



X-VDR



Voyage Data Recorder

Installation/Service Manual

System Serial Number

Software Version

Installation Date

INSTALLATION / SERVICE MANUAL

CONFORMITY STATEMENT

This equipment has been designed to comply with IMO regulations and IEC standards.

Document history

Issue number	Release date	Details
1 Rev 02	April 2015	1 st formal issue
1 Rev 07	June 2015	Minor updates Addition of Pre Installation Questionnaire Addition of Commissioning report

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2. Important Notices: Health and Safety

1. All personnel are required to study these notices and familiarise themselves with all applicable safety precautions and bring them to the attention of others in the vicinity.

HIGH VOLTAGE WARNING



LETHAL HIGH VOLTAGES ARE PRESENT IN THE VOYAGE DATA RECORDER

2. A current of 100 mA passing through the human body for one second can kill. This can occur at voltages as low as 35V AC or 50V DC. Some equipment in the system uses electrical power that can be lethal. Whenever practical, before carrying out installation, maintenance or repair, personnel involved must:
 - (1) Isolate the equipment from the electrical supply.
 - (2) Make tests to verify that the isolation is complete.
 - (3) Ensure that power cannot be accidentally reconnected.

DO NOT OPEN ANY OF THE UNITS WHEN THE VOYAGE DATA RECORDER IS OPERATIONAL - UNLESS FULLY QUALIFIED TO DO SO.

3. If it is essential to work on the equipment with power connected, work must only be undertaken by qualified personnel who are fully aware of the danger involved and who have taken adequate safety precautions to avoid contact with dangerous voltages.

HEALTH HAZARD



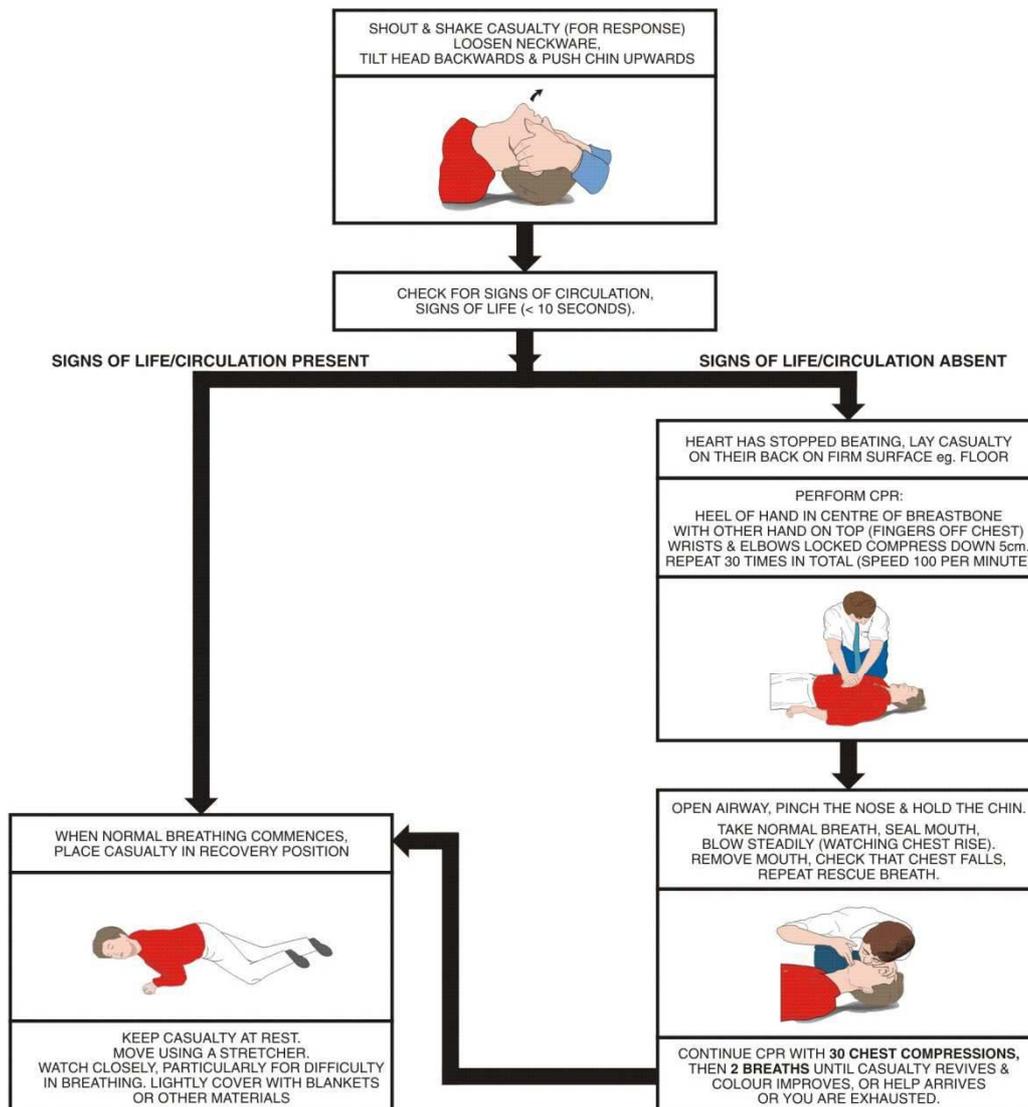
4. This equipment may contain materials which produce toxic fumes when ignited.
5. The inhalation of dust and fumes or any contact with lubricants when cleaning the equipment may be temporarily harmful to health, depending on individual allergic reactions. Components which are broken or overheated may release toxic fumes or dust and must be treated with caution. Do not inhale the fumes and ensure that the dust and debris do not enter open cuts or abrasions. It is prudent to regard all damaged components as being potentially toxic, requiring careful handling and appropriate disposal.

PERSONAL PROTECTION

6. Personal protection must be used whenever the possibility of an uncontrolled hazard exists. For example, a suitable face visor, gloves and a body apron should be worn when handling cathode ray tubes, as a precaution against injury in the event of breakage.

ELECTRIC SHOCK RESUSCITATION

- 1 SHOUT FOR HELP. SWITCH OFF ELECTRICITY IF POSSIBLE.**
 SWITCH OFF ELECTRICITY IMMEDIATELY. IF NOT POSSIBLE, DON'T WASTE TIME SEARCHING FOR A SWITCH
- 2 REMOVE CASUALTY FROM DANGER.**
 SAFEGUARD YOURSELF WHEN REMOVING CASUALTY FROM HAZARD. IF CASUALTY IS STILL IN CONTACT WITH ELECTRICITY AND THE SUPPLY CANNOT BE ISOLATED, STAND ON A DRY NON-CONDUCTING MATERIAL (RUBBER MAT, WOOD, LINOLEUM). USE RUBBER GLOVES, DRY CLOTHING WOODEN BROOM, STOOL, CHAIR, LENGTH OF DRY ROPE OR WOOD TO PULL OR PUSH CASUALTY AWAY FROM THE HAZARD.
- 3 REMOVE ANY OBVIOUS OBSTRUCTION TO BREATHING.**
 IF CASUALTY IS NOT BREATHING, START RESUSCITATION AT ONCE. GET HELP.



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MEDICAL ASSISTANCE MAY BE OBTAINED ON / AT



CAUTION

Handling of Electrostatic-Sensitive Semiconductor Devices

Certain semiconductor devices used in the equipment are liable to damage due to static voltage. Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- (1) Persons removing sub-units from an equipment using these devices must be earthed by a wrist strap and a resistor at the point provided on the equipment.
- (2) Soldering irons used during the repair operations must be low voltage types with earthed tips and isolated from the mains voltage by a double insulated transformer.
- (3) Outer clothing worn must be unable to generate static charges.
- (4) Printed Circuit Boards (PCBs) fitted with these devices must be stored and transported in anti-static bags.

CD-1100

3. Terms and definitions Alert

Announcement of abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions.

Note: the VDR is only every required to raise a 'caution' for any condition that may arise. Therefore any mention of an 'alert' in this document should be considered a 'caution' state.

Bridge work station

The position at which a person is expected to be when performing normal bridge duties,

For example:

- Centre line conning;
- Bridge wing(s);
- Main radar;
- Chart table;
- Helm;
- Communication console

Caution

The lowest priority of an alert. A condition which does not warrant an alarm or warning condition, but still requires attention and out of the ordinary consideration of the situation or of given information

A caution is indicated by a steady visual indication with a message of sufficient detail to enable the bridge team to identify and address the caution condition. No acknowledgement is required and the caution should be automatically removed after the condition is rectified.

Combined EPIRB/VDR capsule

Single unit which meets all the requirements of a satellite EPIRB (as required by the carriage requirements of SOLAS IV) and all the requirements of a VDR (as required by the carriage requirements of SOLAS V)

Configuration data

Describes the vessel's equipment, its installation on the vessel and its relation to the VDR. The storage and playback software uses this data to store the data record and to convert the data record into information that assists casualty investigation during playback.

Data

Any item of information received by the VDR for recording, including numerical values, text and audio or radar signals and including all configuration data, except where specifically stated or where the context dictates otherwise

Dedicated reserve power source

A battery, with suitable automatic charging arrangements, dedicated solely to the VDR, of sufficient capacity to operate it for a minimum of 2 hours.

Final recording medium

The items of hardware on which the data is recorded such that access to any one of them would enable the data to be recovered and played back by use of suitable equipment.

The combination of a fixed recording medium and float-free recording medium and long-term recording medium, together, is recognised as the final recording medium.

Fixed recording medium / Fixed Capsule

Part of the Final Recording Medium which is protected against fire, shock, penetration and a prolonged period on the ocean floor. It is expected to be recovered from the deck of the vessel that has sunk and has a means of indicating location.

Float-free recording medium / Float Free Capsule

Part of the Final Recording Medium which should float-free after a sinking. It has a means of indicating location

Long-term recording medium (LTRM)

Permanently installed part of the Final Recording Medium. It provides the longest record duration and has a readily accessible interface for downloading the stored data.

Playback equipment

Any data medium with the playback software, the operational instructions and any special parts required for connecting a commercial-off-the-shelf laptop computer to the VDR.

Playback software

Copy of the software program to provide the capability to download the stored data and play back the information. The software should be compatible with an operating system available with commercial-off-the-shelf laptop computers and where non-standard or proprietary formats are used for storing the data in the VDR, the software should convert the stored data into open industry standard formats

Playback system

System including the playback equipment that is capable of downloading and playing back the recorded data

Recorder

Complete system, including any items required to interface with the sources of input signals, their processing and encoding, the final recording medium, the playback equipment, the power supply and dedicated reserve power source.

Resolution

Smallest detectable increment between two values

Signal source

Any sensor or device external to the VDR, to which the VDR is connected and from which it obtains signals and data to be recorded

4. Abbreviations

BCP	Bridge Control Panel
COG	Course Over Ground
DVI	Digital Visual Interface
ECDIS	Electronic Chart Display Information System
EPFS	Electronic Position Fixing System
EPIRB	Emergency Position Indicating Radio Beacon
FRM	Final Recording Media
FRU	Field Replacement Unit
GMDSS	Global maritime distress and safety system
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HRU	Hydrostatic Release Unit
HVR	Hardened Voyage Recorder
IEC	International Electrotechnical Commission
IMO	International Maritime Organization
INS	Integrated navigation system
IP	Internet Protocol
LAN	Local area network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MEU	Main Electronics Unit
MIC	Microphone Unit
MMSI	Maritime Mobile Service Identity
NMEA	National Marine Electronic Association
OS	Operating System
PC	Personal Computer
PDC	Protective Data Capsule
RADAR	Radio Aid to Detection And Ranging
ROV	Remotely operated vehicle
RTD	Real Time Display
SAR	Search and rescue
SOG	Speed Over Ground
SOLAS	Safety Of Life At Sea
STW	Speed Through Water
ULB	Underwater Locator Beacon
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UTC	Coordinated universal time
VHF	Very high frequency
VESA	Video Electronics Standards Association
VGA	Video Graphics Array
VDR	Voyage Data Recorder
X-16A	X Series 16 input Analogue to Serial NMEA Interface
X-32D	X Series 32 input Digital to Serial NMEA Interface
X-VDRTSM	X Series VDR Touch Screen Monitor
X-VDRMEU	X Series Main Electronics Unit.
X-VDRUPS	X Series Uninterruptible Power Supply
X-VDRMIC-I	X Series Microphone Internal
X-VDRMIC-E	X Series Microphone External

5. Foreword

This Manual provides installation and commissioning information for the X-Series Voyage Data Recorder (X-VDR). The manual is intended for use by qualified installation personnel only.

Installation and maintenance must only be undertaken by qualified service engineers or by Kelvin Hughes Ltd and their approved agents. Unauthorised 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 authorisation certificate issued by Kelvin Hughes Ltd.

When operating, installing or maintaining your system, this manual should be used in conjunction with the System Manuals provided for each particular installation, which provide Operating and System Commissioning Information

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
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. Purchase order number with invoicing details
7. Contact Name

You may contact Kelvin Hughes Ltd using the below details:

Website: www.Kelvinhughes.com

Service email: service@kelvinhughes.co.uk

Service phone: +44 (0) 1992 805 302

Fax: +44 (0) 1992 805 310

6. Product Introduction

The “X-Series” VDR and interfaces have been developed using expertise in VDR design spanning more than a decade, along with 20+ years’ experience in marine electronic re-transmission and interfacing. The result is a system that is designed and built in the UK from the “ground up”. A system that not only meets the new VDR regulations but offers more flexibility, functionality and features to the end user than ever before.

New Regulations: - in compliance with MSC.333(90), enforced by 1 July 2014, if installed on or after 1 July 2014, conform to performance standards not inferior to those specified in the annex to the present resolution: and if installed before 1 July 2014, conform to performance standards not inferior to those specified in the annex to resolution A.861(20), as amended by resolution MSC.214(81)

Cable Entry System:

The new “X-Series” VDR includes a compact and innovative design of cable gland. These cable glands are ideal for applications where many cables are needed to run into a small space.

The VDR has specialised cable entry frames with compression inserts for installing pre-terminated cables e.g. VGA, Ethernet cables directly into the VDR main unit. The selection of inserts can be customised to vessel needs with cables entries from 2mm to 14mm

Unit ID	Part Number	Unit Description
MEU	X-VDRMEU	Main Electronic Unit
TSC / BCP	X-VDRTSCON	Touch Screen Console
X-72-I	X-VDRMIC-I	Internal Microphone
X-72-E	X-VDRMIC-E	External Microphone
HC-NOV	X-VDRHC-NOV	Fixed Hardened Capsule
FF-JOT	X-VDRFF-JOT	Float-Free Capsule
UPS	X-VDRUPS	Uninterruptible Power Supply

Standard Scope of Supply:

- VDR Main Electronic Unit (X-VDRMEU)
- VDR Bridge Control Panel (X-VDRTSPAN)
- 3 x Internal Microphones (X-VDRMIC-I)
- 2 x External Microphones (X-VDRMIC-E)
- Fixed Capsule (X-VDRHC)
- Float-free Capsule (X-VDRFF)
- Dedicated Uninterruptible Power Supply Unit (X-VDRUPS)

System Features:

- Compact and easy to use cable entry system
- Bridge Control Unit for efficient system monitoring
- 10 individual audio channels allowing up to 16x microphones and 2x VHF
- Compliant with MSC.333(90) and IEC61996-1 Ed 2.0
- 2 Year warranty as standard
- Global service and support network

7. Product Overview

X- VDRMEU - Main Electronic Unit

The MEU has a removable front panel for access but is screwed in place for security. There is a tamper switch to ensure that any access to the internal circuitry of the MEU is logged.

The Key Switch Board has LEDs to indicate the VDR status and a key switch for switching the system on and shutting the system down.

Specialist glands blocks are installed and may be supplied to suit the cables being passed into the MEU. The rectangular gland block is used for cables that have been pre-terminated, such as VGA cables and Ethernet cables, etc.

Designed with a modular component structure for quick and easy replacement of system specific interfaces - Data, Audio, Radar Capture, Network and processor. Compact easy to mount enclosure with new easy to use cable entry system.



All built into a single box with no need for additional parts:

- 8 x Audio inputs (up to 16x microphones)
- 2 x Audio VHF inputs
- 20 x NMEA inputs (Selectable baud rates)
- 2 x RADAR capture inputs (Expandable to 4)
- Dedicated Network connections for ECDIS Image capture.

USB 3.0 socket provided for fast data download (optional feature)

Built in Redundancy for OS and archived data:

- Operating System Backup - Built in independent “Sleeping” backup drive for quick recovery of the operating system in the unlikely event of a system failure. Can be accessed remotely for instant recovery, saving time and money on engineer’s visits.
- Archived Data Backup – RAID configured second industrial 2.5” hard drive present to ensure that in the unlikely event of a drive failure that no data is lost.

X-VDRUPS - Uninterruptible Power Supply

Designed to provide a minimum of 2 hours of continuous power the VDR to ensure data is collected at the most critical times in the event of ships "power out".

- Long life batteries lasting 3 years between replacements
- Easy access for convenient battery replacement
- AC Fail and Battery Fail visual indications on BCP
- AC Fail and Battery Fail visual indications on BCP.

X-SERIES VDR Microphones

The X-VDR microphones have been designed with high quality audio and easy installation in mind. Using noise reducing 600Ω balanced audio for the clearest possible recording the audio clarity is second to none. The built in auto test ensures all microphones are functioning correctly, giving a visual indication on the BCP in the event of a failure.

External microphones have been built and tested to function in the harshest of outdoor environments without deterioration.



External microphones are IP rated for external use to protect against the harsh elements experienced on a vessel's bridge wing.

Each microphone has an individual GAIN control for optimal performance in the particular environment.

X-VDR TSC - Touch Screen Console (also referred to as Bridge Control Panel or BCP)

The panel mount 8.4" full colour touchscreen control panel gives the operator a clear and simple overview of the VDR system. The optimal viewing distance for the BCP is 0.7m



Seven selectable control tabs include:

- HOME – Vessel and system details
- VIDEO – Status of the Radar and ECDIS captured images
- AUDIO – Audio level of all channels and test status of microphones
- NMEA – Data received and status of expected data
- CAPSULE – Status of both capsules and long term recording medium
- POWER – AC supply status, DC supply status and next battery replacement date
- EVENT LOG – Log of all systems alarms, status changes and milestones

Other features include:

- On demand system self-test
- Manual event logger
- Brightness control

Information displayed on all available screens includes:

- UTC Time and Date
- Selection tabs
- System alarm status' and acknowledgement status

Further information may be found in the document "X-VDR Bridge Control Panel Operation Guide"

X-VDR HC-NOV - Fixed Hardened Capsule

Hard shell, solid core – the HC-NOV fixed capsule combines the highest mechanical security with the simplest operation.

With excellent build quality the HC-NOV was designed with reliability and durability as the highest priority.

Connection to the VDR is achieved over a LAN interface with a 64GB internal memory the capsule holds a minimum of 48 hours of data for recovery and playback in the event of a catastrophic incident.



X-VDRFF- Float Free Capsule

The Tron X-VDRFF-JOT has water activated contacts which will begin distress transmission once deployed into water.

The Float Free bracket has a hydrostatic release unit (HRU) which will release the capsule if the submerged to a depth of 2-4 meters. Once activated the battery will maintain the EPIRB's operation for a minimum of 168 hours.

Connection to the VDR is achieved over a LAN interface with a 64GB internal memory the capsule holds a minimum of 48 hours of data for recovery and playback in the event of a catastrophic incident.



8. Pre-Installation Requirements

The main unit should ideally be as close as possible to the bridge display unit.

9. Unpacking and Inspection

When opening the equipment packing cases:

- (1) It is essential that the contents are checked against the invoice.
- (2) Carefully examine all packing materials to ensure that no items have been overlooked. In particular, ensure that the fitting kits and cable supplied are recovered from the packaging.

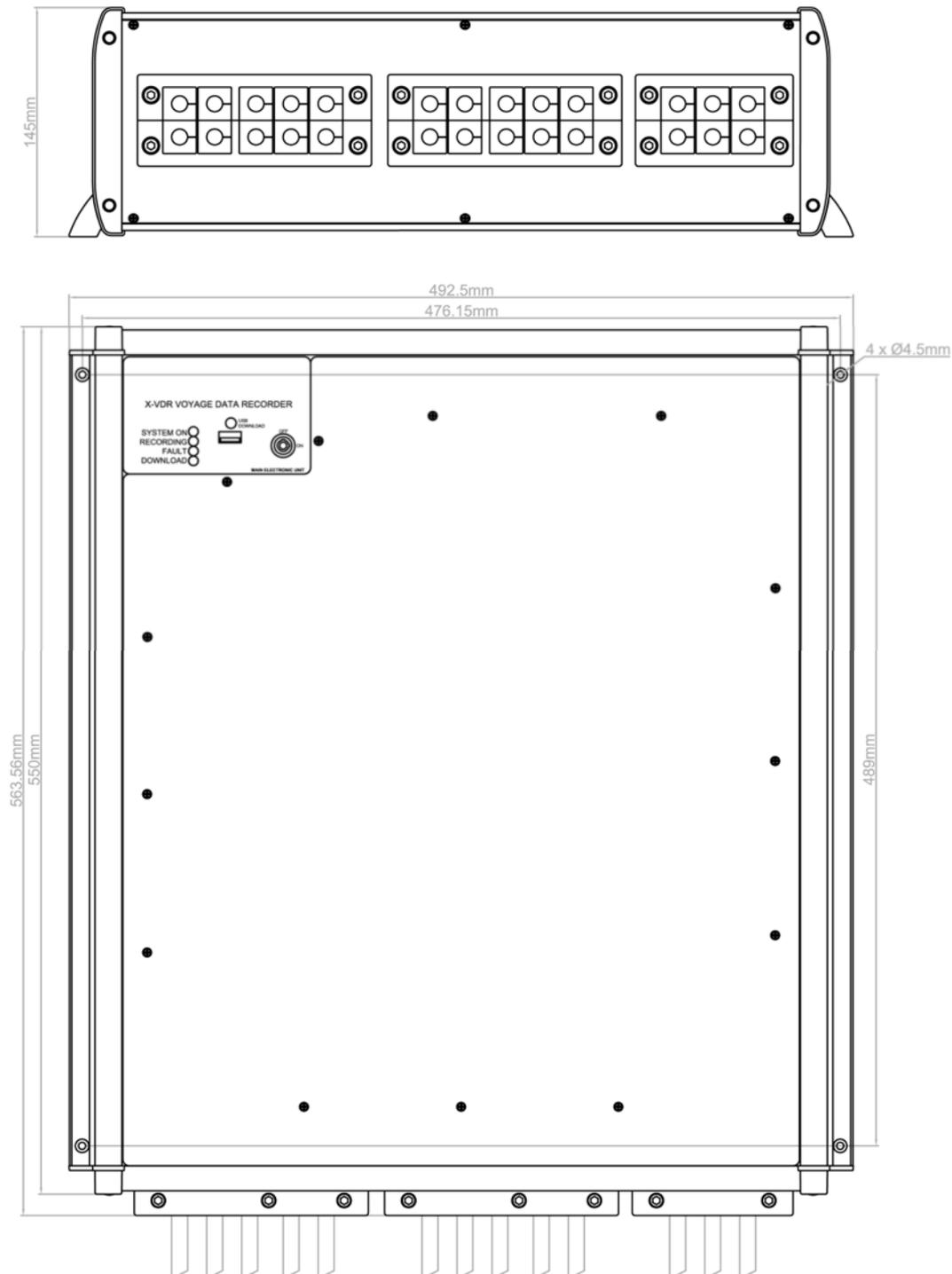
Prior to installing the equipment:

- (1) Check that the Installation Fitting Kit is available including keys.
- (2) Ensure that there is sufficient space in front of the units' designated position to allow the operator to work comfortably, and at the bottom to allow the installation of cables.
- (3) Ensure that there is enough space around the unit for maintenance purposes.

In the event of any discrepancy, the supply authority **MUST** be informed immediately.

10. Unit Dimensions and Installation

10.1 Main Electronic Unit



Weight: 8kg

The main electronics unit comes pre-assembled with the exception of the cable entry system.

Refer to the relevant illustrations provided in this Chapter, to ascertain the space requirements for each item of equipment and ensure that adequate space is provided, both for operation and maintenance access.

Locate and confirm a suitable location for the main electronics unit. The main electronics unit enclosure is secured to the bulkhead using 4 x M6 screws (not supplied).

11. Notes on Ventilation:

Due to the operational characteristics of the VDR the system has will run at a high temperature if not well ventilated. Therefore the MEU should be installed in a area of good ventilation. Inside a cabinet or console should not be considered an area of good ventilation.

The inlet filters should be replaced at least once per year.

Mounting of the main electronics unit is recommended using a prefabricated bracket.

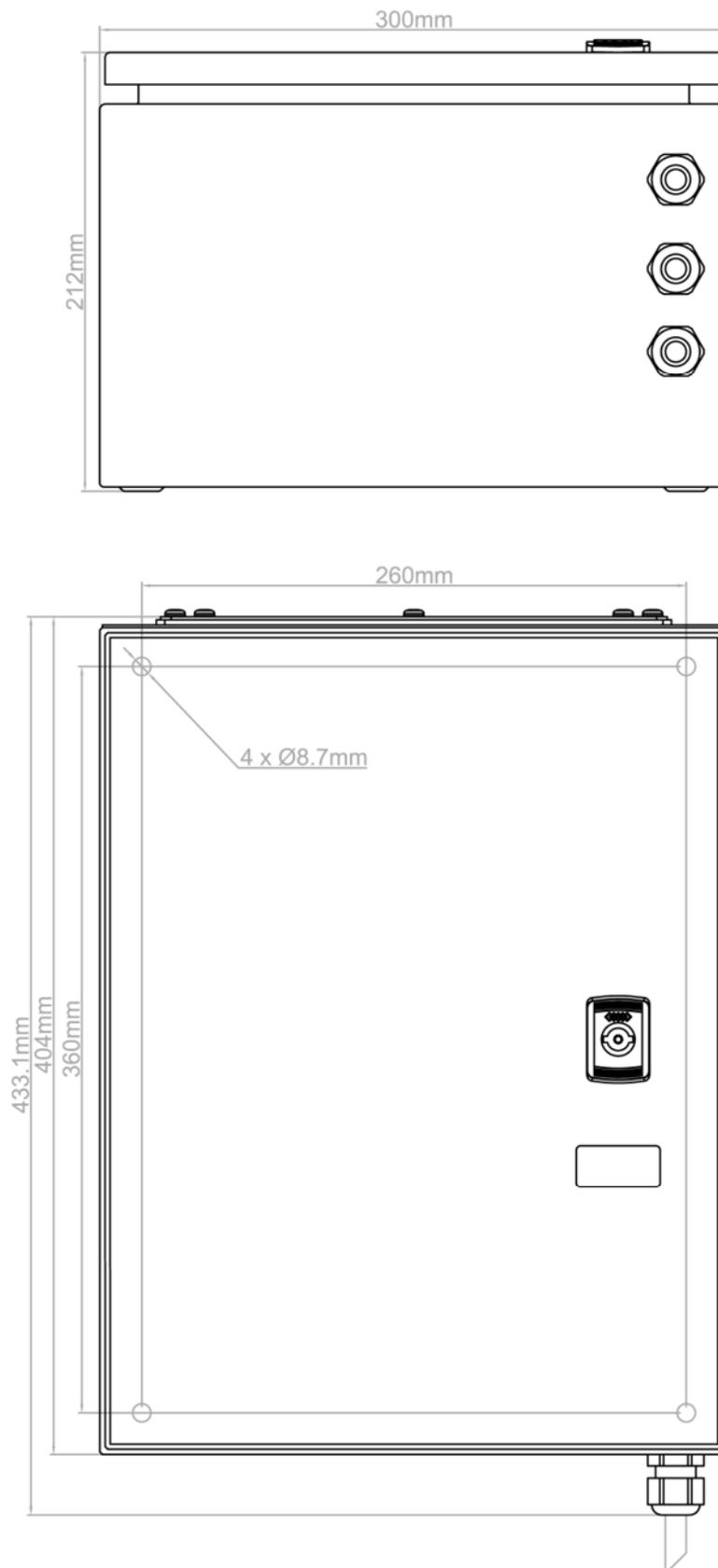


On completion of mounting the main electronics unit it is now ready for the termination of the cables.

