

Mini-Bar 15-16

Crowbar Circuit

Basic Kit



Basic Kit User Manual

Designed by: WA2IVD

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A2Z Tech LLC

Thank you for purchasing the MiniBar 15-16 Basic Kit crowbar circuit!

Introduction

The MiniBar 15-16 crow-bar circuit is designed to protect electronic equipment from damage because of over-voltage in the event of a power supply failure. It is designed for radio and electronic equipment that operates nominally at 13.8 Volts DC. The MiniBar 15-16 can be set to trip at 15 volts or 16 volts. The 15 volt setting is best when operating directly from a 13.8 volt power supply and provides the highest level of protection for electronic equipment.

The 16 volt setting can be used when operating from a vehicle 12 volt system or from lithium ion batteries while connected to solar or other charging equipment. Some lithium battery charging systems and automotive charging systems can operate very close to 15 volts under certain conditions. The 16 volt trip setting provides additional margin against false trips while still providing overvoltage protection for sensitive loads.

NOTE: The actual trip voltage can vary from the nominal based on component tolerances and operating temperature.

15 volt trip: 14.5 – 15.5 volts actual trip range

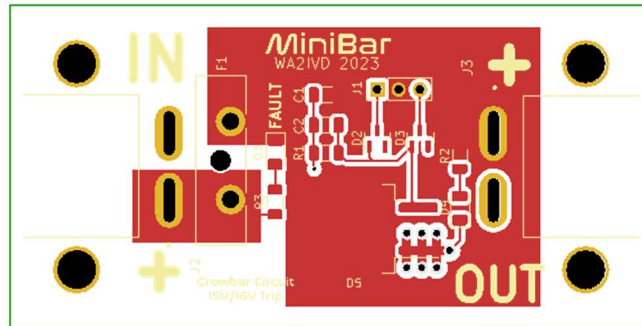
16 volt trip: 15.5 – 16.5 volts actual trip range

The MiniBar 15-16 includes filtering to suppress noise spikes that might trip the crowbar when it is plugged into a live power source.

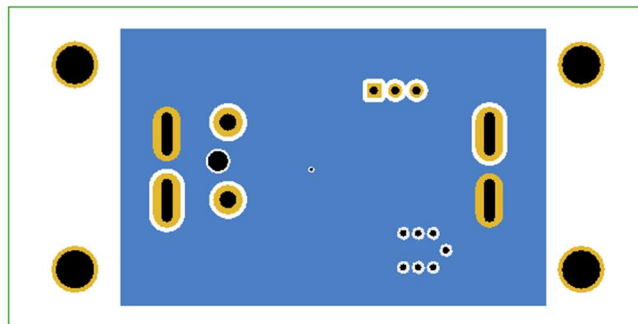
Multiple connection options are possible. The MiniBar can be used with its own internal fuse or with a separate external fuse. The MiniBar can be connected with power running through it. For higher power applications, it can be used for the crowbar function only with primary power running external to the MiniBar.

Board Layout and Schematic

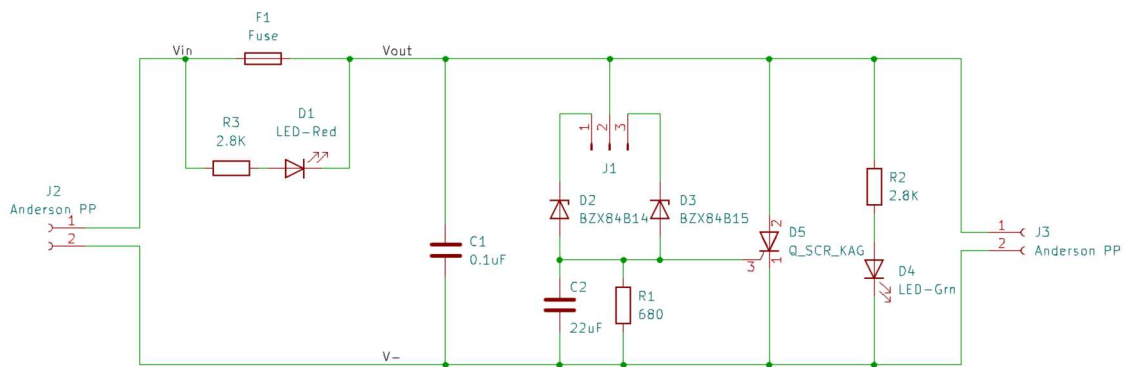
When wired in its normal configuration, the positive load current goes through the fuse and solid copper planes on the front side of the board. Negative load current goes through a solid copper plane on the back side of the board.



PC Board Front side Copper



PC Board Back side Copper (viewed from front)



Schematic

Wiring Options

For all the wiring options listed on the following pages, you must add a jumper to the board to select the desired trip voltage.

