

SmartBoat® Modules

A Complete Gateway Solution for
Sensor Connectivity, Control and Communication



Components of the
SmartFlex™ System



Patent Pending



Connectivity and Full Control

SmartFlex™ View

- Every model in the SmartBoat System features an embedded browser-based interface which uses intuitive, menu-driven guidance for the set up and control of all connected devices. Drop down menus make set-up intuitive and fast.
- SmartFlex View is available wirelessly to any PC or tablet and via AIRMAR's CAST app on any mobile device.

The screenshot shows the 'SmartBoat® Module Status' page for an ASM-CES-T2 module. The left sidebar contains a navigation menu with options: Status, Configuration, WiFi / Ethernet, View Network, NMEA 0183, Support, Guided Setup, and Administration. The main content area is divided into two sections: 'Module Information' and 'Networking'. The 'Module Information' section displays fields for Serial Number (155110DC), Hardware Version (ASM-CES-T2), Firmware Version (1.0.0), Running Time (0 Days : 1 Hours : 43 Minutes), Total Running Time (163.4 Hours), USB Storage (Not available), and Installation Description. The 'Networking' section shows Access point (SSID: ASM-CES-T2-155110DC, Enabled), Wifi status (Disabled), and Ethernet (Not Connected). At the bottom, it indicates 'NMEA 2000'.

SmartFlex™ Alert, Best-in-Industry Alerting

- SmartBoat modules feature a highly configurable alerting system. Alerts can be defined for any PGN on the network and created as user-defined, customized alert based on sensor status. Examples are customized oil pressure alert parameters at various RPM ranges, or alerting if wind speed is over a certain amount AND an awning is deployed, plus retract the awning automatically.
- SmartFlex Alert configuration allows for four types of alert variables; PGN value (from a PGN message), calculated value (logic equation from multiple values), timer (desired variable did or did not happen within a certain time), and event counter (event happened X many times within the measured time). In addition to displaying an alert status, binary switch values may be set and NMEA 2000 bus alert messages may be generated for display on a wide range of MFDs.

The screenshot shows the 'SmartFlex® Alert Configuration' page. The left sidebar is identical to the previous interface. The main content area has a table with columns: Name, Type, Description, and Action. Three alerts are listed: 'HiSpeed' (PGN Value, Device: 410607 PGN: 128259 - Speed Water Referenced), 'HighWind' (PGN Value, Device: 48330 PGN: 130306 - Wind Speed), and 'hiTemp' (PGN Value, Device: 69852 PGN: 130316 (0,2) - Temperature Source). Below the table, there is a 'New condition' section with a dropdown menu set to 'Calculated' and a 'Configure' button.

SmartFlex™ Filter

- SmartFlex Filter can be used to control PGN message traffic between the primary and secondary NMEA 2000 buses. For each PGN, the user can easily program whether or not a PGN from one bus is bridged to the other. The SmartFlex Filter is configured using a "AllowList/BlockList" approach to allowing bridging or not.

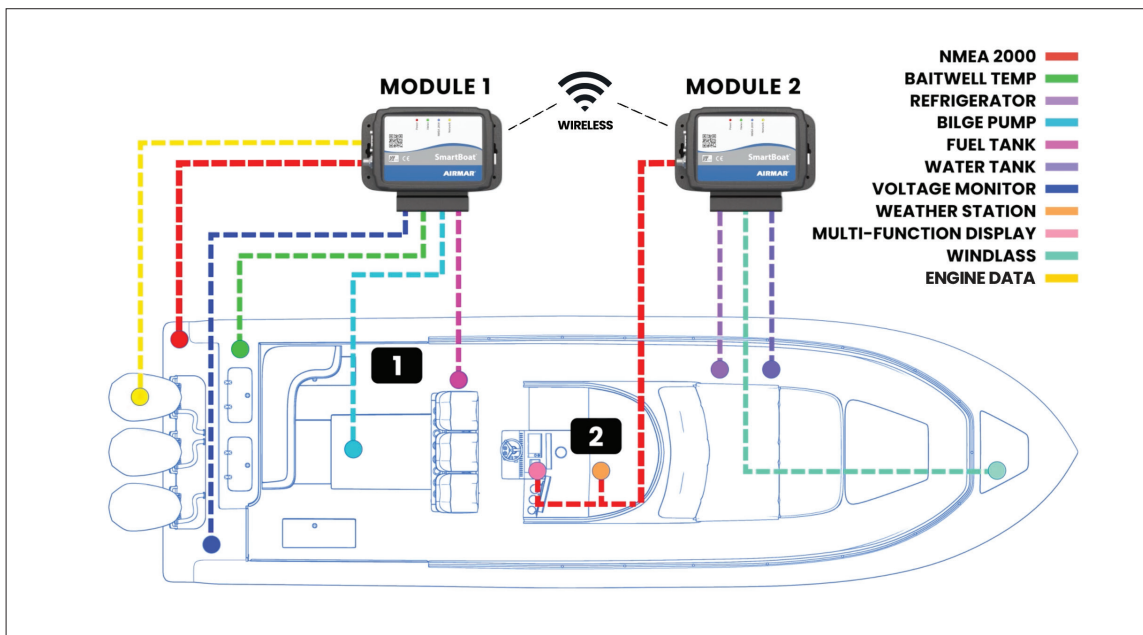
The screenshot shows the 'SmartFlex® NMEA Network Filter Setup' page. The left sidebar is identical. The main content area is divided into three sections: 'Global', 'Primary Network', and 'Local NMEA 2000 Devices'. The 'Global' section has a 'Global default setting' with a grid of checkboxes. The 'Primary Network' section has a 'Default for bridging from primary network' with a grid of checkboxes. The 'Local NMEA 2000 Devices' section lists various sensors and their PGNs, with a grid of checkboxes for each. The sensors listed are: WX Series WeatherStation Sensor (ID: 48330), PGN 127250 (Steering / Vessel Heading), PGN 127251 (Steering / Rate of Turn), PGN 127257 (Steering / Attitude), PGN 127258 (Steering / Magnetic Variation), PGN 129025 (Navigation / Position, Rapid Update), PGN 129026 (Navigation / COG & SOG, Rapid Update), PGN 129029 (Navigation / GNSS Position Data), and PGN 129033 (Navigation / Time & Date).

The SmartBoat® System Solution

The SmartBoat® system is uniquely designed to connect, control, and communicate sensor data across multiple networks regardless of sensor output protocols and peripheral types. SmartBoat delivers universal interfaces to the varied sensors and protocols onboard and provides the ability to control and manage what is required of each one, including setting alerts, AllowList/BlockList of PGNs, sensor state controlled actions and more. The system also significantly reduces the required interface devices, cabling and labor currently used for conventional networking systems, saving thousands on every install. Never has the marine market had such versatility, affordability, and rich support capabilities.

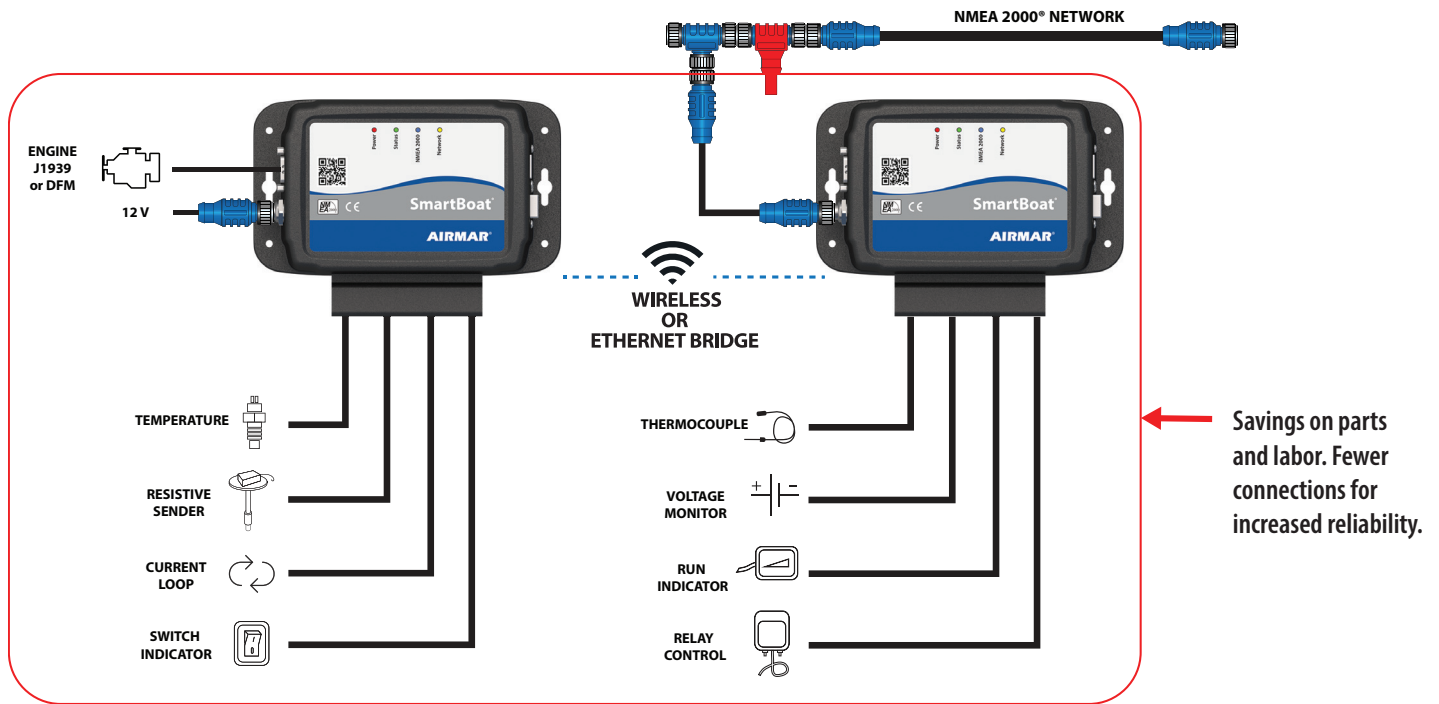
What Sets SmartBoat Apart?

- SmartBoat modules are certified for use with NMEA 2000 networks and designed specifically for marine applications (IP66 and IP67 rated). They are the marine components of AIRMAR's new SmartFlex™ System products which support multiple network standards across many markets.
- SmartBoat modules all share a common set of features including built-in wireless networking support and browser-based configuration and management.
- All advanced (T1 and T2) models provide embedded, highly configurable sensor interface for a wide range of analog devices and sensors including voltage, current loop sensors, resistive senders, thermistor and thermocouple temperature sensors, run detection, switch detection, relay control.
- Advanced models add support for multi-network bridging and management including multiple NMEA 2000 networks, NMEA 0183 support, and SAE J1939/J1708/J1587 engine interfaces. And digital senders such as diesel flow meters, battery monitors, and engine data are also easily connected.
- Browser-based interface, SmartFlex View, is wirelessly accessed from any laptop, tablet, or mobile device, which features intuitive, menu-driven navigation for set up, control and management of connected sensors and networks.
- Industry leading alerting and automation via SmartFlex Alert, and SmartFlex Filter provide the ability to directly configure interfaced sensors to report, alert and filter data through user programmed parameters.
- Diesel Flow Meter data via SmartBoat's exclusive single and dual chamber (differential) models. These CAN based DFM sensors are easily connected to the ASM and configured using SmartFlex View. Fuel flow data is then available via NMEA 2000.
- The SmartBoat System is ideal for boat builders and installers. System settings are easily saved and cloned for duplication on future installations.

