



BAC-19xx63-ZEC FlexStat

Application Guide

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INTRODUCTION

This guide provides instructions for setting up a BAC-190063C-ZEC, BAC-190063CE-ZEC, BAC-193263C-ZEC, or BAC-193263CE-ZEC to function as a Roof Top Unit (RTU) controller, a Heat Pump Unit (HPU) controller, or a room sensor/zone controller as part of a Zone Actuator Control (ZAC) system.

Basic configuration and scheduling can be performed using the on-screen menu system.

Software is required to fully configure alarms and trends, add custom Control Basic code, and customize the display. For compatible software, see the [BAC-19xx63-ZEC FlexStat Data Sheet](#).

INSTALLATION

For general installation procedures, see the [BAC-19xx63-ZEC FlexStat Installation Guide](#) at kmccontrols.com.

For information on connections and wiring, refer to the [BAC-19xx63-ZEC Zone Equipment Controller Sequence of Operation and Wiring Guide](#).

For general information about network and other wiring, see [Troubleshooting on page 18](#).

SETTINGS

NOTE: Select the (HPU, RTU, or ZAC) application and units **BEFORE** changing any other settings. Changing applications later will reset most settings back to their defaults. Use Restore APP in the Advanced menu or software to verify or change applications. See [Communication Options on page 4](#).

NOTE: Available menu options depend on the FlexStat model and selected application. Some options may require custom Control Basic for operation (e.g., DCV functions using an external CO2 sensor).

NOTE: Some changes to settings will not affect operation until after the FlexStat is restarted.

NOTE: Software is required for fully configuring alarms and trends, adding custom Control Basic code, and customizing the display—see [Display Customization Via Software on page 9](#). For compatible software, see the [BAC-19xx63-ZEC Series FlexStat data sheet](#).

Accessing Settings

1. Press and hold the upper left corner of the screen (temperature reading) to start.
2. Enter the password. See [Passwords on page 9](#).
3. Press the desired selection.
4. Press **Enter**.

Configuration Navigation/Selection

1. Press the desired selection.
2. Adjust the default selection or value (by pressing the + or -) as desired.
3. Press **Enter** to save and move to the next setting.
4. Press **Done** to return to the previous or home screen.

NOTE: Available options depend on the FlexStat model and selected application.

INITIAL CONFIGURATION

For initial BAC-19xx63-ZEC configuration, it is recommended to follow the menu steps in this order.

1. Set the password(s). Most screens can be accessed only by entering a Level 2 password. For more information, see [Passwords on page 9](#).
2. Check that the desired (RTU, HPU, or ZAC) application is selected. If not, use the **Restore Apps** screen (**Advanced>Restore Apps**) to select the application from the following options.
 - **RTUZEC-E**—The RTU application using English units
 - **RTUZEC-M**—The RTU application using metric units
 - **HPUZEC-E**—The HPU application using English units
 - **HPUZEC-M**—The HPU application using metric units
 - **ZAC-E**—The Zoning Actuator Controller application in English units
 - **ZAC-M**—The Zoning Actuator Controller application in Metric units

For more information, see [Advanced \(Menu Options\) on page 13](#). Once the application is selected, the controller must restart for the change to take effect.

⚠ CAUTION

Select the (RTUZEC, HPUZEC, or ZAC) application and units **BEFORE** changing any other settings. Changing the application later will reset most settings to their default values.

For more information, see [Communication Options on page 4](#).

For more information, see [System \(Menu Options\) on page 11](#).

3. Configure the setpoints. For more information, see [Set-points \(Menu Options\) on page 10](#).
4. Set the time. For more information, see [Set Clock \(Menu Options\) on page 10](#).

NOTE: Units connected to a BACnet MS/TP network with a designated time sync master device will automatically receive the proper clock settings.

NOTE: Conquest Zoning FlexStat settings can also be adjusted through KMC Connect or TotalControl software or the BAC-5051AE router served web pages. See the respective documentation.

NOTE: The default device instance range of the BAC-19xx63-ZEC is 2-17, but it can be set for any range between 2 and 4,194,304.

NOTE: Configure the system settings for the ZAC application (if selected). *At a minimum*, set the first device instance and last device instance.

5. Configure schedules. See [Schedule \(Menu Options\) on page 11](#).

COMMUNICATION OPTIONS

Configure the BACnet MS/TP or Ethernet communication settings. The factory default settings for BACnet MS/TP models are Device Instance=1, MAC=1, Baud Rate=38400. The factory default setting for Ethernet models is 8802.3

NOTE: FlexStat communications can be set in the built-in display menu system or using software.

To use the built-in menus to select the appropriate MS/TP or Ethernet/IP communication method and address information, see [Display Menu Options on page 4](#)

Display Menu Options

To use the COMM (Communications) screen to set up network connections.

1. Press and hold the temperature reading near the upper left corner of the display until the Password 2 screen appears.
2. Enter the password.
3. Press **OK**.
4. When the SETTINGS screen appears, press **COMM**.
5. Press **ENTER**.
6. Adjust the selection or value.

On "C" (MS/TP) models:

- **Device ID**—Enter the device instance in a range from 1 to 4,194,304.
- **Baud Rate**—Select the baud rate (9600 to 115200).
- **MAC Address**—Enter the MAC address.
- **MAX Master**—Change MAX MASTER to four numbers higher than the greatest MAC address on the network.

On "E" (Ethernet) models:

- **Comm Type**—Select **IP** or **Ethernet**.
- **Device ID**—Enter the device instance in a range from 1 to 4,194,304.
- **IP Mode**—Select **Normal**, **Foreign**, or **BBMD**.
- **IP Address**—Enter the IP address. Select each octet and then use the numeric keypad to enter the appropriate numeral(s).
- **Subnet Mask**—Enter the Subnet mask. Select an octet and then use the numeric keypad to enter the appropriate numeral(s).
- **Gateway Address**—Enter the Gateway address. Select an octet and then use the numeric keypad to enter the appropriate numeral(s) for each.
- **UDP Port**—Enter the FlexStat's UDP port number.
- **BMDP Port**—Enter the UDP port number of the BBMD to which the FlexStat is registering as a foreign device.
- **BBMD Address**—Enter the remote BBMD IP address.

Select an octet and then use the numeric keypad to enter the appropriate numeral(s) for each.

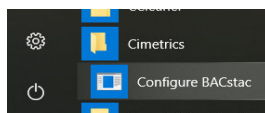
- **Foreign Time To Live**—Enter the Interval (in seconds) at which the FlexStat (if set as a BBMD) must re-register with a BBMD to prevent deletion from the BBMD's Foreign Device Table (FDT). The valid interval range is 1 to 65,535 seconds. The default interval is 600 seconds.

7. When finished entering information, press **ENTER**.
8. When the message Restart Required appears, press **RESTART**.

Ethernet/IP Configuration via Software

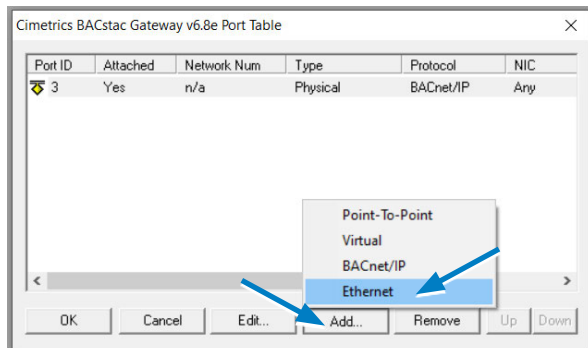
"E" model FlexStats have a default configuration of **BACnet Ethernet** and a **Device ID of 1**. To configure the FlexStat to BACnet IP using KMC software (see the [BAC-19xx63-ZEC FlexStats Data Sheet](#) for versions that support FlexStats), perform the following steps:

1. If necessary to see the FlexStat under Network Manager, add or change a port in BACstac to Ethernet:
 - A. Click the Microsoft® Windows® **Start Menu** at the lower left corner of the screen.
 - B. Click **Cimetrics**.
 - C. Click **Configure BACstac**.



Starting BACstac

- D. Click **Add**.
- E. Select **Ethernet** and enter the necessary Port ID, Network Number, and NIC.



Creating an Ethernet Port in BACstac

- F. Click **OK** and **OK**.

NOTE: Port ID and Network Numbers cannot duplicate those of another port in BACstac. It may be easier to temporarily change an existing IP port to Ethernet.

2. Under Network Manager In KMC Connect or TotalControl, right-click **BACnet** and select **Find Devices...** or **Regenerate All Networks....**
3. Right-click the FlexStat device object, and select **Configure Device....**
4. Under General Properties, enter the desired **Device Instance**.
5. Under IP Configuration Properties, select **Comm Type: BACnet IP**.
6. Enter the desired **IP Address**, **Default Gateway**, and **Subnet Mask**.
7. Select BACnet IP Mode: **Normal**, **Foreign Device**, or **BBMD**.

NOTE: FlexStats can be used **with** a BBMD (as a Foreign Device) but not **as** a BBMD.

8. Click **Save Changes**.
9. Click **Refresh**.
10. Verify that the settings are valid.
 - If IP Configuration Good is **True**, then proceed.
 - If IP Configuration Good is **False**, check IP Configuration Status for possible causes.
11. Under IP Configuration Command, select **Commit**.
12. Click **Save Changes** at the top.
13. Restart the FlexStat.
14. If necessary, change the BACstac port from Ethernet back to IP.

NOTE: For more details, see the software Help system.

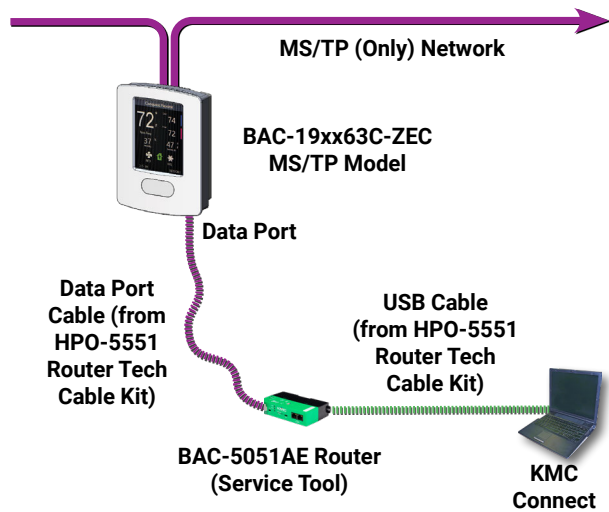
MS/TP Configuration via Software

For MS/TP models to communicate with KMC software, a router (e.g., **BAC-5051AE**) is required. See the software and router product information for more details.

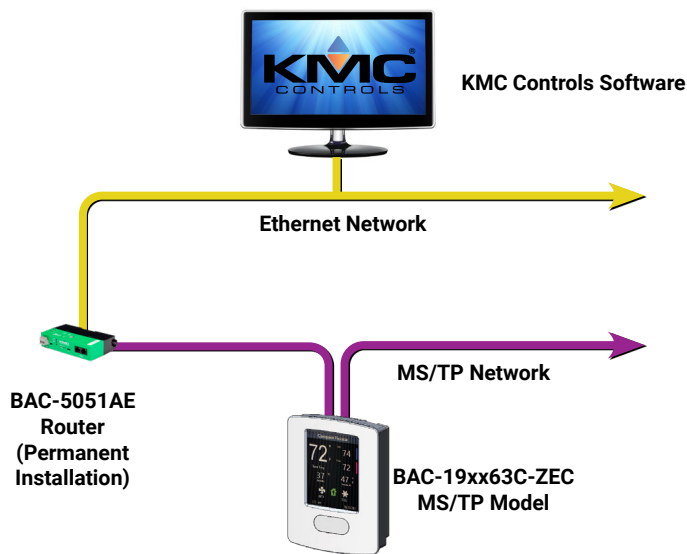
After discovery of the FlexStat in the software, change the MS/TP configuration as desired, restart the device, and rediscover the network.

DISPLAY CUSTOMIZATION VIA FLEXSTAT

The FlexStat menu allows basic display customization (e.g., color theme, brightness, contrast). See **Communication Options** on page 4.



Temporary MS/TP Network Access Through Data Port



Permanent MS/TP Network Access Through Router

DISPLAY CUSTOMIZATION VIA CONTROL BASIC

Additional customization can be done using the Control Basic programming feature in KMC Connect, KMC Converge, or TotalControl software.

The screenshot shows the KMC Connect v1.0.14.4 interface. The left pane shows a tree view of objects, with 'Display Objects' expanded and '[UI1] UI_01' selected. The right pane shows the 'General' tab configuration for this object. Blue arrows point to various fields: 'Title Bar' points to the 'Title' field; 'Display Options' points to the 'Settings' section; 'Time/Date Options' points to the 'Footer' field; 'Level 1 and 2 Passwords' points to the 'Level One Password' and 'Level Two Password' fields; and 'Display Object [UI1] UI_01' points to the selected object in the tree.

General Tab

The screenshot shows the 'Rotations' tab configuration for the same display object. Blue arrows point to the 'Top Rotation' section, labeled '(Large) Top Rotation Space Temp Only (Default)', and the 'Bottom Left Rotation' section, labeled 'Lower Rotations'.

Rotations Tab

The screenshot shows the 'Icon Bar' tab configuration for the same display object. Blue arrows point to the 'Icon Options' section, which includes fields for 'Icon Type', 'Icon Object', 'Caption Object', and 'Animation Object'.

Icon Bar Tab

Setpoint Options

Display Name	Object	Property	Priority	Scale	Minimum	Maximum
Cool	[AV3] ACT_COOL_STPT	PRESENT VALUE	8 Manual Operator	1	[AV9] MIN_CL_STPT	85
Heat	[AV4] ACT_HEAT_STPT	PRESENT VALUE	8 Manual Operator	1	60	[AV10] MAX_HT_STPT

Setpoints Tab

NOTE: One setpoint can be disabled if the FlexStat is used for only cooling or only heating.

System Configuration Options

Setpoint Configuration Options

Display Name	Object	Property	Priority	Scale	Minimum	Maximum
Override Timer	[AV38] OVRD_TIME	PRESENT VALUE	8 Manual Operator	1	0	32767
Fan Off Delay	[AV25] FAN_OFF_DELAY	PRESENT VALUE	8 Manual Operator	1	0	60
Occupied Fan	[BV13] OCCUPIED_FAN	PRESENT VALUE	8 Manual Operator	1	0	60
Equipment Delay	[AV26] MIN_OFF_TIME	PRESENT VALUE	8 Manual Operator	1	0	60
Stage Delay	[AV27] STAGE_DELAY	PRESENT VALUE	8 Manual Operator	1	0	60
Economizer Enable	[BV16] ECON_ENABLE	PRESENT VALUE	8 Manual Operator	1	0	100
Min Economizer Damper	[AV15] MIN_ECON_DA...	PRESENT VALUE	8 Manual Operator	1	32	212
Economizer Enable Temp	[AV16] ECON_ENABLE_T...	PRESENT VALUE	8 Manual Operator	1	32	212
Minimum DAT	[AV14] MIN_DAT	PRESENT VALUE	8 Manual Operator	1	32	212

Advanced Tab

Enable/Disable System and Communications Menus on the Display

Name	Enabled
System	☒
Communications	☒

NOTE: If disabled, system or communication options can then only be changed in software.

Options Tab

NOTE: See [Settings on page 3](#) for explanations of options. After saving changes, restart the FlexStat.

DISPLAY CUSTOMIZATION VIA SOFTWARE

KMC software allows more complete customization using the Display Object. (See the [BAC-19xx63-ZEC FlexStats Data Sheet](#) for the current software packages and versions that support the FlexStat.)

See the software Help system for more information.

PASSWORDS

Entering a Level 2 password is required to access most menus in the BAC-19xx63-ZEC series.

To protect against unauthorized tampering with the configuration parameters, Conquest controllers are factory-set with a default level 2 password when using a BAC-19xx63-ZEC series FlexStat.

LEVEL	DEFAULT	PROTECTS	DESCRIPTION
Level 1	0000	Setpoints	Four digits, with each digit being a number 0 to 9. If all four numbers are 0, no password is required of the user for that level.
Level 2	(See the Conquest Controllers Default Password Technical Bulletin)	Configuration	

NOTE: If an optional Level 1 password is set, users must enter that password to change a setpoint. No password required (0000) is the default.

NOTE: FlexStats are set at the factory with a Level 2 password as the default

For more information about the default password, log in to the KMC website and see the **Conquest Controllers Default Password Technical Bulletin**.

NOTE: For security purposes, change the controller's default password(s). Be sure to document any changes made to passwords!

Set the Password(s)

To set the Level 1 Password:

1. From the SETTINGS screen, select the **Advanced** menu.
2. Select **Level 1 Password**.
3. Use the keypad to enter four zeros (**0000**). This removes the current password

4. Press **OK**.
5. Type the new password.

To set the Level 2 Password:

1. Select the **Advanced** menu.
2. Select **Level 2 Password**.
3. Use the keypad to enter four zeros (**0000**). This removes the existing password.
4. Type the new password.

HOME SCREEN

The Home screen shows the time and date, temperature, fan status, and depending on whether the unit is configured as an RTU controller, HPU controller, or Zone Equipment Controller, discharge air temperature (DAT), zone (room) temperature, the number of zones connected, and the number of zone calls for heating and cooling.

NOTE: When programmed for Roof Top Unit (RTU) or Heat Pump Unit (HPU) Discharge Air Temperature (DAT) control, the value displayed in the upper left corner of the screen is the DAT instead of the room temperature.

SETTINGS SCREEN

The SETTINGS screen provides access to the Setpoints, Set Clock, Schedule, System, Summary, Communication, and Advanced screens.

To access the SETTINGS screen:

1. On the Home screen, press and hold the temperature reading near the upper left corner of the display until the Password 2 screen appears.
2. Enter the password.
3. Press **OK**.
4. When the **SETTINGS** screen appears, press the desired selection.
5. Press **ENTER**.
6. Adjust the selection or value.
7. When finished, press **ENTER**.
8. To return to the home screen, press **DONE**.

Setpoints (Menu Options)

System menus vary according to the application type (RTU, HPU, or ZAC).

RTU Application only

The RTUZEC setpoints menu provides access to access to the following adjustment screens.

- **Occupied Cooling**—Set the Occupied Cooling setpoint.
- **Occupied Heating**—Set the Occupied Heating setpoint.
- **Min Cooling Setpoint**—Set the Minimum Cooling setpoint.
- **Max Heating Setpoint**—Set the Maximum Heating Setpoint.
- **Dehum Setpoint**—Set the Dehumidification Setpoint.
- **Dehum Differential**—Set the Dehumidification Differential.
- **CO2 Basic Setpoint***—Set the CO2 basic setpoint in parts per million (ppm). This is the desired CO2 level at which point the economizer damper will begin modulating open from MIN POSITION (600 ppm default). Below this level, the economizer damper will be at MIN POSITION during Occupied mode. (This can be adjusted no lower than the CO2 BASE.)
- **CO2 Basic Deadband**—Set the CO2 basic deadband.

***NOTE:** For CO2 sensor and DCV operation information, see [CO2 Sensors and DCV Operation on page 14](#).

- **Economizer Enable temp**—Set the Economizer Enable Temperature.
- **Minimum DAT**—Set the Minimum Discharge Air Temperature.

HPU Application only

The HPUZEC setpoints menu provides access to access to the following adjustment screens.

- **Occupied Cooling**—Sets the Occupied Cooling setpoint.
- **Occupied Heating**—Sets the Occupied Heating setpoint.
- **Unoccupied Cooling**—Set the Minimum Cooling setpoint.
- **Unoccupied Heating**—Set the Maximum Heating Setpoint.
- **Dehum Setpoint**—Set the Dehumidification Setpoint.
- **Dehum Differential**—Set the Dehumidification Differential.
- **CO2 Basic Setpoint***—Set the CO2 basic setpoint in parts per million (ppm). This is the desired CO2 level at which point the economizer damper will begin modulating open from MIN POSITION (600 ppm default). Below this level, the economizer damper will be at MIN POSITION during Occupied mode. (This can be adjusted no lower than the CO2 BASE.)
- **CO2 Basic Deadband**—Set the CO2 basic deadband.

***NOTE:** For CO2 sensor and DCV operation information, see [CO2 Sensors and DCV Operation on page 14](#).

- **Economizer Enable temp**—Set the Economizer Enable Temperature.
- **Minimum DAT**—Set the Minimum Discharge Air Temperature.

ZAC Application only

The ZAC setpoints menu provides access to access to the following adjustment screens.

- **Occupied Cooling**—Sets the Occupied Cooling setpoint.
- **Occupied Heating**—Set the Occupied Heating setpoint.
- **Unoccupied Cooling**—Set the Minimum Cooling setpoint.
- **Unoccupied Heating**—Set the Maximum Heating Setpoint.
- **Min Cooling Setpoint**—Set the Minimum Cooling setpoint.
- **Max Heating Setpoint**—Set the Maximum Heating Setpoint.
- **Min Setpoint Differential**—Set the Minimum difference between the Heating and Cooling setpoints.

Set Clock (Menu Options)

The Set Clock menu provide access to the Date, Time, Coordinated Universal Time (UTC)-Offset, Daylight Saving Time (Dst) Enable and Daylight Saving Time (Dst) Auto screens.

NOTE: ZEC units connected to a BACnet MS/TP network with a time sync master will automatically receive the proper clock settings.

1. To access the SETTINGS menu, press and hold the temperature reading near the upper left corner of the display until the Password 2 screen appears.
2. Enter the password.
3. Press **OK**.
4. When the SETTINGS screen appears, select **Set Clock**.
5. Select one of the following parameters and press **Enter**.
 - **Date**—Press to select the month, date, or year (the default is 01/01/2000), and use the keypad to select the desired value for each. Press the **Clear** button to remove the current value and then use the keypad to type the desired value. Press **OK** when finished.
 - **Time**—Select the hour, minute or second, and use the keypad to select the desired value for each. Press the **Clear** button to delete the current vasetpointglue and then use the keypad to type the desired value. Press **OK** when finished.

- **UTC-Offset**—Press the current value in the window (shown in minutes plus or minus Coordinated Universal Time) and then use the keypad to enter the new value using the BACnet time format. Press the +/- button to toggle between plus and minus UTC. For example, -180 is three hours behind the UTC meridian, while 180 is three hours in advance. Refer to [Appendix: UTC Offset Time Zones on page 25](#) for examples of time zones and their respective offset values. Press **OK** when finished
- **Dst Enable**—Allows for manual selection of Daylight Saving Time for the time zone selected in the UTC-Offset screen. Press to select either **DISABLE** or **ENABLE**.
- **Dst Auto**—Set the Daylight Saving Time mode to automatically detect the change to- or from Daylight Saving Time for the time zone selected in the UTC-Offset screen. Press **DISABLE** to deactivate or **ENABLE** to activate this feature.

Schedule (Menu Options)

The Schedule menu provides access to the following schedule adjustment screens.

NOTE: If no schedule is set, the FlexStat will remain in continuous occupied state as a default.

- **Entire Week**—Set a schedule that applies to all seven days of the week from among six (6) time slots.
- **Weekdays**—Select the occupied schedule for weekdays (Monday through Friday only) from among six (6) time slots.
- **Weekends**—Set the occupied schedule for Saturday and Sunday only from among six (6) time slots.
- **Individual Days**—Set a schedule that applies to designated days only.
- **Holidays**—Set the occupied schedule for up to 12 designated holidays.
 - **Date**—Set the date of the holiday.
 - **Date Range**—Select the from- and to- dates.
 - **Week and Day**—Set the ordinal number of the occurrence (e.g., First), the day of the week (e.g., Monday), and the month (e.g., January).
 - **Time and Value**—Set the time and value for the day entered.

First, enter the Date, Date Range, or a Week and Day (for holidays occurring on a different date each year). Then enter at least one (and up to six) Time and Value pair(s) for the day entered.

NOTE: During a scheduled Off time, the RTU/HPU fan does not run unless there is a call for heating or cooling.

System (Menu Options)

System menus vary according to the application type (RTUZEC, HPUZEC, or ZAC).

RTU Application

- **Hysteresis**—Sets the number of controllers above 50% of the total required for changeover to the other mode (heating or cooling).

NOTE: The BAC-19xx63-ZEC FlexStat determines RTU/HPU heating or cooling mode by “majority rule” of the number of heating and cooling calls from the SimplyVAV controllers. If the number of heating and cooling calls is equal, the previous mode is maintained.

- **1st Device Instance**—Set the device instance of the controller in the first zone.
- **Last Device Instance**—Set the device instance of the controller in the last zone.
- **Unoccupied Override**—Set the number of unoccupied zones that require heating or cooling.
- **Duct Static**—Set the Duct Static Setpoint.
- **Fan Off Delay**—Set the time (in minutes) before the fan deactivates.
- **Occupied Fan**—Set the fan as on or off when in Occupied mode.
- **Fan Status**—Press **DISABLE** to deactivate or **ENABLE** to activate fan proving. Disabled by default.
- **Equipment Delay**—Set the start equipment delay time (in minutes) to prevent short cycling.
- **Stage Delay**—Set the time (in minutes) between stages in multiple-stage equipment.
- **Economizer**—Enable or disable the Economizer mode.
- **Min Economizer Damper**—Set the Minimum Economizer Damper position.
- **Dehumidification**—Enables or disables Dehumidification mode.
- **Heating Valve Action**—Set the valve type as either heating or cooling.
- **Cooling Proportional**—Set the cooling proportional band value as part of a PID loop.
- **Cooling Integral**—Set the number of cooling integral resets per hour as part of a PID loop.

- **Heating Proportional**—Set the heating proportional band value as part of a PID loop.
- **Heating Integral**—Set the number of heating integral resets per hour as part of a PID loop.
- **Heating Integral**—Set the Heating Integral value.

HPU Application

- **Hysteresis**—Sets the number of controllers above 50% of the total required for changeover to the other mode (heating or cooling).

NOTE: The BAC-19xx63-ZEC FlexStat determines RTU/ HPU heating or cooling mode by “majority rule” of the number of heating and cooling calls from the SimplyVAV controllers. If the number of heating and cooling calls is equal, the previous mode is maintained.

- **1st Device Instance**—Set the device instance of the controller in the first zone.
- **Last Device Instance**—Set the device instance of the controller in the last zone.
- **Unoccupied Override**—Set the number of unoccupied zones that require heating or cooling.
- **Duct Static**—Set the Duct Static Setpoint.
- **Fan Off Delay**—Set the time (in minutes) before the fan deactivates.
- **Occupied Fan**—Set the fan as on or off when in Occupied mode.
- **Fan Status**—Press **DISABLE** to deactivate or **ENABLE** to activate fan status.
- **Equipment Delay**—Set the start equipment delay time (in minutes) to prevent short cycling.
- **Stage Delay**—Set the time (in minutes) between stages in multiple-stage equipment.
- **Economizer**—Enable or disable the Economizer mode.
- **Min Economizer Damper**—Set the Minimum Economizer Damper position.
- **Dehumidification**—Enable or disable Dehumidification mode.
- **Cooling Proportional**—Set the cooling proportional band value as part of a PID loop.
- **Cooling Integral**—Set the number of cooling integral resets per hour as part of a PID loop.
- **Heating Proportional**—Set the heating proportional band value as part of a PID loop.
- **Heating Integral**—Set the number of heating integral resets per hour as part of a PID loop.

ZAC Application

- **Cooling Proportional**—Set the cooling proportional band value as part of a PID loop.
- **Cooling Integral**—Set the number of cooling integral resets per hour as part of a PID loop.
- **Heating Proportional**—Set the heating proportional band value as part of a PID loop.
- **Heating Integral**—Set the number of heating integral resets per hour as part of a PID loop.
- **Damper Override**—Select the damper override function. When “On”, override allows for manual positioning of the damper.
- **Damper Ovrd Setpoint**—Set the position (as the percentage open) of the damper while it is in override
- **Damper Ovrd Timer**—Set the time (in minutes) the damper remains in override.
- **Damper Max**—Set the maximum position (as the percentage open) of the damper.
- **Damper Min**—Set the minimum position (as the percentage open) of the damper.

NOTE: See the [MEP-4xxx Direct-Coupled Actuators \(40 to 90 in-lb.\) Applications Guide](#) and the [BAC-19xx63-ZEC FlexStat Zone Equipment Controller Sequence of Operation and Wiring Guide](#) for information on connecting an MEC-4002 to a BAC-19xx63-ZEC series FlexStat.

Summary (Menu Options)

Select **Summary** from the SETTINGS menu to view the status of all connected zones (up to 16). Options for the status of each zone are:

- Call for Cooling
- Call for Heating
- No Call for either Cooling or Heating
- **NoCOMM**—There is a communication problem with a zone or no zone is connected.

The Summary screen also shows the duct static pressure in inches of water column (inH2O).

Communications (Menu Options)

See [Communication Options on page 4](#).

Advanced (Menu Options)

Select **Advanced** to access menus for choosing the application, setting passwords and setting up features of the Home screen.

- **Password 1**—Set password Level 1 (for Active Heating and Cooling Setpoints). See .
- **Password 2**—Set password Level 2 (for Settings menu).
- **Display**—Display options:
 - **Color Scheme**—Select **Blue**, **Grey**, **Orange**, or **Red**.
 - **Contrast**—Adjust the percentage value.
 - **Brightness**—Adjust the percentage value (to the minimum needed for the ambient lighting). Decreasing the default brightness reduces energy consumption and (depending on lighting conditions) can enhance the appearance of the display.
- **Time Format**—Display the date (if shown) as 12 Hour (MM/DD/YYYY), 12 Hour (DD/MM/YYYY), 24 Hour (MM/DD/YYYY), or 24 Hour (DD/MM/YYYY).
- **Time Date Options**—Display at the bottom of the screen Date and Time, Time Only, Date Only, or None.
- **Inactive Timer**—Enter the **seconds** after the last press that the display blanking option activates (0=No Blanking, the default). See the **Blanking Options** below.
- **Blanking Options**—Select None (default), Dim (display dims slightly), Backlight Off (display becomes entirely black), or Inactivity Screen (only the space temperature is displayed on a black screen).
- **Lockout**—Select None (default), Icon Bar, or Setpoints. If selected, the item's value can be changed only in software until this setting is changed back to None.
- **Temperature Calibration**—Set the calibration factor for temperature sensing (Analog Input #1). Use the +/- button to change from a positive value to a negative value or vice versa.
- **Relative Humidity Calibration**—Set the calibration factor for room humidity. Use the +/- button to change from a positive value to a negative value or vice versa.
- **CO2 Calibration**—Set the calibration factor for room humidity. Use the +/- button to change from a positive value to a negative value or vice versa.
- **Restore App**—Select the application (RTUZEC, HPUZEC, or ZAC) in either English (-E) or Metric (-M) units. The FlexStat will need to restart for any application change to take

effect. After restarting, most settings will revert to their default values. Communication settings and user-defined passwords are not affected.

NOTE: For further customization of the display, see [Display Customization Via Software on page 9](#) and [Display Customization Via Control Basic on page 7](#).

CAUTION

Changing the application later will reset most settings to their default values.

NOTE: KMC Connect or TotalControl software may also be used to verify or change application.

NOTE: When programmed for Roof Top Unit (RTU) or Heat Pump Unit (HPU) Discharge Air Temperature (DAT) control, the value shown in the upper left corner of the display is the DAT instead of the room temperature.

Trends and Alarms

Trend logs for the space temperature, active cooling setpoint, and active heating setpoint are created by default. Use KMC software to access these features.

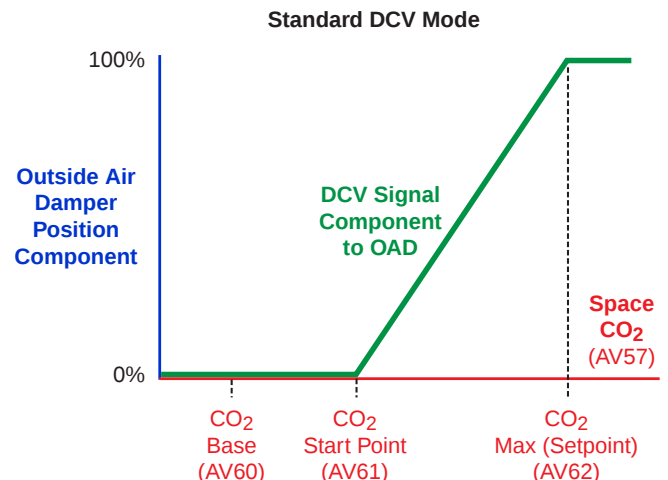
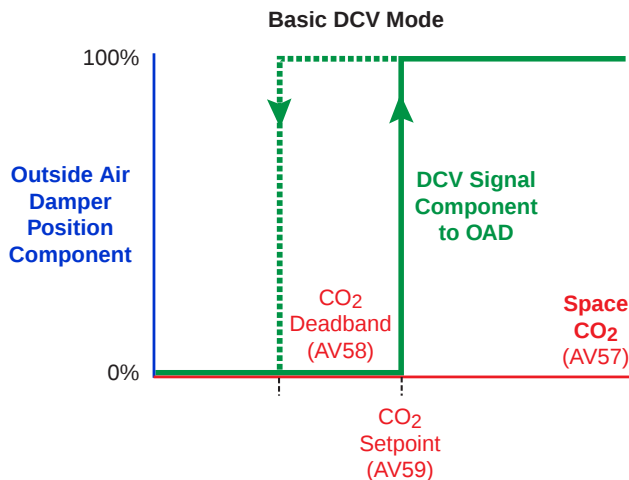
CO₂ SENSORS AND DCV OPERATION

Introduction

BAC-193263C-ZEC and BAC-193263CE-ZEC model Flex-Stats include CO₂ sensors for **DCV (Demand Control Ventilation)** operation in RTU and HPU applications with an outside air damper. See the illustrations and descriptions of Basic and Standard DCV options and operations.

NOTE: High CO₂ measurements may indicate high levels of other airborne contaminants.

NOTE: A modulating **OAD** (Outside Air Damper) is required for DCV. An OAD is used by both DCV mode and economizer mode. Economizer mode brings outside air into a building for “free” cooling when appropriate conditions are met. The OAD opens to the greatest call between the needs of DCV mode and economizer mode.



DEMAND CONTROL VENTILATION

Description	Menu Options	Notes	Default Value	Object	DCV Mode
CO ₂ Level		Available as a rotation value on the display.	0 ppm	AV57	
Select DCV Mode	DCV Mode	Select None, Basic, or Standard.	None	MSV12	
Basic DCV Setpoint	CO2 Basic Setpoint	In Basic DCV mode, the desired CO ₂ level at which point the economizer damper opens for maximum outside air flow.	1200 ppm	AV59	Basic
Basic DCV Deadband	CO2 Basic Deadband	In Basic DCV mode, the amount the CO ₂ level must drop below the setpoint before DCV control is relinquished (and outside DCV air flow returns to minimum).	200 ppm	AV58	
Standard DCV Baseline (Outside Air CO ₂ Level)*		In Standard DCV mode, the presumed average CO ₂ concentration level of outside air at the building's location. Every week after installation, the lowest detected reading in the previous week is written into AV60 (replacing the original default or previous value).	380 ppm	AV60	Standard
Standard DCV Start Point*		In Standard DCV mode, the CO ₂ level (setpoint) at which the economizer damper begins to modulate open . It equals the DCV CO ₂ baseline plus 200 ppm, and the value is recalculated weekly.	580 ppm	AV61	
Standard DCV Maximum Allowed CO ₂ Level*		In Standard DCV mode, the maximum allowed CO ₂ concentration level during an occupied period. The economizer damper modulates to fully open at this level. It equals the DCV CO ₂ baseline plus 600 ppm, and the value is recalculated weekly.	980 ppm	AV62	

*NOTE: Standard DCV values are self-calculating and are not configurable by the user in the FlexStat menu.

NOTE: Whenever DCV is initiated, the fan is set to On. If the fan is multi-speed or modulating, it is set to its maximum output.

NOTE: The FlexStat's CO₂ sensor uses a **self-calibration** technique designed to be used in applications where **CO₂ concentrations will periodically drop to outside ambient conditions** (approximately 400 ppm), typically during unoccupied periods. (There is no provision for calibrating with gas.)

NOTE: Models without CO₂ sensors still have DCV applications available that customers can enable in the Control Basic code for use with external CO₂ sensors. This requires custom programming by the customer.

NOTE: If more than one CO₂ sensor is attached to the FlexStat (which requires custom configuration), the DCV application will use the CO₂ sensor with the highest CO₂ reading.

NOTE: See also the white paper [Demand Control Ventilation Benefits for Your Building](#).

NOTE: In Standard DCV mode, the damper is at the minimum position (assuming there is no other demand on the economizer) at the DCV start point. The start point equals the calculated baseline (e.g., 380 ppm) plus 200 ppm (e.g., 580 ppm). At the maximum allowed CO₂ level (e.g., 980 ppm), the damper opens to its maximum position.

NOTE: Standard DCV mode complies with **2019 California Title 24 Part 6 120.1(c)4**. To comply with Title 24:

- If there is an outside air CO₂ sensor, then the OAD begins to modulate open starting at the baseline CO₂ level plus 200 ppm setpoint to the maximum open setpoint at the baseline CO₂ level plus 600 ppm.
- If there is no outside CO₂ sensor, then the baseline CO₂ level shall be set to 400 ppm (for Title 24).

NOTE: Every week after the FlexStat's installation, the lowest detected space CO₂ reading in the previous week is written into AV60 (replacing the original default or previous value). This value is assumed to be the approximate CO₂ level of outside air during an unoccupied period—thereby emulating an outside CO₂ sensor. The value in AV60 is used in the DCV calculations for the following week until it is replaced by an updated value.

Basic DCV Mode

Basic DCV mode is On/Off and aims to optimize IAQ (Indoor Air Quality). It maximizes the supply of fresh outside air to the space after a sufficient level of occupancy is detected (from the CO₂ level exceeding the CO₂ Setpoint).

During occupied mode, the modulating OAD is controlled typically by the economizer application. When the space CO₂ rises above the CO₂ setpoint (e.g., 1200 ppm), the damper opens to its maximum position. The OAD remains fully open until the space CO₂ falls below the CO₂ setpoint minus the CO₂ deadband (e.g., 200 ppm or a reading of 1000 ppm).

When Basic DCV mode is selected, **adjust the setpoint and deadband for the situation.**

Standard DCV Mode

Standard DCV mode is continuously variable and aims to optimize energy efficiency while also still supplying adequate levels of fresh outside air to the space. Setpoints for minimum and maximum DCV airflows are automatically calculated based on the lowest weekly measured CO₂ levels. The setpoint values have no user configuration, and they do not appear in the menu.

WIRING CONSIDERATIONS

General Wiring Considerations

⚠ CAUTION

BAC-19xx63-ZEC models are NOT compatible with the backplates of older BAC-10xxx/12xxx/13xxx/14xxx FlexStats! If replacing an older FlexStat, replace the backplate as well.

⚠ CAUTION

To avoid damage from ground loops and other communication issues in networked FlexStats, correct phasing on MS/TP network and power connections on ALL the networked controllers is critically important.

⚠ CAUTION

Relays are for Class-2 voltages (24 VAC) only. Do not connect line voltage to the relays!

Do not mistakenly connect 24 VAC to an analog output ground.

NOTE: FlexStat relays are **NO, SPST (Form "A")**. (To emulate binary outputs with the analog outputs, set the output voltage to be either 0 or 12 VDC in Control Basic.)

- Because of the many connections (power, network, inputs, outputs, and their respective grounds or switched commons), be sure wiring is well planned before installation of conduit!
- For information on principles and good practices when connecting transformers, see [Tips for Connecting 24-Volt Power Application Note \(AN0604D\)](#).
- To prevent excessive voltage drop, **use a conductor size that is adequate for the wiring length! Allow plenty of "cushion" to allow for transient peaks during startup.**
- Make sure that conduit for all wiring has adequate diameter for all necessary wiring. Using 1-inch conduit and junction boxes is recommended!
- Use external junction boxes above the ceiling or in another convenient location as needed to make connections that run to the FlexStat's junction box.
- Using multiple conductor wires for all inputs (e.g., 8 conductor) and outputs (e.g., 12 conductor) is recommended. Grounds for all inputs can be combined onto one wire.

MS/TP Network Wiring Considerations

Use 18 gauge, twisted-pair, shielded cable with capacitance of no more than 51 picofarads per foot (167 pf/m) for all network wiring. Log in and see the [EIA-485 Network Wire Recommendations Technical Bulletin](#) for recommendations. For principles and good practices when connecting an MS/TP network, see [Planning BACnet Networks \(Application Note AN0404A\)](#).

- To maintain critical communications in case of an open conductor on the network cable, use redundant wiring routed separately to enhance reliability.
- Connect no more than 128 addressable BACnet master devices (total) to one MS/TP network. The devices can be any mix of controllers or routers. (Up to 127 slave devices can also be connected.) Limiting the MS/TP network size to no more than about 30 controllers will optimize network performance.
- If the network has more than 31 MS/TP devices or if the cable length exceeds 4,000 feet (1,220 meters), use a [KMD-5575](#) repeater (on an MS/TP-only network if the baud rate on the network is no higher than 38.4K baud) or a faster [BAC-5051AE](#) router with an Ethernet network. For each network segment, connect the shields to a good earth ground at only one end of the segment; tape back the shield ground at the other end. Generally, use no more than four KMD-5575 repeaters per MS/TP network.
- Use a [KMD-5567](#) surge suppressor where a cable exits the building.
- Avoid possible ground loops. See [Avoiding and Troubleshooting Ground Loops Application Guide](#).
- For troubleshooting wiring, see [Wiring Issues on page 24](#) and the [MS/TP Troubleshooting Using a Multimeter - Bifurcation](#) video and downloadable troubleshooting guide.

Ethernet Network Wiring Considerations

- For BAC-19xx63CE-ZEC models (only), plug an Ethernet patch cable into the back of the FlexStat.
- The Ethernet patch cable should be T568B Category 5 or better and a maximum of 328 feet (100 meters) between devices.

RESTARTING THE FLEXSTAT

Types of Restart

If the FlexStat is not operating correctly, restart (reinitialize or reset) it. Any restart interrupts normal operation, and three types of restart exist:

- A warm start is generally the least disruptive option (restarting normal operation the quickest).
- A cold start can be used if problems persist after a warm start..
- If problems still persist, restoring applications (and reconfiguring and reprogramming the FlexStat) may be required.

Warm and Cold Starts

⚠ CAUTION

During a restart, the analog outputs go to zero, and relays go to their normally open state. A restart is a process that lasts up to half a minute, and it may result in several changes of state for an output, turning equipment off and on abruptly. Before resetting the FlexStat, manually override equipment as needed. If a large fan is controlled by the FlexStat, for example, set a minimum off time.

A **warm start** does the following in the FlexStat:

- Zeroes out objects (during the restart process).
- Restores **present values of objects to their last values before the restart** (until they are updated by the FlexStat's programs).
- Restarts the controller's Control Basic programs.
- Leaves configuration and programming intact.

⚠ CAUTION

If the checksum test in RAM fails during a warm start, a cold start is performed instead.

A **cold start** does the following in the FlexStat:

- Zeroes out objects (during the restart process).
- Returns **all object values to their relinquished defaults** (until they are updated by the FlexStat's programs).
- Restarts the controller's Control Basic programs.

- Leaves configuration and programming intact.

NOTE: Menu changes may take several minutes to write to nonvolatile Flash memory. If power to the FlexStat is lost during this time, changes may be lost. **Restarting the FlexStat from its menu (when possible) or KMC software are the recommended methods.**

NOTE: When power is restored after an outage, the FlexStat will attempt to do a warm start as long as the values in RAM are retained (up to about six hours). If the RAM checksum test fails, a cold start will be done instead.

NOTE: In custom Control Basic programming, using the POWERLOSS command may be desirable to determine start-up conditions and to take appropriate actions. Refer to the Help system in software for more information.

To perform a WARM start, do one of the following:

- From KMC software, select **Reinitialize Device > Warm Start**.
- Momentarily remove power to the FlexStat.

To perform a COLD start, select Reinitialize Device > Cold Start in KMC software.

To restore the application, do one of the following:

- From the FlexStat menu, select **Advanced > Restore APP > another application and/or units**. Let the FlexStat restart. Restore to the original application in the same manner. From KMC software, right-click the FlexStat in the Network Manager and select **Configure Device...**, expand **Application Properties**, and then select the application and units in the Base.
- In the Application Index drop-down menu, **click Save Changes**, right-click the FlexStat in the Network Manager, select **Reinitialize Device...**. Restore to the original application in the same manner.

NOTE: After the application has been changed, most settings are returned to their default values. Configure them as needed.

TROUBLESHOOTING

Alarm Issues

Alarm, (False) Fan Status Fail

- Check configuration. Be sure the Fan Status option is not enabled when there is no sensor/switch for it.
- Check fan status input wiring.
- Check the connected fan status sensor/switch. Using KMC software, check that BI6 (or equivalent fan status binary input) is not configured as “Out Of Service.”

Alarms, Other

Use KMC software to create any additional alarms. See the Help system in software for more information.

Back-Up Issues

NOTE: Backing up the existing settings and firmware image before or during the upgrade process is recommended practice.

- Use KMC software to back up FlexStats. See the software documentation.
- See also [Updating Firmware Issues on page 23](#).

Communication Issues

(MS/TP) Data Port Communication Issues

NOTE: For Ethernet-enabled models, the EIA-485 data port is not supported.

- See the [BAC-5051AE](#) documentation.
- Reduce the Max Master number to the minimum needed for that network.
- See also [MS/TP Network Communication Issues on page 18](#) below.

Ethernet/IP Network Communication Issues

- Restart the FlexStat.
- Check communication settings.

- Use a BAC-5051AE router to check route status for network issues such as duplicate network numbers.

MS/TP Network Communication Issues

- Check the phasing of the power and network lines.
- Check MAC address and device instance numbers (especially for duplicate numbers on the network).
- Check that EOL switches are fully latched in the correct positions (see the [BAC-19xxxx FlexStat Installation Guide](#)). Check the baud rate setting (which should be the same on all the controllers on the network).
- Check the Max Master setting in a configuration tool. It should be just higher than the highest numbered controller.
- Ensure wiring is correct. See [Planning BACnet Networks \(Application Note AN0404A\)](#).
- Check for ground loops. See [Avoiding and Troubleshooting Ground Loops Application Guide](#).
- See the [MS/TP Troubleshooting Using a Multimeter - Bifurcation](#) video and downloadable [troubleshooting guide](#).

Cover, Display, and Reset Issues

Cover Binds on Backplate

CAUTION

BAC-19xxxx FlexStats are NOT COMPATIBLE with the backplates of older BAC-10xxx/12xxxx/13xxxx/14xxxx series FlexStats! If replacing an older FlexStat, replace the backplate as well.

- To remove the cover, turn the hex screw in the bottom of the FlexStat **CLOCKWISE only until it clears the cover**. Swing the cover up from the backplate (mounting base).

CAUTION

To prevent the mounting screw from causing damage to the case or circuit board, DO NOT DRIVE IN THE SCREW FARTHER THAN NECESSARY to remove the cover. Using a power screwdriver for this operation is not recommended. Also, use only the mounting screws supplied by KMC Controls since other types of screws may damage the FlexStat.

- **Carefully** remove the FlexStat cover from the backplate and

inspect for bent pins and/or terminal socket connectors. If cover pins are bent, use a needle-nose pliers to straighten them. If socket connectors are bent, use a pointed object (such as a thumbtack or straightened paperclip) to straighten them. (Pushing the pointed object into the socket from the back side might be helpful.)

- Replace the backplate.

NOTE: When installing the cover on the backplate, be sure to not pinch or dislodge any wiring. Do not use excessive force. If there is any binding, pull off the cover and examine pins and terminal socket connectors.

Display Is Blank, Erratic, or Frozen

- If the display comes on when an area is pushed, Screen Blanking is enabled. See [Communication Options on page 4](#).
- Check for a tripped circuit breaker to the transformer.
- Carefully remove the FlexStat cover from the backplate. Check pins and connectors. Reinstalling the cover on the backplate should restart the FlexStat if it is supplied adequate power.
- If the FlexStat has been damaged, check the phasing of the power and network lines. See [Wiring Considerations Troubleshooting on page 18](#). See also [Display Keeps Resetting on page 19](#).

Display Keeps Resetting

- Carefully remove the FlexStat cover from the backplate, check pins and connectors, and reinsert. (See [Cover Binds on Backplate on page 18](#).)
- Check for proper supply voltage and phasing from the transformer and that the transformer has enough capacity (VA) for all connected devices. See their respective data sheets and [Tips for Connecting 24-Volt Power Application Note \(AN0604D\)](#).

NOTE: Wiring must be adequate to avoid excessive voltage drop on long runs! Allow plenty of “cushion” in measurements. A meter may be too slow to register transient dips or peaks during startup. See [Troubleshooting on page 18](#).

- Attach the FlexStat onto a backplate connected to a (test) transformer with short wiring, enough capacity (VA), and no other connected devices. If the FlexStat works with the test

transformer, the wiring and/or transformer in its previous location is inadequate. If it does not work with the test transformer, replace the FlexStat.

- Place another FlexStat on the installed backplate. If the second FlexStat functions properly, replace the first FlexStat.

Configuration and Programming Issues

NOTE: Use the relevant KMC software or app to perform the following tasks.

Application is Not Correct

NOTE: Use Select the (RTU, HPU, or ZAC) application and units BEFORE changing any other settings. Changing applications later will reset most settings to their defaults. Use Restore APP in the Advanced menu or KMC software to verify or change applications.

NOTE: When programmed for Roof Top Unit (RTU) or Heat Pump Unit (HPU) Discharge Air Temperature (DAT) control, the value shown in the upper left corner of the display is the DAT instead of the room temperature. on page 13

- Select the correct application either through the menu or through KMC software.
- Select a different model FlexStat with the necessary options.

NOTE: BAC-19xx63xx-ZEC models support (only) Rooftop Units, Heat Pump Units, and Zone Actuator Control.

Control Basic Programs Do Not Work

NOTE: The FlexStat contains a library of applications and options that are configured through the FlexStat's display. Beyond these standard configurations, custom changes can be added to a FlexStat using KMC software.

NOTE: Control Basic programs 1 through 5 are used for built-in applications. Programs 6 through 10 are empty and can be used for additional programming. Using KMC software, a program (1 through 5) can be copied, pasted into a new

program code object (6 through 10), edited, and run in place of the original. Make a backup before modifying any built-in programs!

NOTE: Customized programs are the responsibility of the user. KMC Controls does not provide support for such programs.

- Check that program objects are running and that **Run on Cold Start** is selected.
- Check that program objects are not configured as **Out Of Service**.
- Check the Control Basic code for errors in syntax, priority levels, and other issues. For assistance with Control Basic commands, see the Help system in the software.
- If firmware has just been upgraded, see [Updating Firmware Issues on page 23](#)

NOTE: BAC-19xx63xx models support (only) Rooftop Units, Heat Pump Units, and Zone Actuator Controls.

Configuration Issues

- Check for proper connections between the controller and software.
- See the help information in the documentation or the software.
- To restore configuration values to their factory defaults, change and then restore the application.

Objects Are Missing

- For missing objects (e.g., objects that have been accidentally deleted), use KMC software to create objects.

(Unknown) Password Is Required

- A default Level 2 password is required for initial configuration. See the [Conquest Controllers Default Password Technical Bulletin \(TB150716\)](#) by logging into the [KMC Controls website](#).

NOTE: If a Level 1 or 2 password is configured for 0000 in the Advanced menu, that password screen is bypassed in later use.

NOTE: To enhance security after configuration, change

the Level 2 password in the Advanced menu. Be sure to document the new password for future reference!.

- If a user-configured Level 2 password has been forgotten, use KMC software to view the password in the Display Objects screen. In KMC software, both levels of passwords can be viewed and changed as desired without having to first enter either one.

Software Not Compatible with the FlexStat

- Upgrade to the latest version of KMC software. See the [BAC-19x63xx-ZEC FlexStats Data Sheet](#) for versions of KMC software that support the ZEC FlexStat.

Input, Sensor, and Value Issues

CO₂ Level Value is Frozen at 0

- After power is first applied or the FlexStat is restarted, the sensor goes undergoes a warm-up for approximately half a minute. During that time, the sensor count will be 0 ppm.
- CO₂ models periodically self-calibrate. During the self-calibration, the sensor PPM reading may appear frozen and not react to changing CO₂.
- Using KMC software, check that the input is not configured as "Out Of Service."
- See [CO₂ and DCV Sequences Are Not Working on page 20](#).

CO₂ and DCV Sequences Are Not Working

- After power is first applied or the FlexStat is restarted, the sensor goes undergoes a warm-up for approximately half a minute. During the time the sensor count will be 0 ppm.
- Ensure that the desired CO₂ DCV mode is enabled (under System in Settings or MSV12).
- Ensure that the desired CO₂ DCV mode is enabled (under System in Settings or MSV12).
- Check that an economizer is enabled.
- For Basic DCV, adjust the CO₂ setpoint and/or deadband (under the Setpoints menu or AV58/AV59).
- Check that conditions for self-calibration are met. The CO₂ sensor uses a self-calibration technique designed to be used in applications in which CO₂ concentrations will periodically drop to outside ambient conditions

(approximately 400 ppm), typically during unoccupied periods.

- In KMC software, check that AV57 (ROOM_CO2) is not out of service.

CO₂ Level Is “Too High”

- To reduce nuisance complaints by occupants, turn off visibility of the CO2 level rotation in the display.
- See [CO2 and DCV Sequences Are Not Working on page 20](#).

Input Values Outside Expected Range

- After initial power-up, allow time for readings to stabilize.
- Using KMC software, check that the sensor’s input is properly configured and that “Out Of Service” is not selected.
- Check connected sensors and input wiring — see [Wiring Issues on page 24](#).

NOTE: Faulty wiring on one input can potentially cause fluctuating input values on other inputs.

- Check the application configuration.
- Restore the FlexStat application settings (see [Troubleshooting on page 18](#)) and reconfigure the settings.

Humidification/Dehumidification Issues

- Check the application configuration.
- See also [Input Values Outside Expected Range on page 21](#).

Temperature Reading Is Incorrect

NOTE: Fahrenheit **decimal** values are **not** displayed by default but can be enabled by setting Precision to 0.1 in the Display Object’s Rotations tab. The size of the digits, however, is considerably reduced.

- After applying power for the first time (or after an outage), allow the FlexStat to self-calibrate a half hour before verifying the temperature reading.
- Check that the correct °F/°C temperature scale is selected.

- Check that the sensor is properly mounted in a proper location. See the [Room Sensor and Thermostat Mounting and Maintenance Application Guide](#).
- Check that the temperature sensors are not covered or blocked.
- Check for the correct remote temperature sensor configuration.
- Using KMC software, check that AI1 and AV1 (space temp.) are not configured as “Out Of Service.”
- See also [Input Values Outside Expected Range on page 21](#).

Temperature Setpoint Is Not Maintained

- Select Occupied mode from the Home Menu.
- Override the fan to **On** from the Home Menu.
- Check that the appropriate application is selected.
- Check inputs and outputs.
- Check schedules.
- Check that room temperature is being sensed correctly—see [Time and/or Date Are Not Correct on page 22](#).
- Check that the corresponding analog value object (e.g., AV3, AV4) is not configured as Out of Service.
- If the HVAC system has trouble recovering from the unoccupied setpoint to the occupied setpoint during very cold weather, decrease the amount of setback or adjust the schedule.
- If space temperature is overshooting the setpoint or oscillating, try increasing the proportional band by a degree. If the problem persists, try increasing the integral value slightly (up to 20%). If the problem still persists, try setting the integral value to 0. (The optimal integral value is dependent on the characteristics of the particular space and HVAC system.)

Operation Issues

Schedules Do Not Operate Properly

- Check for proper schedule configuration.
- Check the FlexStat’s time. See [Time and/or Date Are Not Correct on page 22](#).

- Using KMC software, check the outputs. Check that the schedule object is not configured as Out Of Service.

Time and/or Date Are Not Correct

NOTE: When a FlexStat is unpowered long enough to lose the RTC (Real Time Clock) time, it will revert to the default time and date of 12:00 AM 01/01/2000.

- Using KMC software, send a time synchronization command.
- Set the time and date in the menu. See [Fan Does Not Run on page 22](#).
- Check the DST (Daylight Saving Time) settings.
- Check the UTC Offset.

Trends Do Not Work

NOTE: A trend log for space temperature, cooling setpoint, and heating setpoint are automatically generated. Use KMC software to view it and create other trend logs.

- Check that the trend log object Start Time and Stop Time are valid in the configuration.
- Check that Log Enable is selected.
- Check that the log is not full because **Stop When Full** is selected.
- Check that trend log objects are not configured as Out Of Service. Check the relevant sensors. See [Input, Sensor, and Value Issues on page 20](#).

Other Issues

- Thoroughly check appropriate connections, wiring, and settings.
- Restart the FlexStat.
- Consult with the network administrator for proper network settings.
- Contact KMC Controls technical support.

Output, Fan, and Relay Issues

Analog Output Does Not Work

CAUTION

Do not mistakenly connect 24 VAC to an analog output ground. This is not the same as a relay's switched common (SC). See the installation guide or the backplate's terminal label for the correct terminal.

NOTE: Each short-circuit protected universal output capable of driving up to **100 mA** (at 0–12 VDC) or **100 mA total** for all outputs. Excessive loads will be clamped at the maximum. External relays may chatter or fail to latch if they need more current than the maximum allowed.

- Check that the (total) current draw of the load is no more than 100 mA. Substitute an output device that draws less current.
- Using KMC software, check the outputs. Check that the output object (e.g., AO7) is not configured as Out Of Service.
- Check for proper output object configuration.
- Check that the output is on.
- Check the Control Basic programs, loop objects, and schedules.
- See [Wiring Issues on page 24](#).
- See also [Fan Does Not Run on page 22](#).

Damper/Economizer Does Not Work

- Enable the economizer in the System section of Settings.
- Connect to the correct output.

Fan Does Not Run

NOTE: The animated fan icon is associated with BV1 in the packaged programming (not the actual fan output terminal).

- Select Occupied mode from the Home screen by pressing the icon.
- Override the fan to On from the Home screen by pressing the icon.

- See [Wiring Issues on page 24](#). Check that the appropriate application is selected.
- Check the fan.
- Restart the FlexStat.

Relay (External) Does Not Work

- See [Analog Output Does Not Work on page 22](#).
- See [Relay \(Internal\) Does Not Work on page 23](#).

Relay (Internal) Does Not Work

CAUTION

Relays are for Class-2 voltages (24 VAC) only. Do not connect line voltage to the relays!

NOTE: Max. output current is **1 A for individual relays @ 24 VAC/VDC or a total of 1.5 A per bank of 3 relays** (relays 1–3 and 4–6). Do not attach a device that draws current that exceeds the corresponding value. Relays are NO, SPST (Form “A”).

- Check the current draw of load. Substitute an output device that draws less current.
- Using KMC software, check the outputs.
- Check that the output object (e.g., B04) is not configured as Out Of Service.
- Check for proper output object configuration.
- Check that the output is on.
- See [Wiring Issues on page 24](#).
- Restart the FlexStat.

Updating Firmware Issues

NOTE: Use KMC software to update firmware **over the network**. See the [BAC-190000 Series FlexStats data sheet](#) for versions of KMC software that support the FlexStat.Finding and Selection Issues

- To view and download **firmware updates** from FlexStat product pages on the KMC Controls web site, you must log in with a valid user name and password.
- **Use firmware designated for over-the-network updates.** Firmware meant for the HTO-1104 Firmware Upgrade Kit will not work over the network.

- **Ensure firmware for the correct model is selected.** If firmware for the wrong model is installed, the outputs will not match the applications/configuration on the display.

NOTE: **Backing up** the existing settings and firmware image **before or during the upgrade process** is recommended practice.

Malfunction after Firmware Update

- Restart the FlexStat.
- Check the application configuration.

NOTE: Restoring to the factory defaults and reconfiguring might be needed if how the FlexStat operates changes. Read all notes accompanying the firmware update!

- Change the state of each custom program by loading/running each program from KMC software.

NOTE: See also [Wiring Issues on page 24](#).

NOTE: **Customized programs are the responsibility of the user.** KMC Controls does not provide support for such programs.

Power Issues

- Check for a tripped circuit breaker to the transformer.
- Check for proper supply voltage and phasing from the transformer (or power supply) and that the transformer has enough capacity (VA) for all connected devices. See the devices’ respective data sheets and [Tips for Connecting 24-Volt Power Application Note \(AN0604D\)](#).

NOTE: Wiring must be adequate to avoid excessive voltage drop on long runs! Allow plenty of “cushion.” A voltage meter may be too slow to register transient dips or peaks during startup.

Protocol Issues

NOTE: On “E” models, the default protocol is BACnet over Ethernet with a Device ID of 1. To see new “E” models in KMC software, ensure the software on the network can discover BACnet over Ethernet devices. (Add a BACnet over Ethernet network in BACstac if needed.) See [Ethernet/IP Configuration via Software on page 5](#).

- To prevent losing communication with “E” models,

changing from the default Ethernet to an IP setting requires multiple steps in software. See [Ethernet/IP Configuration via Software on page 5](#).

Wiring Issues

- Review the wiring information in [Wiring Considerations on page 16](#), the [BAC-19xx63-ZEC FlexStat Installation Guide](#), and the [BAC-19xx63-ZEC FlexStat Sequence of Operation and Wiring Guide](#).
- Remove the FlexStat from the backplate and inspect the terminals for loose or shorted wires.
- Check for ground loops. See the [Avoiding and Troubleshooting Ground Loops Application Guide](#).
- Use a voltmeter and ohmmeter to check the terminals for expected values. See the backplate terminals illustration.

NOTE: Voltage on the BACnet MS/TP terminals changes according to the signals (token passing) between controllers on the network. No voltage may indicate a bad connection or simply no active network.

NOTE: Wiring must be adequate to avoid excessive voltage drop on long runs! Allow plenty of “cushion” in measurements.

- Check the wiring at the connected devices.

⚠ CAUTION

To avoid damage from ground loops and other communication issues in networked FlexStats, correct phasing on network and power

connections on ALL the networked controllers is critically important.

⚠ CAUTION

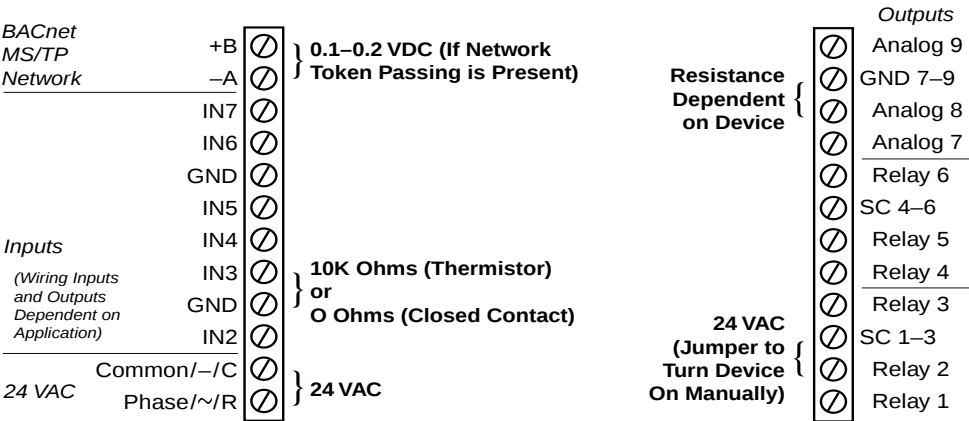
Do not connect 24 VAC to an analog output ground. This is not the same as a relay’s switched common. See the backplate’s terminal label for the correct terminal.

⚠ CAUTION

Relays are for Class-2 voltages (24 VAC) only. Do not connect line voltage to the relays!

⚠ CAUTION

BAC-19xx63-ZEC FlexStats are NOT COMPATIBLE with the backplates of older BAC-10xxx/12xxx/13xxx/14xxx series FlexStats! If replacing an older FlexStat, replace the backplate as well.



Terminal Voltages and Resistances with FlexStat REMOVED from Backplate

NOTE: BAC-19xxx63C Backplate Terminals Shown with FlexStat Removed; Outputs and Inputs Vary According to Application

NOTE: Values Shown Are Approximate!
NOTE: SC = Switched (Relay) Common, Should Have the Phase Side of 24 VAC Connected

APPENDIX: UTC OFFSET TIME ZONES

To select a time zone and optional DST, see [Set Clock \(Menu Options\)](#) on page 10.

If the FlexStat is used in a BACnet network with **UTC (Coordinated Universal Time)** synchronization (via broadcasting or addressing a single thermostat) set the UTC Offset value. The UTC Offset value is in minutes and corresponds to the distance of the local time zone to the zero degree meridian. **In stand-alone operation or networks that do not have UTC broadcasts, setting this value is NOT necessary.**

UTC (also commonly known as Zulu or Greenwich Mean Time) is, for example, **5** hours ahead of **Eastern Standard Time** or **4** hours ahead of **Eastern DST (Daylight Saving Time)**. See the chart below for more time zone conversions.

SAMPLE TIME ZONES*	OFFSET FROM UTC TO EQUAL LOCAL TIME**	+/- SIGN IN FLEXSTAT
American Samoa, Midway Atoll	UTC – 660 minutes (11 hours)	None (+)*** (West of 0 degree Meridian)
Hawaii, Aleutian Islands	UTC – 600 minutes (10 hours)	
Alaska, French Polynesia	UTC – 540 minutes (9 hours) or 480 minutes (8 hours) during DST	
USA/Canada Pacific Standard Time	UTC – 480 minutes (8 hours) or 420 minutes (7 hours) during DST	
USA/Canada Mountain Standard Time	UTC – 420 minutes (7 hours) or 660 minutes (6 hours) during DST	
USA/Canada Central Standard Time	UTC – 360 minutes (6 hours) or 300 minutes (5 hours) during DST	
USA/Canada Eastern Standard Time	UTC – 300 (default) minutes (5 hours) or 240 minutes (4 hours) during DST	
Canada Atlantic Standard Time, Chile	UTC – 240 minutes (4 hours) or 180 minutes (3 hours) in areas observing DST	
Brazil, Uruguay, Argentina	UTC – 180 minutes (3 hours)	
Iceland, Ireland, Portugal	0 hours	
France, Germany, Hungary	UTC + 60 minutes (1 hour)	– (East of 0 degree Meridian)
Egypt, Israel, Turkey	UTC + 120 minutes (2 hours)	
Kuwait, Saudi Arabia	UTC + 180 minutes (3 hours)	
United Arab Emirates	UTC + 240 minutes (4 hours)	
Maldives, Pakistan	UTC + 300 minutes (5 hours)	
India, Sri Lanka	UTC + 330 minutes (5.5 hours)	
Bangladesh, Bhutan	UTC + 360 minutes (6 hours)	
Laos, Thailand, Vietnam	UTC + 420 minutes (7 hours)	
China, Mongolia, Western Australia	UTC + 480 minutes (8 hours)	
Korea, Japan	UTC + 540 minutes (9 hours)	
Central Australia	UTC + 570 minutes (9.5 hours)	
Eastern Australia, Tasmania	UTC + 600 minutes (10 hours)	
Vanuatu, Solomon Islands	UTC + 660 minutes (11 hours)	
New Zealand, Fiji	UTC + 720 minutes (12 hours)	
*Minor parts of the named areas may be in other time zones.		
**May also need to convert from 24 to 12 hour format.		
***The BACnet standard for this offset value is: “The time zones to the west of the zero degree meridian shall be positive values, and those to the east shall be negative values.” The value is in minutes, not hours.		

ADDITIONAL RESOURCES

See the [CSP-4702](#) page for information about the differential pressure controller/actuator.

See the [MEP-4002](#) page for information about the proportional actuator.

See also the [BAC-8000 series](#) for information about the VAV controller-actuators.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. A BAC-19xx63-ZEC Class B digital apparatus complies with Canadian ICES-003.

NOTE: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. A BAC-19xxxx Class A digital apparatus complies with Canadian ICES-003.

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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 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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