

**NMEA 2000 Engine Gateway**  
**EG-1-N2K**



*Installation Manual*

Dec. 2025  
(1.1)





---

# TABLE OF CONTENTS

---

<b>1</b>	<b><i>Introduction</i></b> .....	<b>5</b>
1.1	<b>Contact</b> .....	5
1.2	<b>Compliant Use</b> .....	5
1.3	<b>Copyrights &amp; Trademarks</b> .....	5
<b>2</b>	<b><i>Safety</i></b> .....	<b>6</b>
2.1	<b>Safety Alerts</b> .....	6
2.2	<b>Notice to Installer</b> .....	6
2.3	<b>Product Hazards</b> .....	6
<b>3</b>	<b><i>About The NMEA 2000 Engine Gateway</i></b> .....	<b>7</b>
3.1	<b>Product Description</b> .....	7
3.2	<b>Intended Use</b> .....	7
3.3	<b>Technical Data</b> .....	7
<b>4</b>	<b><i>Unpacking the Product</i></b> .....	<b>8</b>
<b>5</b>	<b><i>Mechanical Installation</i></b> .....	<b>9</b>
5.1	<b>Choosing the Installation Location</b> .....	9
5.2	<b>Mounting the Product</b> .....	9
5.3	<b>3D Model Reference</b> .....	9
<b>6</b>	<b><i>Connecting the Electrical</i></b> .....	<b>10</b>
6.1	<b>Electrical Connectors</b> .....	<b>10</b>
6.1.1	Analog Input Bank #1 Connector.....	10
6.1.2	Digital Input #2 Connector .....	10
6.1.3	RPM Input Connector .....	11
6.1.4	NMEA 2000 M12 Connector.....	11
6.2	<b>Connecting the analog inputs</b> .....	<b>12</b>
6.3	<b>Cabling Recommendations</b> .....	<b>12</b>
6.4	<b>Application Examples</b> .....	<b>13</b>
6.4.1	Measure engine parameters without electro-mechanical gauges .....	13
6.4.2	Measure engine parameters with electro-mechanical gauges .....	14
<b>7</b>	<b><i>Configuration &amp; Operation</i></b> .....	<b>15</b>
7.1	<b>Configuring the NMEA 2000 Engine Gateway Device</b> .....	<b>15</b>
7.2	<b>Enabling the device Wi-Fi interface</b> .....	<b>15</b>
7.3	<b>Configuring the device</b> .....	<b>16</b>
7.4	<b>Engine Run Time</b> .....	<b>16</b>
7.5	<b>Device Settings</b> .....	<b>16</b>

---

<b>7.6</b>	<b>Input Settings</b> .....	<b>17</b>
7.6.1	Selecting the appropriate data type and a PGN .....	17
7.6.2	Calibration .....	18
7.6.3	Oil pressure calibration example.....	18
7.6.4	Tachometer (RPM) calibration example.....	18
7.6.5	Coolant Temperature calibration example .....	19
7.6.6	Alarms/Alerts.....	20
<b>7.7</b>	<b>Wi-Fi Settings</b> .....	<b>21</b>
<b>7.8</b>	<b>Firmware update</b> .....	<b>22</b>
<b>7.9</b>	<b>Device Information</b> .....	<b>23</b>
<b>8</b>	<b>Troubleshooting</b> .....	<b>24</b>
8.1	Status LED Blink Codes:.....	24
<b>9</b>	<b>Warranty</b> .....	<b>25</b>
<b>10</b>	<b>Appendix A: NMEA 2000 PGN List</b> .....	<b>26</b>

---

# 1 INTRODUCTION

---

## 1.1 CONTACT

**Across Ocean Systems Ltd. (AOS)**

351 Lynn Ave. Unit #4  
North Vancouver, British Columbia,  
Canada, V7J 2C4

pre/post sales Tel:

+1-236-688-8948

Email:

contact\_us@acrossoceansystems.com

Website:

[acrossoceansystems.com](http://acrossoceansystems.com)

This document is intended to clearly present comprehensive product data and provide technical information to assist the end user in design applications. Across Ocean Systems Ltd. reserves the right, without notice, to change the design, or construction, of any products and to discontinue or limit distribution of any products. Across Ocean Systems Ltd. (AOS) also reserves the right to change, or update, without notice, any technical information contained within this document.

Across Ocean Systems Ltd. recommends that customers visit our website to check for updates to this Manual. Once a product has been selected for use, it should be tested by the user to ensure proper function in all possible applications. For further instructions, please contact our distributors or visit our website.

## 1.2 COMPLIANT USE

This device is an aid only and should not be used as the sole method of decision making. It will not protect the systems that it is monitoring.

The installer shall:

- Only use non-defective products.
- Check the safety of operation and the condition of the device before each use.
- Verify that the product is operational at all times and keep it in good working conditions.

Only Across Ocean Systems Ltd. Authorized Dealers or Authorized Technicians are to repair this device.

## 1.3 COPYRIGHTS & TRADEMARKS






All product names, logos and brands are property of their respective owners. All company, product and service names used in this manual are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

## 2 SAFETY

Throughout this manual, the following symbols are used to alert the installer to special instructions concerning a service or operation that may be hazardous if performed incorrectly or carelessly. The associated risk levels are

### 2.1 SAFETY ALERTS

Throughout this manual, the following symbols, and their accompanying explanation, are used to alert the user to special instructions concerning a service or operation that may be hazardous if performed incorrectly or carelessly. The associated risk levels are stated below.



 <b>DANGER</b>	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	This symbol indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
 <b>NOTICE</b>	This symbol informs the reader of events not related to personal injury but which there is a risk of damage to property or equipment.
 <b>SAFETY INSTRUCTIONS</b>	This symbol informs the reader of safety-related instructions or procedures.

### 2.2 NOTICE TO INSTALLER

Disregarding the following safety measures can result in an accident causing severe injury to personnel and damage to material assets.

- Only use the product as directed in this manual.
- Never put the product into service if there is evidence of visible damage.
- Never put the product into service before fully completing installation and commissioning.
- Do not carry out any modifications to the product.
- Only use authentic AOS spare parts.
- Observe all local regulations, directives and laws during the installation of this product.
- All installation, commissioning, and maintenance work must only be conducted by qualified personnel. (For the purpose of this manual, qualified personnel are persons who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.)
- Observe all specifications in this manual. If these guidelines are not followed and damage occurs, the warranty will be voided.

### 2.3 PRODUCT HAZARDS

 <b>WARNING</b>	<b>Disconnect Power:</b> Turn off power at distribution panel before beginning installation to protect installer from electrical hazards.
 <b>CAUTION</b>	<b>Voltage and Current Compatibility:</b> Confirm that the power source is compatible with the maximum voltage and current ratings of is product variant. Failure to do so could result in damage or fire.

## 3 ABOUT THE NMEA 2000 ENGINE GATEWAY

### 3.1 PRODUCT DESCRIPTION

The NMEA 2000 Engine Gateway Device allows the user to convert analogue gauge/sender readings to NMEA 2000® messages, output to NMEA 2000 network and present the analog signals being read with standard NMEA 2000 PGNs that Multifunction Displays should understand.

### 3.2 INTENDED USE

This device is designed measure voltages on 12V or 24 V system, convert the that data to NMEA 2000 protocol and send it to other devices on the same NMEA 2000 network

### 3.3 TECHNICAL DATA

Table 1: NMEA 2000 Engine Gateway Device Technical Data

Electrical	
Operating Voltage	12 VDC and 24 VDC Nominal
Operating Current	Less than 50 mA (1 LEN) with Wi-Fi off
Short Circuit Protection	Yes.
Reverse Battery Protection	Yes. Indefinite.
Voltage Surge Protection	Yes
Interfaces	NMEA 2000
Connectors	1x NMEA 2000 M12 4 Analog Inputs 4 Digital (on/off) inputs 1 RPM Input
Analog Inputs Limits	0 – 32VDC 0.005V resolution
Digital Inputs Limits	On 7.5V / off 4.5V up to 32V continuous
RPM Input Limits	From 0.1V and up signal
Mechanical	
Physical Dimensions (L x W x H)	126 mm x 50 mm x 35 mm [5.0" x 2.0" x 1.4"]
Mounting Dimensions (L x W)	113.4 mm x 31.8 mm [4.465" x 1.252"] 4.5 mm [0.17"] Thru-Holes
Product Weight	0.1 kg [0.22 lbs]
Enclosure Material	Plastic, Polycarbonate
Shipping Dimensions (L x W x H)	216 mm x 140 mm [8.5" x 5.5"]
Shipping Weight	0.2 kg [0.44 lbs]
Environmental	
Operating Temperature	-20°C to 55°C [-4°F to 131°F]
Storage Temperature	-30°C to 70°C [-22°F to 158°F]
Operating Humidity	95% Non-condensing
Storage Humidity	75% Non-condensing
Ingress Protection	IP40
Certifications	
Certifications	NMEA 2000 (Pending)

## 4 UNPACKING THE PRODUCT

---

When unpacking the box containing the device, the box should include the following additional items:

- 1 x NMEA 2000 Engine Gateway – the NMEA 2000 Device
- 1 x 5 position connector for analog inputs
- 1 x 5 position connector for digital inputs
- 1 x 2 position connector for RPM inputs
- 4 x Philips type mounting screws

If any of these items are missing or damaged, please contact Across Ocean Systems Ltd. to arrange replacements.

## 5 MECHANICAL INSTALLATION

---

### 5.1 CHOOSING THE INSTALLATION LOCATION

The installer should consider the following parameters when choosing a mounting location:

1. The Device should be protected from direct water or direct moisture exposure.
2. The Device should be mounted near the signals to be measured.
3. The Device should be mounted away from any AC cabling or power sources.
4. The Device should be mounted away from any large sources of Electromagnet Interference (EMI).
5. Wiring between the Device and signals should not run parallel to high voltage or high current carrying wires or cables.

### 5.2 MOUNTING THE PRODUCT

Securing the Device is a crucial step in the installation process. This ensures safety to the product while providing ease of access to the installer.

There are two steps to securing Device:

1. Ensure that there is enough room to accommodate the depth of the product and the attached cables. Note, the NMEA 2000 connection exits from the top of the unit and requires a substantial bend radius for the cable.
2. Use supplied screws to secure it into place at each side. Do not over-tighten the screws as it can lead to damaging the enclosure.

### 5.3 3D MODEL REFERENCE

A 3D Model of the unit is available on demand.

## 6 CONNECTING THE ELECTRICAL

The Engine Gateway Device requires cables to connect all the required instruments to the appropriate connectors on the unit. Cables are supplied separately and are available through a NMEA 2000 dealer or local marine installer.

### 6.1 ELECTRICAL CONNECTORS

Connectors are indicated as ① to ④. Connection to ④ is required for basic operation. All other connections are optional and based on the users' specific installation needs.

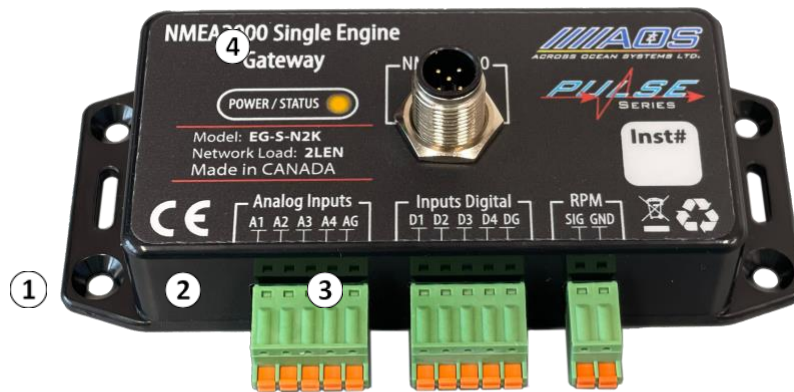


Figure 1: Engine Gateway Device Connector Layout

Table 1: Connector List

No.	Connector Name
1	Analog Input #1 Connector
2	Digital Input #2 Connector
3	RPM Input #3 Connector
4	NMEA 2000 M12 #4 Connector

#### 6.1.1 Analog Input Bank #1 Connector

The Analog Inputs #1-3 Connector allows the connection of up to four (a) Analog signals

Table 2: Analog Input Bank #1 Connector

1 Analog Input Connector			
Pin #	Pin Designator	Pin Type	Function
1	A1	Input	Analog input #1 Positive
2	A2	Input	Analog input #2 Positive
3	A3	Input	Analog input #3 Positive
4	A4	Input	Analog input #4 Positive
5	AG/AGND	Input	Analog Ground (Negative connection)

#### 6.1.2 Digital Input #2 Connector

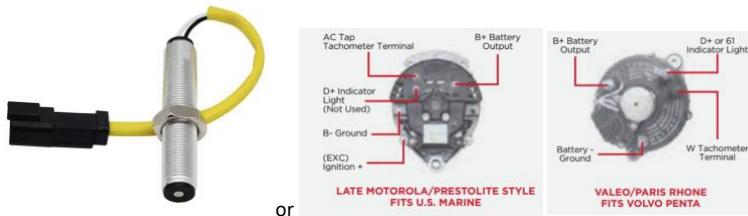
The Digital Input #2 Connector allows the connection of up to four (4) Digital (on/off) signals

Table 3: Analog Input Bank #2 Connector

2 Digital Input Connector			
Pin #	Pin Designator	Pin Type	Function
1	D1	Input	Digital input #1 Positive
2	D2	Input	Digital input #2 Positive
3	D3	Input	Digital input #3 Positive
4	D4	Input	Digital input #4 Positive
5	DG/DGND	Input	Digital input Ground (separate from AG)

6.1.3 RPM Input Connector

This is input for RPM signal. It is designed to work with variable reluctance magnetic pickup or inductive sender (the most common RPM sensor available) or with “W”, “R” or “AC” (aka AC Tap) output of the alternator or hall effect sensor. Below are few examples:



Another installation option will be to connect to the signal and GND of the existing tachometer

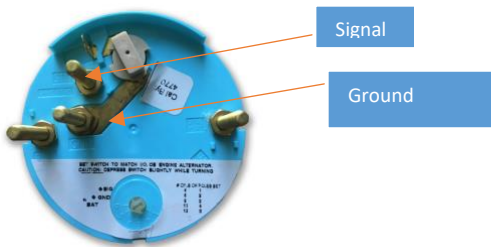


Table 4: Ground reference connector

3 RPM Input Bank #3 Connector			
Pin #	Pin Designator	Pin Type	Function
1	SIG	Reference	RPM Signal
2	GND	Reference	RPM Signal Negative

**NOTICE**

for magnetic pickup sensor reverse the two input wires if does not read RPM on initial connection

6.1.4 NMEA 2000 M12 Connector

The NMEA 2000 M12 Connector is used to directly connect to standard NMEA 2000 networks based on circular connector cabling standards. The connector has the following pin-out.

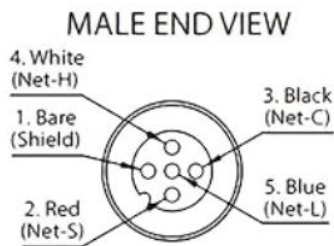


Table 5: NMEA 2000 M12 Connector

4 NMEA 2000 M12 Connector			
Pin #	Pin Designator	Pin Type	Function
1	SHIELD	Power	NMEA 2000 Shield Pin
2	NET-S	Power	NMEA 2000 Power Supply Positive
3	NET-C	Power	NMEA 2000 Power Supply Ground
4	NET-H	Comms	NMEA 2000 CAN High Signal
5	NET-L	Comms	NMEA 2000 CAN Low Signal

## 6.2 CONNECTING THE ANALOG INPUTS

The analog inputs can be connected to measure voltage on any device on the vessel, e.g. batteries, analog engine sensors for pressure or temperature, trim tabs position sensors, tank level sensors etc.

## 6.3 CABLING RECOMMENDATIONS

The analog inputs have input impedance over 100k Ohm, therefore will not influence the voltage sources they have been connected to. All four (4) analog inputs are independent but share the same negative/ground connection. Presence or absence of voltage on one or more of the inputs will not have effect on the others. The analog inputs are very sensitive and have resolution of about 5mV. That allow the unit to measure from very low voltages all the way to 32VDC with incredible accuracy.

Note that if DC source such as battery voltage source is connected to the analog inputs to apply appropriate fuse protection (1A) to protect the wire and the source (ABYC standard calls for protection within 1' from the source). For analog signals (such as oil pressure gauge or temperature gauge signals) fusing is not necessary as this signal cannot generate high enough current to blow even 1A fuse. When connecting, please use caution when not to short any signals.

Follow recommended wiring practices and standards as per relevant local codes.

## 6.4 APPLICATION EXAMPLES

### 6.4.1 Measure engine parameters without electro-mechanical gauges

The following diagram shows an example where the device is connected to the engine senders directly when electromechanical gauges removed or not present. In this example, analog ch1 measures oil pressure, analog ch2 measures coolant temperature, analog ch3 measures transmission oil pressure (if transmission oil pressure sender is present) and RPM is connected to alternator AC or W terminal.

This type of connection requires sourcing and purchasing 1kOhm 1Watt resistors that are inexpensive and widely available from electronic suppliers such as [Digikey](#), [Mouser Electronics](#), [Newark Electronics](#) and even available on [Amazon](#)

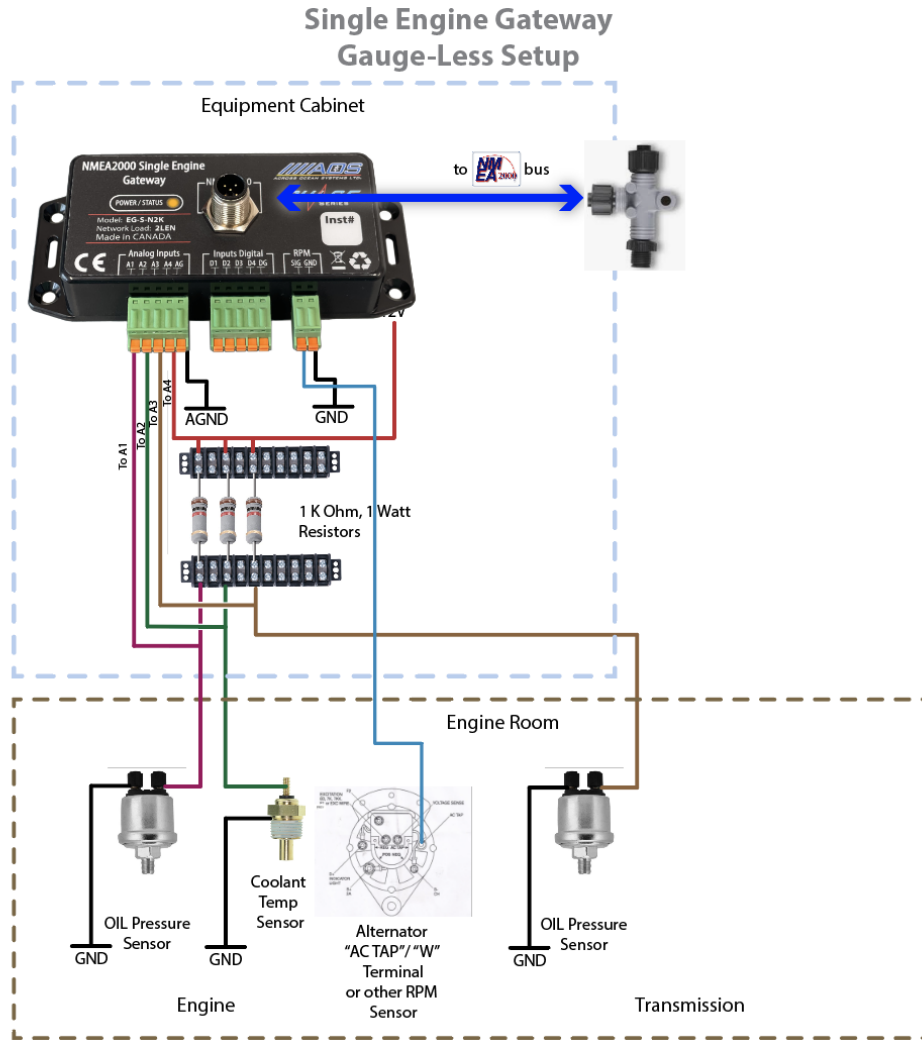


Figure 2: Connecting two batteries to input 1 and input 2 of the device

### NOTICE

Please note that all analog inputs use one common ground connection to avoid possible ground loop problems

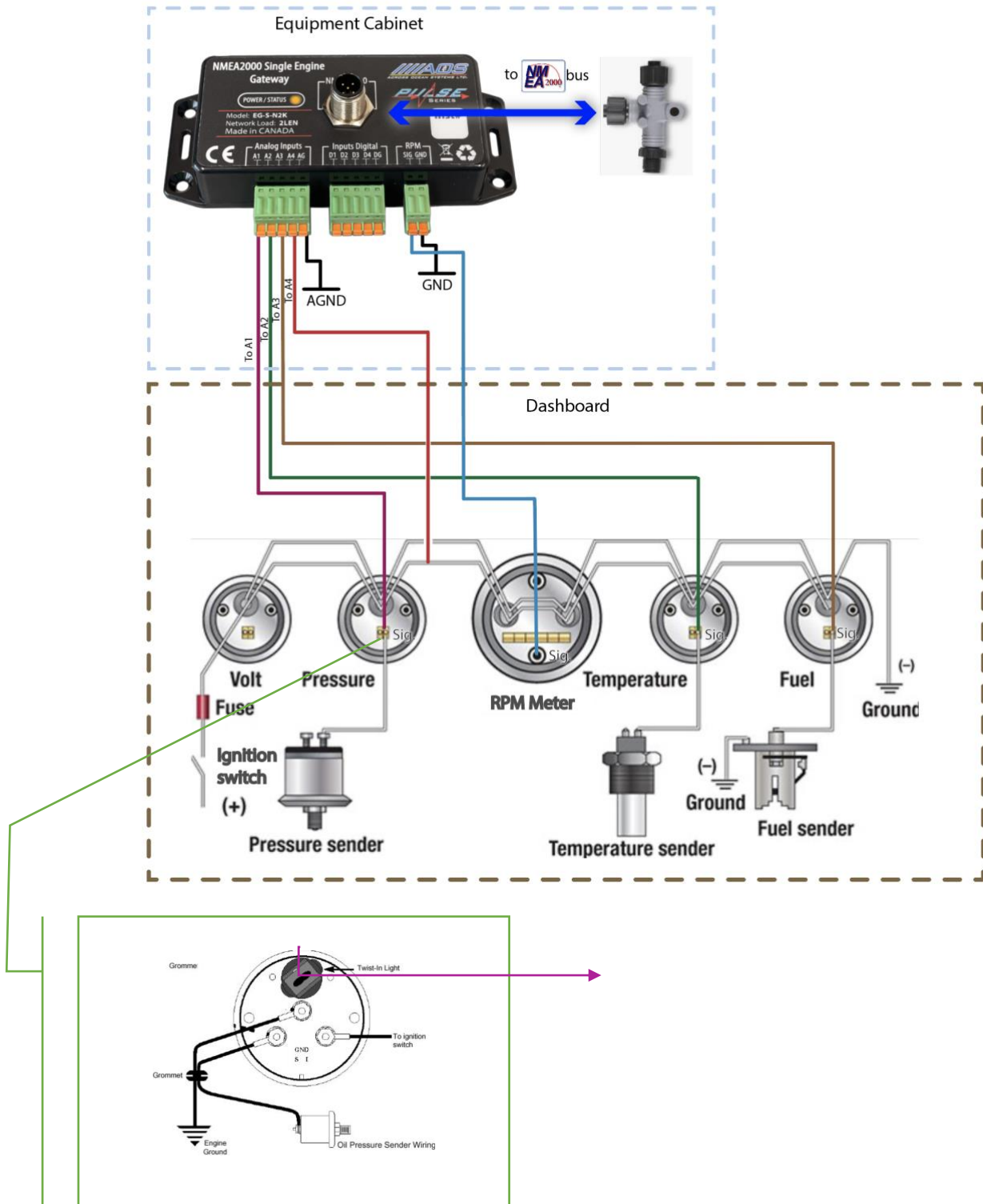
### CAUTION

**Voltage and Current Compatibility:** Confirm that the power source is NOT connected to the AG (analog ground) connection. Failure to do so could result in damage to the device.

### 6.4.2 Measure engine parameters with electro-mechanical gauges

The following diagram shows an example where the device is connected to the engine gauges directly. This is usually the easiest way to connect the gateway as all of the signals from the engine room are already wired to the dash gauges.

### Gauge-Less Setup with Engine Gateway Module



## 7 CONFIGURATION & OPERATION

Once installed onto a properly configured NMEA 2000 network the NMEA 2000 Engine Gateway Device will identify itself to the other devices and acquire an address. Once it is configured, it will start transmit PGNs messages on the network. In order to change the transmitted PGNs and configure each input, one must setup the device via the Wi-Fi web interface.

### 7.1 CONFIGURING THE NMEA 2000 ENGINE GATEWAY DEVICE

All Across Ocean System's NMEA 2000 Devices are equipped with built-in Wi-Fi interface for configuring the sensor.

Once the device is connected to a powered and properly terminated NMEA 2000 network, the STATUS LED become active and emit short flash then be off for about 3 seconds and the pattern will repeat. This is an indication of normal operation.

