Testing Controller / Thermostat Communication Chip

TCS Technical Bulletin

The following will guide you along the process of testing a controller or thermostat communication chip

A. Test the network

Steps:

1. Measure AC and DC voltage at the A, B & Ref terminals.

   Use a meter to measure and record the 6 measurements below.

   a. Measure B to A - AC voltage

   b. Measure B to Ref - AC voltage

   c. Measure A to Ref - AC voltage

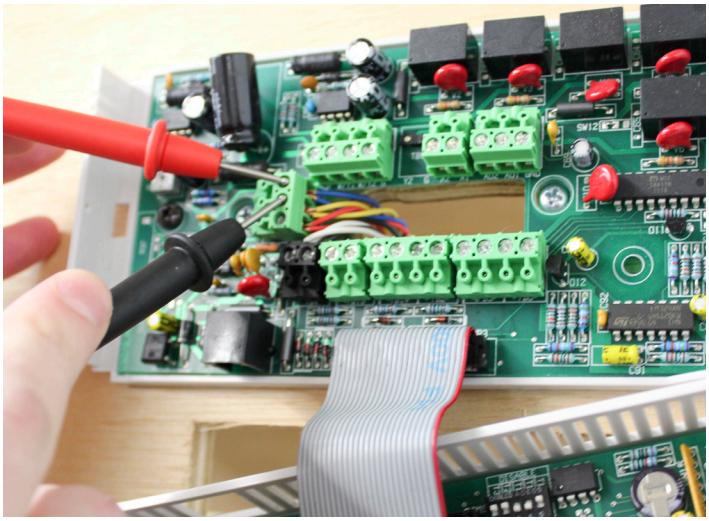
   d. Measure B to A - DC voltage

   e. Measure B to Ref - DC voltage

   f. Measure A to Ref - DC voltage

Volts AC

Volts DC



NOTE:

- **The values shown are without a terminating resistor in place. If 1-2 terminating resistors are used, the voltages will be much lower.**
- **The B to Ref DC measurement should always be greater than the A to Ref DC measurement.**
- **These values DO NOT GUARANTEE network communication, they simply identify the presence of wiring issues/problems.**

RESULTS:

MEASURE ACROSS	METER SET TO VAC	METER SET TO VDC
B to A	0	1 to 4
A to Ref	0	0 to 1
B to Ref	0	2 to 5

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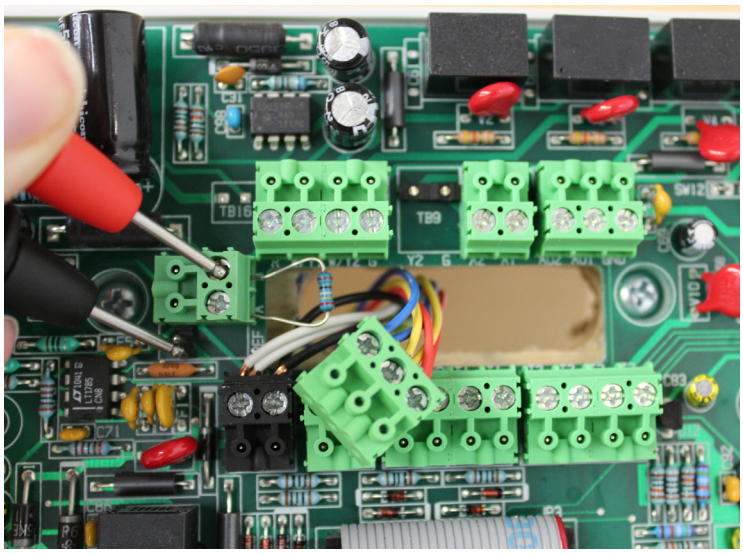
B. Test the communication chip



Steps:

1. Remove the communication wires from the product.
   - It is fine to leave it hanging to the side.

2. Place the resistor across the A and B terminals
   - The resistor can be anything from 50 ohms to 1000 ohms.
   - The terminating resistor included with a QD1010 is 124 ohms and will work, as will the 499 ohm resistors included with modulating products.

3. Measure DC voltage at the A & B terminals.
   a. Measure B to Ref - DC voltage
   b. Measure A to Ref - DC voltage

NOTE:

- **As the chip gets older and / or starts failing, the voltage will start dropping.**
- **Old thermostats and SL1001a do not have a Ref terminal and in these cases, instead of measuring to the Ref terminal, measure to a GND or 24 V- terminal.**

Results:

MEASURE ACROSS	METER SET TO VDC	COMM CHIP STATUS
A to Ref	~ 2.5	OK
B to Ref	~ 2.5	OK
Either Measurement	< 2.0 or unbalanced values	BAD

Examples:

B to Ref = 1.9 VDC
A to Ref = 1.1 VDC } **Bad Comm Chip**

B to Ref = 2.21 VDC
A to Ref = 2.23 VDC } **Good Comm Chip**

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