



Data sheet

## **IMSF-650-NAI**

### **ID Marking Sign with floodlight**

- **Ruggedized construction made for a harsh offshore environment**
- **Floodlight with standard NAI bus interface for power supply and communication**
- **Installation on standard guarding rail**
- **Low weight**
- **Low maintenance**
- **Low number of spare parts required for a fast repair**
- **Low power consumption**
- **High visibility with a minimum of light pollution**

The IMSF-650-NAI is developed for the easy night time ID marking of offshore wind turbines.

The IMSF-650-NAI can be mounted on the guarding rail of the transition piece working platform so that no special fixtures are needed for the ID marking.

The IMSF-650-NAI is built up of three main components:

**Mounting frame** – the mounting frame is made of stainless steel 1.4404 (316L) and attached to the rail with plastic clamps to avoid damage to the rail coating. The sign board can easily be fixed to the mounting frame. The flood light is mounted on an arm which can be rotated to facilitate service for the light without dismounting the whole sign.

**Floodlight** – The ALS 110 floodlight is a compact, ruggedized LED floodlight with optics especially designed for this application giving an absolutely spot-free illumination of the sign and nearly no light outside the sign which directly or indirectly (reflected) could disturb or blind the mariners. The floodlight is made in marine grade cast aluminium, IP67 ingress protection and an extremely low wattage for long time operation on battery based UPS.

The floodlight's integrated NAI bus interface is used to supply power and control the intensity and switching status and to transmit status and error messages to the central NAI Controller. The messages are then available to the central SCADA system.

**Sign board** – The sign board is made of marine grade anodize aluminium and constructed for a long life under harsh conditions e.g. high wind speed, salt and UV radiation.

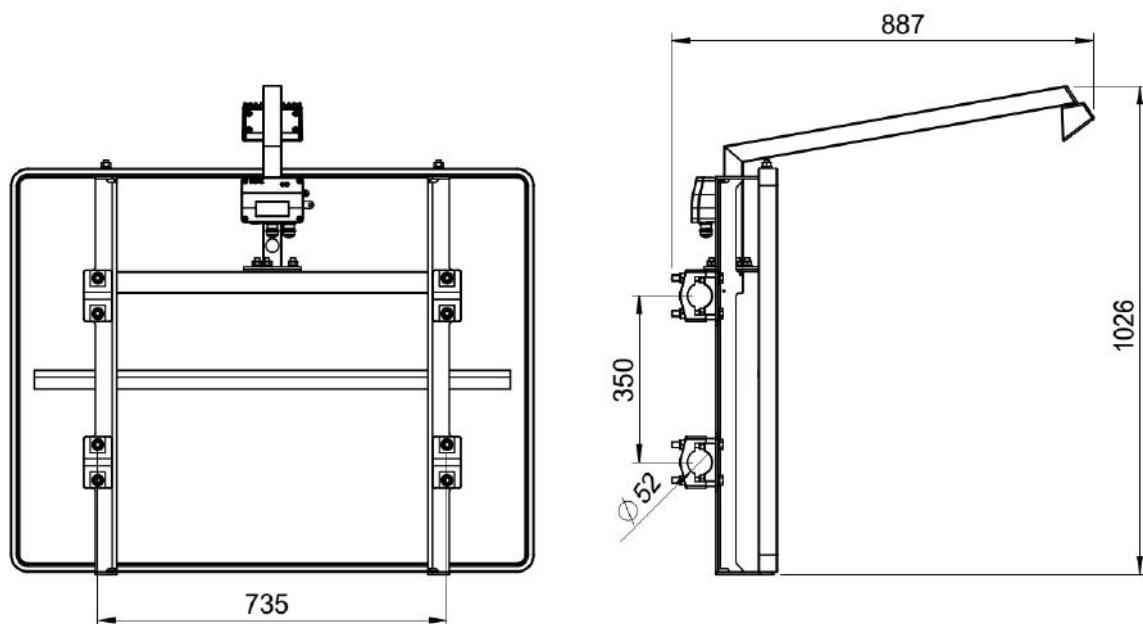
The ID consist of up to 3 characters per sign board, depending on the character width (see DIN 1451-2, medium-spaced lettering). The character height is 650 mm. The characters are yellow on black background.

The sign board is lightweight and can easily be mounted in the bracket within a few minutes.

## Technical Data

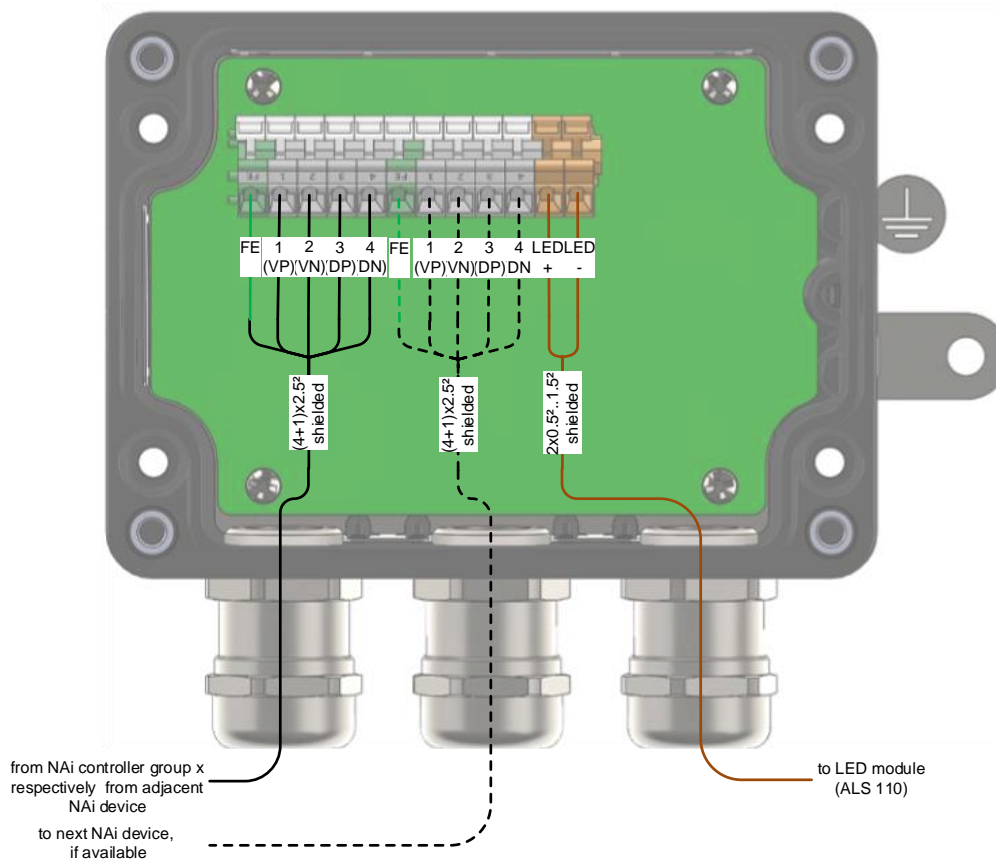
### Typical Dimensions and weight

Variations available upon request.



|   |   |         |
|---|---|---------|
| <b>Width (mounting frame)</b>           |   | 735 mm  |
| <b>Height (overall)</b>                 |   | 1026 mm |
| <b>Depth (including mounting frame)</b> |   | 887 mm  |
| <b>Weight</b>                           | <b>Arm with ALS 110 and connection socket</b> | 5 kg    |
|   | <b>Board with a maximum width of 1560 mm</b>  | 16 kg   |
|   | <b>Mounting frame</b>                         | 10 kg   |

## Electrical connection



|  |                             |
|--|-----------------------------|
| <b>Spring terminal block electrical connection</b> | 2,5 mm <sup>2</sup>         |
| <b>Operating voltage V<sub>IN</sub></b>            | 19 to 36 V DC               |
| <b>Power consumption</b>                           | 2 W                         |
| <b>EMV cable gland (M20x1,5)</b>                   | Cable diameter 7,5 to 14 mm |

## Optical system

|   |                   |
|---|-------------------|
| <b>Light colour</b>                                   | 3850 K            |
| <b>Uniformity [E<sub>min</sub> : E<sub>max</sub>]</b> | better than 1 : 3 |

## Reliability

|                             |             |
|-----------------------------|-------------|
| <b>MTBF Electronics</b>     | 2 130 000 h |
| <b>Minimum LED Lifetime</b> | 100 000 h   |

## Environmental conditions

|   |                                  |
|---|----------------------------------|
| <b>Regulations</b>  | IEC 60945, device type 'exposed' |
| <b>Ambient temperature (operation)</b>                    | -25 to 55 °C                     |
| <b>Ambient temperature (storage / transport)</b>          | -40 to 70 °C                     |
| <b>Humidity (operation / storage / transport)</b>         | max. 95 % according to IEC 60945 |
| <b>Atmospheric pressure (operation/storage/transport)</b> | 80 kPa bis 108 kPa               |
| <b>Protection degree (according to IEC 60529)</b>         | IP67                             |
| <b>Protection class</b>                                   | III                              |

## Mechanical requirements

|   |                   |
|---|-------------------|
| Vibration testing sinusoidal vibrations | acc. to IEC 60945 |
|---|-------------------|

