MaxxECU

Be a tuning mastermind. Like us.

MaxxECU quickstart guide

(2021-03-03)

Online help!
maxxecu.com/support

- Wiring diagrams
- Installation help
- Pinout
- Support

maxxecu.com/support

Legal disclaimer
All performance modifications and installations are at the customer's own risk. MaxxECU or associates disclaim any liability, either implied or otherwise, for mechanical, electrical or other failure when using any of our aftermarket performance products.
Products are sold for off-road use only and may be illegal in many countries, states and provinces. They are intended solely for racing vehicles and should never be used on public roads.

By purchasing any MaxxECU aftermarket performance product, the customer assumes full liability for any use, and/or misuse of the product, and agrees that MaxxECU holds no responsibility for any consequences, legal, otherwise, of such use and/or misuse.

MaxxECU	MINI	STREET	SPORT	RACE	PRO
Max sequential cylinders	4	6	6	8	12
Max wasted spark cylinders	8	12	12	16	16
Sensor input: IAT, TPS, CLT	Yes	Yes	Yes	Yes	Yes
Built-in MAP-sensor (boost pressure up to 3bar/43.5 psi)	Yes	Yes	Yes	Yes	Yes
Built-in wideband O2 (LSU 4.2/4.9)	No	Yes	Yes	Yes	Yes (dual)
Built-in EGT	No	No	No	8	12
Built-in Bluetooth	No	No	Yes	Yes	Yes
Trigger inputs (VR/Digital)	1	2	2	2	2
Extra analog inputs	2	4	8	8	22
Extra digital inputs	2 (hall only)	2 (hall only)	2 (hall only)	4 VR/HALL	4 VR / 6 HALL
Injector outputs	4 (saturated)	6 (saturated)	6 (high/low impedance)	8 (high/low impedance)	16 (high/low impedance)
Ignition outputs	4	6	6	8	12
Extra outputs (GND)	4	5	7	9	18
Extra outputs (+12V)	No	No	No	2	8
Extra E-Throttle motor outputs (H-bridge)	No	No	2	2	4
E-Throttle output (s)	No	No	Single	Single	Dual
Internal loggings (max 144 channels)	1000Hz	1000Hz	1000Hz	1000Hz	1000Hz
CAN bus	Single	Single	Single	Single	Dual
OBDII, OEM CAN protocols built-in	Yes	Yes	Yes	Yes	Yes
VANOS/VVTi support	Yes	Yes	Yes	Yes	Yes
Launch & anti-lag	Yes	Yes	Yes	Yes	Yes
Built-in knock	No	No	No	Yes	Yes
Flex fuel	Yes	Yes	Yes	Yes	Yes

All MaxxECU products are for off-road use only. They are not intended for use on the highways or streets.

Limited warranty

- MaxxECU guarantees that its systems is to be free from defects in material or workmanship for a period of 12 months from the date of purchase.
- Proof of purchase (bill of sale or sales invoice) must be presented to obtain warranty services.
- If the MaxxECU system is found to be defective, it will be replaced or repaired if returned with proof of purchase.
- To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations, either expressed or implied, including any implied warranty of merchantability or fitness.
- MaxxECU or associates shall never be liable for special or consequential damages.
- Components damaged as a result of incorrect set up/faulty installation will not be regarded as warranty repairs.

Warnings

- Damage to the engine or components may occur if an ignition or fuel system is incorrectly configured and the ECU is powered up.
- Always disconnect all the outputs when updating firmware.
- Failure to follow all of the warnings and precautions in this manual or online help system can lead to engine or component damage.
- Avoid open flames, sparks or electrical devices near flammable substances.
- Always disconnect the battery cables when carrying out electrical work or welding on your vehicle.
- Do not disconnect the vehicle battery while the engine is running.
- Fuel system components and wiring should always be mounted far away from heat sources.
- Make sure there are no fuel leaks, and no wiring is left uninsulated.
- Be sure to follow all proper workshop safety procedures when working on your vehicle.

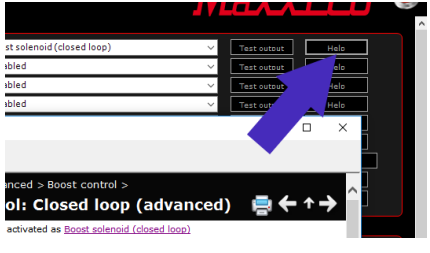
Software installation (MTune)

1. Download MTune PC-software from maxxecu.com/mtune.
2. Run the downloaded installer and follow the on-screen instructions.

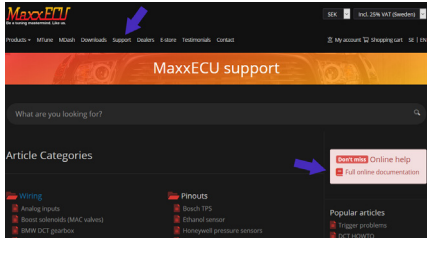
Online help system

MaxxECU online help is always available from maxxecu.com/support, and is also integrated into MTune PC software.

Access to integrated help is available within MTune PC software by pressing the help button shown above, or by pressing the F1 key.



Integrated help is also available within MTune PC software after each input/output to get fast help.



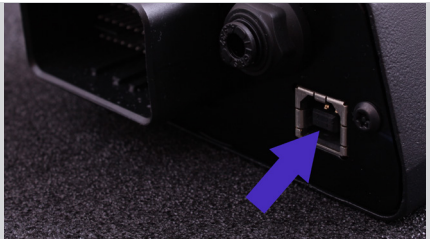
Support page and online documentation available on maxxecu.com/support.

ECU overview

USB communication ports.

MINI, microUSB.
STREET/SPORT/RACE, USB type B.
RACE H2O/PRO USB mini type B.

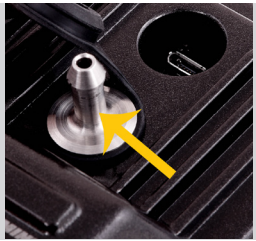
(USB cables always included in kits).

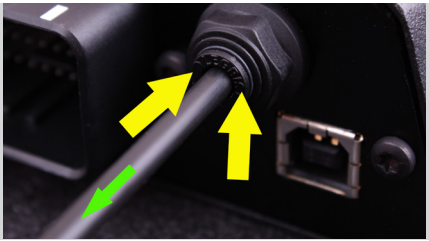


Built-in MAP sensor, 3 bar/43.5 psi of boost

MINI
Uses a regular hose fitting.

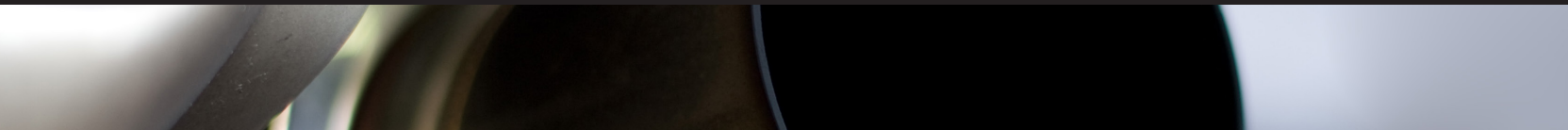
STREET/SPORT/RACE/PRO
Push the MAP connector to secure.
To remove, press on the lock ring and pull out.





MaxxECU connectors

MINI STREET/SPORT RACE PRO



ECU installation

STREET/SPORT/RACE units must be mounted inside the vehicle (not waterproofed)
MINI/RACE H2O/PRO units can be mounted in the engine bay (waterproofed), away from excessive heat, and the connectors must always face downwards.

Example of a MaxxECU PRO installation.

Wiring - A proper wiring job is important to get a reliable vehicle

Example of a finished engine harness.

Use a firewall bushing to prevent damage to the cables.

Use shrink tubing with adhesive when splicing cables.

Engine ground wire - Very important!

- **The ECU Engine ground wire must ALWAYS be connected to cylinder head**
- **Engine must ALWAYS be grounded to the chassis**
- **Battery negative (-) must ALWAYS be connected to chassis**

Inputs

Intake air temperature sensor (IAT)
This sensor is optional, although highly recommended especially for forced induction engines. The sensor should be mounted in the intake manifold or intake pipes (after the intercooler for forced induction engines). Use a temperature sensor with an exposed sensing element (faster response time) for forced induction engines.

Throttle position sensor (TPS)
The TPS should be mounted on the actual throttle body, and output a linear signal all the way from closed to fully open. Almost all newer and aftermarket sensors do this, but if your throttle body and TPS are very old or have high mileage you should consider replacing them, as a clean signal is important to get a smooth-running engine.

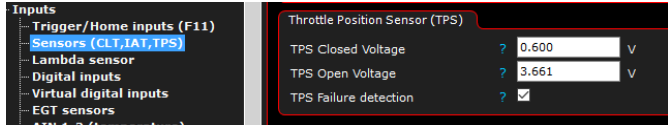
E-Throttle installation? --> maxxecu.com/support

Lambda sensor (WBO)
All MaxxECU units have built-in wideband controller(s). Supports Bosch LSU 4.2 and 4.9. External wideband electronics can be connected to MaxxECU 0-5V analog inputs (AIN) channels.

Make sure the correct type of sensor is selected in MTune before connecting the sensor, otherwise the sensor WILL be damaged. Never connect or disconnect the sensor with the power on.

Exhaust gas temperature sensors (EGT)
MaxxECU RACE and PRO have built-in EGT amplifiers connected to the wiring harness. Inputs --> EGT sensors.
Use only good quality EGT sensors and special "type K/N" thermocouple cable and connectors.

Coolant temperature sensor (CLT)
The CLT sensor should be mounted in the engine block/head where the water flow will not be affected by the thermostat. The sensor should never be mounted on the radiator or the coolant hoses.



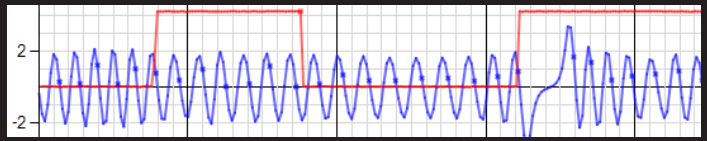
Don't forget to calibrate sensors, Inputs --> Sensors (CLT, IAT, TPS)

MAP-sensor
All MaxxECU units have a built-in MAP sensor, up to 3 bar/43.5 psi of boost. An external MAP sensor can be connected to MaxxECU 0-5V analog input (AIN) channels if more boost pressure is expected.

Analog inputs (AINx)
Used for temperature and pressure sensors or other 0-5V position sensors. Inputs --> AIN.

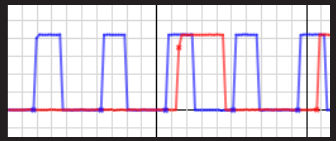
Digital inputs (DINx)
Can be used to control MaxxECU functions, such as start logging, launch control activation, anti-lag enabling, shift-cut, speed sensor, boost selection, nitrous activation etc. Inputs --> Digital inputs.
Inputs marked "VR" can also be connected directly to VR-sensors such as ABS-wheel speed sensors.

Trigger sensor
A trigger sensor must be connected to MaxxECU to read engine RPM.

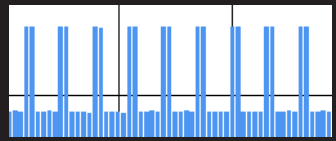


MaxxECU has a built-in trigger oscilloscope for easy fault diagnostics and examination of trigger signals. Here, a VR sensor connected to TRIGGER (blue line) and a digital sensor connected to HOME (red line). Diagnostics --> Trigger oscilloscope

Home/CAM sensor
A home/cam sensor must be fitted to run engines sequentially.



Two digital inputs connected to TRIGGER and HOME. Diagnostics --> Trigger oscilloscope



Using the built-in trigger logger, connected signals can be examined and sent to us for implemantions of new trigger types. Diagnostics --> Trigger logger

Trigger problem? --> maxxecu.com/support

Outputs

Ignition (IGN)

- Must be connected directly to an ignition module or to a coil with built-in amplifiers, wired to the engine in cylinder order.
- Coils without built-in drivers MUST be connected via external ignition modules.
- It is highly recommended to disconnect all ignition-related products during ECU configuration.
- MaxxECU ignition outputs produce a +5V signal to control ignition modules.
- Some ignition boxes designed to be triggered from ground (MSD for example), must be connected to GPOs instead.

Injection (INJ)

- All injectors should be wired to the engine in cylinder order.
- Do not connect low impedance injectors to MINI/STREET without a power resistor, failing to do so will result in damage.
- MaxxECU grounds the INJ outputs to open the injector,
- Unused injector outputs can also be used as general-purpose outputs (grounding).

MaxxECU MINI/STREET is designed to be used with high impedance injectors only.
Injector impedance can be checked by using a multimeter.
Greater than 8 ohms --> High impedance injectors.
Lower than 8 ohms --> Low impedance injectors --> external power resistors (~4.7ohm) MUST be fitted in series with injectors.

MaxxECU SPORT/RACE/PRO is designed to work with both high and low impedance injectors (no external resistors needed).

General Purpose Outputs (GPO)

- GPOs are capable of closing the circuit to GND or producing a pulsed waveform with varying duty cycle and/or frequency.
- Some GPOs are marked "+12V" and are therefore able to provide a direct output of +12V instead of ground.

Motor outputs/E-Throttle (H-bridge)

- When output is off/disabled, the output is grounded.
- When output is on/activated, the output is +12V.

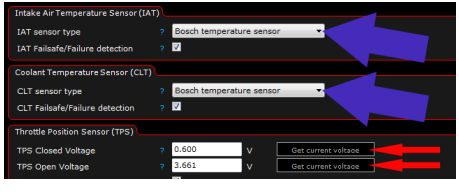
Wiring problem? --> maxxecu.com/support

Engine start

After installing the MTune PC-software, connect the included USB-cable and power up the ECU.
To get started faster, please visit **maxxecu.com/downloads** and download a suitable base tune. Load the file into the MaxxECU by opening (yellow icon to the left) it and following the on-screen instructions.

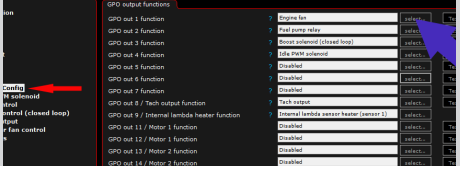
Go through the tabs in MTune and do a basic setup for your engine.
The settings you most likely want to adjust, are listed below:

- The number of cylinders, firing order, engine volume. Configuration --> Engine settings.
- Dwell of ignition coils. Ignition --> Ignition settings.
- Correct ignition systems. Ignition --> Ignition settings.
- Correct fuel injector and fuel type. Fuel --> Fuel Inj General.
- The type of trigger system. Inputs --> Trigger / Home inputs.



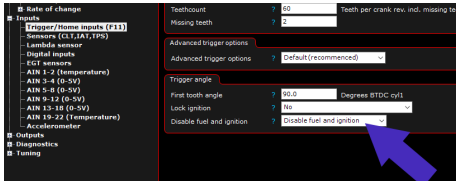
TPS calibration. Inputs --> Sensors (CLT, IAT, TPS).
Calibrate the TPS at 0% and 100% throttle opening positions. Select the CLT and IAT sensors.
Check their values in the RealTime Data tab in the lower part of MTune.

Please note that TPS values is pedal position when using E-Throttle.
E-Throttle help --> maxxecu.com/support



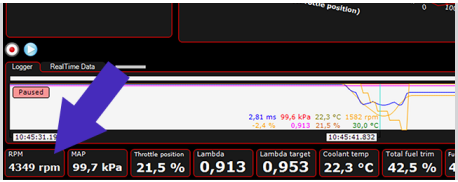
Configure all outputs according to your wiring set-up. Outputs --> Output config.

Use the test output button feature to test certain outputs to ensure correct wiring.
Diagnostics --> Output test to test injectors and coils without cranking the engine.
Please note that outputs need to be activated as injector/coil to be able to use the test feature.



In order to crank the engine WITHOUT trying to start the engine, use the built-in feature Disable fuel /ignition in Inputs --> Trigger/HOME inputs, Trigger angle options.

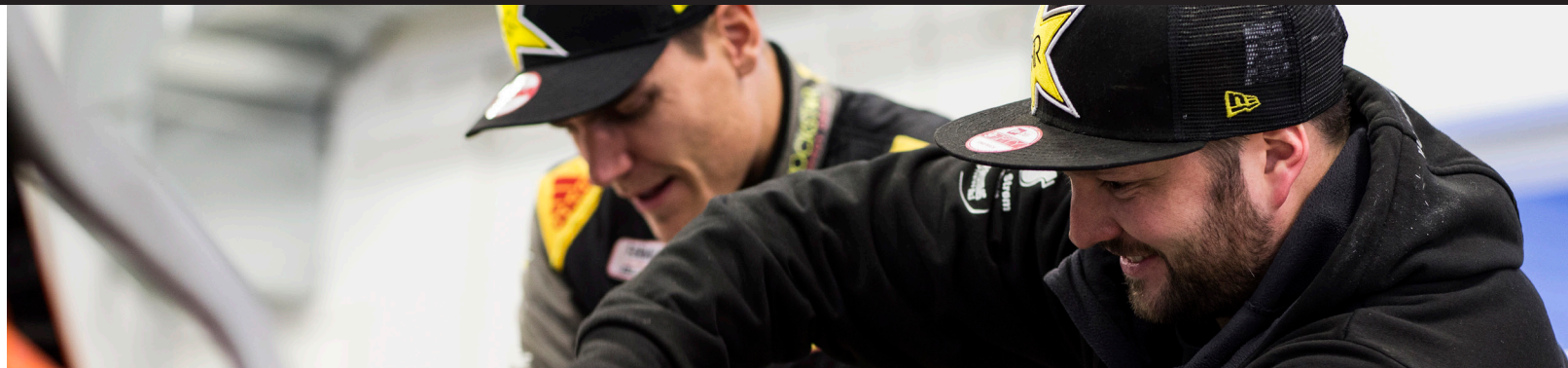
(Please re-enable when subsequently attempting to start the engine)



Start cranking, check trigger polarity, adjust timing with an ignition timing lamp.
Diagnostics --> Trigger oscilloscope - Built-in tool to see actual trigger inputs.
Diagnostics --> Trigger logger - Built-in tool to see the actual time between each trigger input.
Inputs --> Trigger, Trigger angle options - Functions to "lock ignition advance" to sync timing.

When all inputs/outputs are configured and engine settings, trigger systems and ignition are synced, it is time to try to start the engine.

Engine start problems? --> **maxxecu.com/support**



Thank you for using MaxxECU!

"You as a customer is our most valued asset"

MaxxECU

Be a tuning mastermind. Like us.

www.maxxecu.com