To install the cabling to the main electronics unit, refer to chapter # for unit specific connections and implement the following:

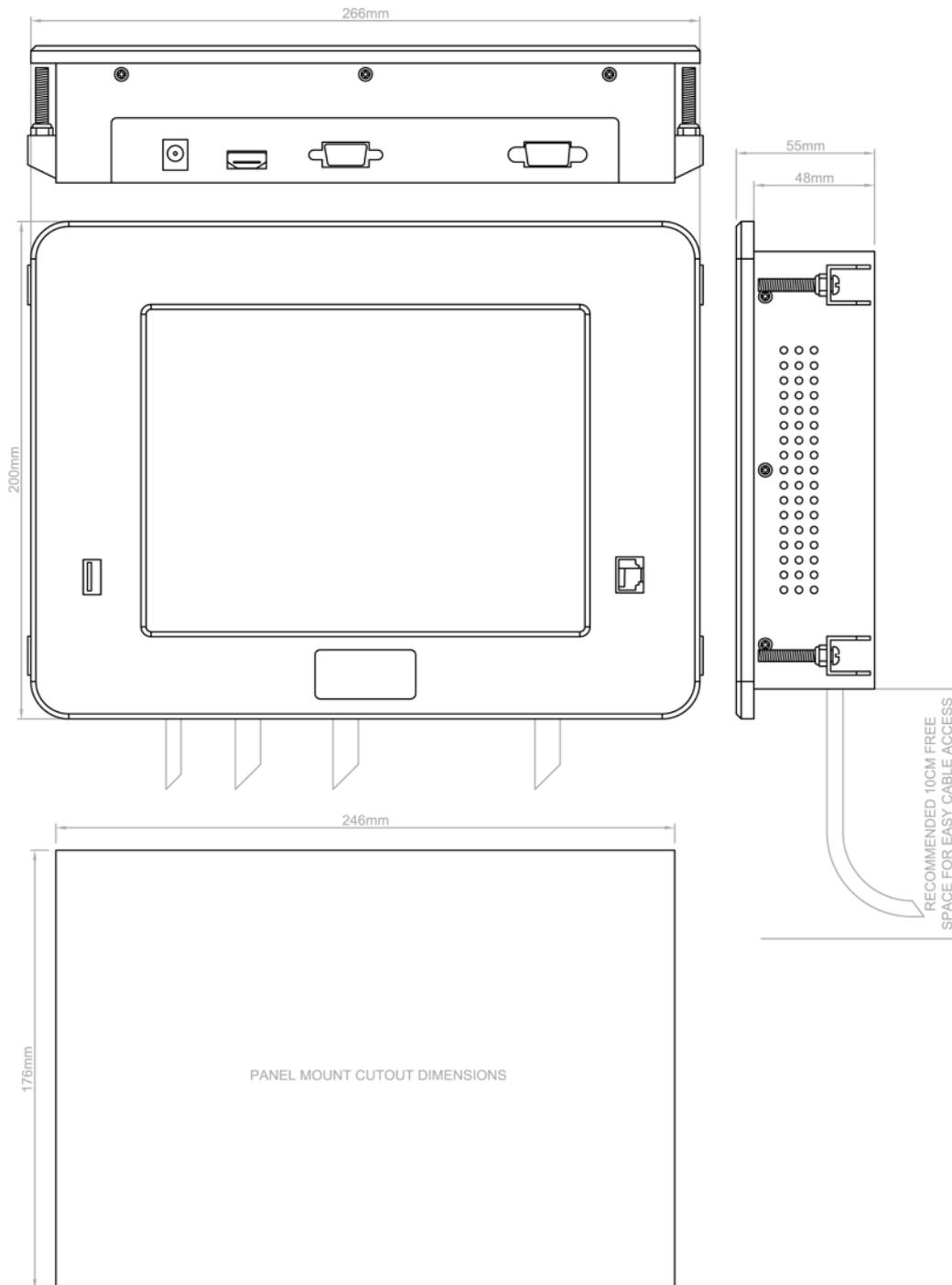
- (1) Remove the M3 x 6mm screws holding the front panel to gain access to the terminal board.
- (2) Fit the cable entry frames and cable inserts best suited to the cables to be used. Spare cable inserts are available on request.
- (3) Connect cabling via the insert holes in the base of the unit. Ensure that the sheathing of each cable is cut back sufficiently to allow its EMC shield to be made into a fly lead and terminated with a ring crimp to fit on one of the earth studs. It is recommended for a neat and easy installation that the UPS supply, video and capsule cables are fed through the right-hand cable frame, the data and monitor cables via the centre cable frame and the microphone and VHF cables via the left-hand cable frame in the base of the unit.
Make the connections, as detailed in the appropriate interconnections diagram(s).
- (4) Ensure that each cable is clearly and indelibly labelled with its connector number and function.

12. Uninterruptible Power Supply



Weight: 10kg

13. Touch Screen Console / Bridge Control Panel



Weight: 1.5kg

The Bridge Control Panel comes as a console flush mount.

A rectangle hole should be cut into the console making sure that there is enough space behind to enable the access to the VGA and Serial ports. This will allow the attaching of the VGA cable and the serial connector.

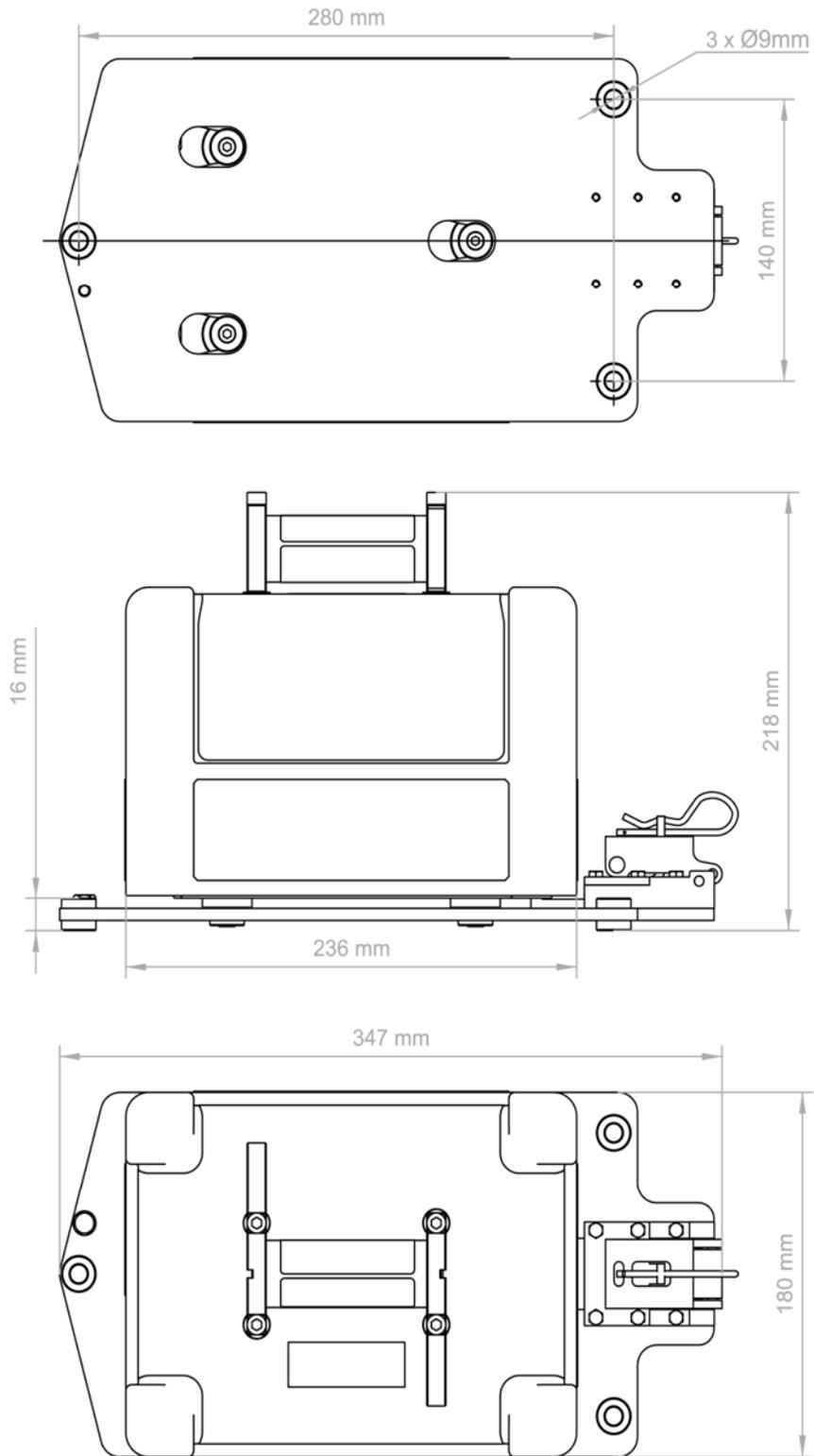
The Bridge Control Panel is fixed into position using the 4 x clamps provided.

The Bridge Control Panel requires a 12VDC power source which comes from the MEU via the provided 24V to 12V power supply adaptor. This will ensure that 12V is available at the Bridge Control Panel.

Display Specification:

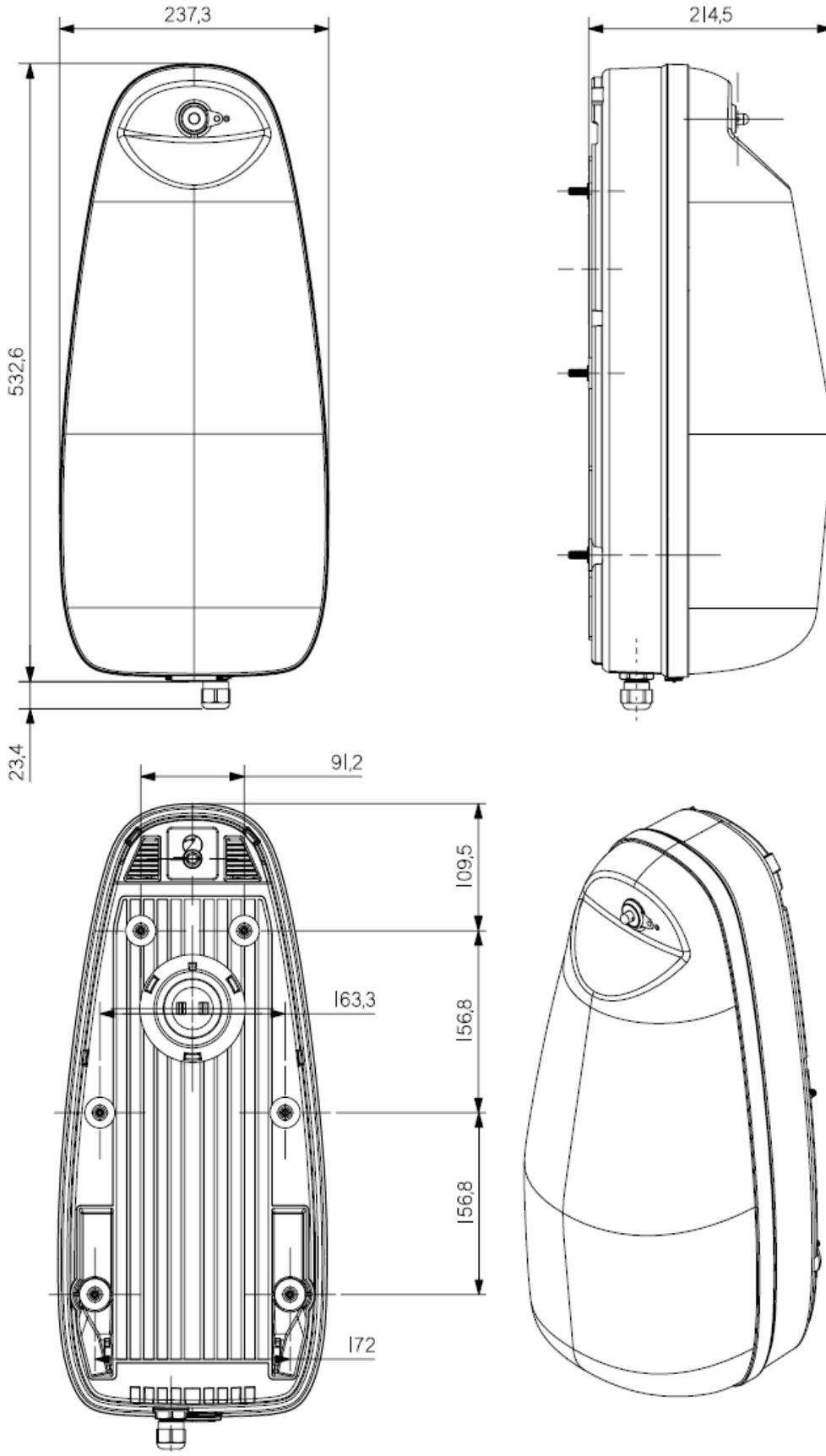
Screen size	8.4"
Aspect Ratio	4:3
Active Area	170.4 x 127.8mm
Brightness	250nits
Contrast	500:1
Response time	10ms
Viewing Angle	140(H) / 120(V)
Light Source	1CCFL
Touch Screen	Resistive
Touch Interface	RS232
Video Interface	VGA / HDMI
Power Input	12Vdc
Power Consumption	<15W

14. Fixed Hardened Capsule:



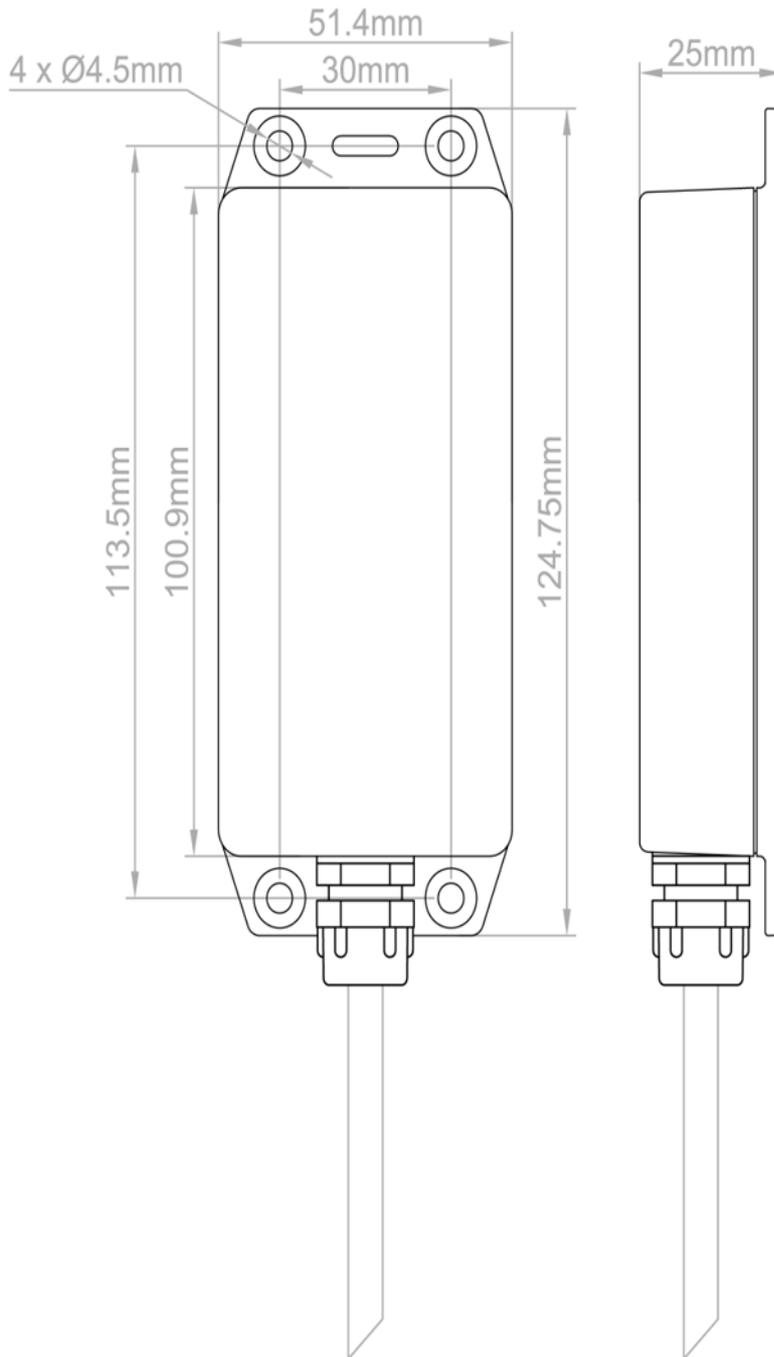
Weight: 12kg including mounting plate.

15. Float-Free Capsule:



Weight: 2.9kg

16. Microphones:



17. Installation guidance

17.1 Service mode

The X-VDR systems will automatically restart itself if the internal health check detects an error with the system such as the software not running.

Switch SW2 on the Terminal PCB has two positions. OPERATE and SERVICE.

Prior to any work being carried out on the XVDR software the system should be put into SERVICE MODE which will disable the auto-restart feature, allowing maintenance to be carried out safely.

Once maintenance is completed it is critical to return the switch to the OPERATE position for normal operation.

17.2 NMEA Data Inputs

The X-VDR has 20x NMEA data input ports which will accept NMEA 0183 data from 4800 baud to 38400 baud, selectable by DIP switch.

Port TB1	19200 or 38400
Port 2 and 3	4800
Port 4	19200 or 38400
Port 5 and 6	4800
Port 7	4800, 9600, 19200 or 38400
Port 8 and 9	4800
Port 10	4800 or 38400
Port 11 and 12	4800
Port 13	4800 or 38400
Port 14 and 15	4800
Port 16	4800 or 38400
Port 17 and 18	4800
Port 19	4800 or 38400
Port 20	4800

SW1 Selectable Baud Rates- All other TB are set to 4800 Baud.

	4800	9600	19200	38400
TB1	-	-	S1 = 0	S1 = 1
TB4	-	-	S2 = 0	S2 = 1
TB7	S3 = 0 and S4 = 1	S3 = 1 and S4 = 0	S3 = and S4 = 0	S3 = and S4 = 1
TB10	S5 = 0	-	-	S5 = 1
TB13	S6 = 0	-	-	S6 = 1
TB16	S7 = 0	-	-	S7 = 1
TB19	S8 = 0	-	-	S8 = 1

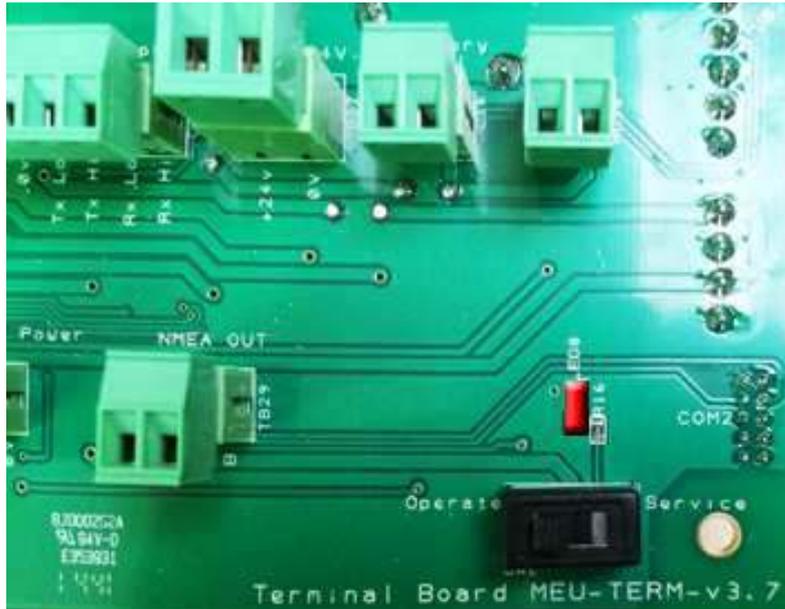
18. System setup

18.1 Service heading

The XVDR system will automatically restart itself if the internal health check detects an error with the system such as the software not running.

Switch SW2 on the terminal PCB has two positions. OPERATE and SERVICE.

Prior to any work being carried out on the XVDR software the system should be put into SERVICE MODE which will disable the auto – restart feature, allowing maintenance to be carried out safely.



When in the **Service Mode** LED8 will be lit.

Once the maintenance is complete it is critical to return the switch to the OPERATE position for normal operation.

To ease with any service it is recommended that wherever possible a USB keyboard and mouse is used.

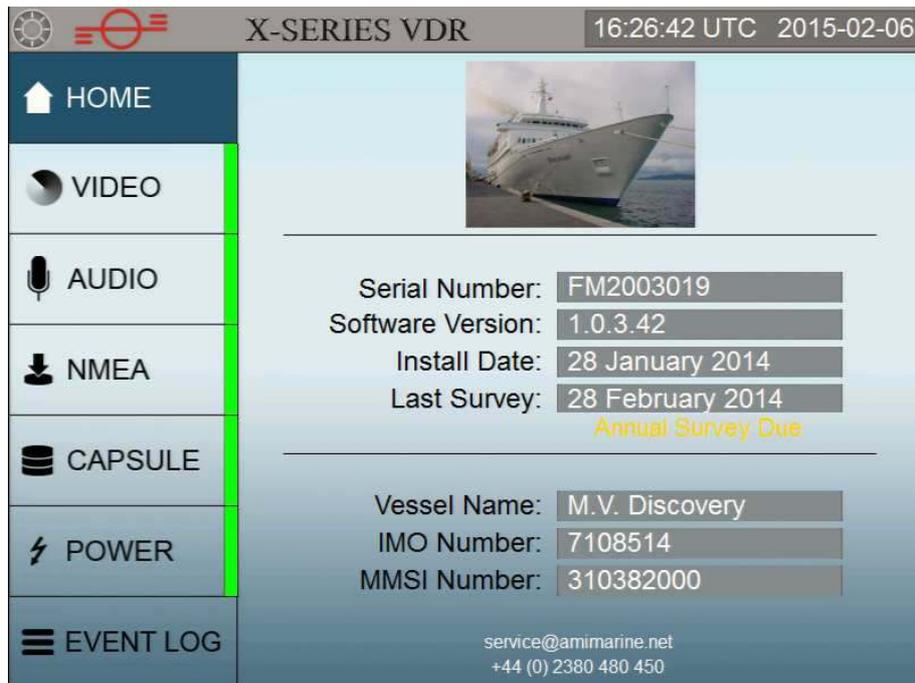
Please note: that the mouse cannot be seen whilst the X-VDR application is running.

19. On Initial start-up

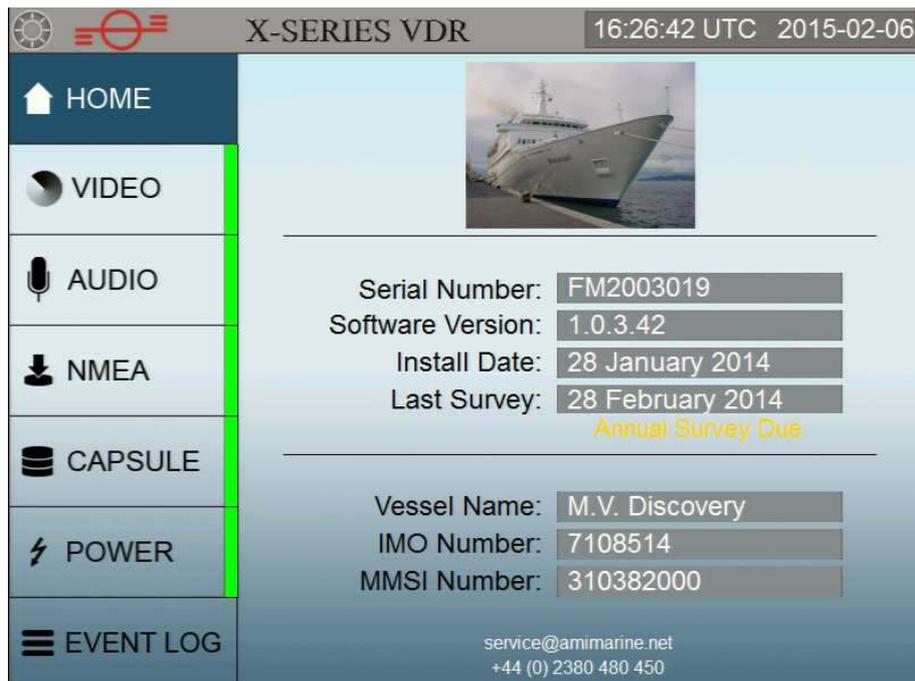
On initial start-up you will go direct into the windows environment. If not and the system starts into the X-VDR application then go to conduct the following:

20. Exiting the X-VDR Application

To exit the X-VDR application the procedure is to **press and hold** the vessel image for 10 seconds.



Now **TAP** the X-SERIES VDR banner 5 times.

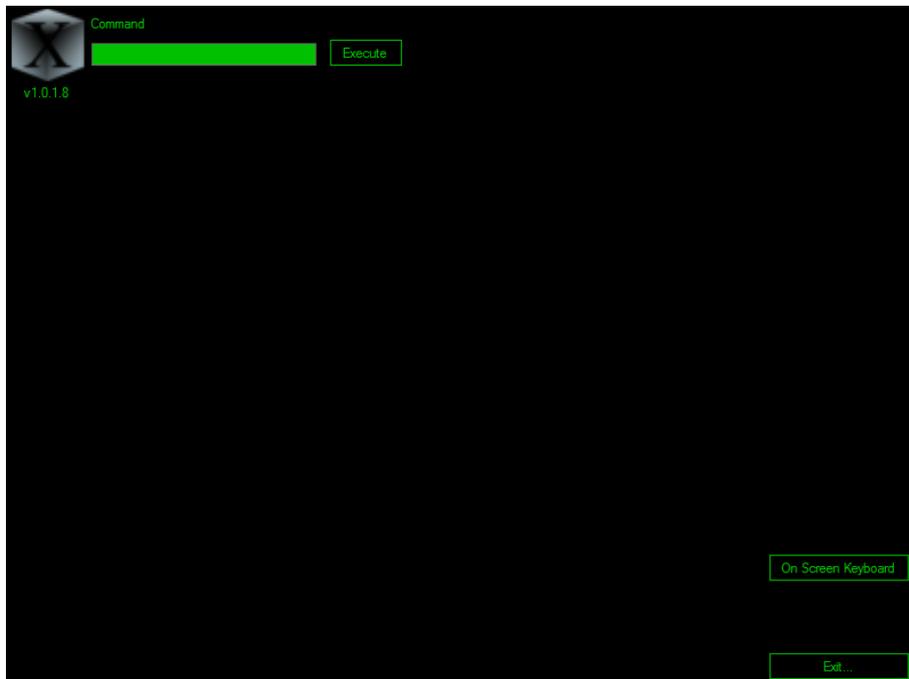


The engineer Log-In screen will appear with the On-Screen keyboard.

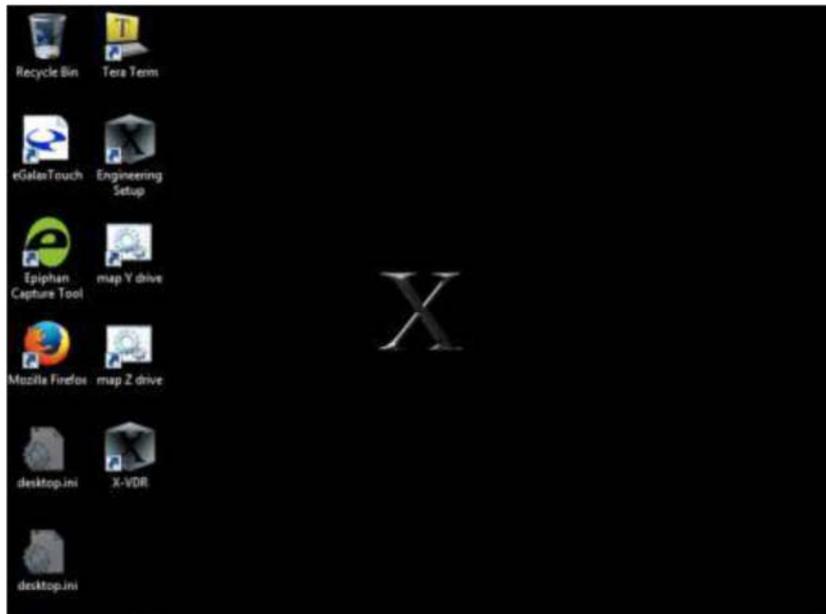


Type in your Username and Password which will have been issued to you and can be found on your training certificate. Press 'Shutdown X-VDR'. You have 120 seconds to enter these details before the Login screen disappears. If it disappears start the procedure from the beginning.

On successful acceptance of your details the X-VDR application will shut down and reveal the black explorer screen. In the green Command box type in 'explorer' then press Execute. This will open windows explorer. If you have a mouse connected you will be able to navigate easier.



21. Windows Desktop application



Here you will find the following applications;



Engineering setup

Here you will type in the requested ships particulars, consumables expiry dates.



Epiphany Capture Tool

This application allows you to monitor and adjust the video images being received.



Terra Term

With this tool you are able to see real time the NMEA data being received.



eGalax Touch

From here we can recalibrate the touch screen as necessary.



Mozilla Firefox

Mozilla Firefox allows you to log on to the capsules and perform maintenance tasks.



Map Y and Z drive batch commands

These are quick and easy shortcuts to map each of the capsule ready for operation.



X-VDR application

Once the Engineering Setup and the capsule have been mapped you can start the X-VDR application to confirm everything is ok.

22. Engineering Setup

NOTE: This program must be run and all pages completed, where applicable, prior to running the X-VDR software for the first time.

The Engineering Setup utility has been designed to make creating the X-VDR configuration files easier for the installation and service engineers. When executed for the first time the configuration files will be saved to the Operating System drive, with backups recorded to the LTRM and both capsules. When run on the X-VDR after the initial installation the software will read in the existing configuration files and populate the data into the text boxes and fields automatically.

This document has been written with reference to version 1.0.4.3 of the software and as such is subject to change.

The X-VDR Engineering Setup software is broken down into TABs for each area of the system. The screen shot below shows the view on opening the software (this example shows a test X-VDR system, so information has been pre-loaded automatically).

The screenshot displays the 'X-VDR Engineering Setup - v1.0.4.3' application window. The 'General Information' tab is active, showing various configuration fields. The 'Vessel Information' section includes fields for Name (DEV SYSTEM 1), IMO Number (IMO-DEV-00001), and MMSI Number (MMSI-DEV-000001). The 'VDR Information' section shows Install Date (10 November 2014), Last Survey (10 November 2014), and Serial Number (Development001). The 'Vessel Image' section has a Location field (C:\) and a 'Select Folder' button. The 'Trial Approval Information' section includes Type Approval Authority (DNV GL SE), Type Approval Reference (TEST System), and Type Approval Date (12 November 2014). The 'Capsule Information' section contains three rows of data for ULB, Hydrostatic Release, and Batteries, each with 'Last Replaced' and 'Replacement Due' dates. The 'File Location Information' section is divided into 'Local Storage', 'Temporary Storage', 'Float Free Module', and 'Fixed Module', each with location and headroom fields. The 'Configuration Files Date' section shows 'Last Saved' as 14 Nov 2014 @ 13:01:24. At the bottom, there are four buttons: 'Load Config Files', 'Load Config File', 'Backup Config Files', and 'Save Config Files'.

The aforementioned TABs are shown in the above example. These are 'General Information', 'VIDEO Capture', 'IEC 61162-450', 'AUDIO', 'Serial Data', 'NMEA Sentences' and 'Sensor Source Data'. VDR Information and Capsule information are selected from the drop down boxes and the dates are selected as necessary.

23. General Information Page

Vessel Information

Name	DEV SYSTEM 1
IMO Number	IMO-DEV-00001
MMSI Number	MMSI-DEV-000001

The Vessel Information Box only contains 3 pieces of information (Name of the Vessel, Vessels IMO number and the Vessels MMSI Number), each one of these fields needs to be complete for the X-VDR system to work.

Vessel Image

Location: C:\



The Vessel Image Box, is not required for the X-VDR system to work and can be left blank. But if you have an image of the vessel or a corporate logo you can copy it to the X-VDR system and then use the Select Folder button to select the image file (PNG, JPG and BMP files).

VDR Information

Install Date	10 November 2014	<input type="button" value="Calendar"/>
Last Survey	10 November 2014	<input type="button" value="Calendar"/>
Serial Number	Development001	

The VDR Information Box holds the information about when the system was initially installed and when the last survey of the system was conducted, these are selected by clicking the icon and then selecting the appropriate date. The serial number is the X-VDR System Serial Number.

Capsule Information

ULB Last Replaced:	10 November 2014	<input type="button" value="Calendar"/>	Replacement Due:	10 November 2015	<input type="button" value="Calendar"/>
Hydrostatic Release Last Replaced:	10 November 2014	<input type="button" value="Calendar"/>	Replacement Due:	10 November 2015	<input type="button" value="Calendar"/>
Batteries Last Replaced:	10 November 2014	<input type="button" value="Calendar"/>	Replacement Due:	10 November 2015	<input type="button" value="Calendar"/>

The Capsule Information Box holds information about when the ULB, Hydrostatic release and Batteries were fitted or replaced, for this you will need to select as above the dates fitted and then also select the date that replacements are due in the box to the right of each item. As the replacement date approaches the X-VDR system will show text to inform the crew.

The screenshot shows a configuration window titled "File Location Information". It is divided into four quadrants, each representing a different storage location. Each quadrant has a "Location" text box, a "Headroom (MB's)" text box with a value of 100, and "Format" and "Browse" buttons. The "Local Storage" quadrant has a location of "L:\". The "Temporary Storage" quadrant has a location of "L:\Temp". The "Float Free Module" quadrant has a location of "Y:\" and a "Serial Number" of "00001". The "Fixed Module" quadrant has a location of "Z:\" and a "Serial Number" of "000002". To the right of these four quadrants is a single "Format all Locations" button.

The File Location Information Box holds information about where the X-VDR is to store the Files it records each Box Local Storage, Temporary Storage, Float Free Module and Fixed Module all work in the same way. The Location text box contains where the files will be stored, local storage is where the 30 days of recorded data will be stored locally (within folders). So taking the Local Storage Location as D:\ above the files will be stored as follows:

- D:\Archive\ where all recorded data will be stored
- D:\Config\ where the X-VDR Configuration files will be stored.
- D:\Log\ where the X-VDR Event Log is stored.

The Temporary file location is where the X-VDR stores data as it arrives before packaging it into 1 minute compressed zip files.

The Float Free Module and Fixed Module will store the files in a similar manner to the Local Storage but there will not be a Log Directory.

The Browse button in each storage box will allow you to browse for the Folder/location where the files are to be saved and then put that location into the Location textbox.

The format buttons for each storage location will format the location with the directories the X-VDR system requires to run:

Local storage will have:

Archive, Config and Log Directories

Temporary storage will have:

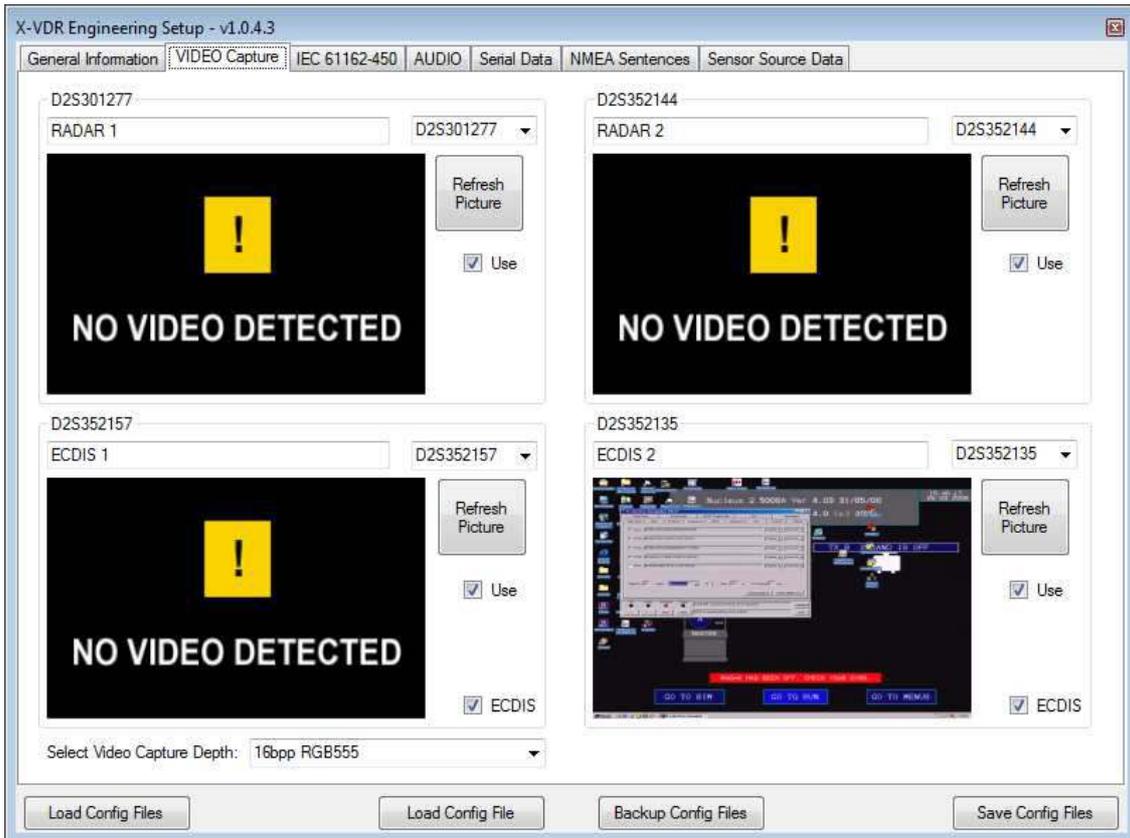
Odd and Even directories

The Float and Fixed Module locations will have:

Archive and Config Directories

If all locations are populated (Local, Temporary Storage, Float Free Module and Fixed Module), then the Format All Locations will work as if you had clicked each Format button in turn.

24. VIDEO Capture page

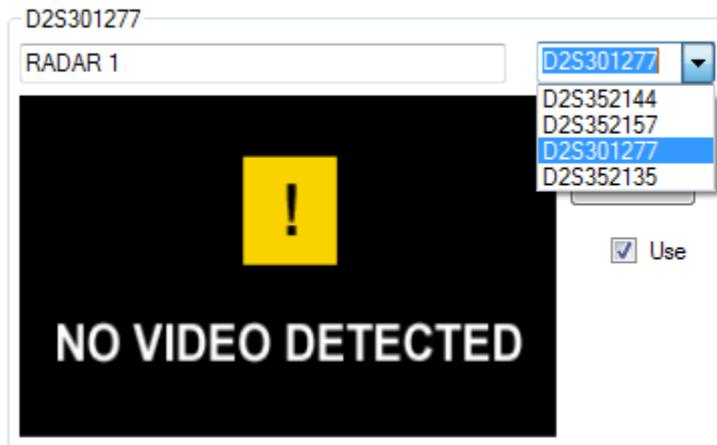


The Video Capture tab accesses the Video Capture Cards (Maximum of 4). All cards can be used for RADAR video capture, but if Video Capture is required for ECDIS then only the lower two cards can be used for ECDIS capture.

Each Box (Card 0, Card 1, Card 2 and Card 3), have a textbox, this is the text that is displayed on the folders in the X-VDR software when it is running (RADAR 1, RADAR 2, ECDIS 1 and ECDIS 2 in the image above). If a card is fitted then the Use checkbox should be ticked and the textbox filled in. Each image displayed will load when the engineering setup program is initially opened, if you want an updated screen capture then click the Refresh Picture button for the card you want to refresh.

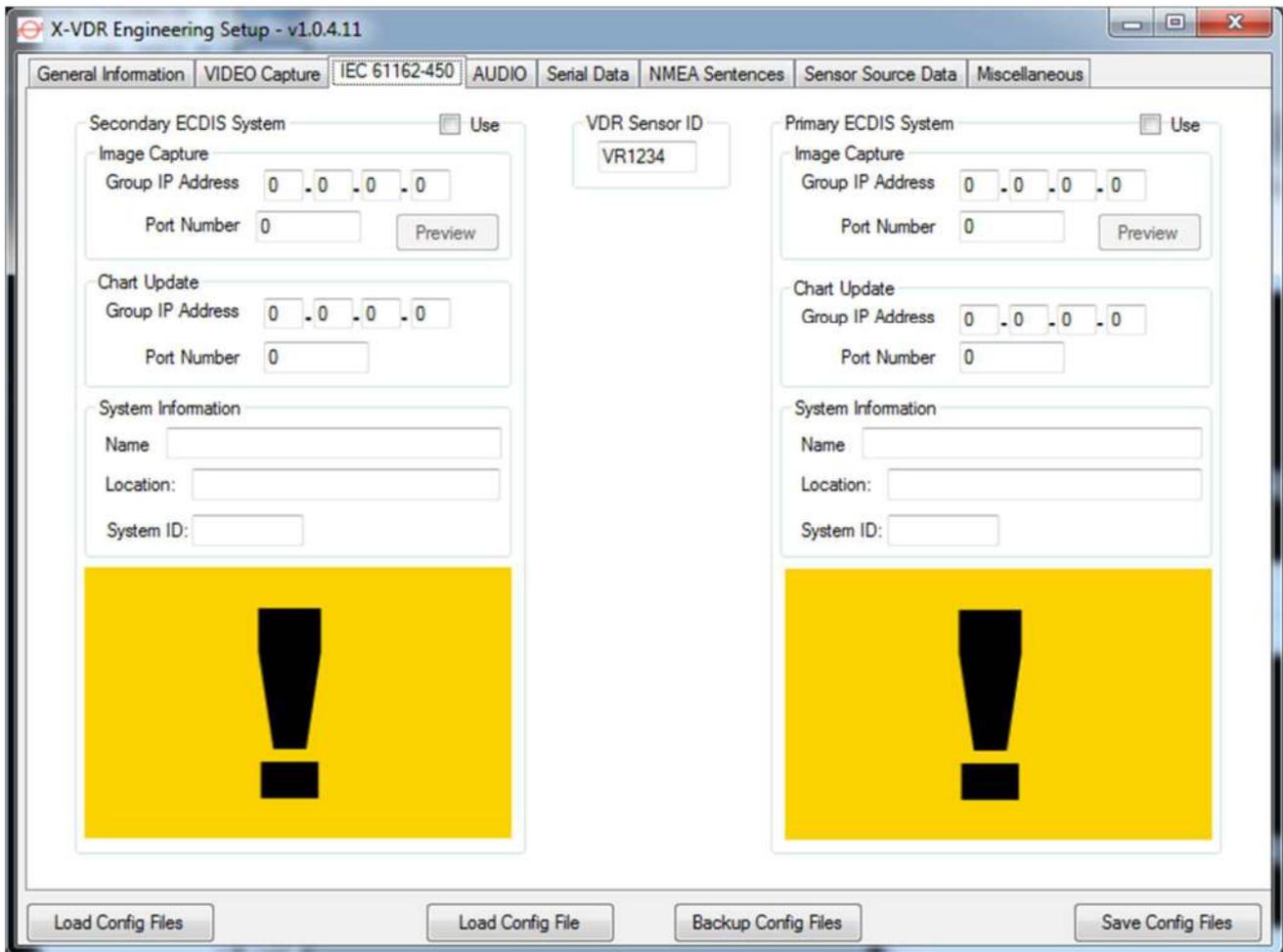
For the lower two boxes (D2S352157 and D2S352135), the ECDIS check box should only be checked if the card is capturing from an ECDIS system. If any ECDIS check box is selected then you will be unable to use IEC61162-450 for capturing ECDIS.

The select Video Capture Depth box gives options for the compression type and level of the saved Images.



You can assign any card to any box, the selection dropdown box shown above shows all of the Video capture cards fitted into the X-VDR system, when you select the card the text above the system text will change to the selected cards serial number. If the card you select has already been selected in one of the other slots a warning will be displayed asking you if you want to use the selected card, if you select yes then the card will be removed from wherever else its currently selected.

25. IEC 61162-450 Page



This page is used to configure the capture of ECDIS screen images and chart updates over Light Weight Ethernet (LWE)

The VDR Sensor ID, is initially set to VR1234 and this should not require changing, but if another system on the network is set to the same ID then this will need to be changed to prevent conflicts.

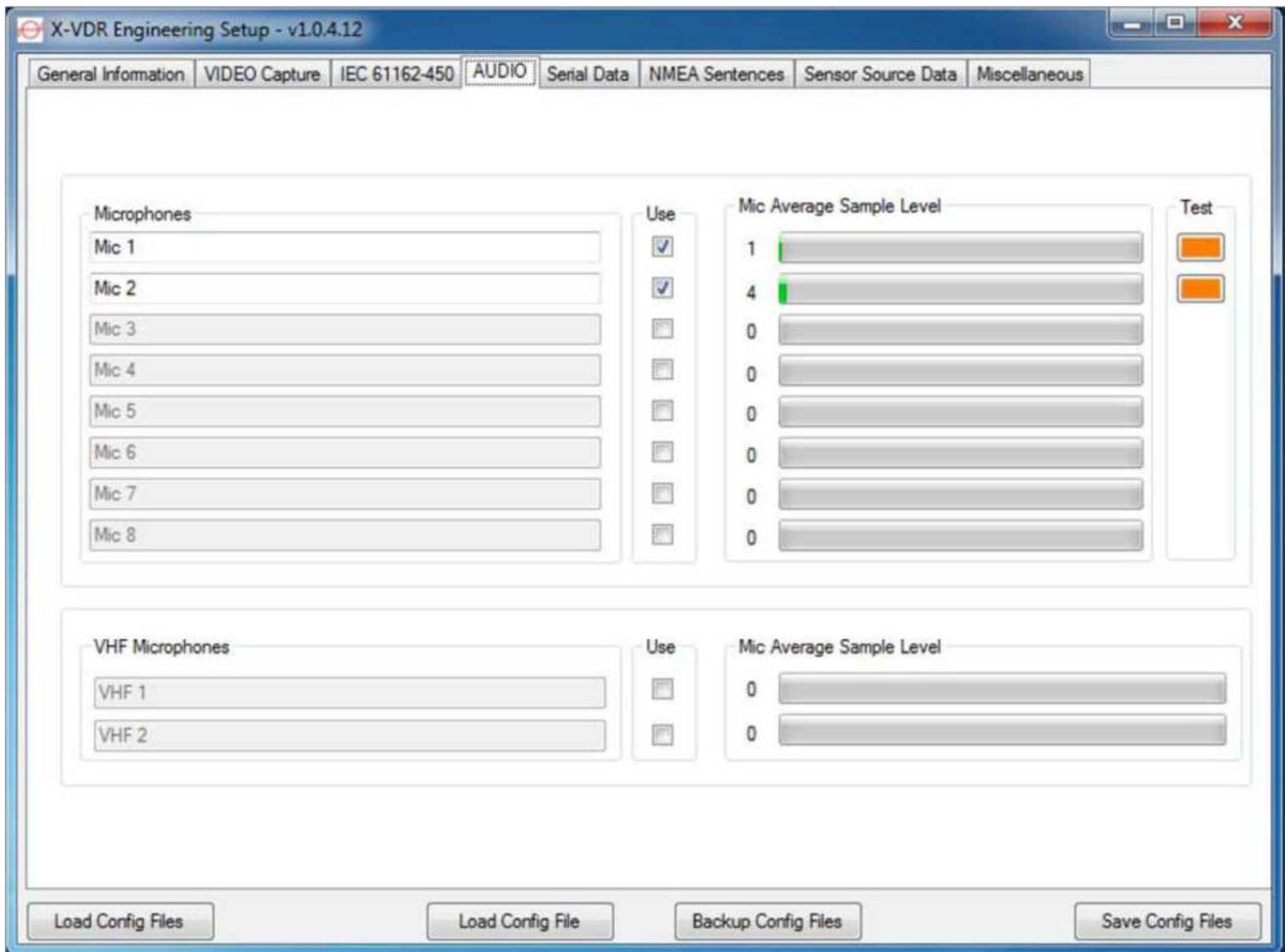
The X-VDR has the facility to record the image/chart information from two separate UDP networks. For each ECDIS the Group IP address and port number are required for Image Capture and Chart Update information, this information should be available from the ECDIS manual and will vary on each vessel.

Once the correct IP and Port numbers have been added the System Name will need to be entered (Set to ECDIS 1 and ECDIS 2 in the image above), this text will be displayed on the folder tabs on the X-VDR GUI when the system is running.

The location is for information only and is saved in the Configuration files but is not displayed on the X-VDR GUI.

Once all relevant information has been entered the Use checkbox needs to be ticked so that the system will capture from the source, if any of the VIDEO capture cards are set to ECDIS then a warning message will be displayed and you will be unable to select the use checkbox until the VIDEO capture tick box is un-ticked for ECDIS use.

26. AUDIO Page



The AUDIO tab contains 10 Text boxes and 10 Checkboxes. The bottom 2 boxes are for VHF Microphones and the top 8 boxes for all other microphones. To enter text you must first check the 'use' box next to the textbox you want to enter data.

The text entered should be an accurate description of the location of the associated microphone, or make and model of VHF unit.

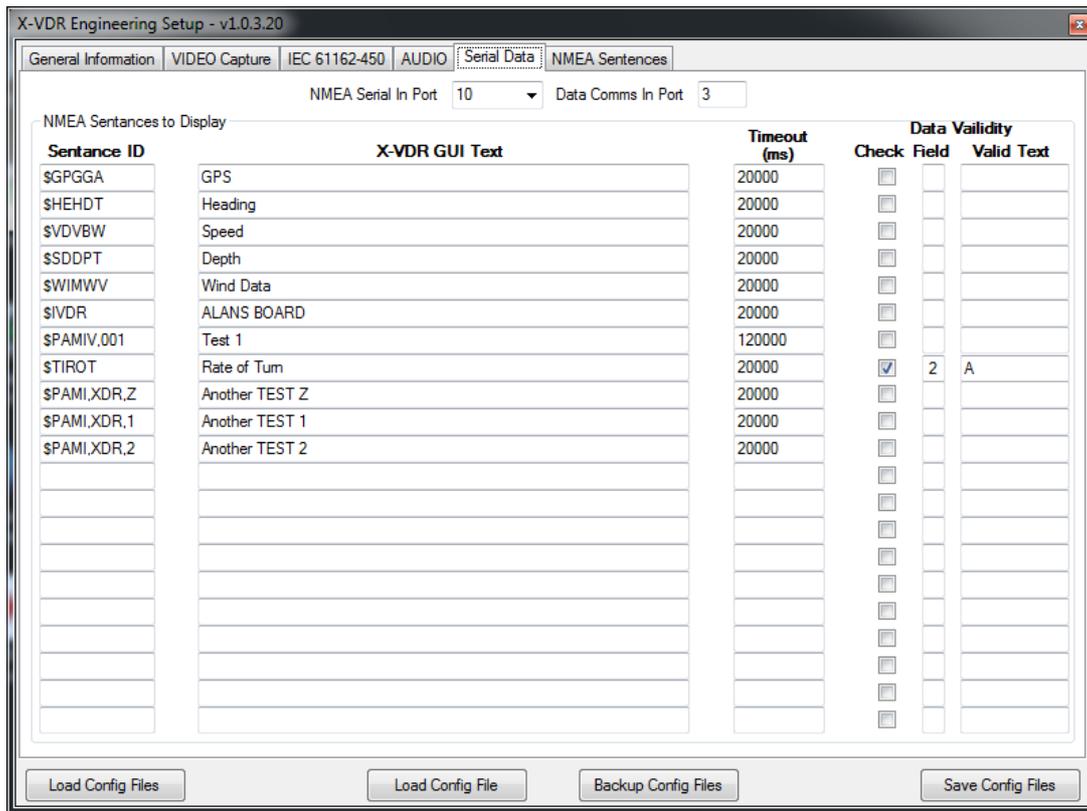
Only when the 'Use' check box is selected will that channel be recorded by the X-VDR.

When the 'Use' box is checked then you can monitor and test each microphone individually.

You can see the 'Mic Average Sample Level' as a green bar which will increase as the audio level is increased.

The 'Test' button is amber on first starting the X-VDR Engineering Setup, Pressing the 'Test' button will initiate an audible test and if everything is OK the button will go green if it fails it will go red.

27. Serial Data Page



On this page the NMEA sentence headers should be added that are to be monitored, and for which an alert is to be present if the respective serial data is not received.

Note that not all sentences from a single source need to be monitored e.g. the GPS of all the sentences that are available the recommended sentence to monitor is the date and time i.e. \$GPZDA because it can be assumed that if this goes missing then there is a problem with the source.

The facility to select the timeout period is in milliseconds and the default is 20000 i.e. 20 seconds.

The additional option is to enable the further checking of an NMEA sentence by selecting a field within that sentence and stating what is the correct or required value. If that value changes or goes missing the system will raise a caution.

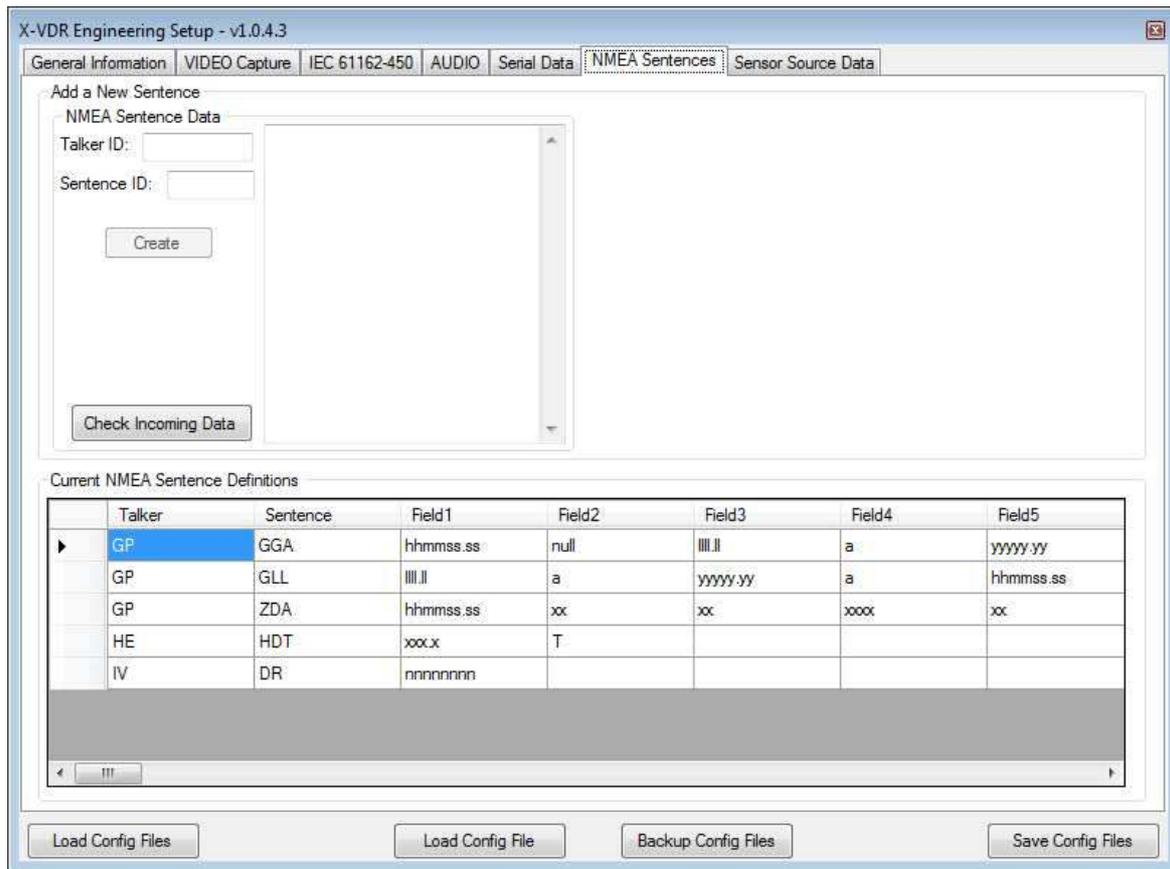
By checking the Port inputs you can identify what is being recorded and decide which is the priority sentence from that particular equipment. You are not restricted on selecting multiple sentences from source equipment but there are only 21 sentences that can be monitored.

If the 'check' checkbox is selected then the system will look at a single field within the sentence to see if a valid return has been received. In the image above the \$TIROT had this box ticked. The X-VDR system will now check field 2 of the NMEA string for an 'A' character. If any character other than 'A' is present in field 2 then an alert is generated and a log entry written.

The 'Valid Text' can be either a single character or a string of characters dependent on the particular string being monitored.

The return must be exactly the same as the text in the 'Valid Text' box, and is case sensitive.

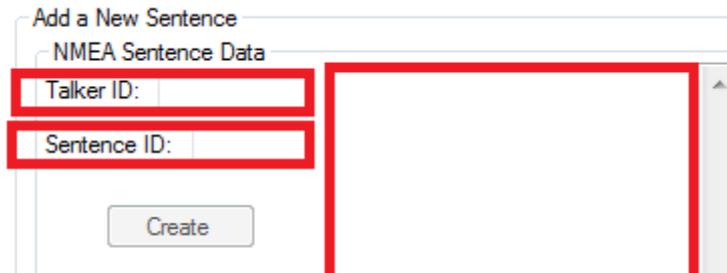
28. NMEA Sentences Page



The NMEA Sentence Page enables the identification of any NMEA sentences, notably any proprietary sentences, along with a descriptions of each of the individual fields within the NMEA string. This will be particularly useful on playback to clearly identify the meaning of these sentences.

As can be seen above currently 4 sentences are held in the configuration files, this can be edited, deleted and new sentences added from this tab.

To add new sentences follow the instructions below:



Enter a Talker ID and Sentence ID into the 'NMEA Sentence Data' box and a description of the sentence in the box to the right (all three highlighted in red above), then the Create button will then become enabled.

Click the 'Create' Button

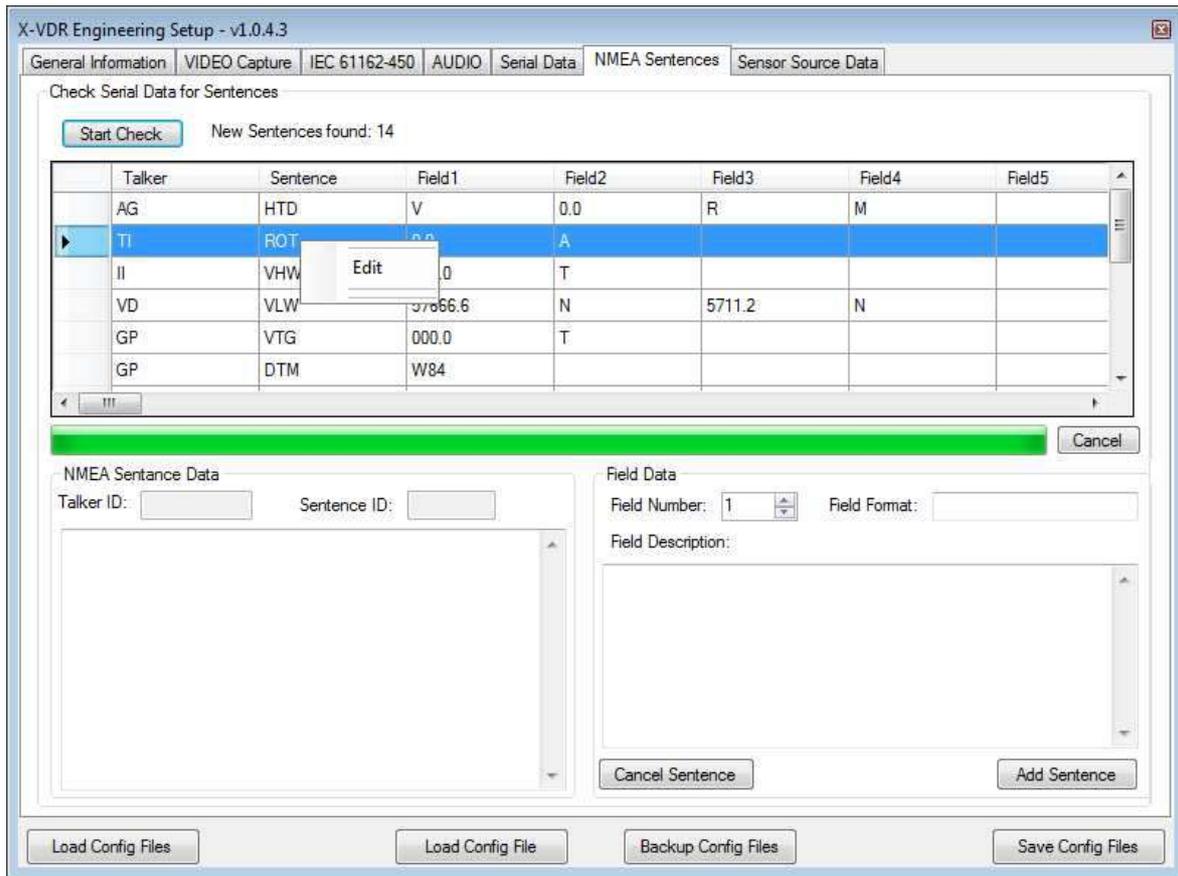
The screenshot shows a software interface for adding a new NMEA sentence. It is divided into two main sections: 'NMEA Sentence Data' and 'Field Data'.
In the 'NMEA Sentence Data' section, there are two input fields: 'Talker ID' with the value 'PA' and 'Sentence ID' with the value 'MIV'. Below these is a 'Create' button. To the right is a large text area labeled 'Test NMEA Message'. At the bottom left of this section is a 'Check Incoming Data' button.
The 'Field Data' section is on the right. It has a 'Field Number' dropdown menu set to '1' and a 'Field Format' text box containing 'text'. Below these is a 'Field Description' text area containing the text 'This Contains example text'. At the bottom of this section are two buttons: 'Cancel Sentence' and 'Add Sentence'.

To the right of the 'NMEA Sentence Data' a new box will appear called 'Field Data', this is where you can enter the structure for each field of the sentence.

Use the Field Number selection box to select the desired field and then enter the Field Format this could be nnnn.nn for a four figured number with two decimals to xxxxxx for data of 6 characters length, and then enter a description of the field. The maximum number of fields is 100.

Once you have entered all the data for the sentence click the 'Add Sentence' button, you can click 'Cancel Sentence' at any time and the current sentence you are creating/editing will be removed from the 'Add a New Sentence' boxes.

To edit an existing sentence then follow the instructions below:

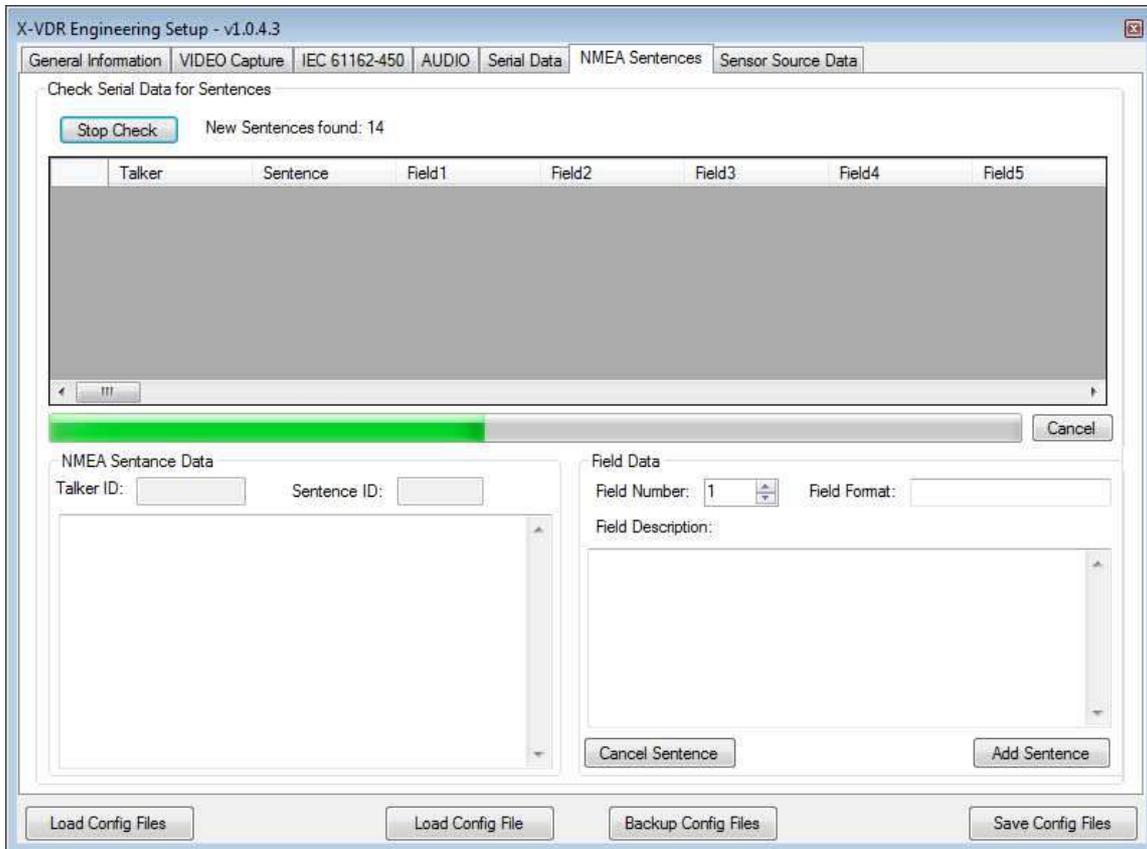


In the 'Current NMEA Sentence Definitions' Right click the sentence you wish to edit a small menu next to your mouse icon will appear with the option to Edit or Delete. Select Edit and the 'Add a New Sentence' box will be updated to contain the information for the selected sentence (you will be unable to change your selected sentence in the 'Current NMEA Sentence Definitions' box until you either Cancel Sentence or Update. You can now change any of the text for the Sentence or Field data, once you are happy with the edit click the Update button to update this definition, or click the Cancel Sentence to cancel your edit action without changing the sentence.

Note: Until you click the 'Save Config Files' any edits to this file will be lost if you exit the program or the computer crashes for any reason.

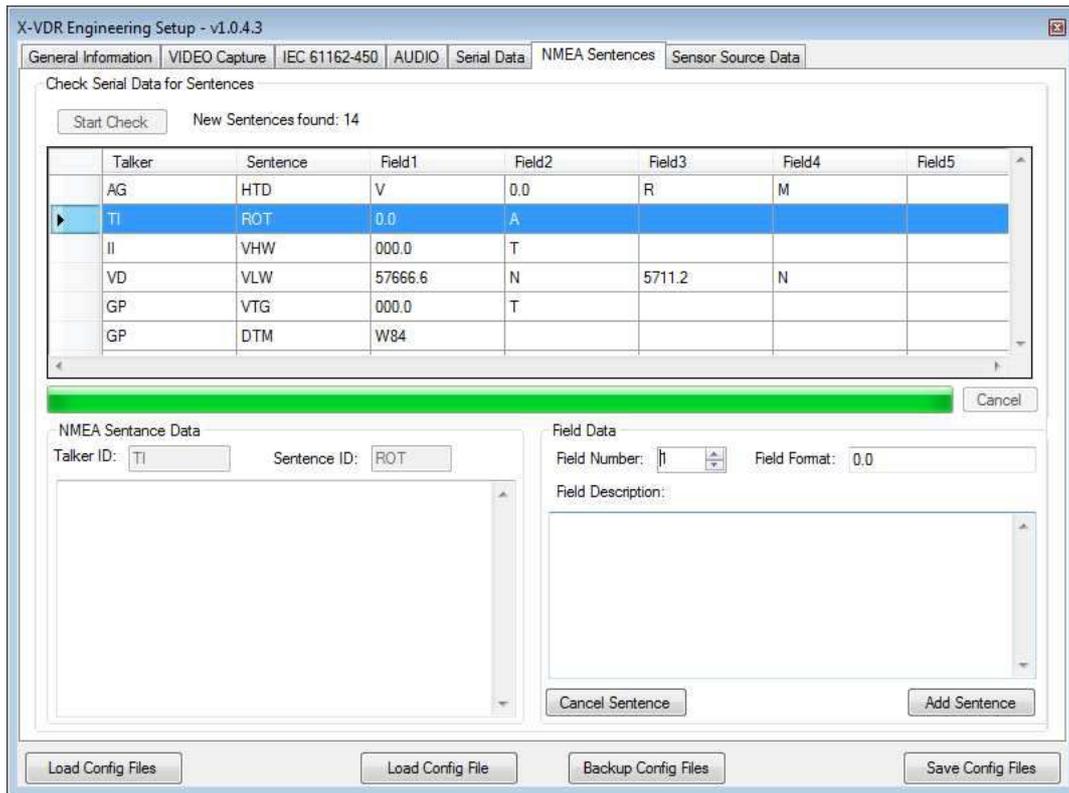
You can check what sentences are currently being received by the X-VDR system and by clicking the 'Check Incoming Data' button.

Once clicked you will see the screen above, to open the Serial Communications click the 'Start Check' button.



To the right of the Start/Stop check button a count of new sentences found is displayed. New sentences are any that are not already in the Sentence definitions described earlier. The Green progress bar will start to increase as no new sentences are received, if nothing new is received for 30 seconds then the search will stop automatically, or if you believe all sentences have been received then you can also click the 'Stop Check' to manually stop the search.

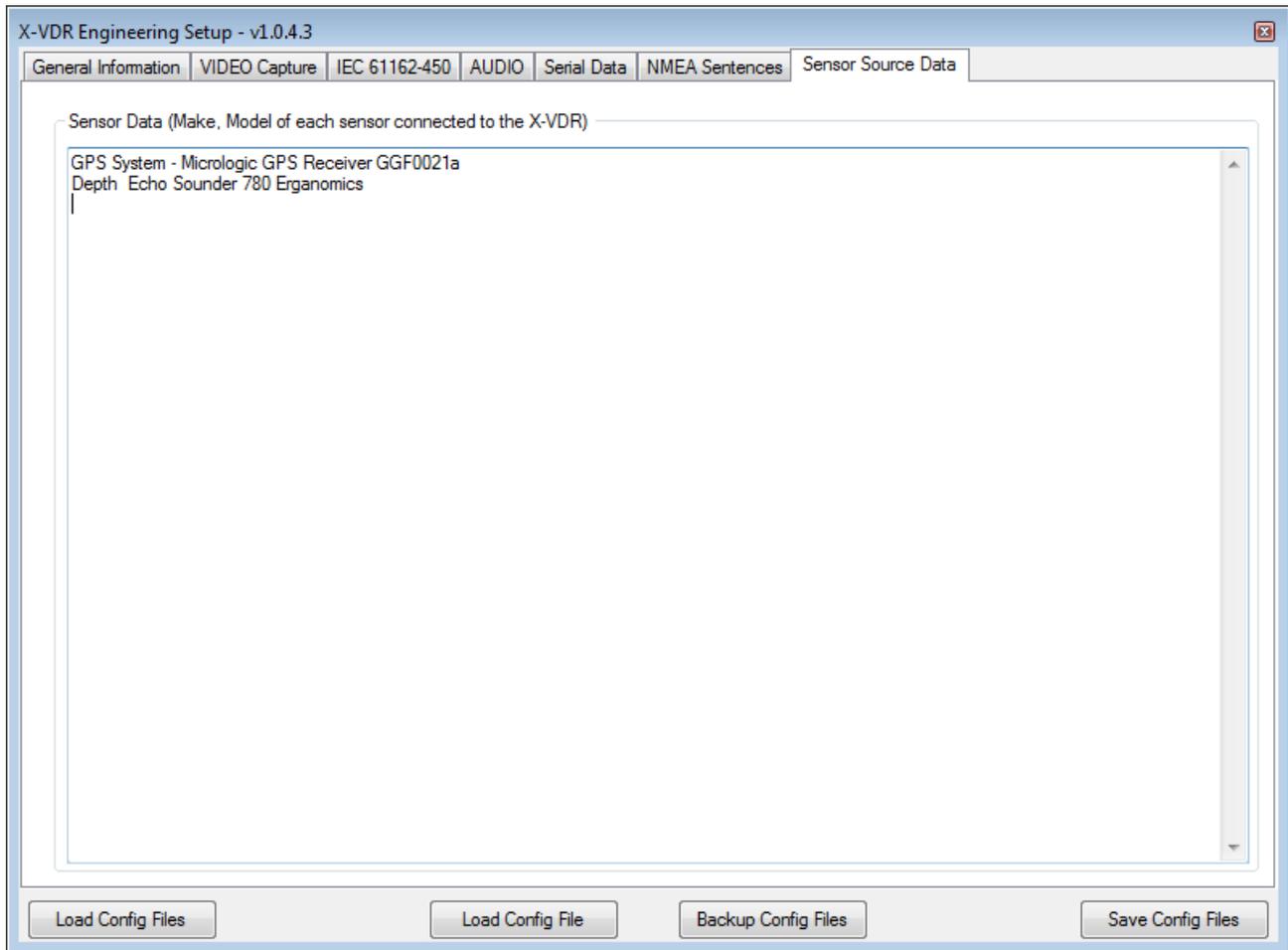
Once the search has found all new sentences or is manually stopped you will then the screen below is displayed:



The table at the top of the screen shows each new sentence that was received and the data that was in each field when it is received. What you need to do now is edit each one and then add it to the definitions list, to do this right click the sentence you want to edit and select edit, the data will populate to the 'NMEA Sentence Data' and the 'Field Data' boxes below, you can now enter a description for the sentence in the box below the Talker ID and Sentence ID boxes, and also scroll through the Field Data by selecting the Field numbers, the Field format will contain the data received and this will need changing to the format so if the data received was 0.0 then you would change it to n.n, you also need to enter a field description and then move to the next field by clicking the up arrow on the field number box. Once you have completed all fields and the Sentence description you can click 'Add Sentence' The sentence will now be removed from the top of the page and placed into the definitions. This should be done for all sentences in the top box.

Once complete click the 'Cancel' button next to the progress bar, you will now see the new sentenced in the 'Current NMEA Sentence Definitions' box.

29. SENSOR SOURCE DATA



The Sensor Source Data tab only contains a free text box to add the names, make, model and even serial number of the sensors connected to the X-VDR System.

For example:

Raymarine RayStar130 GPS Receiver (Serial SN2232233) provides GPGGA, GPZDA, GPGLL, GPGSA, GPGSV, GPRMB, GPRMC.

NKE Marine Interface Output (Serial SMK4424) provides IIVHW, IIVLW, IIDPT, IIDBT, IIMTW IIVWR, IIMWD, IIVWT, IIMTA, IHDG, IHDM, IHDT.

This information is saved to the configuration files for playback and investigation purposes.

30. Miscellaneous Page

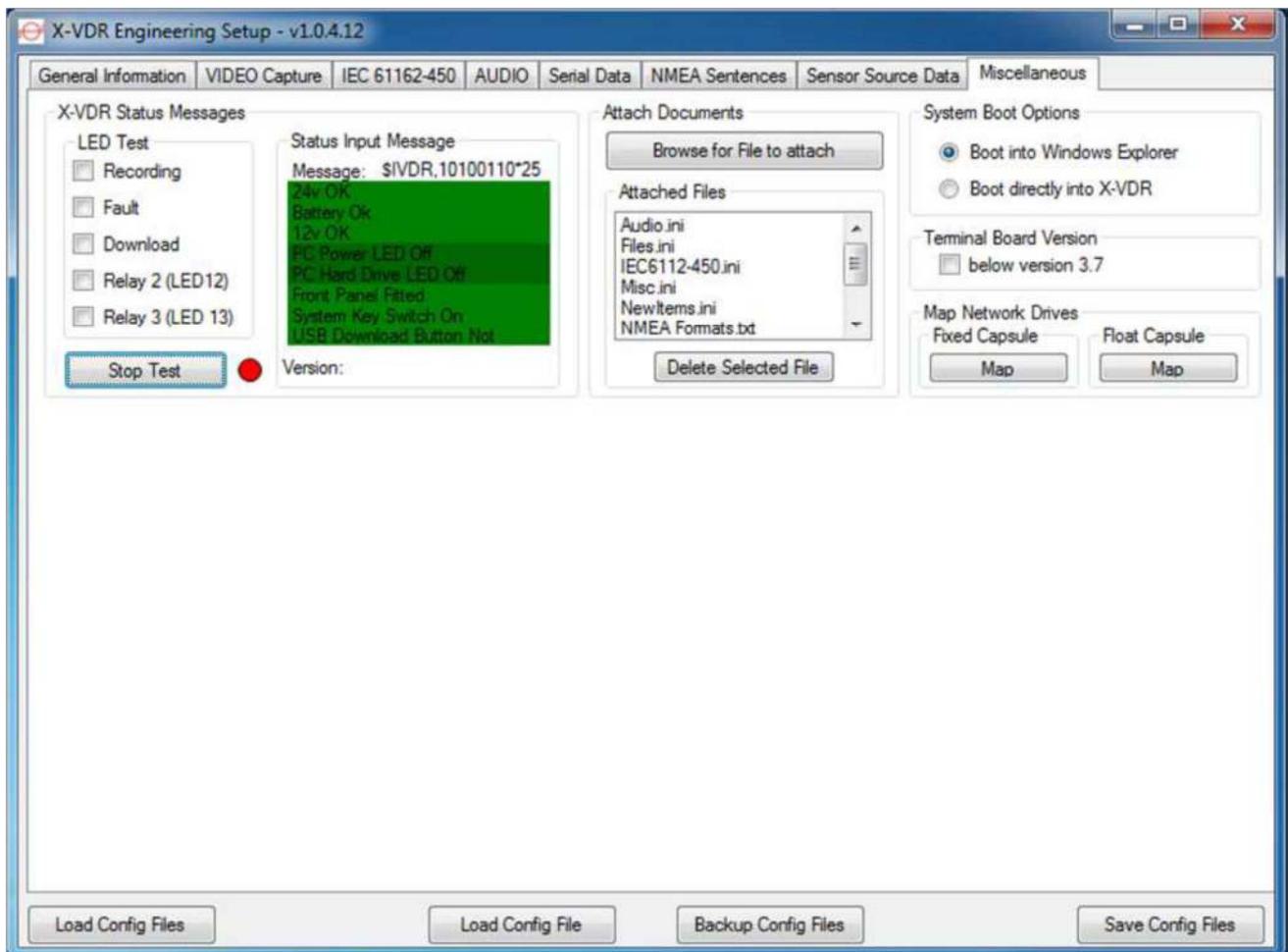
The Miscellaneous page allows you to test the DIO function of the Data Interface PCB i.e. switching on the LEDs or activating the fault relays.

Here you can also add any documents for any proprietary equipment or indeed any document that you think would be handy for any visiting engineer.
Note you cannot delete any of the Config files and it will not allow you to attach documents of the same name. To replace an updated document you must delete the old one first.

If upgrading the X-VDR application on an older system to ensure that the battery fail signal is correctly interpreted the Terminal Board Version must be ticked. The version number can be found on the PCB next to the Operate/Service switch.

Here also you can map both Fixed and Float Free Capsules.

Once you are happy that everything is correct and the Config files are saved you can now select 'Boot directly into X-VDR' and restart the system.



31. Config File Buttons



The buttons on the bottom of the screen are there no matter what tab you have selected, the description of each is below:

Load Config Files

If you have not saved any changes/edit then this button will load **all** config files from the X-VDR system and overwrite anything you have done.

Load Config File

This button opens a selection window for you to select the file you wish to load, it will only allow you to load the config file for the tab that is currently selected, thus if you have the VIDEO Capture tab selected then it will not allow you to load the Serial Config file.

This will load the selected config file and overwrite only the data in the selected tab.

Backup Config files

Once you have completed you set up you can take a copy of all of the configuration files, click this button and a dialog box will appear and let you select a folder or drive (USB or fixed) to save the configuration files to, see image below:



Save Config Files

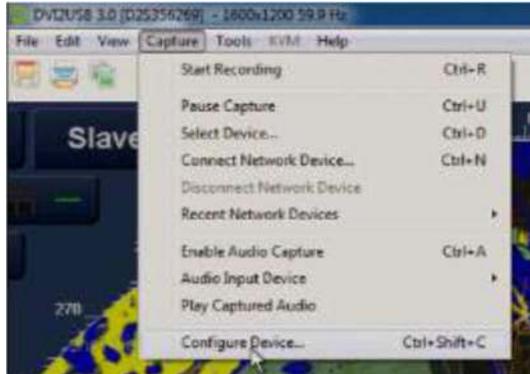
This button will save your configuration files to the X-VDR system and overwrite any existing files (if the system was working correctly before it would be a good idea to make a copy of the existing files if you do not already have them).

Once clicked a message will be displayed 'Are you sure you want to save Config Files, all existing files will be overwritten', if you now click 'Yes' the files will be saved if you click 'No' then the files will not be saved, a message will be displayed once saved or cancelled.

32. Epiphan Capture Tool

In most cases you should not have to adjust or configure a VGA mode. Usually the Frame Grabber and VGA source can automatically select a VGA mode.

Adjustments tab:



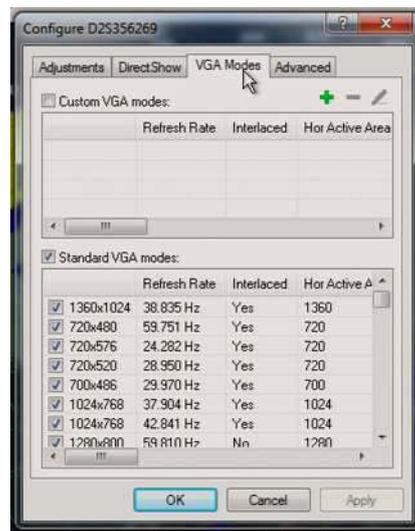
<p>Horizontal shift</p>	<p>Increasing or decreasing the value entered in the configure horizontal shift to offset the captured image shifted to the right can be corrected with minor adjustments to the horizontal shift settings Horizontal Shift field shifts the image to the right or left.</p>
<p>Vertical shift</p>	<p>Configure vertical shift to offset the captured image position. For example, a captured shifted slightly downward (vertically) can be corrected with minor adjustments to the vertical shift settings Increasing or decreasing the value entered in the Vertical Shift field shifts the image up or down.</p>
<p>Set offset/ gain</p>	<p>The offset and gain settings control the image brightness and contrast respectively. Increasing the offset control causes the image to become darker. Increasing the offset control causes the image to become darker. Increasing the Gain control gives the image more contrast.</p>
<p>Sampling phase</p>	<p>This setting adjusts the vertical synchronization properties of the image. You may need to change it when there is a repetitive distortion or blurriness on the horizontal axis of the image. Adjust the setting in small steps until a sharper image is displayed.</p>
<p>PLL adjustment</p>	<p>This setting is used to squeeze or stretch the image horizontally.</p>
<p>Prefer wide VGA mode</p>	<p>This checkbox, when enabled, allows Wide Aspect Ratio VGA modes to be displayed by the video capture application window. The Epiphan USB device may not be able to determine whether the video source is sending a wide video mode signal. You can select this option if your video source uses a wide video mode to make sure that the Epiphan USB device driver selects a wide video mode.</p>
<p>YCrCb capture</p>	<p>Select this checkbox when you need to capture analogue component video with the YCrCb encoding.</p>

33. Configuring VGA modes

If you are capturing images from a VGA stream, from the capture menu of the video capture application you can select Configure Device and then select the VGA modes tab to configure the VGA modes that the Frame Grabber can operate in. You can also configure VGA modes from the VGA2USB control panel application.

In most cases you should not have to configure VGA modes. Usually the Frame Grabber and VGA source can automatically select a VGA mode.

However, configuring VGA modes can be useful if you have special requirements or if the VGA source and Frame Grabber do not automatically select the VGA mode that you want. To resolve problems like this you can configure VGA modes to either limit the standard VGA modes that the Frame Grabber can operate in or you can add one or more custom VGA modes and configure the Frame Grabber to operate in a custom VGA mode.



The Frame Grabber acts like a display device. Many VGA sources set the VGA mode that they use by checking the VGA modes the display can use and then setting their VGA output mode to match. So if you can control the VGA mode that the Frame Grabber uses you may be able to control the VGA mode that the VGA source uses.

If the Frame Grabber and the VGA source cannot automatically select the VGA mode that you want them to use, you may be able to resolve this by only allowing the Frame Grabber to operate in one or some standard VGA modes.

If you want to make sure that the Frame Grabber selects a specific video mode you can unselect all standard VGA modes, then select the VGA that you want the Frame Grabber to use.

If the VGA source operates in a non-standard mode, you can use the custom VGA mode settings to add that non-standard mode to your Frame Grabber. The Frame Grabber can then operate in that mode.

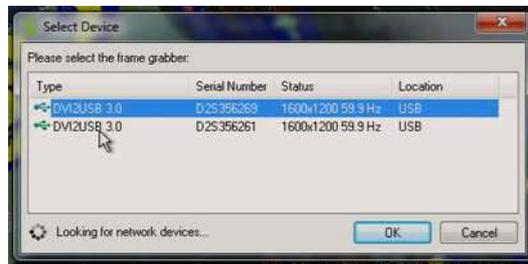
34. Adding custom VGA modes

In most cases the Frame Grabber will automatically select the custom video mode that most closely matches the VGA output. If you want to make sure the Frame Grabber selects a specific custom video mode you can unselect all standard VGA modes and all custom VGA modes except for the one that you want the Frame Grabber to use.

Usually you would configure a custom VGA mode to match the custom VGA mode of your VGA source. (You do not need to understand the details of custom VGA modes to add them.) All you need to know are the details about the VGA mode settings of your VGA source then add that specific information to the custom VGA mode configuration.

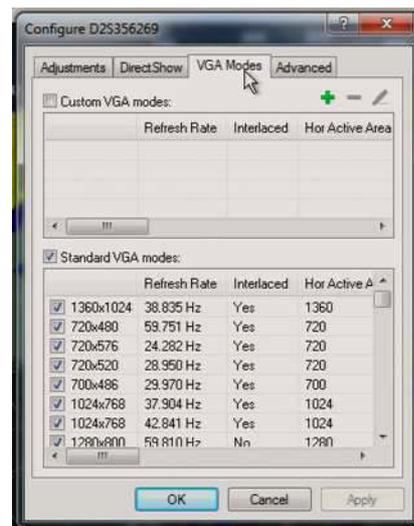
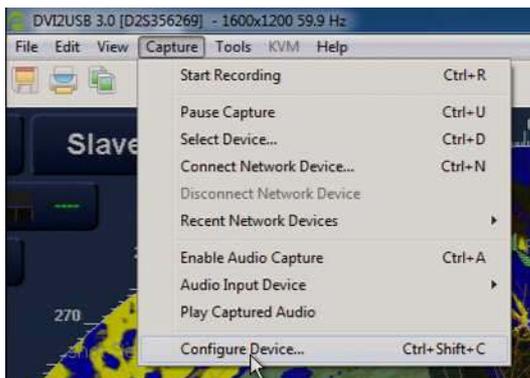
To add a custom VGA mode to a Frame Grabber

Start the video capture application.
From the capture menu, select Device



Select the Frame Grabber to add a custom VGA mode to and select OK.

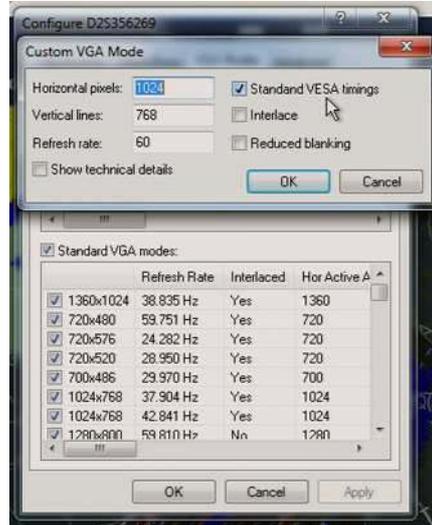
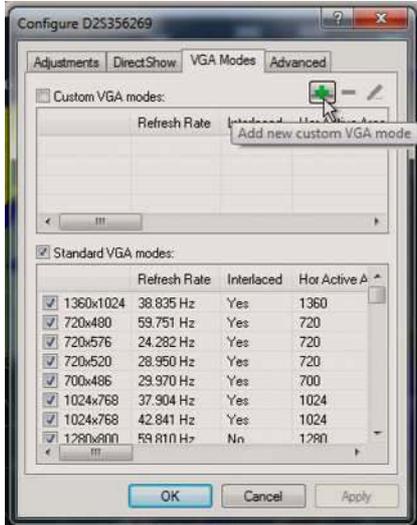
From the Capture menu, select Configure Device and Select the VGA Modes tab.



Select Add new custom VGA mode.

Configure the custom VGA mode with the following information:

- Horizontal pixels
- Vertical lines
- Refresh rate
- Select Interlaced if required



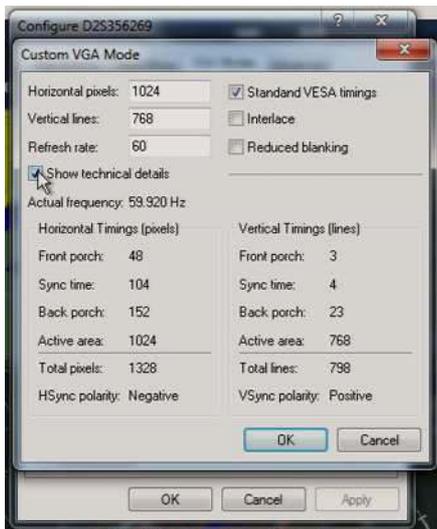
To access and modify the timings of the video sources select Show details.

Horizontal Timings (pixels):

- Active area
- Front porch
- Sync time
- Back porch
- Sync polarity (positive or negative)

Vertical timings (pixels):

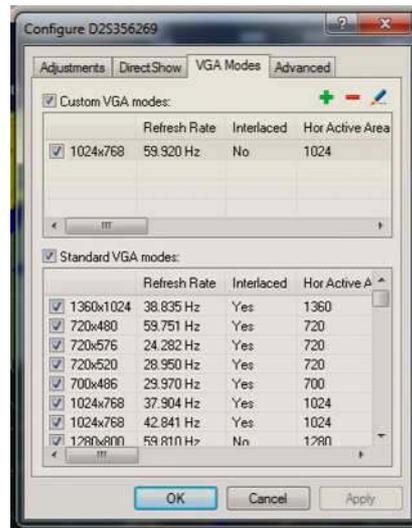
- Active area
- Front Porch
- Sync time
- Back porch
- Sync polarity (positive or negative)



Select OK.

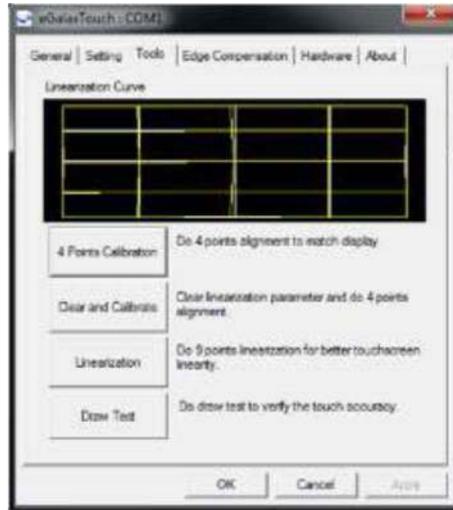
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Chapter 34: Adding custom VGA modes

Make sure that the required custom VGA mode/modes are selected in the Custom VGA modes list.



36. eGalax Touch

The eGalax Touch utility is for calibrating the touch screen. This is done at the factory prior to the soak test but can be calibrated if needed during commissioning or service attendance.



To conduct the calibration select Tools and select either the 4 Points Calibration or if this is not satisfactory conduct Linearization option.

If the following icon appears on opening the utility then check the serial cable.



37. Map Y and Z drive batch commands



These are quick and easy shortcuts to map each of the capsule ready for operation.

This function can now also be found on the miscellaneous page in the engineering software versions v1.0.4.12 and higher.

These operations will automatically map the capsule assuming that they are correctly terminated and all you will see is a window pop open then almost immediately close.

If any of the below windows appear this is an indication that the termination is not correct or possibly be a problem with the capsules. Y: for the Float Free and Z: for the fixed.

```
ca. map Y drive
The network connection could not be found.
More help is available by typing NET HELPMSG 2250.
System error 53 has occurred.
The network path was not found.
Error mapping drive Y:
The network connection could not be found.
More help is available by typing NET HELPMSG 2250.
```

```
ca. map Z drive
Error mapping drive Z:
The network connection could not be found.
More help is available by typing NET HELPMSG 2250.
System error 53 has occurred.
The network path was not found.
Error mapping drive Z:
The network connection could not be found.
More help is available by typing NET HELPMSG 2250.
System error 53 has occurred.
The network path was not found.
Error mapping drive Z:
The network connection could not be found.
More help is available by typing NET HELPMSG 2250.
```

38. Operation

The X-VDR has a very user friendly control set. Other than the On/Off key switch and data download button on the MEU the system is fully interacted using the touch screen panel.

39. Switching on

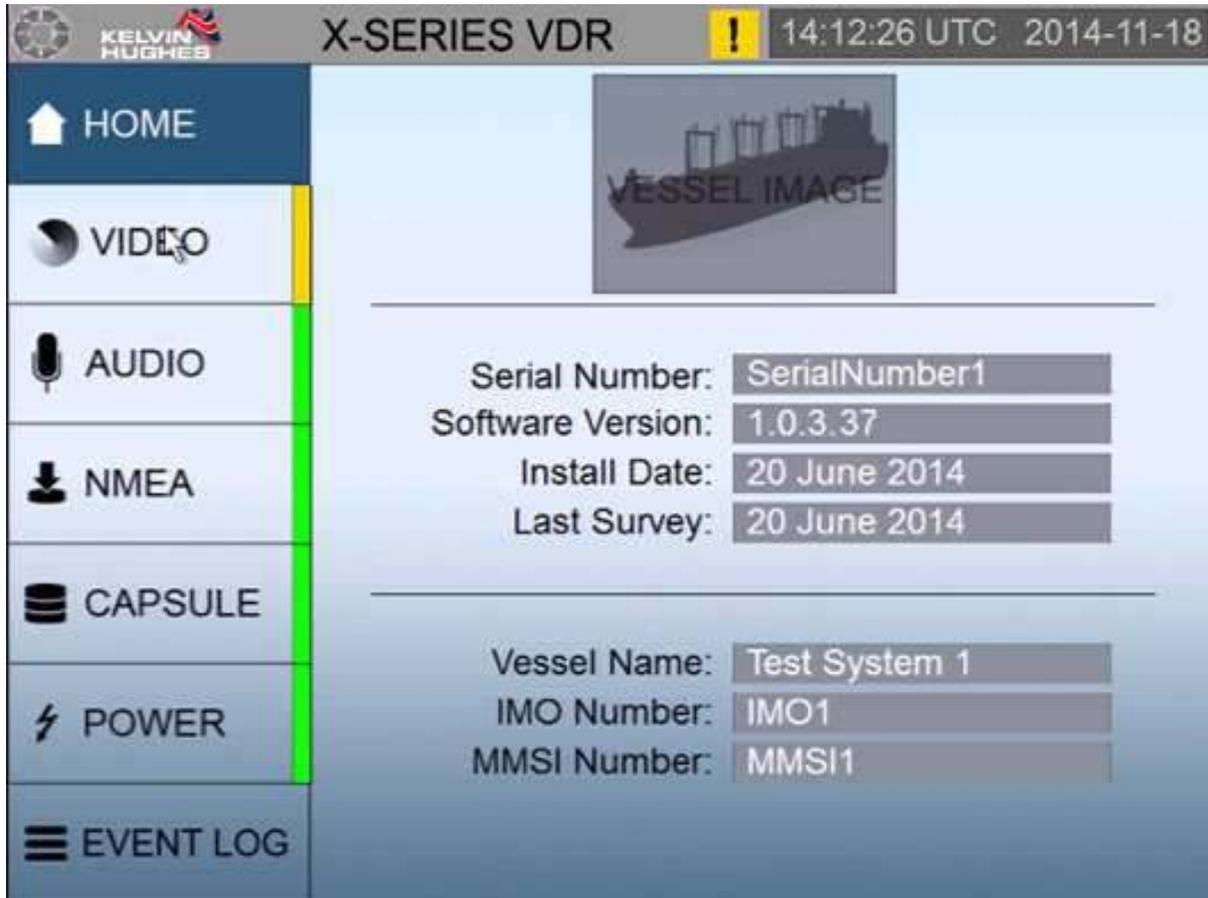
The MEU has a key switch in the top left of the enclosure. This is for security purposes and ensures that only the key holder may switch off the system when required.

Turning the key switch from the vertical ON position through 90 degrees clockwise to the horizontal position the system will boot up after a few seconds delay, and the display panel will show the boot screen



40. Home Screen

Once the system has completed the boot sequence the home screen will be displayed as below



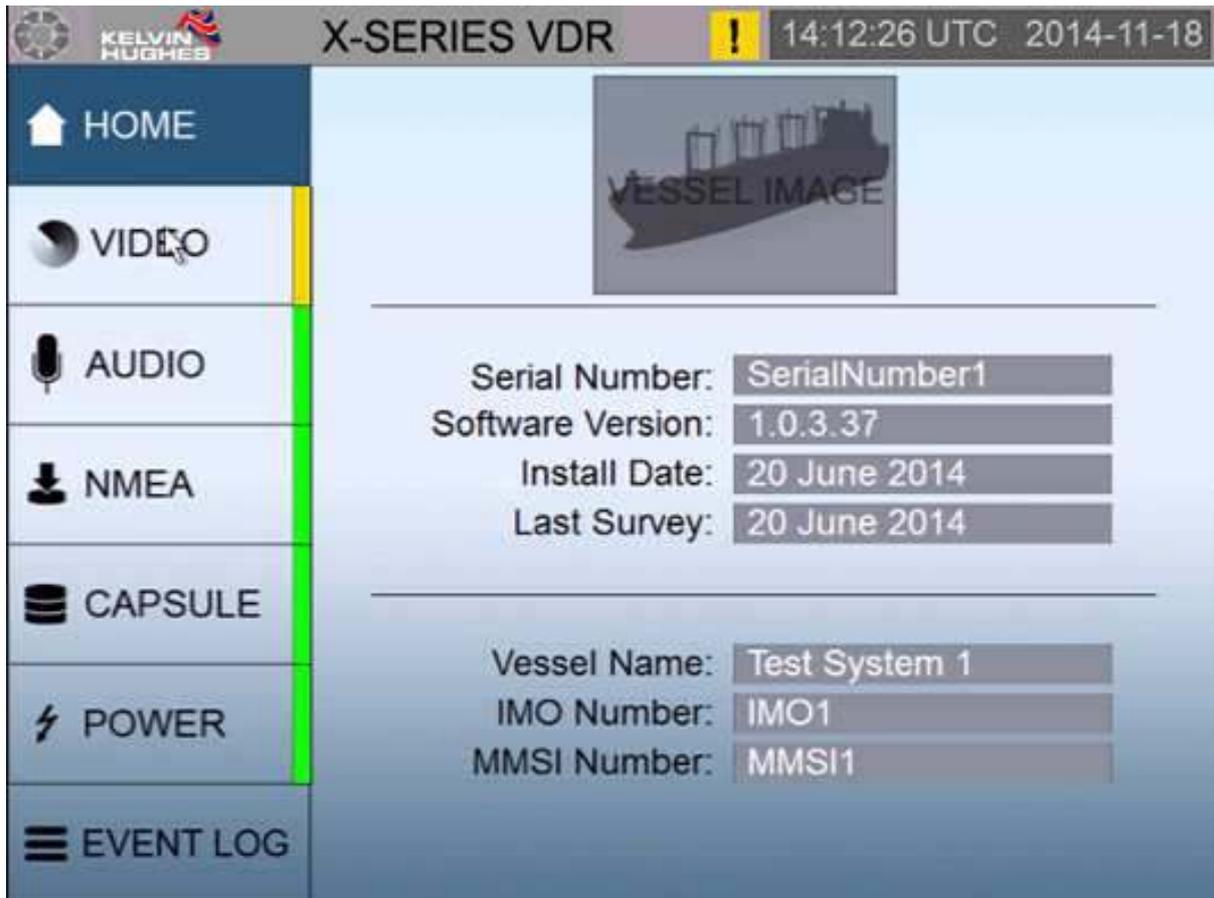
Pressing one of the options on the navigation menu on the left of the screen will open the corresponding status screen. These are explained further in the System Modules section on the following pages.

40.1 Home Screen

The HOME tab is a general information page which shows the system and vessel information. As with all other pages each of the tabs along with the UTC date and time are displayed.

Unique to the HOME page are the following:

- Image of the vessel (if available)
- Currently installed software version
- Date of system installation
- Date of last service call
- Vessel name
- IMO number
- MMSI number
- Service contact details



The UTC date and time will be automatically updated from the received GPS data. If the GPS data is not received, or is lost, then the time and date at the top of the home screen will be displayed in red characters.

41. Radar and ECDIS Image Capture

By default two image capture cards are installed for both S-Band and X-Band Radar capture. Two more capture cards are available on request for additional image capture, such as ECDIS where the ship's ECDIS does not have an option for image over Ethernet.



Within the software the image capture screen, titled RADAR, has the preview boxes, to show the current images being captured, four of which are viewable at any one time. The top two boxes have two user selectable tabs each, representing the four image capture cards. The lower two boxes show a preview of the image received from the ECDIS over Ethernet connection.

If the Radar is switched off a caution is raised, the RADAR status tab itself will flash YELLOW. Once acknowledged the RADAR tab will revert to its default colour but the alert panel will remain YELLOW until the issue is cleared.

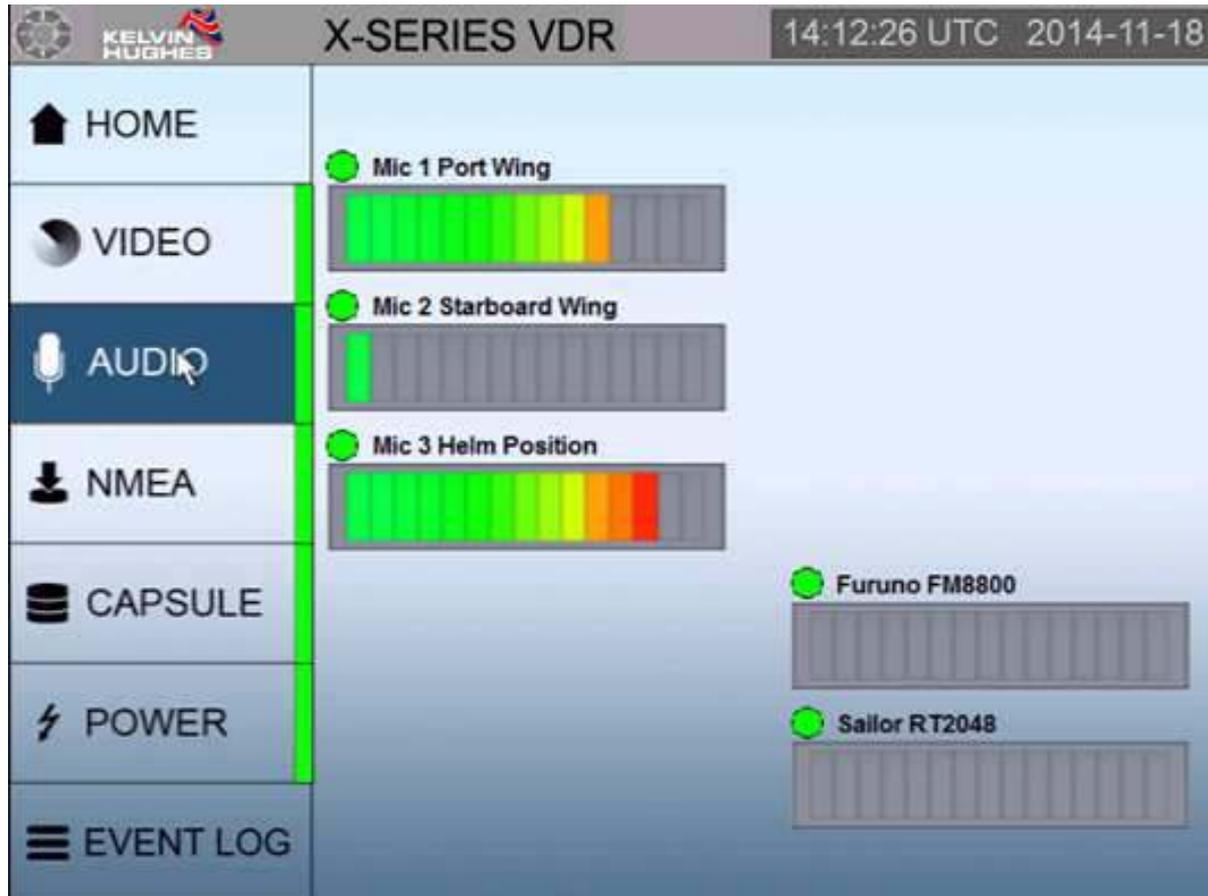
Preview boxes will always be present, even if the associated capture card isn't installed. In this instance the respective tab will show "Empty Slot".

42. Audio Module

The Audio module has ten separate input channels. Each of these can be preconfigured as a Microphone or VHF input channel. By default inputs 1 to 8 are microphone channels and inputs 9 and 10 are allocated to the ship's radios.

The microphones have a built in self-test which will be periodically automatically tested, or on demand as part of the System Test.

The microphone status and microphone and VHF audio level will be displayed on the "Audio" page of the XVDR Software, which can be seen in image.



As can be seen from the above image the "Audio" page will show each channel's received audio level and the current status each microphone. – If two microphones are combined into one channel then a failure of one microphone will be displayed as an error with the channel to which they are connected.

Above each channel there is an indicator that will be green or yellow. A GREEN indication means all is well, YELLOW indicates that there has been a prolonged low audio level or that the audio test has failed.

Once the audio level has been tested and is an acceptable level the indication will revert to green.

43. NMEA Module

The X-VDR has 20 individual NMEA inputs. All accept 4800Bd as standard. 7 of these can be preconfigured to accept other certain baud rates 9600, 19200 & 38400Bd.

Along with collecting the data from the vessel's sensors the NMEA Data Board also acts as the internal control module, passing messages to and from the Main Processor Board.

Configuration of the NMEA inputs within the X-VDR software involves simply adding the expected NMEA data string, along with the name of the sensor, into the respective channel of the configuration program.

If one of the expected NMEA data strings is lost an caution will be raised (as per IMO 333(90), and the associated sensor label will turn YELLOW



Once the page has been viewed, the flashing highlight will stay constant but the “missing data” indicator will remain YELLOW to the left of the label.

Only when the data is received again will the “missing data” indicator will revert back to GREEN.

44. Final Recording Medium

The X-VDR has four final storage devices - a fixed capsule, float free capsule and two industrial grade hard drives in a RAID 1 configuration to ensure no loss of data in the unlikely event of a hard drive failure.

The fixed and float free capsules operate in the same manner as a network hard disc drive. They are connected to the system's internal network via the six way connector on the Terminal Board.

Each capsule will store a minimum of 48 hours data on their internal memory which will overwrite itself on a first in first out basis (FIFO).

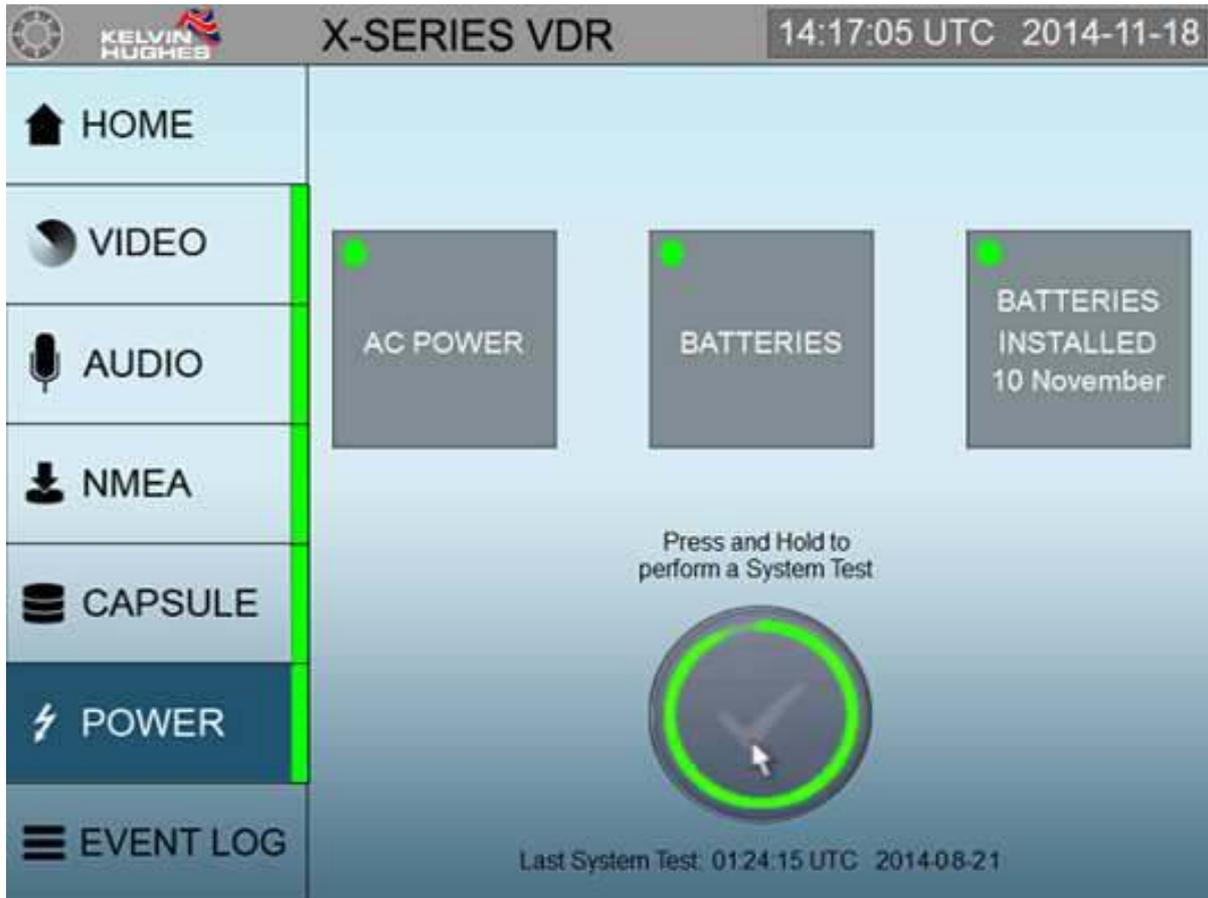
The "long term medium" will hold at least 30 days of data and the regulations state that it should be located such that access to the drive is not possible without the use of tools. In the case of the X-VDR the hard drives are mounted on top of the Processor Board under the front panel.

The X-VDR software tab CAPSULES is where the status of the final recording medium may be found. In the event of an error with any of these the status image will turn YELLOW.



Also displayed within this page are the ULB (Underwater Locator Beacon) expiry date and the float free capsule's HRU (Hydrostatic Release Unit) expiry date.

45. Power Page



On this page the Mains Power and UPS are monitored in the event of a failure.

If the Mains Power should fail the indication will turn YELLOW and the system will start a 2 hour countdown to switch OFF.

If the UPS fails then this indicates that the batteries are not charging and a service centre should be notified.

Also this is where a system test is initiated. Hold the button until the outer ring has transversed 360 degrees and the tick has gone GREEN.

The test function will be inhibited for 2 minutes.

46. Event Log Page

The screenshot shows the X-SERIES VDR Event Log page. The interface includes a sidebar with navigation options: HOME, VIDEO, AUDIO, NMEA, CAPSULE, POWER, and EVENT LOG. The main area displays an Event Log table with columns for Date, Time UTC, Priority, Reporting System, and Details. The table contains various system events, including system tests, temperature readings, and incident markers. A search bar at the top allows filtering by Date, Hour UTC, and Priority. The system run time is shown as 0 Hrs, 3 Mins.

Date	Time UTC	Priority	Reporting System	Details
2014-08-21	06:57:04	Information	System Test	Tamper Alarm Correct
2014-08-21	06:57:04	Information	System Test	Local
2014-08-21	06:57:07	Information	System Test	All Microphones Correct
2014-08-21	06:57:07	Information	System Test	End of System Test
2014-08-21	07:16:51	Information	System	Internal System Temperature: 27.34 C
2014-08-21	07:46:51	Information	System	Internal System Temperature: 28.15 C
2014-08-21	08:34:58	Information	System	System Start Up
2014-08-21	08:36:01	Warning	System	There was an undetermined error whe...
2014-08-21	08:36:01	Information	System	System Running
2014-08-21	08:36:01	Warning	System	Time Unavailable from GPS source. VD...
2014-08-21	08:36:02	Information	System	Internal System Temperature: 28.15 C
2014-08-21	08:37:00	Warning	System	User Initiated Incident Marker Buton ...
2014-08-21	08:37:11	Warning	Screen Capture Card	Card 2 No Video Detected
2014-08-21	08:37:26	Warning	Screen Capture Card	Card 2 Defective Card
2014-08-21	08:37:43	Information	Screen Capture Card	RADAR/ECDIS Alarms Acknowledged
2014-08-21	08:38:05	Information	Screen Capture Card	RADAR/ECDIS Alarms Acknowledged
2014-08-21	08:38:12	Information	Screen Capture Card	Card 2 Fault Cleared

On this page you can review all events.

You can select the search parameters by Date, Hour or Priority by selecting the relevant drop down box.

In the event of an incident the user may press the Incident Maker button which will add an Event marker in RED so during playback the incident can be easily located.

The above screen shot shows the results of a system test which is highlighted in pale blue.

47. System Log Entries		
System Log Entries		
Log Entry	Description	Action
Audio Recording Stopped!	Audio Recording has been stopped ready for shutting down the X-VDR	Nil
Batteries are past replacement date (FITTED DATE)	Batteries fitted in the UPS have passed their replacement date	Contact manufacturer to organise replacement of the batteries
CAPSULE Alerts (?) Acknowledged	All outstanding Capsule page alerts have been acknowledged by the user	Nil
Fixed Capsule Communications Lost	Communications over the Network have failed to the Fixed Capsule	Restart the VDR using the key. If the alert is still present after 10 minutes please contact the manufacturer for technical assistance.
Fixed Capsule Communications Re-established	Communications with the Fixed capsule have been re-established after a failure	Nil
Float Free Capsule Communications Lost	Communications over the Network have failed to the Float Free Capsule	Restarting the VDR using the key. If the alert is still present after 10 minutes please contact the manufacturer for technical assistance.
Float Free Capsule Communications Re-established	Communications with the float Free capsule have been re-established after a failure	Nil
Hydrostatic Release is past replacement date (FITTED DATE)	The hydrostatic release fitted to the Float Free Capsule has passed its replacement date	Contact manufacturer to organise replacement of the Hydrostatic release.
Internal 24V Failure Detected	24V battery output has failed in the UPS	If alert persists for greater than 10 minutes contact the manufacturer. The UPS batteries may be defective.
Internal 24V Restored	24V battery output has been re-established	Nil
Local Recording Module Communications Lost	The local recording module (hard drive) can no longer be recorded too	Restart the VDR using the key. If the alert is still present after 10 minutes please contact the manufacturer for technical assistance.
Local Recording Module Communications Re-established	The local recording module (hard drive) can be written to once again after a failure	Nil
Local shutdown requested by (USER NAME)	System was shut down by the {person named} locally	Nil
Mains Input to 24v has been restored	24 volts mains has been re-established	Nil
Mains Input to 24v has failed	24 volts mains input to the X-VDR has failed - system will use UPS batteries for 2 hours	Check AC power is available from ships supply, if AC power is not restored the X-VDR will shut down after 2 hours has elapsed.

System Log Entries		
Log Entry	Description	Action
No Serial Data Received for (TOTAL SECONDS) Seconds	No NMEA data has been received for the indicated time	Check the source equipment is transmitting data correctly. Check all connections at source equipment and at VDR
POWER Alerts (?) Acknowledged	All POWER page alerts have been acknowledged by the user.	Nil
Remote Shutdown requested by (USER NAME)	System was shut down by the person named by remote using the X-VDR companion software	Nil
Serial Data now being received again	NMEA serial data is now being received again after nothing had been received for a set time	Nil
Serial Data Port Closed - Trying to Open Port	There was an error trying to open the serial data connection - X-VDR is trying to establish communications to the serial data port	Restart the VDR using the key. If the alert is still present after 10 minutes please contact the manufacturer for technical assistance.
Serial Recording Stopped!	Serial Data Recording has been stopped ready for shutting down the X-VDR	Nil
Still no Serial Data Received for (TOTAL SECONDS) Seconds	No NMEA data has been received for a further amount of indicated time	Check the source equipment is transmitting data correctly. Check all connections at source equipment and at VDR
System Config files were either missing or different from back up. The backup files have been copied to the boot drive	System Configuration files on the boot drive were missing or differ from the backup versions and have been replaced with the backup versions	Nil
System Running	X-VDR system is running and recording	Nil
System Shut Down (Local Shutdown Initiated)	Local system shutdown has been initiated (using the system key)	Nil
System Shut Down (Remote Shutdown Initiated)	Remote system shutdown has been initiated (using the Companion software)	Nil
System Start Up	X-VDR system start up time - system is not recording until System Running log entry is seen	Nil
There was an undetermined error when checking System Config files	There was a problem with original configuration and back up configuration files	If system doesn't boot or displays multiple errors, try restarting the system, if fault persists contact manufacturer.
Time Synchronised with GPS	The X-VDR system time has been resynchronised with GPS time (this occurs every 12 hours once synchronised)	Nil
Time Synchronised with GPS (RMC)	If GPS time (GPZDA) is unavailable then the X-VDR will use GPRMC to synchronise system time.	Nil

System Log Entries		
Log Entry	Description	Action
Time Unavailable from GPS source VDR using System time	If no GPS is available or both GPZDA and GPRMC are not received then the X-VDR cannot synchronise with system time and will use the current X-VDR system time.	Check GPS is on and working correctly, enable GPZDA or GPRMC at the GPS
ULB is past replacement date (FITTED DATE)	The Underwater Locator Beacon fitted to the Float Free Capsule has passed its replacement date	Contact manufacturer to organise replacing the Beacon.
UPS has been restored	UPS battery power is available again after a failure	Nil
UPS has failed	UPS battery power is unavailable -If the AC power fails then the batteries will not be able to power the X-VDR system	Check power and UPS, if problem persists contact the manufacturer
USB Download Complete	Download of USB data is complete (Future Option)	Nil
USB Download Initiated	USB data download has been started (Future Option)	Nil
User Initiated Incident Marker Button Pressed	The user pressed and held the Incident Marker button for 5 seconds, another marker cannot be added for a further 60 seconds	Nil
VDR Electronics Case Opened	Someone has removed the front panel of the X-VDR MEU Enclosure	Nil
VDR Electronics Case Closed	X-VDR MEU enclosure front panel has been replaced after being removed	Nil
Video Capture Stopped!	VIDEO Capture Recording has been stopped ready for shutting down the X-VDR	Nil
INI FILENAME backup file missing	The Named X-VDR Configuration backup file is missing	Contact manufacturer
INI FILENAME Both INI files missing	The Named X-VDR Configuration backup file and main files are missing	Contact manufacturer
INI FILENAME file corrupt - copied from backup	The Named X-VDR Configuration file is different from backup, backup version has been copied to the boot location	If this error occurs after every boot contact manufacturer
INI FILENAME file missing - copied from backup	The Named X-VDR Configuration file is missing from the boot location, backup version has been copied to the boot location	If this error occurs after every boot contact service manufacturer
INI FILENAME Fixed Capsule file corrupt - copied from backup	The Named X-VDR Configuration file held on the fixed capsule is different from the backup copy, backup version has been copied to the fixed capsule.	If this error occurs after every boot contact service manufacturer

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Chapter 47: System Log Entries

System Log Entries		
Log Entry	Description	Action
INI FILENAME Fixed Capsule file missing - copied from backup	The Named X-VDR Configuration file held on the fixed capsule is missing; backup version has been copied to the fixed capsule.	If this error occurs after every boot contact manufacturer
INI FILENAME Float Free Capsule file corrupt - copied from backup	The Named X-VDR Configuration file held on the float free capsule is different from the backup copy, backup version has been copied to the float free capsule.	If this error occurs after every boot contact manufacturer
INI FILENAME Float Free Capsule file missing - copied from backup	The Named X-VDR Configuration file held on the float free capsule is missing; backup version has been copied to the float free capsule.	If this error occurs after every boot contact manufacturer
INI FILENAME Local file corrupt - copied from backup	The Named X-VDR Configuration file held on the local recording medium is different from the backup copy, backup version has been copied to the local recording medium.	If this error occurs after every boot contact manufacturer
INI FILENAME Local file missing - copied from backup	The Named X-VDR Configuration file held on the local recording medium is missing; backup version has been copied to the local recording medium.	If this error occurs after every boot contact manufacturer
Internal System Temperature: TEMPERATURE READING	Displays internal system temperature (shown every 6 hours if below 30°C, every 30 minutes if between 30°C and 40°C, every 10 minutes if between 40°C and 50°C, every 5 minutes if between 50°C and 55°C and every 1 minute if over 55°C)	Nil
All Microphones Correct	All microphones have passed test	Nil
Annual Survey Due	The Annual Survey date has passed	Contact manufacturer to arrange annual survey
Batteries are past replacement date (FITTED DATE)	Batteries fitted in the UPS have passed their replacement date	Contact manufacturer to organise replacing the batteries.
End of System Test	System test has complete	Nil
Fixed Module Correct	Fixed Capsule if connected and functioning correctly	Nil
Fixed Module Failed	Fixed Capsule communications have failed - X-VDR unable to record to the fixed capsule	Check fixed capsule is connected and configured correctly, if error persists after restart contact manufacturer
Float Free Module Correct	Float free Capsule if connected and functioning correctly	Nil

System Log Entries		
Log Entry	Description	Action
Float Free Module Failed	Float free Capsule communications have failed - X-VDR unable to record to the float free capsule	Check float free capsule is connected and configured correctly, if error persists after restart contact manufacturer.
Hydrostatic Release is past replacement date (FITTED DATE)	The hydrostatic release fitted to the Float Free Capsule has passed its replacement date	Contact manufacturer to organise replacing the Hydrostatic release.
Local Fixed and Float Free Modules Correct	All recording mediums are functioning correctly (Local, Fixed and Float free capsules)	Nil
LTRM Modules Correct	Local recording medium if connected and functioning correctly	Nil
LTRM Modules Failed	Local recording medium communications have failed - X-VDR unable to record to the local recording medium	Restart the X-VDR. If error persists after restart contact manufacturer
Microphone (MICROPONE NAME) Correct	Named microphone is functioning correctly	Nil
Microphone (MICROPONE NAME) Failed	Named microphone failed its self-test	Nil
Tamper Alarm Activated	System Case is open.	Nil
Tamper Alarm Correct	System Case is closed.	Nil
FF Battery is past replacement date (FITTED DATE)	The battery fitted to the Float Free Capsule has passed its replacement date	Contact manufacturer to organise replacement Float Free battery
All Capture Cards Correct	All video capture cards have passed self-test	Nil
Automated System Test Started	An Automated system test has been started (occurs every 12 hours)	Nil
CAPTURE CARD Card functioning correctly but failed the last capture due to unspecified error	Named VIDEO capture card is functioning but was unable to capture an image	if fault remains after 5 minutes restart the system, if fault remains after restart contact manufacturer
CAPTURE CARD Correct	Named Capture Card is functioning correctly	Nil
CAPTURE CARD No Capture card has been detected - card defective	Named VIDEO capture card is not available to X-VDR system	restart required, if fault remains contact manufacturer
CAPTURE CARD No video signal is has been detected by the card but the card is functioning correctly	Named VIDEO capture card is not detecting any video	Video source equipment may be switched off If the source RADAR/ECDIS is on and available then check the connectivity between the X-VDR and source equipment. If problem persists contact manufacturer
Mains Input Correct	Mains power is on and providing power correctly	Nil
NMEA SENTANCE Not received within the last 20 seconds	Named NMEA sentence has not been received for the indicated time	Check source equipment is on and operating correctly

System Log Entries		
Log Entry	Description	Action
NMEA SENTANCE Received within the last 20 seconds	Named NMEA sentence has been received within the indicated time	Nil
Serial Data Correct	All Serial Data is being received correctly	Nil
UPS Correct	UPS is functioning correctly	Nil
UPS has Failed	UPS battery power is unavailable - if mains fails X-VDR will cease functioning until power is restored	Check power and UPS, if problem persists contact manufacturer
User Initiated System Test Started	A user initiated system test has been started, another test cannot be started for 60 seconds	Nil

AUDIO LOG ENTRIES

Log Entry	Description	Action
Audio Alarms Acknowledged	All Audio module alerts have been acknowledged by the user	Nil
Audio Module Communications re-established	X-VDR system has re-established communications to the Audio recording PCB after a fault	Nil
Communications to Audio Board Established	X-VDR system has established communications to the Audio recording PCB	Nil
No Communications to Audio Board	The Audio PCB recording status is not active	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
No Communications to Audio Module	X-VDR is unable to communicate with the Audio PCB	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
Unable to set Audio recording path	Audio PCB not responding correctly to X-VDR system	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
Unable to set connected Audio Channels	Audio PCB not responding correctly to X-VDR system	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
Unable to set sample rate	Audio PCB not responding correctly to X-VDR system	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
Unable to start Audio Recording	Audio PCB not responding correctly to X-VDR system	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer
MICROPONE NAME Fault	A fault has been reported with the Named Microphone	run self-test to check Microphone again, if fault remains contact manufacturer
MICROPONE NAME On-Line	Microphone reported fault has cleared	Nil
Unable to initialise Audio Capture Card	Audio PCB not responding correctly to X-VDR system	restart if communications not re-established after 60 seconds, if fault remains contact manufacturer

VIDEO LOG ENTRIES

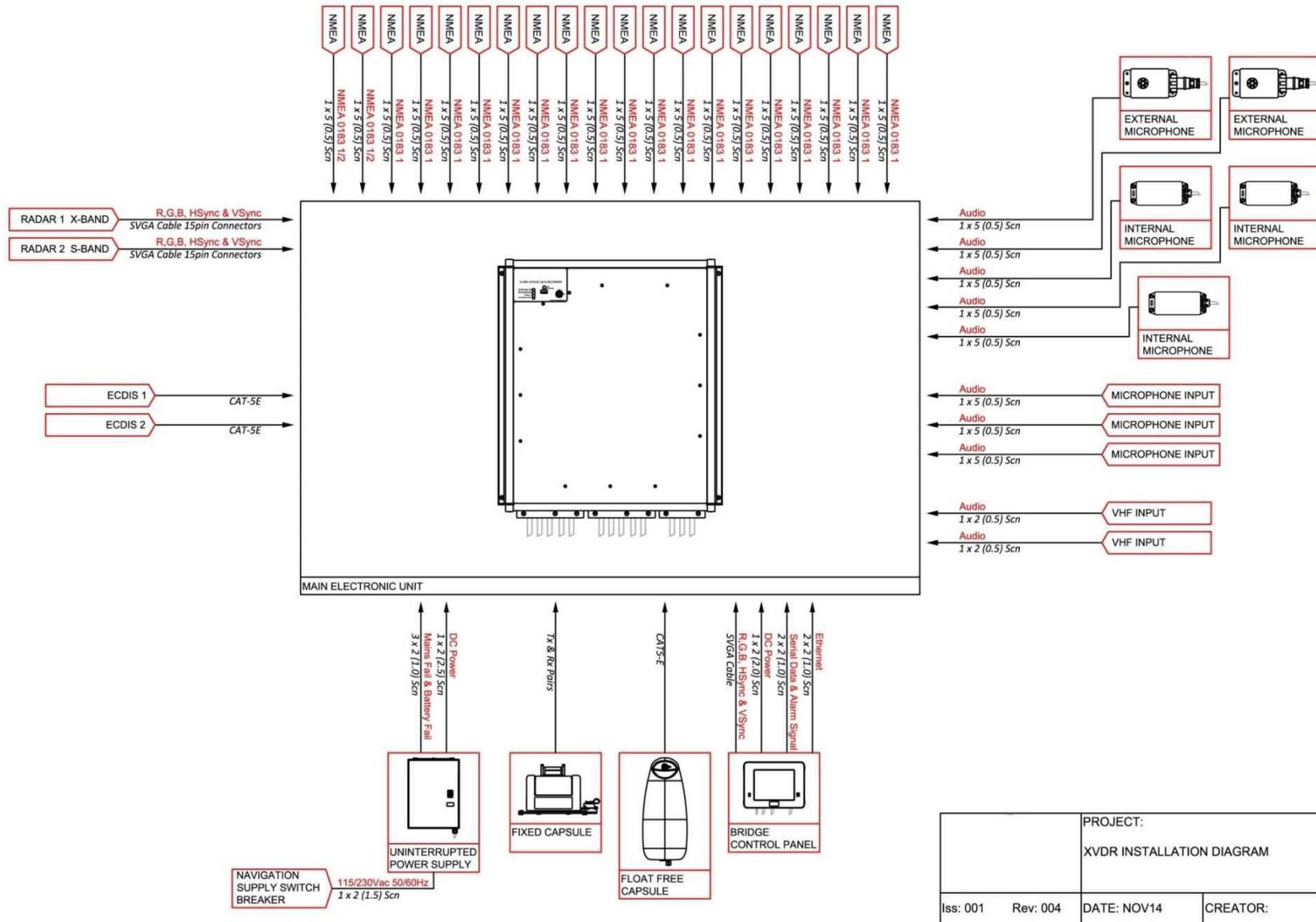
Log Entry	Description	Action
VIDEO Alarms Acknowledged	All extant video alarms have been acknowledged by the user	
CAPTURE CARD Defective Card	Named VIDEO capture card is not available to X-VDR system	restart required, if fault remains contact manufacturer
CAPTURE CARD Failed to Capture Image	Named VIDEO capture card is functioning but was unable to capture an image	if fault remains after 5 minutes restart the system, if fault remains after restart contact manufacturer
CAPTURE CARD No Video Detected	Named VIDEO capture card is not detecting any video	This could mean that the RADAR is off (if the source RADAR/ECDIS is on and available then the connectivity between the X-VDR and source equipment is suspect - contact manufacturer)
CAPTURE CARD VIDEO Capture Alerts Cleared	Named VIDEO capture card all Alerts have been cleared	Nil
CAPTURE CARD Fault Cleared	Named VIDEO capture card all Faults have been cleared	Nil

SERIAL LOG ENTRIES

Log Entry	Description	Action
NMEA Alarms Acknowledged	All extant NMEA alarms/alerts have been acknowledged by the user	Nil
NMEA SENTANCE Checksum Correct	A previously reported checksum error for the named NMEA sentence has cleared.	Nil
NMEA SENTANCE Checksum Incorrect	Named NMEA sentence has an incorrect checksum	Nil
NMEA SENTANCE Data Validity now Correct	Named NMEA sentence validity marker is now correct	Nil
NMEA SENTANCE has not been received for TOTAL MILLISECONDS milliseconds or more	Named NMEA sentence has not been received for the indicated time	Check source equipment is on and operating correctly
NMEA SENTANCE Timeout Fault Cleared	Named NMEA sentence has now been received again after a timeout fault	Nil
NMEA SENTENCE Data Invalid	Named NMEA sentence data validity marker is not correct	Check source equipment is on and operating correctly
IEC61162-450 LOG ENTRIES		
IEC61162-450 Communications re-established	IEC61162-450 network communications to the ECDIS have been re-established after a failure	Nil
IEC61162-450 Communications error	X-VDR is not receiving data from the IEC61162-450 ECDIS output	Ensure ECDIS is on and configured to output IEC61162-450
IEC61162-450 no data received within the last 30 seconds	X-VDR is not receiving data from the IEC61162-450 ECDIS output	Ensure ECDIS is on and configured to output IEC61162-450
IEC61162-450 data corrupt	The data received from IEC61162-450 checksum is incorrect	if fault is continuous after 10 minutes contact manufacturer
IEC61162-450 retransmission error	A Data packet was re-requested but was not received.	Nil

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48. System Diagram



PROJECT:		XVDR INSTALLATION DIAGRAM	
Iss: 001	Rev: 004	DATE: NOV14	CREATOR:

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49. Cable Terminations

VESSEL NAME

.....

Ship yard are to complete the document by filling in the relevant terminations and Cable core identifications.

