

## A quick guide to the EZStepper® starter kit

Revision C1

This guide applies when using the RS232-to-RS485 Converter, or the USB-to-RS485 Converter after USB driver is installed.

### For these products

- EZ17
- EZHR23
- EZHR17
- EHR17EN

### You will need:

- ▶ Your EZStepper® Controller/Driver and stepper motor. A motor rated at about 1/4 of supply voltage is best.
- ▶ RS232 to RS485 Converter or USB to RS485 Converter, with cables supplied
- ▶ PC with port to match cable supplied, with USB driver installed if USB to RS485 Converter is being used.
- ▶ Power supply, 12 to 40V. For first-time EZStepper users we recommend a current-limited power supply to protect against miswiring.
- ▶ HyperTerminal application (For Windows 98, download HyperTerminal Private Edition 4.0+ from [www.hilgraeve.com](http://www.hilgraeve.com). This corrects echo problem in Windows 98 version.)
- ▶ Crimp tool (recommended): T-handle crimp tool, Digikey part A9982. Otherwise, soldering equipment.
- ▶ Small Philips screwdriver for operating address switch
- ▶ If troubleshooting is required: ohmmeter, oscilloscope

### Precautions

- ▶ Observe all electrostatic discharge precautions to avoid damaging circuit boards.
- ▶ Allow at least 0.1" air gap when bolting EZStepper to motor, for cooling.
- ▶ Use 4-40 round standoffs to bolt EZStepper to motor, NOT hex (Hex standoffs will touch components).
- ▶ DO NOT disconnect motor wires while power is on, to avoid damage to circuit board.
- ▶ DO NOT place EZStepper board or RS485 Converter on metal surface when powered (to prevent shorts).
- ▶ DO NOT run Palm Pilot Hotsync on the computer. It will take over the comm port.
- ▶ Avoid bundling encoder or IO wires with motor power wires, as this may cause noise pickup from motor wires. If bundling is necessary, put motor wires in a separate shielded twisted-pair cable.
- For 10' or longer, shield each IO line individually.
- If using ribbon cable, add grounds between signal wires and motor wires.

### Starting up

Start with power supply OFF.

1. Connect power supply to RS485 Converter.
  - ▶ Turn power ON. Confirm current is less than 100mA. Turn power OFF.

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2. Connect EZ Stepper to RS485 converter.
  - ▶ If using EZ Start kit, use cable provided. If not using kit, wire mating 4-pin connectors pin-to-pin per the markings on the connector. (See Wiring Note below.)
  - ▶ Turn power ON. Ensure current is less than 0.25A, and green Life LED blinks. *If not, look for bad power connection.* Turn power OFF.

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3. Connect stepper motor to middle four pins of the motor connector as shown in diagram: (See Wiring Note below.)
 

**CAUTION!**  
Always turn off power before connecting or disconnecting motor to avoid damaging circuit board.

"MA" and "MB" are marked on bottom of circuit board.

If using unipolar motor, leave center taps unconnected.

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4. Set address switch firmly to number 1 with Philips screwdriver.

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5. Turn power ON. Motor should execute a factory stored command. *If this doesn't occur, check for poor motor connections.*

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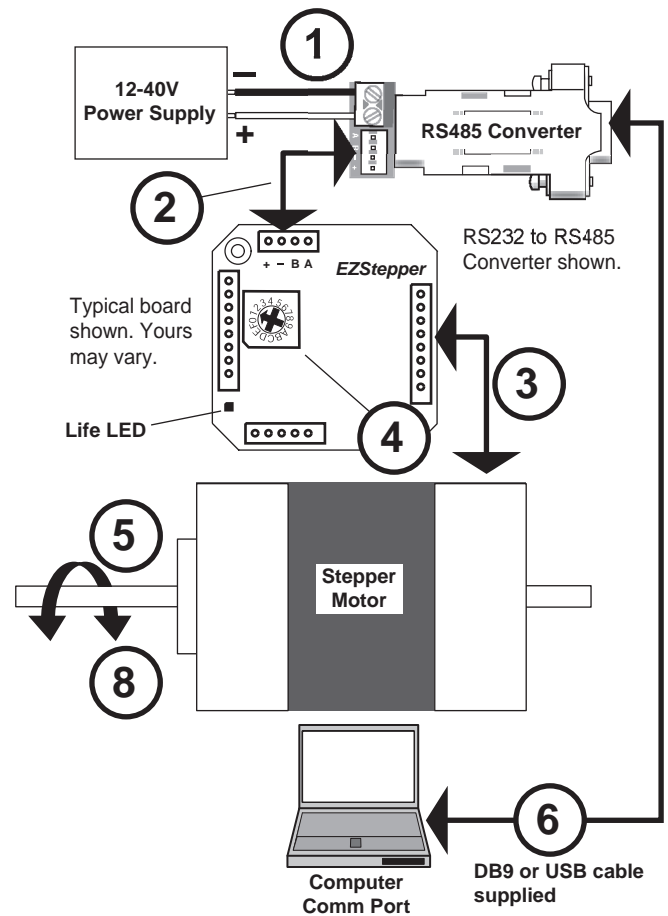
6. Connect RS485 Converter to the pc.

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7. Start HyperTerminal or the EZCommander™ application (see other side of sheet for HyperTerminal).

