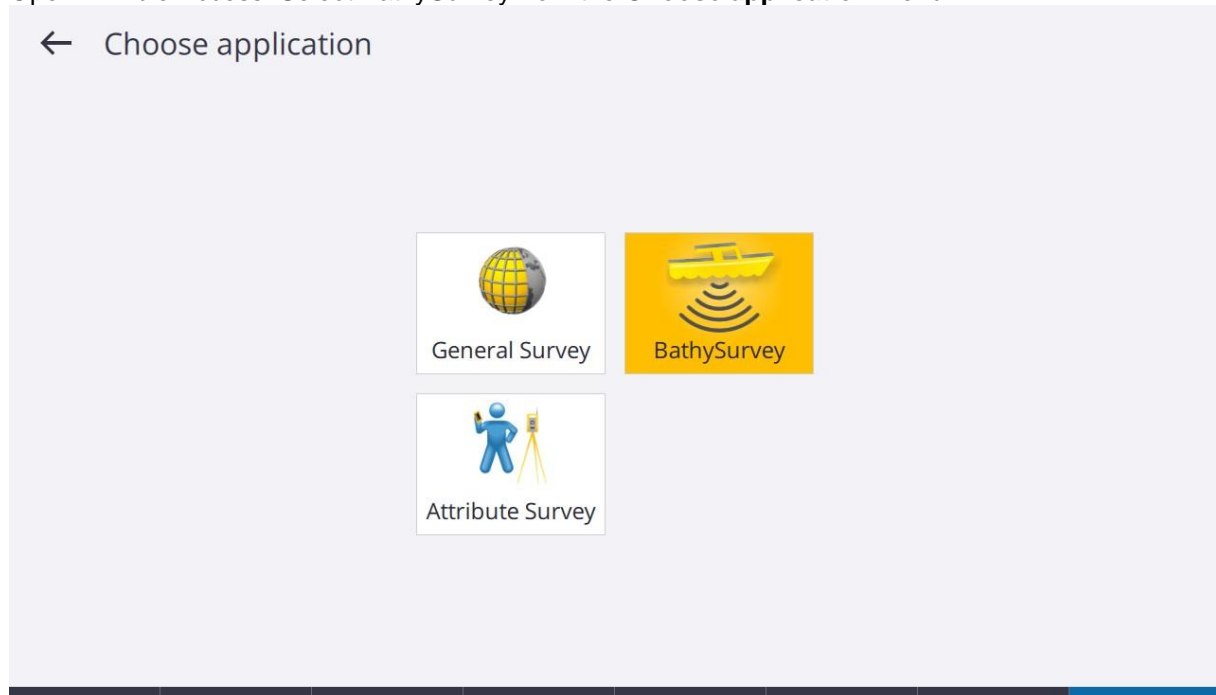
The application can be used freely for 30 days as a try-out version. After 30 days the app can be purchased via Geometius or any other Trimble dealer. The app can be used for one year. After one year, a license code is required. This license code can be requested from Geometius and is valid for one year. Please send an email to info@geometius.nl for requesting BathySurvey app or BathySurvey license. Please send the following details with your request:

- Trimble Access version
- Device type (e.g. TSC7)
- Serial number of your device

