

# Data Line Voltage Troubleshooting and Bias Switches



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Proper data voltage is essential to robust and reliable communication on the *ComfortNet™* system.

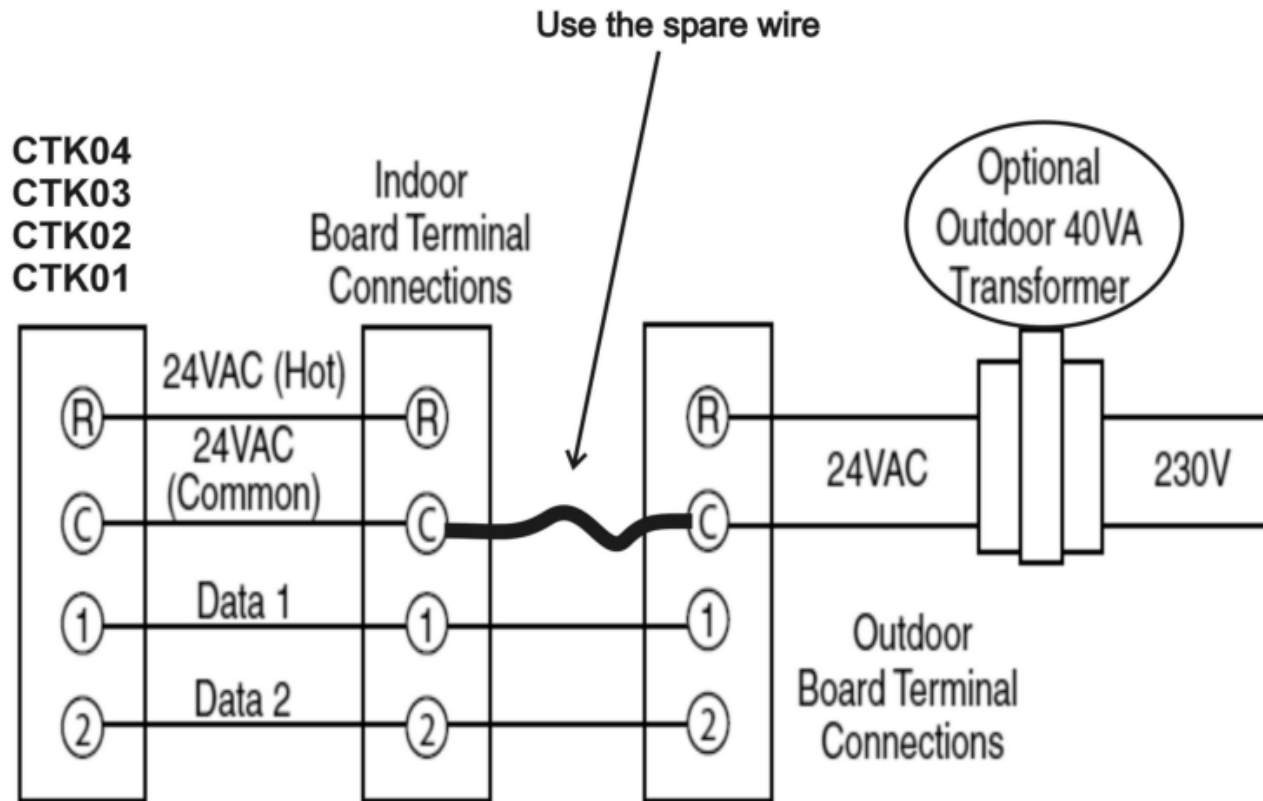
- Any wiring issues must be corrected for good communication.
  - Poor wiring connections at the terminal blocks
  - Low voltage wires that are shorted, grounded or broken.
  - Communicating wires that are not connected to the proper terminals.
  - 24 volt common outside and inside are not at the same ground potential
- Bias dip switch conflict between indoor board and outdoor board.

# Data Line Voltage Troubleshooting and Bias Switches

- A removable plug connector is provided with the control to make thermostat wire connections.
- This plug may be removed, wire connections made to the plug, and replaced.
- It is STRONGLY recommended that you do not connect multiple wires into a single terminal.
- Wire nuts are recommended to ensure one wire is used for each terminal.
- Failure to do so may result in intermittent operation.
- Typical 18 AWG thermostat wire may be used to wire the system components. One hundred (100) feet is the maximum length of wire between indoor unit and outdoor unit, or between indoor unit and thermostat.

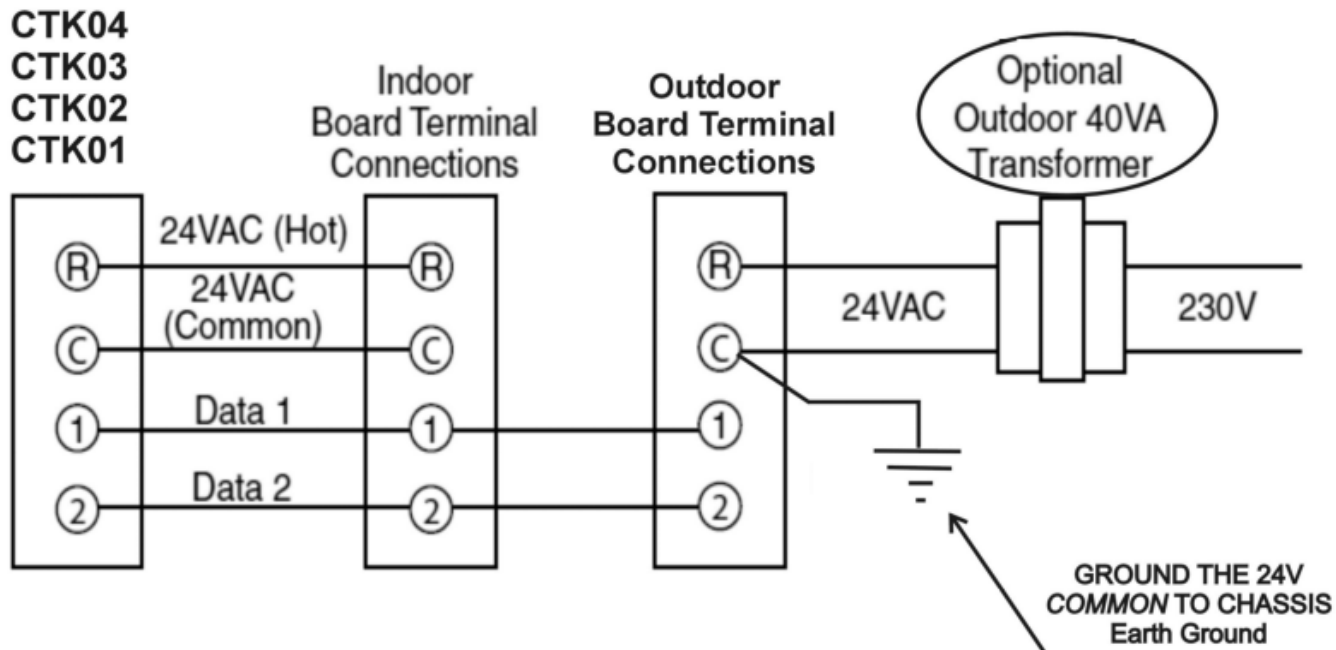
# Data Line Voltage Troubleshooting and Bias Switches

***When a transformer is installed outside*** and there are 3 wires available, use the 3rd (spare) wire to connect the two 24v commons together. *That will insure both 24v commons are at the same ground potential.*



# Data Line Voltage Troubleshooting and Bias Switches

***When a transformer is installed outside*** and there are only 2 wires available, ground the “C” 24v common of the outside transformer to chassis (earth) ground! *Not as good as using a 3rd wire, but better than leaving the outdoor “C” 24v common floating.*



# Data Line Voltage Troubleshooting and Bias Switches

If all the wiring and connections are per the IO and the *ComfortNet™* system will not operate properly the issue could be a bias switch conflict.

Proper bias data voltages are the key to proper communication on the *ComfortNet™* system.

# Data Line Voltage Troubleshooting and Bias Switches

Only one unit should control the Bias.

- ✓ Air Handler or Furnace should never have their bias switches moved. Indoor bias switches are always in the “ON” position
- ✓ A/C and Heat Pump bias switches can be moved.
- ✓ Thermostats do not have bias switches.
- ✓ It maybe necessary to move bias switches on the outdoor unit to achieve proper bias. If the switches need to be moved both switches must be moved.



# Checking Bias Voltage

- Remove communicating wires from outdoor board and thermostat and check voltage at the indoor board.
- DC voltage from C to data 1 should read approximately 1.9vdc or 2.8vdc for some furnaces. (Figure 1)
- DC voltage from C to data 2 should read approximately 1.3vdc. Or 2.2vdc for some furnaces (Figure 2)
- Difference in voltage should be .6vdc.

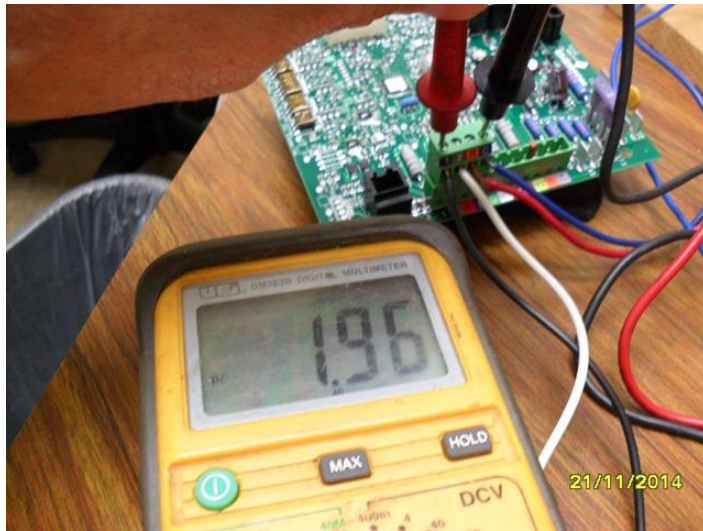


Figure 1

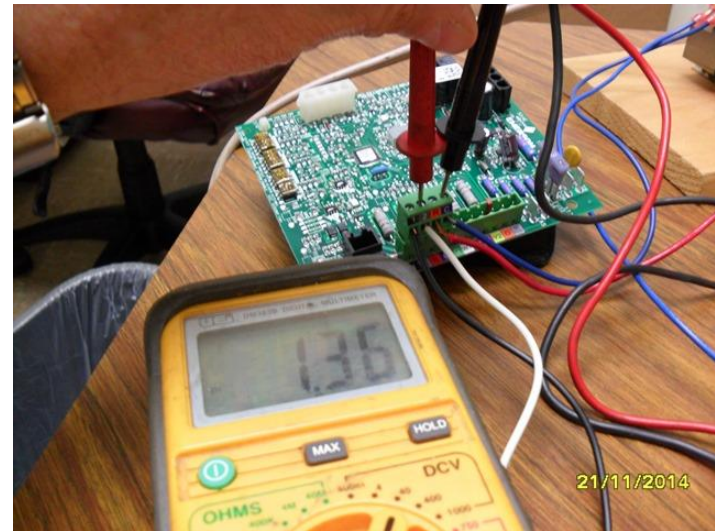


Figure 2



# Checking Bias Voltage

Reconnect communicating wires from outdoor board check voltage again For Example:

- DC voltage from C to data 1 now reads approximately 1.83vdc. (Figure 1)
- DC voltage from C to data 2 reads approximately 1.50vdc. (Figure 2)
- Difference in voltage is now .33vdc instead of .6vdc.
- Bias switches on outdoor board need to be changed to “off” from the factory setting of “on”.

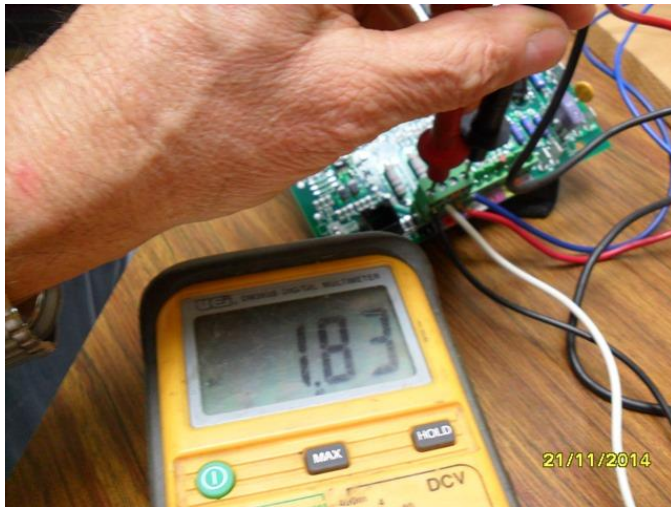


Figure 1

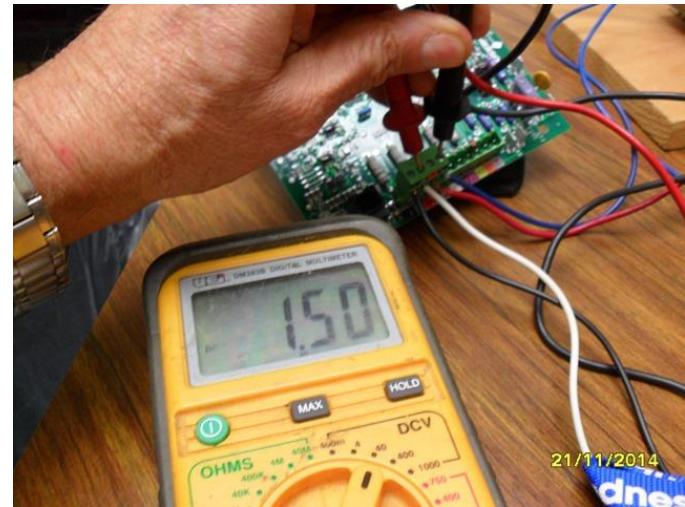
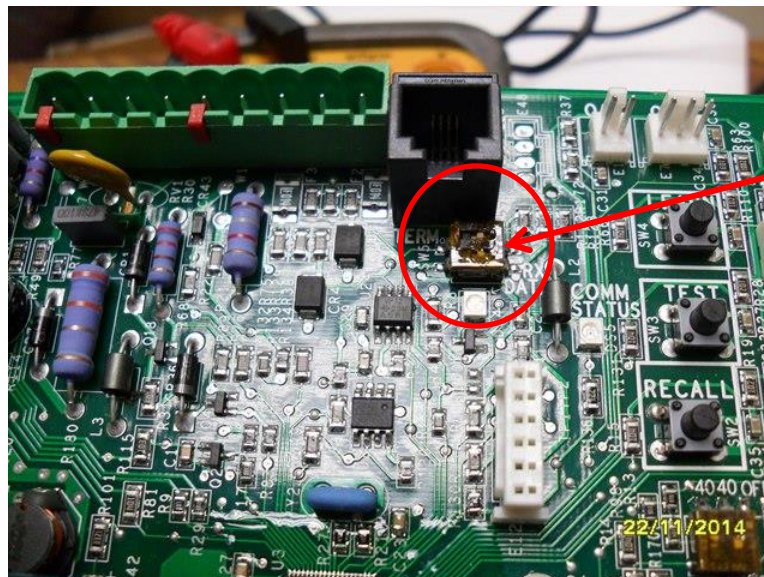


Figure 2

# Setting Outdoor Bias Switches

- Remove plastic film covering switches with screw driver or knife.
- Turn both Bias switches to the off position.
- Recheck DC voltage between C and 1 and C and 2.



Turn switches to OFF

# Checking Bias Voltage

- Recheck DC voltage with wires from outdoor board connected.
- DC voltage from C to data 1 should read approximately 1.9vdc or 2.8vdc furnaces (Figure 1)
- DC voltage from C to data 2 should read approximately 1.3vdc or 2.2vdc furnaces (Figure 2)
- Difference in voltage should be .6vdc.
- Adjustment is complete and communication should be working.

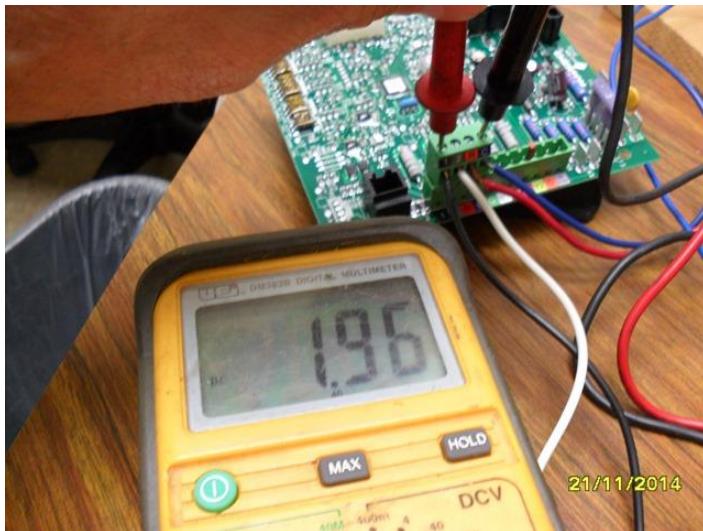


Figure 1

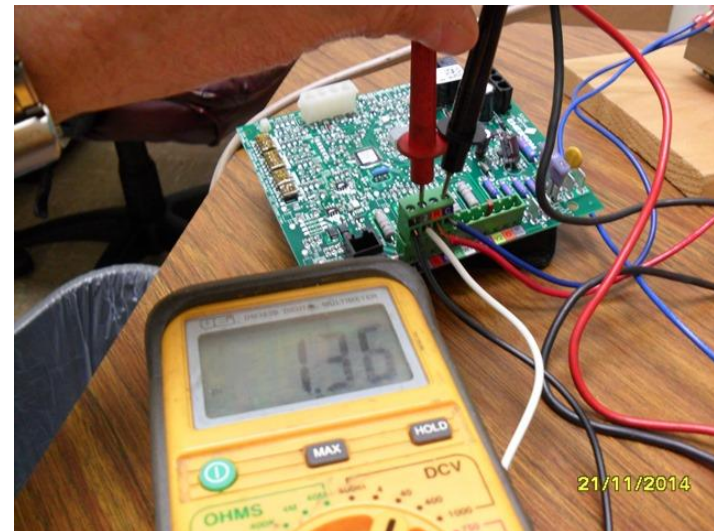


Figure 2