

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00007V4

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 Radar equipment

with type designation(s)
MNS-100R Series

Issued to

MRC Inc.
Busan, Korea, Republic of

is found to comply with the requirements in the following Regulations/Standards:

Regulation (EU) 2023/1667,

item No. MED/4.64 SOLAS 74 as amended, Reg. V/18, 19, X/3, IMO Res. MSC.36(63)-(1994 HSC Code) 13, IMO Res. MSC.97(73)-(2000 HSC Code) 13, IMO Res. A.278 (VIII), A.694(17), MSC.191(79), 192(79), 302(87), IMO MSC.1/Circ.1349, ITU-R M.1177-4 (04/11)

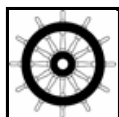
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2028-12-06**.

Issued at **Høvik** on **2023-12-07**

DNV local unit:
Gimhae Station

Approval Engineer:
Tommi Juhani Rifaat



for **DNV AS**

Notified Body
No.: **0575**

Mydlak-Röder, Christine
Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005, and amended by Decision No 1/2023 dated August 21st, 2023.



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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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 300,000 USD.



Product description

MNS-100R series Radar system consists of the following components:

Unit	Type	Location
X-Band Antenna	9ft X-Band Antenna 6ft X-Band Antenna	Exposed
X-Band Transceiver (up-mast)	25kW X-Band Transceiver 12kW X-Band Transceiver	Exposed
S-Band Antenna	12ft S-Band Antenna	Exposed
S-Band Transceiver (up-mast)	30kW S-Band Transceiver	Exposed
X-Band Antenna Pedestal	X-Band ANT Pedestal	Exposed
S-Band Antenna Pedestal	S-Band ANT Pedestal	Exposed
Display Unit	HD27T22 MMD-MA4-FAGA or ER2701	Protected
Processor Unit	HTC03-i5-AC-yzzzzzz or HTC03-i7-AC-yzzzzzz or DPC-OT-22B	Protected
Network Unit	Cisco C9200L-48P-4G-E or HP Aruba Instant 1030 series HPE JL868A	Protected
Power Supply Unit	R5000 220VAC Power Supply	Protected
Sensor Adapter Unit	Hatteland HT 00262 OPT-A1 (USB to 4x RS422/485) MDCU-100S (LAN to RS422/485)	Protected
Control Unit	HiINS KPD A + HiINS TPD	Protected

Application/Limitation

- The installation shall be verified and tested onboard according to manufacturer's installation instructions.
- The MNS-100R radar systems are found to be in compliance with RADAR for ships, CAT 1& CAT 2.
- The system shall be connected to an alarm transfer system for transfer of back-up navigator alarms.

Type Examination documentation

DNV No	Drw No	Rev	Title
46	TAA000039Z		Certificate: DNV, Bridge Monitor ER2701 ECDIS Monitor
3	MRA000003D		Certificate: DNV, Hatteland Computers
4	MRA0000016	Rev.3	Certificate: DNV, Hatteland Monitors
45	TAA000003A2		Certificate: DNV, Maritime Computer DPC-OT22B
23		2023-11-23	Doc: Navico, R5000 IEC 60945 12.3 Display Emission Waiver
24		2023-11-23	Doc: Navico, R5000 IEC 60945 12.4 X-Ray radiation Waiver
21		2023-11-23	Doc: Navico, R5000 IEC 60945 8.10 Solar Radiation Waiver
22		2023-11-23	Doc: Navico, R5000 IEC 60945 8.12 Salt mist Waiver
51	IM		Manual: MRC, MNS-100R Series Instruction Manual
52	TM		Manual: MRC, MNS-100R Series Technical Manual
15	1-3423-11-01-10	2012-05-23	Report: Cetecom, S-band antenna IEC 62388 EMC Test Report
16	2-3052-01-02/02	2002-11-25	Report: Cetecom, S-band antenna IEC 62388 EMC Test Report
26	4-2638-01-03/07		Report: Cetecom, SRT TXRX, SRT Adapter Box, IEC 60945 Test Report
25	1-3423/11-01-05		Report: Cetecom, Up Mast/S-002 IEC 60945 8.8 Rain & Spray Test Report
17	4-2638-01-04/07	2007-08-10	Report: Cetecom, X-band antenna IEC 62388 EMC Test Report
19	TR 20160314	2016-03-14	Report: Finmeccanica, Test Report X-band
27	DREKETC2212-0139	2022-12-20	Report: KOLAS, HiINS Operating Kit IACS UR E10 EMC Test Report
30	DRCKREL2301-0006	2023-01-02	Report: KOLAS, HiINS Operating Kit IEC 60945 Enclosure and Environmental Test Report
29	DREKETC2212-0138	2022-12-20	Report: KOLAS, HiINS Operating Kit IEC 60945 Immunity Test Report

DNV No	Drw No	Rev	Title
28	DRCKREL2301-0004	2023-01-02	Report: KOLAS, HiINS Operating Kit IEC 60945 Vibration Test Report
32	ICRT-TR-I230347-0A	1	Report: Kolas, MDCU-100 Series IEC 60945 Temperature and Vibration Test Report
9	21580ALL18057en	2018-07-26	Report: Koncar, IEC 60945 Test Report SIMRAD R5000
50	008058_01_H		Report: KRIWAN, IEC 60945 Shock test SRT X-Band with 9" antenna
12	058/16PC	2016-07-26	Report: MECC, R5000 S-band Wind Tunnel Test Report
13	058/16PC	2016-07-26	Report: MECC, R5000 X-band Wind Tunnel Test Report
34	MNS-TSR-008	1.0.0	Report: MRC, IEC 61162-1/2 Test Report for MDCU box
35	MNS-TSR-003	1.0.0	Report: MRC, RADAR IEC 61162-1 Edition 5.0 Test report
36	MNS-TSR-004	1.0.0	Report: MRC, RADAR IEC 61162-2 Edition 1.0 Test report
37	MNS-TSR-005	1.0.0	Report: MRC, RADAR IEC 61162-450 Edition 2.0 Test report
49	MNS-TSR-002	1.0.2	Report: MRC, RADAR IEC 62288 Edition 3.0 Test report
31	MNS-TSR-001-1		Report: MRC, RADAR IEC 62388 Edition 2.0 Test Procedure Parts 6.9.2 & 6.9.3
48	MNS-TSR-001	1.0.3	Report: MRC, RADAR IEC 62388 Edition 2.0 Test report
38	MNS-TSR-006	1.0.0	Report: MRC, RADAR IEC 62923-1 Edition 1.0 Test report
39	MNS-TSR-007	1.0.0	Report: MRC, RADAR IEC 62923-2 Edition 1.0 Test report
14	ANTI12LP/S0001	2012-04-10	Report: SELEX, Radiate Measurements
20	S/N AH100	2008-03-31	Report: SELEX, Radiate Measurements
40	F690501-RF-EMC001335	0	Report: SGS, MDCU-100 series IACS UR E10/ IEC 60945 EMC Test Report

Tests carried out

- Performance testing, IEC 62388 (2013) incl. IEC 62388 Corr.1:2014
- Environmental testing, IEC 60945 (2002) incl. IEC 60945 Corr.1:2008
- Serial interface testing, IEC 61162-1 (2016)
- Serial interface testing, IEC 61162-2 (1998)
- LAN interface testing, IEC 61162-450 (2018)
- Presentation testing, IEC 62288 (2021)
- Bridge Alert Management testing, IEC 62923-1 (2018) and IEC 62923-2 (2018)

Marking of product

The type designation and name and contact address of the manufacturer shall be affixed visibly, legibly and indelibly to the product. In addition the product shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.