

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Network and Communication Components**with type designation(s)
MACH 1000 Family, MACH 1040 Family

Issued to

Hirschmann Automation and Control GmbH
Neckartenzlingen, Baden-Württemberg, Germanyis 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.**

Type	Temperature	Humidity	Vibration	EMC	Enclosure
MACH 1000 Family	B/D *	B	A	B	
MACH 1040 Family	B/D *	B	A	B	

Required protection according to DNV GL Rules shall be provided upon installation onboard.Issued at **Hamburg** on **2019-02-08**This Certificate is valid until **2022-12-20**.DNV GL local station: **Augsburg**Approval Engineer: **Heinz Scheffler**

Digitally Signed By: Rinkel, Marco

for **DNV GL**

Location: Hamburg, on behalf of

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.



Job Id: **262.1-019180-4**
Certificate No: **TAA00001ET**
Revision No: **3**

Product description

MACH 1000 Family Industrial Ethernet Ruggedized Switches

The modular switches support switched Ethernet networks in accordance with IEEE standard 802.3 or 802.3u using copper and fiber optic technology. The switches are mounted with fixing brackets into the switch cabinet or in an upright position at the wall.

The product designation of the device is made from combining the desired product characteristics in accordance with the following structure: **MARaabc – ddeeffghhijjkkllmmnnooppqrstu**

Position 4 and 5 (aa): Product

10: Standard Construction

11: Ports on Backside

Position 6 (b): Product

2: FE Switch

3: GE Switch

Position 7 (c): Product

0: Standard Construction

2: PoE Ports

Position 8: - : hyphen

Position 9 and 10 (dd)

99: Module not populated (in case of type MAR 1x2x)

CC: 2 * Combo Port Gigabit Ethernet (SFP only 1000Mbit)

4O: 2 * 2 Port Gigabit Ethernet SFP Modul (only 1000Mbit)

4T: 2 * 2 Port Gigabit Ethernet RJ45 Modul

OT: 2 Port Gigabit Ethernet SFP Modul (only 1000Mbit) and 2 Port Gigabit Ethernet RJ45 Modul

Position 11 and 12 (ee): Fast Ethernet Ports 1,2

99: Module not populated

TT: 2 * Twisted Pair (Tx) / RJ45

MM: 2 * Multimode FX DSC

JJ: 2 * Multimode FX MTRJ

NN: 2 * Multimode FX ST

BB: 2 * Multimode SFF/LC

VV: 2 * Singlemode FX DSC

UU: 2 * Singlemode FX ST

LL: 2 * Singlemode Long Haul FX DSC

GG: 2 * Singlemode Long Haul FX DSC 200km

ZZ: 2 * SFP (only 100Mbit)

RR: 2 * Twisted Pair (Tx) / M12

FF: 2 * Multimode FL ST (only 10Mbit)

Position 13 and 14 (ff): Fast Ethernet Ports 3, 4

Same as under Position 11 and 12

Position 15 and 16 (gg): Fast Ethernet Ports 5, 6

Same as under Position 11 and 12

Position 17 and 18 (hh): Fast Ethernet Ports 7, 8

Same as under Position 11 and 12

Position 19 and 20 (ii): Fast Ethernet Ports 9, 10

Same as under Position 11 and 12

Position 21 and 22 (jj): Fast Ethernet Ports 11, 12

Same as under Position 11 and 12

Position 23 and 24 (kk): Fast Ethernet Ports 13, 14

Same as under Position 11 and 12

Position 25 and 26 (ll): Fast Ethernet Ports 15, 16

Same as under Position 11 and 12

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- Position 27 and 28 (mm): Fast Ethernet Ports 17, 18
Same as under Position 11 and 12
- Position 29 and 30 (nn): Fast Ethernet Ports 19, 20
Same as under Position 11 and 12
- Position 31 and 32 (oo): Fast Ethernet Ports 21, 22
Same as under Position 11 and 12
- Position 33 and 34 (pp): Fast Ethernet Ports 23, 24
Same as under Position 11 and 12
- Position 35 (q): Surrounding air temperature range & coating
- C:** 0°C up to +60°C inclusive conformal coating of PCB's
 - S:** 0°C up to +60°C
 - U:** -40°C up to +85°C
 - F:** -40°C up to +85°C inclusive conformal coating of PCB's
- Position 36 (r): Power supply rating PSU1
- C:** 18 – 60 V DC
 - G:** 77 – 320 V DC or 90 – 265 V AC optional
 - L:** 18 - 60 V DC pluggable
 - M:** 77 - 300 V DC or 90 - 265 V AC pluggable optional
- Position 37 (s): Power supply rating PSU2
- 9:** not populated
 - C:** 18 – 60 V DC
 - G:** 77 – 320 V DC or 90 – 265 V AC optional
 - L:** 18 - 60 V DC pluggable
 - M:** 77 - 300 V DC or 90 - 265 V AC pluggable optional
- Position 38 (t) - Specifications
- H:** DNV GL
- Position 39 (u): Software variant, optionally be followed by additional digits
- E:** enhanced
 - P:** professional
- Any letter** - customer specific derived from "professional"

Software release: 07.x,
Software release: 08.x
Software release: 09.x

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MACH 1040 Family Industrial Ethernet Ruggedized Switches

The modular switches support switched Ethernet networks in accordance with IEEE standard 802.3 or 802.3u using copper and fiber optic technology. The switches are mounted with fixing brackets into the switch cabinet or in an upright position at the wall.

The product designation of the device is made from combining the desired product characteristics in accordance with the following structure: **MARaaaa-bbccddeeffgghijkl**

Position 4 to 7 (aaaa): Product

- 1040:** MACH Ruggedized Gigabit Ethernet Switch
- 1042:** MACH Ruggedized Gigabit Ethernet Switch with PoE
- 1140:** MACH Ruggedized Gigabit Ethernet Switch, ports on the back
- 1142:** MACH Ruggedized Gigabit Ethernet Switch, ports on the back and with PoE

Position 8: - : hyphen

Position 9 and 10 (bb): 10/100/1000 Mbit/s-Ports 1 to 4

- 4C:** 10/100/1000 Mbit/s-Port 4 x combo port (SFP slot: 100/1000 Mbit/s, alternatively twisted pair RJ45 socket: 10/100/1000 Mbit/s)

Position 11 and 12 (cc): 10/100/1000 Mbit/s-Ports 5 to 8

- 4C:** Same as under Position 9 and 10

Position 13 and 14 (dd): 10/100/1000 Mbit/s-Ports 9 to 12

- 4C:** Same as under Position 9 and 10

Position 15 and 16 (ee): 10/100/1000 Mbit/s-Ports 13 to 16

- 4C:** Same as under Position 9 and 10

Position 17 and 18 (ff): Ports 17 to 20

- 99:** Not present

Position 19 and 20 (gg): Ports 21 to 24

- 99:** Not present

Position 21 (h): Surrounding air Temperature range

- C:** 0°C up to +60°C inclusive conformal coating of PCB's
- S:** Standard 0°C ... +60°C
- T:** Extended -40°C ... +70°C
- E:** Extended -40°C ... +70°C, inclusive conformal coating of PCB's

Position 22 (i): Voltage range and Power Supply unit 1

- L:** 18V DC ... 60V DC pluggable
- M:** 77V DC ... 300V DC or 90V AC ... 265V AC pluggable

Position 23 (j): Voltage range and Power Supply unit 2 or PoE power supply unit

- 9:** Not present
- L:** 18V DC ... 60V DC pluggable
- M:** 77V DC ... 300V DC or 90V AC ... 265V AC pluggable

Position 24 (k): Certifications

- B or H or C:** GL

Position 25 (l): Software variant

- P:** Layer 2 Professional
- R:** Layer 3 Professional

May be followed by additional suffixes, customer specific designations - not relevant for this certificate.

Software Release: 06.x

Software Release: 08.x

Software Release: 09.x

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Application/Limitation

Equipment not for installation within a distance of 5 m from magnetic compass.

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, 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 GL Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. 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 GL for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Type Approval documentation

See ANNEX

Place of manufacture

See ANNEX

Tests carried out

Applicable tests according to Class Guidelines DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with:

- Model name
- Manufacturer name
- Serial number

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 typeapproved 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