Bigmate Syrus 3G
ECU Monitor
Installation Manual

Version Control:

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Contents:

1. Introduction

The Syrus 3G with the addition of an ECU (Engine Control Unit) Monitor interface module is capable of reading fixed parameters from the J1939/OBDII interface of vehicles. J1939 and OBDII are standardised systems for the communication of engine management information and vehicle parameters.

1.1 ECU Monitor Specifications

Some of the specifications of the ECU Monitor are:

- Supports DC voltage between 8V and 32V. Protected against transients.
- 1-Wire interface used to connect to the Syrus (White/Red Wire).
- CAN J1939
- ISO14230(KWP2000) and ISO9141 OBDII protocols.
- ISO15765 OBDII protocol.
- Analogue interface for fuel level readings. Differential voltages between 0V and 5V.

1.2 Parameters Read

The parameters that can be read by the ECU Monitor are:

- Accelerator Pedal Position — %
- Engine Speed — RPM
- Total Vehicle Distance — Meters
- Total Fuel Used — Millilitres
- Total Engine Hours — Minutes
- Total Fuel Used While Idle — Millilitres
- Vehicle Current Fuel Level — Millivolts from analogue input on ECU monitor
- Oxygen Sensor — Millivolts
- Fuel Efficiency — Millilitres per minute
- Trip Odometer — km
- Total Time Engine Idle — Minutes
- Fuel Level — % (from the ECU if available)
- Instantaneous Fuel Economy — Millilitres per minute
- Diagnostic Error Codes

NOTE

Not all manufactures or vehicles support the reading of these parameters from the J1939/OBDII interface. A vehicle may only support some or none of these parameters despite having a compatible J1939/OBDII bus.

In addition to the channels above, the following events are reported based on values for parameters read from the ECU monitor. These thresholds are configurable, the defaults have been indicated below:

- Vehicle speed 118 Km/h
- Engine RPM 6000rpm
- Engine Coolant Temperature 120°C
- Engine Coolant Level 90%
- Battery Voltage 10V
- Transmission Liquid Level 90%
- Transmission Liquid Temperature 137°C
- Accelerator Pedal Position 95%
- Engine Coolant Pressure 20psi
- Engine Oil Pressure 20psi
- Engine Oil Level 50%
- Distance with Engine Light on 300km

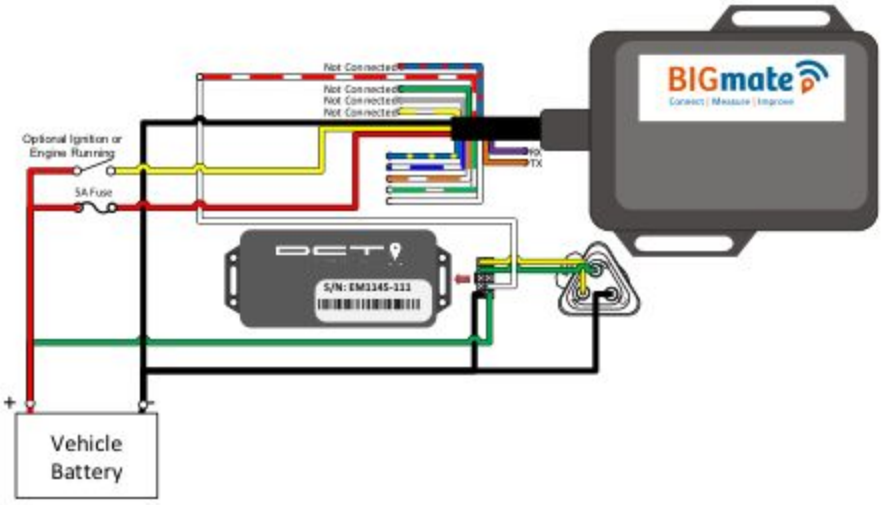
2. Installation

Before starting the installation, make sure that the vehicle is turned off. The ignition switch must be in the OFF position, not on the Accessories position.

There are 2 types of Installation, J1939 installation and OBDII installation

2.1 J1939 Installation

The J1939 is generally used for heavy vehicles and equipment.



Colour	Description
Connections to the Syrus	
Green	Main power. 8V - 32V. Must be connected to the Syrus main power cable (green - pin #7) or directly to the vehicle's battery positive terminal.
Black	GND. Device's Electrical Ground. Must be connected to the Syrus GND (black - pin #1) or the same GND connection used by the Syrus. This is usually the vehicle's battery negative terminal.
White	1-Wire. Must be connected to the Syrus 1-Wire bus (Red/White - pin #14).
Connections to the vehicle engine	

Yellow	**CAN_H**. Positive signal of the J1939 bus. Must be connected to the vehicle's **CAN_H** cable. This cable is twisted together with the green **CAN_L** cable on the ECU Monitor. In the vehicle this cable could have a different colour, but the connector will be marked correctly. Please see the connector diagrams below.
Green	**CAN_L**. Negative signal of the J1939. Must be connected to the vehicle's **CAN_L** cable. This cable is twisted together with the yellow **CAN_H** cable on the ECU Monitor. In the vehicle this cable could have a different colour, but the connector will be marked correctly. Please see the connector diagrams below.

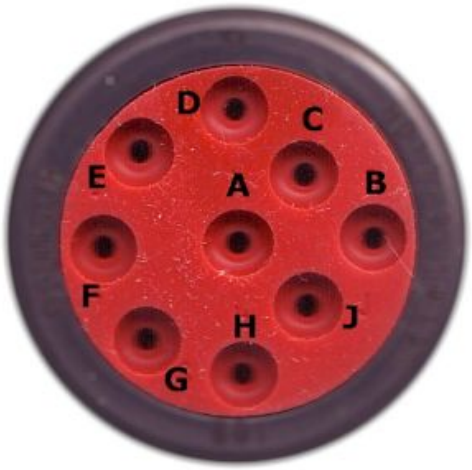
CAUTION

The cables that connect the ECU Monitor to the vehicle's engine should not be cut. If the cables must be cut for any reason they must be cut to the same length and must be kept twisted. If the cables are cut different lengths or untwisted performance may be impacted.

2.1.1 How to find the J1939 bus

2.1.1.1 9 Pin Connector

Road vehicles that support the J1939 protocol should have the connector shown below. The connector is usually found in the vehicle's cabin, often under the steering wheel area. Once the connector is found, simply connect the ECU Monitor's cables by intercepting the connector's cables on the rear part of the connector.



Pinout:

A. GND. Must be the same GND connected to the Syrus.

B. Vehicle's battery positive terminal (+). Please verify that the voltage is always present and does not disappear when the engine is turned off. If the voltage disappears from this terminal when the engine is turned off, please connect the ECU Monitor directly to the vehicle's battery.

C. CAN_H. Positive signal of the J1939 bus.

D. CAN_L. Negative signal of the J1939 bus.

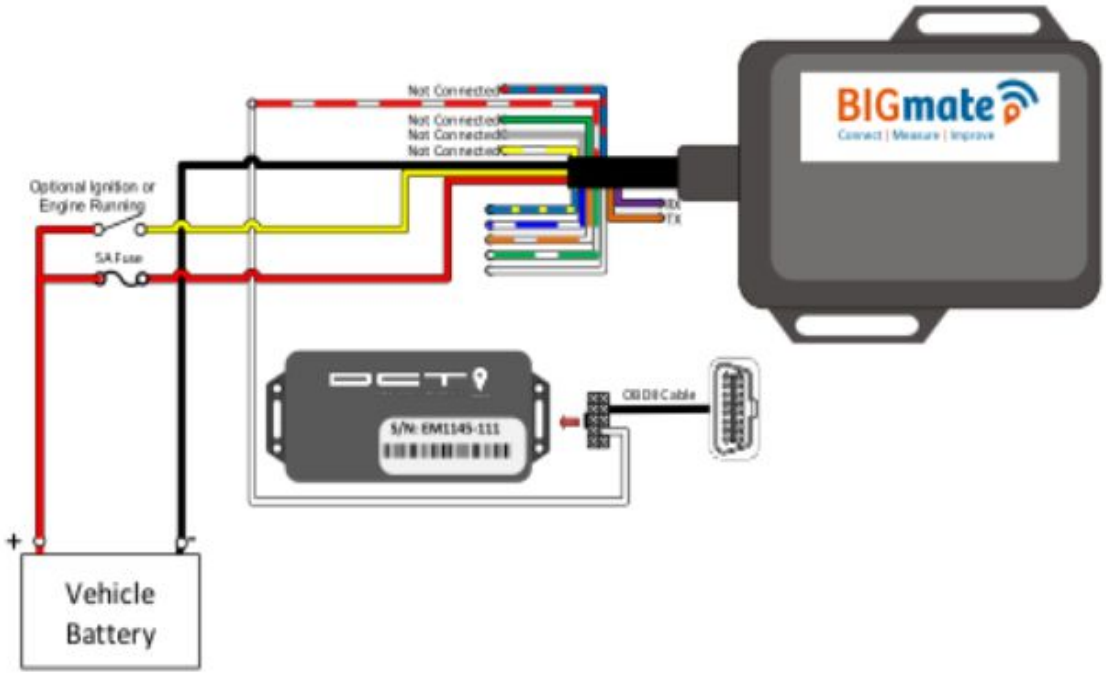
2.1.1.2 Alternatives Locations

Off road equipment may have the J1939 bus in the vehicle or on the engine management controller. CAN_H and CAN_L are typically a twisted pair of Yellow and Green wires.

Consult the equipment wiring diagram, service manual or contact the manufacturer for more information.

2.2 OBDII Installation

The OBDII bus is generally used for passenger and light commercial vehicles.



Colour	Description
Connections to the Syrus	
Green	Main power. 8V - 32V. Must be connected to the Syrus main power cable (green - pin #7) or directly to the vehicle's battery positive terminal.
Black	GND. Device's Electrical Ground. Must be connected to the Syrus GND (black - pin #1) or the same GND connection used by the Syrus. This is usually the vehicle's battery negative terminal.
White	1-Wire. Must be connected to the Syrus 1-Wire bus (Red/White - pin #14).
For OBDII Operation the ECU Monitor is supplied with a cable to connect to the OBDII port on the vehicle.	

2.3 Installing the Fuel Sensor

Connections to the vehicle's fuel tank level sensor:

Colour	Description
Blue	**FL+**. Positive input for the fuel tank level sensor. This cable is twisted together with the grey **FL-** cable on the ECU Monitor.
Grey	**FL-**. Negative input for the fuel tank level sensor. This cable is twisted together with the blue **FL+** cable on the ECU Monitor.

Identify the two cables that connect the fuel tank level sensor and follow them to a place near the vehicle's cabin. Find a place where it is convenient to connect these cables to the ECU Monitor's input cables.

In most cases the cables are located on the top of the tank, near the middle, under a plastic cover. These cables do not have a standard colour scheme, for this reason it is necessary to determine which cable is the positive and which cable is the negative. To do this, lift the plastic cover and use a voltmeter to measure the voltage on these cables, the vehicle's engine must be turned on. The measurement must be done between both cables and not referenced to ground. If the voltage read is positive, then the positive probe of the voltmeter is on the positive cable of the fuel tank level sensor. This cable must be connected to the FL+ input on the ECU Monitor, The other cable must be connected to the FL- input.

Please record the following information and forward to Bigmate to calibrate the Fuel Level input.

Gauge Position	Voltage Reading MAX 5V
0	
¼	
½	
¾	
Full Scale	

3. Contacts and Enquiries

For any other details contact:

Bigmate Service & Support

Phone: 1300 477 787 or +61 (0) 7 4968 5970

E-mail: support@bigmate.com.au