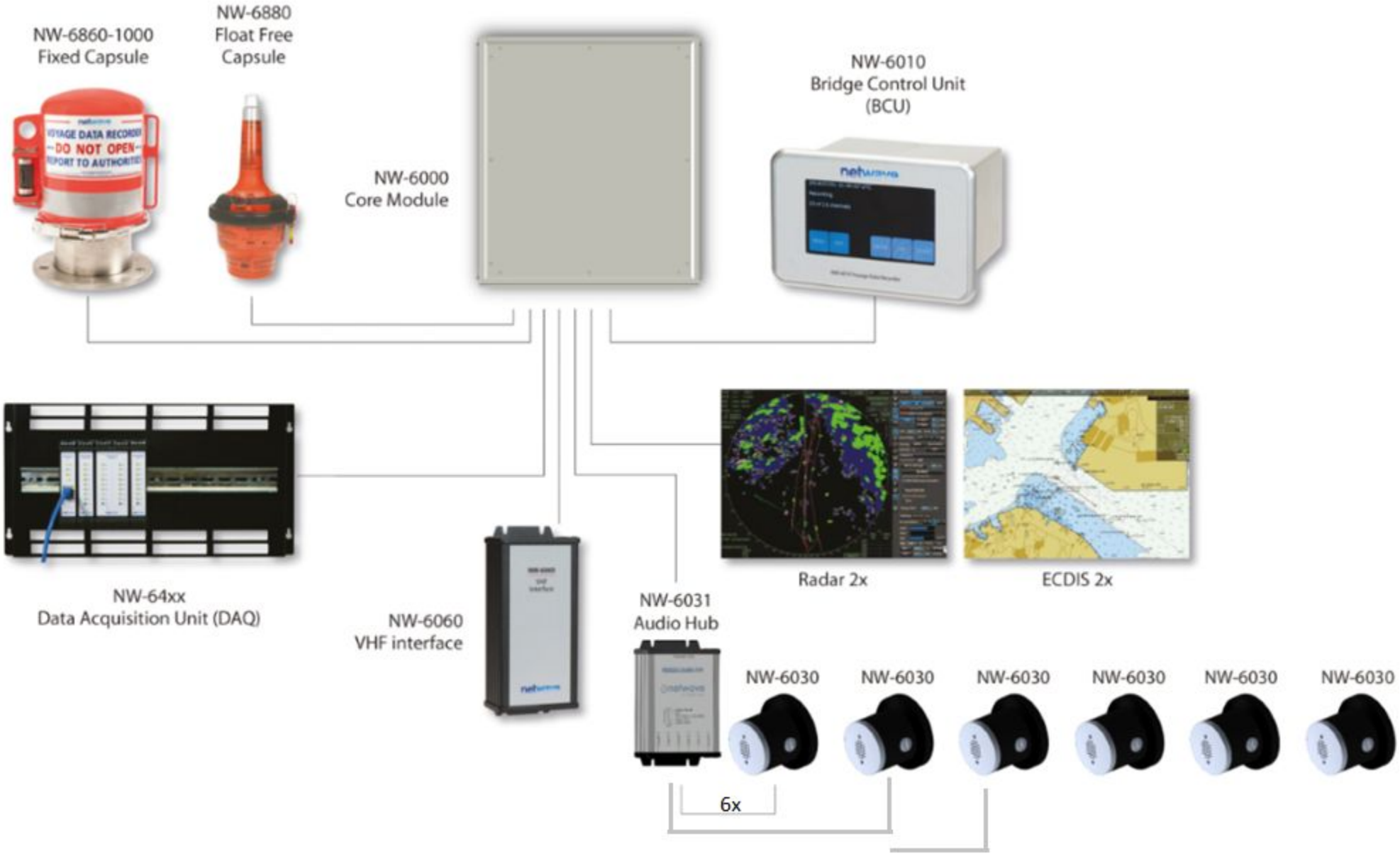
NW6000 TRAINING

Module 1 – Hardware & Installation

NW6000 TRAINING

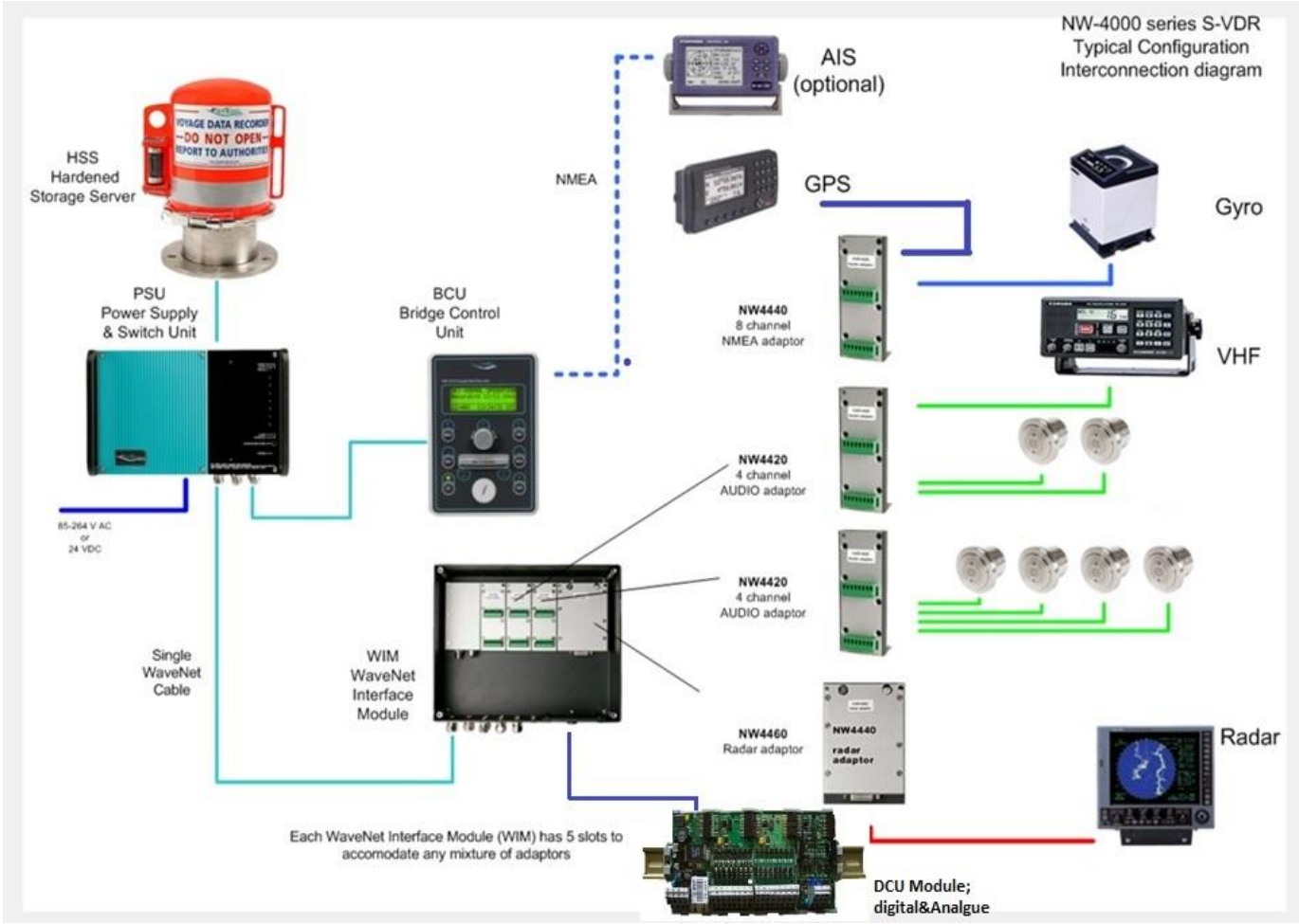


INTRODUCTION

- Netwave started as development company for pure 2nd generation of VDRs in 2005
- Headquarters and main production are located in Zoetermeer, the Netherlands
- 1st of June 2011, acquisition of Rutter VDR, making Netwave no. 1 in VDR install base worldwide
- Install base of 5500 (S)VDRs and still growing…
- NW6000 (S)VDR introduced in 2014 according to IMO MSC.333(90)
- 2017 Netwave acquired by Orolia
- 2021 Netwave acquired by Seas of Solutions

SEASOFSOLUTIONS/NETWAVE MANUFACTURER OF VOYAGE DATA RECORDERS

NW4000 developed in 2005 > obsolete installed on approx. 700 vessels



RUTTER VDR'S CANADIAN PRODUCT RETRIEVED BY NETWAVE 2011

100/G1

100/G2

100/G3

SUPPORT – HELP -APT

CONTACT ADDRESSES AND PHONE NR'S

To contact VDR Support: service@seasofsolutions.com
To contact VDR RMA: rma@seasofsolutions.com
To contact Training: training@seasofsolutions.com
To contact Sales: sales@seasofsolutions.com

- **Service phone** +31 88 11 81 500
- **16:00-07:00 UTC** +31 62 15 02 167

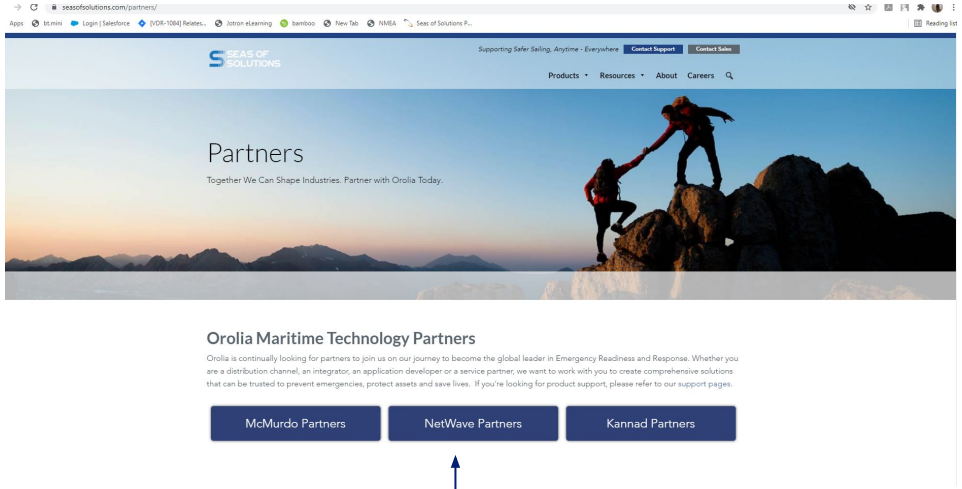
UPLOADING APT DATA

netwavesystems.wetransfer.com

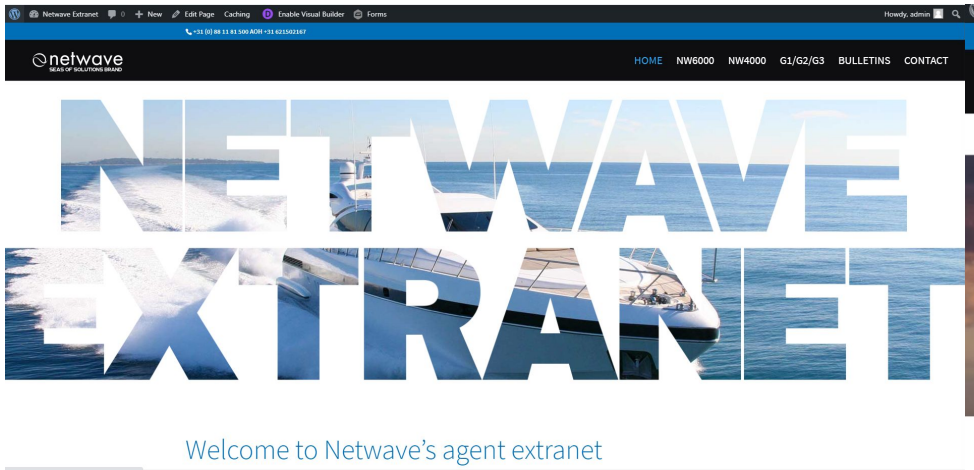
APT GENERAL QUESTIONS
apts@seasofsolutions.com

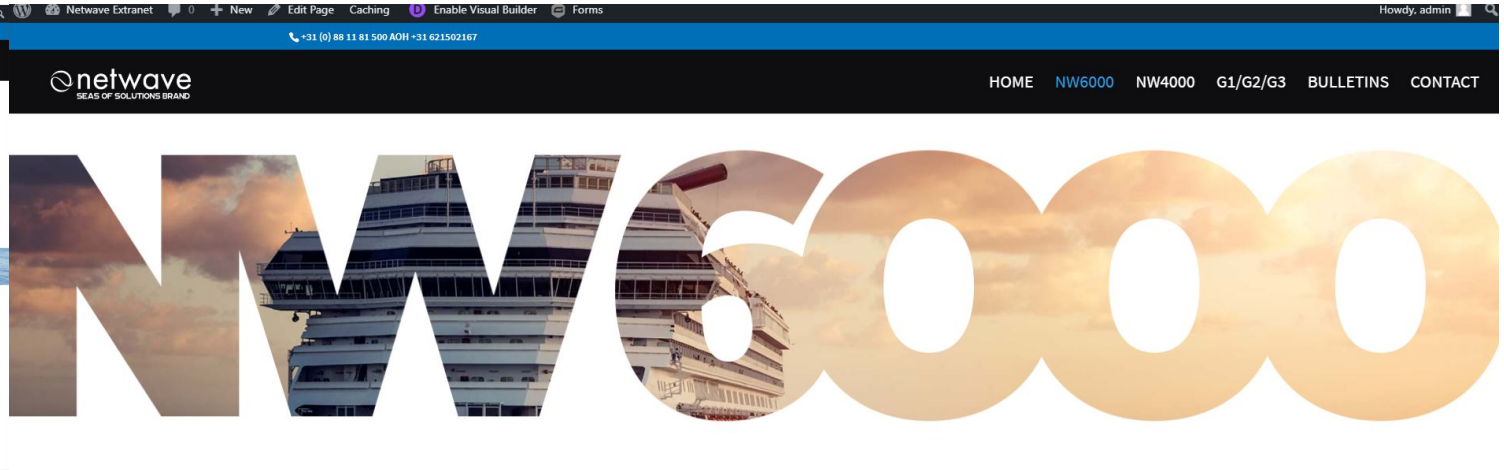
STAY UPDATED, VISIT OUR PARTNER PORTAL
GET YOUR USER NAME AND PASSWORD FOR ACCESS VIA OUR SERVICE DEPARTMENT

VISIT…
WWW.SEASOFSOLUTIONS.COM

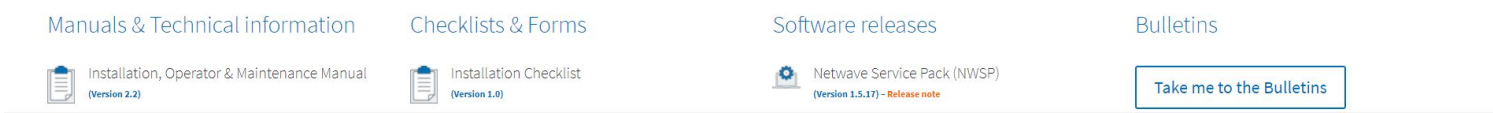


OPENING THE EXTRANET LOCATION





Find all last bulletins, manuals, APT forms and software for all our VDR products on this location.



Video: *Netwave Extranet*

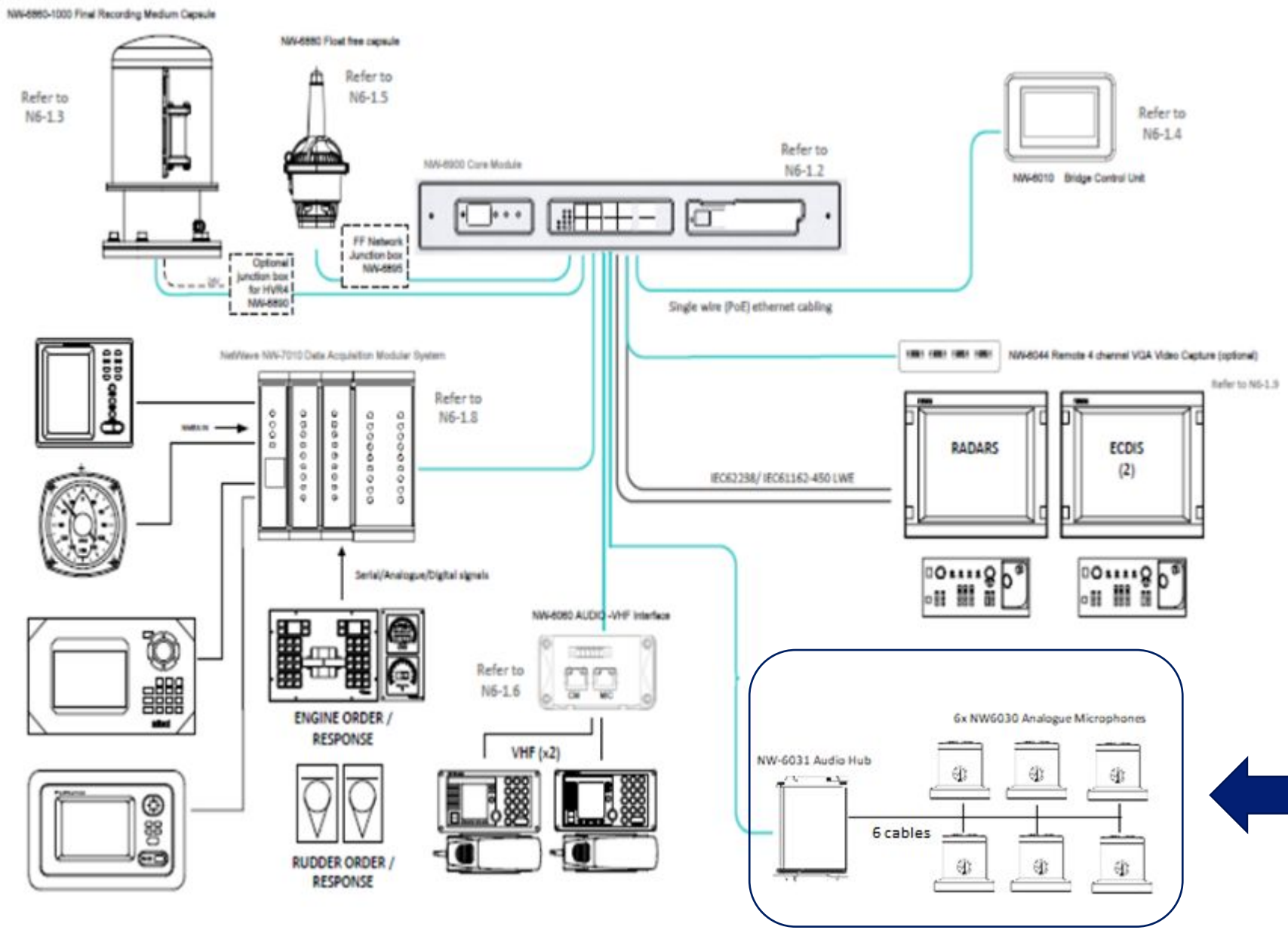
NW6000 PUBLICATIONS

- NW6000-10 VDR Installation and Maintenance Manual
- NW6000-10 VDR Operator Manual
- APT Checklist form (see APT presentation/folder)
- NW6000-60 Authority Access Manual
- NW6000-90 VDR Commissioning PT and TA Certificates

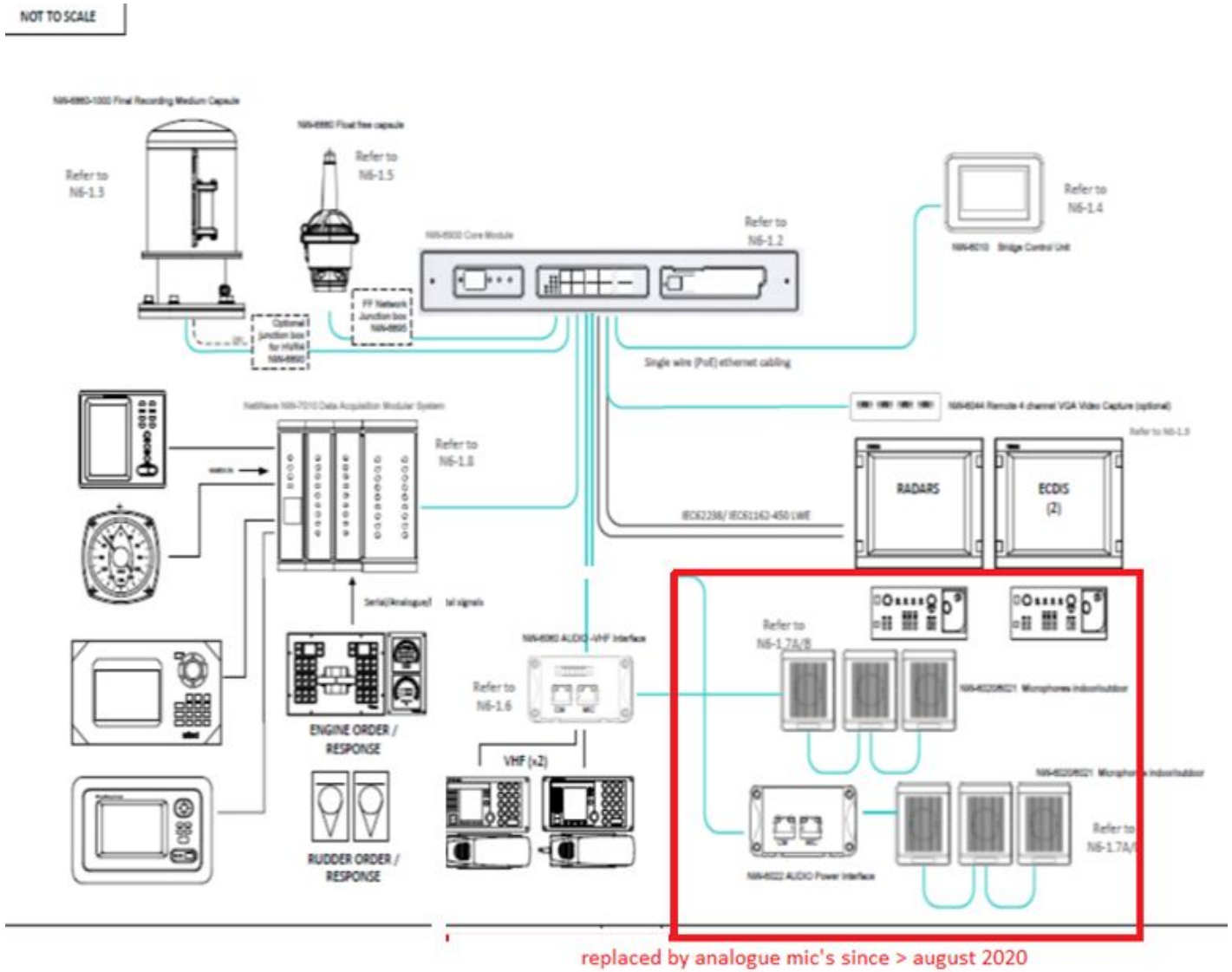
All publications will be updated regularly, get the latest info and bulletins via our extranet.

QUESTIONS?

NW6000 SINGLE LINE DIAGRAM >AUGUST2020

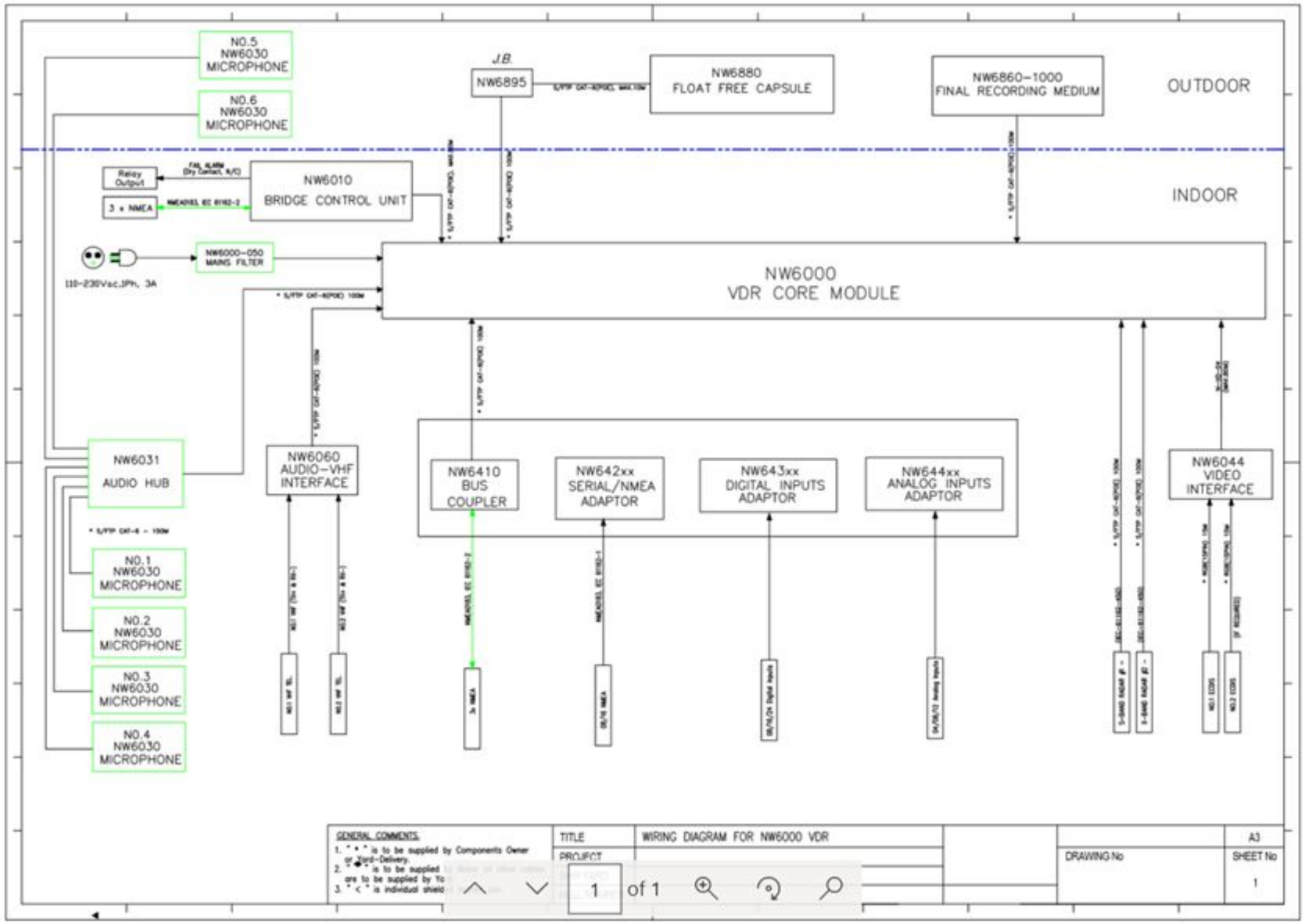


NW6000 SINGLE LINE DIAGRAM <AUGUST2020
BEWARE! CERTIFICATION EXPIRED NO MORE INSTALLS WITH DIGI MIC'S ALLOWED



OLD!

