Actisense®
www.actisense.com
sales@actisense.com
+44 (0)1202 746682

DATA SHEET
Issue 2.04

EMU-1

NMEA 2000® Engine Monitoring Unit

Share engine information on the NMEA 2000 bus.

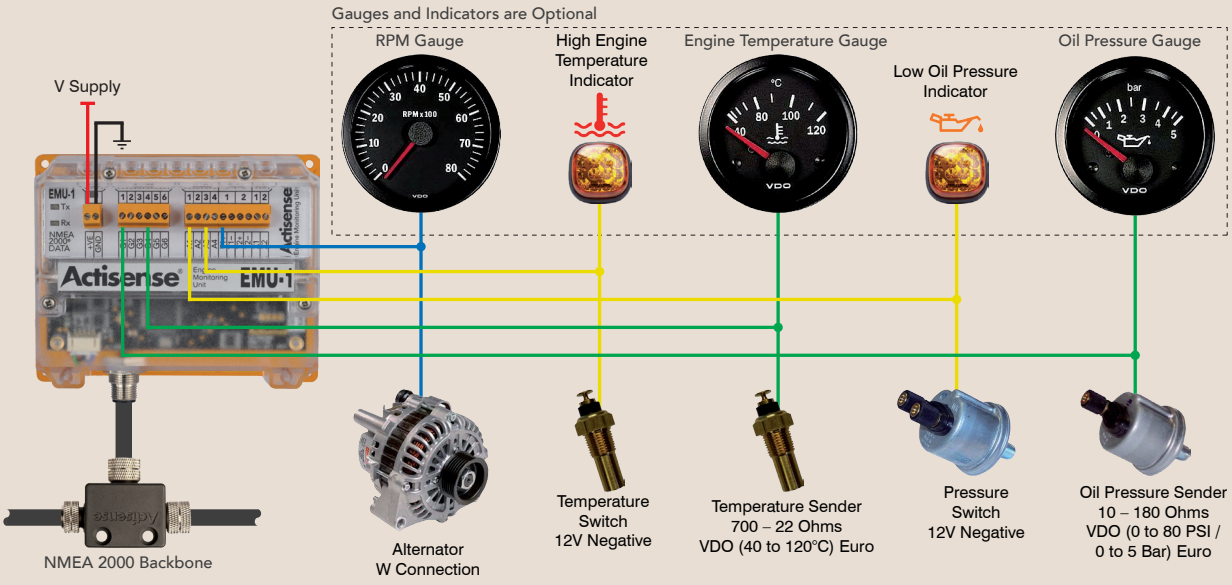
Introduction

The Actisense EMU-1 is a specialised analogue to NMEA 2000 Gateway which converts data from analogue engine senders into NMEA 2000. The EMU-1 enables NMEA 2000 display devices to monitor one or two engines on a vessel.

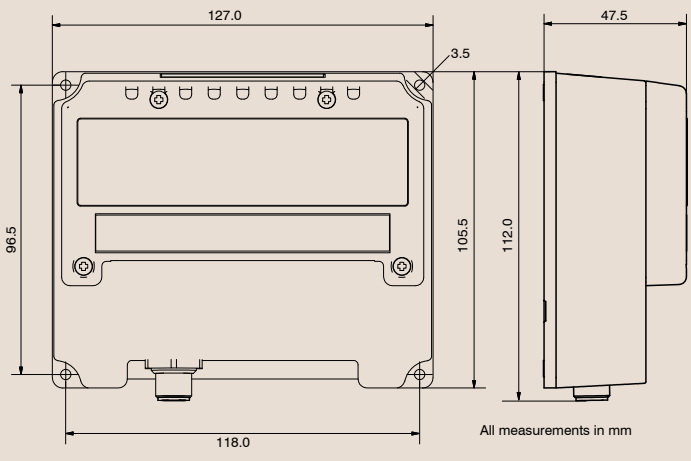
Features

- 6 gauge inputs
- 4 alarm inputs
- 2 tacho inputs
- Dual engine support (with a common ground)
- Logs total engine time using the tacho inputs
- Simple single wire gauge connections; common ground referenced design
- Manual measurements are not required to configure
- Firmware and configuration can be modified remotely over the NMEA 2000 network to suit different installations (requires an NGT-1 and PC software)
- Waterproof electronics and splash-proof connections
- Pluggable connectors for quick and easy installation
- Optional DIN rail mounting kit available

Connection Diagram Example



Case Dimensions



Please note the products described in this data sheet and the specifications thereof may be changed without prior notice.

