
ADVANCED PROGRAMMING & USER INTERFACE SETUP GUIDE

BrightStat

Air Conditioner/Heat Pump Room Controller



Climate Control Solutions

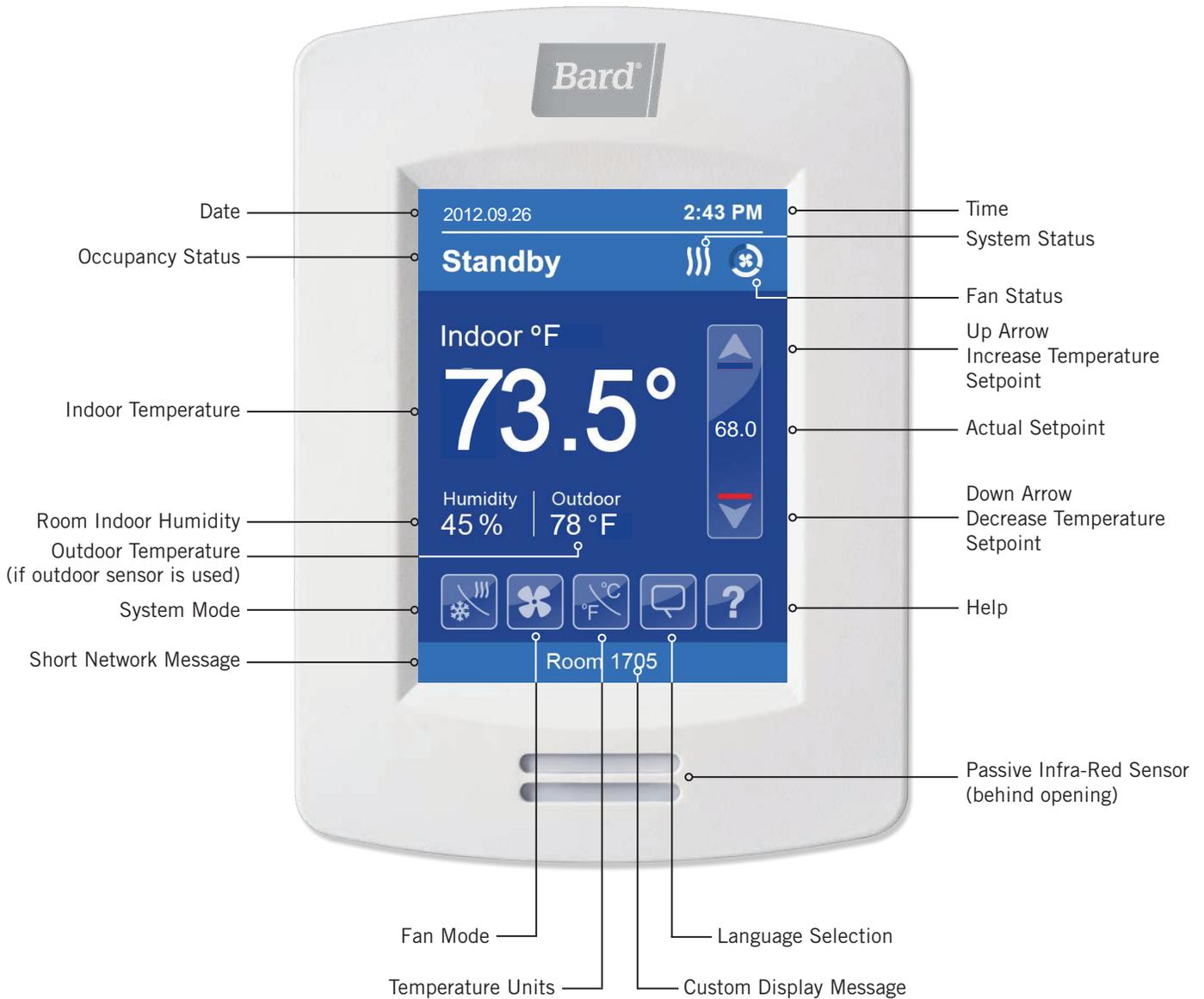
Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 2100-681A
Supersedes: 2100-681
Date: 3-17-23

CONTENTS

HMI Display	3
Setup Screen	6
Setup Screen Display 1/2	6
Setup Screen Display 2/2	7
Schedule Menu Screen	7
Clock Settings	8
Power Outage Clock Reset	8
Schedule Settings.....	9
Configuration Parameters Screens	11
Configuration 1/11	
UI16, UI17,UI19 Configuration, Smart Recovery, Setpoint Function, Mode Button.....	11
Configuration 2/11	
Fan Control in Heating, Fan Delay, Standby Mode, Standby Temperature Differential,Power-Up Delay, Occupancy Source.....	14
Configuration 3/11	
Standby Time, Unoccupied Time, Temperature Occupancy Time, Room Temperature Sensor, Dehumidification (Humidity Control) Hystereris, Dehumidification Lockout	16
Configuration 4/11	
Cooling Output Cycles per Hour, Heating Stages Cycles per Hour, Frost Protection, Binary Auxiliary Output Configuration, Anti Short Cycle Time, Minimum Supply Heat	19
Configuration 5/11	
Proportional Band Setting, Number of Heating Stages, Number of Cooling Stages, Economizer Operation Configuration, Changeover Setpoint, Mechanical Cooling Allowed	22
Configuration 6/11	
Heating Lockout from Outside Air Temperature, Cooling Lockout from Outside Air Temperature, Discharge High Limit, Discharge Low Limit, Supply Heat Lockout, Fresh Air Range	23
Configuration 7/11	
Economizer Minimum Position, Economizer Maximum Position, Minimum Fresh Air, Maximum Fresh Air, Minimum CO ₂ , Maximum CO ₂	25
Configuration 8/11	
Application, High Balance Point, Low Balance Point, Comfort or Economy Mode, Reversing Valve Operation, Compressor Auxiliary Interlock	27
Configuration 9/11	
Main Password, User Password, Schedule Menu, USB Access	29
Configuration 10/11	
Calibration of Room Temperature Sensor, Calibration of Outside Temperature Sensor,Calibration of Humidity Sensor, Relative Humidity Sensor, CO ₂ Sensor Source.....	31
Configuration 11/11	
Reinitialization.....	33
Password Settings	34
Setpoint Settings 1/2.....	36
Setpoint Settings 2/2.....	38
Display Settings 1/2	39
Display Settings 2/2	43
Service Screen Views	45
Test Outputs 1/2	50
Test Outputs 2/2	51
Language Selection	52
Wireless Ecosystem	53
BrightStat LUA Use	55
Network Settings	57
ZigBee Pro Network Settings	58
BACnet Network Settings	61
BACnet Instance Number.....	62
Modbus Network Settings.....	63

HMI Display Definitions



Date: The upper left corner of the screen may be used to display the date as it was programmed into the controller or is received from a network synchronization command. The date will not be shown unless the controller date is set manually set or the controller is on a network and the synchronization feature is used.

Time: The upper right corner of the screen may be used to display the time as it was programmed into the controller or is received from a network synchronization command. The time will not be shown unless the controller time is set manually set or the controller is on a network and the synchronization feature is used.

Occupancy Status: The controller will display one of four status messages in the upper left if the controller is set to local occupancy or an occupancy status is being sent from a network system. There are four modes of occupancy for the controller:

- **Occupied:** Occupied mode is when occupants are in the room. The user can program in a schedule to indicate when the room is occupied, can use a motion sensor to sense movement in the room and indicate the room is occupied, or call for occupancy through a network system.
- **Unoccupied:** Unoccupied mode is when occupants are not in the room. The user can program in a schedule to indicate when the room is occupied, can use a motion sensor to sense movement in the room and indicate the room is occupied, or call for occupancy through a network system.
- **Standby:** Standby mode is when the motion sensor is not indicating movement for a specified amount of time. Temperature differences in the room for standby mode can be set along with occupied and unoccupied setpoints or can be an offset value.
- **Override:** Override mode is activated manually by the user or is triggered by contacts opening in a door, window or other switch. If manually activated by the user, the room conditions will go into a temporary occupied mode. Door, window or other switches can be programmed to put the controller into override mode and signal temporary occupancy. Override mode length of time can be set in the controller.

System Status: The controller will display a system status icon in the upper right area. System status indicates what unit mode of operation is being called for by the controller. During normal operation, the system status indicator will show if the controller is calling for cooling (snowflake), heating (wavy lines) or is off based on system mode selection. System mode selections will be shown here when pushing the System Mode button.

Fan Status: The controller will display a fan status icon in the upper right area when the indoor fan is operating. Fan status indicates if the indoor fan is being called for by the controller. When the fan is being called for by the controller, a picture of a fan will be present. No fan picture is present when the controller is not calling for fan operation. Fan mode selections will be shown here when pushing the Fan Mode button.

Indoor Temperature: Shows current indoor temperature at the controller in .5° increments. Temperature readings are available in either Fahrenheit or Celsius.

Room Indoor Humidity: Shows current indoor humidity level in %RH. The humidity display can be enabled or disabled in the configuration menu.

Outdoor Temperature (or Indoor CO₂ Level): Shows current outdoor temperature sensor measurement when outdoor sensor is connected. The current CO₂ level can also be shown if an optional CO₂ card is installed. CO₂ display can be enabled or disabled in the configuration menu.

Up Arrow, Down Arrow: The up and down arrows allow for temperature setpoint adjustment for occupied mode on the display screen. The actual occupied setpoint(s) will be displayed between the up and down arrows. The amount of temperature adjustment that can be made can be defined in the configuration menu. If scheduling is used, changing the heating or cooling setpoint on the display will not affect heating or cooling during unoccupied periods.

Actual Setpoint(s): The temperature setpoint(s) for occupied mode are displayed between the up and down arrows. For cooling or heating system modes, one temperature setpoint will be shown. For auto system mode, two temperature setpoints will be shown. The upper area will show the cooling setpoint and the lower area will show the heating setpoint. The difference between the two setpoints is dependent on the setpoint function command in the configuration menu. If Dual SP is selected, heating and cooling setpoints can be adjusted independently. If Attach SP is selected, heating and cooling setpoints will always be separated by the deadband value.

System Mode: System mode selection allows the user to decide if the controller will call for cooling only, heating only, automatically decide to heat or cool or disable all unit operation with the off command. Setting the controller to heat or cool will ensure that equipment only operates in the specific mode selected. However, user interaction may be necessary as temperature conditions seasonally change over the course of the year. Auto mode provides a means to supply both heating and cooling throughout the year without user interaction. However, based on outdoor conditions, the unit may provide heating in the summer or cooling in the winter based on indoor temperature conditions. The off command allows the user to disable controller operation when cooling, heating or ventilation are not needed. The controller has the following four modes of operation:

- **Cool:** Cooling mode will provide cooling-only operation along with optional ventilation to the indoor space. Heating mode will be disabled. A cooling setpoint is provided by the user to signal when cooling operation is desired.
- **Heat:** Heating mode will provide heating-only operation along with optional ventilation to the indoor space. Cooling mode will be disabled. A heating setpoint is provided by the user to signal when heating operation is desired.

- **Auto:** Auto mode provides both a cooling and heating setpoint with a deadband between both temperature settings. Seasonal user interaction to decide if the controller should call for heating or cooling is not necessary, and operation of heating and cooling will be decided by the setpoints for both modes of operation.
- **Off:** Off mode disables heating, cooling and ventilation. When in off mode, signals for all normal unit operation are not sent from the controller to the unit.

Fan Mode: Fan mode selection allows the user to define how the indoor fan operates and when indoor airflow will occur. Fan mode and operation has the following three options: **On** (the fan will operate continuously regardless of unit operation), **Auto** (the fan will operate as needed for heating and cooling operation) and **Smart** (the indoor fan will operate continuously during occupied times).

- **On:** The indoor fan will operate constantly regardless of cooling, heating or occupancy ventilation operation. This mode is selected when continuous airflow throughout the indoor space is needed.
- **Auto:** The indoor fan will operate continuously during heating and cooling but will be off during all other modes of operation. When using auto mode, indoor fan operation during ventilation operation will require special low voltage wiring to occur. See unit manual for details on wiring requirements.
- **Smart:** The indoor fan will operate continuously during heating and cooling operation and during occupied periods per the occupancy schedule or motion sensor. Smart mode is useful for operating the indoor fan during occupied periods when ventilation is required, and additional unit wiring is not necessary for indoor fan use.

Temperature Units: Unit selection allows the controller to display temperature measurements and setpoints in either Fahrenheit or Celsius. Unit selection effects the screen display and setpoints in the configuration and setpoints menus.

Language Selection: Language selection allows the user to use multiple languages shown on the main display and in setup menus.

Help: Help provides a basic description of the items shown on the main display.

Custom Display Message: Custom messages are optional on the main display. Custom messages are often used with LUA script files and BACnet-defined notifications.

NOTE: *In the event of a power outage, configuration programming is not lost as it is stored in internal memory. See page 8 for information on expected clock performance after a power outage.*

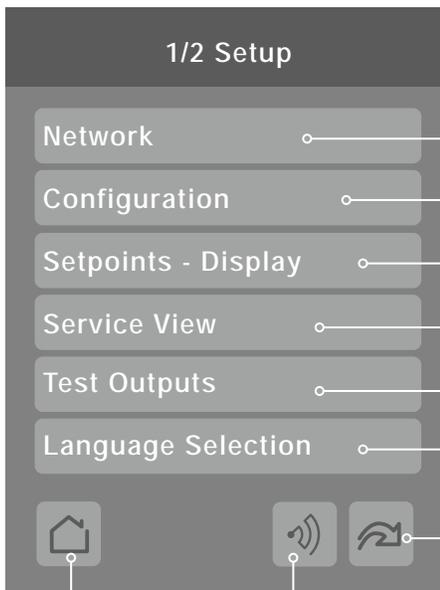
SETUP SCREEN



Touch and hold this point for 3 seconds to enter setup mode

NOTE: If a configuration/installer password is activated to prevent unauthorised access to the configuration menu parameters, a password entry prompt shows to prevent access to device configuration components.

SETUP SCREEN DISPLAY 1/2



- Network Enter BACnet® & ZigBee® network settings (only if ZigBee is detected)
- Configuration Enter parameter configuration menu
- Setpoints - Display Enter setpoint and display settings
- Service View Enter status and service view
- Test Outputs Enter output testing mode
- Language Selection Enter language selection
- (Home icon) Return to home screen
- (Discover Mode icon) **Discover Mode** The controller becomes discoverable on the wireless ZigBee network for 1 minute (this button is hidden if ZigBee settings are not configured)
- (Advance icon) Advance to next menu

General Note:

- Adjustable parameter
- Nonadjustable parameter
- Indicates invisible conditional field. Appears based only on model, presence of a ZigBee wireless adapter module or presence of a Lua script, depending on the field.

NOTE: The following menus show according to context:

- ZigBee menu shows if ZigBee card is detected
- Network choice inside does not show if no network is available

SETUP SCREEN DISPLAY 2/2



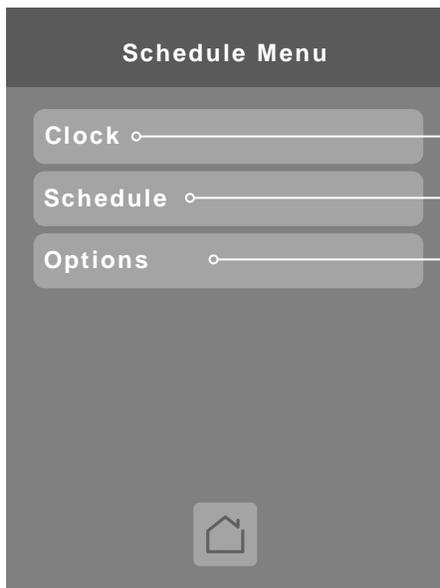
Enter Schedule menu screen

Enter Wireless Ecosystem menu screen (ZigBee wireless adapter module required)

Enter Lua script settings (Lua script required)

NOTE: *Wireless Ecosystem, wireless IO, LUA scripting, networking with BACnet and Modbus information can be found towards the end of this manual.*

SCHEDULE MENU SCREEN



Enter Clock settings

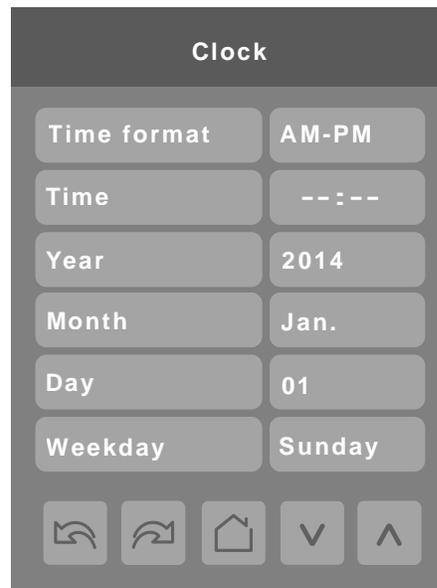
Enter Schedule settings

Enter Occupancy settings

NOTE: *The Schedule menu screen is directly accessible from the main display if the Schedule Menu configuration parameter is enabled. See Configuration Parameters Screen 9/11 on page 29 for more information.*

CLOCK SETTINGS

The Clock settings screen allows the device's internal time settings to be changed, including current time, standard day, month, year and weekday options, as well as choice between a 12 hour AM/PM display or a 24 hour display.



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Time Format Default value: AM-PM	Time Format: Current time display format. Choice between 12 hour (AM - PM) time format or 24 hour time format. Note: Changing the value of this parameter automatically changes the format of the displayed value of the time parameter. Choices: AM-PM or 24 Hours
Time Default value: Current time at power up	Time: Standard time display, 12 hour AM-PM or 24 hour format determined by the Time Format parameter value.
Year Default value: 2014	Year: Current year Range: 2000 - 2100
Month Default value: Jan.	Month: Current month Range: Jan. - Dec.
Day Default value: 1	Date: Current date Range: 1 - 31
Weekday Default value: Monday	Day: Current day Range: Monday - Sunday

POWER OUTAGE CLOCK RESET

In the event of a power outage, controller will retain the correct time as long as the duration of the power outage is not prolonged. Depending on the duration of the power outage, the controller's internal clock may need to be updated or reset completely. The following table gives an indication of the expected clock performance after a power outage.

Outage Duration	Controller Behavior
0 - 24 hours	Clock functions are normal.
24 - 36 hours	Clock accuracy not guaranteed; time may need to be adjusted.
36 - 72 hours	Clock no longer increments and must be adjusted when power is restored.
72+ hours	Clock functions are fully reset and must be re-initialized as per new installation.

SCHEDULE SETTINGS

There are seven different schedule setting screens, one for each day of the week, titled accordingly. Each day can have different scheduled events where the room controller is set to Occupied status or back to Unoccupied status and use the appropriate setpoints, back and forth up to three times per day.



Screen title is identified by day of the week (Sunday through Saturday)

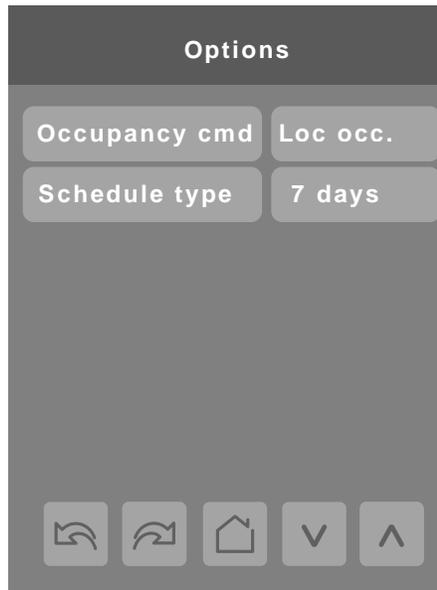
PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Occupied 1 - 3 Default value: None	Occupied 1 - 3 Defines a time when the room controller is automatically set to use the Occupied setpoint. <i>NOTE: There are three separate Occupied parameter entries.</i> Range: 00:00 - 24:00
Unoccupied 1 - 3 Default value: None	Unoccupied 1 - 3 Defines a time when the room controller is automatically set to use the Unoccupied setpoint. <i>NOTE: There are three separate Unoccupied parameter entries.</i> Range: 00:00 - 24:00

Configuration programming is stored in internal memory and is not lost in the event of a power outage.

OCCUPANCY SETTINGS

The occupancy settings screen allows the control of how the room controller will determine whether it is functioning in Occupied or Unoccupied mode.



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Occupancy cmd Default value: Local occ. Loc occ. is normally selected for units with ventilation option in school applications.</p>	<p>Occupancy Command Loc occ.: Occupancy is determined by local sequences (either PIR or schedule, as configured under Occ. source). Occupied: Force occupied mode. Unoccup: Force unoccupied mode. Choices: Loc occ, Occupied, Unocc.</p>
<p>Schedule type Default value: 7 days 5+2 days is normally used in school applications.</p>	<p>Schedule Type 7 days: Independent scheduling identified by day of the week (Sunday - Saturday) 5+1+1 days: Weekdays scheduling and Independent Weekend scheduling identified as Weekdays, Saturday and Sunday 5+2 days: Weekdays scheduling and Weekend scheduling identified as Weekdays and Weekend Choices: 7 days, 5+2 days, 5+1+1</p>

CONFIGURATION 1/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>UI16 config Default value: None</p>	<p>Universal Input Configuration No. 1 – Universal Input Terminal 16 Options</p> <p>None: No function will be associated with the input. Input can be used for remote network monitoring of the UI16 contacts being open or closed by a field supplied device.</p> <p>Rem NSB: Remote night setback (NSB) timer clock input. The scheduling is set per the binary input and provides low-cost setback operation via the dry contact UI16. This feature requires a secondary field-supplied device connected to UI16 that will operate the NSB function.</p> <p>Motion NO and Motion NC: Uses advanced motion occupancy functions with a normally open (NO) or normally closed (NC) relay in a remote motion sensor. This requires an additional field-supplied motion sensor to be in the room and connected to the UI16 dry contacts.</p> <p>Window: Forces system to disable any current heating or cooling action by room controller when window is open. This requires an additional field-supplied window sensor to be in the room and connected to the UI16 dry contacts.</p> <p>Fan Lock: When (G) fan output is activated, if this input is not activated after 10 seconds, the room controller disables heat and cool outputs and displays “Fan Lock” alarm.</p> <ul style="list-style-type: none"> • Open contact = No airflow alarm • Closed contact = Airflow present, normal operation <p>This requires a secondary device connected to UI16 that will operate the Fan Lock function.</p> <p>Choices: None, Rem NSB, Motion NO and Motion NC, Window, Fan Lock</p>

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
UI17 config Default value: None	User Defined Universal Input No. 2 – Universal Input Terminal 17 Options None: No function associated with input. Door Dry: Room Controller goes to standby mode when door is opened then closed followed by no presence detection for the next 10 seconds if the local PIR is used in this application. The “Occupancy command” must be set to “Local Occupancy” and “Occupancy Source” must be set to “Motion”. This requires an additional field-supplied door sensor to be in the room and connected to the UI17 dry contacts. Override: A closed contact forces the room controller to go in occupied mode. An open contact keeps the current occupancy mode. This requires an additional field-supplied device to be connected to the UI17 dry contacts. Filter: Backlit flashing filter alarm shows on the room controller screen when input is energized. This requires an optional dirty filter switch in the Bard HVAC unit that is connected to UI17 dry contacts. Service: Backlit flashing service alarm shows on room controller screen when input is energized. This requires an optional alarm relay (J controls package) in the Bard HVAC unit that is connected to UI17 dry contacts. Choices: None, Door Dry, Override, Filter, Service
UI19 config Default value: None	User Defined Universal Input No. 3 for External CO₂ Sensor This input is used for a wired CO ₂ sensor providing a 0-10VDC output. None: No function associated with input; however, input can be used for remote network monitoring if a field-supplied 0-10VDC device is connected to the UI19 contact. CO2: Uses the CO ₂ level measured by a wired CO ₂ sensor providing a 0-10VDC signal to the controller. The CO ₂ signal controls the 0-10VDC ventilation output. This option requires a field-supplied CO ₂ sensor that is connected to the UI19 contacts capable of supplying a 0-10VDC signal. Choices: None or CO2
Smart recovery Default value: Off	Smart Recovery Feature Off: No smart recovery. The occupied schedule time is the time at which the system will begin conditioning (heating or cooling) the room. On: Smart recovery active. The occupied schedule time defined by the user is the time at which the desired occupied temperature will be attained. The room controller automatically optimizes the equipment start time. The system will at least begin conditioning the room 10 minutes prior to the occupied period time. Smart recovery is automatically disabled if UI16 is configured to remote NSB. Choices: Off or On

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Setpoint function Default value: Attach SP</p>	<p>Setpoint Function Local setpoint settings to set the local setpoint interface for the User.</p> <p>Dual SP: “Minimum” Deadband, Heat and Cool Setpoints can be adjusted independently. The cooling setpoint will be displayed in the upper portion of the temperature adjustment bar on the left side of the main display. The heating setpoint will be displayed in the lower portion of the temperature adjustment bar on the left side of the main display.</p> <p>Attach SP: “Fixed” Deadband in occupied mode, Heat and Cool setpoints always follow each other, separated by deadband value. A room temperature setpoint will be displayed in the middle portion of the temperature adjustment bar on the left side of the main display. The user-selectable temperature deadband will select heating or cooling operation based on this single setpoint.</p> <p>Choices: Dual SP or Attach SP</p>
<p>Mode button Default value: Normal</p>	<p>Mode Button Changes the behavior of the system mode button functionality and hides/ shows temperature setpoints in the setpoint adjustment bar on the main display screen.</p> <p>Normal: System mode button switches between ‘Off’, ‘Auto’, ‘Cool’ and ‘Heat’. Temperature setpoint(s) are displayed in the setpoint adjustment bar on main display screen.</p> <p>Off-Auto: System mode button switches between ‘Off’ and ‘Auto’. Hides temperature setpoints shown in the setpoint adjustment bar on main display screen.</p> <p>NOTE: Setting ‘Mode button’ to ‘Off-Auto’ forces the setpoint function parameter to ‘Attach SP’.</p> <p>Choices: Normal or Off-Auto</p>

CONFIGURATION 2/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Fan cont. heat Default value: On	Fan Control in Heating Mode On: Room controller always controls the fan (terminal G). Valid for On or Auto fan mode. This is the recommended setting for all Bard HVAC equipment. Off: Fan (terminal G), when heating stages (terminals W1 & W2) are solicited, will not be energized. The fan is controlled by the equipment fan limit control. Valid only for Auto fan mode. On fan mode still keeps the indoor fan always on. For multi-stage models, fan control applies to W1 & W2. Choices: On or Off
Fan delay Default value: On	Fan Delay On: Fan mode will leave the indoor fan on for 60 seconds after a call for heating or cooling ends. Valid only for Auto fan mode. Off: Fan delay not operational. Indoor fan operation ends after the call for heating or cooling. Choices: On or Off
Standby mode Default value: Absolute	Standby Mode Configuration Standby setpoints used for temperature control when occupancy is not sensed by the motion sensor. Absolute: Standby entered values are used for standby mode. Offset: Occupied setpoints +/- Standby diff. used for standby mode. Choices: Absolute or Offset

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Standby diff. Default value: 4°F (2°C)</p>	<p>Standby Temperature Differential When Standby mode is set to 'offset', standby setpoints are calculated as follows: Standby cool: Cool setpoint + Standby differential. Standby heat: Heat setpoint - Standby differential. Range: 1 to 5°F (0.5 to 2.5°C)</p>
<p>Power-up delay Default value: 10 Sec.</p>	<p>Power-Up Delay On initial power up of the room controller there is a delay before any operation is authorized (fan, cooling or heating). This can be used to sequence the startup of multiple room controllers in one location. By sequencing startup operation (using different values for multiple controllers), the immediate amp load at startup after a power outage can be reduced. Range: 10 to 120 seconds</p>
<p>Occupancy src Default value: Motion</p>	<p>Occupancy Source Motion: Occupancy status is received from a motion sensor from a wired, wireless or local onboard PIR sensor (8403-081). It is important that the motion sensor is in an area where occupants will be able to trigger occupancy status. Schedule: Occupancy status is determined by the schedule set by the user. Motion Occupancy: Occupied during scheduled occupancy AND when motion is detected. Both the schedule and motion sensor must indicate the room is occupied. 8403-081 controller or field-supplied motion sensor must be used for this feature. Motion sensor must be in a location where occupancy can be sensed. Motion Unoccupied: Occupied during scheduled occupancy OR when motion is detected. Either the schedule or the motion sensor can indicate the room is occupied. 8403-081 controller or field-supplied motion sensor must be used for this feature. Motion sensor must be in a location where occupancy can be sensed. Choices: Motion, Schedule, Mot. Occ., Mot. Unocc.</p>

CONFIGURATION 3/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Standby time Default: 0.5 hrs	Standby Time The time between the moment when the motion sensor detects last movement in the area activating occupancy and the time which the room controller standby setpoints become active. 8403-081 controller or field-supplied motion sensor must be used for this feature. Motion sensor must be in a location where occupancy can be sensed. <i>NOTE: This parameter is not active when the "Door" function is used (wired or wireless).</i> Range: 0.5 to 24.0 hours (0.5 hour increments)
Unocc. time Default: 0.0 hrs	Unoccupied Time Time between the moment where the room controller toggles from stand-by mode to unoccupied mode and unoccupied setpoints become active. 8403-081 controller or field-supplied motion sensor must be used for this feature. Motion sensor must be in a location where occupancy can be sensed. <i>NOTE: Default value of 0.0 hours disables the unoccupied timer forcing unoccupied mode. This prevents the room controller from being able to switch from stand-by mode to unoccupied mode when motion only (no schedule) is used to signal occupancy.</i> Range: 0.0 to 24.0 hours (0.5 hour increments)

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Temp. occ. time Default value: 2 hrs	Temporary Occupancy Time The time the room controller stays in override mode before reverting to unoccupied mode. The room controller can go into override mode and leave unoccupied status by pressing the on-screen Override icon or closing the contact on UI17, configured as “Remote Override”. This sets the room controller to Override mode for the defined time and uses the Occupied Cooling and Heating setpoints. Range: 0.0 to 24.0 hours
Temp. sensor Default value: Wired	Room Temperature Sensor Sets the source of the indoor room temperature. This parameter allows the user to designate either the room controller or any of the paired wireless devices that support temperature to act as the source for the room temperature. Wired: Uses a 10k remote temperature sensor when connected to UI20 (RS) as the source to report room temperature. When a remote temperature sensor is not connected to UI20, the internal controller temperature sensor is used. Internal: Sets the internal room controller temperature sensor as the source for the room temperature. The wired sensor will not be used if connected. WL 1 to WL 20: Sets the selected Zigbee wireless device as the source for the room temperature. Only one device can be selected. NOTE: <i>The room controller uses the internal temperature sensor if the UI20 (RS) terminal is empty. If a valid temperature sensor is connected to the UI20 terminal, the room controller will use the sensor as the control point. Disconnecting the sensor, or if the sensor is faulty, the room controller will automatically revert to its internal temperature sensor.</i> Choices: Wired, Internal, WL1 to WL20
Deh. hysteresis Default value: 5% RH	Dehumidification (Humidity Control) Hysteresis Used during dehumidification operation to control when the cycle begins and ends based on dehumidification setpoint. A setting of 5%RH indicates dehumidification begins 5%RH over the dehumidification setpoint and ends 5%RH below the dehumidification setpoint. Reducing the dehumidification hysteresis will reduce the dehumidification runtime. Range: 2 to 20% RH
Deh. lockout Default value: Disabled	Dehumidification Lockout Dehumidification lockout must be set to Enabled for Bard units equipped with dehumidification operation. When disabled, dehumidification operation will not occur. This feature may be used to enable or disable dehumidification if the controller is connected to a network. Enabled: Dehumidification operation occurs based on dehumidification setpoint. Disabled: Dehumidification operation is disabled and cannot occur. Choices: Enabled or Disabled

CONFIGURATION 4/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Cooling CPH Default value: 4 CPH</p>	<p>Cooling Output Cycles per Hour CPH is used to “modulate” On/Off outputs controlling equipment such as compressors. When the room temperature is within the proportional band, the output performs 3 or 4 CPH. A higher CPH represents a higher accuracy of control (additional cooling cycles) at the expense of wearing mechanical components faster.</p> <p><i>NOTE: The CPH does not limit the number of cycles per hour. It is limited by the “anti short cycle” parameter. 4 CPH is typical for standard air conditioning applications.</i></p> <p>Range: 3 to 4 CPH</p>
<p>Heating CPH Default value: 4 CPH</p>	<p>Heating Stages Cycles per Hour CPH is used to “modulate” On/Off outputs controlling equipment such as compressors. When the room temperature is within the proportional band, the output performs 3 to 8 CPH. A higher CPH represents a higher accuracy of control (additional heating cycles) at the expense of wearing mechanical components faster.</p> <p>For heat pump with electric heat models, heat CPH applies to both electric heat and the reversing valve output. A CPH value between 6 and 8 is recommended for 2 stage heat pump applications with electric heat. For gas applications set CPH to 4 and for oil applications set CPH to 3.</p> <p>Range: 3 to 8 CPH</p>

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Frost protec. Default value: Off	Frost Protection Stops the ventilation of the air conditioning unit when room temperature reaches 42°F (5.6°C) and resumes automatically when room temperature exceeds 15°F (-9°C). Off: No room frost protection On: Room frost protection enabled in all system modes at 42°F (5.6°C). Frost protection is enabled even if System mode is 'Off'. Choices: Off or On
BO1 aux config Default value: NO	Binary Auxiliary Output Configuration Output to directly follow the main Occupancy and Fan On commands. NO: Occ or St-By = Contact Closed/Unoccupied = Contact Opened. This is the recommended setting if the BO1 output is to be used for on/off ventilation based on occupancy. NC: Occ or St-By = Contact Opened/Unoccupied = Contact Closed. Choices: NO or NC
Anti short cycle Default value: 2 min	Anti Short Cycle Time Minimum On time and minimum Off time of operation time for stages. IMPORTANT: Anti-short cycling can be set to 0 minutes for equipment that possesses its own anti-cycling timer. All Bard equipment is equipped with this feature inside the unit control panel and a value of 0 can be used. Do not use this value if non-Bard equipment is used that does not have an internal timer. Failure to do so can damage the equipment. Range: 0 to 5 minutes
Min. sup. heat Default value: 64°F (18°C)	Minimum Supply Heat Controls the modulating heating output to maintain the supply air temperature setpoint (min. sup. heat). Apply if "Heat Stages" parameter is set to 0 (Analog Heat on U011) and a 10k supply sensor is installed in the unit and a 10k outdoor air temperature sensor. In Occupied or Override mode, the output will modulate to maintain a minimum supply air temperature. Conditional to outdoor air sensor installed. Feature used when System Mode is in Heat or Auto and outdoor air temperature is less than minimum supply heat value. Range: 50°F to 72°F (10°C to 22°C)

CONFIGURATION 5/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments																														
<p>Prop. band Default value: 3.0</p>	<p>Proportional Band Setting Adjusts proportional band used by room controller PI control loop.</p> <p>NOTE: Default value of 3 gives satisfactory operation in most normal installation cases. The use of a higher proportional band different than the factory value is normally warranted in applications where the room controller location is problematic and leads to unwanted cycling of the unit. A typical example is a wall mounted room controller that is directly influenced by the supply air stream of unit. Small changes while monitoring room conditions in both heating and cooling is recommended if this value is increased.</p> <p>Range: 3 to 10</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #00b050; color: white;">Value</th> <th colspan="2" style="background-color: #00b050; color: white;">Effective Proportional Band</th> </tr> <tr> <td></td> <th style="background-color: #00b050; color: white;">Fahrenheit</th> <th style="background-color: #00b050; color: white;">Celsius</th> </tr> </thead> <tbody> <tr> <td>3.0</td> <td>3</td> <td>1.2</td> </tr> <tr> <td>4.0</td> <td>4</td> <td>1.7</td> </tr> <tr> <td>5.0</td> <td>5</td> <td>2.2</td> </tr> <tr> <td>6.0</td> <td>6</td> <td>2.8</td> </tr> <tr> <td>7.0</td> <td>7</td> <td>3.3</td> </tr> <tr> <td>8.0</td> <td>8</td> <td>3.9</td> </tr> <tr> <td>9.0</td> <td>9</td> <td>5.0</td> </tr> <tr> <td>10.0</td> <td>10</td> <td>5.6</td> </tr> </tbody> </table>	Value	Effective Proportional Band			Fahrenheit	Celsius	3.0	3	1.2	4.0	4	1.7	5.0	5	2.2	6.0	6	2.8	7.0	7	3.3	8.0	8	3.9	9.0	9	5.0	10.0	10	5.6
Value	Effective Proportional Band																														
	Fahrenheit	Celsius																													
3.0	3	1.2																													
4.0	4	1.7																													
5.0	5	2.2																													
6.0	6	2.8																													
7.0	7	3.3																													
8.0	8	3.9																													
9.0	9	5.0																													
10.0	10	5.6																													

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Heat stages Default value: 2 stages	<p>Number of Heating Stages Sets number of heating stages applicable to 2 stage models only.</p> <p>0 Stages: Only (U011) modulating 0-10Vdc output is used for heating. Set to 0 if a modulating hot water valve is used to provide heating capacity for the IA and QA series units. Cannot be used in conjunction with electric heat use as W1 and W2 are disabled when heating output is set to 0.</p> <p>1 Stage: Air conditioner: First stage of electric heat is enabled. Second stage of electric heat is disabled. Heat pump: Reversing valve output and Y1 enabled as first stage. Electric heat is second stage. Recommended setting for single stage heat pump units: QH, WH, TH series units.</p> <p>2 Stages: Air conditioner: First stage of electric heat is enabled. Second stage of electric heat is enabled. Heat pump: Reversing valve output (U09) and Y1 (B03) enabled as first stage. Reversing valve output (U09), Y1 (B03) and Y2 (B02) as second stage. Electric heat (B08) is additionally energized as a third stage. Recommended setting for all air conditioners and 2 stage compressor heat pump units: IH, TS, CH, and QWS series units.</p> <p><i>NOTE: A custom LUA script file is required for the controller to operate heat pump units with (2) stages of electric heat. The 2nd stage of electric heat is considered part of emergency heat use and is energized along with the compressor being disabled. An alternative option to the LUA script file is to order the outdoor thermostat control option with the Bard heat pump unit and wire the 1st and 2nd stage of electric heat to be active when outdoor conditions are below the outdoor thermostat setpoint. When below the outdoor thermostat setpoint, compressor operation is disabled and electric heat is only used to heat the indoor space.</i></p> <p>Choices: 0 stages, 1 stage, 2 stages</p>
Cool stages Default value: 2 stages	<p>Number of Cooling Stages Sets number of cooling stages.</p> <p>1 Stage: Only a single stage of compressor cooling is used. Y1 (B03) terminal is used. Y2 (B02) is disabled.</p> <p>2 Stages: Two stages of compressor cooling are used. Both Y1 (B03) and Y2 (B02) terminals are used in sequence. Recommended setting for all Bard units.</p> <p>Choices: 1 stage or 2 stages</p>
Econo. config Default value: Off	<p>Economizer Operation Configuration Enables or disables the economizer functionality of the controller. Economizer operation relies on the JADE controller for the WA, WH, TH, TS, CH, QA and QH products.</p> <p>On: Economizer activated.</p> <p>Off: Economizer deactivated. Recommended setting for all units using the JADE economizer control or units without an economizer in the Bard air conditioner or heat pump unit.</p> <p>Choices: On or Off</p>

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Changeover SP Default value: 55°F (13°C)</p>	<p>Changeover Setpoint (Used if economizer configuration is set to ON) In cooling mode, the outside air temperature value at which the cooling gets switched over from mechanical (compressor) to free cooling (economizer).</p> <p><i>NOTE: Only used for controller economizer operation. JADE economizer control units will use setpoints programmed into the JADE controller.</i></p> <p>Range: 14°F to 70°F (-10°C to 21°C)</p>
<p>Mech. cooling Default value: Off</p>	<p>Mechanical Cooling Allowed (Used if economizer configuration is set to ON) Allows operation of mechanical cooling if free cooling (economizer) cannot maintain the cooling setpoint.</p> <p>Off: Applies when the mixed air temperature sensor is installed after the evaporator coil. In this case, mechanical cooling never operates at the same time as free cooling.</p> <p>On: Applies when the mixed air temperature sensor is installed before the evaporator coil but after the economizer. In this case, mechanical cooling is allowed when the free cooling (economizer operation) cannot maintain the cooling setpoint.</p> <p>Range: Off or On</p>

CONFIGURATION 6/11

6/11 Configuration

Heat lockout	120.0 °F
Cool lockout	-40.0 °F
Discharge HL	120.0 °F
Discharge LL	45.0 °F
SH lockout	32.0 °F
FA range	0 CFM

↶
↷
🏠
▼
▲

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
0.8014 in	<p>Heating Lockout from Outside Air Temperature Disables mechanical heating operation when outdoor temperature is higher than the “Heating Lockout” value. The outdoor temperature value could be received from a sensor connected directly to the room controller (UI23) or via a BACnet front end (network).</p> <p>Range: -15°F to 120°F (-26°C to 49°C)</p>
Cool lockout Default value: -40°F (-40°C)	<p>Cooling Lockout from Outside Air Temperature Disables mechanical cooling operation when outdoor temperature is lower than the “Cool Lockout” value. The outdoor temperature value could be received from a sensor connected directly to the room controller (UI23) or via a BACnet front end (network).</p> <p>The economizer functionality (freecooling) can still be enabled during the cooling lockout.</p> <p>Range: -40°F to 95°F (-40°C to 35°C)</p>
Discharge HL Default value: 120°F (49°C)	<p>Discharge High Limit Discharge air high temperature value at which the heating stages get locked out.</p> <p>Range: 70°F to 150°F (21°C to 65°C)</p>
Discharge LL Default value: 45°F (7°C)	<p>Discharge Low Limit Discharge air low temperature value at which the cooling stages get locked out.</p> <p>Range: 35°F to 65°F (2.0°C to 19.0°C)</p>

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>SH lockout Default value = 32°F (0°C)</p>	<p>Supply Heat Lockout Disables heating operation if outdoor air temperature (OAT) is higher than “SH Lockout” temperature. The outdoor temperature value could be received from a sensor connected directly to the room controller or via a BACnet front end (network).</p> <p>NOTE: <i>Valid only if “Heat Stages” parameter is set to 0 (Analog Heat on U011).</i></p> <p>Range: -15°F to 120°F (-26°C to 49°C)</p>
<p>FA Range Default value: 0 CFM) 0 l/s</p>	<p>Fresh Air Range Sets the upper limit (reading range) of the “airflow measuring station” (e.g., for 0~1,000 CFM station, set “FA Range” to 1,000). If set to 0 CFM, this function is disabled and the fresh air damper control will be based on the “Min/Max CO2” and “Econo Min/Max Pos” values if set to a value other than 0.</p> <p>Do not change Econo Min/Max Pos if FA range is set to a value greater than 0.</p> <p>Range: 0 to 20,000 CFM (±10 increments) 0 to 9440 l/s (±5 increments)</p>

CONFIGURATION 7/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Econo min pos Default value: 0%	Economizer Minimum Position Minimum outside air damper position when room controller is in occupied, standby or override mode and fan status is ON. If room controller is in unoccupied mode and/or the fan is off, outside air damper position goes to 0%. This feature can be used to provide a minimum ventilation amount when a CO ₂ card is installed in the controller and modulating ventilation (2-10VDC) is used. Review Bard unit installation instructions for ventilation amounts per blade position or vent intake fan percentage. Range: 0% to 100%
Econo max pos Default value: 100%	Economizer Maximum Position Maximum outside air damper position when room controller is in occupied, standby or override mode and fan status is ON. This is valid for economizer and CO ₂ ventilation operation. This feature can be used to provide a maximum ventilation amount when a CO ₂ card is installed in the controller and modulating ventilation (2-10VDC) is used. Range: 0% to 100%
NOTE: The room controller air damper position and output signal is based on a 0-10 VDC analog actuator application. Many installations utilize 2-10 VDC actuators, which cannot be switched to 0-10 VDC control logic. The following chart indicates the appropriate equivalent damper positions for use with 2-10VDC actuators.	
Outside Air %	0 5 10 15 20 25 30 35 40 45 55
Setting for 0-10 VDC Actuator	0 5 10 15 20 25 30 35 40 45 55
Setting for 2-10 VDC Actuator	20 24 28 32 36 40 44 48 52 56 60
Outside Air %	55 60 65 70 75 80 85 90 95 100
Setting for 0-10 VDC Actuator	55 60 65 70 75 80 85 90 95 100
Setting for 2-10 VDC Actuator	64 68 72 76 80 84 88 92 96 100

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Min fresh air Default value: 0 CFM (0 l/s)	Minimum Fresh Air Minimum fresh air required (minimum outside airflow setpoint). Effective only in occupied, standby or override mode and fan status is ON. If FA Range is set to a value other than 0 CFM, the fresh air damper position control will be based on the Min/Max CO ₂ and Min/Max Fresh Air values. If room controller is in unoccupied mode and/or the fan is off, the damper position goes to 0%. Range: 0 to 20, 000 CFM (±10 increments) 0 to 9440 l/s (±5 increments) The value set cannot exceed the value of FA Range parameter. This configuration option is not normally used with Bard equipment.
Max fresh air Default value: 0 CFM (0 l/s)	Maximum Fresh Air Maximum fresh air allowed (maximum outside airflow setpoint). Effective only in occupied, standby or override mode and fan status is ON. If FA Range is set to a value other than 0 CFM, the fresh air damper position control will be based on the Min/Max CO ₂ and Min/Max Fresh Air values. Range: 0 to 20, 000 CFM (±10 increments) 0 to 9440 l/s (±5 increments) The value set cannot exceed the value of FA Range parameter. This configuration option is not normally used with Bard equipment.
Min CO₂ Default value: 800 ppm	Minimum CO₂ – Value used to provide minimum CO₂ controlled ventilation Minimum CO ₂ level setpoint used with controller if CO ₂ card is installed. Ventilation occurs only in occupied, standby or override mode. The outside air intake modulates to maintain the CO ₂ level between “Min CO ₂ ” and “Max CO ₂ ”. If room controller is in unoccupied mode or CO ₂ level is below this amount, outside air amount goes to 0% or minimum economizer position. This configuration requires the use of the optional CO ₂ card. Range: 0 to 5000 ppm
Max CO₂ Default value: 1200 ppm	Maximum CO₂ – Value used to provide maximum CO₂ controlled ventilation Maximum CO ₂ level setpoint used with controller if CO ₂ card is installed. Ventilation occurs only in occupied, standby or override mode. The outside air intake modulates to maintain the CO ₂ level between “Min CO ₂ ” and “Max CO ₂ ”. If the CO ₂ amount reaches the maximum value, the maximum ventilation will occur. This configuration requires the use of the optional CO ₂ card. Range: 0 to 5000 ppm

CONFIGURATION 8/11

8/11 Configuration

Application	Rooftop
High BP	90.0 °F
Low BP	-12.0 °F
Comf. or econ.	Comfort
Rev. valve	O
Comp. interlock	Off



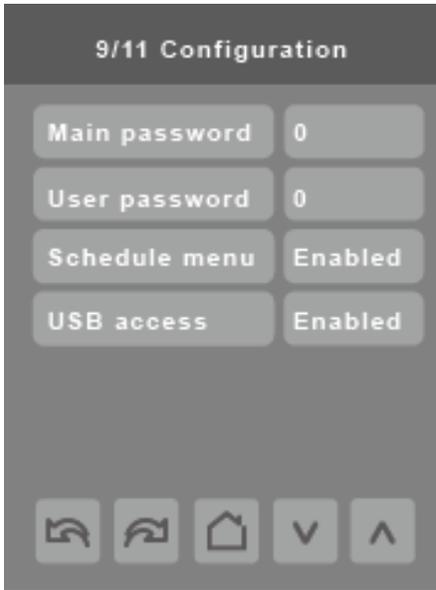
PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Application Default value: Rooftop	Application Sets room controller operating logic for either a rooftop (standard air conditioner) or a heat pump application. <i>NOTE: Standard wall-mount air conditioner products (non-heat pump models) including the WA, WS, QA and IA series will use the rooftop setting. Heat pump models including the WH, QH, IH, TS, TH and CH series will use the heat pump setting.</i> Choices: Rooftop or Heat pump
High BP Default value: 90°F (32.0°C)	High Balance Point – Heat Pump Units Only Used in heat pump models while in heating or auto mode, it is the outside air temperature value at which the auxiliary electric heat is cut off. If the temperature exceeds this value, only the heat pump is used to maintain the heating setpoint. <i>NOTE: Function enabled only if outside air temperature value is available. The outdoor temperature value can be received from a 10k outdoor sensor connected directly to the room controller or an outdoor temperature value provided via a BACnet front end (network).</i> Range: 34°F to 90°F (1.0°C to 32.0°C)
Low BP Default value: -12 °F (-24.5 °C)	Low Balance Point – Heat Pump Units Only In heating, cooling or auto mode, it represents the outside air temperature value at which the heat pump operation will be cut off. If the temperature falls below this value, only the auxiliary electric heat is used to maintain the heating setpoint. <i>NOTE: Function enabled only if outside air temperature value is available. The outdoor temperature value can be received from a 10k outdoor sensor connected directly to the room controller or an outdoor temperature value provided via a BACnet front end (network).</i> Range: -40°F to 30°F (-40°C to -1.0°C)

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Comf. or econ. Default value: Comfort</p>	<p>Comfort or Economy Mode Sets the operation and interaction mode of the heat pump with the auxiliary heat.</p> <p>Comfort Mode: In heating mode, if the heat pump is not able to satisfy the heating setpoint, the auxiliary heat is energized to satisfy the same heating setpoint.</p> <p>Economy Mode: In heating mode, if the heat pump is not able to satisfy the heating setpoint, the auxiliary electric heat is energized to satisfy only when the temperature drops 2.0°F (1.1°C) below the heating setpoint. Selecting economy mode adds a deadband between the heat pump and auxiliary heat in heating mode. The actual temperature maintained will be lower than the true heating setpoint to maximize the heat pump operation. If using an 10k outdoor temperature sensor, when the outdoor air temperature drops below the low balance point, the deadband is eliminated and the auxiliary electric heat maintains the true heating setpoint.</p> <p>Choices: Comfort or Economy</p>
<p>Rev. valve Default value: O</p>	<p>Reversing Valve Operation – Heat Pump Units Only. Heat pump reversing valve operation</p> <p>O: Energize valve in cooling operation. Use this setting for the QWS series unit.</p> <p>B: Energize valve in heating operation. Use this setting for the WH, TH, TS, CH, QH and IH series units.</p> <p>Choices: O or B</p>
<p>Comp. interlock Default value: Off</p>	<p>Compressor Auxiliary Interlock Sets the operation and interaction mode of the heat pump with the auxiliary heat.</p> <p>Off: In heating mode, if the heat pump is not able to satisfy the heating setpoint, the auxiliary heat gets energized at the same time as the heat pump stage. Typically applies when the evaporator indoor coil is installed before the auxiliary heat. This setting is recommended for all Bard units.</p> <p>On: In heating mode, if the heat pump is not able to satisfy the heating setpoint, the auxiliary heat is energized and the heat pump is cut off. Typically applies when the evaporator indoor coil is installed after the auxiliary electric heat (add-on systems) There is a 2-minute delay to restart the heat pump when the auxiliary heat is shut down.</p> <p>Choices: Off or On</p>

CONFIGURATION 9/11



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Main password Default value: 0	Main Password Sets a protective access password to prevent unauthorized access to configuration menu parameters. A default value of “0” will not prompt for a password or lock access to the configuration menu. Range: 0 to 9999
User password Default value: 0	User Password Sets a protective access password to prevent User unauthorized access to main screen adjustments. A default value of “0” will not prompt for a password. Range: 0 to 9999
Schedule menu Default value: Enabled	Schedule Menu Toggles activation of schedule menu direct access and display of the clock. Enabled: Schedule Menu is directly accessible from the main display screen via a touch in the upper corner. Disabled: Schedule Menu can only be accessed through the Setup Menu screens. Enabled No Clock: Schedule Menu is directly accessible from the main screen via a touch in the upper corner. Clock does not appear on the main display screen. Disabled No Clock: Schedule Menu can only be accessed through the Setup Menu screens. Clock does not appear on the main display screen. Choices: Disabled, Enabled, En.no.clk, Dis.no.clk

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
USB access Default value: Enabled	USB Access Enables/disables USB communication with the room controller. Enabled: USB communication with the room controller is enabled, so the Uploader tool can be used to upgrade firmware, standby images, LUA script etc. Disabled: USB communication with the room controller is disabled, so the Uploader tool cannot be used with the device. it is recommended to disable USB access once the room controller has been commissioned to prevent unauthorized access. Choices: Enabled or Disabled
<i>NOTICE</i>	
UNAUTHORIZED USB ACCESS To prevent unauthorized access to the room controller via USB, it is recommended that: <ul style="list-style-type: none">• “USB access” is set to “Disabled” to prevent changing of firmware, standby image, configuration or LUA scripts via USB.• “Main password” is set to a non-zero value to limit configuration menu access to authorized users only. Failure to follow these instructions may lead to unauthorized users modifying the firmware or the configuration of the Room Controller.	

CONFIGURATION 10/11

The screenshot shows a configuration screen titled "10/11 Configuration". It contains five rows of settings, each with a label and a value:

- Calib. temp.: 0.0 °F
- Calib. OS temp.: 0.0 °F
- Calib. humid.: 0.0 %RH
- RH sensor: Internal
- CO2 source: None

At the bottom of the screen, there are five navigation icons: a back arrow, a refresh/circular arrow, a home icon, a downward arrow, and an upward arrow.

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Calib. temp. Default value: 0°F (0°C)	Calibration of Room Temperature Sensor Room temperature sensor calibration. Offset can be added or subtracted to actual displayed room temperature. Range: ± 5.0°F (± 2.5°C)
Calib. OS temp. Default value: 0°F (0°C)	Calibration of Outside Temperature Sensor Outside air temperature sensor calibration. Offset that can be added or subtracted to the actual displayed outdoor temperature. Range: ± 5.0°F (± 2.5°C)
Calib. humid. Default value: 0.0 %RH	Calibration of Humidity Sensor Offset that can be added or subtracted to actual displayed humidity. Range: ± 15.0 %RH
RH sensor Default value: Internal	Relative Humidity Sensor Sets the source of the indoor room humidity. This parameter allows the user to designate either the room controller or any of the paired wireless devices that support humidity to act as the source for the room humidity. Internal: Sets the room controller as the source for the room humidity. WL1 to WL20: Sets the selected Zigbee wireless device as the source for the room humidity. Only one device can be selected. Choices: Internal or WL1 to WL20

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
CO2 source Default value: Local	CO2 Sensor Source Sets the source of the indoor CO ₂ . This parameter allows the user to designate either the optional CO ₂ detection sensor module or any of the paired wireless devices that support CO2 to act as the source for the room CO ₂ . None: CO ₂ source disabled. Local: Sets the optional CO ₂ detection sensor module as the source for the room CO ₂ . This is the recommended setting when the optional CO ₂ card is installed. WL1 to WL20: Sets the selected Zigbee wireless device as the source for the room CO ₂ . Only one device can be selected. Choices: None, Local, WL1 to WL20

CONFIGURATION 11/11



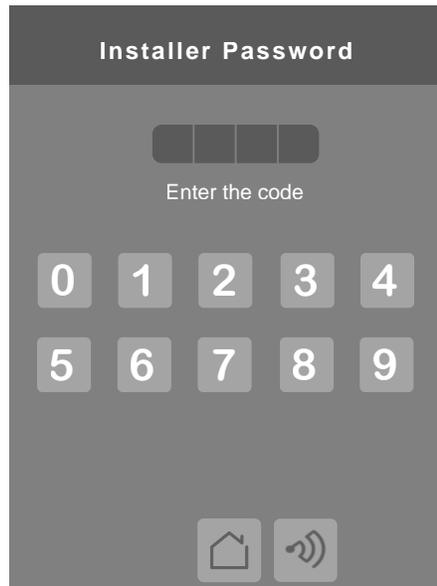
PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Erase all? Default value: No</p>	<p>Erase All Accepting Yes for both and then tapping 'Push to accept' returns all values to the factory default settings except for:</p> <ul style="list-style-type: none"> • COM address • Network Units • Network Language • Baud Rate • BACnet Instance • Device Name • Screen Contrast • Lua Script <p>NOTE: Node type in Zigbee Network screen returns to default value (router).</p>
<p>Are you sure? Default value: No</p>	

PASSWORD SETTINGS

The following shows you how to set-up the password for the Installer and User

Installer Password

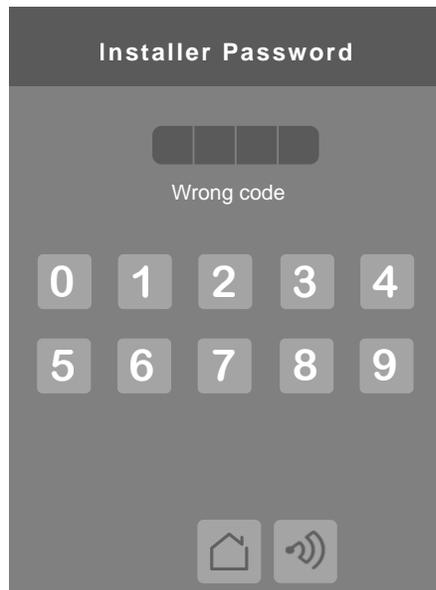


The installer password prompt shows only if password value is greater than 0000. A password value of 0000 disables installer password but does not restrict access to configuration options. The installer password prompt automatically disappears after 10 seconds if no value is entered. An error code is automatically generated if incorrect password is entered. Installer is permitted access to all Installer functions and menus when correct password is entered.

NOTE: When the schedule menu is enabled OR when the 5th button is set to schedule or custom, the clock, occupancy command, schedule or custom pages are NOT password-protected. Always use a system password when the room controller is in regular use to avoid inadvertent changes of the room controller logic.

IMPORTANT: Make sure to record all passwords used and save this information. If password is lost, recovering password information requires contacting Bard.

User Password



The user password prompt shows only if password value is greater than 0000. A password value of 0000 disables user password but does not restrict access to local user functions. The user password prompt automatically disappears after 10 seconds if no value is entered.

The user is permitted access to controller interface to change any allowed settings when correct password is entered. Password lock resumes after 1 minute of non activity.

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Main password Default value: 0	Main Password Sets a protective access password to prevent unauthorized access to configuration menu parameters. A default value of "0" will not prompt a password or lock access to the configuration menu. Range: 0 to 9999.
User password Default value: 0	User Password Sets a protective access password to prevent user unauthorized access to main screen adjustments. A default value of "0" will not prompt for a password. Range: 0 to 9999.

SETPOINT SETTINGS 1/2



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Unocc. cool Default value: 80°F	Unoccupied Cool Setpoint Set between occupied and unoccupied cooling setpoints. Ensure difference between standby and occupied value can be recovered when movement is detected in the zone. Range: 54 to 100°F (12.0 to 37.5°C)
Standby cool Default value: 78°F	Standby Cooling Setpoint Set between occupied and unoccupied cooling setpoints. Ensure difference between standby and occupied value can be recovered when movement is detected in the zone. Range: 54 to 100°F (12.0 to 37.5°C)
Occ. cool Default value: 75°F	Occupied Cool Setpoint Set between occupied and unoccupied cooling setpoints. Ensure difference between standby and occupied value can be recovered when movement is detected in the zone. Range: 54 to 100°F (12.0 to 37.5°C)
Occ. heat Default value: 72°F	Occupied Heating Setpoint Set between occupied and unoccupied heating setpoints. Ensure difference between standby and occupied value can be recovered when movement is detected in the zone. Range: 54 to 100°F (12.0 to 37.5°C)

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Standby heat Default value: 69°F	Standby Heating Setpoint Set between occupied and unoccupied heating setpoints. Ensure difference between standby and occupied value can be recovered in a timely fashion when movement is detected in the zone. Range: 40 to 90°F (4.4 to 32.0°C)
Unocc. heat Default value: 62°F	Unoccupied Heating Setpoint Set between occupied and unoccupied heating setpoints. Ensure difference between standby and occupied value can be recovered in a timely fashion when movement is detected in the zone. Range: 40 to 90°F (4.4 to 32.0°C)

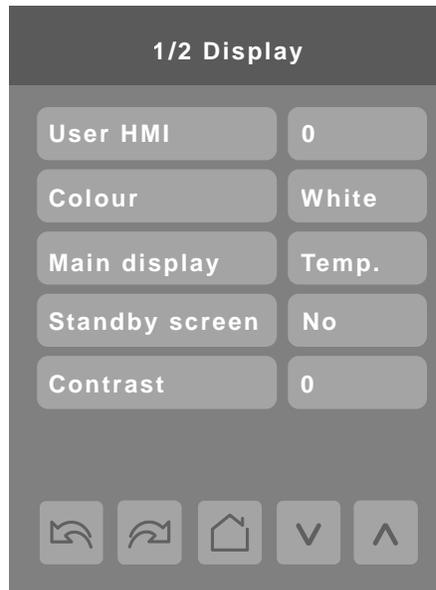
SETPOINT SETTINGS 2/2



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Default heat Default value: 72°F	Default Heating Setpoint Used for hospitality applications in stand-alone mode only. When devices are in deep unoccupied mode, any movement detected by PIR resets actual occupied setpoints to fresh room default setting. Default setpoint is used to write to heating setpoint when thermostat goes to unoccupied mode. Cooling setpoint is set according to Min. deadband (65°F to 80°F). Parameter is only used when standby mode = offset. Range: 65 to 80 °F
Min. deadband Default value: 3°F	Minimum Deadband Minimum deadband value between heating and cooling setpoints applied only when any setpoints are modified. Range: 20°F to 50°F
Max. heating Default value: 90°F	Heating Setpoint Limit Maximum occupied and unoccupied heating setpoint adjustment. Range: 40°F to 90°F
Min. cooling Default value: 54°F	Cooling Setpoint Limit Minimum occupied and unoccupied cooling setpoint adjustment. Range: 54°F to 100°F
Supply air SP Default value: 55°F	Supply Air Setpoint Free cooling supply air setpoint when economizer mode is enabled. Range: 54°F to 100°F
Dehum. SP Default value: 50%RH	Dehumidification Setpoint Used only if dehumidification sequence is enabled: Range: 30-95% RH Only for models with humidity sensor.

DISPLAY SETTINGS 1/2



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
User HMI Default value: 0 Determines which parameters are adjustable	User HMI Select user HMI type. This function turns main screen icons On/Off. See User HMI section for examples of screens. Range: 0 to 11
Colour Default value: White	White Change HMI screen color. Choices: White, Green, Blue, Grey, Dark Grey, Pink, Purple, Red, Orange, Black
Main display Default value: Temp.	Main Display Shows temperature or setpoint on main display. Choices: Temperature or Setpoint
Standby screen Default value: No	Standby Screen When the device is left unattended for 2 minutes, background backlight dims. Installers can load a custom image for brand identification. Choices: No, Yes, Occupied Only, Screen Saver
Lock screen Default value: No	Lock Screen Allow or disallow user to perform any activity on main screen. Choices: No or Yes
Contrast Default value: 0	Contrast Control screen contrast and brightness: 0 is least bright, most contrast; 5 is most bright, least contrast. Range: -5 to 5

User HMI

Hospitality 0



- Setpoint adjustment
- System mode setting
- Fan mode setting
- Local unit scale adjustment
- Local user language
- User help menu

Hospitality 1



- Setpoint adjustment
- System mode setting
- Fan mode setting
- User help menu

Hospitality 2



- Local unit scale adjustment
- Local user language
- User help menu

Hospitality 3



- Setpoint adjustment
- User help menu

Parameters are model dependent and may not appear on certain models.

Hospitality 4



- Fully locked interface with no user settings

Hospitality 5



- Setpoint adjustment
- System mode setting
- User help menu

Hospitality 6



- Setpoint adjustment
- System mode setting
- Fan mode setting
- Local unit scale adjustment
- User help menu

Commercial 7



- Setpoint adjustment
- System mode setting
- Fan mode setting
- Unoccupied mode overdrive
- User help menu

Commercial 8



- Setpoint adjustment
- Unoccupied mode override
- Local user language
- User help menu

Commercial 9



- Setpoint adjustment
- Unoccupied mode override
- User help menu

Commercial 10



- Unoccupied mode override

Commercial 11



- Setpoint adjustment
- System mode setting
- Unoccupied mode override
- User help menu

NOTE: The day/night setback button appears only in unoccupied mode in the commercial HMIs 7 to 11. If UI17 input is configured as “override”, the day/night setback button does not show.

Parameters are model dependent and may not appear on certain models.

Other Functions



Local humidity only shows on models with the humidity sensor present and when enabled by configuration property RH Display.

Outdoor temperature display is dependent on receiving a valid networked outdoor temperature value.

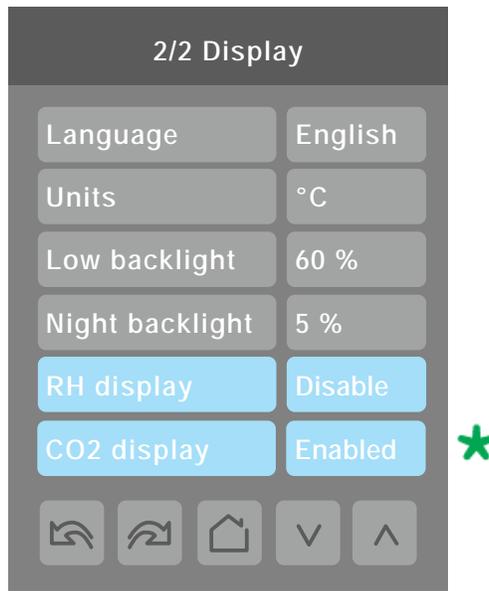
Fan Mode Settings



Fan Mode Setting

Mode	Significance and Adjustments
Fan mode ON	On Fan is on continuously, even when system mode is OFF.
Fan mode Automatic	Automatic Fan cycles on a call for heating or cooling for both occupied and unoccupied periods.
Fan mode Smart	Smart During occupied periods, fan is on continuously. In unoccupied mode, fan cycles on a call for heating or cooling. When Smart fan mode is enabled and ventilation is needed during occupied times, the indoor fan will operate along with ventilation.

DISPLAY SETTINGS 2/2



 This parameter is only displayed on models with CO₂ sensor card installed.

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Language Default value: English	Display Language Select language for main display. Choices: English, French, Spanish, Chinese, Russian, Arabic, Bulgarian (disabled), Czech, Danish, Dutch, Finnish, German, Hungarian, Indonesian, Italian, Norwegian, Polish, Portuguese, Slovak, Swedish, Turkish
Units Default value: SI	Network Units Sets default local scale value when room controller powers up. Choices: SI for Celsius, or °F for Fahrenheit
Low backlight Default value: 60%	Low Backlight Set display backlight intensity after 2 minutes of keyboard inactivity. Adjustable: 0 to 100%
Night backlight Default value: 5%	Night Backlight Set display backlight intensity after 2 minutes of keyboard inactivity. Parameter only available for models with motion/light detectors. The screen backlight progressively decreases down to this setting when room is dark. This feature is used mostly in hospitality applications when a darker unobtrusive lighting level is desired when room is dark. Adjustable: 0 to 100%

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
RH display Default value: Disabled	Relative Humidity Shows humidity level in room in %RH on main HMI screen. On: Display %RH Off: Do not display %RH Choices: Enabled or Disabled Only for models with humidity sensor.
CO2 display Default value: Disabled	CO2 Levels Display Shows carbon dioxide level in room in ppm on main HMI screen. On: Display %CO ₂ Off: Do not display %CO ₂ Choices: Enabled or Disabled Only for models with CO₂ sensor.

SERVICE SCREEN VIEWS

The service view screens show the current status of certain points locally at the controller. These points can also be viewed through the network. Service view allows service contractor to visualize the status of key functionality to correctly diagnose operational system issues.

1/9 Service view

Firmware rev.	1.5.1	Firmware Revision
Room temp.	xx.x °F	Room Temperature
UI20 temp.	0 PPM	CO ₂ Remote Sensor Level
Outdoor temp.	xx.x °F	Outdoor Temperature
Supply temp.	xx.x °F	Supply Temperature

Navigation icons: Back, Forward, Home, Down, Up

2/9 Service view

Effective occ.	Occupied	Effective Occupancy
PI cool. dem.	0%	PI Cooling Demand
PI heat. dem.	0%	PI Heating Demand
Cool. dem. limit	0.0%	Cooling Demand Limit
Heat dem. limit	0.0%	Heating Demand Limit
Econo. demand	0.0%	Economy Demand

Navigation icons: Back, Forward, Home, Down, Up

3/9 Service view

UI16 binary	Not activ.	Universal Input Status
UI17 binary	Not activ.	Universal Input Status
UI19 analog	0 %	Universal Input Status
Airflow level	0 l/s	Airflow Level
* Zigb. PIR inst.	Off	External PIR Install Status
* Zigb. sens. mot.	No motion	Local Motion Status

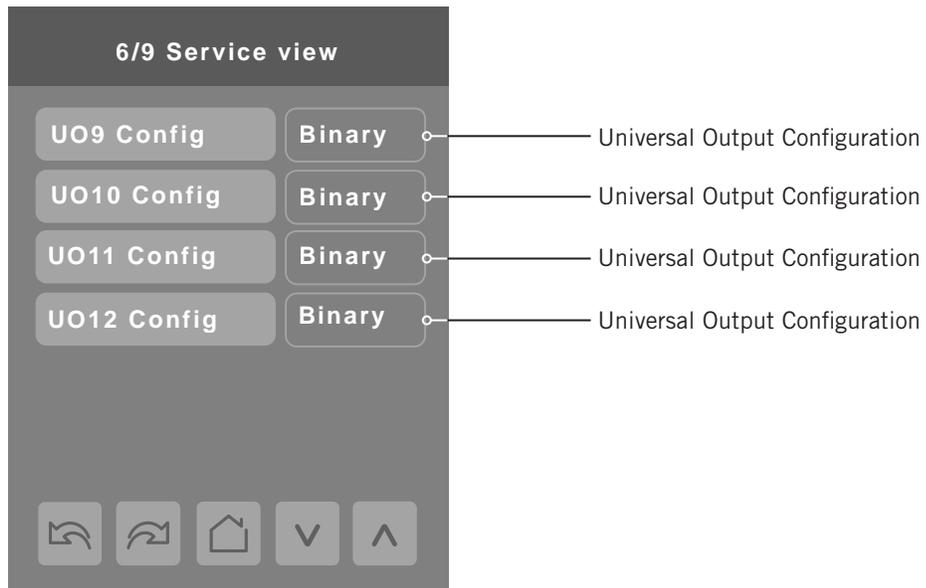
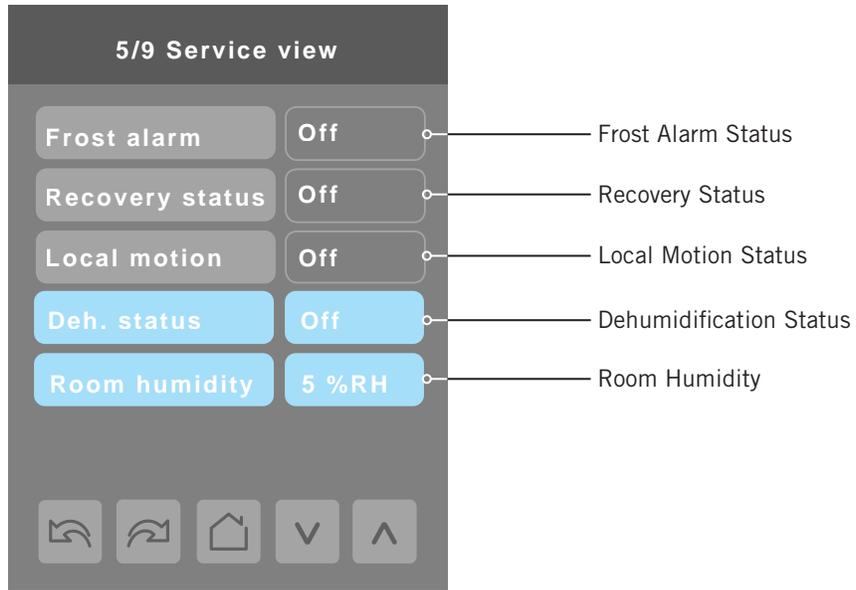
Navigation icons: Back, Forward, Home, Down, Up

* These parameters are only displayed on models with ZigBee modules.

4/9 Service view

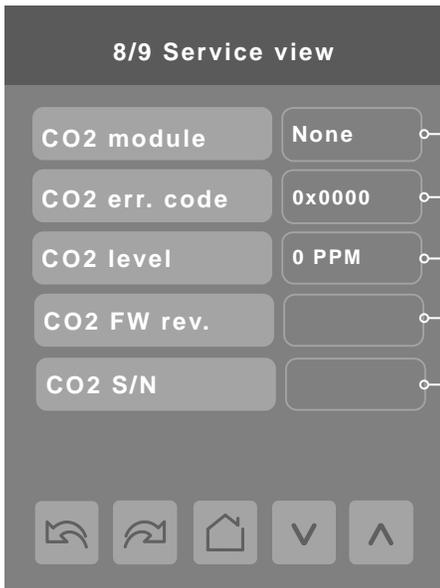
Window alarm	Off	Window Alarm Status
Service alarm	Off	Service Alarm Status
Filter alarm	Off	Filter Alarm Status
Fan lock alarm	Off	Fan Lock Alarm Status
CO ₂ alarm	Off	CO ₂ Alarm Status
Low air alarm	Off	Air Flow Alarm Status

Navigation icons: Back, Forward, Home, Down, Up

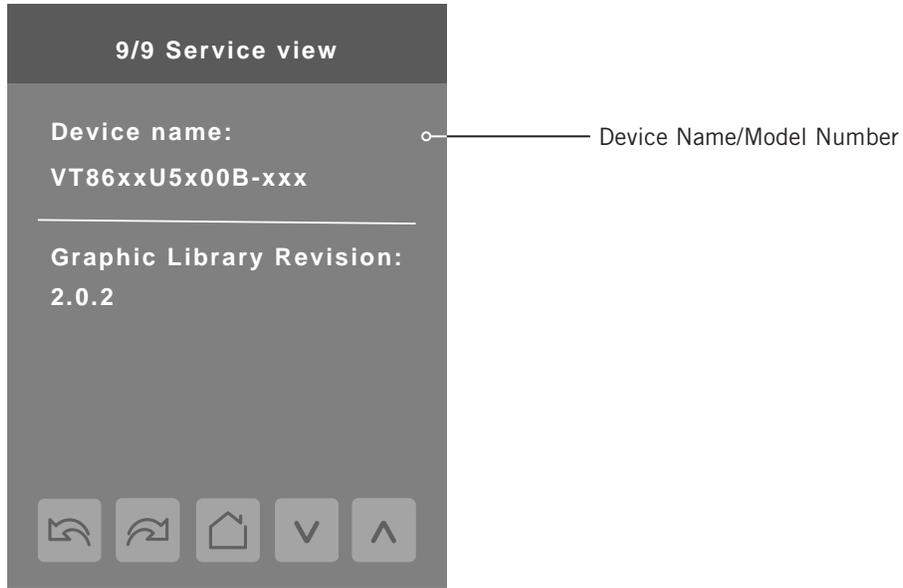




- Universal Input (Voltage)
- Universal Input Configuration
- Universal Input Configuration
- Universal Input Configuration
- Universal Input (Voltage)



- CO₂ Sensor Module
- CO₂ Sensor Error Code
- CO₂ Remote Sensor Level
- CO₂ Sensor Firmware Revision
- CO₂ Sensor Serial Number



The model number is the BACnet device name automatically assigned when using the current BACnet addressing scheme based on the MAC address. The network can update and change the device BACnet name. If changed, the new updated BACnet device name shows on the screen.

For example, when a VT8600U5500B thermostat with a MAC address of 41 is connected to a network, its default device name is VT8600U5x00B-41 and its default BACnet device ID is 83041.

TEST OUTPUTS 1/2



The test output menu may be used to energize outputs from the controller that are connected to the Bard unit. This is useful for commissioning a new installation or troubleshooting wiring and unit operation. OFF indicates 24VAC is not being sent from the controller to the Bard unit. ON indicates 24VAC is being sent from the controller to the Bard unit. 0-10VDC indicates that this is an analog signal being sent from the controller to the unit, and voltage can be adjusted incrementally. When controller outputs are energized manually to send signals to the unit, they remain energized for 1 minute after the change is made and no screen interaction is sensed.

When energizing outputs, it is important to understand which terminals are energized to provide unit functionality. This information can be found in the Bard unit installation instructions in the section where low voltage terminals are identified. A table will be provided called “Low Voltage Connections for DDC Control” and it is important to review the sequences describes to avoid equipment damage.

Test Output	Selection Options	Function	Controller Terminal #
BO1 aux output	On/off	This terminal is energized during occupancy for schedule or motion-based ventilation.	1
G fan status	On/off	This terminal is energized for indoor fan operation.	4
Y1 status	On/off	This terminal is energized for compressor operation. For 2 stage equipment, this is part load operation.	3
Y2 status	On/off	This terminal is energized for full load compressor operation in 2 stage equipment.	2
W1 status	On/off	This terminal is energized for the first stage of electric heat.	8
W2/OB status	On/off	For heat pump models, terminal is used to energize the reversing valve. For Standard AC models, this is the second stage of electric heat.	9
UO10 analog	0-10vdc	Modulating CO ₂ ventilation output.	10
UO11 analog	0-10vdc	Modulating hot water heat.	11
UO12	On/off	Energizes 2-way dehumidification valve in units equipped with dehumidification.	12

NOTE: Test outputs may be affected in units that utilize a custom LUA script.

TEST OUTPUTS 2/2



LANGUAGE SELECTION



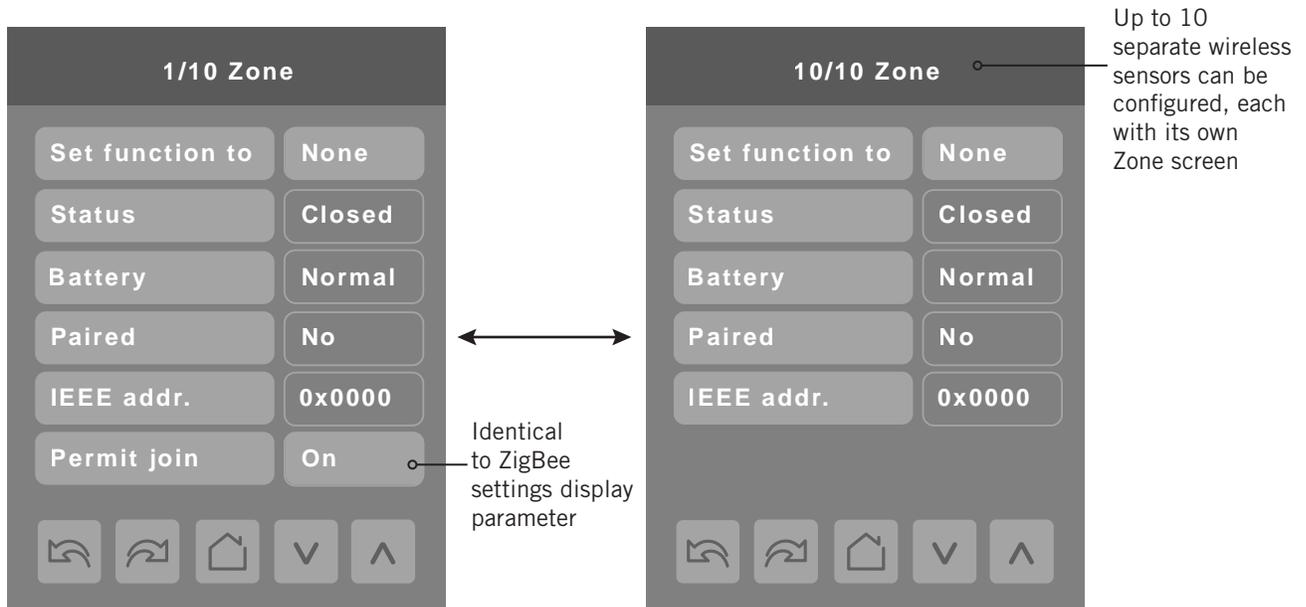
Only English, French, Spanish, Chinese and Russian are enabled by default and are accessible to users cycling through languages on the display settings menu screen. To change the language selection settings, touch a language on the screen and then use the arrow buttons to disable or enable it.

NOTE: English is always enabled.

WIRELESS ECOSYSTEM

Wireless Accessories, LUA Scripts and Networking

When wireless sensors are set up to communicate with a room controller, the functioning of each such sensor is described in a separate Zone screen, up to a maximum of 10 Zones. Select the appropriate type of sensor based on the required functioning using the up and down arrow keys.



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>Set function to Default value: Status Displays current value; see Choices.</p>	<p>Wireless Zone Set Function Describe function of specified wireless sensor.</p> <p>None: No sensor function for this zone</p> <p>Door: Sensor is a door contact switch</p> <p>Window: Sensor is a window contact switch</p> <p>Motion: Sensor is a motion sensor</p> <p>Status: Updates the BACnet status of the sensor. No action is taken by room controller.</p> <p>Remove: Clears zone of all settings for the attached sensor. However, the sensor will automatically try to reconnect with the room controller unless it is manually reset as well.</p> <p>Choices: None, Door, Window, Motion, Status, Remove</p>
<p>Status Read only Displays current value; see Choices.</p>	<p>Wireless Zone Status Current status of information received from the sensor</p> <p>Close: Sensor in closed state (door/window only)</p> <p>Open: Sensor in opened state (door/window only)</p> <p>No Motion: Sensor detects no motion (motion sensor only)</p> <p>Motion: Sensor detects motion (motion sensor only)</p> <p>None: No status information received from sensor.</p> <p>Choices: Close, Open, No motion, Motion, None</p>

PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Battery Default value: None Read only	Wireless Zone Battery Current status of sensor battery. Low: Replacement or recharge required soon Normal: Normal range. Replacement or recharge not currently needed. None: Sensor does not use a battery Choices: Low, Normal, None
Comm. Status Default: Not paired Read only	Comm. Status Sensor pairing state. Choices: Not paired, Online, Invalid, Offline
IEEE addr. Default: 0x0000 Read only	IEEE Address Shows network address of sensor.
Permit join Default: Off	Permit Join Allows room controller to bind with sensor. Choices: On or Off

BRIGHTSTAT LUA USE

Product applications often require specific thermostat settings and at times customized unit operation. The BrightStat is a highly customizable advanced controller that provides flexibility beyond what is capable when using standard thermostats. Features that normally take advanced programming are available by using a simple, yet powerful code called LUA script. LUA script files can be pre-programmed by Bard or user programmed by uploading a file using an uploader tool. LUA script files allow features to be pre-programmed into the BrightStat including set point, user passwords, operational settings, custom messages, special unit operation, and much more.

Field LUA Script Installation

This manual will not concentrate on field installing the LUA script file. Installing a LUA script requires a LUA script file (.lua extension), a MicroUSB cable, a Windows laptop and instructions regarding the procedure needed to install the LUA file. Training is highly recommended before installing LUA script files. See www.bardhvac.com and navigate to the Bard software page (see shortcuts at bottom of homepage) for further instructions regarding field-installed LUA script files when available.

Factory-Installed LUA Script Files

Custom programmed BrightStats with pre-installed LUA scripts will have an additional 3-digit suffix designator after the base controller part number.

Example:

8403-081 – Base controller part number.

8403-081-001 – Base controller part number with custom LUA script designator.

The LUA script file used in the controller will match the controller part number.

Example:

8403-081-001 base controller part number will have a LUA-0001 custom script file installed.

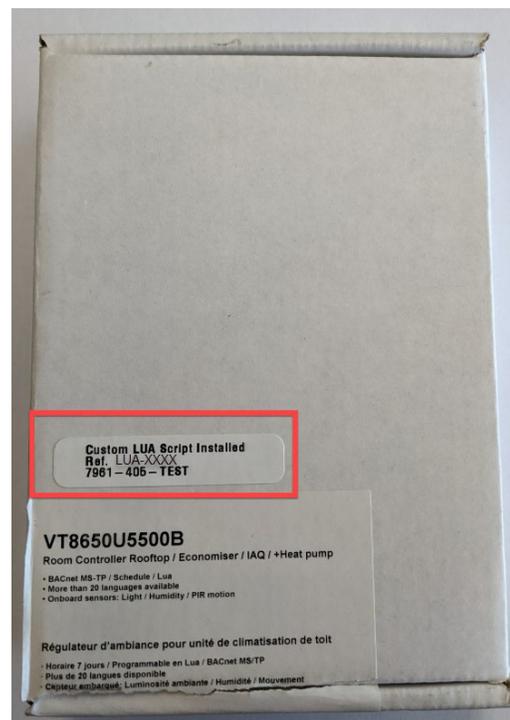
Factory-installed LUA scripts will be pre-loaded and user programming is not necessary. User interaction begins by installing the BrightStat and interacting with setup and configuration menus. These menus and features will be described in the manual that is shipped with the custom-programmed BrightStat.

Identification of the factory-installed LUA file can be found on the back of the display when removed from the wiring base and on the outside of the shipping packaging.

Back of Display



On Shipping Packaging



LUA Script Verification in Setup Menu

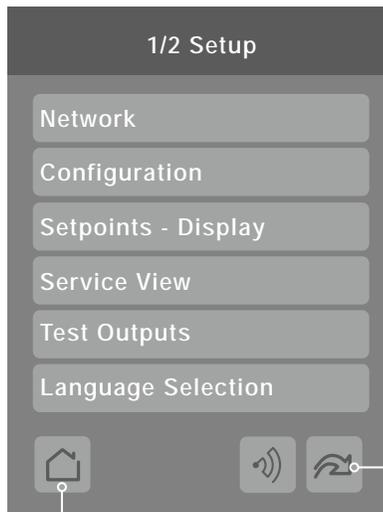
The LUA script can be viewed on page 2 of the setup menu.



Touch and hold this point for 3 seconds to enter setup mode

NOTE: If a configuration/installer password is activated to prevent unauthorised access to the configuration menu parameters, a password entry prompt shows to prevent access to device configuration components.

SETUP SCREEN DISPLAY 1/2



Select Advance to next menu

Return to home screen

SETUP SCREEN DISPLAY 2/2



Select LUA

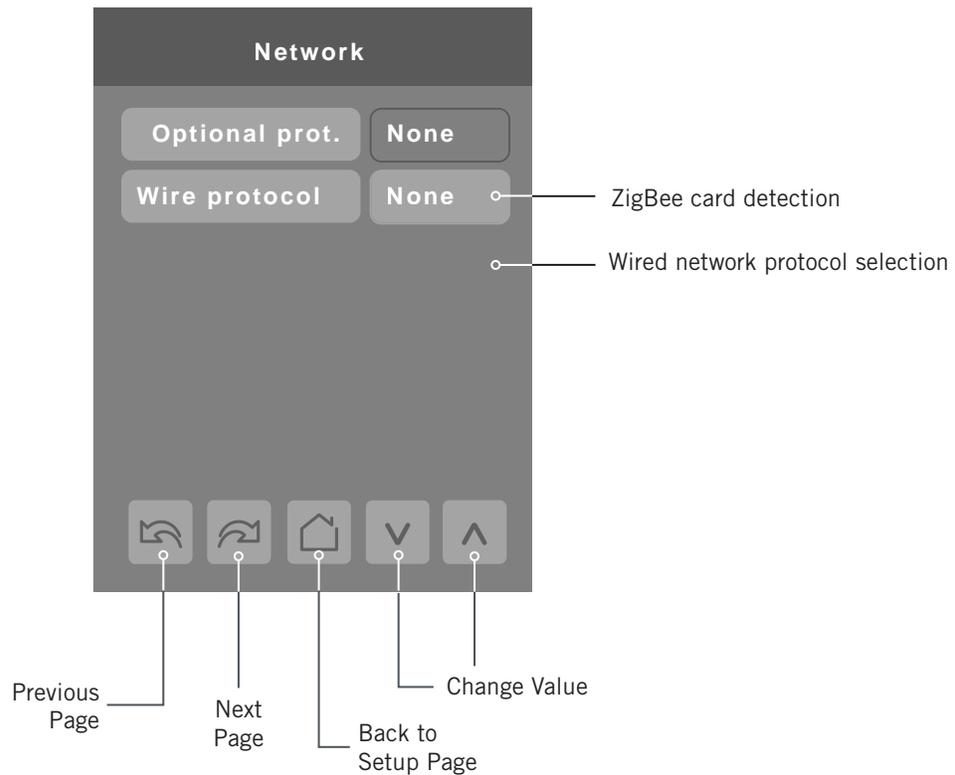


The title of the LUA script is shown here

The body of the LUA script is shown here

NETWORK SETTINGS

Network screen shows if a ZigBee card is detected and selection between BACnet or Modbus network protocols.

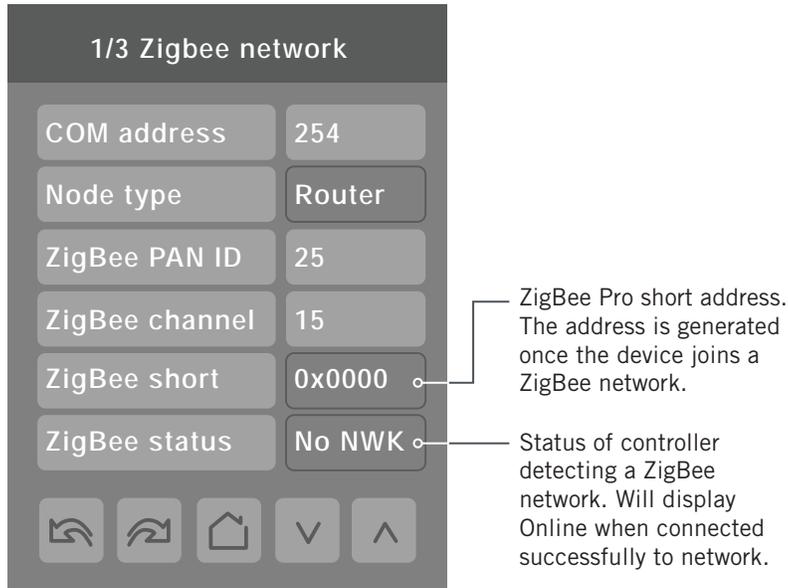


PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Optional prot. Default value: None	Optional Protocol Default value can be changed by user None: No ZigBee card detected ZigBee: ZigBee card detected Choices: None or ZigBee
Status Read only Displays current value; see Choices.	Wire Protocol None: No wired protocol configured BACnet: Enable BACnet network protocol Modbus: Enable Modbus network protocol Choices: None, BACnet, Modbus

ZIGBEE® PRO NETWORK SETTINGS

The ZigBee Pro set-up screen shows when a ZigBee card is detected in the model. Select the desired parameter and use up or down arrows to set the parameter to the desired value.

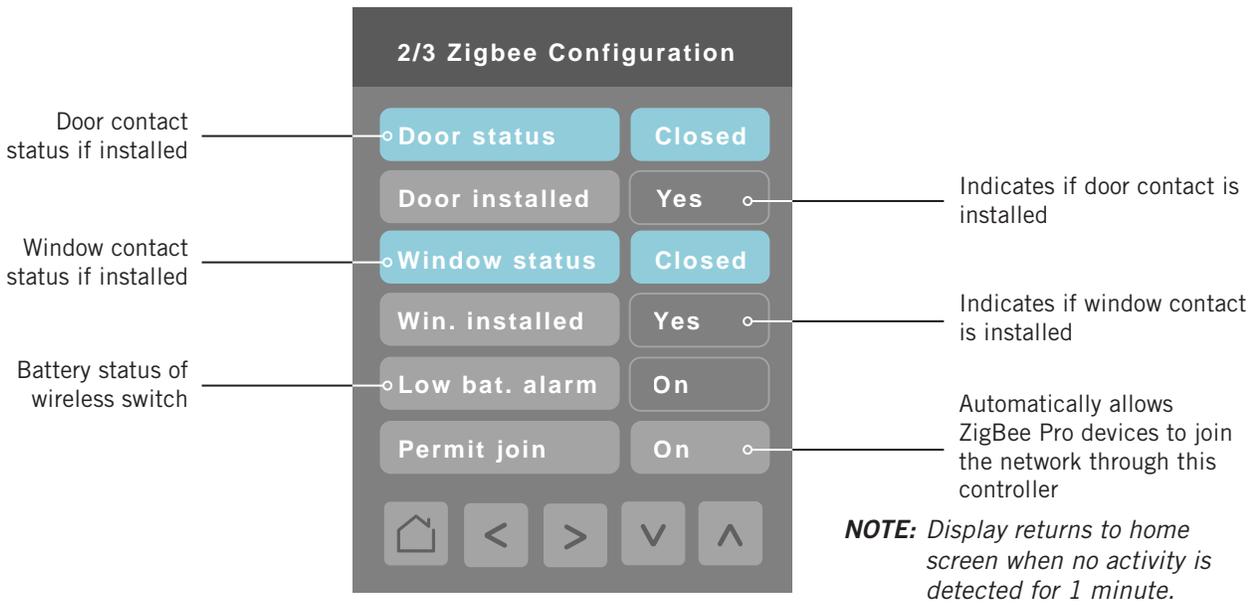


PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
COM address Default value: 254	COM Address Room controller networking address. For wireless models, the use of the COM address is not mandatory. The COM address is an optional way to identify a device on the network and is recommended if used with an MPM. It is mandatory for BACnet. Range: 0 to 254
Node type Default: Coordinator	Node Type Choices: Coordinator or Router
ZigBee PAN ID Default value: 0	ZigBee PAN ID Personal Area Network identification that links specific room controllers to specific ZigBee coordinators. For every room controller reporting to a coordinator, set the SAME channel value both on the coordinator and the room controller(s). The default value of 0 is NOT a valid PAN ID. Range 1 to 500: For centralized networked applications using a ZigBee coordinator. Range 501 to 1000: for stand-alone applications where each room controller is its own coordinator for stand-alone installation of wireless door and window switches. Range: 1 to 1000

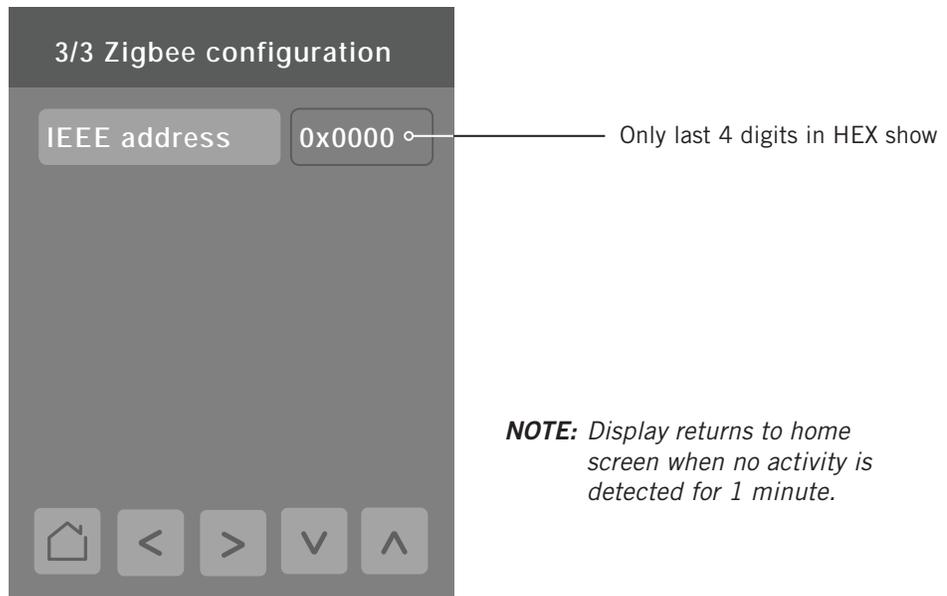
PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
<p>ZigBee channel Default value: 10</p>	<p>ZigBee Channel This parameter links specific room controllers to specific ZigBee coordinators. For every room controller reporting to a coordinator, set the SAME channel value both on the coordinator and the room controller(s). The default value of 10 is NOT a valid channel. The valid range of available channel is from 11 to 25. Using channels 15 and 25 is recommended. Range: 10 to 25</p>
<p>ZigBee short Default value: 0</p>	<p>ZigBee Short Address ZigBee Pro short address. The address is generated once device joins a ZigBee network.</p>
<p>ZigBee status Default value: Not det.</p>	<p>ZigBee Status Not det: ZigBee module not detected Pwr on: ZigBee module detected but not configured No NWK: ZigBee configured but no network joined Joined: ZigBee network joined Online: Communicating Choices: Not det., Pwr on, No NWK, Joined, Online</p>



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Permit join Default value: On	Permit Join Changing this value to Off locks out any new ZigBee devices from joining the network through this room controller. Choices: On or Off

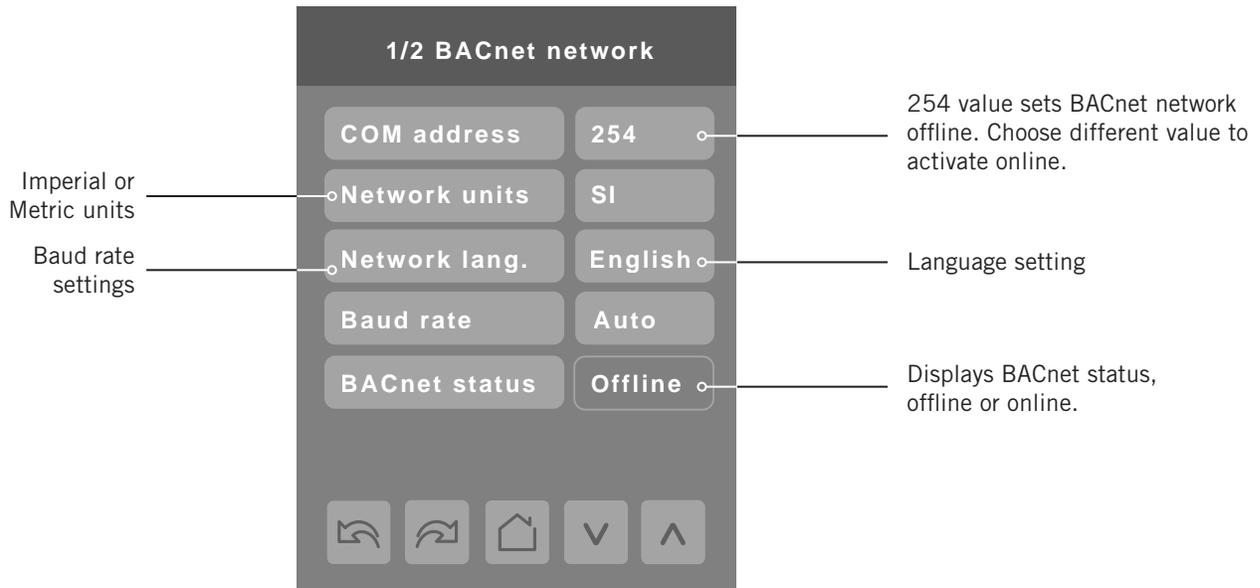


PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
IEEE address Default value: 0x0000	IEEE Address The extended IEEE ZigBee node address identifies the device on the network.

BACNET® NETWORK SETTINGS

BACnet network set-up screen shows when BACnet is detected in model. Select desired parameter and use up or down arrow to set parameter to desired value.



PARAMETER DETAILS

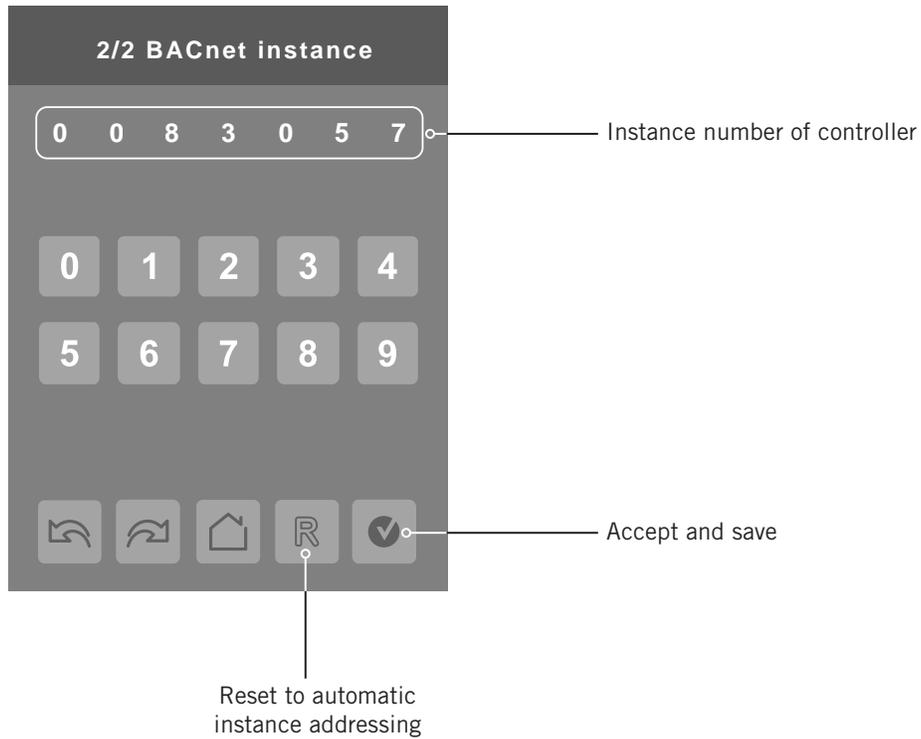
Configuration Parameters Default Value	Significance and Adjustments
Comm address Default value: 254	Communication Address Room controller networking address. For BACnet MS-TP models, the valid range is from 1 to 127. Default value of 254 disables BACnet communication for the room controller. Range: 0 to 254
Network units Default value: SI	Measurement Units Imperial: Network units shown as Imperial units. SI: Network units shown as International Metric units. Choices: Imperial or SI
Network lang Default value: English	Network Language Network language/object names transmitted over network. Choices: English, French, Spanish
Baud rate Default value: 115200	BACnet Baud Rate Leave the value at Auto unless instructed otherwise as this automatically detects BACnet MS/TP baud rate. Choices: 115200, 76800, 57600, 38400, 19200, 9600
BACnet status Default value: Offline	BACnet Status Shows if BACnet is detected or not. Choices: Online or Offline

BACNET INSTANCE NUMBER

The default BACnet instance number is generated by the model number and COM address of the controller. For example, the instance number of a VT8600A5500B with a COM address of 57 is generated as “86057”.

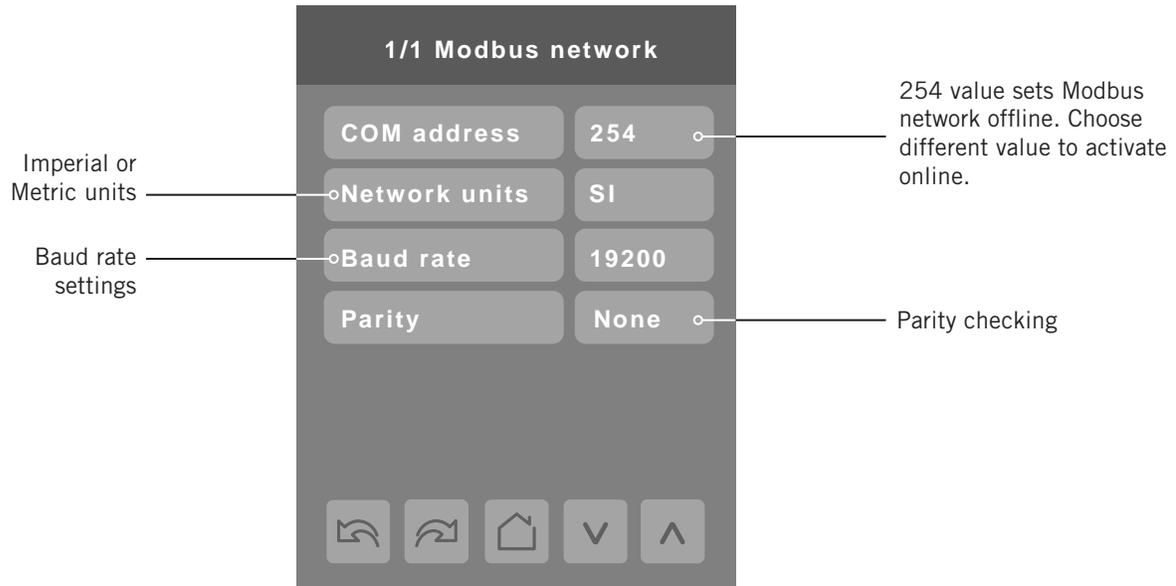
The default instance number appears first. To change the instance number, use number pad and press **Accept and save**.

Press **Reset** to automatic instance addressing to reset to automatic instance addressing.



MODBUS NETWORK SETTINGS

Modbus network set-up screen shows when Modbus is detected in model. Select desired parameter and use up or down arrow to set parameter to desired value.



PARAMETER DETAILS

Configuration Parameters Default Value	Significance and Adjustments
Comm address Default value: 254	Communication Address Room controller networking address default value of 254 disables Modbus communication for the room controller. Range: 0 to 254
Network units Default value: SI	Measurement Units Imperial: Network units shown as Imperial units. SI: Network units shown as International Metric units. Choices: Imperial or SI
Baud rate Default value: 9600	Modbus Baud Rate Leave the value at Auto unless instructed otherwise as this automatically detects Modbus baud rate. Choices: 57600, 38400, 19200, 9600, 4800
Parity Default value: Odd	Parity Parity checking of the data character frame. Choices: None, Odd, Even