



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA000028U
Revision No:
3

This is to certify:

that the **Peripheral Equipment**

with type designation(s)

Wave II, SMART, and PERFORMANCE monitor series

issued to

North Invent Norway AS

Haugesund, Norway

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

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.

Location classes:

Temperature	B (tested down to -15°C)
Humidity	B
Vibration	A
EMC	B
Enclosure	A

Issued at **Høvik** on **2024-12-03**

for **DNV**

This Certificate is valid until **2029-10-22**.

DNV local unit: **Haugesund**

Approval Engineer: **Nikolai Arntzen**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

Wave II, SMART, and PERFORMANCE monitor series, comprising the following units:

Model no.	Description	Compass safe distance	
		Standard compass	Steering compass
WE185	Wave II 18.5" monitors	190 cm	120 cm
	Wave II 18.5" touch monitors		
	Wave II 18.5" Display Units (DIU)		
	Wave II 18.5" hinge (stands)		
	Wave II 18.5" panel mounting kits		
	Wave SMART 18.5" monitors		
	Wave PERFORMANCE 18.5" monitors (PPC)		
WE190	Wave II 19" monitors	190 cm	120 cm
	Wave II 19" touch monitors		
	Wave II 19" Display Units (DIU)		
	Wave II 19" hinge (stands)		
	Wave II 19" panel mounting kits		
	Wave SMART 19" monitors		
	Wave PERFORMANCE 19" monitors (PPC)		
WE215	Wave II 21.5" monitors	190 cm	120 cm
	Wave II 21.5" touch monitors		
	Wave II 21.5" Display Units (DIU)		
	Wave II 21.5" hinge (stands)		
	Wave II 21.5" panel mounting kits		
	Wave SMART 21.5" monitors		
	Wave PERFORMANCE 21.5" monitors (PPC)		
WE240	Wave II 24" monitors	190 cm	120 cm
	Wave II 24" touch monitors		
	Wave II 24" Display Units (DIU)		
	Wave II 24" hinge (stands)		
	Wave II 24" panel mounting kits		
	Wave SMART 24" monitors		
	Wave PERFORMANCE 24" monitors (PPC)		
WE270	Wave II 27" monitors	220 cm	145 cm
	Wave II 27" touch monitors		
	Wave II 27" Display Units (DIU)		
	Wave II 27" hinge (stands)		
	Wave II 27" panel mounting kits		
	Wave SMART 27" monitors		
	Wave PERFORMANCE 27" monitors (PPC)		
WE000	Wave II Electronic Units (ELU)	190 cm	120 cm
	Wave II HMI units		
WE002	Wave PERFORMANCE Box (ELU)	190 cm	120 cm
AA213	21.3" OEM monitor	200 cm	130 cm

The Wave II Electronic Units (ELU) include the following interfaces; Up to 2 inputs each of the following: DisplayPort (incl. DDC/CI), DVI (incl. DDC/CI), Ethernet, RS422/485, USB A and 1 each of RS232 input, USB B input and DVI output.

The Wave PERFORMANCE Electronic Units are configurable with the following CPUs; Celeron 4305UE, i3-8145UE, i5-8365UE and i7-8665UE and include the following interfaces; SSD: 3 x M2 slot + SATA, configurable size, Memory: DDR4 SODIMM 2666, configurable size, Ethernet: 2 x 10/100/1000 (4 x 10/100/1000 optional), 2 x DisplayPort, 4 x USB 3.1, 2 x RS232/RS485/422 + 2 x RS232 (D-SUB).

The monitors consist of Display Unit (DIU) and Electronics Unit (ELU).

Tested and approved for nominal voltage 115-230 Vac 50 Hz, and 24 Vdc, configured as single AC, single DC, or any combination of the two.

Place of manufacture

GPV Asia (Thailand) Co., Ltd.
834 Moo4, Bangpoo industrial Estate Soi 11, 12
Sukhumvit Road, Praksa, Muang Dis.
Samutprakarn 10280, Thailand

Approval conditions

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 classification of ships Pt.4 Ch.9 Control and monitoring systems.

Type Approval documentation

Design documentation:

WE185

WE185 000 067 (18.5" display specifications) Rev. B1
WE185 000 143 (18.5" monitor specifications) Rev. B1
WE185 000 143 DRW (outline drawing) Rev. B1

WE190

WE190 000 063 (19" display specifications) Rev. B1
WE190 000 144 (19" monitor specifications) Rev. B1
WE190 000 144 DRW (outline drawing) Rev. B1

WE215

WE215 000 059 (21.5" display specifications) Rev. B1
WE215 000 145 (21.5" monitor specifications) Rev. B1
WE215 000 145 DRW (outline drawing) Rev. B1

WE240

WE240 000 091 (24" display specifications) Rev. B1
WE240 000 150 (24" monitor specifications) Rev. B1
WE240 000 333 (24" wave performance specifications) Rev. B2
WE240 000 150 DRW (outline drawing) Rev. B1

WE270

WE270 000 040 (27" display specifications) Rev. B1
WE270 000 147 (27" monitor specifications) Rev. B1
WE270 000 147 DRW (outline drawing) Rev. B1

AA213

AA213 000 037 (21.3" monitor specifications) dated 2018-02-19
AA213 002 037 DRW (outline drawing) dated 2018-02-19

WE000

WE000 000 024 (electronics unit specifications) Rev. B1

WE002

Wave PERFORMANCE Box (WE002) Short Spec
ELU002 - config 1 (outline drawing) dated 2020-01-28
ELU002 - config 2 (outline drawing) dated 2020-01-28

Manuals:

User's Manual for Wave II Monitors, dated 2019-10
User's Manual for Wave PERFORMANCE Monitors (PPCs), dated 2020-09

Test reports / Engineering judgement:

RISE test report 8P03677-CSD 1 Rev. 1, dated 2018-05-15
RISE test report 8P03677-CSD 2 Rev. 1, dated 2018-05-15
EKTOS test report P17-0120-3 Rev. 1, dated 2018-02-12
EKTOS test report P18-0006 Rev. 2, dated 2019-05-16
EKTOS test report P18-0056 Rev. 1, dated 2019-05-24
North Invent Engineering Judgement, dated 2019-10-03
Applica test report 30473 Rev. 2, dated 2020-10-08

Wave II Monitors – Alternative Buzzer Mounting, dated 2022-04
EKTOS test report P22-0047 Rev. -, dated 2022-04-21

Type approval renewal assessment report for North Invent Norway A/S, DNV Haugesund 2024-09-19
Type approval renewal assessment report for GPV Asia (Thailand) Co., Ltd., DNV Bangkok 2024-10-24

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.
Applicable tests according to IACS Unified Requirements E10, Rev.10.
Applicable tests for protected equipment according to IEC 60945, 4th edition (2002), except for section 8.12 Corrosion (salt mist).

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