

DANELEC DM100 S-VDR DATA LOGGER OPERATOR'S MANUAL

Quick Links

[Method for Initiating a Backup on the Vdr Data Disk](#)

[Bridge Alarm Unit](#)

[Error Codes](#)

[Service and Maintenance](#)

Table of Contents

Table of Contents

References

Terms and Abbreviations

System overview for an S-VDR

Data Acquisition Unit (DAU)

Bridge Alarm Unit (BAU)

Bridge Microphone Units (BMU)

Fixed Data Capsule

Float-free data capsule

Remote video interface (RVI)

Bridge alarm Unit

Alarm display

Method for initiating a backup on the VDR data disk

DPU

Power LEDs

AC breaker

AC inlet

Battery switch

VDR status LED

Main CPU LED

LEDs in the Ethernet connectors

RVI address

Ethernet ports

ST LED

Error codes for a basic S-VDR installation

Additional error codes for installations utilizing a SIU and
nd RVI

Verification of the S-VDR functionality following service on any sensor

Setting the IP address of the PC, windows 7

Connecting the PC to the S-VDR

Run the VDR Verifier program

Examination of the report

List of most common spare parts

Other ManualsLib Projects

Operator's Manual

For the DM100 S-VDR

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Contents

REVISION RECORD	2
1 SCOPE AND PURPOSE	5
1.1 References.....	5
1.2 Terms and Abbreviations	5
2 SYSTEM OVERVIEW	6
2.1 System overview for an S-VDR.....	6
2.1.1 Data Acquisition Unit (DAU)	6
2.1.2 Bridge Alarm Unit (BAU).....	6
2.1.3 Bridge Microphone Units (BMU).....	6
2.1.4 Fixed Data Capsule	6
2.1.5 Float-free data capsule.....	7
2.1.6 Remote video interface (RVI)	7
3 OPERATION.....	9
3.1 Bridge alarm Unit	9
3.1.1 Alarm display.....	9
3.1.2 Method for initiating a backup on the VDR data disk	9
4 OPERATION DM100 DAU	11
4.1 DPU	12
4.1.1 Power LEDs	12
4.1.2 AC breaker	12
4.1.3 AC inlet.....	12
4.1.4 Battery switch	13
4.1.5 VDR status LED	14
4.1.6 Main CPU LED	14
4.1.7 LEDs in the Ethernet connectors.....	14
5 OPERATION OF STANDARD RVI 02-004 AND RVI 02-004D (POE)	15
6 OPERATION OF RVI WITH AC POWER SUPPLY	16
6.1.1 RVI address.....	16
6.1.2 Ethernet ports.....	16
6.1.3 ST LED.....	16
7 ERROR CODES	17
7.1 Error codes for a basic S-VDR installation	17
7.2 Additional error codes for installations utilizing a SIU and 2 nd RVI	23
8 SERVICE AND MAINTENANCE	25

8.1	Verification of the S-VDR functionality following service on any sensor.....	25
8.2	Setting the IP address of the PC, windows 7	26
8.3	Connecting the PC to the S-VDR.....	29
8.3.1	Run the VDR Verifier program.....	29
8.3.2	Examination of the report	32
8.4	List of most common spare parts	36

1 Scope and purpose

Operator's Manual for the DM100 S-VDR

1.1 References

DBS10704 Installation Manual for DM100/DM400 VDR compact Sensor Interface Unit
DBS10885 Installation Manual for DM100 S-VDR
DBS10911 Inspectors and Authorities Manual for DM100 S-VDR
DBS10919 Installation manual for Remote Video Interface RVI 02-004(D)

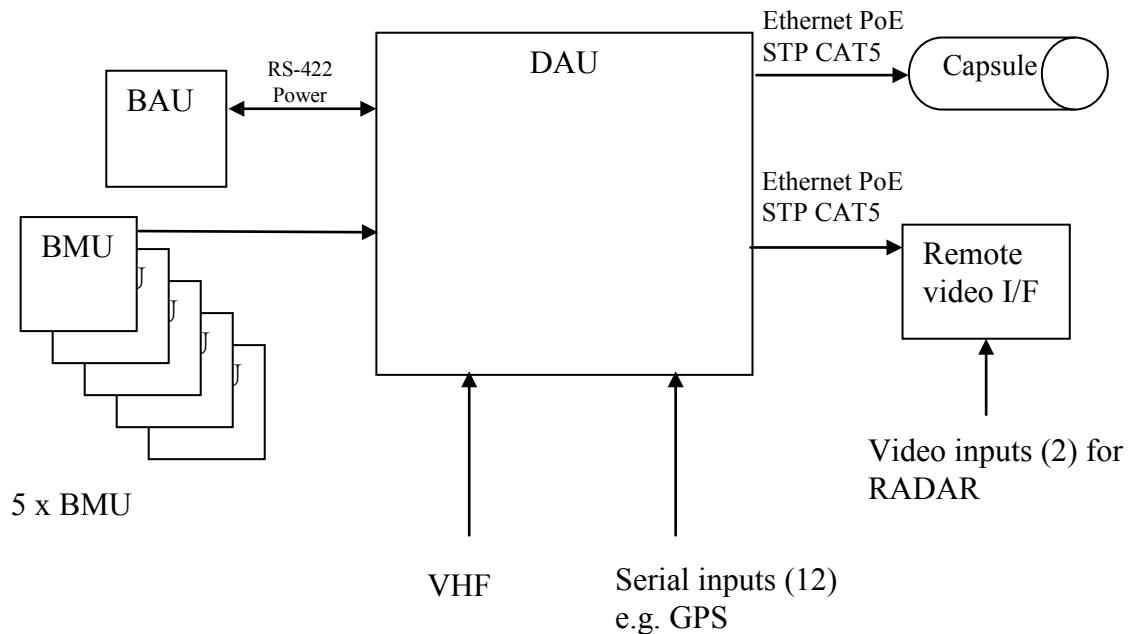
1.2 Terms and Abbreviations

BAU	Bridge Alarm Unit
BMU	Bridge Microphone Unit
DAU	Data Acquisition Unit
DPU	Data Processing Unit (located inside the DAU)
SIU	Sensor Interface Unit
RVI	Remote Video Interface
NAS	Network Attached Storage (option used for external extended backup)

2 System overview

2.1 System overview for an S-VDR

The S-VDR is composed of the following units:



S-VDR System overview (typical configuration)

2.1.1 Data Acquisition Unit (DAU)

The Data Acquisition Unit contains the Data Processor Unit (DPU). The DAU must be installed indoors in the proximity of the bridge.

2.1.2 Bridge Alarm Unit (BAU)

The BAU must be installed on the bridge either in a console or mounted on a bulkhead. System errors will generate a visual and audible alarm.

2.1.3 Bridge Microphone Units (BMU)

A number of BMUs must be installed on the bridge (console, ceiling or bulkhead mounted). Watertight outdoor BMUs for the bridge wings are available.

2.1.4 Fixed Data Capsule

The data capsule (“the orange box”) must be installed on an “external deck close to the vessel’s center line”; typically on the external deck above the bridge.

2.1.5 Float-free data capsule

As an alternative to the fixed data capsule, a float-free capsule may be used instead.

2.1.6 Remote video interface (RVI)

RADAR video is acquired using a Remote Video Interface (RVI). The RVI must be installed indoors; typically close to the RADARs. It must be connected to the DAU with a cable which may be up to 100m long.

2.1.6.1 Maximum number of supported interfaces

If needed, additional equipment may be used to make larger or non-standard configurations. The maximum number of supported interfaces for an S-VDR is listed below:

Interface type	Maximum configuration
Serial inputs	28 (12 on DAU + 2 modules)
Analog inputs	32 (2 modules)
Digital inputs	128 (8 modules)
Audio inputs	18 (10 on DAU + 8 on RAI)
Video inputs	4 (2 RVIs)

3 Operation

3.1 Bridge alarm Unit

The BAU is the primary user interface for an installed operational S-VDR. It serves two purposes:

- Alarm display
- Interface for initiating a backup on the VDR data disk

3.1.1 Alarm display

The S-VDR will generate an alarm message if a system error is detected. The alarm messages will be displayed on the BAU. An audible alarm will be generated with each new alarm and the error LED will start flashing. Pressing ACK will mute the audible alarm. The error LED will be illuminated as long as there is any error in the system, the cause of the error(s) will be displayed in the LCD display.

3.1.1.1 Protection against intermittent errors

Intermittent errors can be a source of irritation. The S-VDR will regard a system component or a data source which fails 3 times within 12 hours as permanently failed; i.e. that system component/data source will not be able to generate more audible alarms. A permanent visual alarm will be displayed instead and the S-VDR will still try to recover from the problem, e.g. record data even if it contains many errors. Repetitive alarms are marked with an “R” after the error code. The “repetitive” error status for a failed system component/data source will be automatically reset if no error has been generated for 12 hours. The “Purge List” button on the BAU will force reset of “repetitive” error status for all system components/data sources.

3.1.1.2 Dimming

The button with the light bulb symbol may be used to alter the brightness of the keyboard, error LEDs and the LCD display simultaneously.

3.1.2 Method for initiating a backup on the VDR data disk

The S-VDR system is only guaranteed to record data for twelve hours, i.e. important data may be overwritten after twelve hours unless a backup of data is made following an incident.

The crew on the bridge must initiate the backup procedure shortly after the ship has been involved in an incident or if an incident involving other vessels is observed.

The backup procedure is started when the two “Save” buttons are pressed simultaneously. The S-VDR is able to make the backup within seconds.

The system is capable of storing three incidents. The “Save” LED indicates when there is multiple, one or no save opportunity left (disk full). A backup will be protected for 30 days after which the space on the disk will be released automatically.

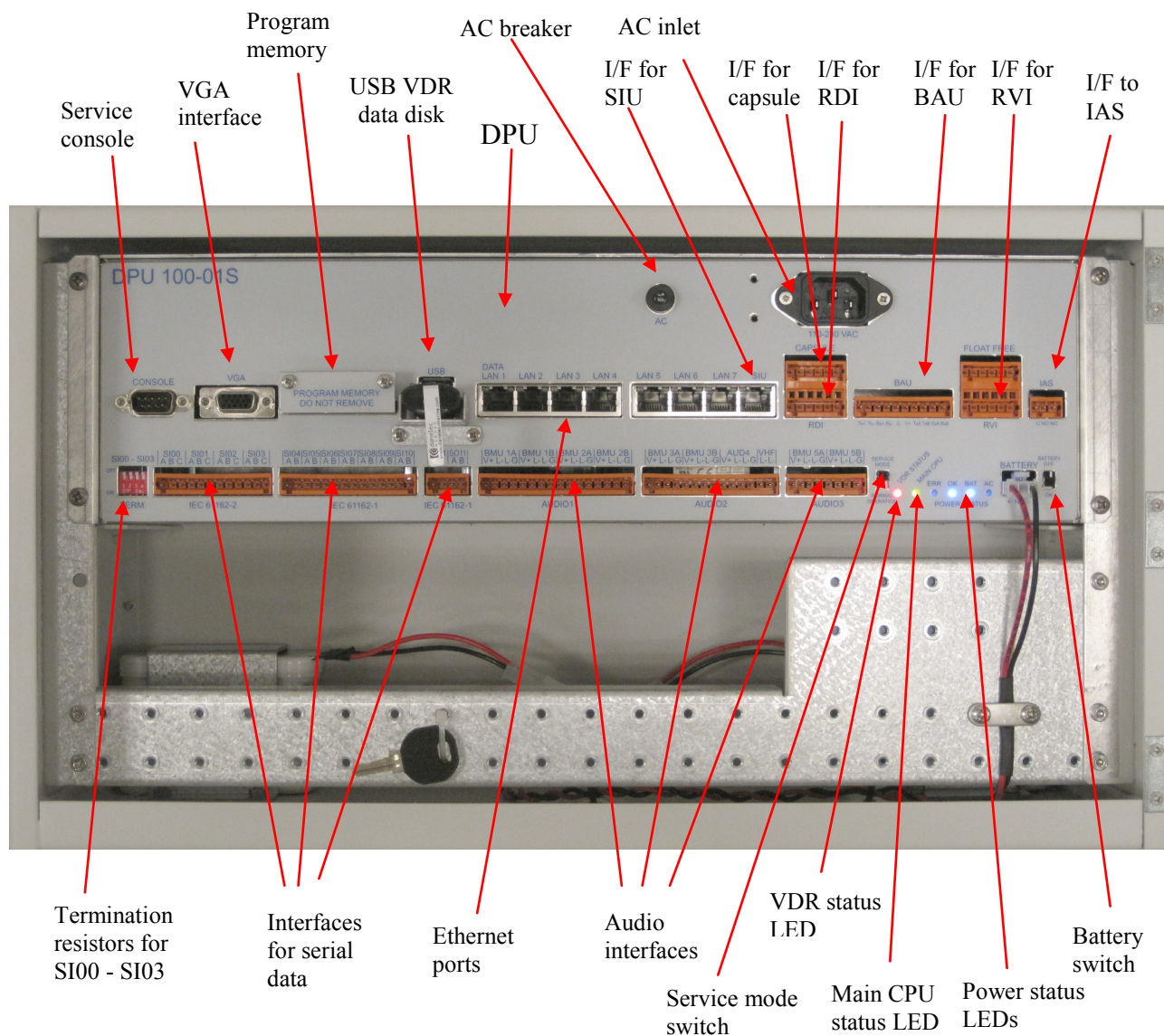
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This VDR data disk must be replaced if it becomes full (which is unlikely under normal circumstances). Alternatively, data from the disk must be transferred to another media, and space on the disk can be manually released. This requires proper authorization and cannot be done from the BAU.

The VDR data disk, which is easily removed from the DAU, must be retrieved if the vessel is abandoned after a serious incident.

4 Operation DM100 DAU

The door to the DAU must be locked after the S-VDR is installed and operating normally. This section of the manual is only relevant during installation and service, or if the (USB) VDR data disk has to be removed following a serious incident.



4.1 DPU

The DPU is the main computer in the system. It is basically a PC, but it has been designed from scratch in a completely different manner in order to withstand environmental stress which far exceeds what an ordinary industrial PC can sustain.

4.1.1 Power LEDs

BAT LED (blue)

Steady light	Battery fully charged	OK
Blinking (1Hz)	Charging battery	OK
Blinking (5Hz)	Battery is not detected	Error
Off	The battery switch on the DPU is "OFF"	(Error)

AC LED (blue)

Steady light	AC power OK	OK
Off	AC power failed	Error

ERR LED (red)

Steady light	The internal power control circuit has failed	Error
Off	The internal power control circuit is operating	OK

OK LED (blue)

Steady light	Power to DPU present	OK
Off	No power to the DPU	Error (note 1)

4.1.2 AC breaker

The AC breaker is a combination of a fuse and a manually operated switch, i.e. it can be used to manually switch off the AC power sources, but it will also pop out automatically if too much current is drawn from the power source or if over voltage is detected.

Warning: The AC breaker must be released (popped out) and the battery switch on the front of the DPU must be set in its "Off" position in order to switch the unit fully off.

4.1.3 AC inlet

The main power source for the S-VDR is ship's AC (110V-240V).

4.1.4 Battery switch

The battery switch indirectly controls a relay between DPU and the battery pack. When switching the S-VDR off, do the following: Pop out the AC breaker and move the battery switch to its “OFF” position shortly. Move the battery switch back to its “ON” after the S-VDR is turned off.

4.1.5 VDR status LED

The status of the system is displayed using a tri-color LED. The BAU will display text messages and error codes explaining the problems, if the LED becomes yellow or red.

VDR status LED (tri color)

Steady green	The information displayed is just information	OK
Steady yellow	The information displayed is a warning The system is still fully operational but may fail soon. Service is needed.	(OK)
Steady red	The information displayed contains information about system errors which prevent normal operation. Service is needed immediately.	Error

4.1.6 Main CPU LED

The main CPU LED is controlled by the power control circuit which will become active as the first circuit after power is applied. The power circuit uses the LED to show information about the main CPU.

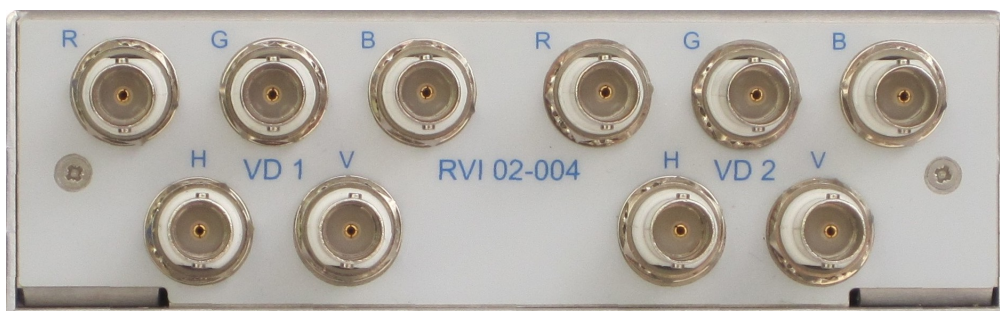
OFF	The power circuit is not started yet – should only take a few seconds.	(OK)
Green 1Hz	The power circuit is waiting for the main CPU to start (boot load) – may take up to two minutes	(OK)
Steady green	The main CPU is operating normally	OK
Steady red	The main CPU is not responding	Error

4.1.7 LEDs in the Ethernet connectors

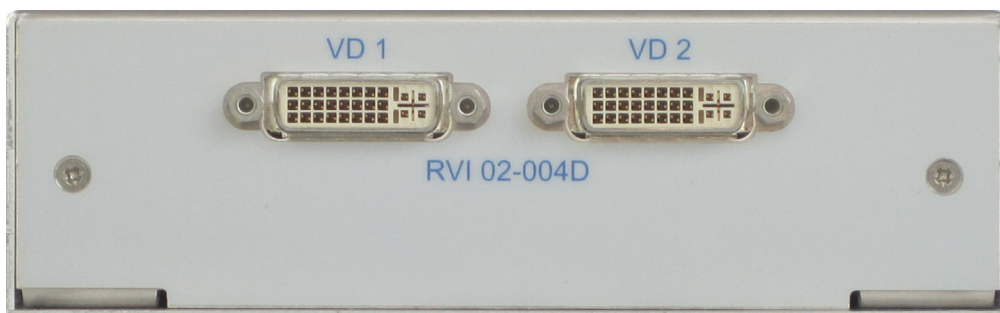
Two LEDs are integrated into each Ethernet connector. The left LED will be illuminated when a communication link is established and shows the speed (yellow = 100Mbit/sec, green = 1000Mbits/sec). The right LED (green) will be illuminated when a communication link is established and will flicker depending on the traffic load.

