

# SETUP GUIDE

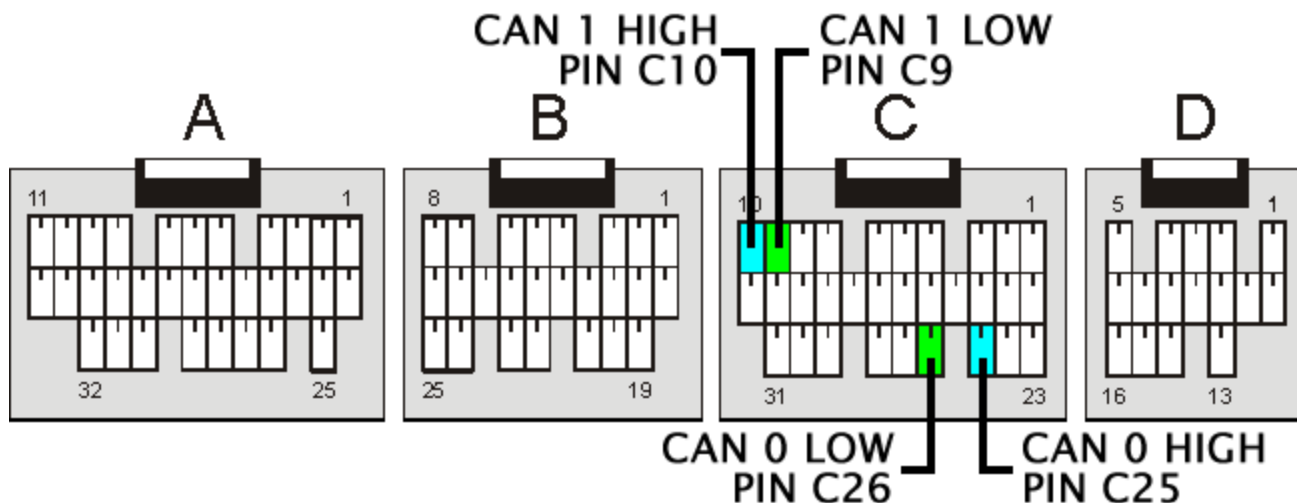


## FAST XFI 2.0 ECU CAN Interface to CD Dash

### Supported Devices

FAST XFI 2.0 ECU

### CAN Bus Wiring



The FAST XFI ECU has 2 separate CAN bus ports. AEM recommends you use XFI CAN Bus 0 which is located on pins C25 and C26. This bus is also the one that is included in most FAST engine harnesses.

AEM CD has 2 separate CAN ports. For 3rd party devices, AEM recommends you use AEM CAN Bus 2, whose

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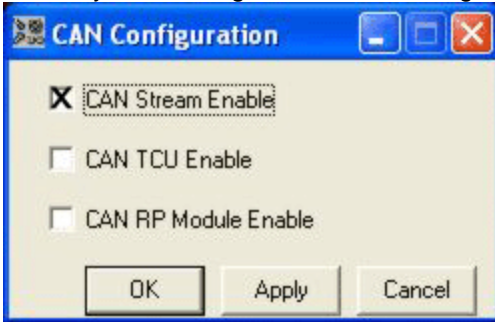
connections are contained in a 2 pin Deutsch DTM connector. On older harnesses it may be in an unterminated, twisted/shielded flying lead in the dash harness.

FAST C25 (CAN 0+) → AEM CD "CAN 2" Pin 1 (CAN 2+), Gray wire in twisted/shielded pair  
FAST C26 (CAN 0-) → AEM CD "CAN 2" Pin 2 (CAN 2-), Black wire in twisted/shielded pair

A CAN bus network needs two terminating resistors in order to function correctly – one at each physical end of the network. The CD-7 has a software selectable internal CAN terminating resistors. The XFI ECU does not have internal terminating resistors and relies on external terminating plugs (FAST pn 301414). AEM has provided a pre-configured layout for use with the FAST ECU and the Port 2 terminating resistor is turned on by default. A single FAST terminating plug should be used in order to provide the second terminating resistor in the network.

## ECU Software Setup

The CAN Stream output must be enabled. This is performed through the pulldown menus by going to View>System Configuration>CAN Configuration.



Make sure the CAN Stream Enable box is checked.

## Supported Channels

The CD-7 supports 118 unique channels transmitted from the FAST XFI 2.0 ECU.

CH	CD-7 CHANNEL NAME	FAST XFI CHANNEL NAME	CH	CD-7 CHANNEL NAME	FAST XFI CHANNEL NAME
1	AFR	Actual A/F	41	FuelInjDutyPrimary	Inj. DC (%)
2	AFRControlGain	CL Gain	42	FuelInjEffectivePulsewidth	HR GPW(mS)
3	AFRControlTrim	O2 Corr. (%)	43	FuelInjEPulsewidth	INJ E GPW(mS)
4	AFRErrorState	Wideband Fault	44	FuelInjFPulsewidth	INJ F GPW(mS)
5	AFRSensorPresent	WB O2	45	FuelInjGPulsewidth	INJ G GPW(mS)
6	AFRTarget	Target A/F	46	FuelInjHPulsewidth	INJ H GPW(mS)

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7	AirConOutputState	AC Clutch
8	BaroPress	Baro
9	BoostControlOutput	Boost %DC
10	CamSyncErrorState	Cam Sync Position Error
11	ClutchSw itchState	Clutch Flag
12	CoolantFan1State	Fan
13	CoolantTemp	Coolant(*F)
14	CoolantTempBiasErrorState	CTS Bias Error
15	CoolantTempErrorState	CTS Fault
16	CoolantTempSensorVolts	Raw CTS(V)
17	CrankSyncErrorStatus	Crank Sync Position Error
18	DriveshaftSpeed	DS RPM
19	DriveshaftSpeedDelta	Delta DS RPM
20	ECUBatteryVoltage	Battery (V)
21	ECUBattVoltsErrorState	Ign. Voltage Fault
22	ECURunTime	ECU powered up timer
23	EngineLimitBoostCutState	Overboost Fault
24	EngineRunTime	Run Time (S)
25	EngineSpeed	RPM
26	EngineVolumetricEfficiency	VE (%)
27	FuelAccelPumpMAPpulse	MAP AE
28	FuelCorrectionBaroPress	Baro Corr. (%)
29	FuelCorrectionCoolantTemp	CTS Corr. (%)
30	FuelCorrectionEngineStart	AFT Corr. (%)
31	FuelCorrectionFuelPressure	FP Corr.(%)
32	FuelCorrectionGRS	Grs Corr.(%)
33	FuelCorrectionIntakeAirTemp	ATS Corr. (%)

47	FuelInjPulsewidth	HR IPW(mS)
48	FuelMassFlow RateHigh	Fuel lbs/hr (H)
49	FuelMassFlow RateLow	Fuel lbs/hr (L)
50	FuelPress	Fuel Press (PSI)
51	FuelPressErrorState	Fuel Pressure Sensor Fault
52	FuelPressInjDelta	Inj Press (PSI)
53	FuelPumpState	Fuel Pump
54	IdleControlErrorState	IAC Fault
55	IdleControlPosition	IAC Target
56	IdleControlStatus	IAC Status
57	IgnitionTiming	Spark (*BTDC)
58	IgnitionTrimAFR	CTS A/F
59	IgnitionTrimCoolantTemp	CTS Spark (*)
60	IgnitionTrimEngineStart	ATS Spark (*)
61	IgnitionTrimFuelEnergy	FEC Spark
62	InjDutyHighErrorState	Injector Duty Cycle Fault
63	IntakeManAirTempBiasErrorState	ATS Bias Error
64	IntakeManifoldAirPress	MAP (kPa)
65	IntakeManifoldAirPressDelta	Delta MAP
66	IntakeManifoldAirPresSensorVolts	Raw MAP(V)
67	IntakeManifoldAirPressErrorState	MAP Fault
68	IntakeManifoldAirTemp	Air Temp(*F)
69	IntakeManifoldAirTempErrorState	ATS Fault
70	IntakeManifoldAirTempSensorVolts	Raw ATS(V)
71	KnockGlobalIgnOffset	ESC Retard (Deg)
72	LearningState	Learning
73	OilPress	Oil Press (PSI)

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34	FuelEnergyConstant	Fuel Energy Constant
35	FuelEthanolContentErrorState	Fuel Composition Sensor Fault
36	FuelInjAPulsewidth	INJ A GPW(mS)
37	FuelInjBatteryOffset	Inj Open (mS)
38	FuelInjBPulsewidth	INJ B GPW(mS)
39	FuelInjCPulsewidth	INJ C GPW(mS)
40	FuelInjDPulsewidth	INJ D GPW(mS)

74	OilPressErrorState	Oil Pressure Sensor Fault
75	PowerAdderElapsedTime	PA Elapsed T
76	PowerAdderEnableInputState	PA Enable Input
77	PowerAdderFixedIgnTrim	PA Retard
78	PowerAdderFuelDelay	PA Fuel Dly(mS)
79	PowerAdderFuelTrim	PPA Fuel (%)
80	PowerAdderHoldInputState	PA Hold Input

CH	CD-7 CHANNEL NAME	FAST XFI CHANNEL NAME
81	PowerAdderProgDutyCycle	PPA Sol (%)
82	PowerAdderRampedIgnTrim	PA Ramp Rtd
83	PowerAdderStage	PA Stage
84	ThrottlePos	TPS (%)
85	ThrottlePosErrorState	TPS Fault
86	ThrottlePosRateofChange	Delta TPS
87	ThrottlePosSensorVolts	Raw TPS(V)
88	TorqueConverterLockState	TCC Lock
89	VehicleSpeed	MPH
90	XFI_AAuxIn1_Volts	AAUX1(V) (PF)
91	XFI_AAuxIn2_Volts	AAUX2(V) (OP)
92	XFI_AAuxIn3_Volts	AAUX3(V)
93	XFI_AAuxIn4_Volts	AAUX4(V)
94	XFI_AAuxIn5_Volts	AAUX5(V)
95	XFI_AAuxIn6_Volts	AAUX6(V)
96	XFI_AAuxIn7_Volts	AAUX7(V)
97	XFI_AAuxIn8_Volts	AAUX8(V)
98	XFI_AuxOut1	AuxOut1
99	XFI_AuxOut2	AuxOut2
100	XFI_AuxOut3	AuxOut3

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101	XFI_AuxOut4	AuxOut4
102	XFI_AuxSpeed	AUX RPM
103	XFI_CalSw itchPosition	Cal#Sw itch
104	XFI_CalUsing	Cal#Loaded
105	XFI_DigitalAuxIn0	Digital Aux Input #0
106	XFI_DigitalAuxIn1	Digital Aux Input #1
107	XFI_DigitalAuxIn2	Digital Aux Input #2
108	XFI_DigitalAuxIn3	Digital Aux Input #3
109	XFI_DigitalAuxIn4	Digital Aux Input #4
110	XFI_DigitalAuxIn5	Digital Aux Input #5
111	XFI_DigitalAuxIn6	Digital Aux Input #6
112	XFI_DigitalAuxIn7	Digital Aux Input #7
113	XFI_UEGORVolts	UEGOR (V)
114	XFI_UEGOSVolts	UEGOS (V)
115	XFI_UEGOVolts	UEGO (V)
116	XIM_BaseDwellTime	XIMBaseDwell
117	XIM_DwellMod	XIMDwellMod(%)
118	XIM_DwellTime	XIM Dwell(mS)

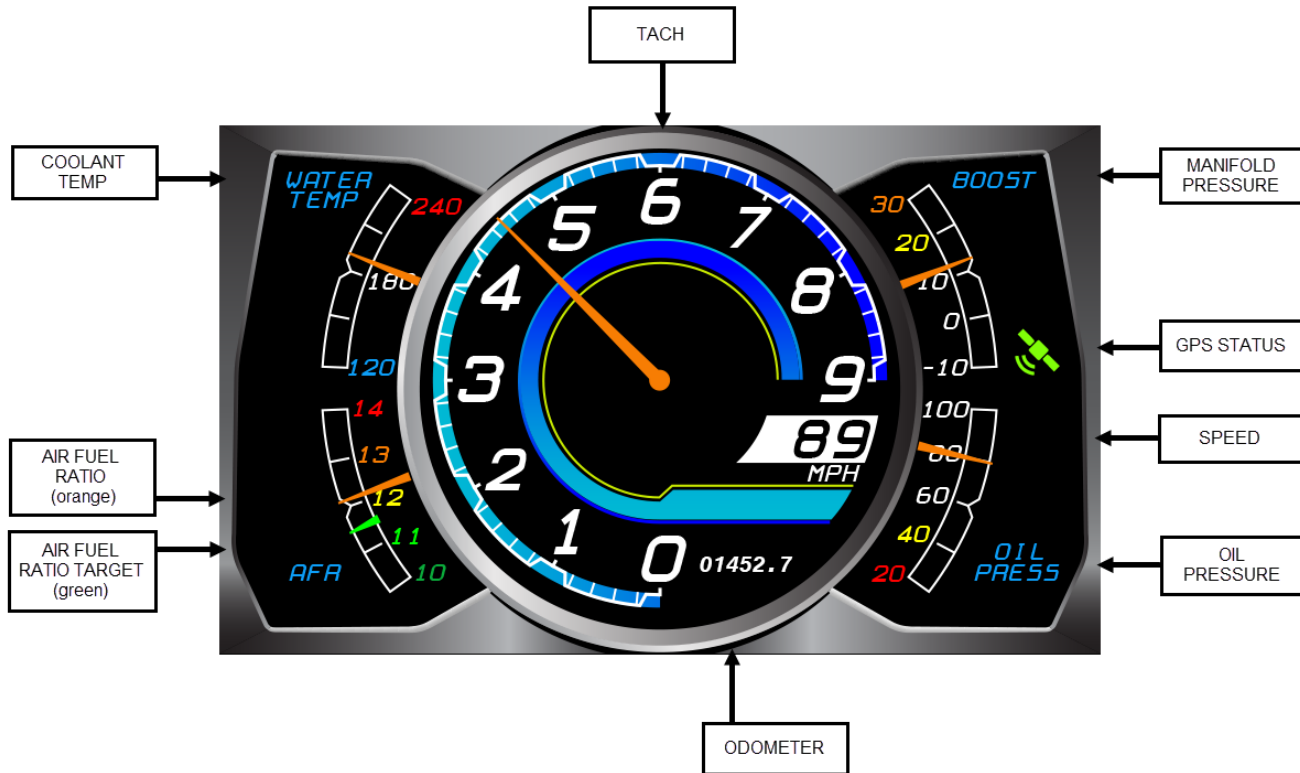
## AEM Setup in DashDesign

AEM has provided a pre-configured default layout to receive, display and log (if using CD-7L) the CAN bus channel data from a FAST XFI 2.0 ECU. To load this, simply open the FAST XFI 2.0 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.

## Layout Overview

### Page 1 & 2 – General

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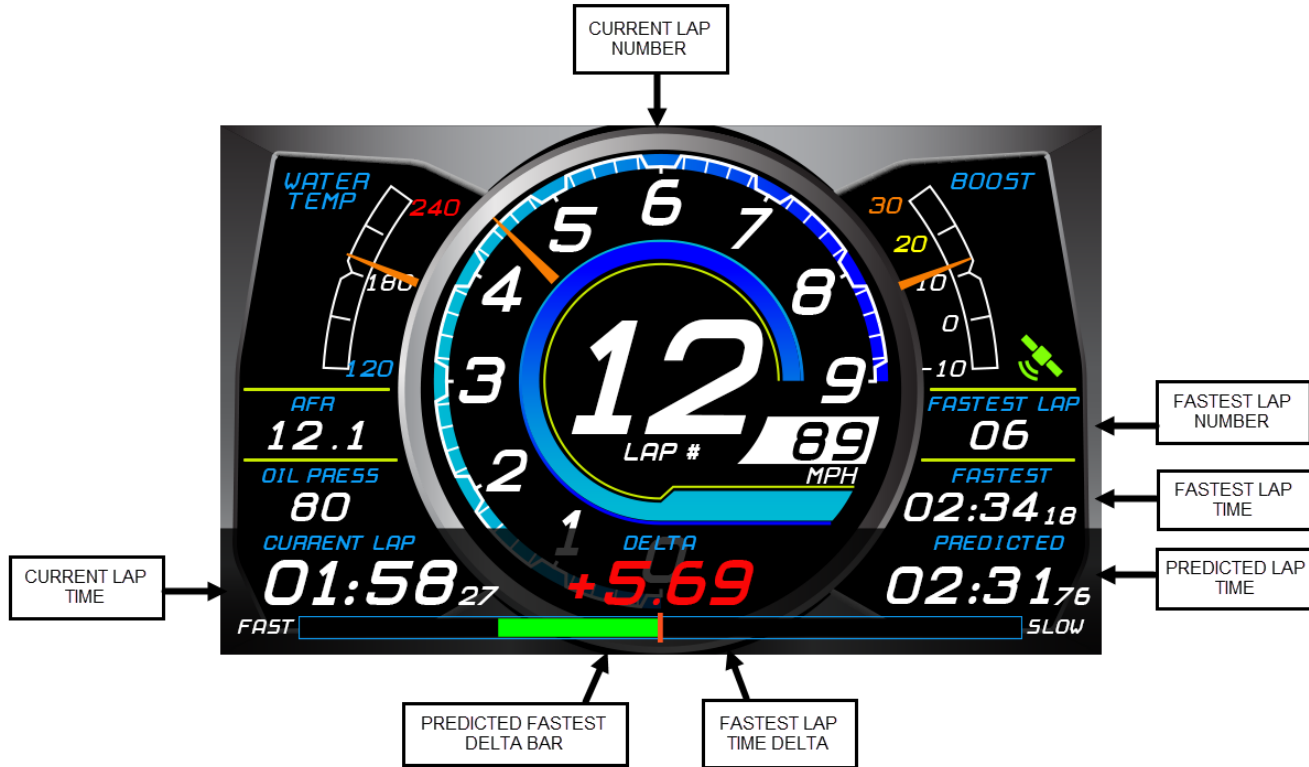


## Additional details:

- 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).
- AFR gauge: Has two needles: orange needle for actual AFR and smaller green needle for AFR Target. This is achieved by having two different gauge channels on top of each other.
- Speedometer: “MPH” text can be changed for other units or speedometer can be changed to completely different channel.

## Page 3 – Lap Timing

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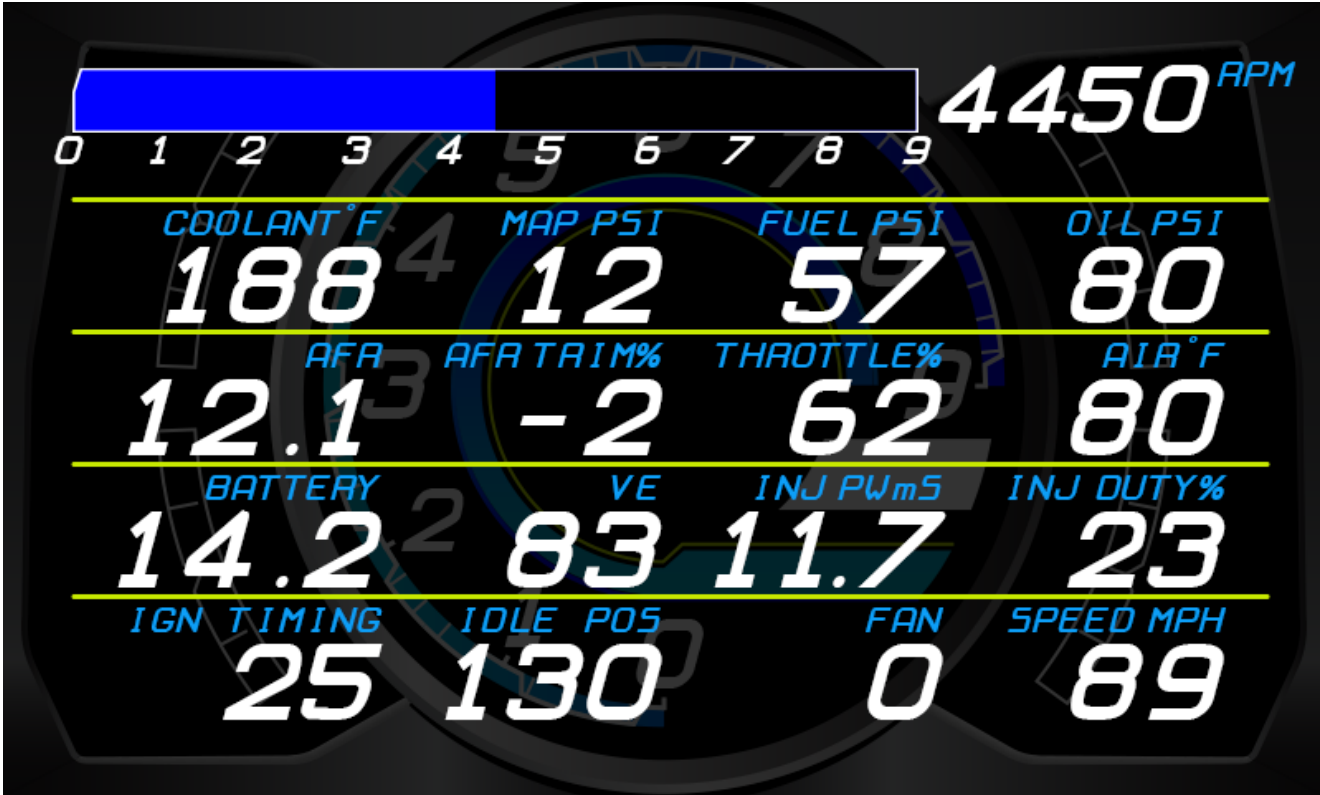
Includes lap timing channels for use with either an AEM VDM or GPS Module\*. This page maintains the upper two perimeter gauges and then displays AFR and Oil Pressure as a numeric read out on the left. The perimeter gauges and numeric read outs can be changed to reference any channel desired. Additional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

## Page 4 – Diagnostic

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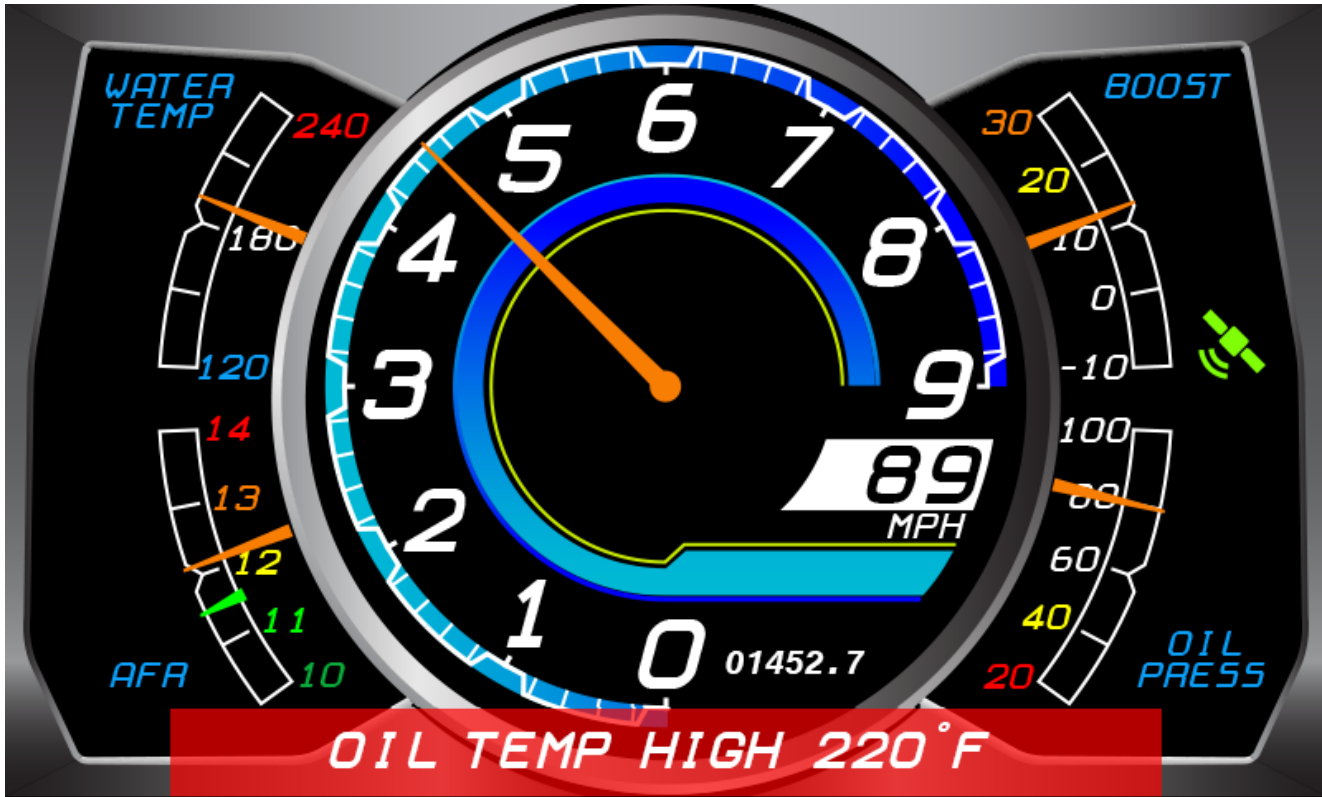
Diagnostic page that allows you to check over many important channels quickly and easily. Inputs that also have error states have their error status monitored by the channel heading's font color (changes from blue to red). For instance, if the channel *FuelPressureErrorState* is 1, the "FUEL PSI" text will turn red thereby indicating that the fuel pressure sensor is in error.

## Warnings and Alarms

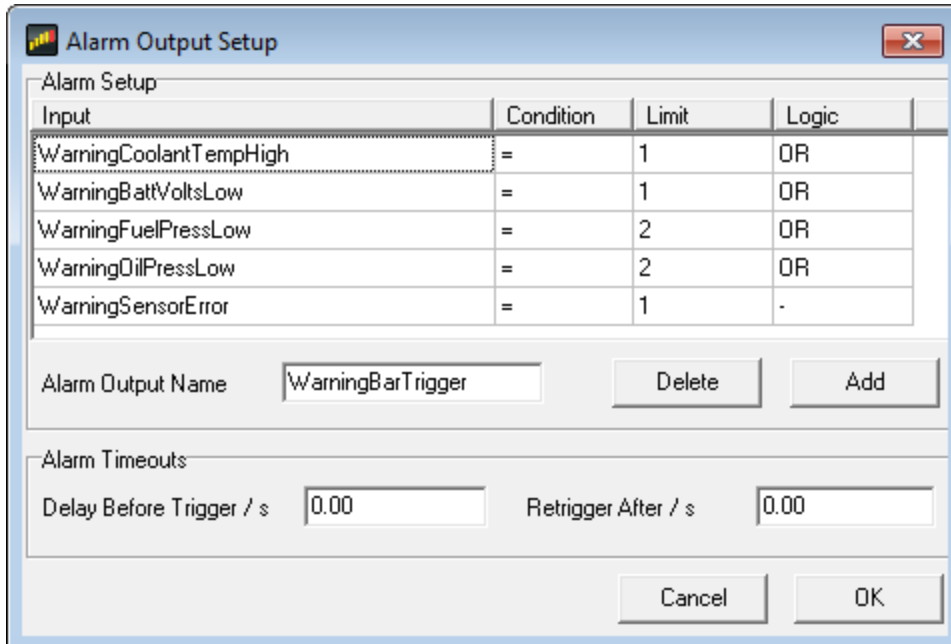
### Warning Bar



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This layout utilizes a number of different warnings and alarms 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. A warning will be triggered and continue to display so long as the warning trigger conditions are still valid. Warnings cannot be forcibly cleared. 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:



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The warning will be triggered if channels *WarningCoolantTempHigh* or *WarningBattVoltsLow* or *WarningSensorError* are 1. Note that *WarningFuelPressLow* and *WarningOilPressLow* are included in the *WarningBarTrigger* alarm but have been set to 2 to disable them from triggering the warning. If fuel and oil pressure sensors are being used, their values may be set to 1 in order to trigger the warning in the event of low oil/fuel pressure.

*WarningSensorError* is an alarm channel that turns on (1) if any of the referenced sensor error states are true/on (1).

Input	Condition	Limit	Logic
CoolantTempErrorState	=	1	OR
IntakeManifoldAirTempErrorState	=	1	OR
IntakeManifoldAirPressErrorState	=	1	OR
OilPressErrorState	=	2	OR
ThrottlePosErrorState	=	1	-

Alarm Output Name:

Alarm Timeouts  
Delay Before Trigger / s:  Retrigger After / s:

Note that *OilPressErrorState* is included in the *WarningSensorError* alarm but has been set to 2 to disable it from triggering the alarm. If an oil pressure sensor is being used, its value can be set to 1 in order to trigger the alarm if the sensor goes into error.

## Alarm Page

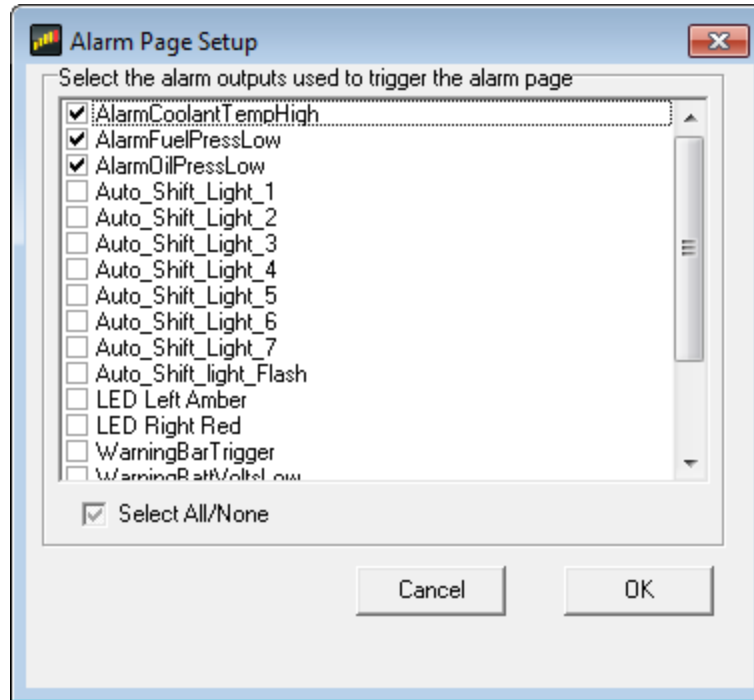
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Alarms are generally used to alert the driver to a severe condition that could potentially cause engine/vehicle damage and vehicle operation should be stopped immediately. When an alarm is triggered, the Alarm Page is displayed on the screen along 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 low oil pressure is triggered at 40 psi but the **alarm** for low oil pressure is triggered at 30 psi. 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.

