DNV·GL

Certificate No:
TAA0000131

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Network and Communication Components

with type designation(s)
Octopus & Octopus II Series

Issued to
Hirschmann Automation and Control GmbH
Neckartenzlingen, 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	**D**
Humidity	**B**
Vibration	**A**
EMC	**B**
Enclosure	**IP67**

Issued at **Hamburg** on **2017-07-19**
This Certificate is valid until **2022-07-18**.
DNV GL local station: **Essen**

Approval Engineer: **Heinz Scheffler**

for **DNV GL**

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.

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Product description

Octopus

The switches support switched ETHERNET networks in accordance with IEEE standard 802.3 or 802.3u using copper and fiber optic technology.

Device	Number FX ports	Number of TX Ports	Connecting
8M	-	8 x TX port	M12 socket (10/100 MBit/s)
16M	-	16 x TX port	M12 socket (10/100 MBit/s)
16M-2FX	2 x FX port (multimode 1300 nm)	14 x TX port	M12 socket (10/100 MBit/s)
24M	-	24 x TX port	M12 socket (10/100 MBit/s)
24M-2FX	2 x FX port (multimode 1300 nm)	22 x TX port	M12 socket (10/100 MBit/s)

Firmware version: 06.x; 07.x; 08.x; 09.x

Octopus II

Octopus II devices are designed for very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.
There are numerous options of combining the device characteristics.
The redundancy concept allows the network to be reconfigured in sufficient time.
There are options for managing the device via:

- a Web browser
- SSH
- Telnet
- HiDiscovery (Software for putting the device into operation)
- network management software (e.g. HiVision)
- a V.24 interface (locally on the device)

The devices work without a fan.

Nomenclature Octopus II

Position	Characteristic	Characteristic value	Description
1 … 2	Product	OS	Octopus II device
3	Data rate	2	Fast Ethernet ports
		3	Fast Ethernet ports and Gigabit Ethernet ports
4	Hardware type	0	Standard
		4	Standard with PoE(+)
5	(hypen)	-	
6 … 7	Number PoE(+) ports	00	0 × PoE(+) ports
		08	8 × PoE(+) ports
		10	10 × PoE(+) ports
		11	11× PoE(+) ports
		12	12× PoE(+) ports

Position	Characteristic	Characteristic value	Description
		14	14 × PoE(+) ports
		15	15 × PoE(+) ports
8 … 9	Number Fast Ethernet ports	08	8 × Fast Ethernet ports
		12	12 × Fast Ethernet ports
		16	16 × Fast Ethernet ports
		20	20 × Fast Ethernet ports
		24	24 × Fast Ethernet ports
		28	28 × Fast Ethernet ports
10 ... 11	Number Gigabit Ethernet ports	00	0 × Gigabit Ethernet ports
		02	2 × Gigabit Ethernet ports
		04	4 × Gigabit Ethernet ports
12 ... 13	Configuration of uplink ports 1 and 2	T5	10/100 Mbit/s twisted pair port 4-pin, D-coded M12 socket
		R5	10/100 Mbit/s twisted pair port 4-pin, D-coded M12 socket with bypass relay
		T6	10/100/1000 Mbit/s twisted pair port 8-pin, X-coded M12 socket
		R6	10/100/1000 Mbit/s twisted pair port 8-pin, X-coded M12 socket with bypass relay
		1M	M-Fast SFP-MM / LC/ EEC / V1
		1S	M-Fast SFP-SM / LC/ EEC / V1
		1P	M-Fast SFP-SM+ / LC/ EEC / V1
		1L	M-Fast SFP-LH / LC/ EEC / V1
		1A	M-SFP-SX / LC / EEC / V1
		1B	M-SFP-LX / LC / EEC / V1
		1C	M-SFP-LH / LC / EEC / V1
		1D	M-SFP-LH+ / LC / EEC / V1
		4M	M-Fast SFP-MM / LC/ EEC / V4
		4S	M-Fast SFP-SM / LC/ EEC / V4
		4P	M-Fast SFP-SM+ / LC/ EEC / V4
		4L	M-Fast SFP-LH / LC/ EEC / V4
		4A	M-SFP-SX / LC / EEC / V4
		4B	M-SFP-LX / LC / EEC / V4
		4C	M-SFP-LH / LC / EEC / V4
		4D	M-SFP-LH+ / LC / EEC / V4
		5M	M-Fast SFP-MM / EEC / QODC

Position	Characteristic	Characteristic value	Description
		5S	M-Fast SFP-SM / EEC / QODC
		5P	M-Fast SFP-SM+ / EEC / QODC
		5L	M-Fast SFP-LH / EEC / QODC
		5A	M-SFP-SX / EEC / QODC
		5B	M-SFP-LX / EEC / QODC
		5C	M-SFP-LH / EEC / QODC
		5D	M-SFP-LH+ / EEC / QODC
		99	Not present
14 ... 15	Configuration of uplink ports 3 and 4	T5	10/100 Mbit/s twisted pair port 4-pin, D-coded M12 socket
		R5	10/100 Mbit/s twisted pair port 4-pin, D-coded M12 socket with bypass relay
		T6	10/100/1000 Mbit/s twisted pair port 8-pin, X-coded M12 socket
		R6	10/100/1000 Mbit/s twisted pair port 8-pin, X-coded M12 socket with bypass relay
		1M	M-Fast SFP-MM / LC/ EEC / V1
		1S	M-Fast SFP-SM / LC/ EEC / V1
		1P	M-Fast SFP-SM+ / LC/ EEC / V1
		1L	M-Fast SFP-LH / LC/ EEC / V1
		1A	M-SFP-SX / LC / EEC / V1
		1B	M-SFP-LX / LC / EEC / V1
		1C	M-SFP-LH / LC / EEC / V1
		1D	M-SFP-LH+ / LC / EEC / V1
		4M	M-Fast SFP-MM / LC/ EEC / V4
		4S	M-Fast SFP-SM / LC/ EEC / V4
		4P	M-Fast SFP-SM+ / LC/ EEC / V4
		4L	M-Fast SFP-LH / LC/ EEC / V4
		4A	M-SFP-SX / LC / EEC / V4
		4B	M-SFP-LX / LC / EEC / V4
		4C	M-SFP-LH / LC / EEC / V4
		4D	M-SFP-LH+ / LC / EEC / V4
		5M	M-Fast SFP-MM / EEC / QODC
		5S	M-Fast SFP-SM / EEC / QODC
		5P	M-Fast SFP-SM+ / EEC / QODC
		5L	M-Fast SFP-LH / EEC / QODC

Position	Characteristic	Characteristic value	Description
		5A	M-SFP-SX / EEC / QODC
		5B	M-SFP-LX / EEC / QODC
		5C	M-SFP-LH / EEC / QODC
		5D	M-SFP-LH+ / EEC / QODC
16 … 17	Configuration of the local ports	T5	10/100 Mbit/s twisted pair port 4-pin, D-coded M12 socket
18	(hyphen)	-	
19	Temperature range	V	Standard −40 °F ... +140 °F (−40 °C ... +60 °C)
		T	Extended −40 °F ... +158 °F (−40 °C ... +70 °C)
20 … 21	Supply voltage	BB	2 voltage inputs for redundant power supply
			Nominal voltage DC 24 V (M12 connector)
		HH	2 voltage inputs for redundant power supply
			Rated voltage range DC 36 V ... 48 V (M12 connector)
		FF	2 voltage inputs for redundant power supply
			Rated voltage range DC 24 V ... 48 V (7/8” 5-pin connector)
		QQ	2 voltage inputs for redundant power supply
			Rated voltage range DC 24 V ... 48 V (M12 connector))
		M9	2 voltage inputs for redundant power supply (without PoE)
			Rated voltage range AC 110 ... 230 V (7/8” 3-pin connector)
22 ... 23	Certificates and declarations	UY UT US U9	Ship appllication
24 ... 25	Software packages	99	Reserved
26 ... 27	Customer-specific version	HH	Hirschmann power supply standard connection
		HA	Hirschmann power supply angled connection
		H1	Hirschmann power supply side connection
28	Hardware configuration	S	Standard
		M	Ports 1 and 2: Fast MRP
		P	Ports 1 and 2: PRP

Position	Characteristic	Characteristic value	Description
		H	Ports 1 and 2: PRP
		D	Ports 1 and 2: DLR
		N	Rated voltage range DC
		T	Ports 1 ... 4: Train backbone (ETB)
29	Software configuration	E	Entry (without configuration)
		D	DLR configuration
		P	ProfiNET/IO configuration
		I	Ethernet /IP configuration
		B	BDEW configuration
30 ... 31	Software level	2S	HiOS Layer 2 Standard
		2A	HiOS Layer 2 Advanced
		3S	HiOS Layer 3 Standard
		99	Reserved
32 ... 36	Software version	04.1.	Software-Version 04.1
		XX.X.	Current software version (only if agreed by DNVGL)
		99.9	Without Software
37 ... 38	Maintenance	XX	Maintenance version 00
		XX	Newest bugfix version
		99	without bugfix

Software Versionen: HiOS 04.x; HiOS 05.x; HiOS 06.x

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 for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Type Approval documentation

Test reports: 412e/06; B_070602e; 2006-1535-2503-REN; 912492.042.002; 912492.042.003; 912492.042.007; 102e/15; 384e/15; 0447_PBN_16071401 E; TRP_95313016_S01_1v0; TRP_95313016_S02_1v0; TRP_95313016_S03_1v0; TRP_95313016_PS01_1v1; TRP_95313016_PS02_1v0; TRP_95313016_EMC01_1v1; TRP_95313016_EMC02_1v0; TRP_95313016_PE01_1v0; TRP_95313016_PE02_1v0; SVD_HiOS_04.0.00_1v0; SVD_HiOS_05_0_1v0; SVD_HiOS_06_0_1v0.

Documents: User Manual OCTOPUS 8M/16M/24M/OS32 (Release 14 02/2017); User Manual Octopus II (Release 04 04/2016); Drawing Overview_OSII_PCB_PCBA_2017-05-12; TRP Amendment OS II Version 1v0 (08.06.2016); Software Releases and Maintenance Process (13. Mai 2015).

Tests carried out

Applicable tests according to class guideline 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 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