Instruction Manual

AEM
PERFORMANCE ELECTRONICS

P/N 30-3510
2001–2006 BMW E46 M3
Manual Transmission
Plug & Play Adapter Harness

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 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 YOU HAVE PURCHASED THIS PRODUCT IN ERROR, DO NOT INSTALL AND/OR USE IT. PLEASE CONTACT THE RETAILER FROM WHOM YOU PURCHASED THE PRODUCT TO ARRANGE A RETURN FOR A FULL REFUND OR VISIT AEMELECTRONICS.COM/PRODUCT-LEGAL-RESTRICTIONS FOR FURTHER INSTRUCTIONS.

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!

OVERVIEW

The 30-3510 AEM Infinity Adapter Kit was designed for the 2001–2006 BMW E46 M3 with manual transmission. This is a true standalone system that eliminates the use of the factory BMW DME (ECU). The use of this adapter makes the kit "plug and play" so no cutting or splicing wires is necessary. The base configuration files available for the Infinity EMS are starting points only and will need to be modified for every specific application. Included in these instructions are descriptions of important differences between using the factory BMW DME and using the AEM Infinity ECU.

The available AEM Infinity EMS part numbers for this adapter kit are:
- 30-7109 INFINITY-8
- 30-7105 INFINITY-10

NOTE: The Infinity-10 EMS has 2 extra ignition coil and injector outputs for a total of 10 each. These are sold separately from this adapter kit.

INFORMATION ON INFINITY ECUS USED ON 2005-06 BMW E46 M3'S EQUIPPED WITH FACTORY COMPETITION PACKAGE:

When the Infinity is used on 2005-06 model year E46 M3s the DSC lamp will remain illuminated when the key is in the "on" position. Certain CAN-bus features of the Infinity are not available via the steering wheel cruise control buttons, as these vehicles did not come with factory cruise control buttons (the features integrated through CAN-bus can be added using an ancillary trim position switch).

GETTING STARTED

Refer to the **10-7100 for EMS 30-7100 Infinity Quick Start Guide** for additional information on getting the engine started with the Infinity EMS. E46 BMW M3 base session is located in C:\Documents\AEM \Infinity Tuner\Sessions\Base Sessions

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 here: **http://www.aemelectronics.com/products/support**

Downloadable files for 2001–2006 BMW E46 M3
- 30-7105 E46 M3 Plug-and-Play (for 30-7105, INF10 BMW)
- 30-7109 E46 M3 Plug-and-Play (for 30-7109, INF8 BMW)

NOTE: The Flash Enable connector (described in the following pages) MUST be "jumped" in order to connect to the Infinity and load the initial firmware file. Subsequent firmware upgrades will not require this step.
- **Ignition key OFF**
- **Insert zip-tied jumper shunt connector into Flash Enable connector**
- **Ignition key ON (RUN position)**
- **Infinity Tuner | Target | Upgrade Firmware… | Upload downloaded .pakgrp file**
- **Disconnect Flash Enable jumper connector**
- **Infinity Tuner | File | Import Calibration Data | Select appropriate base session file**

OPTIONS

30-2001 UEGO Wideband O2 Sensor
Bosch LSU4.2 Wideband O2 Sensor that connects to AEM 30-3600 UEGO Wideband O2 Sensor
Extension Harness

30-3600 UEGO Wideband O2 Sensor Extension Harness
Extension harness to connect AEM UEGO Wideband O2 sensor to 6-pin Deutsch

30-3602 IP67 Logging Cable
USB A-to-A extension cable: 39" long with right angled connector and bayonet style lock

INFINITY CONNECTORS

The AEM Infinity EMS uses the MX123 Sealed Connection
System from Molex. The following sections include
excerpts from the Molex MX123 User Manual illustrating
the basic procedures for working with these high density
connectors.

AEM strongly recommends that users become familiar with
the proper tools and procedures before attempting any
modifications. The entire user manual can be downloaded
direct from Molex at:

http://www.molex.com/mx_upload/family//
MX123UserManual.pdf

INFINITY ADAPTER HARNESS

Included with the BMW E46 M3 kit is an adapter harness. This is used to make the connection between the AEM Infinity EMS and the BMW wiring harness plug and play. This is depicted below with the 73-pin and 56-pin connectors and the BMW M3 header. There are also a few other integrated connectors within this harness described below.
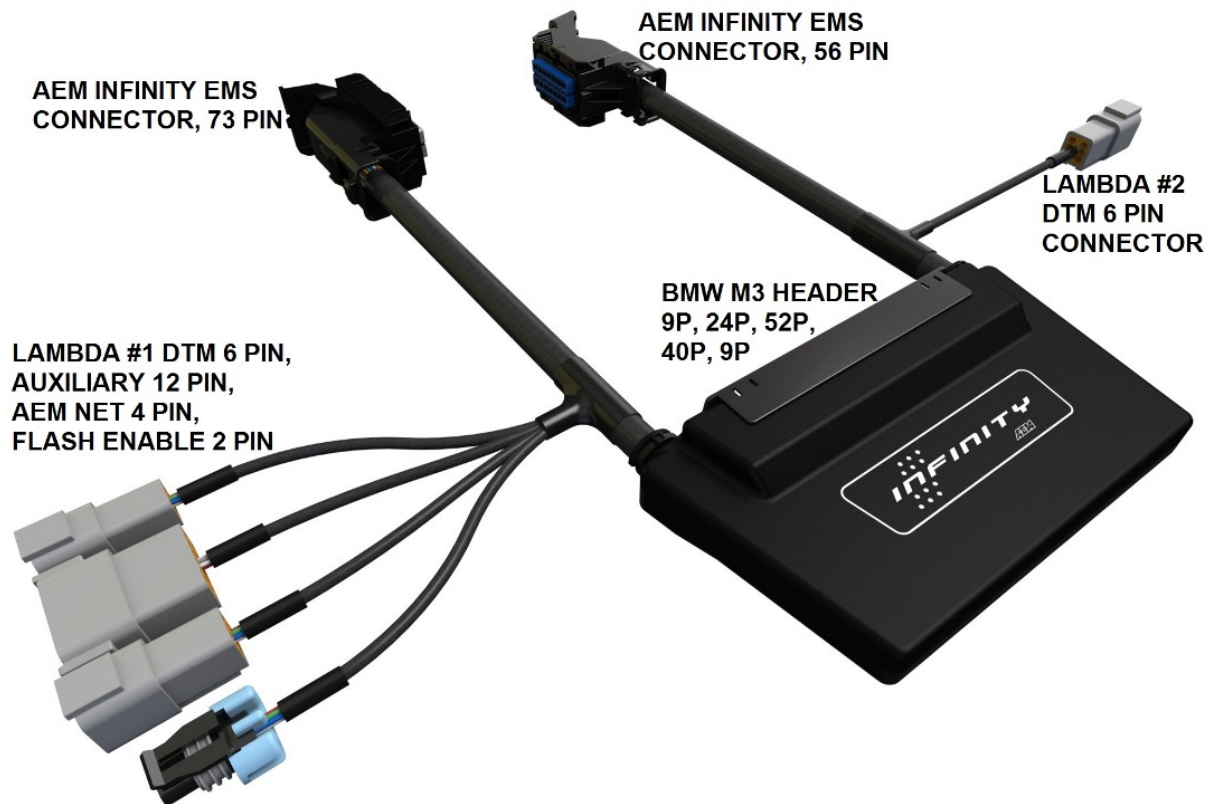

The gray Deutsch 6P DTM "Lambda #1" and "Lambda #2" plugs are for connecting UEGO wideband Bosch LSU4.2 sensors (AEM 30-2001). The UEGO extension harness (AEM 30-3600) mates the adapter harness to the sensor (1 required for each sensor used). Note: Even though the BMW S54 engine architecture is inline, the stock exhaust system pairs the cylinders (1,2,3 and 4,5,6) into 2 separate banks. For this case, 2 sensors are recommended. If a single turbocharger is used, 1 sensor is sufficient.

The gray Deutsch 4P DTM connector is used for "AEMNet". AEMNet is an open architecture based on CAN 2.0 which provides the ability for multiple enabled devices, such as dashboards, data loggers, etc., to easily communicate with one another through two twisted cables (CAN+/CAN-).

The black Delphi 2-pin "Flash Enable" connector is used for secondary hardware flashing. The included shunt connector jumps the 2 wires together. Once initially flashed, the EMS is normally upgraded in the software, not using this connector.

