

Installation Manual

For DM100 VDR and DM100 S-VDR G2

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1 Scope and purpose

Installation Manual for DM100 VDR and DM100 S-VDR G2.

The DM100 VDR complies with IEC 61996-1 Ed.2.0 which applies to VDRs installed after 1st of July 2014.

The DM100 S-VDR G2 complies with IEC 61996-2 Ed.2.0, however with changes required by IEC 62288 Ed.2.0 and IEC 61162-450 Ed.1.0 incl. Am. 1.

1.1 References

- DBS10704 Installation Manual for DM100/DM400 VDR compact Sensor Interface Unit
- DBS10919 Installation manual for Remote Video Interface RVI 02-004(D) for DM100
- DBS11010 Inspector's and Authorities' Manual for DM100 VDR and DM100 S-VDR G2
- DBS11011 Operators Manual for the DM100 VDR and DM100 S-VDR G2
- MAN12405 Installation guide for AC power kit for RVI
- DBS00327 Installation Manual for DM100/DM400 modular Sensor Interface Unit

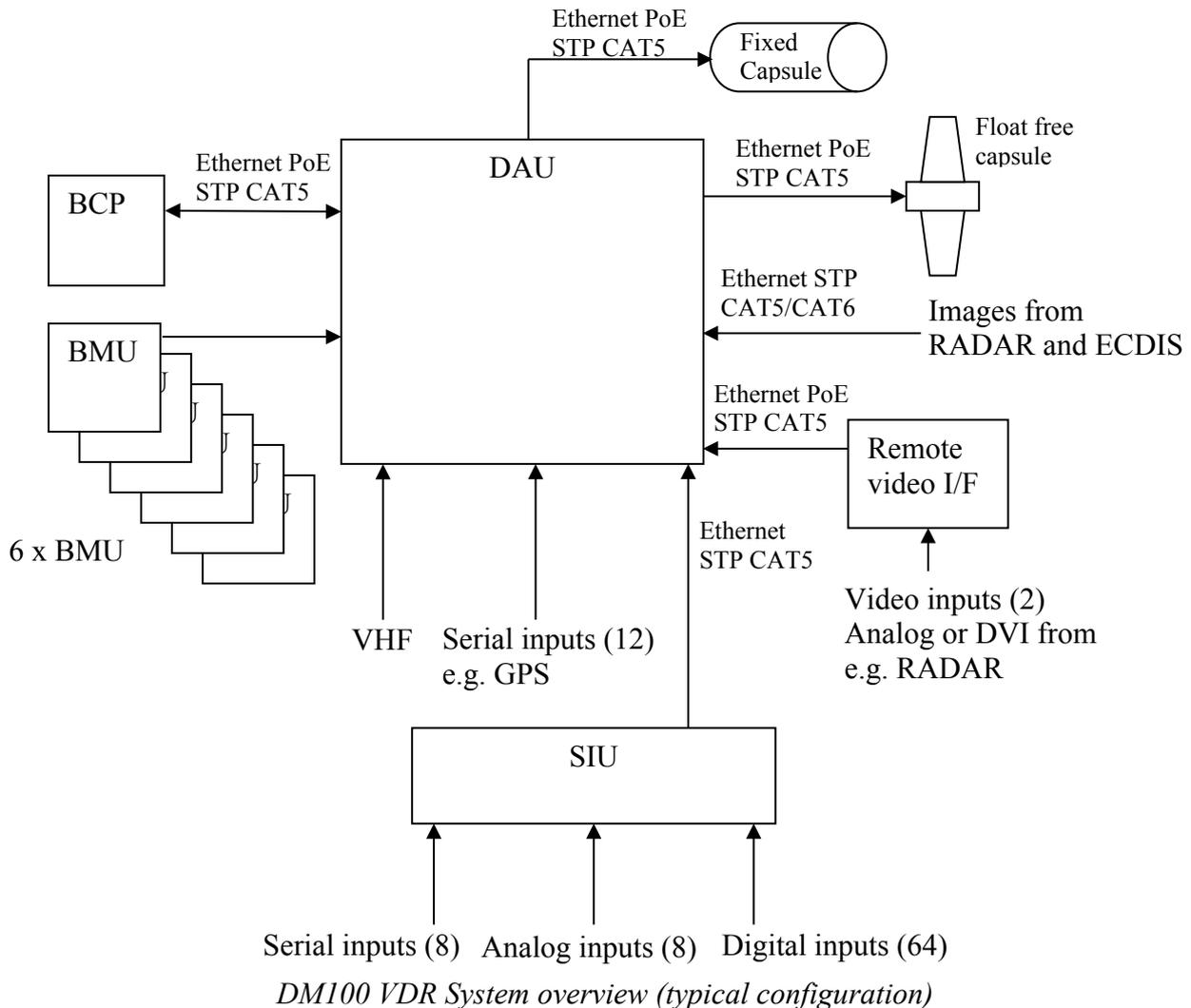
1.2 Terms and Abbreviations

BCP	Bridge Control Panel
BMU	Bridge Microphone Unit
DAU	Data Acquisition Unit
DPU	Data Processing Unit (located inside the DAU)
IAS	Integrated Alarm System
OPT	Operational Performance Test (self-test according to IEC 61996-1 Ed.2.0)
SIU	Sensor Interface Unit
RAI	Remote Audio Interface
RVI	Remote Video Interface

1.3 Nomenclature

The term “VDR” will be used a generic term which covers both the DM100 VDR and DM100 S-VDR G2. When required, the full product names “DM100 VDR” and “DM100 S-VDR G2” will be used to distinguish between the products.

2 System overview for DM100 VDR



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 VDR Bridge Control Panel (BCP)

The BCP must be installed on the bridge either in a console or mounted on a bulkhead. The BCP is the interface for the VDR Operation Performance Test, which must be executed regularly. Further, VDR system alerts will be shown here as cautions (steady yellow light).

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 Capsule

The fixed 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 capsule

The float-free capsule is an additional data capsule which is required according to IEC 61996-1 Ed.2.0. It must be installed in the same way as an EPIRP.

2.1.6 Remote video interface (RVI)

The RVI is optional equipment. An RVI may be used for capture video from e.g. a RADAR which is unable to send images to the VDR using Ethernet; i.e. typically older equipment.

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 in length.

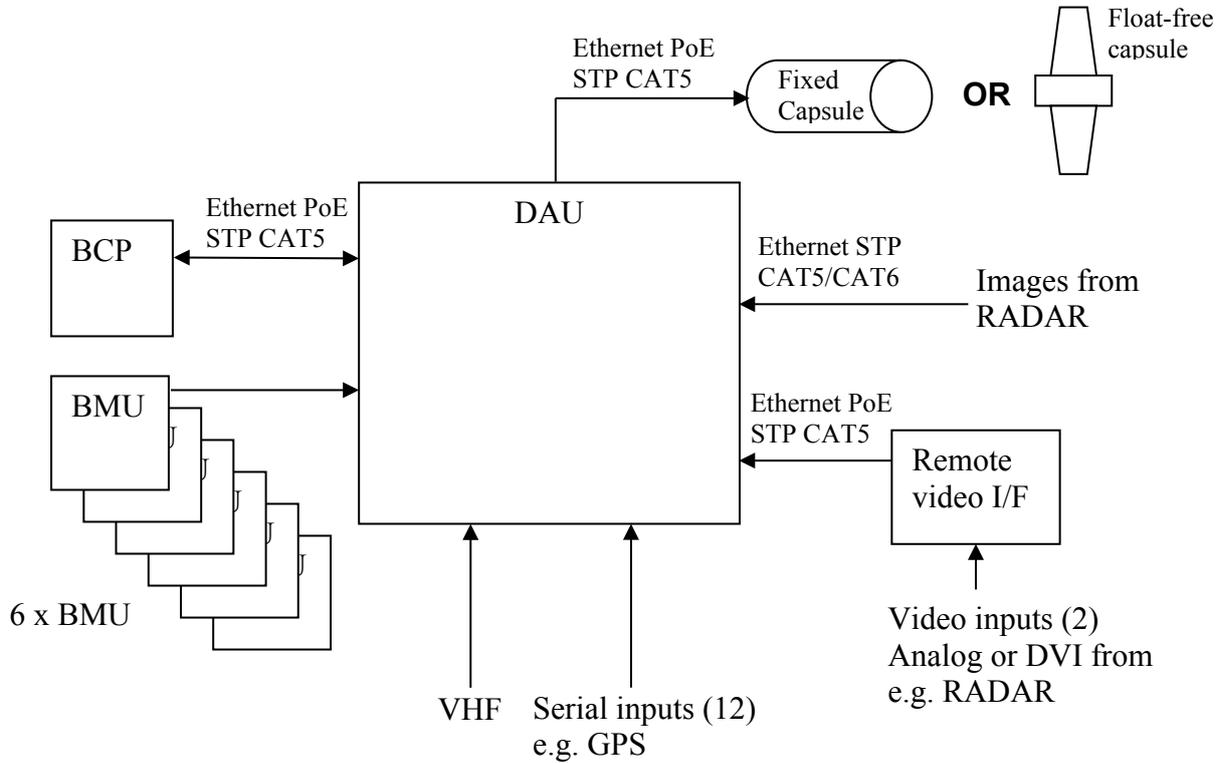
2.1.7 Sensor Interface Unit (SIU)

The SIU is optional equipment. An SIU is needed if for example door status cannot be provided using a serial or Ethernet interface on the VDR.

A standard non-modular compact SIU has 8 serial interfaces, 8 analog interfaces and 64 digital interfaces. A modular SIU also exists which can be configured to have other combinations of interfaces. The SIU must be installed indoors. It must be connected to the DAU with a cable up to 100m long.

2.2 System overview for DM100 S-VDR G2

The requirements for which data types an S-VDR must record are reduced compared to a VDR. The typical S-VDR installation is therefore simpler.



DM100 S-VDR G2 System overview (typical configuration)

2.3 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 a DM100 VDR and DM100 S-VDR G2 is listed below:

Type of input	Maximum configuration
Ethernet interfaces*	7 on DAU
Serial inputs	36 (12 on DAU + 3 modules)
Analog inputs	32 (2 modules)
Digital inputs	128 (8 modules)
Audio inputs	18 (10 on DAU + 8 on RAI)
Video inputs	8

* For configuration of the VDR, acquiring network data and acquiring image data.

3 Installation

The installation must be carefully planned and will depend on the vessel. It is highly recommended that the standard configuration described in section 4.1 and “Appendix B Installation plan for typical DM100 VDR configuration” or “Appendix D Installation plan for typical DM100 S-VDR G2 configuration” is used as a starting point.

3.1 Installation kit

An installation kit p/n 2302718 is supplied with the unit. It contains the following parts:

Item	Part number	Description	QTY	Usage
1	3000558-10	Wire holder 9.5x30	21	For holding the cables to the cable support bar
2	4001314-10	M4x16 screw Pan head PZD stainless steel A4	34	For use in conjunction with Item 1
3	4001318-10	M4x30 screw Pan head PZD stainless steel A4	14	For use in conjunction with Item 1
4	4000488-10	Angled IEC power plug	1	For connecting AC power to the power supply in the DAU
5	3300059-12	Holder for IEC plug,	1	Mount this over the IEC power connector for added support.
6	4001294-10	M3x8 screw Pan head PZD stainless steel A4	4	For use in conjunction with item 5 (2 spares are included)
7	4302357-10	Wago 3 way female connector 3.81mm	1	For IAS
8	4302228-10	Wago 4 way female connector 3.81mm	1	For the serial interfaces SI11 and SO11
9	4301334-10	Wago 8 way female connector 3.81mm	2	AUDIO3 and for the cable to the BCP at the BCP
10	4301821-10	Wago 10 way female connector 3.81mm	1	For cable to BCP cable at the DAU
11	4301061-10	Wago 12 way female connector 3.81mm	1	Serial interfaces SI01-SI03 (IEC 61162-2)
12	4301062-10	Wago 16 way female connector 3.81mm	1	AUDIO1
13	4302128-10	Wago 14 way female connector 3.81mm	2	AUDIO2 and Serial interfaces SI04-SI10 (IEC 61162-1)
14	4300986-10	Push button for 3.5mm and 3.81mm Wago connectors	2	Tool for opening the wire clamps inside the Wago connectors
15	4302619-10	Wago key tool 236-332 (for 236-404)	2	Tool for opening the wire clamps on the terminal block on the microphones
16	5304937-10	Black permanent marker	1	Permanent marker for marking system type on type approval label

3.2 Installation of DAU

3.2.1 System Identification on type approval label

The DAU may be used for both a VDR and S-VDR. The type approval label inside the DAU must be updated accordingly using a black permanent marker.



3.2.2 DAU for bulkhead mounting

The DAU must be installed on a bulkhead which can easily carry the weight of the DAU. The DAU must be protected from rain, seawater and direct sunlight. Consult Appendix F Installation of DAU.

The weight of the DM100 DAU is 11Kg / 25lbs

3.2.3 DAU for installation in 19" rack systems

The DAU must be installed in a 19" rack which can easily carry the weight of the DAU. It is recommended that the horizontal supports supplied with the DAU are used to reinforce the rack system. The supports must be mounted under the DAU so that when properly mounted, the DAU rests on the supports. The standard supports are telescopic and can be used for rack system with a depth up to 400mm. Longer supports are available on request, contact Danelec Support.

The DAU including the supports requires 7U.

The rack system must be large, ventilated or cooled. The normal operating temperature inside the rack system must be below 40C.

The weight of the DM100 DAU including the horizontal supports is 14Kg / 29lbs

3.2.4 Earth stud

The earth stud located inside the DAU (right front corner) must be connected to ship's earth. The diameter of the earth stud is 6mm. The earth strap must be fitted with an M6 ring crimp terminal. Wire dimension minimum AWG 15 or 1.5mm².

3.2.4.1 Power requirements

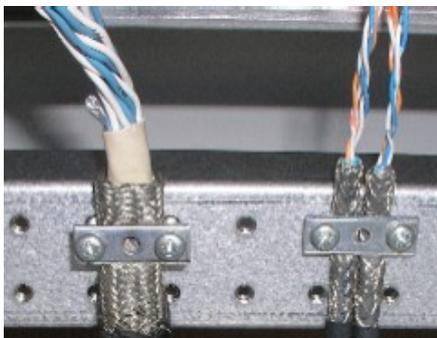
The power supply must be connected to the ship's main power source (110-230AC). The AC power must be backed up by the vessel's emergency power (automatically switch over).

The cables must be as short as possible and have a conductor area of 0.75mm² minimum for the AC input. The angled IEC mains connector supplied with the DAU must be used for the AC input.

The power consumption for the DAU is 75W.

3.3 Grounding of data cables

All data cables must be shielded with a braid screen.

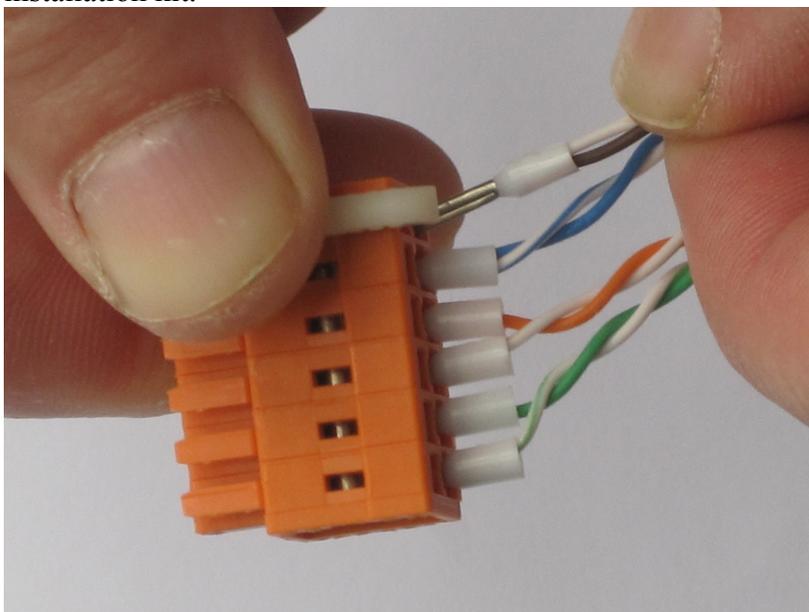


Grounding of data cables

The braid screen, for cables terminated with a Wago terminal block, must be connected to the cable support beam as shown above. This includes cables to the audio module, serial module, BCP, RVI and IAS.

3.4 Tool for opening the wire clamps inside the Wago connectors

The wire clamps in the Wago connectors can be easily opened with a small tool included in the installation kit.



Wago push button

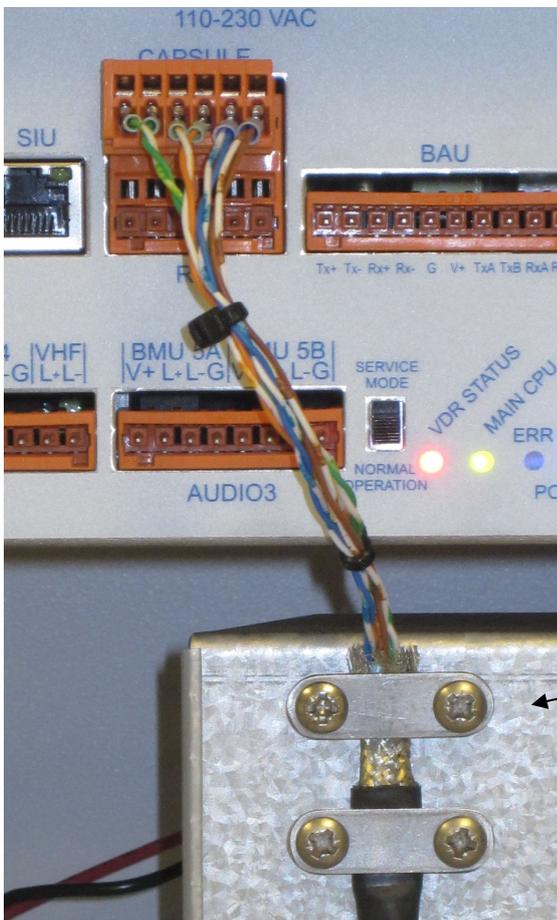
3.5 Fixed data capsule

The fixed data capsule (“the orange box”) must be installed on an external deck close to the vessel’s centerline; typically on the external deck above the bridge. Consult Appendix G Installation of fixed capsule for details.

The weight of the MK4 capsule including the cradle is 8Kg / 17lbs

The capsule is supplied with 50 meters of zero halogen STP cable. The cable may be shortened if it is too long. The cable must be terminated with ferules and a 6-way Wago terminal block.

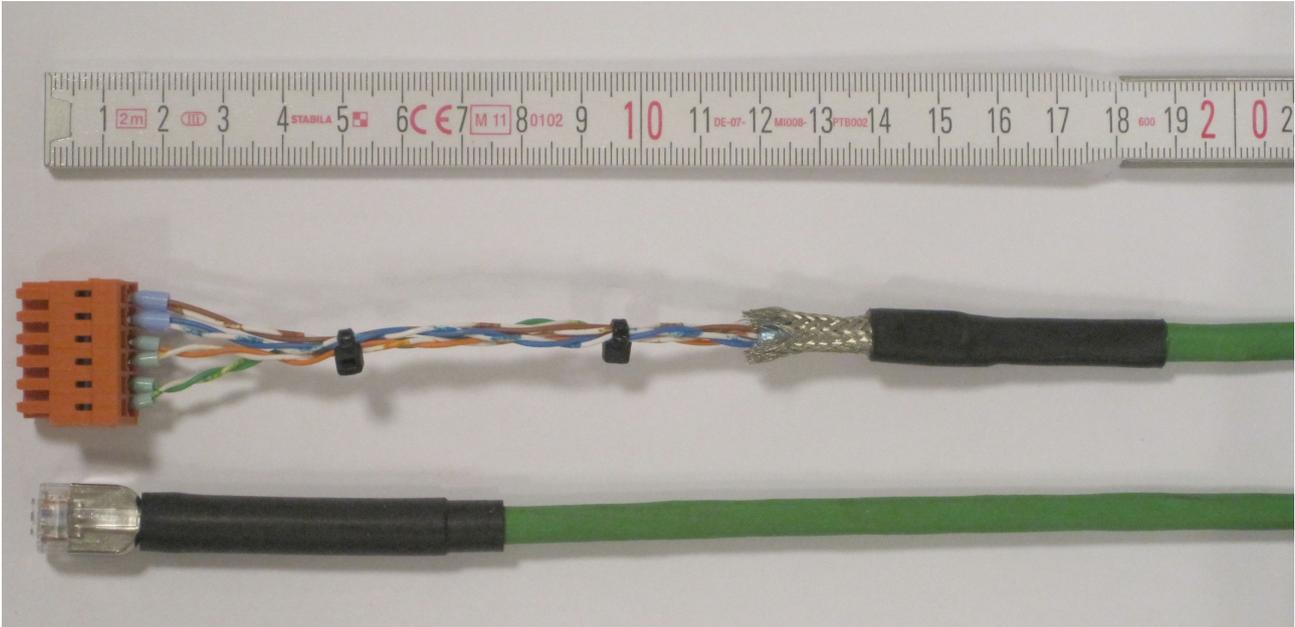
3.5.1 Installation of the cable at the DAU



The cable shield must be clamped to the bar holding the cables.

Do not overtighten the screws – the threaded inserts are self-locking and will prevent the screws from becoming loose.

3.5.2 Description of Cable from DPU to MK4 capsule



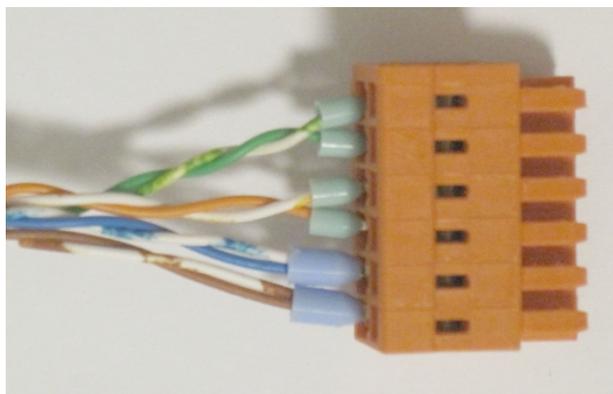
Picture showing the factory supplied cable

If the cable is shortened, pull the cable shield and drain wire back over the jacket and fix it with tape.



Picture showing how to make the cable on board if shortened

Pin 1	Green/white
Pin 2	Green
Pin 3	Orange/white
Pin 4	Orange
Pin 5	Blue and blue/white
Pin 6	Brown and brown/white



Cable termination at the DAU

3.6 Float-free data capsule

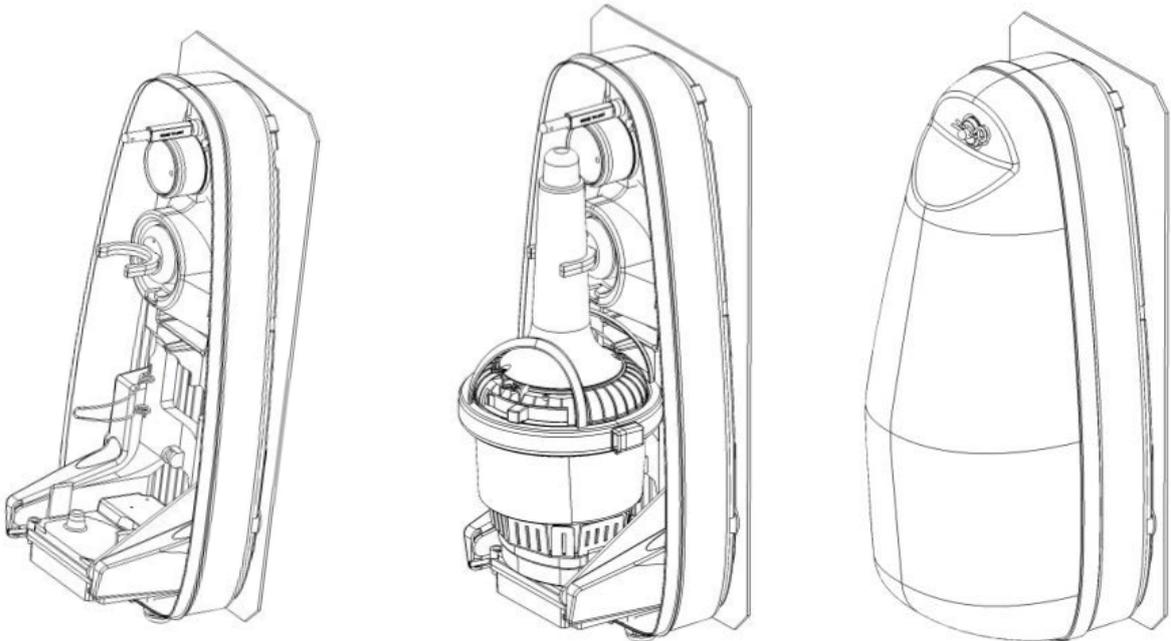
The float-free data capsule must be installed on a bulkhead outside where obstacles will not prevent the capsule floating away from the vessel.

The float-free capsule should be installed in a location guided by COMSAR.Circ 32 (Chap 4.10)
http://www.imo.org/blast/blastDataHelper.asp?data_id=10750&filename=32.pdf

The cable used from the DPU to junction box for the float-free is identical to the cable used for the fixed capsule see section 3.5.1 and 3.5.2. The Wago 6-way must be connected to the “FLOAT FREE” receptor on the DPU.

Consult Appendix H Installation of float-free capsule for more details.

3.6.1 How to fit the capsule into the FB40 bracket



Make sure the FB-40 bracket is mounted correctly on the rail and/or the ship-wall.

Take the Tron 40 VDR Float-Free Capsule and match the lower part correctly on the dock-module and carefully press/lay the unit securely into the stability-bracket. Mount the top-cover correctly by fitting the lower-end first and then making sure the HRU (Hydro Static Release)-bolt is secured by the spacer and splint-pin. Apply silicon grease as directed by Jotron in the area utilized for the wireless transmission of data in order to prevent salt deposits from disrupting the data transmission.

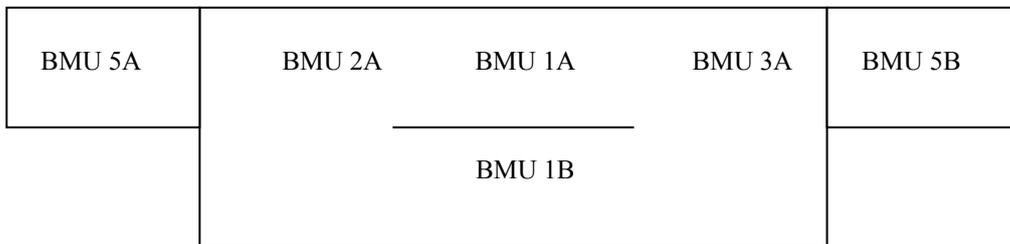
3.7 BMUs

For installation details consult Appendix I Installation of BMU

The VDR records on 6 (optionally 10*) independent audio tracks:

* requires a remote audio interface (RAI).

Microphone		Recommended standard configuration ^{Note 1}
BMU 1A	Track 1	Bridge Center
BMU 1B	Track 1	Chart table
BMU 2A	Track 2	Bridge Port
BMU 2B	Track 2	Bridge Port ^{Note 2}
BMU 3A	Track 3	Bridge Stbd
BMU 3B	Track 3	Bridge Stbd ^{Note 2}
VHF 1	Track 4	Primary VHF channel
AUD 4	Track 5	Additional BMU or communication e.g. VHF
BMU 5A	Track 6	Port bridge wing
BMU 5B	Track 6	Stbd bridge wing
AUD6 – AUD9 (Requires an remote audio interface RAI)	Track 7 – Track 10	Additional BMUs or communication e.g. VHF



Recommended location of BMUs on the bridge

Note 1: BMUs must be positioned close to specific key areas (i.e. conning, main radar, comms), and should be generally positioned as described here. One BMU will typically cover a radius of three meters. Indoor and outdoor microphones must not be mixed together.

Note 2: Additional microphones might be needed on a wide bridge.

3.7.1.1 Cables for BMU

A cable with two pairs and common braid screen is required for each BMU. Use one pair for the signal and one pair for the power/GND (6V electronically limited to 20mA). Minimum wire dimension is AWG26 for cables up to 50 meters and AWG24 for cables up to 100 meters.

3.7.2 VHF1

The sensitivity for the VHF1 input is 0.775V RMS. The primary VHF radio must be connected to this input. A cable with only one pair and common braid screen is needed. Minimum wire dimension is AWG26 for cables up to 50 meters and AWG24 for cables up to 100 meters.

3.7.3 AUD4

An additional microphone may be connected to this input. This channel may also be used for recording other relevant optional communication. The primary VHF radio must not be connected to AUD4.

The sensitivity of AUD4 is 0.775V RMS. V+ and G shall only be used when a BMU is connected to AUD4. Minimum wire dimension is AWG26 for cables up to 50 meters and AWG24 for cables up to 100 meters.

3.7.3.1 Filter characteristic for AUD4

The “BMU 4 active” parameter (see section 4.9) determines the filter characteristic. It also determines whether AUD4 is applicable for a BMU or a VHF set.

	Frequency response	Use input for
Parameter “BMU 4 Active” checked	150-6000Hz	BMU
Parameter “BMU 4 Active” unchecked	150-3500Hz	VHF or other communication equipment

3.7.4 AUD6 – AUD9

An additional remote audio interface may be connected to the DPU. This will add four more audio inputs to the system. The properties for these inputs are identical to the properties for AUD4 described in section 3.7.3.

3.8 BCP

The VDR Bridge Control Panel must be connected to the DAU using a screened cable with 4 pairs. A standard STP CAT5 cable (with 4 pairs) is suitable. Minimum wire dimension is AWG26 for cables up to 25 meters and AWG24 for cables up to 50 meters.

The BCP requires a 121x121mm panel cutout. The size is 144x144mm and requires 100mm behind the panel. See also Appendix J Installation of BCP.

3.9 Serial data

It is highly recommended that the following guidelines are followed where possible.

Serial interfaces on the DAU

	I/F type (note 1)	Recommended use (fits standard configuration)
SI00	IEC 61162-2	AIS
SI01	IEC 61162-2	Auto Pilot
SI02	IEC 61162-2	Engine management system
SI03	IEC 61162-2	Spare
SI04	IEC 61162-1	GPS
SI05	IEC 61162-1	Speed log
SI06	IEC 61162-1	Gyro
SI07	IEC 61162-1	Anemometer
SI08	IEC 61162-1	Echo sounder
SI09	IEC 61162-1	BNWAS
SI10	IEC 61162-1	Inclinometer
SI11	IEC 61162-1 (RX)	Bridge Alert Management
SO11	IEC 61162-1 (TX)	Bridge Alert Management

Note 1: Max baud rate for the IEC 61162-1 interfaces is 9600 and max baud rate for the IEC 61162-2 interfaces is 38400.

When planning the allocation of the serial channels the following rules must be observed:

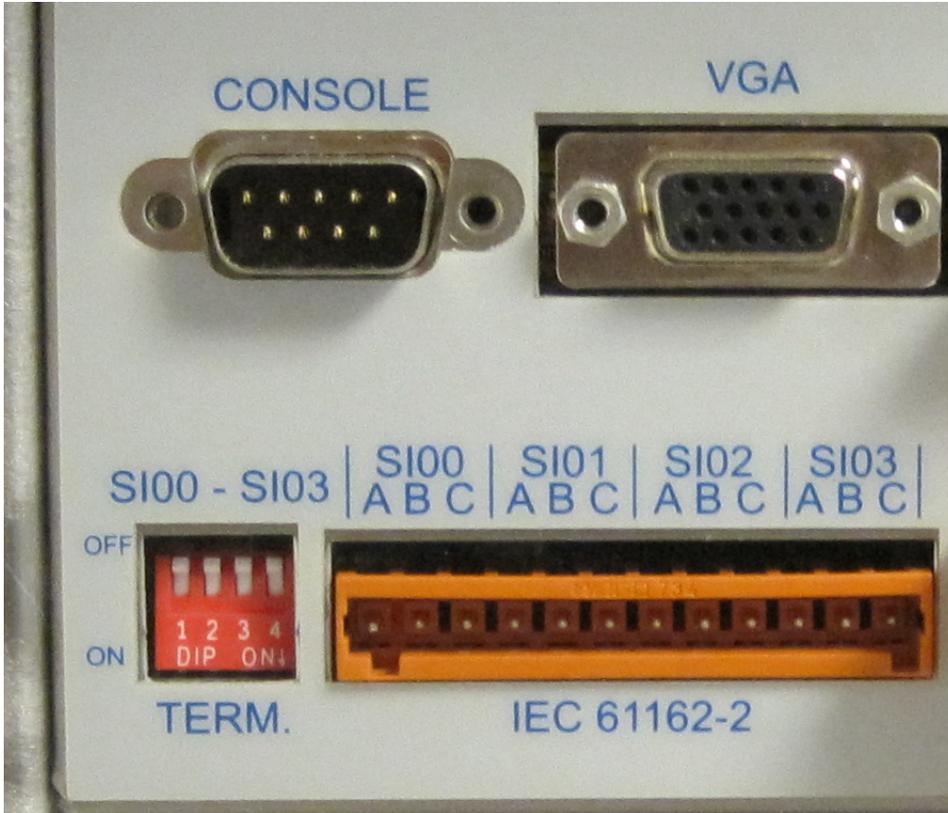
	For DM100 VDR
Date and time	Must be recorded
Ship position	Must be recorded
Speed	Must be recorded
Heading	Must be recorded
Bridge audio	Must be recorded
Communication audio	Must be recorded
Radar images	Must be recorded
ECDIS	Must be recorded
Echo sounder	Must be recorded
Main alarms	Must be recorded
BNWAS 1 st stage alarm (main alarm)	Must be recorded
Engine order and response	Must be recorded
Rudder order and response	Must be recorded
Hull openings status	Must be recorded
Watertight and fire doors	Must be recorded
Acceleration and hull stresses	Must be recorded if equipment is installed
Wind speed and direction	Must be recorded if equipment is installed
Inclinometer	Must be recorded if equipment is installed
Bridge Alert Management system	Must be interfaced to and data recorded if equipment is installed.

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	For DM100 S-VDR
Date and time	Must be recorded
Ship position	Must be recorded
Speed	Must be recorded
Heading	Must be recorded
Bridge audio	Must be recorded
Communication audio	Must be recorded
Radar image	May be substituted by AIS data if COTS (commercial of the shelf) interface to radar is unavailable.
Echo sounder	Must be recorded if available as serial IEC 61162 data
Main alarms	Must be recorded if available as serial IEC 61162 data
BNWAS 1 st stage alarm (main alarm)	Must be recorded if available as serial IEC 61162 data
Engine order and response	Must be recorded if available as serial IEC 61162 data
Hull openings status	Must be recorded if available as serial IEC 61162 data
Watertight and fire doors	Must be recorded if available as serial IEC 61162 data
Acceleration and hull stresses	Must be recorded if available as serial IEC 61162 data
Wind speed and direction	Must be recorded if available as serial IEC 61162 data

3.9.1 Termination resistors for IEC 61162-2 interfaces (RS-422)

The termination resistor for the last IEC 61162-2 interface on the cable must be switched on. The switch which controls the termination resistors is located on the front of the DPU.



3.10 IAS

The VDR is equipped with an interface for an Integrated Alarm System (IAS). The IAS interface is based on a relay which is energized when the VDR is operational and when no errors are detected. Two outputs are available:

NC to C	Closed (≈ 0 Ohm) when the VDR is fully operational and no errors are detected otherwise open
NO to C	Open ($>10M$ Ohm) when the VDR is fully operational and no errors are detected otherwise closed

The relay is rated to 1A@24V

3.11 Image capture interface

Image capture is done using the LAN port on the DPU (Ethernet/IEC 61162-450, IEC62388 H.4) or by using external remote video interfaces.

3.11.1 Recommended standard configuration for image capture on VDR

Image source	Image channel in the VDR	Ethernet interface on VDR ^{Note 1}	Interface on Remote video interface ^{Note 2}
S-band RADAR	VD01	LAN 2	VD1 on RVI connected to the RVI port on the DPU
X-band RADAR	VD02	LAN 3	VD2 on RVI connected to the RVI port on the DPU
ECDIS 1	VD03	LAN 4	
ECDIS 2	VD04	LAN 5	

Note 1: If the source is connected directly to the VDR (using an Ethernet cable).

Note 2: If the source is unable to send its images using Ethernet (i.e. older equipment where the images must be captured locally using a remote video interface).

3.11.2 Description of remote video interfaces

Two remote video interfaces may be connected to the DPU, each having interfaces for two video sources.

RVI 02-004 P/N 1302358: Remote video interface with two 5xBNC analog video interfaces.

RVI 02-004D P/N 1302365: Remote video interface with two DVI-I interfaces.

A DVI-I interface may be used as a single link DVI interface or as an analog interface with the same properties as the interfaces on RVI 02-004.

If the video signal is transmitted from the source using 5 coaxial cables, then utilize the RVI 02-004 (rather than the RVI 02-004D) with an adaptor cable in order to avoid unnecessary problems.

It is recommended that the first remote video interface is connected to the “RVI” port on the DPU. A second remote video interface may be connected to the “RDI” port on the DPU. If the “RDI” port is occupied, a locally powered remote video interface may be used. A locally powered remote video interface must be connected to one of the LAN ports or the SIU on the DPU, see MAN12405-10 Installation guide for AC power kit for RVI.

3.12 System startup after installation

1) Check that the battery switch is “ON”. Push the AC breaker. The LED on the DPU will show the progress of the start-up sequence.

State	VDR STATUS	MAIN CPU	ERR	OK	BAT	AC
1	Yel/red/green	Yel/red/green	Red	Blue	Blue	Blue
2	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	Green 1Hz	OFF	Blue	OFF	Blue
4	OFF	Green 1Hz	OFF	Blue	Blue 1Hz	Blue
5	Green	Green	OFF	Blue	Blue 1Hz	Blue
6	Red	Green	OFF	Blue	Blue 1Hz	Blue

State 1 and 2)

Hardware initialization - state 1 and 2 should only take few seconds.

State 3)

The power control circuit and charger check basic power parameters. This will normally take a few seconds

State 4)

The blinking “MAIN CPU” LED indicates that the power control circuit is waiting for the main CPU to respond, i.e. booting from the program memory (compact flash).

The blinking BAT LED indicates that the charger has started charging the battery (if the battery switch is in its ON position and the battery is present and working properly).

Booting the main CPU will normally take 2 minutes. The system will automatically restart after five minutes if booting the main CPU fails (if this happens, check that a compact flash with proper program code is installed)

State 5)

The green “MAIN CPU” LED indicates that the main CPU is responding, i.e. the boot process was successful.

The green “VDR status” LED indicates that the VDR is, so far working properly without any errors detected - a new un-configured system will enter state 6 shortly.

State 6)

The red VDR status LED indicates that the VDR has discovered a problem which is typically for a new system – messages in the caution list on BCP should describe the problem. Configure and restart the system.

4 Configuration

The system must be configured as described below:

Setup of configurator PC	4.3
System login	4.4
Configuration of vessel ID	4.5
Configuration of UTC and position source	4.6
Configuration of serial interfaces	4.7
Configuration of position source and GPS antenna position	4.7.1
Configuration of network interface	4.8
Configuration of audio interfaces	4.9
Configuration of RADAR and ECDIS interface	4.10
Backup of configuration file	4.11
Configuration of SIU	See the installation manual for SIU
Backup of configuration file	4.11
Upload of VDR Explorer configuration to VDR (for OPT)	5.1

4.1 Default configuration for the DM100 VDR

The Boot Flash contains a default configuration, which corresponds to the installation guidelines.

I/F	I/F type	Channel ID text	Comm. setup	Timeout	Active	NMEA Formatters
SI00	IEC 61162-2	AIS	38400,8,N,1	Enabled	Yes	VDM,VDO
SI01	IEC 61162-2	Autopilot	4800,8,N,1	Disabled	Yes	RSA, HTD
SI02	IEC 61162-2	Engine control	4800,8,N,1	Disabled	Yes	XDR
SI03	IEC 61162-2	Spare	4800,8,N,1	Disabled	Yes	
SI04	IEC 61162-1	GPS	4800,8,N,1	Enabled	Yes	ZDA,DTM,GLL,VTG
SI05	IEC 61162-1	Speed log	4800,8,N,1	Enabled	Yes	VHW
SI06	IEC 61162-1	Gyro	4800,8,N,1	Enabled	Yes	ROT,HDT
SI07	IEC 61162-1	Anemometer	4800,8,N,1	Disabled	Yes	MWV
SI08	IEC 61162-1	Echo sounder	4800,8,N,1	Enabled	Yes	DPT
SI09	IEC 61162-1	BNWAS	4800,8,N,1	Enabled	Yes	ALR
SI10	IEC 61162-1	Inclinometer	4800,8,N,1	Disabled	Yes	
SI11	IEC 61162-1	BAM	4800,8,N,1	Disabled	Yes	ALC,HBT

Microphone	Channel ID text	Active	BMU active	Source type
BMU 1A	Bridge Center	Yes	Yes	BMU 003
BMU 1B	Chart table	Yes	Yes	BMU 003
BMU 2A	Bridge port	Yes	Yes	BMU 003
BMU 2B	Bridge port	Yes	No	BMU 003
BMU 3A	Bridge stbd	Yes	Yes	BMU 003
BMU 3B	Bridge stbd	Yes	No	BMU 003
BMU 5A	Port bridge wing	Yes	Yes	BMU 004
BMU 5B	Stbd bridge wing	Yes	Yes	BMU 004
VHF 1	Primary VHF channel	Yes	No (N/A)	
AUD 4		Yes	No	
AUD 6 - 9		No	No	

* Signal applied to the input will be recorded (cannot be disabled for input BMU 1A – AUD 4)

Image channel	Active	Image input type	Source type
1	Yes	Ethernet	S-band RADAR
2	Yes	Ethernet	X-band RADAR
3	Yes	Ethernet	ECDIS 1
4	Yes	Ethernet	ECDIS 2

4.2 Default configuration for the DM100 S-VDR G2

The Boot Flash contains a default configuration, which corresponds to the installation guidelines.

I/F	I/F type	Channel ID text	Comm. setup	Timeout	Active	NMEA Formatters
SI00	IEC 61162-2	AIS	38400,8,N,1	Disabled	Yes	VDM,VDO
SI01	IEC 61162-2	Spare	4800,8,N,1	Disabled	No	
SI02	IEC 61162-2	Spare	4800,8,N,1	Disabled	No	
SI03	IEC 61162-2	Spare	4800,8,N,1	Disabled	No	
SI04	IEC 61162-1	GPS	4800,8,N,1	Enabled	Yes	ZDA,DTM,GLL,VTG
SI05	IEC 61162-1	Speed log	4800,8,N,1	Enabled	Yes	VHW
SI06	IEC 61162-1	Gyro	4800,8,N,1	Enabled	Yes	ROT,HDT
SI07	IEC 61162-1	Anemometer	4800,8,N,1	Disabled	No	MWV
SI08	IEC 61162-1	Echo sounder	4800,8,N,1	Disabled	Yes	DPT
SI09	IEC 61162-1	BNWAS	4800,8,N,1	Disabled	Yes	ALR
SI10	IEC 61162-1	Spare	4800,8,N,1	Disabled	No	
SI11	IEC 61162-1	Spare	4800,8,N,1	Disabled	No	

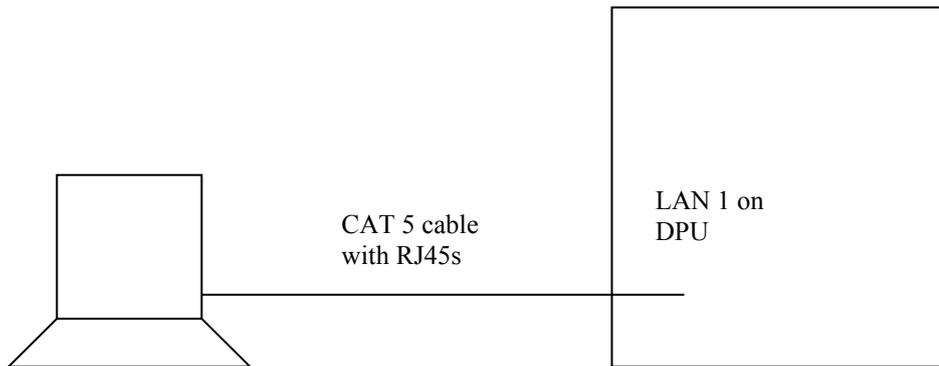
Microphone	Channel ID text	Active*	BMU active	Source type
BMU 1A	Bridge Center	Yes	Yes	BMU 003
BMU 1B	Chart table	Yes	No	BMU 003
BMU 2A	Bridge port	Yes	Yes	BMU 003
BMU 2B	Bridge port	Yes	No	BMU 003
BMU 3A	Bridge stbd	Yes	Yes	BMU 003
BMU 3B	Bridge stbd	Yes	No	BMU 003
BMU 5A	Port bridge wing	Yes	No	BMU 004
BMU 5B	Stbd bridge wing	Yes	No	BMU 004
VHF 1	Primary VHF channel	Yes	No (N/A)	
AUD 4		Yes	No	
AUD 6 - 9		No	No	

* Signal applied to the input will be recorded (cannot be disabled for input BMU 1A – AUD 4)

Image channel	Active	Image input type	Source type
1	Yes	Ethernet	S-band RADAR
2	No	Ethernet	X-band RADAR

4.3 Setup of configurator PC

The VDR is configured using a PC with Internet Explorer V10.x (or newer) and an Ethernet interface. Use a straight cable (normal patch cable) between the PC and the VDR.

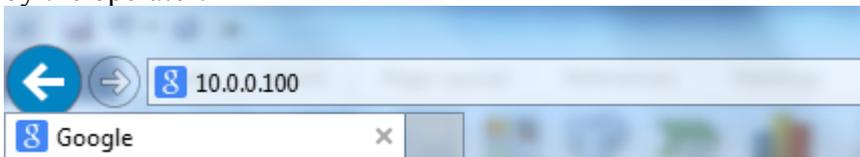


Connecting a configurator PC to the VDR

The IP address of the PC must match the IP address of the VDR. Consult Appendix K Setup of configurator PC if you want to know more about how to change the IP address for a PC. The IP address of the VDR is 10.0.0.100 (default) and subnet mask 255.255.255.0.

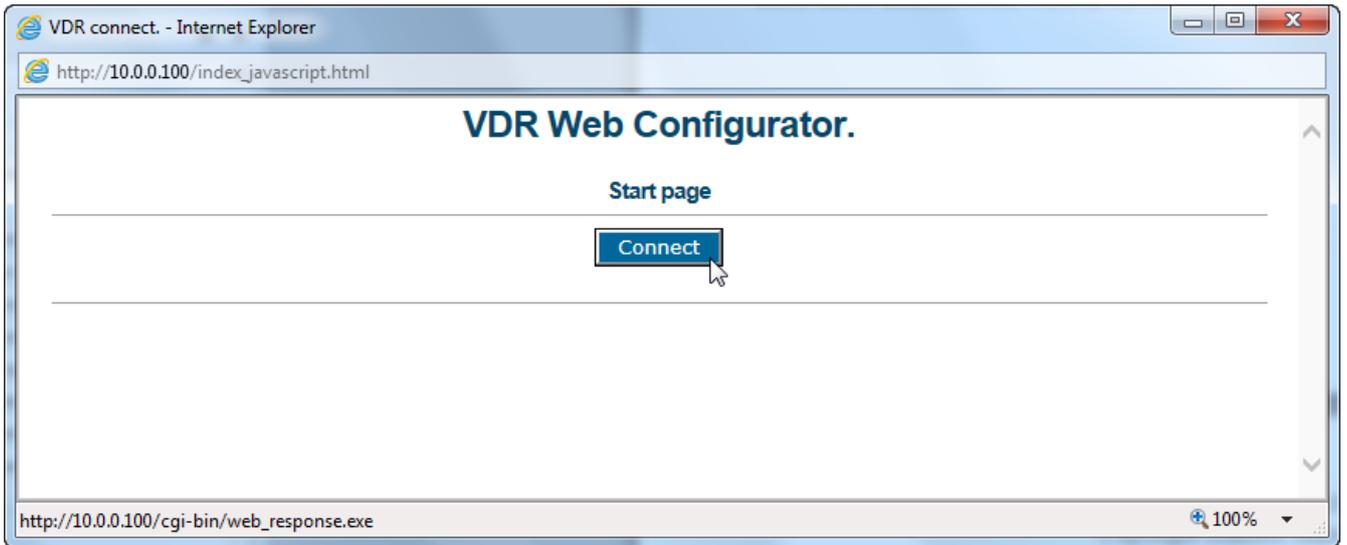
4.4 Login to VDR

The IP address of the VDR is 10.0.0.100 (default). The address, if necessary can be changed later by the operator.

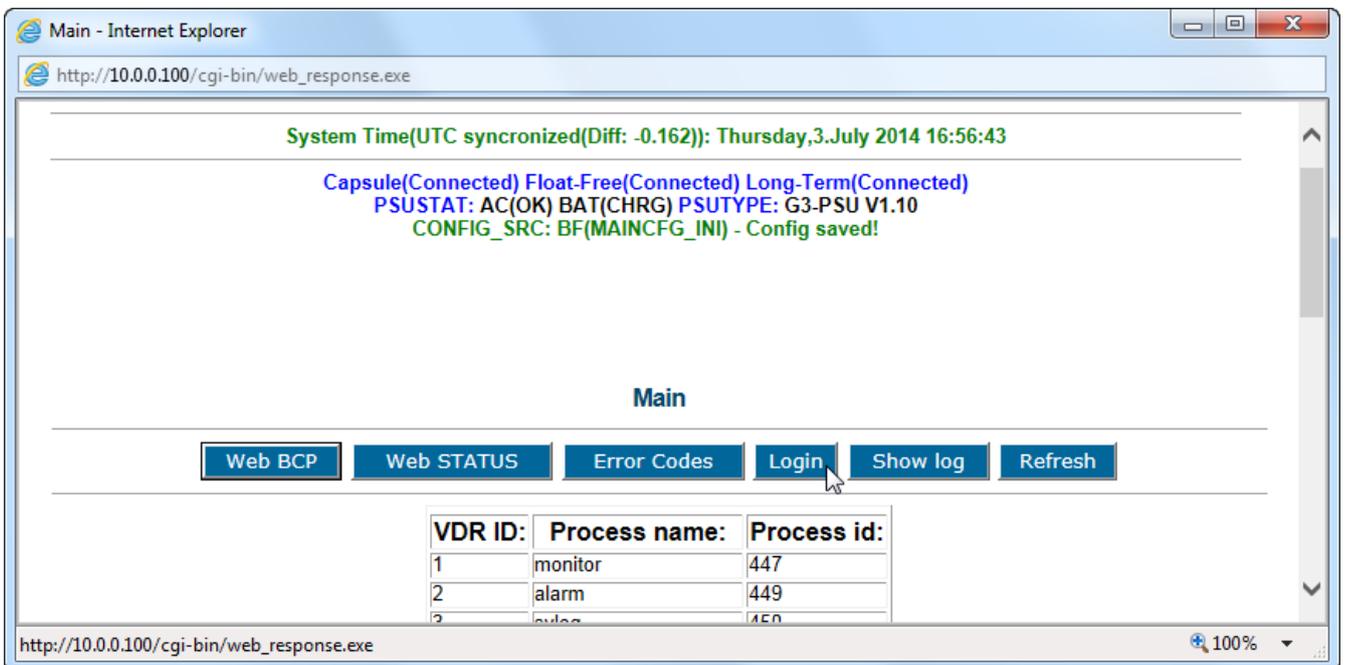


Enter the IP address of the VDR in the browser address field

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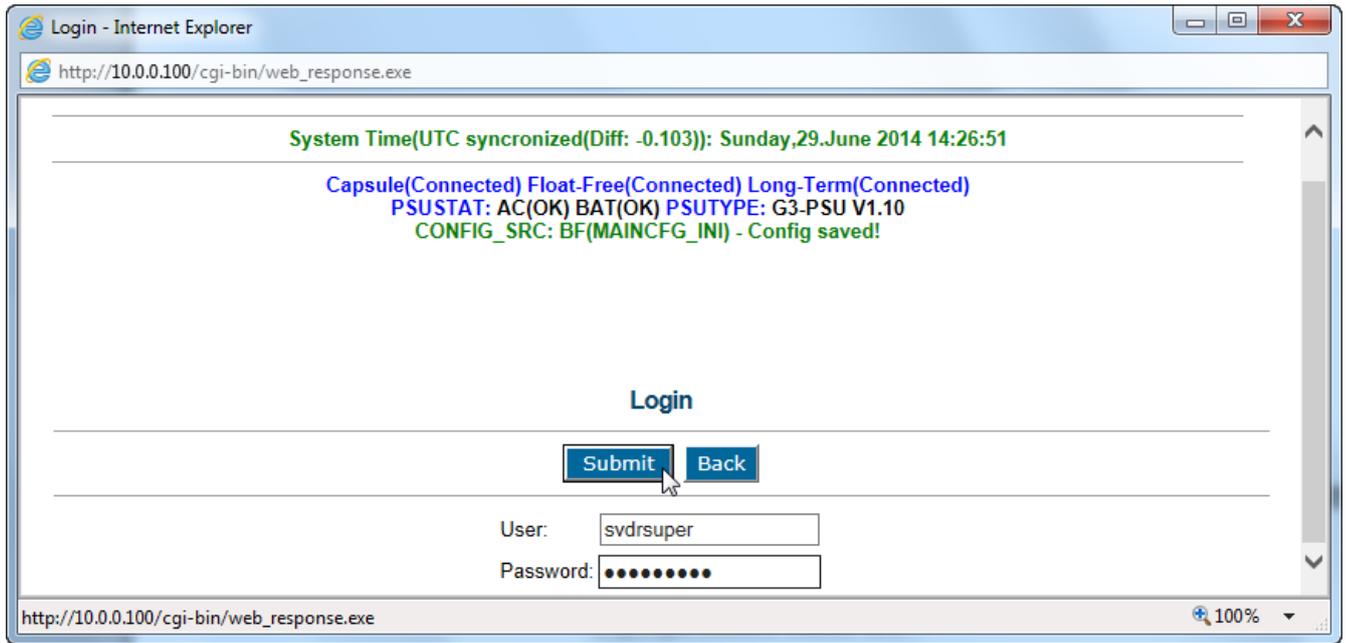


Click on the connect button



Click on the Login button (the other buttons on this page are explained in section 4.12)

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Enter User (ID) and password and click on Submit
The default user is "svdrsuper"
The default password is "danelec.."

The main configuration menu will appear if the user ID and password are correct.



The VDR main configuration menu

4.5 Configuration of Vessel ID

Select Vessel ID from the main menu.

The screenshot shows a web browser window titled "Vessel ID - Internet Explorer" with the address bar displaying "http://10.0.0.100/cgi-bin/web_response.exe". The main content area displays the following status information:

- Capsule(Connected) Float-Free(Connected) Long-Term(Connected)
- PSU STAT: AC(OK) BAT(OK) PSUTYPE: G3-PSU V1.10
- CONFIG_SRC: BF(MAINCFG_INI) - Config saved!

Below this, it states "SUPERvisor-user logged in". The main heading is "Vessel ID - Edit". There are two buttons: "Submit" and "Back".

The form contains the following fields:

- Type approval authority and reference:
- Authority of commissioning:
- Vessel name:
- Vessel IMO no:
- Vessel MMSI no:
- Vessel flag:
- VDR Model:
- Installation date: (Format: YYYY-MM-DD)
- DAU serial number: (Format: Annnnn-nnnnnn)
- Battery expiry date: (Format: YYYY-MM-DD)

The browser's status bar at the bottom right shows "100%" zoom level.

Click on Edit and enter:

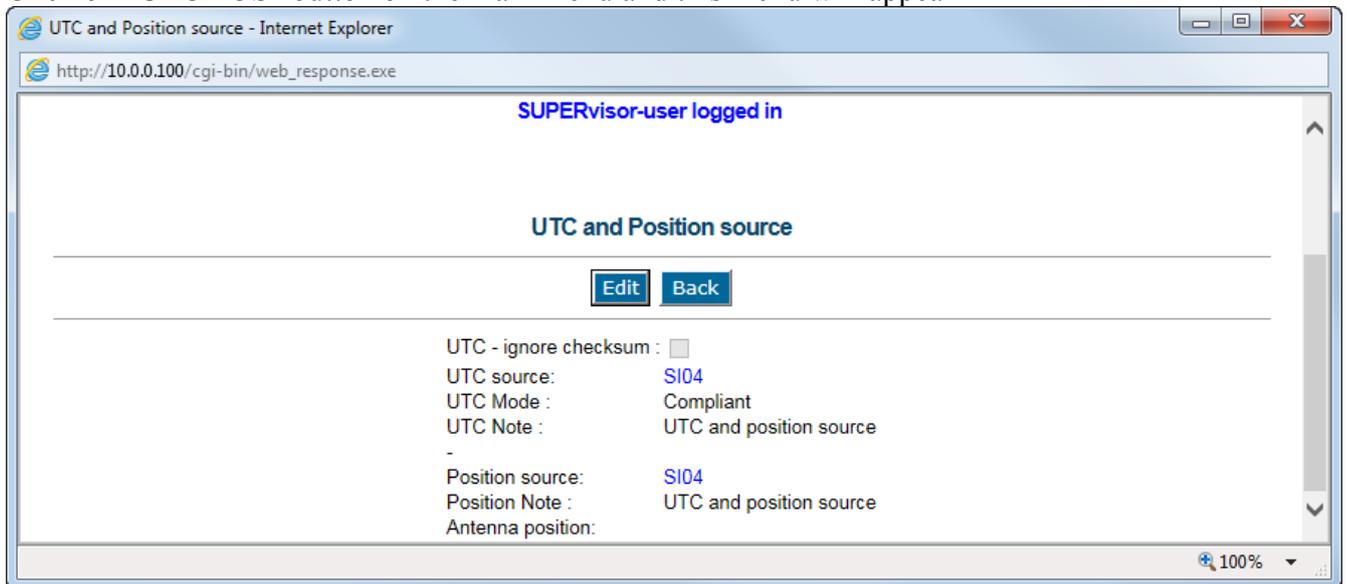
- Vessel name
- Vessel IMO no.
- Vessel MMSI no.
- Vessel Flag
- Date of installation
- The serial number for the main unit (the DAU)
- The expiry date for the batteries (located in the DAU)

Click on Submit to save!

“Authority of commissioning” must be set after the installation is approved.

4.6 Configuration of UTC source and position source

Click on “UTC POS” button on the main menu and this menu will appear



The error code 60 will be displayed in the caution list on the BCP if no UTC source is present.

A GPS is normally used as source for UTC and position and according to the default configuration must be connected to SI04. If the UTC source is connected elsewhere, click on the “Edit” button in order to make the necessary modifications.

The VDR is able to scan data from the UTC source and automatically recognize NMEA sentences with UTC information.

Older GPS receivers may not generate the checksum correctly and there is an option for setting the VDR to ignore that. In addition “UTC mode” may be set to “Simple” if the GPS is not compliant with the current standards. Problems related to the UTC source may be monitored by checking the UTC error status (“Tech Support->UTC Error Status”).

4.6.1 Antenna position

Antenna position cannot be configured here (this topic is covered in section 4.7.1). Go back to the main menu.

4.7 Configuration of serial channels

Select the serial submenu (click on Serial) from the main menu.

Channel #	State	Channel id	Input type	Timeout	Settings	NMEA Formatters	Source type	Source info
SI00	Disabled	AIS	NMEA data	10 sec	9600,8,None,1	VDM,VDO		
SI01	Disabled	Auto Pilot	NMEA data	No timeout	38400,8,None,1	RSA,HTD		
SI02	Disabled	Engine Control System	NMEA data	No timeout	4800,8,None,1	XDR		
SI03	Disabled	Inclinometer	NMEA data	No timeout	4800,8,None,1		Inclinometer model XLS100	Inclinometer
SI04	Enabled	GPS	NMEA data	60 sec	4800,8,None,1	ZDA,DTM,GLL,VTG		
SI05	Disabled	Speed Log	NMEA data	60 sec	9600,8,None,1	MHW		
SI06	Disabled	Gyro	NMEA data	60 sec	9600,8,None,1	ROT,HDT		
SI07	Disabled	Anemometer	NMEA data	60 sec	9600,8,None,1	MWV		

Serial sub menu

Slot

Position of serial module #1. Informational only, the position of serial module #1 is fixed. Note that serial module #1 is embedded on the SAP board in the DM100 DPU as well a serial module#2.

Active

Informational only, serial module #1 cannot be disabled.

Name

Type name for the serial module (do not change).

Node id

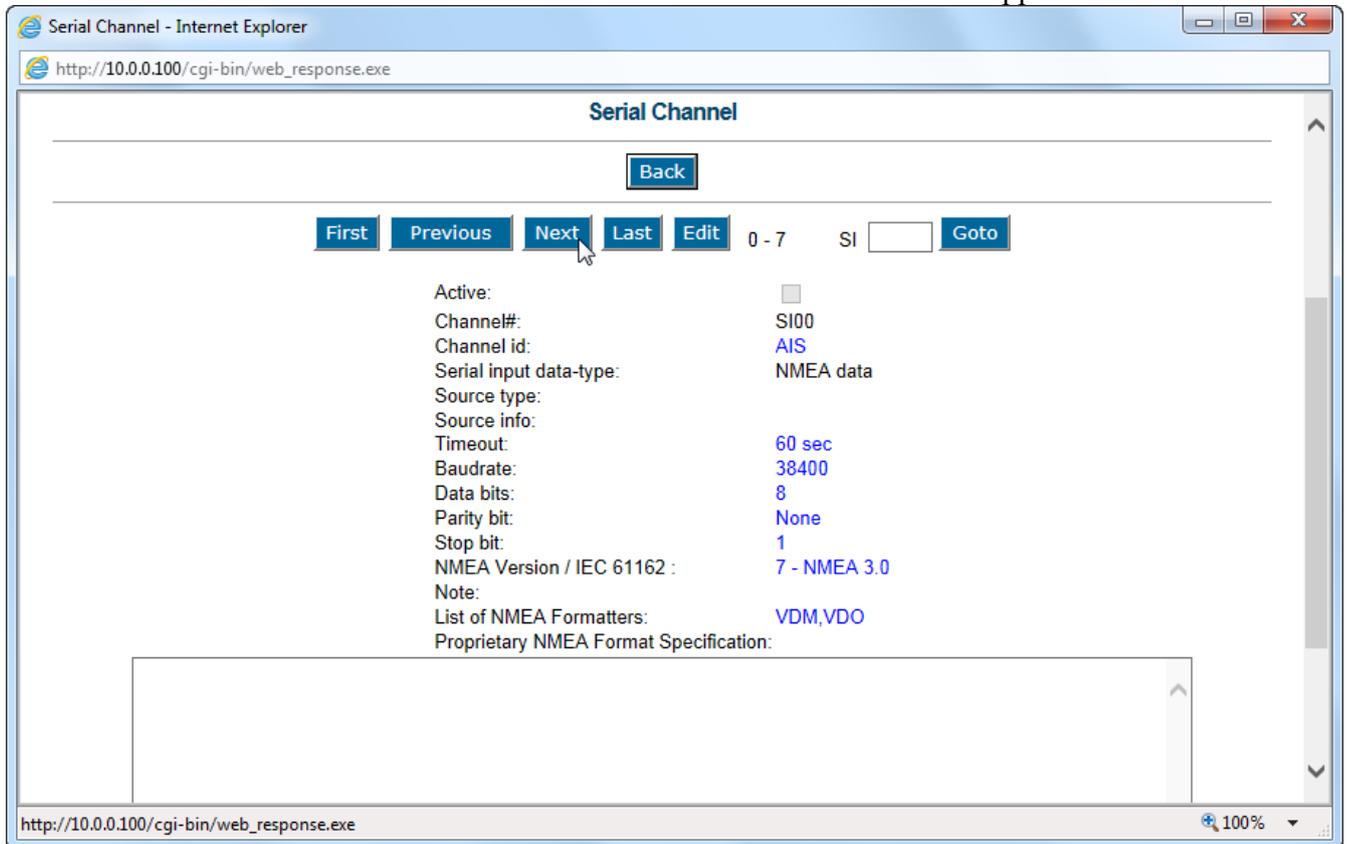
Reserved for future use, do not change.

Number of channels

Informational only.

4.7.1 Setup of antenna position for position source

Click on the “Channels” button on the “Serial” submenu and this menu will appear.



Select the serial input channel to where the position source is connected (this is normally SI04, i.e. click on “Next” four times) and then “Edit”.

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Serial Channel - Edit

Submit Back

This channel is used for UTC - information
This channel is used for POSITION - information

Active:

Channel#: SI04

Channel id: GPS

Serial input data-type: 0 -> NMEA

Source type:

Connected equipment - model, type:

Antenna position:

Timeout: 60 secs / 1 Minute

Baudrate: 4800

Data bits: 8

Parity bit: 0 none

Stop bit: 1

Select NMEA version / IEC 61162: 7 - NMEA 3.0

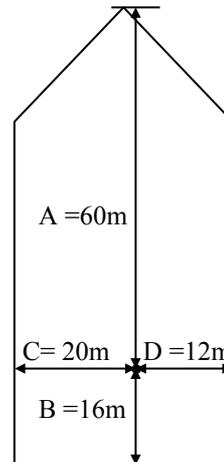
Note: UTC and position source

List of NMEA Formatters (capitals, comma-separated): ZDA,DTM,GLL,VTG

Proprietary NMEA Format Specification (Only ASCII characters between 32 decimal (") and 126 decimal (~)):

Enter the antenna position using the following format:

A60B16C20D12



4.7.2 Other parameters for a serial channel

Active

Used to enable/disable the channel.

Channel ID

There are several descriptive fields related to the configuration for a serial channel. The text entered in this field will be used in conjunction with the replay software and OPT. The typical use of this field is to store the generic term for the connected equipment e.g. GPS.

Serial input data type

This parameter will not affect whether data is recorded or not, but may affect how data is displayed in the monitoring tools for the VDR.

Source type

Descriptive field - must be used for unambiguously describing the equipment connected to this interface i.e. type, model.

Antenna position/source

Descriptive field used for indicating the antenna position for the position source. This field is named "source info" for all other channels and may be used for optional information.

Timeout

The maximum allowed pause on the serial line before an alert is generated. Timeout cannot be disabled for UTC and position source.

Baud rate, data bits, parity bits and stop bits

The communication parameters for the serial line.

Select NMEA version/IEC 61162

Informative only. Does not affect the operation of the VDR or replay software.

Note

Optional informational text.

List of NMEA formatters

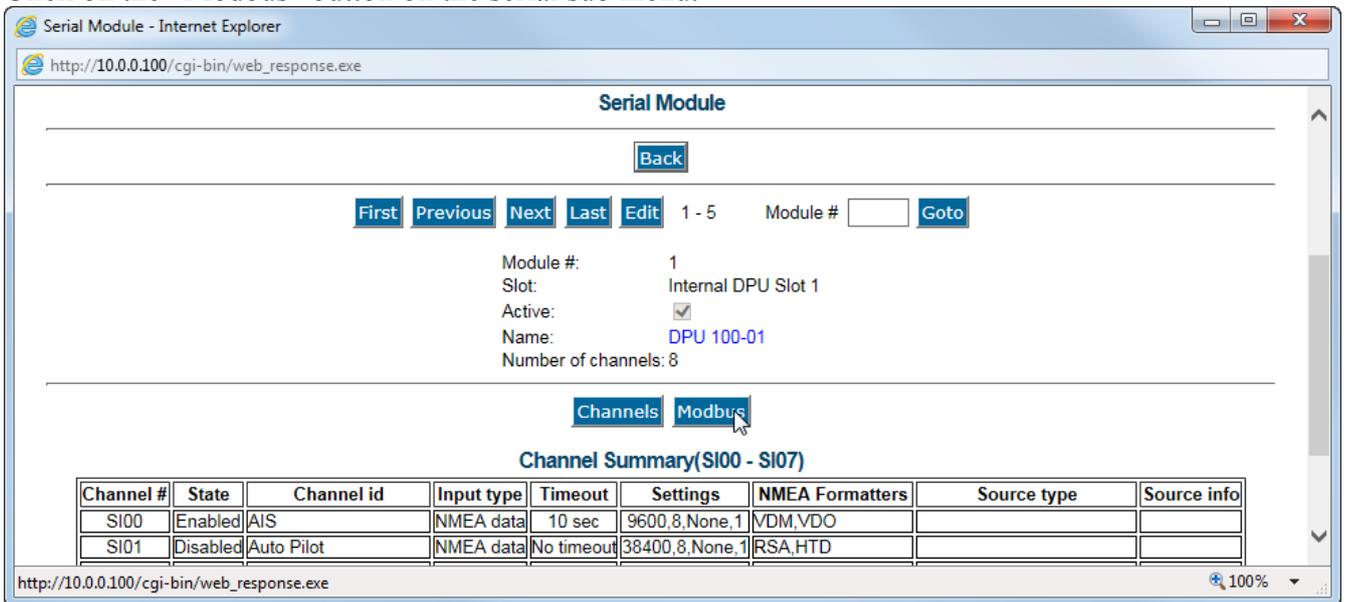
The list must contain the NMEA formatter for the sentences to be received on this serial channel. This is required by the VDR standard. The VDR will not generate an alert if a sentence is missing. However, the VDR verification tool (the VDR Verifier) will check this.

Proprietary NMEA format description

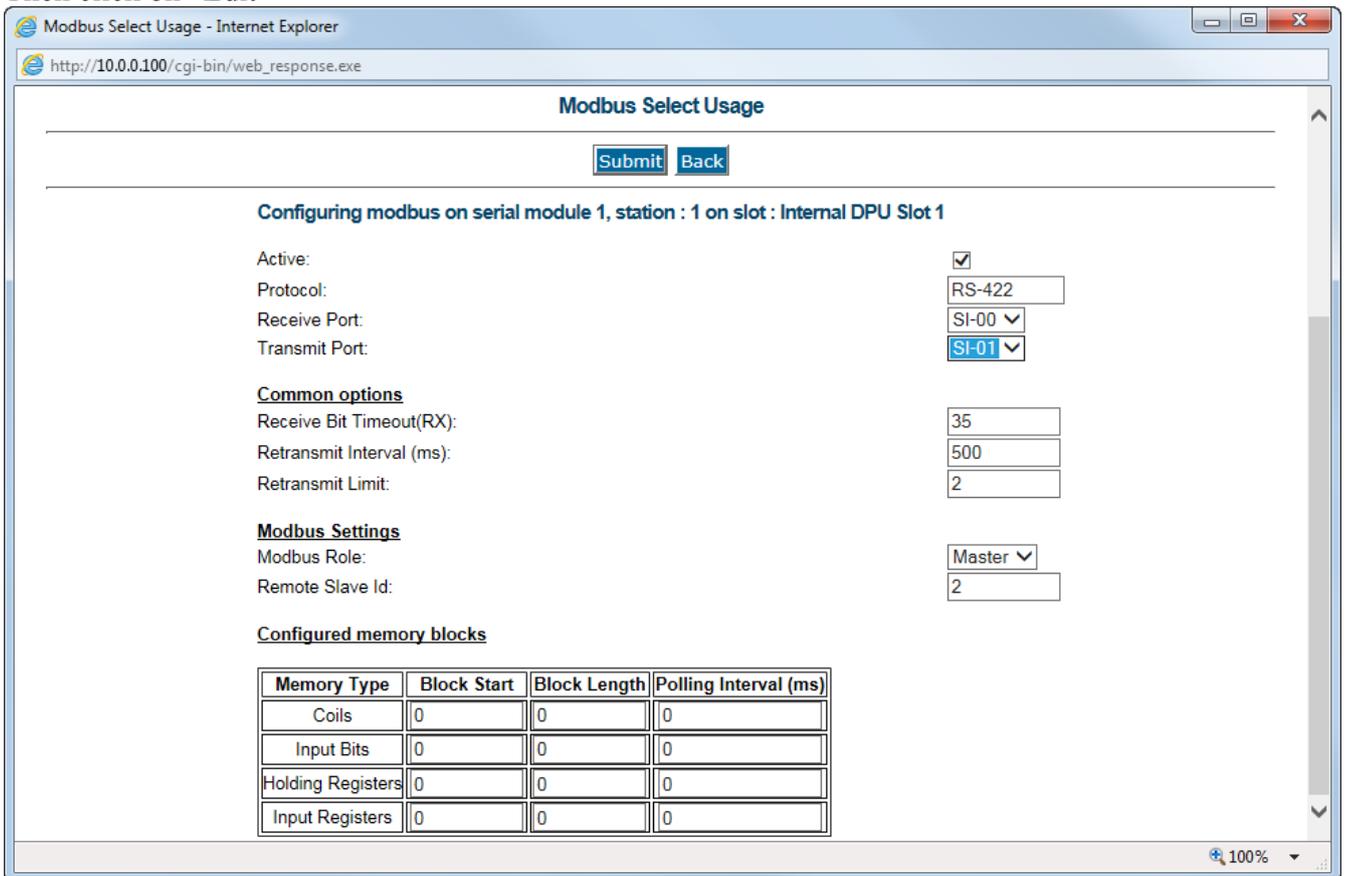
The VDR standard requires that information about the format for proprietary NMEA sentences is included in the VDR configuration. The information must be sufficient for the authorities to decode the information. Note that it is unacceptable only to specify an URL (Internet link) to the relevant information. Maximum size is 2000 characters.

4.7.3 Support for Modbus

Click on the “Modbus” button on the serial sub menu.

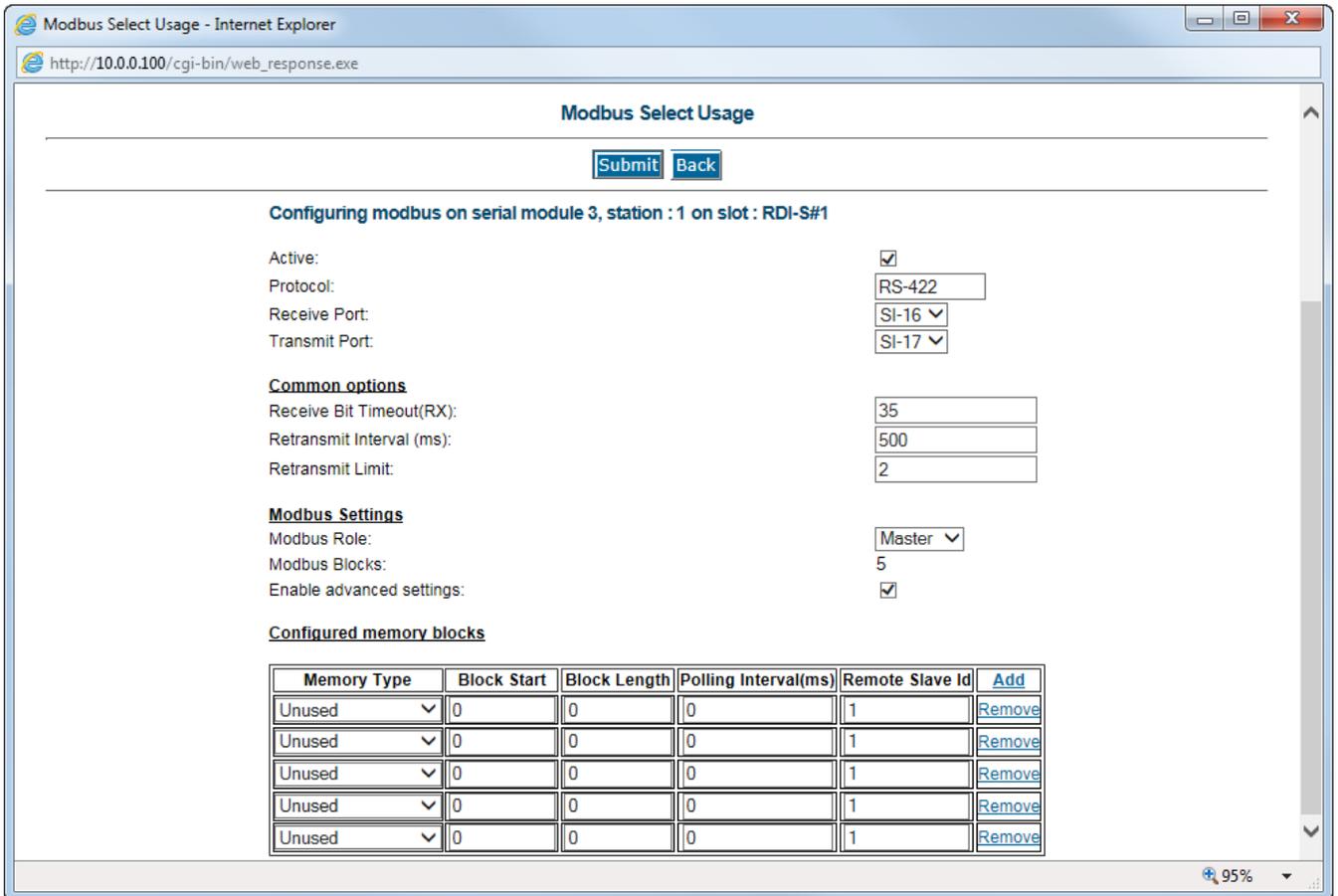


Then click on “Edit”



Modbus configuration page for serial interfaces on the DPU and a SIU.

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Modbus configuration page for serial interfaces on RDI 08-001S.

Note that adding extra memory blocks and advanced settings for master mode is currently only supported on RDI 08-001S and for Modbus over network (Ethernet).

4.8 Configuration of data capture via network

Select the network submenu from the main menu (click on Network).

The screenshot shows the 'NetworkData Overview' page in a web browser. At the top, it says 'SUPERVISOR-user logged in'. Below that is the title 'NetworkData Overview' and a 'Back' button. A 'Channels' button is also visible. The main content is a table titled 'Channel Summary(NI200 - NI215)'. The table has columns for Channel #, State, Channel id, Protocol type, Input type, Timeout, Settings, NMEA formatters, Source type, and Source info. All channels listed (NI200 to NI215) are in a 'Disabled' state.

Channel #	State	Channel id	Protocol type	Input type	Timeout	Settings	NMEA formatters	Source type	Source info
NI200	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI201	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI202	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI203	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI204	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI205	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI206	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI207	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI208	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI209	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI210	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI211	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI212	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI213	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI214	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			
NI215	Disabled		IEC 61162-450 Multi-cast (UDP)	NMEA data	No Timeout	VDRD (239.192.0.5:60005), Remote SFI:xx0001			

4.8.1 Configuration of “Data over Network” channels

Click on the “Channels” button and this configuration page will be displayed.

