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Make Your Own ESC by

GreatScottLab (/member/GreatScottLab/) in arduino (/explore/category/technology/keyword/arduino/)

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5 Steps



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In this project I will firstly demonstrate how a common ESC works and afterwards create a circuit consisting of an Arduino Nano, an L6234 motor driver IC and a couple of complementary components in order to build a DIY ESC.

Let's get started!

Step 1: Watch the Videos!

Make your own ESC || BLDC Motor Driver (Part 1)



About This Instructable

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(/member/GreatScottLab/)
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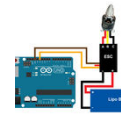


The two videos give you a good idea of what is necessary to do to create your own ESC. In the following steps I will present you some additional information.

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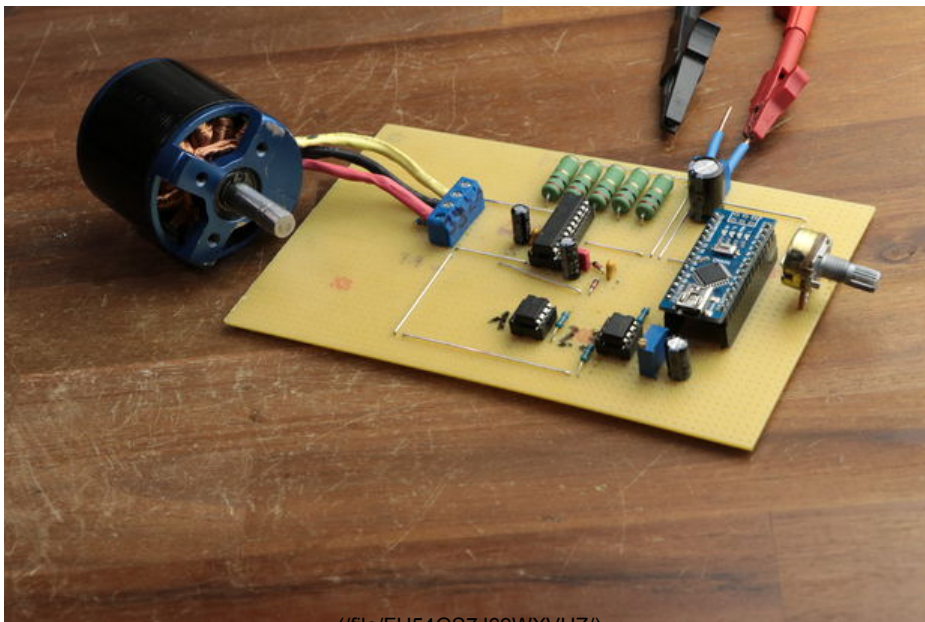
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Step 2: Order Your Components!



Here you can find a parts list with example seller:

Amazon.com:

1x Arduino Nano: <http://amzn.to/2fCdkMI> (<http://amzn.to/2fCdkMI>)

2x LM393 Comparator: <http://amzn.to/2wUuM25> (<http://amzn.to/2wUuM25>)

1x L6234 IC: <http://amzn.to/2wG6WHY> (<http://amzn.to/2wG6WHY>)

4x 470nF, 1x 100nF, 1x 10nF, 1x 220nF Capacitor: <http://amzn.to/2uA0eWA>
(<http://amzn.to/2uA0eWA>)

2x 1µF Capacitor: <http://amzn.to/2vRNvi1> (<http://amzn.to/2vRNvi1>)

4x 1kΩ, 3x 10kΩ Resistor: <http://amzn.to/2wG9Cpk> (<http://amzn.to/2wG9Cpk>)

5x 1Ω Resistor: <http://amzn.to/2fCjiNi> (<http://amzn.to/2fCjiNi>)

2x 10kΩ Potentiometer: <http://amzn.to/2vRZZGf> (<http://amzn.to/2vRZZGf>)

2x 1N4148 Diode: <http://amzn.to/2vyFPhT> (<http://amzn.to/2vyFPhT>)

Ebay:

1x Arduino Nano: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>

(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=162002876661&ipn=psmain&icep_vectorid=229466&kwid=902099&
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2x LM393 Comparator: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>

(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=291549103310&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

1x L6234 IC: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>

(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=221471524653&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

4x 470nF, 1x 100nF, 1x 10nF, 1x 220nF Capacitor:

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(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=221372015123&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

2x 1µF Capacitor: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>

(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=252358753188&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

4x 1kΩ, 3x 10kΩ Resistor: [http://rover.ebay.com/rover/1/711-53200-19255-](http://rover.ebay.com/rover/1/711-53200-19255-0/1?...)

[0/1?...](http://rover.ebay.com/rover/1/711-53200-19255-0/1?...) (<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

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icep_item=401036186511&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

5x 1Ω Resistor: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>

(<http://rover.ebay.com/rover/1/711-53200-19255-0/1?>

icep_ff3=2&pub=5575101368&toolid=10001&campid=5337582279&customid=&
icep_item=181766275671&ipn=psmain&icep_vectorid=229466&kwid=902099&
mtid=824&kw=lg)

2x 1N4148 Diode: <http://rover.ebay.com/rover/1/711-53200-19255-0/1?...>
([http://rover.ebay.com/rover/1/711-53200-19255-0/1?
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1x Arduino Nano: <http://amzn.to/2w0QQLZ> (<http://amzn.to/2w0QQLZ>)

2x LM393 Comparator: <http://amzn.to/2uRTgaM> (<http://amzn.to/2uRTgaM>)

1x L6234 IC: <http://amzn.to/2w2M2VK> (<http://amzn.to/2w2M2VK>)

4x 470nF, 1x 100nF, 1x 10nF, 1x 220nF Capacitor: <http://amzn.to/2wUe03i> (<http://amzn.to/2wUe03i>)

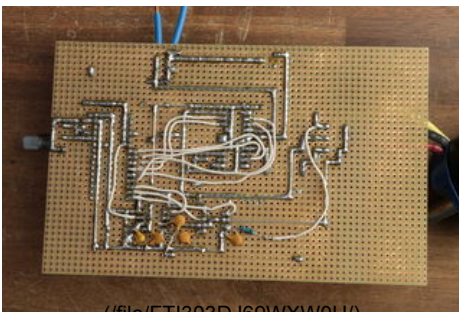
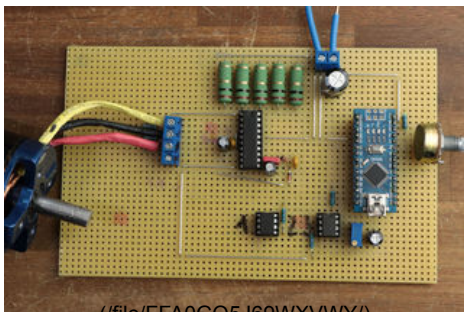
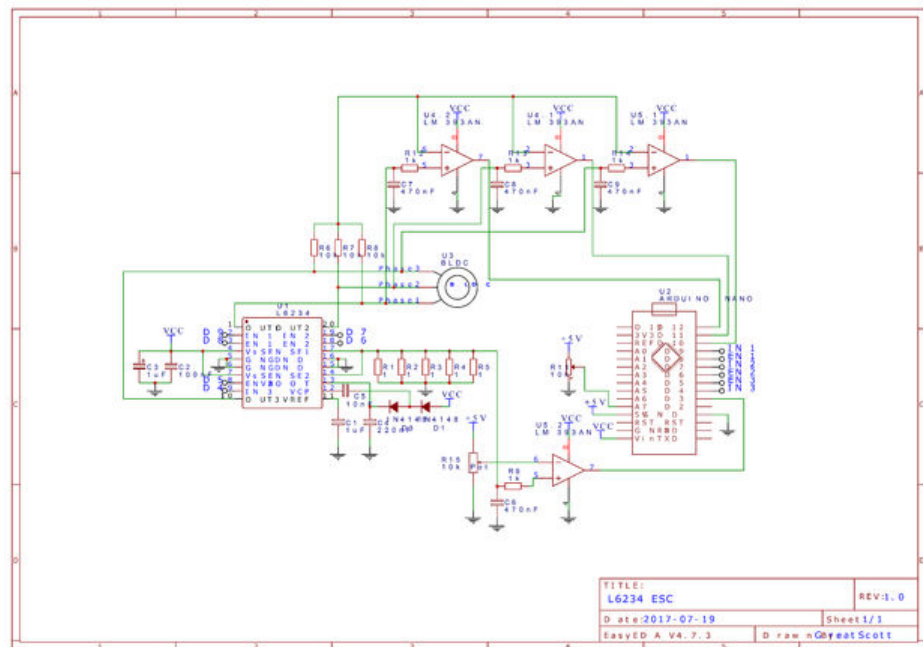
2x 1μF Capacitor: <http://amzn.to/2wUyby6> (<http://amzn.to/2wUyby6>)

