AiM Infotech

ECU connection of AiM devices via OBDII

Release 1.04

This manual explains how to connect AiM devices to the vehicle ECUs using an OBDII Protocol.

1
OBDII: protocols, pinout and position

OBDII is a standard diagnostic system introduced in the USA at the end of the nineties. You can use it to make your AiM device communicate with the vehicle ECU. This diagnostic system supports different communication protocols. AiM devices support the following protocols:
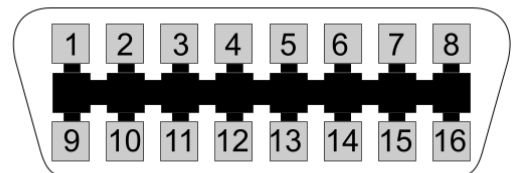
ISO15765/4 – CAN	Supported by AiM devices
ISO9141/2 – K Line	Supported by AiM devices *
ISO14230/4 – KWP200 – K Line	Supported by AiM devices *
J1850	**Not** supported by AiM devices

* N.B.: MXL, MXL Pista, MXL Pro and MXL Pro05 **do not support K – line** ECU communication protocols.

1.1
OBDII plug pinout

Car OBDII plug is shown here below on the left while its connector drawing is on the right (**vehicle side – front view**).

Here follows the connector standard pinout.

OBDII connector pin	Function
2	Positive bus line – SAE J1850 protocol: **not supported by AiM devices**
4	Chassis GND
5	GND signal
6	CAN High – ISO 15765-4 and SAE J2234 protocols
7	K line – ISO 9141-2 and ISO 14230-4 protocols
10	Negative bus line – SAE J1850 protocol: **not supported by AiM devices**
14	CAN low – ISO 15765 and SAE J2234 protocols
15	L line – ISO 9141-2 and ISO 14230-4 protocols
16	Battery supply

1.2
OBDII plug position

OBDII plug can be placed in different positions in the car cockpit. Some car manufacturers use to protect the plug with covers, caps etc... Here below the most common positions of OBDII plug are indicated.
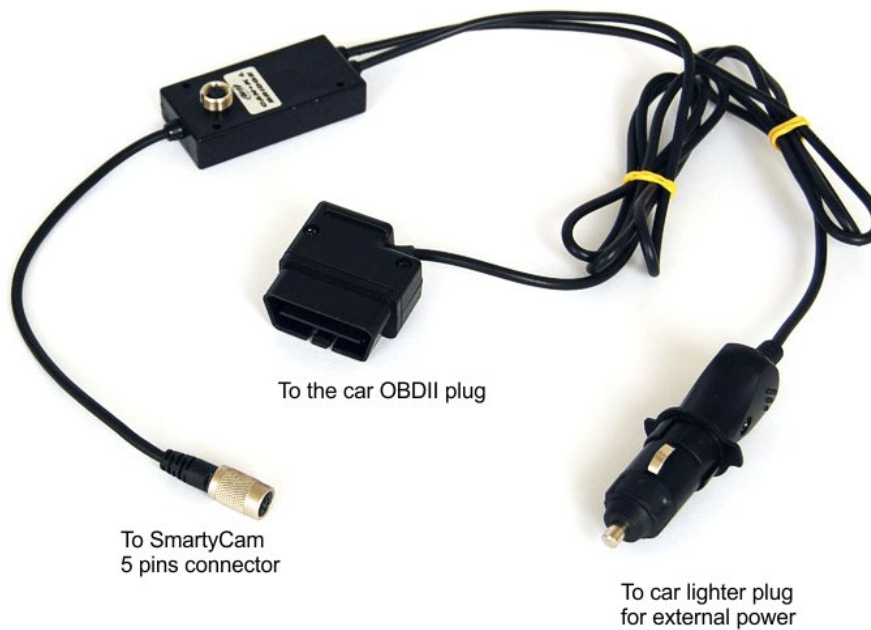
2
Connection of AiM devices to OBDII plug

Here follows the description of OBDII connection methods of the AiM devices.

2.1
ECU Bridge

The ECU Bridge can be purchased ended with OBDII plug, whose part number is: **X90BGCK12MA**.

2.2
EVO4

It is possible to connect EVO4 to the vehicle ECU via OBDII using a proper cable. AiM has developed two dedicated cables: one for CAN line and the other for K line.
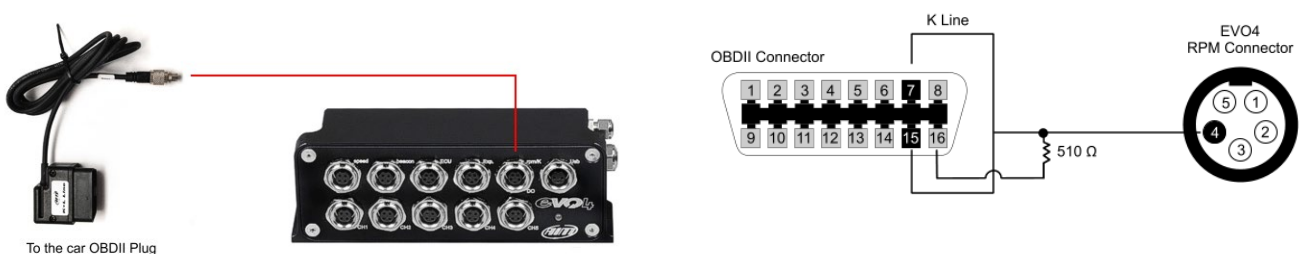
EVO 4 CAN cable for connection to the ECU via OBDII plug part number is: **V02563040** (cable length: 150 cm).
It must be connected to EVO4 Binder connector labelled "ECU". Here below, connection scheme (on the left) and the cable electrical scheme (on the right) are shown.
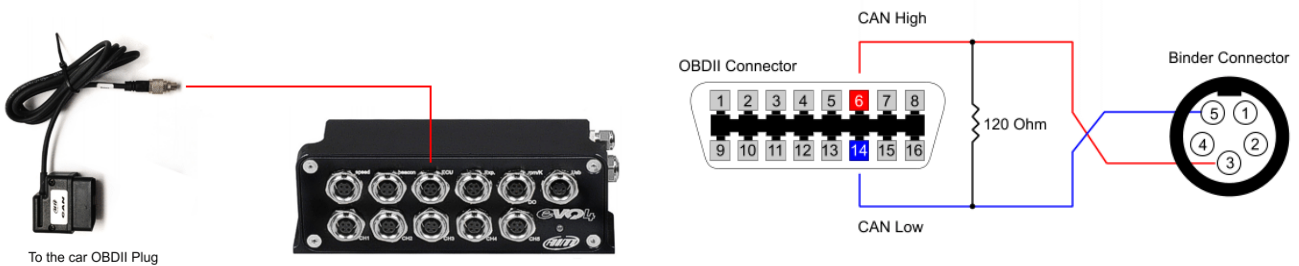
EVO4 K line cable for connection to the ECU via OBDII plug part number is **V02563050** (cable leght: 150 cm).
It must be connected to EVO4 Binder connector labelled "RPM". Here below, connection scheme (on the left) and the cable electrical scheme (on the right) are shown.

2.3
EVO4S

It is possible to connect EVO4S to the vehicle ECU via OBDII using a proper cable.

EVO4S cable for connection to the ECU via OBDII plug (with CAN + K line protocols) part number is: **V02585030** (cable length: 200 cm).
It must be connected to EVO4S Binder connector labelled "ECU". Here below, connection scheme (on the left) and the cable electrical scheme (on the right) are shown.
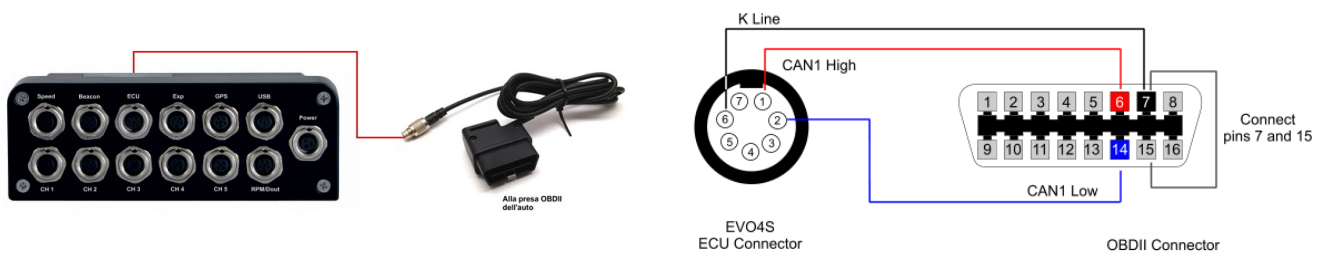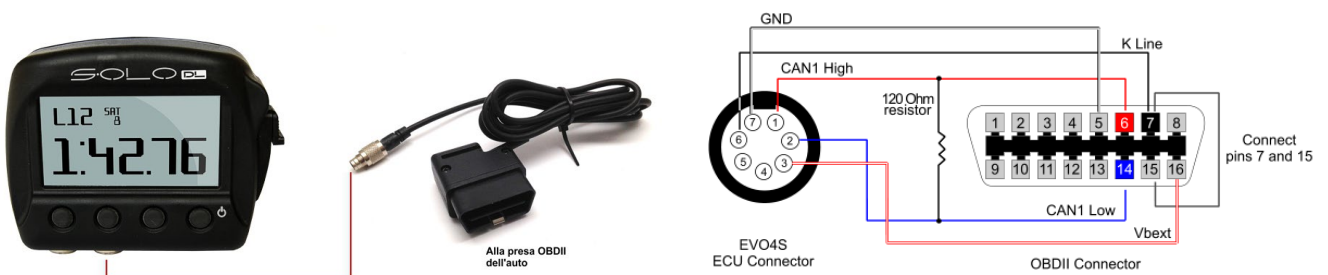
2.4
SoloDL

It is possible to connect SoloDL to the vehicle ECU via OBDII using a proper cable, available in two different lengths. Their part numbers are:

- **V02569010**: cable length 200 cm
- **V02569090**: cable length 120 cm

The cable must be connected to SoloDL right Binder connector. Here below, connection scheme (on the left) and the cable electrical scheme (on the right) are shown.

Please note: CAN termination resistor is integrated in the cable while K line pull-up resistor is integrated in SoloDL.

2.5
Solo 2 DL

It is possible to connect Solo 2 DL to the vehicle ECU via OBDII using a proper cable, available in two different lengths. Their part numbers are:

* **V02589040** – cable length: 200 cm
* **V02589060** – cable length: 260 cm

The cable must be connected to Solo 2 DL right Binder connector. Here below, connection scheme (on the left) and the cable electrical scheme (on the right) are shown.
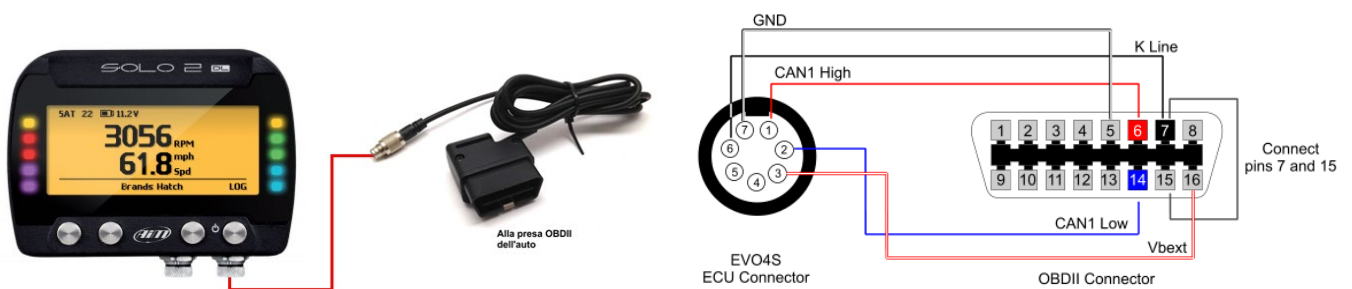
2.6
MXS Strada/MXx 1.2 Strada systems

It is possible to connect MXx Strada systems **(MXS Strada, MXS 1.2 Strada, MXG 1.2 Strada, MXP Strada)** to the vehicle ECU via OBDII plug using the 14pins main harness ended with OBDII plug counterpart, whose part number is:

- **V02573320:** 14pins main harness ended with OBDII connector for MXS Strada
- **V02573340:** 14pins main harness ended with OBDII connector for MXx 1.2 Strada
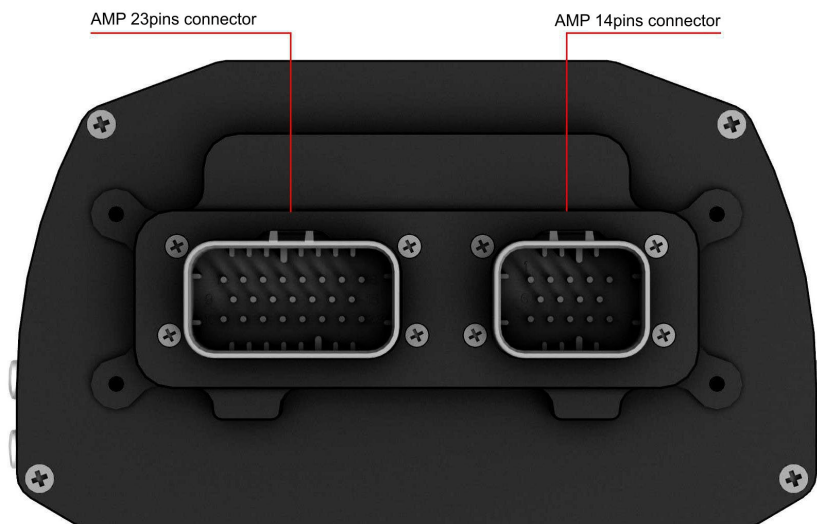
AMP 23pins connector · · · · · · · · · AMP 14pins connector

Please note: CAN termination resistor and K line pull-up resistor are integrated in MXx systems.

2.7
MXx systems+ EVO5

You can connect MXx systems **(MXS, MXS 1.2, MXG, MXG 1.2, MXP, MXL2, MXm)** and **EVO5** to the vehicle ECU via OBDII plug using the 37 pins main harness with free wires (product code: **V0257301**), that must be cabled with the OBDII plug counterpart.
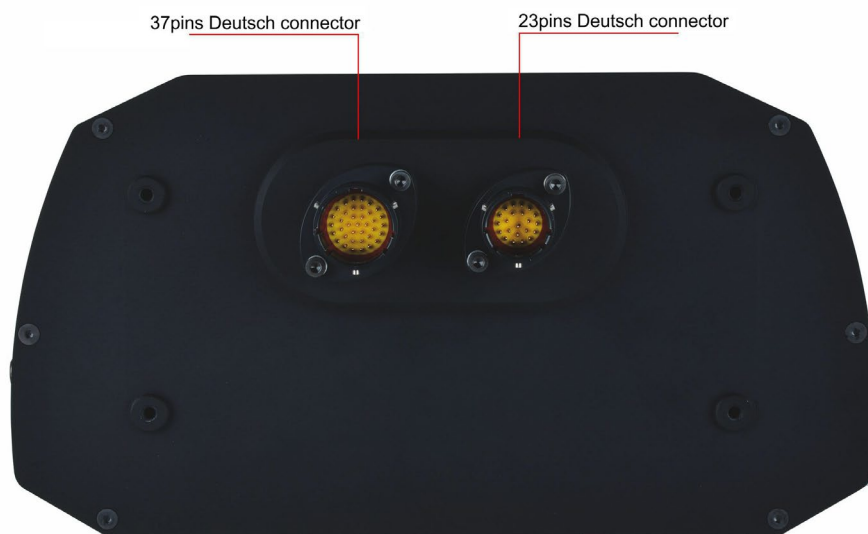
Here are the wires to be used for ECU connection.

AiM harness free wires	Connector pin	Function
CAN +	8	CAN High
CAN –	9	CAN Low
K line	11	K-Line
GND K-line	10	GND K-Line

Please note: CAN termination resistor and K line pull-up resistor are integrated in MXx systems and in EVO5.

3
Race Studio configuration

Before connecting your AiM device to the OBDII plug, set it up via software. The software to be used changes according to the device you are configuring.

Race Studio 2 software is to be used for:
- ECU Bridge
- EVO4
- SoloDL

Race Studio 3 software is to be used for:
- MXS, MXS 1.2, MXS Strada, MXS 1.2 Strada
- MXG, MXG 1.2, MXG 1.2 Strada
- MXP, MXP Strada
- MXm
- MXL2
- EVO4S
- EVO5
- Solo 2 DL

3.1
Configuration with Race Studio 2

- run Race Studio 2 software, click Device Configuration, select the device you are using and click Go To; select the configuration to use or press New to create a new one
- from each drop-down menu, select ECU manufacturer "OBDII" and – according to your vehicle OBDII protocol – ECU Model:
  - "CAN"
  - "ISO9141_2"
  - "KWP2000_FAST_INIT"
  - "KWP2000_SLOW_INIT"
- transmit the configuration to the device pressing "Transmit".

3.2
Configuration with Race Studio 3

- run Race Studio 3 software, select the configuration to use or press New to create a new one, select the device you are using and click OK
- enter the ECU Stream tab
- select ECU manufacturer "OBDII" and – according to your vehicle OBDII protocol – ECU Model
  - "CAN"
  - "ISO9141_2"
  - "KWP2000_FAST_INIT"
  - "KWP2000_SLOW_INIT"
- transmit the configuration to the device pressing "Transmit"

4
OBDII protocol

Received channels by AiM device via OBDII are shown here below:

CHANNEL NAME	FUNCTION
OBDII_RPM	RPM
OBDII_SPEED	Vehicle speed
OBDII_ECT	Engine coolant temperature
OBDII_TPS	Throttle position sensor
OBDII_IAT	Intake air temperature
OBDII_MAP	Manifold air pressure
OBDII_MAF	Manifold air flow
OBDII_FUEL_LEV	Fuel level
OBDII_PPS	Pedal position sensor

Technical note: not all data channels outlined in the ECU template are validated for each manufacturer model or variant; each manufacturer can choose which channel should be available to standard diagnostic tools.