

Standard 30 MF

110-700

Operator and Service Manual



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This manual has been drawn up as a description and reference work.
It will help answer questions and will solve problems in the quickest possible manner.

Before operating the equipment read and follow the instructions and hints provided in this manual.

For this purpose refer to the table of contents and read the corresponding chapters thoroughly.

If you have any further questions, please contact us at the following address:

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Since errors can hardly be avoided in the documentation in spite of all efforts, we would appreciate any remarks and suggestions.
Subject to alterations.

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TABLE OF CONTENTS

0	General	0-1
0.1	Change History	0-1
0.2	Conventions of Depiction.....	0-1
0.3	General Safety Instructions	0-2
0.4	List of Abbreviations	0-4
0.5	Product and Performance Standards	0-5
0.6	Further Documents	0-5
1	Description.....	1-1
1.1	Intended Use	1-2
1.2	Scope of Delivery	1-2
1.3	Technical Data.....	1-2
1.3.1	Mechanical Data.....	1-2
1.3.2	Accuracy.....	1-2
1.3.3	Electrical Data	1-3
1.3.4	Input Data.....	1-3
1.3.5	Output Data	1-4
1.3.5.1	Sentence PANZHRP	1-5
1.4	Technical Description	1-6
1.4.1	Operator Units	1-6
1.4.1.1	Operator Unit Gyro Standard 30 MF, type 130-627.NG00x.....	1-6
1.4.1.2	Operator Unit Gyro, type 130-626.NG00x	1-6
1.4.2	System Overview	1-6
1.4.2.1	Standalone System.....	1-7
1.4.2.2	Standard 30 MF with Distribution Unit, type 138-118.NG002/NG003.....	1-8
1.4.2.3	Gyro Compass System with Redundancy in Distribution.....	1-10
1.4.3	Operation and Display Elements	1-11
1.4.4	Interfaces / Cables	1-12
1.4.4.1	Data Interfaces N1 and N2	1-12
1.4.4.2	Power Supply Sockets P1 and P2	1-17
1.4.4.3	Ethernet Ports E1 and E2	1-18
2	Installation.....	2-1
2.1	Safety Information and Remarks	2-1
2.2	Operation within Service Menu.....	2-3
2.3	Installation Instructions	2-4
2.3.1	Required Installation Material.....	2-5
2.3.2	Installation Material for System Applications.....	2-5

2.3.3	Preparations	2-6
2.3.4	Cabling	2-7
2.3.5	CAN-Bus Termination.....	2-8
2.3.6	Setting the CAN-Bus address.....	2-8
2.3.7	Connection of the Operator Unit Standard 30 MF 130-627	2-9
2.3.8	Setting to Work and Commissioning the Standard 30 MF.....	2-10
2.3.8.1	Calculating the Heading Correction Value	2-17
2.3.8.2	Setting the Heading Correction Value.....	2-18
2.3.8.3	Compass Positioning Display.....	2-20
2.3.9	Adjustment of Interfaces	2-20
2.3.9.1	Serial Output Data Setup	2-21
2.3.9.2	Ethernet Output Data Setup.....	2-27
2.3.9.3	CAN Output Data Setup.....	2-29
2.3.9.4	Angular Rates Output Setup	2-32
2.4	Change of Serial Inputs Baud Rates, CAN and Ethernet IP Addresses	2-36
2.4.1.1	Installation of <i>WinSCP</i> on a Service PC	2-36
2.4.1.2	Cabling.....	2-36
2.4.1.3	Login	2-36
2.4.1.4	Change of Settings.....	2-38
2.5	Documentation of Settings.....	2-43
2.5.1	Mounting Position	2-43
2.5.2	Setting – Correction Values	2-43
2.5.3	Serial Output Data Settings	2-44
2.5.3.1	Serial Port 3	2-44
2.5.3.2	Serial Port 4	2-45
2.5.3.3	Serial Port 5	2-45
2.5.3.4	Serial Port 6	2-46
2.5.4	Ethernet Output Data Settings.....	2-46
2.5.4.1	Ethernet Port 1	2-46
2.5.4.2	Ethernet Port 2	2-47
2.5.5	CAN Output Data Settings.....	2-47
2.5.6	Angular Rates Output Settings	2-47
3	Operation	3-1
3.1	Switching On and Off.....	3-1
3.2	Standard Operation with Operator Unit Standard 30 MF 130-627.....	3-1
3.3	Manual Input of Latitude and Speed	3-3
3.3.1	Latitude Input.....	3-4
3.3.2	Speed Input	3-6
3.4	Menu Item COMPASS STATUS.....	3-8

4	Alert Management	4-1
4.1	Bridge Alert Management.....	4-1
4.2	Alert Messages.....	4-3
5	Maintenance and Repair.....	5-1
6	Disposal.....	6-1

TABLE OF FIGURES

Figure 1-1	Standard 30 MF, Front View	1-1
Figure 1-2	Standard 30 MF, Standalone.....	1-7
Figure 1-3	Standard 30 MF, Single System with DU	1-8
Figure 1-4	Gyro Compass System with Redundancy in Distribution.....	1-10
Figure 1-5	Operator Unit Gyro 130-626	1-11
Figure 1-6	Sockets of Data Interfaces N1 and N2	1-12
Figure 1-7	Open Cable Ends of STD 30 Data Cables N1 and N2	1-12
Figure 1-8	Power Supply Plugs P1 and P2.....	1-17
Figure 1-9	Open Cable Ends of STD 30 Power Supply Cables P1 and P2	1-18
Figure 1-10	Ethernet Sockets E1 and E2.....	1-18
Figure 1-11	Ethernet Plug for E1 and E2.....	1-18
Figure 1-12	STD 30 Ethernet Cable for E1 and E2.....	1-19
Figure 2-1	Menu Structure	2-3
Figure 2-2	Standard 30 MF, Attachment Drill Holes	2-4
Figure 2-3	Setting to work, Schematic Example	2-10
Figure 2-4	Service Menu.....	2-13
Figure 2-5	Dialog for Selecting the Final Installation Orientation	2-13
Figure 2-6	Establishing a Common Ground Connection.....	2-15
Figure 2-7	Positive Correction Value Figure 2-8 Negative Correction Value	2-17
Figure 2-9	Service Menu.....	2-18
Figure 2-10	Heading Correction Value Dialog	2-18
Figure 2-11	Service Menu.....	2-21
Figure 2-12	Submenu <i>COMPASS OUTPUT DATA SETUP</i>	2-21
Figure 2-13	<i>Dialog SERIAL OUTPUT DATA SETUP – COURSE BUS</i>	2-22
Figure 2-14	<i>Dialog SERIAL OUTPUT DATA SETUP – NMEA</i>	2-23
Figure 2-15	<i>Dialog SERIAL OUTPUT DATA SETUP – NMEA ALERTS</i>	2-26
Figure 2-16	Service Menu.....	2-27
Figure 2-17	Submenu <i>COMPASS OUTPUT DATA SETUP</i>	2-27
Figure 2-18	<i>Dialog ETHERNET OUTPUT DATA SETUP</i>	2-28
Figure 2-19	Service Menu.....	2-29
Figure 2-20	Submenu <i>COMPASS OUTPUT DATA SETUP</i>	2-30
Figure 2-21	<i>Dialog CAN OUTPUT DATA SETUP</i>	2-30
Figure 2-22	Service Menu.....	2-32

Figure 2-23	Submenu <i>COMPASS OUTPUT DATA SETUP</i>	2-33
Figure 2-24	Dialog <i>ANGULAR RATES OUTPUT SETUP</i>	2-33
Figure 2-25	<i>Login</i> - Dialog	2-37
Figure 2-26	<i>WinSCP</i> Program Window	2-38
Figure 2-27	Directory <i>/home/applic/config</i> with File <i>Config.xml</i>	2-38
Figure 2-28	<CAN> Section in <i>Config.xml</i>	2-39
Figure 2-29	<Ethernet> Section in <i>Config.xml</i>	2-40
Figure 2-30	<Aiding> Section in <i>Config.xml</i>	2-41
Figure 2-31	Closure of Configuration Changes	2-42
Figure 3-1	Standard 30 MF, Screens in Standard Operation	3-1
Figure 3-2	Start Screen on Operating Unit.....	3-2
Figure 3-3	Information in the Lower Section, Screen 2	3-2
Figure 3-4	Information in the Lower Section, Screen 3	3-2
Figure 3-5	Information in the Lower Section, Screen 4	3-3
Figure 3-6	Operator Menu, <i>LATITUDE INPUT</i>	3-4
Figure 3-7	Dialog for Entering the Latitude.....	3-4
Figure 3-8	Operator Menu, <i>SPEED INPUT</i>	3-6
Figure 3-9	Dialog for Entering the Speed	3-6
Figure 3-10	Operator Menu, <i>COMPASS STATUS</i>	3-8
Figure 3-11	Submenu <i>COMPASS STATUS</i>	3-8
Figure 3-12	Submenu of <i>HMU STATUS</i>	3-9
Figure 3-13	<i>SPU STATUS</i>	3-10
Figure 3-14	<i>HMU OPERATIONAL STATUS</i>	3-10
Figure 3-15	<i>HMU MEASUREMENT STATUS</i>	3-11
Figure 3-16	<i>CDU STATUS</i>	3-11
Figure 4-1	Alerts, Unacknowledged	4-4

TABLE OF TABLES

Table 1-1	N1 Pin Assignments.....	1-13
Table 1-2	N2 Pin Assignments.....	1-15
Table 1-3	STD 30 Power Supply Cables P1 and P2, Pin Assignments	1-17
Table 1-4	Pin Assignments for Ethernet According to EIA / TIA-568B.....	1-19
Table 2-1	CAN-Bus addresses within a compass system.....	2-8
Table 2-2	Example Calculations for the Heading Correction Value	2-17
Table 2-3	Factory Settings for Serial Output.....	2-25
Table 2-4	Correction Values	2-43
Table 2-5	Output Data –Activation, Refresh Rate and Baud Rate for Serial 3.....	2-44
Table 2-6	Output Data –Activation, Refresh Rate and Baud Rate for Serial 4.....	2-45
Table 2-7	Output Data - Activation, Refresh Rate and Baud Rate for Serial 5	2-45
Table 2-8	Output Data - Activation, Refresh Rate and Baud Rate for Serial 6	2-46
Table 2-9	Output Data - Telegram, Activation and Refresh Rate for Ethernet 1	2-46

Table 2-10	Output Data - Telegram, Activation and Refresh Rate for Ethernet 2	2-47
Table 2-11	CAN Output Data - Activation and Output Rate.....	2-47
Table 2-12	Angular Rates Output - Damp Values	2-47
Table 2-13	Angular Rates Output - Output Range for RoT.....	2-47
Table 4-1	Alert List – Warning Symbols.....	4-2
Table 4-2	Alert List – Caution Symbol	4-2
Table 4-3	Alert Signaling.....	4-3
Table 4-4	Possible Alerts	4-5

ANNEX

Spare Parts Catalogue Standard 30 MF

Dimensional Drawing Standard 30 MF, 110-700.HP005

Dimensional Drawing Operator Unit Gyro Std 30 MF, 130-627.HP005

Cable and Connection Diagram Standard 30 MF, 10-CO-D-X00002-C

Cable and Connection Diagram Dual Standard 30 MF with Distribution Unit, 10-CO-D-X00003-C

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0 General

0.1 Change History

Date	Change
March 2017	First edition
August 2018	Chapter 1.3.5.1 Description of Pos. C changed.

0.2 Conventions of Depiction

Depiction	Meaning
•	List
1.	Actions in the specified order
-	Direct effect of action
▶	Actions without a specified order
<i>Text</i>	Operating element or display text

<p>WARNING</p> 	<p>Warning statements indicate a hazardous situation that, if not avoided, could result in minor, moderate or serious injury or death.</p>
-----------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------

<p>CAUTION</p> 	<p>Caution statements indicate a hazardous situation that, if not avoided, could result in equipment damage or environmental damage.</p>
-----------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

	<p>Notes indicate information considered important but not hazard related.</p>
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0.3 General Safety Instructions

<p>WARNING</p> 	<p>Danger due to voltage-regulated devices</p> <p>Risk of death or serious injury caused by electrical shock</p> <ul style="list-style-type: none"> ▶ Switch off the voltage supply if the wires have damaged insulation. ▶ Work on the electric system must be performed only by qualified electricians. ▶ Keep moisture away from live parts. ▶ Keep the system closed. ▶ Do not attempt to bypass or disable fuses.
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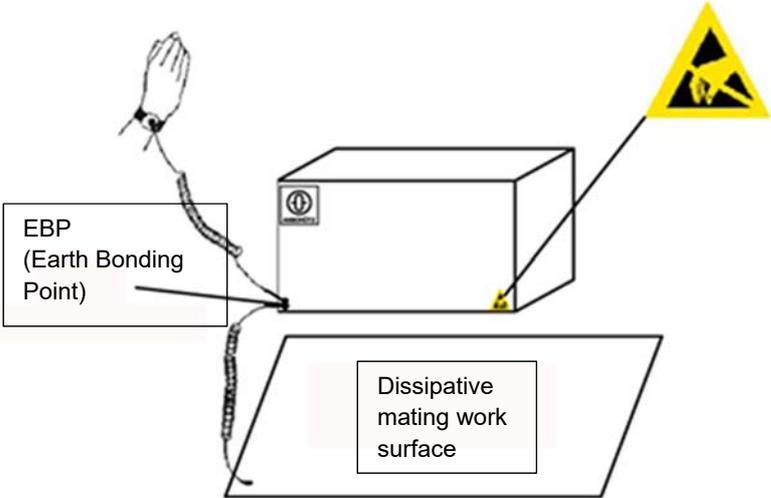
<p>WARNING</p> 	<p>Danger due to improper operation and purpose</p> <p>Risk of serious injury and material damage</p> <ul style="list-style-type: none"> ▶ Use the product only for the intended purpose. ▶ Perform the operation steps according to this manual.
----------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>WARNING</p> 	<p>Danger due to operation / maintenance by unqualified personnel</p> <p>Risk of serious injury and material damage</p> <ul style="list-style-type: none"> ▶ Keep unqualified personnel away from the operation area. ▶ All operation / maintenance must be performed only by qualified personnel.
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<p>WARNING</p> 	<p>Danger due to non-adherence of general rules and regulations</p> <p>Risk of death or serious injury and material damage</p> <ul style="list-style-type: none"> ▶ Adhere to all national and regional disposal rules and regulations. ▶ Adhere to all general rules and regulations specified for the work area. ▶ Adhere all instructions placed on the components or described in related documentation.
-----------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>CAUTION</p> 	<p>Hazard due to wrong disposal of harmful substances</p> <p>Risk of environmental damage caused by wrong disposal</p> <ul style="list-style-type: none"> ▶ Adhere to all national and regional disposal rules and regulations. ▶ Adhere to all disposal instructions placed on the components or described in related documentation.
---------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ESD = Electrostatic Sensitive Device



EBP
(Earth Bonding Point)

Dissipative mating work surface

Devices/assemblies which are labeled as shown are electrostatic sensitive. This label indicates that handling or use of this item may result in damage from ESD if proper precautions are not taken. To perform installation and/or calibration work appropriate protective measures must be deployed. All the necessary equipment for these protective measures can be supplied (on special order) with the RAYTHEON Anschütz ID no. 1.990106.

0.4 List of Abbreviations

Term	Description
Alert ACK	Alert Acknowledge
BNWAS	Bridge Navigational Watch Alarm System
CAM	Central Alert Management
CAN	Controller Area Network
CDU	Control and Display Unit
CHMU	Compass Heading Measurement Unit
CSPU	Compass Signal Processing Unit
DU	Distribution Unit
EIA / TIA	Electronic Industries Alliance / Telecommunications Industry Association
GNSS	Global Navigation Satellite System (such as GPS)
HMI	Human Machine Interface
HMU	Heading Measurement Unit
HRG	Hemispherical Resonant Gyroscope
IMO	International Maritime Organization
INS	Integrated Navigation System
NMEA	National Marine Electronics Association
RMS	Root Mean Square
RoT	Rate of Turn
SDC	Strapdown Compass
SPU	Signal Processing Unit
UDP	User Datagram Protocol

0.5 Product and Performance Standards

Standard	Description
IEC 60945	Maritime navigation and radio communication equipment and systems – General requirements – Methods of testing and required test results
IEC 61162-1/-2	Maritime navigation and radio communication equipment and systems
ISO 8728	Ships and marine technology – Marine gyro-compasses
ISO 16328	Ships and marine technology – Gyro-compasses for high-speed craft
ISO 20672	Ships and marine technology – Rate of turn indicators
EIA/TIA-568B	Standard for contacting eight-pole RJ-45 plugs and sockets

0.6 Further Documents

Standard	Description
4305	Operator Unit 130-626
3970	Distribution Unit 138-118.NG002
4008	Distribution Unit 138-118.NG003

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1 Description

The Standard 30 MF is a marine gyro compass equipped with an inertial measurement unit, called heading measurement unit (HMU), a compass signal processing unit (SPU) and interfaces.

The HMU is composed of three mutually orthogonal rate integrating angular rate sensors, two nominally horizontal and orthogonal accelerometers and pertaining electronics for sensor control as well as measurement data generation, correction and output.

The SPU computes the vessel's attitude and heading from HMU data but also externally provided information such as the vessel's latitude and speed.

The interfaces, the Ethernet ports, the power supply connectors and the earthing stud are located on the front of the device.

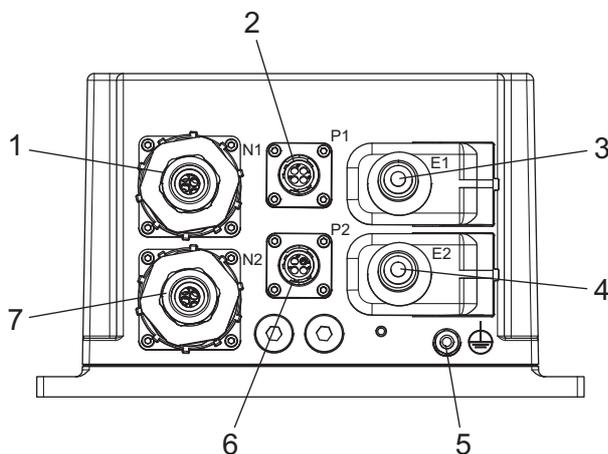


Figure 1-1 Standard 30 MF, Front View

Pos.	Description
1	37-pin round socket N1, data
2	4-pin round socket P1, supply voltage
3	RJ45 socket E1, Ethernet
4	RJ45 socket E2, Ethernet
5	Bolt, M6 x 25, ground connection
6	4-pin round socket P2, supply voltage
7	37-pin round socket N2, data

1.1 Intended Use

The Standard 30 MF determines the ships heading in relation to geographical north, its rate of turn, as well as its roll and pitch angles considering current values for latitude and speed. The determined data is displayed on the Operator Unit and can be transmitted to a variety of users, devices, and systems through different transmission channels.

1.2 Scope of Delivery

The scope of delivery includes the following items:

- 1 Gyro Compass Standard 30 MF, ident-no. 4006300
- 1 Operator Unit Gyro STD 30 MF, ident-no. 4006311 (required for configuration)
- 2 STD 30 power supply cables 1/2, ident-no. 1701305 and 1701307
- 2 STD 30 data cables 1/2, ident-no. 1701301 and 1701303
- 2 STD 30 Ethernet cables 1/2, ident-no. 1701324 and 1701325
- 2 resistors 120 Ω for CAN-Bus termination, ident-no. 1722701
- This operator and service manual

1.3 Technical Data**1.3.1 Mechanical Data**

Housing dimensions (H x W x D)	130 mm x 240 mm x 145 mm
Weight (without cables)	3.3 kg

1.3.2 Accuracy

Heading	0.25° secLat RMS
Roll & Pitch	0.2° RMS
Rate of turn	0.5° + 5 % of the indicated rate of turn of the ship
Maximum latitude	$\pm 85^\circ$

1.3.3 Electrical Data

Nominal Supply voltage	24 V DC
Nominal Power consumption	24 W
Interfaces	<ul style="list-style-type: none">- 2x CAN-bus- 2x Serial input (latitude, speed)- 4x Serial output- 2x Relais (heading O. K. system fault)- 1x Analog rate of turn- 2x Ethernet (input and output)

1.3.4 Input Data

The Standard 30 MF can read and process the following signals via the data interfaces and the Ethernet interfaces:

- NMEA Speed from __VTG, __VBW, __VHW
- NMEA Latitude from __GGA, __GLL, __GNS
- NMEA Alert from CAM

Standard 30 MF provides two different methods for alert management. The first method is based on alarms and acknowledgement according to IEC 61162-1. The second method provides different priorities of alerts and alert escalations. This method was introduced with Integrated Navigation Systems based on IEC 61924-2.

Inputs for alert management:

- ACK, HBT according to IEC 61162-1 (via serial interface) or
- ACN according to IEC 61924-2 (via Ethernet)

1.3.5 Output Data

The following NMEA standard telegrams are output via the data interfaces and the Ethernet interfaces:

- HEHDT
- HETHS
- HEROT
- HEHCR
- TIROT



The standard telegrams comply with the international standard IEC 61162-1 Maritime navigation and radio communication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners.

Course bus data are also provided.

The following NMEA manufacturer telegrams are output via the data interfaces and the Ethernet interfaces:

- PANZHRP (for heading, roll and pitch)
- PANZSDC (for internal use only)

Standard 30 MF provides two different methods for alert management. The first method is based on alarms and acknowledgement according to IEC 61162-1. The second method provides different priorities of alerts and alert escalations. This method was introduced with Integrated Navigation Systems based on IEC 61924-2.

Outputs for alert management:

- ALR, HBT according to IEC 61162-1 (via serial interface) or
- ALC, ALF, ARC according to IEC 61924-2 (via Ethernet)

1.4 Technical Description

1.4.1 Operator Units

Standard 30 MF requires different operator units depending on the application.

Possible applications are:

- Standalone
- Used in combination with Distribution Unit, type 138-118.NG002/NG003.

1.4.1.1 Operator Unit Gyro Standard 30 MF, type 130-627.NG00x

It is required for the configuration of Standard 30 MF. In the standalone application it can be used for indication purposes (e.g. heading, rate of turn, roll, pitch, alerts) and operation purposes (e.g. manual speed and latitude input). It is recommended that this Operating Unit remains on board for possible configuration changes.

1.4.1.2 Operator Unit Gyro, type 130-626.NG00x

This Operator Unit is supplied when Standard 30 MF is used in combination with distribution unit, type 138-118.NG002/NG003. In this application it is used for sensor selection, heading monitoring, inputs for speed error correction among other functions.



Do not use Operator Unit Gyro Standard 30 MF type 130-627.NG00x in combination with distribution unit, type 138-118.NG002/NG003

1.4.2 System Overview

The Standard 30 MF can be operated as a standalone device in connection with at least one Distribution Unit 138-118.NG002/NG003.

Using Distribution Units enables systems with a maximum of three gyro compasses in which any combination of Standard 30 MF and Standard 22 gyro compass is possible. Alternatively two gyro and one GNSS compass (transmitting heading device) can be integrated.

A magnetic compass can be integrated via a magnetic sonde type 108-010.

The Distribution Unit, type 138-118.NG003 allows to input two compasses via NMEA.

The following are examples of standalone and system applications.

1.4.2.1 Standalone System

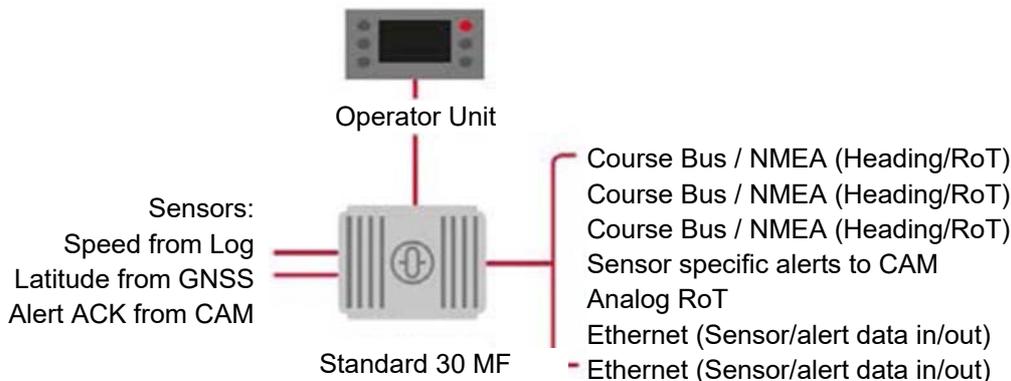


Figure 1-2 Standard 30 MF, Standalone

The standalone system provides four (three if one serial output is required for alert management) serial outputs for heading, RoT and roll and pitch. RoT is also available as analogue ± 10 V output. Thus, Standard 30 MF can also be used as a RoT indicator (required for vessels above 50.000 GT). Speed and latitude are input as serial data. In addition the Ethernet interfaces can be used for data communication, e.g. with an Integrated Navigation System such as Synapsis. In this case speed and latitude can be input via Ethernet. Heading, RoT and roll and pitch can be output via Ethernet.

