

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Programmable Electronic System**

with type designation(s)

Atlas; Atlas II; Atlas PC; Atlas SC; EGCP-3, RTN Gateway Hardware for Engine and Turbine Controls

Issued to

**Woodward Inc.
Fort Collins, CO, United States**

is found to comply with

DNV GL rules for classification – Ships and offshore units**DNV GL rules for classification – 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:**

Temperature	B
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to the Rules to be provided upon installation on board.

This Certificate is valid until **2018-06-12**.Issued at **Høvik** on **2016-06-13**for **DNV GL**DNV GL local station: **Houston**Approval Engineer: **Thorbjørn Hansen**

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.

Product description

All controls covered by this Type Approval are fully programmable and capable to operate engine control, turbine control and load sharing control for a wide range of prime mover applications.

Hardware for Engine and Turbine controls as follows:

Stack Configuration	Atlas	Atlas II	Atlas PC	Atlas SC	EGCP-3	RTN Gateway
Power Supply	X	X	X	X	X	X
Power Sense	X	X	X	X	X	
A5200 Smartcore		X				X
Smartcore Master	X		X	X	X	
Smartcore Slave	X		X	X	X	
EBX Analog I/O		X		X		
Pentium CPU (w. DeviceNet, EtherNet or CAN)	X		X			
DLE	X	X	X			
Profibus	X	X	X			
CAN Communication						X

Following boards/ modules are included:

Part Number	Rev.	Description	Reference Drawing/Rev.	TSP/Rev.
5466-413	H	VXWorks Pentium ¹⁾	9938-028/ New	11538
5466-422	A	PC104 Profibus Module ¹⁾³⁾	9938-038/New	+
5466-424	A	PC104 Devicenet Module ¹⁾³⁾	9938-037/New	+
5466-421	A	PC104 CAN OPEN Module ¹⁾		+
5466-427	A	PC104 Ethernet Module ¹⁾³⁾		+
5503-215	E	Power Sense ³⁾	9934-175/B, 9934-176/B, 9989-441/New	11735/E
5503-251	R	EBX Analog I/O Combo ³⁾	9934-544/D, 9934-545/D, 9989-441/ New	11535/F
5503-293	F	Smartcore Master w/Actuator Driver	9934-908/ B 9934-909/ B	11751
5503-302	G	Smartcore Slave w/Actuator Driver ³⁾	9934-908/ B 9934-909/ B	11751
5503-306	H	Smartcore w/Actuator Driver ²⁾³⁾	9934-908/ B 9934-909/ B	11751
5503-903	New	Ethernet Isolation Module (single) ¹⁾³⁾	9934-542/ New 9934-543/ New	+
601-1005	B	DLE Communications	801-1005/A 901-1005/New	12159
601-1007	A	Devicenet/Profibus Isolation Module ¹⁾³⁾	801-1007/B 901-1007/New	+
601-1008	D	New Power Supply ³⁾	801-1008/A 901-1008/A	12158
601-1110	G	Power Sense	801-1110/B 901-1110/B	11735/F
601-1234	G	A5200Smartcore	801-1234/ A 901-1234/ B	13902/C 14049/New
5441-699	A	Atlas Relay Module ⁴⁾	5441-699	
8200-1252		RTN Gateway, 10 Channel ⁵⁾	9989-1382/new	15001

- 1) The Profibus, Devicenet, CAN OPEN, and Ethernet Modules mount on the Pentium card. Each communication module is used with an Isolation module for the proper connection facility.
 - 2) This is a de-populated Smartcore to be used with the ECGP-3 configurations.
 - 3) Modules included in at least one of the configurations used to conduct the environmental tests.
 - 4) See document 00267-04-MAR-03-01.
 - 5) Incorporated in Type Approval Certificate during renewal June 2016
- † No TSP's for isolation modules.
‡ Purchased modules supplied by approved suppliers.

Configuration examples (#1, 2 and 3 used during qualification tests):

	Profibus	P2
	LON	P1
	Pentium	L5
	DLE	L4
FAN	EBX	L3
Power Supply	EBX	L2
Smartcore		L1
Side A	Side B	Level
Configuration #1: AtlasPC (8273-079)		

Power Supply		L3
Powersense		L2
Smartcore		L1
Side A	Side B	Level
Configuration #3: ECGP-3 (8406-103)		

	Devicenet	P2
	Ethernet	P1
	Pentium	L5
	DLE	L4
FAN	EBX	L3
Power Supply	EBX	L2
Powersense		L2
Smartcore		L1
Side A	Side B	Level
Configuration #2: AtlasPC (8273-078)		

Power Supply	EBX	L3
Powersense		L2
Smartcore		L1
Side A	Side B	Level
Configuration #4: AtlasSC (8273-043)		

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 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 of Application Functions is to be performed at the manufacturer of the application system 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.

Type Approval documentation

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Tests carried out

RTN-Gateway tested according to DNVGL-CG-0339, November 2015.

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