



## 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

**MantaDigital™ X-Band HSC Radar System  
MantaDigital™ S-Band HSC Radar System**

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

**Annex A.1/4.37 Radar Equipment for High Speed Craft CAT 1H and  
A.1/4.38c Radar Equipment for High Speed Craft CAT 1HC 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: *M Hardy*

Issue Date: 23 June 2014

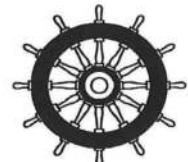
On Behalf of TÜV SÜD BABT

Number: BABT-MED001081 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](mailto:BABT@tuv-sud.co.uk)



**0168**



## Marine Equipment Directive Module B Type Examination Certificate

### Description of Equipment:

Radar Equipment for High Speed Craft (MED Item A.1/4.37)  
and HSC Radar Equipment with Chart Option (MED Item A.1/4.38c).

**Model: MantaDigital™ X and S-Band CAT1H& CAT1HC Radar Systems**

		X-Band 10kW			X-Band 25kW			S-Band 30kW		
		Pedestal	Desktop	Kit Form	Pedestal	Desktop	Kit Form	Pedestal	Desktop	Kit Form
<b>System Components:</b>										
MantaDigital 26" Display Pedestal & integrated Radar Processor	MDD-A1-26	X			X			X		
MantaDigital 26" Desktop Display	MDD-A30-26		X			X			X	
MantaDigital 26" Console Display	MDD-A20-26			X			X			X
MantaDigital Radar Processor	MDP-A1		X	X		X	X		X	X
MantaDigital Remote Trackerball	MDD-A110			X			X			X
Transmitter Interface Unit	NNR-A66	X	X	X						
10kW Transceiver & HSC Turning Unit	CAE-A30-21	X	X	X						
Bulkhead Transceiver – 25kW and X-Band HSC Turning Unit	CTX-A8 & CAE-A30-23				X	X	X			
30kW Transceiver/Turning Unit or Bulkhead Transceiver – 30kW and S-Band Turning Unit	CTX-A9 & GTX-A11							X	X	X
Turning Unit Drive control <sup>(Note 1)</sup>	GTX-A24							X	X	X
1.3m, -Band Low Profile Antenna or 1.9m, -Band Low Profile Antenna or 2.5m, -Band Low Profile Antenna	LPA-A13 or LPA-A19 or LPA-A25	X	X	X	X	X	X			
3.9m, S-Band Low Profile Antenna	LPA-A3							X	X	X

<b>Software:</b>	Code Identity	Version <sup>Note 2</sup>
MantaDigital Core Software	ZM-2144	2.8.1
Transmitter interface Firmware	ZM-2114	1.60
Transmitter interface FPGA	ZM-2160	1.8
Display interface Firmware	ZM-2007	1.6
Systems interface Firmware	ZM-2008	1.6



## 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	<b>MDD-A101</b> <sup>Note 3</sup>
MantaDigital™ Control Panel & Trackerball	<b>MDD-A102</b> <sup>Note 3</sup>
MantaDigital™ Trackerball & pencil tray	<b>MDD-A100</b> <sup>Note 3</sup>
MantaDigital™ Remote Keyboard	<b>MDD-A130</b> <sup>Note 3</sup>
Ergonomic Trackerball (Ergopod, right handed)	<b>NRR-A18</b> <sup>Note 3</sup>
Ergonomic Trackerball (Ergopod, left handed)	<b>NRR-A18-2</b> <sup>Note 3</sup>
MantaDigital™ Radar Interswitch (6 display x 6 transceiver)	<b>MDP-A12</b>
Serial Interface Module (provides 8 additional ports)	<b>FSD-A198</b>
Dual DNC Unit	<b>FSD-A10</b> <sup>Note 4</sup>
Network Audio & Video Control Unit	<b>FSD-A13</b> <sup>Note 4</sup>
NTI Audio & Video Switch Matrix	<b>IT-SM-8‡-AV-LCD</b> <sup>Note 5</sup>

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

### NOTES:-

- 1 The rotational speed of the S-Band turning unit is set in the Drive control unit to 46RPM for high speed craft.
- 2 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.
- 3 These are alternative/additional control options to the standard trackerball.
- 4 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.
- 5 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.1/4.37 and A.1/4.38c

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 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:

CAE-K30-21 Revision 2, 2014-05-19	LPA-K13 Revision 2, 2014-05-19	MDD-K110 Revision 2, 2014-05-09
CAE-K30-23 Revision 2, 2014-05-19	LPA-K19 Revision 2, 2014-05-19	MDD-K130 Revision 2, 2014-05-16
CTX-K8 Revision 2, 2014-05-19	LPA-K25 Revision 2, 2014-05-19	MDP-K1, Revision 4, 2014-06-11
CTX-K9 Revision 2, 2014-05-19	MDD-K1-26 Revision 4, 2014-06-10	MDP-K9, Revision 1, 2012-09-03
FSD-K10 Revision 2, 2014-05-19	MDD-K20-26 Revision 3, 2014-05-16	MDP-K12 Revision 1, 2012-09-06
FSD-K13 Revision 2, 2014-05-19	MDD-K30-26 Revision 4, 2014-06-11	NNR-K18 Revision 1, 2012-09-06
FSD-K198 Revision 1, 2012-09-05	MDD-K100 Revision 2, 2014-05-19	NNR-K18-2 Revision 1, 2012-09-06
GTX-K24 Revision 2, 2014-05-19	MDD-K101 Revision 2, 2014-05-19	NNR-K66 Revision 2, 2014-05-09
LPA-K3 Revision 6, 2014-05-19	MDD-K102 Revision 2, 2014-05-19	-

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-12/10-01.

## 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 BABT or a person appointed by TÜV SÜD BABT 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: M Hardy  
on behalf of TÜV SÜD BABT

Date: 23 June 2014