

# Speed Log Simulator and NMEA0183 Tester

## SIM999 Operation Manual



**NINGLU**

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# Introduction

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SIM999 is a handheld portable tester for Doppler speed log, transducer and NMEA0183 (IEC61162-1).

Doppler speed log tester

SIM999 can measure the output of a Doppler speed log, and if required, reply with a user defined signal to simulate operation of the transducer.

NMEA0183 tester

SIM999 receives and displays the NMEA0183 signal.

## Features

- ◆ Doppler speed log simulator & transducer tester & NMEA0183 tester
- ◆ Connect with PC and used in Doppler log teaching system
- ◆ Built-in rechargeable battery
- ◆ Big screen green with black words on LCD display

## Functions

### Doppler speed log simulator

Test the transmitting frequency, transmitting pulse width and transmitting amplitude of the speed log. Simulate the operation of the speed log transducer to send navigation signal, including speed, step time and frequency set by users to speed log, which is used for the installation, debugging and trouble removal.

### Transducer tester

Measure the impedance and phase angle of transducer under the set frequency by users and calculate the resonant frequency, resonant frequency and resonant phase angle. Compare with the resonant parameters to determine whether the transducer can work normally.

**NMEA0183 tester**


Receive and display the NMEA0183 signals output from the connected device.

**Doppler speed log teaching system (optional)**

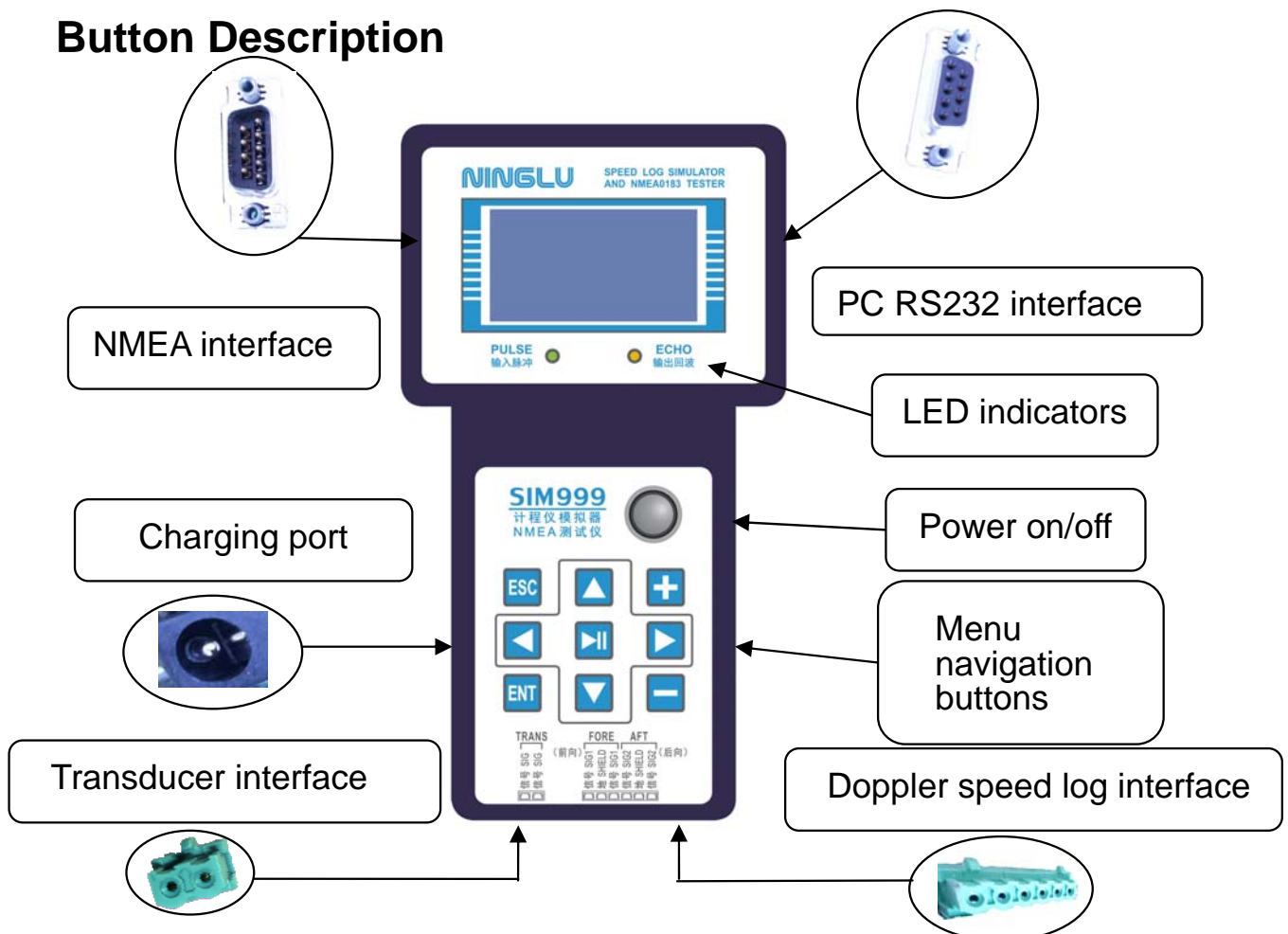
Optional part for speed log teaching system, please contact NINLGU if you need to this function.

