SERVICE MANUAL

Voyage Data Recorder (VDR) / NVR-9000

&

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

NVR-9000 & NVR-9000S SM.E 20230209-07

NOTICE

Ensuring safety of vessel is the obligatory responsibility of the navigation officer.
The use of the equipment does not relieve the user from the need to take any safety precautions or checks whether it is mandatory or otherwise in accordance to international and national rules.

SAFETY INSTRUCTIONS

NOTICE	This notice indicates an unsafe operation which, 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 personal with knowledge for electrical devices.
Observe handling regulations! Removal or insertion of a subgroup or printed wiring board with live voltage can lead to severe damage.
Never insert fuses with other values than those stipulated!

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

No.	Component Name	Part No.	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

FOREWORD

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 or by New Sunrise Ltd and approved agents. Unauthorized repair of equipment during the Warranty period may invalidate the Warranty. If you wish to undertake the maintenance of the equipment, then can you please ensure that the service engineers hold a valid authorization certificate issued by New Sunrise Ltd.

If a unit exhibits an issue that cannot be rectified onboard, and a service engineer is required to attend your vessel, please contact our Service Centre, giving full details of the following:

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	2023/2/9	ALL	07	General modification

Table of Contents

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 in the moments leading to an incident and help to identify the cause of the accident. The data recorded by VDR can be used for vessel management, such as equipment health management, ship position management.

NVR-9000 is the first generation of NSR VDR product. The product is designed to meet the following standards：

1. MSC.333 (90): Adoption of Revised Performance Standards for Ship borne Voyage Data Records (VDRs)
2. IEC 61996-1 (2013) incl. Corrigendum 1 (2014): Maritime Navigation and Radio communication Equipment and Systems-Shipborne Voyage Data Recorder (VDR) -Part 1: Performance Requirements, Methods of Testing and Required Test Results
3. MSC214（81）: "Amendments to the Performance Standard for Ship borne/Ship borne Simplified Voyage Data Recorder"
4. IEC 61996-2 {Ed.2.0} 2007: Maritime Navigation and Radio communication 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
5. IEC 60945 (2002) incl. Corrigendum 1 (2008): Maritime navigation and radio communication equipment and Systems - General requirements-Methods of testing and required test results
6. IEC 62923-1 (2018) and IEC 62923-2 (2018)
7. IEC 61162-1 (2016), IEC 61162-2 (1998) and IEC 61162-450 (2018)

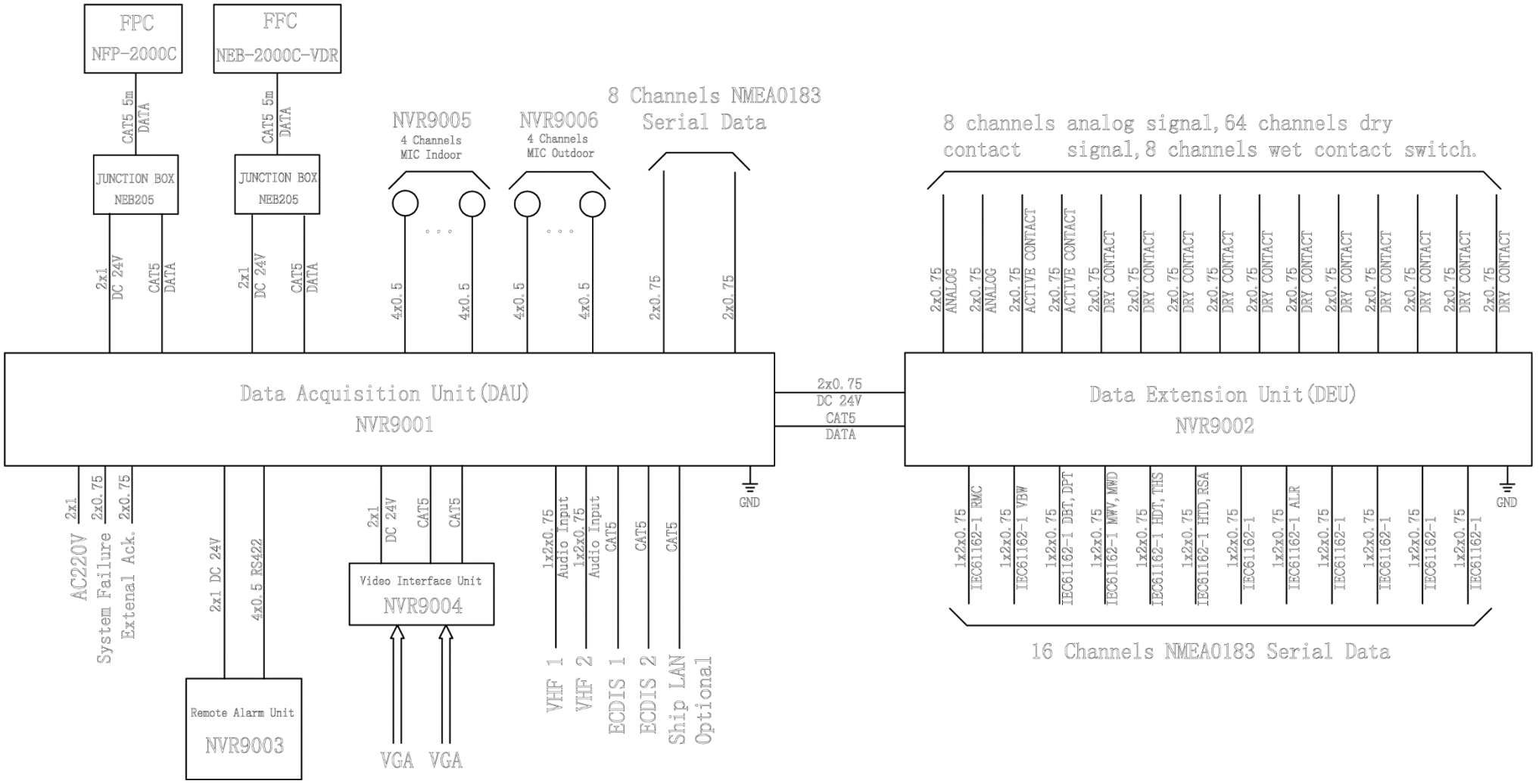
1.2 System Configuration

NVR-9000/NVR-9000S comprises of 9 components as below:

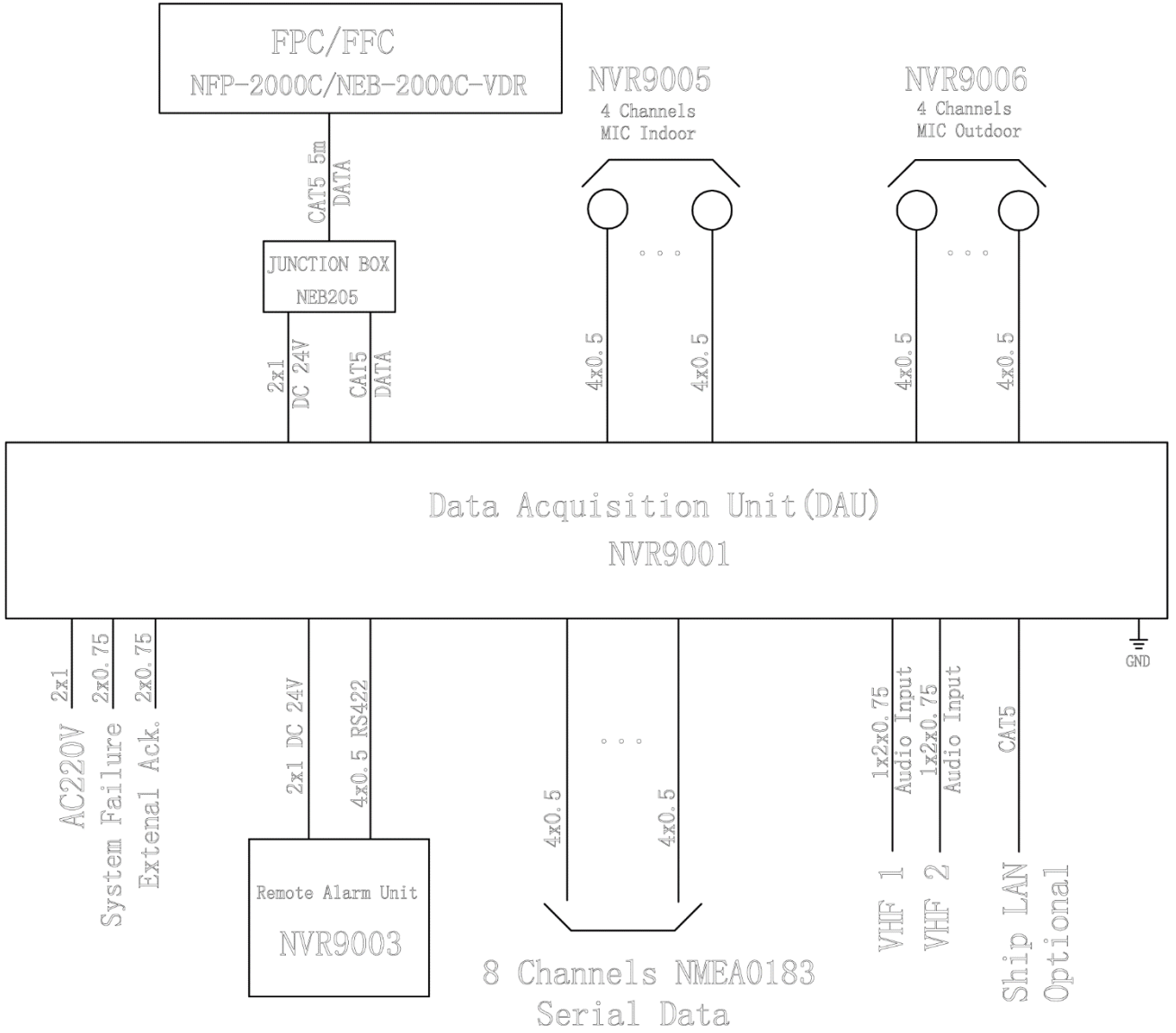
No.	Component Name	Part No.	NVR-9000 VDR	NVR-9000S SVDR	Environmental category
1	Data Acquisition Unit (DAU)	NVR9001	X	X	Protected
2	Data Extension Unit (DEU)	NVR9002	X	O	Protected
3	Remote Alarm U nit (RAU)	NVR9003	X	X	Protected
4	Video Interface Unit (VIU)	NVR9004	O	O	Protected
5	Indoor Microphone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

Note: *For SVDR, FPC or FFC may be selected between.*

X: standard O: optional



NVR-9000 VDR SYSTEM CONFIGURATION



NVR-9000S SVDR SYSTEM CONFIGURATION(standard)

1.3 System Description

The VDR system continuously stores data in FPC and FFC for at least 48 hours by overwriting the old data with new data.

Following data may be recorded by NVR-9000:

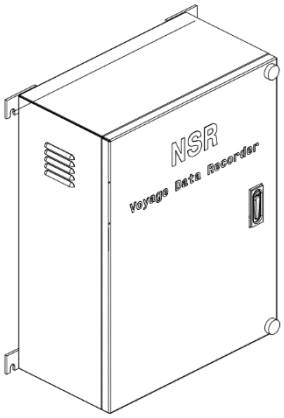
Date and time
Ship's Position
Speed
Heading (true)
Heading (magnetic)
Depth (Echo sounder)
Main Alarms
Rudder sensor angle
Rudder order status
Heading/track control command
Heading/track control data
Engine order/response
Hull openings (doors) status
Watertight and fire door status
Accelerations and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

When power supply fails:

NVR-9000 is powered with AC220V/AC110V. If both the ship's main power and emergency power source fail, VDR will be powered by internal battery (NBT900) to keep recording the bridge audio.

1.3.1 Data Acquisition Unit (DAU)

Long-term Data Recording Unit (LRU), network switch, main board, and audio board are located in the Data Acquisition Unit (DAU). DAU controls the running of the whole system. The Long-term Data Recording Unit (LRU) with 512G records the last 720 hours data and is accessible by Ethernet while protected from any unauthorized changes with seals. The DAU provides 8 channels of microphone input, 2 channels of VHF audio input, 2 ECDIS inputs, and 8 serial inputs as well.

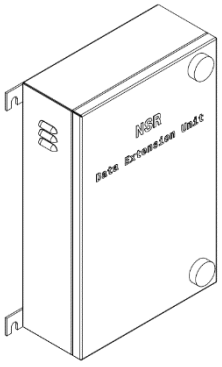


1.3.2 Data Extension Unit (DEU)

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.

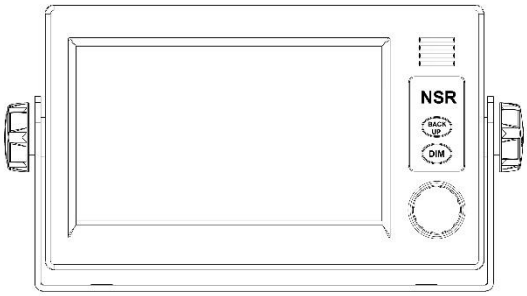
Note:

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



1.3.3 Remote Alarm Unit (RAU)

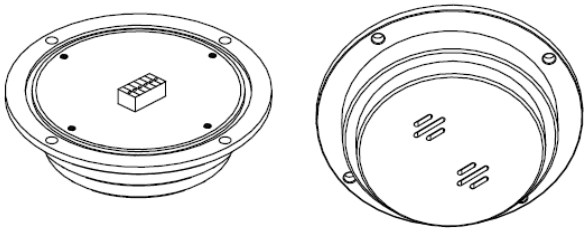
Remote Control Unit (RAU) is used to check and display alarms generated in DAU.



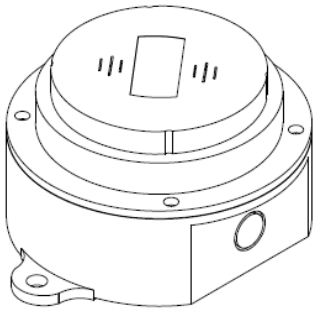
1.3.4 Indoor Microphone Unit (IMU) and Outdoor Microphone Unit (OMU)

The VDR system comes with two types of the microphone, indoor microphones and outdoor microphone. Outdoor microphones are protected against water ingression.

- **Indoor Microphone Unit (IMU)**

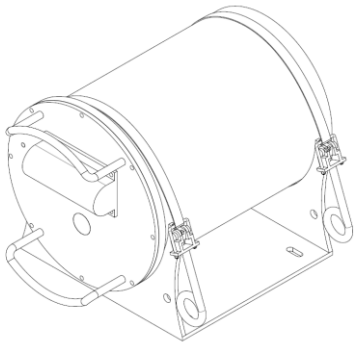


- **Outdoor Microphone Unit (OMU)**



1.3.5 Fixed Protective Capsule (FPC)

Fixed Protective Capsule (FPC) with memory capacity of 64GB supports a data recording time of 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 the 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 at least 168 hours.

1.3.7 Video Interface Unit (VIU)

Video Interface Unit (VIU) is used to convert VGA signal into Ethernet signal. The VGA input can be up to 1920 x 1080 high-definition resolution.
VIU can be configured up to 4：IP address 172.16.8.90, 172.16.8.91, 172.16.8.92, 172.16.8.93, Port 5000. If only two VIU, IP 172.16.8.90 and 172.16.8.91 respectively.

2. MAINTENANCE

2.1 Replacement Parts List

The following is replacement parts, check the expiration date.

LOCATION	PART NAME	PART NO	EXPIRY *	Replacement method
NVR9001/DAU	Battery Pack	NBT900	4 years	Refer to 2.3
NFP-2000C/FPC	Beacon	DKM502/90	3 years	Refer to 2.4
NEB-2000C-VDR/FFC	Battery Pack	NBT400	5 years	Refer to 2.5
	Hydrostatic Release Unit	NHR-100	2 years	Refer to 2.6
	Cable Cutter	NCC-100	2 years	

*Note: It is recommended that the battery can be stored at the dealer/agent max 1 year since purchased and it should be replaced in above mentioned years after supplied to a vessel.

⚠WARNING

Batteries should have two terminals insulated prior to disposal because the remained power could cause sever harm to human beings. Local regulations should be followed when batteries are disposed in order to protect your environments.

2.2 Maintenance Parts List

The following is maintenance parts.

No	Unit	Parts	Remark
1	DAU	Main Control Unit – MCU (NVR905+NVR926)	
		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 – ASU (NVR907)	Contain ASU1, ASU2, ASU3
		Power Control Board (NVR902)	
		AC-DC (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)	

3	FPC	FPC Storage Board (NVR901)	
4	FFC	FFC Storage 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 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

2.4 Replace Acoustic Beacon on FPC: DKM502/90

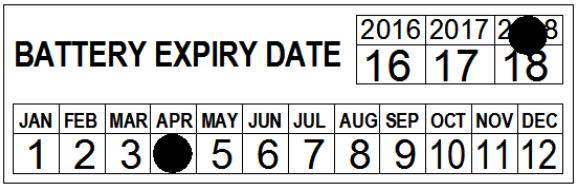
1) Remove M5 inner hexagon screw.
2) Replace the Beacon
3) Lock the screw.
4) Record the expiration date of the beacon

2.5 Replace battery in FFC – NBT400

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

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

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



For example, the above sticker is punched as the expiry date of April 2018.

Note:

Lithium batteries should have two terminals insulated prior to disposal because the remained power could cause severe harm to human beings. Local regulations should be followed when batteries are disposed in order to protect your environments.

Replace method

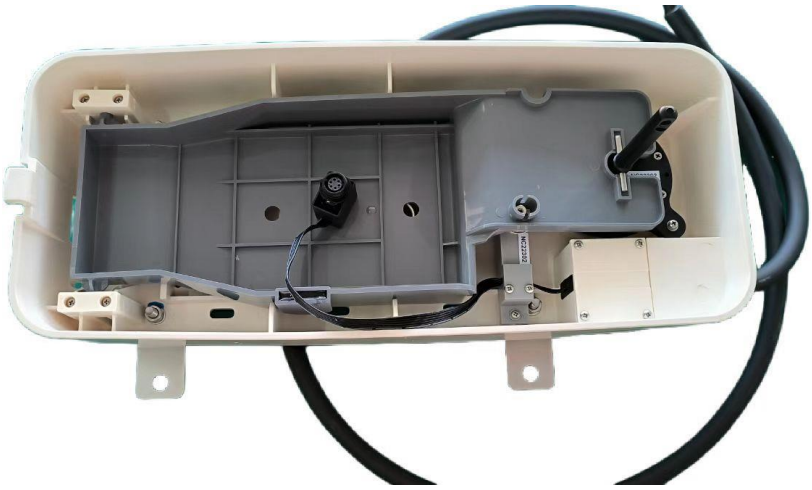
1, Open the container to take out the beacon.

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 HRU & cable cutter in FFC

NHR-100 hydrostatic release unit and NCC-100 cable cutter should be replaced every 2 years. It's strongly recommended the whole container bottom part be replaced together with NHR-100 and NCC-100.



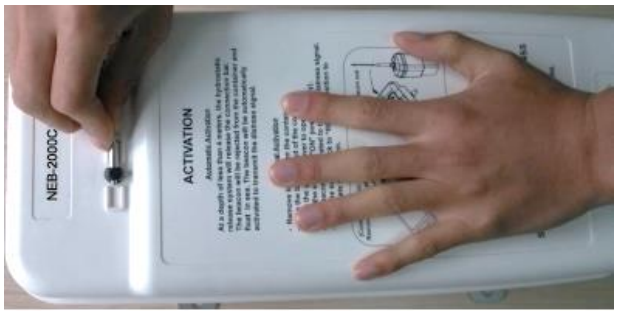
An expiry NHR-100 may result in failure in operation and the BEACON may be mis-released and expiry NCC-100 may result in failure in cutting the cable properly. The expiry date is marked on the ejector so as to be checked regularly.
Please contact NSR authorized agent to carry out the replacement.

Replacement method:

1, Turn off VDR. Open the cover of FFC junction box. Plug out FFC cable from junction box.

2, Loosen 4 screws to remove old FFC container.

3, Open the container to take out the beacon.



4, Disconnect the data cable.

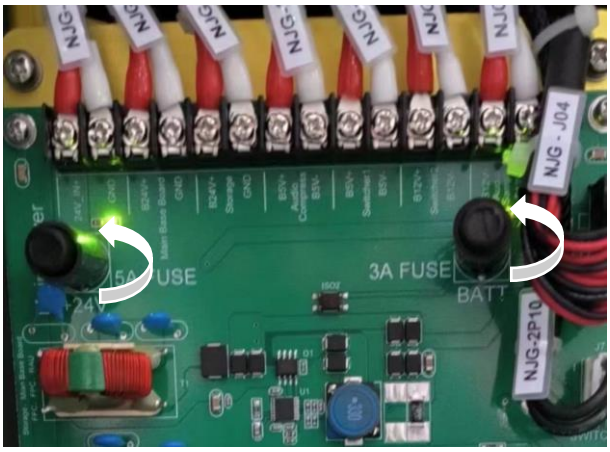
5, Replace FFC container, and assemble in the reverse order of disassembly.

2.7 DAU

2.7.1 Fuse Replacement

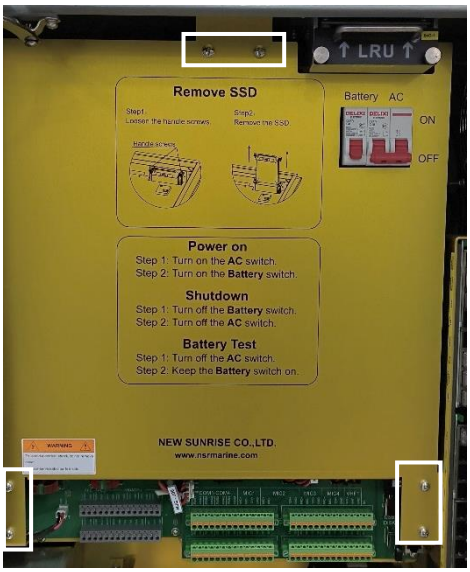
Open the DAU, you will see the fuses behind the back of the door. 3A for Battery and 5A for the AC power.

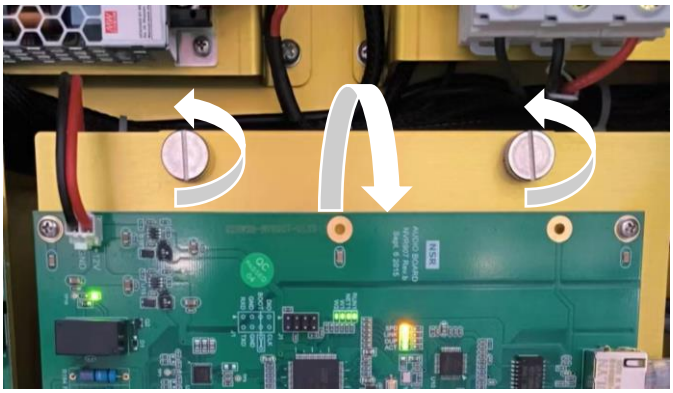
If the Fuse burn-out, choose the right fuse to change.
1, Remove the front cover
2, Remove the shelter on the PCB boards, find the Main Power or the BATT.
3, Push the head of the black column and spin a bit, the fuse will come out.
4, Pull out the fuse, and put a new fuse back.
5, Insert the new fuse into the right place.



2.7.2 LRU Replacement

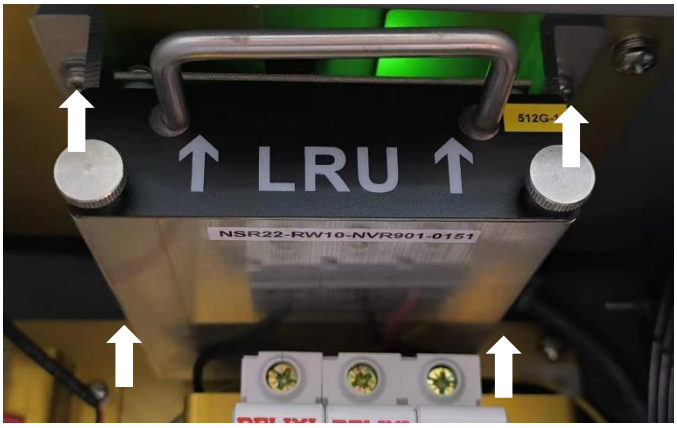
1, Shut down the system and unplug the AC power
2, Remove the front cover
3, Loosen the two screws shown in the picture and open the second cover.

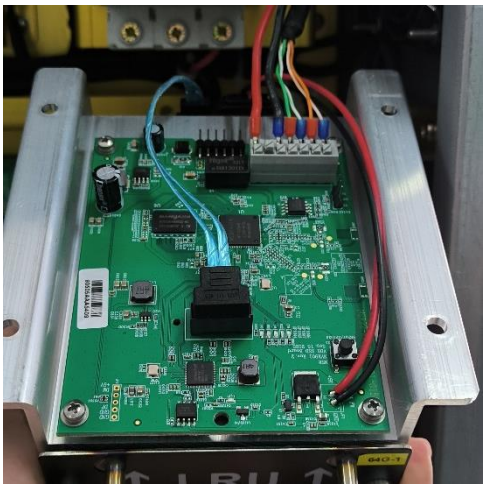




4, Release four Screws at the position as below

5, Remember the order and pull out the connecting cable



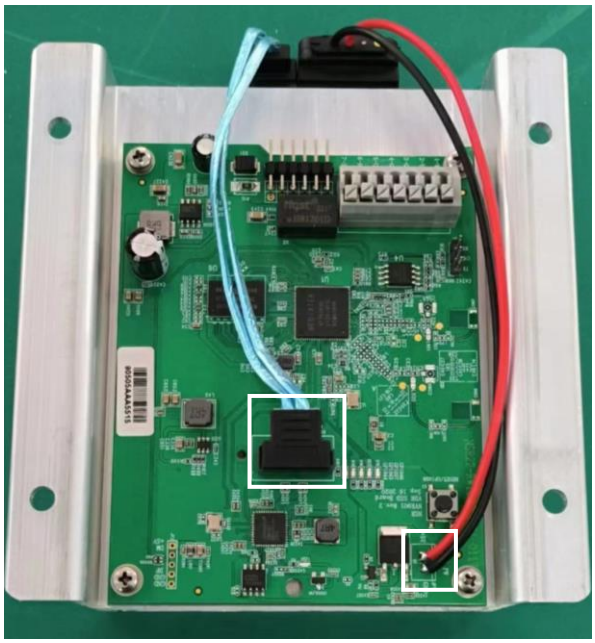


6, Install the new LRU

2.7.3 LRU SSD Board (NVR901) replacement

1, Refer to section 2.7.2 1-5

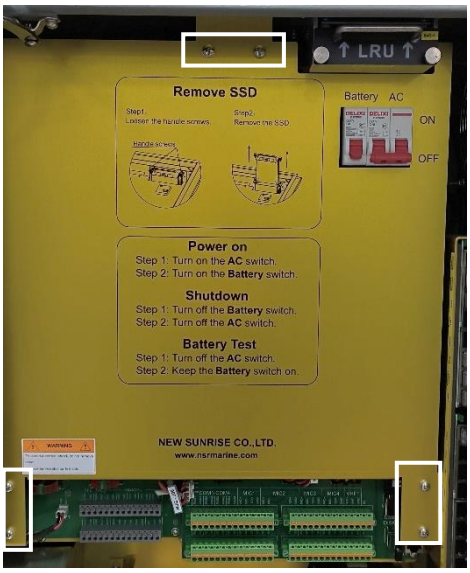
2, Unplug the SATA cable and solder the 5V SSD power cable. Then replace the LRU SSD Board (NVR901)

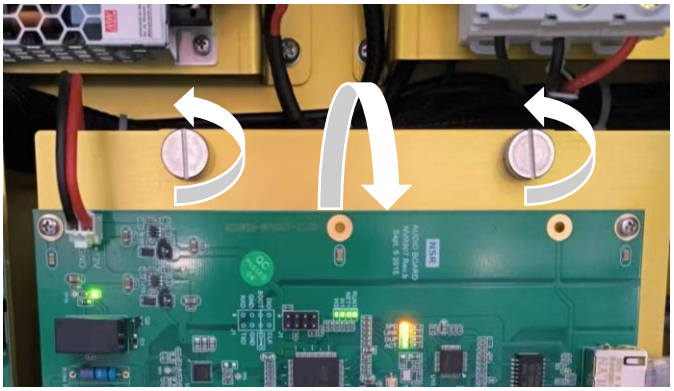


3, Assemble in the reverse order of disassembly.

