Ford Mustang via OBDII Connection

Racing Data Power

INTRODUCTION

AIM has developed special applications for many of the most common ECUs: by special applications we mean user-friendly systems which allow to easily connect your ECU to our hi-tech data loggers: user need only to install harness between the logger and the ECU.

Once connected, the logger displays (and/or records, depending on the logger) values like RPM, engine load, throttle position (TPS), air and water temperatures, battery voltage, speed, gear, lambda value (air/fuel ratio), analog channels etc…

All AIM loggers include – free of charge – **Race Studio 2** software, a powerful tool to configure the system and analyze recorded data on your PC.

Warning: once the ECU is connected to the logger, it is necessary to set it in the logger configuration in Race Studio 2 software.
Select Manufacturer "Ford" and Model (depending on own car model – refer to "Communication protocols" Chapter).
Moreover refer to Race Studio configuration user manual for further information concerning the loggers configuration.

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Chapter 1 – Car Models

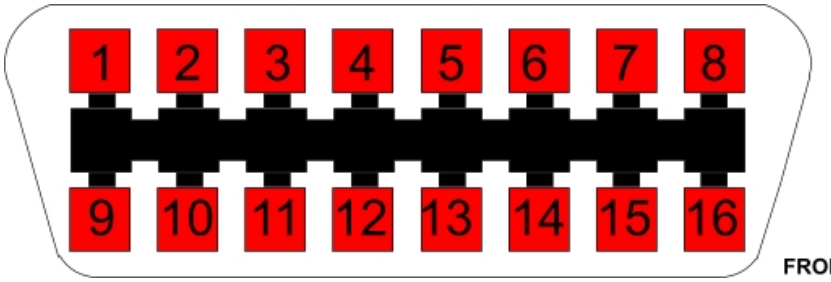
Ford ECU is installed on the following car models:

- Ford Mustang FR500C
- Ford Mustang FR500C MS
- Ford Mustang 2005/2009 - all models
- Ford Mustang 2010 - all models

Chapter 2 – OBDII CAN Communication Setup

In all Ford models listed in the previous chapter (ECU communicates On Board Diagnostic values to AIM loggers through the CAN bus (ISO 15765/4) communication protocol. It works with EVO4, MXL, EVO3, XGLog, ECU Bridge, using OBDII standard connector

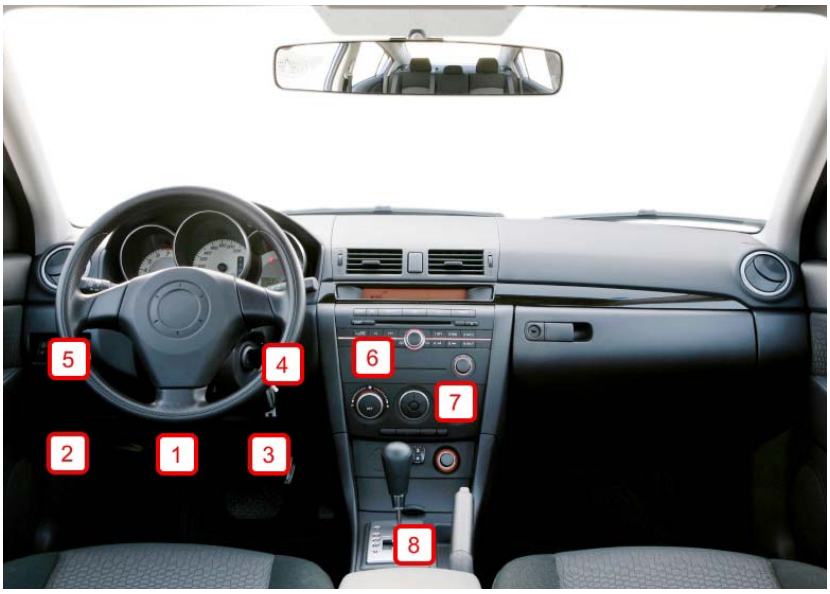
OBDII standard connector and its pinout are (see below):



Pin	Function
2	Bus positive Line of SAE-J1850
4	Chassis Ground
5	Signal Ground
6	CAN + (ISO 15765-4 and SAE J2234)
7	K Line of ISO 9141-2 and ISO 14230-4
10	Bus negative Line of SAE-J1850
14	CAN – (ISO 15765-4 and SAE-J2234)
15	L line of ISO 9141-2 and ISO 14230-4
16	Battery voltage

Chapter 3 – OBDII position

OBDII connector position depends on the car model.
The scheme below shows some of the most common OBDII connector position.



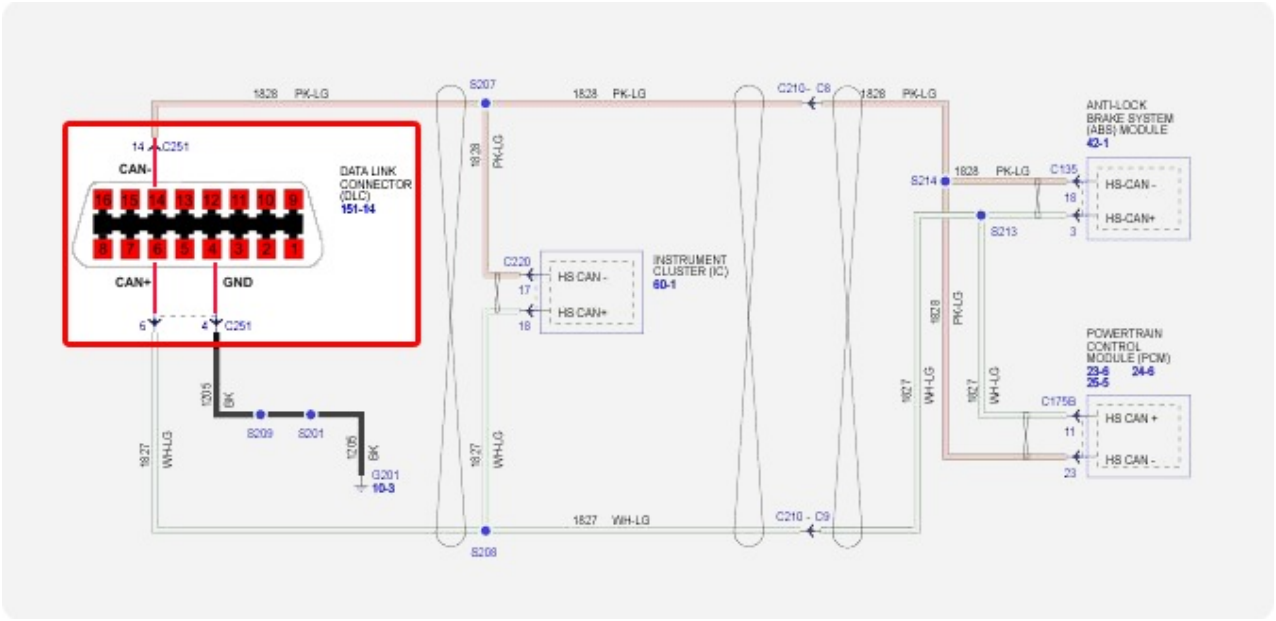
Location	Description
1	Driver's side, underneath dashboard, in the area under the steering column, +and-150 mm (i.e.,+/-6 inches on either side of the steering column).
2	Driver side, underneath dashboard, between the driver- side door and steering column area.
3	Driver side, underneath dashboard, between the steering column area and the center console (also includes connectors on the driver side but connected to the center console).
4	Driver's side, dashboard instrument/gauge area, between the steering column and the center console.
5	Driver's side, dashboard instrument/gauge area, between the steering column and the center console
6	Center console , vertical surface (i.e. near radio and climate controls), left of the vehicle centreline.
7	Center console, vertical surface right of the vehicle centreline or on passenger side of center console.
8	Center console, horizontal surface (i.e. armrest , and brake area) in front passenger area
9	Any location other than locations #1-8 (i.e. rear passenger area, passenger side glove box, top of dashboard near windshield)

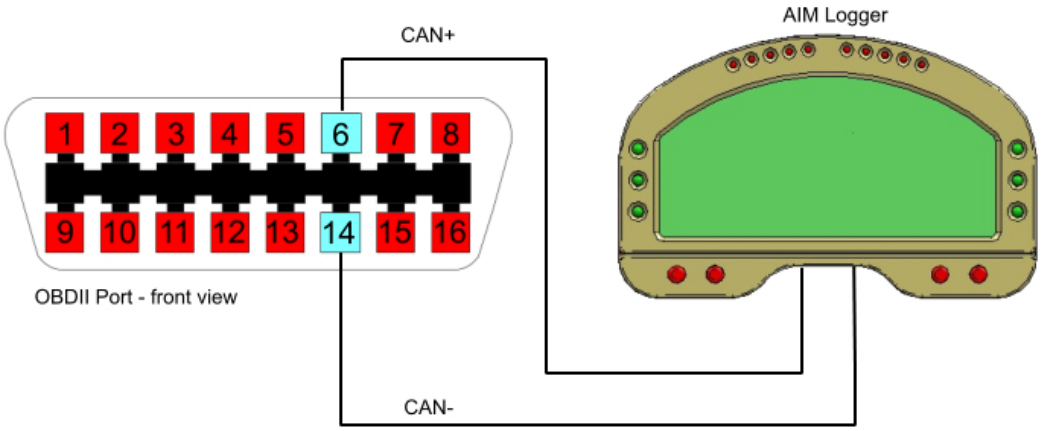
Note: some manufacturers use covers to protect the integrity of the connector. For further information it is suggested to ask to the dealer where OBDII connector is situated on the vehicle.

Connections to AIM loggers

To connect Ford vehicles to AIM loggers:

- connect the cable labelled CAN+ of the logger to pin 6 of the OBDII port
- connect the cable labelled CAN- of the logger to pin 14 of the OBDII port





Warning :OBDII is not powered by the vehicle master switch, so if AIM logger is connected to OBDII for a long time the battery runs down. The communication works only if the dashboard is switched on.

Chapter 4 – Ford communication protocols

Depending on the car model there is a different selection to configure the logger (refer to the appropriate paragraph for more detail about the correct configuration).

4.3 – Ford Mustang FR500C communication protocol

To configure Ford Mustang FR500C select the following ECU model “FR500C”
Channels received by AIM loggers connected to Ford Mustang FR500C ECU are:

ID	CHANNEL NAME	FUNCTION
ECU_1	FR500C_RPM	RPM
ECU_2	FR500C_WHEELSPEED	Wheel speed
ECU_3	FR500C_LOAD	Engine load
ECU_4	FR500C_DESIRED_LAMBDA	Desired lambda value
ECU_5	FR500C_WATERTEMP	Engine coolant temperature
ECU_6	FR500C_FUELPRESS	Fuel pressure
ECU_7	FR500C_BATTVOLT	Battery supply
ECU_8	FR500C_TPS	Throttle position sensor
ECU_9	FR500C_LH_LAMBDA	Left bank lambda value
ECU_10	FR500C_AIRTEMP	Intake air temperature
ECU_11	FR500C_EXHAUST_TEMP	Exhaust temperature
ECU_12	FR500C_RH_LAMBDA	Right bank lambda value
ECU_13	FR500C_TRANS_TEMP	Transmission box temperature
ECU_14	FR500C_GEAR	Engaged gear
ECU_15	FR500C_SYNC_LEVEL	Sync. Level

4.3 – Ford Mustang FR500C MS communication protocol

To configure Ford Mustang FR500C MS select the following ECU model “FR500C_MS”
Channels received by AIM loggers connected to Ford Mustang FR500C MS ECU are:

ID	CHANNEL NAME	FUNCTION
ECU_1	MS_ENG_SPD	RPM
ECU_2	MS_VEH_SPD	Speed
ECU_3	MS_ACC_PDL_POS	Pedal Position Sensor
ECU_4	MS_WHL_SPD_FL	Wheel speed front left
ECU_5	MS_WHL_SPD_FR	Wheel speed front rear
ECU_6	MS_WHL_SPD_RL	Wheel speed rear left
ECU_7	MS_WHL_SPD_RR	Wheel speed rear right
ECU_8	MS_GEAR_PS_ACT	Engaged Gear
ECU_9	MS_ABS_TELTAL	Abs alert
ECU_10	MS_TYRE_SZ	Tyre size
ECU_11	MS_ENG_COOL_T	Engine Coolant Temperature
ECU_12	MS_LOAD	Engine load
ECU_13	MS_DESI_LAMBDA	Lambda
ECU_14	MS_RH_LAMBDA	Lambda
ECU_15	MS_LH_LAMBDA	Lambda
ECU_16	MS_AIR_CH_TEMP	Air Charge Temperature
ECU_17	MS_CPS_SYNC	Chamshaft / Cranckshaft position sensor
ECU_18	MS_FUEL_PRESS	Fuel pressure
ECU_19	MS_BATT_VOLT	Battery Voltage
ECU_20	MS_ZE_FR_TYRE	Tyre
ECU_21	MS_ZE_RR_TYRE	Tyre
ECU_22	MS_MAF_VOLT	Manifold Air Flow Voltage
ECU_23	MS_AIR_FW	Mass Air flow
ECU_24	MS_INJ_PW_Ms	Injection Power
ECU_25	MS_IAC_DC	Idle Air Control (digital value)

4.5 – Ford Mustang 2005-2009 communication protocol

To configure Ford Mustang 2005-2009 select the following ECU Model ”Mustang 2005/09”
Channels received by AIM loggers connected to Ford Mustang 2005-2009 ECU are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M_RPM	RPM
ECU_2	M_SPEED	Speed
ECU_3	M_PEDAL_POS	Pedal position sensor
ECU_4	M_WH_SPD_FL	Front left wheel speed
ECU_5	M_WH_SPD_FR	Front right wheel speed
ECU_6	M_WH_SPD_RL	Rear left wheel speed
ECU_7	M_WH_SPD_RR	Rear right wheel speed
ECU_8	M_TENGINE	Engine temperature
ECU_9	M_ETC_TELTAL	Engine Traction control tell tale
ECU_10	M_TBO_BST	Turbo boost
ECU_11	M_FUEL_LEV	Filtered fuel level
ECU_12	M_FUEL_I_1	Instant fuel level sensor 1
ECU_13	M_FUEL_I_2	Instant fuel level sensor 2
ECU_14	M_FUEL_AVE	Fuel average level
ECU_15	M_FFLUX	Fuel flux
ECU_16	M_CLCH_SW	Clutch switch
ECU_17	M_TCS_BRK	Traction control brake switch
ECU_18	M_TCS_ENG	Traction control engine switch
ECU_19	M_BRK_SW	Brake switch
ECU_20	M_ABS_TELTAL	ABS tell tale
ECU_21	M_AXLE_RATIO_R	Rear axle ratio
ECU_22	M_MIL_TELTAL	Malfunction indicator lamp
ECU_23	M_FAILSAFE_COOL	Failsafe coolant tell tale
ECU_24	M_GEAR	Engaged gear
ECU_25	M_TYRE	Tyre revs per km
ECU_26	M_SMART_AL	Smart alarm

4.5 – Ford Mustang 2010 communication protocol

To configure Ford Mustang 2010 select the following ECU Model “Mustang 2010”
Channels received by AIM loggers connected to Ford Mustang 2010 ECU are:

ID	CHANNEL NAME	FUNCTION
ECU_1	F_RPM	RPM
ECU_2	F_SPEED	Speed
ECU_3	F_PEDAL_POS	Pedal position sensor
ECU_4	M_WH_SPD_FL	Front left wheel speed
ECU_5	M_WH_SPD_FR	Front right wheel speed
ECU_6	M_WH_SPD_RL	Rear Left wheel speed
ECU_7	M_WH_SPD_RR	Rear right wheel speed
ECU_8	M_ECT	Traction control
ECU_9	M_ETC_TELTAL	Traction control alarm
ECU_10	M_TURBO_BOOST	Turbo boost
ECU_11	M_FUEL_LVLMEAN	Fuel level
ECU_12	M_FUEL_INST_1	Instantaneous fuel consumption (1)
ECU_13	M_FUEL_INST_2	Instantaneous fuel consumption (2)
ECU_14	M_FUEL_AVERAGE	Average fuel level
ECU_15	M_FUEL_FLOW	Fuel flow
ECU_16	M_CLUTCH_SW	Clutch switch
ECU_17	M_TCS_BRK_EVE	Traction Control Brake Event in progress
ECU_18	M_TCS_ENG_EVE	Engine Control Engine Event in progress
ECU_19	M_BRK_LAMP_SW	Brake switch
ECU_20	M_ABS_TELTAL	ABS Alarm
ECU_21	M_AXLE_RATIO	Axle ration
ECU_22	M_MIL_TELTAL	Malfunction Indicator Light
ECU_23	M_FAILSAFECOOL	Fail safe cooling mode
ECU_24	M_GEAR	Gear
ECU_25	M_TYRE_SIZE	Tyre size
ECU_26	M_SMART_ALARM1	Not available
ECU_27	M_SB_CTRL_TEL	Stability Control Telltale NO/YES
ECU_28	M_SB_CTRL_MTXT	Stability Control Telltale Text Message (code)
ECU_29	M_ABS_EVENT	Not Available
ECU_30	M_ESP_EVENT	Electronic Stability Control event in progress

ECU_31	M_TRQ_ACT (Nm)	Torque
ECU_32	M_BRK_WARN_TEL	Brake Warning Telltale ON/OFF
ECU_33	M_VEH_YAW_RATE	Vehicle Yaw Rate
ECU_34	M_VEH_LAT_ACC	Vehicle lateral acceleration
ECU_35	M_STEER_WH_ANG	Steering wheel angle
ECU_36	M_TYRE_RV_MILE	Tyre revolutions for mile