TTL High Current Driver Assembly Instructions

SuperDroid Robots has four types of TTL High Current Drivers. They all have seven channels of input and output. Some versions have status LEDs, which will light with the TTL (+5VDC) logic input. The driver boards with relays are rated at 10A@120VAC per relay. An external power is source is plugged into the board that drives the loads. If you use the relays, then the supply needs to be either 5VDC or 12VDC otherwise the supply needs to be between 5-50VDC. The 5VDC coils will draw about 60mA each. The 12VDC coils will draw about 37mA each.

TTL logic outputs from the OOPic or basic stamp, PIC, etc do not have the capacity to drive much more than an LED. These boards allow you to easily drive higher current devices. It will drive up to 50V and 2 watts of power (1 watt per channel, but the channels can be paralleled for over 1 watt). The circuit can handle about 500mA continuously. The circuit also has inductive load transient suppression, which occurs when driving such things as coils on relays.

Table of Contents:

List of Figures:

Assembly of the 4 Relay board:

1. Start by laying the board out in front of you. The Label should be on the middle left topside. Refer to Figure 1.

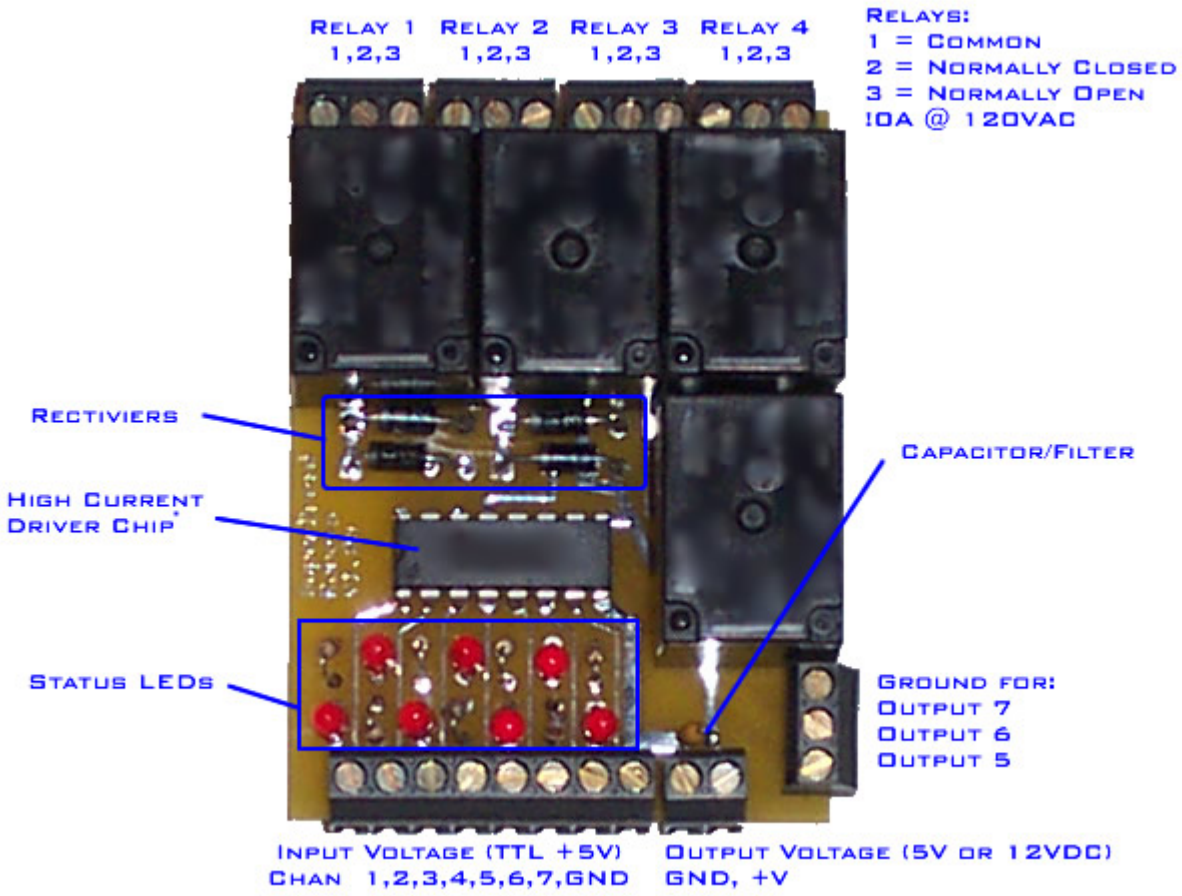

Figure 1: TTL High Current Driver with 4 Power Relays

2. Insert all the LEDs as shown in Figure 1 in a staggered location. The long leg of the LED should be towards the TTL Input edge of the board (they will not work if put in the other way).

   Please Note: If you use the LEDs, the supplied voltage to the output will be about 10% less than the Input voltage since it drops some voltage to ground to light the LEDs. (If you put 12V as the input voltage, you will only get about 11 volts on the output pins.) Both the 12V and 5V relays will still pull in fine at this slightly reduced voltage. If the voltage drop is an issue either increase the output voltage supply or don't use the LEDs.

3. Insert all the resistors as shown in Figure 1. The orientation of the resistor is not important.
4. Insert the Diodes. Orientation of the Diodes is important. It will short the circuit if put in the wrong way. The lead that comes out of the side of the diode with a line on it should go in the square pad hole (face towards the left edge of the board as shown in Figure 1).
5. Insert the capacitor as shown in Figure 1. Orientation is not important.
6. Insert the Relays as shown in Figure 1. All the relays should be placed in their locations at the same time before soldering. Push the relays down so they are all flat and start soldering the terminals, checking to make sure the relays stay flat.
7. Install the Screw Terminals (if provided) as shown in Figure 1.
8. Insert the high current driver IC. The orientation is important. The chip will be shorted and will not work if put in wrong. Pin one goes in the square pad hole such that the notch on the chip is closest to the label on the board. Refer to Figure 1.
9. Attach either 12VDC or 5VDC to the Output Voltage using the polarity shown in Figure 1. Turn on the power, no sparks or smoke should appear at this time.
10. Attach your TTL lines from a PIC/+5VDC signal to the Input locations. If you want 1 TTL signal to dive multiple channels, just install jumpers between the inputs.
11. Attach the Ground for the PIC/+5VDC signal to the input voltage Ground location.
12. Send TTL signals (+5V). The LED should light and the Relays will pull in if you are hooked to channels 1-4. Channels 5-7 will measure ~90% of the output voltage between the grounded output channel to the +VDC for the output voltage supply.

Assembly of the 2 Relay board:

1. Start by laying the board out in front of you. The Label should be on the bottom right topside. Refer to Figure 2.

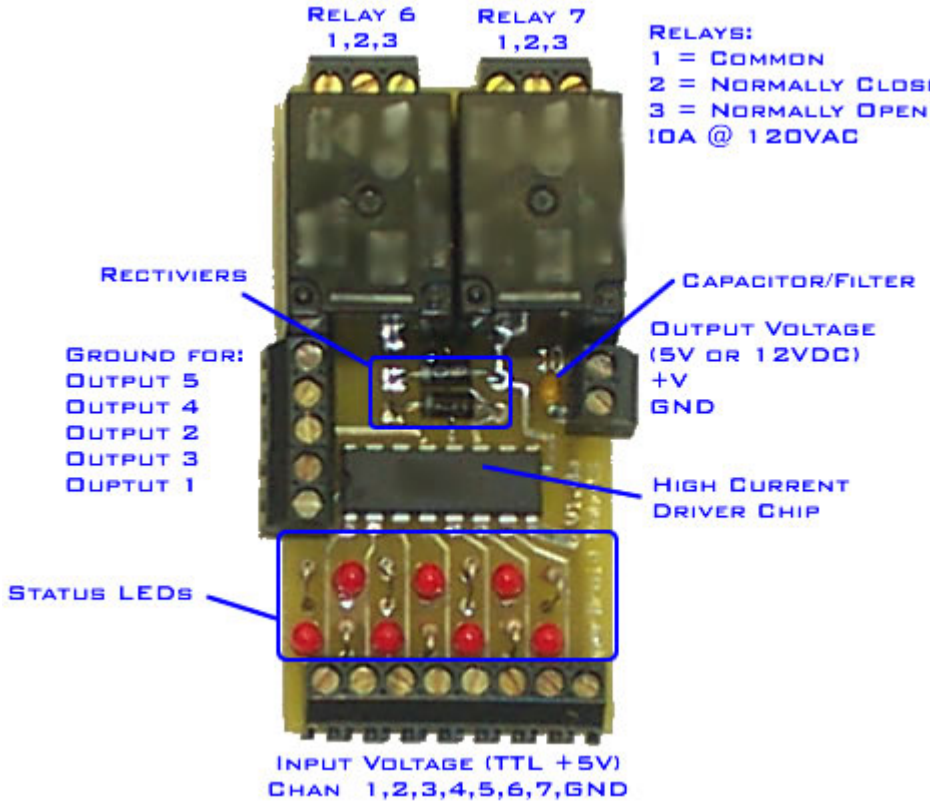

Figure 2: TTL High Current Driver with 2 Power Relays

2. Insert all the LEDs as shown in Figure 2 in a staggered location. The long leg of the LED should be towards the TTL Input edge of the board (they will not work if put in the other way).

   Please Note: If you use the LEDs, the supplied voltage to the output will be about 10% less than the Input voltage since it drops some voltage to ground to light the LEDs. (If you put 12V as the input voltage, you will only get about 11 volts on the output pins.) Both the 12V and 5V relays will still pull in fine at this slightly reduced voltage. If the voltage drop is an issue either increase the output voltage supply or don't use the LEDs.

3. Insert all the resistors as shown in Figure 2. The orientation of the resistor is not important.
4. Insert the Diodes. Orientation of the Diodes is important. It will short the circuit if put in the wrong way. The lead that comes out of the side of the diode with a line

on it should go in the square pad hole (face towards the left edge of the board as shown in Figure 2).

5. Insert the capacitor as shown in Figure 2. Orientation is not important.
6. Insert the Relays as shown in Figure 2. All the relays should be placed in their locations at the same time before soldering. Push the relays down so they are all flat and start soldering the terminals, checking to make sure the relays stay flat.
7. Install the Screw Terminals (if provided) as shown in Figure 2.
8. Insert the high current driver IC. The orientation is important. The chip will be shorted and will not work if put in wrong. Pin one goes in the square pad hole such that the notch on the chip is closest to the label on the board. Refer to Figure 2.
9. Attach either 12VDC or 5VDC to the Output Voltage using the polarity shown in Figure 2. Turn on the power, no sparks or smoke should appear at this time.
10. Attach your TTL lines from a PIC/+5VDC signal to the Input locations. If you want 1 TTL signal to dive multiple channels, just install jumpers between the inputs.
11. Attach the Ground for the PIC/+5VDC signal to the input voltage Ground location.
12. Send TTL signals (+5V). The LED should light and the Relays will pull in if you are hooked to channels 6&7. Channels 1-5 will measure ~90% of the output voltage between the grounded output channel to the +V for the output voltage supply.

Assembly of the 1 Relay board:

1. Start by laying the board out in front of you. The Label should be on the bottom middle topside. Refer to Figure 3.

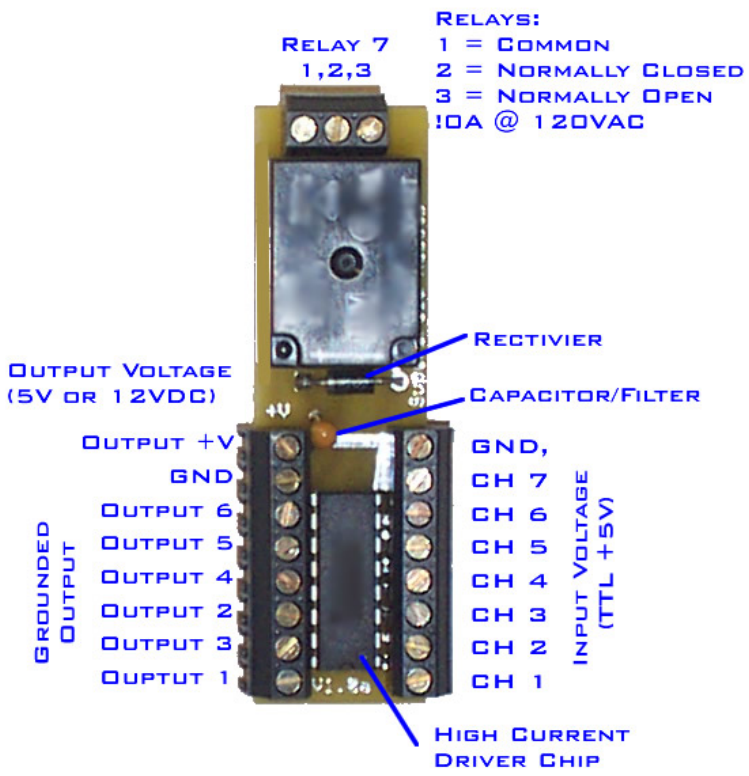

Figure 3: TTL High Current Driver with 1 Power Relay

2. Insert the Diode. Orientation of the Diode is important. It will short the circuit if put in the wrong way. The lead that comes out of the side of the diode with a line on it should go in the square pad hole (face towards the left edge of the board as shown in Figure 3).
3. Insert the capacitor as shown in Figure 3. Orientation is not important.
4. Insert the Relay as shown in Figure 3. Push the relay down so it's all flat and start soldering the terminals, checking to make sure the relay stay flat.
5. Install the Screw Terminals (if provided) as shown in Figure 3.
6. Insert the high current driver IC. The orientation is important. The chip will be shorted and will not work if put in wrong. Pin one goes in the square pad hole such that the notch on the chip is closest to the label on the board. Refer to Figure 3.

7. Attach either 12VDC or 5VDC to the Output Voltage using the polarity shown in Figure 3. Turn on the power, no sparks or smoke should appear at this time.
8. Attach your TTL lines from a PIC/+5VDC signal to the Input locations. If you want 1 TTL signal to dive multiple channels, just install jumpers between the inputs.
9. Attach the Ground for the PIC/+5VDC signal to the input voltage Ground location.
10. Send TTL signals (+5V). The Relay will pull in if you are hooked to channel 7. Channels 1-6 will measure ~90% of the output voltage between the grounded output channel to the +V for the output voltage supply.

Assembly of TTL Driver with Status LEDs:

1. Start by laying the board out in front of you. The Label should be on the bottom right topside. Refer to Figure 4.

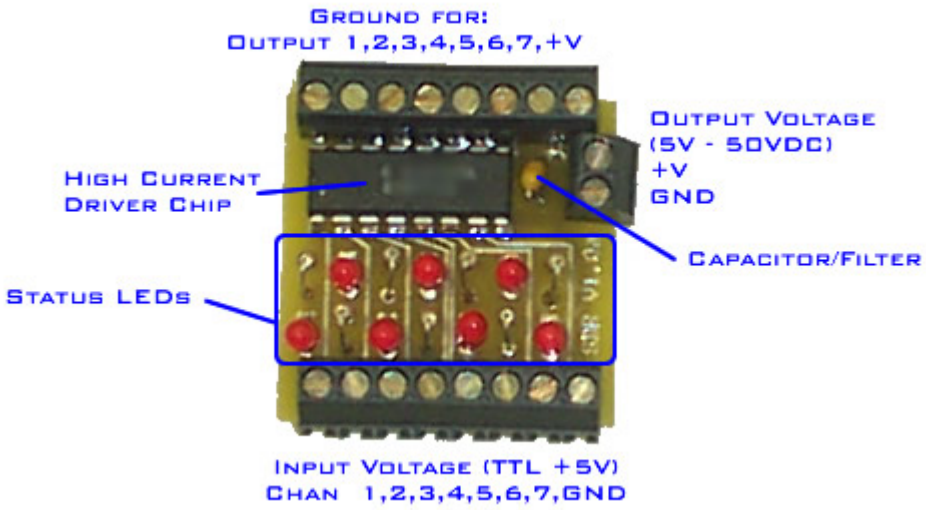

Figure 4: TTL High Current Driver with Status LEDs

2. Insert all the LEDs as shown in Figure 4 in a staggered location. The long leg of the LED should be towards the TTL Input edge of the board (they will not work if put in the other way).

   Please Note: If you use the LEDs, the supplied voltage to the output will be about 10% less than the Input voltage since it drops some voltage to ground to light the LEDs. (If you put 12V as the input voltage, you will only get about 11 volts on the output pins.) If the voltage drop is an issue either increase the output voltage supply or don't use the LEDs.

3. Insert all the resistors as shown in Figure 4. The orientation of the resistor is not important.
4. Insert the capacitor as shown in Figure 4. Orientation is not important.
5. Install the Screw Terminals (if provided) as shown in Figure 4.
6. Insert the high current driver IC. The orientation is important. The chip will be shorted and will not work if put in wrong. Pin one goes in the square pad hole such that the notch on the chip is closest to the edge of the board (away from the capacitor). Refer to Figure 4.
7. Attach 5-50VDC to the Output Voltage using the polarity shown in Figure 4. Turn on the power, no sparks or smoke should appear at this time.

8. Attach your TTL lines from a PIC/+5VDC signal to the Input locations. If you want 1 TTL signal to dive multiple channels, just install jumpers between the inputs.
9. Attach the Ground for the PIC/+5VDC signal to the input voltage Ground location.
10. Send TTL signals (+5V). The LED should light and channels 1-7 will measure ~90% of the output voltage between the grounded output channel to the +V for the output voltage supply.

Assembly of TTL Driver without Status LEDs:

1. Start by laying the board out in front of you. The Label should be on the bottom right topside. Refer to Figure 5.

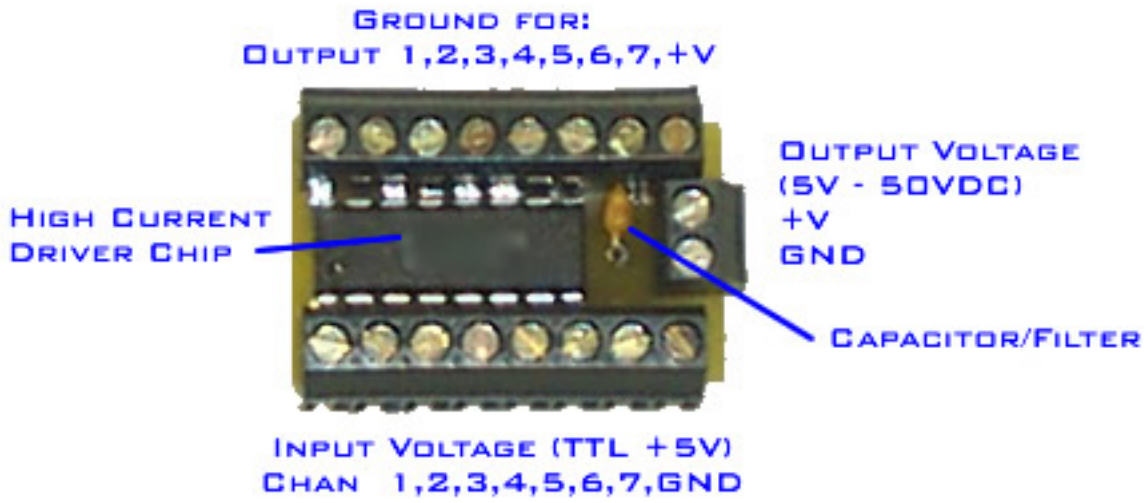

Figure 5: TTL High Current Driver without LEDs

2. Insert the capacitor as shown in Figure 5. Orientation is not important.
3. Install the Screw Terminals (if provided) as shown in Figure 5.
4. Insert the high current driver IC. The orientation is important. The chip will be shorted and will not work if put in wrong. Pin one goes in the square pad hole such that the notch on the chip is closest to the label on the board. Refer to Figure 5.
5. Attach 5-50VDC to the Output Voltage using the polarity shown in Figure 5. Turn on the power, no sparks or smoke should appear at this time.
6. Attach your TTL lines from a PIC/+5VDC signal to the Input locations. If you want 5 TTL signal to dive multiple channels, just install jumpers between the inputs.
7. Attach the Ground for the PIC/+5VDC signal to the input voltage Ground location.
8. Send TTL signals (+5V). The LED should light and channels 1-7 will measure ~90% of the output voltage between the grounded output channel to the +V for the output voltage supply.