VOYAGE EVENT RECORDER®

VER4000/VER4000-S®

INSTALLATION MANUAL

Issue 03

June 2006

Spec No 500.20.01

SELEX Communications Ltd - (Marine Division), BLDG 20/A1-2 (South Side), P O Box 5,
Filton, Bristol BS34 7QW,United Kingdom.
Telephone: +44 (0) 117 931 3550 Fax: +44 (0) 117 969 6528
Website: www.broadgate-uk.com E-Mail: marine.bristol@selex-comms.com

Index

1. Introductory Notes 6
1.1. Quality Standards 6
1.2. Environmental Specification 6
1.3. Glossary of Terms 6
2. VER Certificate of Compliance, Installation Report and Warranty Registration Card 7
3. Preparation 9
3.1. Unpacking 9
3.2. System Installation Planning 9
3.3. Equipment to be installed 9
3.3.1. Mandatory 9
3.3.2. Optional 9
3.4. Equipment Location 10
3.4.1. Main Electronics Enclosure 10
3.4.2. Crash Protected Memory 12
3.4.3. Microphone Mounting Location 12
3.4.4. Mounting the Main Electronics Enclosure 13
3.4.5. Cable Arrangements 13
4. Cable Termination 17
4.1. MEE (500.01) 17
4.1.1. 24 V d.c. Main Power Supply 17
4.1.2. Video Cables. 17
4.1.3. Microphone Cables. 18
4.1.4. VHF Communications Audio. 19
4.1.5. Crash Protected Memory 20
4.1.6. CPM RJ45 Fitting Instructions 21
4.1.7. 61162 Data Channels 23
4.1.8. External Ships Alarm 24
4.2. Crash Protected Memory (500.04) 25
4.2.1. Crash Protected Memory 25
4.2.2. Gland Arrangements 25
4.2.3. Cable Terminations 26
4.2.4. CPM Final Installation 26
4.3. Microphones 28
4.3.1. Mounting the Microphones 28
4.3.2. Cable Termination 29
4.3.3. Microphone Connector Terminal Numbers 30
5. Optional Equipment Installation 31
5.1. Remote Alarm Unit (500.06) 31
5.2. VHF Interface (500.07) 32
5.3. ARPA Radar Isolation Unit (500.10) 34
5.4. 61162 Signal Interface (500.08) 35
5.4.1. Analogue Isolation Board (500.08.02.02) 36
5.4.2. Digital Isolation Board (500.08.02.03) 37
6. Illustrations 38
6.1. Photographs 38
6.1.1. Installed Main Electronics Enclosure (500.01) 38
6.1.2. Installed Crash Protected Memory (500.04) 39

6.1.3. Signal Interface (500.08) 40
6.1.4. ARPA Isolation Unit (500.10) 41
6.1.5. VHF Interface (500.07) 41
6.1.6. Remote Alarm Unit (500.06) 42
7. Drawings 43

Document History and Minor Update Record

Minor changes to this manual will be instigated by the issue of update pages. These are to be inserted in the manual as indicated with the changes. These changes are to be recorded in the table below.

Issue No.	Date	Pages Affected	Comments	Date Entered in Manual	Entered By
01	02/06		Initial Issue to QinetiQ Type Approval Authority	02/06	ACH
02	04/06		See CRF019	04/06	ACH
03	06/06		See CRF027	06/06	ACH

Preface

The Broadgate Voyage Event Recorder (VER) is designed to provide a recording of various operational events in a ship over the previous 12 hours. These include voice, radar information and other such data. The purpose of these recordings is to be able to analyse the events leading up to a casualty or near miss situation involving the vessel in which the equipment is fitted. In order to facilitate the analysis of the recorded information a Playback Suite is provided at a location ashore.

The following guidelines outline the installation of the VER4000/VER4000-S. This process prioritizes the primary units, i.e. the Main Electronics Enclosure (MEE), the Crash Protected Memory (CPM) and the microphones, however the use of other units such as the Video Isolation Unit, the Signal Interface, the VHF Interface and the Remote Alarm Unit will often be required. It must be noted that if the installation of these separate units is required the process of installation for the other units will be affected, particularly at the planning stage.

It is essential that only screened cables are used in an installation and the screens/braids terminated at both ends of every cable to earth. When fitting the wiring between the units and the units themselves, take care to observe usual good practice to avoid interference and other damage.

All the photos and drawings contained within the text are for guidance only.

The VER4000/VER4000-S recorder complies with IMO Performance Standard A861 (20) and IEC Performance Requirements and Methods of Test 61996.

1. Introductory Notes

1.1. Quality Standards

All assembly must meet standards set out in the SELEX Communications Ltd Procedures and Work Instructions Manual and the outline criteria in the SELEX Communications Ltd Quality Manual.

Unless otherwise stated, all screw type cable terminations into terminal blocks; headers or plugs should be made using an appropriately sized bootlace ferrule on each core, crimped using the correct tool.

Only screened cables must be installed and their screens or braids must be connected to earth at both ends.

1.2. Environmental Specification

The equipment supplied will meet all the applicable requirements of IEC Specification 60945.

Performance requirements are complied with in meeting IEC Specification 61996.

1.3. Glossary of Terms

AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
CPM	Crash Protected Memory (Also known as Protective Capsule)
EMC	Electromagnetic Compatibility
FRM	Final Recording Medium (Also known as CPM)
HSM	Hull Stress Monitoring
IDC	Inline Dual Connector
IEC	International Electronic Commission
IMO	International Maritime Organisation
MEE	Main Electronic Enclosure
PC	Protective Capsule (Also known as Crash Protected Memory)
PCB	Printed Circuit Board
PSU	Power Supply Unit
SPU	Signal Processing Unit
TIU	Transition Interface Unit (PCB)
VDR	Voyage Data Recorder
S-VDR	Simplified Voyage Data Recorder
VER	Voyage Event Recorder

2. VER Certificate of Compliance, Installation Report and Warranty Registration Card

The following form is to be completed for all Installations and forwarded to the address on the form.

Note: The Broadgate VER4000/VER4000-S system will not be registered for warranty, until this form and associated installation information has been received and verified by SELEX Communications Ltd.

Broadgate

VER Certificate of Compliance, Installation Report and Warranty Registration Card

To ensure the warranty is activated, this form must be completed in full and returned to SELEX Communications Ltd within 30 days of installation. A test recording and Ships Configuration File is also to be supplied, in Electronic Format, to the e-mail address below. Failure to do so will invalidate the warranty. A copy of all documentation is to be retained on board the vessel.

Vessel name / hull number: _____ **System type:** VER4000 / VER4000-S

Vessel owner / shipyard: _____ **System Serial Number:** _____

Date of installation: _____

Systems Recorded

		Signal Format/ IEC 61162 Header	Data Source	Checked By (Initials)
Audio	Yes / No			
VHF	Yes / No			
Radar	Yes / No			
Speed Log	Yes / No			
Gyro	Yes / No			
GPS	Yes / No			
AIS	Yes / No			
Echo Sounder	Yes / No			
Wind	Yes / No			
Rudder demand*	Yes / No			
Rudder achieved*	Yes / No			
Engine demand*	Yes / No			
Engine achieved*	Yes / No			
Thruster Demand*	Yes / No			
Thruster Achieved*	Yes / No			
Hull openings *	Yes / No			
Watertight doors *	Yes / No			
Fire doors *	Yes / No			
Alarms *	Yes / No			
HSM	Yes / No			

*** = Additional detailed Commissioning Forms to be attached.**
I certify that the Broadgate VER4000/VER4000-S is Type Approved to IMO A861 (20) / IEC61996 and this installation complies with the relevant requirements of those standards.

Installation and commissioning completed by:

Signature _____ **Company** _____ **Date** _____

Installation and commissioning accepted by:

Signature _____ **Print name** _____ **Date** _____

Return to the following address: VER Service Administration, Selex Communications Ltd (Marine Division), BLDG 20/A1-2 (South Side), PO Box 5, Filton, Bristol, BS34 7QW or email to marine.bristol@selex-comms.com

SELEX Communications
a Finmeccanica Company

Issue 01 05/06

3. Preparation

3.1. Unpacking

On unpacking the equipment check for damage sustained during transport and ensure that all units and components are checked against the list of contents. In the case of irregularities contact SELEX Communications Ltd for further instructions.

3.2. System Installation Planning

The process of fitting the VER4000/VER4000-S to a vessel must be planned in advance. In the case of installing on older vessels, an inspection is advised to address installation difficulties in advance. For new vessels at the design stage, it is advised that all bridge arrangement drawings be submitted to SELEX Communications Ltd, for location recommendations.

3.3. Equipment to be installed

3.3.1. Mandatory

Main Electronic Enclosure (MEE) 500.01
Crash Protected Memory (CPM) 500.04
Microphones (maximum 8) 500.02 (Internal) or 500.03 (External)

3.3.2. Optional

VHF Interface 500.07
Video Isolation Unit 500.10
Remote Alarm Unit 500.06
Signal Interface 500.08

3.4. Equipment Location

3.4.1. Main Electronics Enclosure

The Main Electronics Enclosure (MEE) should be mounted in a clean, dry, preferably air conditioned area, within easy reach of the crew. Ideal locations would be the bridge, especially the wheelhouse or an electrical locker within the bridge deck area.

The MEE should be at least 95 centimetres away in the horizontal plane from Standard, Steering, Standby or Magnetic Compass.

All the connecting cables enter the unit from below. Therefore, to meet the unit's service requirements the following guidelines should be met:

a) The top surface of the MEE must be no more than 1350 mm from the deck in order for controls and indications to be easily accessible and visible. 400 mm clearance is to be allowed at the top of the MEE to allow access to the top panel, which is required for service access.

b) The base of the unit is to be more than 400mm from the deck or other obstruction, to allow the cables to enter the unit with ease.

c) The MEE is to have a free clearance of 200mm to the left and right hand side, to allow ventilation.

d) The MEE must have a clearance of 500 mm in front of the unit, to allow the door to open fully.

Refer to drawing GA.500.01.00.00.000 Sheet 2, equipment weight 33 Kg

Environmental Safety Consideration. Although the test conditions for bridge units provide for a maximum operating temperature of 55ºC, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25ºC. This is a necessary prerequisite for long life and low service costs.

The MEE is to be connected to ships Earth with 2.5 mm^2 Earth Bonding wire, as per photos 3.4.1.1. and 6.1.1.

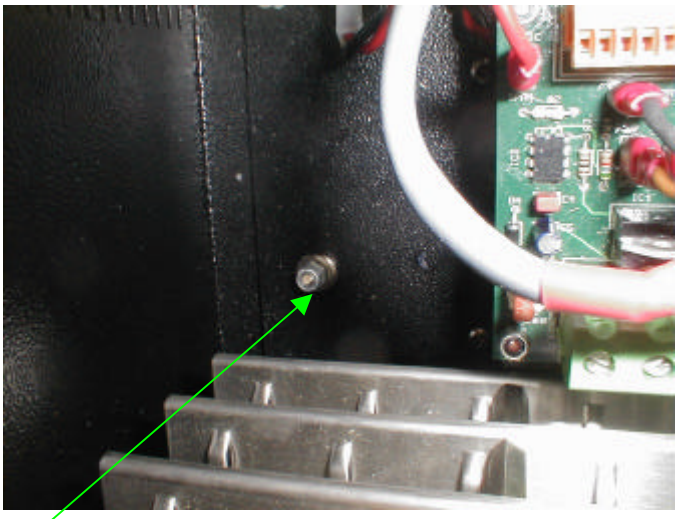


Photo 3.4.1.1.

MEE Earth Bolt

3.4.2. Crash Protected Memory

The Crash Protected Memory (CPM) should be located on the open deck sufficiently clear of any obstacles. Positioning the CPM should take into account possible recovery by a Remotely Operated Vehicle (ROV) should the vessel sink. This area is most likely to be the monkey island directly above the bridge (although any open deck within 100 metres cable length will suffice). The CPM must be secured in a place where it will not obstruct footway passage, and where people cannot either tamper with or accidentally tread on cables.

The Crash Protected Memory should be at least 1 meter away in the horizontal plane from Standard, Steering, Standby or Magnetic Compass.

It is important to find a position that can securely support the CPM unit. For appearance and longevity purposes, the CPM can be fitted on a stand above the deck level.

Refer to drawing GA.500.04.00.00.000 – equipment weight 15 Kg

3.4.3. Microphone Mounting Location

The positioning of the microphones within the bridge of the vessel is important. Their overall effectiveness is reliant on their location in relation to the vessel's bridge size, layout, usage, acoustics, etc.

Locate microphones at all major conning positions such as radar, helm, chart table, manoeuvring console (engine telegraphs), bridge wing consoles and wheelhouse telephone, GMDSS, etc. Microphones should be positioned approximately half a meter in front of where a person will stand when conning the vessel. Avoid positioning microphones close to air conditioning vents, fluorescent strip lights or loudspeakers.

Each microphone should be at least 0.5 meter away in the horizontal plane from Standard, Steering, Standby or Magnetic Compass in the case of an Internal Microphone, and 1 meter in the case of an External microphone.

Refer to drawings: GA.500.02.00.00.000 Sht 1 – unit weight 0.5 Kg.

3.4.4. Mounting the Main Electronics Enclosure

The MEE is to be mounted in a vertical plane, using six M8 bolts.

Refer to drawing GA.500.01.00.00.000 Sht 2

3.4.5. Cable Arrangements

The connections to the MEE are made to the lower section of the MEE, as follows :-

Microphone – Connection to the TIU board
VHF – Connection to the TIU board
61162 Data Inputs – Connections made to the TIU board
24 V d.c. power – Connection to the TIU board

CPM – Connection to the CPM RJ45 connector

Radar Video – Connection to the BNC connectors located on the MEE internal bulkhead.

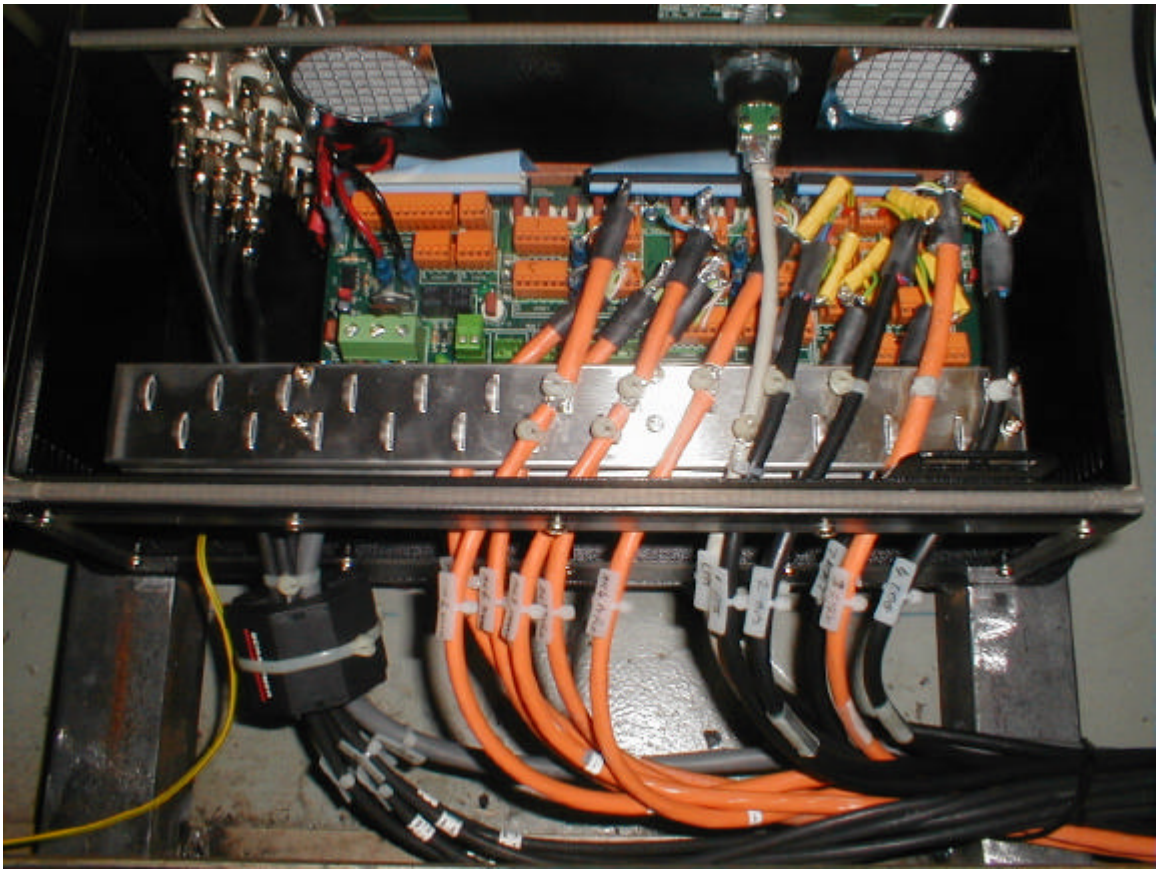


Photo 3.4.5.1.

Cable Allocation	Cable Type	Connector
CPM	Sen5E, 4 Pair Cat 5e 24 awg	CPM
Main Power In (24V)	CY3 2.5 3 Core	CON25 (TIU)
Remote Alarm Out	16/2/12C DEF61-12	CON28 (TIU)
Microphones In	3 Pair 0.33mm^2	CON17 to CON24 (TIU)
VHF Audio In	3 Pair 0.33mm^2	CON26 (TIU)
AIS In	16/2/4C DEF61-12	CON1 (TIU)
IEC 61162 Data In	16/2/4C DEF61-12	CON2 to CON16 (TIU)
ARPA Video Buffer 24 V Supply	16/2/4C DEF61-12	CON30 TIU
Signal Interface 24 V Supply	16/2/4C DEF61-12	CON31 TIU
Video In	URM70 75 ohm Coax	BNC Male Connector

Table 3.4.5.1. Field cable connections

For full cable type, see drawing GA.500.00.00.00.000-4.4, the above table is for guidance only.

Cable Screens are to be made off as follows, all cable lengths must be short, within the MEE, using the three cable Bridges to route cables as in the following pictures :-

Main Power – Connect screen to cable Bridge and screen connection on CON25, see photo 3.4.5.2.

CPM – Connect screen and armour to cable Bridge, run screen up to RJ45 connector, see photo 3.4.5.4.

Microphone and VHF Cables – Connect screen to cable Bridge and to earth tag SPA6 to SPA14, adjacent to each audio socket, see photo 3.4.5.3.

AIS and IEC 61162 Data Cables – Connect screens to pin three of the relevant data connector CON1 to CON16, see photo 3.4.5.3.

Video cable screens are not to be made off at cable entry, see photo 3.4.5.5.

All other cables are to have their screens made off on the cable Bridge.

All cables are to have their sheaths cable tied to the cable Bridge, for physical support.

The Schaffner 0444177081 ferrite is to be fitted around the Main Power and Video cables, then secured in position using cable ties, as per photo 3.4.5.5.

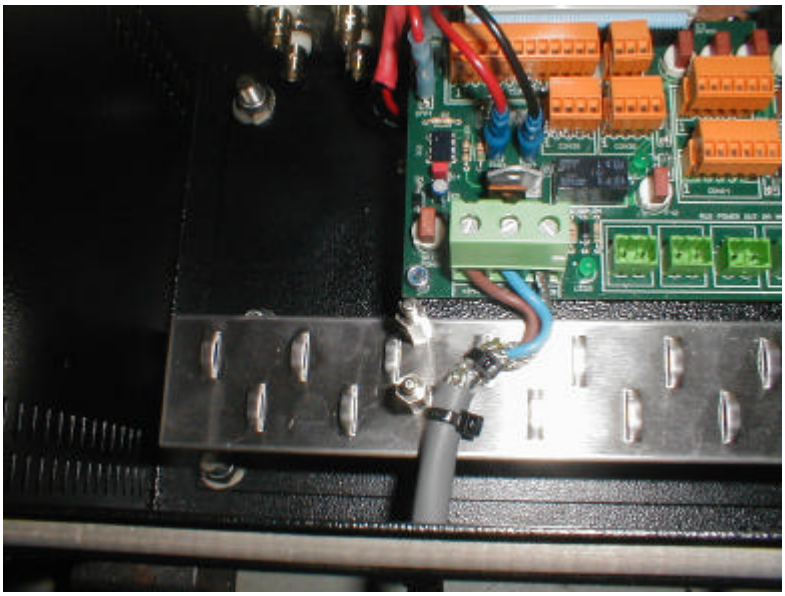


Photo 3.4.5.2.

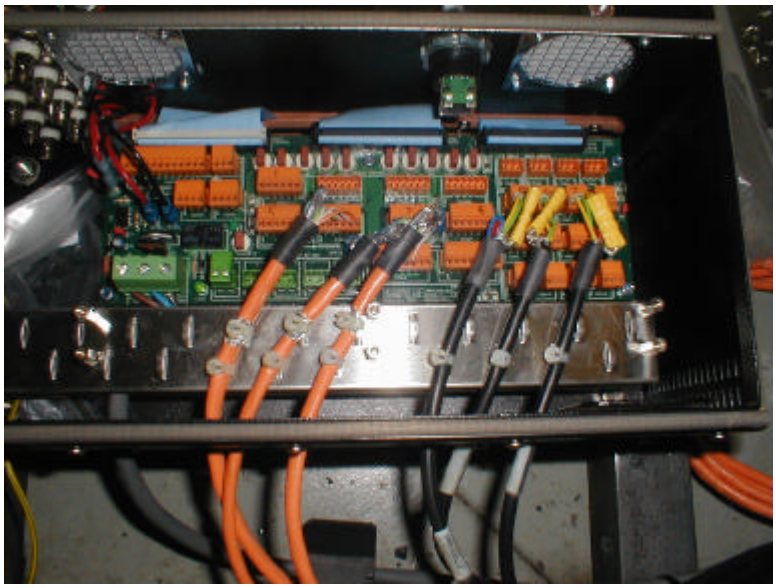


Photo 3.4.5.3.

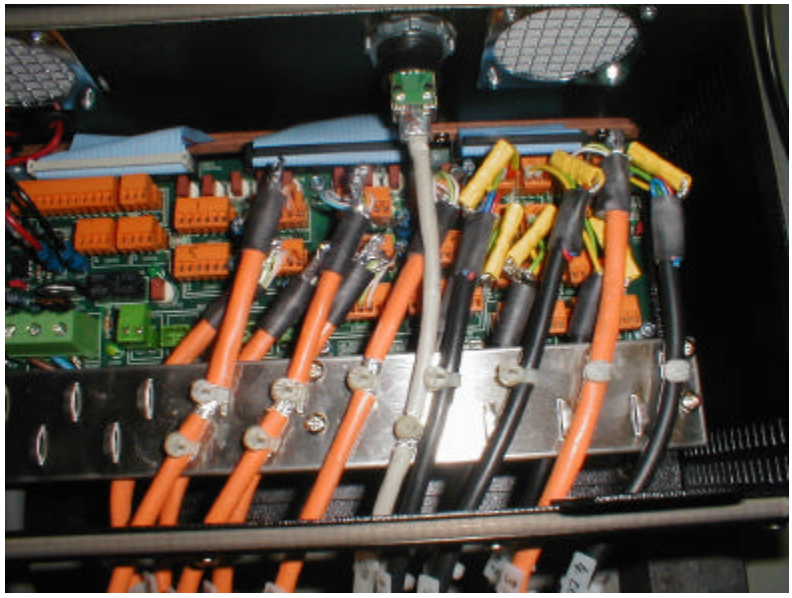


Photo 3.4.5.4.

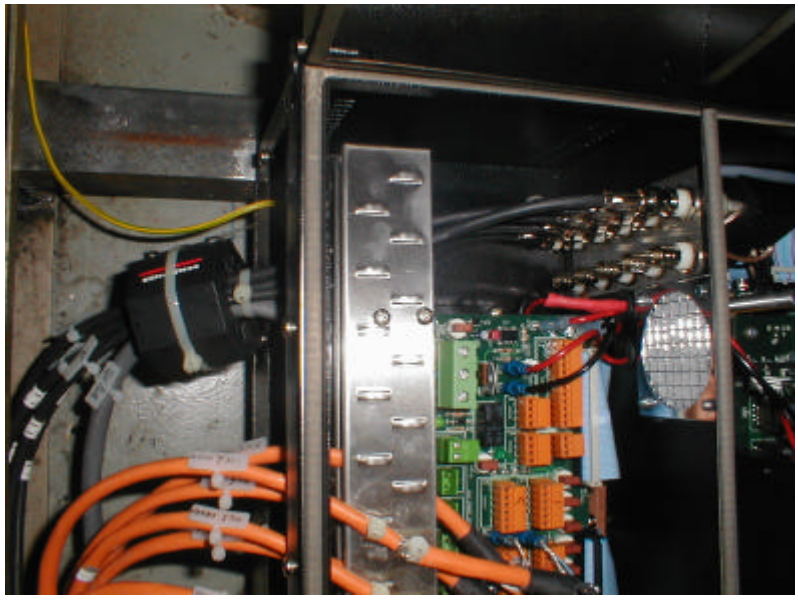


Photo 3.4.5.5.

4. Cable Termination

4.1. MEE (500.01)

WARNING: Ensure that 24 V d.c. supply is isolated before attempting to terminate cables.

Terminate the cores of the in-coming field cables in accordance with the following information and with reference to drawing GA.500.00.00.00.000-3.4 (VDR) or GA 500.00.00.00.000-4.4 (S-VDR)

4.1.1. 24 V d.c. Main Power Supply

(24V – Max current 10 Amp, normal running less than 3A).

Terminate mains supply cable using Boot Lace Ferrules and connect the two cores and screen to CON25. Ensure positive core is connected to '+24V', the negative core to the '0V' and the screen to 'Screen' terminals.

4.1.2. Video Cables.

Terminate the URM70 Video cables with BNC Plugs, 75O in accordance with instructions supplied with connectors.

Connect Video cables to MEE central bulkhead sockets ensuring that the signal lines are connected to the appropriate socket, as labelled (i.e. Red to "R", Green to "G", Blue to "B", H-Sync or Combined Sync to "H/C" and V-Sync to "V", as required), paying particular attention to the Sync inputs.

When the Video input has a 'Combined' sync signal, this is connected to the 'H/C' input. The connector on the top side of the 'H/C' input is to be disconnected and the spare BNC to BNC lead is connected between the top of the 'H/C' bulkhead BNC connector and the 'C1' input on the Video Processor pcb.

4.1.3. Microphone Cables.

Terminate microphone cables in accordance with Table 4.1.3.1., using Plug In Connectors Orange 6 way.

Connect plugs into TIU sockets CON 17-24.

Cores	**Pin**	**Use**
White/Black	1	Audio Out (+)
Black/White	2	Audio Out (-)
Green/Black	3	Audio In (+)
Black/Green	4	Audio In (-)
Black/Red	5	0 V
Red/Black	6	+ 12 V
Screen		SPA 6 to 13

Table 4.1.3.1. Microphone cable TIU terminations.

Note: First colour indicates colour to connect, second colour indicates pair, for example **Black**/White indicates that the Black wire is connected of the Black and White pair.

4.1.4. VHF Communications Audio.

Terminate VHF Communication audio cable in accordance with Table 4.1.4.1., using Plug In Connectors CON26 Orange 8 way and Table 4.1.4.2 Plug In Connector CON34 Green 2 way.

Note: CON26 Pins 3 and 4 have a higher gain level (12dB) than CON26 pins 5 and 6.

CON26	
Pin	**Use**
1	Not connected
2	Not connected
3	Audio In Low Level (+)
4	Audio In Low Level (-)
5	Audio In High Level (+)
6	Audio In High Level (-)
7	Not Connected
8	Not Connected
Screen	SPA 14

Table 4.1.4.1. VHF Communications audio TIU terminations - Audio.

CON34	
Pin	**Use**
1	+24 V
2	0 V

Table 4.1.4.2. VHF Communications audio TIU terminations - Power

4.1.5. Crash Protected Memory

Terminate Crash Protected Memory data cable with Plug In RJ45 Connector, as in Table 4.1.5.1., Figures 4.1.5.1., 4.1.6.1., 4.1.6.2. and Section 4.1.6. The screens of the cable are to be connected to earth on the Cable Bridge and are to be run up to the RJ45 CPM connector, as per photo 3.4.5.4.

CPM		
Cable	**Pins**	**Use**
Green/White	1	Tx Data +
Green	2	Tx Data -
Orange/White	3	Rx Data +
Blue	4	0 V
Blue/White	5	0 V
Orange	6	Rx Data -
Brown/White	7	+ 12 V
Brown	8	+ 12 V

Table 4.1.5.1. Crash Protected Memory data cable terminations.

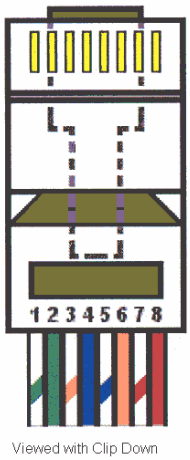


Figure 4.1.5.2.

4.1.6. CPM RJ45 Fitting Instructions

Instructions for preparing an RJ45 connection - with a length of 120mm between the outer braid and connector.

1. Strip back the outer cable insulation to expose the outer metal braid. In order to correctly earth the internal wire earth, you will need to strip back more than double the final required length. As the required final length is 80 mm in these instructions, the length to be stripped back will be 210 mm (double the length + 50mm).
2. Fold the braid back over the cable for a length of about 50mm and temporarily secure.
3. Strip back the inner cable insulation 80 mm taking care not to damage the foil shielding.
4. Cut foil shielding back to 80 mm from the inner cable insulation taking care not to damage the wires.
5. Fold back the wire earth down the length of the cable and secure with to inner cable insulation. Secure earth wire and braid with rubber sleeving. Leave 20mm of braid and wire exposed so that it can be effectively earthed.

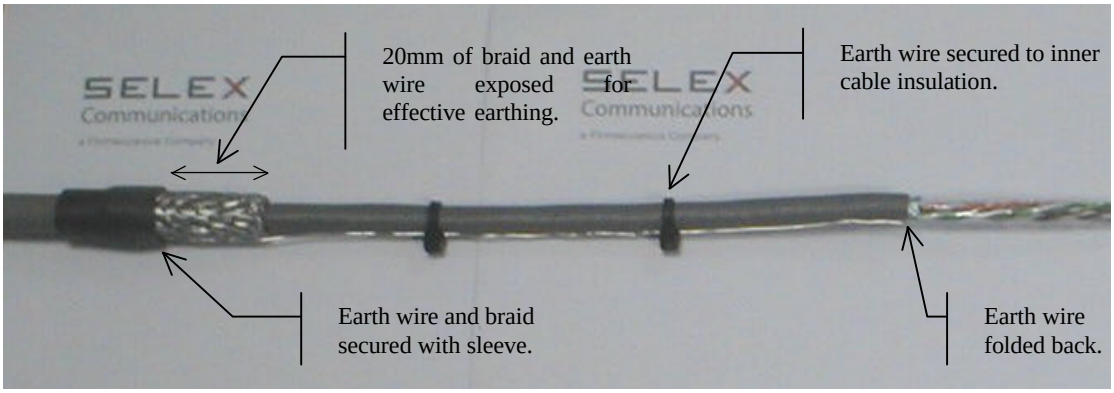


Figure 4.1.6.1.

6. Cut back the clear plastic film down to the foil shielding.
7. Cut the 4 twisted pairs down to 100mm. Unwind the pairs and straighten out the individual wires.
8. Arrange the wires so that they match the required layout, see Table 4.1.5.1. and Figure 4.1.5.1. Then pinch the base of the wires and arrange them in so that they will fit into the RJ45 connector.
9. Still pinching the base of the wires, cut the wires at 90 degrees to the cable and 15mm from the inner cable insulation.
10. Push the wires into the connector, ensuring the wires stay in the correct layout. As the inner cable insulation is quite thick, a reasonable amount of pressure can be applied to push the wires fully home.

11. The wires *should* reach all the way to the front of the connector where the copper cores should be clearly seen. If this is not possible, the wires **must** reach under the brass inserts in the connector.
12. Offset the earth wire to ensure the crimping tool does not crush it.
13. Crimp the connector to the wires, release the crimping tool and repeat the process to ensure a good secure crimp.

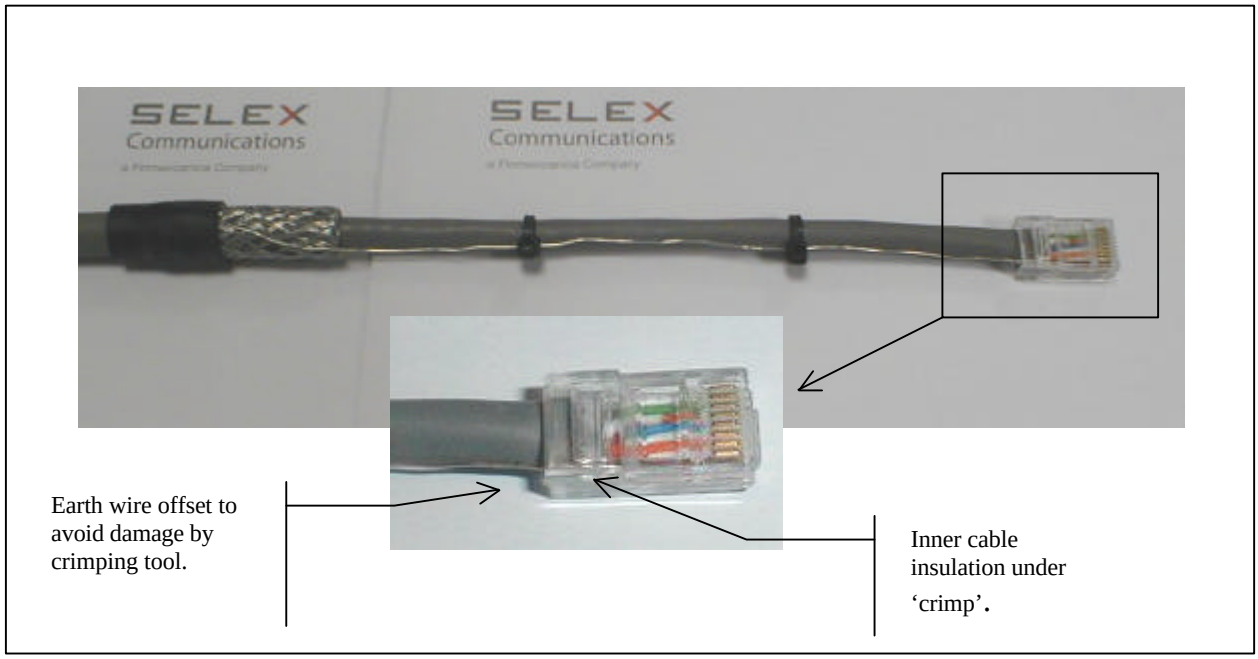


Figure 4.1.6.2.

14. Examining the RJ45 connector from the end, the copper cores from the wires should be clearly visible. Viewed from the sides, the outside wires should reach to the front edge of the connector.

4.1.7. 61162 Data Channels

AIS Data is to be connected to CON1.

Repeated IEC 61162 Header Data is to be connected to CON2, for example, Alarm Data.

Other data can be connected to any of the remaining 14 IEC 61162 Data In channels CON3-CON16, however to ensure consistency of installation it is recommended that signals are connected as per table 4.1.7.2. Terminate data input cables using Plug In Connectors Orange 3 way in accordance with Table 4.1.7.1. Terminate the screen on the appropriate connector, pin 3 only.

Pins CON1-16	**Use**
1	Data In (A) +
2	Data In (B) -
3	Screen

Table 4.1.7.1. IEC 61162 Data input connections.

Channel	**VDR**	**S-VDR**
1	AIS *	AIS **
2	Repeated Data	Repeated Data
3	GPS	GPS
4	Gyro	Gyro
5	Speed Log	Speed Log
6	Echo Sounder	Echo Sounder ***
7	Wind ****	Wind ***
8	Signal Interface	As Required
9	As Required	As Required
10	As Required	As Required
11	As Required	As Required
12	As Required	As Required
13	As Required	As Required
14	As Required	As Required
15	As Required	As Required
16	As Required	As Required

Table 4.1.7.2. IEC 61162 Data recommended input connections.

* = AIS Optional

** = AIS Mandatory if radar cannot be recorded by an ‘off-the-shelf interface’.

*** = Items to be recorded only if IEC 61162 Signal are available.

**** = Item to be recorded if Anemometer is fitted to vessel.

As Required = Inputs required as per IEC 61996-2 VDR/S-VDR Specification.

4.1.8. External Ships Alarm

An external ships alarm can be connected to the VER4000/VER4000-S. This will allow other ships monitoring systems to be connected to the VDR, to monitor when the VDR is in normal operation or abnormal operation.

Connections are to be made as per table 4.1.8.1.

CON29	**Use**
1	Normally Open
2	Common
3	Normally Closed

Table 4.1.8.1. External Alarm Connections

4.2. Crash Protected Memory (500.04)

4.2.1. Crash Protected Memory

This can be fitted in one of two ways: -

1.1 Securing the base plate using 4 off M8 hexagonal bolts going into greased taps fitted into its plinth.

1.2 If there is access available beneath at the deck head, then greased 50mm M12 hex bolts can be secured from the other side.

Should any contact occur between aluminium and steel, rubber sleeves should be fitted to prevent corrosive damage.

4.2.2. Gland Arrangements

Run the CPM cable (CAT5E) from beneath decks securing together using cable-ties. Fit any exposed runs inside a conduit to minimize weather damage.

When the cables penetrate an exposed deck, install a cable gland to carry the cable and leave a length of cable (do not coil the cable) near the CPM, for future re-instatements, before the cables reach the capsule.

Unscrew the four M4 bolts at the end of the Crash Protected Memory and remove the end cap.

Cut the CAT5E cable to appropriate length to terminate inside the Crash Protected Memory, making off the screen or braid at the gland, see photo 4.2.2.1.

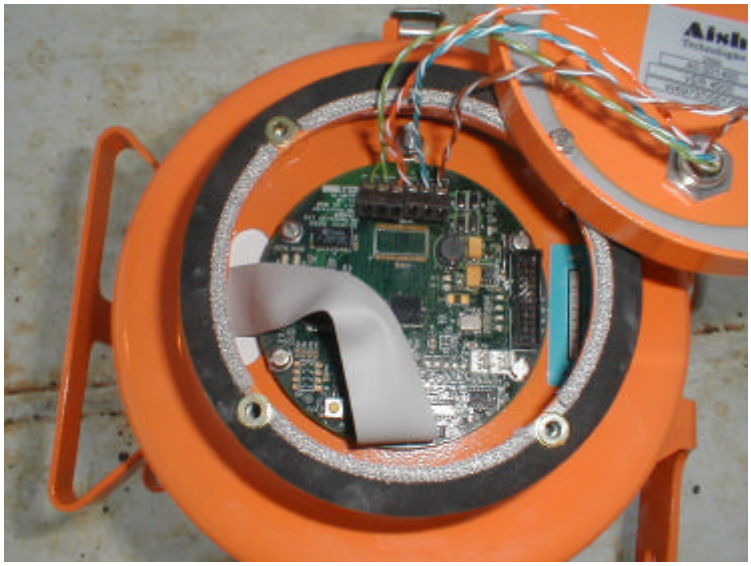


Photo 4.2.2.1.

4.2.3. Cable Terminations

Terminate the data and power cables in accordance with Table 4.2.3.1. below.

On completion fit the lid, ensuring that it sits squarely onto the Crash Protected Memory seal. Line up the screw hole in the end of the tube. Insert and tighten 4 x M4 bolts.

Cable	Terminal	Use
Brown/White	1	+12 V
Brown	1	+12 V
Blue/White	2	0 V
Blue	2	0 V
Orange/White	3	Tx Data +
Orange	4	Tx Data -
Green/White	5	Rx Data +
Green	6	Rx Data -

Table 4.2.3.1. Crash Protected Memory Terminations SK6

4.2.4. CPM Final Installation

1) Fit the end CPM end cover, using the four M4 stainless steel bolts and washers.

2) The Farnell 964-0452 ferrite is to be fitted around the CPM Cable, and then secured in position using cable ties, as close to the cable gland as is possible.

3) After ensuring correct operation of the MEE and CPM, fit the four stainless steel cable ties, two to the CPM base locking pins and two to the side clips of the CPM body, ensuring that these are wrapped around the back of the clip, as per photo 4.2.4.1., 4.2.4.2. and 6.1.2.

Photo 4.2.4.1.

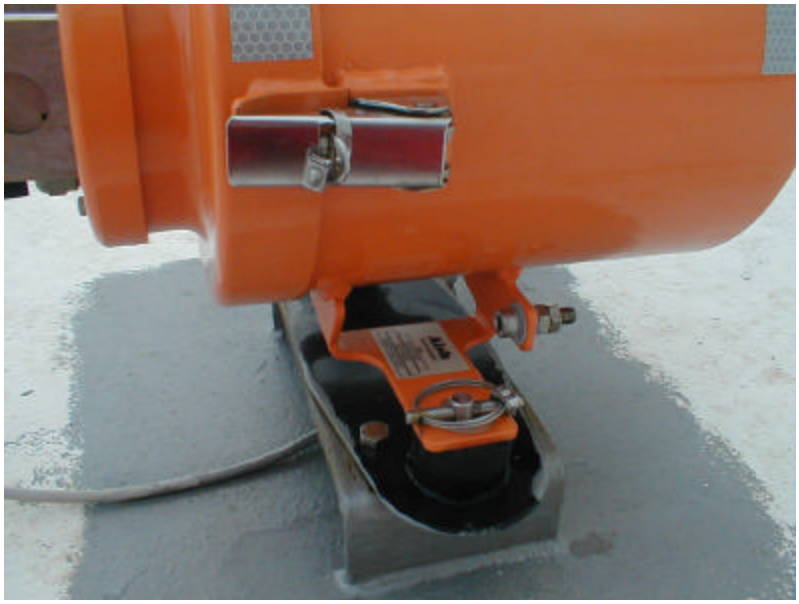


Photo 4.2.4.2.

4.3. Microphones

4.3.1. Mounting the Microphones

Prepare to fix the individual microphones in their allocated positions by removing their covers. There are two different types of microphone units and each should be secured in the following manner :-

Internal (500.02)

The microphone is secured to the deckhead using M4 screws or bolts as appropriate, but cable termination should be completed prior to the Microphone enclosure being secured. Cable entry is via M16 EMC Gland at the rear of the enclosure.

External (500.03)

This microphone is for use in areas that are exposed to the weather. Fixing is achieved by removing the lid and securing it to the bulkhead or deckhead, through the 2 off mounting holes in the base of the enclosure. Cable entry is via M16 EMC Gland at the top of the enclosure.

After the External Microphone has been installed and tested then the joint between the lid and base should be effectively sealed by the use of sealant around the edge of the base.

4.3.2. Cable Termination

Make off the cable at the gland of each microphone, taking care to ensure the screen or braid of the cable is terminated at the cable gland and the individual screening covers the wires up to the connectors, see Photo 4.3.3.1.

Terminate the cable in accordance with Table 4.3.2.1. below using Plug in Connectors Green 2 way (PW1) and Plug in Connectors Orange 4 way (CON2). Connect plugs into appropriate sockets on the microphone boards.

PW1			**CON2**		
Core	**Pin**	**Use**	**Cores**	**Pin**	**Use**
Black/Red	1	0 V	**White**/Black	1	Audio Out (+)
Red/Black	2	+12 V	**Black**/White	2	Audio Out (-)
			Green/Black	3	Audio In (+)
			Black/Green	4	Audio In (-)

Table 4.3.2.1. Microphone cable terminations.

Note: First colour indicates colour to connect, second colour indicates pair, and for example **Black**/White indicates that the Black wire is connected of the Black and White pair.

Replace the covers of the Internal Microphones using 2 off M4 screws, first ensuring that the enclosure base is secured to the bulkhead or deckhead.

When fitting External Microphone, ensure that lid is tightened sufficiently to stop ingress of water.

After the External Microphone has been installed and tested then the joint between the lid and base should be effectively sealed by the use of sealant around the edge of the base.

4.3.3. Microphone Connector Terminal Numbers

The microphone connector terminal numbers are as per Photo 4.3.3.1.

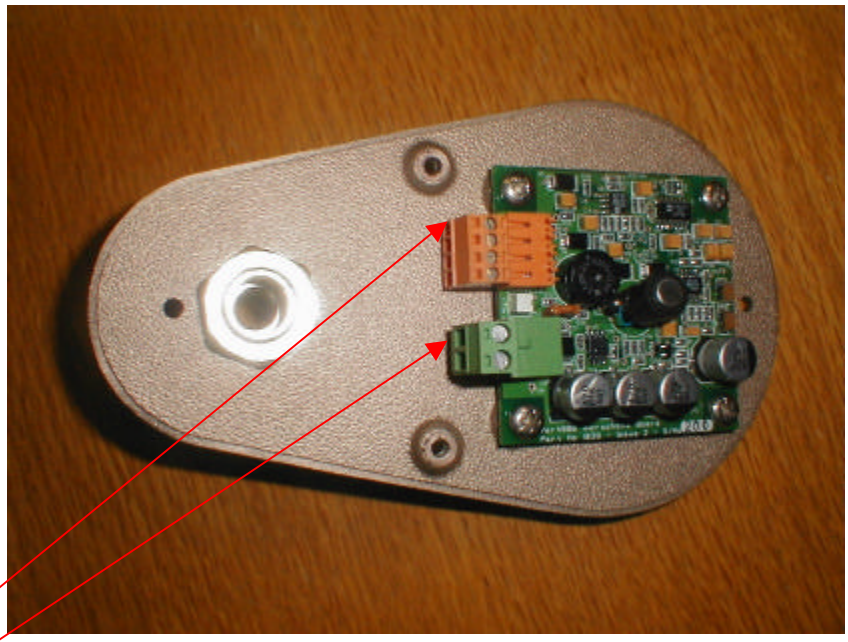


Photo 4.3.3.1.

5. Optional Equipment Installation

5.1. Remote Alarm Unit (500.06)

The remote alarm is required when the MEE unit is located away from the wheelhouse in an unpopulated or concealed position. The unit indicates when there is an alarm on the main unit. Consequently, the remote alarm needs to be positioned in a highly visible place on the bridge.

Refer to drawing MAN.500.06.01.00.001 – equipment weight 1 Kg.

Once a suitable location has been selected, make off a suitable length 16/2/12C cable, ensuring screen or braid is terminated correctly.

Cut the cores to length and connect in accordance with Table 5.1.1.

Terminal	**Core**	**Use**
1	Red	Ext. Cancel button (-)
2	Blue	Ext. Cancel button (+)
3	Green	Ext. Alarm LED (-)
4	Yellow	Ext. Alarm LED (+)
5	White	Ext. Alarm buzzer (+)
6	Black	Ext. Alarm buzzer (-)
7	Brown	Ext. Dimmer (+)
8	Violet	Ext. Dimmer (wiper)
9	Orange	Ext. Dimmer (-)
10	Pink	Power LED 0 V
11	Turquoise	Power LED + V
12	Grey	Not Connected

Table 5.1.1. Remote Alarm Unit connections

At the Main Electronics Enclosure, make off the 16/2/12C, cut cores to length and terminate in accordance with Table 5.1.2.

CON28	**Core**	**Use**
1	Red	Ext. Cancel button (-)
2	Blue	Ext. Cancel button (+)
3	Green	Ext. Alarm LED (-)
4	Yellow	Ext. Alarm LED (+)
5	White	Ext. Alarm buzzer (+)
6	Black	Ext. Alarm buzzer (-)
7	Brown	Ext. Dimmer (+)
8	Violet	Ext. Dimmer (wiper)
9	Orange	Ext. Dimmer (-)
10	Pink	Power LED 0 V
11	Turquoise	Power LED + V
12	Grey	Not Connected

Table 5.1.2. Remote Alarm connections at the TIU.

5.2. VHF Interface (500.07)

In order to convert the VHF signals of the vessel's radio to specified levels for the VER3000 to record; an optional VHF interface may be required.

Position this interface as close to the VHF radio unit as possible to minimise interference affecting the audio signal. The initial run of cable from the MEE to the VHF interface should be 3 pair 0.33mm^2, individual and overall foil screened, 9.12 mm diameter, and is fitted to gland on the VHF interface, adjacent to SKT3. The run of cable, 16/2/4C, from the host VHF enters adjacent to SKT1/SKT2 in the VHF interface unit.

Terminate the cable from the MEE in accordance with Table 5.2.1. below using Plug in Connector Orange 4 way (PL3), making off the screen or braid at the gland.

SKT3		
Core	**Pin**	**Use**
Black/Red	1	0 V
Red/Black	2	+ 24 V
Green/Black	3	Audio +
Black/Green	4	Audio -

Table 5.2.1. VHF input cable terminations.

Terminate the cable from the host VHF in accordance with Table 5.2.3. below using Plug in Connectors Orange 2 way (SKT1, SKT2) for separate transmit and received audio signals, making off the screen or braid at the gland.

SKT1			**SKT2**		
Core	**Pin**	**Use**	**Cores**	**Pin**	**Use**
Red/Black	1	Transmit Audio +	**Green**/Black	1	Receive Audio +
Black/Red	2	Transmit Audio -	**Black**/Green	2	Receive Audio -

Table 5.2.3. Microphone cable terminations

If the output from the host VHF is a composite transmit/receive audio signal then connect to SKT1

Connect plugs into appropriate sockets on the VHF Interface board.

Refer to drawings MAN.500.07.01.00.001 – equipment weight 0.6 Kg.

5.3. ARPA Radar Isolation Unit (500.10)

The ARPA Video Buffer is required to convert the video signals from the vessel's range to those specified for use in the VER4000 (if they are different). The Video Buffer needs to be positioned close to the radar, within 2 metres if possible. Total length of cables from the Video Buffer to the MEE should not exceed 50 metres. Refer to drawing MAN.500.10.01.00.001, equipment weight 1.0 Kg.

The format of the cables from the radar to the interface will be one of three types.

- Red, Green, Blue, with Synch on Green cable.
- Red, Green, Blue, with a composite Synch cable.
- Red, Green, Blue, with separate vertical and horizontal Synch cables.

Run the appropriate number of coax cables between the host radar and the Video Buffer, terminating them with BNC, 75-Ohm plugs and fit to the appropriate input sockets on the buffer.

Connect the URM70 cables from the Video Buffer to the MEE to enter at the MEE and terminate at each end with BNC 75O plugs.

Run the power cable between the Video Buffer (see Table 5.3.1.) and the MEE (see Table 5.3.2.) to supply 24V DC to the buffer. Terminate at CON30 in the MEE using a Plug In Connector Green 2 way, ensuring that the polarity is correct when connected to the Video Buffer. Connect the Video Buffer end to the Buffer using bootlace terminals, making off the screen or braid at the gland.

SKT10		
1	Red	+24 V DC
2	Blue	0 V

Table 5.3.1.

CON 30		
1	Red	+24 V DC
2	Blue	0 V

Table 5.3.2.

5.4. 61162 Signal Interface (500.08)

The Signal Interface provides isolation between the host equipment and the VER4000 and converts analogue voltage/current signals to IEC 61162 format prior to recording. It can also accept a number of digital (on/off) inputs. It consists of a Motherboard and Analogue Isolation and/or Digital Isolation boards.

Position the unit in a dry internal location. Allow sufficient clearance to facilitate opening of the outer cover. Refer to drawing GA.500.08.00.001 for Signal Interface Dimensions, equipment weight 15 Kg.

Secure the unit to a bulkhead using four M8 bolts or screws.

Data connections from the Interface to the MEE are via SKT9 on the Motherboard, as per table 5.4.1. The Screen of the cable is to be connected to and secured on the Cable Plate, at the base of the unit.

SKT9		
1	Blue	0 V
2	Red	+ 24 V
3	Yellow	Data A
4	Green	Data B

Table 5.4.1.

At the MEE, make off the other end of the inter-connecting cables at the cable bridge, terminate the data pair with Plug In Connectors Orange 3 way and plug into the appropriate data input terminals CON7 on the TIU, as per table 5.4.2. – see section 4.1.7.

Pins CON7		
1	Yellow	Data In (A) +
2	Green	Data In (B) -
3	Screen	Screen

Table 5.4.2. IEC 61162 Data input connections.

Power is fed to the Signal Interface from CON31 in the MEE via a Plug In Connector Green 2 way, as per table 5.4.3.

CON 31		
1	Red	+24 V DC
2	Blue	0 V

Table 5.4.3.

5.4.1. Analogue Isolation Board (500.08.02.02)

Input signals, up to 4 per board, are via connector SKT 1. Polarity as marked on the board.

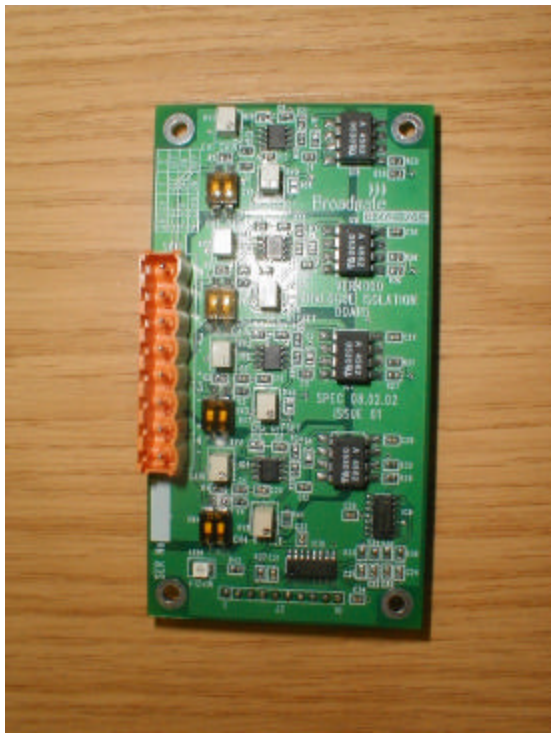


Photo 5.4.1.1.

5.4.2. Digital Isolation Board (500.08.02.03)

Input signals, up to 16 per board, are via connector SKT 1 and SKT 2. Polarity as marked on the board.

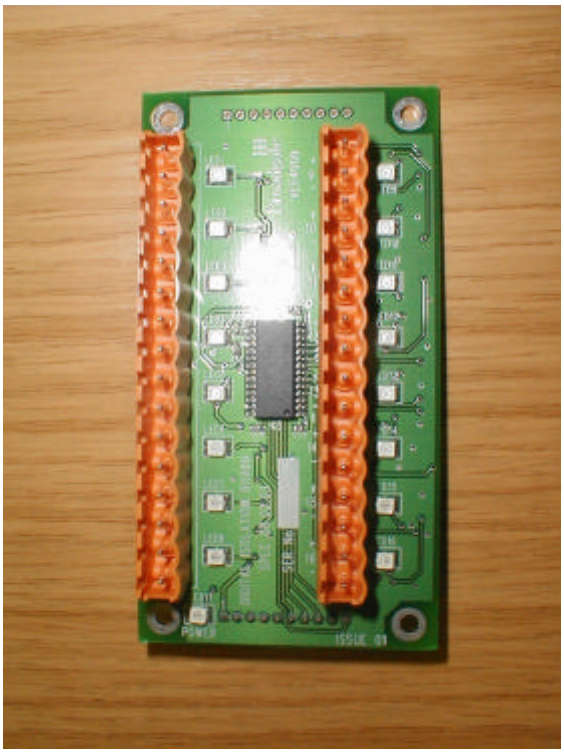


Photo 5.4.2.1.

6. Illustrations

6.1. Photographs

Earth Bolt

6.1.1. Installed Main Electronics Enclosure (500.01)

6.1.2. Installed Crash Protected Memory (500.04)

Note: Fit Metal Cable ties (supplied) to ensure that the locking pin and cover clamp cannot accidentally be un-clipped.

6.1.3. Signal Interface (500.08)

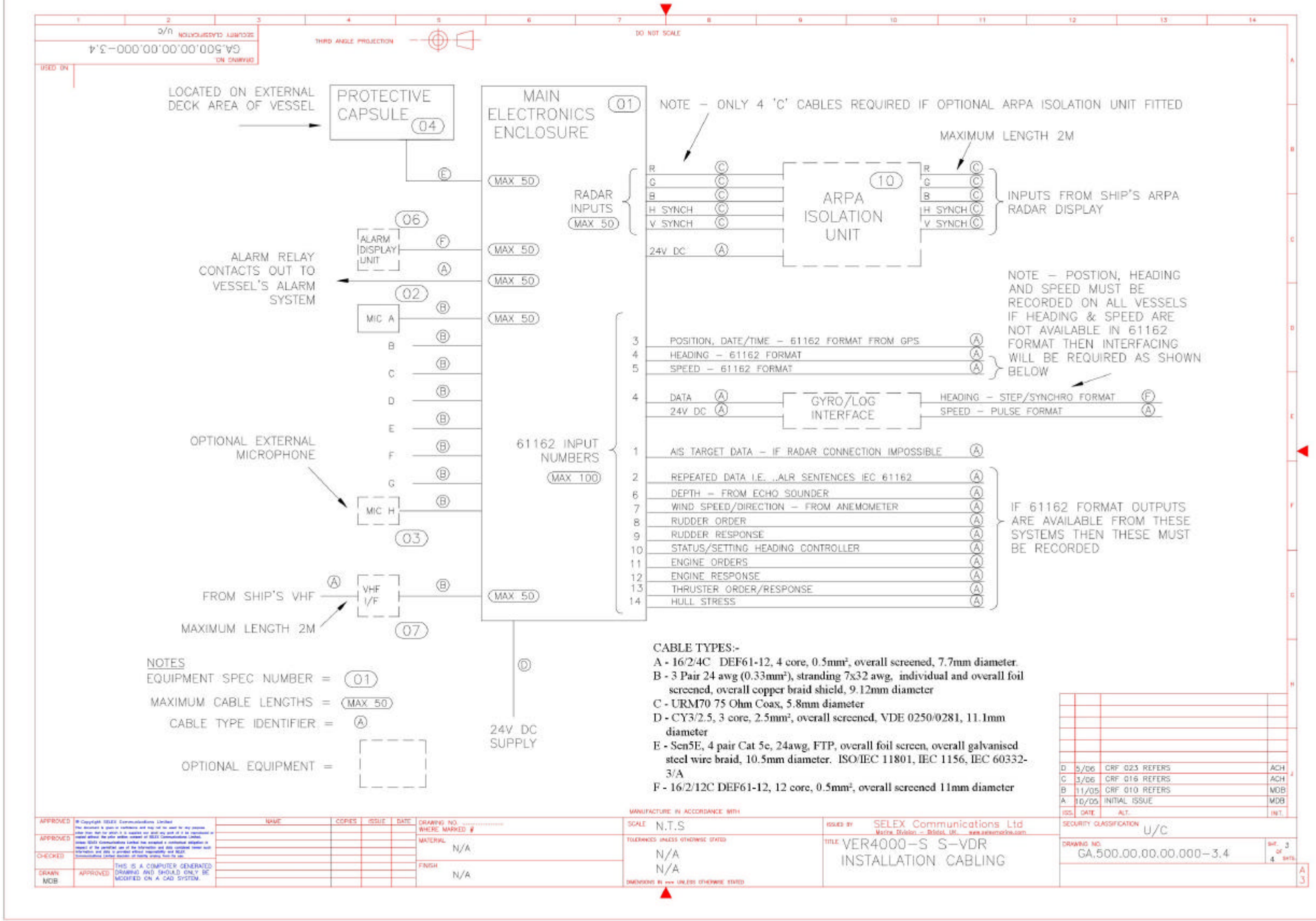
6.1.4. ARPA Isolation Unit (500.10)

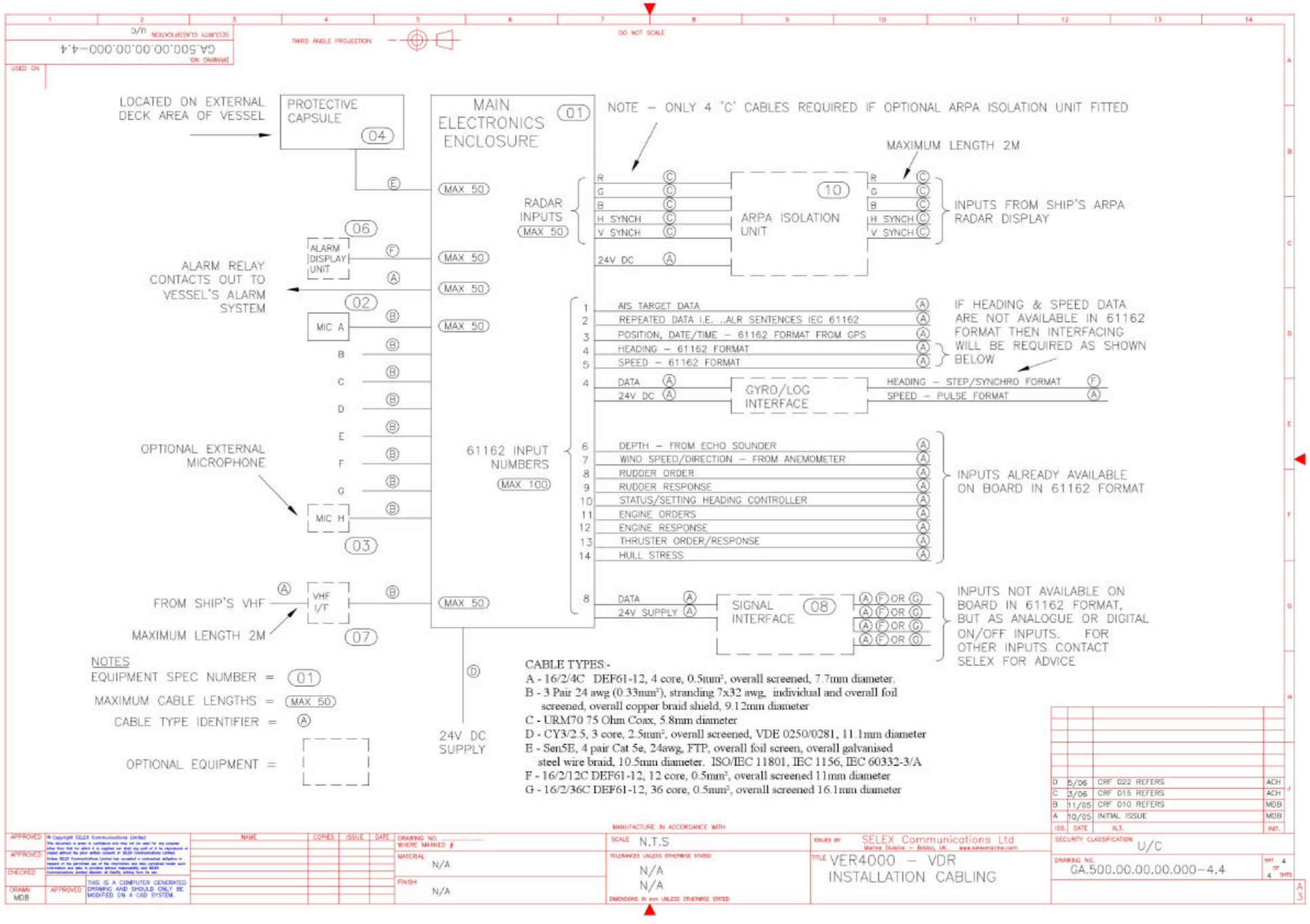
6.1.5. VHF Interface (500.07)

