Lotus Plug&Play kit

Racing Data Power

INTRODUCTION

The P&P kit specifically designed for Lotus – including an **ECU Bridge** with an OBDII connector for immediate plug into the engine control unit (ECU) network – makes **SmartyCam** connection and activation very easy.

In fact, it is enough to connect the **ECU Bridge** to the vehicle socket – as detailed in this document – to get the key values from the engine control unit and record/overlay them on **SmartyCam** videos.

Index

Chapter 1– Kit and optionals

1.1 – The kit

The kit includes:

1 – **SmartyCam**; (1)
1 – **ECU Bridge** with car adapter; (2)
1 – 2m or 4m CAN cable;(3)

1.2 – The optionals

The optionals (see below) are 2 different installation kits and – to improve audio quality – the external microphone.

Suction cup kit:

1 – ball head
1 – 60 mm. arm
1 – suction cup
1 – washer

Roll-bar kit:

1 – ball head
1 – 60 mm. arm
1 – roll bar bracket
1 – washer

CAN cable with external microphone

Chapter 2 – Preliminary information

Lotus cars can support one of these OBDII diagnosis protocols: K Line (ISO9141/2), CAN (ISO 15765/4) or KWP2000 Fast Init (ISO 14230/4). Please check below which is the appropriate protocol for each model.

2.1 – Car Models and communication protocol

Lotus cars support CAN (ISO 15765/4) OBDII diagnosis protocols. This protocol is supported by all Lotus models since 2008 (2-Eleven excluded).

2.1.1–OBDII CAN (15765/4) protocol

CAN (ISO 15765/4K) protocol is supported by the following models:

- all Elise models since 2008
- all Exige models since 2008;
- all 2-Eleven since 2008;
- Evora since 2009

2.1.2 –OBDII K Line (ISO9141/2) protocol

K-Line (ISO9141/2) protocol is supported by the following models

- all Elise models from 2004 to 2007
- all Exige models from 2004 to 2007;
- 2-Eleven since 2007;
- Elise S2 Rover from 2001 to 2004

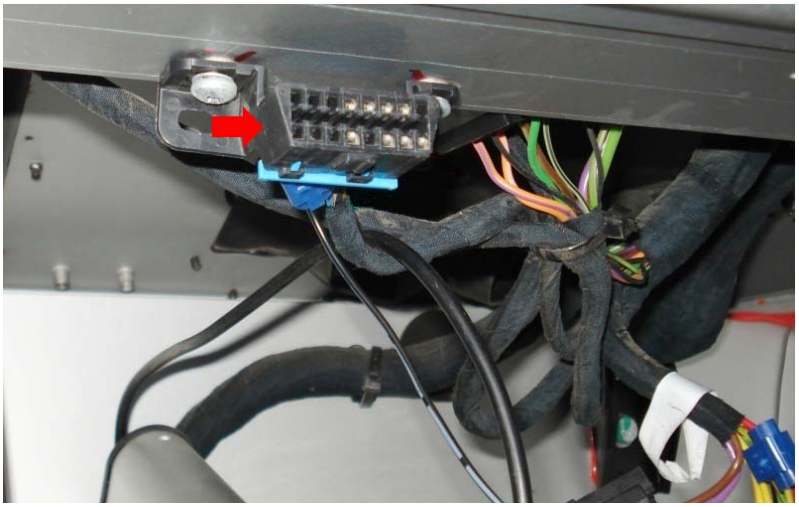
2.1.3 –OBDII KWP2000 Fast Init (ISO 14230/4) protocol

KWP2000 (ISO14230/4) protocol is supported by the following models:

- all Europa models since 2006

2.2 – Lotus OBDII connector position

Lotus OBDII black connector is placed on the driver's side, below the dashboard on the vertical central console – see below:

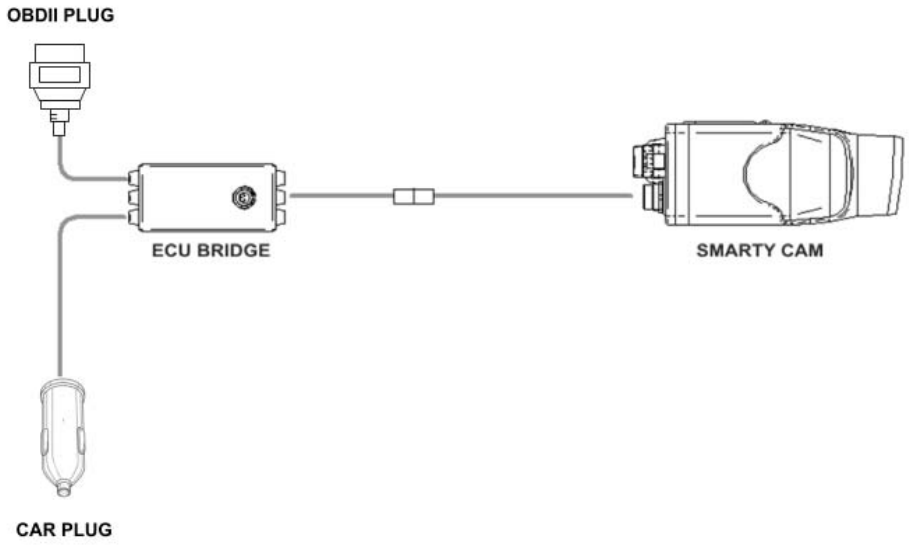


Chapter 3 – Connections

To receive the info provided by the vehicle ECU it is necessary to connect:

Step 1 – SmartyCam to ECU Bridge
Step 2 – ECU Bridge to the vehicle

The image below shows the connections .



3.1 – Connecting SmartyCam to ECU Bridge

To connect **SmartyCam** to **ECU Bridge**:

- Connect the 7 pins connector placed on the **SmartyCam** back to the 2m or 4m power cable + CAN supplied with the kit.

3.2 – Connecting ECU Bridge to the car

To connect **ECU Bridge** to the vehicle:

- plug ECU Bridge OBDII male connector into OBDII socket (see image below);
- put the car adapter in the car cigarette lighter socket.

Chapter 4 – Elise, Exige, 2–Eleven from 2004 to 2007

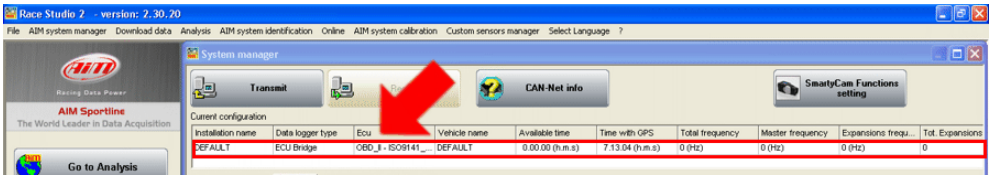
4.1 – Configuration setting

Once **ECU Bridge** is connected, it is necessary to configure it in **Race Studio 2** software. Please refer to Chapter 1 to check which is the appropriate communication protocol. Then:

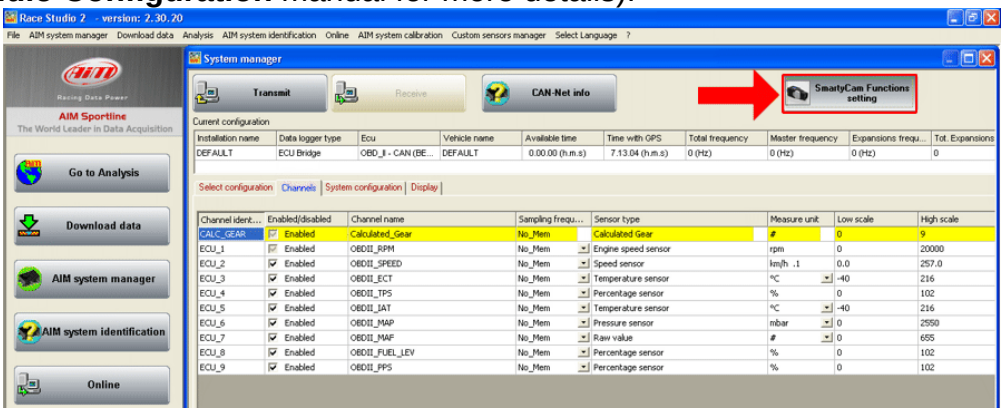
- Launch **Race Studio2 Configuration** Software
- Create a configuration pressing "**New**".

Depending on the parameters to visualize, it is possible to choose between 2 different configurations. Please refer to "Communication protocols" chapter to check the more appropriate configuration.

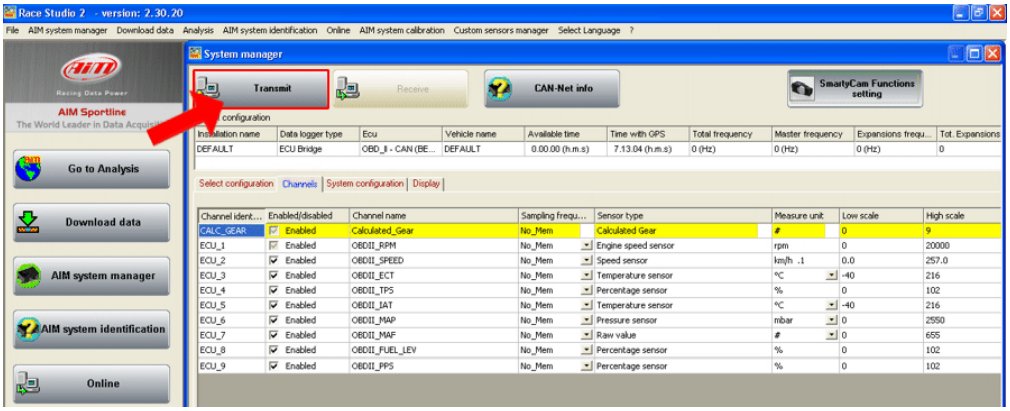
- select from "**ECU manufacturer**" menu: "**OBD_II**" or "**LOTUS**";
- select from "**ECU Model**" menu: "**ISO9141/2**"or "**Clusters 04-07**"



- Select "**SmartyCam Function setting**" to set **SmartyCam** channels (refer to **Race Studio Configuration** manual for more details).



- transmit the configuration to **AIM** logger clicking "**Transmit**" (see below).



Note: it is suggested to disable non-used channels (see image above).

4.2 – Communication protocols

4.2.1 – OBDII Protocol

Channels received by **AIM** loggers connected to OBDII are:

ID	CHANNEL NAME	FUNCTION
ECU_1	OBDII_RPM	Engine Speed
ECU_2	OBDII_SPEED	Speed Value
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 Absolute Pressure
ECU_7	OBDII_MAF	Mass Air Flow
ECU_8	OBDII_FUEL_LEV	Fuel Level
ECU_9	OBDII_PPS	Pedal Position Sensor

Note: all the above channels are managed by AIM OBDII. Please consider that acquired channels depend on the car model; for this reason some of them could not be available. Moreover it is suggested to disable the error channels to allow a faster data transmission.

4.2.2 – Clusters 04-07 Protocol

Channels received by **AIM** loggers using Clusters 04-07 protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	CU_SPEED	Speed value
ECU_2	CU_RPM	Engine speed
ECU_3	CU_FUEL_IST	Fuel level
ECU_4	CU_FUEL_AVE	Fuel average
ECU_5	CU_ENGT	Engine coolant temperature
ECU_6	CU_SF_LIGHT	Shift light
ECU_7	CU_MIL_LIGHT	Malfunction Indicator limiter light
ECU_8	CU_OIL_LIGHT	Oil light
ECU_9	CU_TC_LIGHT	Traction control light

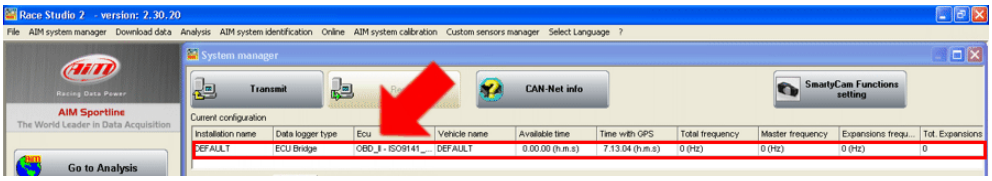
Chapter 5 – Elise, Exige, 2–Eleven since 2008

5.1 – Software configuration setting

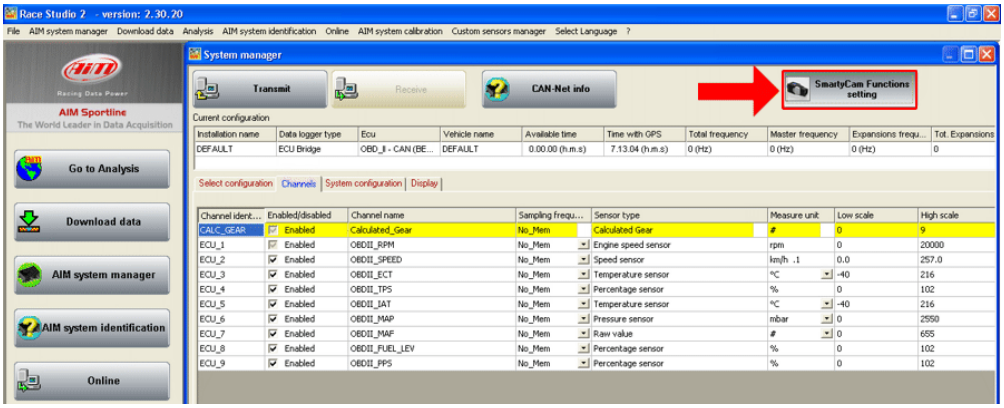
Once **ECU Bridge** is connected, it is necessary to configure it in **Race Studio 2** software. Please refer to Chapter 1 to verify which is the appropriate communication protocol. Then:

- Launch **Race Studio2 Configuration** Software
- Create a configuration pressing "**New**".

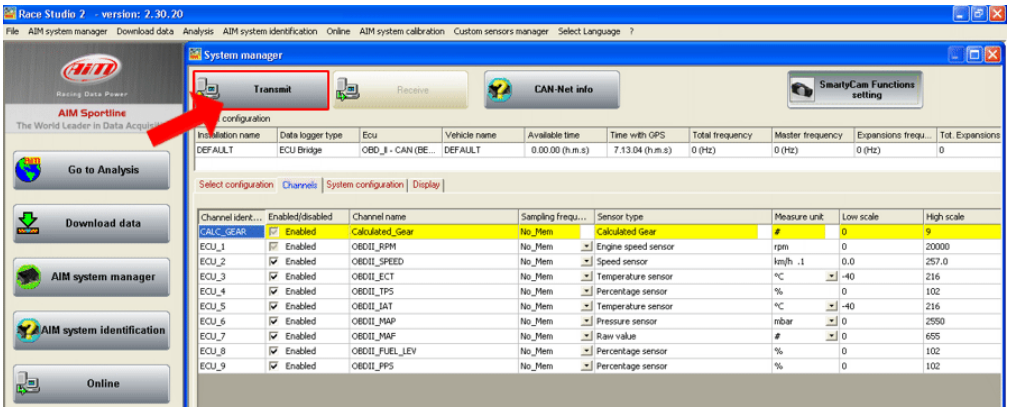
- select from "**ECU manufacturer**" menu: "**LOTUS**";
- select from "**ECU Model**" menu: "**Clusters 08-09**".



