EC TYPE EXAMINATION (MODULE B) CERTIFICATE (EC-US MRA)

No. **03-001827/031537**

THIS IS TO CERTIFY:

That Croatian Register of Shipping did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with requirements of Marine Equipment Directive (MED) 2014/90/EU, subject to any conditions in the schedule attached hereto.

TYPE AND DESCRIPTION OF PRODUCT

SIMRAD R5000 Radar System

NUMBER AND ITEM DESIGNATION (in accordance with Annex of Regulation (EU) 2020/1170)

MED/4.36 – Radar equipment CAT 3

MANUFACTURER:

NAVICO RBU ITALIA S.r.l.
Via Romita 26, 50025 Montagnana VP, Firenze – ITALY

REGULATIONS AND STANDARDS (in accordance with Annex of Regulation (EU) 2020/1170)

SOLAS 1974 as amended, Reg. V/18, Reg. V/19

IMO Res.A.278(VIII), IMO Res.A.694(17), IMO Res.MSC.191(79), IMO Res.MSC.192(79), IMO Res.MSC302(87) and ITU-R M.1177-4(04/11).

USCG Module B number: 165.117/EC2489/03-001827 *(see application/limitation of use)*

NOTICE:

1. Further details of the product and conditions for certification are given overleaf.
2. This certificate will not be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with the notified body named on this certificate.
3. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply.
4. 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-control phase module (D, E, or F) of Annex II of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
5. In case limitations of use apply, these should be indicated of in the Schedule of Approval.
6. This product has been assigned **U.S. Coast Guard Module B number** in accordance with the European Council Decision 2004/425/EC dated 21 April 2004 on the conclusion of an Agreement between the European Community and the United States of America on Mutual Recognition of Certificates of Conformity for Marine Equipment, as amended by Decision No.1/2018 of the Joint Committee established by the Agreement of the European Community and the United States of America of 18 February 2019.

Issued by Croatian Register of Shipping, notified body number 2489.

This certificate is valid until: **2025-07-15**

Place and date: Split, 2021-07-15 Seal

Signature
Marinko Popović, dipl.ing.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

SIMRAD R5000 Radar System consists of the different components:
This is stated in the Annex 1 to this EC type examination (Module B) certificate – 03-001827/031537.
System may be configured in accordance with correlation table:
This is stated in the Annex 2 to this EC type examination (Module B) certificate – 03-001827/031537.

2. APPLICATION/LIMITATION OF USE

SIMRAD R5000 Radar System is found to comply with the Radar carriage requirements for different kind of vessels in all three categories CAT 3, CAT 2, CAT 1 as well as for HSC vessels:

	CAT 3	***CAT 2***	***CAT 1***
Minimum operational display area diameter	*180 mm*	*250 mm*	*320 mm*
Auto acquisition of targets	*Yes*	*Yes*	*Yes*
Minimum acquired radar target capacity (actual)	*20 (100)*	*30 (100)*	*40 (100)*
Minimum activated AIS target capacity (actual)	*20 (100)*	*30 (100)*	*40 (100)*
Minimum sleeping AIS target capacity (actual)	*100 (300)*	*150 (300)*	*200 (300)*
Minimum total AIS target and reports capacity (actual)	*120 (300)*	*180 (300)*	*240 (300)*
Trial manoeuvre	*Yes*	*Yes*	*Yes*

This product has been assigned U.S. Coast Guard Approval Category for the Radar Equipment with Automatic Radar Plotting Aid (ARPA), Radar Equipment with Automatic Tracking Aid (ATA) as well as Radar Equipment with Electronic Plotting Aid (EPA).
However the manufacturer must obtain the Federal Communication Commission (FCC) certification on the Radar System before installation on board the U.S. vessel.
The R5000 radar system is tested for compliance with BAM requirements – IMO Res.MSC.302(87).
Communication with ship's VDR is provided by DVI video display and IEC 61162-450 network interface.

3. DESIGN DRAWINGS AND SPECIFICATIONS

GENERAL DESCRIPTION OF THE SYSTEM - Simrad R5000 Radar Line,
R5000 S-BAND DOWN-MAST RADAR SYSTEM (Block Diagram) - 992-24490-00,
R5000 S-BAND UP-MAST RADAR SYSTEM (Block Diagram) - 992-24491-00,
R5000 X-BAND DOWN-MAST RADAR SYSTEM (Block Diagram) - 992-24492-00,
R5000 X-BAND UP-MAST RADAR SYSTEM (Block Diagram) - 992-24493-00.

TECHNICAL MANUALS:

R5000 - Commissioning manual - 988-12293-003,
R5000 - Operator Manual - 988-12294-003,
R5000 - Quick reference guide - 988-12280-001,
R5000 - Quick guide multilingual - 988-12281-001,
R5000 - PSU installation guide - 988-12284-003,
R5000 - System installation manual - 988-12283-003,
R5000 - Processor installation manual - 988-12282-003,
R5000 - Installation manual, S-band down-mast SRT-LAN radar sensor - 988-12285-003,
R5000 - Installation manual, S-Band up-mast SRT-LAN radar sensor - 988-12287-003,
R5000 - Installation manual, X-Band down-mast SRT-LAN radar sensor - 988-12289-003,
R5000 - Installation manual, X-Band up-mast SRT-LAN radar sensor - 988-12291-003,
R5000 - Service manual X-Band down-mast SRT-LAN radar sensor - 988-12290-003,
R5000 - Service manual X-Band up-mast SRT-LAN radar sensor - 988-12292-005,
R5000 - Service manual, S-Band down-mast SRT-LAN radar sensor - 988-12286-002,
R5000 - Service manual, S-Band up-mast SRT-LAN radar sensor - 988-12288-003,
R5000 – Installation guide, EDS-405A managed switch - 988-12834-001.

4. TYPE TEST RECORDS/LABORATORY RECOGNITION STATUS

Performance testing – IEC 62388 Ed. 2.0 (2013-06), CRS witness test – Montagnana, September 2018;
Presentation of navigation information – IEC 62288 Ed. 2.0 (2014-07), CRS witness test – Montagnana, September 2018;
Serial interface testing – IEC 61162-1(2016) & IEC 61162-2 Ed. 1.0 (1998), CRS witness test – Montagnana, September 2018;
Environmental testing – IEC 60945 Ed. 4.0 (2002-08) including Corrigendum 1(2008);
CRS letter of approval – 2211/TSE/VB/031362 dated 2018-09-27;
Bridge alert management testing – IEC 62923-1 Ed. 1.0 (2018) & IEC 62923-2 Ed. 1.0 (2018), Montagnana, June 2021;
Serial interfaces testing – IEC 61162-450 Ed. 2.0 (2018), Montagnana, June 2021;
CRS letter of approval – 1467/TSE/NP/031537 dated 2021-07-12.

5. MATERIALS OR COMPONENTS REQUIRED TO BE TYPE APPROVED OR TYPE TESTED

This approval remains valid for subsequent minor software amendments, as allowed by the SW numerical format.
Written details of any such modification shall be submitted to and accepted by the approvals authority.

6. OTHER MATERIALS AND/OR COMPONENT

Antennas installations on board HSC vessels include S-Band 12ft antenna and X-Band 6ft and 9ft antennas only.
The system can be equipped with antenna group heaters to work in extreme cold environment up to -40°C.

7. PRODUCTION SURVEY REQUIREMENTS

The manufacturer is allowed to affix the Mark of Conformity to equipment referred and to issue a Declaration of Conformity as long as either of the following is fulfilled:

Module D – The quality system for production and testing shall be approved by the Notified Body.

