

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

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 GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:

That the Radar equipment CAT 1C

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

Issued to
Kongsberg Maritime AS
KONGSBERG, Norway

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2015/559,**
Annex A.1, item No. A.1/4.38 and Annex B, Module B in the Directive; SOLAS 74 as amended,
Regulation V/18, IMO Resolutions A.278(VIII), A.694(17), MSC.191(79), MSC.192(79) and
ITU-R M.1177-4 (04/11)
IMO Resolution MSC.302(87) Performance standards for Bridge Alert Management

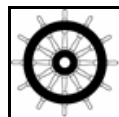
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2022-01-30**.

Issued at **Høvik** on **2017-01-31**

DNV GL local station:
Sandefjord

Approval Engineer:
Steinar Kristensen



Notified Body
No.: **0575**

for **DNV GL AS**

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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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



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-Nav Radar, intended as standalone radar

See Appendix for further details.

Application/Limitation

- The installation shall be installed and tested on board according manufacturers manuals.
See Type Examination documentation below for details
- With the chart option disabled, the radar is found to be in compliance with requirements given for radar equipment CAT 1; A.1/4.34
- The K-Bridge Radar is certified and found to be in compliance with 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 and K-Nav Radar with Radar Interface Network (RIN) is equivalent to an inter-switch facility required by DNV GL Rules Pt.6 Ch.3.
- K-Bridge and K-Nav Radar is found to comply with the requirements for binary image transfer to VDR as defined in IEC 61162-450 (2011) and IEC 61996-1 (2013)

Tests carried out

- Performance testing, IEC 62388 (2013)
- Environmental testing, IEC 60945 (2002)
- Serial interface testing, IEC 61162-1 (2010) and IEC 61162-1 (2016)
- Presentation of navigation information, IEC 62288 (2014)

Type Examination documentation

See appendix for details.

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.

APPENDIX

Product description

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	: See below
• Transceivers and Antenna Units	: See below

K-Nav Radar system comprises:

<u>Item:</u>	<u>Model/Type:</u>
• K-Nav Operator Station	: As defined in separate certificate*)
• Software Modules	: As defined in separate certificate*)
• Radar Interface	: See below
• Transceivers and Antenna Units	: See below

For K-Bridge and K-Nav Radar systems:

<u>Item:</u>	<u>Model/Type:</u>
• Radar Interface:	
Radar Interface Network	: RIN rev A or rev C
Ethernet switch	: Moxa EDS-G509

NOTE: Radar Interface Network with RIN is only supported in combination with Northrup Grumman Sperry Marine transceivers and antenna units in an up-mast configuration

- Transceivers and Antenna Units : Ref details on next page for options

The K-Bridge Radar and K-Nav Radar can be delivered in K-Bridge Console KM05 or as built in version for other consoles

*) Type Examination Certificate for K-Bridge and K-Nav System Platforms, see Type Examination documentation.

Transceivers and Antenna Units, Northrop Grumman Sperry Marine:

<u>Transceivers:</u>			<u>See Notes:</u>
X-band Transceiver/Turning Unit (10kW) or Transceiver/Bulkhead (10kW)	Type	65910#A#	*1,2,3,6
	Type	65810A,B,E,F,G,H,L,P,T or W	*6
X-band Transceiver/Turning Unit (25kW) or Transceiver/Bulkhead (25kW)	Type	65925#A#	*1,2,3,6
	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) or Transceiver/Bulkhead (30kW)	Type	65830M§R or N§#	*3,4,6
	Type	65831A or B	
Turning unit S-band (w/bulkhead Tx)	Type	65830B§# or C§#	*3,4,6
Scanner Control unit S-band	Type	65837Aø	*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.

Type Examination documentation

DNV GL No	Document ID	Rev.	Description
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	A	Report: Kongsberg Maritime, Test report for K-Bridge CCRS -Clause 6
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)
309	411835	A	Manual: Kongsberg Maritime, K-Nav Radar, Operator Manual, Release 8.0
308	415091	A	Manual: Kongsberg Maritime, K-Bridge Radar, Operator Manual, Release 8.0
307	OObEvidenceFor62388Ed2	2	Report: NGSM, Assessment report for S- and X-band radar towards IEC62388 Ed2.0
306	399058/A	A	Manual: Kongsberg Maritime, Installation Manual for K-NAV Radar
304	399059/A	A	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	B	Manual: Kongsberg Maritime, Radar turning unit (S-band, upmast), Installation manual
282	346861	B	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	C	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	-	Certificate: DNVGL, Moxa EDS series ethernet switches
271	TAA00000FJ	Latest rev.	Certificate: DNVGL, 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/T	March	Report: QinetiQ, Unwanted Emissions Measurements of a

Job Id: **344.1-000648-9**
Certificate No: **MEDB000013U**

DNV GL No	Document ID	Rev.	Description
	R022173	2002	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