VDR-100G2/G2S Operation User Manual

RUT-UM-02-002 Rev.2.0

Rutter Technologies Inc
70 Brookfield Road
St. John's, NL Canada
A1E 3T9

Tel: (709) 368-4213
Fax: (709) 368-1337

www.ruttertech.com

Rutter Technologies Inc.
VDR-100G2/G2S Operation
User Manual

RUT-UM-02-002 Rev. 2.0

Revision Issue Date: December 23, 2008

Regional Offices

Germany
Joseph-Hayden Str 20
D 28209 Bremen, Germany
Tel: +49 421 34 99 538
Fax: +49 721 151 329 560
germany@ruttertech.com

Greece
17, Voulis Street (2nd Floor)
105 63 Syntagma, Athens
Greece
Tel: +30 210 323 6935
Fax: +30 210 322 0643
greece@ruttertech.com

Italy
Rutter Technologies Inc. - European Office
Viale Boccaccio 111
50053 Empoli
Italy
Tel: +39 0571 945099
Fax: +39 0571 945406
italy@ruttertech.com

Sweden
Rutter Technologies Inc.
Lered 111
SE 274 92 Skurup
Sweden
Tel: +46 706 386 396
Fax: +46 706 143 143
sweden@ruttertech.com

The **Rutter Technologies' Worldwide Service List** is available for download in PDF format at the following web site address: http://www.ruttertech.com/support/

This page is intentionally blank.

Amendment Record for VDR—100G2/SVDR Operation User Manual

The details of any amendment made to this documentation should be recorded in the table below.
These details should include the signature of the person responsible for inserting the latest amendment.

Description	Date Inserted
RUT-UM-02-002, Rev. 2.0 Addition of Chapter 7: Maintenance	December 22, 2008

This page is intentionally blank.

Table of Contents

List of Figures

List of Tables

1 SYSTEM

1.1 VDR-100G2 System Components

The VDR-100G2 is a modular, Ethernet-based data acquisition and storage system. It is designed to collect and maintain a secure, retrievable record of information related to the position, movement, physical status, and command & control of a marine vessel.

While this manual references the VDR-100G2, it is **also applicable to the Simplified Voyage Data Recorder (VDR-100G2S) unless otherwise stated**.

There are three (3) types of information recorded by a Voyage Data Recorder (VDR):

1. Audio data acquired from microphones mounted in the immediate vicinity of a vessel's main bridge workstations and a primary VHF radio is required to be recorded. The VDR-100G2 has the capability to record public address systems, internal communications, additional radios, or other areas of the ship if necessary.
2. Video data can be captured at 15 second intervals from one (1) complete radar video frame screen via a dedicated buffered output port of the radar. The VDR-100G2 can record images captured from multiple Radars, electronic chart, or CCTV displays at various capture intervals. An SVDR is not required to capture video data.
3. ASCII serial data related to the position, heading, speed, wind, water depth, hull openings, bulkhead doors, alarm status, manoeuvring commands, and responses can be recorded with the VDR-100G2. The standard format for this data is defined in the NMEA 0183/IEC 61162 standards; through the implementation of an interface module, non-standard data can be converted to this format.

For a complete list of data items to be recorded, refer to IEC 61996.

The VDR-100G2 is a fully IMO compliant VDR. The base system consists of the following components:

1. **Data Processing Unit** (DPU), consisting of:
   - Data Management Module (DMM)
   - Power Supply Module
   - Power Control Module
   - 2 x 28Ah 12V batteries
   - Cooling Fan with thermostat
   - 4-Port Ethernet switch
   - 4GB USB Memory Stick

2. **Data Acquisition Unit** (DAU)*, consisting of:
   - 4-Channel Audio Module
   - 1-Channel Video Module
   - 8-Channel NMEA Module

* The DAU is optional with the VDR-100G2S.

3. **Operation & Alarm Unit** (OAU)

4. **Final Recording Medium** (FRM)

5. **Internal and External Microphones**

Optionally, the VDR-100G2 can also be supplied with the following components:

1. 2 or 4 additional audio channels (to a maximum of 16 inputs)
2. 1, 2, or 3 additional video channels (to a maximum of 4)
3. 8 or 16 NMEA channels
4. Remote Storage Module (RSM) (implemented for long term archiving and/or additional data backup storage retrieval)
5. Data Interfaces (implemented for the conversion of non-standard signals to NMEA format). Interfaces include:

    - DataAnalog
    - DataDiscrete
    - DataSynchro
    - DataGyro
    - DataProtocol

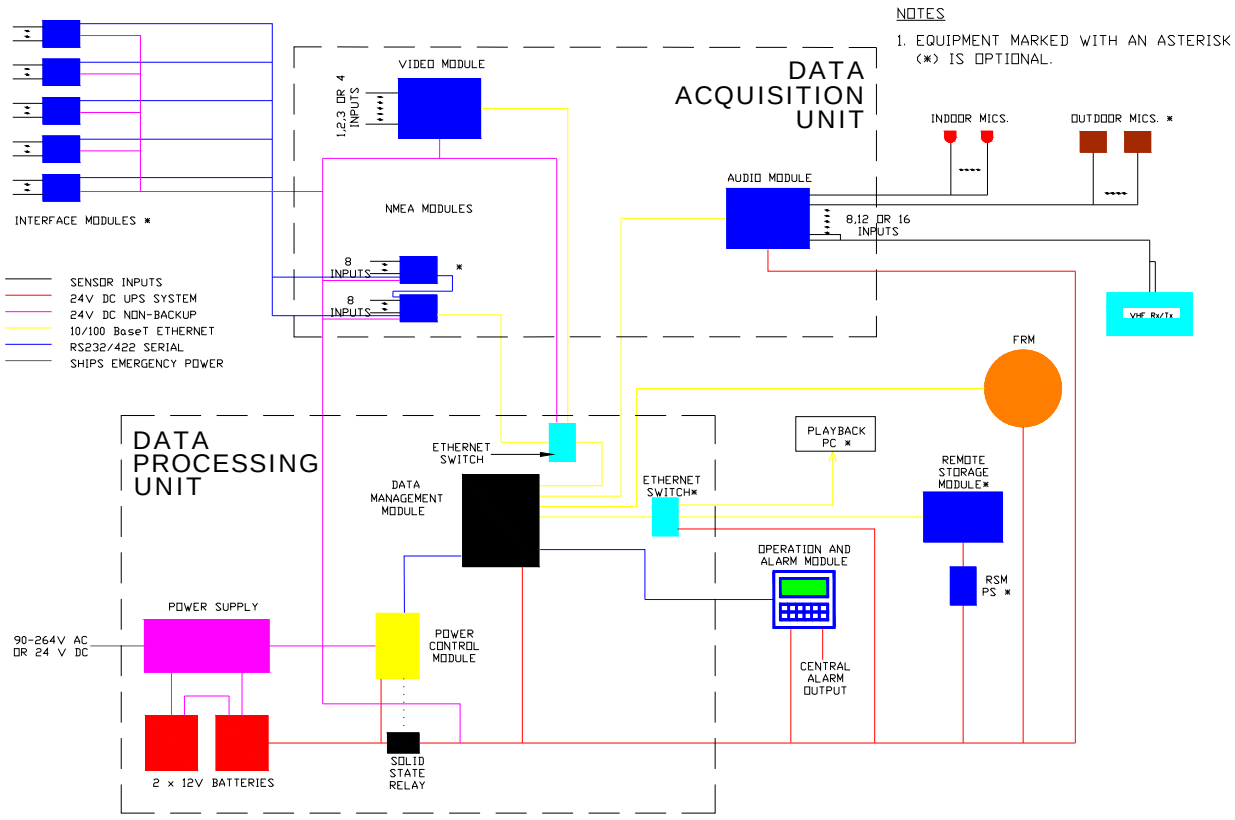


Figure 1-1 - VDR-100G2 Block Diagram

The VDR-100G2S has many similar components to the VDR-100G2, with the following differences:

- The Video Module is only required if the vessel's radar has an available COTS (commercial off-the-shelf) interface. Therefore, the recording of video data may not be applicable in some VDR-100G2S installations.
- The VDR-100G2S has an accompanying Simplified FRM (SFRM) capsule.

1.1.1 Data Processing Unit (DPU)

The **Data Processing Unit** (DPU) receives and processes information provided from the various Audio, Video, and NMEA Input Modules. This information is processed in the Data Management Module (DMM) for archiving on the DMM's internal hard drive, the Final Recording Medium (FRM), USB Memory Stick, and the optional Remote Storage Module (RSM).
The VDR-100G2 power system is housed in the DPU, and accepts universal AC or 24VDC from the ship's emergency power while providing 24VDC to the VDR-100G2 modules. The power system includes batteries to provide uninterrupted power to the audio recording system in the event of a blackout.

The DPU also contains an Ethernet switch (hub) which provides the ability to combine video and NMEA data into a single Ethernet link.

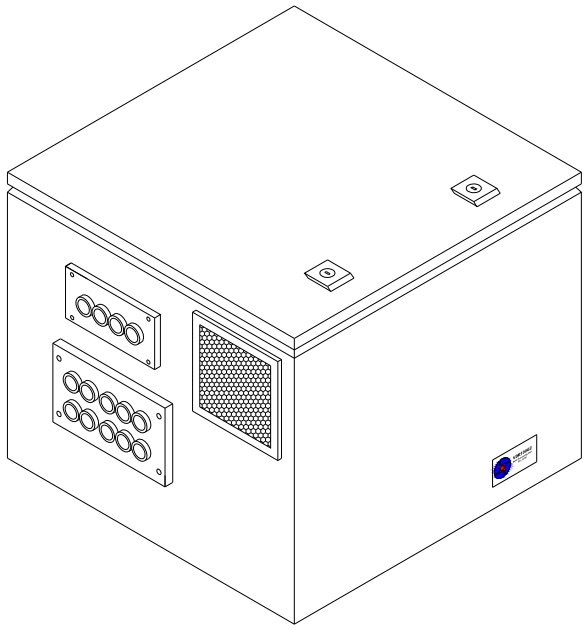


Figure 1-2 - Data Processing Unit

1.1.1.1 Data Management Module

The **Data Management Module** (DMM) is a rugged, small form factor Pentium computer. It is equipped with four (4) Ethernet input ports, two (2) serial ports, two (2) USB ports, a high capacity hard disk drive, and a compact flash card containing an embedded Windows XP operating system.

The module compresses and stores data received from the acquisition modules and, simultaneously, outputs processed data to the FRM, USB Memory Stick, optional Remote Storage Module (RSM), and optional Download/Playback PC (as described below).

Communication with the Operation and Alarm Unit (OAU) and Power Control Module (PCM) occurs via the serial ports. Additionally, the DMM can be configured to provide data for real-time display via an Ethernet connection.

In addition to the most current data set, the base model DMM can store numerous previously recorded full data sets in a secure location. This secure location prevents previously recorded data sets from being overwritten.

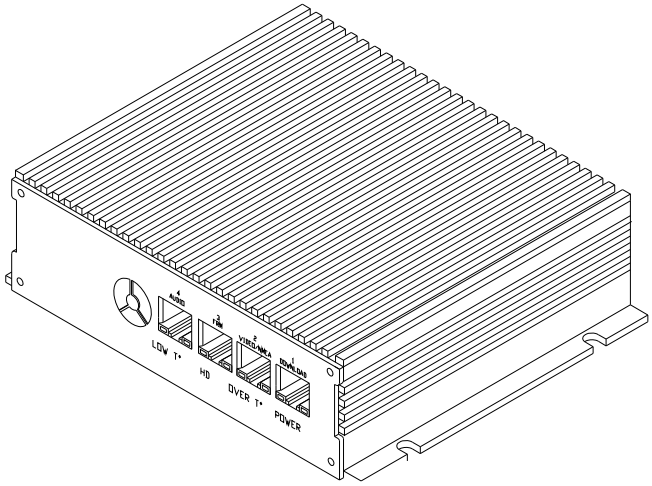


Figure 1-3 - Data Management Module (Rear View)

1.1.1.2 Power Supply Module

The VDR-100G2 has the option of being powered by either AC or DC supply (**must** be chosen at time of order as it is **not field configurable**):

- The AC input range is 85-264V, 47-63Hz.
- The DC input range is 19-28V.
- The output of both supplies is 27.6VDC, which is the normal operating voltage of the VDR.

The power supply also acts as a battery charger for re-charging low batteries or maintaining a full charge. The battery input is reverse polarity protected by a crossbar diode and a replaceable fuse.

1.1.1.3 Power Control Module

The Power Control Module monitors the power system and communicates the power system status information to the DMM. It also controls the switching circuitry to transfer the load from the power supply to the batteries.

1.1.2 Data Acquisition Unit (DAU)

The **Data Acquisition Unit** (DAU) is an optional component that can house up to four (4) main data acquisition modules:

- Audio Module
- Video Module
- (2) NMEA Modules

These modules are used to capture ship information and output this acquired data through an Ethernet port, transmitting it to the DPU for processing and storage.

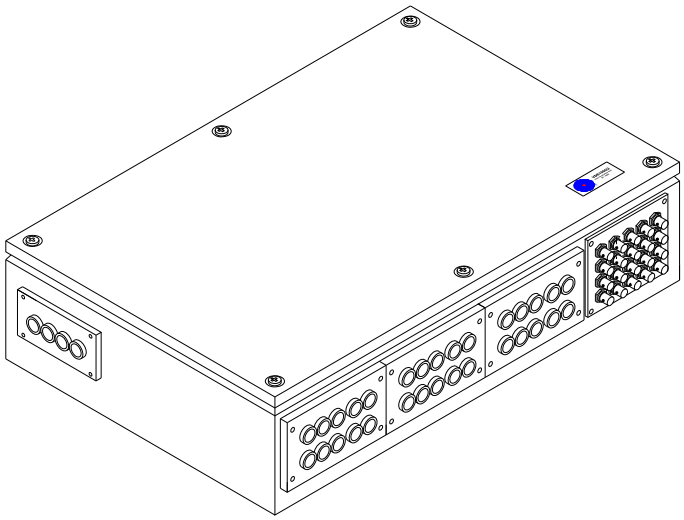


Figure 1-4 - Data Acquisition Unit

1.1.3 Audio Module

The **Audio Module** receives audio information from bridge microphones and vessel radios in accordance with the IEC 61996 standard. All audio data is routed to the DMM for processing, storage, and eventual retrieval. This module also controls the test buzzers used to verify the functionality of all microphones connected to the VDR-100G2.

The standard Audio Module is an autonomous audio capture and broadcast device with eight (8) input ports for capturing audio data from a combination of microphones or line level inputs. An example combination may be:

- Six (6) microphones
- Transmitted and received signals from the primary VHF radio.

The module combines pairs of input signals, digitizes the combined audio channels, and outputs the audio data through an Ethernet port. **Twelve** or **sixteen** input Audio Module units are also available for capturing audio data from **additional** microphones or other sources.

Additional specifications:

- The audio inputs are transformer coupled and can be configured on site as either microphone or line level connections.
- The 8, 12, or 16 audio inputs are mixed 2:1 (either LEFT/RIGHT for microphones, or TX/RX for VHF) to produce 4, 6, or 8 single-ended digital signal streams respectively.
- Separate level control potentiometers are located on the PCB, and can be adjusted using a screwdriver. These levels are **preset** during manufacturing.
- The audio signals are sampled to 12-bit resolution. The resulting digitized data stream is broadcast across an Ethernet cable for storage.
- The Audio Module Ethernet output is connected to a dedicated Ethernet port on the DMM.

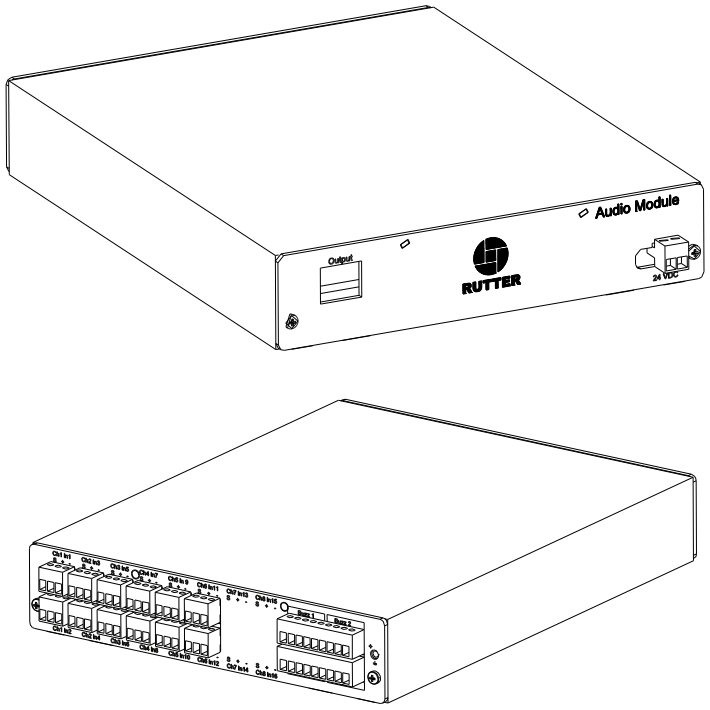


Figure 1-5 – 12-Input (6-Channel) Audio Module

There are two (2) types of microphones available with the VDR-100G2:

- The indoor microphones are condenser style boundary microphones, ordinarily mounted to the ceiling in the bridge area, with a junction box mounted above the ceiling for cable connection.
- The outdoor (external) microphone has an externally mounted wiring junction box.
- Both microphone assemblies include a microphone test buzzer.

