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Introduction

Overview

The HydroLite Plus Single Frequency system is a hydrographic grade echosounder kit. This system's rugged design and flexibility address the need for general land survey applications and more detailed hydrographic surveys. The system has the ability to integrate with traditional land survey data collectors and software to generate generic bottom track elevation data. It can also output high quality echogram data into dedicated collection software to post process the bottom track more accurately.

Components



*GPS & data collector not included

HydroLite Plus topside

HydroLite Plus transducer

Charger

Data cable

RS232 – USB adapter

3x Poles

Transom mount

4mm allen Driver

Null modem

Gender changer

Warranty Information

Seafloor Systems, Inc. makes every effort to assure its products meet the highest quality, reliability and durability standards and warrants to the original purchaser or purchasing agency that each HydroLite Plus be free from defects in materials or workmanship for a period of one year from date of shipment.

Warranty does not apply to defects of misuse, negligence or accidents. Warranty also does not cover repairs or alterations outside of our facilities, or use of the HydroLite Plus for purposes other than water measurements. Seafloor is not responsible for loss of instruments, damage to property, or injury/death associated with the use of any of its products or 3rd party products that may be included or used with Seafloor products. Seafloor does not warranty third-party products sold by Seafloor. These may include GPS, depth sounders and other ancillary equipment. All warranty services are FOB Seafloor's facility in Shingle Springs, California, U.S.A.

Assembly

To assemble the HydroLite Plus, attach the transducer to one of the provided survey poles. Loosen the locking nut on the Transom Mount and slide the pole through both holes, tighten the locking nut when in the desired position. When mounting on the side of a vessel, ensure that the pole is as close to vertical as possible. Additional 2ft pole sections can be threaded on.

Attach the HydroLite Plus topside to the pole using the included allen driver and plug in the transducer cable. To the "Sonar/Charger" port. The included MilSpec-RS-232 cable attaches to the RS-232 port. Note – When this is plugged in, Bluetooth output is disabled.

is disabled.

Connection – Windows Device

Power on the HydroLite Plus by pushing the button the front face of the unit. This system is capable of connection over either Bluetooth or hardwire connection.

Bluetooth – Connection and Com Port

- 1. Open Settings in Windows 10/11
- 2. Select Bluetooth and Devices
- 3. Add Device
 - a. Device ID: HYDROLITE### (serialized per device)
 - b. Password: SEAFLOOR
- Open Control Panel > Hardware and Sound > Devices and Printers (Win 11 when in Hardware and Sound, right click Devices and printers and select Open in New Window)
- 5. Scroll to the bottom where the "Unspecified" devices are. Double Click the HydroLite and navigate to the Hardware Tab. From there, Note the COM number assigned to the Device. See figure on next page.

\leftrightarrow \rightarrow \checkmark \uparrow \blacksquare \diamond \diamond			
	Control Panel > Hardware a	Ind Sound > Devices and Printers	م C
Add a device Add a printer	An Dark Drinker	HYDROLITE118 Properties X General Hardware Services Bluetooth HYDROLITE118 et Pro	
ABS PDF Driver Audus v v400	DF AnyDesk Printer	Device Functions: Io] Name Type HYDROLITE118 Relationth Strenderd Satial over Relationth link (COM3) Pots (COM	HP9CA73C (HP Microsoft Print Microsoft Ars OfficeJet Pro to PDF Document Writer 9010 series)
Officejet Pro 8600 [1B6231] (Deskto V Unspecified	Dite OneNote for Windows 10		
HP Officelet Pro 9010 series	TE109 HYDROLITE118	Device Function Summary Manufacturer: Microsoft Location: on Microsoft Bluetooth Enumerator Device status: This device is working property. Properties	
26 items		OK Cancel Apply	
* W J			
Hardwir	'e – C	onnection and C	om Port
 Open D Open D Plug in correct assigne under the image content of the image	evice manage the USB Ad driver for the d to it. (If it of nat category on next page	ger and select the dropdown for Po apter and it should automatically do e device. A new port should appear doesn't, Look under Other devices r. The driver needed for this adapte e.	rts (COM & LPT) ownload and install the with a COM number and see if the adapter is r is called CH340. See
Offset			
Enter rod height f	rom:	GPS phase c	enter
Enter rod height f	rom:	GPS phase c TTo Bottom of tran	enter : isducer

le Action View Help	 	
> 🖓 Human Interface Devices	 	_
> 📹 IDE ATA/ATAPI controllers		
> 🚠 Imaging devices		
> 🥅 Keyboards		
> II Mice and other pointing devices		
> 🛄 Monitors		
> 🚽 Network adapters		
> 😰 Other devices		T.
🗸 🛱 Ports (COM & LPT)		L
💭 Standard Serial over Bluetooth link (COM3)		L
💭 Standard Serial over Bluetooth link (COM4)		L
💭 Standard Serial over Bluetooth link (COM5)		L
Standard Serial over Bluetooth link (COM6)		L
💭 USB-SERIAL CH340 (COM9)		L
> 🔁 Frinc queues		L
> 🚍 Printers		L
> Processors		L
> P Security devices		L
> 📱 Software components		L
> Software devices		L
> I Sound, video and game controllers		L
> 🍇 Storage controllers		L
> 🏣 System devices		L
> 🌵 Universal Serial Bus controllers		
> 🚍 WSD Print Provider		1

Device Settings

Control Program

The control program is included on the USB dongle, if misplaced it is also available on seafloorsystems.com

Connect to the control program by selecting the COM port assigned to the echosounder.

Echosounder default baud rate: 115200

GPS: None

Once connected you can use this program to monitor your bottom track as well as change the parameters of the system to better suit the environmental condition.

	Serial Po	rt Number	Serial Port S	peed, bps		Output Data Folder		Data Playback
ichosounder TPS	SEC.		115200 (def	nult) 💌	Connect	C:\DetaEcho\	×	Select input data file
	Inorie	-	1113600	-				
Echosounder	Paramete	ns:		-				2
Range, m		20	•			Collection of States	A COMPANY AND A COMPANY	
Tx Length, u	ks	20	•					1 1 1
Intervel, sec		0.2	٠	-				-
Deedzone, m	m	300	•					
Offset, mm		0	•		1.10			
Altimeter Th	eshold, %	10	•	-				
Gain, dB		0 d8	•	100		Rena con a la l		-
Sound speed	, mps	1500		-				-
Sutput Mode	Echosour	der	•			alah in ∨ S		-
Re-reed pere	meters	Ap	ply.					
Device: Echol	ogger 100	210			(Million of			
GPGSV.3.3.11 GPGGA.14110 GPGLL.2918.7 GPRMC,14110 GPGSA.M.3.0 GPGSV.3.1.11 Sensora Outp	25,25,089 5,00,2918 0003,N,09 1,7,174,79 5,00,A,29 1,11,12,14 ,01,14,316	43,31,59,2 78083,N,09 449,60437,1 M,3,14,N,5 8,78083,N, 18,22,25,31 ,42,11,20,2 42,11,20,2	04, 1	Data Scale:	Linear Scale Max Amplitude Device	epoten IDEC Per AD And DA	AT TAUSE TITE REPLAY Renge	Auto Range
100 C	c 9	288 27.1 1.3 3	1	>> - Set Seria >> - Cick but >> Data Log Fi >> Data Log Fi	al Port Number and bau ten CONNECT. older:2./Documents/Ma older:2./Documents/Ma lata log File: 2./Docume	drate. rketing\EU-ECT-ECS400\ rketing\EU-ECT-ECS400\ nts\Marketing\EU-ECT-ECS400\E	inheloggerProg/20130520_084615_Enhelogg	er450kH±_1D_0000-1.log

On the left-hand side of the window you can see the different parameters that can be changed.

On the right will be a bottom track of the system returns this can be utilized to better tune the system.

Bottom left will display information regarding the transducer status, and bottom right displays the terminal commands being broadcast.

Deadzone, mm

Parameters

Range, m

Tx length, µsec

Interval, sec

0

 increase value to clock any unwanted surface noise that may be effecting the true bottom surface return.

• Set transmitted pulse length in microseconds. (Up to 100 µsec)

Interval (repetition rate) between pulses in seconds. (From 0.1 to

- Offset, mm
 - Vertically offset the position of the device in millimeters.
- Altimeter threshold, %
 - Altimeter threshold percentage of full scale (return sensitivity)
- Gain, dB
 - Analog gain of amplifier in dB
- Sound Speed, m/s
 - Speed of sound in water

The setup parameters are as follows:

Range in meters

3600 (1 Hour))

- Output mode
 - Select output data formats
 - Altimeter simple
 - Echosounder
 - Altimeter NMEA
 - Echosounder fixed 200 samples
 - Echosounder fixed 500 samples
 - Echosounder fixed 1000 samples
 - PSA-916
 - Altimeter simple & temperature
 - Hydrolite DFX
 - Hydrolite OLD

Each of these settings can be adjusted by using the drop-down menus. For the settings
to be updated on the echosounder, one must hit "Apply" after any changes are made.
There are range limitations for certain intervals, baud rates, and output modes. See
next page for more information.

Echosounder Paramet	ers:	
Range, m	10	-
Tx Length, uks	20	•
Interval, sec	0.2	-
Deadzone, mm	300	-
Offset, mm	0	•
Altimeter Threshold, 9	6 10	•
Gain, dB	0 dB	-
Sound speed, mps	1500	
Output Mode Echosou	inder	-
Re-read parameters	Apply	
Device: Echologger		

Baud Rate: 115200 bps

Altimeter Mode	
Interval (sec)	Maximum Range (m)
0.1	10
0.2	40
0.25	80
0.3	100
Echosounder Mode	
Interval (sec)	Maximum Range (m)
Interval (sec) 0.1	Maximum Range (m)
Interval (sec) 0.1 0.2	Maximum Range (m) 1
Interval (sec) 0.1 0.2 0.25	Maximum Range (m) 1 2
Interval (sec) 0.1 0.2 0.25 0.5	Maximum Range (m) 1 2 8
Interval (sec) 0.1 0.2 0.25 0.5 1	Maximum Range (m) 1 2 8 20
Interval (sec) 0.1 0.2 0.25 0.5 1 2	Maximum Range (m) 1 2 8 20 80

Baud Rate: 921600 bps

Altimeter Mode	
Interval (sec)	Maximum Range (m)
0.1	15
0.2	40
0.25	100
0.3	100
Echosounder Mode	
Interval (sec)	Maximum Range (m)
0.1	2
0.2	10
0.25	15
0.5	30
1	100

Echogram

The Echogram is an important feature of this system when data is being collected in software that can utilize the results to better post process. This is also a useful tool for configuration and troubleshooting issues. Below is an example of the echogram window and descriptions of the different functions.



- Data scale: Echo signal can be changed between linear scale and dB scale
- Data output: Display max or mean amplitude
- Range: Sets the range of the echogram shown on screen (does not affect raw data)
- Color palette: Select different color schemes

When the real time returns are being shown in the echogram, the altitude is determined when the signal passes the set threshold parameter. For this reason, altitude threshold, deadzone, and gain are the important settings when tuning the system. See example on the next page.



All tuning should be conducted with the output mode: echosounder

Notice that the circled altitude is reporting a depth of 0.387 m. This is due to the initial reverberation

(1), being picked up as a return.

To avoid this, make sure that the dead zone parameter, is large enough to bypass the reverberation and track the real reflection (2).

In altimeter modes (simple, NMEA, PSA-916, OLD Hydrolite) increase the gain, so the return signal can be saturated enough to strongly reflect the true bottom.

Furthermore, the altitude threshold should be as small as possible without generating returns off of the unwanted signals. If this is not set properly, the system will generate false returns from reflections in the water column and not off the true bottom.

Seafloor settings:

Range:	100000
Tx Length	100
Interval	0.5
Deadzone	300
Offset	0
Altimeter	10
Threshold	
Gain	+6
Sound speed	1500
Output	OLD
Mode	Hydrolite

Software Integration

Trimble Access

Output Format: Hydrolite OLD

Data Example: 1 0.00 0 0 0 11.0 100 0

Connection Guide:

To Configure Survey Style

Upload custom style sheet (delimited w/depth applied). From the Trimble Access menu, tap settings / survey styles / <Style name>







Tap Echosounder. Select an instrument from the type field. Configure



RTK	*	? – 🗙
Base options		
Base radio		
Topo point		
Observed control point		
Rapid point		
Continuous points		
Stakeout		=
Site calibration		
Duplicate point tolerance		
Laser rangefinder		
Echo sounder		_
Fee		F-14
ESC Store		Εαπ

😰 Echo sounder		? – ×
Type:		100 %
SonarMite	•	
Controller port:	Baud rate:	P
COM1 🔻	9600 or 4800 🔻	
Data bits:	Parity:	
8	None 🔻	
Stop bits:	Latency:	Map
1	0.0s	Menu
Draft:		Favorites
۲. ۲		S <u>w</u> itch to
Esc		Accept

Configure the Controller port: If you set the Controller port to Bluetooth, you must configure the Echosounder bluetooth settings. If you set the Controller port to COM 1 or COM 2, you must configure the port settings.

SonarMite		SonarMite 💌		SonarMite 💌	
Controller port: Baud rate:		Controller port: Latency:		Controller port: Baud rate:	
COM1 9600 or 48	300 🕶	Bluetooth 0.0s		COM1 9600 or 4800	
COM1 Parity:		Draft:		Data bits: Parity:	
COM2 None 🔻		?		8 None 🔻	
Bluetooth Latency:	Map		Map	Stop bits: Latency:	
10.0s	Menu		Menu	10.0s	
Draft:	Favorites		Favorites	Draft:	Fa
?	Cuitch to		Switch to	?	Su
	<u>SWItch to</u>				25
Esc	Accent	Esc	Accept	Esc	A

Latency and draft are normally left at 0. The latency caters for echo sounders where the depth is received by the controller after the position. General survey software uses the latency to match and store the depth when it is received with continuous topo points that were saved previously. Tap accept and then tap Store to save changes.

📡 Echo sounder	-> O	? – 🗙
Туре:		100%
SonarMite	▼	-
Controller port:	Baud rate:	1
COM1 🔻	9600 or 4800 🔽	~
Data bits:	Parity:	
8	None 🔻	
Stop bits:	Latency:	Map
1	0.0s	Menu
Draft:		Favorites
?		Switch to
Esc		Accept



Bluetooth Partnership

Tap Settings from the main Trimble Access menu. Tap connect to continue. Select Bluetooth.

Survey styles - log by time, GPS output every .5 seconds



Tap Config and make sure that Bluetooth is switched on. On a TSC2 controller, make sure that the [turn on Bluetooth] and [Make this device discoverable to other devices] check boxes are selected. On a Trimble CU (model 3) controller, select the power tab and then make sure that the [enable Bluetooth] and [Discoverable] check boxes are selected. On a Trimble CU controller, make sure that the [Enable Bluetooth] checkbox is selected.

Image: Second system Image: Second system Connect to GNSS rover: Connect to GNSS base: R8 ROVER 3 R8 BASE 3	Settings isotropy Bluetooth
Connect to conventional instrument: None Please wait Connect Waiting for Bluetooth configuration. Connect Connect None Connect Connect Connect None Connect	 ✓ Turn on Bluetooth ✓ Make this device discoverable to other devices
Esc Config Accept	Mode Devices COM Ports

Start a scan on the controller. On a Trimble Tablet, Tap [Add a device]. On a TSC2 controller, tap the [devices] tab and tap. [New Partnership...]. On a Trimble CU (Model 3) controller, tap the [scan device] tab and then tap [scan]. On a Trimble CU controller, tap [Scan Device]. (Do not use [stop] - wait for the scan to complete.) Tip - Be sure that the transducer is plugged into the TXR before selecting the Bluetooth partnership.

🖊 Settings 😽 👯 11	l:47 ok	🖊 Settings	↔ × ◄ € 11:48
Bluetooth		Select a Bluetooth Device	e 🕜
Tap New Partnership to scan for other Bluetooth devices. Tap on a device to modify		Scanning for Bluetooth Device	25
New Partnership			S
Mode Devices COM Ports			Refresh
	DS D-BIT	Cancel	Next

Start a scan on the controller. On a Trimble Tablet, Tap [Add a device]. On a TSC2 controller, tap the [devices] tab and tap. [New Partnership...]. On a Trimble CU (Model 3) controller, tap the [scan device] tab and then tap [scan]. On a Trimble CU controller, tap [Scan Device]. (Do not use [stop] - wait for the scan to complete).

🚰 Settings	+*× ◄ € 11:48	👫 Settings	↔x 4 € 11:48
Select a Bluetooth Device	0	Select a Bluetooth Device	(
Select a device to connect with and tap Next.		Select a device to connect with and tap Next.	
(2) SMIL040111		Osmilo40111	
	Refresh		Refresh
Cancel	Next	Cancel	Next

The controller searches for other Bluetooth devices within range. Once the scan is complete, highlight the Bluetooth device to connect to: On a Trimble Tablet tap [Next].

Not the settings the settings the settings the settings the settings the setting the setting the set of the s	🚰 Settings 🗸 👯 ч€ 11:49
Bluetooth	Partnership Settings
Enter Passkey	Display Name: SMIL040111
Enter a passkey to establish a secure connection with SMIL090311.	Select services to use from this device.
Passkey: ****	
Mode Devices COM Ports	Refresh
	Back 🔤 Finish

The Bluetooth Pin for this is set to: SEAFLOOR

Leave the serial port box empty. Tap finish and the Bluetooth will

be configured.

Trimble SCS900

Output Format: Hydrolite OLD

Data Example: 1 0.00 0 0 0 11.0 100 0

Connection Guide:

Summary

Brief instructions on how to use SCS900 and HydroLite Plus echosounder for a small hydrographic survey.

餐 File Explorer	🛞 ## +((1:19	×
🧾 Show 🗸		Name	: 🗸
My Device	2/14/06	2.75M	
Program Files	2/14/06	2.32M	
• <u>T</u> rimble SCS900	9/8/06	268B	
SMtsc 🔛	8/15/06	302K	
<pre> Spoken_losttarget </pre>	12/8/05	22.8K	H
StorePoint	12/8/05	6.08K	
Success	12/8/05	12.7K	≡
Warning	12/8/05	5.68K	
😚 wgs84	12/8/05	255B	•
Up	 Me	enu	

In Trimble's SCS900 software it is possible to combine the depths of a HydroLite Plus echosounder and the positions or optical instruments.

In order to do so, a DLL and program should be stored in the following order \Program Files \Trimble SCS900 there are different programs available, one for each type of data logger. In this document the TSC2 was used (Windows Mobile 5).

It is possible to create a shortcut of the executable in the folder \Windows\Start Menu enabling the software to be started from the start menu. First of all, the echosounder should be connected to the data logger, this can be done using a serial connection, i.e. via Bluetooth (it is also possible to use a serial cable if the GPS receiver supports.

Bluetooth). Pairing Bluetooth Devices

Assuming the Hydrolite Plus is not paired yet, go to Start>Settings>Connections and select Bluetooth. Make sure the checkboxes are both ticket (turn on Bluetooth and make this device discoverable to other devices) now select the page devices. At this stage, turn on the already charged Hydrolite Plus by connecting the transducer (the green light flashes briefly) now select new partnership and the scanning procedure will start. After all discoverable devices are found, select the HydroLite Plus(Device will appear as HydroLite###)and select next.

🏄 Settings	(◎ # ◀€ 2:02 🗙	Settings	(◎ #1 ◀€ 2:	24 ok
• 🥘 🚷		Bluetooth		
<i>ह</i> Settings 🛛 🖗 🗱 ┥€ 3:24	ok 🎤 Settings	()) ;;; 	🚝 Settings	🛞 #1 ◀€ 3:27
Bluetooth	Add a Device	0	Bluetooth	0
To connect to a device, tap New Outgoing Port. To allow other devices to connect, tap New Incoming Port. For other options, tap and hold an existing port.	Select the device you want to a SM020405 HOLUX GPSIm236	dd	Port: COM8	•
New Outgoing Port New Incoming Port	DLE 150 Connect R8-2, 4550104523: Rob's B Rob's K750i R8-2, 4550104540: R8GNS:	Base S		
Mode Devices COM Ports	Cancel 🕅	A Next	Back 🕮	Finish

Enter the Passcode (SEAFLOOR in all capital letters) and enter the partnership settings, by checking the serial port service. After this, the Hydrolite is visible under the tab Devices.

🛃 Settings 🛛 🛞 🗱	↓ € 2:29	ह Settings	los (1:05	/ Settings	🛞 🗱 ┥< 3:06
Select a Bluetooth Device	0	Enter Passkey	0	Partnership Settings	0
Select a device to connect with and tap Next.		Enter a passkey to establish a sec connection with SM020405.	ure	Display Name: Select services to use from	\$M020405 m this device.
© 300-1820 © Franky © 5M020405 Rob's K750i <	▲ ■ ▼ ▼ Refresh	Passkey:		Serial Port	Refresh
Cancel 🔤	Next	Back 🖽	Next	Back	Einish

After this, the serial port has to be assigned by selecting the tab COM ports and select New Outgoing Port. Again select the HydroLite and select Next. Now deselect (uncheck) secure connection and select Finish. Remember the comport number assigned to this service (in this case COM 8)

📢 3:24 ok 🏄 Settings	() #	♦€ 3:23	🚝 Settings	() ()	↓ € 3:27
Add a Device		0	Bluetooth		0
Select the device SM020405 HOLUX GPSIin	e you want to add n236		Port: COM8	•	
DLE 150 Con R8-2, 455010 R05's K7501 R8-2, 455010	nect 14523: Rob's Base 14540: R8GNSS				
	▲€ 3:24 ak Settings Add a Device Select the dv: Select the dv: SMDEXA405 HOLUX GPSin DLE 150 Com DL 150 Com R8-2, 455010 R8-2, 455010	↓€ 3:24 ok Add a Device Add a Device Select the device you want to add BM020405 HOLUX GPBIn236 DLE 150 Connect R8-2, 4550104523: Rob's Base R0b's K7500 R8-2, 4550104540: R8GNSS	↓€ 3:24 ok ↓	Add a Device Bluetooth Select the device you want to add Port: BM02004055 HOLUX GPSIm236 DLE 150 Connect COM8 DLE 150 Connect Descure Connection R8-2, 4550104532: Rob's Base Rob's K750i R8-2, 4550104540: RBGNSS On-the	↓ (\$ 3:24 ok ↓ (\$ 3:23) ↓ (\$ 3:23) ↓ (\$ 3:23) ↓ (\$ 3:23) ↓ (\$ 3:24)

Starting a Hydrographic Survey

In order to combine the depths from the Hydrolite and the positions in SCS900 it is essential the Hydrolite software is started and remains running during the survey. **Starting the Hydrolite Software**

If a shortcut is created, select Start>SMtsc. If the shortcut is not created, find the executable located under \Program Files\Trimble SCS900. If the software is not registered, please register on Ohmex's website <u>http://ohmex.com/register.htm</u>



Now select Device>Hydrolite and select the previously assigned COM port (in this case COM 8) Leave the other settings as per default (As the baud rate is capped at 38400, the output speed will need to be changed in the HydroLite Terminal Program (#speed 38400) See Terminal Section for commands) Select OK and the echo sounder should now return depths. It is possible to fine-tune the Quality threshold, it is advised to leave it low in order to pass all data. Leave the Hydrolite software running and continue with the next part. If you encounter problems (unable to connect etc) reset the TSC2 (switch Bluetooth back on) and retry. If this fails, start from the beginning (pairing devices)

In the latest version of the Hydrolite SW or SCS900, it is now possible to set the sound velocity. To do this, double tap the center of the Hydrolite screen and the following display appears.



The functions that display, select Device>Hydrolite and select the previously assigned COM port (in this case COM 8) Leave the other settings as per default (9600,8,n,1 no flow control) Select OK and the echo sounder should now return depths. It is possible to fine-tune the Quality threshold, it is advised to leave it low in order to pass all data. Leave the Hydrolite software running and continue with the next part. If you en-counter problems (unable to connect etc) reset the TSC2 (In this document I assume the user is familiar with the basics of SCS900. The concept of Sites, Designs and Work orders are assumed as common knowledge. If not, please refer to the SCS900 manual. If a folder structure is prepared by the Survey office, simply start SCS. If not, it is assumed the following files are selectable on the data logger:

- · Design (DXF or TTM)
- · Site Calibration (or DC file)
- · Control points or Bench Marks (TXT)
- · Background map

In this example we take this step, which is not required if a folder structure is prepared by the Survey office.

Before starting the Hydrographic survey, be sure to check the system setup by measuring a bench mark. Start SCS900 and create a new Work Order Select the site or create a new one (A site contains the items mentioned above) in this case a new site is created.

🚰 Start	🛞 🗱 ┥€ 5:03 🗙
🗊 🏽 🔁	21 Heave 0.00
Anday Today	malanasinanalmanalmas <mark>naminanalman</mark> i
 Internet Explorer Messaging SMtsc Survey Controller Trimble SCS900 	
Programs	



In the new site, the various files are selected, a minimum is the site calibration file (DC file) in order to get the proper coordinate system, or a csv file containing control points (Since it is recommended to check the system setup, a .csv file is important). Currently this site calibration can contain a Geoid model, but CAN NOT contain a

Select a Site		Site Creation Options
Select a site for this work of Site to create a powerite	order, or tap [New	Select site background plan:
Sitej to create a new site.		ondergrondleidseschouweiken Browse
Select Site:	New Site	Select site calibration file:
OGO906PF01 ADVIN KANTOOR		PSEUDO-RD-NOGEO.dc Browse
		Select control point file:
		IT WORKS.csv Browse
?) Esc Cancel	🔒 Next 🛃	🕘 🕄 🕄 Back 🔹 🔒 Finish 🛃

If no calibration file (DC) is at hand, it is possible to calibrate the site using the known points in the .csv file. Simply select calibrate site in the Systems Setup menu.

System Settings

It is possible to set the required accuracies under Settings , this can vary from one jobsite to another. There is a difference in acceptance criteria (will it store a position and depth or not) and the Calibration tolerance (will it accept a System Setup check)

1 Units & Formats	GPS position acceptance criteria:
2 GPS Precision & Calibration	Required Horz Accuracy: 0.05 m
3 Internet Connection Settings	Required Vert Accuracy: 0.05 m
4 Instrument Setup Tolerances	Calibration tolerances:
5 (Setting Out Tolerance	Horizontal: 0.05 m
(6) (Data Output Options	Vertical: 0.05 m

System Setup

Now it is time to start the rover, Select System Setup and Setup Rover, or go directly to Measure Surface. Topo Surface and SCS900 will prompt you to set up a GPS rover. In this process, follow the instructions on screen

Measure Surface Menu	No Device Connected
1 Check Surface Elevation	You should setup an instrument or a GPS receiver before you proceed. Do you want to:
2 Check Material Thickness	1 Setup a GPS Rover.
3 Topo Surface	Setup an instrument.
4 Measure Site Features	Continue without setting up a device
5 Display Real-Time Cut/Fill	S continue without setting up a device.
	(4) Continue without setting up a device, and do not show this prompt again.
🕐 Esc Close 🛛 🗙 🕱 🔒	Esp Cancel 🛛 🔀 🕅 🔒

The instructions will take you step by step through the system setup. It will ask you if the receiver is connected by cable or Bluetooth (a), if it uses an internal, external radio or other correction method (b), and the coverage map grid size and antenna height (c)



Once started, SCS900 will ask you if you want to check the system setup, it is advised to do so. After the System Setup is completed and checked, the topo survey can start. Bear in mind there are survey methods, shown in the top left corner. These are Standing (red figure) Walking (yellow figure) and on vehicle mode (yellow quad) Those methods automatically set the position update rate and the different antenna heights. Changing this mode can be done by clicking it. For a hydrographic survey, select the vehicle mode (click here) and enter the height from the bottom of the transducer to the bottom of the antenna.



Finally select the measurement density required for the job, this will make the system log at a minimum interval or elevation change.

Are you recording the bottom?

In order to check if the system is indeed setup to record the bottom, look at the difference of the elevation shown on top of the screen and the recorded point elevation. To annotate points with their elevation, select the take the following steps. Select the button 123 Des (buttons may be changed by selecting the black triangle) Check display Point Elevations and select OK.



Remember that if loads of points are stored, this option can slow down the CE device and make the map hard to read, so switch off again if required.

Now start a measurement, SCS900 will prompt you for a point name (this will increment automatically) and a code (tip, this code can be used to identify a cross section number or profile number) After selecting OK again, a point is measured and stored, and annotated with the actual height. In this example, the elevation of the bottom of transducer was 5.330, the measured depth was 0.377 (bucket) and the bottom is in that case 4.953.