5 Operation of standard RVI 02-004 and RVI 02-004D (PoE)

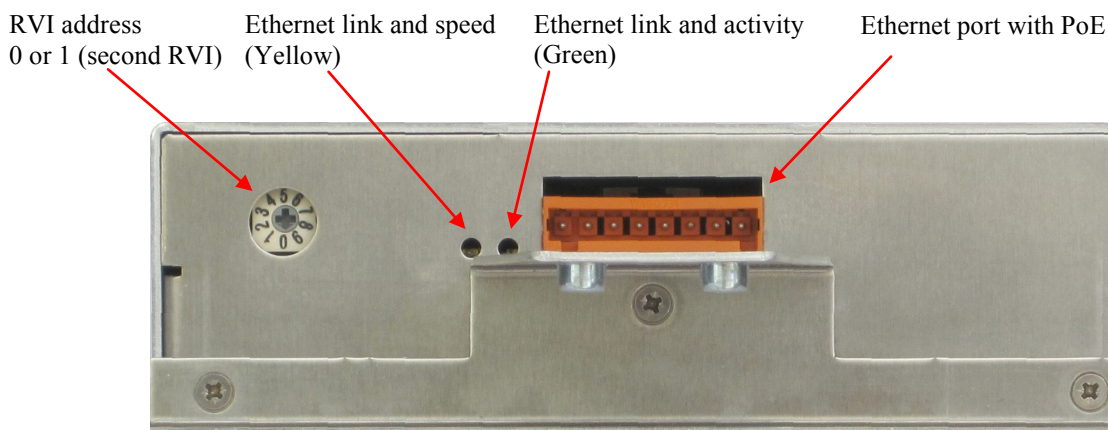
The DM100 will normally use an RVI 02-004 and RVI 02-004D for image capture. Another type exists (see section 6) which may be used if the “Power over Ethernet” ports on the DPU are used for other purposes.



RVI 02-004



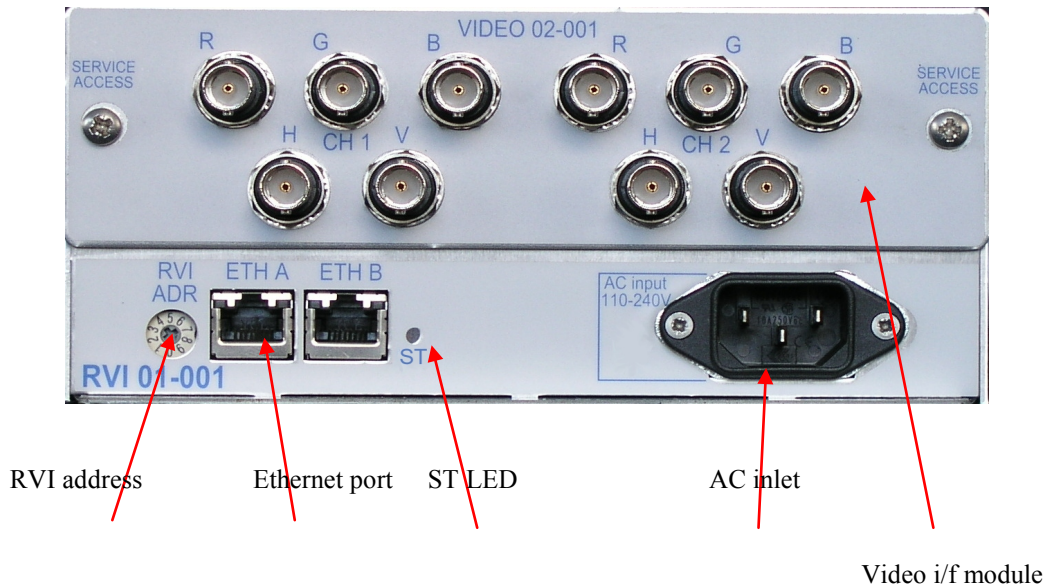
RVI 02-004D



RVI 02-004 and RVI 02-004D rear panel

6 Operation of RVI with AC power supply

This type is only used if the “Power over Ethernet” ports on the DPU are used for other purposes.



6.1.1 RVI address

Must be set to “0” or “1” if it is the second RVI.

6.1.2 Ethernet ports

ETH A must be connected to the DAU. Notice that the LEDs in the Ethernet connectors (RJ45) are inactive for this unit.

6.1.3 ST LED

The Status LED (Yellow) will flash (1Hz) after power on and then become steady if a communication link is established to the DAU. The LED will always switch itself off after one minute.

7 Error codes

Error codes and messages will be displayed by the BAU when errors are detected. An “R” after the error code denotes a repetitive alarm; see section 3.1.1.1.

7.1 Error codes for a basic S-VDR installation

004	SYSTEM FATAL ERROR	The VDR has encountered an unrecoverable system error. Reboot the system. If the error persists, call for assistance. The most probable cause is a faulty CPU board or system RAM
018	STORAGE Storage failure	Internal software error. Reboot the system. If the error persists call for assistance.
030	BAU Communication error	The DPU is unable to communicate with the BAU. Check the cable from the DPU to the BAU. Reboot the system. If the error persists call for assistance. The most probable cause is a faulty cable, BAU or DPU.
031	BAU #1 Communication error	Only relevant for dual BAU installations. The DPU is unable to communicate with BAU #1 of 2. Check the cable from the DPU to the BAU. Reboot system. Also check switch settings on BAU #1: Switch 1 should be ON, switch 2 OFF. If the error persists, call for assistance. The most probable cause is a faulty cable, BAU or DPU.
032	BAU #2 Communication error	Only relevant for dual BAU installations. The DPU is unable to communicate with BAU #2 of 2. Check the cable from the DPU to the BAU. Reboot system. Also check switch settings on BAU #2: Switch 1 should be OFF, switch 2 ON. If the error persists call for assistance. The most probable cause is a faulty cable, BAU or DPU.
036	CONFIG Unable to save	The VDR was unable to save the configuration. Please retry. This error is only expected to occur during configuration (installation) of the system.
042	CONFIG Configuration failed	The VDR is unable to find any configuration at all. Replace the boot compact flash in the DPU (a properly made boot flash contains a default configuration from which the system can start). Restore a backup of the configuration.
054	ALARM Running on battery	The system is running on battery. Both the main power and the emergency power are absent. If there is a general power failure on the vessel, ignore (ACK) this message, otherwise check the power supply status in the DAU. Consult section 4.1.1 for details.
056	AUDIO Microphones failed	The microphone test failed. Force a microphone test (this is a feature in the VDR configurator under AUDIO settings). This test will reveal which microphone is causing the problem. Check that the “BMU active” checkbox is unchecked for non-existing microphones. Check the cables to the microphones reported as faulty. Test the inputs on the audio interface module with a spare microphone. Replace microphones which are reported faulty if no other error is discovered.

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058	AUDIO Power short circuit	One or more microphones are using too much power. The cabling and microphones must be checked.
060	STATUS UTC timeout	The system is not receiving UTC from the GPS. Check that the GPS is on. Check the signal from the GPS (use serial monitor in VDR explorer, WEB status or VGA status display). If no signal is present check the cable, otherwise check that the configuration is done correctly.
070	PSU Communication failed	The communication between the power supply circuit and the main CPU in the DPU has been interrupted. If the error persists, the DPU is probably defective.
074	SERIAL module 1 Missing (SI00-07)	The serial data interface module on the SAP board in the DPU cannot be detected. If the error persists, the DPU is probably defective.
076	VIDEO module 1 Missing (VD01-02)	VIDEO module 1 cannot be detected. The most probable cause is that the cable to the RVI from the DPU is disconnected or the RVI is defective. Additional causes for an AC powered RVI: Power to the RVI is switched off, the internal Ethernet cable in the RVI is disconnected or the video interface module is defective.
078	AUDIO module 1 Missing (BMU1-BMU5)	The audio data interface module on the SAP board in the DPU cannot be detected. If the error persists, the DPU is probably defective.
080 082 084 086	VIDEO VD0n no input	There is no input from the radar. Check the radar and the cable. Enter the video calibration menu for that channel and examine the image. Unused video channels must be configured inactive (the Active parameter must be unchecked).
088 090 092 094	VIDEO VD0n image too big	The radar image exceeds the allocated space in the capsule and the system is therefore unable to record for 12 hours. Check the radar image for noise. Check the calibration of the video channel. Reduce the number "color mask bits" if needed.
089 091 093 095	VIDEO VD0n wrong size	The radar image is not the same size as defined in the configuration. Check the size of the image from the radar. If correct, check calibration and settings for the video channel.
096	Not configured Configure VDR	The VDR has started on the default configuration. Configure the system correctly. The VDR is unable to operate correctly on the default configuration since at least the GPS antenna position and vessel ID must be entered.
117	PSU battery Battery switch "OFF"	The battery switch on the front of the DPU is in the "OFF" position.
118	PSU battery Not present	The power supply is unable to detect the battery pack. Check that the battery pack is connected to the DPU. If the error persists for more than five minutes, the batteries are probably defective.
120	PSU battery Could not be charged	The charger was unable to fully charge the battery within a pre-defined time. Switch the battery switch on the DPU "OFF" briefly and then "ON". If the error returns (this may take 18 hours), the battery pack is defective and must be replaced.
124	PSU Low output voltage	The output voltage from the battery pack has dropped below 16V. This message will appear shortly before the battery is discharged

		when the VDR is operating from the battery only. This message will not appear if the battery pack is new and was fully charged, since the VDR will power down automatically after two hours when operating from the batteries (well before the voltage drops below 16V). If AC power is present (and the AC fuse/breaker is pushed in) while this error is displayed, the DPU must be repaired.
126	PSU Error	The internal PSU (power supply) in the DPU is defective. The DPU needs to be repaired.
128	AUDIO module 2 Missing (AUD5)	This will only happen if audio module 2 (the Remote Audio Interface) is enabled in the VDR configuration. Check the cable to the Remote Audio Interface.
130 132 134	xxxxxxx Module duplicate	xxxxxxx = SERIAL, VIDEO, AUDIO Two modules with identical system locations have been detected. Restart the system. If the error persists, check the installation and the VDR configuration.
136 138 140 142 144	xxxxxxx Wrong rack type	xxxxxxx = SERIAL, ANALOG, DIGITAL, VIDEO, AUDIO A module is located in a rack (DPU, SIU or RVI) where it is not supposed to be. Check the installation.
148	SERIAL Module in wrong slot	The VDR configuration is not consistent with the physical configuration of the VDR, e.g. an additional serial module is not installed the in the slot which is specified in the VDR configuration.
150	AUDIO Module in wrong slot	The VDR configuration is not consistent with the physical configuration of the VDR, e.g. the additional remote audio interface is not connected to the port on the DPU which is specified in the VDR configuration.
152	VIDEO Module in wrong slot	The VDR configuration is not consistent with the physical configuration of the VDR, e.g. the additional remote video interface is not connected to the port on the DPU which is specified in the VDR configuration.
160	EXTERNAL BACKUP Not recording	The system is unable to record data to the extended external backup disk (NAS). If no other relevant errors e.g. #162 are displayed, the NAS is probably defective.
162	EXTERNAL BACKUP Cannot find	The communication to the extended external backup disk (NAS) has been interrupted. Check that the extended external backup disk is installed correctly (e.g. is the LAN cable connected to DPU?). Reboot system. If the error persists, the most probable cause is a defective/misconfigured NAS.
174	STORAGE Wrong FRM connected	The VDR has detected a float-free capsule while being configured for a fixed one or vice versa. Make sure that you have only one such capsule attached and that the VDR configuration matches this.
180	SYSTEM In Service Mode	The VDR is in service mode. It is possible to make changes to the VDR configuration. When this is done, the mode switch on the DPU front must be set to position "Normal operation".

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190	DPU CPU fan failed	The primary fan in the DPU has failed. The secondary fan in DPU will serve as a backup until the problem is rectified. The VDR will be able to operate normally unless the secondary fan also fails (error 191). This problem must be rectified, by the latest, at the next APT.
191	DPU Backup fan failed	The secondary fan in the right side of the DPU has failed. This is only a major problem if the primary fan has also failed (error 190). If both fans have failed and immediate repair of the DPU is required.
300-307	SERIAL Timeout on S1xx	Mandatory serial data is not received. Check that the source is on. Check the signal from the source (serial monitor in VDR explorer, WEB status or VGA status display). If no signal is present check the cable and make sure that the configuration is correct.
400-549	Error codes related to a configuration utilizing a SIU and a second RVI	See Section 7.2
550	STORAGE Dataset incomplete	One or more types of data have not been recorded. If the error persists then restart the VDR. Authorized service of the VDR is required if this error still persists.
560	BACKUP INCIDENTS Backupdisk too small	The capacity of the VDR data disk is too small for the configured incident record size. Change the VDR data disk or reduce the incident record size.
561	BACKUP INCIDENTS Incident too small	The configured incident record size on the VDR data disk is too small for storing the capsule data. Change the incident type to large incident or replace the capsule for one with lower memory capacity.
562	INTERNAL BACKUP Backupdisk too small	The capacity of the VDR data disk is too small for internal extended backup. Change the VDR data disk or disable this feature.
609	STORAGE Device resets	The VDR has detected that the capsule and /or VDR data disk has been disconnected and/or connected too many times within a given interval
631	BACKUP Not recording	The VDR is unable to record data to the VDR data disk. Another error explaining why (e.g. #632 BACKUP Cannot find) is normally displayed in advance. Try to fix the preceding error, otherwise reboot the system. If the error persists call for assistance.
632	BACKUP Cannot find	The VDR is unable to detect a VDR data disk. Check that the VDR data disk is connected correctly. If the error persists call, for assistance.
633	BACKUP Cannot access	The VDR has detected a VDR data disk but is unable to get access. The most likely cause is that the VDR data disk is not initialized (formatted) correctly. A certified service technician can fix this.
634	BACKUP WR errors level 1	Too many write-errors (writing to the VDR data disk) have occurred within a given interval. Retrying to write data fixed the problem. The most likely cause is communication problems. The VDR data disk is not taken out of service and data is still recorded.
635	BACKUP WR errors level 2	Too many write-errors (writing to the VDR data disk) have

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		occurred within a given interval. More sophisticated measures than just retrying to write data were needed in order to fix the problem. The most likely cause is serious communication problems or a defective VDR data disk. The VDR data disk is not taken out of service and data is still recorded.
637	BACKUP Cannot write log	The VDR is unable to write log messages to the VDR data disk
638	BACKUP Record-data too big	The amount of data received by the VDR exceeds the capacity of the VDR data disk. The most probable cause is that the VDR is unable to compress the radar images due to noise or other errors, or that the VDR is configured to record images from multiple high resolution radars.
651	INTERNAL BACKUP Not recording	The VDR is unable to utilize the VDR data disk for extended backup. Another error explaining why (e.g. #652 INTERNAL BACKUP Cannot find) is normally displayed in advance. Try to fix the preceding error, otherwise reboot the system. If the error persists call for assistance.
652	INTERNAL BACKUP Cannot find	The VDR is unable to detect a VDR data disk or utilize the VDR data disk for extended backup. Check that the VDR data disk is connected correctly. If the error persists, call for assistance.
653	INTERNAL BACKUP Cannot access	The VDR has detected a VDR data disk but is unable to get access. The most likely cause is that the VDR data disk is not initialized (formatted) correctly. A certified service technician can fix this.
654	INTERNAL BACKUP WR errors level 1	Too many write-errors (writing to the VDR data disk) have occurred within a given interval. Retrying to write data fixed the problem. The most likely cause is communication problems. The VDR data disk is not taken out of service and data is still recorded.
655	INTERNAL BACKUP WR errors level 2	Too many write-errors (writing to the VDR data disk) have occurred within a given interval. More sophisticated measures than just retrying to write data were needed in order to fix the problem. The most likely cause is serious communication problems or a defective VDR data disk. The VDR data disk is not taken out of service and data is still recorded.
701	CAPSULE Not recording	The VDR is unable to record data to the fixed capsule. Another error explaining why (e.g. #702 CAPSULE Cannot find) is normally displayed in advance. Try to fix the preceding error. Otherwise reboot the system.
702	CAPSULE Cannot find	The VDR is unable to detect a fixed capsule. Check that the fixed capsule is connected correctly. If the error persists, the fixed capsule is probably defective.
703	CAPSULE Cannot access	The VDR has detected a fixed capsule but is unable to get access to the memory. If the error persists, the fixed capsule is probably defective.
704	CAPSULE, too many write errors	Too many write-errors (writing to the fixed capsule) have been detected by the DPU over a period of time. The most likely cause is communication problems. Check the cable from the DPU to the fixed capsule.
705	CAPSULE, too many	Too many write-errors (writing to the FRM memory) have been

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	write errors	detected by the fixed capsule over a period of time. The most likely cause is serious communication problems or a defective fixed capsule.
706	CAPSULE, too many read errors	Too many read-errors (reading back data from the fixed capsule) have been detected by the DAU over a period of time. The VDR was unable to write and verify data despite several attempts. The most likely cause is serious communication problems or a defective fixed capsule.
707	CAPSULE, too many read errors	Too many read-errors (reading back data from the fixed capsule) have been detected by the fixed capsule over a period of time. The VDR was unable to write data despite several attempts. The most likely cause is serious communication problems or a defective fixed capsule.
708	CAPSULE Verification failed	The VDR found too many data errors within a given interval when verifying the data written to the fixed capsule. The fixed capsule is probably defective.
709	CAPSULE Record too big	The amount of data collected for a 15-second period exceeds the maximum allowed size for the fixed capsule. This is typically caused by receipt of too much image data. Use the "Analysis of recorded data" utility on the BCP or in the configurator tool to determine the cause. If the problem relates to image data, carry out an OPT and check the recorded images.
710	CAPSULE Record-data too big	The amount of data received by the VDR exceeds the capacity of the fixed capsule. This is typically caused by receipt of too much image data. Use the "Analysis of recorded data" utility on the BCP or in the configurator tool to determine the cause. If the problem relates to image data, carry out an OPT and check the recorded images.
711	CAPSULE Wrong Attachment	The capsule is connected to the wrong port on the DPU. Connect the capsule to the port labelled CAPSULE
712	FLOAT-FREE Wrong Attachment	The float-free is connected to the wrong port on the DPU. Connect the float-free to the port labelled FLOAT FREE.
901-933	SYSTEM FAILURE ERROR 901-933	The software is not working properly. Restart the VDR and report this error if it is repeated.
970	SELF-TEST Memory test failed	The amount of RAM is insufficient to start the VDR. Restart the system. If the error persists, call for assistance.
972	SELF-TEST VGA failed to init.	Required Video (VGA) circuitry could not be initialized. Restart the system. If the error persists, call for assistance
980	BAU and DPU not compatible	The software in BAU is incompatible with the software in the DPU.
981	No communication to DPU	The BAU has never been able to communicate with the DPU. The most probable cause is a defective cable or that the VDR did not boot correctly.
982	No communication to DPU	Initial communication took place, but the communication has failed later. The most probable cause is that the VDR encountered a fatal error and completely stopped. Restart the system. If the error persists, call for assistance.
---	Time, VDR	No errors detected

7.2 Additional error codes for installations utilizing a SIU and 2nd RVI

400-423	SERIAL Timeout on SIxx	Mandatory serial data is not received. Check that the source is on. Check the signal from the source (serial monitor in VDR explorer, WEB status or VGA status display). If no signal is present, check the cable and make sure that the configuration is correct.
441	SERIAL module 2 Missing (SI08-12)	The serial data interface module on the SAP board in the DPU cannot be detected. If the error persists, the DPU is probably defective.
442	ANALOG module 1 Missing (AN00-15)	If only one module is affected: A module has been removed or has failed. Check that the module is installed correctly. If installed in a modular SIU the blue “link” LED for the module must be illuminated. If the LED is already illuminated switch the power to the SIU off and on. If the error persists replace the module. If all modules in a SIU are affected: Check the power to the SIU. Check the cable from the SIU to the DAU and link status; see section 4.1.7, Error! Reference source not found. and Error! Reference source not found. If no error is found, try to restart both the DAU and the SIU (power off and then on) If the error persists, the DPU or the Module rack/Uni rack is probably defective.
443	DIGITAL module 1 Missing (DI00-15)	
444	DIGITAL module 2 Missing (DI16-31)	
445	DIGITAL module 3 Missing (DI32-47)	
446	DIGITAL module 4 Missing (DI48-63)	
450-452	SIU xxxxxxxx Module in wrong slot	xxxxxxx = SERIAL, ANALOG, DIGITAL A module has been misplaced. Modules must be installed according to the VDR configuration.
460-462	SIU xxxxxxxx Wrong MR address	xxxxxxx = SERIAL, ANALOG, DIGITAL A SIU with the wrong Module Rack address has been detected. Set the MR/UR address to 0 or 1. See section Error! Reference source not found.
470-472	SIU xxxxxxxx Module duplicate	xxxxxxx = SERIAL, ANALOG, DIGITAL The VDR has detected two different modules with the same MR/UR address and slot number. This may occur if two SIUs are connected to the DAU, with the same address.
482	RVI VIDEO Module missing	VIDEO module 2 cannot be detected. The most probable cause is that the cable to the RVI from the DPU is disconnected or the RVI is defective. In addition, for an AC powered RVI: Power to the RVI is switched off, the internal Ethernet cable in the RVI is disconnected, or the video interface module is defective.
484	RVI VIDEO Wrong RVI address	An AC powered RVI with incorrect RVI address has been detected. The RVI address must be 0 or 1. All RVIs connected to the VDR must be setup in the VDR configuration.

500	ANALOG module 2 Missing (AN16-31)	If only one module is affected: A module has been removed or has failed. Check that the module is installed correctly. If installed in a modular SIU, the blue “link” LED for the module must be illuminated. If the LED is already illuminated switch the power to the SIU off and on. If the error persists replace the module. If all modules in the SIU are affected: Check the power to the SIU. Check the cable from the SIU to the DAU and link status; see section 4.1.7, Error! Reference source not found. and Error! Reference source not found. If no error is found, try to restart both the DAU and the SIU (power off and then on) If the error persists, the DPU or the Module rack/Uni rack is probably defective.
501	DIGITAL module 5 Missing (DI64-79)	
502	DIGITAL module 6 Missing (DI80-95)	
503	DIGITAL module 7 Missing (DI96-111)	
504	DIGITAL module 8 Missing (DI112-127)	
505	SERIAL module 3 Missing (SI16-23)	
506	SERIAL module 4 Missing (SI24-31)	

8 Service and maintenance

The S-VDR requires an annual performance test carried out by a certified service organization. Please refer to “Installation Manual for DM100 S-VDR” for further details.

8.1 Verification of the S-VDR functionality following service on any sensor

It is a requirement of the S-VDR standard that the functionality of the S-VDR is verified followed service on any sensor (e.g. the GPS) connected to the S-VDR.

The bridge alarm panel will display obvious errors if, for example the signal from a sensor sending NMEA sentences is missing completely. However, it is required that recorded data is retrieved and checked to a certain extent. A tool for doing that is stored on the S-VDR and may be downloaded via a web browser to the PC.

The following steps are necessary:

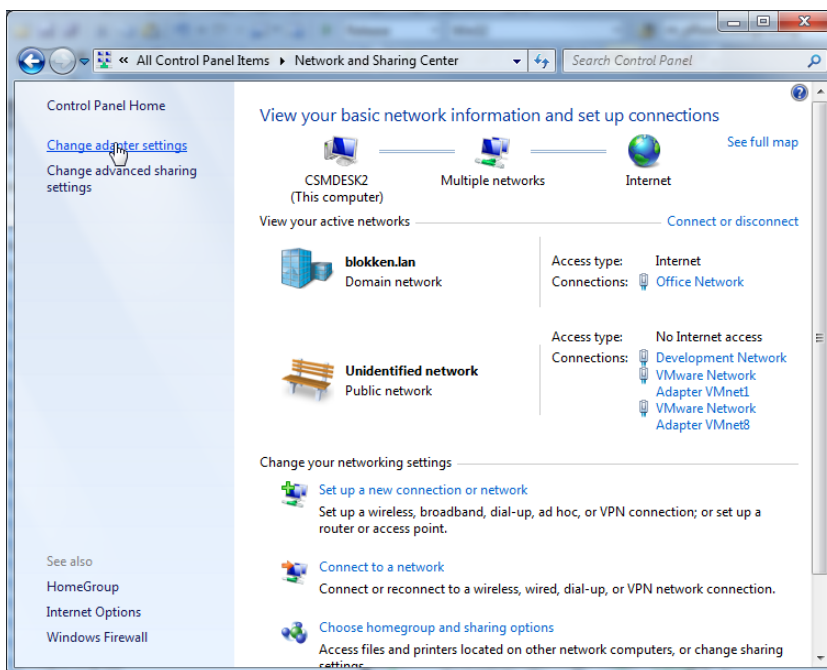
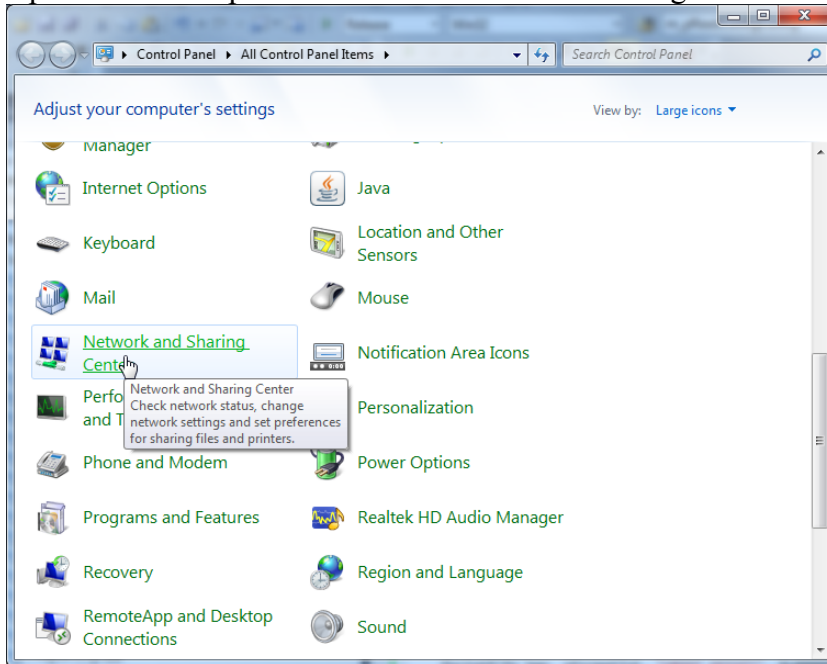
- Setting the IP address of the PC to match the S-VDR
- Connecting the PC to the S-VDR
- Running the VDR Verifier program
- Examination of the report

8.2 Setting the IP address of the PC, windows 7

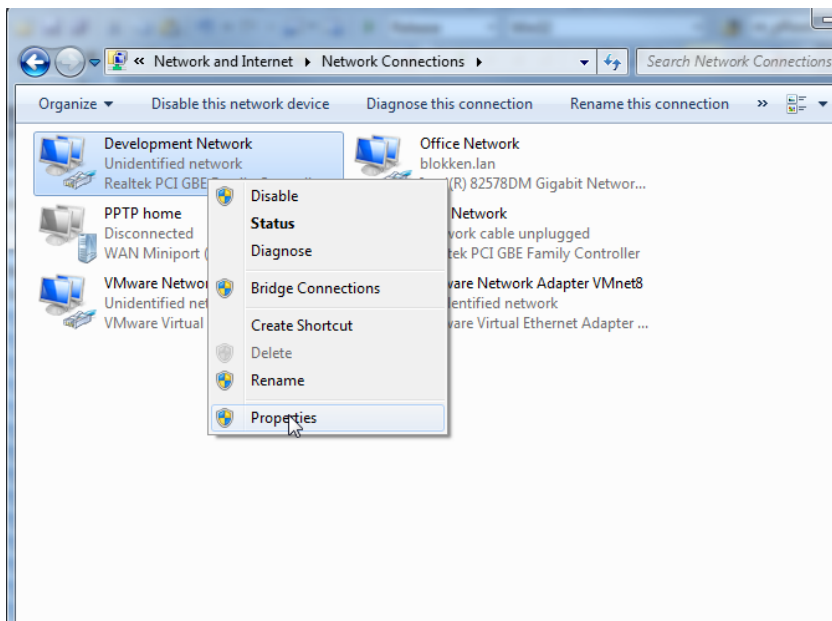
The default IP address of the S-VDR is 10.0.0.100 (255.255.255.0). The PC must use an IP address within the same range.

Note: The operator may have changed the IP address for the S-VDR. This must be documented on label inside the door of the main unit (DAU).

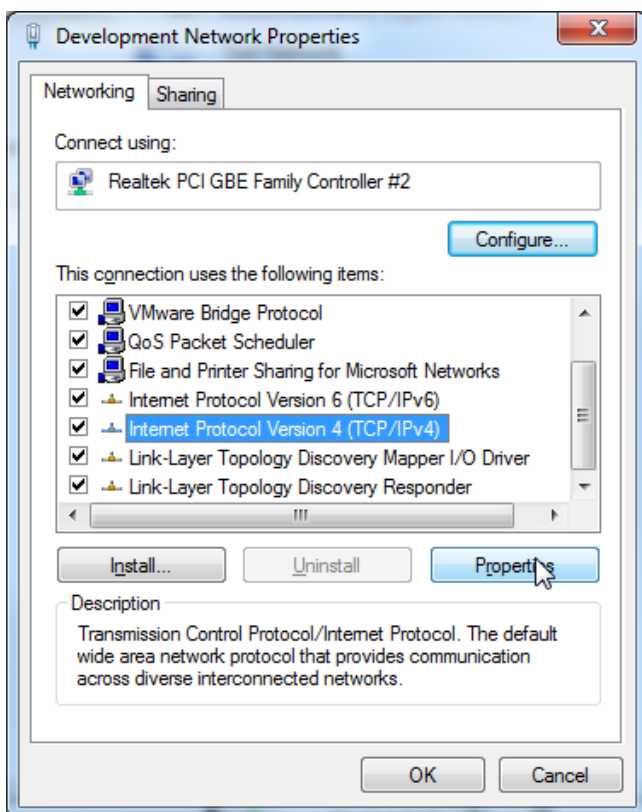
Open the control panel for the “Network and Sharing Center”



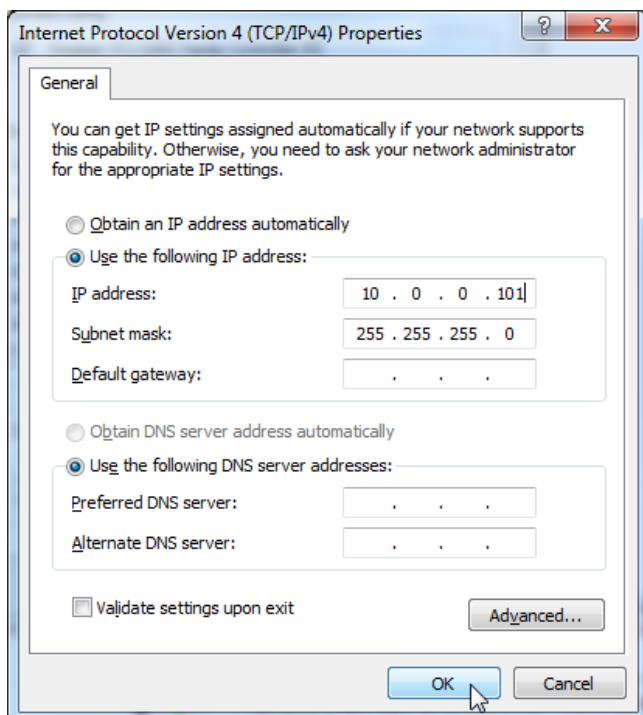
Click on “Change adaptor settings”.



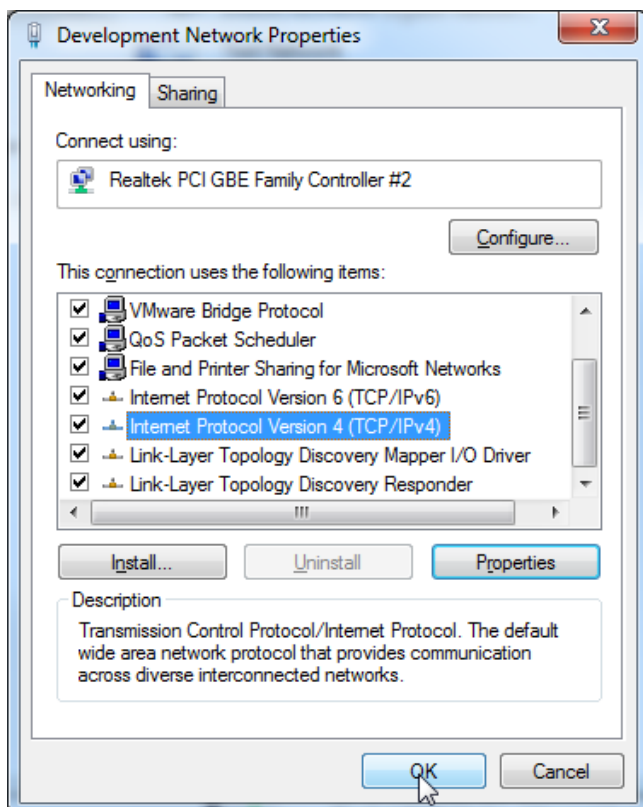
Right click on the icon representing your Ethernet adaptor and select “Properties” from the drop down menu.



Open the “Properties” for “Internet Protocol 4”.



Set the new IP address for the PC and click on “OK” (It is a good idea to write down the previous settings).

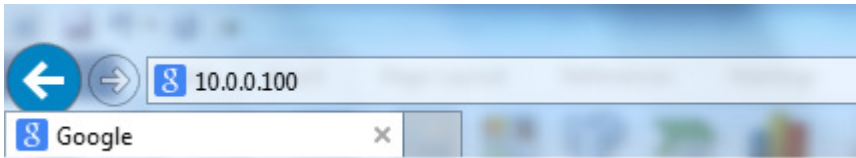


Click on “OK”

8.3 Connecting the PC to the S-VDR

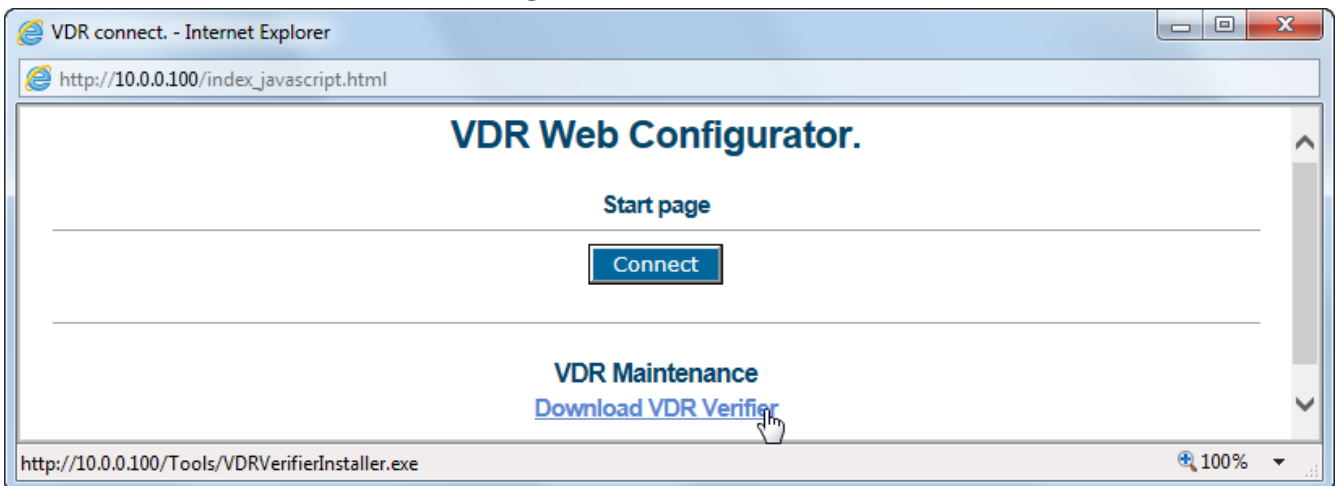
Connect the PC to the S-VDR using a standard CAT5 patch cable.

Open an Internet browser on the PC

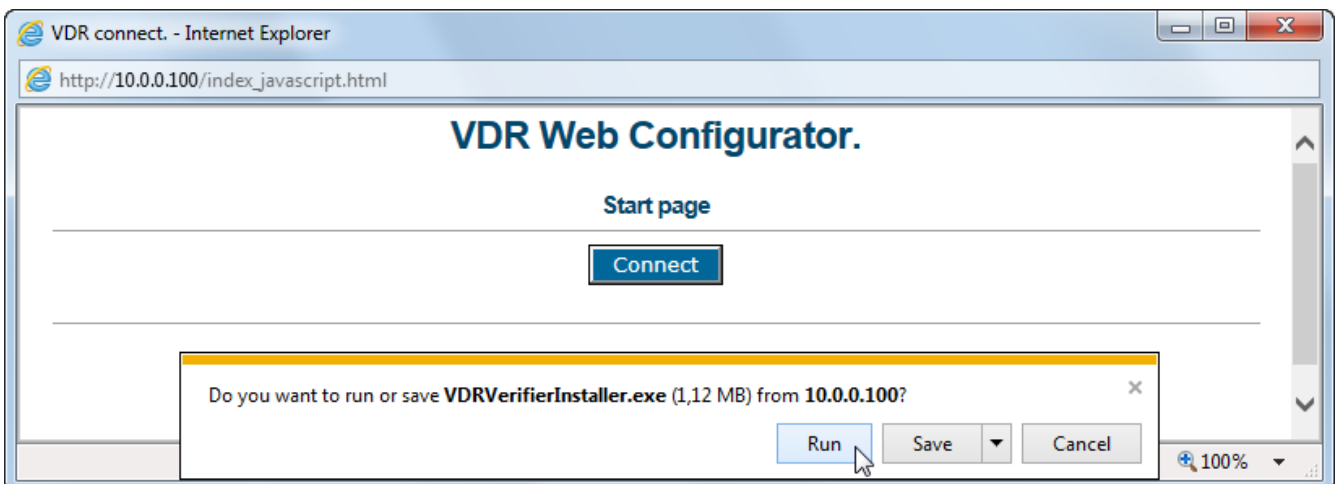


Type in the IP address of the S-VDR in the browser address field. The IP address of the S-VDR is 10.0.0.100 (default).

8.3.1 Run the VDR Verifier program



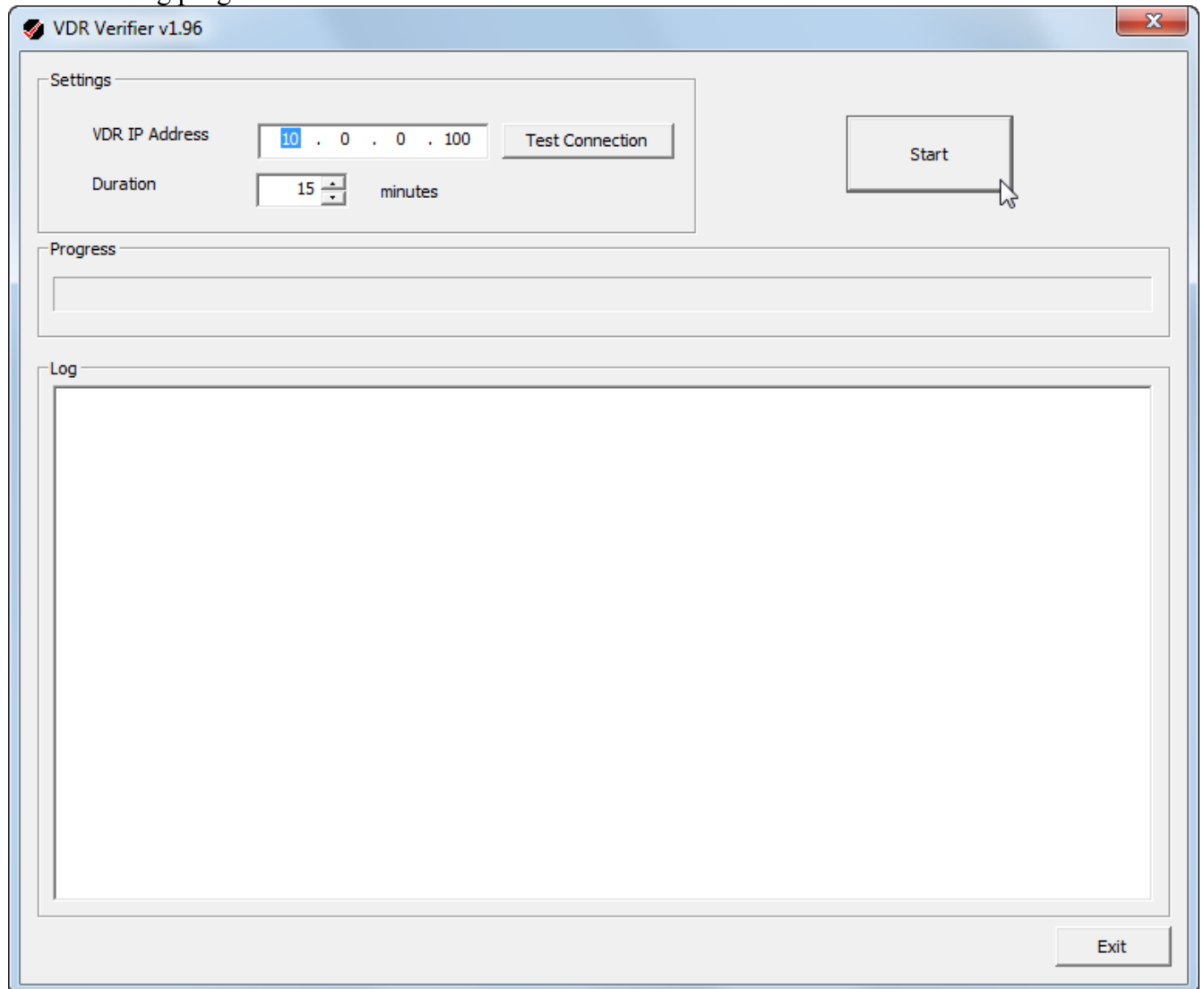
Click on the “Download VDR Verifier” link.



Click “Run” to start the program.

Windows will probably display a security warning.
Click “Yes” to start the program.

The following program will start:

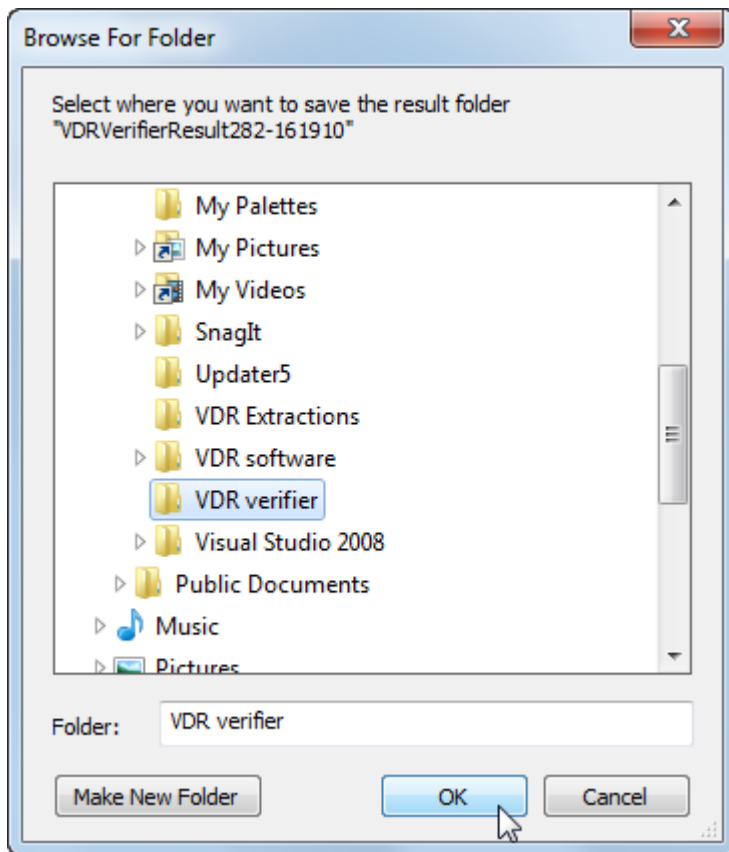


If necessary, change the IP address. The default IP address is set to the default at program start.
Pressing “Test” will verify that a connection can be made to S-VDR.

