

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Control and Monitoring System**

with type designation(s)
Vista Next Automation System

Issued to

maresystems GmbH
Hamburg, Germany

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature
Humidity
Vibration
EMC
Enclosure
Environmental Classes: see page 2

Issued at **Hamburg** on **2020-07-29**

for **DNV GL**

This Certificate is valid until **2022-07-15**.

DNV GL local station: **Hamburg CMC**

Approval Engineer: **Jens Dietrich**

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Joannis Papanuskas
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

System components:

Prod. Name	Prod. description	Prod.no.	Temp.	Humidity	Vibration	EMC	Encl.
F802	SMU-Substation Management Unit	F802	B	B	A	B	*
F803	SMU-Substation Management Unitv	F803	B	B	A	A	*
A218	Interface Converter	A218	B	B	A	B	*
DAD	Data Acquisition Display, 128 LED	A205	B	B	A	B	*
DAD	Liquid Crystal Diode Display +64 LEDs	A206	B	B	A	B	*
RCP/RCD	Remote Panels / Displays	F504, F505, F506	B	B	A	B	*
PCP	10.4" TFT Process Control Panel	F507001, rev.A	B	B	A	B	*
VBI-1	1-Channel Fieldbus Converter	F403	B	B	A	B	*
VBI-5	5-Channel Fieldbus Converter	F401	B	B	A	B	*
VBI-6	6-Channel Fieldbus Converter	F404	B	B	A	B	*
XAS	Extension Alarm Panel	F503	B	B	A	B	*
XAS-X	Extension Alarm System XAS Distribution Board	F902 A002A	B	B	A	B	*
PPI	Parallel Printer Interface Node	F601	B	B	A	B	*
	OKI ML280	D701	B	B	A	B	*
	Ethernet Switch AT-FS700	D903	B	B	A	B	*
	Keyboard and Trackball	D502	B	B	A	B	*
UPS	Uninterruptible Power Supply	UPS700	B	B	A	B	*
ACI-6	Bus node, 6 input channels: 0-25mA	F101	B	B	B	B	*
API-6	Bus node, 6 input channels: PT100	F102	B	B	B	B	*
ATI-6	Bus node, 6 input channels: Thermocouple	F103	B	B	B	B	*
DVI-24	Bus node, 24 Binary Voltage Inputs	F104	B	B	A	B	*
DCI-24	Bus node, 24 Binary Contact Inputs NC/NO	F105	B	B	B	B	*
DCO8	Bus node, 8 Relay contact outputs	F201	B	B	A	B	*
DCO16	Bus node, 16 Relay contact outputs	F203	B	B	A	B	*
ACO8	Bus node, 8 analogue outputs, 0-25mA	F202	B	B	A	B	*
RSI	RS232 Signalling Interface		B	B	A	B	*
SCN	Slave Clock Node	F402	B	B	A	B	*

ACI-6, API-6, ATI-6, DCI-24, ACO8 and DCO16 also existing in version "Plus" (with DC/DC-converter) and "Red" (with redundant field bus interface).

Compass safe distance: Minimum 5m.

Application/Limitation

This Type Approval covers hardware and basic design principles with following features:

Operator Workstation:

- Managing of up to 8192 I/O channels from up to 16 substations
- Intuitively operation and monitoring of the process via keyboard and trackball

Graphical representation of:

- Alarms, alarm history lists, list of non-reset alarms
- Blocking list, list from faded out alarms (e.g. sensor failure)
- Pre-configured trend pages
- Control permission handling to assign different user rights
- Parameter changing e.g. alarm limits, fade in/out, alarm group (e.g. for XAS panel), alarm delay (rise/fall time)
- Exhaust gas temperature, exhaust gas average deviation with slowdown function
- System diagnosis list for communication error and hardware failure
- Paperless alarm registration (Storage of complete alarm list and/or daily alarm reports)
- Sub system UDP Print (electronic alarm registration).

SMU/Bus Nodes:

- Managing of up to 512 I/O-channels per substation
- Collecting, preparing, indicating and providing of sensor data
- Alarm groups, blocking groups and channel groups
- Detecting, indicating and reporting of exceeded limits or sensor failures
- Analogue mean value deviation calculation and indication
- Measuring point parameter changing
- Alarm and journal printer interface with buffer for 100 alarms

XAS

- Extended alarm indication on bridge and cabins, alarm list of the last 10 alarms
- Selection of duty engineer, engineer call, independent fire alarm signalling

With reference to DNV GL Rules for Classification of Ships Pt.4 Ch.9, the documentation listed below is required to be submitted for approval to DNV GL for each application:

- Reference to this type approval certificate
- Reference to valid type approval certificates for other hardware/third party equipment, alternatively datasheets of similar information documenting compliance with environmental requirements in DNV GL Pt.4 Ch.9 Sec.5 [2]
- Equipment list
- System block diagram/topology drawing
- Power supply arrangement (may be part of the system block diagram)
- Functional description
- List of controlled and monitored points (I/O list, including data transferred on communication links)
- Test program for product certification
- For integrated systems a functional failure analysis covering network including a procedure for the test and verification.

Product certificate

Each delivery of the application system is to be certified according to DNV GL Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. After the certification the following clause for application software control will be in force:

Clause for application software control

All changes in software are to be recorded. The records of all changes are to be forwarded to DNV GL for evaluation and approval. Major changes in the software are to be approved and possibly tested before being installed in the computer onboard.

Job Id: **262.1-034101-1**
Certificate No: **TAA00002UH**

Type Approval documentation

Test reports: CE-Cert 404.022.xx, 2004; IABG P340 2222-13 TA 22-1, dated 2004-05-06; Schwille no. 1980, dated 2004-04-07; System documentation PCB circuit diagrams; SW-Questionnaire RC3 dated 2005-03-17; Add. reports Raytheon ET04-04-06, GEDIS EMV005306e.
Additional test reports: EMC Testreport 24/17, rev.1; Delphi VL2010001JCK.115.02-01; Raytheon ET55-11-09; ET54-11-09, ET53-11-09; N. Eichler, 09-005, 09-006, 09-007, 09-008, 09-009, 09-010, GEDIS AB2258. I/O update 2011: Eichler 11-004, 11-006, 11-008, 11-010; ET-11-05-11, ET-12-05-11, ET-13-05-11, ET-14-05-11; GEDIS AB2591-001, AB2571-001/002.
Additional EMC Test Report TREO 163-20, issue 2, dated 2020-07-14.
Renewal Assessment Report, DNV GL Hamburg, dated 2020-07-16.

Tests carried out

Applicable tests according to DNV GL CG-0339, December 2019.
Functional Performance tests.

Marking of product

Components are marked with product name and product number as listed in the table above.

Periodical assessment

The scope of the periodical assessment 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 assessment are:

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

Periodical assessment is to be performed at renewal of this certificate.

END OF CERTIFICATE

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	maresystems GmbH
Address	Kupferhammer 7, Hamburg, 22399, Germany
Type	Control and Monitoring System
Description	Integrated Automation System
Trade Name	Vista Next Generation
Application	Marine, offshore and industrial applications for use in environmental categories ENV1, ENV2 and ENV3 as defined in Lloyd's Register's Type Approval System, Test Specification Number 1 - 2002
Specified Standard	Vista Alarm Automation System User's Manual, rev 1.02, dated 08.01.2021
Ratings	see appendix
Additional Tests	Low temperature test (-15°C/16 hours) for components DCI 24 in Plus or red version and DCO 16 in Plus or red version
Other Conditions	For the use of the "paperless" alarm printer a USB stick is required. The utilized USB sticks are to be registered, stored and made available to a LR surveyor at any time.

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

Jochen Koerner

Senior Specialist to Lloyd's Register EMEA
A member of the Lloyd's Register group

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Type Approval Certificate

Final functional arrangements are to comply with the appropriate Lloyd's Register Rules and Regulations and will be subject of a Plan Approval process.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document HTS/ETS 40688-20 and its supplementary Type Approval Terms and Conditions form part of this Certificate.