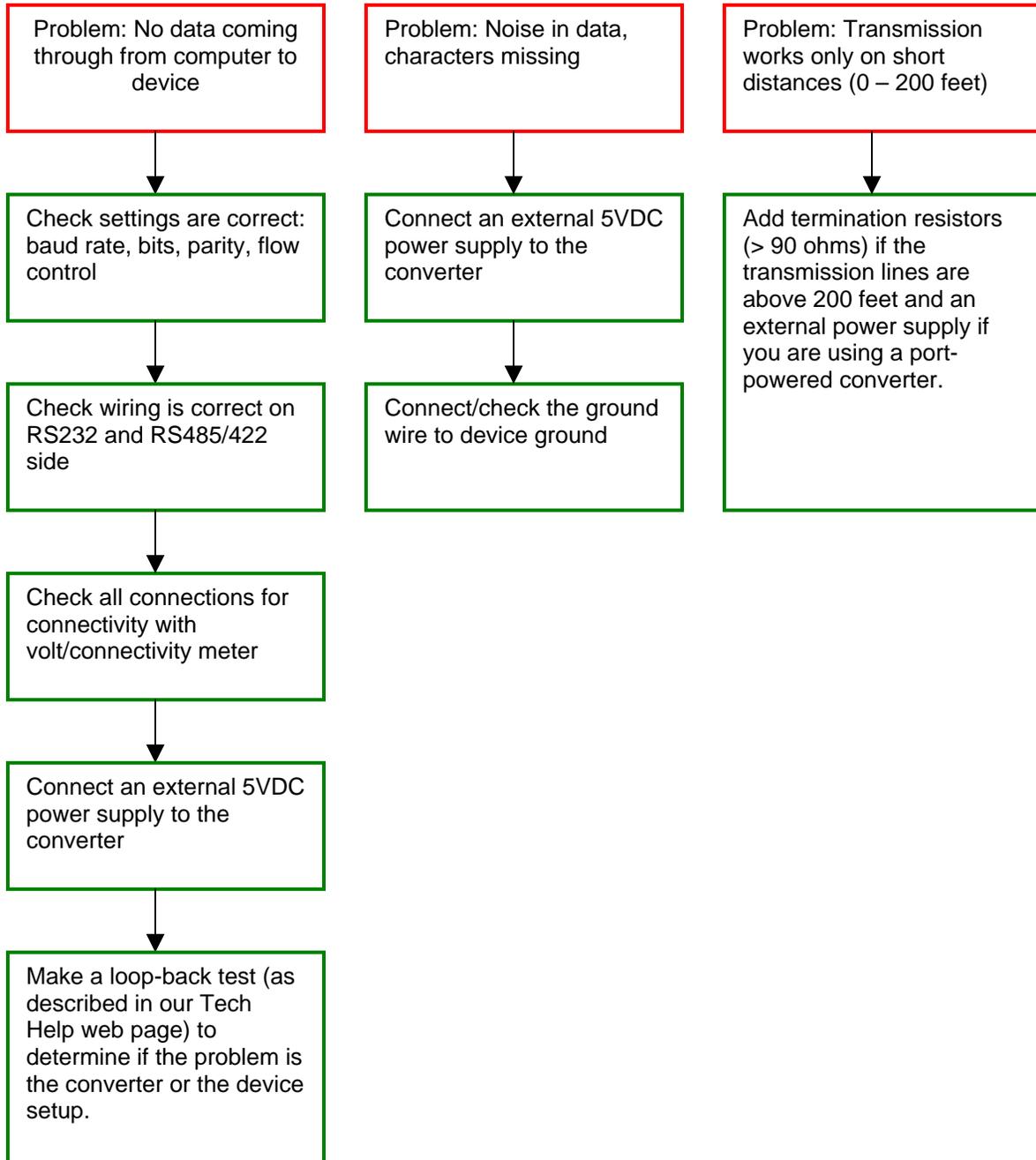


**RS232 to RS485/422 Troubleshooter**



### **Other RS-232 Connection Problems**

1. Handshaking lines RTS and CTS not interconnected, DTR and DSR not interconnected. Swap as needed.
2. Programs may use the RTS/CTS connection to check that a device is ready to receive data and respond. If there is No CTS connection, the program will never send data, but wait a long time or timeout with an error. The RTS line may need to be looped back to the CTS input. Data errors can occur if the device actually requires handshaking.
3. Programs may also use the DTR/DSR line connection to check that a cable is connected or that the device is turned on. If there is No DSR signal, the DTR line may need to be looped back to the DSR input. Some devices use DTR handshaking.
4. Each signal required for unit operation must be carried through by the isolator, modem or RS-422 or fiber optic converter. The primary "2 Channels" for RS-232 are Receive & Transmit. There are 2 data flow control channels, RTS and CTS. If these are missing, data is lost, characters missing, or files scrambled.
5. Connections to Telephone Modem/FAX modem - Make sure CD & RI lines are connected.

### **Using a DC Voltmeter to troubleshoot, (DCE/DTE):**

With a DC voltmeter you can measure the DC level from signal ground (pin#5 on DB9, pin#7 on DB25) on the connector to pin #2 or pin #3. When the unit is powered and not sending data, the output line should have a DC voltage of minus polarity, 3 volts to 11 volts will be typical. The other pin will have little or no voltage.

For example, we measure -11 volts on pin#2 of a DB9 connector and the line is labeled Rx, (the device is wired as DCE). If we measure the voltage on pin#3, it is DTE. Measure pin #2 and pin #3 to ground (pin # 5 - DB9) (pin #7 -- DB25) on the cable from the first device, then on the device you want to connect. If the cable and device have voltage on the same pin, you need to use a crossover or null modem connector that swaps pins #2 & #3 and the other pins.

Electrically active handshaking lines will be negative when not asserted or positive when asserted. Active handshaking lines can be found by measuring each pin for voltage. Output lines will have voltage. On a DTE port, DTR and RTS will have voltage if used. On a DCE port, DSR and CTS will have voltage, and if it's a modem with CD (Carrier Detect) and RI (Ring Indicator) these last two will be low until Ring is detected or a Carrier connection is made.

If handshaking lines don't have voltage when the device is powered on and ready, the device doesn't output them, they may be looped back, RTS to CTS and DTR to DSR. You can turn off the device power and measure for continuity (zero ohms) between pins to confirm if they are looped back.