- Select "**SmartyCam Function setting**" to set **SmartyCam** channels (refer to **Race Studio Configuration** manual for more details).



- transmit the configuration to **AIM** logger clicking "**Transmit**" (see below).



Note: it is suggested to disable non-used channels (see image above).

5.2 – Communication protocol

Channels received by AIM loggers using Clusters 08-09 protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	CU_SPEED	Speed
ECU_3	CU_RPM	Engine speed
ECU_4	CU_FUEL_IST	Fuel level
ECU_5	CU_FUEL_AVE	Fuel average
ECU_6	CU_ENGT	Engine coolant temperature
ECU_7	CU_SF_LIGHT1	Shift light 1
ECU_8	CU_SF_LIGHT2	Shift light 2
ECU_9	CU_SF_LIGHT3	Shift light 3
ECU_10	CU_MIL_LIGHT	
ECU_11	CU_OIL_LIGHT	Oil light
ECU_12	CU_TC_LIGHT	Traction control light
ECU_15	CU_SERV_LIGHT	
ECU_19	CU_TH2O_LIGHT	
ECU_23	CU_SEL_LTC	
ECU_24	OBD_PPS	Pedal Position sensor
ECU_25	OBD_TPS	Throttle Position Sensor
ECU_26	OBD_IAT	Intake Air Temperature
ECU_27	OBD_MAF	Mass Air Flow

Chapter 6 – Europa 2006+ and Elise S2 Rover 2001-2004

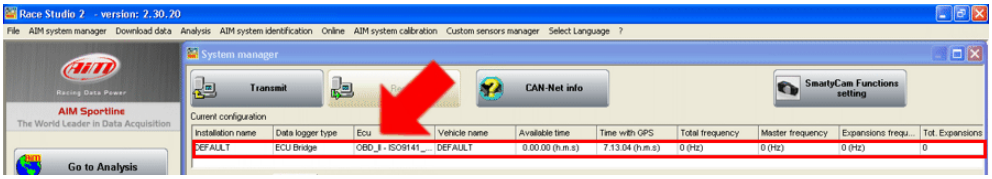
Europa since 2006 and Elise S2 Rover from 2001 to 2004 only work with Kline protocol.

6.1 – Software configuration setting

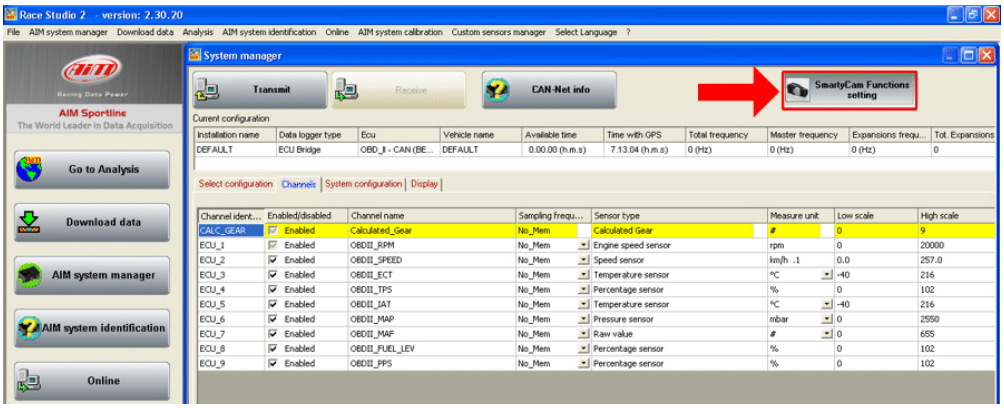
Once **ECU Bridge** is connected, it is necessary to configure it in **Race Studio 2** software. Please refer to Chapter 1 to check which is the appropriate communication protocol. Then:

- Launch **Race Studio2 Configuration** Software
- Create a configuration pressing "**New**".