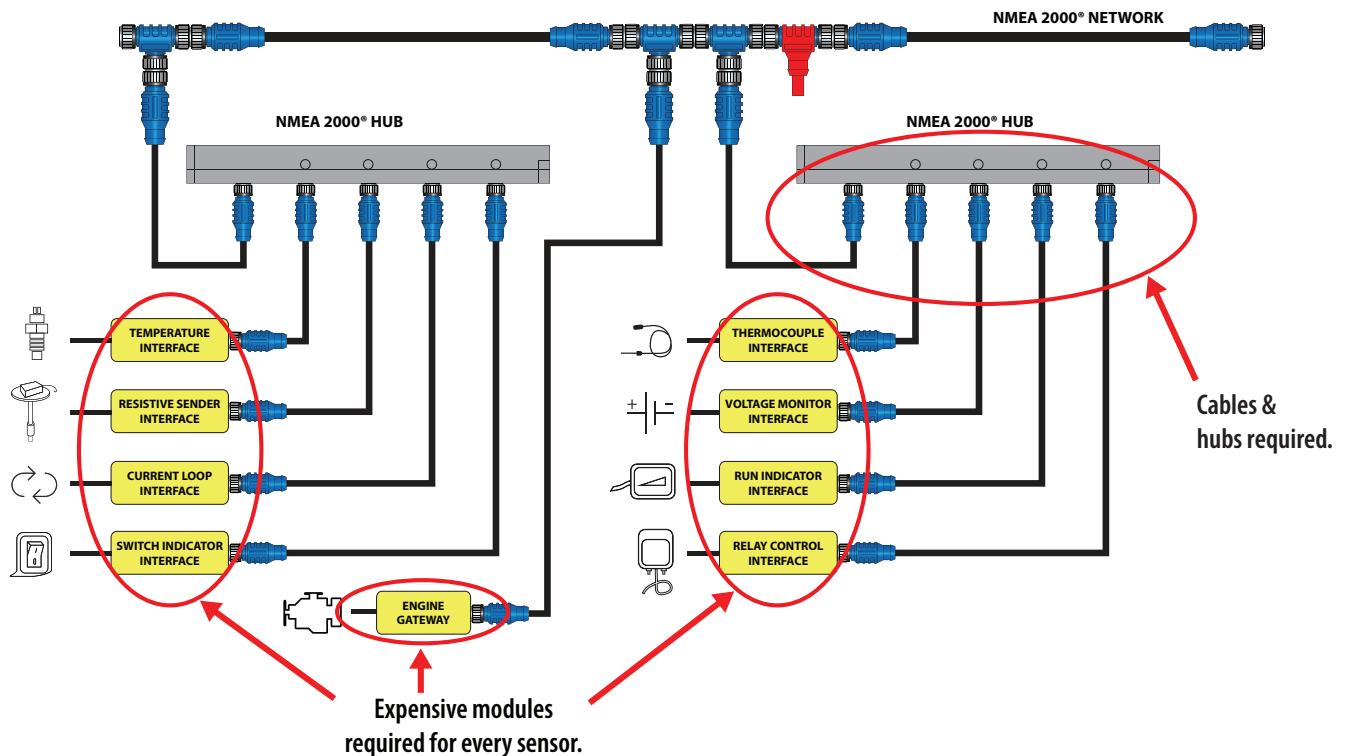


Significant Savings on Every Installation With SmartBoat!

With SmartBoat



Without SmartBoat



A Model for Every Installation!

