

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Redundant Ethernet Backbone for NACOS 1x00 Systems

Issued to

**Wärtsilä SAM Electronics GmbH
Hamburg, Germany**

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft
DNV GL class programme DNVGL-CP-0203 – Type approval – Electronic and programmable
equipment and systems****IEC 60945 Ed. 4 (2002-08) Maritime navigation and radiocommunication equipment and
systems – General requirements – Methods of testing and required test results****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL. It/they fullfill(s) the requirements of IEC 60945 (2002) for protected equipment.**Issued at **Hamburg** on **2018-02-23**This Certificate is valid until **2023-02-22**.for **DNV GL**DNV GL local station: **Hamburg**Approval Engineer: **Jörg Rebel**

**Arne Schaarmann
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.



Product description

The redundant Ethernet Backbone for navigation systems NACOS 1000 and NACOS 1100 is based on:

<i>Component/workstation</i>	<i>Software version no.</i>
• Managed switches MOXA type EDS-408	3.1 or higher
as approved for Platinum INS for connecting below equipment in typical bridge configurations:	
• CHARTPILOT 9330	5.59 or higher
• MULTIPILOT 1000	3.2.14 or higher
• RADARPILOT 1000	3.2.x
OR	
• CHARTPILOT 1100	6.19 or higher
• MULTIPILOT 1100	5.1.9 or higher
• RADARPILOT 1100	5.2.x

Approval conditions

The above described network configuration is only permitted for retrofit installations in NACOS 1x00 bridge configurations already implemented.

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- Functional description
- System block diagram including network topology & components
- Power supply arrangement (may be part of the System block diagram)
- Onboard test program

The Type Approval covers hardware and software listed under Product description.

When the type-approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Product certificate

A product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after retrofit installation onboard. The test shall be witnessed by a DNV GL surveyor. After the successful testing the clause for application software control will be put into force.

Application software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board.

Type Approval documentation

DNV GL No	Document ID	Rev.	Description
1	-	01 (2017-12)	Report: NACOS 1000 and 1100 Network including Annex
2	390005726	01 (2018-01)	Manual: Technical Manual NACOS 1x00 – Switched Ethernet
3	ED3042G652	13 (2013-11)	Manual: Technical Manual_CHARTPILOT 9330
4	ED3032G232	13 (2013-12)	Manual: Operating Instructions CHARTPILOT 93xx
5	ED3043G542	03 (2007-06)	Manual: Technical Manual MULTIPILOT 1000
6	ED3043G022	09 (2017-04)	Manual: Operating Instructions MULTIPILOT 1000
7	ED3053G652	03 (2008-07)	Manual: Technical Manual CHARTPILOT 1100
8	ED3053G622	04 (2017-02)	Manual: Operating Instructions CHARTPILOT 1100
9	ED3051G542	05 (2008-07)	Manual: Technical Manual MULTIPILOT 1100
10	ED3051G522	04 (2017-02)	Manual: Operating Instructions MULTIPILOT 1100

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016. For the bridge mounted components the 'Compass safe distance' was measured according to section 11.2 of IEC 60945 (2002). Applicable tests for protected equipment according to IEC 60945 Ed.4 (2002) including Corrigendum 1 (2008).

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings
- Compass safe distance (if not marked on the product, to be given in the equipment manual)

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE