

VDR G4^[e]

S-VDR G4^[e]

Voyage data recorder systems that comply with all IMO performance standards and offer additional tracking and monitoring features.



Marine Electronics &
Satellite Communications

www.mackaymarine.com



MACGREGOR

Designed to perform with the sea

Definitions & Benefits

More than 900 commercial and passenger ships sail with a voyage data recorder system from MacGregor's Interschalt maritime systems.

We offer

1. Voyage Data Recorder VDR G4^[e] complies with all IMO performance standards of MSC.333(90).
2. Simplified Voyage Data Recorder S-VDRG4^[e] complies with all IMO performance standards of MSC.163(78) and is valid for existing cargo ships of 3,000 gross tonnages and upwards constructed before 1 July 2002.

Your benefits

- Data provision for third parties
- Industry standard interfaces
- Modular and scalable design
- Reliability thanks to enhanced VDR G4 technology
- Annual performance tests carried out by us and our certified service partners worldwide
- Five-year support packages
- Fabricated in Germany
- Low power consumption
- In-house development ensuring short reaction time and integration of additional data if required

Added-value features

Besides the required standard equipment, we offer shipowners and ship managers additional benefits from optional equipment features.





VDR G4^[e] is on demand and available with the following services:

- Up to 365 days of recording time and possible to upgrade on demand
- Real-time monitoring
- Additional audio recording (e.g. engine control room, telephones)
- Corridor tracking with off-track email notification
- Vessel-specific visualisation

Five-year support package

VDR G4^[e] as well as S-VDR G4^[e] come with an optional five-year support package.

The support package includes:

- Four annual performance tests (APT) including travel to major ports
- Five-year spare-part kit (wear and tear)
- EC type examination certificates
- Repair of all defects and damages leading to breakdown during operation time
- Transportation to key ports
- Handling of VDR G4^[e] damage claims for the ship-owner

Approved by VDR G4^[e] as well as S-VDR G4^[e] are approved by:

- BSH, Federal Maritime and Hydrographic Agency, Germany
- Chinese Classification Society (CCS), China

Worldwide network



Our VDR service stations

- Asia**
- Singapore
- Europe**
- Hamburg, Germany
 - Rotterdam, Netherlands

Our service partners locations

- Africa**
- Nigeria
 - Egypt
 - South Africa
- Americas**
- Panama
 - USA
 - Argentina
 - Colombia
 - Canada
 - Brazil
 - Chile
 - Ecuador
 - Peru
- Asia**
- India
 - UAE
 - Hong Kong
 - Korea
 - China
 - Taiwan
- Australia**
- Australia
- Europe**
- Malta
 - Morocco
 - Spain
 - Italy
 - Denmark
 - Estonia
 - Poland
 - Russia
 - Finland
 - Bulgaria
 - Germany
 - Croatia
 - Greece
 - Romania
 - United Kingdom
 - Turkey
 - Lithuania