The screenshot shows the 'Data over Network Page' configuration interface. It includes a 'Back' button and navigation controls: 'First', 'Previous', 'Next', 'Last', 'Edit', '200 - 215', 'NETWORK - channel', and 'Goto'. The configuration details for the selected channel are as follows:

- Active:
- Protocol Type: IEC 61162-450 Multi-cast (UDP)
- Channel#: NI200
- Channel id:
- Source type:
- Source info:
- Network Interface(s): All Data Network Interfaces
- Transmission Group: 5 --> VDRD (239.192.0.5:60005)
- Remote System Function ID: xx0001
(Format cxxxxx)
- Input alarm timeout: 0 no timeout
- NMEA Version: 7 - NMEA 3.0
- Note:
- List of NMEA Formatters:
- Proprietary NMEA Format Specification:

The VDR can receive NMEA/IEC 61162-1 data, “unformatted” ASCII and binary over Ethernet. Images may also be received over Ethernet, however this topic is covered in section 4.10.

The VDR has 16 “virtual” inputs for receiving data over Ethernet. When received, this data is treated as if received from a serial port. Also many of the configuration parameters are the same as for a serial port.

Eight protocols are supported:

IEC 61162-450 Multicast UDP: Support for this protocol is required according to VDR standard and will become the primary way of sending data over Ethernet. See section 4.8.3

Unicast UDP, IEC 61162-450 tagged data: This option may be used if it is not possible or desirable to send IEC 61162-450 tagged data as multicast. See section 4.8.4

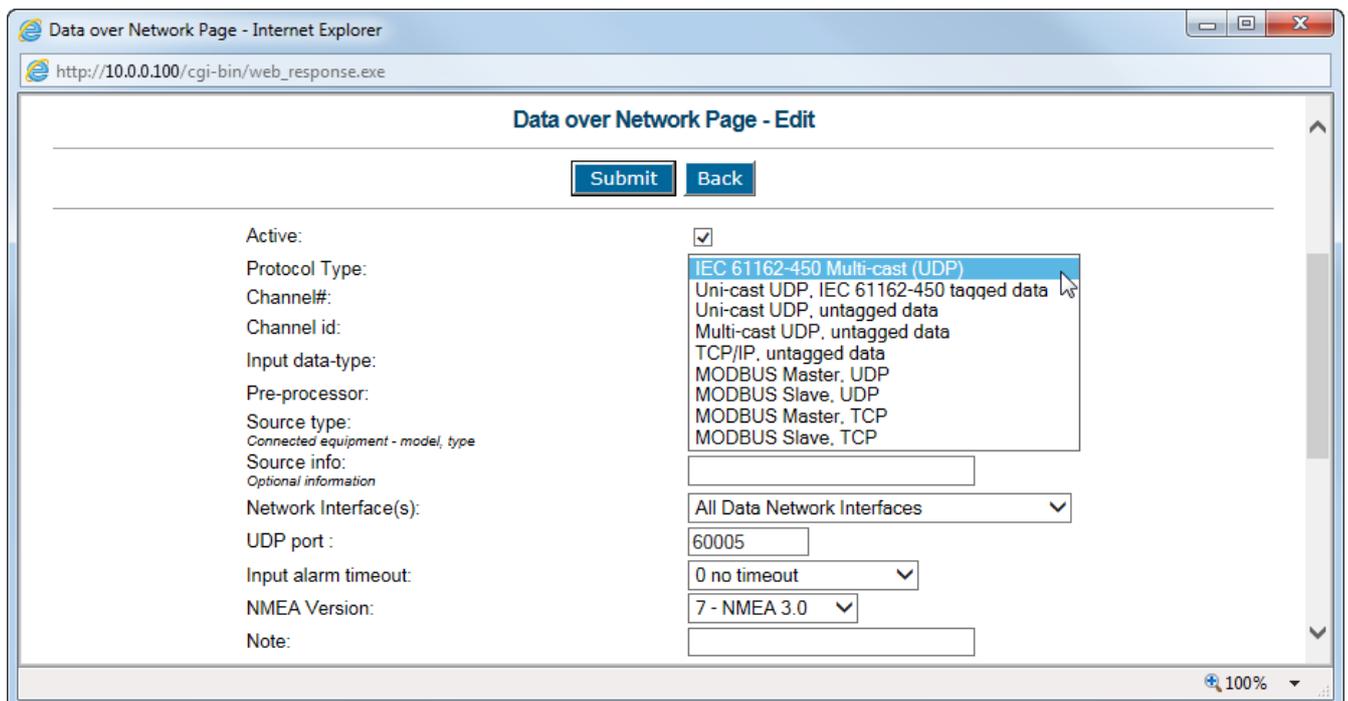
Unicast UDP, untagged data: Untagged data in UDP packets, e.g. NMEA strings “as they appear on a serial line. See section 4.8.5

TCP/IP, untagged data: Untagged data sent over a TCP/IP connection, e.g. NMEA strings “as they appear on a serial line. See section 4.8.6

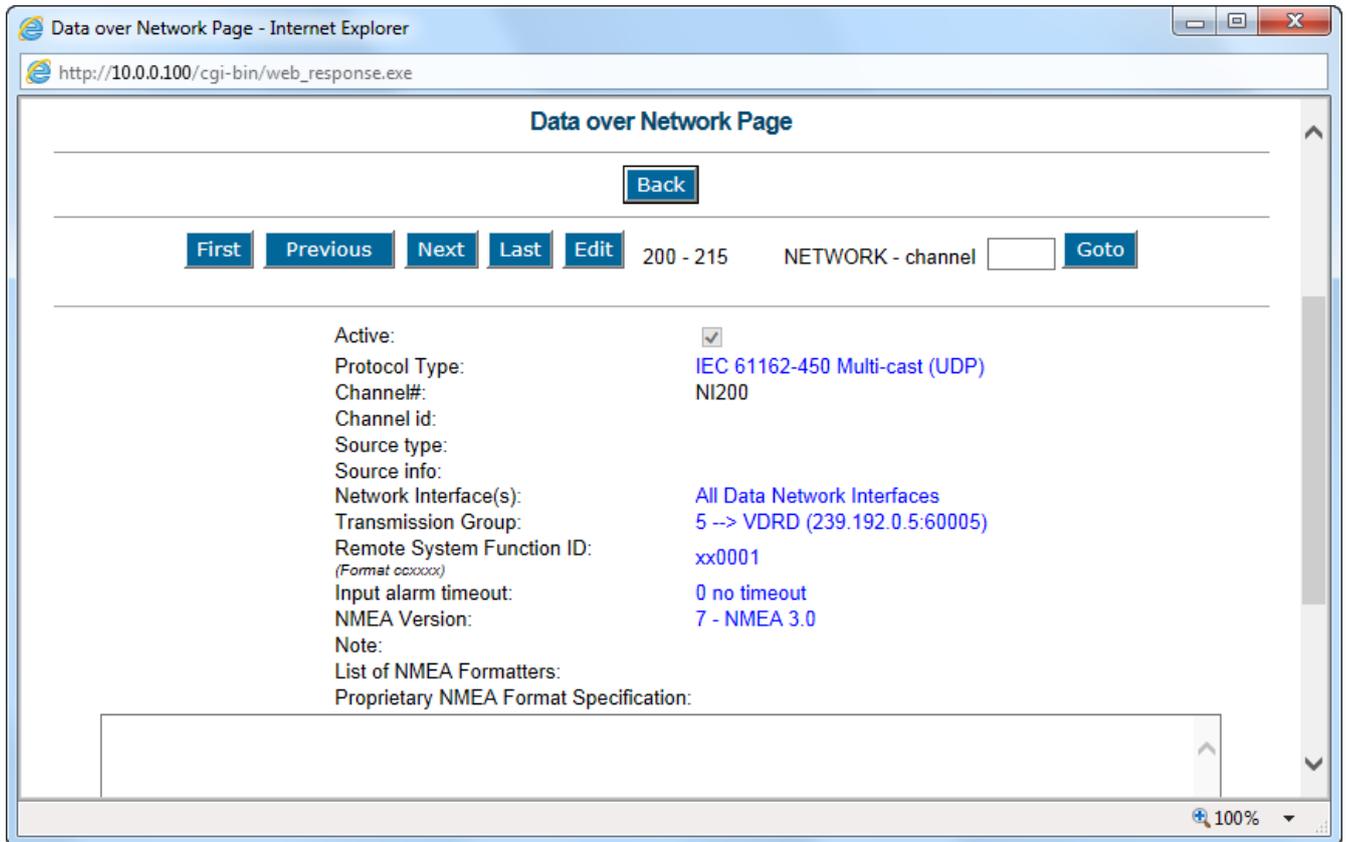
Modbus Master UDP and Modbus Master TCP

Modbus Slave UDP and Modbus Slave TCP

In order to change protocol, select a new protocol from the “Protocol type” drop down menu and click on “Submit”. The configuration window will change depending on the selected protocol.



4.8.2 Configuration of network channel in general (common parameters)



Active

Used to enable/disable the virtual channel.

Protocol type

The VDR supports four communication protocols, see section 4.8.

Channel#

The system ID for this virtual channel (cannot be changed).

Channel ID

There are several descriptive fields related to the configuration for a serial channel. The text entered in this field will be used in conjunction with the replay software and OPT. The typical use of this field is to store the generic term for the connected equipment e.g. AIS.

Source type

Mandatory descriptive field - must be used for unambiguously describing the equipment connected to this interface; i.e. type, model.

Source info

Additional optional information about the source such as its location.

Input alert timeout

The maximum allowed pause between receipts of data before an alert is generated.

NMEA version

Informative only. Does not affect the operation of the VDR or replay software.

Note

Optional informative text.

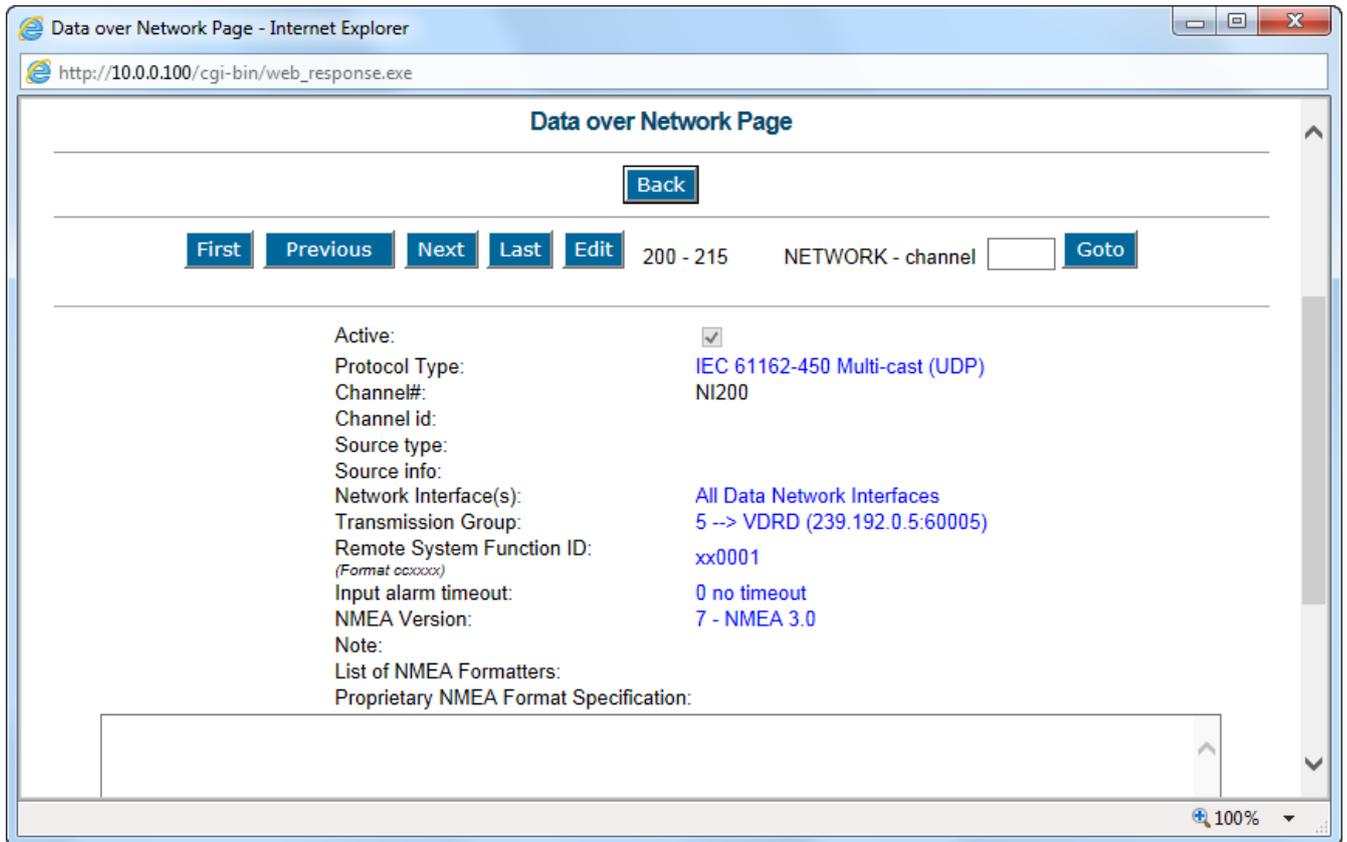
List of NMEA formatters

The list must contain the NMEA formatter for the sentences to be received on this serial channel. This is a requirement of the VDR standard. The VDR will not generate an alert if a sentence is missing. However, the VDR verification tool (the VDR Verifier) will check this.

Proprietary NMEA format description

The VDR standard requires that information about the format for proprietary NMEA sentences is included in the VDR configuration. The information must be sufficient for the authorities to decode the information. Note that it is unacceptable only to specify an URL (Internet link) to the relevant information. Maximum size is 2000 characters.

4.8.3 Configuration of IEC 61162-450 Multicast UDP



The common parameters are described in section 4.8.2.

Network Interfaces

Up to six virtual network interfaces for receiving data may be enabled (see section 4.14.9). It is possible to utilize any network interface or select a specific interface.

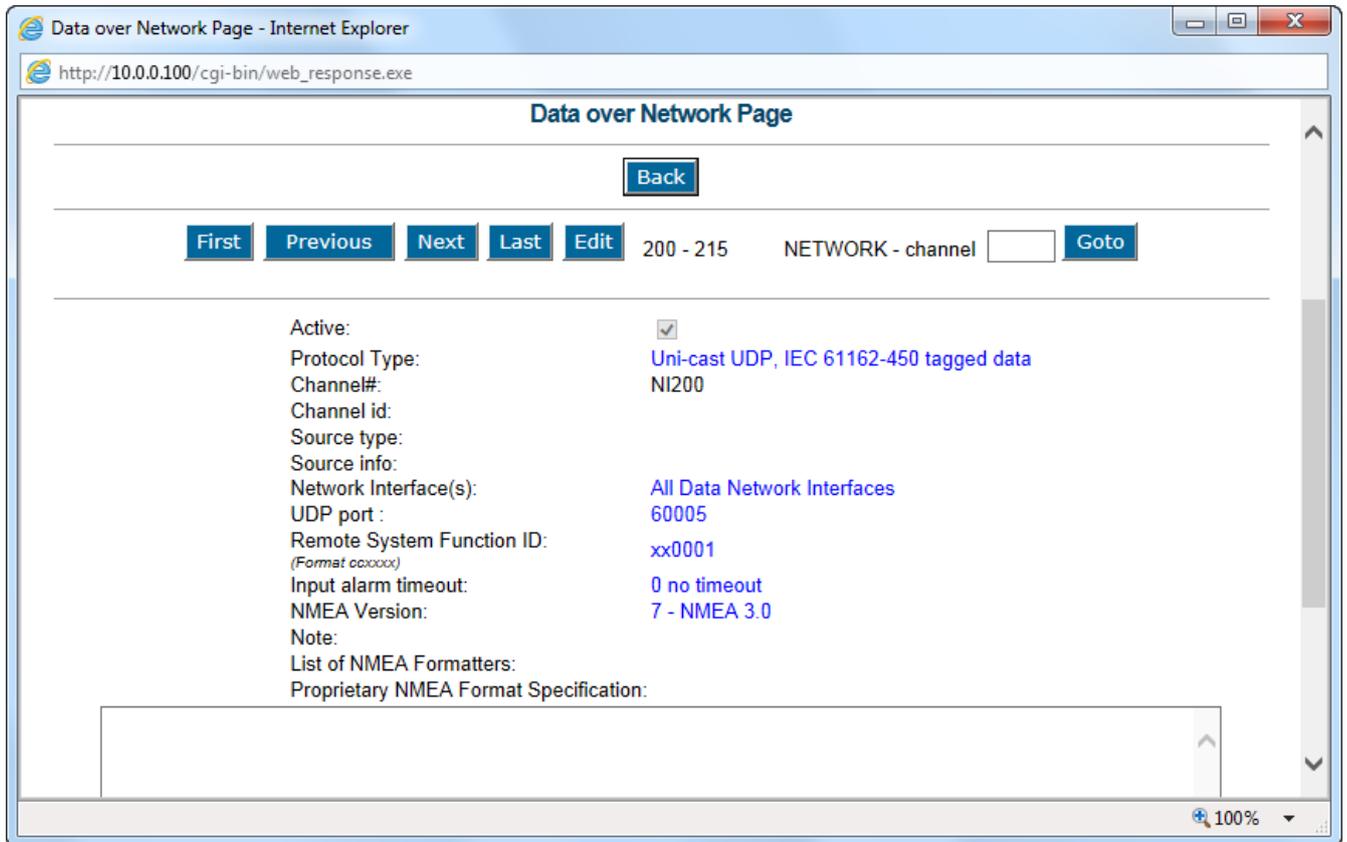
Transmission group

Sixteen transmission groups have been defined for transmitting data according to 61162-450 table 4. Transmission group 5 (VDRD) is typically used for transmitting data to the VDR.

Remote System Function ID

The ID of the transmitter (SFI) according to IEC 61162-450; e.g. AI0001 for the first AIS

4.8.4 Configuration of Unicast UDP, IEC 61162-450 tagged data



The common parameters are described in section 4.8.2.

Network Interface

Up to six virtual network interfaces for receiving data may be enabled (see section 4.14.9). It is possible to utilize any network interface or select a specific interface (recommended).

UDP port

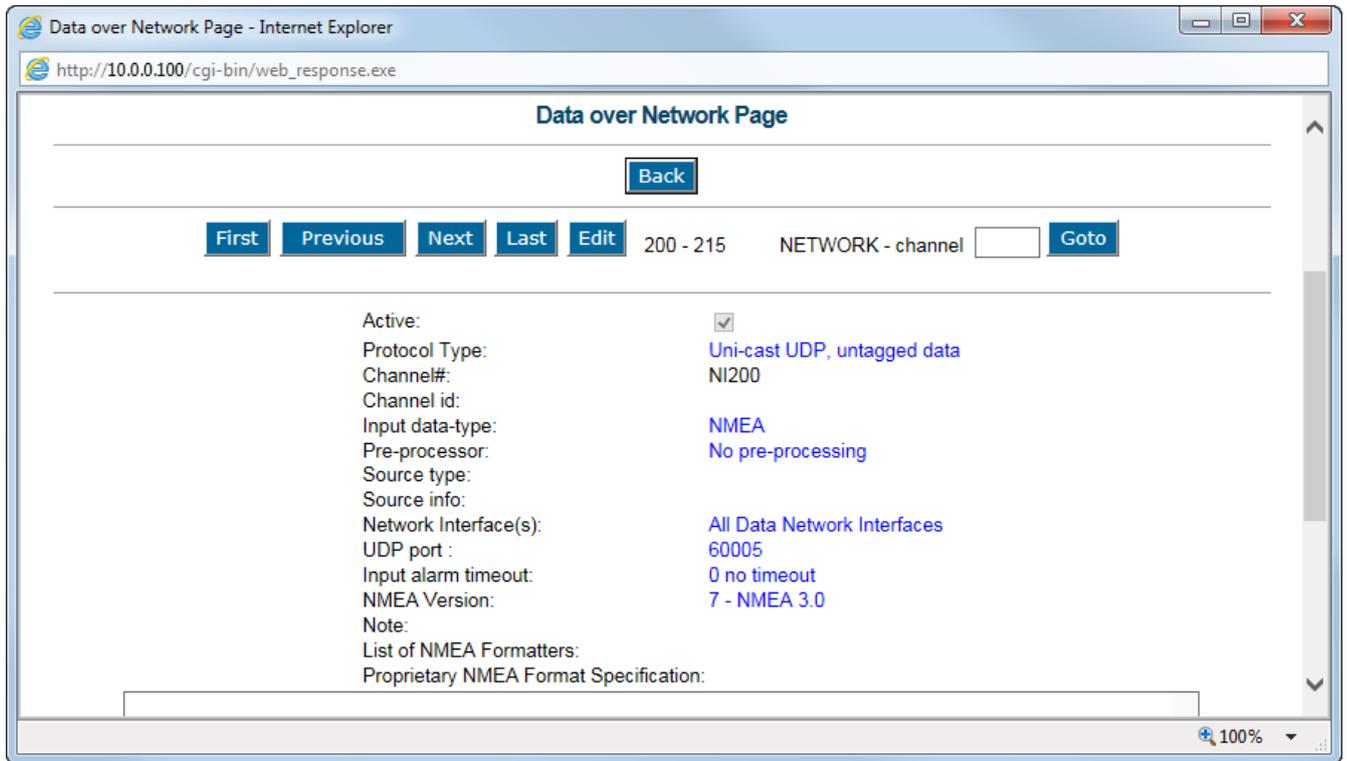
The UDP port on the VDR to which the data must be addressed.

Remote System Function ID

The ID of the transmitter (SFI) according to IEC 61162-450 e.g. AI0001 for the first AIS.

Note that destination IP address for the datagrams is the IP address of the Network interface see section 4.14.9

4.8.5 Configuration of Unicast UDP, untagged data



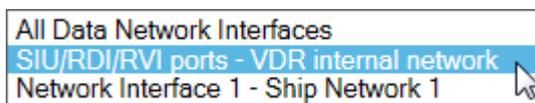
The common parameters are described in section 4.8.2.

Pre-processor

The DM100 is able to receive and process custom formatted data. When data is sent as IEC 61162-1 sentences embedded in UDP datagrams no pre-processor is required (default).

Network Interface

Up to six virtual network interfaces for receiving data may be enabled (see section 4.14.9). When Protocol type is “Unicast UDP, untagged data” an additional virtual network interface will appear on the list.



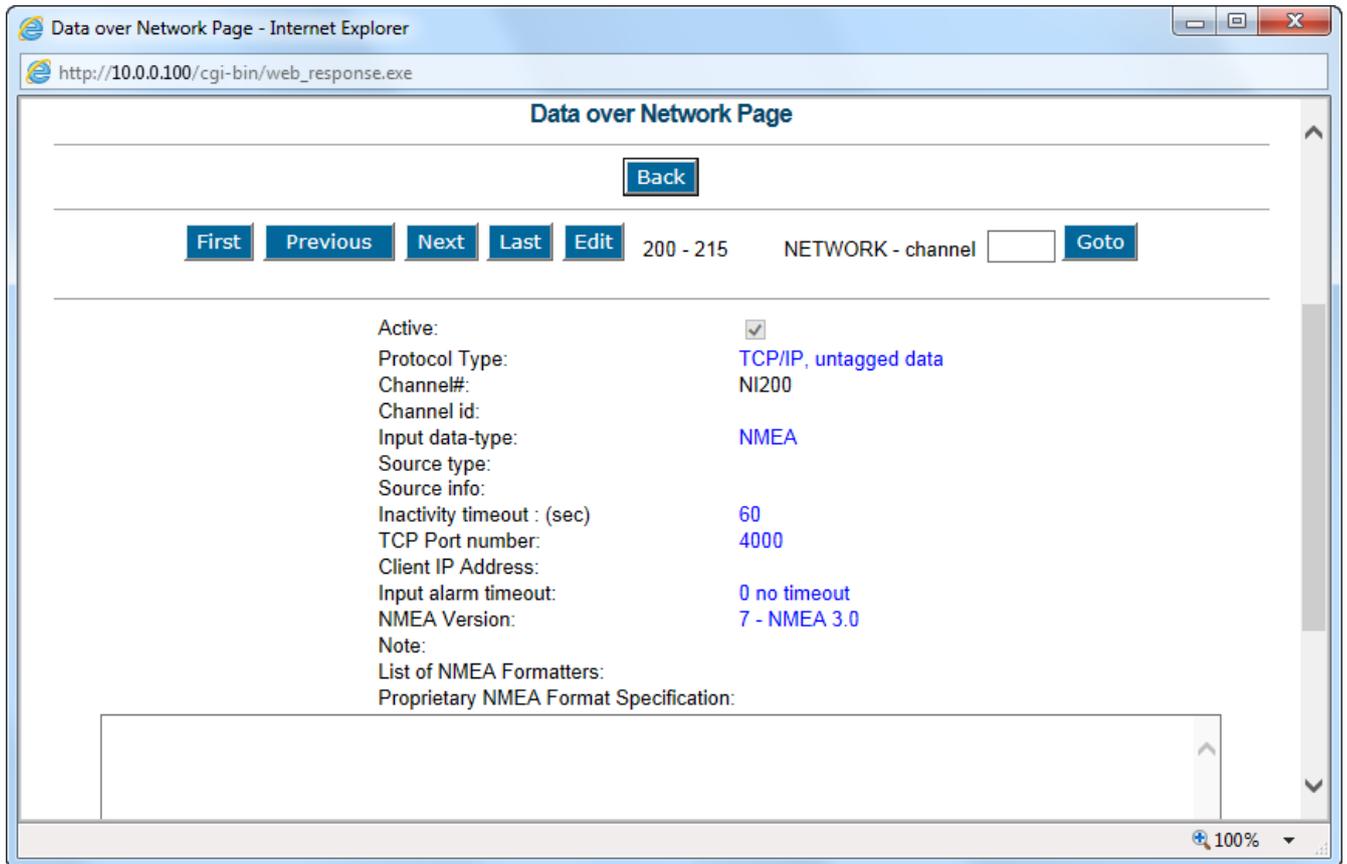
“SIU/RDI/RVI port on DPU” must be selected if the network channel is used for receiving data from an RDI 08-001A or RDI 24-001D which are connected to the SIU, RDI or RVI port on the DPU.

UDP port

The UDP port on the VDR to which the data must be addressed.

Note that destination IP address for the datagrams is the IP address of the Network interface see section 4.14.9

4.8.6 Configuration of TCP/IP, untagged data



The common parameters are described in section 4.8.2.

Inactivity timeout

The time before the VDR will disconnect the TCP/IP connection when no data is being received.

TCP port number

The TCP port on the VDR to which the VDR will listen.

Note that the VDR is the server and the client sending the data must establish a TCP/IP connection to the IP address of the VDR's "Configuration/VDR data" interface (see section 4.14.9).

Client IP address

If set, only packets from a source with this IP address will be accepted.

4.8.7 Configuration of Modbus master, UDP and TCP/IP

Data over Network Page - Edit

Submit Back

Active:

Protocol Type: MODBUS Master, UDP

Channel#: NI200

Channel id:

Input data-type: NMEA

Source type:
Connected equipment - model, type

Source info:
Optional information

List of NMEA Formatters:
Capitals, comma-separated

Slave IP Address:

UDP Port Number: 502

Modbus Blocks: 0

Enable advanced settings:

Configured memory blocks

Memory Type	Block Start	Block Length	Polling Interval(ms)	Remote Slave Id	Add
-------------	-------------	--------------	----------------------	-----------------	-----

Slave IP address

The IP address of the slave must be entered here. An appropriate network interface for the slave must exist (see section 4.14.9).

UDP port number

The UDP port on the Modbus slave. Note that 502 is the default port number according to the most common Modbus standards.

The remaining parameters specific to Modbus are not described in this manual.

4.8.8 Configuration of Modbus slave, UDP and TCP/IP

The screenshot shows a web browser window titled "Data over Network Page - Internet Explorer" with the address bar showing "http://10.0.0.100/cgi-bin/web_response.exe". The main content area is titled "Data over Network Page - Edit" and contains the following configuration fields:

- Active:
- Protocol Type: MODBUS Slave, UDP (dropdown menu)
- Channel#: NI200
- Channel id:
- Input data-type: NMEA (dropdown menu)
- Source type:
- Connected equipment - model, type:
- Source info:
- Optional information:
- Network Interface(s): All Data Network Interfaces (dropdown menu)
- List of NMEA Formatters:
- Capitals, comma-separated:
- UDP Port Number: 502
- Modbus Blocks: 0

Below the configuration fields, there is a section titled "Configured memory blocks" with a table header:

Memory Type	Block Start	Block Length	Add
-------------	-------------	--------------	-----

The browser window also shows "Submit" and "Back" buttons at the top of the form area, and a zoom level of 100% at the bottom right.

Network Interface

Up to six virtual network interfaces for receiving data may be enabled (see section 4.14.9). It is possible to utilize any network interface or select a specific interface (recommended).

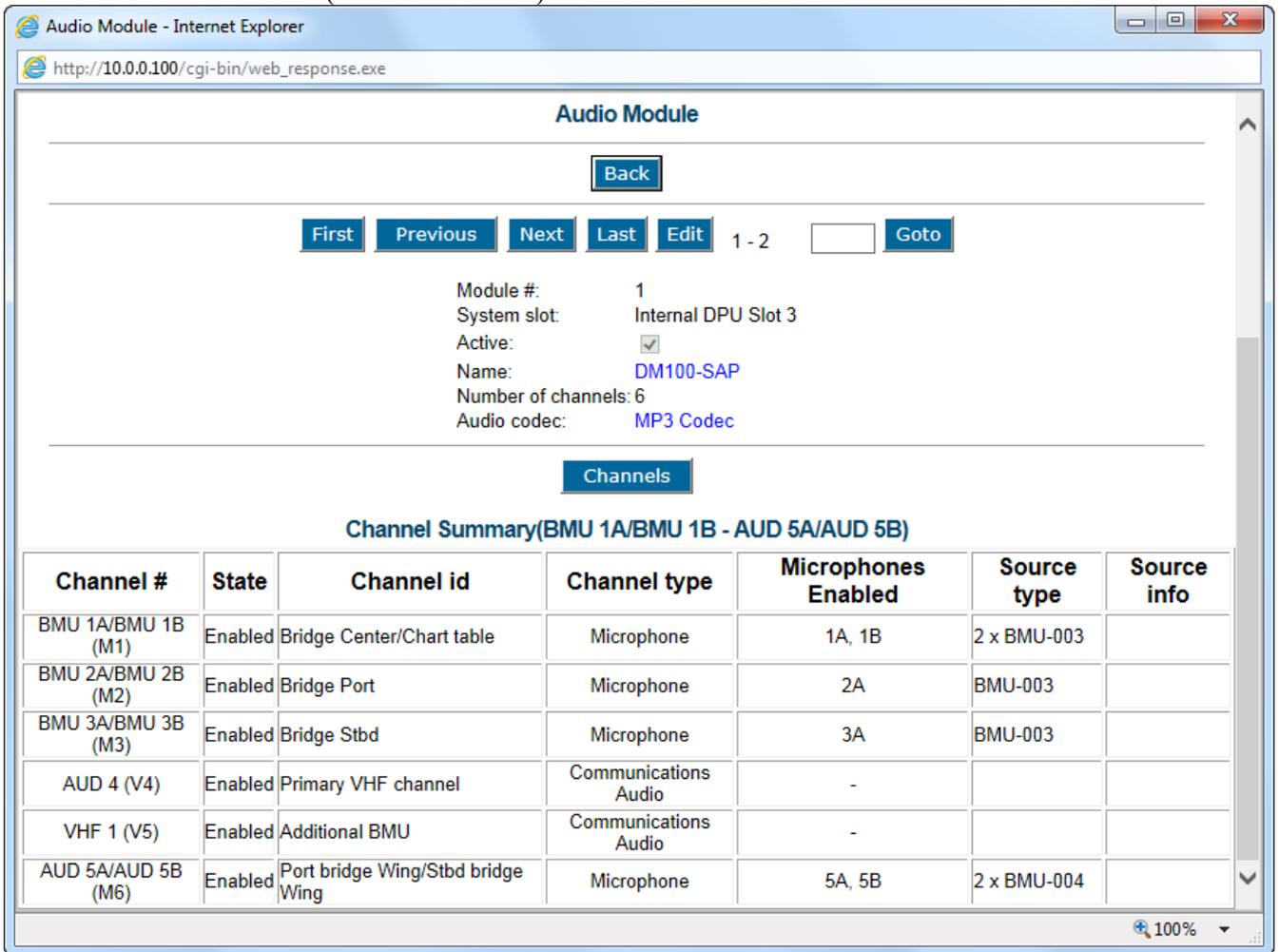
UDP port number

The UDP port the DM100 listens to, i.e. the Modbus master must address this port. Note that 502 is the default port number according to the most common Modbus standards.

The remaining parameters specific to Modbus are not described in this manual.

4.9 Configuration of audio channels

Select the audio submenu (click on “audio”) from the main menu.



Audio submenu

Click on Edit if you want to edit the parameters.

System slot

The “position” of the module.

Active

Used to enable/disable the audio module. Audio module #1 cannot be disabled.

Name

The name for the audio module (do not change).

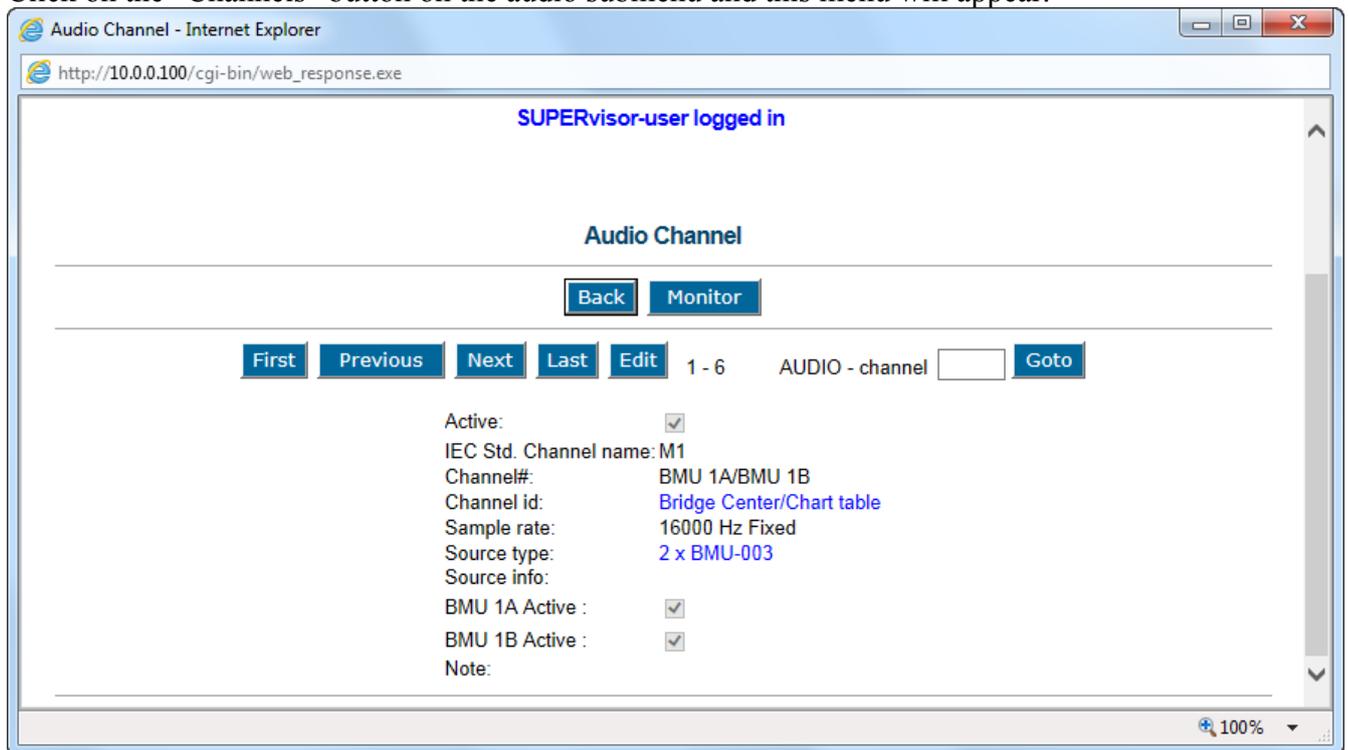
Number of channels

Informational only.

Audio codec

Informational only.

Click on the “Channels” button on the audio submenu and this menu will appear.



Click on “Edit” if you want to edit the parameters

Active

Used to disable/enable the channel.

IEC Std. Channel Name

The latest VDR standard calls for image channels are labeled using specific names. This information may be used when data is analyzed by the authorities and others.

Channel#

An unambiguous ID for the channel – this is the name which was defined before IEC defined standard names.

Channel ID

There are several descriptive fields related to the configuration for an audio channel. The text entered in this field will be used in conjunction with the replay software. The typical use of this field is to indicate the position of the BMU, e.g. center console.

Sample rate

Informational, cannot be changed.

Source type

Descriptive field, the type ID for the BMU is currently “BMU-003” for the indoor model and “BMU-004” for the outdoor model

Source info

Descriptive field

BMU nA Active

(n = 1,2,3,4 or 5 depending of channel).

This will enable the microphone test for the microphone.

BMU nB Active

(n = 1,2,3 or 5 depending of channel)

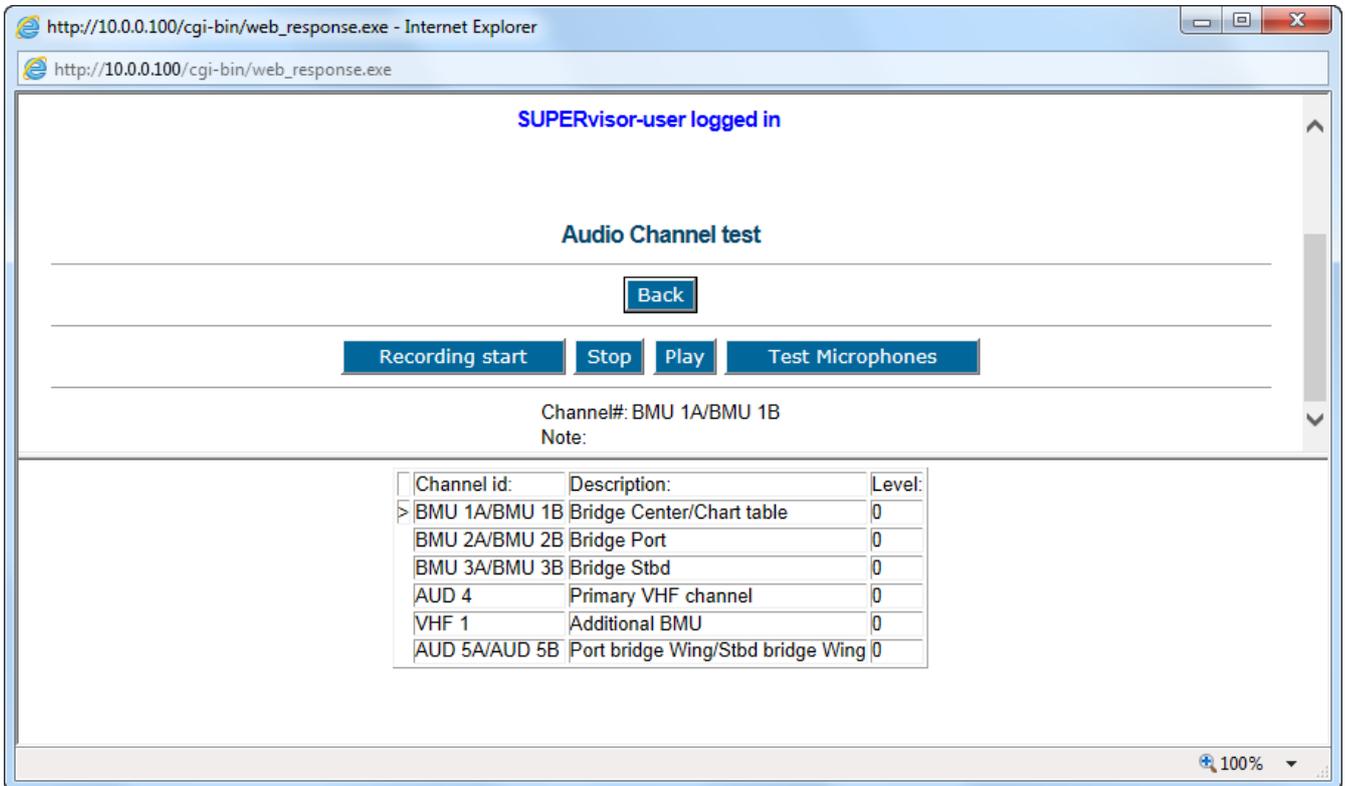
This will enable the microphone test for the microphone.