NW6000 WIRING DIAGRAM



COMPONENTS OF THE NW6000

NW-6000-920** CM bulkhead enclosure
NW-6010 Bridge Control Unit
NW-6060 VHF Audio Interface
NW-6020 Microphone Interior IP21 *(1)*
NW-6021 Microphone Exterior IP67 *(1)*
NW-6022 Power Converter for Microphones *(1)*
NW-6030 Analogue Microphone
NW-6031 Audio Hub
NW-6044 Video Interface 4 channel
NW-6880 FRM Float Free Capsule Jotron TRON 40
NW-6860-2000 FRM (Final Recording Medium) fixed HSS Capsule
NW-6890** FRM PoE Splitter Box f. (For use ofHVR04)
NW-6410 WaveNet Buscoupler
NW-64208/16/24 Serial/NMEA 8/16/24 CH adaptor
NW-64308/16.24 Digital 8/16/24 CH adaptor
NW64404/08/12 Analogue 4/8/12 CH adaptor

Notes:

(1) No longer certified with NW6000 as it has been replaced by the NW6030 Analogue Microphone and NW6031 Audio Hub Spares support still available for installations with certifified before August 2020.

COMPONENTS – CORE MODULE NW6000B

Our new system is modular and uses Power Over Ethernet.

The main unit named the ***Core Module***, can be located on the bridge or other convenient location like the electrical equipment room, where a connection can be made with the emergency power source

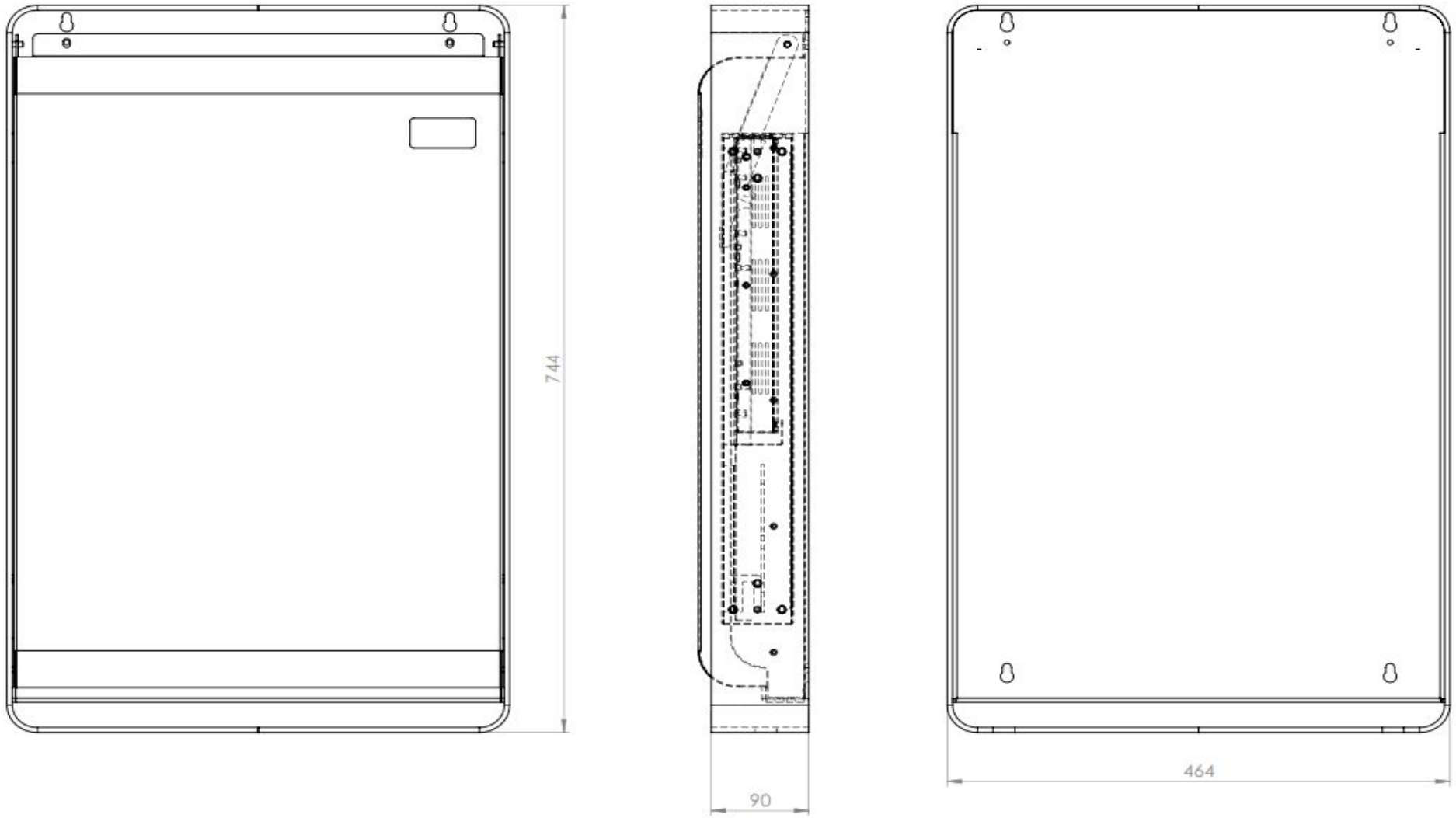
NW-6000 VDR Core Module (19" enclosure) based in Bulk Head

Inside the Core Module you will find 3 replacable units:

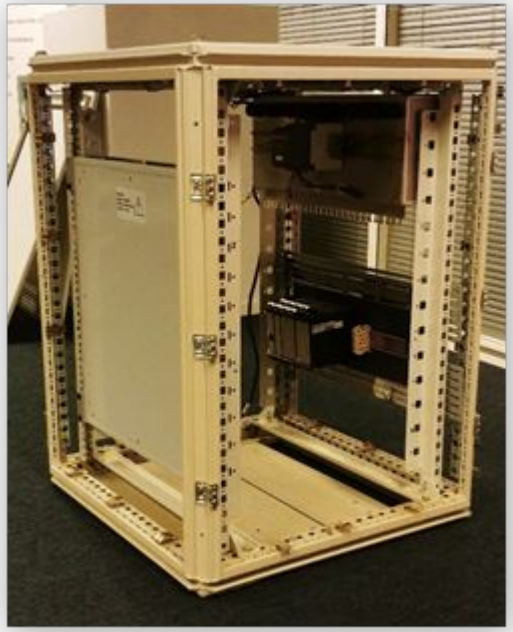
- ***NW-6000-100 CM Power Module***
- ***NW-6000-200 CM Network Module***
- ***NW-6000-300 CM CPU Module***

Core Module

DIMENSIONS



COMPONENTS – CORE MODULE



The VDR 19”enclosure can be taken out of the bulkhead and installed in an existing 19”cabinet.

For this, upgrade kits are available to mount the enclosure horizontally or vertically inside the 19”cabinet.

Video: *removing the 19”enclosure (Core Module)*

COMPONENTS – VDR CORE MODULE (19” ENCLOSURE)

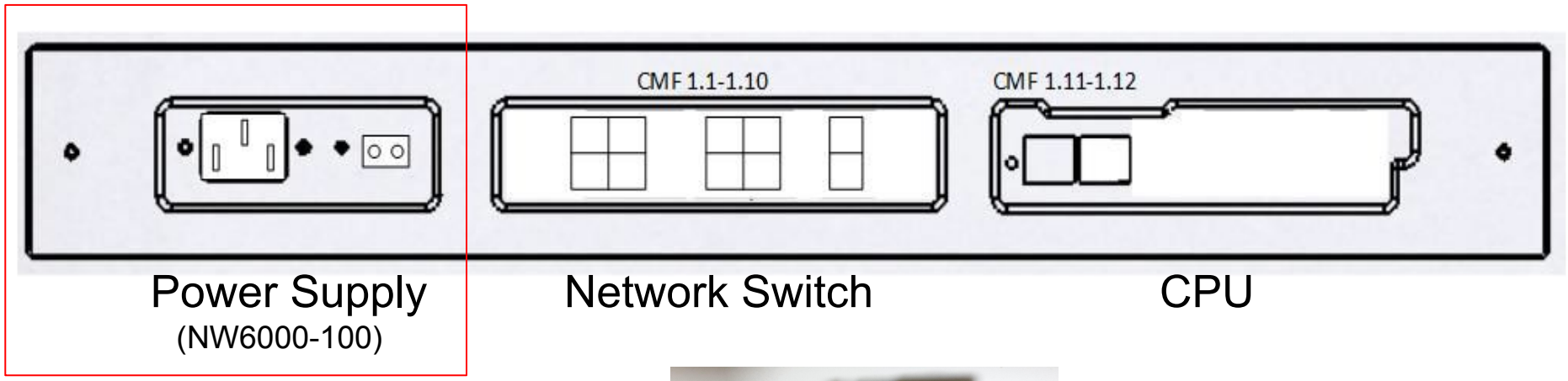
The Core Module combines 3 functions from 3 independent modules

These modules are interconnected via a backplane PCB within the enclosure.

They can easily be removed and replaced by sliding each module out of the front of the rack.

Video: *removing and replacing the modules*

COMPONENTS – POWER SUPPLY MODULE



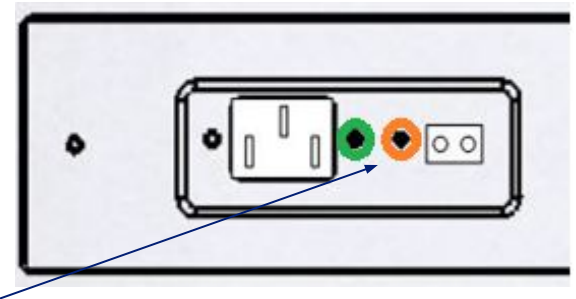
Led indication on Power Module

Normal function 110V/230V power connected:

Green led on power module is on.

When UPS function AC power not connected:

Green led blinking.

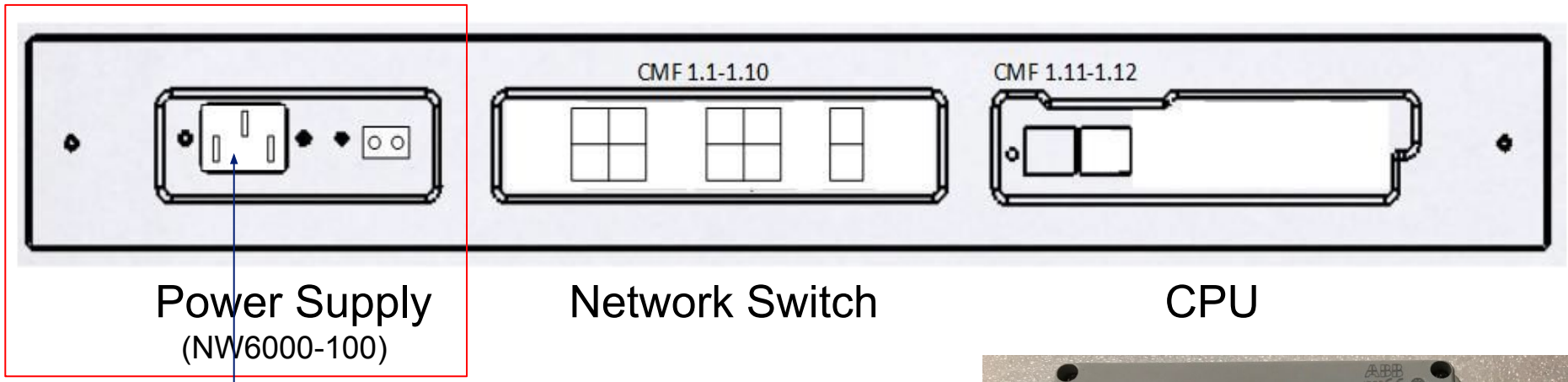


If the battery power comes below 22V the yellow led will be on. (warning!)

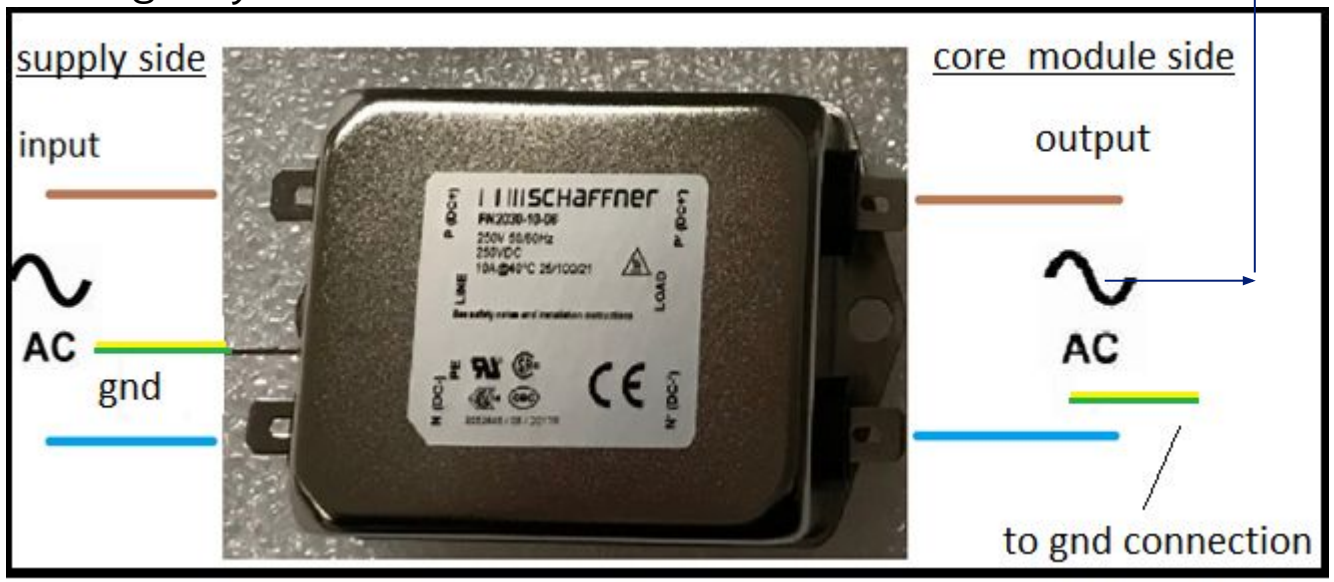
Below 20V the UPS the system will be powered off.

Powering down the system can only be done by sliding out the PSU module from the Core Module

INSTALLATION – POWER SUPPLY MODULE CONNECTION

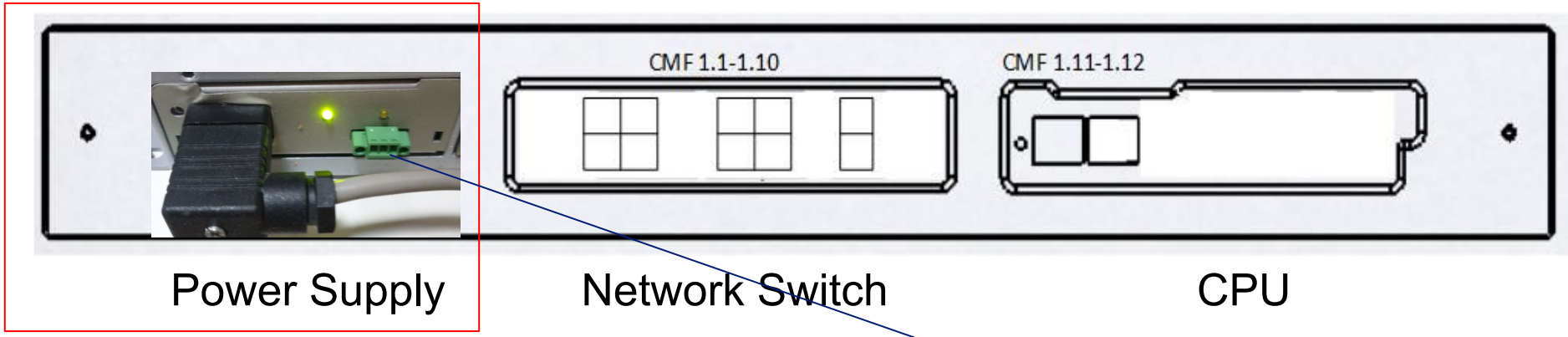


The Power Supply should be connected via the delivered filter **NW6000-050**. Connect it to the 110VAC/220VAC Emergency Power Source on board



NW6000-050

COMPONENTS – POWER SUPPLY MODULE

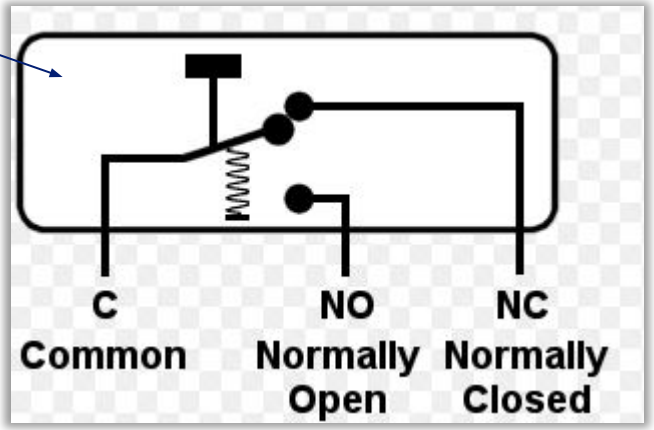


The CM Power modules also serves to provide an external CAUTION contact (green plug) which can be connected to a central alarm system, if and when present on the ship.

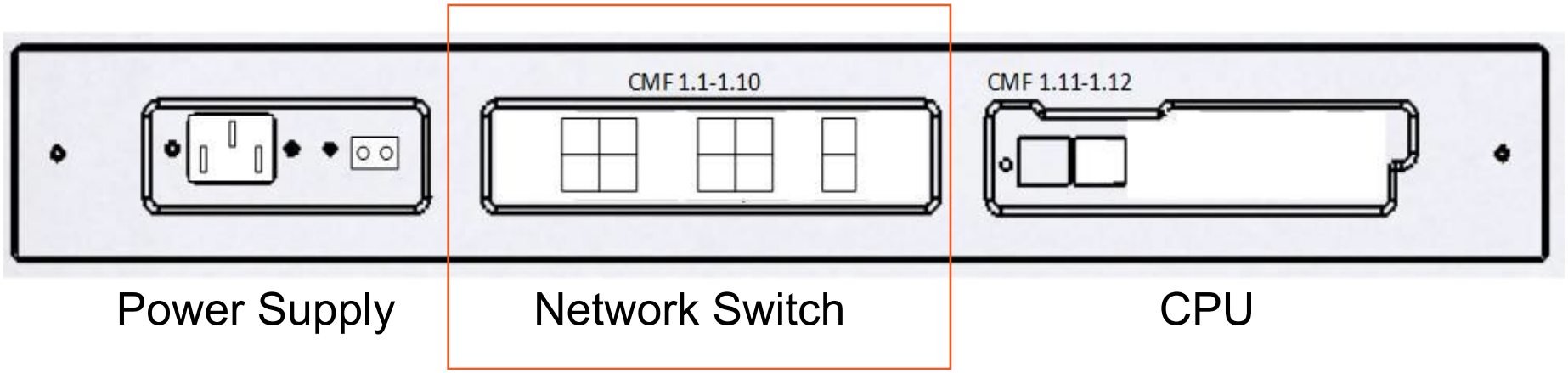
The following contacts are provided;

- During normal operational mode of the VDR (without any CAUTIONs internal to the VDR) the CAUTION relay is held energized (by the VDRs Central Processing Unit) and the CAUTION contacts are closed.

- If the VDR presents an error or (power) fails, the contacts will open to their default (NO). This allows remote CAUTION management systems to register the VDR (internal!) CAUTIONs.

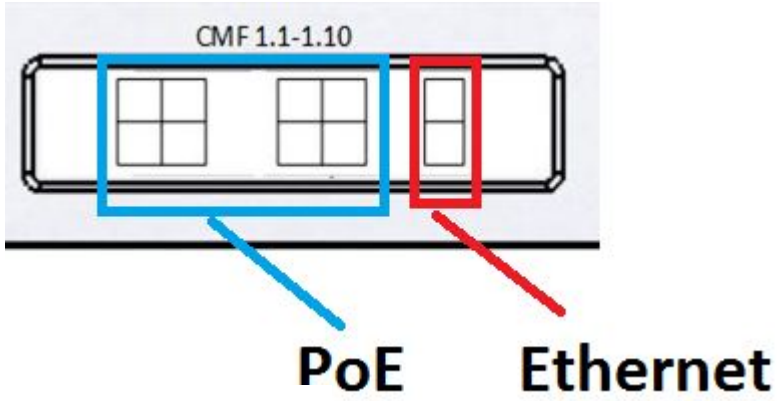


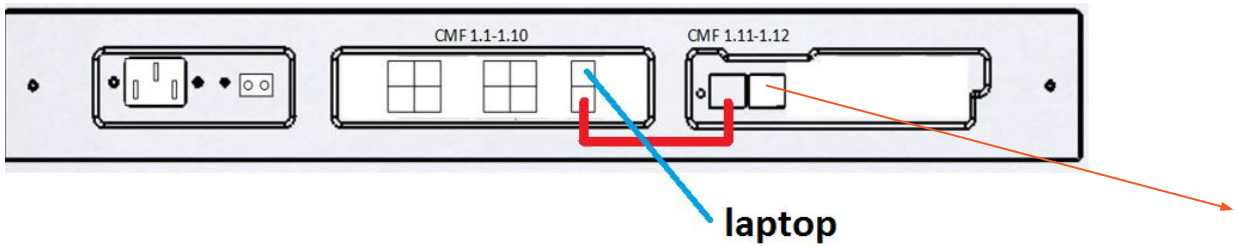
COMPONENTS – NETWORK SWITCH

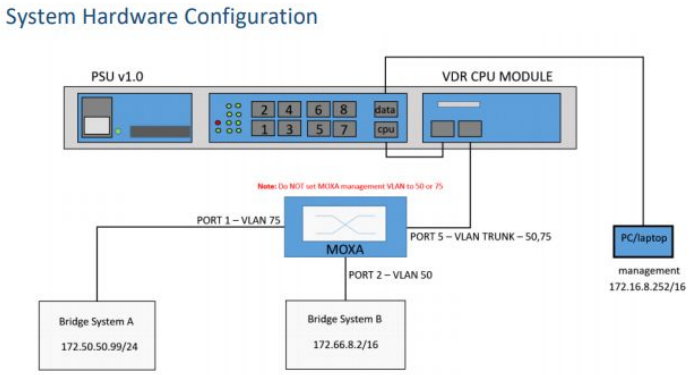


The Network Switch has 8x PoE RJ45 network connectors and 2 ‘normal’ Ethernet connectors.

CPU is always connected to one Ethernet connector, the other one can be used for laptop connection or LWE 450 purposes.

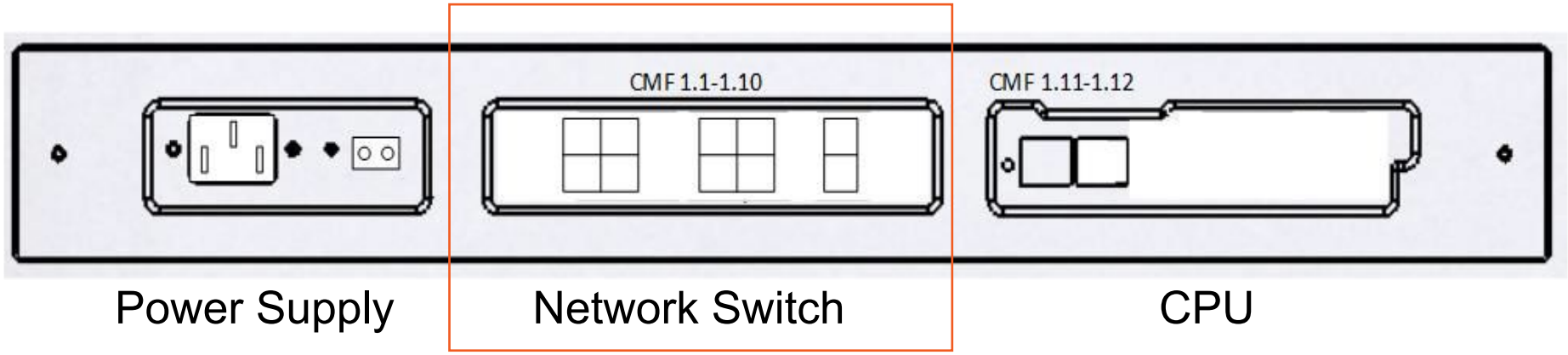






[VLAN connection]

COMPONENTS – NETWORK SWITCH



LED indicators on the data switch

Green

Off Ethernet link not established. Either the RJ-45 cable is unplugged or defective; the nodes on the LAN is switched off.

On Ethernet link properly established.

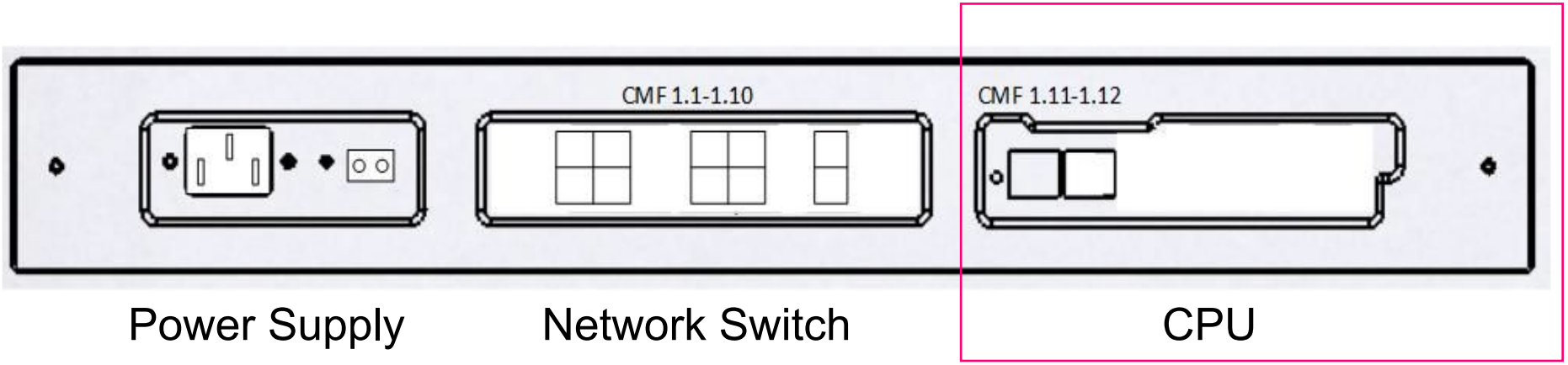
Yellow

Off No traffic detected on the Ethernet.

On (pulsing): LED glows each time an Ethernet packet (originating from/directed to any node on the Ethernet) is detected.

When more PoE inputs are required, an additional MOXA should be applied.

COMPONENTS – CPU



The CPU module contains the long-term recording medium which records the data for a minimum of 1 month inside the VDR.

It is a Linux based system containing a 1 TB SSD disk.

- ✔ The orange LED indicates communication between switch and CPU
- ✔ The green LED should be flickering, indicating that there is a heartbeat

COMPONENTS – NW6000-0155-KIT BATTERY REPLACEMENT

- The battery replacement kit contains the items below.

Batteries should be replaced every 2 years

Read bulletin *Installation instructions 2017-12-002 Version 1.1 New battery type for enhanced VDR NW6000* first before replacing the batteries!

COMPONENTS – NW6000-0155-KIT BATTERY REPLACEMENT

Battery Kit is provided with;

-**installation manual**

-4 x 6V batteries

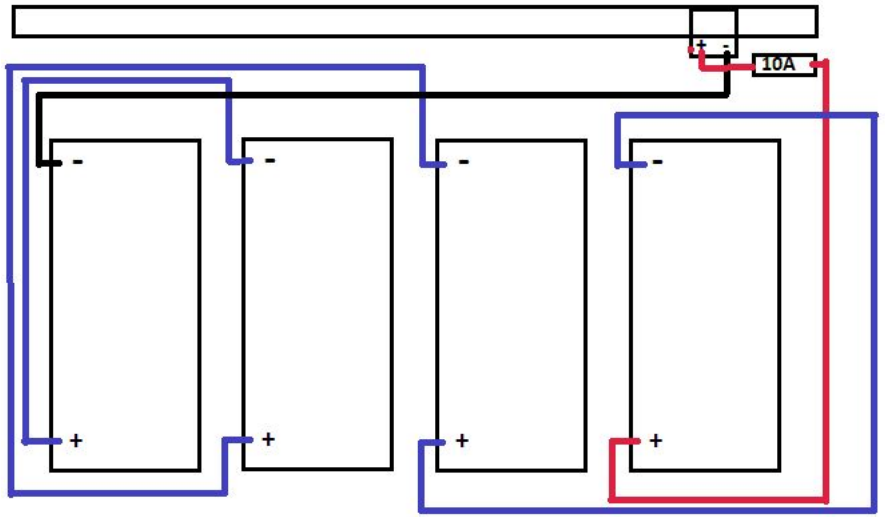
-new wiring

-battery stickers

-10A fuse and holder

-rubbers

-round expiry date sticker



WIRING SCHEDULE BATTERIES NW6000 CORE MODULE

- Replace all wiring, fuse and when needed the rubber stickered underneath the frame
- Cut out the new expiry date on the stickers from the batteries
- Put the round expiry sticker visible on the outside of the Core Module

Video: *replacing the PSU batteries*

QUESTIONS?

INSTALLATION - CORE MODULE

The CM (Core Module) is powered from the emergency backup power source which should be 100-264V AC (+/- 10%) 50 - 60Hz with a maximum frequency deviation of 5% (IEC60945). The power consumption is rated at maximum of 150W for the entire VDR system, thus including all PoE (Power over Ethernet) connections (up to 15W each). This power consumption does not include any devices external to the VDR where these must be powered individually from the ship's power source.

Mains power cables: type: 3-core mains, flame retardant, halogen free. The power-connector and cable are provided within the standard scope of supply and indication for the position for the L (Brown), N (Blue) and GND (Yellow/Green) connections are also indicated within the plug-connector.

The leads must be connected to the supply as follows;

Brown	L
Blue	N
Yellow/Green	Ground

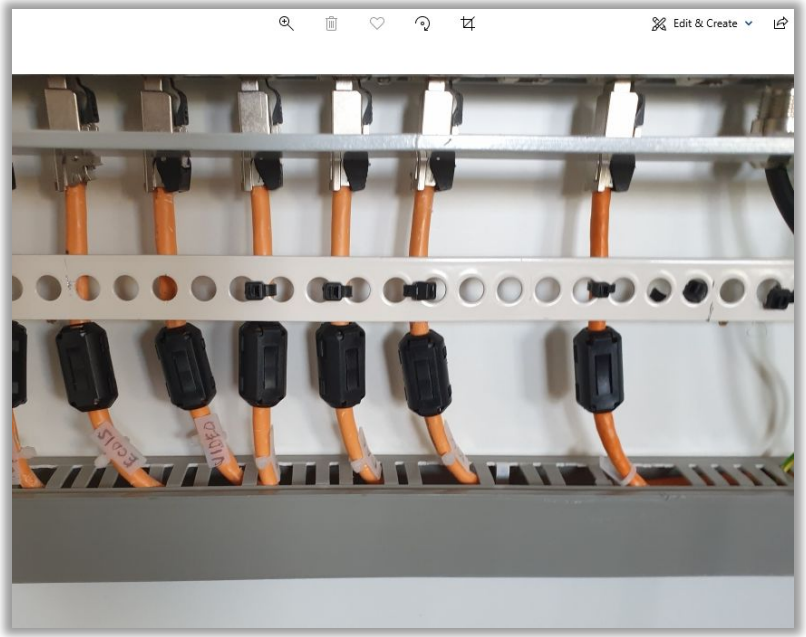
The 3 leads (L,N,GND) must have a minimal diameter of 1 mm^2

INSTALLATION CORE MODULE – MOUNTING

- If the bulkhead-mounting enclosure is used, mount the bracket with your choice of bolts supplied with the unit.
- Disconnect all plugs and take out the Core Module so you can easily mount the bulkhead
- Make sure the bracket is mounted with the slotted holes in the correct vertical direction.
- Keep 50 mm of free space above the bracket to provide sufficient ventilation for this unit.
- Slide the CM into the cabinet or bulkhead enclosure by making use of the hinges and screw/tighten the 2 bolts at the back to secure the unit.
- Connect the Ground stud to a suitable safety ground.

INSTALLATION - CORE MODULE

NETWORK CONNECTIONS TO THE DIFFERENT MODULES AND FRM'S ARE MADE ON THE BOTTOM SIDE OF THE UNIT (RJ45 FEMALE-FEMALE).



Install delivered ferrite cores on all Network Cabling close to the Core Module side.

Instruction video; *installing ferrite cores*

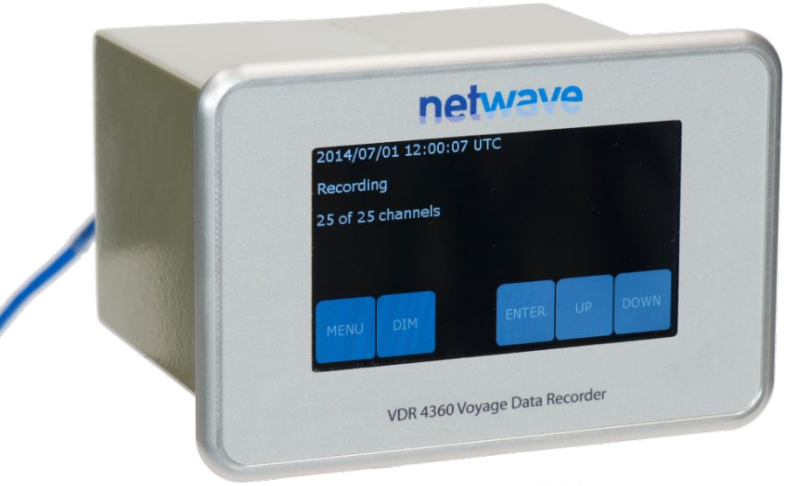
INSTALLATION - CORE MODULE EXAMPLES

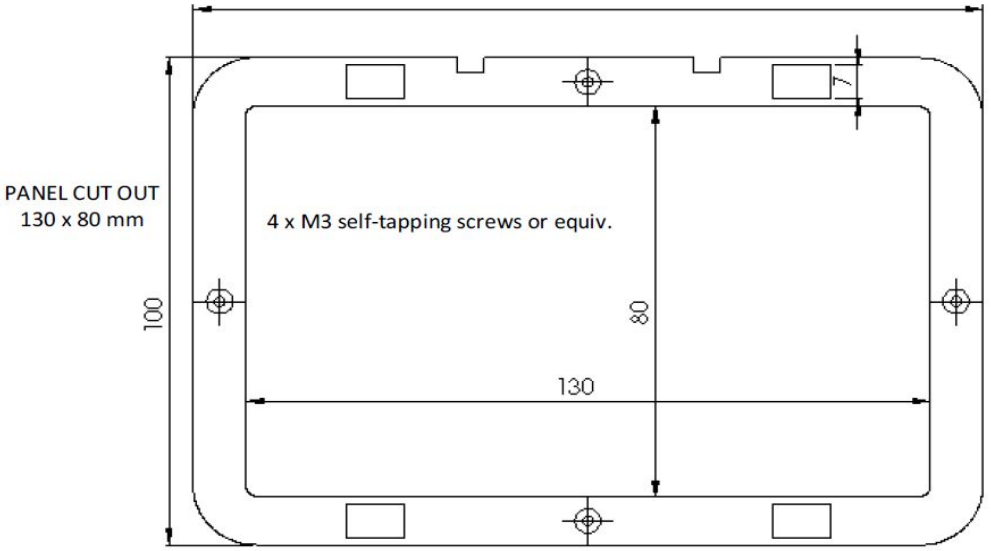
COMPONENTS – BCU (BRIDGE CONTROL UNIT) NW6010

The Bridge Control Unit (BCU) is the operating panel of the VDR and serves both as an interface for serial/NMEA data as well to display the operational status and provide user functionality like, but not limited to, operational performance tests.

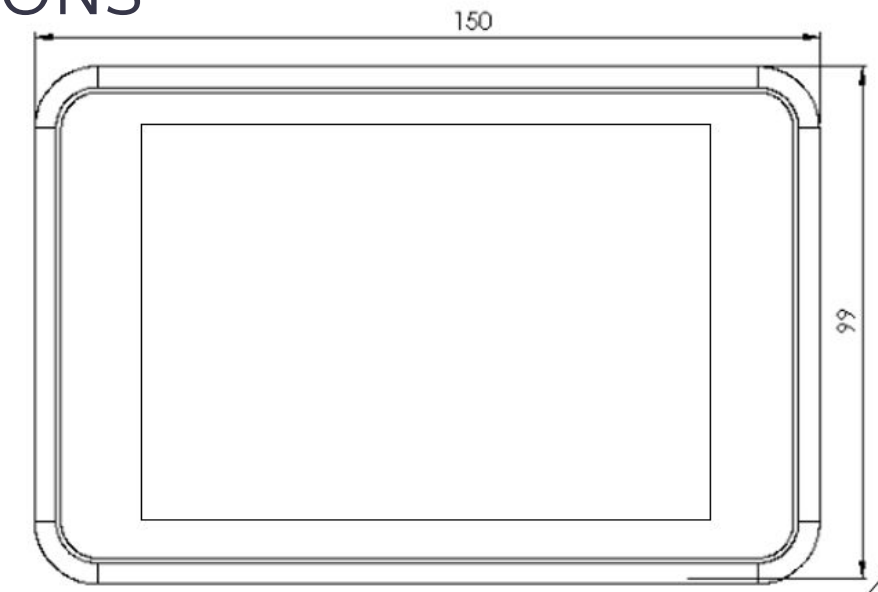
The BCU should be mounted in a protected environment at any convenient location visual on the bridge, taking account the compass safe distance as indicated on the unit.

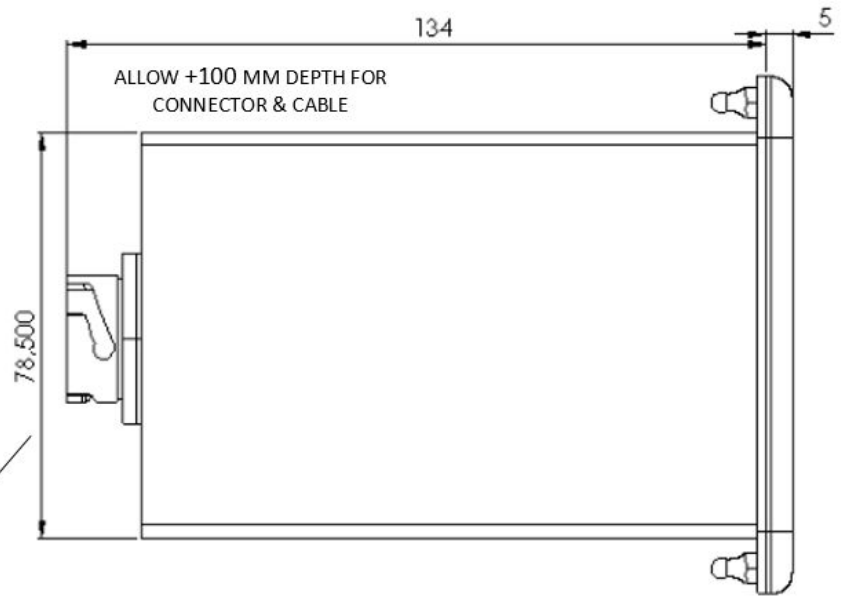
BCU



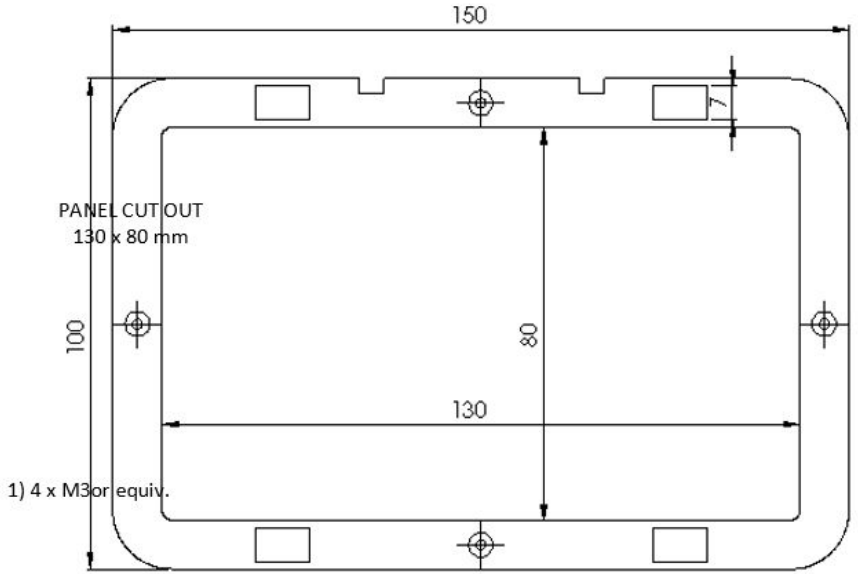


BCU DIMENSIONS



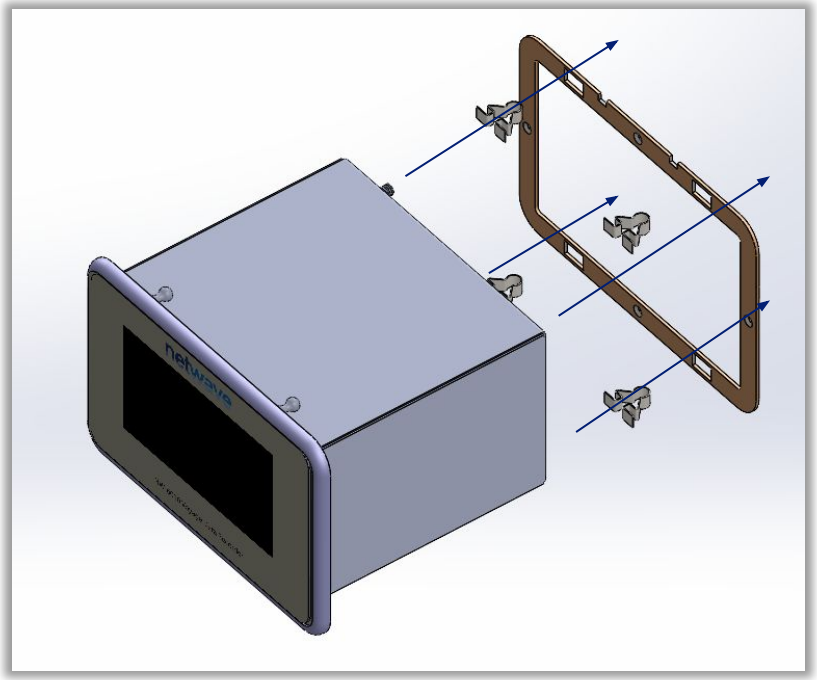


CONNECTS TO CFM 1.3



Weight	1,8 kg
Color	Alloy grey
IP rating	IP20

INSTALLATION

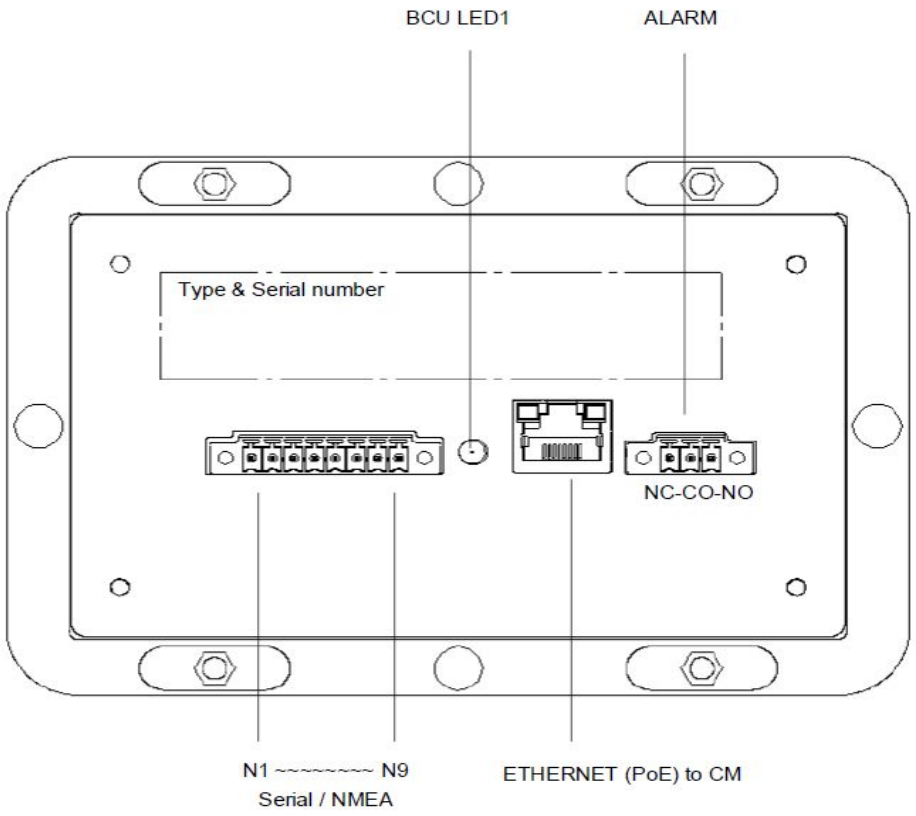


Install the BCU on a place where it always can be watched and operated!

Never install a BCU in the radio room or behind curtains of the chart area.

Best place would be inside the conning console.

BCU - CONNECTIONS ON BACKSIDE

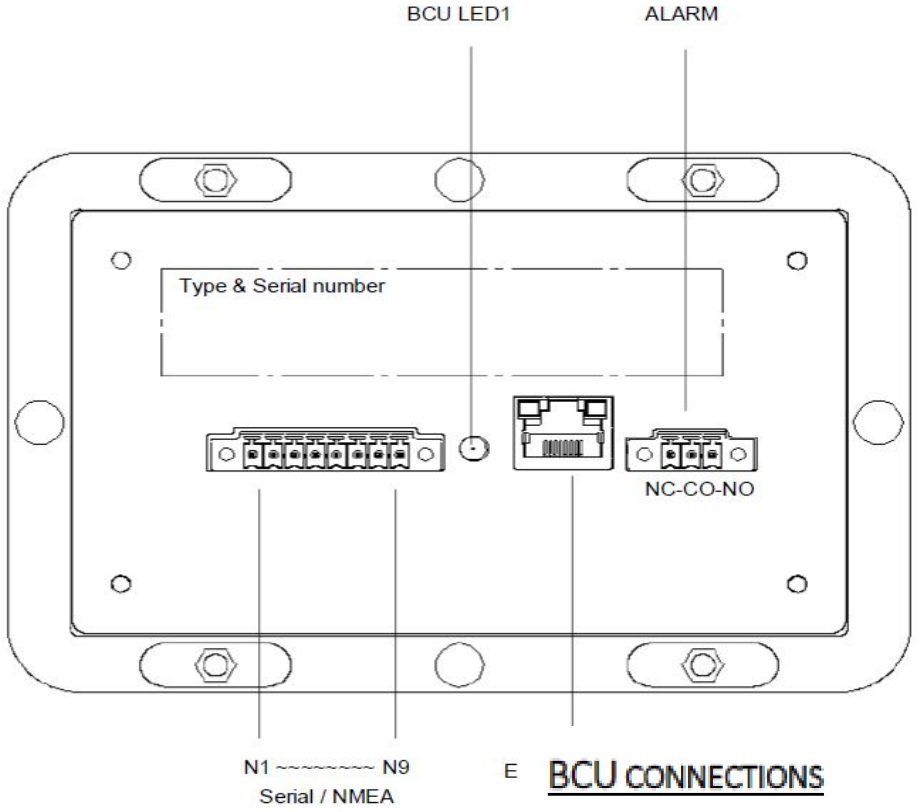


IEC 61162-1/2 series serial ports (3 of) speeds must be set during commissioning time.
NMEA ports can be used as input or output ports (BAM)
Inputs are typically used for GPS, AIS, etc.
Baud rates up to 38k4 supported for all ports.

BCU – NMEA CONNECTIONS

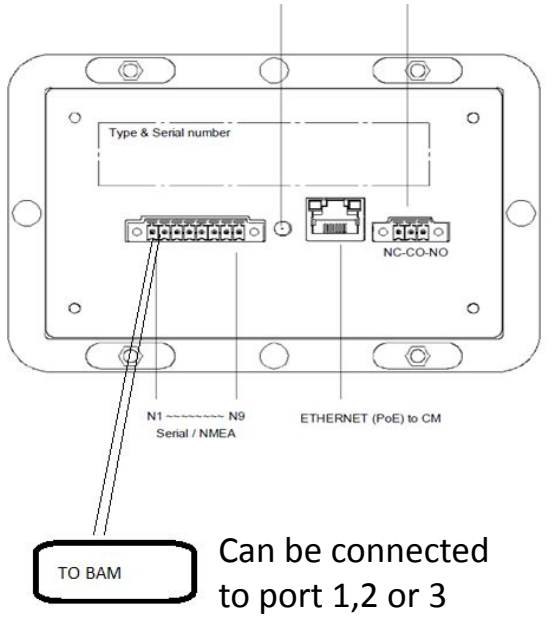
May be convienent in order to make short connections to AIS, GPS etc

Baudrate from 4800-38400 bps



Input Connector Data rate

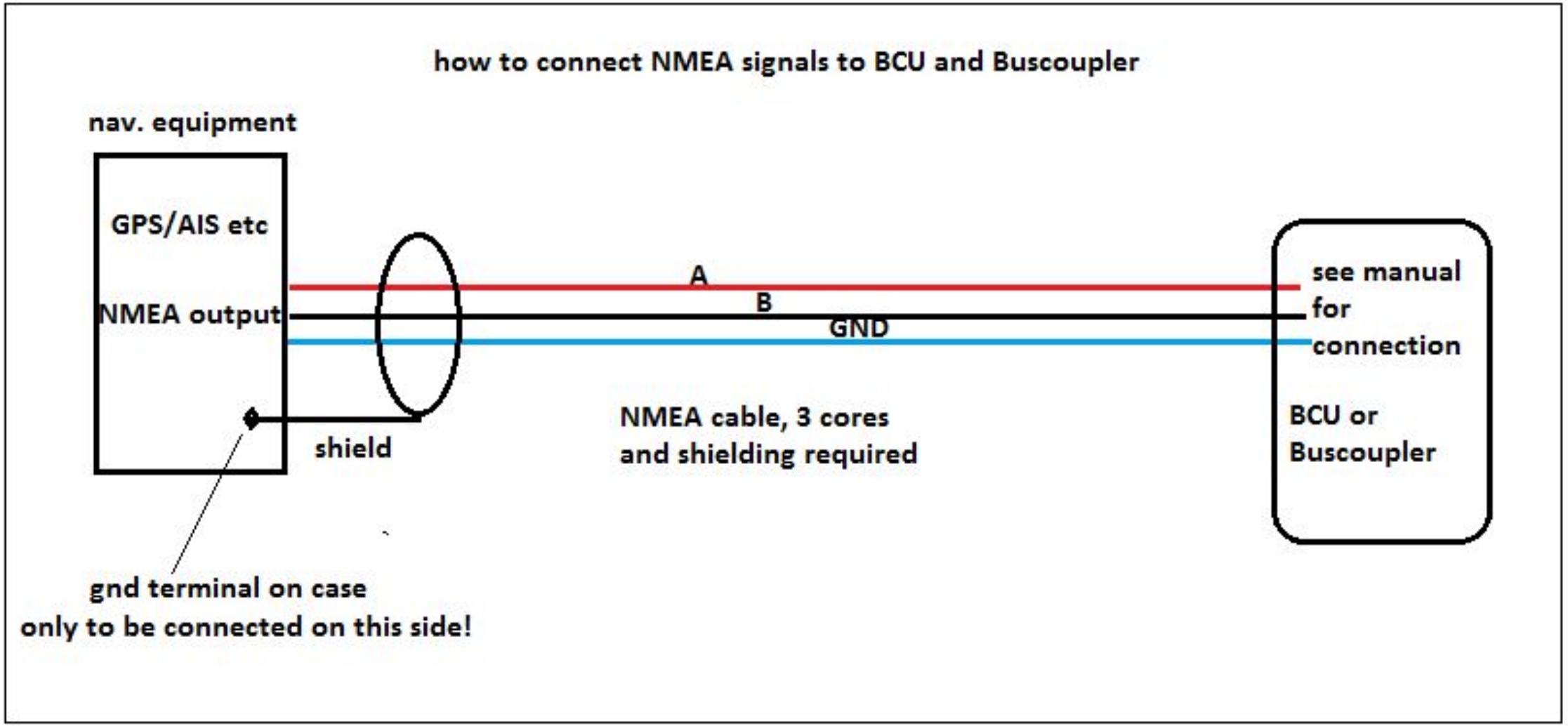
N1 NMEA channel 1 A
N2 NMEA channel 1 B
N3 NMEA channel 1 GND
N4 NMEA channel 2 A
N5 NMEA channel 2 B
N6 NMEA channel 2 GND
N7 NMEA channel 3 A
N8 NMEA channel 3 B
N9 NMEA channel 3 GND



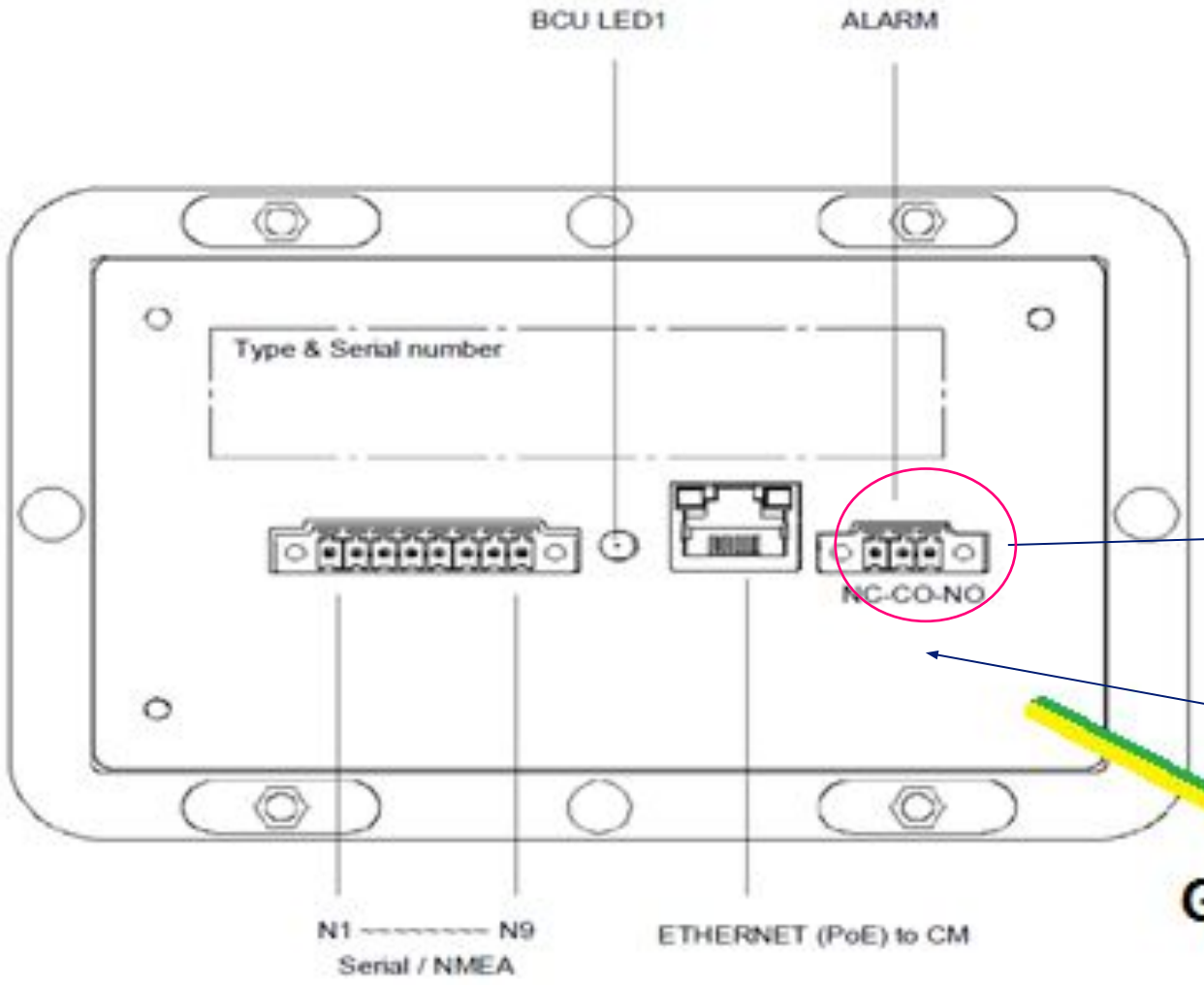
Can be connected to port 1,2 or 3

Channel 1			Channel 2			Channel 3			Eth Connection	Alarm Contact		
A	B	Signal GND	A	B	Signal GND	A	B	Signal GND		NC	C	NO

BCU – NMEA CONNECTIONS

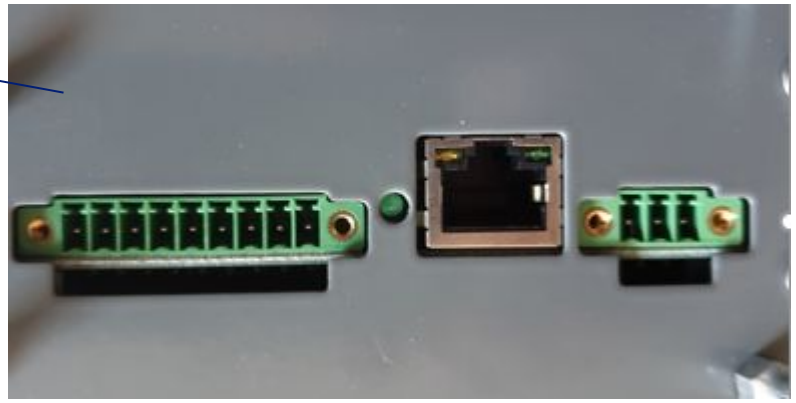


BCU – CENTRAL ALARM PANEL CONNECTION

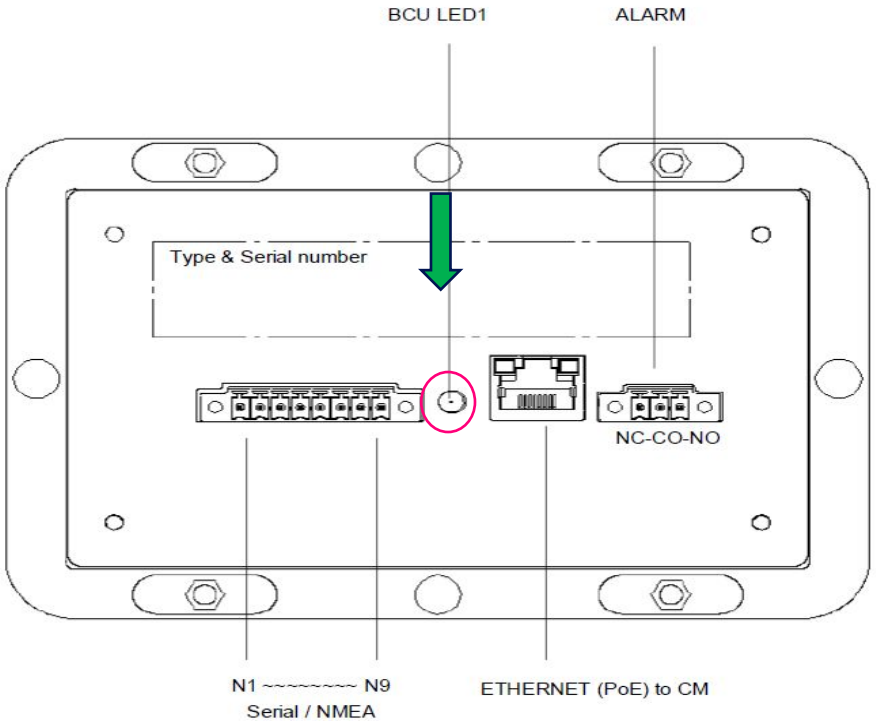


Central Alarm Panel (contacts) can be connected via BCU or Core Module

Ground!!



BCU – COMMUNICATION AND POWER



The BCU has 1 green LED to indicate that the power supplied to it is present, in other words, at least a PoE link is established to the core module.

In the event the LED is illuminated (steady, green), the video display on the unit must work.

The network port provides Link and Activity LED'S on the back of the unit with following meaning:

Link speed (Green LED); the LED is on when there is a link connection, otherwise, the LED is off

BCU – ERROR INDICATION

In the event the LED on the back side of the unit is On, the display is illuminated and showing text (buttons), but when no valid (UTC) time is presented on the display, the data-link to the core module is not functional at that time.

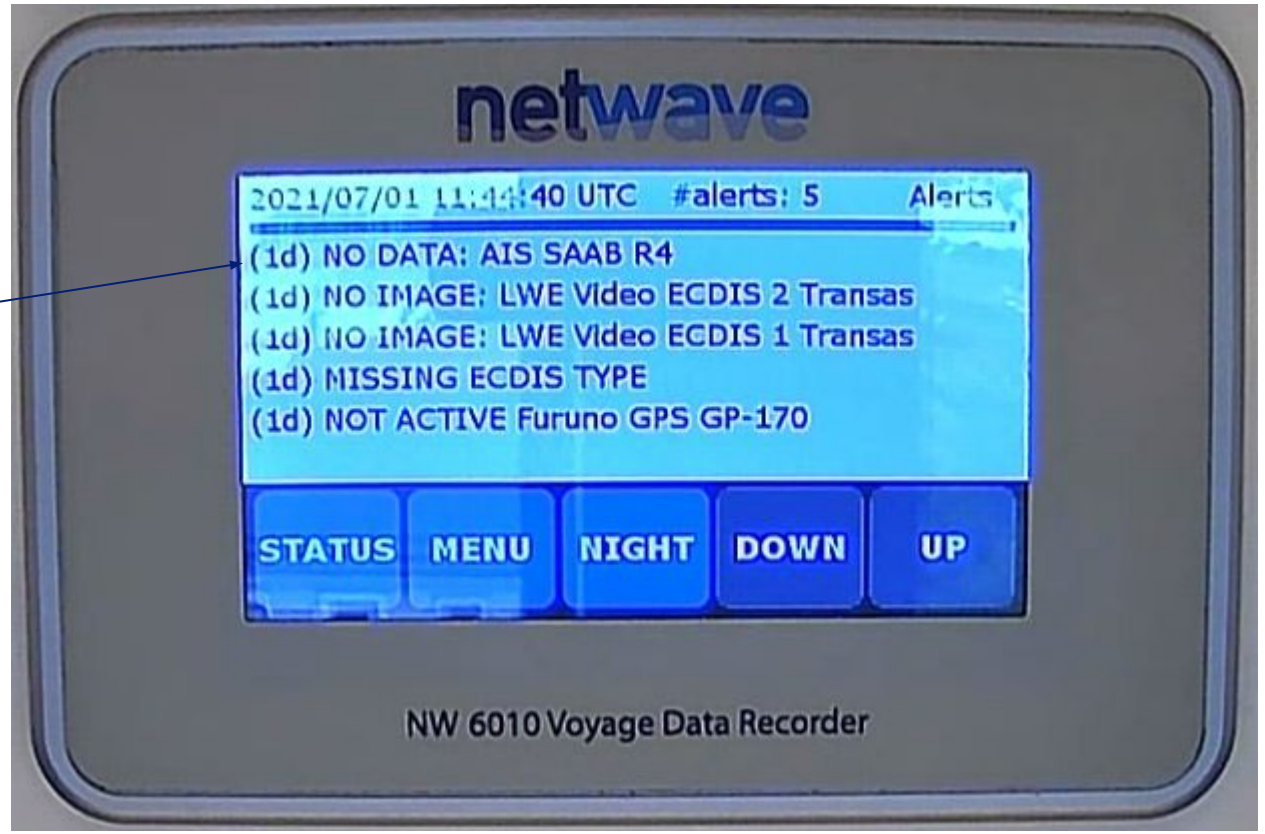
Click to add text

All other errors are presented on the display.

BCU – OPERATION

Any recording errors, being it data integrity, loss of sensor information or other circumstance as represented in the VDR Performance Standard will lead to a CAUTION/WARNING condition which stays active and displayed on the BCU. In case the CAUTION/WARNING is resolved the message will disappear.

(1d) = 1 day



BCU – UNITS OR DEVICES (WARNING)

In the event of network-absence or malfunction of any hardware device a Warning will be generated.

These Warnings relate to communications errors (HSS server), temperature overflow, absence of power, memory storage space, etc.

A Warning will occur if any of the microphones becomes dysfunctional. Every microphone is automatically tested every 12 hours.

BCU – OPERATIONAL PERFORMANCE TEST

- Can be conducted on the BCU
- Will test all incoming signals
- Must be carried out on board (by Cpt. crew) at least 10x (monthly) every Year
- Log file's will be created, can displayed after download and must be checked during APT

Video: *BCU instructional movie*

QUESTIONS?

COMPONENTS – NW6860 (FRM) FIXED HSS CAPSULE
NW6880 FFC TRON40 VDR FLOAT FREE CAPSULE

Requirement from 1 july 2014 (MSC333) is, to install 2 recording mediums

(full VDR only) on the vessel, one fixed and one float free (EPIRB)

containing each 48hr's of data

The NW6000 is connects with the NW6860-2000 HSS (Hardened Storage Server) and NW6880 TRON40 Float Free Capsule

Fixed; HSS

NW6860-2000

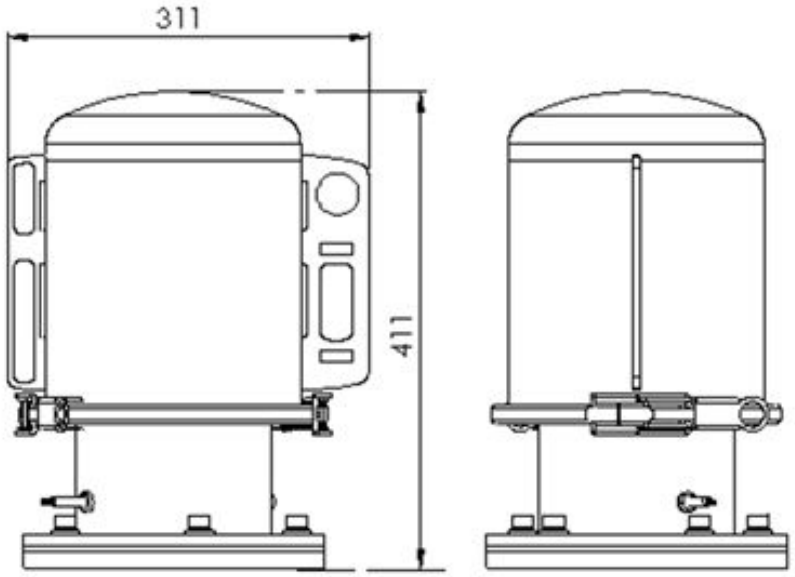
FFC; TRON40 VDR

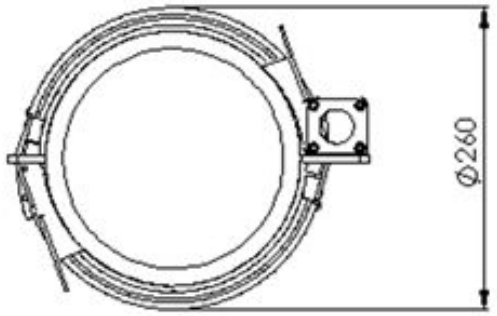
NW6880

COMPONENTS – NW-6860 (FRM) FIXED HSS CAPSULE

- Fully meets IMO Resolution A.861(20) and all applicable Safety Of Life At Sea (SOLAS) Regulations.
- Fully compliant to the IEC 61996-1:2013 Ship borne Voyage Data Recorder
- Performance Requirements and IEC60945, Maritime navigation and Radio communication systems - General requirements
- Records a minimum of 48 hours of voyage data
- Single wire Power and high speed (100BASE-TX) Ethernet communications.
- Reliable solid-state recording (2+ years data retention un-powered).
- Fitted with an acoustic underwater location beacon (PT9-90) operating in the frequency band of 25 kHz to 50 kHz with a battery life of at least 90 days, which meets SAE AS 8045A.
- Tamper-resistant capsule design

NW-6860 DIMENSIONS



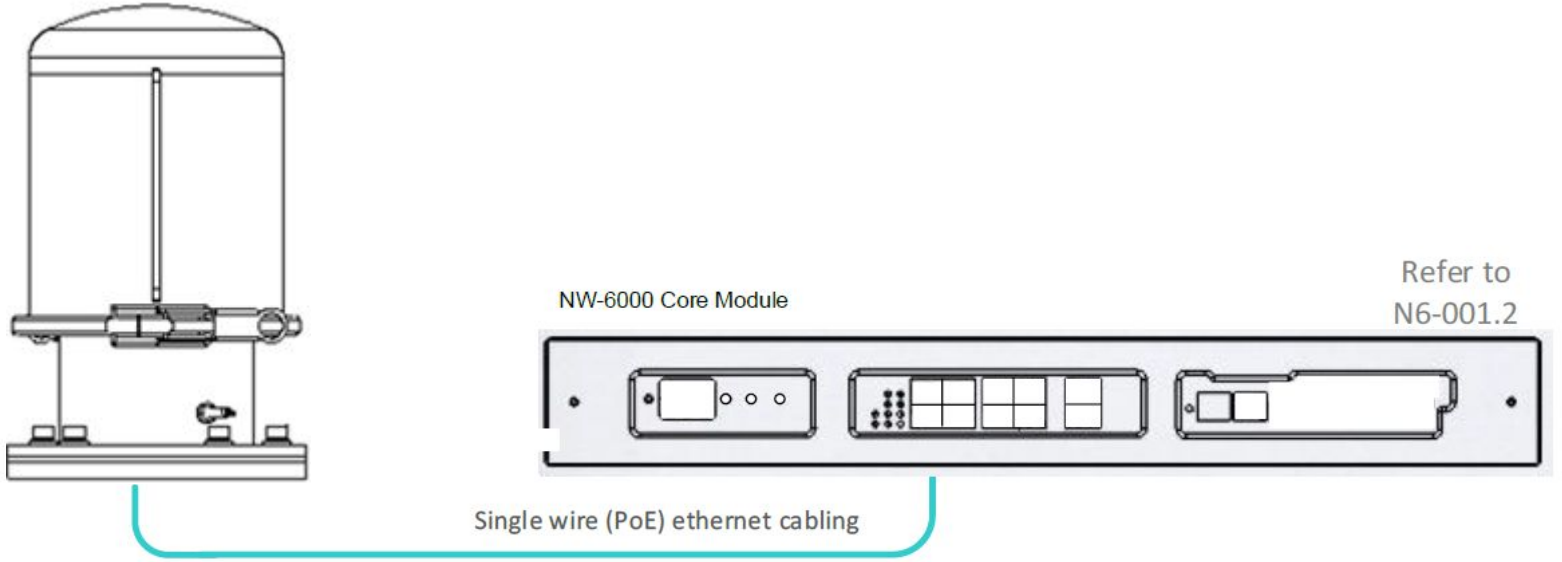


Weight	27,5 kg
Color	bright orange
IP rating	IP68K

Mounting Plate included for retrofit or welding

Mild steel or Aluminium welding plate
Refer to drawing N6-1.3.1

COMPONENTS – NW6860 FIXED CAPSULE MEMORY CAPACITY 64GB

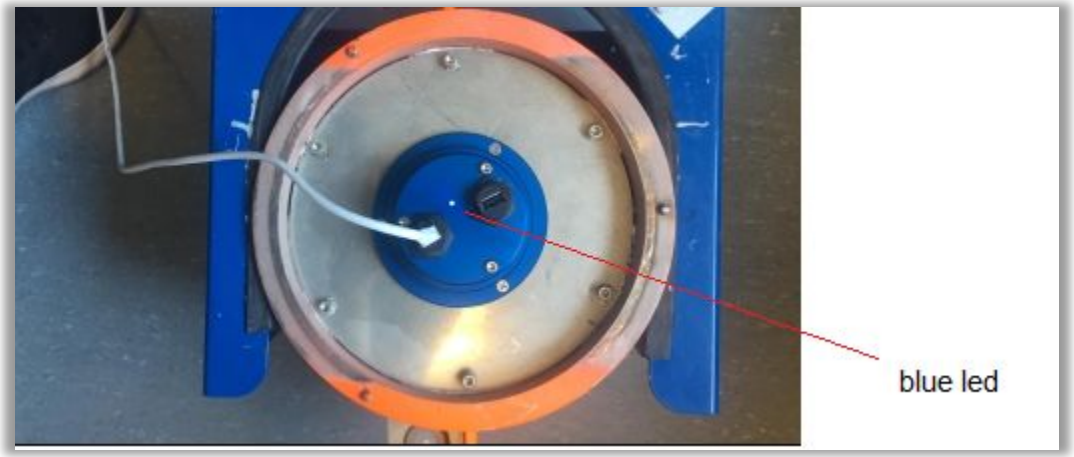


The capsule shall be positioned clear of rigging and other potential obstructions **and as near to the centerline of the ship as practically possible**

This unit has 1 x 100BASE-TX PoE port, receiving 802.3af compliant PoE @48V and fully relies on the Ethernet PoE supplied from the Core Module. The total power budget for the capsule is 2.5 Watts

HSS is provided with an RJ45 connector in order to connect the Poe Cable, not included, **cable can be ordered, contact sales department**

COMPONENTS – INDICATORS



When in unassembled state (and viewed from the bottom of the capsule part) a blue LED is available to determine link and activity.

Led on- power (start up)

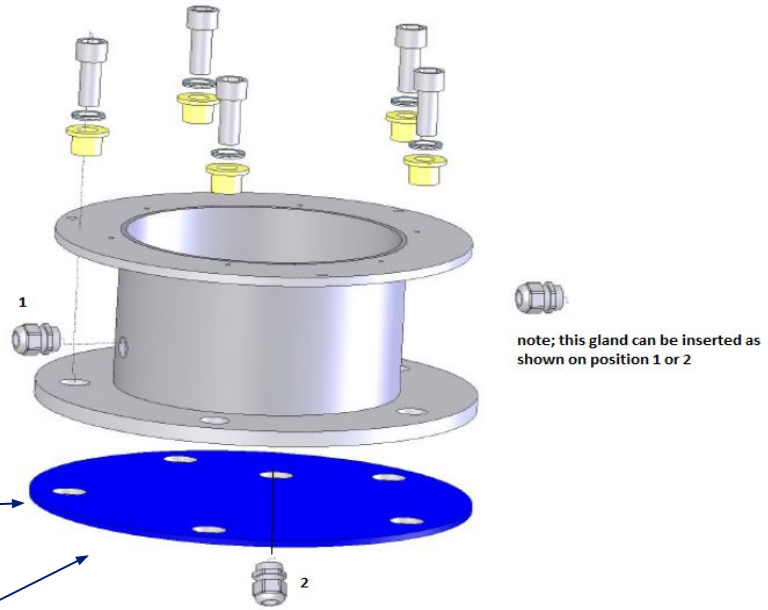
Led should go off after few seconds and start blinking when the recording is started.

Note: If the LED remains on, the memory, based in the orange part, is <u>not</u> found.

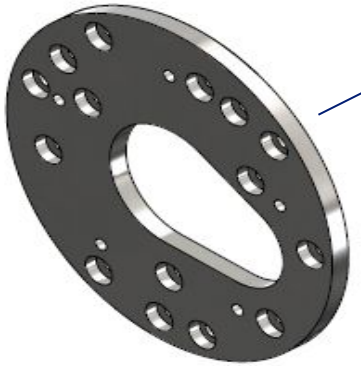
<u>In this case the capsule needs to be replaced!!</u>

Video: *led indication FRM*

INSTALLATION – DECKMOUNT ASSEMBLY



Rubber gland



Mounting plate

Cable through bottom

Cable through side,and goose neck

- Choose the right position on the monkey deck
- Weld or screw the mounting plate onto the deck

Note: existing capsules can be easily exchanged with the delivered plate

- Paint the plate to avoid corrosion
- Fit the deckmount: insert the rubber gland between mounting plate and deckmount.
- Cable can be installed via side or bottom (drill hole through deck), fill hole with delivered Sikaflex kit.

INSTALLATION – CABLING

Cable through bottom

Cable through side,and goose neck

USE ONLY APPROVED CAT7 CABLING & CONNECTORS
ORDER VIA SALES@SEASOFSOLUTIONS.COM

Measure made network cabling with a good instrument.

Example;FlukeCIQ-100

Use shielded Maritime Approved CAT7 cabling

Video: *test RJ45 connections*

Video: *installing connector*

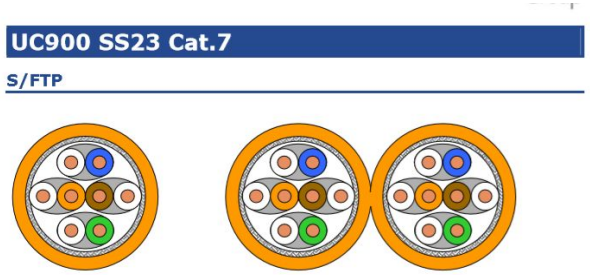
INSTALLATION – CABLING

Jokari 132 mm Wire Stripper, 8mm → 28mm

RS-stocknr.: **344-3797** | Fabrikantnummer: **10270** | Fabrikant: Jokari

Maritime Approved CAT7 cable

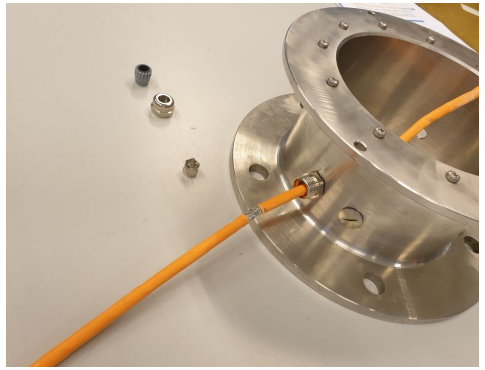
[Lloyd's Certificate UC900-SS23-Cat.7]

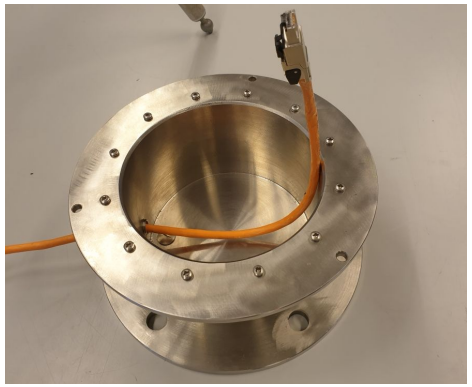


Cable through bottom

Cable through side, and goose neck

WIRE STRIPPER





Video: [installing cable FRM]

INSTALLATION – ULB PT9 NINETY

The HSS has an externally mounted underwater location beacon (ULB) with an activation sensor to avoid inadvertent activation (90 days)due to spray/rain/hosing off.

The HSS (memory module) protective capsule is painted a highly visible fluorescent orange with the required text: VOYAGE DATA RECORDER, DO NOT OPEN and REPORT TO AUTHORITIES USE PT9 NINETY ONLY!

NOTE SERIAL NR AND EXPIRY DATES IN INSTALLATION AND APT REPORTS, PHOTOGRAPH SHOULD BE TAKEN

PT9 NINETY IS AUTHORISED BEACON ONLY!

BATTERY EXCHANGE – EVERY 3 YEARS

BEACON REPLACEMENT– EVERY 6 YEARS

MAINTENANCE – ULB NW4860-695

The ULB battery should be replaced after 3 years.

Battery kit NW4860-693 should be ordered and replacement instructions followed.

The beacon should be tested every year during APT.

Manual: *Netwave PT9 NINETY Manual*

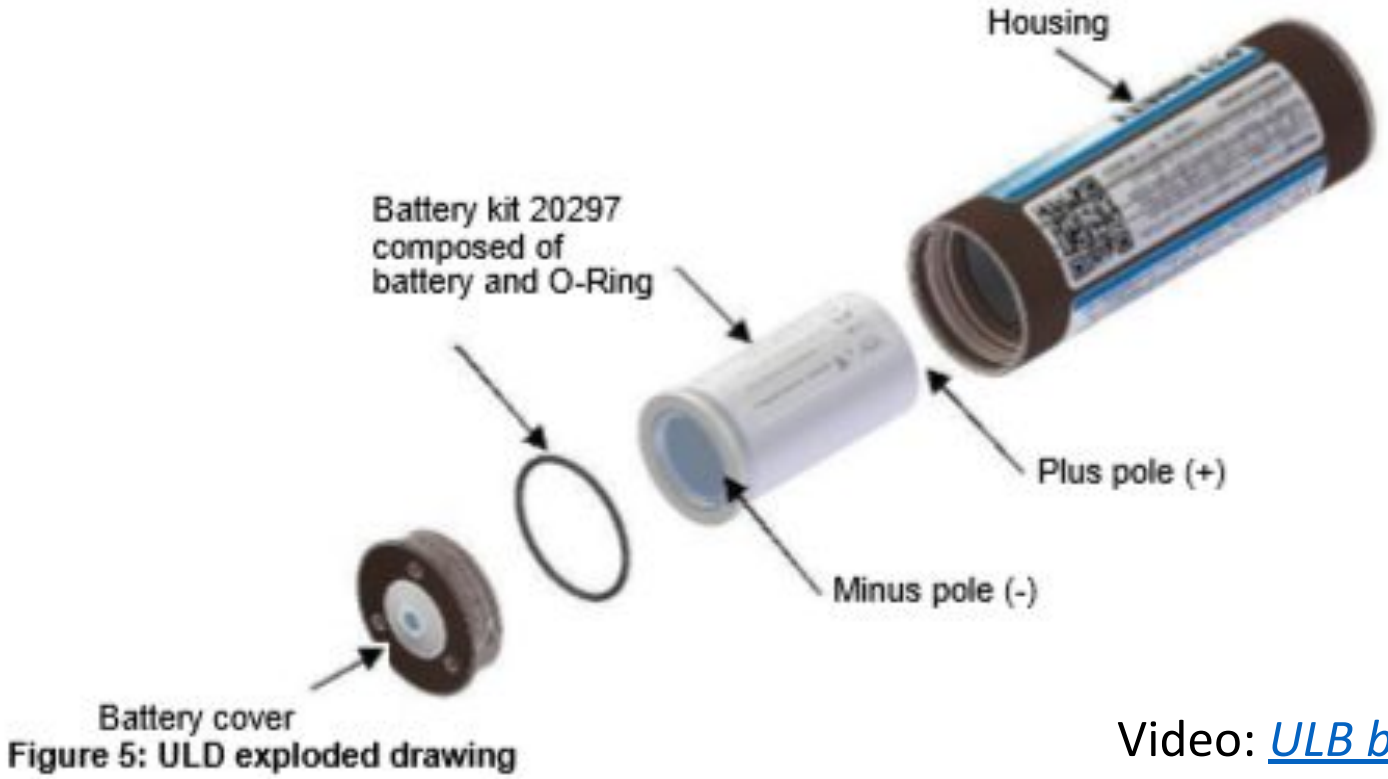
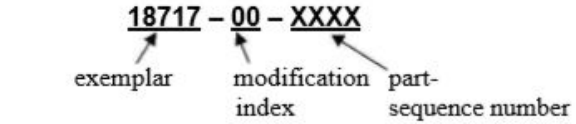


Figure 5: ULD exploded drawing



Type plate:

Video: *ULB battery replacement*

PROCEDURE – ULB NW4860-695

- Take the ULB from the capsule
- Replace the battery with the battery tool NW4860-594
- Place the new expiry sticker on the label
- Put the new expiry date in the APT report
- Test the beacon and mention test results in the report
- Provide a photo with your data content to be send

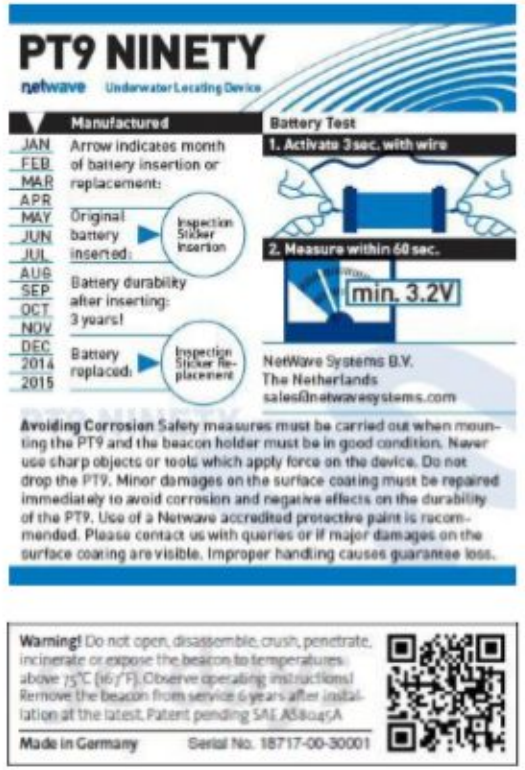
NW4860-594 battery replacement tool

18717 – 00 – XXXX

exemplar — modification index — part-sequence number

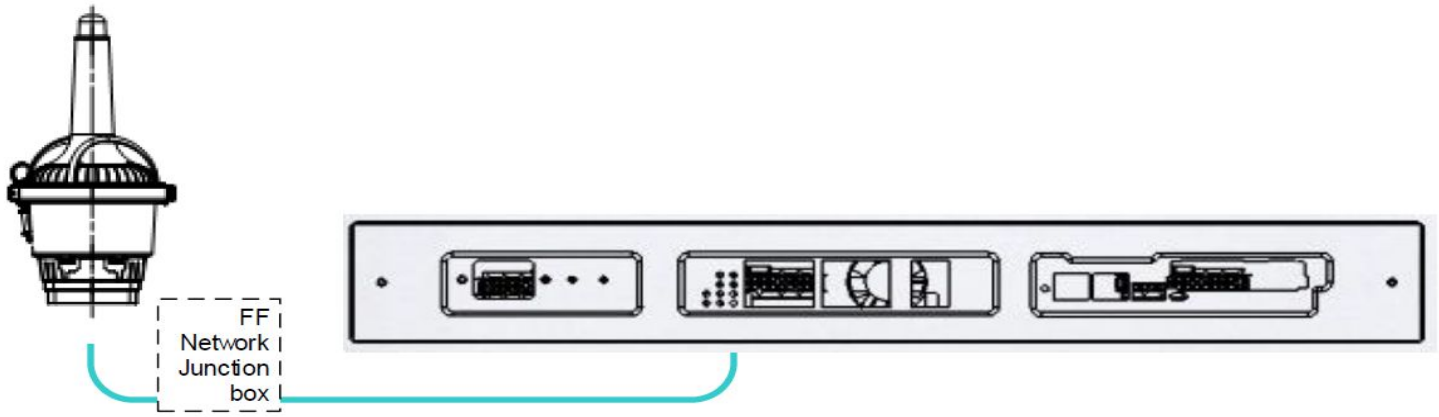
Type plate:

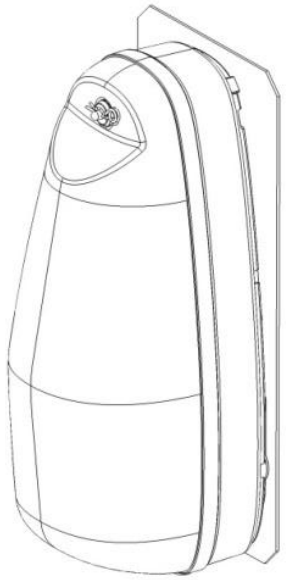
Herstellungsdatum Monat/Jahr markiert →



QUESTIONS?

COMPONENTS –NW6880 FRM FLOAT FREE CAPSULE JOTRON TRON 40

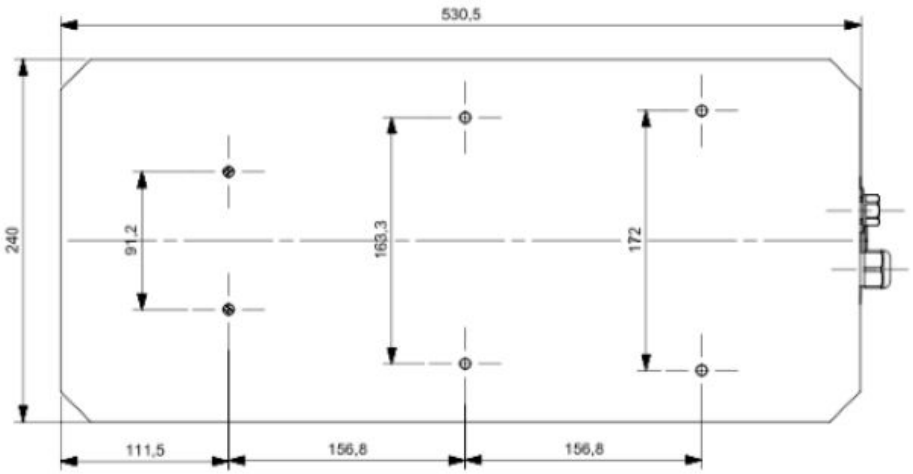


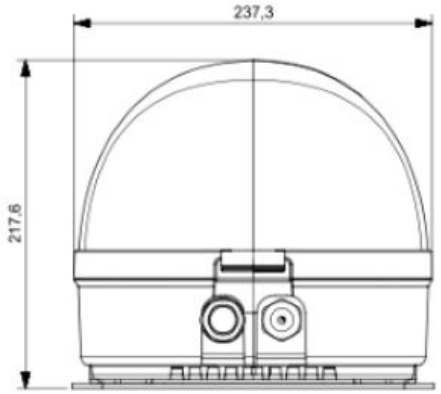


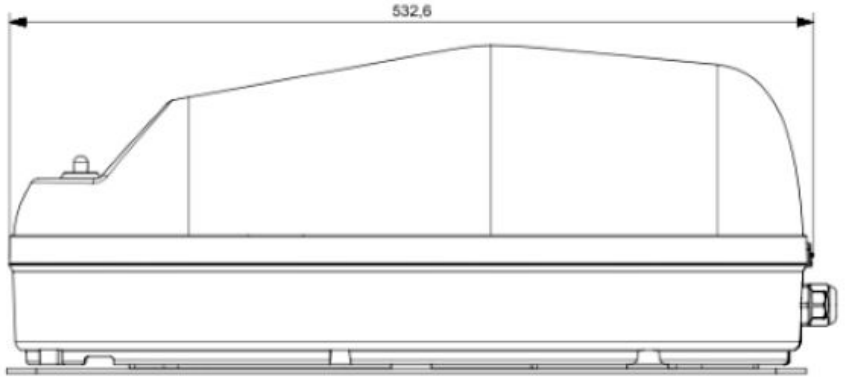
Bracket MKI <feb 2018

Bracket MKII >feb 2018

DIMENSIONS







COMPONENTS –NW6880 FRM FLOAT FREE CAPSULE JOTRON TRON 40

The location of automatically activated EPIRBs should ideally be sited in a clear location on a ship, for example on the wing of the bridge or on the “monkey island” above the bridge, because it is critical that you choose a position where the released EPIRB will not get trapped by overhangs, rigging, antennas and so forth, should the vessel ever sink**.**

Mandatory!!

Bracket MKII

INSTALLATION –NW6880 FRM FLOAT FREE CAPSULE JOTRON TRON 40

- It is not recommended to locate the TRON 40VDR on the compass deck because of high risk of exposure to strong RF signals.

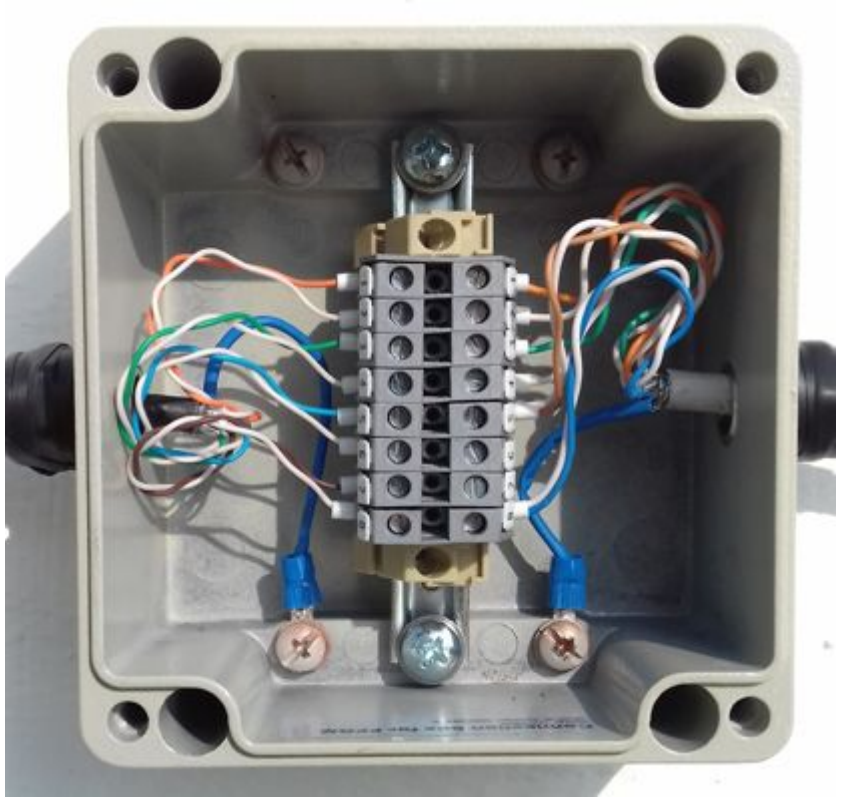
- Find a (new) mounting location as far away as possible from any radar interference and/or other antennas conform Jotron specifications (see Jotron installation manual). Make sure the TRON 40VDR is not directly in line of sight of any radar, and at least 3 meters away from any antenna.

- Stronger antenna signals (than the TRON 40VDR is approved for) can affect the VDR storage performance. The TRON 40VDR is approved for 100 V/m in the VHF frequency range 156 - 165 MHz. In other areas of the frequency range 150 KHz - 2 GHz the requirement is 10 V/m. A standard VHF antenna will have 10 V/m at distance of 3 meters in the antenna lobe. Therefore, the absolute minimum distance to a VHF antenna, at the same height needs to be no less than 3 meters. It is strongly recommended to have a much larger distance to other transmitting antennas.

- RF signals from transmitting antennas are likely to be weaker at low levels. Therefore, reduction of interference may be achieved by installing the TRON 40VDR lower than all transmitting antennas.

INSTALLATION – CABLING

USE ONLY APPROVED CAT7 CABLING & CONNECTORS
ORDER VIA SALES@SEASOFSOLUTIONS.COM

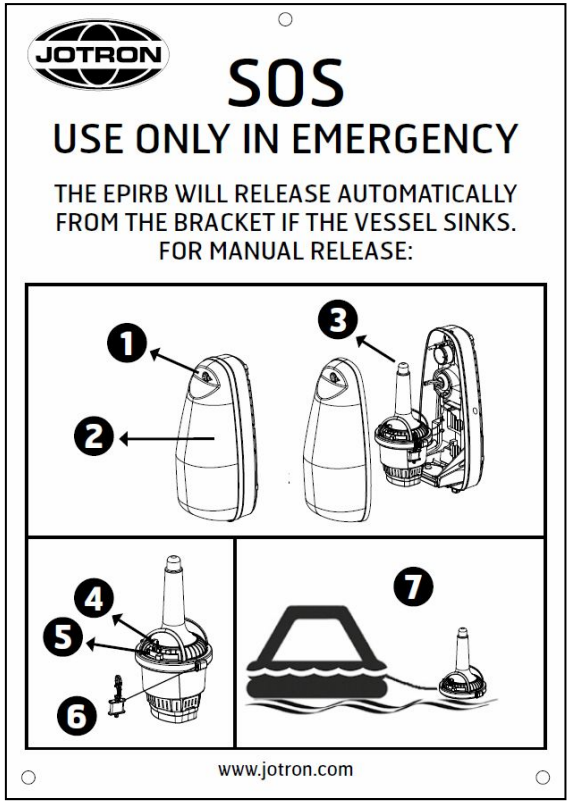


INSTALLATION – HARDWARE

MOUNT THE TRON40 ON A STEEL PLATE AND INSTALL IT IN VERTICAL POSITION
READ BULLETIN TB01-2015

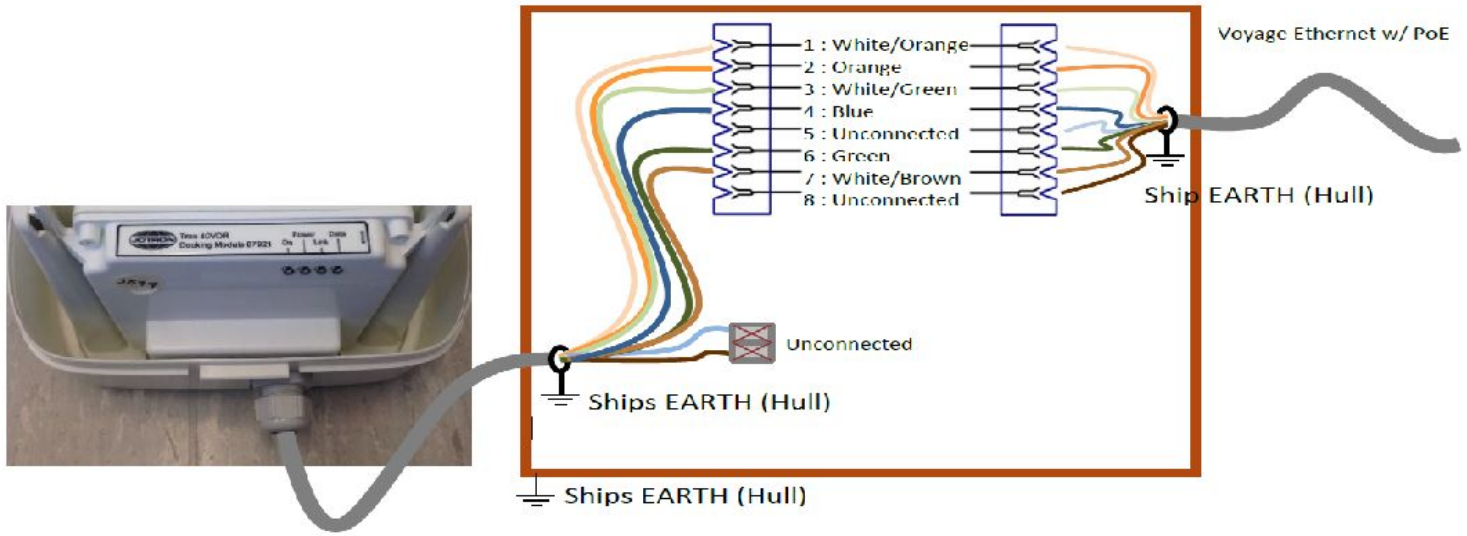
Install the delivered instrucion plate next to the bracket

Don’t install too close to the floor, this is correct!



Don’t forget to install this plate!! It’s mandatory

INSTALLATION – CONNECTIONS FOR MKI

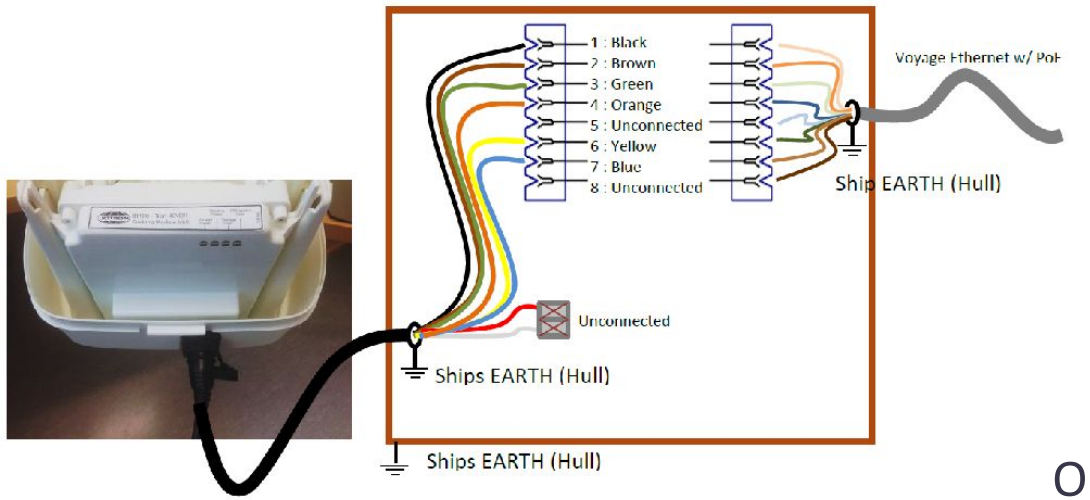


Cable connection

Tron 40VDR	Connection Pins	10/100 mixed DC & Data (mode A)	10/100 mixed DC & Data (mode B*)	VDR Computer (T568B color)
White/orange	**1**	Rx + / DC+	Rx +	White/orange
Orange	**2**	Rx - / DC +	Rx -	Orange
White/green	**3**	Tx + /DC -	Tx +	White/green
Blue	**4**	Unused	DC + 2)	Blue
White/Blue	Unconnected	Unused	DC + 2)	White/Blue
Green	**6**	Tx - / DC -	Tx -	Green
White/brown	**7**	Unused	DC - 3]	White/brown
Brown	Unconnected	Unused	DC - 3]	Brown
Shield	**Ship EARTH**			Shield
Unconnected				
White/blue	Unconnected			
Brown	Unconnected			

*) Note: Mode B is not wired according to standard; it uses only one wire from each pair.
2) In mode B it is recommended to connect Blue (DC-) and White/Blue (DC-) wires from VDR computer together to minimize resistant loss in the wires.
3) In mode B it is recommended to connect Brown (DC+) and White/Brown (DC +) wires from VDR computer together to minimize resistant loss in the wires.

INSTALLATION – CONNECTIONS FOR MKII



OR:

Cable connection

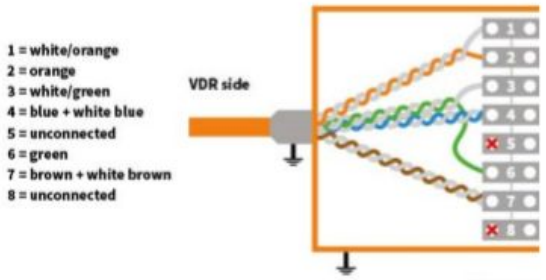
Tron 40VDR	Connection Pins	10/100 mixed DC & Data (mode A)	10/100 mixed DC & Data (mode B*)	VDR Computer (T568B color)
Black	**1**	Rx + / DC+	Rx +	White/orange
Brown	**2**	Rx - / DC +	Rx -	Orange
Green	**3**	Tx + /DC -	Tx +	White/green
Orange	**4**	Unused	DC + [2]	Blue
		Unused	DC + [2]	White/Blue
Yellow	**6**	Tx - / DC -	Tx -	Green
Blue	**7**	Unused	DC – [3]	White/brown
		Unused	DC – [3]	Brown
Shield	**Ship EARTH**			Shield
Unconnected				
Red	Unconnected			
White	Unconnected			

Cable type 1 Standard T-568B (of TRON 40 VDR MKII)
Serial numbers docking module > 11203 (from October 2017)

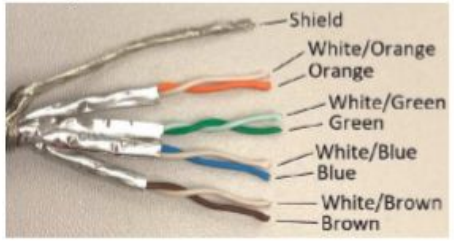
	VDR side	Connector pin	TRON 40VDR side	
Rx+	White/orange	1	White/orange	Rx+
Rx-	Orange	2	Orange	Rx-
Tx+	White/green	3	White/green	Tx+
Tx-	Green	4	Green	Tx-
N/A	Not connected	5	White/blue	Connected but not used
DC+	**White/blue + Blue**	6	White/brown	DC+
DC-	**White/brown + Brown**	7	Blue	DC-
N/A	Not connected	8	Brown	Connected but not used

INSTALLATION – CONNECTIONS

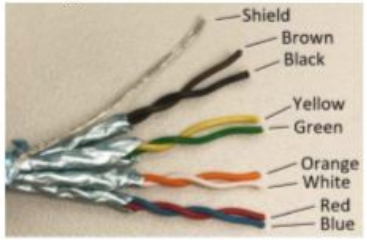
Use ferrules to make a solid and good electrical connection, ground the cable on the gland.



Cable type 1 TRON 40VDR:



Cable type 2 TRON 40VDR:

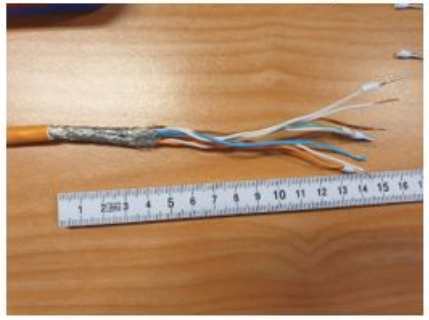


Read bulletin:

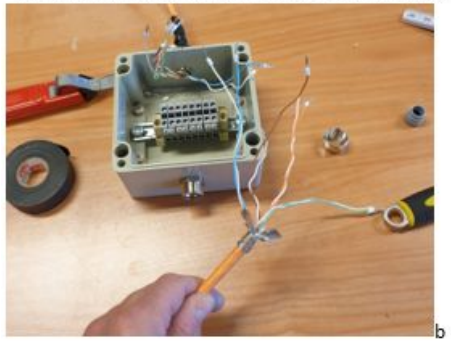
[Service-bulletin-SB2016-10-009-Relocation-and-connections-TRON-40VDR-MKII]

Video: [Junction Box Connection]

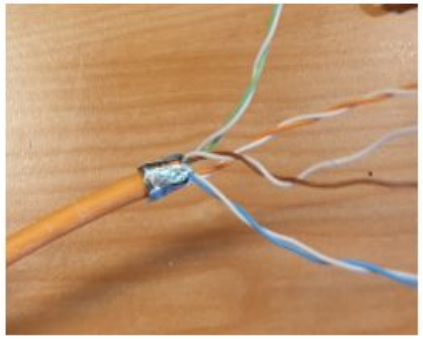
It is important that the grounding shields of the cables (of TRON 40VDR and VDR) are in contact with the cable glands of the junction box. Therefore, firstly strip off 10 cm of the cables to create 4 cm of grounding shield. Separate the grounding shields from the cables. Do not remove the grounding shields.



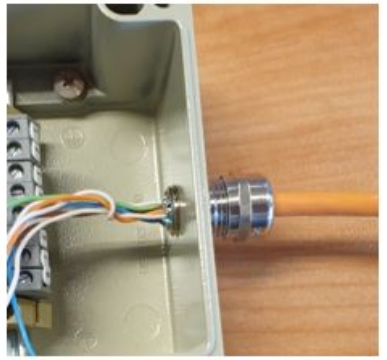
Twist the grounding wires and wrap it over the cable. Bend the foil over the twisted grounding and insert it in the gland. In this way the grounding shields are connected to the metal cable glands.

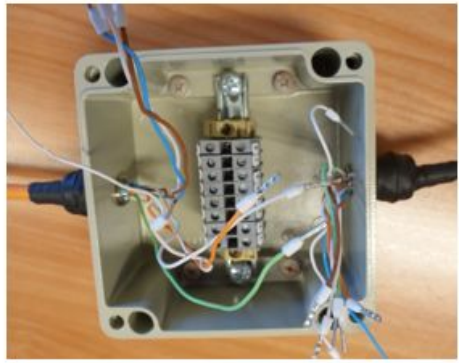


b



To ensure water tightness make sure the cable glands are tightened well and the provided vulcanizing tape is placed around the 2 cable glands as shown on picture below.

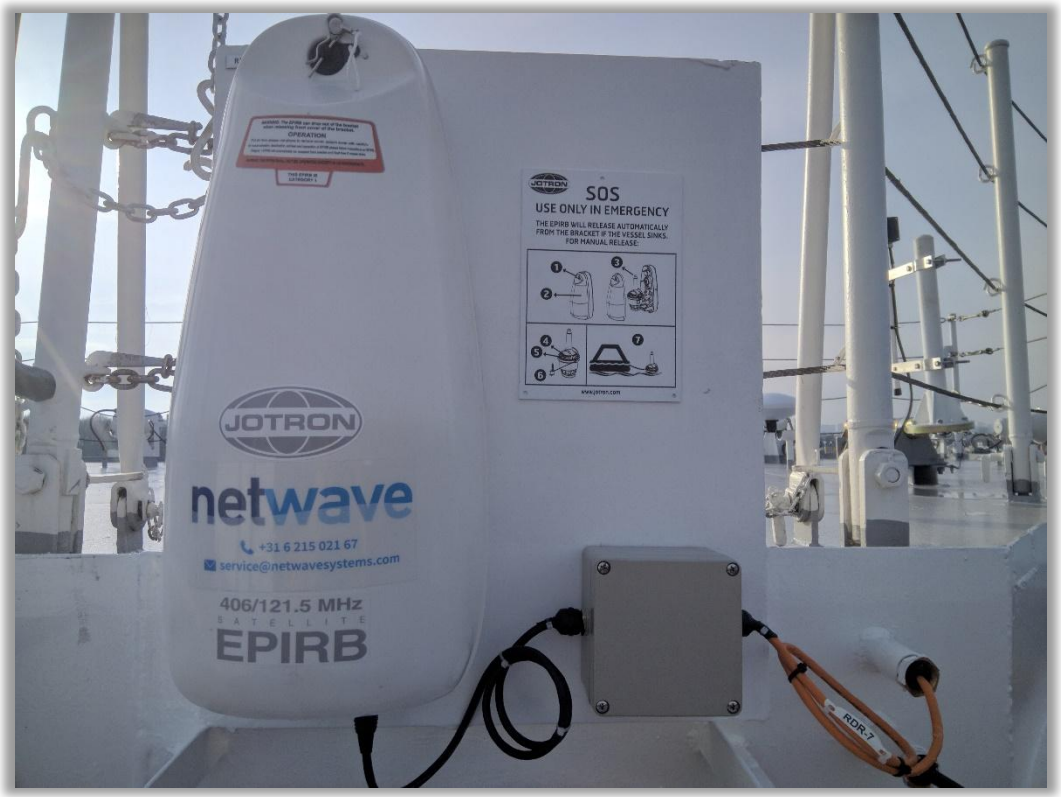




INSTALLATION – LOCATION

The location of automatically activated EPIRBs should ideally be sited in a clear location on a ship, for example on the wing of the bridge or on the “monkey island” above the bridge, because it is critical that you choose a position where the released EPIRB will not get trapped by overhangs, rigging, antennas and so forth, should the vessel ever sink**.**

Don’t install the bracket too low to the floor! Keep at least 0,5mtr distance.



LED INDICATION – BRACKET

Green LED's identification on the bracket explained:

Bracket MKI <feb 2018

LED	ON	OFF	Flashing
ON	Storage Module Power OK	Storage Module Power failure	
Power	Bracket Power OK	Bracket Power failure	
Link	100Mb/s	10 Mb/s	
Data	Connected, but No Data	No connection to VDR computer or Ethernet switch	Connected and data received/ transmitted *

** Shows only that there is communication between VDR computer and Docking Module, not that it's actually communication up to the VDR storage module. To further check this communication, use Terminal software and "Ping" command.*

Bracket MKII >feb 2018

Below is a description of the LED lights on the 83180 module:

LED:	Storage Power	Docking Power	Storage Com	VDR system Com
Description:	Indication on status of power to the storage module.	Indication of the Power internally in the Docking Module.	Indication of data communication between Docking module and Storage module	Indication of data communication between the Docking module and the on-board VDR (Voyage Data Recorder) computer
ON	Storage module Power OK	Docking module Power OK		
OFF	Storage module Power Failure	Docking module Power Failure	Storage module communication Failure	No connection to VDR computer or Ethernet switch
Flashing	Flashing 5-15 sec, active watchdog	Flashing 5-15 sec, active watchdog	Connected and data received/ transmitted to Storage module	Connected and data received/ transmitted to the VDR computer

Video: *LED indication TRON40*

QUESTIONS?

COMPONENTS – VHF INTERFACE NW6060

The audio-interface serves two combined functions;

1. As a VHF (line-in) interface for up to two VHF installations.

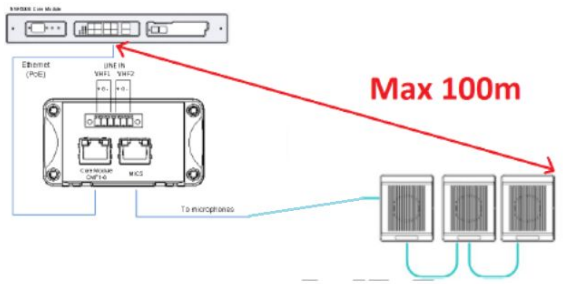
2. As a power converter for 3 digital microphones.(as installed <august 2020)

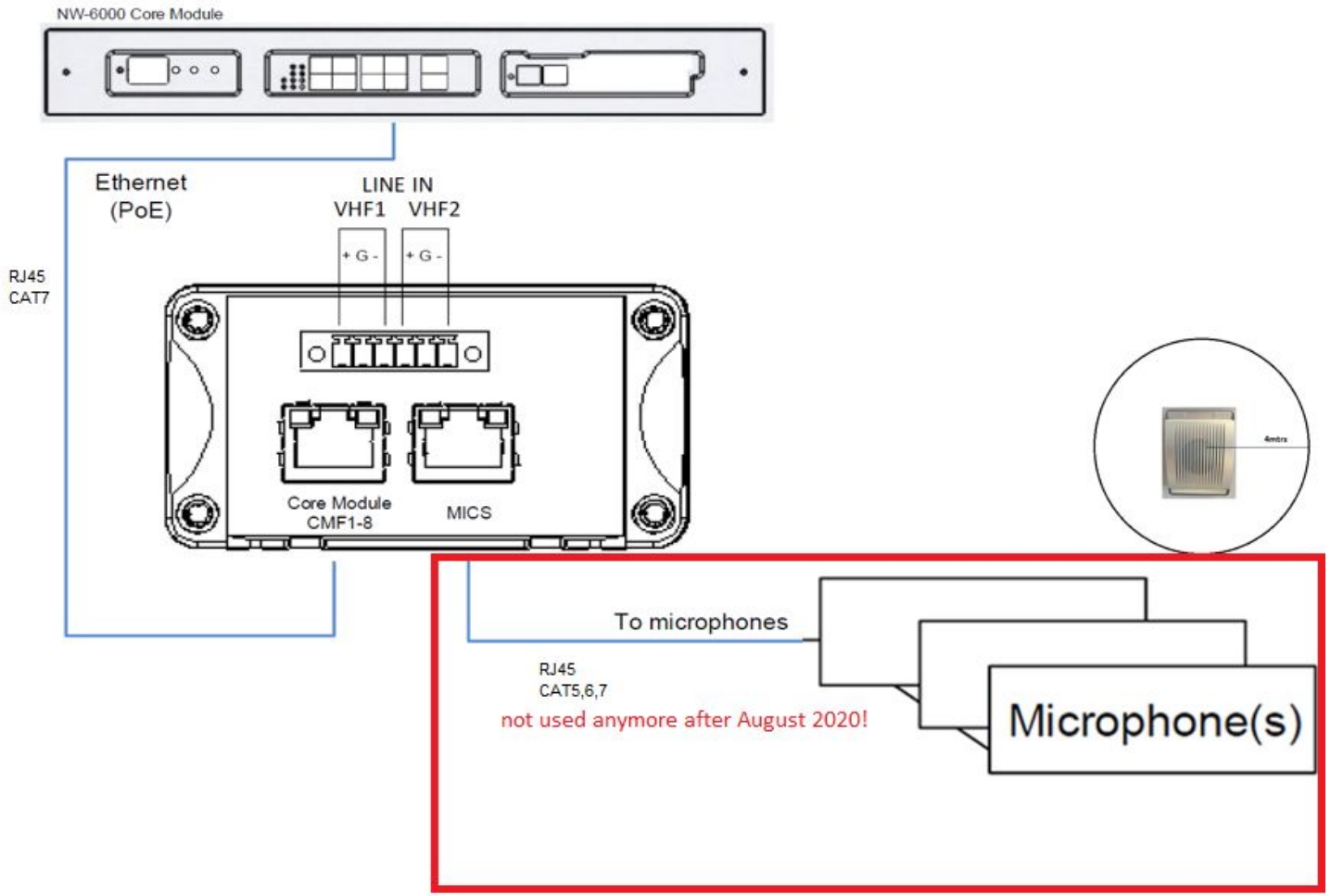
CONNECTIONS – VHF INTERFACE NW6060

MAX CABLE LENGTH

Using Cat5e / Cat6 or Cat7 for installation a maximum of 100m cable between the switch
of the connected equipment applies.

- From coremod to DAQ buscoupler maximum 100m.
- From coremod to Capsule, including junction box, maximum 100m.
- From coremod to end of a microphone chain, maximum 100m.





Digital mic's NW6020/6021 used < august 2020

Systems are still running in old s/w and playback s/w

CONNECTIONS – VHF INTERFACE NW6060 WITH OLD DIGITAL MIC'S <AUG2020

1. The NW-6060 VHF / Audio Interface is connected to any of the PoE ports on the Core Module Core Module (CMF 1-8) by means of an Ethernet cable.

2. The NW-6060 VHF / Audio Interface is connected to the first microphone within the daisy-chain of microphones

3. The NW-6060 VHF / Audio Interface is connected to the VHF equipment by means of the VHF1 & 2 (line level) ports as follows;

V1 VHF1 signal +

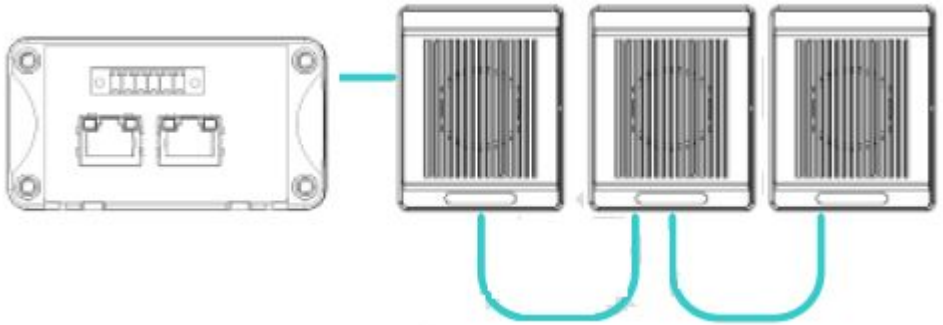
V2 VHF1 gnd

V3 VHF1 signal –

V4 VHF2 signal +

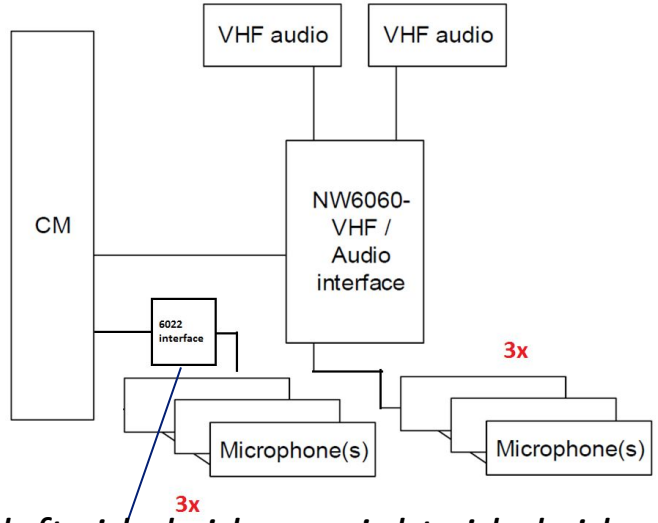
V5 VHF2 gnd

V6 VHF2 signal –

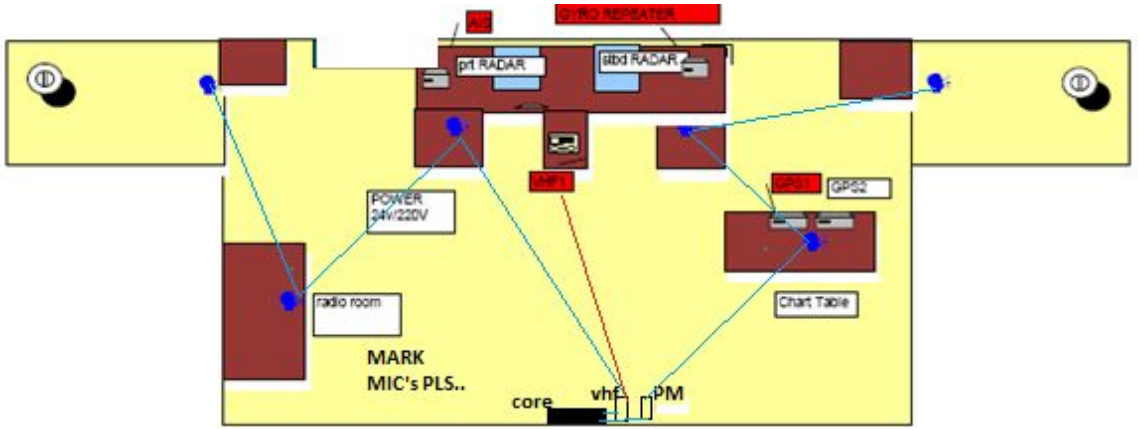


Digital mic's NW6020/6021 used < august 2020

COMPONENTS – POWER CONVERTER NW6022 <AUGUST2020



left side bridge *right side bridge*



Old style mic lay out (installed < august 2020)
with daisy chained mic's via LAN cable

The power converter (installed < august 2020)

was used as a power converter for 3 more additional digital microphones. Not applied/used anymore for new systems.

COMPONENTS – CONFIGURATION <AUGUST2020

The individual microphone and VHF channel's IP-addresses are set during commissioning time. Please refer to VDR Configuration old style.

See presentation 13. old style NW6000 Configuration and Playback 1.5.17 systems

COMPONENTS – NW 6020/6021 IN AND OUTDOOR MICROPHONES

AS INSTALLED < AUGUST 2020

The microphones are of a sea-water resistant, durably anodized type of aluminum and are of a single, universal type, may be used in both a protected and unprotected environment .

As installed < august 2020

Note: spare mic's still orderable.

The individual microphone and VHF channel's IP-addresses must be set during commissioning time. Please refer to VDR Configuration

COMPONENTS – NW 6020/6021 IN AND OUTDOOR MICROPHONES DIGITAL 'OLD STYLE' <AUGUST 2020

The microphone has a multi-color led built within the enclosure which is only visible and may be controlled during commissioning and (Operational Performance) Testing

Green (fixed)

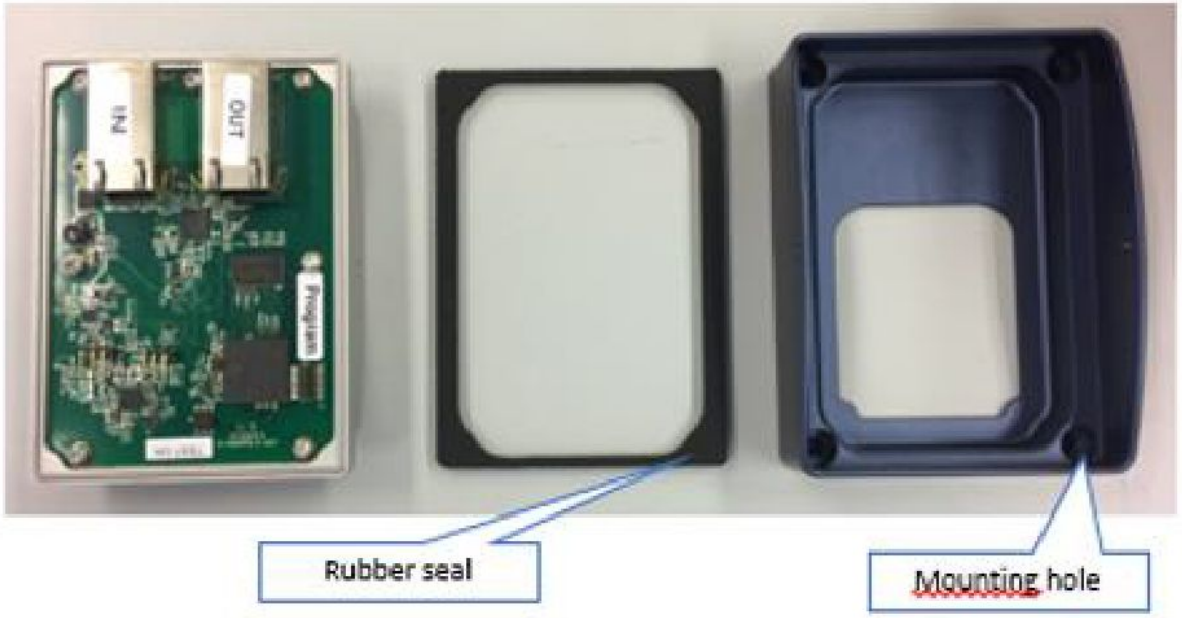
when there is a link connection but no audible sound is registered

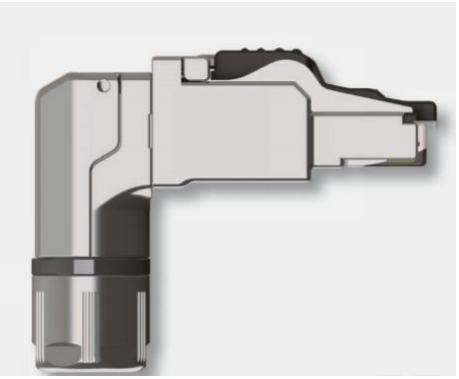
Blue (fixed)

During OPT test, buzzer will sound.

MOUNTING – NW 6020/6021 'DIGI' IN AND OUTDOOR MICROPHONES <AUGUST2020 OR AS REPLACEMENT PART

Remove the rubber gland which is covering up the mounting hole, mount the bracket.
remove the protected cover from the adhesive and fit inside the bracket.





