



LONMARK^â

Functional Profile:

Discharge Air Controller

SFPTdischargeAirController

NOTE: The SCPT names in this document have been lengthened. There is a 63-character limit to SCPT names, rather than a 16-character limit assumed in this Profile.

When time permits, this Profile will be modified to have the proper SCPT names.

Overview

This document describes the profile for a *Discharge Air Controller* object. A Discharge Air controller is used to control duct static pressure and discharge air temperature, along with other auxiliary functions such a humidity and/or ventilation control.

Some common types of Discharge Air Units include:

- Packaged Rooftop Units
- Indoor Air Handling Units
- Outdoor Air Handling Units
- Water-cooled Self-contained Units

Although some of the physical characteristics of the HVAC equipment may vary, many of the same controller functions are used. The primary control functions within the Discharge Air controller include:

- Fan System Control
- Supply Temperature Control for Heating and Cooling
- Economizer and Ventilation Control
- Humidity Control

Sensors for various control functions may either be hardwired to the controller or connected via the network. Actuating devices such as valves and dampers will normally be hardwired to the controller, but may be connected to the controller via the network.

Operation of the equipment is subject to the Discharge Air controller's safety checks before external requests are honored and processed.

The network variables and configuration properties of the Discharge Air object are listed in Tables 1.1, 1.2 and 1.3.

Example Usage

The Discharge Air Controller resides on a LONTALK network, interacting with one or more of the following LONTALK nodes:

- Return air or space temperature sensor
- Return air or space humidity sensor
- Discharge air temperature sensor
- Discharge air humidity sensor
- Outdoor air temperature sensor
- Outdoor air humidity sensor
- Condenser water temperature sensor
- Building static pressure sensor
- Other sensors
- Scheduler
- Supervisory controller
- Monitoring device
- Installation/service tool
- VAV terminal controllers
- Heat actuator
- Cool actuator
- Fan speed controller(s)
- Outdoor air damper actuator
- Humidifier
- Other nodes as required

Figure 1 shows a typical application of a Discharge Air Controller.

REMARKS

New and Revised SNVTs

In this document new and revised SNVTs are proposed. These SNVTs are marked as SNVT_xxx*. A brief description is included at the end of this document.

Valid Ranges

In this document, the term “Valid Range” is used to indicate the minimum range of input values that a Discharge Air Controller object must be able to accept. Product manufacturers can choose to support a broader range in a product, at their discretion.

Mandatory Variables and Configuration Properties

In this document, mandatory variables and properties indicate the minimum features that a Discharge Air Controller object must support. Other profiles that are derived from this template can have additional mandatory features.

Typical Default Values

In this document, the term “Typical Default Value” is used to indicate a typical value for a manufacturer-specified default. This term is commonly used for Configuration Properties, whose default values are all manufacturer-defined.

Methods for Implementing Configuration Properties

Configuration Properties can be implemented as either Configuration Network Variables or by using Direct Memory Read/Write and Standard Configuration Property Type (SCPT) references. The device manufacturer needs to determine the best method for the intended application.

Discharge Air System

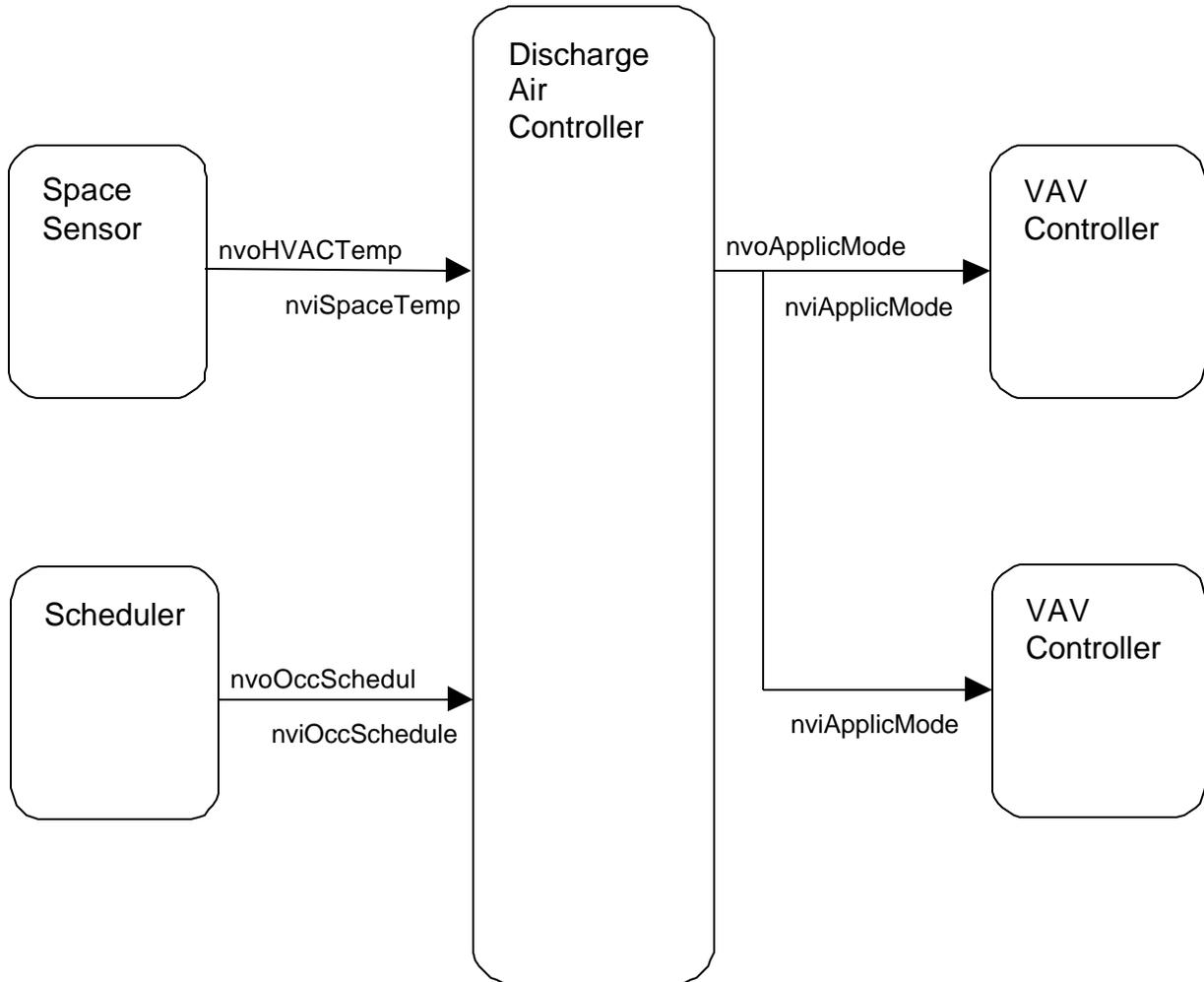


Figure 1 **Typical Discharge Air System Drawing**

Discharge Air Controller Object Details

Table 1.1: Network Variable Inputs

NV # (M/O)**	Name	Recv HrtBt	SNVT Type	SNVT Index	Class	Description
1 (M)	nviOccSchedule	Yes	SNVT_tod_event	128	RAM	Occupancy Scheduler Input
2 (O)	nviOccManCmd	No	SNVT_occupancy	109	RAM	Occupancy Override Input
3 (O)	nviApplicMode	Yes	SNVT_hvac_mode	108	RAM	Application Mode Input
4 (O)	nviEmergOverride	No	SNVT_hvac_emerg	103	RAM	Emergency Override Input
5 (O)	nviDuctStatPress	Yes	SNVT_press_p	113	RAM	Duct Static Pressure Input
6 (O)	nviDuctStaticSP	No	SNVT_press_p	113	RAM	Duct Static Pressure Setpoint Input
7 (O)	nviDACISP	No	SNVT_temp_p	105	RAM	Discharge Air Cooling Setpoint Input
8 (O)	nviDAHtSP	No	SNVT_temp_p	105	RAM	Discharge Air Heating Setpoint Input
9 (O)	nviSupFanCap	Yes	SNVT_lev_percent	81	RAM	Supply Fan Capacity Input
10 (O)	nviExhFanCap	Yes	SNVT_lev_percent	81	RAM	Exhaust Fan Capacity Input
11 (O)	nviRetFanCap	Yes	SNVT_lev_percent	81	RAM	Return Fan Capacity Input
12 (O)	nviFanDiffSP	No	SNVT_lev_percent	81	RAM	Fan Differential Setpoint Input
13 (O)	nviBldgStatPress	Yes	SNVT_press_p	113	RAM	Building Static Pressure Input
14 (O)	nviBldgStaticSP	No	SNVT_press_p	113	RAM	Building Static Pressure Setpoint Input
15 (O)	nviPriCoolEnable	Yes	SNVT_switch	95	RAM	Primary Cool Enable Input
16 (O)	nviPriHeatEnable	Yes	SNVT_switch	95	RAM	Primary Heat Enable Input
17 (O)	nviEconEnable	Yes	SNVT_switch	95	RAM	Economizer Enable Input
18 (O)	nviOAMinPos	No	SNVT_lev_percent	81	RAM	Outdoor Air Minimum Position Input
19 (O)	nviMinOAFlowSP	No	SNVT_flow	15	RAM	Minimum Outdoor Air Flow Setpoint Input
20 (O)	nviOutdoorTemp	Yes	SNVT_temp_p	105	RAM	Outdoor Air Temperature Input
21 (O)	nviOutdoorRH	Yes	SNVT_lev_percent	81	RAM	Outdoor Air Humidity Input
22 (O)	nviOAEenthalpy	Yes	SNVT_enthalpy		RAM	Outdoor Air Enthalpy Input
23 (O)	nviMATSP	No	SNVT_temp_p	105	RAM	Mixed Air Temperature Setpoint Input
24 (O)	nviRATemp	Yes	SNVT_temp_p	105	RAM	Return Air Temperature Input
25 (O)	nviSpaceEnthalpy	Yes	SNVT_enthalpy		RAM	Space Enthalpy Input
26 (O)	nviSpaceTemp	Yes	SNVT_temp_p	105	RAM	Space Temperature Input

NV # (M/O)**	Name	Recv HrtBt	SNVT Type	SNVT Index	Class	Description
27 (O)	nviSpaceRH	Yes	SNVT_lev_percent	81	RAM	Space Humidity Input
28 (O)	nviHumEnable	Yes	SNVT_switch	95	RAM	Humidification Enable Input
29 (O)	nviSpaceHumSP	No	SNVT_lev_percent	81	RAM	Space Humidification Setpoint Input
30 (O)	nviDehumEnable	Yes	SNVT_switch	95	RAM	Dehumidification Enable Input
31 (O)	nviSpaceDehumSP	No	SNVT_lev_percent	81	RAM	Space Dehumidification Setpoint Input
32 (O)	nviDADewPointSP	No	SNVT_temp_p	105	RAM	Discharge Air Dewpoint Setpoint Input
33 (O)	nviCWTemp	Yes	SNVT_temp_p	105	RAM	Condenser Water Temperature Input
34 (O)	nviCWFlow	Yes	SNVT_switch	95	RAM	Condenser Water Flow Input

** M = mandatory, O = optional

Table 1.2: Network Variable Outputs

NV # M/O**	Name	Send HrtBt	SNVT Type	SNVT Index	Class	Description
35 (M)	nvoDischAirTemp	Yes	SNVT_temp_p	105	RAM	Discharge Air Temperature Output
36 (M)	nvoUnitStatus	Yes	SNVT_hvac_status	112	RAM	Unit Status Output
37 (O)	nvoEffDATempSP	Yes	SNVT_temp_p	105	RAM	Effective Discharge Air Temperature Setpoint Output
38 (O)	nvoDuctStatPress	Yes	SNVT_press_p	113	RAM	Duct Static Pressure Output
39 (O)	nvoEffDuctStatSP	Yes	SNVT_press_p	113	RAM	Effective Duct Static Pressure Setpoint Output
40 (O)	nvoHeatCool	Yes	SNVT_hvac_mode	108	RAM	Effective Heat/Cool Output
41 (O)	nvoApplicMode	Yes	SNVT_hvac_mode	108	RAM	Application Mode Output
42 (O)	nvoEffectOccup	Yes	SNVT_occupancy	109	RAM	Effective Occupancy Output
43 (O)	nvoSupFanStatus	Yes	SNVT_switch	95	RAM	Supply Fan Status Output
44 (O)	nvoSupFanOnOff	Yes	SNVT_switch	95	RAM	Supply Fan On/Off Control Output
45 (O)	nvoSupFanCap	Yes	SNVT_lev_percent	81	RAM	Supply Fan Capacity Output
46 (O)	nvoExhFanStatus	Yes	SNVT_switch	95	RAM	Exhaust Fan Status Output
47 (O)	nvoExhFanOnOff	Yes	SNVT_switch	95	RAM	Exhaust Fan On/Off Control Output
48 (O)	nvoExhFanCap	Yes	SNVT_lev_percent	81	RAM	Exhaust Fan Capacity Output
49 (O)	nvoExhDamper	Yes	SNVT_lev_percent	81	RAM	Exhaust Damper Control Output
50 (O)	nvoRetFanStatus	Yes	SNVT_switch	95	RAM	Return Fan Status Output
51 (O)	nvoRetFanOnOff	Yes	SNVT_switch	95	RAM	Return Fan On/Off Control Output
52 (O)	nvoRetFanCap	Yes	SNVT_lev_percent	81	RAM	Return Fan Capacity Output
53 (O)	nvoRetFanPress	Yes	SNVT_press_p	113	RAM	Return Fan Pressure Output
54 (O)	nvoBldgStatPress	Yes	SNVT_press_p	113	RAM	Building Static Pressure Output
55 (O)	nvoEconEnabled	Yes	SNVT_switch	95	RAM	Economizer Enabled Output
56 (O)	nvoOADamper	Yes	SNVT_lev_percent	81	RAM	Outdoor Air Damper Output
57 (O)	nvoOAFFlow	Yes	SNVT_flow	15	RAM	Outdoor Air Flow Output
58 (O)	nvoLocalOATemp	Yes	SNVT_temp_p	105	RAM	Local Outdoor Air Temperature Output
59 (O)	nvoOutdoorTemp	Yes	SNVT_temp_p	105	RAM	Outdoor Air Temperature Output

