SERVICE MANUAL

Voyage Data Recorder (VDR) / NVR-9000

&

Simplified Voyage Data Recorder (S-VDR) / NVR-9000S

NVR-9000 & NVR-9000S SM.E 20260205-10

NOTICE

Ensuring the vessel's safety is the navigation officer's obligatory responsibility.
Using the equipment does not relieve the user from taking any safety precautions or checking whether it is compulsory or otherwise following international and national rules.

SAFETY INSTRUCTIONS

NOTICE	This notice indicates an unsafe operation that, if not avoided, could result in property damage or equipment malfunction.

WARNING
 High Voltages are located over many areas in the systems!
Caution during operations: Never touch or have any body contact with active electrical circuits!
All relevant safety regulations and safety standards must be closely observed.

CAUTION
Maintenance and repairs must only be carried out by trained and qualified personnel with knowledge of electrical devices.
Observe handling regulations! Removal or inserting a subgroup or printed wiring board with live voltage can lead to severe damage.
Never insert fuses with values other than those stipulated!

Observe the following compass safe distance to prevent deviation of magnetic compass:

No.	Component Name	Part Type	Standard compass	Steering compass
1	Data Acquisition Unit (DAU)	NVR9001	2.00m	1.20m
2	Data Extension Unit (DEU)	NVR9002	1.45m	0.95m
3	Remote Alarm U nit (RAU)	NVR9003	0.35m	0.20m
4	Video Interface Unit (VIU)	NVR9004	0.95m	0.55m
5	Fixed Protective Capsule (FPC)	NFP-2000C	1.00m	0.55m
6	Float-Free Capsule (FFC)	NEB-2000C-VDR	0.90m	0.45m

PREFACE

This Manual provides installation and commissioning information for the NVR-9000(S). The manual is intended for use by qualified installation personnel only.

Installation and maintenance must only be undertaken by qualified service engineers, New Sunrise Ltd, and approved agents. Unauthorized repair of equipment during the Warranty period may invalidate the Warranty. If you wish to undertake the equipment maintenance, please ensure that the service engineers hold a valid authorization certificate from New Sunrise Co., Ltd.

If a unit exhibits an issue that cannot be rectified onboard, and a service engineer is required to attend to your vessel, please don’t hesitate to get in touch with our Service Centre and give all the following details:

1. Name of vessel (Phone number if available)
2. Equipment Type and Serial Number
3. Software status (version number)
4. Next port of call, ETA/ETD, and ship's agents
5. Fault description (with as much detail as possible)
6. Contact Name

You can find detailed contact information on the website: www.nsrmarine.com.

MODIFY RECORD

No.	Modify by	Date	Paragraph	Version	Reason
1	Q/A	2016/07/19		01	First edition
2	Q/A	2016/10/26	2.2	02	Product improvement
3	Q/A	2017/03/07		03	General modification
4	Q/A	2017/10/30	5.2.2	04	Beacon brand replacement
5	Q/A	2018/06/19		05	Cover modification
6	Q/A	2018/12/27		06	General modification
7	Q/A	2023/02/09	All	07	General modification
8	Q/A	2025/03/01	All	08	General modification
9	Q/A	2025/08/01	2.11	09	Section 2.11.6 addition
10	Q/A	2026/02/05	3.1, 3.10, 3.11, 4.4, 4.5, 4.13, 4.15	10	Some modification

VERSION COMPARISON TABLE

Manual Version	Program Version	Remarks
20250801_09 20260205_10	MCU: 1.36 20250108 APP : 2.19 20240812	

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1. OVERVIEW

1.1 Outline

Voyage Data Recorder (VDR) is designed to record and store in a secure and retrievable form, information concerning the ship's position, movement, physical status, and control command for the period leading up to and following an incident. It enables the accident investigators to review procedures and instructions at the moment leading up to an incident, and helps to identify the cause of the accident. The data recorded by the VDR can be used for vessel management, such as equipment health management and ship position management.

NVR-9000 is flexible enough to form a VDR or S-VDR, and easy to install and maintain. The product is designed to meet the following standards：

1. MSC.494 (104): AMENDMENTS TO THE PERFORMANCE STANDARDS FOR SHIPBORNE VOYAGE DATA RECORDERS (VDRs) (RESOLUTION MSC.333 (90))
2. MSC.493 (104): AMENDMENTS TO THE PERFORMANCE STANDARDS FOR SHIPBORNE SIMPLIFIED VOYAGE DATA RECORDERS (S-VDRs) (RESOLUTION MSC.163 (78), AS AMENDED)
3. MSC.333 (90): ADOPTION OF REVISED PERFORMANCE STANDARDS FOR SHIPBORNE VOYAGE DATA RECORDS (VDRs)
4. MSC 214 (81): ADOPTION OF AMENDMENTS TO THE PERFORMANCE STANDARD FOR SHIPBORNE VOYAGE DATA RECORDER (VDRS) (RESOLUTION A.861 (20)) AND PERFORMANCE STANDARD FOR SHIPBORNE SIMPLIFIED VOYAGE DATA RECORDER (S-VDRS) (RESOLUTION MSC.163 (78))
5. IEC 61996-1 (2021): Maritime navigation and radiocommunication equipment and systems - Shipborne voyage data recorder (VDR) - Part 1: Performance requirements, methods of testing, and required test results
6. IEC 61996-2 {Ed.2.0} 2007: Maritime navigation and radiocommunication equipment and systems - Shipborne voyage data recorder (VDR) - Part 2: Simplified voyage data recorder (S-VDR)-performance requirements, methods of testing and required test results
7. IEC 60945 (2002) incl. Corrigendum 1 (2008): Maritime navigation and radio communication equipment and systems - General requirements-methods of testing and required test results
8. IEC 62923-1 (2018): Maritime navigation and radiocommunication equipment and systems - Bridge alert management - Part 1: Operational and performance requirements, methods of testing, and required test results
9. IEC 62923-2 (2018): Maritime navigation and radiocommunication equipment and systems - Bridge alert management - Part 2: Alert and cluster identifiers and other additional features
10. IEC 61162-1 (2016): Maritime navigation and radiocommunication equipment and systems - Digital

interfaces - Part 1: Single talker and multiple listeners

11. IEC 61162-2 (1998): Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 2: Single talker and multiple listeners, high-speed transmission
12. IEC 61162-450 (2018): Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 450: Multiple talkers and multiple listeners - Ethernet interconnection

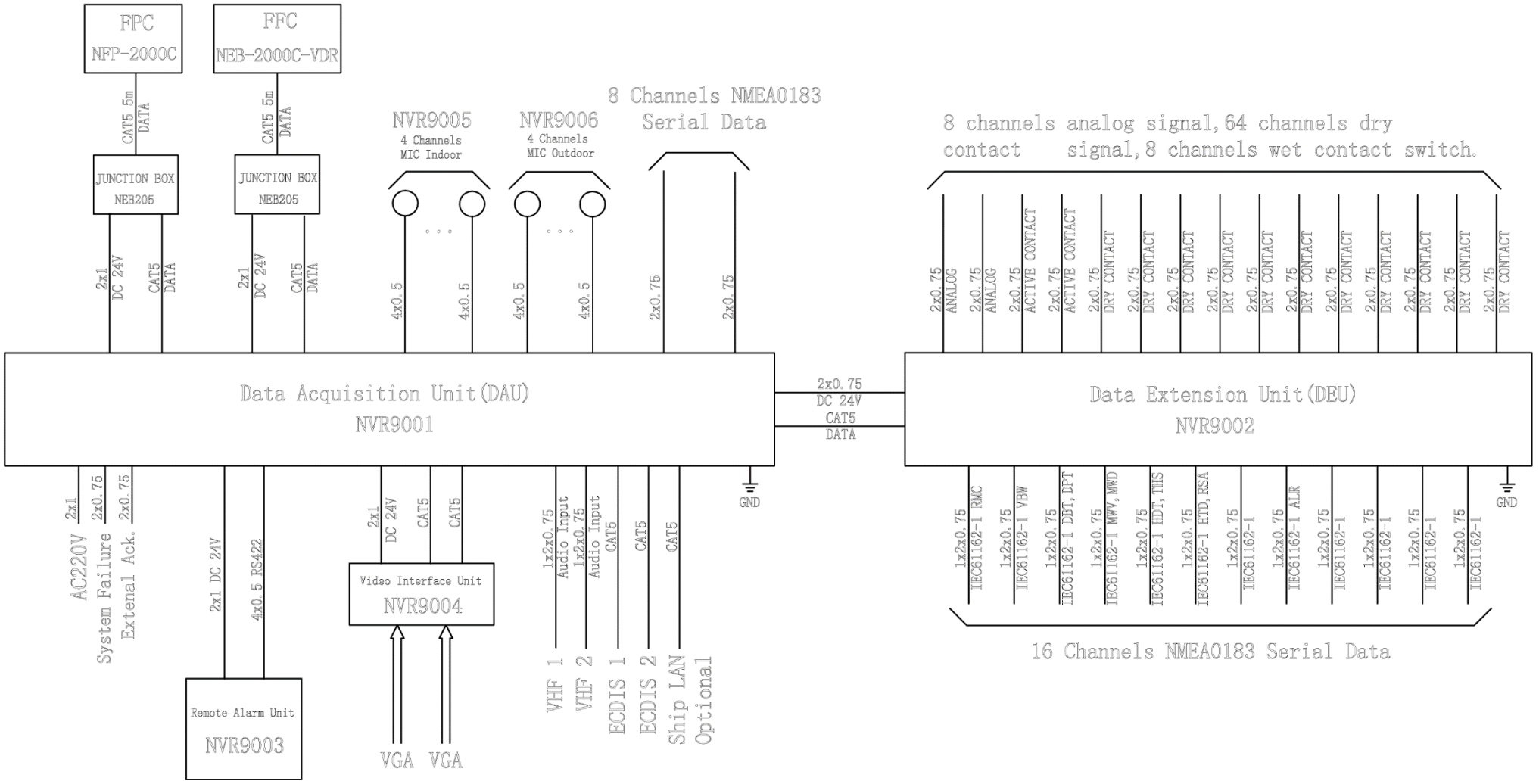
1.2 System configuration

NVR-9000 comprises 9 components as follows:

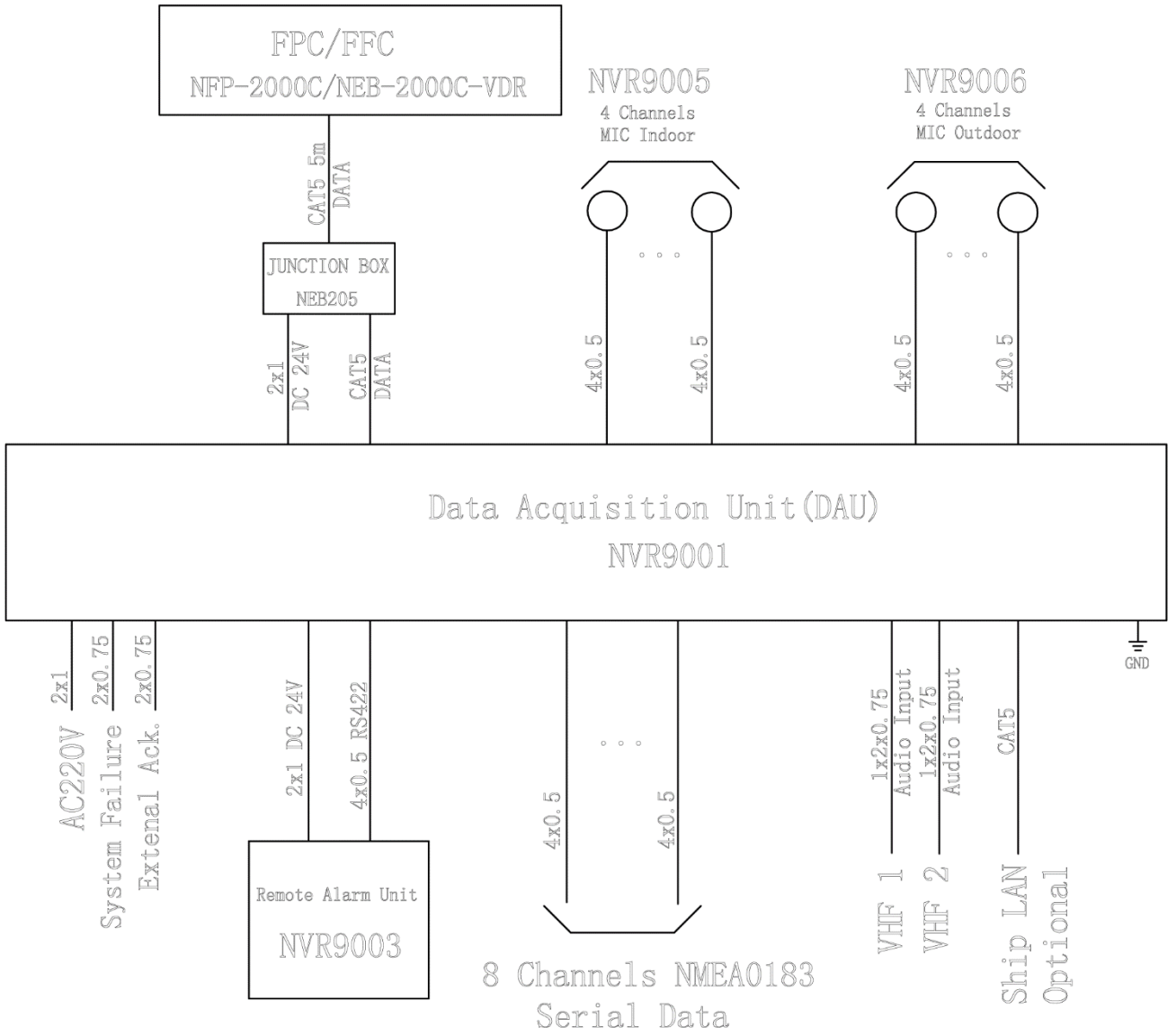
No.	Component Name	Part Type	NVR-9000 VDR	NVR-9000S S-VDR	Environmental Category
1	Data Acquisition Unit (DAU)	NVR9001	X	X	Protected
2	Data Extension Unit (DEU)	NVR9002	X	O	Protected
3	Remote Alarm Unit (RAU)	NVR9003	X	X	Protected
4	Video Interface Unit (VIU)	NVR9004	O	O	Protected
5	Indoor Microphone Unit (IMU)	NVR9005	X	X	Protected
6	Outdoor Microphone Unit (OMU)	NVR9006	X	X	Exposed
7	Fixed Protective Capsule (FPC)	NFP-2000C	X	X[Note]	Exposed
8	Float-Free Capsule (FFC)	NEB-2000C-VDR	X		Exposed
9	Junction Box for Capsule (JBC)	NEB205	X	X	Exposed

Note: *For* NVR-9000S *S-VDR, FPC or FFC may be selected.*

X: standard O: optional



NVR-9000 VDR SYSTEM CONFIGURATION



NVR-9000S S-VDR SYSTEM CONFIGURATION (standard)

1.3 System description

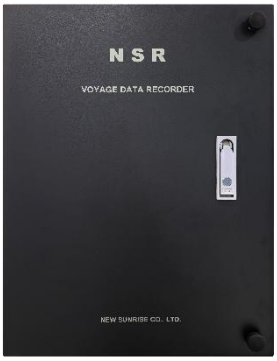
The VDR system continuously stores data in FPC and FFC for at least 48 hours and in LRU for at least 720 hours by overwriting the old data with new data.
NVR-9000 may record the following data:

- *Date and time*
- *Ship's Position*
- *Speed*
- *Heading (true)*
- *Heading (magnetic)*
- *Depth (Echo sounder)*
- *Main Alarms*
- *Rudder sensor angle*
- *Rudder order status*
- *Heading/track control command*
- *Heading/track control data*
- *Engine order/response*
- *Hull openings (doors) status*
- *Watertight and fire door status*
- *Accelerations and hull stresses*
- *Wind speed and direction*
- *AIS*
- *VDR alert output*
- *Heartbeat supervision sentence*
- *Electronic logbook*
- *Bridge Audio*
- *Communications Audio*
- *Radar Data*
- *ECDIS*

When the power supply fails:
NVR-9000 is powered with AC220V/AC110V. If the ship's main and emergency power sources fail, the VDR will be powered by a backup battery (NBT900) to keep recording the bridge audio.

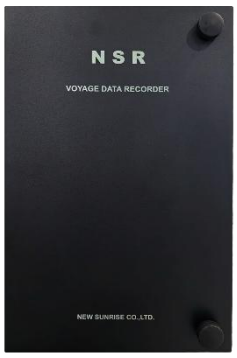
1.3.1 Data Acquisition Unit (DAU)

The Data Acquisition Unit (DAU) contains the Long-Term Recording Unit (LRU), network switch, main board, and audio board. The DAU controls the operation of the whole system. The LRU, with 512G memory, records the last 720 hours of data and is accessible by Ethernet while protected from unauthorized changes with seals. The DAU provides 8 channels of microphone input, 2 channels of VHF audio input, 2 ECDIS, and 8 serial inputs.
Note: *For S-VDR, the LRU is not mandatory. However, a 64GB SSD LRU is typically equipped in the DAU of NVR-9000S S-VDR.*



1.3.2 Data Extension Unit (DEU)

The Data Extension Unit (DEU) has 64 volt-free dry contact inputs, 8 wet contact inputs, 8 analog inputs for ±10V or 4-20mA signal, and 16 serial inputs.



Note:
Up to 4 DEUs may be connected to the DAU of NVR-9000 VDR.

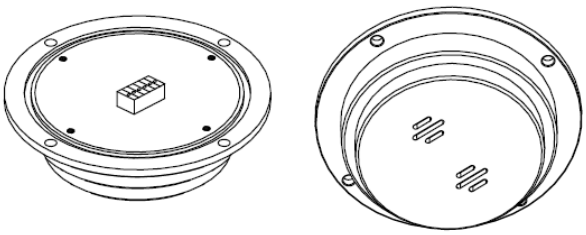
1.3.3 Remote Alarm Unit (RAU)

The Remote Alarm Unit (RAU) checks and displays alarms/alerts generated in the DAU.

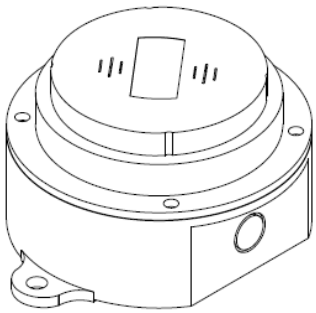
1.3.4 Indoor Microphone Unit (IMU) and Outdoor Microphone Unit (OMU)

The VDR system comes with two types of microphones: indoor and outdoor. Outdoor microphones are protected against water ingress.

- **Indoor Microphone Unit (IMU)**



- **Outdoor Microphone Unit (OMU)**

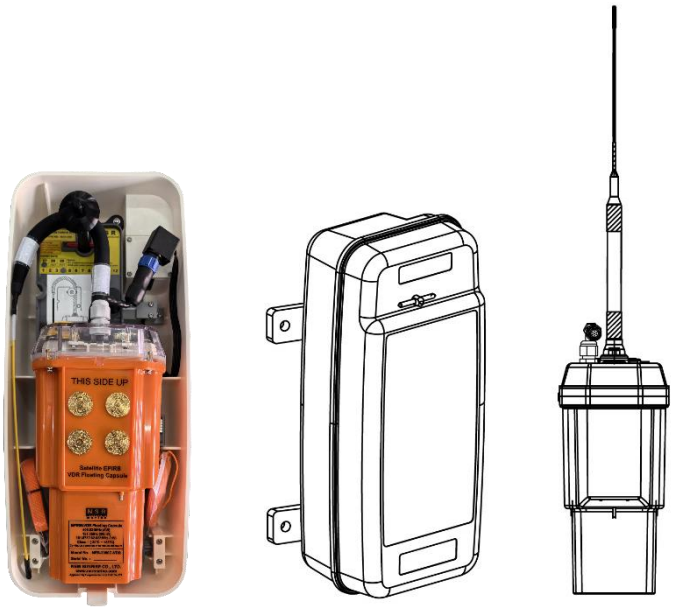


1.3.5 Fixed Protective Capsule (FPC)

A Fixed Protective Capsule (FPC) with a memory capacity of 64GB supports data recording for at least 48 hours. The capsule is built to withstand extreme environmental conditions such as 1100°C temperature, penetration, high underwater pressure, and immersion while maintaining data integrity.

1.3.6 Float-Free Capsule (FFC)

NEB-2000C-VDR Float-Free Capsule (FFC) complies with IMO A.810 (19), ITU-RM.633-3:2004, IEC61097-2 and IEC61096-7 regulations and requirements. Its memory capacity of 64GB can support more than 48 hours of recorded data. The internal battery (NBT400) can keep the FFC transmitting on 406MHz/121.5MHz for at least 168 hours.



1.3.7 Video Interface Unit (VIU)

A NVR9004 Video Interface Unit (VIU) converts the VGA signal into an Ethernet signal. The VGA input can be up to 1920 x 1080 high-definition resolution.

VIU NVR9004-1 supports one video channel, while VIU NVR9004-2 supports two video channels.

Four channels can be configured to support up to 4 IP addresses: 172.16.8.90, 172.16.8.91, 172.16.8.92, 172.16.8.93, along with Port 5000.

If only two channels are used, the IP addresses will be 172.16.8.90 and 172.16.8.91.

2. MAINTENANCE

2.1 List of consumable parts

The following are consumable parts in the NVR-9000 VDR system.

Location	Part Name	Part Type	Shelf Life (year)	Service Life (years)	Replacement Instruction
NVR9001 DAU	Backup battery	NBT900	1	4	Refer to 2.3
NFP-2000C FPC	Acoustic beacon	BC90	1	3	Refer to 2.4
NEB-2000C-VDR FFC	FFC battery	NBT400	1	5	Refer to 2.5
	FFC container kit	NCC-100	1	2	Refer to 2.6

Shelf life is the maximum stock time at the distributor's or/and dealer's warehouse. It's also the time from the shipping date from NSR to the installation date on a vessel.
Service life is the maximum lifetime the product can be labeled for.

⚠WARNING

Batteries should have two terminals insulated before disposal because the remaining power could cause severe harm to humans. Local regulations should be followed to protect the environment when batteries are disposed of.

2.2 List of main boards

The following are the main PCB boards.

No	Unit	Parts	Remark
1	DAU	Main Control Unit – MCU (NVR905+NVR925)	
		Long-Term Recording Unit – LRU 512G (NVR901+NVR922) – LRU 64G (NVR901+NVR921)	 NVR-9000 512G NVR-9000S 64G
		Audio Compress Unit – ACU (NVR927+NVR915)	
		Audio Sample Unit (Audio Board)– ASU (NVR907)	ASU1, ASU2, ASU3
		Power Control Board (NVR902)	
		AC/DC PSU (NVR916)	
		Serial Data Board (NVR909)	
		100M-switch (NVR917)	Behind the second cover
		1000M-switch (NVR918)	
		Fuse (3A/5A)	
2	DEU	DEU Main Board (NVR910)	
		DEU Interface Board (NVR911)	

No	Unit	Parts	Remark
3	FPC	FPC Data Processor Board (NVR901)	
4	FFC	FFC Data Processor Board and SSD (NVR901 + NVR923)	
5	IMU	Indoor Microphone Unit (NVR9005)	
6	OMU	Outdoor Microphone Unit (NVR9006)	
7	RAU	Remote Alarm Unit (NVR9003)	

2.3 Replace backup battery in DAU: NBT900

1) Unplug the [BATT] power supply.
2) Release the protective cover.
3) Replace the NBT900.
4) Install the protective cover.
5) Plug in the [BATT] power.

NBT900

Note:

It's very important to replace with NSR NBT900 battery pack originally supplied/made by NSR, when the battery is expiry. NSR guarantees the quality of NSR VDR only when the original NSR battery pack is used.

When VDR was tested and type approved, NSR NBT900 was an integral part *of the VDR. If a counterfeit battery pack is used, this VDR will automatically lose the guarantee of all type approval certificates, and then, NSR will be exempted from the responsibility of warranty and other service guarantees. The counterfeit battery pack will affect the VDR from operating properly.*

2.4 Replace acoustic beacon on FPC: BC90

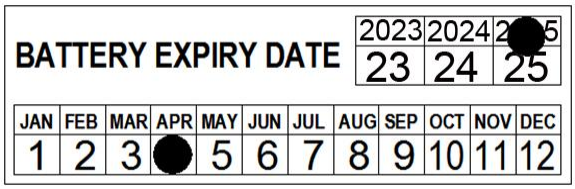
1) Remove the M5 inner hexagon screw.
2) Replace the Beacon.
3) Lock the screw.
4) Record the expiration date of the beacon.

2.5 Replace FFC battery: NBT400

The expiry date is marked on the beacon and should be checked regularly.

The NBT400 battery pack for the beacon comprises four 3.6V Lithium batteries. The NBT400 battery pack should be replaced when one of the following cases happens:
-The BEACON has been used in an emergency.
-A false activation exceeds 2 hours of use.
-The expiry date has been reached.

The expiry date can be found on the beacon by the attached expiry sticker.



For example, the above sticker is punched with an expiry date of April 2025.

It's very important to replace with the NBT400 battery pack originally supplied/made by NSR (together with a seal and a protector tab for replacement), when it has expired. **NSR guarantees the quality of NEB-2000C-VDR FFC/EPIRB only when the original NSR battery pack (NSR NBT400) is used.**

When NEB-2000C-VDR was tested and type-approved, NSR NBT400 was an integral part of the FFC/EPIRB unit. If a counterfeit battery pack is used, this FFC/EPIRB unit will automatically lose the guarantee of all type approval certificates unless all tests needed for type approvals have been done again for the unit installed with a counterfeit battery pack. Those tests and approval processes usually take 1-3 years, and the cost shall be borne by the supplier or buyer of the counterfeit battery.

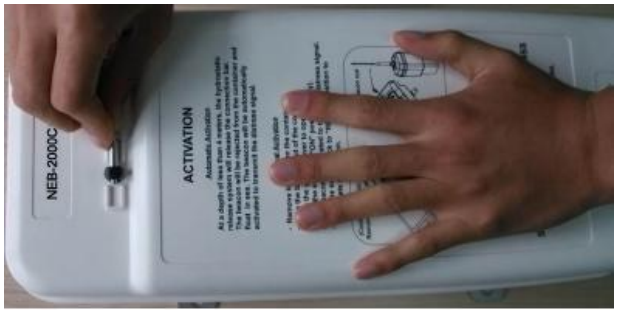
If a counterfeit battery pack is used on the NEB-2000-VDR, NSR will be exempted from the responsibility of warranty and other service guarantees. The counterfeit battery pack will affect the FFC/EPIRB unit from operating properly when the FFC/EPIRB unit is activated in an emergency.

The battery pack replacement should be performed by NSR, or the NSR-authorized EPIRB maintenance facility, or an NSR-authorized, trained and certified person.

Note:
Lithium batteries should have both terminals insulated before disposal, as any remaining power could cause severe harm to human safety. Local regulations should be followed when batteries are disposed of to protect the environment.

Replacement instructions:

1) Open the container to take out the beacon.



2) Loosen the front and rear four screws.
3) Unplug the two connecting cables.

4) Take out the battery pack.
5) Replace the battery.
6) Assemble in the reverse order of disassembly.

2.6 Replace FFC container kit: NCC-100

The NCC-100 FFC container kit, including the HRU and cable cutter, should be replaced every 2 years.

Please refer to Appendix C for replacement instructions.

2.7 Replace fuse and boards in DAU

2.7.1 Fuse replacement

When you open the DAU, you will see the fuses behind the back of the door: 3 A for the Battery and 5 A

for the AC power.

If the Fuse burns out, choose the right fuse to change.

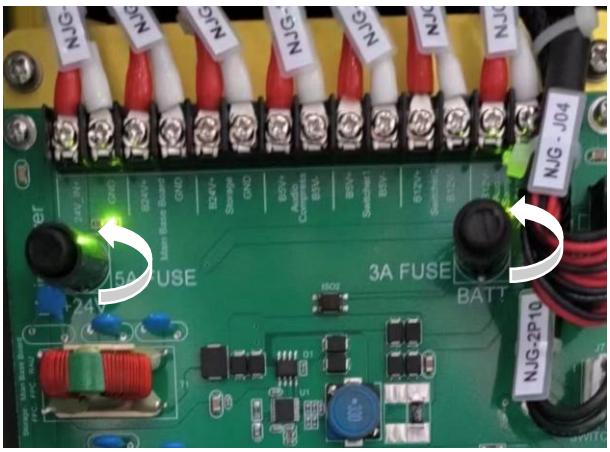
1) Remove the front cover.

2) Remove the shelter on the PCB boards and find the Main Power or the BATT.

3) Push the head of the black column and spin it a bit, the fuse will come out.

4) Pull out the fuse, and put a new fuse back.

5) Insert the new fuse into the right place.

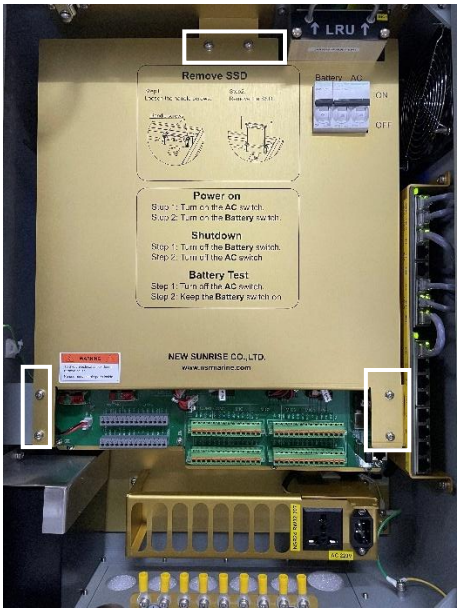


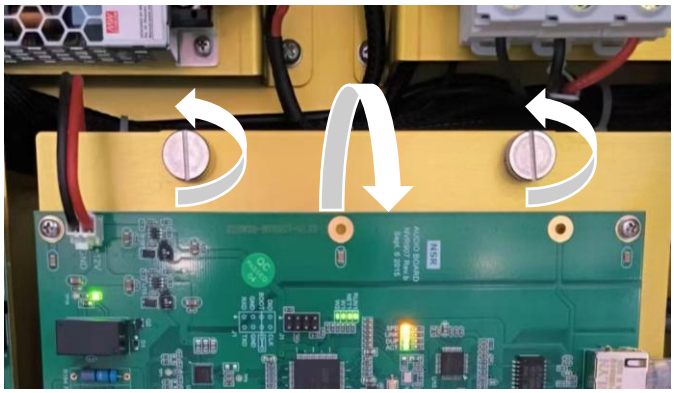
2.7.2 LRU replacement

1) Shut down the system and unplug the AC power.

2) Remove the front cover.

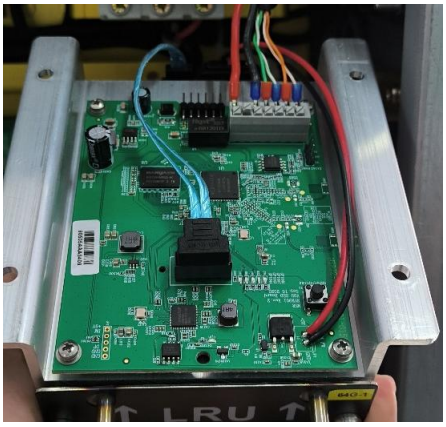
3) Loosen the two screws shown in the picture and open the second cover.





4) Release four Screws at the position as below.

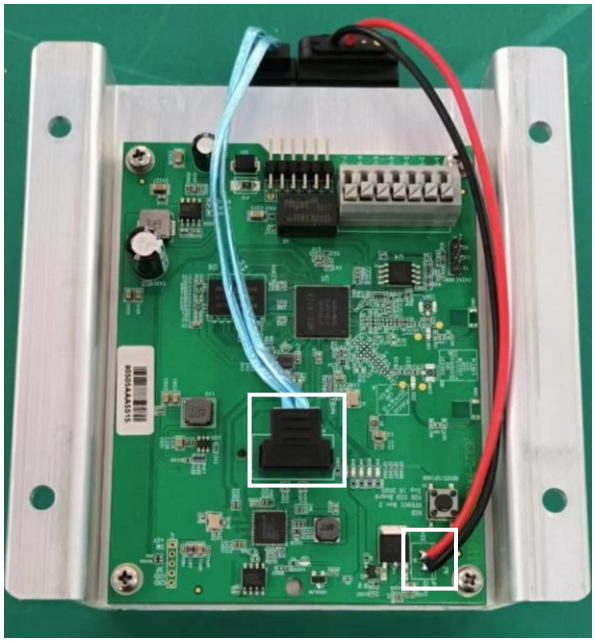
5) Remember the order and pull out the connecting cable.



6) Install the new LRU.

2.7.3 LRU Boards (NVR901/921/922) replacement

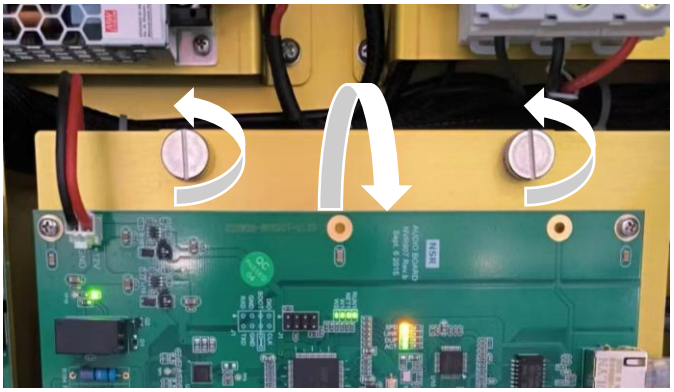
1) Refer to Section 2.7.2 (1-5).
2) Unplug the SATA cable and solder the 5V SSD power cable. Then replace the LRU SSD Board (NVR921/NVR922) or the Data processor board (NVR901).

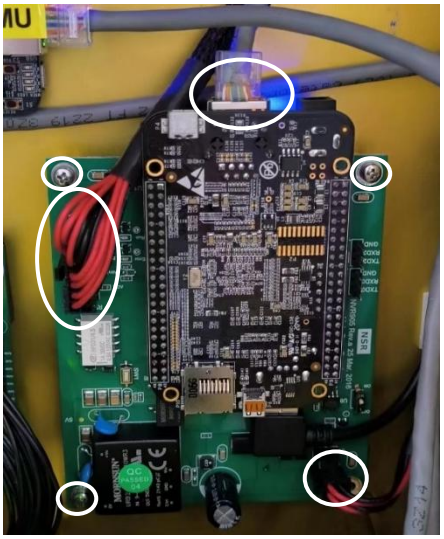


3) Assemble in the reverse order of disassembly.

2.7.4 MCU (NVR905/925) replacement

1) Remove the front cover.
2) Loosen the two screws shown in the picture and open the second cover.





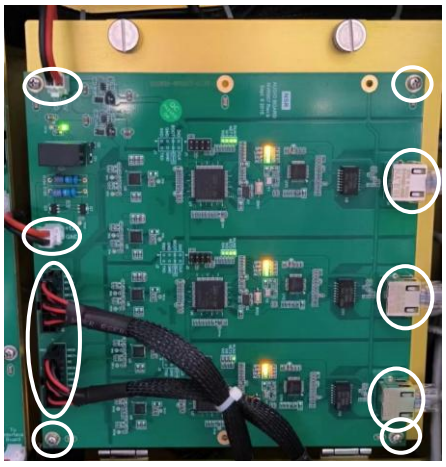
3) Find MCU (NVR905+NVR925).
4) Pull out the connection cable.
5) Loosen the screw and replace the MCU.
6) Resend the configuration file. You can find the configuration file in the downloaded data.

2.7.5 ACU (NVR915/917) replacement

1) Remove the front cover.
2) Loosen the two screws shown in the picture and open the second cover.
3) Find ACU (NVR927+NVR915).
4) Pull out the connection cable.
5) Loosen the screw and replace the ACU.

2.7.6 ASU (NVR907) replacement

1) Remove the front cover.
2) Find ASU/Audio PCB (NVR907).
3) Pull out the connection cable.
4) Loosen the screw and replace the ASU/Audio PCB.



2.7.7 Power Control Board (NVR902) replacement

1) Remove the front cover.
2) Find the Power Control Board (NVR902).
3) Pull out the connection cable.
4) Loosen the screw and replace the ASU.

2.7.8 Serial Data Board (NVR909) replacement

1) Remove the front cover.
2) Loosen two screws on the second cover and open it.
3) Find Serial Data Board (NVR909).
4) Pull out the connection cable.
5) Loosen the screw and replace the Serial Data Board (NVR909).

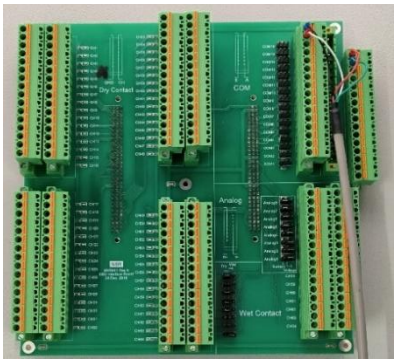
2.8 Replace boards in DEU

2.8.1 DEU Main Board (NVR910) replacement

1) Disconnect the power of the DEU.
2) Remove the DEU Interface Board (NVR911).
3) Loosen the screw and replace the DEU Main Board (NVR910).

2.8.2 DEU Interface Board (NVR911) replacement

1) Pull out the connector.
2) Loosen the screw and replace the DEU Interface Board (NVR911).

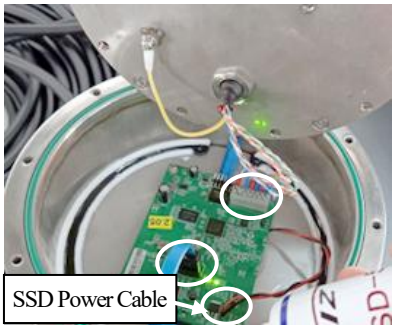


2.9 Replace boards in FPC

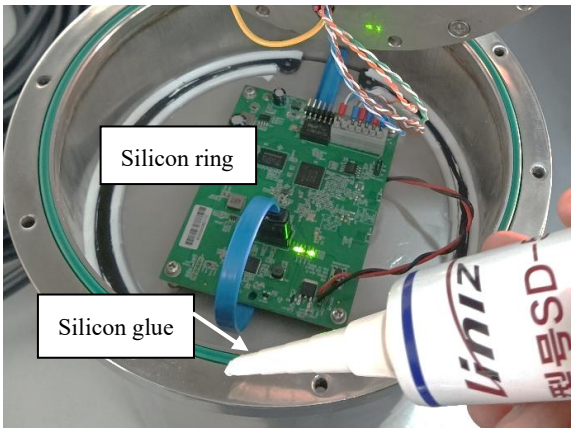
2.9.1 Data Processor Board (NVR901) replacement

1) Remove the M5 inner hexagon screw and open the protective cover.

2) Disconnect the cables.
3) Loosen the screw and replace the NVR901.
4) Soldering SSD power cable.
5) Connect the cables.



6) Install the silicon ring. Apply silicon glue to the contact area for the cover.

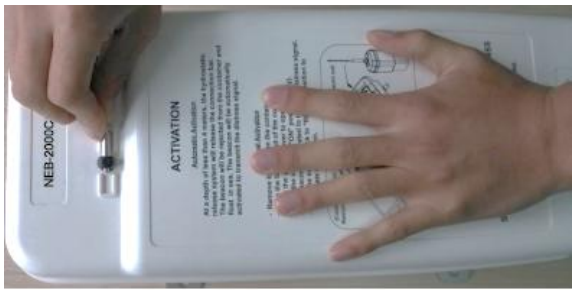


Note: *FPC's IP is 172.16.8.120. If the replaced NVR901 is set with the default IP 172.16.8.100, which needs to be changed.*

2.10 Replace boards in FFC

2.10.1 FFC Storage Boards (NVR901/923) replacement

1) Open the container to take out the beacon.

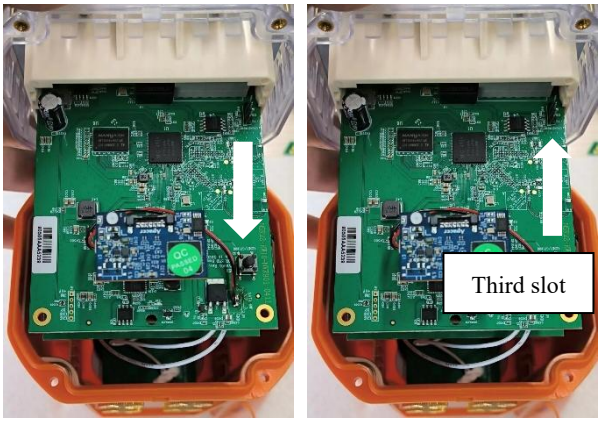


2) Loosen the front and rear four screws.

3) Take out the NVR901 (Data Processor Board) and NVR923 (SSD).

4) Insert the new NVR901+NVR923 into the third slot.

5) Assemble in the reverse order of disassembly.



2.11 Software update

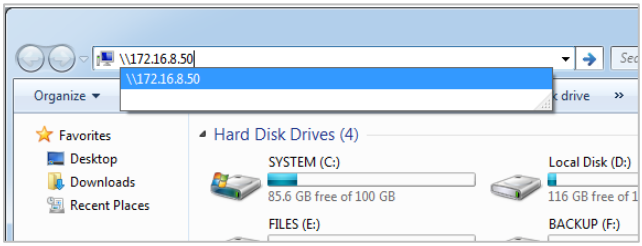
2.11.1 MCU update

1) Connect the PC and VDR with a network cable. Any network port is fine.

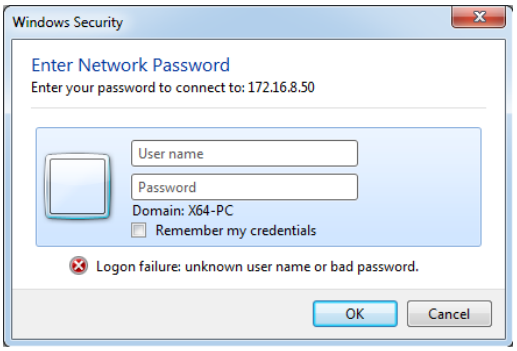
2) Configure the computer's IP address, subnet mask, and default gateway.

IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

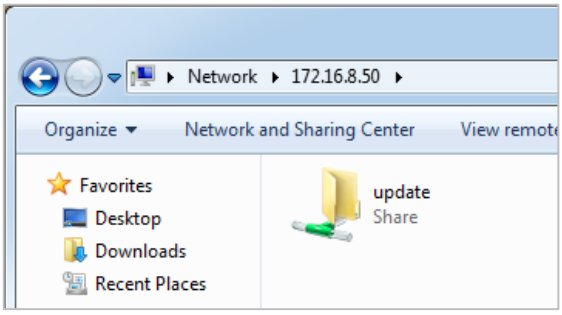
3) Enter " \\172.16.8.50 " in the address bar of the folder.

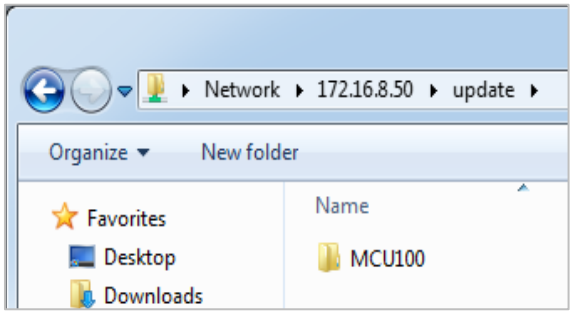


4) Input the user and password.
User: update, Password: 123456.



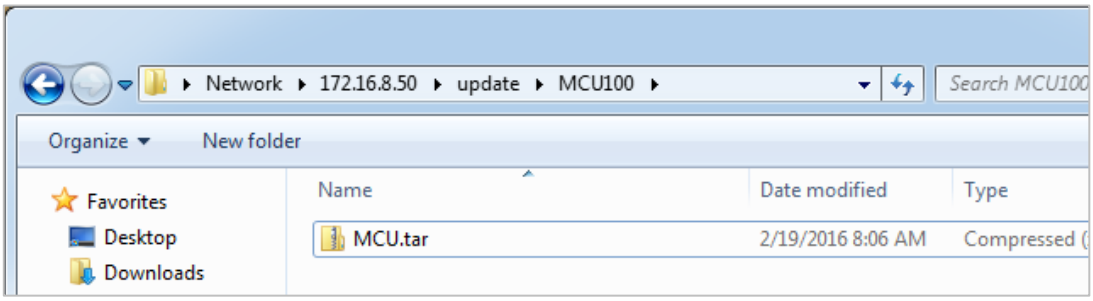
5) Enter the folder of update and you will see the MCU100.



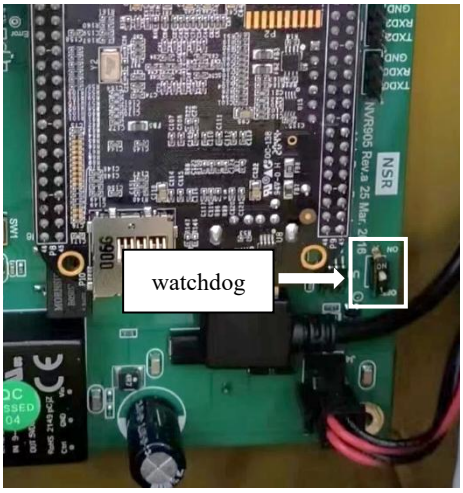


6) Copy the "MCU.tar" (update file) to MCU100.

***Wait for 1 minute, then restart NVR-9000*.**



Note: *When the MCU is not working properly, the MCU will restart in 2 min after powering on. Turn off the watchdog switch on the NVR905 to stop the restart.*



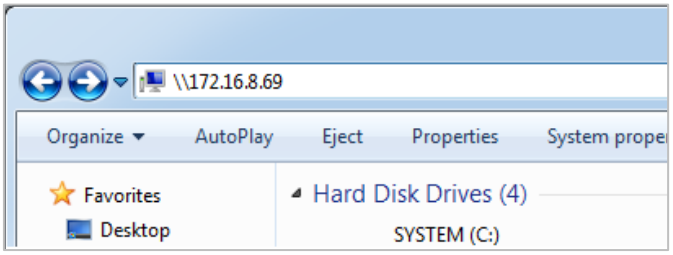
2.11.2 ACU update

1) Connect the PC and VDR with a network cable. Any network port is fine.

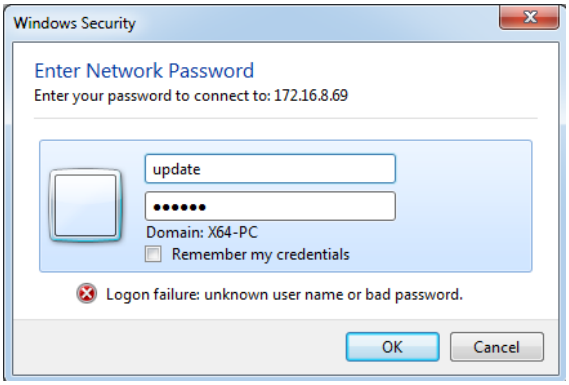
2) Configure the computer's IP address, subnet mask, and default gateway.

IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

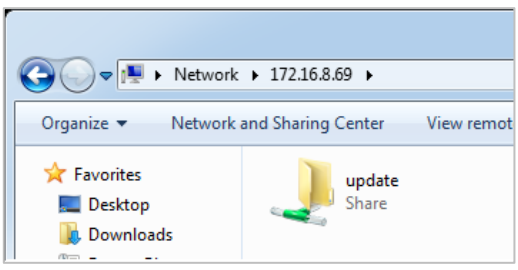
3) Enter "\\172.16.8.69 "in the address bar of the folder.

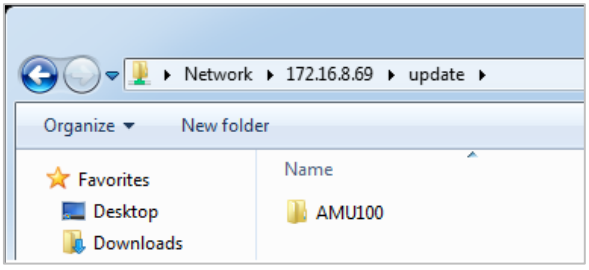


4) Input the user and password.
User: update, Password: 123456.



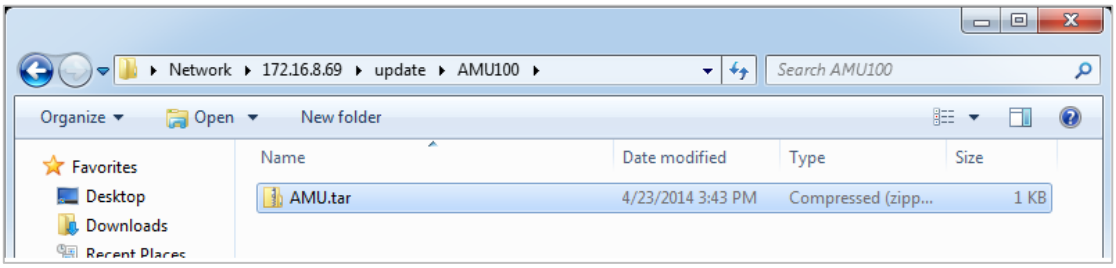
5) Enter the folder of update and you will see the AMU100.





6) Copy the AMU.tar (update file) to AMU100.

***Wait for 1 minute, then restart NVR-9000*.**

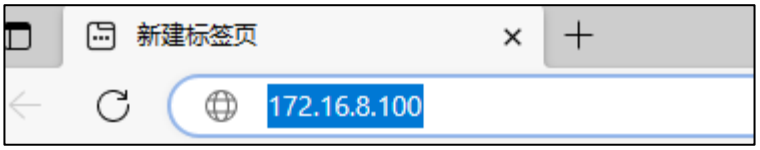


2.11.3 LRU/FFC/FPC update

1) Connect the PC and VDR with a network cable. Any network port is fine.
2) Configure the computer's IP address, subnet mask, and default gateway.

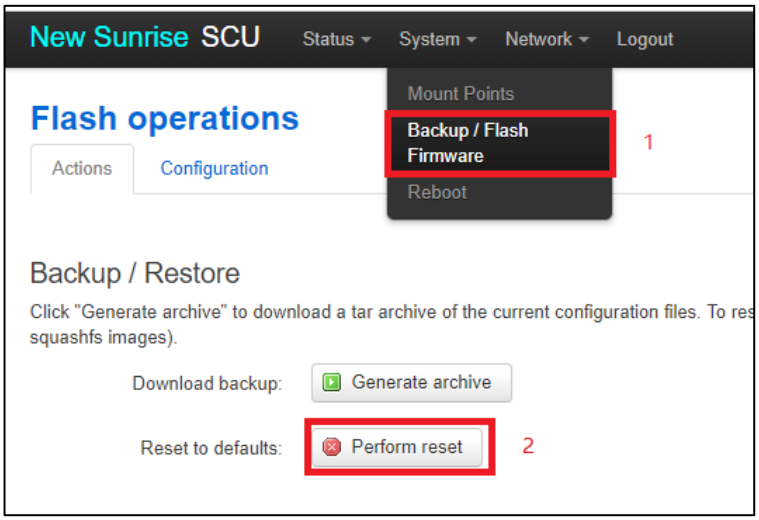
IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

3) Enter the IP in the browser.
LRU: 172.16.8.100
FFC: 172.16.8.110
FPC: 172.16.8.120



4) Login, User: root, Password: 123.

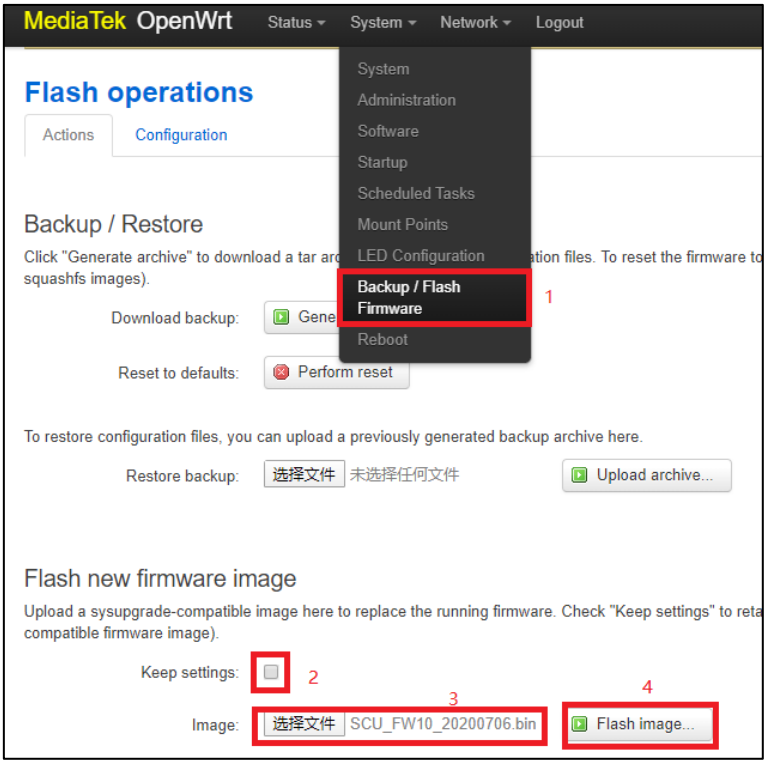
5) Go to [System] - [Backup / Flash Firmware], click "Perform reset", then wait 2 min.



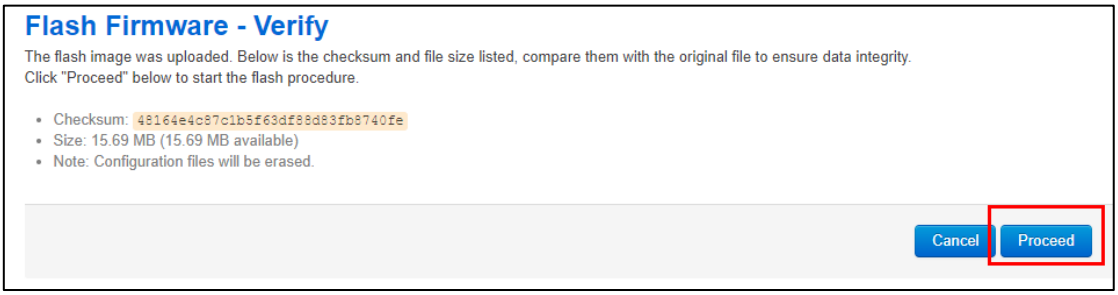
6) Configure the computer's IP address, Subnet mask, and Default gateway.

IP address	192.168.1.175
Subnet mask	255.255.0.0
Default gateway	192.168.1.1

7) Enter the IP in the browser: 192.168.1.1, operate like below, and select upgrade firmware.



8) Click Proceed.



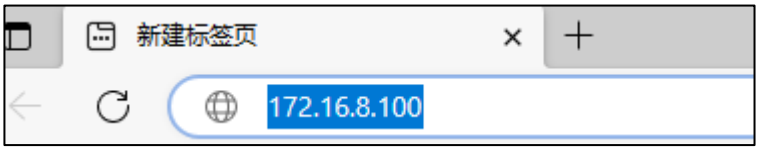
9) Wait about two minutes, and the upgrade is finished.

2.11.4 LRU/FFC/FPC SSD format

1) Connect the PC and VDR with a network cable. Any network port is fine.
2) Configure the computer's IP address, Subnet mask, and Default Gateway.

IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

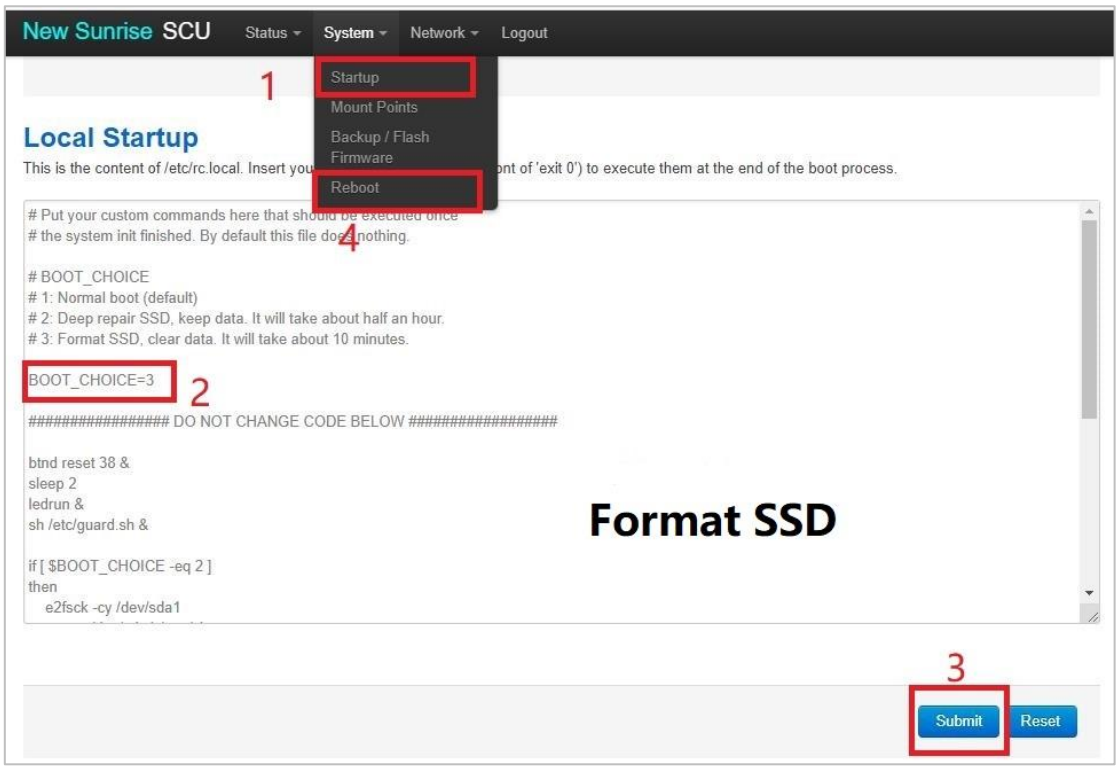
3) Enter the IP in the browser
LRU: 172.16.8.100
FFC: 172.16.8.110
FPC: 172.16.8.120



4) Login, User: root, Password: 123.

5) Follow the steps shown in the figure.

a. Go to “System -> Startup”.
b. Change BOOT_CHOICE to “**3**”.
c. Click “Submit”.
d. Click “System -> Reboot”.
e. Wait for about 10 min. The recorded time on RAU will be restored to 00.



6) After formatting the SSD, the data in the capsule is emptied. VDR needs to be reconfigured to save the configuration file to the recording medium.

a. Open VDRConfig.exe.

b. Click 

after “Get successfully”. Next,

c. Click 

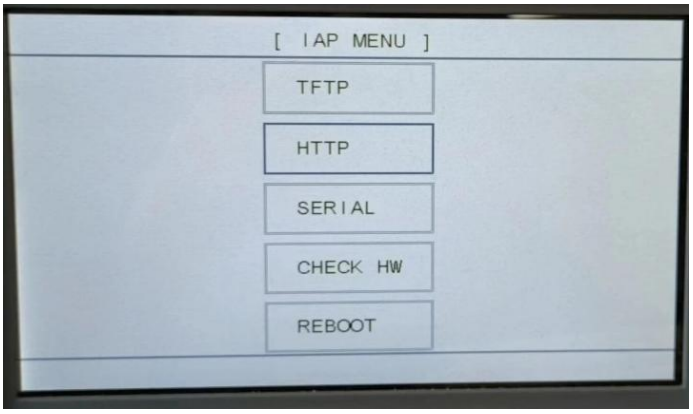
after “Send successfully”. It’s done.

2.11.5 RAU update

- **Via network port**

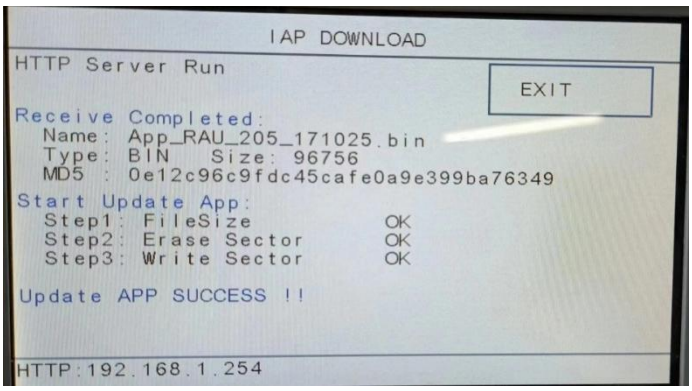
IP address	192.168.1.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

1) Connect the PC and RAU with a network cable.
2) Configure the computer's IP address, subnet mask, and default gateway.
3) Power off RAU.
4) Press and hold the [DIM] key, then power on, and enter [IAP MENU].
5) Select [HTTP].



6) Enter the IP "192.168.1.254" in the browser.
7) Load the Upgrade file, then "Upload".

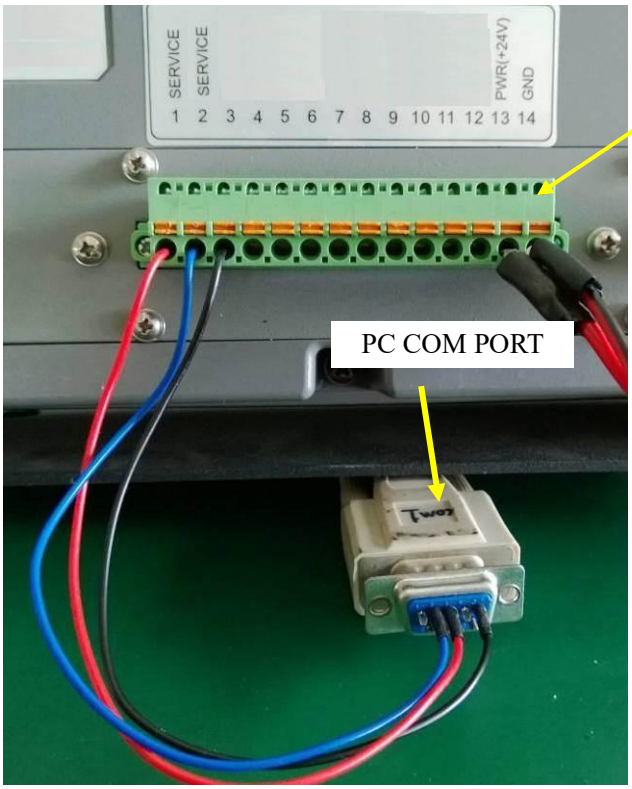
8) Show "Update APP SUCCESS!!" on RAU.



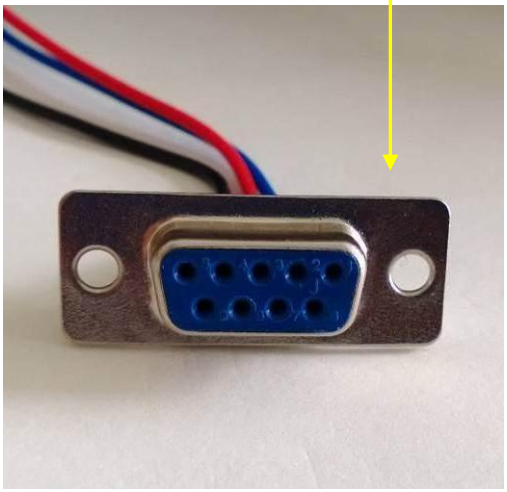
9) Click [EXIT] - [REBOOT].

- **Via RS232 port**

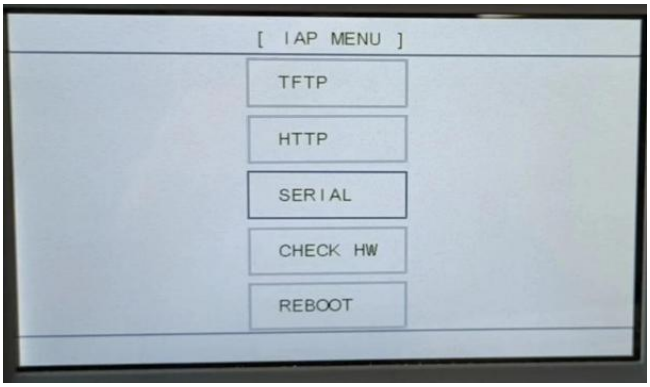
1) Connect RAU to the RS-232 port of the PC; a DB9 female cable is required.



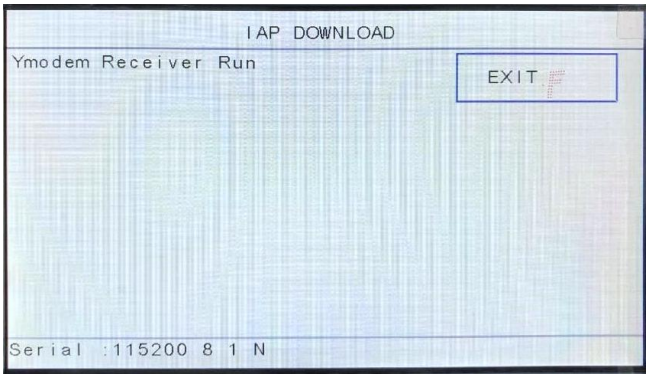
RAU Pin	DB9 Female Hole
3	5
1 SERVICE	3
2 SERVICE	2



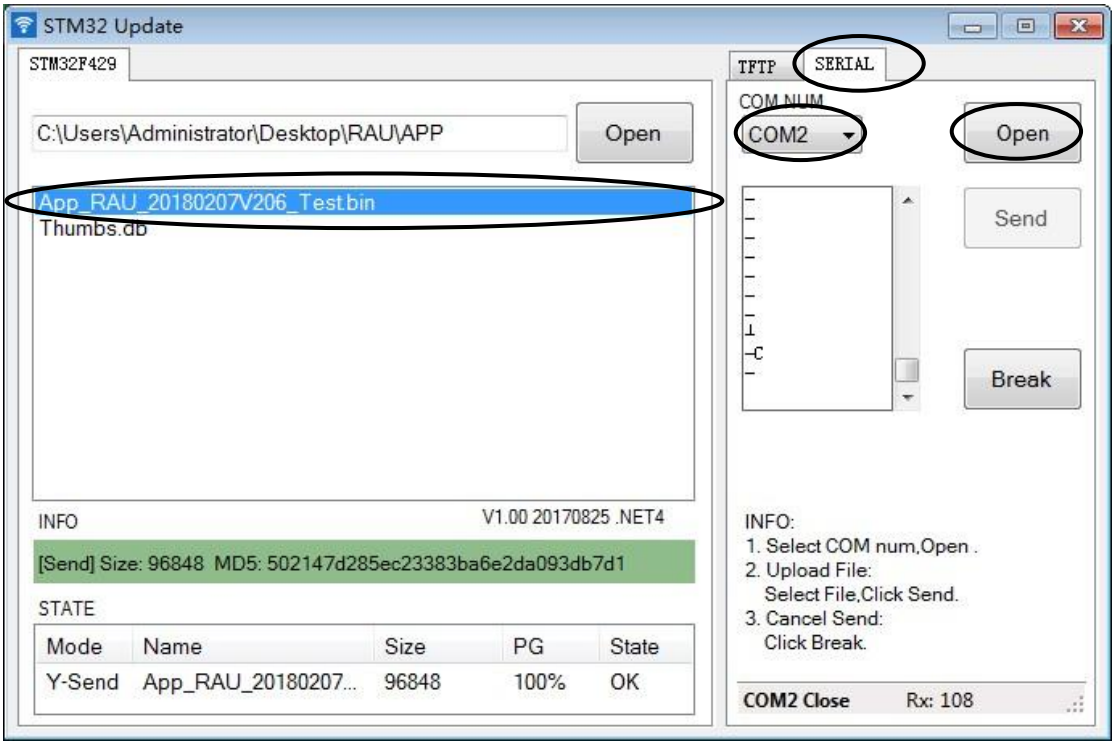
2) Power off RAU.
3) Press and hold the [DIM] key, then power on, and enter [IAP MENU].



4) Select [SERIAL] and enter [IAP DOWNLOAD].

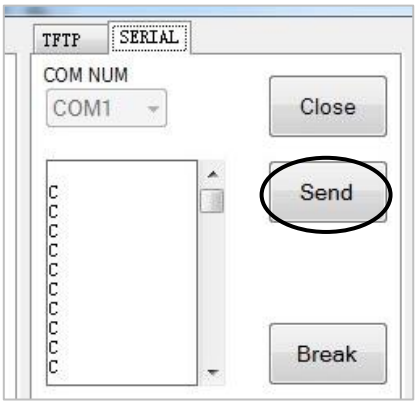


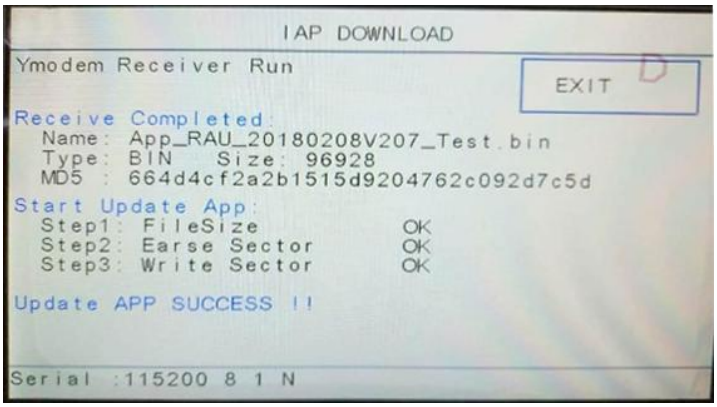
5) Open the software “STM32 update”, select page “SERIAL”, select the COM number (the number may be different for each computer), and click [Open].



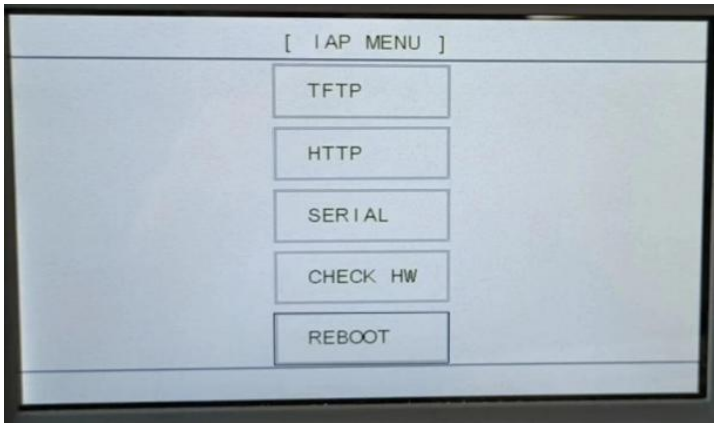
6) Select the bin file to update. The update file is “App_Rau-2xx-xxxxxx.bin”.

7) Click [Send]. After finished, click [EXIT] on RAU.





8) Then click [REBOOT] to restart RAU.



After the update, check the software of RAU in the menu: [MENU]-[DIAGNOSTICS]-[PROGRAM VERSION]-[RAU].

2.11.6 Software compatibility information

- **RAU**

Version No	Latest Version	Description
1.xx		5.7-inch silver bright LCD, update via RS232 port. It is recommended to replace the 7-inch color LCD directly if it has problems. The version depends on the MCU version V1 or V2.
<2.10	2.07, 190221	7-inch color LCD, SMT type core board, update via RS232 port.
⩾2.10	2.19, 240812	7-inch color LCD, plug-in type core board. As of Version 2.13, the alert system has been changed to BAM. It requires MCU version 1.26 or higher. If an upgrade is needed, it is recommended to update both RAU and MCU to the latest version simultaneously.

- **MCU**

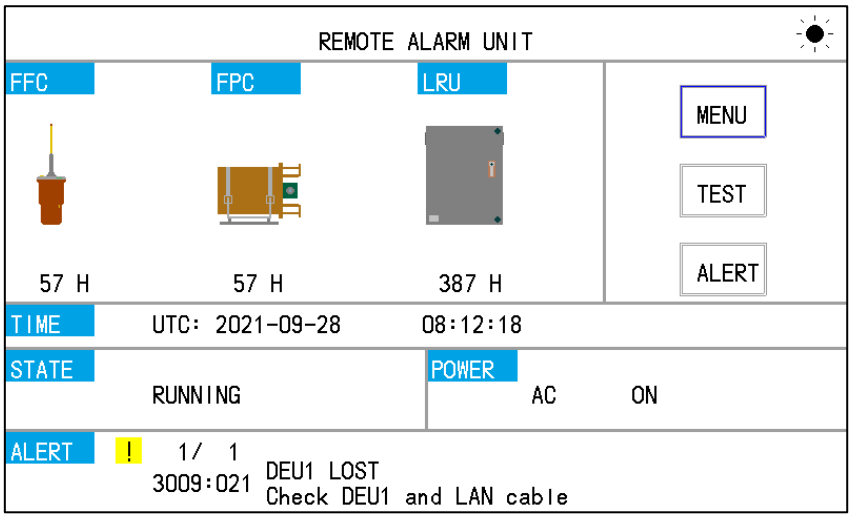
Version No	Latest Version	Description
<1.10	1.09, 180706 (V1)	For the V1 version MCU, after updating the system firmware, it becomes incompatible with the V2 version. The RAU version must be lower than 2.13.
⩾1.10	1.36, 250108 (V2)	The V2 version MCU can be upgraded to the latest version and is compatible with all RAU versions.

- **LRU/FFC/FPC**

Version No	Latest Version	Description
1.xx	1.03 170623	The old version of NVR901. It is recommended to replace a new one if it has problems.
2.xx	2.11 220427	The new version of NVR901. Version 2.10 adds a formatting function.

3. TROUBLESHOOTING

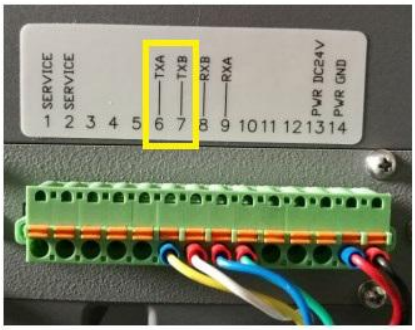
The DAU would have an alert under the fault state in the debugging process. Alert messages will be displayed at the bottom of the main interface, as shown below. Clicking [ALERT] will show all Alert messages. Please refer to Appendix D for details

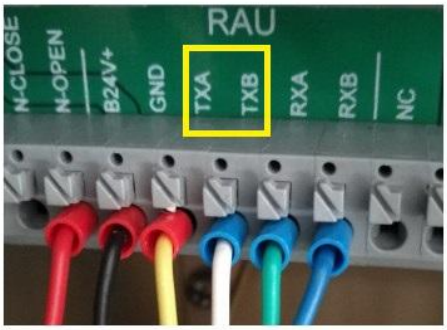


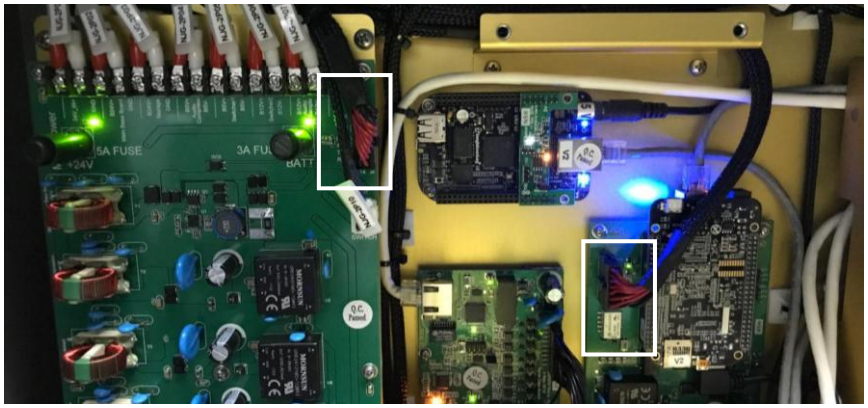
3.1 DAU lost (NO CONNECTION)

RAU shows "DAU LOST", which means that RAU cannot get messages from MCU.
Check according to the following steps:

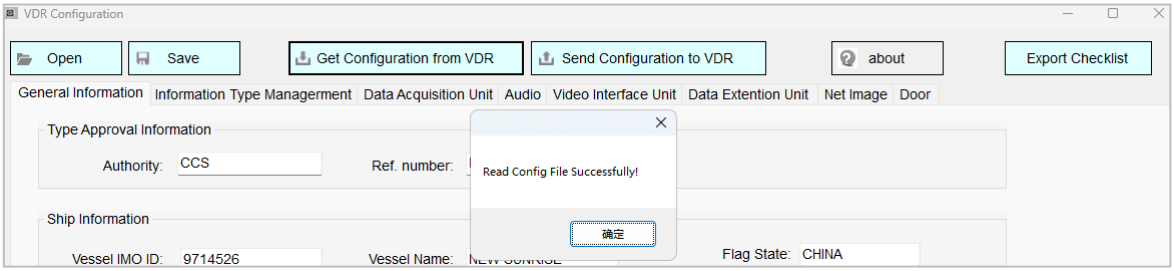
1) Check the lines in RAU and MCU, as shown in the following figure.





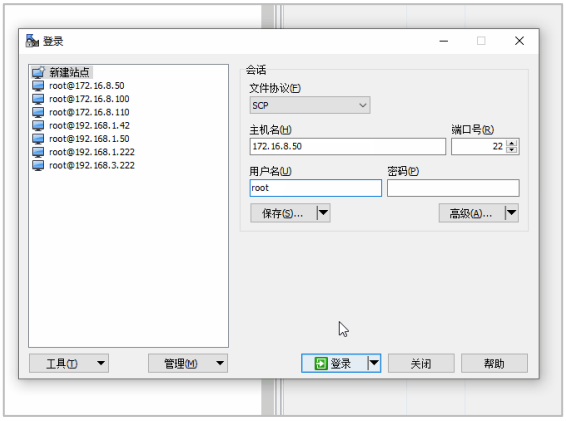


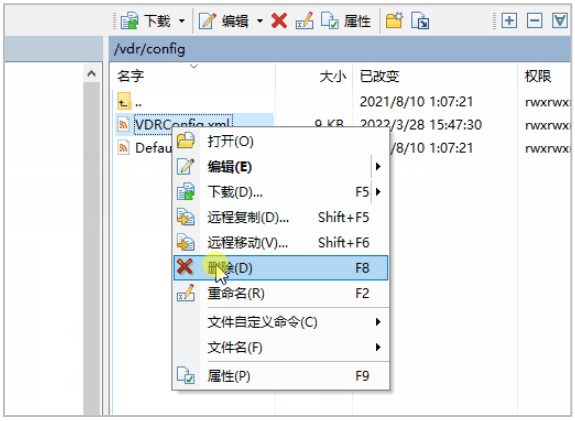
2) Check that the MCU is working properly.
   a. Open windows cmd.exe, “ping 172.16.8.50 -t”.
   b. Use VDRConfig.exe to get VDR configuration.



3) If it happens after the upgrade, please upgrade again; refer to 2.11.1.

4) If it happens after the configuration file is sent. The current configuration file for the MCU needs to be deleted.
   a. Download winscp.exe.
   b. Use WinSCP to connect MCU, Protocol: SCP, ip: 172.16.8.50, port:22.
   c. Login, user: root, password: 123456.
   d. Find “/vdr/config/VDRConfig.xml” and delete it.

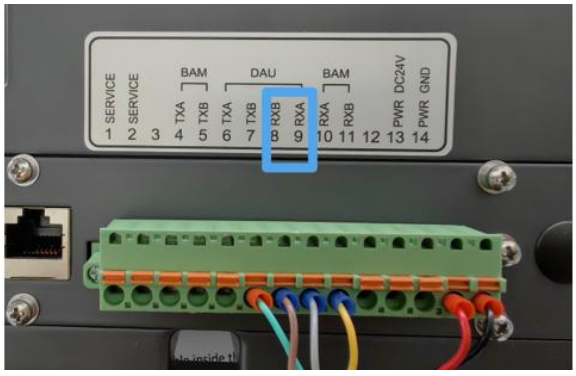


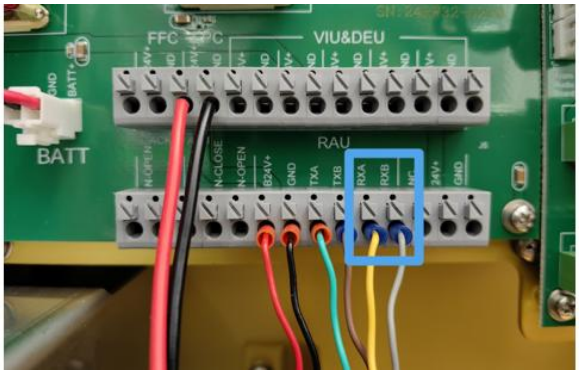


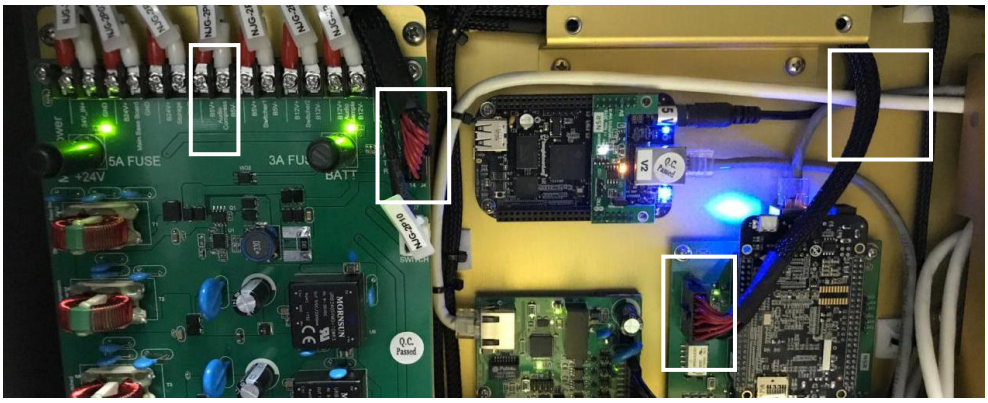
5) If the problem cannot be solved, please replace the spare parts. For the MCU replacement, please refer to 2.7.4.

3.2 RAU lost

1) Check the lines in RAU and MCU, as shown in the following figure.







2) If the alarm remains, please don't hesitate to contact the manufacturer for spare parts.

3.3 AC power lost

If the RAU shows "AC POWER LOST", please check the working status of the power distribution board and measure the power module. Follow the steps below:

1) Check whether the AC power switch is on.
2) Measure the input/output stage of the AC power module if there is voltage, and the voltage is normal (AC110/220V ± 10%). If it is abnormal, please replace the power module.
3) Check if the exchange of insurance of the power distribution board is loose or burned.
4) Check whether the power module's input and output are normal. If they are abnormal, please replace the power module.

5) Check whether the following connection is working.

3.4 Battery low

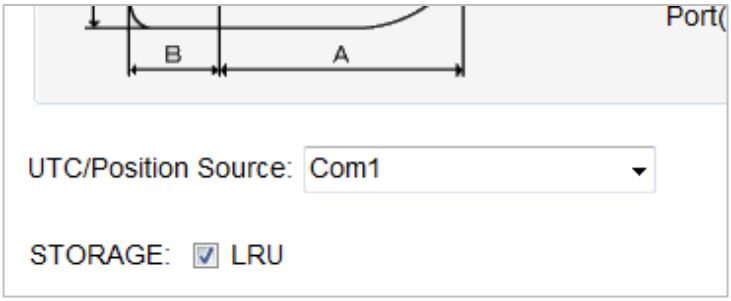
RAU shows “BATTERY LOW”, mainly caused by the battery discharge due to the AC power not being connected. Follow these steps to check:

1) Check the operating unit if the battery voltage is less than 16V.
2) Check whether the AC switch is turned on.
3) If not, replace the battery. Please refer to Section 2.3.

3.5 UTC lost

RAU shows “UTC LOST”, mainly due to No access to the configuration of the UTC data source. Follow these steps to check:

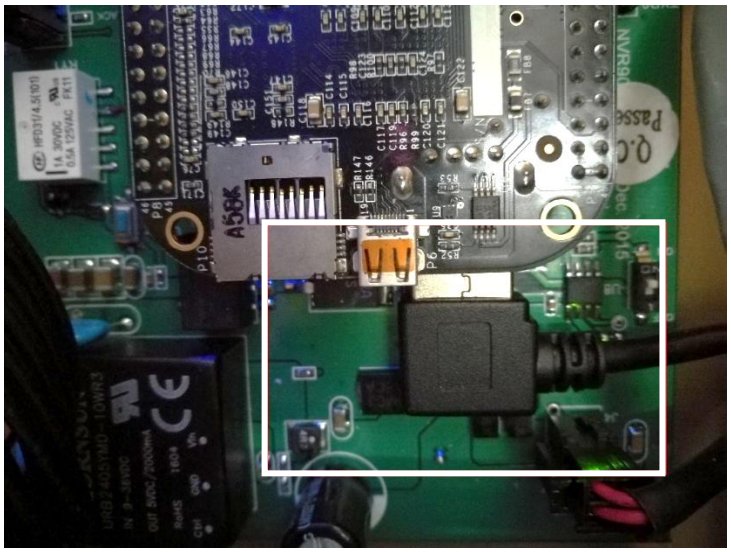
1) Ensure the UTC serial port of the VDR configuration and UTC source connected to the serial port are the same.
2) Check that the UTC source data format is correct, the ZDA sentence is needed.



3.6 USB disk RW fail

RAU shows “USB DISK RW FAIL”, and the alarm appears when the SELF TEST and the USB backup. Follow these steps to check:

1) Confirm that the USB memory is not damaged.
2) Directly insert the USB memory into the main board USB interface and test if the USB extension cord is damaged.



3.7 FPC LAN lost

The operating unit alert shows “FPC LAN LOST” to check the FPC and host connection status. Because of the FPC’s enclosed structure, open housing is not recommended for a working state view. Follow these steps to check:

1) Open the Junction Box to check whether the power cable and the communication line are connected correctly and the voltage is normal.
2) Check whether the network cable is connected properly in DAU. LAN led flash on the switch.
   Ensure the FPC’s IP address is 172.16.8.120 and unchanged.
   If restored to the original setting, the IP will become 192.168.1.1. If so, please refer to 2.11.3(6) to upgrade the software again.
3) Replace FPC SSD Board (NVR901), please refer to Section 2.9.1.
4) Replace the whole FPC.

3.8 FFC LAN lost

RAU shows “FFC LAN LOST” to check the connection status of the FFC and the host. Due to the FFC's enclosed structure, open housing is not recommended for a working status view. Follow these steps to check:

1) Open the Junction Box to check whether the power cable and communication line are connected correctly and the voltage is normal.
2) Check whether the network cable is connected properly in DAU. LAN led flash on the switch.
3) Ensure that the FFC's IP address is 172.16.8.110 and unchanged. If restored to its original setting, the IP will become 192.168.1.1. If so, please refer to 2.11.3(6) to upgrade the software again.
4) Replace FFC SSD Board (NVR901), please refer to Section 2.10.1.
5) Replace the whole FFC.

3.9 LRU LAN lost

RAU shows “LRU LAN LOST” to check the LRU and host connection status. Follow these steps to check:

1) Check that the host network interface is connected correctly. LAN led flash on the switch.
2) Ensure the LRU's IP address is 172.16.8.100 and unchanged. If restored to its original setting, the IP will become 192.168.1.1. If so, please refer to 2.11.3(6) to upgrade the software again.
3) Replace LRU SSD Board (NVR901), please refer to Section 2.7.3.
4) Replace the whole LRU, please refer to Section 2.7.2.

3.10 FPC lost

RAU shows only “FPC LOST” and no “FPC LAN LOST”, the alarm occurs mainly to check the status of FPC. Due to the FPC's enclosed structure, open housing is not recommended for a working status view.

Follow these steps to check:

1) Restart the VDR.
2) Refer to 4.18 for SSD diagnostics.
3) Replace FPC.

3.11 FFC lost

RAU shows “FFC LOST” and no “FFC LAN LOST”, the alarm occurs mainly to check the status of FFC. Due to the FFC's enclosed structure, open housing is not recommended for a working status view. Follow these steps to check:

1) Restart the VDR.
2) Refer to 4.18 for SSD diagnostics.
3) Replace FFC SSD Board (NVR901 + NVR923), please refer to Section 2.10.1.

3.12 LRU lost

RAU shows “LRU LOST” and no “LRU LAN LOST”, which occurs mainly to check the status of the LRU. Follow these steps to check:

1) Reboot the system.
2) Refer to 4.18 for SSD diagnostics.
3) Replace LRU’s SSD.

4) Replace the whole LRU, please refer to Section 2.7.2.

3.13 DAU COM LAN lost

RAU shows “DAU COM LAN LOST”, which occurs mainly to check the status of NVR909. Follow these steps to check:

1) Check whether the power supply of the Serial Data Board (NVR909) is normal.
2) Check whether the Serial Data Board (NVR909) connection with the switch is normal.
3) Reboot the system.
4) Replace Serial Data Board (NVR909), please refer to Section 2.7.8.

3.14 DEU1 LAN lost

RAU shows “DEU1 LAN LOST”, which occurs mainly to check the status of DEU1. Please replace the spare parts if the failure cannot be ruled out. Follow these steps to check:

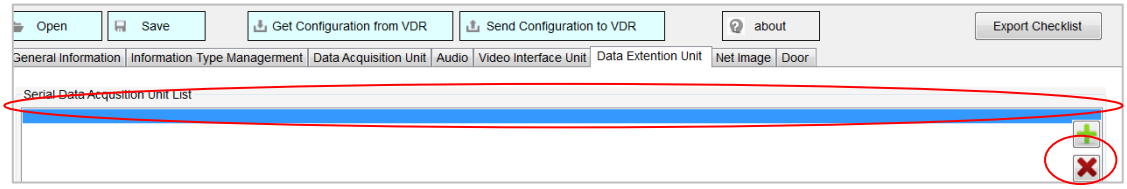
1) Check whether the power supply of DEU1 is normal.
2) Check whether the DEU1 connection with the switch is normal.
3) Restart the system.
4) Replace DEU Main Board (NVR910), please refer to Section 2.8.1.

When the following issues are encountered:

a. Alarm: DEU1 LAN LOST;
b. No DEU in your configuration;
c. Your VDRConfig.exe version is before 2016.12.29.

Please follow the steps below:

a. Download the latest VDRConfig.exe version;
b. Connect VDR with your laptop;
c. Get Configuration from VDR, then you may get a blank line in the DEU page, like below;



d. Select the blank line (show blue), then delete it;
e. Finally, send the configuration to VDR.

3.15 VIU1 LAN lost

RAU shows “VIU1 LAN LOST”, which occurs mainly to check the status of VIU1. Follow these steps to check:

1) Check whether the power supply of VIU1 is normal.
2) Check the LAN cable between VIU and DAU, the switch is working properly.
3) Restart the system.
4) Replace VIU1.

3.16 VIU1 sample fail

RAU shows “VIU1 SAMPLE FAIL”, which occurs mainly to check the status of VIU1. Follow these steps to check:

1) Check whether the RADAR/ECDIS connection with VIU1 is working.
2) Check whether the VGA of the VIU1 is connected normally.

3) Restart the system.
4) If it occurs during installation, please refer to the Installation Manual and Appendix A.
5) Replace VIU1.

3.17 DAU COM1…16 fail

RAU shows “DAU COM1……FAIL”, the alarm is mainly due to the DAU corresponding to the serial port not receiving the data. Follow these steps to check:

1) Check whether the connection to the DAU alarm port is connected properly.
2) Check whether the serial port connected to the DAU alarm device works properly and sends serial data.
3) Check whether the configuration is consistent with the source data baud rate.
4) Check whether it can be received properly on other ports.

3.18 DEU1 COM1……fail

RAU shows “DEU1 COM1……FAIL”, the alarm is mainly due to the DEU1 corresponding to the serial port not receiving the data. Follow these steps to check:

1) Check whether the connection to the DEU alarm port is connected properly.
2) Check whether the serial port connected with the DEU alarm device is working properly and send serial data.
3) Check whether the configuration is consistent with the source data baud rate.
4) Check whether it can be received properly on other ports.

3.19 MIC: xx, xx, xx, xx, xx... fail

RAU shows “MIC: xx, xx, xx, xx, xx... FAIL: The alarm occurs, mainly to check the status of MIC. Follow these steps to check:

1) Check that the MIC cable is intact.
2) Use the self-check function on the RAU test again.
3) Check to see if MIC is working on other ports.
4) If the failure cannot be ruled out, please replace the MIC.

3.20 ACU lost

RAU shows “ACU LOST”, and the alarm occurs, mainly to check the status of the ACU. Follow these steps to check:

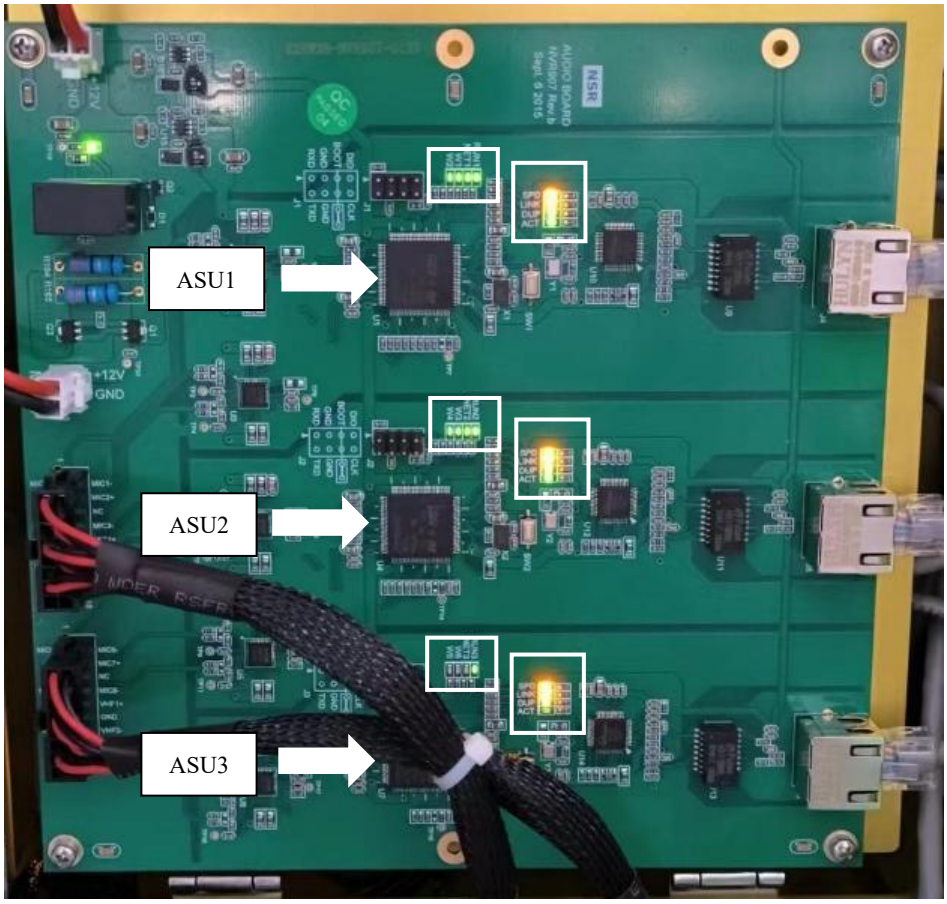
1) Restart the system.
2) Check that the ACU cable is properly connected and restart.
3) If the failure cannot be ruled out, please replace the spare parts. Refer to Section 2.7.5.

3.21 ASU1/2/3 lost

RAU shows “ASU1 LOST”, and the alarm occurs, mainly to check the status of ASU1. Follow these steps to check:

1) Restart the system.
2) Check whether the cable on the top of the ASU plate is connected correctly, as shown in the figure.
3) Check if the chips run lights flashing.

LED	Lighting Specifications
RUN	Blink every 1 sec when the CPU is running normally.
NET	Light when the LAN IC is normal.
W1-6	When audio channels A1-A6 are normal.
SPD	Light when the link is established on 100BASE-T.
LINK/ACT	Light when the LINK is established; Blink at the time of receiving or sending data; Light or blink continuously in normal operation; Check the wiring and the power source when it is OFF.



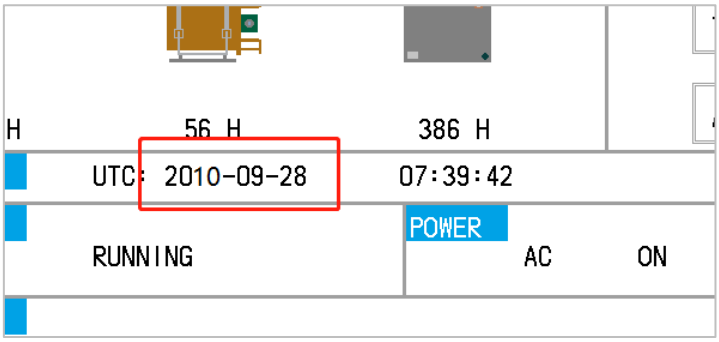
4) Please replace the spare parts if the failure cannot be ruled out, and refer to Section 2.7.6.

3.22 NET IMAGE lost

1) Check whether the RADAR/ECDIS is working.
2) Check whether the LAN cable between RADAR/ECDIS and VDR is normal.
3) Restart the system.
4) If it occurs during installation, please refer to Appendix B.

3.23 Recording time is not increased

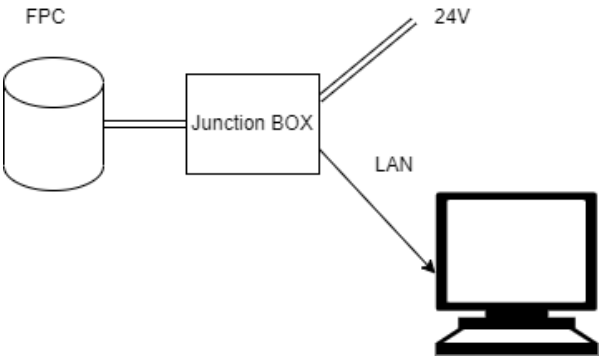
When the system time is earlier than 2016, the system stops recording. Please set the current time.

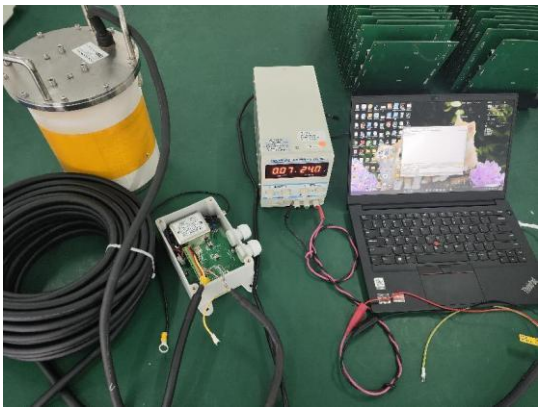


4. FAQ

4.1 How to check FPC without DAU connected?

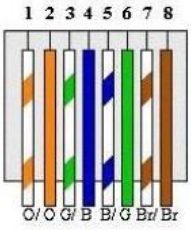
1) Connect the FPC to the PC as below.

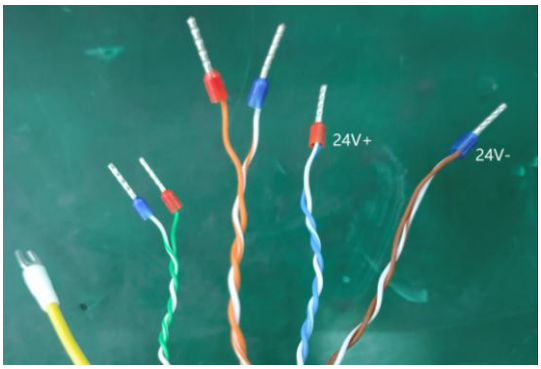




If the Junction Box is not available, use the cable with FPC directly.

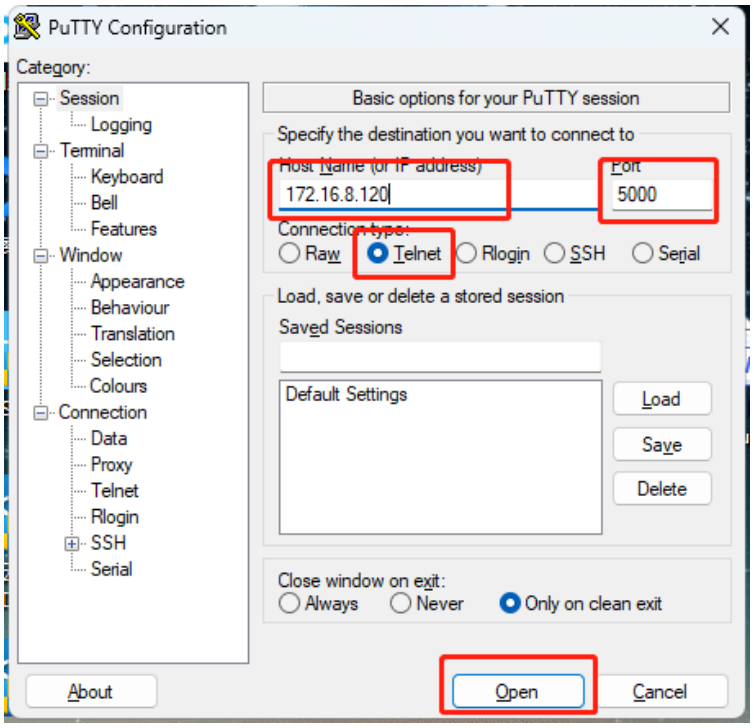
Only wires 1/2/3/6 are used for Ethernet connection.



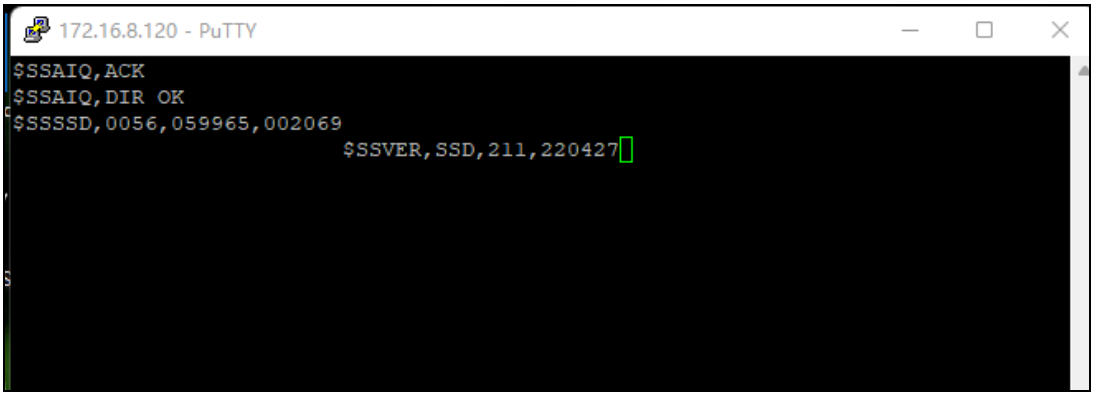


2) Configure the PC for IP 172.16.8.175.

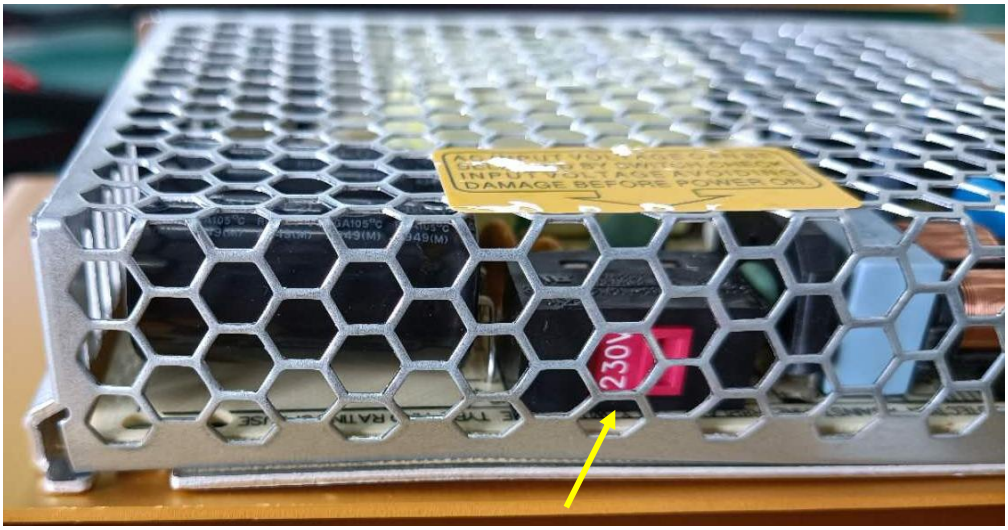
3) Use putty.exe to check. https://putty.org/



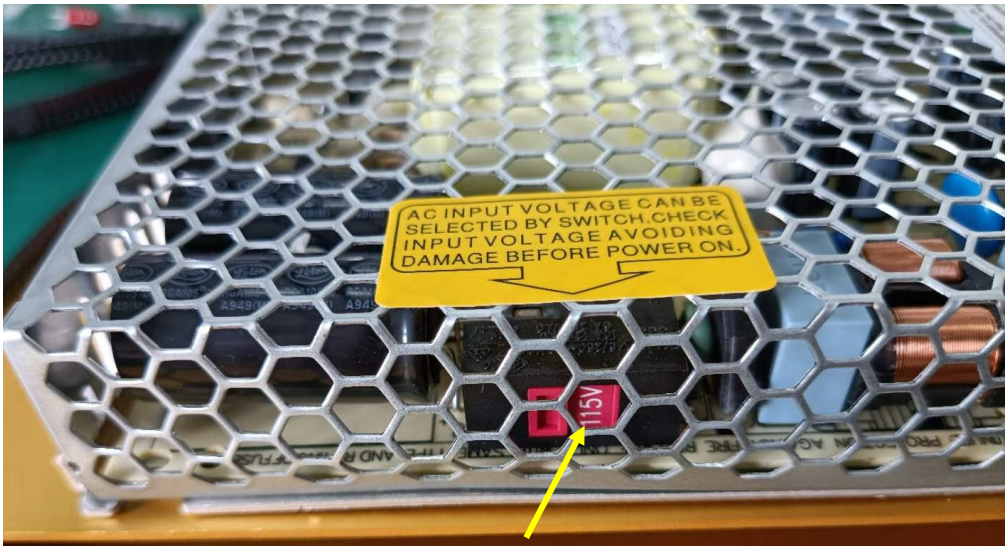
If it shows as below, it means FPC works normally.



4.2 How to change the power supply from AC220V to AC110V?



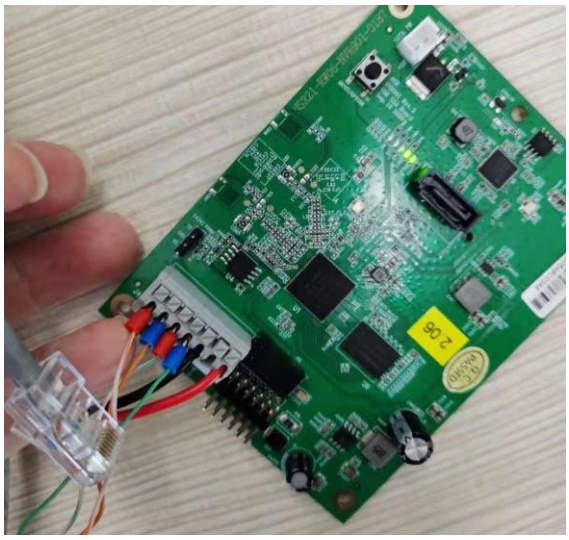
Move the switch to 230V for AC220V



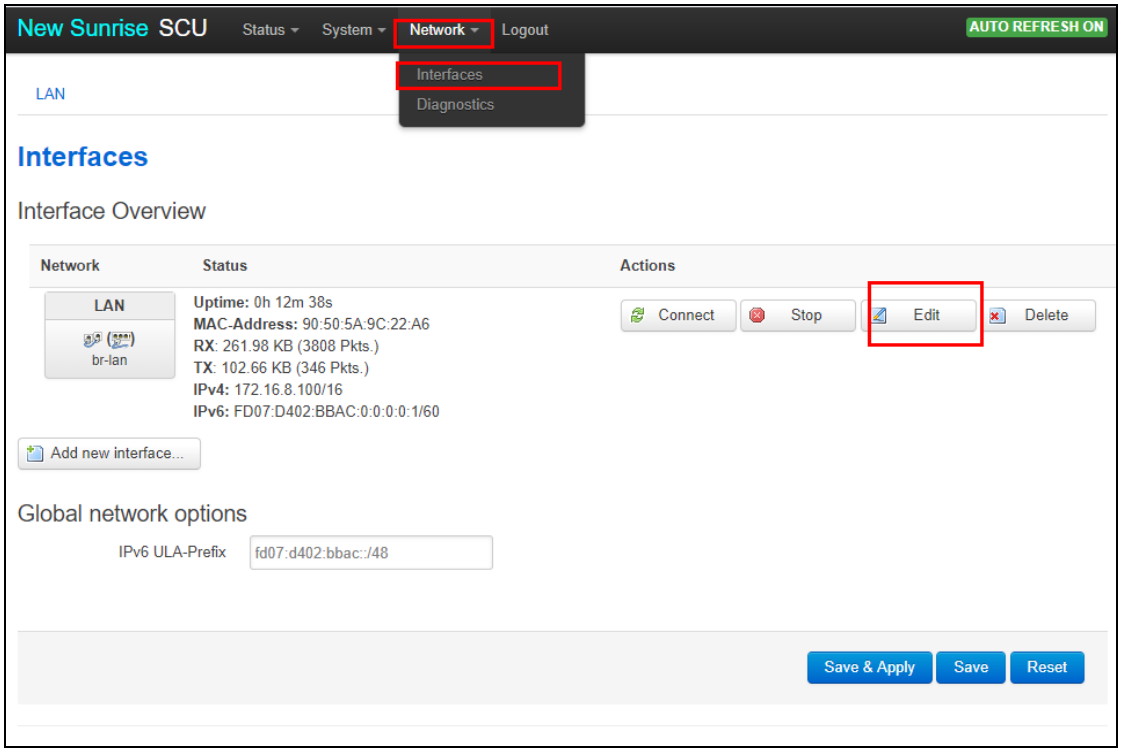
Move the switch to 115V for AC110V

4.3 How to change IP address for NVR901?

The IP addresses for LRU, FPC, and FFC are all stored in the NVR901 PCB.



1) Connect NVR901 PCB to PC (see the above photo). Connect the power DC24V.
2) Set the PC IP address: 172.16.8.145.
3) Enter the IP addresses in the browser:
   LRU: 172.16.8.100
   FFC: 172.16.8.110
   FPC: 172.16.8.120
4) Login user: root, password: 123.
5) Click below.

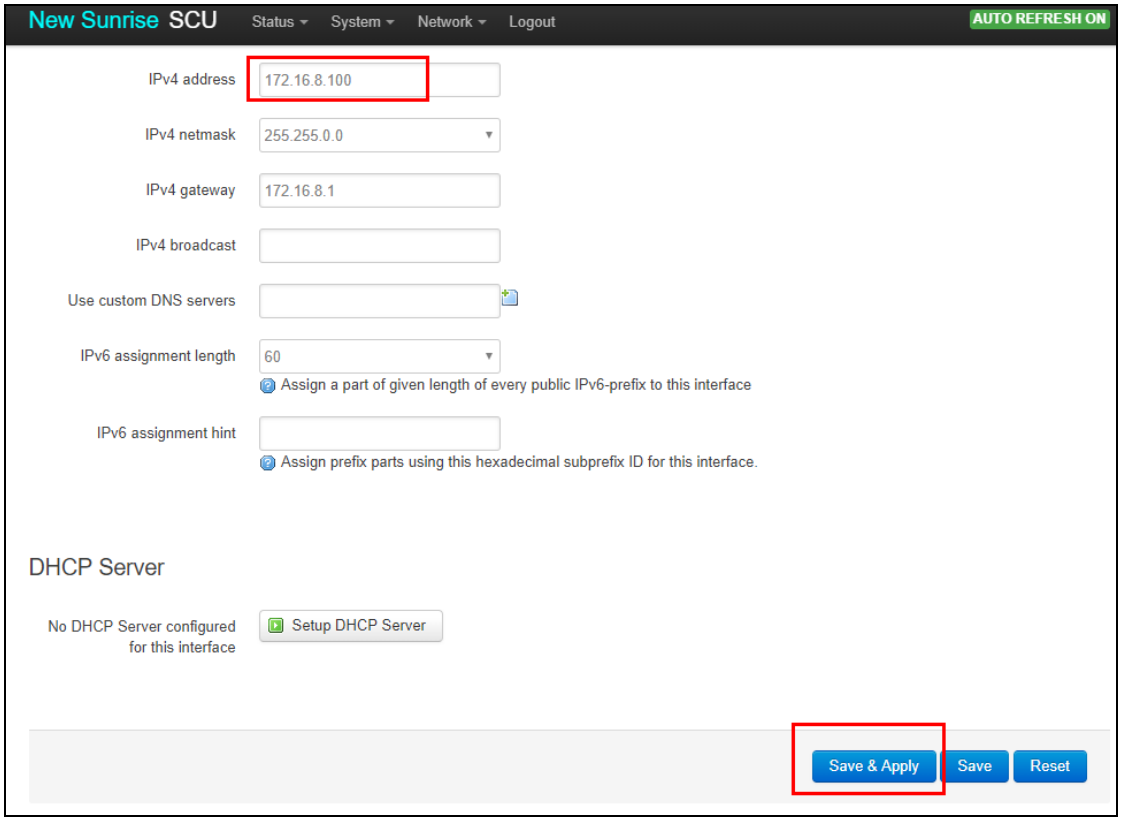


6) Modify IP addresses and save them：

LRU: 172.16.8.100

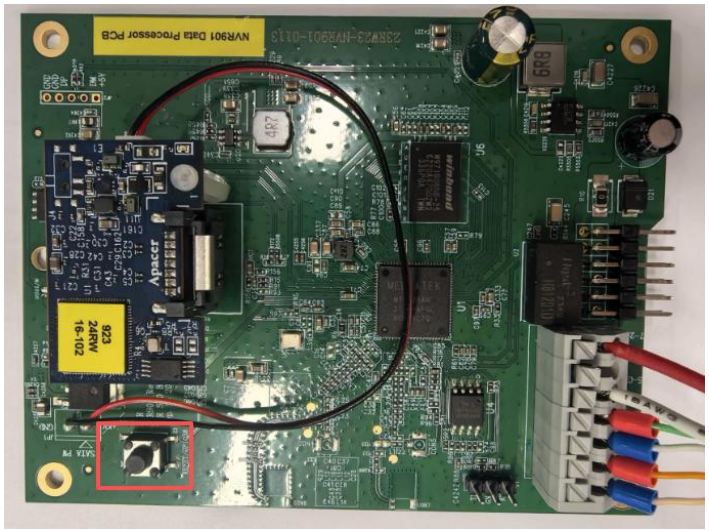
FFC: 172.16.8.110

FPC: 172.16.8.120



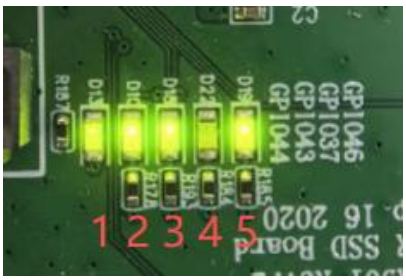
4.4 How to reflash NVR901 without knowing the IP?

When the IP address is unknown, try to enter the NVR901's bootloader. Press and hold the RESET button, then power on the device.



The IP of the bootloader is 192.168.1.1. Change PC IP to 192.168.1.X(175). Then, enter the IP address in a browser to access the bootloader. Then select as below, and upload the firmware of LRU/FFC/FPC.

4.5 How to check LED Status of NVR901?



LED1	LED2	LED3	LED4	LED5	Description
ON	ON	ON	OFF	Flash 1s	Normal
ON	ON	ON	Flash	OFF	In bootloader mode IP: 192.168.1.1, upgrade firmware again.
ON	ON	Flash	OFF	OFF	Reset to factory mode IP: 192.168.1.1, upgrade firmware again.

4.6 How to set VIU IP address?

4.6.1 Change VIU IP address

4.6.1.1 Connect

- Connect the PC to the VIU PCB via an Ethernet cable.
- There are four IP addresses for VIU as follows:
  VIU1: 172.16.8.90
  VIU2: 172.16.8.91
  VIU3: 172.16.8.92
  VIU4: 172.16.8.93
- Connect the power DC 24V to VIU.

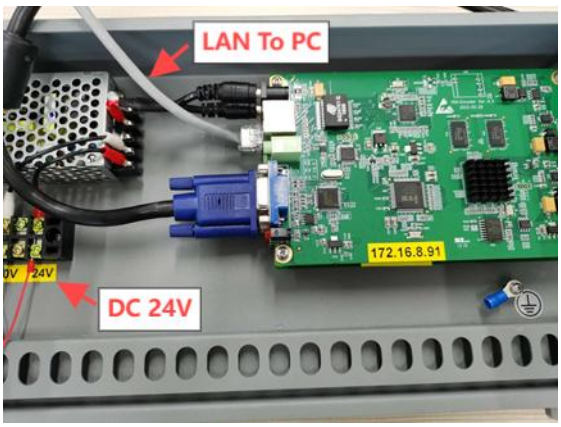
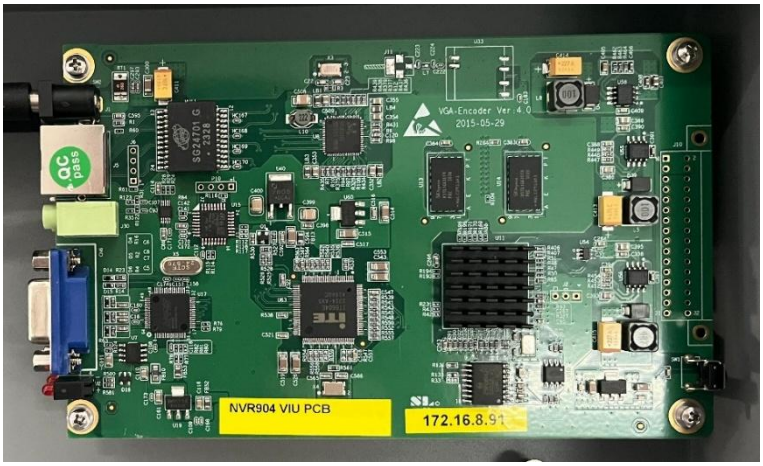


Figure 1 Connection Method

4.6.1.2 PCB Versions

- **Ver.1**

  Designed date 2015.05.29:



- **Ver.2**

  Designed date 2024.11.11:

The connection is shown in Figure 1, regardless of the version.

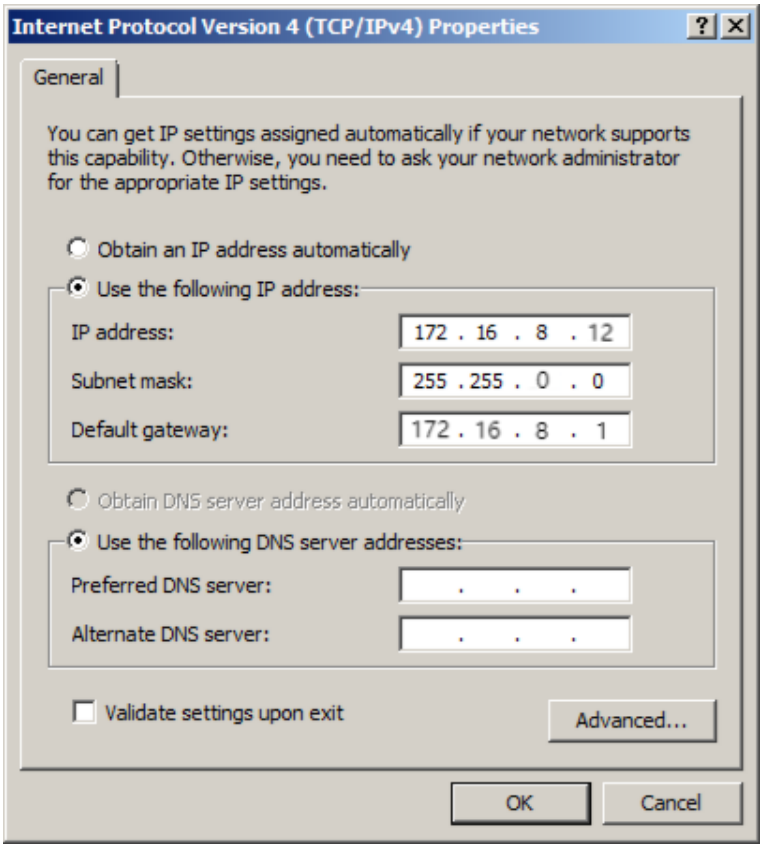
4.6.1.3 Configure

4.6.1.3.1 Set the PC IP address

IP: 172.16.8.12

Mask: 255.255.0.0

Gateway: 172.16.8.1



4.6.1.3.2 Set VIU IP address

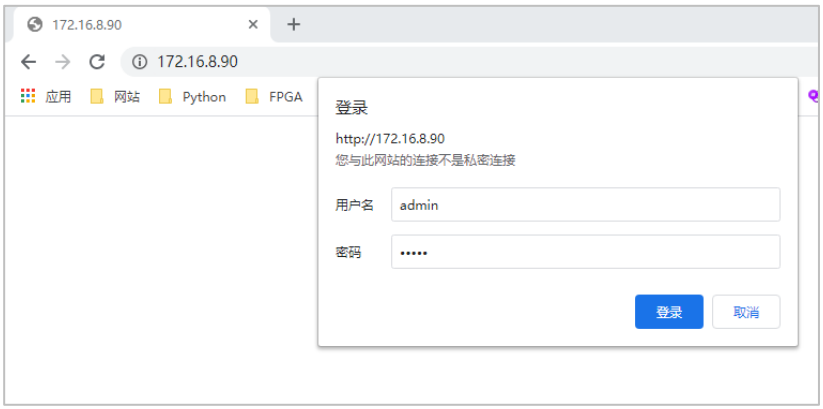
- **VIU Ver.1**

For example, change VIU1 IP to VIU4 IP.

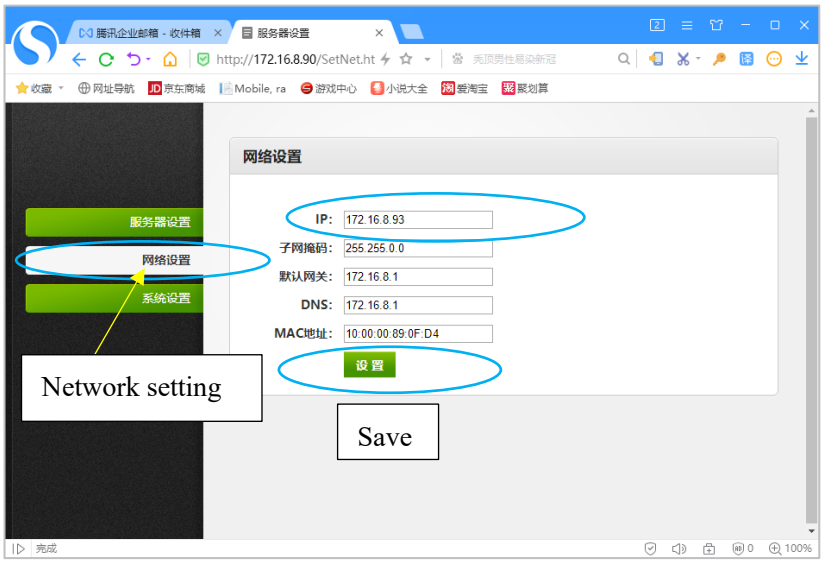
Open a browser and enter the original IP address 172.16.8.90.

USER: admin.

PWD: admin.



Fill in the new IP on the network setting page. Then "Save".

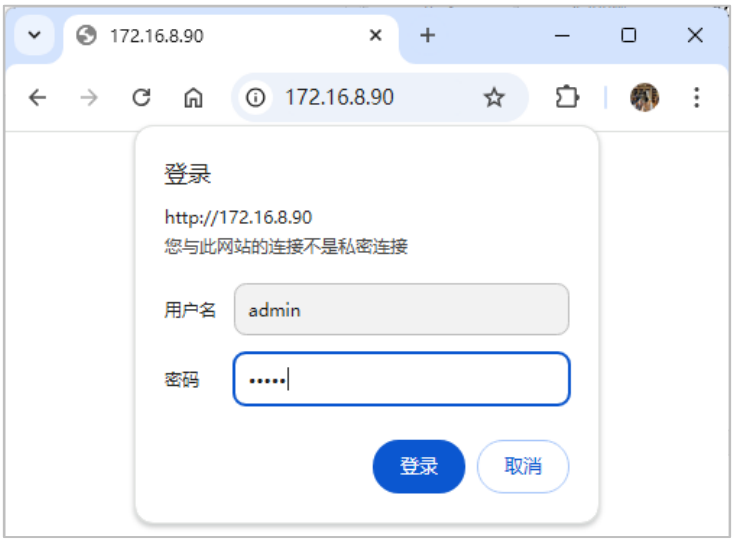


Re-power the VIU, and check the new IP address in the browser.

- **VIU Ver.2**

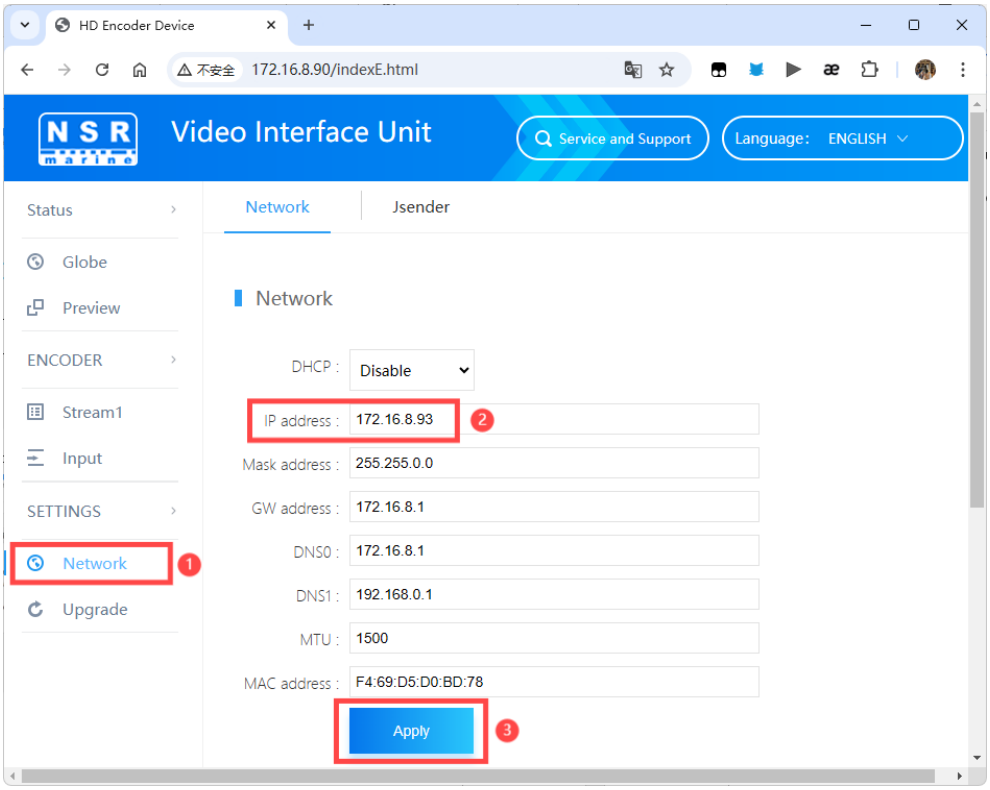
For example, change the VIU1 IP to the VIU4 IP.

Open a browser and enter the original IP address 172.16.8.90, USER: admin, PWD: admin.

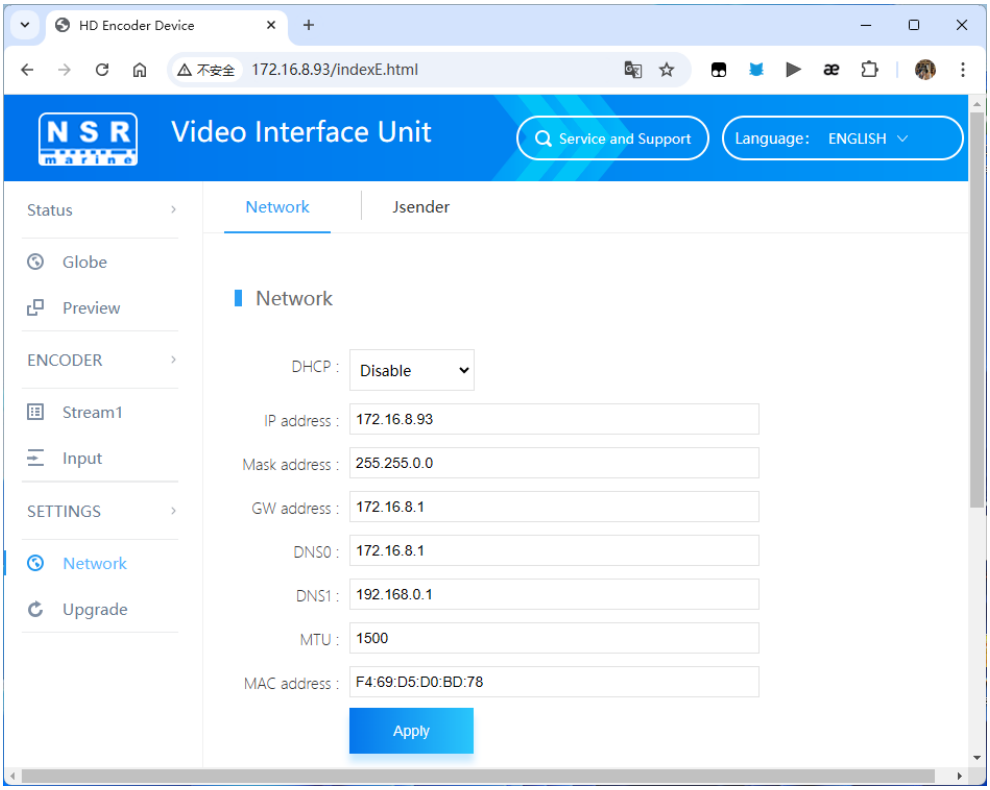


Language options can be switched in the upper-right corner of the page.

Fill in the new IP address on the network setting page. Then “Apply”.



Re-power the VIU and check the new IP address in the browser.



4.6.2 VIU restore

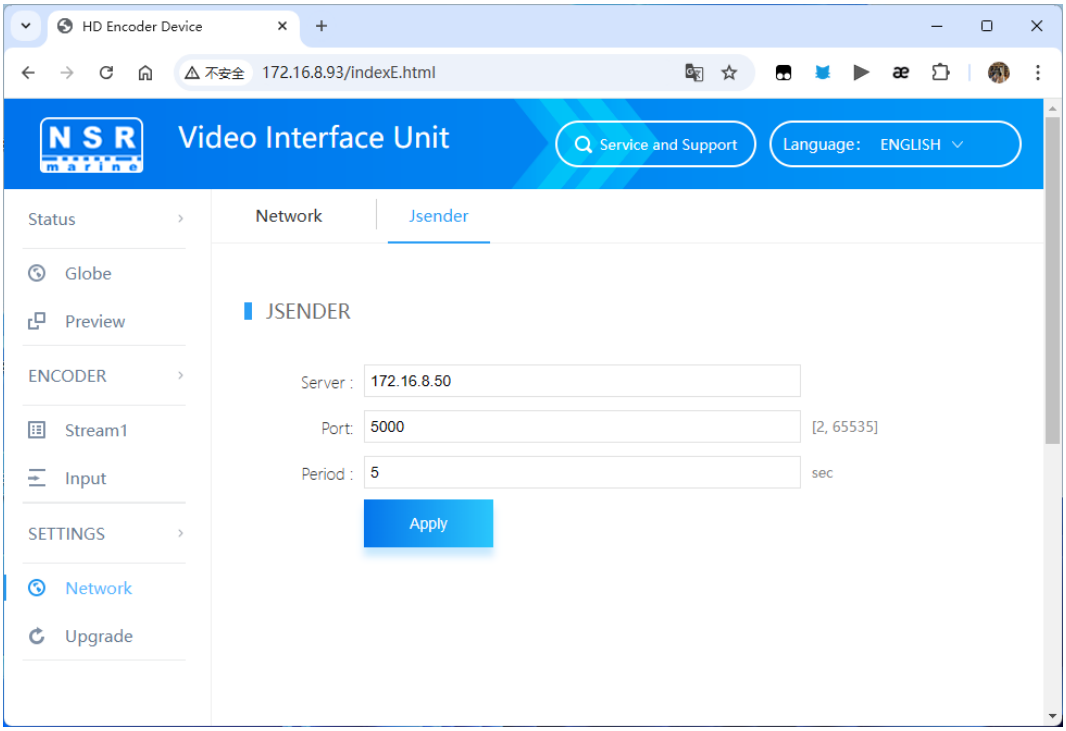
- **VIU Ver.1**

1) After the reset, the VIU IP address has been changed to 192.168.1.80.
2) The PC's IP address changed to 192.168.1.175.
3) The browser enters 192.168.1.80, user name: admin, password: admin.
4) Modify the server settings as follows, then click 设置 .

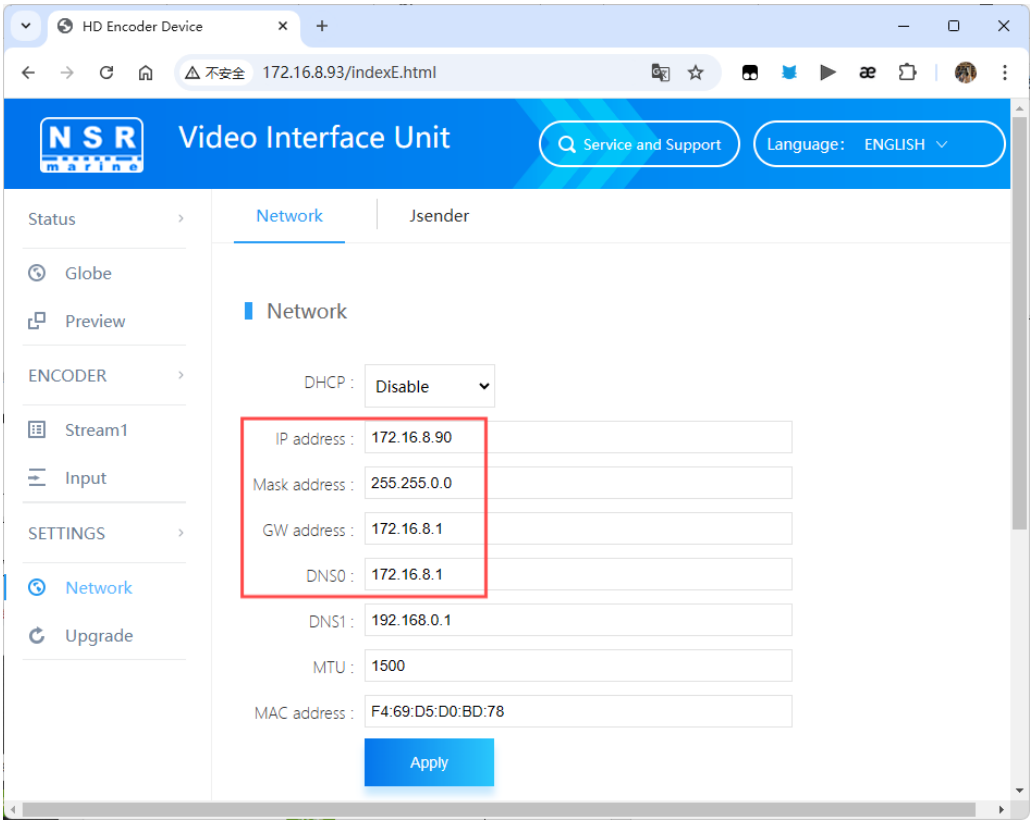
5) Modify the network settings as follows：172.16.8.90, then click 设置 .

- **VIU Ver.2**

1) After the reset, the VIU IP address has been changed to 172.16.8.93.
2) The PC's IP address changed to 172.16.8.12.
3) The browser enters 172.16.8.93, user name: admin, password: admin.
4) Modify the server settings as follows, then click "Apply".



5) Modify the network settings as follows:
IP: 172.16.8.90, Mask: 255.255.0.0, DNS:172.16.8.1. then click "Apply".

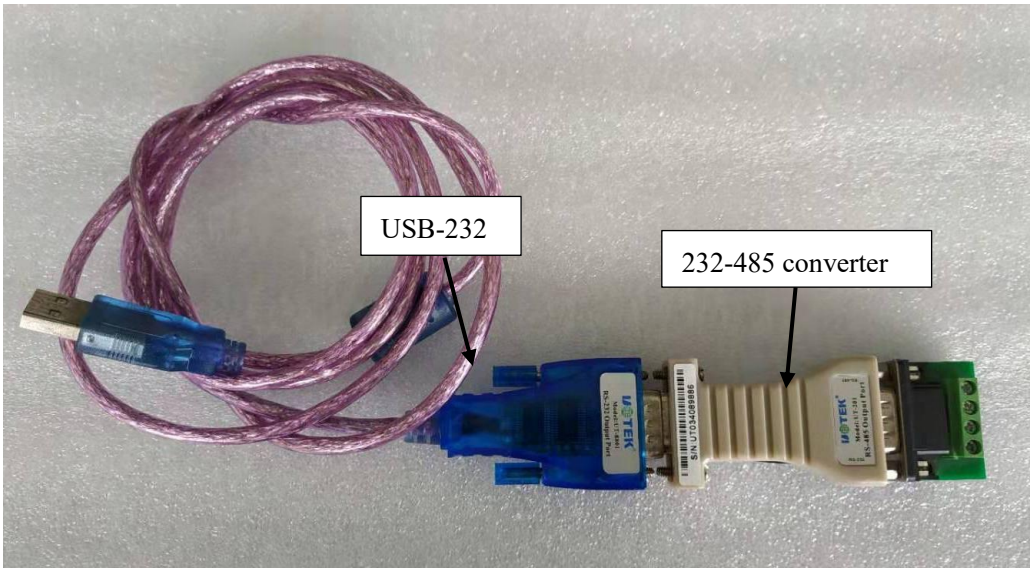


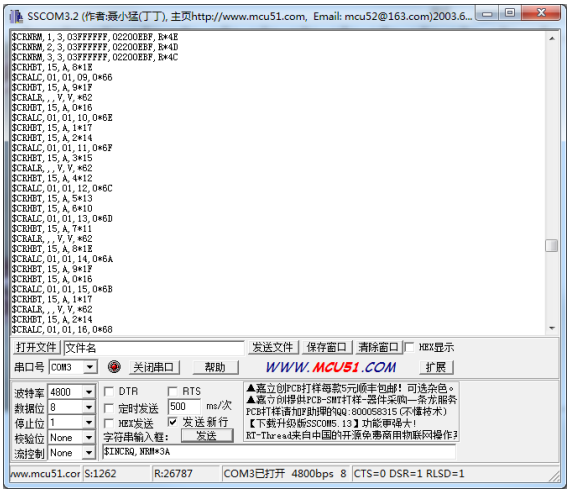
4.7 How to check NMEA signal?

The NVR-9000 and NVR-9000S support RS422 and RS485 formats, which comply with IEC 61162-1.

Step 1

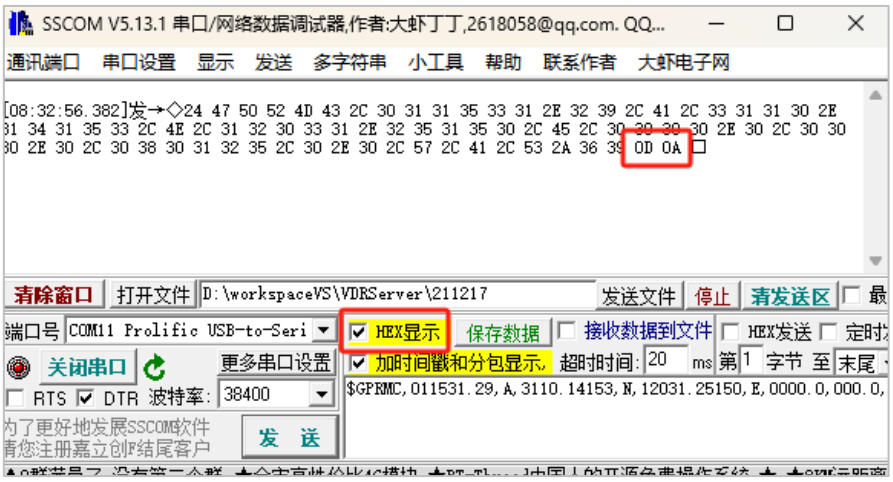
Check the NMEA signal with PC and USB-485 converter or USB-232&232-485 converter. The NMEA sentence should be received by the PC serial port tool. If not, the data source may be wrong. Check the NMEA source.





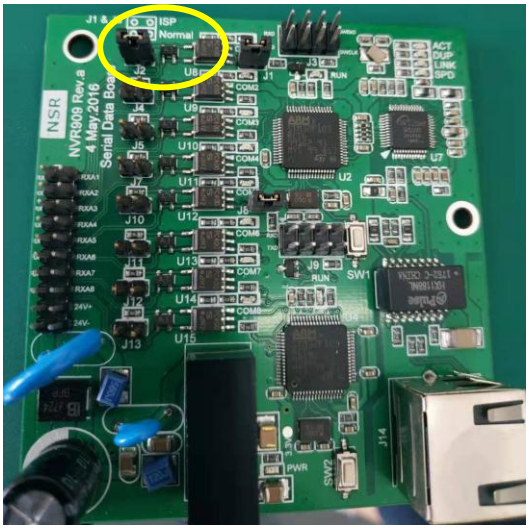
Step 2

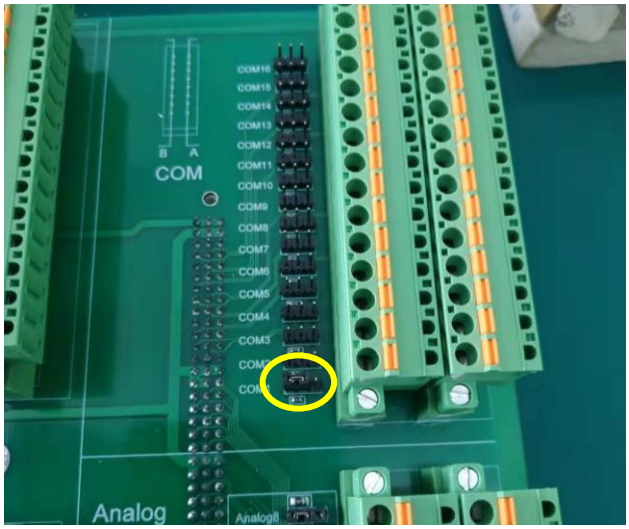
If step 1 is OK. However, VDR cannot receive sentences. Check the data in hex mode. Find the end character “0D 0A”. If there is no “0D 0A”, ask the sender to modify the data.



Step 3

If VDR still does not receive NMEA. Short the pins with a jumper to enhance the signal according to the COM number. The jumper is in the pack with a LAN cable and a CD.





Step 4

If VDR still does not receive NMEA. It may need an NMEA distributor to enhance the signal.

4.8 How to check the NBT900 backup battery?

The battery should last for 2 hours after 1 day of charging.

Note: *Turn the AC ON and Battery ON, and the system will charge the battery.*

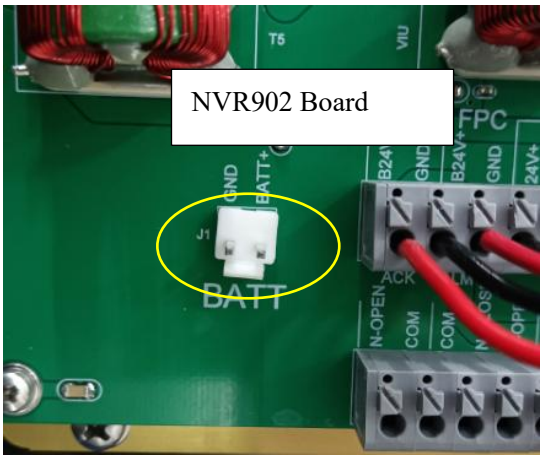
Please test as follows:

Step 1. Turn the AC ON and the Battery ON. Remove the battery from the BATT connector. Measure the BATT connector voltage.

If the voltage is 23 - 24V, the NVR902 Power Control Board is OK.

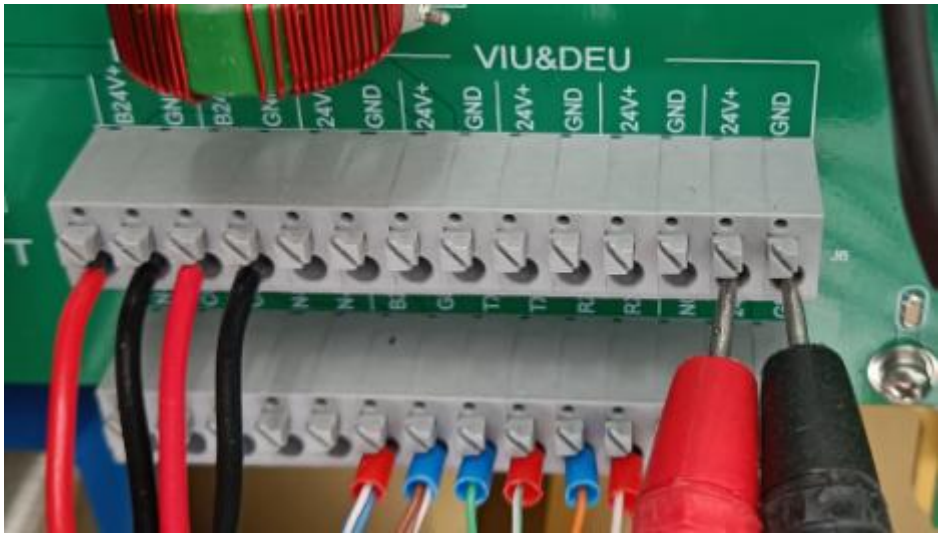
If the voltage is 0-10V, the NVR902 Board is faulty.

If the voltage is 19.2 - 22V, follow step 2.



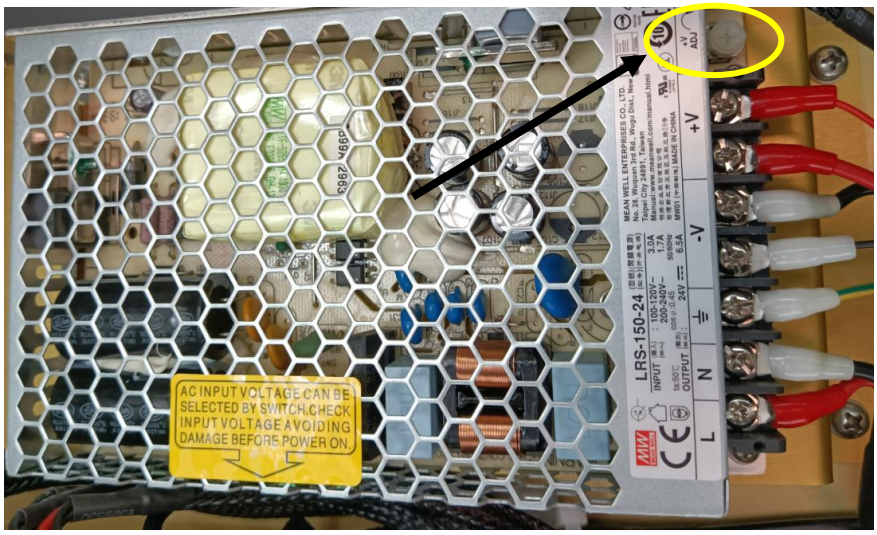
Step 2. Measure the voltage of the VIU&DEU connector.

Measure the output voltage between “+V” and ”-V” at the AC-DC converter.



If the voltage is 19.2-22V, adjust the output of the AC-DC converter to 24V by “+V ADJ”.

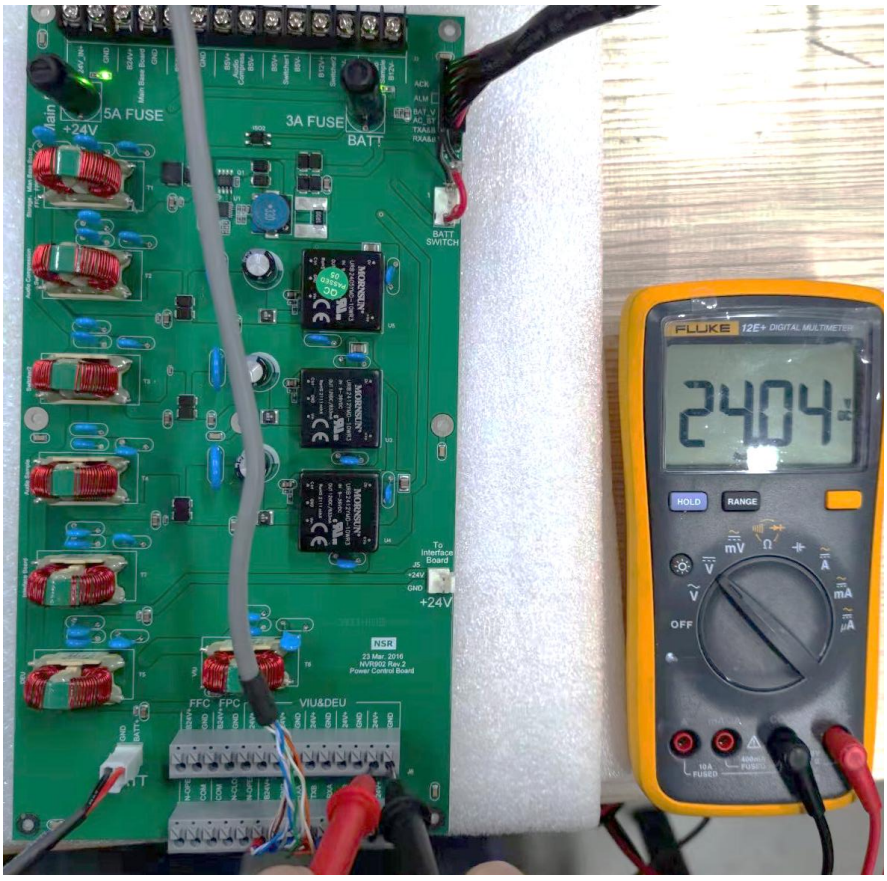
If the voltage is 23-24V, the AC-DC converter is OK. The NVR902 Board should be faulty.



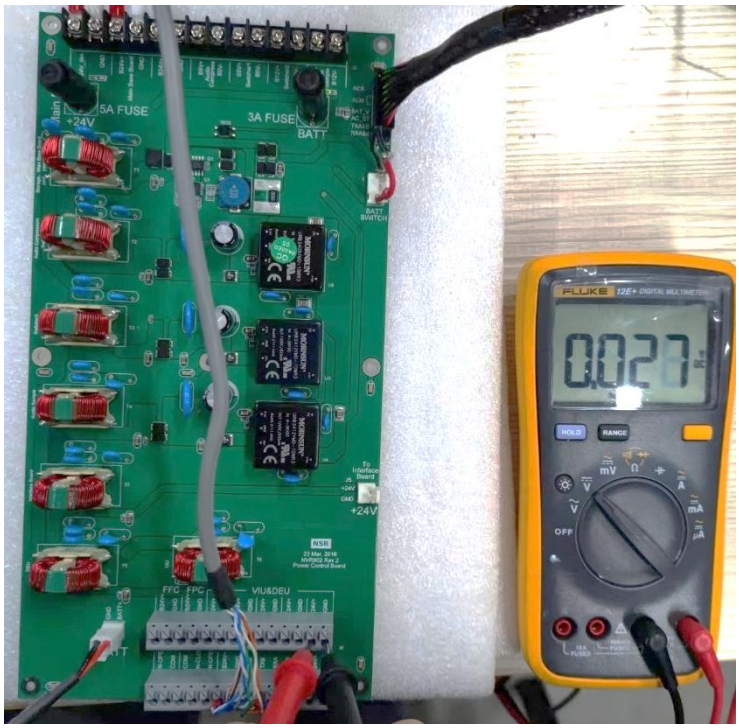
Step 3. If step 1 is OK. Turn the AC ON and the Battery ON for 1 day. Then, test the battery again. If the battery can last for 2 hours. The capacity of the battery has decayed. Replace the battery.

4.9 How to check the problem of the AC/Battery indicator?

1) Measure the VIU&DEU 24V&GND
   AC ON=24V, LED of +24V ON



AC OFF=0V, LED of +24V OFF



2) Measure the AC_ST&GND at NVR902 PCB. Pay attention to the polarity of the probe.
Measure with the diode gear of the multimeter.

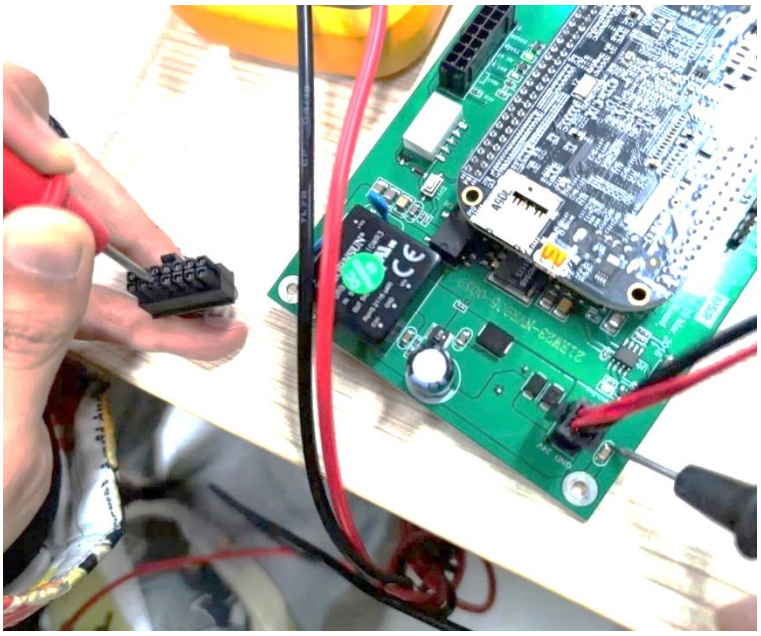
AC ON=Diode open

AC OFF=Diode closed

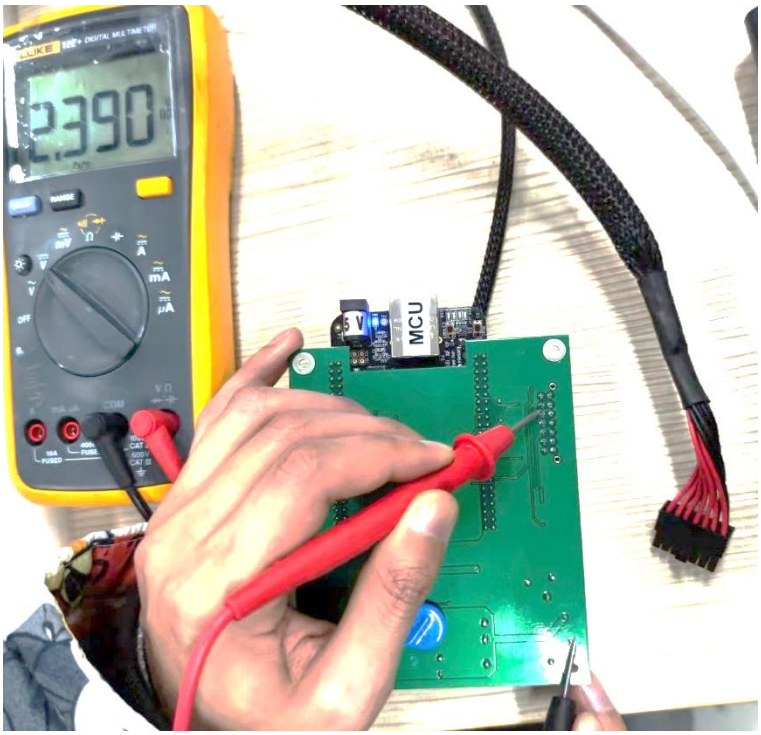
3) Measure the AC_ST&GND from the cable between NVR902 and NVR905, keep one side connected to NVR902. (To make sure the cable connection is OK).

Pay attention to the polarity of the probe.
Measure with the diode gear of the multimeter.

AC ON = Diode open
AC OFF = Diode closed

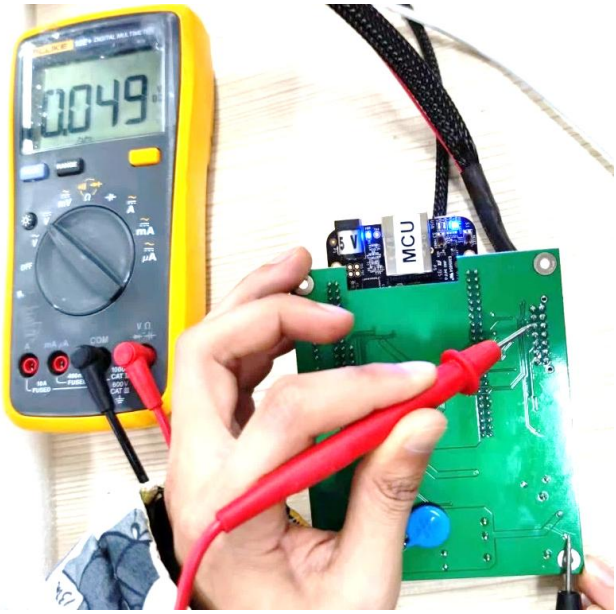


4) NVR905 is powered ON but without a data cable. Measure the AC_ST&GND. It should be more than 2V.

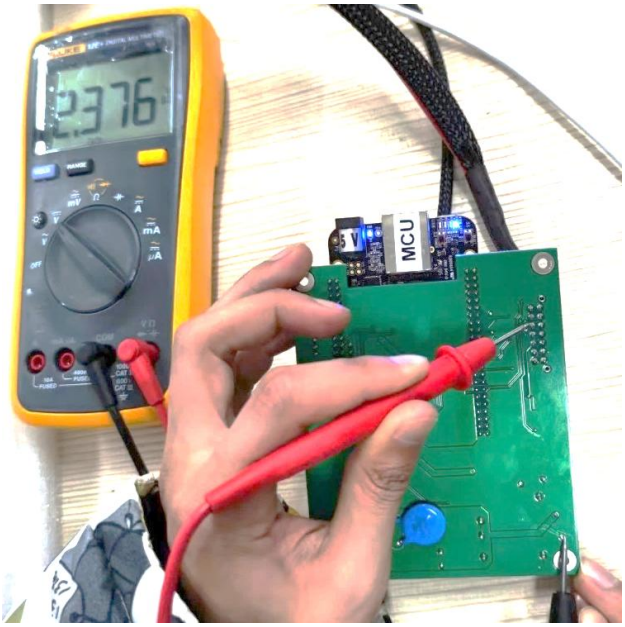


5) Connect all the cables. Measure AC_ST&GND for NVR905.

AC ON = 0V

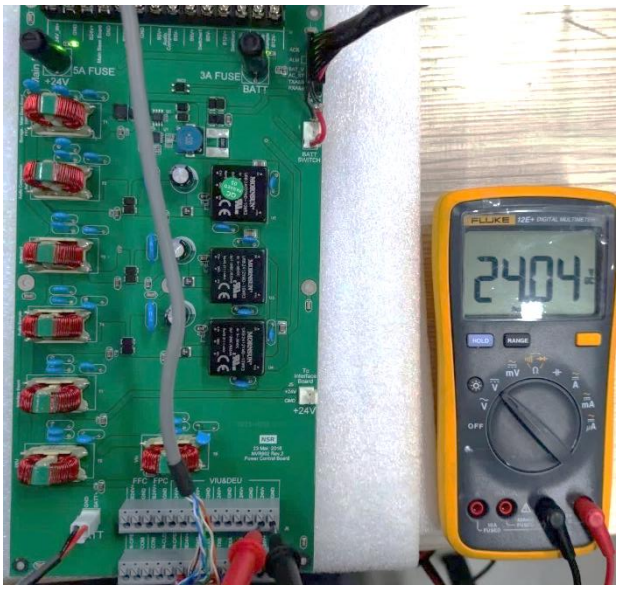


AC OFF > 2V

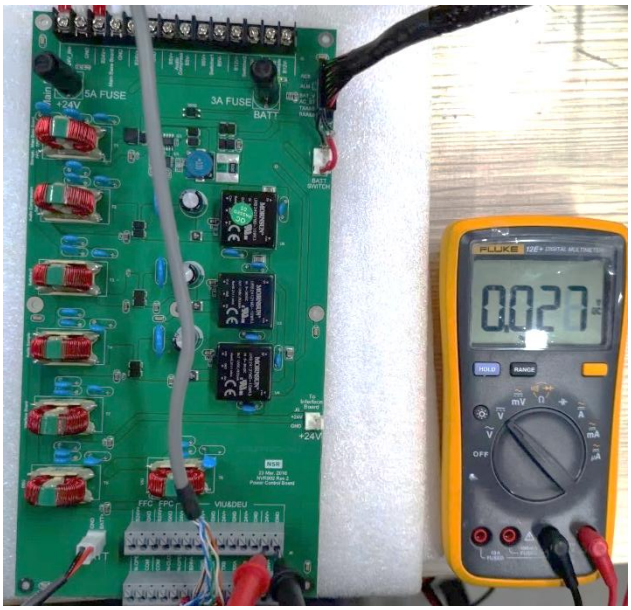


6) Measure the VIU&DEU 24V&GND

AC ON=24V LED of +24V ON

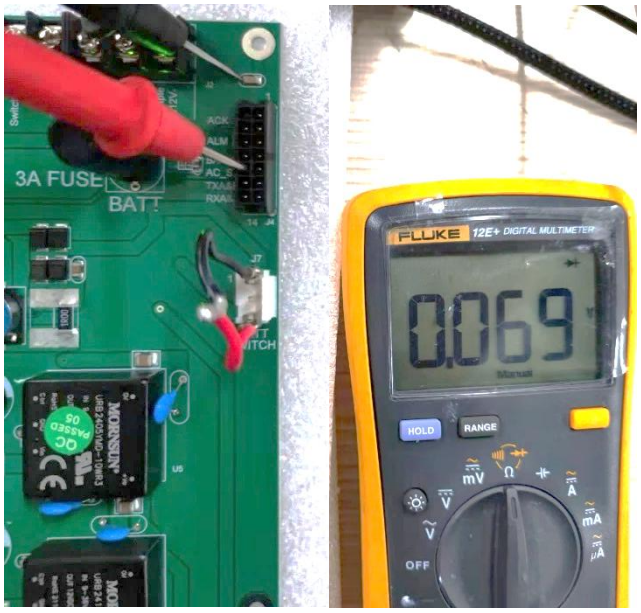


AC OFF=0V LED of +24V OFF

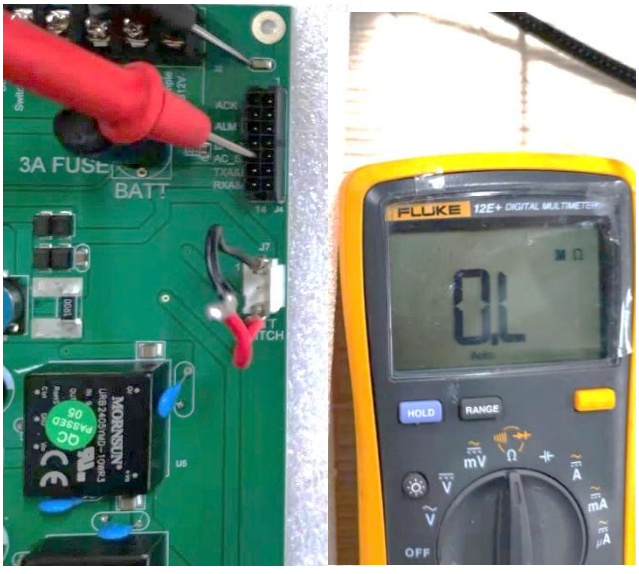


7) Measure the AC_ST&GND at NVR902 PCB. Pay attention to the polarity of the probe.
Measure with the diode gear of the multimeter.

AC ON = Diode open

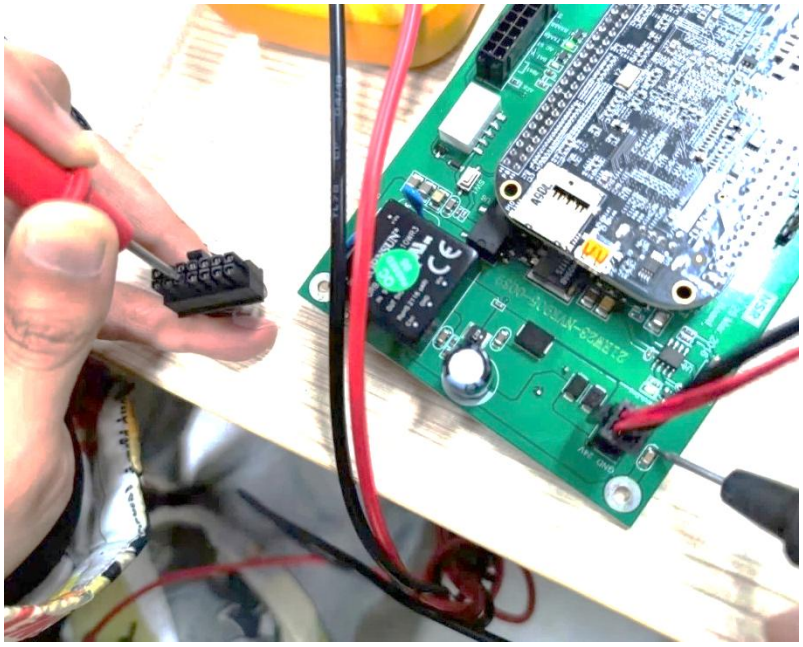


AC OFF = Diode closed

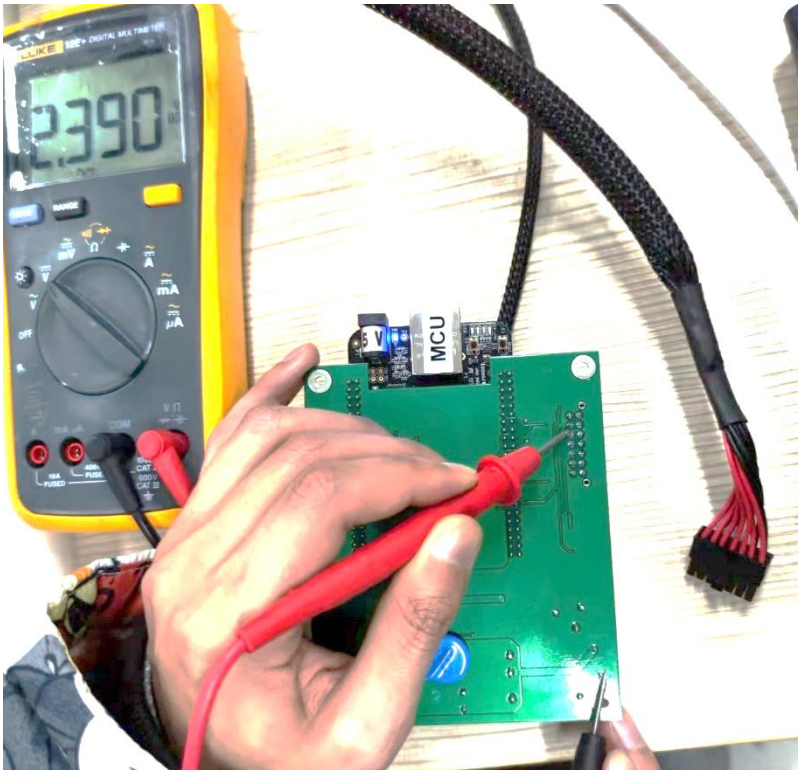


8) Measure the AC_ST&GND from the cable between NVR902 and NVR905, keep one side connected to NVR902. (To make sure the cable connection is OK).
Pay attention to the polarity of the probe.
Measure with the diode gear of the multimeter.

AC ON = Diode open
AC OFF = Diode closed

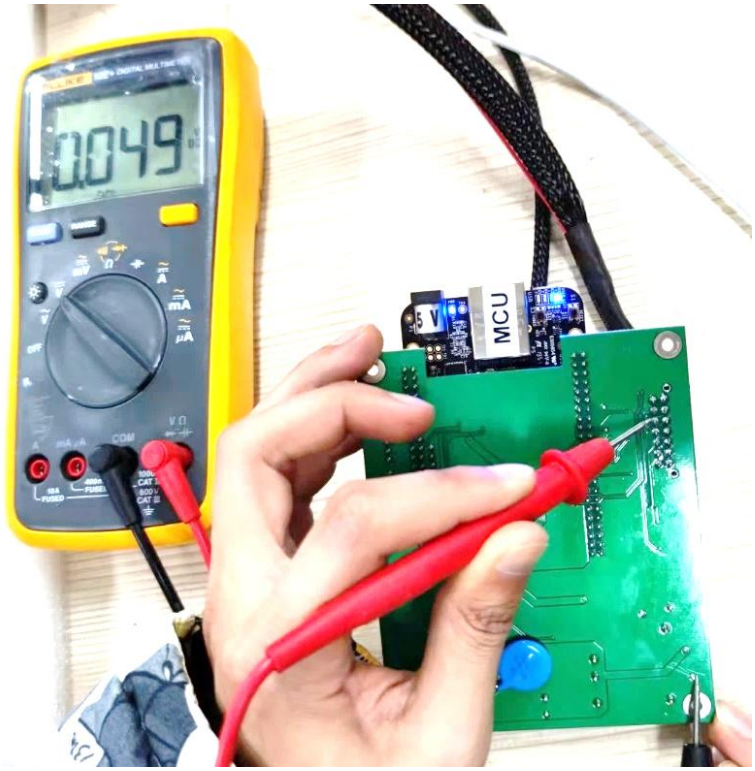


9) NVR905 is powered ON, but without a data cable. Measure the AC_ST&GND. It should be more than 2V.

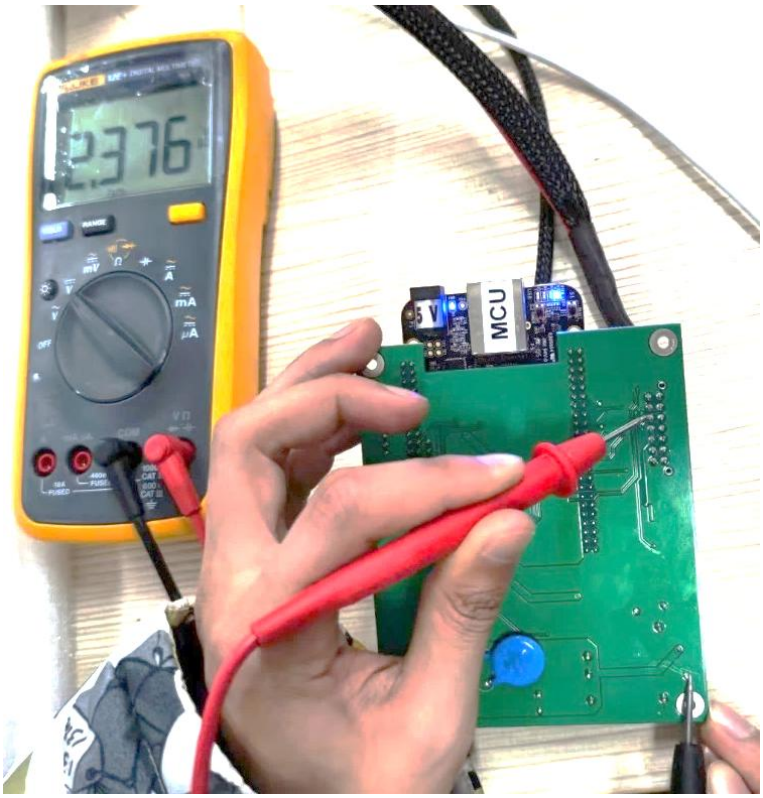


10) Connect all the cables. Measure AC_ST&GND for NVR905.

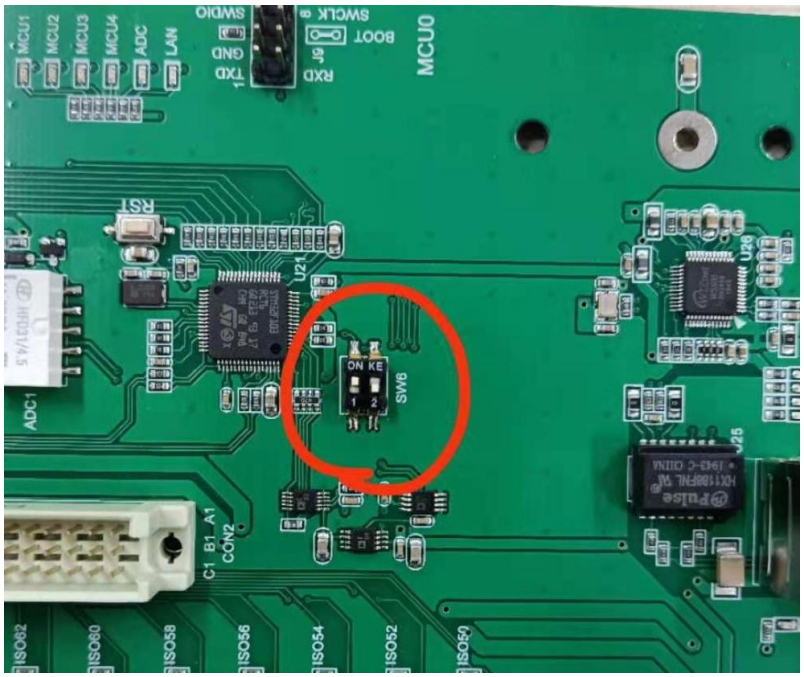
AC ON = 0V



AC OFF > 2V



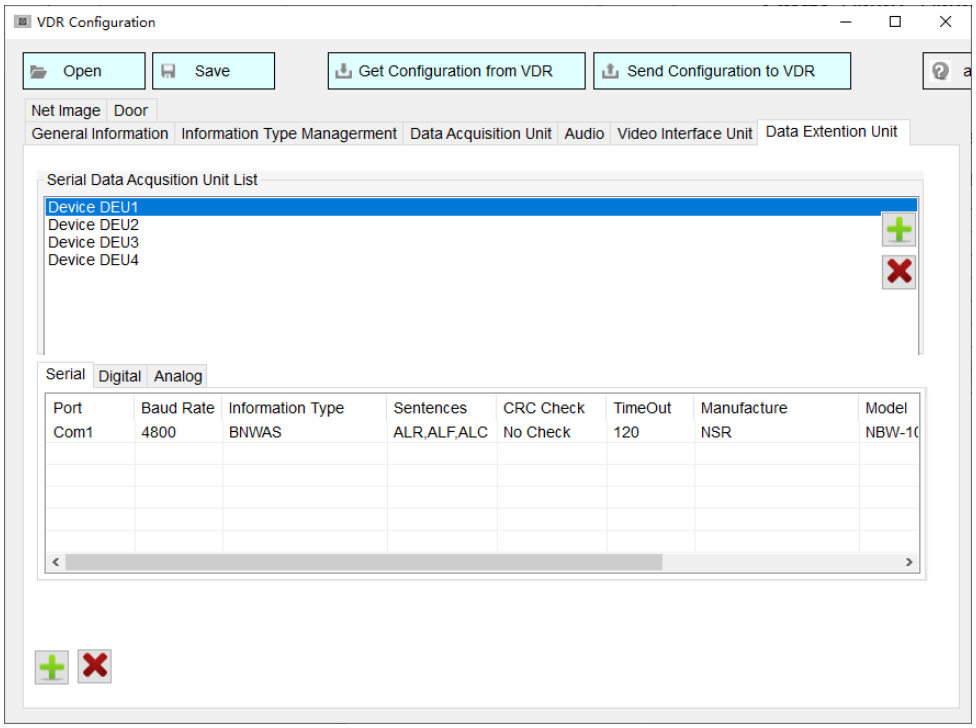
4.10 How to configure more than one DEU?



Set SW6 according to the table below.

	SW6-1	SW6-2
DEU1	ON	ON
DEU2	ON	OFF
DEU3	OFF	ON
DEU4	OFF	OFF

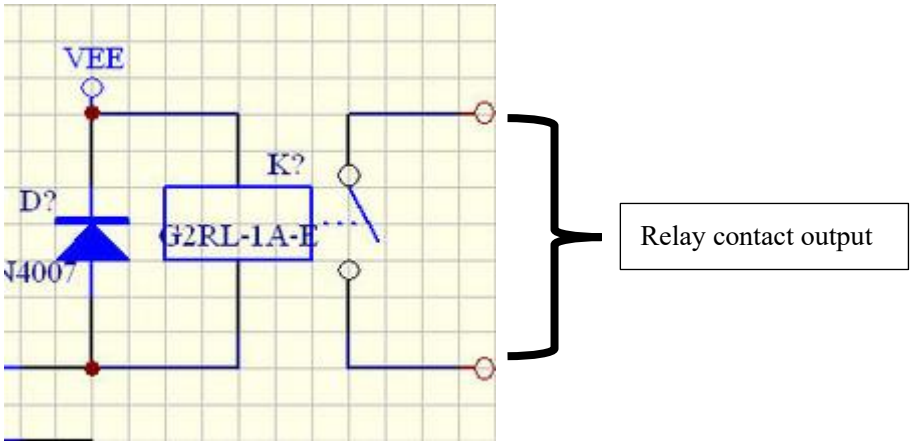
A maximum of 4 DEUs can be configured.



4.11 How to connect an alarm signal to VDR?

What is an Alarm Signal? The alarm on the bridge should be a Dry contact output from the equipment.

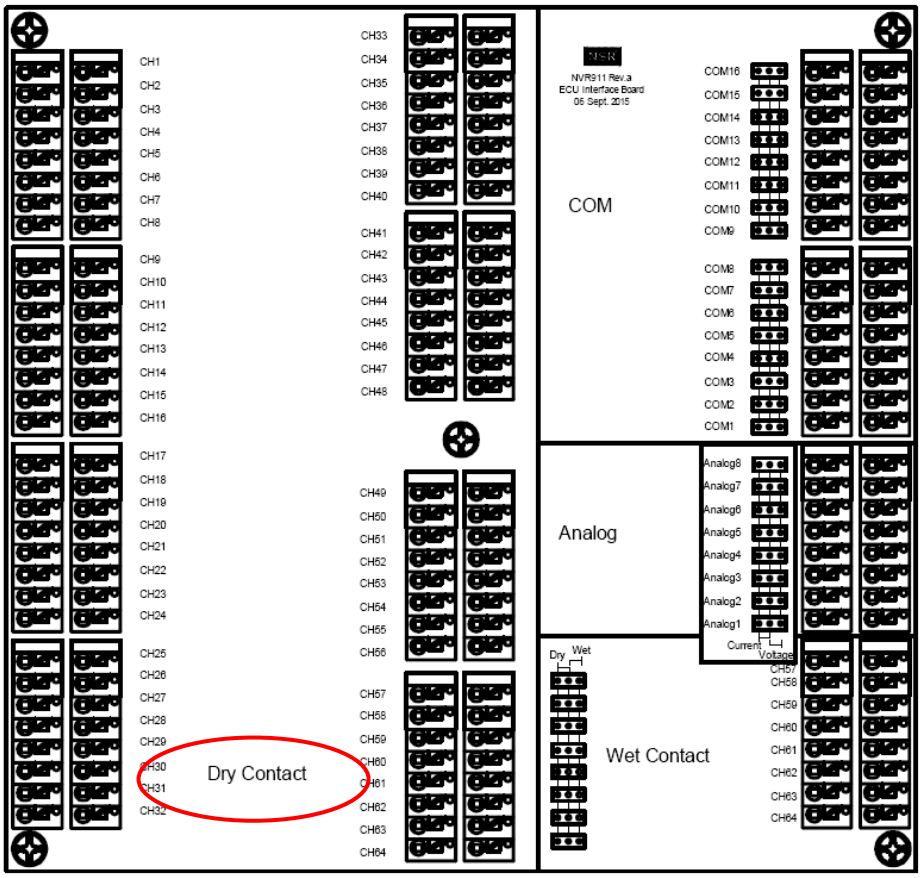
The Dry contact output means the signal comes from the Relay contact pins. There is no voltage on the two output pins, but it can be measured by **open or short**.



For example, if a Watertight & fire door alarm, the Dry contact may be **short**. And if it is normal, the Dry contact may be **open**.

Step 1:

Connect the Dry contact 2 wires to the DEU (Data Extension Unit), Dry contact area, CH1~CH64.



Step 2:

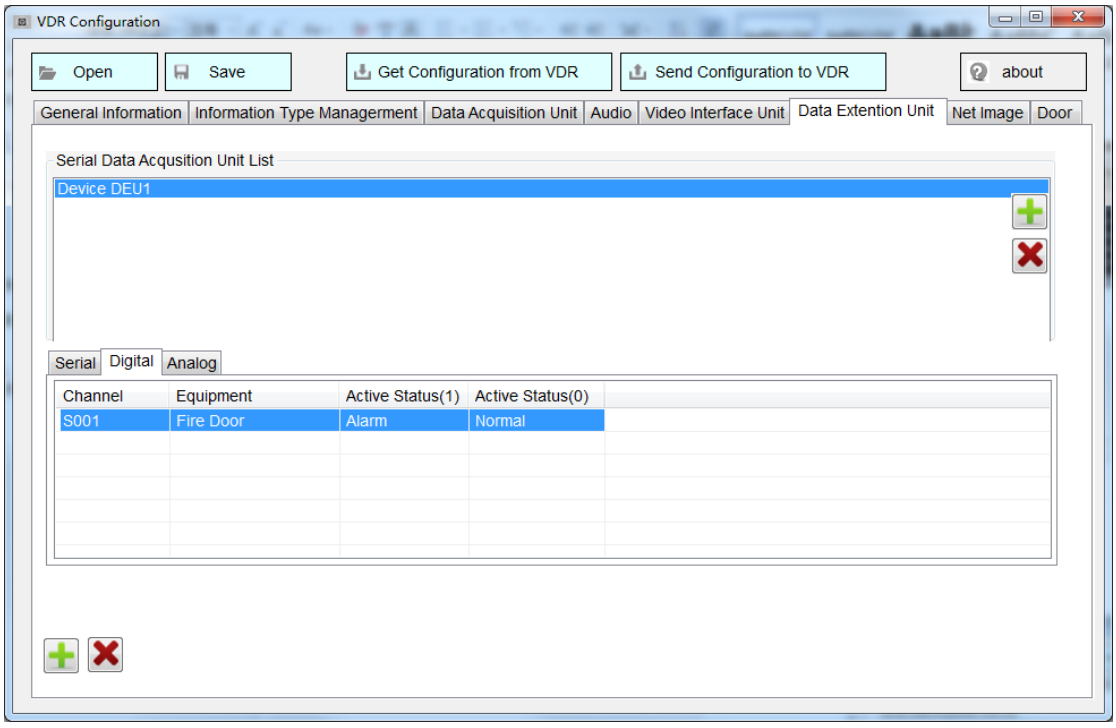
Fill in the information to the configuration.

On the “Data Extention Unit” page, “Digital” table.

Select “Channel”, and fill in “Equipment”.

If the equipment output Dry contact **short** when alarm**,** fill “Active Status(1)” (Dry contact **short**) with “**Alarm**”.

If the equipment output Dry contact **open** when normal**,** fill “Active Status(0)” (Dry contact **open**) with “**Normal**”.



Step 3:

Do not forget to “Send Configuration to VDR”.

4.12 How to connect an analog signal to VDR?

What is an Analog Signal? Analog signals are two lines with voltage or current. One DEU supports 8 analog inputs for ±10V or 4-20mA.

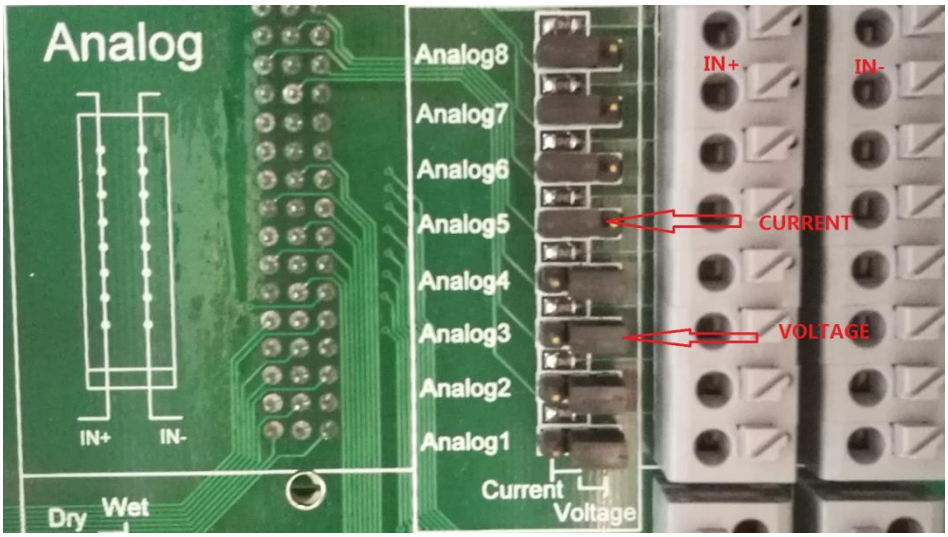
Step 1:

Ask the equipment manufacturer for the signal type(voltage or current) and its parameter table. In the table, it contains the relationship between the device value and the signal value. It is needed in step 3.

Step 2:

Connect the signal into DEU.

Here is a switch for each analog port on the board. When there is a current signal, put the jumper cap on the current and insert the active into IN+ and the negative into IN-. The same is true for the voltage signal.

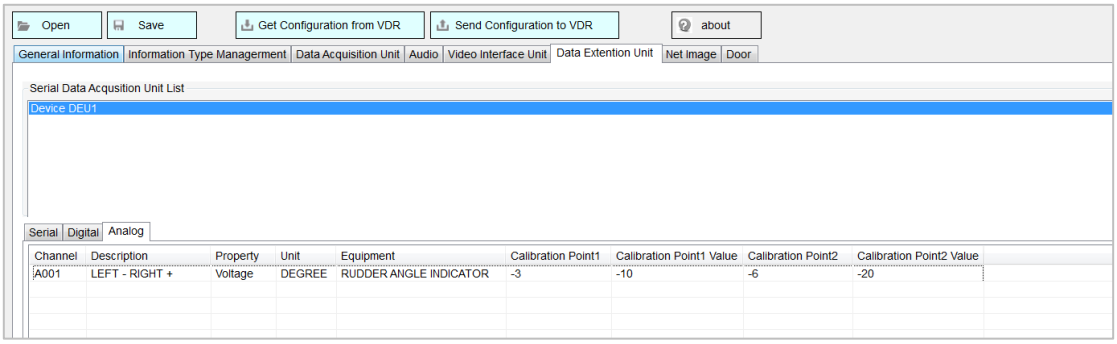


Step 3

Fill in the information to the configuration.

1) Find Data Extention Unit -> Select Device DEU1 -> Analog

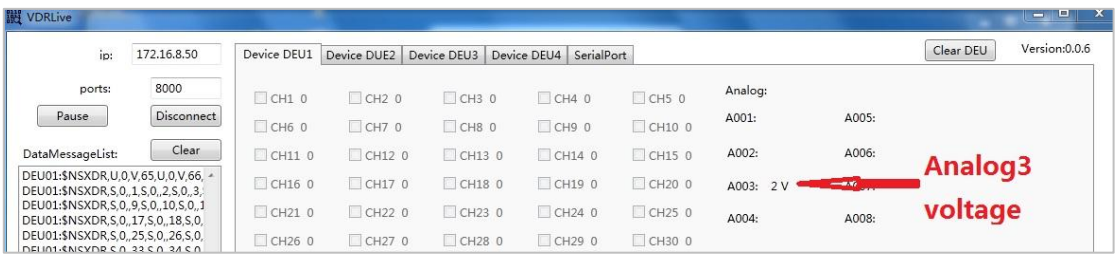
2) Click the button  , add a channel.



3) Fill in the information, for example, add the rudder angle indicator, which is a voltage signal. The unit is Degree. Fill the calibration with the table from Step 1, two points are needed. When the rudder is left 10 degrees, the voltage signal is -3V, so the calibration point 1 is -3, and the calibration point 1 value is -10. Calibration point 2 for another data.

Step 4

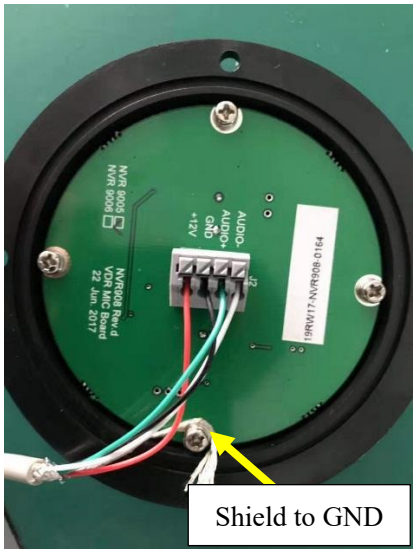
Confirm the signal has been acquired.

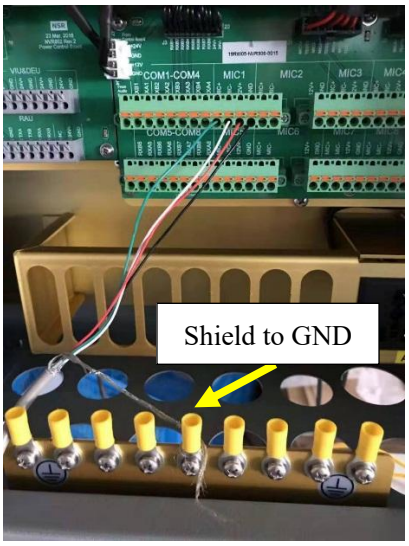


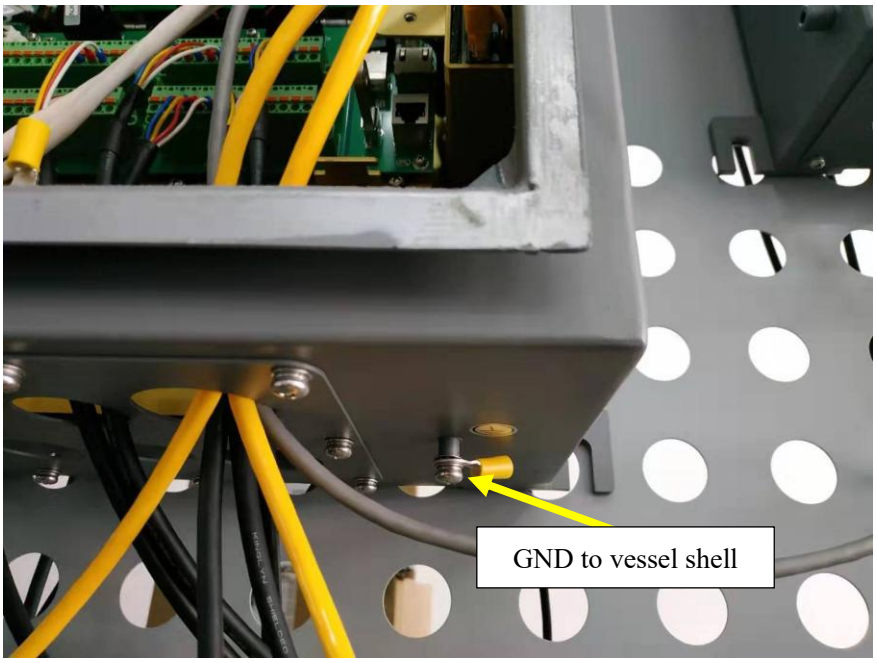
Connect the software VDRLive.exe and the analog will display on the right side as the picture.

4.13 How to connect the microphone to DAU?

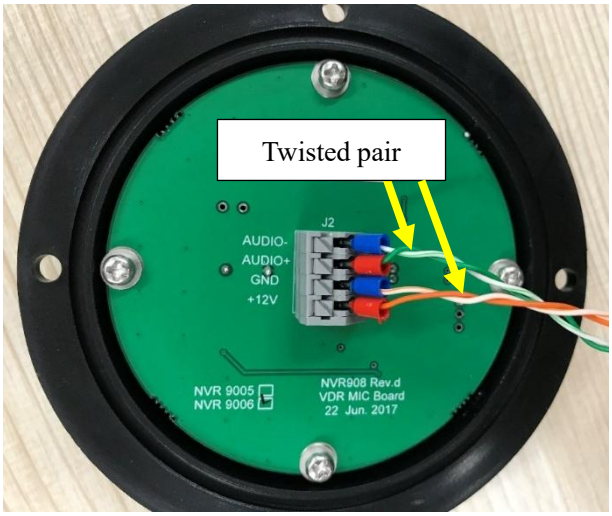
1) Connect by **shielded cable**. The shell should be connected to GND at the microphone side and DAU side. And the DAU should be connected to the shell of the vessel.
   If it is a replacement installation with the old cable, please check whether there is a Junction Box and other equipment in the middle of the original cable. Measure the resistance of the cable in a few ohms.

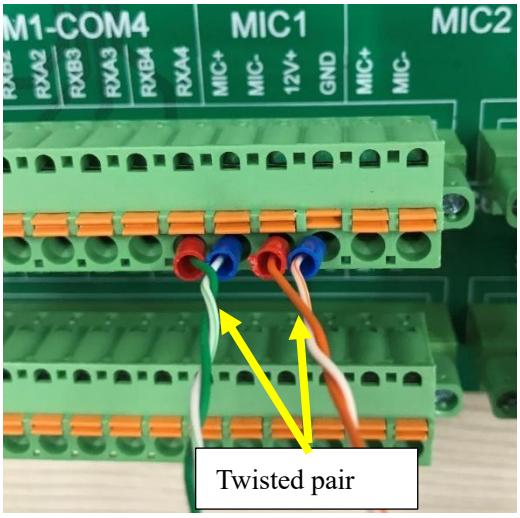






2) The twisted pair is better for differential audio.

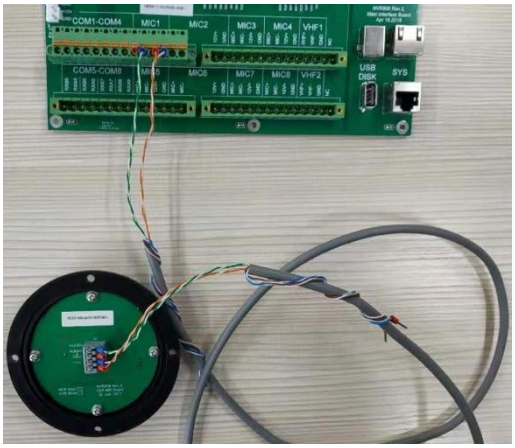




3) Test with a short cable.

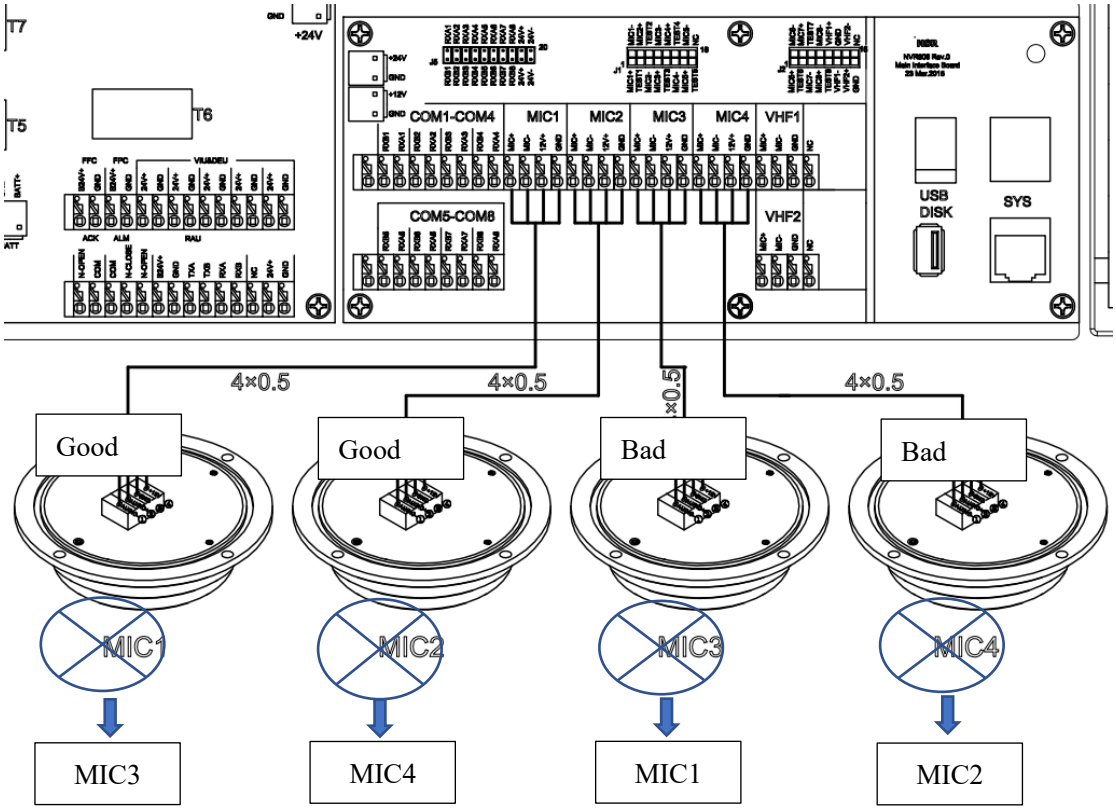
If the audio from a short cable is OK, but there is noise from a long cable, please check the long cable or change the long cable to another channel for checking. If all the channels have noise, the microphone unit may be faulty.

Channel 1=MIC1+MIC2 Channel 2=MIC3+MIC4
Channel 3=MIC5+MIC6 Channel 4=MIC7+MIC8

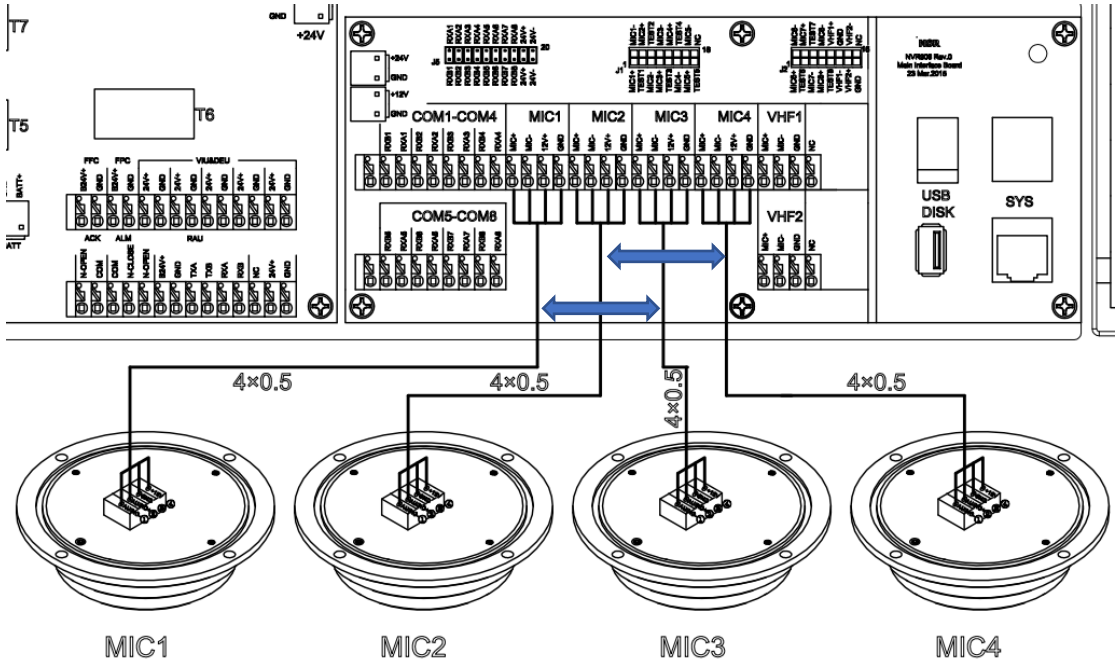


4) Exchange good channel and bad channel

Exchange the microphone unit to check if the microphone is faulty or not.



Exchange the cable to check if the cable is good or bad.



5) Adjust the volume

Too much volume can cause noise.

The default volume for MIC is 16 and VHF is 10.

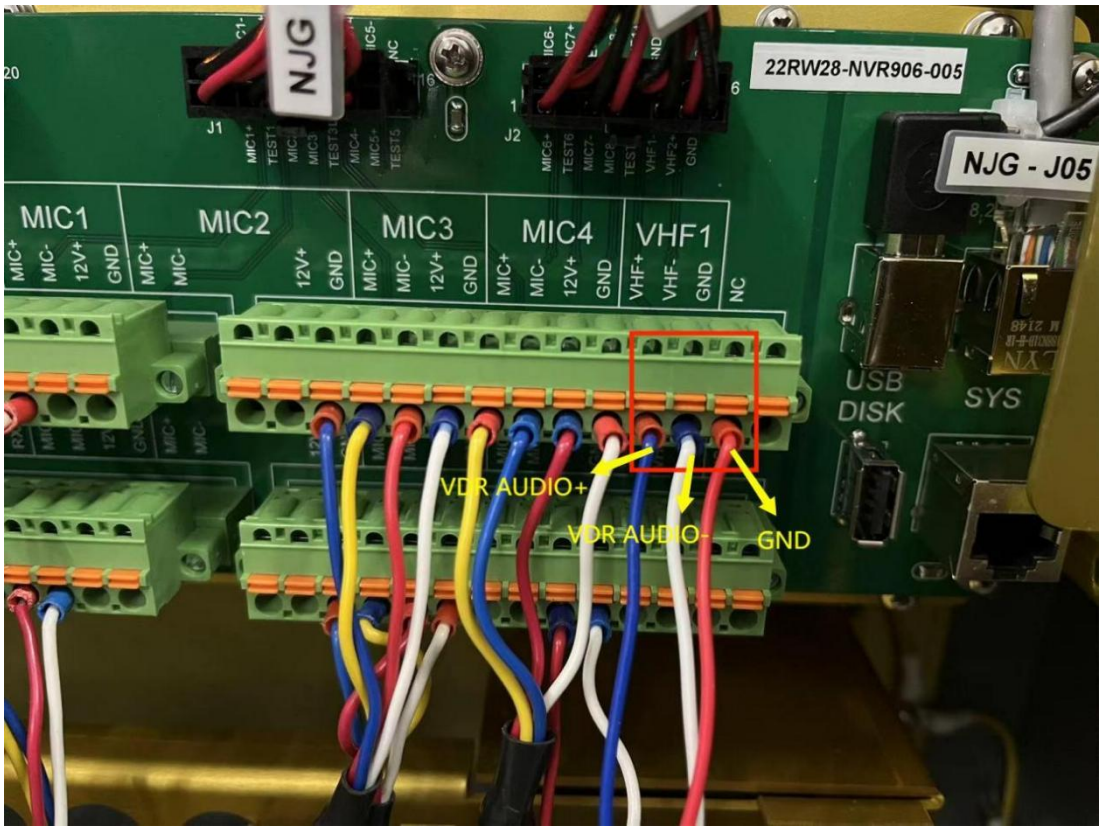
Please lower the volume setting when the sound is too loud.

Microphone ID	Location	Volume, dB (0-63)	Description
MIC1(A1)		16	
MIC2(A1)		16	
MIC3(A2)		16	
MIC4(A2)		16	
MIC5(A3)		16	
MIC6(A3)		16	
VHF1(A5)		10	
VHF2(A5)		10	

4.14 How to connect VHF to VDR?

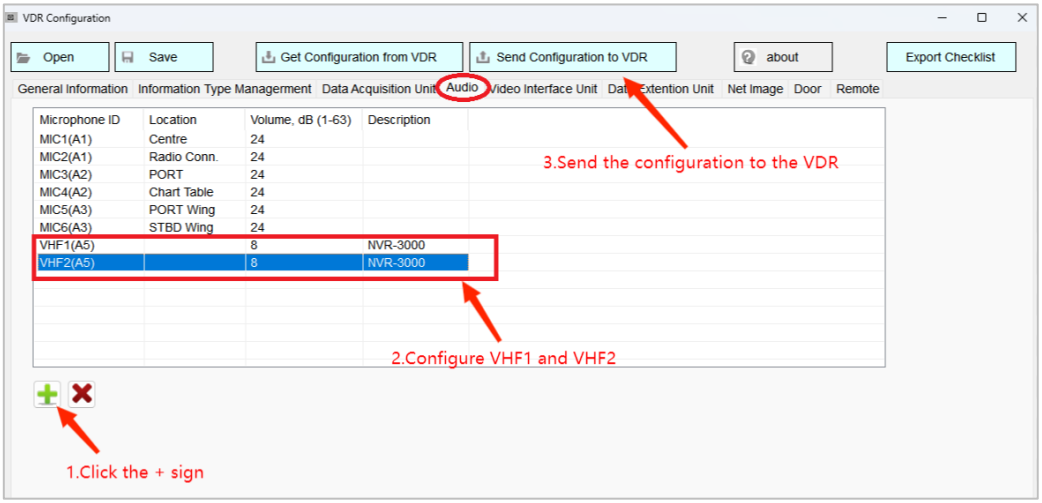
Step 1

The three plug-in cables of VHF voice output: VDR AUDIO+, VDR AUDIO-, and GND are connected to the three ports of VHF+, VHF-, and GND respectively



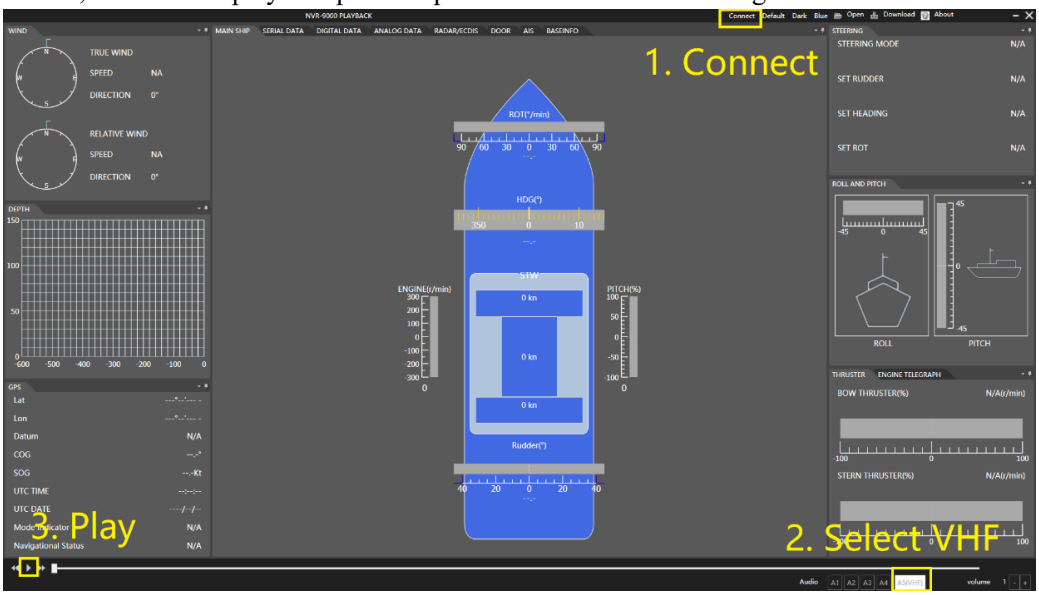
Step 2

Open the VDRConfig.exe application and perform the following Settings on the Audio page.



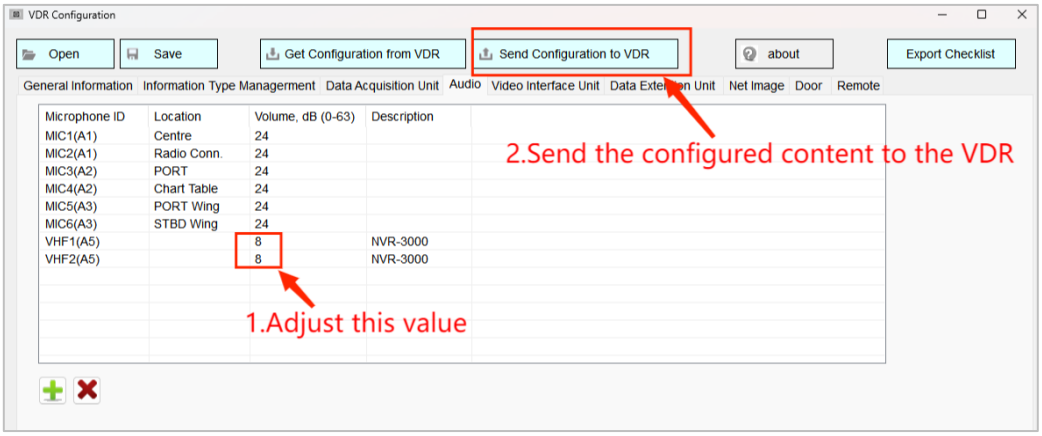
Step 3

Open the VDRPlayer.exe application and click “connect” in the upper right corner. After the connection is successful, it will be displayed. Specific operations are shown in the figure below:



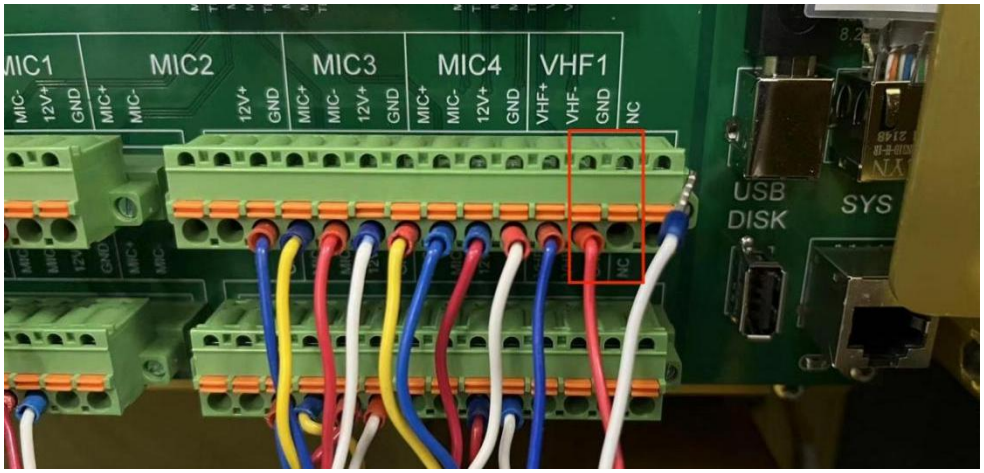
If the sound quality is not good, it can be adjusted through the following two solutions:

Solution 1: Adjust the VDR Configuration software to reduce the voice gain (Volume), as shown in the following figure:



The recorded voice is better than the real-time voice. You can download and check the data.

Solution 2: By adjusting the cable for VHF- and GND, as shown in the figure below: Connect GND to VHF-



Problem check

If the VHF channel of the VDR is not working properly, you can connect the MIC's audio line(MIC+&MIC-) to VHF and check whether the VHF input is normal.

4.15 How to connect the third VHF to VDR?

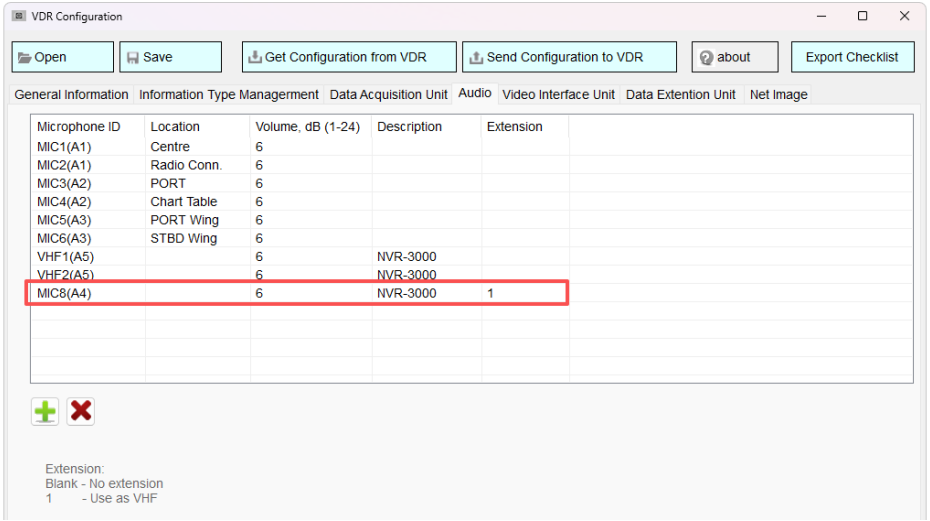
Program requirements:

MCU version ≥ 1.32 20240423

VDRConfig.exe version ≥ 1.0.1.9 20240423

VDR supports 8 MIC + 2 VHF inputs. A third VHF can be added via the configuration software. Then, one of the MIC inputs can be changed to a VHF input.

SETP: Add a MIC input, then set the **[Extension]** to **1**. Then send the configuration. It is recommended to use a separate channel(A4) to record the third VHF; otherwise, its audio will be mixed with the MIC on the same channel.



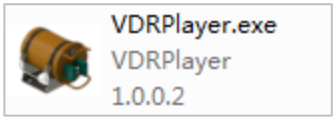
4.16 How to get data and log file for APT?

Computer IP address config:

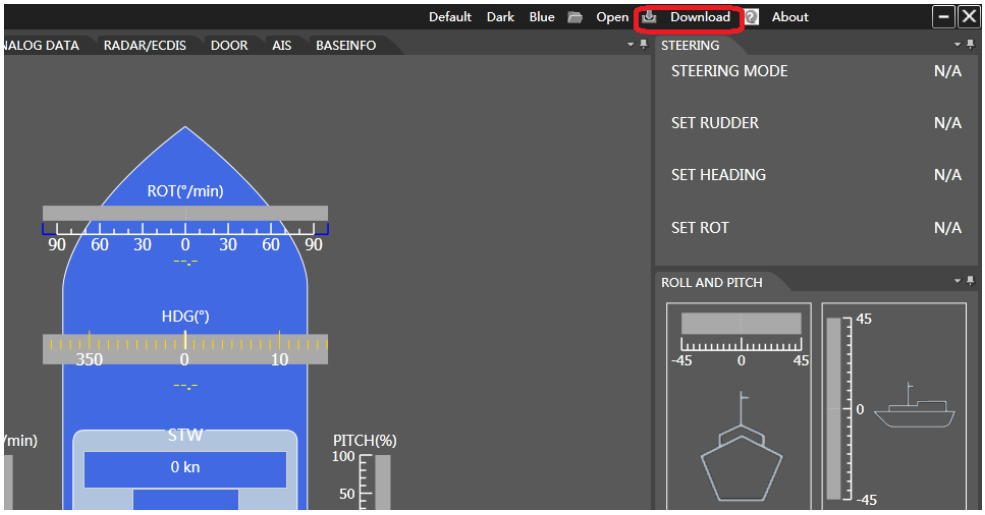
IP:172.16.8.175

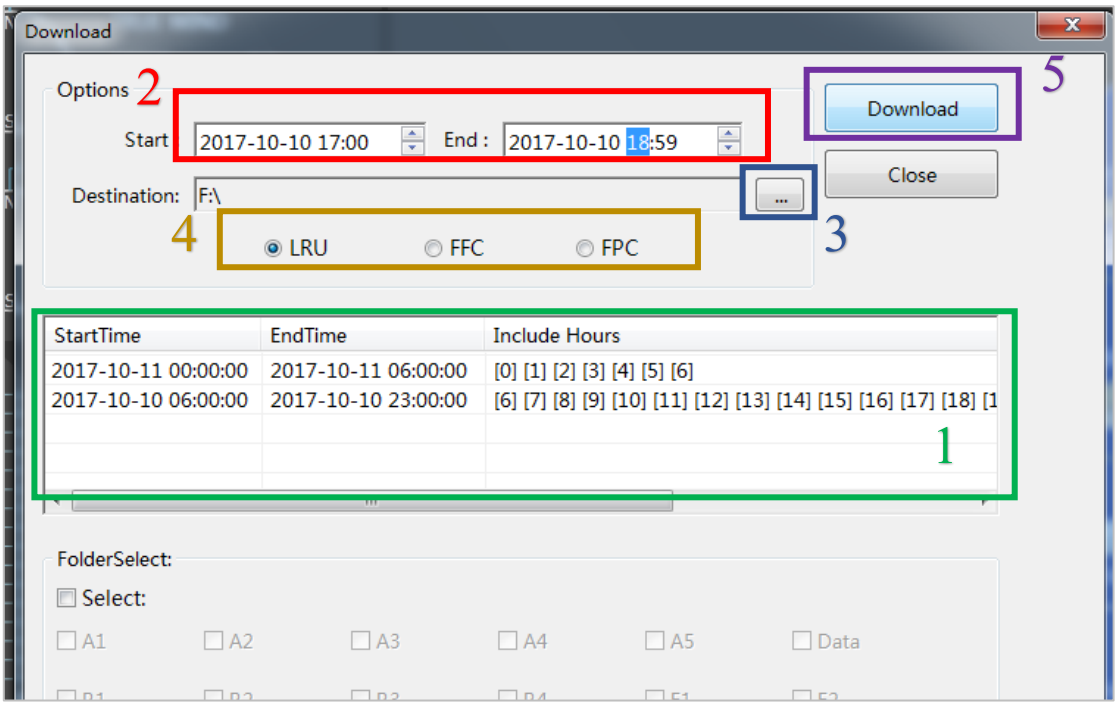
MASK:255.255.0.0

Getway:172.16.8.1



Run VDRPlayer. Click the button “Download”.

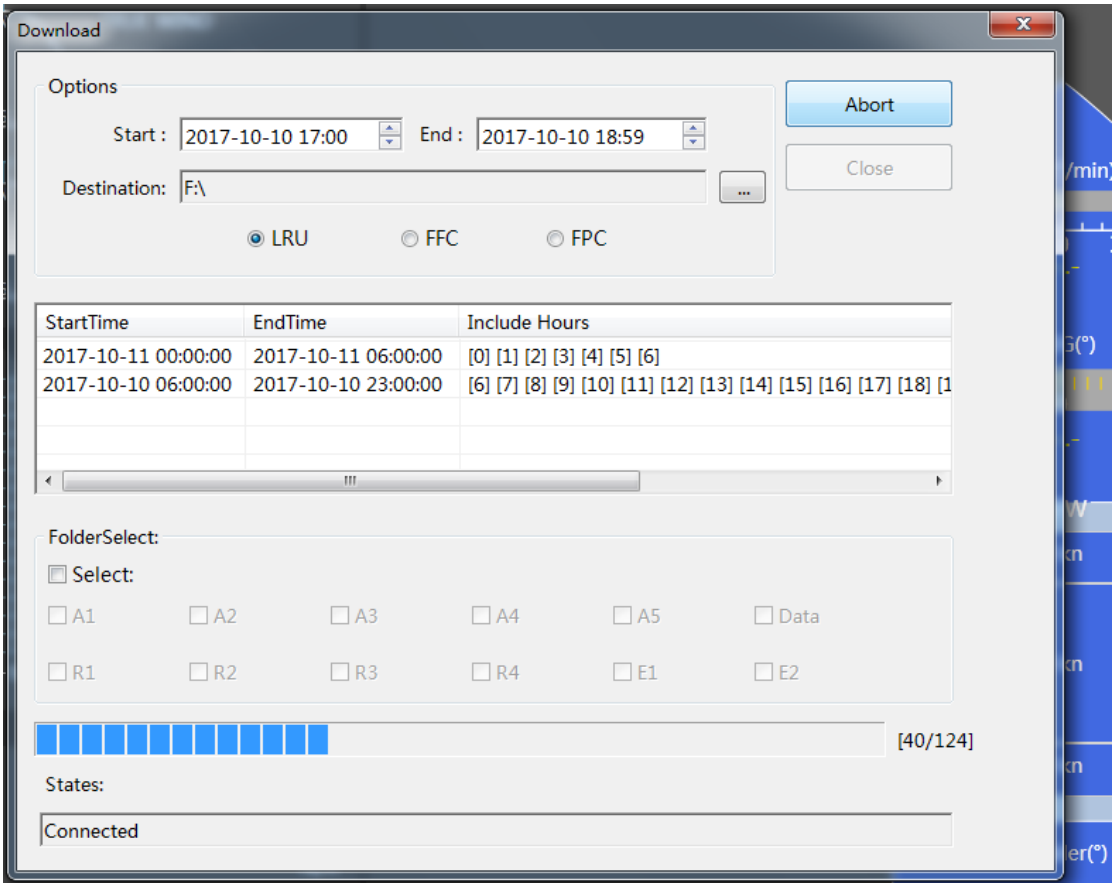


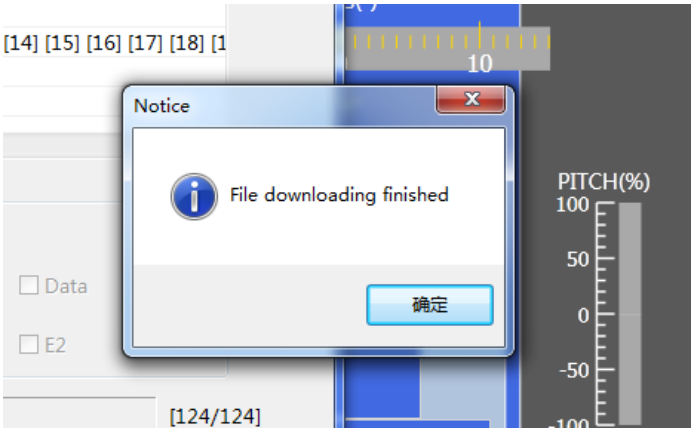


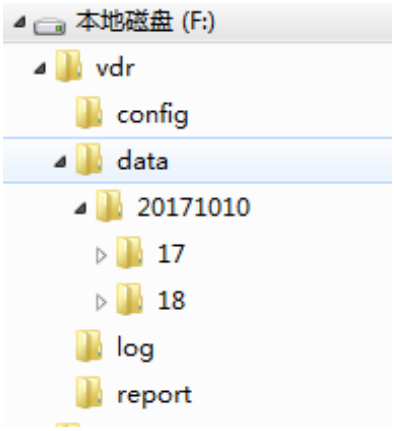
1) This table shows the data that has been recorded.
2) Select the start time and end time of the data to be downloaded. Normally, 2 hours.
3) Select the data destination where the data will be downloaded.

4) Select data where downloaded from, such as “LRU”, “FFC” or ”FPC”.

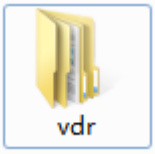
5) Click the button to download.







When the download is finished, there will be a folder like this.



Please compress the file “vdr” and send the compressed file (*.rar, *.zip).

The method of uploading files:

① Send with e-mail to as@nsrmarine.com

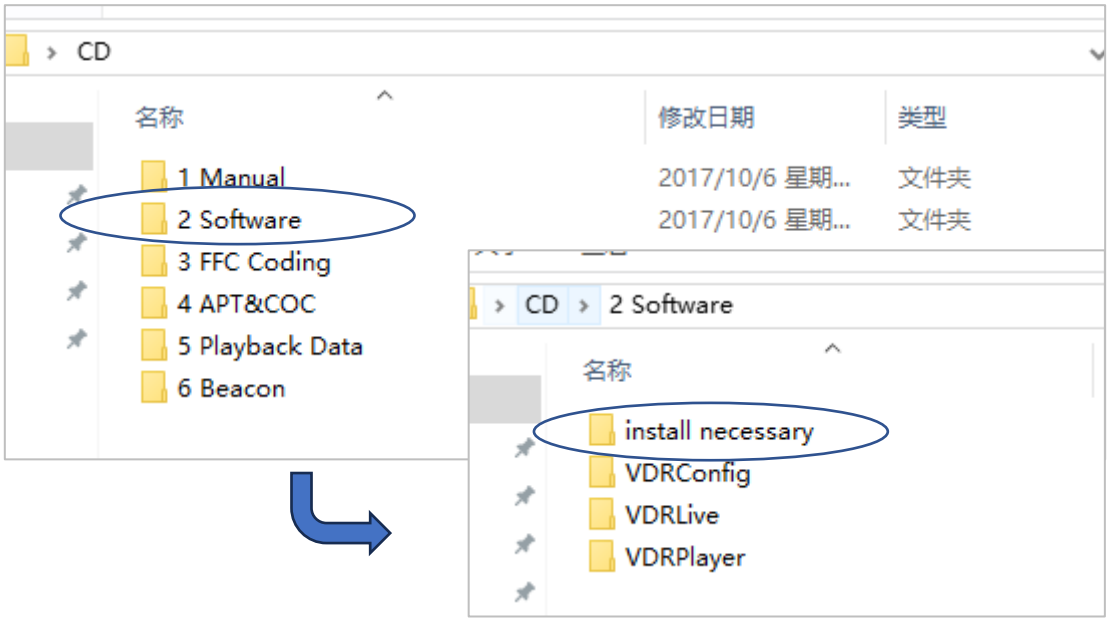
② Send through https://wetransfer.com/

4.17 VDRPlayer.exe problem during real-time/playback/download

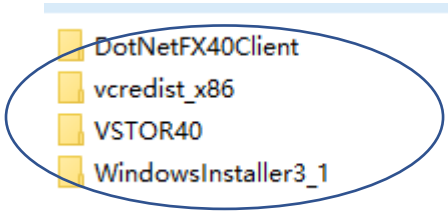
If issues occur while using the VDRPlayer for real-time connection, playback, or download, please check the following.

4.17.1 Install the necessary plug for VDR software on a PC?

1) Where is the plug software?
   In the folder of "install necessary".
   The direction is "CD\2 Software\install necessary".
   It is in the CD or USB disk of DAU.



2) Install all the plug software in the folder "install necessary" if possible.
   If some plugs fail to install. That means the Windows system does not fit them. It does not matter.

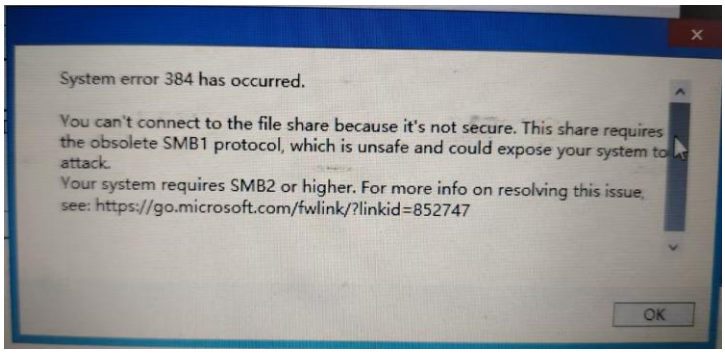


4.17.2 Change the system language to English

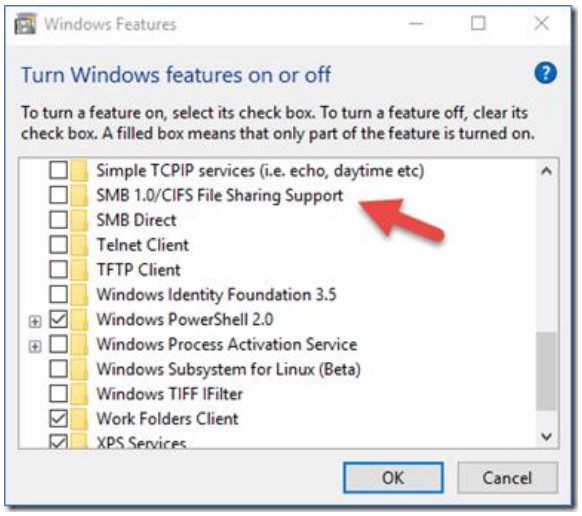
The software may occur issues when used on systems with languages other than English or Chinese. It is recommended to use an English version of Windows first.

4.17.3 System error 384 when download

When the system shows an error like below when downloading data:



It means that windows system didn't turn on the SMB1.0. Search "windows features" on Windows search. Open "SMB 1.0/CIFS File Sharing support". Then reboot windows system.



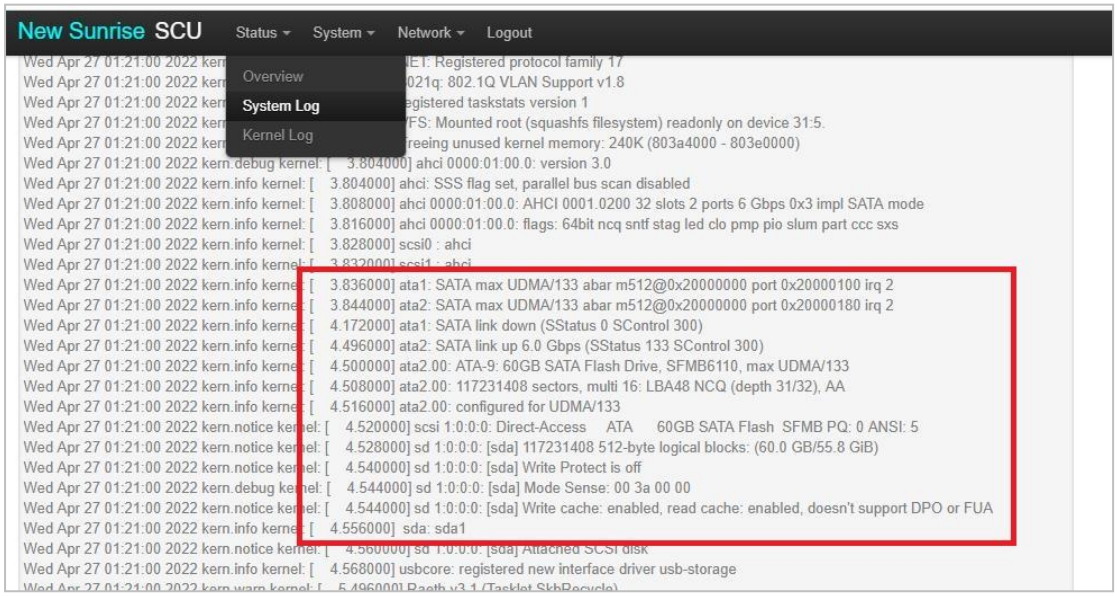
4.18 How to diagnose LRU/FFC/FPC LOST

Alert LRU LOST/FFC LOST/FPC LOST indicates that the system has detected that the SSD in the recording medium is not working properly. You can try the following steps to detect and restore it.

1) Modify the PC IP address: 172.16.8.145.
2) Enter the IP address in the browser.
   LRU: 172.16.8.100
   FFC: 172.16.8.110
   FPC: 172.16.8.120
3) Login user: root, password: 123.

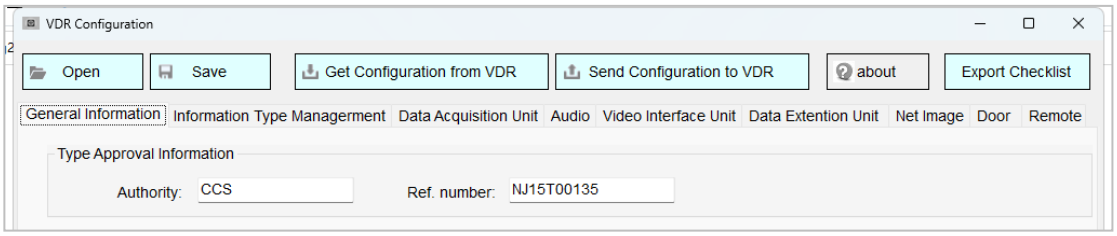
Check SSD status

Enter status -> system log.



If the sda1 information can be seen in the log, it can be considered that the SSD can still be detected.
Then refer to 2.11.4 LRU/FFC/FPC SSD Format.
If not, it is recommended to replace the entire recording medium.

4.19 Why is no audible alert heard while an alert is displayed on RAU?



Regulation relative:
IEC 61996-1 2021 for VDR
IEC 62923-1, IEC 62923-1 2018 for BAM(Bridge Alert Management)

1) Define Alert
IEC 62923-1

3.1.8
alert
(MSC.302/A) *announcement of abnormal situations and conditions requiring attention*

Note 1 to entry: *Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions. An alert provides information about a defined state change in connection with information about how to announce this event in a defined way to the system and the operator.*

2) Alert priorities
Emergency alarm, Alarm, Warning, Caution
Caution should not make an audible signal.

IEC 62923-1, P39

6.3.6 Cautions

6.3.6.1 Presentation

6.3.6.1.1 Requirement

(MSC.302/7.5.1) *A caution* shall *be indicated* (presented) *by a steady visual indication. No acknowledgement* shall *be necessary for a caution.*

A caution shall be silent and is not allowed to be accompanied by audible signal or speech output (see Table 5).

(MSC.302/7.5.3) *A message* shall *be provided of sufficient detail to enable the bridge team to identify and address the caution condition.*

3) All the Alerts of VDR are Caution

IEC 61996-1, P16-P17

Checking of recording integrity will make a Caution.

4.4.4 Recording integrity

(See 6.1.10)

(MSC.333(90)/5.3.3) *The recording method* shall *be such that each item of the recorded data is checked for integrity,* i.e. it is identical to the data being received, *and an* alert according to IMO A.1021(26) *given if a non-correctable error is detected.*

The VDR shall automatically continuously monitor the following:

- power supply;
- record function;
- microphone functionality.

Malfunction of any of the above shall generate a caution (see 3.1.4). The caution shall remain until the equipment is serviceable. It shall also indicate its caution status by means of contacts of a relay (or equivalent) which is held energized in the no-alert condition.

The VDR shall also continuously monitor the period of data stored on each element of the final recording medium. If the period of any of the elements falls below the minimum compliant period defined in 4.5.4 a caution shall be generated and remain while the condition is true.

4) IEC61996-1 2021 modified from the previous version

P7, All the Alarms were changed to Caution.

e) References to "alarm" requirements in the previous edition have been substituted by references to "cautions" in line with current IMO recommendations. The test methods in Clause 6 have been updated to reflect the new requirements.

Annex A at NVR-9000 user manual Alert List of NVR-9000

All the alerts are Caution, they will not make audible signals.

ANNEX A ALERT LIST

Alert Identifier	Ins	Alert Title	Alert Description	Prio	Cat	Reason
3009	2	RAU LOST	Check RAU	C	B	DAU lost connect with RAU
3009	3	DAU LOST	Check DAU	C	B	RAU lost connect with DAU
3023	4	AC POWER LOST	Check AC power and switch	C	B	AC 110V/220V Lost
3023	5	BAT LOST	Check battery	C	B	Battery Voltage Lost
3023	6	BAT LOW	Check battery	C	B	Battery Voltage Low
3009	7	UTC LOST	Check GPS	C	B	UTC Source Lost
3009	8	USB RW FAIL	Check USB disk	C	B	USB Disk Read and Write Fail
3009	9	LOG W FAIL	Check MCU	C	B	MCU Write Log File Fail
3009	10	CONFIG R FAIL	Check MCU	C	B	MCU Write Config File Fail
3009	11	FPC LAN LOST	Check FPC LAN cable	C	B	FPC Lan Connection Lost
3009	12	FFC LAN LOST	Check FFC LAN cable	C	B	FFC Lan Connection Lost
3009	13	LRU LAN LOST	Check LRU LAN cable	C	B	LRU Lan Connection Lost
3009	14	FPC LOST	Check FPC	C	B	FPC Lost
3009	15	FPC LOW CAPACITY	Check FPC	C	B	FPC Low Capacity
3009	16	FFC LOST	Check FFC	C	B	FFC Lost
3009	17	FFC LOW CAPACITY	Check FFC	C	B	FFC Low Capacity
3009	18	LRU LOST	Check LRU	C	B	LRU Lost
3009	19	LRU LOW CAPACITY	Check LRU	C	B	LRU Low Capacity
3009	20	DAU COM LAN	Check NVR909 in DAU	C	B	Lost Connect with NVR901
3009	21	DEU1 LOST	Check DEU1 and LAN cable	C	B	DEU1 Lan Connection Lost
3009	22	DEU2 LOST	Check DEU2 and LAN cable	C	B	DEU2 Lan Connection Lost
3009	23	DEU3 LOST	Check DEU3 and LAN cable	C	B	DEU3 Lan Connection Lost
3009	24	DEU4 LOST	Check DEU4 and LAN cable	C	B	DEU4 Lan Connection Lost
3009	25	VIU1 LOST	Check VIU1 and LAN cable	C	B	VIU1 Lan Connection Lost
3009	26	VIU2 LOST	Check VIU2 and LAN cable	C	B	VIU2 Lan Connection Lost
3009	27	VIU3 LOST	Check VIU3 and LAN cable	C	B	VIU3 Lan Connection Lost
3009	28	VIU4 LOST	Check VIU4 and LAN cable	C	B	VIU4 Lan Connection Lost
3003	29	VIU1 SAMPLE FAIL	Check VIU1 and VGA cable	C	B	VIU1 Sample Image Fail
3003	30	VIU2 SAMPLE FAIL	Check VIU2 and VGA cable	C	B	VIU2 Sample Image Fail
3003	31	VIU3 SAMPLE FAIL	Check VIU3 and VGA cable	C	B	VIU3 Sample Image Fail
3003	32	VIU4 SAMPLE FAIL	Check VIU4 and VGA cable	C	B	VIU4 Sample Image Fail
3003	33	DAU COM	Check DAU COM	C	B	DAU Com Port Connection Fail
3003	34	DEU1 COM	Check DEU1 COM	C	B	DEU1 Com Port Connection Fail
3003	35	DEU2 COM	Check DEU2 COM	C	B	DEU2 Com Port Connection Fail

Appendix A Radar & ECDIS connections

Below radar & ECDIS models can be connected to NVR-9000 VDR.

Brand	Model of Radar/ECDIS	Output	Description	VIU	NET IMAGE
FURUNO	FAR-2137	DVI	DVI	√	
	FAR-2115/2117/2827/2837S	VGA/DVI	VGA: with OP03-180(DVI-RGB kit) DVI: no kit 1280*1024	√	
	FAR-2218/2238	LAN	IEC 61162-450		√
	FR2825/2835	VGA	1066*800 72Hz	√ Need converter	
	FMD-3300/3200/3100	LAN / DVI		√	√
JRC	JAN-901	DVI	1600*1200	√	
	NDC-1417	VGA	Signal Weak	√	
	JMR-92xx/JMR72xx, JAN-92xx/JAN72xx	LAN	IEC 61162-450	√ Need converter	√
	JMA-91xx	VGA	1280*1024	√	
	JMA-5312/5310	DVI		√	
	JMA-99xx	VGA	1024*768	√	
	JMA-7252	VGA	1312*928 45.5Hz	√ Need converter	
Sperry	SPERRY VISION MASTER		1280*1024	√	
	BridgeMaster E BME Radar		1280*1024 39Hz	√ Need converter	
SAM	SAM AZ3068		1280*1024	√	
	SAM 1100 Radar			√	
Consilium	Selesmar Selux T250 ARPA		1280*1024	√	
KODEN	MDC-7912		1280*1024	√	
	MDC-1810P		1280*1024	√	
	MDC-7925P		1280*1024	√	
Kelvin Hughes	Nucleus 3 5000		Upgrade Radar	√	
TRANSAS	Navi-Sailor-4000	LAN			√
TKC	EC-8100/EC-8600	LAN			√
	BR-3440	RGsB	1280*1024	√ Need converter	
ChartWorld	eGlobe G2	LAN			√

All models in the above table can be connected to NVR-9000 in one of the following ways:

1) With a direct LAN cable.
2) With NSR NVR9004 VIU only.
3) With NSR NVR9004 VIU together with additional converters described in A.1/A.2/A.3.

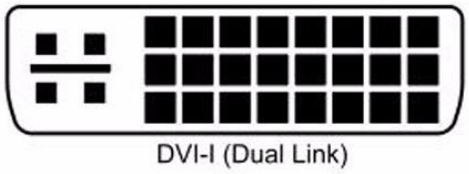
For those models that are not mentioned in the above table, please contact NSR for further instructions.

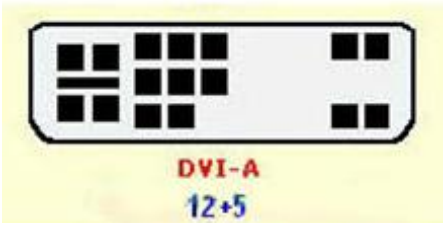
A.1 Use VGA Hub to enhance the signal

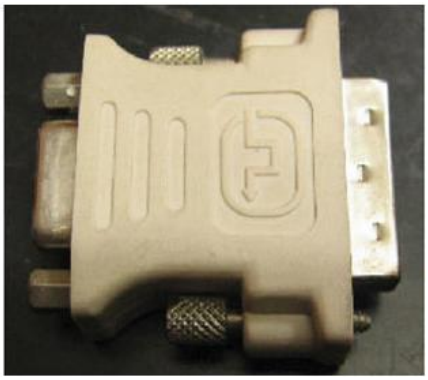
A.2 Use the correct DVI-VGA for different DVI types

- **DVI-I & DVI-A**

For DVI-A and DVI-I output, use the DVI-I to VGA convert cable.

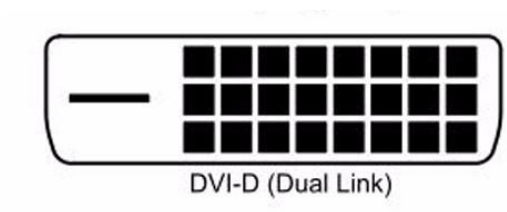






- **DVI-D**

For DVI-D output, use the DVI-D to VGA converter box.



A.3 For displays with high resolution 1920*1200

For displays with a resolution of 1920*1200 to be connected, use a converter to convert the resolution 1920*1200 to 1920*1080 which VIU can accept.

Appendix B How to setup NET IMAGE (IEC 61162-450)

B.1 Check whether the sender supports IEC 61162-450

The sender is required to support the following protocols：
IEC 61162-450（2011）or
IEC 61162-450（2018）
The following multicast IP address needs to be set up:

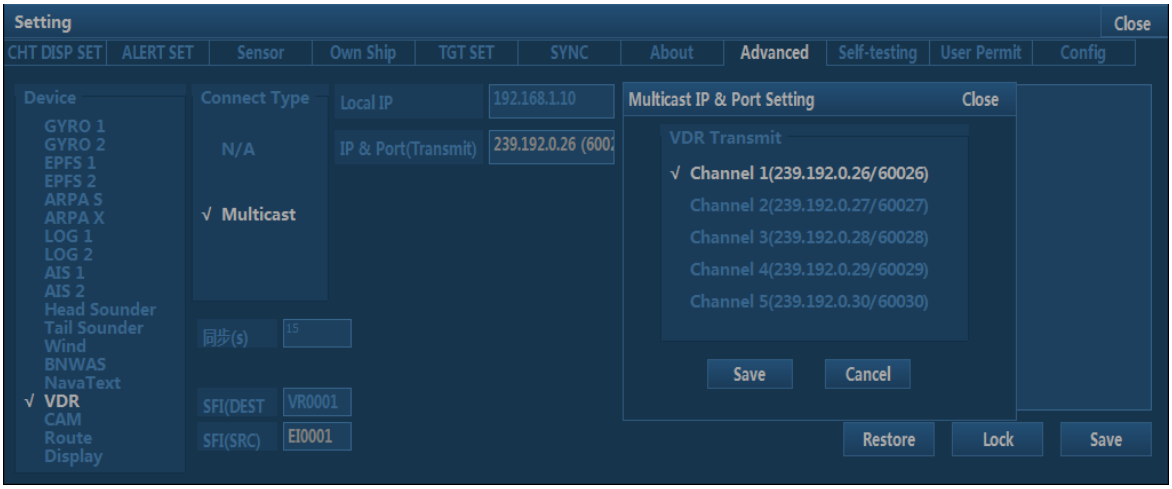
Category	Multicast address	Destination port
IEC 61162-450 (RaUdP – Simple binary file transfer service with UDP Multicast)	239.192.0.21 to 239.192.0.25	60021 to 60025
IEC 61162-450 (RrUdP – Re-transmittable binary file transfer service with UDP Multicast)	239.192.0.26 to 239.192.0.30	60026 to 60030
Address 239.192.0.25, port 60025 is the default for ECDIS route transfer (see IEC 61174). Address 239.192.0.26, port 60026 is the default for VDR image transfer (see IEC 61996-1). Address 239.192.0.30, port 60030 is the default for ECDIS re-transmittable data blocks for route transfer (see IEC 61174).		

When on board, you can test whether the equipment supports or not through 5 Problem Check without VDR.
Only a network cable is needed between VDR and ECDIS/RADAR. VDR is the receiver and ECDIS/RADAR is the sender. It is recommended to use the VIU1-4 LAN port for the connection.

B.2 Configure sender ECDIS/RADAR

As the sender, ECDIS/RADAR needs to be configured to output multicast pictures.
Usually, connect to the sender to the specify network port, set up IP, Port and SFI.
Take NES-3000 as an example, other products see Annex.
The SFI of some devices is unknown, which can be obtained by the method in 5. Problem Check.

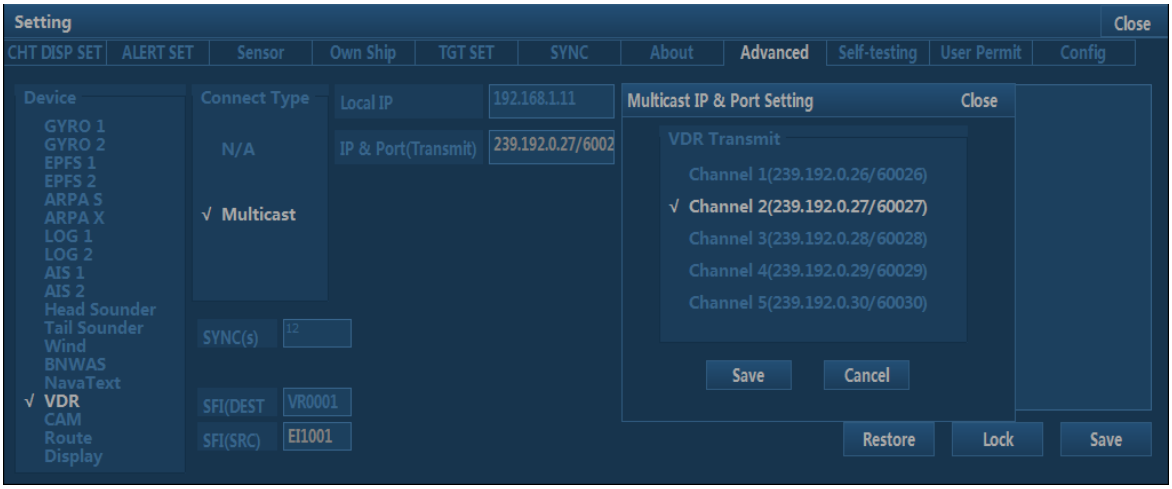
➢ NES-3000 MASTER



IP: Consistent with VDR, the scope is shown in Table 1, for example:239.192.0.26.
Port: Consistent with VDR, the scope is shown in Table 1:60026.
Local IP: This is the IP address of the network port connected to the VDR. It can also be set to 192.168.1.10
Local Port: Same as Port.
同步(S) (Synchronization):15.
SFI: Here is the destination SFI, the Source SFI of VDR. VDR default SFI is VR0001.

In addition, you need to enter NES-3000's Source SFI o in the VDR configuration (the default is EI0001).

- **NES-3000 BACK-UP**

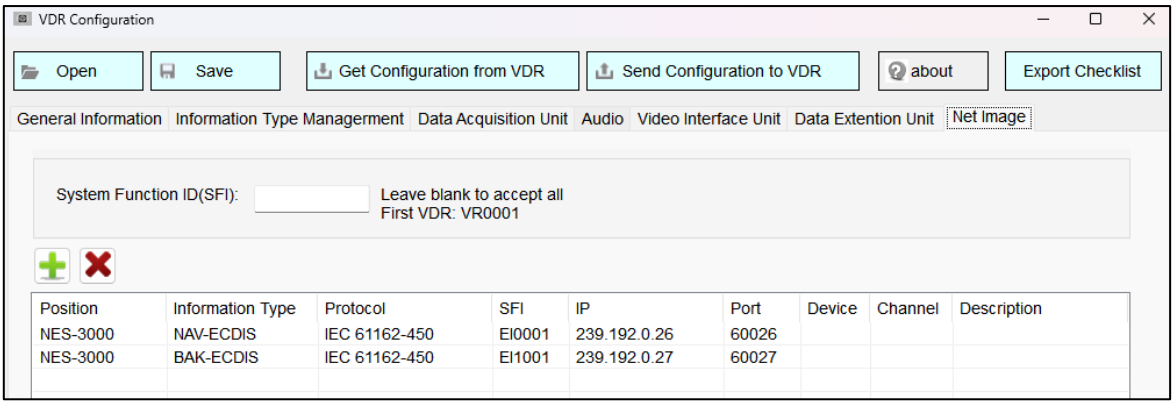


IP: Consistent with VDR, the scope is shown in Table 1, for example:239.192.0.27.
Port: Consistent with VDR, the scope is shown in Table 1:60027.
Local IP: This is the IP address of the network port connected to the VDR. It can also be set to 192.168.1.10
Local Port: Same as Port.
SYNC(S) (Synchronization):15.
SFI: Here is the destination SFI, the Source SFI of VDR. VDR default SFI is VR0001.

In addition, you need to enter NES-3000's Source SFI o in the VDR configuration (the default is EI1001).

B.3 Configure the receiver NVR-9000 Net Image

VDR, as the receiver, needs to configure the same parameters as the sender.
NVR-9000 needs to set the parameters "**SFI**", "**IP**" and "**PORT**" according to the different sender. Generally, the settings are as follows：



System Function ID: SFI of VDR, default is VR0001, leave blank for receive all.

Important Items：

Protocol: IEC 61162-450 uses multicast, suitable for most devices

SFI: Source SFI of ECDIS/RADAR

IP: Multicast IP address of ECDIS/RADAR

Port: Multicast port of ECDIS/RADAR

Note: *The same combination of IP: port and SFI cannot be used when multiple sets of devices are connected to VDR.*

B.4 Check result

After the configuration is completed. Check to see if VDR successfully received the image. Enter “\\172.16.8.100” in the folder address bar or Win+R run, user name: admin password: 123.

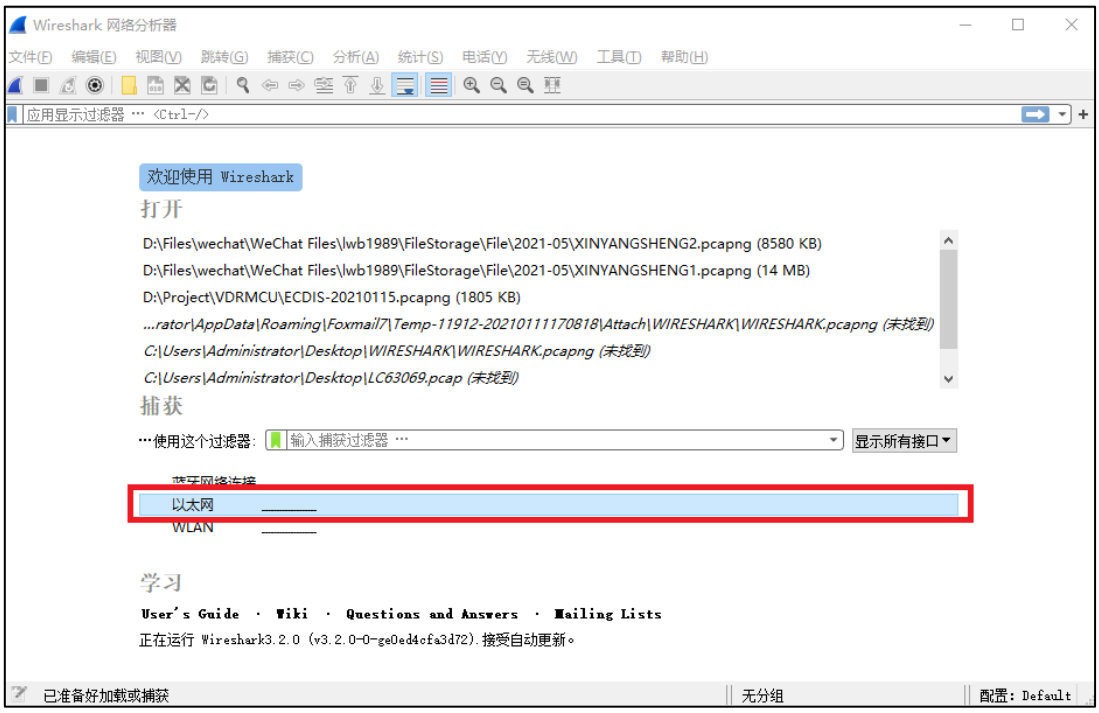
Check the latest data in "vdr\ data\ [date]\ [time]\ E1" directory to see if any new images are generated.

If multiple devices are configured, select E1, E2, E3, E4 according to the configuration order.

B.5 Problem check

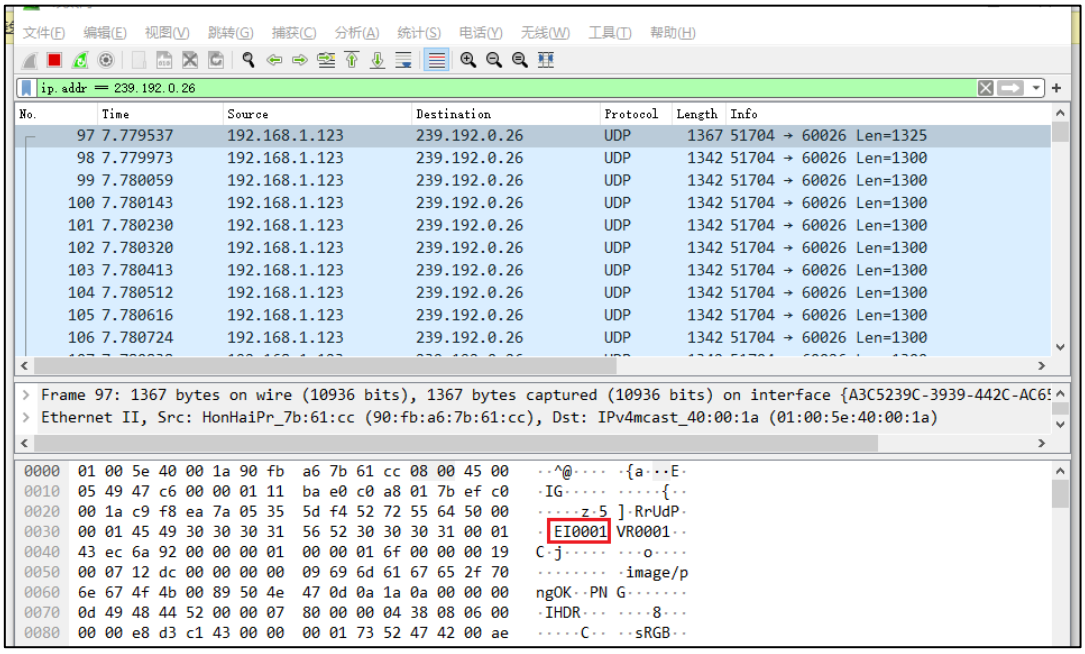
When the VDR cannot receive the picture correctly, it can first check whether the IEC 61162-450 packet is sent by the sender (ECDIS/RADAR) through Wireshark.

1) Download the software “Wireshark” from the Internet.
2) Connect the PC to the sender's network port.
3) Set Wireshark, select the corresponding network card connected to the network port and double-click to capture.



4) In the filter column, enter the IP set by the sender, such as "IP.addr = = 239.192.0.26." If a picture is sent from the sender, Wireshark will receive the data frame shown below. In addition, the framed part of the picture below is the sender's Source SFI, which needs to be consistent with the configuration in VDR.

   If you cannot receive the data frame, check the ECDIS/RADAR settings.



➢ Furuno FMD-3300/3200/3100

- **Network port**: LAN2

LAN port	IP address/ Subnet mask	Setting value
LAN1 (Gateway network)	IP address	192.168.31.200
	Subnet mask	255.255.255.0
LAN2 (Sensor network)	IP address	172.31.16.200
	Subnet mask	255.255.0.0

- **Set parameters related to VDR:**

- **Destination**: IP and Port need to be configured to VDR.
- **SFID**： Refer to the Furuno manual in the table below, you need to configure to VDR.

• The Processor Unit's SFID, Device No. and Channel change as shown in the following table.

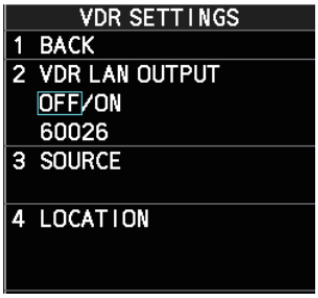
Equipment ID	SFID	Device No.	Channel
CRA001	RA0001	61	1, 2, 3
CRA002	RA0002	62	1, 2, 3
CRA003	RA0003	63	1, 2, 3
CRA004	RA0004	64	1, 2, 3
ECD001	EI0001	21	1, 2, 3
ECD002	EI0002	22	1, 2, 3
ECD003	EI0003	23	1, 2, 3
ECD004	EI0004	24	1, 2, 3
ECD005	EI0005	25	1, 2, 3
ECD006	EI0006	26	1, 2, 3
ECD007	EI0007	27	1, 2, 3
ECD008	EI0008	28	1, 2, 3
ECD009	EI0009	29	1, 2, 3
ECD010	EI0010	30	1, 2, 3
ECD011	EI0011	31	1, 2, 3
ECD012	EI0012	32	1, 2, 3
ECD013	EI0013	33	1, 2, 3
ECD014	EI0014	34	1, 2, 3
ECD015	EI0015	35	1, 2, 3
ECD016	EI0016	36	1, 2, 3

➢ Furuno FAR-2218/2238

- **Network port**: LAN2
- **Set parameters related to VDR**:

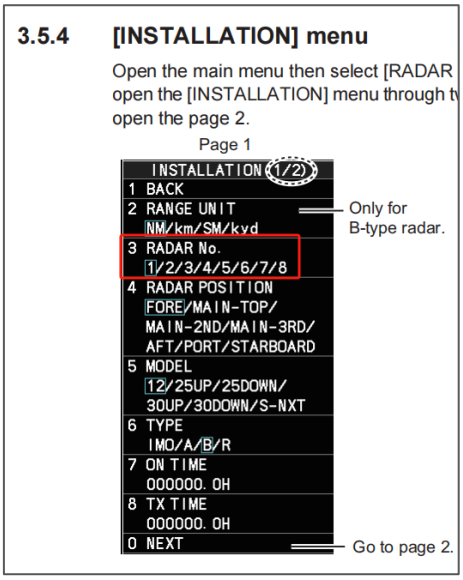
[VDR SETTINGS]

- [VDR LAN OUTPUT]: Select [ON] to output the VDR signal through LAN connection. For [ON], set the multicast port with the software keyboard.
- [SOURCE]: Set the status and information text, max 16 characters with the software keyboard (Example: "Xband.1").
- [LOCATION]: Set the status and information text, max 32 characters with the software keyboard (Example: "No1").



Note: 60026 corresponds to IP:239.192.0.26. You need to set the IP and port to VDR.

- **SFI**: Refer to Furuno manual. No.1 Radar is "**RA0011**" and needs to be configured to VDR.



[LAN2 IP ADDRESS]

The IP address is assigned according to the radar No (See "[RADAR No.]" on page 3-8). Set the IP address as shown below. This IP address can be changed as required.

Radar No.	LAN2	SFID
No.1	172.31.16.11	RA0011
No.2	172.31.17.11	RA0012
No.3	172.31.16.12	RA0013
No.4	172.31.17.12	RA0014
No.5	172.31.16.13	RA0015
No.6	172.31.17.13	RA0016
No.7	172.31.16.14	RA0017
No.8	172.31.17.14	RA0018

➢ JRC JMR-92xx/JMR72xx, JAN-92xx/JAN72xx

- **Network port:** J4122/J4117

5.3 Connection of VDR

5.3.1 Connection with LAN (IEC61162-450)

When the VDR have LAN port, use connection with the LAN (IEC61162-450). There is the LAN port J4117 which is located in central control unit (NDC-1590). See the drawing below.

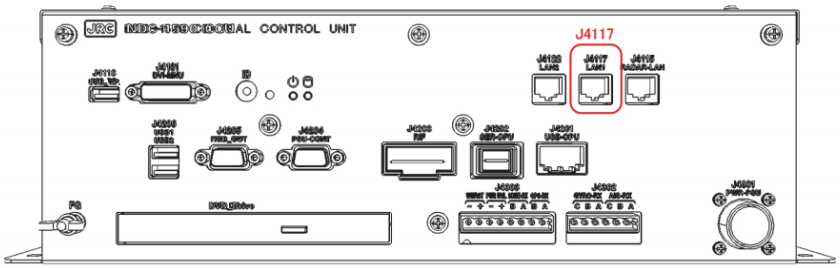
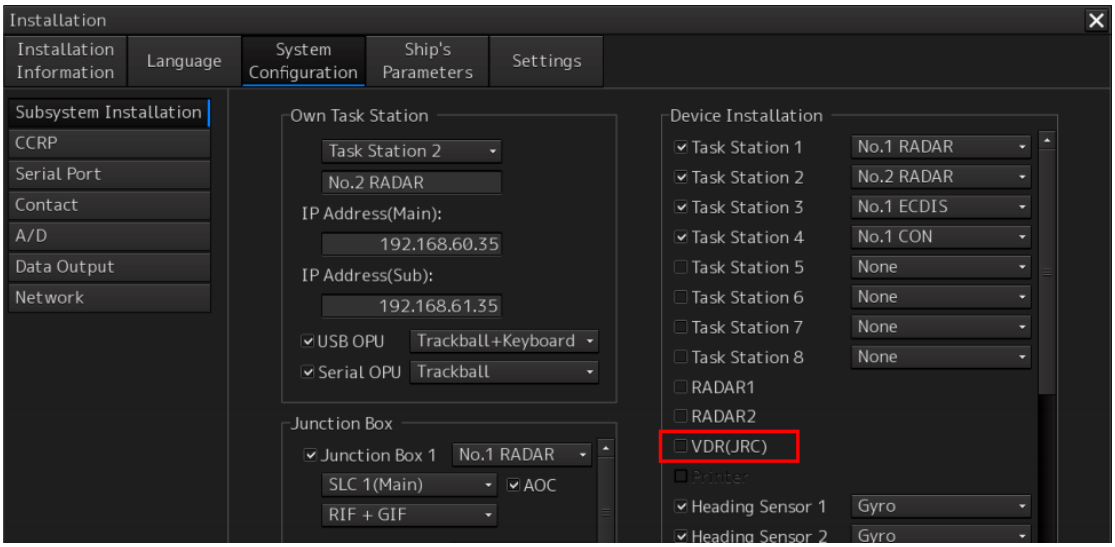
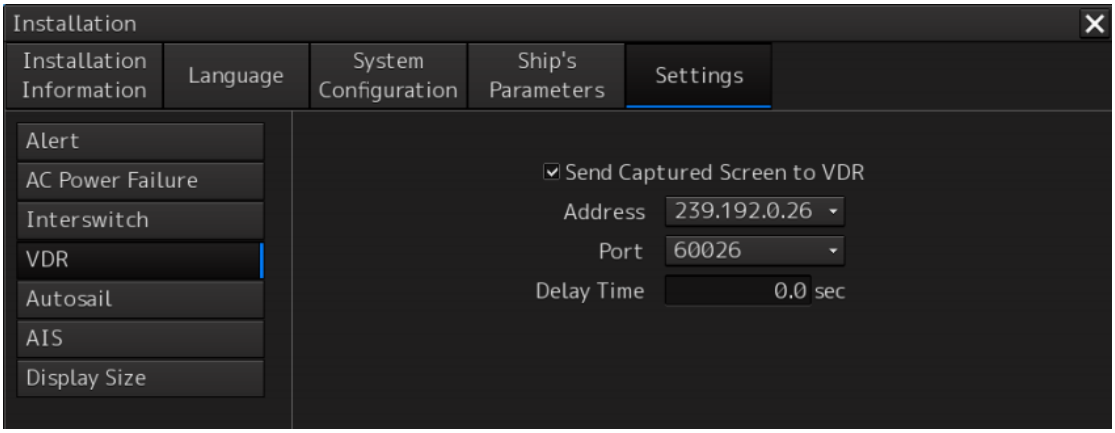


Fig 5-17 VDR connection connector LAN(IEC61162-450)

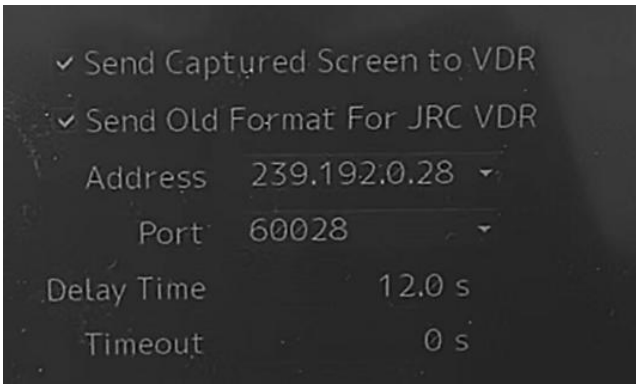
After the connection, please set the display unit by referring to the **4.15 Setting of VDR.**

- **Set parameters related to VDR:**





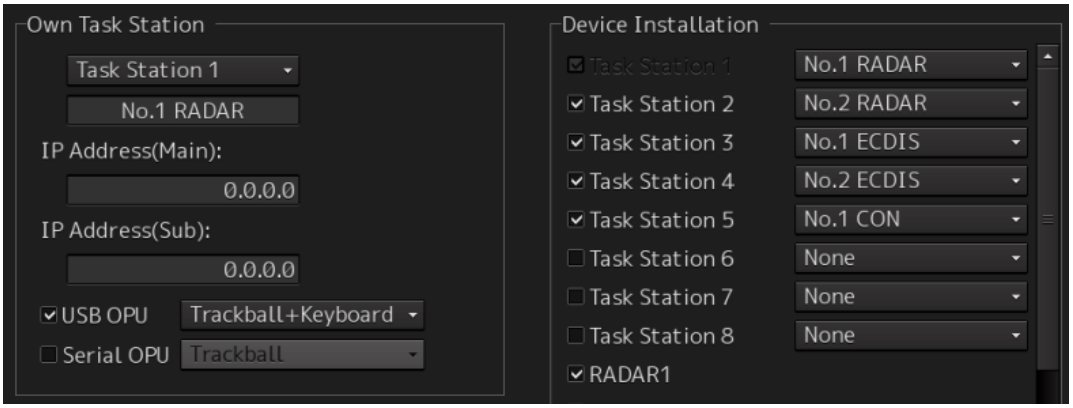
Some new products need to be checked "☐Send Old Format For JRC VDR", "Timeout" set to "0".



