

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Control and Monitoring System**with type designation(s)
G-DATA/ Mega-Guard/ Maxi-GuardIssued to
PRAXIS Automation Technology B.V.
Leiderdorp, Netherlandsis found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**Application :****Location classes:**

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules to be provided upon installation on board.

This Certificate is valid until **2016-06-30**.Issued at **Høvik** on **2014-07-03**DNV GL local station: **Rotterdam**Approval Engineer: **Knut Omberg**for **DNV GL**

Odd Magne Nesvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **A-13822**
File No: **867.60**
Job Id: **262.1-002808-3**

Product description

G-DATA/ Mega-Guard/ Maxi-Guard Control and Monitoring System, consisting of:

1. Operator Work Station (OWS) comprises the following components:
 - Model 6001 Marine Personal Computer; including redundant network i/f (type 98.6.001.7xx.x)
 - Model 6001 Marine Personal Computer; including redundant network i/f (type 98.6.001.8xx)
 - TFT colour Graphic screen (type 98.6.02x.6xxx)
 - Operator Keyboard (type 93.6.02x.00x)
 - Engineering Keyboard (type 76.0.200)
 - Keyboard/Tracker ball (type 93.6.02x.x0x)
 - Ethernet HUB/Router (type 76.0.81x)
 - Ethernet switches 24-port (76.0.84x)
 - Ethernet switches 8-port (76.0.85x)
 - 6010 Fieldbus Driver Board (type 98.6.010.7xx)

The OWS is intended used for control and graphic presentation of the below typical applications, subject to product certification:

- Alarm, control and monitoring
 - Electrical power management
 - Main engine control
 - Pump and valve control
 - Duty alarm system
 - Patrol alarm system
 - PID control
 - Graphic presentation of ship's data
 - Dynamic positioning (Note 1)
2. Extension Alarm System (EAS) for the remote alarm indication consisting of:
 - Local Operator Panel (type 98.6.02x.6xx)
 - Local Operator Panel (type 93.0.96x)
 - 3 / 8 Channel LED Panel (type 93.0.31x)
 - Fire Alarm Panel (type 98.6.021.60x)
 - Watch Entrance Unit (type 93.0.35x, 93.0.36x and 93.0.37x)
 - Reset Box (type 93.0.35x)
 - Bedroom Buzzer (type 93.0.35x and 93.0.36x)
 3. Process Control Units (PCU/DPU) Maxi-Guard/Mega-Guard DIN Rail Model (also called SAU) for processing of inputs, outputs, alarms and control loops, consisting of:
 - Model 6030, 12 x Digital input / 8/12 x Digital output, DIN rail model (Type 98.6.030.7xx)
 - Model 6030, 18 x Digital input / 18 x Digital output, DIN rail model (Type 98.6.030.8xx)
 - Model 6032, 24 x Digital Input unit, DIN rail model (type 98.6.032.7xx)
 - Model 6032, 36 x Digital Input unit, DIN rail model (type 98.6.032.8xx)
 - Model 6034, 16 x Analog input /mixed input output, DIN rail model (type 98.6.034.7xx)
 - Model 6034, 24x Analog input /mixed input output, DIN rail model (type 98.6.034.8xx)
 - Model 6049, Control Processor with redundant network i/f, DIN rail model (type 98.6.049.7xx)
 - Model 6049, Control Processor redundant network i/f, DIN rail model (type 98.6.049.8xx)
 - Display Panel (type 98.6.02x.6xx)
 - Serial Interface Converter (type 91.6.040.40x)
 - Serial Interface Converter (type 91.6.040.80x)
 - USB to NMEA Interface (type 98.6.040.80x) (temperature class D)
 - Sensor Supply Module (type 98.6.010.7xx)
 - Alarm Panel 16 Ch. (type 93.0.92x)
 - Window Wiper Panel (type 93.0.95x)
 - Window Wiper I/O Module (type 98.6.030.80x)
 - LCD Operator Panel (type 93.0.96x.x)

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4. Bridge Manoeuvring system (BMS/PCS) consisting of:
 - All models mentioned under PCU
 - Bridge/Control Room control Lever and Telegraph Panel (type 98.6.02x.62x)
 - BMS Telegraph Panel (type 98.6.02x.62x)
 - Bridge Order Printer Panel (type 98.6.02x.63x)
 - Telegraph and Safety Panel (type 98.6.02x.63x)
 - LCD Operator Panel (type 93.0.96x.x).
 - Governor Panel (type 98.6.02x.60x)
 - Emergency Stop DIN Module (type 98.6.034.7xx)
 - Electronic Drive Unit (type 98.6.010.7xx)
 - Electronic Actuator (type 98.0.3xx)
 - 7" TFT Operator Panel (type 98.6.02x.6xx)
 - 8" TFT Operator Panel (type 98.6.02x.64x) (temperature class D)
 - BMS Indication/Command Panel (type 98.6.02x.62x)
 - BMS Command Panel (Type 98.6.02x.64x)
 - BMS Indication Module (type 98.6.034.7xx)
 - PCS Control lever (Type 98.6.022.621x) (temperature class D)
 - PCS Azimuth control lever (Type 98.6.022.622x) (temperature class D)
5. AHS: Anti Heeling System (AHS) comprising of:
 - All models mentioned under OWS
 - All modules referenced under PCU
 - Inclinometer (type 98.0.23x)
6. PMS: Power Management System comprising of:
 - All models referenced under PCU
 - PMS input/output module, DIN rail module (type 98.6.034.7xx)
 - PMS input/output module, DIN rail module (type 98.6.034.8xx)
 - Local operator panel as referenced under EAS
 - 7" TFT operator panel as referenced under BMS/PCS
 - 8" TFT Operator Panel (type 98.6.02x.64x) (temperature class D)

The PMS is intended used for the below power management functions, subject to product certification:

- Standby start
- Synchronizing
- Preferential trip
- Load sharing
- Low load stop
- Manual start/stop

Any protection functions are to be implemented in dedicated units for each equipment being protected and which are independent of corresponding control/alarm functions.

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7. Basic software/firmware:

Device	Pro-series	E-series	Description
MPC	CAMMAN.EXE (rev.4.xx, 5.xx)	-	G-Data Marine Personal Computer
MPC	MEGA-GUARD.EXE (rev.6.xx)	MEGA-GUARD (rev.6.xx)	Data collection, central visualization and HMI
XP	60XX_XXX.HEX (rev.1.xx, 2.xx, 3.xx, 4.xx)	-	Data processing
XP	DIN (rev. 2.x)	app-xxx; loader-xxx (rev2.x)	Data processing
Local Operator Panel /LCD Panel	LOP_XXX.HEX (rev. 1.xx)	app-xxx; loader-xxx (rev2.x)	Data processing, Local data visualization and local HMI
Functional keyboard	Functional keyboard (rev. 2.xx, 3.xx)	Functional keyboard (rev. 2.xx, 3.xx)	Dedicated (limited) operator keyboard
I/O Modules (DIN, DIN/DOOUT, AIN, MIXED)	IO Module (rev. 2.x)	IO Module (rev. 2.x)	Data acquisition
Stand-alone Panels	PANEL (rev.1.x)	PANEL (rev.1.x)	Stand-alone panels (Alarm Panel and Window Wiper) data processing and visualization

Application/Limitation

The type approval covers hardware and basic software/firmware listed above. All changes in the type approved products shall be recorded and submitted for evaluation. If the changes are evaluated to affect functionality for which rule requirements apply, a new functional type test may be required and the certificate may have to be renewed to identify the modifications. Application software shall be tested in manufacturing survey for each delivery.

Note 1: Application software for dynamic positioning is not included in this type approval certificate

Plan approval

The following documentation is to be submitted for approval for each application

- Reference to this type approval certificate
- System block diagram/topology drawing
- Power supply arrangement (may be part of the block diagram)
- Functional description of application software
- List of controlled and monitored points including data transferred on communication links/network
- Test program for manufacturing survey

Product certification

Each delivery of the application system is to be certified according to DNV rules Pt.4 Ch.9 Sec.1. The certification test shall be performed at the manufacturer of the application system before the system is shipped to the yard. After certification all changes are to be managed and recorded in accordance with DNV rules Pt.4 Ch.9 and Pt.7 Ch.1.

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Type Approval documentation

Test report from IWECO 5166053-88-1 dated November 1988.

Functional Specification Version 2.2 page 1-42.

Drawing NP873720, NP873740, S6001, S60035, S6003D, S6004B, S6005C, S6007C, S6008B, Flow Diagram FDA, -DDBS.

