

-----SDE-18S Digital Echo Sounder-----

Operation Manual

2017.06.27

WARRANTY/LIABILITY

WARRANTY:

Seller warrants that all of its products sold hereunder, will at the time of delivery, be free from defects in materials and workmanship and will conform to Seller's applicable specifications. Seller's obligation hereunder shall be limited to, at Seller's option, either correcting, refunding the purchase price of or replacing any product for which written notice of nonconformance hereunder is received by Seller within one year following date of shipment. Seller's written authorization is required for return of non-conforming products. Shipping charges to and from Seller's plant are at Buyer's expense. In no event will Seller be liable for any incidental or consequential damages. This warranty shall not apply to any products which Seller determines have, by Buyer or otherwise, been subjected to operating and/or environmental conditions in excess of the maximum values in the applicable specifications, or operating instructions, or otherwise have been the subject of misuse, neglect, improper installation, repair, alteration or damage.

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It is expressly understood and agreed that SOUTH is not an ensure that the products or services sold hereunder will perform functions or prevent occurrences, or the consequences therefrom, which the products or services are designed to perform or prevent; that SOUTH shall be exempt from liability for all loss or damage therefrom. All sums payable to hereunder are based upon the fair market value of the goods, services, and equipment. Buyer further agrees that, if SOUTH should be held liable for any loss or damage in any respect and from whatever cause, including, but not limited by tort law for injury or harm to Buyer or other persons, and/or for economic loss to their property arising from or caused by any inherently dangerous or undiscoverable defect in the products or services sold hereunder due to any act or omission of SSMICL, its agents, or employees, in manufacturing, installing, or servicing said products or services, SOUTH's liability shall be limited to an amount equal to the consideration paid by buyer for such products or services as the buyer's exclusive remedy.

TO OUR VALUSE CUSTOMERS

It is our continuing interest to remain in contact with our customers and assist them in any way we can.

To this end we avail our firm to your electronics personnel via telephone, letter or fax provide information pertaining to the operation of the SDE-28.

We believe that the SDE-28 is the most advanced survey depth sounder on the market, and once an operator is familiar with its features, excellent data will be gathered and many years of trouble free performance will be provided.

Please feel free to contact us at anytime.

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Chapter1 Preview

§1.1 Introduction

SOUTH SDE-18S echo sounder is a kind of automatic control and industrial echo sounder which is integrated with control unit, echo sounding unit, and I/O unit via RS-232. The IPX6 design makes it dust-proof, waterproof, and shockproof. These features make the instrument strong compatibility, stable performance and reliable accuracy. SED-18S can connect to computer via RS-232 which can delivers depth data to different hydrographic surveying software. SDE-18S is only 2 kilogram that it's very convenient for water measurement and unmanned ship measurement.

With the sounder control unit inside, SDE-18S can automatically adjust the sound-variables which perplexes surveyor always. The sound-variables like pulse length, power adjust, blanking pulse and so on.

§1.2 Echo Sounding Principles

The principle of echo sounder is to use ultrasound spread through dielectric, and on different media surface produce reflective phenomenon, using ultrasonic transducer (probe) launch ultrasound, and then measure delta-T between the emission wave and the reflected wave.

Acoustic propagation velocity in water is V , transducer (probe) transmits ultrasound, acoustic emission by the probe to the bottom of the sea, reflected back by the bottom and received by the transducer, then measure the round trip time the acoustic experienced by t , then: $Z = Vt / 2$; At the same time, read the scale on the

junction pole to get the value of the draft(draft is the value between the water surface and the bottom of the transducer), as Fig.1.

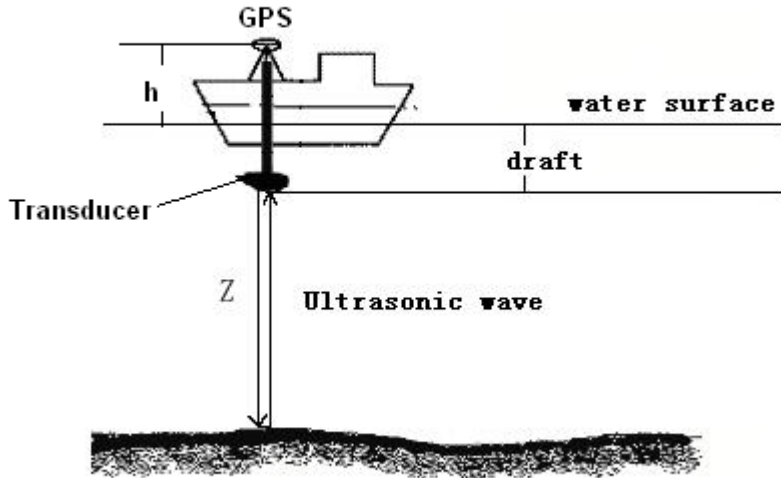


Fig.1 Echo Sounding Principles

The signal frequency of the high-frequency transducer is about 200KHz, that of the low-frequency transducer is about 20KHz. Low frequency signal has a longer wavelength, strong diffraction function, so strong penetration capacity, the general penetrate a certain thickness of silt.

§1.3 Specifications and Accessories

§1.3.1 SPECIFICATIONS

Sound Frequency: 200K Hz

Beam Angle:5°

Depth Range: 0.4-100m

Accuracy: $\pm 0.01m \pm 0.1\%D$ (D takes the instant depth)

Depth Resolution: 0.01m

Input Voltage: DC 9V—18V

Output Data: User-defined via RS-232

Working Temperature: $-30^{\circ} - 60^{\circ} C$

Weight: 2 KG

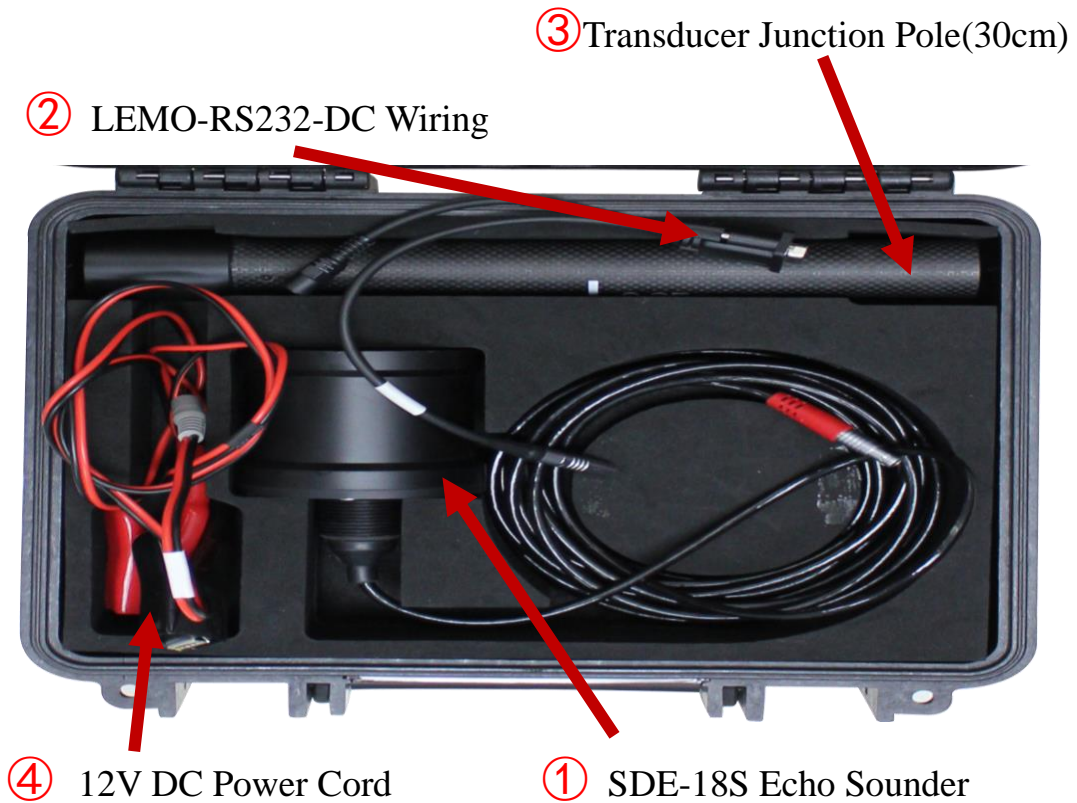
Water Pressure: $\leq 50m$

Transducer size: 85mm (dia) \times 80mm (H)

