Control the speed of a DC motor without sacrificing torque. This Pulse-Width-Modulation (PWM) DC motor speed controller can provide up to a maximum continuous current of 30A to your DC motor or other DC load thanks to a digital microcontroller based (PIC) design and two highly efficient High-Power 110A MOSFETs for cooler operation.

The controller has two modes of operation: **Fixed** or **Variable** frequency. The fixed frequency mode of operation runs the controller at 100 Hz. In the variable frequency mode of operation, the frequency is adjustable from 244 Hz to 3.125 KHz. Duty cycle is fully adjustable from 0% to 100% in both modes.

The controller also offers built-in **soft-start** feature that greatly reduces the mechanical stress on the motor as well as the electrodynamic stress on the attached cables and battery therefore extending the life span of the whole system. When power is connected to the circuit, the duty cycle will start from 0% and go up to the preset value in about 1 to 1.5 seconds.

An optional fan is available separately (Model #: FAN-12V) and recommended for continuous operation at maximum power or for high frequency at high current applications.

Recommended Generic Case: BX-1591LF

Operating Instructions

1. The controller has two modes of operation: "Fixed" and "Variable" frequency. With the jumper head placed on "J1", the controller will be in the Fixed mode of operation. If removed, the controller will be in the Variable mode. Note that to change from one mode to another, you first have to disconnect the power supply.

VARIABLE FREQUENCY (244 Hz – 3.125 KHz)

FIXED FREQUENCY (100 Hz)

J1

J1

2. Connect the controller to the power supply (6 to 24V DC) and the load as indicated on the Wiring Diagram.
3. You can control the Duty Cycle using potentiometer "P2" and if in the variable frequency mode, the Frequency using potentiometer "P1".

Important Notes

An appropriately rated fuse (rated a little higher than the maximum current you expect to draw) is required to ensure safe operation.

The controller is NOT reverse-polarity protected. Double check all connections before applying power and always turn off the power supply before making any wiring changes.

Do not connect the load's negative terminal to the power supply ground. The controller switches the load's negative terminal to the ground via the MOSFET.

If operating the controller at maximum current continuously, or at high frequency and high current, it is recommended to add an appropriate fan to cool the MOSFETs. Two terminals marked "F–" and "F+" are available on the board in order to connect a fan of appropriate voltage (same as your supply voltage).

The MOSFETs heat sinks are electrically live and connected to the "M–" terminal. Make sure no wires touch the heat sinks.

Always use the shortest possible length for all wiring carrying high current to ensure minimal loss. The longer the wire, the higher the voltage drop across it which leads to a less efficient overall system.
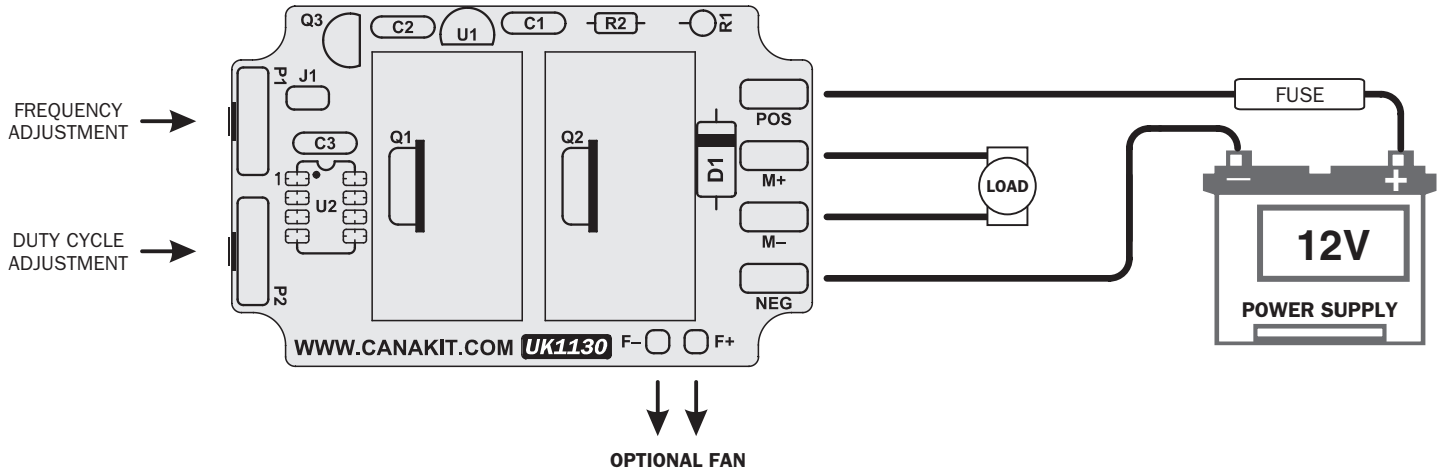
Make sure all wires marked as "High Gauge" on the wiring diagram are of the appropriate AWG gauge depending on the maximum current you expect to draw.

Recommended AWG gauges are as follows:

AWG 14 : 15A
AWG 12 : 20A
AWG 10 : 30A

FREQUENCY
ADJUSTMENT →

DUTY CYCLE
ADJUSTMENT →

Q3 C2 U1 C1 R2 R1
P1 J1
C3 Q1 Q2 D1 POS
1 U2 M+
P2 M−
WWW.CANAKIT.COM **UK1130** F− ⬤ ⬤ F+ NEG

FUSE

LOAD

12V
POWER SUPPLY

OPTIONAL FAN

Wiring Diagram

* Recommended Generic Case: BX-1591LF

Schematic Diagram