

Instruction Manual



Infinity Supported Application 2003–2005 Mitsubishi EVO VIII 2006–2008 Mitsubishi EVO IX



STOP!

THIS PRODUCT HAS LEGAL RESTRICTIONS.
READ THIS BEFORE INSTALLING/USING!

THIS PRODUCT MAY BE USED SOLELY ON VEHICLES USED IN SANCTIONED COMPETITION WHICH MAY NEVER BE USED UPON A PUBLIC ROAD OR HIGHWAY, UNLESS PERMITTED BY SPECIFIC REGULATORY EXEMPTION. (VISIT THE "EMISSIONS" PAGE AT [HTTP://WWW.SEMASAN.COM/EMISSIONS](http://www.semasan.com/EMISSIONS) FOR STATE BY STATE DETAILS.)

IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IF THIS PRODUCT WAS PURCHASED IN ERROR, DO NOT INSTALL AND/OR USE IT. THE PURCHASER MUST ARRANGE TO RETURN THE PRODUCT FOR A FULL REFUND.

THIS POLICY ONLY APPLIES TO INSTALLERS AND/OR USERS WHO ARE LOCATED IN THE UNITED STATES; HOWEVER CUSTOMERS WHO RESIDE IN OTHER COUNTRIES SHOULD ACT IN ACCORDANCE WITH THEIR LOCAL LAWS AND REGULATIONS.

WARNING: This installation is not for the tuning novice! Use this system with **EXTREME** caution! The AEM Infinity Programmable EMS allows for total flexibility in engine tuning. Misuse or improper tuning of this product can destroy your engine! If you are not well versed in engine dynamics and the tuning of engine management systems **DO NOT** attempt the installation. Refer the installation to an AEM-trained tuning shop or call 800-423-0046 for technical assistance.

NOTE: All supplied AEM calibrations, Wizards and other tuning information are offered as potential starting points only. **IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM IF THE CALIBRATION IS SAFE FOR ITS INTENDED USE.** AEM holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

AEM Performance Electronics
AEM Performance Electronics, 2205 126th Street Unit A, Hawthorne, CA 90250
Phone: (310) 484-2322 Fax: (310) 484-0152
<http://www.aemelectronics.com>
Instruction Part Number:
Document Build 1/6/2015

OVERVIEW

The AEM Infinity EMS can be adapted to most fuel injected engines. The base configuration files available for the Infinity ECU are starting points only and will need to be modified for your specific application. This manual lists the files available and suggested changes for your engine. It also includes a pinout with suggestions for adapting the Infinity ECU to your engine harness. It is the responsibility of the installer to verify this information before starting the engine.

MODELS

Mitsubishi EVO VIII

- 2003–2005 RS, 5-Speed Manual Transmission
- 2003–2005 MR RS, 6-Speed Manual Transmission
- 2003–2005 GT, 5-Speed Manual Transmission
- 2003–2005 GSR, 6-Speed Manual Transmission
- 2003–2005 MR GSR, 6-Speed Manual Transmission

Mitsubishi EVO IX

- 2006–2008 Standard, 5-Speed Manual Transmission
- 2006–2008 RS, 5-Speed Manual Transmission
- 2006–2008 SE, 5-Speed Manual Transmission
- 2006–2008 MR, 6-Speed Manual Transmission

DOWNLOADABLE FILES

Files can be downloaded from www.aeminfinity.com. An experienced tuner must be available to configure and manipulate the data before driving can commence. The Quick Start Guide and Full Manual describe the steps for logging in and registering at www.aeminfinity.com. These documents are available for download in the Support section of the AEM Electronics website: <http://www.aemelectronics.com/products/support/instructions>.

FILES

Downloadable files for 2003–2005 EVO VIII and 2006–2008 EVO IX

- 7100-XXXX-62 Infinity-10 (XXXX = serial number)
- 7101-XXXX-63 Infinity-8 (XXXX = serial number)

In order to properly control a 2003–2005 EVO VIII or 2006–2008 EVO IX engine, the [application specific settings](#) described in this document MUST be changed to the given settings. Failure to do so may result in improper function and possible ECU damage.

ADAPTER HARNESS OPTIONS

30-3702 Harness, Mini Lead

This harness includes a fused power distribution center with main relay. Pre-terminated connectors are available for the internal UEGO sensors and AEMNet. A bag of multi-color flying leads is included to simplify custom harness builds.

30-3701 Connector Kit

This kit includes mating connectors and terminals for the Infinity. It also includes a main relay kit which is necessary for proper power distribution. This kit is best suited for experienced installers who want to build their own harness.

30-3600 O2 Sensor Extension Harness

30-3601 IP67 Comms Cable

30-3602 IP67 Logging Cable

IMPORTANT APPLICATION SPECIFIC SETTINGS

Infinity Tuner Wizard Setup

Engine

In the Wizard Engine tab confirm the following settings:

Number of Cylinders = 4
Engine Cycle Type = 4 Stroke
Ignition Type = Wasted Spark
Firing Order = 1A-2A-1B-2B Wasted Spark

Cam/Crank

In the Wizard Cam/Crank tab confirm the following setting:

Mitsubishi EVO 8 (2003–2005) / 9 (2006–2008)

Add a text grid control to your layout and select the following channels. Make sure their values match the settings below for initial timing sync. These values will be populated when the Cam/Crank pattern is selected.

TrigOffset [degBTDC] = 176

CamSyncAdjustment = 3.0

Ignition Sync

See QuickStart Guide section **Setup: Ignition Sync** for instructions on timing sync.

Injector Setup

In the Wizard Injector Setup tab confirm the following settings:

Number of Injectors = 4

Injector Phasing Table:

- *Injector 1* = 540.00
- *Injector 2* = 360.00
- *Injector 3* = 0.00
- *Injector 4* = 180.00

Idle

In the Wizard Idle tab confirm the following settings:

Idle Stepper Max Steps = 33
Idle Airflow Invert = Unchecked

Variable Valve Control

In the VVC Wizard tab confirm the following settings:

VVC1A Enable = Checked

VVC1A Cam = 1

Cam 1 Sync = 132

Under "VVC1 Options" confirm the following settings:

VVC1 Failsafe Min = -5
VVC1 Failsafe Max = 35

VVC1 Feedback Min = -20
VVC1 Feedback Max = 20

VVC1 Duty Min = 0
VVC1 Duty Max = 80

VVC1 Proportional Gain = 1.0000
VVC1 Integral Gain = 0.2500
VVC1 Derivative Gain = 0.0500

In the Lowside Assignment Tables tab, configure LS8 as shown below:

LS8 Frequency = 250 Hz
LS8_Duty X-Axis = Engine Speed [RPM]
LS8_Duty Y-Axis = VVC1A_Duty [%]

Add a 2D table to the Infinity Tuner layout called "LS8_Duty [%]" and configure it exactly as shown below.

VVC1A_Duty [%]	0	1000	2000	3000	4000	5000	6000
0	0	0	0	0	0	0	0
20	20	20	20	20	20	20	20
40	40	40	40	40	40	40	40
60	60	60	60	60	60	60	60
80	80	80	80	80	80	80	80
100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101

Input Function Assignments

In the Wizard Input Function Assignments tab confirm the following setting:

AC Request Switch Setup = Digital 6

A/C Setup

Add a 1D Table for AC_Request_In. Populate the table as shown below.

AC_Req_dig	1.0	0.0
0.0	0.0	1.0

LowSide Assignment Tables

In the Wizard Output Functions tab confirm the following settings:

LS5 Setup (Coolant Fan):

- *Frequency* = 20 Hz
- *LS5_Duty X-Axis* = Vehicle Speed (reassignable)
- *LS5_Duty Y-Axis* = Coolant Temp [C]

LS8 Setup (VVC1A):

- *Frequency* = 250 Hz
- *LS8_Duty X-Axis* = Engine Speed [RPM]
- *LS8_Duty Y-Axis* = VVC1A_Duty [%]

Radiator Fan Control

Populate the 2D LS5_Duty [%] table similar to the table below. A higher value in the LS5_Duty [%] table will result in a faster fan speed (0% duty = max fan speed, 100% duty = fan off).

CoolantTemp [C]	0	20	40	60	80	100	120
120	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
90	30	30	30	30	30	30	30
80	50	50	50	50	50	50	50
60	100	100	100	100	100	100	100
40	100	100	100	100	100	100	100

IMPORTANT IDLE AIR CONTROL VALVE REQUIREMENTS

Many Toyota, Mitsubishi, and other vehicles use an Idle Air Control Valve with a Unipolar Stepper Motor (6-pin connector) and **MUST** be modified. See instructions below. A Bipolar Stepper Motor (e.g., GM) will have a 4-pin connector and **DOES NOT** need to be modified. This example is shown on a Toyota Supra but the same procedure is required for all 6-pin Unipolar Stepper Motor Idle Air Control Valves.

*This info does not apply to vehicles that utilize IACV solenoids.



The 2 center pins (Black-Red wires) supply 12V power to the stepper motor in the factory setup, however these pins **MUST BE DISCONNECTED** before powering the AEM Infinity ECU.



Step 1: Disconnect connector from IACV housing and gently remove the retainer from the connector.



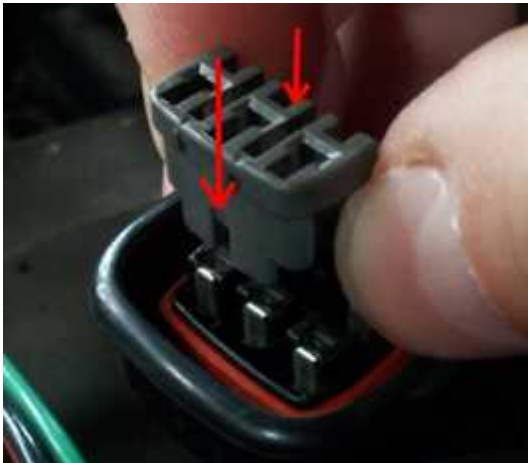
Step 2: Use a small flat-blade screwdriver/pick to move the terminal locks while pulling the Black-Red wires out from the backside of the connector.



Step 3: Use heat shrink to insulate both 12V wires, and then zip-tie the insulated wires to a nearby loom.



Step 4: Reinstall the retainer, and then plug the connector back into the IACV.



PINOUTS

Infinity Pinout

Dedicated	Dedicated and not reconfigurable
Assigned	Assigned but reconfigurable
Available	Available for user setup
Not Applicable	Not used in this configuration
Required	Required for proper function

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-1	LowsideSwitch_4	A/C Relay Control	8	20	Lowside switch, 4A max, NO internal fly back diode.	See "LowSide Assignment Tables" for output assignment.
C1-2	LowsideSwitch_5	LS5	21	18	Lowside switch, 4A max with internal fly back diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS5_Duty [%]" for activation.
C1-3	LowsideSwitch_6	LS6			Lowside switch, 4A max with internal fly back diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS6_Duty [%]" for activation.
C1-4	UEGO 1 Heat	UEGO 1 Heat			Bosch UEGO controller	Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be power by a fused/switched 12V supply.
C1-5	UEGO 1 IA	UEGO 1 IA				Trim Current signal. Connect to pin 2 of Bosch UEGO sensor.
C1-6	UEGO 1 IP	UEGO 1 IP				Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor.
C1-7	UEGO 1 UN	UEGO 1 UN				Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor.
C1-8	UEGO 1 VM	UEGO 1 VM				Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-9	Flash_Enable	Flash Enable			10K pulldown	Not usually needed for automatic firmware updates through Infinity Tuner. If connection errors occur during update, connect 12 volts to this pin before proceeding with upgrade. Disconnect the 12 volts signal after the update.
C1-10	+12V_R8C_CPU	Battery Perm Power	80	60	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered. (See C1-65.)
C1-11	Coil 4	Coil 4			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-12	Coil 3	Coil 3			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-13	Coil 2	Coil 2	23	12	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-14	Coil 1	Coil 1	10	11	25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-15	Coil 6	Coil 6			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-16	Coil 5	Coil 5			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C1-17	LowsideSwitch_2	Coolant Fan 1 Control	32, 34	30, 31	Lowside switch, 4A max, NO internal fly back diode.	See "LowSide Assignment Tables" for output assignment.
C1-18	LowsideSwitch_3	MIL Output	36	22	Lowside switch, 4A max with internal fly back diode. Inductive load should NOT have full time power.	See Wizard page "LowSide Assignment Tables" for output assignment. MIL Activates when any of the following flags are true: ErrorAirTemp, ErrorBaro, ErrorCoolantTemp, ErrorEBP, ErrorFuelPressure, UEGO_0_Diag_error, UEGO_1_Diag_error, ErrorMAFAnalog, ErrorMAFDigital, ErrorMAP, ErrorOilPressure, ErrorThrottle.
C1-19	AGND_1	Sensor Ground	92	49	Dedicated analog ground	Analog 0-5V sensor ground