At this point, the Wi-Fi interface in the Device is disabled. To enable the Wi-Fi interface and configure the device, execute the steps in the paragraph below

### 7.2 ENABLING THE DEVICE WI-FI INTERFACE

Power on the sensor by connecting it to the NMEA 2000 network. If the LED on the sensor is flashing with rate of 0.2s at approx. 3 seconds intervals, the sensor is functioning properly. In about 15 sec after power-up, the LED flash pattern will change and the LED will start flashing much faster with rate (0.2s On/0.2s Off). Now disconnect the sensor from power. After few seconds, reconnect the Device again to the NMEA 2000 network (power it on). You should observe slow flash pattern (3s On/3s off). This is an indication that the device's Wi-Fi web interface is enabled and ready for connection.

On your smart phone or computer, go to the Wi-Fi settings.

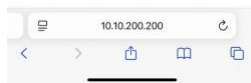
Find and connect to the following network:

SSID = Pulse

and enter for

Password = #Pulse-00000

Now your NMEA 2000 Engine Gateway Device web configuration is accessible via the browser on your computer or smart phone. Open your browser (Chrome works best) and type in the address bar the following address: <http://10.10.200.200>



### 7.3 CONFIGURING THE DEVICE

In the upper left corner, there is a menu icon that allows access to all configuration pages



### 7.4 ENGINE RUN TIME

The device has a built in engine timer. It automatically start counting engine hours if you have RPM connected and configured. The count begins when engine is running (RPM >400) and stops when engine is shut down (RPM <400).

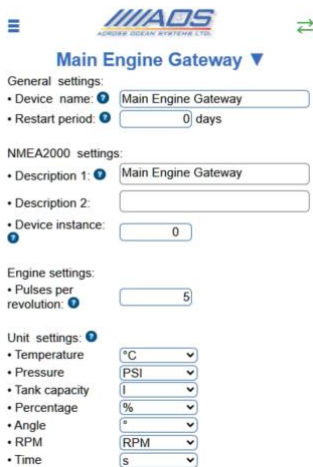


Tapping on the "Run time" value will open a pop-up window where you can enter the current hours of your engine. If you don't do that the systems will start counting from 0:00 engine hours. The running hours will be automatically transmitted to the NMEA 2000 network. No other setup is needed.

Now your engine running hours can be displayed on you MFD.

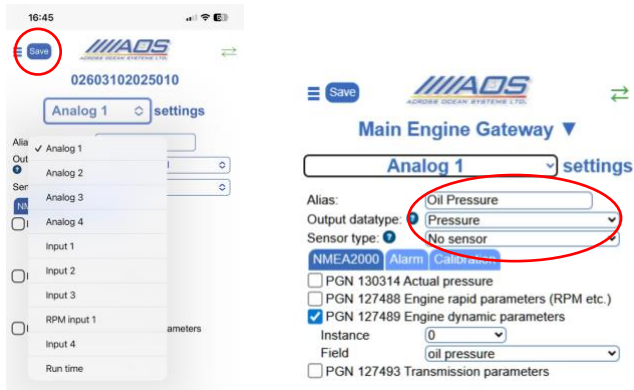
### 7.5 DEVICE SETTINGS

Select "Device setting" from the menu. Enter the Device name as per your preferences. The Serial Number which was a placeholder for the name of the device is automatically replaced by the new name. This will help you to easy recognize the inputs from this device on your MFD displays. Some MFDs may not display the name properly. Also, you can select the units' type, but they are relevant only for the configuration WEB display. The NMEA 2000 units are not configured here, but rather on your MFD.



## 7.6 INPUT SETTINGS

Select “Input settings” from the menu. Here each input can be individually named and configured. Under “Alias” enter the name of the gauge which status this input will report e.g., Oil Pressure. Leave Sensor type to “No Sensor” as this options are designed for very specific sensors, not like the type you are configuring. From the Input drop down control, select “Input 2” and repeat the operation above. Give the second input the appropriate alias for the gauge that it will represent. Continue the operation till all intended for use inputs are named. If you choose, you can ignore naming the inputs, but when they are named, will be easier to setup your Vessel Monitoring system or your multi-function display MFD as there will be a direct reference to the devices you’ve chosen to monitor and you will not have to guess which input is for what...



**WARNING**

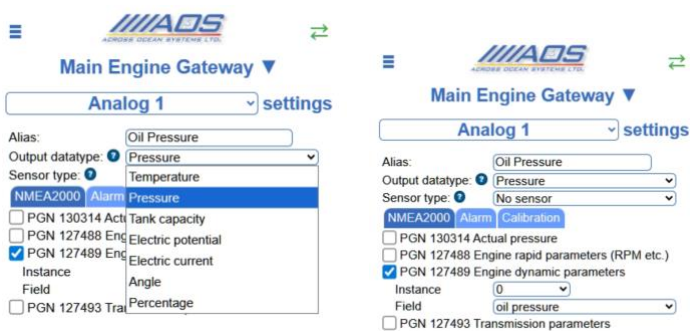
If device configuration has been changed, quickly a “Save” button will appear next to the menu symbol. The device will trigger automatic saving of the new setting in approximately 30 seconds of inactivity it will save the new setting even if the Save button is not being depressed. If new settings are not saved yet, the **System status** will be showing **Changes pending**, and the status LED will be on for about 3 seconds with short off cycle and then on again for about 3 seconds etc...

If power is disconnected from the device during this time, the new setting will be lost. **DO NOT DISCONNECT** the NMEA 2000 connector before the new settings are applied and the **System status** reads OK (**0000**)

When finish the configuration either tap on the “Save” button that appears or wait for about 40 seconds. Changes to single page are cashed, thus moving to configure the next input or setting is OK. But killing the device power prematurely will lead to losing the newly introduced settings.

### 7.6.1 Selecting the appropriate data type and a PGN

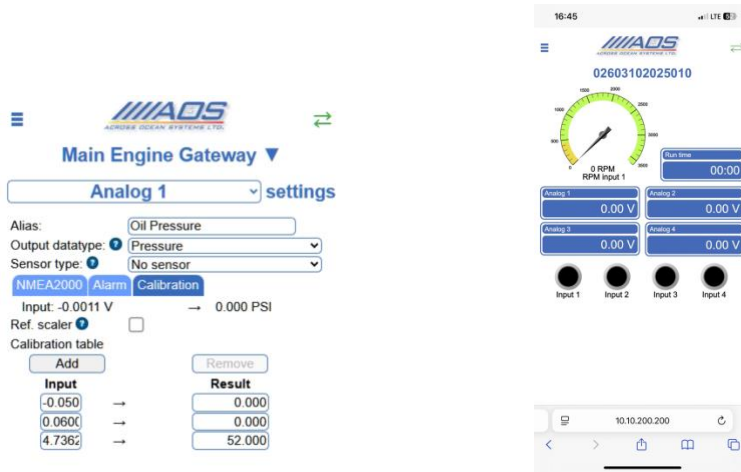
These settings need to be updated for each analog input as they are completely independent and can represent different data types, such as pressure, voltage temperature etc. On the “Input settings” page select the analog input port you would like to configure. Under “Output data type” drop down menu select type of parameter you would like to read with this analog channel. The list of NMEA 2000 PGNs will update according with the plausible PGNs for the datatype you’ve selected. Put a check mark on the PGN for the datatype that your Multi-function display supports. That will enable the device to send the selected PGN to the NMEA 2000 network.



### 7.6.2 Calibration

On the “Input settings” page select the analog input port you would like to calibrate. Tap the Calibration tab. There you have the options to add calibration point to the calibration table, remove point that is highlighted, or change the values in the table.

### 7.6.3 Oil pressure calibration example

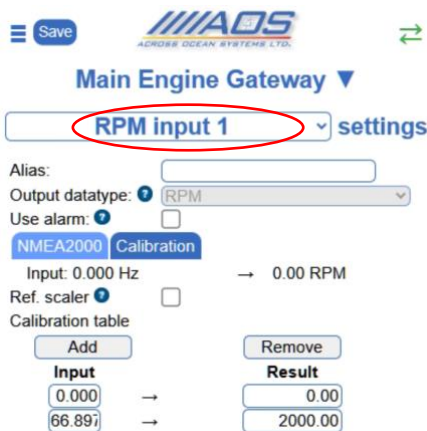


In order to explain better here are the easiest way to calibrate oil pressure reading. Any other readings are calibrated in very similar fashion.

Start with the engine off and the ignition switch off. Follow the steps below:

1. First tap on “Add”. The system will automatically read the voltage value and it will appear on the left side of the table. Do not edit left side. On the right side enter either “0.00”.
2. Turn the ignition on. Tap on “Add”. This will create a second line in the calibration table. On the left side the system will read the voltage that represent 0 PSI as the engine is not started yet and there is no oil pressure yet. Enter “0.00” on the second line right side.
3. Start the engine. Wait a few seconds for the oil pressure to build-up and raise RPM to the cruising RPM. Keep the RPM steady and tap on “Add”. This will create a third line in the calibration table. On the left side of third line the system will read the voltage that represent your oil pressure at cruising RPM. Do not change that entry. On the right side enter the pressure as you read it from the electromechanical gauge. In the example screenshot above the value is 52PSI
4. The oil pressure calibration is complete. You can monitor the oil pressure by tapping on the AOS logo which will bring the default page indicating the real-time readings on all channels of the device.
5. Repeat the procedure for the other channels and enter the appropriate numbers for the data type you are configuring the specific analog channel
6. Don't forget to tap “save” when done with the changes.

### 7.6.4 Tachometer (RPM) calibration example



To calibrate RPM, select the RPM input from the inputs drop down menu. Start with the engine off and the ignition switch on and follow the steps below:

1. First tap on “Add”. The system will automatically read the frequency value (in this case with engine off should be 0) and it will appear on the left side of the table. Do not edit left side. On the right side enter either “0”.

2. Start the engine and run it to high idle (not in gear) to your cruising RPM. If you have electromechanical tachometer set and observe the proper RPM there. For the benefit of this example, we will go with 2000 RPM. If you don't have electromechanical tachometer, you will need optical device to set to 2000 RPM on the main engine pulley
3. Once the engine is running at the cruising RPM tap on "Add". This will add second calibration point. Leave the left side alone as the device will enter there the proper frequency that is reading for this RPM and on the right side enter the cruising RPM that the engine is running at this moment - in our example that will be "2000"
4. Your setup is now complete. You can pull the engine back to idle and check the RPM reading on the main page (tap the AOS logo to get to the main page)

<b>NOTICE</b>	For all sensors with linear outputs such as pressure, RPM, voltage, current etc. two calibration points are perfectly sufficient. It is not recommended to enter more calibration point for linear devices. For non linear sensors such as engine temperature 3 or 4 calibration points will be more accurate.
---------------	--

### 7.6.5 Coolant Temperature calibration example

The screenshot shows the 'Main Engine Gateway' settings for 'Analog 2'. The alias is 'Coolant Temp', the output datatype is 'Temperature', and the sensor type is 'No sensor'. The input is set to '-0.0022 V' and the unit is 'NA °C'. A calibration table is shown with the following data:

Input	Result
-0.009	NA
2.500	100.00
2.650	90.00
3.100	70.00
3.850	40.00
5.458	20.00

Two graphs are included: 'Typical Engine Coolant Temperature (ECT) Sensor Curve' showing Sensor Resistance (Ohms) vs Coolant Temperature (°C), and 'Engine Coolant Temperature Sensor Voltage vs Temperature' showing Sensor Signal Voltage (V) vs Coolant Temperature (°C).

To calibrate coolant temperature, select the Analog input connected to the temperature gauge from the inputs drop down menu. In this example is "Analog 2" Start with the engine off and the ignition switch in off position and follow the steps below:

1. Start with the engine off and the ignition switch in off position and Tap on "Add". The system will automatically read the voltage on the temperature sensor and it will appear on the left side of the table. Do not edit left side. On the right side enter either "NA". This is the entry when the ignition key is off, therefore data not available thus the NA entry.
2. Begin calibration with cold engine. Keep the engine off, but switch the ignition switch to on position.
3. Tap on "Add". The system will add second line and automatically read the voltage on the temperature sensor. It will appear on the left side of the table. Do not edit left side. On the right side enter either the current engine temperature. The electromechanical gauge most likely will be not in range yet, so you can measure directly engine temperature with an infrared thermometer and enter it. In this example is 20 deg C. Keep in mind the coolant sensor is almost always an NTC thermistor (Negative Temperature Coefficient):
  - Cold engine → high resistance → higher voltage drop
  - Hot engine → low resistance → lower voltage drop
4. Start your engine. Proceed to warm up the engine.
5. In the process of warming up repeat "step 3" few times at approximately equal intervals, with the last one when the engine is up to normal operating temperature. For each calibration point either measure the engine temperature with infrared thermometer or read the electromechanical gauge and enter the value on the right side.

