ECL-PTU-207 Preloaded Applications

User Guide

DISTECH CONTROLS™

an AcuityBrands company

Innovative Solutions for Greener Buildings™

Document Revision History

Version 1.0 – Initial Release – April 2016

Version 1.1 – April 2016

- Updated wiring diagrams

Version 1.2 – November 2016

- Updated accessibility with EC-Net 4

Version 1.3 – July 2017

- Removed EC-Net^{AX} sections
- Updated Configuration Assistant section

Legal Notice

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Introduction to the Preloaded Applications

Distech Controls' ECL-PTU controllers come preloaded with code containing standard 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*Applications, an application that is accessible through EC-Net^{AX} Pro, which is powered by the Niagara^{AX} Framework®. dc *gfx*Applications provides an intuitive interface for configuring controllers.

Alternatively, an Allure™ EC-Smart-Vue Sensor can be used to configure a controller's preloaded applications on site.

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

Applications Comparison Chart

	ECL-PTU-107	ECL-PTU-207	ECL-PTU-307	ECL-PTU-208	ECL-PTU-308
Fan Type	None OR 3-speed	None OR 3-speed OR variable speed	None OR 3-speed OR variable speed	None OR 3-speed OR variable speed	None OR 3-speed OR variable speed
Electric Heater	1	1	1	1	1
Valve Outputs Type	2 x PWM valves OR 2 x On/Off valves OR 1 x floating valve	2 x PWM valves OR 2 x On/Off valves OR 1 x floating valve AND 2 x 0-10V valves	2 x PWM valves OR 2 x On/Off valves OR 2 x floating valves OR 2 x 0-10V valves*	2 x PWM valves OR 2 x On/Off valves OR 1 x floating valve OR 2 x 0-10V valves*	2 x PWM valves OR 2 x On/Off valves OR 2 x floating valves OR 2 x 0-10V valves*
Valve Voltage	100-240 VAC	100-240 VAC	100-240 VAC	24 V	24 V
System Type	2 pipes cooling only OR 2 pipes cooling only with electric heater OR 2 pipes change-over OR 2 pipes change-over with electric heater OR 4 pipes OR 4 pipes with electric heater	2 pipes cooling only OR 2 pipes cooling only with electric heater OR 2 pipes change-over OR 2 pipes change-over with electric heater OR 4 pipes OR 4 pipes with electric heater	2 pipes cooling only OR 2 pipes cooling only with electric heater OR 2 pipes change-over OR 2 pipes change-over with electric heater OR 4 pipes OR 4 pipes with electric heater	2 pipes cooling only OR 2 pipes cooling only with electric heater OR 2 pipes change-over OR 2 pipes change-over with electric heater OR 4 pipes OR 4 pipes with electric	2 pipes cooling only OR 2 pipes cooling only with electric heater OR 2 pipes change-over OR 2 pipes change-over with electric heater OR 4 pipes OR 4 pipes with electric heater

Table 1: Available configurations

*: if neither ECM Fan (Variable Speed) nor Damper are used.

Purpose of the User Guide

This user guide is intended to provide information and instruct a user to configure an ECL-PTU controller from its preloaded applications using either EC-*gfx*Program or an Allure EC-Smart-Vue sensor. However, this guide is not designed to instruct the user on how to use an ECL-PTU 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 the Distech Controls website.

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 installing and configuring the devices specified in this user guide have prior training in the usage of these devices.

Conventions Used in this Document

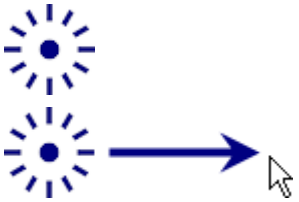
Notes

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.

Variables

Enum Constants

ConfigOccSensor (ConstantEnum1)

This variable is used to configure the source of the motion detection sensor.

ID	Enumeration	Default Value
Constant Enum 1	0 = Unused: The system is not using any occupancy detection, the final occupancy is equal to the occupancy received from the BMS system, except if the device is a Slave device. 1 = Multi-Sensor : The system is using the EC-Multi-Sensor to receive the occupancy detection information 2 = ComSensor : The system is using the EC-Smart-Vue to receive the occupancy detection information 3 = DigitaInput : The system is using a Digital Input on DI6 to receive the occupancy detection information. 4 = Auto/All : The system is using any occupancy sensor connect to receive the motion detection information. If only one sensor is occupied, the variable MotionSensor(MSV5) is set to occupied.	Auto/All

UI2Config (ConstantEnmu2)

This variable is used to configure the source of Hardware Input 2.

ID	Enumeration	Default Value
Constant Enum 2	0 = Unused : Hardware Input 2 is not used. 1 = Discharge Temp : Hardware Input 2 is used to connect the Discharge Temperature sensor 2 = Return Temp: Hardware Input 2 is used to connect the Return air Temperature sensor 3 = Return Temp: Hardware Input 2 is used to connect the Water Temperature sensor 4 = SpOffset: Hardware Input 2 is used to connect the setpoint offset of the EC-Sensor-SO.	SpOffset

DI4Config (ConstantEnum3)

This variable is used to configure the hardware Input 4.

ID	Enumeration	Default Value
Constant Enum 3	0 = Unused: Hardware Input is not used. 1 = WindowContactNO : Hardware Input is used to connect a normally opened window contact. (Contact close = Window Open) 2 = WindowContactNC : Hardware Input is used to connect a normaly close window contact. (Contact close = Window Close)	WindowContactNC

DI5Config (ConstantEnum4)

This variable is used to configure hardware Input 5.

ID	Enumeration	Default Value
Constant Enum 4	0 = Unused: Hardware Input 5 is not used. 1 = AuxContactNO : Hardware Input 5 is used to connect a normally open auxiliary contact. 2 = AuxContactNC : Hardware Input 5 is used to connect a normally close auxiliary contact. 3 = ChangOverHtg : Hardware Input 5 is used to connect a change-over input. (Contact close = Ceating mode) 4 = ChangOverClg : Hardware Input 5 is used to connect a change-over input. (Contact close = Cooling mode) 5 = CondSensorNO : Hardware Input 5 is used to connect a normally open condensation sensor. (Contact close = Alarm) 6 = CondSensorNC : Hardware Input 5 is used to connect a normally close condensation sensor. (Contact close = Normal)	Unused

DI6Config (ConstantEnum5)

This variable is used to configure hardware Input 6.

ID	Enumeration	Default Value
Constant Enum 5	0 = Unused: Hardware Input 6 is not used. 1 = AuxContactNO : Hardware Input 6 is used to connect a normally open auxiliary contact. 2 = AuxContactNC : Hardware Input 6 is used to connect a normally close auxiliary contact. 3 = ChangOverHtg : Hardware Input 6 is used to connect a change-over input. (Contact close = Ceating mode) 4 = ChangOverClg : Hardware Input 6 is used to connect a change-over input. (Contact close = Cooling mode) 5 = OccSensorNO : Hardware Input 6 is to connect a normally open occupancy sensor. configured to occupancy sensor normaly open. (Contact close = occupied) 6 = OccSensorNC : Hardware Input 6 is to connect a normally close occupancy sensor. configured to occupancy sensor normaly open. (Contact close = unoccupied)	AuxContactNO

SystemType (ConstantEnum6)

This variable is used to configure the system type of the installation.

ID	Enumeration	Default Value
Constant Enum 6	0 = Cool : 2 pipes cooling only 1 = CoolElectHeat : 2 pipes cooling only with electric heater 2 = heat : 2 pipes heating only 3 = CoolElectHeat : 2 pipes heating only with electric heater 4 = ChgOver: 2 pipes change-over 5 = ChgOverElectHeat: 2 pipes change-over with electric heater 6 = CoolHeat: 4 pipes 7 = CoolHeatElectHeat: 4 pipes with electric heater	CoolHeat

CoolValveType (ConstantEnum7)

This variable is used to configure the Cooling or Change-Over Valve.

ID	Enumeration	Default Value
Constant Enum 7	0 = Unused: The valve is not used. 1 = 0-10V:: Only AO9 is used to control the valve. 2 = Thermal: DO5 is used to control the thermal valve and AO9 to control the analog valve. 3 = On-Off: DO5 is used to control the digital valve and AO9 to control the analog valve. 4 = Floating: DO5 and DO6 (DO5 = Open, DO6 = Close) are used to control the Floating valve and AO9 to control the analog valve.	Thermal

See IO assignement section for more details.

HeatValveType (ConstantEnum8)

This variable is used to configure the Heating Valve.

ID	Enumeration	Default Value
Constant Enum 8	0 = Unused: The valve is not used. 1 = 0-10V: Only AO10 is used to control the valve. 2 = Thermal: DO6 is used to control the thermal valve and AO10 to control the analog valve. 3 = On-Off: DO6 is used to control the digital valve and AO10 to control the analog valve. 4 = Floating: DO5 and DO6 (DO5 = Open, DO6 = Close) are used to control the Floating valve and AO10 to control the analog valve.	Thermal

See IO assignement section for more details.

DamperCtrlType (ConstantEnum9)

This variable is used to configure the damper control type or disabled the damper control.

ID	Enumeration	Default Value
Constant Enum 9	0 = None: Damper Control is disabled. 1 = 0-10V : Damper used 0-10V signal type. 2 = 2-10V: Damper used 0-10V signal type	0-10V

See IO assignement section for more details.

Hardware Inputs

UI1: CO2 Sensor

This input is used to connect a space or return CO2 sensor.

The variable CO2Range (NumericConstant2) can be used to configure the range of the CO2 sensor. The default value is 2000 ppm.

ID	Units	Valid Range	Default Value
nvoHwInput_1	Volts (V)	0.1 to 10 V	Null

UI2: UI2

This input is used to connect the Discharge Temperature, Return Temperature, Water Temperature or Setpoint Offset. It is configurable using UI2Config (EnumConstant2) .

ID	Units	Valid Range	Default Value
nvoHwInput_2	Ohms (Ω)	0 to 55000 Ω	0 Ω

SI3: SI3

This input is used to connect the Discharge Temperature, Return Temperature, Water Temperature or Space Temperature. It is configurable using nciMiscConfig.SI3Config (nviFP44) .

ID	Units	Valid Range	Default Value
nvoHwInput_3	Degrees-Celsius (°C)	-10 to 50 °C	Null

DI4: DI4

This variable is used to connect the window contact. Note that reversing the window contact operation using DI4Config (EnumConstant3) will not reverse this input. To display the status of the window contact, one should use the variable nvoWindowContact (nvoFP24).

ID	Units	Valid Range	Default Value
nvoHwInput_4	Snvt_Switch	0 to 100% / On to Off	0 % / Off

DI5: DI5

This input is used to connect Auxiliary Contact, Change Over State (heating/cooling) or Condensation sensor. It is configurable via DI5Config (EnumConstant4).

ID	Units	Valid Range	Default Value
nvoHwInput_5	Snvt_Switch	0 to 100% / On to Off	0 % / Off

DI6: DI6

This input is used to connect Auxiliary Contact, Change Over State (heating/cooling) or Occupation sensor. It is configurable via DI6Config (EnumConstant5) .

ID	Units	Valid Range	Default Value
nvoHwInput_6	Snvt_Switch	0 to 100% / On to Off	0 % / Off

EC-Smart-Vue: Humidity display

This input is used to display the Allure EC-Smart-Vue humidity reading if an Allure EC-Smart-Vue equipped with a humidity option is connected to the system.

ID	Units	Valid Range	Default Value
nvoComSensor01_04	Percent Relative Humidity (% RH)	0 to 100 %RH	NaN

EC-Smart-Vue: Temperature display

This input is used to display the Allure EC-Smart-Vue temperature reading if an Allure EC-Smart-Vue is connected to the system.

ID	Units	Valid Range	Default Value
nvoComSensor01_04	Degrees-Celsius (°C)	0 to 50°C	NaN

EC-Smart-Vue: CO_2 display

This input is used to display the Allure EC-Smart-Vue CO_2 concentration reading if an Allure EC-Smart-Vue equipped with a CO_2 sensor is connected to the system.

ID	Units	Valid Range	Default Value
nvoComSensor01_04	ppm	0 to 2000 ppm	NaN

Hardware Outputs

DO1: FanSpeed1 / Fan Start

This output is used to control Fan Speed 1 or Fan Start based on the configuration of nciFanSettings.FanCtrlType (nviFP39).

ID	Units	Valid Range	Default Value
nvoHwOutput_1	Start / Stop	Start to Stop (Boolean)	Stop

DO2: FanSpeed2 / Damper

This output is used to control Fan Speed 2 only if nciFanSettings.FanCtrlType (nviFP39) is set to 3-speed fan or to control a digital damper based on occupancy status only if nciFanSettings.FanCtrlType (nviFP39) is set to none, onespeed, or VarSpeed.

ID	Units	Valid Range	Default Value
nvoHwOutput_2	Start / Stop	Start to Stop (Boolean)	Stop

DO3: FanSpeed3

This output is used to control Fan Speed 3 only if nciFanSettings.FanCtrlType (nviFP39) is set to 3-speed fan.

ID	Units	Valid Range	Default Value
nvoHwOutput_3	Start / Stop	Start to Stop (Boolean)	Stop

DO4: ElectHeatCmd

This output is used to control the Electric Heater relay. Do NOT manually override this output to Active since the electric heater will not be linked to the fan start anymore.

ID	Units	Valid Range	Default Value
nvoHwOutput_4	Start / Stop	Start to Stop (Boolean)	Stop

DO5: Valve DO5

This output is used to control the cooling valve or the open output of a floating valve (heating or cooling).

- When CoolValveType (EnumConstant7) is set to either Thermal or On/Off, this output will control the cooling valve.
- When either CoolValveType (EnumConstant7) or HeatValveType (EnumConstant8) is set to Floating, this output is used to open the corresponding floating valve.

The normally closed / normally opened setting of the output can be changed using CoolValveConfig (BooleanConstant5).

ID	Units	Valid Range	Default Value
nvoHwOutput_5	Percent (PWM)	0 to 100%	0%

DO6: Valve DO6

This output is used to control the heating valve or the close output of a floating valve (heating or cooling).

- When HeatValveType (EnumConstant8) is set to either Thermal or On/Off, this output will control the heating valve.
- When either CoolValveType (EnumConstant7) or HeatValveType (EnumConstant8) is set to Floating, this output is used to close the corresponding floating valve.

The normally closed / normally opened setting of the output can be changed using HeatValveConfig (BooleanConstant4).

ID	Units	Valid Range	Default Value
nvoHwOutput_6	Percent (PWM)	0 to 100%	0%

AO7: VarFanSpeed

This output is used to control the variable fan speed operation (ECM Motor) if nciFanSettings.FanCtrlType (nviFP39) is set to Variable fan.

ID	Units	Valid Range	Default Value
nvoHwOutput_7	Percent (%)	0 to 100%	0%

AO8: DamperAO

This output is used to control an analog damper. The type of signal (0-10V or 2-10V) can be configured using DamperCtrlType (EnumConstant9).

ID	Units	Valid Range	Default Value
nvoHwOutput_8	Percent (%)	0 to 100%	0%

AO9: Cooling Valve

This output is used to control the Cooling or Change-Over Valve operation.

This output is usually used to control a 0-10 valve actuator.

ID	Units	Valid Range	Default Value
nvoHwOutput_9	Percent (%)	0 to 100%	0%

AO10: Heating Valve

This output is used to control the Heating Valve.

This output is usually used to control a 0-10V valve actuator.

ID	Units	Valid Range	Default Value
nvoHwOutput_10	Percent (%)	0 to 100%	0%

Network Variables Input

nviSpaceTemp

This variable is used to receive the Space Temperature from an external node on the network.

This variable has priority over the local space temperature inputs. If this variable is received, the controller will use this value to control and will output the value in nvoSpaceTemp.

The only variable that can override nviSpaceTemp is nviSpaceTempAvg. For more details, refer to nviSpaceTempAvg(nviFP15).

ID	Units	Valid Range	Default Value
nviSpaceTemp	SNVT_Temp_p (°C)	-10 to 50°C	327,67°C

nviSetpoint (nviFP01)

This input network variable is used to allow the temperature setpoints for the occupied and standby modes to be changed via the network.

If a valid value is not present, either a locally wired setpoint knob or the appropriate setpoint as configured in nciSetpoints will be used.

Note: The unoccupied setpoints are not changed.

The effective heat/cool setpoints for the occupied and standby modes are derived from nciSetpoints plus the absolute setpoint offset, calculated as the difference between nviSetpoint and the mean of the occupied_heat and occupied_cool setpoints defined in nciSetpoints:

- abs_setpoint_offset = nviSetpoint - (occupied_cool + occupied_heat)/2
- effective_occupied_cool = occupied_cool + abs_setpoint_offset
- effective_occupied_heat = occupied_heat + abs_setpoint_offset
- effective_standby_cool = standby_cool + abs_setpoint_offset
- effective_standby_heat = standby_heat + abs_setpoint_offset

If nviSetpoint and nviSetptOffset are used together, the result on the effective setpoints is cumulative.

ID	Units	Valid Range	Default Value
nviFP01	SNVT_Temp_p (°C)	10 to 35°C	327,67°C

nviSpOffset (nviFP02)

This input network variable is used to shift the effective occupied and standby temperature setpoints by adding nviSetptOffset to the current setpoints.

It is typically bound to a supervisory node or to an external wall module having a relative setpoint knob.

All occupied and standby setpoints will be shifted upward (+) or downward (-) by the value of nviSpOffset.

Note: The unoccupied setpoints are not changed.

If nviSetpoint and nviSetptOffset are used together, the result on the effective setpoints is cumulative.

ID	Units	Valid Range	Default Value
nviFP02	SNVT_Temp_p (°C)	-10 to 10°C	327,67°C

nviOccManCmd (nviFP03)

This input network variable is used to command the Controller into different occupancy modes.

It is typically sent by a wall-mounted occupant interface module or supervisory node, to manually control occupancy modes, or override the scheduled occupancy.

If a local Bypass Input is present, it can be used in conjunction with this network variable input.

The local input, when active, forces a Bypass request (equivalent to OC_BYPASS), overriding nviOccManCmd for the duration of the Local Bypass Time (determined by the configuration property nciBypassTime).

When nviOccManCmd indicates OC_BYPASS, the Local Bypass Time is also used.

Whenever an update of nviOccManCmd is received indicating OC_BYPASS, the bypass timer is restarted.

This input is used in conjunction with nviSchedule1 and nviOccSensor (if installed) to determine the effective occupancy mode.

Refer to nvoEffectOccup(nvoFP02) for more information.

ID	Units	Default Value
nviFP03	SNVT_Occupancy 0 = OC_OCCUPIED: The Space Comfort Controller should operate in the occupied mode 1 = OC_UNOCCUPIED: The Space Comfort Controller should operate in the unoccupied mode 2 = OC_BYPASS: The Space Comfort Controller should operate in the occupied mode for a period of time defined by nciBypassTime. 3 = OC_STANDBY: The Space Comfort Controller should operate in the standby mode 0xFF = OC_NUL: This is the initial value after power-up and it remains until another value is received. It is used to indicate that this network variable input is invalid, unused or to cancel a previous command.	0xFF = OC_NUL

nviOccSensor (nviFP04)

This input network variable is used to indicate the presence of occupants in the controlled space and it is typically sent by an occupancy sensor.

In cases where an occupancy sensor is hardwired to the Space Comfort Controller, a valid value for nviOccSensor will take precedence over the hardwired input.

This input is used in conjunction with nviSchedule1 and nviOccManCmd (if installed) to determine the effective occupancy mode.

Refer to nvoEffectOccup(nvoFP02) for more information.

ID	Units	Default Value
nviFP04	SNVT_occupancy 0 = OC_OCCUPIED: The occupancy sensor is indicating that there ARE occupants in the space. 1 = OC_UNOCCUPIED: The occupancy sensor is indicating that there are NO occupants in the space. 0xFF = OC_NUL: This is the initial value after power-up and it remains until another value is received. It is used to indicate that this network variable input is invalid or unused. OC_NUL is equivalent to OC_OCCUPIED. All other enumerations are handled as equivalent to OC_NUL.	OC_NUL

nviApplicMode (nviFP05)

This network variable input is used to coordinate the Space Comfort Controller with any supervisory controller.

If a mode that is not supported by the unit controller is requested, the unit controller will use HVAC_AUTO.

The nviApplicMode overrides the local control of nvoHeatCool.

Refer to nvoHeatCool(nvoFP03) for more information.

ID	Units	Default Value
nviFP05	SNVT_hvac_mode 0 = HVAC_AUTO (Mode determined by unit) 1 = HVAC_HEAT (Use heat setpoints) 2 = HVAC_MRNG_WRMUP (Morning warmup) 3 = HVAC_COOL (Use cool setpoints) 4 = HVAC_NIGHT_PURGE (Free cooling) 5 = HVAC_PRE_COOL (Morning cooldown) 6 = HVAC_OFF (No unit operation allowed) 7 = HVAC_TEST (Special test mode, manufacturer-defined) 8 = HVAC_EMERG_HEAT (Emergency heat) 0xFF = HVAC_NUL (same as HVAC_AUTO) All other enumerations will be interpreted as HVAC_AUTO	HVAC_AUTO

nviFanSpeedCmd (nviFP06)

This input network variable is used to override the local fan speed operation.

The system can be configured to use this variable as a 3 speed fan override or a variable speed fan override.

To use this input as a 3 speed fan override, the Boolean constant nviFanSpeedCmdDigital (nciCb01_124/ConstantBool3) must be set to true.

When in 3 speed fan operating mode, the requested speed (Off, 1,2,3,Auto) are linked to the values of nciFanSettings.FanSpeed1Level,FanSpeed2Level and FanSpeed3Level (nviFP39).

When nviFanSpeedCmd is not in Auto mode, the fan will be set to the value of either FanSpeed1Level, FanSpeed2Level or FanSpeed3Level based on the received information from nviFanSpeedCmd.

When in variable fan speed operating mode, if not in auto mode the fan output will be set to the value received by nviFanSpeedCmd.

State	Value	Equivalent Percent	Request Speed
0	N/A	0 %	OFF
0	0 to 100	0 %	OFF
1	0.5 to 33	1 to 33%	SPEED 1
1	33.1 to 66	33.1 to 66%	SPEED 2
1	66.1 to 100	66.1 to 100%	SPEED 3
-1	N/A	AUTO	AUTO

ID	Units	Default Value
nviFP06	SNVT_switch	0% / -1

nviAuxHeatEnable (nviFP08)

This input is used to disable auxiliary heat operation.

This input is typically sent from a system supervisor panel. For example, during peak electrical demand periods, electric heat operation could be disabled.

It is also possible to have a hardwired input to a unit controller to be used for auxiliary heat enable.

In instances where both a hardwired input and network input are present, the network variable has precedence over the physical input.

This input can be used for simple enable/disable functions, or can be used to enable a portion of the unit's auxiliary heat capacity. Values less than 100% are used to limit the electric heater operation to the specified level.

State	Value	Equivalent percent	Auxiliary Heat Operation
0	N/A	0%	Limited 0% (disabled)
1	0	0%	Limited 0% (disabled)
1	0,5 to 99,5	0,5 to 99,5%	Limited (Enabled)
1	100%	100%	Not limited (Enabled)
-1	N/A	N/A	Not limited (Invalid)

ID	Units	Default Value
nviFP08	SNVT_switch	0% / -1

nviEnergyHoldOff (nviFP09)

This input is used to stop heating and cooling while allowing the unit to protect the space from extreme temperatures.

When the unit is in Energy Hold Off, the unit will not operate unless the space temperature exceeds the frost protection setpoint (nciMiscConfig.FrostProtSp (nviFP44)).

This input is usually associated with a device such as a window contact sensor.

If a physical sensor is connected and the network variable is present, the network variable as priority over the physical input.

State	Value	Energy Hold Off	State
0	N/A	Normal	0
1	0	Normal	1
1	1 to 100	Energy Hold Off	1
-1	N/A	Normal (Invalid)	-1

ID	Units	Default Value
nviFP09	SNVT_switch	0% / -1

nviSourceTemp (nviFP10)

This input network variable is used to indicate the temperature of water being supplied to the unit for heating and/or cooling capacity.

Valid values of nviSourceTemp have priority over local sensor values.

When using 2 pipes change-over systems, this value will be used to determine the heat/cool mode.

See nvoChgOver (nvoFP21) for more information about the heat/cool management.

ID	Units	Valid Range	Default Value
nviFP10	SNVT_temp_p (°C)	0 to 100¨C	327,67°C

nviOutdoorTemp (nviFP11)

This input network variable represents information from an outdoor air temperature sensor.

This value is typically generated from either a communicating sensor or a supervisory controller. The unit may also have a locally wired outdoor air temperature sensor.

Valid values of nviOutdoorTemp have priority over local sensor values.

This network variable is used to display the outside temperature on the EC-Smart-Vue sensor if configured.

ID	Units	Valid Range	Default Value
nviFP11	SNVT_temp_p (°C)	-50 to 50¨C	327,67°C

nviSpaceCO2 (nviFP13)

This input network variable measures the space CO2.

The unit can also have a locally wired sensor or use the Allure EC-Smart-Vue or EC-Smart-Air integrated CO2 sensor.

Valid values of nviSpaceCO2 have priority over local sensor values.

ID	Units	Valid Range	Default Value
nviFP13	SNVT_ppm	0 to 5000 ppm	65535 ppm

nviTerminalLoad (nviFP14)

This network variable, when used with nvoTerminalLoad from another controller can be used to coordinate master/slave operation.

