Issue Details

I have a stepper motor but do not have the pinouts for the motor. How can I determine how to wire my stepper motor without the pinouts?

Solution

In general, 2-phase stepper motors can have 4, 6 or 8-wire leads (not including any optional encoder lines).
Some stepper motors have a motor case ground that can be tied to the ground of the system. It is usually a black wire, and it will add one additional wire to the overall count (4 coil wires + 1 casing ground = 5 wires total).

The best solution is to obtain the pinout from the motor manufacturer. If you do not have access to the pinout, then the following procedure will help you in wiring the 2-phases.

If you have four coil wires from the stepper motor:

- Approach 1 (using a multimeter)
    1. Each of the two phases should have the same resistance when measured with a multimeter. When measuring the resistance across one wire from each of the two phases, the resistance should be infinite because the circuit is open. Locate the two pairs of wires that represent the two phases; both pairs of wires will have similar internal resistance.
    2. Connect each phase to the amplifier and ignore the polarity (+ / -), for now. You have a 50 percent chance of guessing right.
    3. Send a command to move the motor. If the motor rotates in the wrong direction, then switch either phase A and A- or B and B- (effectively reversing directions).
- Approach 2 (without a multimeter)
    1. Connect the four coil wires to the amplifier in any arbitrary pattern. Send a command to move the motor.
    2. If the motor moves erratically or not at all, then switch one wire from phase A with one wire from phase B.
    3. If the motor is rotating in the wrong direction, then switch either phase A and A- or B and B- (effectively reversing directions).

If you have six coil wires, then each phase has a center tap wire:

- The center tap wire should have half the internal resistance of the full phase. The easiest option is to use a multimeter to find the two pairs of wires that have the maximum resistance.
- Connect each phase to the amplifier, and ignore the polarity (+ / -) for now. You have a 50 percent chance of guessing right. The motor should rotate, and if it is in the opposite direction, then switch either phase A and A- or B and B- (effectively reversing directions).

If you have eight coil wires, then it is highly recommended you find the exact pinout for the motor.

- The eight wires represent four pairs of wires, and each pair has the same resistance. It is not easy to find what two pairs represent phase A and phase B without dismantling the motor.