



AiM Infotech

MoTec M400-M600-M800

Release 1.04



ECU



This tutorial explains how to connect MoTec M400-M600-M800 ECUs to AiM devices.

1

Mandatory prior checks

MoTec M400, M600 and M800 ECUs feature a data transmission bus based on CAN.

These three prior checks and settings are mandatory to avoid that the communication fails for different reasons, related to hardware as well as to firmware or software reasons.

1.1

Firmware check

MoTec M400, M600, M800 ECUs baud rate changes according to the ECU firmware version. Please select the proper model in accordance with the following list.

- firmware version lower than 2.30S
 - baud rate 400kbit select ECU Model "M8XX-M600-M400"
- firmware version 2.30S or higher
 - baud rate 1Mbit select "M8XX-M600-M400-1M"
- firmware version 3.x – baud rate can be set on 1M or 500 kbit
 - select ECU Model "M8XX-M600-M400-**1M**_v3" or "M8XX-M600-M400-**500k**_v3"

1.2 Software check and setting

MoTeC ECUs can communicate with AiM devices only if some communication parameters are set. To check or set them use MoTeC ECU Manager software 3.x version.

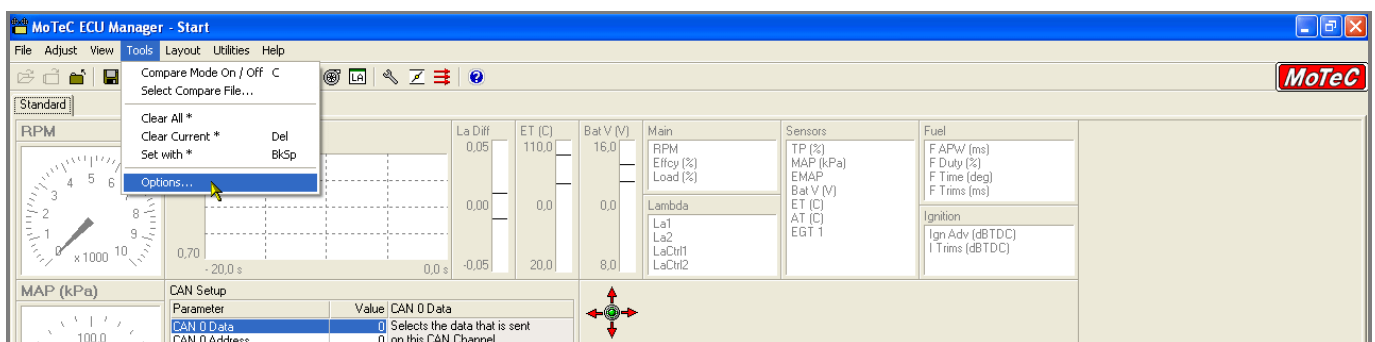
Run "ECU Manager" software and follow this path:

- File -> Open ECU...



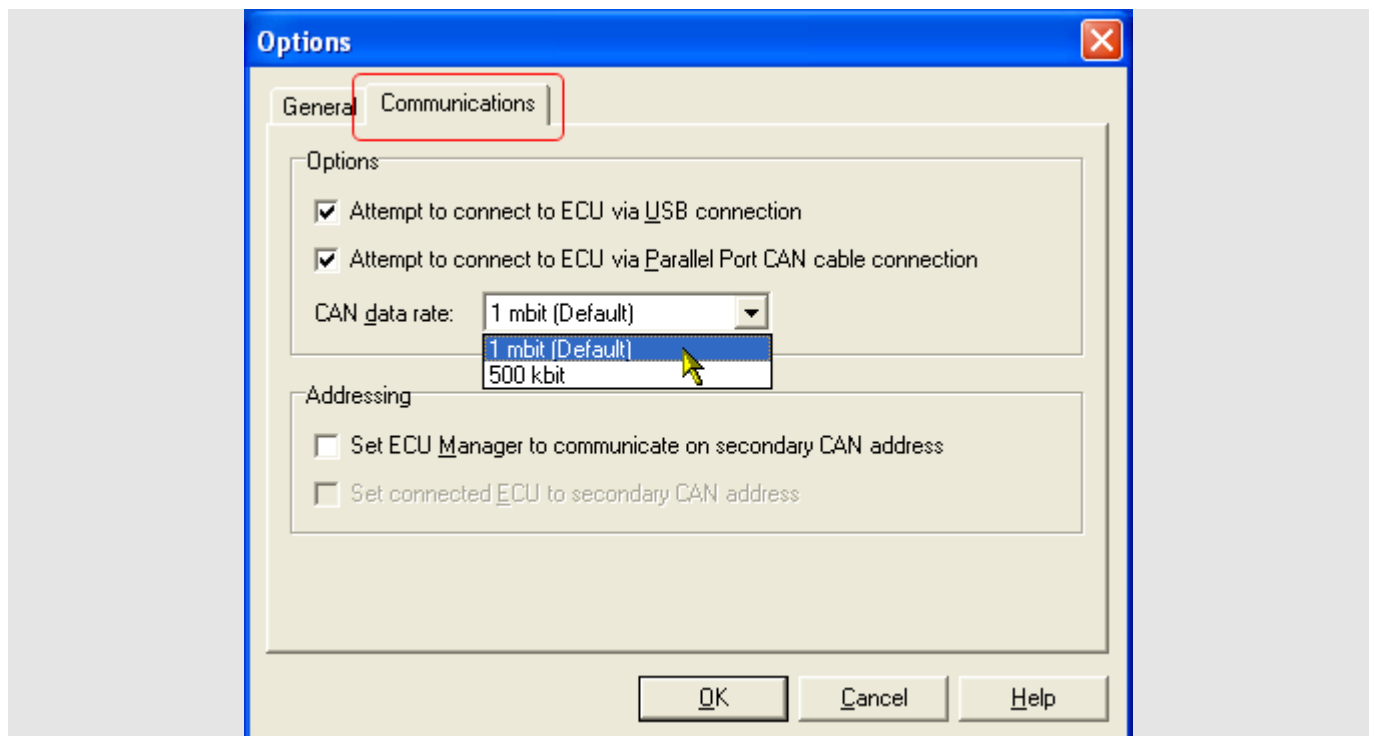
Check communication parameters following this path:

- Tools -> Options...



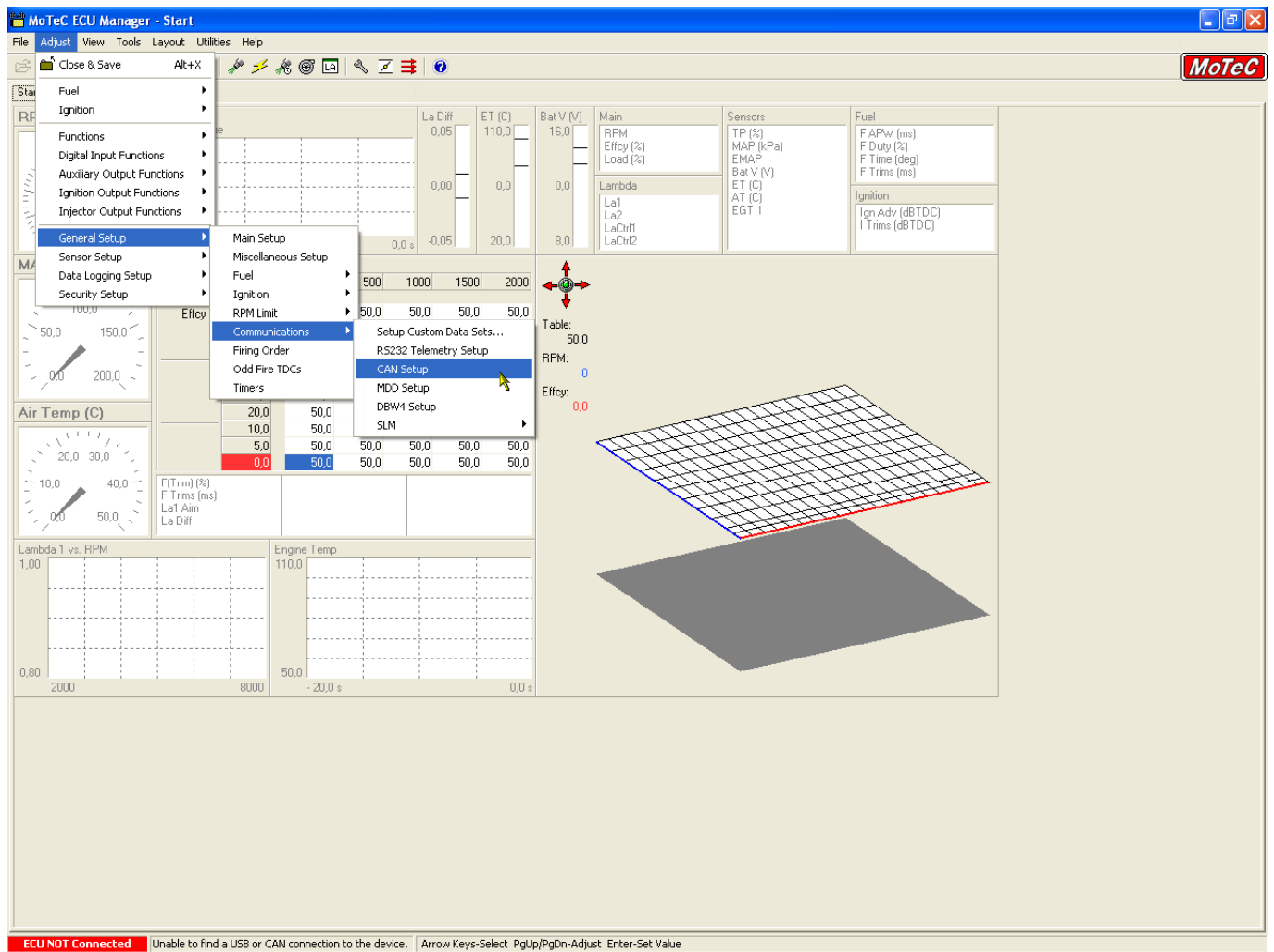
This panel appears:

- select "communication" layer and
- choose "1 mbit (Default)" or 500 kbit according to your ECU setting



It is now necessary to set some communication parameters. Follow this path:

- Adjust → General Setup → Communications → CAN Setup.



The window here below appears. The parameters to set are:

- CAN Data
- CAN Address

You can choose CAN 0 or CAN1 line and the other parameter is subsequent.

In the example below CAN 0 was chosen.

Start selecting the CAN line you want to use and right click on it selecting "Properties..." as shown below.

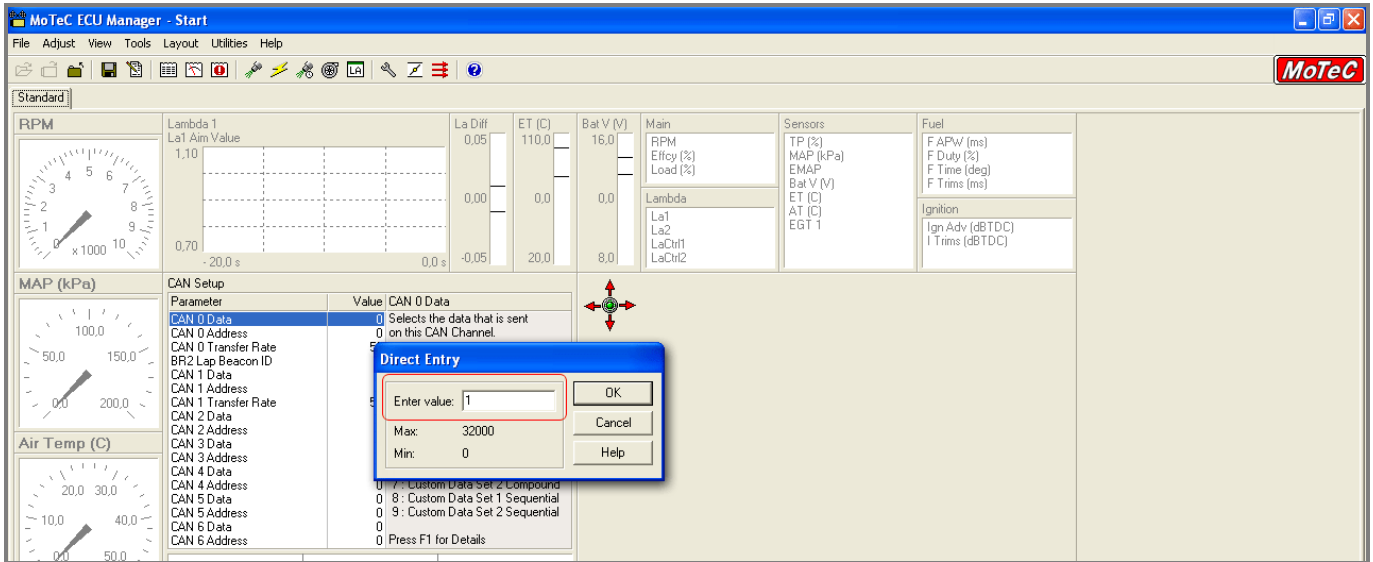
The screenshot shows the MoTeC ECU Manager software interface. The main window is titled "MoTeC ECU Manager - Start". The interface includes a menu bar (File, Adjust, View, Tools, Layout, Utilities, Help) and a toolbar. The main display area is divided into several sections:

- Standard:** A row of gauges including RPM, Lambda 1 (La1 Aim Value), La Diff, ET (C), Bat V (V), Main (RPM, Efficcy (%), Load (%)), Sensors (TP (%), MAP (kPa), EMAP, Bat V (V), ET (C), AT (C), EGT 1), and Fuel (F APW (ms), F Duty (%), F Time (deg), F Trims (ms)).
- MAP (kPa):** A gauge showing MAP (kPa).
- Air Temp (C):** A gauge showing Air Temp (C).
- CAN Setup:** A table with columns "Parameter" and "Value". The table lists various CAN parameters, including CAN 0 Data, CAN 0 Address, CAN 0 Transfer Rate, BR2 Lap Beacon ID, CAN 1 Data, CAN 1 Address, CAN 1 Transfer Rate, CAN 2 Data, CAN 2 Address, CAN 3 Data, CAN 3 Address, CAN 4 Data, CAN 4 Address, CAN 5 Data, CAN 5 Address, CAN 6 Data, and CAN 6 Address. A context menu is open over the "CAN 0 Data" row, showing options: Properties..., Paste, Delete, Add..., Bring To Front, and Send To Back.
- Lambda 1 vs. RPM:** A graph showing Lambda 1 vs. RPM.
- Engine Temp:** A gauge showing Engine Temp.

At the bottom of the window, a status bar displays the message: "ECU NOT Connected Unable to find a USB or CAN connection to the device. Arrow Keys-Select PgUp/PgDn-Adjust Enter-Set Value".

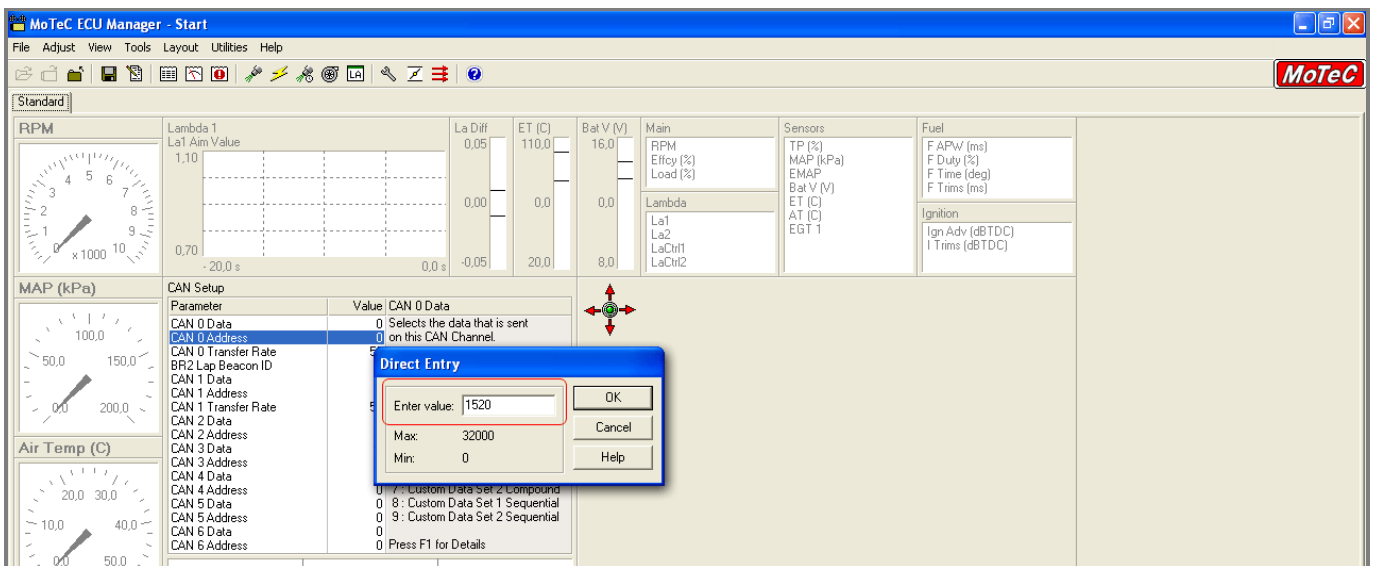
"Direct Entry" panel appears.

- fill in "1" and press "OK"



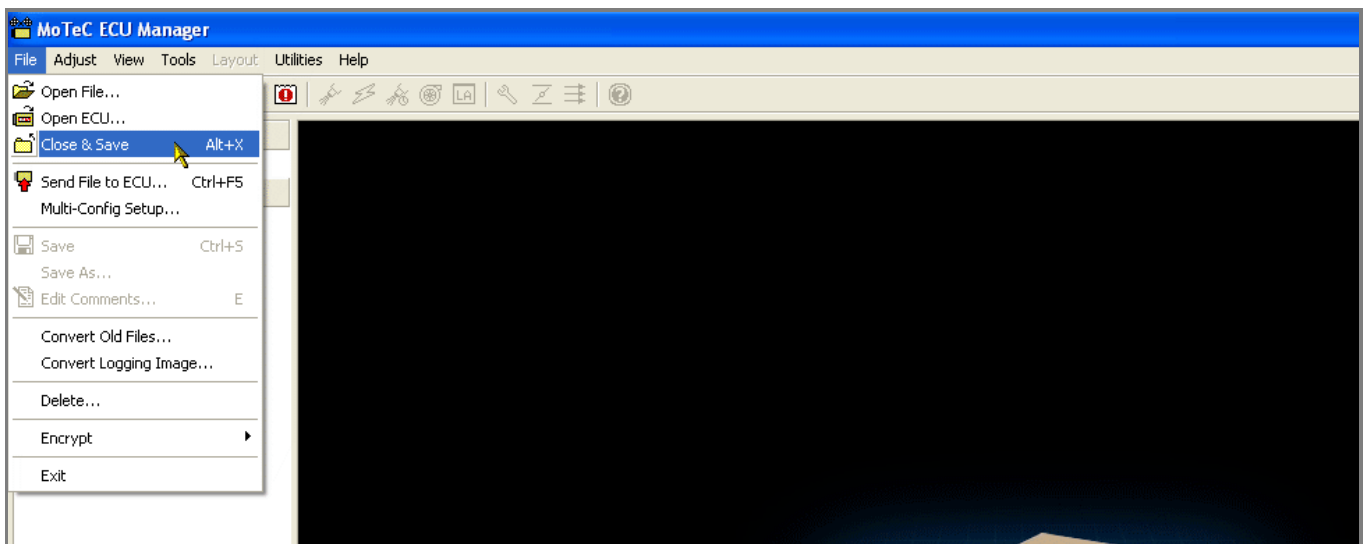
Then do the same with "CAN 0 Address"

- fill in 1520 and press "OK"



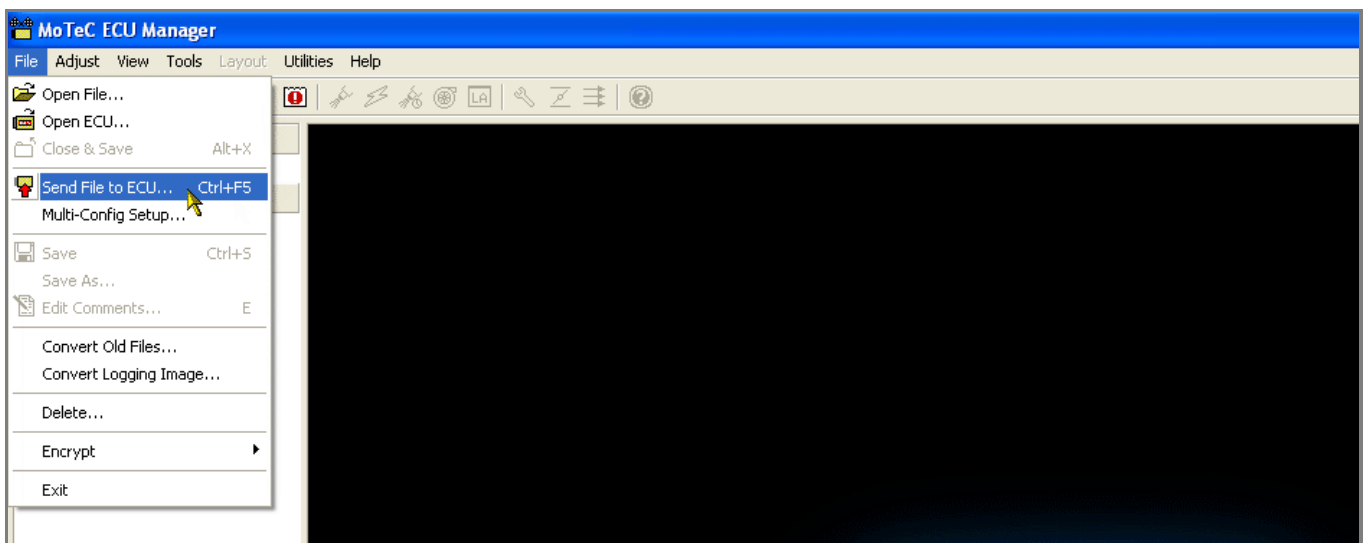
The software comes back to the main window. Save and close following this path:

- File -> Close & Save



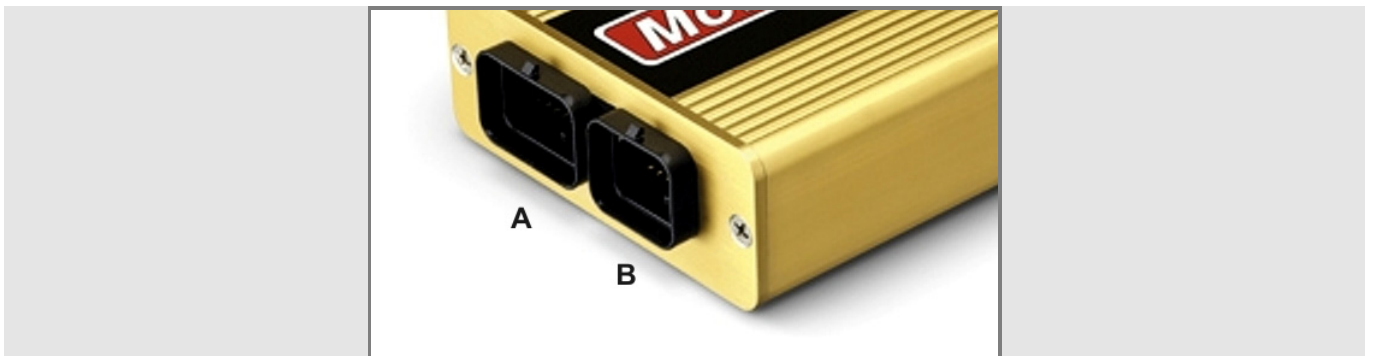
Transmit the configuration to the ECU following this path:

- File -> "Send file to ECU..."

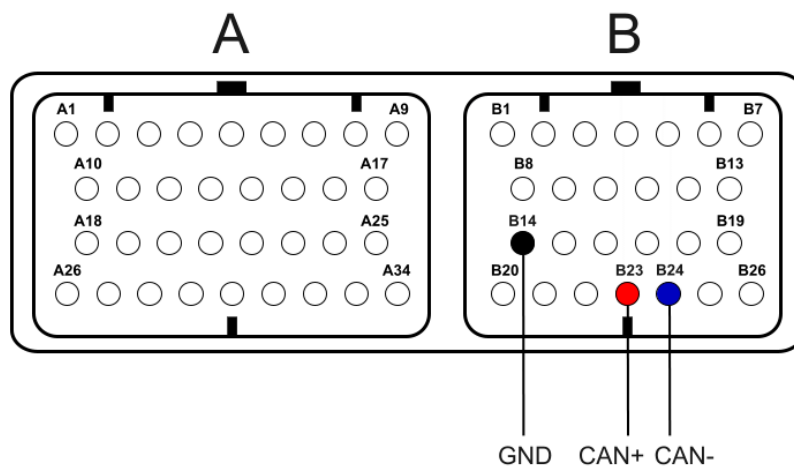


2 CAN Connection

M400, M600, M800 ECUs are equipped with two front male connectors labelled as "A" (34 pins) and "B" (26 pins) shown here below. The CAN bus is available on "B" connector.



Here below you see ECU connectors pinout as well as connection table.



"B" connector pin	Pin function	AiM Cable
B23	CAN+	CAN+
B24	CAN-	CAN-
B14	GND	GND

Please note: this connection requires GND to be connected too.

3

AiM device configuration

Before connecting the ECU to AiM device set this up using AiM software. The parameters to select in the device configuration are:

- ECU manufacturer "MoTec"
- ECU Model (protocol)
 - M8XX-M600-M400 for ECU with firmware version lower than 2.30S
 - M8XX-M600-M400-1M for ECU with firmware version 2.30S onwards
 - M8XX-M600-M400-1M_v3 for ECU with firmware version 3.x set to 1Mbit baud rate
 - M8XX-M600-M400-500k_v3 for ECU with firmware version 3.x set to 500kbit baud rate

4

Available channels

Channels received by AiM devices change according to the ECU Model you selected in Race Studio 2 configuration.

4.1

MoTeC M8XX-M600-M400 protocol

Channel received by AiM devices connected to "MoTec" "M8XX-M400-M600" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M800_RPM	RPM
ECU_2	M800_THROTPOS	Throttle Position
ECU_3	M800_MANIFPRES	Manifold air pressure
ECU_4	M800_AIRTEMP	Intake air temperature
ECU_5	M800_ENGINE_TEMP	Engine temperature
ECU_6	M800_LAMBDA1	Lambda value 1



ECU_7	M800_LAMBDA2	Lambda value 2
ECU_8	M800_EXHAUST_PRESS	Exhaust gas pressure
ECU_9	M800_AIR_CHARGE	Air/fuel ratio
ECU_10	M800_FUELTEMP	Fuel temperature
ECU_11	M800_FUELPRESS	Fuel pressure
ECU_12	M800_OILTEMP	Oil temperature
ECU_13	M800_OILPRESS	Oil pressure
ECU_14	M800_GEARVOLT	Gearshift voltage
ECU_15	M800_KNOCKVOLT	Knock sensor voltage
ECU_16	M800_GEARSHIFTFORCE	Gearshift force
ECU_17	M800_EXHTEMP1	Exhaust temperature 1
ECU_18	M800_EXHTEMP2	Exhaust temperature 2
ECU_19	M800_CHANN1	Custom channel 1
ECU_20	M800_CHANN2	Custom channel 2
ECU_21	M800_CHANN3	Custom channel 3
ECU_22	M800_CHANN4	Custom channel 4
ECU_23	M800_BATTVOLT	Battery supply
ECU_24	M800_ECUTEMP	ECU temperature
ECU_25	M800_SPEED1	Vehicle speed 1
ECU_26	M800_SPEED2	Vehicle speed 2
ECU_27	M800_SPEED3	Vehicle speed 3
ECU_28	M800_SPEED4	Vehicle speed 4
ECU_29	M800_GROUNDSPEED	Ground speed
ECU_30	M800_DRIVESPEED	Dashboard speed
ECU_31	M800_SLIP	Driven/dragged speed difference
ECU_32	M800_AIMSLIP	Target slip value
ECU_33	M800_LAUNCHRPM	RPM at launch
ECU_34	M800_GEAR	Engaged gear

4.2

MoTeC M8XX-M600-M400-1M protocol

Channel received by AiM devices connected to "MoTec" "M8XX-M400-M600-1M" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M800_RPM	RPM
ECU_2	M800_THROTPOS	Throttle position
ECU_3	M800_MANIFPRES	Manifold air pressure
ECU_4	M800_AIRTEMP	Intake air temperature
ECU_5	M800_ENGINE_TEMP	Engine temperature
ECU_6	M800_LAMBDA1	Lambda value 1
ECU_7	M800_LAMBDA2	Lambda value 2
ECU_8	M800_EXHAUST_PRESS	Exhaust gas pressure
ECU_9	M800_AIR_CHARGE	Air/fuel ratio
ECU_10	M800_FUELTEMP	Fuel temperature
ECU_11	M800_FUELPRESS	Fuel pressure
ECU_12	M800_OILTEMP	Oil temperature
ECU_13	M800_OILPRESS	Oil pressure
ECU_14	M800_GEARVOLT	Gearshift voltage
ECU_15	M800_KNOCKVOLT	Knock sensor voltage
ECU_16	M800_GEARSHIFTFORCE	Gearshift force
ECU_17	M800_EXHTEMP1	Exhaust gas temperature 1
ECU_18	M800_EXHTEMP2	Exhaust gas temperature 2
ECU_19	M800_CHANN1	Custom channel 1
ECU_20	M800_CHANN2	Custom channel 2
ECU_21	M800_CHANN3	Custom channel 3
ECU_22	M800_CHANN4	Custom channel 4
ECU_23	M800_BATTVOLT	Battery supply
ECU_24	M800_ECUTEMP	ECU temperature
ECU_25	M800_SPEED1	Vehicle speed 1



ECU_26	M800_SPEED2	Vehicle speed 2
ECU_27	M800_SPEED3	Vehicle speed 3
ECU_28	M800_SPEED4	Vehicle speed 4
ECU_29	M800_GROUNDSPEED	Ground speed
ECU_30	M800_DRIVESPEED	Dashboard speed
ECU_31	M800_SLIP	Driven/dragged speed difference
ECU_32	M800_AIMSLIP	Target slip value
ECU_33	M800_LAUNCHRPM	RPM at launch
ECU_34	M800_GEAR	Engaged gear
ECU_35	M800_OILP_PSI	Oil pressure in PSI
ECU_36	M800_FUELP_PSI	Fuel pressure in PSI

4.3

MoTeC M8XX-M600-M400-1M_v3 protocol

Channel received by AiM devices connected to "MoTec" "M8XX-M400-M600-1M_v3" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M800_RPM	RPM
ECU_2	M800_THROTPOS	Throttle position sensor
ECU_3	M800_MANIFPRES	Manifold pressure
ECU_4	M800_AIRTEMP	Intake air temperature
ECU_5	M800_ENGINE_TEMP	Engine temperature
ECU_6	M800_LAMBDA1	Lambda value 1
ECU_7	M800_LAMBDA2	Lambda value 2
ECU_8	M800_EXHAUST_PRESS	Exhaust gas pressure
ECU_9	M800_AIR_CHARGE	Air/fuel ratio
ECU_10	M800_FUELTEMP	Fuel temperature
ECU_11	M800_FUELPRESS	Fuel pressure
ECU_12	M800_OILTEMP	Oil temperature
ECU_13	M800_OILPRESS	Oil pressure



ECU_14	M800_GEARVOLT	Gear voltage
ECU_15	M800_KNOCKVOLT	Knock sensor voltage
ECU_16	M800_GEARSHIFTFORCE	Gearshift force
ECU_17	M800_EXHTEMP1	Exhaust gas temperature 1
ECU_18	M800_EXHTEMP2	Exhaust gas temperature 2
ECU_19	M800_CHANN1	Custom channel 1
ECU_20	M800_CHANN2	Custom channel 2
ECU_21	M800_CHANN3	Custom channel 3
ECU_22	M800_CHANN4	Custom channel 4
ECU_23	M800_BATTVOLT	Battery supply
ECU_24	M800_ECUTEMP	ECU temperature
ECU_25	M800_SPEED1	Vehicle speed 1
ECU_26	M800_SPEED2	Vehicle speed 2
ECU_27	M800_SPEED3	Vehicle speed 3
ECU_28	M800_SPEED4	Vehicle speed 4
ECU_29	M800_GROUNDSPEED	Ground speed
ECU_30	M800_DRIVESPEED	Dashboard speed
ECU_31	M800_SLIP	Driven/dragged speed difference
ECU_32	M800_AIMSLIP	Target slip value
ECU_33	M800_LAUNCHRPM	RPM at launch
ECU_34	M800_GEAR	Engaged gear
ECU_35	M800_OILP_PSI	Oil Pressure in PSI
ECU_36	M800_FUELP_PSI	FUEL Pressure in PSI

4.4

MoTeC M8XX-M600-M400-500K_v3 protocol

Channel received by AiM devices connected to "MoTec" "M8XX-M400-M600-500K_v3" protocol are:

ID	CHANNEL NAME	FUNCTION
ECU_1	M800_RPM	RPM
ECU_2	M800_THROTPOS	Throttle position
ECU_3	M800_MANIFPRES	Manifold air pressure
ECU_4	M800_AIRTEMP	Intake air temperature
ECU_5	M800_ENGINE_TEMP	Engine temperature
ECU_6	M800_LAMBDA1	Lambda value 1
ECU_7	M800_LAMBDA2	Lambda value 2
ECU_8	M800_EXHAUST_PRESS	Exhaust gas pressure
ECU_9	M800_AIR_CHARGE	Air/fuel ratio
ECU_10	M800_FUELTEMP	Fuel temperature
ECU_11	M800_FUELPRESS	Fuel pressure
ECU_12	M800_OILTEMP	Oil temperature
ECU_13	M800_OILPRESS	Oil pressure
ECU_14	M800_GEARVOLT	Gear voltage
ECU_15	M800_KNOCKVOLT	Knock sensor voltage
ECU_16	M800_GEARSHIFTFORCE	Gearshift force
ECU_17	M800_EXHTEMP1	Exhaust gas temperature 1
ECU_18	M800_EXHTEMP2	Exhaust gas temperature 2
ECU_19	M800_CHANN1	Custom channel 1
ECU_20	M800_CHANN2	Custom channel 2
ECU_21	M800_CHANN3	Custom channel 3
ECU_22	M800_CHANN4	Custom channel 4
ECU_23	M800_BATTVOLT	Battery supply
ECU_24	M800_ECUTEMP	ECU temperature
ECU_25	M800_SPEED1	Vehicle speed 1



ECU_26	M800_SPEED2	Vehicle speed 2
ECU_27	M800_SPEED3	Vehicle speed 3
ECU_28	M800_SPEED4	Vehicle speed 4
ECU_29	M800_GROUNDSPEED	Ground speed
ECU_30	M800_DRIVESPEED	Dashboard speed
ECU_31	M800_SLIP	Driven/dragged speed difference
ECU_32	M800_AIMSLIP	Target slip value
ECU_33	M800_LAUNHRPM	RPM at launch
ECU_34	M800_GEAR	Engaged gear
ECU_35	M800_OILP_PSI	Oil Pressure in PSI
ECU_36	M800_FUELP_PSI	FUEL Pressure in PSI