DNV·GL

Certificate No:
TAA0000063

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Programmable Electronic System

with type designation(s)

Issued to
LSIS Co., Ltd. (Cheon-an Plant)
Chungcheongnam-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 :

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

Temperature	**B**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**According to IEC 60529**

This Certificate is valid until **2017-06-30**.

Issued at **Busan** on **2015-10-29**

for **DNV GL**

DNV GL local station: **Seoul**

Approval Engineer: **Eun Sook Kim**

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.

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Product description

Programmable electronic system XGT Series, consisting of:

1) CPU Module

Model	Description
XGK-CPUE	High speed CPU module (Max. I/O point: 1,536 points)
XGK-CPUS	High speed CPU module (Max. I/O point: 3,072 points)
XGK-CPUA	High speed CPU module (Max. I/O point: 3,072 points)
XGK-CPUH	High speed CPU module (Max. I/O point: 6,144 points)
XGK-CPUU	High speed CPU module (Max. I/O point: 6,144 points)
XGI-CPUE	High speed CPU module (Max. I/O point: 1,536 points)
XGI-CPUS	High speed CPU module (Max. I/O point: 3,072 points)
XGI-CPUH	High speed CPU module (Max. I/O point: 6,144 points)
XGI-CPUU	High speed CPU module (Max. I/O point: 6,144 points)
XGI-CPUU/D	High speed CPU module (Max. I/O point: 6,144 points)

2) Base, Power

Model	Description
Main Base	
XGB-M04A	Main base for 4 module installation
XGB-M06A	Main base for 6 module installation
XGB-M08A	Main base for 8 module installation
XGB-M12A	Main base for 12 module installation
Expansion Base	
XGB-E04A	Main base for 4 module installation
XGB-E06A	Main base for 6 module installation
XGB-E08A	Main base for 8 module installation
XGB-E12A	Main base for 12 module installation
Power Module	
XGP-ACF1	Power Module, 3A(5V), 0.6A(24V), Voltage (110V/220V)
XGP-ACF2	Power Module, 6A(5V), Voltage (110V/220V)
XGP-AC23	Power Module, 8.5A(5V), Voltage (220V)
XGP-DC42	Power Module, 6A(5V), Voltage (DC 24V)

3) I/O Modules

Model	Description
Digital Input Module	
XGI-D21A	DC 24V Input, 8 point (Current source /sink input)
XGI-D22A	DC 24V Input, 16 point (Current source /sink input)
XGI-D24A	DC 24V Input, 32point (Current source /sink input)
XGI-D28A	DC 24V Input, 64 point (Current source /sink input)
XGI-D22B	DC 24V Input, 16 point (Current source input)
XGI-D24B	DC 24V Input, 32 point (Current source input)
XGI-D28B	DC 24V Input, 64 point (Current source input)
XGI-A12A	AC 110V Input, 16 point
XGI-A21A	AC 220V Input, 8 point

Digital Output Module	
XGQ-RY1A	Reply output, 8 point (for 2A, single COM.)
XGQ-RY2A	Reply output, 16 point (for 2A)
XGQ-RY2B	Reply output, 16 point (for 2A), Varistor included
XGQ-TR2A	Transistor output, 16 point (for 0.5A, Sink output)
XGQ-TR4A	Transistor output, 32 point (for 0.1A, Sink output)
XGQ-TR8A	Transistor output, 64 point (for 0.1A, Sink output)
XGQ-TR2B	Transistor output, 16 point (for 0.5A, Source output)
XGQ-TR4B	Transistor output, 32 point (for 0.1A, Source output)
XGQ-TR8B	Transistor output, 64 point (for 0.1A, Source output)
XGQ-SS2A	Triac output, 16 point (for 0.6A)
Digital Input/Output Module	
XGH-DT4A	DC24V 16point, Transistor, 16point, Sink
Analog Input Modules	
XGF-AV8A	Voltage input: 8 channels, DC 1 ~ 5V / 0 ~ 5V / 0 ~10V / -10 ~ +10V
XGF-AC8A	Current Input: 8 channels, DC 4 ~ 20mA / 0 ~ 20mA
XGF-AD8A	Voltage/Current Input: 8 channels
XGF-AD4S	Voltage/Current Input: 4 channels, Isolation between channels
XGF-AD16A	Voltage/Current Input: 16 channels
XGF-AW4S	2Wire, Voltage/Current Input: 4 channels
Analog Output Modules	
XGF-DV4A	Voltage Output: 4 channels, DC 1 ~ 5V / 0 ~ 5V / 0 ~10V / -10 ~ +10V
XGF-DC4A	Current Output: 4 channels, DC 4 ~ 20mA / 0 ~20mA
XGF-DV4S	Voltage Output: 4 channels, Isolation between channels
XGF-DC4S	Current Ouput: 4 channels, Isolation between channels
XGF-DV8A	Voltage Output: 8 channels, DC 1 ~ 5V / 0 ~ 5V / 0 ~10V / -10 ~ +10V
XGF-DC8A	Current Output: 8 channels, DC 4 ~ 20mA / 0 ~20mA
Analog Input/Output Module	
XGF-AH6A	Voltage/Current Input: 4 channels, Voltage/Current Output: 2 channels
Thermocouple Input Module	
XGF-TC4S	Temperature (T/C) Input, 4 channels, Isolation between channels
RTD Input Module	
XGF-RD4A	Temperature (RTD) Input, 4 channels
XGF-RD4S	Temperature (RTD) Input, 4 channels, Isolation between

	channels
High speed Counter Module	
XGF-HO2A	Voltage input type (Open Collector type), 200kHz, 2 channel
XGF-HD2A	Differential Input type (Line Driver type), 500kHz, 2 channel
Position Control Moudle	
XGF-PO3A	Pulse output (Open Collector type), 3 axes
XGF-PO2A	Pulse output (Open Collector type), 2 axes
XGF-PO1A	Pulse output (Open Collector type), 1 axis
XGF-PD3A	Pulse output (Line Driver type), 3 axes
XGF-PD2A	Pulse output (Line Driver type), 2 axes
XGF-PD1A	Pulse output (Line Driver type), 1 axis
XGF-PO4H	Pulse output (Open Collector type), 4 axes
XGF-PO3H	Pulse output (Open Collector type), 3 axes
XGF-PO2H	Pulse output (Open Collector type), 2 axes
XGF-PO1H	Pulse output (Open Collector type), 1 axis
XGF-PD4H	Pulse output (Line Driver type), 4 axes
XGF-PD3H	Pulse output (Line Driver type), 3 axes
XGF-PD2H	Pulse output (Line Driver type), 2 axes
XGF-PD1H	Pulse output (Line Driver type), 1 axes
Temperature Control Module	
XGF-TC4UD	Temperature Controller, 4loops, Universal input
XGF-TC4RT	Temperature Controller, 4loops, Temperature(RTD) Input
Event Input Module	
XGF-SOEA	DV 24V, 32points
Smart IO Module	
GPL-D22C	DC Input 16Points
GPL-D24C	DC Input 32Points
GPL-TR2C	TR Output 16Points(0.5A, Source)
GPL-TR2C1	TR Output 16Points(0.5A, Sink)
GPL-TR4C	TR Output 32Points(0.5A, Source)
GPL-TR4C1	TR Output 32Points(0.5A, Sink)
GPL-RY2C	Reply Output 16Points
GPL-DT4C	DC Input 16Points / TR Output 16Points(0.5A, Source)
GPL-DT4C1	DC Input 16Points / TR Output 16Points(0.5A, Sink)
GPL-AV8C	Analog Voltage Input, 8Channel
GPL-AC8C	Analog Current Input, 8Channel
GPL-DV4C	Analog Voltage Output, 4Channel
GPL-DC4C	Analog Current Output, 4Channel
GDL-TR2C	TR Output 16Points(0.5A, Source)

GDL-TR2C1	TR Output 16Points(0.5A, Sink)
GDL-TR4C	TR Output 32Points(0.5A, Source)
GDL-TR4C1	TR Output 32Points(0.5A, Sink)
GDL-DT4C	DC Input 16Points /TR Output 16Points(0.5A, Source)
GDL-DT4C1	DC Input 16Points /TR Output 16Points(0.5A, Sink)
GDL-RY2C	Reply Output 16Points
GDL-D22C	DC Input 16Points
GDL-D24C	DC Input 32Points
GRL-TR2C	TR Output 16Points(0.5A, Source)
GRL-TR2C1	TR Output 16Points(0.5A, Sink)
GRL-TR4C	TR Output 32Points(0.5A, Source)
GRL-TR4C1	TR Output 32Points(0.5A, Sink)
GRL-RY2C	Reply Output 16Points
GRL-DT4C	DC Input 16Points /TR Output 16Points(0.5A, Source)
GRL-DT4C1	DC Input 16Points /TR Output 16Points(0.5A, Sink)
GRL-D22C	DC Input 16Points
GRL-D24C	DC Input 32Points

4) Communication Modules

Model	**Description**
RAPIEnet Module	
XGL-EIMT	RAPIEnet Twisted pair
XGL-EIMH	RAPIEnet Twisted pair/Fiber
XGL-EIMF	RAPIEnet Twisted optic 2ch
XOL-EIMT	RAPIEnet Twisted pair 2ch
XOL-EIMF	RAPIEnet Fiber optic 2ch(PC)
Ethernet Module(Open)	
XGL-EFMF	Fast Ethernet(multi-modefiber-opticmedia), Master,100/10Mbps support
XGL-EFMT	Fast Ethernet (CAT5media), Master, 100/10Mbps support
XGL-ESHF	Fast Ethernet type (Industrial optic ring)
XGL-EH5T	Fast Ethernet switch hub
Ethernet-IP Module	
XGL-EIPT	Industrial Ethernet, 2ports
Ethernet (Dedicated) Module	
XGL-EDMF	Fiber optic, Master, SC type
XGL-EDMT	Twisted pair, Master, RJ-45
Cnet Module	
XGL-C22A	Serial communication, RS-232C, 2channels
XGL-C42A	Serial communication, RS-422(485), 2channels
XGL-CH2A	Serial communication, RS-232C1, channels/ RS-422(485) 1Channel
Rnet Module	
XGL-RMEA	Rnet, Master, TP

Profibus-DP Module	
XGL-PMEA	Profibus-DP Master Module
XGL-PMEC	Profibus-DP Master Module
Device Net Module	
XGL-DMEA	Device Net Master Module
Fnet Module	
XGL-FMEA	Dedicated network

5) Other

Model	Description
Terminator	
XGT-TERA	Must use for base expansion
Dummy module	
XGT-DMMA	Dust protection module for unused slot

Application/Limitation

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.

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1.
The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. 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

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

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
- 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