



Marine & Offshore  
Division

Certificate number: 23070/B1 BV

File number: AP4121

Product code: 4501H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Bachmann electronic GmbH**

Feldkirch - AUSTRIA

*for the type of product*

**PROGRAMMABLE LOGIC CONTROL UNITS**

M1 series

**Requirements:**

Bureau Veritas Rules for the Classification of Steel Ships

EC Code: 33

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 23 Apr 2020**

**For BUREAU VERITAS,**

At BV HAMBURG, on 15 May 2017,

Dirk Hoepfner



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 October 2014

This certificate consists of 5 page(s)

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION:

MI series are programmable logic controller and comprises the following modules:

Module type	Model	Description
Processor Modules	ME203	80386 EX (33MHz)
	ME203/N/E/EN/C/CN	80386 EX (33MHz) (N: Integrated power supply, E: Ethernet, C: CANopen)
	MH212	CPU Core 2 DUO (1.2GHz)
	MH212/S	CPU Celeron (1.2GHz)
	MPC240	CPU Celeron (400MHz)
	MPC265	CPU Celeron (650MHz)
	MPC270	CPU Pentium III - class (700MHz)
	MPC293	CPU Pentium III - architecture (933MHz)
	MPE240	CPU Celeron (400MHz), 2 PCI slots
	MPE265	CPU Celeron (650MHz), 2 PCI slots
	MPE270	CPU Pentium III (700MHz), 2 PCI slots
	MX207	CPU x86 Pentium equivalent (66MHz)
	MX213	CPU x86 Pentium equivalent (133MHz)
	MX220	CPU x86 Pentium equivalent (200MHz)
	MC205	CPU Atom E620 (600MHz)
	MC210	CPU Atom E680 (1,6GHz)
Digital I/O	DI212	12 inputs, one group, 24VDC
	DI216	16 inputs, two groups, 24VDC
	DI232	32 inputs, two groups, 24VDC
	DI232/np1	32 inputs, four groups, 24VDC
	DIO216	0 to 16 inputs, 0 to 16 outputs, 24VDC
	DIO216/4	0 to 16 inputs, 0 to 16 outputs, 24VDC
	DIO232	16 to 32 inputs, 0 to 16 outputs, 24VDC
	DIO248	16 to 32 inputs, 16 to 32 outputs, 24VDC
	DIO264	24 to 40 inputs, 24 to 40 outputs, 24VDC
	DIO280	32 to 48 inputs, 32 to 48 outputs, 24VDC
	DO216	16 outputs, 24VDC
	DO232	32 outputs, 24VDC
	DO232/48	32 outputs, 48VDC
	DOR206	6 outputs for relays
	DOR206/230	6 relay outputs, 230VAC/1A or 24VDC/0.5A
	Analogue I/O	AI204/1
	AI204/2	2 inputs, +/-10V
	AI204/4	4 inputs, +/-10V
	AI202/SI	2 inputs, 0(4) to 20mA, isolated
	AI204/SI	4 inputs, 0(4) to 20mA, isolated
	AI208/SI	8 inputs, 0(4) to 20mA, isolated
	AIC212	9 inputs +/-6V, 3 inputs +/-10V
	AIO208	8 inputs/outputs (configurable)
	AIO216	16 inputs/outputs (configurable)
	AIO202/SI	2 inputs/outputs, isolated (configurable)
	AIO204/SI	4 inputs/outputs, isolated (configurable)
	AIO208/SI	8 inputs/outputs, isolated (configurable)

Module type	Model	Description
Analogue I/O	AIO288	8 inputs, 8 outputs, 4 inputs PT100/PT1000, isolated
	AIO288/1	8 inputs, 8 outputs, 4 inputs PT100/PT1000, non isolated
	AO202	2 outputs, +/- 10V
	AO202/SI	2 outputs, 0 to 20mA
	AO204/SI	4 outputs, 0 to 20mA
	AO208/I	8 outputs, 0(4) to 20mA
	PTAI216	4 inputs, +/-1V, +/-10V or 0 to 20mA, 12 inputs, PT100/PT1000
	TI214	14 inputs, PT100/PT1000/J/K
	TI214/2	14 inputs, N/S
General I/O	GIO212	12 inputs/outputs, isolated (individually configurable)
Technology Modules	CNT204	Counter, 1 INC HTL and 1 INC RS422 and 2 counter or 4 counter
	CNT204/H	Counter, 2 INC HTL + 2 counter or 4 counter
	CNT204/R	Counter, 2 INC RS422 + 2 counter or 4 counter
	ISI202	Encoder, 2 INC/SSI, 1MHz, 2 analogue out +/- 10V, 2 INIT
	ISI202/5	Encoder, 2 INC, 5MHz, 2 analogue out +/- 10V, 2 INIT
	ISI222	Encoder, 2 INC/SSI, 1MHz, 2 analogue out +/- 10V, 2 INIT, 2 TRIGGER
	ISI222/8	Encoder, 2 INC, 8MHz, 2 analogue out +/- 10V, 2 INIT, 2 TRIGGER
	PVA204	Proportional valve amplifier, current regulated, max.4 unipolar solenoids
	PVA208	Proportional valve amplifier, current regulated, max.8 unipolar solenoids
Interface Modules	FCS214/F/G	Switch, 1 fibre optic, 4 RJ45, (F: 10/100Mbit/s, G: 10/100/1000Mbit/s)
	RS204	Serial interfaces, 4 RS232/422/485
	RS204/T	Serial interfaces, 3 RS232/422/485, 1 TTY
	RS204/R	Serial interfaces, 3 RS232/422/485, 1 RS232
	RS204/2	Serial interfaces, RS232/422/485, 2MBit/s
	SWI205/S	Ethernet Switch, 5 ports, RJ45
Bus Modules	CM202	2 CAN bus master
	CS200	2 CAN bus slave
	CS200/N	2 CAN bus slave, integrated power supply
	DNM201	DeviceNet master
	DPM200	2 PROFIBUS connectors
	EM303	Ethernet master, 3 RJ45, 10/100MBit/s
	EM213	Ethernet master, 3 RJ45, 10/100MBit/s
	FM211, FM221	FAST bus master, 1 fibre optic interface
	FM212, FM222	FAST bus master, 2 fibre optic interfaces
	FS211, FS221	FAST bus slave, 1 fibre optic interface
	FS211/N, FS221/N	FAST bus slave, 1 fibre optic interface, integrated power supply
	FS212, FS222	FAST bus slave, 2 fibre optic interfaces
	FS212/N, FS222/N	FAST bus slave, 2 fibre optic interfaces, integrated power supply
	Decentral CAN Modules	DA3284-C
DIO16-C		16 digital inputs/outputs
DIO32-C		32 digital inputs/outputs
DIO48-C		32 digital inputs/outputs and 16 digital inputs
DIO264-C		32 digital inputs/outputs and 32 digital inputs
TCO204-C		4 analogue inputs (TC type J or K) and 8 digital outputs, 24VDC
TCO208-C		8 analogue inputs (TC type J or K) and 12 digital outputs, 24VDC
TCO216-C		16 analogue inputs (TC type J or K) and 24 digital outputs, 24VDC

Module type	Model	Description
Accessories	BS201 to BS216	Backplanes with 1 to 16 module slots
	BS203/S to BS216/S	Backplanes with 1 to 16 module slots for class 1 protective connection
	BS202/ET to BS208/ET	Backplanes with 2 to 8 module slots, for heat dissipation
	S201	Backplane with 1 module slot, without bus
	CF200	CF-Card (64/128/256/512MB, 1/2/4/8GB)
	LM20	Dummy modules
	LM201	Dummy modules
	NT250	Power supply modules, 24VDC
	NT255	Power supply modules, 24VDC
	PCC201/x	PC-Card (8/16/32/64MB)

**Main characteristics:**

Power supply: 24VDC nominal voltage  
Degree of protection: IP20  
Firmware version: M-Base V4.xx and V3.xx

**2. DOCUMENTS AND DRAWINGS:**

- Technical Documentation V01/Feb.2009
- Data sheets dated 18.03.2011, 03/2014, 02/2015 and 04/2015 ; PVA20xDoku\_13228-000-24 Rev000
- Operating manuals: Benutzerhandbuch M-BASE V4.00, revision 02, dated 28 April 2016
- Software Quality Assurance documents: G130, dated 28.07.2016 ; G135, dated 28.07.2016 ; G142, dated 16.08.2016 ; G150, dated 07.10.2016 ; G161, dated 11.10.2016 ; G162, dated 11.10.2016 ; G170, dated 29.11.2016 ; G180, dated 07.10.2016 ; G194, dated 01.08.2016 ; RLG100-20, REV 000.1, dated 13.02.2013 ; RLG100-01, REV 017, dated 11.4.2016 ; RLG100-07, REV 005, dated 27.04.2015 ; RLG100-17, REV 008.1, dated 15.02.2011 ; RLG100-08, REV002, dated 09.02.2015 ; RLG100-18, REV005.1, dated 09.03.2011

**3. TEST REPORTS:****Bachmann:**

- 10992 dated 22.July.2009, 30.July.2009, 2x 17.08.2009, 2x 17.Aug.2009, 14.Aug.2009, 4.August.2009 and 16.Oct.2009
- 09144/09 dated 16.Sept.2008 2x 22.Sept.2008 and 11.Sep.2008, SuV010 dated 1.July.2008
- 9942 dated 21.11.01, 10469 dated 14.Jänner 2008, 10631 dated 13.12.2007, 9825 dated 16.9.1999 and 13.12.1999, 10511 dated 29.5.2008,
- 10134 dated 2.4.2002, 9584 dated 09.03.1999, 10123 dated 28.3.2002, 10502/03 dated 22.Sep.2008
- 9483 dated 05.11.1999, 9810 dated 28.03.2001, 10463 dated 08.06.2006, 10814 dated 09.11.2007, 9949 dated 01.12.2000
- 10346 dated 16.09.04, 10741 dated 27.10.2008, 09144/09 dated 23.Sep.2008 and 10992 dated 15.07.2010
- 12482 dated 05 May 2011, 13 June 2011 and 19 Aug 2011
- 12718.00.03/04 dated 29.10.2014; 12718.00.05/06/11 dated 28.11.2014; 12718.00.10 dated 24.11.2014
- 12718.00.13/14/17/18 dated 30.10.2014; 12718.00.19 dated 30.10.2014; 12718.00.20 dated 30.10.2014
- 12718.00.21 dated 22.01.2015 Rev.1
- 13228-000-3,4, dated 01.02.2016, Rev.000; 13228-000-5,6,11, dated 21.03.2016, Rev.000; 13228-000-9, dated 21.03.2016, Rev.000 ; 13228-000-10, Rev.000, dated 04.02.2016 ; 13228-002-13,14,15,16,17,18, Rev.003, dated 06.06.2016 ; 13228-000-19,20, Rev.000, dated 01.02.2016 ; 13228-000-21, Rev.000, dated 21.01.2016

**ZAMM:**

- 436-0508 dd.: 2008-05-13, 403-0109 dd.: 2009-01-29, 424-0308 dd.: 2008-03-11 and 453-1109 dd.: 2009-11-03

**SGS:**

- BOTW0001 dd.: Oct 09.2008

**TÜV SÜD:**

- 71366028 dated 2010-06-21, 14312-03974-1(Ed. 1) dated 28 July 2011 and 71386807 dated 2011-08-04
- 713051191 dated 2014-11-25; 14312-52016-01 Ed.1 dated 13 Nov 2014
- 713077298, Rev 1, dated 2016-02-16

**4. APPLICATION / LIMITATION:**

- 4.1 - Bureau Veritas Rules for the Classification of Steel Ships.
- 4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT** and **AUT-IMS**.
- 4.3 - Bureau Veritas Environmental Category, **EC Code: 33**.
- 4.4 - The equipment fulfils the EMC requirements for installation in on bridge or deck by using an interference filter on the power supply lines as specified in the M-Base V4.xx Operating manual.
- 4.5 - The product designation of some modules may be followed by "CC" and additional marked with "\*" at the front and the product designation of processor modules may be followed by "W". These features are not relevant for the certificate.
- 4.6 - Each application and configuration is to be submitted to the Society's examination prior to fitting on board.
- 4.7 - Data processing system used for machinery protection is to be independent from the control and monitoring system.
- 4.8 - Depending on the application, submission of documents, Factory Acceptance and On-board Tests are to be performed in accordance with requirements for programmable electronic systems categories II or III.
- 4.9 - Only Hardware and Software successfully tested together in compliance with the regulations as referred to in page one, according to the declaration of the manufacturer is covered by this certificate.

**5. PRODUCTION SURVEY REQUIREMENTS:**

- 5.1 - The above products are to be supplied by **Bachmann electronic GmbH** in compliance with the type described in this certificate.
- 5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320 and as such does not require a BV product certificate.
- 5.3 - **Bachmann electronic GmbH** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products :

**Bachmann electronic GmbH**  
**Kreuzäckerweg 33**  
**6800 Feldkirch**  
**AUSTRIA**

- 5.4 - Each equipment is to be supplied with manual (s) for installation, use and maintenance.

**6. MARKING OF PRODUCT:**

- Maker's name or trademark.
- Date of manufacture and/or serial number.
- Equipment type or model identification under which it was type-tested.
- For each application title and version of each software element included in the installed software system shall be either marked on the equipment or displayed on a panel on command.

**7. OTHERS:**

- 7.1 - It is **Bachmann electronic GmbH - AUSTRIA** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.
- 7.2 - This certificate supersedes the Type Approval Certificate N° 23070/B0 BV issued on 23 Apr 2015 by the Society.

\*\*\* END OF CERTIFICATE \*\*\*