EM2000 series Engine Monitor

Installation & User Manual

NMEA 2000® Gateway for Yanmar Engines
Integrates with existing Yanmar B Panel

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Table of Contents

Product Overview

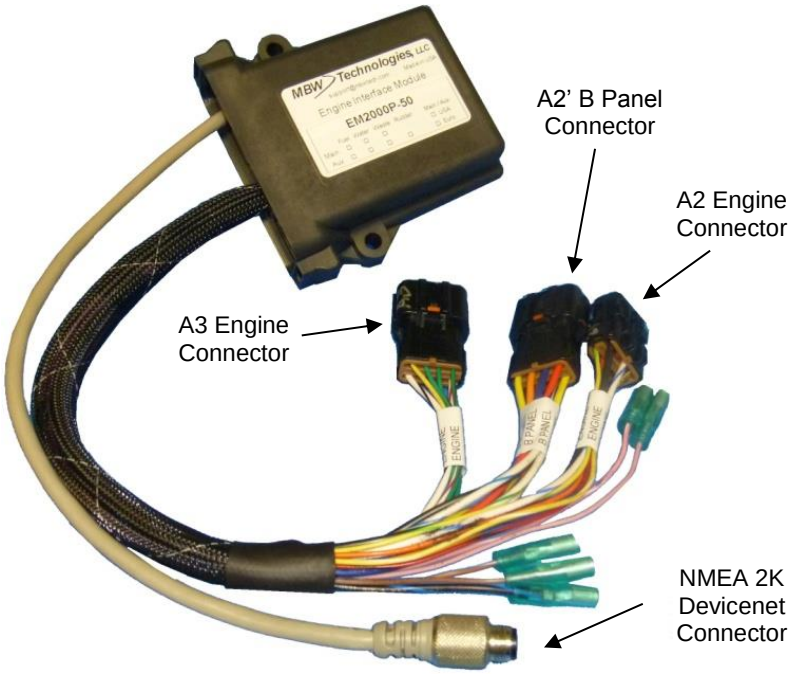
The EM2000 Product (EIM) is designed as a Plug 'N' Play NMEA 2000 engine monitoring gateway for Yanmar Mechanical Engines. The EM2000 converts the data and alarms from your analog engine to the NMEA 2000 protocol. The engine information can then be viewed on any NMEA 2000 compliant multifunction display. The EM2000 is fully compatible with the Yanmar B panel and can be installed at the helm or in the engine room. No additional wiring is needed because the EM2000 plugs directly into your Yanmar engine harness. There is no need to purchase a separate 'Y' harness as this connection requirement is built into the EM2000 wiring harness. To install simply disconnect your B panel from the Yanmar engine harness. Then connect the EM2000 to the engine harness and finally the B panel to the EM2000. Connect to your NMEA network and you are ready to go.

Components

EM2000G	EM, Eng Monitor, JH/YM, Single Eng System	1 per engine
EM2000P	EM, Eng Monitor, JH/YM, Port, Dual Eng System	1 per engine
EM2000S	EM, Eng Monitor, JH/YM, Stbd, Dual Eng System	1 per engine
EM2100G	EM, Eng Monitor, LP/LY2/CX, Single Eng System	1 per engine
EM2100P	EM, Eng Monitor, LP/LY2/CX, Port, Dual Eng System	1 per engine
EM2100S	EM, Eng Monitor, LP/LY2/CX, Stbd, Dual Eng System	1 per engine
MN10020	Manual, Install / User, EM2000X	1 per system
MN10019	Data Sheet, EM2000X	Optional
1000042-00	Sender; Temperature 0-120C, 10-180Ω	Optional
1000043-00	Sender; Oil Pressure, 0-10bar, 10-180Ω	Optional
1000043-50	Kit; Oil Pressure, Tee, Adaptor, Sender (0-10bar)	Optional
1000043-51	Hardware; Adaptor, 1/8 x 1/8 F3HGS	Optional
1000043-52	Hardware; Tee, 1/8 MRO-S	Optional
CM100xx	Harness; Devicenet, xx'	Optional
CM10051	Terminator; Devicenet, Male	1 per network
CM10052	Terminator; Devicenet, Female	1 per network
CM10060	T; Devicenet	1 per node

XX: Denotes part number option for length, position or model.

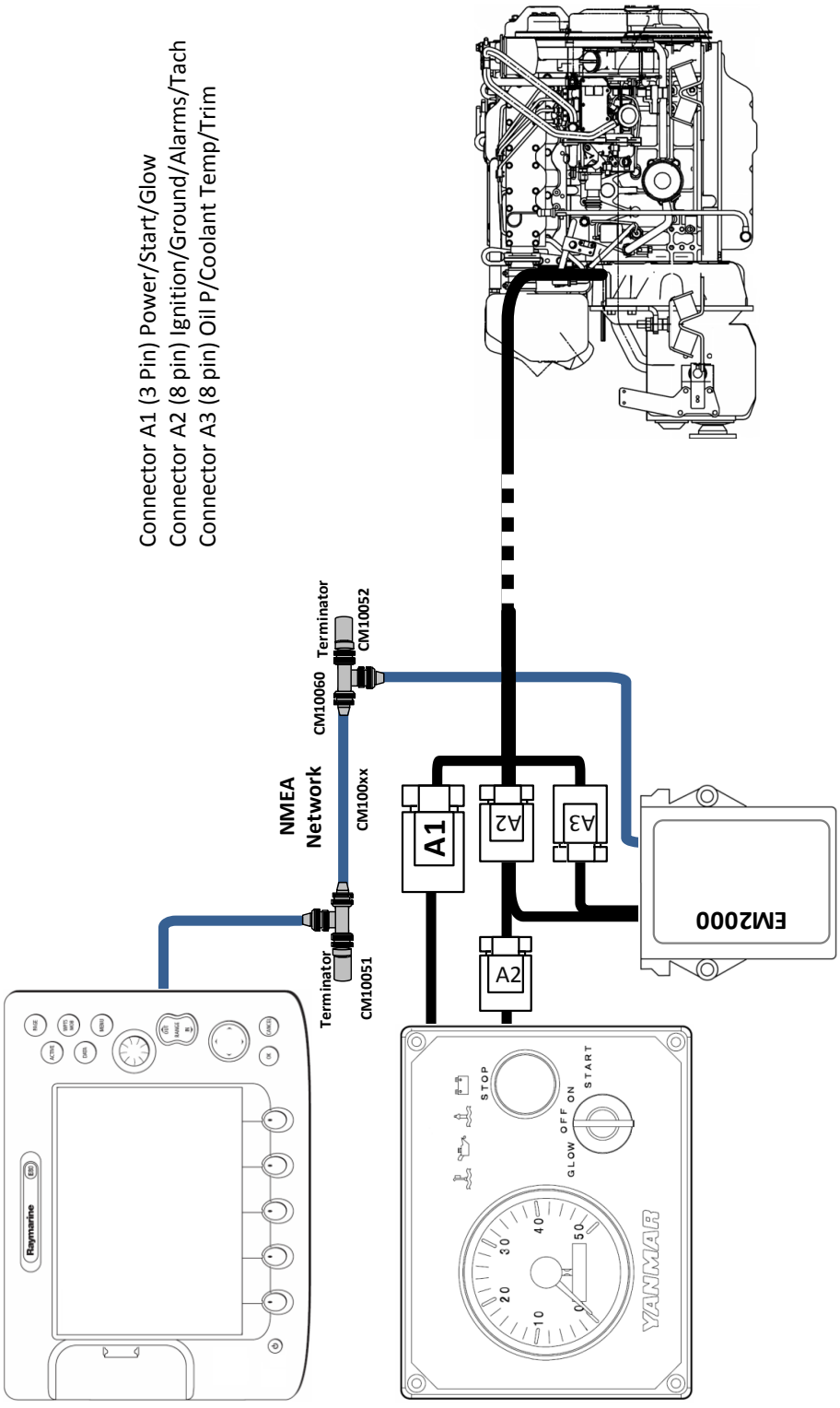
EM2000 Connectors



EM2000 B-Panel Connection

EM2000 Block Diagram – Single Engine

Connector A1 (3 Pin) Power/Start/Glow
Connector A2 (8 pin) Ignition/Ground/Alarms/Tach
Connector A3 (8 pin) Oil P/Coolant Temp/Trim



Installation

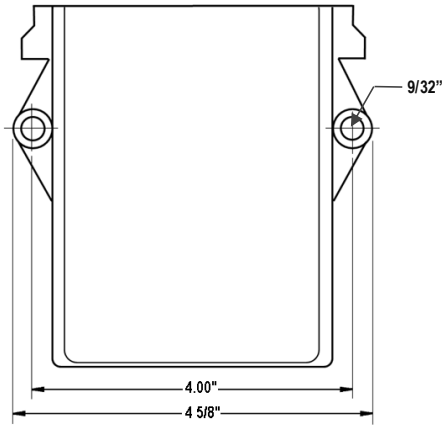
⚠ CAUTION

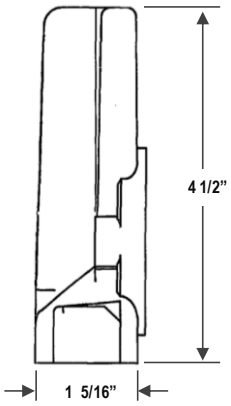
The safety messages that follow have CAUTION level hazards.

ALWAYS ensure the power supply is OFF and battery cables are disconnected before you make any electrical connections.

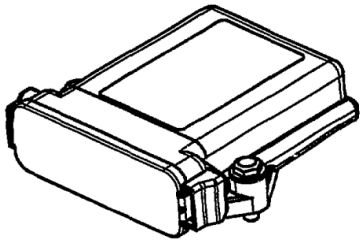
Step 1. EM2000 Mounting

Determine the best location for installing the EM2000 (helm or engine room). The EM2000 can be installed at either location. Final location is left to the installer based on vessel wiring and ease of access.

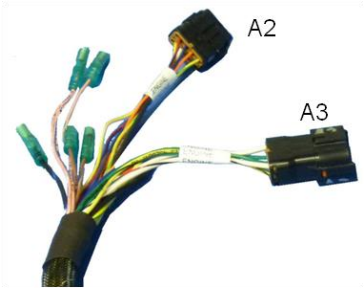




Not To Scale



Step 2. Engine Connections



The EM2000 has three Yanmar compatible connectors. Two of the connectors (A2 & A3) mate with the engine harness. The third (A2') mates with the ignition panel.

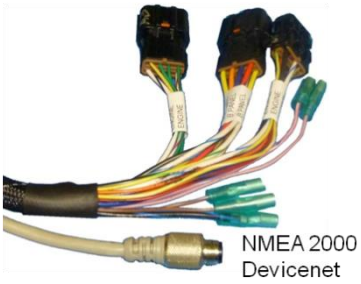
A2 is a plug type connector (female contacts) and provides connections for ignition, tachometer and various alarms such as; oil pressure and coolant temp.

A3 is socket type connector (male contacts) and provides connections for analog senders such as oil pressure, coolant temperature and trim. The B panel does not use these inputs and therefore the EM2000 does not provide a mating B panel connector for these inputs. The EM2000 does have the capability to measure these inputs and therefore provides a mating connector via A3. Depending on your model engine the engine harness will provide a mating A3 connector. Typically all 4JH and most 3YM engines will have this mating connector as part of the engine harness. 2YM and 3YM engines will not typically have this connector. If your engine does not have a mating A3 connector oil pressure and coolant temperature will not be measured unless a wiring harness is added to your engine.

Step 3. B Panel Connection

The EM2000 has one B Panel compatible connector (A2'). A2' is a plug type connector and duplicates the signal connections contained in connector A2. Plug this connector into the B panel connector.

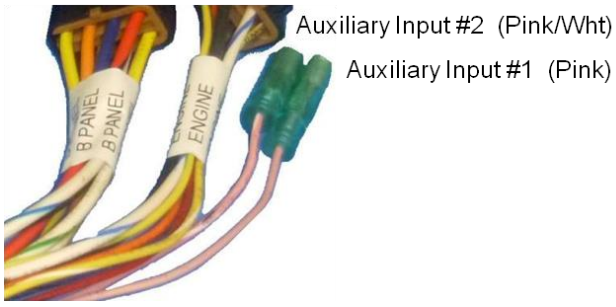
Step 4. NMEA Network Connection



For connection to the NMEA 2000 network the EM2000 provides a NMEA 2000 compliant devicenet connector. This is a round 5 pin connector and connection is made to the backbone by using a CANBus devicenet Tee. If a NMEA 2000 backbone is not currently installed you will need to do so.

See section NMEA 2000 Backbone Installation for more details.

Step 5. Auxiliary Sensor Connections (Optional)



The EM2000 has two auxiliary sensor inputs. Auxiliary input #1 is configured to measure fuel level using a 240-33 ohm sender. This input connection is the pink wire. Auxiliary input #2 is configured to measure fuel level using a 240-33 ohm sender. This input connection is the pink/white wire. Both of these inputs are terminated with 0.156 DIA disconnect style connectors. These inputs may be re-configured using an M701 display or via special order. See System Default section for more information. The EM2000 does not require these inputs to be connected for proper operation.

EM2000 Operation

The EIM is an analog to NMEA 2000 gateway and is designed specifically for Yanmar mechanical engines. The module converts all the analog engine data to the NMEA CANBus protocol. This allows any NMEA 2000 compliant display to be used for displaying engine data. In addition to engine data two auxiliary inputs are provided for fluid level measurement. The EIM is configured at the factory per the part number specification. See Factory defaults for more details. No additional configuration is needed.

Power

The EM2000 is powered via system ignition. When engine ignition is activated power will be applied to the module via connector A2. Once powered the module will provide NMEA 2000 network power via a 4A fuse. Upon power up the EIM will start broadcasting NMEA data. The engine does not need to be started for network data to be broadcast.

Alarms

The EM2000 monitors engine generated alarms such as; oil pressure, coolant temperature, water-in-fuel, charge, coolant level and sail drive (gear alarm).

All alarms will be suppressed if the engine is not running with the exception of the following alarms. They will continue to be monitored even if the engine is not running: Coolant Temperature, Water-in-Fuel and Coolant Level.

Note: Water-in-Fuel and coolant level alarms are contained in connector A3 of the engine harness. Some engine models will only have 2 connectors (A1 and A2) instead of 3 connectors (A1,A2 & A3). For 2 connector engines water-in-fuel and coolant level alarms are not available.

Engine Data

The following engine data is measured by the EM2000: Battery Voltage, Engine Speed, Engine Hours, Oil Pressure*, Coolant Temperature* and Boost Pressure**.

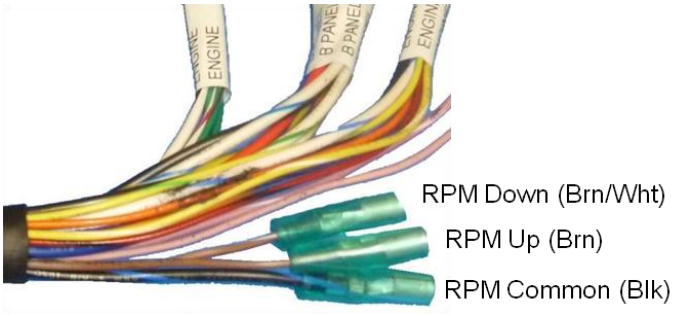
*Senders not installed in most 3 and 4 cylinder models. Optional sender kit required.
**LP/LY2 engine only.

Tachometer Input

The EM2000 as shipped from the factory uses the alternator for the tachometer input. This is standard wiring for 3 and 4 cylinder model Yanmar engines. See section Factory Defaults for more information.

Calibrating Tachometer

The system is configured for the Yanmar standard 10.29 pulses/rev. Should the pulses/revolution value need adjusting the EM2000 provides three inputs for adjusting the tachometer calibration. These inputs are provided in the EIM harness as 0.156 DIA disconnect type connections and are labeled “RPM Up”, “RPM Down” and “RPM Common”. To increase the RPM measurement momentarily touch the RPM Up wire to RPM Common. This will increase the RPM value by 10 RPM. To decrease the RPM measurement momentarily touch the RPM Down wire to RPM Common. This will decrease the RPM value by 10 RPM. As the RPM value is increased or decreased the system instantaneously calculates the corrected pulses/rev value and stores this number into non-volatile memory for continued use. See wiring diagram section for connection details.



Note: The first time tachometer calibration is used the system will create a base rpm idle value to calibrate against. This value is 820 RPM. The system will start adjusting the measured RPM value from that base RPM value. For example, if the displayed engine speed is 840 rpm and the desired rpm value is 800 rpm; the first time the rpm down connection is made the display rpm value will jump to 820 rpm as a base engine speed calibration value. All subsequent rpm adjustments will cause a +/ – 10 rpm change from the displayed value.

Oil Pressure

The EM2000 provides for oil pressure measurement. Should your engine have an oil pressure sender installed the EIM will convert this value to the NMEA 2000 output for display. If your engine does not have a sender installed no action is needed. The EIM will automatically sense that the sender is missing and provide a “N/A” data value to the NMEA network. If you wish to install an oil pressure sender the EIM is compatible with Yanmar sender P/N: 119773-91650. This sender has a pressure range of 0-10bar with a resistance of 10-180 ohms respectively.

To install an oil pressure sender, see section “Oil Pressure Sender Installation”.

Coolant Temperature

The EM2000 provides for coolant temperature measurement. Should your engine have a coolant temperature sender installed the EIM will convert this value to the NMEA 2000 output for display. If your engine does not have a sender installed no action is needed. The EIM will automatically sense that the sender is missing and provide a “N/A” data value to the NMEA network. If you wish to install a coolant temperature sender the EIM is compatible with Yanmar sender P/N: 119773-91700. This sender has a pressure range of 0-120 Deg C with a resistance of 180-10 ohms respectively.

To install a coolant temperature sender, see section “Coolant Temp Sender Installation”.

Boost Pressure (LH/LP/LY2/CX only)

The EM2000 provides for boost pressure measurement. It is common for LH/LP/LY2/CX engines to have a boost pressure sender installed from the factory and therefore the EIM will convert this value to the NMEA 2000 output for display. If your engine does not have a sender installed not action is needed. The EIM will automatically sense that the sender is missing and provide a “N/A” value to the NMEA network. If you wish to install a boost pressure sender the EIM is compatible with Yanmar sender P/N: 119773-91301. This sender has a pressure range of 0-2.94 bar (0-42.6 psi) with a resistance range of 83-12 ohms respectively.

Auxiliary Input #1

This input is configured for fluid level measurement. Specifically fuel level. The sender type (USA or European) and NMEA 2000 tank instance (0,1,2 or 3) is configured at the factory and is dependent on the part number ordered. See Factory Defaults section for details.

Auxiliary Input #2

This input is configured for fluid level measurement. Specifically fuel level. The sender type (USA or European) and NMEA 2000 tank instance (0,1,2 or 3) is configured at the factory and is dependent on the part number ordered. See Factory Defaults section for details.

NMEA 2000 Network Fuse

The EM2000 provides power to the NMEA network and therefore provides a 4A fuse for protection. The fuse is a standard 4a ATC type fuse.

Factory Defaults

As shipped from the factory the EM2000 is configured as follows;

EM2000G

Engine Position	Port engine application
Engine Model	YM/JH
Tachometer Input	Alternator (10.29 ppr)
Tachometer Calibration	Alternator (10.29 ppr)
Oil Pressure	Enabled
Coolant Temp	Enabled
Auxiliary input #1	Fuel Level (NMEA instance 0)
Auxiliary input #2	Fuel Level (NMEA instance 1)
Engine Senders	VDO Type
Auxiliary inputs	USA Type senders (240-33 ohms)
Oil Pressure Alarm	Enabled
Coolant Temp Alarm	Enabled
Charge Alarm	Enabled
Sail Drive Oil Alarm	Enabled
Water In Fuel Alarm	Enabled
Trim	Disabled

EM2000P

Engine Position	Port engine application
Engine Model	YM/JH
Tachometer Input	Alternator (10.29 ppr)
Tachometer Calibration	Alternator (10.29 ppr)
Oil Pressure	Enabled
Coolant Temp	Enabled
Auxiliary input #1	Fuel Level (NMEA instance 0)
Auxiliary input #2	Fuel Level (NMEA instance 2)
Engine Senders	VDO Type
Auxiliary inputs	USA Type senders (240-33 ohms)
Oil Pressure Alarm	Enabled
Coolant Temp Alarm	Enabled
Charge Alarm	Enabled
Sail Drive Oil Alarm	Enabled
Water In Fuel Alarm	Enabled
Trim	Disabled

EM2000S

Engine Position	Starboard engine application
Engine Model	YM/JH
Tachometer Input	Alternator (10.29 ppr)
Tachometer Calibration	Alternator (10.29 ppr)
Oil Pressure	Enabled
Coolant Temp	Enabled
Auxiliary input #1	Fuel Level (NMEA instance 1)
Auxiliary input #2	Fuel Level (NMEA instance 3)
Engine Senders	VDO Type
Auxiliary inputs	USA Type senders (240-33 ohms)
Oil Pressure Alarm	Enabled
Coolant Temp Alarm	Enabled
Charge Alarm	Enabled
Sail Drive Oil Alarm	Enabled
Water In Fuel Alarm	Enabled
Trim	Disabled

Oil Pressure Sender Installation

To install an oil pressure sender you will need to answer the following questions;

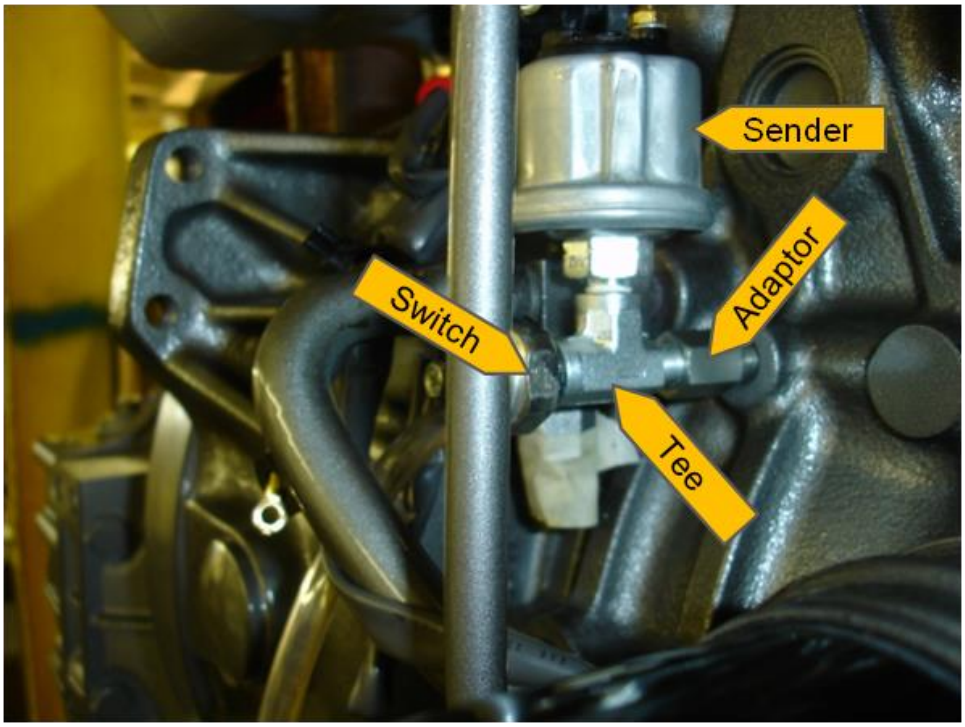
Question 1; Does your engine have a port to install the sender?
Question 2; Does your engine harness have 3 connectors?

Note: If your engine only has 2 connectors (A1 & A2) oil pressure cannot be measured.

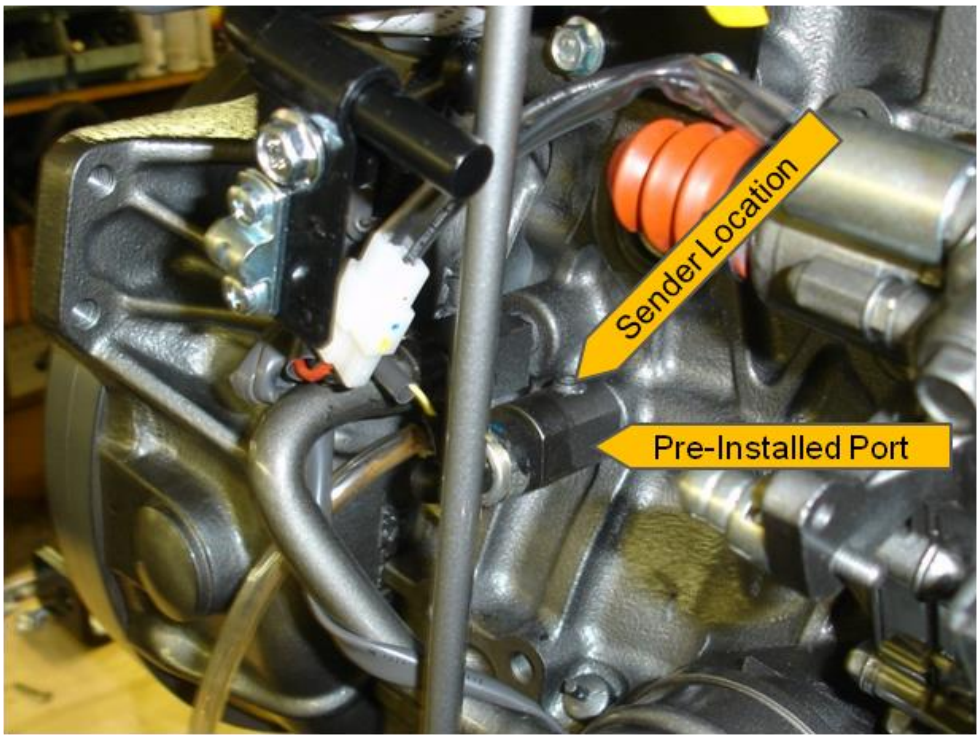
Oil Pressure Sender Mounting

Installing the oil pressure sender is dependent on the model engine you have. Older series engines do not have a port and require the addition of Tee and an adaptor to add the sender. Newer series engines have a port for installing the sender. An adaptor is still needed between the sender and the engine port to accommodate the pipe thread differences.

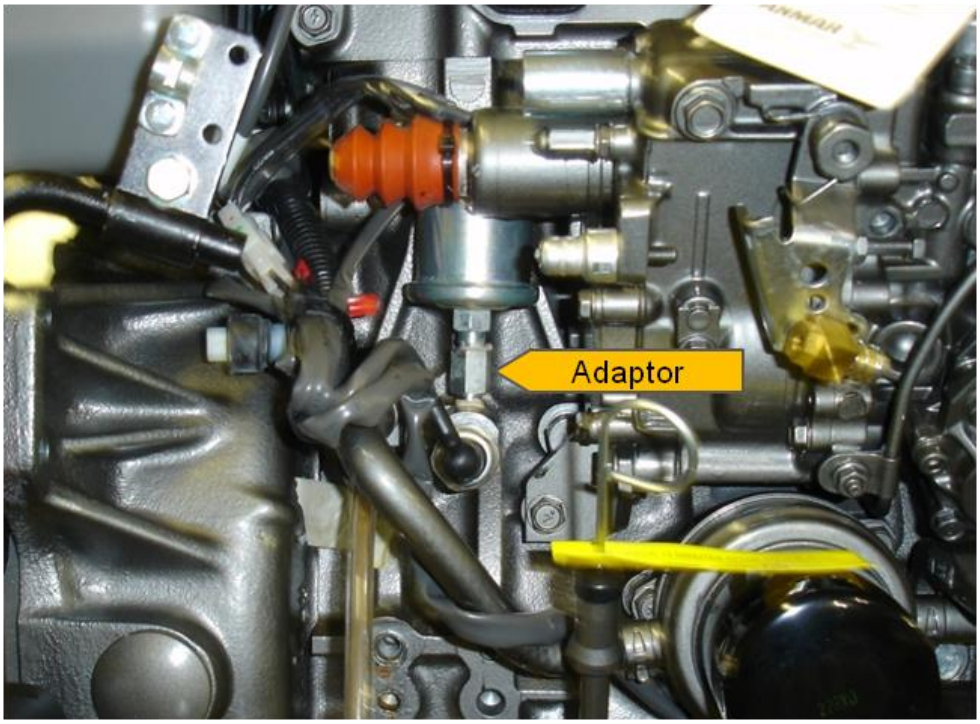
Older Series Engines



Newer series engines



An adaptor between the oil pressure sender and the engine port is needed to accommodate the sender. See Figure below.



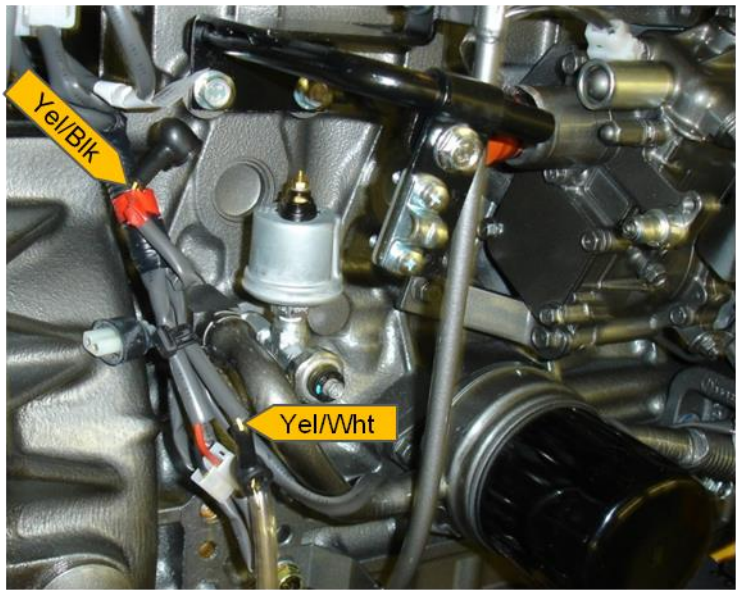
Oil Pressure Sender Connection

The engine oil pressure sender is connected to the EM2000 via connector A3. Most 3 and 4 cylinder engines have a 3 connector engine wiring harness;

- Connector A1 (3 position power connector)
- Connector A2 (8 position ignition/alarm connector) and
- Connector A3 (8 position analog sender connector)

See Section Wiring Diagram for more details.

To connect the oil pressure sender to the EM2000 attach the pre-installed Yellow/Black engine harness wire to the sender. The Yellow/White wire must be connected to the oil pressure alarm sender. This connection provides the oil pressure alarm indication for the ignition panel and EM2000. See figure to the right for wire locations.



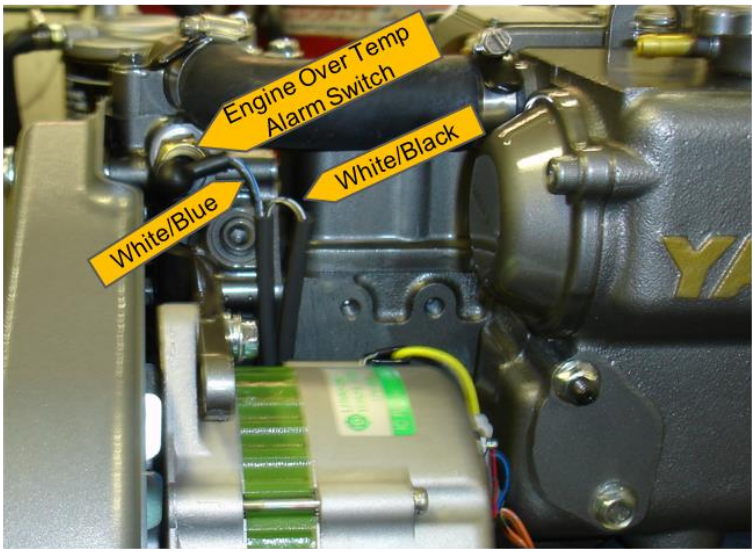
Coolant Temp Sender Installation

As with the oil pressure sender the EM2000 requires a 3 connector engine harness when measuring the coolant temp sender. The connection for temp sender is made via connector A3.

See Section Wiring Diagram for more details.

To connect the coolant temp sender to the EM2000 attach the pre-installed White/Black engine harness wire to the sender. The White/Blue wire must be connected to the coolant temp alarm sender. This connection provides the engine overheat alarm indication for the ignition panel and EM2000.

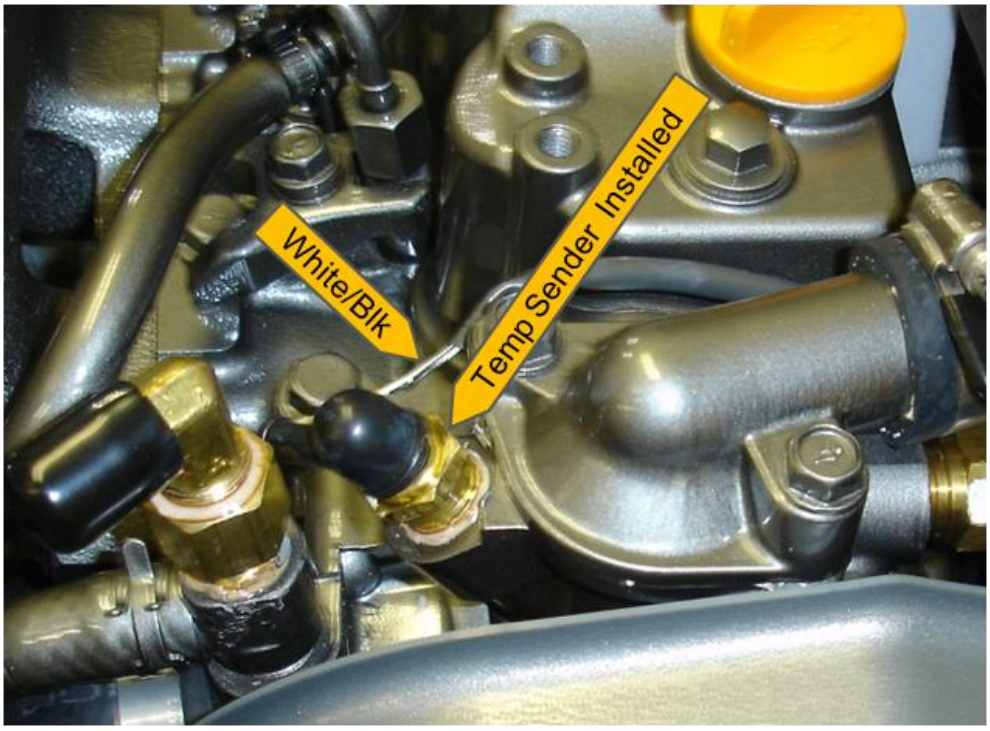
See figure to the right for wire locations.



Coolant Temp Sender Mounting

Most model engines have multiple locations for installing a coolant temperature sender. See Figure below for sender and wire locations.

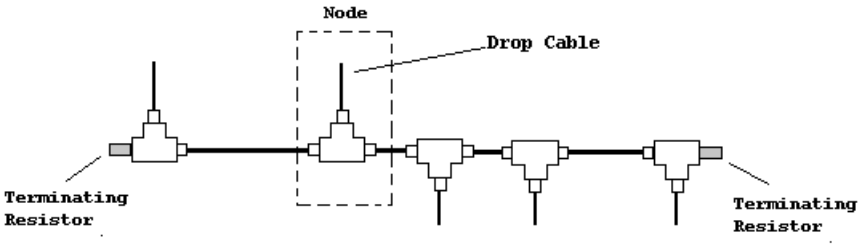
Coolant Temp Sender Connection



NMEA 2000 Backbone Installation

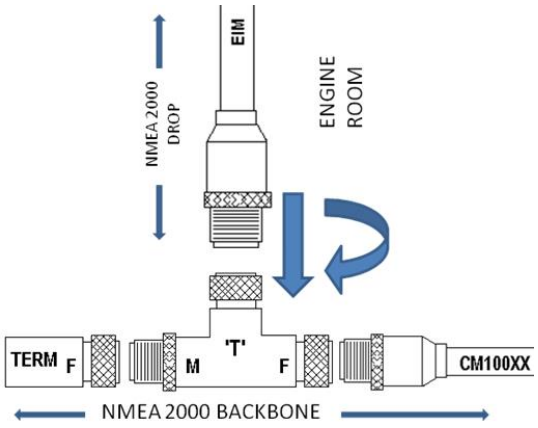
Network Basics

The network consists of a single cable run (known as a backbone or trunk line) to which devices are connected to it by means of a "T" Connector. At **EACH** end of the single cable run is a termination resistor. The termination resistors must be installed to ensure proper network operation and reliability.



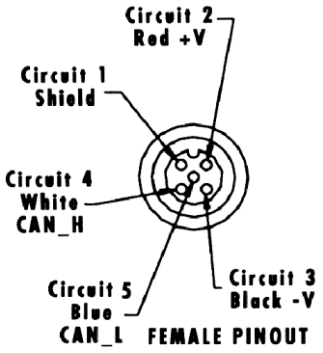
Note regarding connectivity of "T" Connectors

- When connecting a product to the backbone always use a "T" connector. This is generally referred to as a node connection.
- When connecting a product to a "T" connector (drop cable) always install via the middle connection on the "T".



The network cable is a Devicenet standard cable which consists of two twisted pair wires and a shield. One twisted pair is CANBus data and the other is CANBus power. The shield protects the signal and power wires from Radio Frequency Interference (RFI) and helps to reduce the RFI transmission from the cable.

The CANBus data wires are referred to as CAN Hi (white) and CAN Lo (Blue). The power wires are V+ (red) and common (black). The diagram below is an illustration of the Micro C connector pinout used on the EM2000 module.



Three Devicenet cable types are available Mini, Mid and Micro. The mini cable provides the largest current carrying capacity at 8 amps. The Mid and Micro cables have a current capacity of 4 amps but the Mid cable provides larger diameter wire power wires yielding less voltage drop over the Micro cable.

Network Specifications

- Up to 50 physical connections known as node connections.
- Network speed is 250K baud
- Maximum drop cable length is 6 meters (20').
- Maximum current draw per node is 1 amp.
- Backbone maximum length for Mini C cable is 200 meters (656').
- Backbone maximum length for Mid and Micro C cable is 100 meters (328').
- Each network needs 2 and **ONLY** 2 terminators (one male and one female).
- Network voltage 9-16volts.

Network Power

The CANBus requires a nominal 12v of DC power for network operation. Do not connect your network to 24v. The Micro C CANBus cable has a modest wire gauge (22AWG) and therefore is subject to voltage loss when large backbones are installed. As the backbone cable length increases so does the cable resistance. This causes a loss in voltage across the length of the cable. This loss increases as more nodes are connected to the network. Each NMEA2K device must specify a Load Equivalency Number (LEN). The combination of cable type and total network load (addition of all LEN values) will determine backbone length. See guide below for typical backbone lengths using Micro C cable and a nominal network voltage of 12 volts.

LEN	Network Length		LEN	Network Length
5	300' (91M)		13	120' (36M)
6	260' (79M)		15	100' (31M)
7	220' (67M)		18	80' (24M)
8	200' (61M)		23	60' (18M)
9	180' (55M)		32	40' (12M)
10	160' (49M)		50	20' (6M)
11	140' (43M)		80	<10' (<3M)

The LEN value for the EM2000 is 1.

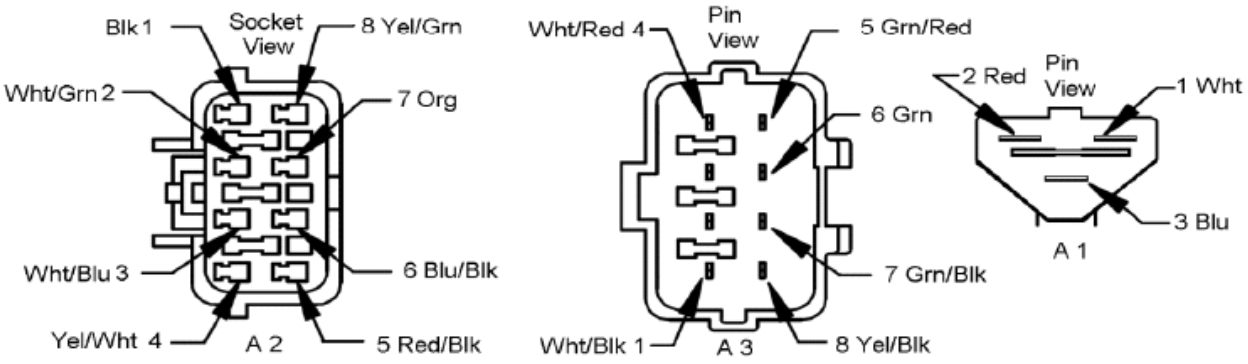
Typically a backbone installation with one EM2000 module and two Multifunction color displays can support a network length up to 76 meters (250') without requiring additional power.

When connected to the NMEA 2000 network the EM2000 product provides the necessary power for network operation. No additional power wiring is needed. The EM2000 provides a 4A fused connection for the network power.

Note: Should the your network length exceed the rated LEN value in the table above you many need to provide a second source of network power.

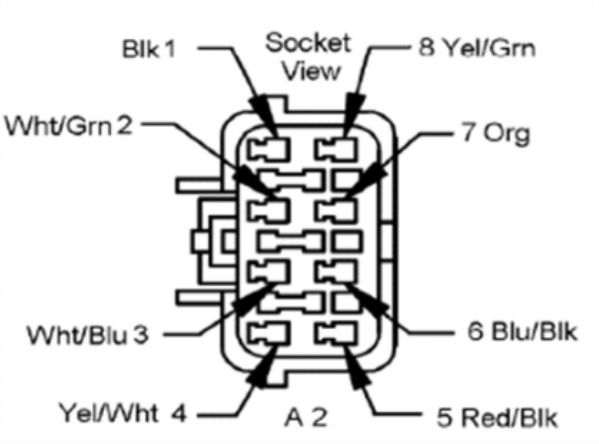
Wiring Diagram

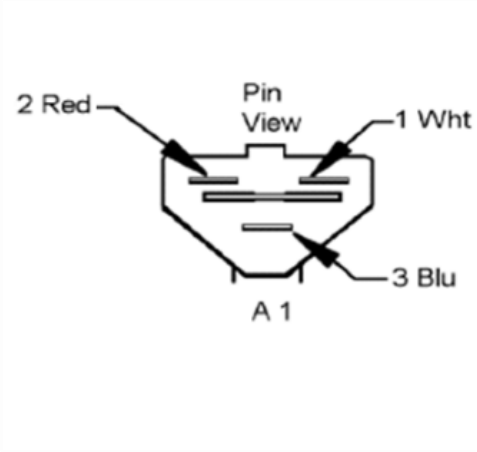
3 Connector Engine Harness



Connector A1		
Pin Number	Description	Wire Color
1	Start	White
2	Power	Red
3	Air Heaters (Glow)	Blue
Connector A2		
Pin Number	Description	Wire Color
1	Engine Ground	Black
2	Not Used	
3	Alarm, High Coolant Temp	White/Blue
4	Alarm, Low Oil Pressure	Yellow/White
5	Ignition	Red/Black
6	Charge	Blue/Black
7	Sender, Tachometer	Orange
8	Alarm, Gear Oil	Yellow/Green
Connector A3		
Pin Number	Description	Wire Color
1	Sender, Coolant Temp	White/Black
2	Not Used	
3	Not Used	
4	Alarm, Coolant Level	White/Red
5	Alarm, Water-in-Fuel	Green/Red
6	Sender, Trim	Green
7	Sender, Boost	Green/Black
8	Sender, Oil Pressure	Yellow/Black

2 Connector Engine Harness



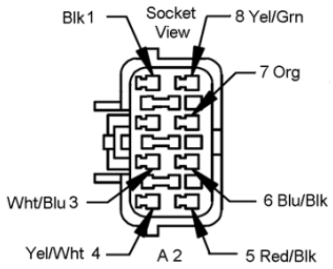


Connector A1		
Pin Number	Description	Wire Color
1	Start	White
2	Power	Red
3	Air Heaters (Glow)	Blue
Connector A2		
Pin Number	Description	Wire Color
1	Engine Ground	Black
2	Not Used	
3	Alarm, High Coolant Temp	White/Blue
4	Alarm, Low Oil Pressure	Yellow/White
5	Ignition	Red/Black
6	Charge	Blue/Black
7	Sender, Tachometer	Orange
8	Alarm, Gear Oil	Yellow/Green

EM2000 Connections

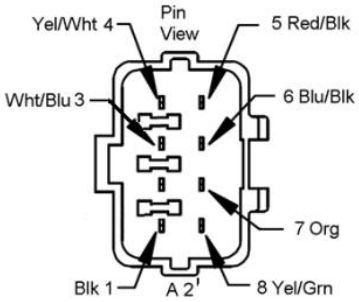
Connector A2 – connects to engine harness

Pin Number	Description	Wire Color
1	Engine Ground	Black
2	Not Used	
3	Alarm, High Coolant Temp	White/Blue
4	Alarm, Low Oil Pressure	Yellow/White
5	Ignition	Red/Black
6	Charge	Blue/Black
7	Sender, Tachometer	Orange
8	Alarm, Gear Oil	Yellow/Green



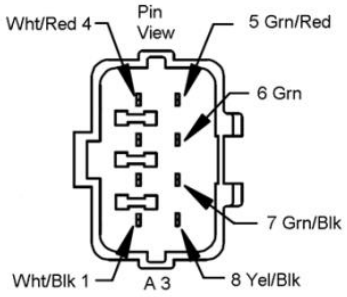
Connector A2' – connects to Yanmar Ignition Panel (B Panel)

Pin Number	Description	Wire Color
1	Engine Ground	Black
2	Not Used	
3	Alarm, High Coolant Temp	White/Blue
4	Alarm, Low Oil Pressure	Yellow/White
5	Ignition	Red/Black
6	Charge	Blue/Black
7	Sender, Tachometer	Orange
8	Alarm, Gear Oil	Yellow/Green



Connector A3 – connects to engine harness

Pin Number	Description	Wire Color
1	Sender, Coolant Temp	White/Black
2	Not Used	
3	Not Used	
4	Alarm, Coolant Level	White/Red
5	Alarm, Water-in-Fuel	Green/Red
6	Sender, Trim	Green
7	Sender, Boost	Green/Black
8	Sender, Oil Pressure	Yellow/Black



Auxiliary Inputs – Disconnect 0.156 DIA Female

Description	Wire Color
Auxiliary Input #1 – Fluid level (240-33 ohms)	Pink
Auxiliary Input #2 – Fluid level (240-33 ohms)	Pink/White
RPM Calibrate Common	Black
RPM Up	Brown
RPM Down	Brown/White

Technical Specifications

Environmental

Operating Voltage	6 to 16 VDC
Operating Temperature	-18C to +77C
Storage Temperature	-40C to +85C
Power Consumption - operating	<50mA @ 12VDC
NMEA LEN Value	1
Power Consumption – power down	<100uA
Vibration	ABYC P-24
Communication	NMEA 2000®
Humidity Test 100 Hours	+77C @ 90-95% Rel. Humidity
Transient Voltage Test	SAE J1113-12
Protection	IP67
Corrosion / Salt Spray	300 hrs per ASTM B117
EMI Emissions	ABYC P-24
EMI Immunity	ABYC P-24
Dimensions (base unit not including harness)	117mm x 115mm x 35mm (4.63” x 4.50” x 1.38”)

Data Transmitted

Input Measured	Alarms
Engine Speed	Oil Pressure Alarm
Oil Pressure*	Coolant Temperature Alarm
Coolant Temperature*	System Charge Alarm
Engine Hours	Transmission Oil Alarm
Battery Voltage	Coolant Level Alarm
Boost Pressure**	Water-in-Fuel Alarm
Engine Trim**	Low Voltage Alarm
Rudder Angle***	
Fuel Level	
Water Level***	
Waste Level***	

***Sender required on certain engine models.**
****LP/LY2/LH/CX Engine Models**
*****Requires Special Part Number (call for information)**

The EIM will automatically transmit data to the network if a sender is connected. When a sender is not connected the data message will not be transmitted. Per the NMEA standard, if the data message contains several types of engine data (i.e. PGN127489) the missing sender data will be transmitted as “Not Available”.

Transmitted NMEA 2000® Parameter Groups

PGN 127488	Engine Parameters, Rapid Update
PGN 127489	Engine Parameters, Dynamic
PGN 127493	Transmission Parameters, Dynamic
PGN 127245	Rudder
PGN127505	Fluid Level
PGN 127508	Battery Status
Proprietary PGN	Maintenance Timer All Configuration Messaging

Appendix A – Engine Models

The table below lists the various Yanmar engine model numbers and their factory default harness configuration.

Model	Engine Harness	Note
2YM15	2 connector	See note 1
3YM20	2 connector	See note 1
3YM30	2 connector	See note 1
JH3 Series		
4JH3-T	3 connector	See note 3
4JH3-TE	3 connector	See note 3
4JH3-HTE	3 connector	See note 3
JH4 Series		
3JH4E	3 connector	See note 2
4JH4E	3 connector	See note 2
4JH4-AE	3 connector	See note 2
4JH4-TE	3 connector	See note 2
4JH4-HTE	3 connector	See note 2
JH5 Series		
3JH5E	3 connector	See note 2
4JH5E	3 connector	See note 2
LH Series		
4LHA-HTP	3 connector	See note 2
4LHA-DTP	3 connector	See note 2
4LHA-STP	3 connector	See note 2
LP Series		
6LPA-DTP	3 connector	See note 4
6LPA-STP	3 connector	See note 4
6LP-STE	3 connector	See note 4

To install oil pressure or coolant temperature senders the following may apply;

Note 1: An engine with a 2 connector harness will need to install the third connector (A3 - analog sender connector) to attach the desired senders. These engines will also need adaptor plumbing to add the desired senders.

Note 2: The engine has the third connector (connector A3) installed. These engines also have plumbing installed to attach the senders. Senders optional.

Note 3: The engine has the third connector (A3) installed. These engines require additional plumbing fixtures to install the senders.

Note 4: The engine has the third connector (A3) installed. Sender installed by factory.

*Should your engine have been installed with a Yanmar ‘C’ Panel it is likely that one or both the oil pressure and coolant temperature senders were previously installed. The EM2000 is not compatible with a Yanmar ‘C’ Panel.

Appendix B - Installation Notes:

Existing Installation:	
Engine Model:	
Ignition Panel:	
System Voltage:	
Number of Engines:	
Number of Stations:	
USA or European Install:	
Display / Gauge Type:	
Auxiliary #1 Fluid Tank:	
Auxiliary #2 Fluid Tank:	
Oil Pressure Sender Installed:	
Coolant Temp Sender Installed:	
Water-in-Fuel Alarm:	
Existing Network:	
Sail Drive Connected:	
Engine Hours:	

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Harleysville, PA 19438
Sales: (267) 932-8573 x340
Support: (267) 93208573 x341

Email: sales@mbwtech.com
Email: support@mbwtech.com
OR
Contact your local Yanmar Dealer

P/N MN10020-50