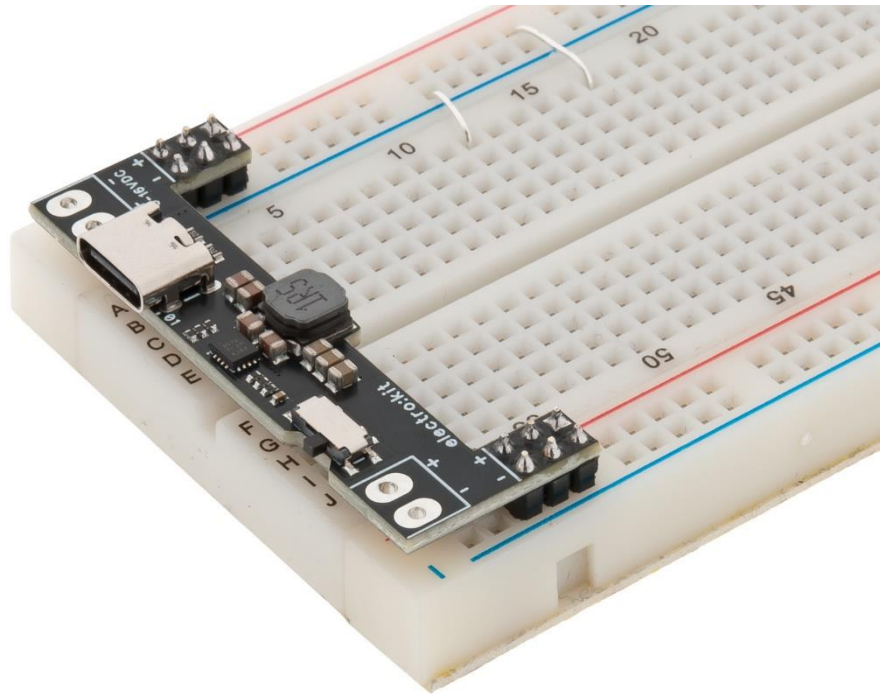


# USB-C Breadboard Power Supply 3.3V/5V

Part.no. 41024241



EKM008 is a very slim power supply, intended for direct use with breadboards. The power supply will span the height of the breadboard and connect to both power rails, providing 3.3V or 5V depending on the switch setting.

The module can be powered either via the USB-C port, using any regular USB power supply, or the adjacent holes marked "IN 3-16V". **Please note that only one of the inputs may be used! Using both simultaneously may cause damage to the connected power supplies!** The auxiliary input can however be used as a direct output from the USB-port to supply 5V when the module is set to 3.3V.

The included 2x3-pin headers can be soldered on either side of the board and will provide power to both lengthwise power rails with the same voltage. An additional output with a pitch of 3.5mm is available on the edge and will fit a standard 3.5mm screw terminal or wires soldered directly to the board.

Maximum current draw is limited by the internal switches in the regulator and depends on the input voltage. When supplied with 5V from a standard USB power supply, it should be able to supply around 2A. Please note that the current draw is limited during power up and regulation will fail if the current is too high (figure 19, page 22, TPS63070 datasheet). Safe start-up current is limited to around 600mA.

Since the regulator is a switching step-up/step-down regulator, the efficiency is very high (over 90%) and it will happily convert a lower voltage to a higher or a higher to a lower without interruption or glitches.

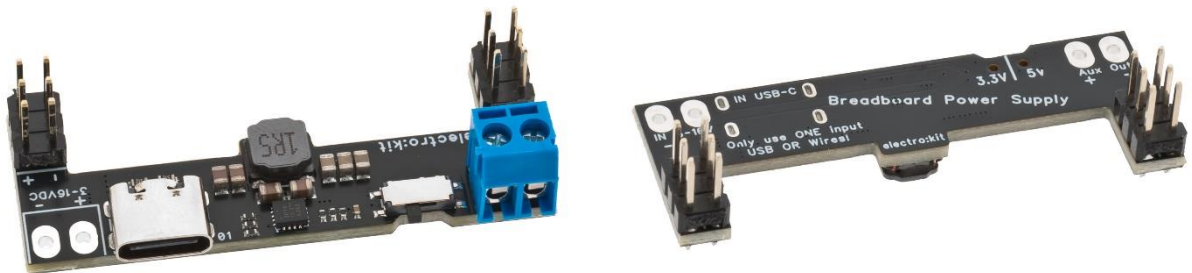
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## Functions

- 3 to 16V input
  - Can be powered with 3.7V Lipo battery
  - USB-C connector
  - Selectable output (3.3V or 5V)
  - High efficiency switching design (90%+)
  - Low quiescent current (50uA)
  - 2.4MHz switching frequency
  - Up to 2A current output
  - Very low noise and ripple
  - Auxillary input and output for 3.5mm screw terminals
  - Slim design to maximize breadboard usage
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## Assembly

To use the power supply with a breadboard, the included 2x3-pin headers must first be soldered to the board. The headers can be soldered to either side. If soldered to the component side, the board markings will be visible during use and the components will be hidden from accidental shorts.