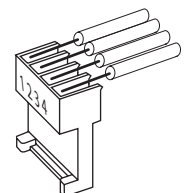
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8. Issue the command /1P10000R <CR> and observe result. This command tells motor to move to absolute position 10000 microsteps.



### Wiring Note

Always wire to the mating connectors supplied on circuit board. Use crimp tool if you have it, or else solder. (DO NOT solder to circuit board; damage is likely. Also, DO NOT press in with a screwdriver, because this makes unreliable connections.)



## Starting HyperTerminal

1 Make sure no other programs are using the comm port you will be connecting to with HyperTerminal.

2 Open HyperTerminal by following this (typical) path:

**Start/All Programs/Accessories/ Communications/ HyperTerminal/ HyperTerminal**

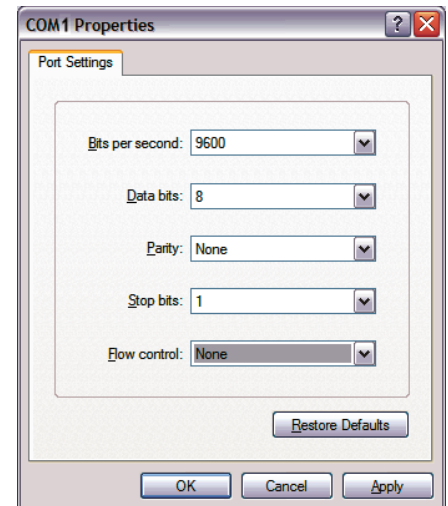
The path shown is for Windows XP.



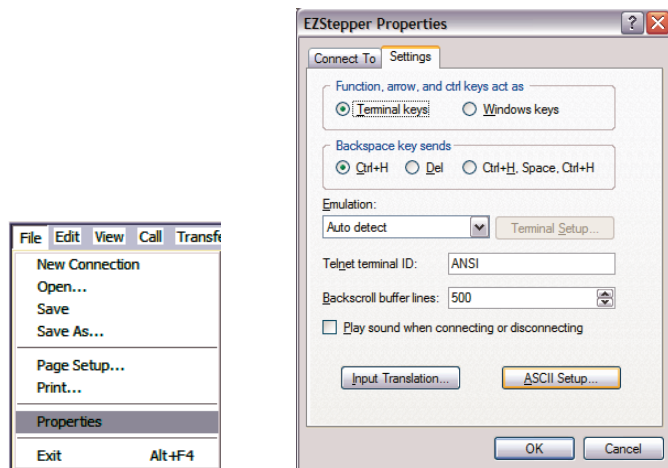
3 Name the new connection and select an icon. Click **OK**.



4 Select connection. Click **OK**. Note that USB uses higher port number.

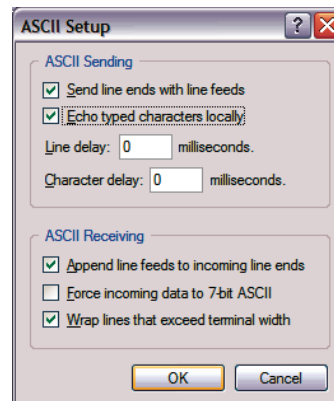


5 Make the port settings shown above. Click **Apply**, then click **OK**.



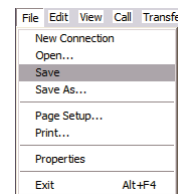
6 In HyperTerminal, choose **File/Properties**.

7 Click the **ASCII Setup** button on the **Settings** tab.



8 Make selections shown above. Click **OK**, then click **OK** again.

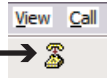
Your commands and responses will appear together as separate pairs.



9 Click **File/Save** to store this connection. Now you're ready to send commands.

You can open this connection later by choosing **File/Open** from the HyperTerminal menu.

To change connection properties later, first click the **Call/Disconnect** icon to terminate the connection.



You can also use the EZCommander™ Windows application to control your stepper motor. To obtain the application, visit the part of our website for your product.

## Troubleshooting

**If motor does not respond to commands:**

- ▶ Make sure address switch is detented exactly on position number 1. (After resetting, power must be cycled to establish new address).
- ▶ Turn off Palm Pilot Hotsync or other applications that use the comm port.
- ▶ Re-check that correct com port is selected.
- ▶ Issue "reconnect" command from HyperTerminal.
- ▶ Confirm good ground between PC and power supply. First measure resistance with power off; then check for voltage drop with power on. Repair poor ground connections.
- ▶ Issue command `/1<CR>` and verify that the response `" /0b "` is received. If ok, motor connection may be miswired or loose. If not, continue to next item.
- ▶ Check continuity of communication data to EZStepper board at point 1 in diagram below. If not present, check at other points shown. Suspect failed component or faulty wiring/connector between point where signal is present and last point where signal is absent.

**If motor misses steps at high speed:**

- ▶ Increase either the Move current or the supply voltage. To increase Move current, issue an "m" for Fast Move Current and/or "l" command (lower case L) for Slow Move Current. Example: `/1m75` = set current to 75% max. *Step misses typically happen in the middle of a move, where the motor "catches" in the beginning and end, but stalls in the middle.*

**If motor direction is not consistent:**

- ▶ Check that coils of motor are securely connected at both ends. *This is typically caused when one of the coils has a loose connection.*

