

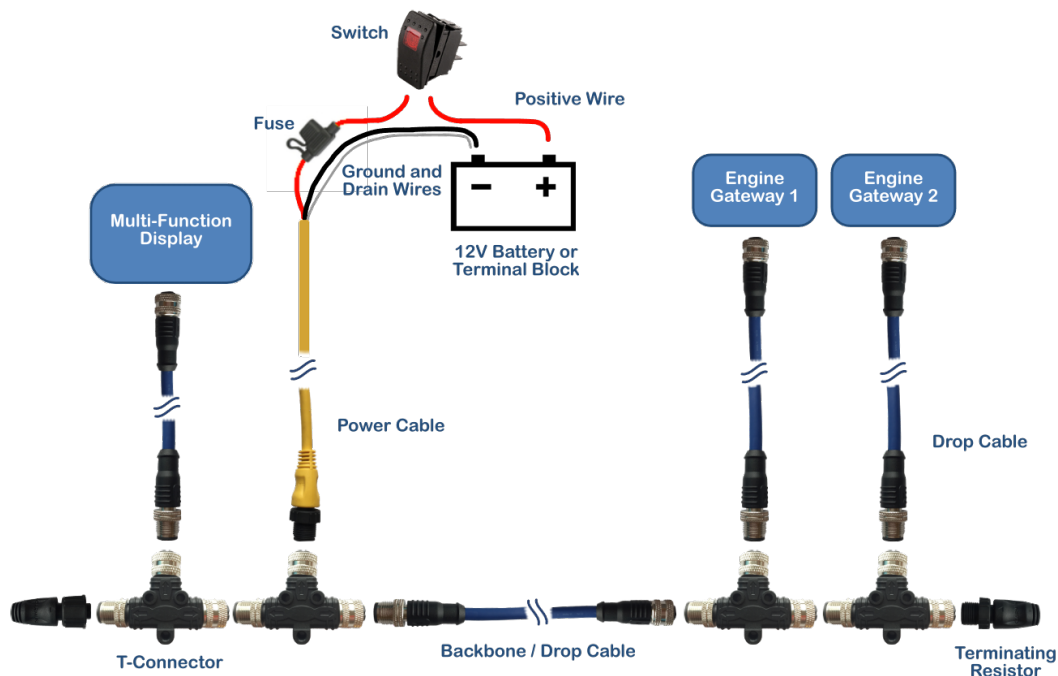


Thank you for your purchase of Fox Marine's ECM-07/08 Engine Gateway. The following details are provided for installation and operating instructions.

### **NMEA 2000 Installation**

Detailed NMEA 2000 (N2k) installation instructions should be provided by the manufacturer of your N2k starter kit.

Reference the diagram below for a graphical representation of a basic N2k setup.



The positive (red) lead from the power cable should contain a fuse and be connected to a switch of equal or greater amperage rating. On single engine setups, N2k power can be connected to the ignition-key-on circuit.

The negative (black) lead from the power cable should be connected with the drain (bare) wire at a suitable ground source.

Fox Marine PCM-09 Engine Gateways receive power from the N2k bus. Switch your N2k bus off when not in use.

### **Engine Gateway Installation**

Engine gateways that are purchased in pairs will be setup and labeled as Port and Starboard. If it is desired to verify or change DIP switch positions, unscrew the 4 bolts to remove the lid of the engine gateway. DIP switches are labeled 1, 2, 3, & 4 and have positions labeled OFF (down) and ON (up). Engine gateway power should be off when changing DIP switch positions.

DIP switch 1 toggles between engine identifiers. OFF (down) designates the Engine Gateway as Port (engine #1). ON (up) designates the Engine Gateway as Starboard (engine #2). We also support 3 and 4 engine applications when requested.

DIP switch 2 allows for an alternate ECM address. This normally remains OFF (down), but may be set to ON (up) if a connection is not established with the ECM using the default address setting.

DIP switch 3 allows or disables the ability to change gateway settings via bluetooth. Leave this switch OFF (down) to allow bluetooth connection with the Fox Marine App to change gateway settings (such as changing fuel flow broadcast on the N2k network, RPM averaging, fuel flow scale factor, clear engine codes). ON (up) disables the ability to change settings via bluetooth.

DIP switch 4 toggles normal/simulate mode. OFF (down) allows normal transmission of live engine data. ON (up) enables the transmission of simulated engine data on the N2k network. Simulated data is not transmitted via bluetooth.

Install the lid and proceed to mount the device as follows. The engine gateway is designed to be mounted in the engine compartment away from excessive sources of heat and water. The enclosure is IP66 rated (dust tight and water resistant to jet/spray). Ensure wires are routed away from sources of heat and rotating equipment. Use zip ties as required.



Plug the engine gateway into the boat's 6-pin OBD-M diagnostic connector. This connector may already be plugged in to a cap for protection.

Plug the engine gateway into the N2k network.

## **Operating Instructions**

It is recommended to either key on your ignition(s) or fully start the engine(s) prior to turning on the N2k bus power. This can be ignored if the N2k bus power is provided by the ignition circuit.

Once communication has been established, live engine data will be broadcasted on the N2k bus and via bluetooth. Engine RPM is broadcasted twice per second with the remaining data broadcasted once per second. The Fox Marine iOS/Android app is available on Apple's App Store and Google's Play Store.

Instantaneous engine RPM is averaged with previous values to obtain a smoother RPM display. This allows one to make fine throttle adjustments to match RPMs between two engines. The default setting averages 15 RPM values (i.e. 7.5 seconds of data). This setting can be changed from its default value using the iOS app from a range of 1 (no averaging) to 30.

The engine gateway broadcasts the average RPM value on the N2k network only when the absolute difference between the instantaneous RPM and the average RPM is less than a nominal value. When the instantaneous RPM is outside of this band (during rapid acceleration and deceleration), the instantaneous RPM value is broadcasted on the N2k network to prevent any delay in indicated RPM vs. actual.

Each N2k compatible GPS/Multifunction Display will have its own setup menus to obtain and view engine data. Typically, you must adjust display settings to configure the number of engines on your boat before data from the Starboard engine is available to be viewed. Display settings can be changed to adjust the default units used for displaying engine parameters if desired.

The data broadcasted on the N2k network is as follows and may vary or have different meanings depending on the model of ECM and unique manufacturer inputs and settings.

Engine # (as determined by DIP switch), Engine RPM, Fuel Flow Rate, Coolant Temperature, Alternator/Battery Voltage, Engine Run Hours, Throttle Position (Engine Load), and Oil Pressure.

Data broadcasted via bluetooth is more extensive and is similar to what would be available to be seen on a dealership diagnostic scanner. Alarm codes can be viewed and cleared using the Fox Marine iOS/Android app.

Fuel flow rate is calculated internally by your ECM. The Fox Marine iOS/Android app can be used to adjust the scaling of the broadcasted fuel flow rate to better reflect actual fuel usage if a deviation is apparent.

Switch off your N2k bus when not in use as the engine gateway(s) will be consuming power (up to 80 milliamps each) while constantly trying to obtain/transmit engine data and bluetooth data.

### **Simple Troubleshooting**

#### ***If RPM values are rounded to the nearest 25 rpm or some other standard value.***

Some GPS/Multi-Function Displays round the RPM value to preset divisors. Consult the manufacturer of your display for more details.

#### ***If single engine data is not displaying.***

Ensure the 6-pin diagnostic connector's terminals are not pushed through the housing on the engine wiring harness side of the connection. Refer to the installation section above regarding DIP Switch #2. Contact Fox Marine for additional troubleshooting details.

#### ***If twin engine data is missing or not displaying properly.***

Ensure the port engine gateway has DIP Switch #1 OFF (down) and the starboard engine gateway has DIP Switch #1 ON (up). Ensure your GPS/Multi-Function Display is properly configured to expect to receive engine data from two engines. Consult the manufacturer of your display for more details on display setup. Contact Fox Marine for additional troubleshooting details.

#### ***If the units for certain engine data is not preferred.***

Changing the units for engine data is a function of your GPS/Multi-Function Display. Refer to your GPS/Multi-Function Display settings or consult the manufacturer of your display for more details.

Please contact [customer.service@fox-marine.com](mailto:customer.service@fox-marine.com) with any questions/comments/concerns.