



# AK-LED-DRIVER

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Reference manual

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# About this document

## Revision history

The table below displays the revision history for the chapters in this manual.

Chapter	Date	Revision	Changes made
All	December 2016	1.0	First publication

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## Board Description

The AK-LED-DRIVER board is a constant-current buck DC/DC converter based on the Diodes Incorporated AL8807 IC, capable of driving a wide range of LED types, from normal, high power or laser LEDs. The board has four output current selections: 300mA, 500mA, 700mA and 1A, selectable by solder jumpers. It also has a pin for dimming using PWM or analog voltage. The board input voltage is 6V up to 32V.

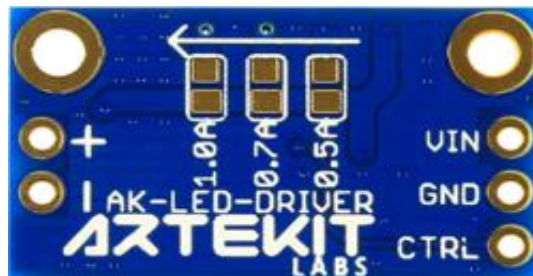
### Hardware overview



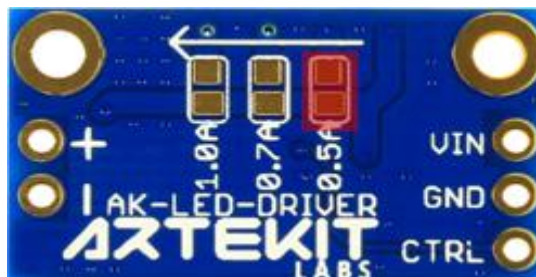
## Usage

### Changing the maximum output current

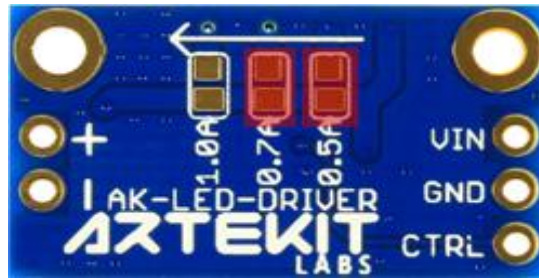
By default, the output current is 300mA, and requires no additional soldering.



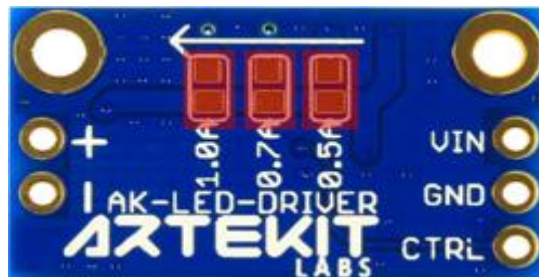
Setting 500mA as the maximum output current: join the pads as indicated (in red) here below:



Setting 700mA as the maximum output current: join the pads as indicated (in red) here below:



Setting 1A as the maximum output current: join the pads as indicated (in red) here below:



The AK-LED-DRIVER board is capable of driving LED strings if the sum of the LED forward voltages are 3V lower than the input voltage:  $(V_{in} - f_{v1} - f_{v2} - f_{vN}) \geq 3V$

## LED dimming

There are two methods to dim the LED:

- 1) Using a voltage level applied to CTRL pin
- 2) Using a PWM signal applied to CTRL pin

**Warning** If the CTRL pin is left floating, the board will output its maximum current to the LED. To automatically set the LED off when the board is powered up, connect CTRL to ground.

### **Using a voltage level**

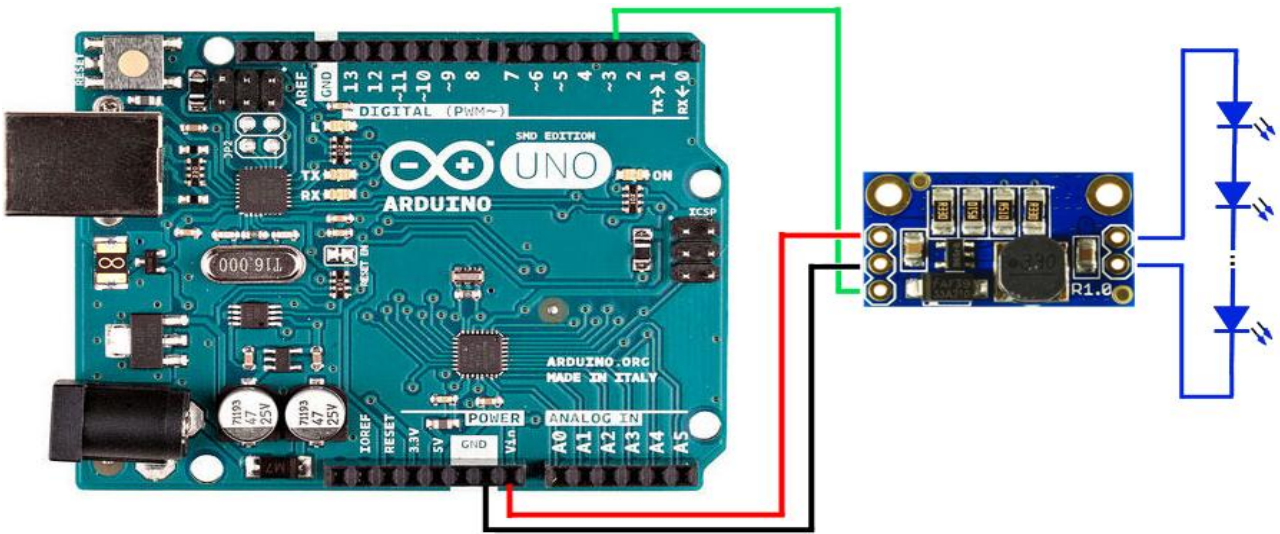
By applying a positive analog voltage level to the CTRL pin (from 0.5V to 2.4V) the output current changes from 20% to 100%. Note that the maximum voltage in the CTRL pin cannot exceed 5V. Under 0.4V the board disables the LED output.

### **Using a PWM signal**

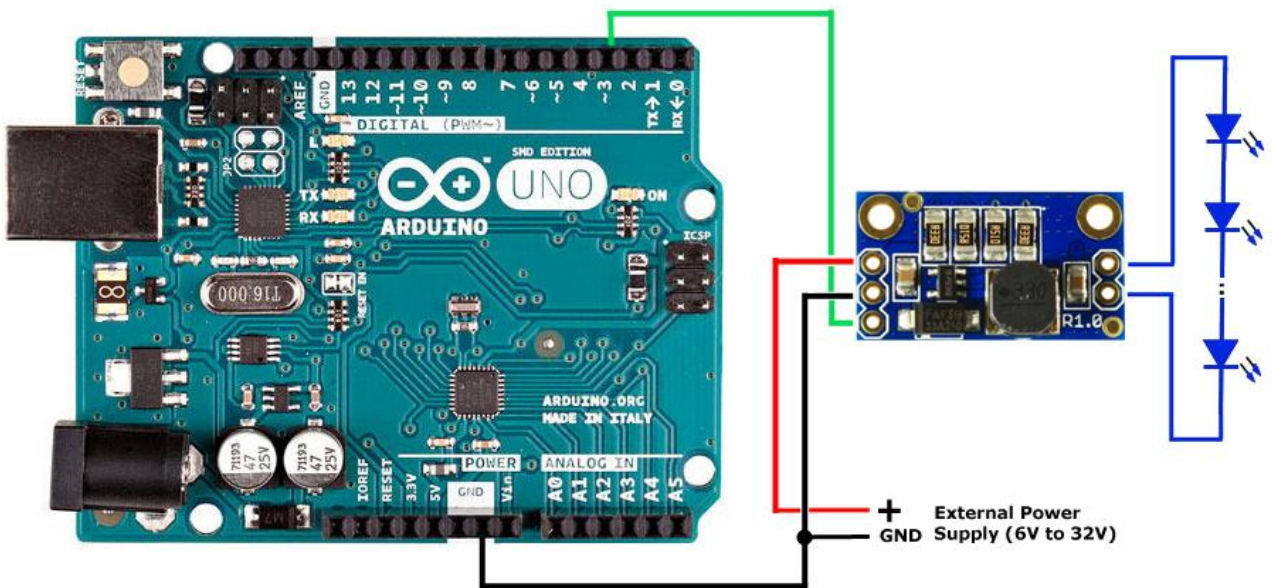
The output current changes accordingly to the duty cycle of a PWM signal going into the CTRL pin. The recommended PWM frequency is 500Hz, where the relationship of duty cycle percentage and output current is almost linear.

## Example connection using an Arduino

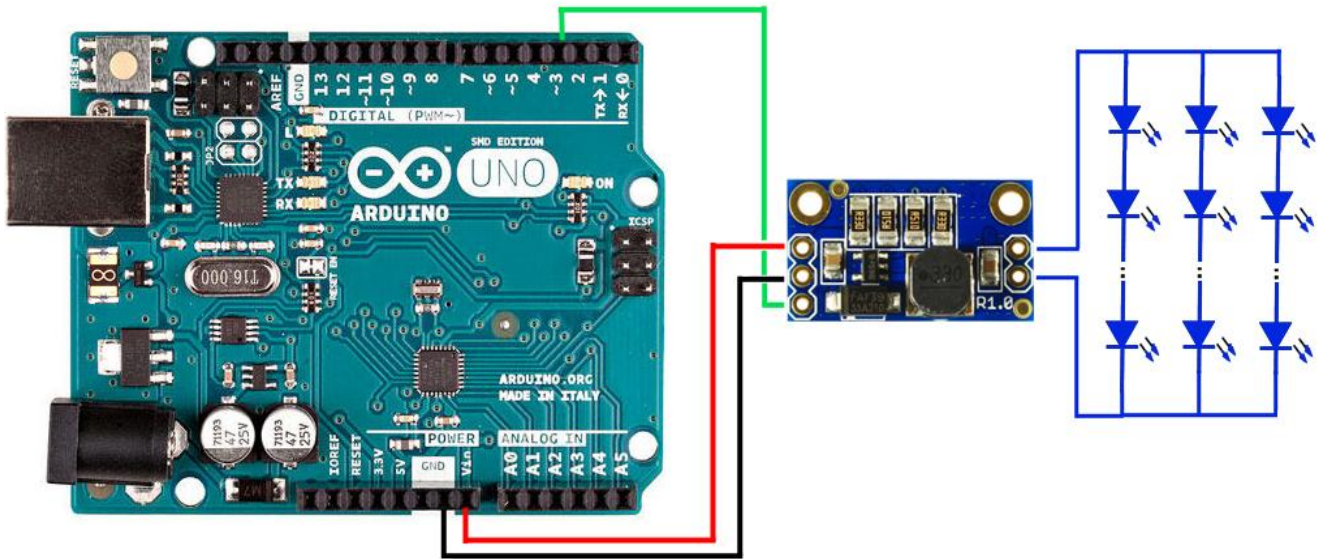
The following illustration shows the AK-LED-DRIVER board connected to an externally powered Arduino UNO.



If the connected LEDs need a higher voltage or current, an external power supply for the AK-LED-DRIVER board is necessary.



Parallel LED strings can also be used. In this case it is recommended to use the same brand and type of LEDs in the entire string.



### Board dimensions

All dimensions are in millimeters