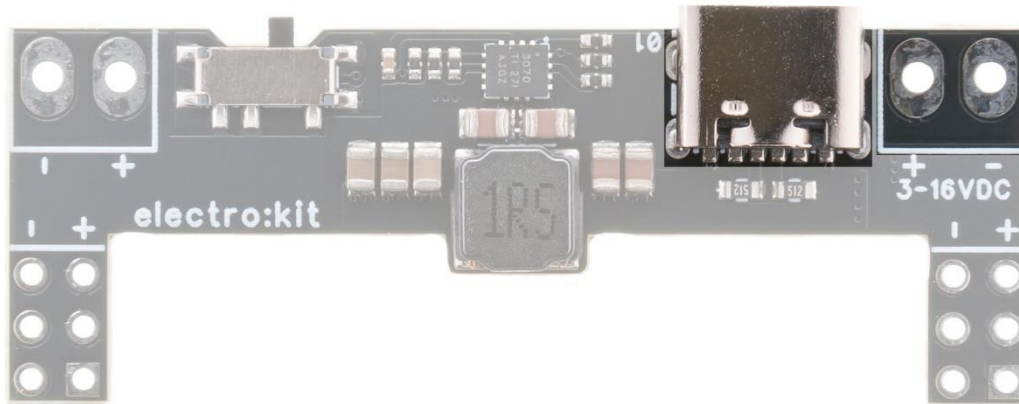


Take note of the "+" and "-" markings when plugging the module into the breadboard. They should align with the red and blue lines on the power rails on the breadboard to avoid confusion.

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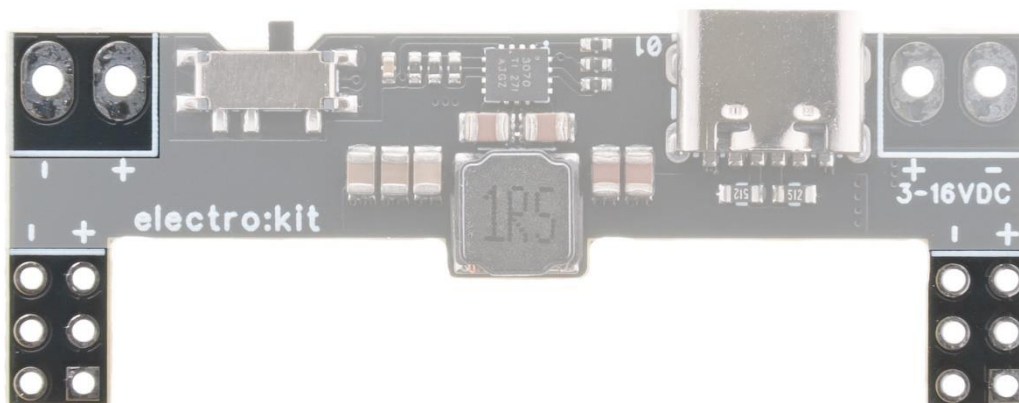
## Connections

### Power input:



The module has two different ways to supply power, either via the USB-C port or via the adjacent holes, using any DC power supply between 3 and 16V. The inputs are directly connected and bad things can happen if both are used at the same time! The auxillary input can however be used as an output to supply other modules and components with the raw 5V from the USB-port. This is handy when the regulator is set to 3.3V and 5V is required for something as well. The auxillary connector has a pitch of 3.5mm and will fit standard 3.5mm screw terminals.

### Power output:

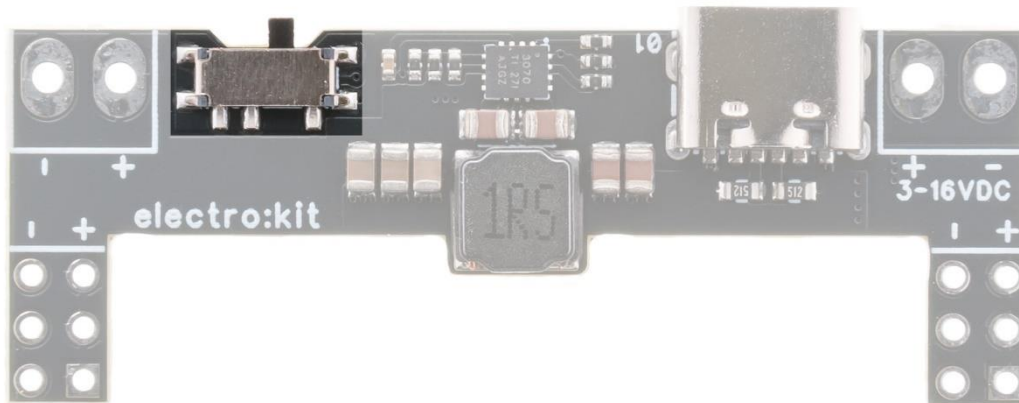


As soon as the module is supplied with a voltage on the USB connector or via the auxillary input, the outputs will provide either 3.3V or 5V depending on the switch setting.

The regulator is protected against overcurrent and high temperature faults. It will survive long periods of short circuit without damage, which could occur quite often in a breadboard environment.

Please note that the regulator will still provide as much current as it can during short circuit events and will heat up significantly! Even though the regulator will survive, damage to the breadboard or components inserted into it may occur and short circuits should be avoided for extended periods of time.

## Voltage selector:



The regulator can be set to output either 3.3V or 5V using the onboard switch. The same voltage will be provided to both sides of the breadboard. If one requires both 3.3V and 5V at the same time, wires can be soldered to the auxiliary input to provide 5V and used where needed. With the switch in 3.3V, the power rails on the breadboard will then provide 3.3V.

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## Mechanical dimensions