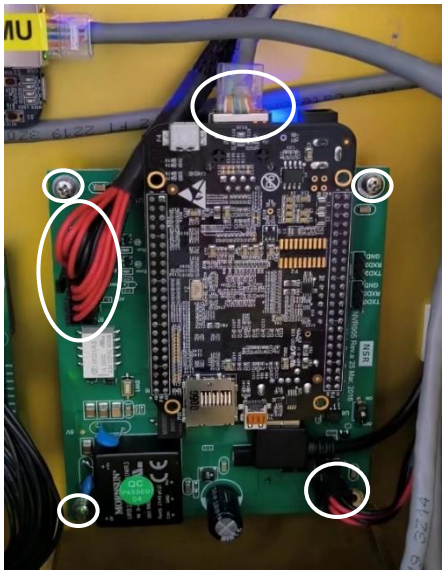
2.7.4 MCU Replacement

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





3, Find MCU (NVR905+NVR926),
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.

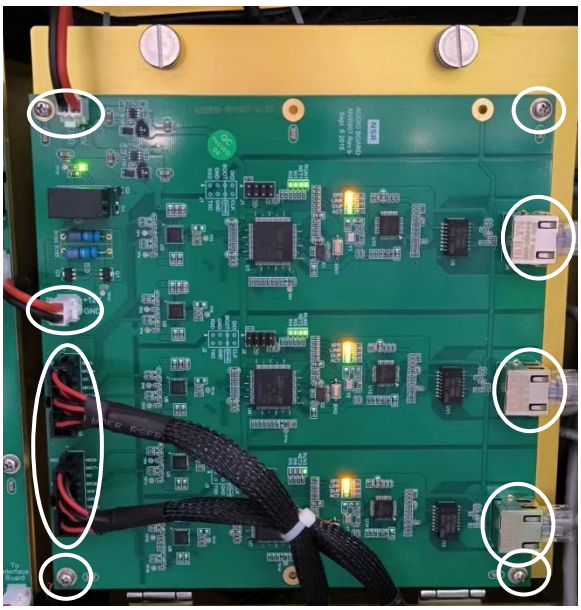


2.7.5 ACU replacement

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

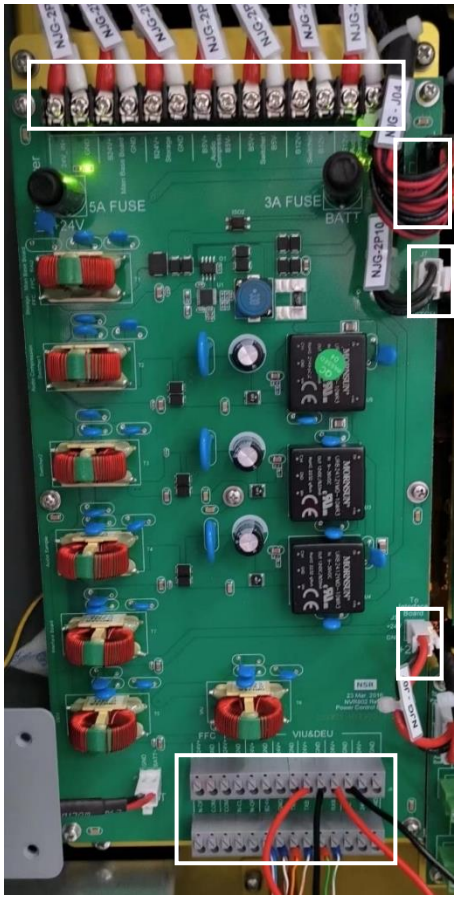
2.7.6 ASU replacement

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



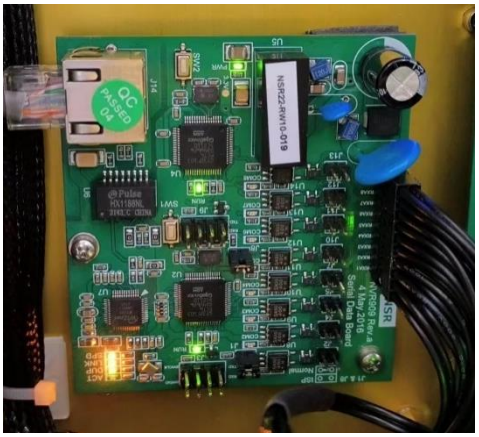
2.7.7 Power Control Board(NVR902) replacement

1, Remove the front cover
2, Find 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

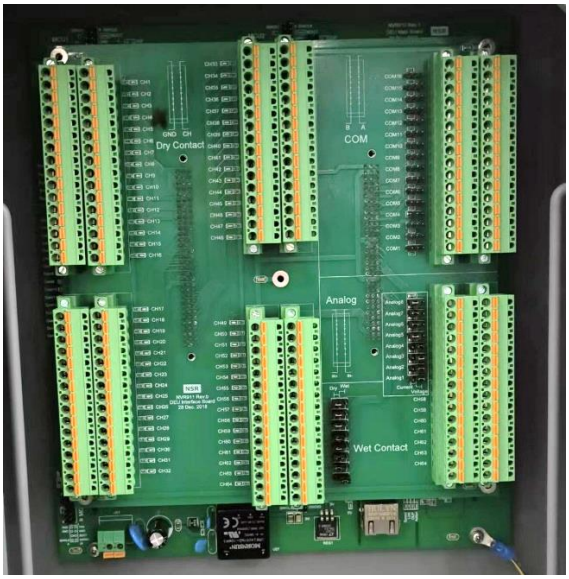
1, Remove the front cover
2, Loosen two screws on the second cover and open it.
3, Find Serial Data Board (NVR909),
4, Pull out the connection cable
5, Loosen the screw and replace the Serial Data Board (NVR909)



2.8 DEU

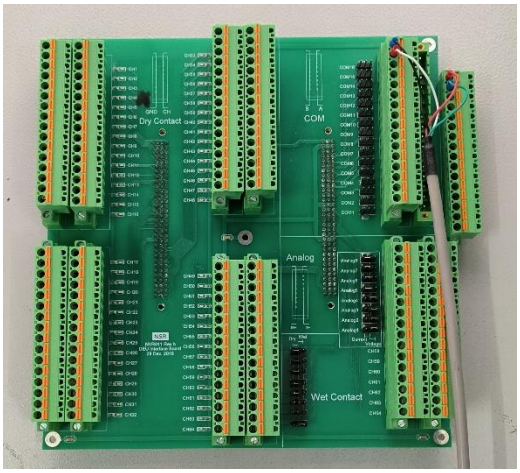
2.8.1 DEU Main Board (NVR910) replacement

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)

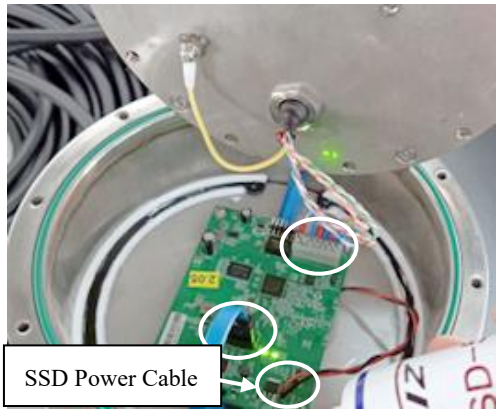


2.9 FPC

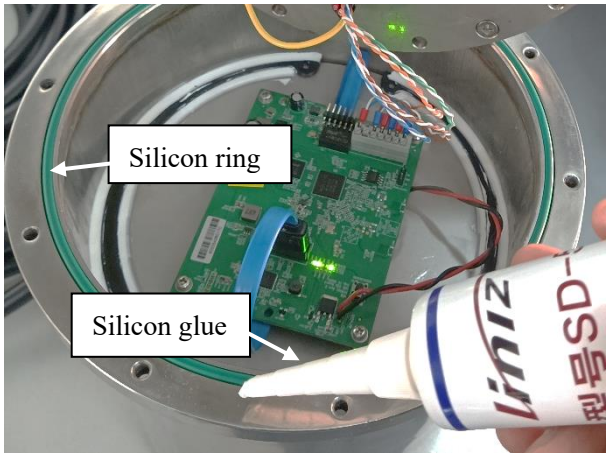
2.9.1 FPC SSD Board (NVR901) replacement

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 at the contact area for the cover.

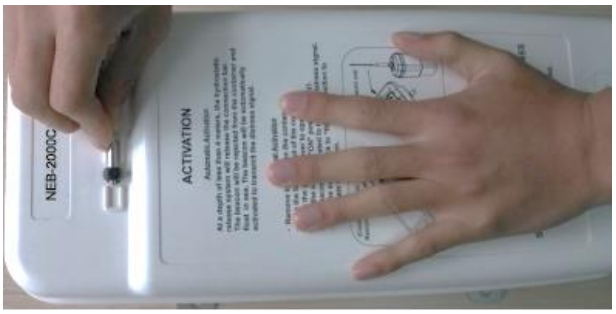


Note: The IP of FPC is 172.16.8.120. If the replaced NVR901 does not change the IP, the default is 172.16.8.100, which needs to be changed.

2.10 FFC

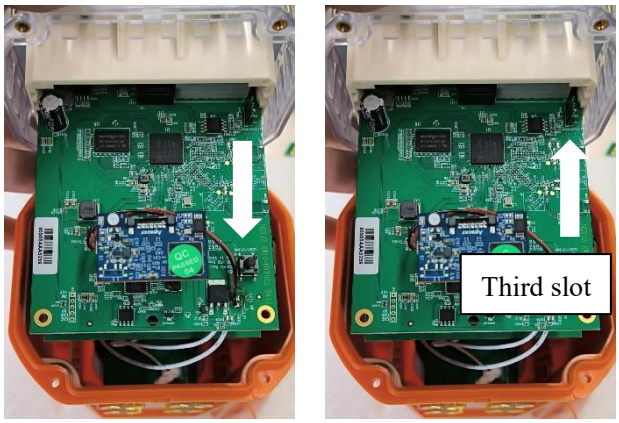
2.10.1 FFC Storage Board (NVR901 + NVR923) replacement

1, Open the container to take out the beacon.



2, Loosen the front and rear four screws

3, Take out the NVR901 with SSD
4, Insert the new NVR901 with SSD to the Third slot



5, Assemble in the reverse order of disassembly.

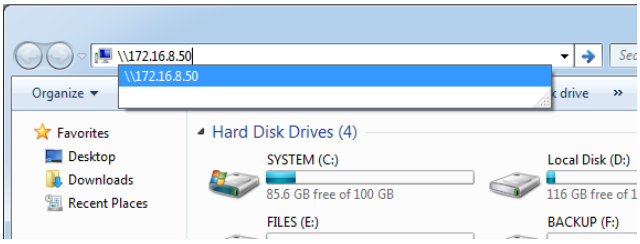
2.11 Software Update

2.11.1 MCU Update

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

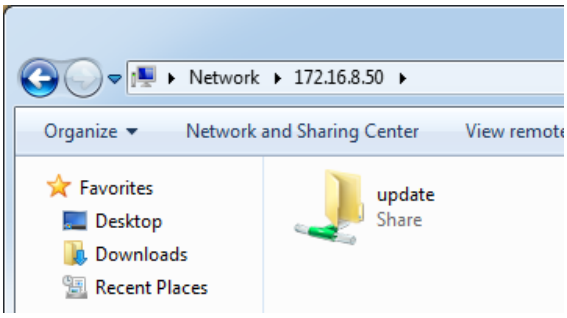
IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

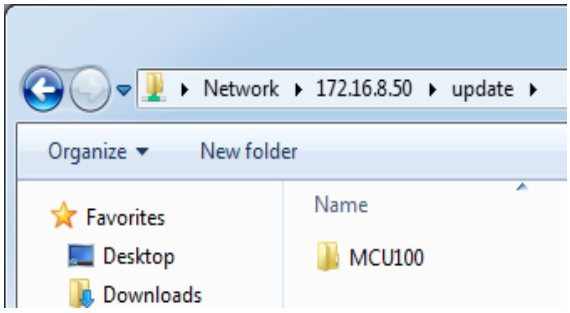
3, Enter " \\172.16.8.50 " in the address bar of the folder.



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

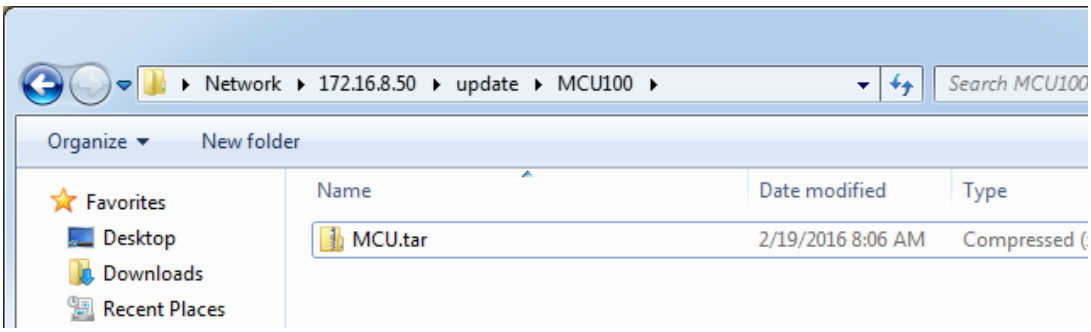
5, Enter the folder of update and you will see the MCU100.





