

SETUP GUIDE

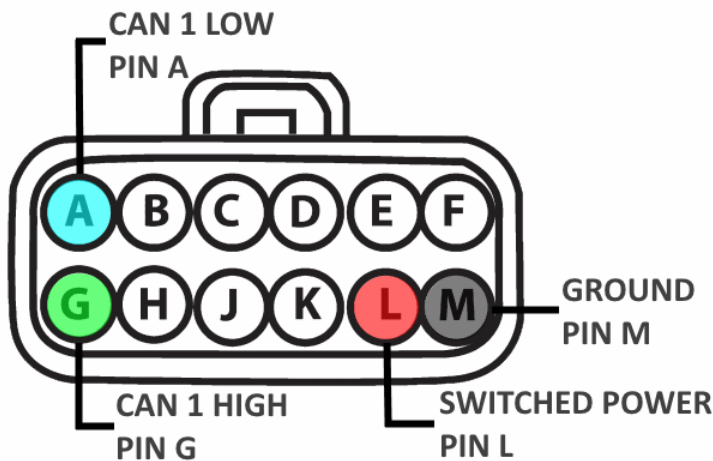


GM E67 Crate Engine ECU CAN Interface to CD Dash

Supported Devices

GM E67 Crate Engine ECUs

CAN Bus Wiring



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GM E67 crate engine harnesses provide switched power, ground, and access to GMLAN (CAN) on a 12 pin bulkhead connector. AEM recommends you power the CD Dash and access GMLAN (CAN) from this connector. The Delphi bulkhead mating connector assembly and terminals must be externally sourced.

Bulkhead Connector Part Numbers

Bulkhead mating connector, 1 required → **PN 15326854**

Male terminals, 4 required → **PN 15304701**

Wire seals, 4 required → **PN 15366021**

Plug seals, 8 required → **PN 15305171**

TPA, 1 required → **PN 15430903**

AEM CD has 2 separate CAN ports. For 3rd party devices, AEM recommends you use AEM CAN Bus 2, whose connections are contained in a 2 pin Deutsch DTM connector. On older harnesses it may be in an unterminated, twisted/shielded flying lead in the dash harness.

Wiring Recommendation to AEM CD-5/CD-7

GM bulkhead connector pin G (CAN+) → AEM CD port 2 connector pin 1 (CAN 2+).

GM bulkhead connector pin A (CAN-) → AEM CD port 2 connector pin 2 (CAN 2-).

GM bulkhead connector pin L (Switched Power) → AEM CD port 1 connector pin 3 (12V Power).

GM bulkhead connector pin M (Ground) → AEM CD port 1 connector pin 4 (Ground).

A CAN bus network needs two terminating resistors in order to function correctly – one at each physical end of the network. The CD Dash has a software selectable internal CAN terminating resistors. On a typical GM crate engine install, there's only one terminating resistor on the network, which is located in the GM E67 ECU. AEM has provided a pre-configured layout for use with GM E67 crate engine ECUs and the Port 2 terminating resistor is turned on by default.

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Supported Channels

The CD Dash supports 30 channels from GM E67 crate engine ECUs, however basic crate engines may not have all available sensors installed. For example, to support 'Fuel Tank Level', a two wire GM fuel level sensor must be wired into the GM E67 ECU pins J1-9 and J1-44. Additionally, an AEM 22 channel CAN sensor module (30-2212) can be installed to add a vast array of sensor data to the CD Dash.

CH	CD CHANNEL NAME
1	AFR Bank 1 Long Term Fuel Trim
2	AFR Bank 1 Short Term Fuel Trim
3	AFR Bank 2 Long Term Fuel Trim
4	AFR Bank 2 Short Term Fuel Trim
5	Ambient Air Temp
6	Baro Pressure
7	Cat Temp Bank 1
8	Cat Temp Bank 2
9	Coolant Temp
10	Distance Traveled While MIL Active
11	Distance Traveled Since DTC Cleared
12	Warm Ups Since DTCs Cleared
13	Battery Voltage
14	Absolute Load
15	Load
16	Engine Run Time
17	Engine Speed
18	EVAP Purge Command
19	EVAP Pressure
20	Fuel Air EQ Ratio Target
21	Fuel Pressure
22	Fuel Tank Level
23	Ignition Timing

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CH	CD CHANNEL NAME
24	Intake Manifold Pressure
25	Intake Manifold Air Temperature
26	Mass Airflow
27	MIL State
28	Monitor Status This Drive Cycle
29	Throttle Position
30	Vehicle Speed

AEM Setup in DashDesign

AEM has provided a pre-configured default layout to receive, display and log (if using a logging CD Dash) the CAN bus channel data from a GM E67 crate engine ECU. To load this, simply open a GM E67 layout and upload it to the dash. No additional dash setup or channel configuration is required for general usage however, all elements within the layout are fully user configurable should you choose to customize the layout to suit your specific needs.

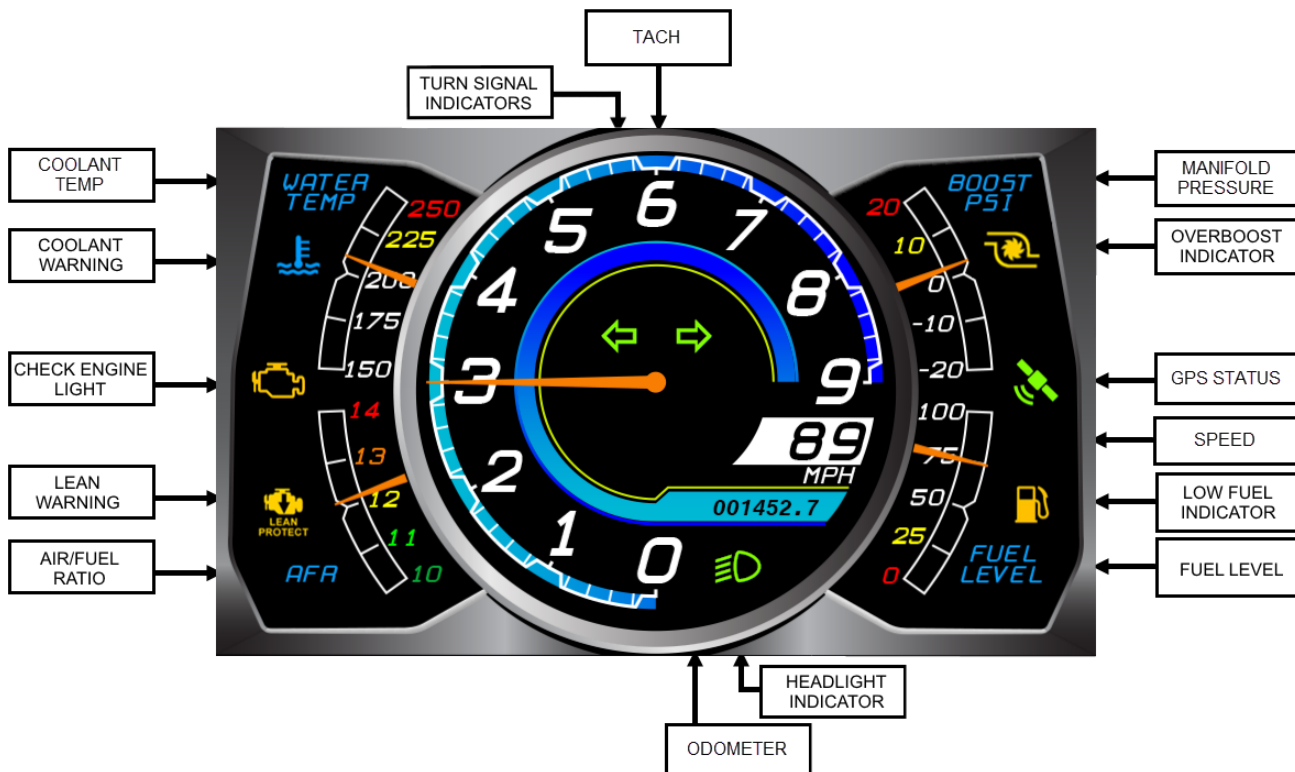
Go File>Open, navigate to Documents\AEM\DashDesign\Setups\App Specific and select the E67 layout file. To load layout onto dash, connect USB cable from dash to PC with dash powered on and go File>Upload to Display or use keyboard shortcut CTRL+U.

No additional dash setup or channel configuration is required for general usage however, all elements within the layout are fully user configurable should you choose to customize the layout to suit your specific needs.

*NOTE: Verify that dash is on latest firmware before loading layout. Go Tools>Upload Firmware and load latest .bin file.

Layout Overview

Page 1 & 2 – General



Additional details:

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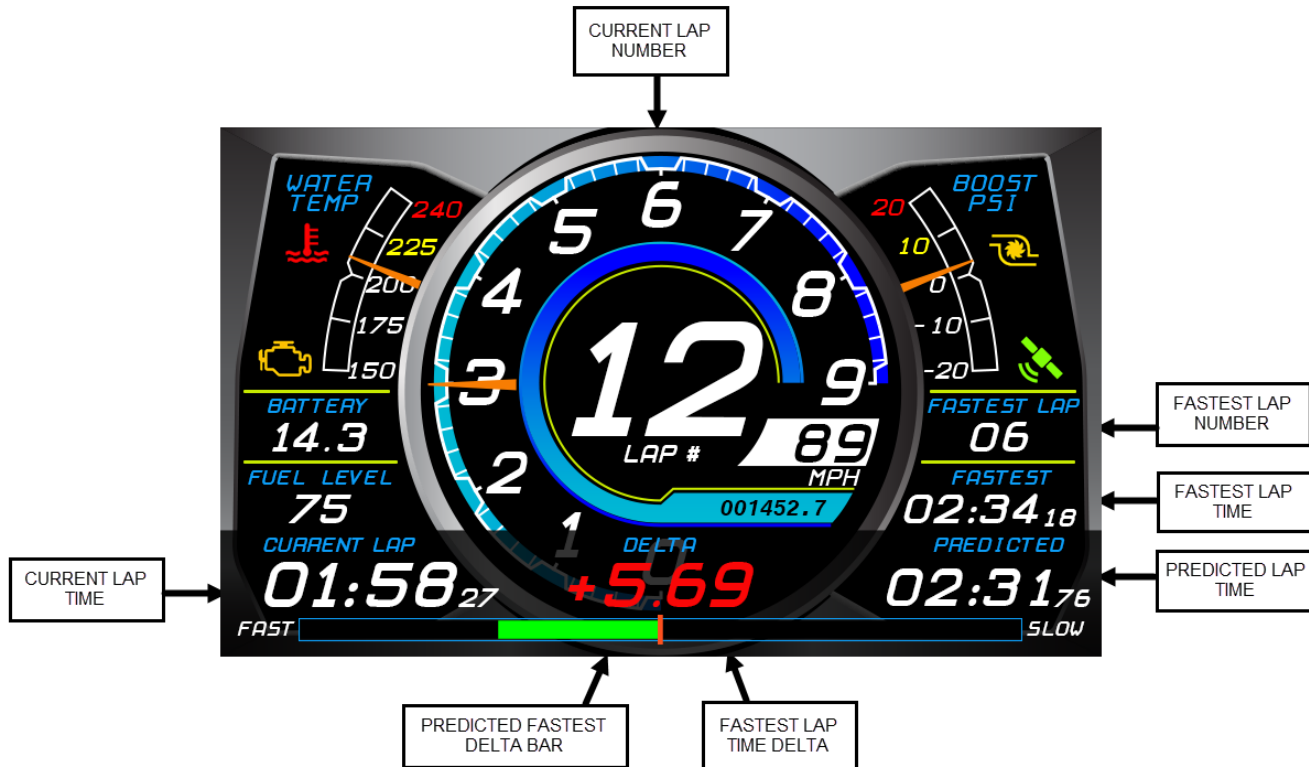


- Perimeter gauges: Gauge channels are user configurable – can be set to any channel desired. Gauge heading names are editable text.
- Number scaling: The number scale on all four of the perimeter gauges is user configurable and can have its color and value changed (for units, sensor range, etc).
- Speedometer: “MPH” text can be changed for other units or speedometer can be changed to completely different channel.

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Page 3 – Lap Timing



Includes lap timing channels for use with either an AEM VDM or GPS Module*. This page maintains the upper two perimeter gauges and then displays AFR and Oil Pressure as a numeric read out on the left. The perimeter gauges and numeric read outs can be changed to reference any channel desired. Additional lap timing channel details:

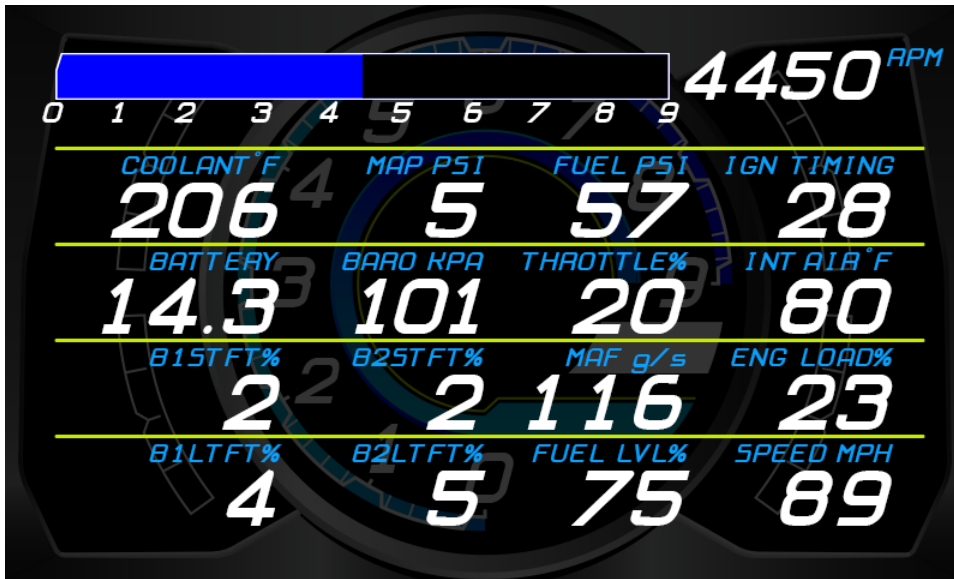
- Fastest Lap Number: Displays the number of the fastest lap.
- Fastest Lap Time: Displays the time of the fastest lap.
- Predicted Lap Time: Displays the predicted lap time for the current lap based upon progress through the GPS track map.
- Fastest Lap Time Delta: Displays the difference in seconds between the last completed lap and the fastest lap. Negative deltas (faster) display as green and positive deltas (slower) display as red.
- Predicted Fastest Delta Bar: Graphically displays the delta time between the predicted lap time and the fastest lap time. Faster displays as green and slower displays as red.

*If not using an AEM VDM or GPS Module for lap timing, Page 3 can be replaced with either Page 1 or 2. With Page 3 selected as the active page, go Edit>Paste Screen From Setup File, open the same AEM 5 Gauge layout file and select the desired page to import.

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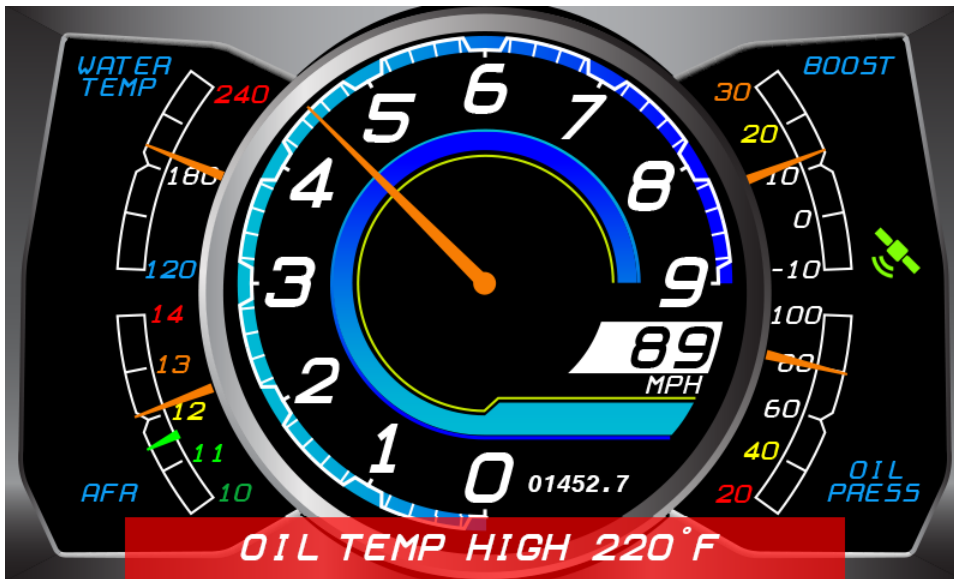
Page 4 – Diagnostic



The diagnostic page allows you to check over many important channels quickly and easily.

Warnings and Alarms

Warning Bar

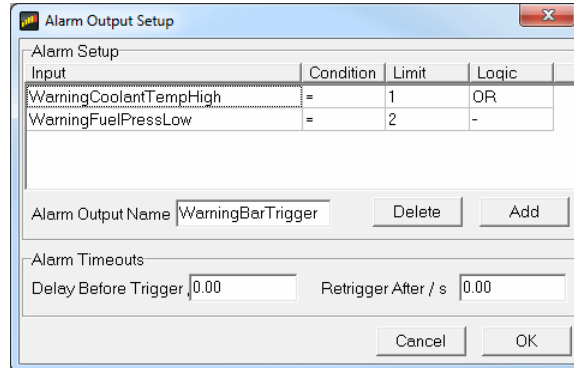


This layout utilizes a number of different warnings, alarms, and icons to notify the driver of problems and their severity. A warning is generally used to report non-urgent conditions that the driver should be aware of but continue operating the vehicle. Warnings are viewable on any of the four main layout pages and icons vary per page. A warning will be triggered and continue to display so long as the trigger conditions are still valid. Warnings cannot be forcibly cleared.

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The red warning bar and warning message text are two separate elements that are triggered by output *WarningBarTrigger* which is an alarm that references the following channels:



The warning will be triggered if channels *WarningCoolantTempHigh* or *WarningFuelPressLow* are 1. Note that *WarningFuelPressLow* has been set to 2 to disable it from triggering the warning. If a fuel pressure sensor is being used, the value may be set to 1 in order to trigger the warning in the event of low fuel pressure.

Indicators

The AEM provided GM E67 ECU layouts utilize a few indicators with pre-defined trigger criteria. Additional indicators can be added as well as existing indicators be edited or removed.



The arrow indicators are configured as turn signal indicators and will trigger when the 'Spare1' (right) and 'Spare2' (left) inputs are grounded.



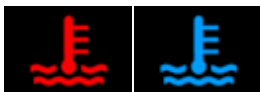
The light low beam indicator will trigger when the dimmer (headlight) input is provided 12V.



The charge malfunction indicator will trigger when battery voltage is below 11.5 volts and engine speed is >400 RPM. This can be reconfigured by editing the 'WarningBattVoltsLow' output.



The check engine indicator will trigger when the 'MILIndicatorState' output is active. This can be reconfigured by editing the 'IndicatorMIL' output.



The coolant temp high and coolant temp low indicators will trigger when coolant temp is above 220 degrees F (red) or below 140 degrees F (blue). This can be reconfigured by editing the 'Coolant_Icon_Index' function.

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The low fuel level indicator will trigger when fuel level is below 10%. This can be reconfigured by editing the 'WarningFuelLevelLow' output.

Note: A two wire GM fuel level sensor must be wired into the GM E67 ECU pins J1-9 and J1-44 for the fuel level gauge and indicator to function.



The turbo indicator will trigger when the boost pressure is above 10 PSIG. This can be reconfigured by editing the 'WarningBoost' output.



The GPS indicators will trigger when a satellite connection is acquired (green) or lost (red).

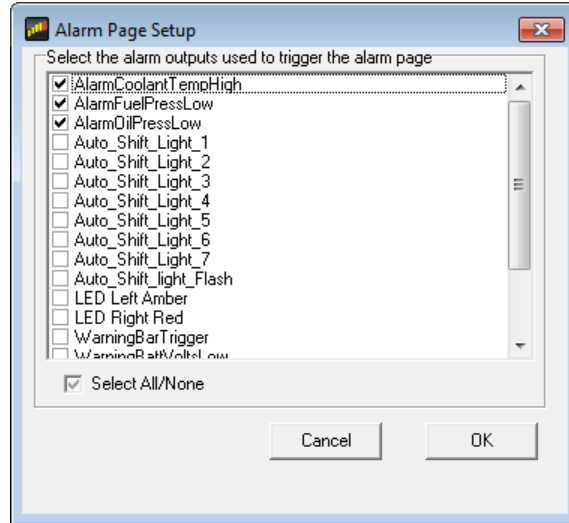
Alarm Page



Alarms are generally used to alert the driver to a severe condition that could potentially cause engine/vehicle damage and vehicle operation should be stopped immediately. When an alarm is triggered, the Alarm Page is displayed on the screen along with an alarm message. An alarm can be cleared or "ignored" by the driver by pressing the left button on the dash.

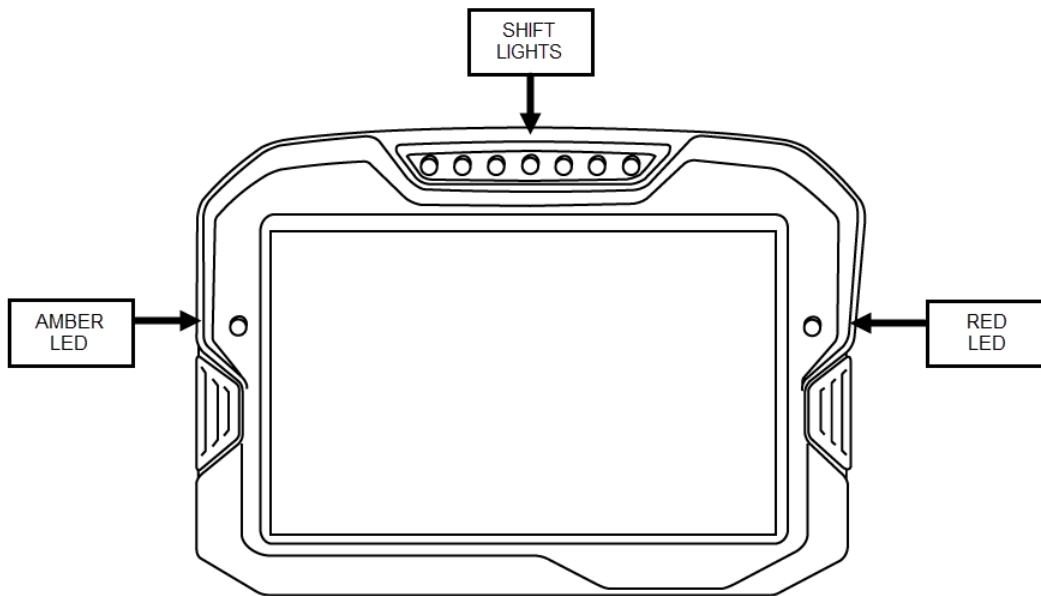
Alarms are configured similarly to warnings with one significant difference. There are separate alarm outputs that appear similar to the warning outputs but typically have more severe trigger thresholds. For example, the **warning** for high coolant temp is triggered at 220 F but the **alarm** for high coolant temp is triggered at 230 F. The trigger criteria for the Alarm Page is configured by going to Setup>Alarm Page. The Alarm Page Setup references all the alarm outputs in the layout.