# Introduction

## Packing List

Description	Comment	Specification	Qty	Function
Simulator data cable		2m length	1	connect speed log with this unit
NMEA cable		0.5m length	1	connect NMEA signal with this unit
Battery charger		(110/220V) 12.6V/350mA	1	charge build-in battery

## Button Description



# Introduction

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## LED Indicators:





Pulse yellow light will flash when receiving the input from speed log.

Echo red light will flash when outputting bottom echo signal.


Note: The echo light will not flashing until the pulse light flashing.


Power on/off: Switch on/ off power.


## Menu Navigation Buttons:

    Flashing cursor key, change the location of flashing cursor

  Increase/decrease key, increase/decrease parameter value

 Start/pause key, start/pause simulation

 ESC key, return to the previous menu

 Enter key, enter into the selected menu

NMEA interface: DB-9P male connector, connected to the tested device.

Computer RS232 interface: DB-9P female connector, used for the teaching system only.

# Specifications

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## Summary

Display screen:	128×64 dot-matrix LCD
Dimension:	235mm×135mm×55mm
Weight(battery included):	700g
Build-in rechargeable lithium battery:	12.6VDC 1500mAh
Battery charger:	12.6V/350mA
Working temperature:	-15~55℃

## Analog Parameters

Parameters	Range	Resolution	Accuracy
Input Frequency	900 kHz - 2100	100 kHz	±10 kHz
Input Width	9,000 us - 60,000	100 us	±100 us
Input Amplitude	50 V - 400 V	N/A	N/A
Center Frequency	1000 kHz - 2000	1 kHz	±1 kHz
Output Depth	0 m - 9 m	1 m	±0.1 m
Output Width	0 ms - 20 ms	1 ms	±0.1 ms
Output Angle	20 Deg - 80 Deg	1 Deg	±0.5 Deg
Low Speed	-10 kn - 40 kn	1 kn	±0.5 kn
High Speed	-10 kn - 40 kn	1 kn	±0.5 kn
Step Frequency	0 kn - 10 kn	1 kn	±0.5 kn
Step Time	0 min - 5 min	1 min	±0.1 min

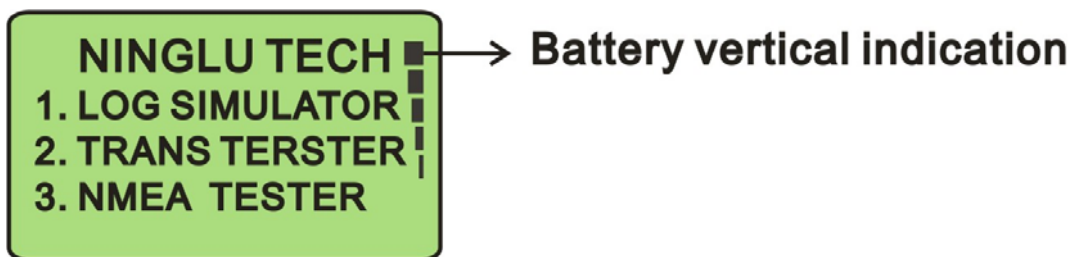
# Operation

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Note: This manual introduces the operation of SIM999 by taking an example of Ninglu DS99 Doppler speed log, but the SIM999 is not limited to connect with the DS99 and it can also be applied to other logs within the parameter ranges on Page 4 (*Analog parameters*).

