Lotus Plug&Play kit







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.



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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 .



CAR PLUG

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).

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

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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:

CHANNEL NAME	FUNCTION
OBDII_RPM	Engine Speed
OBDII_SPEED	Speed Value
OBDII_ECT	Engine Coolant Temperature
OBDII_TPS	Throttle Position Sensor
OBDII_IAT	Intake Air Temperature
OBDII_MAP	Manifold Absolute Pressure
OBDII_MAF	Mass Air Flow
OBDII_FUEL_LEV	Fuel Level
OBDII_PPS	Pedal Position Sensor
	CHANNEL NAME OBDII_RPM OBDII_SPEED OBDII_ECT OBDII_TPS OBDII_IAT OBDII_MAP OBDII_MAF OBDII_FUEL_LEV OBDII_PPS

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).

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	ECU_2	Enabled	OBDII_SPEED		No_Mem	-	Speed sensor		km/h .1	0.0	257.0
AIM system manager	ECU_3	Enabled	OBDII_ECT		No_Mem		Temperature sensor		°⊂	-40	216
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• transmit the configuration to AIM logger clicking "Transmit" (see below).

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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).

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	ECU_4	Enabled	OBDII_TP5		No_Mem	•	Percentage sensor		%	0	102
	ECU_5	Enabled	OBDII_IAT		No_Mem	-	Temperature sensor		~ _	-40	216
	ECU_6	Enabled	OBDII_MAP		No_Mem	•	Pressure sensor		mbar 🔄	0	2550
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	ECU_8	Enabled	OBDII_FUEL_LEV		No_Mem	•	Percentage sensor		%	0	102
	ECU_9	Enabled	OBDII_PPS		No_Mem	-	Percentage sensor		%	0	102
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• transmit the configuration to **AIM** logger clicking "**Transmit**" (see below).

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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).

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	ECU_2	Enabled	OBDII_SPEED		No_Mem	-	Speed sensor		km/h .1	0.0	2	57.0
AIM system manager	ECU_3	Enabled	OBDII_ECT		No_Mem	٠	Temperature sensor		∾⊂	-40	2	:16
	ECU_4	Enabled	OBDII_TPS		No_Mem	•	Percentage sensor		%	0	1	02
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All anten identification	ECU_6	 Enabled 	OBDII_MAP		No_Mem	•	Pressure sensor		mbar	• 0	2	550
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• transmit the configuration to AIM logger clicking "Transmit" (see below).

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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
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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