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Technical Specifications

Power Supply	
Supply Voltage	9 to 35V DC
Supply Current	Typically < 25mA @ 12V DC
Supply Protection	Continuous reverse polarity protection and load dump protection (meets SAE J1113)
Supply Connector	Pluggable 2-way screw terminal, 3.5mm pitch
Supply Voltage (NMEA 2000 port)	9 to 29V DC
Supply Current (NMEA 2000 Port)	< 20mA @ 12V DC from NMEA 2000 bus
Load Equivalence Number (NMEA 2000 Port)	1 LEN
Supply Protection (NMEA 2000 Port)	Continuous reverse polarity protection and overvoltage protection to 40V
NMEA 2000 Port - In/Out	
Compatibility	NMEA 2000 compatible
Galvanic Isolation	2500V input to ground
Speed / Baud Rate	250kbps
NMEA 2000 connector	M12 male (A coded) connector
Gauge Inputs	
Voltage Range	0 to 35V DC
Input Impedance	> 50kΩ
Sender Feed	0, 4 or 18mA
Accuracy	<= 2%
Input Connector	Pluggable 6-way screw terminal, 3.5mm pitch
Input Protection	Overvoltage protection to ±40V
Alarm Inputs	
Voltage Range	0 to 37V DC
Input Impedance	> 50kΩ
Threshold Voltage	Configurable, default is 5V
Alarm Polarity	Configurable, default is alarm on low input
Accuracy	<= 2%
Input Connector	Pluggable 4-way screw terminal, 3.5mm pitch
Input Protection	Overvoltage protection to ±40V

Tacho Inputs	
Voltage Range	±3 to ±60V
Input Impedance	> 100kΩ to ground
Input Pulse Range	4 to 50,000Hz
Accuracy	<= 1%
Sender Compatibility	Ignition coil, alternator ("W", "R" or "AC") terminal, hall effect, VR or inductive sender
Threshold	Automatically adjusts to signal level
Input Connector	Pluggable 4-way screw terminal, 3.5mm pitch
Input Protection	Can withstand an ignition pulse to ±500V
Engine Log	
Engine Hours	2 separate engine hour logs internally connected to the tacho Inputs. Hours are logged when RPM is present, stored in non-volatile memory
Mechanical	
Housing Material	Polycarbonate
Protective Lid Material	Polycarbonate
Sealing Materials	Expanded silicone foam gasket, closed cell polyurethane splash guard and ePTFE waterproof vent
Dimensions	127mm (L) x 112mm (W) x 48mm (H)
Weight	250g
Mounting	4 x 3.5mm lugs to allow panel mount with self tapping s/s screws (included), optional DIN Rail mount available on request
Approvals and Certifications	
Fully NMEA 2000 Certified	
EMC	EN 60945 (sections 9 & 10)
Environmental Protection	IP66 (PCB housing)
Operating Temperature	-20°C to +55°C
Storage Temperature	-30°C to +70°C
Relative Humidity	0 to 93% RH
Guarantee	3 years

All specifications are taken with reference to an ambient temperature (TA) of +25°C.

Additional Information

The EMU-1 supports a number of different gauges and senders. Always confirm the required gauges and senders are supported by referring to the Actisense website **www.actisense.com/EMU-1** or the latest release of the Config Tool. New gauges and senders will be added periodically; changes will announced on **www.twitter.com/ActisenseTech**.

Part Number	Description
EMU-1-BAS	Engine Monitoring Unit with default configuration and without a cable harness
DIN-KIT-1	DIN Rail mounting kit for use with rail types: Top hat rail EN 50 022 or G section rail EN 50 035
STNG-A06045	SeaTalkNG to NMEA 2000 adaptor cable (drop).