The gray Deutsch 12P DTM "Auxiliary" connector (shown below) is used to adapt many common ancillary inputs and outputs easily. Included in the kit are a DTM 12P mating connector, 12 DTM terminals, and a DTM 12P wedgelock. If used, these components will need to be terminated by the installer or end user with 16–22awg wire (not included). Note: the pin numbering is molded into the connector, as shown.
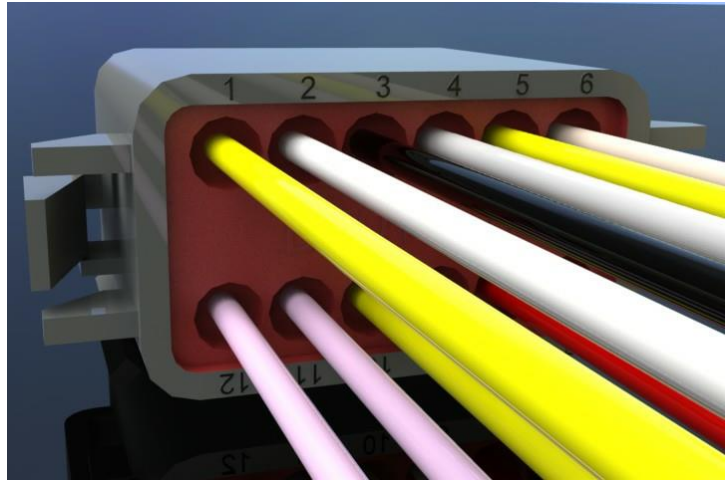
Below is a description of each of the available input/output found in the BMW specific "Auxiliary" connector.
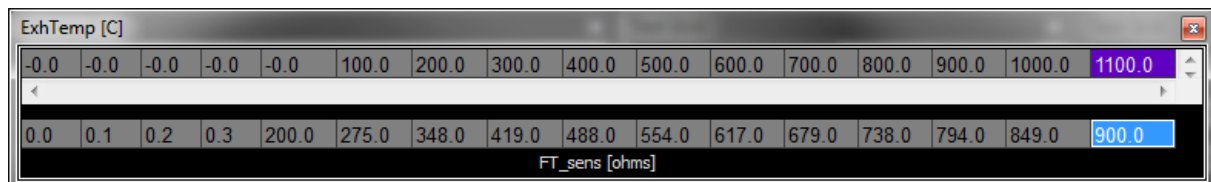

Available I/O	Typical Use	Notes	Component	Wiring
Fuel Press	This is used for monitoring fuel pressure input to the Infinity. It can also be used to increase or decrease injector fuel pulse to compensate for a failing fuel pump.	Typical electronic fuel injection fuel pressure varies 30–100psi.	AEM carries 0–5V fuel pressure sensors (sold separately).	This wire goes directly to the signal wire of the pressure sensor.
Air Temp	Air temperature is typically used for fuel and ignition timing correction.	The S54 comes standard with a MAF sensor which has an integrated intake air temperature sensor. This wire is run in parallel with the stock sensor. This means if an aftermarket sensor is to be wired using this pin, the factory MAF sensor must be disconnected or else the signal will be skewed drastically.	AEM carries air temperature sensors (sold separately). However, the Infinity can accept any thermistor sensor and can be calibrated in the Infinity Tuner software.	Intake air temp sensors have two wires with no polarity.
Sensor Ground	Isolated ground for inputs.	This is not the same as a power ground or chassis ground.	This is shared for the **Fuel Press, Air Temp, MAP (Manifold Press), Ethanol Sensor**, etc.	This should be wired to the ground pin of the following: **Fuel Press, Air Temp, MAP,** and **Ethanol Sensor**.
5V Reference	5 volt supply for the following aux inputs.	When measured with a voltmeter, it is normal to not measure exactly 5V.	This is shared for the **Fuel Press, MAP (Manifold Press),** and **Ethanol Sensor** inputs.	This should be wired to the voltage reference pin of the following: **Fuel Press, MAP,** and **Ethanol Sensor**.

Available I/O	Typical Use	Notes	Component	Wiring
MAP (Manifold Press)	Manifold pressure is used for speed density fuel calculation, ignition timing correction, 02 feedback, boost control, variable valve control, ancillary outputs, etc.	Electronic fuel injection is calculated in absolute pressure not gauge pressure.	AEM carries MAP sensors (sold separately). However, the Infinity can accept any 0–5V pressure sensor and can be calibrated in the Infinity Tuner software.	This should be wired directly to the MAP sensor's signal pin.
Ethanol Sensor	This is used for customers who are converting their vehicle to utilize ethanol fuels such as E85 or E98.	This digital input can be used for other functions as well.	The GM Fuel Composition Sensor (FCS) is the most commonly used for converting a vehicle to flex fuel.	This pin needs to be wired directly to the signal pin of the fuel composition sensor.
Boost Control Solenoid	This is used to operate a 12V PWM solenoid.	Boost control solenoids can be normally open (NO) or normally closed (NC). This will change the duty cycle strategy but is also depends upon how the wastegate is plumbed with hoses.	AEM carries boost control solenoids (sold separately). However, the Infinity can control most factory boost control solenoids.	Solenoids have two wires and have no polarity.
Power from Relay	Can be used for many things, however, this 12V source was implemented to be paired with the **Boost Control Solenoid**.	This 12V is coming through the vehicle's main relay.	Because of using shared power, this should only be used for low current electronics.	N/A
High Side Output	Can be used to activate the 12V side of a solenoid	If attempting to drive a component over 4amps, a relay must be used.	The Infinity can directly drive an electronic component up to 4amps max, such as a boost solenoid.	For a relay, this should be wired to terminal 86 (or 85). Supply chassis ground to the opposite terminal 85 (or 86). If directly driving a low current component, wire this to the 12V terminal.
Boost Target Trim Selector Input	Can be used for to trigger multiple boost targets.	This analog input can be used for other functions as well.	AEM 12 Position Universal Trim Pot (or typical potentiometer). Can also be used with any simple ON/OFF switch.	This wire should be routed to the signal output of the component. If used with a simple ON/OFF switch, route the opposite terminal to an Infinity sensor ground.

Available I/O	Typical Use	Notes	Component	Wiring
Radiator Fan 1	Can be used to operate an auxiliary fan for a radiator, intercooler, etc.	This low side (ground) output can be used for other functions as well. If attempting to drive a component over 4amps, a relay must be used.	The Infinity can directly drive an electronic component up to 4amps max.	For a relay, this should be wired to terminal 85 (or 86). Supply 12V to the opposite terminal 86 (or 85). If directly driving a low current component, wire this to the ground terminal.
No Lift Shift Trigger	Cutting fuel and/or cutting spark and/or retarding ignition timing when shifting gears without releasing the throttle pedal.	Cut time is typically 200-300mS. Ignition retard is typically 20degree with a 50mS ramp-in time after the fuel cut. Ignition cut is not commonly used.	AEM 12 Position Universal Trim Pot (or typical potentiometer). Can also be used with any simple ON/OFF switch.	This wire should be routed to the signal output of the component. If used with a simple ON/OFF switch, route the opposite terminal to an Infinity sensor ground.

EXHAUST GAS TEMPERATURE SENSOR

The BMW M3 S54 engine uses an exhaust gas temperature sensor (EGT). This is a 0–5V resistive temperature device (RTD) that is input to the Infinity EMS. AEM has already done the work by calibrating and entering the EGT data (shown below) into the base session files. There is currently no fuel control, but this channel can be data logged for tuning purposes.

ExhTemp [C]															
-0.0	-0.0	-0.0	-0.0	-0.0	100.0	200.0	300.0	400.0	500.0	600.0	700.0	800.0	900.0	1000.0	1100.0
0.0	0.1	0.2	0.3	200.0	275.0	348.0	419.0	488.0	554.0	617.0	679.0	738.0	794.0	849.0	900.0

FT_sens [ohms]

DRIVE-BY-WIRE THROTTLE CONTROL

The BMW M3 S54 engine uses 6 individual throttle bodies controlled via drive-by-wire (DBW). It is important to note that throttle control is a critical system which needs to be correct, and the BMW E46 throttle and intake system is a unique implementation with several details that require careful attention. The basic terms of drive-by-wire are as follows: the 'gas pedal' inside the passenger cabin is called the Accelerator Pedal (DBW_APP1%), while the electronically controlled throttles in the engine bay are referenced as 'Throttle' (Throttle%, DBW1_TPSA%). Based on the measured Accelerator Pedal position, the ECU determines a desired DBW_Target position and moves the Throttle to that position.
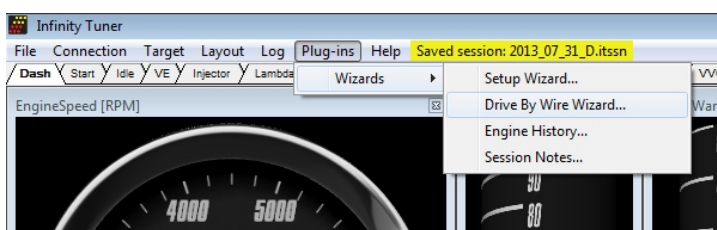
As shown, there is a Drive By Wire Wizard which must be used to calibrate accelerator pedal and throttle position sensors. Although sensor calibration values from one vehicle may be close enough to work for another vehicle under some circumstances, it is absolutely necessary to run the Drive By Wire Wizard before running the engine for the first time. The wizard should be repeated if any components in the throttle control system are removed or replaced such as the throttle bodies, TPS sensors, throttle linkage, electronic throttle control motor, or accelerator pedal.

Please ensure the vehicle's battery is fully charged (at least 12.5 Volts) before running the Drive By Wire Wizard, as low battery voltage can result in abnormal sensor measurements. If a battery charger is available, it is preferable to connect the battery charger in 5A, 10A, or 20A mode and perform the Drive By Wire Wizard while the battery voltage is near 13.5–14.0 Volts. When connected to the Infinity EMS with the engine OFF, go to Plug-in | Wizards | Drive By Wire Wizard. On the first page, be sure to check the 'Calibrate Sensor Data Only' checkbox before selecting 'Start'. Follow the step-by-step instructions for each page.

The BMW E46 M3 SPORT button located in the center console (shown) still serves as a switch input to the ECU. Contrary to some misinformed beliefs, this button never changed the maximum power output of the engine. This switch changes the accelerator-pedal to throttle-target relationship in the stock BMW DME. These curves are configurable in the Infinity Tuner software using the DBW_ThrottleCurve1 / DBW_ThrottleCurve2 tables, which allow the tuner to define the DBW throttle target based on Accelerator Pedal Position and Engine Speed.

The ModeSelect_DBW table is preconfigured to switch between the two different DBW_ThrottleCurve tables, depending on the status of the CAN_SPORTBUTTON signal. The CAN_SPORTBUTTON toggles between 0 and 1 (2 and 3 are not used) when depressing the SPORT button. States 0 and 1 are mapped to the DBW_ThrottleCurve1 and DBW_ThrottleCurve2 tables respectively. Both 2D tables use accelerator pedal position for the y-axis and RPM for the x-axis. The values that are entered in the table are throttle position targets. Unlike the example shown here, both ThrottleCurve tables are set to the same values in the AEM-supplied base maps.
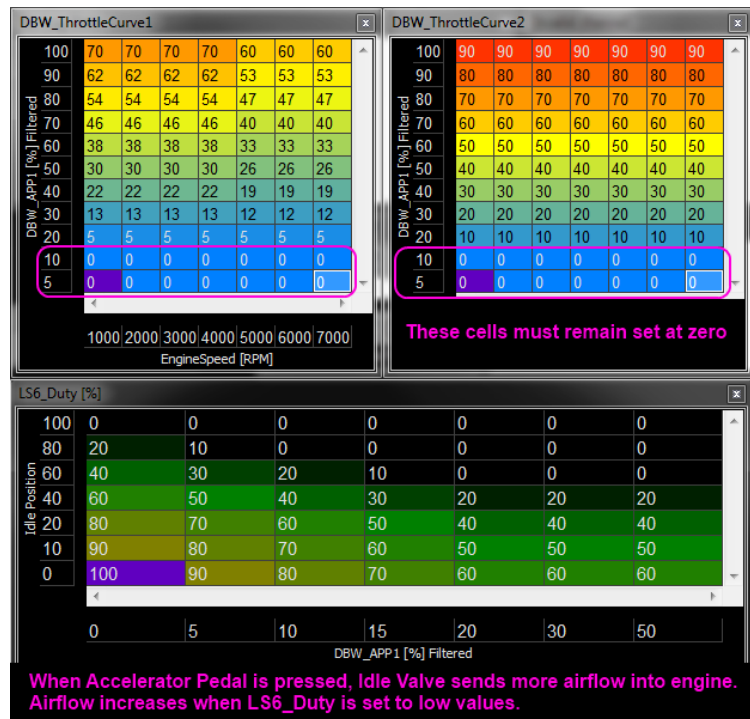

Between 0-10% accelerator pedal position, the idle valve supplies all airflow to the engine while the individual throttles remain fully closed. This behavior can be observed in the LS6_Duty table (which increases airflow through the idle valve when the accelerator pedal is pressed) and the DBW_ThrottleCurve tables. If tuners desire to adjust the DBW_ThrottleCurve tables, the lower two rows must remain set to 0. Great care must be taken when adjusting the ThrottleCurve tables, poor choices here can result in undesirable engine response or drive-by-wire tracking errors.

If it is desired to mimic the OEM BMW throttle control strategy, set the target to 75% throttle below 5500 RPM when the Accel Pedal is 100% open and 90% throttle above 5500 RPM. **NOTE: Do not enter values above 90% in the throttle curve tables; this will force the throttles against the mechanical 'full open' stop which is not desirable and could cause failsafe actions to occur.**

Tuning Tool Tip: Because the AEM base session files use TPS as the VE table y-axis, the throttle target tables can be used as a tuning aid. Simply set the DBW_APP1 100% row to Throttle target values that correspond to values which need attention in the VE tables. This enables each cell to be accessed easily by the tuner on a dynamometer for example.

The factory BMW traction control and rev limiter is controlled using the DBW, whereas many other applications use a fuel cut or, in some rare cases, an ignition cut or ignition retard. With the AEM Infinity, these can be controlled by any or all of the aforementioned methods.

Note that there is also a DBW Tuning section in the Plug-in | Wizards | Setup Wizard… However, most of these channels will already be set up properly in the AEM base session file and should not be changed.
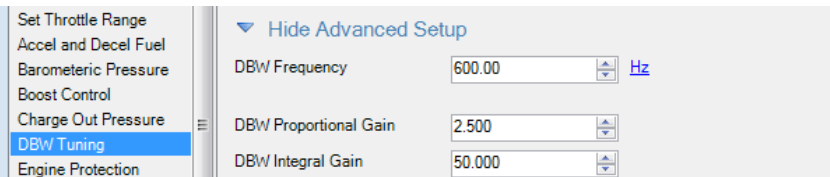
There are a few integrated DBW fail safes incorporated into the Infinity system. The ECU constantly monitors the accelerator pedal sensor voltage and throttle position sensor voltages to ensure the signals are not excessively high or low due to damaged sensors, short circuits, or broken wires. The ECU also performs self-diagnostics to ensure the electronic throttle is following desired DBW_Target properly, that the DBW throttle control motor is not using excessive energy to move the throttle, and watching to see that all the redundant sensors are working together as expected. If any of these conditions are determined to be abnormal or unsafe, the ECU can shut the engine down to prevent unintended engine acceleration. When the ECU shuts the engine off due to problems detected in the DBW system, the AEM Infinity notifies the driver by illuminating the Engine Malfunction Lamp (EML) on the dashboard. This error will reset when the ignition key is cycled or if the problem is fixed.

CAN BUS

The AEM Infinity EMS for the BMW E46 M3 supports the majority of the OEM features including: Tachometer, Oil Temperature Gauge, Coolant Temperature Gauge, A/C Request Button, and Fuel Consumption (MPG).

When the EMS is connected to a PC and changes are being committed either through table values or the wizard, the CAN transmission may occasionally pause and the gauges will drop out one at a time until they all stop working. This does not happen during normal operation. Cycling the ignition switch will reset everything back.
NOTE: If the vehicle is used on rollers such as a dynamometer where the front wheels and rear wheels are operating at completely different speeds, the DSC light, the TPMS (tire pressure monitoring system), and the BRAKE light will illuminate as usual. When the vehicle is driven conservatively on a road, these 3 lights will be OFF like normal. However, if the tires experience any slippage, these 3 lights will flash ON/OFF, warning the driver of traction issues. If the tires are excessively spun, these 3 lights may stay ON replicating a dynamometer speed test. If this happens, a simple cycle of the ignition key will reset these lights back to OFF.

Rather than OBD2 diagnostics, the SES-Service Engine Soon light is now dedicated to the AEM "MILOutput" feature. The AEM MILOutput activates if any 1 of the following inputs are in an error state: air temp, baro pressure, coolant temp, exhaust back pressure, fuel pressure, UEGO #1, UEGO #2, MAF analog, MAF digital, MAP, oil pressure, or throttle position. If any of these sensors are not used, they should be turned OFF in the Wizard to avoid any false readings. To activate the MILOutput feature, go to the Wizard and check "Enable MIL Output" in Diagnostics.

The red oil can light still illuminates if there is low engine oil pressure. However, it will no longer change to yellow when the engine oil level is low. But, if an aftermarket oil pressure sensor is installed, the oil can will illuminate yellow and beep if the AEM failsafe "OilPressProtectOut" is triggered. This feature needs to be activated in the Engine Protection section of the Wizard, as shown below left. Also, there is a corresponding RPM dependent "OilPressProtect" 1D Table that needs to be set up as well. When the oil pressure falls below this set value, the Oil Press Protect feature will be activated.
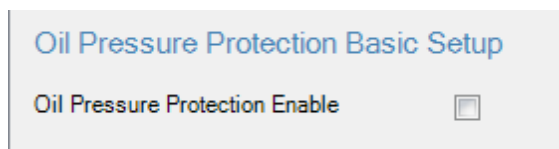
Rather than OBD2 diagnostics, the EML-Engine Malfunction Lamp on the dash warns the driver if the "DBW_Error_Fatal" has been activated. If this happens, the engine will be shut down for safety and the error will reset when the ignition key is cycled and the condition that caused the error is no longer present.

The coolant temperature gauge's red warning LED, located in the BMW gauge cluster, is programmable. When the coolant exceeds the value entered in the channel "CoolantHighLEDLimit" the LED will illuminate (default = 100C).

The 4000–9000RPM red and yellow tachometer LEDs (shown) will now always match the current RPM limiter. For example, if the 2-step rev limiter is active and targeting 5000RPM, the tachometer LEDs will move the displayed "redline" to 5000RPM. This happens even if the engine is idling and not actively banging against the 2-step limiter. If the 2-step rev limiter is OFF, but the main rev limiter is set to 7000RPM, the LEDs will show the displayed "redline" at 7000RPM. If the 3-step rev limiter turns ON and changes the target rev limiter to 6500RPM, the LEDs will show the displayed "redline" at 6500RPM.

The main rev limiter is configurable in the setup wizard. The 2-step and 3-step rev limiters are configurable in the setup wizard and in corresponding tables. Keep in mind, there are fuel cuts, spark cuts, ignition retards, and cut start windows. The tachometer LEDs are driven by the lower value between the fuel and spark cuts and ignores the ignition retard and cut start window RPMs.

The following channels on the BMW CAN bus are available for logging. The AEM traction control utilizes the CAN wheel speed sensors: CAN_FLWS [MPH], CAN_FRWS [MPH], CAN_RLWS [MPH], CAN_RRWS [MPH]. The following steering channels are only for data logging: CAN_STEERANGLE [deg].

The rate of fuel consumption (MPG) is calculated based on injector duty cycle, injector size, engine speed, etc. The output display will be close, but keep in mind there are many factors and variables. To customize and make completely accurate, there is a trim channel named "CAN_FUELFLOWSCALER". The default value is 9.6.

CRUISE CONTROL

Currently, a cruise control feature is not supported with the AEM Infinity. However, the multi-functional steering wheel buttons are run over the BMW MFL bus and are available for miscellaneous purposes described below. There are 4 buttons: Enable, Resume Set, Accelerate+, and Decelerate- (as shown).
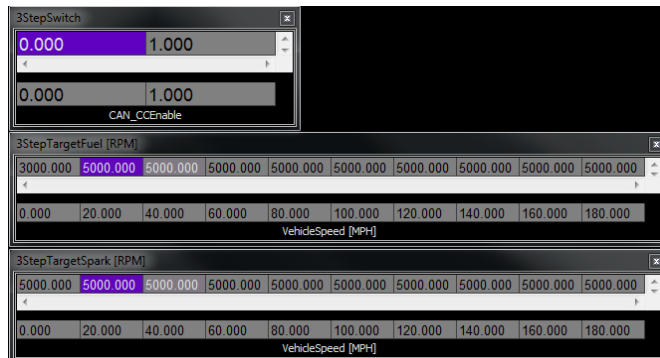
The Enable button now engages the 3-step rev limiter channel "CAN_CCEnable". A 3-step rev limiter is a simplified traction control based system that uses engine and vehicle speed or launch timer inputs to limit the RPM of the engine. To operate, first be sure the 3StepSwitch table is set to recognize the "momentary" Enable button, as shown. Set the 3StepTargetFuel and/or the 3StepTargetSpark table's first (0 MPH) cell to the desired launch RPM. When the Enable button is held down, the EMS will limit the engine's corresponding RPM. Once the car is launched and the EMS begins to register vehicle speed, the RPM limit can then be tailored to prevent wheel spin using these tables.

The Resume Set button is used as an AEM traction control switch. **Note: The DSC button is not available as it is a direct link to the VDC. The BMW VDC system is disabled when using the AEM Infinity.** Instead, the latching Resume Set button changes the TC_SlipTargetTrim 1-axis lookup table (shown). Simultaneously, the Cruise Control icon on the dash is illuminated to inform the driver the status of the programmable AEM traction control. Normally this table is used with a multiple position switch. However, because the BMW Resume Set button is either OFF (0) or ON (1), only the first two cells of the table are used. Two possible traction scenarios, for example, could be ON/OFF or aggressive/nonaggressive. To use this feature, it must be enabled in Infinity Tuner: Plug-Ins | Wizard | Setup wizard | Traction Control | Traction Control Enable.
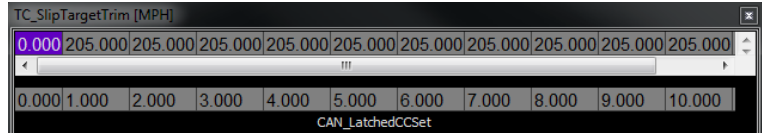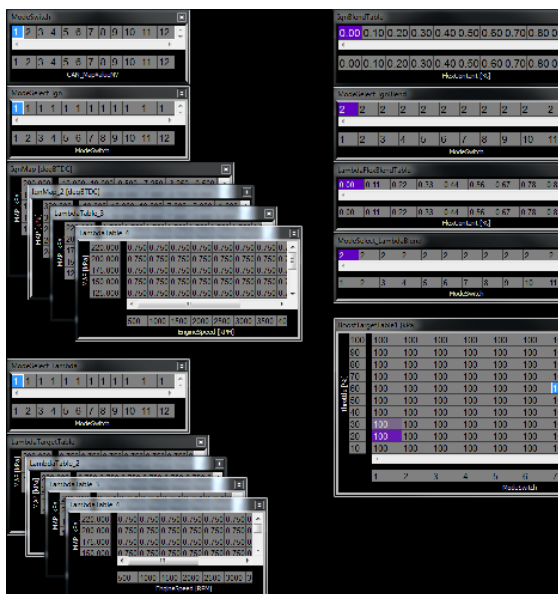
The steering wheel's Accelerate+ and Decelerate-momentary buttons increment and decrement the map switching function "CAN_MapValueNV". This feature is extremely flexible as it can be used to switch VE tables, ignition maps, lambda targets, and boost levels.

When the Accelerate+ or Decelerate- button is depressed (or when KeyOn occurs) the tachometer displays 1k, 2K, 3K, 4K, 5K, 6K, 7K, or 8K momentarily representing the currently selected value of ModeSwitch. Because of the BMW E46 M3 tachometer range, 1–8 are the only valid values (9–12 are not used for this application).

For safety precautions, the AEM base session files come standard with the VE tables, ignition maps, lambda targets, and boost tables all set the same because the Accelerate+ or Decelerate- button could be mistakenly bumped.

In order to use this feature, care must be taken into account when setting up the tables and tuning. Enter the number of the table into the corresponding mode selection table for each feature (VE tables, ignition maps, lambda targets, and boost levels).

INFINITY EMS INSTALLATION

Step 1

Open the trunk and disconnect the battery.

Open the hood and locate the E-Box on the left side near the firewall. This is where the factory ECU (Digital Motor Electronics or DME) resides.

Remove the four screws using a T25 Torx wrench (late models) or 5mm Allen wrench (early models). Simultaneously pull up and rotate the E-Box cover to release it from the vehicle. This will be reused.

Step 2

There are 5 DME connectors. These must be removed in a sequence from the left to the right (as pictured) or connector 5-4-3-2-1.

First remove connector 5 using your thumb by squeezing the release tab. Hold down and pull upwards.

Step 3

Connectors 4, 3 and 2 all have a swinging latch. First press the "button" and then rotate the swing latch downwards towards the DME.

Note: When reinserting connectors into the header, the swing latch must be open for initial engagement.
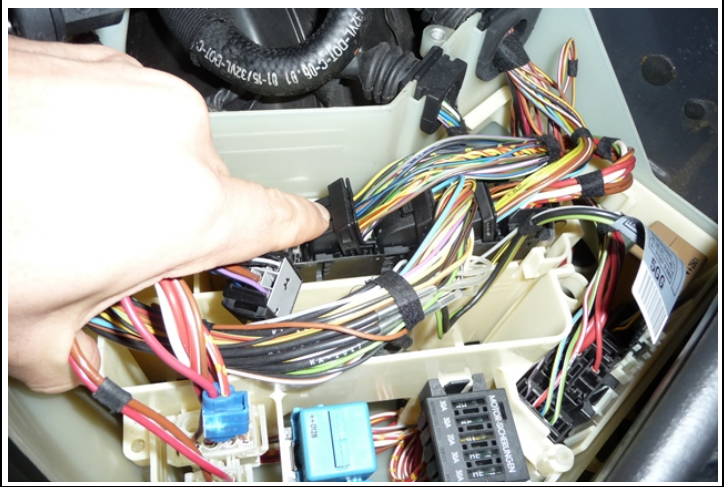
Step 4

The connector will automatically push itself away from the DME connector's header.

After removing connectors 4, 3, and 2, remove connector 1 the same way as connector 5 using your thumb.
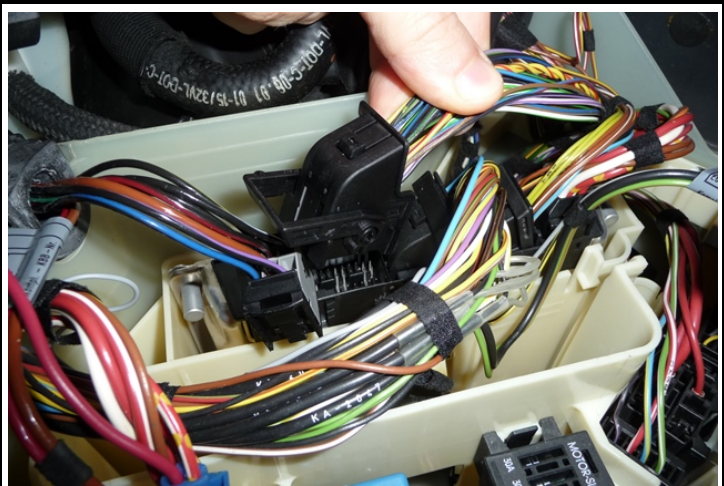
Step 5

To remove the DME (stock ECU) from the internal plastic "skeleton", push the two tabs away from the bottom side of the DME, as shown.
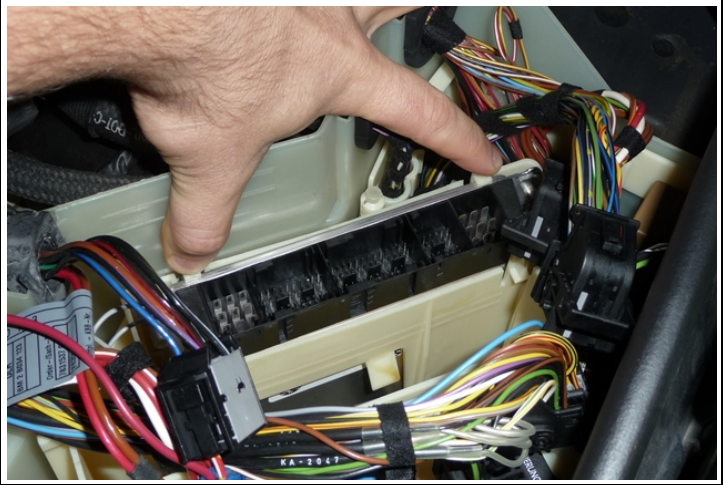
Step 6

Simultaneously unlock the plastic tabs and pull the DME up and out of the engine bay.

The stock DME will NOT be reused.

Step 7

Next, there will need to be room made for the AEM Infinity EMS and jumper box to fit within the E-Box compartment.

Note: Some of the instructions below may slightly differ from vehicle to vehicle.

Unplug the 2 white connectors (shown) by squeezing each connector's locking tabs.

Note: These two connections will be reconnected later.
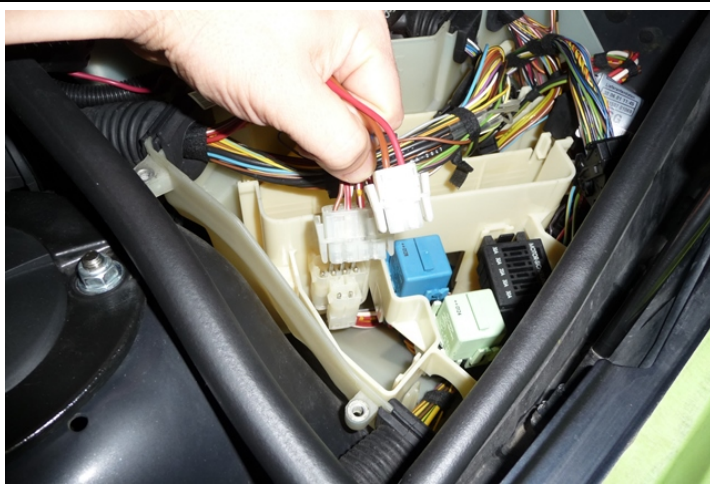
Step 8

Using a flat blade, such as a screwdriver, unlock the black fuse block's tab, as shown, and lift upwards.