§1.3.2 Accessories

SED-18S Package Check List

Part Number	Item	Quantity
1	SDE-18S Echo Sounder(with 5m wiring)	1
2	LEMO-RS232-DC Wiring	1
3	Transducer Junction Pole(30cm)	1
4	12V DC Power Cord	1
5	Instrument Box	1
6	Echo Sounder Manual	1



SDE-18S echo sounder Accessories

Chapter 2 Installation and Communications

§2.1 Installation

Show in Figure 2-1, the installation of SDE-18S is comparative simple.

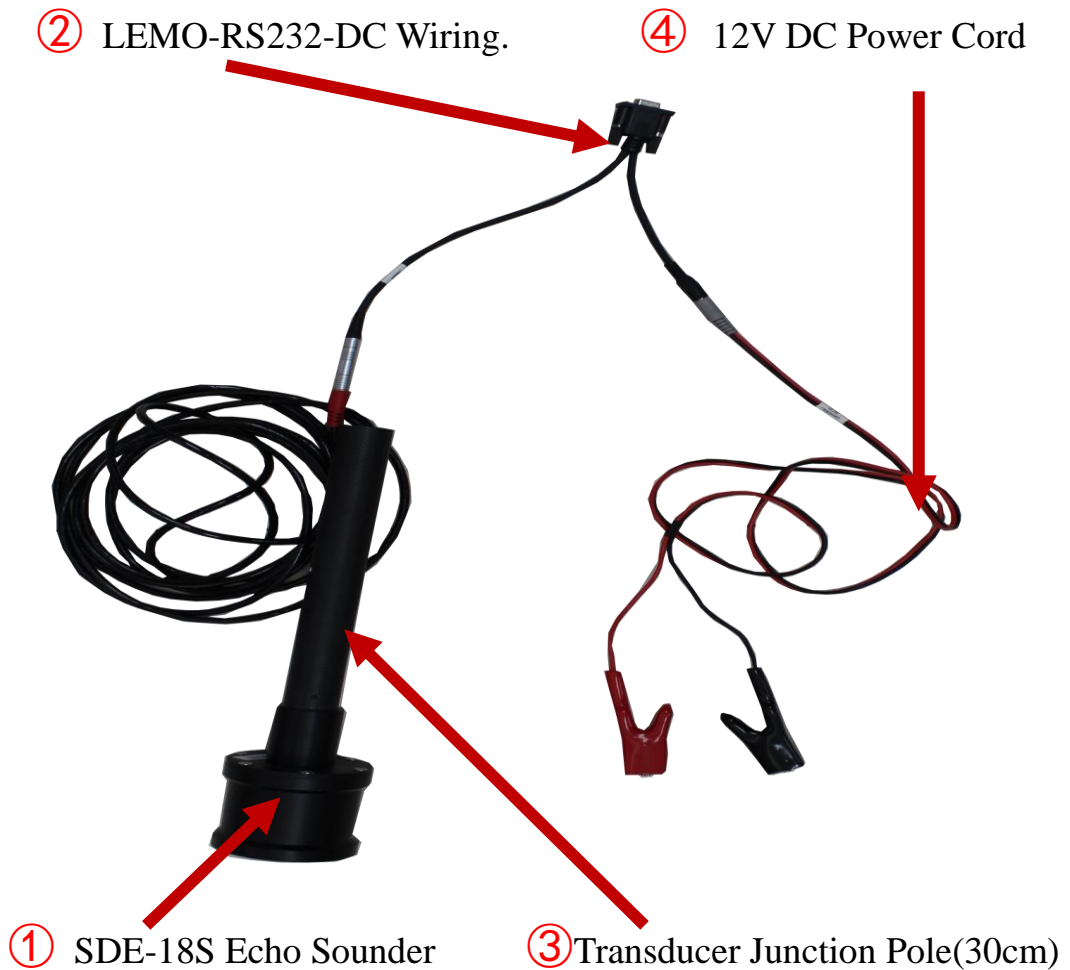


Figure 2-1 Installation of SDE-18S

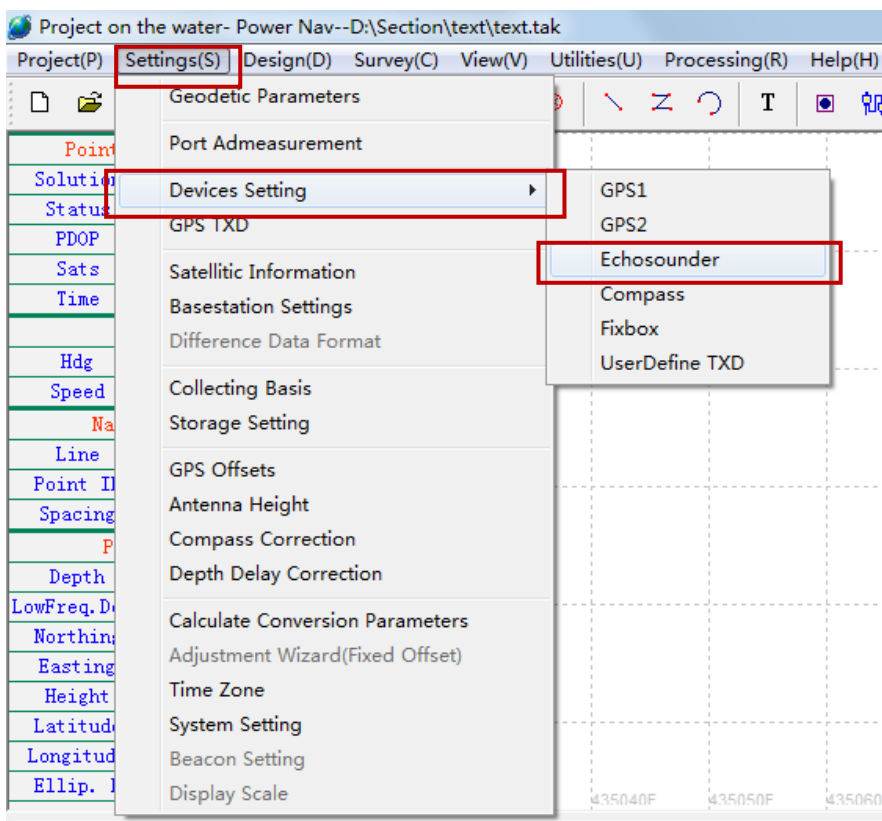
The RS-232 connects with computer or equipment for data output. The 12V DC power cord contains a conventional DC two clamps. The red color clamp connects the battery anode and the black one connects the cathode.

§2.2 Communications

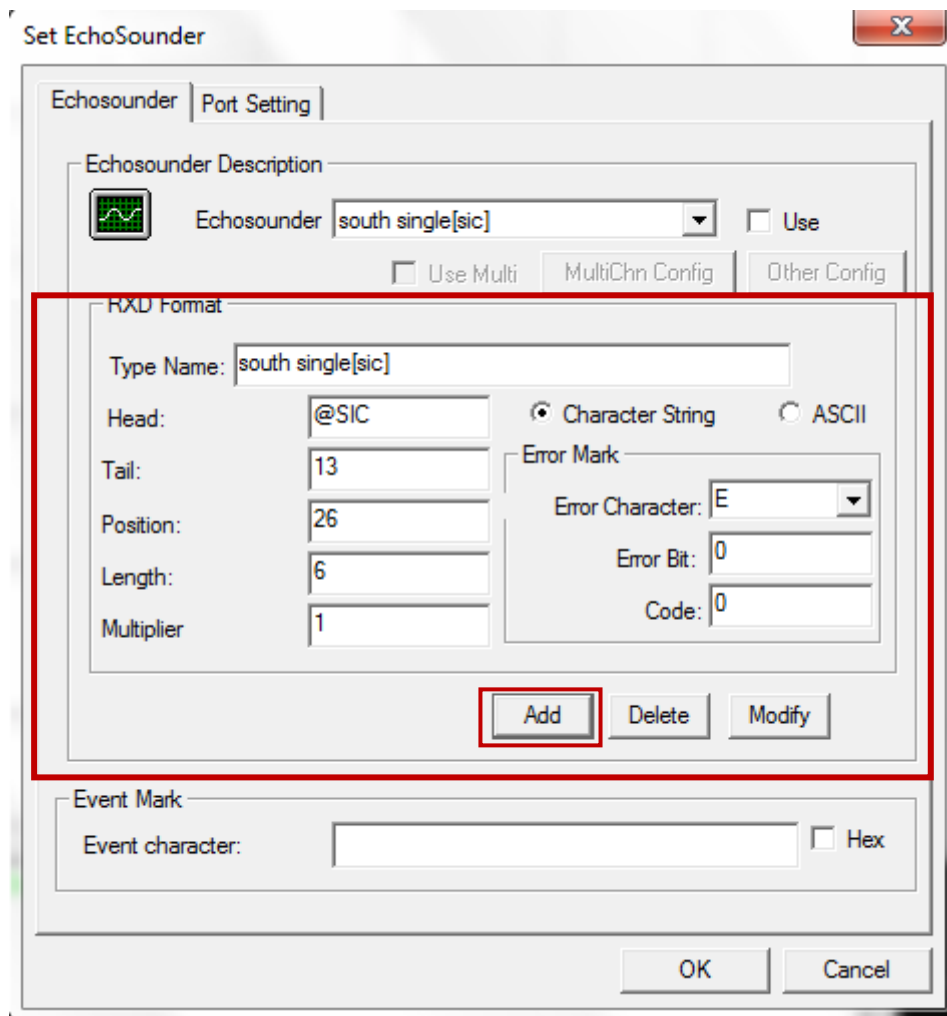
§2.2.1 SDE-18S connection configure

Take the software Power Nav for example.

1. Open the Power Nav. Click “Setting”--“Device Setting” – “Echo sounder” as below screenshot.



2. Add a new output data type for SDE-18S as bellow. It's just the format that SDE-18S outputs its depth data.



Head: data header, begin letters in each row;

Tail: the end of each data, always use ASCII, 13 means Enter.