At renewal/extension 2002: Ring binders "G-Data, Maxi/Mega-Guard / Control, Monitoring & Alarm System Project Binder vol 1-3" containing:

Vol.1:

1. Letter to DNV
2. Company profile
3. Colour Brocures G-Data, Maxi-Guard, Mega-Guard
4. Test specification: Env. Test Report, Type Approval Test
5. TA certificate copies
6. Software History Rev. list Rev. 1.8, dated 02-09-18
7. Reference List

Vol.2:

1. Maxi-Guard Operator Work Station/ Extension Alarm System/ Operator Guide
2. Mega-Guard Operator Work Station/ Extension Alarm System/ Operator Guide
3. Mega-Guard Process Control Unit/ Operator Guide
4. Mega-Guard Power Management System/ Operator Guide
5. Mega-Guard Propulsion Control System (for 2-stroke engines) Operator Guide

Vol.3:

1. KEMA test report 93130-KRQ/EMC 99-4334 (EN45001)
2. Test Forms G-MOWS/G-CAM
3. Test Forms G-ELPA
4. Test Forms G-EGOV
5. Test Forms G-PROP
6. Notes to the CISPR16 (EMC) tests for LOP and Electronic Actuator

Software Revision History List Rev.1.10 dated 2004-10-19.

Software Revision List_Rev1 20.doc. Dated 2007-01-26. (Electronic file in 262.1-002808)

Certification Retention Survey Report; DNV Id. No.: ROT 07.2477.1. Dated: 2007-01-15. DNV Rotterdam

At renewal/extension 2009: Ring binders "G-Data, Maxi/Mega-Guard / Control, Monitoring & Alarm System Project Binder vol 1-4" containing:

Vol.1:

1. Company Profile
2. Product Overview
3. Type Approval Certificates
4. Software Revision List
5. Reference list
6. Operator Guide Mega-Guard Operator Work Station
7. Operator Guide Maxi-Guard Operator Work Station
8. Operator Guide Mega-Guard Process Control Unit (DPU/SAU)
9. Operator Guide Mega-Guard Process Control Unit (DPU/SAU)

Vol.2:

1. Operator Guide Bridge Manoeuvring System
2. Operator Guide Power Management System
3. Operator Guide ARPA

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4. Operator Guide ECDIS

Vol.3:

1. Operator Guide Dynamic Positioning
2. Test Reports

Vol.4:

1. Test Reports
2. Front Sheets Binders
3. Proposal Text TA Certificate

DNV Rotterdam Certificate retention survey report for A-10266, dated: 2009-04-03
Software Revison List_Rev1.21.doc. Dated 2008-01-25.

At renewal/extension 2011:

1. Environmental test report ship automation system from Praxis, rev.1.2, dated 21-jun.2011
2. Vibration tests on a control processor module according to the test standard IEC 60068-2-6:2007 from Sebert Trillingstechniek B.V, report M11.001-2011.7016, rev.01 dated 8-apr-2011.
3. Climate tests on a control processor module according to the test standard GL and Lloyds from Sebert Trillingstechniek B.V, report M11.002-2011.7063, dated 16-may-2011.
4. Report EN61000-4-3 and EN61000-4-6 from BICON, report id PRA-20091214-X1 dated 2010-04-01.
5. Report IEC60945:2002 [Radiated emission] from BICON, report id PRA-20110411-X1, dated 2011-05-02.
6. Report IEC60945:2002 [Radiated emission] EN61000-4-3 and EN61000-4-6 from BICON, report id PRA-20110411-X2, dated 2011-04-28.
7. Mega Guard EMC tests report from Praxis, rev.1.0, dated 21-jun-2011
8. Mega Guard Dry heat test report from Praxis, rev.1.0, dated 08-jun-2011
9. Mega Guard Low temperature test report from Praxis, rev.1.0, dated 21-jun-2011
10. Renewal survey report dated 13-apr-2011.
11. Software Revison List_Rev1.22.doc. Dated 2009-08-26.
12. Software Revison List_Rev1.23.doc. Dated 2011-11-24.

At renewal/extension in 2014:

1. Environmental Test Report Ship Automation System" Rev.1.2 dated August 19. 2013
2. Environmental Test Report Ship Automation System" Rev.1.3 dated November 14. 2013
3. Compiled EMC test report for 8.4" TFT monitor (emc 84 tft.pdf)
4. Compiled EMC test report for NMEA to USB interface (emc nmea usb.pdf)
5. Compiled EMC test report for PCS control lever (emc pcs.pdf)
6. Compiled EMC test report for Azimuth control lever (emc azimuth.pdf)
7. Detailed Software Description List to Certificate Number A-12560 dated 1. September 2013
8. DNV Rotterdam Certificate retention survey report for A-12560, dated: 2013-11-19

Tests carried out


Applicable tests according to DNV standard for certification 2.4.

Periodical assessment

The scope of the retention/renewal survey is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the survey are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)



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- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Retention survey is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE