CANVU

CANvu Veethree Engine Monitor

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1. INTRODUCTION

These pages provide operating instructions for the Veethree Engine Monitor which displays J1939-compatible engine/ transmission data. Please read through the guide before use.

The Veethree Engine Monitor (VEM) user-configurable application software creates graphical instrument clusters to display parameters and alarms - providing users with a timesaving solution for introducing equipment incorporating higher degrees of electronic display and control.

We hope that you will be pleased with this product and that you will have many years of trouble free operation. If you have any problems or ideas for improvement then we would like to hear from you.

For more information please see the web site: www.v3instruments.com or contact us at: sales@veethree.com

The VEM software runs on a CANvu display with five soft keys, providing a flexible and intuitive Human-Machine Interface (HMI). The 5 soft keys access a graphical menu structure that uses standard and easily-understood icons to indicate the key's current function. This enables the operator to select the required engine/transmission data and display it in the following formats:

- Analog gauges
- Digital values
- Current alarm messages

Additionally, various diagnostic screens are available, allowing detailed investigation of the engine and transmission data stream. The underlying structure of the VEM and its interaction with the soft keys are further explained in the following section. By accessing the Configuration menu, users can customize some of the displayed data to show, for example, metric or imperial units, and various parameters such as the full-scale reading of gauges.

1.1 Getting Started

[Splash Screen]

1.2 Preferred Screen Store

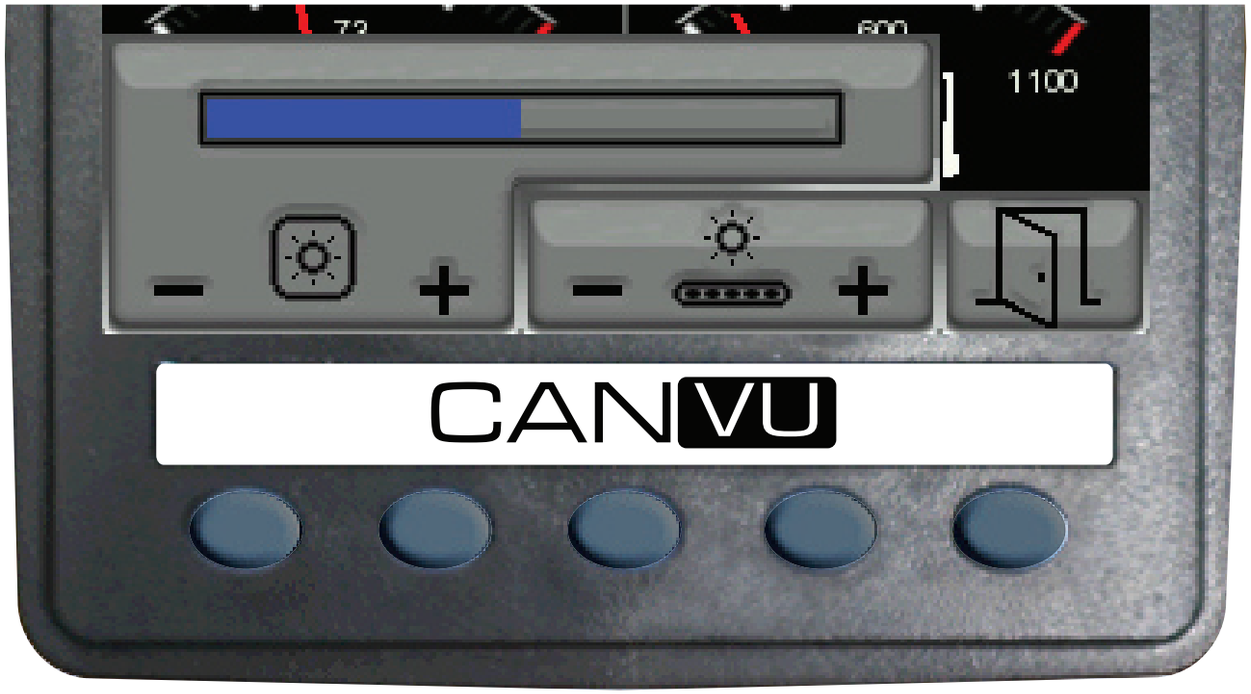
The VEM automatically stores the current screen as the user's preferred page, after a delay of approximately 15 seconds (if no buttons are pushed). On the next power-up the display will start with the splash screen, and then go to the last stored screen. Note: Selecting Restore Defaults on the Systems sub-menu of Configuration will set the screen 1 as the default display.

2. GENERAL OPERATION

2.1 Keys 1 to 4 Operation

There are 4 main user screens accessed via the first four keys. The keys have icons to represent the screen view types, as follows.

Key 1 is a quad gauge view, Key 2 is a quad digital data view and key 3 is a single analog gauge view. Key 4 is used to access the alarm screen.



2.2 Adjusting Lighting and Contrast

Pressing Key 5 (the right-hand key) when the menu icons are not being displayed brings up the lighting menu. The LCD has a number of back-lighting levels that allow the display brightness and keypad brightness to be adjusted. The appropriate level is selected by pressing keys 1 or 2 to decrease or increase the illumination level of the LCD. The keypad brightness is adjusted in the same manner, using Keys 3 and 4. Adjusting the brightness plus or minus will activate the day / night feature. White background for better visibility in daylight and black background for better visibility at night.

3. DISPLAY SCREENS

3.1 Quad Analog View (Screen 1)

This screen is a configurable quad analog gauge view. There is an option to have up to 4 quad analog views (so a total of 16 gauges can be selected). The number of quad views is adjustable between 1 and 4 (default). The data that can be chosen shall also be configurable (an option in the DBViewer screen)

Note. If a parameter is not available from the engine/ transmission, it will not be possible to select it. If the parameter becomes unavailable while in view, '- - -' is displayed.

To adjust the contents of the quad screens - first press any of the first four keys to raise the button bar and then press key 5 to enable the cycling through of all the display parameters.

Data Available for Quad Screens (both analog and digital views)

db_0190_ENGINE_RPM,	db_0084_0517_NAV_WHEEL_BASED_ VEHICLE_SPEED,
db_0110_ENGINE_COOLANT_TEMP,	db_0168_0158_ELEC_BAT_POTENTIAL,
db_0167_ALTERNATOR_POTENTIAL,	db_0115_ALTERNATOR_CURRENT,
db_0114_NET_BATTERY_CURRENT,	db_0102_BOOST_PRESSURE,
db_0109_COOLANT_PRESSURE,	db_0094_FUEL_DELIVERY_PRESSURE,
db_0100_ENGINE_OIL_PRESSURE,	db_0247_TOTAL_ENGINE_HOURS,
db_0127_TRANS_OIL_PRESSURE,	db_0177_TRANS_OIL_TEMP,
db_0173_EXHAUST_GAS_TEMP,	db_0175_ENG_OIL_TEMP_1,
db_0105_INTAKE_MANIFOLD_1_TEMP,	db_0092_TORQUE_USE_AT_RPM,
db_0091_ACCELERATOR_POSITION,	db_0524_SELECTED_GEAR,
db_0523_CURRENT_GEAR,	db_0441_AUXILIARY_TEMP_1,
db_1387_AUXILIARY_PRESSURE_1,	db_0975_EST_PERCENT_FAN_SPEED,
db_0174_FUEL_TEMP,	db_0176_TURBO_OIL_TEMP,
db_0052_ENGINE_INTERCOOLER_TEMP,	db_0098_ENGINE_OIL_LEVEL,
db_0111_COOLANT_LEVEL,	db_0108_BARO_PRESSURE,
db_0172_AIR_INLET_TEMP,	db_0106_AIR_INLET_PRESSURE,
db_0107_AIR_FILTER_1_DIFF_PRESS,	db_0183_FUEL_RATE,
db_0513_ACTUAL_ENGINE_PERCENT_TORQUE,	db_1029_TRIP_AVERAGE_FUEL_RATE,
db_1036_TRIP_ENGINE_RUNNING_TIME	db_0096_FUEL_LEVEL

Quad Digital View (Screen 2)

This screen is a configurable quad digital view. There is an option to have up to 4 quad views (so a total of 16 items can be selected). The number of quad views are adjustable between 1 and 4 (default). The data that can be selected is also configurable (an option in the DBViewer screen).

Note. If a parameter is not available from the engine/ transmission, it will not be possible to select it. If the parameter becomes unavailable while in view, '- - -' is displayed.

3.2 Single Analog View (Screen 3)

This screen is a single analog gauge view. The data selected is also configurable (an option in the DBViewer screen).

Note. If a parameter is not available from the engine/ transmission, it will not be possible to select it.
If the parameter becomes unavailable while in view, '- - -' is displayed.

Data Available for Single Screen

db_0190_ENGINE_RPM,	db_0110_ENGINE_COOLANT_TEMP,
db_0100_ENGINE_OIL_PRESSURE,	db_0183_FUEL_RATE,
db_0102_BOOST_PRESSURE,	db_0168_0158_ELEC_BAT_POTENTIAL,
db_0167_ALTERNATOR_POTENTIAL,	db_0115_ALTERNATOR_CURRENT,
db_0114_NET_BATTERY_CURRENT,	db_0109_COOLANT_PRESSURE,
db_0094_FUEL_DELIVERY_PRESSURE,	db_0127_TRANS_OIL_PRESSURE,
db_0177_TRANS_OIL_TEMP,	db_0173_EXHAUST_GAS_TEMP,
db_0175_ENG_OIL_TEMP_1,	db_0105_INTAKE_MANIFOLD_1_TEMP

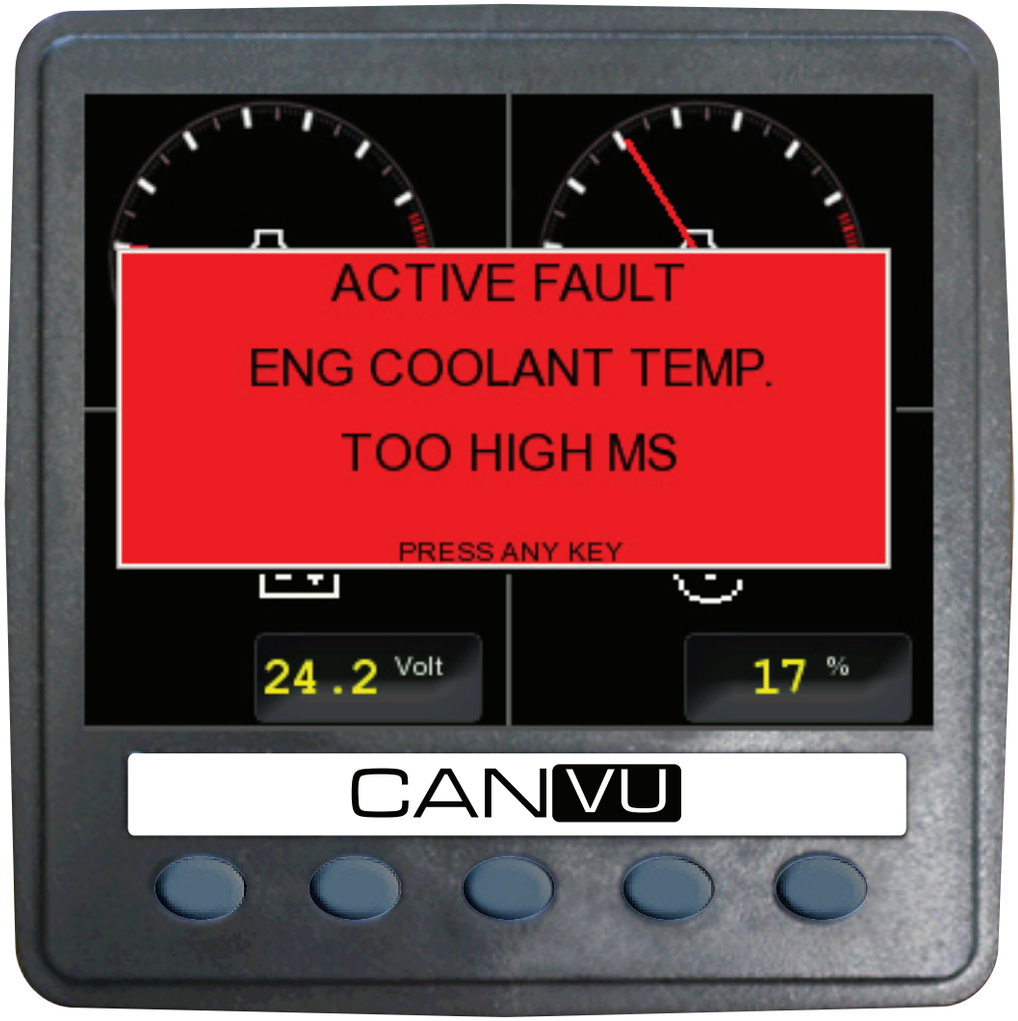
4. ALARM FUNCTIONALITY

(Screen 4)

The VEM supports active faults received from DM1 messages.

When an active/current alarm is received, a flashing pop-up window appears overlaid on the active screen, showing details of the current alarm. When an active alarm is received, the VEM activates its internal sounder.

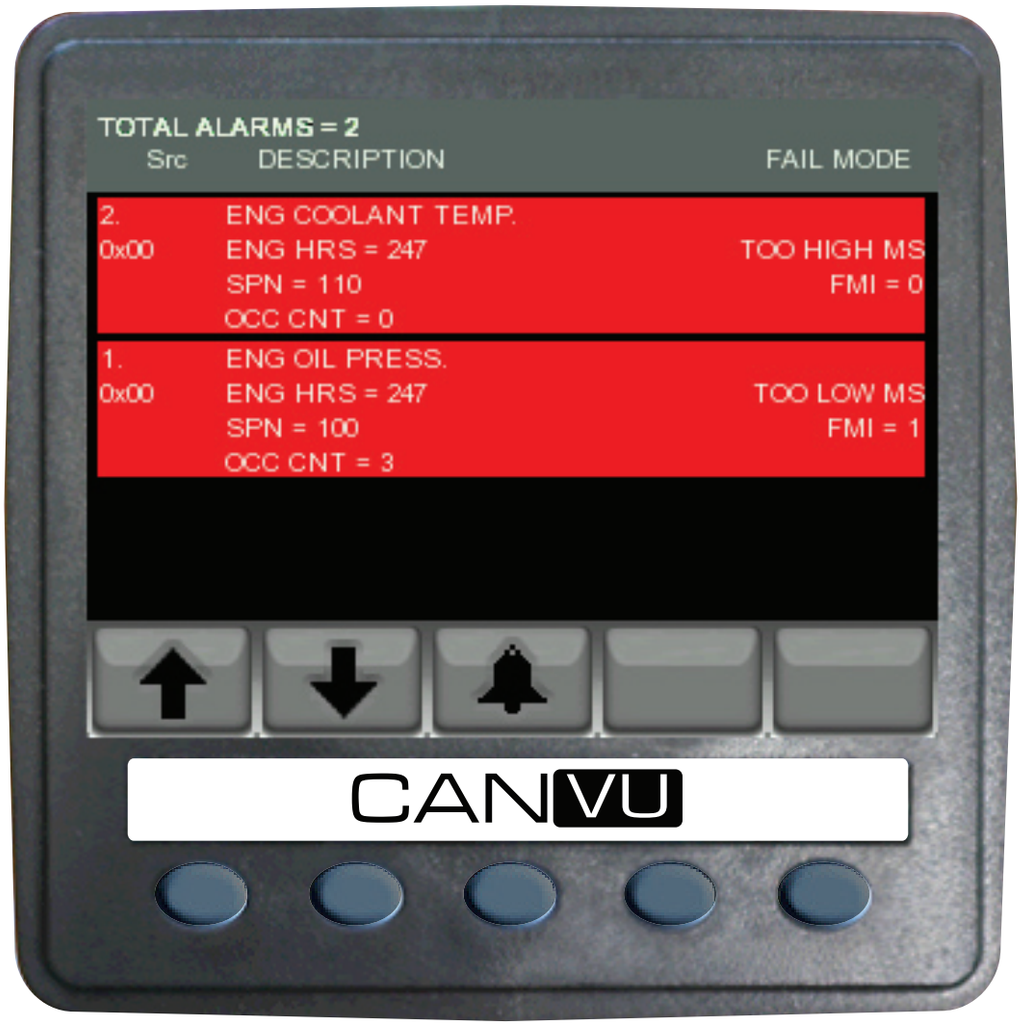
The alarm list is accessed by pressing any key while an alarm pop-up is displayed, or by pressing any of the first 4 keys to show the button bar, and then key 4. This screen displays all current active alarms. Alarms not yet acknowledged are shown



Alarm Pop-up Screen

in black text on a red background. Alarms already acknowledged are shown in white text on black. If the engine hours data is available, the list indicates when the alarm was initiated.

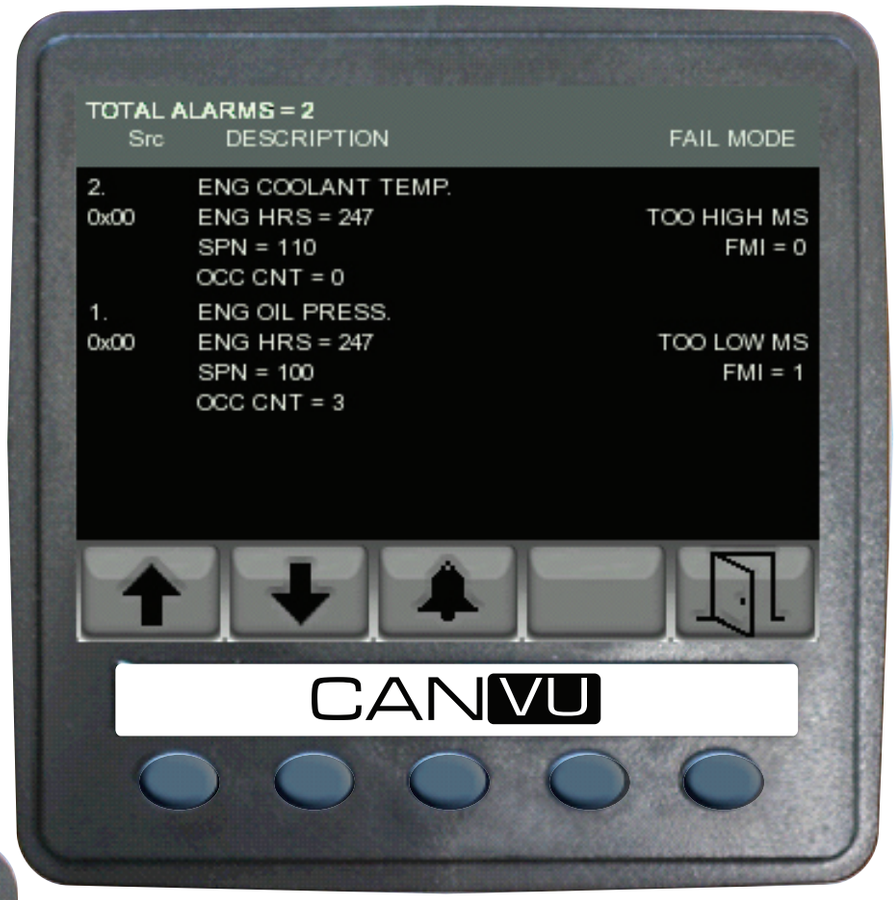
When first entering the alarm screen, the list automatically displays the most recent alarm. The list can be scrolled using keys 1 and 2. This screen cannot be exited until all alarms have been acknowledged by pressing key 3. Alarm messages are automatically cleared from the list when no longer received by the VEM.



Alarm Screen Before Alarm Acknowledge.

ENGINE SERVICE WARNING. In the Configuration menu, users can set the engine service interval in hours. When the VEM determines an engine service is due, it will display SERVICE REQUIRED on the splash screen that appears at power-up.

DATA COMMUNICATIONS FAILURE. If the VEM cannot detect engine/transmission data broadcasts, a pop-up window with a data communications failure warning icon will appear and flash. Once engine/transmission data is detected the warning disappears and normal data display resumes.

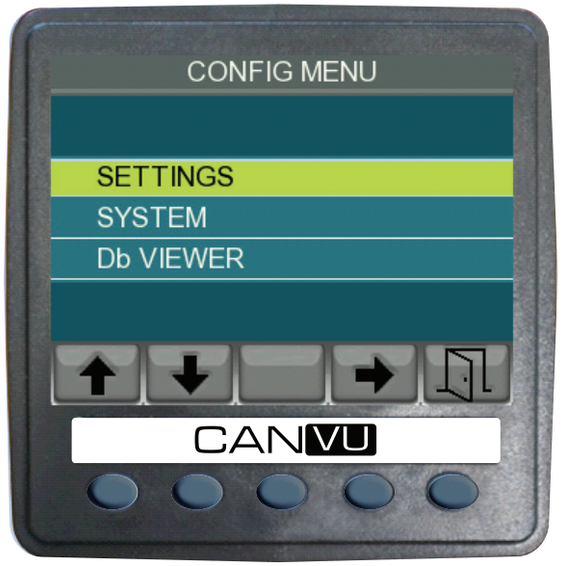


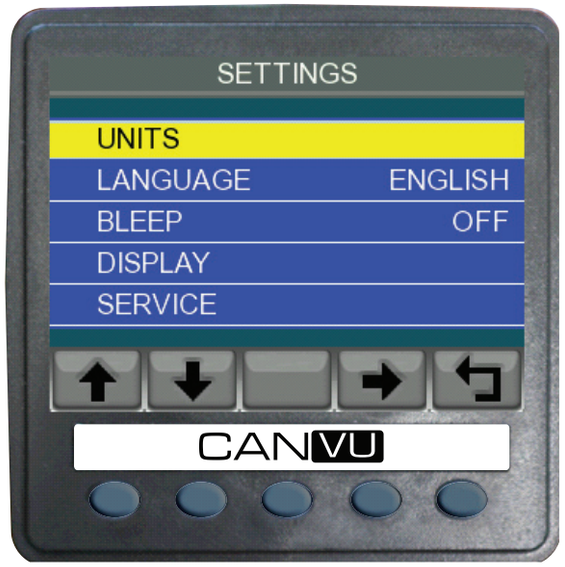
Typical Alarm Screen after Alarm Acknowledge

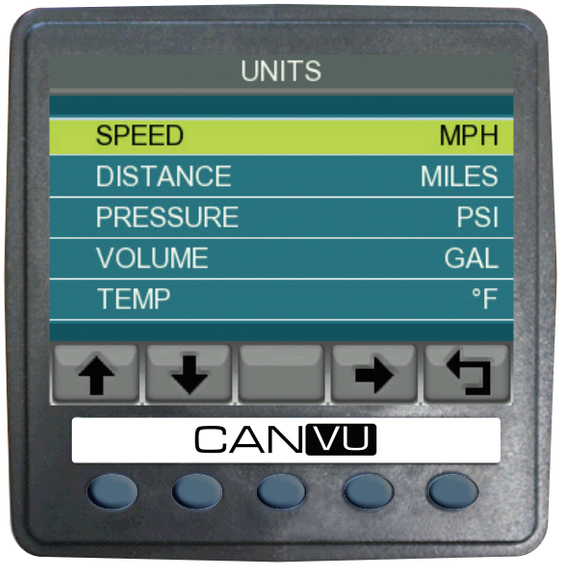
If any active alarms still exist after acknowledging the icon shown to the left will continue to flash to indicate this.

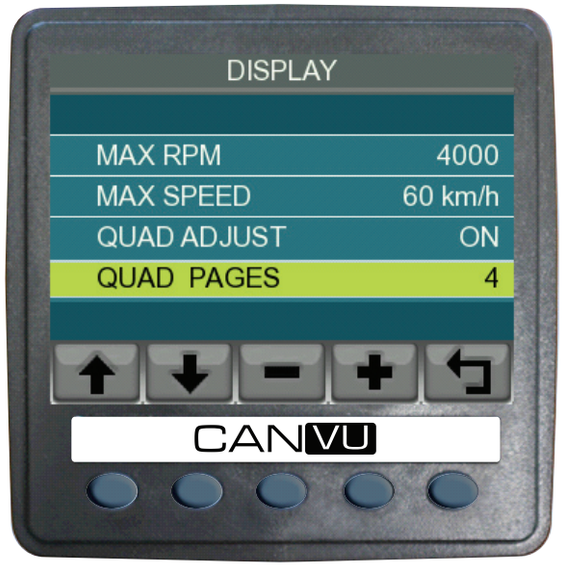
5. MENU SCREENS

5.1 Top Level Menu



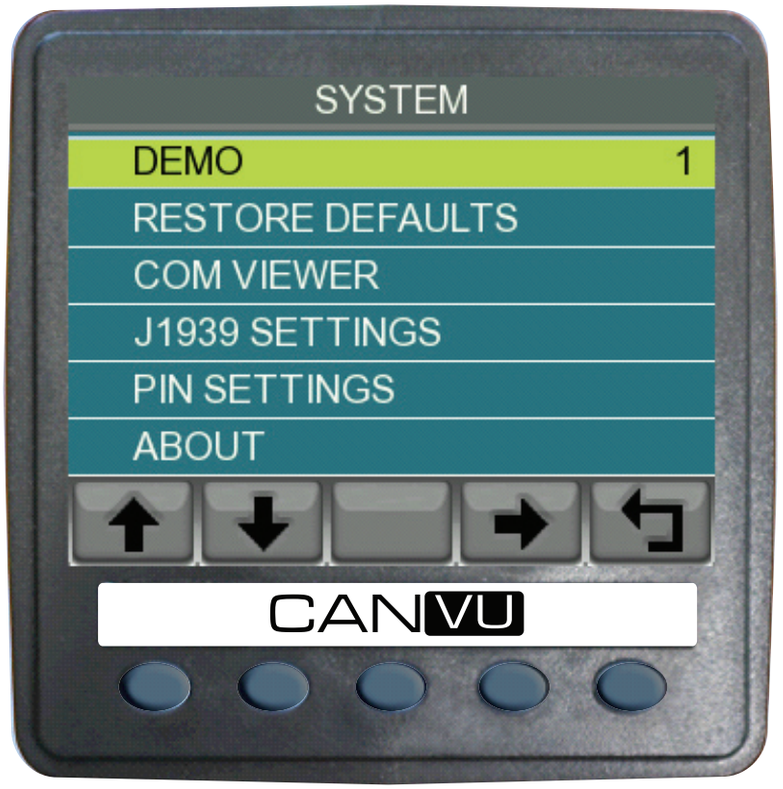


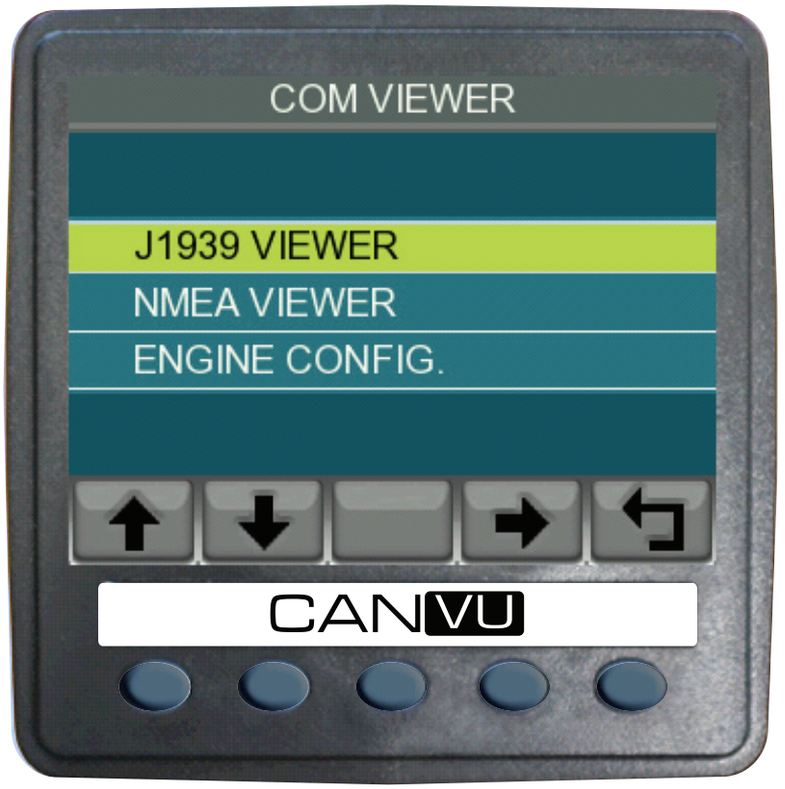


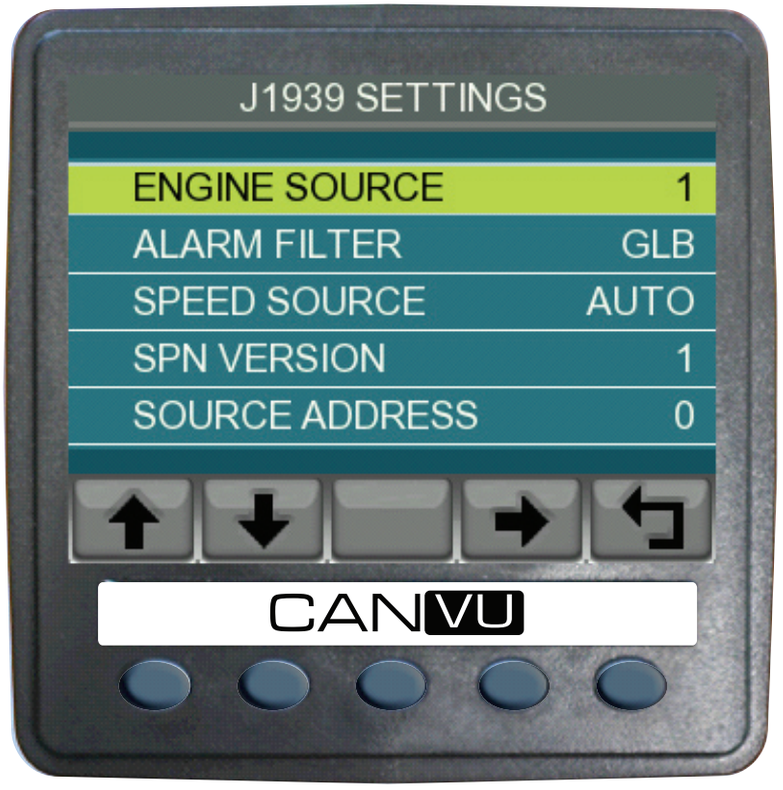


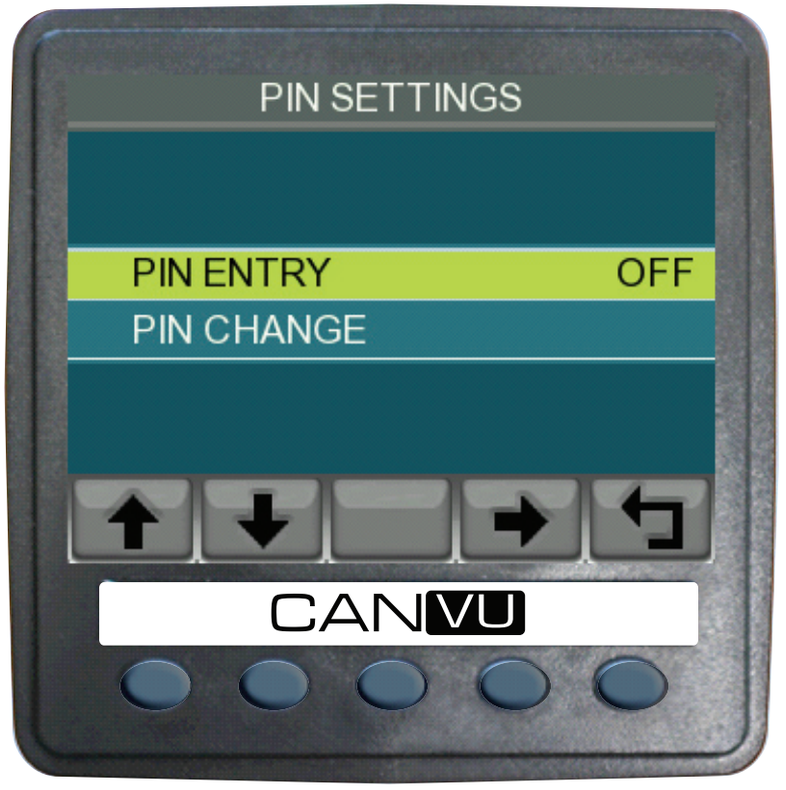
5.2 Settings Menu and Sub-menus

5.3 System Menu and Sub-menus

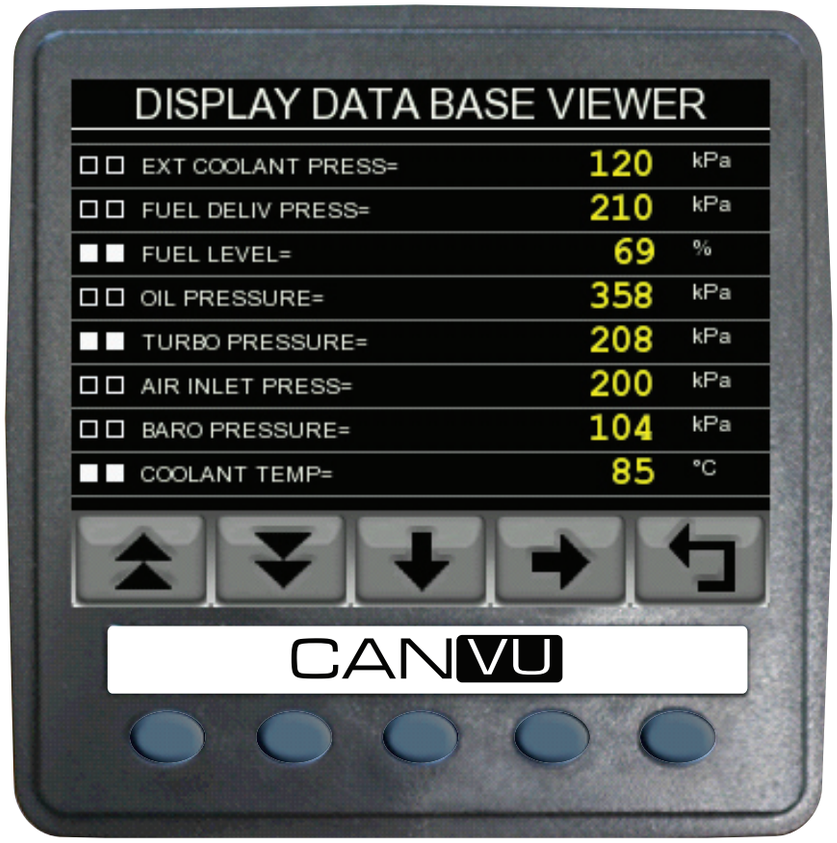


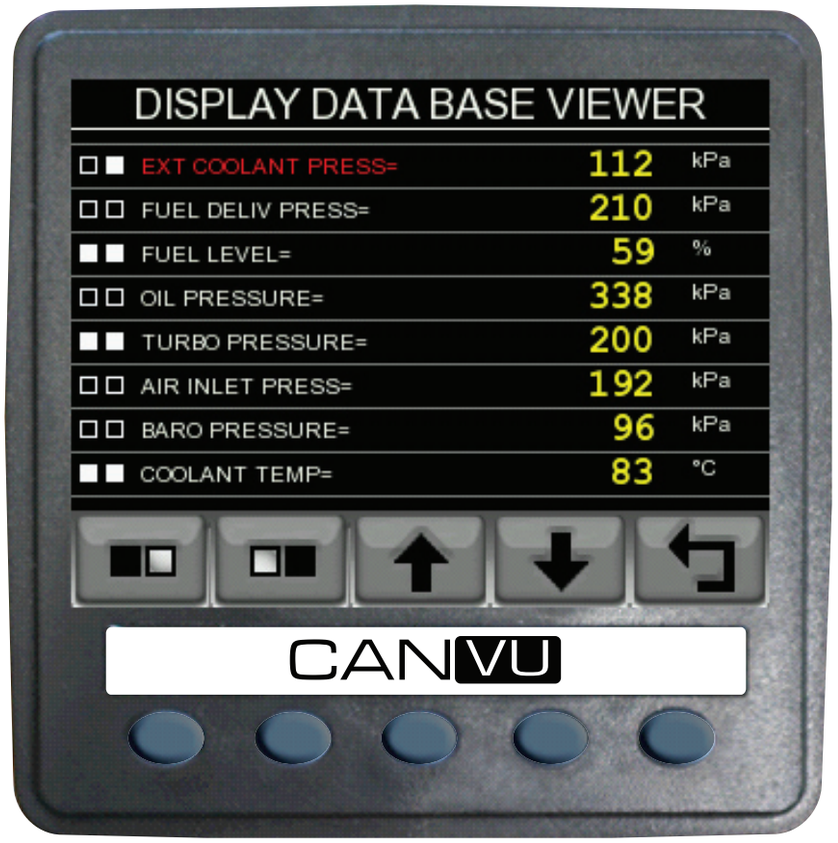






5.4 Data Base Viewer / Display Mapping





LEFT: This screen can be adapted to allow the data mapping / filter for each of the three data views. The operator can check boxes for each item they want to appear on each of the standard views (Quad and Single). Key 1 and Key 2 are page up/down respectively. Key 3 moves down the list one item and Key 4 is to edit the settings of the view filters.

RIGHT: This shows the screen in “edit” mode where the highlighted item (in RED) can be chosen to be viewed in the quad or the single view or in both or in neither.

6. J1939 PGNs SUPPORTED

// PGN 61442 (0xF002) ETC1 (Electronic Transmission Controller #1)

// PGN 61443 (0xF003) EEC2 (Electronic Engine Controller #2)

// PGN 61444 (0xF004) EEC1 (Electronic Engine Controller #1)

// PGN 61445 (0xF005) ETC2 (Electronic Transmission Controller #2)

// PGN 65169 (0xFE91) Fuel Leakage

// PGN 65178 (0xFE9A) Turbocharger Information 2

// PGN 65187 (0xFEA3) Exhaust Port Temperature 1 - EPT1

// PGN 65188 (0xFEA4) Engine Temperature 2 - ET1

// PGN 65203 (0xFEB3) Fuel Information (Liquid) LFI

// PGN 65253 (0xFEE5) Engine Hours Revolutions

// PGN 65262 (0xFEEE) Engine Temperature

// PGN 65265 (0xFEE8) Vehicle Direction Speed

// PGN 65257 (0xFEE9) Fuel Consumption

// PGN 65263 (0xFEEF) Engine Fluid Level/Pressure

// PGN 65164 (0xFE8C) Auxiliary Analog Information

// PGN 65266 (0xFEF2) Fuel Economy

// PGN 65270 (0xFEF6) Inlet Exhaust Conditions

// PGN 65271 (0xFEF7) Vehicle Electrical Power

// PGN 65272 (0xFEF8) Transmission Fluids

// PGN 65276 (0xFEFC) Dash Display

// PGN 65213 (0xFEBD) Fan Drive

// PGN 65248 (0xFEE0) Vehicle Distance

// PGN 65265 (0xFEF1) Cruise Control/Vehicle Speed

// PGN 65269 (0xFEF5) Ambient Conditions

// PGN 65243 (0xFEDB) Engine Fluid Level/Pressure #2

// PGN 65245 (0xFEDD) Turbocharger - TC

// PGN 65246 (0xFEDE) Air Start Pressure - Air 2

// PGN 65247 (0xFEDF) Electronic Engine Controller 3 - EEC3

// PGN 65226 (0xFECA) DM1 (Active Trouble Codes)

// PGN 57088 (0xDF00) DM13 (Start/Stop Broadcast)

7. DATABASE LIST AND PGNs

DATABASE NAME	Description	J1939 PGN
db_0109_COOLANT_PRESSURE,	Extended Coolant Pressure	FEEF
db_0094_FUEL_DELIVERY_PRESSURE,	Fuel Delivery Pressure	FEEF
db_0096_FUEL_LEVEL,	Fuel Level	FEFC
db_0100_ENGINE_OIL_PRESSURE,	Engine Oil Pressure	FEEF
db_0102_BOOST_PRESSURE,	Turbo Pressure	FEF6
db_0106_AIR_INLET_PRESSURE,	Air Inlet Pressure	FEF6
db_0108_BARO_PRESSURE,	Barometric Pressure	FEF5
db_0110_ENGINE_COOLANT_TEMP,	Engine Coolant Temperature	FEEE
db_0127_TRANS_OIL_PRESSURE,	Transmission Oil Pressure	FEF8
db_0168_0158_ELEC_BAT_POTENTIAL,	Battery Potential (Voltage) - Switched	FEF7
db_0173_EXHAUST_GAS_TEMP,	Exhaust Temperature	FEF6
db_0175_ENG_OIL_TEMP_1,	Engine Oil Temperature	FEEE
db_0177_TRANS_OIL_TEMP,	Transmission Oil Temperature	FEF8
db_0183_FUEL_RATE,	Fuel Rate Per Time	FEF2
db_0190_ENGINE_RPM,	Engine Speed	F004
db_0247_TOTAL_ENGINE_HOURS,	Total Engine Hours	FEE5
db_0250_TOTAL_FUEL_USED,	Total Fuel Used	FEE9
db_0092_TORQUE_USE_AT_RPM,	Percent of Available Torque at RPM Currently Being Used	F003

DATABASE NAME	Description	J1939 PGN
db_0091_ACCELERATOR_POSITION,	Percent Accelerator Position	F003
db_0441_AUXILIARY_TEMP_1,	Auxiliary Temperature #1	FE8C
db_0105_INTAKE_MANIFOLD_1_TEMP,	Inlet Manifold Temperature	FEF6
db_0084_0517_NAV_WHEEL_BASED_ VEHICLE_SPEED,	Navigation Based Vehicle Speed	FEF1
db_0182_TRIP_FUEL,	Trip Fuel	FEE9
db_1036_TRIP_ENGINE_RUNNING_TIME,	Trip Hours	FEB0
db_1029_TRIP_AVERAGE_FUEL_RATE,	Average Fuel Rate	FEB3
db_FUEL_REMAINING,	Fuel Remaining (Calculated)	
db_DISTANCE_REMAINING,	Distance Remaining (Calculated)	
db_FUEL_MASS,	Mass of Remaining Fuel	
db_0167_ALTERNATOR_POTENTIAL,	Alternator Voltage	FEF7
db_0115_ALTERNATOR_CURRENT,	Alternator Current	FEF7
db_0114_NET_BATTERY_CURRENT,	Net Battery Current	FEF7
db_0524_SELECTED_GEAR,	Selected Gear	F005
db_0523_CURRENT_GEAR,	Current Gear	F005
db_0244_TRIP_DISTANCE,	Trip Distance	FEE0
db_0245_TOTAL_VEHICLE_DISTANCE,	Total Distance	FEE0
db_0975_EST_PERCENT_FAN_SPEED,	Fan Speed	FEBD
db_0174_FUEL_TEMP,	Fuel Temperature	FEEE

CONTINUES ON NEXT PAGE

7. DATABASE LIST AND PGNs CONTINUED

DATABASE NAME	Description	J1939 PGN
db_0176_TURBO_OIL_TEMP,	Turbo Oil Temperature	FEEE
db_0052_ENGINE_INTERCOOLER_TEMP,	Engine Intercooler Temperature	FEEE
db_0098_ENGINE_OIL_LEVEL,	Engine Oil Level	FEEF
db_0111_COOLANT_LEVEL,	Engine Coolant Level	FEEF
db_0184_INSTANT_FUEL_ECON,	Instantaneous Fuel Economy	FEF2
db_0185_AVG_FUEL_ECON,	Average Fuel Economy	FEF2
db_0172_AIR_INLET_TEMP,	Air Inlet Temperature	FEF5
db_0157_INJ_METERING_RAIL_1_ PRESSURE,	Injector Metering Rail 1 Pressure	FEDB
db_1349_INJ_METERING_RAIL_2_ PRESSURE,	Injector Metering Rail 2 Pressure	FEDB
db_1387_AUXILIARY_PRESSURE_1,	Auxiliary Presssure #1	FE8C
db_0191_OUTPUT_SHAFT_SPEED,	Output Shaft Speed	F002
db_0161_INPUT_SHAFT_SPEED,	Input Shaft Speed	F002
db_0573_TORQUE_CONVERTER_LOCKUP_ ENGAGED,	Torque Lockup Engaged	F002
db_SERVICE_HOURS,	Engine Hours Until Next Service	
db_0107_AIR_FILTER_1_DIFF_PRESS,	Air Filter Differential Pressure	FEF6

DATABASE NAME	Description	J1939 PGN
db_0513_ACTUAL_ENGINE_PERCENT_ TORQUE,		F004
db_0512_DRIVERS_DEMAND_PERCENT_ TORQUE,	Demand Being Placed on Engine, e.g. Accelerator Pedal	F004
db_0082_AIR_START_PRESSURE,		FEDE
db_0103_TURBO_1_SPEED,		FEDD
db_0123_CLUTCH_PRESSURE,		FEF8
db_0515_ENGINES_DESIRED_OPERATING_ SPEED,		FEDF
db_0988_TRIP_GROUP_1,		DE00
db_1136_ENGINE_ECU_TEMP,		FEA4
db_1137_EXHAUST_GAS_PORT_1_TEMP,		FEA3
db_1138_EXHAUST_GAS_PORT_2_TEMP,		FEA3
db_1172_TURBO_1_COMPRESSOR_INLET_ TEMP,		FE9A
db_1239_FUEL_LEAKAGE_1,		FE91
db_1240_FUEL_LEAKAGE_2,		FE91
db_0164_INJECTION_CONTROL_PRESSURE,		FEDB

8. COMMUNICATIONS

The product supports J1939 and NMEA 0183 receive only. NMEA 0183 should be used to acquire speed data from a GPS sensor.

9. ACCESSORIES

* CAN + POWER Cable
* FRONT MOUNT KIT
* USER MANUAL

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CANvu Veethree Engine Monitor