Point Code	% 2.205 m	💿 Surface Points 🝥
You can enter an optional code and name for the points:	Cut:	Elv: 5.330
Code:		
Point Name: Topol	٦ ٣	
Always prompt for each point	, b	
	2 B	Dea
🕐 🔄 Cancel 🛛 💉 🖞 🔒 🖬 🛛 🛛 OK 📢	() (50) Stop 8	୧ 🕆 🛯 🕤 🛛 Manual 🛃

Complete Work Order

Once finished with the survey, the export files are written in the export folder those files consist of a record.TXT and report.txt optional a DXF can be written but remember this can consume a lot of memory.

Work Orders Menu	💦 File Explorer	🝥 🛱 ┥€ 5:38 🗙
Site: Brief Instructions SM Current W.D.: day one	<mark></mark> Show ↓ <u>M</u> y Device	Name 🗸
New	<u>T</u> rimble SC5900 Data <u>B</u> rief Instructions SM	9/12/06 4.79K 9/12/06 238B
2 Open 3 Change Design	<u>₩</u> ork Orders • <u>d</u> ay one	
Complete Work Order		
(5) (Export Data		
(?) Esc Close	Up	Menu

Terrasync

Output Format: Altimeter NMEA

Data Example: \$DBT,0.00,f,0.00,M

Set Speed to 38400 in Terminal by using the command:

#speed 38400

Connection Guide:

Make Bluetooth connection to Hydrolite using Trimble

Settings menu:

Start -> Settings -> Connections -> Bluetooth

Ensure Bluetooth is turned on

Search for Devices -> Select Hydrolite Serial Number

(HydroLite###) Pass Key is SEAFLOOR

Leave "Serial Port" box unchecked

Tap "COM Ports" tab which is located to the left of the "Devices" tab after connecting

to the Hydrolite.

Assign the Hydrolite an Outgoing Port so that is what is used.

If under COM Ports the HydroLite Plus is not listed as (COM5) go back to Devices and disconnect the Bluetooth connection to the Hydrolite by clicking and holding on the Hydrolite device and clicking delete. Start again at the top of this block of directions by searching for the Hydrolite.

Configure Terrasync to use Hydrolite as an External Device

Always check that the options below are selected correctly. It does seem that as long

as Sensor 2 is selected, all of the options are saved correctly.

- Tap upper dropdown and select "Setup"
- Tap "External Sensors" (bottom right corner)
- Make sure that Sensor 2 is checked (or Hydrolite) and tap "Properties"
- Set "Port" to the COM you assigned the Hydrolite to (COM5: SMIL201215)
- Baud: 4800
- Data Bits: 8
- Stop Bits: 1
- Parity: None
- Set Prefix to: \$SMDBT
- Set Suffix to: ,f
- This will bring depths in as feet
- For depth in meters Set prefix to: ,f and suffix to: M,
- Max Bytes: leave blank
- Time Out: 0.00s
- Set Receive mode: Unsolicited
- Logging Intervals (Point Feature, Line/Area Feature, Not in Feature): 'All' for them all
- Data Destination: Uninterpreted

Configure the rest of Terrasync as you normally would (you can collect continuous data in either "point" or "line" survey modes)

- Start logging data to a file to check that the Hydrolite is outputting data
- Tap upper dropdown and select "Status"
- Tap lower dropdown and select "Sensor"
- Verify that the sensor is active and sending numerical data. Numbers should be increasing

Data Export using Pathfind Software

Under the data tab, below the Create Point Features From section Make sure

'Sensor Records' is checked. This is not a default.

TopCon

Output Format: Altimeter NMEA

Data Example: \$DBT,0.00,f,0.00,M

Connection Guide:

Note: The output baud rate may need to be adjusted

GNSS receiver and Depth Sounder

Topcon Technical Support



Product: Magnet field basic set up for Depth Sounder

These instructions are basic depth sounder set up for further detail in the equipement being used it will depend on the hardware and configuration being used (RTK, Optical, Network RTK, DGPS)



Add a new Confirguration or you cand edit an existing one | Choose the correcton type



>>>Next 3 Times the Perirals set up button will be available | Also remember to use the correct driver for the depth sounder if driver not available select generic NMEA and the port information default is Bluetooth but serial is incorraged

Config: Rover Receiver	Yeripherals		Config: D	epth Sounder	× ×
Ext. Receiver Bluetooth	NMEA Ports		Simulati	on Mode	
Elevation Mask 13 deg			Model	Hydrolite-tm	
	Depth Sounder	Parameters	De all Carro		
Antenna GR-5 S/N	mmGPS+		Port Depth Sound	COM1	
Ant Ht 6.562 USft Vertical 🔽 🌩	External Laser		Baud	9600 or 4800 🔽 Parity	None
			Stop	Data	8 🔽
Peripherals << Back Next >>					

Also remember that you can go to the topo module, then to the map view and tab on the screen to select depth Note: Newer 2013 and 1/2 models use baud rate of 4800

Leica Captivate

Output Format: Hydrolite OLD Data Example: 1 0.00 0 0 0 11.0 100 0 Connection Guide:

From the home screen go to Settings connections all other connections.

