



# SVS1500 Sound Velocity Sensor User Manual

Beijing Hydro-Tech Marine Technology Co., Ltd.

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#### **Customer Supports**

Welcome to contact us at any time. We would feedback in time and provide good service to you. Below is the contact information.

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#### **1. Product Introduction**

SVS1500 sound velocity sensor adopts "Time Leap" technology for sound velocity measurement. Combining with advanced digital signal processing technology, the sound velocity measuring accuracy can reach 0.05m/s. Base on compact IC and sensing technology, SVS1500 is small size and easy to carry. It is so convenient that completely reduce not only the big error risk caused by the table checking method, but also troublesome of the original inspection board comparing work.

The main Features of SVS1500 are listed as below.

- **High Accuracy:** With "Time Leap" technology, SVS1500's accuracy was enhanced to 0.05m/s.
- Quick Response: Highest output rate can reach 30Hz, which means SVS1500 can rapidly feedback to abnormal water current and sound velocity changing in some water field, so that it can provide accurate calibration to sound velocity.
- **Stable Performance:** Adopt up-to-date sound velocity sensor, new material & measuring technology, SVS1500 greatly minimize the impact caused by environment in order to ensure the data performance.
- **Easy Operation:** Plug and play mode is suitable for out field application. It can quickly work with Laptop and various echo sounder, or integrated with other devices requiring sound velocity measuring results.



## 2. System Specifications

#### 2.1. Technical Specifications

Sound Velocity Range	1400m/s ~ 1600m/s
Sound Velocity Resolution	0.01m/s
Sound Velocity Accuracy	0.05m/s
Sound Frequency	2MHz
Sampling Rate	1 ~ 30Hz
Max. Working Depth	300m
Temperature Sensor Type	PT1000
Temperature Resolution	0.001°C
Temperature Accuracy	0.05℃

#### 2.2 . Electrical Specification

Power Supply	12V
Data Port	RS232
Data Rate	2400bps ~ 115200bps

#### 2.3 . Physical Specification

Cover Material	316L Stainless Steel
Weight	1kg
Size	Ф34mm x 163.5mm
Working Temperature	-5℃ ~45℃
Storage Temperature	-20°C ~ 55°C



#### 3. Installation

Use the cable provided with SVS1500, connect to the power & data port at the back side of SVS1500 and screw it clockwise.

Connect the DB9 end to standard serial port of computer.

Connect power cable to 12V power supply.

Put the probe into water, and SVS1500 is ready to work normally.

Power on the power supply, about 10 seconds later, it starts to output sound velocity measurement results.

The definition of each pin of the cable is shown in the following table.

ltem	P2 (DB9)	P3 (Cable Pins)	Description
12V		Pin in Red	12V Positive
PGND		Pin in Black	12V Negative
ТХ	Pin2		RS232 TX to PC RX
Rx	Pin3		RS232 RX to PC TX
SGND	Pin5		RS232 Ground



Below is the size of SVS1500.



In the process of usage, in order to prevent sound velocity sensor from directly colliding with the hull or water bottom ground and causing the deformation of the reflective surface support rod, it is recommended to pay attention to avoid damage this part on the sound velocity sensor.

Notice: The sound velocity sensor connecting cable cannot bear too big weight, so we recommend to use another dragging cable during operation.



#### 4. Configuration & Operation

The sound velocity sensor can be configured the baud rate, output sound speed rate, and whether to output water temperature. For the specific setting method, see the following setting process.

- 1) Connect sound velocity sensor to computer serial port.
- 2) Double-click the "SVS1500SetupEN V1.2.0" file and run the setup software;



3) Select the software installation path as you like. The default installation path is C:\Program Files. Then click "Next" to install the software to the computer, as shown in the following figure:



hoose Install Location			
Choose the folder in which to inst	tall SVS1500 V1.2.0.		
Setup will install SVS1500 V1.2.0 i Browse and select another folder.	in the following folder. To install ir . Click Install to start the installat	n a different folder, c ion.	lick
Destination Folder			
Destination Folder C: \Program Files (x86)\Hydro	o-tech Marine\SVS1500 V1.2.0	Browse	
Destination Folder C: \Program Files (x86) \Hydro pace required: 22.4 MB	o-tech Marine\SVS1500 V1.2.0	Browse	
Destination Folder C: \Program Files (x86) \Hydro Space required: 22.4 MB Space available: 94.6 GB	o-tech Marine\SVS1500 V1.2.0	Browse	
Destination Folder C: \Program Files (x86) \Hydro Space required: 22.4 MB Space available: 94.6 GB soft Install System v3.04	o-tech Marine\SVS1500 V1.2.0	Browse	

4) After the installation is completed, SVS software will automatically create a shortcut of "SVS1500" on the desktop.



5) Double-click the "SVS1500" shortcut to run the software, first set up the working serial port as shown in the red box in the figure below. Select the right port and baud rate, which default is 9600bps, data bit is 8, check bit is NONE, stop bit is 1 bit, click "Open COM" and complete the setting.



COM Port: COM1 · Baud Rate: 9000 · Data Bit: 8 · Check Bit: NONE · Stop Bit: 1 bit · Open COM SVS Configuration SVS Configuration SVS Sudd Rat: 9600 · SVS Update Rate: 8 Range: (1-30) Temp Output: Permission · SVS Output Format: Default · 4VG SV Point: 5 Point Setting Send CFG Save CFG Stop Save	COM Setting	Data	Display				
AVG SV Soutput Format: WC SV Point: 5 Point Setting Send CFC Save CFC Stop Save	COM Port: CO		SV :	0000	$00^{\circ}$	<b>n</b>	S
Check Bit: NONE - Stop Bit: 1 bit - Open COM SVS Configuration SVS Configuration SVS Eaud Rat: 9600 - SVS Update Rate: Temp Output: Permission - SVS Output Format: AVG SV Point: Point Setting Send CFG Save CFG Stop Save	Data Bit: 8	•		0000			
Stop Bit: 1 bit •       RT Temp: 00000.0000 °C         SVS Configuration         SVS Eaud Rat: 9600 •       SVS Update Rate:         B       Range: (1-30)         Temp Output: Permission •       SVS Output Format:         VG SV Point:       5         Point Setting       Send CFG         Save CFG       Stop Save	Check Bit: NO	E - A	VG SV :	0000	0.00	<b>m</b> /	S
Open COM RT Temp: 00000.000 C SVS Configuration SVS Baud Rat: 9600 • SVS Update Rate: 8 Range: (1-30) Temp Output: Permission • SVS Output Format: Default • AVG SV Point: 5 Point Setting Send CFG Save CFG Stop Save	Stop Bit: 1	bit •		000	0 0 0		
SVS Configuration SVS Baud Rat: 9600  V SVS Update Rate:  Range: (1-30) Temp Output: Permission  SVS Output Format:  Default  VG SV Point:  Found Setting Send CFG Save CFG Stop Save	Open CO	R'	l lemp:	0000	J.00	0°C	
	AVG SV Point:	5	Point Setting	Send CFG	Save CFG	Stop Save	9
	atus Display						
	tatus Display						
	tatus Display						
	tatus Display						

6) After the connection is completed, user can configure the corresponding working parameters of the sound velocity sensor, including baud rate of the sound velocity sensor, output rate of sound velocity information, and whether to output water temperature.

For example, if user need set baud rate to 115200, update rate is 8 Hz, and water temperature output is turned on. The configuration method is as follows:

- Step 1: Before the sound velocity sensor is powered on, first set the parameters in "serial port parameter setting" area same as the parameters currently used by sound velocity sensor. Then open the working serial port, as shown in the red box in the following figure.



COM Setting		Data I	Display				
COM Port: CO	M1 -	рт	CV .	000	0 00	$\mathbf{\alpha}$	
Baud Rate: 96	• 00	КI	SV :	000	<b>0.00</b>	U	m/s
Data Bit: 8	•	A 17	C CV .	000	0 00	$\wedge$	1
Check Bit: NO	NE 🔹	AV	6 SV :	000	<b>0.00</b>	U	m/s
Stop Bit: 1	bit 🔻	рл	<b>7</b>	000	0 00	<u>^</u>	-
Open CO	M	KI	lemp:	000	0.00	U	U
SVS Configura	tion						
SVS Configura SVS Baud Rat:	9600	•	SVS Update Rate:		8	Range:	(1-30)
Temp Output:	Permissi	on 🔹	SVS Output Format:			Defaul	t v
11							

- Step 2: In the "SVS Configuration" area, input SVS Baud Rate to what you want, such as 115200.

Power on sound velocity sensor, and quickly press the "Send CFG" button on the software within 3 seconds after the sound velocity sensor is powered on to enter configuration mode, as shown in the red box in the following figure.

COM DECCIII;	3	Data Dis	splay					
COM Port:	COM1 -	рт	CV	. 🗖	0000		0	-
Baud Rate:	9600 🔹	Π	21	•		J. UU	U	ш/ 5
Data Bit:	8 🔹	AUC	CU		0000		0	1
Check Bit:	NONE -	AVG	1 21		0000	J. 00	U	m/s
Stop Bit:	1 bit •	DT	T		0000	0.00		
Open	COM	KI	lemp	):		$\mathbf{J}.\mathbf{U}\mathbf{U}$	U	C
SVS Config	uration	the second se						
SVS Config SVS Baud R:	at: 115200	- s	VS Update R	ate: _	8		Range:	(1-30)

If in the "Status Display" area, display the following information shown in the red box below, it means that the configuration is completed successfully.

Otherwise, please power off and repeat the steps above to re-configure.



```
Status Display

Water temp enable

Set Water Temperature Output: Enable

>

Juart bps 115200

Set Uart Bps: 115200 OK

>data rate 8

Set Output Rate: 8Hz OK

>water temp enable

Set Water Temperature Output: Enable

>
```

Notice: If you do not click "Send CFG" button within 3 seconds after powering on, the system cannot modify working parameters. It means if you want to modify parameters, you must click the "Send CFG" button within 3 seconds after powering on.

- Step 3: After configuration, click the "Save CFG" button to save the configuration information into SVS as shown in the red box below:

Sound Velocity	Sensor Cor	nfiguratio	on V1.1					
COM Setting —		Data Di:	splay					
COM Port: CO	M1 -	DT	CV		000	0 00	0	
Baud Rate: 96	• 00	KI	21		000	<u>U. UU</u>	Ų	m/s
Data Bit: 8	•	ATTC			000	0 00	0	
Check Bit: NO	NE 🔻	AVC	5 SV	:	000	0.00	U	m/s
Stop Bit: 1	bit 💌	рл	m		000	0 00	0	
Close CC	M	RT	Temp	):	000	0.00	0	C
SVS Configura	tion							
SVS Baud Rat:	9600	▼ s	VS Update F	ate:		8	Range	e: (1-30)
Temp Output:	Permission	1 • S	VS Output F	ormat:			Defa	ult -
AVG SV Point:	5		Point Set	ting	Send CFG	Save CFG	Sav	ve Data

If in the "Status Display" block, it displays message of "Set Success!" shown as red box below, it means the configuration is saved successfully. Otherwise, click "Save CFG" again to save configuration parameters.

Status Display Set Uart Hps: 115200 OK >data rate 8 Set Output Rate: 8Hz OK >water temp enable Set Water Temperature Output: Enable >done Confirm Change?[y/n] >y Set Success!



- Step 4: If baud rate has been reset, click "Close COM". When next time powering on, select baud rate as 115200 and then "Open COM". At this time, sound velocity sensor will work under baud rate of 115200 as shown in the red box below.

COM Setting -		-Data I	Display				
COM Port: C	0M1 ▼	RT	SV :	0000	0.00	<b>()</b> m/	/s
Data Bit: 8	-		a au	0000			
Check Bit: N	one 🔹	AV	G SV :	0000	0.00	() m/	s
		-					
Stop Bit: 1 Open C	bit 🔻	RT	Temp:	0000	). 00	0 0	2
Stop Bit: 1 Open Co SVS Configura	bit • OM	RT	Temp:	000(	). 00	0 C	2

7) Save sound velocity measurement data

Click "Save Data" button on the right bottom of the software user interface and input saving file name, file format and saving path to save data during surveying process in real time as shown below.

Save the data as				×
$\leftarrow  \rightarrow  \checkmark  \uparrow$	🔄 > 此电脑 > 桌面	~ C	搜索"桌面"	م
组织 🔹 新建文件夹				≣ • 🕐
~ 📮 此电脑	名称 ^	修改日期	类型	大小
> ▶ 视频	<b>5</b> 29	2022/5/29 9:20	文件夹	
> 🔀 图片	20220428	2022/5/5 11:11	文件夹	
> 📑 文档 > 址 下载	🔁 HydroNavi处理数据	2022/4/6 17:58	文件夹	
> 🕑 音乐	📒 HydroQuest V6.3.3_待测	2022/5/19 9:19	文件夹	
> 🛄 桌面	HydroSonar V1.0.146.19	2022/6/6 15:42	文件夹	
> 🚢 系统 (C:) > 💼 软件 (D:)	<b>V6.3.0.22</b>	2022/5/31 18:11	文件夹	
文件名(N): 保存	异数据示例.txt			~
保存类型( <u>T</u> ): tex	t(*.txt );Custom file(*.*);			~
> 隐藏文件夹			保存( <u>S</u> )	取消

During saving, click "Close Save" to stop saving data, as shown in the



#### following figure.

com bettin	g	Data Display		
COM Port:	COM1 -	RT SV ·	0000 0	
Baud Rate:	115200 -	<b>NI 01 .</b>	0000.0	
Data Bit:	8 •	AVC CV	0000 0	
Check Bit:	NONE -	AVG SV :	0000.0	
Stop Bit:	1 bit •		0000 0	
Open	COM	RI Temp:	0000.0	00 °
SVS Config	uration	• CUC Undata Data.		Parga (1-20)

At this time, you can open the data file to view the saved measurement data as shown in the following figure.

	Ø,		0, , , , , , , , , , , , , , , , , , ,
1	Ş	1420.952	18,996
2	Ş	1420.951	18.999
3	Ş	1420.952	19.000
4	Ş	1420.955	19.000
5	Ş	1420.954	19.001
6	Ş	1420.952	19.000
7	Ş	1420.951	18.998
8	Ş	1420.951	19.000
9	Ş	1420.951	19.000
10	Ş	1420.950	18.997
11	Ş	1420.947	18.998
12	Ş	1420.948	18.998
13	Ş	1420.951	18.996
14	Ş	1420.948	18.993
15	Ş	1420.948	18.994
16	Ş	1420.949	18.994
17	Ş	1420.952	18.995
18	Ş	1420.951	18.997
19	Ş	1420.952	18.997
20	Ş	1420.952	18.997
21	Ş	1420.952	19.000
22	Ş	1420.953	19.000
23	Ş	1420.954	19.001
24	Ş	1420.954	19.001
25	Ş	1420.955	19.004
26	Ş	1420.951	19.002
27	Ş	1420.953	19.003
28	Ş	1420.954	19.003
29	Ş	1420.953	19.001
30	Ş	1420.951	18.999



lte	Description	Demo	Remar
m			k
0	\$(space)SoundVelocity(space)	\$ •1500.000 •20.000 •20.000	Default
	Temperature(space)TemperatureC		
	R/LF		
1	(space)Temperature(space)	• 20.00 • 1500000	
	SoundVelocityCR/LF		
2	(space)Temperature(space)	• 20.00 • 1500.00	
	SoundVelocityCR/LF		
3	(space)Temperature(space)	• 20.000 • 1500.000	
	SoundVelocityCR/LF		
4	(space) SoundVelocityCR/LF	• 1500000	
5	(space) SoundVelocityCR/LF	• 1500.00	
6	(space) SoundVelocityCR/LF	• 1500.000	
7	\$(space) SoundVelocityCR/LF	\$ • 1500.000	



#### 5. Cautions

- Any small change of the acoustic reflecting surface at front of sound velocity probe will lead to big measurement error. So it is necessary to avoid collision with other objects. Especially when it needs to be placed on the deck, hold the sound velocity sensor and gently place it horizontally to the deck surface. Make sure it will not roll over due to any boat moving.
- 2) After each measurement, clean it with fresh water immediately. Pay special attention to avoid foreign matters on the acoustic reflecting surface.
- In order to ensure the sound velocity measurement accuracy, the equipment needs to be returned to the manufacturer for calibration every 3 years.