Position: means that the depth data is from this position, include the space before the short data.

Length: the numbers of effective digits, counting from the Head.

Error character: when the error character appear means there is incorrect data.

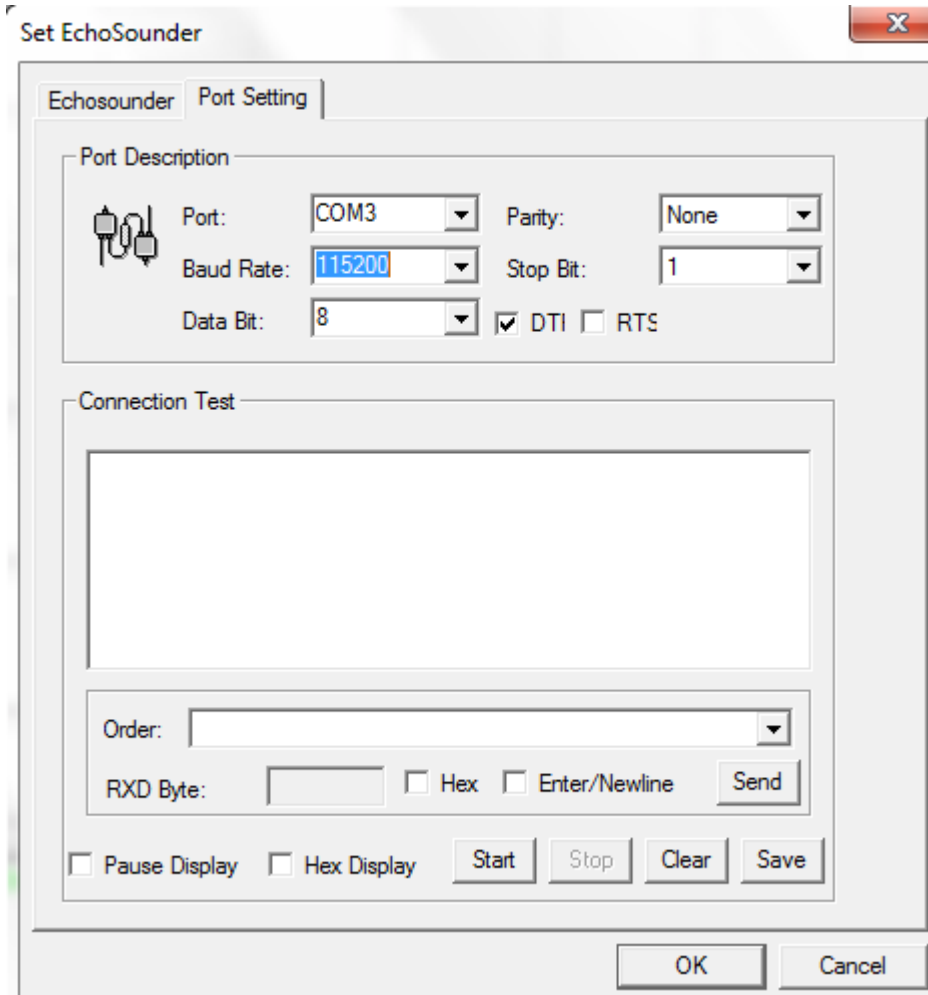
Multiplier: when transform the unit of the depth value to meter, need to shift the decimal point, such as 0.01 needs to shift the decimal point towards the left 2bits.