When a controller has multiple outputs for heating, cooling, and fan speed this one connection can replace multiple connections for parallel operation.

ID	Units	Valid Range	Default Value
nviFP14	SNVT_lev_percent (%)	-100 to 100%	163,835%

nviSpaceTempAvg (nviFP15)

This variable is used to receive the Space Temperature readings of slave controllers.

When connected to the nvoLocalSpaceTemp of slave controllers using Fan-In bindings, the master controller will automatically calculate the average space temperature of the zone.

The controller will then use this value to control the space and output this value via nvoSpaceTemp.

This variable has priority over the local space temperature inputs and nviSpaceTemp.

The slave controllers can then use this temperature if a binding is made between nvoSpaceTemp of the master controller and nviSpaceTemp of the slave controllers.

ID	Units	Valid Range	Default Value
nviFP15	SNVT_temp_p (°C)	-10 to 50°C	327,67°C

nviOutdoorCO2 (nviFP16)

This input network variable measures the outdoor space CO2.

When this value is received, the local unit will automatically adjust the space CO2 setpoint using nviOutdoorCO2 and nciDamperSettings/outdoorCO2Offset (nviFP40).

SpaceCO2Setpoint = nviOutdoorCO2 + outdoorCO2Offset

ID	Units	Valid Range	Default Value
nviFP16	SNVT_ppm	300 to 5000 ppm	65535 ppm

nviChgOver (nviFP17)

This input is used to control the heat/cool operation when using 2 pipes change-over systems.

When this variable is used, it has priority over nviSourceTemp and all locally connected inputs.

State	Value	ChangeOver Mode
0	N/A	Cool
1	0	Cool
1	1 to 100	Heat
-1	N/A	Unused

ID	Units	Default Value
nviFP17	SNVT_switch	0% / -1

nviDewPtSensor (nviFP18)

This input is used to receive a dew point sensor value.

When condensation occurs on cooling pipe, this network value can stop the cooling valve operation.

When this variable is used, it has priority over a locally connected input.

Upon return to normal of this network value, a delay is started before enabling the cooling valve.

This delay can be adjusted using DewPointSensorDelay (nciCn01_07/ConstantNum5), the default value is 600 sec.

State	Value	Cooling Valve
0	N/A	Enable
1	0	Enable
1	1 to 100	Disable
-1	N/A	Enable

ID	Units	Default Value
nviFP18	SNVT_switch	0% / -1

nviWindowContact (nviFP20)

This input is used to receive window contact status.

When connected to nvoWindowContact of slave controllers using Fan-In bindings, the master controller will automatically validate if a window is open in the zone.

The controller will then output this value using nvoEnergyHoldOff to be able to shutdown the slave units when a window is open. The locally connected window contact is processed in conjunction with nviWindowContact to calculate nvoEnergyHoldOff.

As soon as an Open value is received nvoEnergyHoldOff will be set to 1,100.

If no other Open value is received during the next 150 seconds, nvoEnergyHoldOff will be set to 0,0.

Therefore, the MaxSendTime of the nvoWindowContact network variable of the other controllers must be set to a value lower than 150 seconds to make sure that the controller will receive an update before the end of the timer.

State	Value	Window
0	N/A	Close
1	0	Close
1	1 to 100	Open
-1	N/A	Close

ID	Units	Default Value
nviFP20	SNVT_switch	0% / -1

nviShedding (nviFP21)

This input is used to receive shedding information from a supervisory node.

Two types of shedding are available for the HVAC equipment.

The first type is a direct shedding of the electric heater. The electric heater is rescaled between 0% and (100% - nviShedding). For example, if nviShedding = 40% and the electric heater demand is 65%, the electric heater will be set to 39% (65% * (100% - 40%)).

The second type of shedding is an offset of the occupied/unoccupied setpoints. The shedding will automatically calculate an offset based on the difference between the occupied and standby setpoints to apply to the effective setpoint.

For example, in Occupied mode:

- EffectCoolSp = ((StbyCoolSp – OccCoolSp) * nviShedding/100) + OccCoolSp
- EffectCoolSp = ((26°C - 24°C) 30% / 100) + 24°C = 24.6°C
- EffectHeatSp = ((StbyHeatSp – OccHeatSp) * nviShedding/100) + OccHeatSp
- EffectHeatSp = ((18°C - 20°C) 30% / 100) + 20°C = 19.4°C

For example, in Standby mode:

- EffectCoolSp = ((StbyCoolSp – OccCoolSp) * nviShedding/100) + OccCoolSp
- EffectCoolSp = ((26°C - 24°C) 30% / 100) + 26°C = 26.6°C
- EffectHeatSp = ((StbyHeatSp – OccHeatSp) * nviShedding/100) + OccHeatSp
- EffectHeatSp = ((18°C - 20°C) 30% / 100) + 18°C = 17.4°C

Shedding can be disabled using the variable nciMiscConfig/SheddingEnable (nviFP44).

To configure the system for shedding on setpoints, the variable nciMiscConfig/SheddingOnSetpoint (nviFP44) must be set to True.

It is also possible to do shedding on lighting outputs. See the variable nviLightBlndCnfg (nviFP42) for more information on this topic.

ID	Units	Valid Range	Default Value
nviFP21	SNVT_lev_percent (%)	0 to 100%	163,835%

nviUnitStatus (nviFP22)

This input is used to receive information from a supervisory node.

This variable is usually used to do master/slave direct control of outputs.

If this variable is used, all the outputs of the slave controller will be set to the values received by nviUnitStatus.

The actual outputs are linked to the following fields:

Field	Description
Mode	Hvac mode
heat_output_primary	Heating valve control
heat_output_secondary	Electric heater control
cool_output	Cooling or changeOver valve control
econ_output	Damper control
fan_output	Fan control
inAlarm	Not used

Field Name	Min Value	Max Value	Default Value
Mode	0	9	NUL
heat_output_primary	0%	100%	163,84%
heat_output_secondary	0%	100%	163,84%
cool_output	0%	100%	163,84%
econ_output	0%	100%	163,84%
fan_output	0%	100%	163,84%
inAlarm	0	255	255

ID	Units	Default Value
nviFP22	SNVT_hvac_status	N/A

nviSlaveInfo (nviFP23)

This input is used to receive information from a slave controller.

The different information received from the slave controller will be processed by the master controller to calculate the different operating mode and functions of the master controller.

In a master/slave scenario, this variable will be bound to nvoSlaveInfo of a slave controller.

This variable can be used in a Fan-In binding configuration, some values are averaged and others are processed in a last valid configuration. The nvoSlaveInfo of the master controller must be bound to its own nviSlaveInfo to ensure that the information is processed in the calculation.

This variable has priority over the locally connected inputs.

Field	Description
SpaceTemp	Not used
SetpointOffset	Affect nvoSetptOffset when SetpointOffsetUpdate is true.
FanSpeedCmd	Affect nvoFanSpeedCmd when FanSpeedCmdUpdate is true.
LightLevel	The controller will average the values received on this variable and will not process the ReflexFactor.
Occupancy:	Change or reset the room occupancy when OccupancyUpdate is true.
Motion	Affect the motion detection of the zone.
Window	Window contact information, 0 = Close; 1 = Open. The controller will process these with nviWindowContact and affect nvoEnergyHoldOff using Fan-In Bindings
SetpointOffsetUpdate	Must be true for SetpointOffset to be processed.
FanSpeedCmdUpdate	Must be true for FanSpeedCmd to be processed.
OccupancyUpdate	Must be true for Occupancy to be processed
Group1	Indicate an update of the EC-Remote remote control group commands
Group2	EC-Remote remote control group commands (Light/Blind/)

Field Name	Min Value	Max Value	Default Value
SpaceTemp	-10°C	50°C	327.67°C
SetpointOffset	-10°C	10°C	0°C
FanSpeedCmd	0%	100%	0%
LightLevel	0	65534	65535
Occupancy	-1	1	-1
Motion	-1	1	-1
Window	0	1	0
Alarm	0	1	0
SetpointOffsetUpdate	0	1	0
FanSpeedCmdUpdate	0	1	0
OccupancyUpdate	0	1	0
GroupUpdate	0	1	0
Reserved1	0	1	0
Reserved2	0	1	0
Group1	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group2	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group3	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group4	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group5	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group6	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group7	0 (Off)	6 (Sunblind Rot Down)	-1 (null)
Group8	0 (Off)	6 (Sunblind Rot Down)	-1 (null)

ID	Units	Default Value
nviFP23	UNVT_Slaveinfo	N/A

nciSpaceCO2Lim (nviFP37)

This configuration property defines a high limit CO2 setpoint for the controlled space.
This setpoint will be used to control the air quality damper if nviOutdoorCO2 is not used.

ID	Units	Valid Range	Default Value
nviFP37	SNVT_ppm	300 to 5000 ppm	1000 ppm

nciFanSettings (nviFP39)

This configuration property defines the different available fan configurations.

Field	Description
FanCtrlType	This configuration is used to choise the fan control type (Variable, 3Speed, 2Speed,1 Speed or None)
FanMode	This configuration is used to configure the behavior of the fan. Continuous = Fan continuously operating Cycle = Fan cycling based on cooling/heating load Con Cycle = Fan continuously operating in occupied mode and cycling in unoccupied mode. Cycle Heat = Fan cycling based on heating load only Cycle Cool = Fan cycling based on cooling load only
CoolMaxFanSpeed	This configuration is used to set the maximum fan speed in cooling mode.
HeatMaxFanSpeed	This configuration is used to set the maximum fan speed in heating mode.
FanOffDelay	This configuration is used to set the Fan Off delay. On a request to stop the fan, the fan will run at minimum speed during this delay before being completely stopped. During that time, heating/cooling operation is disabled.
FanSpeed1Level	This configuration is used to configure the load (heating/cooling) required to start the fan when in Cycle mode configuration. This is also the fan speed at which the fan will be set when the system is overridden to low speed and nviFanSpeedCmdDigital (nciCb01_124/ConstantBool3) is set to TRUE.
FanSpeed2Level	This configuration is used to configure the fan speed at which the fan will be set when the system is overridden to medium speed and nviFanSpeedCmdDigital (nciCb01_124/ ConstantBool3) is set to TRUE.
FanSpeed3Level	This configuration is used to configure the fan speed at which the fan will be set when the system is overridden to high speed and nviFanSpeedCmdDigital (nciCb01_124/ ConstantBool3) is set to TRUE.
VarSpeedMinLevel	This configuration is used to set the minimum fan speed operation.
FanCoolLow	This configuration is used to set the minimum cooling load required to start the fan operation algorithm
FanCoolHigh	This configuration is used to set the cooling load at which the fan will be set to CoolMaxFanSpeed.
FanHeatLow	This configuration is used to set the minimum heating load required to start the fan operation algorithm
FanHeatHigh	This configuration is used to set the heating load at which the fan will be set to HeatMaxFanSpeed.

Field	Min Value	Max Value	Default Value
FanCtrlType	-1 (Mem Nul)	4 (VaFanSpeed)	4 (VarFanSpeed)
FanMode	1 (Nul)	4 (Cycle Cool)	0 (Continuous)
CoolMaxFanSpeed	0%	100%	100%
HeatMaxFanSpeed	0%	100%	100%
FanOffDelay	0s	6553.5s	120s
FanSpeed1Level	0%	100%	5%
FanSpeed2Level	0%	100%	31%
FanSpeed3Level	0%	100%	67%
VarSpeedMinLevel	0%	100%	10%
FanCoolLow	0%	100%	0%
FanCoolHigh	0%	100%	100%
FanHeatLow	0%	100%	0%

ID	Units	Default Value
nviFP39	UNVT_fan_settings	N/A

See IO assignement section for more details.

nciDamperSettings (nviFP40)

This configuration property defines the different configuration of the air quality damper.

Field	Description
outdoorCO2Offset	This configuration is used to calculate the effective Space CO2 setpoint when nviOutdoorCO2 is used.
minPositionOcc	This configuration is used to set the minimum damper position in occupied mode.
minPositionStby	This configuration is used to set the minimum damper position in standby mode.
maxPosition	This configuration is used to set the maximum allowable damper position.
Reserved1	This configuration is not used in this program.
Reserved2	This configuration is not used in this program.

Field Name	Min Value	Max Value	Default Value
outdoorCO2Offset	100 ppm	2000 ppm	600 ppm
minPositionOcc	0%	100%	10%
minPositionStby	0%	100%	5%
maxPosition	0%	100%	100%
Reserved1	0%	100%	0%
Reserved2	0%	100%	0%

ID	Units	Default Value
nviFP40	UNVT_Damper_settings	N/A

nciHVACScaling (nviFP41)

This configuration property can be used to rescale the heating cooling load of the different equipments.

Field	Description
minCoolingValve	This configuration is used to select the cooling load value before starting the cooling valve operation.
maxCoolingValve	This configuration is used to select the cooling load value at which the cooling valve will be at 100% operation.
minHeatingValve	This configuration is used to select the heating load value before starting the heating valve operation.
maxHeatingValve	This configuration is used to select the heating load value at which the heating valve will be at 100% operation.
minElectHeater	This configuration is used to select the heating load value before starting the electric heater operation.
maxElectHeater	This configuration is used to select the heating load value at which the electric heater will be at 100% operation.

Field Name	Min Value	Min Value	Default Value
Default Value	Default Value	Default Value	Default Value
Default Value	Default Value	Default Value	Default Value
Default Value	Default Value	Default Value	Default Value
Default Value	Default Value	Default Value	Default Value
Default Value	Default Value	Default Value	Default Value
Default Value	Default Value	Default Value	Default Value

ID	Units	Default Value
nviFP41	UNVT_hvac_scaling	N/A

nciMiscConfig (nviFP44)

This configuration property defines miscellaneous configurations for the HVAC control functions.

Field	Description
SI3Config	This configuration is used to configure sensor type link to SI3 input.
SpOffsetLimit	Setpoint Offset Limit for EC-Remote remote control and EC-Smart-Vue
SpaceTempOffset	Space Temperature Calibration Offset
DischTempOffset	Discharge Temperature Calibration Offset
ReturnTempOffset	Return Temperature Calibration Offset
MinDischAirSP	Minimum Discharge Temperature Setpoint Limitation
MaxDischAirSP	Maximum Discharge Temperature Setpoint Limitation
FrostProtSp	Frost Protection Setpoint
DischAirLimitType	Discharge temperature limitation type
ChgOverDelay	Change Over Delay between Heat/Cool Mode
MotionHoldTime	Motion Hold Time Delay (Delay is divided by 3 when BMS is in Unoccupied Mode)
BypassTime	Bypass Time from Occupany Push Button or EC-Smart-Vue
Sensor1Zone	EC-Multi-Sensor #1 Infrared Zone Number
Sensor2Zone	Unused
SheddingOnSetpoint	Enable Shedding via Setpoints Offset or via direct load shedding
SheddingEnabled	Enable Shedding Commands for HVAC equipment

Field	Min Value	Max Value	Default Value
SI3Config	0 (SpaceTemp)	4 (Other)	0
SpOffsetLimit	0°C	10°C	3°C
SpaceTempOffset	-10°C	10°C	0°C
DischTempOffset	-10°C	10°C	0°C
ReturnTempOffset	-10°C	10°C	0°C
MinDischAirSP	5 °C	20 °C	13°C
MaxDischAirSP	20 °C	45 °C	35°C
FrostProtSp	2 °C	15 °C	8 °C
DischAirLimitType	0	3	0(Not Limited)
ChgOverDelay	0 min	30 min	1 min
MotionHoldTime	1 min	120 min	15 min
BypassTime	0 min	360 min	60 min
Sensor1Zone	0	30	0
Sensor2Zone	0	30	0
SheddingOnSetpoint	0	1	0
SheddingEnabled	0	1	1
Reserved1	0	1	1
Reserved2	0	1	0
Reserved3	0	1	0
Reserved4	0	1	0
Reserved5	0	1	0
Reserved6	0	1	0

ID	Units	Default Value
nviFP44	UNVT_Misc_Config_PTU	N/A

nciComSensorConfig (nviFP45)

This configuration property can be used to rescale the heating cooling load of the different equipments.

Field	Description
MinCoolSP	Unused
MaxCoolSP	Unused
MinHeatSP	Unused
MaxHeatSP	Unused
ComSensorSpType	unused
ComSensorDisplay	Defines the value to be displayed by the EC-Smart-Vue (SpaceTemp, MidSetpoint, SetPtOffset, EffectSp)
ComSensor1Lock	Defines the available menus level on the EC-Smart-Vue (Full Access, Sp & Overrides, Sp Only, No Access)
ComSensor2Lock	Unused
ComSensor1DegF	Unused
ComSensor2DegF	Unused
DisplaySpaceCO2	Used to enable the display of the space CO2 concentration on the EC-Smart-Vue rolling display
DisplayOutdoorTemp	Unused
DisplaySpaceRH	Used to enable the display of the space air humidity on the EC-Smart-Vue rolling display
Reserved1	Unused
Reserved2	Unused
Reserved3	Unused

Field Name	Field Name	Max Value	Max Value
MinCoolSP	15.5°C	32.5°C	20°C
MaxCoolSP	15.5°C	32.5°C	26°C
MinHeatSP	12.5°C	29.5°C	16°C
MaxHeatSP	12.5°C	29.5°C	22°C
ComSensorSpType	0(coolheatsp)	2(midsetpoint)	1(spoffset)
ComSensorDisplay	0(spacetemp)	3(effectsp)	0(spacetemp)
ComSensor1Lock	0(Full Access)	3(No Access)	0(Full Access)
ComSensor2Lock	0(Full Access)	3(No Access)	0(Full Access)
ComSensor1DegF	0	1	0
ComSensor2DegF	0	1	0
DisplaySpaceCO2	0	1	0
DisplayOutdoorTemp	0	1	0
DisplaySpaceRH	0	1	0
Reserved1	0	1	1
Reserved2	0	1	1
Reserved3	0	1	0

ID	Units	Default Value
nviFP45	UNVT_comsensor_1to2_config	N/A

nviSchedule_1

This input network variable is used to command the Space Comfort Controller into different occupancy modes. It is typically sent by a scheduler or supervisory node.

This network variable input overrides the internal scheduler, if this input is not bound, the internal scheduler will be used in the controller configuration.

SNVT_tod_event is a structure containing three parts. The first part, current_state, is required for this network variable input. The additional parts, next_state and time_to_next_state, are optional. They can be used for control strategies that provide improved transitions between states.

A scheduler node should send OC_NUL and 0, respectively, if it does not use these functions.

The controller node will ignore these values if the functions are not supported by the controller.

This input is used in conjunction with nviOccManCmd and nviOccSensor (if installed) to determine the effective occupancy mode. Refer to Effective Occupancy Output (nvoEffectOccup) for more information.

ID	Units	Default Value
nviSchedule_1	SNVT_tod_event 0 = OC_OCCUPIED: The Space Comfort Controller should operate in the occupied mode 1 = OC_UNOCCUPIED: The Space Comfort Controller should operate in the unoccupied mode 3 = OC_STANDBY: The Space Comfort Controller should operate in the standby mode 0xFF = OC_NUL: It is used to indicate that this network variable input is invalid or unused. for next_state: (optional)	OC_OCCUPIED

Network Variables Output

nvoSpaceTemp

This output network variable is used to monitor the effective space temperature that the Space Comfort Controller is using for control.

If the input nviSpaceTempAvg has a valid value, this output will be equal to the average of all values received by nviSpaceTempAvg.

If the input nviSpaceTemp has a valid value and nviSpaceTempAvg is not valid, this output will echo the value of the input.

If a valid value for nviSpaceTemp does not exist, the locally wired sensor value is used.

If neither value is available, the output will send the invalid value.

The locally wired sensor priority order is the following:

- SI3 Space Temperature
- EC-Smart-Vue temperature
- EC-Smart-Comfort temperature
- EC-Remote Space Temperature
- SI3 Return Temperature
- EC-Multi-Sensor Temperature

ID	Units	Valid Range	Default Value
nvoSpaceTemp	SNVT_temp_p	N/A	N/A

nvoUnitStatus

This output network variable is available to report the Space Comfort Controller status.

It combines the operating mode, the capacity of heating and cooling used and an indication if any alarms are present in the object. SNVT_hvac_status allows this information to be provided in one network variable.

Refer to Effective Heat/Cool Output novHeatCool for additional information regarding the value reported in the mode field.

The outputs are linked to the following fields:

Field	Description
mode	nvoHeatCool
heat_output_primary	heating valve control
heat_output_secondary	electric heater control
cool_output	cooling or change-over valve control
econ_ouput	Damper control
fan_output	Fan control
inAlarm	This input manage 7 digital alarms : (1) : SpaceTempFault (2) : Light Extension 1 offline (4) : Light Extension 2 offline (8) : Blind Extension 1 offline (16) : Blind extension 2 offline (32) : MultiSensor offline (64) : EC-Smart-vue offline (128) : additional digital alarm in gfx.

ID	Units	Valid Range	Default Value
nvoUnitStatus	SNVT_hvac_status	N/A	N/A

nvoEffectSetpt (nvoFP01)

This output network variable is used to monitor the effective temperature setpoint that may depend on nciSetpoints, nvoEffectOccup, nviSetpoint, nviSetpointOffset, nviHeatCool, and any local setpoint adjustment.

For example, if the occupancy state is unoccupied and the heat/cool state is heat, then the effective setpoint would be equal to the unoccupied heating setpoint defined in nciSetpoints.

ID	Units	Valid Range	Default Value
nvoFP01	SNVT_temp_p	N/A	N/A

nvoEffectOccup (nvoFP02)

This output network variable is used to indicate the actual occupancy mode of the unit.

This information is typically reported to a supervisory controller, or provided to another Space Comfort Controller to coordinate the operation of multiple units.

The occupancy mode is determined by a combination of optional input network variables and logic in the controller. See Occupancy Control section for more information.

ID	Units	Valid Range	Default Value
nvoFP02	SNVT_occupancy	N/A	N/A

nvoHeatCool (nvoFP03)

This output network variable is used to indicate the actual heat/cool mode of the unit.

This information is typically reported to a supervisory controller, or provided to another Space Comfort Controller to coordinate the operation of multiple units.

When nviApplicMode is equal to AUTO or NUL, nvoHeatCool mode is set by the controller based on the heating/cooling demand.

When nviApplicMode is not equal to AUTO or NUL, nvoHeatCool is equal to nviApplicMode.

When the space temperature is below the frost protection setpoint, nvoHeatCool is equal to HVAC_EMERG_HEAT.

ID	Units	Valid Range	Default Value
nvoFP03	SNVT_hvac_mode	N/A	N/A

nvoFanSpeed (nvoFP04)

This output network variable reflects the actual fan speed control command.

See Fan Control Section for more information.

Fan Status	State	Value
Off	0	n/a
Between 1% and 100%	1	>0%

ID	Units	Valid Range	Default Value
nvoFP04	SNVT_switch	N/A	N/A

nvoDischargeAirTemp (nvoFP05)

This output network variable is used to display the actual discharge air temperature sensor value.

ID	Units	Valid Range	Default Value
nvoFP05	SNVT_temp_p	N/A	N/A

nvoTerminalLoad (nvoFP06)

This output indicates the current heat/cool energy demand of the unit.

Positive values indicate that cooling energy is required (or in use) by the space comfort controller, while negative values indicate that heating energy is required (or in use) by the space comfort controller.

This reports the output of the heating/cooling control algorithm.

ID	Units	Valid Range	Default Value
nvoFP06	SNVT_lev_percent	N/A	N/A

nvoSpaceRH (nvoFP07)

This output network variable indicates the space humidity in percent, if the Space Comfort Controller Device has an Allure EC-Smart-Vue sensor with humidity. If not used, this variable output is 163.835%

ID	Units	Valid Range	Default Value
nvoFP07	SNVT_lev_percent	N/A	N/A

nvoSpaceCO2 (nvoFP09)

This output network variable indicates the space CO2 concentration in ppm, if the Space Comfort Controller Device has a locally wired CO2 sensor.

If a valid value is received by nviSpaceCO2, this value has priority over the local input or the Allure EC-Smart-Vue sensor with CO2 sensor.

If not used, this variable output is 65535 ppm.

ID	Units	Valid Range	Default Value
nvoFP09	SNVT_ppm	N/A	N/A

nvoEnergyHoldOff (nvoFP10)

This output indicates the actual Energy Hold Off state of the device.

If the variable nviWindowContact is connected, the Energy Hold Off will be set to 1,100 if a window is open within the zone.

The hard-wired window contact input will also affect this variable.

ID	Units	Valid Range	Default Value
nvoFP10	SNVT_swith	N/A	N/A

nvoLocalSpaceTemp (nvoFP11)

This output network variable provides the value of a local hardwired space temperature input.

This is useful for averaging several controllers' data together when controlling a large space.

Refer to nviSpaceTempAvg for information on how to average multiple controllers together.

This output value will output one of the following using this priority order:

- SI3 Space Temperature
- EC-Smart-Vue temperature
- EC-Remote Space Temperature
- SI3 Return Temperature
- EC-Multi-Sensor Temperature

ID	Units	Valid Range	Default Value
nvoFP11	SNVT_temp_p	N/A	N/A

nvoReturnTemp (nvoFP12)

This output network variable is used to monitor the temperature of the air that enters the Space Comfort Controller, if the input SI3 is linked to the return air temperature custom block. If not used, this variable output is 327.67°C.

ID	Units	Valid Range	Default Value
nvoFP12	SNVT_temp_p	N/A	N/A

nvoFanSpeedCmd (nvoFP13)

This output network variable will output the actual fan speed command override of the unit.

When nviFanSpeedCmd is valid (State between 0 and 1), nvoFanSpeedCmd equals nviFanSpeedCmd. Otherwise, nvoFanSpeedCmd is linked with the local fan speed override of the EC-Remote, the EC-Smart-Vue or the EC-Smart-Comfort.

Fan Override	State	Value
Auto	-1	n/a
Off	0	n/a
Low	1	33%
Med	1	66.50%
High	1	100%

Fan Override	State	Value	Fan Override
Auto	-1	n/a	Auto

nvoSourceTemp (nvoFP14)

This output network variable is used to monitor the temperature of the source temperature.

If nviSourceTemp is valid, nvoSourceTemp will use this value.

If nviSourceTemp is invalid, nvoSourceTemp will be equal to a local input, if configured.

If not used, this variable output is 327.67°C.

ID	Units	Valid Range	Default Value
nvoFP14	SNVT_temp_p	N/A	N/A

nvoEffectCoolSp (nvoFP15)

This output network variable is used to monitor the effective cooling setpoint.

ID	Units	Valid Range	Default Value
nvoFP15	SNVT_temp_p	N/A	N/A

nvoEffectHeatSp (nvoFP16)

This output network variable is used to monitor the effective heating setpoint.

ID	Units	Valid Range	Default Value
nvoFP16	SNVT_temp_p	N/A	N/A

nvoEffectHeatSp (nvoFP16)

This output network variable is used to monitor the effective heating setpoint.

ID	Units	Valid Range	Default Value
nvoFP16	SNVT_temp_p	N/A	N/A

nvoSetPtOffset (nvoFP17)

This output network variable is used to monitor the effective setpoint offset used by the controller.
The calculation of the effective setpoint offset is done using the following priority order:

- nviSetPtOffset
- Last value received via nviSlaveInfo/SetpointOffset
- Value received via EC-Multi-Sensor, Allure EC-Smart-Vue or EC-Smart-Comfort
- Hard wired input

ID	Units	Valid Range	Default Value
nvoFP17	SNVT_temp_p	N/A	N/A

nvoTempErr (nvoFP18)

This output network variable is used to monitor the temperature deviation from setpoint.
This variable is equal to the cooling temperature deviation plus the heating temperature deviation.

ID	Units	Valid Range	Default Value
nvoFP18	SNVT_temp_diff_p	N/A	N/A

nvoCO2Load (nvoFP19)

This output network variable is used to monitor the actual fresh air request based on the CO2 concentration.

ID	Units	Valid Range	Default Value
nvoFP19	SNVT_lev_percent	N/A	N/A

nvoPresence (nvoFP20)

This output network variable is used to monitor the actual presence detection used by the controller.
If a valid value is received via nviOccSensor, this value will be used.
If a motion valid value is received via nviSlaveInfo, this value will be used as a 2nd priority.
The last priority is the Allure EC-Smart-Vue sensor and/or the EC-Multi-Sensor in parallel.
This network variable uses the HoldTime for detection.

ID	Units	Valid Range	Default Value
nvoFP20	SNVT_occupancy	N/A	N/A

nvoChgOver (nvoFP21)

This output network variable is used to monitor the actual change over status used by the controller.
The changeover status is calculated using the following priority order:

- Valid value received by nviChgOver
- Valid value received by nviSourceTemp (a calculation is then made to switch the mode between heat/cool based on the source temperature). The change over is switch between heating and cooling based on ChgOverCoolOn(NumericConstant16) and ChgOverCoolOff(NumericConstant17)

If none of these are valid, nvoChgOver is by default set to Heat and will output -1.0.

ID	Units	Valid Range	Default Value
nvoFP21	SNVT_switch	N/A	N/A

nvoDewPointSensor (nvoFP22)

This output network variable is used to monitor the actual dew point sensor status used by the controller.

The dewpoint status is calculated using the following priority order:

- Valid value received by nviDewPtSensor
- Hardware input configured for dew point sensor (Digital Input)

If none of these are valid, nvoDewPtSensor is by default set to Enable and will output -1.0.

State	Value	Cooling Valve
0	n/a	Enable
1	0	Disable
1	>0	Disable
0xFF	n/a	Enable

ID	Units	Valid Range	Default Value
nvoFP22	SNVT_switch	N/A	N/A

nvoWindowContct (nvoFP24)

This output network variable is used to monitor the window contact status of the space comfort controller.

State	Value	Window Contact
0	n/a	Close
1	0	Close
1	> 0	Open
0xFF	n/a	Close

ID	Units	Valid Range	Default Value
nvoFP24	SNVT_switch	N/A	N/A

nvoAuxContact (nvoFP25)

This output network variable is used to monitor the status of an auxiliary contact wired to the space comfort controller.

State	Value	Contact Status
Contact Status	Contact Status	Contact Status
Contact Status	Contact Status	Contact Status
Contact Status	Contact Status	Contact Status
Contact Status	Contact Status	Contact Status

ID	Units	Valid Range	Default Value
nvoFP25	SNVT_switch	N/A	N/A

nvoEcoVue (nvoFP26)

This output network variable can be used to display the actual ECO-Vue of the unit. This variable is not used in this program.

ID	Units	Valid Range	Default Value
nvoFP26	SNVT_energy_efficient	N/A	N/A

nvoSlaveInfo (nvoFP27)

This output is used to send information from a slave controller.

The different information received from the slave controller will be processed by the master controller to calculate the different operating mode and functions of the master controller.

In a master/slave scenario, this variable will be bound to nviSlaveInfo of the master controller.

The nvoSlaveInfo of the master controller must be bound to its own nviSlaveInfo to make sure that the information is processed in the calculation.

Field	Description
SpaceTemp	Local Space Temperature
SetpointOffset	Local Setpoint Offset
FanSpeedCmd	Local Fan Speed Command
LightLevel	Local light level of EC-Multi-Sensor with nciLightLoopCfg/ReflexFactor
Occupancy	Local Occupancy from EC-Remote
Motion	Local Motion detection
Window	Local Window Contact Information
SetpointOffsetUpdate	Local Setpoint Offset Update
FanSpeedCmdUpdate	Local Fan Speed Command Update processed.
OccupanyUpdate	Local Occupancy Update
GroupUpdate	Local EC-Remote Group Command Update
Group1-8	EC-Remote remote control group commands (Light/Blind/)

ID	Units	Valid Range	Default Value
nvoFP27	SNVT_SlaveInfo	N/A	N/A

Boolean Constants

FreeCoolingEnable (ConstantBool1)

This variable is used to enable free cooling via the fresh air damper.

ID	Units	Valid Range	Default Value
Constant Boolean 1	TRUE/FALSE	N/A	FALSE

EnableRoomUnocc (ConstantBool2)

This variable is used to configure the behavior of RoomOccupancy when the OccupancyCmd is set to unoccupied.

When this variable is set to TRUE, the RoomOccupancy (BV2), will be set to Unoccupied on the reception of an unoccupied command from nviSchedule_1.

ID	Units	Valid Range	Default Value
Constant Boolean 2	TRUE/FLSE	N/A	TRUE

nviFanSpeedCmdDigital (ConstantBool3)

This variable is used to configure the behavior of the fan speed signal when receiving fan speed command override from nviFanSpeedCmd.

When this value is set to TRUE, the value received from nviFanSpeedCmd will be considered 3 fan speed operation commands.

See nviFanSpeedCmd for more information on this configuration parameter.

ID	Units	Valid Range	Default Value
Constant Boolean 3	TRUE/FALSE	N/A	TRUE

HeatValveConfig (ConstantBool4)

This variable is used to configure the operating mode of the heating valve.

ID	Units	Valid Range	Default Value
Constant Boolean 4	NormOpen/NomClose	N/A	NormClose (FALSE)

CoolValveConfig (ConstantBool5)

This variable is used to configure the operating mode of the cooling or change-over valve

ID	Units	Valid Range	Default Value
Constant Boolean 5	NormOpen/NomClose	N/A	NormClose (FALSE)

Numeric Constants

Elevation (ConstantNum1)

This constant must be set for any elevation above 500ft (152m) to obtain the highest elevation compensation accuracy for the EC-Smart-Vue CO2 and the EC-Smart-Comfort reading: the sensor will automatically compensate CO_2 readings for a number of factors including the current room temperature and the elevation.

ID	Units	Valid Range	Default Value
Constant Numeric 1	meters	N/A	0 m

RangeCO2 (ConstantNum2)

This variable is used to configure the range of the CO2 sensor connected to UI1.

ID	Units	Valid Range	Default Value
Constant Numeric 2	ppm	N/A	0 ppm

UnoccOccDelay (ConstantNum3)

This variable is used to configure the delay required to change the nvoEffecOccup from unoccupied to occupied when motion is detected while an unoccupied mode is received from nviSchedule_1.

The variable is used to prevent the HVAC system to be set to occupied when someone is detected during a short delay while in unoccupied mode. Lights and sunblinds are not affected by this delay.

ID	Units	Valid Range	Default Value
Constant Numeric 3	seconds	N/A	600 seconds

DamperMinPosUnocc (ConstantNum4)e

This variable is used to configure the dampers minimum position while in unoccupied mode.

ID	Units	Valid Range	Default Value
Constant Numeric 4	Percent (%)	0 to 100%	0 %

DewPointSensorDelay (ConstantNum5)

This variable is used to configure the delay after the return to normal of the dew point sensor before enabling the cooling operation of the unit.

ID	Units	Valid Range	Default Value
Constant Numeric 5	seconds	N/A	600 seconds

ElectricHeatPeriod (ConstantNum6)

This variable is used to configure the electric heater pwm period.

ID	Units	Valid Range	Default Value
Constant Numeric 6	seconds	60 to 300 seconds	240 seconds

FloatingDriveTime (ConstantNum7)

This variable is used to configure the drive time of the floating valve when either CoolValveType (ConstantEnum7) or HeatValveType (ConstantEnum8) is set to Floating.

ID	Units	Valid Range	Default Value
Constant Numeric 7	seconds	N/A	95 seconds

SensorSleepTime (ConstantNum8)

This variable is used to configure the sensor sleep time of the EC-Smart-Comfort sensor. If set to 0, the sensor sleep time is disabled

ID	Units	Valid Range	Default Value
Constant Numeric 8	seconds	N/A	0 second

SlaveTempDelta (ConstantNum14)

This variable is used to configure the minimum temperature variation before updating the nvoSlave-Info.SpaceTemp value.

ID	Units	Valid Range	Default Value
Constant Numeric 14	Degrees-celsius (°C)	N/A	0,1 °C

SlaveDelayMotion (ConstantNum15)

This variable is used to configure the motion stop delay before updating the nvoSlaveInfo.Motion value

ID	Units	Valid Range	Default Value
Constant Numeric 15	seconds	N/A	10 seconds

ChangeOverCoolOn (ConstantNum16)

This variable is used to configure the water temperature below which 2 pipes change-over systems are considered to be in cooling mode.

ID	Units	Valid Range	Default Value
Constant Numeric 16	Degrees-celsius (°C)	N/A	16 °C

ChangeOverCoolOff (ConstantNum17)

This variable is used to configure the water temperature above which 2 pipes change-over systems are considered to be in heating mode.

ID	Units	Valid Range	Default Value
Constant Numeric 17	Degrees-Celsius (°C)	N/A	20 °C

Sequence of Operation

Occupancy Control

The nvoEffectOccup (nvoFP02) is managed based on nviSchedule and RoomOccupancy (BV2)

The nviSchedule is usually received from the network and the RoomOccupancy (BV2) is based on motion detection and occupancy overrides.

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

nviSchedule	RoomOccupancy (BV2)	nvoEffectOccup (nvoFP02)
Occupied	Occupied	Occupied
	Unoccupied	Standby
Unoccupied	Occupied	Occupied
	Unoccupied	Unoccupied
Bypass	Occupied	Occupied / Bypass[1]
	Unoccupied	Standby
Standby	Occupied	Occupied
	Unoccupied	Standby

Table 2: Occupancy Control

1. If no motion is connected and schedule is unoccupied, the bypass mode is activated for 60 minutes if the room occupancy is set to occupied (EC-Smart-Vue, EC-Smart-Sensor and EC-Smart-Comfort).

Motion Hold Time

After the last occupancy detection, RoomOccupancy (BV2) is maintained to OCCUPIED for 15 minutes (motion hold time default value). If no detection happens during this periodnvoEffectOccup (nvoFP02) is set to STANDBY (if nviSchedule = OCCUPIED) or UNOCCUPIED (if nviSchedule = UNOCCUPIED). When nviSchedule is UNOCCUPIED, this motion hold time is divided by 3.

Temperature Setpoint Control

The actual setpoints nvoEffectHeatSp and the nvoEffectCoolSp are computed according to nvoEffectOccup (nvoFP02)nvoSetPtOffset

nvoEffectOccup (nvoFP02)	nvoEffectHeatSp	nvoEffectCoolSp
Occupied or Bypass	OccHeatSP (nciSetpoints) + nvoSetPtOffset	OccCoolSP (nciSetpoints) + nvoSetPtOffset
Standby	StandbyHeatSP (nciSetpoints) + nvoSetPtOffset	StandbyCoolSP (nciSetpoints) + nvoSetPtOffset
Unoccupied	UnoccHeatSP (nciSetpoints)	UnoccCoolSP (nciSetpoints)

Table 3: Actual setpoints values

The effective setpoint nvoEffectSetpt is computed according to HvacModeStatus:

HvacModeStatus value	nvoEffectSetpt
Heat or Off	nvoEffectHeatSp
Cool	nvoEffectCoolSp

Table 4: Effective setpoint value

Fan Control

The fan is controlled according to nciFanSettings.FanCtrlType (nviFP39), nciFanSettings.FanCtrlMode, FanSpeedCmd (EV6), TerminalLoad (nvoFP06) and nvoEffectOccup (nvoFP02).

When configured for ECM Motor (Var Speed), the fan is controlled using a 0-10V signal on AO7. The fan start can also be connected on DO1.

When configured for a 3-speed fan (3Speed), the fan is controlled using DO1, DO2 and DO3.

Fan Type setting	FanSpeedCmd (EV6)	nciFanSettings.FanCtrlMode	Fan management
None	Any	Any	Outputs DO1, DO2, DO3 and AO7 are not used.
ECM Motor (VarSpeed)	Auto	On	The fan is set to FanSpeed1Level (nciFanSettings) and the fan request based on the TerminalLoad (nvoFP06). See Temperature Management for more details.
		Auto	The fan is set to the fan request based on TerminalLoad (nvoFP06). See Temperature Management for more details. If the system is controlled by a return temperature sensor, the fan will be enabled at minimum speed for 5 minutes every 2 hours to validate the temperature reading.
		Smart	When nvoEffectOccup (nvoFP02) is occupied, the fan is controlled in On FanCtrlMode. When nvoEffectOccup (nvoFP02) is not occupied, the fan is controlled in Auto FanCtrlMode. When in unoccupied mode, if the system is controlled by a return temperature sensor, the fan will be enabled at minimum speed for 5 minutes every 2 hours to validate the temperature reading.
	Off	Any	The fan is set to 0% unless the system is in freeze protection mode/ In that case the fan is set to HeatMaxFan (nviFP39)
	Low		The fan is set to FanSpeed1Level (nciFanSettings).
	Med		The fan is set to FanSpeed2Level (nciFanSettings).
	High		The fan is set to FanSpeed3Level (nciFanSettings).
3 Speed Fan	Auto	On	The fan will always be at least at Speed1. Fan speed2 will be enabled when the fan request based on TerminalLoad (nvoFP06). is greater than FanSpeed2Level (nciFanSettings). Fan speed3 will be enabled when the fan request based on TerminalLoad (nvoFP06). is greater FanSpeed3Level (nciFanSettings). See Temperature Management for more details about fan request.
		Auto	Fan speed1 will be enabled when the fan request based on TerminalLoad (nvoFP06). is greater than FanSpeed1Level (nciFanSettings). Fan speed2 will be enabled when the fan request based on TerminalLoad (nvoFP06). is greater than FanSpeed2Level (nciFanSettings). Fan speed3 will be enabled when the fan request based on TerminalLoad (nvoFP06). is greater FanSpeed3Level (nciFanSettings). See Temperature Management for more details about fan request
		Smart	When the nvoEffectOccup (nvoFP02) is occupied, the fan is controlled in On FanCtrlMode. When the OccupancyStatus is not occupied, the fan is controlled in Auto FanCtrlMode. When in unoccupied mode, if the system is controlled by a return temperature sensor, the fan will be enabled at minimum speed for 5 minutes every 2 hours to validate the temperature reading.
	Off	Any	The fan is set to off unless the system is in freeze protection mode. In that case the fan is set to maximum speed.
	Low		The fan is set to fan speed 1.
	Med		The fan is set to fan speed 2.
	High		The fan is set to fan speed 3.

Table 5: Fan Control

Whenever the system is in freeze protection mode, the fan is set to HeatMaxFan (nviFP39).

When the fan request switches from active to inactive, the FanOffDelay is enabled if equipments were being controlled before stopping the fan.

HVAC Mode Management

The nvoHeatCool is computed according to nviApplicModeTerminalLoad (nvoFP06)nvoWindowContact, nviSpaceTemp and FreezepProtSp (nviFP44)

A ChgOverDelay (nviFP44) prevents the nvoHeatCool from switching between cooling and heating too often.

nviSpaceTemp	nvoWindowContact	nviApplicMode	TerminalLoad (nvoFP06)	nvoHeatCool
>FreezepProtSp (nviFP44)	Open	Any	Any	Off
	Closed	Auto	>0	Cool mode
			<0	Heat mode
			=0	Unchanged
		Other than Auto	Any	nviApplicMode
<FreezepProtSp (nviFP44)	Any	Any	Any	Heat mode, the fan and the heating outputs are overriden to 100% untilnviSpaceTempreaches FreezepProtSp (nviFP44) +2°C.

Table 6: HVAC modes

Temperature Management

Cooling Mode

The cooling or change-over valve is controlled in sequence with the fan speed to maintain the space temperature to the actual cooling setpoint nvoEffectCoolSp.

The cooling or change-over valve is:

- **rescaled** between 0% to 100% when the TerminalLoad (nvoFP06) is between 0% and 100%.
- **disabled** when the fan is not running unless the nciFanSettings.FanCtrlType (nviFP39) is set to None.
- **disabled** while in cooling mode if a condensation sensor input is active on DI5 or received from a master controller.

The fan speed request is rescaled between 0% and CoolMaxFan (nviFP39) when the TerminalLoad (nvoFP06) is between FanCoolLow and FanCoolHigh.

Heating Mode

The heating or change-over valve is controlled in sequence with the electric heater and the fan speed to maintain the space temperature to the actual cooling setpoint nvoEffectHeatSp.

- If the system is not equipped with an electric heater, the heating or change-over valve is rescaled between 0% and 100% when TerminalLoad (nvoFP06) is between 0% and 100%.
- If the system is equipped with an electric heater, the heating or change-over valve is rescaled between 0% to 100% when TerminalLoad (nvoFP06) is between 0% and 50% while the electric heater is rescaled between 0% to 100% when TerminalLoad (nvoFP06) is between 50% and 100%.

The heating or change-over valve and the electric heater are disabled when the fan is not running unless the nciFanSettings.FanCtrlType (nviFP39) is set to None.

The fan speed request is rescaled between 0% and HeatMaxFan (nviFP39) when TerminalLoad (nvoFP06) is between FanHeatLow and FanHeatHigh.

Damper Control

The damper control is based is on SpaceCO2, CoolingLoad, and nvoEffectOccup (nvoFP02)
The CO2 load is calculated using PID_CO2 nvoSpaceCO2 as measured value and nciSpaceCO2Lim.

nvoEffectOccup (nvoFP02)	EnableFreeCooling (BC1)	Damper management
Unoccupied	Any	The damper is closed to 0%.
Occupied or Bypass	Enable	The damper is controlled by the grater of the CO2 and Cooling load signals.
	Disable	The damper is controlled by the CO2 load.
Standby	Enable	The damper is controlled by the Cooling load.
	Disable	The damper is closed to 0%.

Table 7: Damper Control

Discharge Temperature Control

The discharge temperature control allows the limitation of the heating and/or cooling valve depending on the configuration of nciMiscConfig.DischargAirLimitType (nviFP44) and of the matching PID value (MaxDischAirLimit (PID4) / MinDischAirLimit (PID5)):

- Heating valve limitation (if nciMiscConfig.DischargAirLimitType (nviFP44) = Highlimit or High-LowLimit): the heating valve is limited by MaxDischAirLimit (PID4) which is calculated depending on the discharge temperature and nciMiscConfig.MaxDischAirSP (nviFP44): the valve opening is limited to the minimum value between Heating Load and MaxDischAirLimit (PID4).
- Cooling valve limitation (if nciMiscConfig.DischargAirLimitType (nviFP44) = LowLimit or High-LowLimit): the cooling valve is limited by MinDischAirLimit (PID5) which is calculated depending on the discharge temperature and nciMiscConfig.MinDischAirSp (nviFP44) , the valve opening is limited to the minimum value between Cooling Load and MinDischAirLimit (PID5).

Master/Slave Control

Principles

Local temperature management

The slave devices use their own temperature for control. The master device sends information to limit the slave that uses its own information.

Limiting the slave device in heating // cooling mode avoids having different modes in a single zone. The slace device always has the same mode as the master.

Centralized temperature management

The slave device uses the master device temperature to control its euipments with nvoSpaceTemp. The slave device does not use its own temperature but the temperature used by the master device. Nevertheless, the master device can average the local temperatures sent by the slave devices (nvoLocalSpaceTemp on the master's nviSpacetempAvg to send that average value to the slave devices. Master and slace devices all use the averaged temperature from all the sensors within the zone for control.

The slave device takes the same PID value as the master device via nvoTerminalLoad. The slave device has the same mode and the same demand as the master. All the control is achieved by the master. Nevertheless, the slave keeps its own valve parameters (rescaling).

Temperature setpoint management

The slave uses the same occupancy status as the master via nvoEffectOccup. The slave will therefore have the same occupancy status as the master, and temperature setpoints will change depending on this occupancy status.

The slave uses the same setpoint offset as the master via nvoSetPtOffset. The slave therefore has the same setpoint offset as the master, but uses its own setpoint parameters, which can differ from the master.

Fan management

The slave uses local control for the automatic control of its fan, if nvoTerminalLoad is unused, but overrides are managed by the master using nvoFanSpeedCmd. The slave will have the same fan speed as the master when the occupant manually overrides the fan speed settings with the room device.

The slave has the same fan speed as the master, whereas in Auto mode or overridden if nvoFanSpeed is binded to the slave's nviFanSpeedCmd. In this case, the slave does not control its fan any more.

Total Master Management

The slave uses the equipment values from the master using nvoUnitStatus. The slave behavior is identical to the master.

Bindings

nvoTerminalLoad Bindings

Using nvoTerminalLoad, the master can control all the equipments in parallel

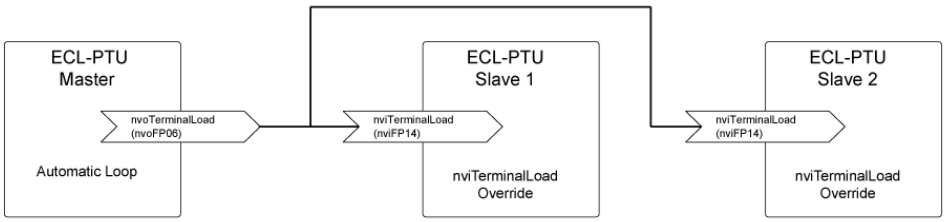


Figure 1: nvoTerminalLoad-Bindings

nvoEffectOccup Bindings

Using nvoEffectOccup, the master can control the occupancy of slave controllers by linking nvoEffectOccup to nviOccManCmd of slave controllers.

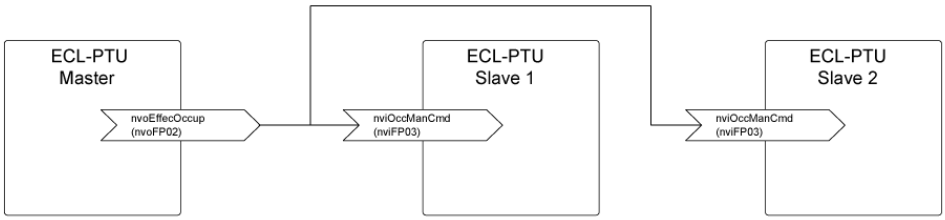


Figure 2: nvoEffectOccup-Bindings

nvoHeatCool Bindings

Using nvoHeatCool, the master controller can make sure that all the controllers in a zone are controlled based on the same operating mode.

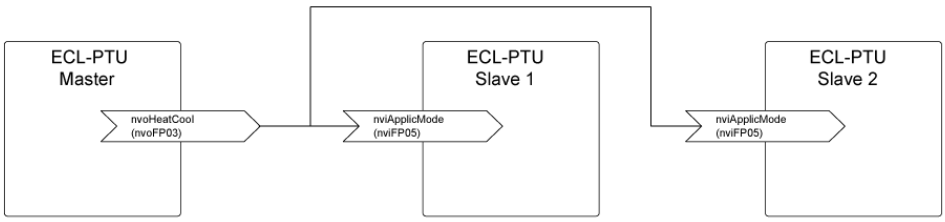


Figure 3: nvoHeatCool-Bindings

nvoSpaceTemp Bindings

Using nvoSpaceTemp, the master can transfer it's own temperature to all the slaves in the zone.

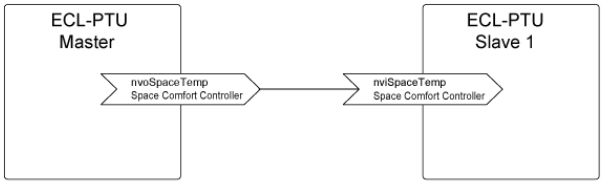


Figure 4: nvoSpaceTemp-Bindings

nvoSetPtOffset Bindings

Using nvoSetPtOffset, the master can transfer the setpoint offset to all the controllers in the zone. The master will always output the last valid value received via nviSlaveInfo.

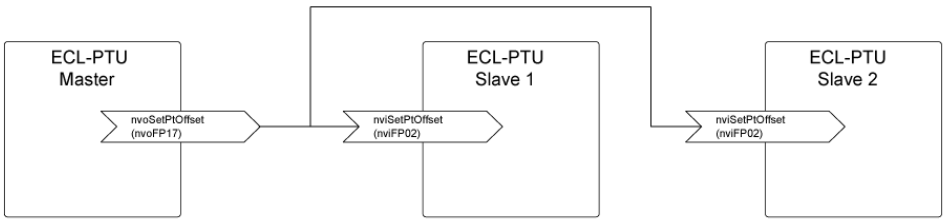


Figure 5: nvoSetPtOffset-Bindings

nvoSlaveInfo Bindings

All the controllers, including the master itself must send their nvoSlaveInfo to the variable nviSlaveInfo of the master controller. The master will use this variable to calculate occupancy detection and all other relevant information.

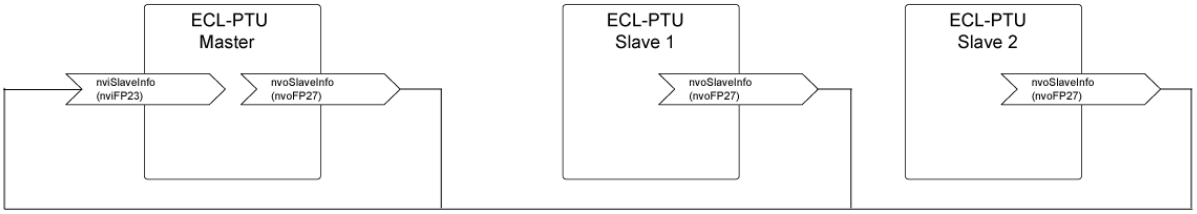


Figure 6: nvoSlaveInfo-Bindings

nvoWindowContact Bindings

All the controllers, including the master itself must send their nvoWindowContact to the variable nvi-WindowContact of the master controller. The master will use these values to calculate the nvoEnergy-HoldOff.

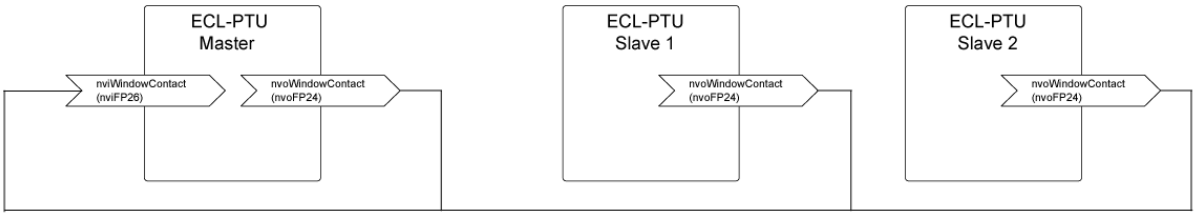


Figure 7: nvoWindowContact-Bindings

nvoEnergyHoldOff Bindings

Using nvoEnergyHoldOff, the master can synchronise the energy hold off value between controllers when a window is open in the zone.

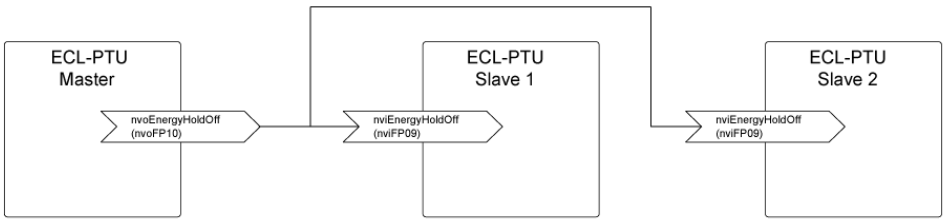


Figure 8: nvoEnergyHoldOff-Bindings

FanSpeed Bindings

nvoFanSpeed

Using nvoFanSpeed, the master send FanSpeed value to every slave via nviFanSpeedCmd.

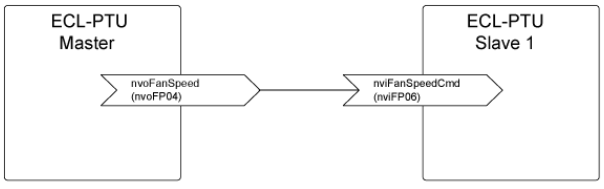


Figure 9: nvoFanSpeed

nvoFanSpeedCmd

Using nvoFanSpeedCmd, the master send FanSpeedCmd (override) value to every slave via nvi-FanSpeedCmd.

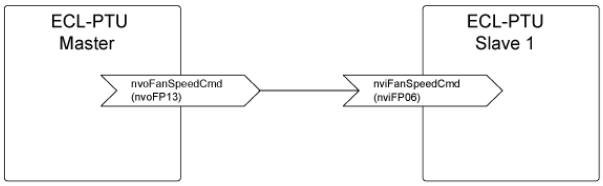


Figure 10: nvoFanSpeedCmd

HVAC Bindings

Using nvoUnitStatus, the master send every HVAC value (Fanspeed, Valves, Damper, Hvaec Mode and Electric heater).

This enables all the units to work based on the control signal of the master.

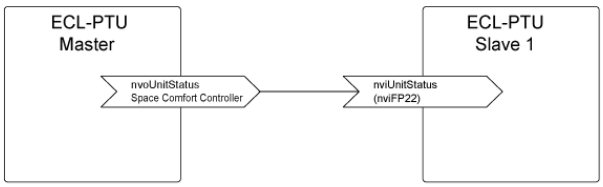


Figure 11: HVAC-Bindings

Using the dcgfxApplications

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 how to configure equipment settings and setting up trends to be followed.

Accessing the Preloaded Applications with EC-Net Pro

The ECL-PTU Series preloaded applications can be found in the dc *gfx*Applications module in the template side bar.

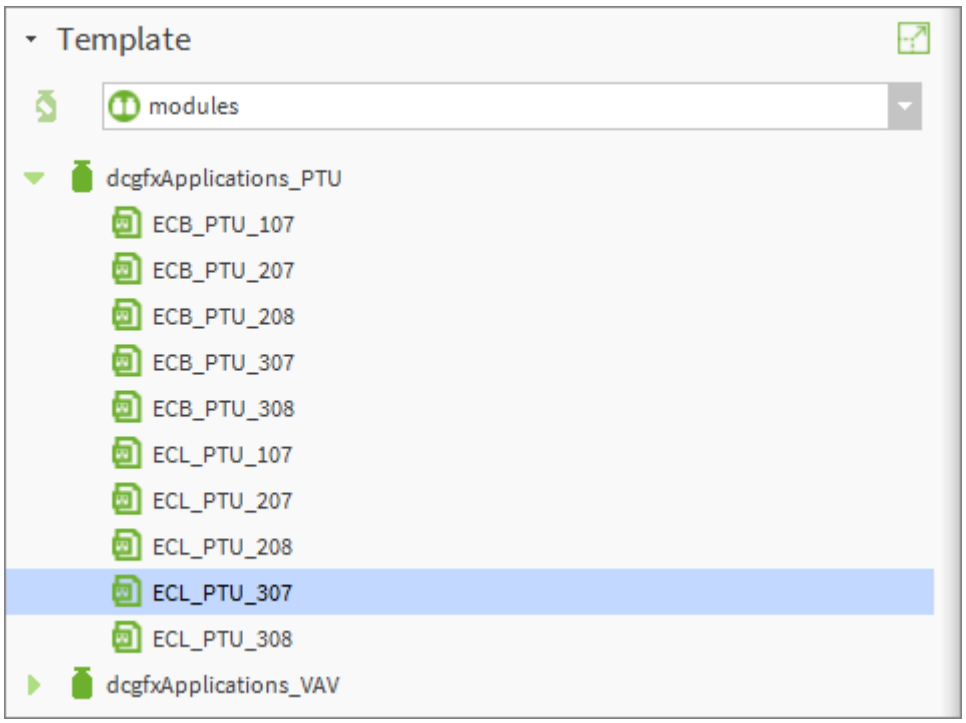
Certain elements must be installed on the EC-Net platform being used, namely:

- 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 ECL-PTU controller, it must be first created in the BcpLonNetwork driver of the configured station and then matched with an existing device in the BcpLonNetwork. 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 *gfx*Applications modules folder in the template sidebar



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

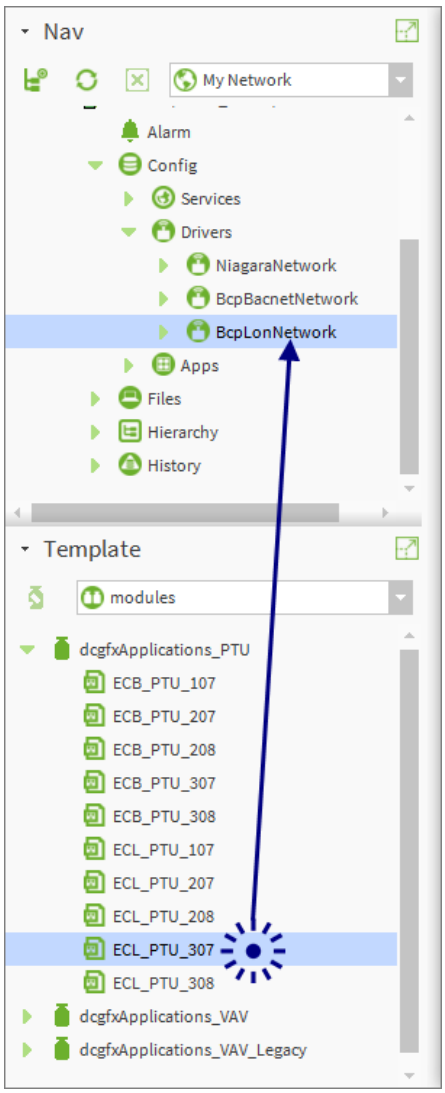


Figure 12: Adding device to the BcpLonNetwork driver

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

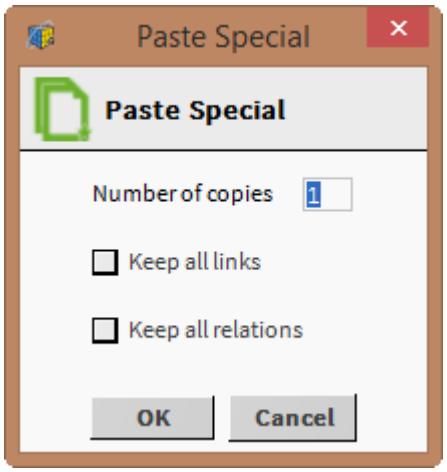


Figure 13: Adding Multiple Copies of a Device

3. Double-click the **BcpLonNetwork** driver. The Bcp Lon Device Manager appears in the View pane.
4. Click **Discover**. The discovered devices appear in the View pane's top section and the BcpLon-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**.

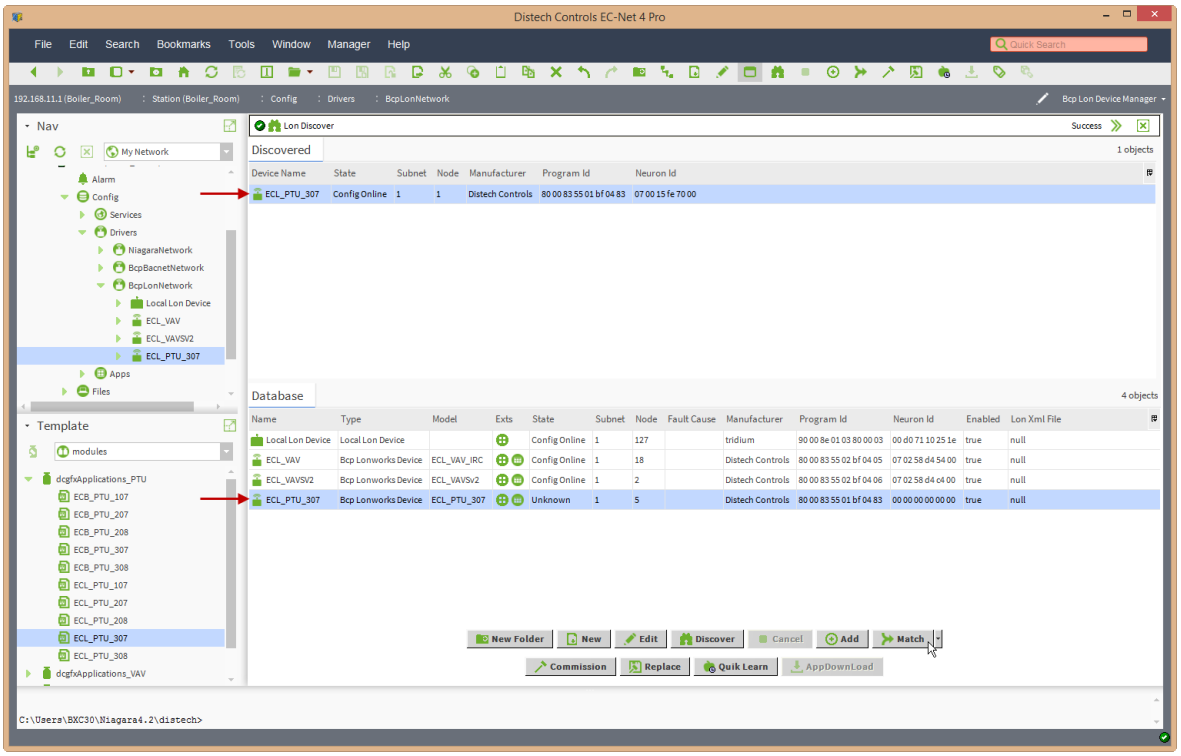


Figure 14: Matching discovered device with Device in Database

The **Match** window appears.

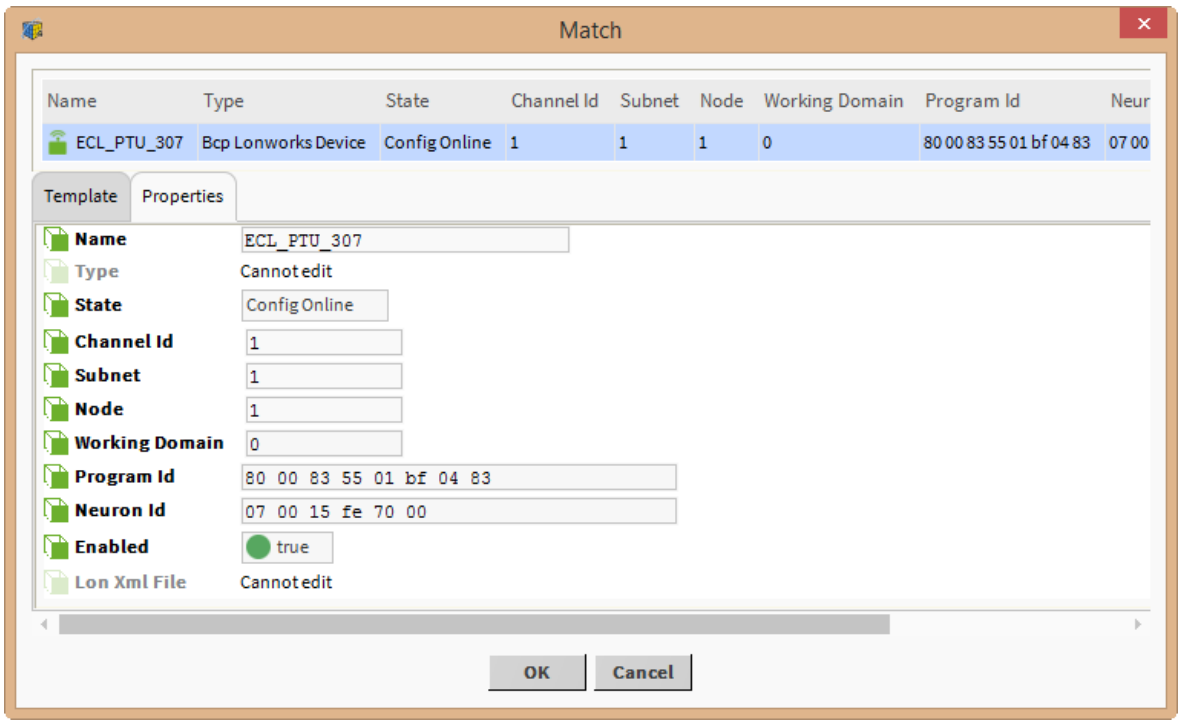


Figure 15: Match Window

6. Click **OK**. The devices are now matched and added to the LONWORKS Network database.

7. Once the devices have been added to the LONWORKS NETWORK, commission the devices: To do so, double-click **BcpLonNetwork**, select the device(s), and click **Commission**.

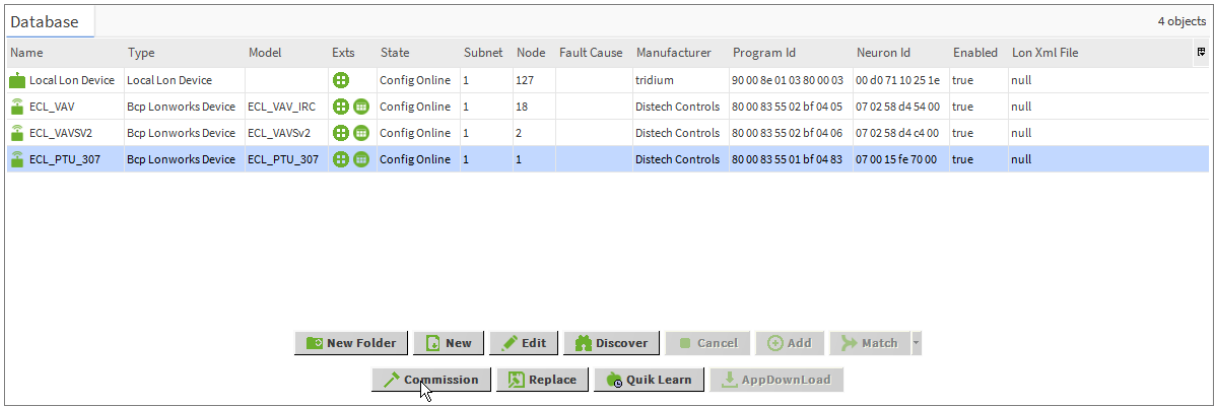


Figure 16: Commissioning the Device

8. The **Commission** window is displayed. Click **Service Pin** and then physically press the service pin button on the device. You can also commission the device manually by entering the device's Neuron ID number. For more details on how to commission a device, refer to the "Getting Started" sections in the EC-*gfx*Program User Guide.

9. Now to synchronize the data, the configuration properties must be downloaded from the database to the controller. Right-click on the new device and select **Actions** and then **Download**.

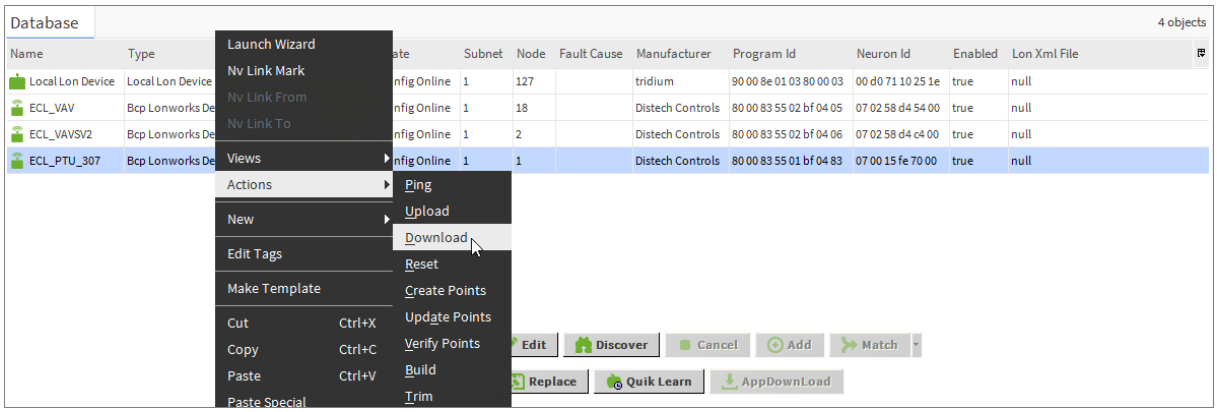


Figure 17: Action Download - Action Upload

10. Click OK and then perform an upload on the device: Right click on the device and select Actions and then Upload. This will take the configuration properties from the controller to the database.

11. Now from the BcpLonNetwork folder, double-click the new device. An overview of the system in place appears in the View pane.

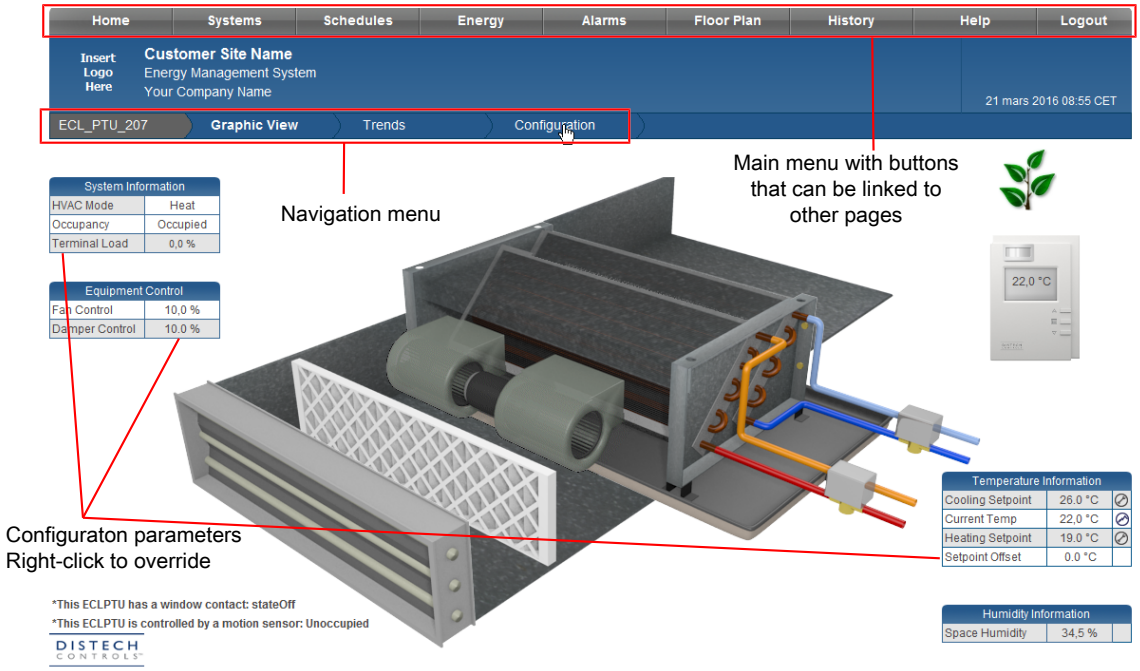


Figure 18: ECL-PTU System View with various parts explained

Configuring the PTU with EC-Net 4

The preloaded applications can easily be configured from within the dcgfxApplications interface. All the configuration parameters related to the equipment setup as well as its input and output settings are accessible from the **Configuration** page and are grouped into several tables.

To select the **Configuration** page:

In the navigation menu at the top of the system view, click **Configuration**.

The **Configuration** page appears.

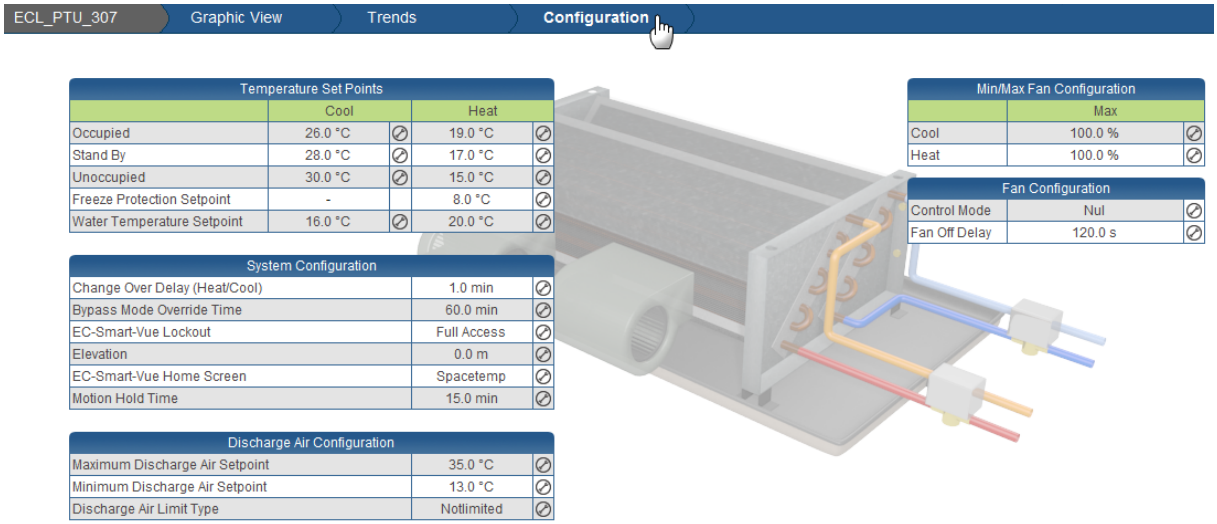


Figure 19: Configuration Page

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.

Temperature Set Points				
	Cool		Heat	
Occupied	26.0 °C	⊘	19.0 °C	⊘
Stand By	28.0 °C	⊘	17.0 °C	⊘
Unoccupied	30.0 °C	⊘	15.0 °C	⊘
Freeze Protection Setpoint	-		8.0 °C	⊘
Water Temperature Setpoint	16.0 °C	⊘	20.0 °C	⊘

Figure 20: Temperature Setpoints

Parameter	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.
Freeze Protection Setpoint	The limit at which the system is maintained to prevent freezing conditions.
Water Temperature Setpoint	Enter the desired setpoints for heating and cooling water.

Configuring the System Parameters

In the **System Configuration** table, general controller parameters are set such as the changeover delay and bypass mode override time. 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		
Change Over Delay (Heat/Cool)	1.0 min	⊘
Bypass Mode Override Time	60.0 min	⊘
EC-Smart-Vue Lockout	Full Access	⊘
Elevation	0.0 m	⊘
EC-Smart-Vue Home Screen	Spacetemp	⊘
Motion Hold Time	15.0 min	⊘

Figure 21: System Configuration

Parameter	Description
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.
Elevation	For accurate CO_2 concentration levels, input geographic elevation here if elevation is greater than 152m above sea level. By default, the sensor is factory calibrated to sea level.
EC-Smart-Vue Home Screen	Indicate whether **SpaceTemp**, **SpOffset**, **MidSetpoint**, or **EffectSP** will be the home screen on the connected Smart-Vue sensor.
Motion Hold Time	Enter the amount of time the motion sensor is on hold after first being initiated.

Discharge Air Configuration

The following table describes the discharge air parameters that can be configured.

Discharge Air Configuration		
Maximum Discharge Air Setpoint	35.0 °C	⊘
Minimum Discharge Air Setpoint	13.0 °C	⊘
Discharge Air Limit Type	Notlimited	⊘

Figure 22: Discharge Air Configuration

Parameter	Description
Maximum Discharge Air Setpoint	Enter the desired setpoint for heating discharge air. The duct heater is limited when the discharge air temperature reaches this setpoint.
Minimum Discharge Air Setpoint	Enter the desired setpoint for cooling discharge air. The duct cooling is limited when the discharge air temperature reaches this setpoint.
Discharge Air Limit Type	**notLimited** – No limits for discharge air temperature. **lowLimit** – Limit to cooling discharge air temperature. **highLimit** – Limit to heating discharge air temperature. **highLowLimit** – Limit to heating and cooling discharge air temperature.

Minimum and Maximum Fan Configuration

The following table describes the minimum and maximum fan configuration.

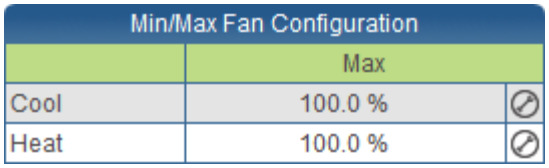


Figure 23: Minimum and Maximum Fan Configuration

Parameter	Description
Maximum Discharge Air Setpoint	Set the maximum discharge air setpoint.
Minimum Discharge Air Setpoint	Set the minimum discharge air setpoint.

Fan Configuration

The following table describes the fan configuration.

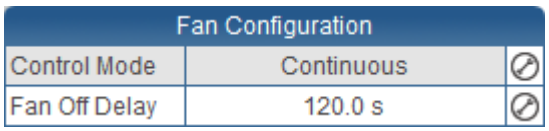


Figure 24: Fan Configuration

Parameter	Description
Control Mode	**Continuous – Fan continuously operating** **Cycle – Fan cycling based on heating/cooling load** **Con Cycle – Fan continuously operating in occupied mode and cycling during unoccupied periods** **Cycle Heat – Fan cycling based on heating load only** **Cycle Cool – Fan cycling based on cooling load only**
Fan Off Delay	Amount of time before the fan enters standby.

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**.

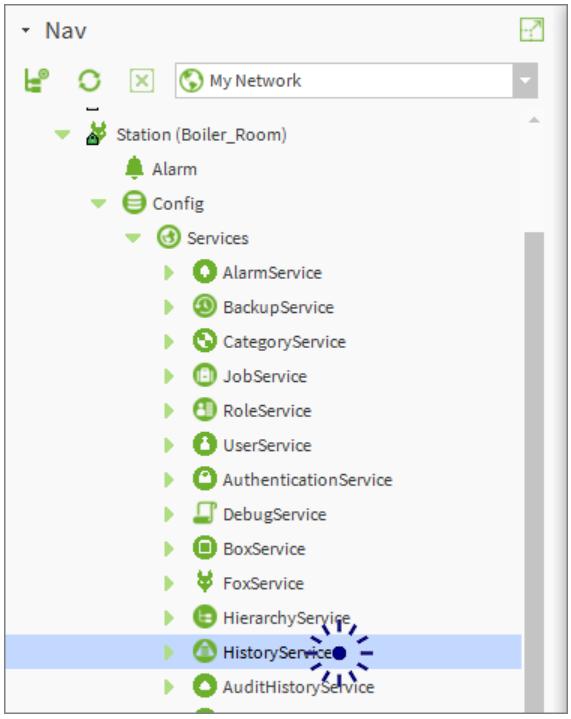


Figure 25: Double-clicking HistoryService

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

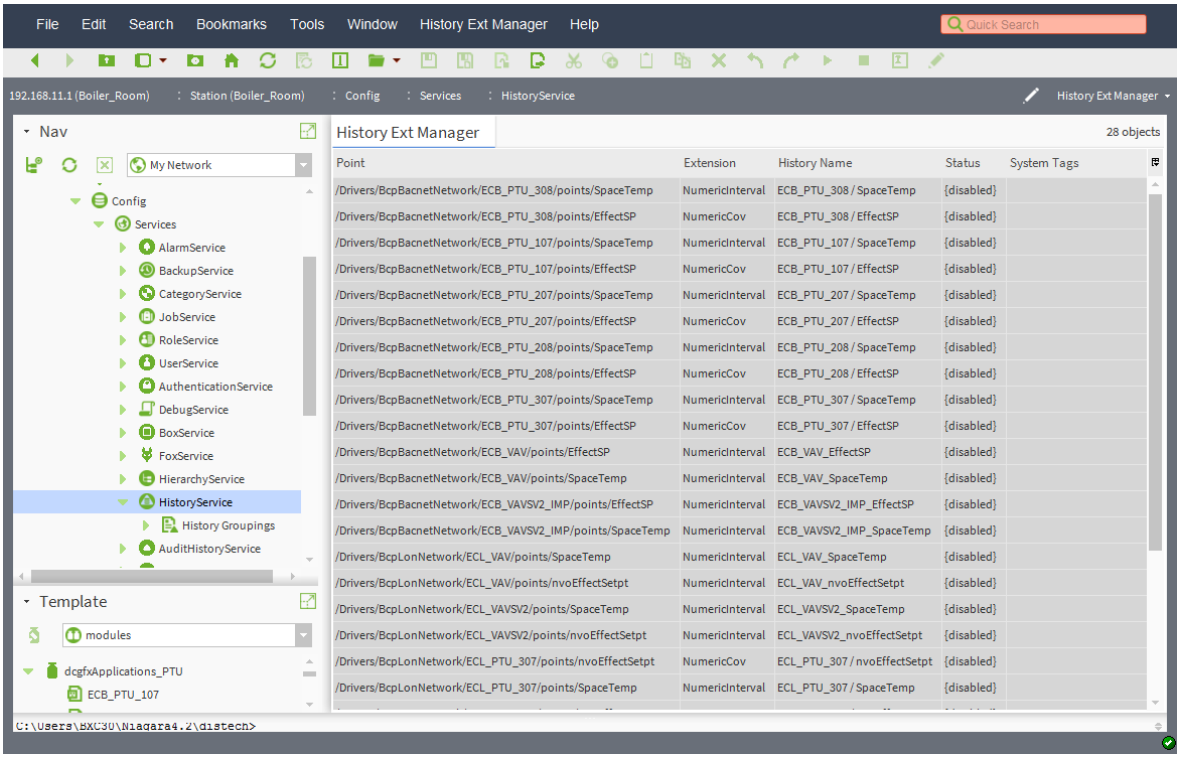


Figure 26: History Extension Manager

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

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

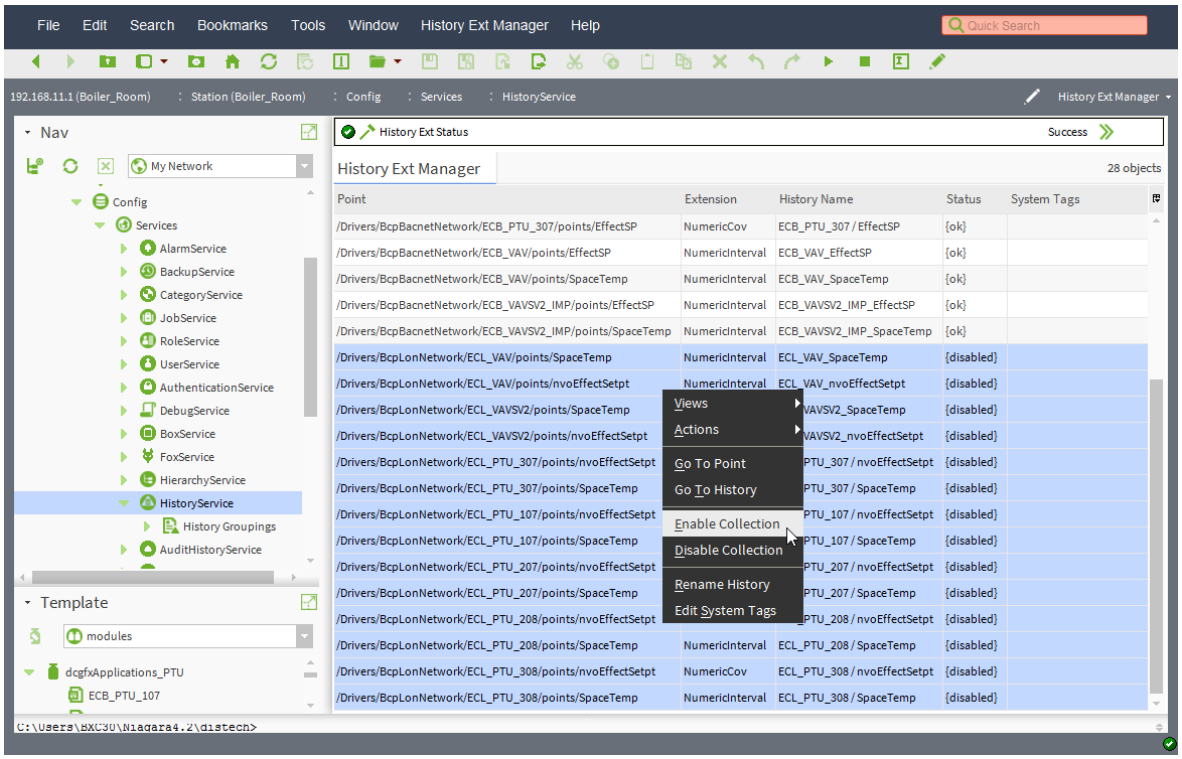


Figure 27: Enabling Numeric Interval Extensions

5. Click **Enable Collection**. The selected extensions get enabled and the histories of their corresponding points start being 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 PTU navigation menu located at the bottom of the dc *gfx*Applications interface.

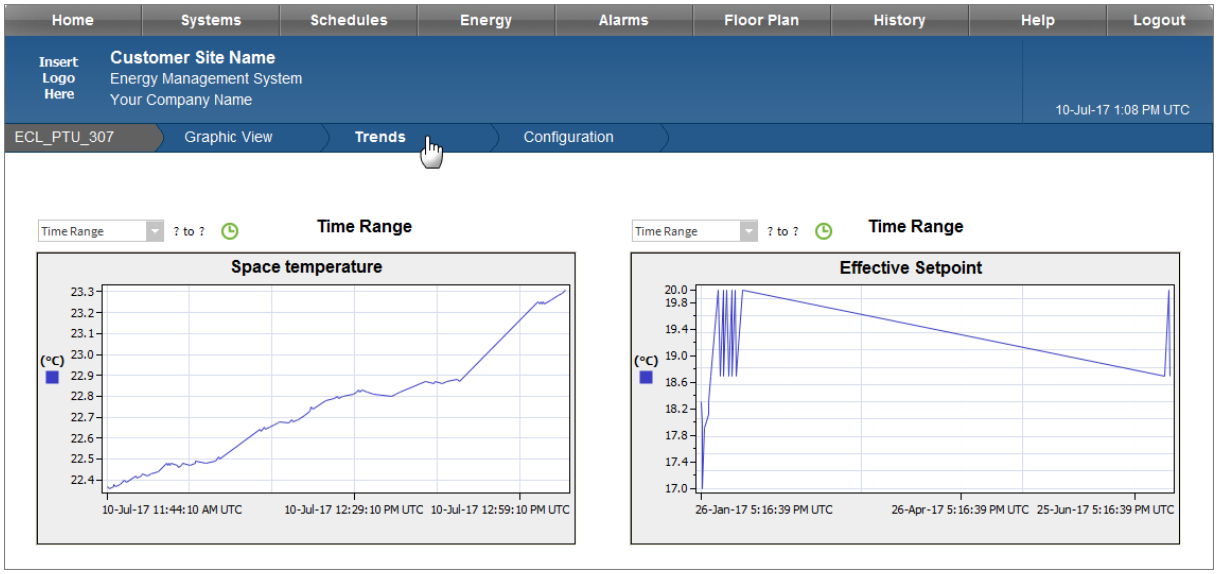


Figure 28: Trends Page

Configuring the Preloaded Applications

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

To access the **Configuration Assistant** page:

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

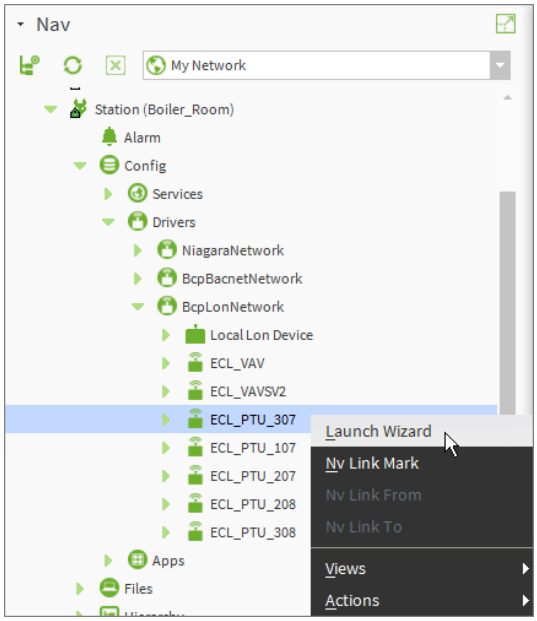


Figure 29: Launching the Wizard from the Nav sidebar

The **Configuration Assistant** page appears.

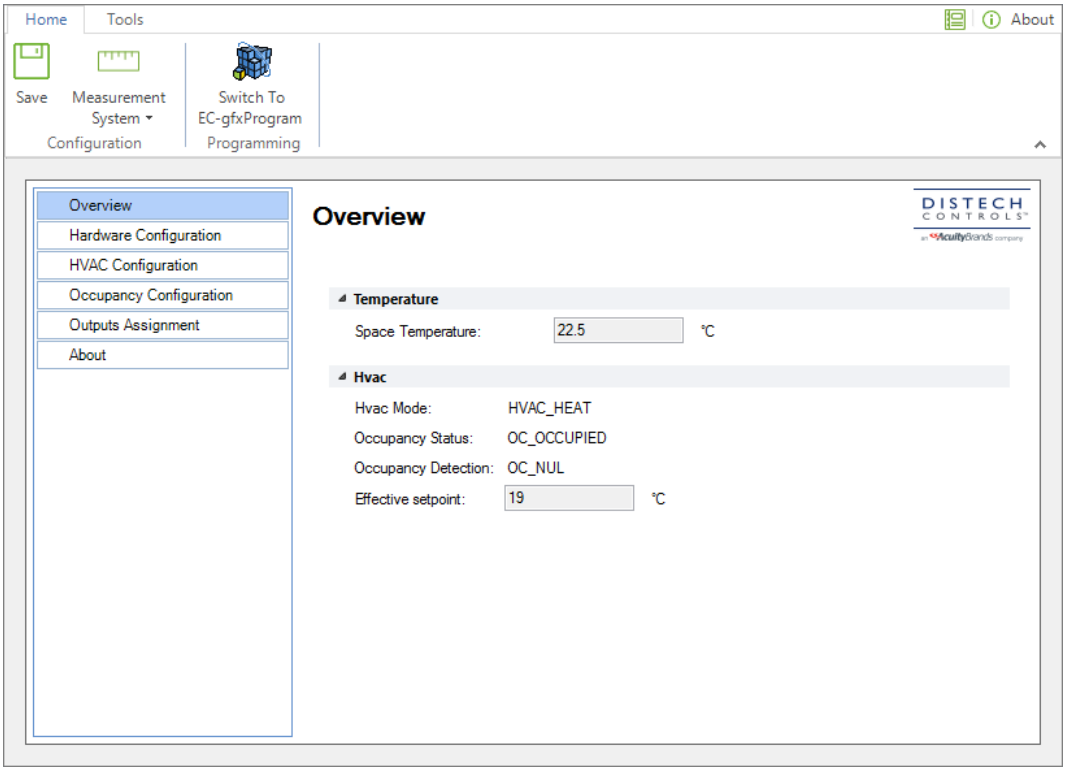


Figure 30: Configuration Assistant page in EC-gfxProgram

Overview

The **Overview** tab of the Configuration Assistant allows a user to view many general settings that are conveniently located.

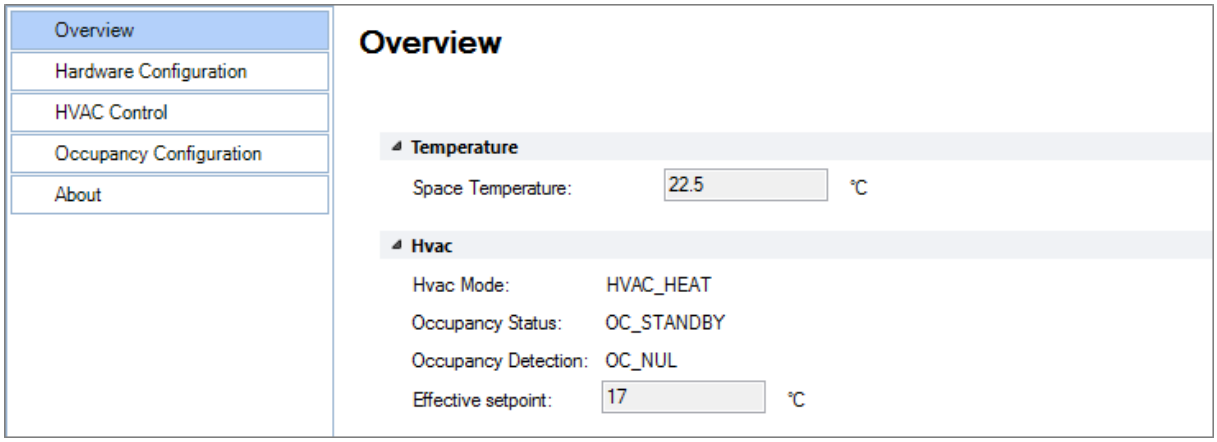


Figure 31: Overview tab general settings

Hardware Configuration

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

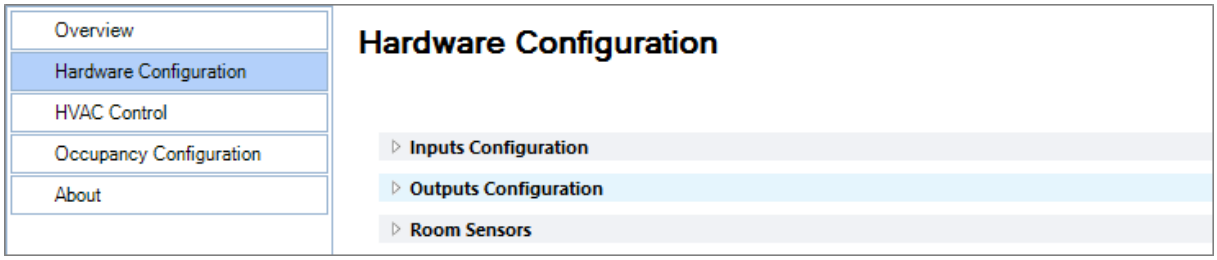


Figure 32: Hardware Configuration Tab

Inputs Configuration

All input configuration setpoint parameters are found in the **Inputs Configuration** subsection of the **Hardware Configuration** tab.

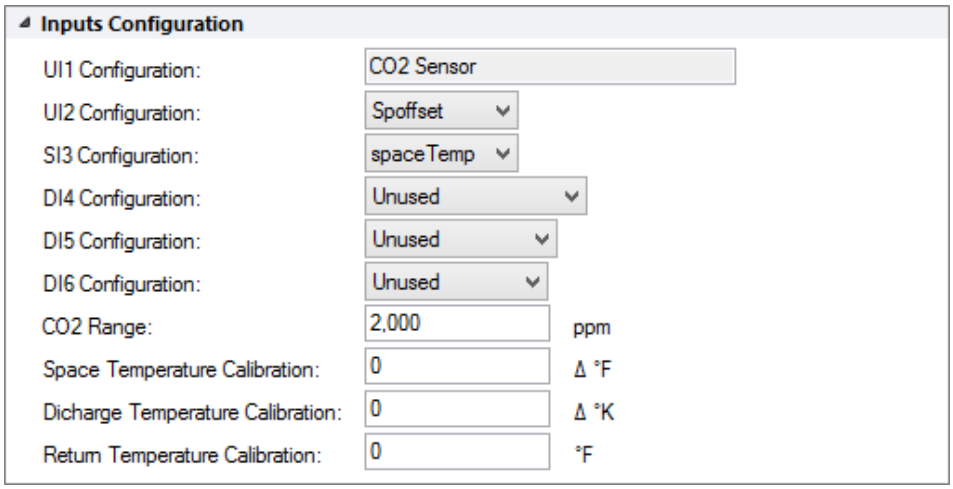


Figure 33: Inputs Configuration subsection

Parameter	Description
UI2 Configuration	**Unused –** not used. **Discharge Temp –**Discharge Temperature sensor. **Return Temp –** Return air Temperature sensor. **Water Temp –** Water Temperature sensor. **SpOffset – S**etpoint offset of the EC-Sensor-SO.
SI3 Configuration	**Unused –** not used. **Discharge Temp –** Discharge Temperature sensor. **Return Temp –** Return air Temperature sensor. **Water Temp –** Water Temperature sensor. **SpaceTemp –** Space Temperature sensor.
DI4 Configuration	**Unused –** not used. **WindowContactNO – N**ormally open window contact. (Closed contact = Open window). **WindowContactNC –** Normally closed window contact (Closed contact = Closed window).
DI5 Configuration	**Unused –** not used. **AuxContactNO – N**ormally open auxiliary contact. **AuxContactNC – N**ormally closed auxiliary contact. **ChangOverHtg –** Change-over input. (Closed contact = Heating mode). **ChangOverClg – C**hange-over input. (Closed contact = Cooling mode). **CondSensorNO –** Normally open condensation sensor. (Closed contact = Alarm). **CondSensorNC –** Normally closed condensation sensor. (Closed contact = Normal).
DI6 Configuration	**Unused –** not used. **AuxContactNO –** Normally open auxiliary contact. **AuxContactNC –** Normally closed auxiliary contact. **ChangOverHtg –** Change-over input. (Closed contact = Heating mode). **ChangOverClg –** Change-over input. (Closed contact = Cooling mode). **OccSensorNO –** Normally open occupancy sensor. (Closed contact = occupied). **OccSensorNC –** Normally closed occupancy sensor. (Closed contact = unoccupied).
CO_2 Range	Set the CO_2 upper limit for the sensor (0V=0 ppm and 10V=CO_2 range)
Space Temperature Calibration	Set the space temperature calibration offset.
Discharge Temperature Calibration	Set the discharge temperature calibration offset.
Return Temperature Calibration	Set the return temperature calibration offset.

Table 8: Inputs Configuration Table

UI1 is not configurable but is factory-assigned to CO2 sensing.

Outputs Configuration

All valves and fan configuration parameters are found in the **Outputs Configuration** subsection.

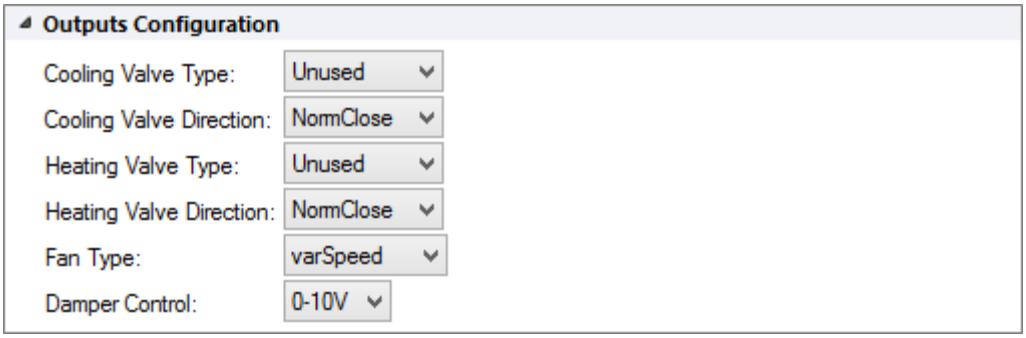


Figure 34: Outputs Configuration subsection

The table below gives a brief description of each type of output configuration parameter.

Parameter	Description
Cool Valve Type	**Unused** – The valve is not used. **0-10V** – Only AO9 is used to control the valve. **Thermal** – DO5 is used to control the thermal valve and AO9 to control the analog valve. **On-Off** – DO5 is used to control the digital valve and AO9 to control the analog valve. **Floating** – DO5 and DO6 (DO5 = Open, DO6 = Close) are used to control the Floating valve and AO9 to control the analog valve.
Cool Valve Direction	Select the cooling valve polarity: **Normally open** **Normally closed**
Heat Valve Type	**Unused** – The valve is not used. **0-10V** – Only AO10 is used to control the valve. **Thermal** – DO6 is used to control the thermal valve and AO10 to control the analog valve. **On-Off** – DO6 is used to control the digital valve and AO10 to control the analog valve. **Floating** – DO5 and DO6 (DO5 = Open, DO6 = Close) are used to control the Floating valve and AO10 to control the analog valve.
Heat Valve Direction	Select the heating valve polarity: **Normally open** **Normally closed**
Fan Type	**noFan** – The system is not equipped with fan control. **1 Speed** – The system is equipped with a 1 speed fan. **2 Speed** – The system is equipped with a 2 speed fan. **3 Speed** – The system is equipped with a 3 speed fan. **VarSpeed** – The system is equipped with a variable fan speed.
Damper Control	**None** – The damper control is disabled for CO_2 load and free cooling. **0-10V** – The damper is controlled using a 0-10V signal. **2-10V** – The damper is controlled using a 2-10V signal.

Room Sensors

Allure EC-Smart-Vue and Allure EC-Smart-Comfort or EC-Smart-Air configuration parameters are found in the Room Sensors subsection of the Hardware Configuration tab.

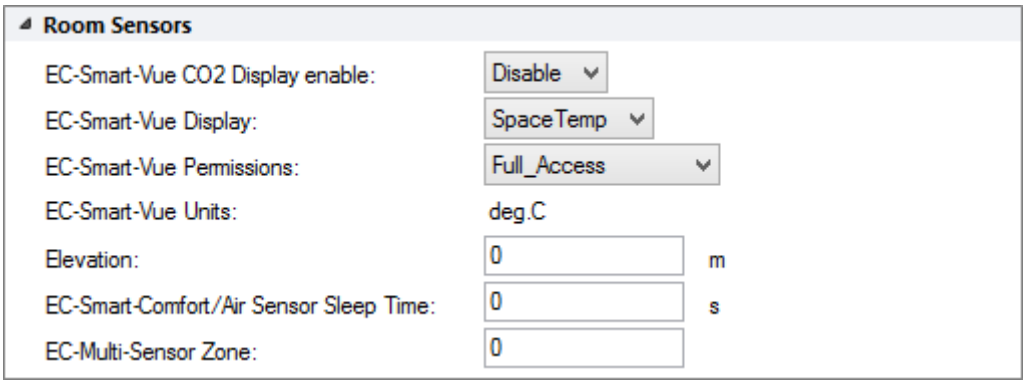


Figure 35: Room Sensor subsection

Parameter	Description
EC-Smart-Vue CO_2 Display enable	Select whether the EC-Smart-Vue CO_2 Display is **Enabled** or **Disabled**.
EC-Smart-Vue Display	Select what will be displayed on the home screen of the EC-Smart-Vue: **SpaceTemp:** Displays the space temperature. **SpOffset:** Displays the setpoint offset. **MidSetpoint:** Displays the middle setpoint. **EffectSp:** Displays the effective setpoint.
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 Units	Displays the units being used for the EC-Smart-Vue.
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 Sensor Sleep Time	Enter the amount of time before the sensor goes into standby mode.
EC-Multi-Sensor Zone	Set the designated zone of the multi-sensor to match the remote. Zone **0** (zero) indicates that the sensor is zone free and can be accessed by any remote with any zone designation if it is within range.

HVAC Control

The **HVAC Control** tab allows a user to configure several parameters such as, setpoints, fan, discharge, and water temperature configuration parameters. A brief description of each type of configuration parameter is outlined below.

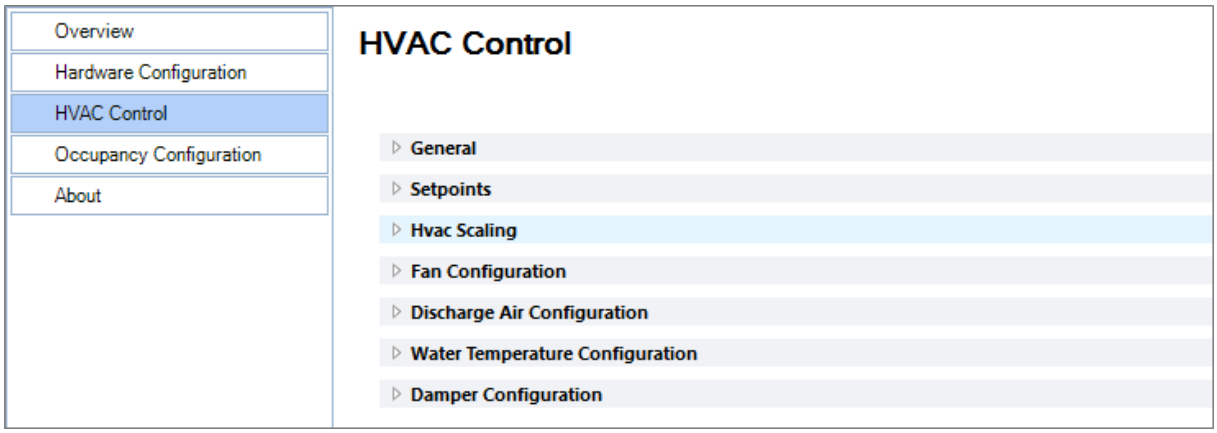


Figure 36: HVAC Control tab

General

The **General Configuration** subsection lets the user select the type of system being used, as well as the change over delay time.

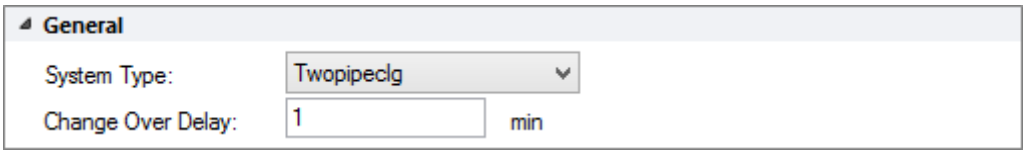


Figure 37: General HVAC subsection

Parameter	Description
System Type	**Twopipeclg –** 2 pipes cooling only. **Twopipeclgelectheat –** 2 pipes cooling only with electric heater. **Twopipehtg –** 2 pipes heating only. **Twopipehtgelectheatt –** 2 pipes heating only with electric heater. **Twopipechgover –** 2 pipes change-over. **Twopipechgoverelectheat –** 2 pipes change-over with electric heater. **Fourpipe –** 4 pipes heating and cooling. **Fourpipeelectheat –** 4 pipes heating and cooling with electric heater. **Twopipe6wayvalve –** 2 pipes with a 6 way valve. **Heatpumpunit –** Heat pump unit. **Other –** Other system type
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.
Setpoint Offset Range	Input the range for the setpont offset.

Setpoints

The **Setpoints Configuration** subsection contains the heating and cooling setpoints for the occupied, standby and unoccupied modes.

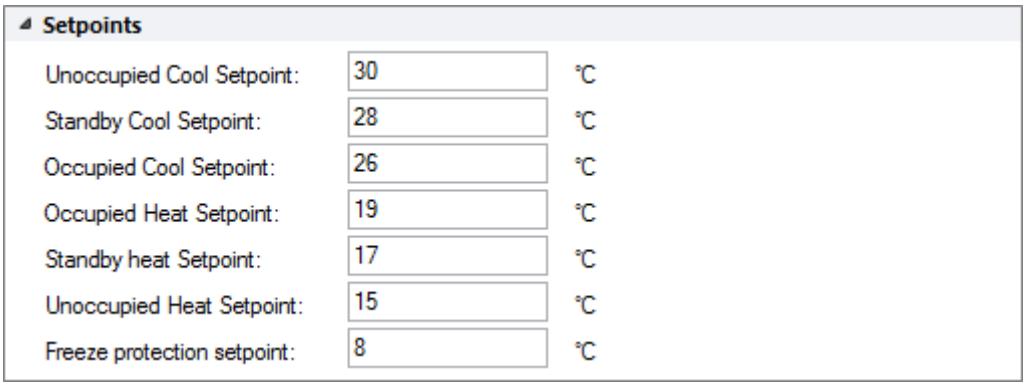


Figure 38: Setpoints configuration subsection

Parameter	Description
Unoocupied	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.
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.
Freeze protection	The limit at which the system is maintained to prevent freezing conditions.

HVAC Scaling

The **HVAC Scaling** subsection contains cooling and heating load values for fully open and fully closed valves.

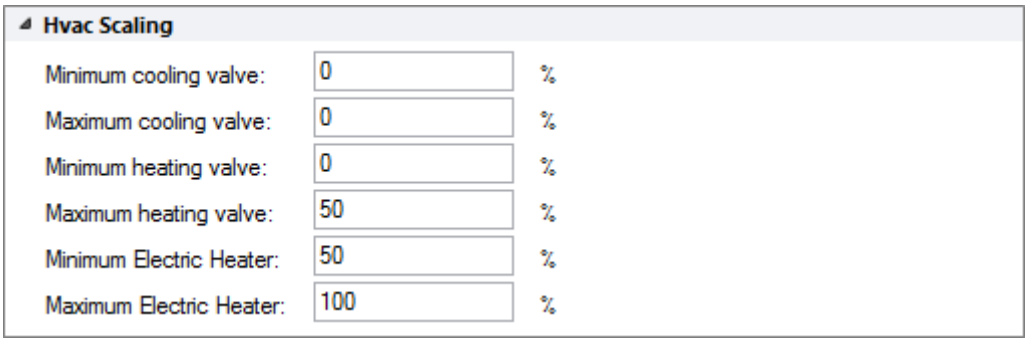


Figure 39: HVAC Scaling Subsection

Parameter	Description
Minimum cooling valve	Input the cooling load value for 0% cooling valve opening.
Maximum cooling valve	Input the cooling load value for 100% cooling valve opening.
Minimum heating valve	Input the heating load value for 0% heating valve opening.
Maximum heating valve	Input the heating load value for 100% heating valve opening.
Minimum electric heater	Input the heating load value for 0% electric heater.
Maximum electric heater	Input the heating load value for 100% electric heater.

Fan Configuration

The **Fan Configuration** subsection contains the fan type and fan mode configuration parameters.

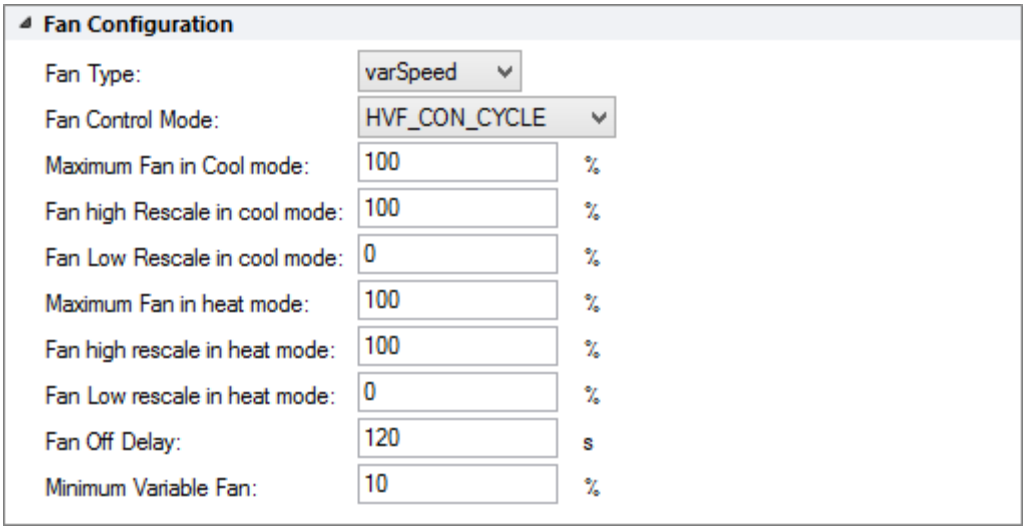


Figure 40: Fan Configuration subsection

Parameter	Description
Fan Type	**noFan –** No fan **oneSpeed –** One speed fan. **twoSpeed –** Two speed fan. **threeSpeed –** Three speed fan. **varSpeed –** Variable speed fan.
Fan Control Mode	Input the cooling load value for 0% cooling valve opening.
Fan control Mode	**HVF_CONTINUOUS –** Fan continuously operating **HVF_CYCLE –** Fan cycling based on heating/cooling load **HVF_CON_CYCLE –** Fan continuously operating in occupied mode and cycling during unoccupied periods **HVF_CYCLE_HEAT –** Fan cycling based on heating load only **HVF_CYCLE_COOL –** Fan cycling based on cooling load only
Maximum Fan in Cool mode:	This configuration is used to set the maximum fan speed in cooling mode.
Fan high Rescale in cool mode	This configuration is used to set the cooling load at which the fan will be set to **Maximum Fan in Cool mode**.
Fan low Rescale in cool mode	This configuration is used to set the minimum cooling load required to start the fan operation algorithm.
Maximum Fan in heat mode	This configuration is used to set the maximum fan speed in heating mode.
Fan high Rescale in heat mode	This configuration is used to set the heating load at which the fan will be set to **Maximum Fan in heat mode**.
Fan low Rescale in heat mode	This configuration is used to set the minimum heating load required to start the fan operation algorithm.
Fan off delay	Amount of time before the fan enters standby.
Minimum variable fan	This configuration is used to set the minimum fan speed operation.

Discharge Air Configuration

The **Discharge Air Configuration** subsection allows the user to adjust discharge air settings such as discharge air limits and setpoints.

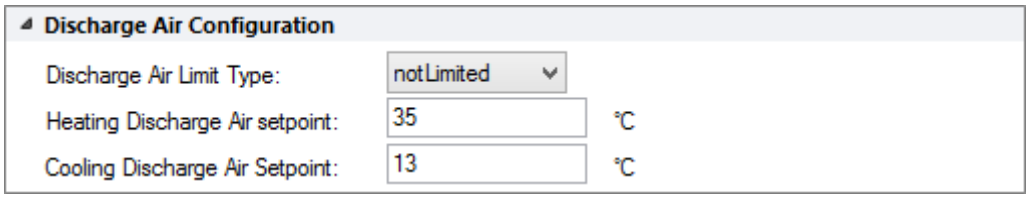


Figure 41: Discharge Air Configuration subsection

Parameter	Description
Discharge Air Limit Type	**notLimited –** No limits for discharge air temperature. **lowLimit –** Limit to cooling discharge air temperature. **highLimit –** Limit to heating discharge air temperature. **highLowLimit –** Limit to heating and cooling discharge air temperature.
Heating Discharge Air Setpoint	Enter the desired setpoint for heating discharge air. The duct heater is limited when the discharge air temperature reaches this setpoint.
Cooling Discharge Air Setpoint	Enter the desired setpoint for cooling discharge air. The duct cooling is limited when the discharge air temperature reaches this setpoint.

Water Temperature Configuration

The Water Temperature Configuration subsection allows the user to adjust heating and cooling water setpoints.

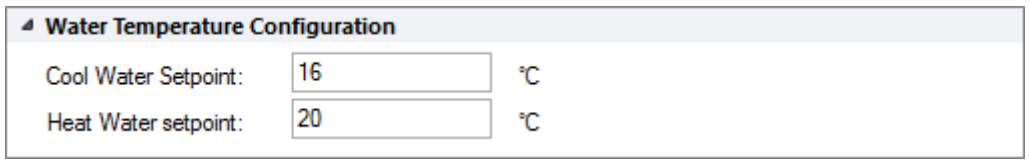


Figure 42: Water Temperature Configuration subsection

Parameter	Description
Cool Water Setpoint	Enter the desired setpoint for cooling water.
Heat Water Setpoint	Enter the desired setpoint for heating water.

Damper Configuration

The configuration assistant contains several configuration parameters that control the damper's behavior. For example, the damper type, position, and CO_2 setpoint can be set.

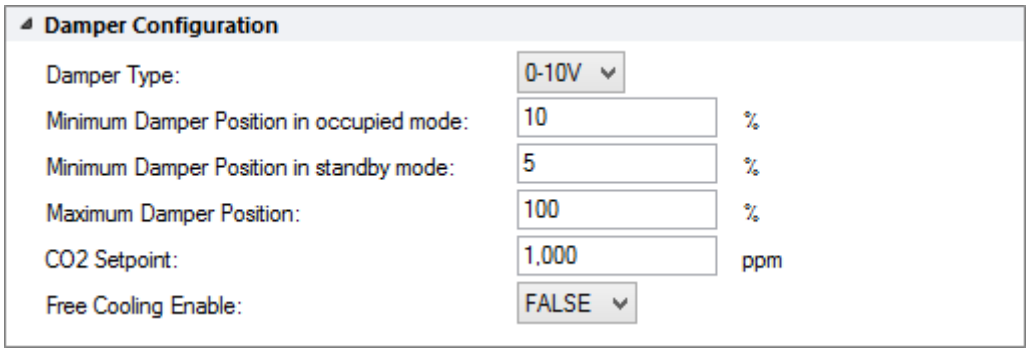


Figure 43: Damper Configuration subsection

Parameter	Description
Damper Type	Set the desired damper signal type. Choose from **None**, **0-10V, 2-10V.**
Minimum Damper Position in occupied mode	Enter the maximum damper position while in occupied mode.
Minimum Damper Position in standby mode	Enter the minimum damper position while in standby mode.
Maximum Damper Position	Enter the overall maximum damper position..
CO_2 Setpoint	Enter the CO_2 setpoint.
Free Cooling Enable	Free cooling is when the damper opening is calculated according to maximum between CO_2 load and cooling load. Choose to enable (TRUE) or disable (FALSE) this feature.

Occupancy Configuration

The **Occupancy Configuration** tab allows the user to configure general occupancy settings. The table below provides a brief explanation of the available settings.

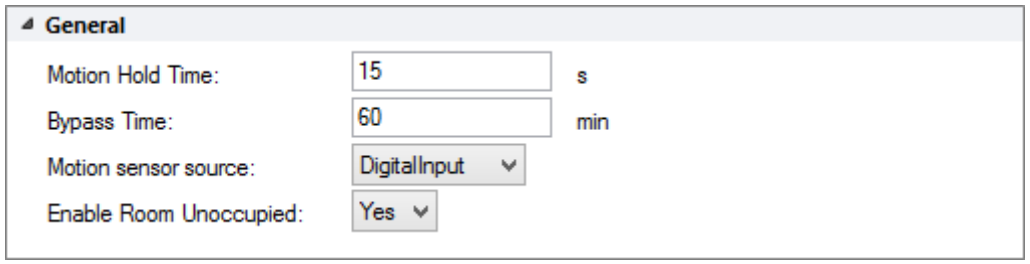


Figure 44: General Occupancy Configuration subsection

Parameter	Description
Motion Hold Time	Enter the amount of time the motion sensor is on hold after first being initiated.
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.
Motion sensor source	**Unused –** No motion sensor is used. **Multi-Sensor –** EC-Multi-Sensor is used. **ComSensor –** Communicating sensor (EC-Smart-Vue) is used. **DigitalInput –** A digital input is used: **Auto/All –** Auto or all types are being used.
Enable Room Unoccupied	Select whether a room can be unoccupied.

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.

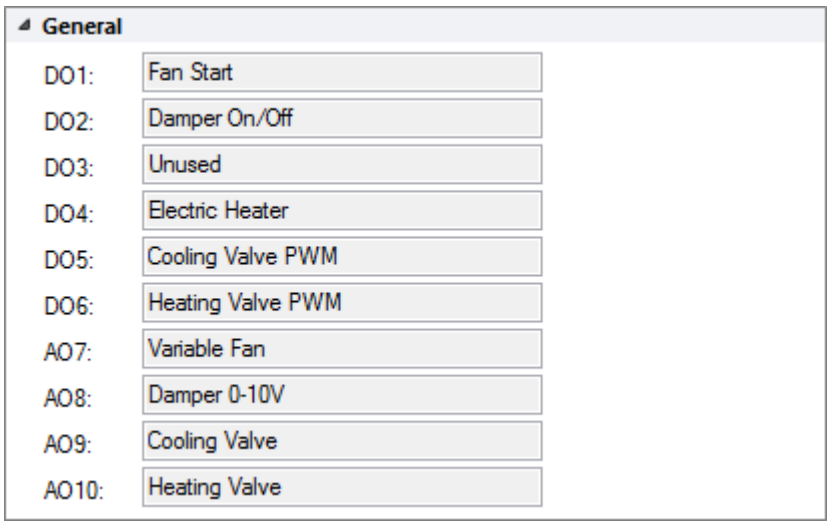


Figure 45: Outputs Assignments Subsection

Saving to Multiple Devices

Save your settings to multiple devices by clicking on the save icon  in the Configuration Assistant menu ribbon. The Configuration Assistant Synchronization window will appear.

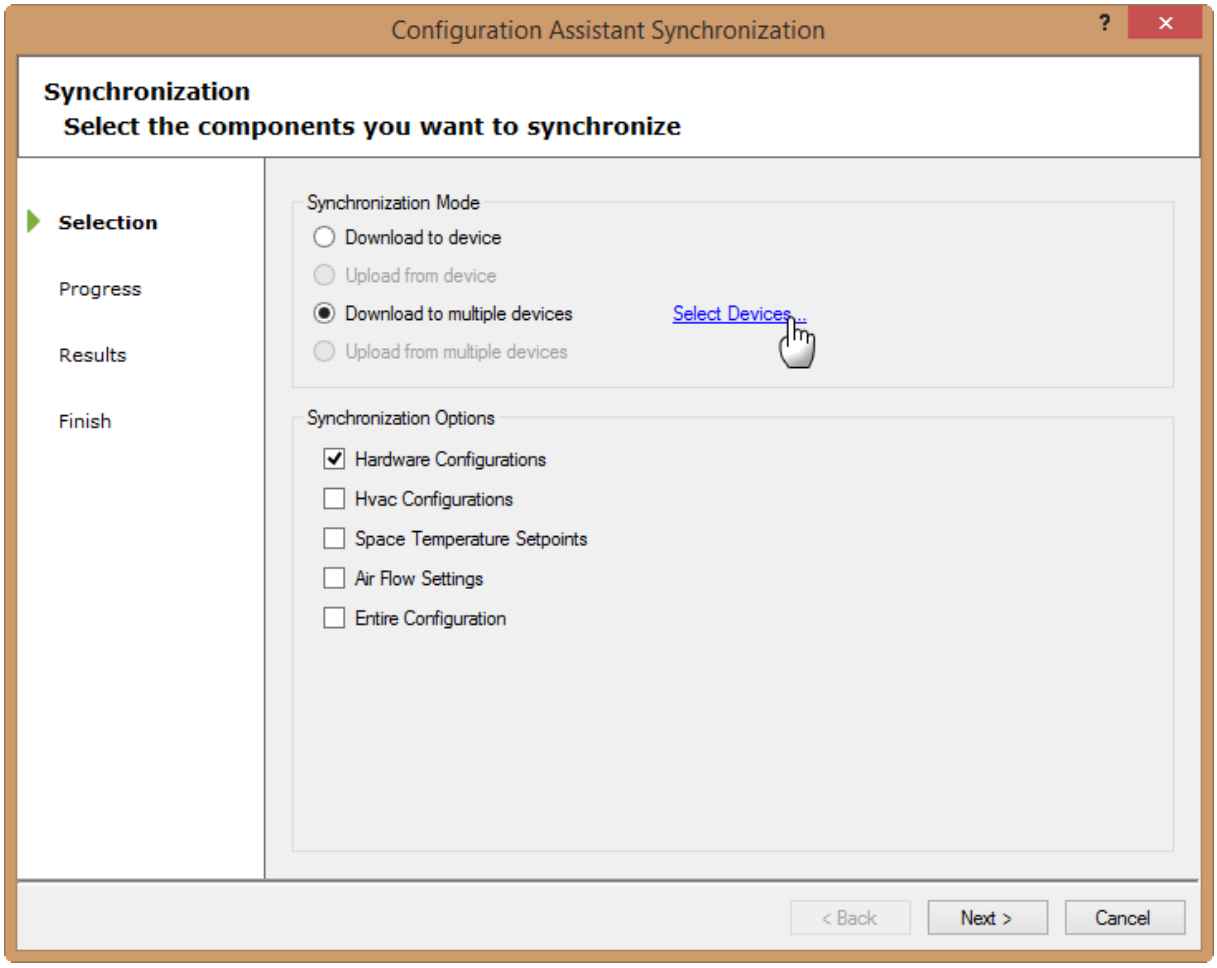


Figure 46: Configuration Assistant Synchronization window

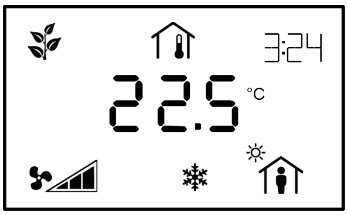
You must select the other devices you wish to save the current configuration to, as well as selecting which parameters you wish saved to those controllers. Click next to advance and complete the process.

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

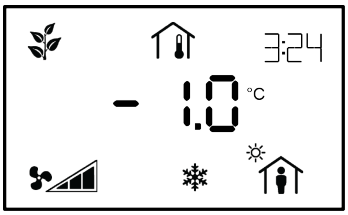
Setting the home screen

Depending on the value of ComSensorDisplay (MSV29), the Allure EC-Smart-Vue sensor home screen will display either:

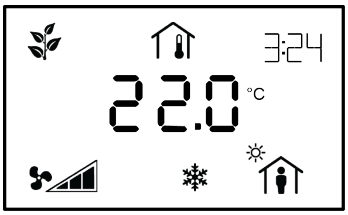
- the space temperature



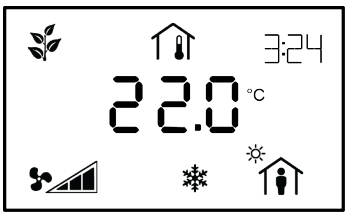
- the setpoint offset



- the effective setpoint



- the average setpoint



Configuration menus

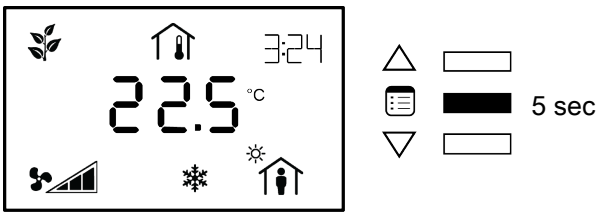
Setting up the system configuration

This section is used to set the system conguration.

See the Enumeration tab section for more details.

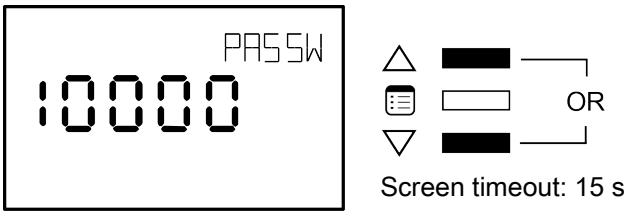
To enter the advanced menus:

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



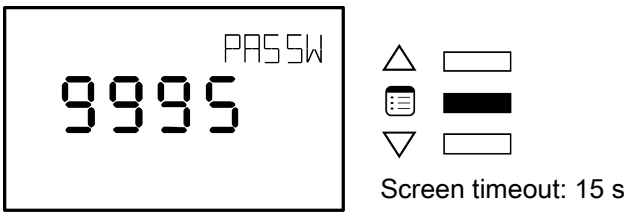
The password field appears.

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



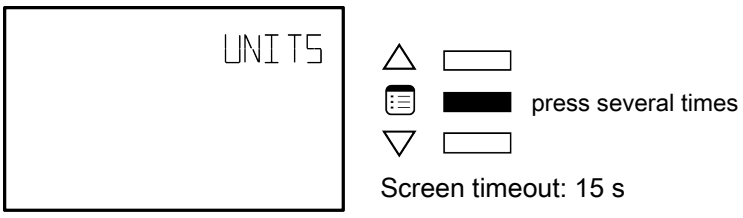
By default, the password is 9995.

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

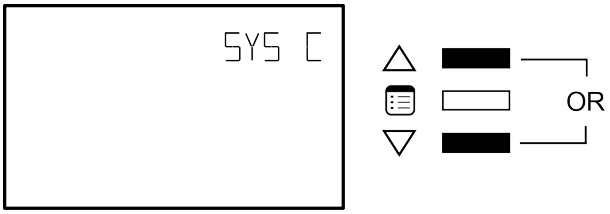


Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

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

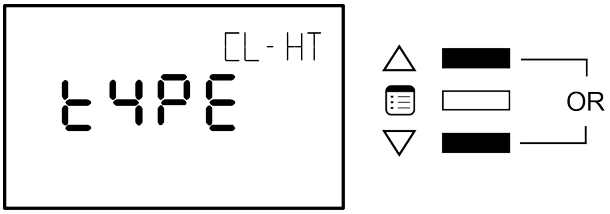


5. Press either of the arrow keys to enter the System Configuration submenu.



TYPE

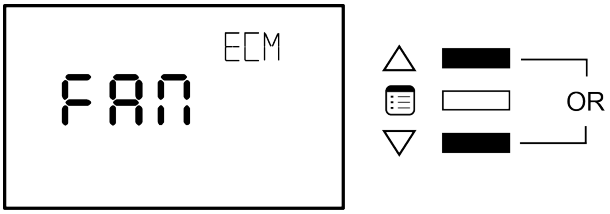
This menu is used to select the type of system (2 pipes, 4 pipes, etc.)



Parameter	Default	Valid Choices		Description
TYPE (EC6)		0	CL	2 Pipes cooling
		1	CL-EH	2 Pipes cooling with electric heater
		2	HT	2 Pipes Heating
		3	HT-EH	2 Pipes Heating with electric heater
		4	CO	2 Pipes Change Over
		5	CO-EH	2 Pipes Change Over with electric heater
	X	6	CL-HT	4 Pipes
		7	CL-HT-EH	4 Pipes with electric heater

FAN

This menu is used to configure the fan type.

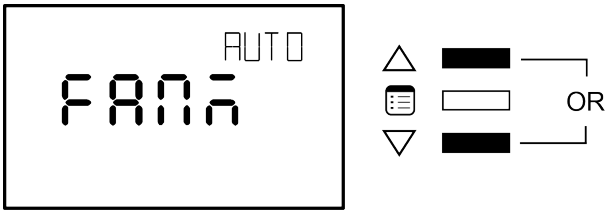


Parameter	Default	Valid Choices		Description
FT (nviFP39)		0	NONE	Fan control is not used
		1	1 SP	1-Speed fan
		2	2 SP	2-speed fan
		3	3 SP	3-speed fan
	X	4	ECM	ECM motor (0-10V output)

Table 9: Fan Ctrl Type

FANM

This menu is used to configure the fan control mode.



Parameter	Default	Valid Choices		Description
FAN (nviFP39)		0	ON	Fan is controlled between minimum speed and 100%
		1	AUTO	Fan control is based on terminal load
	X	2	SMART	Fan control is based on terminal load when unoccupied, and between minimum speed and 100% in other occupancy modes.
		3	AUTO HEAT	Fan control is based on heaing load
		4	AUTO COOL	Fan control is based on cooling load

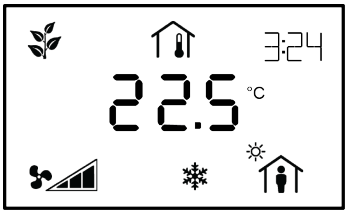
Table 10: Fan Mode

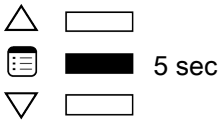
Setting up Inputs

Input Configuration

To enter the advanced menus:

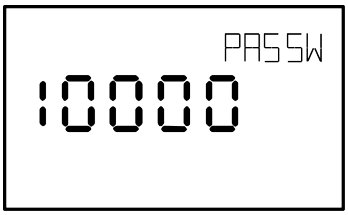
1. Hold the **Menu** button for five seconds:

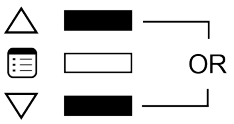




The password field appears.

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

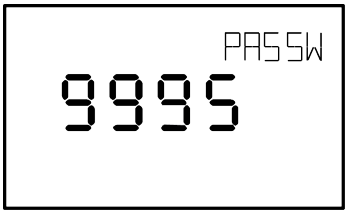


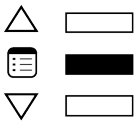


Screen timeout: 15 s

By default, the password is 9995.

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

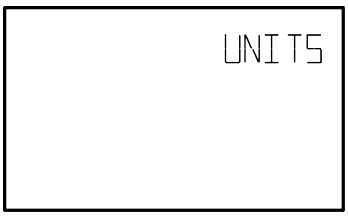


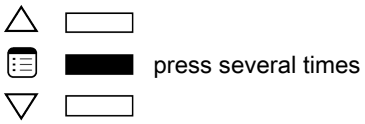


Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

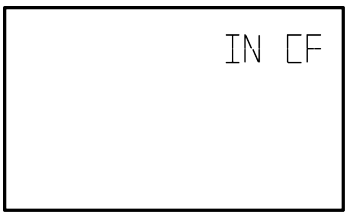
4. Press the **Menu** button several times until IN CFG appears on the display.

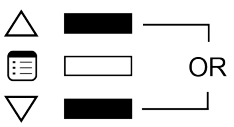




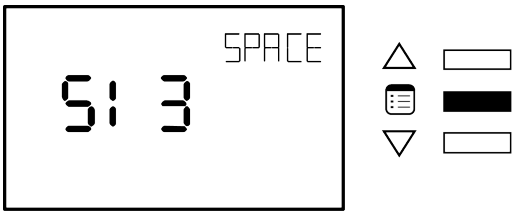
Screen timeout: 15 s

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

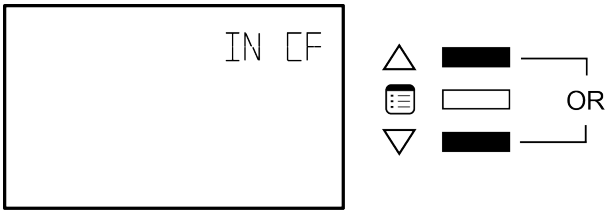




6. Press the Menu button to navigate between the different submenus.



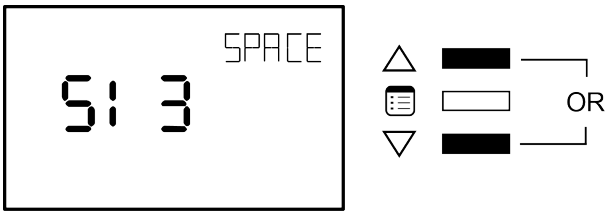
UI2 - Input 2



Parameter	Default	Valid Choices		Description
UI2 (EC2)	X	0	SP OFFSET	Setpoint offset is connected to UI2
		1	DISCH TEMP	Discharge temperature sensor is connected to UI2.
		2	RETURN TEMP	Return air temperature sensor is connected to UI2.
		3	WATER TEMP	Water Temperature sensor is connected to UI2.
		4	UNUSED	UI2 is not used.

Table 11: Universal Input 2

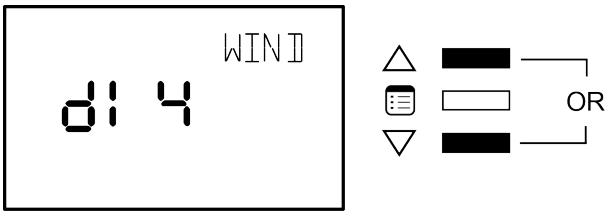
SI3 - Input 3



Parameter	Default	Valid Choices		Description
SI3 (nviFP44)	X	0	SPACE TEMP	Space temperature sensor is connected to SI3
		1	DISCH TEMP	Discharge temperature sensor is connected to SI3.
		2	RETURN TEMP	Return air temperature sensor is connected to SI3.
		3	WATER TEMP	Water Temperature sensor is connected to SI3.
		4	UNUSED	SI3 is not used.

Table 12: Sensor Input 3

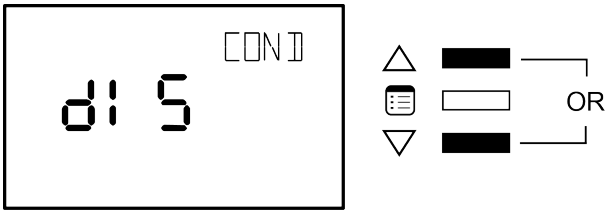
DI4 - Input 4



Parameter	Default	Valid Choices		Description
DI4 (EC3)	X	0	UNUSED	DI4 is not used
		1	WINDOW NO	Window Contact is normally open
		2	WINDOW NC	Window Contact is normally closed

Table 13: Digital Input 4

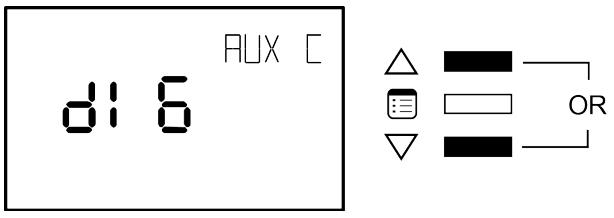
DI5 - Input 5



Parameter	Default	Valid Choices		Description
DI5 (EC4)	X	0	UNUSED	DI5 is not used
		1	AUX CONT NO	Auxiliary contact is normally open
		2	AUX CONT NC	Auxiliary contact is normally closed
		3	CHG OVER HEAT	Changeover contact (TRUE = Heat / FALSE = Cool)
		4	CHG OVER COOL	Changeover contact (TRUE = Cool / FALSE = Heat)
		5	COND SENSOR NO	Condensation sensor is normally open
		6	COND SENSOR NC	Condensation sensor is normally close

Table 14: Digital Input 5

DI6 - Input 6



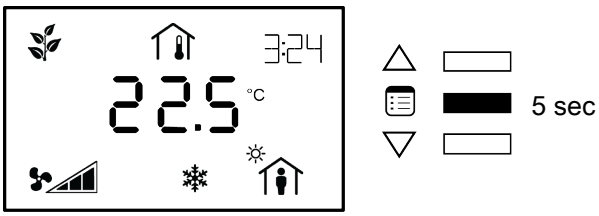
Parameter	Default	Valid Choices		Description
DI6 (EC5)		0	UNUSED	DI5 is not used
	X	1	AUX CONT NO	Auxiliary contact is normally open
		2	AUX CONT NC	Auxiliary contact is normally closed
		3	CHG OVER HEAT	Changeover contact (TRUE = Heat / FALSE = Cool)
		4	CHG OVER COOL	Changeover contact (TRUE = Cool / FALSE = Heat)
		5	OCC SENSOR NO	Occupancy sensor is normally open
		6	OCC SENSOR NC	Occupancy sensor is normally closed

Table 15: Digital Input 6

Displaying Input Values

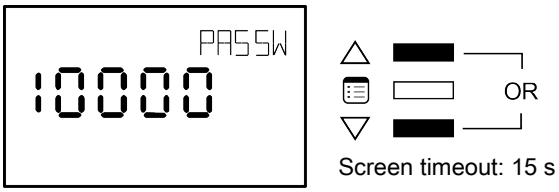
To enter the advanced menus:

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



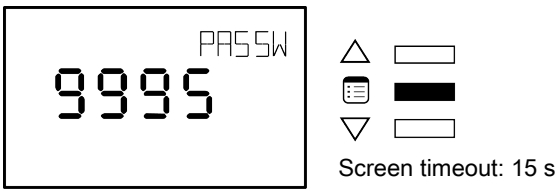
The password field appears.

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



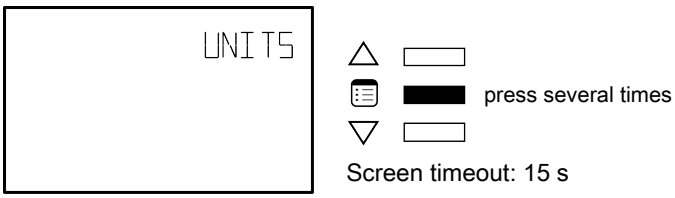
By default, the password is 9995.

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

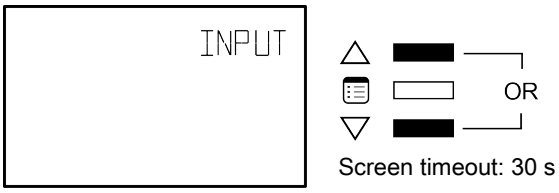


Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

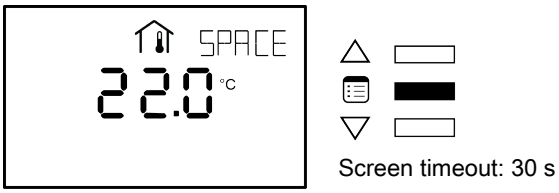
4. Press the **Menu** button several times until INPUTS appears on the display.



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



6. Press the Edit button to display successively the inputs values.



Code	Description
UI1	Displays UI1 value (volts)
DISCH	Displays the actual discharge temperature value (-327°C if not configured or not connected)
RETU	Displays the actual return temperature value (-327°C if not configured or not connected)
WATE	Displays actual water temperature value (-327°C if not configured or not connected)
SP OF	Displays setpoint offset from UI2.
SPAC	Displays the actual space temperature value from SI3. (-327°C if not configured or not connected)
DI4	Displays the actual state of DI4. (0 = Open, 1 = Close)
DI5	Displays the actual state of DI5. (0 = Open, 1 = Close)
DI6	Displays the actual state of DI6. (0 = Open, 1 = Close)

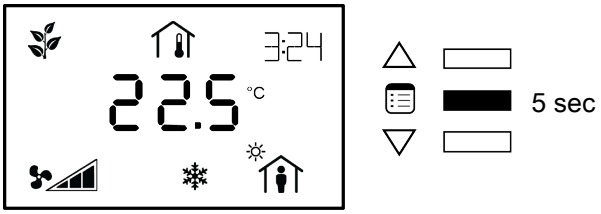
Table 16: Displaying Input Values

Setting up Outputs

Output Configuration

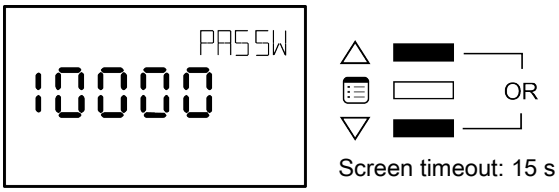
To enter the advanced menus:

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



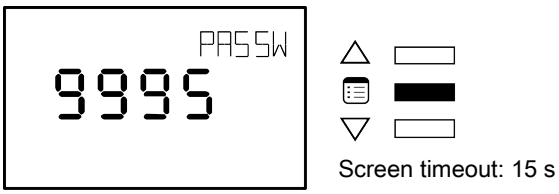
The password field appears.

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



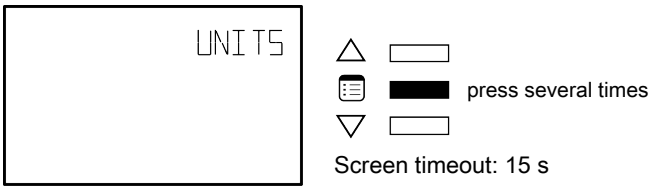
By default, the password is 9995.

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

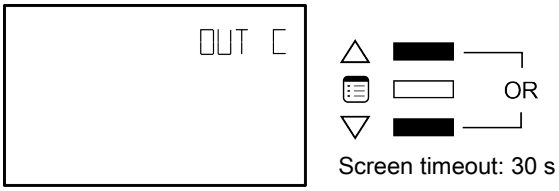


Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

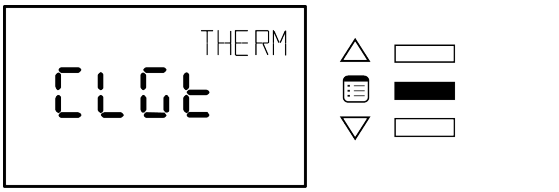
4. Press the **Menu** button several times until OUT CFG appears on the display.



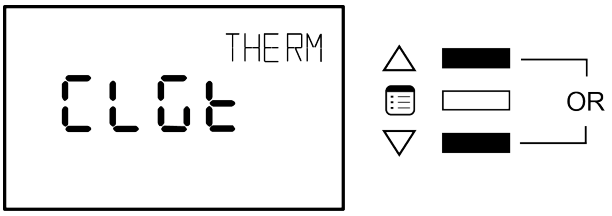
5. Press either of the arrow keys to enter the Outputs Configuration submenu.



6. Press the Menu button to navigate between the different submenus.



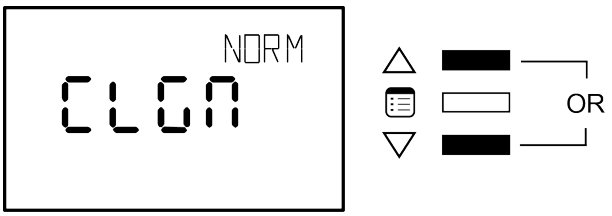
CLG T - Cooling Valve Type



Parameter	Default	Valid Choices		Description
CLG TYPE (EC7)		0	UNUSED	Cooling valve is not used
	X	1	0-10V	0-10V cooling valve only is used
		2	THERMAL	Thermal and 0-10V cooling valve are used
		3	ON_OFF	On/Off and 0-10V cooling valve are used
		4	FLOATING	Floating and 0-10V cooling valve are used

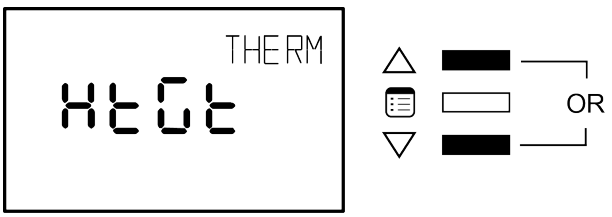
Table 17: Cooling Valve Type

CLG N - Cooling Valve Polarity



Select Normally Open or Normally Closed depending on your system.

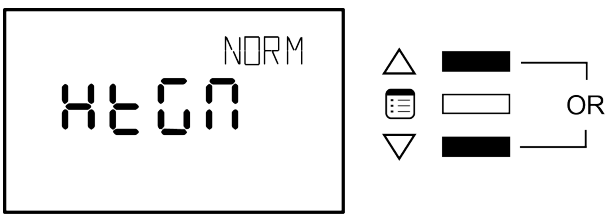
HTG T - Heating Valve Type



Parameter	Default	Valid Choices		Description
HTG TYPE (EC8)		0	UNUSED	Heating valve is not used
	X	1	0-10V	0-10V heating valve only is used
		2	THERMAL	Thermal and 0-10V heat valve are used
		3	ON_OFF	On/Off and 0-10V heat valve are used
		4	FLOATING	Floating and 0-10V heat valve is used

Table 18: Heating Valve Type

HTG N - Heating Valve Polarity

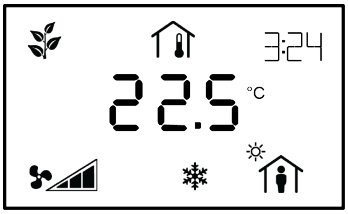


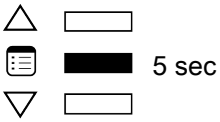
Select Normally Open or Normally Closed depending on your system.

Equipment Override

To enter the advanced menus:

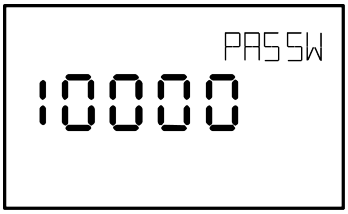
1. Hold the **Menu** button for five seconds:

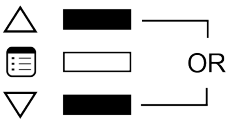




The password field appears.

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

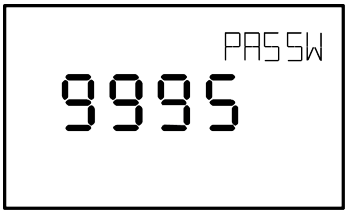


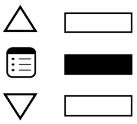


Screen timeout: 15 s

By default, the password is 9995.

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

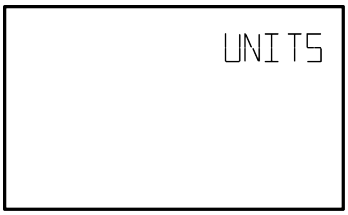


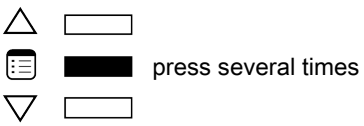


Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

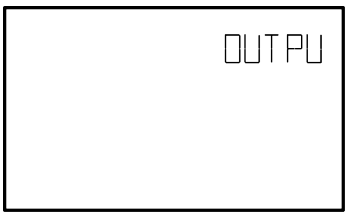
4. Press the **Menu** button several times until OUTPUTS appears on the display.

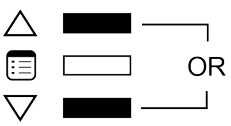




Screen timeout: 15 s

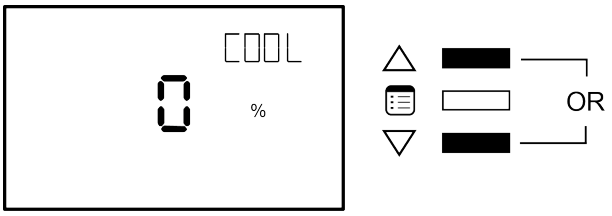
5. Press either of the arrow keys to enter the Outputs Display submenu.





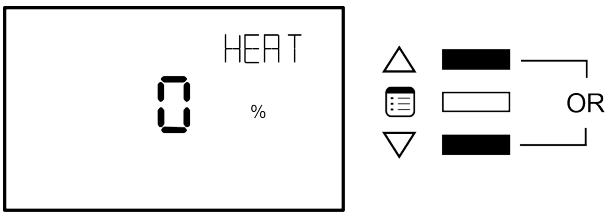
Screen timeout: 30 s

Cooling or change over valve override



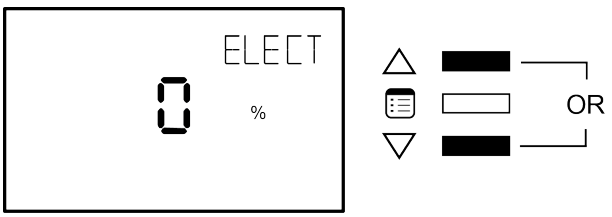
To go back to automatic control, press simultaneously both arrow keys.
Use the **arrow keys** to change the value and press the **Menu** button to validate.

Heating Valve Override



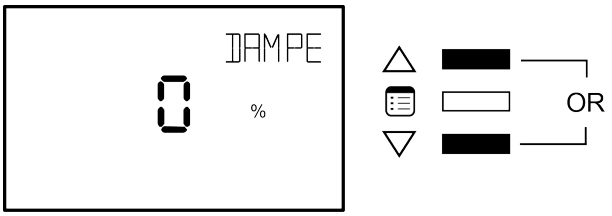
To go back to automatic control, press simultaneously both arrow keys.
Use the **arrow keys** to change the value and press the **Menu** button to validate.

Electric Heater Override



Use the **arrow keys** to change the value and press the **Menu** button to validate.
To go back to automatic control, press simultaneously both arrow keys.

Damper Override



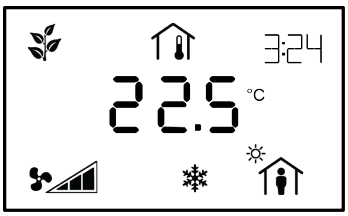
Use the **arrow keys** to change the value and press the **Menu** button to validate.
To go back to automatic control, press simultaneously both arrow keys.

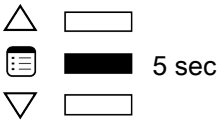
Setting up the network parameters and calibrating the system

Setting up the communication network parameters

To enter the advanced menus:

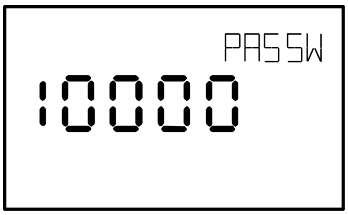
1. Hold the **Menu** button for five seconds:

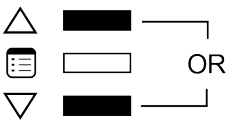




The password field appears.

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

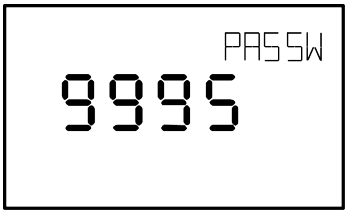


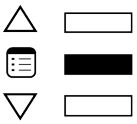


Screen timeout: 15 s

By default, the password is 9995.

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

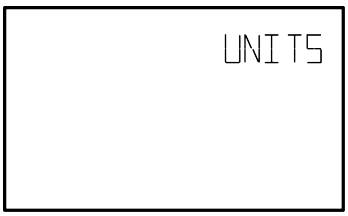


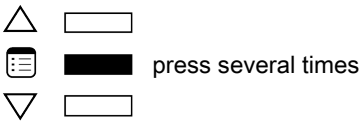


Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

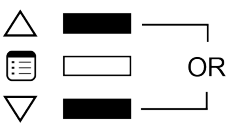
4. Press the **Menu** button several times until GEN CFG appears on the display.





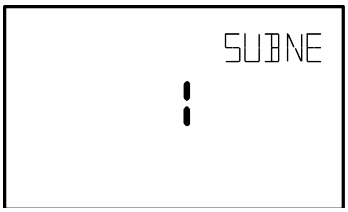
Screen timeout: 15 s

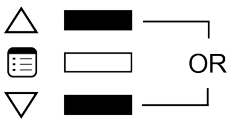
5. Press either of the arrow keys to enter the General Configuration submenu.



Screen timeout: 30 s

Subnet ID

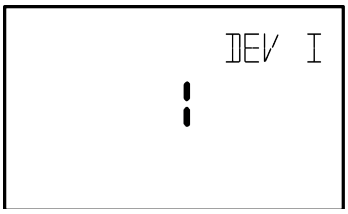


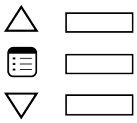


Screen timeout: 30 s

Use the **arrow keys** to change the value and press the **Menu** button to validate.

Device ID

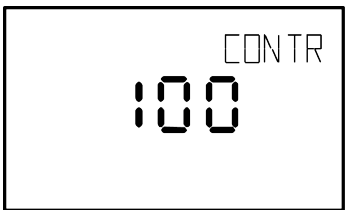


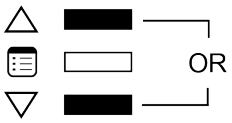


Screen timeout: 30 s

The device ID is a read only value.

Screen Contrast





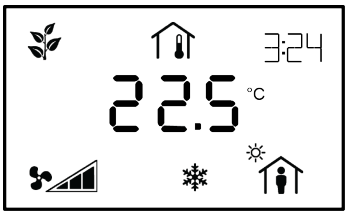
Screen timeout: 30 s

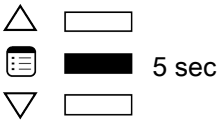
Use the **arrow keys** to change the value and press the **Menu** button to validate.

Calibrating the system

To enter the advanced menus:

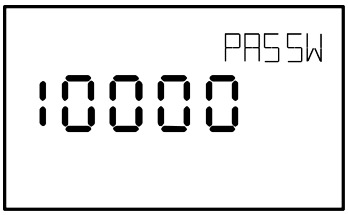
1. Hold the **Menu** button for five seconds:

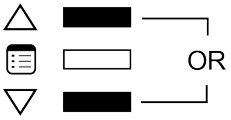




The password field appears.

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

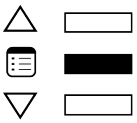




Screen timeout: 15 s

By default, the password is 9995.

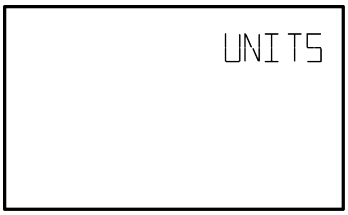
3. Press the **Menu** button to submit the password.

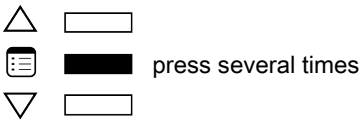


Screen timeout: 15 s

Upon submitting the correct password, the advanced menu is entered and the **Units** submenu is displayed.

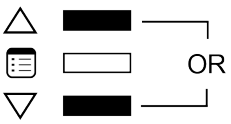
4. Press the **Menu** button several times until CALIBRATION appears on the display.





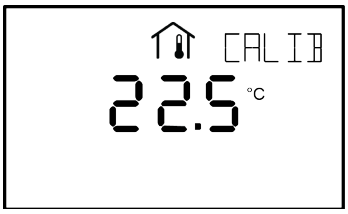
Screen timeout: 15 s

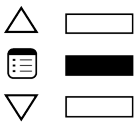
5. Press either of the arrow keys to enter the Calibration submenu.



Screen timeout: 30 s

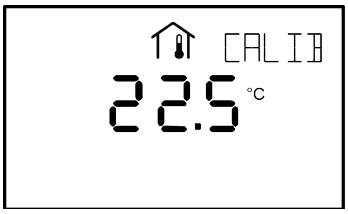
6. Press the Menu button to navigate between the different submenus.

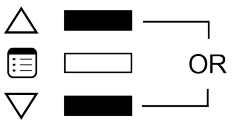




Screen timeout: 30 s

Temperature sensor calibration

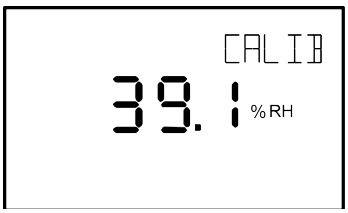


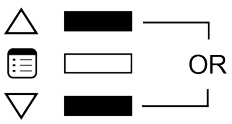


Screen timeout: 30 s

Use the **arrow keys** to change the value and press the **Menu** button to validate.

RH sensor calibration

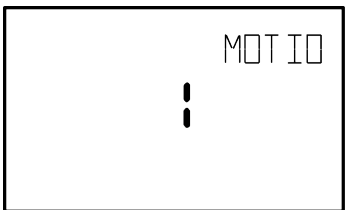


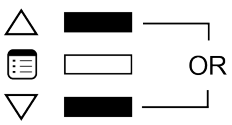


Screen timeout: 30 s

Use the **arrow keys** to change the value and press the **Menu** button to validate.

Motion sensitivity





Screen timeout: 30 s

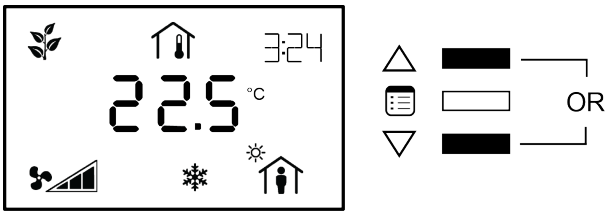
Use the **arrow keys** to change the value and press the **Menu** button to validate.

End-User Overrides

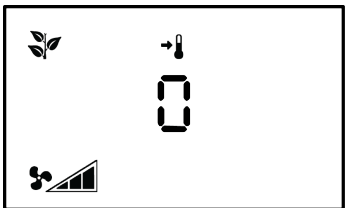
Setpoint Offset Control

Using the Allure EC-Smart-Vue sensor, the user can change the setpoint offset. The setpoint offset range can be configured via SpOffsetRange

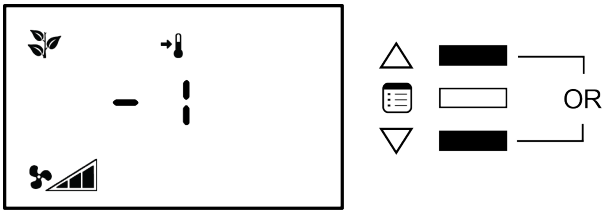
1. Press the up or down buttons to access the setpoint offset screen.



This Screen appears (Timeout 5 seconds).

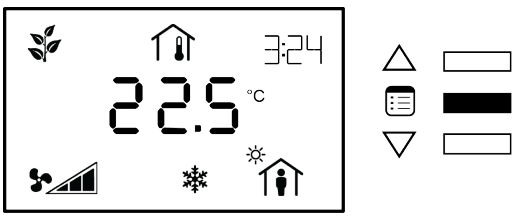


2. Use the up and down buttons to change the setpoint offset. (+- 0.1 Increments)



Occupancy Override

The first press to the **Menu** button switches the room occupancy from unoccupied to occupied.

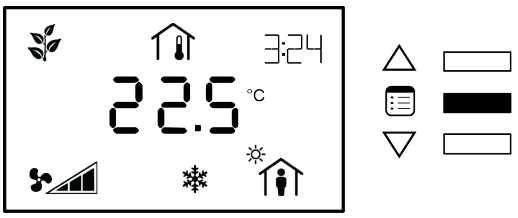


The occupancy override by **the Allure EC-Smart-Vue** sensor is only used to set the room occupancy in occupied mode if the effective occupancy is currently in standby or unoccupied.

If the effective occupancy is Occupied, the Menu button is only used to set the fan speed.

Fan Speed Override

Pressing the Menu button will change the fan speed (variable or 3 speed). The fan override is disabled when the room occupancy is not occupied.



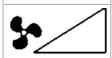
Icon	Description
	Fan is overriden to low speed
	Fan is overriden to medium speed.
	Fan is overriden to maximum speed.
	Fan is manually stopped.

Table 19: Fan Override Icons

Tables of configuration codes

System Type

Parameter	Default	Valid Choices		Description
TYPE (EC6)		0	CL	2 Pipes cooling
		1	CL-EH	2 Pipes cooling with electric heater
		2	HT	2 Pipes Heating
		3	HT-EH	2 Pipes Heating with electric heater
		4	CO	2 Pipes Change Over
		5	CO-EH	2 Pipes Change Over with electric heater
	X	6	CL-HT	4 Pipes
		7	CL-HT-EH	4 Pipes with electric heater

Fan Type

Parameter	Default	Valid Choices		Description
FT (nviFP39)		0	NONE	Fan control is not used
		1	1 SP	1-Speed fan
		2	2 SP	2-speed fan
		3	3 SP	3-speed fan
	X	4	ECM	ECM motor (0-10V output)

Table 20: Fan Ctrl Type

Fan Mode

Parameter	Default	Valid Choices		Description
FAN (nviFP39)		0	ON	Fan is controlled between minimum speed and 100%
		1	AUTO	Fan control is based on terminal load
	X	2	SMART	Fan control is based on terminal load when unoccupied, and between minimum speed and 100% in other occupancy modes.
		3	AUTO HEAT	Fan control is based on heaing load
		4	AUTO COOL	Fan control is based on cooling load

Table 21: Fan Mode

Cooling Valve Type

Parameter	Default	Valid Choices		Description
CLG TYPE (EC7)		0	UNUSED	Cooling valve is not used
	X	1	0-10V	0-10V cooling valve only is used
		2	THERMAL	Thermal and 0-10V cooling valve are used
		3	ON_OFF	On/Off and 0-10V cooling valve are used
		4	FLOATING	Floating and 0-10V cooling valve are used

Table 22: Cooling Valve Type

Heating Valve Type

Parameter	Default	Valid Choices		Description
HTG TYPE (EC8)		0	UNUSED	Heating valve is not used
	X	1	0-10V	0-10V heating valve only is used
		2	THERMAL	Thermal and 0-10V heat valve are used
		3	ON_OFF	On/Off and 0-10V heat valve are used
		4	FLOATING	Floating and 0-10V heat valve is used

Table 23: Heating Valve Type

Cooling Valve Polarity

Parameter	Default	Valid Choices		Description
CLG NO/NC (EC5)	X	0	NORM CLOSE	Cooling valve is normally closed
		1	NORME OPEN	Cooling valve is normally open

Table 24: Cooling Valve Polarity

Heating Valve Polarity

Parameter	Default	Valid Choices		Description
HTG NO/NC (BC4)	X	0	NORM CLOSE	Heating valve is normally closed
		1	NORME OPEN	Heating valve is normally open

Table 25: Heating Valve Polarity

Universal Input 2

Parameter	Default	Valid Choices		Description
UI2 (EC2)	X	0	SP OFFSET	Setpoint offset is connected to UI2
		1	DISCH TEMP	Discharge temperature sensor is connected to UI2.
		2	RETURN TEMP	Return air temperature sensor is connected to UI2.
		3	WATER TEMP	Water Temperature sensor is connected to UI2.
		4	UNUSED	UI2 is not used.

Table 26: Universal Input 2

Sensor Input 3

Parameter	Default	Valid Choices		Description
SI3 (nviFP44)	X	0	SPACE TEMP	Space temperature sensor is connected to SI3
		1	DISCH TEMP	Discharge temperature sensor is connected to SI3.
		2	RETURN TEMP	Return air temperature sensor is connected to SI3.
		3	WATER TEMP	Water Temperature sensor is connected to SI3.
		4	UNUSED	SI3 is not used.

Table 27: Sensor Input 3

Digital Input 4

Parameter	Default	Valid Choices		Description
DI4 (EC3)	X	0	UNUSED	DI4 is not used
		1	WINDOW NO	Window Contact is normally open
		2	WINDOW NC	Window Contact is normally closed

Table 28: Digital Input 4

Digital Input 5

Parameter	Default	Valid Choices		Description
DI5 (EC4)	X	0	UNUSED	DI5 is not used
		1	AUX CONT NO	Auxiliary contact is normally open
		2	AUX CONT NC	Auxiliary contact is normally closed
		3	CHG OVER HEAT	Changeover contact (TRUE = Heat / FALSE = Cool)
		4	CHG OVER COOL	Changeover contact (TRUE = Cool / FALSE = Heat)
		5	COND SENSOR NO	Condensation sensor is normally open
		6	COND SENSOR NC	Condensation sensor is normally close

Table 29: Digital Input 5

Digital Input 6

Parameter	Default	Valid Choices		Description
DI6 (EC5)		0	UNUSED	DI5 is not used
	X	1	AUX CONT NO	Auxiliary contact is normally open
		2	AUX CONT NC	Auxiliary contact is normally closed
		3	CHG OVER HEAT	Changeover contact (TRUE = Heat / FALSE = Cool)
		4	CHG OVER COOL	Changeover contact (TRUE = Cool / FALSE = Heat)
		5	OCC SENSOR NO	Occupancy sensor is normally open
		6	OCC SENSOR NC	Occupancy sensor is normally closed

Table 30: Digital Input 6

Tables of IO Assignments

Fan Configuration

nciFanSettings.FanCtrlType (nviFP39)	Variable Fan	FanSpeed1	FanSpeed2	FanSpeed3
None	Unused	Unused	Unused	Unused
1Speed	Unused	DO1	Unused	Unused
2Speed	Unused	DO1	DO2	Unsued
3Speed	Unused	DO1	DO2	DO3
VarSpeed	AO7	DO1	Unused	Unused

Electric Heater Configuration

SystemType (EC6)	Electric Heater Output
Cool	Unused
CoolElectHeat	DO4
ChgOver	Unused
ChgOverElectHea	DO4
Heat	Unused
HeatElectHeat	DO4
CoolHeat	Unused
CoolHeatElectHeat	DO4

Damper Configuration

DamperCtrlType (EnumConstant9)	Damper Output
None	Unused
0-10V	AO8
2-10V	AO8

Cooling Valve Configuration

SystemType (EC6)	CoolValveType (EnumConstant7)	Cooling Valve Output
Cool/CoolElectHeat or CoolHeat/CoolHeatElectHeat	Unused	Unused
	0-10V	AO9
	Thermal	DO5 and AO9
	On/Off	DO5 and AO9
	Floating	DO5:Open, DO6:Close
Any other settings	-	Unused

Heating Valve Configuration

SystemType (EC6)	HeatValveType (EnumConstant8)	CoolValveType (EnumConstant7)	Heating Valve Output
Heat/HeatElectHeat or CoolHeat/CoolHeatElectHeat	Unused	-	Unused
	0-10V	-	AO10
	Thermal	-	DO6
	On/Off	-	DO6
	Floating	Floating	Invalid Configuration
		Not Floating	DO5:Open, DO6:Close
Any other settings		Unused	Unused

Change-Over Valve Configuration

SystemType (EC6)	CoolValveType (EnumConstant7)	Change-Over Valve Output
ChgOver or ChgOverElectHeat	Unused	Unused
	0-10V	AO9
	Thermal	DO5 and AO9
	On/Off	DO5 and AO9
	Floating	DO5:Open, DO6:Close
Any other settings	-	Unused

Wiring Diagrams

ECL-PTU-207

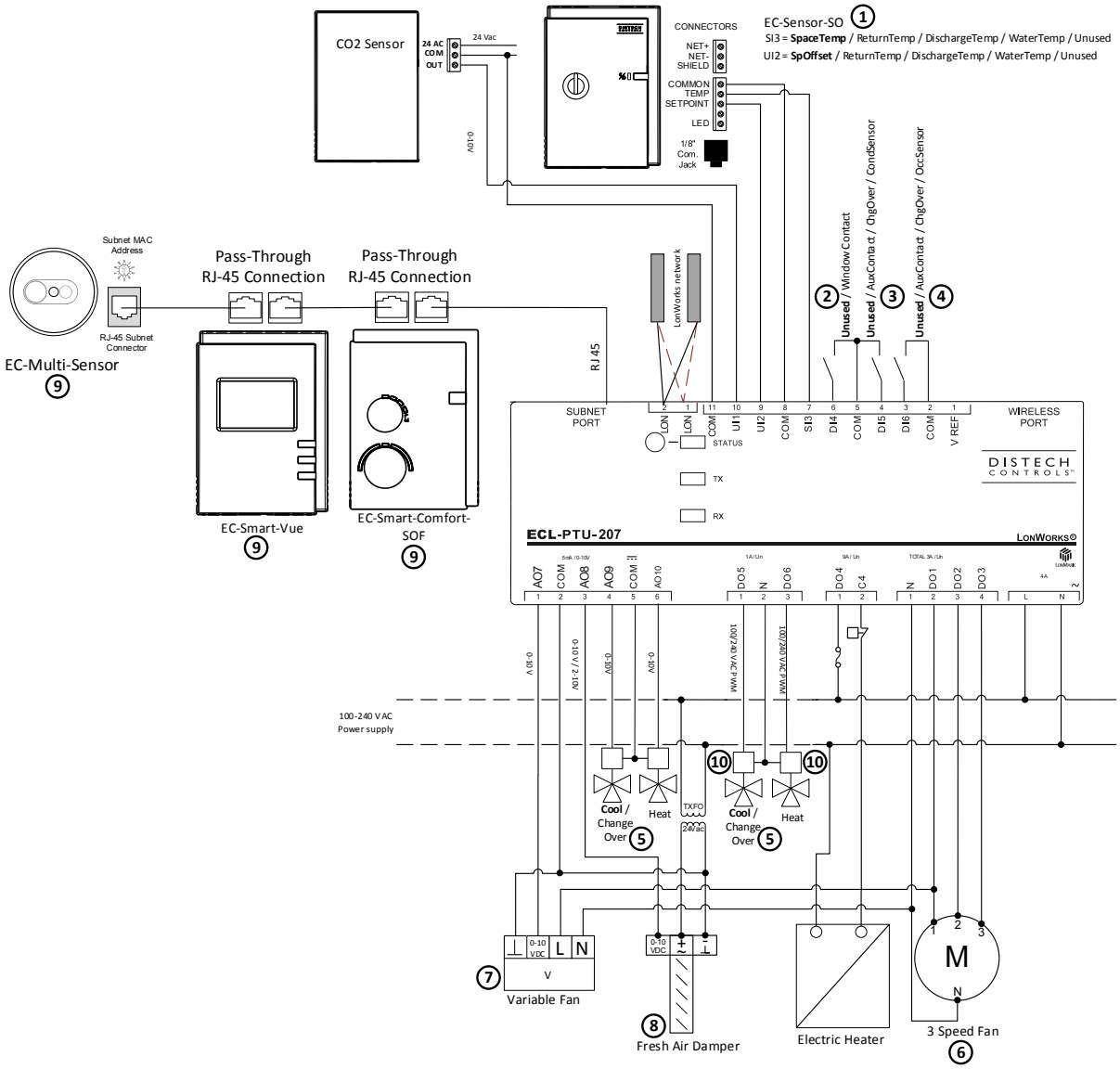


Figure 47: ECL-PTU-207 - Wiring diagram

Notes

1. SI3 input can be configured for SpaceTemp, ReturnTemp, WaterTemp or DischargeTemp sensor (10K Type II) using nciMiscConfig.SI3Config (nviFP44).
   UI2 Input can be configured for SetpointOffset (10K), ReturnTemp, Watertemp or DischargeTemp sensors (10K Type II) using UI2Config (EnumConstant2).
2. DI4 input can be configured for WindowContactNO or WindowContactNC using DI4Config (EnumConstant3).
3. DI5 input can be configured for AuxContactNO, AuxContactNC, ChgOverHeat, ChgOverCool, CondSensorNO or CondSensorNC using DI5Config (EnumConstant4).
4. DI6 input can be configured for AuxContactNO, AuxContactNC, ChgOverHeat, ChgOverCool, OccSensorNO or OccSensorNC using DI6Config (EnumConstant5).
5. This valve output is used for Change Over if SystemType (EC6) is set to ChgOver / ChgOverElecHeat.
6. 3-speed fan is used if nciFanSettings.FanCtrlType (nviFP39) is set to 3Speed.
7. Variable speed fan is used if nciFanSettings.FanCtrlType (nviFP39) is set to VarSpeed.
8. Fresh air damper control signal can be configured for 0-10V or 2-10V using DamperCtrlType (EnumConstant9).
9. Supports any version of EC-Multi-Sensor, Allure EC-Smart-Vue, Allure EC-Smart-Comfort and Allure EC-Smart-Air.
10. DO5 and DO6 outputs can be used to control a floating valve (heat, cooling or change Over) using HeatValveType (EnumConstant8) or CoolValveType (EnumConstant7) with DO5 = Open and DO6 = Closed.

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