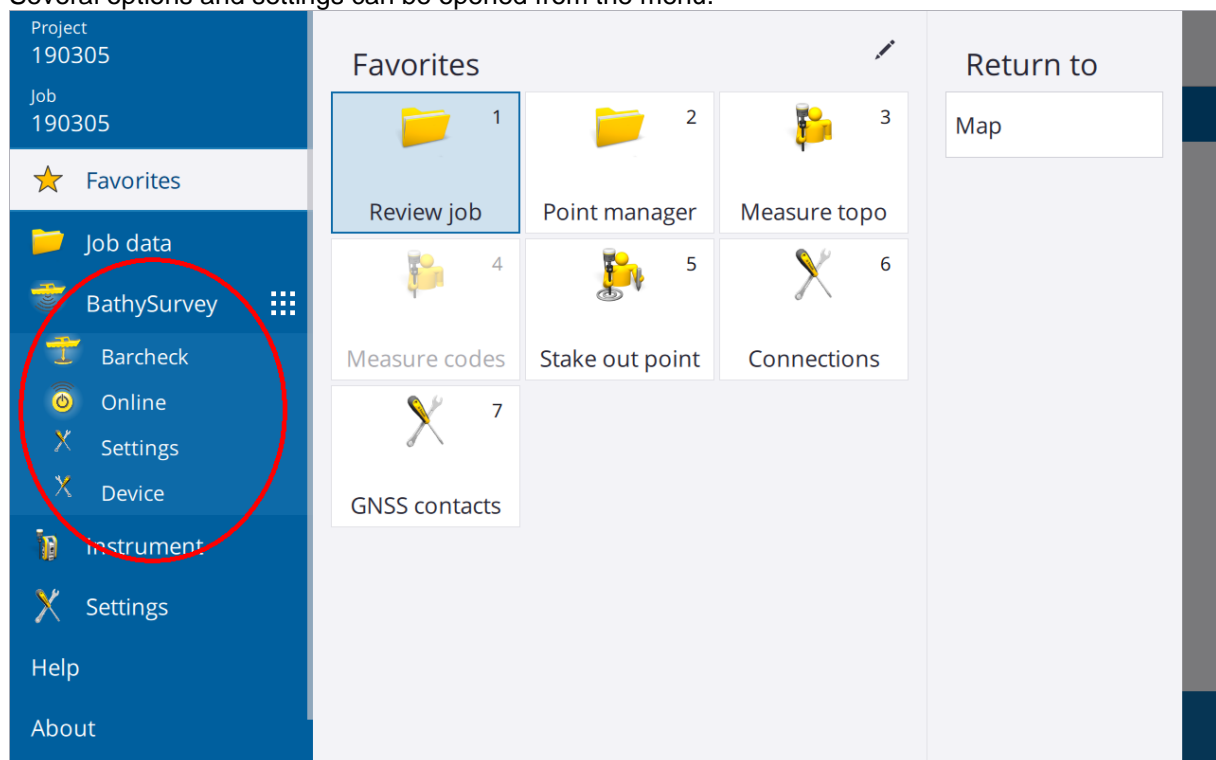
Open the Trimble Installation Manager. Select 'BathySurvey' in the software trials tab. Select **License** and log in with your Trimble ID to install the application.



Open Trimble Access. Select BathySurvey from the **Choose application** menu.



Several options and settings can be opened from the menu.



One year after installation of BathySurvey, the app will automatically ask for a license code. This license can be requested from Geometius and is valid for one year. Fill in the license code to continue using BathySurvey.

Licentie ★

Serienummer
DAD181201422

Vul licentie code in of neem contact op met Geometius BV

Licentie code
?

[Update licentie](#)

Geldige licentie met Echologger functionaliteit tot 10-7-2024 23:59:59

Esc Accept.

3 Device

The type of echosounder and the interfacing of the echosounder can be selected in the **Device** menu.

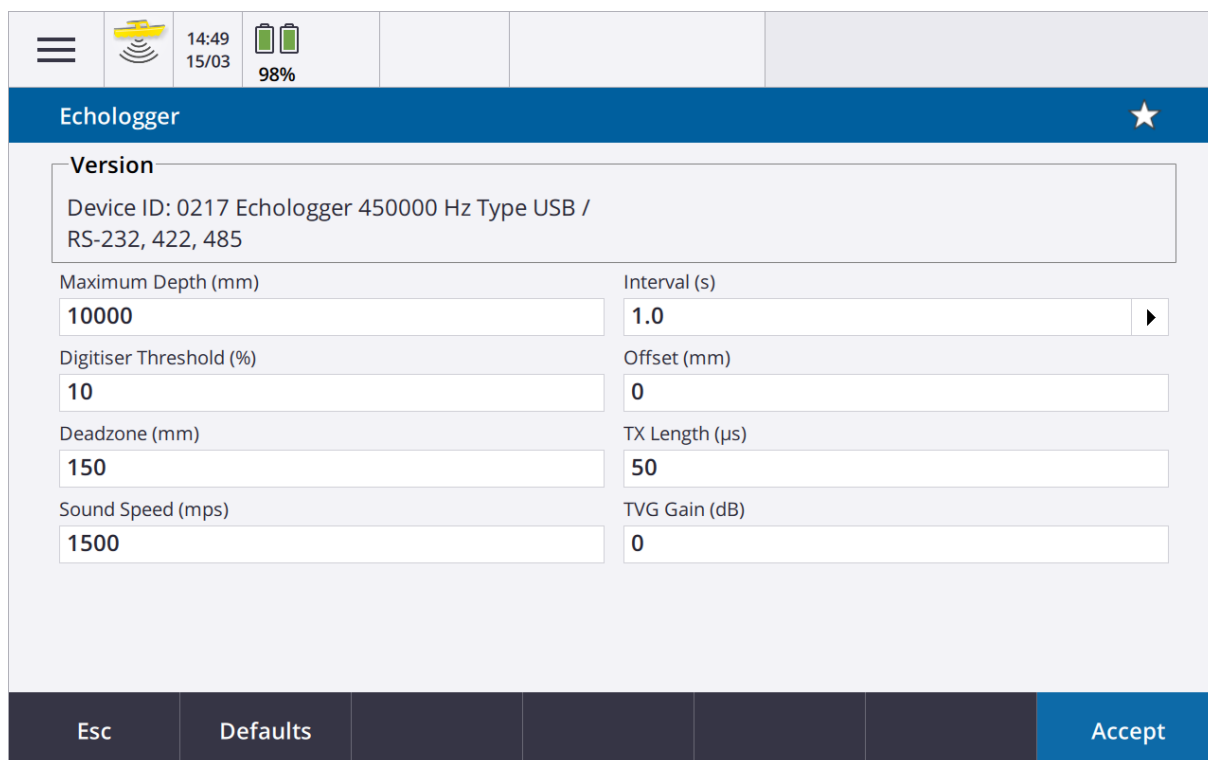
In case the port used by the echosounder is unknown, all USB and serial connections can be found in the Windows **Device Manager**. When the echosounder is connected using Bluetooth the used port can be found in the Windows Bluetooth settings (**more bluetooth settings**).

