Maxxtuning.eu

Dynotuning ■ Engine Management ■ Motorsport

MaxxECU E-Throttle module

Technical Data:

Supply voltage:	8-24V
Max intermittent load:	5A (internal PWM current limit)
Max continuous load:	2A
Operating temperature:	-40 to 125C

Protected from overload and high temperatures, but not waterproof!

Extends MaxxECU capabilities to support E-Throttle functions.

Do not mount the module close to heat sources such as exhaust components.
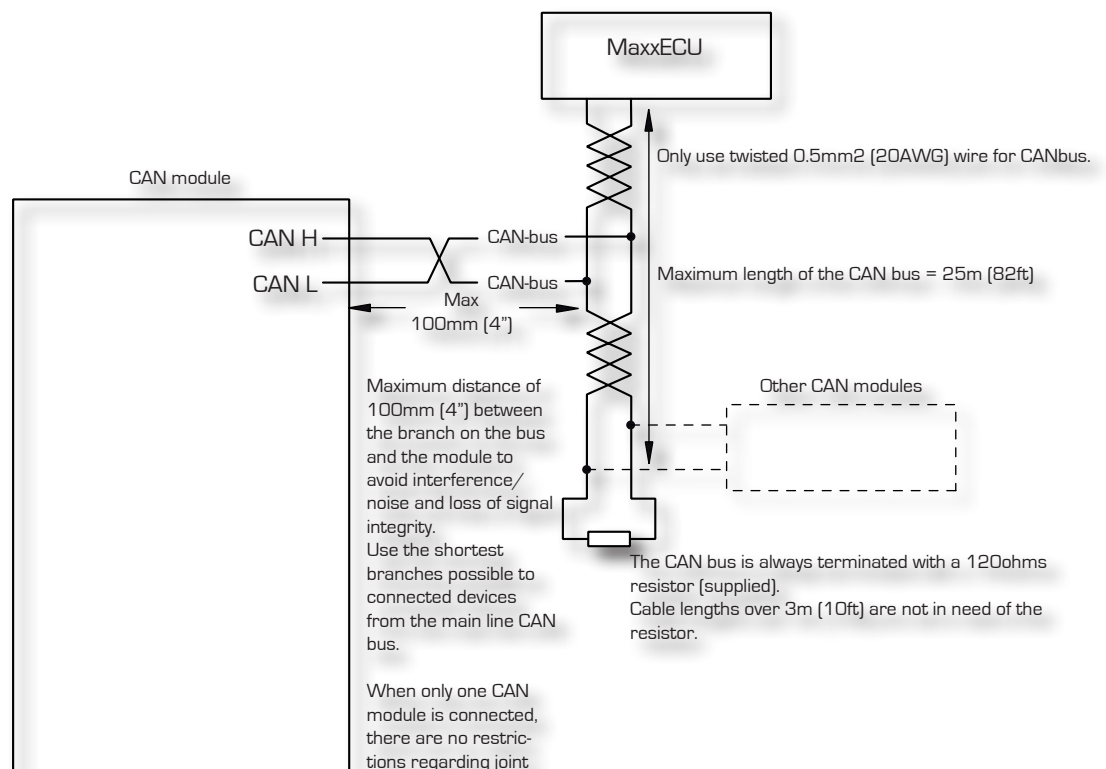
Pinout (20-pin connector)

PIN	Label/function
2	+5V power supply for throttle position sensor
3	0-5V analog input 1 (throttle position sensor 1)
4	0-5V analog input 2 (throttle position sensor 2)
5	Signal GND for throttle position sensors
6	Motor -
7	Motor +
8	Power GND
9	+12V power supply
10	CAN H
12	+5V power supply for pedal position sensor
13	0-5V analog input 3 (pedal position sensor 1)
14	0-5V analog input 4 (pedal position sensor 2)
15	Signal GND for pedal position sensors
20	CAN L

MaxxECU E-Throttle module is connected via CAN and will only work with MaxxECU.
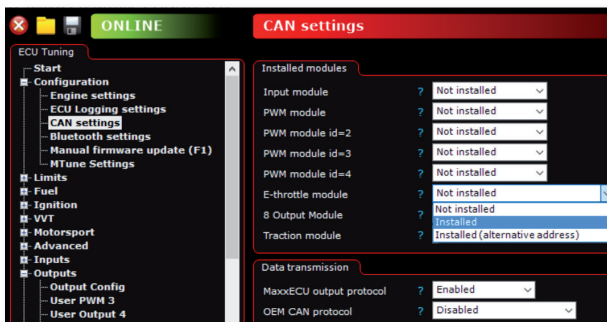
Pay attention to different +5V power and Signal GND sources, do not mix or connect them together. They are separated for safety reasons!

Do not mix or connect MaxxECU +5V supply with E-Throttle module +5V power supply.

CAN-bus wiring

MaxxECU

CAN module

CAN H — CAN-bus
CAN L — CAN-bus
Max 100mm (4")

Only use twisted 0.5mm2 (20AWG) wire for CANbus.

Maximum length of the CAN bus = 25m (82ft)

Maximum distance of 100mm (4") between the branch on the bus and the module to avoid interference/ noise and loss of signal integrity.
Use the shortest branches possible to connected devices from the main line CAN bus.

When only one CAN module is connected, there are no restrictions regarding joint

Other CAN modules

The CAN bus is always terminated with a 120ohms resistor (supplied).
Cable lengths over 3m (10ft) are not in need of the resistor.

MTune settings - Testing

Step1: Enable E-Throttle CAN module (Configuration –> CAN settings –> E-Throttle module).
There are 2 different options for E-Throttle module, most people will use the "Installed" dropdown option.

MTune will then expand it's setting pages for E-Throttle capabilities, extra inputs and outputs to be configured.
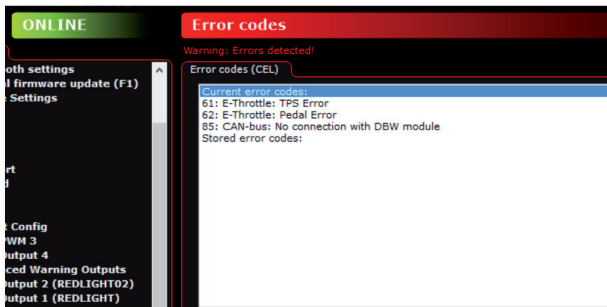
Step 2: After a CAN module is installed and activated in settings, you will probably end up with error codes "TPS Error" and "Pedal Error" which is normal. **If** you do have a "CAN-bus: No Connection..." error code you need to check the following:
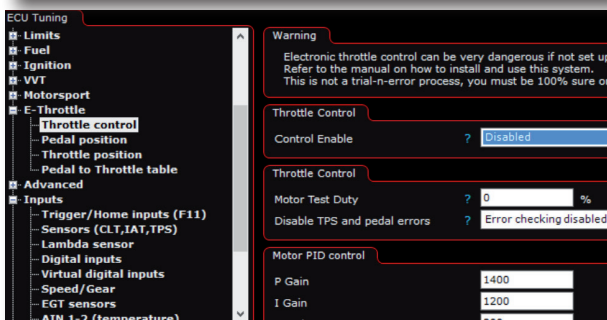• Double check electrical connection!
• CAN Module powered?
• CAN H/L mixed?
Please try to manually reset error codes.
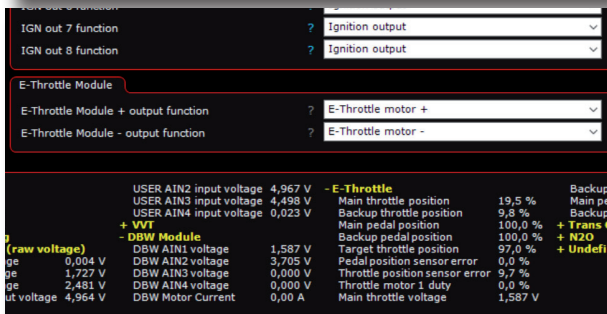
Step 3: Assign motor outputs in Outputs –> Output Config, E-Throttle Module to activate "E-Throttle setting pages" in MTune.

Make sure DBW motor connection is removed before enabling the outputs or you might damage the throttle body!
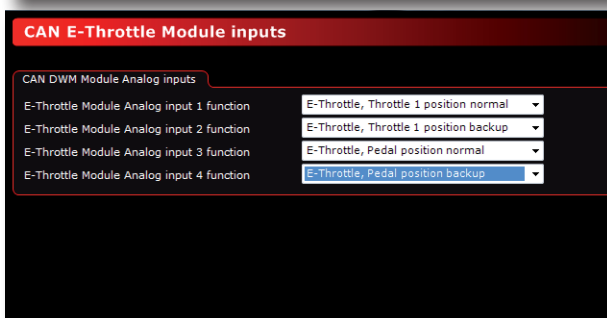

Step 4: Disable Throttle control!
E-Throttle –> Throttle control, Control Enabled = Disabled

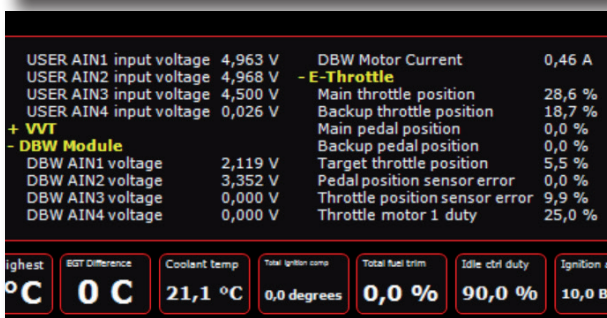(it should be disabled by default, please check to make sure)

Re-connect connector to throttle body which we disconnected in step 3.

Step 5: Enable Analog input sensors.
Inputs –> CAN E-Throttle Module Inputs.
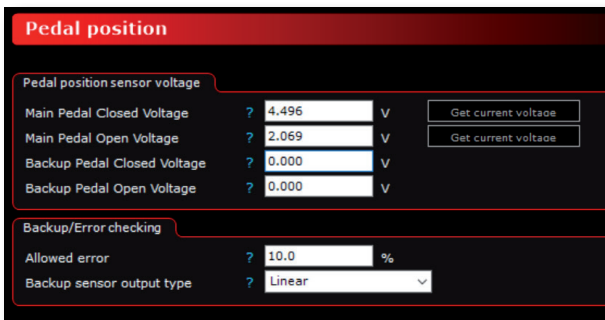Assign each input to the correct function.

Step 6: Check analog input connections
Use MTune RealTime Data tab to test pedal and throttle position sensors to ensure correct wiring.

When testing the throttle body, move the Throttle by hand and watch for changes in voltage on corresponding inputs.
Please calibrate them at the same time as explained in next two steps!

Pedal position

Pedal position sensor voltage

Main Pedal Closed Voltage	?	4.496 V	Get current voltage
Main Pedal Open Voltage	?	2.069 V	Get current voltage
Backup Pedal Closed Voltage	?	0.000 V	
Backup Pedal Open Voltage	?	0.000 V	

Backup/Error checking

Allowed error	?	10.0 %
Backup sensor output type	?	Linear

Throttle position

Throttle position sensor voltage

Main Throttle Closed Voltage	?	1.443 V	Get current voltage
Main Throttle Open Voltage	?	3.804 V	Get current voltage
Backup Throttle Closed Voltage	?	3.799 V	
Backup Throttle Open Voltage	?	1.420 V	

Backup/Error checking

Allowed error	?	15 %
Backup sensor output type	?	Linear

Step 7: Pedal position calibration.
E-Throttle –> Pedal position.

Use "Get current voltage" buttons to automatically get voltage from main and backup pedal position sensors.
There should be underline unique voltage values in each input boxes.

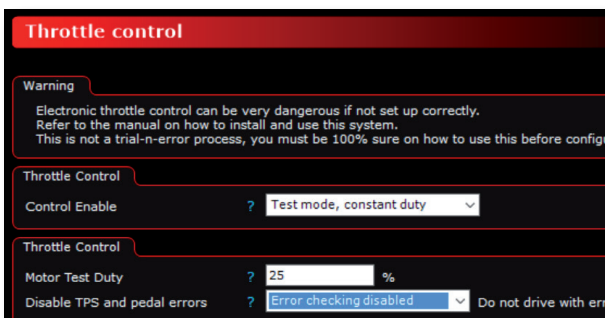Allowed error is a safety function if something goes wrong with the pedal sensors.
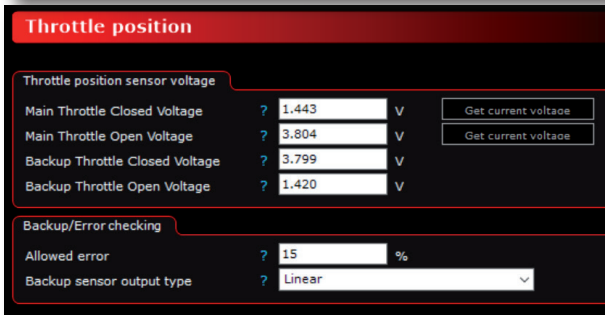
Step 8: Throttle position calibration.
E-Throttle –> Throttle position.

Use "Get current voltage" buttons to automatically get voltage from main and backup throttle position sensors.
There should be underline unique voltage values in each input boxes.

Allowed error is a safety function if something goes wrong with the throttle sensors (must be enabled before driving!)

MTune settings - Control and tuning

Throttle control

Warning

Electronic throttle control can be very dangerous if not set up correctly.
Refer to the manual on how to install and use this system.
This is not a trial-n-error process, you must be 100% sure on how to use this before configu

Throttle Control

Control Enable	?	Test mode, constant duty

Throttle Control

Motor Test Duty	?	25 %
Disable TPS and pedal errors	?	Error checking disabled	Do not drive with err

Deadband	?	0.2 %
Hysteresis	?	1 %

Motor Feed forward control

Feed forward Enable	?	Enabled
Feed forward Max Duty	?	28 %
Feed forward Min Duty	?	-30 %
Feed forward Rest Pos	?	7.8 %

Control damping

Negative damping	?	Disabled
Positive damping	?	Disabled

Step 9: Enable Test Mode for throttle.
E-Throttle –> Throttle control, Control Enabled = Test Mode
In this mode, throttle control is only controlled with the "Motor Test Duty" value (%). Try a low value (10), press enter to watch the throttle body open slowly.

Input "0" and confirm with enter to move throttle body to unaffected position (underline always do this after each test value!).

Try to find the closest duty value which opens the body to 90degree angle (100% open), do the same for close position (0% open).
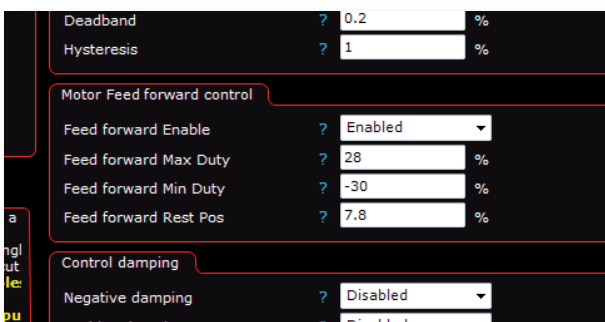
Make sure the mechanical stops are never touched as this might damage your throttle body if hitting to hard.

Input duty values which represent 100% and 0% throttle in the Motor Feed Forward control input boxes.
Feed forward Enable should be "Enabled" for this to work.
Feed forward Rest Pos = Check RealTime Data –> E-Throttle, Main throttle position when Throttle control is disabled (TPS position when not affected by any motor movement)

Note: When E-Throttle module is installed, TPS input (G2) of the MaxxECU is disabled.
TPS value in the MaxxECU is now pedal movement, underline not real Throttle body movement.
(this is because many functions depend on this value to be 0% when not accelerating).
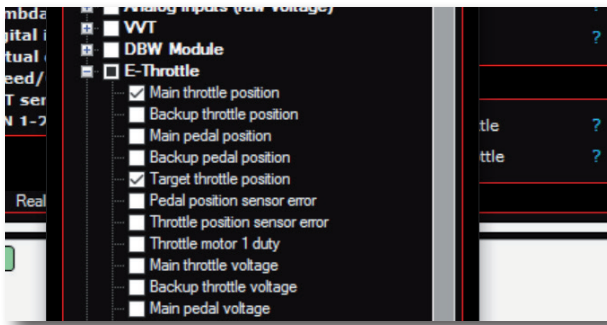
**Step 10:** E-Throttle tuning (Motor PID control)
First, enable E-Throttle –> Throttle control, Control Enabled.

Add channels to live logger for easy tuning, Right click on livelogger, "Select channels". Select "Main throttle position" and "Target throttle position". Press OK to make data available in livelogger.
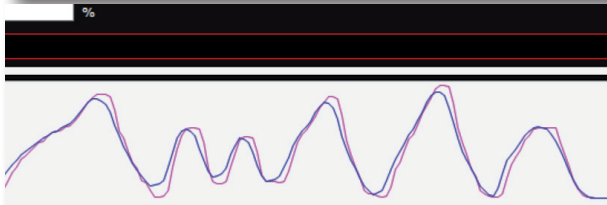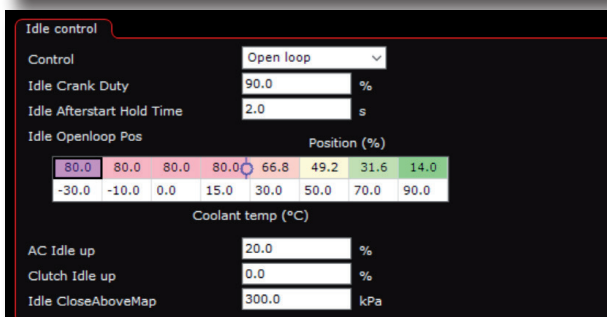
Using livelogger feature, you can tune the PID regulator for throttle control by watching and comparing the above.

Make sure all testing and calibrations are done according to this manual before even trying to enable motor control!
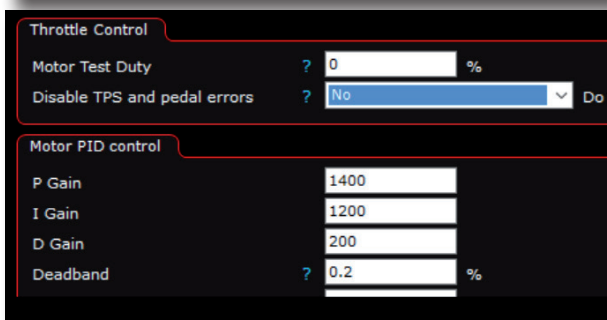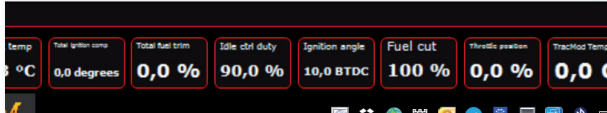
Step 11: Make sure you are driving with all error checking functions activated for security reasons!

Step 12: E-Throttle is a handy function for controlling the idle speed without the need for additional idle control valves or motors. Idle control will be automatically visible when E-Throttle settings is configured.

The 0-100% idle control in the following **example** picture is based upon settings in E-Throttle –> Throttle control, Idle control.
0% idle = 0.7% Throttle pos, 100% idle = 5% Throttle pos.
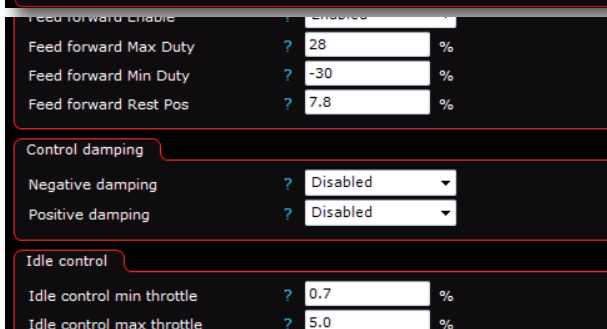
Damping is a function to prevent the throttle body to hit mechanical stops during fast acceleration movement.

The MaxxECU E-Throttle module employs several different safety functions to eliminate the possibility of the throttle sticking open in case of mechanical or electrical failures. Parameters that are monitored include backup throttle and pedal positions, pedal to throttle difference, throttle current and CAN communication.

If the MaxxECU or the E-Throttle module senses that it looses the ability to control the throttle position it will cut the power supply to the throttle and cut engine power by means of fuel and ignition cut.

Make sure to never drive the vehicle without the safety functions fully setup.
Proper setup is critical as any unintended power loss caused by incorrect settings could be dangerous.
MaxxECU, Maxxtuning AB and it's distributors take no responsibility for incorrect tuning.