Note

Optional informational text.

4.9.1 Test of audio

Click on the “Monitor” button and the audio test tool will appear.



Audio level monitor:

The audio level monitor at the bottom of the page shows the current audio level for the BMUs. The VDR is able to record up to level 1023. The level must be well below 1023 when a normal conversation is taking place near a BMU.

Test Microphones:

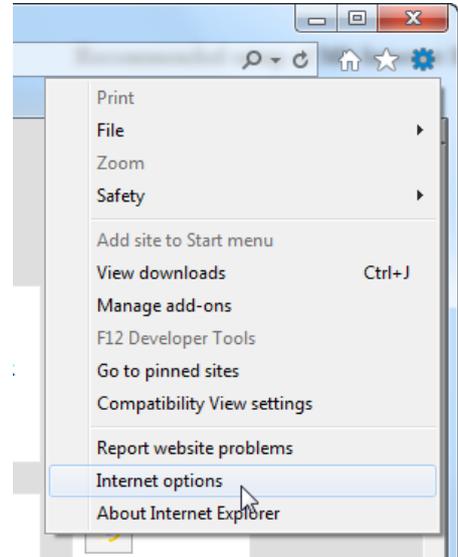
Begins the microphone test.

“Recording Start”, “Stop” and “Play” button:

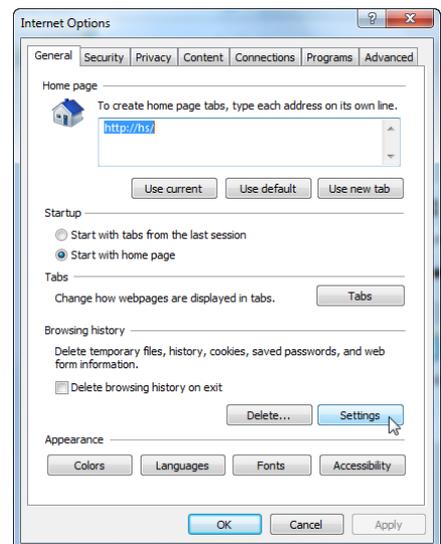
A sample of audio (maximum 60 seconds) may be recorded for evaluation.

4.9.1.1 Recommended setup of Internet Explorer before using the audio test tool

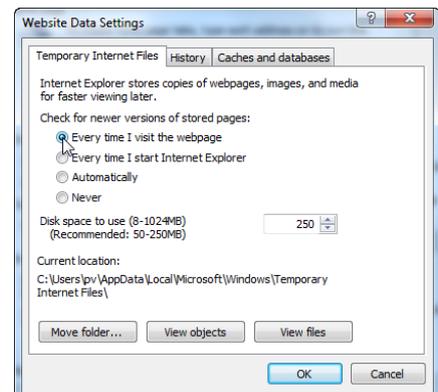
Click Internet Explorer options:



Click Internet Explorer settings:



Select "Every time I visit to the webpage":



4.10 Configuration of image channels

Select the image submenu from the main menu.

SUPERvisor-user logged in

Video Module

[Back](#)

[Edit](#)

Module #1 (VD1-2)
 DPU port or system slot: Unconfigured
 Name of RVI or Module: VIDEO 02-002
e.g. RVI 02-004, VIDEO 02-004D

Module #2 (VD3-4)
 DPU port or system slot: Unconfigured
 Name of RVI or Module: VIDEO 02-002
e.g. RVI 02-004, VIDEO 02-004D

Number of channels: 8

[Channels](#)

Channel Summary(VD 1 - VD 8)

Channel #	State	Channel id	Image input type	Settings	Image format	Source type	Source info
VD 1 (R1)	Enabled	S-band Radar	Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	Sband	Controlled by source	
VD 2 (R2)	Enabled	X-band Radar	Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	Xband	Controlled by source	
VD 3 (E3)	Enabled	ECDIS 1	Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	ECDIS.1	Controlled by source	
VD 4 (E4)	Enabled	ECDIS 2	Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	ECDIS.2	Controlled by source	
VD 5 (O5)	Disabled		Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	OTHER.1	Controlled by source	
VD 6 (O6)	Disabled		Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	OTHER.2	Controlled by source	
VD 7 (O7)	Disabled		Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	OTHER.3	Controlled by source	
VD 8 (O8)	Disabled		Network Multicast (IEC 61162-450)	VDRR1 (239.192.0.26:60026) Receive based on 'Class'	OTHER.4	Controlled by source	

Video submenu

The table on this page shows how the eight channels for recording images are configured. The VDR is per default configured to receive all image data using Ethernet and IEC 61162-450. Remote video interfaces may be utilized for capturing video for equipment which cannot send images using IEC61162-450.

4.10.1 Configuration of image channels

Click on the “Channel” button and the configuration page for the image channels will appear. The page for each image channel will look different depending on the settings for “Image input type”:

For configuration of analog video input, see section 4.10.5

For configuration of digital video input, see section 4.10.10

For configuration of input of images over Ethernet, see section 4.10.4

4.10.2 Connecting and configuring a Remote Video Interface

The VDR will typically utilize a Remote Video Interface which gets power from the VDR (PoE). This type of RVI must be connected to the RVI or RDI port on the DPU in the VDR.

However, it is also possible to power an RVI locally. A locally powered RVI must be connected to one of the LAN ports or SIU port on the DPU in the VDR main unit, see section 3.11.

The VDR configuration must be updated accordingly. Click on the Edit button.

DPU port or system slot

How the RVI is connected to the VDR must be specified here.

Video Module - Edit

Module #1 (VD1-2)

DPU port or system slot: Unconfigured

Name of RVI or Module:
e.g. RVI 02-004, VIDEO 02-004D

Module #2

DPU port or system slot: Unconfigured

Name of RVI or Module:
e.g. RVI 02-004, VIDEO 02-004D

The screenshot shows a configuration window titled "Video Module - Edit". At the top are "Submit" and "Back" buttons. Below are two module configuration sections, "Module #1 (VD1-2)" and "Module #2". Each section has a "DPU port or system slot" dropdown menu and a "Name of RVI or Module" text field. For Module #1, the "DPU port or system slot" dropdown is open, showing options: "Unconfigured", "DPU, RVI port RVI1", and "DPU, RDI port RVI2". Arrows point from these options to explanatory text on the right: "RVI w. PoE connected to the RVI port on the DPU" (pointing to "Unconfigured"), "Locally powered RVI#1 connected to LAN port on the DPU" (pointing to "DPU, RVI port RVI1"), and "RVI w. PoE connected to the RDI port on the DPU" (pointing to "DPU, RDI port RVI2").

Name of RVI or module

The VDR configuration must contain information about the VDR's hardware configuration.

If an RVI with PoE is used specify the type of RVI, for example RVI 02-004 or RVI 02-004D. This information is found on the front of the RVI.

4.10.3 Description of common parameters for an image channel

Image Channel - Edit

Submit Back

Active:

Transmit image to network:

Screen display ID prefix: R (RADAR)

Screen display ID: R1

Channel#: VD 1

Channel id: S-band Radar

Source type: Connected equipment - model, type

Source info: Optional information

Image input type: Network Multicast (IEC 61162-450)

Active

Used to enable/disable the image channel

Transmit image to network

This check box is used for enabling/disabling transmission of the image to the VDR Explorer when playing live data.

Screen display output ID prefix

Screen display output ID prefix according to IEC 61996-1 Ed. 2.0, 4.4.2h. The following prefixes are currently defined R = RADAR, E = ECDIS and D = non-dedicated display.

Screen display output ID

The VDR standard calls for image channels to be labeled using specific names. This information may be used when data is analyzed by the authorities and others. The “Screen display output ID” is a combination of the “Screen display output ID prefix” and the channel number.

Channel#

An unambiguous ID for the channel used by the VDR and VDR Explorer

Channel label

There are several descriptive fields related to the configuration for an image channel. The text entered in this field will be used in conjunction with the replay software. “Channel ID” shall be used for a “generic” description of the connected equipment e.g. “X-band RADAR at center”.

Source type

Mandatory descriptive field - must be used for unambiguously describing the equipment connected to this interface i.e. type, model.

Source info

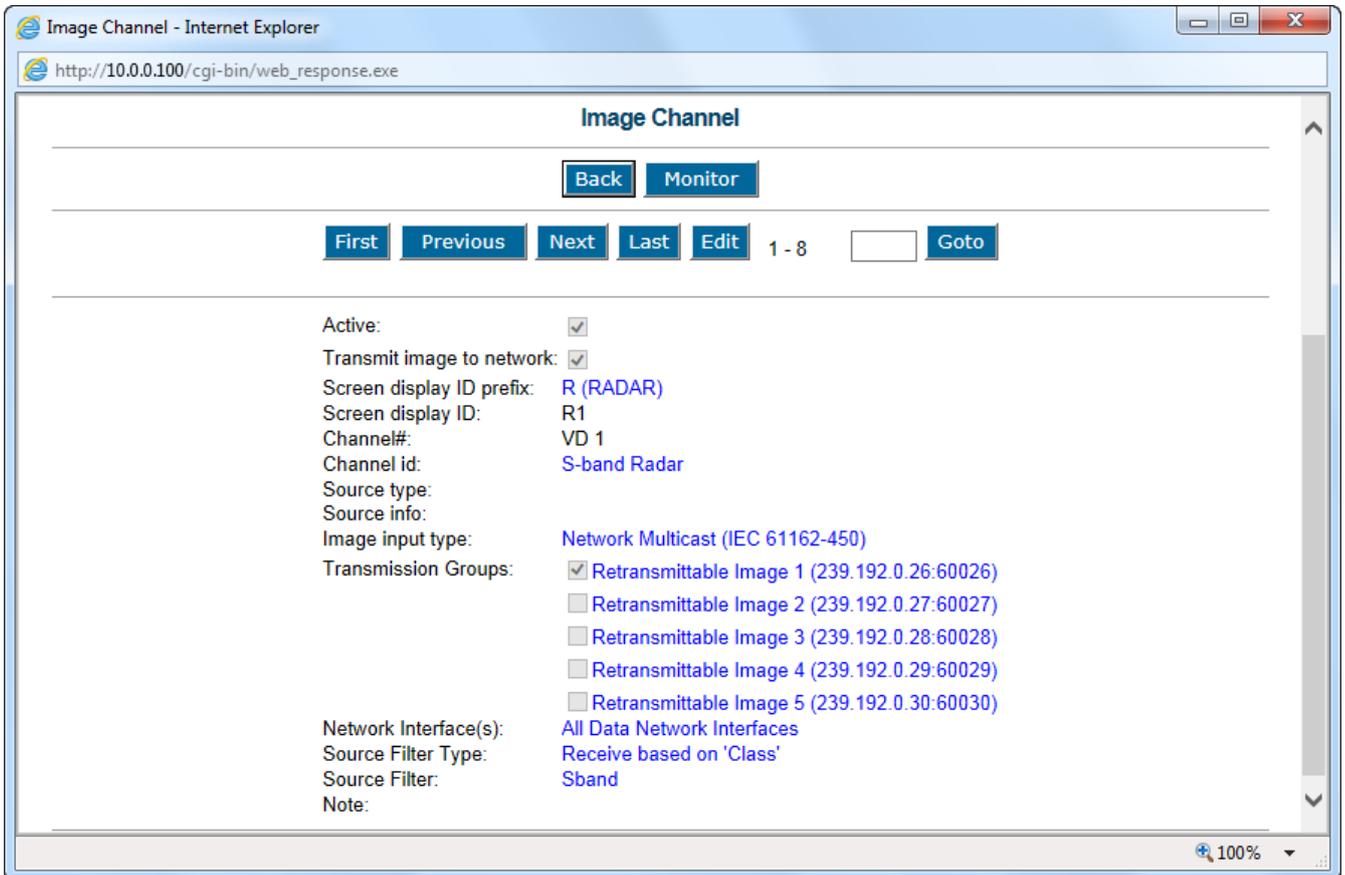
Additional optional information about the connected equipment.

Image input Type

Used to specify from which type of input the images are acquired. “Submit” must be pressed after this parameter is changed. The layout of the configuration page may change if input type is changed.

4.10.4 Configuration of image capture over Ethernet

This section is only relevant if “Image input type” is set to “Network multicast (IEC 61162-450)”



The first nine parameters are described in section 4.10.3

Transmission groups

Five transmission groups are allocated for transmitting images to a VDR. The first transmission group is the default. Only images belonging to the check-marked transmission groups will be recorded on this image channel.

Network Interface

Up to six virtual network interfaces for receiving data may be enabled (see section 4.14.9). An image channel may be configured to record images from all network interfaces or from one particular network interface.

Source filter type:

IEC 61996-1 Ed.2.0 takes into account that multi-functional workstations may be in use.
Consult IEC 61996-1 Ed.2.0 Annex E and F.

Receive based on source:

Only images belonging to a specific class will be recorded on this images channel, for example the images from all workstations showing S-band RADAR data. The name of the class must be specified in "Source Filter". A VDR must record minimum four classes of images: Sband, Xband, ECDIS.1 and ECDIS.2, i.e. minimum four image channels must be utilized.

Receive based on location:

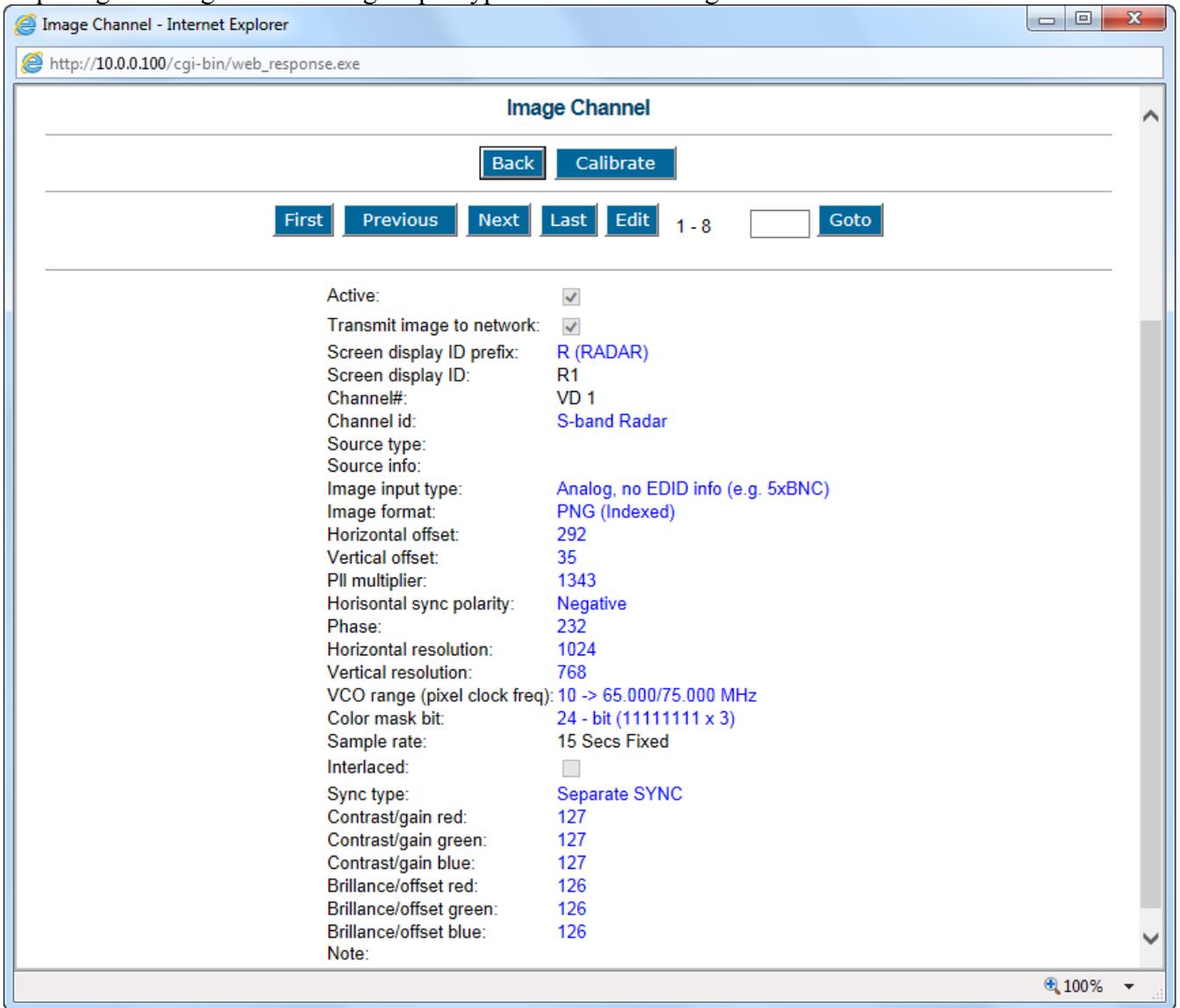
Only images from a specific workstation (location) will be recorded on this image channel.
"Location" must be specified in "Source Filter".

Source filter:

See "Source filter type".

4.10.5 Configuration of analog video

The section is only relevant if a Remote Video Interface supporting analog input is utilized for acquiring the image and if “Image input type” is set to “Analog”.



Select a channel and click “Edit” if you want to edit the parameters for an image channel.

The first nine parameters are described in section 4.10.3

Image format

The VDR can save the acquired images in two formats, indexed PNG or compressed TIFF. In general, indexed PNG is the best choice for computer generated images.

Horizontal offset

Used to shift the image left (higher value) and right (lower value).

Vertical offset

Used to shift the image up (higher value) and down (lower value).

PLL multiplier

Determines the horizontal size of the image (larger value → larger image).

Horizontal sync polarity

Must be set to what is specified for the radar.

Phase

Used “Phase” to align the time of sampling with the center of the pixels. Must be adjusted correctly (experimental) to enhance the sharpness of the image.

Horizontal and vertical resolution

Must be set to what is specified for the radar.

VCO range

The VCO range is normally determined from the other parameters. The VCO range must match the horizontal pixel clock. The hardware will be unable to capture images if the VCO range is wrong.

Non-interlaced:

Standard	Resolution	Refresh Rate (Hz)	Horizontal Frequency (kHz)	Pixel Rate (MHz)	VCO range
VGA	640 x 480	60	31.5	25.175	1
		72	37.7	31.500	2
		75	37.5	31.500	2
		85	43.3	36.000	4
SVGA	800 x 600	56	35.1	36.000	4
		60	37.9	40.000	6
		72	48.1	50.000	7
		75	46.9	49.500	8
		85	53.7	56.250	9
XGA	1024 x 768	60	48.4	65.000	10
		70	56.5	75.000	11
		75	60.0	78.750	12
		80	64.0	85.500	13
		85	68.3	94.500	14
SXGA	1280 x 1024	60	64.0	108.000	15
		75	80.0	135.000	16
		85	91.1	157.500	17
UXGA	1600 x 1200	60	75.0	162.000	18
		65	81.3	175.500	19
		70	87.5	189.000	20
		75	93.8	202.500	21
	1920 x 1080	60	67.1	172.800	19
	1920 x 1200	60	74.7	193.200	20

For interlaced video where only resolution and field frequency* are known, find pixel rate using this table and divide it by 2. Use this number to determine the VCO range. E.g. 1024x768, field frequency = 75Hz. Pixel rate from table +78.750 ≈ 80.000/2 = 40.000 ⇒ VCO range = 6.

* Combined frequency for even and odd fields, which is also equal to vertical sync frequency. The vertical sync frequency is one of the data items in the front-end data (see section 4.10.6).

Color mask

Determines how many different colors are recognized.

If “Image format” is set to PNG:

“Color mask” has normally little influence on how well the image compresses if “Image format” is set to PNG. Set “Color mask” to 24 bits.

If “Image format” is set to TIFF:

“Color mask” should be set to match the color depth of the RADAR or ECDIS. Too many bits will make the image compression ineffective and may cause data overflow in the capsule (error codes 591-598). Most equipment works fine with 9 bits.

Contrast RGB

Used for changing the contrast of the captured radar images. A higher value will decrease the contrast of the image. The value 127 corresponds to a signal level equal to 0,75V which is the most commonly used signal level.

Brilliance RGB

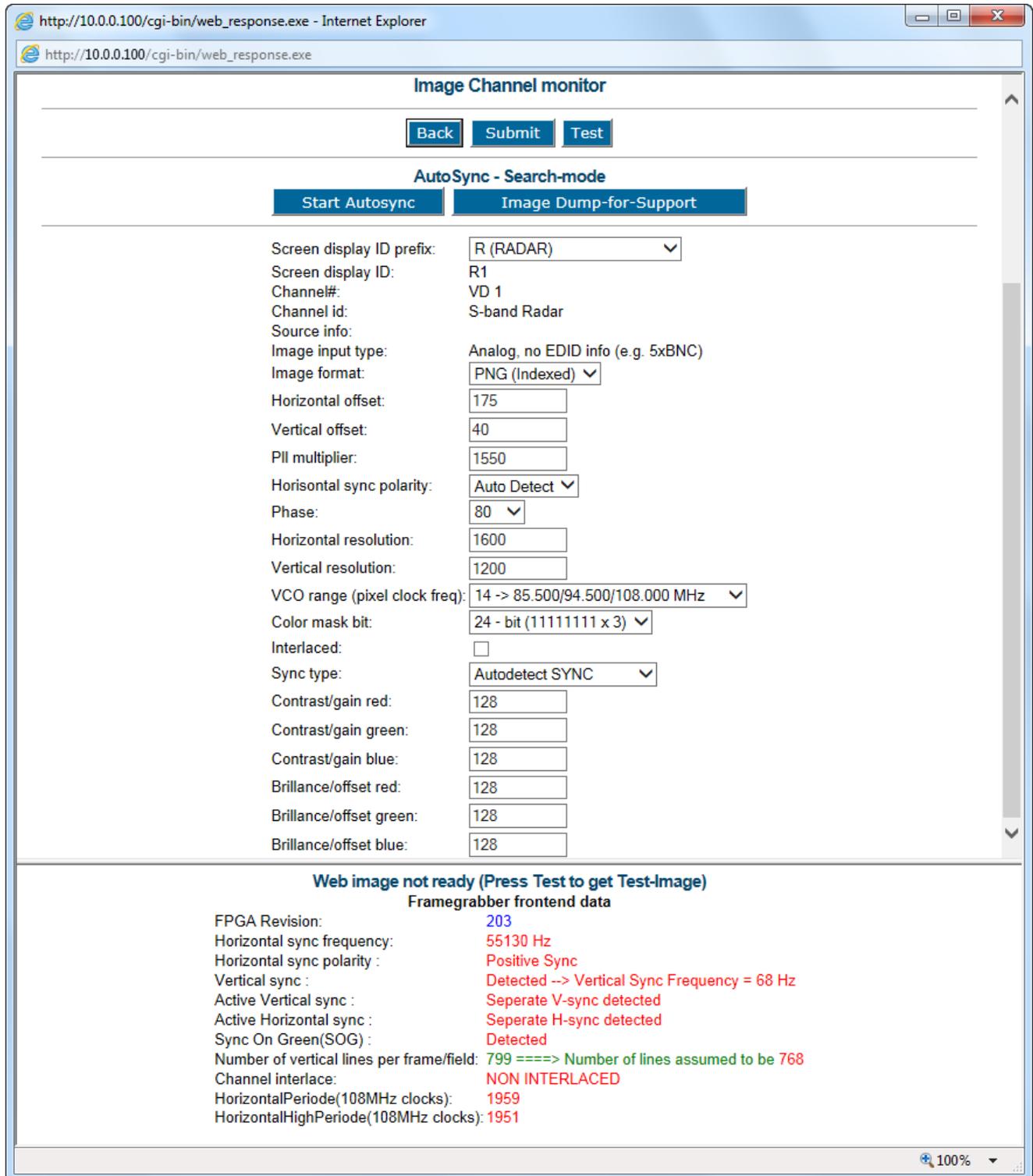
Used for changing the brilliance of the captured radar images. A higher value will decrease the brilliance of the image. The value 127 corresponds to the black level at 0V which is the most commonly used black level.

Note

Optional informative text.

4.10.6 Calibration of analog radar image

Click on “Calibrate” and the “Image Channel Monitor” will be displayed together with another browser window where the grabbed image is displayed. Arrange the two browser windows so switching between them is easily done (slightly overlapped). The settings for the Internet Explorer must be set as described in section 4.9.1.1.



Notice: The frame grabber front-end data is displayed in a second frame beneath primary frame.

4.10.7 Automatic calibration of radar image

The VDR is, under normal circumstances, able to perform an automatic image calibration. The radar must be switched on and set to display a stable image.

Notice:

This section is only relevant when a Remote Video Interface is utilized for acquiring the image.

4.10.7.1 AutoSync

Press “Start AutoSync” to start the AutoSync process. This will take approximately 15-30 seconds. No progress display image will be show during the AutoSync process. The acquired radar image will be displayed when the search is complete

Video Channel monitor

AutoSync - Search-mode

IEC Std. Channel Name:	R3
Channel#:	VD 3
Channel id:	UNDEFINED
Source info:	UNDEFINED
Video Input Type:	Analog, no EDID info (e.g. 5xBNC)

If the AutoSync process fails, try again. If multiple attempts fail, use the “Video Dump-for-support” button to download support data from the frame grabber. Send this to support@danelec-marine.com, alternatively make a manual calibration (see section 4.10.8)

4.10.8 Manual calibration of a radar image

Click on the test button and wait until the new image is grabbed.

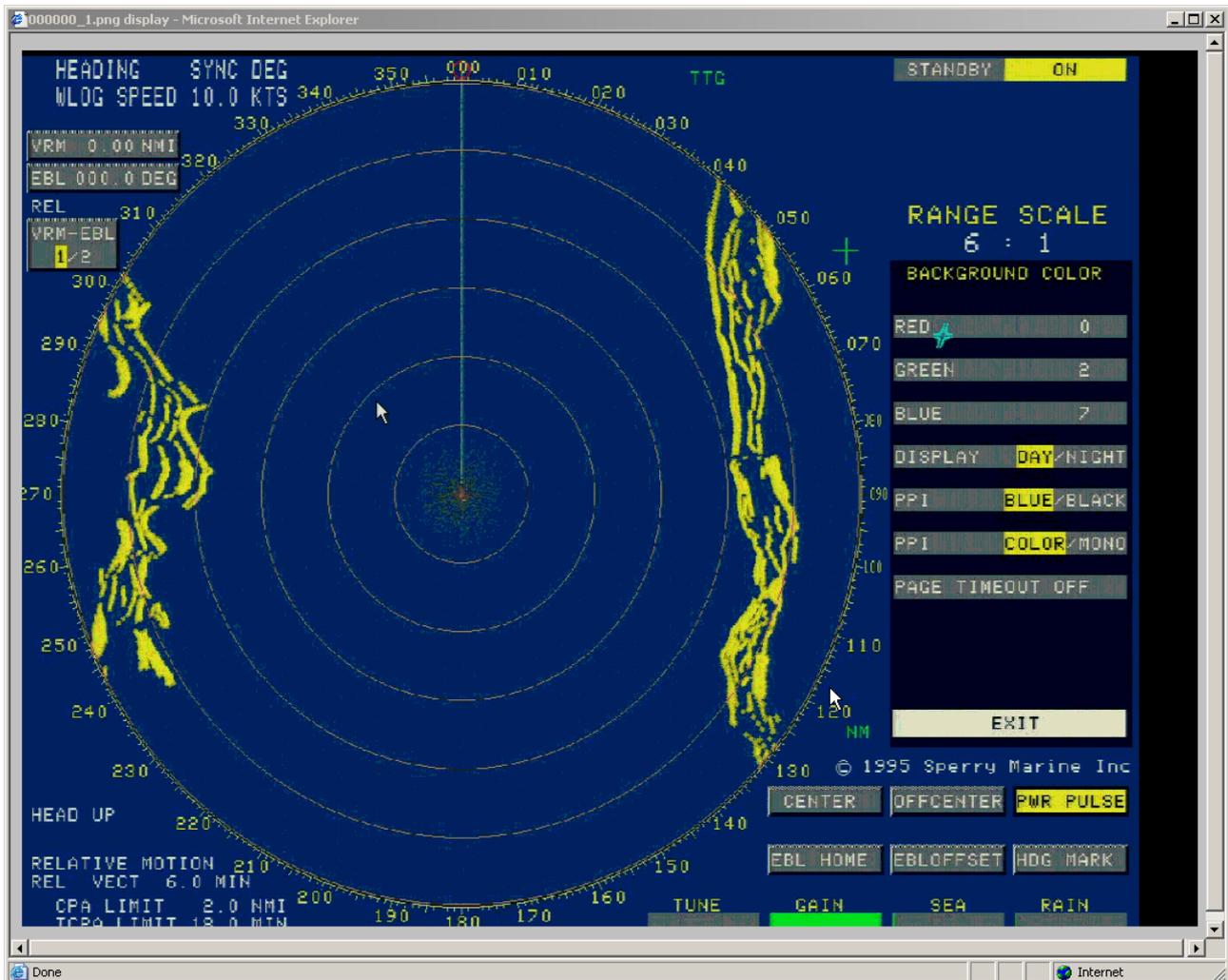


Image before calibration

The video channel is calibrated correctly if the image is sharp, exactly covers the black area, and if the colors, brilliance and contrast are ok. This image needs to be shifted up and to the right; it also needs to become wider. Colors, brilliance and contrast appear to be ok.

Installation Manual for DM100 VDR and DM100 S-VDR G2
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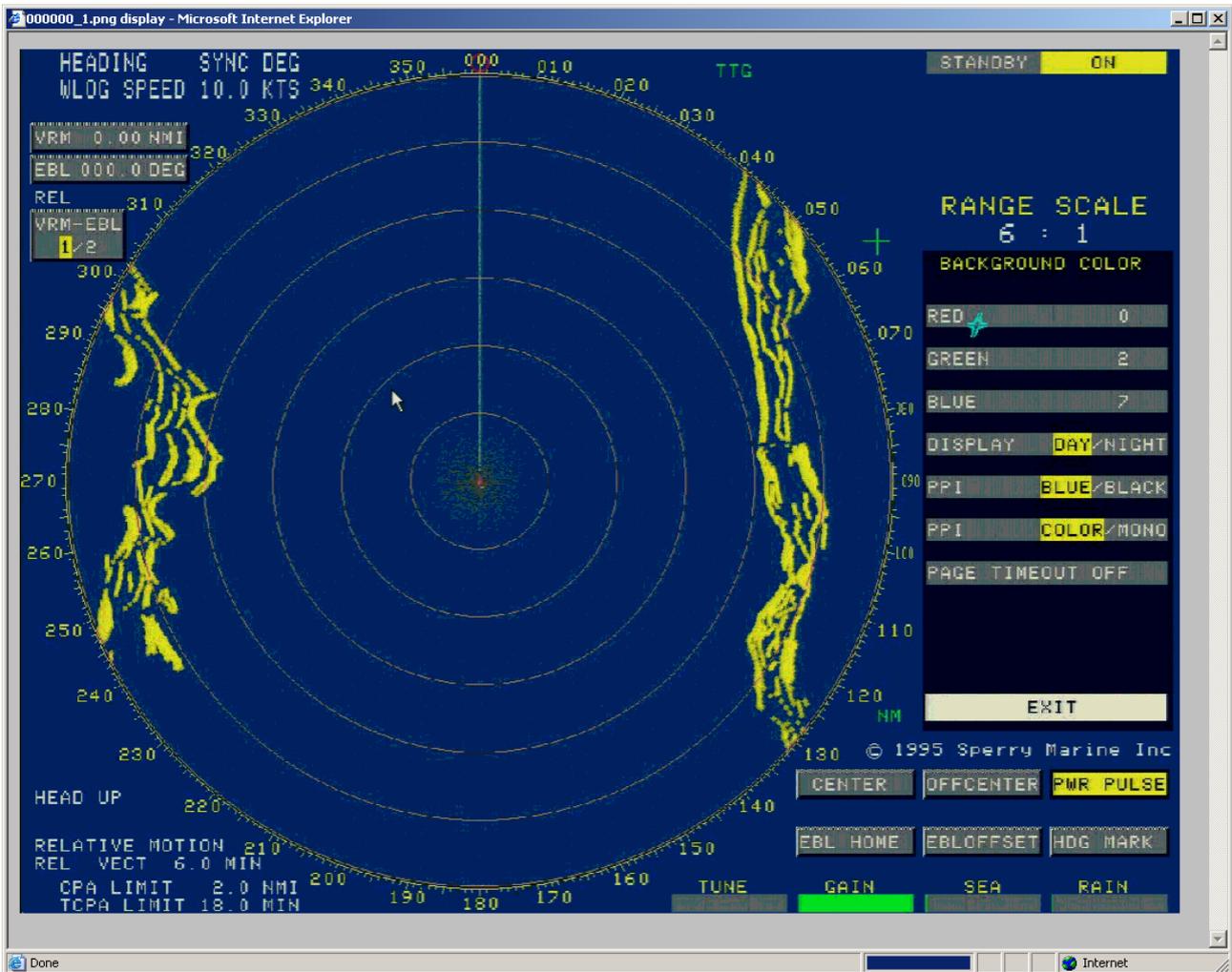


Image after calibration

AutoSync - Search-mode

Start Autosync	Video Dump-for-Support
IEC Std. Channel Name:	R1
Channel#:	VD 1
Channel id:	UNDEFINED
Source info:	UNDEFINED
Video Input Type:	Analog, no EDID info (e.g. 5xBNC)
Horizontal offset:	258
Vertical offset:	23
PLL multiplier:	1338
Horizontal sync polarity:	Positive
Phase:	32
Horizontal resolution:	1024
Vertical resolution:	768
VCO range (pixel clock freq):	12 -> 78.750 MHz

Configuration before

AutoSync - Search-mode

Start Autosync	Video Dump-for-Support
IEC Std. Channel Name:	R1
Channel#:	VD 1
Channel id:	UNDEFINED
Source info:	UNDEFINED
Video Input Type:	Analog, no EDID info (e.g. 5xBNC)
Horizontal offset:	265
Vertical offset:	26
PLL multiplier:	1359
Horizontal sync polarity:	Positive
Phase:	32
Horizontal resolution:	1024
Vertical resolution:	768
VCO range (pixel clock freq):	12 -> 78.750 MHz

Configuration after

If the image already covers the black area at the beginning of the calibration process then it might already fit.

Shift the image slightly to the left by increasing the value for horizontal offset by one, and check that a black vertical line appears to the right of the image

Shift the image slightly to the right by decreasing the value for horizontal offset by two (one from the original value) and check that a black vertical line appears to the left of the image. The image fits the black area if both black lines appear; remember to revert to the original value for horizontal offset.

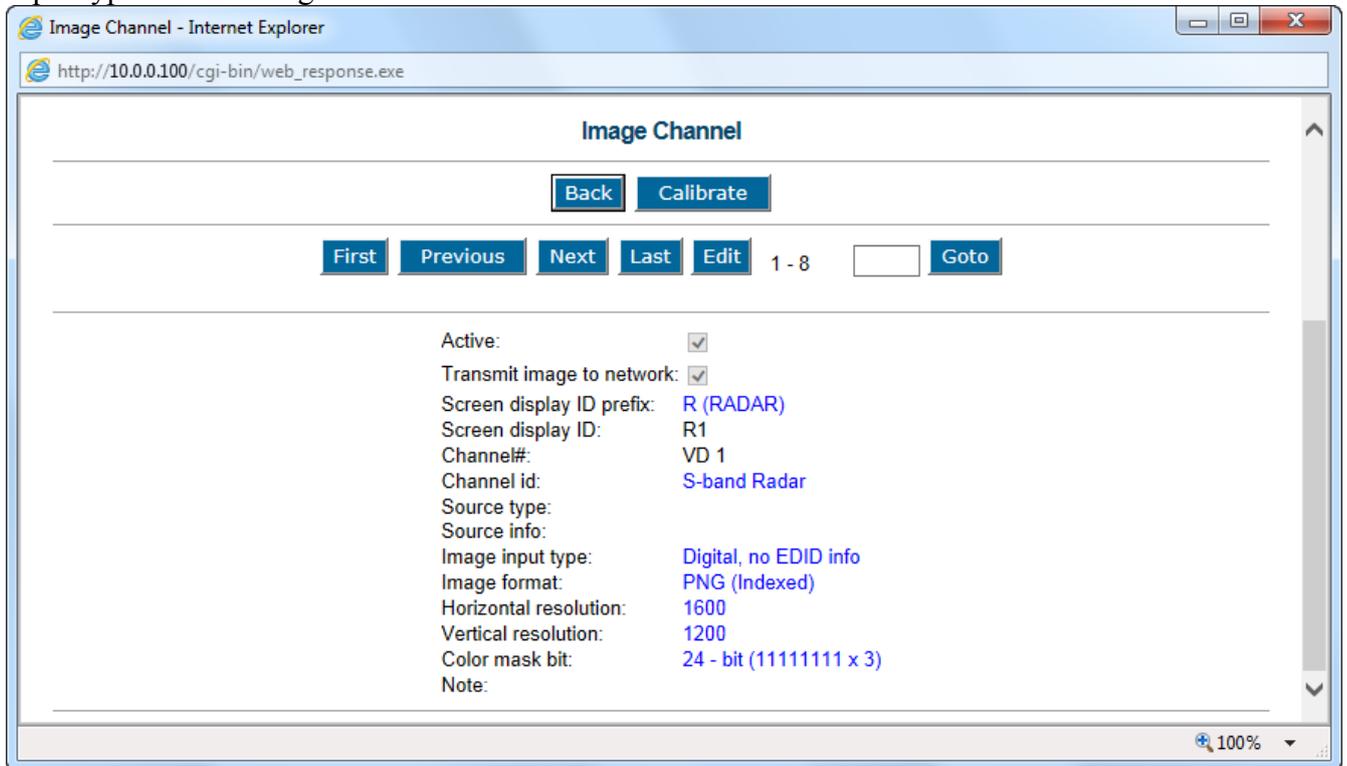
If the above test reveals that the image is too large, then it must be made smaller by decreasing the value for the PLL multiplier.

