



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00000DF
Revision No:
13

This is to certify:

that the **Peripheral Equipment**

with type designation(s)
AXIOLINE Modules & Smart Managed Compact Switch

issued to

Phoenix Contact GmbH & Co. KG
Blomberg, Nordrhein-Westfalen, Germany

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.

Temperature	B*/D
Humidity	B
Vibration	A/B*
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board.

Issued at **Hamburg** on **2025-03-17**

This Certificate is valid until **2029-06-13**.

for **DNV**

DNV local unit: **Essen**

Approval Engineer: **Torsten Dzillak**

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 USD 300 000.

Product description

AXIOLINE Modules

Article	Type	Description
2700988	AXC 1050	Controller for Axioline
2701295	AXC 1050/XC	
2404267	AXC F 2152	
1547350	AXC F 2152 XC	
1069208	AXC F 3152	
2688459	AXL F BK ETH	Axioline F bus coupler for Ethernet
2701949	AXL F BK ETH XC	
2701815	AXL F BK PN	
2701457	AXL F BK SAS	
2701222	AXL F BK PN XC	
2702177	AXL F BK ETH NET2	Axioline F bus coupler for Ethernet for operation in two separate networks
2688394	AXL F BK EIP	Axioline F bus coupler for EtherNet/IP
2688899	AXL F BK EC	Axioline F bus coupler for EtherCAT
2688530	AXL F BK PB	Axioline F bus coupler for PROFIBUS DP
2403869	AXL F BK PN TPS	Axioline F bus coupler for PROFINET
2403115	AXC F XT ETH 1TX	Axioline F, left-alignable Ethernet interface
1159811	AXC F XT SPLC 1000	Axioline F, left-alignable safety-related controller
1020304	AXC F IL ADAPT	Inline adapter terminal (INTERBUS master),
2701686	AXL F BK S3	Axioline F bus coupler for Sercos
2702668	AXL F IF CAN 1H	Axioline interface module, CAN, transparent protocol, max. transmission speed of 1 Mbps
2688666	AXL F RS UNI 1H	Axioline communication module for serial data transmission, 1 interface can be parameterized as RS-485/RS-422 or RS-232
2702006	AXL F RS UNI XC 1H	
2688297	AXL F PWR 1H	Axioline F power module for the communications power UBus, max. 4 A
2688022	AXL F DI16/4 2F	Axioline F digital input module, 16 inputs, 24 V DC, 1-, 2-, 3- or 4-wire connection method
2701224	AXL F DI16/4 XC 2F	
2688310	AXL F DI16/1 1H	
2688035	AXL F DI32/1 1F	Axioline F digital input module, 32 inputs, 24 V DC, 1-wire connection method
2701226	AXL F DI32/1 XC 1F	
2702052	AXL F DI32/1 2H	
2701450	AXL F DI64/1 2F	Axioline F digital input module, 64 inputs, 24 V DC, single-conductor connection technology
2688381	AXL F DO8/2 2A 1H	Axioline F digital output module, 8 outputs, 24 V DC, 2 A, 2-wire connection technology
1035427	AXL F DO8/2 2A XC 1H	
1027904	AXL F DO16/2 2H	Axioline F digital output module, 16 outputs, 24 V DC, 500 mA, 2-, wire connection method
2688048	AXL F DO16/3 2F	Axioline F digital output module, 16 outputs, 24 V DC, 500 mA, 1-, 2-, 3-wire connection method
2701228	AXL F DO16/3 XC 2F	
2688349	AXL F DO16/1 1H	
2701813	AXL F DO16 FLK 1H	Axioline F digital output module, 16 outputs, 24 V DC, 500 mA, FLK20 connection for system cabling

Article	Type	Description
2688051	AXL F DO32/1 1F	AxioLine F digital output module, 32 outputs, 24 V DC, 500 mA, 1-wire connection method
2701230	AXL F DO32/1 XC 1F	
1004925	AXL F DO32/1 2H	
2702053	AXL F DO64/1 2F	AxioLine F digital output module, 64 outputs, 24 V DC, 500 mA, 1-conductor connection technology
2701916	AXL F DI8/1 DO8/1 1H	AxioLine F digital input and output module, 8 inputs, 24 V DC, 8 outputs, 24 V DC, 500 mA, single-conductor connection technology
2702017	AXL F DI8/1 DO8/1 XC 1H	
2702106	AXL F DI16/1 DO16/1 2H	AxioLine F digital input and output module, 16 inputs, 24 V DC, 16 outputs, 24 V DC, 500 mA, 1-wire connection technology
2688491	AXL F AI4 I 1H	AxioLine F analog input module, 4 current inputs, integrated sensor supply
2702007	AXL F AI4 I XC 1H	
2688064	AXL F AI8 1F	AxioLine F analog input module, 8 inputs, 2-wire connection method
2701232	AXL F AI8 XC 1F	
2688501	AXL F AI4 U 1H	AxioLine F analog input module, 4 voltage inputs, integrated sensor supply
2702008	AXL F AI4 U XC 1H	
2688527	AXL F AO4 1H	AxioLine F analog output module, 4 outputs
2702153	AXL F AO4 XC 1H	
2688080	AXL F AO8 1F	AxioLine F analog output module, 8 outputs, 2-wire connection method
2701237	AXL F AO8 XC 1F	
2702072	AXL F AI2 AO2 1H	AxioLine F analog input and output module, 2 inputs, 2 outputs
2688093	AXL F CNT2 INC2 1F	AxioLine F special function module, 2 counter inputs, 2 incremental encoder inputs, 2 outputs
2701239	AXL F CNT2 INC2 XC 1F	
2702159	R-AXL F INC2 1F	AxioLine F special function module, 2 incremental encoder inputs, 2 outputs
2688598	AXL F UTH4 1H	AxioLine F temperature module, 4 inputs for connection of thermocouple sensors
2688556	AXL F RTD4 1H	AxioLine F temperature module, 4 inputs for connecting resistance temperature detectors
2688077	AXL F RTD8 1F	AxioLine F temperature module, 8 inputs for the connection of resistance temperature detectors (RTD)
2701235	AXL F RTD8 XC 1F	
2701559	AXL F PSDI8/4 1F	AxioLine F safety module, 8 single-channel or 4 two-channel safe digital inputs (PROFIsafe system)
1369866	AXL F PSDI8/4 XC 1F	
2702263	AXL F SSDI8/4 1F	AxioLine F safety module, 8 single-channel or 4 two-channel safe digital inputs (SafetyBridge system)
2701560	AXL F PSDO8/3 1F	AxioLine F safety module, 8 single-channel or 4 two-channel safe digital outputs positive switching (PROFIsafe system)
1369867	AXL F PSDO8/3 XC 1F	
2702264	AXL F SSDO8/3 1F	AxioLine F safety module, 8 single-channel or 4 two-channel safe digital outputs positive switching (SafetyBridge system)
2702171	AXL F LPSDO8/3 1F	AxioLine F safety module with integrated safety logic, 8 single-channel or 4 two-channel safe digital outputs positive switching (SafetyBridge system)
2702859	AXL F SSDOR4/2 1F	AxioLine F safety module, 4 single-channel or 2 two-channel safe floating relays outputs (SafetyBridge system)
2702858	AXL F PSDOR4/2 1F	AxioLine F safety module, 4 single-channel or 2 two-channel safe floating relays outputs (PROFIsafe system)
1369870	AXL F PSDOR 4/2 XC 1F	
1061424	AXL F PSAI8 I 1F	AxioLine F safety module, 8 single-channel or 4 two-channel safe analogue inputs (PROFIsafe system)
1369869	AXL F PSAI8 I XC 1F	

XC: Partly coated printed boards

Smart Managed Compact Switch

Article	Type	Description
2891479	FL SWITCH SMCS 6GT/2SFP	6 RJ45 and 2 fiber optic SFP ports Transmission speed: 1 Gigabit/s Power supply: 24V DC, redundant Supported protocols: SNMP, WBM, serial interface (Hyper Terminal) Software (FW): V4.x
2891123	FL SWITCH SMCS 8GT	8 RJ45 ports Transmission speed: 1 Gigabit/s Power supply: 24V DC, redundant Supported protocols: SNMP, WBM, serial interface (Hyper Terminal) Software (FW): V4.x

Application/Limitation

AXIOLINE Modules

- **Location class EMC B:**
To fulfill the EMC limits for bridge and open deck zone, filter ME-MAX/NEF/QUINT10A/20A must be connected in the power line. Compass safe distances: Standard compass 45cm, Steering compass 30cm
- **Location class Vibration B:**
 - AXC F XT ETH 1TX
 - AXC F 2152
 - AXL F IF CAN 1 H
 - AXL F IF DO32/1 2 H
 - AXL F IF DO16/2 2 H
 - AXL F PSDI8/4 1F
 - AXL F SSDI8/4 1F
 - AXL F PSDO8/3 1F
 - AXL F SSDO8/3 1F
 - AXL F LPSDO8/3 1F
 - AXL F PSAI8 I 1F
 - AXL F PSAI8 I XC 1F
 - AXL F PSDI8/4 XC 1F
 - AXL F PSDO8/3 XC 1F
 - AXL F CNT2 INC2 1F
 - AXL F AI 4 I 1H
 - AXL F AI 4 U 1H
 - AXL F RS UNI 1H
 - AXL F BK PN XC
 - AXL F CNT2 INC2 XC 1F
 - AXL F BK PN
 - AXL F BK ETH XC
 - AXL F RS UNI XC 1H
 - AXL F AI 4 U XC 1H
 - AXL F AI 4 I XC 1H
 - AXL F BK ETH NET2
 - AXL F LPSDO8/3 1F
 - R-AXL F INC2 1F

Smart Managed Compact Switch

- **Location class EMC B:**
To fulfill the EMC limits for bridge and open deck zone, Phoenix Contact NEF 1-6 - Power line filter, 230 V AC, 50-60Hz, 6A must be connected in the power line. Compass safe distances: more than 5 m from magnetic compass.
- **Location class Temperature B:**
 - FL SWITCH SMCS 6GT/2SFPFL
 - SWITCH SMCS 8GT

User manuals are to be observed before installation especially for Axioline F.

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. If the control system is intended for remote software maintenance the functionality shall be part of the system documentation as required in DNV 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 and Documents: TAA00000DF_Overview_Documents_Rev.15.

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 4th edition (2002).

Place of manufacture

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