Speed Error Correction

Speed error correction is done with the speed and latitude input via the serial interfaces or via Ethernet. Priority is given to the data input via Ethernet. In addition speed and latitude can be entered manually via the operator unit for manual speed error correction.

Alert Management (see also chapters 1.3.4 and 1.3.5)

If the alert management according to IEC 61162-1 is required, one serial input and one serial output of Standard 30 MF have to be used.

The alert management according to IEC 61924-2 is done via the Ethernet interface of Standard 30 MF.

Operator Unit Standard 30 MF, type 130-627.NG00x

The operator unit is required for the configuration of Standard 30 MF. It displays heading, rate of turn, roll, pitch, and alerts and allows operations such as the manual input of speed and latitude.

1.4.2.2 Standard 30 MF with Distribution Unit, type 138-118.NG002/NG003

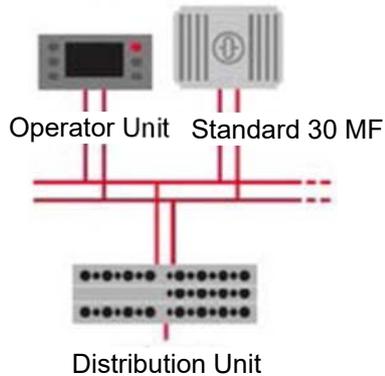


Figure 1-3 Standard 30 MF, Single System with DU

This system allows to connect up to three gyro compasses (or two gyro compasses and one GNSS compass / transmitting heading device) and integrates a magnetic compass via the magnetic sonde. Twelve serial outputs are available in addition to the outputs of Standard 30 MF for the connection of heading receivers, such as repeaters, autopilots, radars and others. The rate-of-turn is available as analogue ± 10 V output and taken from Standard 30 MF for the connection of RoT indicators.

In addition the Ethernet interfaces can be used for data communication, e.g. with an Integrated Navigation System such as Synopsis. In this case speed and latitude can be input via Ethernet. Heading, RoT, roll and pitch can be output via Ethernet. Please note that only the data to/from the dedicated Standard 30 MF is transferred via Ethernet. Neither the data from another Standard 30 MF nor from the Distribution or Operator Unit are distributed, too.

Speed Error Correction

Three different types of speed error correction are possible and selected via operator unit, type 130-626.NG00x.

- Manual speed error correction:
Speed and latitude are entered manually at the operator unit and sent via the redundant CAN-Bus to all connected gyro compasses for speed error correction.
- Automatic Speed Error Correction:
Speed and latitude are input to the Distribution Units and sent via the redundant CAN-Bus to all connected gyro compasses for speed error correction.
- Individual Speed Error Correction:
Speed and latitude are input via the serial interfaces or via Ethernet directly at the compass(es). Priority is given to the data input via Ethernet.

CAUTION 	Danger due to wrong speed and latitude data <p>As for all strapdown compass systems it is very important that Standard 30 MF is supplied with the correct speed and latitude data. Incorrect data input for speed and latitude will result in wrong heading data! A wrong heading value may result in accidents, as well as induction of a self test system shutdown.</p> <ul style="list-style-type: none">▶ It is strongly recommended that a speed from a speed log and latitude from a position receiver are used for speed error correction.▶ Please consider this especially when using manual input of speed and latitude for speed error correction.
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Alert Management (see also chapters 1.3.4 and 1.3.5)

Alert management is done via the serial interfaces of operator unit gyro, type 130-626.NG00x. The Alert Management method (according to IEC 61162-1 or IEC 61924-2) can be configured by use of the Configuration Tool AS.

Operator Unit Standard 30 MF, type 130-627.NG00x

The operator unit 130-627.NG00x is required for the configuration of Standard 30 MF only.

Operator Unit Gyro, type 130-626.NG00x

The operator unit gyro 130-626.NG00x is used for:

- Sensor selection
- Display of heading, RoT, roll and pitch
- Heading monitoring
- Speed error correction (selection of type of speed error correction and input of manual speed and latitude)
- Alert presentation and interfacing

1.4.2.3 Gyro Compass System with Redundancy in Distribution

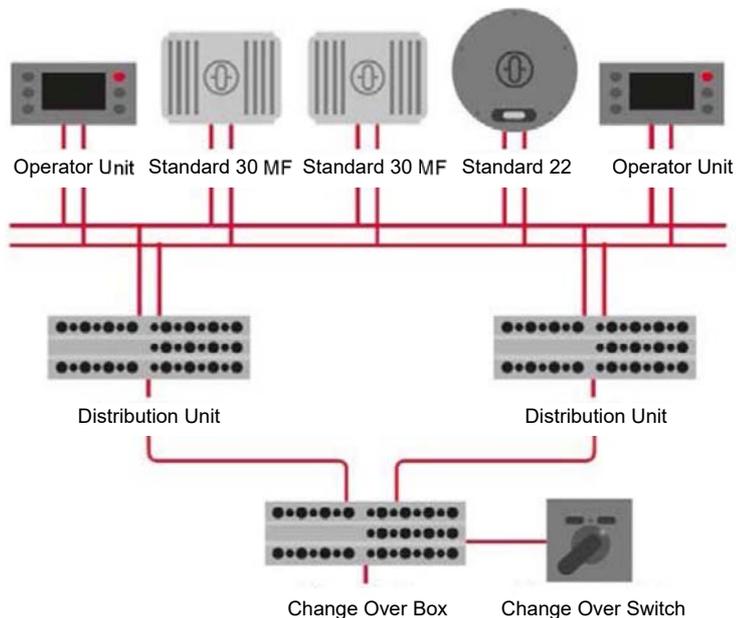


Figure 1-4 Gyro Compass System with Redundancy in Distribution

This system consists of three gyro compasses (in this example two Standard 30 MF and one Standard 22) and provides a redundancy of the distribution system in addition to the redundancy of compasses. No single failure in this system causes a loss of heading information to connected heading receivers. The switch over of the distribution system can be done manually with the change over switch or automatically. Such a system (with two gyros) is compliant for demanding class notations such as DNVGL NAUT-OSV/OC/AW, LR IBS or ABS NIBS.

The explanations given in chapter 1.4.2.2 apply also to this system.

1.4.3 Operation and Display Elements



Figure 1-5 Operator Unit Gyro 130-626

The operation and display element of the Standard 30 MF in systems with distribution units is an Operator Unit 130-626, which is an integral part of the system on the vessel. The Operator Unit is used to display statuses and alerts in normal operation and also to acknowledge alert messages that have occurred.

The Operator Unit 130-627 can be used in standalone applications for indication purposes (e.g. heading, rate of turn, roll, pitch, alerts) and operation purposes (e.g. manual speed and latitude input).

The hardware of the Operator Units 130-626 and 130-627 is equal. However, they differ in the installed software.

i	In either case the delivered Operator Unit 130-627 must be temporarily connected for configuring and calibrating the Standard 30 MF during setting to work. Operator Unit 130-627 is only described in this manual.
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1.4.4 Interfaces / Cables

1.4.4.1 Data Interfaces N1 and N2



Figure 1-6 Sockets of Data Interfaces N1 and N2

Two 37-pin round sockets on the device front serve as data interfaces N1 and N2. The scope of delivery of the Standard 30 MF includes two STD 30 data cables of type RFE-HF 19 x 2 x 0.5 mm², 250 V. They are equipped with a pre-mounted 37-pin plug. The cables for connection to sockets N1 and N2 are approx. 3 m long. The open ends of the connecting cables are fitted with ferrules for connection to a terminal strip. They are labeled with pin number and signal name.

The open cable ends are conducted as shown in the figure below.

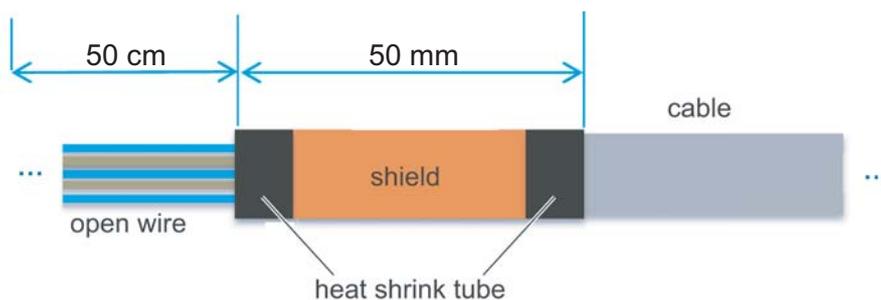


Figure 1-7 Open Cable Ends of STD 30 Data Cables N1 and N2

The pin assignments and factory settings for N1 and N2 are shown in the following tables.

Table 1-1 N1 Pin Assignments

Pin No.	Wire Label	Function / Factory Settings
37	37 CAN1 H (1)	Connection to CAN bus 1
36	36 CAN1 L (1)	
33	33 CAN1 H (2)	CAN bus termination for CAN bus 1 (required if Standard 30 MF is the first or last device in the CAN bus system)
27	27 CAN1 L (2)	
32	32 CAN1 GND	Ground for CAN bus 1
7	7 ROT +/-10V	+/- 10 V for analog rate of turn indicator
3	3 ROT 0V	0 V for analog rate of turn indicator
22	22 K1 NC	Status relay "System Fault" (normally closed)
28	28 K1 CO	Status relay "System Fault" (common)
21	21 K1 NO	Status relay "System Fault" (normally open)
6	6 Rx+ 4	not used
12	12 Rx- 4	
5	5 Tx+ 4	Serial output 4 (Port 4) Telegrams: HETHS, HEROT Baudrate: 38400bd Update rate: 50Hz
10	10 Tx- 4	
11	11 RS4 GND	Ground for serial port 4

Pin No.	Wire Label	Function / Factory Settings
16	16 K2 NO	Status relay "Heading OK" (normally open)
23	13 K2 CO	Status relay "Heading OK" (common)
17	17 K2 NC	Status relay "Heading OK" (normally closed)
9	9 Rx+ 3	not used
15	15 Rx- 3	
8	8 Tx+ 3	Serial output 3 (Port 3) Telegrams: HEHDT, HEROT Baudrate: 38400bd Update rate: 50Hz
13	13 Tx- 3	
14	14 RS3 GND	Ground for serial port 3
2	2 STAT1 IN 5VDC	not used
1	1 STAT1 IN 0VDC	
35	35 Rx+ 2	Serial input 2 (Port 2) for speed Telegrams:VHW, VBW, VTG Baud rate: 4800bd
31	31 Rx- 2	
34	34 Tx+ 2	not used
29	29 Tx- 2	
30	30 RS2 GND	Ground for serial port 2



Pins 4, 18, 19, 20, 24, 25 and 26 at socket N1 are not assigned.

Table 1-2 N2 Pin Assignments

Pin No.	Wire Label	Function / Factory Settings
37	37 CAN2 H (1)	Connection to CAN bus 2
36	36 CAN2 L (1)	
33	33 CAN2 H (2)	CAN bus termination for CAN bus 2 (required if Standard 30 MF is the first or last device in the CAN bus system)
27	27 CAN2 L (2)	
32	32 CAN2 GND	Ground for CAN bus 2
22	22 K3 NC	not used
28	28 K3 CO	
21	21 K3 NO	
6	6 Rx+ 6	not used
12	12 Rx- 6	
5	5 Tx+ 6	Serial output 6 (Port 6) Telegrams: HETHS, Baudrate: 4800bd Update rate: 10Hz
10	10 Tx- 6	
11	11 RS6 GND	Ground for serial port 6
16	16 K4 NO	not used
23	23 K4 CO	
17	17 K4 NC	

Pin No.	Wire Label	Function / Factory Settings
9	9 Rx+ 5	not used / Alternatively: Use this serial input for ALR / ACK alert communication
15	15 Rx- 5	
8	8 Tx+ 5	Serial output 5 (Port 5) Telegrams: HEHDT, Baudrate: 4800bd Update rate: 10Hz / Alternatively: Use this serial output for ALR / ACK alert communication
13	13 Tx- 5	
14	14 RS5 GND	Ground for serial port 5
2	2 STAT2 IN 5VDC	not used
1	1 STAT2 IN 0VDC	
35	35 Rx+ 1	Serial input 1 (Port 1) for position Telegrams: GGA, GLL, RNS Baud rate: 4800bd
31	31 Rx- 1	
34	34 Tx+ 1	not used
29	29 Tx- 1	
30	30 RS1 GND	Ground for serial port 1



Pins 3, 4, 7, 18, 19, 20, 24, 25, and 26 at socket N2 are not assigned.

1.4.4.2 Power Supply Sockets P1 and P2

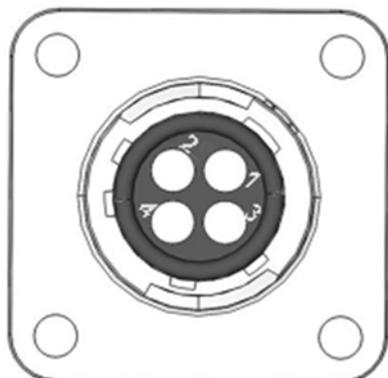


Figure 1-8 Power Supply Plugs P1 and P2

The both 4-pin round plugs P1 and P2 on the device front are provided to connect 2 power supplies for redundancy.

Delivery of the Standard 30 MF includes two STD 30 power supply cables of type LKSM-HF 2 x 1.5 mm², 0.6/1 kV for connection to the power supply. They are equipped with a pre-mounted 4-pin socket. Each cable is approx. 3 m long.

The open ends of the connecting cables are fitted with ferrules for connection to a terminal strip. They are labeled with pin number and signal name.

The pin assignments for P1 and P2 are shown in the following table.

Table 1-3 STD 30 Power Supply Cables P1 and P2, Pin Assignments

Pin No.	Signal	Cable Color
1	24V_1 / 2	brown
2	0V	blue



Pins 3 and 4 are not assigned.

The open cable ends are conducted as shown in the figure below.

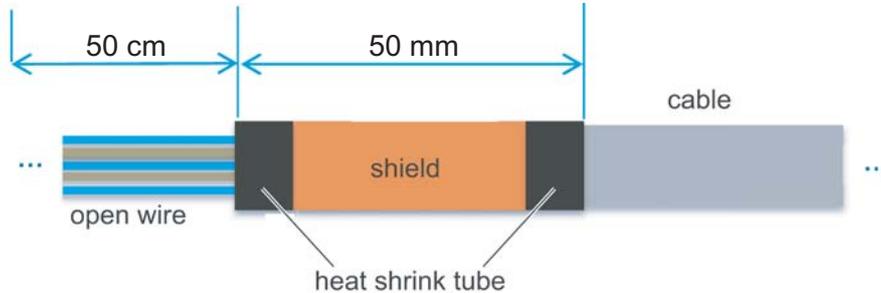


Figure 1-9 Open Cable Ends of STD 30 Power Supply Cables P1 and P2

1.4.4.3 Ethernet Ports E1 and E2



Figure 1-10 Ethernet Sockets E1 and E2

The 2 RJ45 sockets on the device front are provided for connection to an existing Ethernet. Spring-loaded hinged covers protect the sockets against dust and splashing water.



Figure 1-11 Ethernet Plug for E1 and E2

STD 30 Ethernet cables of type UC900 SS27 Cat.7, 4 x 2 x AWG27 S/FTP are used to connect the Standard 30 MF to the Ethernet. They are equipped with a pre-mounted RJ45 plug Neutrik NE8MC6-MO on the device side as shown in Figure 1-11. The other ends are fitted with a plug type Telegärtner STX IP20 RJ45 - AWG24-27 CAT.6a. Each cable is approx. 3 m long.

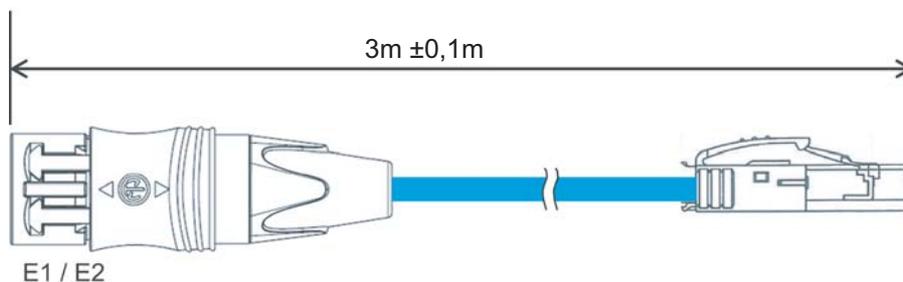


Figure 1-12 STD 30 Ethernet Cable for E1 and E2

The pin assignments for E1 and E2 comply with the standard EIA / TIA-568B.

Table 1-4 Pin Assignments for Ethernet According to EIA / TIA-568B

Pin No.	Signal (Ethernet 10BaseT/100BaseT)	Cable Color
Shield	Shield	
1	TX+	white / orange
2	TX-	orange
3	RX+	white / green
4	---	blue
5	---	white / blue
6	RX-	green
7	---	white / brown
8	---	brown

Intentionally left blank

2 Installation

2.1 Safety Information and Remarks

<p>CAUTION</p> 	<p>Risk of material damage due to improper installation</p> <p>Risk of damage to the Standard 30 MF due to incorrect installation</p> <ul style="list-style-type: none"> ▶ All installation must be performed only by trained and authorized RAYTHEON ANSCHÜTZ service personnel.
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<p>CAUTION</p> 	<p>Risk of malfunction due to improper installation</p> <p>Risk of malfunction due to incorrect installation</p> <ul style="list-style-type: none"> ▶ Mount the Standard 30 MF on a plane surface with a maximum deviation of ± 2 mm ▶ Do not mount the Standard 30 MF on the wall.
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<p>CAUTION</p> 	<p>Risk of malfunction due to non-adherence of the safety information and installation instructions</p> <p>Risk of malfunction due to nonobservance of the safety information and installation instructions.</p> <ul style="list-style-type: none"> ▶ Adhere all safety and installation instructions.
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<p>CAUTION</p> 	<p>Risk of malfunction of other devices due to interference</p> <p>The Standard 30 MF may cause malfunctions of magnetic compasses in the vicinity due to electromagnetic interference</p> <ul style="list-style-type: none"> ▶ Ensure sufficient distance from any magnetic compasses in the vicinity according to the device label when selecting the installation position for the Standard 30 MF.
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To ensure proper installation, make sure that there is sufficient space around the device when selecting the installation position.

In order to ensure the specified heading accuracy of the Standard 30 MF it is recommended to install the Standard 30 MF as close as possible to the ship's roll and pitch axes.

Consider plug lengths, tool lengths and cable stiffnesses.
Prefer to the attended dimension drawing.



The Standard 30 MF can be mounted in four different positions, either on the floor or on the ceiling.

The deviation from the pitch or roll axis of the vessel may be a maximum of $\pm 6^\circ$.



For configuration of multi Standard 30 MF compass systems
It is necessary to select the specific compass first.

2.2 Operation within Service Menu

If parameter settings of the Standard 30 MF are to be changed for servicing, the Operator Unit 130-627 must be temporarily connected in the same way as for the installation. The Service menu of the Operator Unit 130-627 provides access to the dialogs for changing the parameters. The Service menu also provides access to various status displays of the Standard 30 MF.

Press and hold the *Page* key and the *Set* key on the operator unit at the same time to call up the service menu. Navigate to desired menu item with the *arrow down* key. Press *Set* key to confirm a selection.

The following illustration shows the menu structure of the Standard 30 MF if the Operator Unit 130-627 is connected.

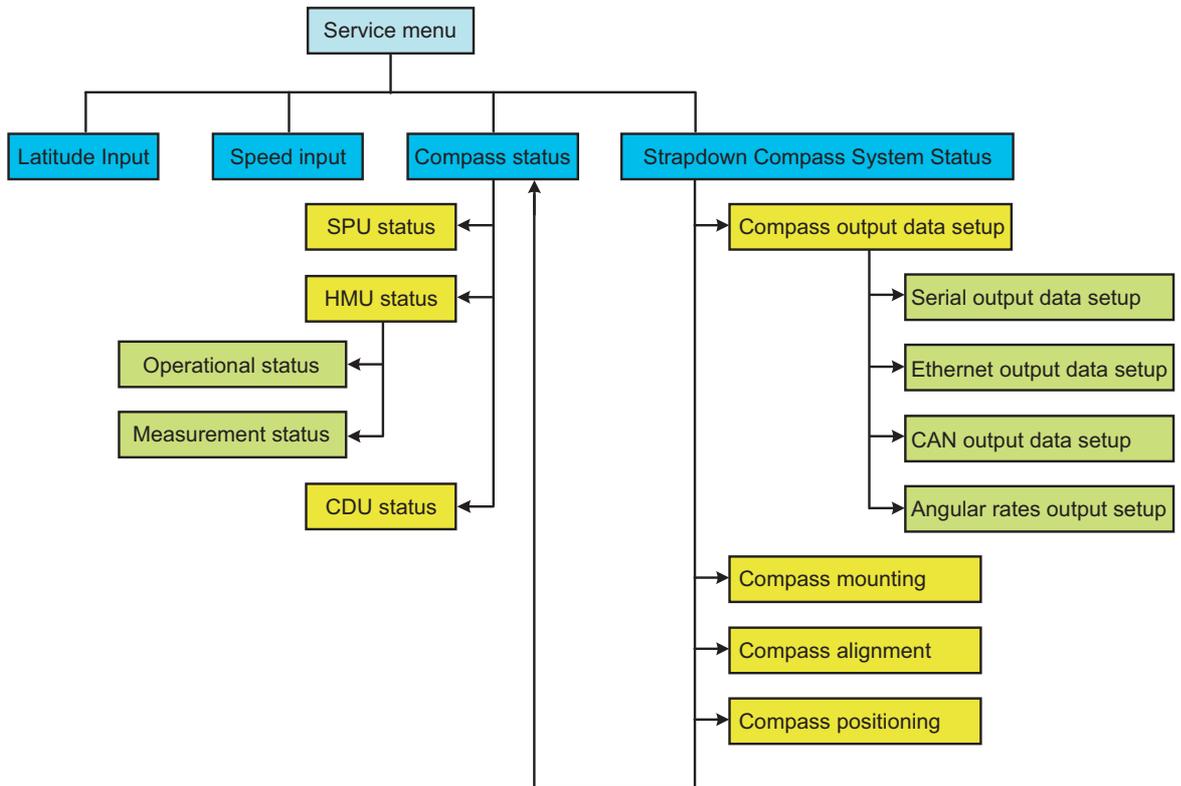


Figure 2-1 Menu Structure

2.3 Installation Instructions

i	<p>The Standard 30 MF can be mounted standing on the floor or hanging from the ceiling.</p> <p>When selecting the installation location, required clearances around the unit have to be considered as shown in the Standard 30 MF dimensional drawing 110-700.HP005 in the annex.</p> <p>Four attachment drill holes with a diameter of 6.6 mm are located in the bottom of the housing as shown in the following figure.</p>
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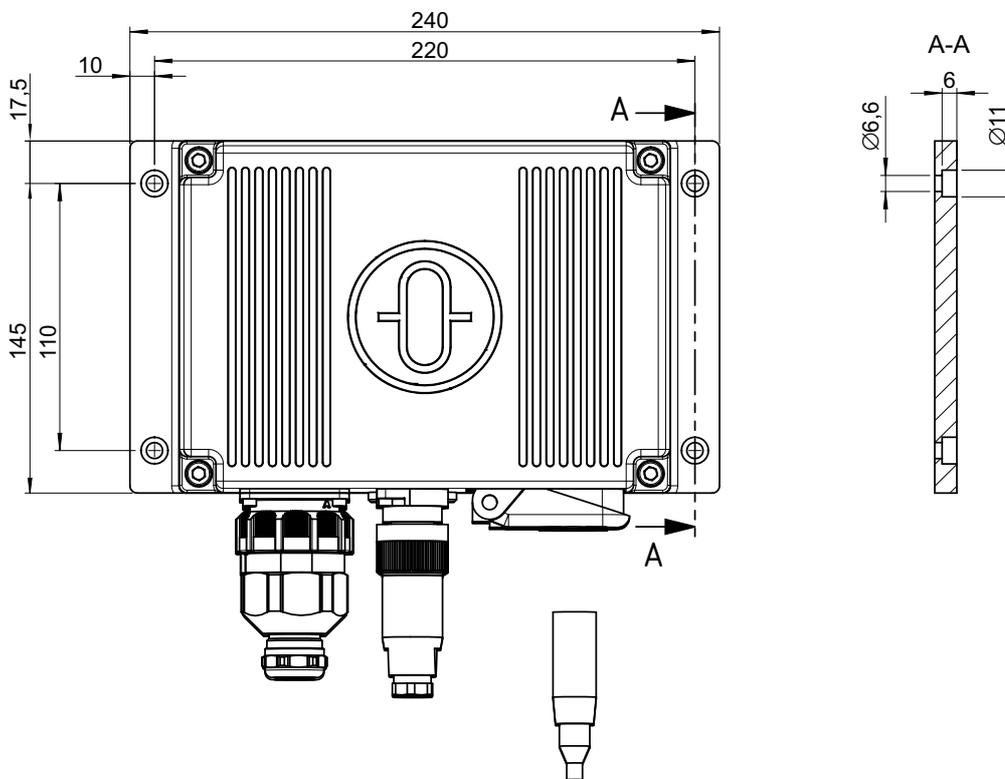


Figure 2-2 Standard 30 MF, Attachment Drill Holes

The connecting sockets are located on the front of the Standard 30 MF. The type of installation and the installation direction have to be specified during setting to work; the side with the connecting sockets shows the installation direction.

i	<p>The Standard 30 MF is provided with a pre-installed ground strap on the housing side. The overall length of the ground strap between the center points of the attachment drill holes is approx. 195 mm.</p>
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The following installation situations are possible:

- Floor mounting and pointing to the bow
- Floor mounting and pointing to starboard
- Floor mounting and pointing to the stern
- Floor mounting and pointing to port
- Ceiling mounting and pointing to the bow
- Ceiling mounting and pointing to starboard
- Ceiling mounting and pointing to the stern
- Ceiling mounting and pointing to port

2.3.1 Required Installation Material

The following material is needed to install the Standard 30 MF:

- 4 cylinder head bolts M6 x 16 or 4 hex-nuts M6 with suitable washers
- Attachment material for ground connection on the vessel side (depending on the design of the ground connection on the vessel side)
- Cable ties and / or cable clamps for cable routing (depending on the environment conditions at the installation position)

2.3.2 Installation Material for System Applications

Required installation material for additional devices (DU, Operator Unit etc.): see the respective manual.

2.3.3 Preparations

The Standard 30 MF is mounted directly to the vessel's structure on the floor or on the ceiling. The surface must be plane. The tolerance in the area of the contact surface is ± 2 mm.

If no attachment points for the Standard 30 MF have been prepared on the vessel side yet, proceed as follows:

1. Select a suitable installation position on the floor or ceiling.
2. Mark attachment points at the installation position according to Figure 2-2.
 - The maximum permissible deviation of the installation orientation from the pitch or roll axis of the vessel after installation is $\pm 6^\circ$. A heading correction factor for the deviation will be defined during setting to work.
3. Drill holes with a diameter of 5.0 mm at the 4 attachment points.
4. Cut an M6 thread into each attachment drill hole.



Alternatively pre-install M6 stud bolts on which to mount the device.

Only if no ground connection point on the vessel side is provided at the installation position, proceed the following steps:

5. Mark the point where to attach the ground connection on the vessel side at a maximum distance of 150 mm from the ground connection on the Standard 30 MF.



The ground connection point on the vessel side may be an M6 bolt or an M6 internal thread.

6. Install the ground connection point on the vessel side:
 - weld the M6 bolt to the prepared surface or
 - drill a hole with a diameter of 5.0 mm at the ground connection point and cut an M6 thread

2.3.4 Cabling

<p>CAUTION</p> 	<p>Risk of device damage</p> <p>Cables connected to a switched-on power supply when establishing the cable connections may cause short circuits.</p> <ul style="list-style-type: none"> ▶ Switch off any connected power sources.
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	<p>The length of the power cables should be such that the device including the connected cable can be turned 180° during the installation procedure without damaging the cable.</p>
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	<p>The cable assignments are specified in chapter 1.4.4.</p>
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1. Connect the open ends of the single cables to the corresponding cable connections on the vessel sided terminal strip.

<p>CAUTION</p> 	<p>Risk of fire due to short circuits</p> <p>Cracks or other damage to the cable insulation may cause short circuits during operation, which may cause a fire.</p> <ul style="list-style-type: none"> ▶ Do not bend, squeeze or twist the cables too much when connecting them. ▶ Do not exert excessive tensile force on the cables when connecting them.
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2. Lay the cables to the Standard 30 MF without kinks.
3. Appropriately secure the cables to the vessel's structure (e.g., with cable ties or cable clamps).

2.3.5 CAN-Bus Termination

	If the Standard 30 MF is connected to a CAN-Bus as the first or as the last device, the CAN-Bus must be terminated using the 120 Ω resistors (included in the delivery).
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1. Connect the two 120 Ω resistors respectively to the CAN#1_H/CAN#1_L and CAN#2_H/CAN#2_L signals at the cable terminal.

	The CAN#1_H / CAN#1_L signals and the CAN#2_H / CAN#2_L signals are respectively present at the free ends of pins 27 and 33 of the STD 30 data cables N1 and N2.
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2.3.6 Setting the CAN-Bus address

The CAN-Bus address for the Standard 30 MF is set with the external service configuration tool *WinSCP* on a service PC (see chapter 2.4). Every CAN-Bus user must have a unique address. The CAN-Bus address for gyro compasses can be set within a range from 14 to 19.

The table below shows the agreement for the CAN-Bus addresses within a compass system.

Table 2-1 CAN-Bus addresses within a compass system

Device(s)	CAN-Bus address
Operator Units	01 to 09
Sensors (GPS-compass)	10 to 13
Sensors (gyro compass)	14 to 19
Distribution Units	20 to 29
Gateway	56 and 57

i	<p>The factory preset CAN-Bus address for the Operator Unit 130-627 is "09".</p> <p>The factory preset CAN-Bus address for the Standard 30 MF is "17".</p>
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i	<p>After a change of CAN-Bus address a reset has to be performed.</p>
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2.3.7

Connection of the Operator Unit Standard 30 MF 130-627

i	<p>During the setting to work procedure, the Operator Unit 130-627 has to be connected to the cable clamps to make all the necessary presettings. If the Standard 30 MF is used in a system environment the Operator Unit 130-627 is disconnected again after completion of the setting to work procedure and the Operator Unit 130-626 is used for further operation.</p> <p>In a standalone environment the Operator Unit 130-627 is also used for operation.</p>
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i	<p>If the Operator Unit 130-627 should be used for operation in a standalone system it has to be mounted in a console. Information about mounting and settings see dimensional drawing 130-627.HP005 in the annex.</p>
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1. Adjust the configuration of the Operator Unit 130-627 to the given circumstances.
2. Connect the Operator Unit 130-627 to the cable terminals.

2.3.8 Setting to Work and Commissioning the Standard 30 MF

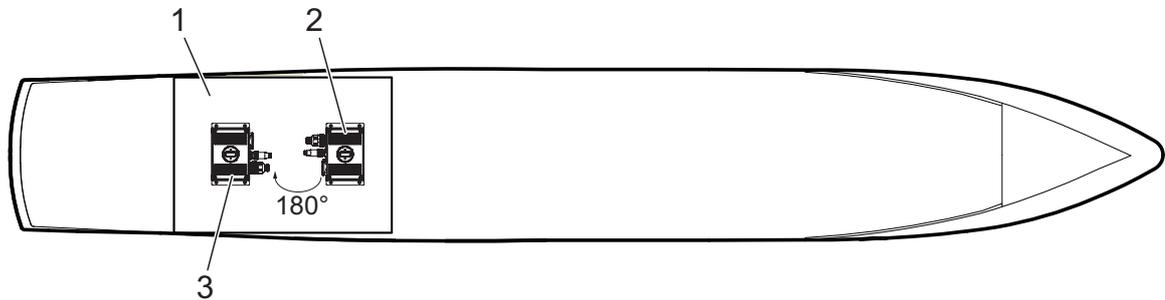


Figure 2-3 Setting to work, Schematic Example

Pos.	Description
1	Installation room on the vessel
2	Final installation position and orientation and first initialization position
3	Second initialization position (turned 180° compared to the final position)

Notes on the schematic view of the installation:

- In the example (Figure 2-3), the compass is mounted on the floor with the front side (plug side) facing the stern.

<p>CAUTION</p> 	<p>Risk of malfunction due to incomplete initialization</p> <p>An interruption of the power supply during the setting to work procedure will trigger an undefined state of the Standard 30 MF.</p> <p>► If the power supply is interrupted during the installation procedure, the entire procedure must be restarted.</p>
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1. Determine the final installation position and the final installation orientation of the Standard 30 MF within a maximum of +/- 6° to roll or pitch axis.

<p>CAUTION</p> 	<p>Risk of device damage when connecting the power supply cables</p> <p>The Standard 30 MF enters operation immediately when the power supply is switched on. The device is not equipped with a separate On/Off switch.</p> <ul style="list-style-type: none"> ▶ Verify that the power supply is switched off prior to connecting the STD 30 power supply cables.
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	<p>Cautions may be generated and displayed on the Operator Unit when Standard 30 MF is switched on or during the Standard 30 MF installation procedure. These cautions extinguish automatically during/after the installation/start-up procedure.</p>
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2. Connect the cables in the following order:
 1. Operator Unit Standard 30 MF
 2. STD 30 data cables
 3. STD 30 Ethernet cables (if required)
 4. STD 30 power supply cables

	<p>Activate the speed and position sensors prior to switching on the Standard 30 MF.</p> <p>If no extern sensors are available, the current values for latitude and speed have to be input manually after Standard 30 MF has started completely (see chapters 3.3.1 and 3.3.2).</p>
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3. Switch on the power supply.
 - The Standard 30 MF starts up and performs a selftest.
 - After completion of the booting process, the start screen appears on the Operator Unit.
 - If an alert is detected during the selftest, the corresponding message appears at the top of the screen of the Operator Unit.

	<p>The ground cable is not connected on the vessel side at this point yet.</p>
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See chapter 2.4

For the change of the serial input baud rate (other than 4800 Bd), the CAN or Ethernet IP-address of Standard 30 MF.

4. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The service menu appears, see chapter 2.2.

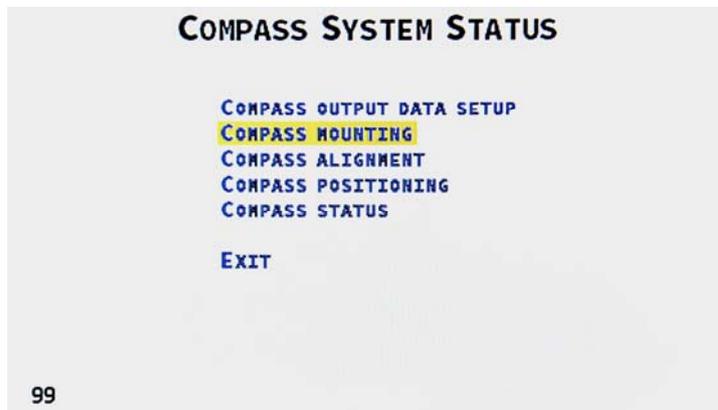


Figure 2-4 Service Menu

5. Select *COMPASS MOUNTING* with the *arrow down* key.
 - The menu item will be highlighted yellow.
6. Press the *Set* key to open the dialog.
 - The dialog for selecting the installation orientation appears.

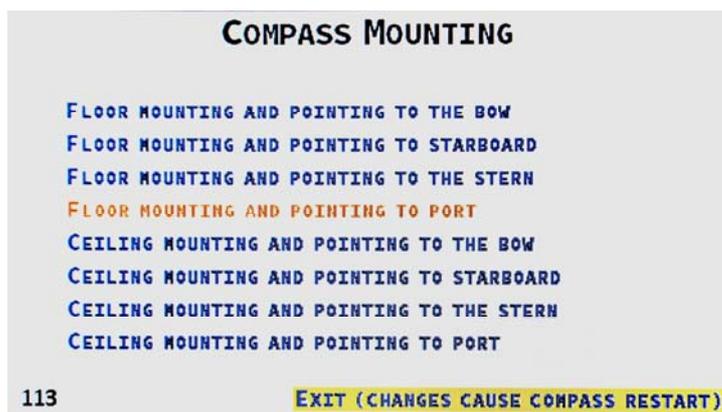


Figure 2-5 Dialog for Selecting the Final Installation Orientation

7. Select the final installation orientation of the Standard 30 MF with the *arrow down* or *arrow up* keys.
 - The selected line will be highlighted yellow.

CAUTION 	Risk of misdirection and resulting accidents Entering an incorrect type of installation and/or installation direction will result in miscalculation of the heading angle during operation. <ul style="list-style-type: none">▶ Verify that the final installation orientation was correctly defined in the <i>COMPASS MOUNTING</i> dialog.
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8. Press the *Set* key.
 - The font color of the selected line changes to orange.
9. Select *EXIT* with the *arrow down* key.
 - The menu item will be highlighted yellow.
10. Press the *Set* key.
 - If the previously selected installation orientation has been changed, the Standard 30 MF will reboot and display the start page on the Operator Unit at the end of the booting process.
11. Mark the final installation orientation with a cross in the list of chapter 2.5.1 on page 2-43.
12. Operate the Standard 30 MF for at least 90 minutes in final installation orientation. The ship has to be moored during settling time of 90 minutes.
13. Loosen all cables except one power supply cable.
14. Attach the Standard 30 MF in a position turned $180^\circ \pm 15^\circ$ compared to the final installation orientation during operation (see Figure 2-3).
15. Operate the Standard 30 MF for at least 90 minutes while it is turned 180° compared to the final installation orientation.
16. Turn the Standard 30 MF to the final installation orientation again while it is in operation.
17. Connect the Operator Unit, data cables, Ethernet cables (if required) and if applicable the second power supply cable to the Standard 30 MF.
18. If necessary, acknowledge displayed warnings which were generated due to missing cable connections.
19. Lay the ground cable to the grounding point on the vessel side.

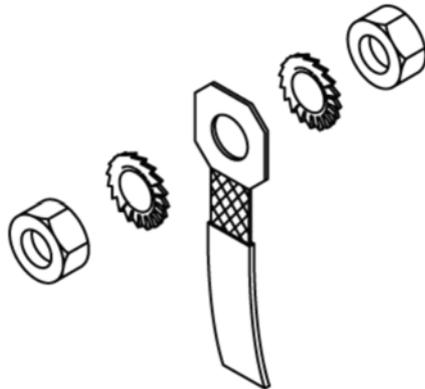


Figure 2-6 Establishing a Common Ground Connection

20. Make the common ground connection as shown in the figure above.
21. Mount the cable bracket between two toothed washers.

	<p>Common ground connections must be free of corrosion and well fastened.</p>
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22. Position the Standard 30 MF in the selected installation position above the prepared attachment points.
23. Loosely attach the Standard 30 MF.
24. Align the Standard 30 MF parallel to the roll axis or, respectively, the pitch axis of the vessel.
25. Tighten the attachment screws and/or attachment nuts on the four attachment points to a tightening torque of 7.5 Nm.
26. Find out the reference heading of the pier at which the vessel is moored from a suitable source (e.g., sea chart).
 - The pier heading serves as a reference value for calculating the heading correction value for the Standard 30 MF.
27. Read the heading displayed on the Operator Unit.
28. Calculate and enter the heading correction value as described in chapters 2.3.8.1 and 2.3.8.2.
29. Proceed in the same way for roll and pitch alignment.



Setting of accuracy level of small correction angles :

- 1) *MINUTE OF ARC LEVEL ACCURACY*
Applies if the mounting position of the Standard 30 MF is exactly known a priori.
- 2) *FEW MINUTES OF ARC LEVEL ACCURACY (default setting)*
Applies if the specified procedure of determining the heading correction value has been executed successfully and the ship's hull is tightly moored to the peer.
- 3) *MULTIPLE MINUTES OF ARC LEVEL ACCURACY*
Applies if the specified procedure of determining the heading correction value has been executed successfully and the ship's hull is only loosely moored to the peer.

2.3.8.1 Calculating the Heading Correction Value

The heading correction value has to be entered during the setting to work procedure of the Standard 30 MF after the settling phase has been completed.

2 values are required for the calculation:

- pier heading P -> reference heading
- value displayed on the Operator Unit I -> actual heading

i	<p>The following applies for the algebraic sign of the heading correction value:</p> <p>If the set value P is in a clockwise direction from the actual value I on the imaginary compass card, the algebraic sign is positive.</p> <p>If the set value P is in a counterclockwise direction from the actual value I on the compass card, the algebraic sign is negative.</p>
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P in clockwise direction from I

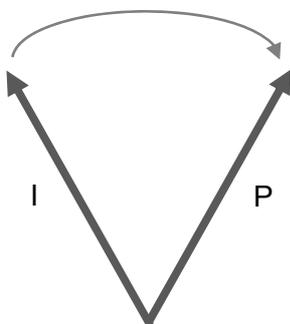


Figure 2-7 Positive Correction Value

P in counterclockwise direction from I

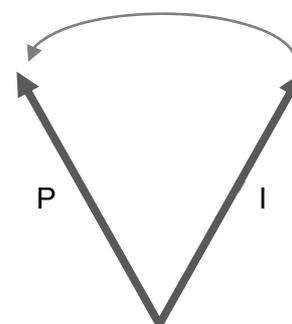


Figure 2-8 Negative Correction Value

Table 2-2 Example Calculations for the Heading Correction Value

P Reference Heading	I Actual Heading	K Heading Correction Value	Note
179.1°	176.3°	2.8°	See figure 2-7
87.1°	90.3°	-3.2°	See figure 2-8
359.1°	1.7°	-2.6°	See figure 2-8
2.1°	358.5°	3.6°	See figure 2-7

2.3.8.2 Setting the Heading Correction Value

1. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The service menu appears.

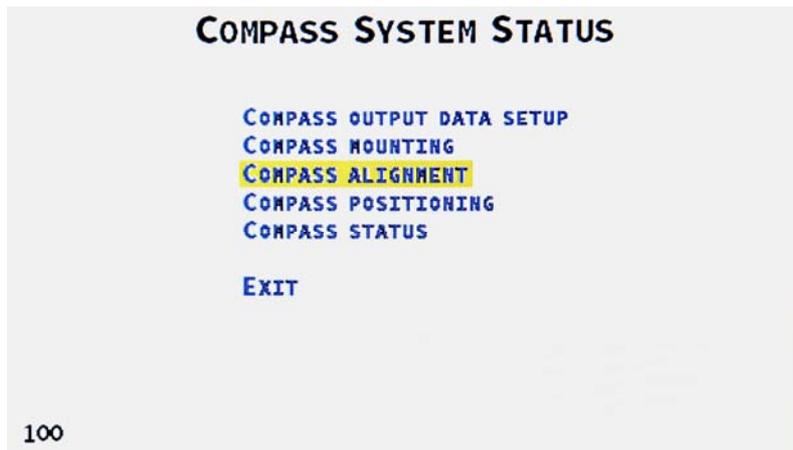


Figure 2-9 Service Menu

2. Select *COMPASS ALIGNMENT* with the *arrow down* key.
 - The menu item will be highlighted yellow.
3. Press the *Set* key to open the dialog.
 - The dialog for entering the heading correction value appears.

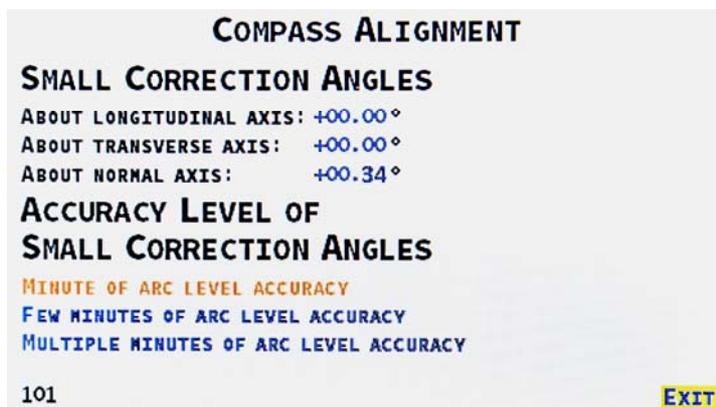


Figure 2-10 Heading Correction Value Dialog

4. Navigate to the displayed value for *ABOUT NORMAL AXIS* with the *arrow down* key.
 - The value will be highlighted yellow.
5. Press the *Set* key.
6. Set the calculated heading correction value with the *arrow down* or *arrow up* keys.
 - The value is incremented or decremented by 0.01° with each press of the key.

CAUTION 	Risk of misdirection and resulting accidents Entering an incorrect heading correction value will result in miscalculation of the heading angle during operation. <ul style="list-style-type: none">▶ Ensure that the heading correction value has been determined correctly and entered correctly in the <i>COMPASS ALIGNMENT</i> dialog.
-----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

7. Press the *Set* key to confirm the entered value.
8. Select *EXIT* with the *arrow down* key.
 - The menu item will be highlighted yellow.
9. Press the *Set* key.

	The input of the heading correction value does not require a restart.
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------

10. Compare the heading displayed on the Operator Unit with the pier heading (set value) again.
 - If the correct heading correction value was entered, the pier heading and the displayed heading are identical.
 - If the displayed heading continues to deviate from the pier heading after correction, an incorrect heading correction value was entered. In this case, the heading correction value has to be set to *00.00* again. Thereafter the heading correction value has to be calculated and entered again.



The correction values for *LONGITUDINAL AXIS* (roll) and *TRANSVERSE AXIS* (pitch) can be calculated and input in the same way as for *NORMAL AXIS*.

11. Record all correction values with the correct algebraic sign in the table in chapter 2.5.2.

2.3.8.3 Compass Positioning Display

The Compass Positioning menu item opens a page which displays the Standard 30 MF software estimated values for the components of the lever arm pointing from the Standard 30 MF location to the ship's centre of rotation

2.3.9 Adjustment of Interfaces



Settings made have to be documented in the tables in chapter 0.

The settings for the individual interfaces have to be adjusted while the Operator Unit 130-627 is still connected.

The *COMPASS OUTPUT DATA SETUP* menu item opens the *COMPASS OUTPUT DATA SETUP* submenu with the following choices:

- SERIAL OUTPUT DATA SETUP
- ETHERNET OUTPUT DATA SETUP
- CAN OUTPUT DATA SETUP
- ANGULAR RATES OUTPUT SETUP

2.3.9.1 Serial Output Data Setup

In the *SERIAL OUTPUT DATA SETUP* dialog, settings for the outgoing signals of the *Course Bus*, *NMEA* and *NMEA Alerts* protocols can be made at the serial interfaces.

1. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The service menu appears:

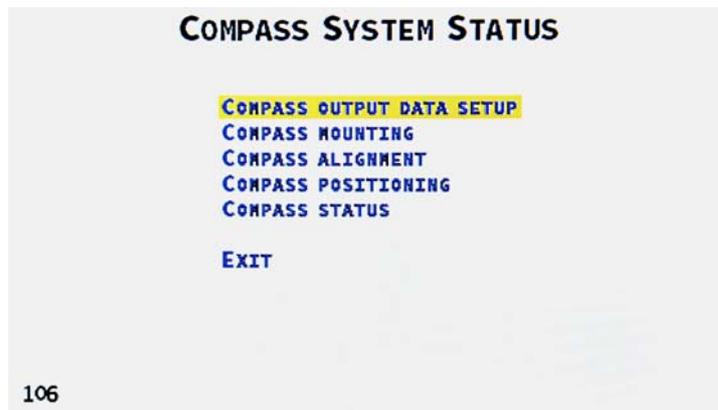


Figure 2-11 Service Menu

2. Select the *COMPASS OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.
3. Press the *Set* key on the Operator Unit.
 - The Submenu *COMPASS OUTPUT DATA SETUP* appears.

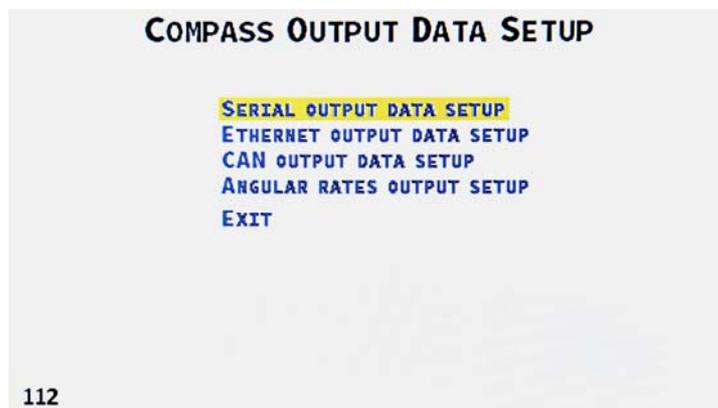


Figure 2-12 Submenu *COMPASS OUTPUT DATA SETUP*

4. Select the *SERIAL OUTPUT DATA SETUP* menu item with the arrow keys.

- The menu item will be highlighted yellow.
5. Press the *Set* key on the Operator Unit.
 - The *SERIAL OUTPUT DATA SETUP* dialog appears.

