

Actisense[®]

EMU-1

NMEA 2000[®] Engine Monitoring Unit

The Actisense EMU-1 is a specialized analogue to NMEA 2000 Gateway which converts data from analogue engine gauges/senders into NMEA 2000 data. The EMU-1 enables the sharing of engine data throughout the NMEA 2000 bus. It digitises analogue engine sensors, enabling NMEA 2000 display devices to monitor the connected engine(s) on a vessel.

The EMU-1 can monitor vital engine parameters such as temperature, pressure, RPM and fluid levels from up to two engines.



Feature

Advantage

Benefit

Converts analogue signals in to digital NMEA 2000 data	Allows analogue engines without an "ECU" to share data digitally	The EMU-1 upgrades an existing engine, allowing older engines to be used with to the latest digital MFDs
6 Gauge inputs	Connects to resistive/voltage gauges or resistive senders	Wide compatibility with existing installations
2 Tacho inputs	Connects directly to the RPM signals from 1 or 2 engines (with a common ground)	The EMU-1 can work with up to two engines simultaneously
4 Alarm inputs	Connects directly to alarm switches or Gauge signals and maps them to NMEA 2000 alarms	Most MFD's understand the NMEA 2000 engine alarm signals, altering users of engine issues, such as 'Over Temperature'
2 auxiliary inputs	Additional voltage monitoring	Future expansion opportunity to support new functionality
Custom Conversion Curves	If the Actisense Toolkit's Conversion Curve library doesn't match, a custom Conversion Curve can be designed	A user can quickly create a custom Conversion Curve without searching for gauge or sender datasheets
Switchable Sender current source	Allows control over the current used to power a resistive Sender without a gauge	When an analogue gauge is not present, the EMU-1 can automatically power the Sender directly
Fluid level Gauge and Sender compatibility	Allows use of Fluid Level Gauges (sharing the engine's common ground) to expand the EMU-1's functionality	The EMU-1 is a flexible analogue to digital solution, reducing installation cost, and offering wide Fluid / Tank Level support
Logs total engine hours	Accumulates engine running hours when the Tacho input indicates engine rotation	Accumulated engine running hours are stored and shared as NMEA 2000 data
Wide operating voltage	Allows operation on 12V or 24V systems	Compatible with all common power systems
Input protection	Protects against reverse polarity and transients	Protects against installation faults, provides peace of mind
Custom IP65 case	Electronic parts and connections are protected from water and dust ingress	Supports installation in more humid below deck, areas of the vessel
Diagnostic LEDs	Clear feedback on operational status and NMEA 2000 communications	Allows a user to quickly diagnose the EMU operation and NMEA 2000 communication
Pluggable 2-Part screw terminal connectors	Clear feedback on operational status and NMEA 2000 communications	Fast and Simple installation saves time and money
Panel or optional DIN rail mount	Can mount to bulkhead or DIN rail using optional mounting brackets	Flexible installation options to save time and money

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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 Equivalent Number (LEN)	1
Supply Protection (NMEA 2000 Port)	Continuous reverse polarity protection
NMEA 2000 Port - In/Out	
Compatibility	Fully NMEA 2000 certified
Galvanic Isolation	NMEA 2000 port
Speed / Baud Rate	250kbps
NMEA 2000 Connector	M12 male (A coded) connector
Gauge Inputs	
Voltage Range	0 to 35V DC
Input Impedance	> 50kΩ
Sender Current Feed	0, 4mA 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 30,000Hz
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	IP65 (PCB housing)
Operating Temperature	-20°C to +55°C
Storage Temperature	-30°C to +70°C
Recommended Humidity	0 - 93% RH
Guarantee	3 years

Part Number: A-EMU-1-BAS

All specifications are taken with reference to an ambient temperature of 25°C unless otherwise specified.
All specifications correct at time of print.