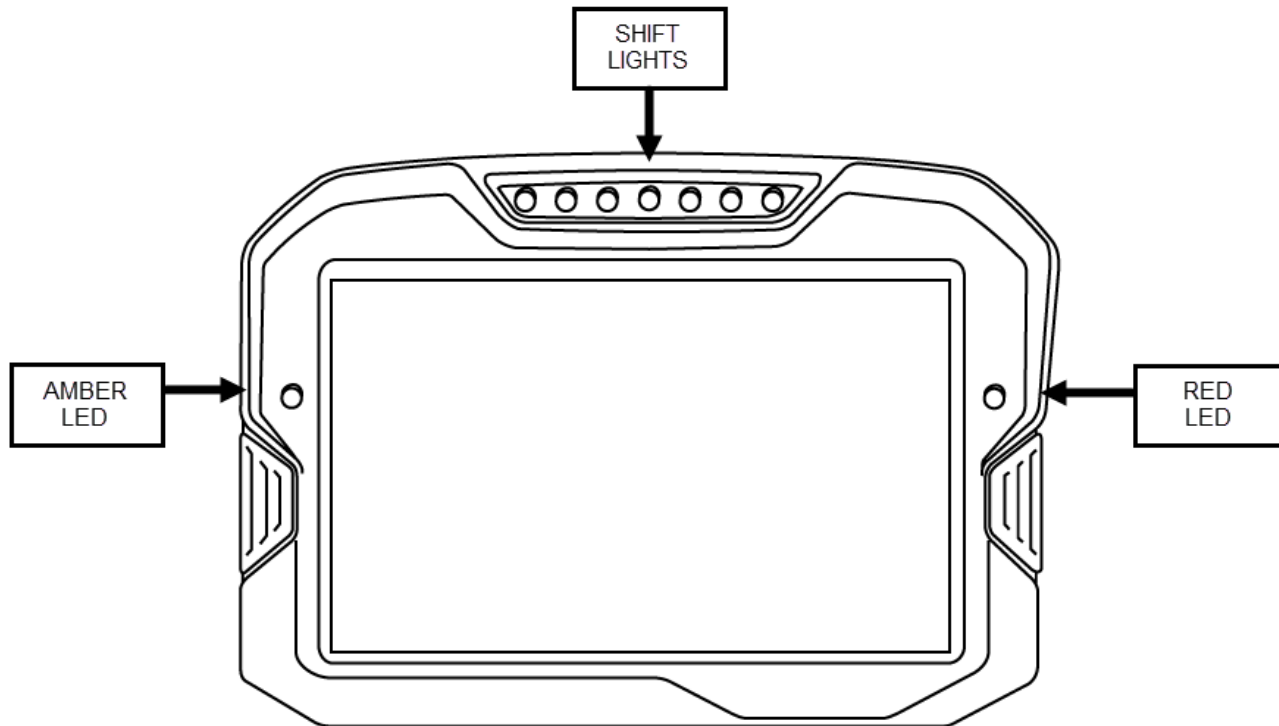
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**NOTE:** Warnings and alarms for low oil and fuel pressure are built into the layout but have been “disabled” by setting their engine speed reference to be >12,000. To make these functions active, set to a pertinent value; ie 3000 rpm.

## Shift Lights & LEDs

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Shift lights and LEDs are configured in Setup>Shift Lights and LEDs. This layout sets the shift lights to start at 5000 rpm, go full scale at 6700 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).

The amber (left) LED references output LED Left Amber which is an alarm that references *PowerAdderEnableInputState*. The amber LED will turn on when the power adder (nitrous) is enabled/armed. The red (right) LED references output LED Right Red which is an alarm that references *PowerAdderElapsedTime*. The red LED will turn on once the power adder (nitrous) has been activated (*PowerAdderElapsedTime*>0).