



**METER**  
ENVIRONMENT

## SDI-12 TROUBLESHOOTING

The main disadvantage of an [SDI-12](#) sensor network is that if one sensor goes down, every sensor on that port can go down until the offending sensor is removed from the data line. Below are a few common problems and troubleshooting techniques. For questions, contact [support.environment@metergroup.com](mailto:support.environment@metergroup.com).

## SENSOR TROUBLESHOOTING

**Anytime I try to address my sensors in a terminal program, I get a message saying “SDI-12 failed”.**

A [ZSC](#) will simplify sensor addressing. Terminal programs have a very short timeout that can be tricky and problematic. However, to use the terminal program, here are a few suggestions:

1. Only hook up one [sensor](#) at a time. Power it continuously through a 12 V port.
2. Query the sensor address first using the `?!` command to be certain the sensor is communicating and that it's changing the address of the correct sensor.
3. Move as fast as possible! The short timeout in terminal programs can be annoying. Get the `aAb!` command out quickly, or SDI-12 will timeout, and the program will show the dreaded “SDI-12 failed” message.
4. If the program shows the “SDI-12 failed” message, get the terminal prompt up again. Type the `sdi12` command, and (if on a data logger) get a message asking what port to use. If this message doesn't show, then SDI-12 was not actually entered.
5. Try again with a different sensor. METER rigorously tests sensors, but unfortunately a bad one escapes from the factory from time to time. Trying again on a different sensor can determine if this is the issue. If the problem does not persist when tried on another sensor, come back to the sensor that caused the trouble.
6. For more help on this, see this [application note](#).

## **All of my sensors are sending back bad data.**

1. Use a ZSC to check each individual sensor for functionality. If a sensor is not working properly, remove that sensor from the network, and [contact METER](#) for a replacement.
2. The bus is not working correctly. To test this, see section on bus troubleshooting below.
3. If the bus is working fine and sensors are working normally, try hooking up just one sensor to the data logger. If the sensors work when checked with the ZSC, but not on the data logger, one of three things could be happening:
  - The data logger may not be working properly. Contact the data logger manufacturer to troubleshoot the individual logger.
  - The sensor is not connected correctly to the logger. Make sure to power the sensor through the 12 V excitation port using the white wire, and ground the sensor using the shielded wire, and connect the red wire to a port on the data logger capable of two-way serial communication. Remember, METER's wiring is opposite of that of many other SDI-12 manufacturers. RED is communication, while WHITE is excitation.
  - The program is not written properly. Try loading one of METER's example programs without changing anything. Example programs can be found [here](#). If this program works fine, your program is most likely not working correctly. Contact the data logger manufacturer for programming assistance, or use METER's Campbell Scientific [Data Logger Programming Service](#).

## **BUS TROUBLESHOOTING**

### **All of my sensors are sending back bad data, and when I checked to see if they were working with a ZSC, all of them were.**

If all sensors are working but sending back bad data, chances are that the problem lies not in the sensors but in the bus. To test a bus, take a multimeter and set it to read resistance (ohms). Touch one of the ends of the multimeter cable to the first port on the bus. If there is no break in communication, the display should read close to zero. If there is, the display will read in the millions or be unable to obtain a value. If this should happen, re-solder that port's connection. Repeat this step on all other ports. If even one of the ports on the bus is not communicating, the bus will not function correctly and the sensors will continue sending back bad data.

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