

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Peripheral Equipment**with type designation(s)  
**Wave II, SMART, and PERFORMANCE monitor series**

Issued to

**North Invent Norway A/S**  
**Haugesund, Norway**is found to comply with  
**DNV GL 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 GL.****Location classes:****Temperature B (tested down to -15°C)**  
**Humidity B**  
**Vibration A**  
**EMC B**  
**Enclosure A**Issued at **Høvik** on **2021-02-09**for **DNV GL**This Certificate is valid until **2024-10-22**.DNV GL local station: **Haugesund**Approval Engineer: **Ståle Sneen****Marta Alonso Pontes**  
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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 300,000 USD.



Job Id: **262.1-031032-2**  
 Certificate No: **TAA000028U**  
 Revision No: **1**

## 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<br>Wave II 18.5" touch monitors<br>Wave II 18.5" Display Units (DIU)<br>Wave II 18.5" hinge (stands)<br>Wave II 18.5" panel mounting kits<br>Wave SMART 18.5" monitors<br>Wave PERFORMANCE 18.5" monitors (PPC) | 190 cm                | 120 cm           |
| WE190     | Wave II 19" monitors<br>Wave II 19" touch monitors<br>Wave II 19" Display Units (DIU)<br>Wave II 19" hinge (stands)<br>Wave II 19" panel mounting kits<br>Wave SMART 19" monitors<br>Wave PERFORMANCE 19" monitors (PPC)               | 190 cm                | 120 cm           |
| WE215     | Wave II 21.5" monitors<br>Wave II 21.5" touch monitors<br>Wave II 21.5" Display Units (DIU)<br>Wave II 21.5" hinge (stands)<br>Wave II 21.5" panel mounting kits<br>Wave SMART 21.5" monitors<br>Wave PERFORMANCE 21.5" monitors (PPC) | 190 cm                | 120 cm           |
| WE240     | Wave II 24" monitors<br>Wave II 24" touch monitors<br>Wave II 24" Display Units (DIU)<br>Wave II 24" hinge (stands)<br>Wave II 24" panel mounting kits<br>Wave SMART 24" monitors<br>Wave PERFORMANCE 24" monitors (PPC)               | 190 cm                | 120 cm           |
| WE270     | Wave II 27" monitors<br>Wave II 27" touch monitors<br>Wave II 27" Display Units (DIU)<br>Wave II 27" hinge (stands)<br>Wave II 27" panel mounting kits<br>Wave SMART 27" monitors<br>Wave PERFORMANCE 27" monitors (PPC)               | 220 cm                | 145 cm           |
| WE000     | Wave II Electronic Units (ELU)<br>Wave II HMI units  | 190 cm                | 120 cm           |
| 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,

Job Id: **262.1-031032-2**  
Certificate No: **TAA000028U**  
Revision No: **1**

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 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.

### **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

Job Id: **262.1-031032-2**  
Certificate No: **TAA000028U**  
Revision No: **1**

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:**

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

Type approval initial assessment report for North Invent Norway A/S, DNV GL Haugesund 2019-05-13  
Type approval initial assessment report for GPV Asia (Thailand) Co., Ltd., DNV GL Bangkok 2019-10-15

**Tests carried out**

Applicable tests according to class guideline DNVGL-CG-0339, December 2019.  
Applicable tests according to IACS Unified Requirements E10, Rev.7.  
Applicable tests for protected equipment according to IEC 60945, 4<sup>th</sup> 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