



TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MERB000013U
Revision No:
0

This Certificate is issued by DNV UK Limited based on authorisation of the Maritime & Coast Guard Agency (MCA) as an UK Approved Body to undertake conformity assessments on marine equipment in accordance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016 as amended.

This is to certify:

That the Radar equipment

with type designation(s)
K-Bridge Radar, K-Bridge Radar Standalone

Issued to
Kongsberg Maritime AS
Kongsberg, Norway

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

Regulation **MSN 1874 Amendment 9**,
item No. UK/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 **2028-12-19**.

Issued at **London** on **2024-10-14**

DNV local unit:
East & South Norway CMC



for **DNV UK Ltd.**

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**Maritime &
Coastguard
Agency**

UK Approved Body Authorised
by the MCA

This certificate will not be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with the approved body named on this certificate.

During the period of validity of this certificate the applicable regulations (international conventions and the relevant resolutions and circulars of the IMO) and testing standards may change, therefore the product conformity may need to be re-assessed by the Approved 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-control phase module (D, E or F) of Schedule 2 of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended is fully complied with and controlled by a written inspection agreement with an approved body. In case limitations of use apply, these should be indicated in the Annex.

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

Kongsberg Maritime Radar is available in two versions:

1. K-Bridge Radar, with support for Multi-Function Display (MFD) in combination with other K-Bridge systems or
2. K-Bridge Radar Standalone, without MFD functionality

K-Bridge Radar system comprises:

<u>Item:</u>	<u>Model/Type:</u>
• K-Bridge Operator Station	: As defined in separate certificate*)
• Software Modules	: As defined in separate certificate*)
• Radar Interface:	
Radar Interface Network	: RIN rev A or rev C
Ethernet switch	: Moxa EDS-G509
• Transceivers and Antenna Units	: Ref details below for alternatives

K-Bridge Radar Standalone system comprises:

<u>Item:</u>	<u>Model/Type:</u>
• K-Bridge Standalone Operator Station	: As defined in separate certificate*)
• Software Modules	: As defined in separate certificate*)
• Radar Interface:	
Radar Interface Network	: RIN rev A or rev C
Ethernet switch	: Moxa EDS-G509
• Transceivers and Antenna Units	: Ref details below for alternatives

The K-Bridge Radar and K-Bridge Radar Standalone can be delivered in K-Bridge Console KM05 or as built-in version for other consoles incl. KM18

*) Certificate TAA00000FJ for K-Bridge and K-Bridge Standalone system platforms (see Type Examination documentation below) in its latest revision at the date of placing the system on the market is part of this certificate. For the relevant revision see also <https://approvalfinder.dnv.com/>.

Transceivers and Antenna Units, Northrop Grumman Sperry Marine:

<u>Transceivers:</u>		<u>See Notes*:</u>
X-band Transceiver/Turning Unit (10kW)	Type 65910#A#	1, 2, 3, 6
or Transceiver/Bulkhead (10kW)	Type 65810A,B,E,F,G,H,L,P,T or W	6
X-band Transceiver/Turning Unit (25kW)	Type 65925#A#	1, 2, 3, 6
or Transceiver/Bulkhead (25kW)	Type 65825A,B,E,F,G,H,L,P,T or W	6
Turning unit X-band (w/Bulkhead Tx)	Type 65901BAR or CA#	2, 3, 6
S-Band Transceiver/Turning Unit (30kW)	Type 65830M\$R or N\$#	3, 4, 6
or Transceiver/Bulkhead (30kW)	Type 65831A or B	
Turning unit S-band (w/bulkhead Tx)	Type 65830B\$# or C\$#	3, 4, 6
Scanner Control unit S-band	Type 65837A#	5, 6
 <u>Antenna Units:</u>		
Array 12' S-unit	Type 65612A	6
Array 8' X-unit	Type 65608A	6
Array 6' X-unit	Type 65606A	6

Notes *:

1. A 1st. letter (#) suffix (M,N,P,T or W) is used to denominate the choice Bias limiter, Extra short pulse transmit or Additional facilities.
2. This item is link selectable on installation to 24 or 48 RPM antenna rotation speed.
3. A 3rd letter (#) suffix (R,T or U) is used for denote the choice of pulse and/ or syncro azimuth signal.
4. A 2nd letter (§) suffix (E,F,G,H,J,K,L,M,P,Q,R or S) is used to denote the choice of operating voltage and 24 or 48 RPM antenna speed.
5. A 2nd letter (ø) suffix (B,C,E,F or H) is used to denote the choice of operating voltage and 24 or 48 RPM antenna speed.
6. The type number may be followed by suffix /KM.

Transceivers Units with Antenna, JRC:

X-band Transceiver (10kW), 27 rpm, 6ft antenna or	Type	NKE-2103-6/KM
X-band Transceiver (25kW), 24 rpm, 9ft antenna or	Type	NKE-1125-9/KM
S-Band Transceiver (30kW), 24 rpm, 12ft antenna or	Type	NKE-1130-12S/KM
S-band Transceiver, Solid State (250W), 24 rpm, 8ft antenna or	Type	NKE-2632-8S/KM
X-band Transceiver, Solid State (600W), 24 rpm, 6ft antenna or	Type	NKE-1696-6/KM
X-band Transceiver, Solid State (600W), 24 rpm, 9ft antenna	Type	NKE-1696-9/KM

Transceivers Units with Antenna for HSC, JRC:

X-band Transceiver (10kW), 48 rpm, 6ft antenna or	Type	NKE-2103-6-HS/KM
S-band Transceiver, Solid State (250W), 48 rpm, 8ft antenna	Type	NKE-2632-8S-H/KM

Application/Limitation

- The K-Bridge Radar and K-Bridge Radar Standalone meet the requirements for Radar with Chart option for CAT 1, CAT 2, CAT 1H and CAT 2H, subject to display size and transceiver types applied in the installation:
 - Minimum display size for CAT 1 and CAT 1H is 27", minimum display size for CAT 2 and CAT 2H is 24".
 - Transceivers for CAT 1H and CAT 2H: See Transceivers Units with Antenna for HSC, JRC in Appendix below.
- The installation shall be installed and tested on board according manufacturers manuals. See Type Examination documentation below for details.
- The K-Bridge Radar meets the requirements for Multi-Function Display (MFD) when connected in a KM network. The MFD may serve as Radar, ECDIS, back-up ECDIS, HCS, TCS and BNWAS.
- K-Bridge Radar and K-Bridge Radar Standalone with Radar Interface Network (RIN) is equivalent to an inter-switch facility required by DNV Rules Pt.6 Ch.3 Sec. 3 and Sec. 5.
- K-Bridge Radar and K-Bridge Radar Standalone is found to comply with the requirements for binary image transfer to VDR as defined in IEC 61162-450 (2018) and IEC 61996-1 (2013)

Note

- K-Bridge Radar Standalone has previously been designated K-Nav Radar. References to K-Nav Radar in previously issued documentation or certificates should therefore be considered valid also for K-Bridge Radar Standalone.

Tests carried out

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

Type Examination documentation

DNV No	Document ID	Rev	Description
388	110-0072553	A	Report: Kongsberg Maritime, Solid-State JRC X-Band Radar Transceiver Type Approval Test Report
387	455906	A	Manual: Kongsberg Maritime, ECDIS and Radar Display Distances, Installation Manual
386	110-0061458	A	Manual: Kongsberg Maritime, K-Bridge Radar Standalone, Operator Manual, Release 9.1
385	110-0054820	A	Manual: Kongsberg Maritime, K-Bridge Radar, Operator Manual, Release 9.1
384	110-0052052	A	Report: Kongsberg Maritime, K-Bridge test Report IEC 62288 Ed.3 (2021)
382	470337	D	Manual: Kongsberg Maritime, RIN JRC 230VAC IP66, Installation Manual
381	470318	B	Manual: Kongsberg Maritime, RIN JRC 230VAC IP66, Maintenance Manual
380	454440	B	Manual: Kongsberg Maritime, AIS 300 option, Operator Manual
379	RD21ZZ0618A	1.0	Report: JRC, Wind tunnel test report for NKE-1696-9
378	QINETIQ/MARTIME/TSTR2100654	1.1	Report: QinetiQ, Unwanted emissions measurement of NKE-1696 radar system
375	75953086 Report 01	Issue 1	Report: TÜV SÜD, Environmental test report for radar system incl NKE-1696
374	21-370 (E)	2021-11-11	Report: RIME, Compass safe distance test report for Marine Radar scanner unit NKE-1696
373	JPX-TR-21285-0	2021-11-15	Report: TÜV SÜD, EMC test report for radar incl NKE-1696 scanner unit
371	110-0004215	A	Report: Kongsberg Maritime, K-Bridge v9 HMI Test Report
368	463763	F	Manual: Kongsberg Maritime, KM Marine Radar Scanner, Maintenance Manual
367	463736	F	Manual: Kongsberg Maritime, KM Marine Radar Scanner, Installation Manual
366	477915	C	Report: Kongsberg Maritime, K-Bridge and K-NAV CAM BAM Type Approval Test report
365	480424	A	Report: Kongsberg Maritime, K-Bridge/K-Nav VDR communication IEC61162-450:2018 Type Approval Report
364	476824	A	Report: Kongsberg Maritime, Radar HSC Test Report
363	462698	C	Report: Kongsberg Maritime, JRC Radar Transceiver Test Report
362	R07002/ R07003/ R07004/ R07005/ R07006/ R07007	2007-08-14	Report: JAEA, Wind Tunnel Test Report for NKE-1130-12, NKE-1125-9, NKE-2103-6, NKE-2103-6HS
360	YN0801004-3	2008-03-28	Report: Chemitox, EMC Immunity test report for marine radar JMA-9123-9XA (NKE-1129, NTG-3225=NKE-1125 variant)
359	YN0801004-1	2008-03-13	Report: Chemitox, EMC Immunity test report for marine radar incl NKE-1130
357	YN0712004-1	2008-02-27	Report: Chemitox, EMC Emission test report for marine radar JMA-9123-9XZ (NKE-1129, NTG-3225=NKE-1125 variant)
356	YN0712002-1	2008-12-18	Report: Chemitox, EMC Emission test report for marine radar JMA-5332-12(NKE-1130)

