

Revision	Date
Initial Release	Dec 27, 2018
Updated images to DD2	Feb 6, 2019



#### AEM Series 1 ECU's (RS232) to AEM CD-5 & CD-7 Displays

EM 30-1000         AEM 30-1121         AEM 30-1610           EM 30-1010         AEM 30-1130         AEM 30-1611           EM 30-1012         AEM 30-1220         AEM 30-1612           EM 30-1020         AEM 30-1300         AEM 30-1620           EM 30-1030         AEM 30-1310         AEM 30-1621           EM 30-1040         AEM 30-1311         AEM 30-1622           EM 30-1042         AEM 30-1312         AEM 30-1623           EM 30-1050         AEM 30-1313         AEM 30-1623           EM 30-1052         AEM 30-1320         AEM 30-1710           EM 30-1052         AEM 30-1320         AEM 30-1720           EM 30-1060         AEM 30-1400         AEM 30-1800           EM 30-1070         AEM 30-1500         AEM 30-1800           EM 30-1080         AEM 30-1500         AEM 30-1820           EM 30-1080         AEM 30-1500         AEM 30-1820           EM 30-1081         AEM 30-1600         AEM 30-1900U		
AEM 30-1000	AEM 30-1121	AEM 30-1610
AEM 30-1010	AEM 30-1130	AEM 30-1611
AEM 30-1012	AEM 30-1220	AEM 30-1612
AEM 30-1020	AEM 30-1300	AEM 30-1620
AEM 30-1030	AEM 30-1310	AEM 30-1621
AEM 30-1040	AEM 30-1311	AEM 30-1622
AEM 30-1042	AEM 30-1312	AEM 30-1623
AEM 30-1050	AEM 30-1313	AEM 30-1710
AEM 30-1052	AEM 30-1320	AEM 30-1720
AEM 30-1060	AEM 30-1400	AEM 30-1800
AEM 30-1070	AEM 30-1401	AEM 30-1810
AEM 30-1080	AEM 30-1500	AEM 30-1820
AEM 30-1081	AEM 30-1510	AEM 30-1821
AEM 30-1100	AEM 30-1600	AEM 30-1900U
AEM 30-1101	AEM 30-1601	AEM 30-1902U
AEM 30-1110	AEM 30-1602	Mopar Performance P5153528
AEM 30-1120	AEM 30-1603	Mopar Performance P5153608

# **Required Interface Device**

AEM 30-2228, Serial2CAN Adapter, AEM Series 1



# **Supported Channels**

The CD-5 & CD-7 displays support 21 channels transmitted by the AEM Series 1 ECUs:

EngineSpeed (RPM)	ECUAnalogInput11Voltage (Volts)
EngineLoad (%)	ECUAnalogInput13Voltage (Volts)
CoolantTemp (F)	ECUAnalogInput14Voltage (Volts)
IntakeManifoldAirTemp (F)	ECUAnalogInput15Voltage (Volts)
ThrottlePos (%)	ECUAnalogInput16Voltage (Volts)
AFR1 (A/F)	ECUAnalogInput17Voltage (Volts)
AFR2 (A/F)	IntakeManifoldAirPressErrorState (OK/Error)
VehicleSpeed (MPH)	BaroPressErrorState (OK/Error)
ECUBatteryVoltage (Volts)	CoolantTempErrorState (OK/Error)
GearPosCalculated	IntakeManifoldAirTempErrorState (OK/Error)
	ThrottlePosErrorState (OK/Error)

## **CAN Bus Wiring**

To hook the AEM CD-5 & CD-7 to an AEM Series 1 ECU, you first plug the Serial2CAN adaptor into the 9 pin comms connector on the EMS. Then 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.

## **AEM Series 1 ECU Setup**

The Serial Telemetry must be enabled on the Series 1 ECU. This is done using the AEMPro Software.

Note: The serial datastream will only work with version 1.19 or newer firmware. When connected to the EMS, the firmware version is shown in the blue strip at the top of the screen. If your ECU is not running version 1.19 or later, you can download the required files from the aemelectronics.com website.

