



USER MANUAL

SART TESTER NST-200

MODIFY RECORD

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1. PURPOSE

SART Tester NST-200 (further Tester) is intended to carry out the tests of any Radar-SART in accordance with the requirement of SOLAS Convention 74/88 and Recommendations of ITU-R M.628-2 of Maritime Registry of Shipping.

In order to check the Radar-SART, the Tester creates the request pulse in automatic mode with following parameters:

- Carrier frequency of the request pulses - 9350 MHz;
- Request pulse repetition rate - 1000 Hz;
- Duration of request pulse - 1.4 μ s.

The Tester allows performing in automatic mode:

- Signal reception and verifying the frequency in range of 9140 ~ 9560 MHz;
- Measurement of response signal duration in range of 50 ~ 150 μ s;
- Indication of response signal power level in range of 300 ~ 950 mW;
- Counting the number of sweeps in response signal;
- Calculation of the distance from SART across radial line on the radar screen;
- Printing of full test report.

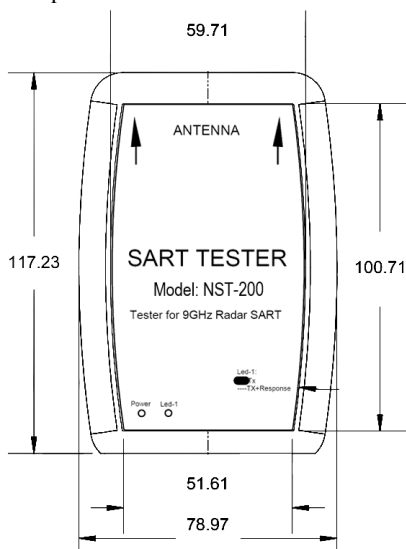


Fig.1-1. Tester's front view

The Tester is designed to operate in range of + 5°C to + 55°C and 95% relative humidity in internal ship space.

2. GENERAL DESCRIPTION AND SPECIFICATION

- The Tester requires the connection to a personal computer or laptop by means of USB port for test performance. Free software is available for Windows and Mac OS;
- Dimensions: 117 mm x 76 mm x 23 mm, weight: 105g.

The Tester creates request pulses with parameters showed in Table 2-1.

Table 2-1

No.	Parameter	Range (values)	Accuracy (±)
1	Carrier frequency, MHz	9140 ~ 9560	
2	Repetition rate, Hz	1000	5%
3	Duration, μs	1.4	5%

The Tester allows measuring the parameters of the response signal according to the table 2-2.

Table 2-2

No.	Parameter	Range (values)	Accuracy (±)
1	Duration, μs	50 ~ 150	5%
2	Power level, mW	300 ~ 950	2.0 dB

- The tester provides measurements of SART parameters in automatic mode;
- Current consumption of the Tester when working in measurement mode is ≤ 350 mA;
- The Tester allows checking the SART parameters and displaying the results on the PC screen with possibility to print it out.

3. COMPLETE SET

Complete set of the tester corresponds to the following Table 3-1.

Table 3-1

No.	Item	Quantity	Notice
1	SART TESTER NST-200	1	
2	USB-micro USB cable	1	
3	Software	1	
4	User's manual	1	

4. TESTER OVERVIEW AND OPERATION

The tester is designed to test and control Search and Rescue Radar Transponders (SART) of any manufacturer in accordance with the requirements of Convention SOLAS-74/88.

The tester is made in a plastic case and connects to the PC or laptop through USB cable. It is controlled by special software included in the complete set.

The tester allows measuring/calculating the following SART parameters in automatic mode:

- Signal reception and verifying the frequency;
- Measurement of duration of response signal;
- Indication of power level of response signal;
- Counting the number of sweeps in response signal;
- Calculation of the distance from SART across radial line on the radar screen.

The result of the test is displayed on the PC screen and can be saved to create and print the test report.

5. SETUP AND OPERATION PROCEDURES

5.1 Controls and connection elements.

There are two LEDs on the bottom panel of the Tester (Fig. 5-1).