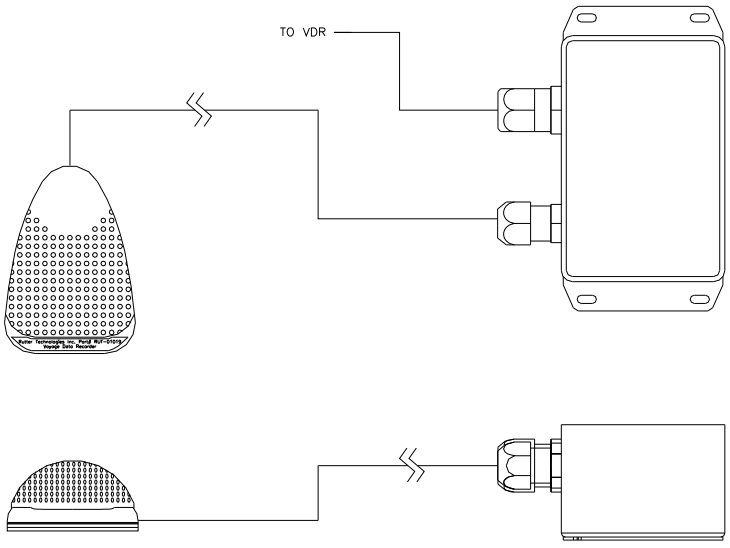


Figure 1-6 - Indoor Microphone

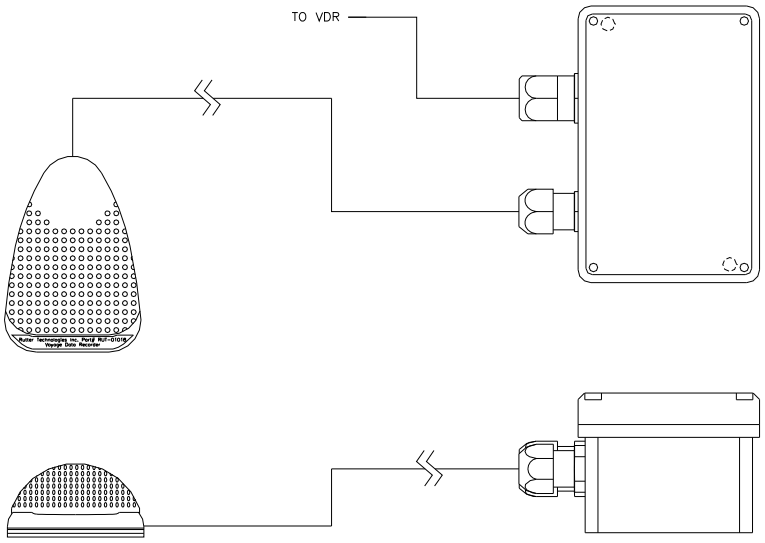


Figure 1-7 - Outdoor Microphone

1.1.4 Video Module

The **Video Module** is an autonomous video capture and broadcast device. It has one (1) input port for capturing images from a dedicated buffered output port of the primary radar. The module digitizes the video signals and outputs the video data through an Ethernet port. Video modules with up to four (4) inputs are also available for capturing images from additional video displays.

The module provides periodic updates of RGB images. For maximum flexibility, the board holds sufficient memory to accommodate 1600 x 1200 x 24-bit colour images and refresh rates up to 85Hz. For maximum capability, the A/D samples at up to 170MHz, with a clock inversion option that allows larger images to be sampled by interleaving two (2) consecutive frames.

The Data Management Module (DMM) initiates the capture of video information and specifies its configuration. This includes:

- The video channel to be digitized.
- The sources of the vertical and horizontal syncs.
- The coefficients for the PLL-generated pixel clock (or selection of an external clock).
- The dimensions (number of samples and lines) of the captured frame.

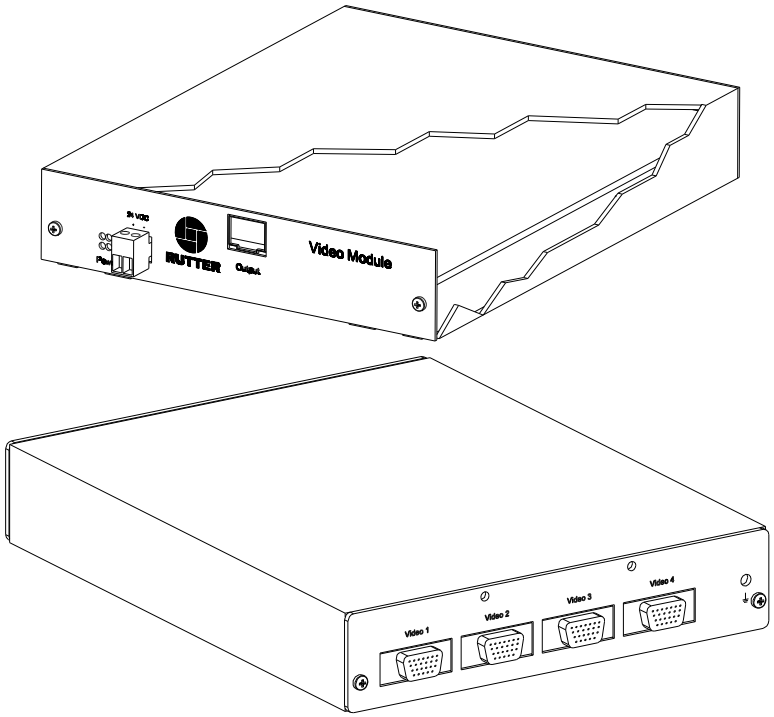


Figure 1-8 - Video Module

1.1.5 NMEA Input Modules

The **NMEA Input Modules** provide connection to all IMO-required data items in both NMEA 0183/IEC 61162 and limited ASCII data formats. NMEA modules multiplex up to eight (8) NMEA-0183 data streams from shipboard systems onto a single RS-232/422 serial data channel, and simultaneously on an Ethernet connection (UDP). Captured data is sent to the DMM via an Ethernet connection for storage and eventual retrieval.

These modules use embedded microprocessor technology with real-time buffer storage to handle simultaneous arrival of data on multiple channels without conflict. Additionally:

- An efficient anti-collision algorithm preserves the integrity of the data even at high incoming data rates.
- Data is handled on a first-in-first-out basis, assembled, and then transmitted via the serial output port to the receiving computer or data logger.

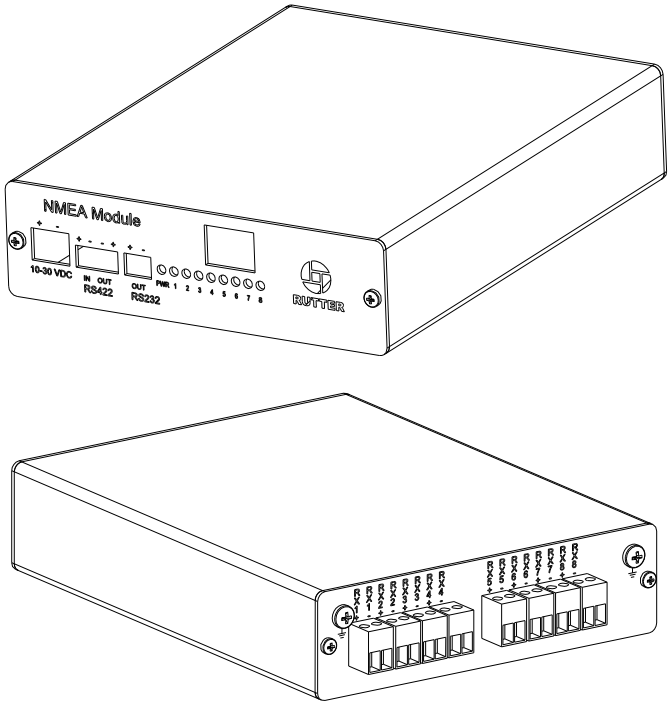


Figure 1-9 – NMEA Input Module

1.1.6 Operation & Alarm Unit (OAU)

The **Operation & Alarm Unit** (OAU) provides a visible and audible alarm in the event of a VDR-100G2 error condition. Using an output connection to a vessel's central bridge alarm system, the OAU alerts an Integrated Bridge System (IBS) of any VDR-100G2 system failures or error conditions. The alarm unit is also used to initiate an IMO required download operation on the VDR-100G2.

The OAU has three (3) primary functions:

- Alert the ship's officer on watch of any detected failure within the VDR-100G2.
- Allow a user to secure recorded data. This action must be taken within 24 hours of any incident to prevent the recording of the incident from being overwritten.
- Allow a user to connect or disconnect, as well as copy secured data, to the optional RSM.

The unit has a simple menu interface which allows a user to secure the recorded data and enable or disable the optional RSM. It is equipped with:

- Audible and visual alarm indicators
- A 12-button keypad
- A 4 x 20 character LED
- An output for monitoring in a central alarm system

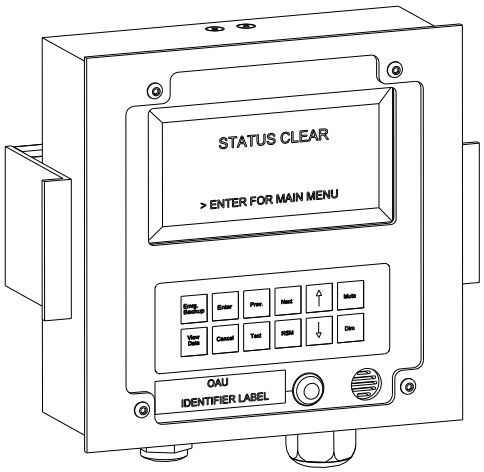


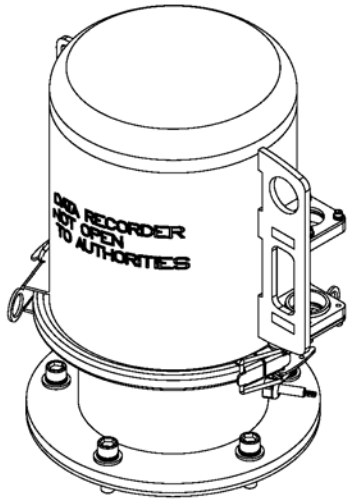
Figure 1-10 - Operation & Alarm Unit

1.1.7 Final Recording Medium (FRM/SFRM)

The **Final Recording Medium (FRM/SFRM)** is a solid-state storage unit capable of storing a minimum of 12 hours of VDR-100G2 data in compliance with IMO resolution A.861(20.). The difference between a VDR and a Simplified-VDR mainly relates to the number of recording channels and their characteristics. Both systems require radar video, bridge microphones and VHF audio, in conjunction with position data, heading and course information, to be recorded for a minimum of 12 consecutive hours.

- The primary function of the FRM/SFRM is to provide a protective capsule for the IMO required data acquired by the VDR. This data will be used, in the event of an incident, by an accident investigation team.
- The FRM/SFRM is mounted on the exterior deck of the ship and connected to the DMM.
- The FRM/SFRM receives data from the VDR via an Ethernet link.
- The SFRM is available in two types: float-free and fixed.

1.1.7.1 Rutter FRM (RUT-02447) Fixed Capsule



The Rutter FRM (RUT-02447) Fixed Capsule contains 4GB of solid-state storage memory, intended to store ship parameters in real time. The storage memory will continually store the last 12 hours (minimum) of received data. When the power supply is removed, the Rutter FRM (RUT-02447) Fixed Capsule will retain the data for more then 10 years.

The Rutter FRM (RUT-02447) Fixed Capsule is an armoured stainless steel (A316) capsule, connected to other system components via independent power and Ethernet cables. Data transfer to and from the capsule is via a 10/100 Base-T Ethernet connection using TCP/IP standard protocol.

Figure 1-11 – Rutter FRM (RUT-02447) Fixed Capsule

The Rutter FRM (RUT-02447) Fixed Capsule is the “Black Box” storage medium for ships is coloured bright orange for ease of location in the event of an incident. It is designed to be mounted externally close to the bridge - typically on the ´monkey island´ - and is fitted with an acoustic beacon to aid underwater recovery by a Remotely Operated Vehicle or diver in the event of an incident.

The unit is designed to meet the requirements of the IEC Performance standard which are the same as those enforced by the maritime and aerospace authorities.

The protected memory is stored in the retrievable capsule and is connected by a quick-release cable-connector assembly to the deckmount.

The Rutter FRM (RUT-02447) Fixed Capsule has a release mechanism to facilitate underwater recovery both by a diver or a ROV. Suitable handles are provided to ensure that the capsule may be retrieved safely after release.

When the Rutter FRM (RUT-02447) Fixed Capsule has been damaged after an incident, e.g. the capsule was exposed to fire or the ship has sunk, the manufacturer should be contacted to extract the data. Alternatively, authorities may apply to the manufacturer for instructions on how to retrieve the recorded data.

1.1.7.2 L3 HVR-01/02 and SVR-01/02 Fixed FRM/SFRM Capsules

The externally mounted L3 SVR-02 Fixed SFRM Capsule is certified to meet or exceed requirements for the environmental qualification categories of IEC 60945, and the survivability requirements of IEC 61996-2.

The L3 SVR-02 Fixed SFRM Capsule is designed specifically for the Simplified Voyage Data Recorder (S-VDR) as required in MSC.163(78) and includes an expandable 2 GB of solid state memory with a storage capacity of more than 12 hours of voyage data including radar, audio, and sensor.

The L3 HVR-02 Fixed FRM Capsule is certified to meet or exceed requirements for the environmental qualification categories of IEC 60945, and the survivability requirements of IEC 61996. The Unit includes

2 GB of solid state memory with a storage capacity of more than 12 hours of voyage data including radar, audio, and sensor.

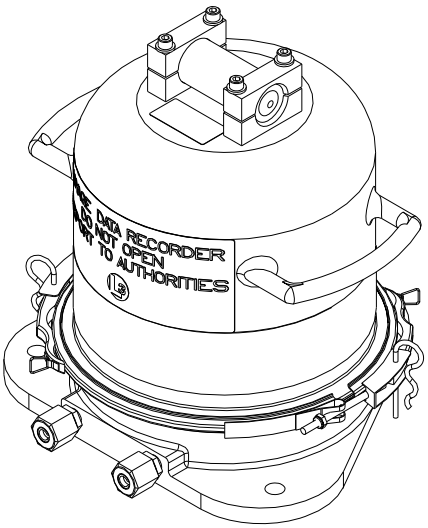


Figure 1-12 –L3 HVR-01 Fixed FRM Capsule

Figure 1-13 - L3 HVR-02 Fixed FRM Capsule

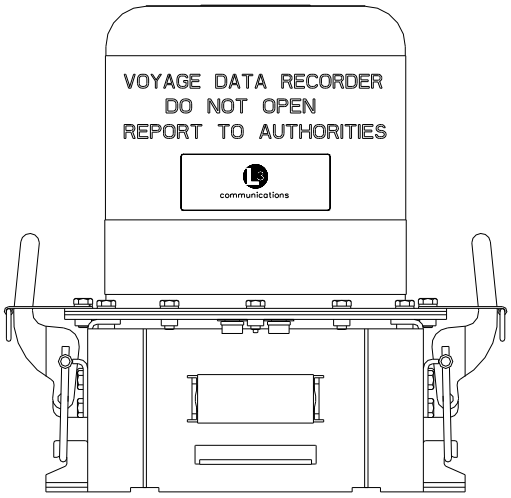


Figure 1-14 - L3 SVR-01 Fixed SFRM Capsule

Figure 1-15 - L3 SVR-02 Fixed SFRM Capsule

1.1.7.3 JoTron Float-Free SFRM Capsule

The JoTron Float-Free SFRM Capsule is a combined SFRM and Cospas-Sarsat EPIRB (Emergency Positioning Indicating Radio Beacon), approved for use with the VDR-100G2S. The capsule contains a memory module with a standard 1.75GB storage capacity and 10Mb Ethernet with TCP/IP interface. The capsule will store 12 hours of captured data. In a situation where a ship may be sinking, the capsule will float free while transmitting both its position and MMSI for at least seven (7) days.

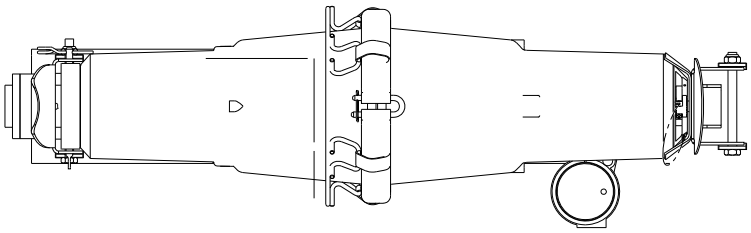


Figure 1-16 - Jotron Float-Free SFRM Capsule

1.1.7.4 Rutter-ACR Float-Free SFRM Capsule

The Rutter-ACR Float-Free SFRM Capsule contains 4GB of non-volatile memory (Flash), intended to store ship parameters in real time. The storage memory will continually store the last 12 hours (minimum) of received data.

The interface between the VDR-100G2S and the memory capsule is a standard 10/100 Base-T Ethernet connection using TCP/IP standard protocol. Power for the capsule is provided over the same Ethernet cable using PoE (Power Over Ethernet). This feature has the advantage in that a separate power cable is not required.

Much like a black box on an airplane, in an emergency your float free 406 memory capsule will store the last 12 hours of the ship's critical and navigational data to be retrieved and reviewed to assist in explaining the cause of the accident.

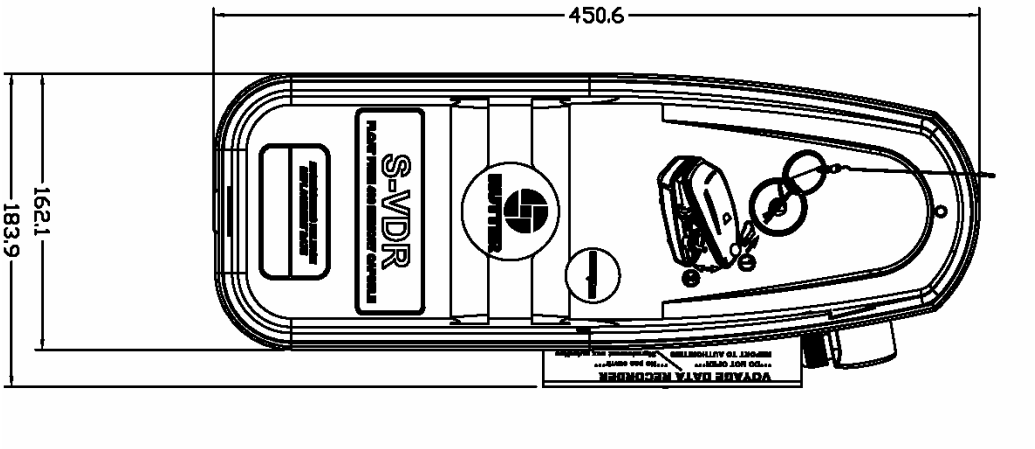


Figure 1-17 - Rutter-ACR Float-Free SFRM Capsule

1.1.8 Remote Storage Module (RSM)

The **Remote Storage Module** (RSM) is an optional data storage device which provides the ability to automatically archive longer periods of recorded data.

The module:

- Has an Ethernet interface to accept data from the VDR and a USB2.0 port which allows the stored data to be retrieved and/or reviewed on any modern PC.
- Sufficient to archive 160GB of data, or can be used to retrieve several previously secured data sets.

When the RSM is supplied as a data retrieval device, a universal AC adapter is included. When supplied with the extended archiving software module, universal AC and 24VDC power supplies are included.

The RSM is similar to the FRM, except:

- It is not designed to survive extreme conditions.
- It has a much larger storage capacity.
- It is small and easy to transport.

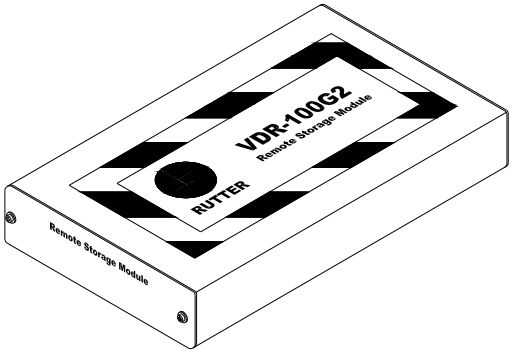


Figure 1-18 - Remote Storage Module

1.1.9 External Data Interfaces

The **External Data Interfaces**, used to sense data signals from ship's equipment in order to provide 61162/NMEA0183 compliant data sentences, are recorded via the NMEA Modules described earlier in this documentation. Non-compliant data can be recorded using one (1) of the following interfaces:

DataAnalog
The DataAnalog Input Module monitors the status of eight (8) analog input signals and indicates the voltage or current which corresponds to the equipment setting on each input channel via an NMEA-0183/IEC 61162 format data sentence transmitted once per second. The DataAnalog interface has eight (8) channels and can simultaneously monitor signals from four (4) separate systems while maintaining isolation between them. This interface is ideally suited to measure the electrical indications for order and response from four (4) shipboard systems (i.e., Rudder Order/Response, ME RPM Order/Response, Pitch Order/Response, Bow Thruster Order and Response).

DataDiscrete
Discrete inputs can be monitored via Rutter Technologies' DataDiscrete interface unit. Discrete inputs are data items recorded simply as open/closed or on/off. These discrete inputs reflect their status by the presence or absence of discrete voltage levels or by the closure of a set of relay contacts. The

DataDiscrete input module monitors discrete input points and outputs an NMEA-0183/IEC 61162 format data sentence to represent them. This output is connected to the VDR-100G2 through a NMEA input channel on the NMEA Module. The DataDiscrete interface is a microprocessor-based unit that incorporates 24 opto-isolated inputs arranged in four (4) banks of six (6) (with each bank having its own common return).

Additional Interfaces
A number of additional Rutter Technologies interfacing devices, including the DataGyro, DataProtocol, DataSplitter, and DataSynchro can be supplied to convert data from shipboard systems to an output sentence in compliance with the IEC 61162/NMEA0183 format. For further details, contact Rutter Technologies Inc. or an authorized Rutter dealer.

1.2 Client / Playback PC

An optional Client PC connected to the DMM via an Ethernet connection may be used for two (2) purposes:

- Downloading data from the VDR
- Data playback

When the Client / Playback PC is connected to the VDR-100G2 via an Ethernet connection, previously recorded data may be downloaded at any time during normal system operation without interrupting the VDR-100G2 recording process. This downloaded data may then be replayed via the playback software.

The playback software presents radar video and IEC 61162 data on the PC display and outputs the audio through the system sound card. The audio channels may be mixed on playback or played back separately, permitting localization of sound sources. During playback, all the primary navigation data required for operating an electronic chart system or an electronic chart display and information system is available via the serial port on the playback PC. Software associated with the optional Client PC is described in *Section 6 - PLAYBACK SOFTWARE*.

1.2.1 Minimum Requirements

- Pentium III or higher processor
- 256 MB of memory
- SVGA Video port and monitor (it is recommended that the monitor be 15” or larger and supports a non-scrollable resolution of 1024x768 or greater)
- Audio hardware with PC speakers or headphones
- 100 Base-TX Ethernet Interface
- USB 2.0 Port
- Serial data port (if external ECDIS display support is required)
- 16X DVD-R/DVD-RW drive
- 80 GB or larger internal Hard Disk Drive
- USB, AT or PS/2 mouse and keyboard
- Power Supply: Dual Input Voltage: 115V at 60 Hz; or 220V at 50 Hz
- English O/S Edition: Windows 2000 or Windows XP (recommended).

1.3 System Overview Drawings

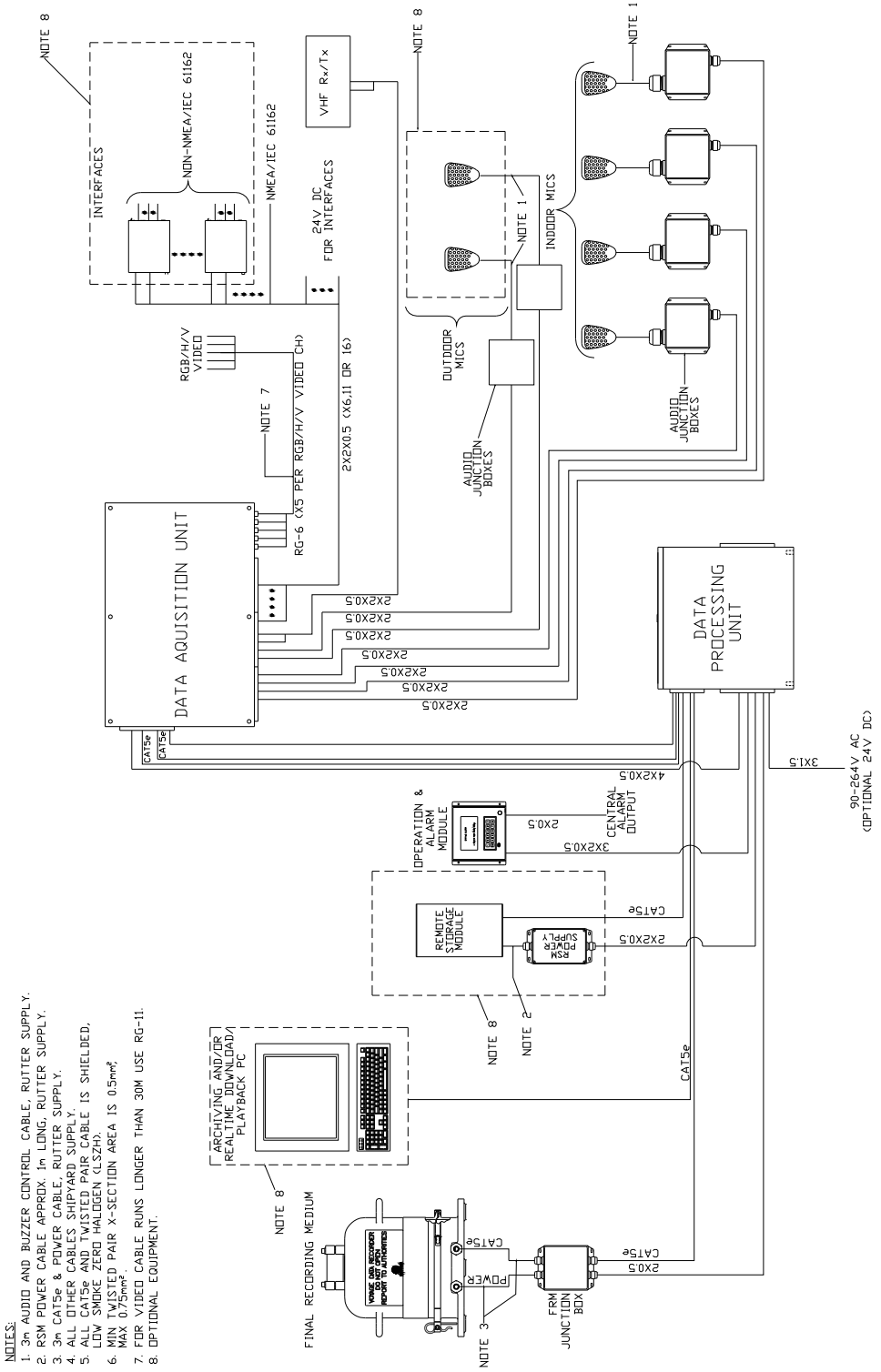


Figure 1-19 - System Overview (with DAU)

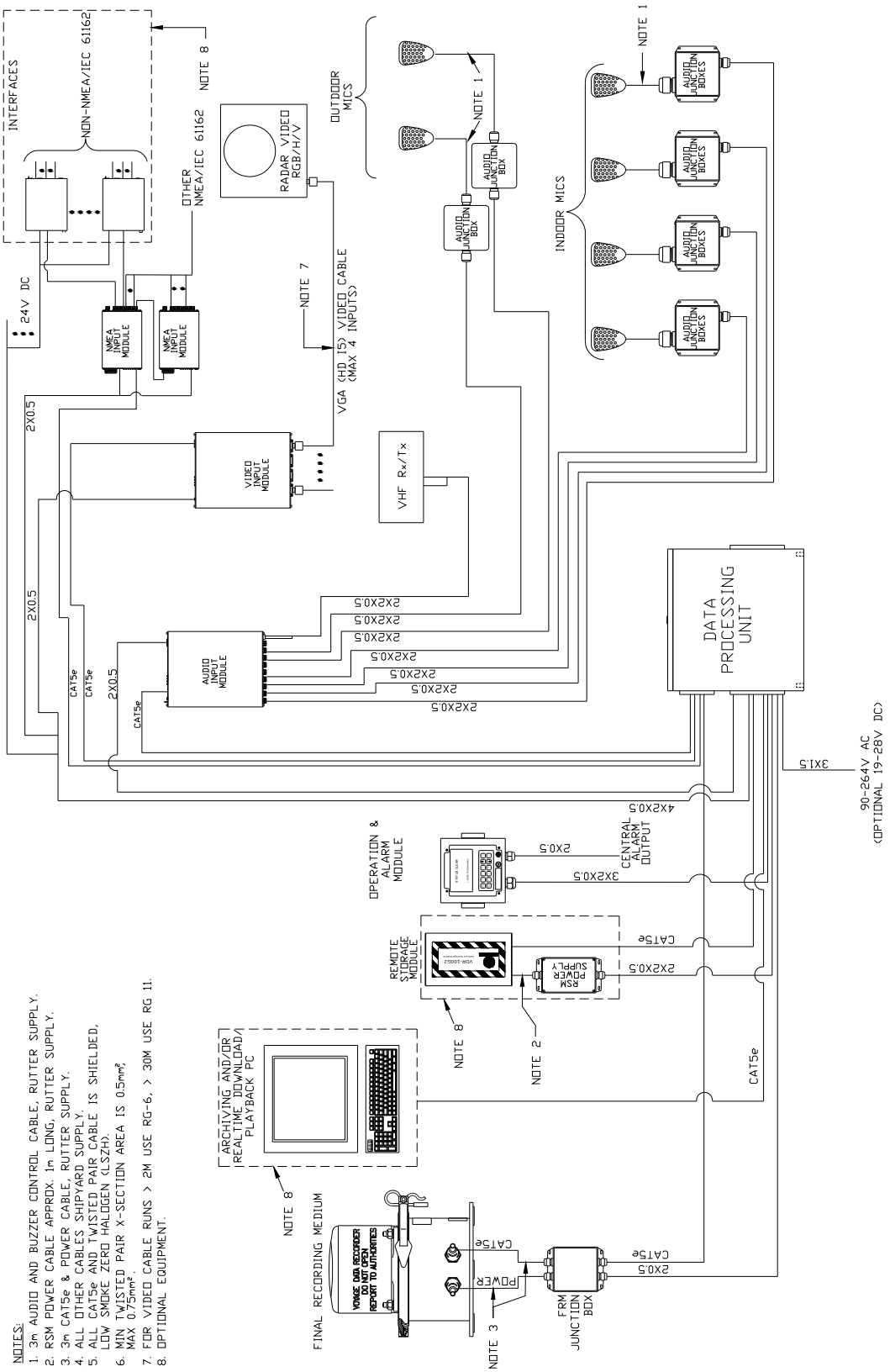


Figure 1-20 - System Overview (without DAU)

2 TECHNICAL SPECIFICATIONS

The following tables contain a summary of the technical specifications for the Rutter VDR-100G2 system components:

Power Consumption	
Normal Operating Current (approx)	1.1 A @ 220VAC (approx. 250 Watts) 2.1 A @ 120VAC (approx. 250 Watts) 11 A @ 24VDC
Maximum Current Draw (approx)	2.9 A @ 220VAC (during battery charge) 5.3 A @ 120VAC (during battery charge) 26.7 A @ 24VDC (during battery charge)
Recommended Ship Main Breaker	10 A @ 220VAC 15 A @ 120VAC 30 A @ 24VDC

DPU Specifications	
Weight	43.2Kg
Dimensions	350 x 400 x 400mm (H x W x D)
Input Power	85 -264 VAC 50-60Hz (optional 24VDC)
Output Power	24VDC to FRM, optional DAU, Alarm Module, optional Remote Storage and optional interfaces
Data Ports	Ethernet input from Audio, Video, and NMEA Modules Ethernet Output to FRM Ethernet Output to Optional Remote Storage and/or Download/Playback PC RS232 Input/Output for Alarm Module RS232 Input/Output for Power Control Module
Battery Backup Power	2 Hrs @ -15 Deg C for Audio system, Alarm Module, DMM, and FRM
Data Storage Capacity	24 hours of most current data (Units prior to S/N: 20105020037, with the exception of S/N: 20105020034, have a standard storage capacity of 12 hours of current data) Plus multiple secured data sets and 30 days extended NMEA 4GB Download USB 2.0 Drive

DAU Specifications (the DAU Cabinet is optional and not applicable to VDR-100G2S)	
Weight	16.8Kg
Dimensions	400 x 600 x 150mm (H x W x D)
Input Power	24VDC from DPU
Output Power	24VDC to remote interfaces (Max 6A)
Audio Input Capacity	8, 12, or 16 Audio inputs Flexible Microphone and VHF/Line level combinations
Video Input Capacity	Up to 4 video input ports 170MHz pixel rate with 2 megapixels input resolution, up to 340MHz pixel rate captured from two consecutive frames with clock inversion (Includes 1600 x 1200 x 75 Hz & 1280 x 1024 x 85 Hz) 24 bit RGB; monochrome H and V sync input
Data Input Capacity	8 or 16 NMEA 0183/IEC61162 Data Input ports. Interfaces for converting non-standard signal formats are to be DIN rail mounted as close to the signal source as practical. The following interfaces are available for remote mounting: • DataAnalog analog signals interface • DataDiscrete contact signal interface • DataGyro gyrocompass interface • DataSynchro synchro type gyrocompass interface • DataSplitter NMEA splitter interface • DataProtocol protocol conversion interface

FRM/SFRM Specifications	
Weight	L3 HVR-02 Fixed FRM Capsule: 10.9kg L3 SVR-02 Fixed SFRM Capsule:10.4kg JoTron Float-Free SFRM Capsule: 3.5kg; Rutter-ACR Float-Free SFRM Capsule (EPIRB Only): 1.021kg Rutter FRM (RUT-02447) Fixed Capsule: 18kg
Dimensions	L3 HVR-02 Fixed FRM Capsule: Height: 218.3mm, Diameter: 206.5mm, Base Width: 182.39mm L3 SVR-02 Fixed SFRM Capsule: Height: 215.17mm, Diameter: 206.5mm, Base Width: 182.39mm JoTron Float-Free SFRM Capsule: Height: 695mm, Depth: 226mm, Width: 205mm Rutter-ACR Float-Free SFRM Capsule (EPIRB Only): Height: 178mm, Depth: 108mm, Width: 92mm Rutter FRM (RUT-02447) Fixed Capsule: Height: 350mm, Diameter: 220mm
Input Power	24VDC
Memory Type	L3 HVR-02 Fixed FRM Capsule: Solid State L3 SVR-02 Fixed SFRM Capsule: Solid State JoTron Float-Free SFRM Capsule: Solid State Rutter-ACR Float-Free SFRM Capsule: Solid State Rutter FRM (RUT-02447) Fixed Capsule: Solid State
Capacity	12-hour minimum (1.75GB)

OAU Specifications	
Weight	1.4Kg
Dimensions	With front mounting plate: 144 x 144 x 52.3mm Without front mounting plate: 136.6 x 136.6 x 50mm
Input Power	24VDC
Audible Alarm	60dBA

Indoor Microphone Assembly Specifications	
Weight	0.95Kg
Dimensions	Mic: 64 x 92 x 31mm / Box: 80 x 149.1 x 56.5mm
Input Power	Phantom Power

Optional Outdoor Microphone Specifications	
Weight	1.17Kg
Dimensions	Mic: 64 x 92 x 31mm / Box: 85.1 x 129.9 x 65.7mm
Input Power	Phantom Power

Optional RSM Specifications	
Weight	1.36Kg
Dimensions	35 x 127 x 214mm
Input Power	24VDC or Universal AC with external power supply
Capacity	250GB

Optional RSM 24VDC Power Supply Specifications	
Weight	1.0Kg
Dimensions	138 x 166.2 x 50mm
Input Power	24VDC

3 USER GUIDE

The following section provides a user guide for operating the VDR-100G2/S. All user-level operation occurs via the OAU. The OAU provides the ability to secure data as well as offering audible alarms that alert the user to potential problems with the unit and/or component connections.

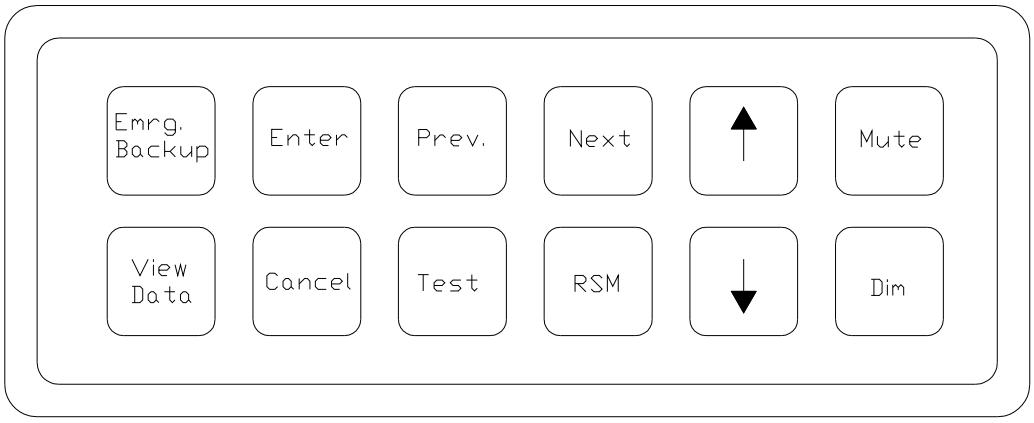


Figure 3-1 – OAU Menu Pad

3.1 Securing Data

To secure data to the DMM, complete the following steps:

1. Press the “Emrg Backup” button on the OAU menu pad. The following message will appear on the OAU’s LCD:

   “Perform Emergency Backup of VDR Data”
   “> Enter to Confirm”

2. Press the “Enter” button on the OAU menu pad. The following message will appear:

   “Downloading Data”
   “Please Wait…”

3. Allow the download to complete. A progression message may appear (i.e., “20% Complete”) dependant upon the size of the download.

3.2 Viewing Secured Data

To view previously secured data sets, complete the following steps:

1. Press the “View Data” button on the OAU menu pad.

2. Secured data sets appear two (2) per screen. If more than two (2) secured data sets exist, press the “Prev” and/or “Next” buttons on the menu pad to scroll through all sets available. Data sets appear from oldest to newest and are recorded with the following time format: yyyy-mm-dd-hr-mt (where yyyy=year, mm=month, dd=day, hr=hour, and mt=minute).

3.3 Securing Data to the RSM

For instructions on securing data to the RSM/USB Memory Stick, see *Section 5 – RSM & USB Memory Stick*.

3.4 Muting Audible Alarm

To mute the audible alarm, press the “Mute” key on the OAU menu pad.

3.5 Dimming the Display

To dim or brighten the LCD display, press the “Dim” key on the OAU menu pad.

There are four (4) LCD brightness levels ranging from off to bright.

3.6 Test Screen

To obtain the VDR Record software version number or the unique DMM Hardware ID, press the “Test” key on the OAU menu pad.

An example of the information provided via the “Tests” menu, is as follows:

Test Screen
Version: 4.0X.00
ID: 55N5SS5S55X21

Press the “Cancel” button to return to the main screen.

3.7 Alarm Code Description

Listed below are the alarm codes that may appear on the OAU LCD display:

Alarm Code	Description
System Error	Communication with the Record Application has been lost
Video Error	Communication with the Video Module has been lost
Audio Error	Communication with the Audio Module has been lost
FRM Error	Communication with the Final Recording Medium has been lost
Power Fail	Loss of utility power
PCM Error	Communication has been lost with the Power Control Module
Remote Error	Communication has been lost with the Remote Storage Module
Serial Error	Communication has been lost with the NMEA Module
Mic Error	Communication has been lost with one of the microphones
Disk Error	Failure to secure a data set
GPS Error	Failure to record GPS data

Table 3.1 – Alarm Code Description

Pressing the “Mute” button acknowledges the alarm code and silences the alarm.

This page is intentionally blank.

4 DATA RETRIEVAL

The VDR-100G2 is supplied with several options for accessing and replaying data in order to reconstruct voyages:

- The primary method of retrieving data is via the USB Memory Stick. The copying of data to the USB Memory Stick is initiated at the OAU via the RSM button (see *Section 4.4 - Remote Storage Module*).
- The Remote Storage Module (RSM). The download is initiated at the OAU (see *Section 4.4 - Remote Storage Module*).
- An alternate method is to download data via a client PC connected to the VDR by a LAN connection. All necessary software is optional and resident on the client PC (*see Section 4.2 - Installation of Download Software*).

4.1 Optional Client Download PC

If the customer should choose to make use of the optional download client PC, additional copies of the playback software are supplied. The Download/Playback client PC should be a Pentium class or equivalent, and IEC 60945 certified if installed on the Bridge. The computer system should, as a minimum, include:

- Pentium III or higher processor
- 256 MB of memory
- SVGA Video port and monitor (it is recommended that the monitor be 15” or larger and supports a non-scrollable resolution of 1024x768 or greater)
- Audio hardware with PC speakers or headphones
- 100 Base-TX Ethernet Interface
- USB 2.0 Port
- Serial data port (if external ECDIS display support is required)
- 16X DVD-R/DVD-RW drive
- 80 GB or larger internal Hard Disk Drive
- USB, AT or PS/2 mouse and keyboard
- Power Supply: Dual Input Voltage: 115V at 60 Hz; or 220V at 50 Hz
- English O/S Edition: Windows 2000 or Windows XP (recommended)

4.2 Installation of Download Software

There are two (2) steps necessary to install the Download application onto the client PC:

1. Copy the Download application (VDR_Download.exe) from the supplied media to the desktop of the download computer, or if an install file is supplied, double-click the “Install VDR Download.exe” file.
2. Configure the download computer as a ‘Client’ for the ‘Download Application’ to connect to the VDR-100G2 and retrieve the recorded data. To do this, the download PC must be in the same IP segment as the download port on the VDR. The VDR’s download port occupies IP address 200.200.200.200. The client PC must be in the same range, with the last segment different than the VDR (as shown below.) To change the IP segment:
    - Open the Control Panel via the Start menu.
    - Double-click the Network Connections icon.
    - Right-click on the Local Area Connection icon and select Properties from the pop-up menu.
    - In the Local Area Connection Properties window, highlight “Internet Protocol (TCP/IP)” and click the “Properties” button located directly below the available options.
    - In the subsequent Internet Protocol (TCP/IP) Properties window, select the “Use the following IP address” radio button and enter 200.200.200.2 (the last number can be any number from 2 to 254, **except 200**.)
    - Click the “OK” button in the Internet Protocol (TCP/IP) Properties and the Local Area Connection Properties.

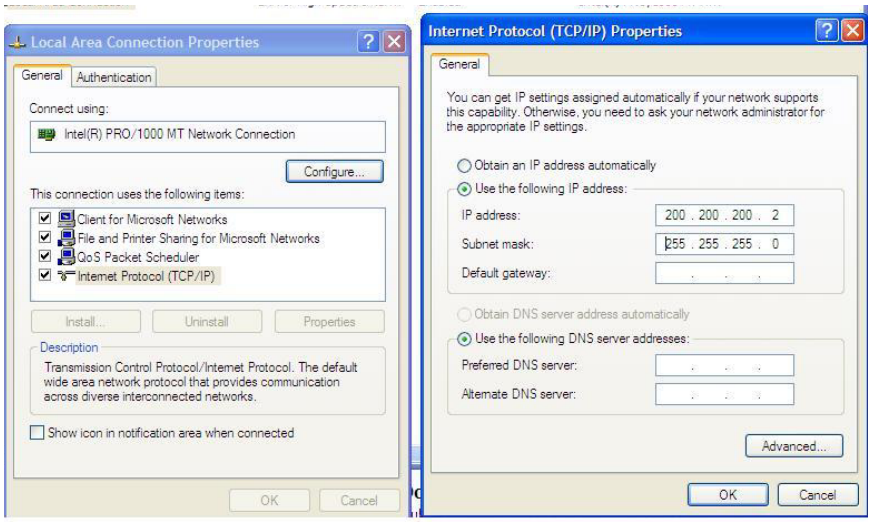


Figure 4-1 - Establishing TCP/IP Address

4.2.1 Starting the Download Process

Start the download utility by double-clicking the download.exe icon located on the Windows desktop. See *Figure 4-2 - Download Software Main Screen* for an example of the download utility.

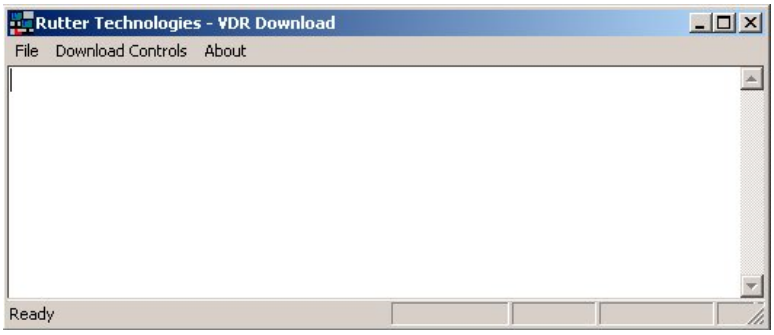


Figure 4-2 - Download Software Main Screen

4.2.2 Begin the Download

Complete the following steps to begin the download of the current data set:

1. Select 'Start download' from the 'Download Controls' menu.

Figure 4-3 - Download Controls Menu

2. Enter a password when prompted.
3. Once prompted with the 'Download Settings' window (see *Figure 4-4 - Download Settings Window*), choose from the following available settings:
   - 'Download complete data set'.
   - 'Download partial data set' – once this option has been chosen, 'Start' and 'Stop' times become available. Using the appropriate slide-bar, set the time frame that will begin and end the downloaded data set.
   - 'Normal data set'.
   - 'Extended NMEA data set' – this option allows for the download of the extended NMEA data set only.

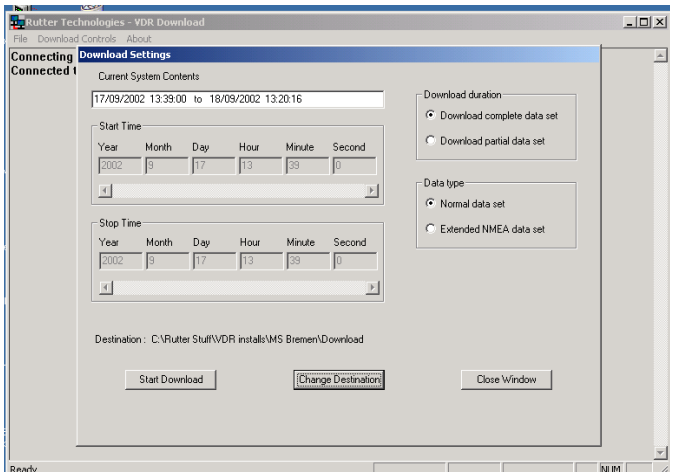


Figure 4-4 - Download Settings Window

4. Confirm that the stated download destination is correct. If it is not, press the 'Change Destination' button, select the correct destination from the file window, and press 'OK'.
5. Press the 'Start Download' button.
6. Confirm all settings are correct in the confirmation window and press 'OK' (if they are not, press 'Cancel' and make the appropriate changes in the 'Download Settings' window).

Name	Size	Type	Date Modified
MainAudio		File Folder	8/23/2005 10:14 AM
MainNMEA		File Folder	8/23/2005 10:12 AM
MainVideo		File Folder	8/23/2005 10:13 AM
AudioDir.vdr	57 KB	VDR File	8/23/2005 10:14 AM
NMEADir.vdr	56 KB	VDR File	8/23/2005 10:14 AM
vdr-cfg.txt	1 KB	Text Document	8/18/2005 1:55 PM
vdrparams.ini	5 KB	Configuration Settings	8/18/2005 1:55 PM
VideoDir.vdr	57 KB	VDR File	8/23/2005 10:14 AM

Figure 4-5 - Sample Download Directory

Once a download is complete, "MainAudio", "MainNMEA", and "MainVideo" folders are visible. The vdrparams.ini and vdr-cfg.txt files are also downloaded and saved to the specified download directory. See *Figure 4-5 - Sample Download Directory* for an example of a typical download directory.

4.2.3 Download Secured Data Set

Complete the following steps to download one (1) of multiple secured data sets from the DMM's internal hard drive:

1. Select 'Download Secured Dataset' from the 'Download Controls' menu.
2. A download progress window will appear indicating that the application is receiving information from the DMM.
3. In the subsequent 'Download Secured Datasets' window, all available secured datasets will be visible. Each dataset shows the date it was initially secured, file size, and start and end time.

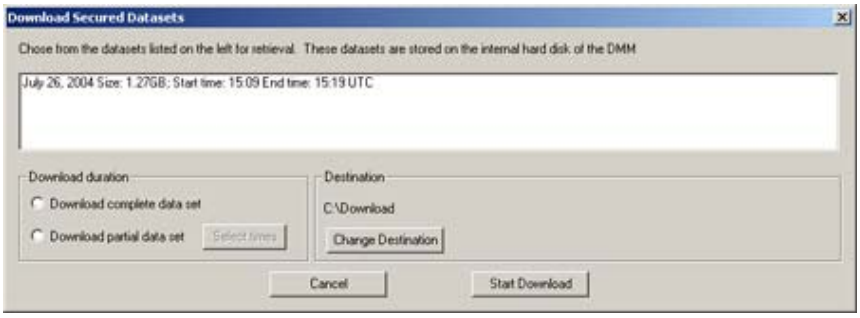


Figure 4-6 - Download Secured Datasets

4. Select the appropriate dataset from the list.
5. To download a complete dataset, choose the "Download complete data set" radio button under 'Download duration'. To download a partial dataset, choose "Download partial data set".
6. If choosing to download a partial dataset, a window will appear from which the time range to be downloaded must be chosen. The associated scroll bar is used to select a start and/or end time (the exact time may also be entered directly in to the time fields.)

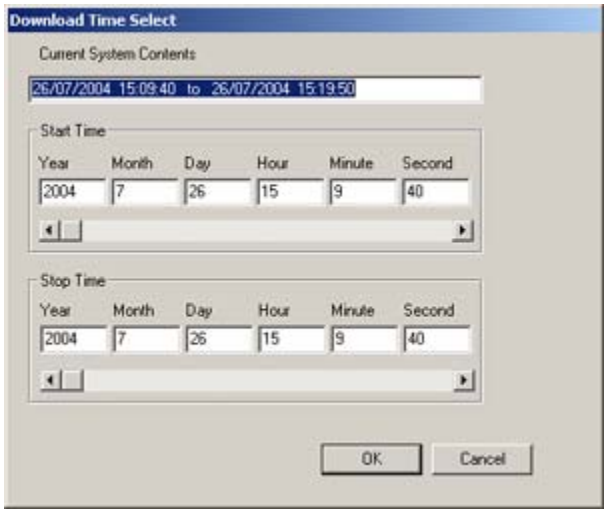


Figure 4-7 - Partial Download Window

7. To choose a directory to which the datasets will be downloaded, other than the one listed under 'Destination', press the "Change Destination" button and follow standard Windows procedure for selecting a desired directory.
8. Once the duration and destination are correct, press 'Start Download'.

9. Enter a password and press ‘OK’.
10. A “Download Settings” dialog will appear providing confirmation information for the dataset to be downloaded. If all information is correct, press ‘OK’ to begin the download.

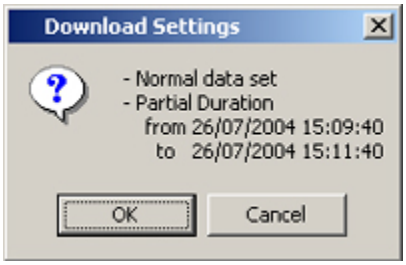


Figure 4-8 - Confirm Download Settings

4.2.4 Extended NMEA Download

The Extended NMEA data set is a VDR-100G2 option, which supports the recording of up to 185 days of NMEA data to the DMM. When an extended NMEA download occurs, no video or audio data is included in the download. To select the extended NMEA download, check the ‘Extended NMEA Download’ located in the ‘Download Settings’ window (see *Figure 4-4 - Download Settings Window*).

Important! *The extended NMEA data set must be purchased as an option and configured on the VDR-100G2 during installation. If the VDR-100G2 is not configured for the extended NMEA data set, this option will not function in the download software.*

4.2.5 Complete vs. Partial Download

A ‘complete’ download is the process of downloading a full 24-hour data set from the DMM. As a user may want only a ‘partial’ download, a ‘Download partial data set’ option is available. Select either ‘Download complete data set’ or ‘Download partial data set’ in the ‘Download Settings’ window (see *Figure 4-4 - Download Settings Window*) to download the desired data set.

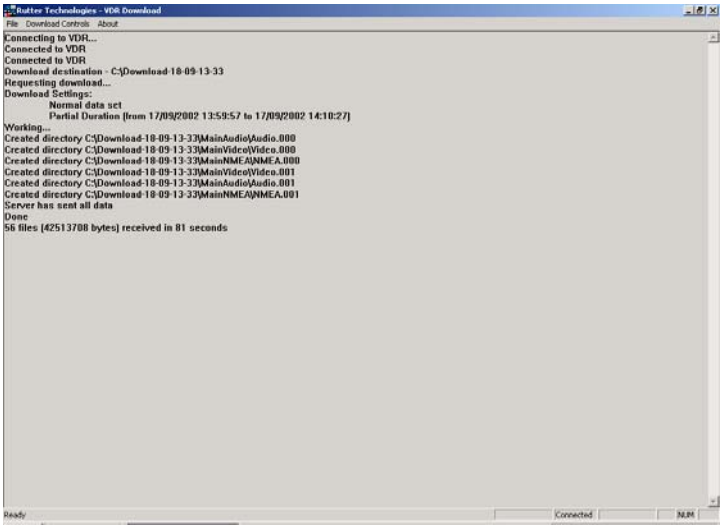


Figure 4-9 - Completed Download

4.2.6 Error Log and Battery Log

To download the error log or battery log file, select the applicable item ('Download Error Log' or 'Download Battery Log') from the 'Download Controls' menu (see *Figure 4-3 - Download Controls Menu*). The system will prompt the user to select a location to save the log file.

4.2.7 Disconnecting from the VDR

To disconnect, simply choose 'Exit' from the 'File' menu.

4.3 USB Memory Stick

The USB Memory Stick is the primary means of retrieving a secure data set recorded by the VDR.

The method for initiating a download to the USB Memory Stick is the same as the method for initiating a data download to the RSM. See *Section 5 - RSM & USB Memory Stick* for further information.

4.4 Remote Storage Module

If installed, the Removable Storage Module (RSM) provides a means of copying data recorded by the VDR.

See *Section 5 - RSM & USB Memory Stick* for information on downloading to the RSM.

This page is intentionally blank.

5 RSM & USB Memory Stick

The primary means of removing data recorded by the VDR-100G2 is via the USB Memory Stick (version 4.05.00 of the vdr_record.exe application and later). Each VDR from Serial No. 20107020850 forward includes a USB Memory Stick. For units built prior to this time, the primary means of removing data is via the RSM. Refer to *Table 5.1 - Data Download: USB Memory Stick vs. RSM* below for a comparison of versions for copying data.

There are no changes in OAU functionality between these units and versions:

- **Where a unit is fitted with a USB Memory Stick and version 4.05.00 of the software, data copied using the RSM menu will be copied to the USB Memory Stick. Where a unit has no USB Memory Stick, data is copied to the RSM (if fitted).**
- A VDR with a USB Memory Stick may also have an optional Remote Storage Module (RSM) for the purposes of automatic archiving.

Unlike the FRM, which contains only data required by IMO regulations, the USB Memory Stick and/or RSM, dependant upon customer requirements, may contain a much larger and highly detailed data set.

For units without a USB drive, read this section to understand that the RSM will perform the same data copying functionality without need for software or hardware changes.

Comparison of VDR-100G2 Units with USB Memory Stick vs. RSM		
VDR Fitted with	**Data Copy Destination (when using OAU)**	**Auto Archive**
USB Memory Stick Only	USB Memory Stick	RSM
RSM Only	RSM	RSM
Both RSM & USB Memory Stick	USB Memory Stick	RSM

Table 5.1 - Data Download: USB Memory Stick vs. RSM

Important! *The configuration (Vdr-cfg.txt) and parameters (vdrparams.ini) files, which may be used to correctly interpret playback information, are stored and located in the root directory of the removable drive.*

A portable copy of the recorded data can be obtained by copying data from the DMM internal hard drive to the USB Memory Stick or RSM. Copying data to the USB Memory Stick (or RSM) does not affect the normal recording operation of the VDR-100G2.

The OAU is used to initiate copying of data to the USB Memory Stick (or RSM) for removal and analysis purposes.

To playback the data from the RSM/USB Memory Stick, a PC will require the following:

- The minimum requirements for a PC outlined in *Section 4.1 - Optional Client Download PC*.
- Rutter Technologies' playback software.

Important! *Downloading a secure data set to the USB Memory Stick is done using the same procedure as downloading to the RSM (described below). If a system has both an RSM and USB Memory Stick connected at the same time, the download instructions below will only download data to the USB Memory Stick. The RSM will continue in auto-archiving mode only.*

5.1 Copying Data to RSM / USB Memory Stick

To retrieve data using the OAU, it is necessary to ensure the USB Memory Stick/RSM is connected and recognized by the G2 system. Complete the following steps:

1. If not already connected, insert the USB Memory Stick into the available USB port or attach the Ethernet and power cable from the RSM to the DPU (or connect the USB Memory Stick to the DMM).

2. Press the "RSM" button on the OAU menu pad.

3. At the main menu screen of the OAU, two (2) options are displayed:

   - "Copy Data"
   - "RSM Archiving"

Note! *The RSM* ***cannot be simultaneously connected*** *via Ethernet to the VDR while connected to the Client PC via a USB connection.*

4. Ensure the "Copy Data" option is highlighted (blinking cursor is adjacent to the option.) Once highlighted, press the "Enter" button on the OAU menu pad.

5. Three (3) options are now displayed:

   - "Copy Current Data": allows a user to retrieve a full 24-hour data set. See *Section 5.1.1 - Copy Current Data*.
   - "Copy Secured Data": allows a user to retrieve specific segments that have been previously secured and may range in length of time. See *Section 5.1.2 - Copying Secured Data*.
   - "Copy Extended NMEA": allows a user to retrieve extended NMEA data. See *Section 5.1.3 - Copying Extended NMEA Data*.

Important! *If Auto Archiving is enabled,* ***do not*** *physically disconnect the Remote Storage Module before disconnecting it from the system via the OAU. See Section 5.1.4 - Disconnecting the RSM for instructions on disconnecting via the OAU.*

It is also recommended to power off the unit prior to physically disconnecting it.

Once the RSM is physically disconnected from the DMM, it will take approximately one (1) minute for the system to recognize this disconnect. ***DO NOT*** *reconnect the RSM before this one (1) minute wait period has elapsed, as it will not be recognized by the system. If the RSM is accidentally reconnected before the one (1) minute wait period has elapsed, physically disconnect the RSM from the DMM and wait one (1) minute before physically reconnecting. Once the RSM is physically connected, connect to the DMM software via the OAU.*

5.1.1 Copy Current Data

To copy the current data from the internal drive of the DMM to the USB Memory Stick/RSM, the following steps must be completed:

- Press the “RSM” key on the OAU menu pad
- Highlight ‘Copy Data’ and press ‘Enter’ on the OAU menu pad
- Highlight ‘Copy Current Data’ and press ‘Enter’ on the OAU menu pad

The full data set residing on the internal drive of the DMM will be copied to the USB Memory Stick/RSM. As the data is copied, the OAU display may indicate the percentage of data that has been copied dependant upon the size of the download. To cancel the download, simply press “Cancel” on the OAU menu pad.

5.1.2 Copying Secured Data

Data sets can be secured on the internal drive of the DMM at any time via the OAU menu pad. If sufficient space does not exist on the internal drive to secure a data set, the oldest secure data set will be automatically deleted. Therefore, it is convenient to copy any one of these secure data sets to the USB Memory Stick/RSM.

Secured data sets can be copied to the USB Memory Stick/RSM for longer term storage or for portability to shore side facilities. To copy a secured data set to the USB Memory Stick/RSM, the following steps must be completed:

- Press the “RSM” key on the OAU menu pad.
- Highlight ‘Copy Data’ and press ‘Enter’ on the OAU menu pad.
- Highlight ‘Copy Secured Data’ and press ‘Enter’ on the OAU menu pad.
- All available secured data sets (displayed in yyyy-mm-dd-hr-mt format) will become visible. Secured data sets appear two (2) per screen. If more than two (2) secured data sets exist, press the “Prev” and/or “Next” buttons on the menu pad to scroll through all sets available. The total number of data set screens available is shown on the screen (for example, “Page 3/21”).
- Once the desired data set is highlighted, press the “Enter” key on the OAU keypad. Press the “Enter” key again to confirm the download.

The selected secured data set will be copied to the USB Memory Stick/RSM. As the data is copied, the OAU display will indicate the percentage of data that has been copied. To cancel the download, simply press “Cancel” on the OAU menu pad.

5.1.3 Copying Extended NMEA Data

The VDR100G2 can optionally store up to 185 days of NMEA data. This data can then be copied to the USB Memory Stick/RSM by the following steps:

1. Press the “RSM” key on the OAU menu pad.
2. Highlight ‘Copy Data’ and press ‘Enter’ on the OAU menu pad.
3. Highlight ‘Copy Extended NMEA Data’ and press ‘Enter’ on the OAU menu pad.

All Extended NMEA data will then be copied to the USB Memory Stick/RSM. As the data is copied, the OAU display will indicate the percentage of data that has been copied. To cancel the download, simply press “Cancel” on the OAU menu pad.

5.1.4 Disconnecting the RSM

When Auto Archiving is enabled, it is important to disconnect via the OAU keypad prior to physically disconnecting from the VDR. To check if Auto Archiving is enabled, press the “RSM” key on the OAU keypad; if “RSM Archiving” appears as a menu option, it is enabled.

To disconnect the RSM:

1. Press the “RSM” key on the OAU menu pad.
2. Press the down (↓) arrow to select the “RSM Archiving” option on the OAU LCD display and press the “Enter” key.
3. Select “Disable Extended Archiving” and press the “Enter” key on the OAU menu pad.
4. Power off the RSM (switch RSM Power Switch to “Off” position).
5. Remove all cable connections from the RSM.

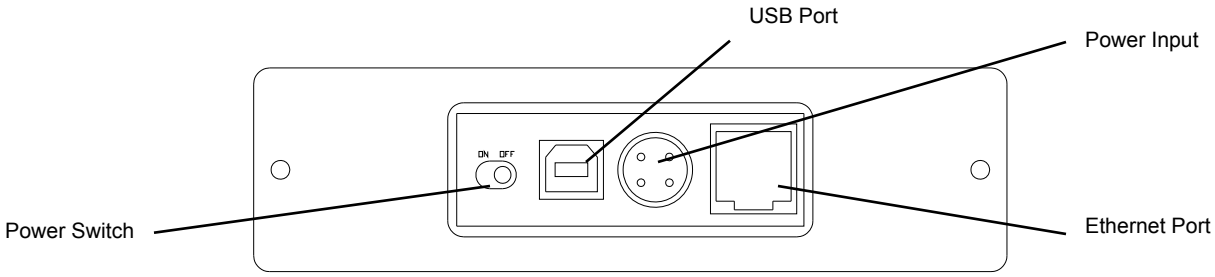


Figure 5-1 - Rear View of RSM Unit

Important! *Do* ***not*** *disconnect the USB Memory Stick during data transfer. If data is being transferred to the Memory Stick the blue light located on the body of the Memory Stick will flash rapidly. Once data transfer is complete the blue light will stay solid.*

5.2 Connecting Client PC to RSM

To retrieve data from the RSM using the Client PC, complete the following steps:

1. Physically disconnect the RSM Ethernet cable and connect it to the Client PC using an “A to B mini” USB cable.
2. The RSM will be visible on the Client PC as a connected hard drive.

This page is intentionally blank.

6 PLAYBACK SOFTWARE

The playback module accompanies the base model VDR and is resident on the download client PC. Additional playback software is available for use in shore-side offices. This additional software is necessary for the playback of data on the RSM or other media once it has been removed from the ship and transported to the office environment.

Important! The computer on which the Playback application is being installed must have its regional and language options adjusted to English*. This may be done by double clicking the 'Regional Options' icon in the Control Panel window and selecting 'English' from the language drop down list. It is recommended that either 'English (United States)' or 'English (Canada)' is selected. However, any of the available English options are acceptable.*

6.1 Playback Installation - Client PC

The installation of playback software is automated and requires little interaction. The install is performed via a self-extracting executable file and is automatically installed to the **C:\Program Files\Playback** directory, with a shortcut placed on the Windows desktop. The install file will normally be named "Install VDR Playback.exe".

To begin the installation, complete the steps listed below:

1. On the installation CD, double click the file entitled 'Install VDR Playback.exe'.

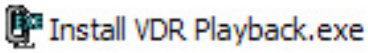


Figure 6-1 - Installation Executable File

2. Choose the directory to which the executable will be installed.

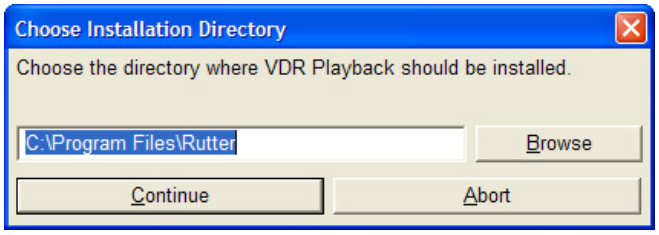


Figure 6-2 - Choose Installation Directory

3. To abort the installation, click the 'Abort' button on the 'Installing…' message window.

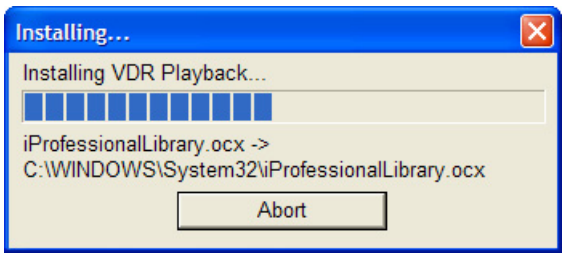


Figure 6-3 - Installing Message Window

4. The install process will place a shortcut to the playback software on the desktop.

6.2 Starting the Playback Application

To start the playback application, double click the playback icon located on the desktop (as mentioned in step 4 of the installation process above). The application will look similar to *Figure 6-4 - Playback Software* shown below.

Note that the playback application interprets information provided in the ship's *VDRPlayback.ini* file therefore the playback interface may contain elements and controls different from what is shown below.

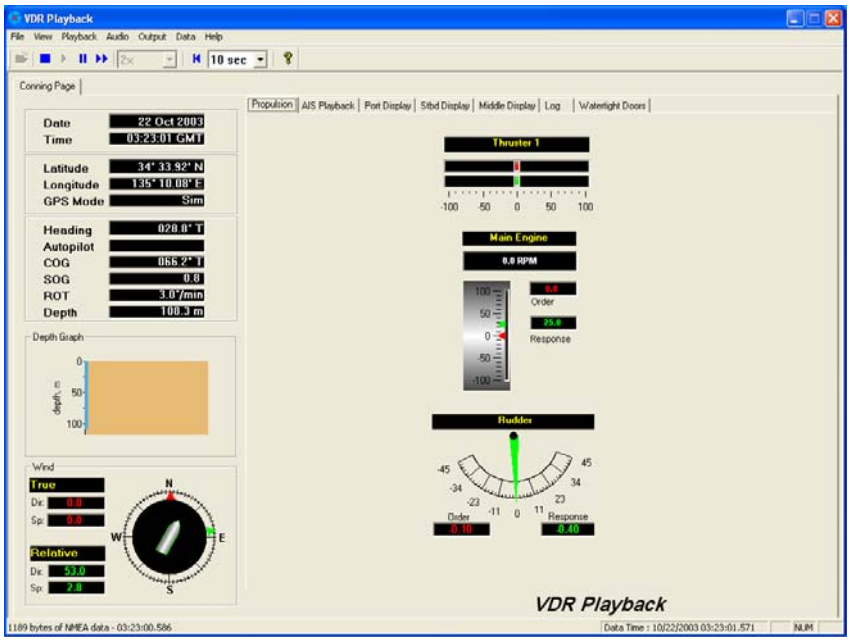


Figure 6-4 - Playback Software

6.2.1 Configuration File

The vessel displayed in the Playback application is automatically configured via the ship's configuration file, which is created by the installation technician during the installation of the VDR. The configuration file pertaining to the ship whose data will be used by the Playback application must be located in an easily accessed location on the local hard drive of the playback PC.

Upon start-up of the Playback application, the configuration file can be loaded using the File > Configure menu item.

