Certificate no.:
TAA00003D3

TYPE APPROVAL CERTIFICATE

This is to certify:

that the General Controller

with type designation(s)
ESX-3CM

issued to
Sensor-Technik Wiedemann GmbH
Kaufbeuren, **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.
Location classes:

Temperature	**D**
Humidity	**B**
Vibration	**A**
EMC	**B**
Enclosure	**C (IP65)**

Issued at **Hamburg** on **2024-05-29**
This Certificate is valid until **2029-01-23**.
DNV local unit: **Augsburg**

for **DNV**

Approval Engineer: **Jens Dietrich**

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 ESX-3CM is a compact, robust and efficient control unit.
All interface pins are fixed assigned prior to the hardware definition. The functions of these pins can be defined in more detail using software.

A second, independent processor monitors the various system voltages and the program sequence. If required, this switches off all outputs via a second shut-down method or resets the main controller.
Digital and analog feedback of signal branches permit diagnostics for the system including the inputs and outputs.

For safety-oriented applications SIL2, a safety layer API is available which permits the separation of safety and non-safety (feedback-free) application sections using a memory protection unit.

Technical data:

- TriCore TC 1798 32 bit, 300 MHz
- 288 kB SRAM internal, 8 MB SDRAM external
- 4 MB Flash internal
- 32 kB EEPROM
- 4 CAN interfaces (CAN 1 with wake-up function), 1 RS232 interface, 1 Ethernet interface
- 28 inputs (SENT support)
- 28 outputs

Device Revision 27.

Application/Limitation

SIL certification is not covered by this certificate and is issued by a notified/recognized Certification Body.

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: TAA00003D3 _Overview_Documents Rev.00
Assessment Report issued by DNV Augsburg, 2023-05-29.

Tests carried out

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

Marking of product

The products to be marked with:

- Manufacturer name: Sensor-Technik Wiedemann GmbH
- Model type designation: ESX-3CM and Device Revision
- 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