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

Wait for 1 minute, then Restart NVR-9000



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

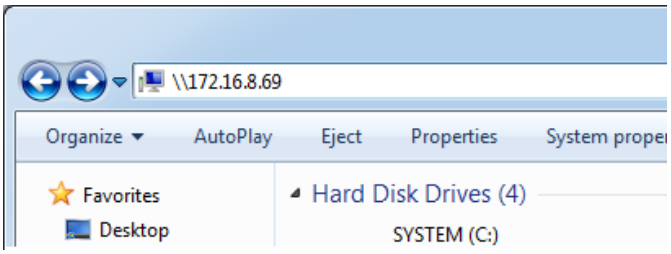
2.11.2 ACU Update

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

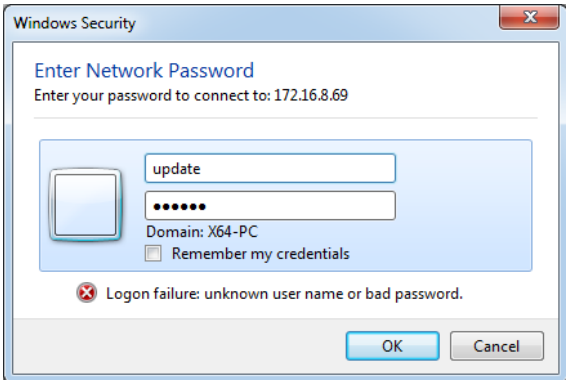
2, Config the computer's IP address, subnet mask, default gateway.

IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

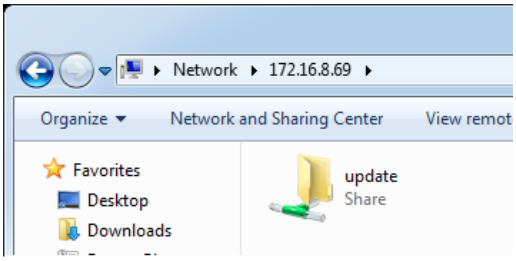
3, Enter " \\172.16.8.69 "in the address bar of the folder.

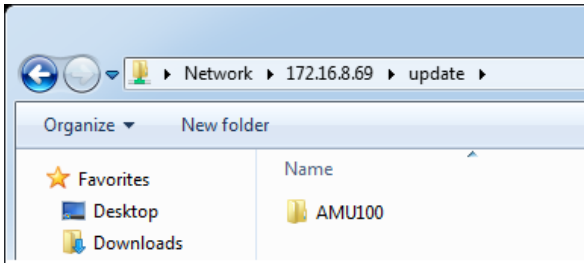


4, Input the user and password.
User: update, Password: 123456

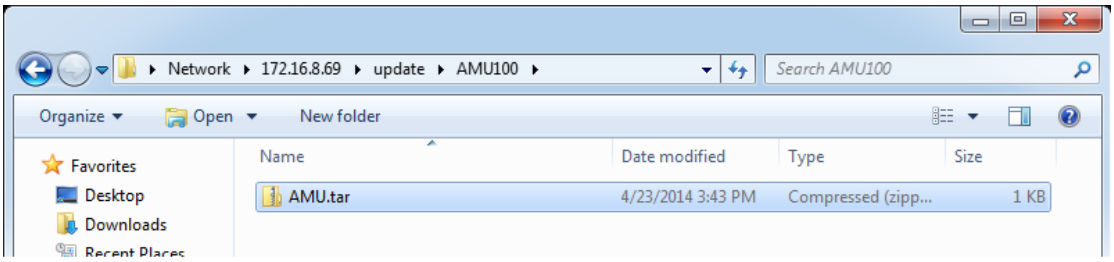


5, Enter the folder of update and you will see the AMU100.





6, Copy the AMU.tar (update file) to AMU100.
Wait for 1 minute, then Restart NVR-9000



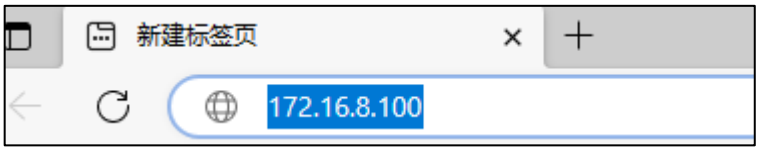
2.11.3 LRU/FFC/FPC Update

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

2, Config the computer's IP address, subnet mask, default gateway.

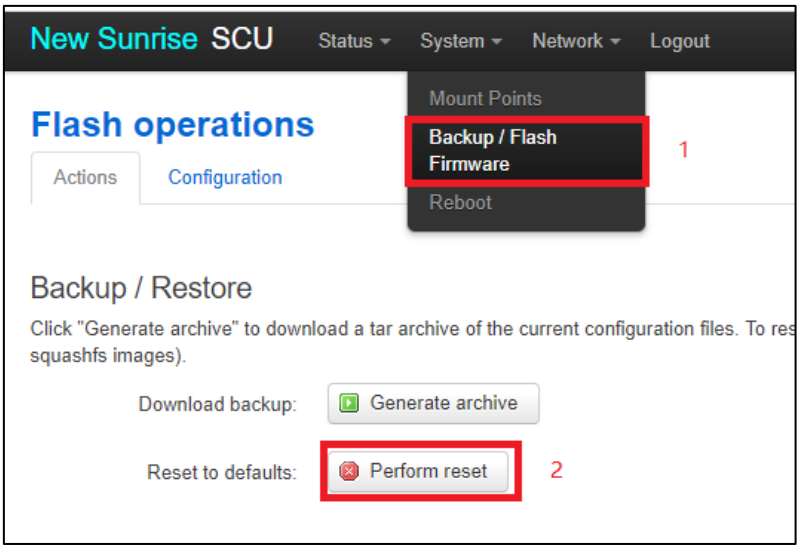
IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

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

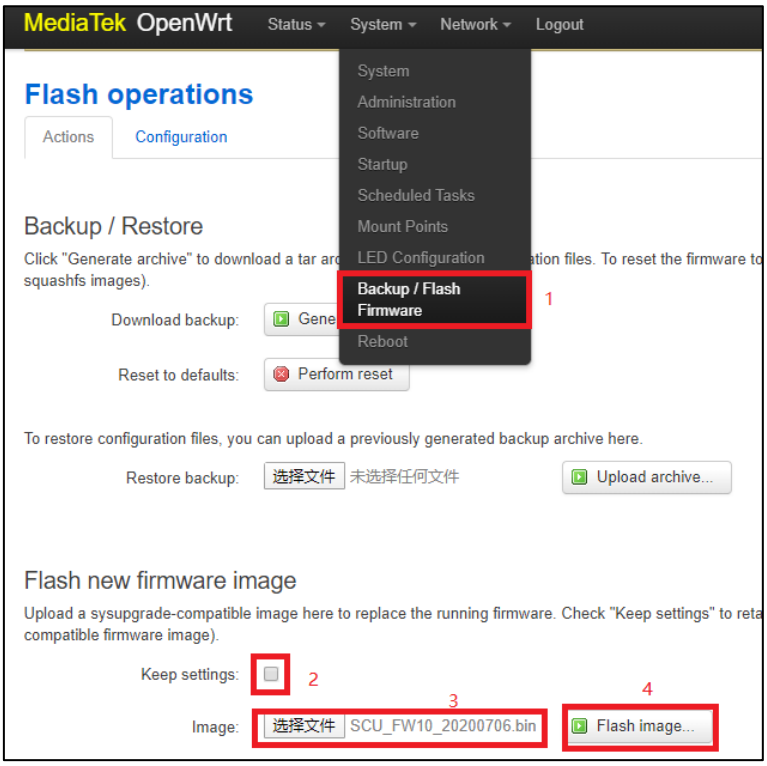
5, Go to [System] -> [Backup / Flash Firmware], click "Perform reset", then wait 2 min



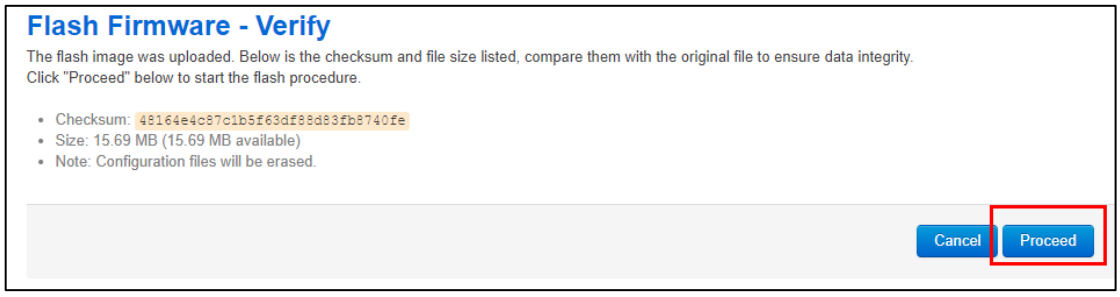
6, Config the computer's IP address, subnet mask, default gateway.

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 minute, upgrade finish.

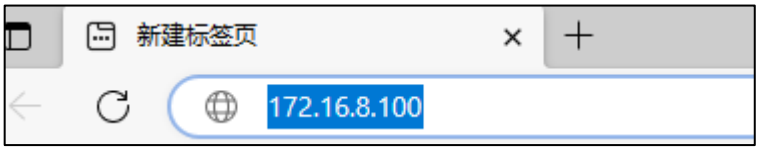
2.11.4 LRU/FFC/FPC SSD format

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

2, Config the computer's IP address, subnet mask, default gateway.

IP address	172.16.8.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

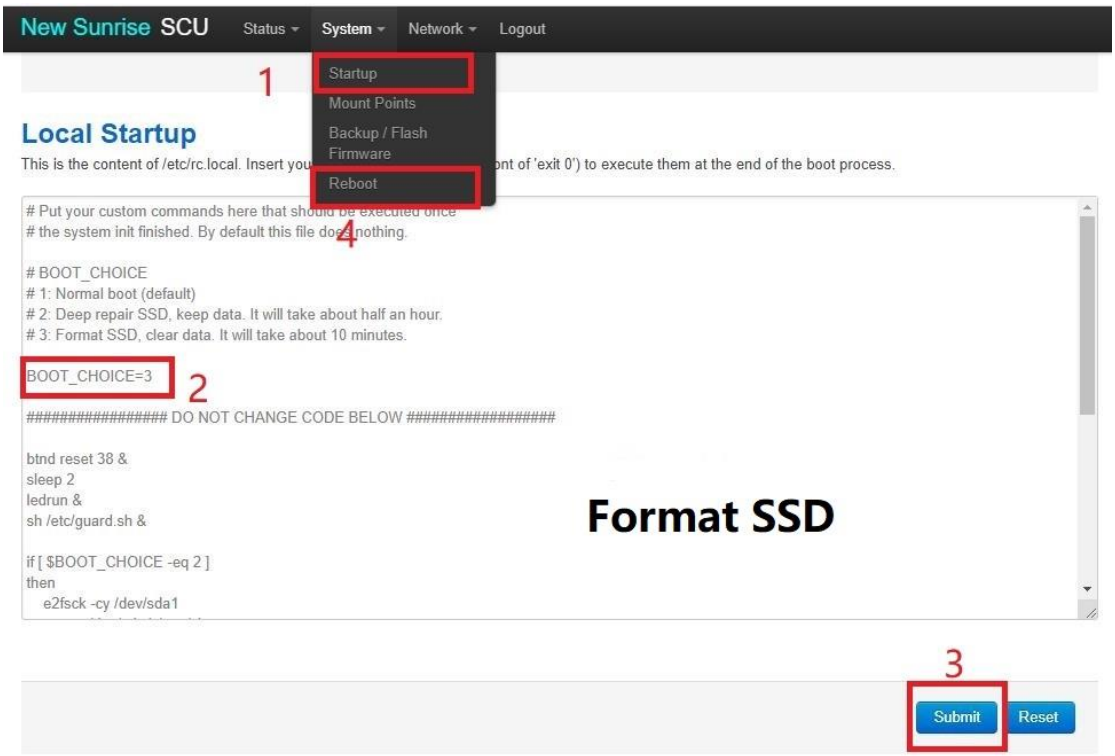
3, Enter the IP in the browser
LRU: 172.16.8.100
FFC: 172.16.8.110
FPC: 172.16.8.120



4, login, User: root, Password: 123

5, Follow the steps shown in the figure

a) Go to “System -> Startup”
b) BOOT_CHOICE change 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.

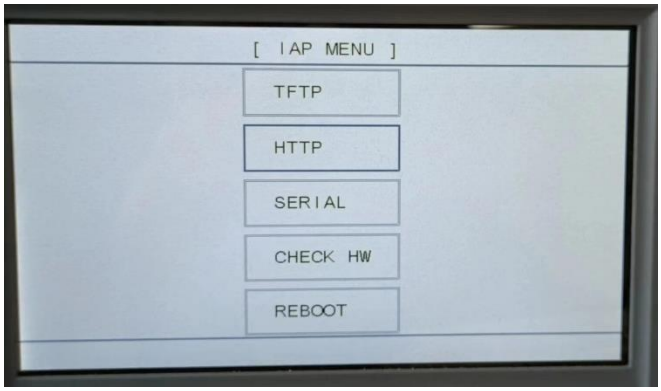


2.11.5 RAU Update

1, Connect PC and RAU with a network cable.
2, Config the computer’s IP address, subnet mask, default gateway.

IP address	192.168.1.175
Subnet mask	255.255.0.0
Default gateway	172.16.8.1

3, Power Off RAU
4, Press and hold the [DIM] key, then power on, will enter [IAP MENU]

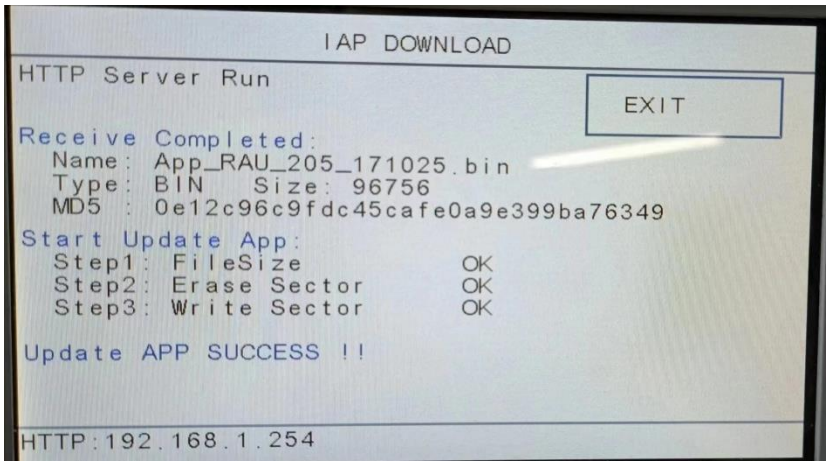


5, Select [HTTP]

6, Enter the IP “192.168.1.254” in the browser

7, Load Upgrade file, then “Upload”

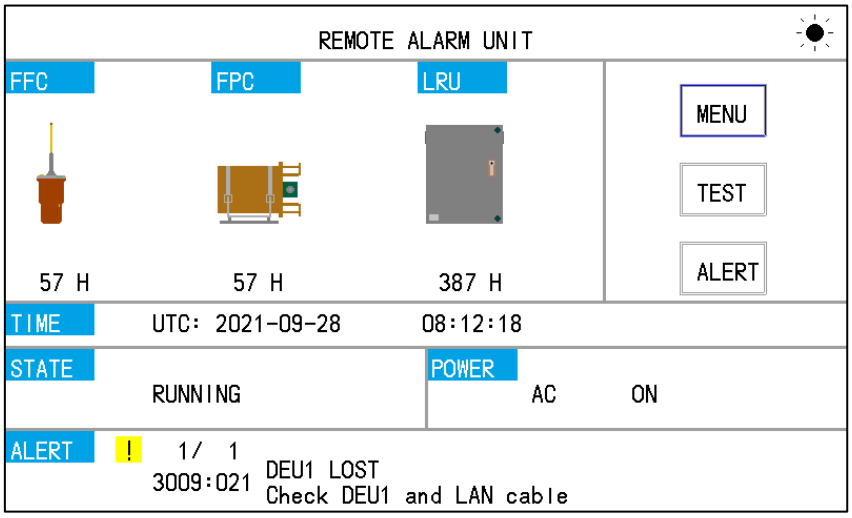
8, Show “Update APP SUCCESS” on RAU



9, Click [EXIT] -> [REBOOT]

3 Troubleshooting

In the process of debugging, operating the unit would have alert under the state of fault. Alert messages will be displayed at the bottom of the main interface, as shown below. Click [ALERT] will show all Alert message.



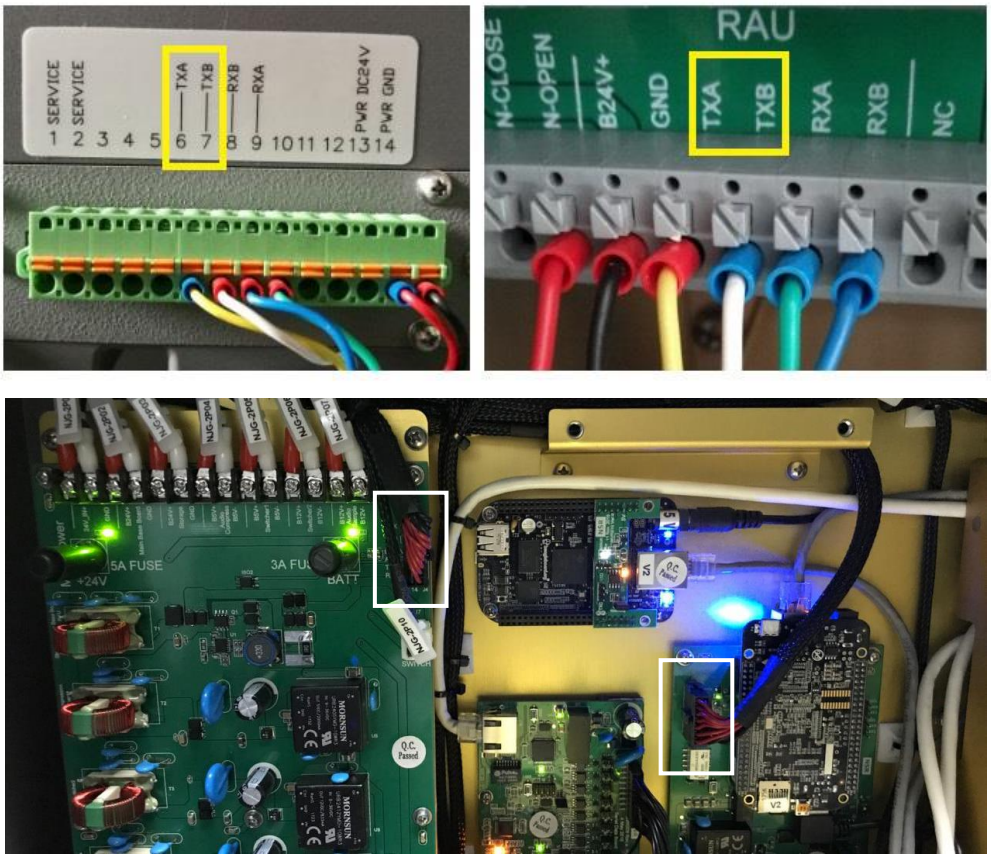
Alert identifier	Ins	Alert title	Prio	Cat	Reason
3009	2	RAU LOST	C	B	DAU lost connect with RAU
3009	3	DAU LOST	C	B	RAU lost connect with DAU
3023	4	AC POWER LOST	C	B	AC 110V/220V Lost
3023	5	BAT LOST	C	B	Battery Voltage Lost
3023	6	BAT LOW	C	B	Battery Voltage Low
3009	7	UTC LOST	C	B	UTC Source Lost
3009	8	USB RW FAIL	C	B	USB Disk Read and Write Fail
3009	9	LOG W FAIL	C	B	MCU Write Log File Fail
3009	10	CONFIG R FAIL	C	B	MCU Write Config File Fail
3009	11	FPC LAN LOST	C	B	FPC Lan Connection Lost
3009	12	FFC LAN LOST	C	B	FFC Lan Connection Lost
3009	13	LRU LAN LOST	C	B	LRU Lan Connection Lost
3009	14	FPC LOST	C	B	SSD of FPC not detected
3009	15	FPC LOW CAPACITY	C	B	Low SSD capacity of FPC
3009	16	FFC LOST	C	B	SSD of FFC not detected
3009	17	FFC LOW CAPACITY	C	B	Low SSD capacity of FFC
3009	18	LRU LOST	C	B	SSD of LRU not detected
3009	19	LRU LOW CAPACITY	C	B	Low SSD capacity of LRU
3009	20	DAU COM LAN	C	B	Lost Connect with NVR901
3009	21	DEU1 LOST	C	B	DEU1 Lan Connection Lost
3009	22	DEU2 LOST	C	B	DEU2 Lan Connection Lost
3009	23	DEU3 LOST	C	B	DEU3 Lan Connection Lost

3009	24	DEU4 LOST	C	B	DEU4 Lan Connection Lost
3009	25	VIU1 LOST	C	B	VIU1 Lan Connection Lost
3009	26	VIU2 LOST	C	B	VIU2 Lan Connection Lost
3009	27	VIU3 LOST	C	B	VIU3 Lan Connection Lost
3009	28	VIU4 LOST	C	B	VIU4 Lan Connection Lost
3003	29	VIU1 SAMPLE FAIL	C	B	VIU1 Sample Image Fail
3003	30	VIU2 SAMPLE FAIL	C	B	VIU2 Sample Image Fail
3003	31	VIU3 SAMPLE FAIL	C	B	VIU3 Sample Image Fail
3003	32	VIU4 SAMPLE FAIL	C	B	VIU4 Sample Image Fail
3003	33	DAU COM	C	B	DAU Com Port Connection Fail
3003	34	DEU1 COM	C	B	DEU1 Com Port Connection Fail
3003	35	DEU2 COM	C	B	DEU2 Com Port Connection Fail
3003	36	DEU3 COM	C	B	DEU3 Com Port Connection Fail
3003	37	DEU4 COM	C	B	DEU4 Com Port Connection Fail
3003	38	MIC FAIL	C	B	Microphone Fail
3009	39	ACU LOST	C	B	ACU Connection Lost
3009	40	ASU1 LOST	C	B	ASU1 Connection Lost
3009	41	ASU2 LOST	C	B	ASU2 Connection Lost
3009	42	ASU3 LOST	C	B	ASU3 Connection Lost
3003	43	ECDIS1 LOST	C	B	ECDIS1 is disconnected
3003	44	ECDIS2 LOST	C	B	ECDIS2 is disconnected
3003	45	ECDIS3 LOST	C	B	ECDIS3 is disconnected
3003	46	ECDIS4 LOST	C	B	ECDIS4 is disconnected
3003	47~54	MIC1…8 LOST	C	B	MIC1…8 at [Position] LOST
3003	55~62	DAU COM1…8 LOST	C	B	DAU COM1…8 [Information Type] LOST
3003	63~78	DEU1 COM1…16 LOST	C	B	DEU1 COM1…16 [Information Type] LOST
3003	79~94	DEU2 COM1…16 LOST	C	B	DEU2 COM1…16 [Information Type] LOST
3003	95~110	DEU3 COM1…16 LOST	C	B	DEU3 COM1…16 [Information Type] LOST
3003	111~126	DEU4 COM1…16 LOST	C	B	DEU4 COM1…16 [Information Type] LOST

3.1 DAU LOST

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

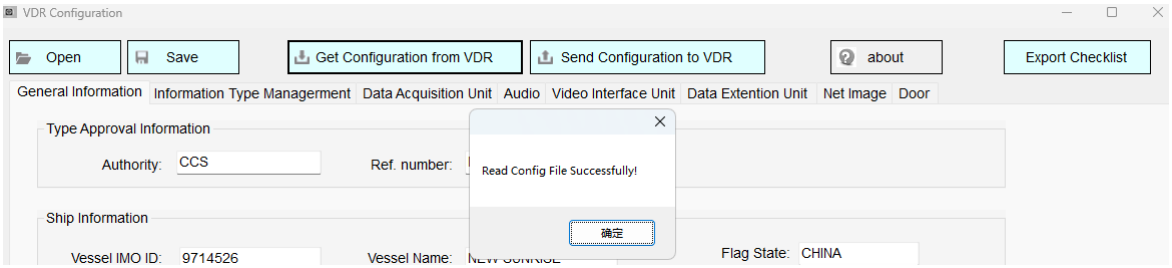
a) Check the lines in RAU and MCU as shown in the following figure.



b) Check that MCU is working properly.

1) Open windows cmd.exe, “ping 172.16.8.50 -t”.

2) Use VDRConfig.exe to get VDR configuration.



c) If it is happened after upgrade, please do upgrade again refer to 2.11.1

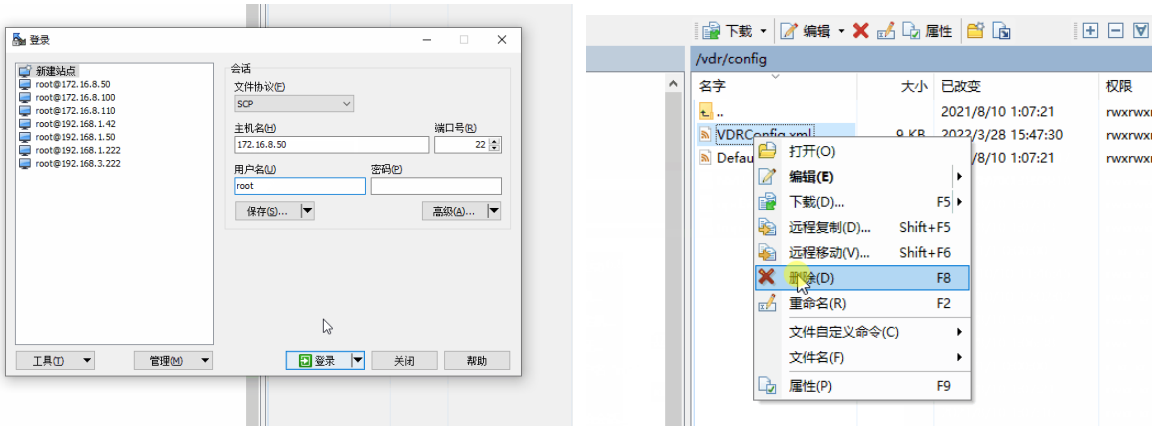
d) If it happens after the configuration file is sent. The current configuration file for MCU needs to be deleted.

1） Download winscp.exe

2） Use winscp to connect MCU, Protocol: SCP, ip: 172.16.8.50, port:22

3） Login, user: root, password: 123

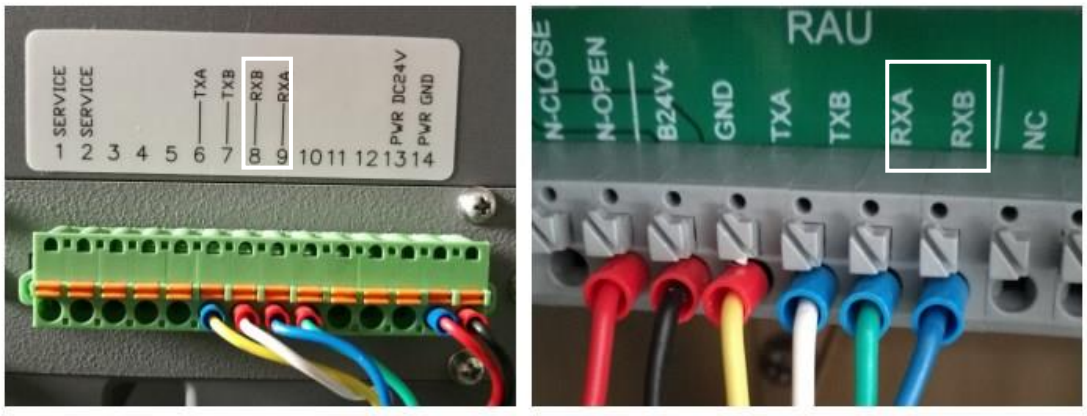
4） Find “/vdr/config/VDRConfig.xml” and delete it.

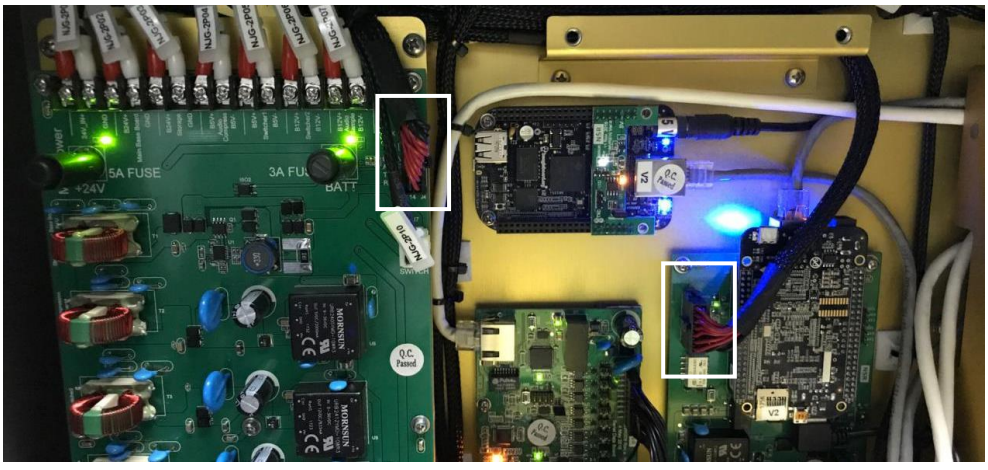


e) If it can not be solved, please replace the spare parts. For MCU replacement, please refer to 2.7.4.

3.2 RAU LOST

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





b) If the alarm remain, please contact the manufacture for spare part.

3.3 AC POWER LOST

Operating unit alarm shows “AC POWER LOST”, Please check the working status of the power distribution board, and measure the power module. Follow the steps below:

a) Check the AC power switch is on.
b) Measuring the input/output stage of the AC power module if there is voltage, and the voltage is normal (AC220 ± 10%). If it is unnormal, please replace the power module.
c) Check the exchange of insurance of the power distribution board is loose or burned.
d) Check whether the input and output of the power module is normal, If it is unnormal, please replace the power module.

e) Check whether the following connection is working

3.4 BATTERY LOW

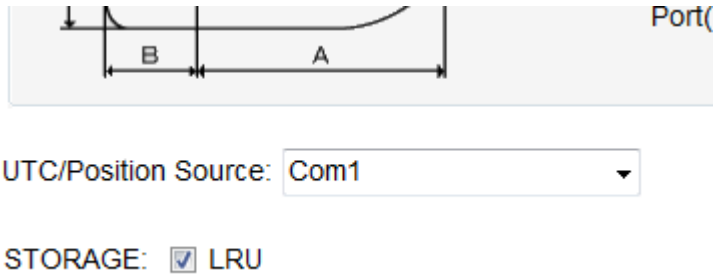
Operating unit alarm shows “BATTERY LOW”, the alarm is mainly due to the AC power unconnected cause the battery discharge. Follow these steps to check:

a) Check the operating unit if the battery voltage is less than 16V.
b) Check the AC switch is turned on.
c) If not, replace the battery. Refer to 2.3

3.5 UTC LOST

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

a) Ensure the UTC serial port of VDR configuration and UTC source is connected to the serial port is the same.

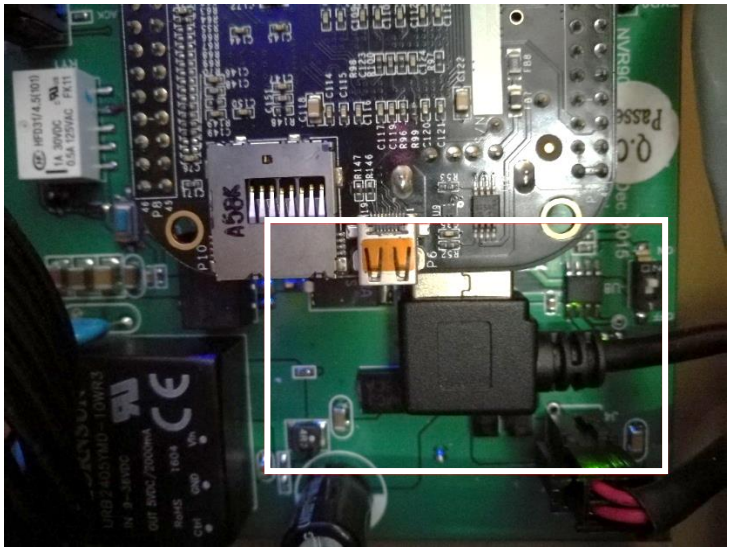


b) Check that the UTC source data format is correct, ZDA sentence is needed.

3.6 USB DISK RW FAIL

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

a) Confirm that the USB memory is not damaged.
b) Directly insert the USB memory on the main board USB interface, test the USB extension cord is damaged.



3.7 FPC LAN LOST

Operating unit alert shows “FPC LAN LOST”, the alarm occurs mainly to check the FPC and the host connection status, because the FPC is a closed structure, it is not recommended to open the housing for working state view, follow these steps to check:

a) Open the junction box to check the power cable, communication line is connected correctly, the voltage is normal.
b) Check whether the network cable is connected properly in DAU.
c) Make sure that the IP address of the FPC is not changed, and that the IP should be 172.16.8.120. If it is 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.
d) Replace FPC SSD Board (NVR901) refer to 2.9.1
e) Replace whole FPC

3.8 FFC LAN LOST

Operating unit alarm shows “FFC LAN LOST”, the alarm occurs mainly to check the status of FFC and host connection. Due to the FFC is enclosed structure, the open shell is not recommended for working status view. Follow these steps to check:

a) Open the junction box to check the power cable, communication line is connected correctly, the voltage is normal.
b) Check whether the network cable is connected properly in DAU.
c) Make sure that the IP address of the FFC is not changed, and that the IP should be 172.16.8.110. If it is 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.

d) Replace FFC SSD Board (NVR901) refer to 2.10.1
e) Replace whole FFC

3.9 LRU LAN LOST

Operating unit alarm shows “LRU LAN LOST”, the alarm occurs mainly to check the status of LRU and host connection, follow these steps to check:

a) Check the host network interface is connected correctly.
b) Make sure that the IP address of the LRU is not changed, and that the IP should be 172.16.8.100. If it is 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.
c) Replace LRU SSD Board (NVR901) refer to 2.7.3
d) Replace whole LRU refer to 2.7.2

3.10 FPC LOST

Operating unit alarm shows only “FPC LOST” and no “FPC LAN LOST”, the alarm occurs mainly to check the status of FPC. Due to the FPC is enclosed structure, the open shell is not recommended for working status view. Follow these steps to check:

a) Restart VDR.
b) Format FPC’s SSD. Refer to 2.11.4
c) Replace FPC

3.11 FFC LOST

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

a) Restart VDR.
b) Format FFC’s SSD. Refer to 2.11.4
c) Replace FFC SSD Board (NVR901 + NVR923) refer to 2.10.1

3.12 LRU LOST

Operating unit alarm shows “LRU LOST” and no “LRU LAN LOST”, the alarm occurs mainly to check

the status of LRU. Follow these steps to check:

a) Reboot system.
b) Format LRU's SSD. Refer to 2.11.4
c) Replace LRU's SSD.

d) Replace whole LRU refer to 2.7.2

3.13 DAU COM LAN LOST

Operating unit alarm shows "DAU COM LAN LOST", the alarm occurs mainly to check the status of NVR909. As shown in the following figure.

a) Check the power supply of Serial Data Board (NVR909) is normal.
b) Check whether the Serial Data Board (NVR909) connection with the switch is normal.
c) Reboot system.
d) Replace Serial Data Board (NVR909) refer to 2.7.8

3.14 DEU1 LAN LOST

Operating unit alarm shows "DEU1 LAN LOST", the alarm occurs mainly to check the status of DEU1. If the failure cannot be ruled out, please replace the spare parts. Follow these steps to check:

a) Check the power supply of DEU1 is normal.
b) Check whether the DEU1 connection with the switch is normal.
c) Restart system
d) Replace DEU Main Board (NVR910), refer to 2.8.1

3.15 VIU1 LAN LOST

Operating unit alarm shows "VIU1 LAN LOST", the alarm occurs mainly to check the status of VIU1.Follow these steps to check:

a) Check the power supply of VIU1 is normal.
b) Check LAN cable between VIU and DAU, the switch is working properly.
c) Restart system.
d) Replace VIU1.

3.16 VIU1 SAMPLE FAIL

Operating unit alarm shows “VIU1 SAMPLE FAIL”, the alarm occurs mainly to check the status of VIU1. Follow these steps to check:

a) Check the RADAR/ECDIS connect with VIU1 is working.
b) Check whether the VGA of the VIU1 is connected normally.
c) Restart system
d) If it occurs during installation, please refer to Installation manual and Appendix A.
e) Replace VIU1

3.17 DAU COM1…16 FAIL

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

a) Check connect to DAU alarm port is connected properly.
b) Check the serial port connected with the DAU alarm device is working properly and send serial data.
c) Check the configuration is consistent with the source data baud rate.
d) Check whether it can be received properly on other ports.

3.18 DEU1 COM1……FAIL

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

a) Check connect to DEU alarm port is connected properly.
b) Check the serial port connected with the DEU alarm device is working properly and send serial data.
c) Check the configuration is consistent with the source data baud rate.
d) Check whether it can be received properly on other ports.

3.19 MIC:xx,xx,xx,xx,xx... FAIL

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

a) Check that the MIC cable is intact.
b) Using the self-check function on RAU test again.
c) Check to see if MIC is working on other ports.
d) If the failure can not be ruled out, please replace the MIC.

3.20 ACU LOST

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

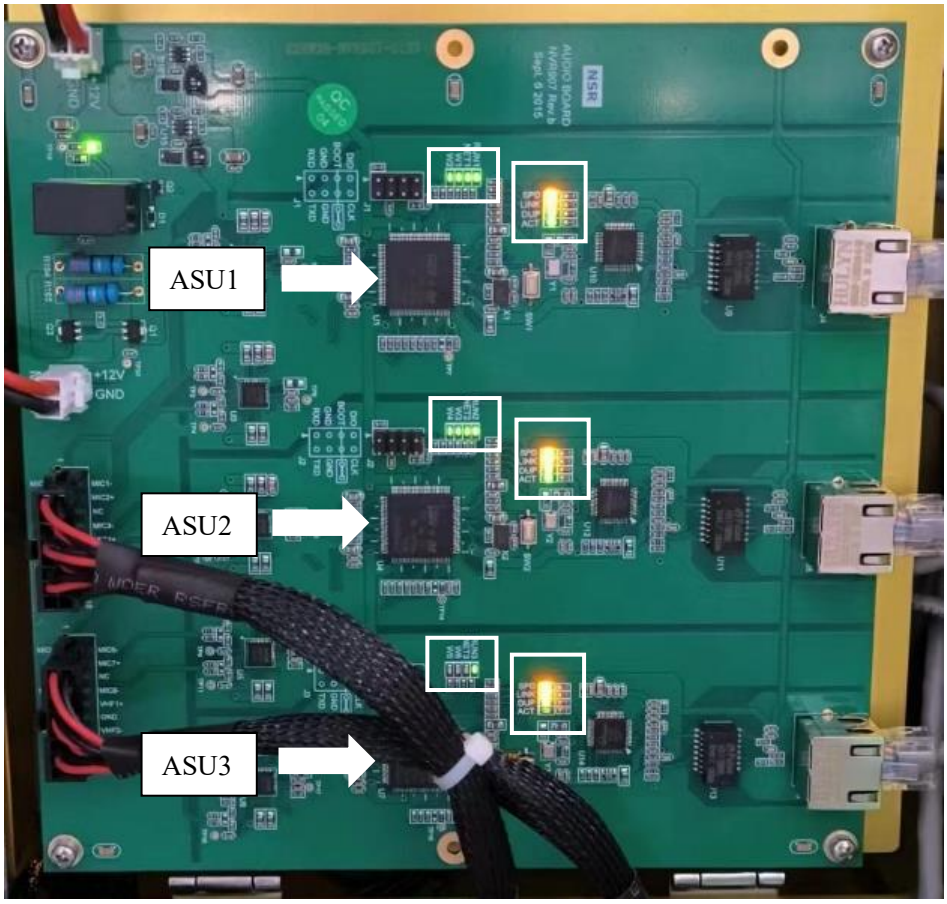
a) Restart system.
b) Check that the ACU cable is properly connected, and restart.
c) If the failure can not be ruled out, please replace the spare parts. Refer to 2.7.5

3.21 ASU1/2/3 LOST

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

a) Restart system.
b) Check whether the cable on the top of the ASU plate connected correctly as shown in figure.
c) Check if chips run lights flashing.

LED	Lighting Specifications
RUN	blink every 1 sec when CPU run normal.
NET	Light when LAN IC is normal
W1-6	When audio channel A1-A6 is 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



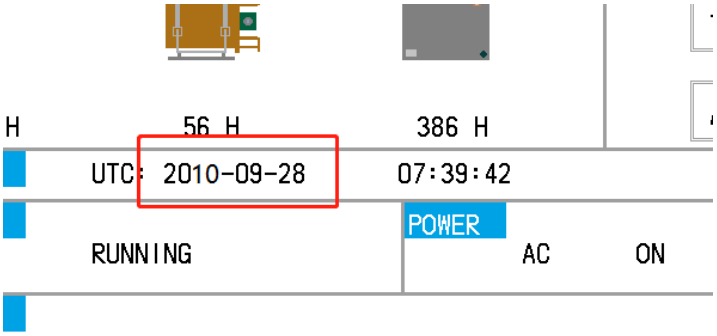
d) If the failure can not be ruled out, please replace the spare parts. Refer to 2.7.6

3.22 NET IMAGE LOST

a) Check whether the RADAR/ECDIS is working.
b) Check the LAN cable between RADAR/ECDIS and VDR is normal.
c) Restart system.
d) If it occurs during installation, please refer to Appendix B.

3.23 Record time is not increased

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



Appendix A Radar & ECDIS

Radar & ECDIS Model

Brand	Model	Output	Description	VIU	NET IMAGE
FURUNO	FAR-2137	DVI	DVI	√	
	FAR-2115/2117/2827/2837S	VGA	1280*1024	√	
	FAR-2218/2238	LAN	IEC 61162-450		√
	FR2825/2835	VGA	1066*800 72Hz	Fail	
	FMD-3300/3200/3100	DVI/LAN		√	√
JRC	JAN-901	DVI	1600*1200	√	
	NDC-1417	VGA	Signal Weak	√	
	JMR-92xx/JMR72xx, JAN-92xx/JAN72xx	LAN	IEC 61162-450		√
	JMA-9122-6XA	VGA	1280*1024	√	
	JMA-5312/5310	DVI		√	
	JMA-9932-SA	VGA	1024*768	√	
	JMA-7252	VGA	1312*928 45.5Hz	Fail	
Sperry	SPERRY VISION MASTER		1280*1024	√	
	BridgeMaster E BME Radar		1280*1024 39Hz	Fail	
SAM	SAM AZ3068		1280*1024	√	
Consilium	Selesmar Selux T250 ARPA		1280*1024	√	
KODEN	MDC-7912		1280*1024	√	
	MDC-1810P		1280*1024	√	
	MDC-7925P		1280*1024	√	
Kelvin Hughes	Nulceus 3 5000		Upgrade Radar	√	
XINUO	HM-5818	VGA/LAN	1280*1024	√	√
TRANSAS	navi-sailor-4000	VGA/LAN		√	√

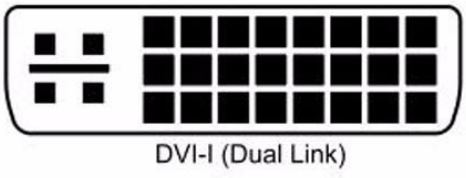
Except for the model of fail in the table. There are mainly the following solutions to the inability to capture Radar&ECDIS connected through VIU.

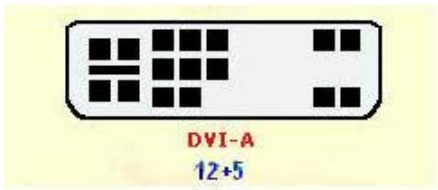
1, Use VGA Hub to enhance the signal

2, Use the correct DVI-VGA for different DVI types

DVI-I & DVI-A

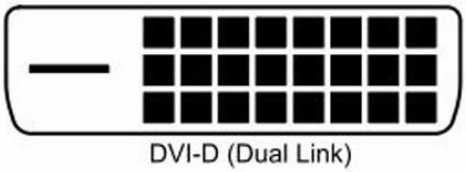
For DVI-A and DVI-I output, use the DVI-I to VGA convert cable.





DVI-D

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



3, For high resolution 1920*1200

For resolution 1920*1200, use converter to convert resolution 1920*1200 to 1920*1080 which VIU can accept.


优 霆
DVI-Universal
ALL TO ALL CONVERTER
AV/YPbPr /VGA/HDMI To AV/YPbPr /VGA/HDMI

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

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 needs to be set up:

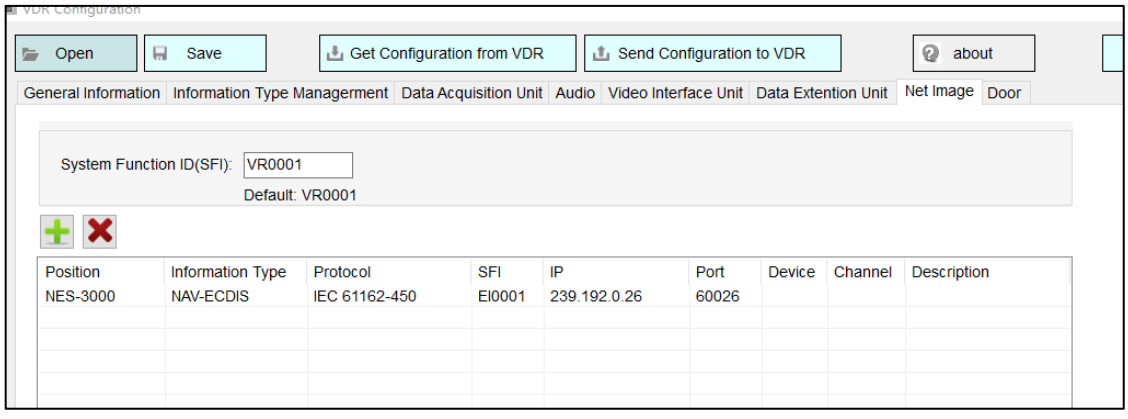
Category	Multicast address	Destination port
IEC 61162-450 (RaUdP – Simple binary file transfer service with UDP Multicast)	239.192.0.21 to 239.192.0.25	60021 to 60025
IEC 61162-450 (RrUdP – Re-transmittable binary file transfer service with UDP Multicast)	239.192.0.26 to 239.192.0.30	60026 to 60030
Address 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).		

Table 1

When on board, you can test whether the equipment supports or not through 3.4 without VDR.
Only a network cable is needed between VDR and ECDIS/RADAR. VDR is the receiver and ECDIS/RADAR is the sender.

2. 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 parameters “SFI, IP and PORT” according to different sender. Generally, the settings are as follows：



You can check whether pictures are received in vdr/data/ [date] / [hour] / E1 by downloading the latest data.

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

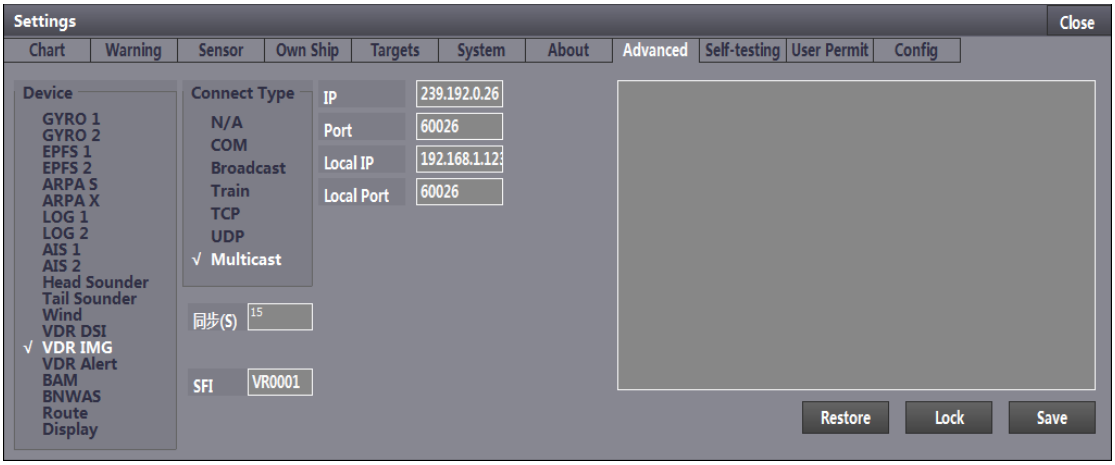
3. Configure sender ECDIS/RADAR

As the sender, ECDIS/RADAR needs to be configured to output multicast pictures.

Usually, connect to the sender to specify the network port, set up IP, Port and SFI.

The SFI of some devices is unknown, which can be obtained by the method in 4. Problem checking.

NES-3000



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 Is the IP of the network port connected to VDR. In general, it can also be set to 0.0.0.0.

Local Port: Same as Port

同步（S）:15

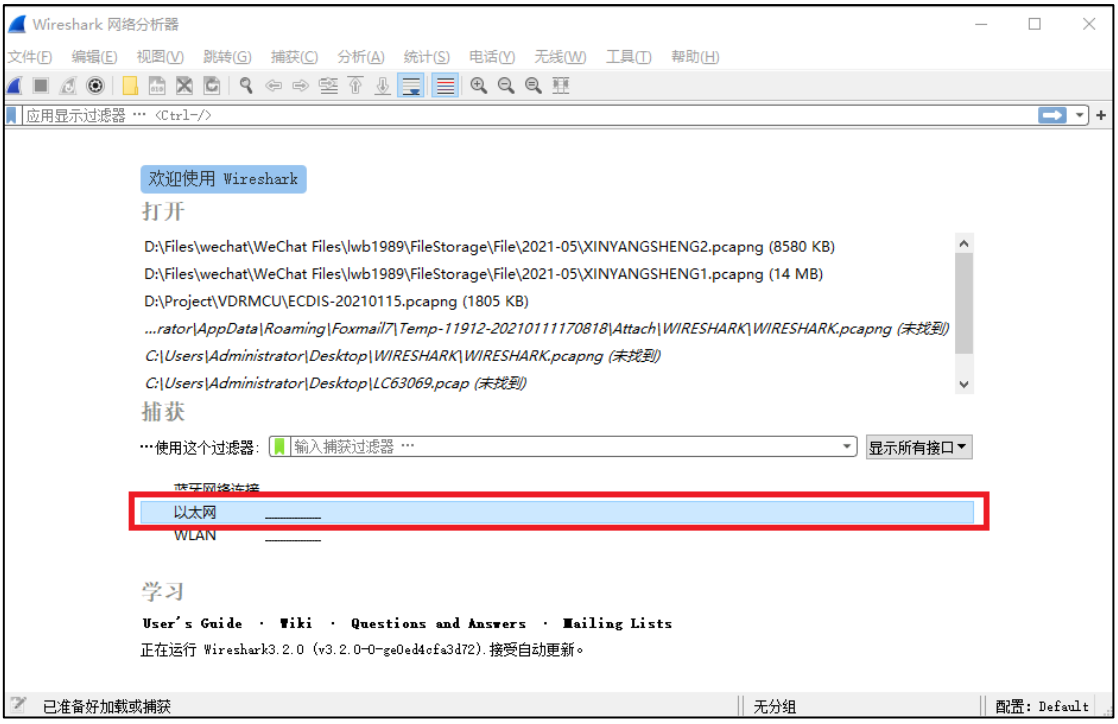
SFI: Here is the destination SFI, that is, the Source SFI of VDR. VDR default SFI is VR0001

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

4. Problem check

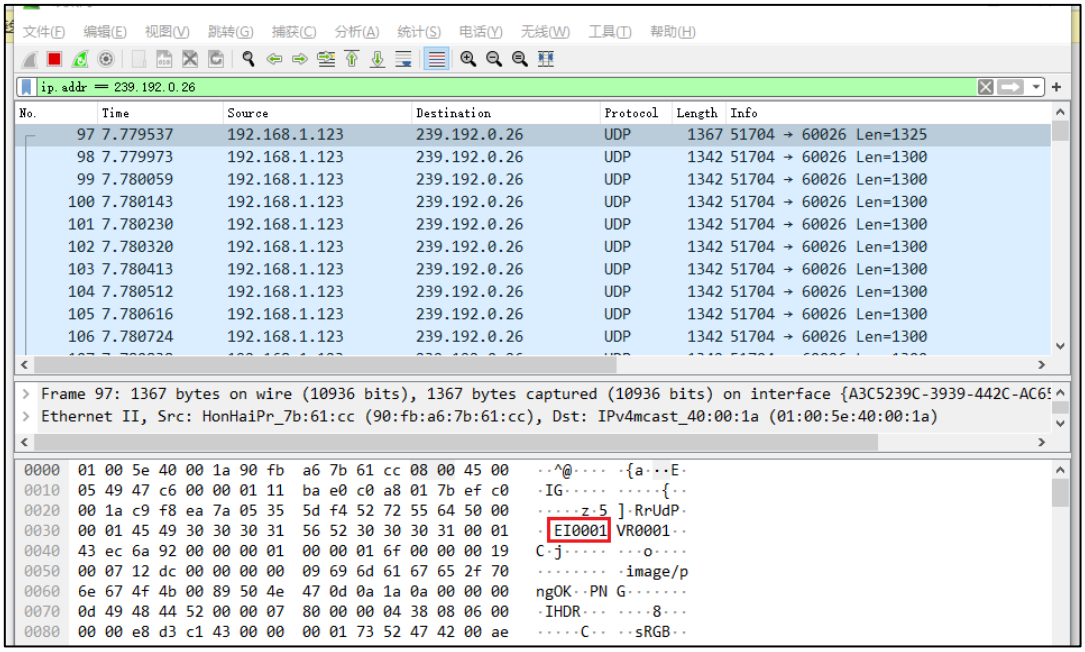
When the VDR cannot receive the picture correctly, it can first check whether the packet of IEC 61162-450 is sent by the sender (ECDIS/RADAR) through Wireshark.

1. Download the software “Wireshark” on 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. Enter the IP set by the sender in the filter column, such as "ip.addr = = 239.192.0.26". If a picture is sent from the sender, the Wireshark will receive the data frame shown below. In addition, the framed part of the picture below is the Source SFI of the sender, which needs to be consistent with the configuration in VDR.

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



5. Connect the sender to VDR, configure the appropriate IP,PORT,SFI and send the configuration, and then enter “\\ 172.16.8.100”, user name: admin password: 123.
Check the latest data in "vdr\ data\ [date]\ [time]\ E1" directory to see if any new pictures are generated. If multiple devices are configured, select E1,E2,E3,E4 according to the configuration order.

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,Port needs to be configured to VDR
- **SFID**：Refer to Furuno manual in below table, need to configure to VDR

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

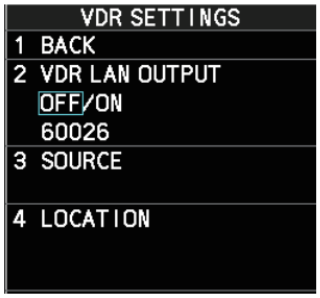
Equipment ID	SFID	Device No.	Channel
CRA001	RA0001	61	1, 2, 3
CRA002	RA0002	62	1, 2, 3
CRA003	RA0003	63	1, 2, 3
CRA004	RA0004	64	1, 2, 3
ECD001	EI0001	21	1, 2, 3
ECD002	EI0002	22	1, 2, 3
ECD003	EI0003	23	1, 2, 3
ECD004	EI0004	24	1, 2, 3
ECD005	EI0005	25	1, 2, 3
ECD006	EI0006	26	1, 2, 3
ECD007	EI0007	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, Port to VDR.