## Charge









Please charge when the battery is too low for extend the battery's life.












# Operation

## Menu

After the power-on, display the product's software version number and welcome words first, and then enter the main menu with 1-3 options. Press    or  to change the location of the flashing cursor, press  to enter the option, press  or  to change the parameters which will be saved automatically, and press  to return to the previous menu.

Main menu	Second menu	Range	Instruction	
1. SPEEDLOG SIMULATOR	1. SPEEDLOG TEST		Press  , display tested results: Freq, Width and Ampl.	
	2.SIMULATOR SET	CentFreq OutDepth OutWidth OutAngle	1000kHz-2000kHz 0 m - 9 m 00 ms - 20 ms 20 Deg- 80 Deg	Set parameters according the log transducer's specifications
	3.SIMULATOR RUN	LowSpeed HighSpeed StepFreq StepTime	-10kn - HighSpeed LowSpeed- +40 kn 00 kn - 10 kn 0 min - 5 min	Choose "2. SIMULATOR SET" first, and then set parameters, press  to send the echo signal, and press  to cancel.
2. TRANSDUCER TESTER	StartFreq FinalFreq Step	10~5999.9 kHz 10~5999.9 kHz 0~5999.9 kHz	Set parameters and press  to test the transducer. Press  to pause the frequency scanning and press  to cancel.	
3. NMEA0183 TEST			Press  , display the NEMA0183 sentences.	

# Operation

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## Language Selection

After the power-on, display the product's software version number and welcome words first, and then enter the main menu.

For the change language, Press **ESC** before you enter the main menu, then the language selection screen will appear, press **▲** or **▼** to change the location of the flashing cursor, and press **ENT** to enter the selected language's main menu.



