



## AiM Infotech

### BMW 3 Series (E46), M3 (E46) OBDII +ECU Connection

Release 1.05



ECU





# 1

## Models and years

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This document explains how to connect AiM devices to the vehicle Engine Control Unit (ECU) data stream.

Supported models and years are:

- BMW 3 Series (E46) 2001-2005
- BMW M3 (E46) 2001-2006

# 2

## Connection and configuration

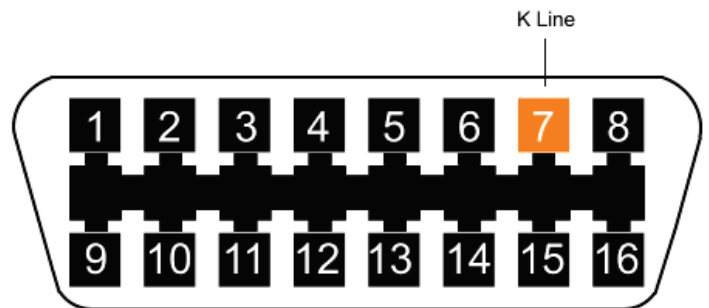
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AiM devices can be connected to these models in two different ways:

- through the OBD II plug, using a standard OBD II protocol (easy connection, basic parameters)
- through a direct connection to the ECU CAN wires, using a specific manufacturer CAN protocol.

## 2.1 OBDII connection

These models feature a standard diagnostic protocol based on CAN/K-Line/RS232, accessible through the OBDII plug placed on the left of the driver seat (following left picture). For this installation refer to the following pinout of the OBDII plug (vehicle side – front view) and connection table.



**OBDII connector pin**

**Pin function**

**AiM cable**

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K Line

K Line

## 2.2 OBDII – Race Studio configuration

Before connecting the AiM device to the OBD II plug, set all functions using AiM software Race Studio. The parameters to set in the device configuration are:

- ECU manufacturer: **OBD\_II**
- ECU Model: **ISO9141-2**

## 2.3 ECU CAN connection

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These models feature a CAN data bus accessible through the ECU main connector. It is strongly recommended to refer to a skilled technician to perform this kind of installation. For this installation refer to the following pinout of the car's ECU connector (vehicle side – front view) and connection table.

Pin function	BMW ECU cable colour	AiM cable label
CAN 1 High	Yellow/Red	CAN+
CAN 1 Low	Yellow/Brown	CAN-
CAN 2 High	Yellow/Black	CAN+
CAN 2 Low	Yellow/Brown	CAN-

**Please note: BMW 3 Series (E46)** ECU has the CAN bus on the 40 pins X60004 connector too. Here below is connection table

40 Pins X60004 connector pin	Pin function	BMW ECU cable colour	AiM cable label
36	CAN High	Yellow	CAN+
37	CAN Low	Black	

## 2.4 ECU CAN – Race Studio configuration

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Before connecting the AiM device to the ECU, set all functions using AiM software Race Studio. The parameters to set in the device configuration are:

- ECU manufacturer: **BMW**
- ECU Model: **BMW\_MINI**

## 3 Protocols

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Channels received by AiM devices change according to the selected protocol.

### 3.1 "OBDII – ISO9141-2" protocol

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Channels received by AiM devices configured with " OBDII – ISO9141-2" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	OBDII_RPM	RPM
ECU_2	OBDII_SPEED	Speed
ECU_3	OBDII_ECT	Engine coolant temperature
ECU_4	OBDII_TPS	Throttle position sensor
ECU_5	OBDII_IAT	Intake air temperature
ECU_6	OBDII_MAP	Manifold air pressure
ECU_7	OBDII_MAF	Manifold air flow
ECU_8	OBDII_FUEL_LEV	Fuel level
ECU_9	OBDII_PPS	Pedal position sensor

**Please note:** channels listed above are those polled by AiM devices. They may or may not come across in the data stream depending on models. RPM, TPS, ECT and speed are generally available. Moreover please **remember:** this protocol will not apply to M3 models.

## 3.2 "BMW – BMW\_MINI" protocol

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Channels received by AiM devices configured with "BMW – BMW\_MINI" protocol are:

<b>CHANNEL NAME</b>	<b>FUNCTION</b>
RPM	RPM
GEAR	Active gear
SPEED	Vehicle speed
WHFL	Front left wheel speed
WHFR	Front right wheel speed
WHRL	Rear left wheel speed
WHRR	Rear right wheel speed
RPM TURBO	Turbo RPM
WATER TEMP	Water temperature
ENGINE OIL TEMP	Oil temperature
GEARBOX TEMP	Gearbox temperature
TEMP OUTSIDE	Outside air temperature
BRAKE PRESSURE	Brake pressure
STEER ANGLE	Steering angle
ENGINE MOMENT	Engine moment
PEDAL POSITION	Pedal position sensor
FUEL	Fuel level
TORQUE	Torque
ABS FAIL	ABS failure
ASC REG	ASC regulation
DSC REG	DSC regulation
STEER ANG2	Steering angle 2



ELECTROV STATE	Electro valve state
BRAKE SWITCH	Brake switch
CLUTCH SWITCH	Clutch switch
FULL LOAD ALTE	Full load alternator
MIL CHK ENG	Engine malfunctioning checking

**Technical note:** not all data channels outlined in the ECU template are validated for each manufacturer model or variant; some of the outlined channels are model and year specific, and therefore may not be applicable