Error Bit: show the position of the error character.

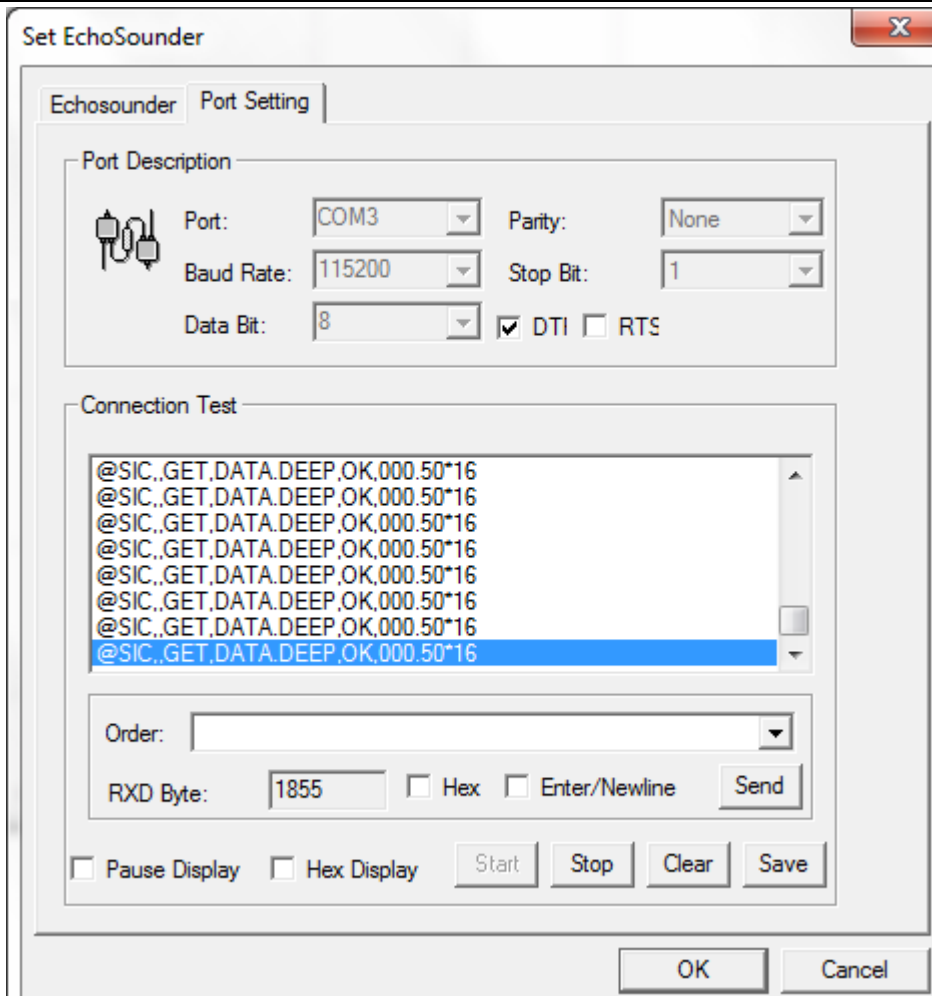
Code: code is the character to perform AND operation with Error Bit(Generally no

use).

