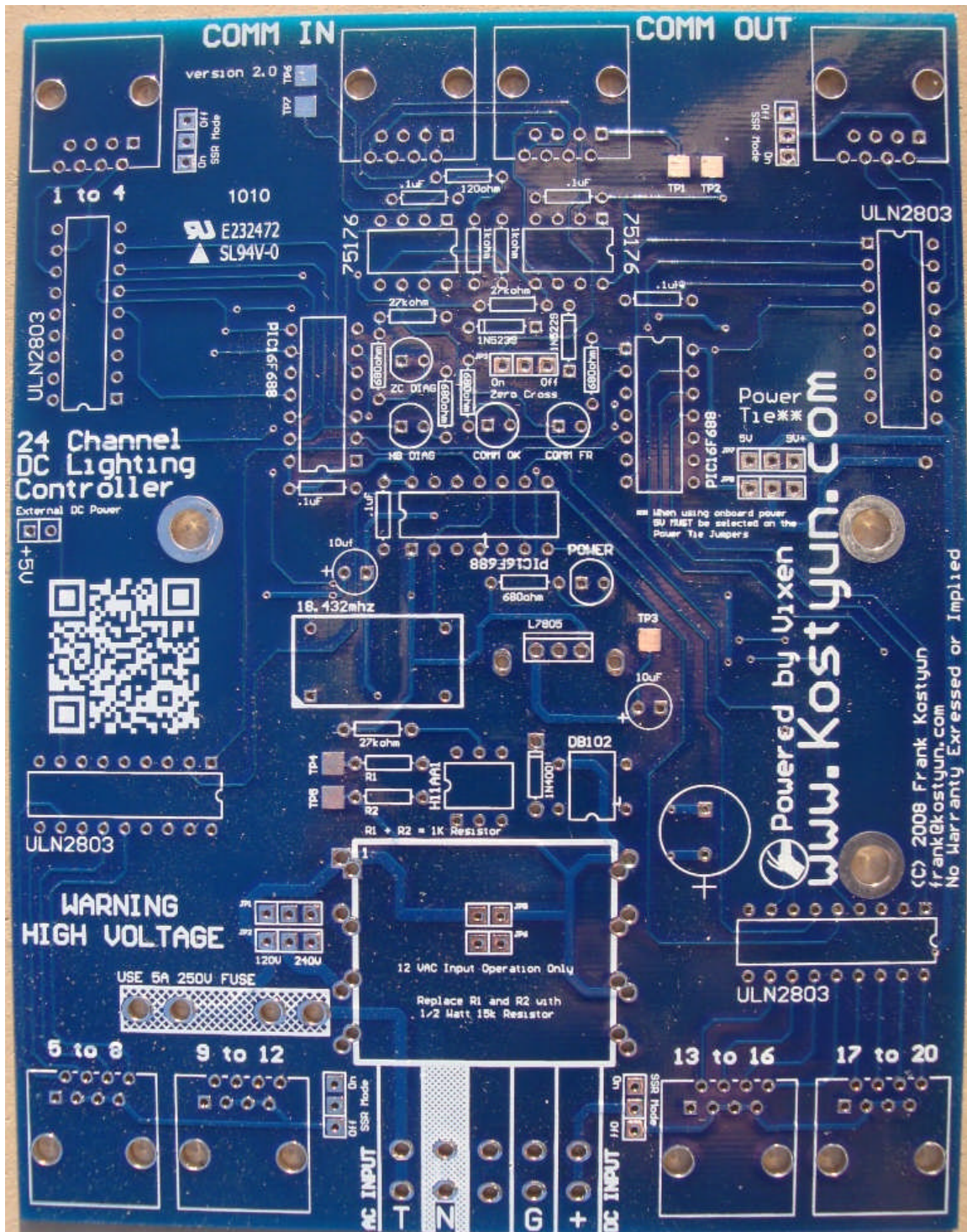


Building the Renard 24 LV Dimmer



Bill of Materials

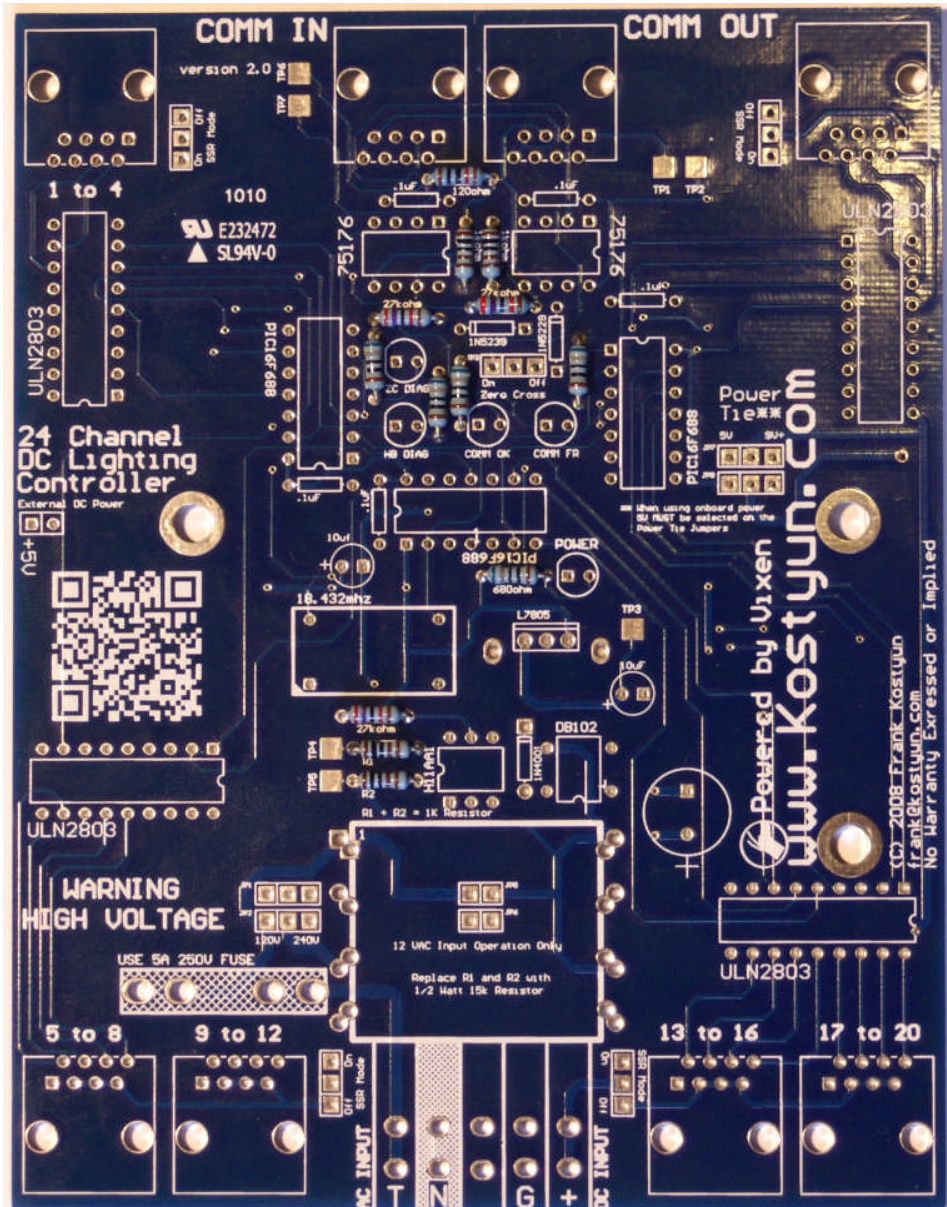
1 Ren24LV Circuit board
1 3FD-316 Power Transformers 16VCT@0.15A 8V@0.3A Dual Primary (24VNR)
4 ULN2803A Darlington Arrays Eight NPN Array
1 Eurostyle Terminal Blocks 5.08MM VERTICAL 6P wire protector"
2 SN75176BP RS-485 Interface ICs Bus Diff
1 L7805CV Voltage Regulators 5.0V 1.0A Positive"
1 DB102G Rectifier Bridge 1A 100V
1 7136DG Heatsink TO-220 VERT 19.7 TR
3 27Kohms "1/4W 1% Metal Film Resistors 1% 50PPM
4 1Kohms "1/4W 1% Metal Film Resistors 1% 50PPM
1 120ohms "1/4W 1% Metal Film Resistors 1% 50PPM"
1 1N4001 Standard Rectifiers 50V 1A
1 1N5239B Zener Diodes 9.1 Volt 0.5 Watt
1 1N5239B Zener Diodes 4.1 Volt 0.5 Watt
1 H11AA1 Optocouplers Bi-Directional Input (24VNR)
1 TCF1843-X Full Size Crystal Clock Oscillators DIP-14 5V 18.432MHz
1 HTRL25V1000-RC Radial Electrolytic Capacitors 25V 1000uF
2 HTRL25V10-RC "Radial Electrolytic Capacitors 25V 10uF
2 3517 Fuse Clips and Holders PC FUSE CLIP 5MM (24VNR)
1 GMA-5 5mm x 20mm Fast Acting Fuses 125VAC 5A Fast Acting (24VNR)
3 PIC16F688-I/P "PICmicro MCUs 7KB 256 RAM 12 I/O
4 WP63ID "LED Standard HI EFF RED DIFFUSED
1 604-WP1503GD LED Standard GREEN DIFFUSED
5 680ohms "1/4W 1% Metal Film Resistors 1% 50PPM"
5 SA105E104MAR Axial Ceramic Capacitors 50volts 0.1uF
9 3 Pin headers
9 2 Pin SHUNT
2 6 Pin IC Sockets 6P ECONOMY TIN (Optional for H11AA1 and DB102)
2 8 Pin IC Sockets ECONOMY TIN
3 14 Pin IC Sockets ECONOMY TIN
4 18 Pin IC Sockets ECONOMY TIN
8 RJ45 Modular Jacks 8 PCB (Top or 90 degree entry)
1 47K 10W wire resistor

(24VNR) = Not required for 24v DC operation

Renard 24LV Assembly

Install 13 resistors as indicated below

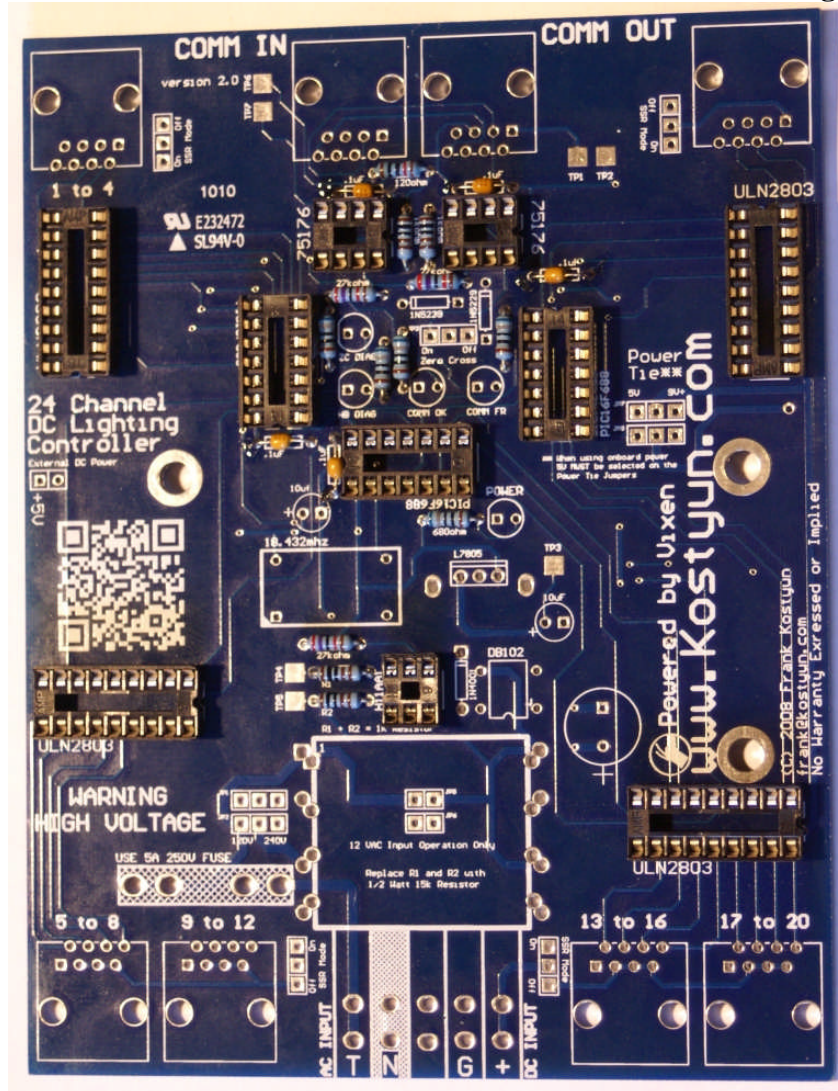
- Install resistors R1 and R2 1K Ohm Resistor located above transformer location.
(Optional if building board to be powered via external 24vdc)
- Install two 1K Ohm resistors between chips labeled 75176 top of the board
- Install one 120 Ohm resistor top of the board.
- Install two 27K ohm resistors below 75176 chip locations.
- Install one 27K ohm resistor below oscillator location.
- Install five 680 ohm resistors. Located in the area of the three PIC16F688 chips.



Installing Sockets and De-Coupling Capacitors

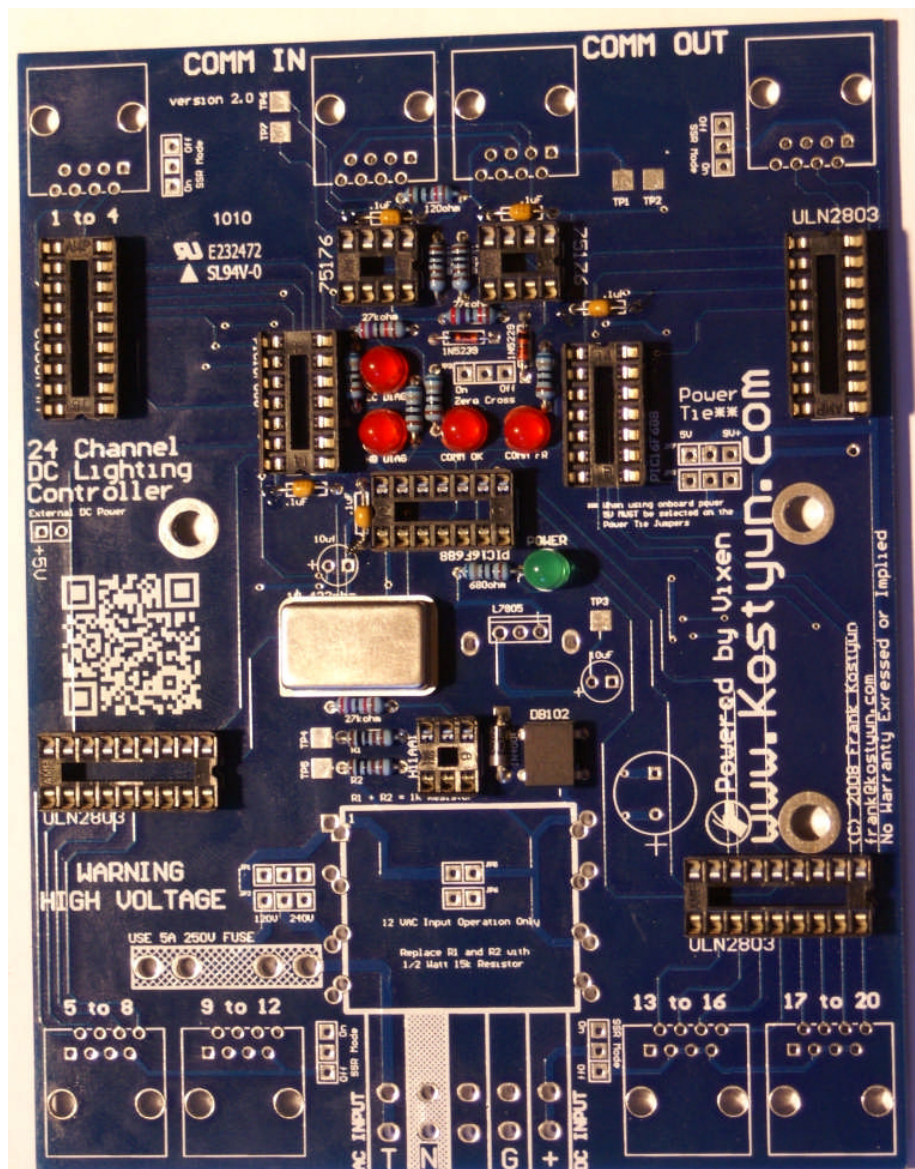
- Install five .1uf capacitors. These are located next to each PIC16F688 chip near the notch and above the 75176 chips near the top of the board.
- Install three 14 pin sockets for the PIC16F688 chips. Located in the center of the board.
- Install four 18 pin sockets for the ULN 2803 chips. Located around the edge of the board.
- Install two 8 pin sockets for the 75176 chips. Located above the transformer location
- Install one 6 pin socket for the H11A11 chip located above the transformer.
(Optional if building board to be powered via external 24vdc)
- If desired a 6 pin socket for may be installed for the DB102 chip; however the center 2 leads must be removed prior to install.

Ensure to note the orientation of the sockets when installing



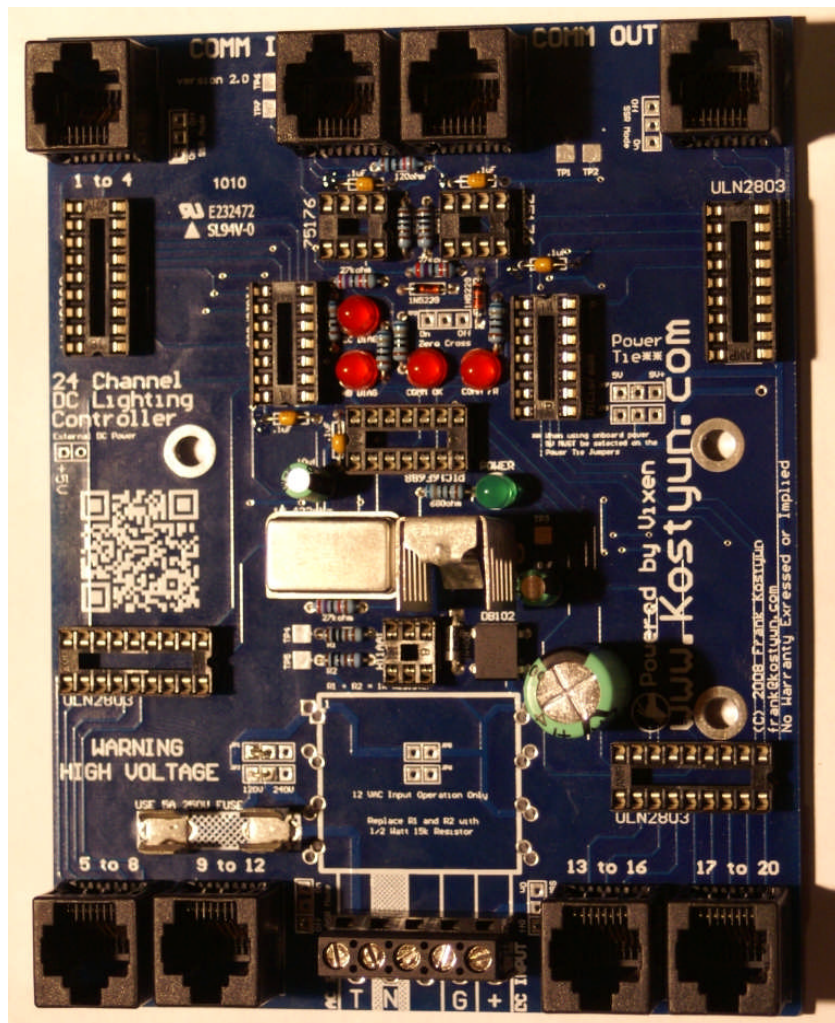
Install Diagnostic LED's, Power connectors and Oscillator and Diodes

- Install the crystal oscillator, pin one will go in the hole with the square pad. Pin one is on the oscillator is identified by the square corner.
- Install the 1N5239 diode and the 1N5229 diode. Located below the 75176 chips
- Install the 1N4001 diode. This is located above the transformer (*Note: Place the cut leads aside for later use*)
- Install the indicator LED's. The shorter leg of the LED will install in the hole with the square pad (cathode)
- Install DB102 rectifier if not using a modified 6 pin socket. + on IC matches plus on board.



Capacitors and Power header install

- Install the two 10uF Capacitors. ****Note**** ensure polarity is verified when installing.
- Install the Eight RJ45 jacks along the top and bottom of the PCB.
- Install the LM7805 voltage regulator and heat sync. The metal tab of the regulator faces the top of the board.
- Install the 1000uF capacitor ****Note**** ensure polarity is verified when installing.
- Install the fuse clips. Note the clips have a fuse retention tabs. *(Optional not required if building board to be powered via external 24vdc)*
- Install the six pin screw down terminal in the power input location below the transformer. ****Note**** place terminal in the holes closest to the transformer to allow the terminal labels to be read. *(Optional a 2 pin header may be used in the G and + bus if building board to be powered via external 24vdc)*
- If desired install the Power header located to the left of the Transformer. Alternatively you can use the cut lead from the 1N4001 diode that was placed assigned to hard wire the power selection. Select either 120VAC or 240VAC. *(Optional not required if building board to be powered via external 24vdc)*



Jumper install:

- Install the Power Tie ** jumpers located right center of the board. This can be hard wired or installed with headers and jumpers.
- Install SSR Mode jumpers located near the RJ45 connector locations around the outer edged of the board (**Optional** if using external SSR's only this jumper is not needed. If powering only RGB strips or other led applications board can be selected to be hard wired to SSR Mode Off to supply power on all pins**)
- If desired install the Zero Crossing jumper (** Optional** jumper is only needed if supplying a ZC signal to another board down, this case is not very common)

Integrated circuit installation

- Install the four ULN2803 chips. Pin 1 faces the notch in the socket
- Install the two 75176 chips in the sockets at the top of the board
- Install the H11AA1 chip in the socket above the Transformer location (*Optional not needed if building board to be powered via external 24vdc*)
- Install the DB102 rectifier in the socket between the H11AA1 and the 1000uf capacitor (only if using a socket).
- Install the three PIC16F688 chips. ** Note ** ensure chips are programmed with the appropriate firmware.

Transformer and power wire installation

- Install the Transformer **Note** Ensure the H11AA1 chip and the DB102 is installed prior to the transformer being installed. Pin 1 of the transformer will plug in to the location identified by the 1 on the PCB.
- Connect the 120 VAC or 240VAC power cable to the T and N connection on the PCB terminal header
- If the fuse has not been installed, install the 5A fuse in the location to the left of the transformer.

Your now ready to test the Ren24LV. If board is being constructed for use with a 24vdc power supply see additional documentation on connection of power supply on next page

Ren24LV Modification to power 24v DC lighting

To use the Ren24LV to power the Mighty Mini's or RGB strips and have the board be powered from the same 24 vdc power supply. When installing parts leave the following components out of your build parts have been indicated during previous instructions as optional in Italics.

- Fuse and Holders
- Jumper shunts on 120/240 Voltage selection headers
- Transformer
- H11AA1 chip

Additional parts needed for the 24 vdc powered Ren24LV

One (1)	280-CR10-47-RC	10 W 47 ohm resistor
Two (2)	571-860163	Receptacle contacts female
One (1)	571-874993	2 pin housing for receptacle

- Complete build as listed above and install the 10W 47ohm resistor across 9vdc pins located on the top of the power selector.
- Install a 2 position shut on the bottom 9v pins.
- Verify the Voltage output of the external power supply and adjust to 24vdc as needed
- Connect the 24v dc power supply to the G and + inputs on the power entry connector bottom center of the board.