Step 9

| Using a flat blade, such as a screwdriver, unlock the blue relay's tab, as shown, and lift upwards. | |

Step 10

| Using a flat blade, such as a screwdriver, unlock the lime green relay's tab, as shown, and lift upwards. | |

Step 11

Carefully pull the internal plastic mount upwards a few inches to unlock it from the base.

Step 12

Cut the factory cable zip-ties to release the BMW wiring harness from the internal plastic mount using a pair of long-reach dikes.

Cut the zip-tie shown.

Step 13

There should be 2 cable ties to cut in the area shown.
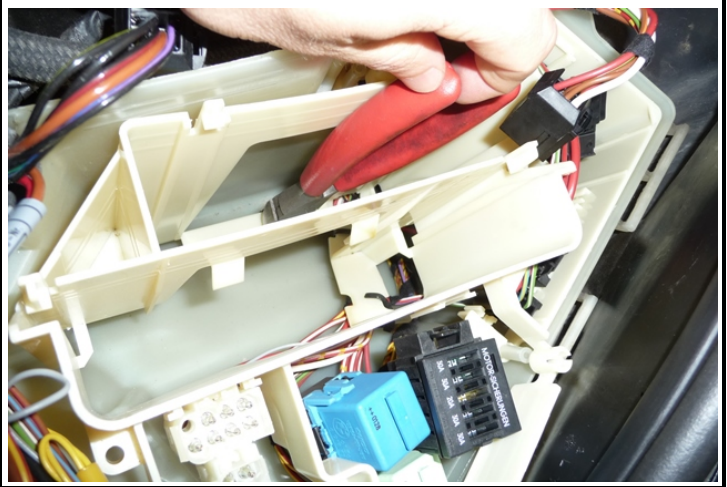
Step 14

Pull the internal plastic mount further away from the vehicle and cut the zip-tie shown.
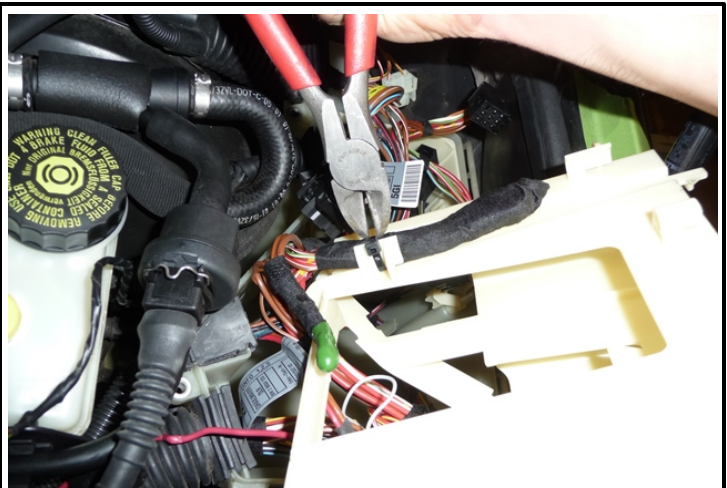
Step 15

As shown, use a pick to unlock this tab. Pull the connector downwards to release it from the inner plastic "skeleton".

Step 16

The internal plastic "skeleton" should now be able to be removed.

To allow space for the AEM EMS kit, the top portion (that the DME was secured to) will have to be cut into 2 pieces.

Using a band saw (or similar) cut the "skeleton" along the dotted line as pictured.

Cut along dotted line.
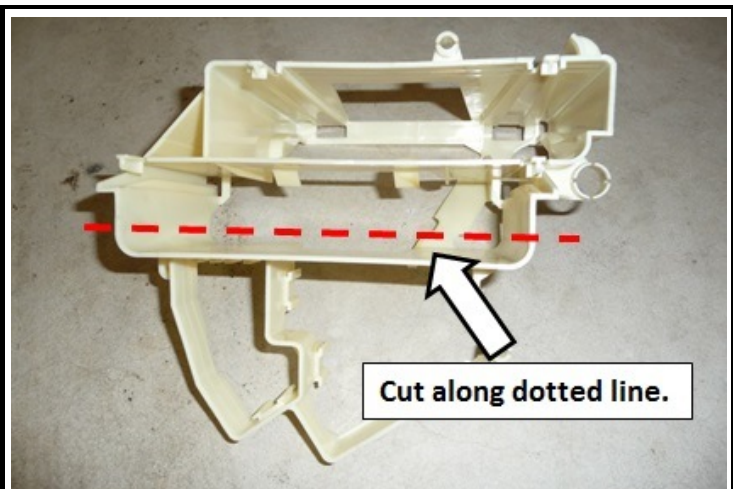
Step 17

The pictured piece can be discarded.

Reinstall the other part of the plastic "skeleton". Reconnect the relays and white plastic connector from the previous steps.

Connect the AEM jumper box and the 90-degree locking comms cable to the AEM Infinity EMS.

Insert the Infinity in a vertical position where the DME was mounted previously. The 2 large Infinity connector cables should be facing upwards. Note: Infinity blue connector towards front and gray connector towards rear of vehicle.
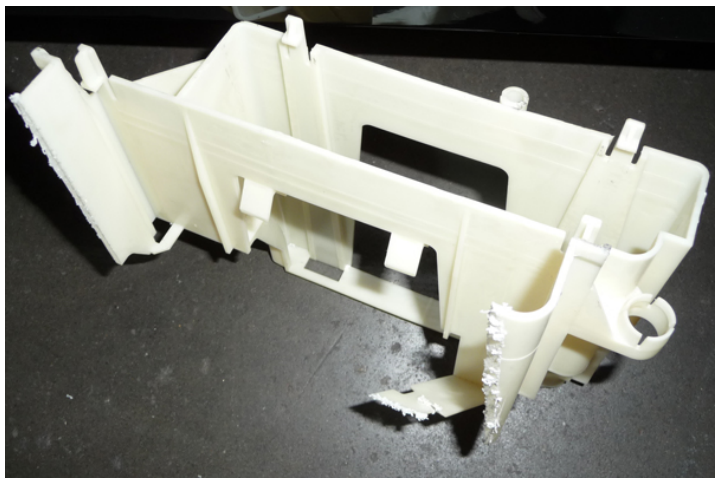
Step 18

Connect the AEM jumper box to the 5 factory BMW DME connectors in reverse order (1-2-3-4-5). Place the jumper box on top of the AEM Infinity EMS, as shown.

Connect the UEGO extension harness(s) to the "Lambda1" (and/or "Lambda2") 6-pin DTM connector(s). If using any AEMNet components, such as an AEM AQ-1 Datalogger, use the 4-pin Deutsch DTM "AEMNET" connector.

Evaluate which ancillary sensors, inputs, and/or outputs will be required to run the vehicle. Using the aux pin-out information, wire the components into the included 12P connector. Plug this into the adapter harness connector labeled "AUX".

Step 19

Before reinstalling the E-Box cover, cut half-circle slot(s) along the edge, shown in yellow. This will allow the comms and miscellaneous cables to exit the E-Box.

This kit requires a MAP sensor. Use the aux connector pinout to wire in a sensor and route the wires through the E-Box cover.

Using a 7/8" wrench, install the optional AEM UEGO sensor(s) in the exhaust at least 36" from the turbo (if applicable). Connect the UEGO extension harness(s) to the sensor(s).

Position everything being cautious not to pinch any of the cables. Secure the E-Box cover with the factory fasteners. This will be a very tight fit.

Step 20

To remove the cowl, disengage the 3 quarter-turn fasteners and remove the interior ventilation filter cover and micro filter element.

Unclip the 4 tabs for the cable duct in front of the cowl and separate the two long pieces. Make sure the engine is cool and pull the large cables out of the plastic retaining seats and gently lay them down on the engine.

Unscrew the four T30 Torx bolts and remove the lower section of the micro filter housing by pulling towards the front of the vehicle.

Step 21

Towards the back of the vacuum rail there is a barbed nipple (shown). There is a short 90-degree rubber hose (not shown) and corresponding hard plastic tube (shown) that connects the vacuum rail to the fuel pressure regulator under the vehicle.

Pull the short rubber hose off the vacuum rail. Be careful not to lose the hard plastic tube which will be zip-tied in place by BMW.

Step 22

Using the barbed TEE and rubber vacuum hose included with the kit, install the MAP sensor's vacuum source, as shown.

Find a location to remotely mount the MAP sensor. Be sure to keep the vacuum hose and electrical cables away from hot exhaust gas areas or moving parts.

Connect the MAP sensor to the auxiliary connector.

The electrical and mechanical installation of the BMW E46 M3 Infinity EMS PnP kit is now complete.

PINOUTS

BMW Pinouts

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

BMW Pin		01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
X60001	1	Fuel Injector Relay-Terminal 15	C1-61	+12V	+12V	12 volt power from relay	12 volt power from relay. Relay must be controlled by +12V Relay Control signal pin C1-29.
	2	Voltage Supply-EDK Actuator with Potentiometer	C1-54	Harness_HBridge0_1	HBridge0_1	5.0A max Throttle Control Hbridge Drive	+12V to open
	3	Diagnosis Signal TXD SMG2 Control Module (SMG Only)	NC				
	4	Ground Point	C1-30	GND	PGND	Power Ground	Connect directly to battery ground
	5	Ground Connector	C1-55	GND	PGND	Power Ground	Connect directly to battery ground
	6	Ground Connector	C1-60	GND	PGND	Power Ground	Connect directly to battery ground
	7	Fuse F102-Terminal 30	C1-10	+12V_R8C_CPU	+12V (Perm Power)	Dedicated power management CPU	Full time battery power. MUST be powered before the ignition switch input is triggered.
	8	Voltage Supply-Engine Electronics Fuse Carrier	C1-61	+12V	+12V	12 volt power from relay	Relay must be controlled by +12V Relay Control signal pin C1-29.
	9	Negative Activation-EDK Actuator with Potentiometer	C1-53	Harness_HBridge0_0	HBridge0_0	5.0A max Throttle Control Hbridge Drive	+12V to close
X60002	1	Heater Ground-Oxygen Sensor I Before Catalytic Converter	NC				
	2	Not Used	NC				
	3	Not Used	NC				
	4	Not Used	NC				
	5	Negative Activation-Oxygen Sensor Grounds	NC				
	6	Not Used	NC				
	7	Heater Ground-Oxygen Sensor I Behind Catalytic Converter	NC				
	8	Not Used	NC				
	9	Not Used	NC				
	10	Signal-Exhaust Temperature Sensor	C2-17	Harness_Analog_In_Temp_6	Exhaust Temp	12 bit A/D, 2.49K pullup to 5V	See ExhTemp [C] table for calibration data and ExhTemp [C] for channel data.

	BMW Pin	01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
	11	Signal-Fuel Pump Relay 1 (USA Models Only)	C1-34	Harness_LowsideSwitch_0	Fuel Pump	Lowside switch, 4A max, NO internal flyback diode.	Switched ground. Will prime for 2 seconds at key on and activate if RPM > 0.
	12	Signal-E-Box Fan Temperature	GND				
	13	Heater Ground-Oxygen Sensor II Before Catalytic Converter	NC				
	14	Signal-Heated Oxygen Sensor I Before Catalytic Converter	NC				
	15	Signal-Heated Oxygen Sensor II Before Catalytic Converter	NC				
	16	Signal-Heated Oxygen Sensor I Behind Catalytic Converter	NC				
	17	Not Used	NC				
	18	Signal-Heated Oxygen Sensor II Behind Catalytic Converter	NC				
	19	Heater Ground-Oxygen Sensor II Behind Catalytic Converter	NC				
	20	Signal-Gear Recognition Clutch Switch	C2-38	Harness_Digital_In_7	Clutch Switch	10K pullup to 12V. Will work with ground or floating switches.	See ClutchSwitch 1-axis table for setup options. Open unless clutch out and gear in = 12V
	21	Signal-CAN Bus Low SMG2 Control Module (SMG Only)	NC				
	22	Signal-CAN Bus High SMG2 Control Module (SMG Only)	NC				
	23	Signal-Main Relay Activation-DME Relay	C1-29	Harness_+12V_Relay_Control	Main Relay	0.7A max ground sink for external relay control	Will activate at key on and at key off according to the configuration settings.
	24	Not Used	NC				
X60003	1	Signal-Hot-Film Mass Air Flow Sensor	C2-33	Harness_Analog_In_20	MAF Analog	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.
	2	Signal-Exhaust Camshaft Position Sensor I	C1-22	Harness_Digital_In_1	Cam1	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
	3	Not Used	NC				
	4	Activation VANOS Inlet Valve Advance	C2-44	Harness_LowsideSwitch_7	VANOS	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW VANOS Control
	5	Signal-Inlet Camshaft Position Sensor I	C1-23	Harness_Digital_In_2	Cam2	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
	6	Signal-Exhaust Camshaft Position Sensor II	NC				
	7	Voltage Supply-Hot-Film Mass Air Flow Sensor EDK Actuator	C2-24	+5V_OUT_2	Sensor +5V	Regulated, fused +5V supply for sensor power	Analog sensor power
	8	Signal-Crankshaft Position Sensor	C1-45	Harness_VR+_In_0	Crank+	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
	9	Not Used	NC				

BMW Pin	01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
10	Signal-EDK Actuator with Potentiometer	C2-21	Harness_Analog_In_16	Throttle2	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.
11	Not Used	NC				
12	Not Used	NC				
13	Signal-Generator Terminal 61	N/A				
14	Voltage Supply-Throttle Position Sensor	C1-42	+5V_OUT_1	Sensor +5V	Regulated, fused +5V supply for sensor power	Analog sensor power
15	Not Used	NC				
16	Not Used	NC				
17	Ground-Hot-Film Mass Air Flow Sensor	C2-32	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
18	Not Used	NC				
19	Tire Pressure Warning Pushbutton	NC				
20	Ground-EDK Actuator with Throttle Position Sensor	C2-32	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
21	Ground-Crankshaft Position Sensor	C1-46	Harness_VR-_In_0	Crank-	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
22	Signal-Intake Air Temperature	C1-67	Harness_Analog_In_Temp_2	Intake Air Temp	12 bit A/D, 2.49K pullup to 5V	See "Air Temperature" Setup Wizard for selection.
23	Signal-Throttle Position Sensor	C1-35	Harness_Analog_In_7	Throttle Position	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 [%] for DBW applications.
24	Signal-Engine Coolant Temperature Sensor	C1-66	Harness_Analog_In_Temp_1	Coolant Temp	12 bit A/D, 2.49K pullup to 5V	See "Coolant Temperature" Setup Wizard for selection.
25	Ground-Engine Coolant Temperature and Knock Sensors	C1-19	AGND_1	Sensor Ground	Dedicated analog ground	Analog 0-5V sensor ground
26	Signal-Oil Pressure Switch	N/A				
27	Not Used	NC				
28	Not Used	NC				
29	Signal-Knock Sensor (Cyl 1-2)	C1-27	Knock1	Knock1	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
30	Signal-Knock Sensor (Cyl 3-4)	NC				
31	Signal-Knock Sensor (Cyl 5-6)	C1-28	Knock2	Knock2	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
32	Not Used	NC				
33	Signal-Cylinder 1 Fuel Injection Valve	C1-63	Injector 1	Injector 1	Saturated or peak and hold, 3A max continuous	Injector 1
34	Signal-Cylinder 2 Fuel Injection Valve	C1-62	Injector 2	Injector 2	Saturated or peak and hold, 3A max continuous	Injector 2
35	Signal-Cylinder 3 Fuel Injection Valve	C1-59	Injector 3	Injector 3	Saturated or peak and hold, 3A max continuous	Injector 3

	BMW Pin	01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
	36	Signal-Cylinder 4 Fuel Injection Valve	C1-58	Injector 4	Injector 4	Saturated or peak and hold, 3A max continuous	Injector 4
	37	Signal-Cylinder 5 Fuel Injection Valve	C1-57	Injector 5	Injector 5	Saturated or peak and hold, 3A max continuous	Injector 5
	38	Signal-Cylinder 6 Fuel Injection Valve	C1-56	Injector 6	Injector 6	Saturated or peak and hold, 3A max continuous	Injector 6
	39	Signal-Oil Level Sensor	C1-24	Harness_Digital_In_3	Digital 3	10K pullup to 12V. Will work with ground or floating switches.	Used for BMW Oil Temperature Gauge
	40	Not Used	NC				
	41	Not Used	NC				
	42	Signal-Evaporative Emission Valve	C1-18	Harness_LowsideSwitch_3	LS3	Lowside switch, 4A max, NO internal flyback diode.	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.
	43	Signal-VANOS Exhaust Valve Retard	C1-02	Harness_LowsideSwitch_5	VANOS	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW VANOS Control
	44	Signal-VANOS Exhaust Valve Advance	C1-02	Harness_LowsideSwitch_5	VANOS	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW VANOS Control
	45	Tire Pressure Warning Lamp (Except M3)	NC				
	46	Signal-Close Idle Speed Control Valve	C1-03	Harness_LowsideSwitch_6	Idle Air Control	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW Idle Air Control
	47	Signal-Open Idle Speed Control Valve	C1-03	Harness_LowsideSwitch_6	Idle Air Control	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW Idle Air Control
	48	Not Used	NC				
	49	Not Used	NC				
	50	Signal-VANOS Inlet Valve Retard	C2-44	Harness_LowsideSwitch_7	VANOS	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	BMW VANOS Control
	51	Signal-Sucking Jet Pump Valve	NC				
	52	Crankcase Breather Valve (2005-2006 Models)	NC				
X60004	1	Signal-Battery Charge Indicator	N/A				
	2	Signal-Engine Start Feedback (M3 Only)	NC				
	3	Signal-Secondary Air Injection Pump Relay	NC				
	4	Signal-Electric Fan	C2-43	Harness_LowsideSwitch_8	A/C Fan	Lowside switch, 4A max with internal flyback diode and 12V pullup resistor. Inductive load should NOT have full time power.	Lowside switch, 4A max with internal flyback diode and 12V pullup resistor. Inductive load should NOT have full time power.
	5	Ground Point (M3 Only)	C2-03	GND	PGND	Power Ground	Connect directly to battery ground
	6	Signal-Ignition Lock Control Module for Instrument Cluster Terminal 50	NC				
	7	Ground-Pedal-Position Sensor	C1-20	AGND_1	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
	8	Signal-Pedal-Position Sensor	C2-13	Harness_Analog_In_18	APP1	12 bit A/D, 100K pullup to 5V	12 bit A/D, 100K pullup to 5V