After starting the Bathysurvey, the app will search all available ports. If the echosounder is connected after starting Trimble Access the used port might not be available. Restart Trimble Access to search for available ports, and try again.

When a connection to the echosounder is established, the settings can be changed in the **Settings** window. When an echosounder with NMEA DBS or NMEA DBT output is used the settings cannot be changed.

For Echologger choose baud rate 115200. For CEE-LINE choose baud rate 9600.

4 Settings: Echologger EU400



The **Defaults** button all settings will be set to their defaults, the default settings are visible in the screenshot above.

The **Maximum Depth** is the maximum depth the echosounder can measure in millimetres, this must be greater than the maximum depth of the survey area (maximum of 100000mm).

The **Digitiser Threshold** is the minimal percentage of the reflection strength required to accept a reflection.

The **Deadzone** is the minimum depth the echosounder in millimetres. This value must be lower than the minimum depth of the survey area (minimum of 150mm). By setting a larger deadzone the disruptive effect of turbulence near the transducer can be reduced.

The **Sound Speed** is the sound velocity in water (meters per second). See chapter 7 for more information about setting the sound velocity.

The **Interval** is the time between measurements in seconds. This should be set as low as possible, however, this is limited by the depth and the baud rate, with a baud rate of 115200 a minimal interval of 0.2s should be used for depths up to 40m and 0.3s for depths up to 100m.

The **Offset** is the draught of the echosounder in millimetres.

The **TX Length** is the length of the acoustic pulse send by the echosounder in microseconds. A longer pulse has a better range, a shorter pulse has a better resolution.

The **Gain** in decibels is the factor by which the received signal is multiplied. This allows a weak signal to be distinguished from the noise.

5 Settings: Echologger EU D24

The screenshot shows the settings interface for the Echologger EU D24. The top status bar includes a menu icon, a signal strength indicator, the time 15:59 on 28/03, battery levels at 100% and 20%, a satellite count of 27, and a 'Geen meting PDOP:1.0' indicator. The main settings area is titled 'Echologger EU D24' and contains the following parameters:

Version DeviceID: 040 Description: EU-D24	
Frequency mode High	Maximum Depth low (mm) 10000
Maximum Depth high (mm) 10000	Interval (s) 1.0
Digitiser Threshold low (%) 0	Digitiser Threshold high (%) 0
Offset low (mm) 0	Offset high (mm) 0
Deadzone low (mm) 300	Deadzone high (mm) 200
TX Length low (µs) 100	TX Length high (µs) 50

At the bottom of the screen, there are three buttons: 'Esc', 'Defaults', and 'Accept.'.

The EU D24 is a Dual Frequency Echosounder. For most of the settings, the settings for low and high frequency can be set separately. This is indicated by **low** and **high**.

