Type II and III Sensors Configuration

Application Guide

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Introduction

This document gives configuration, troubleshooting, and other related information for temperature sensors using Type II and III 10K ohm thermistors.

Changes in temperature cause changes in thermistor resistance. The corresponding resistance values, however, are nonlinear, and KMC controllers use predetermined tables to convert resistance values to the corresponding temperature. At 77° F, Type II and Type III thermistors have equal resistance (10,000 ohms). As the temperature becomes higher or lower than 77° F, the resistance values of the two types diverge. Although the divergence is negligible for normal office space temperatures, it becomes noticeable for temperature extremes measured by outside air temperature sensors. Ensure the correct type is selected during configuration.

For **mounting, wiring, and specifications**, see the respective product installation guide and data sheet.

For **room/space** temperature sensors, see also the mounting and troubleshooting information in the **Room Sensor and Thermostat Mounting and Maintenance Application Guide**.

For the latest support files, see the Documents sections on the product pages of the KMC web site (**www.kmccontrols.com**).

Controller Configuration

Overview

Ensure that the corresponding 10,000 ohm pull-up resistors on the controller are selected (switched On). Consult the controller's installation guide for information on selecting or switching on the pull-up resistors.

See the relevant software section on these pages for controller input configuration instructions.

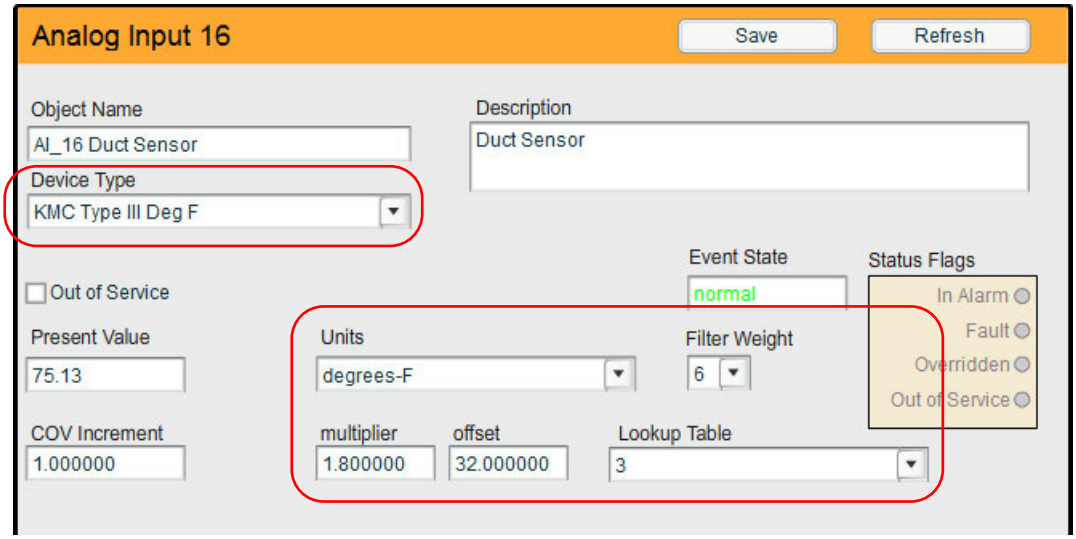
BAC-A1616BC BACnet Building Controller (Web Page)

The Building Controller can be configured through software (see **KMC Connect or TotalControl Software on page 4**) or through its own configuration web page (see the **BAC-A1616BC Building Controller Installation and Operation Guide**). This section is for the Setup > Objects web configuration page.

Select the 10K ohm pull-up resistor jumper position for the corresponding input. (See the Installation section of the BAC-A1616BC Building Controller Installation and Operation Guide for the correct jumper position.)

Because the Building Controller has a 0–12 VDC total input range, different tables are required than in older (0–5 VDC) KMC controllers. **If needed, download the sensor tables (CSV) file from the KMC Controls web site and import the needed tables** as described in the Tables section of the BAC-A1616BC Building Controller Installation and Operation Guide. (You must log in to see the zipped tables file in the Building Controller product page Documents section.)

1. In the desired Analog Input setup screen, select the relevant Device Type: **KMC Type II Deg F**, **KMC Type II Deg C**, **KMC Type III Deg F**, or **KMC Type III Deg C**.
2. Ensure the correct **Lookup Table** for the Type II Thermistor (Table **2**) or Type III Thermistor (Table **3**) is selected.
3. For the Fahrenheit scale, the **multiplier** is **1.8** and the **offset** is **32**. For Celsius, the multiplier is **1** and the offset is **0**.
4. Click **Save**.



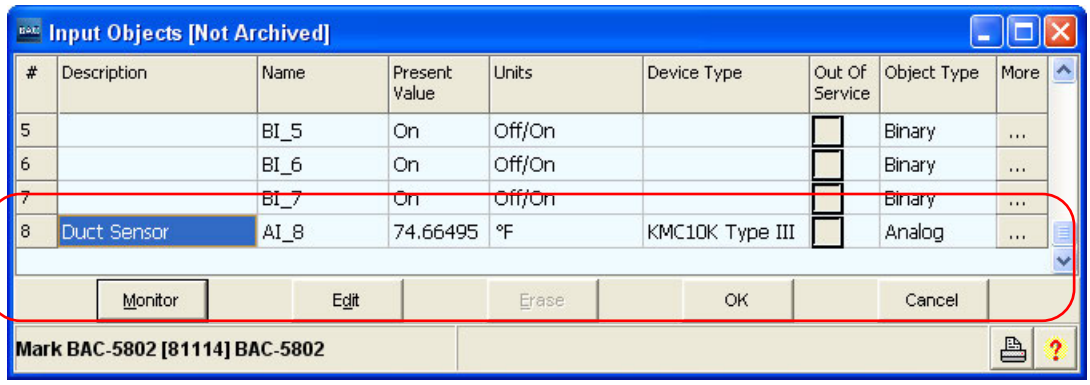
BACstage Software*

***NOTE:** These instructions are for legacy systems. BACstage is no longer available for sale. See KMC Connect or TotalControl for upgrading existing software.

1. In the BACstage software main menu, select **Objects** > **Inputs**.
2. Click **Edit**.
3. Type in a name in the appropriate Description field (up to 32 characters) and/or Name field (up to 16 characters).

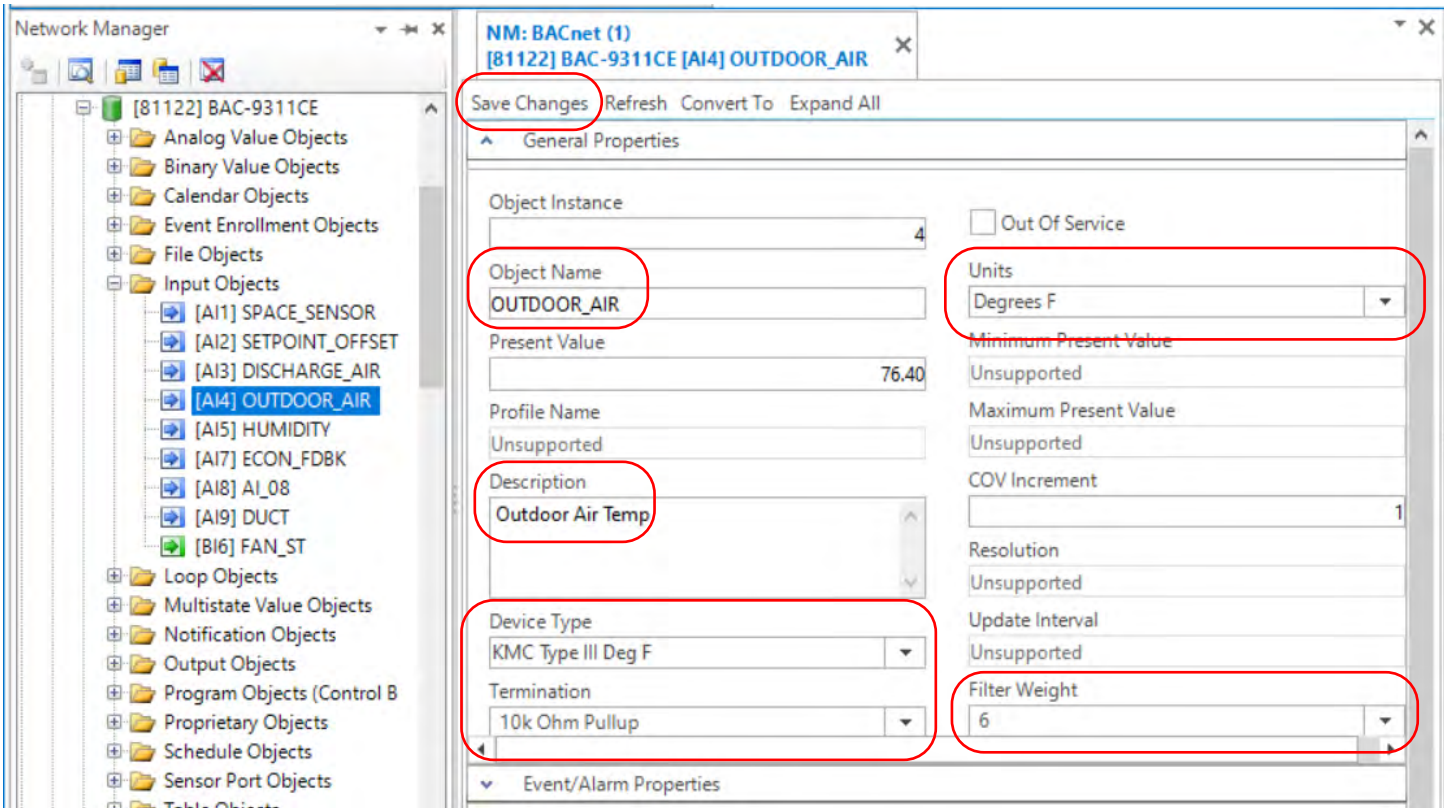
NOTE: No two labels or descriptions in a controller can be identical.

4. Select **Object Type: Analog** if it is not the default.
5. Select **Device Type: KMC10K Type II** or **KMC10K Type III**.
6. Select **Units: °F** or **°C**.
7. Optionally, change the Filter Weight (under More) to the desired number of thermistor readings averaged before displaying the result.
8. Click **End Edit**.
9. Click **Yes** for "Send Update Notification Now?"
10. In the BACstage software main menu, select **Device** > **Device Tables** > **KMC10K Type II Table** or **KMC10K Type III Table**.
11. Click **Edit**.
12. Click **Defaults** (values will fill in).
13. Click **End Edit**.
14. Click **Yes** for "Send Update Notification Now?"
15. Click **OK**.



KMC Connect or TotalControl Software

1. In Network Manager, double-click the relevant Input Object to open it.
2. Select Device Type: **KMC Type II Deg F**, **KMC Type II Deg C**, or **KMC Type III Deg F**, or **KMC Type III Deg C**.
3. Select Termination: **10k Ohm Pullup**.
4. Select Units: **Degrees F** or **Degrees C**.
5. Optionally, type in an Object Name and Description.
6. Optionally, change the Filter Weight to the desired number of thermistor readings averaged before displaying the result.
7. Click **Save Changes**.



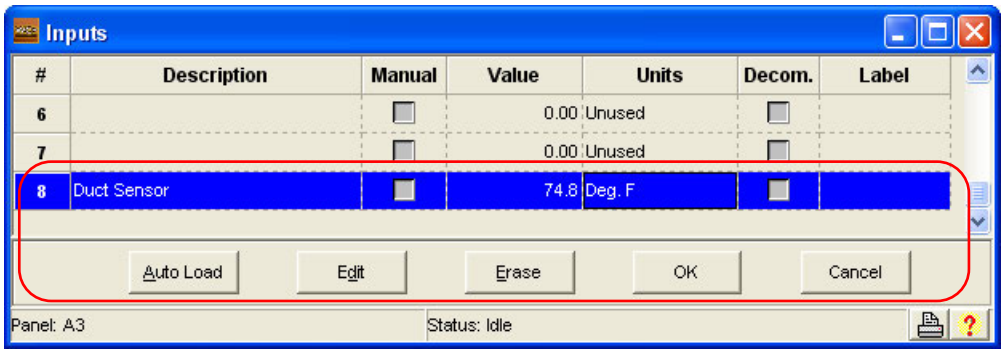
WinControl Software*

***NOTE:** These instructions are for legacy systems. WinControl is no longer available for sale. See TotalControl for upgrading existing software.

1. In the WinControl software main menu, select **Control** > **Inputs**.
2. Click **Edit**.
3. Type in a name in the appropriate Description field (up to 20 characters) and/or Label field (up to 8 characters).

NOTE: No two labels or descriptions in a controller can be identical.

4. Click **Units** (which opens the Configure Inputs screen).
5. Select Type: **Analog** if it is not the default.
6. Select **Deg F KMC10K Type II**, **Deg C KMC10K Type II**, **Deg F KMC10K Type III**, **Deg C KMC10K Type III**.
7. Optionally, change Format from 0 to the desired number of temperature decimal places.
8. Optionally, change the Average to the desired number of thermistor readings averaged before displaying the result.
9. Click **OK**.
10. Click **End Edit**.
11. Click **OK**.



Troubleshooting

- Ensure the 10,000 ohm pull-up resistor on the controller board is selected or turned **ON**.
- Check sensor configuration and tables in the controller.
- Check wiring. To prevent excessive voltage drop, use a conductor size that is adequate for the wiring length!
- Check voltage from the controller.
- Check that the sensor is mounted correctly.
- For sensors in or with an enclosure, apply sealant in openings to prevent air infiltration from skewing the sensor readings.

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.

Support

Additional KMC product information and resources are available on the web at **www.kmccontrols.com**. Log in to see all available files.

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