

# BOSS GARAGE

## BossECU C1XSE V1

Before connecting the ECU to the car

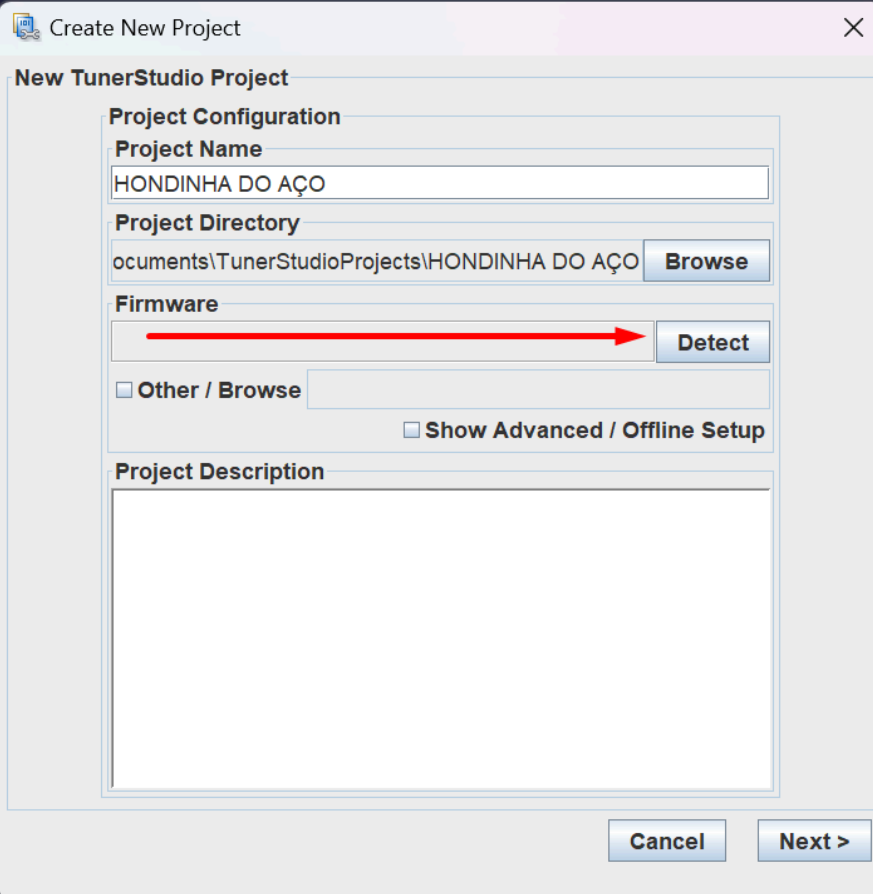
### 1) Download and install:

- TunerStudio software: [LINK](#)
- USB driver: [LINK](#)

### Connectivity:

- **Bluetooth:** Connect via USB to power the ECU and pair the Bluetooth
- **USB:** Unplug the Bluetooth module and connect via the USB

### 2) Create a project and detect firmware



The screenshot shows the 'Create New Project' dialog box in TunerStudio. The window has a title bar with a close button (X). The main content area is titled 'New TunerStudio Project' and contains several sections:

- Project Configuration:**
  - Project Name:** A text box containing 'HONDINHA DO AÇO'.
  - Project Directory:** A text box showing 'ocuments\TunerStudioProjects\HONDINHA DO AÇO' with a 'Browse' button to its right.
  - Firmware:** A section with a red arrow pointing to a 'Detect' button. Below it is a checkbox labeled 'Other / Browse' followed by an empty text box.
  - A checkbox labeled 'Show Advanced / Offline Setup' is located below the 'Other / Browse' section.
- Project Description:** A large empty text area at the bottom of the configuration section.

At the bottom of the dialog box are two buttons: 'Cancel' and 'Next >'.



Trigger Settings

File View Help

**Trigger Settings**

Trigger Pattern Missing Tooth

Primary base teeth 60

Primary trigger speed Crank Speed

Missing teeth 2

Trigger angle multiplier 0

Trigger Angle (Deg) 255

This number represents the angle ATDC when tooth #1 passes the primary sensor.

Skip Revolutions(cycles) 1

Note: This is the number of revolutions that will be skipped during cranking before the injectors and coils are fired

Trigger edge RISING

Secondary trigger edge RISING

Level for 1st phase Low

Missing Tooth Secondary type Single tooth cam

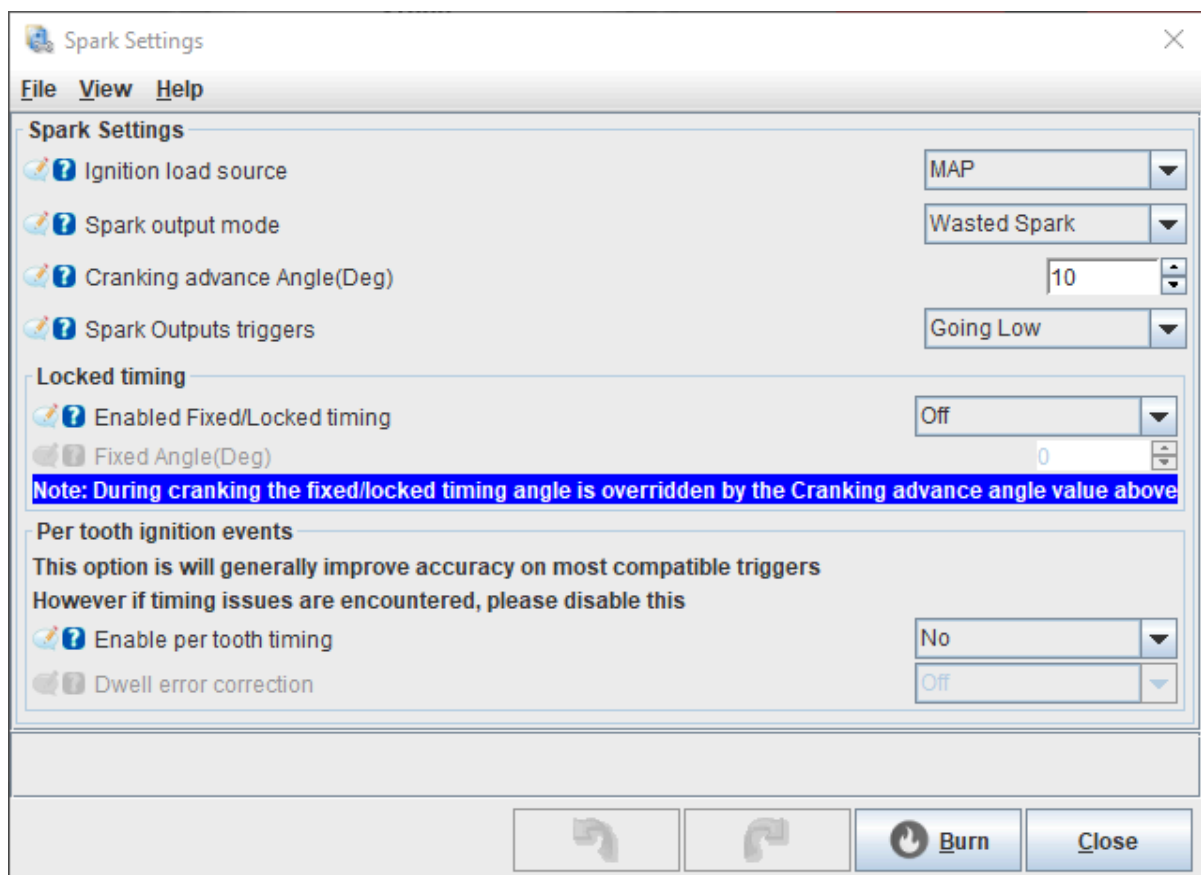
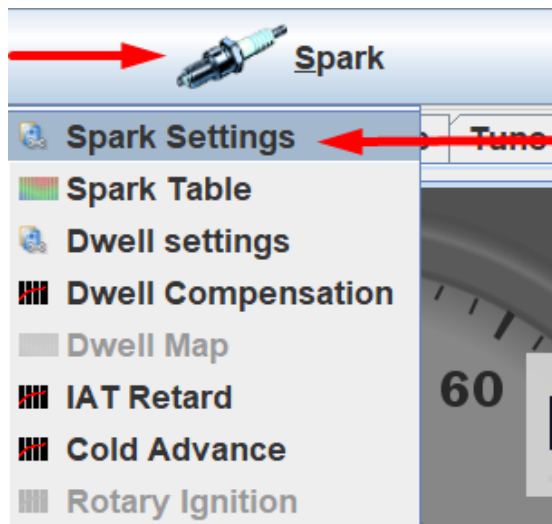
Trigger Filter Medium

Re-sync every cycle No

#### 4) Ignition

On the board Jumper JP1, select the voltage sent to the coils:

- Distributor coil: 12V
- VAG / K20 coils: 5V



Spark output mode:

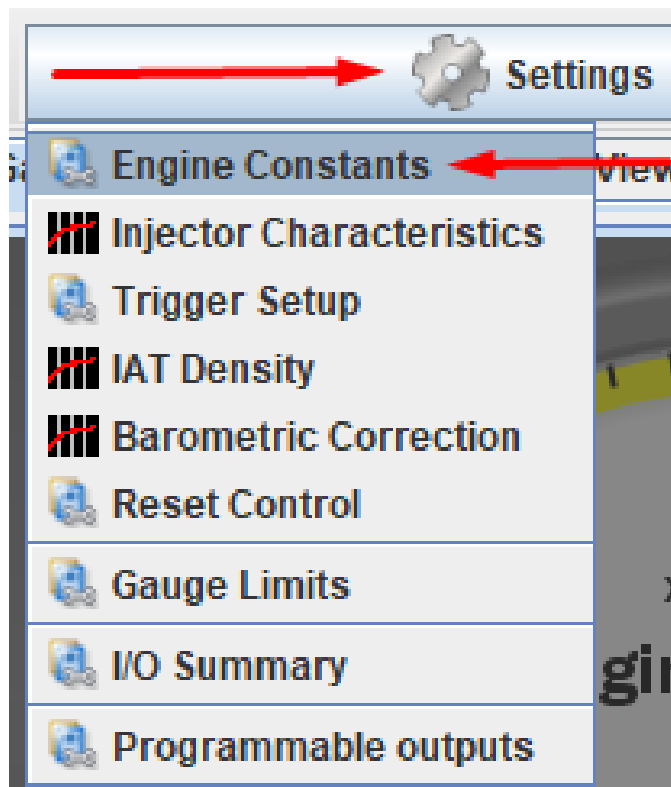
- Single channel: Distributor
- Wasted spark: Only uses 2 signals and sparks the plugs in pairs

Spark output triggers:

- Honda distributor: Going High
- Smart coils: Going Low (most of them)

### 5) Injection:

**WARNING:** Use only high impedance injectors (> 8 ohm) or low impedance with resistor box.



Calculate Required Fuel

12.8  
(ms) 12.8

MAP

Squirts Per Engine Cycle 2

Alternating

Four-stroke

4

Port

4

Even fire

Speeduino Board

**This is a critical setting!**

Outputs WILL NOT work if incorrect board is selected

Speeduino v0.4

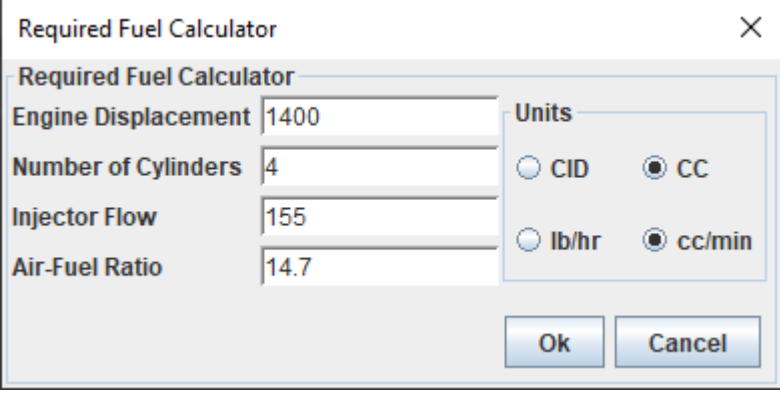
14.7

Paired

Cycle Average

2000

Change the engine displacement and injector flow rate



Required Fuel Calculator

Engine Displacement: 1400

Number of Cylinders: 4

Injector Flow: 155

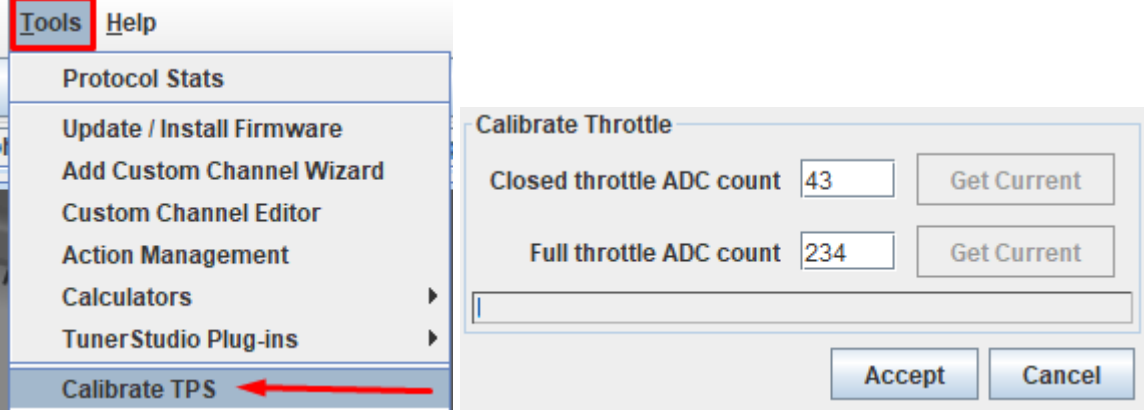
Air-Fuel Ratio: 14.7

Units: ☐ CID ☒ CC  
☐ lb/hr ☒ cc/min

Ok Cancel

Connect the ECU to the car

## 6) Calibrate TPS



Tools Help

- Protocol Stats
- Update / Install Firmware
- Add Custom Channel Wizard
- Custom Channel Editor
- Action Management
- Calculators
- TunerStudio Plug-ins
- Calibrate TPS

Calibrate Throttle

Closed throttle ADC count: 43 Get Current

Full throttle ADC count: 234 Get Current

Accept Cancel

Click on the closed throttle "Get current" button.

Then press full throttle and click on the full throttle "Get current" button.

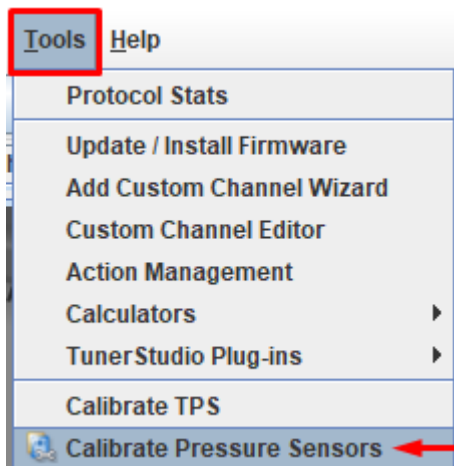
Now, click "Accept" to save.

## 7) Calibrate MAP

STOCK = Sensor in the engine bay

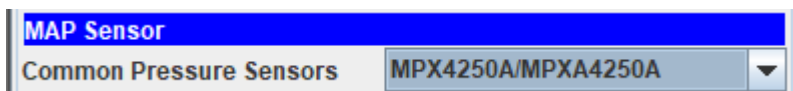
MPX = Map sensor on the board

Stock map sensor configurations:

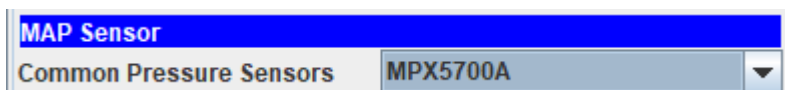


**If it uses a map sensor on the board:**

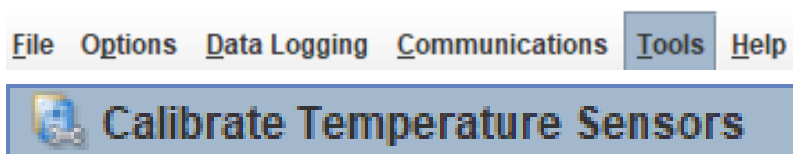
MPX42050AP



MPX5700AP



## 8) Calibrate temperature sensors



Calibrate Thermistor Tables.

Help

Calibrate Thermistor Tables.

Sensor Table
 

Coolant Temperature Sensor

Table Input Solution
 

3 Point Therm Generator

Thermistor Measurements
 

Common Sensor Values 

Select a Common Sensor

Bias Resistor Value (Ohms)
 

2490

☐ Fahrenheit
 ☒ Celsius

Temperature(°C)	Resistance (Ohms)
<div>0</div>	<div>5750</div>
<div>50</div>	<div>850</div>
<div>100</div>	<div>200</div>

Select settings, click  
"Write to Controller"

Write to Controller

Close

Calibrate Thermistor Tables.

Help

Calibrate Thermistor Tables.

Sensor Table
 

Air Temperature Sensor

Table Input Solution
 

3 Point Therm Generator

Thermistor Measurements
 

Common Sensor Values 

Select a Common Sensor

Bias Resistor Value (Ohms)
 

2490

☐ Fahrenheit
 ☒ Celsius

Temperature(°C)	Resistance (Ohms)
<div>0</div>	<div>5500</div>
<div>30</div>	<div>1800</div>
<div>60</div>	<div>600</div>

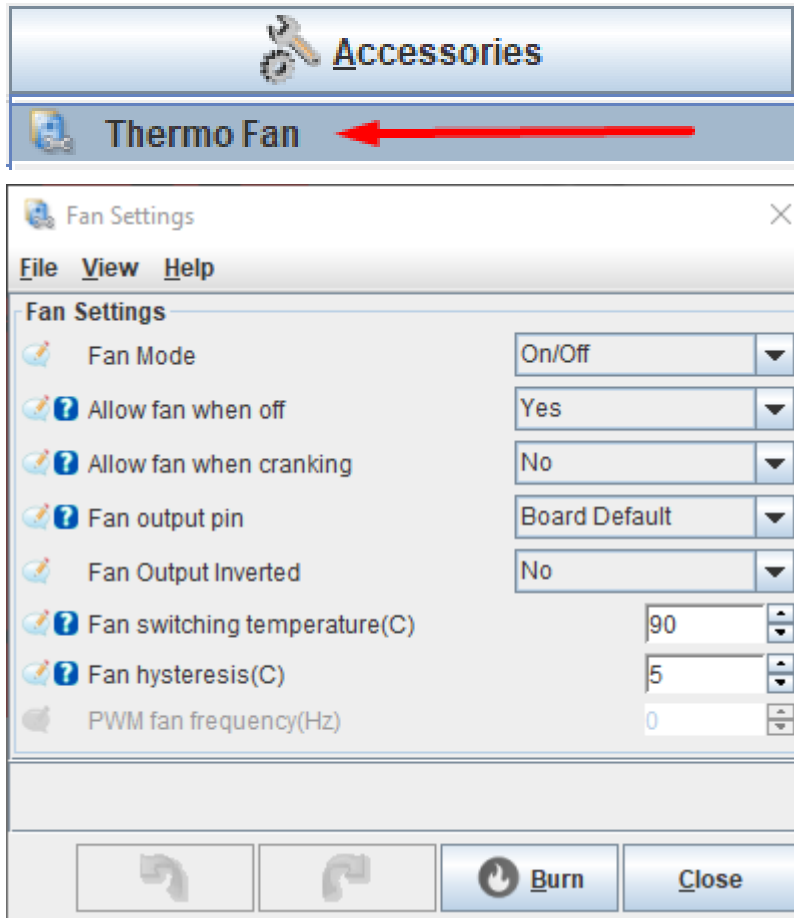
Select settings, click  
"Write to Controller"

Write to Controller

Close

## 9) Electric Fan

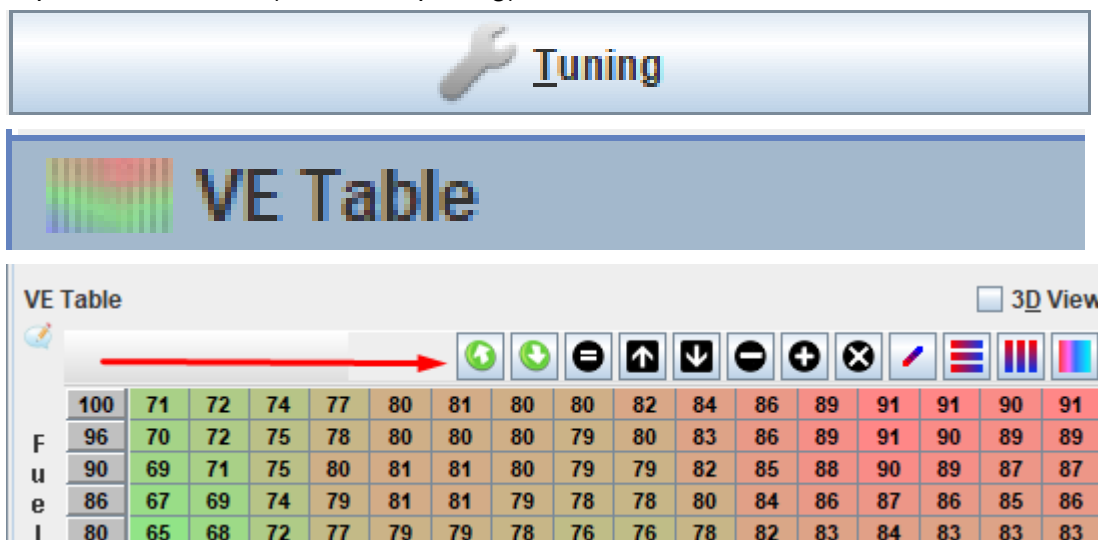
Connect the auxiliary output **FAN** on the PCB to the negative terminal of the FAN relay coil.



## 10) Base timing

To sync the ignition timing with the engine, it's necessary to adjust with the help of a [Timing Light gun](#).

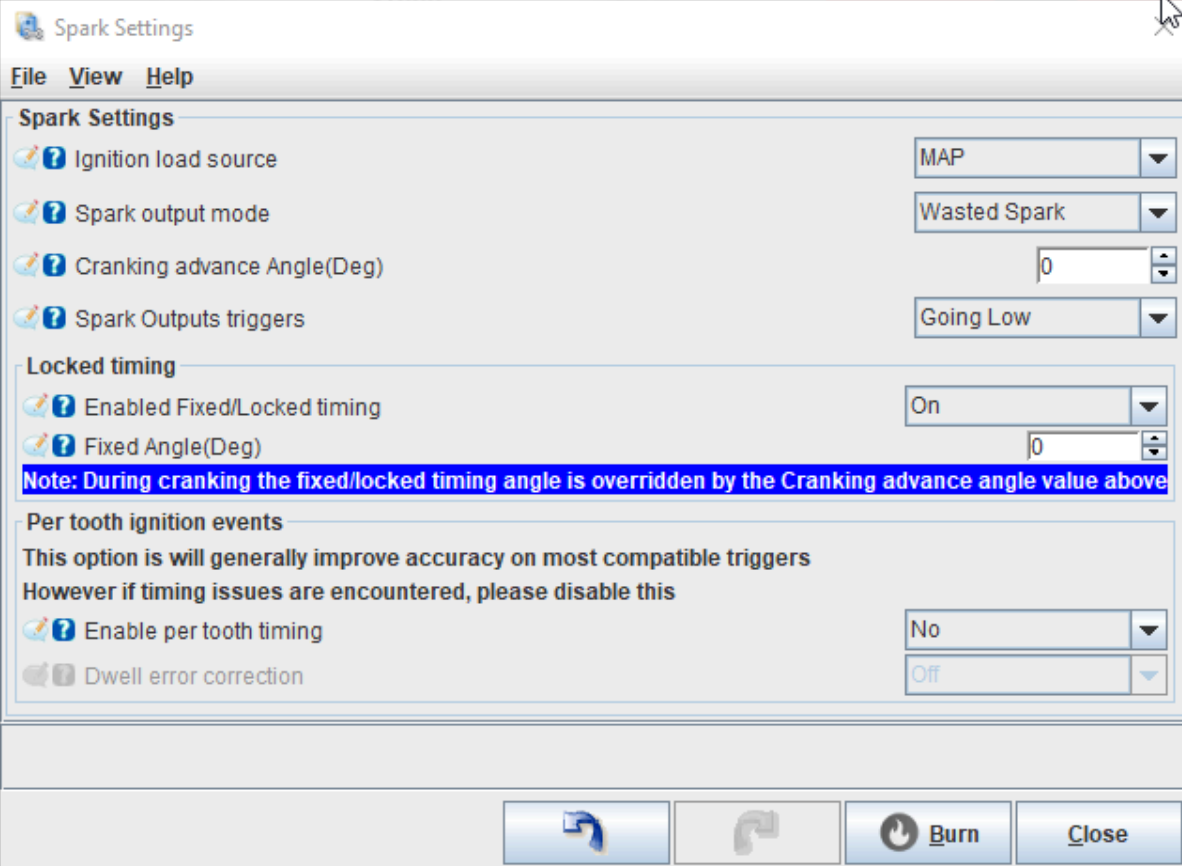
Export the VE Table (for later importing)



Zero all the table or disconnect the injectors, so while cranking doesn't inject fuel

Fuel Load : kPa	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↩	500	700	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500
RPM																	

Lock the timing



Spark Settings

File View Help

**Spark Settings**

Ignition load source: MAP

Spark output mode: Wasted Spark

Cranking advance Angle(Deg): 0

Spark Outputs triggers: Going Low

**Locked timing**

Enabled Fixed/Locked timing: On

Fixed Angle(Deg): 0

**Note: During cranking the fixed/locked timing angle is overridden by the Cranking advance angle value above**

**Per tooth ignition events**

This option is will generally improve accuracy on most compatible triggers  
However if timing issues are encountered, please disable this

Enable per tooth timing: No

Dwell error correction: Off

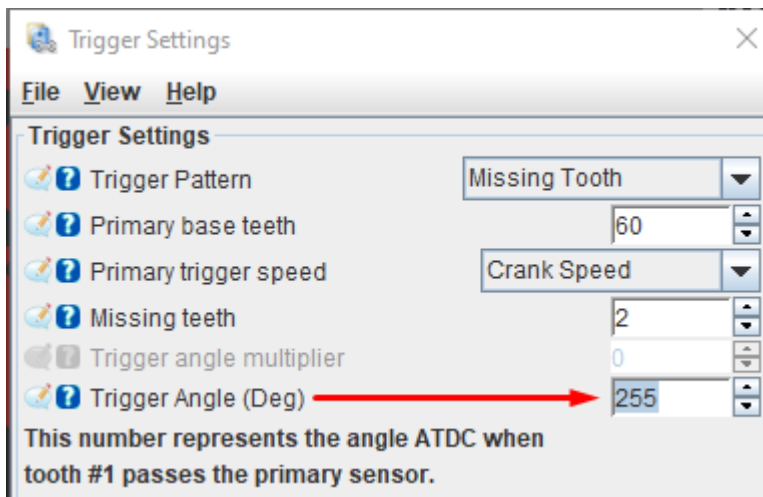
Buttons: ↩, ↶, 🔥 Burn, Close

In the crank pulley, mark 0 degrees with a white highlighter.

Put the timing light clamp on the spark plug wire number 1  
(with the direction of the arrow pointing to the spark plug)

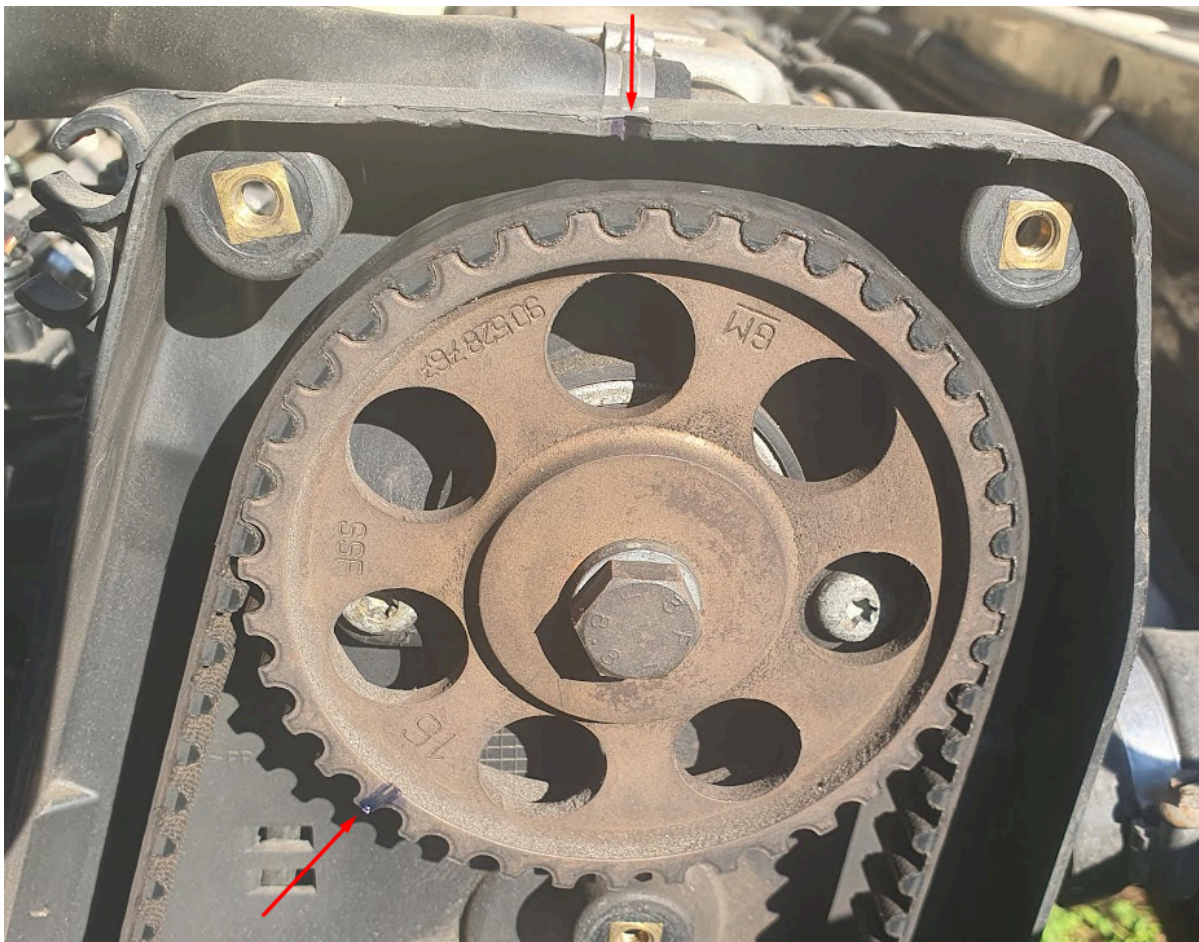


## Trigger Setup

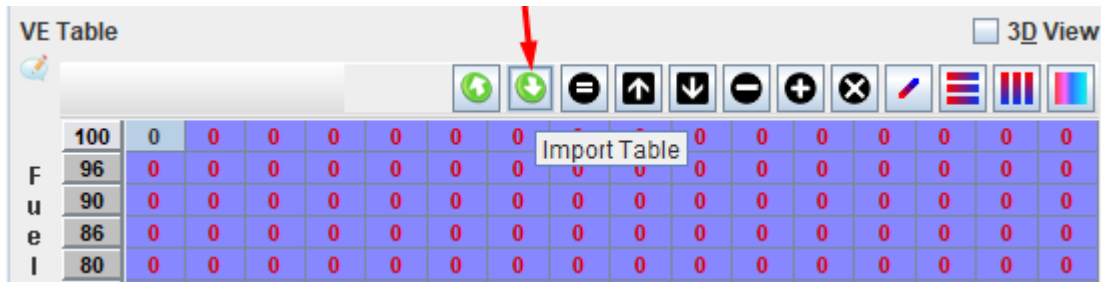


Crank the engine and see if you can see the 0-degree mark...  
If you can't, adjust 30° in 30° in **trigger angle** settings until you see it.

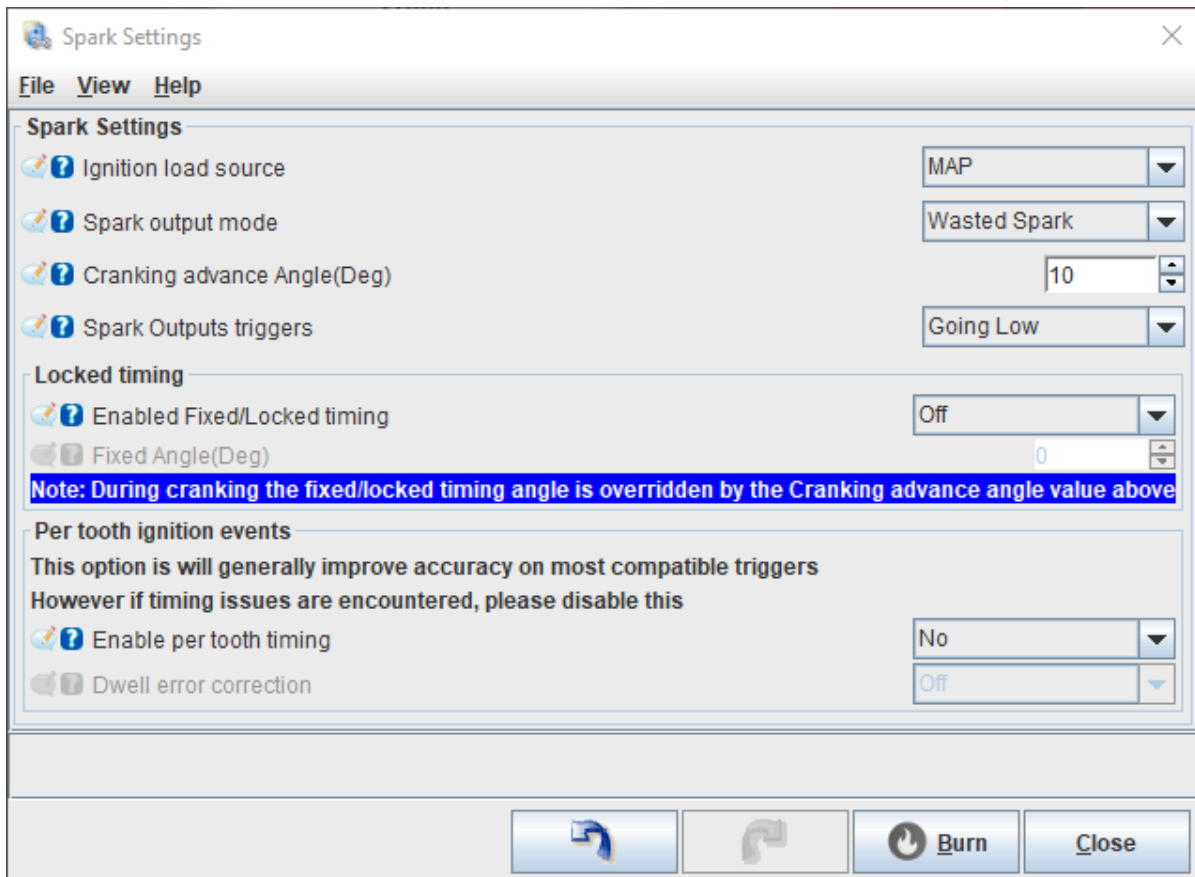
Then make fine adjustments until the crank mark lines up with the distribution cover mark.



After the base timing is synchronized, import the VE table or connect the injectors.



Now, unlock the timing and insert 5 to 10 degrees for cranking



Now, start your car 🎉🎉🎉

## 11) Idle control



Idle Settings

File View Help

Idle Settings

Idle control type Stepper Open Loop

Crank to run taper(S) 5.0

**Fast Idle**

Fast idle temp(C) -40

**PWM Idle**

Number of outputs 1

Idle valve frequency(Hz) 160

Idle valve direction Normal

Run before start No

**Stepper Idle**

Step time (ms) 4

Cool time (ms) 1

Home steps(Steps) 240

Minimum Steps 1

Don't exceed(Steps) 231

Stepper Inverted No

Stepper Power When Active

**Closed loop Idle**

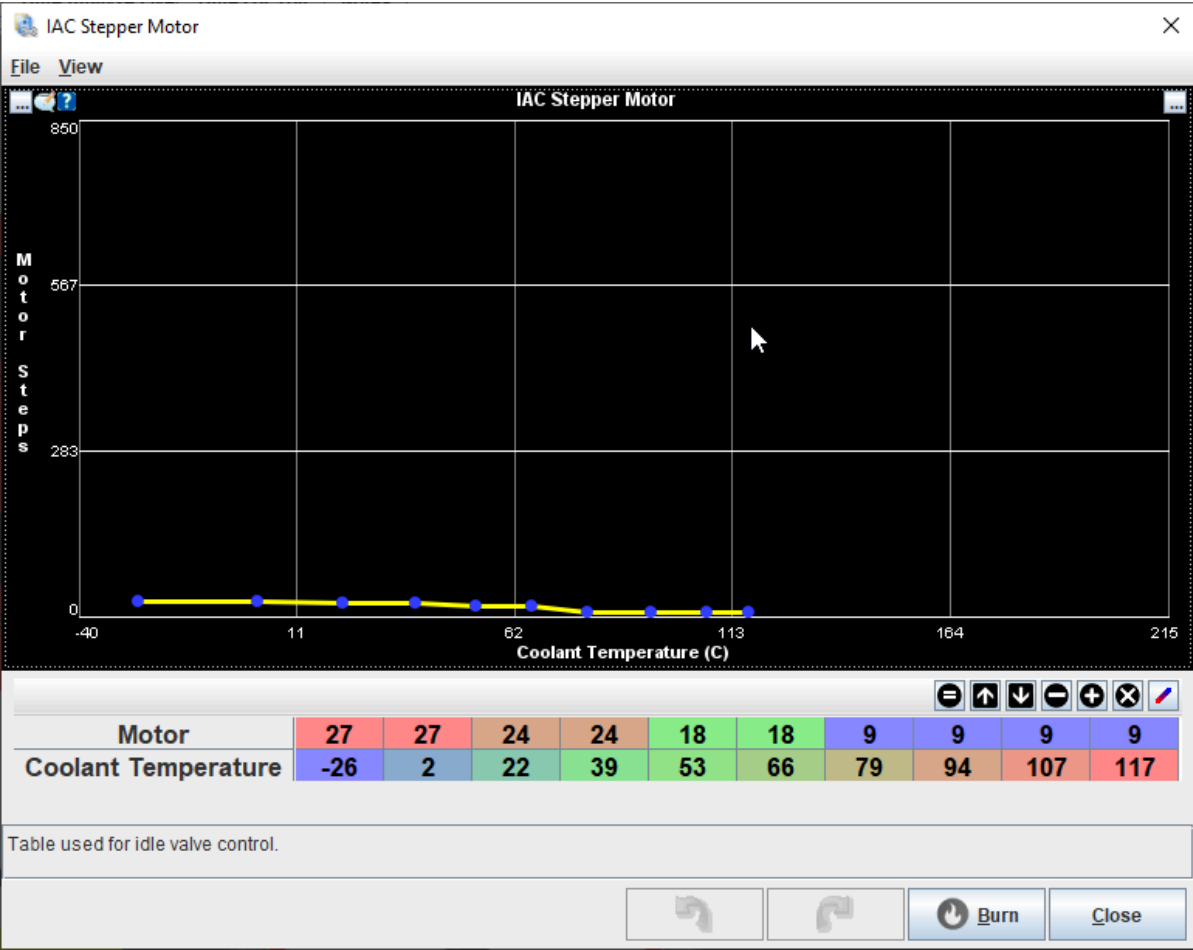
**!!! Please note that 1.0 means 100% !!!**

P(%)	0.03
I(%)	0.09
D(%)	0.000
Minimum valve value(% / Steps)	0
Maximum valve value(% / Steps)	12
Integral reset above TPS(%)	90.0
Integral reset RPM Hysteresis(RPM)	100

Back Home Burn Close

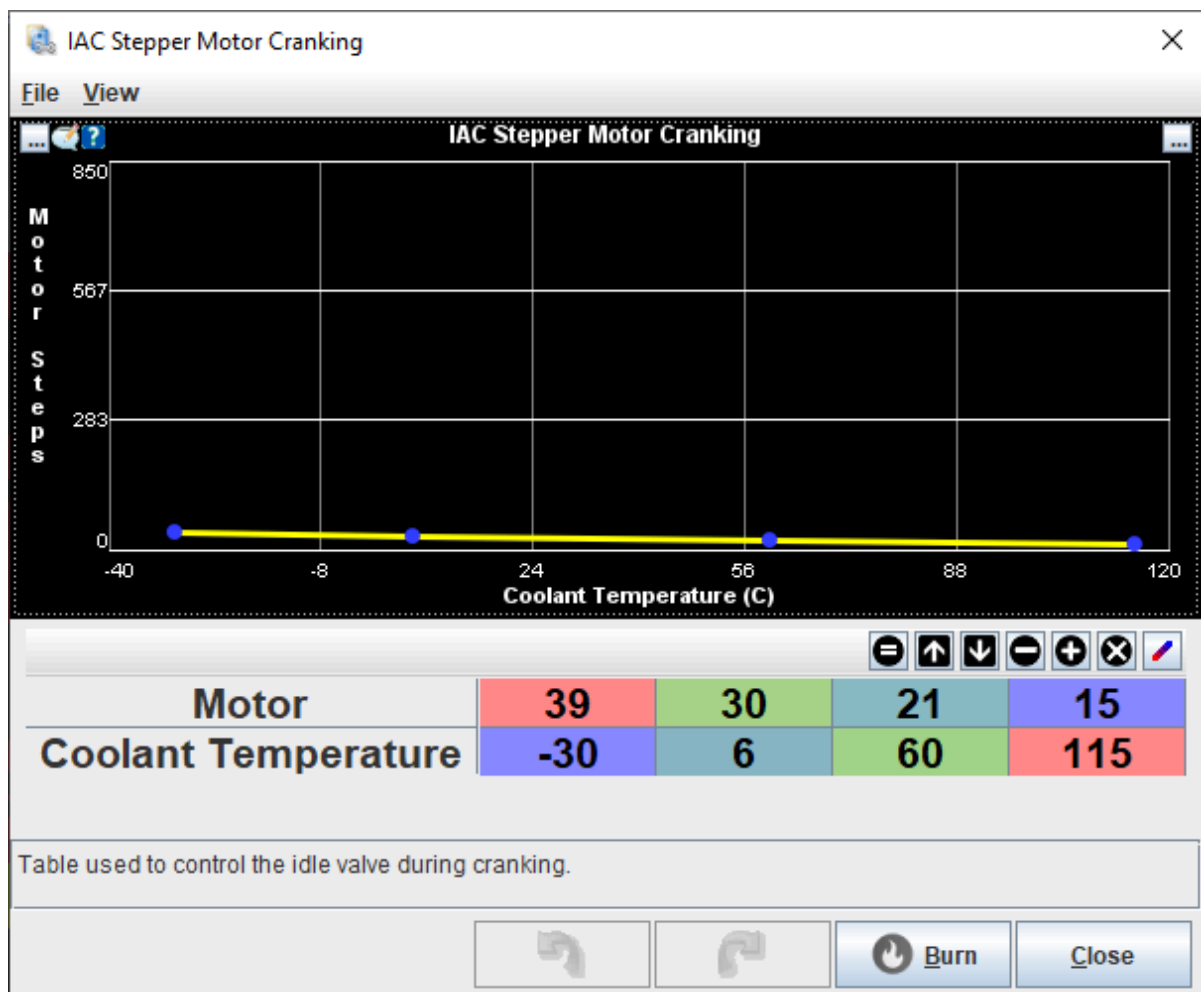
Adjust the duty cycle when the engine is running





Adjust the duty cycle while cranking

## Idle - PWM Cranking Duty Cycle

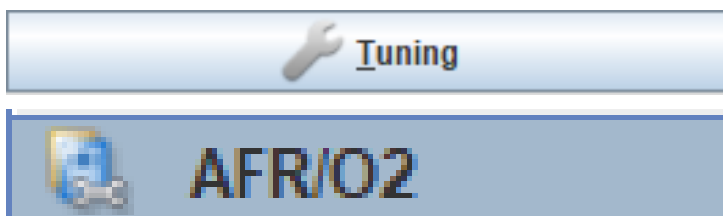


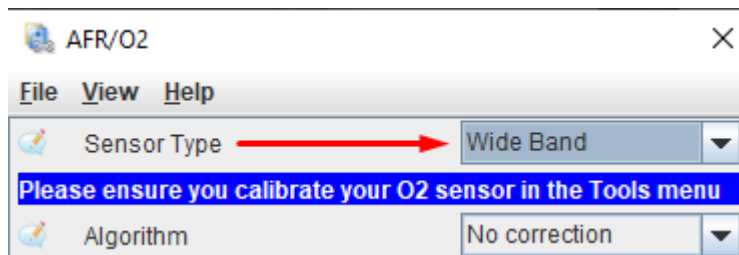
Extra features

### 12) Wideband

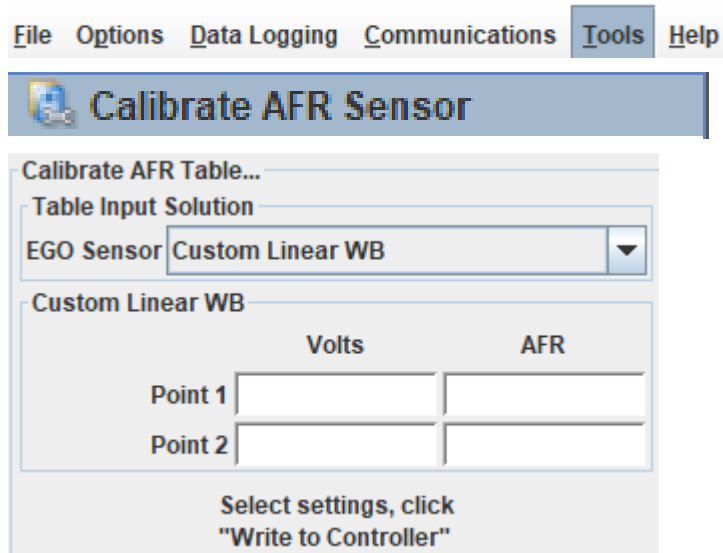
Connect the 0-5V analog wire from the wideband controller to the auxiliary input **WIDEBAND** on the PCB.

Activate the wideband:





Calibrate the sensor settings:

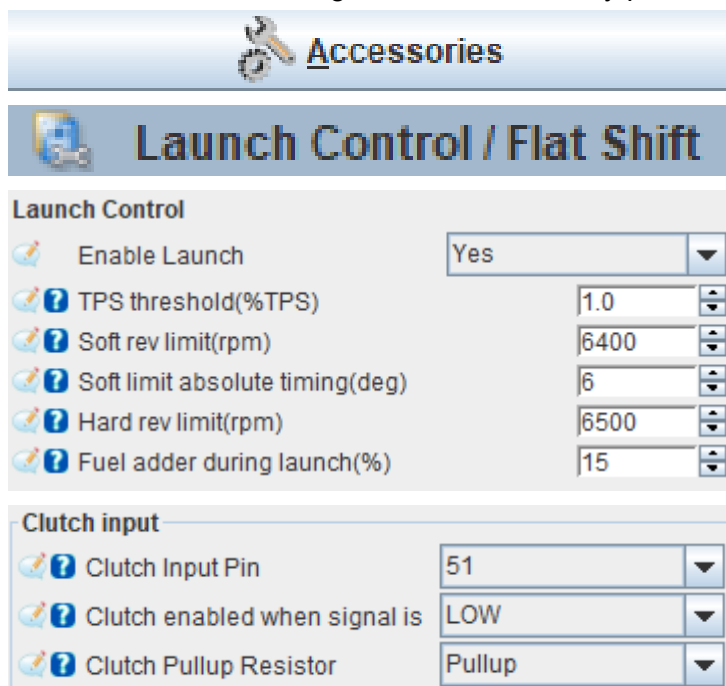


Choose your wideband from the list.

If it's not there, choose "Custom Linear WB" and set the wideband controller values.

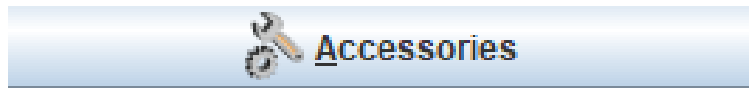
### 13) Launch control

Wire a switch that sends ground to the auxiliary pin **CLUTCH** on the PCB.

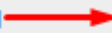


#### 14) Boost control

Connect the auxiliary output **BOOST** on the PCB to the negative wire of the [boost controller valve](#).



**Boost Control**

Boost Control Enabled  On

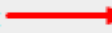
Boost control type Open Loop

Boost output pin 7

Boost solenoid freq.(Hz) 300

**PROTECTION:** Enable boost cut to when the value is reached

**Boost Cut**

Enable Boost limit  On

Boost Limit(kPa) 150


Configure the table:





Mode Open Loop

**Primary Boost table**

In open loop mode, the values in this table are duty cycle %

Boost Duty / Target 



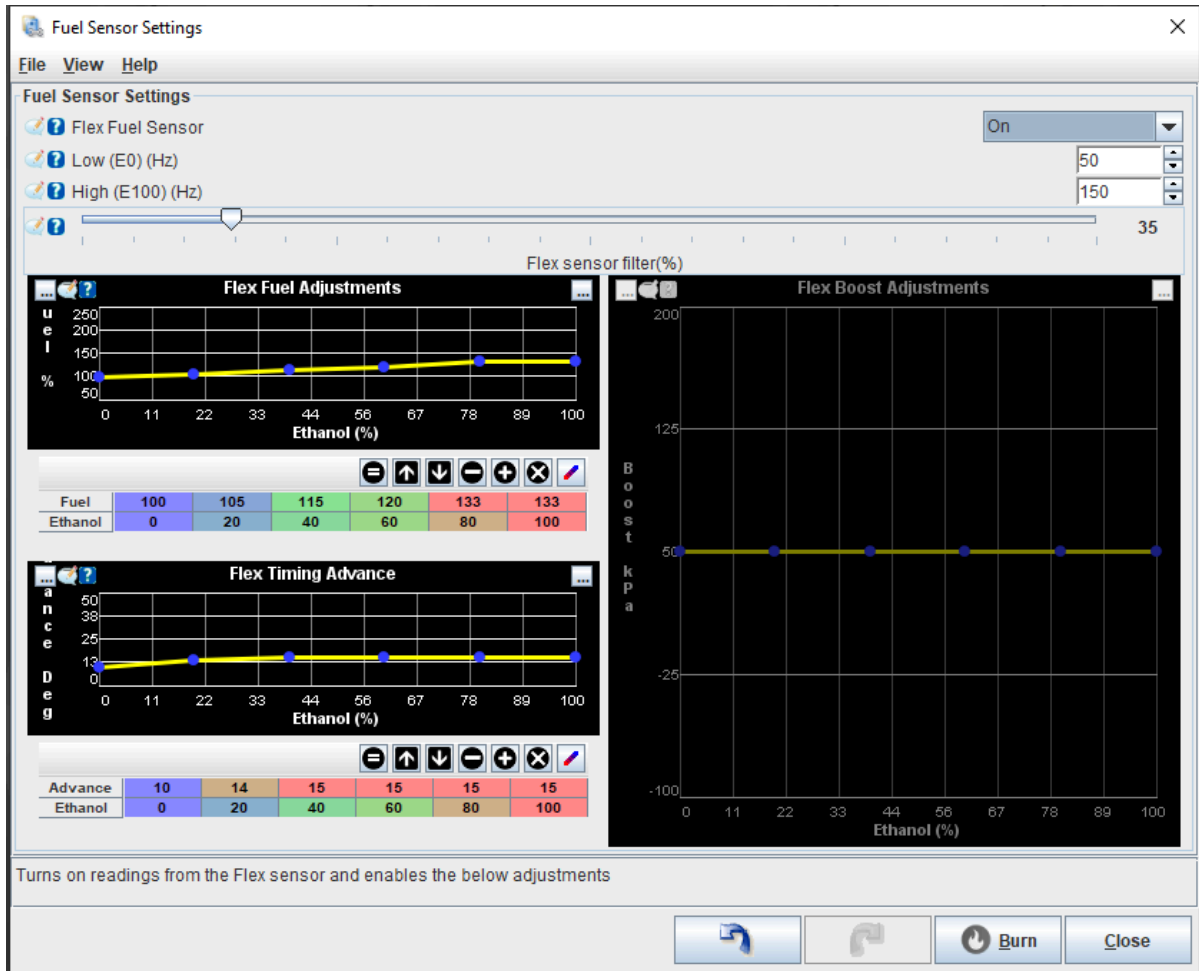
t	100.0	0	0	0	0	0	0	0	0
h	80.0	0	0	0	0	0	0	0	0
r	60.0	0	0	0	0	0	0	0	0
o	40.0	0	0	0	0	0	0	0	0
t	30.0	0	0	0	0	0	0	0	0
t	20.0	0	0	0	0	0	0	0	0
l	10.0	0	0	0	0	0	0	0	0
e	5.0	0	0	0	0	0	0	0	0
:		1500	2000	2500	3000	3500	4000	4500	5000
:									

rpm

#### 15) FLEX

Connect the flex fuel sensor signal to the auxiliary input on the PCB.





## 16) CEL / Shift light / Temp Light

You can use the engine light as a shift light or as you like through a programmable output.



Programmable outputs

File View

Select Rule Number 1

**Rule 1**

Output Pin Num 23

Rule Alias CEL

Output Polarity Active high

**Set 0.0 to disable the delay**

Activation Delay(S) 0.0

2nd Condition OR

**Condition 1**

RPM >= (greater/equal) 6800




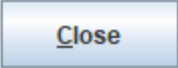
**Condition 2**

coolant >= (greater/equal) 95

**Limit time active**

**Set 0.0 to disable the limit**

Minimum output time(S) 0.0



 Burn
  Close

Wire the output on the PCB to the negative wire of the CEL light in the dashboard.

## 17) Tachometer

Connect the auxiliary output **TACH** on the PCB to the dashboard RPM input.

 Accessories

 **Tacho Output**

**Tacho**

Output pin 49

Tacho pulse mode Fixed Duration

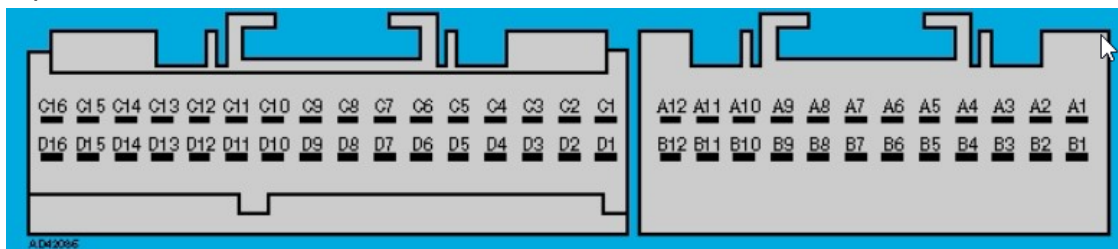
Output speed Normal

Pulse duration(ms) 1

Tacho sweep on boot On

Tacho sweep Max RPM 9000

## 18) ECU Pinout



INPUTS	ECU terminal	Tunerstudio pin
VR1+	A2	x
Manifold pressure	A7	A3
Throttle position	A8	A2
VR1-	B3	x
Coolant temperature	B12	A1
Intake temperature	D3	A0

OUTPUTS	ECU terminal	Tunerstudio pin
Fuel pump / Injectors relay	B6	D45
CEL light	C1	D23
Ignition 2	C3	D38
Injectors 1+2	C10	D8
Injectors 3+4	C11	D9
Ignition 1	D10	D40