

AiM InfoTech

BMW 1 Series Coupè/Cabrio  
(E81/E82/E87/E88), 3 Series  
(E90/E92/E93), Z4 (E89)  
OBDII + ECU Connection

Release 1.02

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# 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 1 Series (E87) 2007 – 2011
- BMW 1 Series Coupè/Cabrio/(E81/E82/E88) 2007 – 2013
- BMW 3 Series (E90/E92/E93) 2005 – 2012
- BMW Z4 (E89) 2009 - 2016

# 2

## Connection and configuration

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

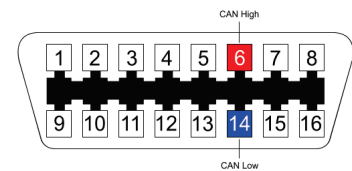
- Through the OBD II plug, using a standard OBD II protocol (easy connection, basic parameters)
- Through a direct connection to the ECU CAN wires, using a specific BMW CAN protocol.

## 2.1 OBDII Connection

These models feature a standard diagnostic protocol based on CAN, accessible on the OBD II plug places on the driver side, in the footrest area. For this installation refer to the following pinout of the car's plug (vehicle side – front view) and connection table:



OBDII Pin	Pin function	AiM cable
6	CAN High	CAN +
14	CAN Low	CAN -



## 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: **CAN**

## 2.3 ECU CAN Connection

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These BMW cars feature a bus communication protocol based on CAN on the car ECU. Regardless of the stock ECU installed on your car, colours of the cables are always the same, they are twisted and here below they are indicated.

<b>Pin function</b>	<b>BMW ECU cable color</b>	<b>AiM cable label</b>	<b>AiM cable color</b>
CAN High	Blue/Red	CAN+	White
CAN Low	Red	CAN -	Blue

In alternative they can be as below.

<b>Pin function</b>	<b>BMW ECU cable color</b>	<b>AiM cable label</b>	<b>AiM cable color</b>
CAN High	Black	CAN +	White
CAN Low	Yellow	CAN -	Blue

## 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\_PT6**

## 3 Protocols

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

### 3.1 “OBDII – CAN” Protocol

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Channels received by AiM devices configured to “OBDII – CAN” protocol are:

<b>CHANNEL NAME</b>	<b>FUNCTION</b>
OBDII_RPM	Engine RPM
OBDII_SPD	Vehicle speed
OBDII_TPS	Throttle position sensor
OBDII_PPS	Pedal position sensor
OBDII_ECT	Engine coolant temperature
OBDII_IAT	Intake air temperature
OBDII_FuelLev	Fuel level
OBDII_MAP	Manifold air pressure
OBDII_MAF	Manifold air flow

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

## 3.2

# “BMW – BMW\_PT6” Protocol

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Channels received by AiM devices configured with “BMW – BMW\_PT6” protocol are:

<b>CHANNEL NAME</b>	<b>FUNCTION</b>
ENG TRQ	Engine torque
RPM	Engine RPM
PEDAL POSITION	Pedal position sensor
TPS	Throttle position sensor
DCT TMP	BMW DCT temperature
GEAR	Engaged gear
CLUTCH SWITCH	Clutch switch
STEER ANGLE	Steering angle position
WHEEL FL	Front left wheel speed
WHEEL FR	Front right wheel speed
WHEEL RL	Rear left wheel speed
WHEEL RR	Rear right wheel speed
BRAKE SWITCH	Brake switch
BRAKE PRESS	Brake pressure
ABS STATUS	ABS status
DSC STATUS	DSC status
SPEED BMW	Vehicle speed
ACC LONG	Inline acceleration
GYRO	Gyroscope
ACC LAT	Lateral acceleration
DASH SPD	Dash speed
MIL	Malfunction indicator lamp
WATER TEMP	Water temperature
OIL TEMP	Oil temperature
MAP	Manifold air pressure



FUEL INJ	Fuel injection
BRK FL PRESS	Front left brake pressure
BRK FR PRESS	Front right brake pressure
BRK RL PRESS	Rear left brake pressure
BRK RR PRESS	Rear right brake pressure
TEMP OUTSIDE	Outside temperature
DRIVE MODE	Drive mode
DISTANCE KM	Distance
FUEL	Fuel level
BATTERY	Battery voltage level

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