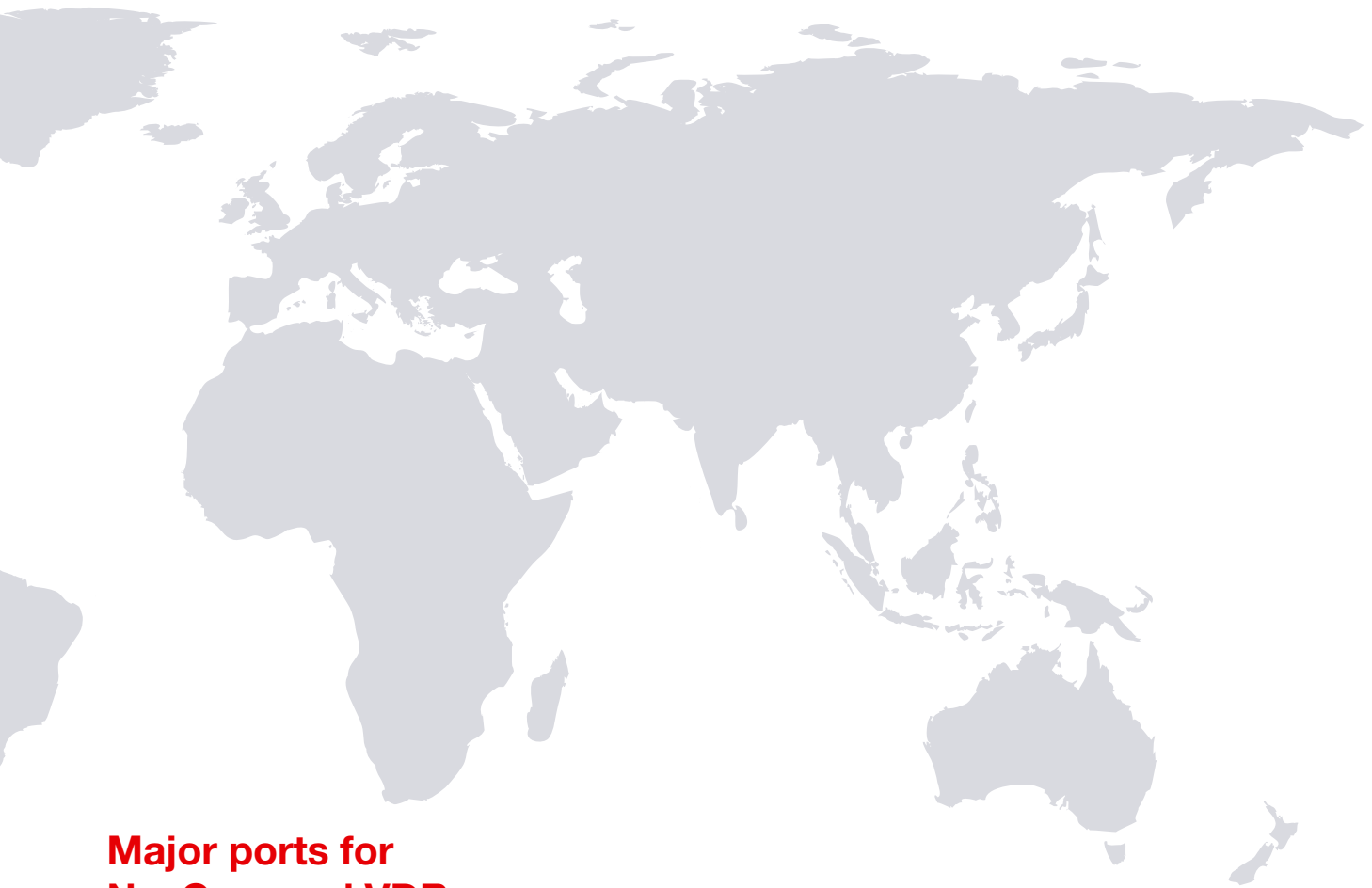


Mackay Marine – High Seas
+1 281 479 1515 marinesales@mackaymarine.com

Mackay Communications, Satellite Solutions
+1 919 850 3100 satserv@mackaycomm.com

Mackay Marine Canada
+1 902 469 8480 sales.canada@mackaymarine.com

Mackay Marine Alaska & Pacific Northwest
+1 206 282 8080 ballard@mackaymarine.com



Major ports for NavCom and VDR

Africa

- Casablanca (Morocco)
- Durban, Cape Town (South Africa)
- Lagos (Nigeria)
- Port Said (Egypt)

Americas

- Balboa (Panama)
- Buenos Aires (Argentina)
- Houston, New York, Los Angeles, Miami (USA)
- Lima, Callao (Peru)
- Montreal (Canada)
- Santos (Brazil)
- Valparaiso, San Antonio (Chile)

Asia

- Bangkok (Thailand)
- Dubai (UAE)
- Hong Kong, Dalian, Tianjin, Yantai, Qingdao, Lianyungang, Yangzhou, Zhoushan, Fuzhou, Xiamen, Guangzhou, Fanchengang, Shanghai (China)
- Kaoshiung, Keelung (Taiwan)
- Mumbai (India)
- Pusan (Korea)
- Singapore

Australia

- Melbourne, Perth

Europe

- Aalborg (Denmark)
- Algeciras, Barcelona, Bilbao, La Coruna, Tarragona, Valencia (Spain)
- Antwerp (Belgium)
- Las Palmas (Canary Islands, Spain)
- Genoa, Ancona (Italy)
- Gdynia, Gdansk (Poland)
- Hamburg, Bremerhaven, Cuxhaven, Rostock, Emden (Germany)
- Istanbul (Turkey)
- Lisbon (Portugal)
- Piraeus (Greece)
- Rotterdam, Amsterdam (The Netherlands)
- Rijeka (Croatia)
- St. Petersburg (Russia)
- Tallinn (Estonia)
- Valletta (Malta)
- Varna (Bulgaria)

VDR requirements

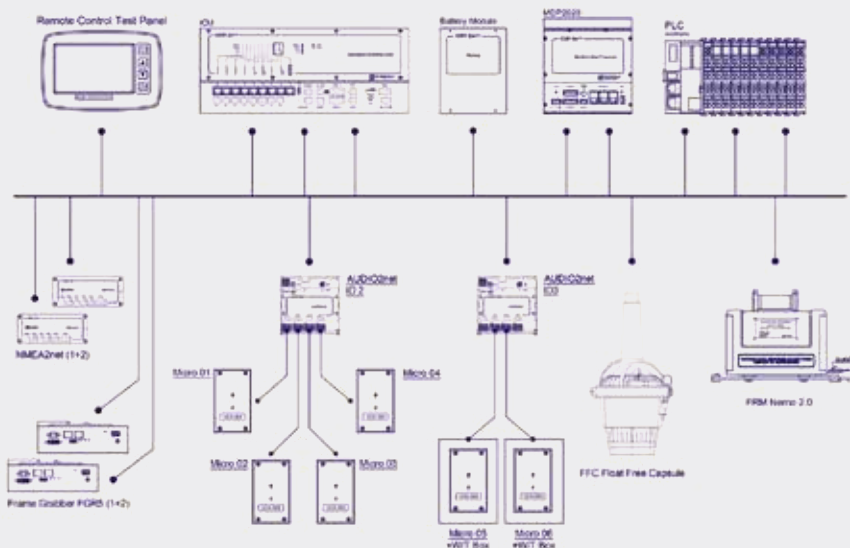
Overview

Our VDR systems comply with all the requirements of MSC.333 (90), such as:

- APT for VDR (including certificate of compliance)
- Integrated performance test to establish data integrity for APT or following a service
- Three data carriers as final recording medium (FRM):
 - fixed capsule
 - float-free capsule
 - long-term recording medium
- Minimum recording interval of 48 hours, long-term recording for 30 days
- At least one separate recording channel for bridge wings. At least two channels for bridge recordings. Definition of intelligibility for speech and environmental signals
- Recording of dual radar units
- Recording of the current ECDIS with the source of chart data and version
- Image recording as per the IEC61162-450 standard
- Recording of all mandatory bridge alarms via interfaces with the alarm management systems
- Order/response recording for engines and all thrusters
- Recording of all automatic identification system (AIS) data
- Recording of heel and list to reproduce rolling movements
- Recording of electronic logbooks, if present
- Recording of VHF communication

VDR G4^[e]

