



UK Approved Body Authorised  
by the MCA



## Marine Equipment UK Assessment Module B Type Examination Certificate

This is to certify that TUV SUD BABT UNLIMITED did undertake the relevant type approval procedures for the type of equipment identified below, which was found to be in compliance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended, under Annex 1 of the listed Amendment of MSN 1874 for the types of equipment identified.

<b>MSN 1874 Amendment</b>	<b>Amendment 8</b>
<b>Certificate Holder and Manufacturer</b>	<b>Kelvin Hughes Ltd. Voltage Mollison Avenue Enfield Middlesex, EN3 7XQ United Kingdom</b>
<b>Product(s)</b>	<b>S &amp; X Band Radar Navigation System</b>
<b>Product Sector</b>	<b>Navigation Equipment</b>
<b>Product Type</b>	<b>UK/4.64 Radar Equipment (Incorporating CAT 2, High speed craft and Chart options)</b>

and on the basis of the Technical Data and information detailed in the Annex to this certificate.

Valid from: 19 March 2024

  
(Thomas J. Twynam)

Expiry Date: 26 August 2026

TÜV SÜD BABT is a UKAS accredited Certification Body No. 0172.  
This certificate has been issued in accordance with the TÜV SÜD Testing, Certification, Validation and Verification Regulations and constitutes page 1 of the combined Certificate and Annex.  
The Conditions for the validity of this certificate are listed in the Annex.  
For further details related to this certification please contact [BABT@tuvsud.com](mailto:BABT@tuvsud.com)

  
**0168**

# Annex to Marine Equipment UK Conformity Assessment Module B Type Examination Certificate



## 1 Equipment Description

Shipborne Radar Equipment CAT 2, CAT 2H and Radar Equipment CAT 2C and CAT 2HC with Chart Option

### 1.1 Models

Model
S & X Band Radar Navigation System

#### 1.1.1 System Components – above deck sensor options

Model	Description
DTX-A40-xAAA <sup>Note 1</sup>	Mk11 SharpEye X Band Transceiver
DTX-A40-xBBA <sup>Note 1</sup>	Mk11 SharpEye X Band Transceiver
DTX-A40-xBEA <sup>Note 1</sup>	Mk11 SharpEye X Band Transceiver
DTX-A40-xBEB <sup>Note 1</sup>	Mk11 SharpEye X Band Transceiver
with LPA-A25-x <sup>Note 2</sup>	2.5m X Band Antenna
DTX-A40-xDBA <sup>Note 1</sup>	Mk11 SharpEye X Band Transceiver
with LPA-A25-x-C <sup>Note 2</sup>	2.5m X Band Antenna
DTX-A30-xAAA <sup>Note 1</sup>	Mk11 SharpEye S Band Transceiver
DTX-A30-xBCA <sup>Note 1</sup>	Mk11 SharpEye S Band Transceiver
DTX-A30-xDCA <sup>Note 1</sup>	Mk11 SharpEye S Band Transceiver
with LPA-A3-x-C <sup>Note 2</sup>	3.9m S Band Antenna
DTX-A1-xNKA <sup>Note 1</sup>	Mk7 SharpEye S Band Transceiver
with LPA-A3-x <sup>Note 2</sup>	3.9m S Band Antenna
PCV-A1-xAAA <sup>Note 1&amp;15</sup>	Mk 5 SharpEye X Band Transceiver
with LPA-A13	1.3m X Band Antenna
with LPA-A13-xBAA <sup>Note 1</sup>	1.3m X Band Antenna
with LPA-A13-xAAA <sup>Note 1</sup>	1.3m X Band Antenna
with LPA-A19	1.9m X Band Antenna
with LPA-A19-xAAA <sup>Note 1</sup>	1.9m X Band Antenna
E70351	X Band 12kW Transceiver
with E70350	1.9m X Band Antenna
NEO-A10	Manta NEO Solid State X-Band Sensor
NEO-A19	Manta NEO 1.9m X-Band Antenna

#### 1.1.2 System Components – below deck equipment

Model	Description
Minimum system components	
MDC-A22-1 <sup>Note 3</sup>	22" Panel PC
MDC-A24-1 <sup>Note 3</sup>	24" Panel PC
MDC-A26-1 <sup>Note 3</sup>	26" Panel PC

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Model	Description
MDC-A27-1 <sup>Note 3</sup>	27" Panel PC
MDC-A201-1 <sup>Note 3, 4</sup>	Managed Network Switch
MDC-A201-2 <sup>Note 3, 4</sup>	Managed Network Switch
MDC-A201-3 <sup>Note 3, 4</sup>	Managed Network Switch
MDC-A200 <sup>Note 3</sup>	Serial Network Converter
MDC-A202-1 <sup>Note 5</sup>	Desktop Keyboard and Trackerball Assembly
E70352 <sup>Note 6</sup>	X Band 12kW Power Supply
GTX-A24 <sup>Note 7</sup>	Drive Control Unit Assembly
PCV-A2-xAAA	Mk5 SharpEye PSU
NEO-A6 <sup>Note 16</sup>	Manta NEO Voltage Control Unit
<b>Optional system components</b>	
MDC-A202	Console Keyboard and Trackerball Assembly
MDC-A203	Console Keyboard Assembly
MDC-A204	Console Trackerball Assembly
17610398 <sup>Note 8</sup>	Keyboard and Trackerball Assembly
DTX-A50-xAAA <sup>Note 9, 10</sup>	Power Control Unit
NAN-A27-x <sup>Note 10</sup>	Man Aloft Switch
MDC-A100-22	22" Desktop Stand
MDC-A100-26	26" Desktop Stand
MDC-A100-27	MDC-A24-1 and MDC-A27-1 Desktop Stand

## 1.2 Software <sup>Note 11</sup>

Identity	Version	Description
ZM-2300	3.12	Navigation Software
ZM-2762	2.2	SharpEye Software (Mk 11 X Band)
ZM-2808	1.4	SharpEye Software (Mk 11 S Band)
E70351	5.11	X Band 12kW Transceiver
ZM-2849	1.4	SharpEye Software (Mk 7 S Band)
ZM-2847	1.10	SharpEye Software (Mk 11 S Band)
ZM-2844	1.10	SharpEye Software (Mk 11 X Band)
ZM-2845	1.5	SharpEye Software (Mk 11 X Band) <sup>Note 12</sup>
ZM-2924	1.4	SharpEye Software (Mk 5 X Band)
NEO-A10	2.41	NEO-A10 Software
Windows 10 IoT Enterprise 2019 LTSC		Baseline Operating System

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## 2 Assessed Requirements

### 2.1 MSN 1874 Amendment 8 Annex 1

### 2.2 Compliance Requirements for UK/4.64 Row 2 of 2<sup>Note 15</sup>

Performance Requirements	International Testing Standards	
Resolution MSC.192(79)	IEC 62388 (2013) incl. IEC 62388 Corr.1 (2014) <sup>Note 14</sup>	Maritime navigation and radiocommunication equipment and systems — Shipborne radar
Resolution MSC.191(79) Resolution MSC.302(87)	IEC 62288 (2021)	Maritime navigation and radiocommunication equipment and systems — Presentation of navigation-related information on shipborne navigational displays — General requirements
Resolution A.694(17)	IEC 60945 (2002) incl. IEC 60945 Corr. 1 (2008)	Maritime navigation and radiocommunication equipment and systems — General requirements
	IEC 61162-1 (2016)	Maritime navigation and radiocommunication equipment and systems — Digital interfaces Part 1: Single talker and multiple listeners
	IEC 61162-2 (1998)	Maritime navigation and radiocommunication equipment and systems — Digital interfaces Part 2: Single talker and multiple listeners, high-speed transmission
	IEC 61162-450 (2018)	Maritime navigation and radiocommunication equipment and systems — Digital interfaces Part 450: Multiple talkers and multiple listeners — Ethernet interconnection
Resolution MSC.302(87)	IEC 62923-1 (2018) <sup>Note 13</sup>	Maritime navigation and radiocommunication equipment and systems – Bridge alert management Part 1: Operational and performance requirements, methods of testing and required test results
	IEC 62923-2 (2018)	Maritime navigation and radiocommunication equipment and systems – Bridge alert management Part 2: Alert and cluster identifiers and other additional features
ITU-R Recommendation	ITU-R M.1177-4 (2011)	Techniques for measurement of unwanted emissions of radar systems

## 3 Technical Documentation

### 3.1 Declaration of Conformity

Declaration of Conformity, DOC-2093 Revision 15

### 3.2 User Guide

Navigation Display Operators Handbook, HBK-2300-1, Revision 11  
 Kelvin Hughes Navigation Display Installation & Commissioning, HBK-2300-2, Revision 10  
 Kelvin Hughes X-band 12kW Upmast Transceiver, HBK-2300-3, Revision 5  
 Kelvin Hughes MK 7 S-Band Transceiver (Asterix), HBK-2300-4, Revision 2  
 Kelvin Hughes MK 11 S-Band Transceiver (Asterix), KH-1605-3, Revision 4  
 Kelvin Hughes MK 11 X-Band Transceiver (Asterix), KH-1605-1, Revision 4  
 Kelvin Hughes MK 5 SharpEye™ Upmast X-Band Transceiver, KH-2200-1, Revision 3  
 Hensoldt Manta NEO X-Band Solid State Sensor Handbook, HBK-2300-9, Issue 1

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## 3.3 Technical Documentation

### 3.3.1 Technical Document File Indexes:

Technical Document File Indexes:

The below being comprehensive listings of documentation relevant to type examination including test reports and details of approved hardware defining overall build level and including circuit diagrams, technical drawings and parts listings (BoM).

DTX-K40-BAAA Revision 5, 2016-11-18	E70351-K Revision 1, 2016-11-17
LPA-K25-1 Revision 3, 2016-11-17	E70352-K, Revision 1, 2016-11-17
DTX-K30-BAAA Revision 4, 2016-11-18	MDC-K201-1 Revision 2, 2016-11-17
DTX-K1-ANKA Revision 2, 2016-11-18	MDC-K201-2 Revision 1, 2022-09-13
LPA-K3-1 Revision 2, 2016-11-17	MDC-K201-3 Revision 1, 2022-09-13
MDC-K22-1 Revision 2, 2019-09-12	MDC-K200 Revision 2, 2016-11-17
DTX-K30-BBCA Revision 1, 2016-11-17	MDC-K202 Revision 2, 2016-11-17
DTX-K40-BBBA Revision 1, 2016-11-17	NAN-K27-1 Revision 2, 2016-11-17
DTX-K40-BBEA Revision 1, 2017-03-01	45-975-0731-001-TDF Revision 1, 2018-09-27
DTX-K40-BBEB Revision 1, 2017-03-01	ZM-2300-TDF Revision 9, 2024-03-19
DTX-K50-BAAA Revision 2, 2016-11-17	LPA-K13 Revision 2, 2014-05-19
DTX-K30-BBCA Revision 2, 2022-06-14	LPA-K19 Revision 2, 2014-05-19
DTX-K30-BDCA Revision 2, 2022-06-14	PCV-K1-AAAA Revision 1, 2021-11-19
DTX-K40-BDBA Revision 1, 2018-05-03	PCV-K1-BAAA Revision 1, 2021-11-19
LPA-K25-2-C Revision 1, 2018-05-03	PCV-K2 Revision 1, 2021-11-19
LPA-K3-2-C Revision 1, 2018-05-03	PCV-K2-BAAA Revision 1, 2021-11-19
E70350-K Revision 1, 2016-11-17	MDC-K24-1 Revision 1, 2023-11-24
MDC-K100-27 Revision 1, 2023-11-24	MDC-K26-1 Revision 2, 2019-09-12
MDC-K27-1 Revision 1, 2023-11-24	

### 3.3.2 Additional Technical Documentation

#### 3.3.2.1 Test Reports

##### 3.3.2.1.1 IEC 60945 (2002) incl. Corr.1 (2008)

75958876 Report 05 Issue 1	Issued	2024-02-01
75958876-04 Issue 02	Issued	2024-02-23
16R096CRF	Issued	2016-03-03
75958876 Report 02 Issue 1	Dated	2024-01-16
Salt Mist Waiver	Dated	2024-02-26

##### 3.3.2.1.2 IEC 62388 (2013) incl. IEC 62388 Corr.1 (2014)

TN-3630	Modified	2023-12-15
75959600 Report 01 Issue 1	Issued	2024-03-18
TP_0953_1048 Wind_Tunnel ESO Test v1	Dated	2021-05-04
596704-1-1	Dated	2021-02-17
75950287-04 Issue 01	Issued	2021-04-23
Cyclone OOB Emissions	Dated	2024-02-26

## 3.4 Build Status

### 3.4.1 Hardware

RAY_HUK_TCVR-0001	Dated	2024-02-27
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## 3.5 Notes

- Note 1 x denotes a letter referencing the final colour of the unit; A signifies white, B signifies grey.
- Note 2 x denotes a letter referencing the final colour of the unit; 1 signifies white, 2 signifies grey.
- Note 3 Each sensor requires a dedicated Panel PC (MDC-A22-1, MDC-A24-1, MDC-A26-1 or MDC-A27-1). Where the system includes more than one sensor it shall include a minimum of two Serial Network Convertors (MDC-A200) and two Managed Network Switches (MDC-A201-X).
- Note 4 In line with current IEC 61162-460 regulations, any IEC 61162-450 approved VDR or sensor may be connected to Port 7 of the MDC-A201-X Managed Network Switch without contacting Kelvin Hughes. Connection to unprotected networks must be via an IEC 61162-460 secure

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- gateway.
- Note 5 Each display must be connected to a Trackerball assembly, the use of a keyboard is optional.
- Note 6 Required only for use with E70351, X Band 12kW Transceiver.
- Note 7 Required only for use with DTX-A1-ANKA, Mk7 SharpEye S Band Transceiver.
- Note 8 Keyboard and Trackerball is Keytouch Technology AS Part No. 17610398 and may also be identified by Kelvin Hughes Part No. 45-975-0731-001.
- Note 9 The Power Control Unit is an optional unit which can be used to protect and control the AC mains supply to the DTX-A40-xxxx and DTX-A30-xxxx turning units. If not used the mains supply should be connected via suitable breakers.
- Note 10 x is a numeral signifying different colour variants.
- Note 11 This approval remains valid for equipment including subsequent minor software amendments which have been formally accepted in accordance with the Testing, Certification, Validation and Verification Regulation.
- Note 12 SharpEye Software (Mk 11 X Band) ZM-2845 contains an additional Helo Mode of operation which is outside of the system type approval. Refer to Kelvin Hughes for advice on use.
- Note 13 This system meets the requirements of IEC 62923-1 for EUT function type P.
- Note 14 Full requirement for Chart Radar are integrated into the IMO Resolution and IEC Standard and form an optional enhancement on standard radar which when enacted qualify the radar for the "C" suffix (CAT2C).
- Note 15 For compliance with High Speed Craft requirements (CAT 2H and CAT 2HC) the PCV-A1-xAAA, Mk5 SharpEye X Band Transceiver, needs to be part of the installation.
- Note 16 Required only for use with NEO-A10, NEO Solid State X-Band Sensor.

## 4 Conditions of Validity

This certificate ceases to be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with TUV SUD BABT or a person appointed by TUV SUD BABT to perform that role.

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.

Signature:   
(Thomas J. Twynam)

Date: 2024-03-19

On behalf of TUV SUD BABT UNLIMITED