Using a PWM controlled fan output on the Gadgets3D fan splitter.

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Product details: http://gadgets3d.com/index.php?route=product/product&path=62&product_id=88

Instruction manual: http://gadgets3d.com/manuals/FAN_Splitter&Cooling_Plate_Manual.pdf

The Gadgets3D fan splitter offers a very convenient means of connecting up to 17 fans or LED lights to your 3D printer.

Two of the outputs on the fan splitter can be PWM speed controlled using spare digital outputs from your controller. RAMPS 1.4 has a total of 3 PWM output channels on board that are often configured to drive a heatbed (D8), a fan (D9) and an extruder (D10). By shifting the fan connection to one of the fan splitter PWM channels, D9 can be made available to control a second extruder.

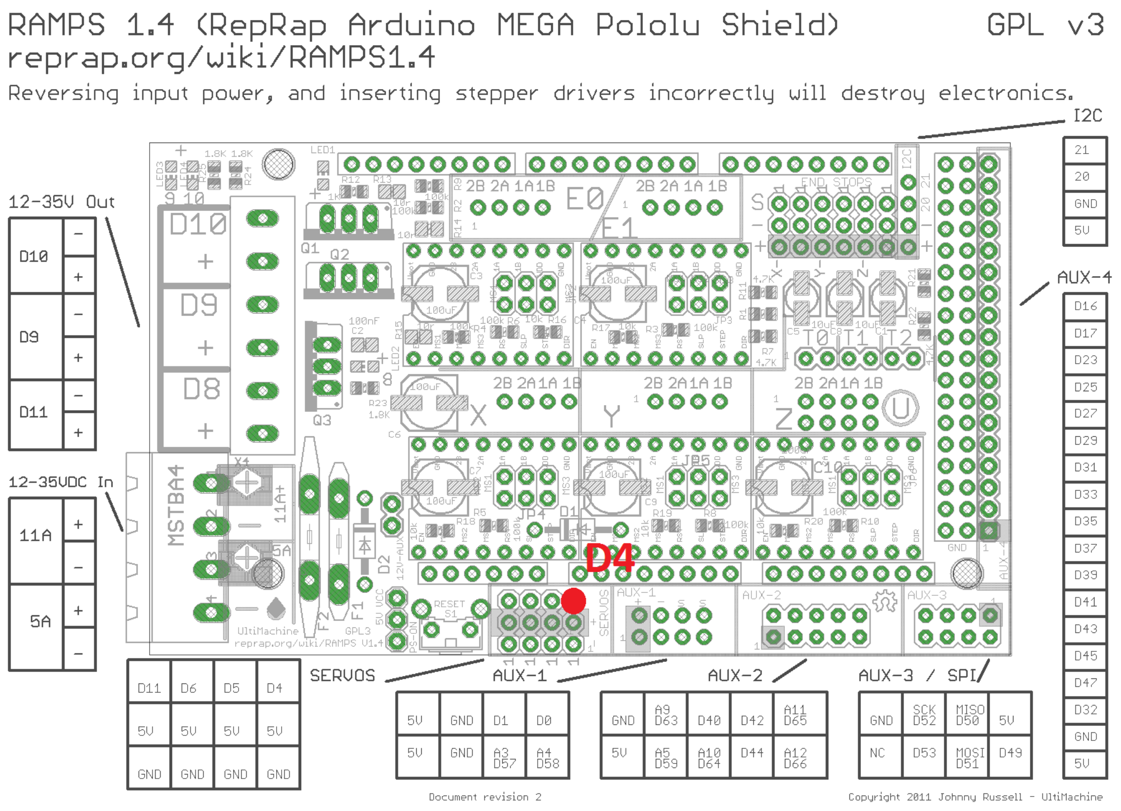
Below I will describe how I made use of one of the fan splitter PWM channels to control the cooling fan on my 3D printer. The instructions relate to my particular configuration (Arduino Mega 2560 with RAMPS 1.4 running Marlin firmware). If you have different hardware or firmware you will need to discover the equivalent steps that will work with your system.

The instructions below assume that you already have the fan splitter connected to a 12V DC supply as described in the instruction manual.

Step 1.

Connect D4 output from your RAMPS 1.4 board to the PWM1 input pin on the fan splitter board. With care it is possible to solder a wire directly to each pin. I used a single wire with a pin plug connector at each end to avoid the need to solder to these pins. Note that the connection does not require a second wire. The ground for the signal is shared with the power supply to the fan splitter.

D4 is the digital output that is connected to the 4th servo motor output connection on RAMPS 1.4 (Servo No.3 - Servos are labelled 0,1,2,3 in software). Marlin is normally configured to disable servo motor outputs. If you want to use the servo motor outputs – either limit their usage to just the first 3 or use another spare digital output for controlling the fan PWM.


RAMPS 1.4 (RepRap Arduino MEGA Pololu Shield) GPL v3
reprap.org/wiki/RAMPS1.4
Reversing input power, and inserting stepper drivers incorrectly will destroy electronics.
12-35V Out
D10
D9
D11
12-35VDC In
11A
5A
D4
SERVOS
AUX-1
AUX-2
AUX-3 / SPI
AUX-4
I2C
Document revision 2
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Step 2.

Connect the fan that you wish to control to the PWM1 OUT connector on the fan splitter. By default my fan was originally connected to D9 on the RAMPS board. I fitted the two wires to a suitable 2 pin socket and plugged it into PWM1 OUT. Make sure you connect the wires round the correct way (red to +). If connected incorrectly, the fan will run in reverse.

Step 3.

Open your Marlin firmware sketch (using Arduino software) and identify what motherboard number your firmware is configured to use. You should find this in Configuration.h at about line 60. You should see some code similar to this:

```
#ifndef MOTHERBOARD
#define MOTHERBOARD 33
#endif
```

In this example the Motherboard is defined as number 33.

Next go to the pins.h file and search for “MOTHERBOARD == 33” (or whatever number your motherboard is defined as) followed by “#define FAN_PIN”

The code segment should look like this:

```
#if MOTHERBOARD == 33 || MOTHERBOARD == 35
  #define FAN_PIN          9 // (Sprinter config)
 #else
```

```
  #define FAN_PIN          4 // IO pin. Buffer needed
#endif
```

Change the FAN_PIN definition from 9 to 4.

Verify the code and upload the modified firmware to your Arduino.

Step 4.

Test fan speed control. If you have an LCD screen controller you can select Control, Temperature Fanspeed from the menu and adjust the speed to say 255. When you press select to confirm the speed, you should hear the fan run full speed. Try turning it down to 100 – it should run slower.

If you don't have a LCD screen controller, you can use Pronterface (or alternative printer control software) to send M codes to test the fan. M106 will switch the fan on full speed. M107 will switch the fan off. M106 S100 will switch the fan to about 39% of full speed (100/255).

You should now be able to print as normal – having the fan speed control operate via the splitter board instead of from the RAMPS directly.