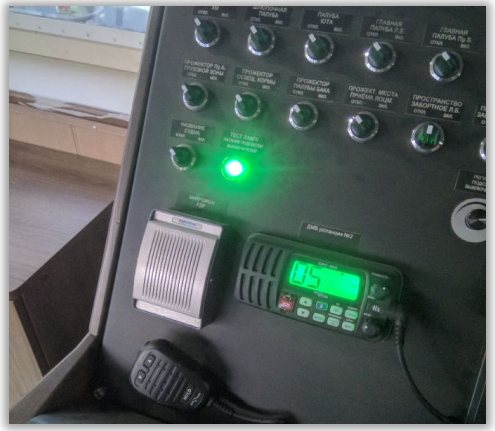
Angled RJ45 connector are delivered with mic's

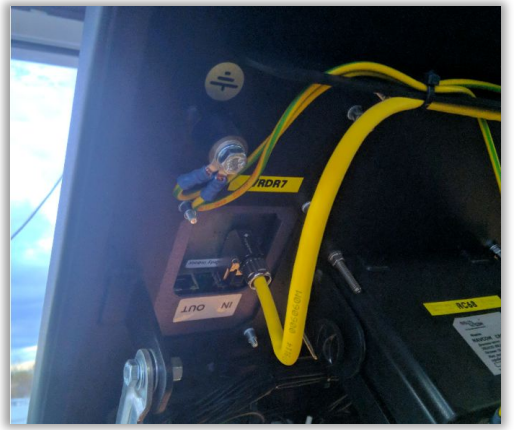
Video: *Housing, Mounting, Connection Digital Microphone NW 6020/6021*

MOUNTING – NW 6020/6021 IN AND OUTDOOR MICROPHONES

EXAMPLES AS INSTALLED < AUGUST 2020

Examples from installed old style digital microphone positions



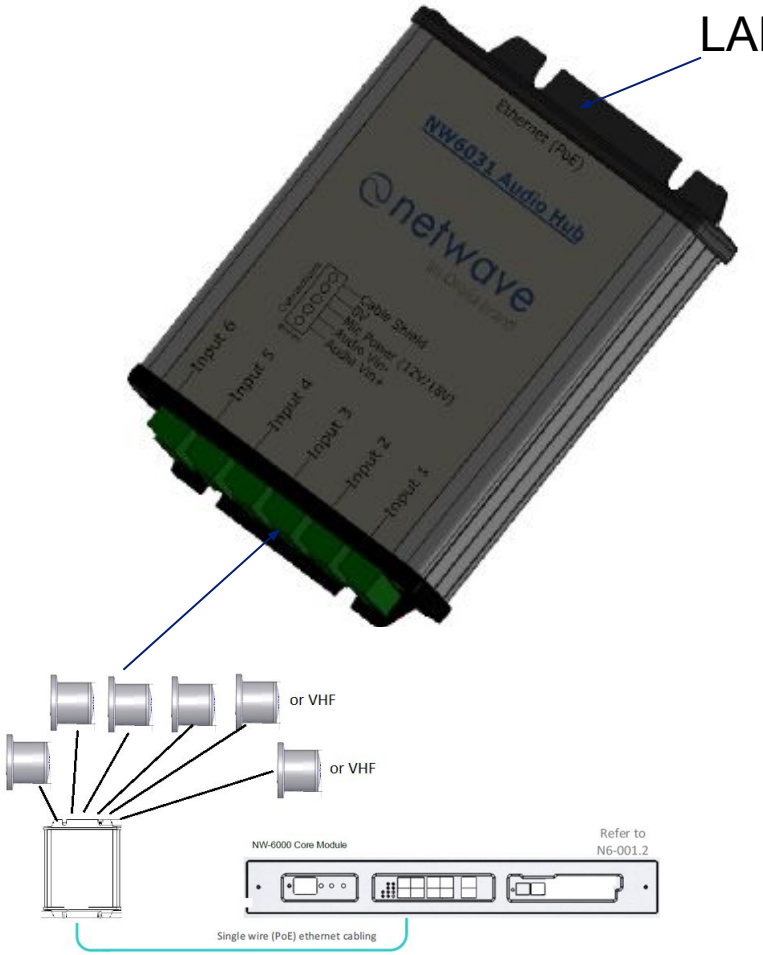


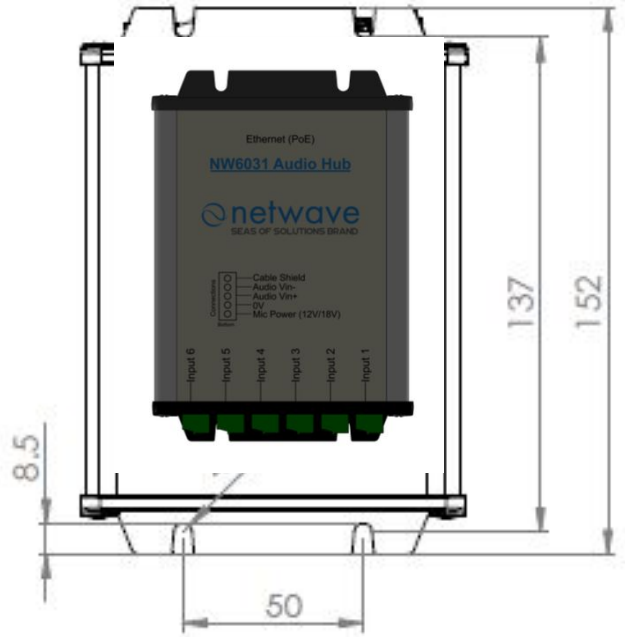
QUESTIONS?

AUDIO COMPONENTS – NW-6031-B AUDIO HUB (FROM > AUG 2020)

The Audio Hub is contained in an extruded aluminium housing. The NW6031 Audio Hub is powered using PoE from the NW6000 and provides 6 audio input channels which are simultaneously sampled.

Digital processing used within the hub to convert sampled analogue data for communications back to the NW6000 over the PoE communications port.





The NW6031 has no external indicators with the exception of the Ethernet communications indicators on the RJ45 socket.

Link speed (Green LED)The LED is on when there is a link connection. Otherwise, the LED is off.

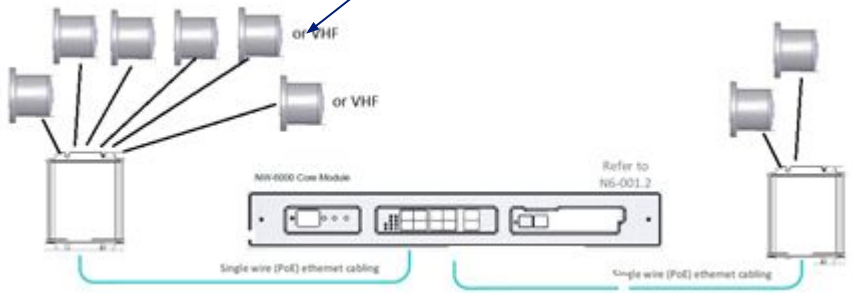
Activity (Yellow LED)The LED is flashing when there is activity on the link. Otherwise, the LED is off.

COMPONENTS – NW-6031-B AUDIO HUB (FROM > AUG 2020)

EXAMPLE INSTALLATION WITH 2X AUDIO HUB AND VHF INTERFACE

VHF can also be connected to the 2nd Audio Hub!

VHF connections



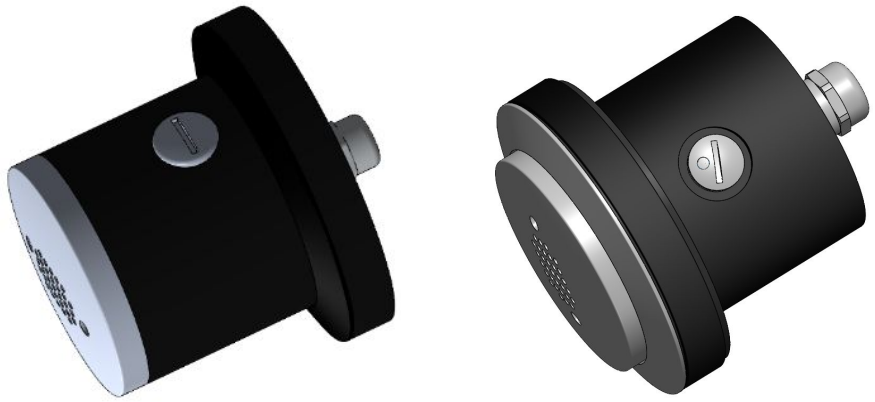
MICROPHONE

COMPONENTS – NW-6030-B ANALOGUE MICROPHONES FROM AUG 2020 >

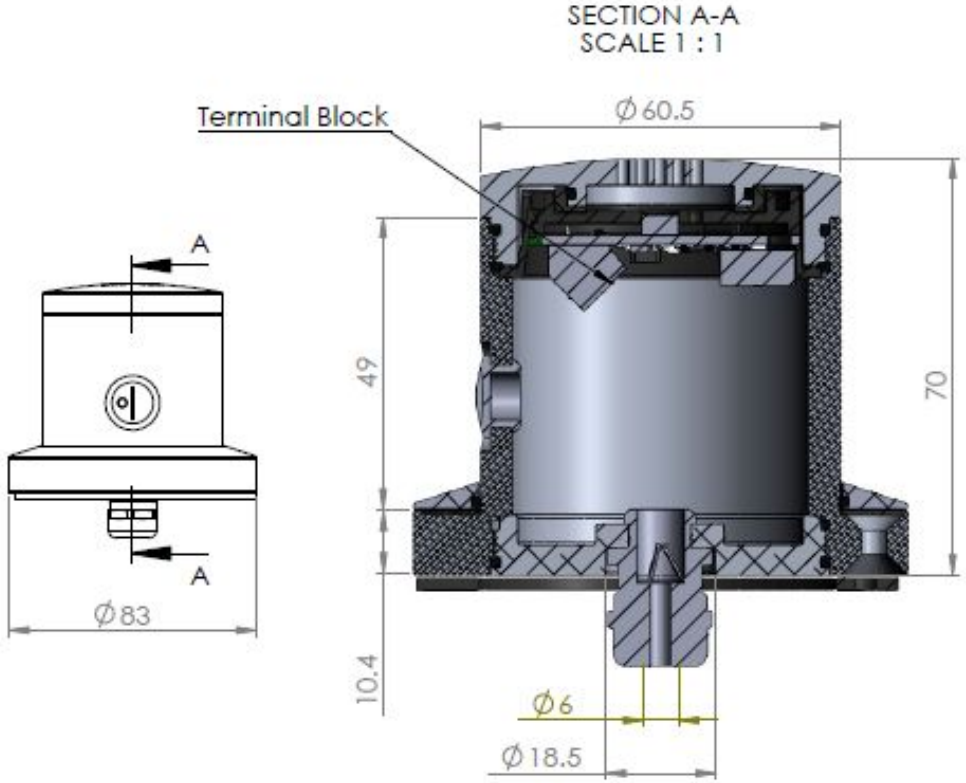
The analogue microphones are of a sea-water resistant, durable anodized aluminum and are of a single, universal type, may be used in both a protected and unprotected environment.

As the name suggests the interface to the microphone is analogue and uses a differential analogue driver to send the audio signal to the Audio Hub (NW6031) for further processing before sending this to the VDR over a PoE connection.

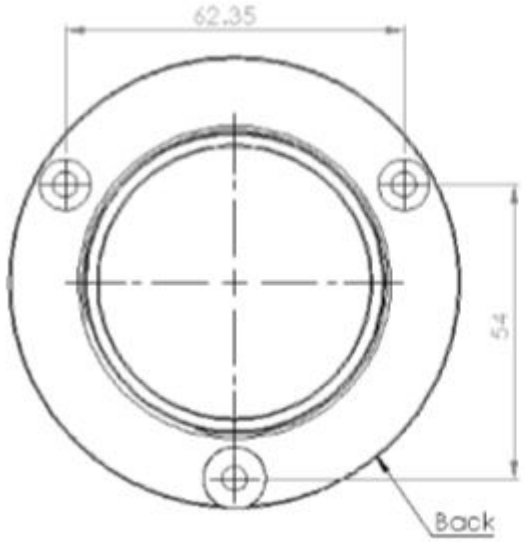
via the NW-6031 Audio Hub interface providing power, directly into the VDR Ethernet network.

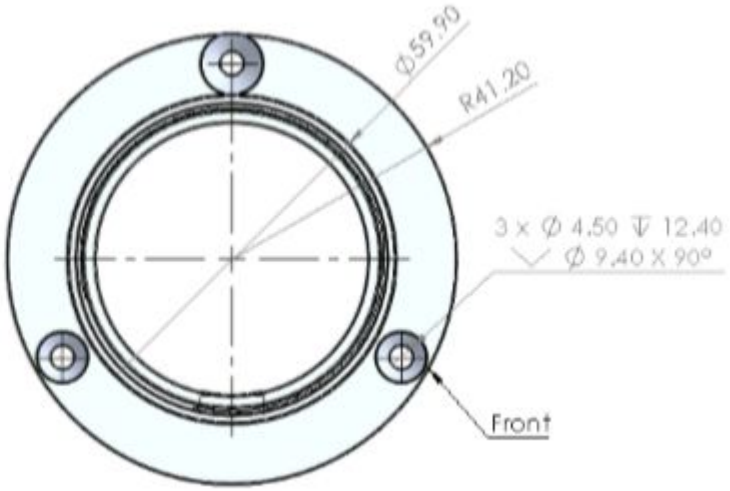


The microphone can be used mounted or used as flush mount!

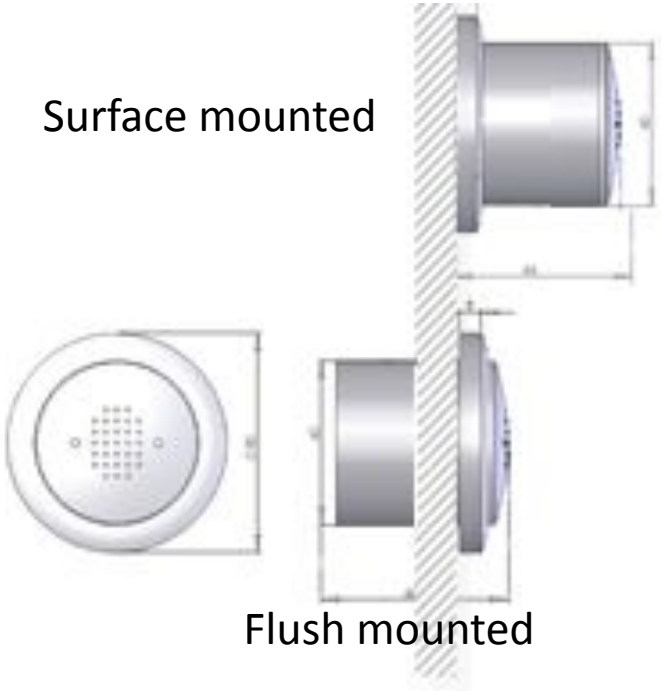


DIMENSIONS

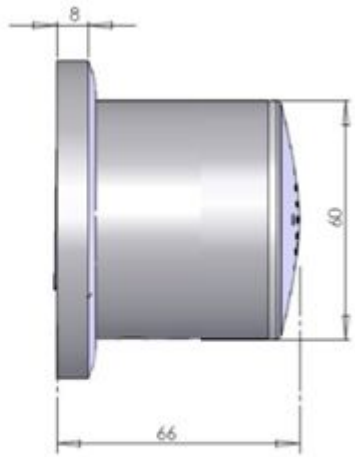




Surface mounted

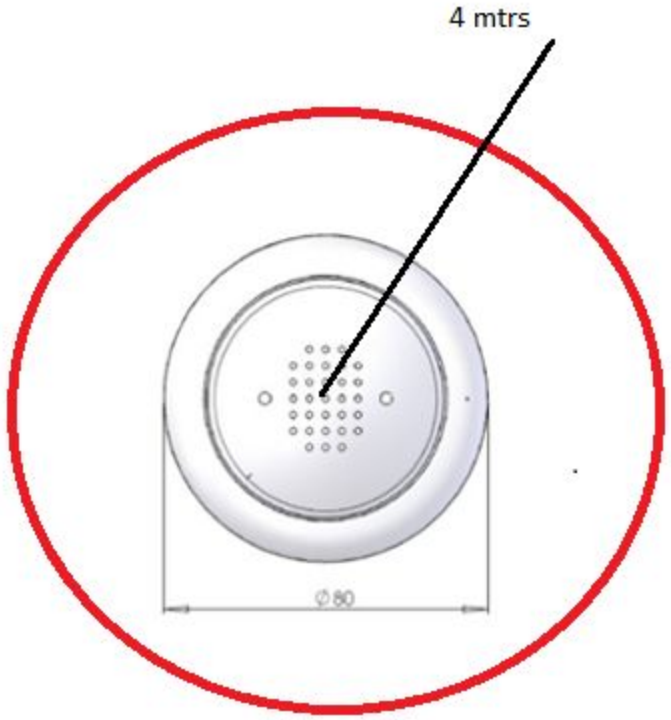


Flush mounted



COMPONENTS – NW-6030-B ANALOGUE MICROPHONES FROM AUG 2020 >

- Omnidirectional cover range = 4 mtrs.
- No minimum distance required between the microphones
- INDOOR & OUTDOOR MIC'S ARE THE SAME

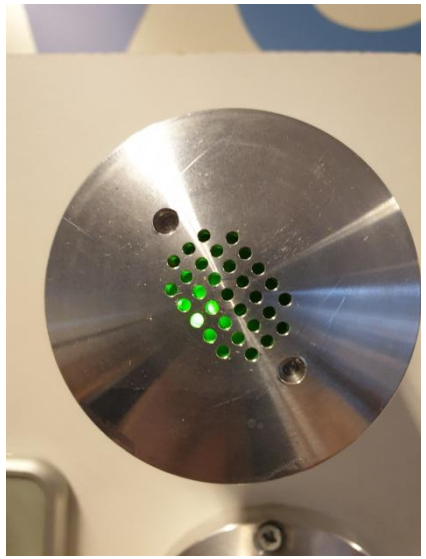


COMPONENTS – NW- 6030-B ANALOGUE MICROPHONES FROM AUG 2020 >

The microphone has a green led built within the enclosure which is only visible and may be controlled during commissioning and (Operational Performance) Testing

Green (blinking) + buzzer sound

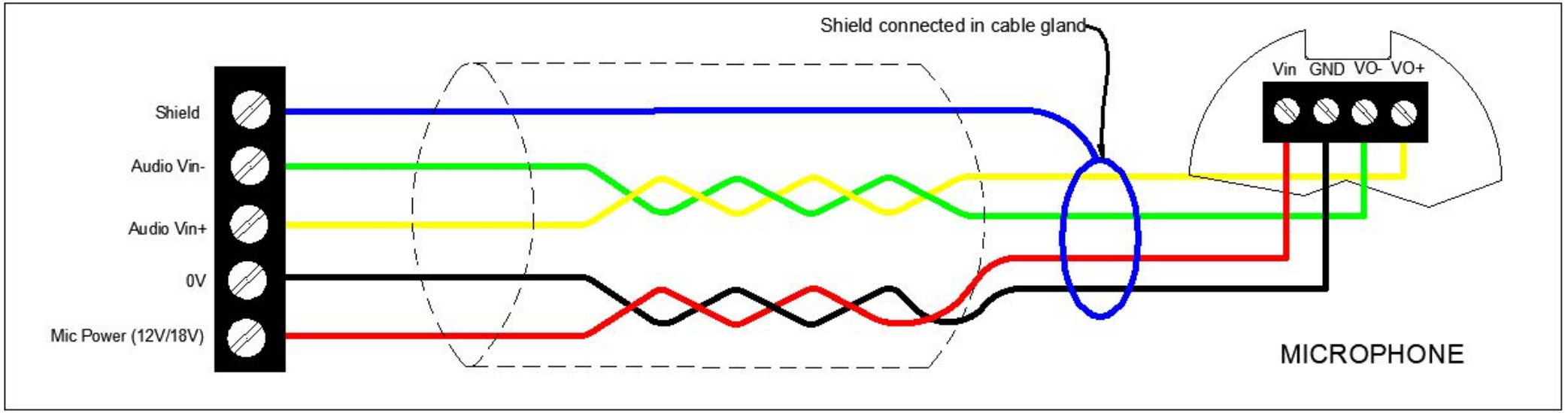
- When there is a link connection but no audible sound is registered.
- During OPT test.



CONNECTIONS – NW- 6030-B ANALOGUE MICROPHONES

Audio-cabling from HUB to Mic should be 2 pair twisted shielded to avoid interference issues

Existing cabling can be re-used again.



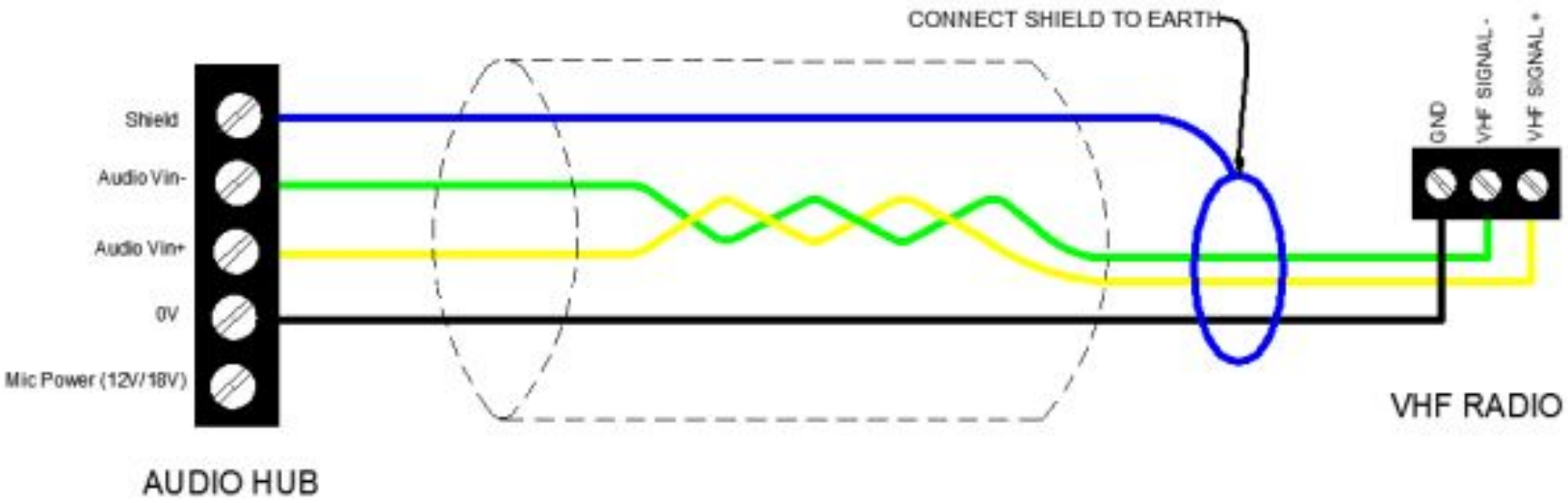
- Only one microphone can be connected to an NW6031 Audio Hub channel.
- Paralleling of microphones into Audio Hub channels is prohibited and will result in the microphone test failing and potentially may damage the electronics in the microphone itself.

Note: Connections to microphones also require using the provided ferrite clamps on both ends of the cable.

CONNECTIONS – NW- 6030-B VHF CONNECTION

Audio-cabling from HUB to VHF should be 1 pair twisted shielded to avoid interference issues

Existing cabling can be re-used again.



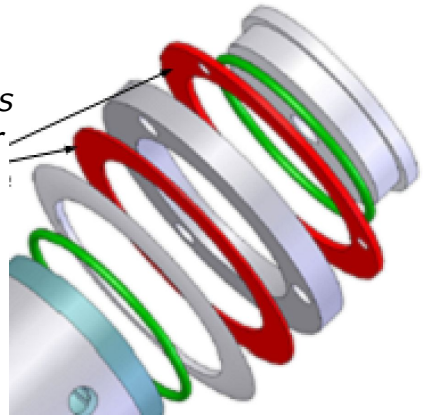
INSTALLATION – NW- 6030-B ANALOGUE MICROPHONES

Mounted outside mic

Outdoor mic

Insert rubber glands on outdoor mic's to prevent corrosion

Rubber Glands Install only for outdoor Mic's



Flush mounted indoor mic

Mounted indoor mic

Video: [Analogue Rebuilding Mounted to Flush]

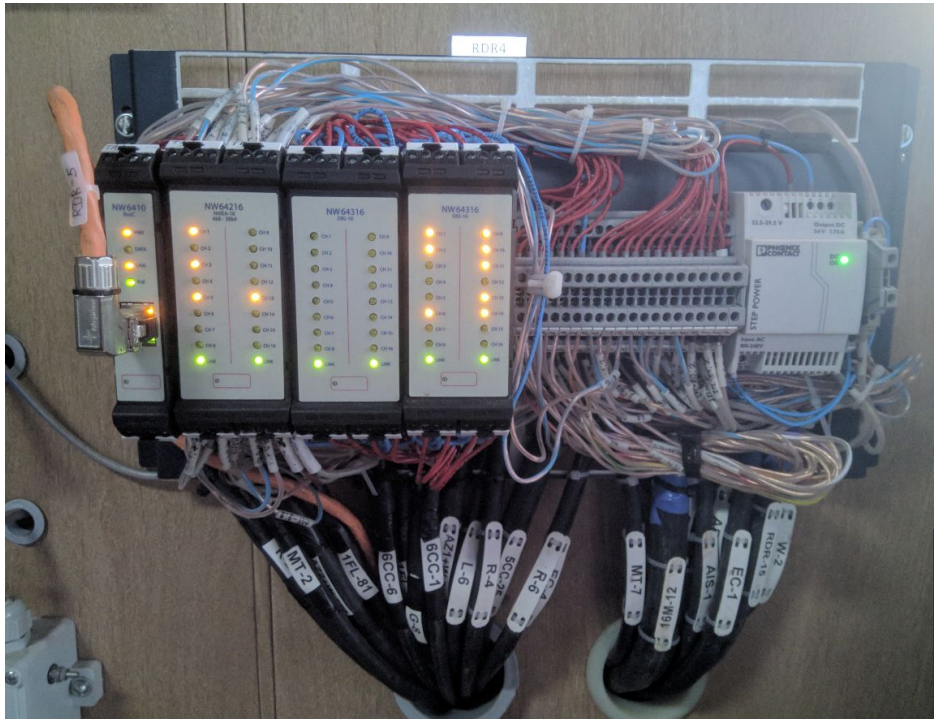
Video: [Cable Connection]

QUESTIONS?

COMPONENTS – NW64XXX DAQ = NMEA, DIGI AND ANALOGUE INTERFACE MODULE

The DAQ system relies on the 'Busbar' integrated within the DIN rail, serving the function of power and data distribution.

COMPONENTS – NW64XXX DAQ-DATA ACQUISITION UNIT



NMEA, Analogue and Digital connections can be made to the DAQ which is containing multiple adaptors called the Buscoupler, (SIM) NMEA module(s), (DIM) Digital module(s) and (AIM) Analogue Module(s), there is only one single Ethernet cable to be connected to the CM. The DAQ is connected and powered via PoE and does not require an additional power source.

Every DAQ module can contain a number of adaptors*, there is always a BusCoupler inserted from which the ethernet cable is connected to the CM.