DNV No	Document ID	Rev	Description
355	YN0709007-1	2008-01-31	Report: Chemitox, EMC Emissions test report for marine radar incl NKE-2103
354	YN0709007-11	2008-01-28	Report: Chemitox, EMC Immunity test report for marine radar JMA-9110-6XAH (NKE-2103)
353	YN0708005-1	2007-12-07	Report: Chemitox, EMC Emission test report for JMA-5312-6HS (NKE-2103)
352	YN0708005-12	2008-03-28	Report: Chemitox, EMC Immunity test report for NKE-2103 and NJU-85
350	YN0706005-1	2007-11-13	Report: Chemitox, EMC Emission test report for marine radar JMA-7110-6XAH (NKE-2103)
349	YN0706005-13	2007-12-11	Report: Chemitox, EMC Immunity test report for AC-DC converter unit, scanner unit and performance monitor unit (NBA-5135, NKE-2103, NJU-85)
346	QINETIQ/14/00249	1.1	Report: QinetiQ, Unwanted emission test report for S-band radar JRS(S)402, ITU-R M1177 (NKE-2632HS)
345	QINETIQ/EMEA/TS/C R0803478/2	2008-02	Report: QinetiQ, Unwanted emission test report for JRC(S)200, JRC(X)200 and JRC(X)201, ITU-R_M1177 (NKE-1130, 2103, 1125)
340	13-326(E)	2013-10-15	Report: Research Institute of Marine Engineering, Compass Safe Distance Measurement, NKE-2103, NKE-2632 and NKE-2632-H
339	07-511(E)	2008-01-31	Report: Research Institute of Marine Engineering, Compass Safe Distance Measurement, NKE-2103, NKE-1125 and NKE-1130 Scanner Units
337	Z071C-13420	2013-12-11	Report: TÜV SÜD, Environmental testing of JRC JMR-9272S, JMR-9282-SH, JMR-7272S, JMR-7282SH Radars, IEC 60945 (incl NEK-1632, NKE-2632H)
334	75923142 Report 05	Issue 3	Report: TÜV SÜD, Environmental testing of JRC JMR-9200 Series Radar Scanners, IEC 60945 and IEC 62388 (2007) (NKE-2632 NKE-1632)
333	75923142 Report 01	Issue 3	Report: TÜV SÜD, Environmental testing of JRC JMR-9200 Series Radar, IEC 60945 (NKE-1130 and aux equipment)
331	75901288 Report 03	Issue 1	Report: TÜV SÜD, Limited Type Approval testing of JRC JMA-9100 Radar System, IEC 60945 (NKE-1130, NKE-1125-9)
330	75901288 Report 02	Issue 1	Report: TÜV SÜD, Limited Type Approval testing of JRC JMA-7100 Radar System, IEC 60945 (NKE-1125-9, NKE-1130)
329	75901288 Report 01	Issue 1	Report: TÜV SÜD, Limited Type Approval testing of JRC JMA-5300 Mk2 Radar System, IEC 60945 and IEC 62388 CDV (2006-11) (NKE 2103-6-HS)
328	QINETIQ/14/01532	1.2	Report: QinetiQ, Unwanted emission measurement of JRC S-band radar NKE-2632
327	QINETIQ/14/01531	1.1	Report: QinetiQ, Unwanted emission measurement of JRC S-band radar NKE-2632-H
318	429330	H	Manual: Kongsberg Maritime, K-Nav Radar, Operator Manual, Release 8.2
317	429323	O	Manual: Kongsberg Maritime, K-Bridge Radar, Operator Manual, Release 8.2
316	430413	A	Manual: Kongsberg Maritime, S-band Scanner Assembly, Upmast, Installation Manual
315	421510	A	Manual: Kongsberg Maritime, X-band Radar Scanner Unit, Installation Manual
314	397564	B	Manual: Kongsberg Maritime, RIN Sperry 230 VAC IP66 Rev. C, Installation Manual
313	394356	B	Manual: Kongsberg Maritime, K-Bridge Built-in 3rd Party WS MK3 RoLAN Operator Station, Maintenance Manual
312	394343	C	Manual: Kongsberg Maritime, K-Bridge Built-in 3rd Party WS MK3 RoLAN Operator Station, Installation Manual
311	418199	B	Report: Kongsberg Maritime, Test report for K-Bridge CCRS -Clause 6

DNV No	Document ID	Rev	Description
310	415226	A	Report: Kongsberg Maritime, K-Bridge & K-Nav Radar Type Approval Test report, IEC 62388 (2013), IEC 62288 (2014) and IEC 61162 (2010)
307	OObEvidenceFor62388Ed2	2	Report: NGSIM, Assessment report for S- and X-band radar towards IEC62388 Ed2.0
306	399058	B	Manual: Kongsberg Maritime, Installation Manual for K-NAV Radar
304	399059	B	Manual: Kongsberg Maritime, Maintenance Manual for K-NAV Radar
303	401092	A	Report: Kongsberg Maritime, Protocol tests on interface for K-NAV Radar
301	QinetiQ/MS/EES/TST R0801808/1	2008-08-29	Report: QinetiQ, Environmental test report for 65925 X Band turning unit
298	396352	A	Drawing: Kongsberg Maritime, RIN Sperry 230VAC IP66 Copper
297	396351	A	Drawing: Kongsberg Maritime, RIN Sperry 230VAC IP66 Fibre
288	DANAK-19/12398	1	Report: Delta, Environmental test report for Radar Interface Network (RIN)
287	393373	A	Report: Kongsberg Maritime, RoLAN Radar Functionality, Type Approval performance test report
286	393352	A	Report: Kongsberg Maritime, RoLAN network test report
285	387381	A	Report: Kongsberg Maritime, RoLAN Target tracker Scenario 1 test report
283	346867	C	Manual: Kongsberg Maritime, Radar turning unit (S-band, upmast), Installation manual
282	346861	C	Manual: Kongsberg Maritime, Radar turning unit 25kW (X-band, upmast), Installation manual
281	331489	A	Manual: Kongsberg Maritime, Guidelines for the installation of shipborne radar equipment
280	300552	G	Manual: Kongsberg Maritime, Radar sensors (Decca), Maintenance manual
274	352102	A	Manual: Kongsberg Maritime, Radar cable kit 67m (S-band), Installation manual
273	347015	A	Manual: Kongsberg Maritime, Radar cable kit 67m (X-band), Installation manual
272	TAA000006N	4	Certificate: DNV, Moxa EDS series ethernet switches, KM Doc. No 427138/F
271	TAA00000FJ	Latest rev.	Certificate: DNV, K-Bridge and K-Nav system platforms
242	328811/P	2010-03-05	Report: Kongsberg Maritime, K-Bridge Radar test procedure
218	QINETIQ/FST/CMT/TR022173	March 2002	Report: QinetiQ, Unwanted Emissions Measurements of a Litton Marine X Band Navigation Radar
216	QINETIQ/D&TS/SES/TC0609653	1.0	Certificate: QinetiQ, Certificate of Test, 30 kW Turning Unit and Scanner Control Unit
215	DERA/SS/WI/R/TT-22/97	Oct 1998	Report: DERA, Page 2 of Appendix B from DERA/SS/WI/R/TT-22/97
214	DERA/SSWI/R/TT-12/97	Oct 1998	Report: DERA, Extracted page from report DERA/SSWI/R/TT-12/97
212	QINETIQ/S&E/SPS/C R050588/1.0	1.0	Report: QinetiQ, BME in FST Pedestal
211		2009-11-20	Report: Prediktor, Radar Tracking Report, date 2009-11-20
209	DERA/SSWI/R/TT-12/97	1.0	Report: DERA, Type testing of Bridgemaster II Series S-Band
208	DERA/SS/CI/R/TT-20/98/1.1	1.1	Report: DERA, Type testing of Bridgemaster E Series Radar Equipment
207	QINETIC/MS/EES/TS TR0801152/ 1.1	1.1	Report: QinetiQ, Performance Compliance Testing
35	KLM1.00.0061 Rev B	B	Report: Kongsberg Fimas, Environmental Test Report Verification Test on AIM Safe System



Job Id: **AA004WJB**
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Revision No: **0**

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.