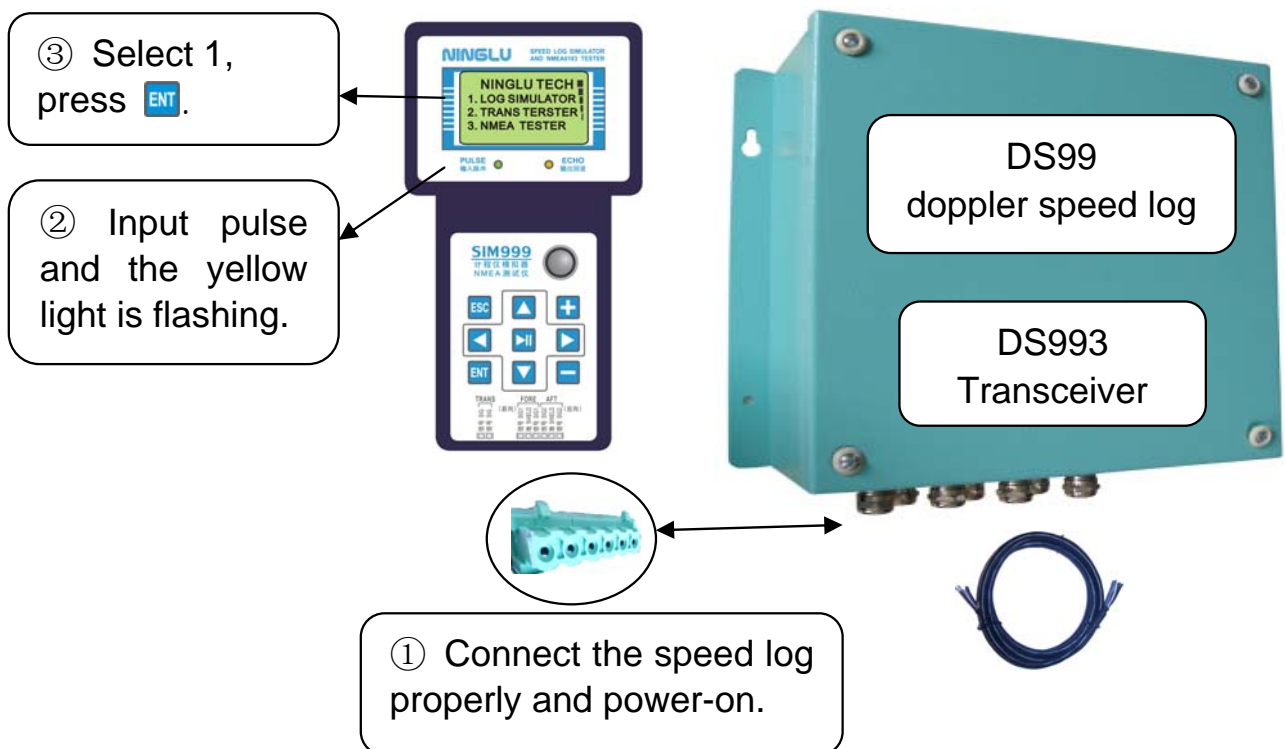
# Operation

## Speed Log Simulator

### Speed Log Test

Speed log tester is used to measure the frequency, pulse width and peak to peak value of speed log.











Before testing, the speed log should be connected properly and be turning on (the pulse yellow light flashing), and then enter the main menu. Press ▲ or ▼ to select "1. SPEEDLOG TEST". Press ENT to display the tested results. And press ESC to cancel and return to the main menu. The data from "1. SPEEDLOG TEST" is the parameter of the single channel "FORE", not the single channel "AFT". If it is needed by users, the connection of the channels "FORE" and "AFT" can be exchanged.



# Operation

## Simulator Set

Set the performance parameters of the speed log transducer, which can be obtained from the transducer manufacturer or the installation manual provided by the manufacturer.

In the main menu screen, press  or  to select “2. SIMULATOR SET”, press  to enter the parameters set screen, press , ,  or  to change the location of the flashing cursor, press  or  to change the parameters where the cursor flashed (the parameters will be saved automatically), and press  to return to the main menu.

	Simulator Set	Range	Recommended Values
<div style="border: 1px solid black; background-color: #d4edda; padding: 5px; width: fit-content;"> <b>CentFreq: 1000 kHz</b>  <b>OutDepth: 2 m</b>  <b>OutWidth: 20 ms</b>  <b>OutAngle: 37 Deg</b> </div>	CentFreq	1000 kHz - 2000 kHz	--
	OutDepth	0 m - 9 m	0 m
	OutWidth	00 ms - 20 ms	20 ms
	OutAngle	20 Deg - 80 Deg	--

The setup of “CentFreq” and “OutAngle” will influence the simulator run's veracity directly, so the customer should obtain the correct values from the manufacturer; if the “OutDepth” and “OutWidth” are unknown, the proposed values can be used.












### Parameters of Part of Speed Log Simulator Setting:

Simulator Set	DS99 (NINGLU)	JLN-205 (JAPAN JRC)
	DS80 (JAPAN Furuno)	
CentFreq	1000 kHz	2000 kHz
OutDepth	2 m	0 m
OutWidth	20 ms	20 ms
OutAngle	37 Deg	20 Deg