M.E.U. – Terminal Connections Audio					
Equipment	Signal	Termination	CORE Colour/No	CABLE No	MEU Termination
MIC 1	12V+	SK1-1			AUD1-1 (12V+)
	0V	SK1-2			AUD1-2 (0V)
	(AUDIO+)	SK1-3			AUD1-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD1-4 (AUDIO-)
	(TEST)	SK1-5			AUD1-5 (TEST)
MIC 2	12V+	SK1-1			AUD2-1 (12V+)
	0V	SK1-2			AUD2-2 (0V)
	(AUDIO+)	SK1-3			AUD2-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD2-4 (AUDIO-)
	(TEST)	SK1-5			AUD2-5 (TEST)
MIC 3	12V+	SK1-1			AUD3-1 (12V+)
	0V	SK1-2			AUD3-2 (0V)
	(AUDIO+)	SK1-3			AUD3-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD3-4 (AUDIO-)
	(TEST)	SK1-5			AUD3-5 (TEST)
MIC 4	12V+	SK1-1			AUD4-1 (12V+)
	0V	SK1-2			AUD4-2 (0V)
	(AUDIO+)	SK1-3			AUD4-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD4-4 (AUDIO-)
	(TEST)	SK1-5			AUD4-5 (TEST)
MIC 5	12V+	SK1-1			AUD5-1 (12V+)
	0V	SK1-2			AUD5-2 (0V)
	(AUDIO+)	SK1-3			AUD5-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD5-4 (AUDIO-)
	(TEST)	SK1-5			AUD5-5 (TEST)
MIC 6	12V+	SK1-1			AUD6-1 (12V+)
	0V	SK1-2			AUD6-2 (0V)
	(AUDIO+)	SK1-3			AUD6-3 (AUDIO+)
	(AUDIO-)	SK1-4			AUD6-4 (AUDIO-)
	(TEST)	SK1-5			AUD6-5 (TEST)

M.E.U. – Termination connections Audio continued

Equipment	Signal	Termination	CORE Colour / NO	CABLE NO	MEU Termination
V9 MIC 7 External 	12V+	M7- SK Pin 1			AUD7-1 (12V+)
	0V	M7- SK Pin 2			AUD7-2 (0V)
	(AUDIO+)	M7- SK Pin 3			AUD7-3 (AUDIO+)
	(AUDIO-)	M7- SK Pin 4			AUD7-4 (AUDIO-)
	(TEST)	M7- SK Pin 5			AUD7-5 (TEST)
V9 MIC 8 External 	12V+	M8-SK Pin 1			AUD8-1 (12V+1)
	0V	M8- SK Pin 2			AUD8-2 (0V)
	(AUDIO+)	M8- SK Pin 3			AUD8-3 (AUDIO+)
	(AUDIO-)	M8- SK Pin 4			AUD8-4 (AUDIO-)
	(TEST)	M8- SK Pin 5			AUD8-5 (AUD)
VHF 1	N/A				AUD9-1 (12V+1)
	N/A				AUD9-2 (0V)
	(AUDIO+)				AUD9-3 (AUDIO+)
	(AUDIO-)				AUD9-4 (AUDIO-)
	N/A				AUD9-5 (TEST)
VHF2	N/A				AUD-10-1 (12V+)
	N/A				AUD-10-2 (0V)
	(AUDIO+)				AUD-10-3 (AUDIO+)
	(AUDIO-)				AUD10-10-4 (AUDIO-)
	N/A				AUD-10-5 (AUDIO-)

M.E.U. — Terminal Connections Power Supply

Equipment	Signal	Termination	CORE Colour/No	CABLE No	MEU Termination
UPS DC SUPPLY	+24VDC				DC IN-1 (24V)
	0VDC				DC IN-2 (0V)
UPS AC FAIL	AC FAIL				PL18-1 (24VPF)
	AC FAIL				PL18-2 ()
UPS BATTERY FAIL	BATT FAIL				PL16-1 (24VBF)
	BATT FAIL				PL16-2 ()
MONITOR AC FAIL	+24VDC				PL27-1 (24V)
	0VDC				PL27-2 (0V)

M.E.U. — Terminal Connections NMEA Data In

Equipment	Signal	Termination	CORE Colour/No	CABLE No	MEU Termination
					TB1 (NMEA 0183 A)
					TB1 (NMEA 0183 B)
					TB2 (NMEA 0183 A)
					TB2 (NMEA 0183 B)
					TB3 (NMEA 0183 A)
					TB3 (NMEA 0183 B)
					TB4 (NMEA 0183 A)
					TB4 (NMEA 0183 B)
					TB5 (NMEA 0183 A)
					TB5 (NMEA 0183 B)
					TB6 (NMEA 0183 A)
					TB6 (NMEA 0183 B)
					TB7 (NMEA 0183 A)
					TB7 (NMEA 0183 B)
					TB8 (NMEA 0183 A)
					TB8 (NMEA 0183 B)
					TB9 (NMEA 0183 A)
					TB9 (NMEA 0183 B)
					TB10 (NMEA 0183 A)
					TB10 (NMEA 0183 B)
					TB11 (NMEA 0183 A)
					TB11 (NMEA 0183 B)

M.E.U. — Terminal Connections NMEA Data In

Equipment	Signal	Termination	CORE Colour/No	CABLE No	MEU Termination
					TB12 (NMEA 0183 A)
					TB12 (NMEA 0183 B)
					TB13 (NMEA 0183 A)
					TB13 (NMEA 0183 B)
					TB14 (NMEA 0183 A)
					TB14 (NMEA 0183 B)
					TB15 (NMEA 0183 A)
					TB15 (NMEA 0183 B)
					TB16 (NMEA 0183 A)
					TB16 (NMEA 0183 B)
					TB17 (NMEA 0183 A)
					TB17 (NMEA 0183 B)
					TB18 (NMEA 0183 A)
					TB18 (NMEA 0183 B)
					TB19 (NMEA 0183 A)
					TB19 (NMEA 0183 B)
					TB20 (NMEA 0183 A)
					TB20 (NMEA 0183 B)

M.E.U. — Terminal Data Out

Equipment	Signal	Termination	CORE Colour/No	CABLE No	MEU Termination
BRIDGE ALARM SYSTEM					TB29 (NMEA 0183 A)
					TB29 (NMEA 0183 B)

M.E.U – Other Connections					
Equipment	Signal	Termination	CORE Colour/ No	CABLE No	MEU Termination
External alarm					
External Alarm					
External Alarm					

M.E.U- Other Terminations			
Equipment	Signal	Cable No	MEU Termination
Bridge control unit	VIDEO- SVGA		Lower DVI Motherboard
Bridge control unit SERIAL – 9 Pin D Type	Tx Pin 2		Rx Pin 3
	Tx Pin 3		Tx Pin 2
	Screen Pin 5		Screen Pin 5
Bridge control unit	NETWORK – RJ45		PL6 Data Download
ECDIS 1	NETWORK – RJ45		PL10 ECDIS 1
ECDIS 2	NETWORK – RJ45		PL13 ECDIS 2
N/A	NETWORK- RJ45		PL8 Expansion

UPS - Terminal Connections

Equipment	Signal	Termination	CORE Colour/No	CABLE No	UPS Termination
SHIPS EMERGENCY AC SUPPLY	LINE				SW1-2 (LINE 1)
	LINE				SW1-3 (LINE 2)
MEU DC IN	24V+				TB1-1 (LOAD +)
	0V				TB1-2 (LOAD -)
MEU PWR FAIL	24V+				TB1-3 (PWR FAIL)
	0V				TB1-4 (PWR FAIL)
MEU BATTERY FAIL	24V+				TB1-5 (BATT FAIL)
	0V				TB1-6 (BATT FAIL)

VDR JB 1 – Protected Data Capsule – Terminal Connections

NOTE! This J.B. is optional and is recommended only where necessary.

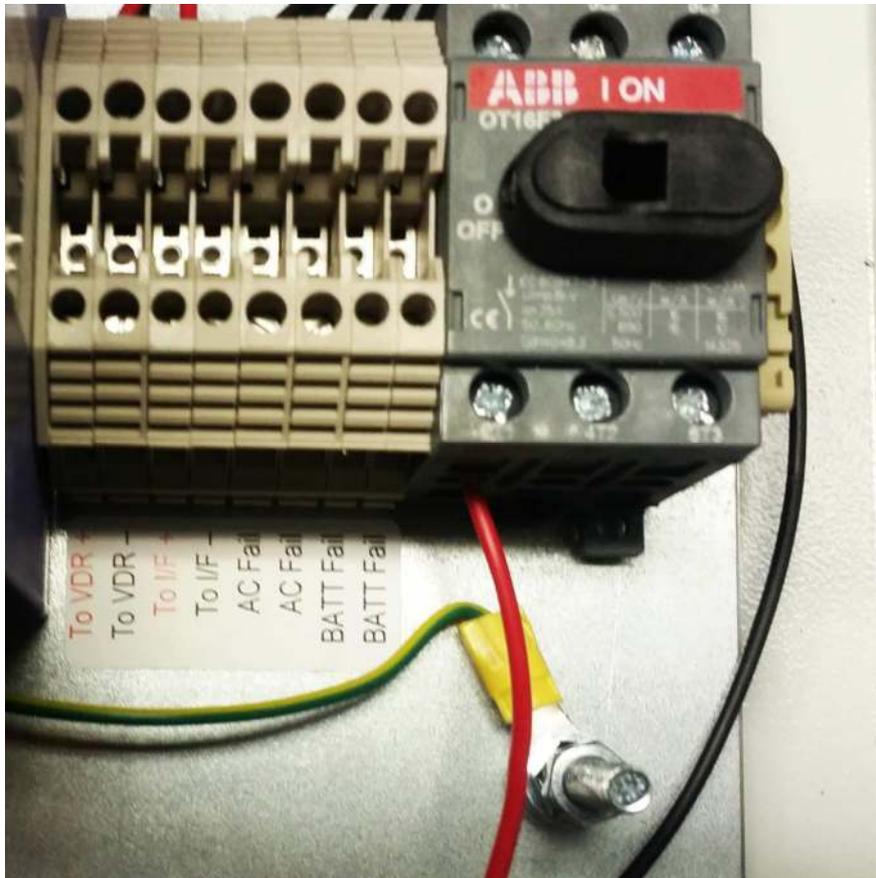
Equipment	Signal	CORE Colour	CABLE No	Junction Box	CORE Colour	MEU Termination
Fixed Capsule X-VDRHC-NOV	24V+					CAP1-1 (24V+)
	0V					CAP1-2 (0V)
	TX LO					CAP1-3 (TX LO)
	TX HI					CAP1-4 (TX HI)
	RX HI					CAP1-5 (RX HI)
	RX LO					CAP1-6 (RX LO)

VDR JB 2 – Float Free Capsule – Terminal Connections

NOTE! This J.B. is optional and is recommended only where necessary.

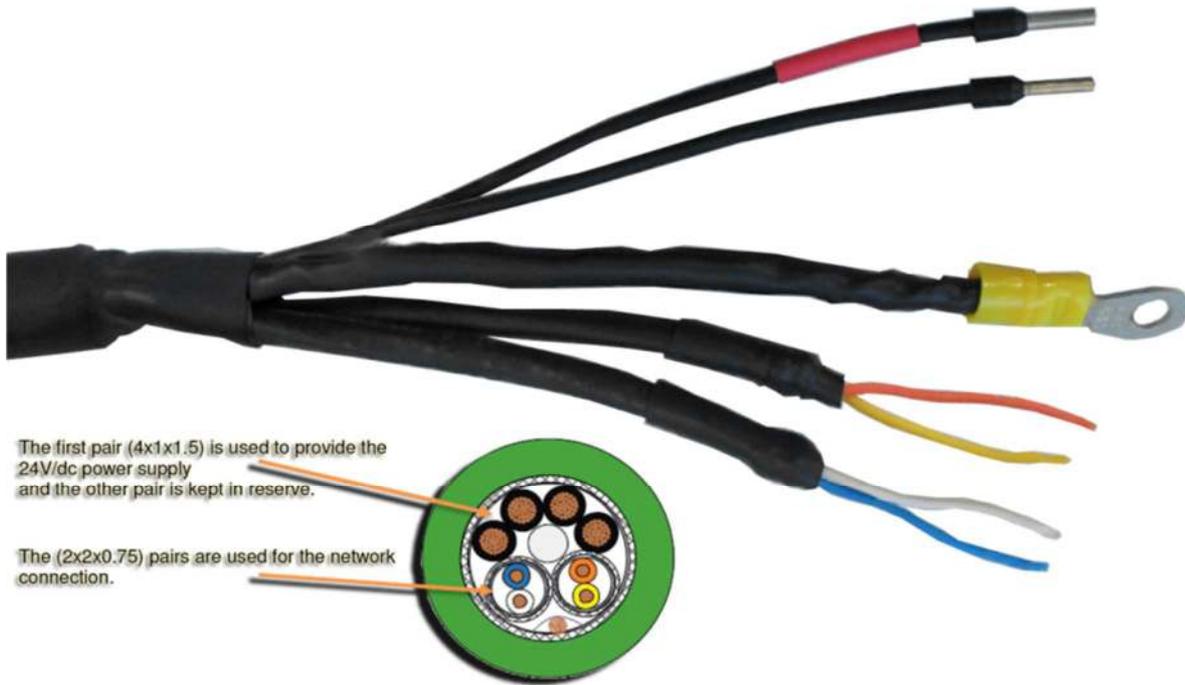
Equipment	Signal	CORE Colour	CABLE No	Junction Box	CORE Colour	MEU Termination
Float Free Capsule X-VDRFF-JOT	+ Supply					CAP2-1 (24V+)
	GND					CAP2-2 (0V)
	TX -					CAP2-3 (TX LO)
	TX +					CAP2-4 (TX HI)
	RX +					CAP2-5 (RX HI)
	RX -					CAP2-6 (RX LO)

X-VDR UPS - Terminal Connections			Version 02		
Equipment	Signal	Termination	CORE Colour/No	CABLE No	UPS Termination
SHIPS EMERGENCY AC SUPPLY	LINE				ABB 4T2
	LINE				ABB 6T3
	GROUND				EARTH STUD
MEU	To VDR+	TB22 +24v			TB1-1
	To VDR-	TB22 0v			TB1-2
	To I/F+	As required			TB1-3
	To I/F-	As required			TB1-4
	AC FAIL	PL18 -1			TB1-5
	AC FAIL	PL18-2			TB1-6
	BATT Fail	PL16-1			TB1-7
	BATT Fail	PL16-2			TB1-8
BATTERY 1	12V+	POS BATT 1	RED		ABB2T1
	0VDC	NEG BATT 1	LINKED		-
BATTERY 2	12V+	POS BATT 2			-
	0VDC	NEG BATT 2	BLACK		DRU30 (BATT-)



M.E.U. – Terminal Connections

Equipment	Signal	Core Colour/No	Cable No	MEU Termination
Fixed Hardened Capsule	24V+	Black 1 (Red Sleeve)		CAP1-1 (24V+)
	0V	Black 2		CAP1-2 (0V)
	TX LO	Orange		CAP1-3 (TX LO)
	TX HI	Yellow		CAP1-4 (TX HI)
	RX HI	White		CAP1-5 (RX HI)
	RX LO	Blue		CAP1-6 (RX LO)



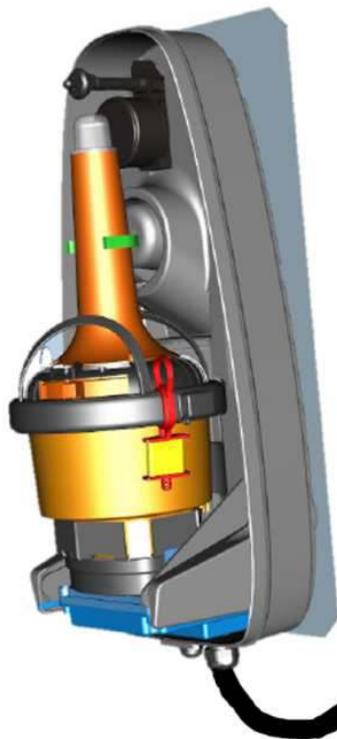
VDR JB 1 – Protected Data Capsule – Terminal Connections

NOTE! This J.B. is optional and is recommended only where necessary.

Equipment	Signal	CORE Colour	Junction Box	Cable No	CORE Colour	MEU Termination
Fixed Capsule X-VDRHC-NOV	24V+	Black 1 (Red Sleeve)	TB 1			CAP1-1 (24V+)
	0V	Black 2	TB 2			CAP1-2 (0V)
	TX LO	Orange	TB3			CAP1-3 (TX LO)
	TX HI	Yellow	TB4			CAP1-4 (TX HI)
	RX HI	White	TB5			CAP1-5 (RX HI)
	RX LO	Blue	TB6			CAP1-6 (RX LO)

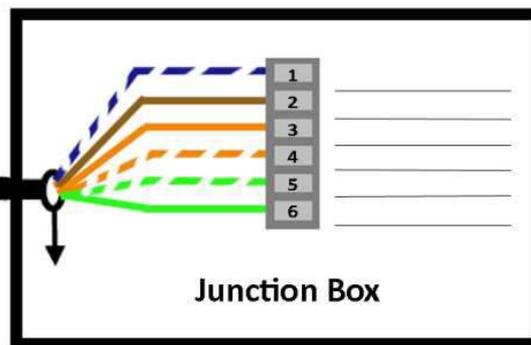
M.E.U. – Terminal Connections

Equipment	Signal	Core Colour/No	Cable No	MEU Termination
Float Free Capsule	24V+	Blue/White		CAP2-1 (24V+)
	0V	Brown		CAP2-2 (0V)
	TX LO	Orange		CAP2-3 (TX LO)
	TX HI	Yellow		CAP2-4 (TX HI)
	RX HI	White		CAP2-5 (RX HI)
	RX LO	Blue		CAP2-6 (RX LO)



Cable connection

Jotron Cable	Voyage Connection
White/blue	24Vdc +
Brown	24Vdc -
Orange	Rx -
White/orange	Rx +
White/green	Tx +
Green	Tx -
Shield	GND



VDR JB 2 – Float Free Capsule – Terminal Connections

NOTE! This J.B. is optional and is recommended only where necessary.

Equipment	Signal	CORE Colour	Junction Box	Cable No	CORE Colour	MEU Termination
Float Free Capsule X-VDRFF-JOT	24V+	Blue/White	TB 1			CAP1-1 (24V+)
	0V	Brown	TB 2			CAP1-2 (0V)
	TX LO	Orange	TB3			CAP1-3 (TX LO)
	TX HI	Yellow	TB4			CAP1-4 (TX HI)
	RX HI	White	TB5			CAP1-5 (RX HI)
	RX LO	Blue	TB6			CAP1-6 (RX LO)

50. Document Issue Details

Document Issue	Date	Modification Number (where applicable) Brief Record of Change and Reason for Change
Iss01 Rev00	04.10.14	Original Issue
Iss01 Rev01	24.11.14	Addition of V8 and V9 External Microphones
Iss01 Rev02	04.12.14	Additional notes on installation guidance

NOTICE

This manual is for informational use only. Kelvin Hughes Ltd continually strives to improve their products and therefore may be changed without prior notice. This manual should not be construed as a commitment of Kelvin Hughes Ltd. Under no circumstances does Kelvin Hughes Ltd assume any responsibility or liability for any errors or inaccuracies that may appear in this document. The equipment should only be used for the purposes intended by the manufacturer; any deviation from this will void the warranty of the product.

NOTE: All alterations must be verified by re-authorisation and approval of the complete document.



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Email: technical.advice@kelvinhughes.co.uk
Web: www.kelvinhughes.com

51. Warranty Form

Kelvin Hughes Ltd Warranty; (abbreviated, full version on request)

The Warranty Period is 24 months from date of dispatch, unless an alternative period has been otherwise agreed in writing.

The first 12 months covers parts and labour, the second 12 months covers parts only.

Warranty covers parts that have failed due to a manufacture defect and does not cover shipping or associated charges

This warranty shall only apply where the REGISTRATION CARD supplied with the goods has been properly completed and returned to Kelvin Hughes Ltd within the period of 21 days from installation.

The registration form can also be downloaded from the Kelvin Hughes Ltd website www.kelvinhughes.com

Returns Procedure;

Send an email RE: REQUEST FOR RETURN AUTHORISATION to technical.advice@kelvinhughes.co.uk

Please do NOT return items until a Return Authorisation Number has been issued.

Documents to be included;

A copy of the original INSTALLATION REPORT and a print out of your RETURN MATERIAL AUTHORISATION INFORMATION EMAIL, and enclose both in the return package.

Be sure to pack the returning product securely and according to carrier instructions. Damage incurred during return shipping due to inadequate protection will render the item ineligible for return, repair, or exchange under the Warranty Terms. Items not received by Kelvin Hughes Ltd, will not be credited.

MOST authorised returns should be returned to the address below - however there are some exceptions, so DO NOT ship to this address without first reviewing your RETURN AUTHORISATION INFORMATION EMAIL for applicable return instructions:

Kelvin Hughes Limited
Voltage
6 Mollison Avenue
Enfield
EN3 7XQ
UK

A full explanation of Kelvin Hughes Ltd warranty conditions can be found on our web site or requested via email.

* Terms of Service and Policies are subject to change without notice.

Please complete and return to Kelvin Hughes Ltd either by post to the above address or by email to technical.advice@kelvinhughes.co.uk

Warranty Registration Form	
Model Number	
Serial Number	
Date of Purchase	
Vessel Name	
IMO Number	

52. Pre Installation Questionnaire

X-VDR

VOYAGE DATA RECORDER

Vessel Name
IMO Number

An accurate quotation and a successful installation rely very much on the provision of accurate information on the following ships equipment (if fitted).

The assessment is based sole on the following information supplied in the VDR Questionnaire. AMI Marine (UK) Ltd will not take any responsibility for any additional work or interfacing requirements due to incorrect or incomplete information supplied.

If equipment is due to be updated or changed within the near future please make a note at end of this questionnaire.

Please complete the following as comprehensive as possible

PLEASE NOTE!

All boxes must be completed.

If not available then that information must be inserted.

Empty boxes will therefore be assumed to be 'Equipment not fitted or not applicable'.

1. These Ships Particulars are required for the Programming of the Capsule. Please complete all where possible.

IMO Number	
Vessels Name/Hull No.	
Owner / Operator	
Ship Contact Name	
Ship Contact Email/ Phone	
Port Of Registration	
Date Of Registration	
Classification Society	
Vessel Type	
MMSI Number	
Gross Tonnage (GRT)	
Call Sign	
Ship Builder	
Keel Laid	
Length O.A.	
Length B.P.	
Breadth (Moulded)	
Depth (Moulded)	
Summer Draft (EXTR)	
Deadweight (SUMMER)	
Max Passenger Capacity	
Max Crew Capacity	

Form Completed By:	
Position/ Rank:	
Date:	
On Behalf of:	

2. Positioning of the Main Electronics Unit (MEU)

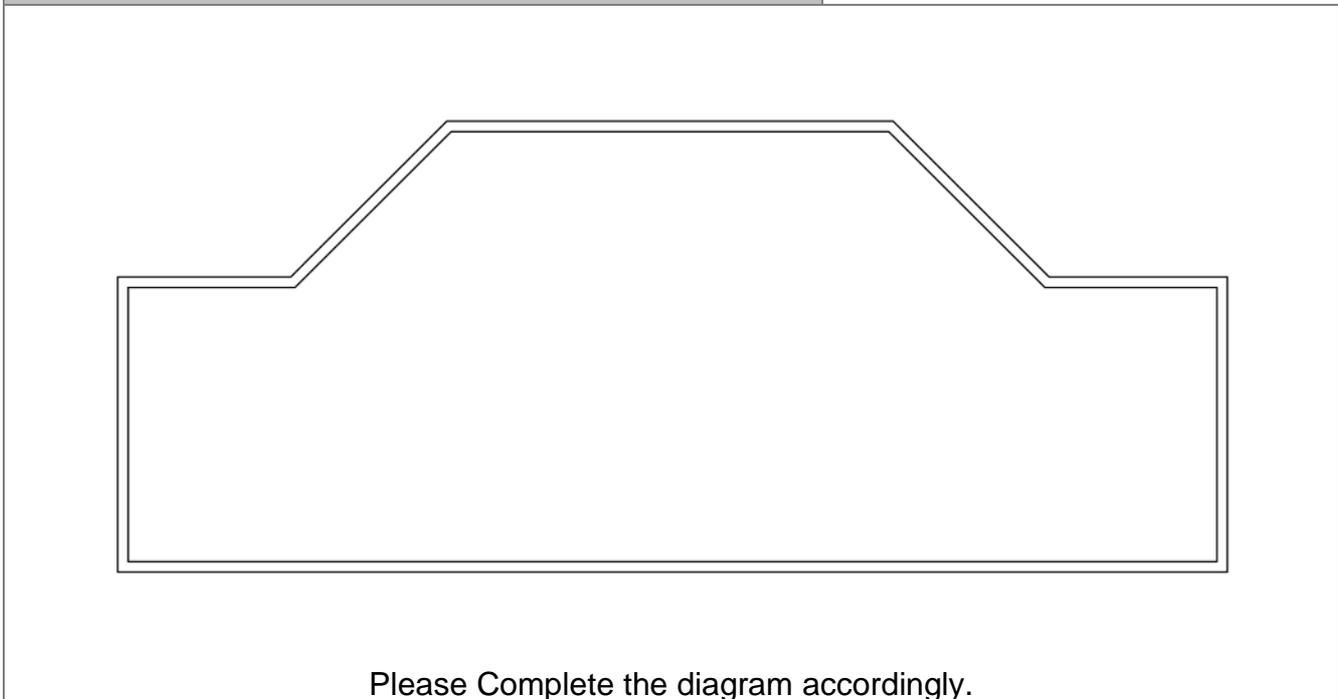
- The MEU is designed for internal use and should not be mounted outside. The area in which it is mounted must be environmentally protected but in a well-ventilated area. Recommended locations are the wheelhouse or the gyro room, radio room.
- Access to the MEU will be required for setting to work, system monitoring and testing so quick and easy access must be taken into account when mounting the unit

Dimensions of the Unit	550x 493x 145mm
Compass Safe Distance	800mm
Clearance Required Above For Ventilation	200mm

Proposed MEU Location

Bridge Width	metres	Bridge Depth	(metres)
--------------	--------	--------------	----------

Does the vessel have external helm positions?	Yes <input type="checkbox"/> No <input type="checkbox"/>
---	--



- An AC voltage supply is required to the MEU; this must be connected to the Emergency switchboard AC supply. The VDR system requires 400vA max.
- Please specify the approximate cable length from the MEU to this mains supply

Ship's Emergency Power Supply	110v 50Hz	110v 60Hz	220v 50Hz	220v 60Hz
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cable Distance to proposed position of MEU		(metres)
--	--	----------

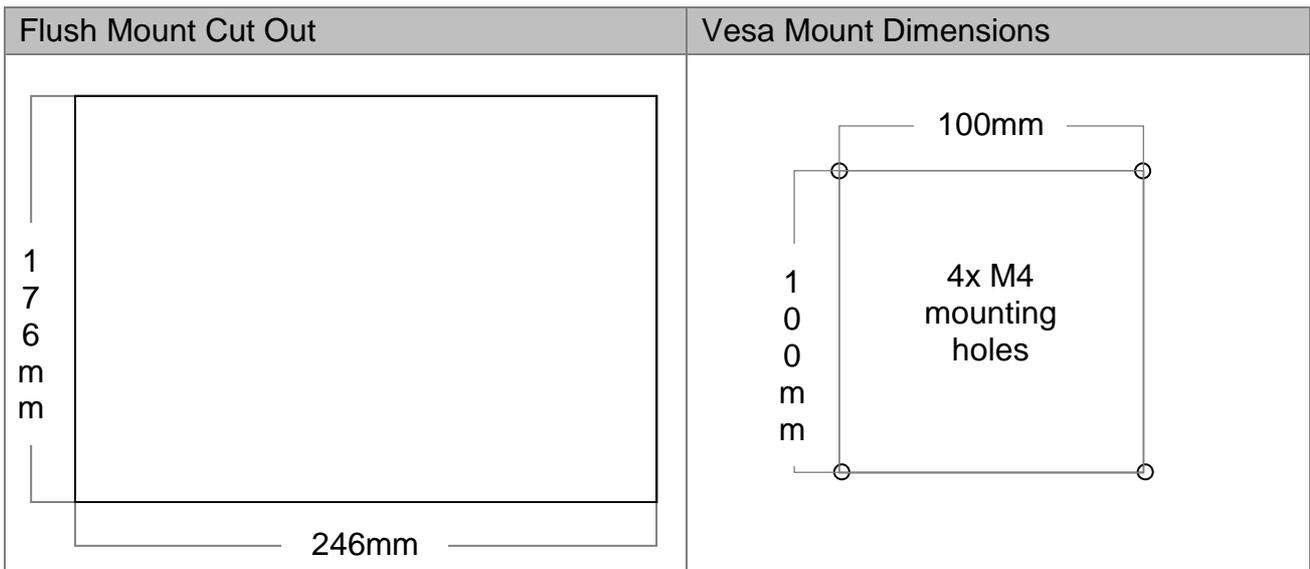
Distance to X-VDR MEU		(metres)
-----------------------	--	----------

3. Positioning of the UPS	
Proposed Location for the UPS	
Must be connected to the ship's emergency AC supply	
Distance from the AC Breaker	(metres)
Distance from the MEU	(metres)

4. Positioning of the Touch Screen Control Panel	
Weight & Dimensions of the Unit	
Compass Safe Distance	
Clearance Required Below For Cable Entry	

Proposed Location for the Touch Screen Control Panel	
--	--

Distance from the MEU	(metres)
-----------------------	----------



Vesa mount required for non-flush mount?	Yes <input type="checkbox"/> No <input type="checkbox"/>
--	--

5. Number of microphones installed / required

NOTE: If the Vessel has existing microphones -

Model		Number of wires	
-------	--	-----------------	--

Microphone 1 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 2 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 3 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 4 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 5 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 6 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 7 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

Microphone 8 - Location		
Microphone Type	Internal <input type="checkbox"/> External <input type="checkbox"/>	
Distance from the MEU		(metres)

6a. X-Band Radar (See Note 1 on page 25)			
Manufacturer			
Model			
SVGA Output Available	Yes <input type="checkbox"/> No <input type="checkbox"/>	DVI Output Available	Yes <input type="checkbox"/> No <input type="checkbox"/>
IEC61162-450 Available	Yes <input type="checkbox"/> No <input type="checkbox"/>	If No then what signal is available	
Distance to X-VDR MEU	(metres)		
Additional Comments			

6b. S-Band Radar (See Note 1 on page 25)			
Manufacturer			
Model			
SVGA Output Available	Yes <input type="checkbox"/> No <input type="checkbox"/>	DVI Output Available	Yes <input type="checkbox"/> No <input type="checkbox"/>
IEC61162-450 Available	Yes <input type="checkbox"/> No <input type="checkbox"/>	If No then what signal is available	
Distance to X-VDR MEU	(metres)		
Additional Comments			