<b>NOTICE</b>	Above setup and graphs are for illustration purposes only. Do not copy values to your setup. You must create and configure calibration points specific to your engine and sensor. Four to five calibration points are more than enough for non linear data sources such as engine coolant temperature sensors or tanks with odd shape
---------------	---

### 7.6.6 Alarms/Alerts

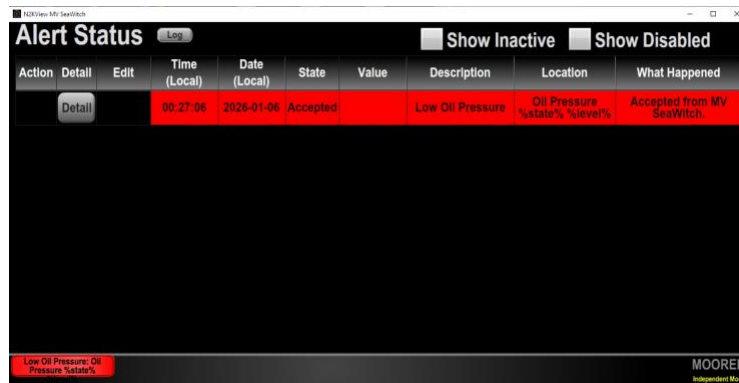
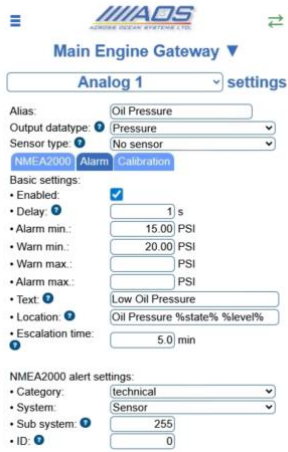
**NOTICE** In the content of this manual alert and alarm terms are used interchangeably.

Your device can be setup to output NMEA 2000 alert to the NMEA 2000 network. The alerts are useful tool to keep you informed for any equipment misfunctions. In order this to

happen there are two conditions that need to be met

- Your multi-function display (MFD) or vessel monitoring software must support alert messaging as they are defined by NMEA 2000 standard
- You must setup the specific triggering values in the sensor at which

The triggers have 2 levels Warning and Alarm where the Alarm is the more severe. The Depending on the parameter being monitored, the warnings and alarms values can be setup to trigger either on level below the entered value, above the entered value or define safe region between minimum and maximum levels - e.g., Oil pressure alarm should be triggered below certain value, coolant temperature should be triggered above certain value, and tank level should have safe region let's say between 10% and 90%. Such alert setting will trigger message when the tank level falls below 10% when used up, or raises above 90% during fill-up

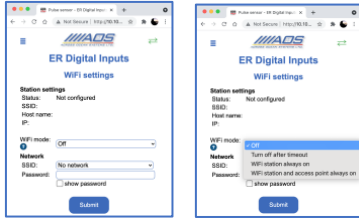



Above is an example of oil pressure minimum warning setup at 20PSI and minimum alarm setup at 15PSI and the alert status triggered in N2K View Software.

**CAUTION** **Compatibility Warning:** At the time of the writing this manual we are only successfully tested alerts with Maretron systems and Garmin MFDs. Furuno, RayMarine and Simrad unfortunately do not support alerts yet. The good news is that in 2026 NMEA 2000 organization have mandated alert support for all manufacturers.

## 7.7 WI-FI SETTINGS

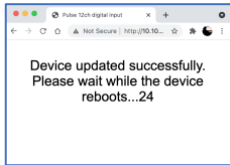
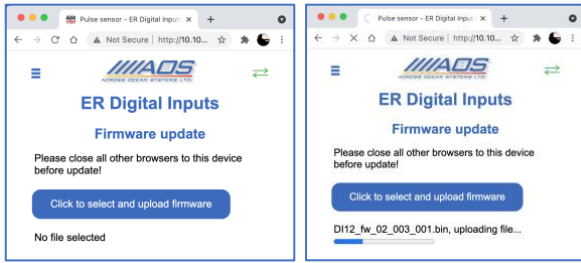
The Wi-Fi Setting page is designed for advanced users. Our recommendation is to leave it as is if you don't have extensive knowledge of setting up and operating Wi-Fi networks. This page gives you the flexibility to configure the sensor to attach to your vessel Wi-Fi Access Point if one already is present there.



 <b>WARNING</b>	<p>It is recommended to leave the default setting as shown on the first picture above. The default setting with Wi-Fi Off provides long term reliability and reduced power consumption of the sensor, as enabling the Wi-Fi network is not necessary for the core operation of the sensor, but just for one time sensor configuration. If sensor configuration is needed again, the Wi-Fi on the sensor can be powered up again following the procedure indicted in paragraph 7.2 Device Wi-Fi Interface</p>
--	--

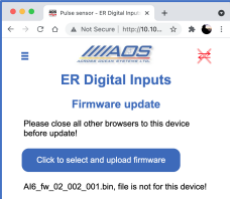
## 7.8 FIRMWARE UPDATE

Select “Firmware Update” from the menu. Here the firmware of the device can be upgraded Over the Air. When new firmware is available from Across Ocean Systems Ltd, download the new XXXXXXXX.bin file save it to a folder that can be easily accessed with the device (smart phone or computer) that you are using to configure the sensor and tap/click on the button “Click to select and upload firmware”. The device will check the validity of the selected firmware file and if the file is the correct for the device you are trying to upgrade, it will automatically commence the upgrade.



On successful completion of the firmware update, the device will restart in order to activate the new firmware. In most cases the browser reconnects automatically to the device, but in case that does not happen, you may have to repeat connecting to the Wi-Fi access point of the device as outlined in 7.2 Enabling the to check that the upgrade have been done successfully.

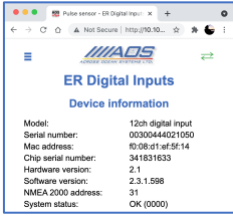
If the firmware update fails, the device will automatically load again the same Firmware Update page. In this case repeat the upgrade procedure until the device gets successfully updated. Failing the upgrade will not harm or “brick” the device, but it will just require to repeat the upgrade procedure.



If wrong firmware file is selected the device will display a warning that the file is not correct file for the device you are trying to upgrade.


## 7.9 DEVICE INFORMATION

The last selection on the menu is “Device Information”



This page presents all of the device specific information, such as model number, serial number, system status, mac address etc.