The **Defaults** button will set the standard settings.

The **Frequency mode** controls which of the two available frequencies are used. The options are High, Low and Dual.

The **Maximum Depth** is the maximum depth the echosounder can measure in millimetres, this has to be greater than the maximum depth of the survey area (maximum of 100000mm).

The **Digitiser Threshold** is the minimal percentage of the reflection strength required to accept a reflection.

The **Deadzone** is the minimum depth the echosounder can measure in millimetres. This value must be lower than the minimum depth of the survey area (minimum of 150mm). By setting a larger deadzone the disruptive effect of turbulence near the transducer can be reduced.

The **Interval** is the time between measurements in seconds. This should be set as low as possible, however, this is limited by the depth and the baud rate, with a baud rate of 115200 a minimal interval of 0.2s should be used for depths up to 40m and 0.3s for depths up to 100m.

The **Offset** is the draught of the echosounder in millimetres.

The **TX Length** is the length of the acoustic pulse send by the echosounder in microseconds. A longer pulse has a better range, a shorter pulse has a better resolution.

☰		15:59 28/03	100%	20%	28		?	Geen meting PDOP:1.0
Echologger EU D24 ★								
TX Length low (µs)				TX Length high (µs)				
<input type="text" value="100"/>				<input type="text" value="50"/>				
Sound Speed (mps)				TVG Gain low (dB)				
<input type="text" value="1500"/>				<input type="text" value="0.0"/> ▶				
TVG Gain high (dB)				Transmit Power (dB)				
<input type="text" value="0.0"/> ▶				<input type="text" value="0.0"/> ▶				
TVG Curve type				TVG Spreading coefficient low				
<input type="text" value="1"/> ▼				<input type="text" value="15.0"/> ▶				
TVG Spreading coefficient high				TVG Absorption low (dB/m)				
<input type="text" value="15.0"/> ▶				<input type="text" value="0.1"/> ▶				
TVG Absorption high (dB/m)				Attenuator enable time low (µs)				
<input type="text" value="0.1"/> ▶				<input type="text" value="0"/>				
Attenuator enable time high (µs)				<input type="text" value="0"/>				
Esc			Defaults			Accept.		

The **Gain** in decibels is the factor by which the received signal is multiplied, which allows a weak signal to be distinguished from the noise.

The **Sound Speed** is the sound velocity in water (meters per second). See chapter 7 for more information about setting the sound velocity.

The power of the transducer can be reduced using the **Transmit Power** setting, this means only negative values can be entered. The transmit power cannot be increased using this setting. The recommended setting is 0.

The **TVG** or Time Variable Gain can correct for the signal loss with increasing depth. The TVG can be controlled using the **TVG Curve type**, **TVG spreading coefficient** and **TVG absorption**. The default setting will be sufficient for most applications, details on the TVG setting can be found in the Echologger EU D24 manual.

The **Attenuator enable time** is the time interval in microseconds between transmitting the acoustic signal and enabling the -20 dB attenuator. When the attenuator is enabled, all received signals will be reduced by -20dB. The recommended setting is 0. This will disable the attenuator.

6 Settings: Trimble Access

Survey Styles: Echosounder

When using the BathySurvey app, the echosounder setting in the survey style should be set to **none**.

Survey Styles: Continuous points

When the vessel moves a lot during surveying it is recommended to turn off **tilt warnings**. For the best result it is also recommended to use **low latency positions**.

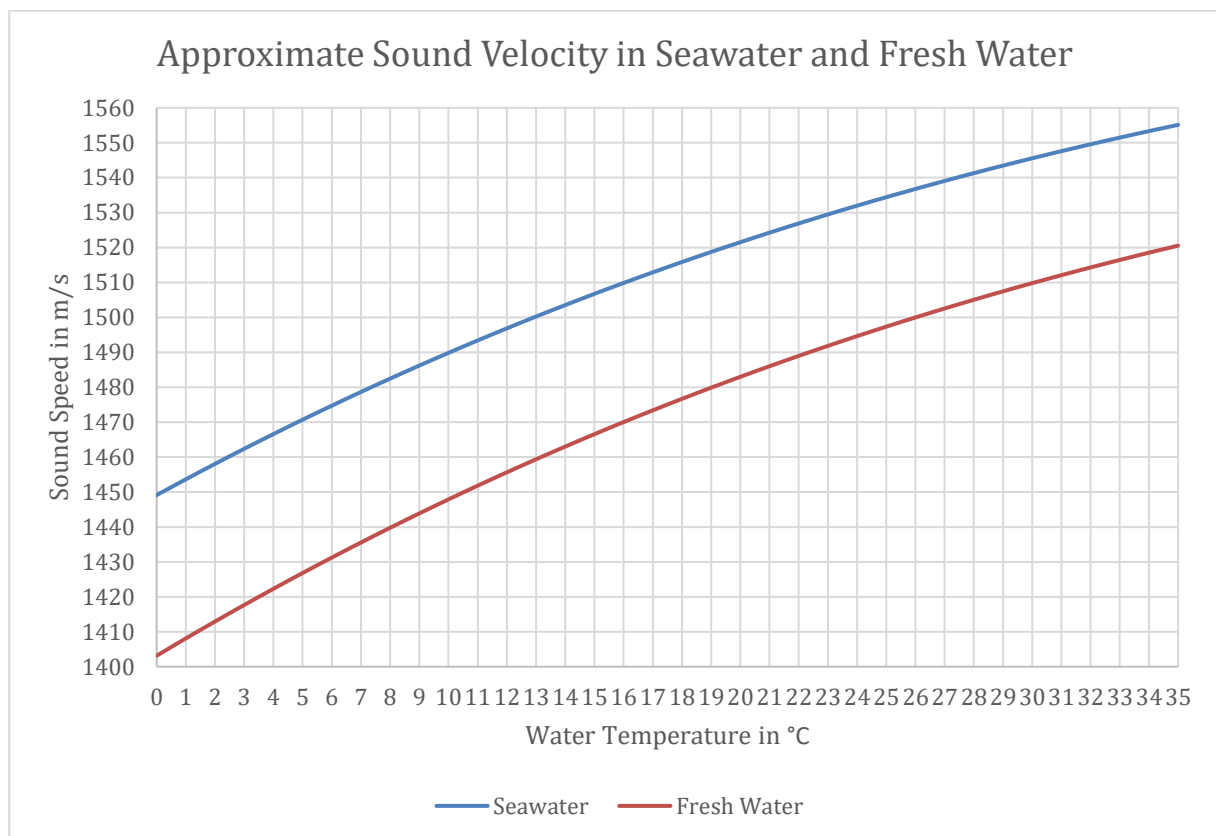
Settings for Continuous points are only applicable when using certain GNSS receivers, such as the Trimble R10.

7 Sound velocity

In order to get good results it is important to know the sound velocity in the water. Generally, the sound velocity ranges from 1400 m/s to 1550 m/s and depends on the salinity, temperature and water depth.

The sound velocity can be determined with a sound velocity sensor or by performing a Bar Check.

The sound velocity for various temperatures at a **depth of 5 m** can be seen in the graph below. When a Bar Check cannot be performed the graph can be used to provide an approximate sound velocity.



8 Bar Check

The sound velocity can be determined by holding a bar or plate at a known depth below the echosounder. The depth of the bar or plate is often marked on the cable(s).

During the first step the bar or plate should be held at a depth no greater than 1 m below the echosounder. The depth measured by the echosounder is displayed under **Digitized Depth**.

During this step the draft of the echosounder needs to be entered. The draft can be measured from the bottom of the transducer to the water surface or can be calculated by subtracting the digitized depth from the depth of the bar.

Select "Next" when the draft has been entered.

The screenshot shows the 'Bar Check Wizard' interface. At the top, there is a status bar with icons for menu, echosounder, time (14:30, 27/03), battery levels (71%, 47%), satellite count (31), and echosounder status (?). A 'Timeout: 12 s' indicator is also present. Below the status bar, the title 'Bar Check Wizard' is displayed with a star icon. The main area contains a section titled 'Shallowest depth (m)' with a sub-label 'Enter draft (m) of transducer'. A text input field contains the value '0.33'. To the right, the 'Digitized Depth (m)' is displayed as '2.77'. At the bottom, there are two buttons: 'Annul.' and 'Vlgnd'.

During the second step the bar check bar or plate should be held at the greatest possible depth at which the plate can still be detected by the echosounder (but not deeper than the maximum depth of the survey area). The depth measured by the echosounder is displayed under **Digitized Depth**.

Enter the depth of the bar or plate. Also enter the initial sound velocity.

