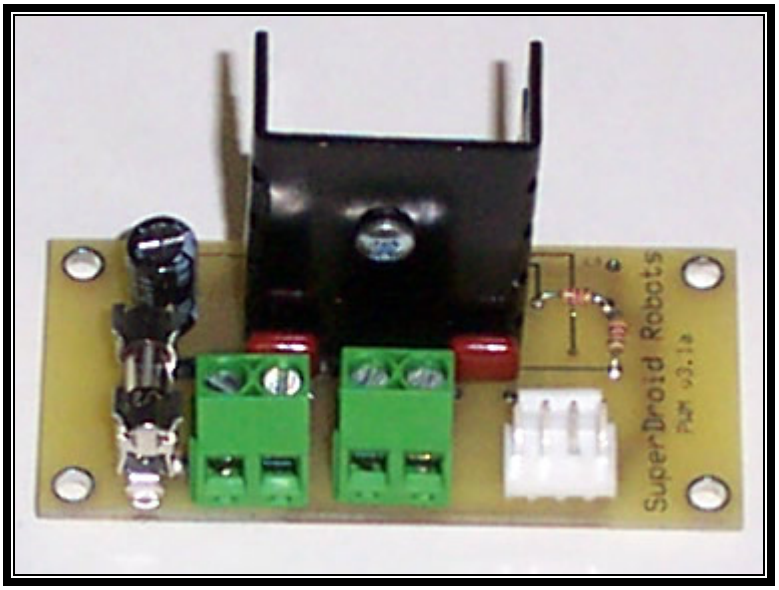
SUPERDROID ROBOTS™

Autonomous Robot Sales and Development

SuperDroid Robots Inc.



PWM Board

Assembly and Operation

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PWM Board

Accurate content is of the utmost importance to the authors of this document. If you find an error or see an item that needs more clarification report it to info@superdroidrobots.com

Assembly:

Recommended Tools

- ♣ 25 watt soldering iron with a sharp tip
- ♣ Solder
- ♣ Solder remover (optional, this should not be needed except to correct mistakes)
- ♣ Wire cutters/strippers
- ♣ Screw Driver
- ♣ Small needle nose pliers
- ♣ Multi-meter (recommended for any troubleshooting)
- ♣ Safety glasses
- ♣ Method of holding board and electronics (optional)

Assembly Sequence

Assembly order is not terribly important. The following steps assume basic soldering skills. SuperDroid Robots has a page on its web site addressing soldering WWW.SuperDroidRobots.com\soldering.htm\).

Tips:

- ♣ Where ever possible solder joints are kept as far from traces as possible or on the top side of the board. However, great care needs to be made to ensure excess solder is not applied and shorts the junction to an adjacent trace. Before powering the board a close inspection needs to be made to ensure no shorts are present.
- ♣ The other common mistake is creating "dry sockets". Dry sockets will look like the solder joint is fine, but upon closer examination the solder is only joined to the board or pin. These connections will yield spurious behavior that is very difficult to troubleshoot. It is important that both the board junction and the pin are heated sufficiently to allow the solder to flow and bond the two components.
- ♣ The figure on the front page shows where all the components are located on the circuit board. The assembly sequence will require referral back this image for positioning of the electronic components.
- ♣ All the components should be placed on the top of the board (the labeled side) and soldered from the backside.

1. Insert the brownish rectangular capacitors. There are two of they go between the IC and the screw terminals as shown on the figure. These are the clamping capacitors. The polarity of these capacitors is not important.
2. Insert the round cylinder shaped capacitor. The polarity is important. The positive (longest) leg goes in hole closest to the "+" sign.
3. Insert the 4.7k Ohm resistors as shown in the figure. Orientation is not important. Use the color bands to identify the resistors resistance. These resistors are pull down resistors for the brake and direction.

Resistor Color Code							
Color	**1st Band**	**2nd Band**	**3rd Band**	**Multiplier**	**Tolerance**	**Reliability**	**Temperature Coefficient**
Black	0	0	0	10^0	-	-	-
Brown	1	1	1	10^1	±1%	1%	100ppm
Red	2	2	2	10^2	±2%	0.1%	50ppm
Orange	3	3	3	10^3	±3%	0.01%	15ppm
Yellow	4	4	4	10^4	±4%	0.001%	25ppm
Green	5	5	5	10^5	±0.5%	-	-
Blue	6	6	6	10^6	±0.25%	-	-
Violet	7	7	7	10^7	±0.1%	-	-
Gray	8	8	8	10^8 or 10^{-2}	-	-	-
White	9	9	9	10^9 or 10^{-1}	-	-	-
Gold	-	-	-	10^{-1}	±5%	-	-
Silver	-	-	-	10^{-2}	±10%	-	-
None	-	-	-	-	±20%	-	-

4. Insert the fuse clips as shown. There are tabs on the outside face of the clips, make sure they face outwards so the fuse can be inserted.
5. Insert screw terminals.
6. Insert the 4-pin header as shown in the figure.
7. Insert the LM18200 PWM driver IC. It can only go in one way from the top side.
8. Mount the heat sink onto the PWM IC using the machine screw and nut. Make sure the heat sink is not close to any traces.
9. Insert the fuse.

Operation

1. Connect power leads to the screw terminal. Polarity if very important, the fuse will not protect you if you hook this up wrong and the whole board will fry.
2. Insert the motor leads. Polarity is not important, after operation if you wish to change the direction of the motor you can swap the leads.
3. 0V to the brake will turn the brake off, 5V will turn it on. The brake IO is labeled “B” on the 4 pin header. There is a pull down resistor on this IO line so you can leave it disconnected if you wish.
4. 0V and 5V will change the direction of the motor. The direction IO is labeled “D” on the 4 pin header. There is a pull down resistor on this IO line too, so if you only desire to drive the motor in one direction, you can leave this IO line disconnected.
5. There is a ground line on the 4 pin header labeled “G” that should be grounded with the PWM generator. Sometimes the circuit will work without this connection, but its good practice to hook it up.
6. The PWM line (labeled “P” on the 4 pin header). The PWM should be 0-5V at 1kHz or more. It must be a PWM, straight DC voltage will not drive the circuit.