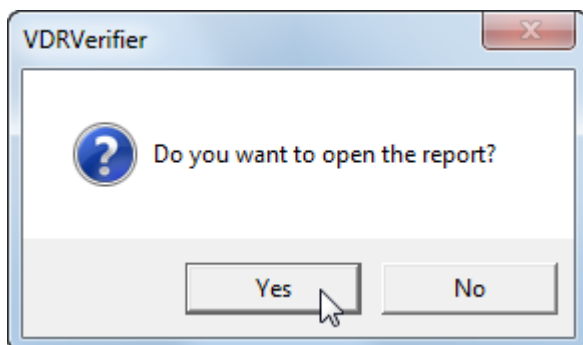
Select the duration of the recording to be verified. Duration can be set from 15min to 720min.
Please notice that duration is limited to the time since the last restart of the S-VDR and that only the radar images recorded to capsule will be checked. The best result is obtained if the data to be verified was recorded during a voyage.

Verification of 15 minutes of recording takes approximately 3min.

Click “Start” to begin the verification process.



Select a folder for the report and data files.
Wait for the verification to finish.



Press "Yes" to open report in a web-browser.

8.3.2 Examination of the report

The following tests have been made. The report starts with a summary.

(S)VDR Verification	
VDR Verifier Version	: 1.49
Data Time Start	: 09:42:55.5
Data Time End	: 09:57:55.5
Verification Duration	: 00:15:00
Verification Date	: 10:03:03 24/06/2011
SVDR Information:	
System Version	: 3.10.00
System Model	: DM200/DM300
Type approval ref.	: BSH
Vessel Information:	
IMO Vessel Id	: M/S TEST
IMO Vessel No	: UNDEFINED
MMSI Vessel No	: UNDEFINED
Vessel Flag	: UNDEFINED
Approval Of Auth	: UNDEFINED
(S)VDR Unit : _____	

VERIFICATION OVERVIEW	RESULT

Pretest - Microphone	PASSED
Analog	PASSED
Digital	PASSED
Audio	(SEE NOTES) WARNINGS
Serial	(SEE NOTES) ERRORS
Video	PASSED
Power	PASSED
Alarms	PASSED

VERIFICATION RESULT	FAILED

8.3.2.1 Verification of microphone functionality

The self-test in the microphones is activated and the result is printed in the report – either passed or failed

Microphone Test:

```
BMU 1A is enabled and did pass the test (level=315)
BMU 1B is disabled
BMU 2A is disabled
BMU 2B is disabled
BMU 3A is disabled
BMU 3A is disabled
AUD 4 is disabled
BMU 5A is disabled
BMU 5B is disabled
BMU 5C is disabled
BMU 5D is disabled
```

8.3.2.2 Verification of analog data

The data on each enabled input is analyzed and the result is printed in the report

Analog:

```
Warning : AN00 - Engine : Value has changed zero times, the value was -
0.65 RPM (time 07:37:06 12/08/2010)
Passed : AN01 - Rudder angle : Value has changed 2 times, Minimum value was -
0.16 Deg (time 07:37:07 12/08/2010), Maximum value was 19.07 Deg (time 07:44:15 12/08/2010)
```

Failed: The input is not calibrated

Warning: The input was steady – the current value is printed and must be checked – e.g. if vessel at harbor SOG should be close to 0

Passed: The input has changed during the verification – the maximum and minimum value is printed and must be checked.

8.3.2.3 Verification of digital data

The data on each enabled input is analyzed and the result is printed in the report.

Digital:

```
Warning : DC00 - Firedoor #1 : OPEN/CLOSED has changed 0 times, last value was CLOSED
Passed : DC01 - Firedoor #2 : OPEN/CLOSED has changed 2 times, last value was CLOSED
```

Warning: The input was steady – the current value is printed and must be checked.

Passed: The input changed during the verification – the current value is printed and must be checked.

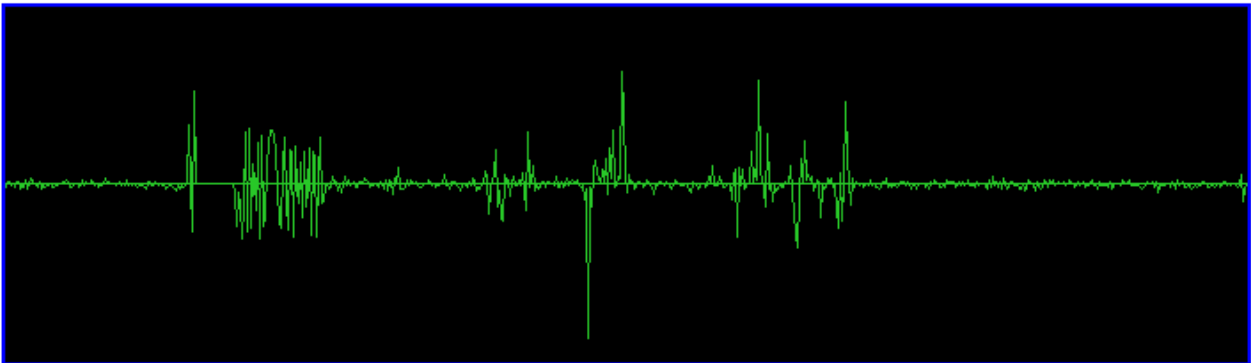
8.3.2.4 Verification of data on the audio tracks

It is recommended that someone speaks on the bridge for the first 100 seconds after the verification program is started – i.e. during the microphone test and until download of data starts. If possible also use the VHF radio.

Audio:

```
Passed : BMU 1A/BMU 1B - Bridge Center/Bridge Stbd : Audio level OK
Warning : VHF 1 - Primary VHF channel : No audio detected or audio level very low
Warning : AUD 4 - (AUD 4) : No audio detected or audio level very low
```

The last 60 seconds of audio



AUDIO CH0 20110624 123040.wav

Passed: The level of recorded audio was normal.

Warning: The level of the recoded audio was very low.

The last 60 seconds of audio from each track* is stored and must be checked before a conclusion is made. A graphical representation of data from each track is shown as additional information.

* Data for tracks with no active microphones which are not configured to record VHF radio communication is omitted.

8.3.2.5 Verification of serial data

The data on each enabled input is analyzed and the result is printed in the report i.e. the list of NMEA formatters defined in the S-VDR configuration is compared with what was received.

Serial:

```
Passed : SI02 - GPS :          Detected NMEA formatters : GPDTM, GPGBA, GPZDA, GPGLL
Error  : SI03 - Speed log :    The following NMEA formatters has not been detected : VBW
```

Error: The received data did not contain the NMEA formatters defined in the S-VDR configuration or list of defined NMEA formatters was empty. Other kind of errors may be displayed e.g. detection of CRC errors.

Passed: The received data contained the NMEA formatters defined in the S-VDR configuration

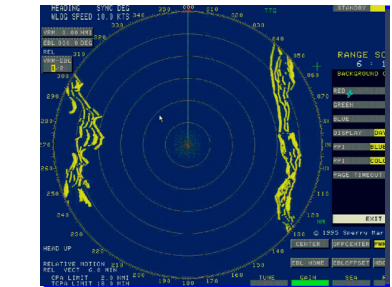
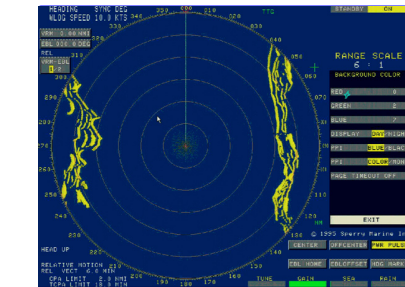
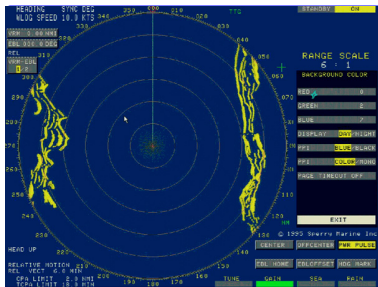
8.3.2.6 Verification of video data

It is recommended that the radar(s) is/are switched on before and after the verification tool is started.

Video:

Passed : VD01 - (VD01) : Images are OK

The last 60 seconds of images



Passed: The image contains information.

Error: The image contains little or no information.

The last four images from each active input are saved and must be checked before a conclusion is made.

8.3.2.7 Verification of power sources

The presence of AC mains, the battery and optional DC is checked

8.3.2.8 Verification of alarm status

A list of S-VDR alarms which were present while the data was recorded will be displayed.

8.4 List of most common spare parts

P/N	Description
1000720	Bridge Alarm unit, BAU
1302646	Bridge Microphone Unit (indoor) BMU 003
1302647	Bridge Microphone Unit (outdoor) BMU 004
1302369	DM100 S-VDR DPU, DPU 100-01S
1302358	RVI with PoE (for DM100) 2 x 5 x BNC
1302365	RVI with PoE (for DM100) 2 x DVI-I
1302373	Fixed capsule, MK4
1302958	Float-free capsule MK1
2302786	Battery pack and fans(2) for DM100
2302144	USB backup drive for DM100 S-VDR
2302807	Ethernet Interface for Capsule MK4
3000671	Beacon replacement kit
3302519	50m zero halogen FTP CAT5 cable from DPU to MK4 fixed capsule or float-free capsule
7302530	Boot flash for DM100 S-VDR
9302533	Set of manuals for the DM100 S-VDR (Hardcopy and CD)

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