Basic Blockview

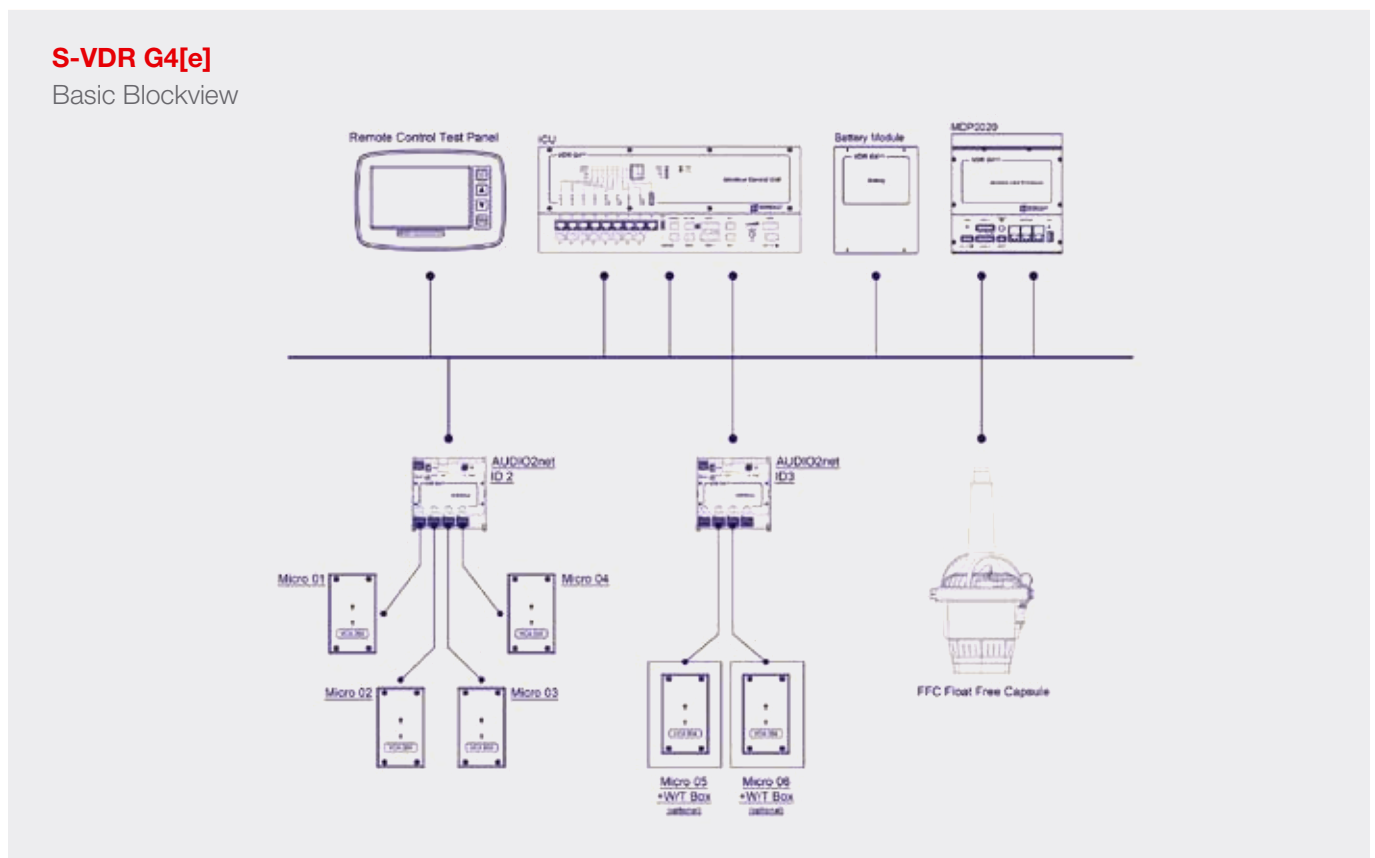


S-VDR requirements

Overview

Our S-VDR systems comply with all the requirements of MSC.163 (78), such as:

- One data carrier as final recording medium (FRM):
 - fixed capsule or
 - float free capsule
- Recording interval of 12 hours
- Recording of bridge audio using microphones
- Recording of VHF communication
- Recording of one of the ship's radar installations where interfaces are available
- Recording of AIS target data if it is impossible to obtain radar data (If radar data is recorded, AIS information may be additionally recorded as a beneficial secondary source of information on both other ships and one's own ship.)
- Recording of date and time, ship's position, speed, heading
- Recording of additional data if available



VDR G4^[e] and S-VDR G4^[e]

Standard equipment



VDR G4^[e] Maritime Data Processor

Maritime data processor

Performance characteristics

- PowerPC dual core, 1 GHz processor, 512 MB RAM, 128 MB NOR flash for the operating system and firmware
- SSD 480 GB (integrated LTRM)
- QNX 6.5 operating system for VDR application
- Power consumption: 8–10 watts
- 3 x Gigabit Ethernet, independent network ports
- Internal µSD card for firmware upgrading and/or parameter memory (standard 4 GB) upgradeable to 32 GB
- Operating voltage: 24 VDC
- 2 x RS422 serial interfaces, high speed
- USB 2.0 for removable storage device
- Web configurable

Interface control unit

Performance characteristics

- Control and monitoring of connected system components
- Power consumption: 10 watts
- Operating voltage: 24 VDC
- Scalable up to 4 ICU units plus MDP
- 2 x VHF audio input
- 2 x RS422 serial interfaces, high speed
- 2 x 100 Megabit Ethernet independent
- 8 ports (1st network)
- 1 port (2nd network)
- Alarm output
- Web configurable
- QNX 6.4 operating system

Remote-control test panel

Performance characteristics

- Ethernet interface
- Serial interface
- Operating voltage: 24 VDC
- Dimmer function
- 7" graphical colour display
- Power consumption: 5 watts
- Embedded Linux operating system

Functionality

- Visualisation of pending alerts
- Alert history of the last 24 hours
- Performance test
- Restart VDR
- Start microphone test/emergency backup
- Switching day–night view/central dimming function
- Easy configuration (only network and dimming settings)

