



Revision	Date
Initial Release	Jan 4, 2019
Updated Images to DD2	Feb 6, 2019



**Serial
data**



***MOTEC M4 based ECU's
to AEM CD-5 & CD-7 Displays***

Supported Devices

***M4 ECU's
M48 ECU's
M8 ECU's
M2R ECU's
MLS ECU's***

Running Hex Version V5.50 and later

Required Interface Device



Motec ECU	AEM Serial2CAN Adaptor
M4 early (s/n 0-2999) M48 (all) M8 (all)	AEM 30-2230 Motec M4 Early
M4 late (s/n 3000+) MLS (all) M2R (all)	AEM 30-2231 Motec M4 Late

Supported Channels

The CD-5 & CD-7 displays support the following 37 parameter channels and 32 State Channels transmitted by the M4/M48/M8 based ECU's:

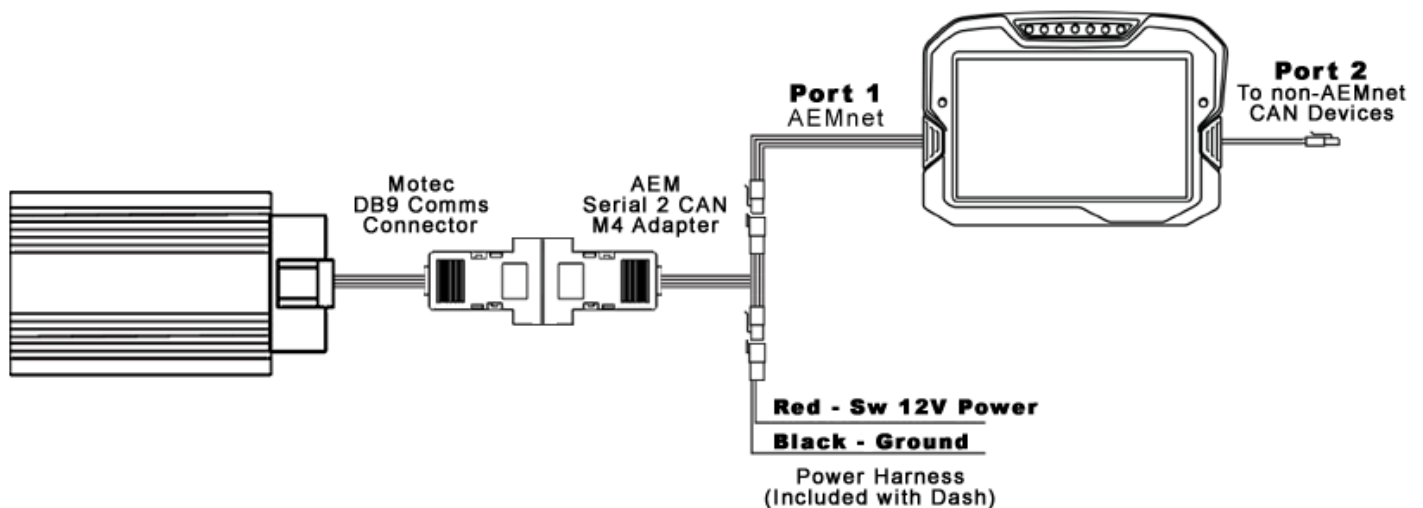
EngineSpeed (rpm)	FuellnjDuty (%)
ThrottlePos (%)	FuellnjAccelEnrichment (mS)
IntakeManifoldAirPress (kPa)	AFRErrorState (OK/Error)
IntakeManifoldAirTemp (C)	REF_ErrorState (OK/Error)
CoolantTemp (C)	BrakeSwitchState (On/Off)
AFR (LA)	SYNC_ErrorState (OK/Error)
IgnitionTiming (deg)	ECU_AUXTDecPtState (On/Off)
FuelUsed (L)	ECU_AUXVDecPtState (On/Off)
ECUBatteryVoltage (V)	NOREF_ErrorState (OK/Error)
ECUTemp (C)	ECUTempErrorState (OK/Error)
BaroPress (kPa)	NOSYNC_ErrorState (OK/Error)
WheelSpeedDig1 (km/h)	ECU_DigitalIn2State (On/Off)
WheelSpeedDig2 (km/h)	ECU_DigitalIn1State (On/Off)
WheelSpeedNonDriven (km/h)	Fuellnj4ErrorState (OK/Error)
WheelSpeedDriven (km/h)	Fuellnj3ErrorState (OK/Error)
WheelSlip (km/h)	Fuellnj2ErrorState (OK/Error)
GearPosnCalculated	Fuellnj1ErrorState (OK/Error)
ECU_LoadPoint	RPMLimitAlarmState (OK/Error)
ECU_SyncPosition (%)	OverBoostAlarmState (OK/Error)
FuellnjCompAuxTemp (%)	WheelSpeed2DecPtState (On/Off)
FuellnjCompAuxVolt (%)	WheelSpeed1DecPtState (On/Off)
ECU_AuxiliaryTemp (C)	InjectorSprayBarState (On/Off)
ECU_AuxiliaryVoltage (C)	ECU_AuxTempErrorState (OK/Error)
IgnitionCutLevel (%)	CoolantTempErrorState (OK/Error)
FuelCutLevel (%)	ThrottlePosErrorState (OK/Error)
ECU_EfficiencyPoint	ECU_AuxVoltsErrorState (OK/Error)
ECU_EfficiencyPoint2	BatteryVoltsErrorState (OK/Error)
ECU_AuxOutputDuty1 (%)	GearShiftCutIgnState (Cut/No Cut)
ECU_AuxOutputDuty2 (%)	FuellnjMaxDutyErrorState (OK/Error)
ECU_AuxOutputDuty3 (%)	MemoryInternalErrorState (OK/Error)
ECU_AuxOutputDuty4 (%)	BatteryVoltsLowAlarmState (OK/Error)
AFRShortTermFuelTrim (%)	BatteryVoltsDeltaErrorState (OK/Error)
AFRLongTermFuelTrim (%)	IntakeManAirTempErrorState (OK/Error)
FuellnjActualPulsewidth (mS)	IntakeManAirPressErrorState (OK/Error)
FuellnjEffectivePulsewidth (mS)	

CAN Bus Wiring

The AEM Serial2CAN adaptor is designed to be a permanent installation in your vehicle and allows the serial output from your ECU to be used with devices that require CAN based communications and is designed to be the only device you need to convert the serial signals from your M4 based ECU into a CAN signal, even if you have an early M4 (or any M48/M8) based unit that requires a CIM to talk to a PC.

On early ECU's, as long as the proper AEM Serial2CAN adaptor is used (AEM 30-2230), no other comms devices are required. Early Motec ECU's that normally require a CIM to communicate with a laptop DO NOT need to use the CIM to connect to the AEM Serial2CAN adaptor. The CIM functionality is built into the AEM 30-2230 Adaptor and the adaptor has the correct DB9 connector gender and pinout to replace the CIM in this permanent installation. This allows you to keep the CIM with your laptop rather than being forced to leave it with the car as part of a permanent dash installation.

To connect the Serial2CAN adaptor to the dash, plug the adaptor into the 4 pin connector on the main harness supplied with the dash and the other 4 pin connector into the power harness supplied with the dash. The Red & Black wires from the power harness should be connected to switched, fused 12V power and ground, respectively.



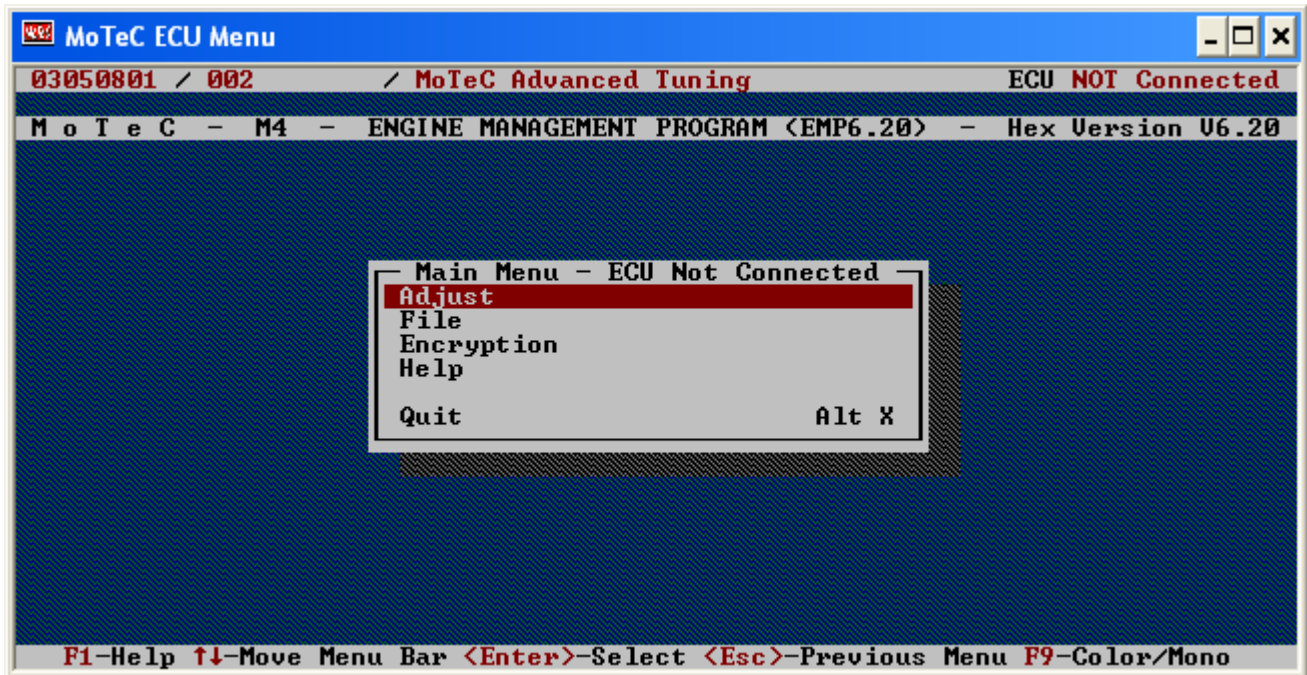
The AEM Serial2CAN adaptor has an internal terminating resistor. As long as the adaptor is on one physical end of the CAN Network and the AEM Display is on the other with its terminating resistor activated then no further action regarding terminating resistors is required on this port.

Motec ECU Setup

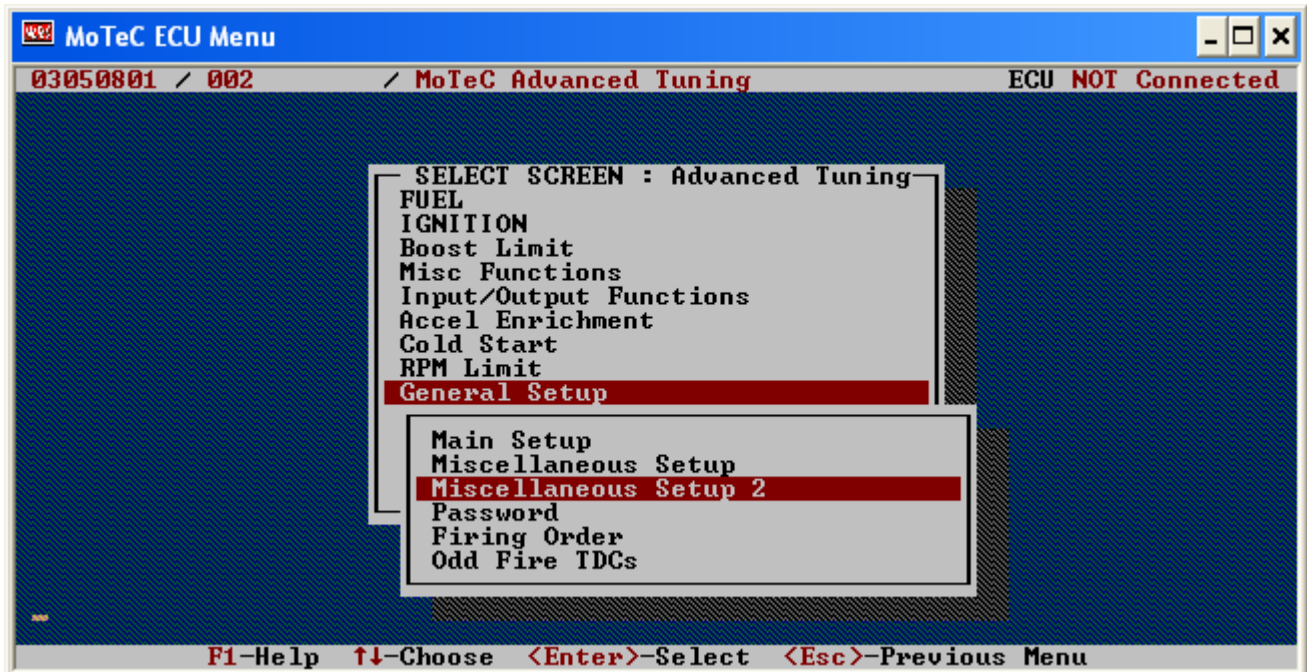
The ECU must be running a Hex version of at least V5.50.

The Telemetry Data Set and Telemetry Baud Rate must be set in the Motec calibration software. All ECU's (M4, M48, M8, MLS, M2R) are set the same way and output the same format.

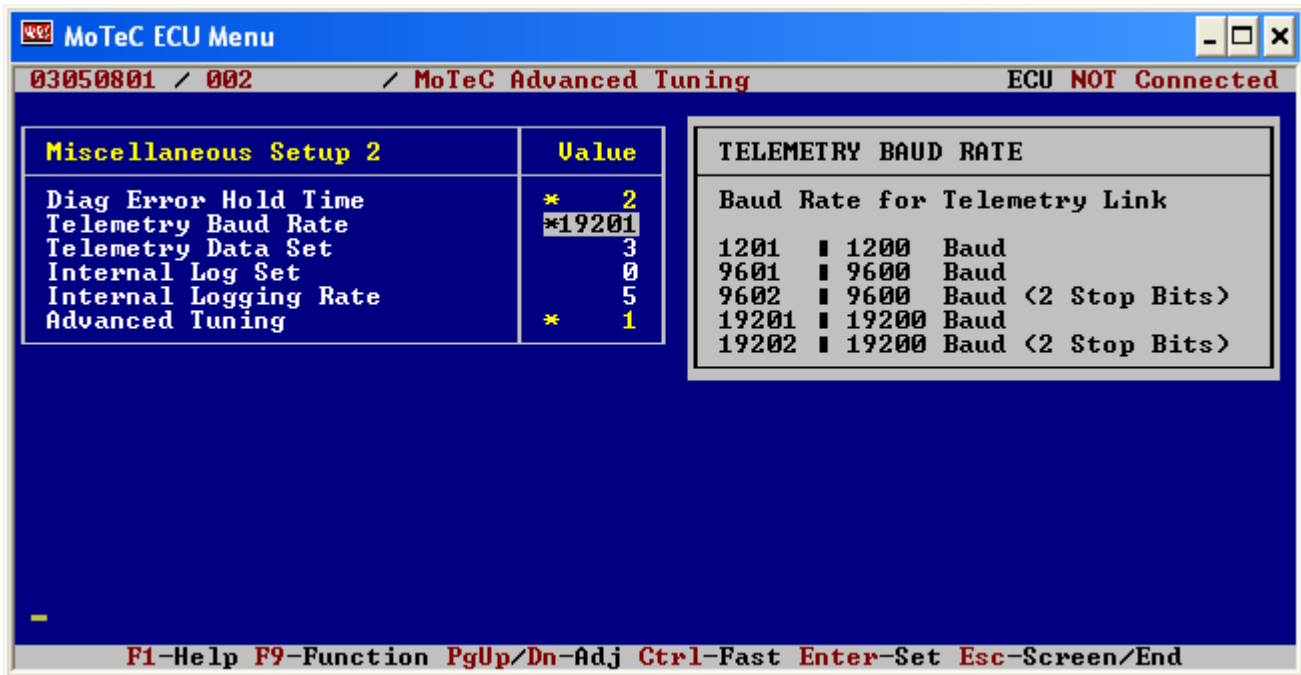
From the main Menu, select "Adjust" to enter the editor;



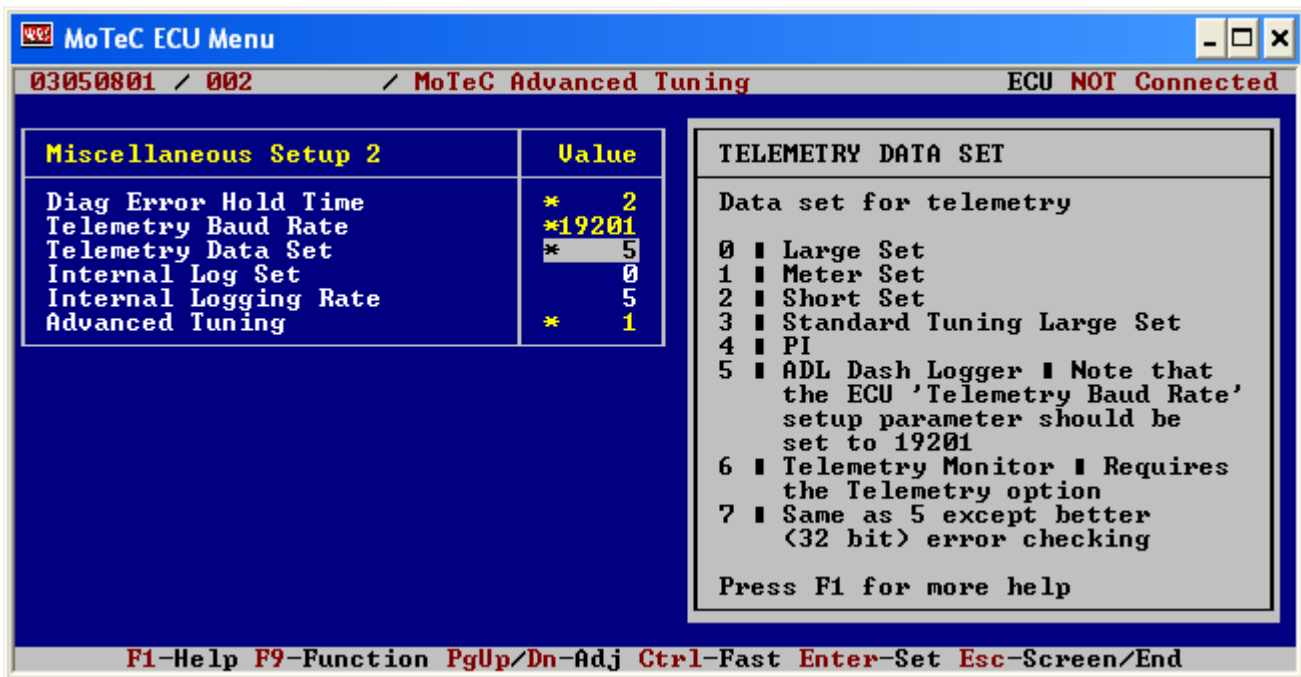
From the Tuning menu, Select "General Setup" then "Miscellaneous Setup 2";



From the “Miscellaneous Setup 2” menu, select the “Telemetry Baud Rate” and set it to “19201”



Next, set the Telemetry Data Set to “5”



Exit this menu, save the file and upload it to the ECU as normal.

AEM Setup in DashDesign

The fastest way to get something working is to start with an AEM created setup for the M4/M48 ECU's using the Serial2CAN adaptor. These are installed with DashDesign on your computer and can be found at:

...\AEM\DashDesign\Setups\App Specific

STOP HERE

You only need to continue if you choose to not use the AEM supplied layout and wish to import M4/M48 Serial2CAN support to custom or other existing layouts.

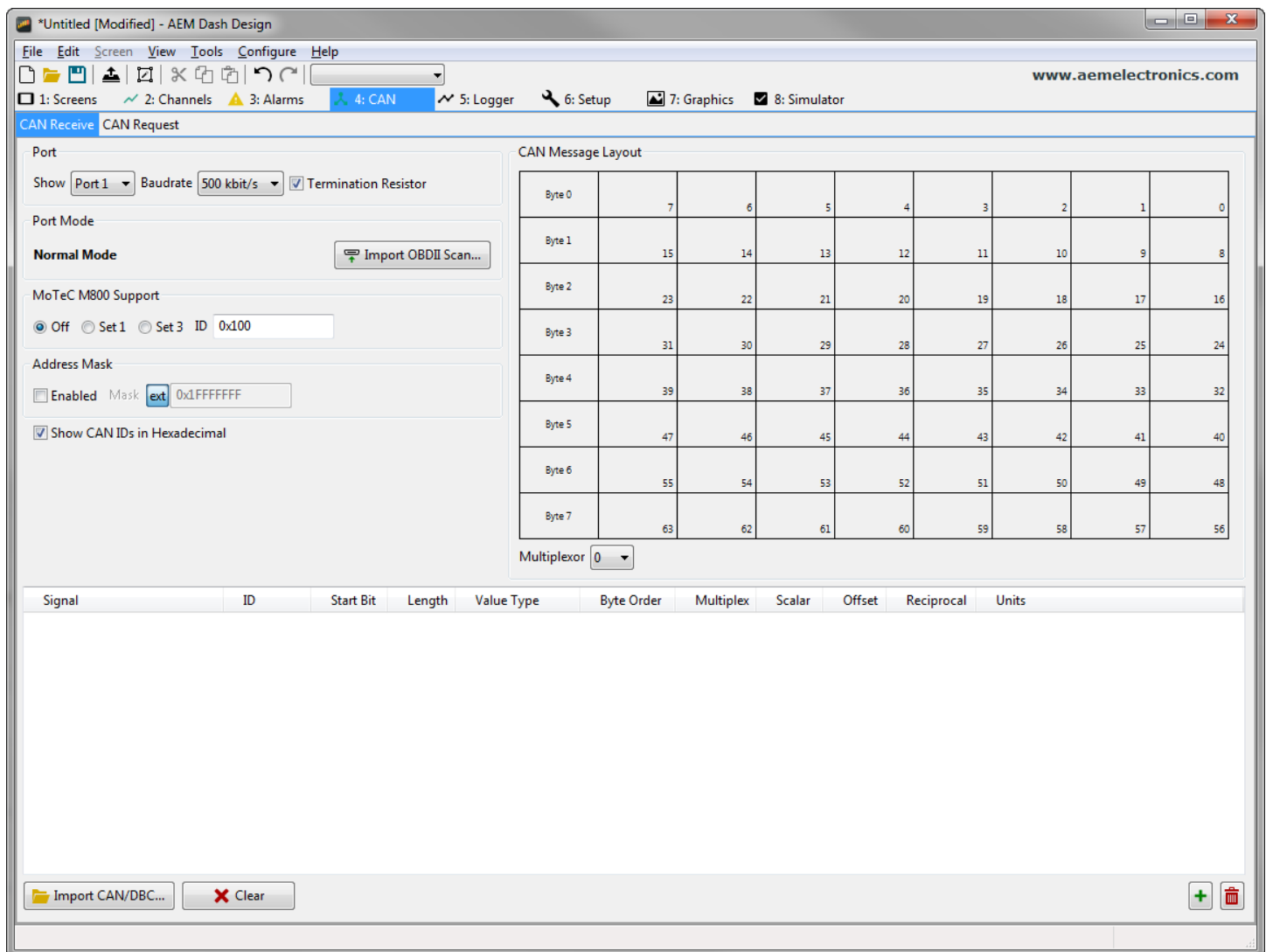
Adding Serial2CAN M4 support on different Layouts