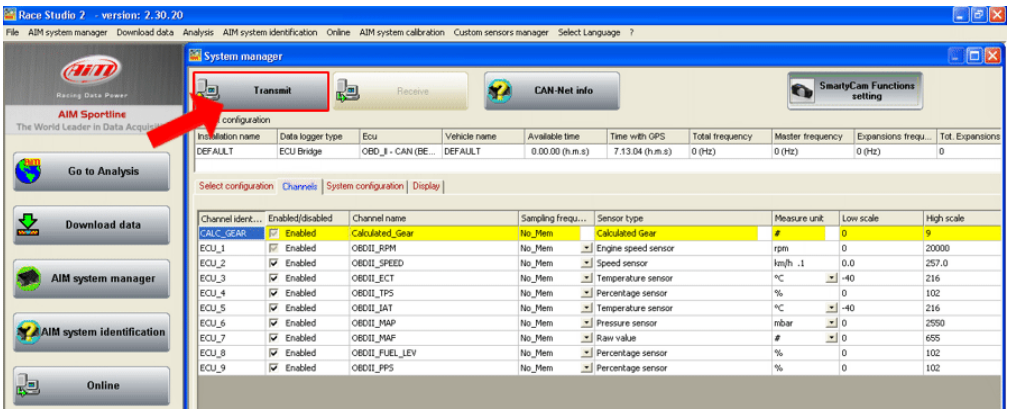
- select from "**ECU manufacturer**" menu: "**OBD_II**";
- to configure Europa, select from "**ECU Model**" menu: "**KWP2000_FAST_INIT**".
- to configure Elise S2 Rover, select from "**ECU Model**" menu: "**ISO9141/2**".



- Select "**SmartyCam Function setting**" to set **SmartyCam** channels (refer to **Race Studio Configuration** manual for more details).



- transmit the configuration to **AIM** logger clicking "**Transmit**" (see below).



Note: it is suggested to disable non-used channels (see image above).

6.2 – Communication protocol

Channels received by **AIM** loggers connected to OBDII are:

ID	CHANNEL NAME	FUNCTION
ECU_1	OBDII_RPM	Engine Speed
ECU_2	OBDII_SPEED	Speed Value
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 Absolute Pressure
ECU_7	OBDII_MAF	Mass Air Flow
ECU_8	OBDII_FUEL_LEV	Fuel Level
ECU_9	OBDII_PPS	Pedal Position Sensor

Note: all the above channels are managed by AIM OBDII. Please consider that acquired channels depend on the car model; for this reason some of them could not be available. Moreover it is suggested to disable the error channels to allow a faster data transmission.

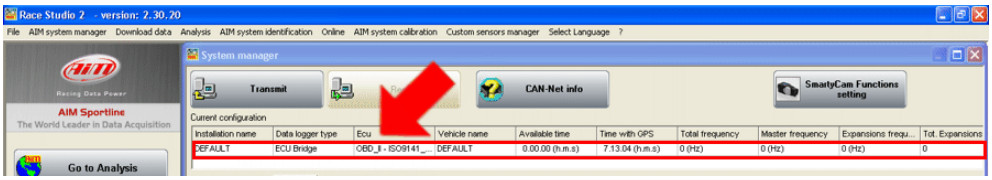
Chapter 7– Evora since 2009

7.1 – Software configuration setting

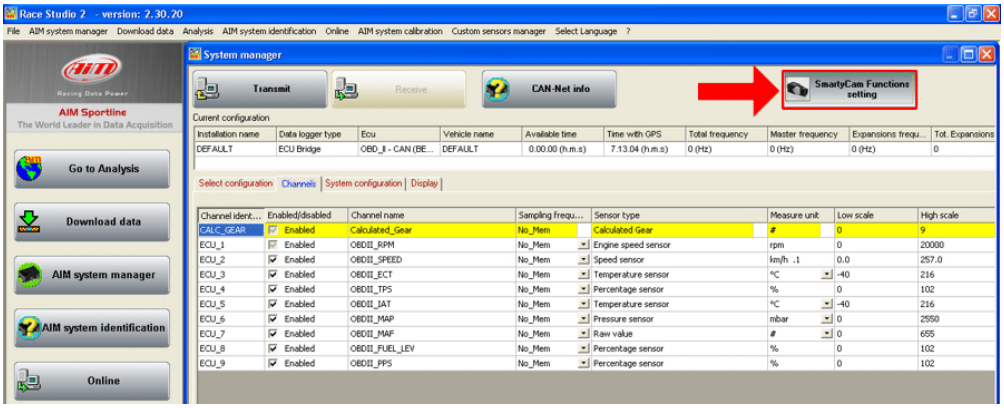
Once **ECU Bridge** is connected, it is necessary to configure it in **Race Studio 2** software. Please refer to Chapter 1 to verify which is the appropriate communication protocol. Then:

- Launch **Race Studio2 Configuration** Software
- Create a configuration pressing "**New**".

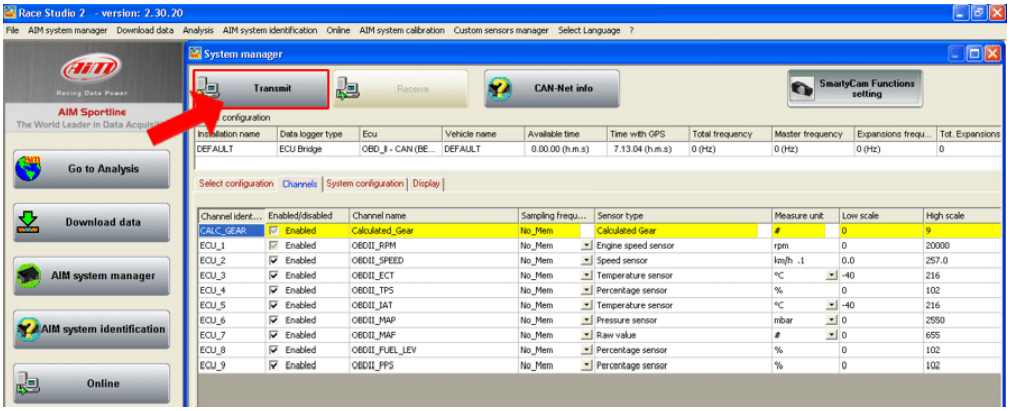
- select from "**ECU manufacturer**" menu: "**OBD_II**";
- select from "**ECU Model**" menu: "**CAN**".



- Select "**SmartyCam Function setting**" to set **SmartyCam** channels (refer to **Race Studio Configuration** manual for more details).



- transmit the configuration to **AIM** logger clicking "**Transmit**" (see below).



Note: it is suggested to disable non-used channels (see image above).

7.2 – Communication protocol

Channels received by **AIM** loggers connected to OBDII are:

ID	CHANNEL NAME	FUNCTION
ECU_1	OBDII_RPM	Engine Speed
ECU_2	OBDII_SPEED	Speed Value
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 Absolute Pressure
ECU_7	OBDII_MAF	Mass Air Flow
ECU_8	OBDII_FUEL_LEV	Fuel Level
ECU_9	OBDII_PPS	Pedal Position Sensor

Note: all the above channels are managed by AIM OBDII. Please consider that acquired channels depend on the car model; for this reason some of them could not be available. Moreover it is suggested to disable the error channels to allow a faster data transmission.

Appendix – Part numbers

Kit:

ECU Bridge OBDII with lighter plug: **X90BGCK12**

SmartyCam with 2m CAN cable: **X90SMYCEC2**

SmartyCam with 4m CAN cable: **X90SMYCEC4**

Optional:

Suction cup kit: **X9KSSMC1**

Roll bar kit: **X9KSSMC0**

CAN cable with external microphone: **V02566100**