Fig. 5-1. LEDs disposition

The GREEN LED indicates that the tester is ready for operation.
The RED LED indicates the beginning of the measurement.

When RED LED is constantly illuminating, the Tester emits a pulse request, but has not yet received the SART sweep signal.

When RED LED is flashing, the Tester is receiving SART sweep signal.

5.2 Tester connection to the computer.

If required, the driver should be installed when the Tester is turned on and connected for the first time to PC.

After the driver installation, STMicroelectronics Virtual Com Port with serial number should appear in device manager. Figure 5-2 shows an example with a connected tester.

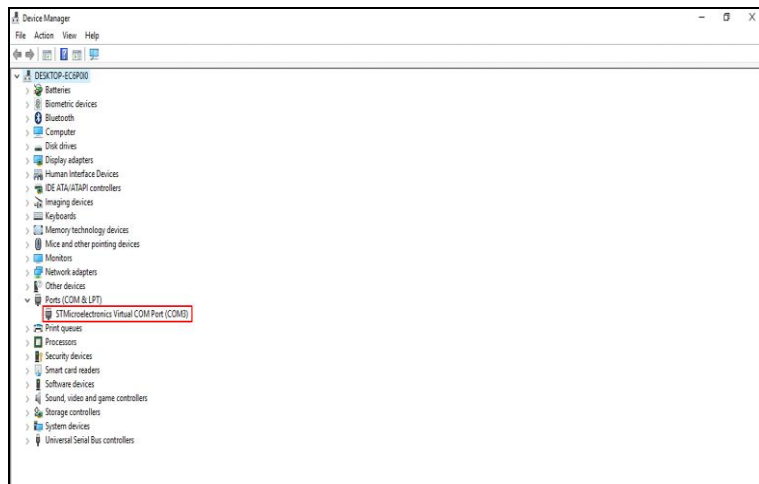
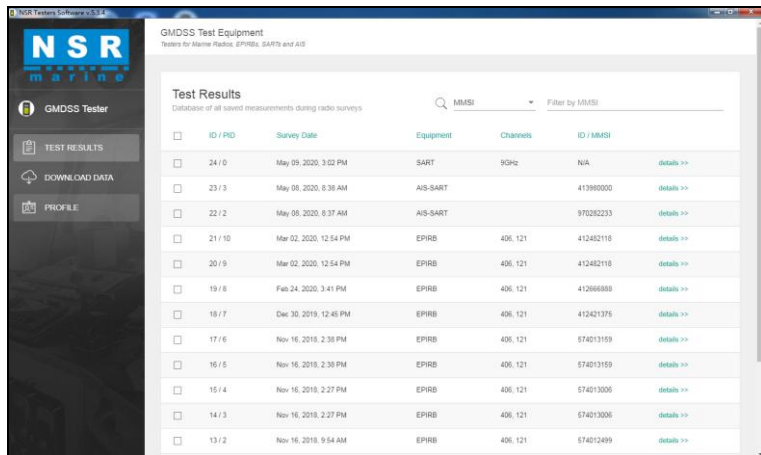


Fig. 5-2. Connected Tester in device manager

It is not required to install drivers on Windows 10 or Mac OS, just on older Windows versions.

5.3 PC software

After connecting, the tester starts the software with double clicking on its icon, the working window of the program will appear (Figure 5-3).



The screenshot shows the 'GMDSS Test Equipment' software interface. On the left is a dark sidebar with the 'NSR marine' logo and a 'GMDSS Tester' menu. The main window has a title bar 'GMDSS Test Equipment' and a subtitle 'Testers for Marine Radios, EPIRBs, SARTs and AIS'. Below the title bar is a 'Test Results' section with a subtitle 'Database of all saved measurements during radio surveys'. There is a search bar for 'MMSI' and a 'Filter by MMSI' dropdown. A table of test results is displayed with columns for 'ID / PID', 'Survey Date', 'Equipment', 'Channels', and 'ID / MMSI'. Each row includes a checkbox, a 'details >>' link, and a 'download' icon.