NMEA2net distributor

Performance characteristics

- Power consumption: 3 watts
- Operating voltage: 24 VDC
- 4 x RS422 serial input
- 1 x RS422 IN/OUT
- Network OUT via proprietary VDR protocol (alternative: plain NMEA, virtual com port)
- Baudrate: 4,800 to 38,400 bit/s
- Web configurable
- 10 Megabit Ethernet

FGR5 frame grabber

Performance characteristics

- Captures images from one of the three inputs
- Also captures two independent images from two of the three inputs
- Digital or analogue plus digital
- RGB input for VESA-compatible analogue signals up to full HD (1920 x 1200 pxl @ 60 Hz)
- Single-link DVI input for digital signals up to full HD (1920 x 1200 pxl @ 60 Hz)
- HDMI input for digital signals up to full HD (1920 x 1200 pxl @ 60 Hz)
- Image compression to bmp.gz, bmp as zip file, png
- Transfer of uncompressed or compressed images via network
- Approved transfer protocol according IEC 62388, Annex H4 and IEC 61996-1, ed.2 (default)
- Transfer protocol according IEC 61162-450 (binary transfer) and IEC 61996-1, ed.2 with upcoming approval
- Power consumption: 8-11 watts
- Embedded Linux operating system
- 1 x Gigabit PoE, 1 x Gigabit Ethernet independent network ports
- Web configurable

Microphone VCA004

Performance characteristics

- Designed for wall box installation (67 mm)
- IP47 / IP67
- Operating voltage 20VDC
- Power consumption < 1 watt

Battery backup 11.500 mAH

Performance characteristics

- Capacity: 11.500 mAH
- Output voltage: 15.6 VDC
- NiMH cells for easy transportation

Diving capsule NEMO 2.0

Performance characteristics

- Beacon PT9 Ninety with a transmission time of at least 90 days
- 32 GB solid-state disk (min. of 48 hours storage capacity)
- Operating voltage: 24 VDC
- PowerPC, 400 MHz processor, 128 MB RAM
- Operating system: LINUX
- 64 MB NAND flash for operational system
- Power consumption: 8 watts
- 2 x Ethernet independent
- 1 x 100 Megabit Ethernet
- 1 x 1 Gigabit PoE Ethernet
- Web configurable
- Designed for SSD replacement on board

Float-free capsule

Performance characteristics

- 64 GB solid-state disk (min. of 48 hours storage capacity)
- 1 x interface ethernet (POE)
- Operating voltage: 24 VDC
- Web configurable
- Power consumption: 6 watts



VDR G4^{el}
Frame Grabber FGR5

Optional equipment & software



Removable storage device

Performance characteristics

- USB 2.0 flash drive with 64 GB capacity
- Capable of performing emergency backups

Pic client digital video interface

Performance characteristics

- Windows- and Linux-based application
- Easy to integrate
- No additional hardware necessary
- Compatible with standard norms
- Up to 4k display resolution
- Digital signal processing
- ECDIS status transfer according to IEC 61996-1 (ed.2, Annex G)