5 Settings		×, 0	7 2D 1D	@	09:19
	7	2	Ľ		3
Connections	GS Sensor		Point sto	orage	
簾† 4		5	X		6
Customisation	System		Tool	s	
7 About Leica Captivate					
OK					Fn
Connection Setti	ings	% , 0	7 2D 1D	@	09:20
CS internet Device CS PXS8 CDMA	Port CS modem				
GS rover Device GS14	Port Cable				
ASCII input Device -	Port -				
GS hidden points Device Disto Sigma	Port Internal Disto				
Export job Device -	Port -				
n OK	Edit			Page	Fn

Check the box store ASCII data rece	eived via an.		
Use the pull down to choose Blueto	ooth 1, or Bluetooth 2.		
Select Device on the bottom of pag	e.		
	👼 🗱 👩 🕈 2D	0 🗖	
ASCII input Annotation 1 Annotation 2	Annotation 3 Annotation 4	09:20	
Store ASCII data received via an external device to an annotation			
Connect using	CS Bluetooth 1	\checkmark	
Device	<cs 1="" bluetooth=""></cs>		
Fn OK	Device	Page Fn	
		. ugo	
Use the down arrow on the thumb	wheel to highlight RS232.		
Select New at the bottom of the pa	ige.		
	₩ 0 2D 1D	(1) 09:21	
Modems/GSM Others		9	
<cs 1="" bluetooth=""> Type <cs 1="" bluetooth=""> Creator</cs></cs>			
RS232	16		
Type K3232 Creator Delat	in t		
Fn OK New Edit	Delete	Page Fn	
Fill in the Name			
Change the baud to 4800			
The rest of the settings should mat	ch the default, if not matcl	the settings in the pic	ture to the left.
Select Store .			
Seafloor Systems Inc. support@s	eafloor.com +1(530) 67	7-1019	Page 31

		sonarmite		
Type		R\$232		
Raud rate		9600	V	
Parity		None	× ×	
Data bits		8		
Stop bit		1	\sim	
Flow control		None	\vee	
Chara				
elect OK				
Devices (BT)		× 2D 0 1D	@	
Modems/GSM Others			Q	
<cs 1="" bluetooth=""> Type <cs 1="" bluetooth=""></cs></cs>	Creator			
RS232 Type RS232	Creator Default			
Hydrolite Type RS232	Creator User			
Type RS232	Creator User	Delete	Page Fn	
Hydrolite Type RS232 En OK New rage over to Annotati	Creator User Edit	Delete	Page Fn	
Hydrolite Type RS232 En OK New Page over to Annotati 다 ASCII Input	Creator User Edit on 1	Delete	Page Fn	
Hydrolite Type RS232 En OK New vage over to Annotati ASCII Input ASCII input Annotation	Creator User Edit on 1	Delete	Page Fn @	
Hydrolite Type RS232 En OK New 'age over to Annotation SCII input ASCII input Annotation Store ASCII data to th	Creator User Edit on 1 Annotation 2 is annotation	Delete	Page Fn @	
Hydrolite Type Type Fin OK New rage over to ASCII Input ASCII Store ASCII Data Store	Creator User Edit On 1 Annotation 2 is annotation	Delete	Page Fn 	
Hydrolite Type RS232	Creator User Edit On 1 Annotation 2 is annotation	Delete	Page Fn 	
Hydrolite Type RS232 En OK New Page over to Annotation ASCII Input ASCII input Annotation Store ASCII data to th	Creator User Edit on 1 Annotation 2 is annotation	Delete	Page Fn @ @	
Hydrolite Type RS232 Image OK New Image OK Annotation Store ASCII Image Store ASCII Image Image OK New Image OK New Image OK New Image OK New Image OK Annotation Store ASCII Image Image OK Image Image OK Image Image Image Image Image	Creator User Edit On 1 Annotation 2 is annotation	Delete	Page Fn (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	

Check the box Store ASCII data to this annotation.

Message description enter depth.

Se	lect	OK
		••••

つ ASCII Input	₩ 0 0 1D 00 09:24
ASCII input Annotation 1 Annotation 2	Annotation 3 Annotation 4
Store ASCII data to this annotation Message desc Message ID Prefix '@ <desc>@' when writing OK</desc>	✓ depth
arch for device.	
hen through select OK	
ASCII Input	
SCII input Annotation 1 Annotation 2	Annotation 3 Annotation 4
ore ASCII data received via an ternal device to an annotation	
onnect using	CS Bluetooth 1 V
vice	Hydrolite
uetooth ID	
ОК	Search Device Page Fn
lect OK.	

 └ Connection Sett 	ings 🙀 🧩 👰 f 2D	(1) 09:27
CS connections GS conne	ctions	0
CS internet Device CS PXS8 CDMA	Port CS modem	
GS rover Device GS14	Port Cable	
ASCII input Device Hydralite	Port CS Bluetooth 1	
GS hidden points Device Disto Sigma	Port Internal Disto	
Export job	Port -	
Fn OK	Edit Control Pa	age Fn

Use RS232 for Bluetooth per the instructions, but the baud rate has to be 115200. When searching for the Hydrolite it connects right away and starts providing depths (if you have the baud rate correct). It does not wait until starting the mission and you do not have to enter a password. When setting up as US Survey Feet but the depths will come through in meters.

Terminal

The system can also be connected to a terminal program to quickly check and adjust settings or view the data being output. This is an alternative to the control program for adjusting settings, not recommended for tuning the system. The terminal can be used to alter the NMEA messages as well as adjust the baud rate of the system. These adjustments cannot be made in the control program and must be edited through the terminal program. See example below of the terminal program displaying settings of the echosounder.



Connect

Open TeraTerm. Click Setup>Serial port. Select the com port assigned to the system either hardwired or Bluetooth. Adjust baud rate to 115200. Then click "New Setting" to open the port.

Once connected, data will start coming across. To issue commands the data coming in needs to be stopped by pressing the space bar.

Commands

The next page contains a list of commands that can adjust the settings of the system.