3. Click the “Port Setting”, get the right port which is connecting with the SDE-18S on the computer, choose 115200 for the Baud rate, and others set as below.



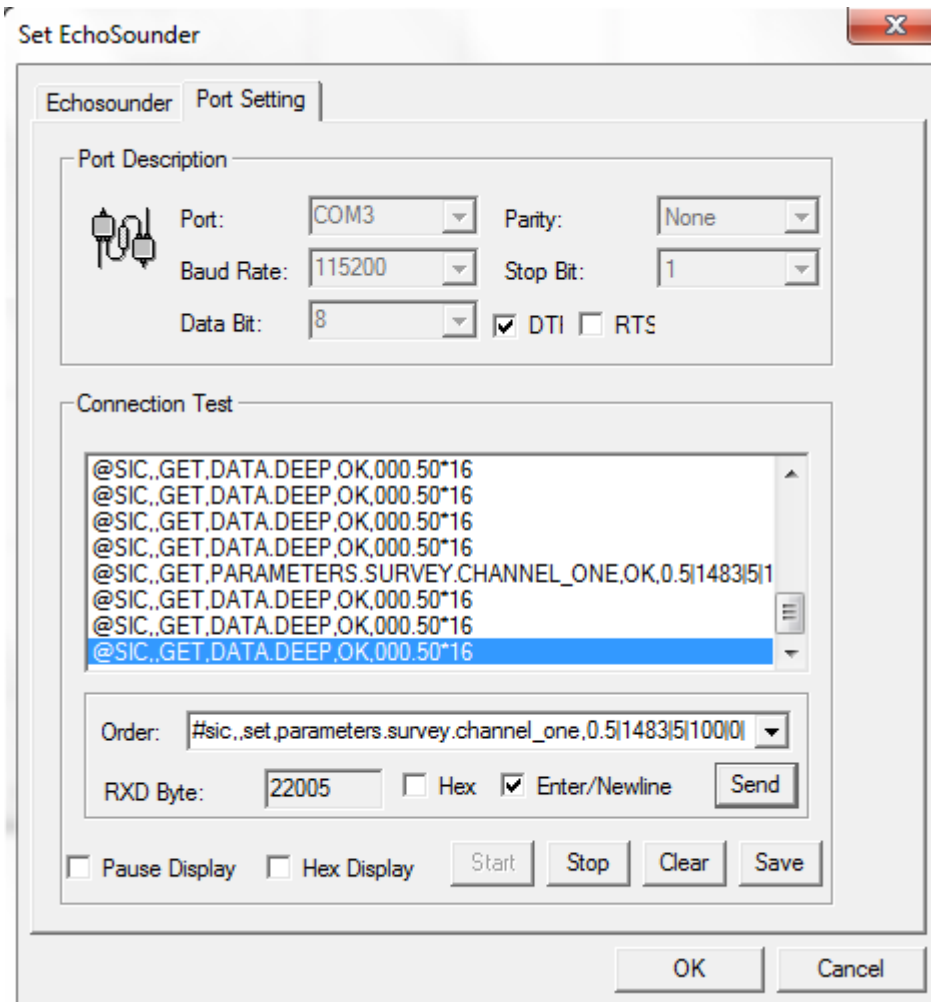
4. Click “Start” button, then the output data comes on the “Connection Test” blank as below screenshot. Click “OK” button to save configurations.



§2.2.2 Order set

Take the Power Nav for example to input order. Every configuration is just like above.

Keep the output data transmitting, input the order in the “Order” blank, select the “Enter/Newline” checkbox, click “send” button. It is successfully setting as below.



