Industrial Shields®

KNOW-HOW · CHECKLIST

RS-485: check a bus in 6 steps

Most intermittent RS-485 faults come from the physical layer, not from the code. Check in this order.

Check	What to do	Good result
1. Topology	Draw how the cable is really installed	One line from node to node, short stubs, no star
2. Termination	Power off and measure the resistance between A and B	About 60 Ω
3. Bias	Power on, stop all traffic and measure the DC voltage between + and -	At least 200 mV, stable
4. Common reference	Disconnect the bus at one node and measure between the signal grounds of two distant nodes	Not several volts, and no jumps when machines start
5. Cable and shield	Check the cable type and its route	120 Ω twisted pair, shield to earth at one end, away from VFD outputs
6. Serial settings	Compare the settings of every node	Same baud rate, data bits, parity and stop bits, and no duplicate addresses

What the readings tell you

- **About 120 Ω:** one termination is missing, or you are measuring only part of the bus.
- **About 40 Ω or less:** three or more terminations are enabled. Check the DIP switches.
- **Very high or open circuit:** no termination, or a broken cable.
- **Near 0 V with no traffic:** no bias. Enable it at one point only, unless all receivers are true fail-safe.

If the bus has never worked

- Swap A and B at one device. Follow the + and - marks, because manufacturers do not use these letters in the same way.
- Compare the baud rate, parity and address on both sides.
- Check that the port is enabled and in the right mode. This depends on your PLC range.

Details for your PLC range: industrialshields.com/slides/slide/rs-485-how-to-check-a-bus-step-by-step-930