Command	Sample of input/output	Comments
#range	#range 10000	Set range in mm, from
	<enters or<="" td=""><td>1000 mm to 100000 mm</td></enters>	1000 mm to 100000 mm
	>#range <enter></enter>	
	>Input Value: 10000 <enter></enter>	
	>ok.	
#interval	#interval 0.5 <enter> or</enter>	Pulse repetition rate.
		Set interval between
	># interval <enter></enter>	pulses (pings) in
	>Input Value: 0.5 <enter></enter>	seconds. From 0.1 to
		3600 seconds
	>ok.	
#threshold	#threshold 10 <fntfr></fntfr>	Set altimeter threshold
		in %% of Full Scale
		(maximum amplitude of
		echo signal)
#offset	#offset 0 <enter></enter>	Set offset of output
		altitude in mm
#deadzone	#deadzone 200 <enter></enter>	Set minimal deadzone in
114		mm.
#txiength	#txlength 20 <enter></enter>	Set transmitted pulse
		Max value 100 uks
#output	#output 1 <enter></enter>	Set Output mode.
		1- Altimeter Simple
		2- Echosounder
		3- Altimeter NMEA
		4- Echosounder Fixed 200 Samples
		5- Echosounder Fixed 500 Samples
		6- Echosounder Fixed 1000 Samples
		7- PSA-916
		8- Altimeter Simple & Temperature
		9- Hydrolite DFX
		10- Hydrolite OLD
		Echosounder Fixed 1000 Samples

#gain	#gain 3 <enter></enter>	Set analog gain of preamplifier in dB.
#tvgmode	#tvgmode 1 <enter></enter>	Set TVG mode
-		(Time Variable
		Gain).
		Only for debugging. Default value: 1.
#tvgs	#tvgs 1 <enter></enter>	Set slope TVG curve.
		Only for debugging. Default value: 1.
#speed	#speed 4800 <enter></enter>	Set serial port speed in
		bods. User can set:
		- 4800
		- 9600
		- 19200
		- 38400
		- 57600
		- 115200
		- 230400
		- 460800
		- 921600
#nmeadbt	#nmeadbt 1 <enter></enter>	\$GPDBT message enable
		- 1, disable - 0
#nmeadpt	<pre>#nmeadpt 1<enter></enter></pre>	\$GPDPT message enable
		- 1, disable - 0
#nmeamtw	#nmeamtw 1 <enter></enter>	\$GPMTW message
		enable
		- 1, disable - 0
#nmeaxdr	#nmeaxdr 1 <enter></enter>	\$GPXDR message enable
		- 1, disable - 0
#nmeaema	#nmeaema 1 <enter></enter>	\$GPEMA message
		enable - 1, disable - 0
#sound	#sound 1500 <enter></enter>	Set sound speed in
		water.

#help or	#info	Show device state
#info	>	and information about
	Info	parameters and
		commands.
	Vitrasonic Echo Sounder ECHOLOGGER EU200 / EC1200 / ECS200 / EG1200	
	Made by EofE Ultrasonics Co., LID(C)	
	Version 3.3 Jun 10 2022 12:31:27	
	Device ID: 0643 Echologger 200000 Hz Type USB / RS-232, 422, 485	
	Specification:	
	* Tx Frequency 200000 Hz	
	* Work Max Range 100m	
	* Tx Length 20~100 uks	
	* Speed of Sound 1500 mps	
	Water Temperature [Celsius]: 20.24°C	
	Tilt Sensor: Pitch(X-axis inclination), degree 0.000	
	Tilt Sensor: Roll (Y-axis inclination), degree 0.000	
	Tilt Sensor is absent!	
	B64INFO[gwIAAKCGAQBkAAAAAD8sAQAACgAAAMBAAACAPwEACgDcBQAAAAAAAAAAAheuhQ QAA]	
	Commander	
	- #help	
	- #go (goto Work Mode)	
	- #default (set default Settings)	
	Device ID: 0643 Echologger 200000 Hz Type USB / RS-232, 422, 485	
	- #range [100000 mm] Range, 1000 ~ 100000	
	- #interval [0.50 sec] Interval between pulses, 0.1 ~ 100000	
	- #threshold [10 %] Threshold, 0 ~ 100% Full Scale	
	- #offset [0 mm] Offset, -+1000	
	- #deadzone [300 mm] Dead Zone 0 ~ 1000	
	- #txlength [100 uks] TX Pulse length, 10 $^{\sim}$ 100	
	- #sound [1500 mps] Sound speed, mps	
	- #output [10] Output format 1 ~ 10	
	1 : Altimeter Simple	
	2 : EchoSounder	
	3 : Altimeter NMEA	
	4 : EchoSounder Fixed 200 Samples	
	5 : EchoSounder Fixed 500 Samples	
	6 : EchoSounder Fixed 1000 Samples	
	7 : PSA-916	
	8 : Altimeter Simple &	
	Temperature 9 : Hydrolite	
	DFX	
	10 : Hydrolite OLD	
	- #gain [6.0 dB] Analog Gain, -30~+30	
	- #tvgmode [1] TVG Curve type, 0,1,2,3	
	- #tygs [1.00] TVG Curve Slope. 0.1~10	

	- #speed [115200] Baud Rate, 4800-921600	
	- #syncextern[0] Sync Pulse External, 0,1 - OFF,ON	
	- #syncextmod[1] External Sync Pulse edge, 0,1 - Falling, Rising	
	- #syncoutpol[1] Sync Pulse Output, 0,1 - Low, High	
	- #nmeadbt [1] NMEA DBT message output, 0,1 - OFF,ON	
	- #nmeadpt [1] NMEA DPT message output, 0,1 - OFF,ON	
	- #nmeamtw [1] NMEA MTW message output, 0,1 - OFF,ON	
	- #nmeaxdr [1] NMEA XDR message output, 0,1 - OFF,ON	
	- #nmeaema [1] NMEA EMA message output, 0,1 - OFF, ON	
	Attention: - #gain [6.000]	
#go	#go <enter></enter>	Start send pulses and
		receive echo signal
#default	<enter></enter>	Set default values:
		- range: 10000mm
		- interval: 1 sec
		- deadzone: 300 mm
		- offset: 0mm
		- threshold: 10%
		- txlength 20 uks
		- gain 0 dB
		- tvgmode: 1
		- tvg slope 1
		output mode: NMEA

Change of Record

2-07-2023Creation Date (V1.0) 6-20-2023Update(Deadzone)(V1.1)