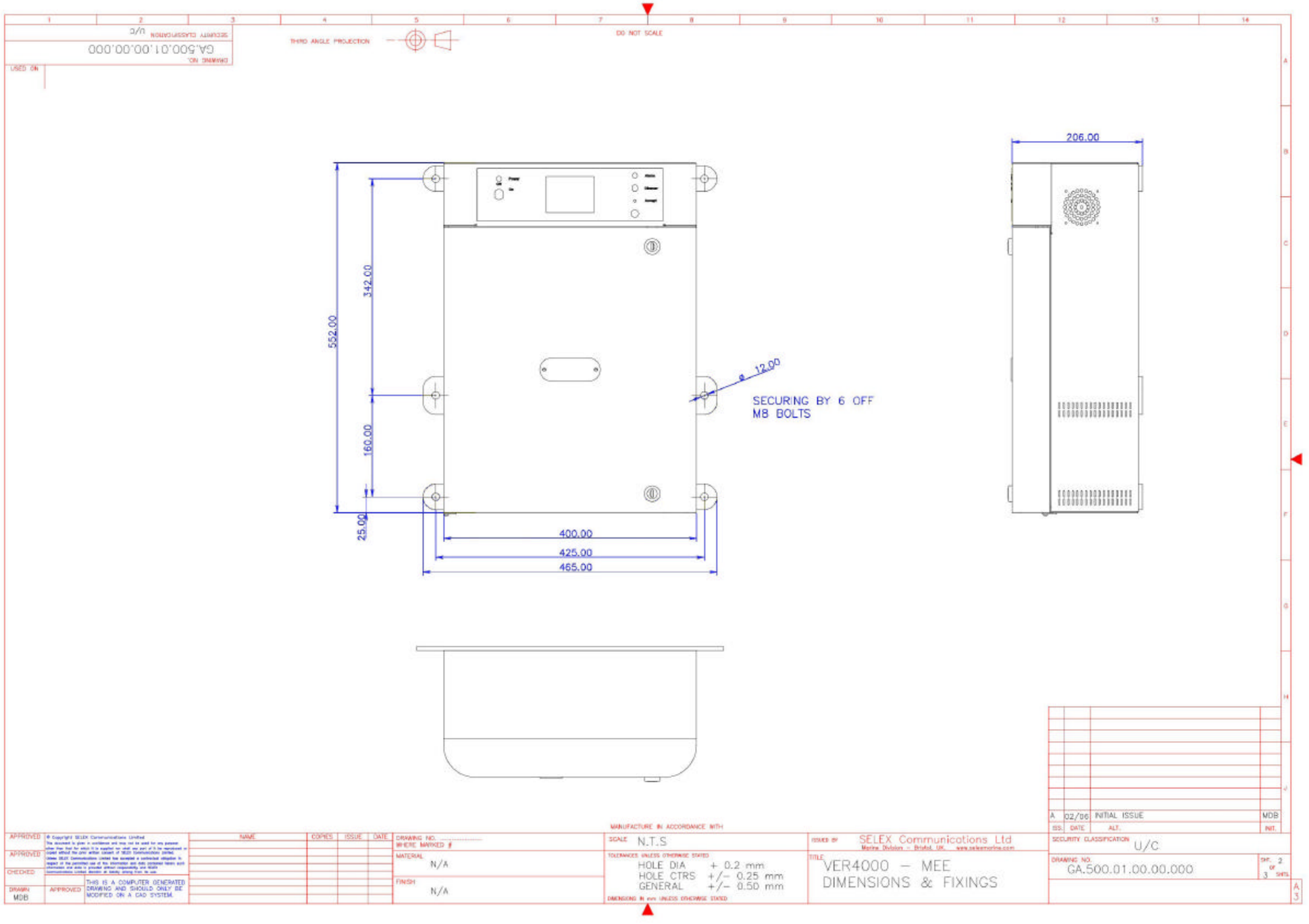
6.1.6. Remote Alarm Unit (500.06)

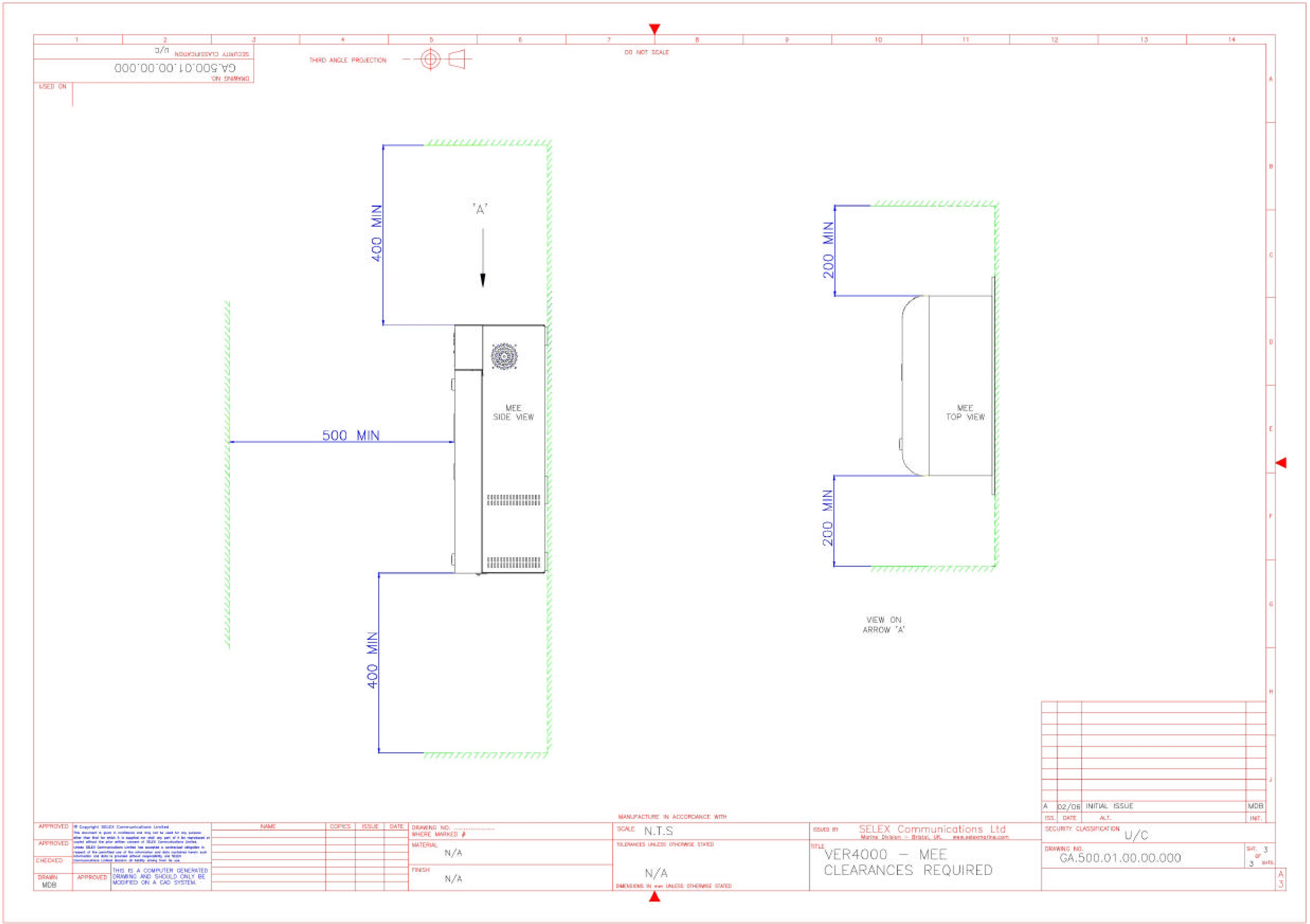
7. Drawings

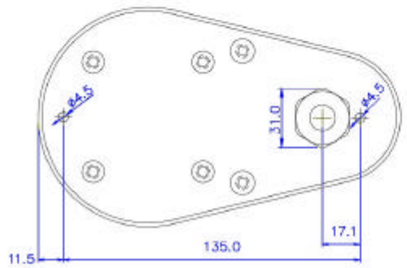
GA.500.00.00.00.000-3.4	Issue D	VER4000-S S-VDR Installation Cabling
GA.500.00.00.00.000-4.4	Issue D	VER4000 VDR Installation Cabling
GA.500.01.00.00.000 Sht 2	Issue A	MEE Dimensions and Fixings
GA.500.01.00.00.000 Sht 3	Issue A	MEE Clearances
GA.500.02.00.00.000 Sht 1	Issue A	Microphone Dimensions, Fixings and Clearances
GA.500.04.00.00.000	Issue A	CPM Fixings and Clearances
MAN.500.06.02.00.001	Issue A	Remote Alarm Installation
MAN.500.07.01.00.001	Issue A	VHF Interface
MAN.500.10.01.00.001	Issue A	Video Buffer
GA.500.00.00.00.000-5.6	Issue B	VER4000 Inter Unit Cable Terminations
GA.500.00.00.00.000-6.6	Issue A	VER4000-S Inter Unit Cable Terminations
GA.500.08.00.001	Issue A	VER4000 Signal Interface Dimensions

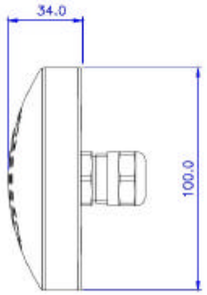

LOCATED ON EXTERNAL DECK AREA OF VESSEL
PROTECTIVE CAPSULE 04
MAIN ELECTRONICS ENCLOSURE 01
NOTE – ONLY 4 'C' CABLES REQUIRED IF OPTIONAL ARPA ISOLATION UNIT FITTED
MAXIMUM LENGTH 2M
RADAR INPUTS MAX 50
R C
G C
B C
H SYNCH C
V SYNCH C
24V DC A
10
ARPA ISOLATION UNIT
INPUTS FROM SHIP'S ARPA RADAR DISPLAY
E
MAX 50
06
ALARM DISPLAY UNIT
F
A
ALARM RELAY CONTACTS OUT TO VESSEL'S ALARM SYSTEM
02
MIC A
B
C
D
E
F
G
MIC H
03
OPTIONAL EXTERNAL MICROPHONE
NOTE – POSTION, HEADING AND SPEED MUST BE RECORDED ON ALL VESSELS IF HEADING & SPEED ARE NOT AVAILABLE IN 61162 FORMAT THEN INTERFACING WILL BE REQUIRED AS SHOWN BELOW
61162 INPUT NUMBERS
MAX 100
3 POSITION, DATE/TIME – 61162 FORMAT FROM GPS A
4 HEADING – 61162 FORMAT A
5 SPEED – 61162 FORMAT A
4 DATA A
24V DC A
GYRO/LOG INTERFACE
HEADING – STEP/SYNCHRO FORMAT F
SPEED – PULSE FORMAT A
1 AIS TARGET DATA – IF RADAR CONNECTION IMPOSSIBLE A
2 REPEATED DATA I.E. ..ALR SENTENCES IEC 61162 A
6 DEPTH – FROM ECHO SOUNDER A
7 WIND SPEED/DIRECTION – FROM ANEMOMETER A
8 RUDDER ORDER A
9 RUDDER RESPONSE A
10 STATUS/SETTING HEADING CONTROLLER A
11 ENGINE ORDERS A
12 ENGINE RESPONSE A
13 THRUSTER ORDER/RESPONSE A
14 HULL STRESS A
IF 61162 FORMAT OUTPUTS ARE AVAILABLE FROM THESE SYSTEMS THEN THESE MUST BE RECORDED
FROM SHIP'S VHF A
MAXIMUM LENGTH 2M
VHF I/F
B
MAX 50
07
24V DC SUPPLY
D
NOTES
EQUIPMENT SPEC NUMBER = 01
MAXIMUM CABLE LENGTHS = MAX 50
CABLE TYPE IDENTIFIER = A
OPTIONAL EQUIPMENT =
CABLE TYPES:-
A - 16/2/4C DEF61-12, 4 core, 0.5mm², overall screened, 7.7mm diameter.
B - 3 Pair 24 awg (0.33mm²), stranding 7x32 awg, individual and overall foil screened, overall copper braid shield, 9.12mm diameter
C - URM70 75 Ohm Coax, 5.8mm diameter
D - CY3/2.5, 3 core, 2.5mm², overall screened, VDE 0250/0281, 11.1mm diameter
E - Sen5E, 4 pair Cat 5e, 24awg, FTP, overall foil screen, overall galvanised steel wire braid, 10.5mm diameter. ISO/IEC 11801, IEC 1156, IEC 60332-3/A
F - 16/2/12C DEF61-12, 12 core, 0.5mm², overall screened 11mm diameter
D 5/06 CRF 023 REFERS ACH
C 3/06 CRF 016 REFERS ACH
B 11/05 CRF 010 REFERS MDB
A 10/05 INITIAL ISSUE MDB
THIRD ANGLE PROJECTION
DO NOT SCALE
DRAWING NO GA.500.00.00.00.000-3.4
SECURITY CLASSIFICATION U/C
USED ON
MANUFACTURE IN ACCORDANCE WITH
SCALE N.T.S
MATERIAL N/A
FINISH N/A
TOLERANCES UNLESS OTHERWISE STATED N/A N/A
ISSUED BY SELEX Communications Ltd
TITLE VER4000-S S-VDR INSTALLATION CABLING
SECURITY CLASSIFICATION U/C
DRAWING NO. GA.500.00.00.00.000-3.4
SHT. 3 OF 4 SHTS
A3
DRAWN MDB
APPROVED
CHECKED
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.