4x 1kΩ, 3x 10kΩ Resistor: <http://amzn.to/2vujMKZ> (<http://amzn.to/2vujMKZ>)

5x 1Ω Resistor: <http://amzn.to/2vzjBwc> (<http://amzn.to/2vzjBwc>)

2x 10kΩ Potentiometer: <http://amzn.to/2uRZveE> (<http://amzn.to/2uRZveE>)

2x 1N4148 Diode: <http://amzn.to/2fCTO2E> (<http://amzn.to/2fCTO2E>)



Here you can find the schematic along with reference pictures of my board layout.

Step 4: Upload the Code!

Here you can download the code that I created for the project. Since I created quite a few of them you can download them all.


Sketch 1: Uses the analogRead function to measure the current

Sketch 2: Uses the external interrupt on pin 3 to measure the current

Sketch 3: Uses timer 2 to control the current chopping

Sketch 4: Uses the interrupts on pin 10,11,12 to switch to the next step

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(<https://cdn.instructables.com/orig/FQP/PQDO/J67484OD/FQPPQDOJ67484OD.ino>)

 Download **2.ino** (<https://cdn.instructables.com/orig/FPS/XBVL/J67484PP/FPSXBVLJ67484PP.ino>)
(<https://cdn.instructables.com/orig/FPS/XBVL/J67484PP/FPSXBVLJ67484PP.ino>)

 Download **3.ino** (<https://cdn.instructables.com/orig/F11/RPRP/J67484SU/F11RPRPJ67484SU.ino>)
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 Download **4.ino** (<https://cdn.instructables.com/orig/FD1/0MTP/J67484U4/FD10MTPJ67484U4.ino>)
(<https://cdn.instructables.com/orig/FD1/0MTP/J67484U4/FD10MTPJ67484U4.ino>)

Step 5: Success!

You did it! You just created your own ESC!

Feel free to check out my YouTube channel for more awesome projects:

(<http://www.youtube.com/user/greatscottlab>)

<http://www.youtube.com/user/greatscottlab>

(<http://www.youtube.com/user/greatscottlab>)

You can also follow me on Facebook, Twitter and Google+ for news about upcoming projects and behind the scenes information:

<https://twitter.com/GreatScottLab> (<https://twitter.com/GreatScottLab>)

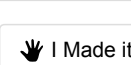
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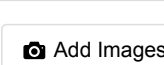
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Please be positive and constructive.

 I Made it!

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kevinmaker2018 (/member/kevinmaker2018/)

2017-08-17

[Reply](#)

Very good project. I had bought some parts from Makerfabs. Hope every thing is OK. Could you please sharing the eagle files? Thanks!



doctek (/member/doctek/)

2017-08-15

[Reply](#)

Very nice! How about a high res version of the schematic that I could actually read? That would be much appreciated.



GreatScottLab (/member/GreatScottLab/) ▶ **doctek** (/member/doctek/)

[Reply](#)

2017-08-16

Left click on the image, left click again and select the resolution on the left side. You can even print it as a poster.



doctek (/member/doctek/) ▶ **GreatScottLab** (/member/GreatScottLab/)

[Reply](#)

2017-08-16

Perfect. Thanks!

samayaraj (/member/samayaraj/)

2017-08-16

[Reply](#)

osm man!

Hamids (/member/Hamids/)

2017-08-15

[Reply](#)

nice job without Fet module , however I was wondering if you've had any research for using the high power IGBT module and its pre driver to control large BLDC motor using in electric car, any advise really appreciated

LesB (/member/LesB/)

2017-08-15

[Reply](#)

What kinds of motors will this work with?

Jonathanrjpereira (/member/Jonathanrjpereira/)

2017-08-15

[Reply](#)

This guy is a Genius!

R Carroll (/member/R+Carroll/)

2017-08-15

[Reply](#)

Is there a motor wattage limit this controller can handle?

AraC3 (/member/AraC3/)

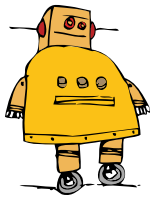
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