DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00001AA
Revision No:
2

This is to certify:

That the Programmable Electronic System

with type designation(s)
PACSystems Rx3i and Rx7i, Series 90-30, VersaMax, Genius Remote I/O and QuickPanel View/Control

Issued to
GE Intelligent Platforms, Inc.
Charlottesville, VA, USA

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.

Temperature	**B**
Humidity	**B**
Vibration	**A**
EMC	**A/B* (*EMC Class B applies only to Versamax products)**
Enclosure	**Required protection according to DNV Rules shall be provided upon installation on board**

Issued at **Hamburg** on **2018-06-07**

This Certificate is valid until **2022-08-20**.

DNV GL local station: **New York**

Approval Engineer: **Didier Girardin**

for **DNV GL**

Joannis Papanuskas
Head of Section

Product description

GE Intelligent Platforms PACSystems Rx3i and Rx7i, Series 90-30, VersaMax, Genius Remote I/O and QuickPanel View/Control consisting of the following catalog numbers:

Series 90-30 Catalog No	Module Description
IC690PWR124	24V DC Power Supply
IC693CHS391	10-slot Backplane
IC693CHS397	5-slot Backplane
IC693PWR321	120V AC Power Supply
IC693PWR331	24V DC Power Supply
IC693NIU004	Ethernet NIU
IC693CPU372	CPU with Ethernet
IC693CPU374	CPU with Ethernet
IC693CPU366	CPU with Profibus Master
IC693CPU367	CPU with Profibus Slave
IC693PBM200	Profibus Master
IC693PBS201	Profibus Slave
IC693MDL645	16 Circuit 24V Input Module
IC693MDL648	16 Circuit Input 48V DC Positive / Negative Logic
IC693MDL655	16 Circuit 24V Input Module
IC693MDL660	32 Point 24V DC Input
IC693MDL740	Output 12/24vdc 0.5A 16 pt. Pos.
IC693MDL748	8 Circuit Output 48V DC 0.5 A Positive
IC693MDL753	12/24 VDC Output, Pos Logic (32 Pts)
IC693MDL754	32 Point 24V DC Output
IC693MDL260	32 Point 120V AC Grouped Input
IC693MDL250	16 Point 120V AC Isolated Input Module
IC693MDL350	16 Point 120V AC Isolated Output Module
IC693MDL916	16 Point Relay Output Module
IC693BEM331	Genius Bus Controller
IC693DNM200	DeviceNET Master
IC693CPU370	CPU 370 Module (240KB config user memory, 4K I/O, 8 Racks)
IC693CPU363	CPU 363 Module (240KB configurable user memory)
IC693ACC302	High capacity battery pack
IC693ALG221	Analog Input / Output Module
IC693ALG222CA	Analog Input; 16/8 channel, voltage, Conformal Coat
IC693ALG223CA	Analog Input; 16 Ch current, Conformal Coat
IC693ALG442CA	Mixed analog module; (4) inputs / (2) outputs; current/voltage, Conformal Coat

PACSystems Rx7i Catalog No	Module Description
IC698CHS017	Rear Mount Rack
IC698CHS117	Front Mount Rack
IC698PSA350	120V AC Power Supply
IC698PSD300	24V DC Power Supply
IC698CPE020	700Mhz CPU, Pentium
IC698CRE020	700Mhz CPU, Pentium with Redundancy Support
IC698CPE030	Rx7i CPU, Pentium
IC698CRE030	Rx7i CPU, Pentium with Redundancy Support
IC698ETM001	Ethernet
IC698CMX016	Communications Memory Exchange
IC698RMX016	Redundancy Memory Exchange
IC697ACC721	120V AC Fan Assembly
IC697ACC744	24V DC Fan Assembly
IC697BEM731	Genius Bus Controller