Note: 60026 corresponds to IP:239.192.0.26. You need to set the IP and port to VDR.

- **SFI:**

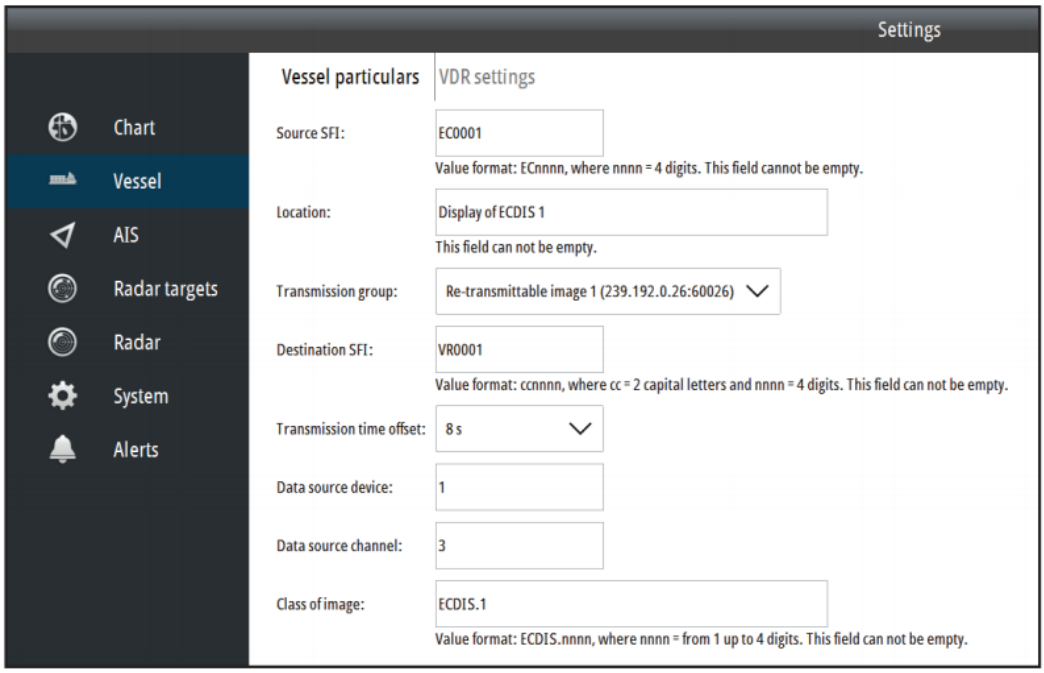
Usually, No.1 ECDIS is EI0001, No.1 RADAR is RA0001. It can be checked by the method in Section 5.



Note: *JMR-92xx series radar does not send pictures when it is not connected to the antenna. Please check whether the antenna is connected.*

➢ SIMRAD E50x

- **Set parameters related to VDR:**



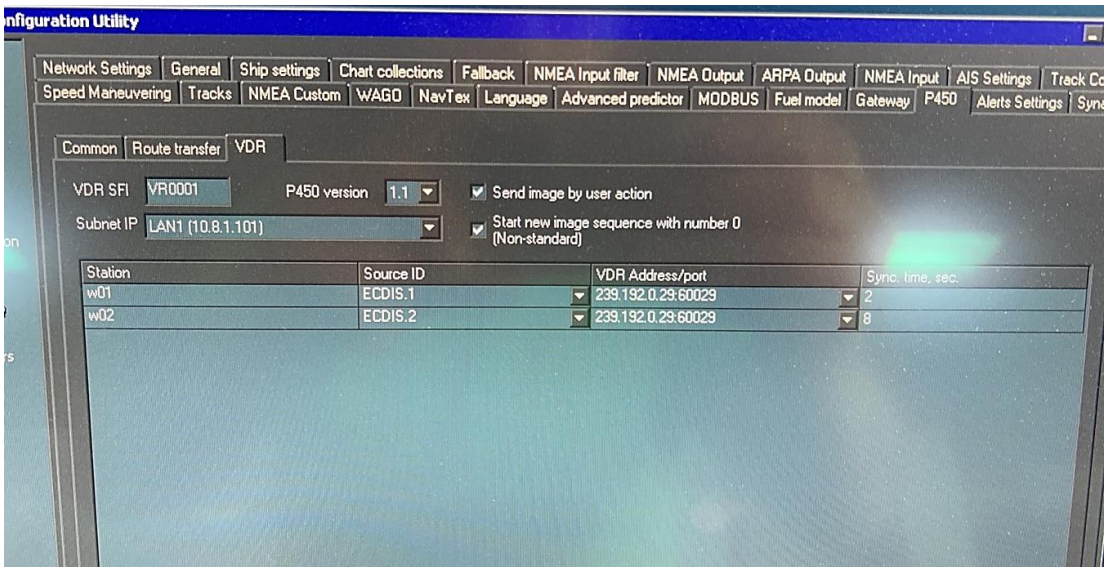
Source SFI: This can be set to EI0001, which needs to be entered into the VDR configuration.

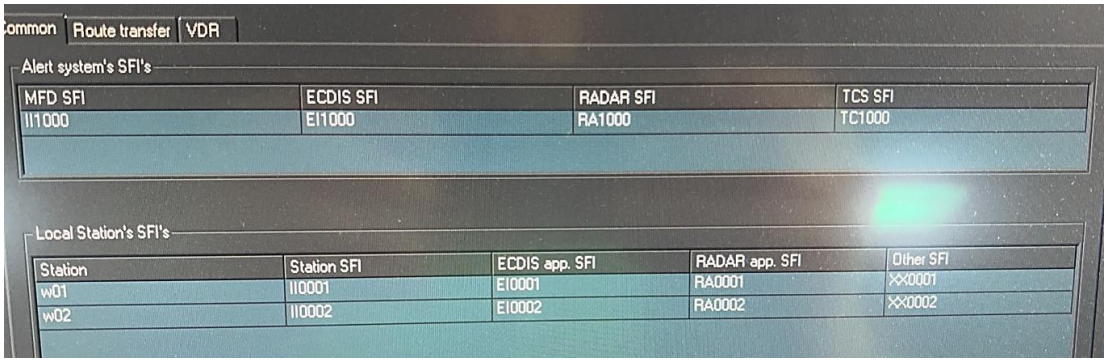
Transmission group: You can select 239.192.0.26:60026, which needs to be entered into the VDR configuration.

Destination SFI: Enter the SFI of VDR. NVR-9000 defaults to VR0001.

➢ TRANSAS

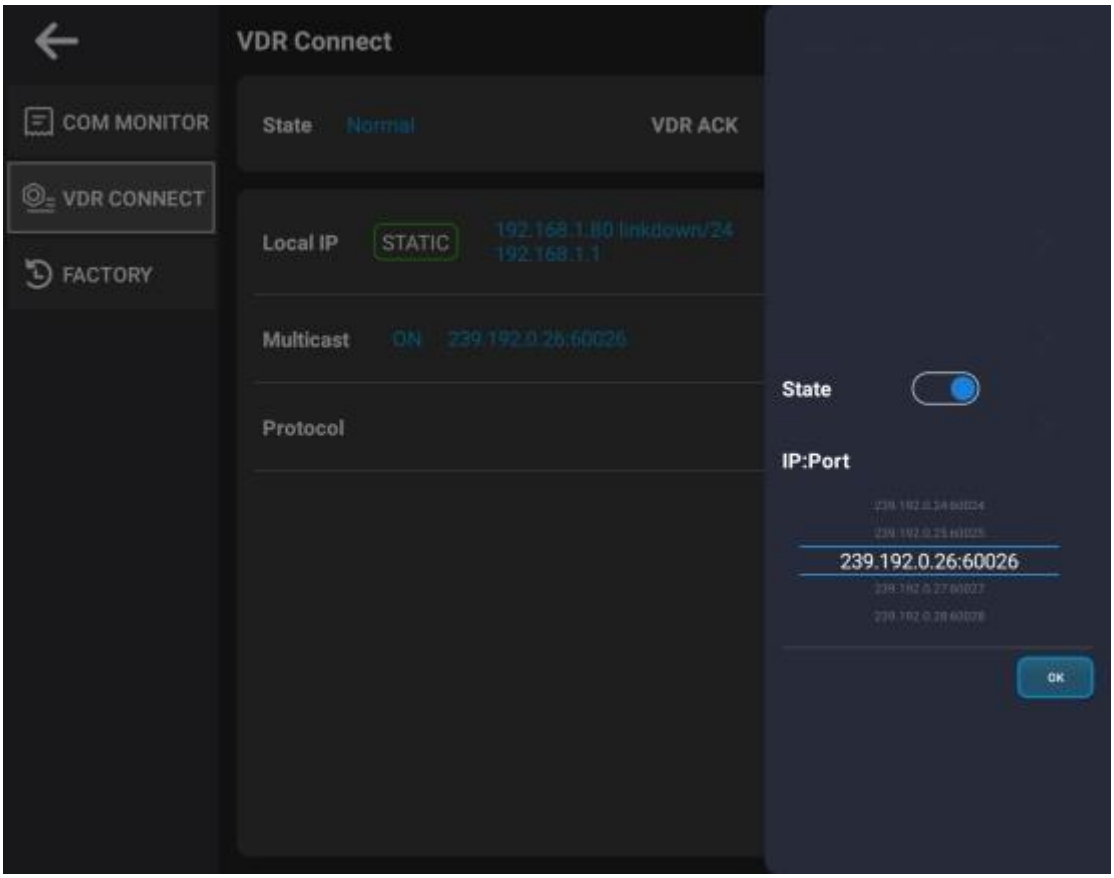
- **Set parameters related to VDR:**
  VDR address/port: Same as configuration in VDR.
  SFI: ECDIS.1 is EI0001, ECDIS.2 is EI0002.
  In some cases, the IP should be set to 239.192.0.29 IP 60029 to be normal, so it is recommended to use this IP for TRANSAS.





➢ NES-1000

- Enter MENU Advanced -> VDR Connect.
- Click Multicast, click State to open.
- Select the IP:Port, SFI. Then configured for VDR.



➢ TKC EC-8100/8600

Press and hold the EBL1 EBL2 RADAR key to boot and enter SERVICE MODE.

- Set parameters related to VDR

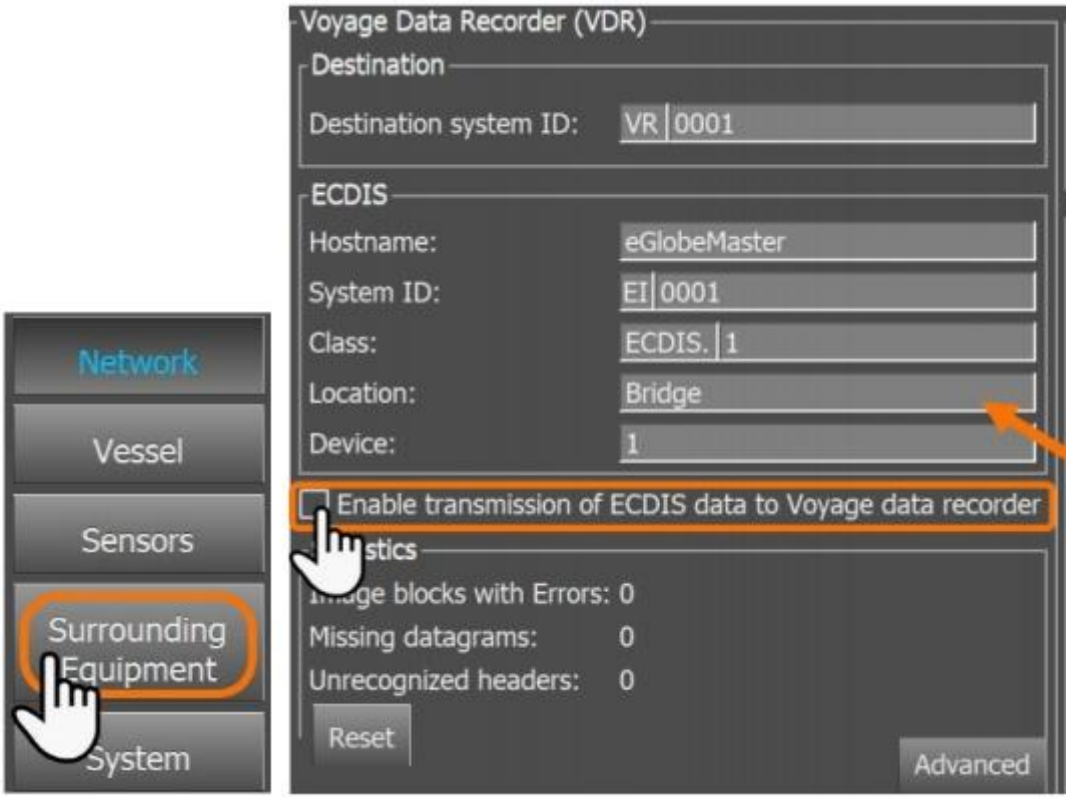
System Function ID: For the SFI of ECDIS, you also need to enter the configuration of VDR.
Local IP: The IP address connected to the VDR is usually connected to LAN2. If the configuration is incorrect, the IP Status displays "Can not open port". For example, 172.16.8.131
IP Settings: Set the network interface IP address to be the same as Local IP. If the configuration is incorrect, IP Status displays "Can not open port". For example, 172.16.8.131
Multicast IP: Set the Multicast IP address, you also need to enter it into the VDR configuration.
Port No: Set the Multicast port, you also need to enter it into the VDR configuration.
ON/OFF: Set the ON open function

Finally, save and enter the chart.

➢ eGlobe G2

- Enter the VDR Setting of ECDIS，password “admincw”.

- Enable “Enable transmission ……”.

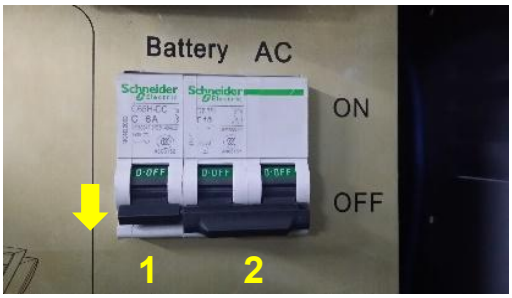


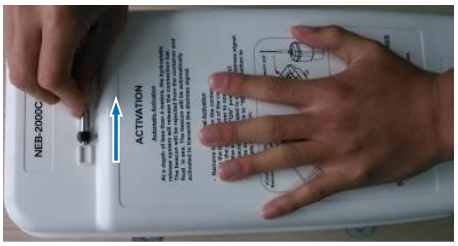
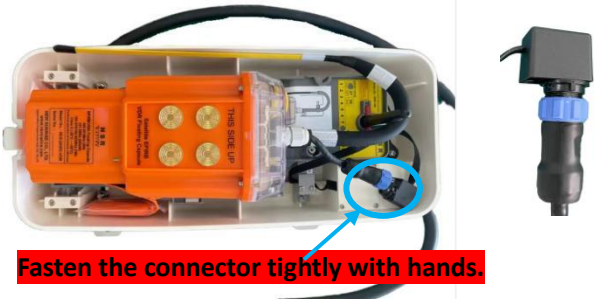
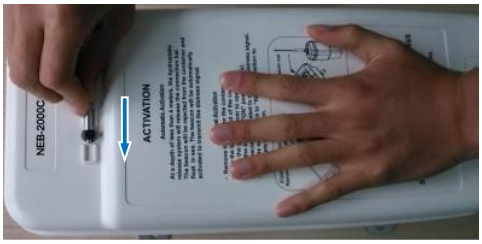
Multicast IP: Default is 239.192.0.26, port: 60026.

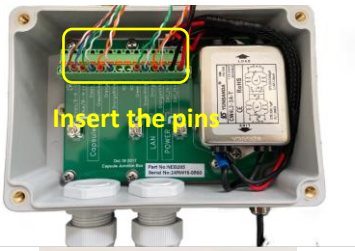
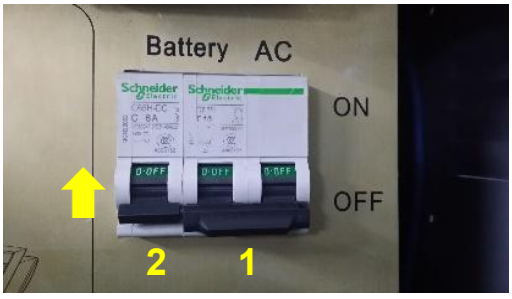
System ID: Main ECDIS set to EI0001.

Configure IP, Port, SFI to VDR.

Appendix C Instructions for changing the FFC container kit

STEP 0	Check the FFC container kit (new type) that you have received. It should be new and in good condition. **Note:** *The NCC-100 FFC container kit (including hydrostatic release unit and cable cutter) should be replaced every 2 years.*	
STEP 1	Power off the VDR. Power switches are located in the VDR main unit (DAU). It's very important to follow the procedure below. ***1. Switch off the Battery power.*** ***2. Switch off the AC power.***	
STEP 2	Open the cover of the Junction Box.	
STEP 3	Remove the FFC cable from the Junction Box.	

STEP 4	Remove the 4 bolts to take off the whole FFC with the container.	
STEP 5	Open the container to take out the FFC/EPIRB unit after disconnecting the cable connector.	
STEP 6	Put the FFC/EPIRB unit into the new container. Fasten the cable connector tightly with hands**.**	
STEP 7	Close the container cover with a lock.	
STEP 8	Re-mount the whole FFC with the container **vertically** or **horizontally**.	

STEP 9	Reconnect the cable in the Junction Box. **Make sure the cable colors match the descriptions on the PCB.**	 
STEP 10	Fasten the cable gland. Close the Junction Box with bolts. Make sure of watertightness.	
STEP 11	**Power on the VDR again.** It's very important to follow the below procedure to start up the VDR system. ***1. Switch on the AC power.*** ***2. Switch on the Battery power.*** The VDR will run its startup process for about 1 minute.	
STEP 12	Check the FFC display at RAU of VDR. The FFC icon and storage hours should be displayed properly.	

Appendix D Alert list

Alert Identifier	Ins	Alert Title	Alert Description	Prio	Cat	Reason
3009	2	RAU LOST	Check RAU	C	B	DAU lost connection with RAU
3009	3	DAU LOST	Check DAU	C	B	RAU lost connection with DAU
3023	4	AC POWER LOST	Check AC power and switch	C	B	AC 110V/220V Lost
3023	5	BAT LOST	Check battery	C	B	Battery Voltage Lost
3023	6	BAT LOW	Check battery	C	B	Battery Voltage Low
3009	7	UTC LOST	Check GPS	C	B	UTC Source Lost
3009	8	USB RW FAIL	Check USB disk	C	B	USB Disk Read and Write Fail
3009	9	LOG W FAIL	Check MCU	C	B	MCU Write Log File Fail
3009	10	CONFIG R FAIL	Check MCU	C	B	MCU Write Config File Fail
3009	11	FPC LAN LOST	Check FPC LAN cable	C	B	FPC Lan Connection Lost
3009	12	FFC LAN LOST	Check FFC LAN cable	C	B	FFC Lan Connection Lost
3009	13	LRU LAN LOST	Check LRU LAN cable	C	B	LRU Lan Connection Lost
3009	14	FPC LOST	Check FPC	C	B	SSD of FPC Not Detected
3009	15	FPC LOW CAPACITY	Check FPC	C	B	Low SSD Capacity of FPC
3009	16	FFC LOST	Check FFC	C	B	SSD of FFC Not Detected
3009	17	FFC LOW CAPACITY	Check FFC	C	B	Low SSD Capacity of FFC
3009	18	LRU LOST	Check LRU	C	B	SSD of LRU Not Detected
3009	19	LRU LOW CAPACITY	Check LRU	C	B	Low SSD Capacity of LRU
3009	20	DAU COM LAN	Check NVR909 in DAU	C	B	Lost connection with NVR901
3009	21	DEU1 LOST	Check DEU1 and LAN cable	C	B	DEU1 Lan Connection Lost
3009	22	DEU2 LOST	Check DEU2 and LAN cable	C	B	DEU2 Lan Connection Lost
3009	23	DEU3 LOST	Check DEU3 and LAN cable	C	B	DEU3 Lan Connection Lost
3009	24	DEU4 LOST	Check DEU4 and LAN cable	C	B	DEU4 Lan Connection Lost
3009	25	VIU1 LAN LOST	VIU1 LAN LOST AT [Information type]	C	B	VIU1 Lan Connection Lost
3009	26	VIU2 LAN LOST	VIU2 LAN LOST AT [Information type]	C	B	VIU2 Lan Connection Lost
3009	27	VIU3 LAN LOST	VIU3 LAN LOST AT [Information type]	C	B	VIU3 Lan Connection Lost
3009	28	VIU4 LAN LOST	VIU4 LAN LOST AT [Information type]	C	B	VIU4 Lan Connection Lost
3003	29	VIU1 SAMPLE FAIL	VIU1 SAMPLE FAIL AT [Information type]	C	B	VIU1 Sample Image Fail
3003	30	VIU2 SAMPLE FAIL	VIU2 SAMPLE FAIL AT [Information type]	C	B	VIU2 Sample Image Fail
3003	31	VIU3 SAMPLE FAIL	VIU3 SAMPLE FAIL AT [Information type]	C	B	VIU3 Sample Image Fail
3003	32	VIU4 SAMPLE FAIL	VIU4 SAMPLE FAIL AT [Information type]	C	B	VIU4 Sample Image Fail
3003	33	DAU COM	Check DAU COM	C	B	DAU Com Port Connection Fail
3003	34	DEU1 COM	Check DEU1 COM	C	B	DEU1 Com Port Connection Fail
3003	35	DEU2 COM	Check DEU2 COM	C	B	DEU2 Com Port Connection Fail
3003	36	DEU3 COM	Check DEU3 COM	C	B	DEU3 Com Port Connection Fail
3003	37	DEU4 COM	Check DEU4 COM	C	B	DEU4 Com Port Connection Fail
3003	38	MIC FAIL	Check MIC	C	B	Microphone Fail
3009	39	ACU LOST	Check ACU in DAU	C	B	ACU Connection Lost
3009	40	ASU1 LOST	Check ASU1 in DAU	C	B	ASU1 Connection Lost

Alert Identifier	Ins	Alert Title	Alert Description	Prio	Cat	Reason
3009	41	ASU2 LOST	Check ASU2 in DAU	C	B	ASU2 Connection Lost
3009	42	ASU3 LOST	Check ASU3 in DAU	C	B	ASU3 Connection Lost
3003	43	NET IMAGE1 LOST	NET IMAGE 1 LOST AT [Information type]	C	B	Device on NET IMAGE1 is lost
3003	44	NET IMAGE2 LOST	NET IMAGE 2 LOST AT [Information type]	C	B	Device on NET IMAGE2 is lost
3003	45	NET IMAGE3 LOST	NET IMAGE 3 LOST AT [Information type]	C	B	Device on NET IMAGE3 is lost
3003	46	NET IMAGE4 LOST	NET IMAGE 4 LOST AT [Information type]	C	B	Device on NET IMAGE4 is lost
3003	47	MIC1 LOST	MIC1 FAIL AT [Location]	C	B	MIC1 LOST
3003	48	MIC2 LOST	MIC2 FAIL AT [Location]	C	B	MIC2 LOST
3003	49	MIC3 LOST	MIC3 FAIL AT [Location]	C	B	MIC3 LOST
3003	50	MIC4 LOST	MIC4 FAIL AT [Location]	C	B	MIC4 LOST
3003	51	MIC5 LOST	MIC5 FAIL AT [Location]	C	B	MIC5 LOST
3003	52	MIC6 LOST	MIC6 FAIL AT [Location]	C	B	MIC6 LOST
3003	53	MIC7 LOST	MIC7 FAIL AT [Location]	C	B	MIC7 LOST
3003	54	MIC8 LOST	MIC8 FAIL AT [Location]	C	B	MIC8 LOST
3003	55	DAU COM1 LOST	DAU COM1 [Information type] LOST	C	B	Device on DAU COM1 LOST
3003	56	DAU COM2 LOST	DAU COM2 [Information type] LOST	C	B	Device on DAU COM2 LOST
3003	57	DAU COM3 LOST	DAU COM3 [Information type] LOST	C	B	Device on DAU COM3 LOST
3003	58	DAU COM4 LOST	DAU COM4 [Information type] LOST	C	B	Device on DAU COM4 LOST
3003	59	DAU COM5 LOST	DAU COM5 [Information type] LOST	C	B	Device on DAU COM5 LOST
3003	60	DAU COM6 LOST	DAU COM6 [Information type] LOST	C	B	Device on DAU COM6 LOST
3003	61	DAU COM7 LOST	DAU COM7 [Information type] LOST	C	B	Device on DAU COM7 LOST
3003	62	DAU COM8 LOST	DAU COM8 [Information type] LOST	C	B	Device on DAU COM8 LOST
3003	63	DEU1 COM1 LOST	DEU1 COM01 [Information type] LOST	C	B	Device on DEU1 COM1 LOST
3003	64	DEU1 COM2 LOST	DEU1 COM02 [Information type] LOST	C	B	Device on DEU1 COM2 LOST
3003	65	DEU1 COM3 LOST	DEU1 COM03 [Information type] LOST	C	B	Device on DEU1 COM3 LOST
3003	66	DEU1 COM4 LOST	DEU1 COM04 [Information type] LOST	C	B	Device on DEU1 COM4 LOST
3003	67	DEU1 COM5 LOST	DEU1 COM05 [Information type] LOST	C	B	Device on DEU1 COM5 LOST
3003	68	DEU1 COM6 LOST	DEU1 COM06 [Information type] LOST	C	B	Device on DEU1 COM6 LOST
3003	69	DEU1 COM7 LOST	DEU1 COM07 [Information type] LOST	C	B	Device on DEU1 COM7 LOST
3003	70	DEU1 COM8 LOST	DEU1 COM08 [Information type] LOST	C	B	Device on DEU1 COM8 LOST
3003	71	DEU1 COM9 LOST	DEU1 COM09 [Information type] LOST	C	B	Device on DEU1 COM9 LOST
3003	72	DEU1 COM10 LOST	DEU1 COM10 [Information type] LOST	C	B	Device on DEU1 COM10 LOST
3003	73	DEU1 COM11 LOST	DEU1 COM11 [Information type] LOST	C	B	Device on DEU1 COM11 LOST
3003	74	DEU1 COM12 LOST	DEU1 COM12 [Information type] LOST	C	B	Device on DEU1 COM12 LOST
3003	75	DEU1 COM13 LOST	DEU1 COM13 [Information type] LOST	C	B	Device on DEU1 COM13 LOST
3003	76	DEU1 COM14 LOST	DEU1 COM14 [Information type] LOST	C	B	Device on DEU1 COM14 LOST
3003	77	DEU1 COM15 LOST	DEU1 COM15 [Information type] LOST	C	B	Device on DEU1 COM15 LOST
3003	78	DEU1 COM16 LOST	DEU1 COM16 [Information type] LOST	C	B	Device on DEU1 COM16 LOST
3003	79	DEU2 COM1 LOST	DEU2 COM01 [Information type] LOST	C	B	Device on DEU2 COM1 LOST
3003	80	DEU2 COM2 LOST	DEU2 COM02 [Information type] LOST	C	B	Device on DEU2 COM2 LOST
3003	81	DEU2 COM3 LOST	DEU2 COM03 [Information type] LOST	C	B	Device on DEU2 COM3 LOST

Alert Identifier	Ins	Alert Title	Alert Description	Prio	Cat	Reason
3003	82	DEU2 COM4 LOST	DEU2 COM04 [Information type] LOST	C	B	Device on DEU2 COM4 LOST
3003	83	DEU2 COM5 LOST	DEU2 COM05 [Information type] LOST	C	B	Device on DEU2 COM5 LOST
3003	84	DEU2 COM6 LOST	DEU2 COM06 [Information type] LOST	C	B	Device on DEU2 COM6 LOST
3003	85	DEU2 COM7 LOST	DEU2 COM07 [Information type] LOST	C	B	Device on DEU2 COM7 LOST
3003	86	DEU2 COM8 LOST	DEU2 COM08 [Information type] LOST	C	B	Device on DEU2 COM8 LOST
3003	87	DEU2 COM9 LOST	DEU2 COM09 [Information type] LOST	C	B	Device on DEU2 COM9 LOST
3003	88	DEU2 COM10 LOST	DEU2 COM10 [Information type] LOST	C	B	Device on DEU2 COM10 LOST
3003	89	DEU2 COM11 LOST	DEU2 COM11 [Information type] LOST	C	B	Device on DEU2 COM11 LOST
3003	90	DEU2 COM12 LOST	DEU2 COM12 [Information type] LOST	C	B	Device on DEU2 COM12 LOST
3003	91	DEU2 COM13 LOST	DEU2 COM13 [Information type] LOST	C	B	Device on DEU2 COM13 LOST
3003	92	DEU2 COM14 LOST	DEU2 COM14 [Information type] LOST	C	B	Device on DEU2 COM14 LOST
3003	93	DEU2 COM15 LOST	DEU2 COM15 [Information type] LOST	C	B	Device on DEU2 COM15 LOST
3003	94	DEU2 COM16 LOST	DEU2 COM16 [Information type] LOST	C	B	Device on DEU2 COM16 LOST
3003	95	DEU3 COM1 LOST	DEU3 COM01 [Information type] LOST	C	B	Device on DEU3 COM1 LOST
3003	96	DEU3 COM2 LOST	DEU3 COM02 [Information type] LOST	C	B	Device on DEU3 COM2 LOST
3003	97	DEU3 COM3 LOST	DEU3 COM03 [Information type] LOST	C	B	Device on DEU3 COM3 LOST
3003	98	DEU3 COM4 LOST	DEU3 COM04 [Information type] LOST	C	B	Device on DEU3 COM4 LOST
3003	99	DEU3 COM5 LOST	DEU3 COM05 [Information type] LOST	C	B	Device on DEU3 COM5 LOST
3003	100	DEU3 COM6 LOST	DEU3 COM06 [Information type] LOST	C	B	Device on DEU3 COM6 LOST
3003	101	DEU3 COM7 LOST	DEU3 COM07 [Information type] LOST	C	B	Device on DEU3 COM7 LOST
3003	102	DEU3 COM8 LOST	DEU3 COM08 [Information type] LOST	C	B	Device on DEU3 COM8 LOST
3003	103	DEU3 COM9 LOST	DEU3 COM09 [Information type] LOST	C	B	Device on DEU3 COM9 LOST
3003	104	DEU3 COM10 LOST	DEU3 COM10 [Information type] LOST	C	B	Device on DEU3 COM10 LOST
3003	105	DEU3 COM11 LOST	DEU3 COM11 [Information type] LOST	C	B	Device on DEU3 COM11 LOST
3003	106	DEU3 COM12 LOST	DEU3 COM12 [Information type] LOST	C	B	Device on DEU3 COM12 LOST
3003	107	DEU3 COM13 LOST	DEU3 COM13 [Information type] LOST	C	B	Device on DEU3 COM13 LOST
3003	108	DEU3 COM14 LOST	DEU3 COM14 [Information type] LOST	C	B	Device on DEU3 COM14 LOST
3003	109	DEU3 COM15 LOST	DEU3 COM15 [Information type] LOST	C	B	Device on DEU3 COM15 LOST
3003	110	DEU3 COM16 LOST	DEU3 COM16 [Information type] LOST	C	B	Device on DEU3 COM16 LOST
3003	111	DEU4 COM1 LOST	DEU4 COM01 [Information type] LOST	C	B	Device on DEU4 COM1 LOST
3003	112	DEU4 COM2 LOST	DEU4 COM02 [Information type] LOST	C	B	Device on DEU4 COM2 LOST
3003	113	DEU4 COM3 LOST	DEU4 COM03 [Information type] LOST	C	B	Device on DEU4 COM3 LOST
3003	114	DEU4 COM4 LOST	DEU4 COM04 [Information type] LOST	C	B	Device on DEU4 COM4 LOST
3003	115	DEU4 COM5 LOST	DEU4 COM05 [Information type] LOST	C	B	Device on DEU4 COM5 LOST
3003	116	DEU4 COM6 LOST	DEU4 COM06 [Information type] LOST	C	B	Device on DEU4 COM6 LOST
3003	117	DEU4 COM7 LOST	DEU4 COM07 [Information type] LOST	C	B	Device on DEU4 COM7 LOST
3003	118	DEU4 COM8 LOST	DEU4 COM08 [Information type] LOST	C	B	Device on DEU4 COM8 LOST
3003	119	DEU4 COM9 LOST	DEU4 COM09 [Information type] LOST	C	B	Device on DEU4 COM9 LOST
3003	120	DEU4 COM10 LOST	DEU4 COM10 [Information type] LOST	C	B	Device on DEU4 COM10 LOST
3003	121	DEU4 COM11 LOST	DEU4 COM11 [Information type] LOST	C	B	Device on DEU4 COM11 LOST
3003	122	DEU4 COM12 LOST	DEU4 COM12 [Information type] LOST	C	B	Device on DEU4 COM12 LOST

Alert Identifier	Ins	Alert Title	Alert Description	Prio	Cat	Reason
3003	123	DEU4 COM13 LOST	DEU4 COM13 [Information type] LOST	C	B	Device on DEU4 COM13 LOST
3003	124	DEU4 COM14 LOST	DEU4 COM14 [Information type] LOST	C	B	Device on DEU4 COM14 LOST
3003	125	DEU4 COM15 LOST	DEU4 COM15 [Information type] LOST	C	B	Device on DEU4 COM15 LOST
3003	126	DEU4 COM16 LOST	DEU4 COM16 [Information type] LOST	C	B	Device on DEU4 COM16 LOST

Ins: an instance of an alert;

Prio: Alert priority: E - Emergency Alarm

A - Alarm

W - Warning

C - Caution

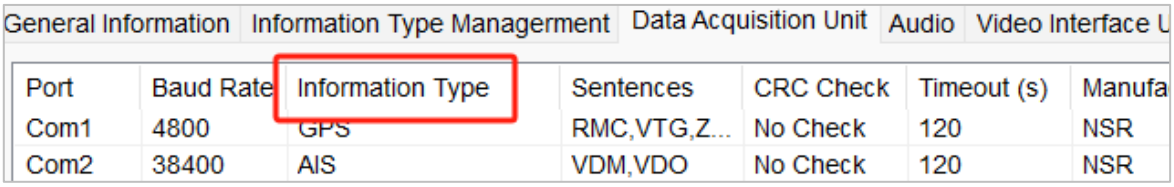
Cat: Alert category.

Note:

All alerts are Caution, and responsibility is not allowed to be transferred.

All alerts are Caution, with no escalation properties.

[Information type] is displayed according to the following configuration (for example). [Location] is also.



www.nsrmarine.com

info@nsrmarine.com

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