8. ONBOARD INSTALLATION AND MAINTENANCE REQUIREMENTS

The installation on board shall be verified and tested according to Installation & Operation Manual.

9. MARKING AND IDENTIFICATION

xxxx/yy

Subject to compliance with the conditions in this Schedule of Approval which forms part of certificate, and those of Articles 9, 10 and 15 of the Directive, the Manufacturer is allowed to affix the "Mark of Conformity" to the Product described herein.

xxxx - the number of the Notified Body undertaking surveillance module(2489 in case of CRS)
yy - the last two digits of year mark affixed

This product has been assigned US Coast Guard Module B number **165.117/EC2489/03-001827**. In those instances where the Notified Body conducting the conformity assessment in accordance with either Module D, E or F of the Marine Equipment Directive is not CRS, such Notified Body would use the above U.S. Coast Guard Module B number to provide the manufacturer with the U.S. Coast Guard approval number by noting it on the Certificate of Conformity, thereby authorizing the manufacturer to mark the product accordingly.

10. OTHER

SOFTWARE:

Transceiver	*Application*
6.1.0.xxx	*1.1.xx*

APPENDIX – TYPE EXAMINATION DOCUMENTATION AND TEST REPORTS

Document title	*Identification number*	*Revision index*
R5000 Radar Processor + O2000 + Trackball + M5027 + R5000 PSU – IEC60945 Ed. 4.0, *Test Report – Končar Institute*	*21580ALL18057en*	*26.07.2018.*
Limited Testing of the R5000 SRT X-Band and S-Band Radar systems – IEC62388 Ed. 2.0, *Test Report – TUV SUD*	*75942092 Report 01 Issue 1*	*September 2018*
Annex to TUV SUD Report, Navico RBU	*DRP-FLR-SI-20180920-01*	*20.09.2018.*
Optic tests Display Simrad 27" – INOA	*3F-RT16008*	*July 22, 2016*
Optic tests Display Simrad 24" – INOA	*3F-RT14009*	*Sept 26, 2014*
Optic tests Display Simrad 19" – INOA	*3F-RT14008*	*Sept 26, 2014*
Optic tests Display Simrad 16" – INOA	*3F-RT14007*	*Sept 26, 2014*
Wind Tunnel Test on a Radar Scanners *X-Band with 12 ft, 9 ft, and 6 ft antenna* *S-Band with 12 ft antenna,* *Test Report – Politecnico di Milan*	*058/16PC*	*July, 26th 2016*
Antenna_Diagram_and_Gain_12 ft S-Band ant. *Test Report – SELEX GALILEO*	*ANT12LP/S0001*	*10/04/2012*
CETECOM – Test report S-BAND UP MAST	*1-3423-11-01-10*	*2012-05-23*
CETECOM - Test report S-BAND UP MAST	*2-3052-01-02/02*	*25.11.2002*
CETECOM - Test report X-BAND	*4-2638-01-04/07*	*10.08.2007*
CETECOM Report – *Unwanted_emission_of_S-Band Up Mast Transeciver*	*1-3423/11-01-10*	*2012-05-23*
SRT 12/002 – SRT 25/002 X-Band Up-Mast, *Test report – BSH*	*BSH/4543/001/4342903/15*	*February 9, 2015*
Test Report on 6ft X-Band antenna *Test Report – FINMECCANICA*	*TR 20160314*	*March 14, 2016*
Test report on 12ft X-Band antenna *Test Report – SELEX GALILEO*	*AH100*	*March 31, 2008*
12 ft S-Band Antenna diagram and gain	*ANT12LP–S0001*	*April 10, 2012*
OP40 / O2000 Keyboard – Buzzer test to (IEC 62388 ed.2), Navico Auckland, NZ	*DRP-AU-ME-2016-09-30*	*July 25, 2016*
R5000 Radar System - *waivers to IEC 60945 ed 4.0* *Paragraf 8.10 – Solar radiation* *Paragraf 8.12 – Corrosion/salt mist* *Paragraf 12.3 – Emission from visual displays,* *Paragraf 12.4 – X-Radiation*	*NAVICO RBU*	*13.09.2018.*
CETECOM – Test report KEYB-002 radar keyboard	*1-6492/13-01-02-A* *1-6492/13-01-03-A*	*07.11.2013.* *21.11.2013.*
NAVICO – Test Report on IEC 61162-450 (2018), IEC 62923-1 (2018) and IEC 62923-2 (2018), CRS witnessed, 2021-06-28	*Navico TestLink*	*27.06.2021.* *28.06.2021.*

- END OF CERTIFICATE -

ANNEX 1 TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No.: 03-001827/031537

R5000 RADAR SYSTEM COMPONENTS

No	*Designation*	*Unit Description*	*Type Number*
1.1	*X-Band Antenna*	*a) 6 ft. X-BAND ANTENNA* *b) 9 ft. X-BAND ANTENNA* *c) 12 ft. X-BAND ANTENNA*	*000-10324-001* *000-10325-001* *000-10875-001*
2.1	*X-Band Transceiver (up-mast)*	*a) 12kW SRT X-BAND LAN TRANSCEIVER* *b) 12kW SRT X-BAND LAN TRANSCEIVER FOR 12FT* *c) 25kW SRT X-BAND LAN TRANSCEIVER* *d) 25kW SRT X-BAND LAN TRANSCEIVER FOR 12ft. ANT*	*000-14939-001* *000-13218-001* *000-13219-001* *000-13221-001*
2.2	*X-Band Transceiver (up-mast) HSC*	*a) 12kW SRT X-BAND LAN TRANSCEIVER HSC* *b) 25kW SRT X-BAND LAN TRANSCEIVER HSC*	*000-13217-001* *000-13220-001*
2.3	*X-Band Transceiver (down-mast)*	*X-BAND SRT 25 KW DOWN-MAST W/DOC*	*000-13319-001*
3.1	*S-Band Antenna*	*12 ft. S-BAND ANTENNA*	*000-11250-001*
4.1	*S-Band Transceiver (up-mast)*	*30kW SRT S-BAND LAN TRANSCEIVER*	*000-13222-001*
4.2	*S-Band Transceiver (up-mast) HSC*	*30kW SRT S-BAND LAN TRANSCEIVER HSC*	*000-13223-001*
4.3	*S-Band Transceiver (down-mast)*	*S-BAND SRT 30 KW DOWN-MAST W/DOC*	*000-13322-001*
5.1	*X-Band Antenna Pedestal*	*a) X-BAND SRT ANT PEDESTAL (6&9 ft.) W/DOC* *b) X-BAND SRT ANT PEDESTAL (12 ft.) W/DOC*	*000-13316-001* *000-13318-001*
5.2	*X-Band Antenna Pedestal HSC*	*X-BAND SRT ANTENNA PEDESTAL (6&9 ft.) HSC*	*000-13317-001*
6.1	*S-Band Antenna Pedestal*	*S-BAND SRT ANTENNA PEDESTAL W/DOC*	*000-13320-001*
6.2	*S-Band Antenna Pedestal HSC*	*S-BAND SRT ANTENNA PEDESTAL HSC W/DOC*	*000-13321-001*
7.1	*Display Unit 180 mm PPI*	*a) SIMRAD M5016 MONITOR* *b) SIMRAD M5019 MONITOR*	*000-12209-001* *000-12210-001*
8.1	*Display Unit 250 mm PPI*	*SIMRAD M5024 MONITOR*	*000-11781-001*
9.1	*Display Unit 320 mm PPI*	*SIMRAD M5027 MONITOR*	*000-12726-001*
10.1	*Control Unit*	*a) O2000 RADAR CONTROLLER* *b) O5000 TRACKBALL* *and/or* *c) KEYB-002 MULTI-FUNCTIONAL KEYBOARD*	*000-13958-001* *000-14278-001* *000-12450-001*
11.1	*Processor Unit*	*R5000 RADAR PROCESSOR*	*000-13216-001*
12.1	*Power Unit*	*R5000 220VAC/48VDC POWER SUPPLY*	*000-13225-001*
12.2	*Power Supply Kit*	*O2000 ACCESSORY PACK*	*000-14606-001*
13.1	*Network Unit*	*EDS-405A MANAGED SWITCH*	*000-15936-001*

