DNV·GL

Certificate No: TAA00000G6

TYPE APPROVAL CERTIFICATE

This is to certify: That the Programmable Electronic System

with type designation(s) FnIO S-Series - Network Remote I/O System

Issued to CREVIS Co., Ltd. Gyeonggi-do, Republic of Korea

is found to comply with Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application :

Location classes:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature	В
Humidity	В
Vibration	В
EMC	B (see limitations on page 3)
Enclosure	Required protection according to DNV Rules shall be provided upon installation on board

This Certificate is valid until **2021-06-30**.

Issued at **Busan** on **2016-07-12**

DNV GL local station: Seoul

Approval Engineer: Eun Sook Kim

for **DNV GL**

Baeg Soon Choi 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 CREVIS Network Remote I/O System, type FnIO S-Series as listed below:

Туре	Catalog	Description
	NΔ-9122	ProfiBus-DP/V1 Network Adapter
	NΔ-9173	Modbus BS485 Network Adapter
	ΝΔ-9189	Modbus-TCP/IP Network Adapter
Network Adapter	NA-9289	Modbus-TCP(UDP) Network Adapter
Module	147 5205	Modbus-TCP/RS232/RS485 Programmable Network
rioduic	NA-9372	Adapter
		Modbus-TCP/RS232/RS485 Programmable Network
	NA-9373	Adapter
	ST-1214	Digital Input, Sink, 4-Points, 12V/24V
	ST-1224	Digital Input, Source, 4-Points, 12V/24V
	ST-1314	Digital Input, Sink, 4-Points, 48V
	ST-1324	Digital Input, Source, 4-Points, 48V
	ST-1114	Digital Input, Sink, 4-Points, 5V
	ST-1124	Digital Input, Source, 4-Points, 5V
	ST-1218	Digital Input, Sink, 8-Points, 12V/24V
	ST-1228	Digital Input, Source, 8-Points, 12V/24V
	ST-121F	Digital Input, Sink, 16-Points, 12V/24V
	ST-122F	Digital Input, Source, 16-Points, 12V/24V
	ST-1804	AC Input, 4-Points, 110Vac
	ST-1904	AC Input, 4-Points, 220Vac
	ST-2314	Digital Output, Sink, 4-Points, 24V/0.5A
	ST-2324	Digital Output, Source, 4-Points, 24V/0.5A
	ST-2318	Digital Output, Sink, 8-Points, 24V/0.5A
	ST-2328	Digital Output, Source, 8-Points, 24V/0.5A
	ST-221F	Digital Output, Sink, 16-Points, 24V/0.3A
	ST-222F	Digital Output, Source, 16-Points, 24V/0.3A
	ST-2414	Digital Output, Sink, 4-Points, Diag, 24V/0.5A
	ST-2424	Digital Output, Source, 4-Points, Diag, 24V/0.5A
	ST-2514	Digital Output, Sink, 4-Points, Diag, 24V/2A
1/O Module	ST-2614	Digital Output, Sink, 4-Points, No Diag, 24V/2A
	ST-2524	Digital Output, Source, 4-Points, Diag, 24V/2A
	ST-2624	Digital Output, Source, 4-Points, No Diag, 24V/2A
	ST-2742	Digital Relay Output, 2-Points
	ST-2744	Digital Relay Output, 4-Points
	ST-2748	Digital Relay Output, 8-Points
	ST-2852	AC TRIAC Output, 2-Points, 12~125V/0.5A
	ST-3114	Analog Input, 4-Channels, Current 0~20mA, 12bit
	ST-3214	Analog Input, 4-Channels, Current 4~20mA, 12bit
	ST-3134	Analog Input, 4-Channels, Current 0~20mA, 14bit
	ST-3234	Analog Input, 4-Channels, Current 4~20mA, 14bit
	ST-3424	Analog Input, 4-Channels, Voltage 0~10V, 12bit
	ST-3524	Analog Input, 4-Channels, Voltage -10~10V, 12bit
	ST-3444	Analog Input, 4-Channels, Voltage 0~10V, 14bit
	ST-3544	Analog Input, 4-Channels, Voltage -10~20V, 14bit
	ST-3624	Analog Input, 4-Channels, Voltage 0~5V, 12bit
	ST-3644	Analog Input, 4-Channels, Voltage 0~5V, 14bit
	ST-3702	Analog RTD Input, 2-Channels
	ST-3802	Analog TC(Thermocouple) Input, 2-Channels
	ST-3428	Analog Input, 8-Channels, Voltage 0~10V, 12bit
	ST-3628	Analog Input, 8-Channels, Voltage 0~5V, 12bit

