ECB-VAVS Preloaded Applications

User Guide

DISTECH CONTROLS™

Innovative Solutions for Greener Buildings™

Document Revision History

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Table of Contents

Introduction

In the first chapter, the ECB-VAVS preloaded applications are introduced and an overview of this user guide is provided.

Introduction to the ECB-VAVS Preloaded Applications

Distech Controls' ECB-VAVS controllers come preloaded with code containing standard VAV applications. This code was created using EC-*gfx*Program, a Graphical Programming Interface (GPI) tool that enables visual assembly of building blocks and the design of custom programs that control Building Automation Systems.

A controller's preloaded applications can be configured using dc *gfx*Application, an application that is accessible through EC-Net Pro, which is powered by the Niagara Framework®. dc *gfx*Application provides an intuitive interface for configuring controllers.

Alternatively, an Allure™ EC-Smart-Vue can be used to configure a controller's preloaded applications on site. The Allure EC-Smart-Vue series communicating sensor features a backlit display and graphical menus. This sensor can be used for indoor temperature measurement, setpoint adjustment, CO_2 sensing, and occupancy state override. An Allure EC-Smart-Vue sensor can also be used to perform system air balancing without requiring an onsite controls engineer and to commission the system.

Controllers can also be custom-programmed using EC-*gfx*Program through EC-Net Pro. With this GPI tool, quick and easy control sequences can be created, which meet the most demanding requirements of any engineering specification.

For detailed specifications regarding the ECB-VAVS controllers, refer to the ECB-VAVS datasheet on SmartSource.

Applications Comparison Chart

	ECB-VAV	ECB-VAVS	ECB–VAV-N
Box Type	Series Fan Parallel Fan Single Duct	Single Duct	Series Fan Parallel Fan Single Duct
Heating Stages	1 Stage 2 Stages 3 Stages	1 Stage 2 Stages	1 Stage 2 Stages
Stages Type	Up to 3 Digital/PWM/TRIAC Up to 2 Analog stages Up to 2 Floating Stages	Up to 2 Digital/PWM/TRIAC Up to 1 Analog stage Up to 1 Floating Stage	Up to 2 Digital/PWM/TRIAC Up to 2 Analog stages Up to 2 Floating Stages
Damper Actuator	Integrated	Integrated	External
Sensor Type	10K Type II 10kK Type III PT1000 NI1000 @ 0C NI1000 @ 22C	10K Type II 10kK Type III	10K Type II 10kK Type III PT1000 NI1000 @ 0C NI1000 @ 22C

Table 1: Available configurations

About This User Guide

Purpose of the User Guide

This user guide is intended to provide information and instruct a user to configure an ECB-VAVS controller from its preloaded applications using either dc *gfx*Applications or an Allure EC-Smart-Vue sensor. However, this guide is not designed to instruct the user on how to use an ECB-VAVS controller. For information on this controller series, refer to its datasheet and to the EC-*gfx*Program user guide, both of which are available on SmartSource.

- This user guide only explains hardware installation in a general sense. Please refer to the individual device's installation guides for specific hardware installation information.
- This user guide does not provide and does not intend to provide instructions for safe wiring practices. It is the user's responsibility to adhere to the safety codes, safe wiring guidelines and safe working practices of the local area. This user guide does not intend to provide all the information and knowledge of an experienced HVAC technician or engineer.

Intended Audience

This user guide is intended for system designers, integrators, and field technicians who have experience with control systems. It is recommended that anyone engineering, programming and configuring the controllers specified in this user guide have prior training in using these controllers.

Conventions Used in this Document

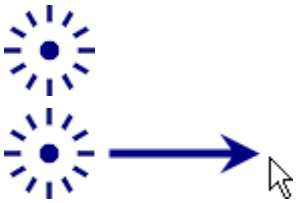
Notes

This is an example of Note text. Wherever the note-paper icon appears, it means the associated text is giving a time-saving tip or a reference to associated information of interest.

Cautions and Warnings

This is an example of Caution and Warning text. Wherever the exclamation icon appears, it means that there may be an important safety concern or that an action taken may have a drastic effect on the device, equipment, and/or network if it is done improperly.

Conventions for Using the Mouse



Click the item.

Click, drag, and release the item.

Acronyms and Abbreviations Used in this Document

BACnet	**B**uilding **A**utomation and **C**ontrol **Net**working Protocol
BAS	**B**uilding **A**utomation **S**ystem
BCP	**B**uilding **C**ontrols **P**rotocol
BCS	**B**uilding **C**ontrols **S**ervices
HVAC	**H**eating, **V**entilation, and **A**ir **C**onditioning
IP	**I**nternet **P**rotocol
LAN	**L**ocal **A**rea **N**etwork
LON	**L**ocal **O**perating **N**etwork
MS/TP	**M**aster-**S**lave/**T**oken-**P**assing
SI	**S**ystem **I**nternational (the Metric system of units)
VAV	**V**ariable **A**ir **V**olume

Sequence of Operation

This chapter presents various aspects of the sequence of operation of an ECB-VAVS controller. Topics covered include occupancy control, temperature setpoints, HVAC modes, airflow control, CO_2 sensing, heat control, and fan control.

Occupancy Control, Temperature Setpoints, and HVAC Modes

In this section, various parts of the ECB-VAVS sequence of operation are presented, including occupancy control, space temperature setpoints, HVAC modes, airflow control, CO_2 sensing, heat control, and fan control.

Occupancy Control

The following table describes the variables that control occupancy.

Variable	Description
OccupancyCmd (MV1)	Occupancy received from the network. If no update is received from the network for more than commFailDelay (AV54), OccupancyCmd falls back into occupied mode.
OccupancyStatus (MV15)	Derived from the above three variables. The occupant can force the system into Bypass mode during unoccupied or standby modes via the room sensor. The override delay can be adjusted through BypassTime (AV47).
OccDetection (MV17)	Current status from a motion detection sensor. When configured, OccupancyStatus is set to standby mode when OccupancyCmd is in occupied mode. Once motion is detected OccupancyStatus is set to occupied for time period of BypassTime (AV47).
WindowContact (MV18)	Current status of a window dry contact. When configured, OccupancyStatus is set to unoccupied mode when the window is open regardless of OccupancyCmd.

An Allure EC-Smart-Vue sensor with occupancy detection (motion sensor) will have priority over any occupancy sensor input. For example, if inputs 1, 2, or 3 are configured for an occupancy sensor and there is also an Allure EC-Smart-Vue sensor with occupancy detection, then OccupancyStatus (MV15) variable will only take into account the Allure EC-Smart-Vue sensor.

The following table describes the sequence of operation for the occupancy control.

OccupancyCmd (Schedule)	OccDetection	WindowContact	OccupancyStatus (Result)
Null	Unconfig	Off	Occupied
		On	Unoccupied
	Unoccupied	Off	Unoccupied
		On	Unoccupied
	Occupied	Off	Occupied
		On	Unoccupied
Occupied	Unconfig	Off	Occupied
		On	Unoccupied
	Occupied	Off	Occupied
		On	Unoccupied
	Unoccupied	Off	Standby
		On	Unoccupied
Standby	Unconfig	Off	Standby
		On	Unoccupied
	Occupied	Off	Occupied
		On	Unoccupied
	Unoccupied	Off	Standby
		On	Unoccupied
Unoccupied	Occupied	Off	Unoccupied
		On	Unoccupied
	Unoccupied	Off	Unoccupied
		On	Unoccupied
	Unconfig	Off	Unoccupied
		On	Unoccupied

Space Temperature Setpoints

There are six configuration setpoints and one setpoint adjustment variable: UnoccCoolSP, Standby-CoolSP, OccCoolSP, OccHeatSP, StandbyHeatSP, UnoccHeatSP and SetPtOffset.

The table below outlines each one as well as other derived setpoints.

Variable	Description
UnoccCoolSP (AV38)	Cooling set point during unoccupied mode
StandbyCoolSP (AV39)	Cooling set point during standby mode
OccCoolSP (AV40)	Cooling set point during occupied mode
OccHeatSP (AV41)	Heating set point during occupied mode
StandbyHeatSP (AV42)	Heating set point during standby mode
UnoccHeatSP (AV43)	Heating set point during unoccupied mode
SetPtOffset (AV7)	Set point adjustment via room sensor (EC-Sensor Series, EC-Smart-Vue Series or EC-Smart-Comfort Series)
ActCoolSP (AV36)	The actual cooling set point is derived based on OccupancyStatus and SetPtOffset.
ActHeatSP (AV37)	The actual heating set point is derived based on OccupancyStatus and SetPtOffset.
EffectSP (AV50)	The effective set point reflects ActCoolSP or ActHeatSP depending on HVACModeStatus.

The dc *gfx*Applications interface and the Allure EC-Smart-Vue sensor can both be used to adjust the heating and cooling setpoints.

For instructions on how to adjust the setpoints using the dc *gfx*Applications interface, see *Configuring the Space Temperature Setpoints*.

For screen-by-screen steps on how to adjust the setpoints using an Allure EC-Smart-Vue sensor, see *Adjusting the Setpoints and Display Units*.

HVAC Modes

The following table describes the HVAC mode variables:

Variable	Description
HVACModeCmd (MV2)	HVACModeCmd is received from the network. If no update is received from the network for more than CommFailDelay(AV54), HVACModeCmd falls back to Auto. The supported modes are: (1)-AUTO, (2)-HEAT, (3)-MRNG_WRMUP, (4)-COOL, (5)-NIGHT_PURGE, (6)-PRE_COOL and (7)-OFF.
HVACModeStatus (MV15)	HVACModeStatus (MV15) is controlled by HVACModeCmd. When HVACModeCmd is set to Auto, HVACModeStatus reflects the room's actual terminal load.

Airflow Control and Calibration

In this section, the sequence of operations related to a controller's airflow control and calibration are presented.

Airflow Control

There are six airflow configuration setpoint variables described in the following table:

Variable	Description
MinFlowSP (AV26)	Absolute minimum flow setpoint during occupied mode
MaxFlowCoolSP (AV27)	Maximum flow setpoint during cooling mode
MinFlowHeatSP (AV28)	Minimum flow setpoint when duct heater is active
MaxFlowHeatSP (AV29)	Maximum flow setpoint during heating mode
MinFlowStbySP (AV30)	Minimum flow setpoint during standby mode
MinFlowUnoccSP (AV31)	Minimum flow setpoint during unoccupied mode

The actual flow setpoint, ActFlowSP (AV2), is calculated based on BoxType (MV20) and other control variables described in the subsections below.

The system uses DuctInTemp (AV6) and the temperature setpoint average (ActCoolSP and ActHeatSP) to evaluate whether the inlet temperature is suitable for cooling or heating the space. If HVACModeStatus is in morning warm up, the air is by default considered suitable for heating the space.

Cooling Mode

When the air is suitable for cooling the space, ActFlowSP varies between MinFlowSP and MaxFlowCoolSP based on terminal load. Otherwise, when the air is too warm, ActFlowSP is by default equal to MinFlowSP.

When OccupancyStatus is in unoccupied or standby mode, MinFlowSP is replaced by either MinFlowUnoccSP or MinFlowStbySP.

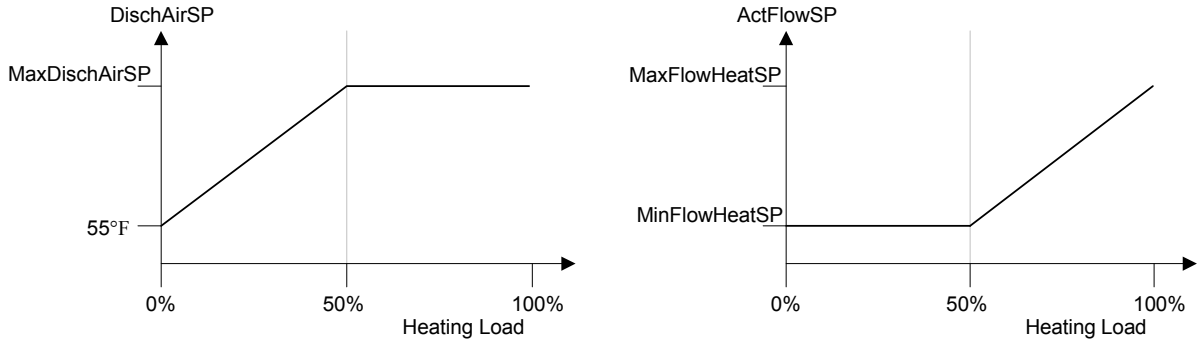
Heating Mode

When the air is suitable for heating the space, ActFlowSP varies between MinFlowSP and MaxFlowHeatSP. Otherwise, when the air is too cold, ActFlowSP is by default equal to MinFlowSP. Regardless, when duct heating is required, MinFlowSp is replaced by the highest value between MinFlowSP and MinFlowHeatSP.

When OccupancyStatus is in unoccupied or standby mode, MinFlowSP is replaced by either MinFlowUnoccSP or MinFlowStbySP.

When the VVTMode (BV12) option is selected, ActFlowSP is converted into a percentage, which controls the damper without using a flow reading.

The dual maximum option, DualMaximum (BV19), is available for the ECB-VAVS model. When in heating mode, ActFlowSP is controlled as follows (see Figure 1): The first 50 percent of the heating load adjusts the DischAirSP (AV12) between 55°F and MaxDischAirSP (AV56). The second 50 percent of the heating load adjusts the ActFlowSP between MinFlowHeatSP and MaxFlowHeatSP. Note that the dual maximum option requires a discharge temperature sensor to be configured. This sequence of operation respects California Title-24.



Discharge air setpoint is adjusted for first 50% of heating load

Actual flow setpoint is adjusted for remaining 50% of heating load

Figure 1: Heating Control with the Dual Maximum Option

Heating Mode for Fan Powered VAV

When the air is suitable for heating the space, ActFlowSP varies between MinFlowHeatSP and MaxFlowHeatSP. Otherwise, when the air is too cold, ActFlowSP is by default equal to MinFlowHeatSP.

When OccupancyStatus is in unoccupied or standby mode, MinFlowSP and MinFlowHeatSP are replaced by either MinFlowUnoccSP or MinFlowStbySP.

When the VVTMode (BV12) option is selected, ActFlowSP is converted into a percentage, which controls the damper without using a flow reading.

For instructions on how to configure a controller's airflow setpoint parameters using the dc *gfx*Applications interface, see *Configuring the Calibration Points*.

For screen-by-screen steps on how to configure the airflow setpoint parameters using an Allure EC-Smart-Vue sensor, see *Configuring the Flow Setpoint Parameters*.

Airflow Calibration

The actual flow, ActFlow (AV1), is calculated using the differential pressure from the onboard sensor and the K-factor.

To calibrate the system, stabilize the flow by either overriding the flow setpoint or the damper position, DamperOvr (AV9). Once stabilized, read the flow hood measurement and enter the value into FlowCalib (AV33). The K-factor will automatically adjust to the proper value.

For instructions on how to perform VAV airflow balancing, see *Air Flow Tab (VAV Balancing)*.

For screen-by-screen steps on how to perform VAV airflow balancing using an Allure EC-Smart-Vue sensor, see *Performing VAV Airflow Balancing*.

CO_2 Sensor

CO_2 sensor priorities are as follows:

1) Allure EC-Smart-Vue with CO_2 sensor.
2) Allure EC-Smart-Air with CO_2 sensor.
3) CO_2 sensor configured on Input 3.

The Allure EC-Smart-Vue with CO_2 sensor will have priority over the EC-Smart-Air with CO_2 sensor and over the CO_2 sensor configured on Input 3. For example, if Input 3 is configured for a CO_2 sensor and there is also one Allure EC-Smart-Vue with CO_2 sensor and one Allure EC-Smart-Air with CO_2 sensor, then the CO_2 Sensor (AV10) variable will only take into account the Allure EC-Smart-Vue with CO_2 sensor.

CO_2 Control

The CO_2 is calculated by a PID loop. The PID loop is activated if CO2Sensor (AV10) variable is valid (less or equal to 5000 ppm). In a PID configuration, the default value of the CO2Setpoint (AV52) variable is 1000 ppm.

The PID output is multiplied by 2 in order to control the air flow in the first half of the PID loop (0-50%). As for the second half of the PID loop (50-100%), the CO2Load (AV53) should be read by the AHU to adjust the outdoor air damper. You can also use the maximum of all the PID loops to increase the minimum fresh air of the AHU supplying this area.

Air Flow Setpoint (AirFlowSP)

The Air Flow calculation depends on the CO_2 load:

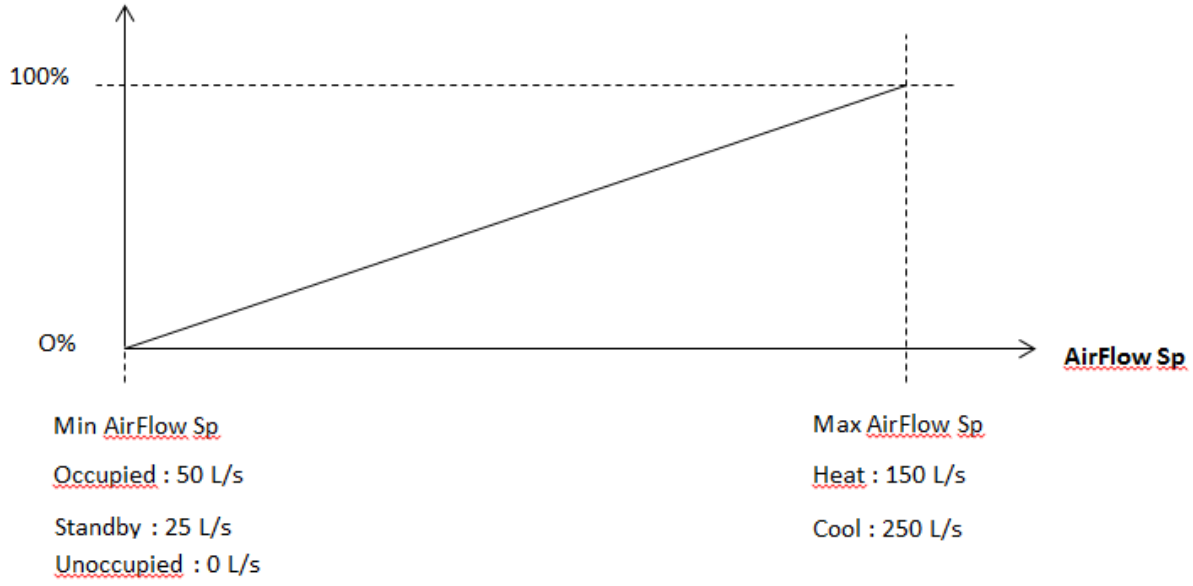


Figure 2: Air Flow Setpoint Calculation

For example, the AirFlow setpoint is directly linked to the CO2Load (AV53):

- If CO2Load is 0% then AirFlowSetpoint is equal to MinAirFlow Sp.
- If CO2Load is 65% then AirFlowSetpoint is equal to the following:

(((MaxFlowSp - MinFlowSp) x 0.65) + MinFlowSp)

The AirFlow setpoint will be the maximum value between the air flow setpoint based on the space temperature and the CO_2 flow setpoint.

CO_2 Elevation Input

The Allure EC-Smart-Vue with CO_2 sensors and Allure EC-Smart-Air with CO_2 sensors are factory calibrated to accurately read CO_2 concentration levels at sea level. The Elevation (AV99) variable adjusts the CO_2 concentration levels when the sensor is used in locations where the elevation is greater than 500ft (152m) above sea level. The Elevation input of the corresponding ComSensor block in EC-*gfx*-Program must be set to the current location's elevation to obtain the most accurate readings.

Heat Control and Output Wiring

Heat Control

Depending on the controller model, up to three heating sources can be controlled. Configuration of these sources is done by the following variables:

- Heat1Type (MV21)
- Heat2Type (MV22)

These variables allow the user to select the type of control signal used to drive the heating source. These variables must be configured in order (i.e. Heat1Type must be used before Heat2Type can be configured, and so on).

Each heat type has a normally open or normally closed configuration option, represented by the following variables:

- Heat1NormOpen (BV20)
- Heat2NormOpen (BV21)

Other relevant variables are described in the table below.

Variable	Description
DuctHeatStgs (MV29)	This variable determines the number of duct heaters which are installed. Duct heaters are always wired starting from Heat1Type. If no duct heaters or only perimeter heat is required, set this variable to “None”. All heat types configured greater than DuctHeatStgs are considered perimeter heaters.
MaxOatDuctHeat (AV48)	Outside air temperature limit to disable the duct heater(s).
MaxOatPerimHeat (AV49)	Outside air temperature limit to disable the perimeter heater(s).
HeatPriority (MV13)	Determines which heating source is activated first. Options are duct heater, perimeter heat or simultaneous.
HotWaterReheat (BV18)	Determines if hot water reheat is used. When in use, the MinFlowHeatSP safeguard is ignored.
Shedding (AV11)	Load shedding Option. A value of zero percent disables this feature. Shedding between 0 and 100 percent attenuates the total heat demand of the system.

Shedding

Shedding is based on the following variable:

Variable	Description
Shedding (AV11)	Load shedding option. 0% = no shedding; 100% = full shedding Heating output is rescaled based on the percentage of shedding required.

Example:

Heating demand = 75%

Shedding = 20%

Max heating = 100% - 20% (shedding) = 80%

Output = 75% (heating demand) x 80% (max heating) = 60% (Scaled output based on required shedding)

Output Wiring

Wiring of outputs depends on heat type configuration.

Heat1Type	Heat1Type always outputs on DO1 and AO4. When using a floating valve, DO1 is used for opening the valve and DO2 is used for closing the valve. When the Pwm Triac option is used, DO1 is used to control the heating source.
Heat2Type	Heat2Type always outputs on DO2 and AO4 unless Heat1Type is a floating valve, in which case the digital outputs are shifted (i.e. DO2 becomes DO3). When using a floating valve, DO1 is used for opening the valve and DO2 is used for closing the valve if Heat1Type is set to Analog. When the Pwm Triac option is used, DO2 and AO4 are used to control the heating source.

Wiring of outputs depends on the type of control signal used to drive the heating sources. For instructions on how to configure a controller's outputs using the dc *gfx*Applications interface, see *Configuring the Preloaded Applications*.

For screen-by-screen steps on how to configure a controller's outputs using an Allure EC-Smart-Vue sensor, see *Setting up Outputs*.

VAV Performance Assessment Control Charts (VPACC)

The ECB-VAVS VPACC feature, which is embedded into the ECB-VAVScontrol sequences, provides a means of automatically detecting when the VAV is operating outside of its design parameters.

In a traditional sequence of operations, alarms are triggered when the value of a point stays outside the alarm limit for a defined period of time. The VPACC improves on this, since it has the capability to set off a warning condition automatically should the system be unstable or consistently too high or low, even if the alarm points are never reached.

Additional benefits of the VPACC:

- Identify failure or unstable control where standard alarming would fail
- Track equipment control over a long period of time
- Identify failure before occupant complaints
- Monitor system only when in occupied mode
- Increase building efficiency
- Reduce major equipment replacement and emergency equipment replacement
- No need to program alarm in EC-BOS or EC-Net Pro.

VPACC Functionality

The example below shows that the airflow of a VAV is unstable. The VPACC feature can detect and diagnose this unstable control by evaluating the frequency of errors over time and producing an alarm should the frequency exceed the established parameters. The VPACC fault detection alerts can be viewed from the dc *gfx*Applications graphics pages and displayed in the EC-Net Web pages. The VPACC is available with all VAV controllers and is used in your custom VAV sequence using *gfx*Applications code library.

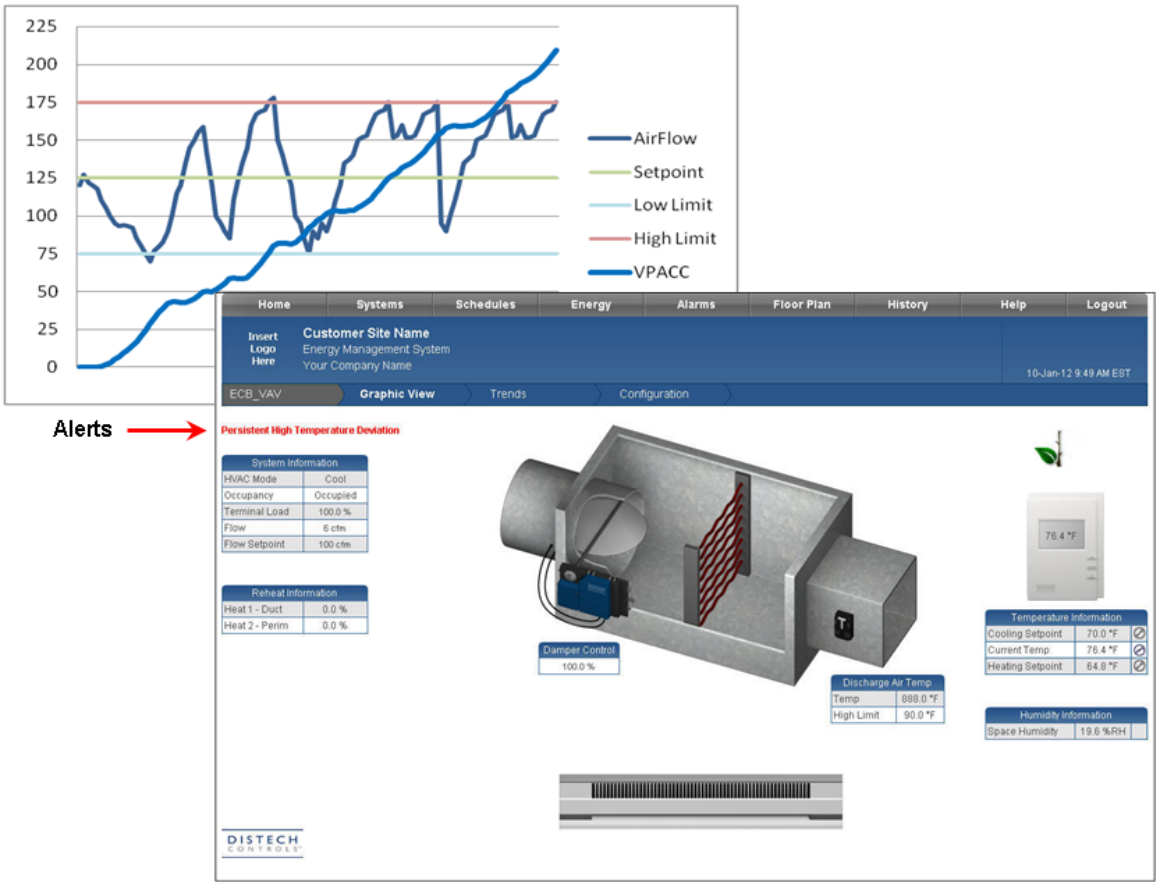


Figure 3: VPACC Functionality

The VPACC will measure the following fault detections:

- Low Space Temperature
- High Space Temperature
- Low Discharge Temperature
- High Discharge Temperature
- Unstable Air Flow
- Low Air Flow
- High Air Flow

VPACC Parameters

- AV80 EnDelayVPACC VPACC Enable Delay (min)
  - Default value : 60 min
- AV81 CUSUM_K_VPACC VPACC CUSUM K Param (no-unit)
  - Default value : 3
- AV82 SpaceTempStdErr VPACC Space Temperature Standard Error
  - Default value : 0.4 Δ°F (0.25 Δ°K)
- AV83 SpaceTempErrAlmSp VPACC Space Temperature Alarm
  - Default value : 500 Δ°F (250 Δ°K)
- AV84 AirFlowStdErr VPACC Air Flow Standard Error
  - Default value : 10 cfm (5 L/s)
- AV85 AirFlowErrAlmSp VPACC Flow Alarm Setpoint
  - Default value : 900 cfm (450 L/s)
- AV86 DischTempStdErr VPACC Discharge Temperature Standard Error
  - Default value : 1 Δ°F (1 Δ°K)
- AV87 DischTempErrAlmSp VPACC Discharge Temperature Alarm Setpoint
  - Default value : 500 Δ°F (250 Δ°K)
- AV88 SpaceTempPosErr VPACC Positive Space Temperature CUSUM (Δ°F) (Δ°K)
- AV89 SpaceTempNegErr VPACC Negative Space Temperature CUSUM (Δ°F) (Δ°K)
- AV90 AirFlowPosErr VPACC Positive Flow CUSUM (cfm) (L/s)
- AV91 AirFlowNegErr VPACC Negative Flow CUSUM (cfm) (L/s)
- AV92 AirFlowAbsErr VPACC Absolute Flow CUSUM (cfm) (L/s)
- AV93 DischTempPosErr VPACC Positive Discharge Temperature CUSUM (Δ°F) (Δ°K)
- AV94 DischTempNegErr VPACC Negative Discharge Temperature CUSUM (Δ°F) (Δ°K)
- MSV40 VPACCStatus VPACC Status Reporting:
  - Normal
  - LowSpaceTemp or HighSpaceTemp
  - LowDischTemp or HighDischTemp
  - UnstableAirFlow or LowAirFlow or HighAirFlow

Receiving Network Values

Typically, a VAV controller will be receiving values from another controller (i.e., AHU system controller) over the network such as UnitStatus, OccupancyCmd, HVACModeStatus, DuctInTemp, OutdoorTemp, and Shedding. If these values are not periodically received, they will fall back to their respective default values after the CommFailDelay (AV54) is expired and given that the object was controlled at priority 14. In the case where CommFailDelay not required, write selected points from the network at a priority other than 14.

Using the dc *gfx*Applications

This chapter explains how to access the preloaded applications using EC-Net Pro and how to navigate the dc *gfx*Applications interface. Various aspects of the dc *gfx*Applications interface are explained, including configuring the VAV settings and setting up trends to be followed.

Accessing the Preloaded Applications with EC-Net Pro

The ECB-VAVS preloaded applications can be found in the dc *gfx*Applications palette.

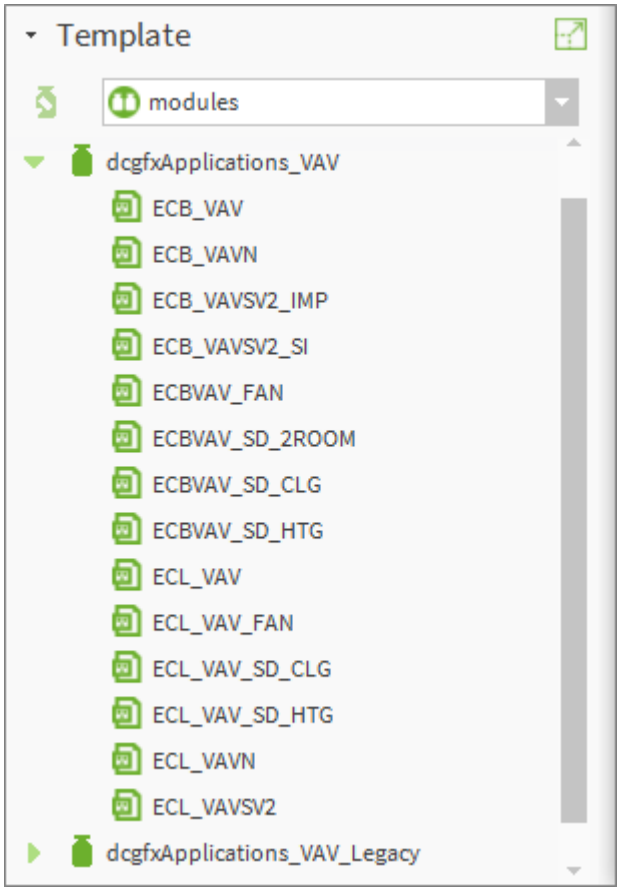
Certain elements must be installed on the EC-Net platform being used, namely:

- EC-Net Support Package
- dcImages
- Haystack tagging
- dc*gfx*Applications

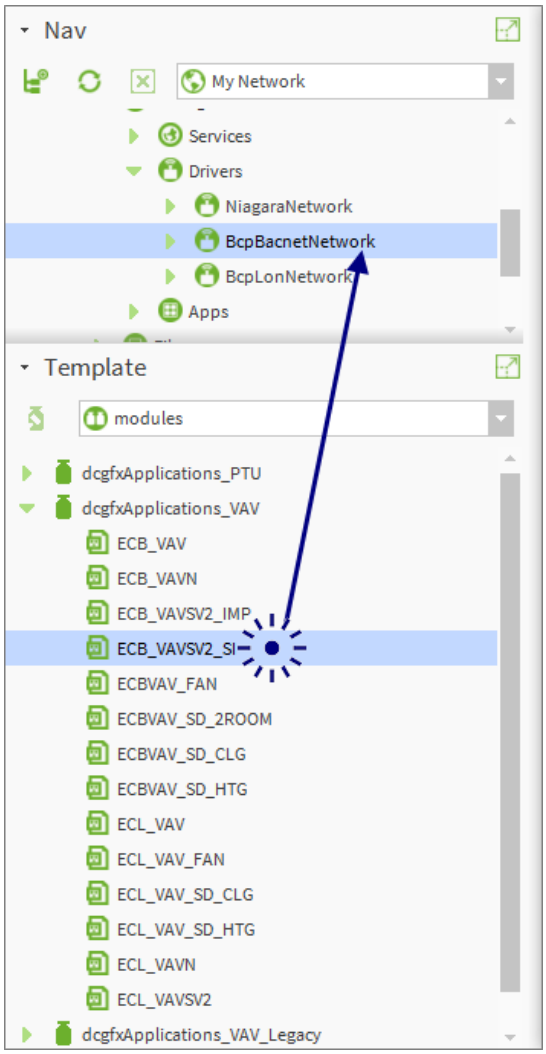
For information on how to prepare an EC-Net station and how to install the dc*gfx*Applications palette or module in an EC-BOS, refer to the *Productivity Enhancing Tools User Guide*.

To access the preloaded applications of an ECB-VAVS controller, it must first be created in the BcpBacnetNetwork driver of the configured station and then matched with an existing device in the BACnet Network. The following procedure explains how to add devices to a configured station and then how to match them with existing devices in the network:

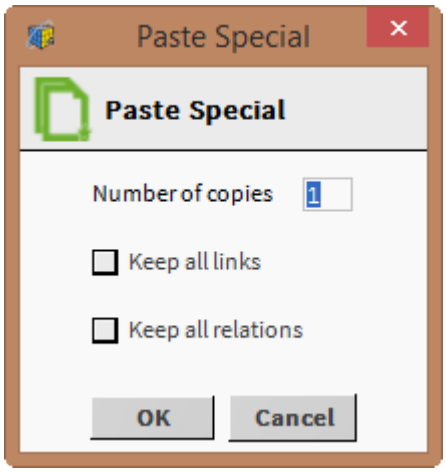
1. Open the dc*gfx*Applications template.



2. Click and drag the name of a controller model from the dc*gfx*Applications module to the **BcpBacnetNetwork** driver of the configured station. Assign an appropriate name to the newly created device.

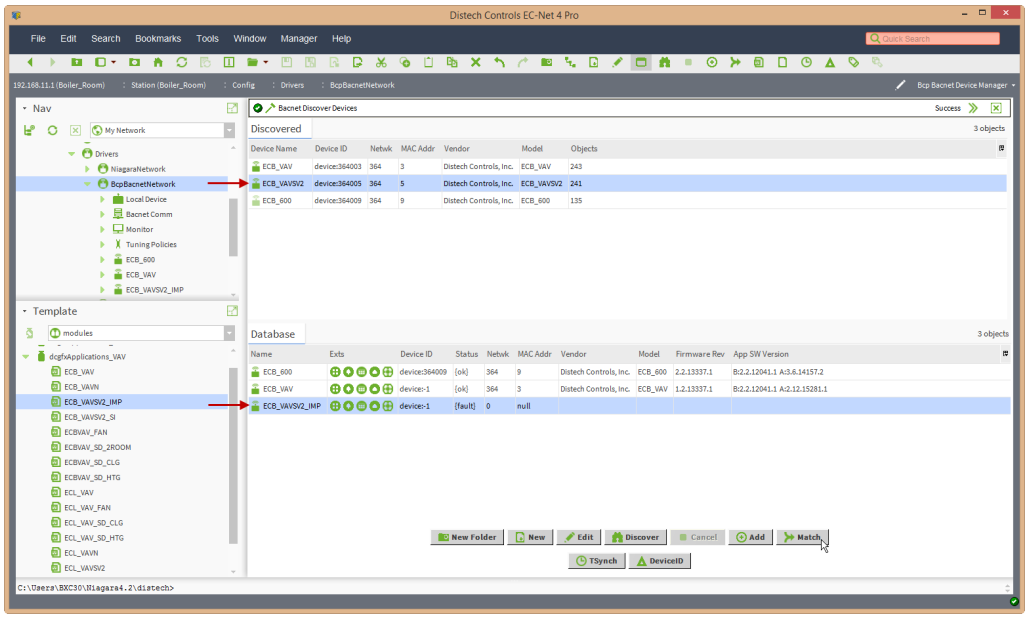


To add multiple copies of the same device, right-click the device just added, click Copy, and then right-click the **BcpBacnetNetwork** driver and click **Paste Special**.

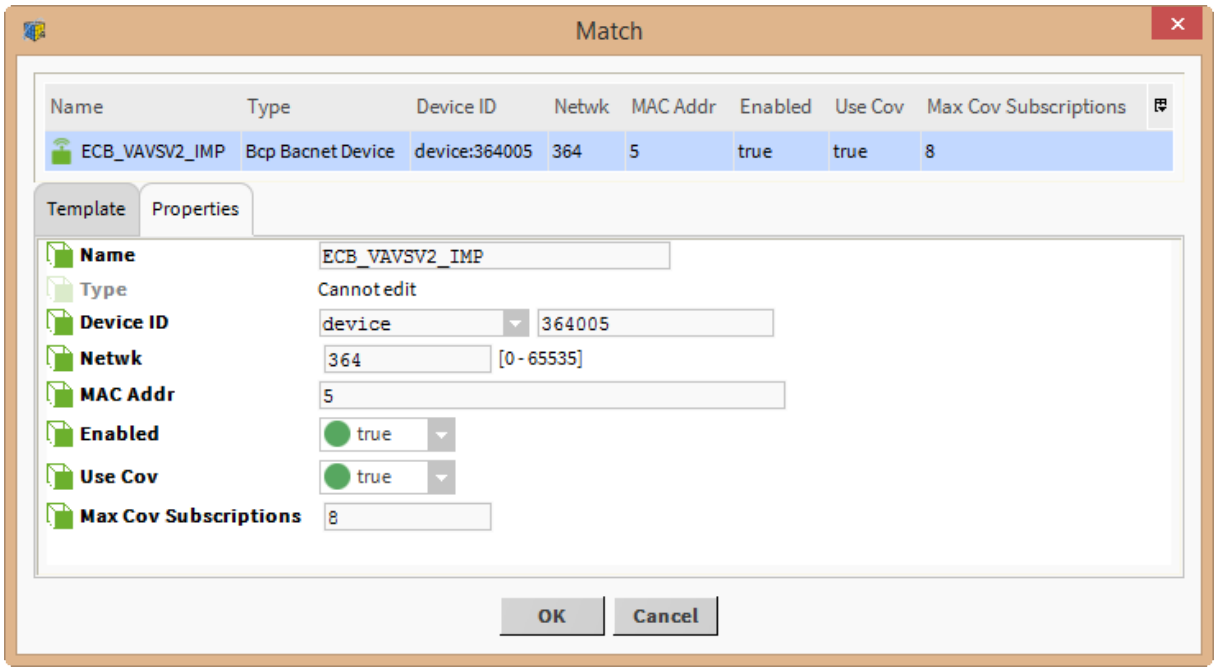


3. Double-click the **BcpBacnetNetwork** driver. The Bcp Bacnet Device Manager appears in the View pane.

4. Click **Discover**. The discovered devices appear in the View pane's top section and the BcpBacnet-Network database appears in the bottom section.
5. Select the discovered device that is to be matched with the one just added to the database. Click **Match**.

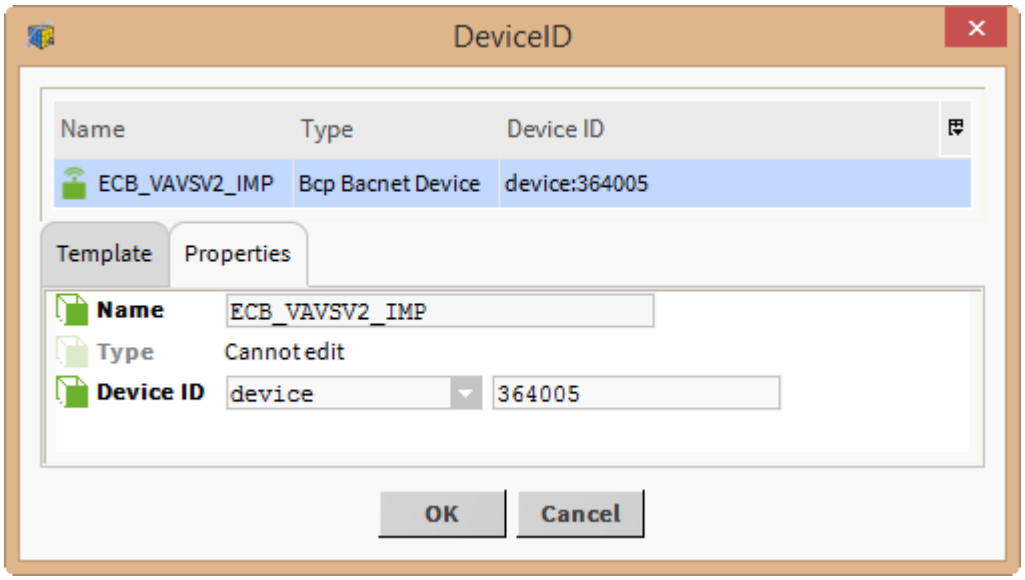


The **Match** window appears.

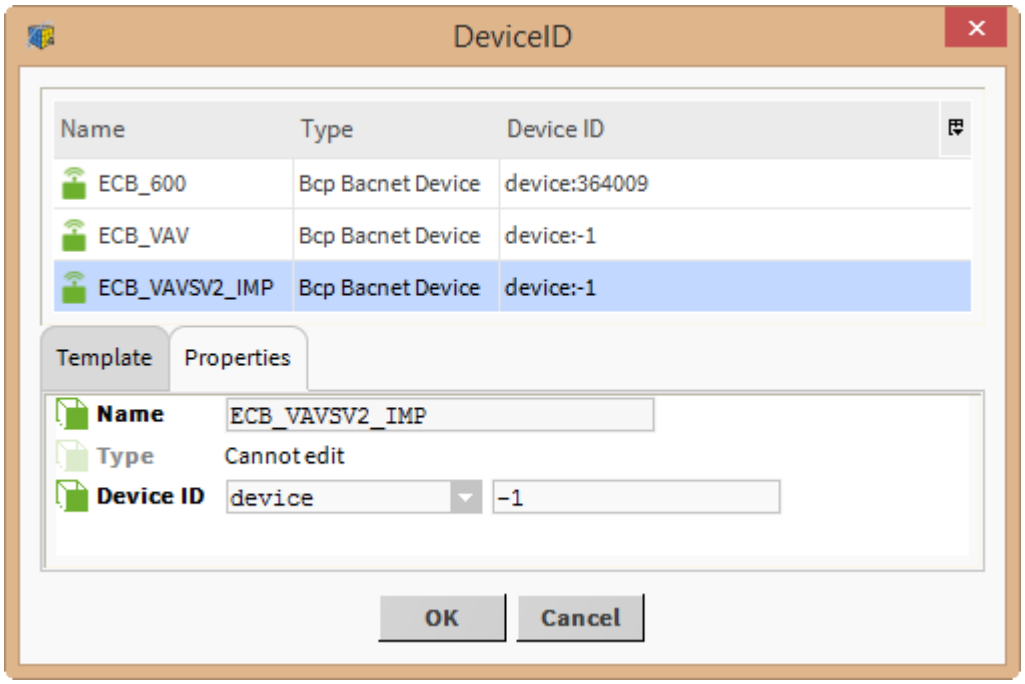


6. Click **OK**. The device in the database is matched with the one in the discovered network. After matching is done, the device ID must be set.

7. Click **DeviceID**. When the **Change Device ID** window appears, click **Yes**. The **DeviceID** window appears.

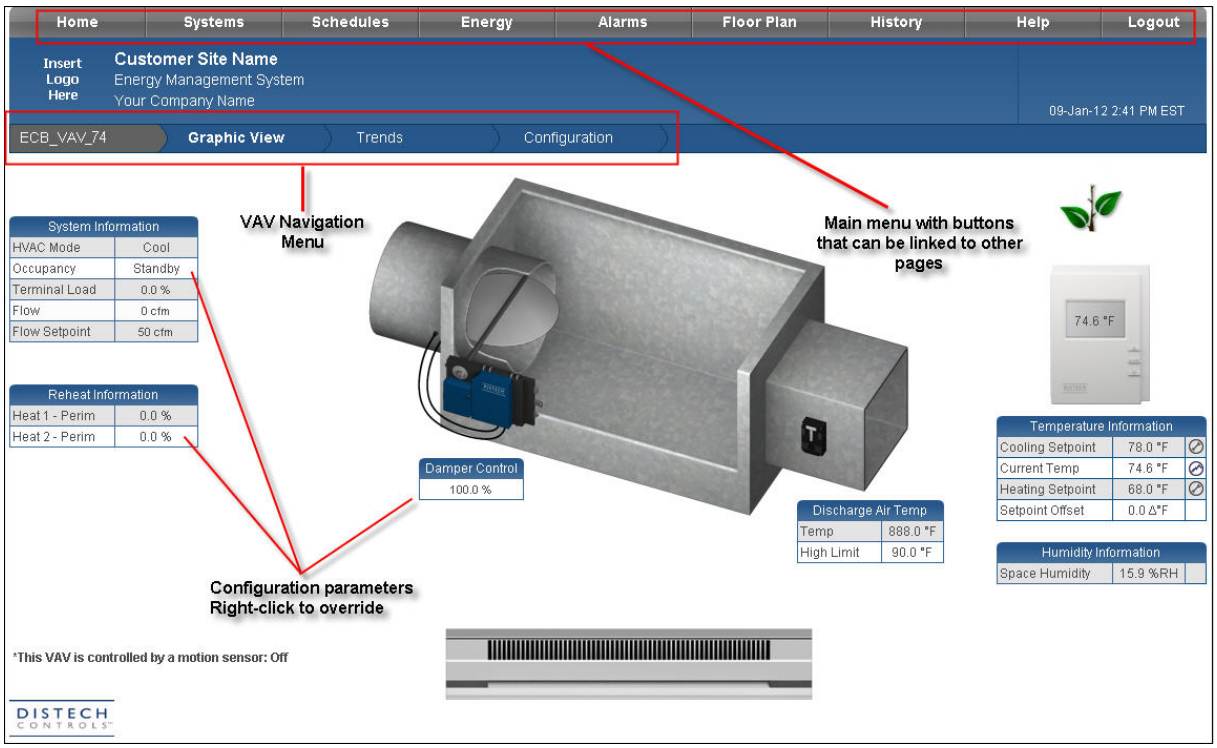


To set the device ID of multiple devices at the same time, select all of them from the database before clicking **DeviceID**. EC-Net Pro automatically increments the device ID when multiple devices are being updated.



8. Set the device ID according to the overall network planning. The device ID must be unique to a device in the entire BACnet network internetwork. The valid range is from 0 to 4194302. Click **OK**.
9. Click **OK** again when the **Change Device ID** window appears.

10. In the Nav tree, double-click the device that was just added and matched. An overview of the VAV system in place appears in the View pane (shown below).



Configuring the VAV with EC-Net 4

From the **Configuration** Px page, certain limited configuration parameters may be changed. These include the VAV's space temperature setpoints, system parameters, flow setpoints, calibration points, and damper configuration. This page can easily be accessed from the VAV navigation menu located at the top of the system view page. Each setpoint can be easily set using its corresponding Edit button .

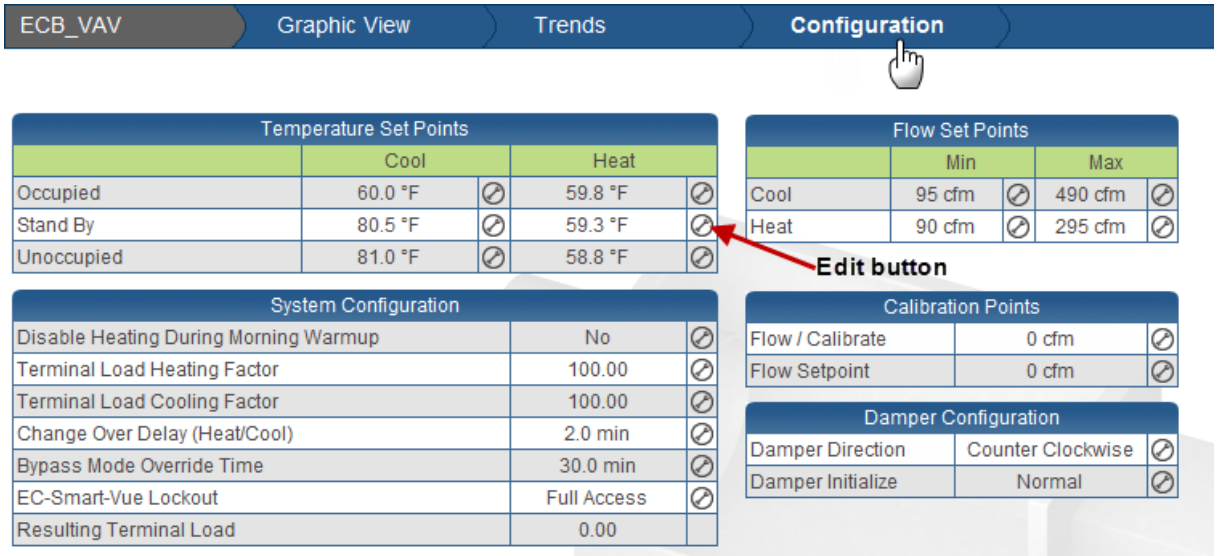


Figure 4: Configuration Tables

Configuring the Space Temperature Setpoints

The **Temperature Setpoints** table contains the heating and cooling setpoints for the occupied, standby and unoccupied modes. Each setpoint can be easily set using its corresponding Edit button. The table below gives a brief description of each type of setpoint.

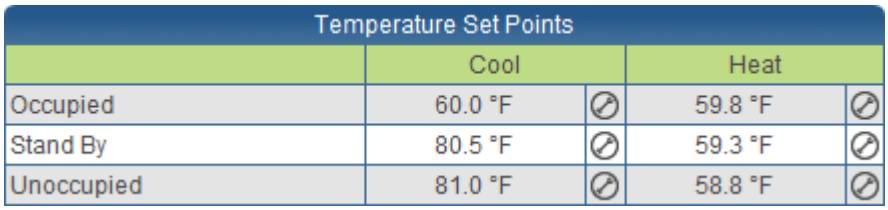
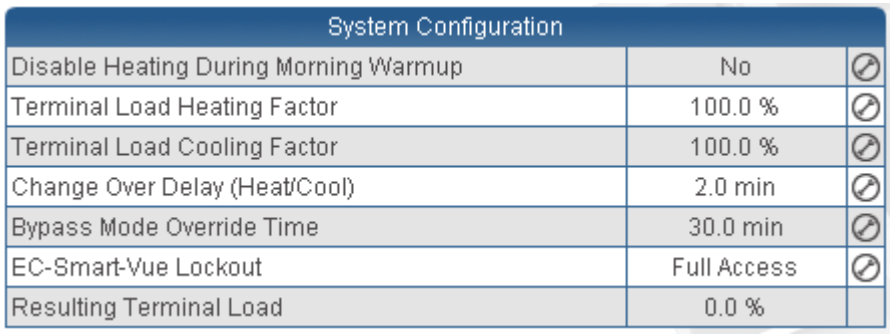


Figure 5: Temperature Setpoints

Setpoints (heating/cooling)	Description
Occupied	The limits between which the temperature is to be maintained by the controller when it is in Occupied mode. This temperature range should be comfortable to building occupants.
Standby	The limits between which the temperature is to be maintained by the controller when it is in Standby mode. In Standby mode, the temperature is usually allowed a larger amount of variance than in Occupied mode. Still, it is maintained at a value close enough to the occupied setpoints so that it can be varied quickly for occupancy.
Unoccupied	The limits between which the temperature is to be maintained by the controller when it is in Unoccupied mode. If the temperature passes these limits, the system reacts to bring the temperature back within these limits. In Unoccupied mode, the space temperature is usually allowed a larger amount of variance than in Occupied mode, thereby lowering operating costs.

Configuring the System Parameters

In the **System Configuration** table, general controller parameters are set such as the changeover delay, bypass mode override time, and terminal load scaling factors. In addition, the Allure EC-Smart-Vue's accessibility settings are defined. The table below describes each of these parameters. Use the Edit buttons to modify these parameters according to the desired system configuration settings.



System Configuration		
Disable Heating During Morning Warmup	No	
Terminal Load Heating Factor	100.0 %	
Terminal Load Cooling Factor	100.0 %	
Change Over Delay (Heat/Cool)	2.0 min	
Bypass Mode Override Time	30.0 min	
EC-Smart-Vue Lockout	Full Access	
Resulting Terminal Load	0.0 %	

Figure 6: System Configuration Table

Parameter	Description
Disable Heating During Morning Warmup	Disables perimeter and duct heating during morning warmup. The morning warmup mode is used to preheat the building so that when building occupants enter the building in the morning, the temperature is already at or close to the occupied heating setpoint. Morning warmup assumes that there is warm air in the duct. When there is a demand for heating during morning warmup, the damper is opened (however, never more than the maximum flow).
Terminal Load Heating Factor	A priority setting parameter for the terminal load factor when the controller is in heating mode. The controller scales the heating requirement of the terminal load based on the terminal load heating factor and then applies the result to the terminal load factor.
Terminal Load Cooling Factor	A priority setting parameter for the terminal load factor when the controller is in cooling mode. The controller scales the cooling requirement of the terminal load based on the terminal load cooling factor and then applies the result to the terminal load factor.
Change Over Delay (Heat/Cool)	Defines the minimum time during which heating must be OFF before cooling can be turned ON as well as the minimum time during which cooling must be OFF before heating turns ON. This parameter prevents the system from continuously oscillating between heating and cooling modes.
Bypass Mode Override Time	The duration of time the controller remains in bypass mode when changed from standby or unoccupied modes. In addition, if a motion sensor is present, the bypass mode override time represents how long the controller remains in occupied mode (no room occupancy is detected) before returning the controller to standby mode.
EC-Smart-Vue Lockout	Defines how much access a user of the Allure EC-Smart-Vue has to the controller's configuration parameters. The Allure EC-Smart-Vue access ranges from full access to limited access or no access at all. Limited access allows setpoint adjustment only or setpoint adjustment and airflow balancing. Regardless of the access level of the Allure EC-Smart-Vue, the controller's configuration parameters cannot be modified through the Allure EC-Smart-Vue except after a password is entered. To learn how to perform various functions using the Allure EC-Smart-Vue's basic and advanced menus, see *Allure EC-Smart-Vue Screen-by-Screen Guide*.
Resulting Terminal Load	Displays the terminal load on the unit.

Configuring the Flow Setpoints

The following table describes the airflow setpoint parameters that can be configured.

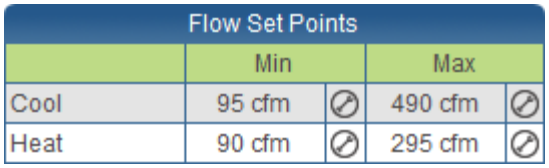


Figure 7: Flow Setpoints

Parameter	Description
Min Cool Flow Setpoint	Minimum cooling flow setpoint
Max Cool Flow Setpoint	Maximum cooling flow setpoint
Min Heat Flow Setpoint	Minimum flow setpoint when duct heater is active
Max Heat Flow Setpoint	Maximum flow setpoint during heating mode

Configuring the Calibration Points

From the **Calibration Points** table, the VAV flow calibration and flow setpoint can be configured.

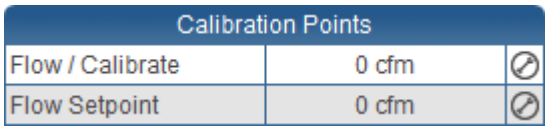


Figure 8: Calibration Points Table

Parameter	Description
Flow / Calibrate	The actual flow in cfm. When the value is sent to the VAV controller, the controller will automatically calibrate its flow reading and readjust the K-Factor.
Flow Setpoint	The actual flow setpoint.

Configuring the Damper

From the **Damper Configuration** table, the adjustment of the damper direction and damper initialization can be performed.

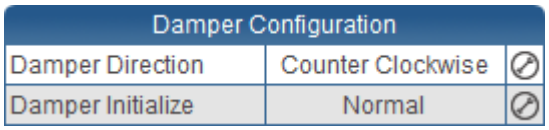


Figure 9: Damper Configuration

Parameter	Description
Damper Direction	Used to specify the direction (clockwise or counter clockwise) in which the actuator rotates to open the damper.
Damper Initialize	If the mechanical stops on the actuator have been moved to limit the range of movement of the damper, then the damper must be initialized. Setting the Damper Initialize parameter to True resets the damper position and calculates the total number of steps between the stops. To initialize the damper, click the Edit button. The status will change from Normal to Initializing during the initialization process.

The actuator mechanical stops should be moved only to limit damper movement from going under 0% or over 100%.

Configuring the Preloaded Applications

The VAV's preloaded applications can easily be configured from within EC-*gfx*Program. The configuration parameters related to a VAV box setup as well as its input and output settings are accessible through the **Configuration Assistant**.

To access the **Configuration Assistant** page:

1. In the Nav sidebar, right click the VAV you wish to configure and click **Launch Wizard**.

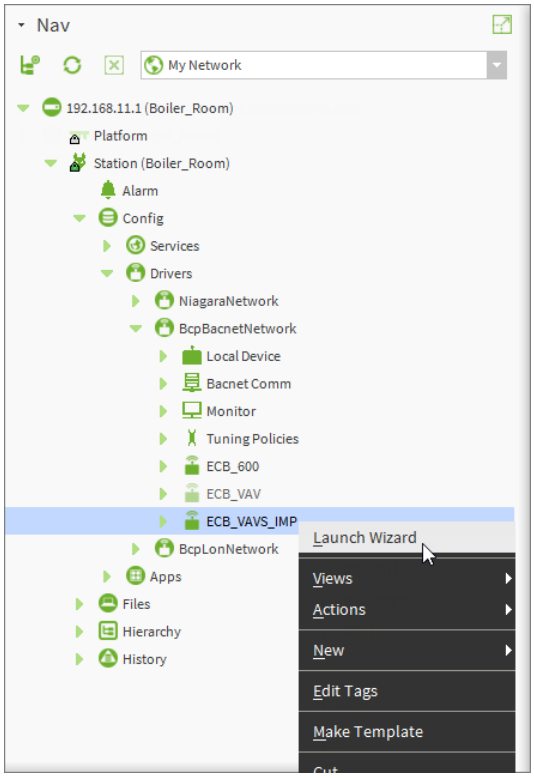


Figure 10: Launching Wizard from the Nav Sidebar

The **Configuration Assistant** page appears.

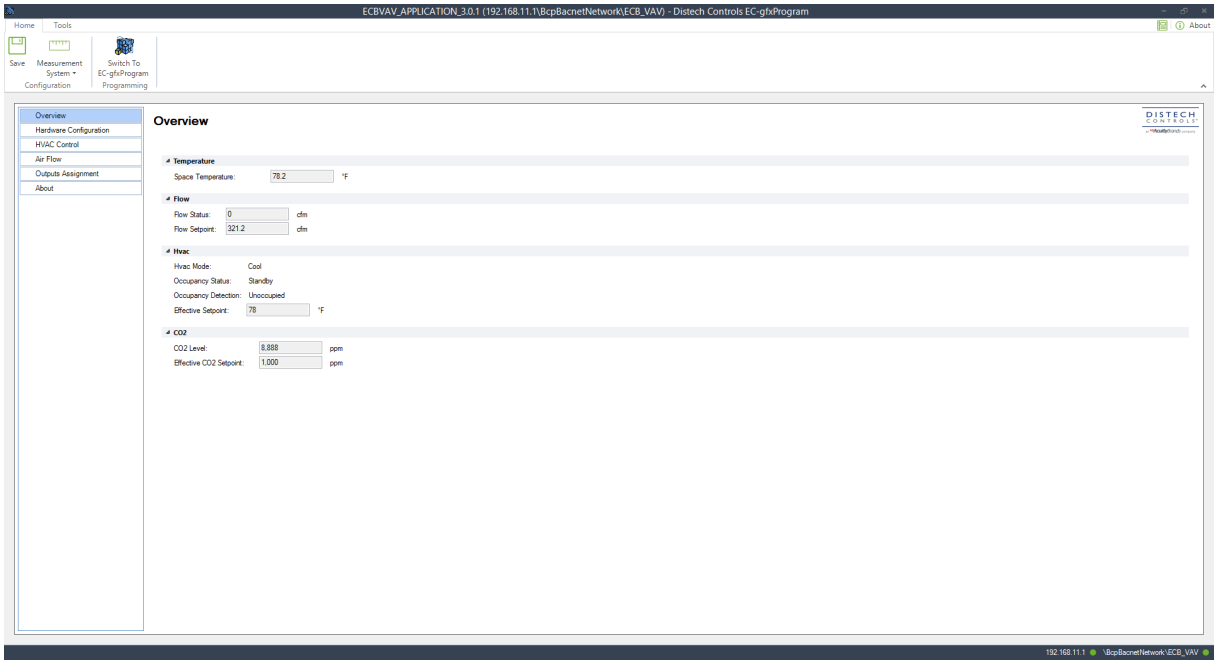


Figure 11: Configuration Assistant Page in EC-gfxProgram

Overview Tab

The **Overview** tab of the Configuration Assistant provides a user with a convenient location to view many general settings, such as setpoints and status.

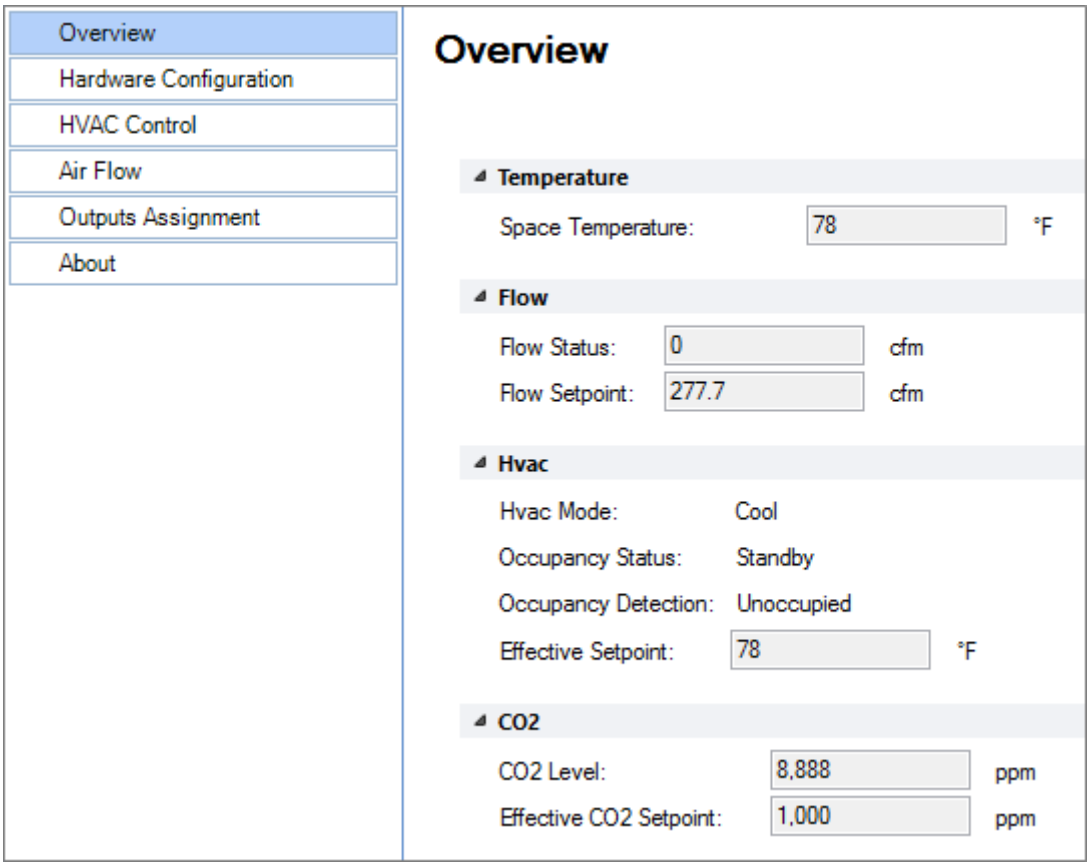


Figure 12: General Settings Overview

Hardware Configuration Tab

The **Hardware Configuration** tab includes Inputs, Outputs, Box, and Room Sensors configuration. A brief description of each type of configuration parameter is outlined below.

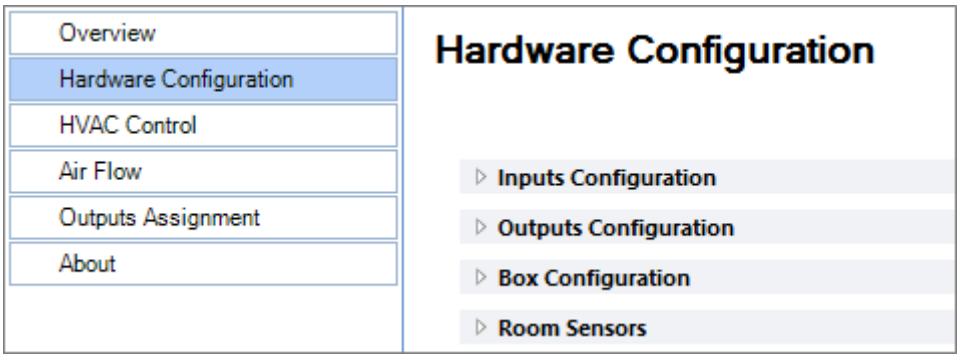
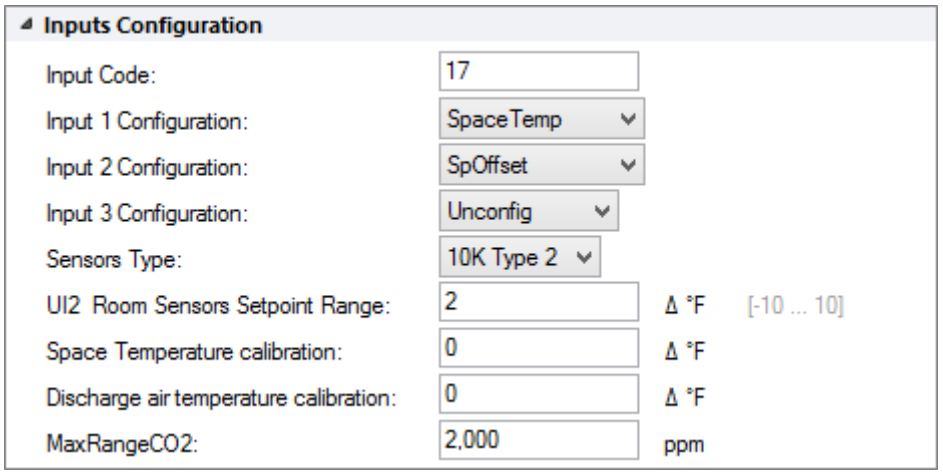


Figure 13: Hardware Configuration Tab

Configuring Input Parameters

All input configuration setpoint parameters are found in the **Inputs Configuration** subsection of the **Hardware Configuration** tab. The table below gives a brief description of each type of input configuration parameter.



Parameter	Description
Input 1 Configuration	**Unconfig** – Not configured. **SpaceTemp** – Room temperature sensor. **OccDetect** – Occupancy detection. **WindowContact** – Window contact.
Input 2 Configuration	**Unconfig** – Not configured. **DischargeTemp** – Discharge air temperature sensor. **OccDetect** – Occupancy detection. **WindowContact** – Window contact. **SpOffset** – Setpoint offset.
Input 3 Configuration	**Unconfig** – Not configured. **CO2 4-20mA** – 4-20mA CO_2 Sensor (0-2000 ppm). **CO2 0-5V** – 0-5V CO_2 Sensor (0-2000 ppm).
Sensors Type	**10K Type 2** **10K Type 3**
UI2 Room Sensors Setpoint Range	Set the universal input 2 (if configured in SpOffset) Allure EC-Smart-Vue and Allure EC-Smart-Comfort offset setpoint range (any value between -10.0 and 10.0).
Space Temperature Calibration Offset	Set the space temperature calibration offset.
Discharge Temperature Calibration	Set the discharge temperature calibration offset.
MaxRangeCO2	Set the maximum range for CO_2 input.

Configuring the Output Parameters

All output configuration setpoint parameters are found in the **Outputs Configuration** subsection of the **Hardware Configuration** tab. The table below gives a brief description of each type of configuration parameter.

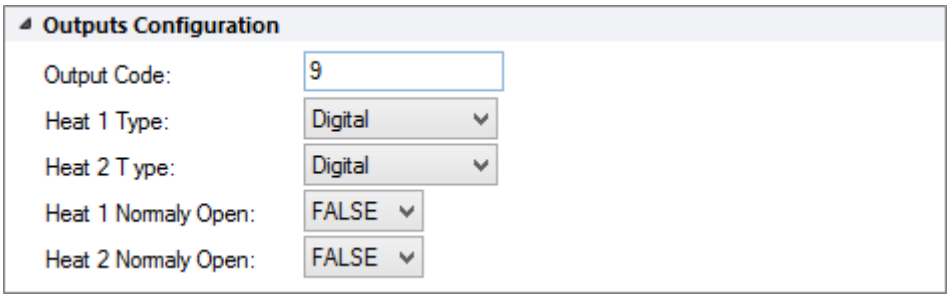


Figure 14: Outputs Configuration Subsection

Parameter	Description
Heat 1 Type	**None** **Digital** **PWM Triac** **PWM valve** **Thermal valve** **Analog 0-10V** **Analog 2-10V** **Floating valve**
Heat 2 Type	**None** **PWM Triac** **Digital** **PWM valve** **Thermal valve** **Analog 0-10V** **Analog 2-10V** **Floating valve**
Heat 1 Normally Open	Set the heat 1 type valve to normally open TRUE or normally open FALSE.
Heat 2 Normally Open	Set the heat 2 type valve to normally open TRUE or normally open FALSE.

Configuring the VAV Box

The **Box Configuration** subsection allows for configuration of the VAV box. The table below gives a brief description of each type of configuration parameter.

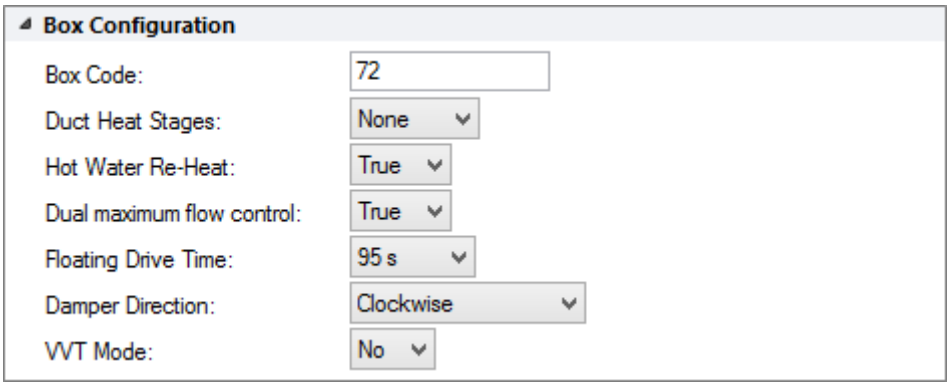


Figure 15: Box Configuration Subsection

Parameter	Description
Box Code	Input the VAV box code.
Duct Heat Stages	The number of duct heater reheat stages: **None** – No duct heater reheat) **3 stages** – Duct heater reheat on heat sources 1, 2, and 3) **2 stages** – Duct heater reheat on heat sources 1, and 2) **1 stage** – Duct heater reheat on heat source 1). If no duct heaters or only perimeter heat is required, set this variable to “None”. All heat types configured greater than Duct Heat Stages are considered perimeter heaters.
Hot Water Reheat	Duct heater reheat by hot water coil (True) or not (False).
Dual Maximum Flow Control	Determine whether the VAV box uses the dual maximum control settings or not. Note that if using the dual maximum option, a discharge temperature sensor is required.
Floating Drive Time	The floating valve drive time which can be set to 25, 30, 50, 60, 95, 125, or 150 seconds or to a custom float time. The custom float time is then manually set in the Custom Floating Drive Time parameter.
Damper Direction	The direction in which the actuator rotates to open the damper (clockwise or counter clockwise).
VVT Mode	Determine whether the VAV box is using flow input or not.

Configuring Room Sensors

Allure EC-Smart-Vue and Allure EC-Smart-Comfort or EC-Smart-Air configuration setpoint parameters are found in the **Room Sensors** subsection of the **Hardware Configuration** tab. The table below gives a brief description of each type of configuration parameter.

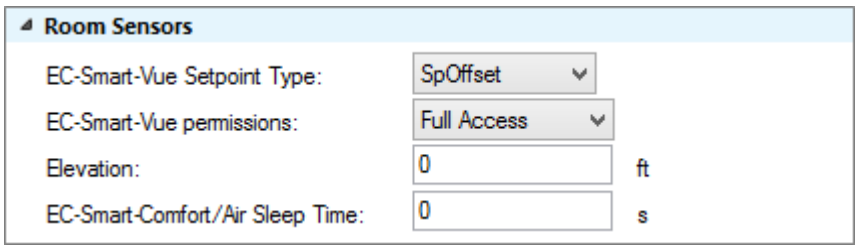


Figure 16: Room Sensors Configuration Subsection

Parameter	Description
EC-Smart-Vue Permissions	Defines how much access a user of the Allure EC-Smart-Vue has to the controller’s configuration parameters. The Allure EC-Smart-Vue access ranges from full access to limited access or no access at all. Limited access allows setpoint adjustment only or setpoint adjustment and airflow balancing. Regardless of the access level of the Allure EC-Smart-Vue, the controller’s configuration parameters cannot be modified through the Allure EC-Smart-Vue except after a password is entered.
EC-Smart-Vue Setpoint Type	Set the EC-Smart-Vue setpoint control to either SpOffset (room temperature setpoint offset) or Cool Heat SP (cooling and heating dual setpoint).
Elevation	For accurate CO_2 concentration levels, input geographic elevation here if elevation is greater than 500ft (152m) above sea level. By default, the sensor is factory calibrated to sea level.
EC-Smart-Comfort/Air Sleep Time	Enter the amount of time before the sensor goes into standby mode.

HVAC Control Tab

The **HVAC Control** tab allows a user to configure System, Setpoints, Heat Control, and Miscellaneous parameters. A brief description of each type of configuration parameter is outlined below.

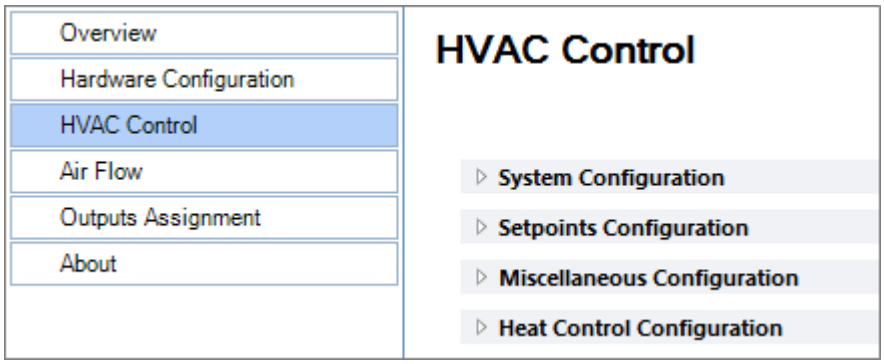


Figure 17: HVAC Control Tab

Configuring the System Parameters

In the System Configuration subsection, general controller parameters are set such as the changeover delay, bypass mode override time, and terminal load scaling factors. The table below describes each of these parameters

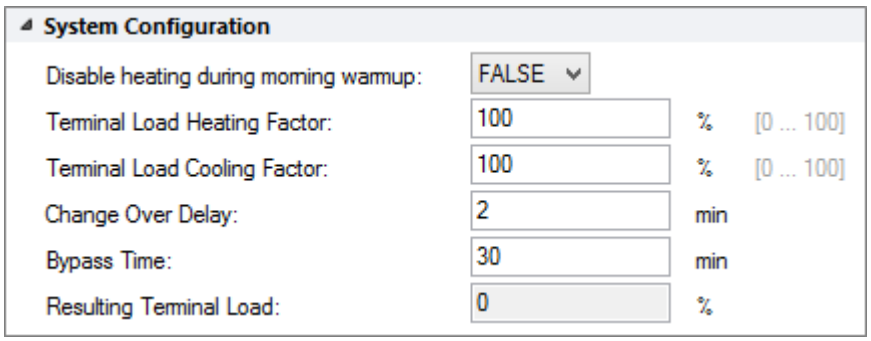


Figure 18: System Configuration Subsection

Parameter	Description
Disable Heating During Morning Warmup	Disables perimeter and duct heating during morning warmup. The morning warmup mode is used to preheat the building so that when building occupants enter the building in the morning, the temperature is already at or close to the occupied heating setpoint. Morning warmup assumes that there is warm air in the duct. When there is a demand for heating during morning warmup, the damper is opened (however, never more than the maximum flow).
Terminal Load Heating Factor	A priority setting parameter for the terminal load factor when the controller is in heating mode. The controller scales the heating requirement of the terminal load based on the terminal load heating factor and then applies the result to the terminal load factor.
Terminal Load Cooling Factor	A priority setting parameter for the terminal load factor when the controller is in cooling mode. The controller scales the cooling requirement of the terminal load based on the terminal load cooling factor and then applies the result to the terminal load factor.
Change Over Delay	Defines the minimum time during which heating must be OFF before cooling can be turned ON as well as the minimum time during which cooling must be OFF before heating turns ON. This parameter prevents the system from continuously oscillating between heating and cooling modes.
Bypass Time	The duration of time the controller remains in bypass mode when changed from standby or unoccupied modes. In addition, if a motion sensor is present, the bypass mode override time represents how long the controller remains in occupied mode (no room occupancy is detected) before returning the controller to standby mode.
Resulting Terminal Load	Displays the resulting terminal load on the unit.

Configuring Space Temperature Settings

The **Setpoints Configuration** subsection contains the heating and cooling setpoints for the occupied, standby and unoccupied modes. The table below gives a brief description of each type of setpoint.

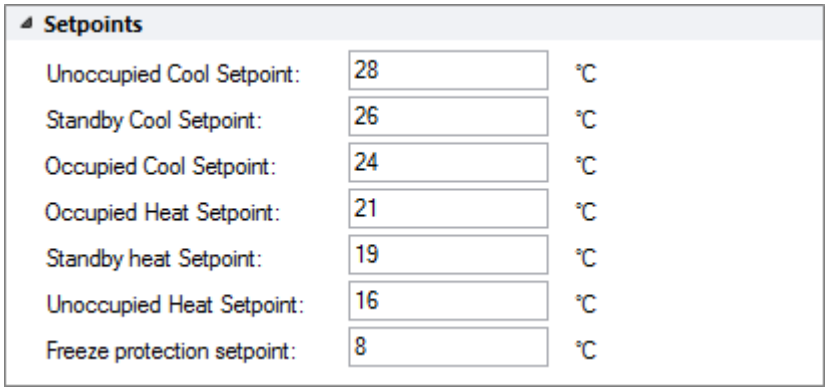


Figure 19: Setpoints Configuration Subsection

Setpoint (heating/cooling)	Description
Occupied	The limits between which the temperature is to be maintained by the controller when it is in Occupied mode. This temperature range should be comfortable to building occupants.
Standby	The limits between which the temperature is to be maintained by the controller when it is in Standby mode. In Standby mode, the temperature is usually allowed a larger amount of variance than in Occupied mode. Still, it is maintained at a value close enough to the occupied setpoints so that it can be varied quickly for occupancy.
Unoccupied	The limits between which the temperature is to be maintained by the controller when it is in Unoccupied mode. If the temperature passes these limits, the system reacts to bring the temperature back within these limits. In Unoccupied mode, the space temperature is usually allowed a larger amount of variance than in Occupied mode, thereby lowering operating costs.

Configuring Miscellaneous Parameters

The **Miscellaneous Configuration** subsection groups two miscellaneous parameters that are also used to configure the VAV's preloaded applications.

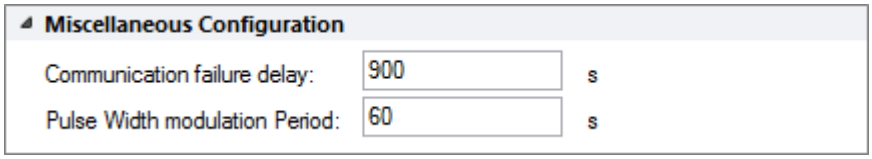


Figure 20: Miscellaneous Configuration Subsection

Parameter	Description
Communication Failure Delay	Set the delay in seconds in case of communication failure (120 seconds or more is allowed).
Pulse Width Modulation Period (Triac)	Set the triac pulse width modulation period. This is relevant to the heat type output code when it is set to PWM Triac.

Configuring Heat Control

The **Heat Configuration** subsection permits the configuration of the heat control settings. The heat priority can be set as well as several maximum limits related to heat control.

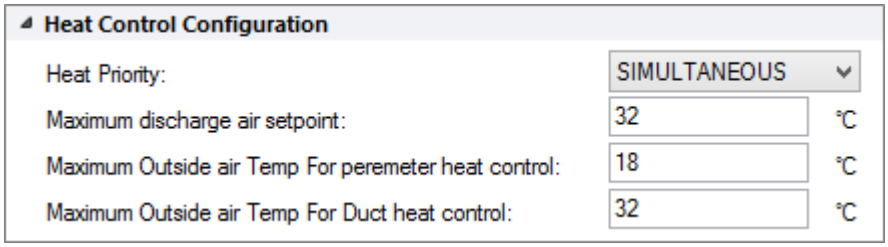


Figure 21: Heat Control Configuration Subsection

Parameter	Description
Heat Priority	The order in which heating equipment connected to the controller is turned ON. Three options are available: **Duct Heater** – Duct heating is activated first, then perimeter heating (depending on the heating demand). **Perimeter Heat** – Perimeter heating is activated first, then duct heating (depending on the heating demand). **Simultaneous** - Duct and perimeter heating are activated simultaneously.
Maximum Discharge Air Setpoint	The maximum discharge air temperature setpoint. In heating mode, the duct heater is limited when the discharge air temperature reaches this maximum setpoint. If the dual maximum option is enabled, the actual airflow setpoint is reset between 13°C (55°F) and the maximum discharge air setpoint by the heating load.
Maximum Outside Air Temp for Perimeter Heat Control	Perimeter heating is disabled when the outdoor temperature exceeds this parameter. Similar to the “maximum outside temp for duct heater control,” the “maximum outside temp for perimeter heat control” helps reduce energy costs by limiting heat consumption when it is relatively warm outside.
Maximum Outside Air Temp for Duct Heater Control	Duct heating is disabled when the outdoor temperature exceeds this parameter. This parameter ensures that the HVAC system is not heating the building more than necessary when the outdoor temperature exceeds certain temperatures limits. In general, this feature reduces energy costs by ensuring that the heating is not enabled when it is relatively warm outside.

Air Flow Tab (VAV Balancing)

The **Air Flow** tab allows a user to configure a damper box, calibrate a VAV box, and configure flow setpoints. A brief description of each type of configuration parameter is outlined below.

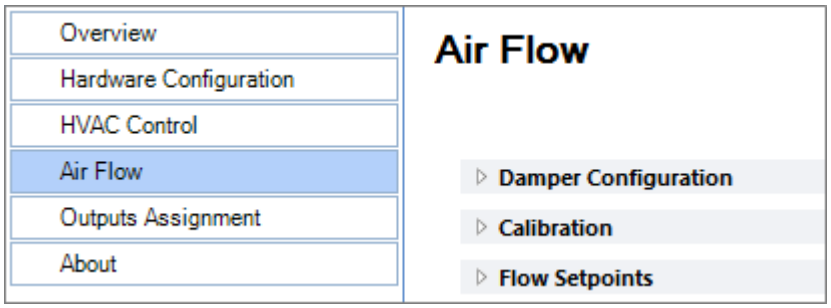


Figure 22: Air Flow Tab

Configuring the Damper

The **Damper Configuration** subsection contains several configuration parameters that control the damper's behaviour. For example, the damper response, speed, and direction can be set. In addition, the damper's position can be overridden. The table below describes all the parameters related to the damper configuration.

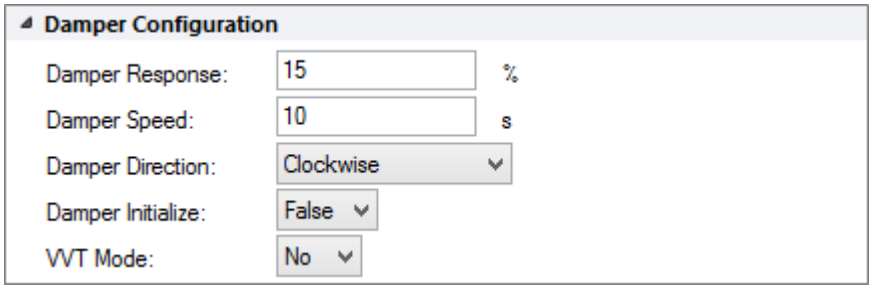


Figure 23: Damper Configuration Subsection

Parameter	Description
Damper Response	A multiplier (in %) applied to the calculated damper movement. It is used to adjust the reaction speed of the damper. The valid damper response range is from 5 to 100%. E.g. Say the VAV determines that the damper should move 25% to achieve the desired flow setpoint. If the damper response is set to 40%, the damper initially moves 10% (25% X 40%). Then, the damper pauses and a new calculation is made to determine how much more it should be moved. This iterative process prevents the damper from overshooting and prevents hunting (oscillations). Minimizing hunting reduces wear on the damper actuator and also minimizes irregular flow.
Damper Speed	Used to specify the time that the damper takes to go from the fully closed position to the fully open position or vice-versa. This parameter can be set between 45 seconds and 95 seconds. However, it is recommended to use the default value of 95 seconds for the built-in actuator. For the built-in actuator in normal control, the lower the damper speed is set, the faster the actuator moves from fully open to fully closed and vice versa. Likewise, the higher the damper speed is set, the slower the actuator moves from fully open to fully closed and vice versa.
Damper Direction	Used to specify the direction (clockwise or counter clockwise) in which the actuator rotates to open the damper.
Damper Initialize	If the mechanical stops on the actuator have been moved to limit the range of movement of the damper, then the damper must be initialized. Setting the Damper Initialize parameter to True resets the damper position and calculates the total number of steps between the stops. To initialize the damper, click the Edit button. The status will change from Normal to Initializing during the initialization process.
VVT Mode	Determine whether the VAV box is using flow input or not.

The actuator mechanical stops should be moved only to limit damper movement from going under 0% or over 100%.

Air Flow Calibration (VAV Balancing)

From the **Calibration** subsection, the VAV airflow balancing procedure can be carried out.

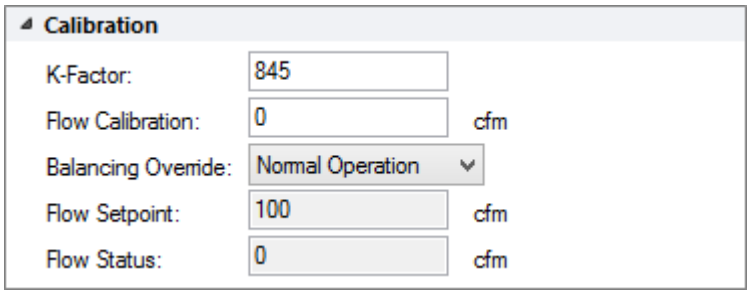


Figure 24: Calibration Subsection

Parameter	Description
K-Factor	The actual flow required to generate 1” WC (in CFM) or 1 Pa (in L/s).
Flow Calibration	The actual flow. When the value is sent to the VAV controller, the controller will automatically calibrate its flow reading and readjust the K-Factor.
Balancing Override	The balancing override setting. Different values can be selected: normal, minimum flow, minimum flow heat, minimum flow cool, 75% maximum flow, 80% maximum flow, 85% maximum flow, 90% maximum flow, 95% maximum flow, damper full open, damper full close, and damper initialization.
Flow Setpoint	Displays the actual flow setpoint (read-only).
Flow Status	Displays the airflow status.

The following steps outline the procedure for balancing a VAV controller:

1. Enter the VAV box’s K-Factor.

The K-Factor can be acquired from the VAV box manufacturer. The table below shows what the K-Factor represents in both Imperial and SI Units.

Units	What the K-Factor represents	
Imperial	Airflow (in cfm) at 1” WC	
SI	Airflow (L/s) at 1 Pa	Airflow (m^3/h) at 1 Pa

2. Override the flow setpoint. To do so, click the Edit button next to the **Flow Setpoint** on the EC-Net 4 configuration PX page and modify it by selecting a relatively high setpoint. You can also modify it using the **Balancing Override** setting to automatically set the flow setpoint to a predefined flow. Monitor the current flow until it stabilizes.
3. Using a flow hood, measure the actual airflow. Enter this measurement in the box beside Flow Calibration. The K-Factor gets adjusted based on the airflow value just entered.
4. Release the flow setpoint override by clicking the Edit button beside Flow Setpoint on the EC-Net 4 configuration PX page. Alternatively, return the **Balancing Override** setting to Normal Operation.

At this point, the VAV controller is balanced. The adjusted K-Factor can be included in the balancing report.

Setting Flow Setpoints

From the **Flow Setpoints** subsection, the flow setpoints can be set.

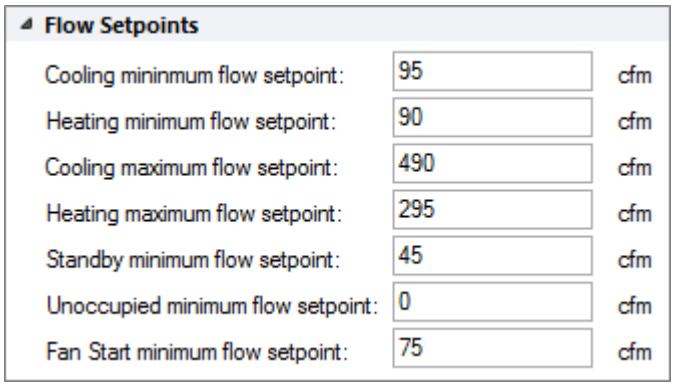


Figure 25: Flow Setpoints Subsection

The following table describes the airflow setpoint parameters that can be configured.

Parameter	Description
Cooling Minumum Flow Setpoint	Minimum cooling flow setpoint
Heating Minumum Flow Setpoint	Minimum flow setpoint when duct heater is active
Cooling Maximum Flow Setpoint	Maximum cooling flow setpoint
Heating Maximum Flow Setpoint	Maximum flow setpoint during heating mode
Standby Minimum Flow Setpoint	Minimum flow setpoint during standby mode
Unoccupied Minimum Flow Setpoint	Minimum flow setpoint during unoccupied mode
Fan Start Minimum Flow Setpoint[1]	Parallel fan flow setpoint

1. Applicable to a parallel fan powered VAV

Output Assignment

The Output Assignment tab indicates which physical outputs are assigned to the configured outputs based on the Outputs Configuration in the Hardware Configuration tab. This facilitates output wiring.

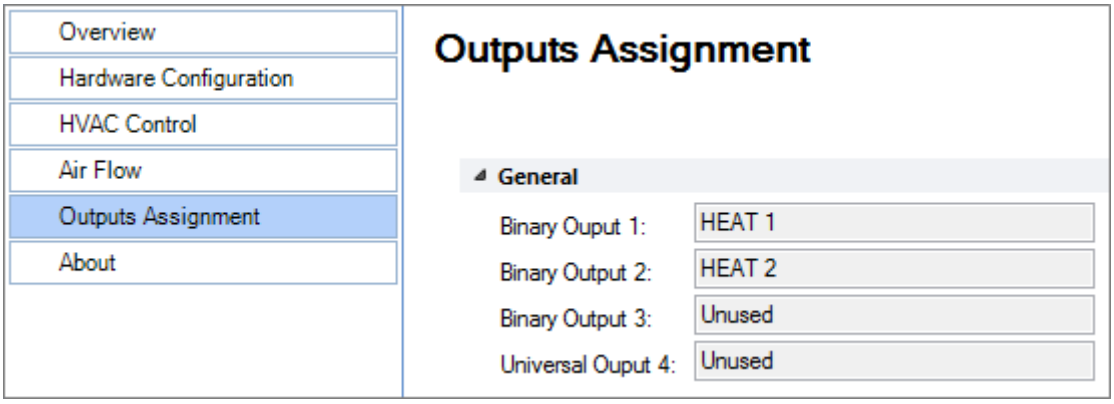


Figure 26: Outputs Assignment Subsection

Saving to Multiple Devices

To save your settings to multiple devices, click on the save icon  in the Configuration Assistant ribbon. The Configuration Assistant Synchronization window will appear.

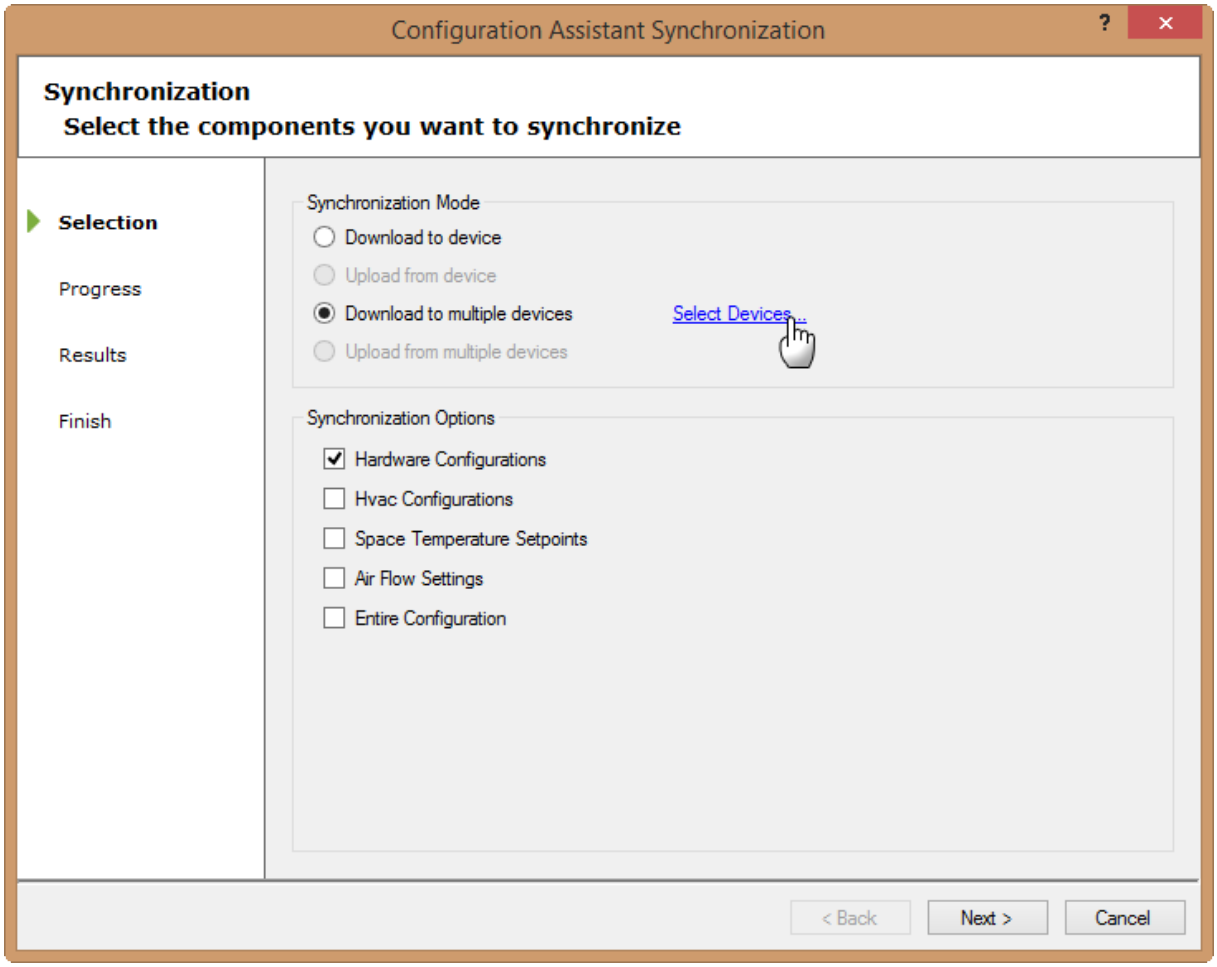


Figure 27: Configuration Assistant Synchronization window

You must select the other devices you wish to save the current configuration to, as well as selecting which parameters you wish saved to those controllers. Click next to advance and complete the process.

Setting Up Trends

The dc *gfx*Applications comes with two preconfigured graphs that show two trends: space temperature and effective setpoint. To enable these two trends, refer to the following procedure:

1. In the Nav tree of EC-Net Pro, expand the **Services** folder of the configured station.
2. Double-click **HistoryService**.

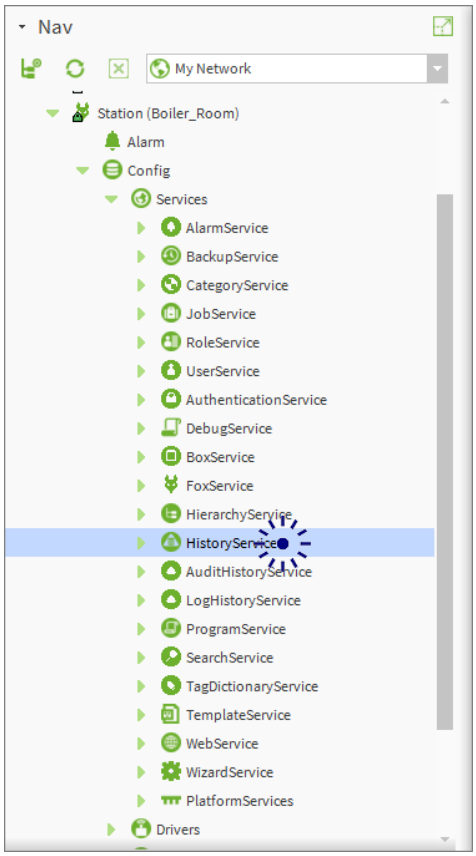


Figure 28: Double-clicking HistoryService

The **History Extension Manager** appears in the View pane.

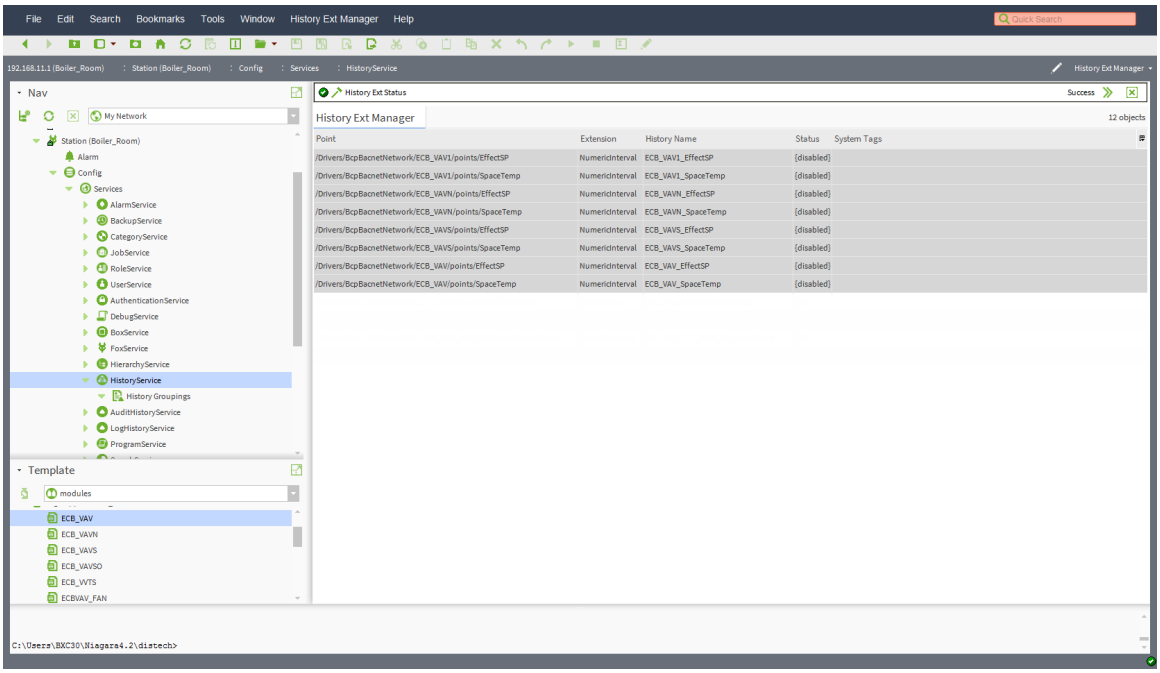


Figure 29: History Extension Manager

The History Extension Manager displays the history-related extensions of all the controllers in the **BcpBacnetNetwork** driver. Of interest are the Numeric Interval extensions of the SpaceTemp and EffectSP points of the VAV controllers, which appear greyed out.

3. Select the greyed out Numeric Interval extensions of the SpaceTemp and EffectSP points corresponding to the VAV controllers whose trends are to be enabled.
4. Right-click the selected entries. A menu appears.

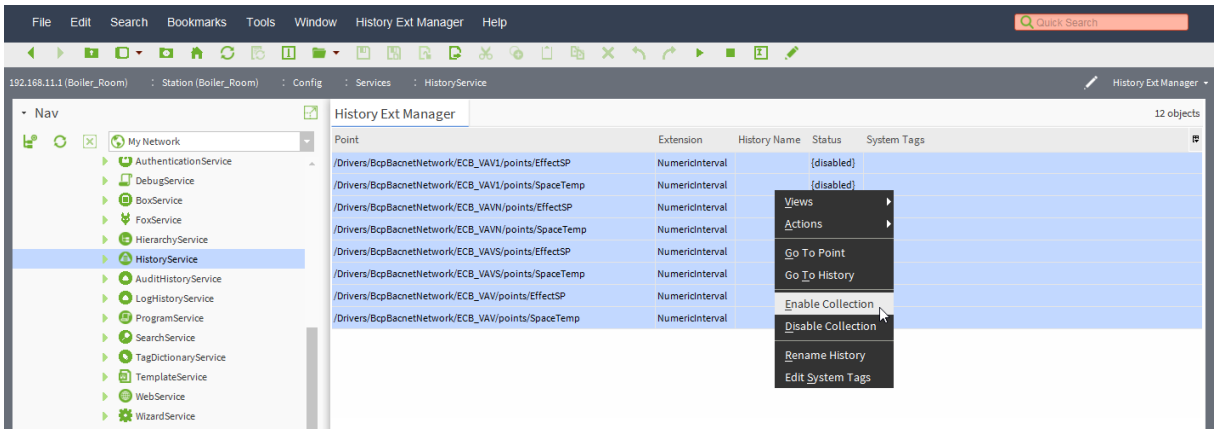


Figure 30: Enabling Numeric Interval Extensions

5. Click **Enable Collection**. The selected extensions get enabled and the histories of their corresponding points start getting collected.

Graphs of the collected data can be viewed in the **Trends** page of the dc *gfx*Applications interface. This page can easily be accessed from the VAV navigation menu located at the bottom of the dc *gfx*Applications interface.

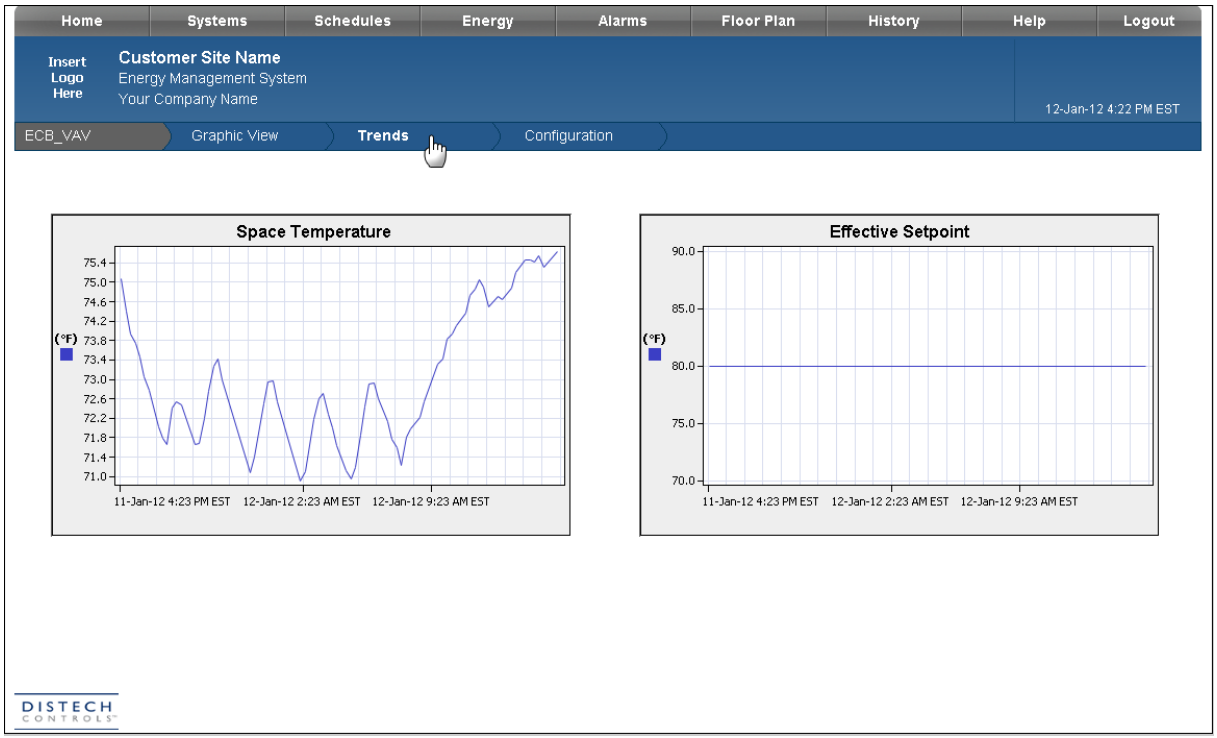


Figure 31: Trends Page

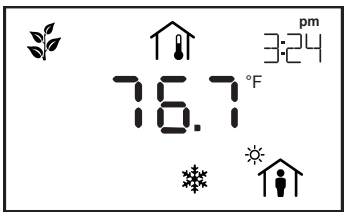
Allure EC-Smart-Vue Screen-by-Screen Guide

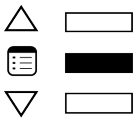
Adjusting the Setpoints and Display Units

When a controller is in occupied or bypass mode, the active setpoint can be adjusted using the Allure EC-Smart-Vue's arrow keys. Alternatively, the heating and cooling setpoints can be adjusted from the sensor's User menu. The User menu also allows modifying the display units. The User menu is not password protected.

To enter into the User menu and make changes to the setpoints or display units:

1. Press the **Menu** button once.

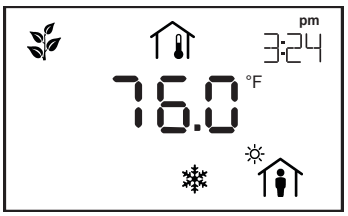


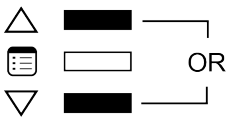


Screen timeout: none

The cooling setpoint starts blinking.

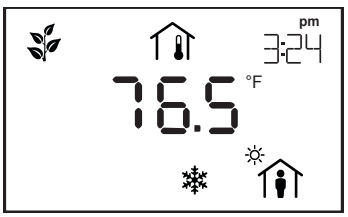
2. Use the arrow keys to increase or decrease the cooling setpoint.

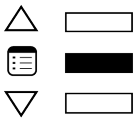




Screen timeout: 3 sec

3. Press the **Menu** button to submit the new cooling setpoint.

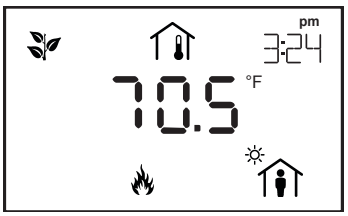


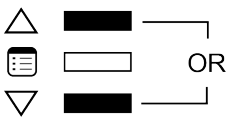


Screen timeout: 3 sec

The heating setpoint starts blinking.

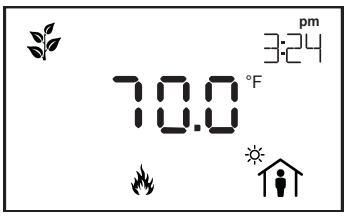
4. Use the arrow keys to increase or decrease the heating setpoint.

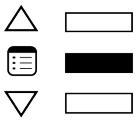




Screen timeout: 3 sec

5. Press the **Menu** button to submit the new heating setpoint.

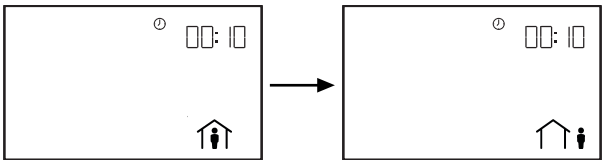




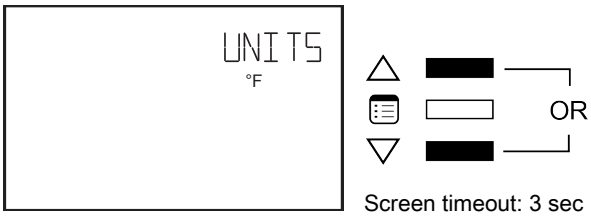
Screen timeout: 3 sec

If the controller is in occupied mode, the Units submenu appears. Otherwise, the Bypass submenu appears with the option to manually end the bypass mode. After the Bypass submenu, the Units submenu appears.

To manually end the bypass mode, press on one of the arrow keys to modify the occupancy icon on the screen. Then press the **Menu** button.

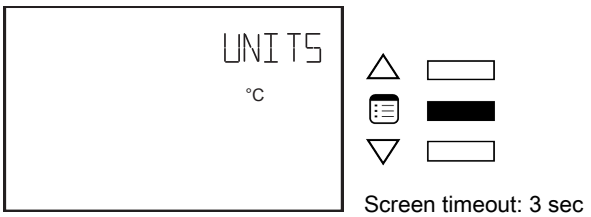


6. Use the arrow keys to select the temperature display units.



Screen timeout: 3 sec

7. Press the **Menu** button to submit the selected display unit.

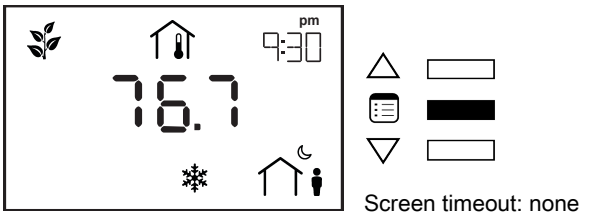


Screen timeout: 3 sec

How to Put a Controller Into Bypass Mode

To change a controller's occupancy mode from standby or unoccupied to bypass mode:

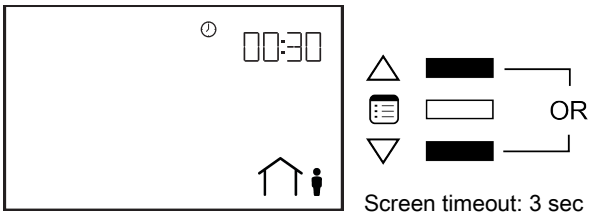
1. Press the **Menu** button once.



Screen timeout: none

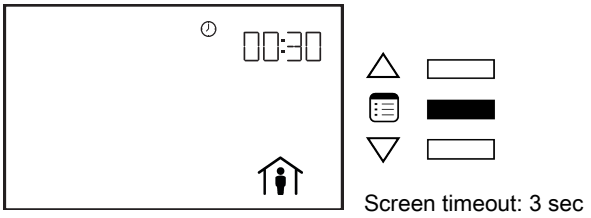
The Bypass submenu appears.

2. Press on one of the arrow keys to modify the occupancy icon on the screen.



Screen timeout: 3 sec

3. Press the **Menu** button.



Screen timeout: 3 sec

The controller goes into bypass mode. When in bypass mode, the Allure EC-Smart-Vue screen displays the current time and also the remaining bypass time.

Setting up the Parameters and Calibrating the Sensor

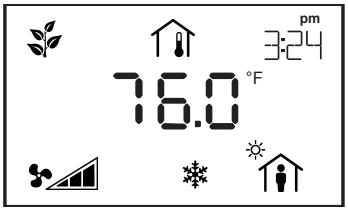
From the Allure EC-Smart-Vue's General Configuration submenu, the sensor's subnet ID can be set. In addition, other functions can be carried out such as calibrating the Allure EC-Smart-Vue's space temperature and humidity sensor, verifying the Device ID and adjusting the screen contrast.

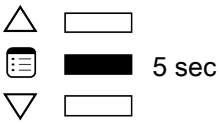
This procedure also allows you to calibrate the humidity sensor if your Allure EC-Smart-Vue is equipped with this option.

How to Enter the General Configuration Submenu

To enter the advanced menus:

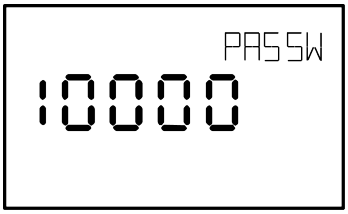
1. Hold the **Menu** button for five seconds:

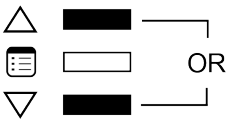




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

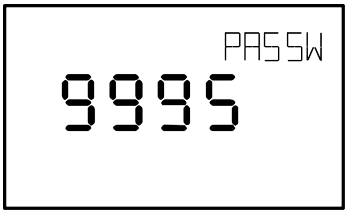


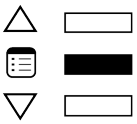


Screen timeout: 15 s

By default, the password is 9995.

3. Press the **Menu** button to submit the password.

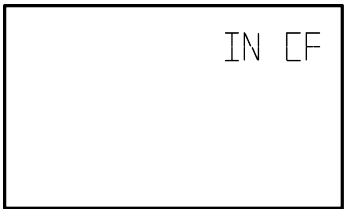


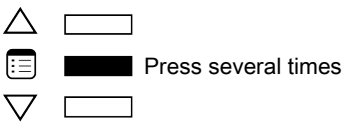


Screen timeout: 15 s

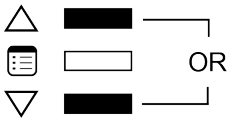
Upon submitting the correct password, the advanced menu is displayed.

4. Press the **Menu** button several times until GEN CFG appears on the display.



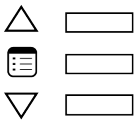


5. Press either of the arrow keys to enter the General Configuration submenu.



Screen timeout: 30 s

Upon entering the general configuration submenu, the MAC ADDRESS parameter is displayed.



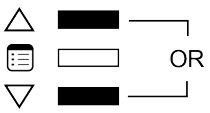
Screen timeout: 30 s

How to Set the BACnet MS/TP Communication Network Parameters

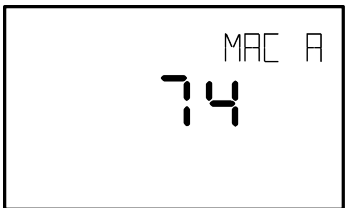
The Allure EC-Smart-Vue can be used to set the controller's BACnet MAC address and baud rate. In doing so, the Allure EC-Smart-Vue must have a subnet ID of 1.

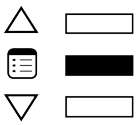
To set up the network parameters:

1. Use the arrow keys to enter the controller's MAC address.



2. Press the **Menu** button to submit the MAC address.

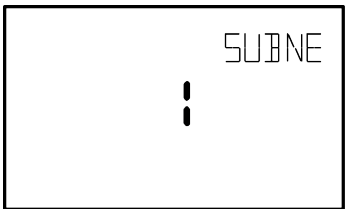


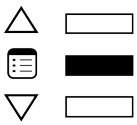


Screen timeout: 30 s

The Allure EC-Smart-Vue's subnet ID of 1 appears on the display.

3. Press the **Menu** button once to move onto the next parameter.

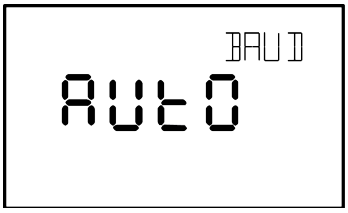


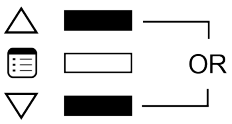


Screen timeout: 30 s

The Baud Rate parameter appears on the display.

4. Use the arrow keys to set the baud rate.

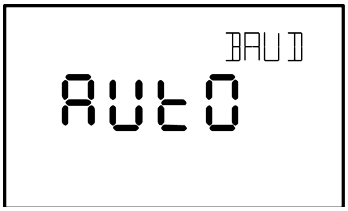




Screen timeout: 30 s

Keep in mind that the all devices on the data bus must be set to the same baud rate. Typically, the baud rate is set at the router level. Therefore, it is recommended to set the baud rate to AUTO so that the baud rate being used on the data bus is automatically detected and applied to the controller accordingly.

5. Press the **Menu** button to submit the baud rate.



Screen timeout: 30 s

The Allure EC-Smart-Vue hardware information appears on the display.

6. Press the **Menu** button once you have finished viewing the Device ID.

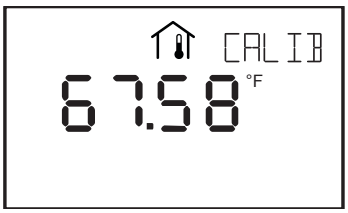
Screen timeout: 30 s

The Allure EC-Smart-Vue's hardware information may be required by Distech Controls Technical Support for troubleshooting purposes.

How to Calibrate the Sensor and Adjust the Screen Contrast

The General Configuration submenu also allows the calibration of the Allure EC-Smart-Vue's space temperature sensor or humidity sensor (if equipped) and adjustment of the screen contrast. To perform these two functions:

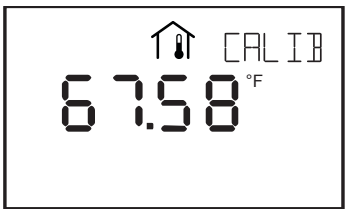
1. In the GEN CFG submenu, navigate to the Calibration parameter.

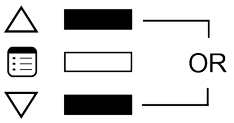


Screen timeout: 30 s

The screen displays the current indoor space temperature.

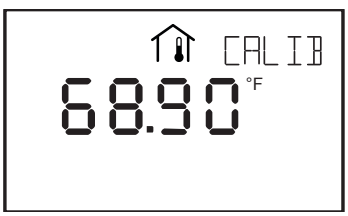
2. Use the arrow keys to modify this reading to make it match that measured by the reference temperature sensor.





Screen timeout: 30 s

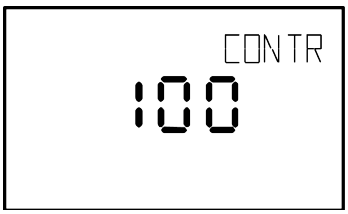
3. Press the **Menu** button to submit the calibrated temperature reading.

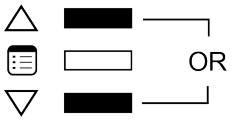


Screen timeout: 30 s

Once you make your entry, humidity sensor calibration will appear if your EC-Smart-Vue model is equipped with one. Otherwise Contrast parameter appears.

Use the arrow keys to adjust the screen contrast.

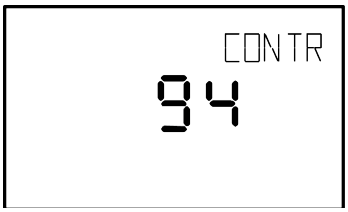


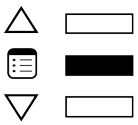


Screen timeout: 30 s

The Contrast parameter ranges from 0 to 100, where smaller values give a dimmer contrast than larger ones.

4. Press the **Menu** button to submit the new contrast level.



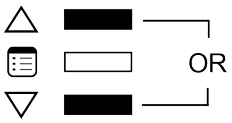


Screen timeout: 30 s

The screen contrast changes according to the new value submitted.

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



Screen timeout: 30 s

□ Press and hold the **Menu** button for 5 seconds.

Configuring the VAV

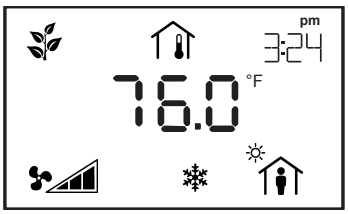
The VAV configuration parameters of an ECB-VAVS controller can be found in the VAV Configuration submenu of the Advanced menu. Through this submenu, various selections can be made, such as a controller's fan powered box type, number of duct heater reheat stages, and VVT operation mode.

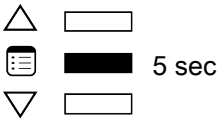
The following instructions explain how to configure a controller's VAV parameters one by one. For instructions on how to configure them all at once using configuration codes, see Procedure for Submitting New Configuration Codes using an Allure EC-Smart-Vue

How to enter the VAV Configuration submenu and select a controller's VAV parameters

To enter the advanced menus:

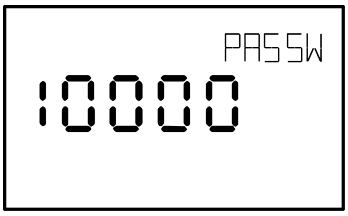
1. Hold the **Menu** button for five seconds:

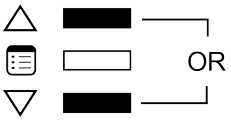




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

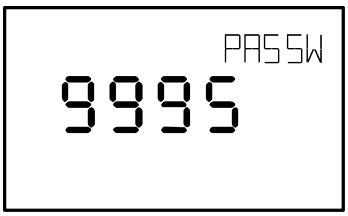


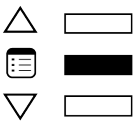


Screen timeout: 15 s

By default, the password is 9995.

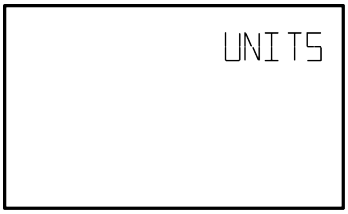
3. Press the **Menu** button to submit the password.

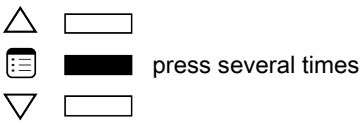




Screen timeout: 15 s

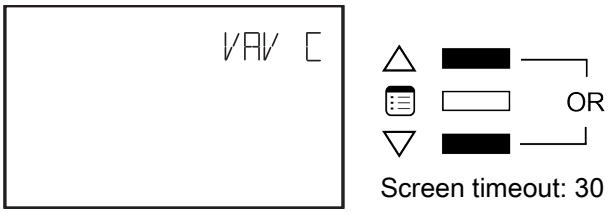
Upon submitting the correct password, the advanced menu is displayed.





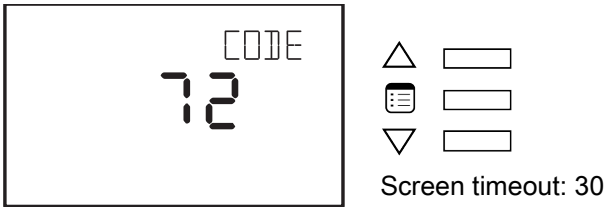
Screen timeout: 15 s

4. Press the **Menu** button several times until VAV CFG appears on the display.



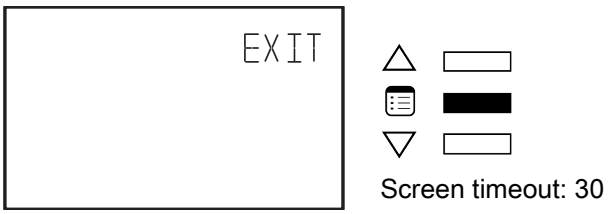
Screen timeout: 30 s

Upon entering the VAV Configuration submenu, the Code parameter appears.



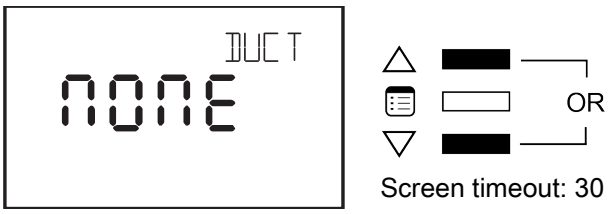
Screen timeout: 30 s

5. To scroll between the different parameters in the VAV Configuration submenu, press the **Menu** button.



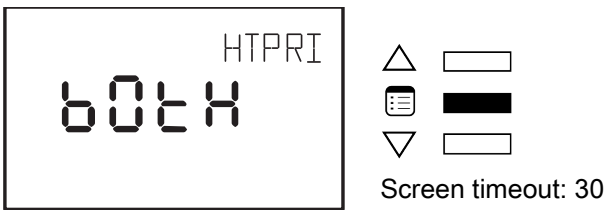
Screen timeout: 30 s

6. To modify a parameter, use the arrow keys.



Screen timeout: 30 s

7. To submit a modified parameter, press the **Menu** button. The next VAV Configuration submenu parameter is displayed.

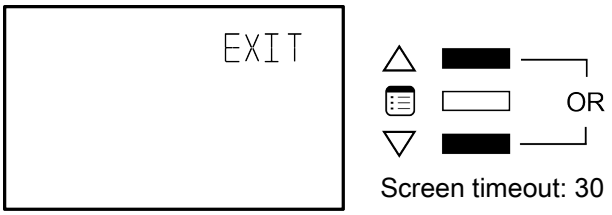


Screen timeout: 30 s

For more information refer to *Configuration parameters for the VAV series*

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



Screen timeout: 30 s

□ Press and hold the **Menu** button for 5 seconds.

Configuration Parameters for the VAV

Parameter		Valid Choices			Descriptions
CODE	VAV Box Code				VAV Box Configuration Code Entry
DUCT HT	Duct Heater Stages	1	nonE	NONE	No Duct Heater Reheat
		2	1 St	1 ST	Duct Heater Reheat on Heat Source 1
		3	2 St	2 St	Duct Heater Reheat on Heat Sources 1 & 2
HTPRIO	Heat Priority	1	duCt	DUCT	Duct Heating 1st
		2	PEri	PERI	Perimeter Heating 1st
		3	bOtH	BOTH	Both Heating Simultaneously
DUAL MAX	Dual Maximum Flow Control	1	no	NO	Box is not using Dual Maximum Control Settings
		2	YES	YES	Box is using Dual Maximum Control Settings
HWREHEAT	Hot Water Reheat	1	no	NO	Duct Heater is not Hot Water Coil
		2	YES	YES	Duct Heater Reheat by Hot Water Coil
VVTMODE	VVT Mode	1	no	NO	Box is using Flow Input
		2	YES	YES	Box is not Using Flow Input
FLOATVLV	Floating Valve Drive Time		Edit	EDIT	
		1	95 S		95 seconds drive time
		2	125 S		125 seconds drive time
		3	150 S		150 seconds drive time
		4	25 S		25 seconds drive time
		5	30 S		30 seconds drive time
		6	50 S		50 seconds drive time
		7	60 S		60 seconds drive time
		8	Custom		Drive time controlled by CustomFloatTime
PWMVLV	Pule Width Modulation Valve Period	1	25.5	25.5	0.1 to 25.5 seconds
		2	5.2	5.2	0.1 to 5.2 seconds

Setting up Inputs

A controller's inputs can be configured through the Input Configuration submenu of the Advanced menu.

The table below shows how many universal inputs are available.

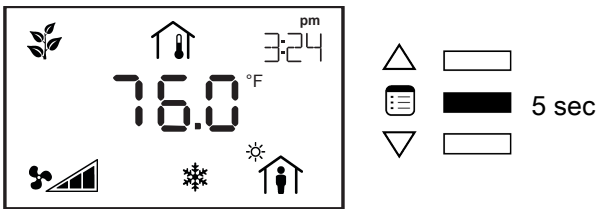
Model	Universal Inputs
ECB-VAVS	3

The following procedure explains how to configure the inputs one by one. For instructions on how to configure them all at once using configuration codes, see *Procedure for Submitting New Configuration Codes using an Allure EC-Smart-Vue*.

How to enter the Input Configuration submenu and configure the inputs

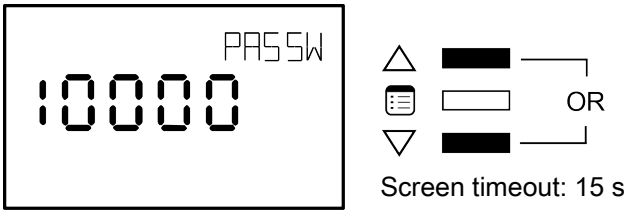
To enter the advanced menus:

1. Hold the **Menu** button for five seconds:



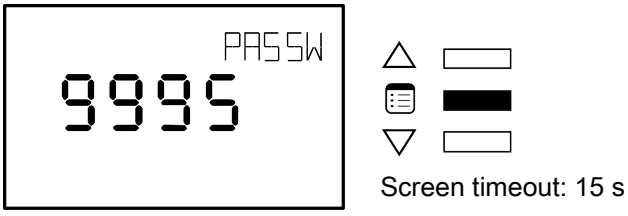
The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

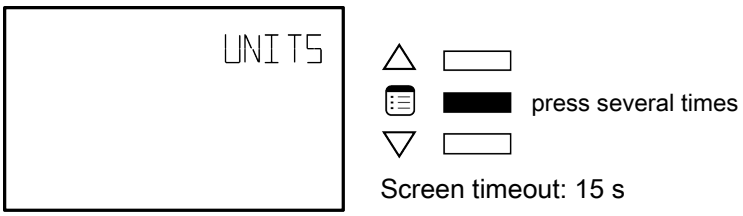


By default, the password is 9995.

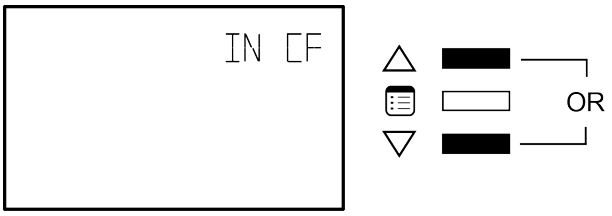
3. Press the **Menu** button to submit the password.



Upon submitting the correct password, the advanced menu is displayed.

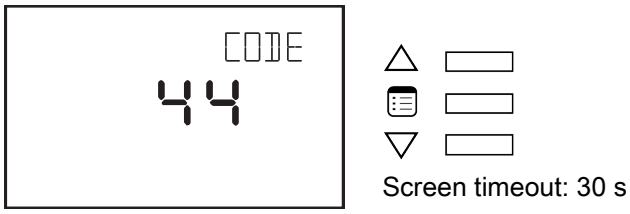


4. Press the **Menu** button several times until *IN CFG* appears on the display.

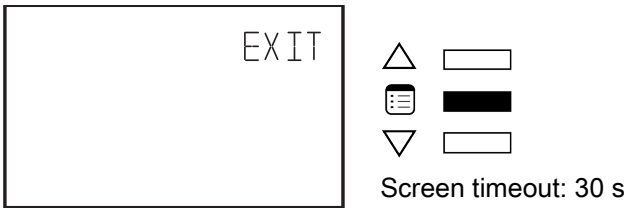


5. Press either of the arrow keys to enter the Input Configuration submenu.

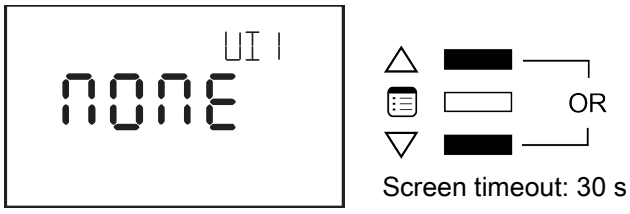
Upon entering the Input Configuration submenu, the Code parameter appears.



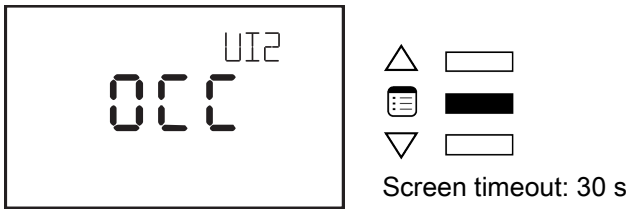
6. To scroll between the different parameters in the Input Configuration submenu, press the **Menu** button.



7. To modify a parameter, use the arrow keys.



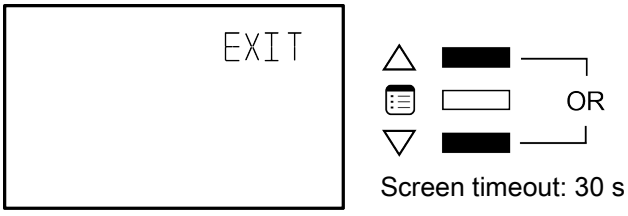
8. To submit a modified parameter, press the **Menu** button. The next Input Configuration submenu parameter is displayed.



There are between three to five parameters to be configured, depending on the controller model. The following table shows all the available input types for each controller input.

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



□ Press and hold the **Menu** button for 5 seconds.

Input Configuration for the VAV

Input		Input Types			Descriptions
CODE	VAV Input Config Code				VAV Input Configuration Code Entry
UI1	Universal Input 1	1	NONE	NONE	Not Configured
		2	SPAC	SPAC	Room Temperature Sensor
		3	OCC	OCC	Occupancy Detection
		4	CONt	CONT	Window Contact
UI2	Universal Input 2	1	NONE	NONE	Not Configured
		2	di SC	DISC	Discharge Air Temperature Sensor
		3	CONt	CONT	Window Contact
		4	OCC	OCC	Occupancy Detection
		5	SEtP	SETP	Room Temperature Setpoint Offset
UI3 CO2	Universal Input 3 CO_2 Sensor	1	NONE	NONE	Not Configured
		2	4-20	4-20	4-20mA CO_2 Sensor (0-2000 ppm)
		3	0-5	0-5	0-5V CO_2 Sensor (0-2000 ppm)
COMSENS SP	EC-Smart-Vue User Setpoint Control	1	dUAL	DUAL	Cooling and Heating Setpoint via EC-Smart-Vue
		2	OFFS	OFFS	Room Temperature Setpoint Offset
SENSORS TYPE	Discharge and Space Temp Sensors Type	1	10-2	10-2	Sensors are 10K Type II
		2	10-3	10-3	Sensors are 10K Type III

Setting up Outputs

A controller's outputs can be configured through the Output Configuration submenu of the Advanced menu. The table below shows how many universal outputs and digital outputs the controller has.

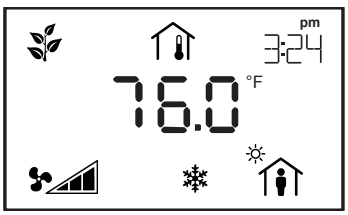
Model	Universal Outputs	Digital Outputs
ECB-VAVS	1	3

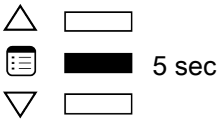
The following procedure explains how to configure the outputs one by one. For instructions on how to configure them all at once using configuration codes, see *Procedure for Submitting New Configuration Codes using an Allure EC-Smart-Vue*.

How to enter the Output Configuration submenu and configure the outputs

To enter the advanced menus:

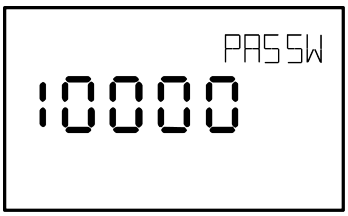
1. Hold the **Menu** button for five seconds:

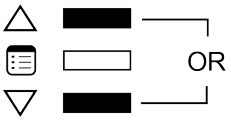




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

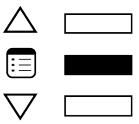




Screen timeout: 15 s

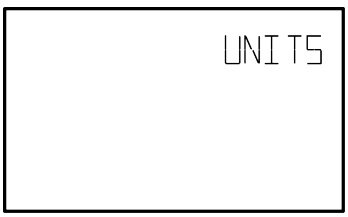
By default, the password is 9995.

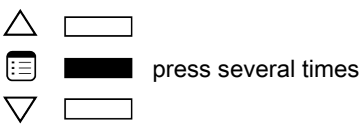
3. Press the **Menu** button to submit the password.



Screen timeout: 15 s

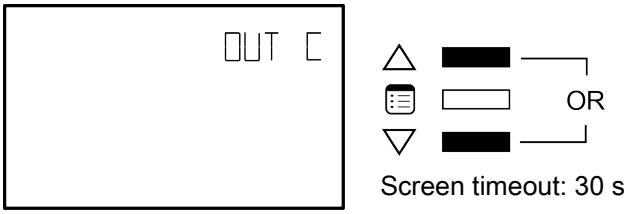
Upon submitting the correct password, the advanced menu is displayed.





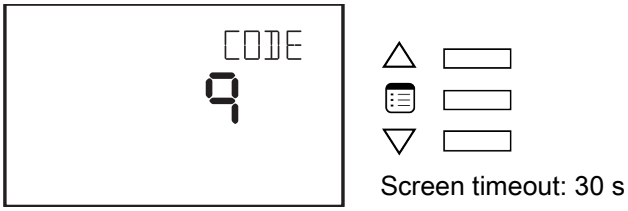
Screen timeout: 15 s

4. Press the **Menu** button several times until OUT CFG appears on the display.
5. Press either of the arrow keys to enter the Output Configuration submenu.



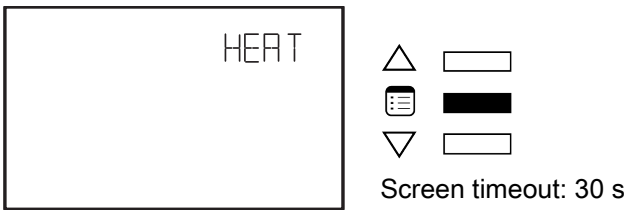
Screen timeout: 30 s

Upon entering the Output Configuration submenu, the Code parameter appears.



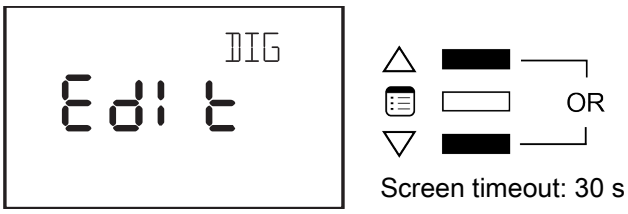
Screen timeout: 30 s

6. To scroll between the different parameters in the Output Configuration submenu, press the **Menu** button.



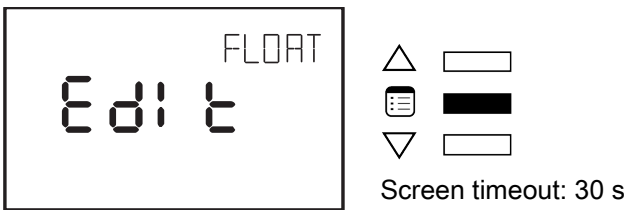
Screen timeout: 30 s

7. To modify a parameter, use the arrow keys.



Screen timeout: 30 s

To submit a modified parameter, press the **Menu** button.



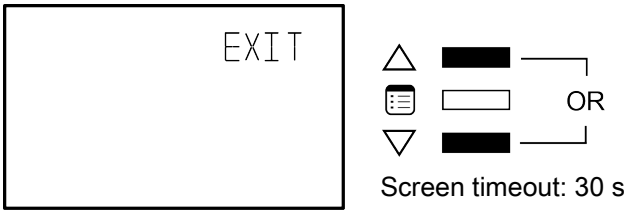
Screen timeout: 30 s

The first two or three parameters of the Output Configuration submenu allow the selection of the types of control signals used to drive the heating sources. The remaining parameters allow configuring the normally open or normally closed option for each heating source.

For details on the available control signal types per heating source and the output wiring guidelines, see the ***Output Wiring*** sections.

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



Screen timeout: 30 s

□ Press and hold the **Menu** button for 5 seconds.

Output Wiring (VAVS)

Heat 1 Configuration

Heat1 Type	Description
None	No Reheat
Pwm Triac[1]	Modulating PWM on DO1 & AO4
Digital	Digital Reheat on DO1
Pwm Valve	PWM Valve on DO1
Thermal Valve	Thermal Valve on DO1
0-10V	Modulating 0-10V on AO4
2-10V	Modulating 2-10V on AO4
Floating Valve	Floating Valve on DO1 and DO2

1. Outputs only on DO1 if Heat2 is 0-10V or 2-10V

Heat 2 Configuration (Depends on Heat 1 Configuration)

<table>
<tr><th>Heat2 Type</th><th colspan="4">Heat1 Type</th></tr>
<tr><th></th><th>Heat 1 not configured</th><th>Heat1 not floating</th><th>Heat1 analog</th><th>Heat 1 Floating</th></tr>
<tr><td>None</td><td colspan="4">n/a</td></tr>
<tr><td>Pwm Triac</td><td rowspan="5">Cannot configure</td><td colspan="2" rowspan="4">DO2</td><td rowspan="4">n/a</td></tr>
<tr><td>Digital</td></tr>
<tr><td>Pwm Valve</td></tr>
<tr><td>Thermal Valve</td></tr>
<tr><td>0-10V</td><td rowspan="2">AO4</td><td rowspan="2">n/a</td><td rowspan="2">AO4</td></tr>
<tr><td>2-10V</td></tr>
</table>

Example:

Suppose Heat 1 Type is an analog 0-10V signal and Heat 2 Type is PWM Triac. In this case, Analog output 4 of the controller is used to control heat source 1 and Digital output 2 of the controller is used to control heat source 2.

Configuring the Flow Setpoint Parameters

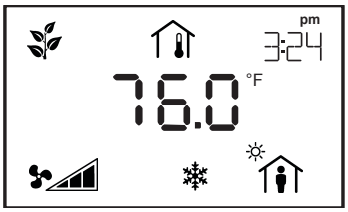
The flow setpoint parameters of the controller can be set in the Flow Setpoint submenu, which is part of the Advanced Menu of the Allure EC-Smart-Vue.

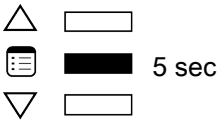
How to enter the Flow Setpoint submenu and configure a parameter

The Flow Setpoint submenu has several configurable parameters. To enter this submenu and configure a parameter:

To enter the advanced menus:

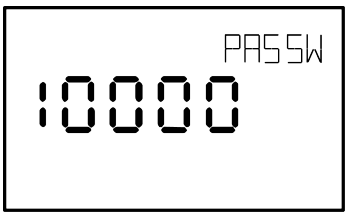
1. Hold the **Menu** button for five seconds:

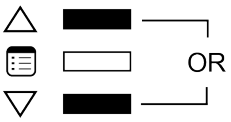




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

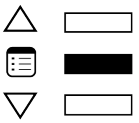




Screen timeout: 15 s

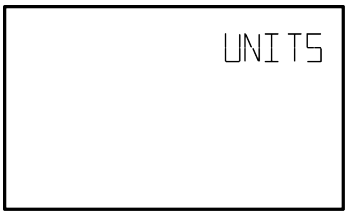
By default, the password is 9995.

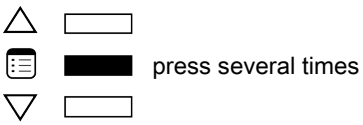
3. Press the **Menu** button to submit the password.



Screen timeout: 15 s

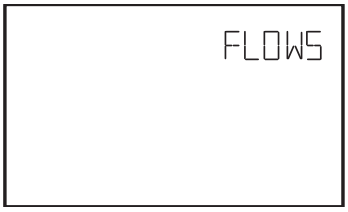
Upon submitting the correct password, the advanced menu is displayed.

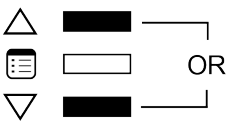




Screen timeout: 15 s

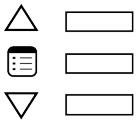
4. Press the **Menu** button until the FLOWSP menu appears on the display.





Screen timeout: 30 s

The minimum flow (MIN) parameter appears.



Screen timeout: 60 s

5. To scroll between the different parameters in the Flow Setpoint submenu, press the **Menu** button.
6. To modify a parameter, use the arrow keys. To enter a new parameter value, press the **Menu** button.

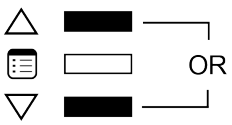
The table below shows all the parameters under the Flow Setpoint submenu.

Parameter	Description	Screen Timeout
MIN	Minimum flow	60 sec
MAX	Maximum flow	60 sec
MINHT	Minimum flow in Heating mode	60 sec
MAXHT	Maximum flow in Heating mode	60 sec
STBY	Minimum flow in Standby mode	60 sec
UNOCC	Minimum flow in Unoccupied mode	60 sec
PFANFLOWSP[1]	Parallel fan flow setpoint	60 sec

1. Applicable to a parallel fan powered VAV.

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



Screen timeout: 30 s

□ Press and hold the **Menu** button for 5 seconds.

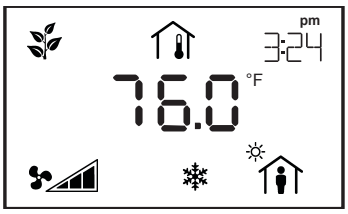
Performing VAV Airflow Balancing

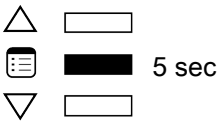
The airflow balancing procedure can be carried out from the Balancing submenu, which is part of the Advanced Menu of the Allure EC-Smart-Vue.

How to enter the Balancing submenu

To enter the advanced menus:

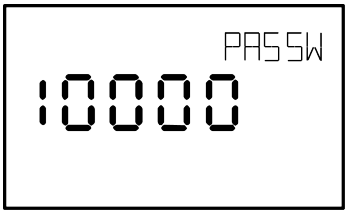
1. Hold the **Menu** button for five seconds:

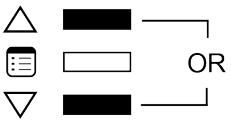




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

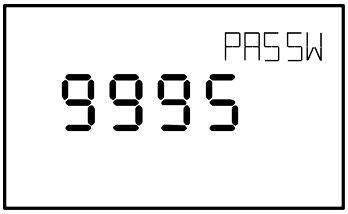


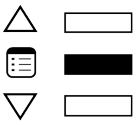


Screen timeout: 15 s

By default, the password is 9995.

3. Press the **Menu** button to submit the password.

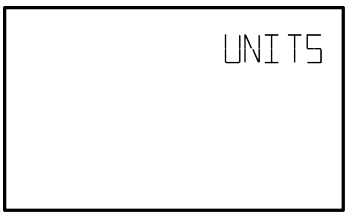


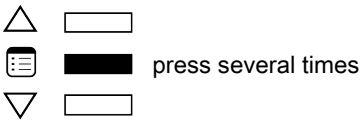


Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is displayed.

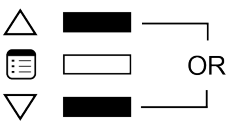
4. Press the **Menu** button to submit the selected display units type.





Screen timeout: 15 s

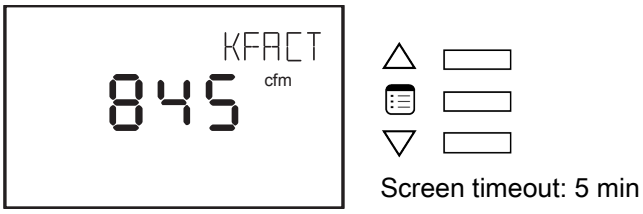
5. Press the **Menu** button several times until the Balancing (BAL) menu appears on the display.



Screen timeout: 15 s

6. Press either of the arrow keys to enter the Balancing submenu.

Upon entering the Balancing submenu, the K-Factor parameter appears.



Screen timeout: 5 min

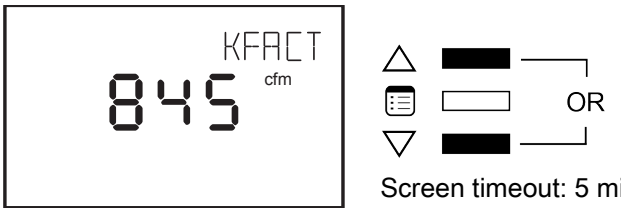
How to perform airflow balancing

The K-Factor can be acquired from the VAV box manufacturer. The table below shows what the K-Factor represents in both Imperial and SI Units.

	Imperial Units	SI Units	
What the K-Factor is	Airflow (in cfm) at 1" WC	Airflow (L/s) at 1 Pa	Airflow (m3/h) at 1 Pa

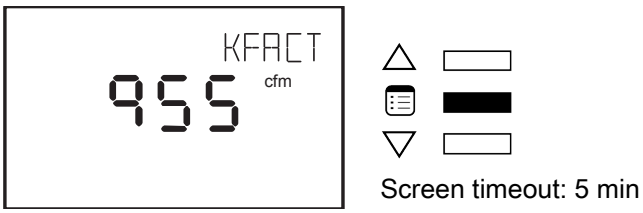
To perform the airflow balancing procedure:

1. Use the arrow keys to enter the K-Factor.



Screen timeout: 5 min

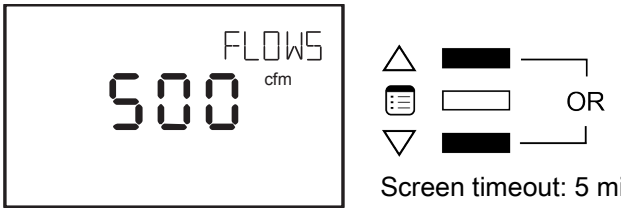
2. Press the **Menu** button to submit the K-Factor.



Screen timeout: 5 min

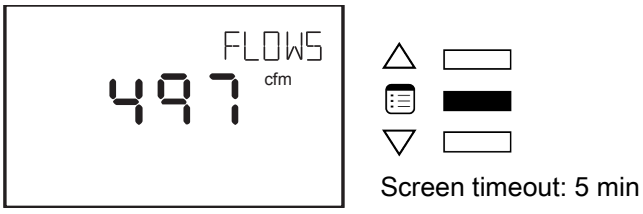
The Flow Setpoint parameter appears.

3. Use the arrow keys to override the flow setpoint. Choose a relatively high setpoint.



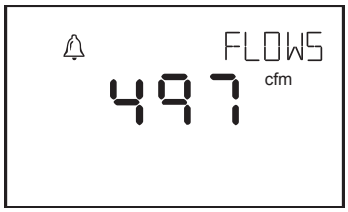
Screen timeout: 5 min

4. Press the Menu button to submit the new flow setpoint.



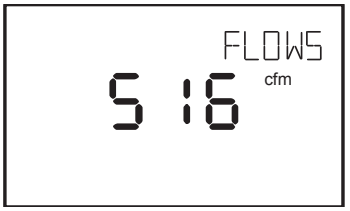
Screen timeout: 5 min

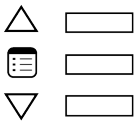
When the flow setpoint is modified, the icon appears, indicating that this parameter has been overridden. For information on removing overrides, see *How to release overrides*.



The Flow parameter appears. This parameter represents the airflow as measured by the controller.

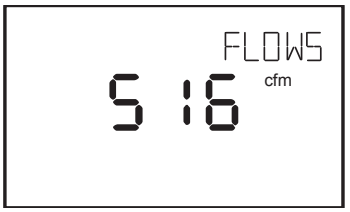
5. Monitor the Flow parameter until it stabilizes.

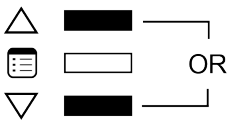




Screen timeout: 5 min

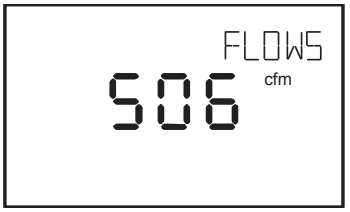
6. Using a flow hood, measure the actual airflow. Use the arrow keys to enter this measurement into the Flow parameter.

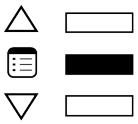




Screen timeout: 5 min

7. Press the **Menu** button to submit the actual airflow.



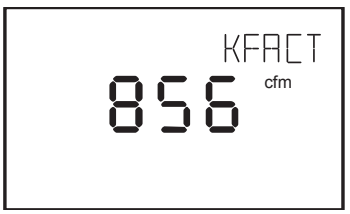


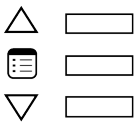
Screen timeout: 5 min

The Damper parameter appears.

Note that at this point, the K-Factor gets adjusted based on the airflow value just entered.

8. Press the **Menu** button several times until the K-Factor parameter reappears. This value can be included in the balancing report.





Screen timeout: 5 min

The VAV controller is now balanced.

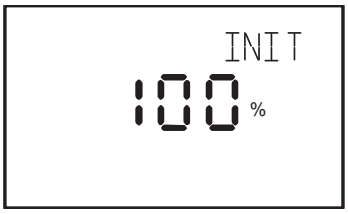
How to initialize the damper

If the mechanical stops on the actuator have been moved to limit the range of movement of the damper, then the damper must be initialized. Damper initialization resets the damper position and calculates the total number of steps between the stops.

The actuator mechanical stops should be moved only to limit damper movement from going under 0% or over 100%.

To initialize the damper using the Allure EC-Smart-Vue:

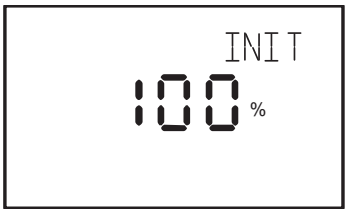
1. Navigate to the Initialize Damper parameter.



Screen timeout: 5 min

The screen displays the current damper position.

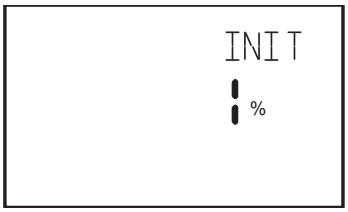
2. Press one of the arrow keys to change the displayed value to 1.



OR

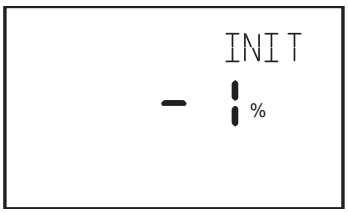
Screen timeout: 5 min

3. Press the **Menu** button.



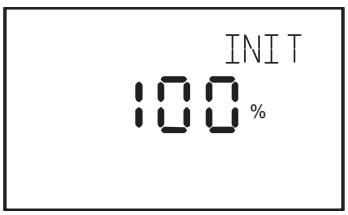
Screen timeout: 5 min

The damper begins the initialization process. During this process, the screen displays -1.



Screen timeout: 5 min

After a few minutes, the screen redisplays the damper's current position.



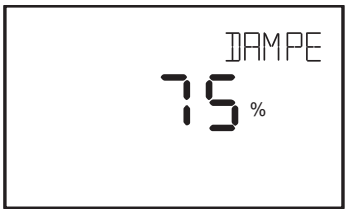
Screen timeout: 5 min

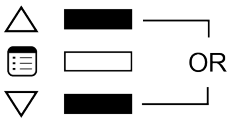
The damper is now initialized.

Other functions in the Balancing submenu

The Balancing submenu contains three other parameters that complement those mentioned above.

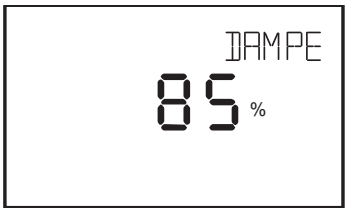
To override the damper position, navigate to the Damper parameter and then use the arrow keys to change the displayed value.

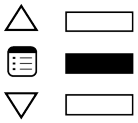




Screen timeout: 5 min

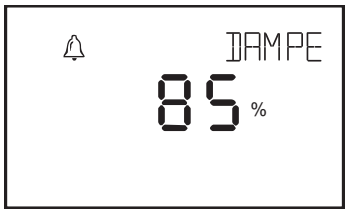
Press the **Menu** button to submit the new value.



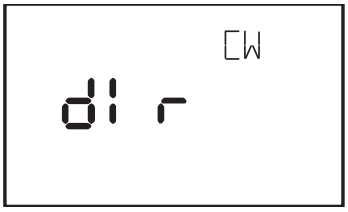


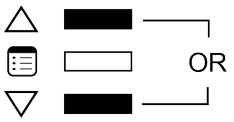
Screen timeout: 5 min

When the damper position is modified, the icon appears, indicating that this parameter has been overridden. For information on removing overrides, see *How to release overrides.*



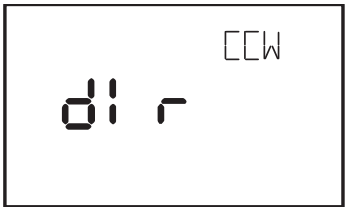
To change the direction in which the actuator rotates to open the damper, navigate to the Direction parameter (dir) and then use the arrow keys to change the rotation direction from clockwise to counter clockwise or vice versa.

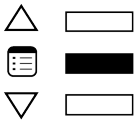




Screen timeout: 5 min

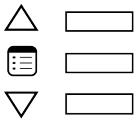
Press the **Menu** button to submit the new rotation direction.





Screen timeout: 5 min

To view the current differential pressure reading, navigate to the Pressure parameter.

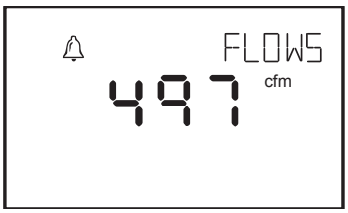


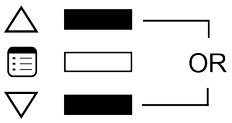
Screen timeout: 5 min

How to release overrides

The presence of the icon in the display screens of the Flow Setpoint or Damper parameters indicates that either of them is overridden. An override normally times out after two hours. However, it should be released manually when airflow balancing is complete. Also note that both the Flow Setpoint and Damper parameters cannot be overridden at the same time, so overriding one parameter automatically releases the other. To manually release an override:

1. Press and hold both arrow keys simultaneously.

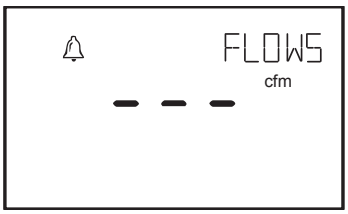


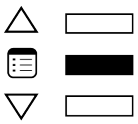


Screen timeout: 5 min

The screen displays three dashes.

2. Press the **Menu** button.

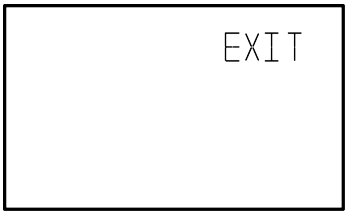


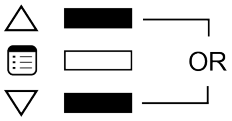


Screen timeout: 5 min

How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.





Screen timeout: 30 s

□ Press and hold the **Menu** button for 5 seconds.

Performing Overrides

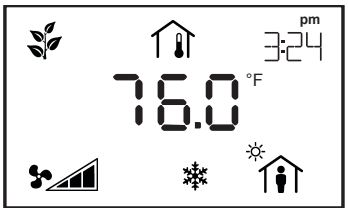
The Overrides submenu of the Allure EC-Smart-Vue's Advanced menu allows performing damper overrides as well as output overrides.

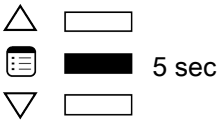
Output overrides range from 0 – 100% in increments of 1%. For digital outputs, any value different from 0 represents On.

How to perform an override

To enter the advanced menus:

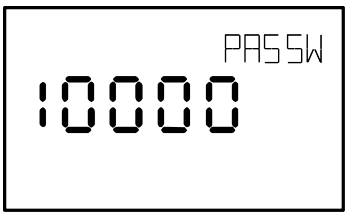
1. Hold the **Menu** button for five seconds:

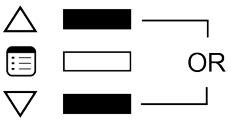




The password field appears.

2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.

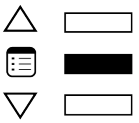




Screen timeout: 15 s

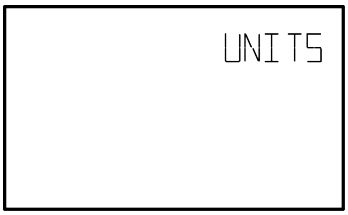
By default, the password is 9995.

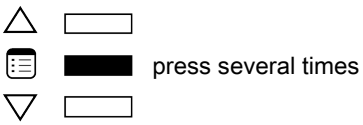
3. Press the **Menu** button to submit the password.



Screen timeout: 15 s

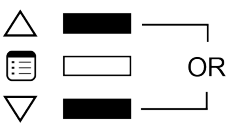
Upon submitting the correct password, the advanced menu is displayed.





Screen timeout: 15 s

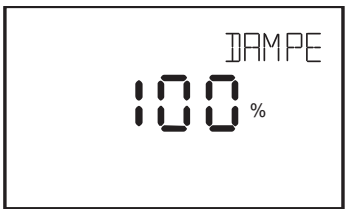
4. Press the **Menu** button several times until OVR appears on the display.



Screen timeout: 30 s

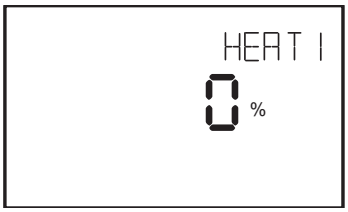
5. Press either of the arrow keys to enter the Overrides submenu.

Upon entering the Overrides submenu, the Damper parameter appears.



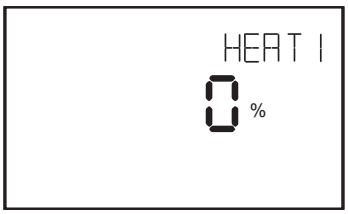
Screen timeout: 5 min

6. To scroll between the different parameters in the Overrides submenu, press the **Menu** button.



Screen timeout: 5 min

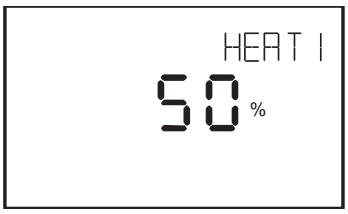
7. To override a parameter, use the arrow keys to modify the displayed percentage value.



OR

Screen timeout: 5 min

8. Press the **Menu** button to put the override into effect.

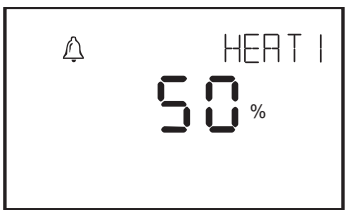


Screen timeout: 5 min

How to release overrides

The presence of the icon in the display screen of a parameter in the Overrides submenu indicates that it is overridden. An override normally times out after two hours. However, it should be released manually when there is no use for it anymore. To manually release an override:

1. Press and hold both arrow keys simultaneously.

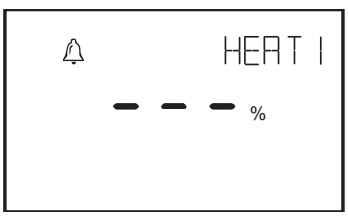


OR

Screen timeout: 5 min

The screen then displays three dashes.

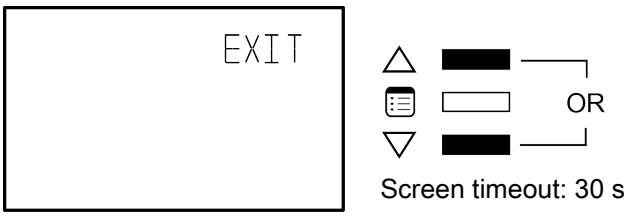
2. Press the **Menu** button.



Screen timeout: 5 min

How to Exit the Submenu

- Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



Screen timeout: 30 s

- Press and hold the **Menu** button for 5 seconds.

Configuration Codes

Configuring the preloaded applications of an ECB-VAVS controller can be easily done using configuration codes. Three different sets of configuration codes exist for the following three categories:

- VAV Configuration
- Input Configuration
- Output Configuration

This chapter describes the use of codes in speeding up the configuration of ECB-VAVS controllers.

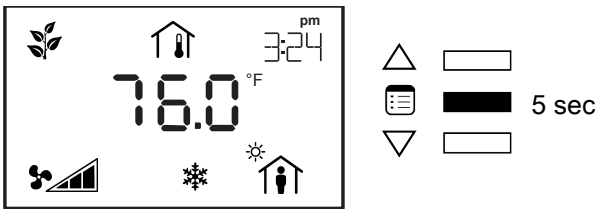
Procedure for Submitting New Configuration Codes using an Allure EC-Smart-Vue

Using codes to configure a controller saves time, especially when working with large quantities. The following three submenus, in the Allure EC-Smart-Vue's Advanced menu, can be configured using codes:

How to submit new configuration codes

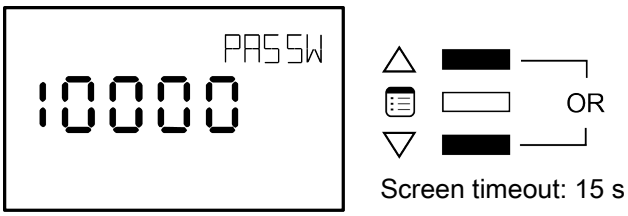
To enter the advanced menus:

1. Hold the **Menu** button for five seconds:



The password field appears.

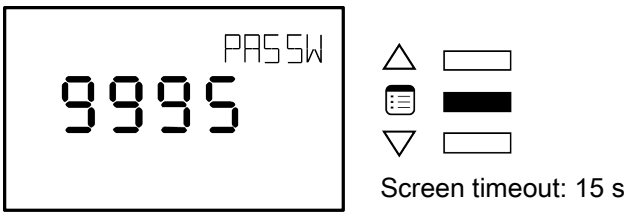
2. Use the arrow keys to increase or decrease the displayed number until it matches the configured password.



Screen timeout: 15 s

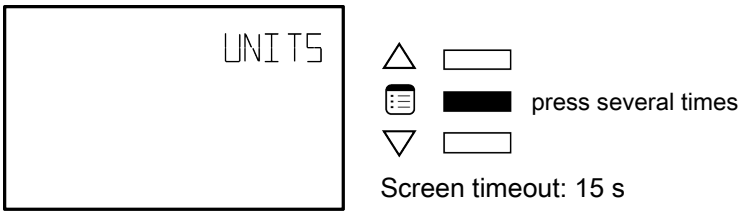
By default, the password is 9995.

3. Press the **Menu** button to submit the password.



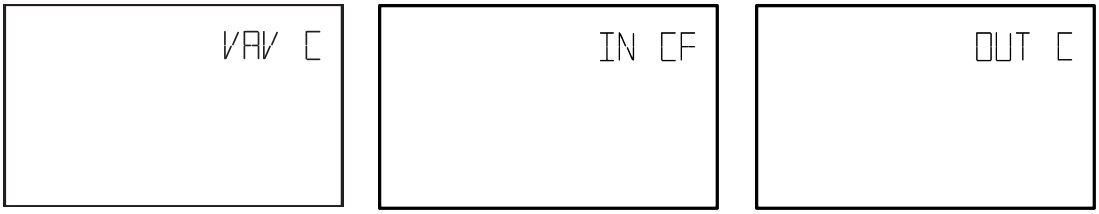
Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is displayed.



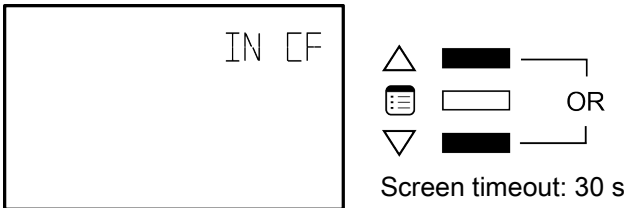
4. Press the **Menu** button several times until the desired submenu appears.

Either one of the following submenus can be configured using a code.



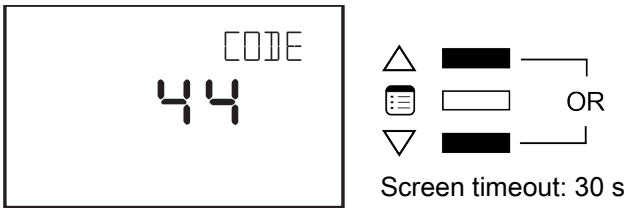
VAV Configuration | Input Configuration | Output Configuration

5. Press either of the arrow keys to enter the submenu.

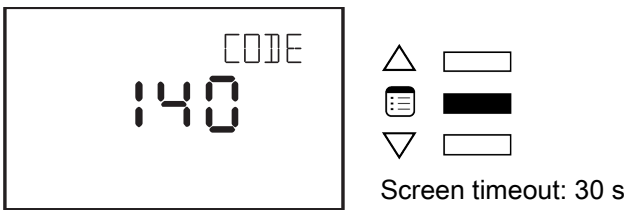


The Code parameter appears.

6. Use the arrow keys to enter a configuration code.

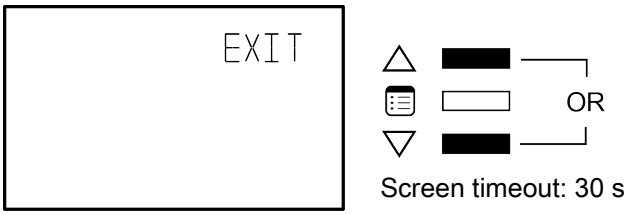


7. Press the **Menu** button to submit the new configuration code.



How to Exit the Submenu

□ Press the **Menu** button several times until the Exit screen appears. Then press either of the arrow keys.



□ Press and hold the **Menu** button for 5 seconds.

Tables of Configuration Codes

The configuration codes for each controller model are presented in the tables below. But first, an example is given illustrating how to calculate a configuration code based on the desired configuration parameters.

As an example, suppose one wanted to configure the inputs of an ECB-VAVS to have the following characteristics:

Input	Binary Code	Description of Binary Code
Universal Input 1	1	Room Temperature Sensor
Universal Input 2	4	Discharge Air Temperature
Universal Input 3	64	CO2 Sensor 0-5V
Communication Sensor Setpoint	0	Cooling and Heating Setpoint via EC-Smart-Vue
Sensors Type	0	Sensors are 10K Type II

The total of the binary codes in the example above is 69. When this code is entered in the Input Configuration submenu, the VAV will be configured with the parameters above.

For a full list of all the configuration codes per controller model, refer to the tables in the following pages.

ECB–VAVS

VAVS Configuration

Parameter	Binary Code	Default	Valid Choices		Description
HEATPRIO	0		1	DUCT	Duct Heating 1st
	1		2	PERI	Perimeter Heating 1st
	2	x	3	BOTH	Both Heating Simultaneously
DAMPERDIR	0	x	1	CW	Damper Direction Clockwise (CW)
	4		2	CCW	Damper Direction Counter Clockwise (CCW)
HWREHEAT	0	x	1	NO	Duct Heater is not Hot Water Coil
	8		2	YES	Duct Heater Reheat by Hot Water Coil
DUCTHEATER	0		1	NONE	No Duct Heater Reheat
	16	x	2	1ST	Duct Heater Reheat on Heat Source 1
	32		3	2ST	Duct Heater Reheat on Heat Sources 1 & 2
DUAL MAX	0	x	1	NO	Box is not using Dual Maximum Control Settings
	64		2	YES	Box is using Dual Maximum Control Settings
FLOATVLVPER	0	x	1	95 sec	95 seconds drive time
	128		2	125 sec	125 seconds drive time
	256		3	150 sec	150 seconds drive time
	384		4	25 sec	25 seconds drive time
	512		5	30 sec	30 seconds drive time
	640		6	50 sec	50 seconds drive time
	768		7	60 sec	60 seconds drive time
	896		8	Custom	Drive time controlled by CustomFloatTime
PWMVLVPER	0	x	1	25.5	0.1 to 25.5 sec
	1024		2	5.2	0.1 to 5.2 sec
VVTMODE	0	x	1	NO	Box is using Flow Input
	2048		2	YES	Box is not Using Flow Input
Default VAV Code		**18**			

Input Configuration

Parameter	Binary Code	Default	Valid Choices		Description
UI1TYPE	0		1	NONE	Not Configured
	1	x	2	SPAC	Room Temperature Sensor
	2		3	OCC	Occupancy Detection
	3		4	CONT	Window Contact
UI2TYPE	0		1	NONE	Not Configured
	4		2	DISC	Discharge Air Temperature Sensor
	8		3	OCC	Occupancy Detection
	12		4	CONT	Window Contact
	16	x	5	SETP	Room Temperature Setpoint Offset
UI3TYPE	0	x	1	NONE	Not Configured
	32		2	4-20	4-20mA CO_2 Sensor (0-2000 ppm)
	64		3	0-5	0-5V CO_2 Sensor (0-2000 ppm)
COMSENS SP	0	x	1	DUAL	Cooling and Heating Setpoint via EC-Smart-Vue
	128		2	OFFS	Room Temperature Setpoint Offset
SENSORS TYPE	0	x	1	10-2	Sensors are 10K Type II
	256		2	10-3	Sensors are 10K Type III
Default Input Code		**17**			

Output Configuration

Parameter	Binary Code	Default	Valid Choices		Description
HEAT1	0		1	NONE	No Reheat
	1	x	2	DIG	Digital Reheat on DO1
	2		3	PWM TRIAC	Modulating PWM on DO1 and AO4
	3		4	PWM VLV	PWM Valve on DO1
	4		5	THERM VLV	Thermal Valve on DO1
	5		6	0-10V	Modulating 0-10V on AO4
	6		7	2-10V	Modulating 2-10V on AO4
	7		8	FLOAT VLV	Floating Valve (120 sec drive time) on DO1 & DO2
HEAT2	0		1	NONE	No Reheat
	8	x	2	DIG	Digital Reheat on DO2
	16		3	PWM TRIAC	Modulating PWM on DO2
	24		4	PWM VLV	PWM Valve on DO2
	32		5	THERM VLV	Thermal Valve on DO2
	40		6	0-10V	Modulating 0-10V on AO4
	48		7	2-10V	Modulating 2-10V on AO4
HT1 NORM OPEN	0	x	1	NO	Heating1 Normally Close Valve
	64		2	YES	Heating1 Normally Open Valve
HT2 NORM OPEN	0	x	1	NO	Heating2 Normally Close Valve
	128		2	YES	Heating2 Normally Open Valve
Default Output Code		**9**			

* DO3 is unused