- **SFI**: Refer to furuno manual, No.1 Radar is "**RA0011**" need to configure 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：** LAN1/LAN2

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 J4122 which is located in central control unit (NDC-1590). See the drawing below.

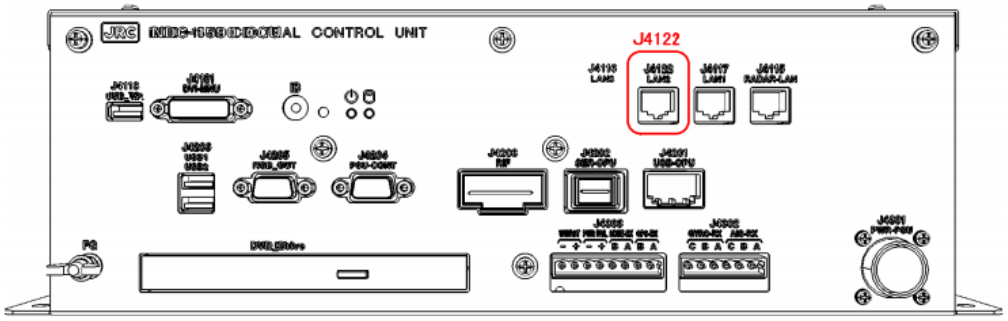
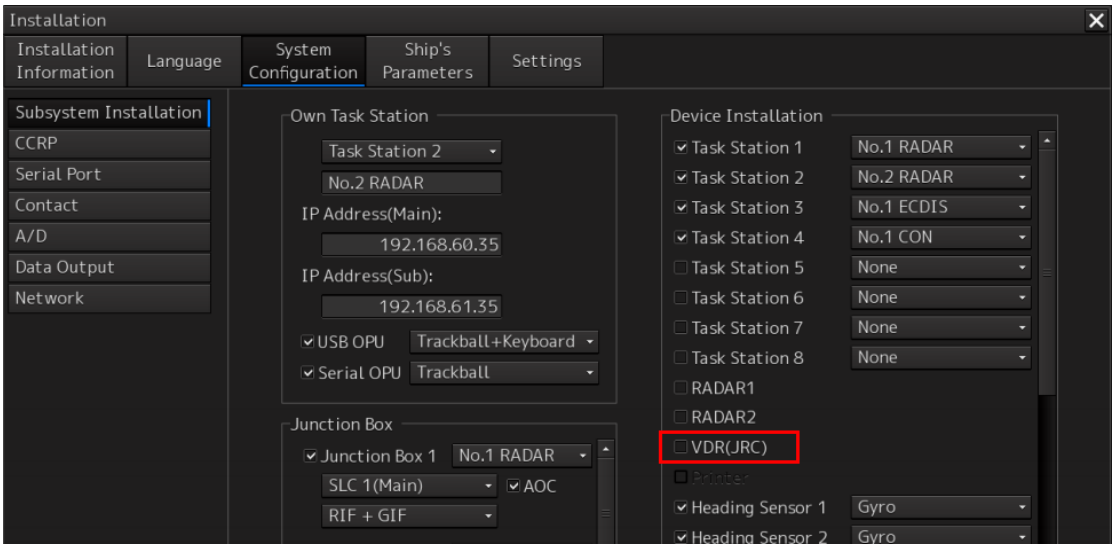
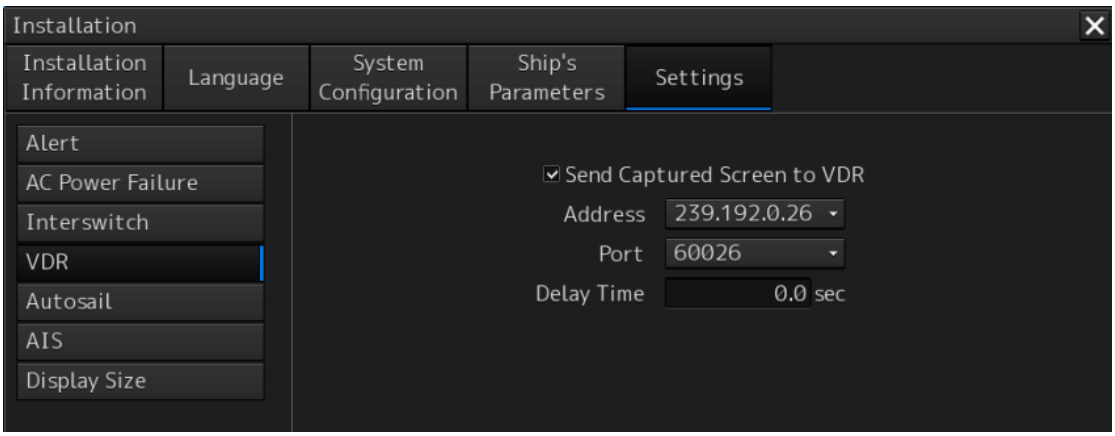


Fig 5-17 VDR connection connector LAN(IEC61162-450)

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

- **Set parameters related to VDR：**



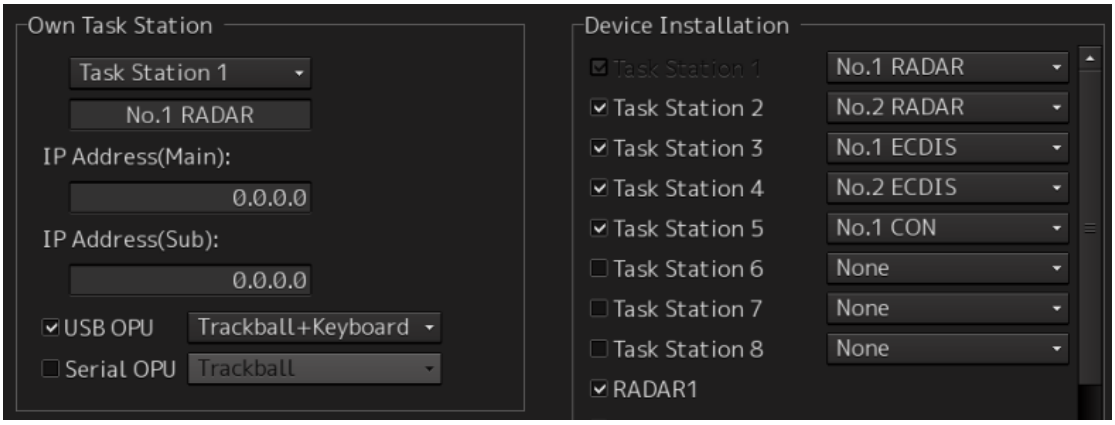


Some new products need to be checked ☐Send Old Format For JRC VDR，Timeout set to 0

Note: 60026 corresponds to IP:239.192.0.26. You need to set the IP, Port to VDR.

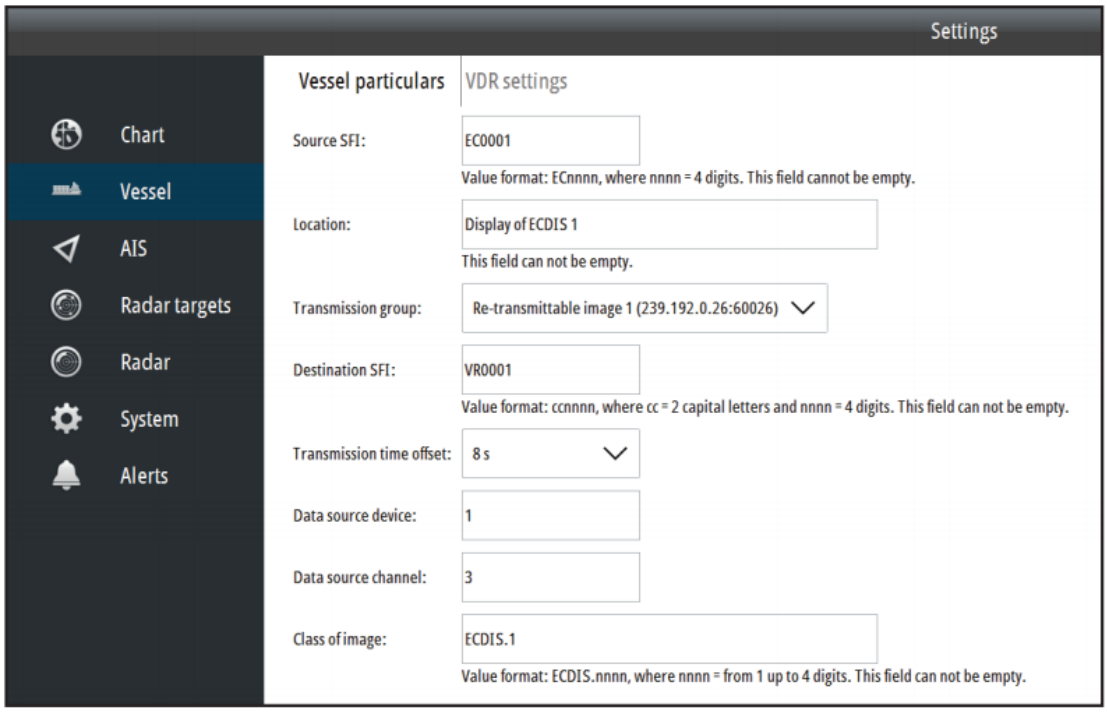
- **SFI：**

Can not find the corresponding description in the JRC specification, usually ECDIS No.1 is EI0001, RADAR No.1 is RA0001. It can be determined by the method in section 4.



SIMRAD E50x

- **Set parameters related to VDR**



Source SFI： 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.

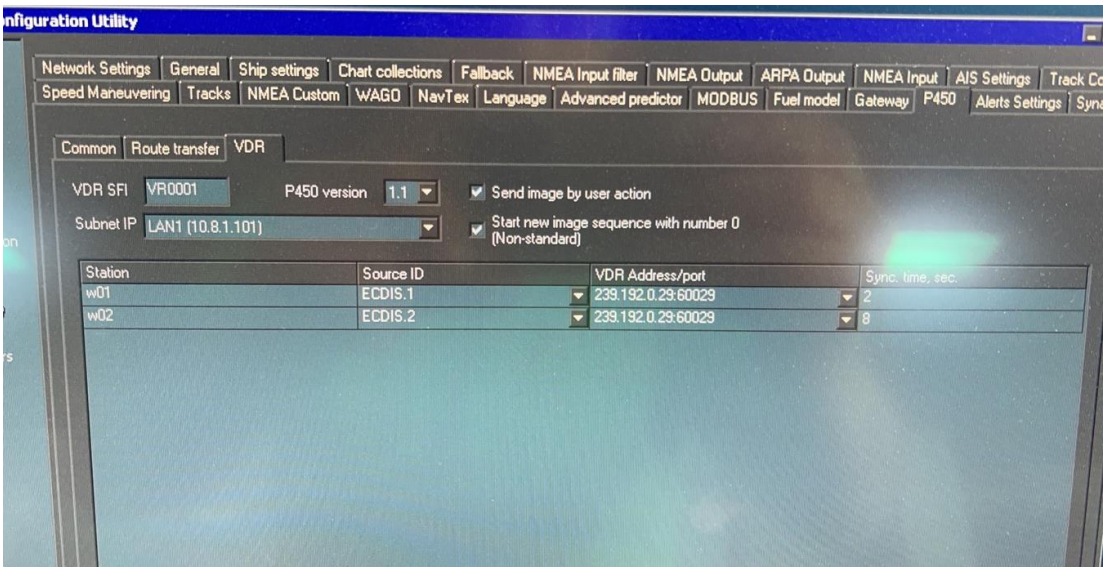
Destination SFI： Enter the SFI of VDR. NVR-9000 defaults to VR0001.

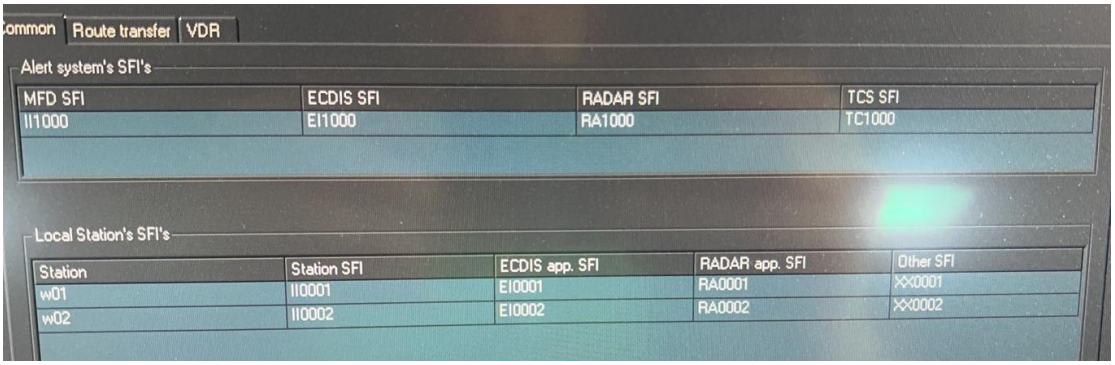
TRANSAS

- **Set parameters related to VDR**

VDR address/port: Same as configuration in VDR

SFI: ECDIS.1 is EI0001, ECDIS.2 is EI0002





XINUO

- **Set parameters related to VDR**

Set port : 60026，format: png，interval: 15s

Note：Since Xinnuo Chart cannot modify IP or SFI, only one can be connected to VDR at the same time. For second, please use VGA interface.


设置
船舶
系统
海图
报警
网络
传感器
LAN IP地址 172 . 16 . 8 . 92
默认网关 172 . 16 . 8 . 1
屏幕图像发送至VDR 组播地址 239 . 192 . 0 . 26
端口号 60026
格式 png
间隔 15S
航线备份 非可重传
组播地址 239 . 192 . 0 . 25
端口号 60025
确定