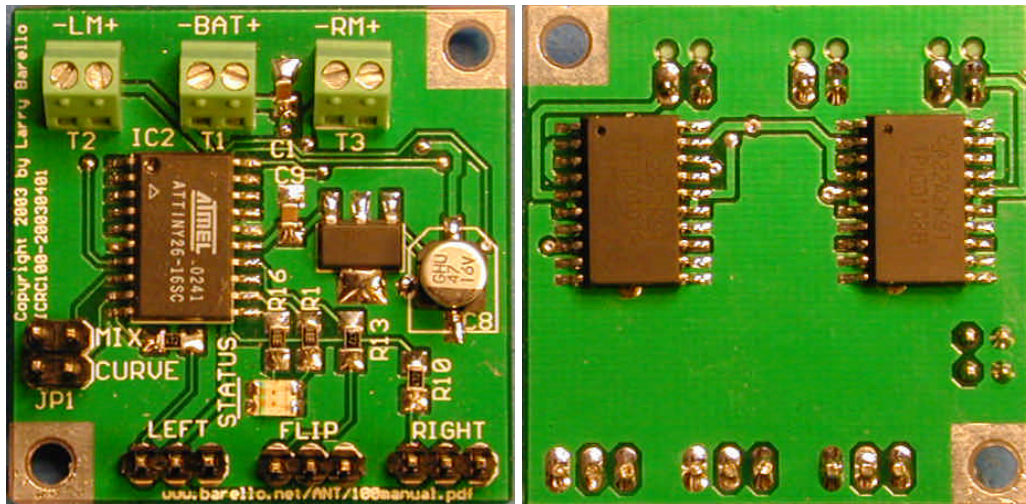


Ant-weight R/C Robot Controller 100



The Ant 100 R/C Robot Controller offers unparalleled functionality and reliability for your creation with dual motor drive, selectable single stick control, Adjustable control curve and a FLIP input that reverses and swaps the motor drive output for robots that are invertible.

Specifications:

- ❑ 1-1/2" x 1-1/2", 1/2 oz with connectors, 1-1/4" hole pattern for 4-40 bolts.
- ❑ 5-20 cell NiCad/NiMh or 2-8 cell Lithium supply. +5v power supplied to radio
- ❑ Three channels input compatible with any R/C radio: Left, Right, and Flip.
- ❑ Left and Right output rated for 2 amps continuous, 5-amp peak each.
- ❑ Outputs protected against shorts, overloads and high temperatures.
- ❑ Selectable channel mixing for single stick or tank style control.
- ❑ Selectable straight or exponential transfer curve for greater control.
- ❑ Flip input for invertible robots activated with 1/2 forward stick, or contact closure.
- ❑ Ultra efficient driver delivers full battery voltage to motors without a heat sink.
- ❑ +/- 70 output levels for precision control.
- ❑ Status LED indicating signal presence for each channel.

Power Supply

The ANT 100 controller will function with a supply voltage as low as 5.0-volts. However, supply voltages less than 8v significantly reduce current capacity (see below). It is recommended to use at least a 7-cell battery pack.

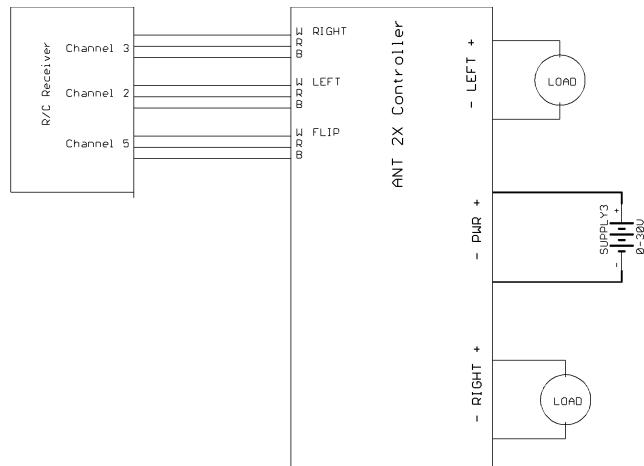
Connections

Connections are straightforward. All connections are labeled on the board (refer to the picture above). The connections are, CCW from the upper right:

- ❑ RIGHT motor connection
- ❑ PWR – Main power connection to board.
- ❑ LEFT motor connection.

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- ❑ MIX – Jumper
Open = Normal tank style control. Left R/C controls Left Motor, etc.
Closed = Joystick control: Left channel = velocity, Right channel= Steering.
- ❑ EXPONENT - Jumper
Open = Straight transfer curve with +/- 8% dead-band
Closed = Exponential transfer curve (beta of 1.4) for soft, easy control of steering.
- ❑ LEFT R/C input that controls the LEFT motor, or, Throttle if the MIX jumper is present.
- ❑ FLIP R/C signal that activates the Flip function on robots that are invertible. Flip activates with stick forward ½ or with simple switch closure. The controller automatically determines which is being used.
- ❑ RIGHT – R/C input that controls the RIGHT motor, or, steering if the MIX jumper is present.



Typical wiring diagrams are shown above. Note that channel assignments will vary depending upon the radio gear used.

Battery Eliminator Circuit (BEC)

Power is supplied for the R/C radio at the connectors. The radio power is not intended to drive servos and will not drive a standard servo under load. If you use a separate battery to drive your radio and servos do not connect the middle lead of the connectors. This lead is typically red and is labeled on the board with an "R". Note: you must cut or detach *all* of the red leads as each is connected to +5v on the board.

Another approach is to power servos with a separate 4.8-7.2v supply (4-6 cells) and while using the controller to power the radio. This requires cutting the red wire on the servo and running the red lead to the separate supply.

Status LED

The status LED blinks green once for each active channel during a 1-1/2 second cycle time. If the LED is on continuously, there is power, but no signal. If the LED is not illuminated, then there is no power or the board is damaged. When a fault is detected (shorted load, open circuit or over temperature) the status LED changes to blinking Yellow for ½ second. If only one motor is connected, then the LED will be yellow continuously indicating an open load.

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FLIP input

FLIP input is used to reverse and swap the left and right output drive. This allows robots that are invertible, or can operate in reverse, to be controlled with normal stick movements. FLIP activates when the selected channel has ½ forward stick movement or if the white and black connections are shorted together with a switch.

Current Rating

Current rating is not a precise value. There are some absolute limits and then there are limits that depend upon the ability of the board to shed heat. The ANT100 is carefully designed to transfer heat from the chips to the board as efficiently as possible. For a plain board in still air the following current/time ratings were determined for one channel:

5-7A	Peak current/limit
3.0 A	25 sec
2.5 A	1 min
2.0 A	> 4 minutes

Plain board in still air, 8 cell 1600ma NiMh battery pack, single channel, room temp 70f, Locked rotor load with varying PWM to maintain current level

Forced Cooling

Forced cooling or additional heat sink material will not increase the sustainable current capacity above 3A. However, additional cooling will extend the amount of time the board can deliver high currents. The following current capacity was measured with the ANT100 bolted to typical chassis material:

5-7A	Peak current/limit
3.0 A	30 sec
2.7 A	3 minutes
2.5 A	> 4 minutes

Board clamped to 3" square 1/16" aluminum plate with thermal compound, 8 cell 1600ma NiMh battery pack, single channel, room temp 70f, Locked rotor load with varying PWM to maintain current level

Disclaimer

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