

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00007V5

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 Track control system (TCS)

with type designation(s)
MNS-100ET Series

Issued to

MRC Inc.
Busan, Korea, Republic of

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

Regulation (EU) 2022/1157,

item No. MED/4.33. SOLAS 74 as amended, Regulations V/18 & V/19, IMO Res A.694(17), IMO Res MSC.74(69),
IMO Res MSC.191(79), IMO Res MSC.302(87)

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

This Certificate is valid until **2025-07-01**.

Issued at **Høvik** on **2023-02-22**

DNV local unit:
Gimhae Station

Approval Engineer:
Tommi Juhani Rifaat



Notified Body
No.: **0575**

for **DNV AS**

Sverre Olav Bergli
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 1/2019 dated February 22nd, 2019.



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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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

MSN-100ET series Track control system consist of following components,

- MRC Inc.: MNS-100E series ECDIS *and*
- Tokyo Keiki Inc.: Heading Control System HCS-9000 Series *or*
- YDK Technologies Co., Ltd. – Heading Control System PT900D, PT900A and PT900A PLUS

MRC Inc. MNS-100E Series ECDIS

Description	Type	Location
Processor Unit	HTC03-i5-AC-yzzzzzz or HTC03-i7-AC-yzzzzzz	Protected
Display Unit	HD27T22 MMD-MA4-FAGA	Protected
Keyboard & Trackball	NSI KSML106-MC1 Series	Protected
Network Hub	Cisco C9200L-48P-4G-E <i>or</i> HP Aruba Instant 1030 series HPE JL868A	Protected
Mini DP to DP Cable	NVIDIA PNY mini Display Port Male to Display Port Female Adapter 91008582V3	Protected
Power Cable	Hatteland TP52/TC01-1.8M	Protected
Sensor Adapter	Hatteland HT 00262 OPT-A1 (USB to 4x RS422/485)	Protected

Software version: 1.0.x where x is higher than 0

Operating system: Windows 10 Pro 64bit

Tokyo Keiki Inc. Heading Control System HCS-9000 Series

Description	Part Name	Software	Location
Heading Control Unit (HCCPU)	HCCPU	2.xx	Protected
	ADNCT2	1.xx (Adaptive)	Protected
Heading Control Interface unit	HCIFU	2.xx	Protected
Heading Control Terminal Unit	HCTU		Protected
Heading Control Switch Unit	HCSWU		Protected

YDK Technologies Co., Ltd. – Heading Control System PT900D, PT900A and PT900A PLUS

Description	Components	Model	PCB Module	Software versions	Location
AP CDU (Autopilot Control & Display Unit)	MPH490	PT900D or	V8225AV	V8225HU B.xx	Protected
			V8225AF	V8225HX B.xx	Protected
		PT900A or	V8225AD	V8225HV B.xx	Protected
			V8225AG	V8225HY B.xx	Protected
		PT900A PLUS	V8225AW	V8225HW B.xx	Protected
Annunciator unit	MPH690	-	V8225BC	V8225DY B.xx	Protected
System Selector	MPH790	-	-	-	Protected
Mode Selector	MPH791	-	V8225EC	V8225EU B.xx	Protected
MCU (Main control unit)	MPH291	-	V8225BQ	V8225BX B.xx	Protected
			V8225FC	V8225FD B.xx	Protected
NAV I/F unit (Navigation interface unit)	MPT590	-	V8225FT	V8225FU B.xx	Protected

Application/Limitation

- The installation shall be verified and tested onboard according to manufacturers installation instructions.
- Both configurations of MRC TCS complies with the requirements for Category C track control systems (track control along pre-planned straight and through turns).
- The system shall be connected to an alarm transfer system for transfer of back-up navigator alarms.
- The sub-systems (ECDIS and HCS) identified in the product description as well as the heading, speed and positioning sensors being interfaced shall hold a valid type approval certificate.

Type Examination documentation

DNV No	Drw No	Rev	Title
3	MRA000003D		Certificate: DNV, Hatteland Computers
4	MRA0000016	3	Certificate: DNV, Hatteland Monitors
14	MEDB00007V3	1	Certificate: DNV, MRC MSN-100E Series
7	MEDB00003NC	2	Certificate: DNV, Tokyo Keiki HCS-9000 Series
1	MEDB00004F2	4	Certificate: DNV, YDK PT900D, PT900A and PT900A PLUS
16	MNS-MEO-001-ED5		Manual: MNS-100E Series Operating Manual
17	MNS-MET-001-ED5		Manual: MNS-100E Series Technical Manual
19	E11-3094D	2021-12	Manual: Tokyo Keiki, PR-9000-ZZ Operator's Manual
18	IM 80B20T01E	4th Edition	Manual: YDK, PT900 Autopilot system User's Manual
28	MNS-TSE-002	1.0.3	Report: MRC, ECDIS IEC 61162-1 Edition 5.0 Type Approval Test Report
29	MNS-TSE-003	1.0.3	Report: MRC, ECDIS IEC 61162-2 Edition 1.0 Type Approval Test Report
24	MNS-TSE-004	1.0.5	Report: MRC, ECDIS IEC 62288 Edition 2.0 Type Approval Test Report
26	MNS-TSE-006	1.0.2	Report: MRC, ECDIS IEC 62923-1 Edition 1.0 Type Approval Test Report
27	MNS-TSE-007	1.0.1	Report: MRC, ECDIS IEC 62923-2 Edition 1.0 Type Approval Test Report
21	MNS-TSE-012	1.0.0	Report: MRC, TCS IEC 61162-1 Ed. 5.0 Test Report
22	MNS-TSE-013	1.0.0	Report: MRC, TCS IEC 61162-2 Ed. 1.0 Test Report
8	MNS-TSE-015	1.0.2	Report: MRC, TCS IEC 62065 Ed. 2.0 Test Procedure - TKI
11	MNS-TSE-008	1.0.2	Report: MRC, TCS IEC 62065 Ed. 2.0 Test Procedure - YDK
20	MNS-TSE-011	1.0.0	Report: MRC, TCS IEC 62288 Ed. 2.0 Test Report
12	MNS-TSE-009	1.0.0	Report: MRC, TCS IEC 62923-1 Ed. 1.0 Test Procedure - YDK
10	MNS-TSE-017	1.0.0	Report: MRC, TCS IEC 62923-2 Ed. 1.0 Test Procedure - TKI
9	MNS-TSE-016	1.0.0	Report: MRC, TCS IEC 62923-1 Ed. 1.0 Test Procedure - TKI
13	MNS-TSE-010	1.0.0	Report: MRC, TCS IEC 62923-2 Ed. 1.0 Test Procedure - YDK

Tests carried out

- Performance testing, IEC 62065 (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)
- Presentation testing, IEC 62288 (2014)
- 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.