<input type="checkbox"/>	ID / PID	Survey Date	Equipment	Channels	ID / MMSI	details >>
<input type="checkbox"/>	24 / 0	May 09, 2020, 3:02 PM	SART	90Hz	N/A	download
<input type="checkbox"/>	23 / 3	May 09, 2020, 6:36 AM	AIS-SART		41398000	download
<input type="checkbox"/>	22 / 2	May 09, 2020, 6:37 AM	AIS-SART		97028233	download
<input type="checkbox"/>	21 / 10	Mar 02, 2020, 12:54 PM	EPIRB	406, 121	412482116	download
<input type="checkbox"/>	20 / 9	Mar 02, 2020, 12:54 PM	EPIRB	406, 121	412482116	download
<input type="checkbox"/>	19 / 8	Feb 24, 2020, 3:41 PM	EPIRB	406, 121	412666888	download
<input type="checkbox"/>	18 / 7	Dec 30, 2019, 12:46 PM	EPIRB	406, 121	412421375	download
<input type="checkbox"/>	17 / 6	Nov 16, 2019, 2:38 PM	EPIRB	406, 121	574013159	download
<input type="checkbox"/>	16 / 5	Nov 16, 2019, 2:38 PM	EPIRB	406, 121	574013159	download
<input type="checkbox"/>	15 / 4	Nov 16, 2019, 2:27 PM	EPIRB	406, 121	574013006	download
<input type="checkbox"/>	14 / 3	Nov 16, 2019, 2:27 PM	EPIRB	406, 121	574013006	download
<input type="checkbox"/>	13 / 2	Nov 16, 2019, 9:54 AM	EPIRB	406, 121	574012499	download

Figure 5-3. Working window of the program

5.3.1. DOWNLOAD DATA menu

Click on the "DOWNLOAD DATA" tab in the upper left corner of the program, the program will try to connect to the Tester.

If the Tester does not connect automatically, it can be connected manually by pressing CONNECT MANUALLY button.

Follow the instructions in software. Install drivers if required.

5.3.2. SART measurement window

After the Tester is connected, the SART measurement window should appear on the screen. Refer to the example in figure 5-4.

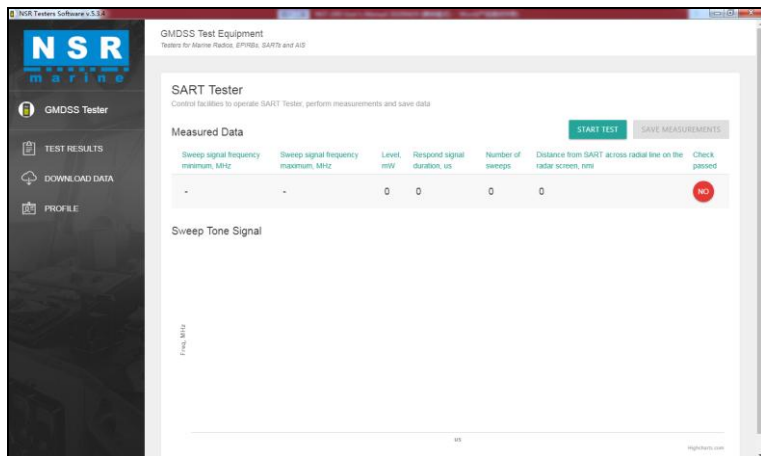


Figure 5-4. SART measurement window

5.3.3. Beginning of SART measurement

To begin the measurement, it is necessary to:

1. Click on the START TEST tab in the program window as shown in Figure 5-5.
2. Turn on the SART.

The test will be finished automatically when all data is correctly measured.