## EMC compliance

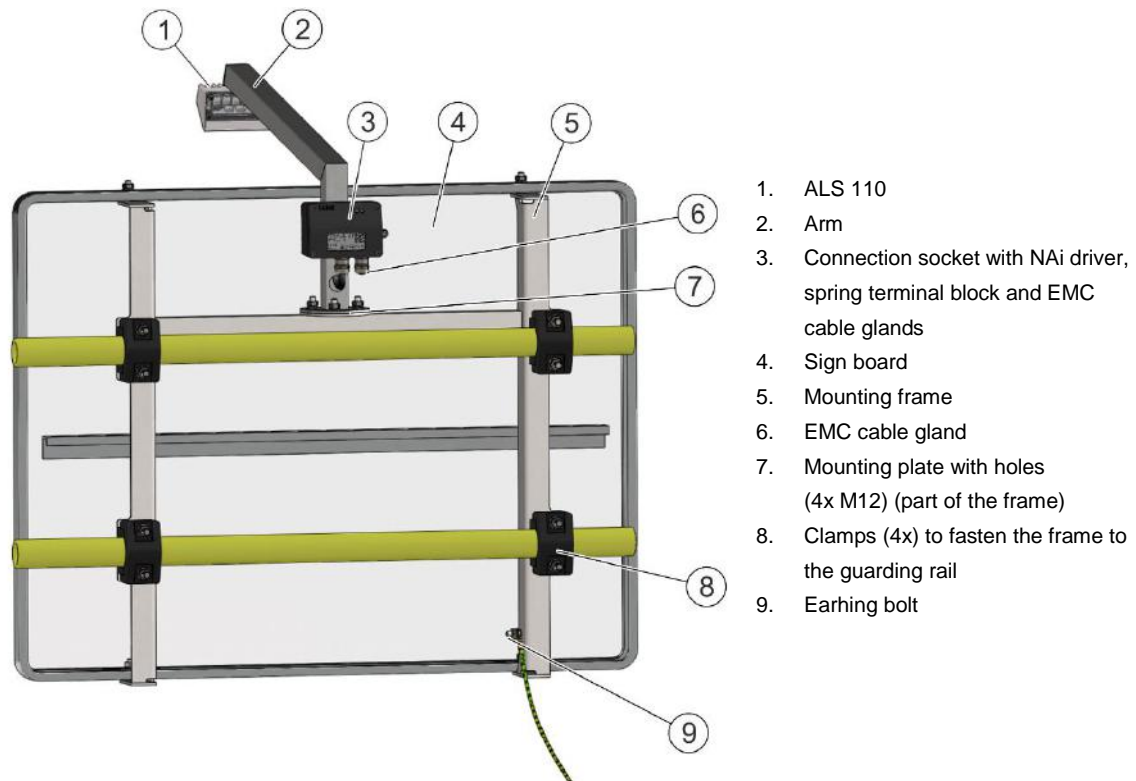
| EMC requirements      |   | Applied Standard  | Test standard/test criteria  |
|-----------------------|---|-------------------|--|
| Emission              | Radiated emission   | EN 60945:2002     | IEC/CISPR 16-2-3:2010<br>Antenna distance 3 m  |
| Interference immunity | Electrostatic discharge (ESD)                             | EN 60945:2002     | IEC 61000-4-2:2008<br>Criterion B<br>8 kV air discharge<br>6 kV contact discharge            |
|                       | Electromagnetic fields                                    | EN 60945:2002     | IEC 61000-4-3:2010<br>Criterion A<br>Field strength 10 V/m                                   |
|                       | Fast transients (burst)                                   | EN 60945:2002     | IEC 61000-4-4:2012<br>Criterion B<br>On NAI bus lines (VP, VN, DP, DN):<br>Test voltage 1 kV |
|                       | High energy transients (surge)                            | EN 61000-6-2:2005 | IEC 61000-4-5:2005<br>1 kV on NAI bus line (shield)  |
|                       | Conducted disturbances, induced by radio-frequency fields | EN 60945:2002     | IEC 61000-4-6:2008<br>Criterion A<br>All lines:<br>Test voltage 10 V                         |

## Mounting (Example)

The mounting frame is mounted to the guarding rail. The floodlight with arm and connection socket is fastened onto the mounting frame. The mounting frame comes with four threaded pins for sign board assembly.



## Components



|                                     |                         |   |                             |
|-------------------------------------|-------------------------|---|-----------------------------|
| <b>EMC cable gland<sup>1)</sup></b> | Dimensions<br>M20 x 1.5 | For cable diameters<br>from 7.5 mm to 14.0 mm | Width across flats<br>24 mm |
|-------------------------------------|-------------------------|---|-----------------------------|

<sup>1)</sup> Type: HELUTOP® MS-EP4

## Material

|  |   |
|--|---|
| <b>Device head</b>   | Anodised and powder coated aluminium (AlSi12) |
| <b>Lenses</b>  | PMMA  |
| <b>Cover pane and signal window</b>                                      | Polycarbonate (PC)                            |
| <b>Arm and installation plate</b>  | Stainless steel 1.4404 (316L)                 |
| <b>Drive housing (connection socket)</b>                                 | PC/ABS  |
| <b>Cable gland</b>   | Nickel-plated brass                           |
| <b>Earthing connection</b>   | Stainless steel 1.4404 (316L)                 |
| <b>Seals</b>   | TPE   |
| <b>Pressure compensation valve for the connection box and LED insert</b> | PTFE membrane                                 |
| <b>Sign board</b>  | AlMg3   |
| <b>Mounting frame</b>  | Stainless steel 1.4404 (316L)                 |
| <b>Clamps</b>  | Polyamide (PA), glass-fibre reinforced        |