Hydrolite Plus Connection Guide

Seafloor Systems

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1 Introduction

This document describes how to connect your Hydrolite Plus Single Frequency or Dual Frequency Echosounder to its native application: Echologger Control Software. The Echologger Control Software allows you to configure your echosounder's settings to suit your intended survey application, survey site, and environmental conditions. The Hydrolite Plus automatically restores the last used settings. It is helpful to remember that the transducer must be plugged in and seated correctly in order for data to be transmitted. If you need to change sonar settings or receive inconsistent readings, please reconnect your device to the Echologger Control Software. Drag and drop the Sonar Control program onto a Windows 10 or 11 device. The program is located on the USB drive that is included with the system. It is also available at: https://www.seafloorsystems.com/manuals

2 Connect your PC or Data Collector to the Hydrolite Plus

2.1 Bluetooth

1. Connect the transducer cable to the sonar/charger and power on the topside unit. If you have the serial cable plugged in, Bluetooth will be disabled.
2. In your Windows Search bar, search for "Bluetooth and Other Device Settings".
3. Select "Add Bluetooth or other device".
4. Search for Bluetooth devices.
5. Select Hydrolite Device. It may also appear as Unknown Device.
6. You will be prompted to enter a pin. The pin is "SEAFLOOR". The serial number and PIN of the sensor should be engraved on the back of the Hydrolite's interface box.
7. Confirm that the device is paired and that the Hydrolite device appears on the Bluetooth and Other Devices List.
8. Windows 10: Search for Devices and Printers.
   (a) Scroll down to Unspecified and select the Hydrolite device.
   (b) Right click on the device and select Properties. Select the Hardware tab.
   (c) Under Device Functions, find Standard Serial over Bluetooth link (COM***). Write down the associated COM port.
9. Windows 11: Search for Bluetooth and devices.
   (a) Scroll down to More devices and printers settings
   (b) Scroll down to Unspecified and select the Hydrolite device.
   (c) Right click on the device and select Properties. Select the Hardware tab.
   (d) Under Device Functions, find Standard Serial over Bluetooth link (COM***). Write down the associated COM port.

2.2 Serial

1. Plug your milspec RS232 cable into the "Serial" port on your topside unit, and the DB9 connector into your laptop or data collector.
2. If you do not have a serial port, use the USB to serial adapter. You may also need the gender switcher. Make sure your computer recognizes the device. Be sure to install the device driver for the USB to serial adapter, which should be on your USB thumb drive.
3. Open Device Manager and expand the drop-down menu underneath COM ports. A new port should appear with a COM port next to it. It will be a direct Communications port if you have a serial port on your laptop or device and were able to go in directly, or a USB to serial connection.
4. Please note the COM port next to your established connection.
5. If no connection was established, try using a null modem and the supplied gender changer.

3 Echologger Control Software

The Echologger Control Software is a Windows application. If you are using a TSC5 or another device with an Android operating system, you will need to find a device with a Windows operating system to run the control software. Tuning your sonar can help improve data quality and ensure the accuracy of the sonar's depth readings. Please note that we do not have preset configurations for different environmental conditions. It is up to you as the user to learn the settings and adjust them as needed.

3.1 Connection

1. Open the sonar control program
2. In the top left corner of the sonar UI, next to Echosounder, select the drop down for Serial Port Number. Select the Echosounder COM port number (COM***) that you recorded.
3. The device is connected to the control program when all parameter values are displayed and selectable. Data should appear on the screen and scroll from left to right. After you have chosen your selected settings, please disconnect from the Echsounder UI.

3.2 Output formats

Most software applications are compatible with the Sonarmite OLD format, the Sonarmite DFX format for Dual Frequency transducers, or the NMEA Altimeter format. Choose the appropriate format for your data collector or hydrographic software package. Please be aware that the Echogram data output format produces large data files that may disrupt the Bluetooth connection. Choosing the right output format is important; if you select a format that is not compatible with your intended collection software- you will not get any depths. Please refer to the manual of your data collection software to see which output formats they can accept.

3.3 Range

This is the maximum detectable depth; check whether the range is in meters(m) or millimeters (mm) and make any necessary conversions. Set the maximum range deeper than the deepest expected depth of your survey area. If your survey depth exceeds your maximum depth, the system will give you zero depths. If you are unsure, start at the maximum range setting and reduce the range as needed.

The longer the range set, the slower the ping rate. It is strongly recommended that you set the range slightly higher than your maximum expected survey depth to ensure that you achieve the maximum ping rate.

