

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB0000B45
Revision no.:
0

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

that the **Integrated navigation system**

with type designation(s)
MNS-100I Series

issued to

MRC Inc.
Busan, Korea, Republic of

is found to comply with the Implementing Regulation (EU) 2025/1533 for
Item no. **MED/4.59** (Row 2 of 3)
according to the following requirements:

SOLAS 74 Reg. V/19, IMO Res. A.694(17), IMO Res. MSC.191(79), IMO Res. MSC.252(83), IMO Res. MSC.302(87), SOLAS 74 Reg. V/15, SOLAS 74 Reg. V/18, SOLAS 74 Reg. X/3, IMO Res. MSC.36(63)-(1994 HSC Code) 13, IMO Res. MSC.97(73)-(2000 HSC Code) 13

(Manufacturers authorised representative)

Movena GmbH
Bremen, Reeder-Bischoff-Str. 65, D-28757, Germany

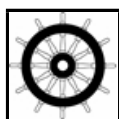
Further details of the equipment and conditions for certification are given overleaf.

Date of issue: **2025-11-04**

Expiry date: **2030-11-03**

DNV local unit:
Busan, CMC Korea

Approval Engineer:
Tommi Juhani Rifaat



for **DNV AS**

Notified Body
no.: **0575**

Christine Mydlak-Röder
Head of Notified Body



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

The MNS-100I Series Integrated Navigation System (INS) consists of several Multifunction displays (MFDs) incorporating the below functions and integrated via redundant Ethernets:

Function	Type
• Route Monitoring (ECDIS)	MNS-100E Series
• Route Planning (ECDIS)	MNS-100E Series
• Collision Avoidance (RADAR)	MNS-100R Series
• Navigation Control data (CID)	MNS-100C Series
• Alert Management (CAM)	MNS-100CA Series
• Status and Data Display (INS)	MNS-100I Series

All functions may be operated on any of the MFDs in the INS.

Please see Appendix: Product Description

Application/Limitation

- The ECDIS and Radar functions shall hold valid type approval certificates documenting compliance with applicable international standards in accordance with the Directive.
- The minimum configuration of MNS-100I Series for SOLAS compliance comprises 5 MFDs. An INS-topology involving additional MFDs may be approved on case-by-case basis.
- The MNS-100I Series INS shall be interconnected with dual installations of position, heading and speed sensors holding valid type approval certificates.
- The MNS-100I Series INS is to be connected to an alarm transfer system for transfer of back-up navigator alarms.
- The MFDs shall be individually connected to the VDR for transfer of ECDIS and RADAR images in compliance with IEC 61996-1.
- The INS Alert Management (CAM) may handle, distribute and present bridge alerts being additional to the MNS-100I Series INS and its primary sensors.
- For vessels where BAM-compliance in accordance with MSC.302(87) is required the INS CAM-HMI should be arranged as the functional HMI for the BAM.
- The MNS-100I Series INS ECDIS function may be integrated with and act as HMI for the MRC MNS-100ET Series Track Control System (TCS)
- The MNS-100I Series INS shall be installed and commissioned onboard according to manufacturer's installation instructions for the individual functions/components.

Type Examination documentation

Tests carried out

• Performance testing:	IEC 61924-2 (2021)
• Environmental testing:	IEC 60945 (2002) incl. Corr.1 (2008)
• Serial Interface testing:	IEC 61162-1, IEC 61162-2 (2024)
• LAN Interface testing:	IEC 61162-450 (2018)
• Presentation of navigation information:	IEC 62288 (2021)
• Bridge Alert Management:	IEC 62923-1 (2018) and IEC 62923-2 (2018)

Marking of product

The designation of Manufacturer and Type shall be fixed in a clearly visible location on the individual equipment. In addition the equipment shall be marked with serial number. Safe distance to magnetic compass and power consumption and/or supply voltage may be included on the label or stated in the individual installation manuals.



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APPENDIX

Product Description

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The MNS-100I Series Integrated Navigation System consists of combinations of the following units and components:

Unit	Type	Components	Remark
ECDIS	MNS-100E Series	Processor unit Display unit Keyboard & Trackball	<i>See ECDIS type examination certificate for details</i>
RADAR	MNS-100R Series	Processor unit Display unit Control unit Antenna unit Transceiver unit Network unit Power Supply	<i>Dual radar installation</i> <i>See RADAR type examination certificate for details</i>
CID	MNS-100C Series	Processor unit Display unit Keyboard & Trackball	<i>See CID type approval certificate for details</i>
CAM	MNS-100CA Series	Processor unit Display unit Keyboard & Trackball	<i>See CAM type approval certificate for details</i>
INS	MNS-100I Series	INS with Status and Display function runs uniformly on all hardware listed	
Network Hub(s)	Cisco C9200L-48P-4G-E or HP Aruba Instant 1930 series HPE JL686A		<i>See ECDIS type examination certificate for details</i>
Sensor Adapter Unit(s)	MDCU-100S (LAN to RS422/485)		<i>See ECDIS type examination certificate for details</i>
Cabling	Please refer to individual Type examination certificates		
Software versions	ECDIS: ver. 1.1.x RADAR ver. 1.0.x CID: ver. 1.1.x CAM: ver.1.1.x INS: ver 1.0.x		x is higher than 0

For the relevant revisions of referred certificates see <https://approvalfinder.dnv.com/>.