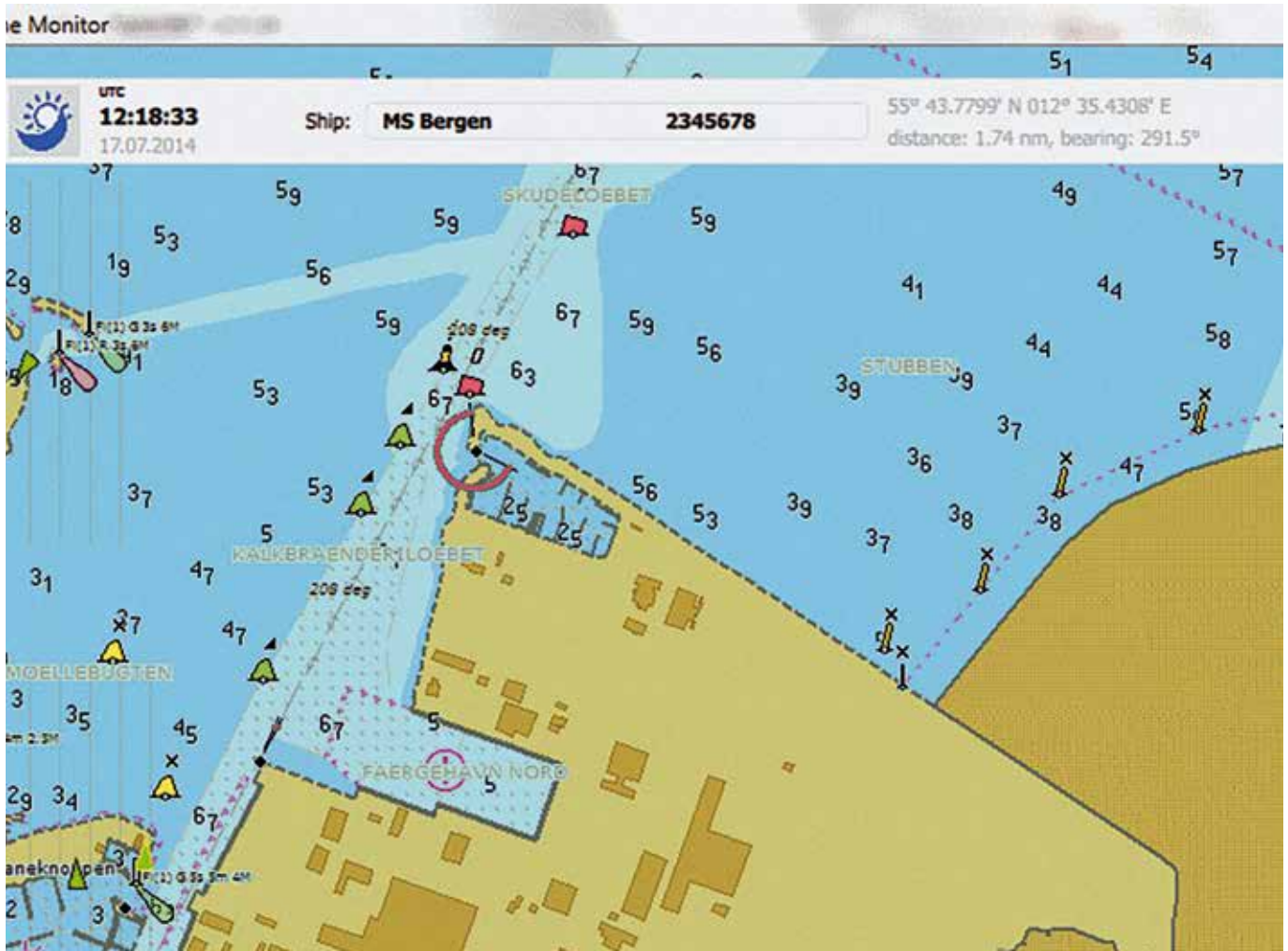
Protocol standards

- MacGregor/Interschalt protocol
- IEC 62388, Annex H.4
- IEC 61162-450 multicast retransmission
- IEC 61162-450 multicast
- IEC 61996-1 (ed.2)

Replay real-time monitor

Performance characteristics

- Actual vessel's position on official sea chart
- Vessel's actual traffic situation incl. AIS information
- Usage of official S57/S63 ENC
- Day and night view
- OPC/UA interface for third-party user (optional)



Extended long-term recording

Performance characteristics

- More than 30 days and up to one year
- Network-based data storage
- Based on additional external mass storage device or based on customer server with very high availability

Corridor tracking tool

Our corridor tracking tool enables ship owners and ship managers to plan safe voyages and to be notified in critical situations.

Performance characteristics

The four-step process can be described as follows:

- Ship route planning via ECDIS
- Corridor planning longitude and latitude along ship's route
- Upload to the VDR
- Shore-based real-time control

Inclinometer

Performance characteristics

- VDR G4[e] interface and according to IEC 60945
- Ethernet interface
- Serial interface
- Operating voltage: 24 VDC
- Dimmer function
- Graphical colour display

Maritime Data Engine (MDE)

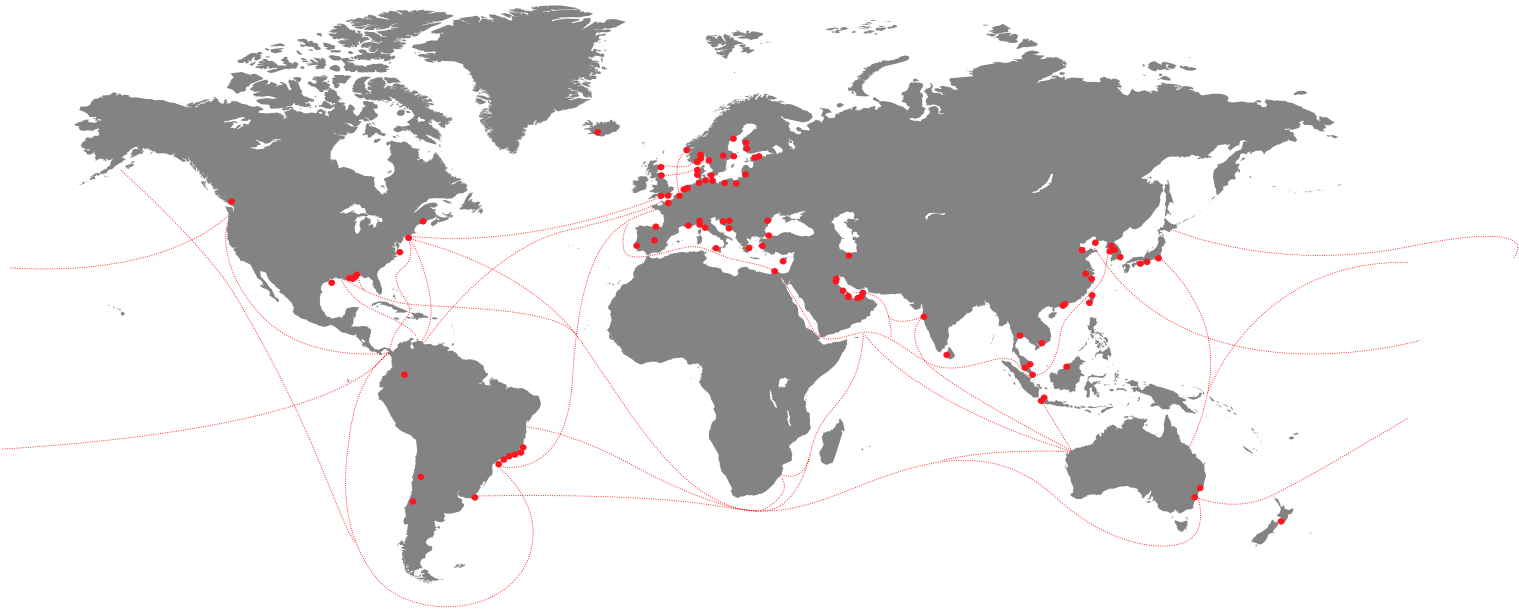
The MDE application works as a data provider, interface duplicator, interface converter and data normaliser as well as a data proxy for all available VDR data in real time.

Performance characteristics

- Pure transmission of NMEA messages
- MER packet input and output connector
- FTP input and (S)FTP output connector
- Data output ports: OPC UA, UDP plain
- Provision of images and voice data
- Windows- and Linux-based applications

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- Allset
- ASCA
- Becker
- BMH
- Conver-OSR
- Grampian Hydraulics
- Flintstone
- Greer Marine
- Hamworthy
- Hatlapa
- Hydramarine
- Häggglunds
- Interschalt
- KGW
- KYB - ASCA
- KYB - Kayaba Industries / Navire Cargo Gear
- Luezhoe
- MacGregor
- MacGregor-Conver
- MacGregor-Häggglunds
- MacGregor-Kayaba
- MacGregor-Navire
- Navire Cargo Gear
- Nordströms
- Ozean Service & Reparatur
- Platform Crane Services (PCS)
- Plimsoll
- Pusnes
- Porsgrunn
- Triplex
- Vestnorsk Hydraulikkservice (VNH)



MacGregor shapes the offshore and marine industries by offering world-leading engineering solutions and services with a strong portfolio of MacGregor, Hatlapa, Porsgrunn, Pusnes and Triplex brands. Shipbuilders, owners and operators are able to optimise the lifetime profitability, safety, reliability and environmental sustainability of their operations by working in close cooperation with MacGregor.

MacGregor solutions and services for handling marine cargoes, vessel operations, offshore loads, crude/LNG transfer and offshore mooring are all designed to perform with the sea.

MacGregor is part of Cargotec (Nasdaq Helsinki: CGCBV).

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macgregor.service@macgregor.com
macgregor.com