# Operation

## Simulator Run

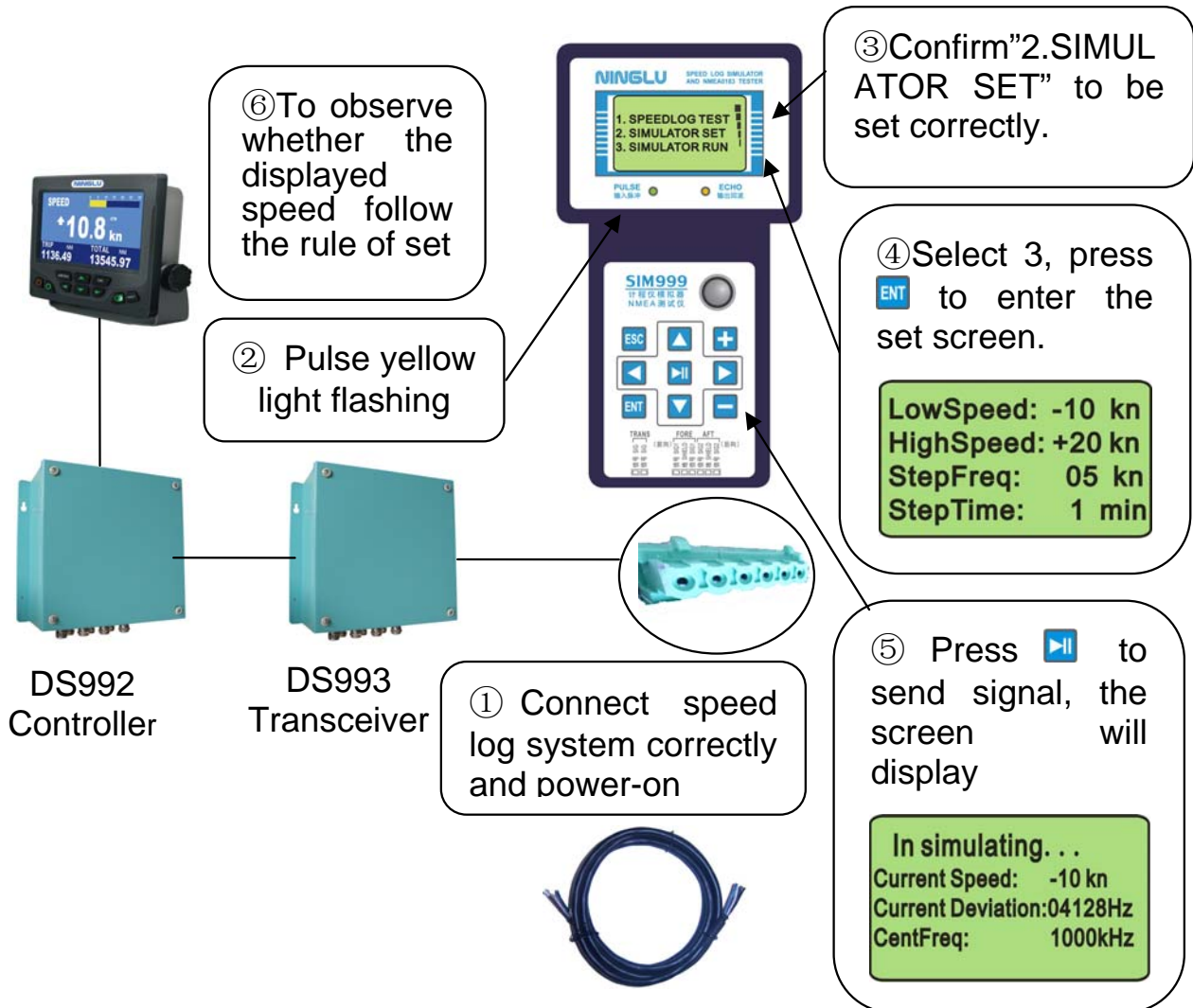
Send the echo signal to the speed log and simulate the ship's movement. Before setting this function, finish "2. SIMULATOR SET". If not, it will impact the accuracy of the simulator.

In the main menu screen, press  or  to select "3. SIMULATOR RUN", press  to enter the parameters set screen, press    or  to change the location of the flashing cursor, press  or  to change the parameters where the cursor flashed (the parameters set will be saved automatically), press  to send the echo signal to speed log, and press  to cancel and return to the setting screen.