3.4 Tx Length uks

This parameter will set the transmit pulse length in microseconds. The length of the sonar transmit pulse directly affects the resolution of the seafloor sounding and the echosounder's ability to penetrate turbidity in the water column or fluff (liquified mud) on the bottom. A short transmit pulse length will accurately detect the bottom in clear water with a hard sandy or rocky bottom, but may struggle to accurately penetrate turbid water and may struggle to detect sandier or softer bottoms. A longer pulse length will penetrate turbidity in the water column and penetrate softer sediments to more accurately detect the true bottom. The recommended settings are:

Clear water, no turbidity, hard bottom: 10 Clear Water, slight tubidity, hard bottom: 15 Turbid Water, hard bottom: 15-20 Turbid Water, soft bottom:: 20-50 Turbid Water, soft bottom, fluff layer: 50-100

Please use these parameters as an initial guide and adjust the values from there.

3.5 Interval (s)

The Interval, or ping repetition rate, is the time between sonar pulses in seconds. The ping rate settings range from 0.1 sec to 3600 sec. 0.1 seconds or 1/10th of a second would translate to 10-Hz or 10 pings/sec. If high-density along-track coverage of the bottom is required, a higher ping rate is recommended.

For each additional setting:

0.1 – 10 pings/sec 0.2 – 5 pings/sec 0.25 – 4 pings/sec 0.5 – 2 pings/sec 1.0 - 1 ping/sec 2.0 – 0.5 pings/sec or 1 ping every 2 seconds 3.0 – 1 ping every 3 seconds 5.0 – 1 ping every 5 seconds 10.0 – 1 ping every 10 seconds 15.0 – 1 ping every 15 seconds 20.0 – 1 ping every 20 seconds 30.0 – 1 ping every 30 seconds 60.0 – 1 ping every 60 seconds 120.0 – 1 ping every 120 seconds 150.0 – 1 ping every 150 seconds 180 – 1 ping every 180 seconds 300 – 1 ping every 300 seconds 600 – 1 ping every 600 seconds 1200 – 1 ping every 1200 seconds 1500 – 1 ping every 1500 seconds 3000 – 1 ping every 3000 seconds 3600 – 1 ping every 3600 seconds 7200– 1 ping every 7200 seconds

3.6 Dead Zone (mm)

The Dead Zone value is the adjustable near-field zone below the transducer; any bottom detections within this zone will be ignored. Within the dead zone, there may be erroneous soundings from noise created by the proximity of mounting hardware, soundings that may reflect off lines, debris, or turbulent fluid layers close to the transducer that may refract soundings.

The minimum Dead Zone value is 150mm (6.0 inches). The maximum Dead Zone value is 1000mm (39.0-inches). Selecting a Dead Zone value will enable the echosounder to ignore any returned depths between 0 and the selected value.

3.7 Offset (mm)

The Offset is the depth of the transducer below the waterline in milimeters. The transducer will be submerged below the waterline, and the offset value improves the accuracy of the depth readings by accounting for that vertical distance between the submerged transducer and the waterline. These offsets may also be called a Draft measurement. Draft offsets are applied during conventional bathymetric surveys to account for boat settlement and to improve vertical accuracy values.

3.8 Altimeter Threshold Percentage

The Altimeter Threshold is a filter that removes a percentage of signals according to your setting. The Threshold filter removes weaker or outlier signals; while keeping consistent and dominant signals. The Altimeter Threshold is a tool that can help to remove erroneous returns in noisy environmental conditions, but setting the Threshold

3.9 Gain (dB)

The gain setting controls the sensitivity of the sonar receiver. Gain is measured in decibels (dB); a decibel is a ratio between two quantities on a logarithmic scale. Gain can be increased in deeper waters

to compensate for signal attenuation and turbidity. Increasing gain values will show more detail, while decreasing gain reduces interference and detections from spurious noise sources in the water.

You can manually adjust gain by selecting values from the drop-down menu. Adjust gain to increase the intensity of the signal when the return is too weak due to environmental conditions or to reduce the intensity of the signal when the returns are too strong. For example, in shallow depths, clear water, or areas reflective hard sand or rock bottom, you may want to reduce gain by selecting a value between -6 and -50 dB. In deeper water or in areas with soft bottom, soundwaves absorb and naturally attenuate; you may need to increase the gain by selecting a value between +6 to +50 dB. Always start at a neutral 0 dB setting, and then observe the image from the echogram while you adjust your gain to find the appropriate setting.

3.10 Sound Speed (m/s)

The Speed of Sound setting describes the speed at which the signal travels in the medium. Sound travels at generally 1500 meters per second in water. Depending on factors such as water temperature, salinity, and depth, the sound speed can change. For example, the speed of the sound will increase in warm, highly saline water or at deep depths. The sound speed will decrease with fresh or cold water. You can conduct a bar check calibration or collect a sound velocity profile to correctly calculate the average sound velocity and enter it into the SoS field in the control program.