7a. ECDIS 1	
Manufacturer	
Model	
IEC61162-450 Available	Yes <input type="checkbox"/> No <input type="checkbox"/>
Distance to X-VDR MEU	(metres)
Additional Comments	

7b. ECDIS 2	
Manufacturer	
Model	
IEC61162-450 Available	Yes <input type="checkbox"/> No <input type="checkbox"/>
Distance to X-VDR MEU	(metres)
Additional Comments	

8a. VHF Radio 1	
Manufacturer	
Model	
Combined Tx and Rx Audio Available?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Distance to X-VDR MEU	(metres)
Additional Comments	

8b.	VHF Radio 2		
	Manufacturer		
	Model		
	Combined Tx and Rx Audio Available?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	Distance to X-VDR MEU	(metres)	
	Additional Comments		

9.	AIS: Automatic Identification System		
	Manufacturer		
	Model		
	Distance to X-VDR MEU	(metres)	
	Additional Comments		

10.	EPFS Electronic position-fixing system – GPS or Other		
	Manufacturer		
	Model		
	Location of EPFS		
	Distance to X-VDR MEU	(metres)	
	Additional Comments		

11.	Gyro Compass		
	Manufacturer		
	Model		
	NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Stepper Output Yes <input type="checkbox"/> No <input type="checkbox"/>
	Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio
	Distance to X-VDR MEU	(metres)	
	Additional Comments		

12.	Speed Log		
	Manufacturer		
	Model		
	NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	200PPM Output Yes <input type="checkbox"/> No <input type="checkbox"/>
	Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio
	Distance to X-VDR MEU	(metres)	
	Additional Comments		

13.	Echo Sounder			
Manufacturer				
Model				
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Separate Tx/Rx Pulse Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Distance to X-VDR MEU		(metres)		
Additional Comments				

14.	Wind Speed and Direction			
Manufacturer				
Model				
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio		
Other (must be specified)				
Distance to X-VDR MEU		(metres)		
Additional Comments				

15.	Heading/ Track Controller (Autopilot System)			
Manufacturer				
Model				
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio		
Distance to X-VDR MEU		(metres)		
Additional Comments				

16.	Rudder Order			
Manufacturer				
Model				
Number of Control Positions				
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio		
NMEA Message				
Distance to X-VDR MEU		(metres)		
Additional Comments				

17. Rudder Response			
Manufacturer			
Model			
Number of Rudders			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
NMEA Message			
Distance to X-VDR MEU	(metres)		
Additional Comments			

18. Bow Thruster Order			
Manufacturer			
Model			
Number of Control Positions			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU	(metres)		
Additional Comments			

19. Bow Thruster Response			
Manufacturer			
Model			
Number of Thrusters			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU	(metres)		
Additional Comments			

20. Stern Thruster Order			
Manufacturer			
Model			
Number of Control Positions			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU			(metres)
Additional Comments			

21. Stern Thruster Response			
Manufacturer			
Model			
Number of Thrusters			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU			(metres)
Additional Comments			

22. Engine Order			
Manufacturer			
Model			
Number of Control Positions			
Number of Engines			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU			(metres)
Additional Comments			

23. Engine Response			
Manufacturer			
Model			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Synchro Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Synchro Ratio	
Distance to X-VDR MEU			(metres)
Additional Comments			

ALARMS AND MONITORING

24.	Fire Doors		
Manufacturer			
Model			
Number of Fire Doors			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>
On/Off Voltage	AC <input type="checkbox"/> DC <input type="checkbox"/>	Voltage Values	
Distance to X-VDR MEU		(metres)	
Additional Comments			

25.	Watertight Doors		
Manufacturer			
Model			
Number of Watertight Doors			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>
On/Off Voltage	AC <input type="checkbox"/> DC <input type="checkbox"/>	Voltage Values	
Distance to X-VDR MEU		(metres)	
Additional Comments			

26.	Hull Doors		
Manufacturer			
Model			
Number of Hull Doors			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Dry Contact	Yes <input type="checkbox"/> No <input type="checkbox"/>
On/Off Voltage	AC <input type="checkbox"/> DC <input type="checkbox"/>	Voltage Values	
Distance to X-VDR MEU		(metres)	
Additional Comments			

27.	Hull Stress Monitoring Equipment		
Manufacturer			
Model			
Number of Sensors			
NMEA Output	Yes <input type="checkbox"/> No <input type="checkbox"/>	Variable Voltage	Yes <input type="checkbox"/> No <input type="checkbox"/>
Other (must be specified)			
Distance to X-VDR MEU		(metres)	
Additional Comments			

28. Mandatory Alarms

This should include the status of all mandatory alarms on the bridge or as received from the Bridge Alert Management System, if installed, recorded as individually identified alarms. See ANNEX 21 RESOLUTION MSC.333(90)

Extract from IEC61996-1 Ed2.

Annex B
(informative)
Mandatory alarms

IMO resolution MSC.333(90) requires in 5.5.10 the recording of mandatory alarms on the bridge as given in Resolution A.1021(26) Code on alert and indicators, Table 10.1.1 Location navigation bridge. This table is reproduced for information as Table B.1.

NOTE Table B.1 includes only the priority of alert specified by “A” (alarm) in A.1021(26) Table 10.1.1.

Table B.1 – Mandatory alarms on the bridge

<u>IMO Instrument</u>	Function	Output Type/Comments
SOLAS II-1		
<u>29.5.2</u>	Steering gear power unit power failure	
<u>29.8.4</u>	Steering control system power failure	
<u>29.12.2</u>	Low steering gear hydraulic fluid level	
<u>30.3</u>	Steering system electric phase failure/overload	
<u>31.2.7, 49.5</u>	Propulsion machinery remote control failure	
<u>31.2.9, 49.7</u>	Low propulsion starting air pressure	
<u>31.2.10</u>	Imminent slowdown or shutdown of propulsion system	
<u>52</u>	Automatic shutdown of propulsion machinery	
<u>51.1.3</u>	Fault requiring action by or attention of the officer on watch(machinery alarm including automatic change-over alarm and alarm for all important pressures, temperatures, fluid levels and other essential parameters)	
<u>13.7.3.1</u>	Watertight door low hydraulic fluid level	
<u>13.7.3.1</u>	<u>Watertight door low gas pressure</u>	
<u>13.7.3.2</u>	Loss of stored energy	
<u>13.7.8</u>	<u>Watertight door electrical power loss</u>	
<u>35-1.2.6.2</u>	High water level alarm	
<u>17-1.1.2, 17-1.1.3</u>	Opening indicator	
<u>25.4</u>	Water level pre-alarm	
<u>25.4</u>	Water level main-alarm	
<u>51.2.2</u>	<u>Alarm system normal power supply failure</u>	
SOLAS II-2		Output Type/Comments
<u>4.5.10.1.3</u>	Hydrocarbon gas detection in tanker cargo pump rooms	
<u>7.4.1, 7.4.2</u>	Fire detection in periodically unattended, automated or remotely controlled machinery space	
<u>20.3.1.3</u>	Loss of required ventilation	
<u>10.5.6.4</u>	Fixed local application fire-extinguishing system activation	
SOLAS XII		Output Type/Comments
<u>12.2</u>	<u>Water level pre-alarm</u>	
<u>12.2</u>	Water level main-alarm	
Resolution A.481(XII)		Output Type/Comments

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Annex 2, paragraph 7.3	Personnel alarm	
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Resolution MSC.128(75)		Output Type/Comments
Annex 4.1.2.3, 5.2.3	BNWAS first stage audible alarm	
<u>Gas or chemical codes</u>		Output Type/Comments
IBC 15.2.4 BCH 4.19.4	High and low temperature of cargo and high temperature of heat-exchanging medium	
IBC 15.5.1.6 BCH 4.20.6	High temperature in tanks	
IBC 15.5.1.7 BCH 4.20.7	<u>Oxygen concentration in void spaces</u>	
IBC 15.8.23.1 BCH 4.7.15(a)	Malfunctioning of temperature controls of cooling systems	
IGC 13.4.1 GC 13.4.1	High and low pressure in cargo tank	
IGC 13.6.4, 17.9 GC 13.6.4, 17.11	Gas detection equipment	
IGC 13.5.2 GC 13.5.2	Hull or insulation temperature	
IGC 17.18.4.4 GC 17.12.2(d)(iv)	Cargo high pressure, or high temperature at discharge of compressors	
IGC 17.14.4.3 GC 17.12.5(d)(iii)	Gas detecting system monitoring chlorine concentration	
IGC 17.14.4.4 GC 17.12.5(d)(iv)	High pressure in chlorine cargo tank	
IBC 15.5.2.5 BCH 4.20.19	High temperature in tanks	
IBC 15.5.2.6 BCH 4.20.20	Oxygen concentration in void spaces	
IBC 15.10.2 BCH 4.3.1(b)	Failure of mechanical ventilation of cargo tanks	
IGC 5.2.1.7, GC 5.2.5(b)	Liquid cargo in the ventilation system	
IGC 8.4.2.1, GC 8.4.2(a)	Vacuum protection of cargo tanks	
IGC 9.5.2, GC 9.5.2	Inert gas pressure monitoring	
IGC 13.6.11 GC 13.6.11	Gas detection equipment	
IGC 17.14.1.4 GC 17.12.5(a)(iv)	Gas detection after bursting disk for chlorine	
IGS		Output Type/Comments
3.14.11	Low water level alarm	
2000 HSC Code		Output Type/Comments
7.7.1.2	Fixed fire detection and fire alarm systems' power loss or fault condition	
7.7.1.4	Fire detection signal	
7.7.1.6	Fire detection manually operated call point section unit indicator	
7.7.2.1	Fire detection for periodically unattended machinery spaces	
7.8.5.3	Loss of required ventilation	
9.1.14	Liquid cooling system failure	
9.2.1	Automatic fire detection system	
9.2.1	Bilge alarm	
9.2.1	Remote machinery alarm system	
9.4.2	Fuel line failure	
9.4.5	Lubricating oil pressure or level falling below a safe level	

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9.5.6	Lubricating fluid supply failure or lubrication fluid pressure loss	
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2000 HSC Code	Continued	Output Type/Comments
10.3.12	Unattended space bilge alarm	
11.2.1	Failure of any remote or automatic control system	
11.4.1	Malfunction or unsafe condition	
11.4.1.1	Indication of conditions requiring immediate action	
12.5.1	Steering system electric overload	
12.5.2	Steering system electric phase failure	
12.6.3	Electrical distribution system low insulation level	

2009 MODU Code		Output Type/Comments
7.4.2.7, 8.5.7	Propulsion machinery remote control failure	
7.4.2.9, 8.5.9	Low starting air pressure	
7.4.2.10	Imminent slowdown or shutdown of the propulsion	
12.6.3	Electrical distribution system low insulation level	
7.6.3	Steering gear phase failure/overload alarm	
8.7.1	Fault requiring attention	
8.7.3	Alarm system normal supply failure	
9.10.1	Fire detection system alarm	
9.11.1, 9.12.1	Gas detection and alarm system	

FSS Code		Output Type/Comments
8.2.5.2.1, 9.2.5.1.2, 9.2.5.1.3	Fire detection or automatic sprinkler operation	
8.2.5.2.1, 9.2.5.1.5, 9.2.5.1.2	Fire detection system fault	
10.2.4.1.4	Smoke detection system power loss	
10.2.4.1.3, 10.2.2.3	Smoke detection	

NOTE 1.

The X-VDR will accept the following screen resolutions:

<ul style="list-style-type: none"> - 720x400 at 70Hz, 85Hz - 640x480 at 60Hz, 70Hz, 72Hz, 75Hz, 85Hz - 800x600 at 56Hz, 60Hz, 72Hz, 75Hz, 85Hz - 1024x768 at 60Hz, 70Hz, 72Hz, 75Hz, 85Hz - 1152x864 at 60Hz, 70Hz, 75Hz, 85Hz 	<ul style="list-style-type: none"> - 1152x900 at 66Hz - 1280x960 at 60Hz, 85Hz - 1280x1024 at 60Hz, 70Hz, 75Hz, 85Hz - 1600x1200 at 60Hz, 70Hz, 75Hz, 85Hz - 1920x1200 at 60Hz
---	---

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Survey Conducted By:		QA Stamp
Name	Company	
Signature	Date	

53. Commissioning Report

X-SERIES VOYAGE DATA RECORDER



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Document Issue	Date	Modification Number (where applicable) Brief Record of Change and Reason for Change
1	28.10.14	Original Issue

NOTE: All alterations must be verified by re-authorisation and approval of the complete document.

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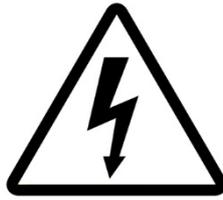
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IMPORTANT WARNINGS



DANGER: HIGH VOLTAGE!
RISK OF ELECTRICAL SHOCK!

This unit has a high voltage source inside.
Disconnect from the power before removing protective covers.
DO NOT remove the covers while the unit is switched on.
24 Volt DC electrical power on interfaces and capsule.

NOTICE

Compass safe distance is 1 meter.

NOTICE

No user serviceable parts inside, servicing only by properly qualified and certified technical staff.

NOTICE

This manual is for informational use only, and may be changed without notice. This manual should not be construed as a commitment of Kelvin Hughes Ltd. Under no circumstances does Kelvin Hughes Ltd assume any responsibility or liability for any errors or inaccuracies that may appear in this document. The equipment should only be used for the purposes intended by the manufacturer; any deviation from this will void the warranty of the product.

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Kelvin Hughes Ltd

**X-SERIES VDR/S-VDR
 COMMISSIONING & INSTALLATION
 REPORT**

Vessel Name:	
IMO Number:	
Port of Registry:	
Class Society:	
Date Keel Laid:	
Gross Tonnage:	
Serial No:	
Install Date:	

PREREQUISITES

The VDR System to be commissioned is connected to the following:	YES	NO
• Confirm that 24V dc (Nominal) power supplies are available.		
• X-VDR UPS		
• Bridge Control Panel		
• Microphone Units		
• VHF		
• Float Free & Fixed Capsules		
• All peripheral equipment connected and operational.		

TEST EQUIPMENT

The following equipment is recommended for an effective and complete install.	YES	NO
USB Mouse & Keyboard		
Laptop Computer		
NMR183 NMEA Reader		
KW907-Beacon Tester		
Digital Multimeter		

UNIT	SERIAL NUMBER	SOFTWARE VERSION
X-VDRMEU (Main Electronics Unit)		
X-VDRTSM (Bridge Control Panel)		
Fixed Capsule		BATTERY INSTALL DATE
Fixed Capsule Sonar Beacon		Battery
X-VDRUPS (Uninterruptable Power Supply)		Batteries
Float Free Capsule		Batteries
Float Free Capsule HRU		HRU

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PHYSICAL INSPECTION		
After installing all hardware, confirm that each unit is secure and all cables and connectors are in place and secured. Check there are no loose items within the enclosure such as screws or washers. Check that all internal system cabling is secure and tied back.	YES	NO
PHYSICAL INSPECTION completed and satisfied		

POWER UP SEQUENCE		
NOTE: <ul style="list-style-type: none"> To avoid system re-boots during the set-up procedure, set the system to 'Service Mode' by moving SW2 on the Terminal PCB to 'Service'. After successful set-up position return this switch to the 'Operate' position On the front of the Main Electronics Unit (MEU) set the Key-switch to the OFF position and follow the below steps: 		
UNINTERRUPTED POWER SUPPLY		
<ul style="list-style-type: none"> Confirm that the battery is connected and the UPS switch is in the OFF Position 	YES	NO
<ul style="list-style-type: none"> Switch on the ship's breaker to supply the X-VDR with 110/220v AC 		
<ul style="list-style-type: none"> Turn the UPS switch to the ON position and confirm the 'DC ON' light on the DRA300 illuminates 	YES	NO
<ul style="list-style-type: none"> Confirm that the 'DC OK' LED is illuminated 		
<ul style="list-style-type: none"> Confirm that the 'BATT FAIL' LED is <u>not</u> illuminated 		
<ul style="list-style-type: none"> Confirm that the 'BATT DISCHARGE' LED is <u>not</u> illuminated 		
<ul style="list-style-type: none"> Check the output voltage to the X-VDR and confirm that it is approx. 27v DC 		
MAIN ELECTRONIC UNIT		
<ul style="list-style-type: none"> Turn the Power Key to the ON position 		
<ul style="list-style-type: none"> SYSTEM ON' LED will begin to flash 		
<ul style="list-style-type: none"> After a few seconds the system will BEEP and the 'SYSTEM ON' LED will remain steady 	YES	NO
<ul style="list-style-type: none"> Bridge Control Panel will show the software booting up 		
<ul style="list-style-type: none"> Ensure that the 5v OK, 12v OK, BATT OK, 24v OK and AC OK LEDs are illuminated on the Terminal PCB 	YES	NO
<ul style="list-style-type: none"> On completion of the boot sequence the X-VDR desktop will be displayed on the Bridge Control Panel 	YES	NO

- Run the X-VDR Engineering Setup software and refer to annex A to configure the X-VDR

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

POWER UP SEQUENCE continued		
BRIDGE CONTROL PANEL		
<ul style="list-style-type: none"> • With the system running and X-VDR software displayed on the Bridge Control Panel ensure that all ship's details are correct 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that no 'Caution' indication is present 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the VIDEO tab and confirm that the video image is displayed from the attached RADAR and ECDIS units 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the AUDIO tab and confirm that the microphones correspond to those Installed 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the microphone activity is present on each channel 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the VHF units correspond to those connected 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the NMEA tab and confirm that all NMEA data that is expected is listed and has a green indication 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the CAPSULE tab and confirm that the FIXED CAPSULE has a green Indication 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the ULB installation date is correct 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the FLOAT FREE CAPSULE has a green indication 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the HYDROSTATIC RELEASE installation date is correct 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the LTRM (Long Term Recording Medium) has a green Indication 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the POWER tab and confirm that the MAINS POWER indication is not in a Caution state 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the UPS indication is not in a Caution state 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Confirm that the BATTERIES indication is not in a Caution state 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Press and hold the SYSTEM TEST pad until the tick turns green – this will start a full system test 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Select the EVENT LOG tab and ensure that no Caution indications are shown in the event log within the text highlighted BLUE 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Press and hold the INCIDENT MARKER for 5 seconds and ensure that a new marker is set in the Event Log 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
POWER UP completed and satisfactory		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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CONFIRMATION OF OPERATION		
VIDEO		
<ul style="list-style-type: none"> Select the VIDEO tab and confirm that no 'Cautions' are present and that images can be seen on each of the active video capture screens 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Remove the physical connection between one Radar and the XVDR, inside the MEU 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the corresponding video box displays NO VIDEO DETECTED and turns amber 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that a Caution indication flashes at the top of the screen 	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the status indicator flashes amber next to the VIDEO tab 	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Select any other tab and then select the VIDEO tab and confirm that the Cautions remain but stop flashing 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Replace the physical connection of the Radar to the XVDR MEU and confirm that the Caution indications no longer remain and that the status indication returns to green 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
AUDIO		
<ul style="list-style-type: none"> Select the AUDIO tab and remove one of the physical microphone connections inside the MEU 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the corresponding microphone displays a yellow 'Caution' Indication 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that an amber 'Caution' indication flashes in the top panel of the Screen 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that a the status tab next to the AUDIO tab flashes amber 	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Select any other tab and then select the AUDIO tab and confirm that all 'Caution' indications remain but stop flashing 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Replace the physical microphone connection and confirm that the 'Caution' indication clears and all indications return to a green status 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
NMEA		

<ul style="list-style-type: none"> Select the NMEA tab and observe a green indication next to each NMEA input label 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Remove the physical data input connection on channel 1 of the terminal PCB 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that an amber bar covers the first corresponding NMEA input label 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the corresponding individual status indicator turns amber 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that an amber 'Caution' indication flashes in the top panel of the Screen 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that a the status tab next to the NMEA tab flashes yellow 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Select any other tab and then select the NMEA tab and confirm that all 'Caution' indications remain but stop flashing 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>

CONFIRMATION OF OPERATION (NMEA) continued		
<ul style="list-style-type: none"> Confirm that the NMEA input label bar returns to the original state but that the individual status indicator remains amber 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Replace the physical data input connection and confirm that all status indicators return green 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the 'Caution' indication clears 	<input type="checkbox"/>	<input type="checkbox"/>
CAPSULES		
<ul style="list-style-type: none"> Confirm that the box labelled 'Fixed Capsule' displays a green status LED in the top left corner 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the box labelled 'Float Free Capsule' displays a green status LED in the top left corner 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the box labelled 'LTRM' displays a green status LED in the top left corner 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the ULB installation date is correct 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the Hydrostatic Release installation date is correct 	<input type="checkbox"/>	<input type="checkbox"/>
POWER		
<ul style="list-style-type: none"> Select the POWER tab and confirm that no amber 'Caution' indicators are Apparent 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Disconnect the positive line of the batteries inside the X-VDR UPS 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the BATTERIES indicator displays an amber 'Caution' 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the Caution indication flashes at the top of the screen 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the status indicator flashes amber next to the POWER tab 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Select any other tab and then select the POWER tab and confirm that the Cautions remain but stop flashing 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Reconnect the batteries in the X-VDR UPS and confirm that all Caution indications are reset 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the BATTERIES INSTALLED date is set correctly 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Switch off the AC supply to the X-VDR UPS and confirm that the AC POWER indicator displays an amber 'Caution' 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
Record the time		<input type="checkbox"/>

• Confirm that the Caution indication flashes at the top of the screen		
• Confirm that the status indicator flashes amber next to the POWER tab		
• Select any other tab and then select the POWER tab and confirm that the Cautions remain but stop flashing	YES	NO
• Confirm that a timer appears in red and begins to count down		
• After 1 hour and 55 minutes confirm that the VDR is still running		
Record the time		

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CONFIRMATION OF OPERATION continued		
<ul style="list-style-type: none"> After two hours from switching off the AC confirm that the VDR system shuts down in a controlled manner 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Turn the X-VDR System On Key to the OFF position 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Switch on the X-VDR system by turning the System On Key to the ON Position 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Select the POWER tab 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Press and hold the SYSTEM TEST button until the tick turns green 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that no 'Caution' indications are displayed 	<input type="checkbox"/>	<input type="checkbox"/>
EVENT LOG		
<ul style="list-style-type: none"> Confirm that the event log filters are set to: <ul style="list-style-type: none"> 'Date' = '{Current}' 'Hour UTC' = 'ALL' 'Priority' = 'ALL' 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the checks carried out above are all present in the log 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that the SYSTEM TEST results are present in the log – these will be highlighted in light blue 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Press and hold the INCIDENT MARKER button for 5 seconds 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Confirm that a marker is present in the log 	<input type="checkbox"/>	<input type="checkbox"/>
CONFIRMATION OF OPERATION completed and satisfactory		
	<input type="checkbox"/>	<input type="checkbox"/>

FUNCTIONAL CHECKS		
AUDIO		
<ul style="list-style-type: none"> • Confirm that the gain control in each microphone has been adjusted to around ¼ turn clockwise from the minimum setting (fully anticlockwise) to give the optimum audio level 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Ensure an audio source is outputting at a good volume within range or each Microphone 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Connect a set of headphones to the first microphone input and listen to the audio being received by the microphone 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Adjust the microphone gain POT to fine tune the audio level, confirming good and clear audio 	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 2 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 3 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 4 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 5 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 6 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Repeat for microphone 7 (if applicable) 	<input type="checkbox"/>	<input type="checkbox"/>

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• Repeat for microphone 8 (if applicable)		
• Connect the headphones to the first VHF input and confirm that the transmit and receive audio is good and clear	YES	NO
• Connect the headphones to the second VHF input and confirm that the transmit and receive audio is good and clear (if applicable)	YES	NO
VIDEO		
• Confirm that the image recorded is a good representation of the source Image If further calibration is required, enter Engineering Setup mode as follows: Hold the vessel image for 10 seconds then tap the Kelvin Hughes logo 5 times. Enter username and password to access the XVDR desktop	YES	NO
• Run the Epiphan Capture Tool for the respective Radar input		
• Adjust the image onscreen and confirm an acceptable image is displayed		
• Close the Epiphan Capture Tool to save settings		
• Wait for five minutes and download a section of images and confirm saved image is good and clear	YES	NO
FUNCTIONAL CHECKS completed and satisfactory		

In addition to this commissioning document the following should also be submitted:

Return a copy of the following files from the system:	YES	NO
• Shipdata.ini (if applicable)		
• Audio.ini		
• Files.ini		
• NMEAFormats.txt		
• Radars.ini		
• Serial.ini		
• Vessel.ini		

Documents to be submitted:

Return a copy of the:	YES	NO
• Bridge Layout with installed equipment		
• Connection diagram		
• Installation Report		

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SIGNATURE PAGE

This post installation test was conducted in accordance with ISO 22472:2006 and forms part of the procedure for the issue of the Installation Performance Test Certificate and is related to the **SAFETY CERTIFICATE** for this vessel which is now due for revalidation on:

Date

PLEASE NOTE THAT THIS REPORT IS NOT AN ANNUAL PERFORMANCE CERTIFICATE

In accordance with the principals of harmonisation of certification it will remain valid until the next annual re-validation of that certificate, subject to the equipment being maintained in appropriate operational condition.

Type Approval Certificate Issued by

Approval Certificate Issued (VDR)

DNV-GL

13652-14HH

Engineer Authorised by the Manufacturer

Comments

Initials & Name

Signature

Date

Class Surveyor

Comments

Initials & Name

Signature

Date

Ships Representative

Comments

Initials & Name

Signature

Date

Ship's
Stamp

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MANUFACTURERS ANALYSIS

This performance test was conducted in accordance with SOLAS regulation V/18.8 and forms part of the procedure for the issue of the Installation Performance Test Certificate.

The results, information and any comments should be relayed to the manufacturer in accordance with the instructions contained within the Operation Manual.

Subject to satisfactory results, an Installation Performance Certificate will then be issued.

Kelvin Hughes Ltd will complete a review, record any changes and issue the completed test report and the Annual Certificate within 45 days. To accommodate performance checks to align with the appropriate survey under the Harmonized System of Survey and Certification (HSSC), the annual performance check may be carried out up to 3 months before the due date for a passenger ship and +/- 3 months of the due date for a cargo ship.

	YES	NO
Confirmation that all data is available throughout the 48-hour recording.	<input type="checkbox"/>	<input type="checkbox"/>
Confirm that a 20 minute section of data, including the listed configuration files will be forwarded to Kelvin Hughes Ltd for analysis.	<input type="checkbox"/>	<input type="checkbox"/>
Confirm that copies of the Service report and Installation Report will be forwarded to Kelvin Hughes Ltd for review.	<input type="checkbox"/>	<input type="checkbox"/>

PLEASE NOTE THAT THIS REPORT IS NOT AN ANNUAL PERFORMANCE CERTIFICATE

TO BE COMPLETED BY KELVIN HUGHES LTD

Kelvin Hughes Ltd 's analysis of the downloaded data and in accordance with (IEC) 61996-2 Maritime navigation and radio communication equipment and systems – Shipborne Voyage Data Recorder (VDR) and (S-VDR_ – Performance requirements – Methods of testing and required test results section 4.6 – Data items to be recorded (resolution A.861 (20), section 5.4). is to be attached to complete this report.

This confirms the endorsement by the manufacturer of the tests and that the master database has been created

Date and Time of above Log		Ship's Stamp
Kelvin Hughes Ltd Number		
Certificate Date Issued		
Certificate Date Expires		