<div style="border: 1px solid black; background-color: #d4edda; padding: 5px; width: fit-content;"> <b>LowSpeed: -10 kn</b>  <b>HighSpeed: +20 kn</b>  <b>StepFreq: 05 kn</b>  <b>StepTime: 1 min</b> </div>	Explanation:	Simulator Run	Range
	Ship's speed increases 5kn per min from -10kn to +20kn uniformly, and then decreases 5kn per min to 10kn uniformly. Loop in turn.	LowSpeed	-10 kn - HighSpeed
		HighSpeed	LowSpeed - +40 kn
		StepFreq	00 kn - 10 kn
		StepTime	0 min - 5 min

At first, the SIM999 should be connected with the Doppler speed log properly and turn on the speed log. Press  to send signal and the pulse yellow light will be flashing. If parameters are set correctly, the echo red light will flash after the signal is sent out from SIM999 successfully.










# Operation



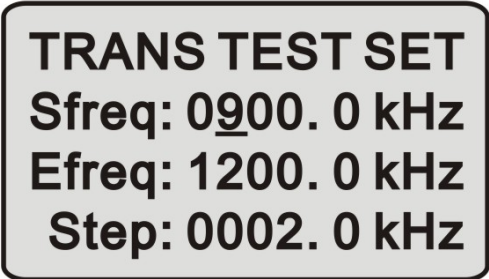
# Operation

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## Transducer Tester

In the main menu screen, press  or  to select "2. TRANS TESTER", press  to enter "TRANS TEST SET", press , ,  or  to change the cursor location and then press  or  to set the parameters of start frequency, end frequency and step.

When testing the transducer, please set the scan range near the resonance point. For example, when there is a 1000kHz transducer, the range of scan settings should be 900kHz~1200kHz.






**TRANS TEST SET**  
**Sfreq: 0900. 0 kHz**  
**Efreq: 1200. 0 kHz**  
**Step: 0002. 0 kHz**


"Sfreq" is start frequency of test scanning.

"Efreq" is end frequency of test scanning.

"Step" is step of frequency change every time.

Factory default is shown in the left default.

And then, press  to start transducer test. During testing, press  to pause/redo the frequency scan. And press  to return back the higher level menu.




**TRANS TESTING. . .**  
**Freq: 0992. 0 kHz**  
**Zmag: 00073 Ohm**  
**Zphase: +067 Deg**

"Freq" is scanning frequency.

"Zmag" is impedance of present frequency.

"Zphase" is phase of present frequency.

After finishing the scan, the resonance is shown on the screen.



**RESONANCE**  
**Freq: 1000. 0 kHz**  
**Zmag: 00076 Ohm**  
**Zphase: +066 Deg**

"Freq" is resonance frequency.

"Zmag" is resonance impedance.

"Zphase" is resonance phase.

Factory default is shown in the left default.

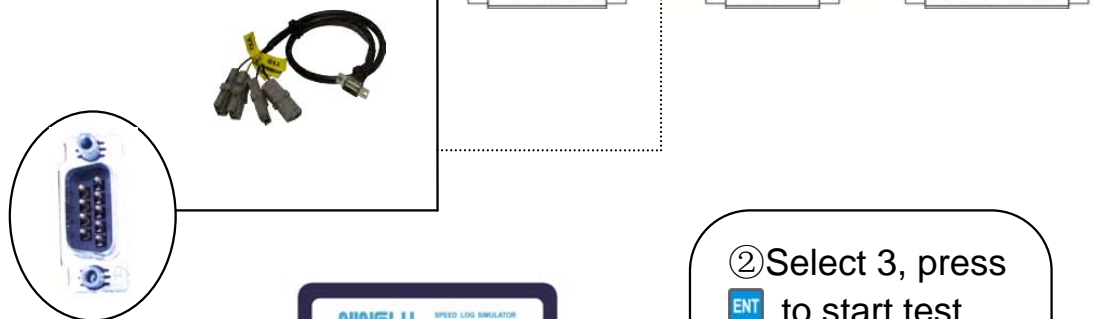
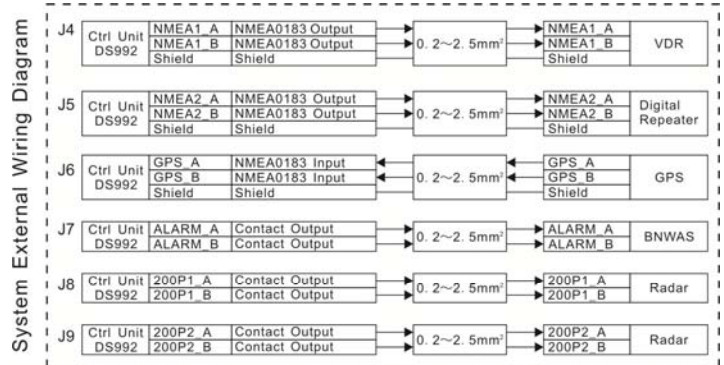
Note: After return back the main menu, the settings will be returned to factory default.

