

AiM Infotech

EFI USA 2.1/2.1\_V7 ECUs

Release 1.04

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ECU



# 1

## Supported models

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This document explains how to connect AiM devices to the Engine Control Unit (ECU) datastream. Supported models are:

- EFI USA 2.1
- EFI USA 2.1\_V7

# 2

## Software configuration

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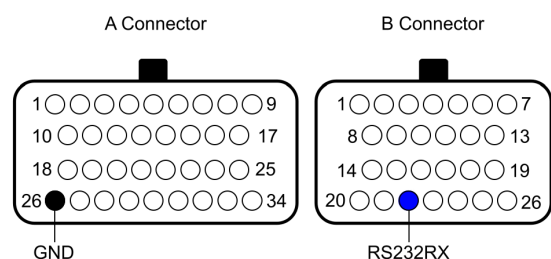
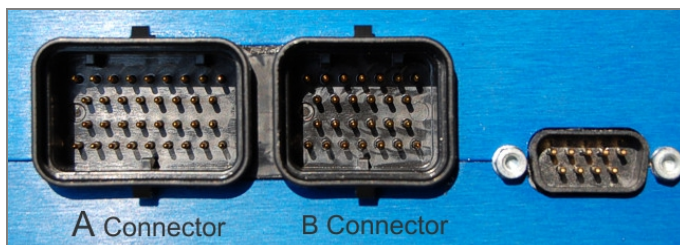
Before connecting EFI USA - 2.1/2.1v7 ECUs to AiM devices set them up using EFI software. The required setting is "Third party DataStream" output.

# 3

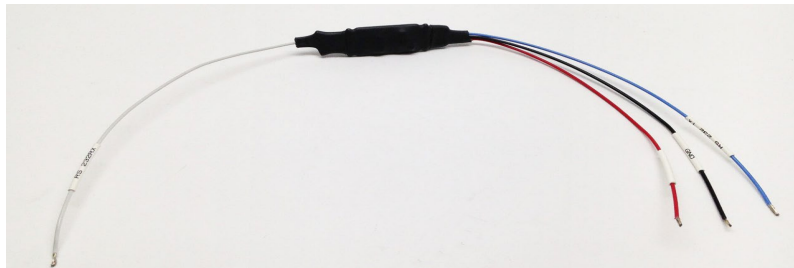
## Wiring connection

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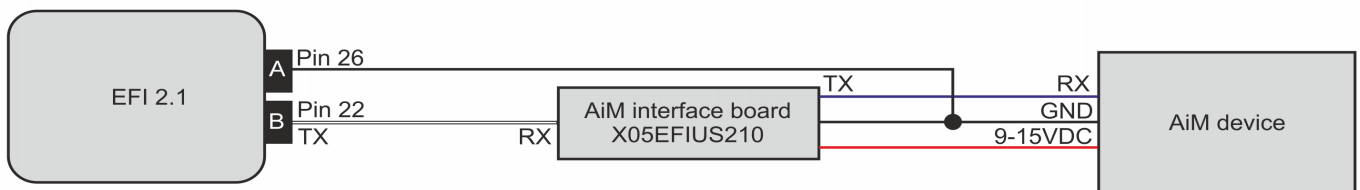
EFI USA 2.1 features a serial communication protocol on the right front male connector (labelled "B"). Here below both connectors are shown with their pinout.



To connect EFI USA - 2.1/2.1v7 ECU to AiM devices an interface board is required. Its part number is: **X05EFIUS210** and it is shown here below.



Here below is the wiring diagram of AiM interface board and bottom of it is the connection table.



EFI connector pin	EFI Pin function	AiM interface board cable label	AiM device pin
"A" connector pin 26	GND	GND (black)	GND
"B" connector pin 22	RS232TX	RS232RX (white)	RS232RX/ECU RS232TX
		RS232TX (blue)	
		9-15VDC (red)	9-15VDC

**Please note:**  
 AiM wiring harnesses supplied after September 2018 have the following labels:  
**ECU RS232TX** (white) to be connected to **ECU TX** pin  
**ECU RS232RX** (blue) to be connected to **ECU RX** pin (if indicated in the connection table above)

AiM wiring harnesses supplied before September 2018 have the following labels:  
**RS232RX** (white) to be connected to **ECU TX** pin  
**RS232TX** (blue) to be connected to **ECU RX** pin (if indicated in the connection table above)

**Warning:** Pin 26 of "A" connector is to be connected directly to GND cable of AiM interface board. Also, the AiM unit must have the same reference ground. Do not use pin 15 of EFI ECU "B" connector for GND.

## 4

# Race Studio configuration

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Before connecting AiM devices to the ECU, set all functions using AiM software Race Studio. The parameters to select in the device configuration are:

- ECU manufacturer: **EFI\_USA**
- ECU Model: **2.1 (Only RS2)**  
**2.1\_V7**

## 5

# Protocols

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Channels received by AiM devices change according to the selected protocol.

## 5.1

# "EFI USA - 2.1" protocol

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Channels received by AiM devices configured with "EFI USA - 2.1" protocol are:

<b>CHANNEL NAME</b>	<b>FUNCTION</b>
EFI_RPM	RPM
EFI_BATTERY	Battery supply
EFI_THROTTLE	Throttle position sensor
EFI_MAP	Manifold air pressure
EFI_SHIFT CUT	Speed limiter
EFI_FUEL_PRESSURE	Fuel pressure
EFI_OILP_PRESSURE	Oil pressure
EFI_BEACON	Lap marker



EFI_FUEL_TEMP	Fuel temperature
EFI_AIR_TEMP	Intake air temperature
EFI_WATER_TEMP	Engine coolant temperature
EFI_OIL_TEMP	Oil temperature
EFI_ECU_TEMP	ECU Temperature
EFI_LAMBDA1	Lambda value 1
EFI_LAMBDA2	Lambda value 2
EFI_SPEED	Vehicle speed
EFI_LAPCOUNT	Lap counter
EFI_GEAR_POSITION	Engaged gear
EFI_FUEL_SWITCH	Fuel switch
EFI_LAMBDA_TEMP	Lambda temperature
EFI_LATERAL_G	Lateral accelerometer
EFI_DUTY1	Duty cycle 1
EFI_DUTY2	Duty cycle 2
EFI_CDI_TEMP	CDI Temperature
EFI_RAW_GEAR	Gear value
RESERVED1	Reserved channel 1
RESERVED2	Reserved channel 2
EFI_FUEL	Fuel level

## 5.2 "EFI USA - 2.1\_V7" protocol

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Channels received by AiM devices configured with "EFI USA - 2.1\_V7" protocol are:

<b>CHANNEL NAME</b>	<b>FUNCTION</b>
EFI_RPM	RPM
EFI_BATTERY	Battery voltage
EFI_TPS	Throttle position sensor
EFI_AIRBOX_PRESS	Airbox pressure



EFI_CRANK_PRESS	Crank pressure
EFI_FUEL_PRESS	Fuel pressure
EFI_OILP_PRESS	Oil pressure
EFI_LATERAL_G	Lateral accelerometer
EFI_FUEL_TEMP	Fuel temperature
EFI_AIR_TEMP	Intake air temperature
EFI_WATER_TEMP	Engine coolant temperature
EFI_OIL_TEMP	Oil temperature
EFI_ECU_TEMP	ECU Temperature
EFI_LAMBDA1	Lambda value 1
EFI_LAMBDA2	Lambda value 2
EFI_CDI_TEMP	CDI temperature
EFI_THROTTLE_RATE	Throttle rate
EFI_GEAR	Engaged gear
EFI_FUEL_SWITCH	Fuel percentage switch
EFI_BOOST_SWITCH	Boost switch
EFI_BEACON	Lap marker
EFI_DUTY1	Duty cycle 1
EFI_DUTY2	Duty cycle 2
EFI_FRONT_SPEED	Front wheel speed
EFI_REAR_SPEED	Rear wheel speed
EFI_FUEL	Fuel level
EFI_INJT	Injection time
EFI_ADVANCE	Spark advance
EFI_EGT1	Exhaust gas temperature 1
EFI_EGT2	Exhaust gas temperature 2