Next, the Bar Check Wizard will calculate the sound velocity based on the measured depth to the bar or plate.

The calculated sound velocity should be entered in the echosounder settings in the app or in the echosounder itself when the setting cannot be changed in the app.

14:30
27/03

71% 48%

31

Geen meting PDOP:1.0

Bar Check Wizard

Deepest depth (m)

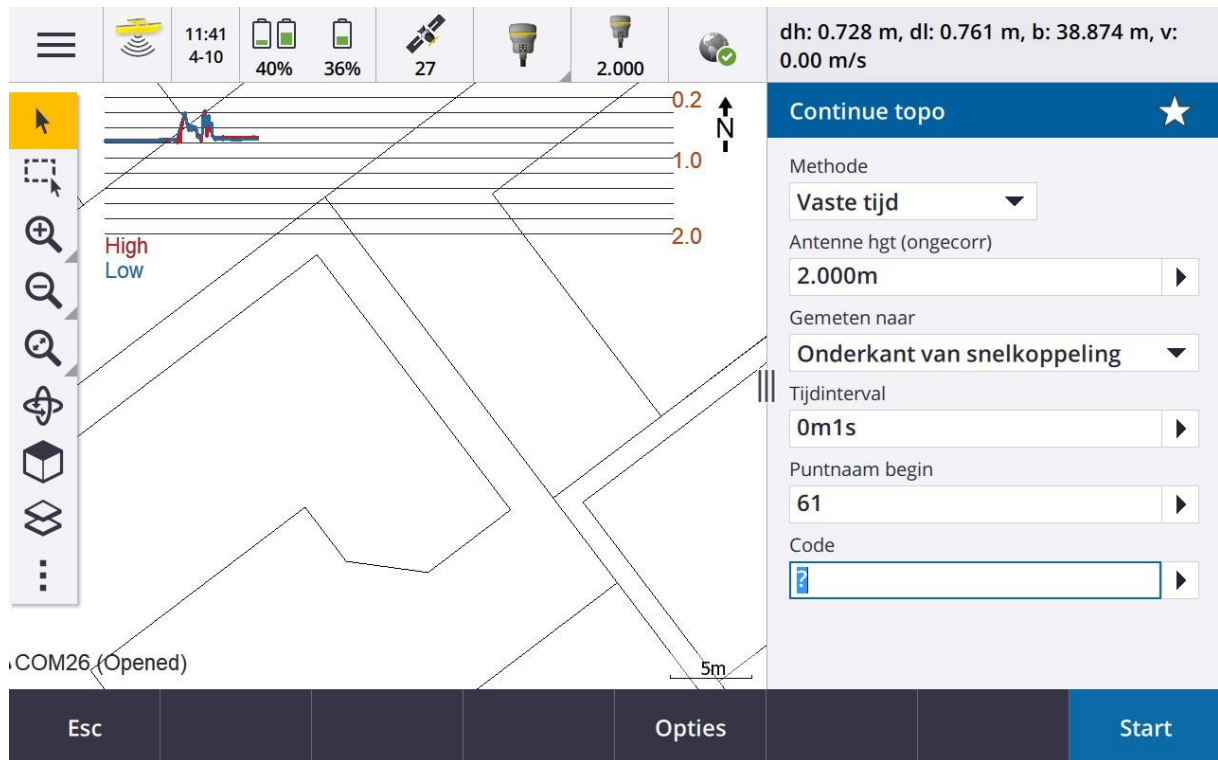
Bar Depth (m) Digitized Depth (m) 2.77

Enter initial sound velocity (m/s) Calculated sound velocity (m/s) 1450

Terug

9 Depth graph

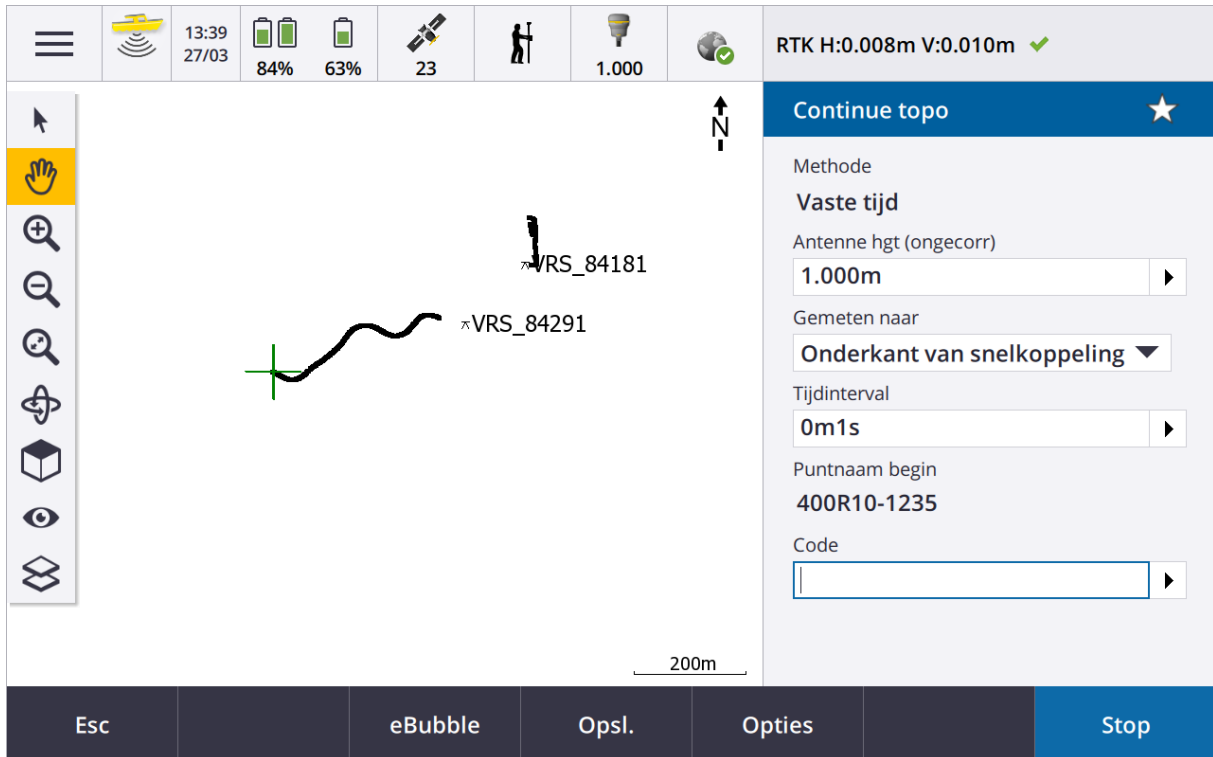
The map view shows an echosounder profile display in the top of the screen. **Touch and hold** in the map view to show or hide the depth graph.



The depth graph also shows the high frequency (red) and low frequency (blue). When a single frequency echosounder is being used, the graph will show only a red profile.

10 Recording data

When the **record** button in the online window is selected, a survey style can be selected after which a continuous points measurement will be started. When a Total Station is used a station setup should first be performed, after which a continuous points measurement will be started.



Attention

When the draft is set in the echosounder, the antenna height should be measured to the waterline.

When no draft is set in the echosounder, the antenna height should be measured to the bottom of the transducer.