If you want to create something from scratch, you can either start with a new dash layout by selecting “File” then “New” in DashDesign or you can select from a pre-designed layout that has screens already designed and inserted but has the CAN inputs left blank. These are chosen by selecting “File” then “Open” and selecting one of the setups titled xzyblank.aemcd7 with the xyz representing a description of the layouts contained in the file.

To import the Serial2CAN Motec M4/M48 CAN configuration into your setup you select the CAN tab from within Dash Design and choose the CAN Receive tab.

Make sure the port settings are as follows:

Show: “Port 1” **Baudrate:** 500 kbit/s **Termination Resistor:** “ON”
Address Mask: “OFF”
M800 Support: “OFF”



Then click on “Import CAN” on the lower left and select the Serial2CAN Motec M4/M48 CAN setup file “S2C_Motec_M4_Rev0.dbc”.

*Untitled [Modified] - AEM Dash Design

File Edit Screen View Tools Configure Help

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1: Screens 2: Channels 3: Alarms 4: CAN 5: Logger 6: Setup 7: Graphics 8: Simulator

CAN Receive CAN Request

Port
 Show Port 1 Baudrate 500 kbit/s Termination Resistor

Port Mode
 Normal Mode Import OBDII Scan...

MoTeC M800 Support
 Off Set 1 Set 3 ID 0x100

Address Mask
 Enabled Mask ext 0x1FFFFFF

Show CAN IDs in Hexadecimal

CAN Message Layout

Byte 0	EngineSpeed	7	6	5	4	3	2	1	0
Byte 1		15	14	13	12	11	10	9	8
Byte 2	ThrottlePos	23	22	21	20	19	18	17	16
Byte 3		31	30	29	28	27	26	25	24
Byte 4	IntakeManifoldAirPress	39	38	37	36	35	34	33	32
Byte 5		47	46	45	44	43	42	41	40
Byte 6	IntakeManifoldAirTemp	55	54	53	52	51	50	49	48
Byte 7		63	62	61	60	59	58	57	56

Multiplexor 0

Signal	ID	Start Bit	Length	Value Type	Byte Order	Multiplex	Scalar	Offset	Reciprocal	Units
EngineSpeed	0x0000800	8	16	Signed Integer	BE/Motorola	Off	6	0	<input type="checkbox"/>	angular_speed:rpm
ThrottlePos	0x0000800	24	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	fraction:%
IntakeManifoldAirPress	0x0000800	40	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	pressure:psi
IntakeManifoldAirTemp	0x0000800	56	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	temperature:F
CoolantTemp	0x0000801	8	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	temperature:F
AFR	0x0000801	24	16	Signed Integer	BE/Motorola	Off	0.01	0	<input type="checkbox"/>	af:LA
ECU_AuxiliaryTemp	0x0000801	40	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	temperature:F
ECU_AuxiliaryVoltage	0x0000801	56	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	temperature:F
ECUBatteryVoltage	0x0000802	8	16	Signed Integer	BE/Motorola	Off	0.01	0	<input type="checkbox"/>	voltage:V
ECUTemp	0x0000802	24	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	temperature:F
BaroPress	0x0000802	40	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	pressure:psi
WheelSpeedDig1	0x0000802	56	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	speed:mph
WheelSpeedDig2	0x0000802	8	16	Signed Integer	BE/Motorola	Off	0.1	0	<input type="checkbox"/>	speed:mph

Import CAN/DBC... Clear

The new items will appear in the table. They can now be viewed on the display or logged. You can rename, filter, or manipulate any of these channels to make them more useful.