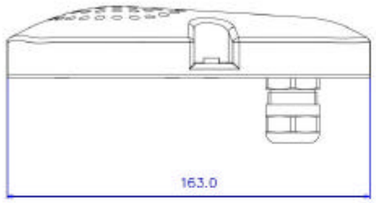

LOCATED ON EXTERNAL DECK AREA OF VESSEL
PROTECTIVE CAPSULE 04
MAIN ELECTRONICS ENCLOSURE 01
NOTE – ONLY 4 'C' CABLES REQUIRED IF OPTIONAL ARPA ISOLATION UNIT FITTED
MAXIMUM LENGTH 2M
RADAR INPUTS MAX 50
R
G
B
H SYNCH
V SYNCH
24V DC
10
ARPA ISOLATION UNIT
INPUTS FROM SHIP'S ARPA RADAR DISPLAY
06
ALARM DISPLAY UNIT
ALARM RELAY CONTACTS OUT TO VESSEL'S ALARM SYSTEM
02
MIC A
MAX 50
OPTIONAL EXTERNAL MICROPHONE
MIC H
03
61162 INPUT NUMBERS MAX 100
1 AIS TARGET DATA
2 REPEATED DATA I.E. ..ALR SENTENCES IEC 61162
3 POSITION, DATE/TIME – 61162 FORMAT FROM GPS
4 HEADING – 61162 FORMAT
5 SPEED – 61162 FORMAT
IF HEADING & SPEED DATA ARE NOT AVAILABLE IN 61162 FORMAT THEN INTERFACING WILL BE REQUIRED AS SHOWN BELOW
4 DATA
24V DC
GYRO/LOG INTERFACE
HEADING – STEP/SYNCHRO FORMAT
SPEED – PULSE FORMAT
6 DEPTH – FROM ECHO SOUNDER
7 WIND SPEED/DIRECTION – FROM ANEMOMETER
8 RUDDER ORDER
9 RUDDER RESPONSE
10 STATUS/SETTING HEADING CONTROLLER
11 ENGINE ORDERS
12 ENGINE RESPONSE
13 THRUSTER ORDER/RESPONSE
14 HULL STRESS
INPUTS ALREADY AVAILABLE ON BOARD IN 61162 FORMAT
FROM SHIP'S VHF
MAXIMUM LENGTH 2M
VHF I/F
07
8 DATA
24V SUPPLY
SIGNAL INTERFACE 08
INPUTS NOT AVAILABLE ON BOARD IN 61162 FORMAT, BUT AS ANALOGUE OR DIGITAL ON/OFF INPUTS. FOR OTHER INPUTS CONTACT SELEX FOR ADVICE
24V DC SUPPLY
NOTES
EQUIPMENT SPEC NUMBER = 01
MAXIMUM CABLE LENGTHS = MAX 50
CABLE TYPE IDENTIFIER = A
OPTIONAL EQUIPMENT =
CABLE TYPES:-
A - 16/2/4C DEF61-12, 4 core, 0.5mm², overall screened, 7.7mm diameter.
B - 3 Pair 24 awg (0.33mm²), stranding 7x32 awg, individual and overall foil screened, overall copper braid shield, 9.12mm diameter
C - URM70 75 Ohm Coax, 5.8mm diameter
D - CY3/2.5, 3 core, 2.5mm², overall screened, VDE 0250/0281, 11.1mm diameter
E - Sen5E, 4 pair Cat 5e, 24awg, FTP, overall foil screen, overall galvanised steel wire braid, 10.5mm diameter. ISO/IEC 11801, IEC 1156, IEC 60332-3/A
F - 16/2/12C DEF61-12, 12 core, 0.5mm², overall screened 11mm diameter
G - 16/2/36C DEF61-12, 36 core, 0.5mm², overall screened 16.1mm diameter
D 5/06 CRF 022 REFERS ACH
C 3/06 CRF 015 REFERS ACH
B 11/05 CRF 010 REFERS MDB
A 10/05 INITIAL ISSUE MDB
SCALE N.T.S
MATERIAL N/A
FINISH N/A
TITLE VER4000 – VDR INSTALLATION CABLING
SELEX Communications Ltd
SECURITY CLASSIFICATION U/C
DRAWING NO. GA.500.00.00.00.000-4.4
A3

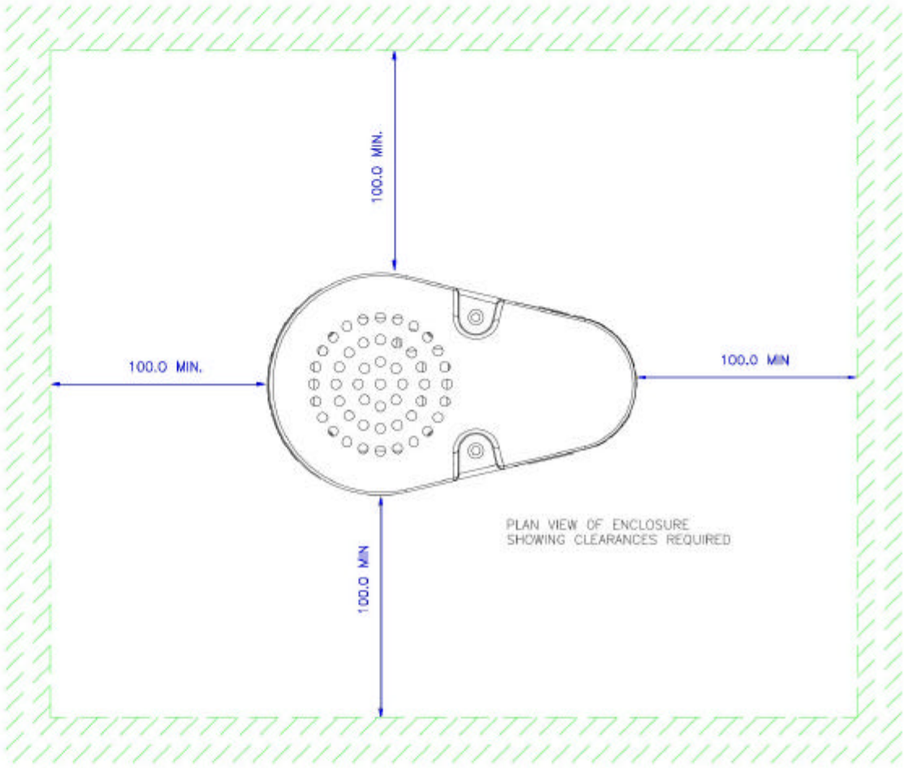

DO NOT SCALE
THIRD ANGLE PROJECTION
DRAWING NO. GA.500.01.00.00.000
SECURITY CLASSIFICATION U/C
USED ON
206.00
342.00
552.00
160.00
25.00
400.00
425.00
465.00
ø 12.00
SECURING BY 6 OFF
M8 BOLTS
MANUFACTURE IN ACCORDANCE WITH
SCALE N.T.S
MATERIAL N/A
FINISH N/A
TOLERANCES UNLESS OTHERWISE STATED
HOLE DIA + 0.2 mm
HOLE CTRS +/- 0.25 mm
GENERAL +/- 0.50 mm
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd
Marine Division - Bristol, UK www.selexmarine.com
TITLE VER4000 – MEE
DIMENSIONS & FIXINGS
DRAWING NO. GA.500.01.00.00.000
SHT. 2 OF 3 SHTS.
A3
A 02/06 INITIAL ISSUE MDB
ISS. DATE ALT. INT.
APPROVED
APPROVED
CHECKED
DRAWN MDB
APPROVED
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
NAME
COPIES
ISSUE
DATE
DRAWING NO. WHERE MARKED #


GA.500.01.00.00.000
THIRD ANGLE PROJECTION
DO NOT SCALE
400 MIN
'A'
MEE
SIDE VIEW
500 MIN
400 MIN
200 MIN
MEE
TOP VIEW
200 MIN
VIEW ON
ARROW 'A'
A 02/06 INITIAL ISSUE MDB
SCALE N.T.S
SELEX Communications Ltd
SECURITY CLASSIFICATION U/C
VER4000 – MEE
CLEARANCES REQUIRED
DRAWING NO. GA.500.01.00.00.000
MATERIAL N/A
FINISH N/A
N/A
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
DRAWN MDB









PLAN VIEW OF ENCLOSURE
SHOWING CLEARANCES REQUIRED

A	02/06	INITIAL ISSUE	MDB
ISS.	DATE	ALT.	INT.

APPROVED	© Copyright SELEX Communications Limited	NAME	COPIES	ISSUE	DATE	DRAWING NO. WHERE MARKED #
APPROVED						MATERIAL N/A
CHECKED						FINISH N/A
DRAWN MDB	APPROVED	THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.				

MANUFACTURE IN ACCORDANCE WITH

SCALE N.T.S

TOLERANCES UNLESS OTHERWISE STATED
HOLE DIA + 0.2 mm
HOLE CTRS +/- 0.25 mm
GENERAL +/- 0.50 mm
DIMENSIONS IN mm UNLESS OTHERWISE STATED

ISSUED BY SELEX Communications Ltd
Marine Division - Bristol, UK. www.selexmarine.com

TITLE VER4000 – MICROPHONE DIMS, FIXINGS & CLEARANCES REQUIRED

SECURITY CLASSIFICATION U/C

DRAWING NO. GA.500.02.00.00.000

SHT. 1 OF 1 SHTS.

A3

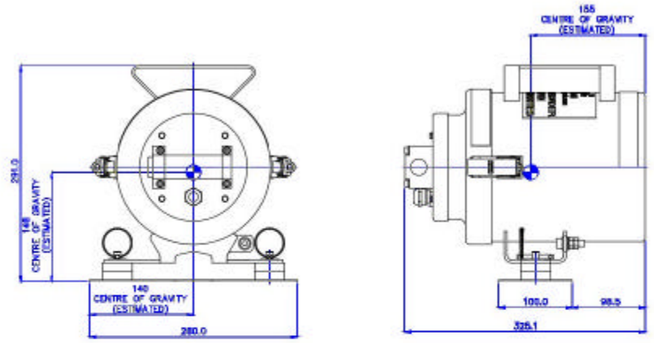
DRAWING NO. GA.500.04.00.00.000

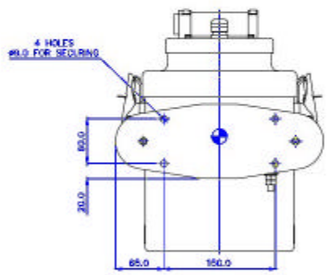
SECURITY CLASSIFICATION U/C

USED ON

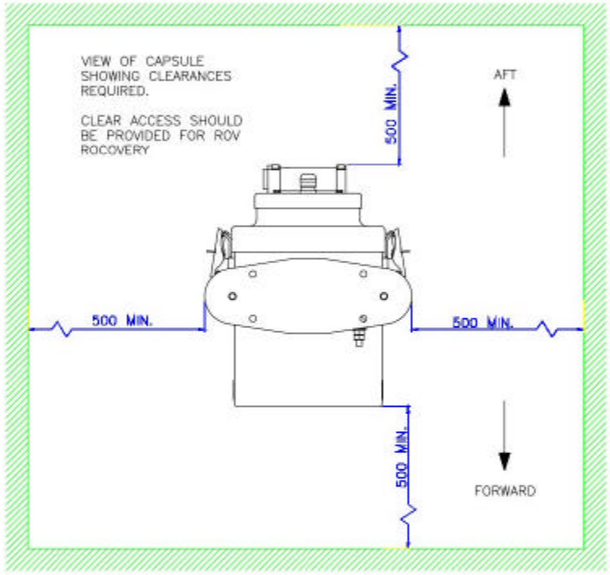
THIRD ANGLE PROJECTION

DO NOT SCALE





CAPSULE MASS = 14KG



APPROVED	© Copyright SELEX Communications Limited	NAME	COPIES	ISSUE	DATE	DRAWING NO. ..... WHERE MARKED #
APPROVED						MATERIAL N/A
CHECKED						FINISH N/A
DRAWN MDB	APPROVED					

THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.

MANUFACTURE IN ACCORDANCE WITH

SCALE N.T.S

TOLERANCES UNLESS OTHERWISE STATED
OVERALL ±2.0
HOLE CRS ±1.0
HOLE SIZE ±0.5

DIMENSIONS IN mm UNLESS OTHERWISE STATED

ISSUED BY SELEX Communications Ltd
Marine Division – Bristol, UK. www.selexmarine.com

TITLE VER4000 – PROTECTIVE CAPSULE DIMS, FIXINGS & CLEARANCES REQUIRED

ISS.	DATE	ALT.	INT.
A	02/08	INITIAL ISSUE	MDB

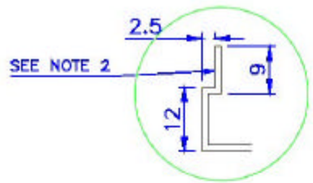
SECURITY CLASSIFICATION U/C

DRAWING NO. GA.500.04.00.00.000

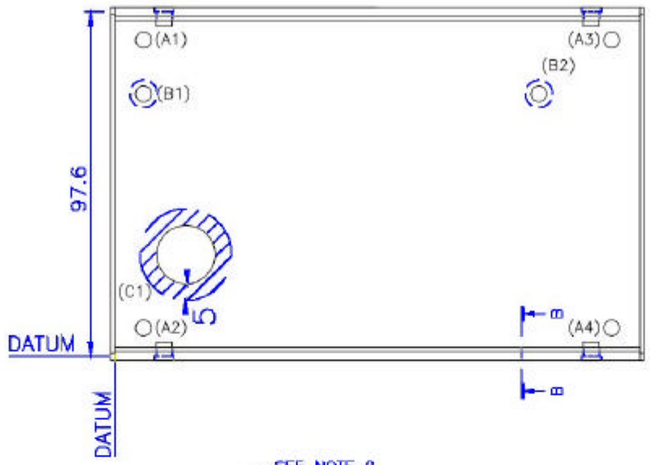
SHT. 1 OF 1 SHTS.

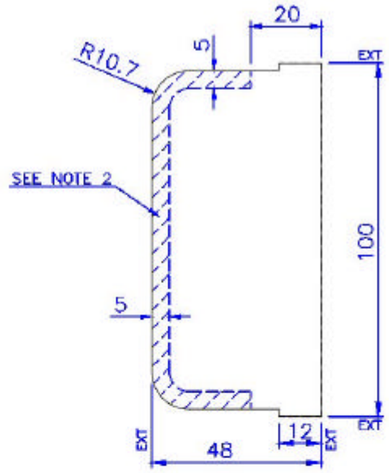
A3

DRAWING NO. MAN.500.06.02.00.001
SECURITY CLASSIFICATION U/C
USED ON
THIRD ANGLE PROJECTION
DO NOT SCALE



SECTION B–B
2.5mm TRAP FOR
EMC FABRIC GASKET
STRIP



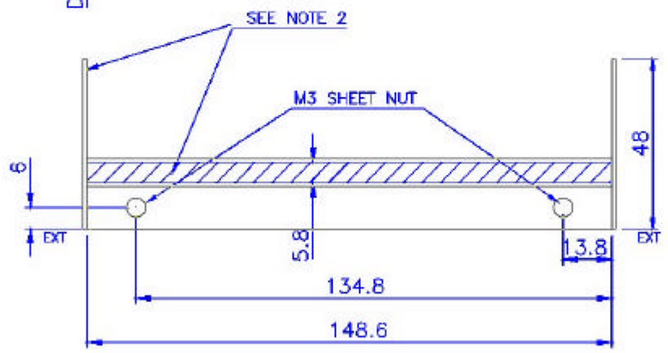


NOTES:

NOTE 1: UNLESS OTHERWISE STATED ALL DIMENSIONS ARE TAKEN FROM THE INTERNAL SURFACE OF THE ENCLOSURE

NOTE 2: AFTER PLATING & PRIOR TO SPRAYING (SEE NOTE 3) MASK HATCHED AREAS TO ENSURE GOOD CONTACT FOR EMC PURPOSES. EXTERNAL SURFACE OF HATCHED AREA TO BE MASKED ON BOTH SIDES OF ENCLOSURE. INTERNAL SURFACE OF HATCHED AREA TO BE MASKED AT BOTH ENDS OF ENCLOSURE. INTERNAL SURFACE OF HATCHED AREA TO BE MASKED INSIDE BOTTOM OF ENCLOSURE.

NOTE 3: FINISH – TRIMITE, EPOXY LEATHERETTE EGGSHELL BLACK, P7420 REF 401/P7420/3 SPRAY EXTERNAL SURFACE ONLY



DATUM:PLAN VIEW, LOWER LH CORNER			
HOLE TYPE A ø4.5	HOLE NO.	DIST. X DATUM	DIST. Y DATUM
	1	8	89.6
	2	8	8
	3	140.6	89.6
	4	140.6	8
HOLE TYPE B ø4.5, C/SINK (EXT) AT 90° TO ø7.8	1	8	74.3
	2	120	74.3
HOLE TYPE C ø16.5	1	20	28.8

ALL ASSOCIATED OPTIONAL ALARM DISPLAY UNIT DRAWINGS:-

ASSY.500.06.00.00.000	VER4000 - OPTIONAL ALARM DISPLAY UNIT ASSEMBLY
MAN.500.06.00.00.000	VER4000 - OPTIONAL ALARM DISPLAY UNIT CIRCUIT
MAN.500.06.01.00.001	VER4000 - OPIONAL ALARM DISPLAY UNIT COVER
MAN.500.06.01.00.002	VER4000 - OPTIONAL ALARM DISPLAY UNIT LABELS
MAN.500.06.02.00.001	VER4000 - OPTIONAL ALARM DISPLAY UNIT BASE
MAN.500.06.02.00.002	VER4000 - OPTIONAL ALARM DISPLAY UNIT RAIL

ISS.	DATE	ALT.		INT.
A	10/05	INITIAL ISSUE		MDB

APPROVED
APPROVED
CHECKED
DRAWN MDB
APPROVED
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.

NAME | COPIES | ISSUE | DATE

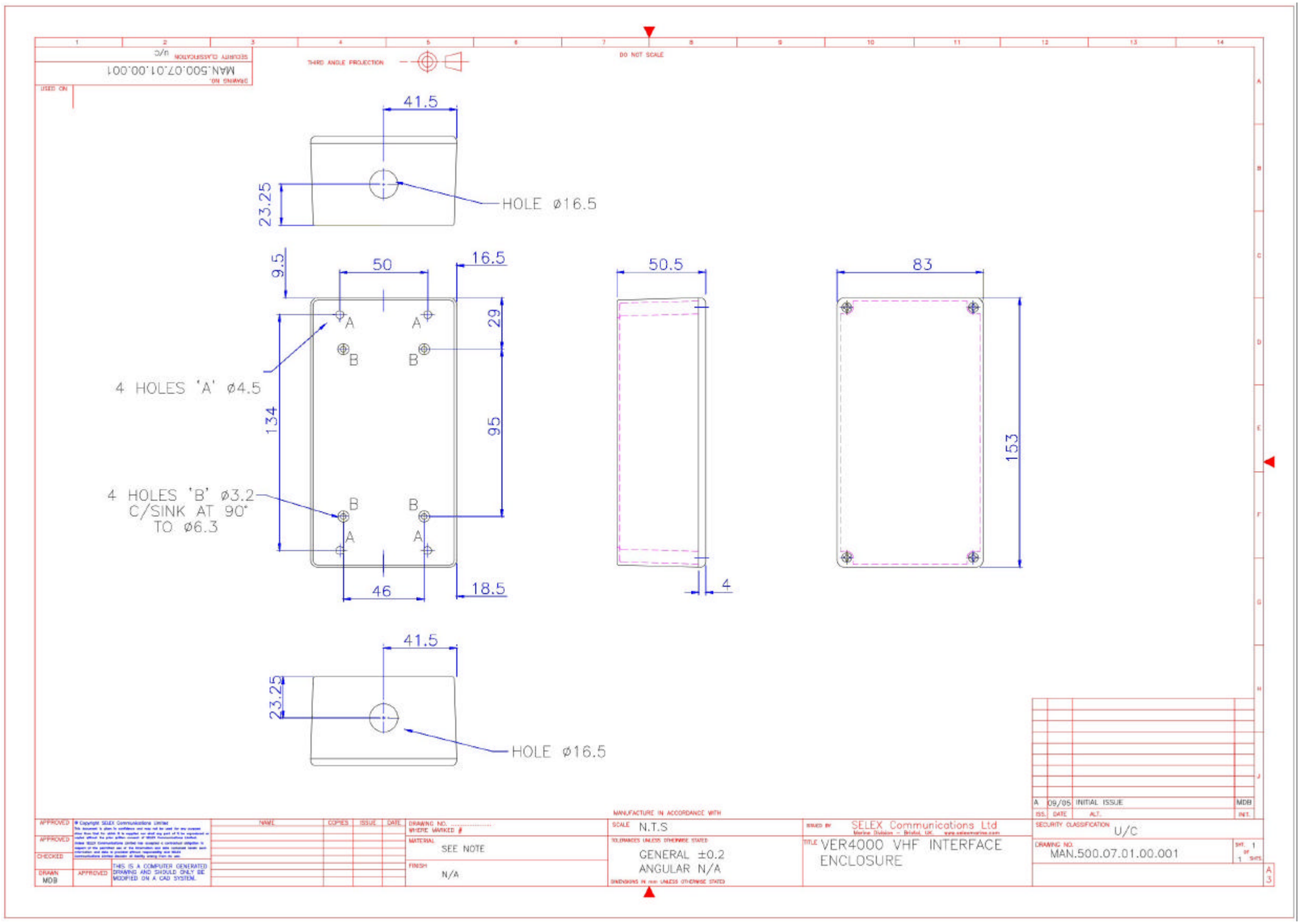
DRAWING NO. WHERE MARKED #
MATERIAL MILD STEEL 1.2MM
FINISH SEE NOTE 3

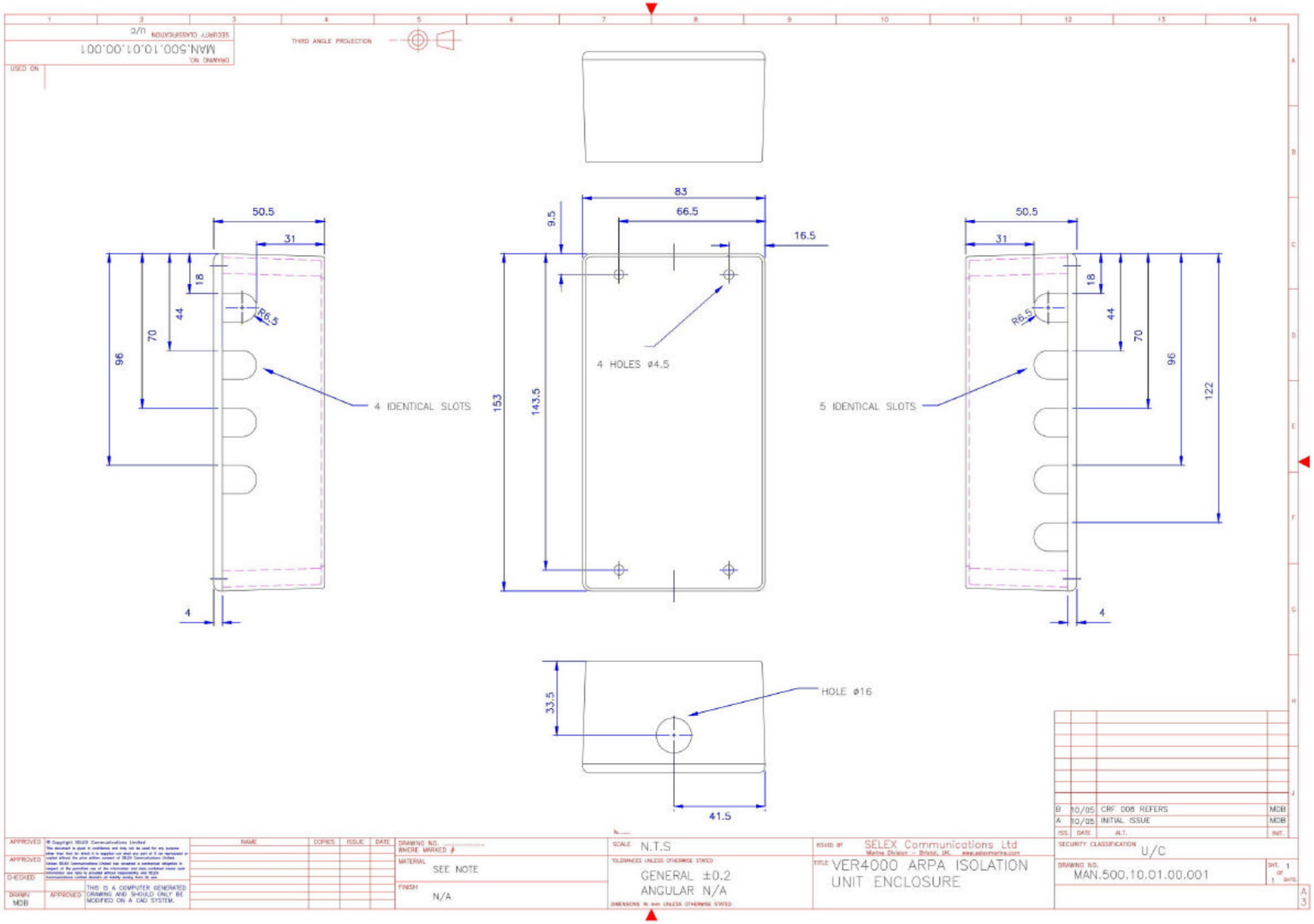
MANUFACTURE IN ACCORDANCE WITH
SCALE N.T.S
TOLERANCES UNLESS OTHERWISE STATED
GENERAL ±0.2
ANGLULAR ±0.5°
DIMENSIONS IN mm UNLESS OTHERWISE STATED

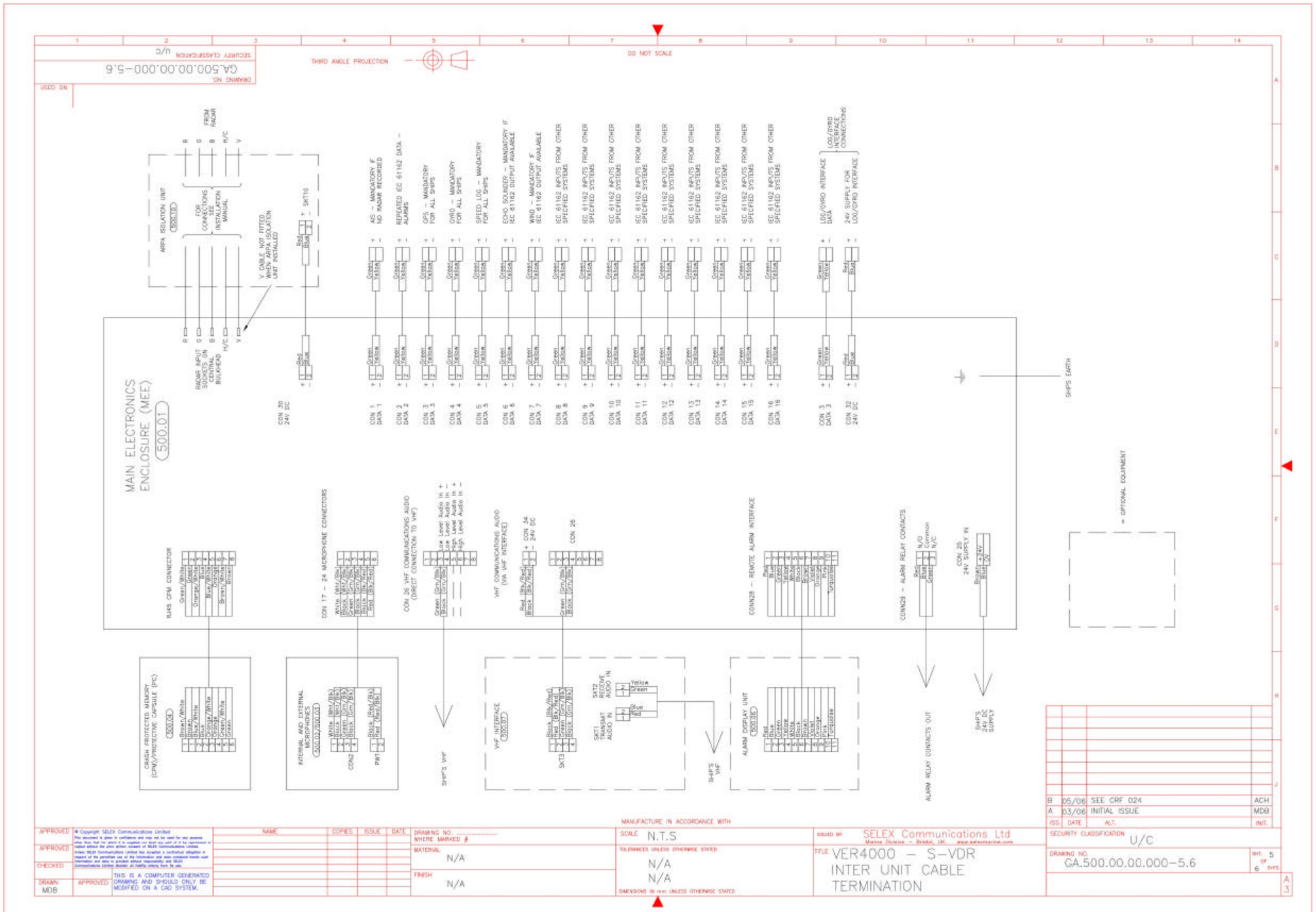
ISSUED BY SELENIA COMMUNICATIONS LTD
MARINE DIVISION – BRISTOL, UK. www.seleniacomms.com

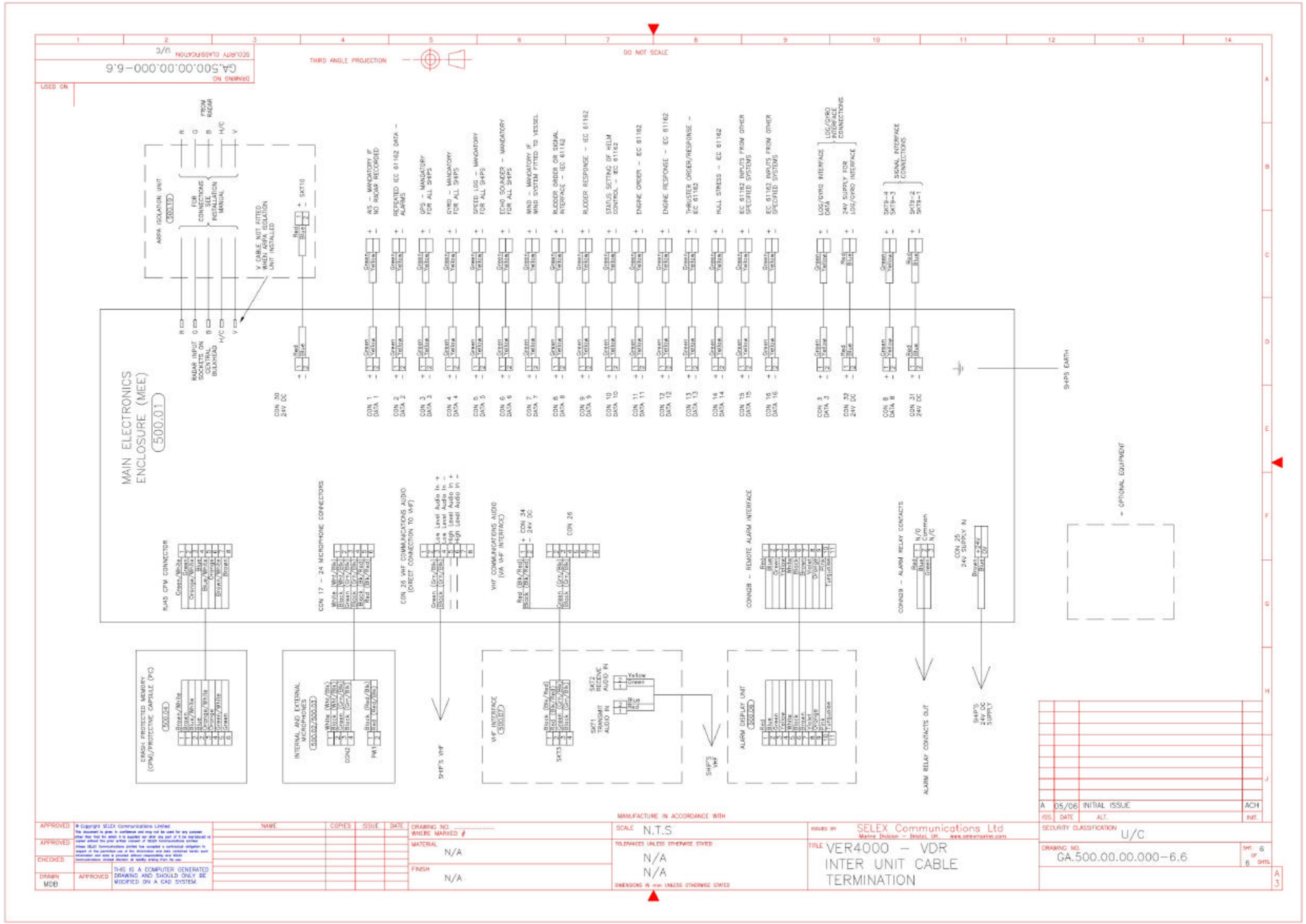
TITLE VER4000 – OPTIONAL ALARM DISPLAY UNIT BASE

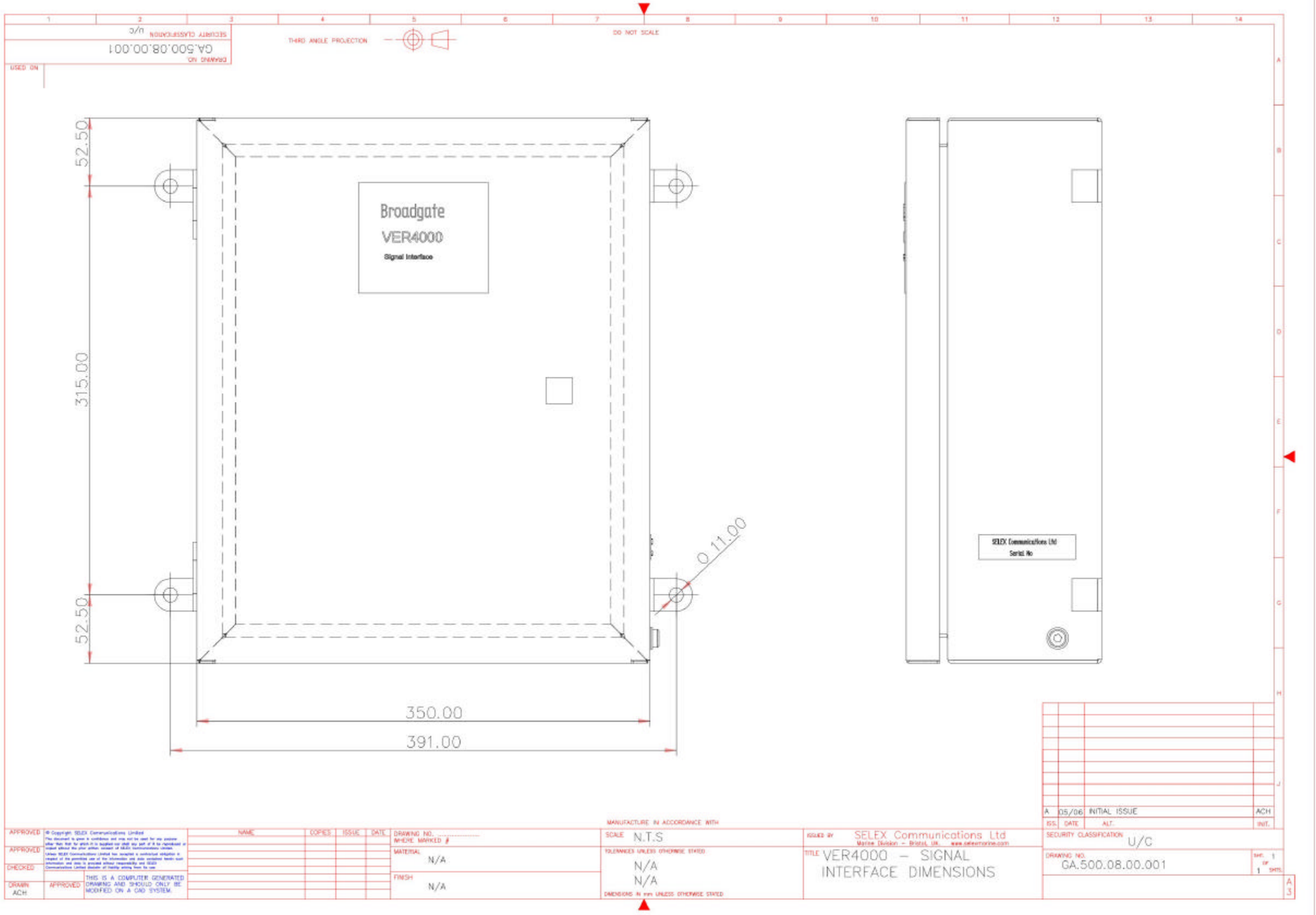
SECURITY CLASSIFICATION U/C
DRAWING NO. MAN.500.06.02.00.001
SHT. 1 OF 1 SHTS
A3


DRAWING NO.
MAN.500.07.01.00.001
SECURITY CLASSIFICATION U/C
NO USED ON
THIRD ANGLE PROJECTION
DO NOT SCALE
41.5
23.25
HOLE ø16.5
9.5
50
16.5
50.5
83
29
95
134
153
4 HOLES 'A' ø4.5
4 HOLES 'B' ø3.2
C/SINK AT 90°
TO ø6.3
A
B
46
18.5
4
41.5
23.25
HOLE ø16.5
MANUFACTURE IN ACCORDANCE WITH
SCALE N.T.S
MATERIAL SEE NOTE
FINISH N/A
TOLERANCES UNLESS OTHERWISE STATED
GENERAL ±0.2
ANGULAR N/A
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd
Marine Division - Bristol, UK. www.selexmarine.com
TITLE VER4000 VHF INTERFACE ENCLOSURE
SECURITY CLASSIFICATION U/C
DRAWING NO. MAN.500.07.01.00.001
SHT. 1 OF 1 SHTS.
A 09/05 INITIAL ISSUE MDB
ISS. DATE ALT. INT.
APPROVED
APPROVED
CHECKED
DRAWN MDB
APPROVED
NAME COPIES ISSUE DATE
DRAWING NO. WHERE MARKED #
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
A3


THIRD ANGLE PROJECTION
DRAWING NO. MAN.500.10.01.00.001
SECURITY CLASSIFICATION U/C
USED ON
50.5
31
18
44
70
96
R6.5
4 IDENTICAL SLOTS
4
83
66.5
9.5
16.5
153
143.5
4 HOLES ø4.5
50.5
31
18
44
70
96
122
R6.5
5 IDENTICAL SLOTS
4
33.5
HOLE ø16
41.5
APPROVED
APPROVED
CHECKED
DRAWN MDB
APPROVED
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
NAME
COPIES
ISSUE
DATE
DRAWING NO. WHERE MARKED #
MATERIAL SEE NOTE
FINISH N/A
SCALE N.T.S
TOLERANCES UNLESS OTHERWISE STATED
GENERAL ±0.2
ANGULAR N/A
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd
Marine Division - Bristol, UK
TITLE VER4000 ARPA ISOLATION UNIT ENCLOSURE
B 10/05 CRF 008 REFERS MDB
A 10/05 INITIAL ISSUE MDB
ISS. DATE ALT. INIT.
SECURITY CLASSIFICATION U/C
DRAWING NO. MAN.500.10.01.00.001
SHT. 1 OF 1 SHTS.
A3


DRAWING NO. GA.500.00.00.000-5.6
SECURITY CLASSIFICATION U/C
USED ON
THIRD ANGLE PROJECTION
DO NOT SCALE
MAIN ELECTRONICS ENCLOSURE (MEE) 500.01
ARPA ISOLATION UNIT (500.03)
FOR CONNECTIONS SEE INSTALLATION MANUAL
FROM RADAR
R
G
B
H/C
V
V CABLE NOT FITTED WHEN ARPA ISOLATION UNIT INSTALLED
RADAR INPUT SOCKETS ON CENTRAL BULKHEAD
CON 30 24V DC
Red Blue
SKT10
AIS – MANDATORY IF NO RADAR RECORDED
REPEATED IEC 61162 DATA – ALARMS
GPS – MANDATORY FOR ALL SHIPS
GYRO – MANDATORY FOR ALL SHIPS
SPEED LOG – MANDATORY FOR ALL SHIPS
ECHO SOUNDER – MANDATORY IF IEC 61162 OUTPUT AVAILABLE
WIND – MANDATORY IF IEC 61162 OUTPUT AVAILABLE
IEC 61162 INPUTS FROM OTHER SPECIFIED SYSTEMS
LOG/GYRO INTERFACE
LOG/GYRO INTERFACE CONNECTIONS
24V SUPPLY FOR LOG/GYRO INTERFACE
CON 1 DATA 1
CON 2 DATA 2
CON 3 DATA 3
CON 4 DATA 4
CON 5 DATA 5
CON 6 DATA 6
CON 7 DATA 7
CON 8 DATA 8
CON 9 DATA 9
CON 10 DATA 10
CON 11 DATA 11
CON 12 DATA 12
CON 13 DATA 13
CON 14 DATA 14
CON 15 DATA 15
CON 16 DATA 16
CON 3 DATA 3
CON 32 24V DC
SHIPS EARTH
= OPTIONAL EQUIPMENT
RJ45 CPU CONNECTOR
CON 17 – 24 MICROPHONE CONNECTORS
CON 26 VHF COMMUNICATIONS AUDIO (DIRECT CONNECTION TO VHF)
VHF COMMUNICATIONS AUDIO (VIA VHF INTERFACE)
CON 34 24V DC
CON 25
CONN28 – REMOTE ALARM INTERFACE
CONN29 – ALARM RELAY CONTACTS
N/O Common N/C
CON 25 24V SUPPLY IN
CRASH PROTECTED MEMORY (CPM)/PROTECTIVE CAPSULE (PC) (500.04)
INTERNAL AND EXTERNAL MICROPHONES (500.02/500.03)
CON2
PWT
SHIP'S VHF
VHF INTERFACE (500.07)
SKT3
SKT2 RECEIVE AUDIO IN
SKT1 TRANSMIT AUDIO IN
ALARM DISPLAY UNIT (500.06)
ALARM RELAY CONTACTS OUT
SHIP'S 24V DC SUPPLY
B 05/06 SEE CRF 024 ACH
A 03/06 INITIAL ISSUE MDB
ISS. DATE ALT. INIT.
APPROVED © Copyright SELEX Communications Limited
APPROVED
CHECKED
DRAWN MDB
APPROVED
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
NAME COPIES ISSUE DATE
DRAWING NO. WHERE MARKED #
MATERIAL N/A
FINISH N/A
MANUFACTURE IN ACCORDANCE WITH
SCALE N.T.S
TOLERANCES UNLESS OTHERWISE STATED N/A N/A
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd Marine Division – Bristol, UK. www.selexcelsius.com
TITLE VER4000 – S-VDR INTER UNIT CABLE TERMINATION
SECURITY CLASSIFICATION U/C
DRAWING NO. GA.500.00.00.000-5.6
SHT. 5 OF 6 SHTS.
A3


DRAWING NO
GA.500.00.00.000-6.6
SECURITY CLASSIFICATION U/C
USED ON
THIRD ANGLE PROJECTION
DO NOT SCALE
MAIN ELECTRONICS ENCLOSURE (MEE) (500.01)
ARPA ISOLATION UNIT (500.03)
FROM RADAR
R
G
B
H/C
V
FOR CONNECTIONS SEE INSTALLATION MANUAL
V CABLE NOT FITTED WHERE ARPA ISOLATION UNIT INSTALLED
RADAR INPUT SOCKET ON CENTRAL BULKHEAD
CON 30 24V DC
SKT10
AVS – MANDATORY IF NO RADAR RECORDER
REPEATED IEC 61162 DATA – ALARMS
GPS – MANDATORY FOR ALL SHIPS
GYRO – MANDATORY FOR ALL SHIPS
SPEED LOG – MANDATORY FOR ALL SHIPS
ECHO SOUNDER – MANDATORY FOR ALL SHIPS
WIND – MANDATORY IF WIND SYSTEM FITTED TO VESSEL
RUDDER ORDER OR SIGNAL INTERFACE – IEC 61162
RUDDER RESPONSE – IEC 61162
STATUS SETTING OF HELM CONTROL – IEC 61162
ENGINE ORDER – IEC 61162
ENGINE RESPONSE – IEC 61162
THRUSTER ORDER/RESPONSE – IEC 61162
HULL STRESS – IEC 61162
IEC 61162 INPUTS FROM OTHER SPECIFIED SYSTEMS
IEC 61162 INPUTS FROM OTHER SPECIFIED SYSTEMS
LOG/GYRO INTERFACE DATA
LOG/GYRO INTERFACE CONNECTIONS
24V SUPPLY FOR LOG/GYRO INTERFACE
SKT9–4 SKT9–3
SKT9–2 SKT9–1
SIGNAL INTERFACE CONNECTIONS
CON 1 DATA 1
CON 2 DATA 2
CON 3 DATA 3
CON 4 DATA 4
CON 5 DATA 5
CON 6 DATA 6
CON 7 DATA 7
CON 8 DATA 8
CON 9 DATA 9
CON 10 DATA 10
CON 11 DATA 11
CON 12 DATA 12
CON 13 DATA 13
CON 14 DATA 14
CON 15 DATA 15
CON 16 DATA 16
CON 3 DATA 3
CON 32 24V DC
CON 8 DATA 8
CON 31 24V DC
S4PS EARTH
RJ45 CPW CONNECTOR
CRASH PROTECTED MEMORY (CPM)/PROTECTIVE CAPSULE (PIC) (500.05)
CON 17 – 24 MICROPHONE CONNECTORS
INTERNAL AND EXTERNAL MICROPHONES (500.02/500.03)
CON2
PM1
CON 28 VHF COMMUNICATIONS AUDIO (DIRECT CONNECTION TO VHF)
Low Level Audio In +
Low Level Audio In –
High Level Audio In +
High Level Audio In –
VHF COMMUNICATIONS AUDIO (VIA VHF INTERFACE)
CON 34 24V DC
CON 26
VHF INTERFACE (500.07)
SKT5
SKT2 RECEIVE AUDIO IN
SKT1 TRANSMIT AUDIO IN
SHIP'S VHF
SHIP'S VHF
CON28 – REMOTE ALARM INTERFACE
ALARM DISPLAY UNIT (500.06)
CON29 – ALARM RELAY CONTACTS
N/O
Common
N/C
CON 25 24V SUPPLY IN
ALARM RELAY CONTACTS OUT
SHIP'S 24V DC SUPPLY
* OPTIONAL EQUIPMENT
A 05/06 INITIAL ISSUE ACH
ISS. DATE ALT. INT.
MANUFACTURE IN ACCORDANCE WITH
APPROVED
APPROVED
CHECKED
DRAWN MDB
APPROVED
© Copyright SELEX Communications Limited
THIS IS A COMPUTER GENERATED DRAWING AND SHOULD ONLY BE MODIFIED ON A CAD SYSTEM.
NAME
COPIES
ISSUE
DATE
DRAWING NO WHERE MARKED #
MATERIAL N/A
FINISH N/A
SCALE N.T.S
TOLERANCES UNLESS OTHERWISE STATED N/A N/A
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd Marine Division – Bristol, UK www.selexmarine.com
TITLE VER4000 – VDR INTER UNIT CABLE TERMINATION
SECURITY CLASSIFICATION U/C
DRAWING NO GA.500.00.00.000–6.6
SHT. 6 OF 6 SHTS.
A3


DRAWING NO
GA.500.08.00.001
SECURITY CLASSIFICATION U/C
USED ON
THIRD ANGLE PROJECTION
DO NOT SCALE
52.50
315.00
52.50
Broadgate
VER4000
Signal Interface
Ø 11.00
350.00
391.00
SELEX Communications Ltd
Serial No
MANUFACTURE IN ACCORDANCE WITH
APPROVED
APPROVED
CHECKED
DRAWN ACH
APPROVED
NAME
COPIES
ISSUE
DATE
DRAWING NO.
WHERE MARKED #
MATERIAL N/A
FINISH N/A
SCALE N.T.S
TOLERANCES UNLESS OTHERWISE STATED
N/A
N/A
DIMENSIONS IN mm UNLESS OTHERWISE STATED
ISSUED BY SELEX Communications Ltd
TITLE VER4000 – SIGNAL INTERFACE DIMENSIONS
A 05/06 INITIAL ISSUE ACH
ISS. DATE ALT. INIT.
SECURITY CLASSIFICATION U/C
DRAWING NO. GA.500.08.00.001
SHT. 1 OF 1 SHTS.
A3