# Operation

## NMEA0183 Test

Read the NMEA0183 sentences from the tested device.

In the main menu screen, press **▲** or **▼** to select "4. NMEA0183 TEST", press **ENT** to display the tested results, and press **ESC** to cancel and return to the main menu.



① Connect tested device's NMEA signal output port correctly, then open the tested device. Connect only one output port at a time.



② Select 3, press **ENT** to start test

RECEIVE MESSAGE. . .

NMEA TEST

\$VDVLW,215.46,N,1.81,N,,N,N\*7F  
\$VDVBW,1.8,,A,,V,,V,\*61



# Connection

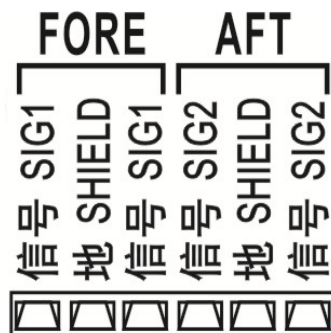
## Connection with Doppler Speed Log



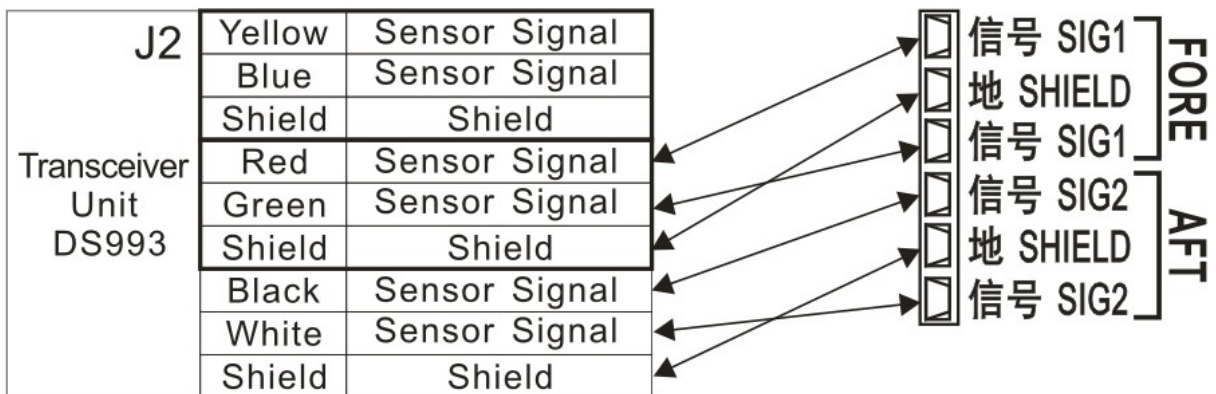
Use the simulator data cable (2 meters) to connect the Doppler speed log and SIM999 according to the signal instructions.

Transducer's fore signal

Transducer's aft signal



## Connection with Ninglu Doppler speed log DS99:



Note: The color marked on DS993's J2 port is not associated with connection cables provided by SIM999.

# Connection

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## Connection with NMEA0183 Interface



Use NMEA0183 cable (0.5 meters) to connect NMEA0183 output interface and SIM999 according to the signal instructions.

Cable color	Signal	Cable color	Signal
Red	No use	Blue	RXA (-)
Black	No use	Yellow	RXB (+)

Refer to NMEA signal instructions of the tested device, connect NMEA A or - with the blue cable, and connect NMEA B or + with the yellow cable.