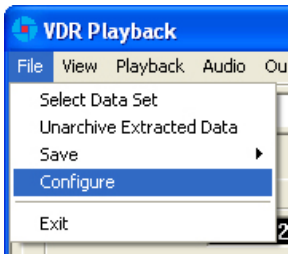


Figure 6-5 - Configuration File Selection - Menu Item

A dialog window will appear allowing the user to select the applicable file. Once the file has been selected the Playback application will shut down momentarily and restart **automatically**. Upon restart the chosen configuration file will load automatically. To change the configuration file, select the File > Configure menu item, as above, and choose the newly desired file.

Figure 6-6 - Restart Warning

With the VDR-100G2, the ship's configuration file will accompany every available data set. When a data set is selected the configuration file will be automatically reloaded as necessary.

6.3 Choosing Data for Playback

To select a data set for playback:

1. Choose the 'Open' icon located directly underneath the 'File' menu
2. A dialog box will appear. Use the dialog box to locate a folder containing downloaded data and select one of the three (3) .vdr files. Ensure "All Files" is selected in the "Files of Type" drop down box.
3. The .vdr files accompany every download and act as an "index" to the actual data files. They are named according to the data items they reference: AudioDir.vdr for audio, NMEADir.vdr for NMEA data and VideoDir.vdr for video data. Selecting any one of these three files will open a data set for playback.

Note! *If the download directory does not display three (3) files with extensions of ".vdr", it is possible that the Microsoft operating system is treating them as hidden files.*

To ensure that the .vdr files are being displayed (and not hidden by the operating system), follow these steps:

1. Open Windows Explorer
2. Select 'Folder Options' from the 'Tools' menu
3. Select the 'View' tab
4. Ensure that 'Show Hidden Files and Folders' **is** selected
5. Press the 'OK' button.

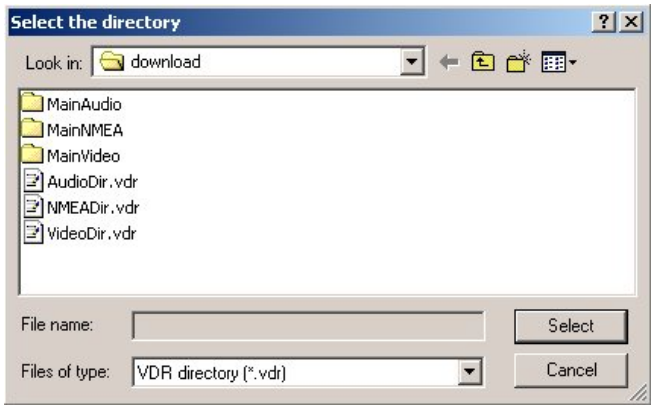


Figure 6-7 - Choose a .vdr File

6.3.1 Unarchive Extracted Data

Data for playback can also be chosen from a previously extracted data archive. If a portion of data has been previously extracted and archived it can be opened for playback via the File > Unarchive Extracted Data file menu option.

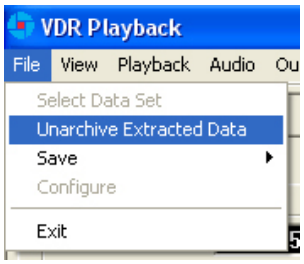


Figure 6-8 - Unarchive Extracted Data

To playback the archived data after selecting the "Unarchive Extracted Data" file menu option, a user will have to locate the .rfa (archive) file and select a folder to which the data can be extracted. Once extracted, an applicable configuration file will need to be selected in order to continue playback.

6.4 Enabling Ethernet Broadcasts

To enable the Playback software and Client PC to broadcast data across a network for use with a separate Electronic Charting System (ECS) or software, open the 'Output' menu dropdown and select "Enable Ethernet Broadcast". If a check appears adjacent to this option, broadcasting is currently enabled. To disable this option, ensure no check sign appears adjacent to it.

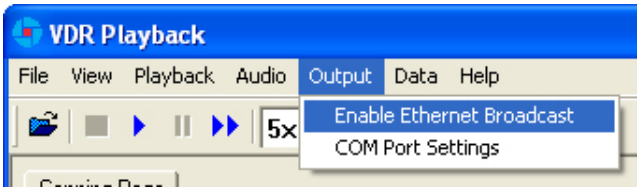


Figure 6-9 - Enabling Ethernet Broadcasting

The broadcast will occur on UDP Port 4450 and 4451. Refer to the relevant ECS manual to properly enable a PC to receive an Ethernet broadcast from Rutter Technologies' Playback software.

6.5 Starting the Playback

To start the data playback, complete the following steps:

1. After a set of download data has been selected for playback, choose 'Start' from the 'Playback' menu or press the 'Play' button located on the 'Controls' toolbar

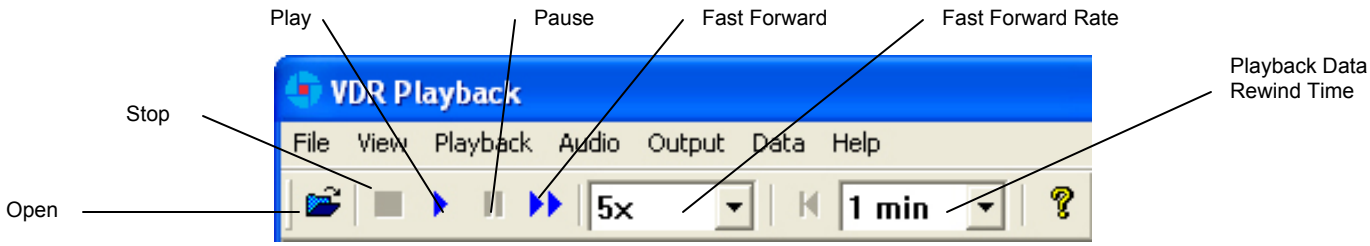


Figure 6-10 - Controls Toolbar

2. A dialog box will appear asking for a password. The default password is "VDR". The password **is case sensitive**. It must be typed in the text box and the 'OK' button clicked
3. After entering the correct password and clicking the 'OK' button, a second dialog box will appear, asking for a start time. Use the scroll bar (or enter a time in the text boxes) to select a playback start time. Click 'OK' to begin the playback.

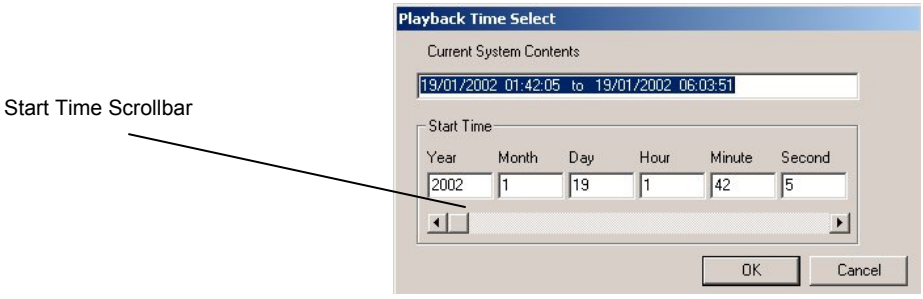


Figure 6-11 - Choose Start Time For Playback

6.6 Passwords

There are 2 passwords required to run the playback software.

The first is necessary to run the playback. It is supplied with the software and can be changed by choosing ‘Set Password’ from the ‘Playback’ file menu. A dialog box will appear asking for the old and new passwords.

The second password is for playback of audio data. It can be changed by choosing ‘Set Password’ from the ‘Audio’ file menu. All default passwords are “VDR” (case sensitive).

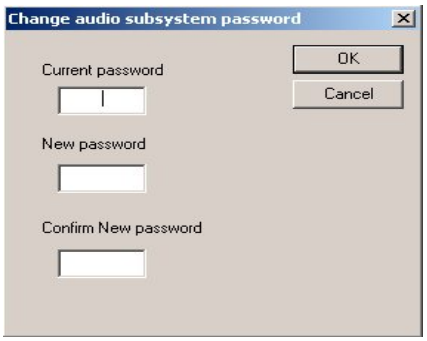


Figure 6-12 - Change Password

6.7 Playback Controls

The playback can be controlled via ‘Playback’ menu items or by using the buttons located on the Controls toolbar. Both options offer a full range of controls, including the ability to run the playback in fast time (with the additional option of choosing replay speed). *Figure 6-10 - Controls Toolbar* provides an illustration of the toolbar. If available for use, buttons will appear blue (such as the ‘Play’ button in the illustration). If unavailable for use, buttons will be greyed (such as the ‘Pause’ button in the illustration).

While playback is stopped, the ‘Fast Forward Rate’ drop down box can be used to set the playback fast forward speed.

Note! *The ‘Fast Forward Rate’ drop down box cannot be manipulated once a playback has started.*

To activate the fast forward feature, press the ‘Fast Forward’ button. Return the playback to normal time by pressing the fast forward button a second time.

Select ‘Set Playback Rate’ (Playback > Set Playback Rate) to adjust the speed of the replay using the ‘Playback’ menu. A dialog box will appear requiring a time compression rate. Enter any integer from 2 to 24 (inclusive) in the open text box and press ‘OK’ (see *Figure 6-13 - Set Fast Forward Rate*).

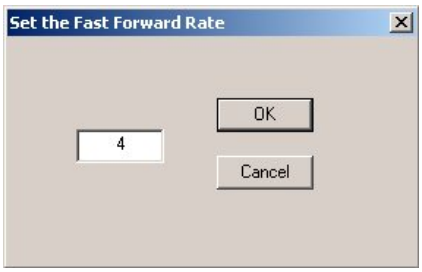


Figure 6-13 - Set Fast Forward Rate

The playback can be halted with the same time index in place by pressing the pause button. Press the pause button a second time to continue the playback.

The Controls toolbar can also be hidden by deselecting 'Controls' from the 'View' menu. By default it is visible therefore a check will appear adjacent to this option. Deselecting it will remove this check mark.

6.8 Audio Volume & Channel Selection

Audio data includes continuous bridge audio and radio communications. The configuration of audio will differ between ships but is generally arranged in two (2) to four (4) banks.

Individual channels contain audio data corresponding to an area of the bridge, bridge wings, or radio communications. Each channel may be included in the playback individually or in conjunction with other channels. For example, a user may wish to play back audio data recorded in the centre of the bridge while turning off external microphones where wind noise may be present.

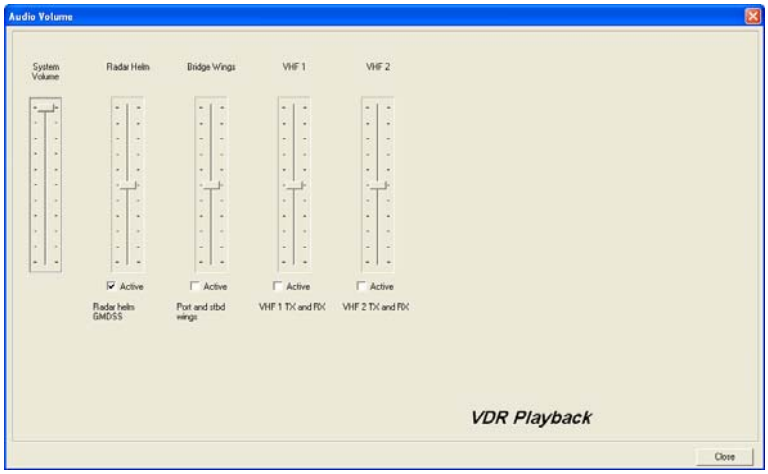


Figure 6-14 - Audio Interface

To activate the audio portion of a playback, choose 'Unlock Audio' from the 'Audio' file menu (see *Figure 6-15 – Audio Menu*). A prompt will appear requiring a password; the default password supplied with the VDR-100G2 is "VDR". Press 'OK' to activate the audio data and make each channel in the 'Audio' file menu selectable.

Once unlocked, audio data will be available for the remainder of the time playback is open. Audio can be adjusted by opening the "Audio Volume" window (see *Figure 6-14 - Audio Interface*) via the "Audio Volume" option in the Audio file menu.

Figure 6-15 – Audio Menu

There are two (2) ways to activate an available audio channel individually:

- Select the appropriate audio channel from the 'Audio' file menu, or,
- Click the 'Active' checkbox below the appropriate channel once the audio has been unlocked.
- It is also possible to print the audio status to the 'Log' Tab Screen by selecting 'Status' from the 'Audio' file menu.

To silence a playback, simply uncheck each channel either on the 'Audio' menu or via the 'Active' checkbox.

6.9 Conning Tab Screen

The Conning Data Tab is the default screen upon Playback start-up. In addition to the Propulsion and Video Channel(s) (for example, PORT X-Band, STBD S-Band, and CCTV) information tab(s) found in the centre of the screen, the Conning Data Tab also contains the following information (all along the upper left hand side of the tab screen):

- Date – Date of playback information
- Time – Time of playback information
- Latitude – Ship's latitude
- Longitude – Ship's longitude
- GPS Mode – Global Positioning System: SPS, DGPS (Differential GPS), PPS, RTK (Real Time Kinematic), FRTK (Float Real Time Kinematic), and DRM (Dead Reckoning Mode)
- Heading – Ship's heading
- Autopilot – Indicates the presence or non-presence of a heading control system (On/Off)
- COG – Ship's Course Over Ground
- SOG – Ship's Speed Over Ground
- Depth – Depth of ship
- ROT – Ship's Rate Of Turn

6.9.1 Depth Graph

The Depth Graph provides an illustration, in metres (m), of the ship's depth.

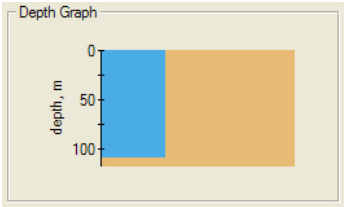


Figure 6-16 - Depth Graph

6.9.2 Wind Information

The Wind Information pane contains data regarding the wind's True and Relative Direction (Dir) and Speed (Sp).

A compass is also provided in order to illustrate wind direction based on ship's heading. The red arrow indicates True wind direction while the green arrow indicates Relative wind direction. The ship graphic indicates the ship's heading.

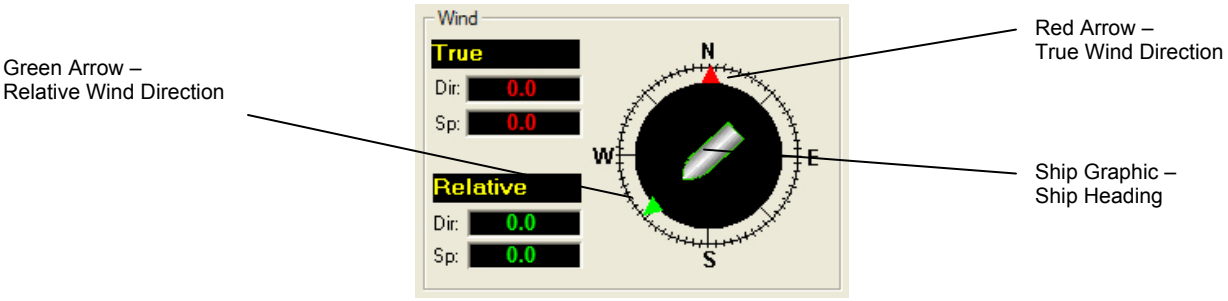


Figure 6-17 - Wind Information

6.9.2.1 Propulsion Data Tab

The Propulsion Data Tab is custom designed for each individual ship according to propulsion systems, bow thruster configuration and NMEA strings broadcast by bridge electronics. These displays are dependant upon the *VDRPlayback.ini* file created for a particular ship.

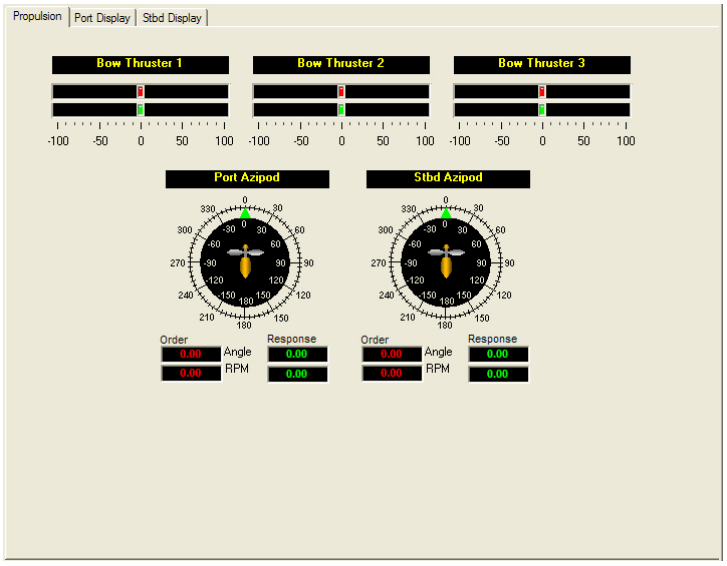


Figure 6-18 – Sample Propulsion Tab

6.9.2.2 Video Channel Data Tab

Radar data is captured at 15-second intervals. If multiple radar images are available for video capture, capture times will be staggered but still allow for individual captures at 15-second intervals.

There are a number of options available when viewing the radar data:

- To display the radar data in its own window, choose Full Size Video > Video Channels from the ‘View’ file menu. To close this window, click the ‘x’ in the top right corner.
- To move the radar image (once in its own window) in order to make a particular section visible without adjusting the window dimensions, click and drag by placing the mouse pointer over a section of the image, pressing the left mouse button and moving the mouse;
- To save the radar image as a .bmp file, select the ‘File’ menu > Save > Video Channels. A dialogue will open allowing a save location to be chosen.

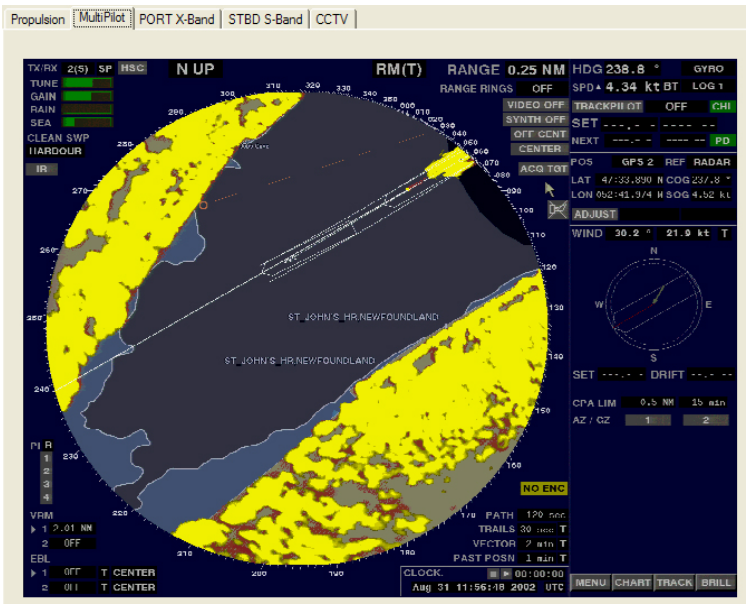


Figure 6-19 – MultiPilot Tab

The images are captured directly from the radar display; therefore any radar supporting ECDIS or chart displays will have the ECDIS or chart image recorded.

Note! *If proprietary data is present in the data playback, a “Proprietary” conning tab may appear. This tab window will present the available proprietary data in sentence format.*

6.10 AIS Playback Tab Screen

The ‘AIS Playback’ Tab Screen displays information captured from the ship’s AIS.

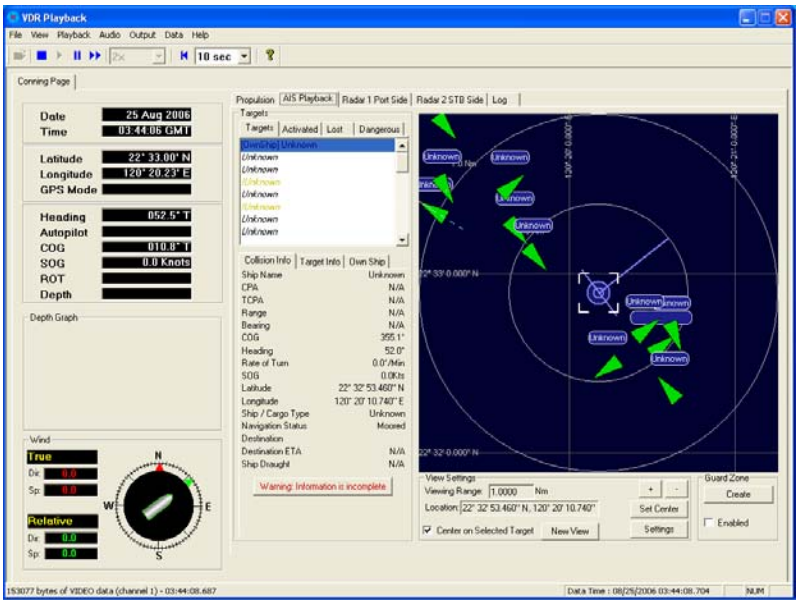


Figure 6-20 - AIS Playback Tab

There are a number of features available within the AIS Playback tab screen that allow a user to better interpret the downloaded information.

6.10.1 Targets

The Targets section of the AIS Playback tab screen provides a range of information about all targets visible in the playback window.

- **Targets Tab** – provides a list of all ships available within the AIS view screen. If a ship’s information becomes unavailable it remains in the list but a line is drawn through its name (it is also added to the “Lost” tab list (see below)).
- **Activated Tab** – provides the name of the ship selected by the user in the AIS view screen.
- **Lost Tab** – provides a list of ships for which information is no longer available.
- **Dangerous Tab** – provides a list of all ships that are currently on a dangerous course relative to the user’s ship.

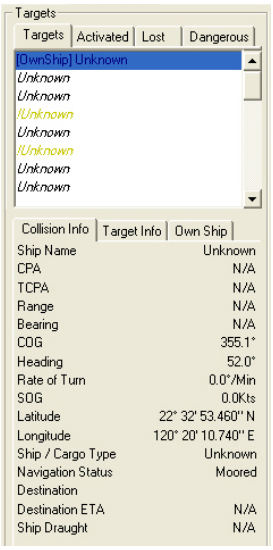


Figure 6-21 - Targets Information Section

Specific ship information is also available in the following tabs (located below the above mentioned tabs):

- **Collision Info** – provides information specific to a selected ship's navigational course.
- **Target Info** – provides registered information (e.g., MMSI, IMO, etc.) specific to a selected ship.
- **Own Ship** – provides registered and navigational information for the user's ship regardless of what target is selected.

6.10.2 View Settings

The View Settings section allows a user a high level of control over the AIS playback view screen.

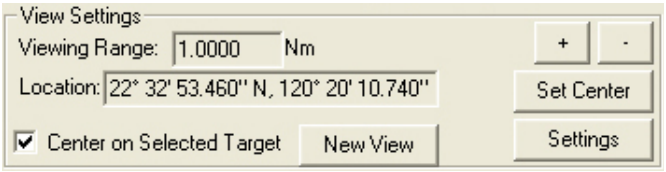


Figure 6-22 - View Settings Section

- **Viewing Range** – It is possible to increase or decrease the viewing range of the AIS playback view screen by pressing the "+" and "-" buttons located in the upper right of the View Settings section. Note that if using a wheel mouse the viewing range can also be increased/decreased by moving the wheel while the pointer is located in the view screen. The viewing range is listed in nautical miles.
- **Location** – The latitude and longitude of the selected target is listed.
- **Center on Selected Target** – If this checkbox is selected the view screen will center on the selected target.
- **Set Center Button** – To set the center point of the view screen, press the "Set Center" button, position the mouse pointer on a location on the view screen and left-click. This point will now be the center point of the view screen. Turning on the "Center on Selected Target" checkbox overrides this control.
- **New View** – Opens a dedicated AIS Playback window.

6.10.2.1 Settings

The “Settings” button located in the View Settings section opens an “AIS Display Settings” window. The settings in this window allow the user to adjust the AIS Playback display.

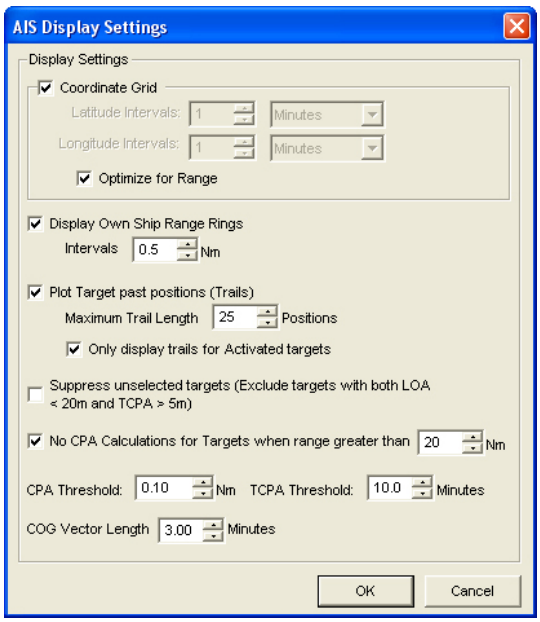


Figure 6-23 - AIS Display Settings Window

- CPA (Closest Point of Approach)
- TCPA (Time to Closest Point of Approach)
- COG (Course Over Ground)
- LOA (Length Over All)

6.10.3 GuardZone

The GuardZone section allows a user to create a guard zone in the view screen. To create a guard zone press the “Create” button, place the mouse cursor in the view screen area and left-click in the locations required to create a guard zone shape. Double-click to complete the guard zone formation.

The guard zone can be enabled or disabled by checking or unchecking the “Enabled” checkbox.

6.11 Fire Doors Tab Screen

The Fire Doors Tab Screen displays information regarding the status of the ship's fire doors. The colour of the light adjacent to the door name, dependant upon the configuration, indicates an active (often indicated with the colour red) or non-active (often indicated with the colour green) door or opening.

Should the number of fire doors exceed the initial screen space, a scroll bar will become visible allowing a user to view all available.

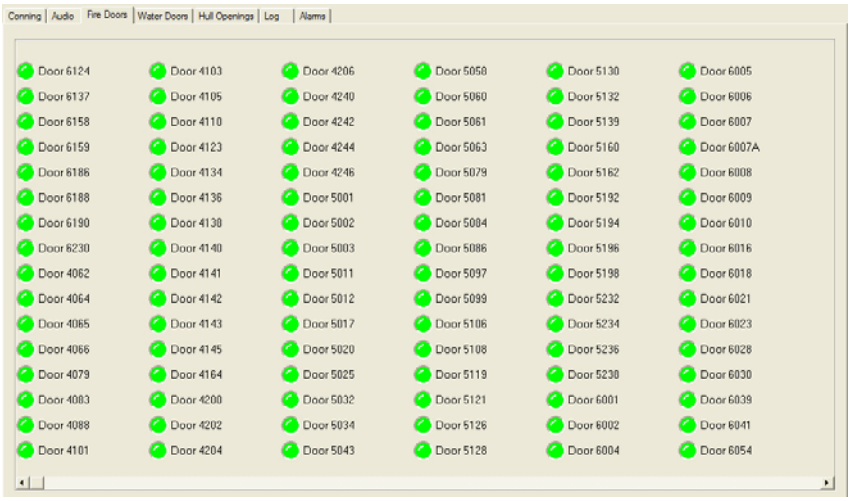


Figure 6-24 - Fire Doors Tab

6.12 Water Doors Tab Screen

The Water Doors Tab Screen displays information regarding the status of the ship's water doors. The colour of the light adjacent to the door name, dependant upon the configuration, indicates an active (often indicated with the colour red) or non-active (often indicated with the colour green) door or opening.

Should the number of water doors exceed the initial screen space, a scroll bar will become visible allowing a user to view all available.

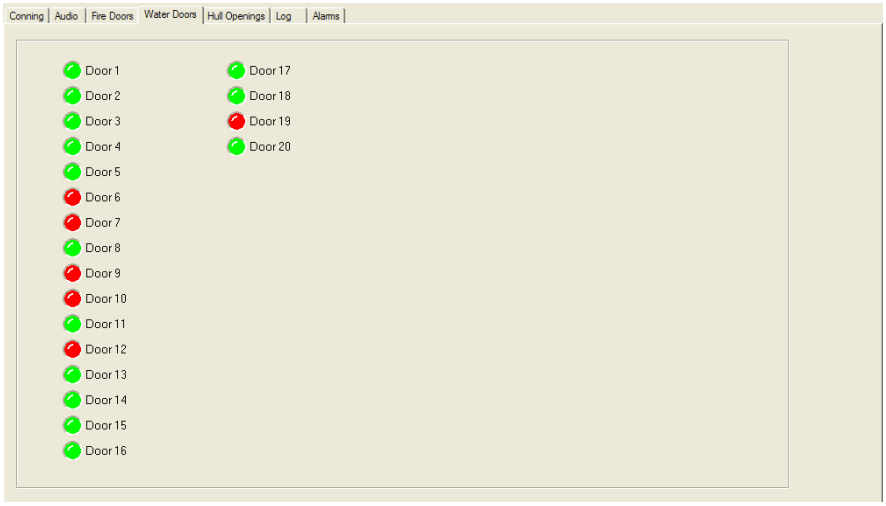


Figure 6-25 - Water Doors Tab

6.13 Hull Openings Tab Screen

The Hull Openings Tab Screen displays information regarding the status of the ship's hull openings. The colour of the light adjacent to the door name, dependant upon the configuration, indicates an active (often indicated with the colour red) or non-active (often indicated with the colour green) door or opening.

Should the number of hull openings exceed the initial screen space, a scroll bar will become visible allowing a user to view all available.

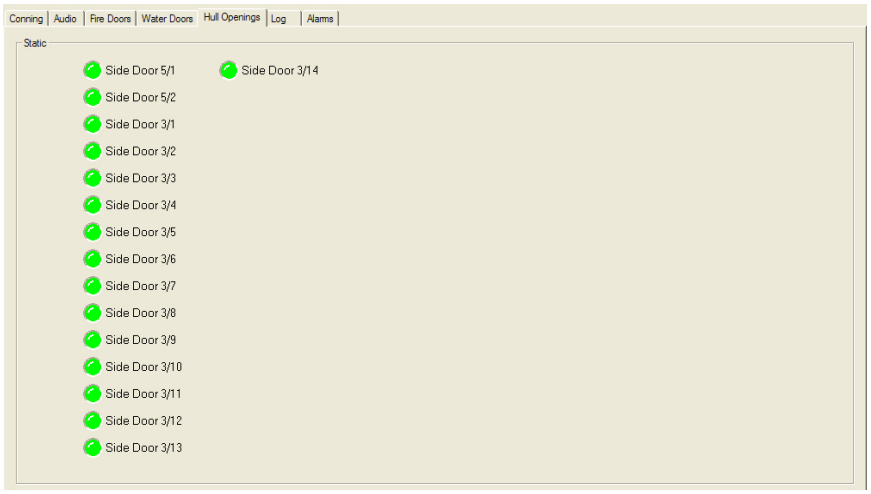


Figure 6-26 - Hull Openings Tab

6.14 Log Tab Screen

The 'Log' Tab Screen displays the size of each type of data block and the time it was recorded. When viewed in compressed time (fast forward), the size of data blocks written at each time-period is displayed, but the actual NMEA strings are not. When played back in normal time, the 'Log' Tab Screen will also display the NMEA strings.

'Log' information can be controlled via the Controls toolbar. To scroll illustrated information, press the 'Pause' button on the Controls toolbar and use the 'Log' scrollbar to navigate.

Figure 6-27 - Log Window

6.15 Alarms Tab Screen

An alarm is an “on” event, only displaying when triggered. When an alarm occurs, the word “ALARM” will display in the lower left corner of the Playback interface. The Alarms tab allows a user to view information pertaining to all triggered alarms.

6.16 Data Extraction

The volume of data contained in downloaded VDR data sets can be very large. In many instances it may be desirable to access smaller portions of the data without downloading the entire data set. As a result it is possible to copy only a specific portion of a data set, which can then be easily removed to a separate location for analysis or e-mailed to a third party.

6.16.1 Open Extraction Window

To extract a specific portion of data, begin the playback of captured data. Once data is in active playback mode allow it to play until the beginning point of the portion desired for extraction is reached:

1. Select “Data Extraction” option from the “Data” file menu.

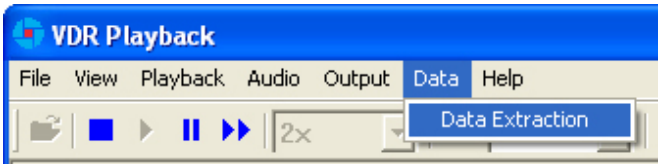


Figure 6-28 - Data Extraction Option

2. The Data Extraction window will open (see *Figure 6-29 - Data Extraction Window* below). This may take a number of seconds. The start time will automatically appear as the point in the playback where the Data Extraction window was opened.

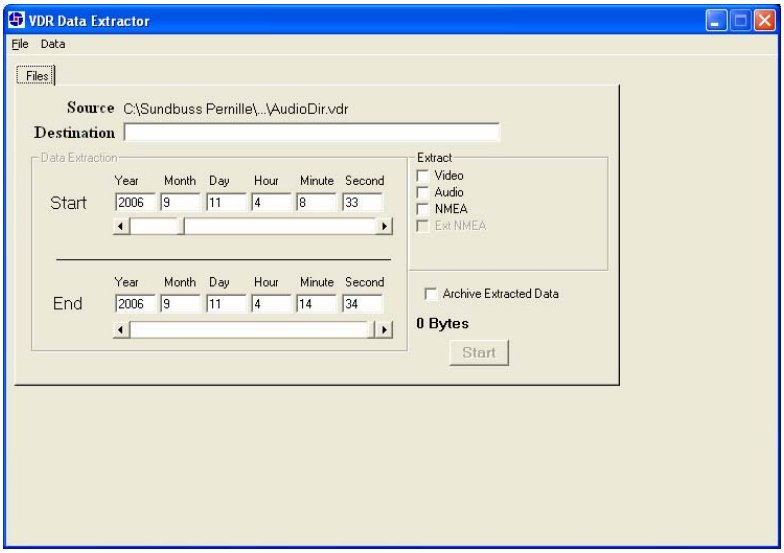


Figure 6-29 - Data Extraction Window

6.16.2 Selecting Data for Extraction

With the Data Extraction window open it is now necessary to select a segment of data to extract and an extraction destination.

1. Three (3) data stream options (Video, Audio, and NMEA) are available for download. Check the adjacent checkbox to select the desired data stream. If no data stream is selected the Start and Stop scroll bars will not be available.
2. When the "Video" checkbox is selected additional options will appear (may take a number of seconds). The user will have the option to download individual Video channels as required (if available). There is also an option to select one (1) to four (4) video image(s) per minute; selecting "1" allows a user to reduce the size of the Video data extraction (one (1) image capture per minute).

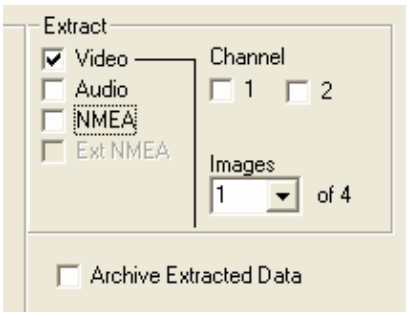


Figure 6-30 - Data Stream Options w/ Video Selected

3. Select a destination directory by clicking the word "Destination" (or, alternately, choosing "Choose Destination Dir" from the "Data" file menu). Note that the destination directory **cannot be the same as the source directory** and **cannot contain any other files**.
4. Select a Start and Stop time for the extracted segment. As mentioned above, the Start time automatically appears as the time when the Data Extraction window was opened. However, this can be changed. To adjust either the Start or Stop time, move the applicable scroll bar. The file size of the extracted segment will appear to the right of the Stop scroll bar. This is particularly useful, for example, when attempting to extract a segment to copy to a recordable Compact Disc.
5. To create an archived file of the extracted data at the same time as the extracted data is being copied to the selected destination folder, select the "Archive Extracted Data" checkbox.
6. To start the data extraction, press the "Start" button located in the lower right of the Data Extraction window or choose the "Extract" option in the "Data" file menu (Data > Extract).
7. A progress bar will appear at the bottom of the window to indicate the progress of the extraction.
8. Once completed, the Data Extraction window can be closed via the "Exit" option in the "File" menu (File > Exit).

6.17 Closing the Application

The application cannot be closed while a voyage playback is running. To close:

1. Stop the playback by selecting 'Stop' from the 'Playback' menu, or by pressing the 'Stop' button in the Controls toolbar.

Press the 'Close' (x) button in the upper right hand corner of the application's main window, or choose 'Exit' from the 'File' menu.

7 Maintenance

7.1 Introduction

The Rutter VDR/SVDR requires regular maintenance to ensure its continued seaworthiness and serviceability. The procedures outlined in this chapter will help the operator to identify any problems that may be caused during the maintenance or repair of the VDR/SVDR or of any sensors connected to it.

In accordance with **IEC 61996**, the operator must follow theses steps to verify the integrity (correctness) of the data being recorded by the VDR/SVDR whenever any one of the following conditions occur:

- When the ship's VDR/SVDR is due for an annual performance test;
  OR
- Whenever maintenance or repair is carried out on the VDR/SVDR and all peripheral devices;
  OR
- Whenever maintenance or repair is carried out on any of the connected sensors from which the VDR/SVDR collects data such as the Radar, GPS, AIS transceiver, etc; OR
- Every three months.

7.2 Preventative Maintenance

NOTE 1: *It is recommended that the following preventative maintenance checks* ***be completed every three months*** *or whenever maintenance or repair is carried out on the VDR/SVDR and peripheral devices, or on any connected sensors from which the VDR/SVDR collects data.*

NOTE 2: *Regular preventative maintenance* ***should be recorded in the Update and Service History Log*** *(see Table 7.4: Update and Service History Log). Any* ***deficiencies*** *found during the scheduled routine* ***must be*** *corrected.*

7.2.1 General Inspection Procedures

1. It is necessary to inspect the VDR/SVDR and all of its peripheral devices. This includes:
   - Data Processing Unit (DPU);
   - Data Acquisition Unit (DAU – if applicable);
   - Operation and Alarm Unit (OAU);
   - Remote Storage Module (RSM - if applicable); Data Conversion Interfaces (i.e. Gyro Converter);
   - Microphones.
2. During a physical inspection the following should be checked:
   - The DPU should be locked to prevent tampering.
   - DPU fan is working. The air filter should be inspected and replaced if necessary.
   - Verify cables entering DPU are not damaged.
   - Verify the DPU is firmly mounted.
   - Inspect the Audio module, NMEA module and Video module (if fitted).
   - All modules should be firmly secured and grounded.
   - All cables should be firmly secured and not damaged.

NOTE: *If the Audio, Video, and NMEA modules are installed inside a DAU, the operator must ensure that the DAU cover is tightened in place and the DAU is firmly mounted.*

3. The OAU should have no alarms and should always show: **Status: Recording**
(Although somne earlier versions of the VDR-100G2 may display **Status: Clear**)
   - Run a test to verify that the display, LED, and buzzer function normally
     - press the OAU's "TEST" button, then
     - After verification, press the "CANCEL" button.

(For alarm code descriptions, refer to section below 7.3.1: *Alarm Code Descriptions*)

4. The RSM and Interfaces (if applicable):
   - Should be firmly mounted;
   - All cables must be securely attached;
5. All microphones should be securely mounted.

7.2.2 Air Flow Check

It is essential that proper airflow is maintained within the DPU. There is 1 fan system, accessible via the top hatch of the DPU, which provides an air intake and exhaust.

Air intake fan: located at the side top corner of the DPU pulls air into the unit to cool internal components. It must be cleaned at least once every 3 months.

Fan Exhaust: located opposite the intake fan and exhausts warm air away from the unit. It must be free from obstructions and ait flow must be unrestricted.

7.2.3 FRM Maintenance

FRM unit must be visually inspected to ensure it has not been tampered with and it is in good working order. **As a minimum**, follow the steps provided below during visual inspection:

1. Ensure the FRM is not damaged in any way.
2. Ensure the integrity of the securing brackets. There should be **no** signs of tampering.
3. Ensure the exterior paint and labelling are fully visible and in excellent condition. There should be **no** signs of chipping or flaking.

7.2.4 Verifying the Data

The following procedure should be used as a guide to download and verify the VDR/SVDR recording.

1. Verify all sensor equipment is on and connected to the VDR/SVDR, i.e. GPS, Heading, AIS, radar, etc.
2. Verify that the OAU is displaying:
   Status: Recording
3. Press the red **Emerg. Backup** key on the OAU keypad to save an emergency backup of current data to a secured data set.

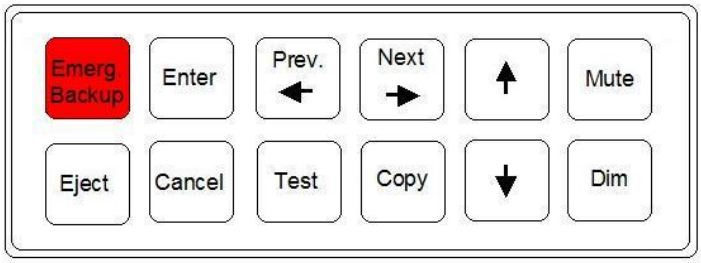


Figure 7–1: OAU keypad.

NOTE: *To secure a data set, refer to* Chapter 3.0: User Guide*,* Section 3.1: Securing Data *of this manual for detailed instructions.*

4. Allow the VDR/SVDR to operate normally for 10 minutes.
   During the 10-minute sample data recording period there the operator must:
   - Locate each indoor/outdoor microphone and voice a test pattern for later replay and verification;
   - Voice a test pattern over the VHF channel(s) for later replay and verification.
5. After 10 minutes, press the **Emerg. Backup** key on the OAU keypad to save an emergency backup of the test data to a secured data set.
6. Make note of the exact time that the test data set was secured.

Example:

If the data set secured in Step 3 was saved as
Secured-2009-01-25-12-20, then the data set secured in Step 5 would be secured as Secured-2009-01-25-12-30.

7. Download or copy the test data set to the Playback PC (Any PC may be used that has the VDR Playback application installed). There are several methods of copying or downloading data depending on the VDR/SVDR model installed. Refer to chapter ***Data Retrieval*** of this manual for the different options and instructions on how to retrieve a data set for playback.
8. Playback and verify the data retrieved in Step 7. Refer to Chapter 6: ***Playback Software,*** Section ***6.1: Playback Installation – Client PC*** of this manual for detailed instruction on how to install and use the VDR Playback application.

7.2.4.1 Video Data Verification

a. Verify that the video is recorded correctly and it is displayed in the appropriate video tabs of the VDR Playback application.

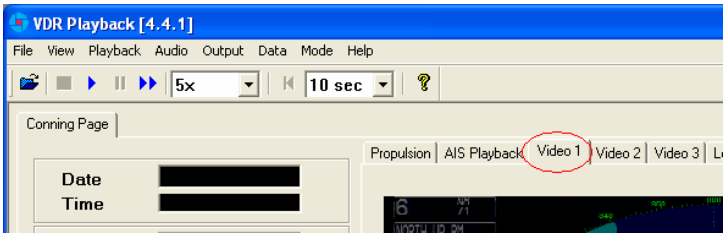


Figure 7–2: Detail of user interface for VDR playback application.

NOTE: *Video images are updated once every 15 seconds for each video tab of the VDR Playback application. Therefore, the information displayed in a tab may not appear to be updating. Observe each video tab to ensure that the source screen displays an update of such items as UTC time, GPS position, etc.*

7.2.4.2 Audio Data Verification

a. Enable each audio channel (one at a time) by putting a check next to the one of interest from the Audio menu. Refer to ***Playback Software*** chapter in this manual for instructions on unlocking Audio and enabling audio channels.
b. With each audio channel enabled, play back the test data set.
c. During playback verify that each voice test pattern from Step 4 is audible and clear.

7.2.4.3 NMEA Data Verification

a. Review the list of sensors that are connected to the VDR/SVDR in the ***Data Items*** section of the ship's ***Installation Commissioning Form***. This form is delivered to the ship's Captain at the time of VDR/SVDR Commissioning.
b. Verify that each NMEA input as listed in the VDR/SVDR's Commissioning Document is displayed in the VDR Playback application.

7.3 Corrective Maintenance

7.3.1 Alarm Code Descriptions

Listed below are the alarm codes that may appear on the OAU LCD display:

Alarm Code	Description
System Error	Communication with the Record Application has been lost
Video Error	Communication with the Video Module has been lost
Audio Error	Communication with the Audio Module has been lost
FRM Error	Communication with the Final Recording Medium has been lost
Power Fail	Loss of utility power
PCM Error	Communication has been lost with the Power Control Module
Remote Error	Communication has been lost with the Remote Storage Module
Serial Error	Communication has been lost with the NMEA Module
Mic Error	Communication has been lost with one of the microphones
Disk Error	Failure to secure a data set
GPS Error	Data is failing to record on TimeMuxID parameters entry

Table 7-1: Alarm Code Description

Pressing the “Mute” button acknowledges the alarm code and silences the alarm. The red alarm indicator lamp will stay illuminated until all alarm conditions are cleared. If there is more than one alarm condition, the OAU display will cycle through the current alarm messages.

SYSTEM ERROR: Turn the ship breaker for the VDR/SVDR power OFF. Wait 2 hours and 15 minutes. Turn the VDR/SVDR power breaker back on and see if this has cleared the error. **If error returns, get service to find and repair the error.**

VIDEO ERROR: Open Data Processing Unit (DPU) (the VDR/SVDR’s main cabinet) and ensure that the 2 AMP DC breaker inside marked ***Video/NMEA*** is closed. Make sure the Ethernet cable plugged into the VDR/SVDR’s computer port marked ***Video/NMEA*** is pressed all the way into this port. There should be a solid green link light and a flashing yellow light associated with this port. Locate the video module and ensure it’s red LED power lights are lit and that its Ethernet cable is securely inserted in the modules Ethernet port. **If error returns, get service to find and repair the error.**

AUDIO ERROR: Open Data Processing Unit (DPU) (the VDR/SVDR’s main cabinet) and ensure that the 2 AMP DC breaker inside marked ***Audio/Alarm*** is closed. Make sure the Ethernet cable plugged into the VDR/SVDR’s computer port marked ***Audio*** is pressed all the way into this port. There should be a solid green link light and a flashing yellow light associated with this port. Locate the audio module and ensure it’s red LED power lights are lit and that its Ethernet cable is securely inserted in the modules Ethernet port. **If error returns, get service to find and repair the error.**

FRM ERROR: Open Data Processing Unit (DPU) (the VDR/SVDR’s main cabinet) and ensure that the 2 AMP DC breaker inside marked ***FRM*** is closed. Make sure the Ethernet cable plugged into the VDR/SVDR’s computer port marked ***FRM*** is pressed all the way into this port. There should be a solid green link light and a flashing yellow light associated with this port. If problem still exists; open the FRM 2-AMP breaker by pressing its *Red Button*, wait 5-seconds and close this breaker by pressing its *Black and White Button marked with the number 2*. **If error returns, get service to find and repair the error.**

PCM ERROR: Open Data Processing Unit (DPU) (the VDR/SVDR’s main cabinet) and ensure that the two serial connectors on the back of the computer are still firmly in place. If problem persists turn the ship breaker for the VDR/SVDR power OFF. Wait 2 hours and 15 minutes. Turn the VDR/SVDR power breaker back on and see if this has cleared the error. **If error returns, get service to find and repair the error.**

REMOTE ERROR: If your system has a Remote Storage Module (RSM), check that the power cable is connected and the power switch on the RSM is in the ON position. Check that either the USB or Ethernet data cable (but not both) is connected. If connected with an Ethernet cable, confirm that the Green LED is lit and the Orange LED is flashing. Remove RSM from VDR/SVDR and connect to playback computer with the USB cable. Verify the latest data is saved to the RSM. If all the current data is not present, arrange service to have the error investigated and repaired.

If your system has a USB memory stick, check that it is present. 'Eject' the USB memory stick and remove it from the VDR/SVDR. After waiting 30 seconds, re-connect the USB memory stick to the VDR/SVDR. Verify if the Remote Error clears. If not, arrange service to have the error investigated and repaired.

.

SERIAL ERROR: Open Data Processing Unit (DPU) (the VDR/SVDR's main cabinet) and ensure that the 2 AMP DC breaker inside marked ***Video/NMEA*** is closed. Make sure the Ethernet cable plugged into the VDR/SVDR's computer port marked ***Video/NMEA*** is pressed all the way into this port. There should be a solid green link light and a flashing yellow light associated with this port. Locate the NMEA module and ensure its red LED power light is lit and that its Ethernet cable is securely inserted in the modules Ethernet port. **If error returns, get service to find and repair the error.**

MIC ERROR: Check that the indicated microphone is not damaged. If it looks good, turn OFF the ship breaker for the VDR/SVDR power. Wait 2 hours and 15 minutes. Turn ON the VDR/SVDR power breaker. If there is a microphone problem it will take more than 12 hours for the error message to reappear. Continue to monitor the system to see if the error returns. **If error returns, get service to find and repair the error.**

DISK ERROR: If your system has a USB memory stick or an RSM, copy the current data set to that device. If your system does not have a USB memory stick or RSM, then connect the download/playback computer to the VDR/SVDR and download the current data set. **If the copy fails, arrange service to have the error investigated and repaired.**

GPS ERROR: If your system has a USB memory stick or an RSM, copy the current data set to that device. If your system does not have a USB memory stick or RSM, then connect the download/playback computer to the VDR/SVDR and download the current data set. Review the data with the playback software and verify that the GPS time and date information is present. If not present, contact the GPS service supplier to correct the GPS problem. I**f it is present in playback, arrange service to have the error investigated and repaired.**

7.3.2 Log Window Error Code Descriptions

The following table provides a list of error codes and descriptions that may be observed in the Log Window of the VDR Playback application:

Error Code	Alarm Message	Binary Bit Position
99$0	Status Clear	0000000000
99$1	Storage Error	0000000001
99$2	Video Error	0000000010
99$4	Audio Error	0000000100
99$8	NMEA Error	0000001000
99$16	Power Error	0000010000
99$32	Microphone Error	0000100000
99$64	FRM Error	0001000000
99$128	Lyngso Error	0010000000
99$256	Power Comms Error	0100000000
99$512	Remote Error	1000000000
99$1024	GPS Error	10000000000

Table 7-2 - Error Codes - Playback Log Window

In the event of simultaneous errors, it will be necessary to convert the displayed error code to its binary counterpart. A multiple error will display multiple 1-bits in the binary string, which must then be interpreted.

***Example**:* The error code 99$17 converts to a binary string of 0000010001, representing a simultaneous Storage and Power error.

7.3.3 NMEA Error Code Descriptions

The error codes in the NMEA data from the NMEA Module identify the NMEA module and its port that has the error. These errors occur when either the data format or speed does not match the received data, or the received data is corrupted.

The error message is in the format NerrorXX, where N is the NMEA ID and XX is the code as listed below.

Code	8-Port NMEA Module	4-Port NMEA Module
A	232/422 Output	232/422 Output
B	422 Input	422 Input
C	Input 1	Input 1
D	Input 2	Input 2
E	Input 3	Input 3
F	Slave/Master Link	Input 4
SA	Output to Slave	NA
SB	Input Port 4	NA
SC	Input Port 5	NA
SD	Input Port 6	NA
SE	Input Port 7	NA
SF	Input Port 8	NA

Table 7-3 - NMEA Error Codes

Example: Error message 1errorSD on an 8 Channel NMEA Module would indicate that the data on input Port 6 has the wrong data format or speed or is corrupt.

7.4 Update Service History Log

Any time preventative or corrective maintenance has been carried out on the VDR/VSDR a new entry should be added to the Update Service History Log (see Table 7-4: Update Service History Log below). A complete record of the Date, Service\Fault Description, Service Supplier and Ship's Representative Signature must be documented in the log for each entry in order for the information to be valid.

Rutter VDR/SVDR Update Service History Log

Date	Service/Fault Description	Service Supplier	Ship's Representative Signature

Table 7-4: Update Service History Log

Inside back cover.

VDR-100G2/G2S
Operation User Manual

RUT-UM-02-002 Rev. 2.0

Rutter Technologies Inc
70 Brookfield Road
St. John's, NL Canada
A1E 3T9

Tel: (709) 368-4213
Fax: (709) 368-1337

www.ruttertech.com