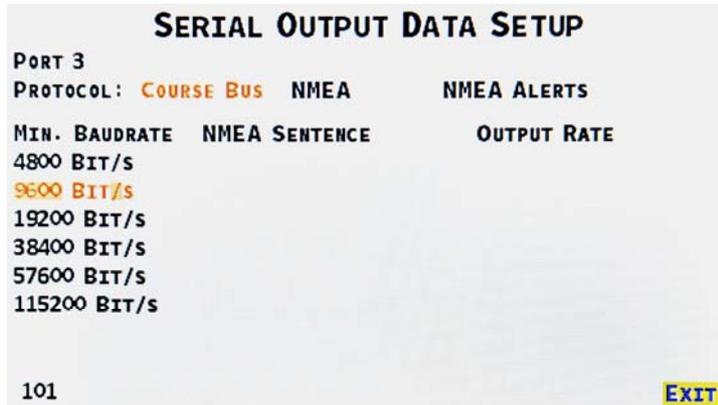


Figure 2-13 Dialog *SERIAL OUTPUT DATA SETUP* – *COURSE BUS*

6. Press *Page* key to select desired port.

i	<p>The dialog can be left at any time via the <i>Exit</i> menu item at the bottom right of the picture.</p> <p>In the <i>PROTOCOL</i> line, the two further dialogs for setting the NMEA telegrams (<i>NMEA</i>) or the NMEA alert messages (<i>NMEA ALERTS</i>) can be opened.</p>
----------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

For Course Bus Adjustments

1. In the *PROTOCOL* line, select the *COURSE BUS* protocol with the arrow keys.
2. Press the *Set* key on the Operator Unit.
 - The dialog for setting the baud rate for the course bus appears (Figure 2-13).
 - The *COURSE BUS* menu entry is displayed in orange.
3. Select the desired baud rate for transmission on the *course bus* with the arrow keys.
 - The selected value will be highlighted yellow.

	<p>The default value for the course bus baud rate is 9600 bit/s.</p>
-----------------------------------------------------------------------------------	----------------------------------------------------------------------

4. Press the *Set* key to confirm the selected value.
 - The font color of the chosen baud rate setting changes to orange.
 - From now on, the signals on the course bus will be transmitted at the newly chosen baud rate.
5. Record the set baud rate for the course bus in the tables in chapter 2.5.3.

For NMEA Adjustments

1. In the *SERIAL OUTPUT DATA SETUP* dialog in the *PROTOCOL* line select *NMEA* with the arrow keys.
2. Press the *Set* key on the Operator Unit.
 - *The dialog for making the NMEA telegram transmission setting appears.*
 - *The NMEA menu entry is displayed in orange and highlighted in yellow.*

SERIAL OUTPUT DATA SETUP		
PORT 4		
PROTOCOL:	COURSE BUS	NMEA
		NMEA ALERTS
MIN. BAUDRATE	NMEA SENTENCE	OUTPUT RATE
4800 BIT/s	HEHDT	OFF 1 Hz 10 Hz 50 Hz
9600 BIT/s	HETHS	OFF 1 Hz 10 Hz 50 Hz
19200 BIT/s	HEROT	OFF 1 Hz 10 Hz 50 Hz
38400 BIT/s	HEHCR	OFF 1 Hz 10 Hz 50 Hz
57600 BIT/s	TIROT	OFF 1 Hz 10 Hz 50 Hz
115200 BIT/s	PANZHRP	OFF 1 Hz 10 Hz 50 Hz
112		EXIT

Figure 2-14 Dialog SERIAL OUTPUT DATA SETUP – NMEA

3. Press *Page* key to select desired port.
4. Select the desired minimal baud rate for transmission of the activated NMEA telegrams with the arrow keys.
 - The selected value will be highlighted yellow.

5. Press the *Set* key to confirm the selected value.
 - The font color of the chosen baud rate setting changes to orange.
 - All activated NMEA telegrams will be transmitted at the newly chosen baud rate.

	<p>The telegram names are followed by information on whether that telegram is activated for transmission or not.</p> <p>In the dialog, each telegram can individually be switched on or off for transmission.</p>
-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

6. Use the arrow keys to navigate to the current *on* or *off* value after a telegram name.

	<p>Important note:</p> <p>If too many telegrams with low baud rates should be enabled, the Standard 30 MF automatically increases the baud rates during activation process without a feedback. To check whether this has happened, it is recommended to open the <i>dialog SERIAL OUTPUT DATA SETUP – NMEA again</i>.</p> <p>If a lower baud rate should be enforced for a telegram, the number of activated telegrams must be reduced or the output rates for other telegrams must be reduced.</p>
------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

7. Pressing the *Set* key once reverses the current value.
 - The transmission of the telegram is activated (*on*) or deactivated (*off*).
 - An activated telegram is refreshed at the refresh rate that is currently set in the *OUTPUT RATE* column.

	<p>In the <i>OUTPUT RATE</i> column, the refresh rate can be set for each telegram individually.</p>
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

8. Use the arrow keys to navigate to the desired refresh rate value.
 - The selected value will be highlighted yellow.
9. Press the *Set* key to confirm the selected value.
 - The font color of the chosen refresh rate setting changes to orange.
 - An activated telegram is refreshed at the refresh rate that is currently set in the *OUTPUT RATE* column.
10. Record the made settings in the tables in chapter 2.5.3.

The factory settings are as shown in the following table.

Table 2-3 Factory Settings for Serial Output

Serial Port	Activated Telegrams	Baud Rate [bit/s]	Refresh Rate [Hz]
3	<ul style="list-style-type: none"> • HEHDT • HEROT 	38.400	50
4	<ul style="list-style-type: none"> • HETHS • HEROT 	38.400	50
5	HEHDT	4.800	10
6	HETHS	4.800	10

For NMEA Alerts Adjustments

1. In the *SDC SERIAL OUTPUT DATA SETUP* dialog in the *PROTOCOL* line select *NMEA Alerts* with the arrow keys.
2. Press the *Set* key on the Operator Unit.
 - The dialog for setting the NMEA Alerts baud rate appears.
 - The *NMEA ALERTS* menu entry is displayed in orange.

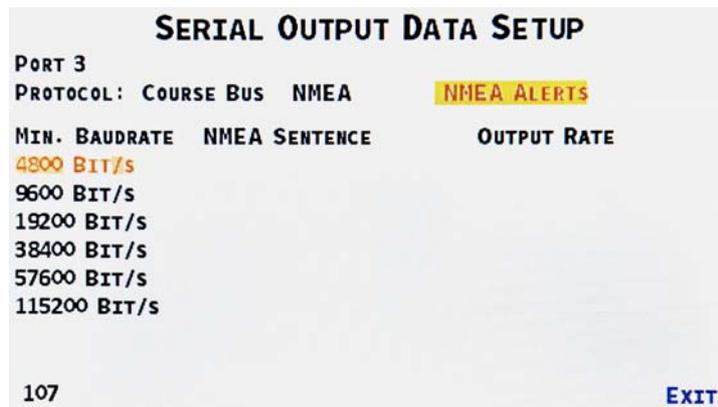


Figure 2-15 Dialog *SERIAL OUTPUT DATA SETUP* – *NMEA ALERTS*

3. Press *Page* key to select desired port.
4. Select the desired baud rate for transmission of the NMEA Alerts with the arrow keys.
 - The selected value will be highlighted yellow.
5. Press the *Set* key to confirm the selected value.
 - The font color of the chosen baud rate setting changes to orange.
 - From now on, NMEA Alerts will be transmitted at the newly chosen baud rate.
6. Record the made settings in the tables in chapter 2.5.3.

2.3.9.2 Ethernet Output Data Setup

The *ETHERNET OUTPUT DATA SETUP* dialog allows the user to make settings for the outgoing signals of the NMEA telegrams at the Ethernet interfaces, if required.

1. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The service menu appears:

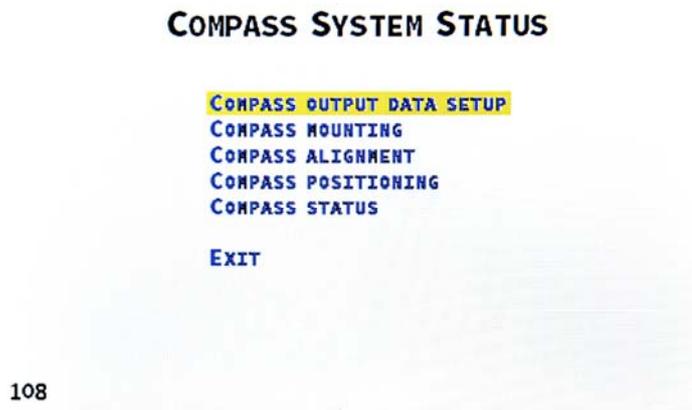


Figure 2-16 Service Menu

2. Select the *COMPASS OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.
3. Press the *Set* key on the Operator Unit.
 - The Submenu *COMPASS OUTPUT DATA SETUP* appears.

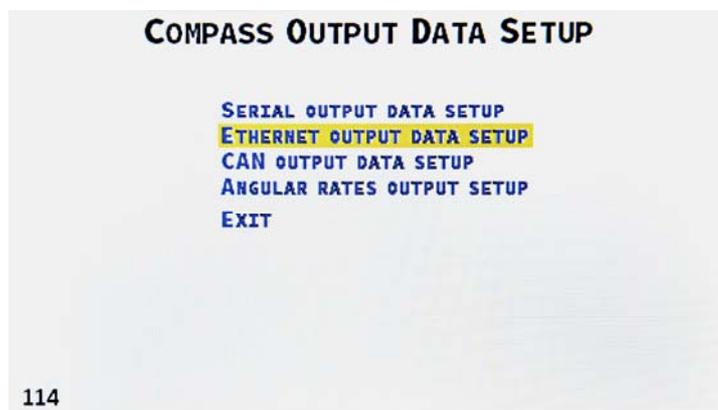


Figure 2-17 Submenu *COMPASS OUTPUT DATA SETUP*

4. Select the *ETHERNET OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.
5. Press the Set key on the Operator Unit.
 - The *ETHERNET OUTPUT DATA SETUP* Dialog appears.

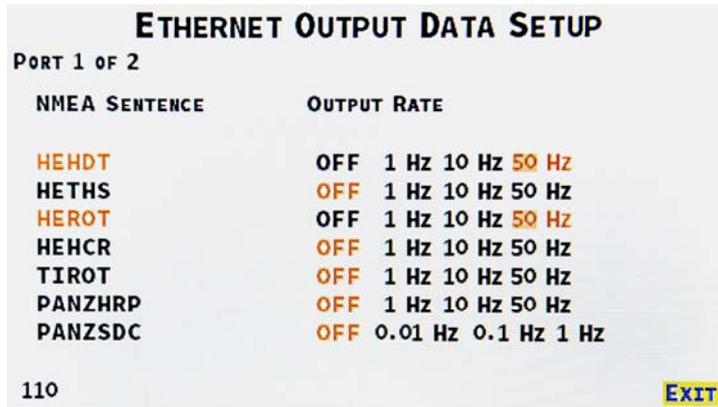


Figure 2-18 Dialog *ETHERNET OUTPUT DATA SETUP*

6. Press *Page* key to select desired port.

	The dialog can be left at any time via the <i>Exit</i> menu item at the bottom right of the picture.
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

	The telegram names are followed by information on whether that telegram is activated for transmission or not. In the dialog, each telegram can individually be switched on or off for transmission.
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

7. Use the arrow keys to navigate to the current *on* or *off* value after a telegram name.
8. Pressing the *Set* key once reverses the current value.
 - The transmission of the telegram is activated (highlighted orange) or deactivated (*off*).
 - An activated telegram is refreshed at the refresh rate that is currently set in the *OUTPUT RATE* column.



In the *OUTPUT RATE* column, the refresh rate can be set for each telegram individually.

The current value is displayed in orange.

9. Use the arrow keys to navigate to the desired refresh rate value.
 - The selected value will be highlighted yellow.
10. Press the *Set* key to confirm the selected value.
 - The font color of the chosen refresh rate setting changes to orange.
 - From now on, the data will be refreshed at the newly chosen refresh rate.
11. Record the settings in the tables in chapter 2.5.4.

2.3.9.3 CAN Output Data Setup

The *CAN OUTPUT DATA SETUP* dialog allows the user to activate or deactivate the output of digital attitude and heading data via the CAN Bus and to set their refresh rates.

1. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The Service menu appears:

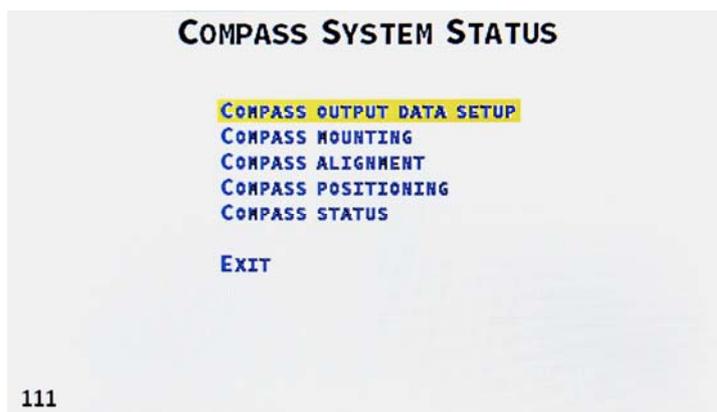


Figure 2-19 Service Menu

2. Select the *COMPASS OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.

3. Press the *Set* key on the Operator Unit.
 - The submenu appears.

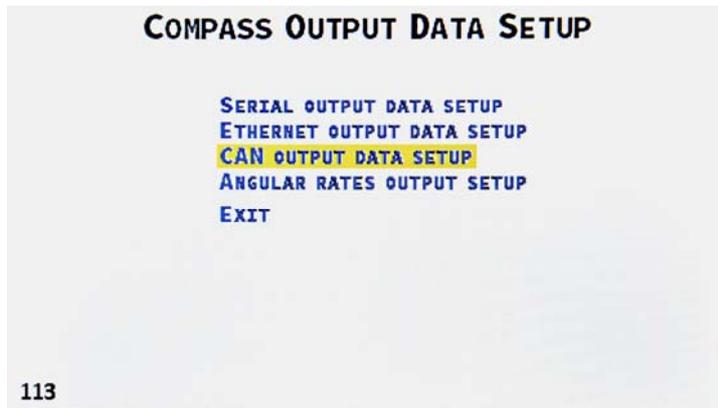


Figure 2-20 Submenu *COMPASS OUTPUT DATA SETUP*

4. Select the *CAN OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.
5. Press the *Set* key on the *Operator Unit*.
 - The *CAN OUTPUT DATA SETUP* dialog appears.

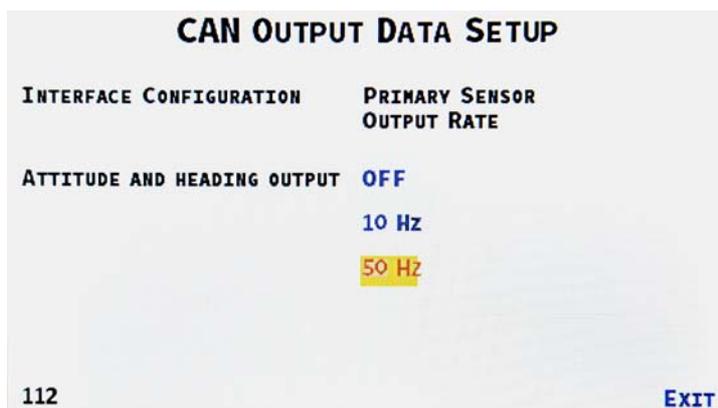


Figure 2-21 Dialog *CAN OUTPUT DATA SETUP*



The dialog can be left at any time via the *Exit* menu item at the bottom right of the picture.

6. Use the arrow keys to navigate to the current *on* or *off* value.
7. Pressing the *Set* key once reverses the current value.
 - The transmission of the data via the CAN Bus is activated (*on*) or deactivated (*off*).
 - The data will be updated at the chosen refresh rate if they are activated for transmission.



In the *OUTPUT RATE* column, the refresh rate for the CAN data transmissions can be set.
The current value is displayed in orange, if output via the CAN Bus is selected.

8. Use the arrow keys to navigate to the desired refresh rate value.
 - The selected value will be highlighted yellow.
9. Press the *Set* key to confirm the selected value.
 - The font color of the selected refresh rate setting changes to orange.
 - From now on, the data will be refreshed at the newly chosen refresh rate.
10. Record the settings in the table in chapter 2.5.5.

2.3.9.4 Angular Rates Output Setup

The *ANGULAR RATES OUTPUT SETUP* dialog allows the user to set the damp values for RoT as well as for roll rate and pitch rate. Damping of the signals smoothes any high-frequency fluctuations and ensures flowing deflections in the display at the Operator Unit. In addition, the output range for the RoT display can be selected from three pre-defined values.

1. Press and hold the *Page* key on the Operator Unit and press the *Set* key at the same time.
 - The Service menu appears:

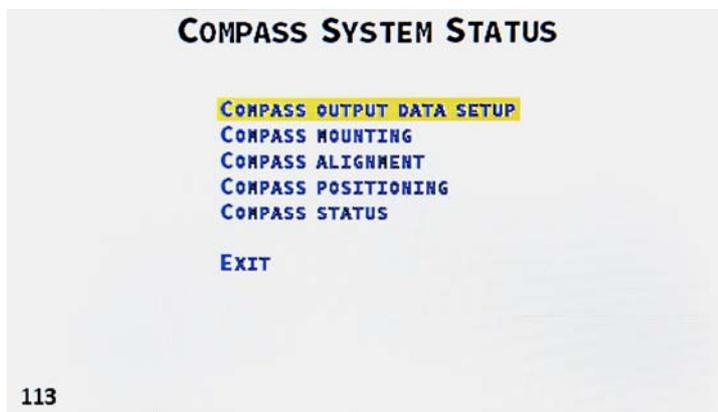


Figure 2-22 Service Menu

2. Select the *COMPASS OUTPUT DATA SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.

3. Press the *Set* key on the Operator Unit.
 - The submenu appears.

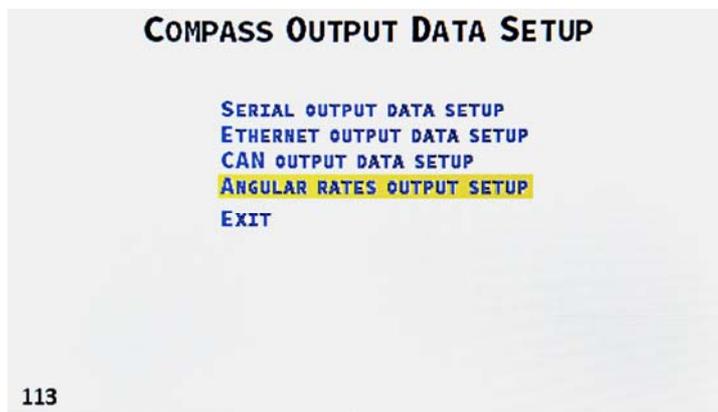


Figure 2-23 Submenu *COMPASS OUTPUT DATA SETUP*

4. Select the *ANGULAR RATES OUTPUT SETUP* menu item with the arrow keys.
 - The menu item will be highlighted yellow.
5. Press the *Set* key on the Operator Unit.
 - The *ANGULAR RATES OUTPUT SETUP* dialog appears.

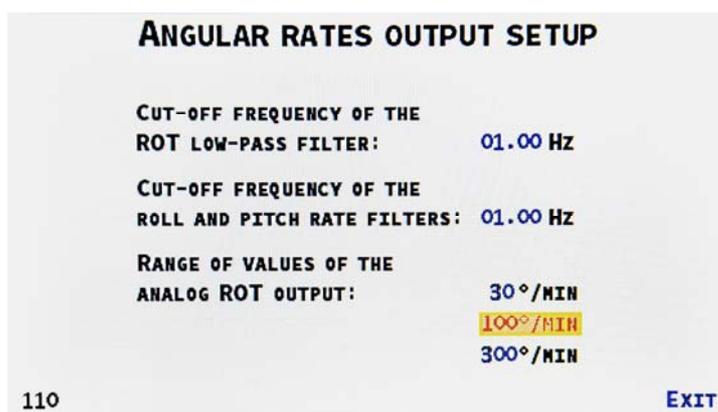


Figure 2-24 Dialog *ANGULAR RATES OUTPUT SETUP*



The dialog can be left at any time via the *Exit* menu item at the bottom right of the picture.

6. Use the *arrow down and arrow up keys* to navigate to the current value of the cut-off frequency for the rate of turn (RoT) low-pass filter. The same applies to the cut-off frequency for the low-pass filters for the roll and pitch rates.

A small value of the cut-off frequency denotes high damping while a large value means low damping.

Often, the term damping time constant is used instead of cut-off frequency: The time constant is the reciprocal value of the product of $2 \cdot \pi$ and the cut-off frequency.

- The selected value will be highlighted yellow.



If Standard 30 MF is used in combination with Standard 22, then, the cut-off frequency value for the rate of turn (RoT) low-pass filter needs to be set to 0.2 Hz in order to harmonize the RoT damping of both compass types at the analog output of the Distribution Unit, type 138-118.NG002 or 138-118.NG003.

7. Press the *Set* key to confirm the selected value.
 - The font color of the chosen damp value setting changes to orange.



The lower the adjusted frequency value the smoother the output behavior.

8. Use the *arrow down and arrow up keys* to set the desired value.
 - The displayed value is incremented or decremented by 0.05 Hz with each press of the key.
9. Press the *Set* key to confirm the entered value.

- The entered value is adopted and becomes effective after the user has exited the dialog.
10. To change the output range for the RoT display, navigate to one of the pre-defined values.
 - The selected value will be highlighted yellow.
 11. Press the *Set* key.
 - The entered output range value is immediately effective.
 12. Navigate to *EXIT* with the *arrow down* key.
 13. Press the *Set* key.
 - The dialog closes.
 14. Record the settings in the tables in chapter 2.5.6.

2.4 Change of Serial Inputs Baud Rates, CAN and Ethernet IP Addresses

With the help of the SW-Tool *WinSCP* installed on a service PC the following changes for the Standard 30 MF can be made:

- Change of CAN addresses
- Change of Ethernet IP addresses
- Change of baud rates of serial input interfaces (GNSS, log aiding sensors)

<p>CAUTION</p> 	<p>Risk of malfunction due to incorrect settings</p> <p>Incorrect settings may cause malfunction of the Standard 30 MF.</p> <p>► All settings must be performed only by trained and authorized RAYTHEON ANSCHÜTZ service personnel.</p>
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2.4.1.1 Installation of *WinSCP* on a Service PC

1. Make sure that the service PC is connected to the internet.
2. Download the *WinSCP* software from the website
<https://winscp.net/eng/index.php>
3. Install the *WinSCP* software on the service PC.

	<p>Should the provided link become obsolete, contact Raytheon Anschutz GmbH for further information.</p> <p>THE SOFTWARE LINKED TO IS A PRODUCT DESIGNED AND CREATED BY A THIRD PARTY. RAYTHEON ANSCHUETZ GMBH ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ANY SUCH THIRD PARTY PRODUCT AND/OR ANY DAMAGES OR LOSSES RESULTING FROM ITS UTILIZATION."</p>
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2.4.1.2 Cabling

1. Connect the Standard 30 MF with either the Ethernet cable E1 or E2 to the service PC.

2.4.1.3 Login

1. Start *WinSCP* on the service PC.
2. Start the login dialog.
 - The *Login* - dialog window appears.

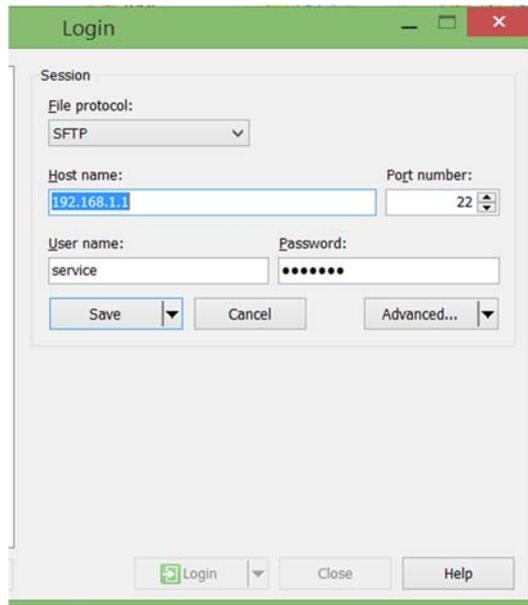


Figure 2-25 *Login* - Dialog

3. Choose the settings as shown in the upper figure:
 - File protocol: SFTP
 - Host name: 192.168.1.1
 - Port number: 22
 - User name: service
 - Password: service
4. Press the *Save* key.
5. Press the *Login* key.

