



GRAYHILL

3D35 Display

EngineView 35 Application Manual

Rev. 2



Revision	Date	Description
1		Pre-Release
2	March 18, 2025	Initial Release

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1. INTRODUCTION

1.1 OVERVIEW

The purpose of this document is to describe the operation of the standard Grayhill EngineView35 application for the 3D35 display.

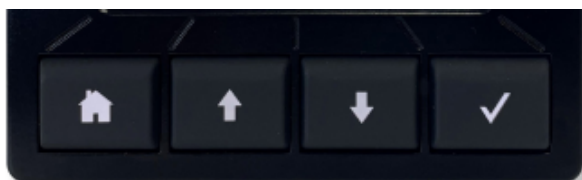
1.2 FUNCTIONALITY

The EngineView35 application for the 3D35 display provides the following functionality:

- Speedometer gauge display: dial style gauge for display of vehicle speed
- Tachometer gauge display: dial style gauge for display of engine RPM
- Parameter monitoring (CAN bus): multiple (up to 6) engine/transmission data parameters can be monitored and displayed on screen. The parameters are configurable using a text-based menu.
- Fault indication: An alert icon is displayed to indicate an active fault. Screens are available for displaying active and stored fault information.

1.3 KEYPAD BUTTONS

The 3D35 display has 4 keypad buttons:



The buttons are used for menu navigation, configuration changes, and parameter adjustments. In general, the buttons function as follows:

Button	Function
	Go to Home screen
	Up / Back / Increase
	Down / Forward / Decrease
	Select



2. STARTUP OPERATION

2.1 POWER ON

On power up of the display, an EngineView35 startup screen will display.

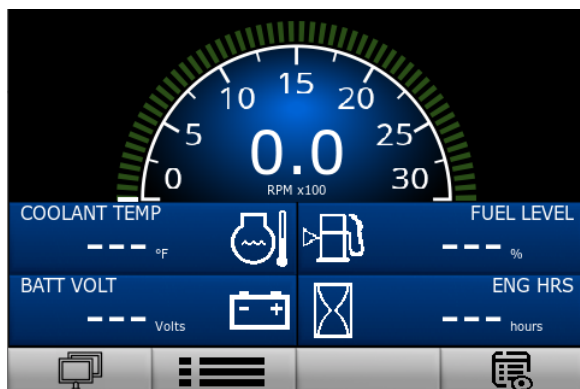
The startup screen will display a preheating message until the “wait-to-start” message (SPN 1081) is received on the CAN bus.



The ST-LINK/V2 is an in-circuit debugger/programmer for the STM8 and STM32 microcontrollers.

2.2 ENGINE RUNNING

After the initial power up sequence is complete and the engine is running, the Home screen is displayed.



3. SCREEN LAYOUT

The Home screen is the main screen displayed during normal operation, providing vehicle information to the operator. The screen consists of the following sections:

- Gauge
- Alert
- Parameters
- Buttons

The Home screen can be assigned 2 customizable screen options, which will be described in detail in a later section.

3.1 GAUGE SECTION

The Gauge section contains a dashboard-style gauge that can be configured to display either vehicle speed or engine speed.



For the engine speed gauge, the maximum RPM value is configurable. The available settings are:

- 3000 RPM
- 4000 RPM
- 6000 RPM

Configuration is done in the User Setup menu, which will be covered in section 4.



3.2 ALERT SECTION

In the Alert section, different icons are displayed indicating vehicle warning conditions.

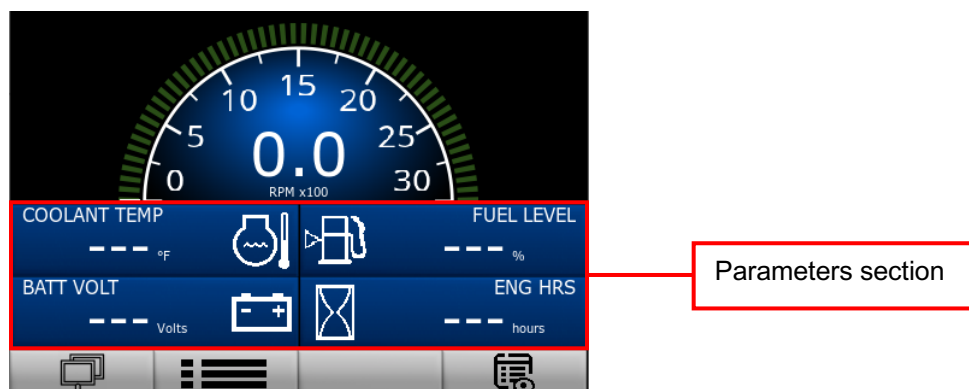


The possible icons include:

Icon	Indicator	Condition
	Red Stop Lamp (RSL)	Severe condition, requires stopping the vehicle
	Amber Warning Lamp (AWL)	Problem condition, does not require immediately stopping the vehicle
	Malfunction Indicator Lamp (MIL)	Emissions related trouble code
	Protect Lamp	Trouble code indicating problem with vehicle system that is most probably not electronic subsystem related

3.3 PARAMETERS SECTION

The Parameters section displays data values and icons for various engine parameters being monitored on the vehicle CAN bus.

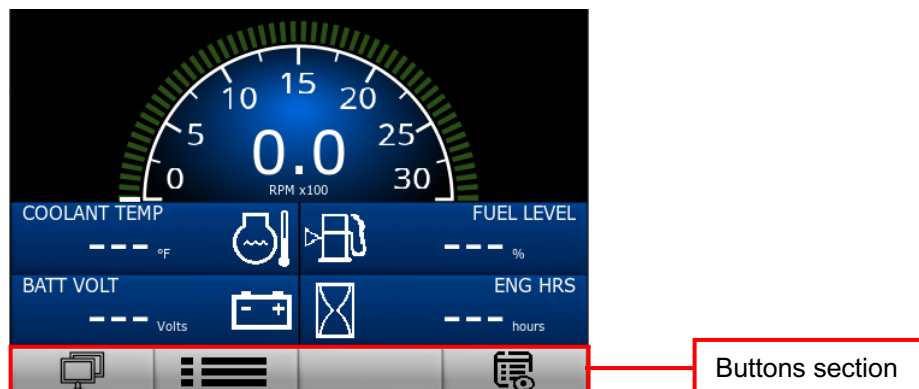


The format of the Parameters section can be configured to display either a maximum of 4 or 6 parameters simultaneously. This setting is configured in the menu and is covered in a later section.



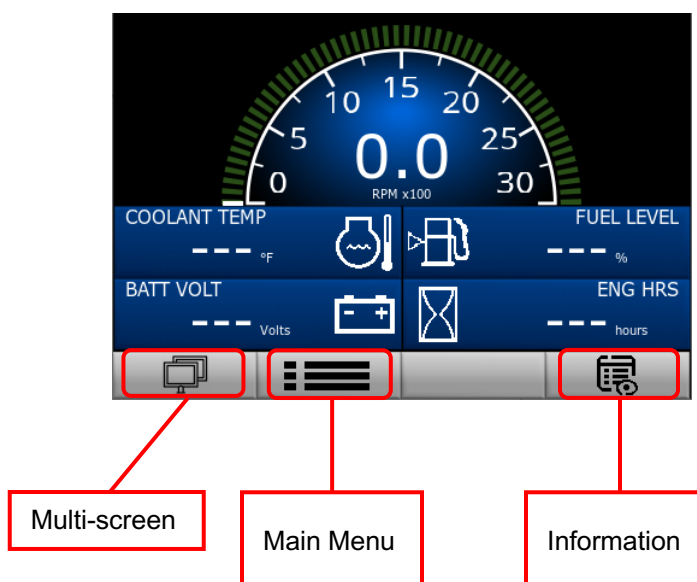
3.4 BUTTONS SECTION

The Buttons section contains soft button icons representing the function of the 4 keypad buttons on the unit. The buttons can have different functions depending on which screen is active. The icons displayed indicate the function of each button for the active screen.



The Home screen typically contains 3 button options: Multi-Screen, Main Menu, and Information.

- Multi-Screen: toggles between the 2 customizable Home screen options
- Main Menu: brings up the Main Menu interface (detailed in section 4)
- Information: displays the Full Parameter list (detailed in section 4)



The Buttons section of other screens/menus contain various button icons. The following table shows the button icons and their corresponding keypad button functions.

Keypad Button	Soft Button	Function
		Multi-screen 1
		Multi-screen 2
		Home
		Menu
		Up / Increment
		Down / Decrement
		Move selection right
		Move selection left
		Accept
		Maintenance
	FAULTS	Fault Screen
		Info



4. MAIN MENU

Various display settings are configurable through the Main Menu.

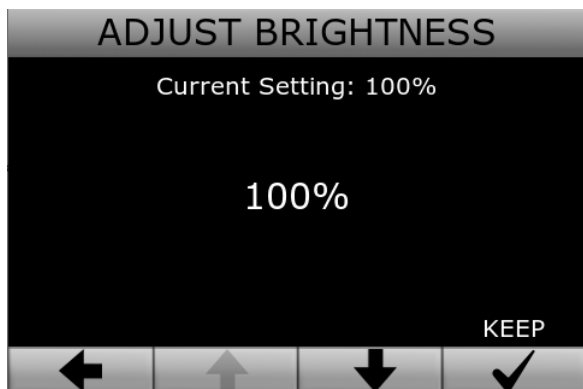


Menu options are selected using the Up and Down arrow buttons to change the highlighted item. Press the Check button to choose the selected option and change to the corresponding screen.

4.1 ADJUST BRIGHTNESS

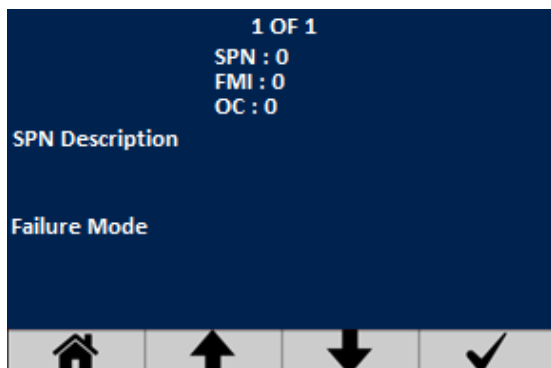
Use the Up and Down arrow buttons to adjust the backlight level between 10 – 100 %.

Press Keep (Check button) to keep the new setting and return to the menu; or press the Left arrow button to discard the new setting and return to the menu.



4.2 ACTIVE FAULTS

When an active fault is detected on the CAN bus, a popup window will automatically display over the Home screen. Information such as the SPN value and description and the Failure Mode Indicator (FMI) will be displayed for the fault in the popup window.



Press the Check button to acknowledge the fault and dismiss the popup window. As long as the fault remains active, the 'FAULTS' indication will be displayed in the Buttons section, and an icon will be displayed in the Alerts section.



Pressing the Faults button while a fault is indicated will bring up the Active Faults screen.

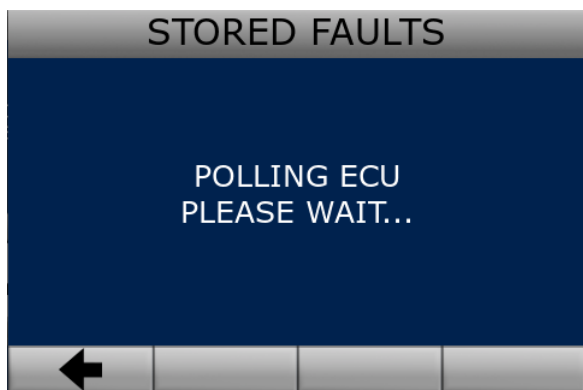


Use the Up arrow and Down arrow buttons to scroll through the list of active faults.



4.3 STORED FAULTS

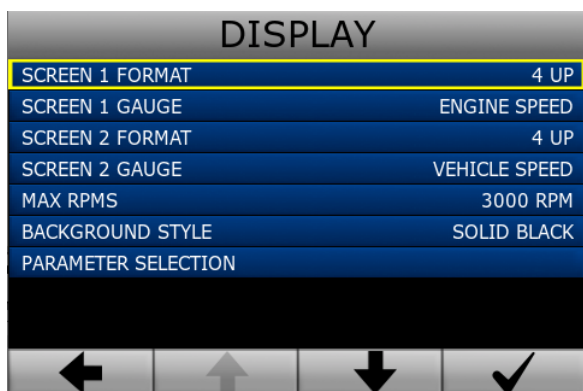
Selecting Stored Faults from the Main menu will display the Stored Faults screen. A request is sent on the CAN bus to retrieve saved fault information from the ECU.



Any stored fault information received from the ECU will be displayed.

4.4 DISPLAY

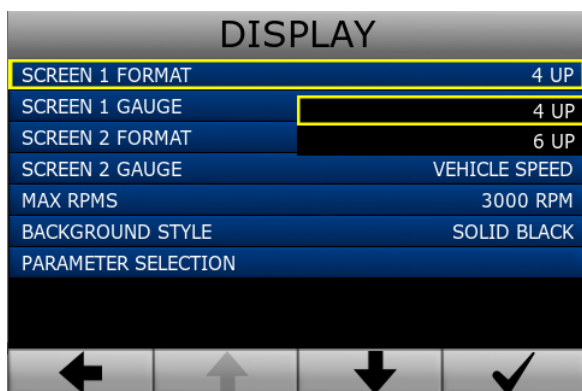
Pressing Display from the Main menu will bring up the Display sub-menu. The Display sub-menu contains several screen layout and configuration items for the user to set according to preference.



4.4.1 HOME SCREEN FORMAT

For the Home screen, 2 screen options can be individually configured via the Display menu. On the main screen, the Multi-screen button is used to toggle between the two main screen options.

From the Display menu, select Screen 1 Format. A dropdown list will display with the available options: 4 UP and 6 UP. The 4 UP and 6 UP format options indicate whether the screen will display up to either 4 or 6 data parameters. Use the Up and Down arrow buttons to select the desired option, then press the Check button to confirm the selection.



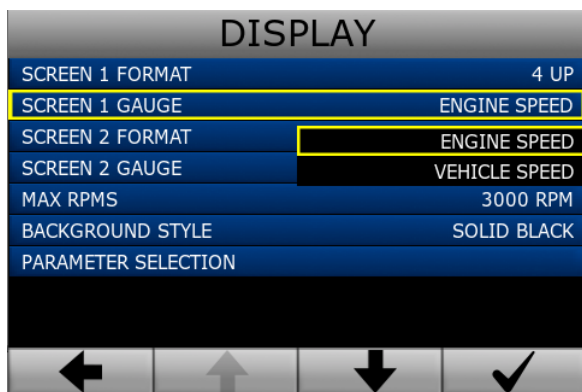
Set the Screen 2 Format in the same fashion.

4.4.2 GAUGE SELECTION

The following gauge options are available for each of the 2 main screens:

- Vehicle Speed
- Engine Speed

From the Display menu, select Screen 1 Gauge. A dropdown list will display with the Engine Speed and Vehicle Speed options. Use the Up and Down arrow buttons to select the desired option, then press the Check button to confirm the selection.



Set the Second Screen Gauge in the same fashion.

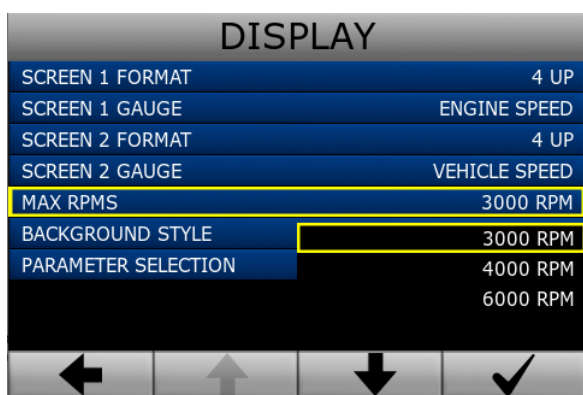


4.4.3 MAX RPM'S

The resolution of the Engine Speed gauge is on the main screen is configurable by setting the maximum RPM value. The following options are possible:

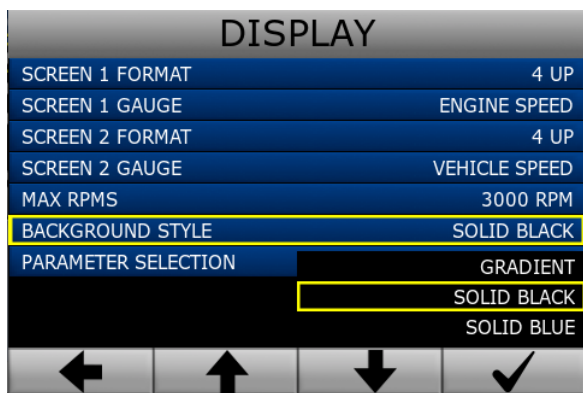
- 3000 rpm
- 4000 rpm
- 6000 rpm

From the Display menu, select Max RPMs. A dropdown list will display with the available RPM options. Use the Up and Down arrow buttons to select the desired option, then press the Check button to confirm the selection.



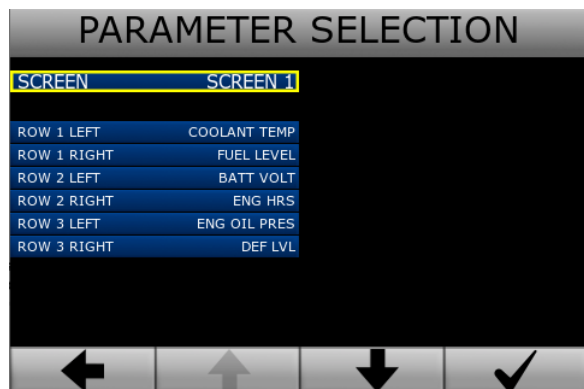
4.4.4 BACKGROUND STYLE

The Background can be set to either Gradient, Solid Black, or Solid Blue. Use the Up and Down arrow buttons to select the desired option in the Background Style dropdown, then press the Check button to confirm the selection.



4.4.5 PARAMETER SELECTION

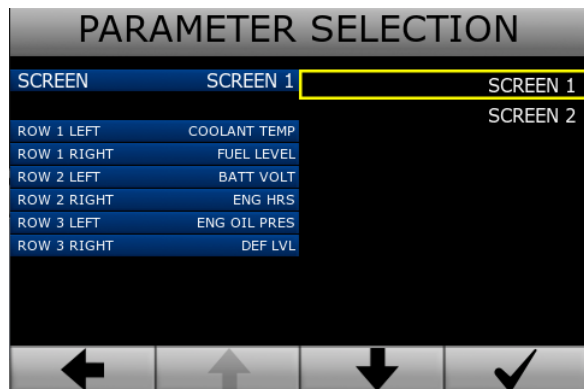
The 2 configurable options for the Home screen can each display up to 6 parameters simultaneously. The parameters and corresponding icons to be displayed are assigned through the Parameter Selection screen.



First, select which Screen to assign parameters to: Screen 1 or Screen 2.

With the Screen highlighted, press the Check button. The Screen 1 and Screen 2 options will be presented to the right.

Use the Up and Down arrow buttons to select the desired screen option and the Check button to confirm.



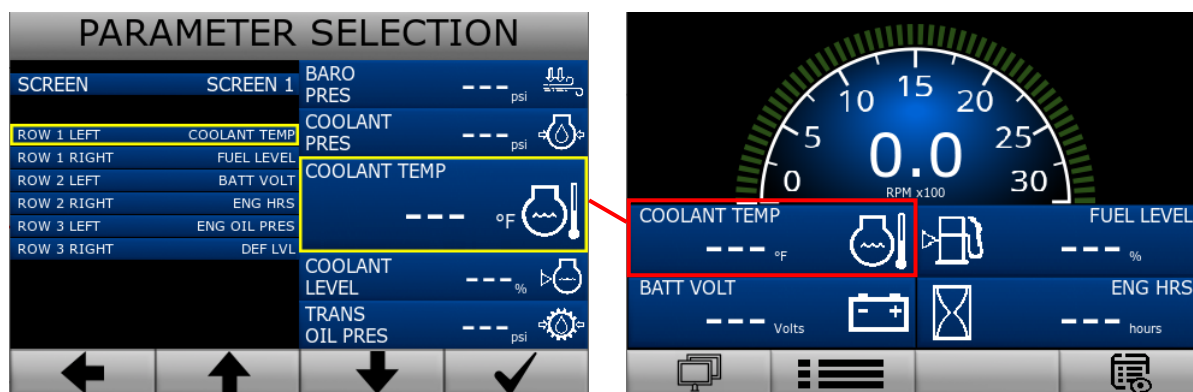
Next, select the parameter location to assign using the Up and Down arrow buttons to highlight the desired location. The available locations are shown in the following table.

Position	4 UP	6 UP
ROW 1 LEFT	X	X
ROW 1 RIGHT	X	X
ROW 2 LEFT	X	X
ROW 2 RIGHT	X	X
ROW 3 LEFT		X
ROW 3 RIGHT		X

Once a parameter location is selected, press the Check button to display the parameter list on the right half of the screen.

From the parameter list, use the Up and Down arrow buttons to choose the parameter to assign to the selected location. Press the Check button to assign the selected parameter or the Left arrow button to cancel and go back to the parameter location selection on the left side of the screen.

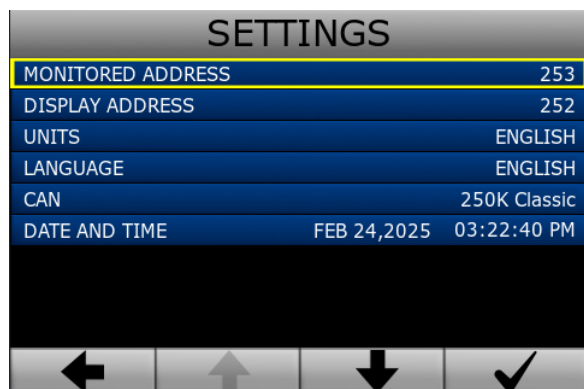
For example: assign Coolant Temp to the ROW 1 LEFT parameter location.



To save the selections, press the Check button. To discard the changes, press the Left arrow button.

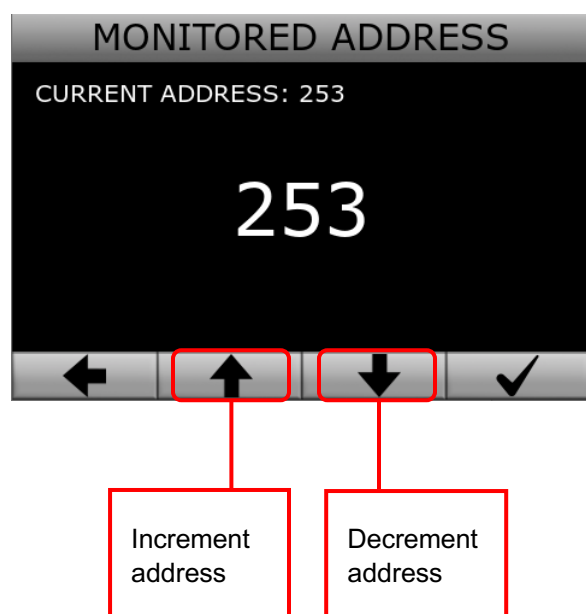
4.5 SETTINGS

Pressing Settings from the Main menu will bring up the Settings sub-menu. The Settings sub-menu contains several device settings to be configured.



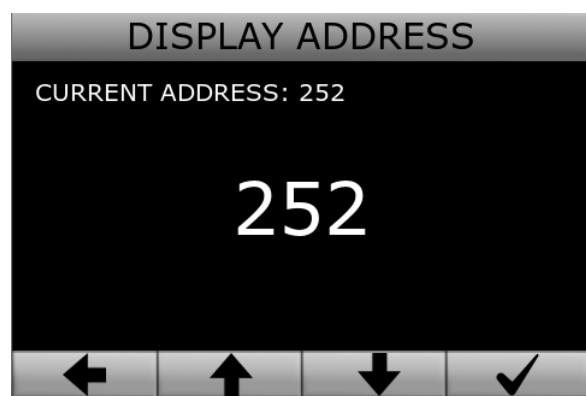
4.5.1 MONITORED ADDRESS

The ECU address to be monitored on the CAN bus is configured using the Up and Down arrow buttons. Use the Up arrow button to increment the address and the Down arrow button to decrement the address. When the desired address is reached, press the Check button to save the selection. Press the Left arrow button to return to the Settings menu.



4.5.2 DISPLAY ADDRESS

The unit's own CAN bus address is configured using the Up and Down arrow buttons. Use the Up arrow button to increment the address and the Down arrow button to decrement the address. When the desired address is reached, press the Check button to save the selection. Press the Left arrow button to return to the Settings menu.

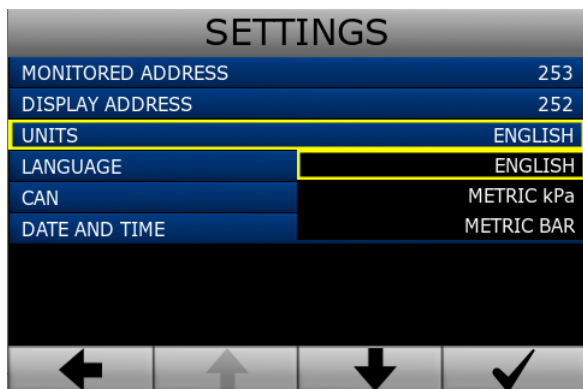


4.5.3 UNITS

From the Settings menu, select Units. A dropdown list will display with the available engineering unit options. The following units are available:

- English
- Metric kPa
- Metric BAR

Use the Up and Down arrow buttons to select the desired units, then press the Check button to confirm the selection.



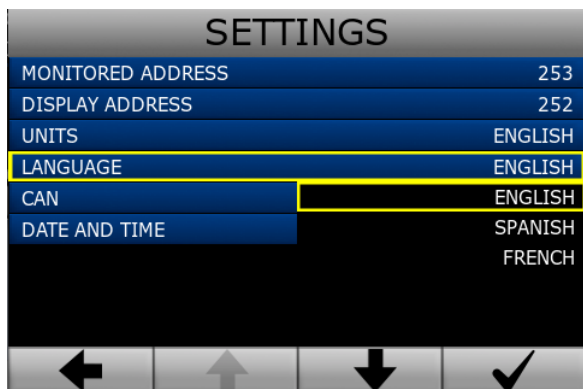
4.5.4 LANGUAGE

From the Settings menu, select Language. A dropdown list will display with the available language options.

The following languages are available:

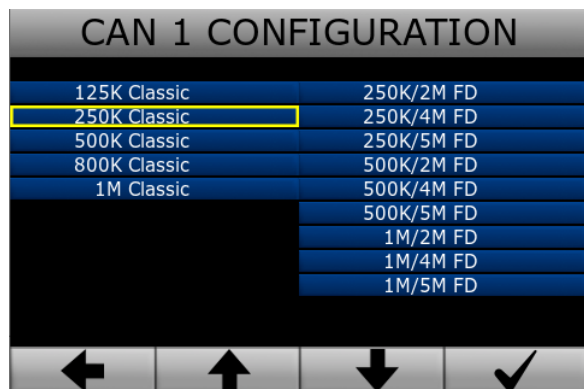
- English
- Spanish
- French

Use the Up and Down arrow buttons to select the desired language, then press the Check button to confirm the selection.

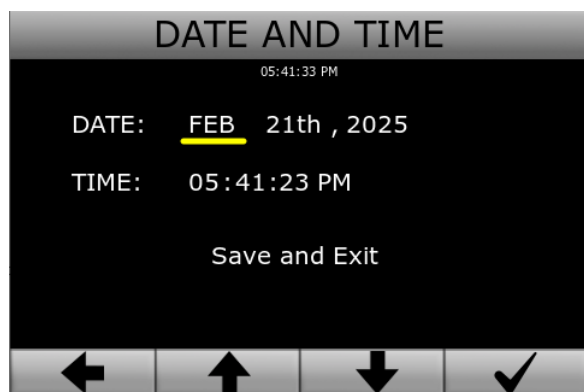


4.5.5 CAN

From the Settings menu, select CAN. Use the Up and Down arrow buttons to select the desired bit rate option, then press the Check button to confirm the setting. The new setting does not take effect until the unit is re-started.



4.5.6 DATE AND TIME



Setting the Date:

When the Date and Time screen is first displayed, the month will be selected. Use the Up and Down arrow buttons to scroll through to the proper month and press the Check button to set the month. The yellow underline cursor will then move to the date. Repeat for setting the date and year.

Setting the Time:

After setting the year, the underline cursor will move to the hour. Proceed in the same manner as with the date fields for setting the hour, minute, seconds, and AM/PM.

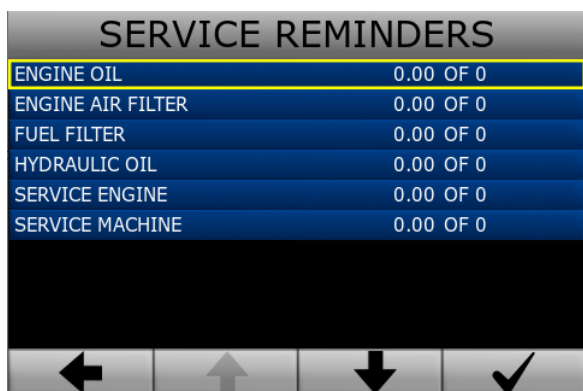
Once the date and time have been set, with Save and Exit underlined, press the Check button to confirm the settings and return to the Settings menu.



4.6 SERVICE REMINDERS

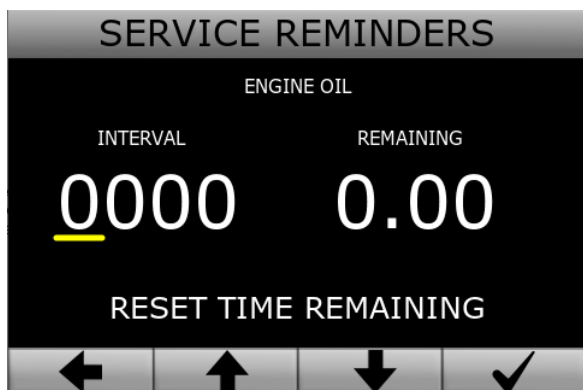
Service reminders can be configured for the following items:

- Engine Oil
- Engine Air Filter
- Fuel Filter
- Hydraulic Oil
- Service Engine
- Service Machine



Use the Up and Down arrow buttons to scroll through the list of service reminders. Press the Check button to select the desired service reminder to set.

For example, the Engine Oil service reminder:

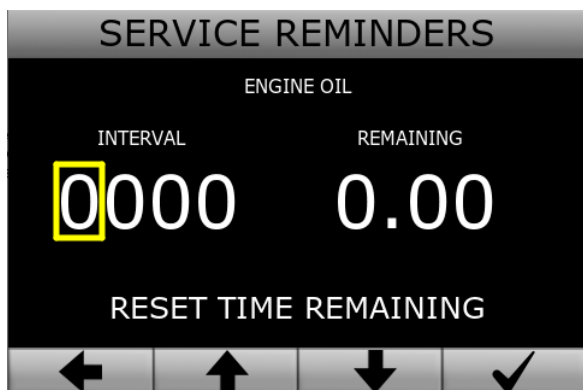


Use the Up and Down arrow buttons to move the underline cursor to each digit you would like to modify.

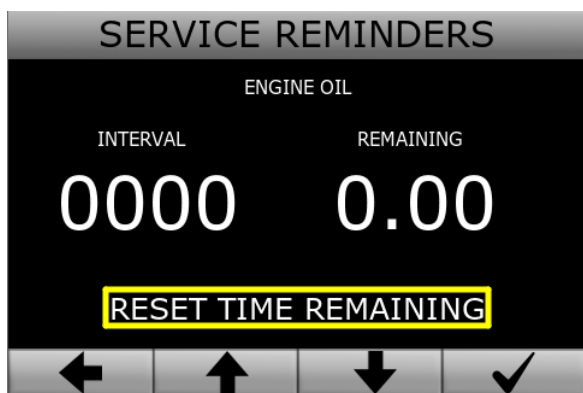
Press the Check button to enter modify mode for the selected digit (indicated by the underline). The yellow underline will change to a yellow box around the digit, indicating it is selected for modification.



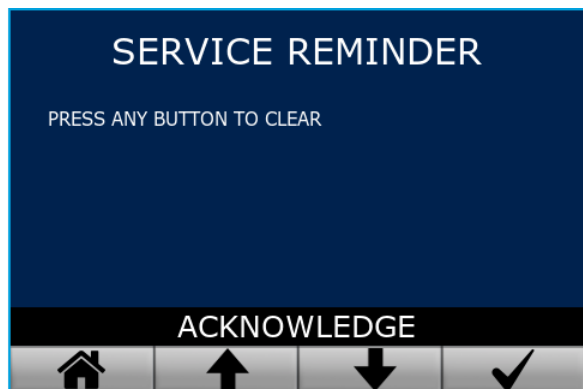
Now use the Up and Down arrow buttons to adjust the value of the indicated digit. Press the Check button to confirm the value for the digit. Move to the next digit with the Down arrow button. Repeat for each digit.



To reset the Service Reminder, cycle past the last digit until Reset Time Remaining is selected with a yellow box, then press the Check button.



When the service reminder time expires, a popup window similar to the following will display over the Home screen.



Press any button to acknowledge the reminder and clear the popup window.



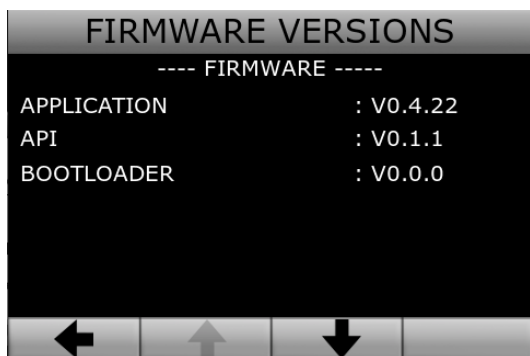
4.7 FIRMWARE VERSION



4.7.1 FIRMWARE VERSIONS SCREEN

The Firmware Versions screen displays the following firmware version information:

- Application
- API
- Bootloader

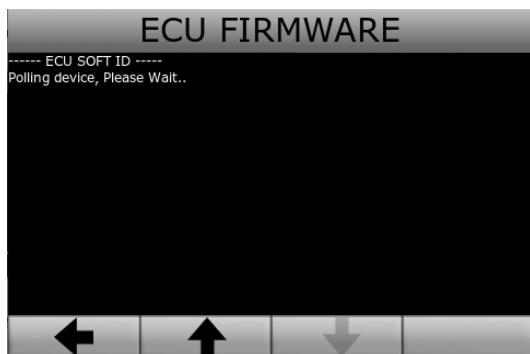


Press the Left arrow button to return to the Main Menu.

Press the Down arrow button to change to the ECU Firmware screen.

4.7.2 ECU FIRMWARE SCREEN

The ECU Firmware screen displays information received from the monitored ECU, such as the Soft ID.



Press the Up arrow button to return to the Firmware Versions screen.



5. FULL PARAMETER LIST

5.1 FULL PARAMETER LIST

The Full Param List screen displays the complete list of available parameters which can be monitored and displayed on the Home screen. For each parameter, the SPN and PGN are shown, along with the engineering units.

Each “page” of the list shows 8 parameters. Press the Down arrow button to scroll to the next page, or the Up arrow to scroll to the previous page.

Page 1 – Parameters 1-8



Next page

Page 2 – Parameters 9-16



Previous page

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6. APPENDIX A: PARAMETERS

SUPPORTED PARAMETER GROUP NUMBERS (PGN'S)

PGN (dec)	SPN	Description
61442	191	Output Shaft Speed
61442	161	Input Shaft Speed
61442	522	Clutch Slippage
61443	91	Accelerator Pedal Position 1
61443	92	Engine Load @ Current Speed
61443	559	Accelerator Pedal Switch
61444	513	Engine Torque
61444	190	Engine Speed
61445	524	Trans Selected Gear
61445	523	Trans Current Gear
61448	1762	Hydraulic Pressure
64891	3719	% Soot
64891	3720	% Ash
64892	3697	DPF (Diesel Particulate Filter) Lamp Command
64892	3698	DPF (Diesel Particulate Filter) Regen Available
64892	3703	DPF (Diesel Particulate Filter) Inhibit
64947	3245	Exhaust Filter Temp
64947	3246	DPF (Diesel Particulate Filter) Out Temp



64948	3241	AFT Intake Temp
64948	3242	Inlet Temp
65110	1761	DEF (Diesel Exhaust Fluid) Level
65110	5246	Emissions Fail
65110	5245	DEF Low Level Indicator
65128	1638	Hydraulic Temp
65159	1436	Actual Engine Timing
65164	441	Auxiliary Temperature
65164	1387	Auxiliary Pressure
65213	977	Fan Drive State
65241	701	Pedal SWT
65247	515	Engine Desired Op Speed
65248	244	Trip Distance
65248	245	Total Vehicle Distance
65253	247	Total Engine Hours
65257	182	Trip Fuel
65257	250	Total Fuel Used
65262	110	Engine Coolant Temperature
65262	174	Fuel Temperature
65262	175	Engine Oil Temperature
65262	52	Engine Intercooler Temp
65262	1134	Thermostat Open
65263	94	Fuel Delivery Pressure



65263	98	Engine Oil Level
65263	100	Engine Oil Pressure
65263	109	Engine Coolant Pressure
65263	111	Engine Coolant Level
65265	84	Wheel Based Vehicle Speed
65266	183	Fuel Rate
65266	184	Engine Instantaneous Fuel Economy
65266	185	Average Fuel Economy
65266	51	Throttle Position
65269	108	Barometric Pressure
65269	172	Air Inlet Temperature
65270	105	Intake Temperature
65270	81	Boost Pressure
65270	107	Filter Diff Pressure
65270	173	Exhaust Gas Temperature
65270	102	Air Inlet Pressure
65271	167	Charge Voltage (Alternator Potential)
65271	158	Battery Voltage
65271	168	Power In 1
65272	127	Transmission Oil Pressure
65272	177	Transmission Oil Temperature
65276	96	Fuel Level



7. APPENDIX B: CAN COMMUNICATION

SUPPORTED CAN BITRATE OPTIONS

Bitrate
50K Classic
100K Classic
125K Classic
250K Classic
500K Classic
800K Classic
1M Classic
250K/2M FD
250K/4M FD
250K/5M FD
500K/2M FD
500K/4M FD
500K/5M FD
1M/2M FD
1M/4M FD
1M/5M FD

