

# Spark Gap x4

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Spark Gap x4 is an open-source, universal standalone engine management system designed for the budget-minded enthusiast seeking a comprehensive all-in-one solution. It is compact and feature-rich, utilizing an off-the-shelf case and connector.

Board Selection in tuner studio for this ECU is "Speeduino v0.4"

MCU and Power



Connector-Proto



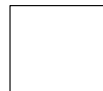
USB-Serial



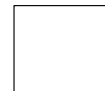
Fuel-Ignition



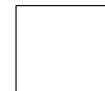
Inputs



CKP-CMP-Input



Output



Notes: revision changes



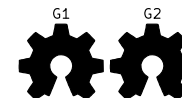
OpenLogicEFI ECU's are designed for use with Speeduino firmware.  
– <https://github.com/noisymime/speeduino>

Board Selection in tuner studio for this ECU is "Speeduino v0.4"

OpenLogicEFI GitHub – <https://github.com/OpenLogicEFI>

Speeduino Official GitHub – <https://github.com/noisymime/speeduino>

Please consider sponsoring Speeduino and Josh on github  
so he can advance his efforts.  
<https://github.com/sponsors/noisymime>



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**OpenLogicEFI**

Sheet: /  
File: Pre\_Ignition.kicad\_sch

**Title: Spark Gap x4**

Size: USLetter Date: 2025-05-18

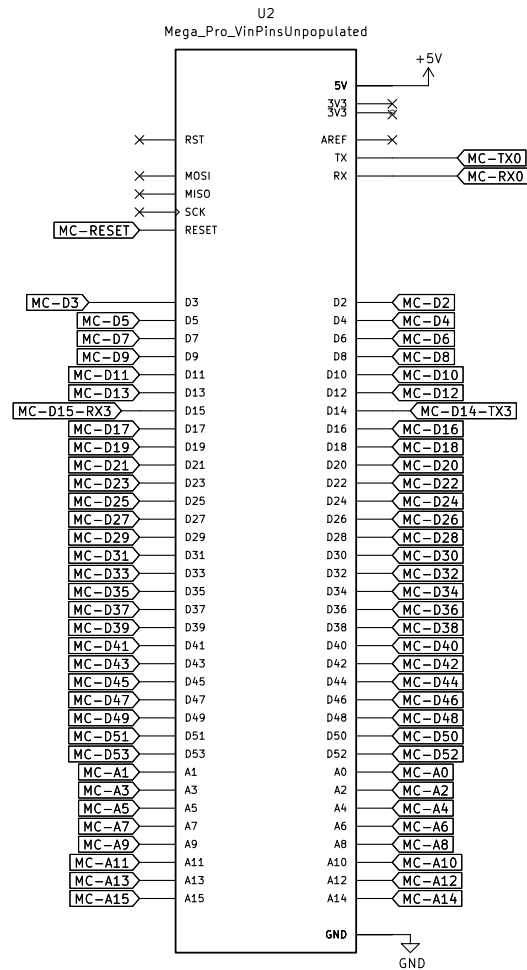
KiCad E.D.A. 9.0.2

**Rev: C**

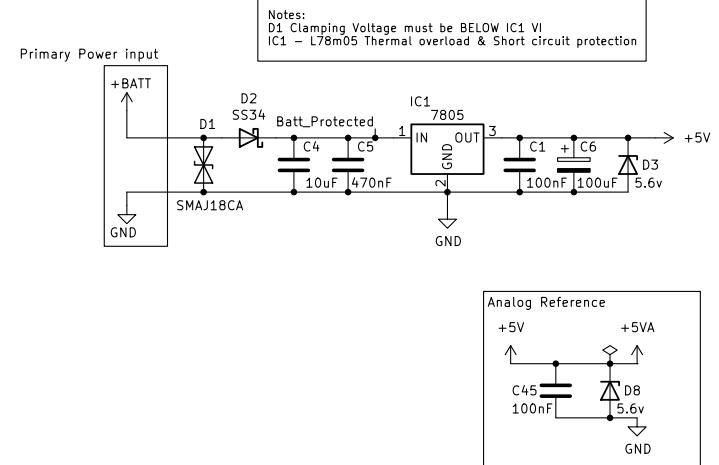
Id: 1/9

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# Mega2560 Pro Mini (Robotdyn Footprint)



## Power Supply



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OpenLogicEFI

Sheet: /MCU and Power/

File: MCU-Power.kicad\_sch

Title: Spark Gap x4

Size: A4

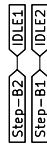
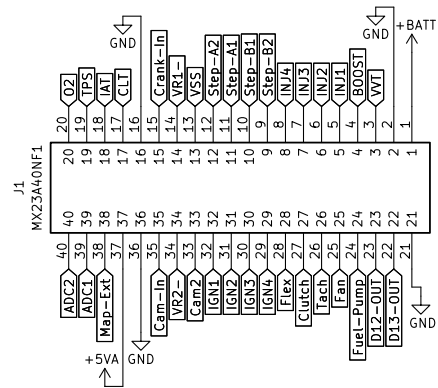
Date: 2025-05-18

Rev: C

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Id: 1/9

# Main Connector



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**OpenLogicEFI**

Sheet: /Connector-Proto/

File: Connector.kicad\_sch

**Title: Spark Gap x4**

Size: A4

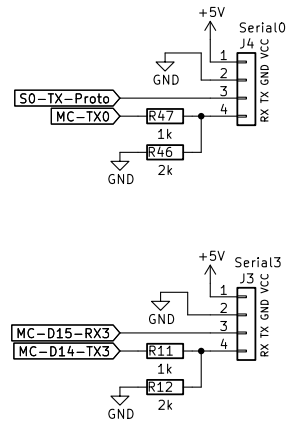
Date: 2025-05-18

**Rev: C**

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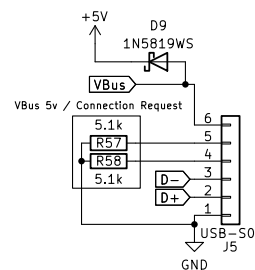
Id: 2/9

## Serial Proto

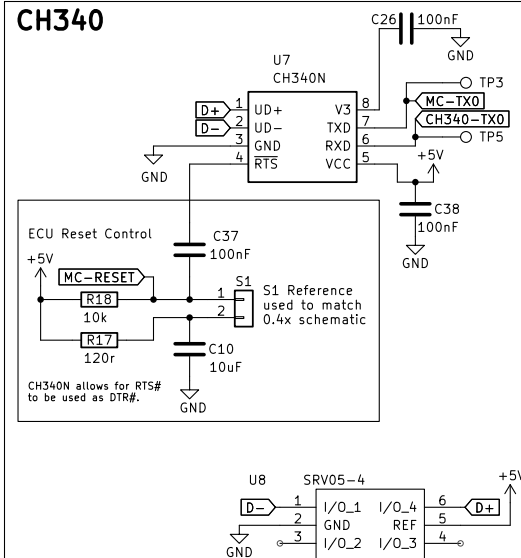


## USB Port

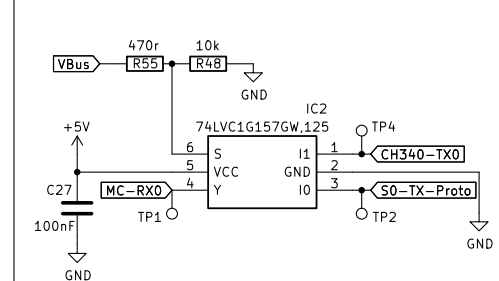
External PH2.0  
pinned usb bulkhead



## CH340



## Serial0 TX Signal Switch/Buffer



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Sheet: /USB-Serial/

File: serial.kicad\_sch

**Title: Spark Gap x4**

Size: A4

Date: 2025-05-18

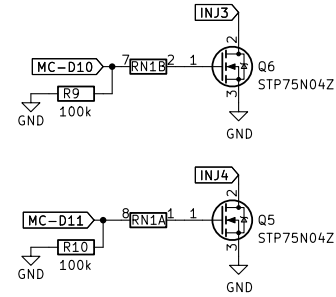
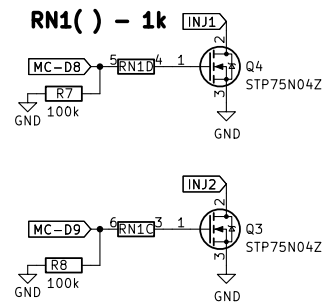
Rev: C

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Id: 3/9

## Fuel Injector Output

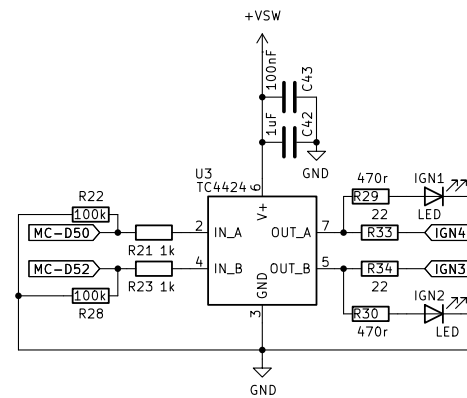
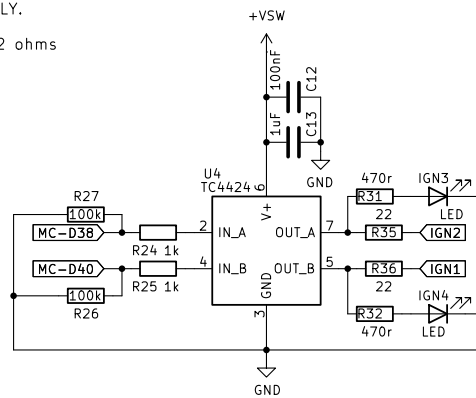
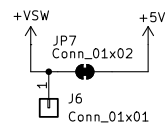
NMOS Must be internally clamped no less than 33v



## Ignition Output

Ignition is Non-Inverting Gate Driver for use with logic level gate control ONLY.

Series output resistors should be 10-22 ohms with a minimum rating of 125 mW.



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**OpenLogicEFI**

Sheet: /Fuel-Ignition/

File: Fuel-Ignition.kicad\_sch

**Title: Spark Gap x4**

Size: A4

Date: 2025-05-18

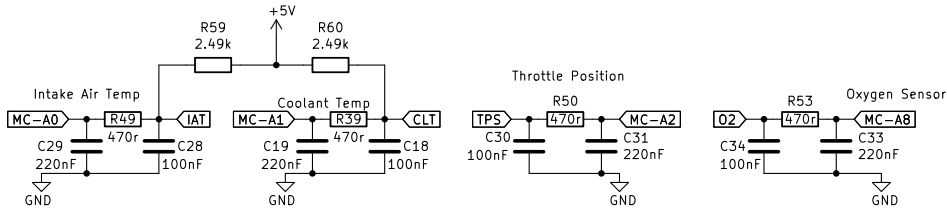
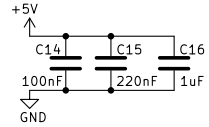
Rev: C

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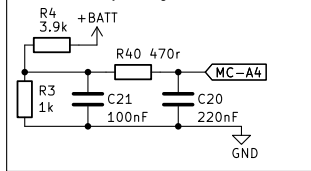
Id: 4/9

## Analog Inputs

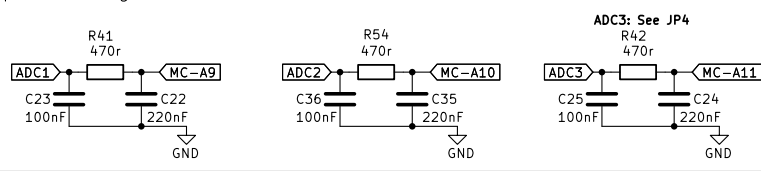
### Decouple Analog



### Battery Voltage Reference

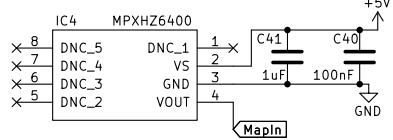


### Spare Analog

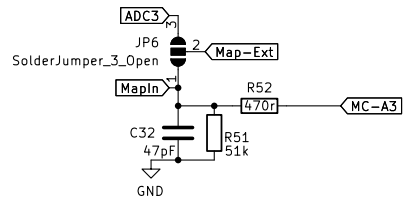
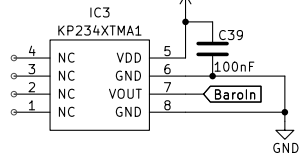


### ADC3: See JP4

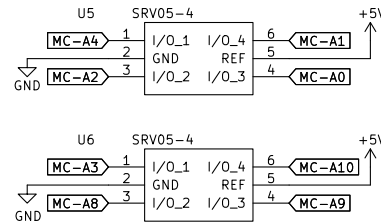
### Map Sensor



### Baro Sensor

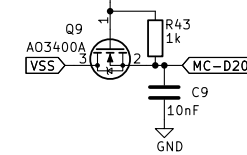


### Clamping

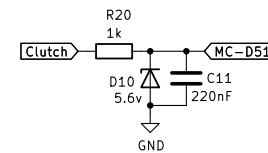


## Digital Inputs (Crank/Cam on Page 7)

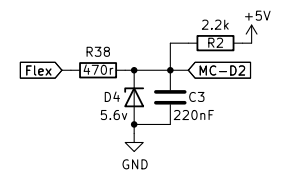
### Spare Digital Input (Vehicle Speed Sensor)



### Clutch Switch (GND Switched)



### Flex Fuel Sensor Input



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Sheet: /Inputs/

File: input.kicad\_sch

Title: Spark Gap x4

Size: A4

Date: 2025-05-18

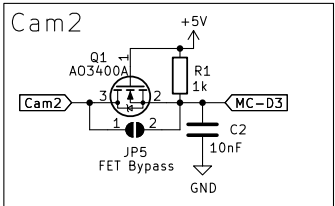
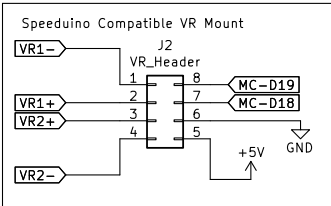
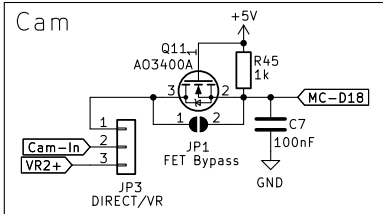
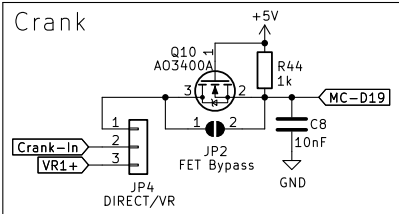
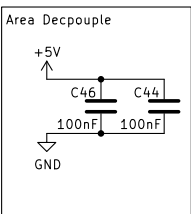
Rev: C

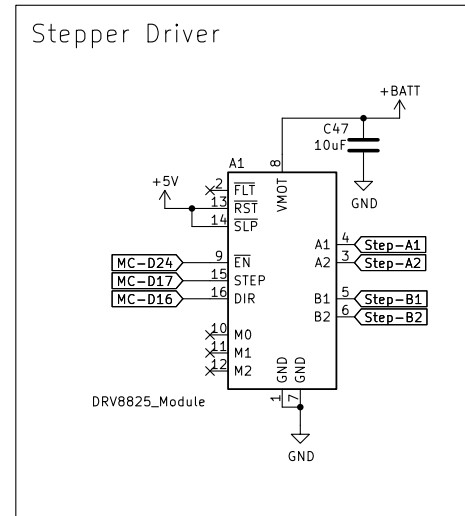
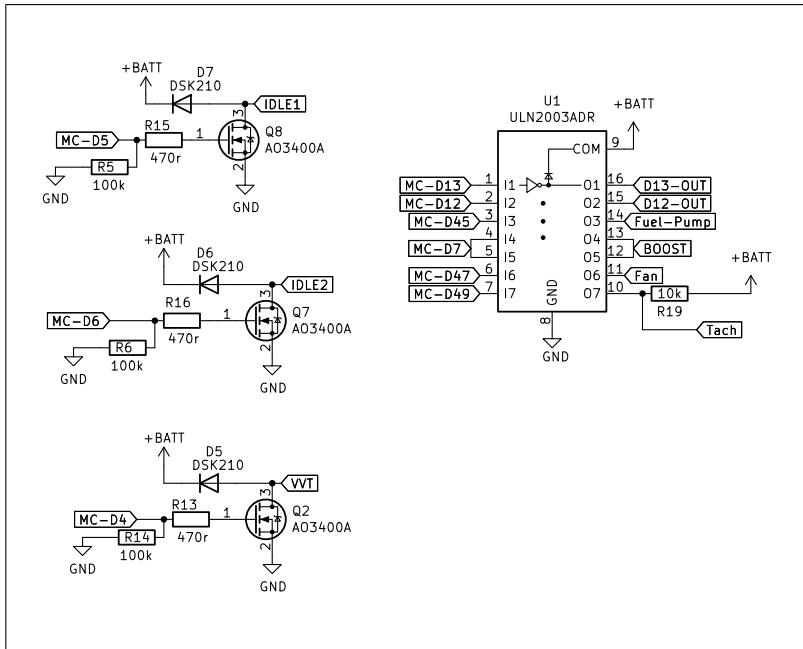
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Id: 5/9

# Crank/Cam Sensor Input

Circuit Reference: Phillips AN97055





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**OpenLogicEFI**

Sheet: /Output/

File: Output.kicad\_sch

**Title: Spark Gap x4**

Size: A4 Date: 2025-05-18

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**Rev: C**

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Spark Gap x4 revision changes:

Notable usage changes:

Added ability to use alternative voltages for Ignition drivers through use of jumper wire.

Usage:

JP6/JP7 added to allow use of alternative ignition driver voltages.

JP7 pin MUST be severed!. ONLY after JP7 is severed, use a jumper wire from alternative voltage source to J6.

Footprint changes:

Minor adjustments in VR conditioner area

Minor adjustments in ignition driver area

Minor adjustments in analog area

Reorganized Analog traces for better noise reduction

Reorganized Cam/Crank traces for better noise reduction

Reorganized traces under primary connector for better spacing

Added additional shotgun vias

Silkscreen Changes:

Minor location adjustments

Updated year to 2025

Updated model number

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**OpenLogicEFI**

Sheet: /Notes: revision changes/

File: notes.kicad\_sch

**Title: Spark Gap x4**

Size: A4

Date: 2025-05-18

Rev: C

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