AiM Infotech

Ducati 999R and 999S

Release 1.03

ECU

AiM

1
Bike years

This tutorial describes how to connect AiM devices to Ducati 999R and 999S. Supported models and years are:

- Ducati 999R   2002-2006
- Ducati 999S   2002-2006

Ducati 999R and 999S are equipped with a Marelli IAW 5.9 ECU that communicates with both the CAN bus and the K line, providing different information as explained in chapter 4.

2
CAN bus connection

The CAN Bus can be reached directly on the ECU or through the bike rear dashboard connector.

Please note: when connecting your AiM device to the bike it is necessary to remove the 120 Ohm resistance that is mounted between CAN+ and CAN- in AiM device CAN cable; otherwise Ducati dashboard will not work.

2.1
Direct ECU connection

Ducati 999R and 999S ECU is equipped with two 38 pins male connectors; they are named "Engine" (black) and "Body"(grey). We will use only Body connector. Here below it is shown with its pinout and connection table.
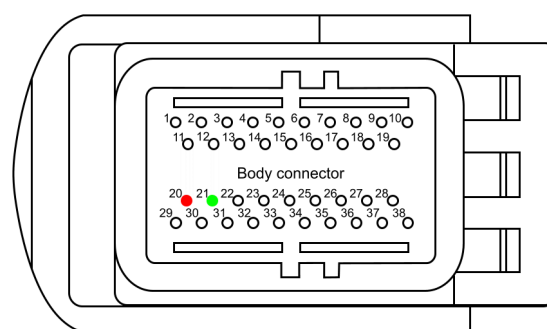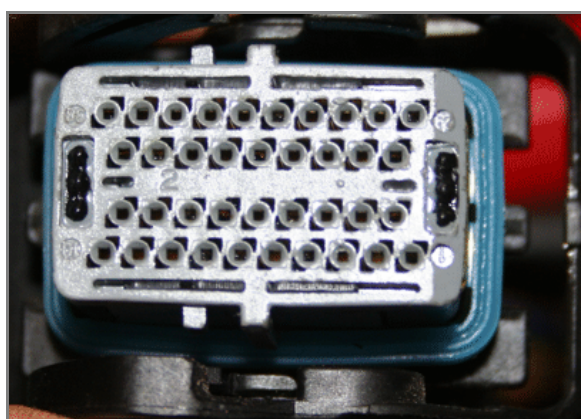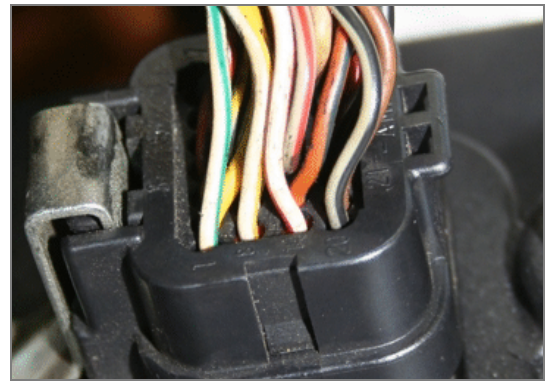

Pin 20 = CAN High
Pin 21 = +12V

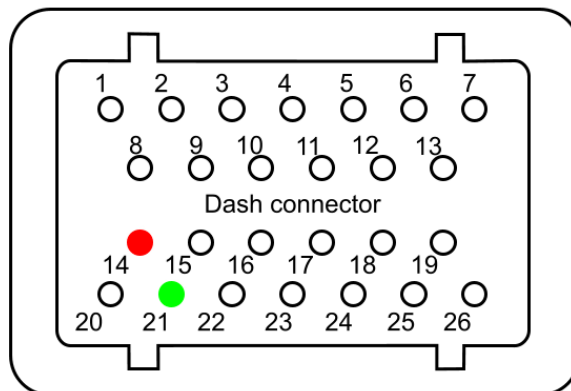| AiM cable	Body connector pin	Pin function
+Vb	21	+12 V
CAN+	20	CAN High
CAN-	**Connect this cable to Ground**	

2.2
Connection through the dashboard

The dashboard connector is placed on its back. Here below it is shown on the dashboard and in detail.

To connect AiM devices to Ducati ECU through the dashboard use its 26 pins rear connector. Here below its pinout and the connection table.