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-20	AGND_1	Sensor Ground	40		Dedicated analog ground	Analog 0–5V sensor ground
C1-21	Crankshaft Position Sensor Hall	Crankshaft Position Sensor Hall	89	43	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-22	Camshaft Position Sensor 1 Hall	Camshaft Position Sensor 1 Hall	88	50	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-23	Digital_In_2	Camshaft Position Sensor 2 Hall	90	53	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-24	Digital_In_3	Turbo Speed Hz			10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Input Function Assignment for calibration constant. TurboSpeed [RPM] = Turbo [Hz] * Turbo Speed Calibration.
C1-25	Digital_In_4	Vehicle Speed Sensor	86	80	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Input Function Assignment for calibration constant.
C1-26	Digital_In_5	Flex Fuel			10K pullup to 12V. Will work with ground or floating switches.	See channel FlexDigitalIn [Hz] for raw frequency input data.
C1-27	Knock Sensor 1	Knock Sensor 1	78	91	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-28	Knock Sensor 2	Knock Sensor 2			Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-29	+12V_Relay_Control	+12V Relay Control	38	57	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
C1-30	Power Ground	Ground	13	46	Power Ground	Connect directly to battery ground.
C1-31	CANL_Aout	AEMNet CANL			Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-32	CANH_Aout	AEMNet CANH			Dedicated High Speed CAN Transceiver	Recommend twisted pair (one twist per 2") with terminating resistor. Contact AEM for additional information.
C1-33	LowsideSwitch_1	Boost Control	11	41	Lowside switch, 4A max with internal fly back diode. Inductive load should NOT have full time power.	See Setup Wizard page Boost Control for options. Monitor BoostControl [%] channel for output state.
C1-34	Lowside Fuel Pump drive	Fuel Pump	22	21	Lowside switch, 4A max, NO internal fly back diode.	Switched ground. Will prime for 2 seconds at key on and activate if RPM > 0.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-35	Analog_In_7	Throttle Position Sensor	84	78	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Set Throttle Range page for automatic min/max calibration. Monitor the Throttle [%] channel. Also DB1_TPSA [%] f for DBW applications.
C1-36	Analog_In_8	MAP Sensor	73	92	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Set Manifold Pressure page for setup and calibration. Monitor the MAP [kPa] channel.
C1-37	Analog_In_9	Fuel Pressure			12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Fuel Pressure page for setup and calibration. Monitor the FuelPressure [psig] channel.
C1-38	Analog_In_10	Baro Sensor	85	51	12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the Setup Wizard Barometric Pressure page for setup and calibration. Monitor the BaroPress [kPa] channel.
C1-39	Analog_In_11	Shift Switch Input			12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the 1D lookup table 'ShiftSwitch' for setup. Also assignable to multiple functions. See Setup Wizard for details.
C1-40	Analog_In_12	Mode Switch			12 bit A/D, 100K pullup to 5V	0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the 1D lookup table 'ModeSwitch' for input state. A multi-position rotary switch such as AEM P/N 30-2056 is recommended. Also assignable to multiple functions. See Setup Wizard for details.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-41	+5V_Out_1	+5V Out	81	42	Regulated, fused +5V supply for sensor power	Analog sensor power
C1-42	+5V_Out_1	+5V Out			Regulated, fused +5V supply for sensor power	Analog sensor power
C1-43	HighsideSwitch_1	HS1 (switched 12V)			0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assignment Tables' for configuration options. See 2D lookup table 'HS1_Table' for activation settings.
C1-44	HighsideSwitch_0	VTEC			0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assignment Tables' for configuration options. See 2D lookup table 'HS0_Table' for activation settings. See Setup Wizard page 'VTEC' for default activation criteria.
C1-45	Crankshaft Position Sensor VR+	Crankshaft Position Sensor VR+			Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-46	Crankshaft Position Sensor VR-	Crankshaft Position Sensor VR-				See Setup Wizard page Cam/Crank for options.
C1-47	Camshaft Position Sensor 1 VR-	Camshaft Position Sensor 1 VR-			Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-48	Camshaft Position Sensor 1 VR+	Camshaft Position Sensor 1 VR+				See Setup Wizard page Cam/Crank for options.
C1-49	VR+_In_2	Non Driven Left Wheel Speed Sensor +			Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C1-50	VR-_In_2	Non Driven Left Wheel Speed Sensor -				
C1-51	VR-_In_3	Driven Left Wheel Speed Sensor -			Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C1-52	VR+_In_3	Driven Left Wheel Speed Sensor +				
C1-53	DBW1 Motor -	DBW Motor Control Close			5.0A max Throttle Control Hbridge Drive	+12V to close
C1-54	DBW1 Motor +	DBW Motor Control Open			5.0A max Throttle Control Hbridge Drive	+12V to open

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-55	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C1-56	Injector 6	Injector 6			Saturated or peak and hold, 3A max continuous	Injector 6
C1-57	Injector 5	Injector 5			Saturated or peak and hold, 3A max continuous	Injector 5
C1-58	Injector 4	Injector 4	15	2	Saturated or peak and hold, 3A max continuous	Injector 4
C1-59	Injector 3	Injector 3	2	24	Saturated or peak and hold, 3A max continuous	Injector 3
C1-60	Power Ground	Ground	26	58	Power Ground	Connect directly to battery ground.
C1-61	+12V	+12V In	25	47	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C1-62	Injector 2	Injector 2	14	9	Saturated or peak and hold, 3A max continuous	Injector 2
C1-63	Injector 1	Injector 1	1	1	Saturated or peak and hold, 3A max continuous	Injector 1
C1-64	+12V	+12V In	12	59	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal pin C1-29 above.
C1-65	+12V_SW	Ignition Switch	82	99	10K pulldown	Full time battery power must be available at C1-10 before this input is triggered.
C1-66	Analog_In_Temp_1	Coolant Temp Sensor	83	44	12 bit A/D, 2.49K pullup to 5V	See "Coolant Temperature" Setup Wizard for selection.
C1-67	Analog_In_Temp_2	Intake Air Temperature	72	62	12 bit A/D, 2.49K pullup to 5V	See "Air Temperature" Setup Wizard for selection.
C1-68	Harness_Analog_In_Temp_3	Oil Temperature Sensor			12 bit A/D, 2.49K pullup to 5V	See 1D table OilTempCal table for calibration data and OilTemp [C] for channel data.
C1-69	Stepper_2A	Stepper 2A	5	15	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor is properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C1-70	Stepper_1A	Stepper 1A	4	14	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor is properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-71	Stepper_2B	Stepper 2B	18	29	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor is properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-72	Stepper_1B	Stepper 1B	17	28	Automotive, Programmable Stepper Driver, up to 28V and $\pm 1.4A$	Be sure that each internal coil of the stepper motor is properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-73	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C2-1	DBW2 Motor +	DBW Motor Control Open			5.0A max Throttle Control Hbridge Drive	+12V to open
C2-2	DBW2 Motor -	DBW Motor Control Close			5.0A max Throttle Control Hbridge Drive	+12V to close
C2-3	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C2-4	Injector 7	Injector 7			Saturated or peak and hold, 3A max continuous	Injector 7
C2-5	Injector 8	Injector 8			Saturated or peak and hold, 3A max continuous	Injector 8
C2-6	Injector 9	Injector 9			Saturated or peak and hold, 3A max continuous	Injector 9
C2-7	Injector 10	Injector 10			Saturated or peak and hold, 3A max continuous	Injector 10
C2-8	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C2-9	+12V	+12V In			12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal, pin C1-29 above.
C2-10	Injector 11	Injector 11			Saturated or peak and hold, 3A max continuous	Not used
C2-11	Injector 12	Injector 12			Saturated or peak and hold, 3A max continuous	Not used

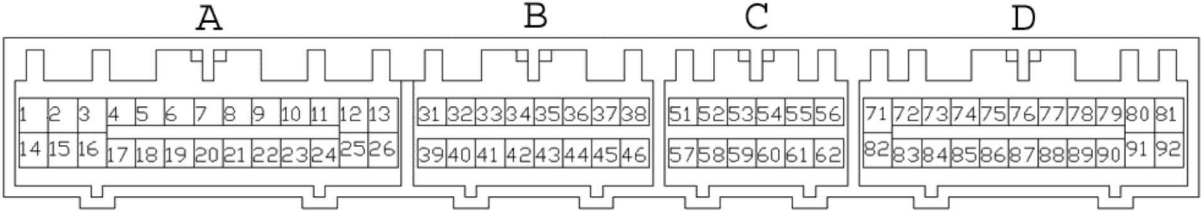
Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C2-12	Analog_In_17	A/C Analog Request			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Input Functions page for input selection. See AC_Request_In 1-axis table for activation logic.
C2-13	Analog_In_18	DBW_APP1 [%]	75		12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C2-14	Analog_In_19	DBW_APP2 [%]			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C2-15	Analog_In_Temp_4	Charge Out Temperature			12 bit A/D, 2.49K pullup to 5V	See ChargeOutTemp [C] table for calibration data and ChargeOutTemp [C] for channel data.
C2-16	Analog_In_Temp_5	Airbox Temperature			12 bit A/D, 2.49K pullup to 5V	See AirboxTemp [C] table for calibration data and AirboxTemp [C] for channel data.
C2-17	Analog_In_Temp_6	Fuel Temperature			12 bit A/D, 2.49K pullup to 5V	See FuelTemp [C] table for calibration data and FuelTemp [C] for channel data.
C2-18	Analog_In_13	Oil Pressure			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Oil Pressure page for setup options. See OilPressure [psig] for channel data.
C2-19	Analog_In_14	Traction Control Mode / Sensitivity			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See the TC_SlipTrgtTrim [MPH] 1-axis table. A multi-position rotary switch such as AEM P/N 30-2056 is recommended.
C2-20	Analog_In_15	Exhaust Back Pressure			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See Setup Wizard Exhaust Pressure page for setup options. See EBPress [kPa] for channel data.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C2-21	Analog_In_16	DBW1_TPSPB [%]			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.
C2-22	+5V_Out_2	+5V Out			Regulated, fused +5V supply for sensor power	Analog sensor power
C2-23	+5V_Out_2	+5V Out			Regulated, fused +5V supply for sensor power	Analog sensor power
C2-24	+5V_Out_2	+5V Out			Regulated, fused +5V supply for sensor power	Analog sensor power
C2-25	VR+_In_5	Driven Right Wheel Speed Sensor +			Differential Variable Reluctance Zero Cross Detection	See Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C2-26	VR-_In_5	Driven Right Wheel Speed Sensor -				
C2-27	VR-_In_4	Non Driven Right Wheel Speed Sensor -			Differential Variable Reluctance Zero Cross Detection	See Non Driven Wheel Speed Calibration in the Setup Wizard Input Function Assignment page.
C2-28	VR+_In_4	Non Driven Right Wheel Speed Sensor +				
C2-29	LowsideSwitch_9	Tachometer	58	45	Lowside switch, 4A max with internal flyback diode, 2.2K 12V pullup. Inductive load should NOT have full time power.	See Setup Wizard page Tacho for configuration options.
C2-30	AGND_2	Sensor Ground			Dedicated analog ground	Analog 0–5V sensor ground
C2-31	AGND_2	Sensor Ground			Dedicated analog ground	Analog 0–5V sensor ground
C2-32	AGND_2	Sensor Ground			Dedicated analog ground	Analog 0–5V sensor ground
C2-33	Analog_In_20	Spare Analog Input			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU.

Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C2-34	Analog_In_21	3 Step Enable Switch			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See 3StepSwitch 1-axis table for setup.
C2-35	Analog_In_22	USB Logging Activate			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See USBLoggingRequestIn channel for input state. See Setup Wizard page USB Logging for configuration options.
C2-36	Analog_In_23	Charge Out Pressure			12 bit A/D, 100K pullup to 5V	0–5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. Do not connect signals referenced to +12V as this can permanently damage the ECU. See ChargeOutPress [kPa] channel for input state. See Setup Wizard page Charge Out Pressure for calibration options.
C2-37	Digital_In_6	Spare Digital Input	45	83	No pullup. Will work with TTL signals.	Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-38	Digital_In_7	Clutch Switch			No pullup. Will work with TTL signals.	See ClutchSwitch 1-axis table for setup options. Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
C2-39	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C2-40	Power Ground	Ground			Power Ground	Connect directly to battery ground.
C2-41	CanH_Bout	CANH			Dedicated High Speed CAN Transceiver	Not used
C2-42	CanL_Bout	CANL			Dedicated High Speed CAN Transceiver	Not used
C2-43	LowsideSwitch_8	Engine Protect Warning Out		32	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	Activates if any of the following flags are true: OilPressProtectOut, LeanProtectOut, or CoolantProtect. Output can be assigned to other functions. See Setup Wizard page LowSide Assignment Tables for additional options.

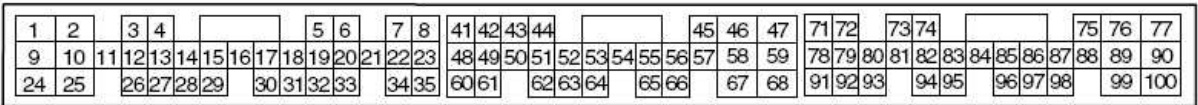
Infinity Pin	Hardware Reference	7100-XXXX-62 7101-XXXX-63 Function	Dest. Pin Evo VIII	Dest. Pin Evo IX	Hardware Specification	Notes
C2-44	LowsideSwitch_7	Spare GPO1			Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Spare GPO1 Basic Setup section of User GPIOs and PWM Setup Wizard page LowSide Assignment Tables for additional options.
C2-45	UEGO 2 VM	UEGO 2 VM			Bosch UEGO Controller	Virtual Ground signal. Connect to pin 5 of Bosch UEGO sensor.
C2-46	UEGO 2 UN	UEGO 2 UN				Nernst Voltage signal. Connect to pin 1 of Bosch UEGO sensor.
C2-47	UEGO 2 IP	UEGO 2 IP				Pumping Current signal. Connect to pin 6 of Bosch UEGO sensor.
C2-48	UEGO 2 IA	UEGO 2 IA				Trim Current signal. Connect to pin 2 of Bosch UEGO sensor.
C2-49	UEGO 2 HEAT	UEGO 2 HEAT				Lowside switch for UEGO heater control. Connect to pin 4 of Bosch UEGO sensor. NOTE that pin 3 of the Sensor is heater (+) and must be powered by a fused/switched 12V supply.
C2-50	+12V_R8C_CPU	Battery Perm Power			Dedicated power management CPU	Optional full time battery power. MUST be powered before the ignition switch input is triggered. (See C1-65.)
C2-51	Coil 7	Coil 7			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-52	Coil 8	Coil 8			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-53	Coil 9	Coil 9			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-54	Coil 10	Coil 10			25 mA max source current	0-5V Falling edge fire. DO NOT connect directly to coil primary. Must use an ignitor OR CDI that accepts a FALLING edge fire signal.
C2-55	Highside Fuel Pump switch	Fuel Pump			Highside switch, 0.7A max, Solid State Relay, NO internal flyback diode.	+12V High Side Drive. Will prime for 2 seconds at key on and activate if RPM > 0.
C2-56	Not used	Not used			Not used	Not used

2003–2005 EVO VII Pin Numbering



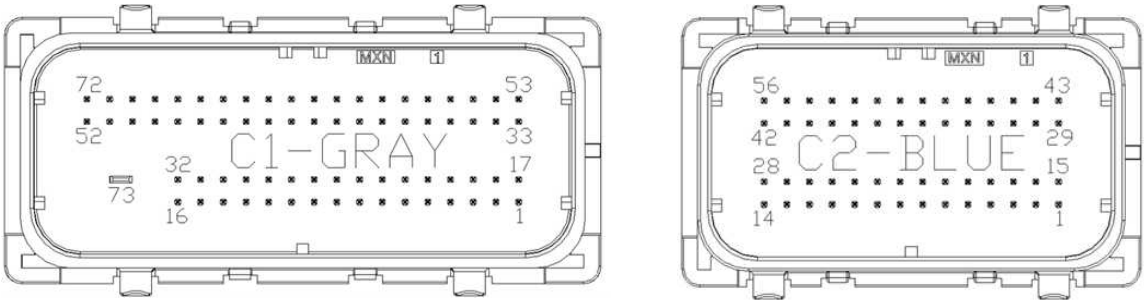
2003–2005 EVO VIII ECU Connectors Viewed from Wire Side

2006–2008 EVO IX Pin Numbering



2006–2008 EVO IX ECU Connectors Viewed from Wire Side

Infinity Pin Numbering



AEM Infinity Connectors Viewed from Wire Side

12 MONTH LIMITED WARRANTY

Advanced Engine Management Inc. warrants to the consumer that all AEM High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at AEM's option, when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by AEM within 30 days of the date the RMA is issued.

Please note that before AEM can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the EMS tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.