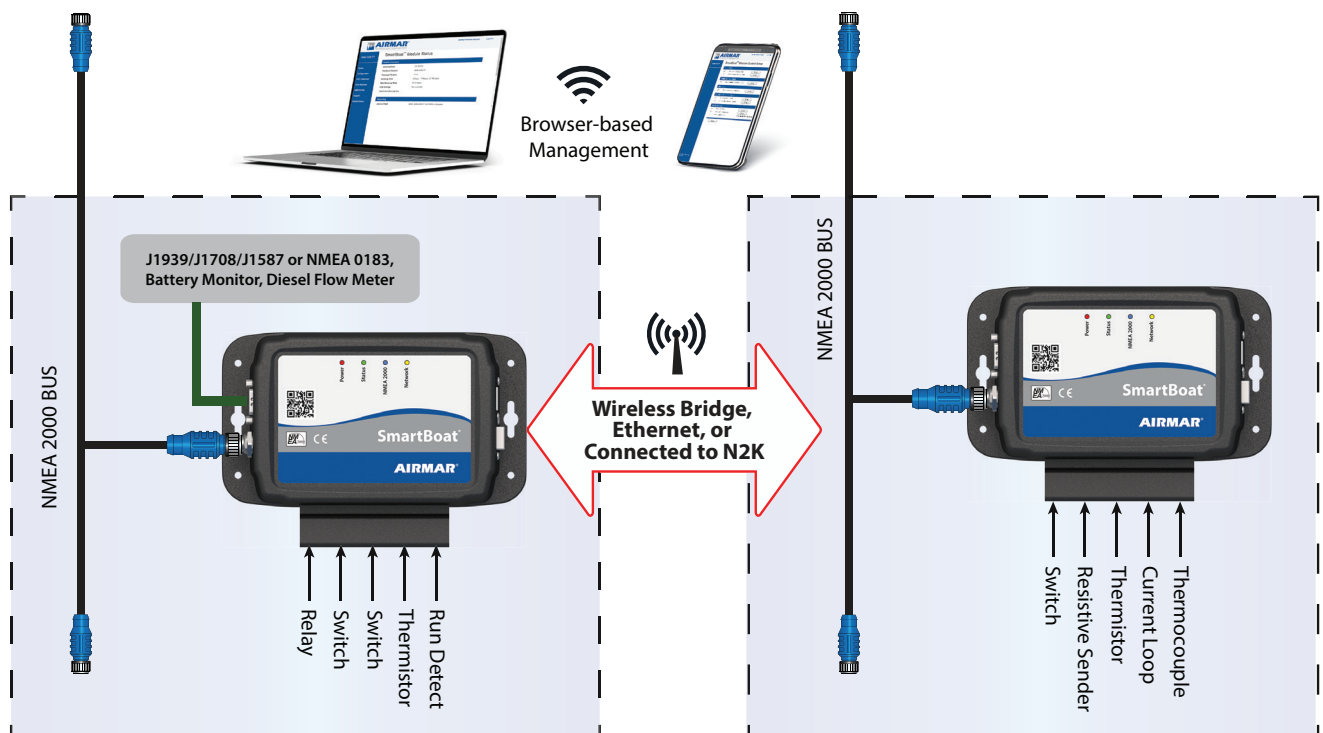
	ASM-C	ASM-C-T1	ASM-C-T2	ASM-CES	ASM-CES-T1	ASM-CES-T2
Programmable Sensor Inputs ⁽¹⁾		Up to 8 Sensor Inputs per ASM	Up to 4 Sensor Inputs per ASM		Up to 8 Sensor Inputs per ASM	Up to 4 Sensor Inputs per ASM
Thermistor (NTC)		✓	✓		✓	✓
Current Loop 4 wire interface		✓			✓	
2 and 3 wire interface		Up to 4 per ASM			Up to 4 per ASM	
Resistive Senders (US, European, or custom)		✓	✓		✓	✓
Binary Switch (0,1,2 EOL Resistors)		✓	✓		✓	✓
Voltage (0-75VDC)			✓			✓
Fixed Sensor Inputs ⁽²⁾		Up to 2 Sensor Inputs per ASM	Up to 4 Sensor Inputs per ASM		Up to 2 Sensor Inputs per ASM	Up to 4 Sensor Inputs per ASM
Thermocouples (J,T,K,E) ⁽³⁾		✓			✓	
Relays (10A Resistive, 5A Inductive)			✓			✓
Run Detector (9-240VDC/VAC rms)			✓			✓
External Connections						
Primary NMEA 2000	✓	✓	✓	✓	✓	✓
WiFi	✓	✓	✓	✓	✓	✓
USB 2.0				2	2	2
Ethernet (RJ-45)				1	1	1
Secondary Network DB9 Male includes: SmartFlex™ Battery Monitor, Diesel Flow Meter, J1939/J1708/J1587 or NMEA 2000 (secondary) NMEA 0183 (RS-422, RS-485, RS232)				1	1	1
Signal K compatibility	✓	✓	✓	✓	✓	✓
OneNet®				✓	✓	✓

⁽¹⁾ Maximum, inputs are shared in a unit.

⁽²⁾ Dedicated, all can be used at the same time.

⁽³⁾ Dry Exhaust

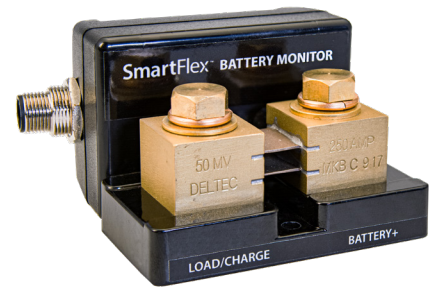
Expand Networks, Communicate Like Never Before



SmartFlex Digital Sensors

SmartFlex Battery Monitor

SmartFlex modules can now monitor and report detailed data for both lead-acid (FLA, AGM, Gel) and lithium batteries. The SmartFlex Battery Monitor (SBM) is fully integrated with the SmartFlex modules using browser-based configuration, network viewing, filtering, and alerts. The SBM interfaces easily with battery banks and provides data to the SmartFlex module for use on the NMEA 2000® network or to a cloud-based solution. The SBM is a fully integrated, complete battery monitor specifically designed to communicate with advanced SmartFlex modules. There are two SBM models available: 250A and 500A, where one SBM is used per bank or battery with a maximum of ten SBMs per SmartFlex advanced module.



Features and Specifications:

- The SBM reports the following to the SmartFlex module:
 - State of Charge (SoC)
 - Terminal Voltage
 - Time Remaining
 - Load/Charge Current
 - Charge Used
 - Battery Temperature
- Voltage range: 6V – 60V
- Automatic and manual synchronization
- Sensing technology: Driftless Coulomb counting (no zero calibration required)
- Field upgradeable firmware
- Exceptionally easy to configure using built-in or manually entered parameters

SmartFlex Diesel Flow Meter

Designed specifically to operate with SmartBoat Modules, each model outputs data that the SmartFlex Module uses for NMEA 2000® messages. Configuration is done with SmartFlex browser-based software. Available for both Single and Dual chamber (differential) functionality as well as a flanged housing model for instances where that is required.

Common Specifications:

- Maximum Pressure: 25 bar
- Kinematic Viscosity : 1.5 – 6.0 mm²/s (cSt) (.059" – .23" ²/s (cSt))
- Threaded connections: M14 x 1.5 unless noted
- Maximum size of inclusions: 0.08 mm (.003")
- Max Pressure drop at max flow: 0.2 bar
- Supply voltage range: 10 – 16 VDC
- Operating ambient temp.: -40 – 85 °C (-40 – 185 °F)
- Water ingress protection: IP54



Single-Chamber DFM



Dual-Chamber (differential) DFM

* For the complete line of SmartFlex digital and analog sensors please visit Gemeco.com or Airmar-EMEA.com

www.airmar.com

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