

Product Manual

Engine Display & Control Panel J1939 Engines



Part Number: MVP-351
Revision: 1.0

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Prior to starting the engine, select the proper throttle control mode and parameters required for application.

CAN Bus Configuration

This module communicates to the engine ECU via the J1939 CAN Bus network. This is a three wire connection to the engine ECU. Engine information and alarm codes are broadcast over the CAN bus from the engine ECU to the controller display. And, the controller communicates throttle commands to the engine ECU over the CAN bus.

To assure proper communications between the engine ECU and the controller, the correct **SOURCE ADDRESS** and **TSC1 ADDRESS** need to be selected in the controller for the particular engine make and model. These settings are available in the **CAN CONFIGURATION MENU**.

Throttle Settings

The MVP-351 Has two Throttle type selections available, Primary and Secondary. The Primary Throttle is utilized when the transmission is in Neutral/Park. The Secondary Throttle is used when the transmission is in gear.

Throttle Configuration	Primary Throttle Type Selection
	Secondary Throttle Type Selection
	TSC Minimum Speed
	TSC Maximum Speed
	TSC Ramp Rate
	Throttle Curve Selection

Manual Throttle Options

1) Vernier Throttle

Vernier throttle is standard up and down throttle between the minimum and maximum selections. The ramp rate is the rate of acceleration in rpm's per second. The control panel uses J1939 throttle, also called "torque speed control" or TSC1.

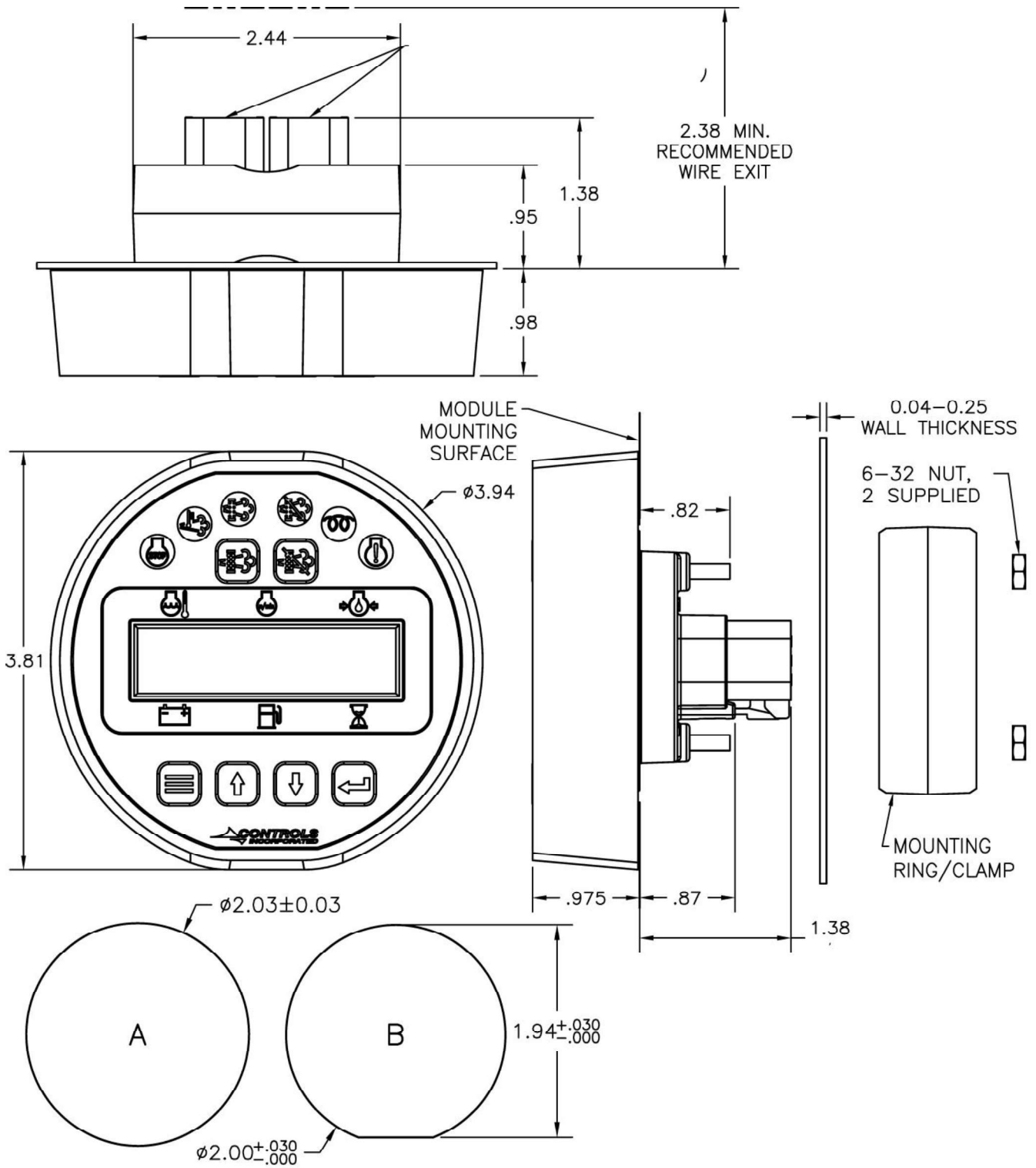
2) Multistate Throttle

Multistate throttle provides for one, two, three or four specific operating speeds. Pressing the up and down buttons adjusts engine speed between the selected multistate speed selections.

3) High/Low

Engine accelerates to the Max speed setting with the UP button is pressed. When the UP button is released, the engine goes back to idle speed.

INSTALLATION INFORMATION



MOUNTING HOLE REQUIREMENTS (A OR B)

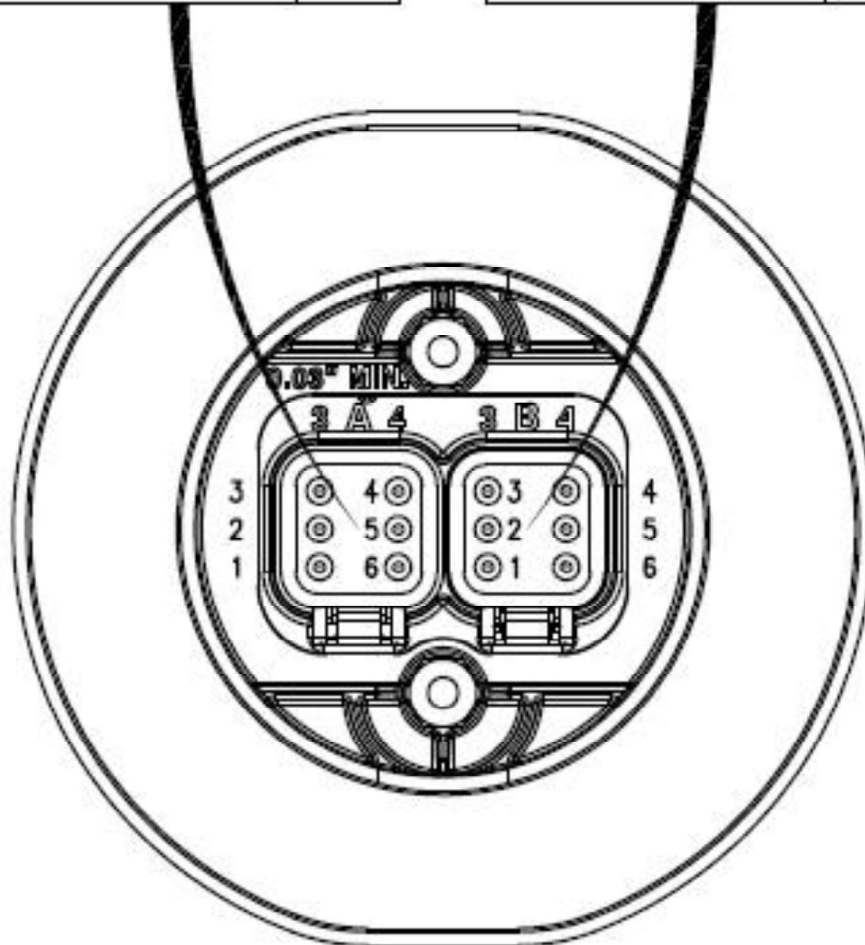
MODULE CONNECTORS

CONNECTOR A

FUNCTION	PIN
BATTERY +	1
CAN high	2
CAN LOW	3
DIGITAL INPUT #1	4
FUEL LEVEL	5
BATTERY -	6

CONNECTOR B

FUNCTION	PIN
5V SUPPLY	1
DIGITAL INPUT 2	2
APS2 THROTTLE	3
APS1 THROTTLE	4
DIGITAL INPUT 3	5
BATTERY -	6



ENGINE ALARMS, CODES AND MESSAGES

Engine ECU Alarm/De-Rate/Shut Downs

It is important to understand panel operation with respect to engine safety protections, alarms, and fault codes. The panel operates with J1939 engines. These engines have an ECU (engine control unit) which is essentially a computer that runs the engine. When engine parameters are out of normal operating ranges, the ECU takes specific actions which can include the following:

- 1) Broadcast a trouble code
- 2) Broadcast a red or yellow lamp
- 3) De-rate the engine
- 4) Shut down the engine
- 5) Turn on alarm horn

It is the engine ECU that de-rates or shuts down the engine when it is not operating within normal parameters. This includes more common shut downs like high engine temperature and low oil pressure but can encompass a large range of parameters depending on the ECU.

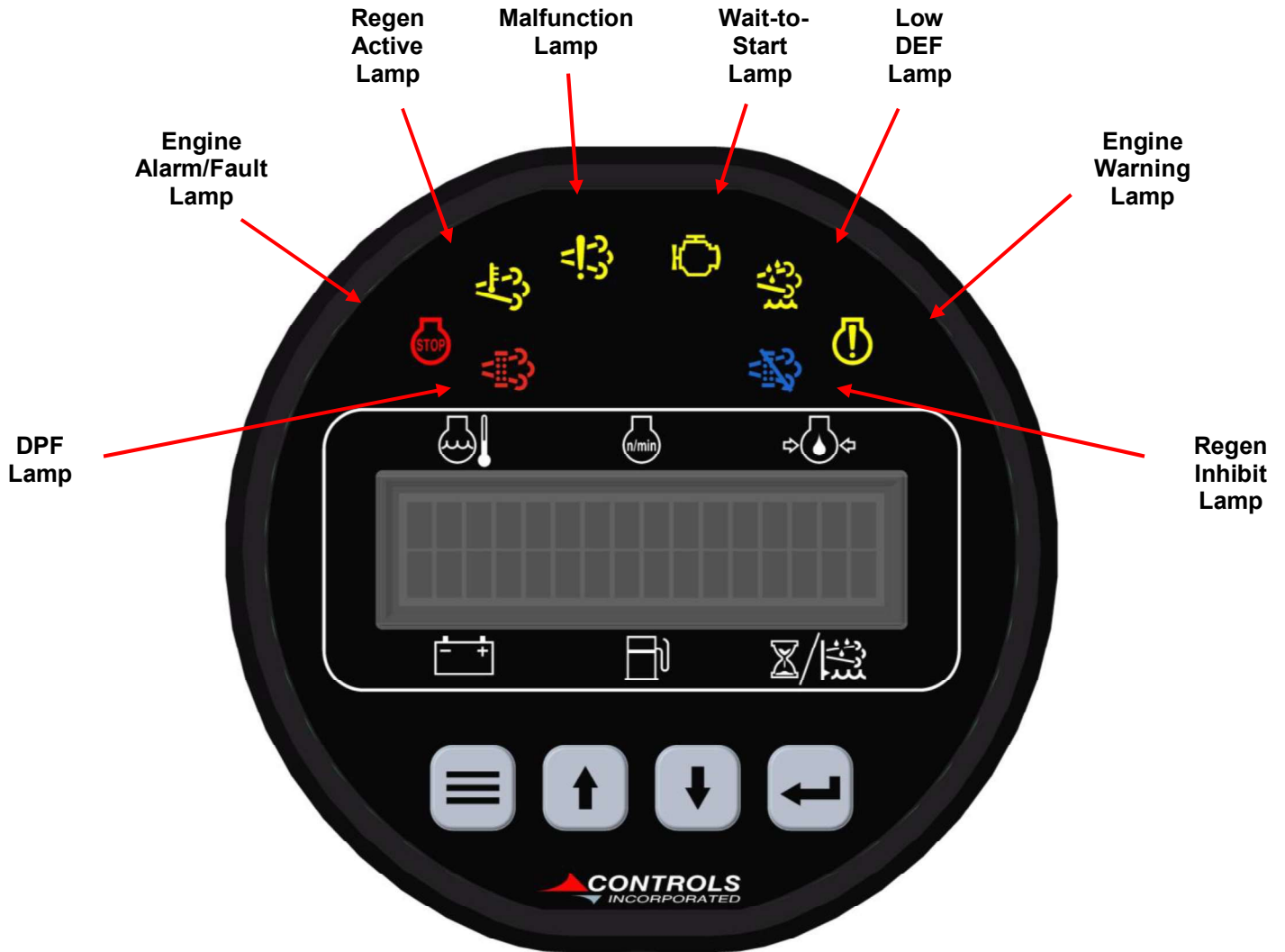
Alarm Annunciation and Code Reader

This panel is configured to operate with standard J1939 engines where engine de-rate and shutdowns are managed by the engine ECU. The panel communicates with the engine ECU and serves as a trouble code reader. When the engine ECU broadcasts a trouble code (called an SPN.FMI code) the panel does the following:

- 1) Illuminate the appropriate LED indicator lamp
 - a. Yellow Lamp = Alarm
 - b. Red Lamp = Engine Shut Down
- 2) Displays the trouble code (standard SPN.FMI code)
- 3) Displays a code description on the LCD screen
- 4) Displays the occurrence count of the code



Indicator Lamps



Active and Stored Engine ECU Codes

The panel also provides the ability to check the engine ECU for all ACTIVE and STORED engine ECU codes. These codes can be viewed via the Active Codes and Stored Codes menus.

CONTROL PANEL ANALOG AND DIGITAL INPUTS

The panel has one analog input and one digital input available to monitor other components, senders or signals. These inputs can be used for a number of purposes including alarms and shut downs. Two digital inputs are pre-set for external throttle control.

Input	Heading	Default	Options	Connector	Pin
Analog 1	Function		Fuel level	A	5
Digital 1	Normally	Open	Open / Closed	A	4
	Function	None			
	Message	None			
	Check	Off	Off / Always / Run		
Digital B2	Function	Throttle Up		B	2
Digital B5	Function	None		B	5

1) **Analog 1 Function Options**

- 1) Fuel Level S-W – Fuel amount, in percentage, can be measured and displayed using a standard Stewart Warner scale sender of 240 ohms – 33 ohms. 240 = Empty and 33 = Full. Sender ground must be common with battery negative.
- 2) Fuel Level VDO – Fuel amount, in percentage can be measured and displayed using a VDO scale sender of 10 ohms – 180 ohms. 10 = Empty and 180 = Full. Sender ground must be common with battery negative.
- 3) Oil Pressure PSI – Oil pressure, in PSI, can be measured and displayed using a standard Stewart Warner scale sender of 240 ohms – 33 ohms. 240 = 0 PSI and 33 = 100 PSI. Sender ground must be common with battery negative.
- 4) Oil Pressure bar – Oil pressure, in bar, can be measured and displayed standard Stewart Warner scale sender of 240 ohms – 33 ohms. 240 = 0 bar and 33 = 7 bar. Sender ground must be common with battery negative.
- 5) Oil Pressure VDO PSI – Oil pressure, in PSI, can be measured and displayed using a standard Stewart Warner scale sender of 10 ohms – 180 ohms. 10 = 0 PSI and 180 = 150 PSI. Sender ground must be common with battery negative.
- 6) Oil Pressure bar – Oil pressure, in bar, can be measured and displayed using a standard Stewart Warner scale sender of 10 ohms – 180 ohms. 240 = 0 bar and 33 = 10 bar. Sender ground must be common with battery negative.
- 7) Switch – This setting allows for a switch to be connected rather than an analog sender. Set Analog 1 Message to assign a label to the switch device.
- 8) None – Set when no functionality is required.

2) **Digital Function Activation**

- 1) Off / Always / Run – Describes when the parameter will be monitored for alarm conditions. Run refers to when the engine is running. Off disables the alarm conditions. Always enables the alarm constantly regardless of engine state.
- 2) Alarm Delay – The time period, after Sender Check Bypass, that the parameter must be on the alarm condition before the alarm becomes latched.

MENU SYSTEM

To Enter Menu System

Hold MENU button and press ENTER button.

Menu Navigation

Press MENU button to scroll menu options.

Press UP arrow button to enter menu.

Press DOWN arrow button to reverse.

Exit Menu System

Hold MENU button and press ENTER button.

To Change a Setting

Press ENTER button to bring up brackets [].

Press UP arrow button and DOWN arrow button to change setting.

Press ENTER button to make selection, brackets disappear.

Recycle key to the OFF position after changing a setting.

Main Menu

Main Menu	Sub Menu		
Emissions Parameters	Regen Options (Auto, Inhibit, Request)	} Viewing Menus	
	DEF Level		
	Regen Active/Not Active View		
	Regen Inhibited/Not Inhibited View		
	DPF Out Gas Temperature View		
	DPF Differential Pressure View		
Active Engine Fault Codes	View/Scroll Active Fault Codes		
Stored Engine Fault Codes	View/Scroll Stored Fault Codes		
Engine Parameters	View ECU Engine Information (% Load, Torque, Oil Temp, etc.)		
Engine Identification	Engine Model # View		
	Engine Serial # View		
Module Information	Control Unit Part# View		
	Control Unit Software Version View		
Controller Setup	Quick Setup	} Configuration Menus	
(PASSWORD PROTECTED)	Engine Parameter Configuration		(1)
	Input Configuration		(2)
	Output Configuration		(3)
	Throttle Configuration		(4)
	Module Configuration		(5)
	Display Configuration		(6)
	CAN Configuration		(7)
	Maintenance Configuration		(8)
	Emissions Configuration		(9)
	Clutch Configuration		(10)
		(11)	

To access the controller setup menus, a password is required.

Configuration Menus

(1) Quick Setup	Engine Manufacturer
	TSC Minimum Speed
	TSC Maximum Speed
	Performance Display Off/On
(2) Eng. Parameter Configuration	Parameter Selection (Fuel Level, Voltage, Hour Meter)
	Parameter Setup (Varies based on parameter)
(3) Input Configuration	Configure Selection (Channels/Message)
	Digital 1-7 Function
(4) Output Configuration	Configure Selection (Channels/Message)
	Relay 1 Function (Default to Clutch)
(5) Throttle Configuration	Primary Throttle Type
	Secondary Throttle Type
	TSC Mode
	TSC Minimum Speed
	TSC Maximum Speed
	TSC Bump Speed
	TSC Ramp Rate
	Throttle Curve
	Multi State Speeds 1-4
(6) Module Configuration	Low Power Mode
	Power Save Delay
	Pre Alarms Displayed
	Clear Number of Starts
	Engine Run Criteria Speed
	Engine Stop Criteria Speed
(7) Display Configuration	English/Metric Selection
	Performance Display Off/On

(8) CAN Configuration	Engine Manufacturer
	TSC1 Address (Default = 3) Others available
	Source Address (Default = 44) Others available
	Engine Address (Default = 0) Others available
	Fuel Level Transmit On/Off
	Voltage Transmit On/Off
	Hours Transmit On/Off
	Engine Status Transmit
	Panel Status Transmit On/Off
	Panel Information Transmit On/Off
	Faults Transmit
	JDLINK Auto Accept

(9) Maintenance Configuration	Service Messages
	Schedule Selection
	Schedule Reset
	Schedule Interval
	Schedule Warning
	Schedule Trip
	Schedule Message

(10) Emissions Configuration	DEF Level Check (Default = Off)
	Low DEF Pre Alarm (Default = 16%)
	Low DEF Alarm (Default = 0%)
	DEF Alarm Delay
	Allow Service Regeneration Yes/No (Deere Only)
	Regeneration Interlock On/Off
	TSC Transmit Yes/No (stop TSC to engine during regeneration)

(11) Clutch Configuration	Clutch #1 Engage Trip (Default = None)
	Clutch #1 Engage Speed (Default = 800 rpm)
	Clutch #1 Engage Load (Default = 0%)
	Clutch #1 Engage Coolant Temperature (Default = 150°F)
	Clutch #1 Engage Delay (Default = 0:00)
	Clutch #1 Engage Interval (Default = 0:00)
	Clutch #1 Release Trip (Default = None)
	Clutch #1 Release Speed (Default = 800 rpm)
	Clutch #1 Release Load (Default = 0%)
	Clutch #1 Release Coolant Temperature (Default = 150°F)
	Clutch #1 Release Delay (Default = 0:00)
	Clutch #1 Release Interval (Default = 0:00)