PACSystems Rx3i Catalog No	Module Description
IC694ACC200CA	POWER SYNC TERMINAL ASSEMBLY , Conformal Coat
IC694ACC310	Rx3i Filler Module
IC694ALG220	Input Analog 4 PT. Voltage
IC694ALG221	Analog Input / Output Module
IC694ALG222CA	Analog Input; 16/8 channel, voltage, Conformal Coat
IC694ALG223	Analog Input / Output Module
IC694ALG223CA	Analog Input; 16 channels, current, Conformal Coat
IC694ALG442CA	Mixed analog module; (4) inputs / (2) outputs; current/voltage, Conformal Coat
IC694ALG232CA	Analog Input; 16/8 channel, voltage, Conformal Coat
IC694ALG233CA	Analog Input; 16 channel, current, Conformal Coat
IC694ALG390	Analog Input / Output Module
IC694ALG391	Output Analog 2 PT. Current
IC694ALG392	Output Analog 8 PT. Current/Voltage
IC694ALG542CA	Mixed analog module; (4) inputs / (2) outputs; current/voltage, Conformal Coat
IC694APU300	High Speed Counter
IC694BEM331	Genius Bus Controller
IC694CEE001CA	EXPANSION CARRIER , Conformal Coat
IC694CHS392	Base (10 slot) expansion
IC694CHS398	Base (5 slot) expansion
IC694DNM200	DeviceNET Master
IC694MDL241	24V AC/DC Pos/Neg Logic Input, 16 pt.
IC694MDL250	16 Point 120V AC Isolated Input Module
IC694MDL260	32 Point 120V AC Grouped Input
IC694MDL350	16 Point 120V AC Isolated Output Module
IC694MDL645	24VDC Pos/Neg Logic Input, 16 pt.
IC694MDL646	Input 24vdc 16 pt. Pos/Neg logic Fast
IC694MDL646CA	INPUT 24 VDC 16PT POS/NEG FAST - Conformal Coat
IC694MDL648	16 Circuit Input 48V DC Positive / Negative Logic
IC694MDL654	Input TTL 32 pt.
IC694MDL655	Input 24vdc 32 pt. Pos/Neg logic Fast
IC694MDL660	32 Point 24V DC Input
IC694MDL660CA	32pt. 24 VDC Input (32 Points) - Conformal Coat
IC694MDL730	Output 12/24vdc 2.0A 8 pt. Pos.
IC694MDL732	Output 12/24vdc 0.5A 8 pt. Pos.
IC694MDL740	Output 12/24vdc 0.5A 16 pt. Pos.
IC694MDL741	Output 12/24vdc 0.5A 16 pt. Neg.
IC694MDL742	Output 12/24vdc 1.0A Pos. ESCP
IC694MDL742CA	OUTPUT 12/24 VDC 1A 16PT POS ESCP - Conformal Coat
IC694MDL748	8 Circuit Output 48V DC 0.5 A Positive
IC694MDL752	Output TTL 32 point
IC694MDL753	Output module, 12/24VDC POS logic, 32 points
IC694MDL754	32 Point 24V DC Output
IC694MDL754CA	24VDC W/ESCP, 32PT OUTPUT REQ HIG DEN TB, Conformal Coat
IC694MDL916	16 Point Relay Output Module
IC694MDL930	Output Relay 4.0A 8 pt. Isolated Form
IC694MDL931	Output Relay 8.0A 8 pt. Isolated Form B-C
IC694MDL940	Output Relay 2.0A 16 pt.
IC694MDR390	Mixed I/O 24vdc In/Relay out 8 pt.
IC694PSM001CA	POWER SYNC MEASUREMENT MODULE, Conformal Coat
IC694PWR321	Power Supply 120/240 VAC 125vdc 30W

IC694PWR330	Power Supply, High Capacity, 120VAC
IC694PWR331	Power Supply
IC694TBB032	Terminal Block
IC695ACC302CA	Smart external battery, Conformal Coat
IC695ACC400	RX3i Energy Pack
IC695ACC402CA	Energy Pac5k, Conformal Coat
IC695ACC403CA	Energy Pack, Conformal Coat
IC695ALG106CA	Isolated Analog Current/Voltage Input, 6 channels, Conformal Coat
IC695ALG112CA	Isolated Analog Current/Voltage Input, 12 channels, Conformal Coat
IC695ALG312CA	Thermocouple Input Module 12-Channel Isolated, Conformal Coat
IC695ALG412CA	Thermocouple Input Module 12-Channel Isolated, Conformal Coat
IC695ALG508CA	8-Channel Isolated RTD Input, Conformal Coat
IC695ALG600CA	Universal Analog Input, Conformal Coat
IC695ALG608CA	8 Channel Non-Isolated Analog Input, Conformal Coat
IC695ALG616CA	16 Channel Non-Isolated Analog Input, Conformal Coat
IC695ALG626CA	16 Channel Non-Isolated Analog Input with HART, Conformal Coat
IC695ALG628CA	8 Channel Non-Isolated Analog Input with HART, Conformal Coat
IC695ALG704CA	4 Channel Non-Isolated Analog Output, Conformal Coat
IC695ALG708CA	8 Channel Non-Isolated Analog Output - Conformal Coat
IC695ALG728CA	8 Channel Non-Isolated Analog Output with HART, Conformal Coat
IC695ALG808CA	8 Channel Isolated Analog Current / Voltage Output, Conformal Coat
IC695CHS012	12-slot backplane
IC695CHS016	16-slot backplane
IC695CEP001CA	FLEXPAC Carrier, Conformal Coat
IC695CMM002CA	Rx3i serial communications module, 2 ports, Conformal Coat
IC695CMM004CA	Rx3i serial communications module, 4 ports, Conformal Coat
IC695CMX128	Control Memory eXchange reflective memory module with 128M
IC695CMU310	CPU Redundant
IC695CPE302CA	CPU, 1 Serial, 1 Ethernet port, 2Mb memory, Conformal Coat
IC695CPE305CA	Rx3i CPE305, 1 serial, 1 Ethernet port, Conformal Coat
IC695CPE310	CPU
IC695CPE310CA	Rx3i CPE310, 2 serial, 1 Ethernet port, Conformal Coat
IC695CPE330CA	1GHz 64MB CPU w/Ethernet, Conformal Coat
IC695CPE400CA	1.2GHz 64MB Quad Core CPU w/ Ethernet, Conformal Coat
IC695CPU310	CPU
IC695CPU320	M class CPU with 64M of memory & 2 serial ports
IC695CRU320	Redundant controller with 64M of memory & 2 serial ports
IC695ETM001	Ethernet
IC695GCG001CA	Genius Communications Gateway, Conformal Coat
IC695LRE001	Serial Bus Transmitter
IC695MDL765CA	24V/125VDC O/P with diagnostics, Conformal Coat
IC695MDL664CA	24VDC INPUT W/ DIAGNOSTICS - Conformal Coat
IC695NIU001	Ethernet NIU
IC695NIU001CA	Ethernet network interface unit w/ 2 serial ports
IC695PBM300	Profibus Master
IC695PBS301	Profibus Slave
IC695PNC001CA	PROFINET controller module, Conformal Coat
IC695PNS001CA	Profinet Scanner, Conformal Coat
IC695PSA140CA	Redundant PWR SUPPLY 120/240VAC, 125 VDC, Conformal Coat
IC695PSA140	120V AC Power Supply
IC695PSD140	24V DC Power Supply
IC695RMX128	Redundant Memory eXchange reflective memory module w/ 128M

VersaMax Catalog No [*]	Module Description

IC200ALG230	Analog input 12 bit voltage/current 4 channel
IC200ALG240	Analog input 16 bit voltage/current 8 isolated channels
IC200ALG260	Analog input 12 bit voltage/current 8ch
IC200ALG264	Analog input 15 bit current 15ch
IC200ALG320	Analog output 12 bit current 4ch
IC200ALG328	Analog I/O Module
IC200ALG620	Analog I/O Module
IC200BEM002	PLC network communications Profibus-DP slave
IC200CHS002	Backplane
IC200CHS006	Communications carrier
IC200CHS022	Compact I/O carrier box style (screw style terminals)
IC200CHS025	Compact I/O carrier spring style
IC200CPU001	CPU 12k user prog 1.80msec/k boolean
IC200CPU002	CPU 20k user prog 1.80msec/k boolean
IC200CPU005	CPU with configurable user memory 0.8 msec/k boolean
IC200CPUE05	CPU with configurable user memory 0.8 msec/k boolean
IC200EBI001	Remote I/O Ethernet network interface unit
IC200ERM001	Expansion receiver isolated
IC200ETM001	Expansion transmitter
IC200GBI001	Remote I/O Genius network interface unit
IC200MDL640	Input 24VDC pos/neg logic (2 group of 8) 16pt
IC200MDL650	Input 24VDC pos/neg logic (4 groups of 8) 32pt
IC200MDL740	Output 24VDC pos logic 0.5a per pt (1 group of 16) 16pt
IC200MDL750	Output 24VDC pos logic 0.5a per pt (2 groups of 16) 32pt
IC200MDD840CA	Mixed 24VDC input/output relay 20pt
IC200MDD841	Mixed 24VDC pos log input group 20pt/output 24VDC output 12pt
IC200MDD844	Mixed 24VDC POS LOG input group 16pt / 24 VDC output 16 pt
IC200MDL940	Output relay 2.0A per pt isolated form a 16pt
IC200PBI001	Remote I/O Profibus DP network interface unit
IC200PNS001CA	VersaMax PROFINET scanner w/ two 10/100Mbps copper interfaces, Conformal Coat
IC200PNS002CA	VersaMax PROFINET scanner with two 100Mbps multi-mode fiber(MMF) ports, Conformal Coat
IC200PWR002 *	Power supply with expanded 3.3VDC 24VDC input
IC200PWR011CA	Power supply 24VDC input, isolated, Conformal Coat
IC200PWR012CA	Power supply with expanded 3.3VDC 24VDC input, isolated, Conformal Coat
IC200PWR102	Power supply with expanded 3.3VDC 120/240VAC input

* IC200PWR002 is a non-isolated power supply that requires an isolated DC-DC converter for installation in marine applications.

Genius Remote I/O Catalog No	Module Description
IC660BBA026	Block 24/48V DC Analog Current Source 6 Inputs
IC660BBD120	Block High Speed Counter
IC660BSM021	Bus Switching Module

QuickPanel Model Number	Module Description
ES0622	6" Color TFT, Loaded QuickPanel
ES0602	6" Monochrome, Basic QuickPanel

Place of manufacture

GE Intelligent Platforms	Spectrum Controls Inc.	OCM Manufacturing Inc.
Charlottesville, VA 22901	Bellevue, WA 98005	Ottwawa, Ontario, Canada

Jabil Circuit (Guangzhou) Ltd.
Guangdong, Province, P.R. China

ProTechnologies Inc.
Pilot Mountain, NC 27041

Hilscher GmbH
Hattersheim, Germany

Horner APG
Indianapolis, IN 46201

Application/Limitation

The Type Approval covers hardware listed under Product description including those conformally coated. 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 Ships Pt.4 Ch.9 Control and Monitoring Systems.

This Type Approval does not cover applications requiring battery back-up or applications powered by battery.
Equipment covered by this Type Approval shall be powered by 120V AC directly or via one of the AC to DC converters covered by this Type Approval.
Equipment covered by this Type Approval shall be mounted inside an RF-tight EMC-shielded cabinet.
Corcom DC line filter, part # 15DCB6F (or equivalent) **and** Panasonic surge absorber, part # ERZV20D680 (or equivalent) shall be applied to the DC line inputs as specified by manufacturer.
I/O cables shall be shielded and grounded on both ends as specified by manufacturer.

- For Versamax installations, all Versamax products with exception of IC200PWR102 are additionally approved for Bridge and Deck installations when IC200PWR011, IC200PWR012, and IC200PWR002 DC power supplies are used in conjunction with an Corcom DC line filter #15DCB6F or equivalent. This limitation is required to meet EMC Class B.
- For RX3i installations inside consoles/housing together with other equipment with temperature rise $\geq$ 5°C, RX3i modules IC695CPE310 and IC695PNC001 must be mounted in the last slot with an empty slot to the left. All other RX3i modules may be installed in any slot. This limitation is required to meet Temperature Class B.
- During conducted RF immunity test IC694MDL660CA input cable requires three turns around ferrite, "Fair-rite, PN: 0461178281" or equivalent.
- During conducted RF immunity test IC695ALG708CA analog accuracy may be degraded by +20% of full scale.

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

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

Marking of product
The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

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