

ABOUT THIS BULLETIN

When there is a communication issue between a BAC-4000 AppStat™ controller and the BACnet MS/TP network to which it is connected, a multimeter can be used to help determine the cause.

An AppStat will become damaged if it is allowed to operate continuously with power on an EIA-485 network.

The following procedures can be used to test if voltage is present on the network.

MATERIALS

- Standard multimeter
- Allen screwdriver (as found on the KMC SP-001)
- Flathead screwdriver (as found on the KMC SP-001)

PROCEDURES

To measure resistance on the MS/TP terminals:

1. Disconnect the AppStat from its power source.
2. Turn the Allen screw in the base of the AppStat clockwise until it clears the mounting base.
3. Swing the controller away from the mounting base to remove it. Be careful not to pinch any wiring.
4. Verify that the End-of-Line (EOL) jumpers are in the **Off** position
5. Set the multimeter to measure a resistance range of greater than 10k ohms.
6. At the MS/TP terminals, measure the resistance between the **A-** pin and the ground (\perp) pin of the AppStat.
7. At the MS/TP terminals, measure the resistance between the **B+** pin and the ground (\perp) connection.
 - If the resistance reads greater than 10k ohms on both pins, then the communication port should operate correctly.

To trace network problems from other sources, use the procedures in the KMC document



TROUBLESHOOTING GUIDE, Diagnosing a BACnet MS/TP Network with a Multimeter.

- If the resistance measures less than 10k ohms on both pins, then it is likely the port was damaged by improper phasing of the network or transformer and the AppStat needs to be replaced. In this event, verify the 24 VAC wiring on the mounting base to prevent the situation from reoccurring.

Note: Use the following procedure if the wiring is consistent with the rest of the 24 VAC wiring.

To measure the voltage on the leads from the transformer to the building ground:

1. Set the multimeter to measure a range of greater than 24 VAC.
2. Measure the voltage of the hot lead. This should read approximately 24 VAC.
3. Measure the voltage of the ground lead. This should read 0 VAC. If there is voltage on the ground lead, you may need to wire it to ground.

To reattach the AppStat to its mounting base:

1. Place the top of the sensor over the top of the mounting base and swing it down over the Allen screw bracket. Be careful not to pinch any wiring.
2. Turn the Allen screw counterclockwise until it backs out of the mounting base and engages the case.
3. Reconnect the AppStat to its power source.

See also the following downloadable KMC documents:

- [Installation, Operation, and Application Guide for AppStat™](#)
- [Avoiding and Troubleshooting Ground Loops Application Guide](#)
- [EIA-485 Network Wire Recommendations](#)
- [Planning BACnet Networks Application Note](#)

HANDLING PRECAUTIONS

For **digital and electronic** sensors, thermostats, and controllers, take reasonable precautions to prevent electrostatic discharges to the devices when installing, servicing, or operating them. Discharge accumulated static electricity by touching one's hand to a securely grounded object before working with each device.



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SUPPORT

Additional resources for product specifications, installation, configuration, application, operation, programming, upgrading and more are available on the KMC Controls website (www.kmccontrols.com). Log in to view all available files.