



# Universal Engine Monitor

Version 1.02

**Revision History**

<b>1.0</b>	<b>Initial Release</b>	
<b>1.01</b>	<b>Multi Language Removed</b>	<b>Multi language support removed from software instructions, translations not included in software</b>
<b>1.02</b>	<b>T7i Fitting Template</b>	<b>Fitting template for T7i amended</b>

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## Introduction

The UEM range of displays are a homogenised approach to engine monitoring. It uses a common base software version to allow all our customers to benefit from new features while the look and feel (as opposed to the function) comes from a configuration file(s).

The UEM is primarily an Engine Monitor, though through future changes we plan to add additional functionality to it to allow it to be used on Gensets or as a Speed Controller through TSC. It can also be used in an emissions regulated environment as long as the right data is provided from the engine and the right configuration is used.



## Wiring the Display

Please use the harnesses supplied with the kit to connect the displays. All connectors must be fitted using blanking plugs where wires are not present to maintain the IP rating against water intrusion.

**Important Note:** Do not swap harnesses between different models of displays including the R3 & C3 displays as different pin out configurations are used. This can cause issues with terminating resistors and will invalidate warranty. Please see [Appendix 2](#) for pin out information.

## Basic Use

### Accessing the Menus:

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#### Buttons

From the main screen;

If you can see no keys, **push any key** to cause them to pop up.

Once the button's pop up, **push the menu button**.

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#### Touch

From the main screen:

**Push and hold** in the middle of the screen for 2 seconds.

Should you end up in the **adjustment menu**, if the title at the top of the screen doesn't say main menu, then **swipe to the right and try again more centred**.

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### Changing Between Screens:

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#### Buttons

From the main screen;

If you can see no key's **push any key** to cause them to pop up.

You should see a **prev and a next** (if you have more than one screen) If you push them, it should cycle through the various screens.

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#### Touch

From the main screen;

**Swipe left to right or right to left** to scroll through the screens.

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### Changing Current Screen:

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#### Buttons

From the main screen;

If you can see no keys **push any key** to cause them to pop up.

You should see an Adj button, **push that** to go to the **adjustment menu** for that screen. (see below)

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#### Touch

From the main screen:

**Push and hold** anywhere not on the middle of the screen, you will be taken to the **adjustment menu** for that screen. (see below)

Should you end up in the Main Menu, **swipe right** and try again further from the middle of the screen.

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**Please Note** that the Adjustment screens can also be found by going to them in the following path;  
Main Menu -> Setup -> Themes -> Adjust Existing -> Screens -> Adjust existing -> Select the screen you wish to adjust

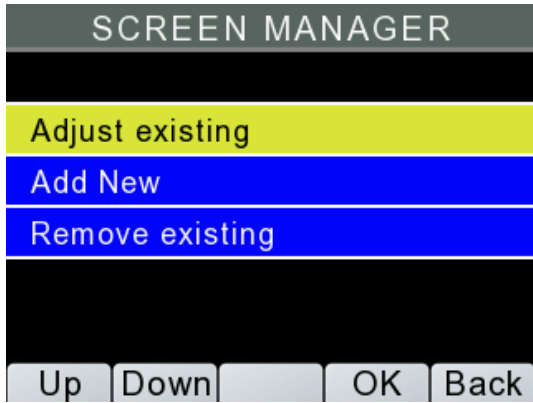
Once you are on the **Adjustment menu**, you can navigate up/down **using either the key's or swiping up/down**.

If an item is "Grey" and does not have buttons it has been marked as not adjustable and cannot be changed.

If you can see **Prev and Next**, then they can be used to cycle through the list of SPN's that can be displayed in that location.

Please have a read of the basic instructions, specifically how to get into the menus.

### Adding Another Screen:



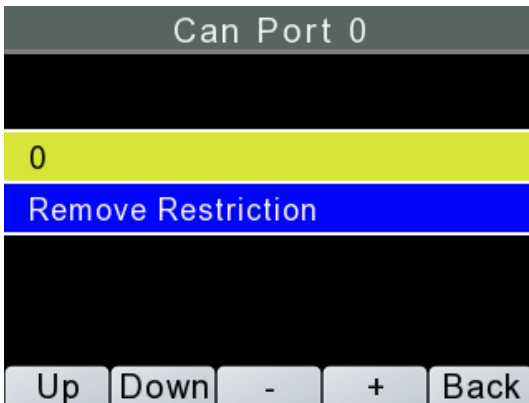
Go to the Screens setup within your current Theme  
**Main Menu -> Setup -> Themes -> Adjust Existing -> Screens**  
 And Choose “**Add New**”  
 Select from the list the layout you would like to add.  
 It will add a new screen, with an incremental number, ie, if you already had a Quad 1, it will add Quad 2  
 You will then need to **adjust** that screen so that it displays what you want it to display.  
 Check out **Changing Between Screens** Under the **Basic Use Section**.

### Setting Up an Engine:



Go to the Menus  
**Main Menu -> Setup -> Engines -> Change current Engine**  
**Select the Engine** that most closely matches the engine type you have.  
 Once Selected it will return you to the **Engines Menu**, select your new engine and fine tune it based on the below.

## Setting or Filtering the CAN Address of the Engine:



**From the Engine Menu (Main Menu -> Setup -> Engines -> YOUR ENGINE) Select Sources Address(s), then if needed, select the CAN Port that the engine is connected to.**

The UEM allows you to restrict supported information based on the Source Address (or even disable that CAN Port for that engine)

### Restrictions

A Restriction is a Source Address that we will accept data from, if there are none, we will accept data from any address.

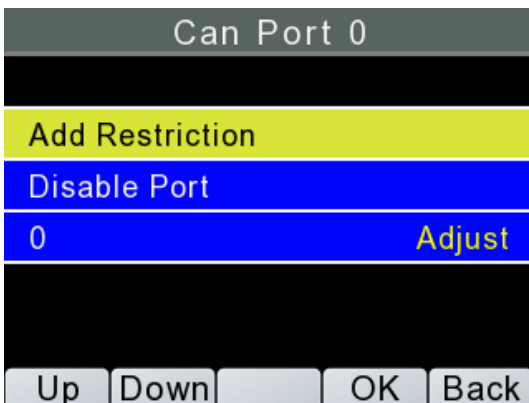
### Removing a Restriction

**Select the Restriction** you want to remove and **choose adjust on the right**.

Select Remove Restriction.

To remove all restrictions **select Disable Port**

Select **Enable Port**



### Adding a Restriction

**Select Add Restriction**, it gets added as Source Address 0 (or the lowest address not already filtered)

You can then select it and adjust that number.

### Enabling the Port for This Engine

You can Enable the port only if it is disabled. **Select "Enabled Port"**.

### Disabling the Port for This Engine?

Select **Disable Port**.

Please be aware, this is ONLY for this engine.



## Setting Up Senders:

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Data Conversions	
Engine RPM	Enabled
Fluid Level	Enabled
Pressure	Enabled
Temperature	Enabled
Supp to Alt Pot	Enabled
Supp to Bat Pot	Enabled
Up	Down
OK	Back

**Navigate to the Data Conversions**, these take Data from one row, convert it and then put it back in another row.

**Select the data conversion** that most closely matches what you are looking for.

On some data conversions some options are not adjustable, these will be grey.

You can then adjust:

- **The Source** (where the data comes from, ie the analogue input it should be using)
  - This takes up two rows, the first row shows the SPN, the second row shows the Name and the current reading.
- **The Destination** (where the data goes once its converted)
  - This takes up two rows, the first row shows the SPN, the second row shows the Name and the current reading.
- **The Frequency** (How often the reading is taken and converted)
- **The Conversion** (How its converted)
  - You may be able to select a Sender Table here
  - You may be able to adjust the Gain and Offset here
  - For more information on this, please see Setting Up a Tach **Signal**.
- **If its Extrapolated** or not.
  - If it is using a Straight Line for the conversion this field is ignored and it is always converted.

If you are using a Sender Table, then, if the raw value is outside the table then this field controls if the conversion is still done as best it can or not done as it is "Out of Range".

## Setting Up a Tach Signal:

Sender Adjust	
Name	Straight Line
Frequency Input	0
Engine Speed	0
Gain	1
Offset	0
Delta	1
Up	Down
Dec	Inc
Back	

You will need to have the **Tach connected to the frequency input** and to know what RPM your engine idles at.

**Navigate to the Data Conversions and select the one that looks the most sensible** (probably Engine RPM or similar)

Check that you have the Tach connected to the frequency input and that you can see the frequency going up as you rev the engine.

**Scroll down to the "Name" and select that** (Probably Straight Line)

You should then be able to see the raw frequency from the Tach and the RPM it's converted into.

- Sit your engine at its idle speed.
- Leave (or set) the Offset to 0

Adjust the Gain until the Engine Speed value matches what you know your engines idle speed is.

## Setting Up NMEA Instances:

Engine Dynamic	
Add instance	
0	Adjust
Up	Down
OK	Back

**Navigate to the Supported PGN's Menu**

**Main Menu -> Setup -> Engines > YOUR ENGINE -> Supported PGN's**

**Select the PGN** you need to add an instance for

**Select Rx** Instances, you can add instances or adjust / remove them.

## Adding Another Engine

Additional engines are not yet supported by the software and can only be added via a configuration change. If you need an additional engine, please contact your OEM.

## Changing the Language:

Main Menu	
Language	English
Bleep	Off
Backlight	10/10
Keypad Backlight	10/10
Tier 4 Regen	
Setup	
Up	Down
OK	Back

### Main Menu -> Languages

Currently only English language is supported, please contact your OEM.

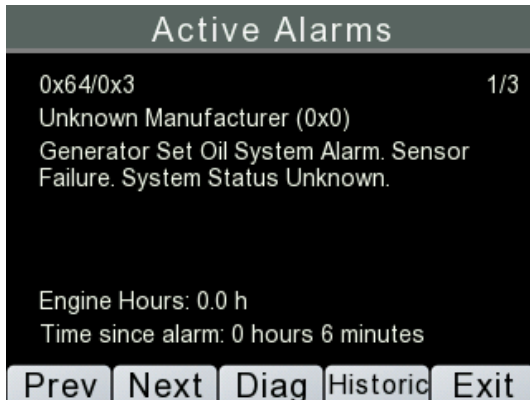
## Changing the Backlight:

Main Menu	
Language	English
Bleep	Off
Backlight	10/10
Keypad Backlight	10/10
Tier 4 Regen	
Setup	
Up	Down
-	+
Back	

The Backlight level can be found in the top level of the menu. On the displays with buttons you will also find a keypad backlight level which is the level of light from behind the keys.

### Main Menu -> Backlight

## Viewing Alarms














Alarms should trigger the alarm screen when they occur. If you have left the alarm screen and want to get back to it, the screen can be found in the menus:

**Main Menu -> Diagnostics -> Alarm Viewer**

### Meaning of Lamp / Picture:

Below are the Lamps that ship with the basic, standard configuration, these may be changed by the OEM.

Lamp	Cause/Description
	Known as HEST called High Exhaust Temperature, commonly caused by SPN 3698.
	Known as DEF this is to do with the Diesel Exhaust Fluid, commonly cause by SPN 5245
	Check Engine
	MIL Lamp
	Engine Protect Lamp
	STOP Engine
	DPF Low – This may mean regeneration is needed, check your engine manual for instructions/details
	DPF Medium – This may mean regeneration is needed, check your engine manual for instructions/details
	DPF High – This may mean regeneration is needed, check your engine manual for instructions/details
	DPF – This may mean regeneration is needed, check your engine manual for instructions/details
	N-DPF – This means the Regeneration is inhibited.

# Supported Parameters

**Please Note:**

- “Via Data Conversion” must be enabled or setup in the Configuration. **1**
- UEM supports Fluid Level (0x1F211) on any LEVEL Parameter, but this must be setup in the Configuration. **2**
- UEM supports Actual Pressure (0x1FD0A) on any PRESSURE Parameter, but this must be setup in the Configuration. **3**
- UEM supports Temperature Extended (0x1FD0C) on any TEMPERATURE Parameter, but this must be setup in the Configuration. **4**

Parameter Name	J1939	NMEA2000	Local	Serial
Fuel Level <sup>2</sup>	SPN:38 PGN:65276 (0x0FEFC)		Via Data Conversion <sup>1</sup>	
Pneumatic Supply Pressure <sup>3</sup>	SPN:46 PGN:65198 (0x0FEAE)		Via Data Conversion <sup>1</sup>	
Throttle Pos	SPN:51 PGN:65266 (0x0FEF2)		Via Data Conversion <sup>1</sup>	
Engine Intercooler Temp <sup>4</sup>	SPN:52 PGN:65262 (0x0FEEE)		Via Data Conversion <sup>1</sup>	
Air Start Pressure <sup>3</sup>	SPN:82 PGN:65246 (0x0FEDE)		Via Data Conversion <sup>1</sup>	
Vehicle Speed	SPN:84 PGN:65265 (0x0FEF1)	0x1F503	Via Data Conversion <sup>1</sup>	
Accelerator Pos	SPN:91 PGN:61443 (0x0F003)		Via Data Conversion <sup>1</sup>	
Percent Engine Load	SPN:92 PGN:61443 (0x0F003)	0x1F201	Via Data Conversion <sup>1</sup>	
Fuel Pressure <sup>3</sup>	SPN:94 PGN:65263 (0x0FEFF)	0x1F201	Via Data Conversion <sup>1</sup>	
Fuel Level <sup>2</sup>	SPN:96 PGN:65276 (0x0FEFC)		Via Data Conversion <sup>1</sup>	
Oil Level <sup>2</sup>	SPN:98 PGN:65263 (0x0FEFF)		Via Data Conversion <sup>1</sup>	
Engine Oil Pressure <sup>3</sup>	SPN:100 PGN:65263 (0x0FEFF)	0x1F201	Via Data Conversion <sup>1</sup>	
Engine Boost Pressure <sup>3</sup>	SPN:102 PGN:65270 (0x0FEF6)	0x1F200	Via Data Conversion <sup>1</sup>	
Turbo 1 Speed	SPN:103 PGN:65245 (0x0FEDD)		Via Data Conversion <sup>1</sup>	
Intake Manifold Temp <sup>4</sup>	SPN:105 PGN:65270 (0x0FEF6)		Via Data Conversion <sup>1</sup>	
Air Inlet Pressure <sup>3</sup>	SPN:106 PGN:65270 (0x0FEF6)		Via Data Conversion <sup>1</sup>	
Air Filter 1 Diff Pressure <sup>3</sup>	SPN:107 PGN:65270 (0x0FEF6)		Via Data Conversion <sup>1</sup>	
Barometric Pressure <sup>3</sup>	SPN:108 PGN:65269 (0x0FEF5)		Via Data Conversion <sup>1</sup>	
Engine Coolant Pressure <sup>3</sup>	SPN:109 PGN:65263 (0x0FEFF)	0x1F201	Via Data Conversion <sup>1</sup>	
Engine Temp <sup>4</sup>	SPN:110 PGN:65262 (0x0FEEE)	0x1F201	Via Data Conversion <sup>1</sup>	
Coolant Level <sup>2</sup>	SPN:111 PGN:65263 (0x0FEFF)		Via Data Conversion <sup>1</sup>	
Net Battery Current	SPN:114 PGN:65271 (0x0FEF7)		Via Data Conversion <sup>1</sup>	
Alternator Current	SPN:115 PGN:65271 (0x0FEF7)		Via Data Conversion <sup>1</sup>	
Clutch Pressure <sup>3</sup>	SPN:123 PGN:65272 (0x0FEF8)		Via Data Conversion <sup>1</sup>	
Gear Pressure <sup>3</sup>	SPN:127 PGN:65272 (0x0FEF8)		Via Data Conversion <sup>1</sup>	
Inj Metering Rail 1 Pressure <sup>3</sup>	SPN:157 PGN:65243 (0x0FEDB)		Via Data Conversion <sup>1</sup>	
Keyswitch Battery Potential	SPN:158 PGN:65271 (0x0FEF7)		Via Data Conversion <sup>1</sup>	
Input Shaft Speed	SPN:161 PGN:61442 (0x0F002)		Via Data Conversion <sup>1</sup>	
Injection Control Pressure <sup>3</sup>	SPN:164 PGN:65243 (0x0FEDB)		Via Data Conversion <sup>1</sup>	
Alternator Potential	SPN:167 PGN:65271 (0x0FEF7)	0x1F201	Via Data Conversion <sup>1</sup>	
Battery Potential	SPN:168 PGN:65271 (0x0FEF7)	0x1F214	Via Data Conversion <sup>1</sup>	
Ambient Air Temperature <sup>4</sup>	SPN:171 PGN:65269 (0x0FEF5)		Via Data Conversion <sup>1</sup>	
Air Inlet Temp <sup>4</sup>	SPN:172 PGN:65269 (0x0FEF5)		Via Data Conversion <sup>1</sup>	
Exhaust Gas Temperature <sup>4</sup>	SPN:173 PGN:65270 (0x0FEF6)		Via Data Conversion <sup>1</sup>	
Fuel Temp <sup>4</sup>	SPN:174 PGN:65262 (0x0FEEE)		Via Data Conversion <sup>1</sup>	
Engine Oil Temp <sup>4</sup>	SPN:175 PGN:65262 (0x0FEEE)	0x1F201	Via Data Conversion <sup>1</sup>	
Turbo Oil Temp <sup>4</sup>	SPN:176 PGN:65262 (0x0FEEE)		Via Data Conversion <sup>1</sup>	
Gear Temp <sup>4</sup>	SPN:177 PGN:65272 (0x0FEF8)		Via Data Conversion <sup>1</sup>	
Trip Fuel	SPN:182 PGN:65257 (0x0FEE9)		Via Data Conversion <sup>1</sup>	
Fuel Rate	SPN:183 PGN:65266 (0x0FEF2)	0x1F201	Via Data Conversion <sup>1</sup>	
Instant Fuel Econ	SPN:184 PGN:65266 (0x0FEF2)		Via Data Conversion <sup>1</sup>	
Avg Fuel Econ	SPN:185 PGN:65266 (0x0FEF2)		Via Data Conversion <sup>1</sup>	
Engine Speed	SPN:190 PGN:61444 (0x0F004)	0x1F200	Via Data Conversion <sup>1</sup>	
Output Shaft Speed	SPN:191 PGN:61442 (0x0F002)		Via Data Conversion <sup>1</sup>	
Trip Distance	SPN:244 PGN:65248 (0x0FEE0)		Via Data Conversion <sup>1</sup>	
Total Vehicle Distance	SPN:245 PGN:65248 (0x0FEE0)		Via Data Conversion <sup>1</sup>	
Total Vehicle Hours	SPN:246 PGN:65255 (0x0FEE7)		Via Data Conversion <sup>1</sup>	
Engine Hours	SPN:247 PGN:65253 (0x0FEE5)	0x1F201	Via Data Conversion <sup>1</sup>	
Engine Revs Total	SPN:249 PGN:65253 (0x0FEE5)		Via Data Conversion <sup>1</sup>	
Total Fuel Used	SPN:250 PGN:65257 (0x0FEE9)		Via Data Conversion <sup>1</sup>	
Auxiliary Temperature <sup>1</sup>	SPN:441 PGN:65164 (0x0FE8C)		Via Data Conversion <sup>1</sup>	
Auxiliary Temperature <sup>2</sup>	SPN:442 PGN:65164 (0x0FE8C)		Via Data Conversion <sup>1</sup>	
Percent Engine Torque	SPN:512 PGN:61444 (0x0F004)	0x1F201	Via Data Conversion <sup>1</sup>	
Actual Engine Percent Torque	SPN:513 PGN:61444 (0x0F004)		Via Data Conversion <sup>1</sup>	
Engines Desired Operating Speed	SPN:515 PGN:65247 (0x0FEDF)		Via Data Conversion <sup>1</sup>	
Speed Nav	SPN:517 PGN:65256 (0x0FEE8)	0x1F802	Via Data Conversion <sup>1</sup>	\$VTG, \$RMC
Current Gear	SPN:523 PGN:61445 (0x0F005)		Via Data Conversion <sup>1</sup>	

Parameter Name	J1939	NMEA2000	Local	Serial
Selected Gear	SPN:524 PGN:61445 (0x0F005)		Via Data Conversion <sup>1</sup>	
Torque Converter Lockup Engaged	SPN:573 PGN:61442 (0x0F002)		Via Data Conversion <sup>1</sup>	
Est Percent Fan Speed	SPN:975 PGN:65213 (0x0FEBD)		Via Data Conversion <sup>1</sup>	
Trip Average Fuel Rate	SPN:1029 PGN:65203 (0x0FEB3)		Via Data Conversion <sup>1</sup>	
Total ECU Distance	SPN:1032 PGN:65201 (0x0FEB1)		Via Data Conversion <sup>1</sup>	
Trip Time			Via Data Conversion <sup>1</sup>	
WTS Status	SPN:1081 PGN:65252 (0x0FEE4)		Via Data Conversion <sup>1</sup>	
Stop Lamp Shutdown	SPN:1109 PGN:65252 (0x0FEE4)		Via Data Conversion <sup>1</sup>	
Stop Lamp Shutdown	SPN:1110 PGN:65252 (0x0FEE4)		Via Data Conversion <sup>1</sup>	
Engine ECU Temp <sup>4</sup>	SPN:1136 PGN:65188 (0x0FEA4)		Via Data Conversion <sup>1</sup>	
Exhaust Gas Port 1 Temp <sup>4</sup>	SPN:1137 PGN:65187 (0x0FEA3)		Via Data Conversion <sup>1</sup>	
Exhaust Gas Port 2 Temp <sup>4</sup>	SPN:1138 PGN:65187 (0x0FEA3)		Via Data Conversion <sup>1</sup>	
Turbo 1 Compressor Inlet Temp <sup>4</sup>	SPN:1172 PGN:65178 (0x0FE9A)		Via Data Conversion <sup>1</sup>	
Fuel Leakage 1	SPN:1239 PGN:65169 (0x0FE91)		Via Data Conversion <sup>1</sup>	
Fuel Leakage 2	SPN:1240 PGN:65169 (0x0FE91)		Via Data Conversion <sup>1</sup>	
Inj Metering Rail 2 Pressure <sup>3</sup>	SPN:1349 PGN:65243 (0x0FEDB)		Via Data Conversion <sup>1</sup>	
Auxiliary Pressure 1 <sup>3</sup>	SPN:1387 PGN:65164 (0x0FE8C)		Via Data Conversion <sup>1</sup>	
Auxiliary Pressure 2 <sup>3</sup>	SPN:1388 PGN:65164 (0x0FE8C)		Via Data Conversion <sup>1</sup>	
Hydraulic Temperature <sup>4</sup>	SPN:1638 PGN:65128 (0x0FE68)		Via Data Conversion <sup>1</sup>	
Catalyst Tank Level <sup>2</sup>	SPN:1761 PGN:65110 (0x0FE56)		Via Data Conversion <sup>1</sup>	
Hydraulic Pressure <sup>3</sup>	SPN:1762 PGN:61448 (0x0F008)		Via Data Conversion <sup>1</sup>	
Ave AC Frequency	SPN:2436 PGN:65030 (0x0FE06)		Via Data Conversion <sup>1</sup>	
Frequency A	SPN:2437 PGN:65027 (0x0FE03)		Via Data Conversion <sup>1</sup>	
Ave Line Line ACRMS	SPN:2440 PGN:65030 (0x0FE06)		Via Data Conversion <sup>1</sup>	
Line Line A	SPN:2441 PGN:65027 (0x0FE03)		Via Data Conversion <sup>1</sup>	
Line Line B	SPN:2442 PGN:65024 (0x0FE00)		Via Data Conversion <sup>1</sup>	
Line Line C	SPN:2443 PGN:65021 (0x0FDFD)		Via Data Conversion <sup>1</sup>	
Line Neutral A	SPN:2445 PGN:65027 (0x0FE03)		Via Data Conversion <sup>1</sup>	
Line Neutral B	SPN:2446 PGN:65024 (0x0FE00)		Via Data Conversion <sup>1</sup>	
Line Neutral C	SPN:2447 PGN:65021 (0x0FDFD)		Via Data Conversion <sup>1</sup>	
Ave ACRMS Current	SPN:2448 PGN:65030 (0x0FE06)		Via Data Conversion <sup>1</sup>	
Current A	SPN:2449 PGN:65027 (0x0FE03)		Via Data Conversion <sup>1</sup>	
Current B	SPN:2450 PGN:65024 (0x0FE00)		Via Data Conversion <sup>1</sup>	
Current C	SPN:2451 PGN:65021 (0x0FDFD)		Via Data Conversion <sup>1</sup>	
Total Real Power	SPN:2452 PGN:65029 (0x0FE05)		Via Data Conversion <sup>1</sup>	
Catalyst Tank Temperature <sup>4</sup>	SPN:3031 PGN:65110 (0x0FE56)		Via Data Conversion <sup>1</sup>	
Aftertreatment 1 EGT <sup>1</sup>	SPN:3241 PGN:64947 (0x0FDB3)		Via Data Conversion <sup>1</sup>	
Aftertreatment 1 EGT <sup>3</sup>	SPN:3245 PGN:64947 (0x0FDB3)		Via Data Conversion <sup>1</sup>	
DPF Lamp Command	SPN:3697 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
ESHT Lamp Command	SPN:3698 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
DPF Active Regen Status	SPN:3700 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
DPF Status	SPN:3701 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
DPF Active Regen Inhibited Switch	SPN:3703 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
Particulate Filter 1 Soot Load	SPN:3719 PGN:64891 (0x0FD7B)		Via Data Conversion <sup>1</sup>	
Particulate Filter 1 Ash Load	SPN:3720 PGN:64891 (0x0FD7B)		Via Data Conversion <sup>1</sup>	
Active Regen Forced Status	SPN:4175 PGN:64892 (0x0FD7C)		Via Data Conversion <sup>1</sup>	
DLC Check Lamp	SPN:5078 PGN:64775 (0x0FD07)		Via Data Conversion <sup>1</sup>	
DLC Stop Lamp	SPN:5079 PGN:64775 (0x0FD07)		Via Data Conversion <sup>1</sup>	
Low DEF Indicator	SPN:5245 PGN:65110 (0x0FE56)		Via Data Conversion <sup>1</sup>	
Cleaning Lamp	SPN:6915 PGN:64586 (0x0FC4A)		Via Data Conversion <sup>1</sup>	
System Cleaning Status	SPN:6916 PGN:64586 (0x0FC4A)		Via Data Conversion <sup>1</sup>	
Inhibit Lamp	SPN:6918 PGN:64586 (0x0FC4A)		Via Data Conversion <sup>1</sup>	
System Cleaning Forced Status	SPN:6934 PGN:64586 (0x0FC4A)		Via Data Conversion <sup>1</sup>	
Supply Voltage			Direct	
Analogue Input 01			Direct	
Analogue Input 02			Direct	
Analogue Input 03			Direct	
Analogue Input 04			Direct	
Analogue Input 05			Direct	
Analogue Input 06			Direct	
Analogue Input 07			Direct	
Analogue Input 08			Direct	
Analogue Input 09			Direct	
Analogue Input 10			Direct	
Analogue Input 11			Direct	
Analogue Input 12			Direct	



Parameter Name	J1939	NMEA2000	Local	Serial
Analogue Input 13			Direct	
Analogue Input 14			Direct	
Digital Input 01			Direct	
Digital Input 02			Direct	
Digital Input 03			Direct	
Digital Input 04			Direct	
Output Requested State 01			Direct	
Output Requested State 02			Direct	
Output Requested State 03			Direct	
Output Requested State 04			Direct	
Output Requested State 05			Direct	
Output Requested State 06			Direct	
Output Requested State 07			Direct	
Output Requested State 08			Direct	
Output Voltage Sense 01			Direct	
Output Voltage Sense 02			Direct	
Output Voltage Sense 03			Direct	
Output Voltage Sense 04			Direct	
Output Voltage Sense 05			Direct	
Output Voltage Sense 06			Direct	
Output Voltage Sense 07			Direct	
Output Voltage Sense 08			Direct	
Frequency Input			Direct	
Display Hours			Direct	
CPU Temperature			Direct	
Estimated Engine Hours			Direct	
Black Water Level <sup>2</sup>			Via Data Conversion <sup>1</sup>	
Course Over Ground		0x1F802	Via Data Conversion <sup>1</sup>	\$VTG, \$RMC
Depth			Via Data Conversion <sup>1</sup>	
Depth Offset		0x1F50B	Via Data Conversion <sup>1</sup>	
Raw Depth		0x1F50B	Via Data Conversion <sup>1</sup>	
Displayed Trim			Via Data Conversion <sup>1</sup>	
Amber Warning Lamp			Via Data Conversion <sup>1</sup>	
Malfunction Indicator Lamp			Via Data Conversion <sup>1</sup>	
Protect Lamp			Via Data Conversion <sup>1</sup>	
Red Stop Lamp			Via Data Conversion <sup>1</sup>	
Charge Indicator		0x1F201	Via Data Conversion <sup>1</sup>	
Check Engine		0x1F201	Via Data Conversion <sup>1</sup>	
EGR System		0x1F201	Via Data Conversion <sup>1</sup>	
Engine Emergency Stop Mode		0x1F201	Via Data Conversion <sup>1</sup>	
High Boost Pressure <sup>3</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Low Coolant Level <sup>2</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Low Fuel Pressure		0x1F201	Via Data Conversion <sup>1</sup>	
Low Oil Level <sup>2</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Low Oil Pressure <sup>3</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Low System Voltage		0x1F201	Via Data Conversion <sup>1</sup>	
Over Temperature <sup>4</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Preheat Indicator		0x1F201	Via Data Conversion <sup>1</sup>	
Rev Limit Exceeded		0x1F201	Via Data Conversion <sup>1</sup>	
Throttle Position Sensor		0x1F201	Via Data Conversion <sup>1</sup>	
Water Flow		0x1F201	Via Data Conversion <sup>1</sup>	
Water in Fuel		0x1F201	Via Data Conversion <sup>1</sup>	
Engine Comm Error		0x1F201	Via Data Conversion <sup>1</sup>	
Engine Shutting Down		0x1F201	Via Data Conversion <sup>1</sup>	
Maintenance Needed		0x1F201	Via Data Conversion <sup>1</sup>	
Neutral Start Protect		0x1F201	Via Data Conversion <sup>1</sup>	
Power Reduction		0x1F201	Via Data Conversion <sup>1</sup>	
Sub or Secondary Throttle		0x1F201	Via Data Conversion <sup>1</sup>	
Warning Level 1 <sup>2</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Warning Level 2 <sup>2</sup>		0x1F201	Via Data Conversion <sup>1</sup>	
Fresh Water Level <sup>2</sup>			Via Data Conversion <sup>1</sup>	
Heading		0x1F112	Via Data Conversion <sup>1</sup>	
Check Engine BRP			Via Data Conversion <sup>1</sup>	
Check Engine Suzuki			Via Data Conversion <sup>1</sup>	
Config Defined 1			Via Data Conversion <sup>1</sup>	
Config Defined 10			Via Data Conversion <sup>1</sup>	

Parameter Name	J1939	NMEA2000	Local	Serial
Config Defined 2			Via Data Conversion <sup>1</sup>	
Config Defined 3			Via Data Conversion <sup>1</sup>	
Config Defined 4			Via Data Conversion <sup>1</sup>	
Config Defined 5			Via Data Conversion <sup>1</sup>	
Config Defined 6			Via Data Conversion <sup>1</sup>	
Config Defined 7			Via Data Conversion <sup>1</sup>	
Config Defined 8			Via Data Conversion <sup>1</sup>	
Config Defined 9			Via Data Conversion <sup>1</sup>	
Engine Temp Suzuki <sup>4</sup>			Via Data Conversion <sup>1</sup>	
Oil Critical BRP			Via Data Conversion <sup>1</sup>	
Oil Low BRP			Via Data Conversion <sup>1</sup>	
Oil Pressure Suzuki <sup>3</sup>			Via Data Conversion <sup>1</sup>	
Rev Limit Suzuki			Via Data Conversion <sup>1</sup>	
Water Temp BRP			Via Data Conversion <sup>1</sup>	
Live Well Level 2			Via Data Conversion <sup>1</sup>	
Magnetic Variation		0x1F112	Via Data Conversion <sup>1</sup>	
Check Transmission		0x1F205	Via Data Conversion <sup>1</sup>	
Transmission Low Oil Level <sup>2</sup>		0x1F205	Via Data Conversion <sup>1</sup>	
Transmission Low Oil Pressure		0x1F205	Via Data Conversion <sup>1</sup>	
Transmission Over Temperature <sup>4</sup>		0x1F205	Via Data Conversion <sup>1</sup>	
Transmission Sail Drive		0x1F205	Via Data Conversion <sup>1</sup>	
Engine Tilt and Trim		0x1F200	Via Data Conversion <sup>1</sup>	
Waste Water Level <sup>2</sup>			Via Data Conversion <sup>1</sup>	
Water Pressure <sup>3</sup>			Via Data Conversion <sup>1</sup>	
Aux Fuel 1			Via Data Conversion <sup>1</sup>	
Aux Fuel 3			Via Data Conversion <sup>1</sup>	
Aux Fuel 2			Via Data Conversion <sup>1</sup>	
Jack Plate Pos			Via Data Conversion <sup>1</sup>	
Rudder Pos		0x1F10D	Via Data Conversion <sup>1</sup>	
Trim Tab Port			Via Data Conversion <sup>1</sup>	
Trim Tab Stbd			Via Data Conversion <sup>1</sup>	
DPF Regen Low			Via Data Conversion <sup>1</sup>	
DPF Regen Moderate			Via Data Conversion <sup>1</sup>	
DPF Regen High			Via Data Conversion <sup>1</sup>	
DEF Lamp			Via Data Conversion <sup>1</sup>	
DEF Check Lamp			Via Data Conversion <sup>1</sup>	
DEF Stop Lamp			Via Data Conversion <sup>1</sup>	
MR Engine			Via Data Conversion <sup>1</sup>	
DPF Lamp			Via Data Conversion <sup>1</sup>	
NDPF Lamp			Via Data Conversion <sup>1</sup>	
Stop Lamp			Via Data Conversion <sup>1</sup>	
Check Lamp			Via Data Conversion <sup>1</sup>	
Current Time (UTC)		0x1F010	Via Data Conversion <sup>1</sup>	\$ZDA, \$RMC
Local Time Offset		0x1F809	Via Data Conversion <sup>1</sup>	\$ZDA
Current Time (Local)			Via Data Conversion <sup>1</sup>	

**Please Note:**

“Via Data Conversion” must be enabled or setup in the Configuration. **1**

UEM supports Fluid Level (0x1F211) on any LEVEL Parameter, but this must be setup in the Configuration. **2**

UEM supports Actual Pressure (0x1FD0A) on any PRESSURE Parameter, but this must be setup in the Configuration. **3**

UEM supports Temperature Extended (0x1FD0C) on any TEMPERATURE Parameter, but this must be setup in the Configuration. **4**



# Common Troubleshooting Problems

## Lamp Not on the List

The lamps can be changed by the OEM, please **take a picture** of:

- The lamp
- The alarm screen (all alarms) (found in the menu **Main Menu->Diagnostics->Alarm Viewer**)
- The about screen (found in the **menus, Main Menu->About**)
- The config page of the about screen

Then contact support under **“Contacting Customer Support”** at the end of this document.

## CAN Based Engine: No Data

- Check the network is **active and properly terminated**.
- Check your installation instructions and that the **right CAN Port is connected to the network**.
- Go into the **Menus (see Basic Use,)** and navigate to **Diagnostics->CAN Viewer**.
- Check the **Port/Direction filters** are correct (**set to both/both**)
- Check if you can see **CAN Traffic on the bus**.
  - No Traffic, you probably have a Physical issue, possibly a wiring issue or a hardware issue.
    - It may also be worth checking the Baud Rate is right in **Setup->Hardware->CAN X Config**
  - Traffic on the Viewer but no Data, there is an issue getting the raw data onto the screen.  
(See below)

### No Traffic (Tx Only)

### Traffic

CAN Stats													
Time	DP	PGN	SA	P	D1	D2	D3	D4	D5	D6	D7	D8	
1296053.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296054.45	Tx2	F011	80	7	70	17	03	CF	FF	FF	FF	FF	
1296054.45	Tx1	F011	80	7	70	17	03	CF	FF	FF	FF	FF	
1296054.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296055.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296056.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296057.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296058.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296059.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1296060.45	Tx1	F011	80	7	70	17	04	CF	FF	FF	FF	FF	
1296060.45	Tx2	F011	80	7	70	17	04	CF	FF	FF	FF	FF	
1296060.95	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	

Port Both
Dir Both
Logger
Stats
Back

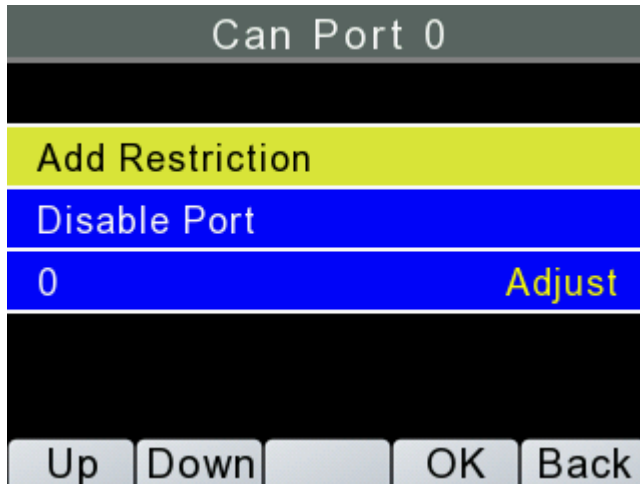
CAN Stats													
Time	DP	PGN	SA	P	D1	D2	D3	D4	D5	D6	D7	D8	
1364662.23	Tx2	F011	80	7	70	17	06	CF	FF	FF	FF	FF	
1364662.28	Rx1	F011	82	7	70	17	D2	CF	FF	FF	FF	FF	
1364662.39	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364662.64	Rx1	E0FF	82	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364663.39	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364663.64	Rx1	E0FF	82	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364664.39	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364664.69	Rx1	E0FF	82	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364665.39	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364665.69	Rx1	E0FF	82	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364666.39	Tx1	E0FF	80	6	FF	FF	FF	FF	FF	F0	FF	FF	
1364666.69	Rx1	E0FF	82	6	FF	FF	FF	FF	FF	F0	FF	FF	

Port Both
Dir Both
Logger
Stats
Back

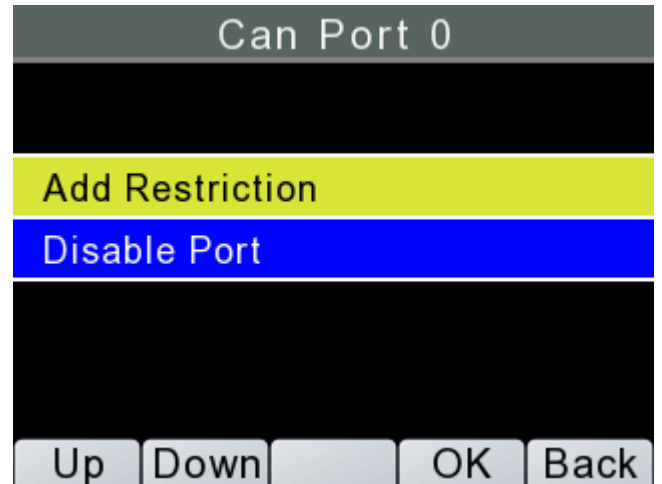
## Getting Raw CAN Data onto the Screen

- i. Check you have raw data (**see CAN Based Engine: No Data**)
- ii. Within the Menu, navigate to Diagnostics->DB Viewer. See what data you have, it may be working, but the data you want is not supported or not available.
- iii. Within the Menu, navigate to **Setup -> Engines -> Your Engine Type -> Source Address(s) -> CAN Port**
  - a. Remove all restrictions on that list and check again.

### Restrictions



### No Restrictions



## Analogue Based Engine: No Data

- i. Within the Menu (see Basic Use) navigate to Diagnostics->DB Viewer
- ii. **Scroll down** until you see **Analogue Input 1** on your current screen
- iii. Check that the Input your sender is connected to is reading a sensible value (within the range of the sender)
  - a. If the value is 0 or over 1000 you have either a Ground fault or a Floating fault respectively
  - b. If the value is just out of range, then there is a different physical issue
  - c. If the value is in the right range for the sender, then there is an issue with the Data Conversion (See Below)

### Potential Sender Data

13 of 27		DB Viewer	
System Cleaning Status	---	None	
Inhibit Lamp	---	lamp	
System Cleaning Forced Status	---	None	
Supply Voltage	0 V		LOCAL
Analogue Input 01	70 Ω		LOCAL
Analogue Input 02	414 Ω		LOCAL
Analogue Input 03	188 Ω		LOCAL
Analogue Input 04	378 Ω		LOCAL
Analogue Input 05	221 Ω		LOCAL

### Probably No Connection

13 of 27		DB Viewer	
System Cleaning Status	---	None	
Inhibit Lamp	---	lamp	
System Cleaning Forced Status	---	None	
Supply Voltage	0 V		LOCAL
Analogue Input 01	1107 Ω		LOCAL
Analogue Input 02	1107 Ω		LOCAL
Analogue Input 03	1107 Ω		LOCAL
Analogue Input 04	1108 Ω		LOCAL
Analogue Input 05	1107 Ω		LOCAL

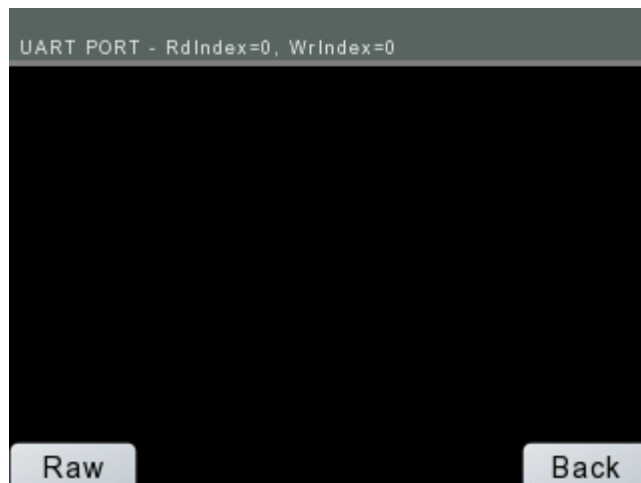
## Data Conversion Issues

- i. Within the Menu navigate to **Setup -> Engines -> Your Engine Type -> Data Conversions**
- ii. Locate your data conversion and **check it is enabled**.
- iii. Within that data conversions menu, **check the raw value is showing**.
- iv. If possible, **adjust the data conversion** (non-adjustable items are greyed out)

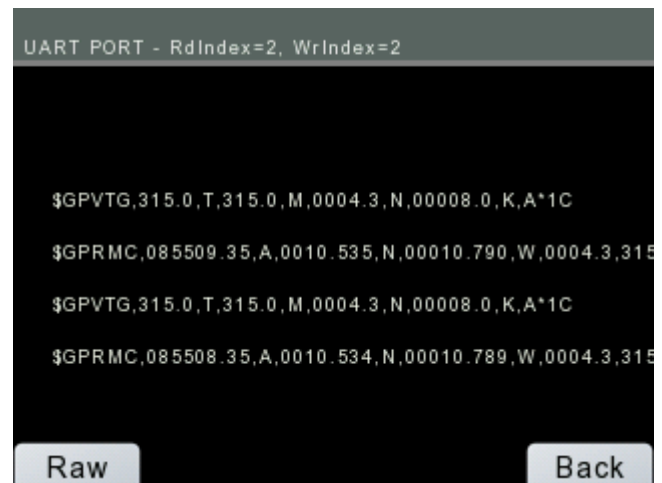
## GPS Not Working

- i. Within the Menu (**see Basic Use**) navigate to **Diagnostics -> UART Viewer**
- ii. Check if you can see messages scrolling past.
  - a. If you can't, check the physical connection
  - b. If you can't, check the Baud Rate
    - i. **Menu->Setup -> Hardware -> UART Baud Rate** – Check it is **correct for your GPS**
  - c. If you can, check the mode is set to **Text (that is says Raw on the button)** and make a note of the messages. (**First block of characters e.g. \$RMC**)

### No Connection



### GPS Data



## Contacting Customer Support

Please go into the **Menus** (see Accessing the **Menus**)

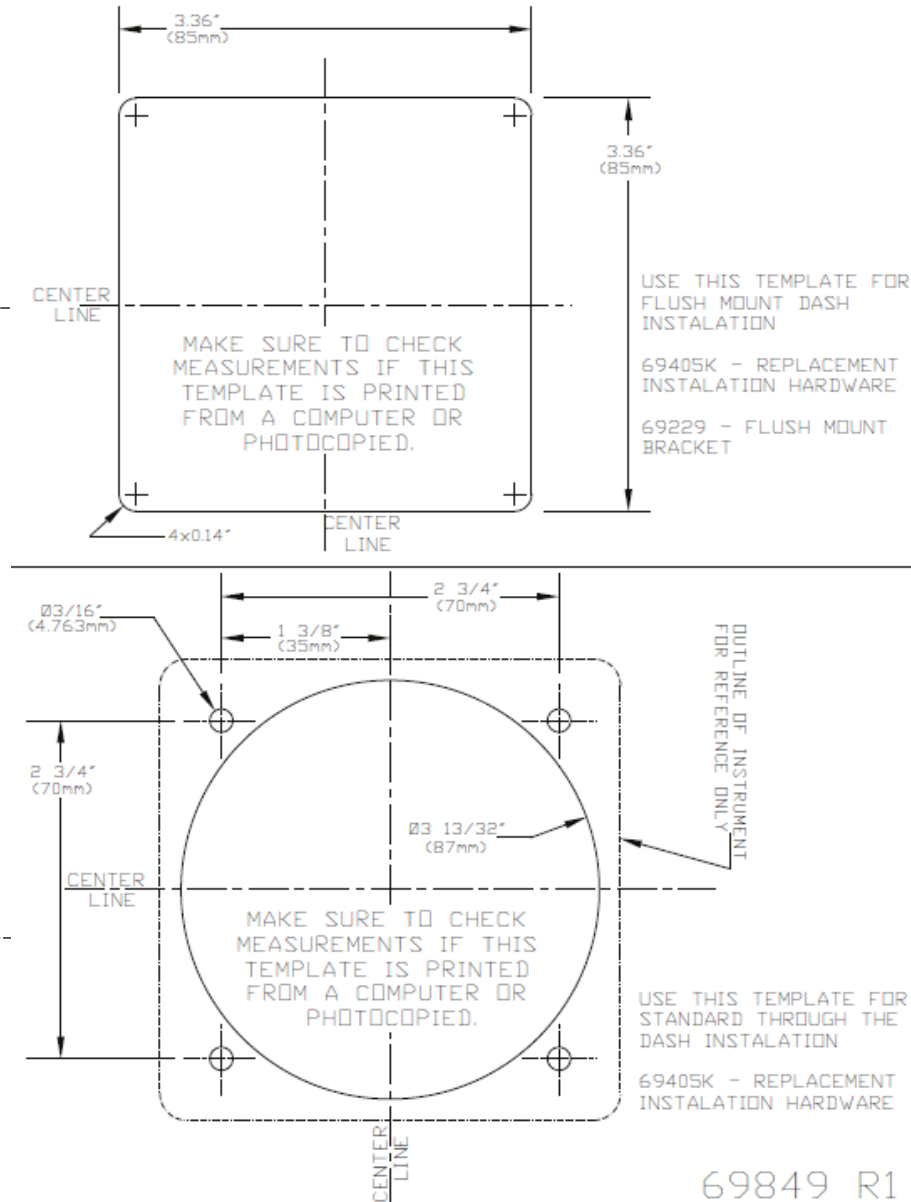
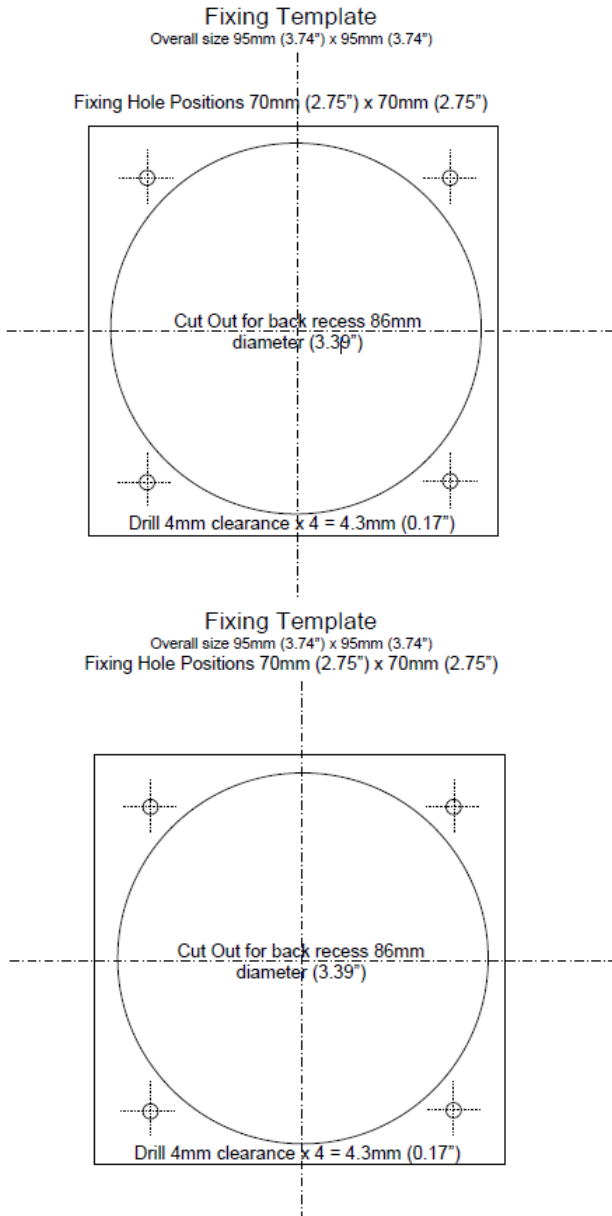
Navigate to the **About Screen** and have that information along with the information on the **Config page** (of the about screen) to hand, along with what is wrong and what you have tried, before contacting support on (+001) 941-538-7775 ext. 815 or email [techservice@veethree.com](mailto:techservice@veethree.com).

## Appendix 1 – Fitting Templates

Please note templates are not to scale and used for information on measurements only. Templates can be downloaded from our website within the Support Section.

### C3 – 3.5” Display

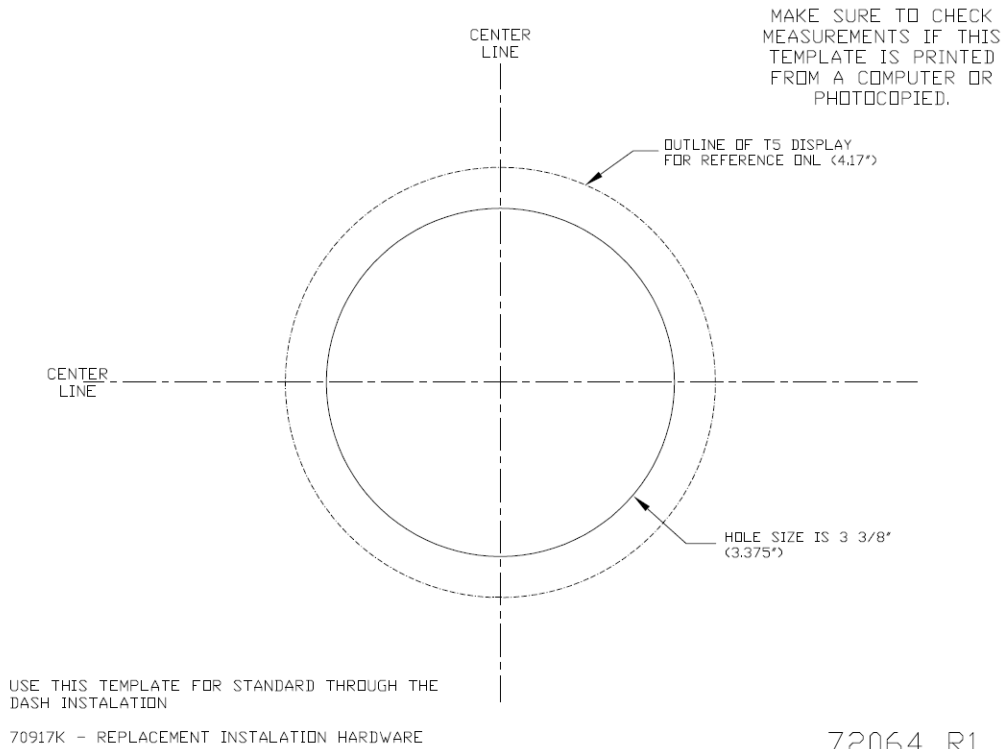
### C3I – 3.5” Low Profile Display



69849 R1

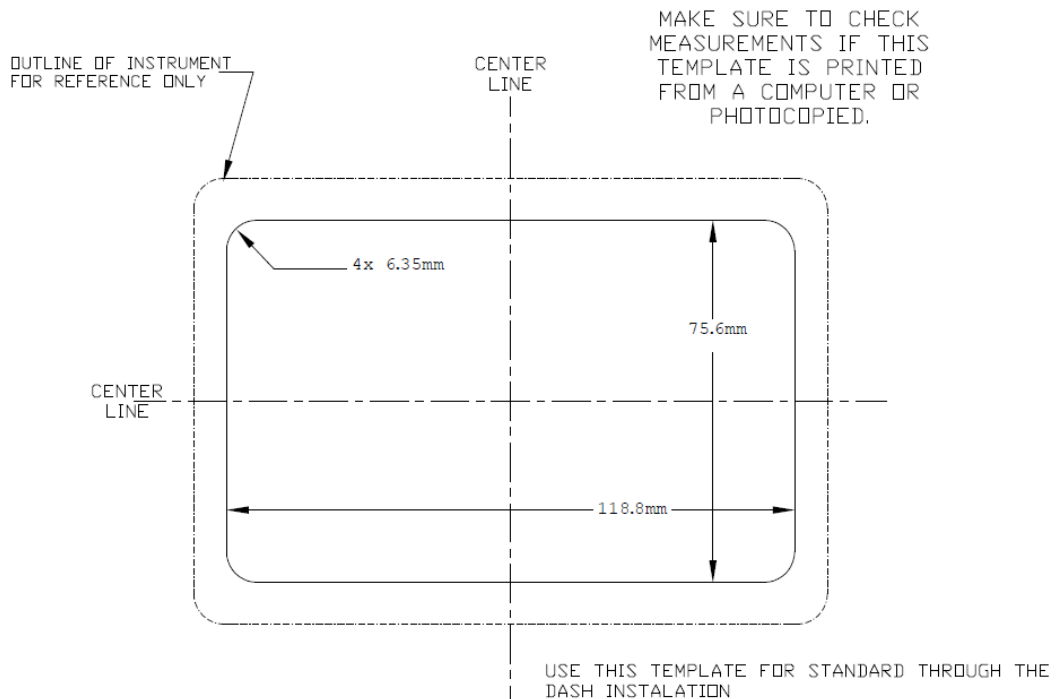
## R3 / R3s – Round Displays

Please note templates are not to scale and used for information on measurements only. Templates can be downloaded from our website within the Support Section.



## T5 – Touch Display

Please note templates are not to scale and used for information on measurements only. Templates can be downloaded from our website within the Support Section.



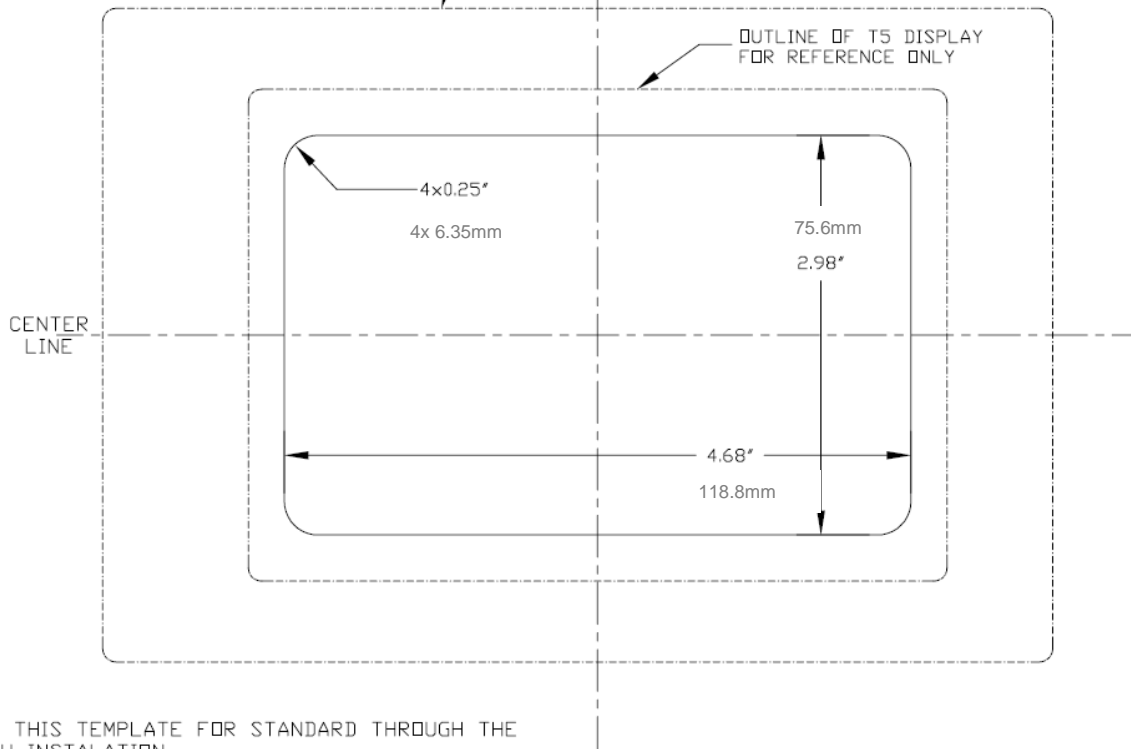
## T7i – Touch Display

Please note templates are not to scale and used for information on measurements only. Templates can be downloaded from our website within the Support Section.

OUTLINE OF T7i DISPLAY FOR REFERENCE ONLY  
(NOTE: T7i LCD IS SHIFTED TO THE LEFT IN RELATION TO CONNECTION BODY CENTER LINE)

CENTER LINE

MAKE SURE TO CHECK MEASUREMENTS IF THIS TEMPLATE IS PRINTED FROM A COMPUTER OR PHOTOCOPIED.



USE THIS TEMPLATE FOR STANDARD THROUGH THE DASH INSTALATION

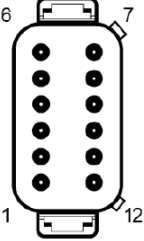


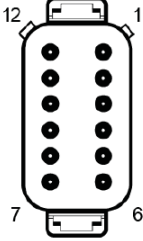
## Appendix 2 – Pin Out Connections

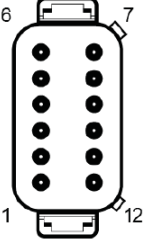
**Important Note:** Do not swap harnesses between the R3 & C3 displays.

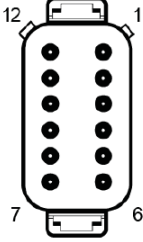
The R3 and C3 primary connector is keyed the same, but the R3 provides Power and Ground OUT on Pin's 11 and 12 for a GPS. If a C3 CAN1 Cable is used on an R3 display then it will put 12v down the CAN Low and Ground the CAN High which will cause issues with terminating resistors and invalidate warranty.

### Connectors for C-Series:

<b>C3: Primary</b>		
	1	Ground
	2	Power
	3	Relay/Solenoid Output 1
	4	Relay/Solenoid Output 2
	5	Isolated CAN Supply (-)
	6	Isolated CAN Supply (+)
	7	Isolated CAN Data H
	8	Isolated CAN Data L
	9	Relay/Solenoid Output 3
	10	Relay/Solenoid Output 4
	11	Primary CAN Data L
	Mates with DT06-12SA	12

<b>C3: Secondary</b>		
	1	Sensor 1 Analogue Input
	2	Sensor 2 Analogue Input
	3	Sensor 3 Analogue Input
	4	Sensor 4 Analogue Input
	5	Sensor 5 Analogue Input
	6	Sensor 6 Analogue Input
	7	Sensor 7 Analogue Input
	8	Digital Input/Flow Sensor 1
	9	Digital Input/Flow Sensor 2
	10	Tachometer Input
	11	RS232 Receiver
	Mates with DT06-12SB	12

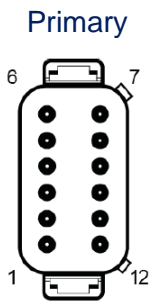
<b>C3I: Primary</b>		
	1	Ground
	2	Power
	3	Relay/Solenoid Output 1
	4	Relay/Solenoid Output 2
	5	Isolated CAN Supply (-)
	6	Isolated CAN Supply (+)
	7	Isolated CAN Data H
	8	Isolated CAN Data L
	9	Relay/Solenoid Output 3
	10	Relay/Solenoid Output 4
	11	Primary CAN Data L
	Mates with DT06-12SA	12

<b>C3I: Secondary</b>		
	1	Sensor 1 Analogue Input
	2	Sensor 2 Analogue Input
	3	Sensor 3 Analogue Input
	4	Sensor 4 Analogue Input
	5	Sensor 5 Analogue Input
	6	Sensor 6 Analogue Input
	7	Sensor 7 Analogue Input
	8	Digital Input/Flow Sensor 1
	9	Digital Input/Flow Sensor 2
	10	Tachometer Input
	11	RS232 Receiver
	Mates with DT06-12SB	12



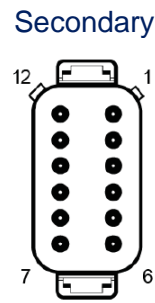
## Connectors for R-Series:

### R3: Connector 1



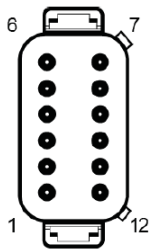
1	Ground (main power supply)
2	Power Input (main power supply – externally fused)
3	Dimmer Input (PWM or Analogue)
4	Analogue In 1 (0-1k OHM)
5	CAN Ground
6	CAN Power
7	NMEA 2000 / J1939 CAN Data H
8	NMEA 2000 / J1939 CAN Data L
9	NMEA 0183+ (Differential)
10	NMEA 0183- (Differential)
11	Power supply (output for GPS)
12	Ground supply (output for GPS)

### R3: Connector 2



1	Analogue Ground
2	Digital Out 1 (Relay/Buzzer)
3	Analogue In 2 (0-1k OHM)
4	Analogue In 3 (0-1k OHM)
5	Analogue In 4 (0-1k OHM)
6	Analogue In 5 (0-1k OHM)
7	Analogue In 6 (0-2.5VDC/ 0-10VDC) (0-1k OHM)
8	Digital Input 1
9	Digital Input 2
10	Digital Input 3
11	Digital Input 4
12	Frequency Input



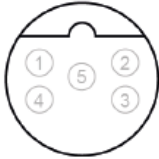
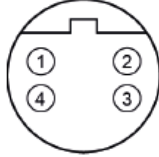
### R3s: Connector 1

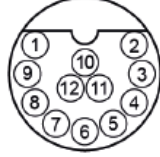


1	Ground
2	Power Input
3	Relay Output 1
4	Relay Output 2
5	CAN Ground – isolated CAN supply (-)
6	CAN Power – isolated CAN supply (+)
7	CAN Data H – isolated CAN Data H
8	CAN Data L – isolated CAN Data C
9	Relay Output 3
10	Relay Output 4
11	Primary CAN Data L
12	Primary CAN Data H

## Connectors for T-Series:


### T5

T5: CAN 1	
	1 No Connection
	2 Positive DC supply
	3 Ground
	4 CAN Data H
	5 CAN Data L
T5: CAN 2	
	1 No Connection
	2 Isolated Volts Positive
	3 Isolated Volts Negative
	4 Isolated CAN Data H
	5 Isolated CAN Data L
T5: Video	
	1 Unused
	2 Unused
	3 Unused
	4 Unused
	5 Unused
Ethernet	
	1 White/Orange +TK
	2 White/Green +RX
	3 Orange - TX
	4 Green


External USB IO	
	1 USB Volts Positive
	2 USB Data Negative (DM)
	3 USB Data Positive (DP)
	4 No Connection
	5 USB Volts Negative
	6 RS422/485 Tx+*
	7 RS422/485 Tx-*
	8 RS422/485 Rx+*
	9 RS422/485 Rx-*
	10 Digital Input
	11 Analogue Input
	12 Relay Output

\* RS422 and RS485 options configured as a build option

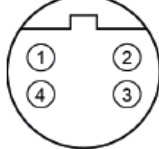
## T7i


<b>T7i: CAN 1</b>	
	1 No Connection
	2 Positive DC supply
	3 Ground
	4 CAN Data H
	5 CAN Data L

<b>T7i: CAN 2</b>	
	1 No Connection
	2 Isolated Volts Positive
	3 Isolated Volts Negative
	4 Isolated CAN Data H
	5 Isolated CAN Data L

<b>Ethernet</b>	
	1 White/Orange +TK
	2 White/Green +RX
	3 Orange - TX
	4 Green

<b>External USB IO</b>	
	1 USB Volts Positive
	2 USB Data Negative (DM)
	3 USB Data Positive (DP)
	4 No Connection
	5 USB Volts Negative
	6 RS422/485 Tx+*
	7 RS422/485 Tx-*
	8 RS422/485 Rx+*
	9 RS422/485 Rx-*
	10 Digital Input
	11 Analogue Input
	12 Relay Output

\* RS422 and RS485 options configured as a build option