AIM Infotech

MoTec M4 and M48 ECUs

Release 1.03

ECU

1
Supported models

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

- M4
- M48

2
Software check (M48 only) and configuration

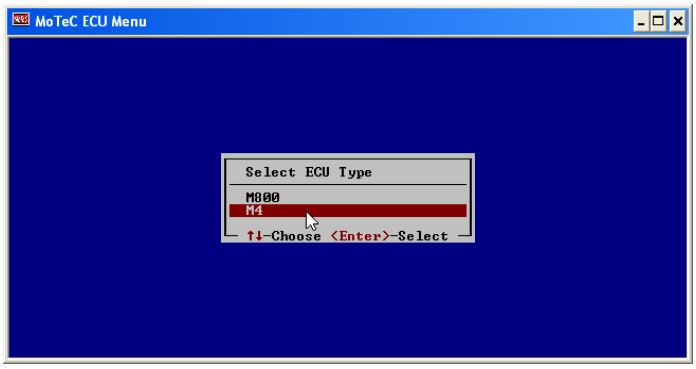
Before connecting MoTec M48 ECU to AiM devices check its settings using MoTec "ECU Menu" V6.20 software. This can be downloaded from MoTec website. Connecting the ECU to PC serial port two cases can occur:

- MoTec software detects an older version in the ECU and an updating is needed; in this case address to your MoTec dealer for a software upgrade unit; upgrading is automatically made by the software selecting the corresponding voice;
- MoTec software detects the ECU software version is ok and nothing is needed.

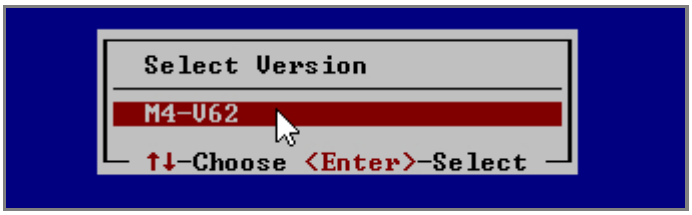
2.1
Software configuration

MoTec ECU needs to be configured via software "ECU Menu" 6.20 version to correctly communicate with AiM devices. Follow these steps.

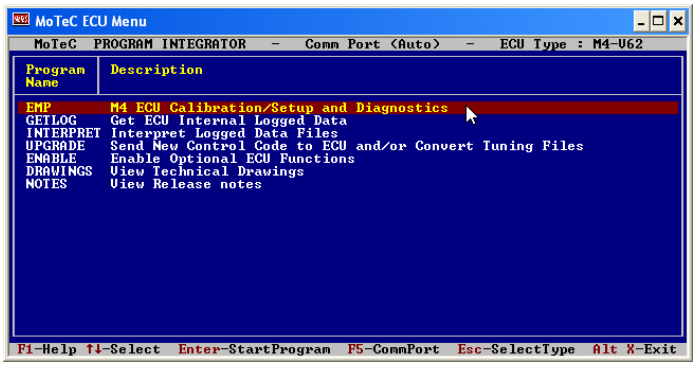
- Run "ECU Menu"
- Select "M4" and press "Enter"



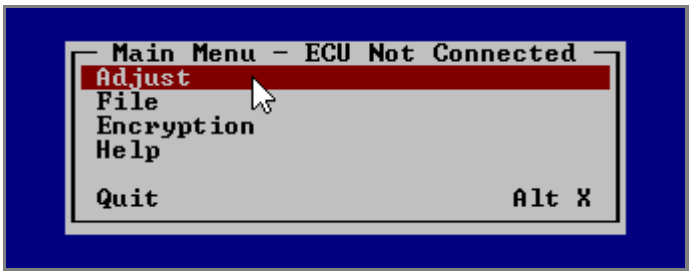
- Press "Enter"



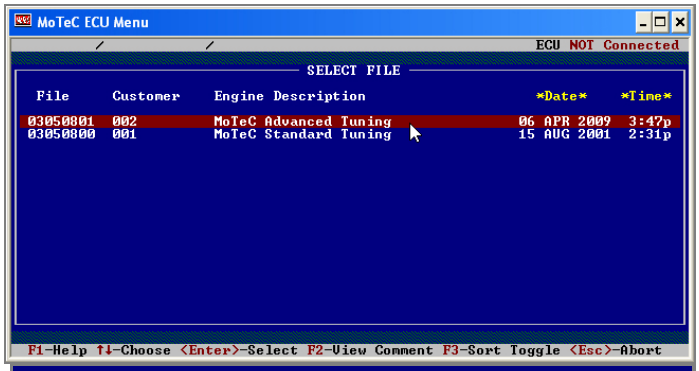
- Select "M4 ECU Calibration/Setup and Diagnostics";
- Press "Enter"



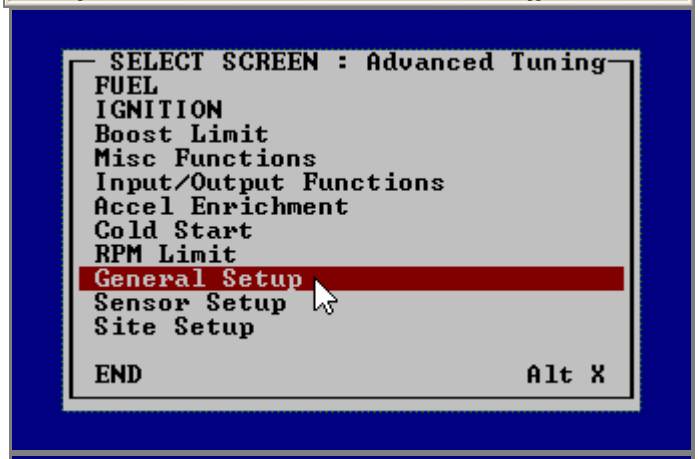
- Select "Adjust"
- Press "Enter"



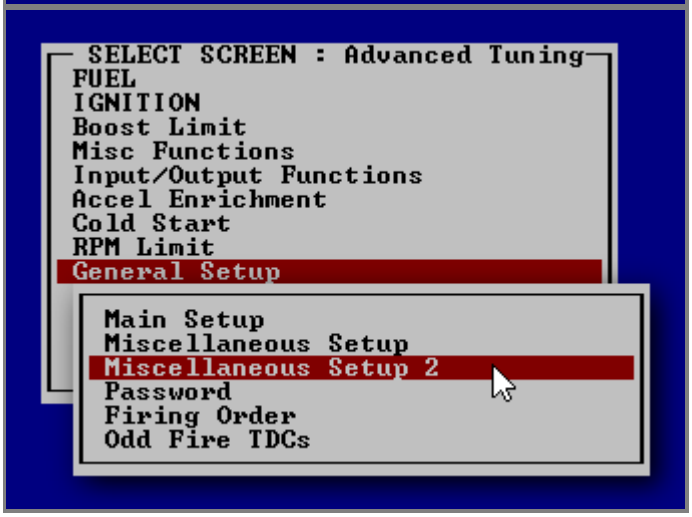
- Select "MoTec advanced tuning"
- Press "Enter"



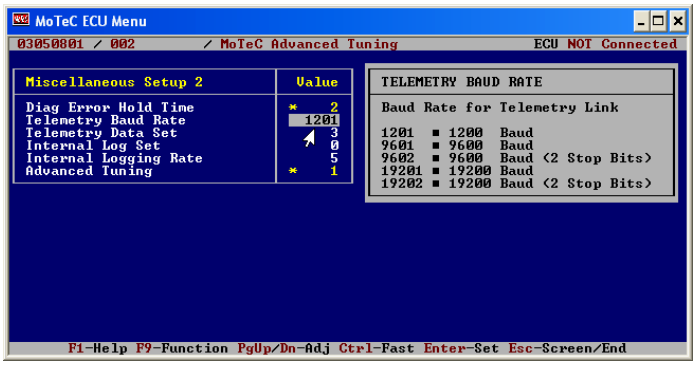
- Select "General Setup"
- Press "Enter"



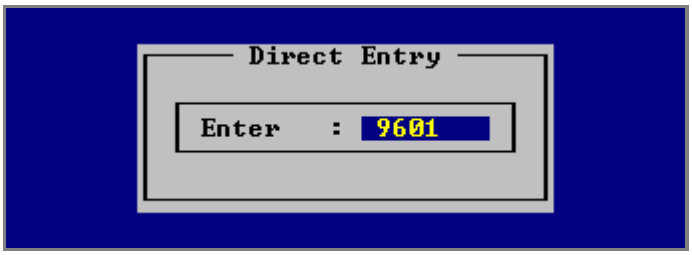
- Select "Miscellaneous Setup 2"
- Press "Enter"



- "Telemetry Baud Rate" and "Telemetry Data Set" need to be set;
- Select the correct row and start writing;
- Setting windows appear;



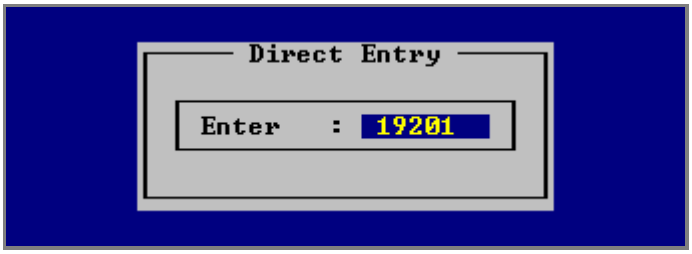
- To set Baud Rate "9600" type: "**9601**"



- Switch to Data Set
- Type "**3**" to use Data Set 3

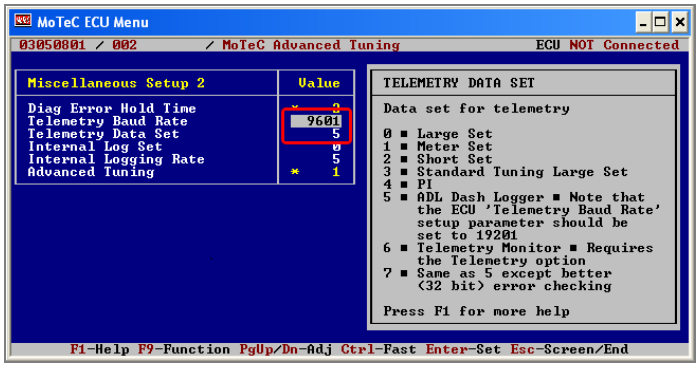
- Type "**5**" to use Data Set 5

- To set Baud Rate at "19200"; type: "**19201**"

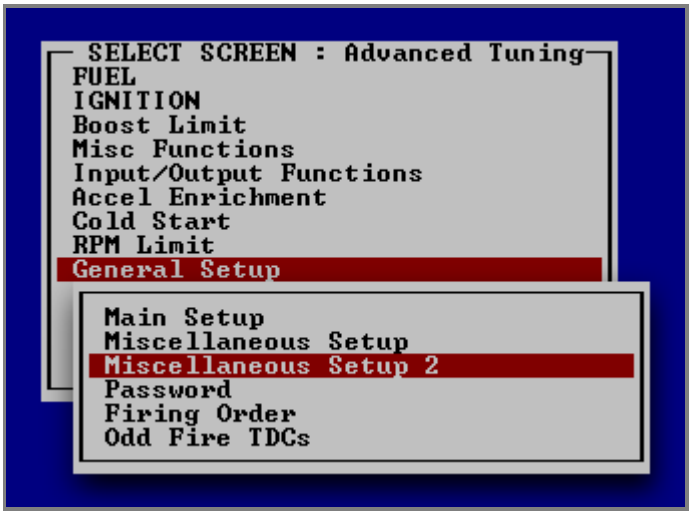


- Switch to Data Set
- Type "5" to use Data Set 5;
- please note: Data Set 3 with Baud Rate 19200 protocol is not supported by AiM devices.

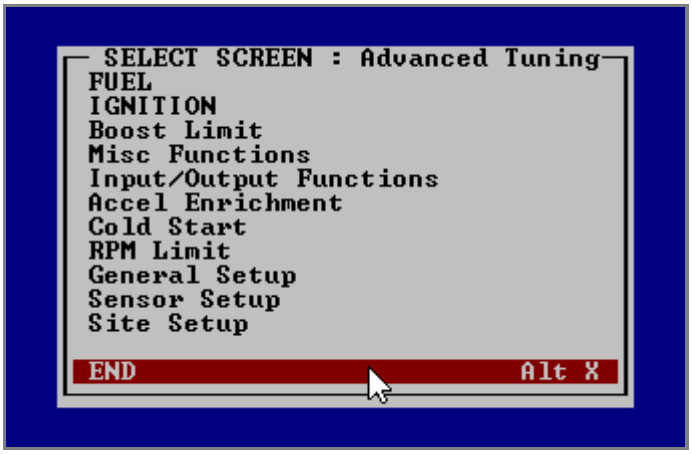
- Now the software shows the parameters correctly set.



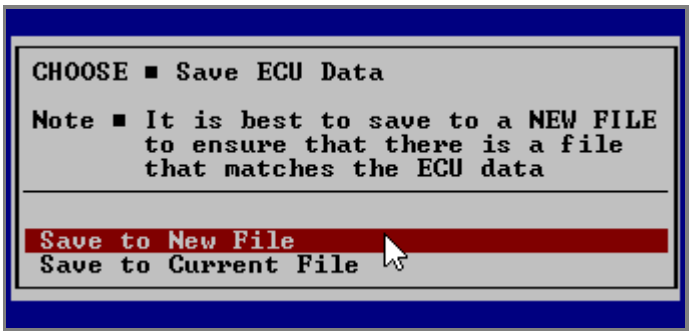
- Press "Esc"



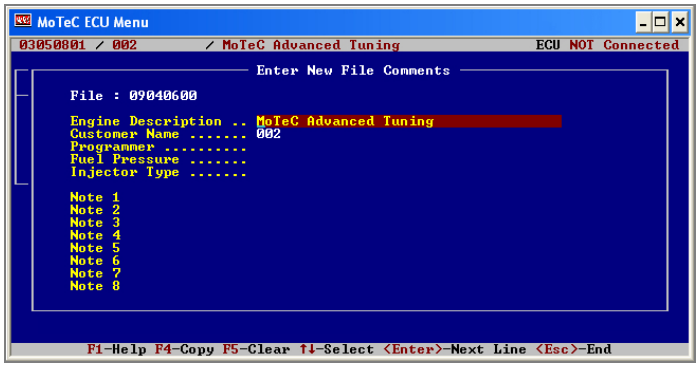
- Select "End" and press "Enter" or press "Alt+X"



- Select "Save to New File"
- Press "Enter"



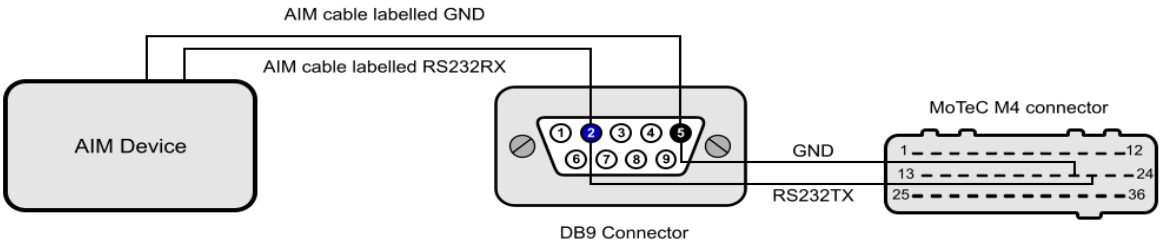
- "File Comments " window appears
- Fill it in as you wish
- Press "Esc"
- The configuration is saved and the ECU is re-started.



3
Wiring connection

MoTec M4 and M48 ECUs feature a serial communication protocol. Using DB9 harness connector you can connect the ECU to AiM devices.

Here below you see connection scheme and connection table of MoTec M4



AiM cable label	DB9 pin	Pin function	MoTec M4 connector pin
RS232RX/ECU RS232TX	2	RS232TX	22
GND	5	GND	21

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)

4
Race Studio configuration

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: **MoTec**
- ECU Model: **M4-M48-Data3** to use Baud Rate 9600 and Data Set3 (Only RS2)
  M4-M48-Data5 to use Baud Rate 9600 and Data Set5
  M4-M48-Data5 19200 to use Baud Rate 19200 and Data Set5

5
Protocols

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

5.1
MoTec - M4-M48-Data3 protocol

Channels received by AiM devices configured with “MoTec - M4-M48 Data3” are:

CHANNEL NAME	FUNCTION
M4_M48_RPM	RPM
M4_M48_FUELUSED	Injected fuel
M4_M48_AUXV	Auxiliary voltage
M4_M48_AUXT	Auxiliary temperature
M4_M48_MAP	Manifold air pressure
M4_M48_TP	Throttle position
M4_M48_LA	Lambda value
M4_M48_ET	Engine temperature

M4_M48_AT	Intake air temperature
M4_M48_VB	Battery supply
M4_M48_ECUTEMP	ECU temperature
M4_M48_FAPW	Fuel actual pulse width
M4_M48_FEPW	Fuel effective pulse width
M4_M48_FTIME	Fuel injection time
M4_M48_DUTY	Duty cycle
M4_M48_ACCEL	Acceleration value
M4_M48_IADV	Ignition advance
M4_M48_EPOINT	Engine point
M4_M48_PWM0_DUTY	Pulse width modulation duty
M4_M48_GEAR	Engaged gear

5.2 MoTec – M4 M48-data5” (9.6 – 19.2kbs) protocol

Channels received by AiM devices configured with "MoTec - M4-M48-Data5" (9.6 – 19.2 kbs) are:

CHANNEL NAME	FUNCTION
M4_M48_RPM	RPM
M4_M48_THROTPOS	Throttle position
M4_M48_MANIFPRES	Manifold air pressure
M4_M48_AIRTEMP	Intake air temperature
M4_M48_ENGINE_TEMP	Engine temperature
M4_M48_LAMBDA1	Lambda value 1
M4_M48_AUXTEMP	Auxiliary temperature
M4_M48_AUXVOLT	Auxiliary voltage
M4_M48_BATTVOLT	Battery supply
M4_M48_ECUTEMP	ECU Temperature
M4_M48_BAROPRESS	Barometric pressure
M4_M48_SPEED1	Vehicle speed 1
M4_M48_SPEED2	Vehicle speed 2

M4_M48_GROUNDSPEED	Ground speed
M4_M48_DRIVESPEED	Drive speed
M4_M48_SLIP	Driven/dragged speed difference
M4_M48_GEAR	Engaged gear
M4_M48_LAMBDASHORTTRIM	Lambda short trim
M4_M48_LAMBDALONGTRIM	Lambda long trim