<b>NOTICE</b>	System status line will indicate the current system status of the device. There could be different <b>System states</b> , but they will be prioritized when displayed.
---------------	--

 <b>WARNING</b>	<p>If device configuration has been changed, the device will trigger automatic saving of the new setting in approximately 30 seconds of inactivity. If new settings are not saved yet, the <b>System status</b> will be showing <b>Changes pending</b>, and the status LED will be on for about 3 seconds with short off cycle and then on again for about 3 seconds etc...</p> <p>If power is disconnected from the device during this time, the new setting will be lost. DO NOT DISCONNECT the NMEA 2000 connector before the new settings are applied and the <b>System status</b> reads OK (<b>0000</b>)</p>
--	---





# 8 TROUBLESHOOTING

If you encounter problems with the operation of your product, please refer to the trouble-shooting suggestions before contacting AOS for assistance. If the steps below do not resolve your issue, please reach out either AOS directly or our Dealers in your area.

## 8.1 STATUS LED BLINK CODES:

On the majority of the Across Ocean Systems' sensors you will see a blinking Status LED. It is designed to provide information on the status of the sensor and also to help troubleshoot it, if necessary. New Blink Codes were implemented with Firmware Ver. 2.4.2.911

**Here is how to read the blink duration:**

Fast Blink = 0.2s on / 0.2s off		Fast Blink
Blink = 0.35s on / 0.35s off		Blink
Long Blink = 1.3s on / 0.35s off		Long Blink
Blink + Pause = 0.35s on / 2.5s off		BlinkE

**The meaning of the blink codes is explained below:**

Sensor Operational - **all OK** = Short on /Very Long off

AP Boot = Continuous Fast Blink -> **during this state toggle the power to start and configure the sensor via its web interface**

Save Pending = 3.1s on / 0.4s off = **Very Long on, Short off** -> **changes of configuration. Do not disconnect till the changes are saved**

Chip Error = Blink, BlinkE = **2 Blink + Pause** -> **Call Technical Support**

Conversion Timeout = Blink, Blink, BlinkE = **3 Blinks + pause** -> **Call Technical Support**

Status N2k Error = Blink, Blink, Blink, BlinkE = **4 Blinks + pause** -> **Check your NMEA 2000 connection of your network**

Sensor Error = Blink, Blink, Blink, Blink, BlinkE = **5 Blinks + pause** -> **Check your pressure sensor connector or input to the analog device**



5 Blinks + pause illustrated above

Table 6: Common Solutions

Problem (Issue encountered)	Cause (What it means)	Corrective Action (What to do)
Status light not blinking	Device power not supplied	1. Check that NMEA 2000 cable is providing power to device.

---

## 9 WARRANTY

---

Across Ocean Systems Ltd. (AOS) warrants the Products and Parts manufactured by AOS to be free from defects in workmanship or material and that said products are designed mechanically and functionally to perform to specifications.

This warranty is effective providing:

- The equipment is used within the intended operating conditions and in accordance with AOS recommendations
- The equipment is installed according to equipment diagrams, specifications and recommendations which AOS has provided

This warranty becomes invalid if the factory supplied serial number has been removed or altered on the product. This warranty does not cover cosmetic damage or damage caused by an act of God, accident, misuse, abuse, negligence or modification of any part of the product. This warranty does not cover damage due to improper operation or maintenance, connection to inappropriate equipment or attempted repair by anyone other than an authorized AOS representative.

Upon identification of a potential issue or defect with AOS Product or Part, the Warranty Applicant ("Applicant") must immediately contact AOS and describe the issue in writing, by letter, fax, email or other electronic conveyance. AOS will then assess the cause of the defect and determine warranty applicability and appropriate remediation.

If any part is found to be defective, AOS will replace said part FOB the AOS factory provided that any such defective part is returned by the Buyer with freight and applicable forwarding charges prepaid by the Buyer. AOS sole obligation to the Applicant will be to repair or replace the defective part with same or similar product, to a maximum value of the list price of the product or part. The AOS warranty does not cover labour charges, Installation charges, travel or any other associated expenses.

All Products and Parts manufactured by AOS are subject to a warranty against manufacturer's defects in materials or workmanship for a period of two (2) years from the date of purchase.

AOS will be responsible for all Products or Parts sold by AOS, but manufactured by 3<sup>rd</sup> party manufacturing companies. However, these products and parts are subject to applicable 3<sup>rd</sup> party warranties and may not be the same as the AOS warranty.

---

## 10 APPENDIX A: NMEA 2000 PGN LIST

---

The following NMEA 2000 Program Group Numbers (PGN) are transmitted by this unit.

### Device PGNs

- PGN59392 ISO Acknowledgement
- PGN59904 ISO Request
- PGN60160 Multi packet data transfer, TP.DT
- PGN60416 Multi packet connection management
- PGN60928 ISO Address Claim
- PGN65240 Commanded Address
- PGN126208 NMEA Request/Command/Acknowledge group function
- PGN126464 PGN List (Transmit and Receive)
- PGN126993 Heartbeat
- PGN126996 Product information
- PGN126998 Configuration information
- PGN127501 Binary Switch Bank Status

### Pressure

- PGN 130314 Actual pressure
- PGN 127488 Engine rapid parameters (RPM etc.)
- PGN 127489 Engine dynamic parameters
- PGN 127493 Transmission parameters

### Temperature

- PGN 130316 Temperature (extended)
- PGN 130312 Temperature
- PGN 127489 Engine dynamic parameters
- PGN 127493 Transmission parameters
- PGN 127508 Battery status
- PGN 130310 Environmental parameters
- PGN 130311 Environmental parameters

### Electric Potential (V)

- PGN 127508 Battery status
- PGN 127751 DC voltage/current
- PGN 127489 Engine dynamic parameters

### Tank Capacity

- PGN 127505 Fluid Level

### Electric Current (A)

- PGN 127505 Fluid Level
- PGN 127751 DC voltage/current

### Percentage (%)

- PGN 127488 Engine rapid parameters (RPM etc.)
- PGN 127489 Engine dynamic parameters
- PGN 130576 Trim tab

### Angle (deg)

*Page Intentionally Left Blank*



**Across Ocean Systems Ltd.**

351 Lynn Ave. Unit #4  
North Vancouver, British Columbia,  
Canada, V7J 2C4  
Sales Tel: +1-236-688-8948

Email: [contact\\_us@acrossoceansystems.com](mailto:contact_us@acrossoceansystems.com)

Website: [acrossoceansystems.com](http://acrossoceansystems.com)