4.10.9 Hints for calibrating an unknown radar

- Use as much information as possible from the “frame grabber front-end data”.
- Set horizontal and vertical offset to low values.
- Try different values for PLL multiplier until a stable image appears.

4.10.10 Configuration of digital video (DVI)

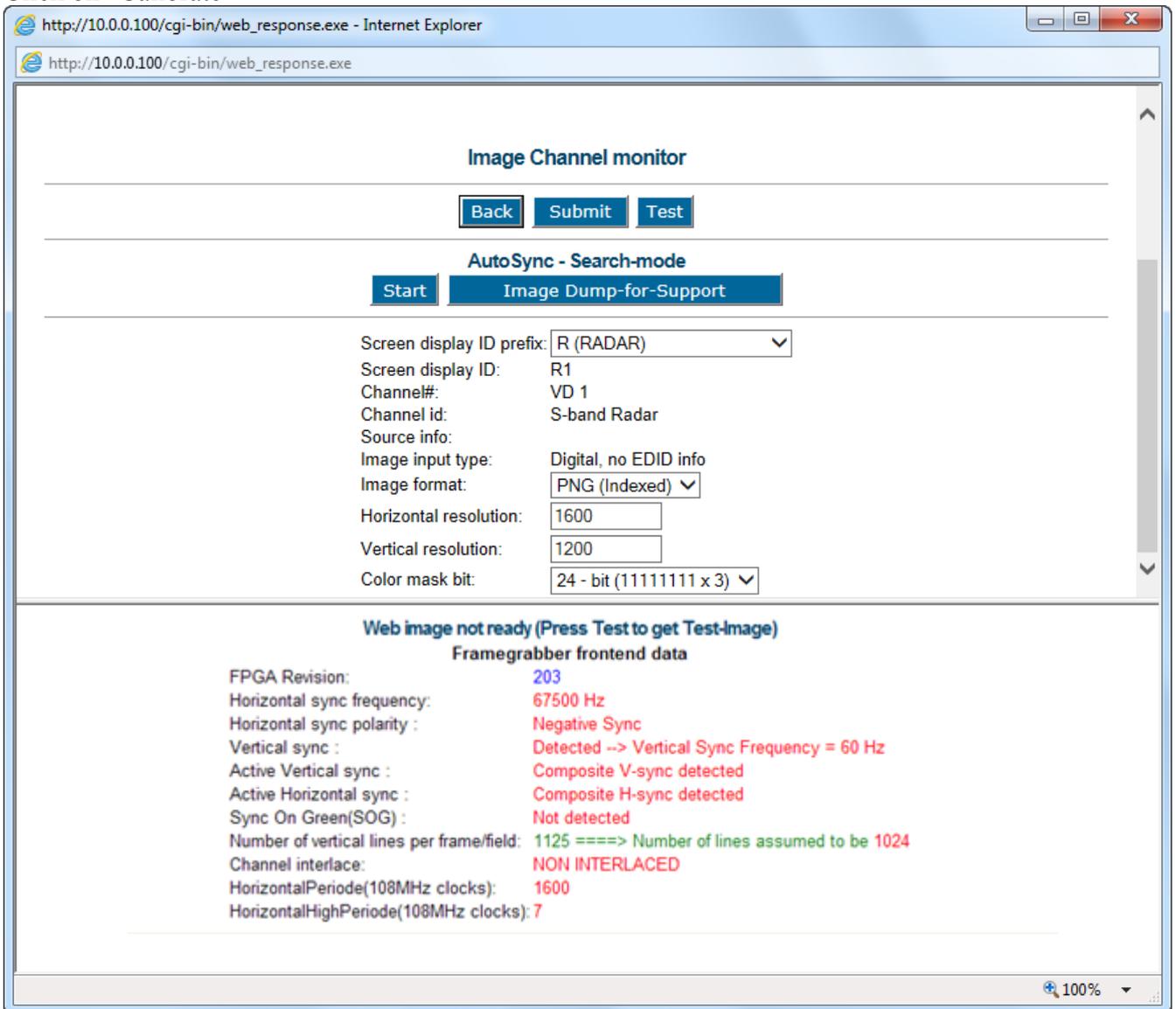
The section is only relevant if a Remote Video Interface supporting DVI is utilized and if Video Input type is set to “Digital”.



The definition of the parameters is explained in section 4.10.3 and 4.10. Horizontal and vertical resolution may be set automatically utilizing the “Calibrate” feature see section 4.10.10.1.

4.10.10.1 Calibrating digital Video

Click on “Calibrate”



The video module receives all necessary information from the DVI signal and the calibration process is very simple.

The RADAR must be switched on.

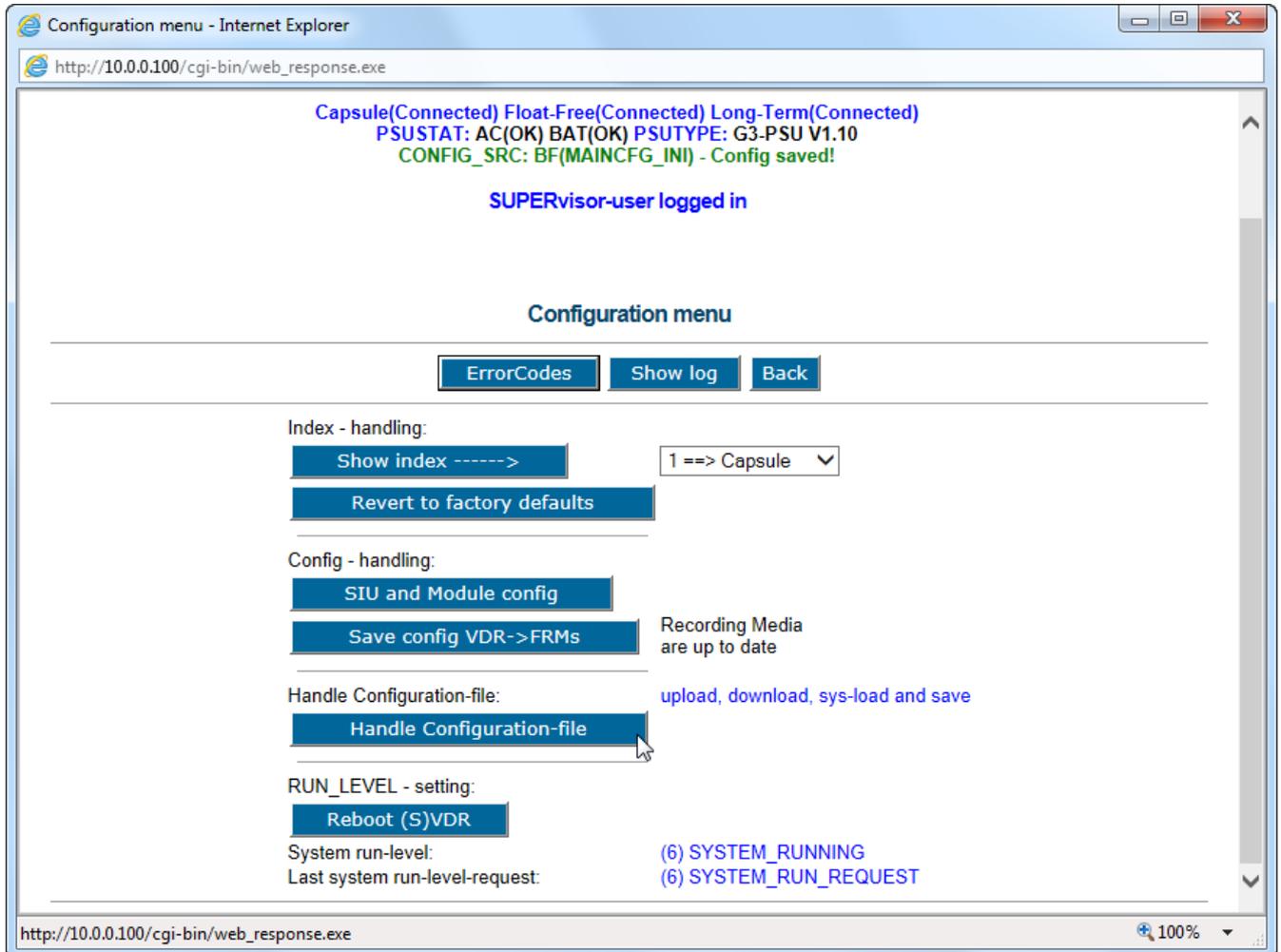
Click on “Start” and the current horizontal and vertical resolution will be transferred to the configuration. This can be saved at the end of the calibration process. Check that the resolution of the image corresponds to what is expected for the radar.

Check the quality of the acquired radar image, which appears in a separate browser window (if no image appears, click on the “Test”). The settings for the Internet Explorer must be set as described in section 4.9.1.1.

Click on “Submit” and the horizontal and vertical resolution will be saved.

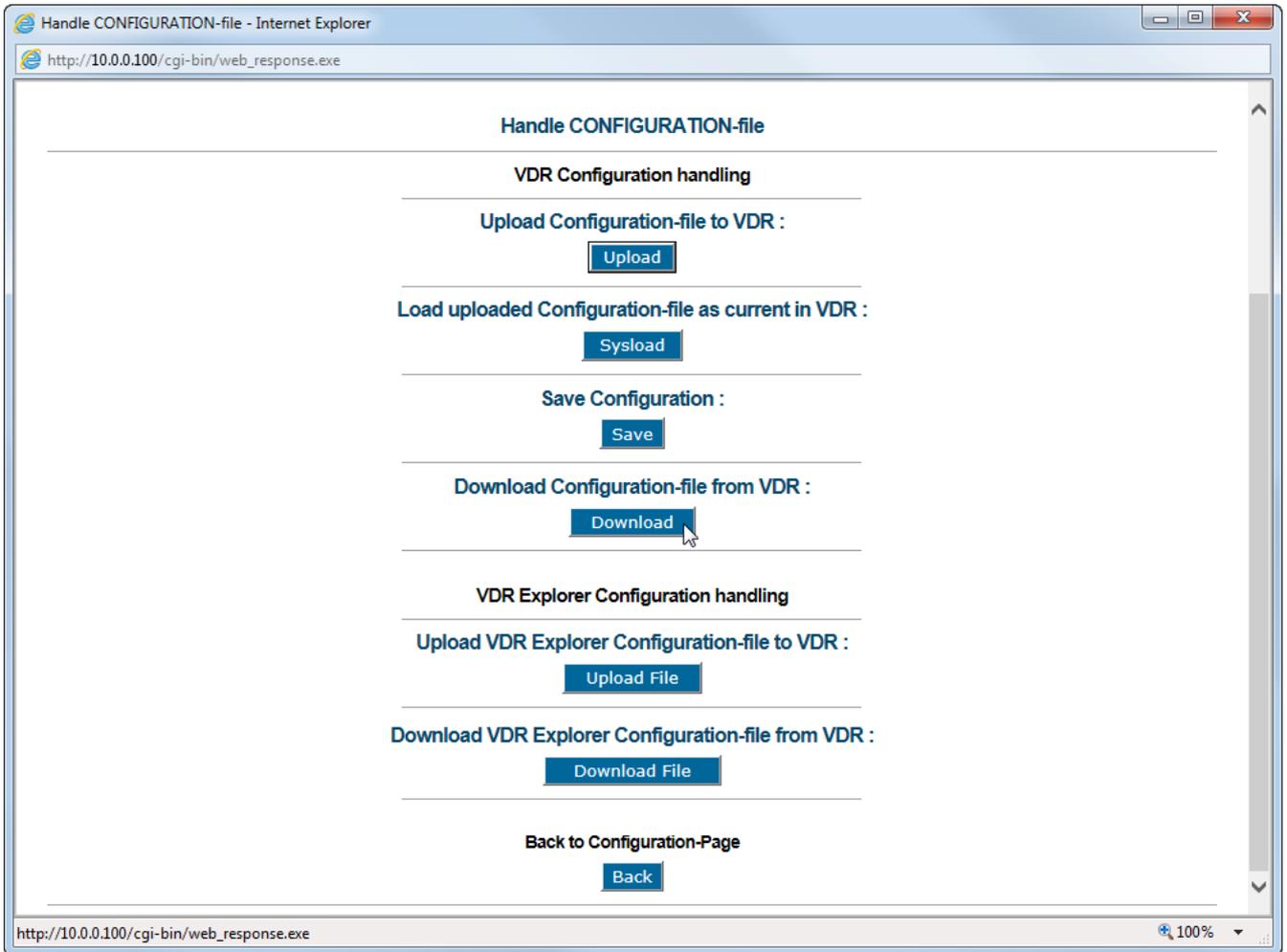
4.11 Backup of configuration file

Select the “Configuration” submenu from the main menu (section 4.16) and then click on the “Handle Configuration-file” button.



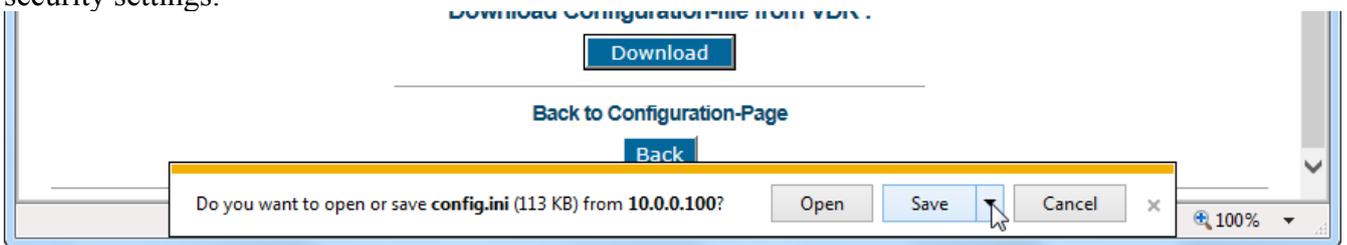
Click on “Handle Configuration-file”

Installation Manual for DM100 VDR and DM100 S-VDR G2
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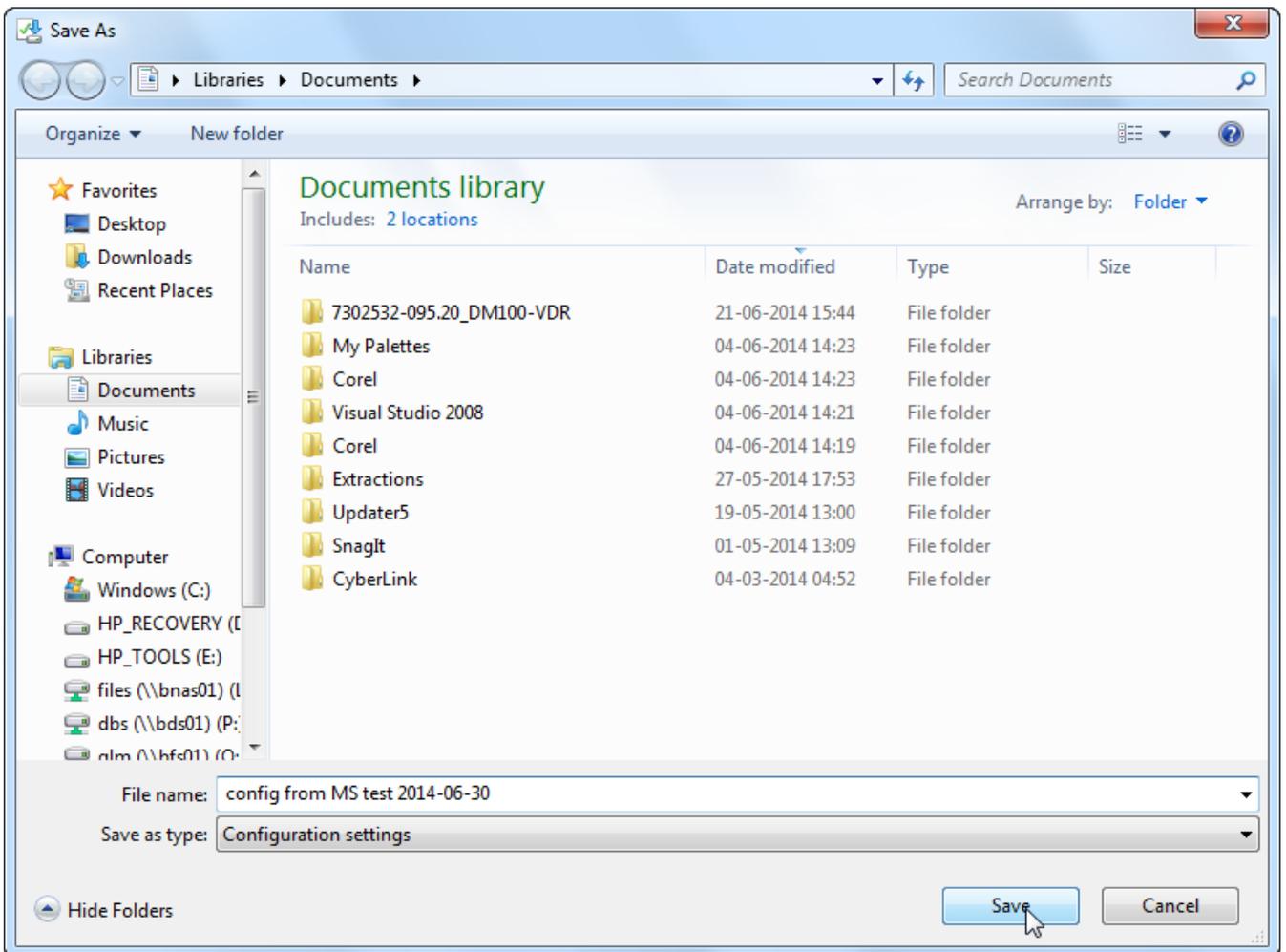


Click on the “Download” under “Download Configuration-file from VDR”.

The browser will respond with a dialog box depending on your browser, operating system and security settings.



Click on save as.

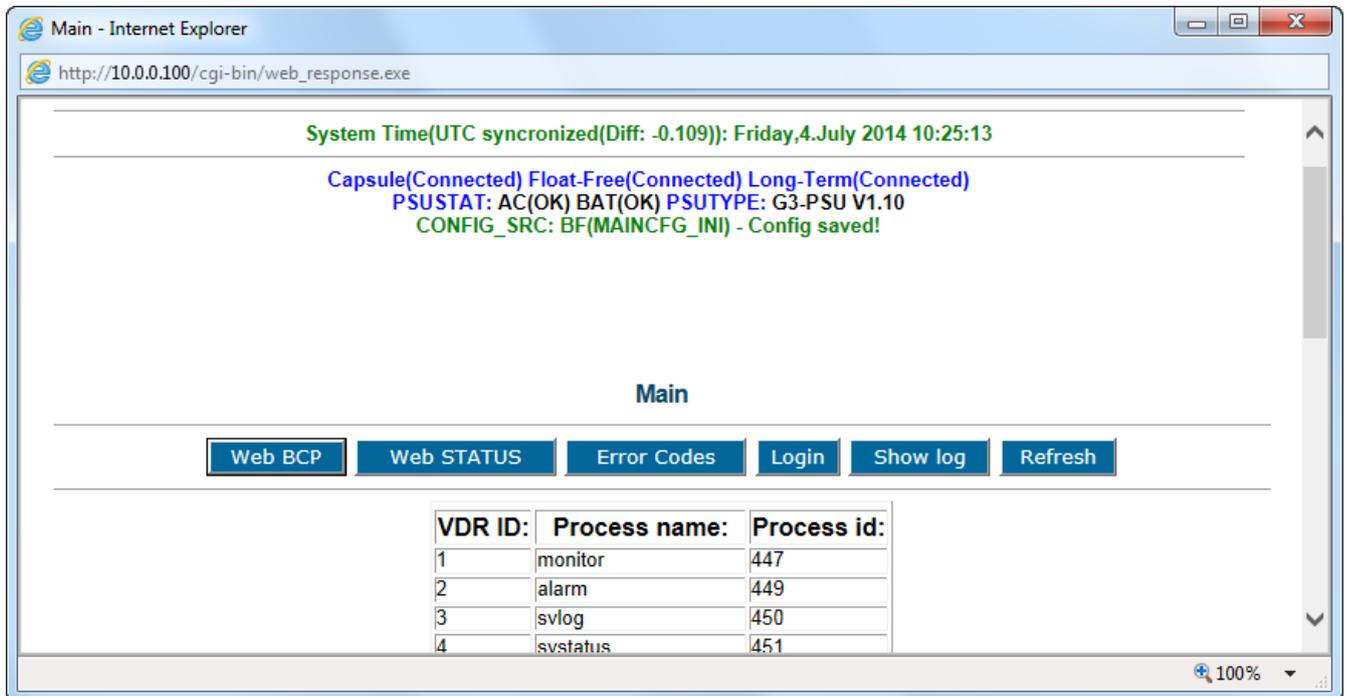


Select a suitable folder and give the file an unambiguous name, do not overwrite the file extension (.ini). Click on save.

How to restore a backup file is described in section 4.16

4.12 Detailed description of the Main page

The Main page is displayed when the configurator PC connects to the VDR. Some basic information about the VDR can be obtained without logging into the system. It is not possible to change the configuration or alter the functionality of the VDR from here.



Web BCP

An interactive image of the BCP will be displayed.

Web STATUS

A replica of the status image which is present on the VGA port on the DPU will be displayed.

Error Codes

A list of the error codes for the VDR will be displayed.

Login

Login to the system (see section 4.4).

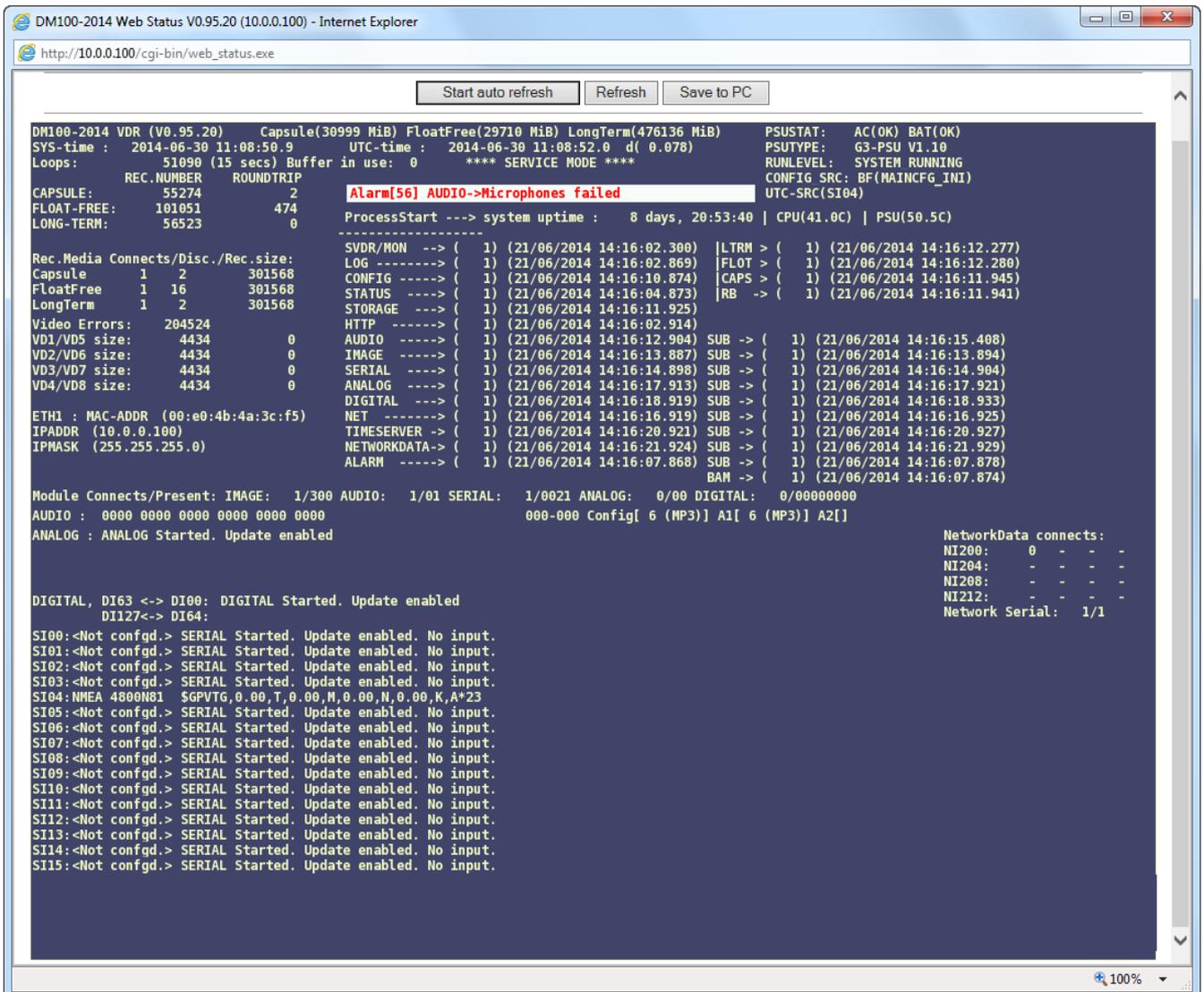
Show log

The latest 4000 entries from the system log will be displayed. This information is only useful for a trained service technician.

Refresh

Used to refresh the page.

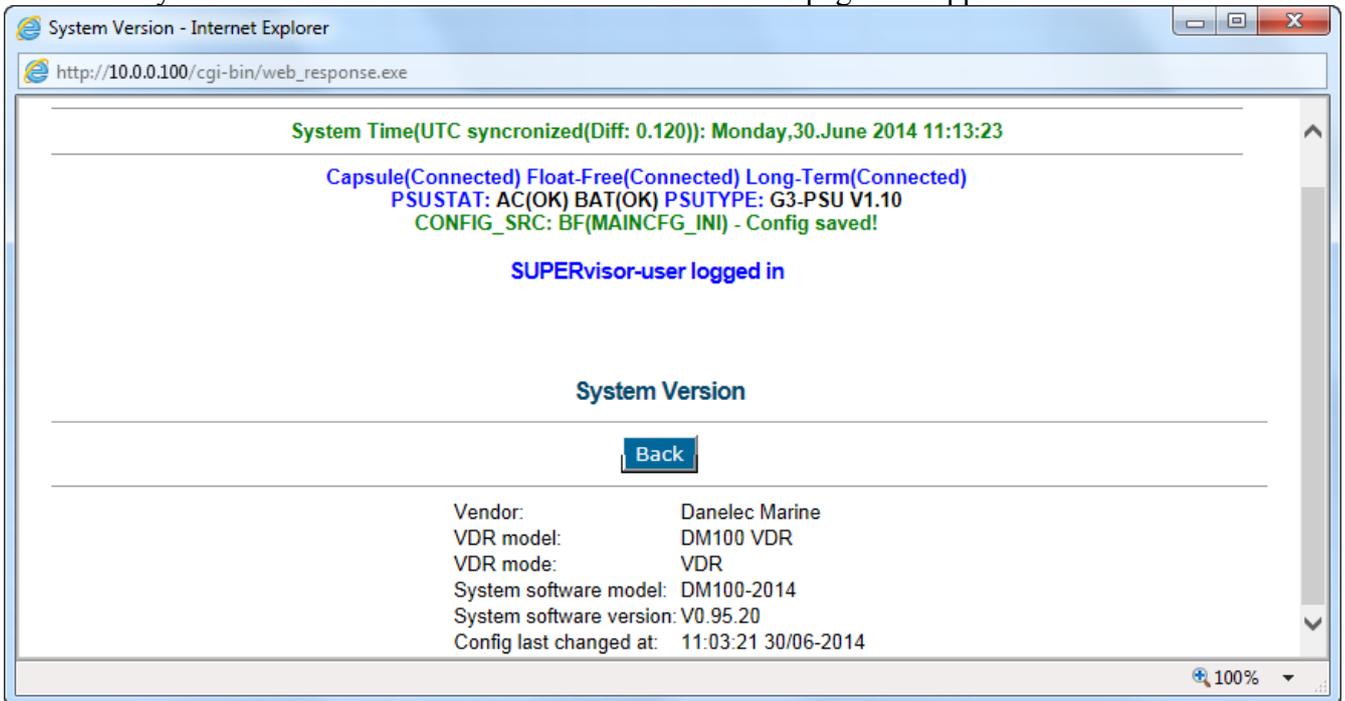
4.12.1 Web status image



The WEB-status image is a replica of the “Status image” which is available from the VGA output on the VDR. The status image displays essential system information, which may be useful during installation and debugging.

4.13 System Info Submenu

Select the System Info submenu from the main menu and this page will appear.



This page contains information about the software and cannot be edited.

4.14 Node configuration page

Select the Nodes submenu from the main menu and this page will appear

Node configuration

[Back](#)

[Edit](#)

Liveplay configuration

Enable multi-cast for Liveplay:

Multi-cast Group: 239.255.0.1

Valid multi-cast groups: 224.0.0.0->239.191.255.255 + 239.192.1.0->239.255.255.255 (default: 239.255.0.1)

Ethernet Capsule(s)

Fixed Capsule IP address: 192.168.239.100

Float-Free IP address: 192.168.239.101

IEC61162-450 Settings

Image communication mode: Compliant mode 2(1-based, multi-cast ACK to destination port)

SFI of image interface: VR0001

SFI of network data interface: VR0001

IGMP

Enable IGMP v3 support: Enabled

Bridge Alert Management Interface

Active:

Use serial connection (SI11):

Network Processor Syslog

Enable Syslog-transmission:

Syslog Multicast Group / IP: 239.192.0.254

Syslog UDP-Port: 514

NAS Backup

Enable extended external backup(NAS): Disabled

NAS IP address: 10.0.0.200

Default address is 10.0.0.200

NAS Retain Interval (days): 0

Audio Mute

Audio Mute Mode: Disabled

[Advanced Alert Settings](#)

[Network Interfaces](#)

Network Interface Summary

Interface	State	Name	IP/Subnet Mask	Ports						
				LAN 1	LAN 2	LAN 3	LAN 4	LAN 5	LAN 6	LAN 7
Configuration/VDR Data	Enabled	Local Config Network	10.0.0.100/255.255.255.0							
Network Interface 1	Enabled	Ship Network 1	192.168.5.101/255.255.255.0							
Network Interface 2	Disabled									
Network Interface 3	Disabled									
Network Interface 4	Disabled									
Network Interface 5	Disabled									
Network Interface 6	Disabled									
Ports available:										

75%

4.14.1 Liveplay configuration

“Enable multicast for Liveplay” must be enabled if the VDR is to send live data simultaneous to multiple replay stations. The feature must be disabled when the VDR is connected to a VRS.

4.14.2 Ethernet capsule settings

The IP addresses for the two capsules are shown here – they cannot be changed

4.14.3 IEC61162-450 settings

The system function ID for the VDR should not be changed (set according to the standard). However, the SFI for recording images and networks data may be optionally configured to not have the same value.

A number of versions and interpretations of IEC61162-450 are supported, “Compliant mode 2” is the newest and all equipment must eventually support this mode.

4.14.4 Bridge Alert Management Interface

If enabled, the VDR is able to communicate with a Bridge Alert Management system according to IEC 61924-2

The VDR can either communicate with a Bridge Alert Management system using serial interface SI11/SO11 or Ethernet.

The alerts in the in the ALF and ALC sentences sent by the VDR will have the following properties:

Alert category is Category C

Alert priority is Caution

The alert identifier is the error code defined in DBS11011 (Operator’s manual) plus 60000 (e.g. Alert 54 “PSU - Running on battery” will have alert identifier 60054)

4.14.5 Network processor syslog

As required by the IEC 61162-450 standard, the VDR is able to send syslog messages related to the IEC 61162-450 communication. See section 7 for details.

4.14.6 NAS backup

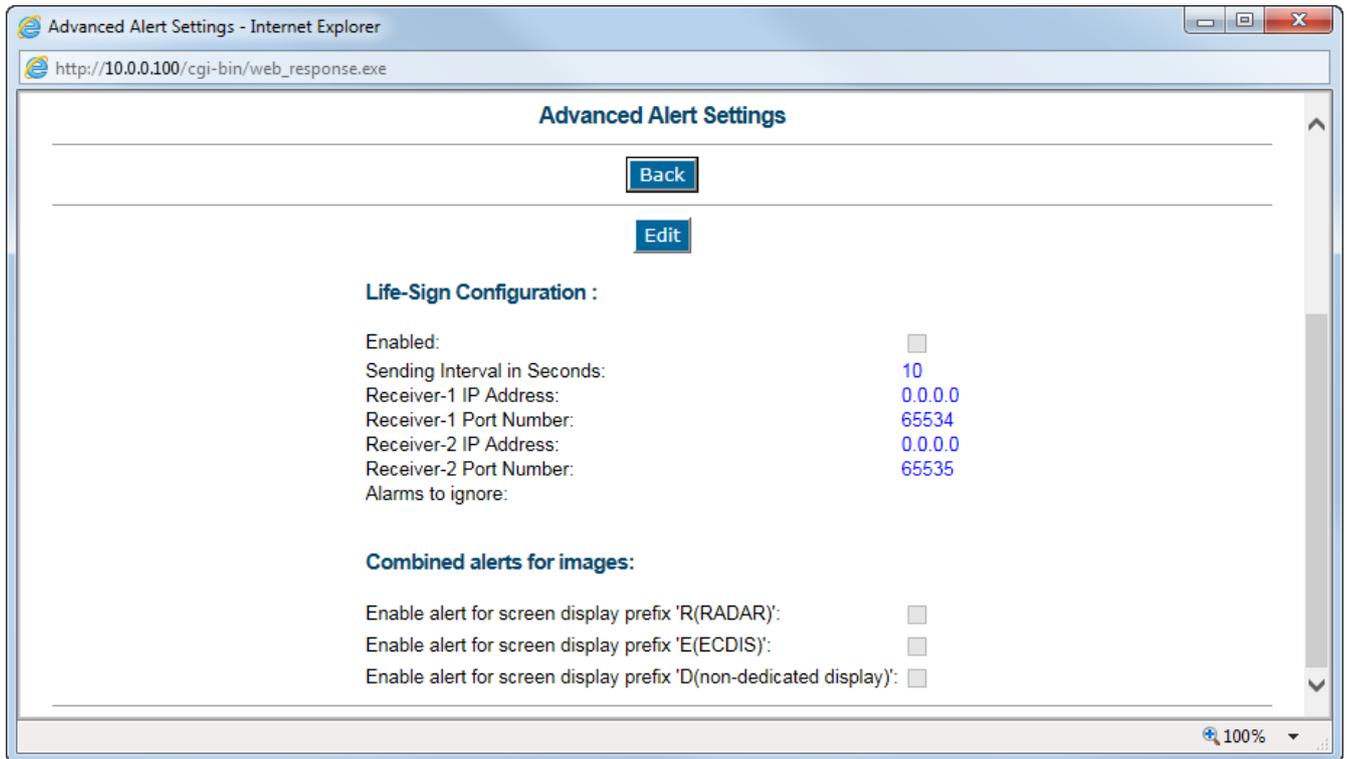
Parameters related to an optional external NAS for extended recording of VDR data.

When enabling the NAS functionality, a LAN port on the DPU for the NAS must be selected. Only LAN ports allocated for the “Configuration/VDR data” network interface can be used for the NAS. The NAS must be connected directly to that port; i.e. the port must not be shared with other equipment using a switch.

4.14.7 Audio mute

It is possible to disable recording of audio temporarily using a switch connected between Tx and Rx on the BCP connector (pin 1 to 3 and pin 2 to 4). This feature should only be used on naval vessels. While audio recording is disabled, caution 170 will be displayed by the BCP.

4.14.8 Advanced Alert Settings



Life-Sign Configuration

The VDR may be configured to send a life-sign (and UDP packet including an overall alert status) to another system.

Combined alerts for images

The VDR may be configured to generate an alert if images from a specific type of equipment (for example RADARs) are not received.

4.14.9 Configuration of network interfaces

It is possible to configure up to seven virtual network interfaces for the VDR. The “Configuration/VDR data” network interface is used for accessing the VDR’s configuration interface and is the “VDR data Interface” to be used by the investigation authorities.

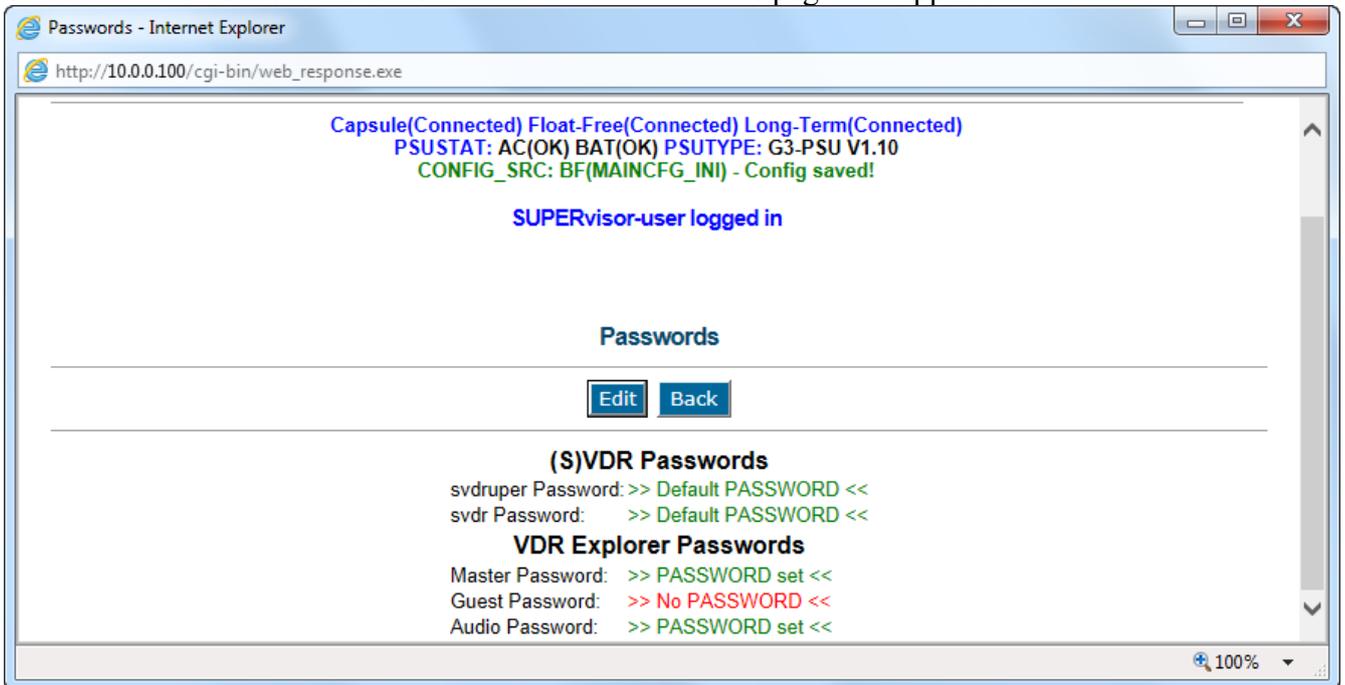
A label clearly showing the new IP address must be attached inside the door of the VDR main unit (the DAU) if the IP address is changed for the “Configuration/VDR data” interface.

The remaining six network interfaces may be used for capturing data sent to the VDR over Ethernet typically according to IEC 61162-450. An IP address and minimum one LAN port must be allocated for a network interface. The default configuration is a single “data capture interface” with six LAN ports allocated.