2.4.1.4 Change of Settings

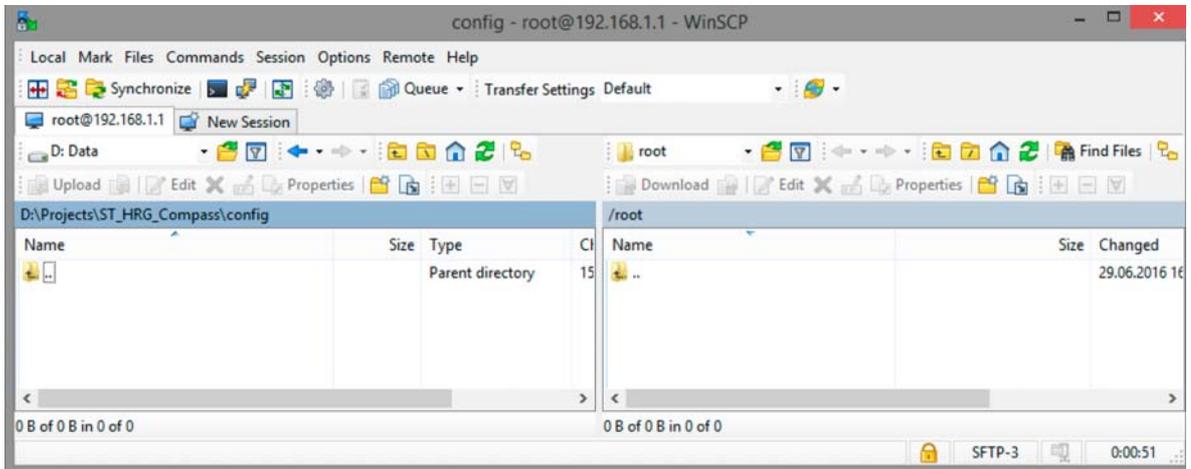


Figure 2-26 WinSCP Program Window

1. Change to the directory `/home/applic/config` in the right window.
 - The content of the directory `/home/applic/config` on the Standard 30 MF is displayed.

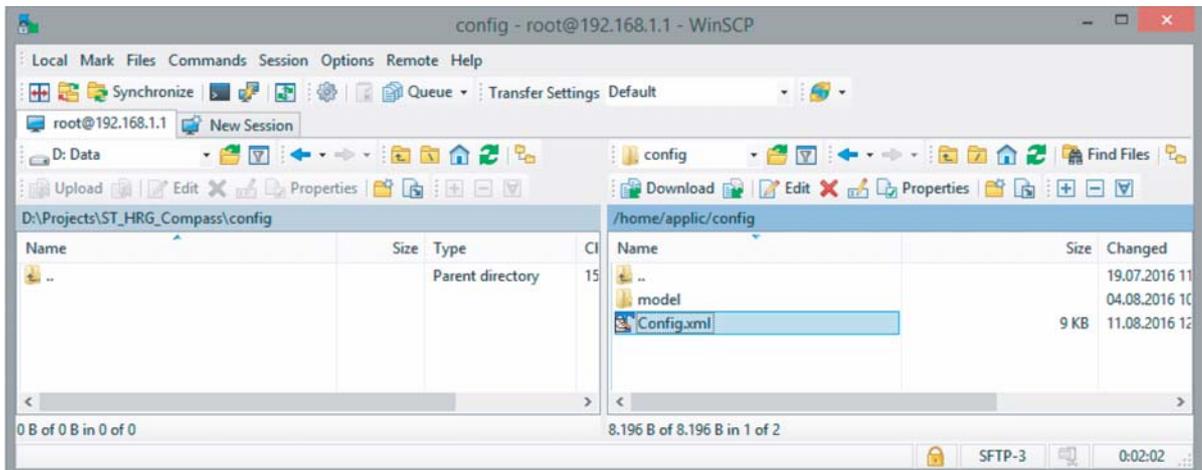


Figure 2-27 Directory `/home/applic/config` with File `Config.xml`

2. Double click on the file `Config.xml`.
 - The file is displayed in a text editor.

	<p>In case of problems it is recommended to save the default file <code>Config.xml</code> on the service PC prior to make changes.</p>
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The file *Config.xml* contains multiple sections which are marked with tags. A beginning tag of a section looks like `<CAN>` and the corresponding end tag looks like `</CAN>`.

```
</sensor>
<CAN>
  <state>enable</state>
  <redundancy>true</redundancy>
  <!-- <PrimaryId>0</PrimaryId> -->
  <!-- <SecondaryId>1</SecondaryId> -->
  <Group>2</Group>
  <DeviceType>11</DeviceType>
  <!-- Valid Addresses for Std30MF: 17, 18, 19 -->
  <Address>17</Address>
  <Bitrate>125000</Bitrate>
  <SelectedRate>10</SelectedRate>
  <RxTimeout>500</RxTimeout>
  <TxTimeout>10</TxTimeout>
  <logging>true</logging>
</CAN>
```

Figure 2-28 <CAN> Section in *Config.xml*

3. For the modification of the CAN address of the Standard 30 MF go to the `<CAN>` section.
4. Change the CAN address on the site, which is highlighted in yellow in Figure 2-28.

```

<Ethernet>
  <Bonding>0</Bonding>
  <!--If Bonding set to 1 then don't set Eth1 or Eth2. Just set IP and Subnet
  in Ethernet part. -->
  <IP>192.168.127.200</IP>
  <Subnet>255.255.255.0</Subnet>
  <!-- end additional config for bonding. -->
  <Interface>
    <Id>eth0:1</Id>
    <IP>192.168.127.179</IP>
    <Subnet>255.255.255.0</Subnet>
  </Interface>
  <Interface>
    <Id>eth1:1</Id>
    <IP>192.168.172.115</IP>
    <Subnet>255.255.255.0</Subnet>
  </Interface>
</Ethernet>
    
```

Figure 2-29 <Ethernet> Section in *Config.xml*

- For modification of the Ethernet IP addresses of the Standard 30 MF go to the <Ethernet> section.

	<p>The first highlighted item in the <Ethernet> section in Figure 2-29 applies to Ethernet interface E1, the second one to Ethernet interface E2</p>
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>CAUTION</p> 	<p>Risk of lack of data traffic</p> <p>An incorrect setting of Ethernet addresses avoids the data traffic of the Standard 30 MF in the vessel's network.</p> <ul style="list-style-type: none"> ▶ Changes in the <Ethernet> section must be harmonized with the network architecture and may entail changes in the <alarm> and <UDP> sections.
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- Change the Ethernet IP addresses on the sites, which are highlighted in yellow in Figure 2-29.

```

<Aiding>
  <ValidityTime>60</ValidityTime>
  <logging>>false</logging>
  <Input>
    <type>GPS</type>
    <Name>GPS_Ser</Name>
    <Protocol>NMEA</Protocol>
    <Priority>3</Priority>
    <Velocity>3</Velocity>
    <Position>3</Position>
    <Port>
      <type>serial</type>
      <PortName>/dev/ttyS2</PortName>
      <BaudRate>4800</BaudRate>
    </Port>
    <logging>>false</logging>
  </Input>
  <Input>
    <type>Log</type>
    <Name>LOG_1</Name>
    <Protocol>NMEA</Protocol>
    <Priority>4</Priority>
    <Velocity>4</Velocity>
    <Position>4</Position>
    <Port>
      <type>serial</type>
      <PortName>/dev/ttyS3</PortName>
      <BaudRate>4800</BaudRate>
    </Port>
    <logging>>false</logging>
  </Input>
  <Input>
    <type>Manual</type>
    <Name>CDU</Name>
    <Protocol>CAN</Protocol>
    <Priority>6</Priority>
    <Velocity>7</Velocity>
    <Position>7</Position>
    <Port>
      <type>CAN</type>
    </Port>
    <logging>>true</logging>
  </Input>
</Aiding>

```

Figure 2-30 <Aiding> Section in *Config.xml*

- For modification of the baud rates for the serial input interfaces go to the <Aiding> section.



The first highlighted item in the <Aiding> section in Figure 2-30 applies to the serial input interface RS-422#1 which expects GNSS/GPS data while the second one applies to serial input interface RS-422#2 which expects log data.

- Change the baud rates on the sites, which are highlighted in yellow in Figure 2-30.

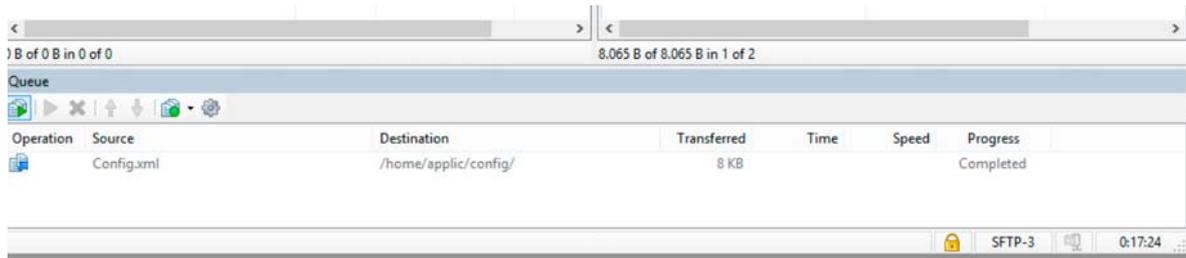


Figure 2-31 Closure of Configuration Changes

9. Save the file in the text editor after completing the modifications.
 - The edited file will be transmitted automatically to the Standard 30 MF and stored there at a predefined memory cell.
 - The successful transmission of the file is displayed in the bottom window of the *WinSCP* program as shown in Figure 2-31.
10. Shut down the service PC and disconnect it from the Standard 30 MF.

	The modified settings will take effect after a restart of the Standard 30 MF.
-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------

11. Restart the Standard 30 MF by power cycling.

2.5 Documentation of Settings

The settings that have been made during setting to work must be recorded in the following lists and tables. Mark or note the made settings.

2.5.1 Mounting Position

- Floor mounting and pointing to the bow
- Floor mounting and pointing to starboard
- Floor mounting and pointing to the stern
- Floor mounting and pointing to port
- Ceiling mounting and pointing to the bow
- Ceiling mounting and pointing to starboard
- Ceiling mounting and pointing to the stern
- Ceiling mounting and pointing to port

2.5.2 Setting – Correction Values

Table 2-4 Correction Values

Parameter	Set Value
Roll angular correction value (about longitudinal axis, with algebraic sign)	____.____°
Pitch angular correction value (about transverse axis, with algebraic sign)	____.____°
Heading angular correction value (about normal axis, with algebraic sign)	____.____°

2.5.3 Serial Output Data Settings

	If a telegram / signal is activated <i>OFF</i> is displayed in black. The selected rate is displayed orange
-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------

2.5.3.1 Serial Port 3

Table 2-5 Output Data –Activation, Refresh Rate and Baud Rate for Serial 3

Telegram/ Signal	Activated?	Refresh Rate	Baud Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
Course Bus	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
NMEA Alerts	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s

2.5.3.2 Serial Port 4

Table 2-6 Output Data –Activation, Refresh Rate and Baud Rate for Serial 4

Telegram/ Signal	Activated?	Refresh Rate	Baud Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
Course Bus	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
NMEA Alerts	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s

2.5.3.3 Serial Port 5

Table 2-7 Output Data - Activation, Refresh Rate and Baud Rate for Serial 5

Telegram/ Signal	Activated?	Refresh Rate	Baud Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
Course Bus	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
NMEA Alerts	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s

2.5.3.4 Serial Port 6

Table 2-8 Output Data - Activation, Refresh Rate and Baud Rate for Serial 6

Telegram/ Signal	Activated?	Refresh Rate	Baud Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
Course Bus	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s
NMEA Alerts	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz	_____ Bit/s

2.5.4 Ethernet Output Data Settings

2.5.4.1 Ethernet Port 1

Table 2-9 Output Data - Telegram, Activation and Refresh Rate for Ethernet 1

Telegram	Activated?	Refresh Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz

2.5.4.2 Ethernet Port 2

Table 2-10 Output Data - Telegram, Activation and Refresh Rate for Ethernet 2

Telegram	Activated?	Refresh Rate
HEHDT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HETHS	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HEROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
HEHCR	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
TIROT	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz
PANZHRP	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 1 Hz / <input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz

2.5.5 CAN Output Data Settings

Table 2-11 CAN Output Data - Activation and Output Rate

Parameter	Activated?	Output Rate
Attitude and heading output	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	<input type="checkbox"/> 10 Hz / <input type="checkbox"/> 50 Hz

2.5.6 Angular Rates Output Settings

Table 2-12 Angular Rates Output - Damp Values

Parameter	Set Value
Cut-off frequency of the RoT low-pass filter	_____ Hz
Cut-off frequency of the roll and pitch rate filters	_____ Hz

Table 2-13 Angular Rates Output - Output Range for RoT

Parameter	Value Range
Cut-off frequency of the RoT low-pass filter	<input type="checkbox"/> 30 °/min / <input type="checkbox"/> 100 °/min / <input type="checkbox"/> 300 °/min

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3 Operation

3.1 Switching On and Off

i	<p>Activate the speed and position sensors prior to switching on the Standard 30 MF.</p> <p>If no extern sensors are available, the current values for latitude and speed have to be input manually after Standard 30 MF has started completely (see chapters 3.3.1 and 3.3.2).</p>
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i	<p>Cautions may be generated and displayed on the Operator Unit when Standard 30 MF is switched on or during the Standard 30 MF installation procedure. These cautions extinguish automatically during/after the installation/start-up procedure.</p>
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The Standard 30 MF can be switched on or off at any time by switching the central power supply on or off.

The Standard 30 MF starts up as soon as the supply voltage is connected. If an Operator Unit is connected, the start screen appears on the Operator Unit after the selftest has been completed.

3.2 Standard Operation with Operator Unit Standard 30 MF 130-627

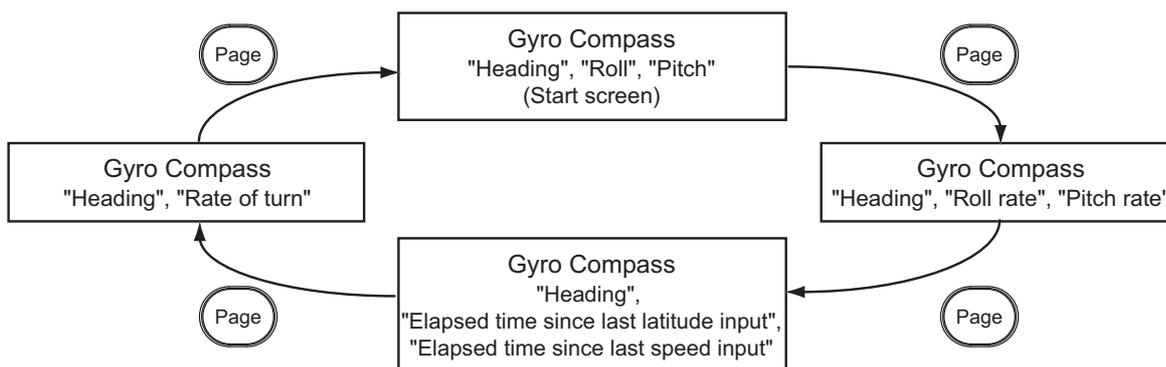


Figure 3-1 Standard 30 MF, Screens in Standard Operation

In standard operation, the user can switch between four screens, starting from the start page, as shown in Figure 3-1 using the *Page* key.

All four screens show the heading in large figures in the upper section.

The information in the lower section of the screen changes when switching through the following pages with the *Page* key.



Figure 3-2 Start Screen on Operating Unit

Information in the lower section of the start screen:

- Roll
- Pitch



Figure 3-3 Information in the Lower Section, Screen 2

Information in the lower section of screen 2:

- Roll rate
- Pitch rate



Figure 3-4 Information in the Lower Section, Screen 3

Information in the lower section of screen 3:

- Elapsed time since last latitude input
- Elapsed time since last speed input

i	<p>The timers are reset with each speed or latitude update. It is irrelevant whether the values were entered manually or fed into the system by external sensors.</p> <p>After 3 hours without any speed or latitude update a message to enter the current speed value or latitude value is issued, respectively.</p>
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Figure 3-5 Information in the Lower Section, Screen 4

Information in the lower section of screen 4:

- RoT as a numerical value
- RoT as a graphical bar

3.3 Manual Input of Latitude and Speed

i	<p>If the Standard 30 MF does not receive any speed and latitude values from a connected system, these values have to be entered manually into the Operator Unit at regular intervals to ensure accurate heading calculation.</p> <p>It is recommended to use correct data from log and GNSS as top priority.</p>
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3.3.1 Latitude Input

1. Press the *arrow down* key on the Operator Unit.
 - The Operator menu appears:

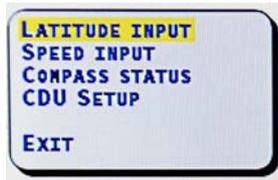


Figure 3-6 Operator Menu, *LATITUDE INPUT*

2. Navigate to *LATITUDE INPUT*.
 - The menu item will be highlighted yellow.
3. Press the *Set* key to open the input mask.
 - The dialog for manually entering the latitude appears.

<p>CAUTION</p> 	<p>Danger due to incorrect latitude entry</p> <p>Entering an incorrect value for the current latitude will result in misdirection of the vessel and may result in accidents, as well as a self test raised system shutdown.</p> <ul style="list-style-type: none"> ▶ Take appropriate measures to ensure that the latitude value is always entered correctly.
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Figure 3-7 Dialog for Entering the Latitude

4. Navigate to the displayed value with the *arrow down* key.
 - The value will be highlighted yellow.
5. Press the *Set* key.
6. Set the north or south latitude with the *arrow down or arrow up* keys.
 - Press the key to switch between North (N) and South (S).
7. Press the *Set* key to confirm the entered value.
 - The cursor jumps to the currently set degree value.
8. Press the *Set* key.
9. Set the degree value of the current position with the *arrow down or arrow up* keys.
 - The displayed value is incremented or decremented by 1° with each press of the key.
10. Press the *Set* key to confirm the entered value.
 - The cursor jumps to the currently set minute value.
11. Press the *Set* key.
12. Set the minute value of the current position with the *arrow down or arrow up* keys.
 - The displayed value is incremented or decremented by 0.1' with each press of the key.
13. Press the *Set* key to confirm the entered value.
14. Navigate to *EXIT* with the *arrow down* key.
15. Press the *Set* key.
 - The dialog closes and the start screen reappears.
 - The entered value will now be used for heading calculation.
 - The internal timer for the latitude entry is reset.

3.3.2 Speed Input

1. Press the *arrow down* key on the Operator Unit.
 - The Operator menu appears:

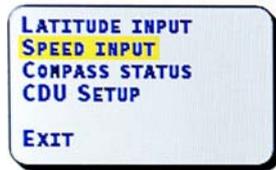


Figure 3-8 Operator Menu, *SPEED INPUT*

2. Navigate to *SPEED INPUT* with the *arrow down* key.
 - The menu item will be highlighted yellow.
3. Press the *Set* key to open the input mask.
 - The dialog for manually entering the speed appears.

<p>CAUTION</p> 	<p>Danger due to incorrect speed entry</p> <p>Entering an incorrect value for the current speed will result in misdirection of the vessel and may result in accidents, as well as a self test raised system shutdown.</p> <ul style="list-style-type: none"> ▶ Take appropriate measures to ensure that the speed value is always entered correctly.
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Figure 3-9 Dialog for Entering the Speed

4. Navigate to the displayed value with the *arrow down* key.
 - The value will be highlighted yellow.
5. Press the *Set* key.
6. Set the speed value with the *arrow down* or *arrow up* keys.
 - The displayed value is incremented or decremented by 0.1 kts with each press of the key.
7. Press the *Set* key to confirm the entered value.
 - The entered value will now be used for heading calculation.
 - The internal timer for the speed entry is reset.
8. Navigate to *EXIT* with the *arrow down* key.
9. Press the *Set* key.
 - The dialog closes and the start screen reappears.

3.4 Menu Item COMPASS STATUS

The *COMPASS STATUS* menu item opens a submenu which provides access to the status displays for SPU, HMU and CDU.

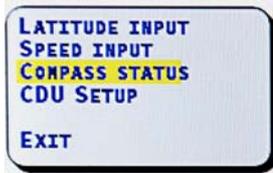
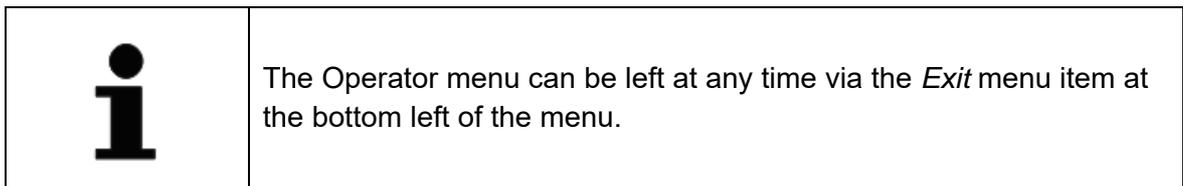
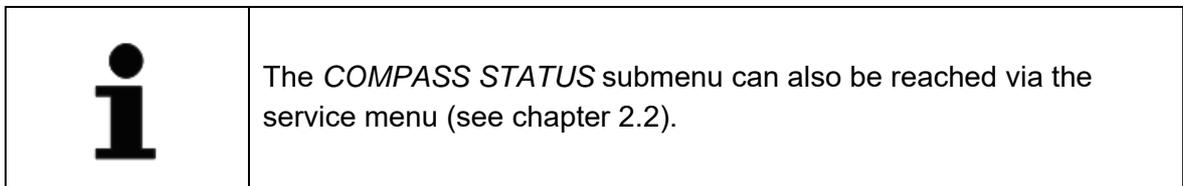


Figure 3-10 Operator Menu, *COMPASS STATUS*



1. Navigate to *COMPASS STATUS* with the *arrow down* key.
 - The menu item will be highlighted yellow.
2. Press the *Set* key to open the submenu.
 - The submenu *COMPASS STATUS* appears.



Figure 3-11 Submenu *COMPASS STATUS*

i	The submenu can be left at any time via the <i>Exit</i> menu item.
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3. Navigate to desired menu item in the submenu with the *arrow down* key.
 - The menu item will be highlighted yellow.
4. Press the *Set* key to open the mask of the desired menu item.
 - The dialog of the desired menu item appears.

i	If HMU Status is called up, an additional submenu opens which contains the menu items <i>OPERATIONAL STATUS</i> and <i>MEASUREMENT STATUS</i> .
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Figure 3-12 Submenu of *HMU STATUS*

i	The called-up status displays can be left at any time via the <i>Exit</i> menu item in the bottom right corner.
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The following illustrations show the corresponding status displays.

SPU STATUS

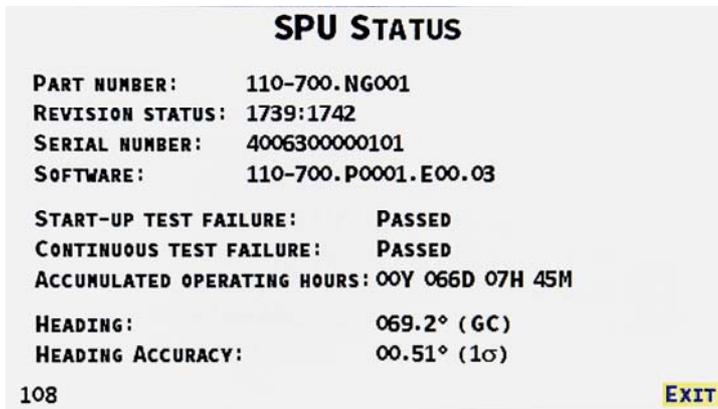


Figure 3-13 *SPU STATUS*

The figure shows the status display for the signal processing unit.

HMU STATUS

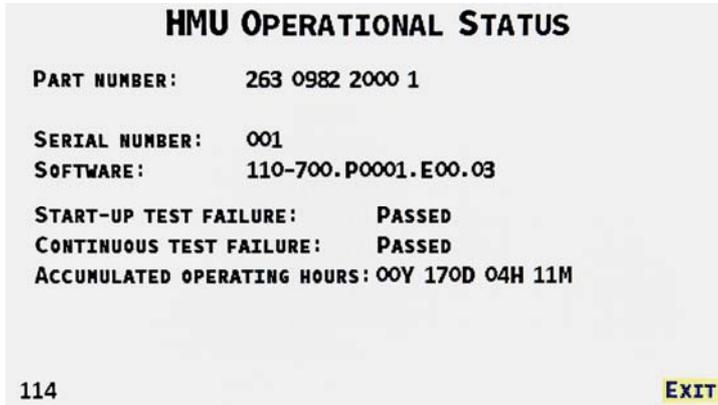


Figure 3-14 *HMU OPERATIONAL STATUS*

The figure shows the operative status display for the heading measurement unit.