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NOTE: Warnings and alarms for low fuel pressure are built into the layout but have been “disabled” by setting their engine speed reference to be >12,000. To make these functions active, set to a pertinent value; ie 3000 rpm.

Shift Lights & LEDs



Shift lights and LEDs are configured in Setup>Shift Lights and LEDs. This layout sets the shift lights to start at 5250 rpm, go full scale at 6750 rpm and flash at 7000 rpm. The shift lights progression range can be configured in Shift Light Setup> Auto Create Outputs. The first shift LED is turned on at the Start rpm and then following LEDs are turned on based on the Offset value. To find the correct Offset value, take the full rpm progression range and divide by 7. For instance, for shift lights that start at 5000 rpm and end/flash at 7000 rpm, take full rpm progression range of 2000 and divide by 7 (Offset = 285).

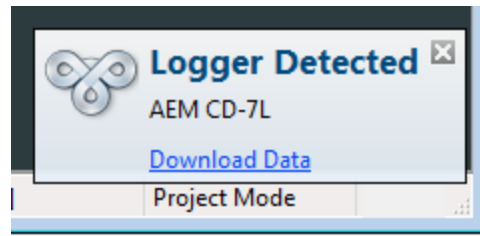
Logging

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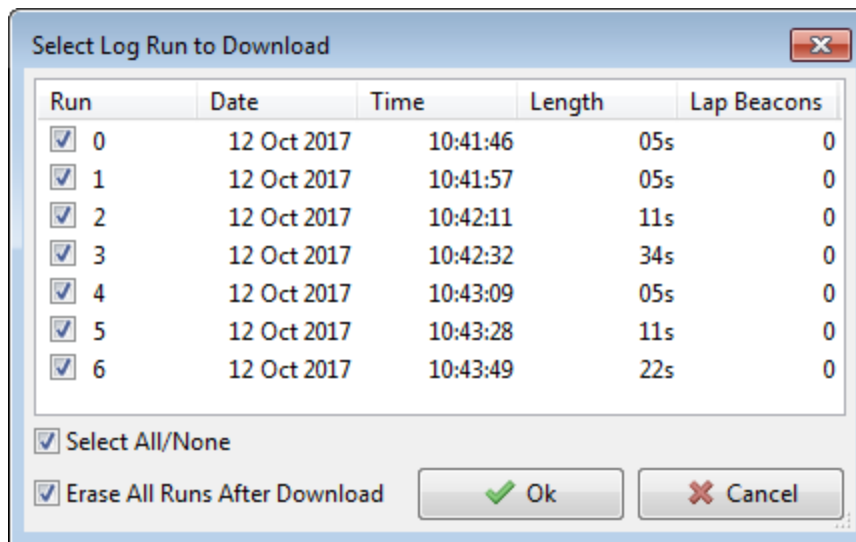


If using the logging version of the dash, the incoming CAN bus data channels can be recorded in a data log for later analysis. The GM E67 Crate Engine ECU layout file is already setup to log with a good selection of useful channels. Logging is set to start/stop based on output *EngineSpeed* so logging will be active whenever the engine is running. To view the logging setup or make changes, go Setup>Logging.

Logs are downloaded from the dash using the AEMdata software. With the AEMdata software open, simply connect the USB cable from the dash to the PC with the dash powered on and the software will automatically detect the dash and that it has logs to download.



Click on Download Data and you'll be prompted to select the sessions to download. Be aware that all the individual log sessions selected will be downloaded as a single .daq file.



Once you click on OK, you'll be prompted for a file name and save location.

TIP: Because multiple log sessions are downloaded as a single .daq log file through AEMdata, you may choose to eliminate useless data (warm up, long periods of idle, etc) to shorten the log to only contain data you're interested in analyzing. This can be accomplished by trimming the log data. To do this, select the log data to be kept (click & drag) and then go File>Trim Log File. Select the channels to be included in the new trimmed .daq file, click on Export and select a file name and save location. You will now have a new trimmed .daq file.