BMW Pin	01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
9	Voltage Supply-Pedal-Position Sensor	C2-22	+5V_OUT_2	Sensor +5V	Regulated, fused +5V supply for sensor power	Analog sensor power
10	Signal Fuel Pump Relay 1 (Not USA Models)	C1-34	Harness_LowsideSwitch_0	Fuel Pump	Lowside switch, 4A max, NO internal flyback diode.	Lowside switch, 4A max, NO internal flyback diode.
11	Signal-Oil Pressure Control Module for Instrument Cluster	N/A				
12	Ground-Pedal-Position Sensor	C2-30	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
13	Signal-Pedal-Position Sensor	C2-14	Harness_Analog_In_19	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.
14	Voltage Supply-Pedal-Position Sensor	C2-23	+5V_OUT_2	Sensor +5V	Regulated, fused +5V supply for sensor power	Analog sensor power
15	Signal-Driving Dynamics Switching Center (M3 Only)	N/A				
16	Driving Dynamics Active LED-Switching Center (M3 Only)	N/A				
17	Engine Speed Signal TD-Data Link Connector	NC				
18	Activation Heating-Diagnostic Fuel Tank Leakage (USA M3 Only)	NC				
19	Reversing Light Switch (M Roadster Only)	NC				
20	Fuel Leakage Valve (Sept 01-up USA M3)/Thermal Oil Level Switch (M Roadster)	NC				
21	Signal-Oil Level Control Module for Instrument Cluster (Except M Roadster)	C1-24	Harness_Digital_In_3	Digital 3	10K pullup to 12V. Will work with ground or floating switches.	Used for BMW Oil Temperature Gauge
22	Signal-Processed Wheel Speed Rear Right-ABS/ASC Unit ABS/DSC Unit	C1-25	Harness_Digital_In_4	VSS (Hz)	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Vehicle Speed for calibration constant.
23	Not Used	NC				
24	Signal-Brake Light Switching Center Control Unit	C2-37	Harness_Digital_In_6	Brake Switch	10K pullup to 12V. Will work with ground or floating switches.	Input can be assigned to different pins. See Setup Wizard page Input Function Assignments for input mapping options.
25	Not Used	NC				
26	Fuse F29-Terminal 15	C1-65	Harness_+12V_SW	IGN Switch	10K pulldown	Full time battery power must be available at C1-10 before this input is triggered.
27	Volute Spring-Data Link MFL	N/A				
28	Signal-Fuel Leakage Pump Module (Sept 01 and Earlier Models Only)	NC				
29	Signal-Relay A/C Compressor	C1-01	Harness_LowsideSwitch_4	AC Compressor	Lowside switch, 4A max, NO internal flyback diode.	See Setup Wizard Pages "User GPOs" for activation criteria and "LowSide Assignment Tables" for output assignment
30	Signal-Leakage Diagnosis Pump	NC				
31	Not Used	NC				

BMW Pin	01–06 E46 M3 00–02 M Coupe 00–02 M Roadster	EMS Pin	Hardware Reference	Function	Hardware Specification	Notes
32	Signal-Data Link TXD-Data Link Connector	NC				
33	Electronic Vehicle Immobilizer Control Unit	NC				
34	Signal-Brake Light Switch	NC				
35	Cruise Control Ground (Except M3)	NC				
36	Signal-Connector CAN Bus High	C2-41	Harness_CanH_Bout	CAN B +	Dedicated High Speed CAN Transceiver	BMW CAN bus communication
37	Signal-Connector CAN Bus Low	C2-42	Harness_CanL_Bout	CAN B -	Dedicated High Speed CAN Transceiver	BMW CAN bus communication
38	Ground-Coolant Outlet Temperature Sensor (M3 Only)	C2-31	AGND_2	Sensor Ground	Dedicated analog ground	Analog 0–5V sensor ground
39	Signal-Coolant Outlet Temperature Sensor (M3 Only)	C2-15	Harness_Analog_In_Temp_4	ChargeOutTemp	12 bit A/D, 2.49K pullup to 5V	See ChargeOutTemp [C] table for calibration data and ChargeOutTemp [C] for channel data.
40	Not Used	NC				
1	Signal-Ignition Coil 1	C1-14	Ignition 1	Ignition 1	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.
2	Signal-Ignition Coil 2	C1-13	Ignition 2	Ignition 2	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.
3	Signal-Ignition Coil 3	C1-12	Ignition 3	Ignition 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.
4	Not Used	NC				
5	Ground Connector	C1-73	GND	PGND	Power Ground	Connect directly to battery ground
6	Signal-Ignition Coil 5	C1-16	Ignition 5	Ignition 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.
7	Signal-Ignition Coil 6	C1-15	Ignition 6	Ignition 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.
8	Not Used	NC				
9	Signal-Ignition Coil 4	C1-11	Ignition 4	Ignition 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.

(X60005)

Infinity Pinouts

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	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
C1-1	LowsideSwitch_4	A/C Compressor Clutch Relay	4-29	Lowside switch, 4A max, NO internal flyback diode.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment, Honda VTEC for VANOS triggering and 2D table "LS3_Duty [%]" for on/off activation.
C1-2	LowsideSwitch_5	Vanos-Exhaust Cam	3-43, 3-44	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	The Vanos drivers are located in the AEM Jumper Box. BMW Vanos cannot be wired directly to the Infinity.
C1-3	LowsideSwitch_6	Idle Air Control	3-46, 3-47	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	The S54 engine uses both an IACV and drive by wire throttles. Idle speed and low APP request is controlled using the IACV.
C1-4	UEGO 1 Heat	UEGO 1 Heat	Use 30-3600 Infinity O2 Sensor Extension Harness	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.
C1-9	Flash_Enable	Flash Enable		10K pulldown	Not usually needed for automatic firmware updates through Infinity Tuner. If connection errors occur during update, jump the 12V Flash Connector before proceeding with upgrade. Disconnect the 12V Flash Connector after the update.
C1-10	+12V_R8C_CPU	Battery Perm 12V Power	1-7	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	5-9	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-12	Coil 3	Coil 3	5-3	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-13	Coil 2	Coil 2	5-2	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-14	Coil 1	Coil 1	5-1	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-15	Coil 6	Coil 6	5-7	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-16	Coil 5	Coil 5	5-6	25 mA max source current	The ignitors are found in the AEM Jumper Box. The BMW Coils cannot be wired directly to the Infinity.
C1-17	LowsideSwitch_2	LS2		Lowside switch, 4A max, NO internal flyback diode.	Found on Aux Connector. See Wizard page "LowSide Assignment Tables" for output assignment and 2D table "LS2_Duty [%]" for activation.
C1-18	LowsideSwitch_3	Evap Emission Valve	3-42	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Wizard page "LowSide Assignment Tables" for output assignment and 2D table "LS3_Duty [%]" for activation. 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	Coolant and Knock Ground	3-25	Dedicated analog ground	Analog 0-5V sensor ground

Infinity Pin	Hardware Reference	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
C1-20	AGND_1	Pedal Sensor Ground	4-7	Dedicated analog ground	Analog 0-5V sensor ground
C1-21	Crank Position Sensor Hall	Crank Position Sensor Hall		10K pullup to 12V. Will work with ground or floating switches.	The BMW S54 uses a VR Crank Sensor, not a Hall Effect Crank Sensor. See Setup Wizard page Cam/Crank for options.
C1-22	Cam Position Sensor 1 Hall	Exhaust Cam Sensor 1	3-2	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	3-5	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Cam/Crank for options.
C1-24	Digital_In_3	Oil Level Sensor	3-39	10K pullup to 12V. Will work with ground or floating switches.	Input used to drive the Oil Temperature Gauge on dash via CAN bus.
C1-25	Digital_In_4	Vehicle Speed Sensor	4-22	10K pullup to 12V. Will work with ground or floating switches.	See Setup Wizard page Vehicle Speed for calibration constant.
C1-26	Digital_In_5	Flex Fuel		10K pullup to 12V. Will work with ground or floating switches.	Found on Aux Connector. See channel FlexDigitalIn [Hz] for raw frequency input data.
C1-27	Knock Sensor 1	Knock Sensor 1	3-29	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-28	Knock Sensor 2	Knock Sensor 2	3-31	Dedicated knock signal processor	See Setup Wizard page Knock Setup for options.
C1-29	+12V_Relay_Control	Main Relay	2-23	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	1-4	Power Ground	Connects directly to ground
C1-31	CANL_Aout	AEMNet CANL		Dedicated High Speed CAN Transceiver	4P DTM Connector found in AEM adapter harness. Contact AEM for additional information.
C1-32	CANH_Aout	AEMNet CANH		Dedicated High Speed CAN Transceiver	4P DTM Connector found in AEM adapter harness. Contact AEM for additional information.
C1-33	LowsideSwitch_1	Boost Control		Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	Found in Aux Connector. See Setup Wizard page Boost Control for options. Monitor BoostControl [%] channel for output state.
C1-34	LowsideSwitch_0	Fuel Pump	2-12, 4-10	Lowside switch, 4A max, NO internal flyback diode.	Pin is located in 2 different locations depending on E46 M3. Switched ground. Will prime for 2 seconds at key on and activate if RPM > 0.
C1-35	Analog_In_7	Throttle Position Sensor	3-23	12 bit A/D, 100K pullup to 5V	0-5V analog signal from the TPS located on the ITB unit.
C1-36	Analog_In_8	MAP Sensor		12 bit A/D, 100K pullup to 5V	Found on the Aux Connector. 0-5V analog signal. 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	Found on the Aux Connector. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. See the Setup Wizard Fuel Pressure page for setup and calibration. Monitor the FuelPressure [psig] channel.
C1-38	Analog_In_10	Baro Sensor		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	Found on the Aux Connector. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. 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	Found on the Aux Connector. 0-5V analog signal. Use +5V Out pins as power supply and Sensor Ground pins as the low reference. See the 1D lookup table 'ModeSwitch' for input state. A multi-position rotary switch such as AEM P/N 30-2056 is recommended. See Setup Wizard for details.
C1-41	+5V_Out_1	+5V Out		Regulated, fused +5V supply for sensor power	Found on the Aux Connector. Analog sensor power
C1-42	+5V_Out_1	+5V Out	3-14	Regulated, fused +5V supply for sensor power	Analog sensor power for the throttle position sensor

Infinity Pin	Hardware Reference	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
C1-43	HighsideSwitch_1	HS1 (switched 12V)		0.7A max, High Side Solid State Relay	See Setup Wizard page 'HighSide Assigment Tables' for configuration options. See 2D lookup table 'HS1_Table' for activation settings.
C1-44	HighsideSwitch_0	HS0 (switched 12V)		0.7A max, High Side Solid State Relay	Found on the Aux Connector. See Setup Wizard page 'HighSide Assigment Tables' for configuration options. See 2D lookup table 'HS0_Table' for activation settings.
C1-45	Crank Position Sensor VR+	Crank Position Sensor VR+	3-8	Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-46	Crank Position Sensor VR-	Crank Position Sensor VR-	3-21		
C1-47	Cam Position Sensor 1 VR-	Cam Position Sensor 1 VR-		Differential Variable Reluctance Zero Cross Detection	See Setup Wizard page Cam/Crank for options.
C1-48	Cam Position Sensor 1 VR+	Cam Position Sensor 1 VR +			
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 Vehicle Speed 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 Vehicle Speed page.
C1-52	VR+_In_3	Driven Left Wheel Speed Sensor +			
C1-53	DBW1 Motor -	DBW Motor Control Close	1-9	5.0A max Throttle Control Hbridge Drive	+12V to close
C1-54	DBW1 Motor +	DBW Motor Control Open	1-2	5.0A max Throttle Control Hbridge Drive	+12V to open
C1-55	Power Ground	Ground	1-5	Power Ground	Connects directly to ground
C1-56	Injector 6	Injector 6	3-38	Saturated or peak and hold, 3A max continuous	Injector 6
C1-57	Injector 5	Injector 5	3-37	Saturated or peak and hold, 3A max continuous	Injector 5
C1-58	Injector 4	Injector 4	3-36	Saturated or peak and hold, 3A max continuous	Injector 4
C1-59	Injector 3	Injector 3	3-35	Saturated or peak and hold, 3A max continuous	Injector 3
C1-60	Power Ground	Ground	1-6	Power Ground	Connect directly to battery ground
C1-61	+12V	+12V In	1-8	12 volt power from relay	12 volt power from relay. See pin C1-29 above.
C1-62	Injector 2	Injector 2	3-34	Saturated or peak and hold, 3A max continuous	Injector 2
C1-63	Injector 1	Injector 1	3-33	Saturated or peak and hold, 3A max continuous	Injector 1
C1-64	+12V	+12V In		12 volt power from relay	Not Connected
C1-65	+12V_SW	Ignition Switch	4-26	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	3-24	12 bit A/D, 2.49K pullup to 5V	See "Coolant Temperature" Setup Wizard for selection.

Infinity Pin	Hardware Reference	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
C1-67	Analog_In_Temp_2	Intake Air Temperature	3-22	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		Automotive, Programmable Stepper Driver, up to 28V and ±1.4A	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-70	Stepper_1A	Stepper 1A		Automotive, Programmable Stepper Driver, up to 28V and ±1.4A	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-71	Stepper_2B	Stepper 2B		Automotive, Programmable Stepper Driver, up to 28V and ±1.4A	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-72	Stepper_1B	Stepper 1B		Automotive, Programmable Stepper Driver, up to 28V and ±1.4A	Be sure that each internal coil of the stepper motor are properly paired with the 1A/1B and 2A/2B ECU outputs. Supports Bi-Polar stepper motors only.
C1-73	Power Ground	Ground	5-5	Power Ground	Connects directly to 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	4-5	Power Ground	Connects directly to 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	NOTE: Only available with Infinity10 BMW, P/N: 30-7105
C2-7	Injector 10	Injector 10		Saturated or peak and hold, 3A max continuous	NOTE: Only available with Infinity10 BMW, P/N: 30-7105
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	NOTE: Only available with Infinity10 BMW, P/N: 30-7105
C2-11	Injector 12	Injector 12		Saturated or peak and hold, 3A max continuous	NOTE: Only available with Infinity10 BMW, P/N: 30-7105
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. See Setup Wizard Input Functions page for input selection. BMW uses CAN bus for A/C switch input
C2-13	Analog_In_18	DBW_APP1 [%]	4-8	12 bit A/D, 100K pullup to 5V	0-5V analog signal.
C2-14	Analog_In_19	DBW_APP2 [%]	4-13	12 bit A/D, 100K pullup to 5V	0-5V analog signal.
C2-15	Analog_In_Temp_4	Coolant Outlet Temperature	4-39	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	Exhaust Gas Temp Sensor	2-10	12 bit A/D, 2.49K pullup to 5V	See ExhTemp [C] table for calibration data and ExhTemp [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. 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. See the TC_SlipTrgtTrim [MPH] 1-axis table. A multi-position rotary switch such as AEM P/N 30-2056 is

Infinity Pin	Hardware Reference	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
					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. See Setup Wizard Exhaust Pressure page for setup options. See EBPress [kPa] for channel data.
C2-21	Analog_In_16	DBW1_TPSB [%]	3-10	12 bit A/D, 100K pullup to 5V	0-5V analog TPS signal found on the ITBs. Use +5V Out pins as power supply and Sensor Ground pins as the low reference.
C2-22	+5V_Out_2	Pedal Position +5V	4-9	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-23	+5V_Out_2	Pedal Position +5V	4-14	Regulated, fused +5V supply for sensor power	Analog sensor power
C2-24	+5V_Out_2	MAF Sensor +5V	3-7	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 Vehicle Speed 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 Vehicle Speed page.
C2-28	VR+_In_4	Non Driven Right Wheel Speed Sensor +			
C2-29	LowsideSwitch_9	Tachometer		Lowside switch, 4A max with internal flyback diode, 2.2K 12V pullup. Inductive load should NOT have full time power.	The BMW tachometer is driven via CAN bus.
C2-30	AGND_2	Pedal Sensor Ground	4-12	Dedicated analog ground	Analog 0-5V sensor ground
C2-31	AGND_2	Coolant Outlet Temp Sensor Ground	4-38	Dedicated analog ground	Analog 0-5V sensor ground
C2-32	AGND_2	MAF Sensor Ground	3-17	Dedicated analog ground	Analog 0-5V sensor ground
C2-33	Analog_In_20	MAF Sensor Signal	3-1	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.
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. 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. 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. See ChargeOutPress [kPa] channel for input state. See Setup Wizard page Charge Out Pressure for calibration options.
C2-37	Digital_In_6	Brake Switch Input	4-24	No pullup. Will work with TTL signals.	Input used for CAN bus.
C2-38	Digital_In_7	Gear Recognition Clutch Switch	2-20	No pullup. Will work with TTL signals.	Circuit is open unless clutch is out and gear in. 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	4-36	Dedicated High Speed CAN Transceiver	Used for BMW CAN bus
C2-42	CanL_Bout	CANL	4-37	Dedicated High Speed CAN Transceiver	Used for BMW CAN bus

Infinity Pin	Hardware Reference	AEM / M3 Function	BMW M3 Pin	Hardware Specification	Notes
C2-43	LowsideSwitch_8	LS8		Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS8_Duty [%]" for activation.
C2-44	LowsideSwitch_7	A/C Fan	4-4	Lowside switch, 4A max with internal flyback diode. Inductive load should NOT have full time power.	See Setup Wizard Page "LowSide Assignment Tables" for output assignment and 2D table "LS7_Duty [%]" for activation.
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 power 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	Not Available
C2-54	Coil 10	Coil 10		25 mA max source current	Not Available
C2-55	HighsideSwitch_2	Fuel Pump		Multi-function pin depending on hardware configuration	+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

AUX Connector Pinouts

Deutsch Pin	Infinity Pin	Wire Color	Pin Name	Default Pin Function
1	C1-37	Yellow	Harness_Analog_In_9	Fuel Press
2	C1-67	White	Harness_Analog_In_Temp_2	Intake Air Temp
3	C1-19	Black	AGND_2	Sensor Ground
4	C1-41	Gray	+5V_OUT_1	Sensor +5V
5	C1-36	Yellow	Harness_Analog_In_8	Manifold Pressure
6	C1-26	Tan	Harness_Digital_In_5	Flex Fuel Sensor (Hz)
7	C1-33	Pink	Harness_LowsideSwitch_1	Boost Control
8	C1-64	Orange	+12V	+12V
9	C1-44	Dark Green	Harness_HighsideSwitch_0	HS0
10	C1-40	Yellow	Harness_Analog_In_12	Boost Switch
11	C1-17	Pink	Harness_LowsideSwitch_2	Rad Fan1
12	C1-39	Yellow	Harness_Analog_In_11	No Lift Shift Trigger

Miscellaneous Pinouts

LAMBDA 1		
Deutsch Pin	**Infinity Pin**	**Default Pin Function**
1	C1-7	UEGO1 UN
2	C1-5	UEGO1 IA
3	---	+12V
4	C1-4	UEGO1 Heat
5	C1-8	UEGO1 VM
6	C1-6	UEGO1 IP

LAMBDA 2		
Deutsch Pin	**Infinity Pin**	**Default Pin Function**
1	C2-46	UEGO2 UN
2	C2-48	UEGO2 IA
3	---	+12V
4	C2-49	UEGO2 Heat
5	C2-45	UEGO2 VM
6	C2-47	UEGO2 IP

AEMNet		
Deutsch Pin	**Infinity Pin**	**Default Pin Function**
1	C1-31	CAN A-
2	C1-32	CAN A+
3	---	+12V
4	C1-30	Ground

FLASH ENABLE		
Delphi Pin	**Infinity Pin**	**Default Pin Function**
1	C1-9	Harness Flash Enable
2	C1-10	Permanent Power

BMW Pin Numbering

Infinity Pin Numbering

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.