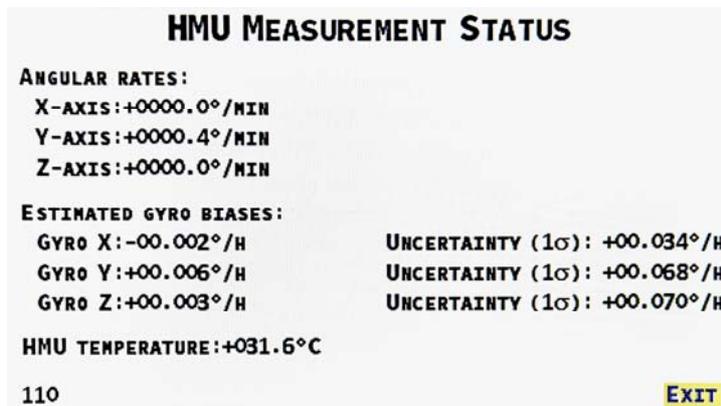


Figure 3-15 *HMU MEASUREMENT STATUS*

The figure shows the status display of the measurement data for the heading measurement unit.

CDU STATUS

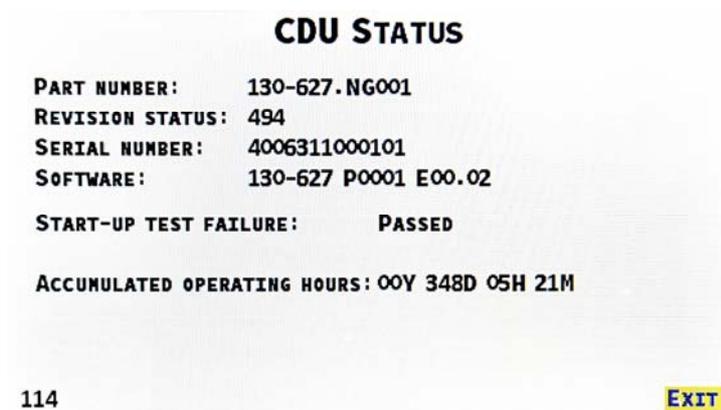


Figure 3-16 *CDU STATUS*

The figure shows the status display for the control and display unit.

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4 Alert Management

Standard 30 MF provides two different methods for alert management. The first method is based on alarms and acknowledgement according to IEC 61162-1. The second method provides different priorities of alerts and alert escalations. This method was introduced with Integrated Navigation Systems based on IEC 61924-2.

The following chapters provide information for the second method, known as Bridge Alert Management.

4.1 Bridge Alert Management

Bridge alert management (BAM) is an overall concept to enhance the handling, distribution and presentation of alerts on the bridge in a consistent manner.

This concept is described in the IMO performance standard "MSC.302(87) Performance standard for Bridge Alert Management". Equipment related details are defined in other equipment related performance and test standards.

The objective of BAM is to harmonize the priority, classification, handling, distribution and presentation of alerts, to enable the bridge team to devote full attention to the safe operation of the ship and to immediately identify any alert situation requiring attention and/or action to maintain the safe operation of the ship.

Unnecessary distraction of the bridge team by redundant and superfluous audible and visual alert announcements should be avoided. It reduces the cognitive workload of the operator by minimizing the information presented which is necessary to draw attention to and to assess the situation.

On the bridge the alerts are presented on the individual equipment and/or on a central alert management human machine interface (CAM-HMI).

Alerts are divided in different priorities:

- Emergency alert¹⁾
Highest priority of an alert. Alerts which indicate immediate danger to human life or to the ship and its machinery exists and that immediate action must be taken.
- Alarm¹⁾
An alarm is a high-priority alert. Conditions requiring immediate attention and action by the bridge team to avoid any kind of hazardous situation and to maintain the safe operation of the ship.
- Warning
Conditions or situations which require immediate attention for precautionary reasons, to make the bridge team aware of conditions which are not immediately hazardous, but may become so. (Warning may be escalated to alarm)
- Caution
Lowest priority of an alert. Awareness of a condition which still requires attention out of the ordinary consideration of the situation or of given information.

¹⁾ *Emergency alert* and *Alarm* are not used in this device.

Alerts are divided in different categories:

- **Category A**
Alerts for which graphical information at the task station (such as Radar or ECDIS) directly assigned to the function generating the alert is necessary, as decision support for the evaluation of the alert-related condition. These alerts can only be acknowledged at the task station.
- **Category B²⁾**
Alerts where no additional information for decision support is necessary besides the information which can be presented at the CAM-HMI. These alerts can be acknowledged at the task station or at the CAM-HMI.
- **Category C**
Alerts that cannot be acknowledged on the bridge but for which information is required about the status and treatment of the alerts (e.g. certain alerts from the engine).

²⁾ All alerts have the category *B*. Categories *A* and *C* are not used in this device.

Table 4-1 Alert List – Warning Symbols

Icon/Symbol	Description
	Active – unacknowledged warning (flashing)
	Active – silenced warning (flashing)
	Active – acknowledged warning
	Rectified – unacknowledged warning (flashing)

Table 4-2 Alert List – Caution Symbol

Icon/Symbol	Description
	Caution

Table 4-3 Alert Signaling

Color	Meaning - visual	Acoustic Signals
Red (Alarm) flashing	Alarms (faults and/or dangerous situations)	Three short signals (pulses), every 7 seconds. Continues until acknowledgment.
Yellowish orange (Warning) flashing	Warnings	Two short signals (pulses) after the event without repetition.
Yellow (Caution)	Status messages information	There is no acoustic signal for status and global messages.

4.2 Alert Messages

The following table provides an overview about Standard 30 MF alerts, their priorities and categories. The alert short message is shown on the Operator Unit. The alert long message is transferred to the CAM.

In the table the short messages and long messages are separated with dotted lines. The display changes to the alert page and generates an acoustic signal when an alert occurs. The state, the origin and the alert text are displayed. Switching back to another page is only possible after acknowledgement of the alert. If the alert was acknowledged but not eliminated, the red alert LED beside the *acknowledge* key on the Operator Unit illuminates continuously when switching back to another page than the alert page.

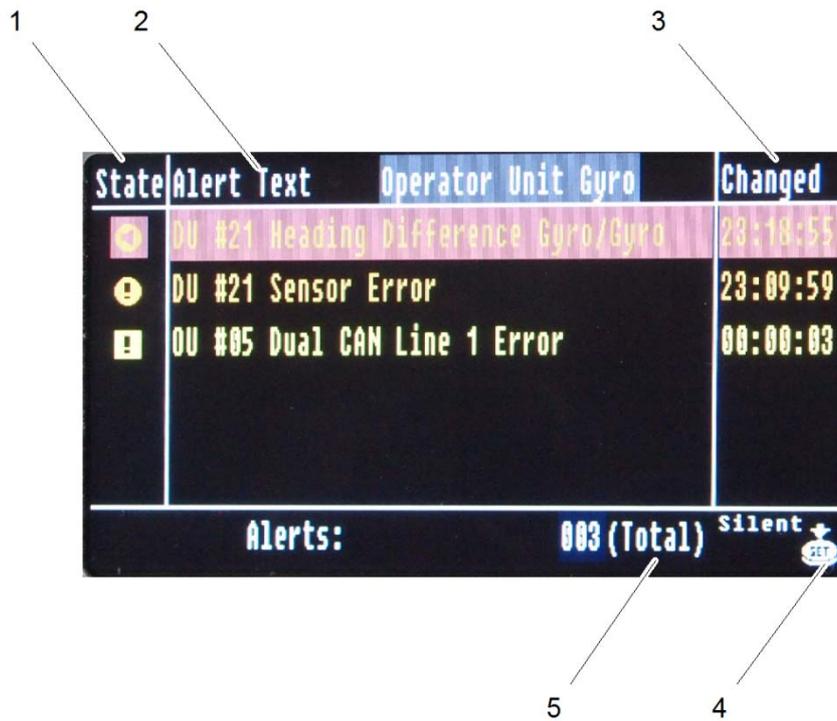


Figure 4-1 Alerts, Unacknowledged

Pos. No.	Designation	Function
1	State	Shows the priority of the alerts.
2	Alert Text	Shows the device and the Unit ID and the alert message. For detailed information of the alert messages.
3	Changed	Shows the time of acknowledgement.
4	Set	Appears on the display to switch the alert to silence.
5	Total	Amount of alerts in total.

Table 4-4 Possible Alerts

Alert short message ----- Alert long message	Cause	Alert Priority	Alert Category	Remedy
System fault ----- CSPU: Start-up failure	CSPU start-up alert	Warning	B	Call Raytheon Anschütz service.
System fault ----- CSPU: Operation failure	CSPU is overheated	Warning	B	Call Raytheon Anschütz service.
System fault ----- CSPU: Memory failure	CSPU cannot access its non-volatile memory	Warning	B	Call Raytheon Anschütz service.
System impairment ----- CSPU: Serial I/F failure	CSPU cannot (establish and) maintain serial data output at CSPU-RS422#1/-RS-422#2/-RS-422#3/-RS-422#4	Caution	B	Check cable connections to connectors N1 and N2.
System impairment ----- CSPU: CAN link to CDU failure	CSPU cannot (establish and) maintain communication with the CDU through its CAN interfaces	Caution	B	Check cable connections to connectors N1 and N2.
System impairment ----- CSPU: Ethernet link failure	CSPU cannot control the Ethernet switch	Caution	B	Check cable connections to connectors E1 and E2.

Alert short message	Cause	Alert Priority	Alert Category	Remedy
Alert long message				
System fault ----- CHMU: Communication failure	CSPU cannot (establish and) maintain communication with the HMU	Warning	B	Call Raytheon Anschutz service.
System fault ----- CHMU: Hardware failure	HMU reports its failure	Warning	B	Call Raytheon Anschutz service.
--- ----- CDU: Start-up failure	CDU start-up alert	Warning	B	Call Raytheon Anschutz service.
--- ----- CDU: Memory failure	CDU cannot access its non-volatile memory	Warning	B	Call Raytheon Anschutz service.
--- ----- CDU: CAN link to CSPU failure	CDU cannot (establish and) maintain CAN link to SPU	Warning	B	Check cable connections to connectors N1 and N2 as well as CAN connections to CDU.
System impairment ----- CSPU: Restart (setting changes)	Operator has commanded primary setting changes	Caution	B	No action required since Standard 30 MF has initiated its restart.

Alert short message	Cause	Alert Priority	Alert Category	Remedy
Alert long message				
System fault	One or more estimated absolute inertial sensor alert correction values of the HMU have exceeded threshold values	Warning	B	<ul style="list-style-type: none"> • Make sure that Standard 30 MF receives dependable latitude and speed aiding data. • Restart Standard 30 MF by power cycling. • If alert appears again call Raytheon Anschütz service.
CHMU: Sensor failure				
System impairment	SPU needs latitude input for compass accuracy preservation	Caution	B	Input correct current latitude.
CSPU: Latitude input requested				
System impairment	SPU needs speed input for compass accuracy preservation	Caution	B	Input correct current speed.
CSPU: Speed input requested				
System impairment	CSPU receives inconsistent latitude values	Warning (becomes an alarm if not acknowledged)	B	Ensure proper operation of latitude source used.
CSPU: Latitude input dubious				
System impairment	CSPU receives inconsistent speed values	Warning (becomes an alarm if not acknowledged)	B	Ensure proper operation of speed source used.
CSPU: Speed input dubious				

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5 Maintenance and Repair

The Standard 30 MF is maintenance-free.

In case of malfunction, the Standard 30 MF has to be replaced completely.

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6 Disposal

The Standard 30 MF or components of it can be disposed according to the respective national regulations for electronic waste without harmful material according to 2002/96 EC WEEE (Waste Electrical and Electronic Equipment).

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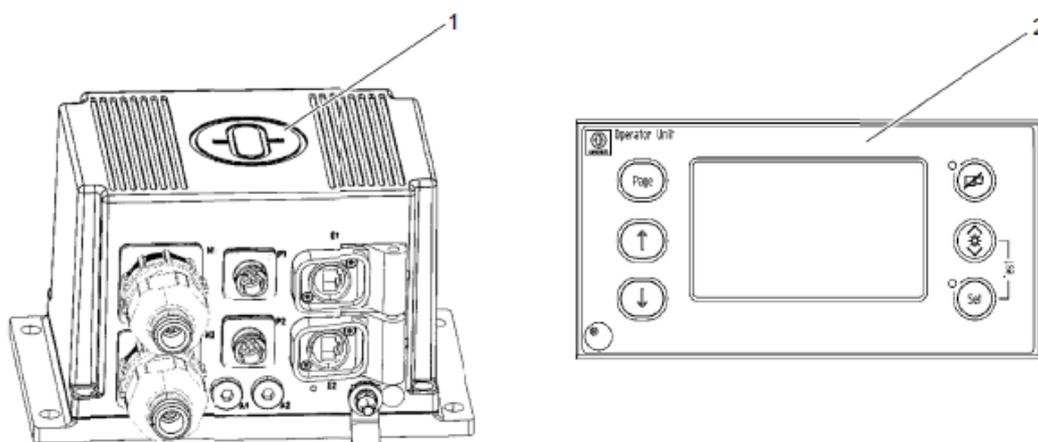
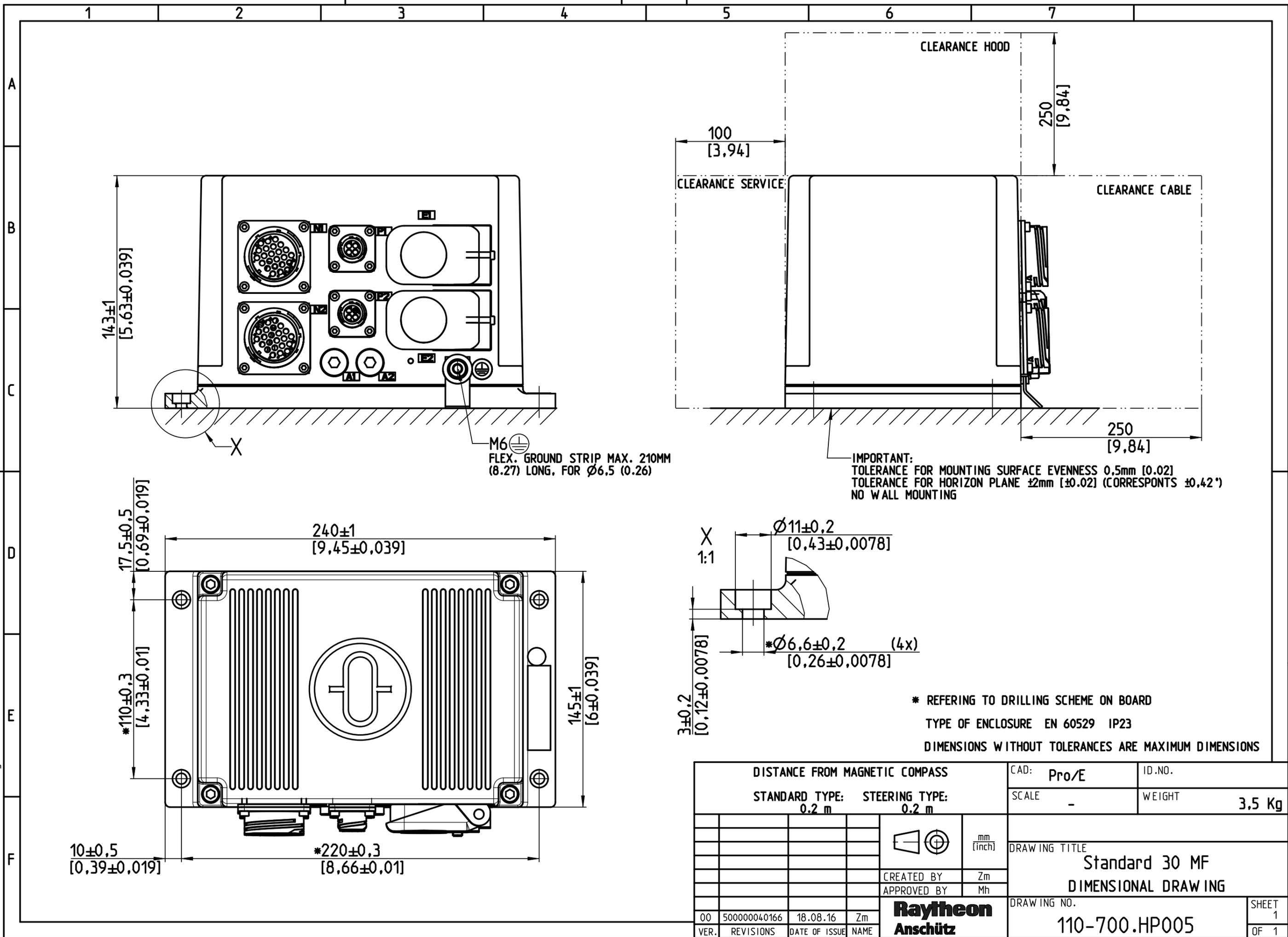


Figure 1

Pos.	Designation	Part-No.	RAN ID	Manufacturer MFRC	Remark
1	Gyro Compass Standard 30 MF	110-700.NG001	4006300	Raytheon Anschütz D2865	
2	Operator Unit Gyro STD 30 MF	130-627.NG001	4006311	Raytheon Anschütz D2865	
3	STD 30 Ethernet Cable 1	445-0696 R	1701324	Raytheon Anschütz D2865	Not illustrated
4	STD 30 Ethernet Cable 2	445-0697 R	1701325	Raytheon Anschütz D2865	Not illustrated
5	STD 30 Data Cable N1 (12,7)	445-0638 R	1701397	Raytheon Anschütz D2865	Not illustrated
6	STD Data Cable N2 (12,7)	445-0639 R	1701398	Raytheon Anschütz D2865	Not illustrated
7	STD 30 Power Supply Cable 1	445-0641 R	1701305	Raytheon Anschütz D2865	Not illustrated
8	STD 30 Power Supply Cable 2	445-0642 R	1701307	Raytheon Anschütz D2865	Not illustrated
9	CAN bus termination 120 Ohm	ST-A-UTTB2,5-BE 120R	1722701	Raytheon Anschütz D2865	Not illustrated
10	ESD-SCHUTZBEUTEL 80x120x0,06	3120.3301	1990068	Raytheon Anschütz D2865	Not illustrated

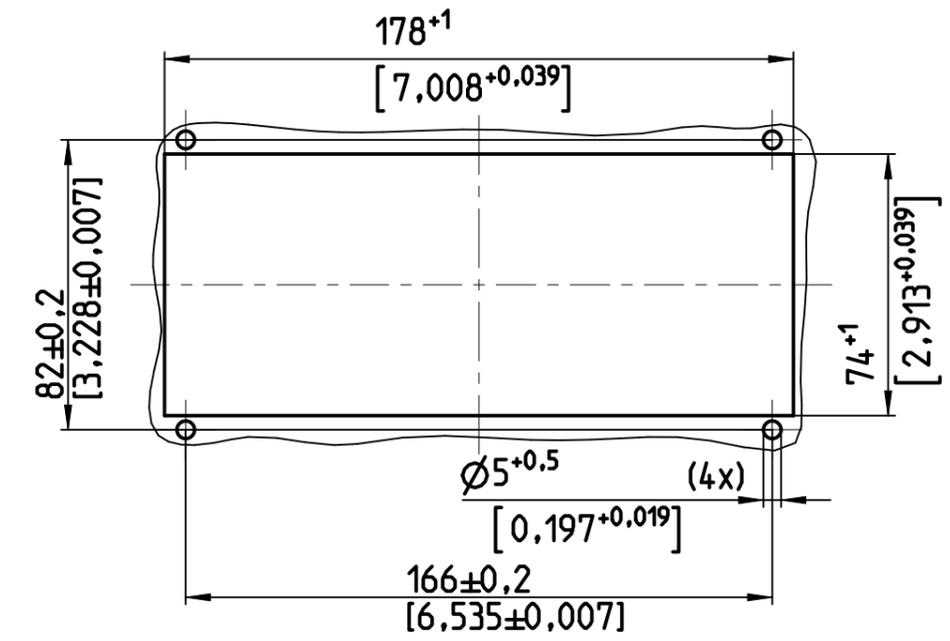
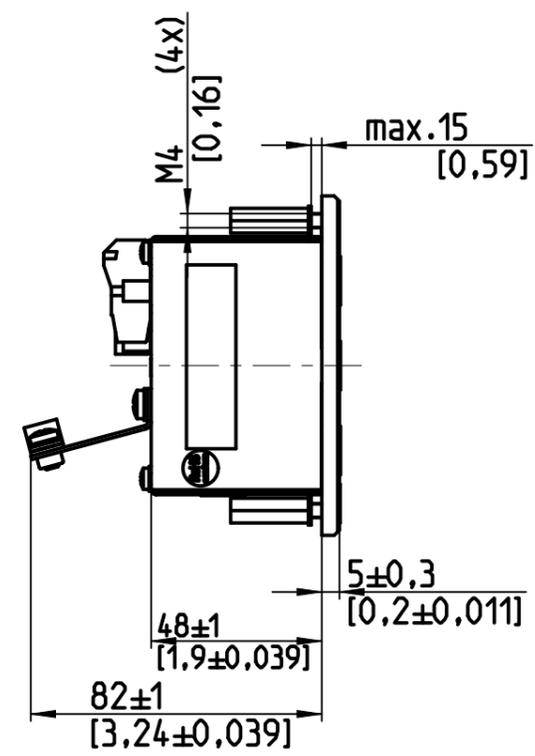
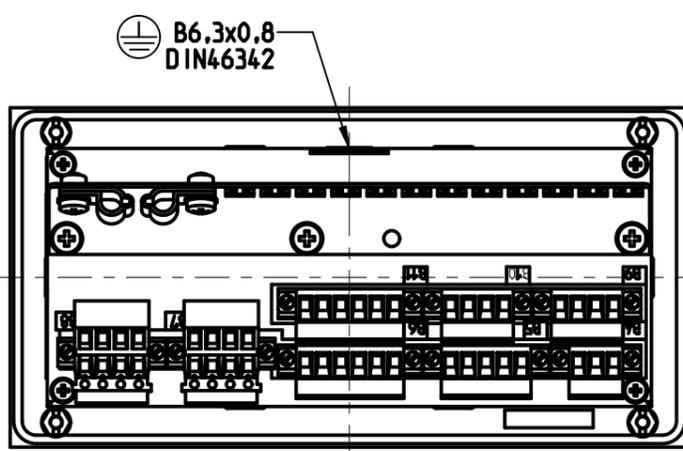
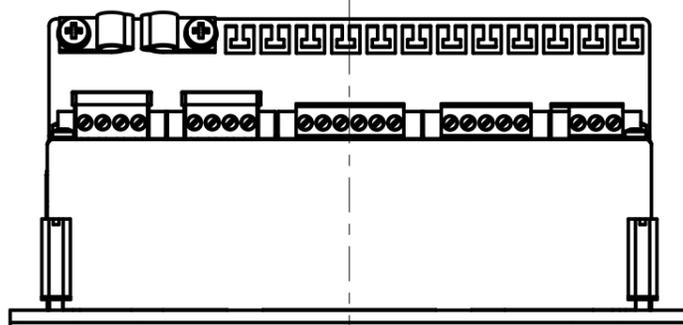
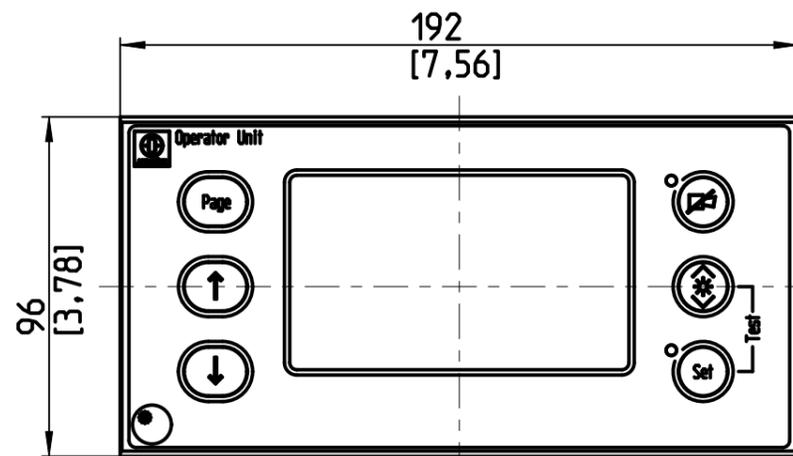
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DISTANCE FROM MAGNETIC COMPASS		CAD: Pro/E	ID.NO.
STANDARD TYPE: 0.2 m STEERING TYPE: 0.2 m		SCALE -	WEIGHT 3.5 Kg
		DRAWING TITLE	
		Standard 30 MF	
		DIMENSIONAL DRAWING	
		DRAWING NO.	
		110-700.HP005	
		SHEET 1	
		OF 1	