Job Id: 262.1-004802-3 Certificate No: TAA00000G6

Туро	Catalog	Description	
туре	Number	Description	
	ST-3118	Analog Input, 8-Channels, Current 0~20mA, 12bit	
	ST-3218	Analog Input, 8-Channels, Current 4~20mA, 12bit	
	ST-3448	Analog Input, 8-Channels, Voltage 0~10V, 14bit	
	ST-3648	Analog Input, 8-Channels, Voltage 0~5V, 14bit	
	ST-3138	Analog Input, 8-Channels, Current 0~20mA, 14bit	
	ST-3238	Analog Input, 8-Channels, Current 4~20mA, 14bit	
	ST-4112	Analog Output, 2-Channels, Current 0~20mA, 12bit	
	ST-4212	Analog Output, 2-Channels, Current 4~20mA, 12bit	
	ST-4422	Analog Output, 2-Channels, Voltage 0~10V, 12bit	
	ST-4522	Analog Output, 2-Channels, Voltage -10~10V, 12bit	
	ST-4622	Analog Output, 2-Channels, Voltage 0~5V, 12bit	
	ST-4424	Analog Output, 4-Channels, Voltage 0~10V, 12bit	
	ST-4426	Analog Output, 6-Channels, Voltage 0~10V, 12bit	
	ST-4428	Analog Output, 8-Channels, Voltage 0~10V, 12bit	
	ST-4624	Analog Output, 4-Channels, Voltage 0~5V, 12bit	
	ST-4626	Analog Output, 6-Channels, Voltage 0~5V, 12bit	
	ST-4628	Analog Output, 8-Channels, Voltage 0~5V, 12bit	
	ST-4114	Analog Output, 4-Channels, Current 0~20mA, 12bit	
	ST-4116	Analog Output, 6-Channels, Current 0~20mA, 12bit	
	ST-4118	Analog Output, 8-Channels, Current 0~20mA, 12bit	
	ST-4214	Analog Output, 4-Channels, Current 4~20mA, 12bit	
	ST-4216	Analog Output, 6-Channels, Current 4~20mA, 12bit	
	ST-4218	Analog Output, 8-Channels, Current 4~20mA, 12bit	
	ST-5101	High Speed Counter, 1-Channel, 5Vdc	
	ST-5111	High Speed Counter, 1-Channel, 24Vdc	
	ST-5211	Serial Interface, RS232, 1-Channel, RTS/CTS	
	ST-5212	Serial Interface, RS232, 2-Channels	
	ST-5221	Serial Interface, RS422, 1-Channel	
	ST-5231	Serial Interface, RS485, 1-Channel	
	ST-5232	Serial Interface, RS485, 2-Channels	
	ST-7111	Expansion Power Supply(Input DC24V, Output	
		1A/5Vdc)	
	ST-7241	Expansion Field Power Distributor	
	CT 7000	(Arbitrary 5vdc, 24vdc, 48vdc,110vac, 220vac)	
	SI-7008	Potential Distributor, for Shield	
	SI-/108	Potential Distributor, for UVac	
	51-/118	Potential Distributor, for 24Vdc	
	51-/188	Potential Distributor, for 24Vdc and 0Vdc	
Power Noise	NBH-06-432-D	Conductive Power Noise Filter, Din-Rail Type	
Filter	NBH-06-462-N	Conductive Power Noise Filter, Normal Type	

Application/Limitation

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.

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.

Job Id: 262.1-004802-3 Certificate No: TAA00000G6

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

Compass safe distances for FnIO S-Series, measured when installed in a metallic cabinet: Standard Compass Safe Distance: 200 cm, Steering Compass Safe Distance: 130 cm

The type approval is only valid when the modules are mounted inside a standard metallic cabinet. The power supply port shall be equipped with COSEL model NBH-06-432D or NBH-06-462N power noise filter.

Type Approval documentation

FnIO S-Series design binder CVS-DNV-002 v1.00 containing:

- Product list, network adaptor and I/O modules
- Schematic file
- Drawing file
- Test program CVS-DNV-001 v1.02
- Product manuals NA-9122, NA-9173, NA-9189 and ST-series I/O modules
- User manuals NA-9122 v1.00, NA-9173 v1.00, NA-9189 v1.00

Test reports:

TESCO:	TE-08-0094	dated 2008-02-28
ERI:	ERI-0800110017	dated 2008-01-15 + 2008-02-26 update
KRISS:	0801-00004-001	dated 2008-01-08
CREVIS:	CVS-DNV-001	dated 2008-01-16
SGS:	R16-1076-EN00	dated 2016-06-15
SGS:	R16-1092-EN00	dated 2016-06-17
SGS:	RF-EMC000821(H)	dated 2016-06-21
KRISS:	1601-00536-001	dated 2016-06-03
KTC:	T2016-05930	dated 2016-06-14

A-10666 retention survey report, DNV Seoul 2012-11-26 A-13040 retention survey report, DNV Seoul 2016-07-15

FnIO S-Series Spec. for NA-9289 Rev1.09, NA-9371/9372/9373 Rev1.04

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006. For the bridge mounted components the 'Acoustic noise and signals' and the 'Compass safe distance' were measured according to sections 11.1 and 11.2 of IEC 60945, 4th edition (2002).

Marking of product

All modules are marked with manufacturer name, serial number and catalog number as listed in Product description.

Periodical assessment

The scope of the retention/renewal survey 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 survey 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

Job Id: 262.1-004802-3 Certificate No: TAA00000G6

- 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 •

Retention survey is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE