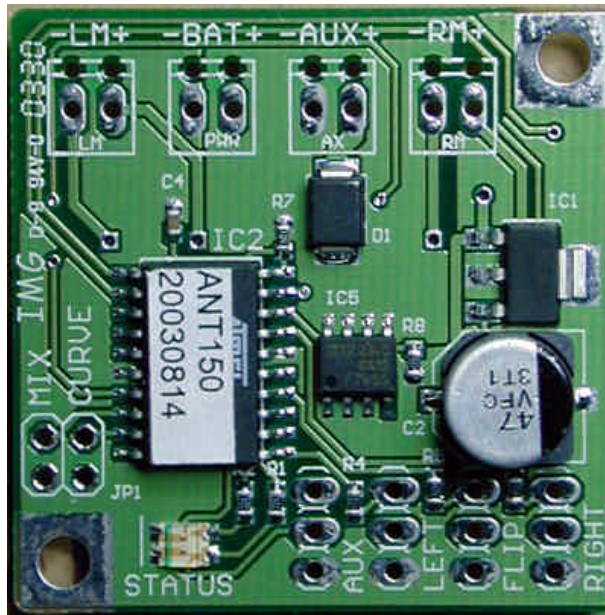


Ant-weight R/C Robot Controller 150



The ANT150 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", ½ oz with connectors, 1-1/4" hole pattern for 4-40 bolts.
- ❑ 5-18 cell NiCad/NiMh or 2-6 cell Lithium supply. +5v power supplied to radio
- ❑ Four channels input compatible with any R/C radio: Left, Right, Flip and AUX.
- ❑ 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 ½ forward stick, or contact closure.
- ❑ Ultra efficient driver delivers full battery voltage to motors without a heat sink.
- ❑ +/- 70 output levels for precision control.
- ❑ 15A auxiliary variable output switch for simple weapon control.
- ❑ Status LED indicating signal presence for each channel.

Power Supply

The ANT150 controller will function with a supply voltage as low as 5.0-volts. However, supply voltages less than 8v significantly reduce current capacity of the board. It is recommended to use at least a 7-cell battery pack. Alkaline cells are NOT recommended for use with the ANT controllers except with very light loads.

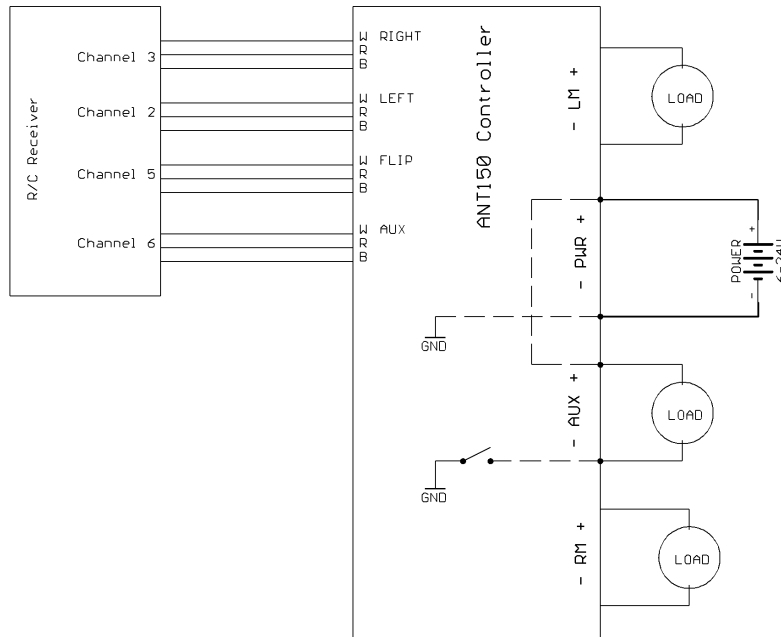
Connections

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

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- ❑ RM – Right motor connection
- ❑ PWR – Main power connection to board.
- ❑ LM - Left motor connection.
- ❑ AUX – Auxiliary load connection
- ❑ MIX – Jumper
 - Open = Normal tank style control. Left R/C controls Left Motor, etc.
 - Closed = Joystick control: Left channel = velocity, Right channel= Steering.
- ❑ CURVE - 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.
- ❑ AUX – R/C input that controls the AUX output switch. Varies from 0-100% in 32 steps

Typical Wiring Diagram



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

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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.

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.

AUX Output Switch

The auxiliary output is a simple switch to ground. It is activated with forward stick position and variable output from 0 to 100%. Although the switch is rated for 15A continuous at room temperature, this value de-rates to something much less when the control board heats up. When the main board is very hot, the safe continuous current is more like 8A.

The AUX output is not protected, so it is important to select a load that won't exceed the temperature/current limits during normal operation.

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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 ANT150 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 ANT150 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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