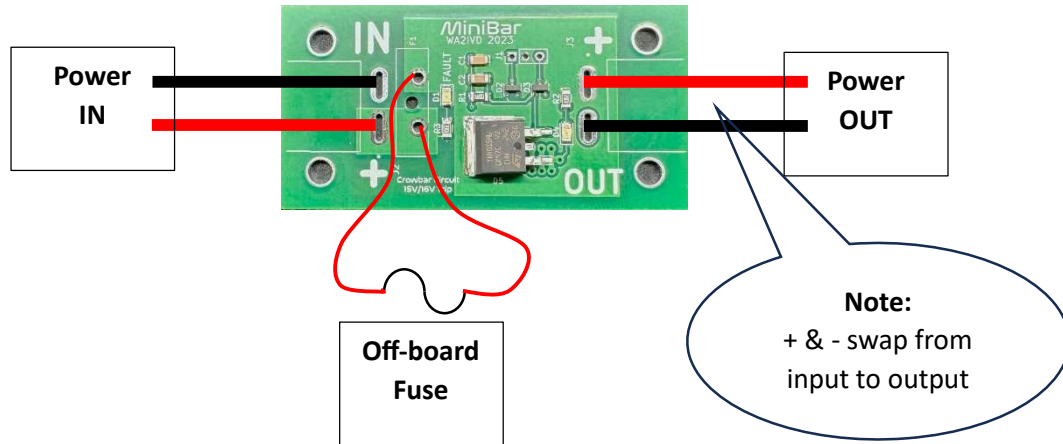
Solder a Jumper from J1-1 to J1-2 to select 15 volt nominal trip voltage



Solder a Jumper from J1-2 to J1-3 to select 16 volt nominal trip voltage



Standard connection with power running through MiniBar



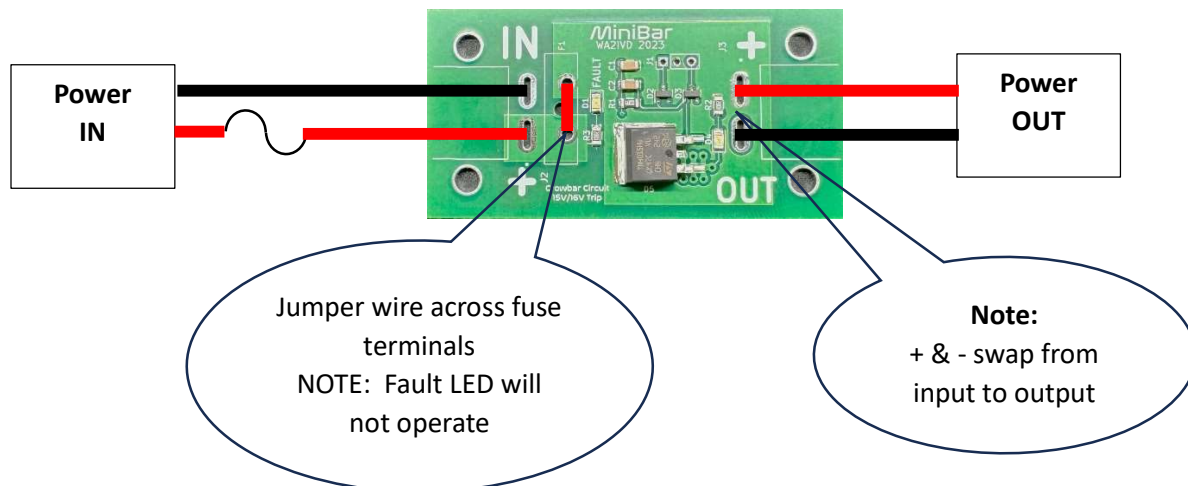
NOTE: Max of 15 Amps Continuous or 25 Amps @ 50% or less duty cycle (30 seconds)
Maximum fuse size: 30 Amps

You can also solder a Littelfuse blade fuse holder, or equivalent onto the board and put the fuse on the board.

Littelfuse p/n: 178.6164.001

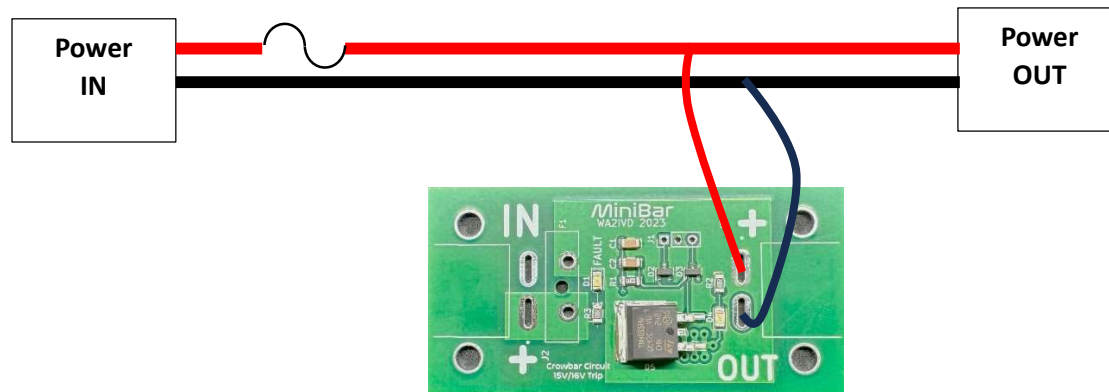
Digi-Key p/n: F5195-ND

Standard connection with external fuse at power source



NOTE: Max of 15 Amps Continuous or 25 Amps @ 50% or less duty cycle (30 seconds)
Maximum fuse size: 30 Amps

MiniBar for crowbar function only



NOTE: Red Fault LED will not operate when crowbar trips.

Important: Use heavy gauge wire to connect MiniBar to power circuit if input fuse is large. The MiniBar may be damaged if fuse sizes larger than 40 Amps are used.

CAUTION: If Power source cannot supply sufficient current to blow the fuse quickly, the MiniBar may be damaged by sustaining a short circuit across the supply.