Note that the VDR will not switch or route data from one LAN port to another except for the possibility of accessing the optional NAS (when enabled) from any LAN port allocated to the “Configuration/VDR data” network interface.

4.15 Password Submenu

Select the Password submenu from the main menu and this page will appear.



svdrsuper Password

Authorizes access to read and change the configuration
The default password is: "danelec.."

svdr Password

Authorizes access to read the configuration and enables updates on the VGA status display
The default password is: "password"

VDR Explorer Master Password

Authorizes access to view live data from the VDR and to upload a new VDR explorer configuration to the VDR.
The default password is: "dsvdr.."

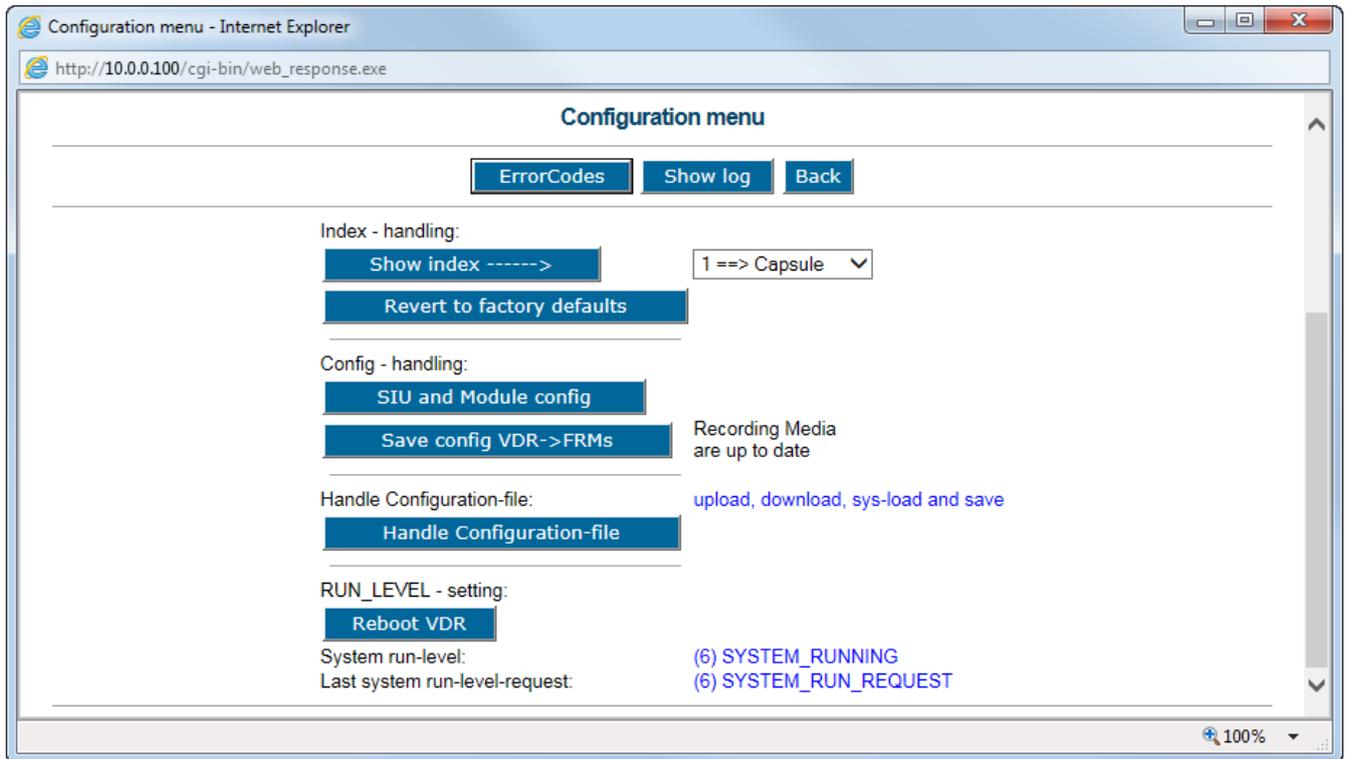
VDR Explorer Guest Password

Authorizes access to view live data from the VDR.
There is by default no password.

VDR Explorer Audio Password

This password, when set, will prevent unauthorized access to audio (both for live and recorded data). The replay software (VDR Explorer) will prompt the user for this password if any attempt to switch on audio is made. Audio will be inaccessible unless entered correctly.
The default password is: "44blokken"

4.16 Configuration submenu



Show index

The index of the selected drive will be displayed. This information is only useful for a trained service technician.

SIU and Module config

The location of the modules will be displayed. A tool for including and removing an SIU to/from to configuration is will be displayed. Consult the installation manual for the SIU.

Save VDR configuration to FRM

Configuration changes are normally not saved to the FRM until service mode is exited or after 10 minutes of inactivity. A click on this button will force the VDR to save the configuration changes immediately.

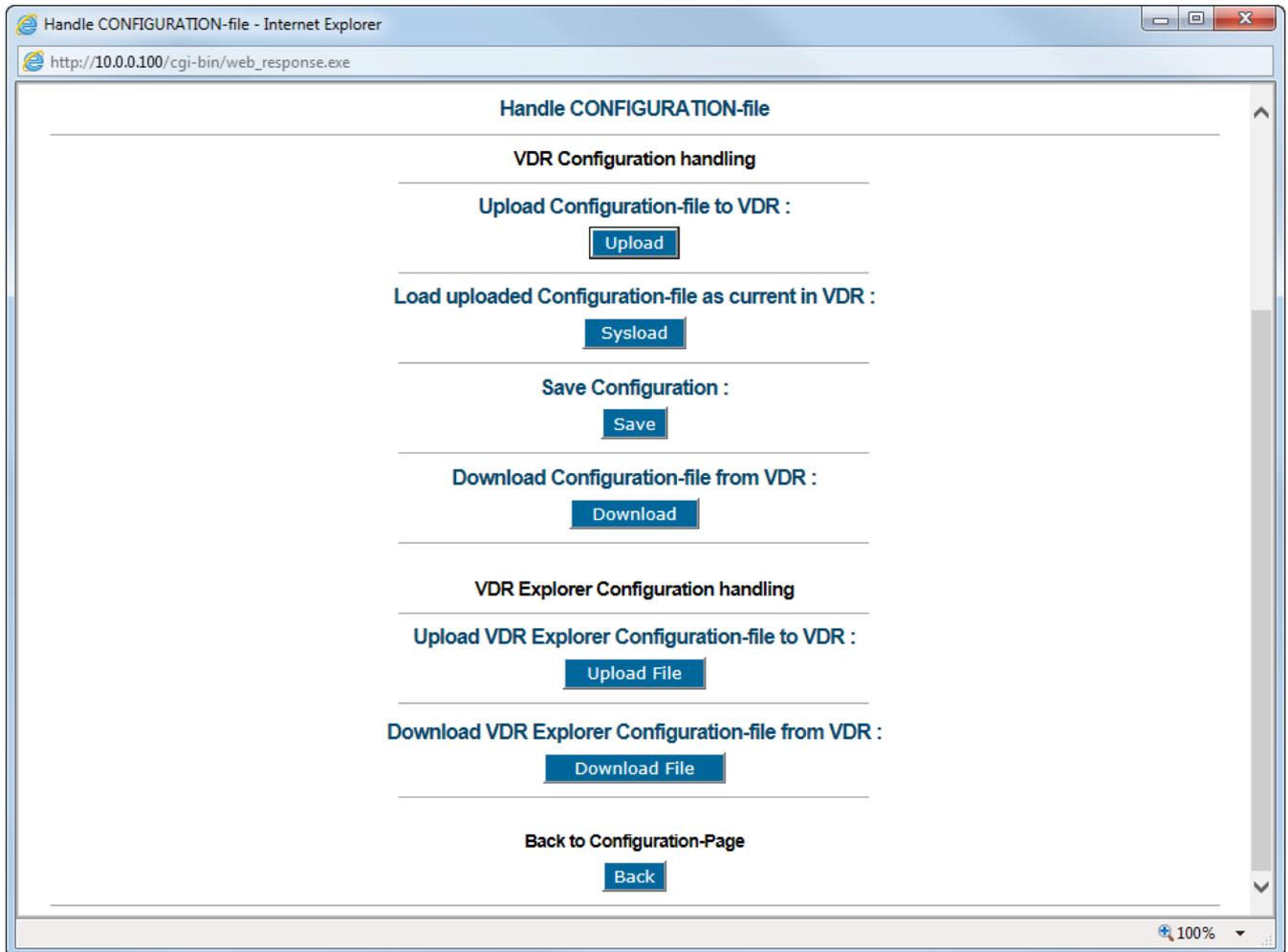
Handle Configuration file

This function is used for making or restoring a backup file of the VDR configuration. Consult section 4.16.1.

Reboot VDR

This button will reboot the system.

4.16.1 Handle Configuration-file



Upload configuration-file to VDR

This function may be used for uploading a previously stored backup of the configuration. How to make the backup file is described in section 4.11. The file will just be uploaded into memory and will not have any effect until a “Sysload” is executed.

Load uploaded configuration-file as current (configuration) in VDR

This function will force the system to use the uploaded backup configuration. The original configuration will NOT be lost until a “Save Configuration” or any submit is executed. If you don't want to use the new configuration then restart the system.

Save Configuration

The uploaded backup configuration will be stored permanently and the original configuration will be lost.

Download configuration from VDR

This is the recommended and secure procedure for making a backup of the configuration. Consult section 4.11 for details.

Upload of VDR Explorer Configuration-file to VDR

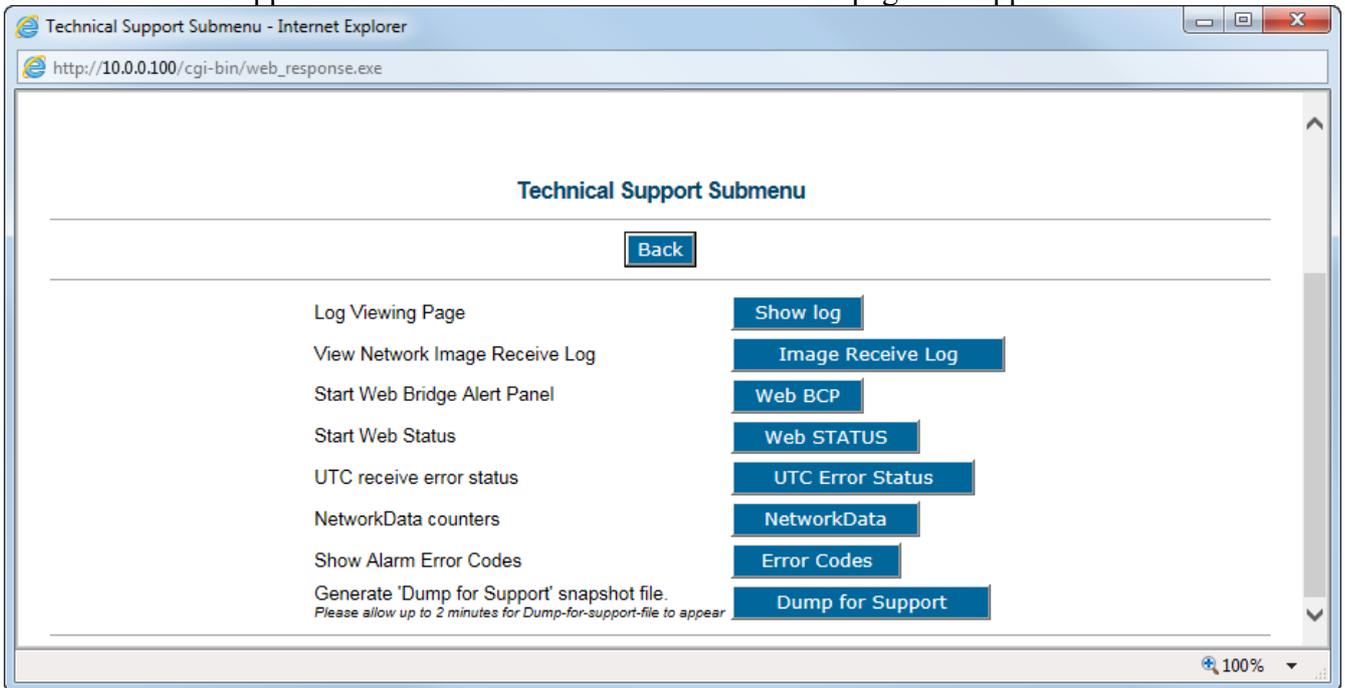
It is a prerequisite for carrying out a successful OPT that a correct VDR Explorer configuration is created and uploaded to the VDR.

Download of VDR Explorer Configuration-file to VDR

The VDR Explorer Configuration-file from the VDR may be retrieved, for example if changes to the configuration are required

4.17 Tech support submenu

Select the “Tech support” Submenu from the main menu and this page will appear



Show log

The latest 4000 entries from the system log will be displayed. This information is only useful for a trained service technician.

Image receive log

A log which contains information about the images received from the network (IEC 61162-450).

Web BCP

An interactive image of the BCP.

Web STATUS

A replica of the status image which is present on the VGA port on the DPU will be displayed.

UTC Error Status

List of errors related to the data received from the UTC source.

NetworkData

A list of the statistical counters related to IEC 61162-450; see section 7 for details.

Error Codes

A list of the error codes for the VDR will be displayed.

Dump for Support

“Dump for Support” is a feature which generates a file containing information from the VDR which can be used for troubleshooting, primarily by Danelec Marine.

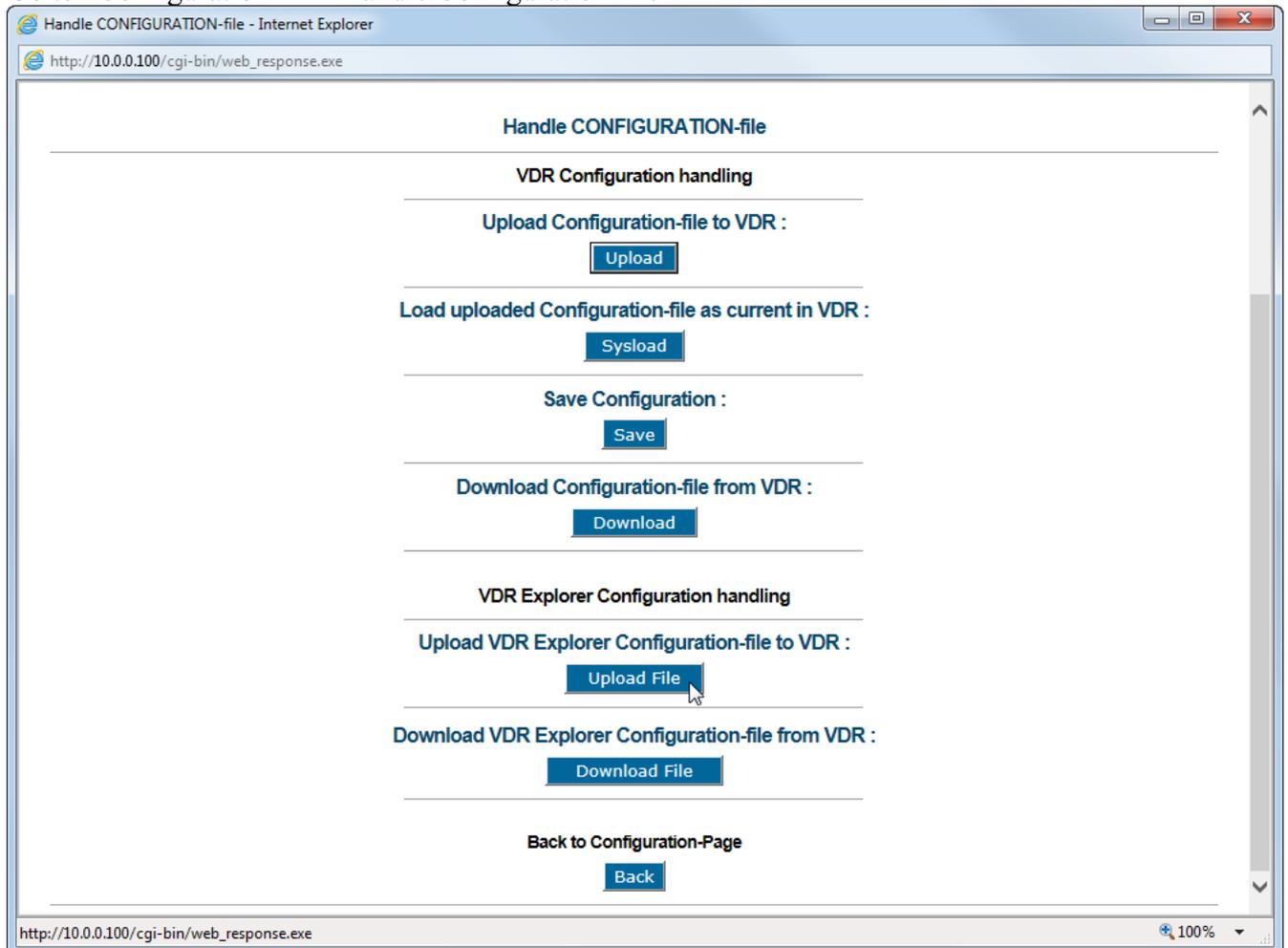
5 Verification of installation and configuration

The installation and configuration must be verified by carrying out an OPT and IPT

5.1 OPT (operational performance test)

It is a requirement that the VDR can pass an OPT. An OPT is started from the BCP. Note that it is a prerequisite for carrying out a successful OPT that a correct VDR Explorer configuration is made and uploaded to the VDR.

Go to “Configuration” -> “Handle Configuration-file”



Click on “Upload File”

5.2 IPT (installation performance test)

The APT tool must be used to verify the installation and configuration. The APT tool will generate a report for documenting that the VDR was installed and configured properly. The data captured by the APT tool must be sent to Danelec, who will issue an IPT certificate (or if requested an APT certificate which is typically needed following a retrofit).

6 Detailed specification of the IEC 61162-450 interface

6.1 Maximum data rate

The tables shows the maximum input rate under which the VDR can still perform all functions required by its performance standards specified as:

- a) Maximum number of datagrams per second received, intended for and processed by the equipment.
- b) Maximum number of datagrams per second received by, but not intended for the equipment.
- c) Maximum number of datagrams per second received by, but not intended for the equipment at 50 % of the maximum load for item a).

Network data (for example IEC61162-1 and NMEA sentences)

	Datagrams/sec	Kbytes/sec (mean rate over 10 second period)
a)	1000	8,4KB / Sec per channel* or a total of 68KB/sec in total
b)	2000	
c)	1500	8,4KB / Sec per channel* or a total of 68KB/sec in total

* See section

IEC 61162-450 image data (for example for RADAR and ECDIS)

	Datagrams/sec	Kbytes/sec (mean rate over 10 second period)
a)	350	500KB / Sec
b)	700	
c)	525	250KB / Sec

BAM communication (for Bridge Alert Management Systems)

	Datagrams/sec	Kbytes/sec (mean rate over 10 second period)
a)	1000	68KB/sec
b)	2000	
c)	1500	68KB/sec

6.2 Maximum datagram size

Network data (IEC 61162-1 and NMEA data) = 2KB

Image data (Re-transmittable binary image transfer) = 2KB

Bridge Alert Management = 64KB

6.3 Default parameters

Transmission groups:

Network data: IEC 61162-1 and NMEA data: VDRD (239.192.0.5:60005)

Image data: Re-transmittable binary image transfer (239.192.0.26:60026)

BAM: MISC (239.192.0.1:60001)

Default SFI = VR0001

Default IP address for data: 172.16.8.2

6.4 Syslog destination address

Multicast address 239.192.0.254, port 514

6.5 Supported transmission groups

Network data: (239.192.0.1:60001) - (239.192.0.16:60016)

Re-transmittable binary image transfer (239.192.0.26:60026) - (239.192.0.30:60030)

Bridge Alert Management: (239.192.0.1:60001) - (239.192.0.16:60016)

6.6 Handling of tag block parameters

g - Group control – Used to group a number of Lines together.

Grouping is supported when receiving Network Data (IEC61162-1/NMEA), and BAM messages.

Grouping is added to BAM output. (IEC61162-450 only)

s -Source Identification – The Source SFI

Network Data: The Source SFI is used for sorting the input data into network channels (NI200-NI215). Only the last source identification in a tag-block is used. If the source SFI does not match any configured channels, the sentence is not recorded.

BAM: The Source SFI must match what is specified in the VDR configuration.

d – Destination identification – The destination SFI

Network Data: If destination SFI present one destination, SFIs must match the SFI (for receipt of Network Data) of the VDR in order for the sentence to be recorded. If no destination SFI is present the sentence will be recorded.

BAM: If destination SFI present one destination, SFIs must match the SFI (for bridge alert management) of the VDR in order for the sentence to be processed. If no destination SFI is present, the sentence will be processed.

n – Line-count parameter – Sentence sequence counter

Network Data: This parameter is ignored

BAM: This parameter is ignored

t - Text string parameter – Proprietary data

Network Data: This parameter is ignored

BAM: This parameter is ignored

6.7 Recording

Network data:

Data is sorted into channels based on the source SFI and filtered based on destination SFI if present i.e. one destination SFI must match the SFI (for receipt of Network Data) of the VDR.

Image data:

Image data is recorded based on class or location.

If images from multiple locations within the same class are received, the images may be recorded round-robin on one track depending of the configuration.

All images from one location may be recorded on one track depending of the configuration.

One image may be recorded on several tracks depending of the configuration.

6.8 Supported sentences (IEC61162-1/NMEA)

Network Data:

Receive: Any

Transmit: N/A, the VDR does not transmit network data

Bridge Alert Management (BAM)

Receive: HBT, ACN

Transmit: HBT, ALC, ALF

6.9 Description of other network function, ONF

6.9.1 Web interface (configuration interface)

TCP/IP

Default IP address: 10.0.0.100/255.255.255.0

6.9.2 Live player

UDP or UDP Multicast (configurable)

When configured to UDP Multicast, one (configurable) IP multicast address within the following ranges is used: 224.0.0.0:239.191.255.255 or 239.192.1.0:239.255.255.255

Default IP multicast address: 239.255.0.1

6.9.3 IP addresses used internally by the VDR

192.168.239.x/255.255.255.0

The VDR cannot communicate with external equipment using these addresses.

6.10 Specification for Interface, connectors and cables

Interface	Max network segment link distance	Connector	Pin assignment	Cable category, minimum
1000BASE-T IEEE 802.3, Clause 40 (802.3ab)*	100m	IEC 60603-7-7, 8-way shielded modular connector. Refer to 802.3 Clause 3 and IEC 60603-7 Figures 1 through 5. See IEEE 802.3/25	The 8-way modular connector specified in IEC 60603-7 is the "8P8C" type that has commonly been used in desktop computer LAN connections and incorrectly but widely referred to as "RJ45". Wires are in the order 1, 2, 3, 6, 4, 5, 7, 8 on the modular jack; the same at each end of a cable. The color-order from wire 1 to 7 shall be green/white, green, orange/white, blue, blue/white, orange, brown/white, brown; the same at both ends of the cable. Refer to IEEE 802.3, 40.8.1 and IEC 60603-7-7.	CAT5 STP Four shielded twisted pairs ANSI/ TIA/EIA-568- A:1995 and ISO/IEC 11801:1995 (Class D).

* 100BASE-TX is implicit supported – auto negotiate.

7 Statistical counters related to IEC 61162-450

A number of error/traffic counters are implemented which are useful for managing the system and for troubleshooting. The counters may be displayed utilizing the BCP or the configuration interface on the VDR (Tech Support -> NetworkData).

The following references are used in this section

[1]	International Standard IEC 61162-450 Ed. 1.0 <i>Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection</i>
[2]	International Standard IEC 61996-1 Ed. 2.0 <i>Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorder (VDR) – Part 1: Performance requirements, methods of testing and required test results</i>
[3]	International Standard IEC 61162-1 Ed. 5.0 <i>Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talkers and multiple listeners</i>

7.1 Counters related to image capture

Header Error

“Number of unrecognized headers”

Description:

The counter for received datagrams with an invalid header as specified in 7.1.1, 7.1.2 and 7.3.9 [1]. Only datagrams with a 61162-450 header with the value of “RrUDP” including a trailing zero are considered a valid datagram for the Image Processor. “RrUDP” datagrams with a “Message Type” (see 7.3.3.5 [1]) other than DATA or QUERY are also considered invalid. Datagrams with an invalid header are discarded.

Syslog:

<131> - - 450-NF - 102 - Datagram header error from host: IP-address
Where IP-Address is the IP address of the transmitting equipment.

Retransmit Request Count

“Number of missing datagrams”

Description:

This counter is incremented each time a retransmit of an image-block is requested by sending an ACK message. This corresponds to the number of missing datagrams error counter, as specified in 7.3.9 [1].

Syslog:

<131> - - 450-VRxxxx - 104 - Missing image datagram
Where VRxxxx is the SFI for the VDR Image receiver.

Incomplete Images Count

“Number of images where errors occurred”

Description:

This counter is incremented if an image is not completely received before the sender starts sending another image. This corresponds to the number of image blocks where errors occur, as specified in 7.3.9 [1].

Syslog:

<131> - - 450-VRxxxx - 104 - Binary image error
Where VRxxxx is the SFI of the VDR Image receiver.

Complete Images Count

“Total number of images received”

Description:

This counter is incremented when a complete image is received.

Syslog:

No syslog message.

Duplicate Location Error Count

“Number of images from duplicate locations”

Description:

This counter is incremented if an image is received from different transmitters (based on host IP) but with the same location name.

Syslog:

<131> - - 450-VRxxxx - 0 - Duplicate location received from multiple hosts: Location
Where VRxxxx is the SFI of the VDR Image receiver and Location is the duplicate location received

New Location Received Count

“Number of images from “New” location”

Description:

This counter is incremented if an image is received from a location starting with “New”.

Syslog:

<131> - - 450-VRxxxx - 0 - "New location received: New-Location
Where VRxxxx is the SFI of the VDR Image receiver and New-Location is the location received

Not Matching Images Count

“Number of images which did not match the “filter” of any image channel”

Description:

This counter is incremented if an image is received but it could not pass any of the filters configured for the image channels.

Syslog:

No syslog message.

Unsupported Image Formats

“Number of images with unsupported format”

Description:

This counter is incremented if an image is received where the format (mime-type) is not supported/understood.

Syslog:

<131> - - 450-VRxxxx - 0 - " Unsupported Image Format Received: Mime-type

Where VRxxxx is the SFI of the VDR Image receiver and Mime-type is the unsupported mime-type.

7.2 Counters related to data capture

Invalid Header

“Number of unrecognized headers”

Description:

Counter for received datagrams with an invalid header as specified in 7.1.2 [1]. Only datagrams with a 61162-450 header with the value of “UdPbC” including a trailing zero are valid according to 7.1.1 and 6.1 [1]. Datagrams with an invalid header are discarded.

Syslog:

<131> - - 450-NF - 102 - Datagram header error from host: IP-Address

Where IP-Address is the ip address of the transmitting equipment

Tag Framing Error

“Number of TAG framing errors”

Description:

Counter for datagrams where a “TAG framing error” (incorrect start or termination of TAG block) is detected when parsing the datagram as specified in 7.2.5 [1].

According to B.2 [1], a tag block is delimited by a back-slash at the start and at the end.

The framing error is detected by:

A datagram contains one or more “lines” (delimited by <CR><LF>)

A framing error is detected by:

- An odd number of back-slashes in a line.
- Characters between an even and an odd back-slash in a line.

Datagrams with a tag-framing error are discarded.

Syslog:

<131> - - 450-VRxxxx - 103 - TAG framing error

Where VRxxxx is the SFI of the VDR NMEA/sentence receiver

Tag Syntax Error

“Number of TAG syntax errors”

Description:

Counter for datagrams where a “TAG syntax error” (line length, use of delimiters, invalid characters) are detected when parsing the datagram, as specified in 7.2.5 [1].

A tag block is considered to have syntax error if:

- It is longer than 80 characters (excluding the back-slashes) as specified in B.2 [1]
- Contains non-valid characters, according the table 1 and table 2 in 8.1 [3].
- Has invalid use of delimiters.

Datagrams with a tag-syntax error are discarded.

Syslog:

<131> - - 450-VRxxxx - 103 - TAG syntax error

Where VRxxxx is the SFI of the VDR NMEA/sentence receiver

Tag Format Error

“Number of TAG format errors”

Description:

Counter for datagrams where “any TAG block formatting error” is detected, as specified in 7.2.5 [1].

This counter is incremented if an error is occurred when parsing the parameter values of a tag block following the format in 7.2.3.1 [1].

- The parser will split the tag-block into parameter entries based on comma delimiter.
- The parser will split each parameter entry into a key-value pair delimited by colon.
- If the key is not a single letter, it is considered a format error.
- If the value for a ‘g’ key does not consists of three integers separated by “-“, it is considered a format error.

Datagrams with a tag-format error are discarded.

Syslog:

<131> - - 450-VRxxxx - 103 - TAG format error

Where VRxxxx is the SFI of the VDR NMEA/sentence receiver

Tag Checksum Error

“Number of TAG checksum errors”

Description:

Counter for datagrams where “TAG checksum error” is detected, as specified in 7.2.5 [1].

The checksum is assumed to be the part after the last “*” in the tag-block.

- If the checksum part is missing, it is considered a tag checksum error
- If the checksum part is not a valid two-digit hex string, it is considered a tag checksum error
- If the checksum part does not match the calculated checksum value, it is considered a tag checksum error.

Datagrams with a tag checksum error are discarded.

Syslog:

<131> - - 450-VRxxxx - 103 - TAG checksum error

Where VRxxxx is the SFI of the VDR NMEA/sentence receiver

Not Matching Sentences

“Number of sentences not being matched”

Description:

This counter is incremented if a sentence is received, and there is no channel configured with the corresponding SFI in the “s” field.

Syslog:

No syslog message.

Sentence Syntax Error

“Number of sentences with syntax errors”

Description:

Counter for datagrams where the tag is parsed successfully, but the IEC 61162-1 (NMEA) content is invalid.

- The 61162-1 sentence includes a checksum field, but it doesn’t match the calculated checksum.
- The 61162-1 sentence contains non-valid characters according the table 1 and table 2 in 8.1 [3].
- The 61162-1 sentence is larger than 82 characters according to 7.3.1 [3].

Datagrams with an invalid 61162-1 sentence are not discarded i.e. the sentence is recorded.

Syslog:

No syslog message.

7.3 Counters related to Bridge Alert Management (BAM)

Invalid Header

“Number of unrecognized headers”

Description:

Counter for received datagrams with an invalid header as specified in 7.1.2 [1]. Only datagrams with a 61162-450 header with the value of “UdPbC” including a trailing zero are valid according to 7.1.1 and 6.1 [1]. Datagrams with an invalid header are discarded.

Syslog:

No syslog supported

Tag Framing Error

“Number of TAG framing errors”

Description:

Counter for datagrams where a “TAG framing error” (incorrect start or termination of TAG block) is detected when parsing the datagram as specified in 7.2.5 [1].

According to B.2 [1], a tag block is delimited by a back-slash at the start and at the end.

A datagram contains one or more “lines” (delimited by <CR><LF>)

A framing error is detected by:

- An odd number of back-slashes in a line.
- Characters between an even and an odd back-slash in a line

Datagrams with a tag-framing error are discarded.

Syslog:

No syslog supported

Tag Syntax Error

“Number of TAG syntax errors”

Description:

Counter for datagrams where a “TAG syntax error” (line length, use of delimiters, invalid characters) is detected when parsing the datagram, as specified in 7.2.5 [1].

A tag block is considered to have syntax error if:

- It is longer than 80 characters (excluding the back-slashes) as specified in B.2 [1]
- Contains non-valid characters, according the table 1 and table 2 in 8.1 [3].
- Has invalid use of delimiters

Datagrams with a tag-syntax error are discarded.

Syslog:

No syslog supported

Tag Format Error

“Number of TAG format errors”

Description:

Counter for datagrams where “any TAG block formatting error” is detected, as specified in 7.2.5 [1].

This counter is incremented if an error is occurred when parsing the parameter values of a tag block following the format in 7.2.3.1 [1].

Datagrams with a tag-format error are discarded.

Syslog:

No syslog supported

Tag Checksum Error

“Number of TAG checksum errors”

Description:

Counter for datagrams where “TAG checksum error” is detected, as specified in 7.2.5 [1].

The checksum is assumed to be the part after the last “*” in the tag-block.

- If the checksum part is missing, it is considered a tag checksum error
- If the checksum part is not a valid two-digit hex string, it is considered a tag checksum error
- If the checksum part does not match the calculated checksum value, it is considered a tag checksum error.

Datagrams with a tag checksum error are discarded.

Syslog:

No syslog supported

Sentence Framing Error

"Number of sentence framing errors"

Description:

Counter for datagrams where a “Sentence framing error” (incorrect start or termination of sentence block) is detected when parsing the datagram, as specified in 7.2.5 [4].

A sentence is considered to have framing error if:

- Does not start with ‘!’ or ‘\$’
- Does not end with <CR>+<LF>

Datagrams with a sentence framing error are discarded.

Syslog:

No syslog supported

Sentence Syntax Error

“Number of sentences with syntax errors”

Description:

Counter for datagrams where the tag is parsed successfully, but the IEC 61162-1 (NMEA) content is invalid.

- The 61162-1 sentence contains non-valid characters according the table 1 and table 2 in 8.1 [3].
- The 61162-1 sentence is larger than 82 characters according to 7.3.1 [3].
- Any other 61162-1 sentence syntax errors.

Datagrams with a sentence syntax error are discarded.

Syslog:

No syslog supported

Sentence Checksum Error

“Number of sentence checksum errors”

Description:

Counter for datagrams where “sentence checksum error” is detected, as specified in 7.2.5 [4].

The checksum is assumed to be the part after the last “*” in the tag-block.

- If the checksum part is missing, it is considered a sentence checksum error
- If the checksum part is not a valid two-digit hex string, it is considered a sentence checksum error
- If the checksum part does not match the calculated checksum value, it is considered a sentence checksum error.

Datagrams with a sentence checksum error are discarded.

Syslog:

No syslog supported

8 Service and maintenance

8.1 Annual inspection (APT)

It is a requirement (by IMO) that an annual performance test (APT) is carried out by a certified service organization. The APT must be done using the APT tool

8.2 Maintenance

Very few parts require regular service. Always bring these parts when attending a vessel for doing an APT.

8.2.1 Batteries

The battery pack located in the DAU must be replaced every fourth year by a qualified service technician.

8.2.2 Cooling Fan

A qualified service technician must replace the cooling fans located in the DPU when the batteries are replaced.

8.2.3 Underwater beacon on capsule

The battery in the underwater beacon located on the fixed capsule must be replaced after three years by a qualified service technician. The beacon must be replaced every sixth year. The expiry dates are printed on the beacon.

8.2.4 Security straps on cradle

The two cable ties which secure the release mechanism must be replaced every sixth year (when the beacon is replaced). Use only the authorized cable ties p/n 4300013.

8.3 List of most common spare parts

P/N	Description
1302116	Uni Rack UR 06-002 - 8ch analog
1302358	RVI with PoE (for DM100) 2 x 5 x BNC
1302365	RVI with PoE (for DM100) 2 x DVI-I
1302373	MK4 capsule with cradle, beacon and 50m cable
1302379	VDR Bridge Control Panel BCP
1302389	MK1 float free capsule with 50m cable and junction box
1302646	BMU 003 - Bridge Microphone Unit Indoor, BMU-I 2014
1302647	BMU 004 - Bridge Microphone Unit Outdoor, BMU-O 2014
1302662	Cradle for MK4 capsule
1302726	DM100 DPU, DPU 100-01
2302807	Ethernet Interface for Capsule MK4 - assembled PCB
2302731	Set of fans (2) for DPU 100-01 (spare part)
2302786	Battery pack and fans (2) for DPU 100-01 (spare part)
2304024	Battery for AUB-90 beacon
3302519	50m zero halogen FTP CAT5 cable w. RJ45 and Wago for capsule MK4 and FF MK1
3000671	Beacon replacement kit
7302532	Boot flash for DM100 VDR
7304878	Boot flash for DM100 S-VDR G2
9302376	Manual for compact Sensor Interface Unit (hard copy and CD)
9302719	Set of manuals for the DM100 VDR and S-VDR G2 (hard copy and CD)

9 Service Log

All repairs and upgrades must be described in the service log.

Date of installation	
Software version (note 1)	
Signature	

Note 1) Software version is printed on the boot compact flash and displayed by the web configurator (on all pages).

Record number	1
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	2
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	3
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	4
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	5
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	6
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	7
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

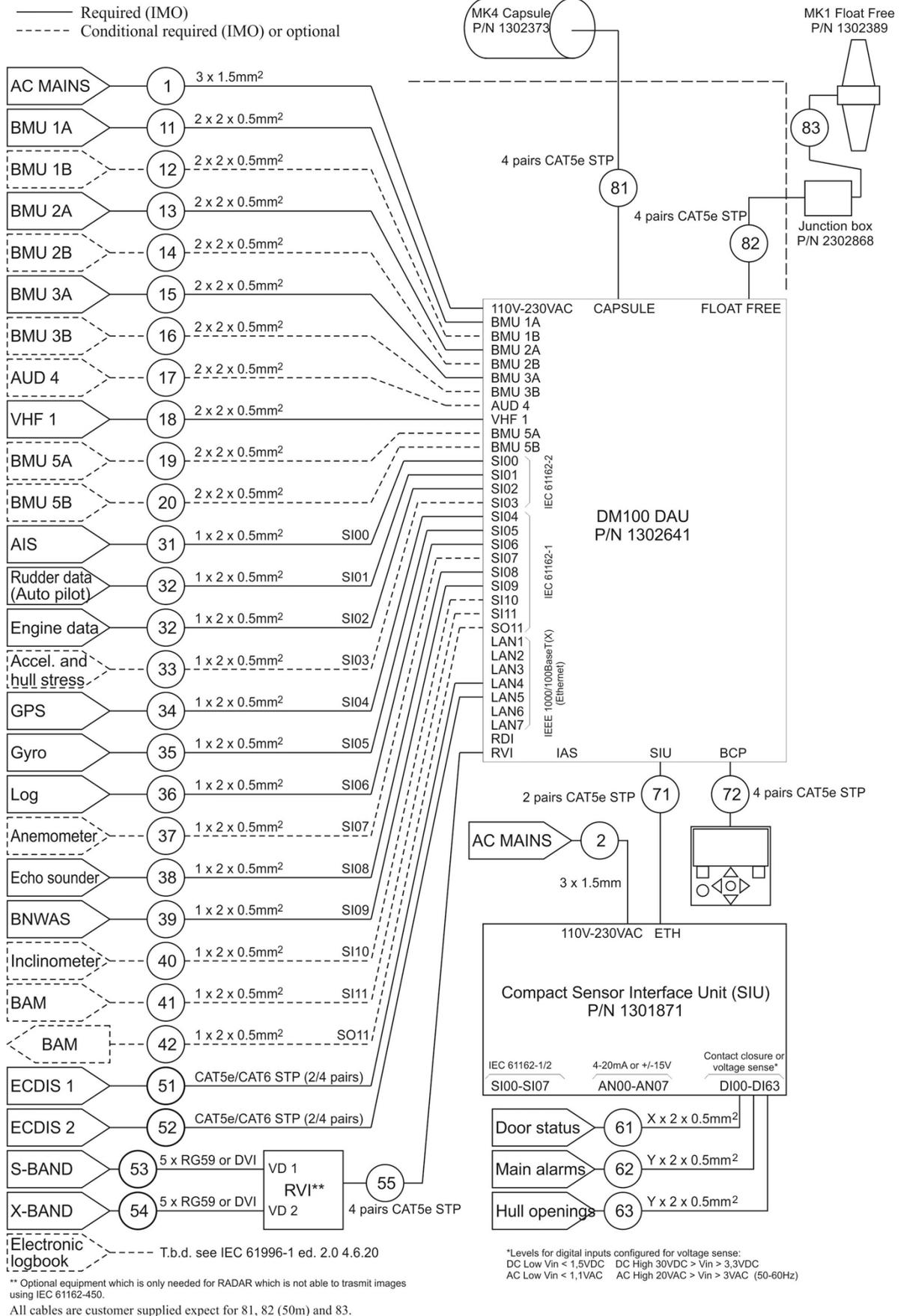
Record number	8
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Record number	9
Date of upgrade/repair	
What is replaced (fill in new version of software if upgraded)	
Reason for upgrade	
Signature	

Appendix A Data items to be recorded for DM100 VDR

Item	IEC 61996-1 Ed.2.0 reference	Default interface	Comments
Date and time	4.6.1	SI04	Typically from the GPS
Ship's position	4.6.2	SI04	Typically from the GPS
Speed SOG	4.6.3	SI04	Typically from the GPS
Speed STW	4.6.3	SI06	Speed log
Heading	4.6.4	SI05	Gyro
Bridge audio	4.6.5	BMU xx	
Communication audio	4.6.6	VHF	
Radar data	4.6.7	LAN x	
ECDIS	4.6.8	LAN x	
Echo sounder	4.6.9	SI05	
Main alarms	4.6.10	SI11	Alternatively, digital interfaces
Rudder data	4.6.11	SI01	Alternatively, analog interfaces
Engine and thruster data	4.6.12	SI02	Alternatively, analog and digital interfaces
Hull openings status	4.6.13	-	Typically digital data
Watertight and fire door status	4.6.14	-	
Acceleration and hull stresses	4.6.15	-	Must only be recorded if vessel is fitted with IMO mandated monitoring equipment
Wind speed and direction	4.6.16	SI07	Where a ship is fitted with suitable sensor
AIS	4.6.17	SI00	
Rolling motion	4.6.18	SI10	Where a ship is fitted with suitable sensor
Configuration data	4.6.19	N/A	The configuration data is automatically stored as the VDR is configured
Electronic logbook	4.6.20	N/A	If a ship is fitted with an electronic logbook in accordance with IMO standards. Currently no such standard exists.

Appendix B Installation plan for typical DM100 VDR configuration



Notes:

Cable 1

Use only cable which is approved for AC mains.

Cable 11-17 and 19-20

Utilization of conductors for cable 11-17 and 19-20 when connected to a BMU.

Pair, conductor	At BMU	At DAU
1,1	V+	V+
2,1	L+	L+
2,2	L-	L-
1,2	G	G

Cable 17

2 pairs are needed when AUD4 is used for a BMU; otherwise only one pair is needed.

Cable 31-41

RX+ corresponds to A terminal on the DPU

RX- corresponds to B terminal on the DPU

Cable 42

Terminal A on the DPU corresponds to TX+

Terminal B on the DPU corresponds to TX-

Cable 81, 82

CAT5e STP FRZH, 50m long. Supplied with the equipment.

Cable 83

CAT6 STP cable, 1.5m long. The cable is permanently fixed to the Tron 40 float free capsule. It must be connected to the junction box.

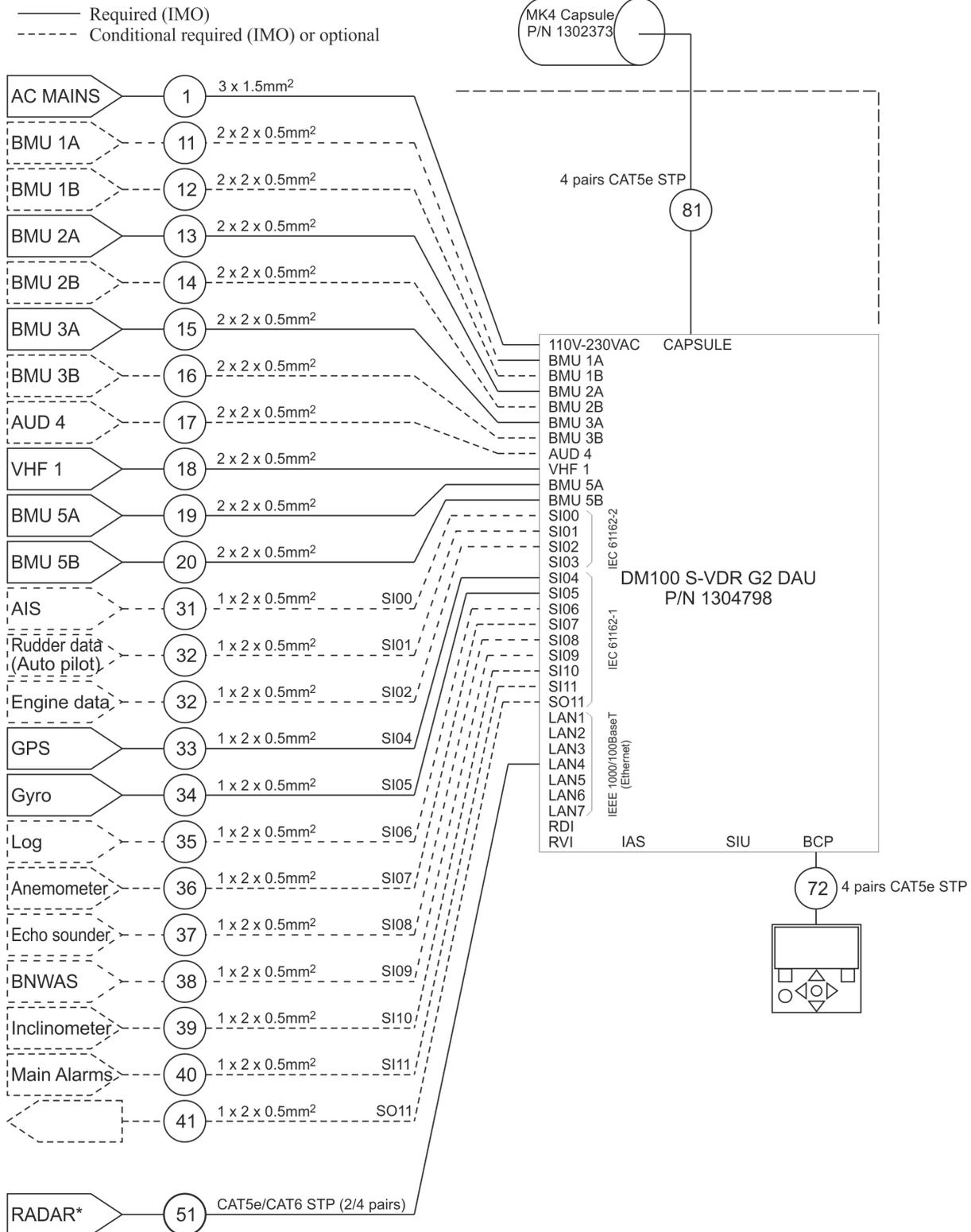
Appendix C Data items to be recorded for DM100 S-VDR G2

Item	IEC 61996-2 Ed.2.0 reference	Default interface	Comments
Date and time	4.6.1	SI04	Typically from the GPS
Ship's position	4.6.2	SI04	Typically from the GPS
Speed SOG	4.6.3	SI04	Typically from the GPS
Speed STW	4.6.3	SI06	Speed log
Heading	4.6.4	SI05	Gyro
Bridge audio	4.6.5	BMU xx	
Communication audio	4.6.6	VHF	
Radar data	4.6.7	RVI	Note 1
AIS	4.6.8	SI00	Note 1
Echo sounder	4.6.10	SI05	Note 2
Main alarms	4.6.11	SI11	Note 2
Rudder data	4.6.12	SI01	Note 2
Engine and thruster data	4.6.13	SI02	Note 2
Hull openings status	4.6.14	-	Note 2
Watertight and fire door status	4.6.15	-	Note 2
Acceleration and hull stresses	4.6.16	-	Note 2
Wind speed and direction	4.6.17	SI07	Note 2

Note 1: Recording of RADAR may be replaced recording of AIS if no commercial over the shelf interface for the RADAR exist.

Note 2: If available as in a format in accordance with the IEC 61162 family of standards.

Appendix D Installation plan for typical DM100 S-VDR G2 configuration



*May be substituted by AIS if the RADAR cannot be connected using COTS equipment.

All cables are customer supplied expect for 81.
 A short cable (2m) is supplied with the RVI (55).

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Notes:

Cable 1

Use only cable which is approved for AC mains

Cable 11-17 and 19-20

Utilization of conductors for cable 11-17 and 19-20 when connected to a BMU

Pair, conductor	At BMU	At DAU
1,1	V+	V+
2,1	L+	L+
2,2	L-	L-
1,2	G	G

Cable 17

2 pairs are needed when AUD4 is used for a BMU; otherwise only one pair is needed.

Cable 31-40

RX- corresponds to A terminal on the DPU

RX+ corresponds to B terminal on the DPU

Cable 41

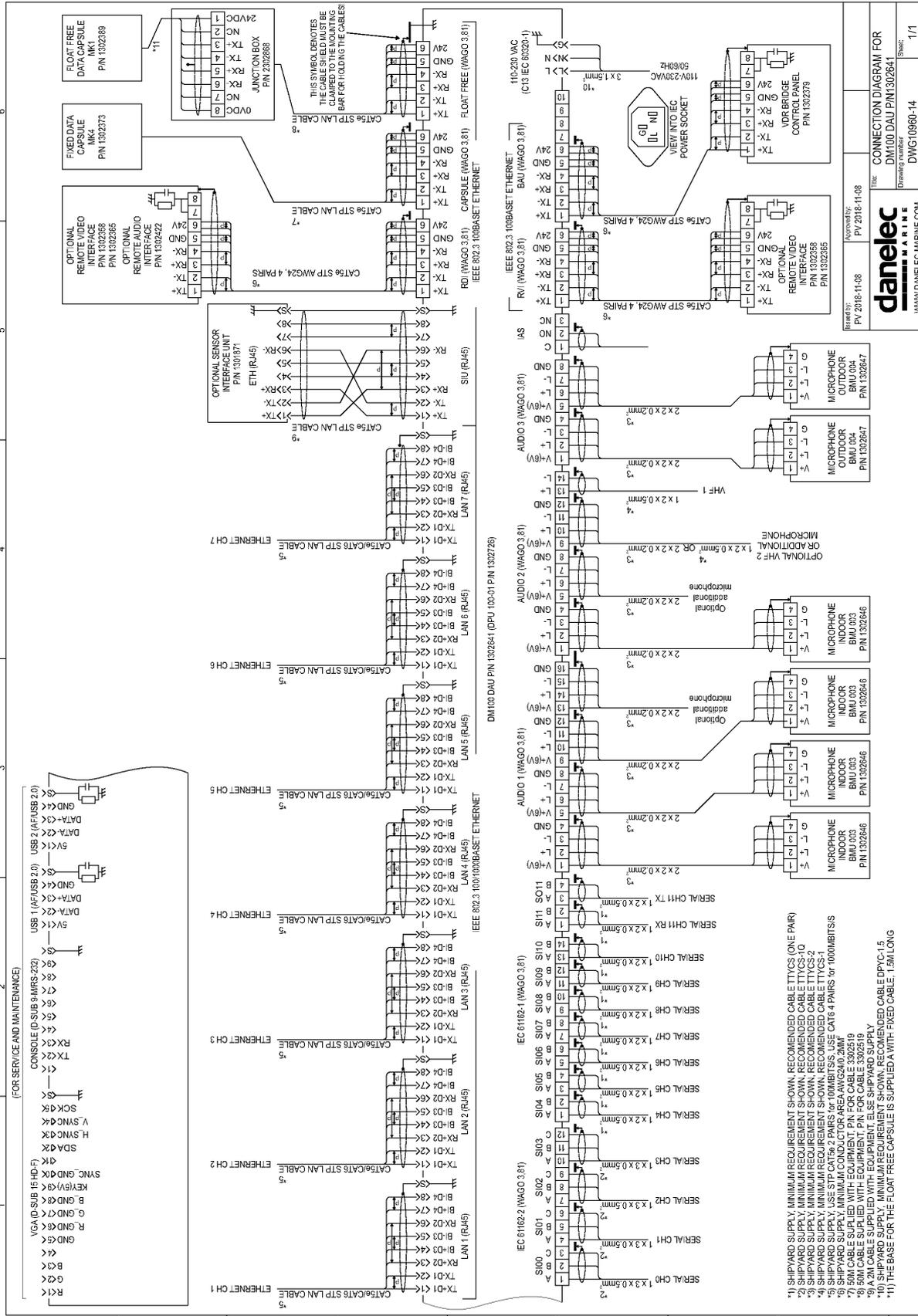
Terminal A on the DPU corresponds to TX-

Terminal B on the DPU corresponds to TX+

Cable 81

CAT5e STP FRZH, 50m long. Supplied with the equipment.

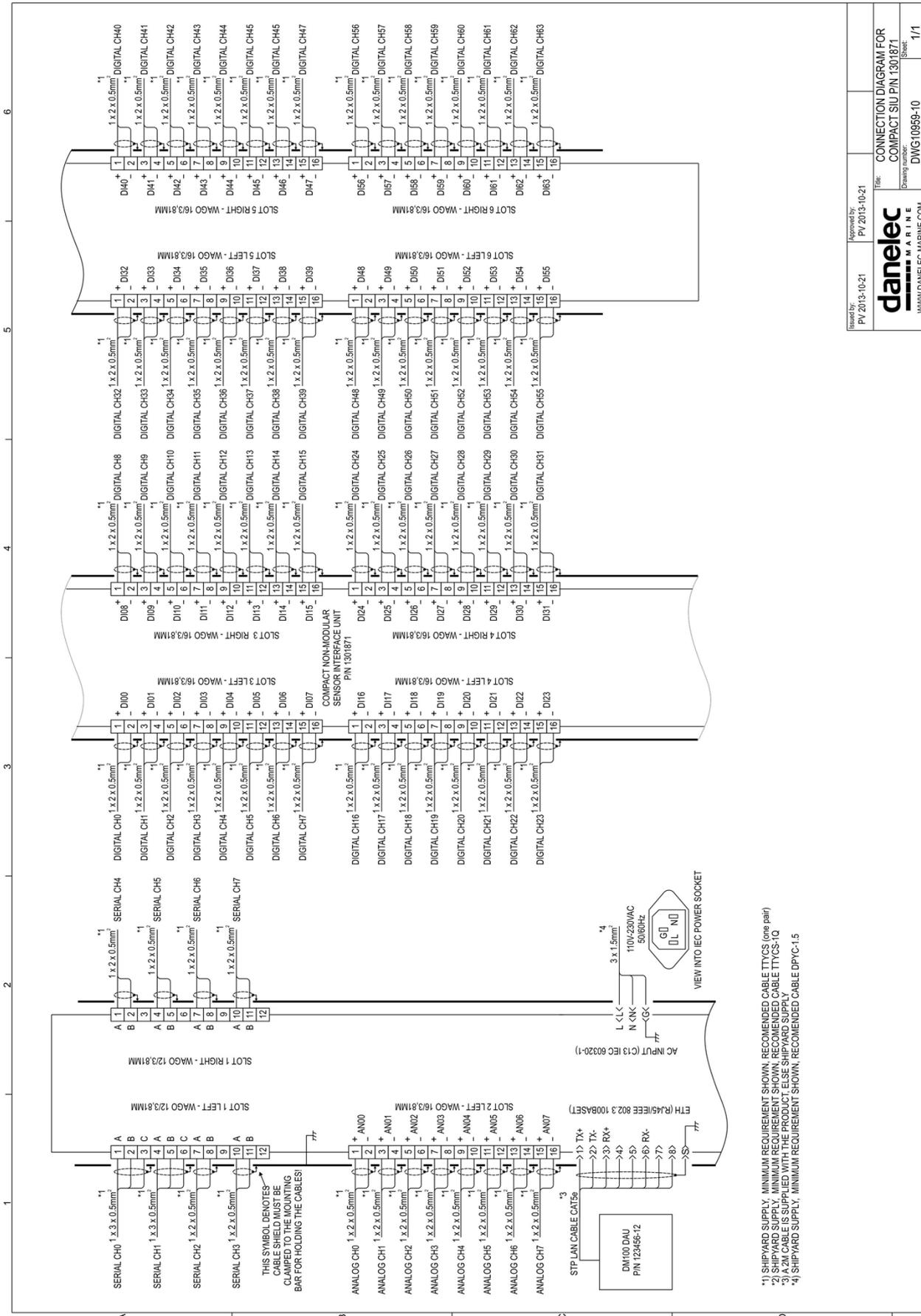
Appendix E Detailed connection diagrams



Approved by: PV 2018-11-08
 PV 2018-11-08
 CONNECTION DIAGRAM FOR
 DM100 DAU PIN 1302641
 DANELEC MARINE
 WWW.DANELEC-MARINE.COM
 DWG:10960-14
 Rev: 1/1

Installation Manual for DM100 VDR and DM100 S-VDR G2

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- 1) SHIPYARD SUPPLY. MINIMUM REQUIREMENT SHOWN. RECOMMENDED CABLE TTYS (one pair)
- 2) SHIPYARD SUPPLY. MINIMUM REQUIREMENT SHOWN. RECOMMENDED CABLE TTYS-TQ
- 3) 2M CABLE SUPPLY. MINIMUM REQUIREMENT SHOWN. RECOMMENDED CABLE DPYC-15
- 4) SHIPYARD SUPPLY. MINIMUM REQUIREMENT SHOWN. RECOMMENDED CABLE DPYC-15

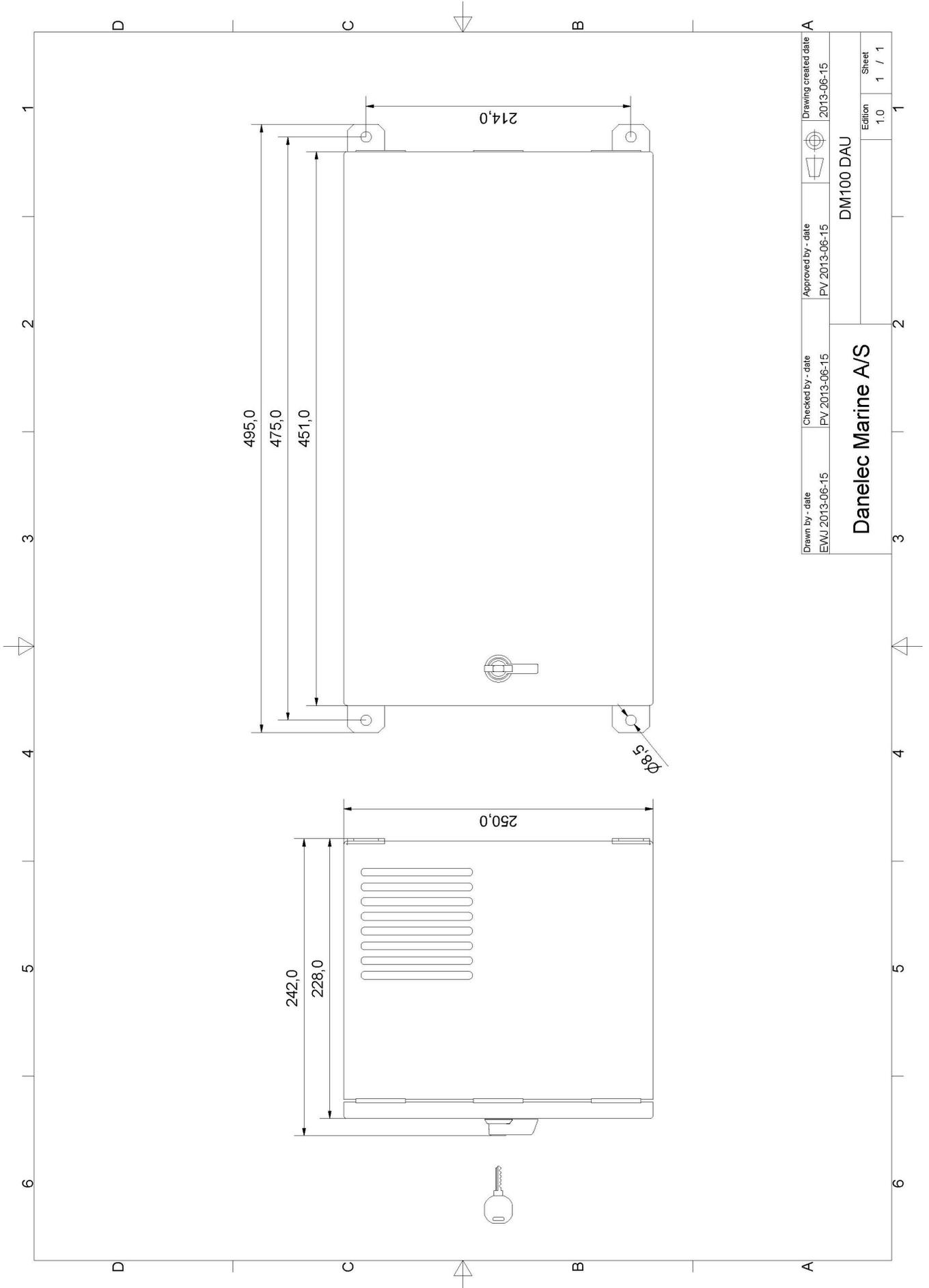
Issued by: PV 2013-10-21	Approved by: PV 2013-10-21	Title: CONNECTION DIAGRAM FOR COMPACT SIU PIN 1301871 Drawing no.: DWG:10959-10
		Sheet: 1/1



Appendix F Installation of DAU

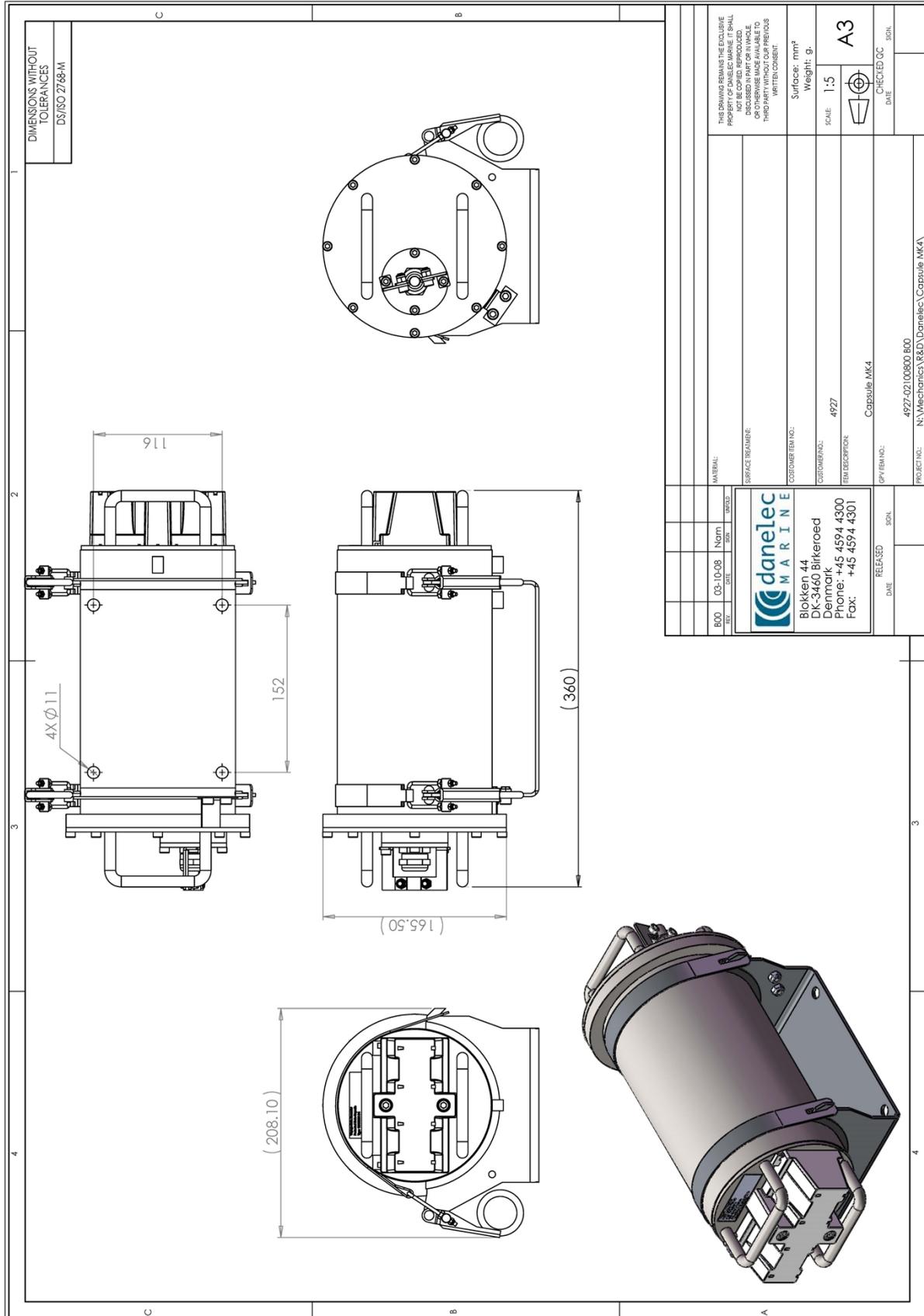
- Use 8mm bolts or threaded studs and nuts. Washers with a 2 mm minimum thickness are required.
 - Leave 50mm of space on each side for ventilation.
 - The DAU must be protected from rain, seawater and direct sunlight
- See drawing on next page.

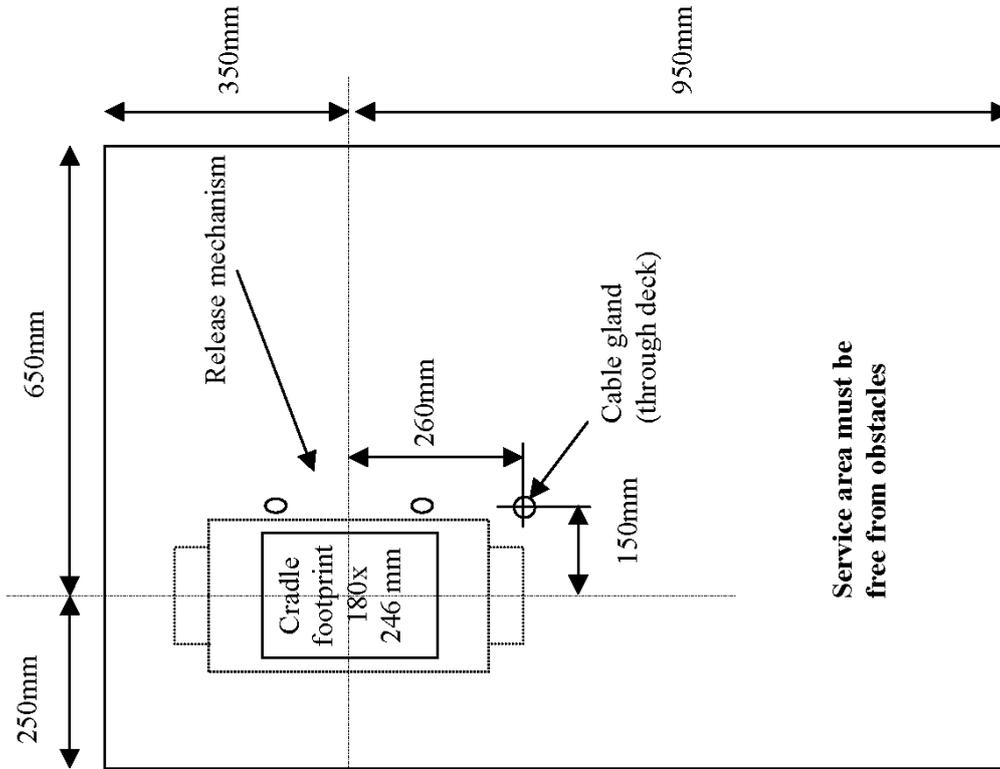
Installation Manual for DM100 VDR and DM100 S-VDR G2
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Drawn by - date EWJ 2013-06-15	Checked by - date PV 2013-06-15	Approved by - date PV 2013-06-15	Drawing created date 2013-06-15
Danelec Marine A/S			DM100 DAU
			Edition 1.0
			Sheet 1 / 1

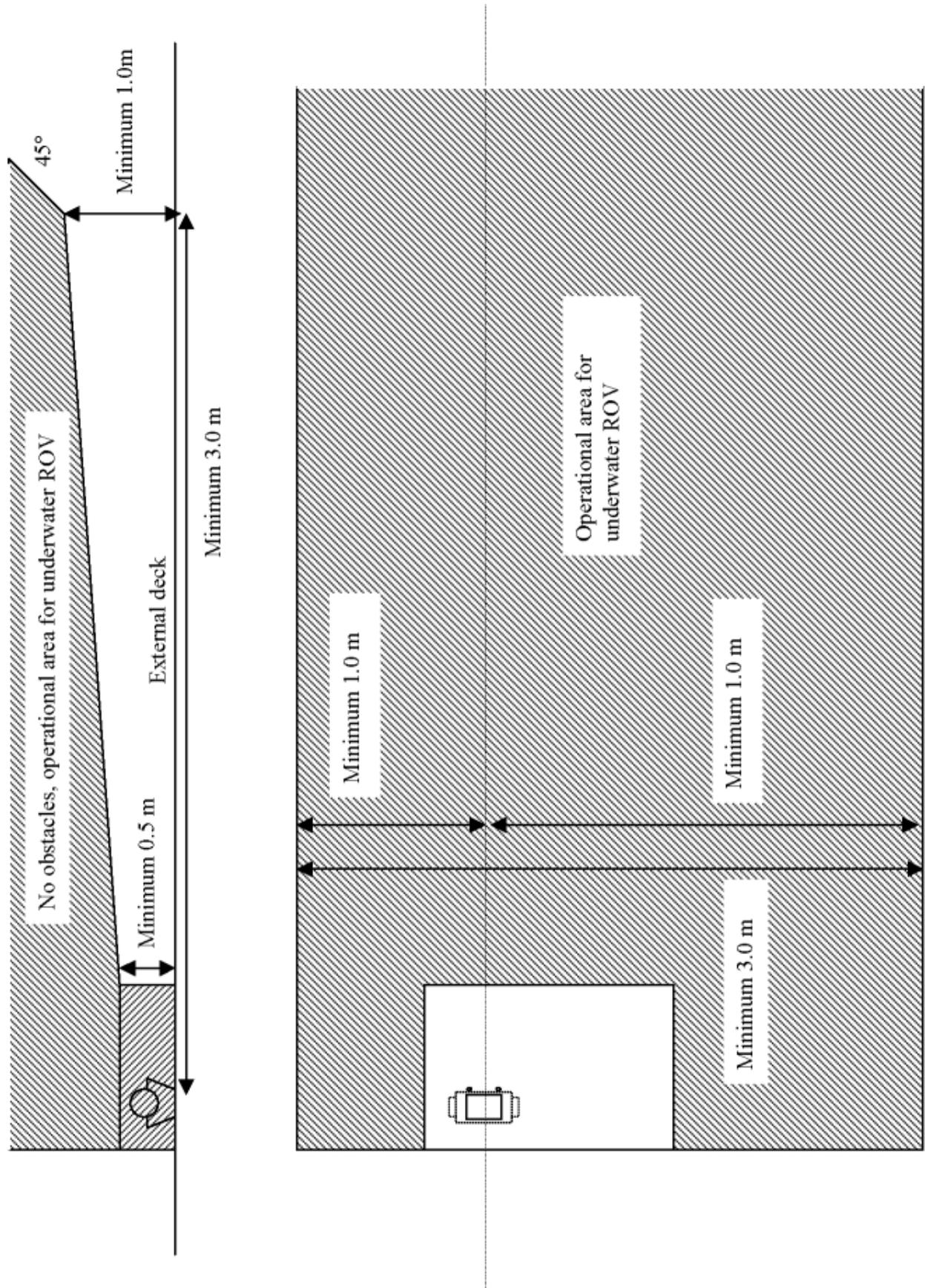
Appendix G Installation of fixed capsule



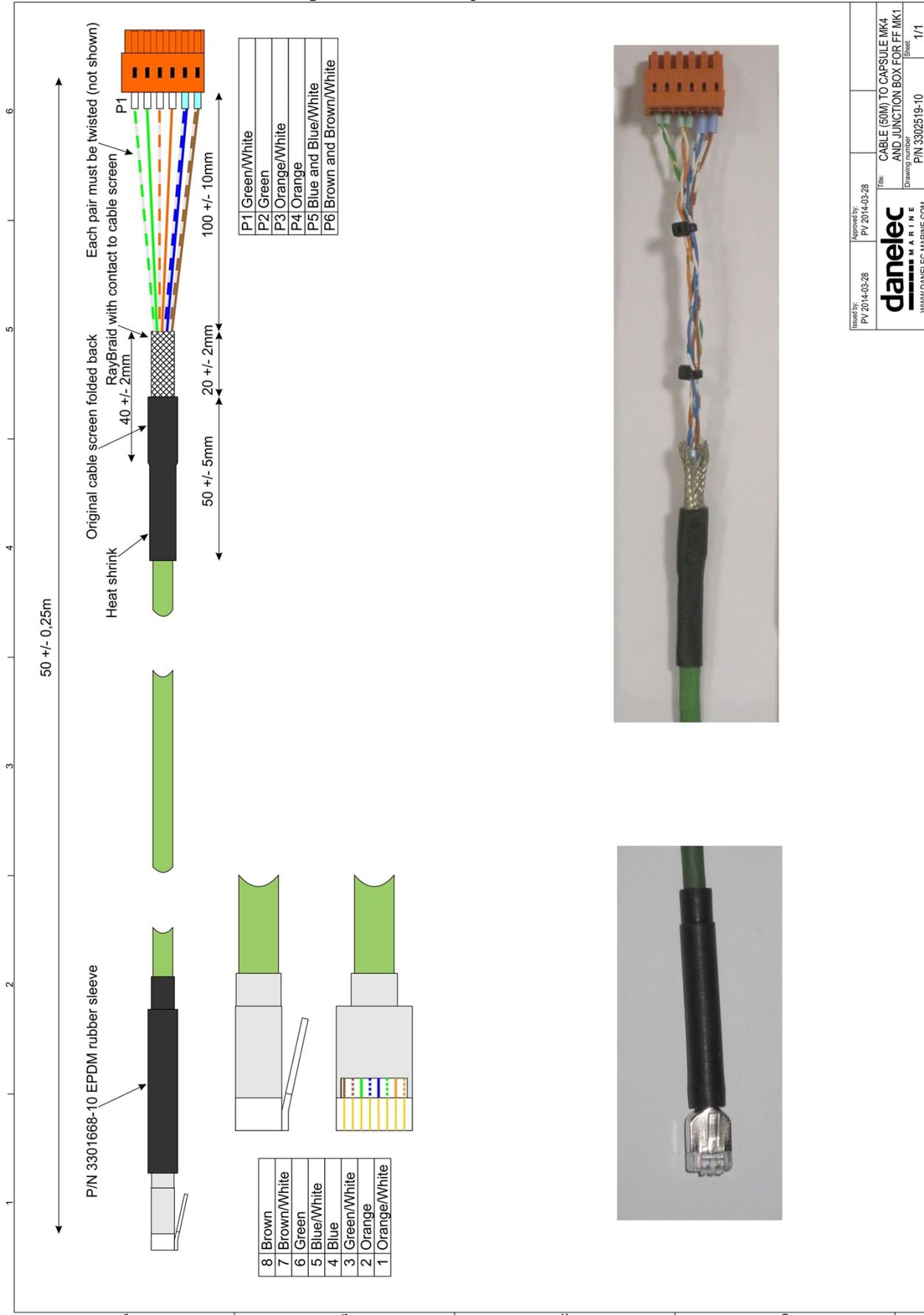


Notes:

- 1) The cable length is 50 meters.
- 2) Care must be taken during installation to prevent breaking of the cable.
- 3) The cradle must be mounted on a horizontal flat exposed surface where access by divers or a Remote Operated Vehicle (ROV) is possible
- 4) Mounting hardware shall be non-corrosive.
- 5) Observe the compass safe distance printed on the capsule
- 6) Do not unwrap the cable service loop i.e. the two loops of cable strapped to the handles of the capsule.
- 7) Cable entry (through deck) shall be made through an upper positioned cable gland. Cable gland must accommodate a cable diameter between 9 - 10 mm.



Cable from DPU 100-01 to Capsule MK4 and junction box for float free



Issued by: PV 2014-03-28	Approved by: PV 2014-03-28	File: CABLE (50M) TO CAPSULE MK4 AND JUNCTION BOX FOR FFMK1	Sheet: 1/1
danelec MARINE		WWW.DANELEC-MARINE.COM	

Appendix H Installation of float-free capsule

Material/Version/Issue:

General tolerance: NS-ISO-2788: 1-in

Surface roughness Ra: 12.5/3.2

Approval: Original model:

Scale: A3

Sheet: 1/2

Part: Revision history

Part: M-87910/A-87920

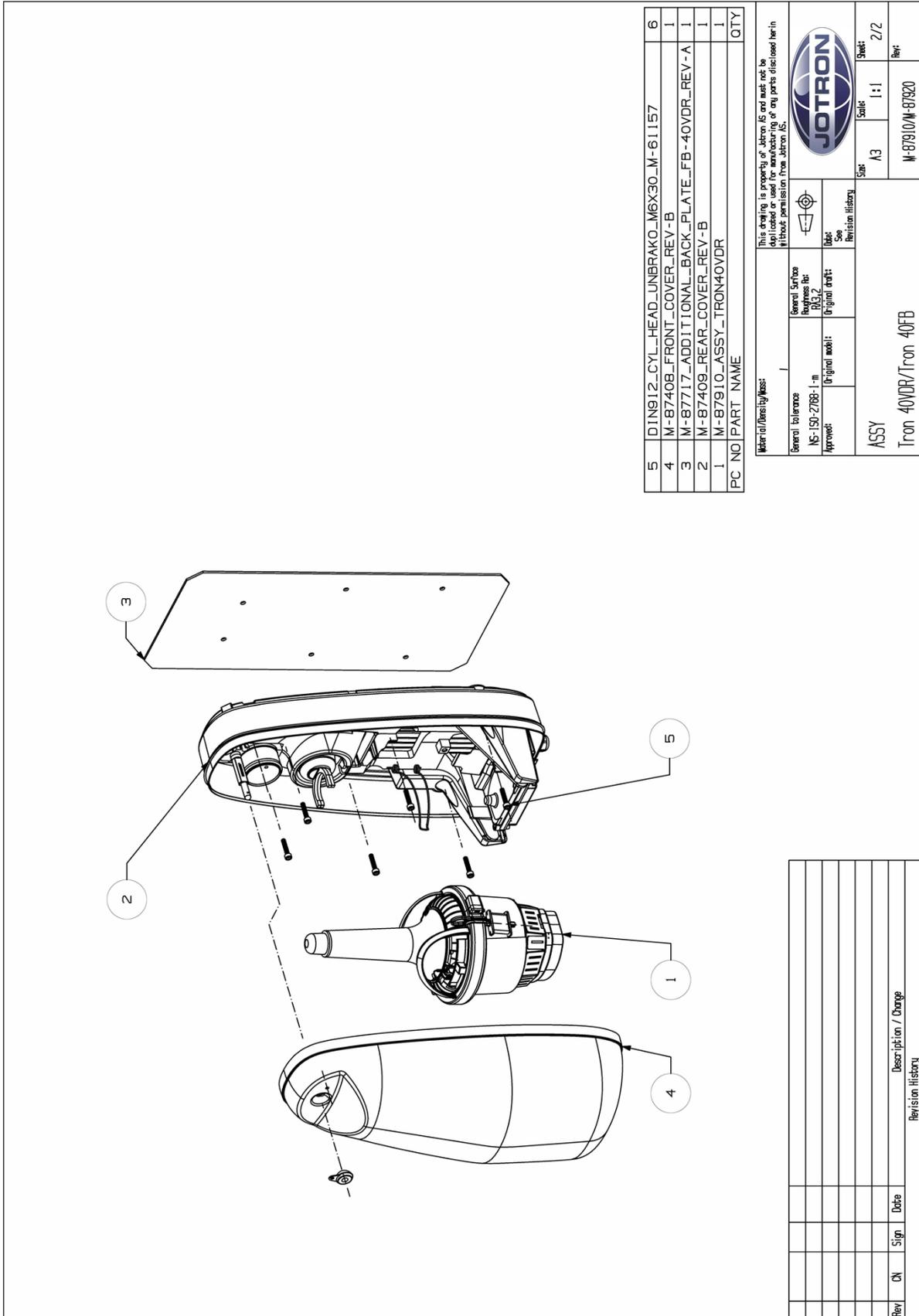
Part: Rev:

ASSY
 Tron40 VDR/Tron 40FB

Rev	Ch	Sign	Date	Part version	Description / Change
P-1			18.02.2014		

This drawing is property of Jotron AS and must not be duplicated or used for manufacturing of any parts disclosed herein without permission from Jotron AS.