**for the maximum number of adaptors check: Power consumption calculation sheet*

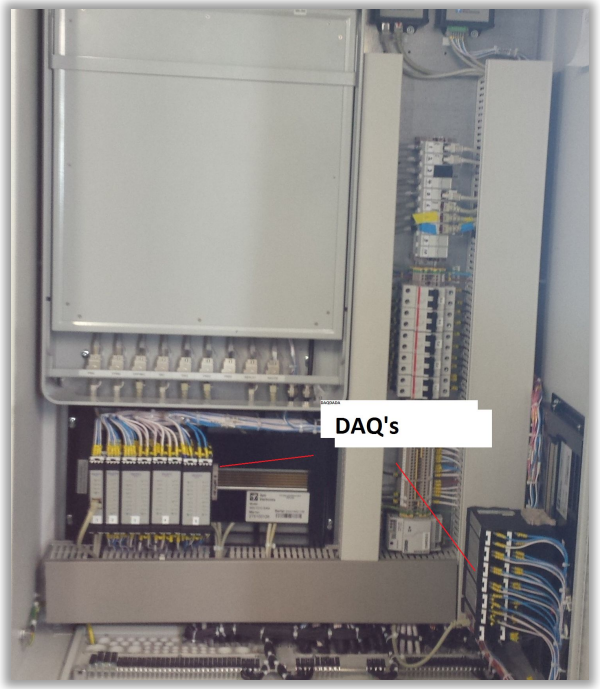
COMPONENTS - NW-6410 WAVENET BUSCOUPLER

There must always be 1 BusCoupler (BC) within any DAQ MODULE to provide data communications to the Core Module

The Buscoupler will provide power to the modules and send data to the Core Module

COMPONENTS - NW-6410 WAVENET BUSCOUPLER

The DAQ Module can be set up with different adaptors combined with always 1x BusCoupler in one interface



A combination of following adaptors can be used;

-NW-64208/16/24 Serial/NMEA 8/16/24 channel adaptor
-NW-64308/16/24 Digital 8/16/24 channel adaptor
-NW-64404/8/12 Analogue 4/8/12 channel adaptor

INSTALLATION - NW-6410 WAVENET BUSCOUPLER

This adaptor has following ports;

Ethernet - to be connected to the Core Module
(or other brands' IEC61162-450 compliant VDR or otherwise)

Channel 1 NMEA - (IEC61162-series) input port (4k8 up to 38K4 Bd)

Channel 2 NMEA - (IEC61162-series) input port (4k8 up to 38K4 Bd)

Channel 3 NMEA - (IEC61162-series) input port (4k8 up to 38K4 Bd)

Power A Power IN - 24 VDC for non PoE applications, do not use this!!

Power B Power OUT - 24 VDC (<u>do not use this source!!)</u>

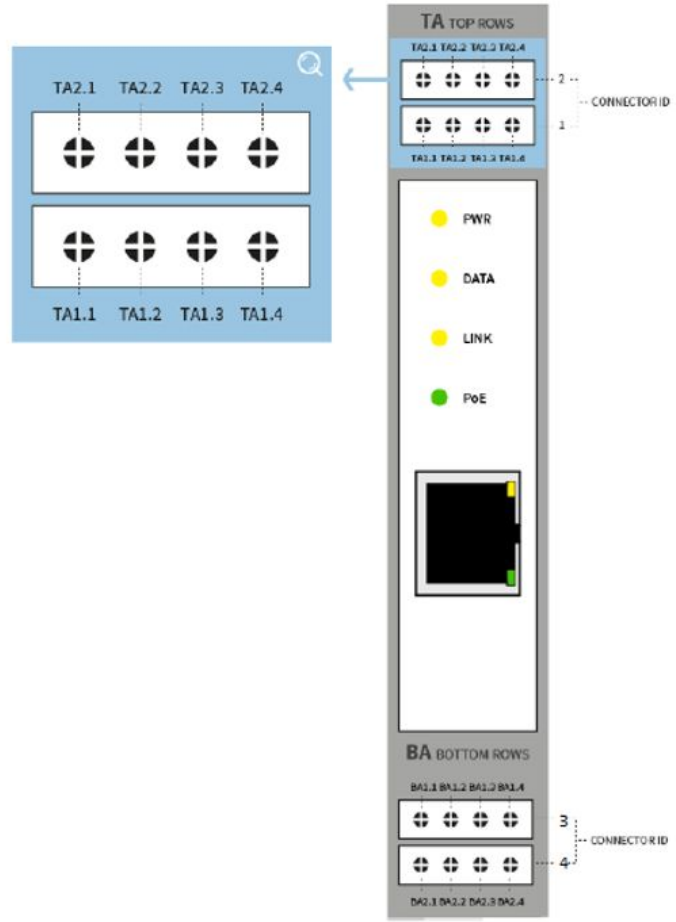


Figure 14.4.A - Connection figure Buscoupler

NW-6410 BusCoupler

Connector ID	Contact ID (top view, left to right)			
	.1	.2	.3	.4
TA1	NMEA 1A	NMEA 1**B**	GND	GND
TA2	NMEA 2A	NMEA 2B	GND	GND
BA1	GND	GND	**NMEA 3A**	**NMEA 3B**
BA2	~~GND~~	~~24V IN~~	~~GND~~	24 V OUT

do not use

INSTALLATION - NW-64XXX CONNECTOR AND WIRING IDENTIFICATION IS AS FOLLOWS

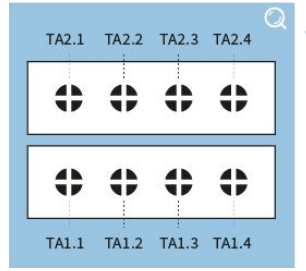
Please note:
the largest width adaptor is shown with connectors in columns A, B and C.

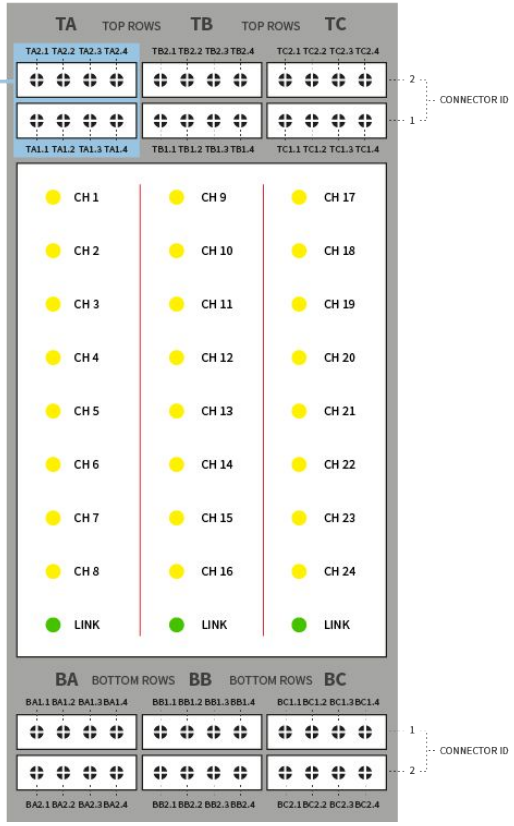
Smaller adaptors, with less channels, will have 1 column (A) or 2 columns (A and B).

Top rows are identified by a T-prefix, whereas the bottom rows have a B-prefix.

Terminal block rows are 1 on the front and 2 on the back.

e.g. TB2.2 is the top terminal of column B at the back and is second from the left.





INSTALLATION - NW-64XXX CONNECTOR AND WIRING IDENTIFICATION IS AS FOLLOWS

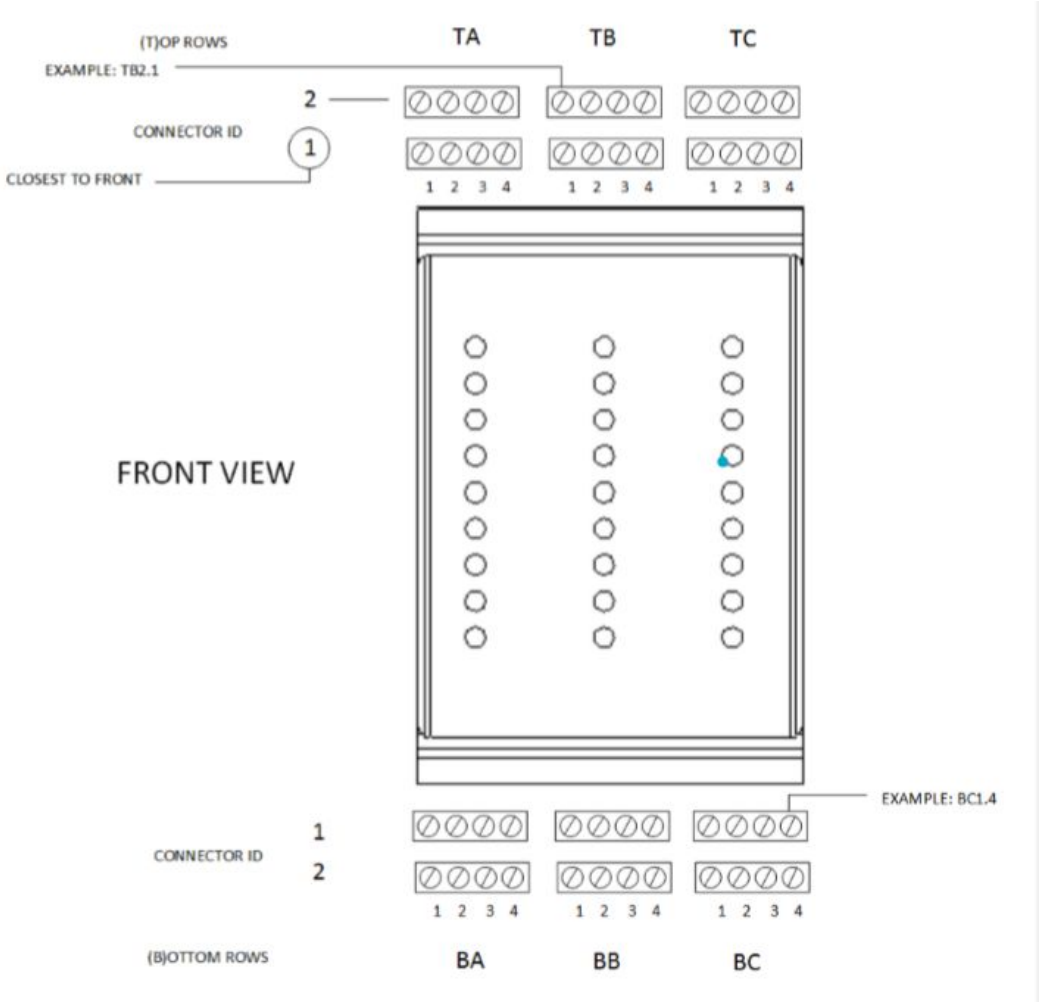
Please note:
the largest width adaptor is shown with connectors in columns A, B and C.

Smaller adaptors, with less channels, will have 1 column (A) or 2 columns (A and B).

Top rows are identified by a T-prefix, whereas the bottom rows have a B-prefix.

Terminal block rows are 1 on the front and 2 on the back.

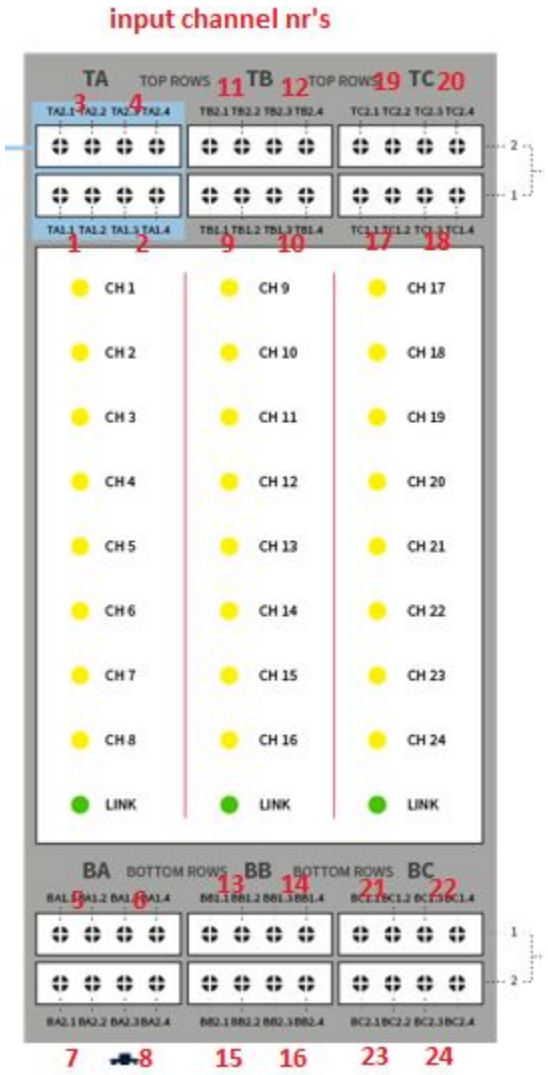
e.g. TB2.2 is the top terminal of column B at the back and is second from the left.



INSTALLATION - NW-64XXX INPUT CHANNEL NUMBERING

Please note:

LED's from each individual channel will be illuminated when 24V is detected (digital), serial data (NMEA module, blinking) or analogue activation (analogue module)



INSTALLATION - NW-64208/16/24 SERIAL/ NMEA 8/16/24 CHANNEL ADAPTORS

These adaptor provide input ports for serial / NMEA data with baud rates up to 38400 baud. They are available in 8, 16 and 24 channel configurations within a harmonized configuration and wiring scheme.

16 input NMEA module

NW64208 (8/16/24) 8, 16 and 24 channel serial (NMEA) modules				
	.1	**.2**	**.3**	**.4**
TA1	CH1-	CH1+	CH2-	CH2+
TA2	CH3-	CH3+	CH4-	CH4+
BA1	CH5+	CH5-	CH6+	CH6-
BA2	CH7+	CH7-	CH8+	CH8-
additional for 16 channel versions				
	.1	**.2**	**.3**	**.4**
TB1	CH9-	CH9+	CH10-	CH10+
TB2	CH11-	CH11+	CH12-	CH12+
BB1	CH13+	CH13-	CH14+	CH14-
BB2	CH15+	CH15-	CH16+	CH16-
additional for 24 channel versions				
	.1	**.2**	**.3**	**.4**
TC1	CH17-	CH17+	CH18-	CH18+
TC2	CH19-	CH19+	CH20-	CH20+
BC1	CH21+	CH21-	CH22+	CH22-
BC2	CH23+	CH23-	CH24+	CH24-

Figure 15.4.D – Connection table NMEA Modules

INSTALLATION -NW-64308/16/24
DIGITAL 8/16/24 CHANNEL ADAPTORS

ON level 5-24V DC, max. input current 1mA. The modules are available in 8,16 and 24 channel configurations within a harmonized configuration and wiring scheme.

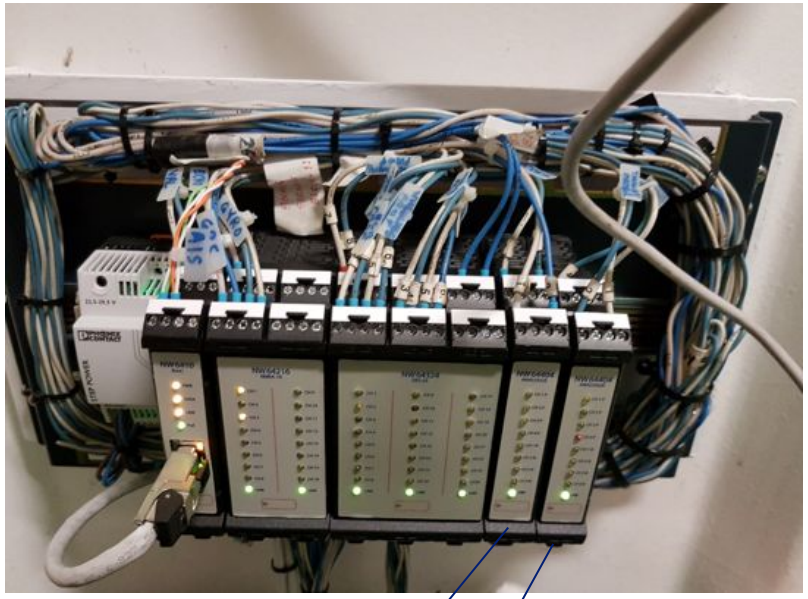
8 input Digital module

NW64308 (8/16/24) 8, 16 and 24 channel digital input modules				
	.1	**.2**	**.3**	**.4**
TA1	CH1+	CH1-	CH2+	CH2-
TA2	CH3+	CH3-	CH4+	CH4-
BA1	CH5-	CH5+	CH6-	CH6+
BA2	CH7-	CH7+	CH8-	CH8+
additional for 16 channel versions				
	.1	**.2**	**.3**	**.4**
TB1	CH9+	CH9-	CH10+	CH10-
TB2	CH11+	CH11-	CH12+	CH12-
BB1	CH13-	CH13+	CH14-	CH14+
BB2	CH15-	CH15+	CH16-	CH16+
additional for 24 channel versions				
	.1	**.2**	**.3**	**.4**
TC1	CH17+	CH17-	CH18+	CH18-
TC2	CH19+	CH19-	CH20+	CH20-
BC1	CH21-	CH21+	CH22-	CH22+
BC2	CH23-	CH23+	CH24-	CH24+

Figure 16.4.D – Connection figure Digital Modules

INSTALLATION -NW-64408 ANALOGUE 4-8-12 INPUT CHANNEL ADAPTOR

These adaptors send analogue data (-10V/10V or 0-20mA) they receive from their input ports into the Busbar ‘backplane’ for further processing by the Buscoupler, which streams the data onto the (VDR) network.



Analogue Adaptors(2x 4channel)

NW64408 (4/8/12) 4, 8 and 12 channel analogue input modules				
	.1	**.2**	**.3**	**.4**
TA1	VOLT 1-	CURR 1-	CURR 1+	VOLT 1+
TA2	VOLT 2-	CURR 2-	CURR 2+	VOLT 2+
BA1	VOLT 3-	CURR 3-	CURR 3+	VOLT 3+
BA2	VOLT 4-	CURR 4-	CURR 4+	VOLT 4+
additional for 8 channel versions				
	.1	**.2**	**.3**	**.4**
TB1	VOLT 5-	CURR 5-	CURR 5+	VOLT 5+
TB2	VOLT6-	CURR 6-	CURR 6+	VOLT 6+
BB1	VOLT 7-	CURR 7-	CURR 7+	VOLT 7+
BB2	VOLT 8-	CURR 8-	CURR 8+	VOLT 8+
additional for 12 channel versions				
	.1	**.2**	**.3**	**.4**
TC1	VOLT 9-	CURR 9-	CURR 9+	VOLT 9+
TC2	VOLT 10-	CURR 10-	CURR 10+	VOLT 10+
BC1	VOLT 11-	CURR 11-	CURR 11+	VOLT 11+
BC2	VOLT 12-	CURR 12-	CURR 12+	VOLT 12+

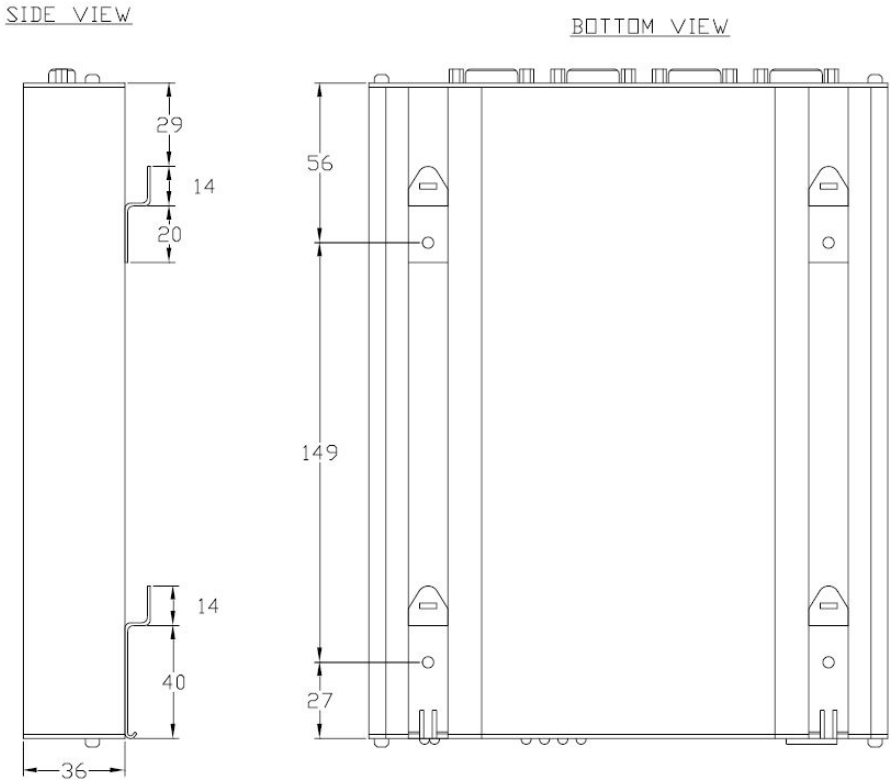
Figure 16.4.D – Connection table Analogue Modules

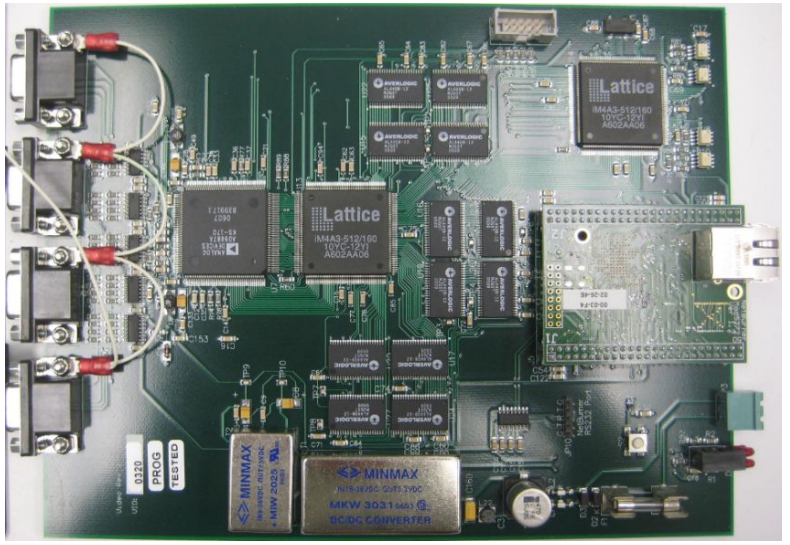
Depending upon which connector entry is chosen,
a choice is made between voltage and current measurement.

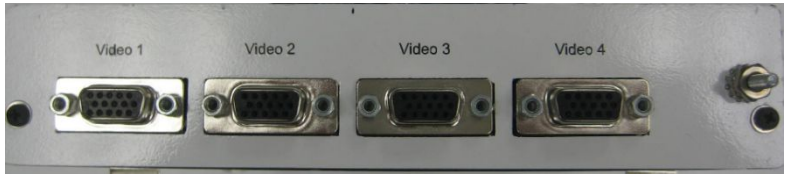
Video: Data Acquisition Module

QUESTIONS?

COMPONENTS – NW6044 VIDEO INTERFACE







X-band, S-band and ECDIS video should be recorded (full VDR installations)

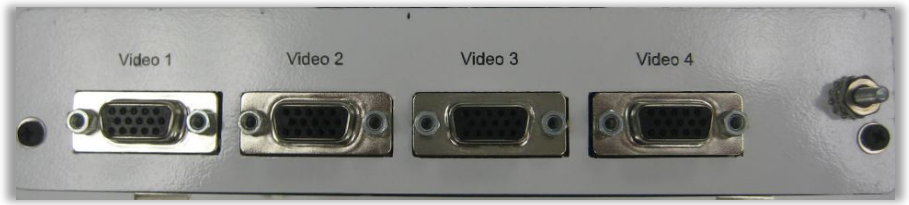
When video is not provided via (LWE 450) network but in an analogue connection method, the NW-6044 should be added.

COMPONENTS – NW6044 VIDEO INTERFACE

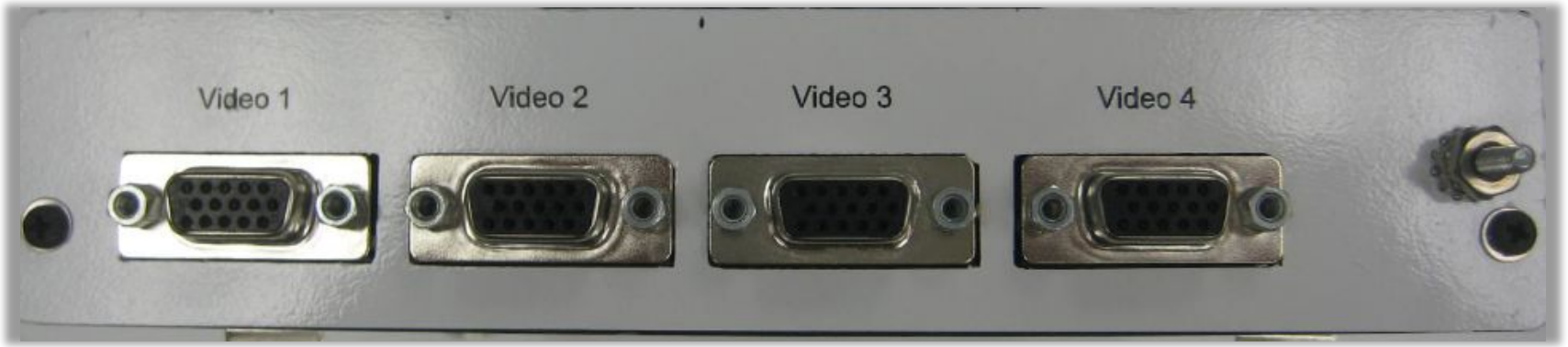
Type of Video Channels

Capture RGB, RGBHV, Monochrome and Composite Video Information from radars, video camera's, ECDIS, and other video sources

This interface has 4 (VGA) input ports for capturing images from a dedicated buffered output port of the video source. The module digitizes the video signal and then outputs the video data through an Ethernet port



INSTALLATION – NW6044 VIDEO INTERFACE



DC power cable connected to a 24Vdc power supply. This can also be from the ship's 24Vdc supply.

The DC power supply connector sits next to the Ethernet port on the unit.

Note: Power is not provided from the VDR!

Video: *video interface*

QUESTIONS?

NW6000 TRAINING