CREATED BY	Zm
APPROVED BY	Mh
Raytheon Anschutz	

00	500000040166	18.08.16	Zm
VER.	REVISIONS	DATE OF ISSUE	NAME



DIMENSIONS WITHOUT TOLERANCES ARE MAXIMUM DIMENSIONS
 TYPE OF ENCLOSURE: EN 60529 IP23/IP56 FRONT-SIDED
 EVENNESS OF MOUNTINGSURFACE < 0.1mm

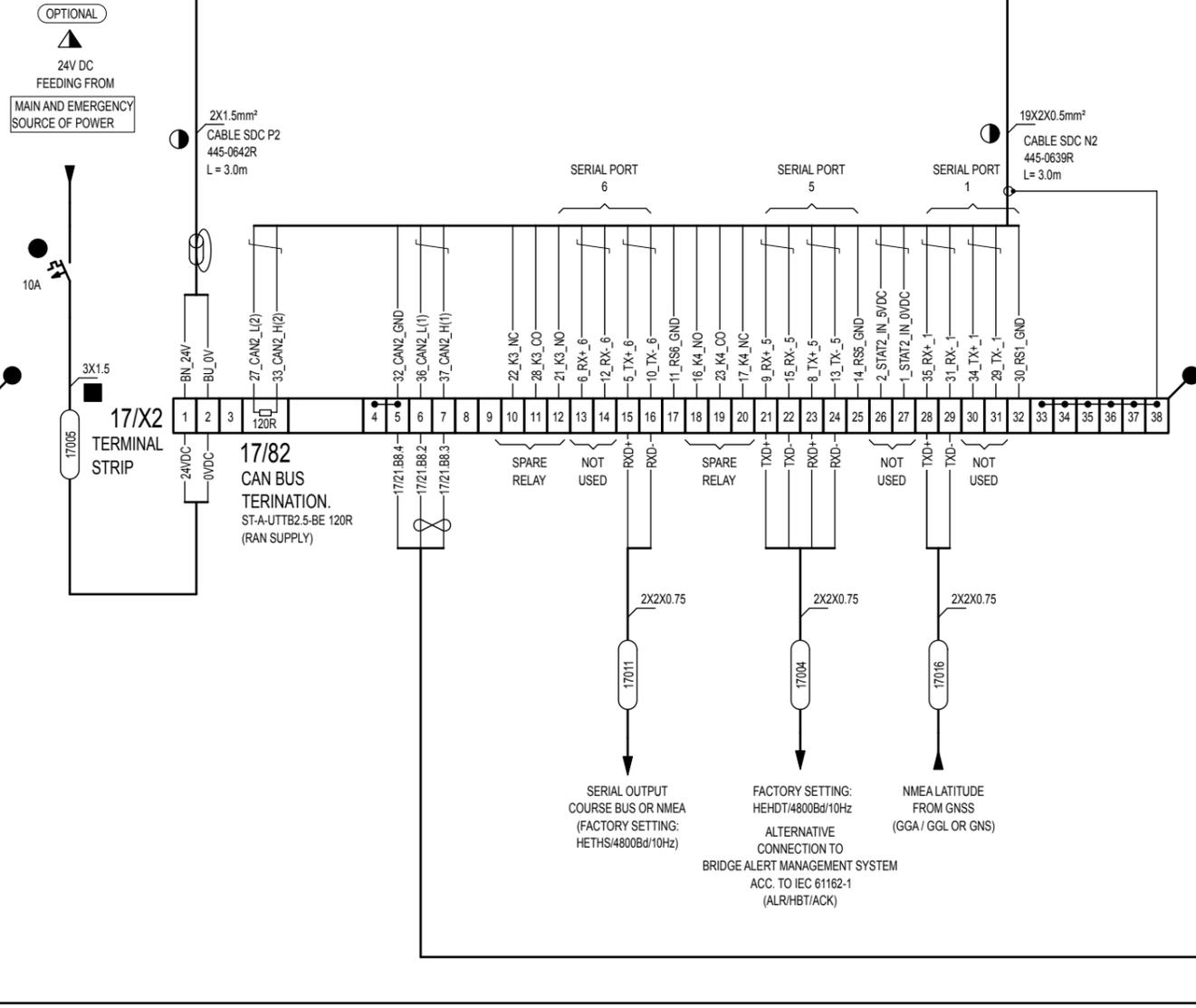
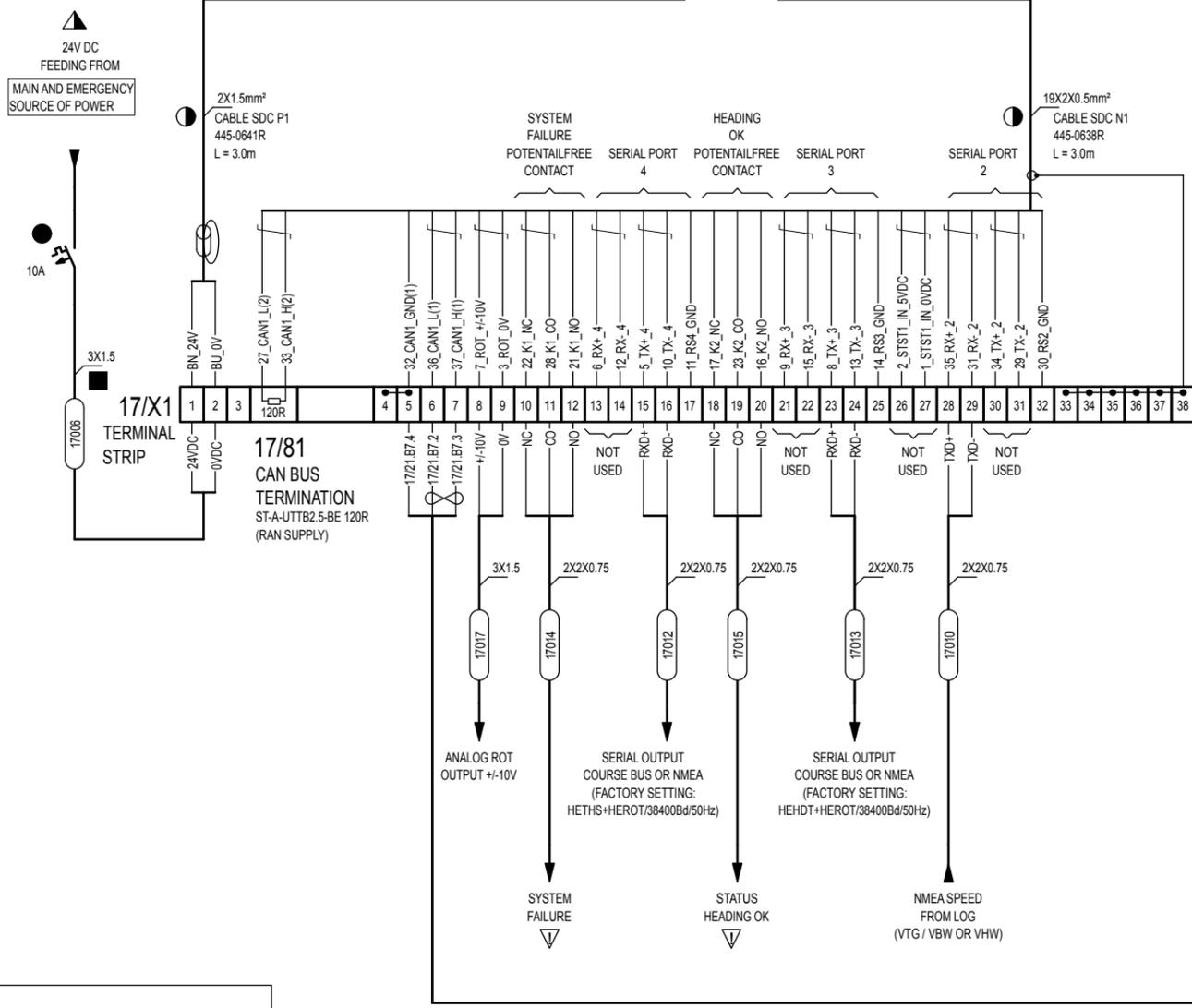
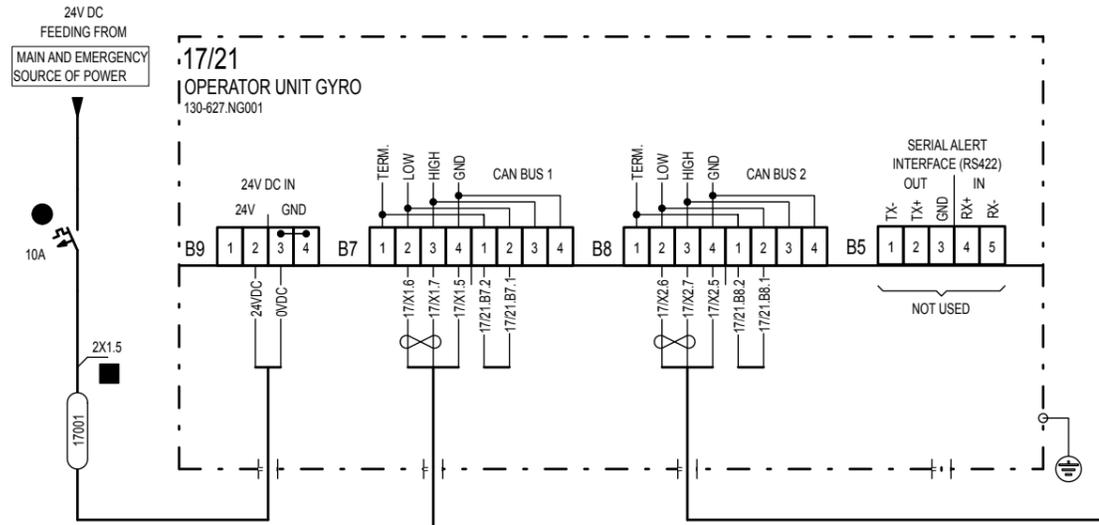
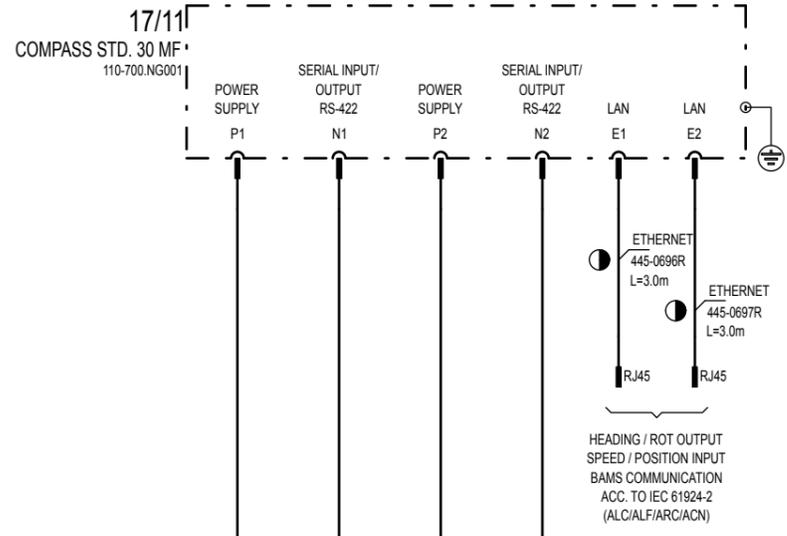
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DISTANCE FROM MAGNETIC COMPASS		CAD: Pro/E	ID.NO.		
STANDARD TYPE: 0.65 m		SCALE -	WEIGHT ca. 1.5 Kg		
STEERING TYPE: 0.35 m		DRAWING TITLE Operator Unit Gyro Std.30 MF DIMENSIONAL DRAWING			
CREATED BY Zm	APPROVED BY Mh				
00	500000040254	04.03.16	Zm	DRAWING NO. 130-627.HP005	SHEET 1 OF 1
VER.	REVISIONS	DATE OF ISSUE	NAME		
Raytheon Anschutz					

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FOR REMARKS SEE SEPARATE DIAGRAM: 37-LE-D-X0001-C FÜR ZEICHENERKLÄRUNG SIEHE SEPARATES DIAGRAM: 37-LE-D-X0001-C

IMPORTANT:
ALERTS MUST BE CONNECTED TO
A BRIDGE ALERT MANAGEMENT SYSTEM



INDEX	MODIFICATION	DATE	NAME	NORM
C	CHANGED 17/11	10.02.2017	HHJ	
B	BAMS CORRECTED	19.01.2017	TB	DRAWN TB
A	CABLES N1, P1+P2 CORRECTED	02.12.2016	TB	CHECK TB



KABEL- UND ANSCHLUSSPLAN
KREISELKOMPASSANLAGE
STANDARD 30 MF

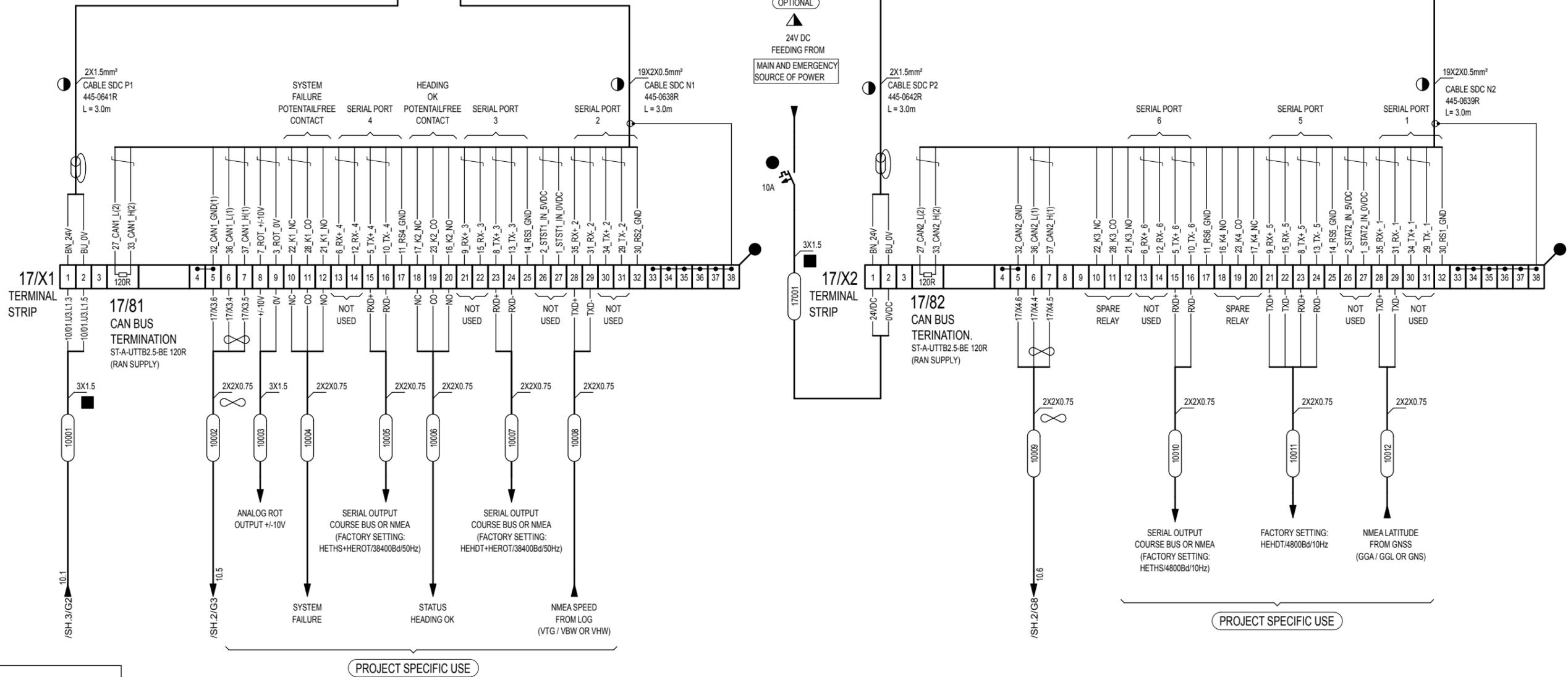
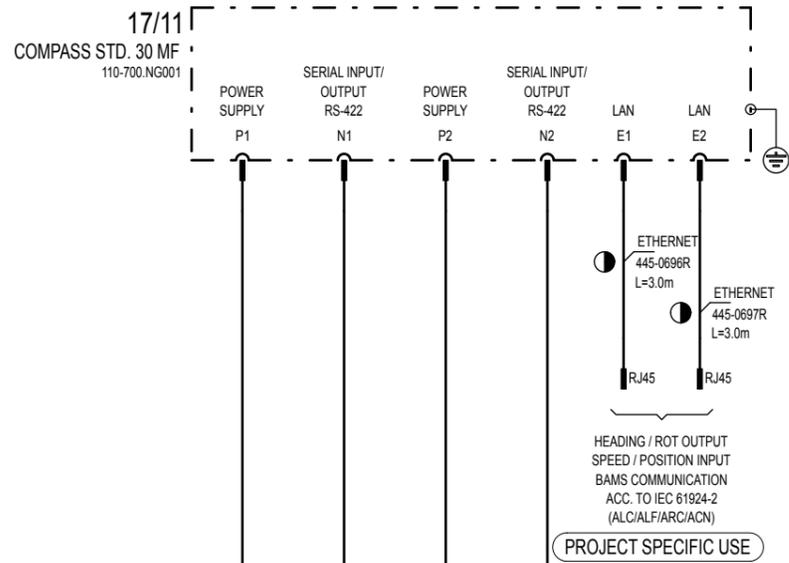
CABLE AND CONNECTION DIAGRAM
GYRO COMPASS SYSTEM
STANDARD 30 MF

10-CO-D-X0002-C

SHEET 1
1 SHEETS

FOR REMARKS SEE SEPARATE DIAGRAM: 37-LE-D-X00001-C
FÜR ZEICHENERKLÄRUNG SIEHE SEPARATES DIAGRAMM: 37-LE-D-X00001-C

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NAME	DATE
DRAWN TB	06.01.2017
CHECK TB	10.02.2017
NORM	

Raytheon
Anschütz

KABEL- UND ANSCHLUSSPLAN
KREISELKOMPASSANLAGE
STD.30 GG

CABLE AND CONNECTION DIAGRAM
GYRO COMPASS SYSTEM
STD.30 GG

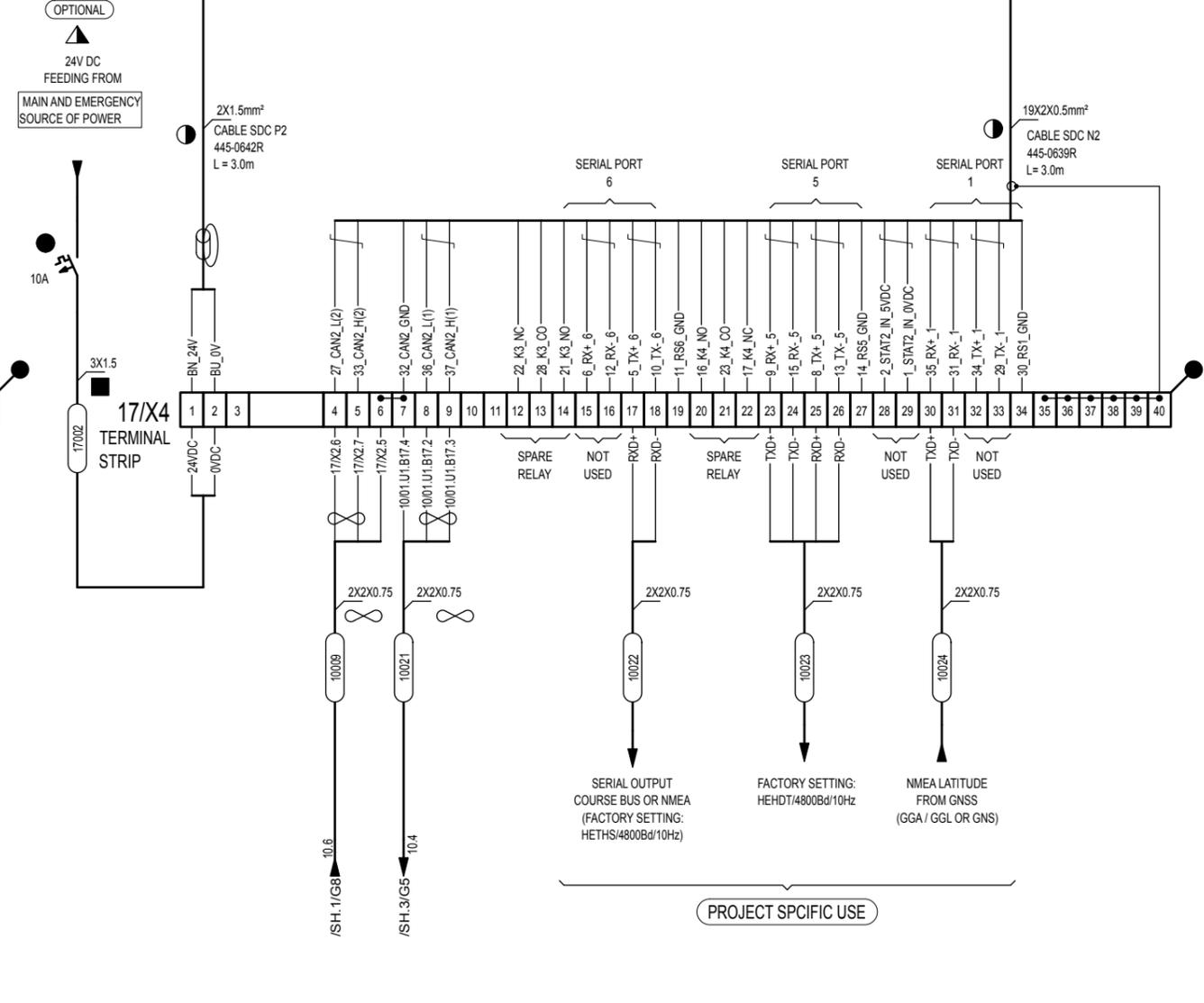
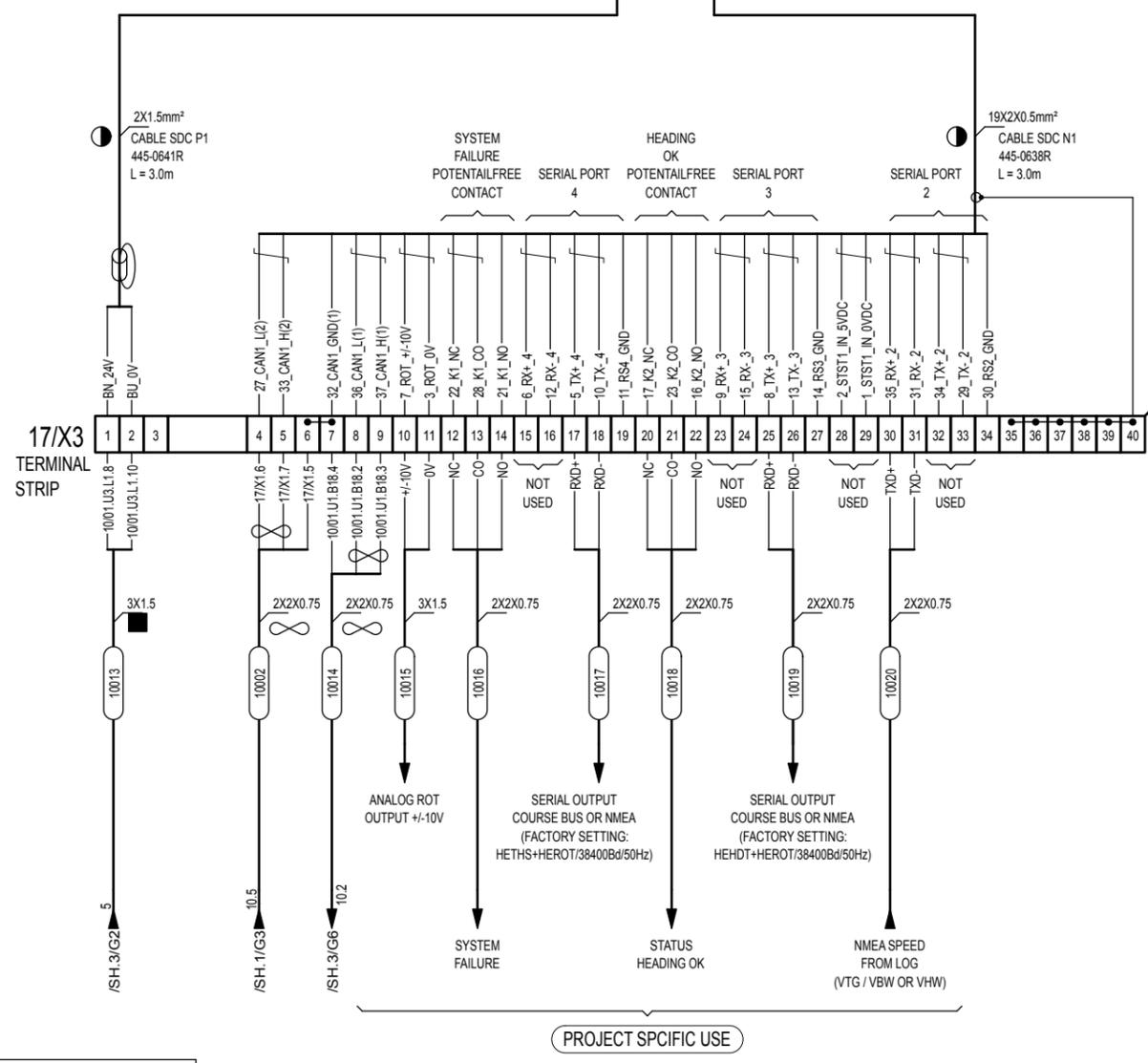
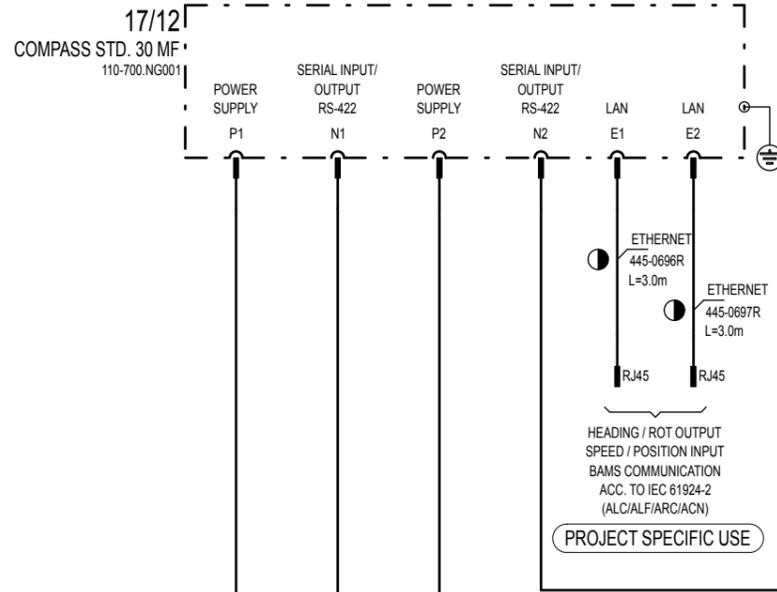
10-CO-D-X00003-C

PROJECT:

SHEET 1
4 SHEETS

FOR REMARKS SEE SEPARATE DIAGRAM: 37-LE-D-X00001-C
 FÜR ZEICHNERKLÄRUNG SIEHE SEPARATES DIAGRAMM: 37-LE-D-X00001-C

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INDEX	MODIFICATION	DATE	NAME	CHECK	NORM
A	CHANGED 17/12	10.02.2017	HJJ	CHECK	NORM

Raytheon
Anschütz

KABEL- UND ANSCHLUSSPLAN
KREISELKOMPASSANLAGE
 STD.30 GG

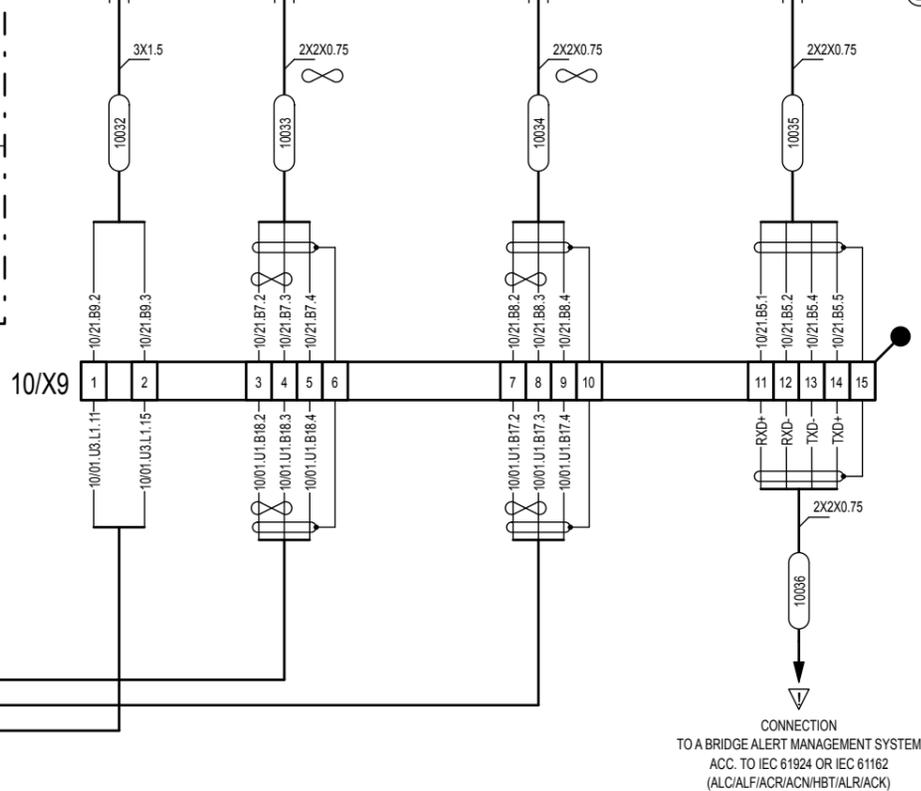
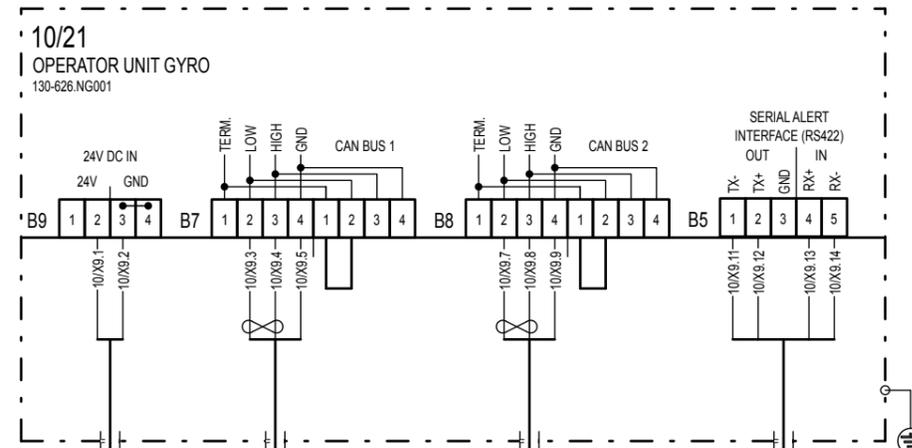
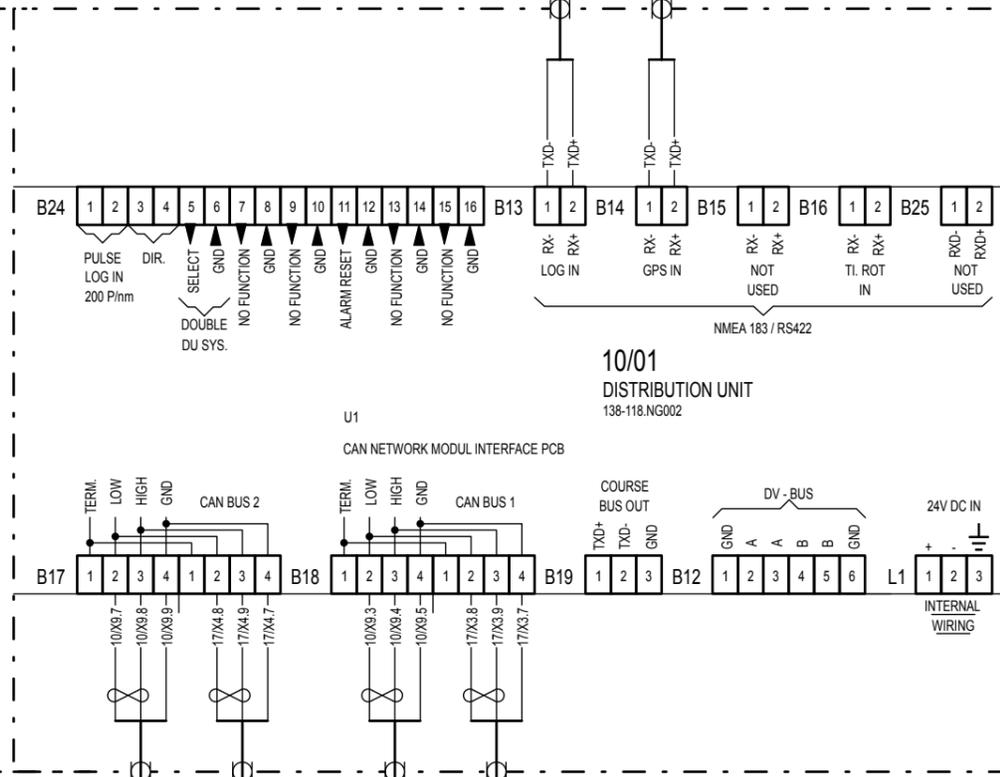
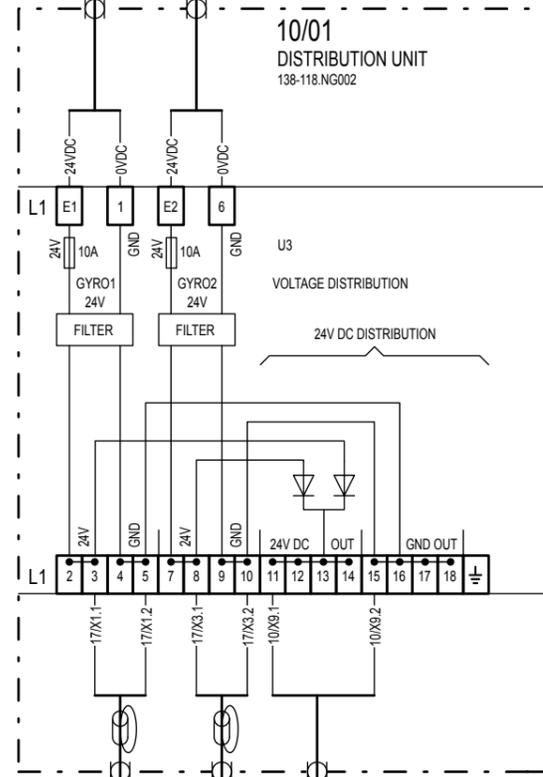
CABLE AND CONNECTION DIAGRAM
GYRO COMPASS SYSTEM
 STD.30 GG

10-CO-D-X00003-C
 PROJECT:

SHEET 2
 4 SHEETS

FOR REMARKS SEE SEPARATE DIAGRAM: 37-LE-D-X0001-C
 FÜR ZEICHNERKLÄRUNG SIEHE SEPARATES DIAGRAM: 37-LE-D-X0001-C

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IMPORTANT:
 ALERTS MUST BE CONNECTED TO
 A BRIDGE ALERT MANAGEMENT SYSTEM

CONNECTION
 TO A BRIDGE ALERT MANAGEMENT SYSTEM
 ACC. TO IEC 61924 OR IEC 61162
 (ALCI/ALF/ACR/ACN/HBT/ALR/ACK)

INDEX	MODIFICATION	DATE	NAME	CHECK	TB
A		10.02.2017	HHJ	CHECK	TB
				NORM	



KABEL- UND ANSCHLUSSPLAN
KREISELKOMPASSANLAGE
 STD.30 GG

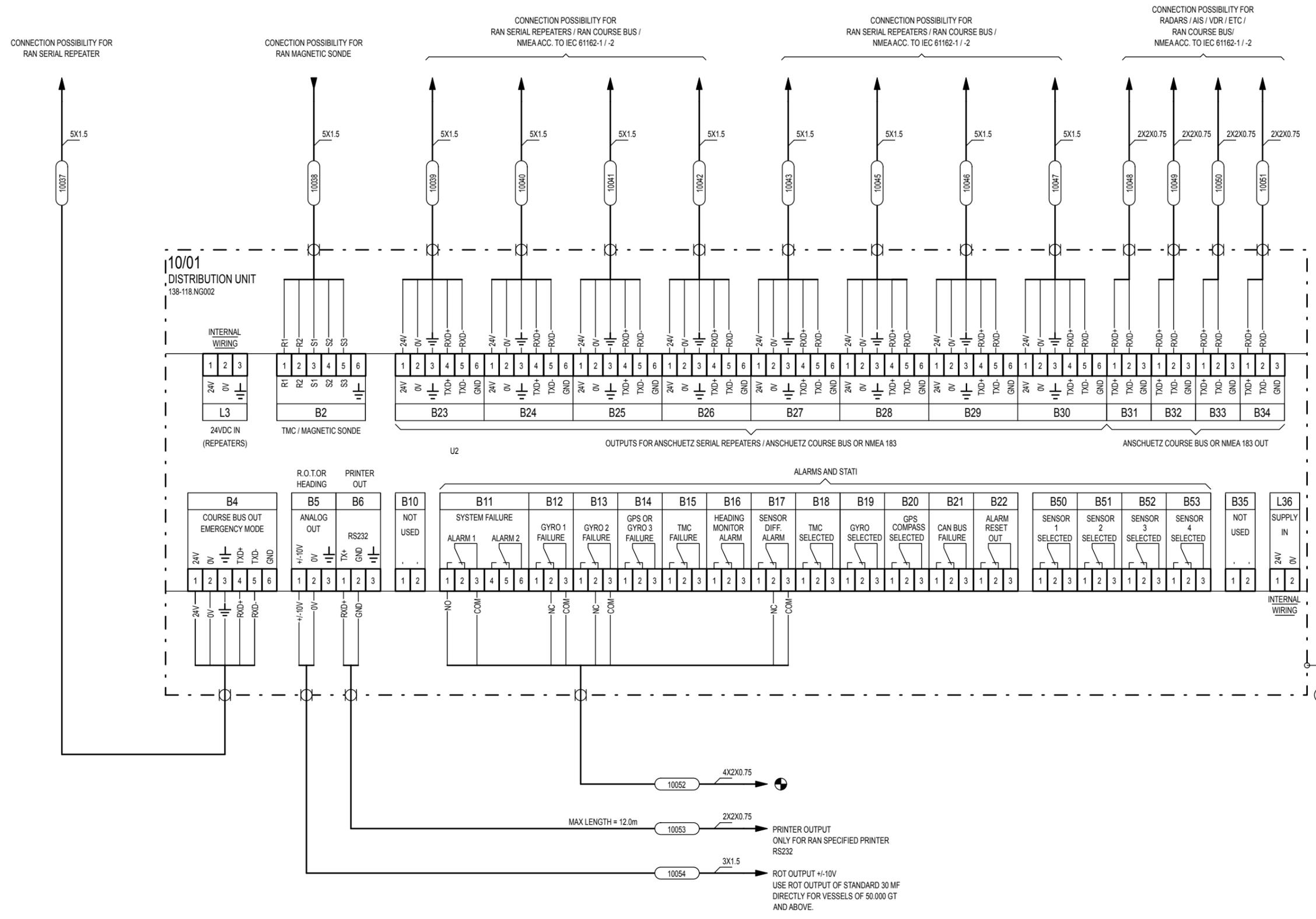
CABLE AND CONNECTION DIAGRAM
GYRO COMPASS SYSTEM
 STD.30 GG

10-CO-D-X0003-C

PROJECT: SHEET 3 OF 4 SHEETS

FOR REMARKS SEE SEPARATE DIAGRAM: 37-LE-D-X00001-C
 FÜR ZEICHENERKLÄRUNG SIEHE SEPARATES DIAGRAM: 37-LE-D-X00001-C

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INDEX	MODIFICATION	DATE	NAME	DATE
A	-	10.02.2017	HJJ	10.02.2017



KABEL- UND ANSCHLUSSPLAN
KREISELKOMPASSANLAGE
 STD.30 GG

CABLE AND CONNECTION DIAGRAM
GYRO COMPASS SYSTEM
 STD.30 GG

10-CO-D-X00003-C
 PROJECT:

SHEET 4
 4 SHEETS

ANMERKUNGEN / REMARKS

ALLE KABEL SIND ABGESCHIRMT / KUPFERDRAHT-GEFLECHT.
ALL CABLES ARE SHIELDED / COPPER WIRE MESH.

NICHT GEKENNZEICHNETE ADERN: 0.75mm², SW
NOT MARKED CORES: 0.75mm², BK

ALLE KABELANGABEN OHNE RESERVEADERN.
ALL CABLES INDICATED WITHOUT SPARE CORES.

VERBINDLICHE ERDUNGSMASSNAHMEN. SIEHE JEWEILIGES INSTALLATIONSHANDBUCH.
THE INSTALLATION MANUALS ARE BINDING FOR GROUNDING INSTRUCTIONS.

KABEL SIND UNTER DECK VERLEGT.
ENERGIE- UND BELEUCHTUNGSKABEL SIND GETRENNT VON SIGNALKABELN VERLEGT.
CABLES TO BE INSTALLED INDOOR. CABLES FOR POWER SUPPLY AND ILLUMINATION TO BE SEPARATED FROM CABLES FOR SIGNALLING / MONITORING.

ALLE ANGABEN ZU ADERQUERSCHNITTEN SIND RAYTHEON-MINDESTANFORDERUNGEN.
DIE ANGABEN IN DEN VORSCHRIFTEN DER JEWEILIGEN KLASSIFIKATIONSGESELLSCHAFT SIND JEDOCH ZU BERUECKSICHTIGEN.
ALL CORE CROSS SPECIFICATIONS ARE MINIMUM RAYTHEON REQUESTS.
BUT TAKE INTO CONSIDERATION THE SPECIFICATIONS OF THE RULES OF CORRECT CLASSIFICATION AUTHORITY.

EMV-SCHUTZANFORDERUNG:
SAEMLICHE GERAETE UND KABEL SOLLEN DEN GROESSTMOEGLICHEN ABSTAND ZU EMV-STOERQUELLEN WIE DAUER-, KURZZEIT- UND KNACKSTOERERN HABEN.
ELECTROMAGNETIC COMPATIBILITY:
INSTALL UNITS AND CABLES AT GREATEST POSSIBLE DISTANCE TO SOURCES OF INTERFERENCE SUCH AS TRANSIENTS, CLICKS.

STEERING CONTROL / GYRO COMPASS

✱✱ KABELSTAEEMME SIND GETRENNT VERLEGT.
CABLE-LOOMS ARE LAID SEPARATELY.

▲ EINSPEISUNG VOM BATTERIEGEPUFFERTEN NOTNETZ.
FEEDING FROM BATTERY BUFFERED EMERGENCY SOURCE OF POWER.

⚡ DIE AUSWAHL UND BEMESSUNG DER KABEL UND LEITUNGEN SIND DEN ANGABEN DES RUDERMASCHINENHERSTELLERS ZU ENTNEMMEN. DIE ZU SCHALTENDEN STROEME DUERFEN
MIN. 0.025 A / 24 V DC
MAX. 48 W / 110 V DC BETRAGEN.
FOR SELECTION AND DIMENSIONING OF CABLES AND LINES SEE SPECIFICATION OF THE STEERING GEAR SUPPLIER. THE SWITCHING CURRENTS MAY BE:
MIN. 0.025 A / 24 V DC
MAX. 48 W / 110 V DC.

■ ANSCHLUESSE ZUM VDR:
SIGNALE ZUM VDR MUESSEN POTENTIALFREI ODER UEBER ISOLATIONSVERSTAERKER / OPTOKOPPLER GALVANISCH GETRENNT UND RUECKWIRKUNGSFREI UEBERTRAGEN WERDEN. DIE ENTKOPPLUNG HAT AM UEBERGABEPUNKT ZU ERFOLGEN. DER VDR-HERSTELLER IST VERANTWORTLICH FUER DIE VOLLSTAENDIGE EINHALTUNG DER RELEVANTEN VORSCHRIFTEN.
CONNECTIONS TO VDR:
SIGNALS TO THE VDR MUST BE TRANSMITTED POTENTIAL FREE OR GALVANICALLY INSULATED VIA INSULATION AMPLIFIERS / OPTOCOUPPLERS REACTION-FREE FROM THE DESIGNATED CONNECTION POINTS. THE VDR MANUFACTURER IS RESPONSIBLE FOR FULL COMPLIANCE WITH RELEVANT REGULATIONS.

Ⓞ KABEL DURCH DEN FERRITKERN SCHLEIFEN!
FERRITKERN MUSS NAHE DER KABELINFUEHRUNG BEFESTIGT WERDEN!
LOOP CABLE AROUND FERRITIC SLEEVE!
SLEEVE MUST BE LOCATED CLOSE TO CABLE GLAND!

END TERMINATION OF CAN BUS:
INSERT JUMPERS B13 AND B16 AT OPERATOR UNIT 130-613.
INSERT JUMPERS B31 AND B32 AT GYRO 110-233 (STD. 22).
INSERT JUMPERS X302 AND X303 AT PROCESSING UNIT STD. 21



NICHT RAYTHEON-LIEFERUNG.
NOT SUPPLIED BY RAYTHEON.



RAYTHEON-LIEFERUNG, LAENGE X
RAYTHEON-SUPPLY, LENGTH X



ANSCHLUSS AM SIGNALTABLEAU IST ZWINGEND ERFORDERLICH.
CONNECTION TO SIGNAL PANEL IS MANDATORY.



ANSCHLUSSMOEGELICHKEIT FUER EXT. SIGNALTABLEAU.
CONNECTION POSSIBILITY FOR EXT. SIGNAL PANEL.



ADERQUERSCHNITT IST ABHAENGIG VON DER KABELLAENGE, SPANNUNGSABFALL ≤ 6%.
CORE CROSS SECTION ACCORDING TO CABLE LENGTH, VOLTAGE DROP ≤ 6%.



NICHT BENOETIGTE ADERN ISOLIEREN UND AUFBINDEN.
NOT REQUIRED CORES INSULATED AND TIED-UP.



KABELINFUEHRUNG AUS METALL MIT AUFNAHME-KONUS FUER SCHIRM (EMV).
METALLIC CABLE-GLAND WITH CONNECTOR FOR SCREEN (EMC).



KABELINFUEHRUNG
CABLE-GLAND



BRUECKE VOR INBETRIEBNAHME EINSETZEN.
INSERT JUMPER BEFOR TRIALS.



BRUECKE VOR INBETRIEBNAHME ENTFERNEN.
REMOVE JUMPER BEFORE TRIALS.



ZU VERWENDEnde ADER: 1.0mm², SW
USE CORE: 1.0mm², BK



SCHUTZLEITER: 1.5mm² (GRUEN/GELB)
PROTECTIVE EARTH CONNECTOR: 1.5mm² (GREEN/YELLOW)



GESCHIRMTE, PAARIG VERDRILLTE KABEL VERWENDEN! (2X2X0.75, SCHLAGLAENGE ≤ 80mm, WELLENWIDERSTAND = 120 OHM / KAPAZITAET < 50pF/m, LAUFZEITVERZOEGERUNG < 5ns/m). MAX. CAN-BUS-LAENGE (TERMINIERUNG ZU TERMINIERUNG) = 400m.

USE SCREENED TWISTED PAIR CABLE! (2X2X0.75, TWIST PITCH LENGTH ≤ 80mm, WAVE IMPEDANCE = 120 OHM, CAPACITY < 50pF/m, CABLE LINE DELAY < 5ns/m) MAX. CAN-BUS-LENGTH (TERMINATION TO TERMINATION) = 400m.



KABEL MUESSEN SO WEIT WIE MOEGELICH UEBER IHRE GESAMTE LAENGE VONEINANDER GETRENNT VERLEGT WERDEN. (vgl. SOLAS Ch. II-1 Reg. 29 Pt. 9)
CABLES SHALL BE SEPARATED AS FAR AS PRACTICABLE THROUGHOUT THEIR LENGTH. (cp. SOLAS Ch. II-1 Reg. 29 Pt. 9)



KABEL WIRD AM GERAET XX/NN IN DER KONSOLE ANGESCHLOSSEN.
CABLE TO BE CONNECTED TO COMPONENT XX/NN INSIDE OF CONSOLE.

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C	TERMINATION OF CAN BUS CORR.	15.11.2016	BEG		NAME	DATE
B	TW. PAIR CORR. / A, B ADD.	03.08.2015	HHJ	DRAWN	PR	19.06.2012
A	TWISTED PAIR CORR.	27.03.2013	BEG	CHECK	HAH	15.11.2016
INDEX	MODIFICATION	DATE	NAME	NORM	X	X



LEGENDE
ZEICHENERKLAERUNG
X

LEGEND
REMARKS
X

37-LE-D-X00001-C
PROJECT: X

SHEET 1
1 SHEETS