



Marine Equipment Directive Module B Type Examination Certificate

This is to certify that TÜV SÜD BABT did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the Navigation requirements of Marine Equipment Directive 96/98/EC as amended by Commission Directive 2012/32/EU and that the equipment of

Kelvin Hughes Ltd

of

Voltage
Mollison Avenue
Enfield
Middlesex
EN3 7XQ
United Kingdom

known as

SharpEye™, MantaDigital™ S-Band Radar System

conforms to the relevant requirements for the following equipment as listed in Marine Equipment Directive Annex A.1:

**Annex A.1/4.34 Radar Equipment CAT 1 and
A.1/4.38a Radar Equipment CAT 1 with Chart Option**

as defined in Commission Directive 2012/32/EU

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

Signed: 
On Behalf of TÜV SÜD BABT

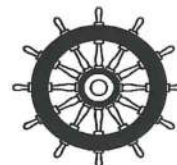
Issue Date: 23 June 2014

Number: BABT-MED001083 Issue: 02

This certificate has been issued in accordance with the Certification Regulations of TÜV SÜD BABT (Notified Body Number 0168) and constitutes page 1 of the combined Certificate and Annex

This certificate is valid from 23 June 2014 until not later than 22 June 2019

The Conditions for the validity of this certificate are listed in the Annex.
For further details related to this certification please contact BABT@tuv-sud.co.uk



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Annex to MED001083

Marine Equipment Directive Module B Type Examination Certificate

Description of Equipment:

Shipborne Radar Equipment (Item A.1/4.34) and Radar with Chart Facility (Item A.1/4.38a).

Model: SharpEye™, MantaDigital™ S-Band Radar Systems

Hardware:

	Radar Category 1			Chart Radar Category 1C		
	Pedestal	Desktop	Kit Form	Pedestal	Desktop	Kit Form

System Components:

MantaDigital 26" Display Pedestal & integrated Radar Processor	MDD-A1-26	X			X		
MantaDigital 26" Desktop Display	MDD-A30-26		X			X	
MantaDigital 26" Console Display	MDD-A20-26			X			X
MantaDigital Radar Processor	MDP-A1		X	X		X	X
MantaDigital Remote Trackerball	MDD-A110			X			X
SharpEye™, Solid State Transceiver/Turning Unit <small>Note 1</small>	DTX-A1	X	X	X	X	X	X
or SharpEye™, Transceiver/Turning Unit <small>Note 2</small>	DTX-A1-ACCA	X	X	X	X	X	X
or SharpEye™, Transceiver/Turning Unit <small>Note 2</small>	DTX-A1-BCCA	X	X	X	X	X	X
or SharpEye™, Transceiver/Turning Unit <small>Note 3</small>	DTX-A1-ADDA	X	X	X	X	X	X
or SharpEye™, Transceiver/Turning Unit <small>Note 3</small>	DTX-A1-BDDA	X	X	X	X	X	X
Turning Unit Drive control <small>Note 3</small>	GTX-A24	X	X	X	X	X	X
3.9m, S-Band Low Profile Antenna	LPA-A3	X	X	X	X	X	X

Software:

	Code Identity	Version ^{Note 4}
MantaDigital Core Software	ZM-2144	2.10.2
Transmitter interface Firmware	ZM-2114	1.62
Transmitter interface FPGA	ZM-2160	1.80
Display interface Firmware	ZM-2007	1.7
Systems interface Firmware	ZM-2008	1.6
Systems interface Firmware	ZM-2797*	1.0
SharpEye™ Core Software	ZM-2165	1.02
SharpEye™ DTX-A101 FPGA	ZM-2166	1.0.1
SharpEye™ DTX-A201 FPGA <small>Note 1</small>	ZM-2234	2.4
SharpEye™ DTX-A202 FPGA <small>Note 2</small>	ZM-2236	1.3
SharpEye™ DTX-A202 FPGA <small>Note 3</small>	ZM-2237	1.51

*Systems Interface Firmware ZM-2797 has been introduced for new systems; ZM-2008 will continue to be used for in-service applications.



Description of Equipment Continued – Ancillary & Optional Units:

The applicant declared that the following units may be added to the basic radar systems illustrated on page 2. These units have been assessed & tested in conjunction with MantaDigital™ and SharpEye™ series radar systems.

ANCILLARY UNITS:-

MantaDigital™ Keyboard & Trackerball	MDD-A101 ^{Note 5}
MantaDigital™ Control Panel & Trackerball	MDD-A102 ^{Note 5}
MantaDigital™ Trackerball & pencil tray	MDD-A100 ^{Note 5}
MantaDigital™ Remote Keyboard	MDD-A130 ^{Note 5}
Ergonomic Trackerball (Ergopod, right handed)	NRR-A18 ^{Note 5}
Ergonomic Trackerball (Ergopod, left handed)	NRR-A18-2 ^{Note 5}
MantaDigital™ Radar Interswitch (6 display x 6 transceiver)	MDP-A12
Serial Interface Module (provides 8 additional ports)	FSD-A198
Dual DNC Unit	FSD-A10 ^{Note 6}
Network Audio & Video Control Unit	FSD-A13 ^{Note 6}
NTI Audio & Video Switch Matrix	IT-SM-8‡-AV-LCD ^{Note 6&7}

-----End of List-----

* NOTES:-

- 1 This Turning unit is fitted with the DTX-A201 solid state transceiver module running ZM-2234 firmware and this combination forms the Non-Doppler SharpEye radar system.
- 2 This Turning unit is fitted with the DTX-A202 solid state transceiver module running ZM-2236 firmware and this combination forms the Standard Doppler SharpEye radar system.
- 3 This Turning unit is fitted with the DTX-A202 solid state transceiver module running ZM-2237 firmware and this combination forms the Enhanced Doppler SharpEye radar system.
- 4 The rotational speed of the S-Band turning unit is set in the Drive control unit to 23RPM for standard speed craft.
- 5 This approval remains valid for equipment including subsequent minor software amendments which have been formally accepted in accordance with the Certification Regulations of TÜV SÜD BABT.
- 6 These are alternative/additional control options to the standard trackerball.
- 7 These items form a display/control interconnection system and may be used to form an adaptive workstation system between units of the MantaDigital™ radar, SharpEye™ radar and MantaDigital™ ECDIS. The exact configuration enabled by this system is fixed on commissioning in accordance with an agreed ships operating plan.
- 8 The ‡ is a numeral in the range 2 to 8 and denotes the number of display units which can be included in the interconnection system.

Compliance Matrix For MED Item A.1/4.34 and A.1/4.38a

IMO Resolutions	International Testing Standards	
Resolution MSC.192(79)*	IEC 62388:2007*	Marine Shipborne Radar Equipment
Resolution MSC.191(79)	IEC 62288:2008	Presentation of navigation-related information
Resolution A694(17)	IEC 60945:2002	General Requirements for Marine Navigation Equipment" (Inc. Corr1:2008)
	IEC 61162-1:2010	Digital Interfaces – Part 1, single talker
	IEC 61162-2:1998	Digital Interfaces – Part 2 High Speed interface
ITU-R Recommendations	M.1177-4:2011	Unwanted Emissions from Radar Systems

* Full requirement for Chart Radar are integrated into the IMO Resolution and and IEC Standard and form an optional enhancement on standard radar which when enacted qualify the radar for the "C" suffix and MED Item A.1/4.38.



Manufacturer:

Name: Kelvin Hughes Ltd
Address: As Holder.

Relevant Technical Documentation

Manuals:

MantaDigital operational manual (User) HBK-4001-1, Issue 3, 2012-04-13
MantaDigital Installation manual (Technical) HBK-1001, Issue 4, 2014-01-02
MantaDigital termination & commissioning HBK-2001, Issue 4, 2013-02-04

Technical Document File Indexes:

DTX-K1, Revision 2, 2014-05-19	GTX-K24 Revision 2, 2014-05-19	MDD-K102 Revision 2, 2014-05-19
DTX-K1-ACCA, Revision 2, 2014-05-19	LPA-K3 Revision 6, 2014-05-19	MDD-K110 Revision 2, 2014-05-09
DTX-K1-BCCA, Revision 1, 2014-05-19	MDD-K1-26 Revision 4, 2014-06-10	MDD-K130 Revision 2, 2014-05-16
DTX-K1-ADDA, Revision 1, 2015-11-26	MDD-K9-26-ABAA Revision 1, 2012-09-06	MDP-K1, Revision 4, 2014-06-11
DTX-K1-BDDA, Revision 1, 2015-11-26	MDD-K20-26 Revision 2, 2014-05-19	MDP-K9, Revision 1, 2012-09-03
FSD-K10 Revision 2, 2014-05-19	MDD-K30-26 Revision 4, 2014-06-11	MDP-K12 Revision 1, 2012-09-06
FSD-K13 Revision 2, 2014-05-19	MDD-K100 Revision 2, 2014-05-19	NNR-K18 Revision 1, 2012-09-06
FSD-K198 Revision 1, 2012-09-05	MDD-K101 Revision 2, 2014-05-19	NNR-K18-2 Revision 1, 2012-09-06

The above 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).

Additional Information:

The products listed on this certificate were originally assessed and certified by QinetiQ under Notified Body number 0191. This certificate replaces QinetiQ Certificate Number QQ-MED-13/10-01.

U.S. Coast Guard Number:

This product has been assigned U.S. Coast Guard Module B number 165.120/EC0168

(This is only applicable to operation Target Tracking (ARPA) aspect of the radar)

Note: The US Coastguard approval number above is issued in accordance with the "Agreement between the European Community and the United States of America on Mutual Recognition of Certificates of Conformity for Marine Equipment" signed February 27th, 2004



Conditions of Validity

This issue of the Annex to the referenced Marine Equipment Module B Certificate relates to Issue 2 of the Certificate.

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 TÜV SÜD B A B T or a person appointed by TÜV SÜD B A B T to perform that role.

Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be reapproved prior to it/them being placed on board vessels to which the amended regulations or standards apply.

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 B of the Directive is fully complied with and controlled by a written inspection agreement with a notified body."

Signed: 

Date: 22nd December 2015.

on behalf of TÜV SÜD B A B T