ANNEX 2 TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE
No.: 03-001827/031537

R5000 RADAR SYSTEM CONFIGURATION TABLE

Radar Cat.	Type of Radar / Designation / No.	1.1 X-Band Antenna	2.1 X-Band Transceiver (upmast)	2.2 X-Band Transceiver (upmast) HSC	2.3 X-Band Transceiver (downmast)	3.1 S-Band Antenna	4.1 S-Band Transceiver (upmast)	4.2 S-Band Transceiver (upmast) HSC	4.3 S-Band Transceiver (downmast)	5.1 X-Band Antenna Pedestal	5.2 X-Band Antenna Pedestal HSC	6.1 S-Band Antenna Pedestal	6.2 S-Band Antenna Pedestal HSC	7.1 Display Unit 180 mm PPI	8.1 Display Unit 250 mm PPI	9.1 Display Unit 320 mm PPI	10.1 Control Unit	11.1 Processor Unit	12.1 Power Unit	13.1 Network Unit
CAT 1	SIMRAD R5027 25D/**n**X	X			X					X						X	X	X	X	X
	SIMRAD R5027 25U/**n**X	X	X													X	X	X	X	X
	SIMRAD R5027 12U/**n**X	X	X													X	X	X	X	X
	SIMRAD R5027 30D/12S					X			X			X				X	X	X	X	X
	SIMRAD R5027 30U/12S					X	X									X	X	X	X	X
CAT 1H	SIMRAD R5027 25D/**m**X HSC	X			X						X					X	X	X	X	X
	SIMRAD R5027 25U/**m**X HSC	X		X												X	X	X	X	X
	SIMRAD R5027 12U/**m**X HSC	X		X												X	X	X	X	X
	SIMRAD R5027 30D/12S HSC					X			X				X			X	X	X	X	X
	SIMRAD R5027 30U/12S HSC					X		X								X	X	X	X	X
CAT 2	SIMRAD R5024 25D/**n**X	X			X					X					X		X	X	X	X
	SIMRAD R5024 25U/**n**X	X	X												X		X	X	X	X
	SIMRAD R5024 12U/**n**X	X	X												X		X	X	X	X
	SIMRAD R5024 30D/12S					X			X			X			X		X	X	X	X
	SIMRAD R5024 30U/12S					X	X								X		X	X	X	X
CAT 2H	SIMRAD R5024 25D/**m**X HSC	X			X						X				X		X	X	X	X
	SIMRAD R5024 25U/**m**X HSC	X		X											X		X	X	X	X
	SIMRAD R5024 12U/**m**X HSC	X		X											X		X	X	X	X
	SIMRAD R5024 30D/12S HSC					X			X				X		X		X	X	X	X
	SIMRAD R5024 30U/12S HSC					X		X							X		X	X	X	X
CAT 3	SIMRAD R50zz 25D/**n**X	X			X					X				X			X	X	X	X
	SIMRAD R50zz 25U/**n**X	X	X											X			X	X	X	X
	SIMRAD R50zz 12U/**n**X	X	X											X			X	X	X	X
	SIMRAD R50zz 30D/12S					X			X			X		X			X	X	X	X
	SIMRAD R50zz 30U/12S					X	X							X			X	X	X	X

Note : *1) **m**X = 6X or 9X*
*2) **n**X = 6X, 9X or 12X*
3) R50zz = R5016 or R5019