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5	DIN912_CYL_HEAD_UNBRAKO_M6X30_M-61157	6
4	M-87408_FRONT_COVER_REV-B	1
3	M-87717_ADDITIONAL_BACK_PLATE_FB-40VDR_REV-A	1
2	M-87409_REAR_COVER_REV-B	1
1	M-87910_ASSY_TRON40VDR	1
	PC NO PART NAME	QTY

Material/Quantity/Notes: This drawing is property of Jotron AS and must not be duplicated or used for manufacturing of any parts disclosed herein without permission from Jotron AS.

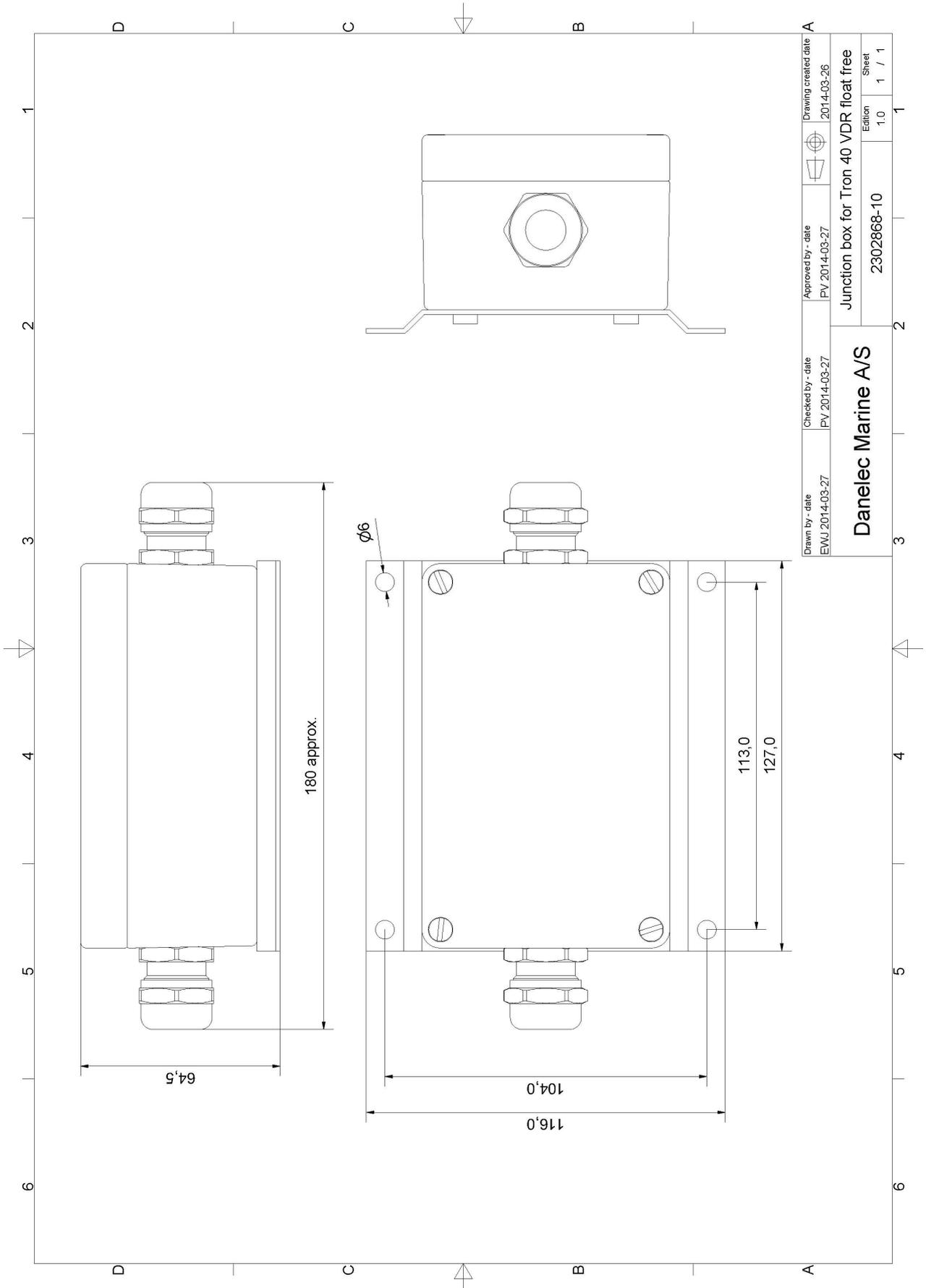
General tolerance ISO 2768-1 m	General Surface Finish R0.32	Scale A3	Sheet 2/2
Approved: [Signature]	Original draft: [Signature]	Scale 1:1	Rev: M-87910/M-87920
Title Revision history		Rev: M-87910/M-87920	

ASSY
Tron 40VDR/Tron 40FB

Rev	CN	Sign	Date	Description / Change

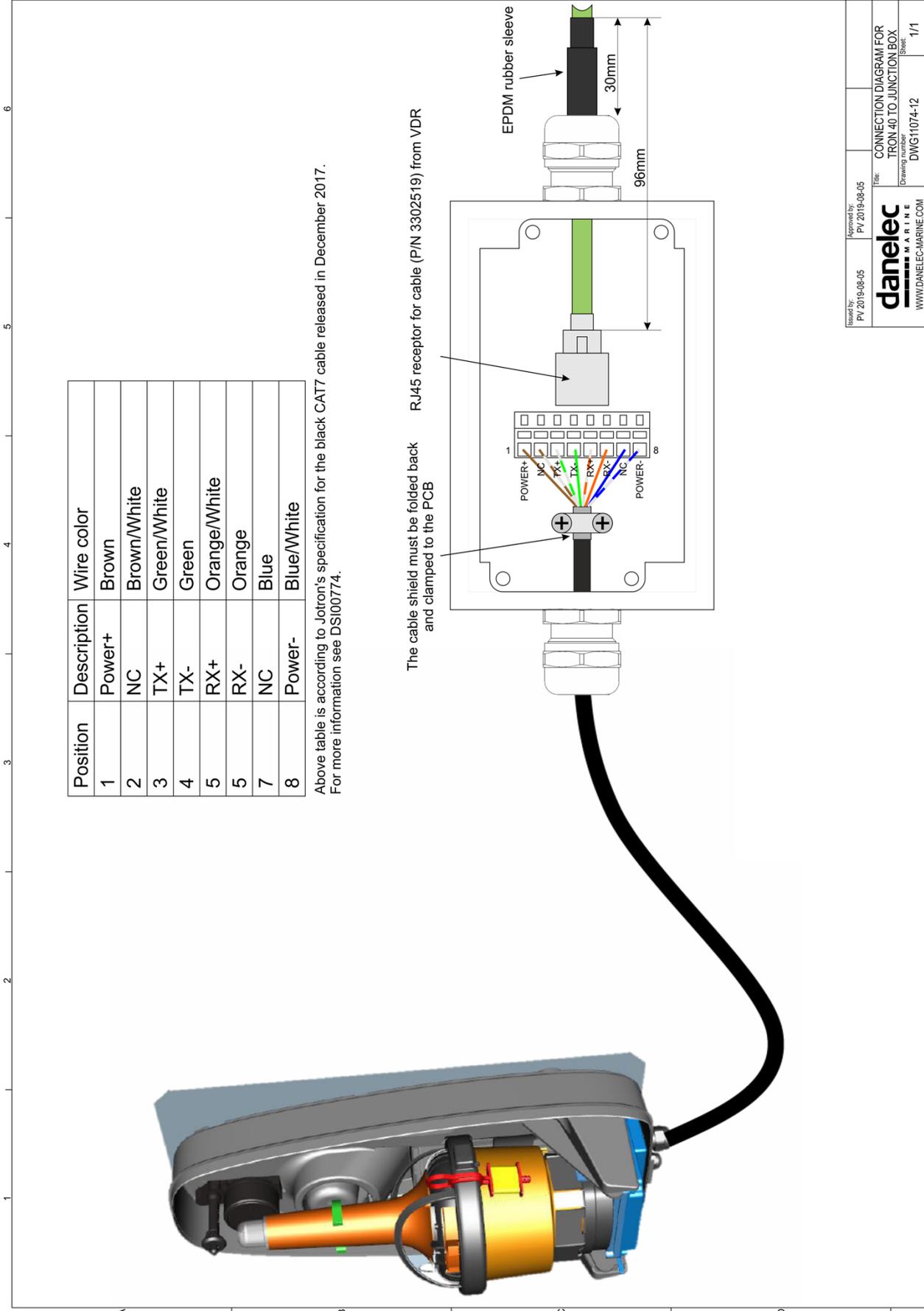
Revision history

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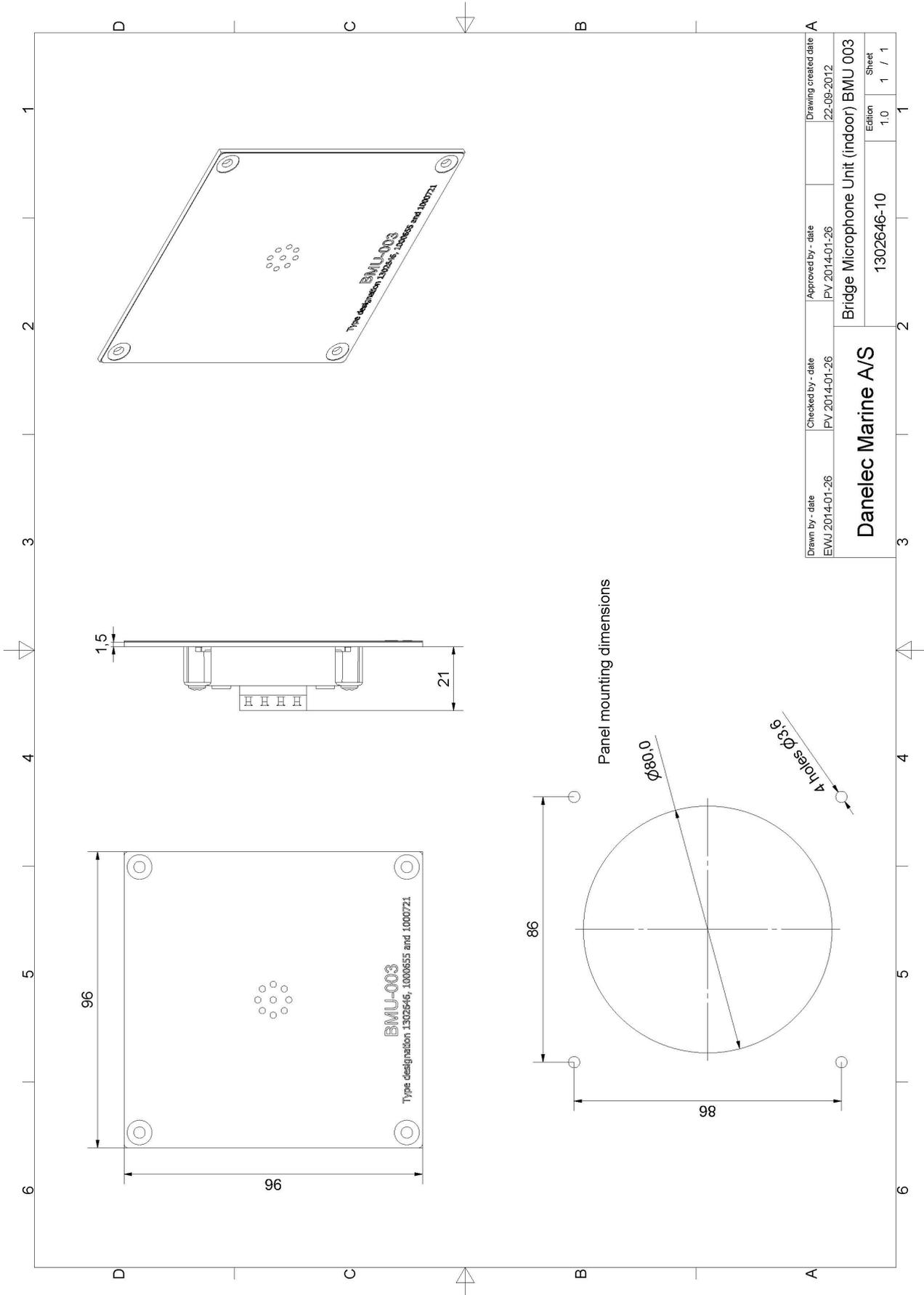
Installation Manual for DM100 VDR and DM100 S-VDR G2

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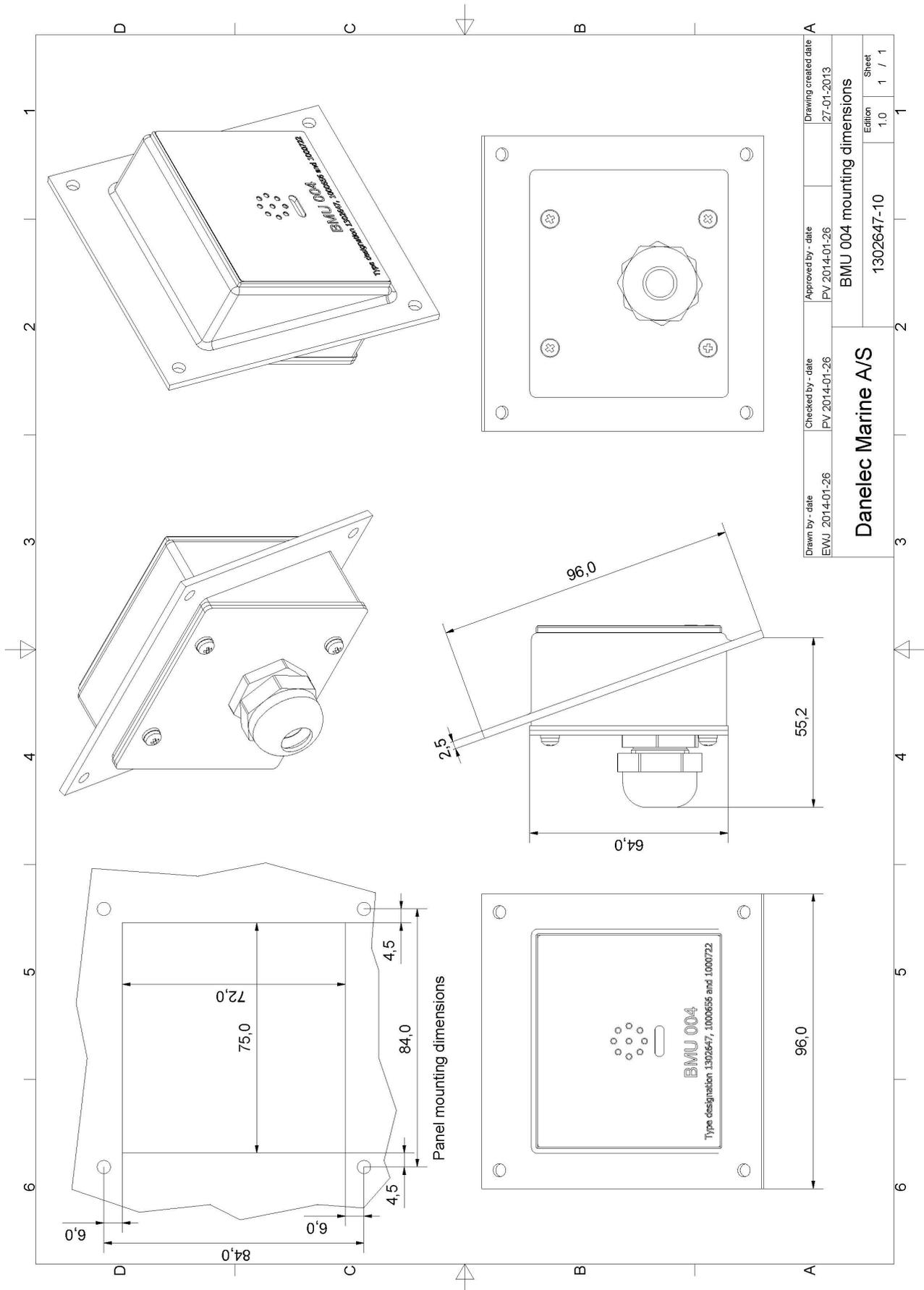


Issued by: PV 2019-08-05	Approved by: PV 2019-08-05	File: CONNECTION DIAGRAM FOR JOTRON 40 TO JUNCTION BOX
danelec MARINE		Drawing number: DWG11074-12
WWW.DANELEC-MARINE.COM		Sheet: 1/1

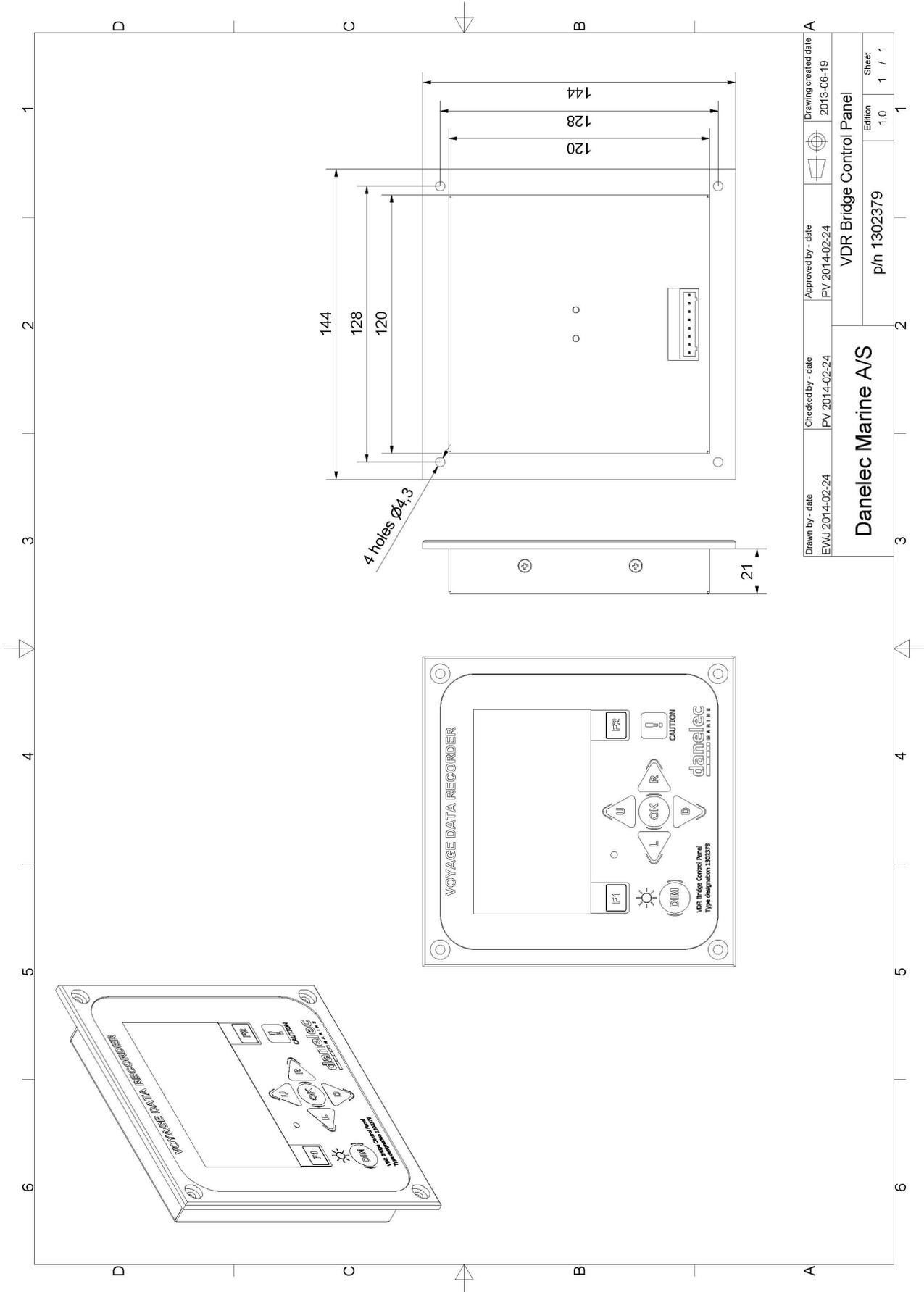
Appendix I Installation of BMU



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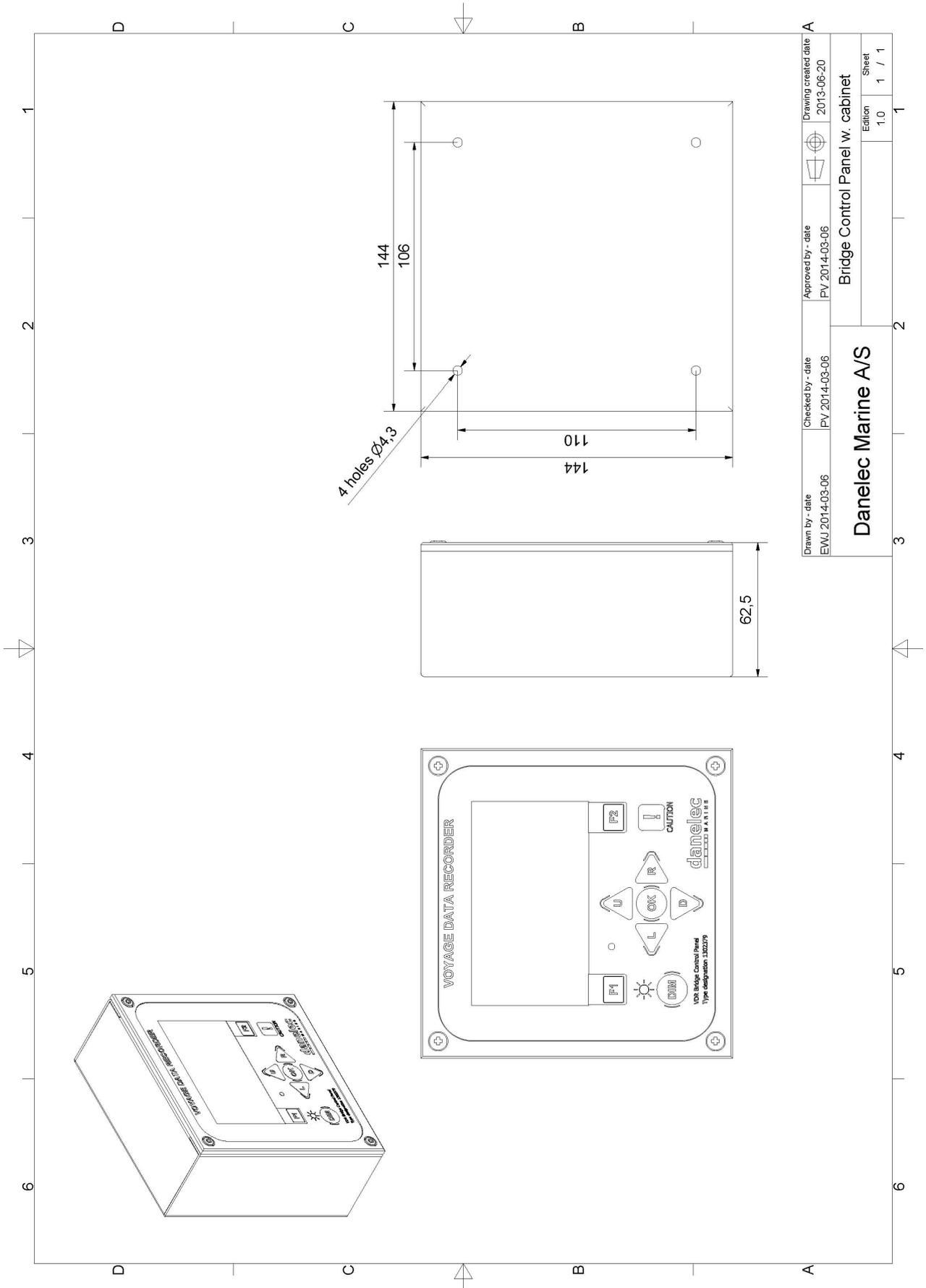


Appendix J Installation of BCP

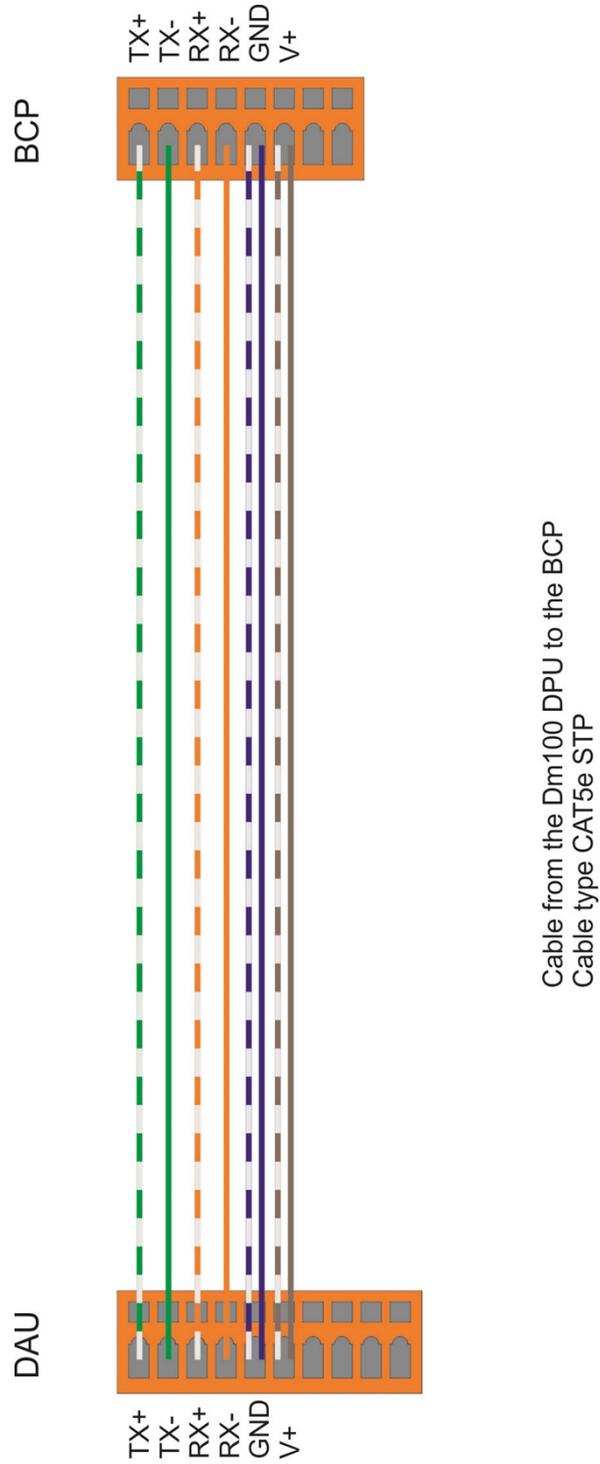


Drawn by - date EWJ 2014-02-24	Checked by - date PV 2014-02-24	Approved by - date PV 2014-02-24	Drawing created date 2013-06-19
Danelec Marine A/S		VDR Bridge Control Panel	
		p/n 1302379	
		Edition 1.0	Sheet 1 / 1

Installation Manual for DM100 VDR and DM100 S-VDR G2
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Cable from the DPU 100-01 to the BCP

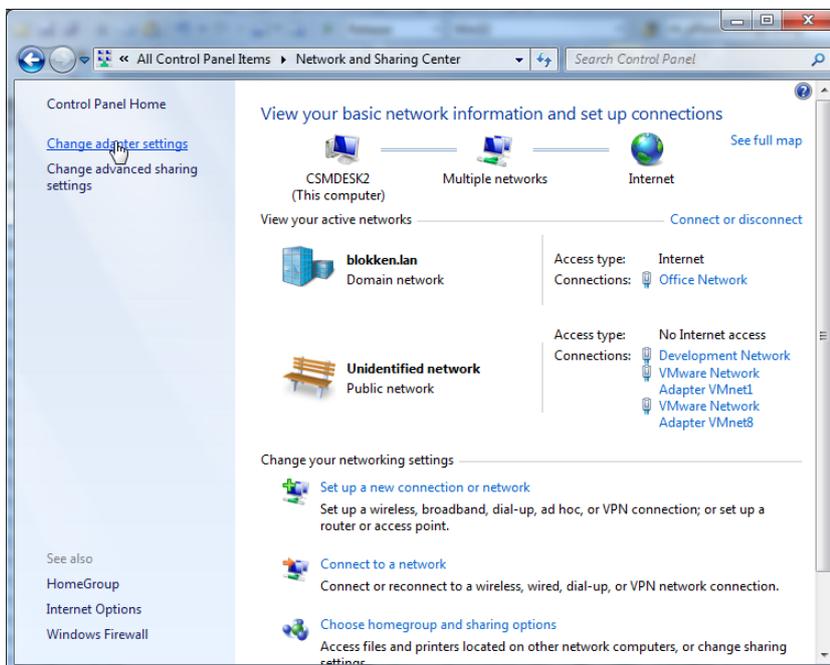
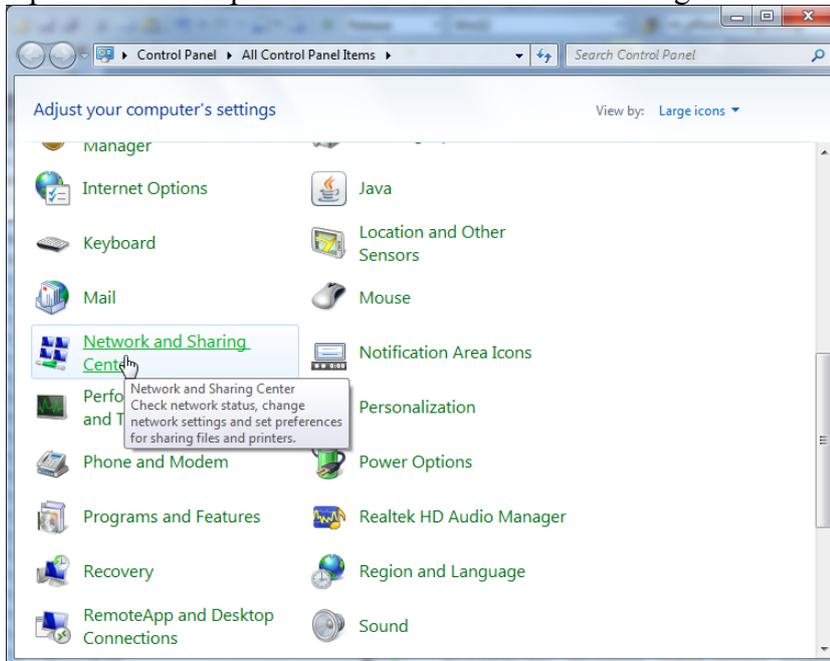


Appendix K Setup of configurator PC

The default IP address of the VDR is 10.0.0.100 (255.255.255.0). A configurator PC, Replay PC or data extractor PC must use an IP address with the same range.

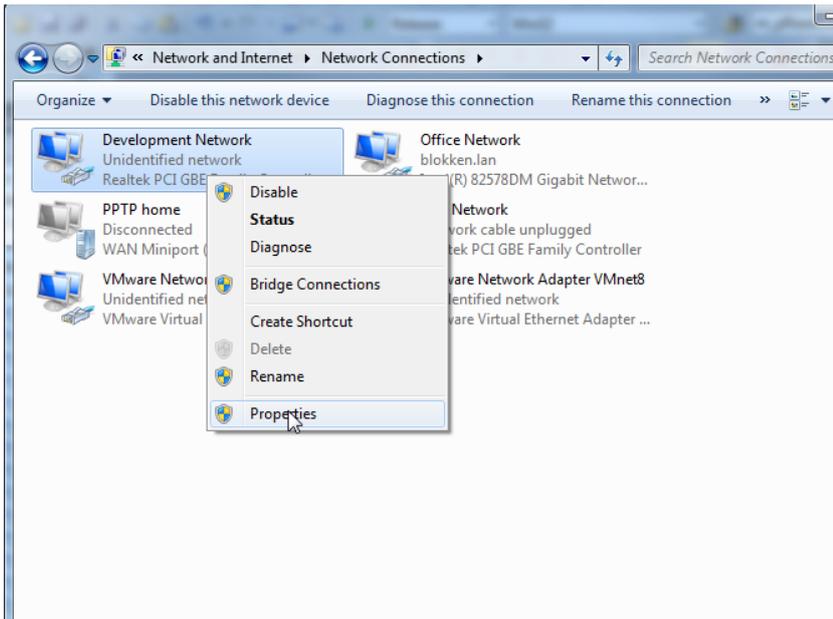
Windows 7

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

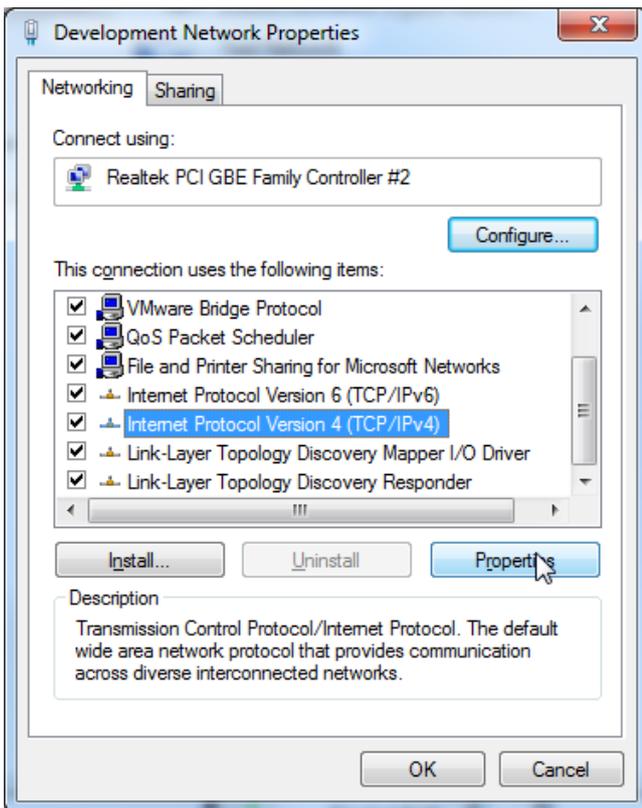


Click on “Change adaptor settings”.

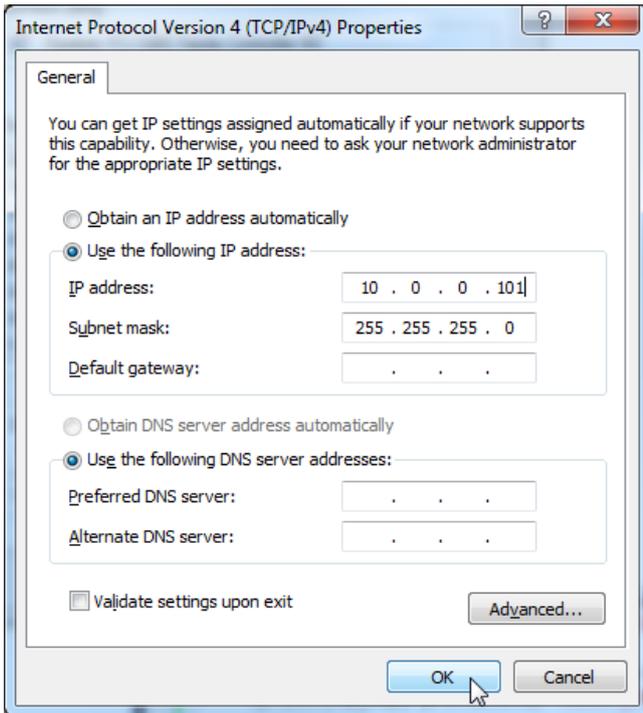
Installation Manual for DM100 VDR and DM100 S-VDR G2
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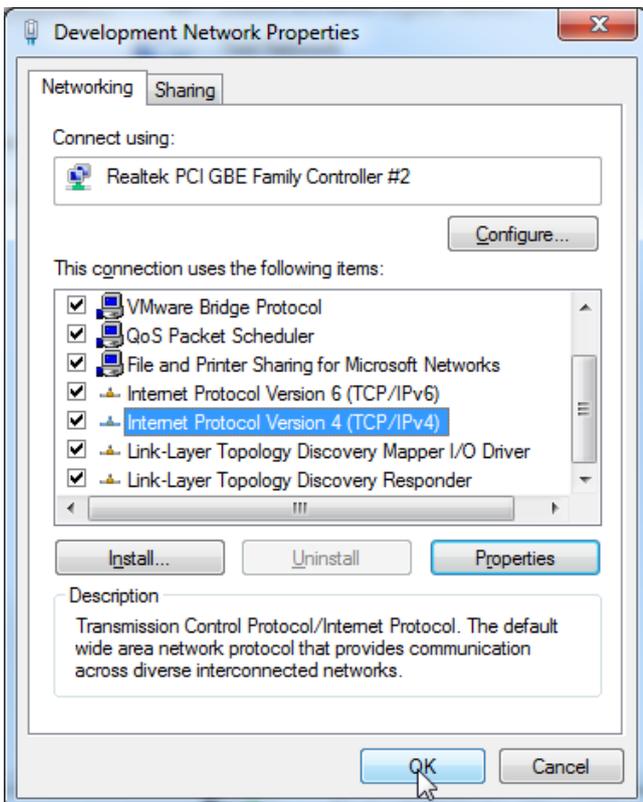
Right click on the icon representing your Ethernet adaptor and select “Properties” from the drop down menu.



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



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



Click on “OK”