PMDX-SmartBOB

How should I connect PUL+, PUL-, DIR+ and DIR- on my motor drivers?

Some stepper drivers and step-servo drivers have differential inputs for their step and direction inputs, usually called "PUL+" and "PUL-" (for "pulse" or "step") and "DIR+" and "DIR-" (for "direction"). There are two different ways to connect this style of driver to the PMDX-122, PMDX-126 or any of the SmartBOB boards. See below for more details.

What about the "ENA+" and "ENA-"? See "Should I Connect the Enable Input On My MotorDrivers".

(1) +5V Common

Tie the "DIR+" and "PUL+" together and connect them to a +5V terminal on the PMDX board. Then connect the "PUL-" and "DIR-" to the step and direction pins on the PMDX board. This corresponds to the "open-collector" method shown in most of the motor driver manuals. How to do this varies depending on which PMDX board you are using.

- **PMDX-122:** On the PMDX-122, set jumper JP1 ("Pin 2-9 Com") to "+5V". Then connect the "PUL+" and "DIR+" terminals to the "COM" terminal on J1, J2, J3 or J4 (I'll use J1 in this example). Now connect the "PUL-" to the step signal on J1 (either "Pin2" or "Pin3" depending on how you have Mach configured), and the "DIR-" to the direction pin on J1.
- **PMDX-126:** On the PMDX-126, connect the "PUL+" and "DIR+" to the "PC+5V" terminal on J1, J2, J3 o rJ4 (I'll use J4 in this example). Then connect the "PUL-" to the step signal on J4 (either "Pin2" or "Pin3" depending on how you have Mach configured), and the "DIR-" to the direction pin on J4.
- **PMDX-SmartBOB:** On the PMDX-SmartBOB boards (PMDX-412, 416 and 424), connect the "PUL+" and "DIR+" to the "COM" terminal next to the step and direction terminals. The connect the "PUL-" to the step signal (for example, "Pin2") and the "DIR-" to the direction terminal (for example, "Pin3"). Then in Mach4, go to the PMDX-SmartBOB plug-in configuration, click on the "Motor Config" tab and change the "Step/Dir Common" to "Step/Dir Common is +5V".

NOTE: With the "+5V Common" scheme you must configure the step signal polarity to be "active low". How you do this depends on whether you are using Mach3 or Mach4 and which motion plug-in you are using. The direction signal polarity will depend on how you have your motors wired to the motor driver. You will have to experiment to see what the direction polarity should be.

(2) GROUND Common

Tie the "DIR-" and "PUL-" together and connect that to a ground terminal (usually labeled "PCgnd") on the PMDX board. Then connect the "PUL+" and "DIR+" to the step and direction pins on the PMDX board. This configuration is not usually shown in the motor driver manuals, but will work just fine.. How to do this varies

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depending on which PMDX board you are using.

- **PMDX-122:** On the PMDX-122, set jumper JP1 ("Pin 2-9 Com") to "GND". Then connect the "PUL-" and "DIR-" terminals to the "COM" terminal on J1, J2, J3 or J4 (I'll use J1 in this example). Now connect the "PUL+" to the step signal on J1 (either "Pin2" or "Pin3" depending on how you have Mach configured), and the "DIR+" to the direction pin on J1.
- **PMDX-126:** On the PMDX-126, connect the "PUL-" and "DIR-" to the "PCgnd" terminal on J1, J2, J3 o rJ4 (I'll use J4 in this example). Then connect the "PUL+" to the step signal on J4 (either "Pin2" or "Pin3" depending on how you have Mach configured), and the "DIR+" to the direction pin on J4.
- **PMDX-SmartBOB:** On the PMDX-SmartBOB boards (PMDX-412, 416 and 424), connect the "PUL-" and "DIR-" to the "COM" terminal next to the step and direction terminals. The connect the "PUL+" to the step signal (for example, "Pin2") and the "DIR+" to the direction terminal (for example, "Pin3"). Then in Mach4, go to the PMDX-SmartBOB plug-in configuration, click on the "Motor Config" tab and change the "Step/Dir Common" to "Step/Dir Common is ground".

NOTE: With the "GROUND Common" scheme you must configure the step signals to be "active high" (or "not active low"). How you do this depends on whether you are using Mach3 or Mach4 and which motion plug-in you are using. As with the "+5V Common" scheme, the direction signal polarity will depend on how you have your motors wired to the motor driver. You will have to experiment to see what the direction polarity should be.

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