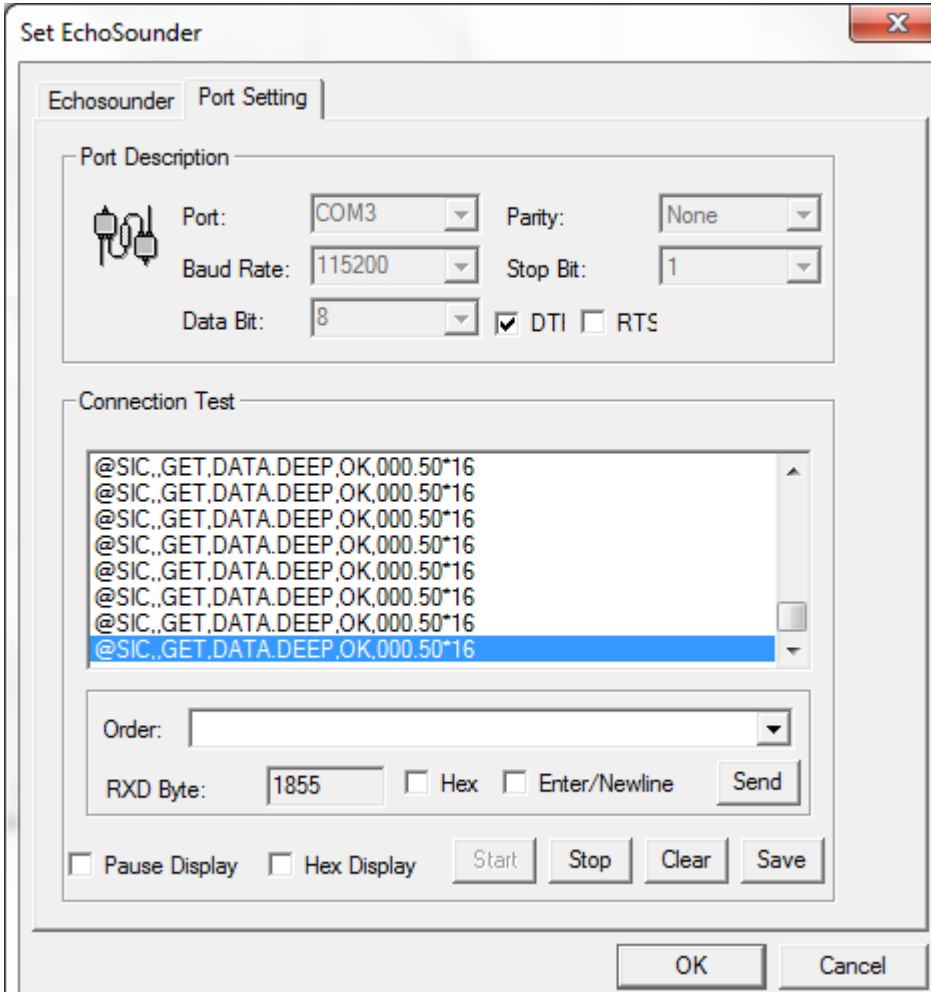
There are 6 orders description:

1. The order “#sic.,set,parameters.survey.channel_one,0.5|1483|5|100|0|1” is use to set the speed of sound and the draft of transducer.
0.5 is the depth of transducer, unit is meter.
1483 is the acoustic propagation velocity in water, unit is meter.
2. The order “#sic.,set,device.survey_status.channel_one,1\r\n” is use to start survey.
3. The order “#sic.,set,device.survey_status.channel_one,0\r\n” is use to stop

- survey.
4. The order “#sic,,set,device.survey_model.channel_one,1\r\n” is use to adjust the sound-variables automatically.
 5. The order “#sic,,set,device.survey_model.channel_one,0\r\n” is use to adjust the sound-variables manually.
 6. The order “#sic,,set,parameters.sounder.channel_one,0.2|1|2|7|1|0|0|0|40|200|1|1\r\n” is an example to adjust the sound-variables by hand.
0.2 is the pulse length. The value only should be 0.01, 0.1, 0.2 and 0.3, unit is millisecond.
1 is the depth restrainer. The value takes form 0 to 10, unit is meter.
2 is the threshold. The value takes form 1 to 4, unit is meter.
7 is the gain of level 1. The value takes form 1 to 7, unit is times.
1 is invalid, but must be hold for the order.
0 is invalid, but must be hold for the order.
0 is invalid, but must be hold for the order.
0 is invalid, but must be hold for the order.
40 is the gain of level 2. The value takes form 20 to 40, unit is times.
200 is invalid, but must be hold for the order.
1 is invalid, but must be hold for the order.

§2.2.3 Output Data Format

SDE-18S echo sounder can output depth data format as below.



Output depth data format is “@SIC.,GET,DATA.DEEP,OK,000.50*16”.

The value “000.50” is the depth which SDE-18S outputs. The unit is meter.