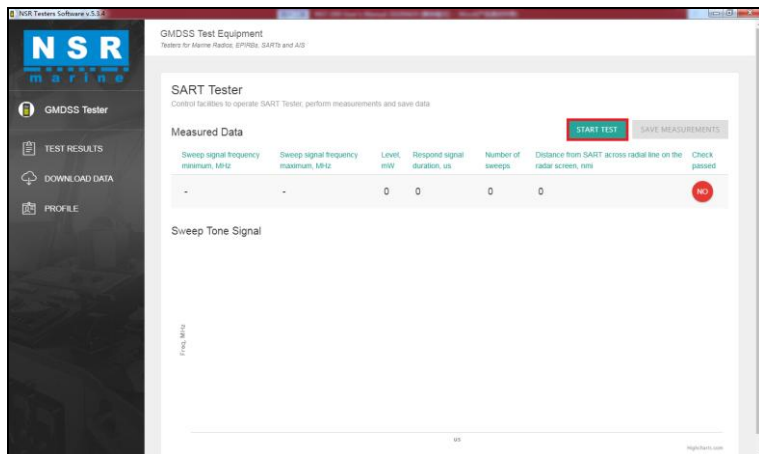


Figure 5-5. START TEST Tab

- Place the Tester at a distance of 0.2 m from the SART antenna as shown in Figure 5-6.



Figure 5-6. SART measurement process

- Changing the distance and slightly turning the Tester to achieve a clear picture of the sweep signal on the graph and wait for the end of the measurement.

The measurement is successful if the Check passed indicator turns green and the Tester stops producing audio signal. The successful measurement is shown in Figure 5-7.

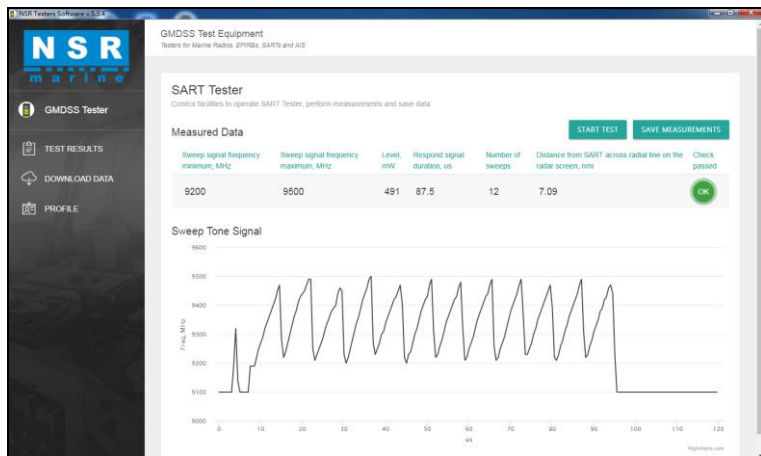


Figure 5-7. Successful SART measurement

5.3.4. Measurement parameters

After successful measurement the following parameters are displayed:

- Indication of the minimum and maximum sweep signal frequency. The result OK means that the frequencies are within the range of acceptable values;
- Power level in mW;
- Duration of the received signal in us;
- Number of received signal sweep pulses;
- Distance from the SART position across radial line on the radar screen in nm.

5.3.5. Report saving and print out

The SART TESTER program allows saving measured parameters, generate and print TEST REPORT.

To save the measured parameters, click on the SAVE MEASUREMENT tab as shown in Figure 5-8.

