



NMEA 2000



A Guide for Honda Marine Engines

For Internal Honda use only

HME Product Planning & Marketing



- What is NMEA
- What is NMEA 2000
- What specification is NMEA 2000
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- How do you connect NMEA 2000 products & devices.
- Basic NMEA 2000 connectivity.
- What kind of engine output data is available.
- What MFDs can display Honda engine data.
- Garmin NMEA 2000 connectivity
- Lowrance NMEA connectivity



I have heard a lot about NMEA recently, but what is it?

What is the meaning of NMEA 2000 ?

How do I connect to this system ?

With NMEA 2000 compatibility, what can it do ?



What kind of information can be displayed ?



What is NMEA?

National Marine Electronics Association

Over 500 Manufacturers and Dealers joined to form & create NMEA.

Presently, NMEA unify the communication method of marine electronic equipment mainly and are working to ensure the standardization of compatibility of each electronic device.

NMEA standard has now been accepted within the marine industry as the standard for electronic equipment.

NMEA Standard

NMEA 2000 (IEC61162-3)

NMEA0183-HS (IEC61162-2)

NMEA0183 (IEC61162-1)

What is NMEA 2000?

NMEA2000 is the on board electronic communication standard of boats & vessels and is based on a CAN (Controller Area Network).

The communication standard of boats equipment (Navigation, Sensor, Display etc) has been unified, so devices are capable of being connected together on the CAN network.

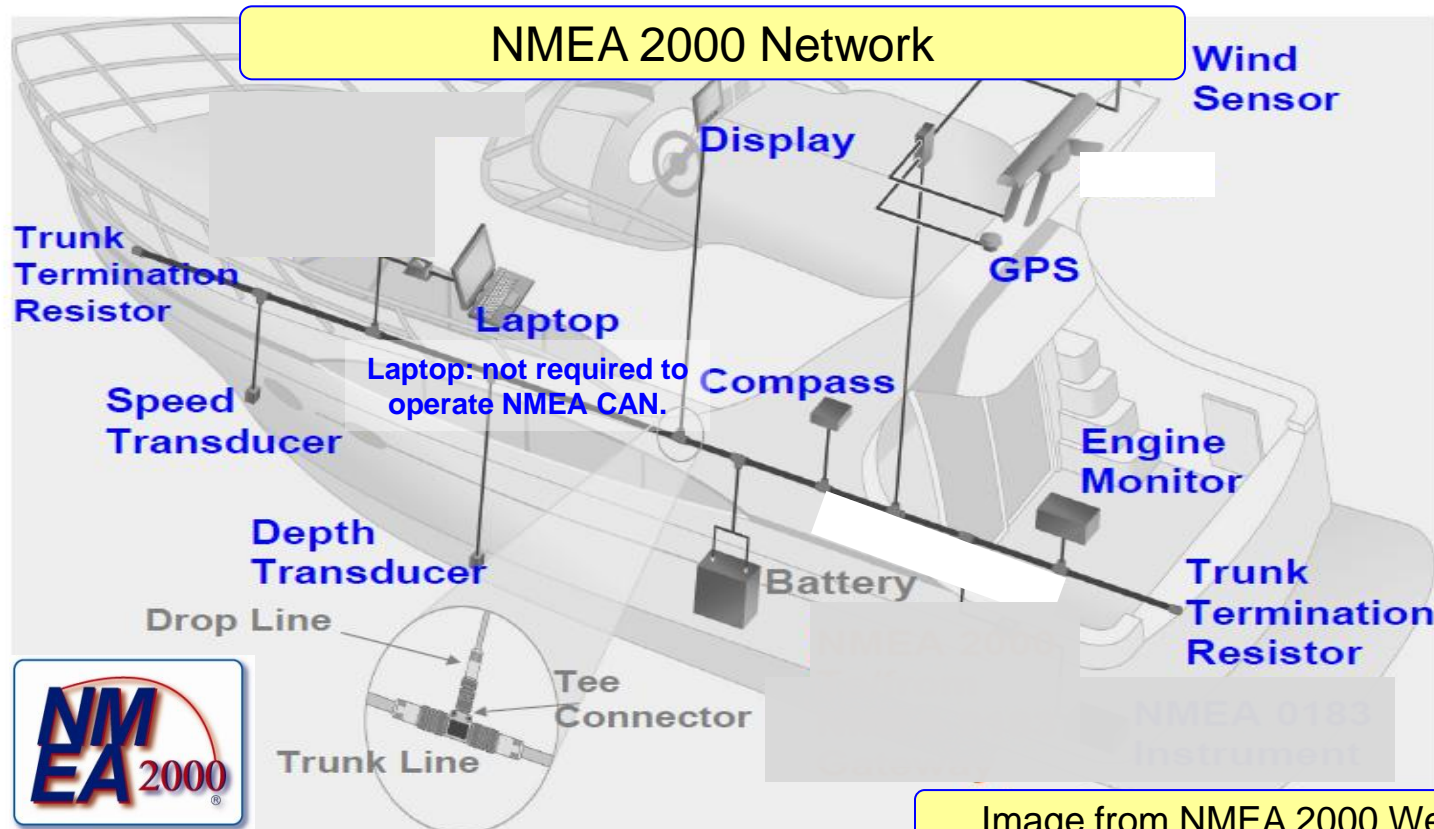


Image from NMEA 2000 Website

What specification is NMEA 2000?

NMEA 2000 is a specification of Marine communication which is based on an SAE-J1939 output standard. It uses a CAN network similar to what has been used in the automobile industry for many years.

<NMEA 2000 specification>

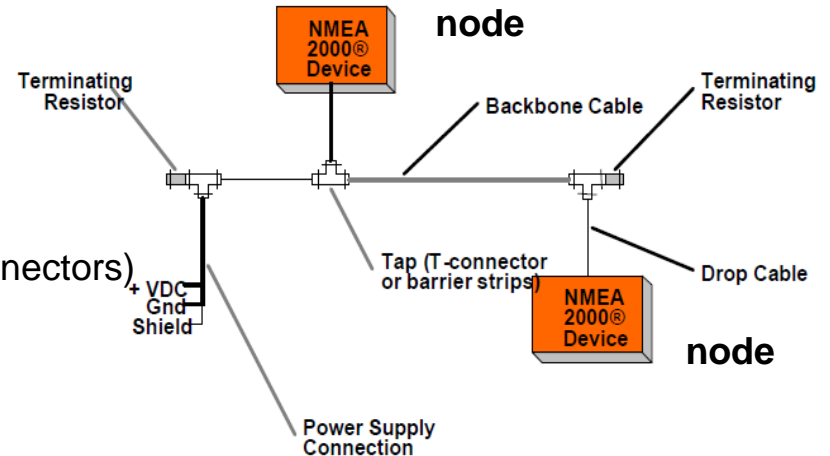
ISO11898 CAN2.0 extended format.

Transmission rate: 250kbps

Max backbone cable length: 100m (with micro c type connectors)

Max drop cable length: 6m

Max number of node connections: 50



node: a device which is connected to the network. The Honda BF engine is considered to be a node.

Backbone cable: Main trunk line of the network.

Drop cable: Diverging line from the main trunk line of the network (from a node).
Sometimes referred to as the interface or communication cable.

MFD: Multi Function Display.

N2K: NMEA 2000 abbreviation

Effect of compatibility with NMEA 2000

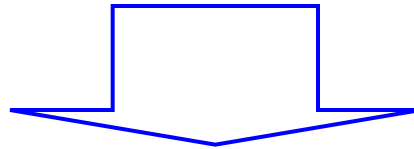
The NMEA 2000 network is composed of the following;

Each device (node) like an MFD, Sensors, Engine, a backbone cable, terminators & power supply cable.

Connection is made easier because of the compatibility which now exists between each node and cable. With the connection of the onboard NMEA2000 MFD, engine information can be displayed easily with simple connections.



Garmin MFD monitor : example of engine display



Lowrance MFD monitor : example of chart plotter

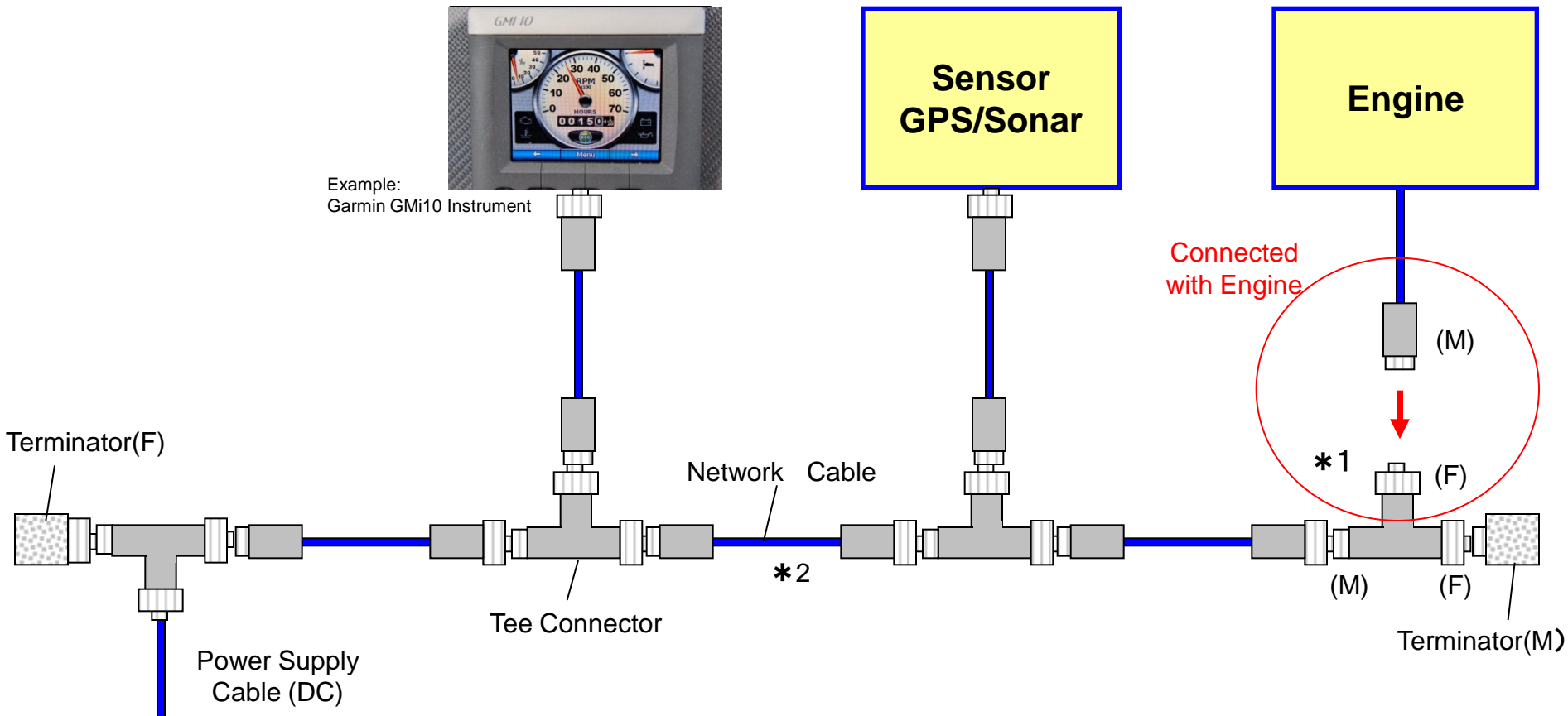
With compatibility of NMEA 2000 equipment, the unified communication protocol and the adoption of Micro-C connectors, this allows customers to expand and customise their own on board network to match exactly their individual requirements.

Each MFD can only display NMEA 2000 engine information they are programmed to receive or interpret.

Functions/information display between manufacturers can vary and are subject to change & update. Ensure that you investigate display function capability on any unit you consider purchasing or using for demonstration purposes.

How do you connect NMEA 2000 products & devices ?

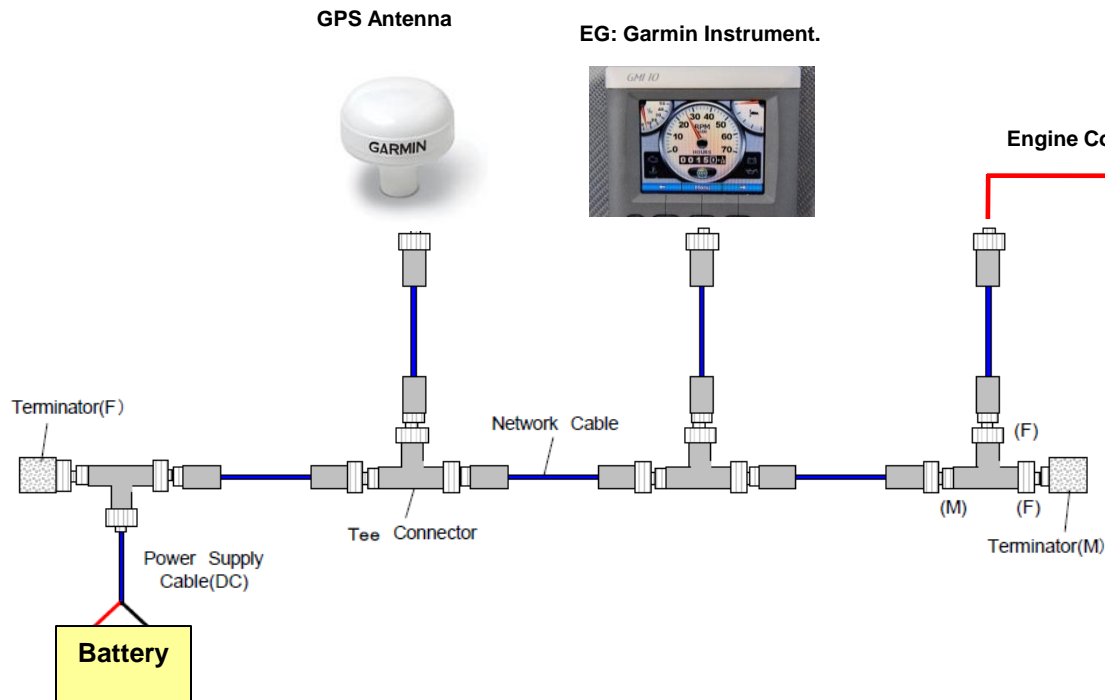
Connect the Honda NMEA 2000 communication cable from the engine to the network. Connect the electronic equipment to network so that the engine data can be provided and viewed on the instrument or MFD.



*1 Every Instrument or MFD needs each companies NMEA 2000 tee connector, or a commercially available Micro-C Tee connector from the market place.

*2 Confirm that the NMEA 2000 network is constructed correctly. If the network is not assembled correctly, engine data will not be displayed.

Basic NMEA 2000 Connectivity



What kind of engine output data is available ?

Honda NMEA 2000 compliant motors produce engine data compatible with NMEA 2000 devices.

These parameters can be displayed, but will be dependant on instrument or MFD individual specifications.

NMEA 2000 PGN Information for Honda Marine Engines

PGN:059392	ISO Acknowledgement	Product information
PGN:059904	ISO Request	
PGN:060928	ISO Address Claim	Engine speed
PGN:126996	Product Information	
PGN:127488	Engine Parameter, Rapid Update • Engine Speed • Engine Boost Pressure • Engine Tilt/Trim	Engine Boost Pressure
		Trim position
		Engine temperature
PGN:127489	Engine Parameter, Dynamic • Engine temp • Alternator potential • Fuel rate • Total engine hours • Engine Discrete Status 1 Check Engine/Over Temperature/Low oil Pressure Charge Indicator/Rev Limit Exceeded Engine Emergency Stop Mode • Engine Discrete Status 2 Warning Level1:Over Temperature/Low oil Pressure Warning Level2:Check Engine/Charge Indicator Power Reduction:Over Temperature/Low oil Pressure	Alternator voltage
		Fuel consumption rate
		Total engine hours
		Each alert operation
		Neutral position
PGN:127493	Transmission Parameter, Dynamic • Transmission Gear⇒Neutral Only	Neutral position

■ Engine parameters that are possible to display differ between electronic companies over which Honda has no control. Always check MFD specification prior to connection

What MFDs can display Honda engine data ?

All major electronic equipment maker's NMEA 2000 compatible MFDs and instruments can display engine data/parameters.

Garmin



GPSMAP 4010



GMI-10



400/500 series

Raymarine



Lowrance



LMF-400/LMF 200



Simrad



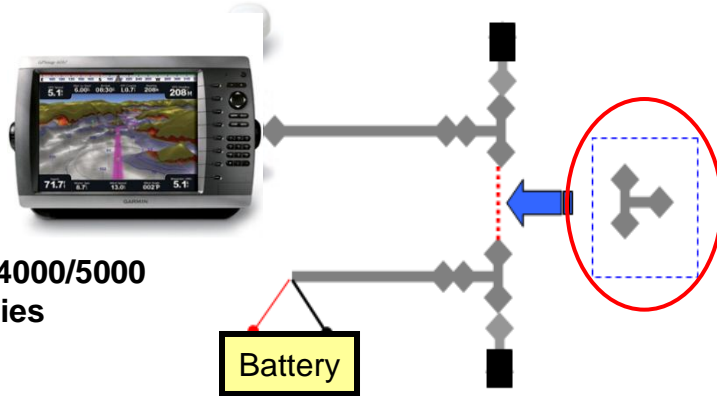
• Each MFD needs each company's NMEA 2000 tee connector, or an equivalent commercially available Micro-C Tee connector .

• Confirm that the NMEA 2000 network is constructed correctly. If the network is not assembled correctly, engine data will not be displayed.

Garmin NMEA 2000 connectivity

Garmin: 4000/5000 Series and GMI10 are NMEA 2000 compatible products.

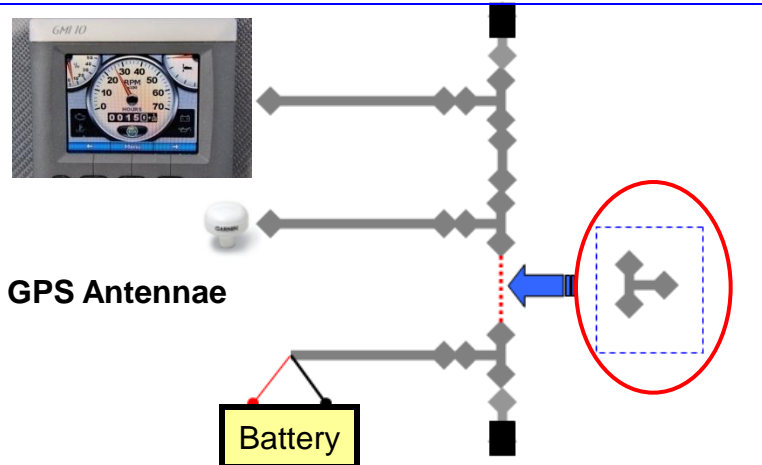
GPSMAP 4000/5000 Series



NMEA 2000 backbone cable requirements.

- 1x NMEA2000 Cable.
 - 1x Terminator (male)
 - 1 x Terminator (female)
 - 3 x Tee-Connector.
 - 1 x Power Supply Cable.
- Connect the Tee connector to the network.
- Then connect the engine communication cable

GMI10



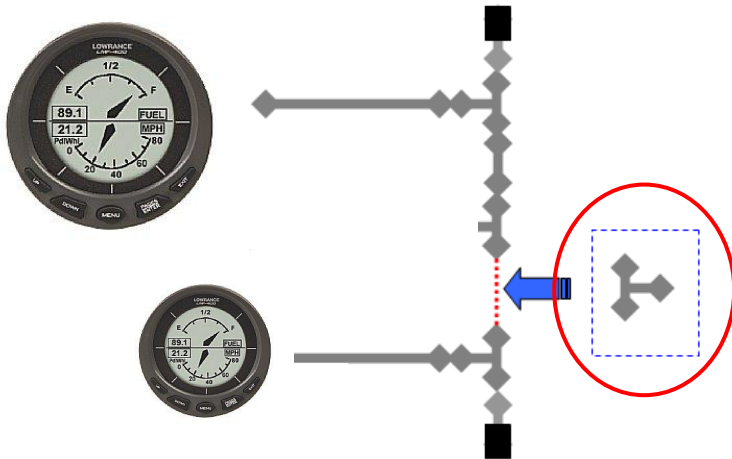
- Connect the Tee-connector to network.
- Then connect the engine communication cable.

NMEA 2000 network with Garmin GMI10 Instrument: <http://www.youtube.com/watch?v=KvddqAUPqD0>

Lowrance NMEA 2000 connectivity

Lowrance: LMF-400/200 series are NMEA 2000 compatible products.

- Connect the Tee-connector to network.
- Then connect the engine communication cable.



NMEA 2000 backbone cable requirements.

- 1x NMEA2000 communication cable.
 - 1x Terminator (male)
 - 1 x Terminator (female)
 - 3 x Tee-Connector.
 - Power Supply Cable (not required on LMF series)
- Connect the Tee connector to the network.
- Then connect the engine communication cable



NMEA 2000



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