Pin 14 = CAN High
Pin 21 = +12V

| AiM cable	Dash connector pin	Pin function
+Vb	21	+12V
CAN+	14	CAN+
CAN-	**Connect this cable to Ground**	

3
K Line connection

The K line is only available on the following AiM devices:
* EVO4
* SoloDL
* ECU Bridge

The connection changes according to the device you are using; moreover K line can be reached in two ways:

* directly on the ECU using Body connector;
* through the AMP connector you find near the ECU

The images here below show: ECU Body connector on the left and AMP connector on the right.
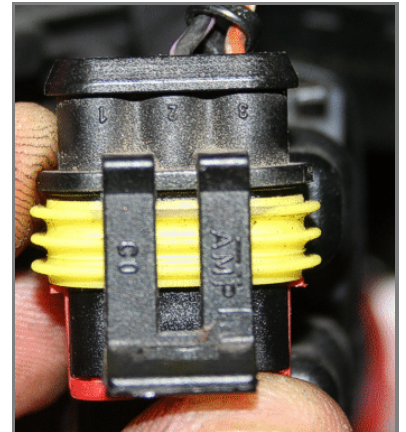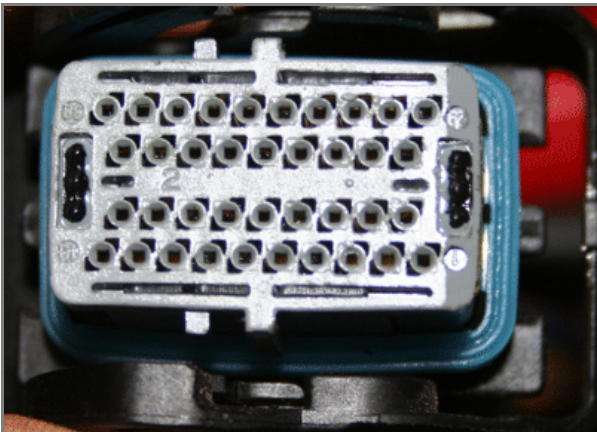
3.1
Direct ECU connection – SoloDL

To connect SoloDL K line to Ducati 999R-999S ECU K line connect: pin 6 of the 7 pins right bottom connector of the logger to pin 16 of ECU Body connector (K line) and pin 7 of the 7 pins right bottom connector of the logger to GND pin of ECU Body connector (GND). Here below SoloDL-ECU direct connection drawing and connection table.
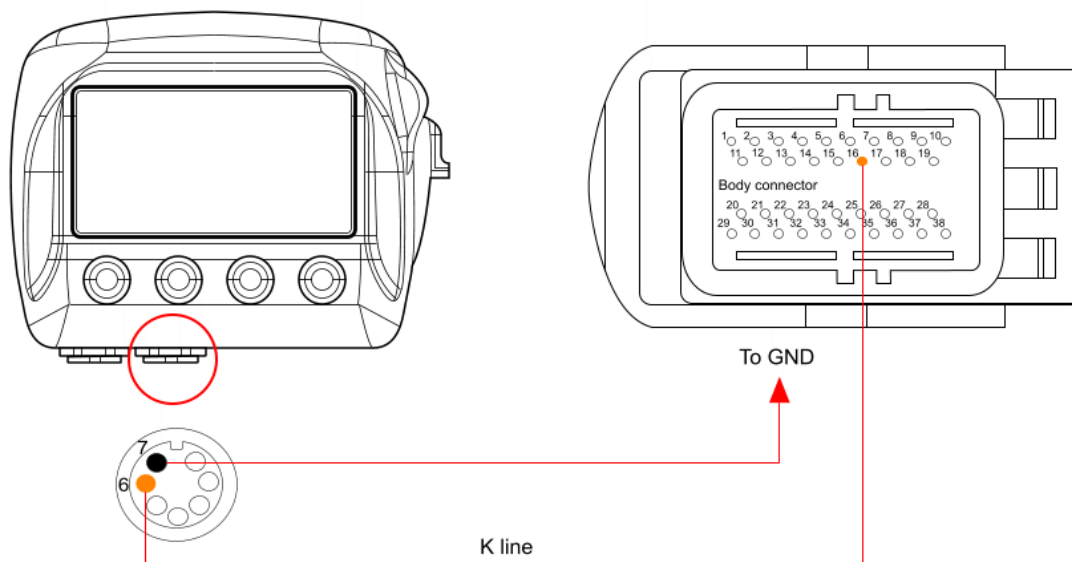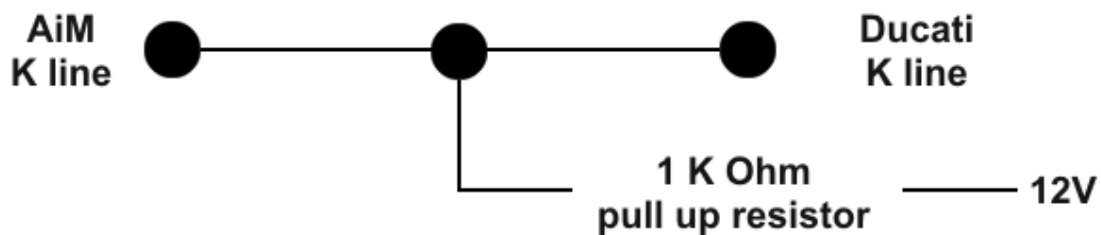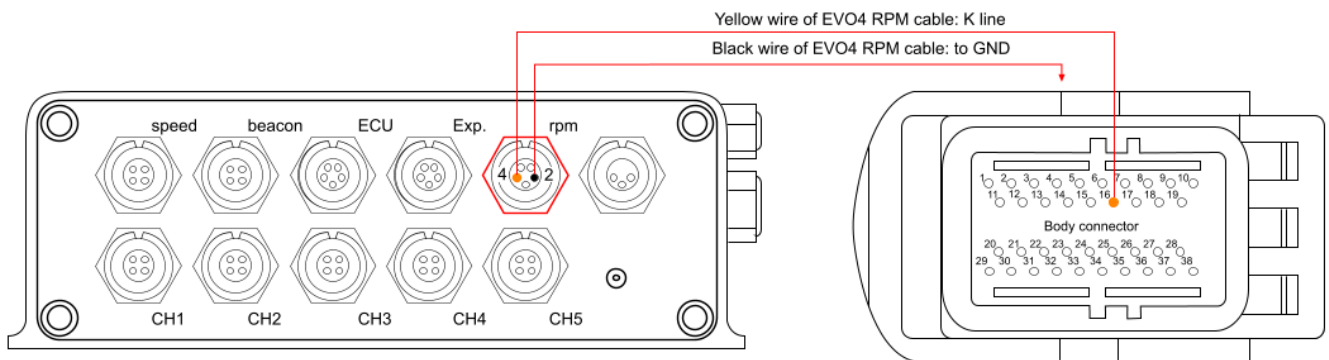

SoloDL 7 pins connector pin	Pin function	Body connector pin
6	K line	16
7	GND	GND

3.2
Direct ECU connection – EVO4

To connect EVO4 K line to Ducati 999R-999S ECU K line connect: the yellow wire of EVO4 RPM cable to pin 16 of ECU Body connector (K line) and the black wire of EVO4 RPM cable to GND pin of ECU Body connector (GND). Furthermore it is necessary to install a 1K Ohm resistor between AiM K line and Ducati ECU. Here below are EVO4-ECU direct connection drawing, 1K Ohm installation scheme and connection table.


EVO4 RPM connector pin	Pin function	EVO4 RPM cable wire	Body connector pin
4	K Line	Yellow	16
2	GND	Black	GND

3.3
Direct ECU connection – ECU Bridge

To connect ECU Bridge K line to Ducati 999R-999S ECU K line you need to have an OBDII version ECU Bridge (part number **X90BGCK12MA**). Connect pin 7 of ECU Bridge OBDII connector to pin 16 of ECU Body connector (K line) and pin 5 of ECU Bridge OBDII connector to GND pin of ECU Body connector (GND). Here below are ECU Bridge-Ducati ECU direct connection drawing and connection table.
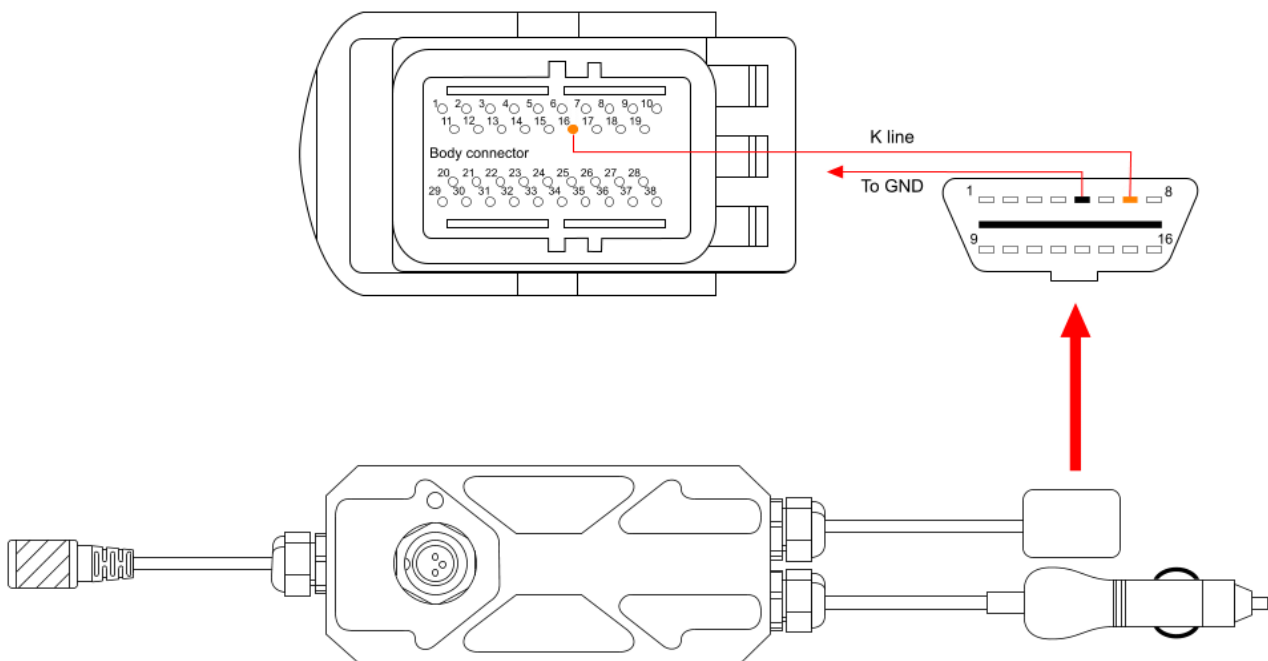
ECU Bridge OBDII connector pin	Pin function	Body connector pin
7	K Line	16
5	GND	GND

3.4
AMP connection – SoloDL

To connect SoloDL K line to Ducati 999R-999S ECU K line using the AMP connector: connect pin 6 of the 7 pins right bottom connector of the logger to pin 3 of AMP connector (K line) and pin 7 of the 7 pins right bottom connector of the logger to pin 2 of AMP connector (GND). Here below are connection drawing and connection table.
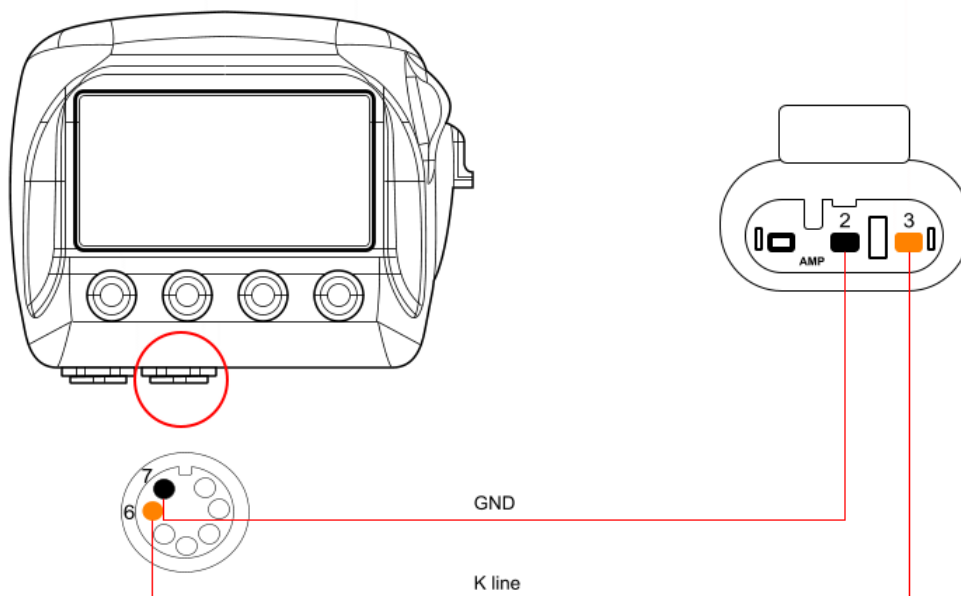
SoloDL 7 pins connector pin	Pin function	AMP connector pin
6	K line	3
7	GND	2

3.5
AMP connection – EVO4

To connect EVO4 K line to Ducati 999R-999S ECU K line using the AMP connector: connect the yellow wire of EVO4 RPM cable to pin 3 of AMP connector (K line) and the black wire of EVO4 RPM cable to pin 2 of AMP connector (GND). Furthermore it is necessary to install a 1K Ohm resistor between AiM K line and Ducati ECU. Here below connection drawing and connection table.
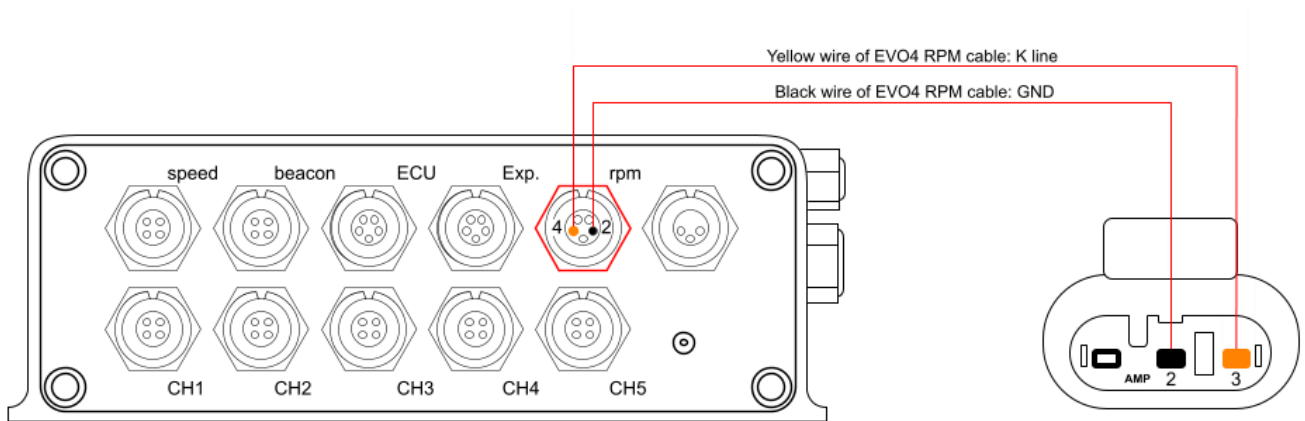
EVO4 RPM connector pin	Pin function	EVO4 RPM cable wire	AMP connector pin
4	K line	Yellow	3
2	GND	Black	2

3.6
AMP connection – ECU Bridge

To connect ECU Bridge K line to Ducati 999R-999S ECU K line using the AMP connector you need to have an OBDII version ECU Bridge (part number **X90BGCK12MA**). Connect pin 7 of the OBDII connector to pin 3 of AMP connector (K line) AND pin 5 of the OBDII connector to pin 2 of AMP connector (GND). Here below ECU Bridge – AMP connector connection drawing and connection table.
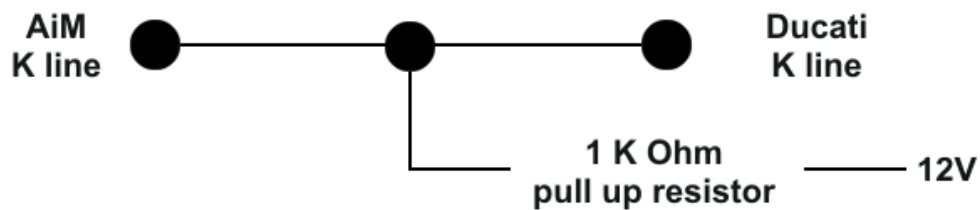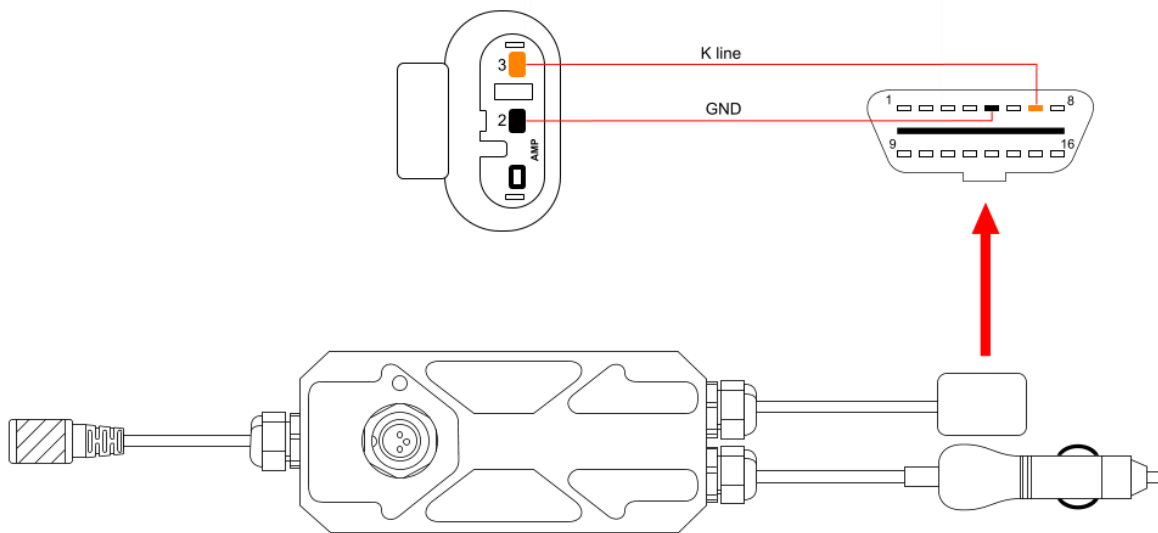

ECU Bridge OBDII connector pin	Pin function	AMP connector pin
7	K Line	3
5	GND	2

4
AiM device configuration

Before connecting the ECU connected to AiM logger set it up as follows.

Run Race Studio 2 software and follow this path:

- Device Configuration –> Select the device you are using;
- select the configuration or press "New" to create a new one;
- select ECU manufacturer "Ducati";
- select ECU Model according to the communication protocol your installation allows you to use:
    - Marelli IAW 5.9M (CAN) to use the CAN bus only;
    - Marelli IAW 5.9 (K_LINE) to use the K line only
    - Marelli IAW 5.9 (CAN+K_Line) to use both communication protocols

- transmit the configuration to the device pressing "Transmit".

5
Available channels

Channels received by AiM devices connected to Ducati 999R-999S change according to the selected protocol.

5.1
Marelli IAW 5.9M (CAN) protocol

Channels received by AiM devices connected to "Ducati" "Marelli 5.9M IAW (CAN)" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M59_RPM	RPM
ECU_2	M59_SPEED	Vehicle speed
ECU_3	M59_NEUTRAL	Neutral signal
ECU_4	M59_ECT	Engine coolant temperature
ECU_5	M59_AIRT	Intake air temperature
ECU_6	M59_VBATT	Battery supply
ECU_7	M59_OIL_LIGHT	Oil level alert

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.

5.2
Marelli IAW 5.9M (K_LINE) protocol

Channels received by AiM devices connected to "Ducati" "Marelli IAW 5.9M (K_LINE)" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	LK_RPM	RPM
ECU_2	LK_MAP	Manifold air pressure
ECU_3	LK_AIR_TEMP	Intake air temperature
ECU_4	LK_ECT	Engine coolant temperature
ECU_5	LK_TPS	Throttle position sensor
ECU_6	LK_IGN_ADV1	Ignition advance 1
ECU_7	LK_BATT	Battery supply
ECU_8	LK_IGN_ADV2	Ignition advance 2
ECU_9	LK_INJ_TIME	Injection time

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.

5.3
Marelli IAW 5.9M (CAN+K_LINE) protocol

Channels received by AiM devices connected to "Ducati" "Marelli IAW 5.9M (CAN+K_LINE)" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M59_RPM	RPM
ECU_2	M59_SPEED	Vehicle speed
ECU_3	M59_NEUTRAL	Neutral signal
ECU_4	M59_ECT	Engine coolant temperature
ECU_5	M59_AIRT	Intake air temperature
ECU_6	M59_VBATT	Battery supply
ECU_7	M59_OIL_LIGHT	Oil level alert
ECU_10	M59_LK_MAP	Manifold air pressure via K line
ECU_11	M59_LK_TPS	Throttle position sensor via K line
ECU_12	M59_LK_IGNADV1	Ignition advance 1 via K line
ECU_13	M59_LK_IGNADV2	Ignition advance 2 via K line
ECU_14	M59_LK_INJ_TIME	Injection time via K line

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.