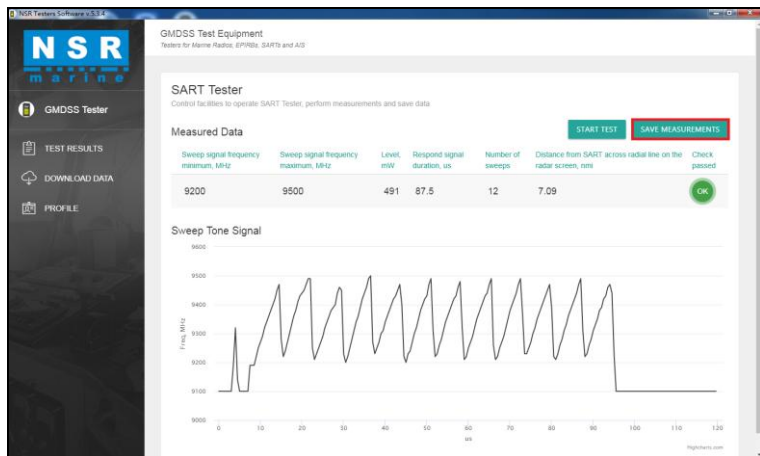


Figure 5-8. Saving of the measured parameters

After saving the measurement parameters, the TEST RESULTS table is displayed on the screen:

GMDSS Test Equipment
Testers for Marine Radios, EPRBs, SARTs and AIS

Test Results
Database of all saved measurements during radio surveys

Search: MMSI Filter by MMSI

<input type="checkbox"/>	ID / PID	Survey Date	Equipment	Channels	ID / MMSI	details >>
<input type="checkbox"/>	25 / 0	May 09, 2020, 3:28 PM	SART	90Hz	N/A	details >>
<input type="checkbox"/>	24 / 0	May 09, 2020, 3:02 PM	SART	90Hz	N/A	details >>
<input type="checkbox"/>	23 / 3	May 08, 2020, 8:38 AM	AIS-SART		41390000	details >>
<input type="checkbox"/>	22 / 2	May 08, 2020, 8:37 AM	AIS-SART		97026233	details >>
<input type="checkbox"/>	21 / 10	Mar 02, 2020, 12:54 PM	EPRB	406, 121	412482118	details >>
<input type="checkbox"/>	20 / 9	Mar 02, 2020, 12:54 PM	EPRB	406, 121	412482118	details >>
<input type="checkbox"/>	19 / 8	Feb 24, 2020, 3:41 PM	EPRB	406, 121	412668888	details >>
<input type="checkbox"/>	18 / 7	Dec 30, 2019, 12:45 PM	EPRB	406, 121	412421375	details >>
<input type="checkbox"/>	17 / 6	Nov 16, 2018, 2:38 PM	EPRB	406, 121	574013159	details >>
<input type="checkbox"/>	16 / 5	Nov 16, 2018, 2:38 PM	EPRB	406, 121	574013159	details >>
<input type="checkbox"/>	15 / 4	Nov 16, 2018, 2:27 PM	EPRB	406, 121	574013006	details >>
<input type="checkbox"/>	14 / 3	Nov 16, 2018, 2:27 PM	EPRB	406, 121	574013006	details >>

Figure 5-9. TEST RESULTS table

Click the DETAILS key to input additional data like SART, vessel details etc. to be used in test report.

GMDSS Test Equipment
Testers for Marine Radios, EPRBs, SARTs and AIS

Test Results
Database of all saved measurements during radio surveys

Search: MMSI Filter by MMSI

<input type="checkbox"/>	ID / PID	Survey Date	Equipment	Channels	ID / MMSI	details >>
<input type="checkbox"/>	25 / 0	May 09, 2020, 3:28 PM	SART	90Hz	N/A	details >>
<input type="checkbox"/>	24 / 0	May 09, 2020, 3:02 PM	SART	90Hz	N/A	details >>
<input type="checkbox"/>	23 / 3	May 08, 2020, 8:38 AM	AIS-SART		41390000	details >>
<input type="checkbox"/>	22 / 2	May 08, 2020, 8:37 AM	AIS-SART		97026233	details >>
<input type="checkbox"/>	21 / 10	Mar 02, 2020, 12:54 PM	EPRB	406, 121	412482118	details >>
<input type="checkbox"/>	20 / 9	Mar 02, 2020, 12:54 PM	EPRB	406, 121	412482118	details >>
<input type="checkbox"/>	19 / 8	Feb 24, 2020, 3:41 PM	EPRB	406, 121	412668888	details >>
<input type="checkbox"/>	18 / 7	Dec 30, 2019, 12:45 PM	EPRB	406, 121	412421375	details >>
<input type="checkbox"/>	17 / 6	Nov 16, 2018, 2:38 PM	EPRB	406, 121	574013159	details >>
<input type="checkbox"/>	16 / 5	Nov 16, 2018, 2:38 PM	EPRB	406, 121	574013159	details >>
<input type="checkbox"/>	15 / 4	Nov 16, 2018, 2:27 PM	EPRB	406, 121	574013006	details >>
<input type="checkbox"/>	14 / 3	Nov 16, 2018, 2:27 PM	EPRB	406, 121	574013006	details >>