Open AEM Pro and connect to the EMS. Wait for the EMS to finish downloading. Left click on "VIEW" and select the telemetry wizard from the wizards drop down menu.

				🐋 Wizard : Telemetry Wizard	x
<u>Options</u>	<u>V</u> iew <u>T</u> emplates	<u>Logging</u>	<u>C</u> onfigure <u>W</u> indow <u>H</u> elp		
	Parameters	Ctrl+P		Configuration	latch
	Wizards	•	Primary Inj Batt Offset Wizard	AEM Covid Detectors Course	den
			O2 Feedback Wizard	 AEM Serial Datastream Gauge	
			Coil Dwell Wizard		
			Advanced Boost Wizard		
			Cam/Crank Sensor Wizard		
			Air Temperature Wizard		
			Coolant Temp Wizard		
			EGT Sensor Wizard		
			O2 Sensor #1 Wizard		
			VSS Wizard		
			MAP Sensor Wizard		
			Staged Inj Batt Offset Wizard	This wizard will enter in the default AEM Telemetry settings into the calibration file fo	г 🔺
			O2 Sensor #2 Wizard	the AEM Serial Datastream Gauge.	
			Basic Boost Control Wizard		
			MAF Sensor Wizard	After this wizard has been selected, be sure to cycle the EMS power before	
			Main Rev Limit Wizard	attempting to reconnect with the AEMPro software.	-
			2Step Rev Limit Wizard		
			Baro Sensor Wizard	Cancel	
			Telemetry Wizard		<u>`</u> ]

In the telemetry wizard, left click on "AEM Serial Datastream Gauge: and click OK. Close AEM Pro, connect the adaptor to the EMS, and cycle power to the EMS. The EMS is now configured to output data to the gauge.

Since the Serial2CAN adaptor shares the comms port with the PC communications cable, the ECU will always start in PC Comms mode when the power is cycled. If the ECU does not sense communications with a PC immediately it will then revert to data telemetry output. To initialize PC comms after the ECU has switched to telemetry mode you will need to power cycle the ECU.

## **AEM Setup in DashDesign**

The Serial2CAN adaptor makes the Serial output from any AEM Series 1 ECU look like the CAN output of an AEM Series 2 ECU.

So the fastest way to get something working is to use the AEM created setups for the Series 2. With the install of DashDesign2 on your computer there are many different base setups you can choose from.

...\AEM\DashDesign\Setups\App Specific\AEM Series2 & EMS-4

#### STOP HERE

You only need to continue if you choose to not use the AEM supplied layout and wish to add Series-1 Serial2CAN support to custom or other existing layouts.

#### Adding Serial2CAN S1 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 DashDesign2 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 Series-1 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" M800 Support: "OFF" Address Mask: "OFF"

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	www.aemelectronics.com									
1: Screens × 2: Channels A 3: Alarms A 4: CAN × 5: Logger CAN Require CAN Request	🔨 6: Set	:up 🛋 7:	Graphics	8: Simulato	or					
Port		a lavout								
	CAN Message	AIN Message Layout								
Show Port 1  Baudrate 500 kbit/s  V Termination Resistor	Byte 0	7	6	5	4	3	2	1	0	
Port Mode										
Normal Mode 🖙 Import OBDII Scan	Byte I	15	14	13	12	11	10	9	8	
MoTeC M800 Support	Byte 2	23	22	21	20	19	18	17	16	
Off ○ Set 1 ○ Set 3 ID 0x100     Ox100	Pute 2									
	byte 5	31	30	29	28	27	26	25	24	
Address Mask	Byte 4	20	20		26	25	24		22	
Enabled Mask ext 0x1FFFFFF		35	30	5/	30		34		32	
Show CAN IDs in Hexadecimal	Byte 5	47	46	45	44	43	42	41	40	
	Byte 6	55	54	53	52	51	50	49	48	
	Data 7									
	byte /	63	62	61	60	59	58	57	56	
	Multiplexor	0 🔻								
Signal ID Start Bit Length Value T	Гуре	Byte Order	Multiplex	Scalar	Offset R	eciprocal	Units			
The Import CAN/DBC									+ 💼	
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Then click on "Import CAN/DBC" on the lower left and select the Serial2CAN AEM Series 1 CAN setup file; "**S2C\_AEMS1ECU\_Rev0.dbc**".

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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					CAN Messa	ge Layout							
Show Port 1 - Baudrate 500 kb	hit/s 🔻 🔽 T	ermination	Resistor			EngineSpeed							
Show Fort T Conception Keriston						4 7	6		5	4	3 2	1	0
Port Mode												-	
Normal Mode		🖵 Imi	oort OBDII Se	an	Byte 1	15	14	1	3	12	11 10	9	8
		<b>T</b>				EngineLoad							
MoTeC M800 Support					Byte 2	4 23	22	2	1	20	19 18	17	16
● Off ○ Set 1 ○ Set 3 ID 0x1	100				Pote 2								
					byte 5	31	30	2	9	28	27 26	25	24
Address Mask					Byte 4	ThrottlePos							
Enabled Mask ext 0x1FFFFF	F					39	38	3	7	36	35 34	33	32
Show CAN IDs in Hexadecimal					Byte 5	47	45		-	44	42 42	41	40
						47 IntakeManifoldAi	40 iTemp		>	44	43 42	41	40
					Byte 6	+ 55	- 54	5	2	52	51 50	49	48
						CoolantTemp		-	-				
			Byte 7	+ 63	62	6	1	60	59 58	57	56		
											I		
Signal	ID	Start Bit	Length	Value T	уре	Byte Order	Multiplex	Scalar	Offset	Reciprocal	Units		*
EngineSpeed 0x	01F0A000	8	16	Unsigned I	nteger	BE/Motorola	Off	0.39063	D		angular_speed:rp	m	
∽ EngineLoad 0×	k01F0A000	24	16	Unsigned I	nteger	BE/Motorola	Off	0.0015259	0		fraction:%		
∽ ThrottlePos 0x	01F0A000	40	16	Unsigned I	nteger	BE/Motorola	Off	0.0015259	0		fraction:%		=
∽ IntakeManifoldAirTemp 0x	k01F0A000	48	8	Signed Inte	eger	BE/Motorola	Off	1	0		temperature:F		
∽ CoolantTemp 0x	01F0A000	56	8	Signed Inte	eger	BE/Motorola	Off	1	0		temperature:F		
CUAnalogInput11Voltage 0x	k01F0A001	8	16	Unsigned I	nteger	BE/Motorola	Off	7.782e-05	0		voltage:V		
∽ ECUAnalogInput13Voltage 0x	k01F0A001	24	16	Unsigned I	nteger	BE/Motorola	Off	7.782e-05	0		voltage:V		
∽ ECUAnalogInput14Voltage 0x	k01F0A001	40	16	Unsigned I	nteger	BE/Motorola	Off	7.782e-05	0		voltage:V		
∽ ECUAnalogInput17Voltage 0x	k01F0A001	56	16	Unsigned Integer		BE/Motorola	Off	7.782e-05	0		voltage:V		
→ ECUAnalogInput18Voltage 0x	k01F0A002	8	16	Unsigned Integer		BE/Motorola	Off	7.782e-05	0		voltage:V		
∽ ECUAnalogInput15Voltage 0x	k01F0A002	24	16	Unsigned Integer		BE/Motorola	Off	7.782e-05			voltage:V		
→ ECUAnalogInput16Voltage 0x	k01F0A002	40	16	Unsigned I	nteger	BE/Motorola	Off	7.782e-05	0		voltage:V		-
	211 20 0002	n	v	Unsigned	ntonor	VE/Motorola	r 144	0.00200635		1000	stel A		
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.