When using the BathySurvey app, the GNSS antenna or prism must be installed vertically (on a pole) above the echosounder. This is needed to prevent a horizontal offset between measured depths and positions.

11 Export

After recording, data can be exported to a CSV file.

Select a Job and select “Export” in the black task bar.

The screenshot shows a software interface with a job list on the left and a task bar at the bottom. The job list is titled "231004 BathySurvey" and contains one entry: "Bathy app" with a date of "4-10-2023". The task bar at the bottom has several buttons: "Esc", "Eigenschappen", "Import", "Export", "Kopieer", and "Openen". The "Export" button is highlighted in blue.

Apply depth to elevation?

When exporting data using the BathySurvey stylesheet, depth can be applied to the elevation. This will result in true heights on the vertical datum. When using a single frequency echosounder the option **single** should be selected, when using a dual frequency **high** or **low** should be selected.

The screenshot shows the "Export" dialog box. It has a title bar with a hamburger menu icon, the word "Export", and a star icon. The dialog contains the following fields and options:

- Bestandsformaat**: A dropdown menu with "BathySurvey" selected.
- Bestandsnaam**: A text input field with "190305.csv" and a folder icon to its right.
- Bekijk aangemaakt bestand**: A checkbox that is currently unchecked.
- Apply depth to elevation?**: A dropdown menu with "Single" selected.

The task bar at the bottom of the dialog has buttons for "Esc" and "Accept.".

de juiste richting...