Figure 5-10. DETAILS key

To generate a measurement report, click the details tab and then **GENERAL TEST REPORT**.

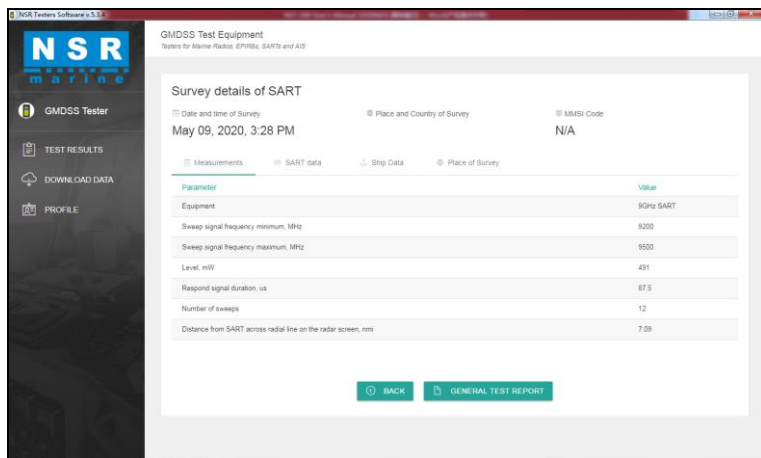


Figure 5-11. GENERAL TEST REPORT

To print the report, press the PRINT key or export to PDF/DOC.

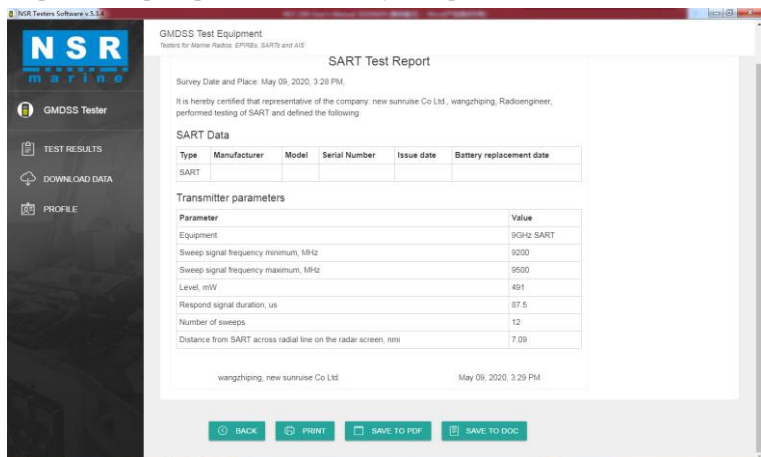


Figure 5-12. Test report

6. TESTER CALIBRATION

The Tester is a complex special-use electric device. Thus, only manufacturer should calibrate it by means of specialized equipment.

The Tester should be calibrated every two years, but no more than 1000 cycles of measurements.

7. GENERAL GUIDELINES

It is necessary to keep the Tester in package for at least two hours in normal conditions after it was substantial temperature variations in the warehouse and working areas.

After storage in conditions of high humidity, the Tester must be kept in normal conditions for 12 hours before turning ON.

8. SAFETY PRECAUTIONS

Before operating with SART Tester, please read this Technical description and user's manual, and attend safety training.