



# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAA00000EH**  
Revision No:  
**4**

## This is to certify:

**That the Programmable Electronic System**

with type designation(s)  
**M1 - Controller System**

Issued to  
**Bachmann electronic GmbH**  
**Feldkirch, Austria**

is found to comply with  
**DNV 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.**

## Location classes:

<b>Temperature</b>	<b>B, D - only for cold climate modules</b>
<b>Humidity</b>	<b>B</b>
<b>Vibration</b>	<b>B</b>
<b>EMC</b>	<b>A, B - with minimum 2x1.8mH Common Mode Filter in Power Supply, GMP232/x2 is excluded</b>
<b>Enclosure</b>	<b>Required protection according to DNV Rules shall be provided upon installation on board</b>

Issued at **Hamburg** on **2023-01-10**

for **DNV**

This Certificate is valid until **2026-12-31**.

DNV local station: **Augsburg**

Approval Engineer: **Dariusz Lesniewski**

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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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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

The following components of the M1 – Controller system are covered:

AI2xx/xx	Analog input module	Max 8 inputs
AIC206/212/214	Condition monitoring module	4/12/12 analog inputs
AIO2xx/x	Analog I/O module	Up to 16 Inputs/Outputs (galvanic isolation)
AIO2xx/SI	Analog I/O module	Up to 8 Inputs/Outputs (galvanic isolation)
AO2xx/xx	Analog output module	Max 8 Outputs
BS2xx/x	Backplane with different slot(s)	Max 16 slots
CF200/xxxx	Compact flash card	64MB to 4 GB
CFA200/x	CFast Card	4 GB to 16 GB
CM202	CAN-Bus module (Master)	2 ports
CNT204/x	Counter module	Max 4 ports
DA3284C	CAN-Bus module (analog/digital I/O)	Several analog and digital I/O ports
DI2xx/xxx	Digital input module	Max 32 Inputs
DIO2xx/x	Digital input/output module	Max 80 in/outputs
DIOxx-C	CAN-Bus module (digital I/O)	Max 48 in/outputs
DIOxxx-C	CAN-Bus module (digital I/O)	Max 64 in/outputs
DO2xx/xx	Digital output module	Max 32 outputs
DOR206/xxx	Digital relay output module	6 outputs from 24VDC to 230VAC
DPM200	Profibus module	Profibus Master
EM2xx	Ethernet master module	3 external ETH ports
FM2xx	Fastbus master module	Multimode and HCS possible
FS2xx/x	Fastbus slave module	Multimode and HCS possible
GIO212	General I/O module	12 Inputs/Outputs
GM260	Grid measurement module	6 analog inputs
GMP232/x	Grid measurement protection module	6 analog inputs, 2 relay output
GMP232/x2	Grid measurement protection module	x can be 1, 2, 3, 4 or 5 (rated voltage); 2 relay outputs
GSP274	Grid measurement, synchronisation and protection module	11 analog inputs, 2 relay outputs, 4 Digital outputs, 4 digital inputs
ISI2xx/x	Encoder interface module	2 analog, 2 init and 2 trig ports optional
LM201, S20x	Dummy module	Dummy module
MC205	CPU module ATOM class	Max 600 MHz clock rate
MC206	CPU module ATOM class	Max 600 MHz clock rate
MC210	CPU module ATOM class	Max 1.6 GHz clock rate
MC212	CPU module ATOM class	Max 2x1.3 GHz clock rate
MC220	CPU module ATOM class	Max 4x1.6 GHz clock rate
MH230/x	CPU module Core2Duo/Celeron class	Max 2x2,3 GHz clock rate
MX207/213/220	CPU module Pentium II class	Max 67MHz up to 200MHz clock rate
MX220/2	CPU module	Max 433MHz clock rate
NT2xx	Power supply 24/48VDC	24VDC and 48VDC possible
PTAI216	Temperature recording module	16 analog inputs
TCO2xx-C	Temperature recording module	Max 16 inputs and 24 outputs
TI214/x	Temperature recording module	Possible types: Pt100/1000, J,K,N,S
PVA202/PVA204	Proportional valve amplifier	2 coils / 4 coils
PVA206/PVA208	Proportional valve amplifier	6 coils / 8 coils
RS204/x	Interface module RS232, 422, 485, TTY	4 data ports
SDI208	Safety digital input module	16 Inputs – can be used redundantly in pairs
SDO204	Safety digital output module	8 outputs – can be used redundantly in pairs
SLC284	Safety logic controller	16 inputs can be used redundantly in pairs 8 outputs can be used redundantly in pairs
SAI205	Safety analog input module	10 Inputs - can be used redundantly in pairs

SCT202	Safety counter module	2 INC/COUNT/Digital inputs (can be used redundantly in pairs) 2 Digital outputs (can be used redundantly in pairs)
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Compass safe distance:

Standard compass	Steering compass
74 cm	50 cm

Cold Weather option for all CPU Modules possible marked by /W

Cold Climate modules marked by CC and/or ❄️.

Software (firmware) version: M-Base V. 3.xx, M-Base V. 4.xx

### Application/Limitation

The equipment fulfils the EMC requirements for installation in all locations including bridge and open deck with EMI filter of min 2x1.8mH, e. g. Phoenix Contact NEF 1-10-2788977.

The GMP232/x2 fulfils the EMC requirements for installation in all locations except bridge and open deck.

### Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

#### Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

#### Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the computer

### Type Approval documentation

Bachmann Electronic project MARINE 003, project No. 10992, dated 22.07.2009, including the following reports:

- EMC-Test Report No. 453-1109, dated 09.11.2009
- EMC-Test Report No. 403-0109, dated 29.01.2009
- EMC-Test Report No. 424-0308, dated 11.03.2008

Bachmann Electronic project MARINE 004, project No. 12482, dated august 2011, including the following reports:

- Test configuration.pdf, rev.01, dated 03.08.2011
- Power supply failure.pdf, rev.00, dated 16.05.2011
- Dry heat.pdf, ref.00, dated 18.07.2011
- Damp heat.pdf, rev.00, dated 18.07.2011
- Vibration: Test Report No.71386807, dated 04.08.2011
- Insulation resistance.pdf, rev.00, dated 25.07.2011
- High voltage.pdf, rev.00, dated 25.07.2011
- (Burst-Fast transit, Surge-Voltage), rev.00, dated 05.05.2011
- Electromagnetic fields (Radiated/conducted emission) Test Report No. 14312-03974-1, rev.1, dated 28.07.2011
- Flammability, rev.00, dated 06.05.2011
- Compass safe distance, rev.00, dated 19.08.2011

Bachmann Electronic project MARINE 005, Document Dossier MARINE005

Bachmann Electronic project MARINE 006, Document Dossier MARINE006

Bachmann Electronic project MARINE 008, Document Dossier MARINE008

Bachmann Electronic project MARINE 012, Document Dossier MARINE012

Test Report: TÜV No. TR-14312-89434-01 (Edition 1), 2020-07-02

Type approval assessment report issued at Augsburg on 2021-10-27

### Tests carried out

Applicable tests according to class guideline DNV CG-0339, August 2021.

For the bridge mounted components the 'Compass safe distance' was measured according to section 11.2 of IEC 60945 4<sup>th</sup> edition (2002).

### **Marking of product**

Each product shall be provided with visible marking, giving at least the following information:

- Manufacturer's name
- Type designation

### **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 after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE