

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Network and Communication Components**

with type designation(s)

**HSIO-100-A, HSIO-100-B, HSIO-100-C**

Issued to

**Kongsberg Maritime AS  
Ranheim, Norway**

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.****Location classes:**

<b>Temperature</b>	<b>D, Tested to -40°C.</b>
<b>Humidity</b>	<b>B</b>
<b>Vibration</b>	<b>A</b>
<b>EMC</b>	<b>B</b>
<b>Enclosure</b>	<b>A / IP20</b>

Issued at **Høvik** on **2017-10-18**for **DNV GL**This Certificate is valid until **2022-10-17**.DNV GL local station: **Trondheim**Approval Engineer: **Nils Jarem**

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**Odd Magne Nesvåg**  
**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: **262.1-026869-1**  
Certificate No: **TAA00001FG**

## Product description

The Kongsberg HSIO-100 module is a family of high-speed data acquisition modules. The HSIO-100 can be an integrated part of Kongsberg Maritime Condition Monitoring system. The high-speed capability is provided by a FPGA (Field Programmable Gate Array) and processor. The data collected can be data from any high-speed data source like for example, vibration sensor, acoustic emission sensor, or specialized sensors for torque measurement. The module provides high-speed communication via Ethernet.

### HSIO-100 DATA ACQUISITION UNITS (HIGH-SPEED I/O MODULES):

Item	Description	Compass safe distances Standard / Steering
HSIO-100-A	CONDITION MONITORING (ACOUSTIC)	20 cm / 10 cm
HSIO-100-B	CONDITION MONITORING (VIBRATION)	130 cm / 90 cm
HSIO-100-C	FIELDBUS AND TORQUE APPLICATIONS	20 cm / 10 cm

Rating: 24V DC, range 18 to 32V DC

HSIO Software revision used during testing: 1.0.x.

## Place of manufacture

Kongsberg Maritime  
Ranheim  
Norway

## Approval conditions

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 classification of ships Pt.4 Ch.9 Control and monitoring systems.

## Type Approval documentation

Data sheets: P-HSIO-100-A/CE Rev. A  
P-HSIO-100-B/CE Rev. A  
P-HSIO-100-C/CE Rev. A  
Test reports: E17008.00 Rev. 00 dated 2017-03-28  
Sw. revision: 424979 Rev. A

## Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

Applicable tests for protected equipment according to IEC 60945, 4th edition (2002) except salt mist test.

## Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

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### **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