NV # M/O**	Name	Send HrtBt	SNVT Type	SNVT Index	Class	Description
60 (O)	nvoLocalOARH	Yes	SNVT_lev_percent	81	RAM	Local Outdoor Air Humidity Output
61 (O)	nvoOutdoorRH	Yes	SNVT_lev_percent	81	RAM	Outdoor Air Humidity Output
62 (O)	nvoOAEnthalpy	Yes	SNVT_enthalpy		RAM	Outdoor Air Enthalpy Output
63 (O)	nvoCoolPrimary	Yes	SNVT_lev_percent	81	RAM	Primary Cooling Output
64 (O)	nvoHeatPrimary	Yes	SNVT_lev_percent	81	RAM	Primary Heating Output
65 (O)	nvoMATemp	Yes	SNVT_temp_p	105	RAM	Mixed Air Temperature Output
66 (O)	nvoSpaceTemp	Yes	SNVT_temp_p	105	RAM	Space Temperature Output
67 (O)	nvoRATemp	Yes	SNVT_temp_p	105	RAM	Return Air Temperature Output
68 (O)	nvoSpaceRH	Yes	SNVT_lev_percent	81	RAM	Space Humidity Output
69 (O)	nvoSpaceEnthalpy	Yes	SNVT_enthalpy		RAM	Space Enthalpy Output
70 (O)	nvoEffSpaceHumSP	Yes	SNVT_lev_percent	81	RAM	Effective Space Humidification Setpoint Output
71 (O)	nvoHumidifier	Yes	SNVT_lev_percent	81	RAM	Humidification Status Output
72 (O)	nvoEffSpaceDHSP	Yes	SNVT_lev_percent	81	RAM	Effective Space Dehumidification Setpoint Output
73 (O)	nvoDehumidifier	Yes	SNVT_switch	95	RAM	Dehumidification Status Output
74 (O)	nvoEffDADewPtSP	Yes	SNVT_temp_p	105	RAM	Effective Discharge Air Dewpoint Setpoint Output
75 (O)	nvoDADewPoint	Yes	SNVT_temp_p	105	RAM	Discharge Air Dewpoint Temperature Output
76 (O)	nvoCondCap	Yes	SNVT_lev_percent	81	RAM	Condenser Capacity Output
77 (O)	nvoLocalCWTemp	Yes	SNVT_temp_p	105	RAM	Local Condenser Water Temperature Output
78 (O)	nvoCWTemp	Yes	SNVT_temp_p	105	RAM	Condenser Water Temperature Output
79 (O)	nvoCWFlow	Yes	SNVT_switch	95	RAM	Condenser Water Flow Output
80 (O)	nvoCWPump	Yes	SNVT_switch	95	RAM	Condenser Water Pump Output

** M = mandatory, O = optional

Table 1.3: Configuration Properties

Config. Property # (M/O)**	Name	SCPT Index	SNVT Type (SNVT Index)	Association	Description
49 (M)	nciSndHrtBt SCPTmaxSendTime	49	SNVT_time_sec (107)		Send Heartbeat
(M)	nciDACISP		SNVT_temp_p (105)		Discharge Air Cooling Setpoint
(M)	nciDAHtSP		SNVT_temp_p (105)		Discharge Air Heating Setpoint
60 (O)	nciSetpoints SCPTsetPnts	60	SNVT_temp_setpt (106)		Occupancy Temperature Setpoints
52 (O)	nciMinOutTm SCPTminSendTime	52	SNVT_time_sec (107)		Minimum Send Time
48 (O)	nciRcvHrtBt SCPTmaxRcvTime	48	SNVT_time_sec (107)	nv1(M),	Receive Heartbeat
17 (O)	nciLocation SCPTlocation	17	SNVT_str_asc (36)	Object	Location Label
34 (O)	nciBypassTime SCPTbypassTime	34	SNVT_time_min (123)		Local Bypass Time
(O)	nciMaxSupFanCap		SNVT_lev_percent (81)		Maximum Supply Fan Capacity
(O)	nciMinSupFanCap		SNVT_lev_percent (81)		Minimum Supply Fan Capacity
(O)	nciMaxREFanCap		SNVT_lev_percent (81)		Maximum Return/Exhaust Fan Capacity
(O)	nciMinREFanCap		SNVT_lev_percent (81)		Minimum Return/Exhaust Fan Capacity
(O)	nciDuctStatSP		SNVT_press_p (113)		Duct Static Pressure Setpoint
(O)	nciMaxDuctStatSP		SNVT_press_p (113)		Maximum Duct Static Pressure Setpoint

Config. Property # (M/O)**	Name	SCPT Index	SNVT Type (SNVT Index)	Association	Description
(O)	nciMinDuctStatSP		SNVT_press_p (113)		Minimum Duct Static Pressure Setpoint
(O)	nciDuctStatLim		SNVT_press_p (113)		Duct Static Pressure Limit
(O)	nciBldgStaticSP		SNVT_press_p (113)		Building Static Pressure Setpoint
(O)	nciRetFanPressSP		SNVT_press_p (113)		Return Fan Pressure Setpoint
(O)	nciFanDiffSP		SNVT_lev_percent (81)		Fan Differential Setpoint
(O)	nciMALowLimitSP		SNVT_temp_p (105)		Mixed Air Low Limit Setpoint
(O)	nciMATSP		SNVT_temp_p (105)		Mixed Air Temperature Setpoint
23 (O)	nciOAMinPos	23	SNVT_lev_percent (81)		Outdoor Air Damper Minimum Position
(O)	nciMinOAFlowSP		SNVT_flow (15)		Minimum Outdoor Air Flow Setpoint
67 (O)	nciOAFlowCalib	67	SNVT_multiplier (82)		Outdoor Air Flow Calibration
46 (O)	nciOAIInletArea	46	SNVT_area (110)		Outdoor Air Inlet Area
(O)	nciOATSP		SNVT_temp_p (105)		Outdoor Air Temperature Setpoint
(O)	nciOAEnthSP		SNVT_enthalpy		Outdoor Air Enthalpy Setpoint
(O)	nciTempDiff		SNVT_temp_p (105)		Economizer Enable Differential Temperature Setpoint
(O)	nciExhStartPos		SNVT_lev_percent (81)		Exhaust Enable Position

Config. Property # (M/O)**	Name	SCPT Index	SNVT Type (SNVT Index)	Association	Description
(O)	nciSpaceHumSP		SNVT_lev_percent (81)		Space Humidification Setpoint
36 (O)	nciSpaceDehumSP SCPThumSetpt	36	SNVT_lev_percent (81)		Space Dehumidification Setpoint
(O)	nciDADewPointSP		SNVT_temp_p (105)		Discharge Air Dewpoint Setpoint
(O)	nciMaxDACISP		SNVT_temp_p (105)		Maximum Discharge Air Cooling Setpoint
(O)	nciMinDACISP		SNVT_temp_p (105)		Minimum Discharge Air Cooling Setpoint
(O)	nciMaxDAHtSP		SNVT_temp_p (105)		Maximum Discharge Air Heating Setpoint
(O)	nciMinDAHtSP		SNVT_temp_p (105)		Minimum Discharge Air Heating Setpoint
(O)	nciCoolLockout		SNVT_temp_p (105)		Cooling Lockout Temperature Setpoint
(O)	nciHeatLockout		SNVT_temp_p (105)		Heating Lockout Temperature Setpoint
(O)	nciCoolResetEn		SNVT_switch (95)		Cooling Reset Enable
(O)	nciHeatResetEn		SNVT_switch (95)		Heating Reset Enable

** M = mandatory, O = optional

Legend

Applic	Application	En	Enable	Pres	Pressure
Bldg	Building	Enth	Enthalpy	Press	Pressure
Bt	Beat	Exh	Exhaust	Pri	Primary
Cap	Capacity	Hrt	Heart	Pt	Point
Calib	Calibration	Ht	Heat	RA	Return Air
Cl	Cool	Hum	Humidification	Rcv	Receive
Cmd	Command	M	Mandatory variable	RE	Return/Exhaust
Cond	Condenser	Man	Manual	Ret	Return
CW	Condenser Water	MAT	Mixed Air Temperature	RH	Relative Humidity
DA	Discharge Air	Max	Maximum	Sec	Secondary
Dehum	Dehumidification	Min	Minimum	Sta	Static
Diff	Differential	MWU	Morning Warm Up	Stat	Static
Duc	Duct	O	Optional variable	Snd	Send
Econ	Economizer	OA	Outdoor Air	SP	Setpoint
Ef	Effective	Occ	Occupancy	Sup	Supply
Eff	Effective	Occup	Occupancy	T	Temperature
Effect	Effective	Out	Output	Temp	Temperature
Emerg	Emergency	Pos	Position	Tm	Timer

Mandatory Network Variables - Inputs

Occupancy Scheduler Input

```
network input SNVT_tod_event nviOccSchedule;
```

This input network variable is used to command the Discharge Air Controller into different occupancy modes. It is typically sent by a scheduler or a supervisory node. 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 to determine the effective occupancy mode. Refer to Effective Occupancy Output (nvoEffectOccup) for more information.

Valid Range

for current_state:

- 0 = OC_OCCUPIED: The Discharge Air Controller should operate in the occupied mode as defined by the manufacturer.
- 1 = OC_UNOCCUPIED: The Discharge Air Controller should operate in the unoccupied mode as defined by the manufacturer.
- 3 = OC_STANDBY: The Discharge Air Controller should operate in the standby mode as defined by the manufacturer.
- 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.

The interpretation of all other enumerations will be manufacturer-specific.

for next_state: (optional)

- 0 = OC_OCCUPIED: The Discharge Air Controller will operate in the occupied mode as defined by the manufacturer.
- 1 = OC_UNOCCUPIED: The Discharge Air Controller will operate in the unoccupied mode as defined by the manufacturer.
- 3 = OC_STANDBY: The Discharge Air Controller will operate in the standby mode as defined by the manufacturer.
- 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.

The interpretation of all other enumerations will be manufacturer-specific.

for time_to_next_state: (optional) 0 to 65,534 minutes, 0 = not used, 65,535 (0xFFFF) = Invalid

Default Value

current_state = 0xFF = OC_NUL

next_state = 0xFF = OC_NUL

time_to_next_state = 0 minutes

These values will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time.

Mandatory Network Variables - Outputs

Discharge Air Temperature Output

network output SNVT_temp_p nvoDischAirTemp;

This output network variable is used to monitor the discharge air temperature measured by a hardwired sensor.

Typical Range

Typical Range is 0 °C to 100 °C. If no hardwired sensor is present, or if the sensor is failed, an invalid value will be sent.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Unit Status Output

network output SNVT_hvac_status nvoUnitStatus;

This output network variable is available to report the Discharge Air 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.

Valid Range

mode:	HVAC_HEAT, HVAC_MRNG_WRMUP, HVAC_COOL, HVAC_NIGHT_PURGE, HVAC_PRE_COOL, HVAC_OFF, HVAC_TEST, HVAC_FAN_ONLY, HVAC_MAX_HEAT.
heat_output_primary:	0-100%, 0x7FFF (INVALID)
heat_output_secondary:	0-100%, 0x7FFF (INVALID)
cool_output:	0-100%, 0x7FFF (INVALID)
econ_output:	0-100%, 0x7FFF (INVALID)
fan_output:	0-100%, 0x7FFF (INVALID)
in_alarm:	0 Means there is no alarm. Not 0 Means there is an alarm. 0xFF Means that alarming is disabled.

NOTE: For the econ_output value: If the unit has an airside economizer, its capacity will be reported. If the unit has only a water side economizer, its capacity will be reported. If the unit has both, only the airside economizer capacity will be reported. If no economizer is used, the invalid value will be reported.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Optional Network Variables - Inputs

Occupancy Override Input

```
network input SNVT_occupancy nviOccManCmd;
```

This input network variable is used to command the Discharge Air Controller into different occupancy modes. It is typically sent by a wall-mounted occupant-interface module or a supervisory node, to manually control occupancy modes, or to 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 network variable input should never be bound to a network variable that uses a Send Heartbeat function.*

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

Valid Range

- 0 = OC_OCCUPIED: The Discharge Air Controller should operate in the occupied mode as defined by the manufacturer.
- 1 = OC_UNOCCUPIED: The Discharge Air Controller should operate in the unoccupied mode as defined by the manufacturer.
- 2 = OC_BYPASS: The Discharge Air Controller should operate in the occupied mode for a period of time defined by nciBypassTime.
- 3 = OC_STANDBY: The Discharge Air Controller should operate in the standby mode as defined by the manufacturer.
- 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.

Default Value

The default value OC_NUL = 0xFF. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Application Mode Input

network input SNVT_hvac_mode nviApplicMode;

This network variable input is used to coordinate the Discharge Air Controller with any supervisory controller. If a mode is requested that is not supported by the unit controller, the unit controller will use a manufacturer-defined default mode.

Valid Range

0 = HVAC_AUTO:	Full automatic operation - manufacturer defined
1 = HVAC_HEAT:	Heating only
2 = HVAC_MRNG_WRMUP:	Morning warm-up
3 = HVAC_COOL:	Cooling only
4 = HVAC_NIGHT_PURGE:	Free cooling
5 = HVAC_PRE_COOL:	Morning cool-down
6 = HVAC_OFF:	No operation allowed
7 = HVAC_TEST:	Special test mode, manufacturer-defined
8 = not used	
9 = HVAC_FAN_ONLY:	No heating or cooling functions operate
10 = not used	
11 = not used	
12 = HVAC_MAX_HEAT	Maximum flow heating mode
0xFF = HVAC_NUL:	(same as HVAC_AUTO)

All other enumerations will be interpreted as manufacturer-defined.

Default Value

The default value is HVAC_AUTO. This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Emergency Override Input

```
network input SNVT_hvac_emerg nviEmergOverride;
```

This input network variable is used to command the device into different emergency modes. It is typically set by a supervisory node. The response to each mode is manufacturer-specific. An example of a possible application is given below.

Valid Range

The valid range is described in the table below:

0 = EMERG_NORMAL: Normal operation

1 = EMERG_PRESSURIZE: Start the PRESSURIZE operation

2 = EMERG_DEPRESSURIZE: Start the DEPRESSURIZE operation

3 = EMERG_PURGE: Start the PURGE operation

4 = EMERG_SHUTDOWN: SHUTDOWN all unit functions

0xFF = EMERG_NUL: Invalid mode (same as EMERG_NORMAL).

Example: Typical usage of these modes is shown in the table below.

	Supply Fan	Outdoor Air Damper	Exhaust or Return Fan	Exhaust Damper
Pressurize	On	Open	Off	Closed
Depressurize	Off	Closed	On	Open
Purge	On	Open	On	Open
Shutdown	Off	Closed	Off	Closed

Default Value

The default value is EMERG_NORMAL. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Duct Static Pressure Input

```
network input SNVT_press_p nviDuctStatPress;
```

This input network variable is used to connect a duct static pressure sensor or network output from another controller. When a duct static pressure sensor is locally wired to the controller, the use of `nviDuctStatPress` is manufacturer-defined.

Valid Range

The valid range is 0 Pa to 1250 Pa. The value `0x7FFF` = 32767 Pa will be handled as an invalid value.

Default Value

Default Value is `0x7FFF`. This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Duct Static Pressure Setpoint Input

```
network input SNVT_press_p nviDuctStaticSP;
```

This input network variable is used to set the duct static pressure setpoint of the controller via the network. If a valid value is not present, either a locally wired setpoint adjustment or the value as configured in `nciDuctStatSP` will be used as defined by the manufacturer.

Valid Range

The valid range is 0 Pa to 1250 Pa. The value `0x7FFF` = 32767 Pa will be handled as an invalid value.

Default Value

Default Value is `0x7FFF`. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Discharge Air Cooling Setpoint Input

```
network input SNVT_temp_p nviDAClSP;
```

This input network variable is used to set the discharge air cooling setpoint of the controller via the network. If a valid value is not present, either a locally wired setpoint knob or the value as configured in `nciDAClSP` will be used.

Valid Range

The valid range is 0 °C to 30 °C. The value `0x7FFF` = 327.67 °C will be handled as an invalid value.

Default Value

Default Value is `0x7FFF`. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Discharge Air Heating Setpoint Input

```
network input SNVT_temp_p nviDAHtSP;
```

This input network variable is used to set the discharge air heating setpoint of the controller via the network. If a valid value is not present, either a locally wired setpoint knob or the value as configured in `nciDAHtSP` will be used.

Valid Range

The valid range is 10 °C to 70 °C. The value 0x7FFF = 327.67° will be handled as an invalid value.

Default Value

Default Value is 0x7FFF. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Supply Fan Capacity Input

```
network input SNVT_lev_percent nviSupFanCap;
```

This input network variable is used to command an override of the supply fan capacity from another controller, and can be used to sequence multiple supply fans (ducted in parallel).

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Exhaust Fan Capacity Input

```
network input SNVT_lev_percent nviExhFanCap;
```

This input network variable is used to connect a network output from another controller to override the local exhaust fan capacity control.

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Return Fan Capacity Input

`network input SNVT_lev_percent nviRetFanCap;`

This input network variable is used to command an override of the return fan capacity from another controller and can be used to sequence multiple return fans (ducted in parallel)

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Fan Differential Setpoint Input

`network input SNVT_lev_percent nviFanDiffSP;`

This input network variable provides a setpoint for the percent capacity difference between the supply and return fans. The return fan will be controlled to maintain this differential in capacity below the supply fan.

Valid Range

The valid range is 0% to 50%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Building Static Pressure Input

`network input SNVT_press_p nviBldgStatPress;`

This input network variable is used to connect a network building static pressure sensor or network output from another controller. When a building static pressure sensor is locally wired to the controller, `nviBldgStatPress` has priority if a valid value is present.

Valid Range

The valid range is -125 Pa to 125 Pa. The value 0x7FFF = 32767 Pa will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (= 32767 Pa). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Building Static Pressure Setpoint Input

```
network input SNVT_press_p nviBldgStaticSP;
```

This input network variable is used to connect a network output from another controller to provide the building Static Pressure Setpoint. When valid, this input will have priority over any locally provided building static pressure setpoint.

Valid Range

The valid range is -100 to 100 Pa. The value 0x7FFF = 32767 Pa will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (= 32767 Pa). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Primary Cool Enable Input

```
network input SNVT_switch nviPriCoolEnable;
```

This input network variable is used to connect a network output from another controller to enable or disable the primary cooling outputs of the unit. This input can be used to disable compressor operation or other forms of mechanical cooling.

This input can be used for simple enable/disable functions, or can be used to enable a portion of the unit's cooling capacity. For example, if a unit has 2 compressors, a value of 100 (50.0%) could indicate that only one compressor is enabled. The interpretation of values less than 100.0% is manufacturer-defined, based on the specific equipment and control algorithms used.

Valid Range

State	Value	Equivalent Percent	Cooling Operation
0	n/a	n/a	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Partially Enabled
1	200 to 255	100.0%	Enabled
0xFF	n/a	n/a	Enabled (Invalid)

Default Value

Default Value is Enable (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Primary Heat Enable Input

network input SNVT_switch nviPriHeatEnable;

This input network variable is used to connect a network output from another controller to enable or disable the primary heating outputs of the unit.

Valid Range

State	Value	Equivalent Percent	Primary Heat Operation
0	n/a	n/a	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Partially Enabled
1	200 to 255	100.0%	Enabled
0xFF	n/a	n/a	Enabled (Invalid)

Default Value

Default Value is Enable (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Economizer Enable Input

network input SNVT_switch nviEconEnable;

This input is used to enable and disable economizer operation. This input is typically sent from a system supervisor panel to override the local economizer enable/decision. For this input, economizer Auto means that the local decision determines economizer operation. Enabled or Disabled means that economizer operation is allowed or not allowed (respectively), overriding the local decision.

Valid Range

State	Value	Economizer
0	n/a	Disabled
1	0	Disabled
1	1-255	Enabled
0xFF	n/a	Auto (Invalid)

Default Value

Default Value is Auto (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Outdoor Air Minimum Position Input

```
network input SNVT_lev_percent nviOAMinPos;
```

This input network variable is used to set the minimum outdoor air damper position of the controller via the network. When a valid value is present, this input has priority over any local minimum outdoor air damper position setpoint.

ValidRange

The valid range is 0 % to 100 %. The value 0x7FFF = +163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF. This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Minimum Outdoor Air Flow Setpoint Input

```
network input SNVT_flow nviMinOAFlowSP;
```

This input network variable is used to command a minimum outdoor air flow rate setpoint from the network. When a valid value is present, this input has priority over any local minimum outdoor air flow setpoint.

Valid Range

The valid range is 0 to 50,000 l/sec. The value 0xFFFF = 65,535 l/sec will be handled as an invalid value.

Default Value

Default Value is 0xFFFF (= 65,535 l/sec). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Outdoor Air Temperature Input

```
network input SNVT_temp_p nviOutdoorTemp;
```

This input network variable is the measured outdoor air dry bulb temperature. It is typically provided by either a network sensor or a supervisory controller. When an outdoor air temperature sensor is locally wired to the controller, the `nviOutdoorTemp` has priority if a valid value is present.

Valid Range

The valid range is -40°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=+327.67°C). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Outdoor Air Humidity Input

`network input SNVT_lev_percent nviOutdoorRH;`

This input network variable is the measured outdoor humidity in percent. It is typically provided by either a network sensor or a supervisory controller. When an outdoor air humidity sensor is locally wired to the controller, the `nviOutdoorRH` has priority if a valid value is present.

Valid Range

The valid range is 0% to 100%. The value `0x7FFF` = 163.835% will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (=163.835%). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Outdoor Air Enthalpy Input

`network input SNVT_enthalpy nviOAEenthalpy;`

This input network variable is used to connect a network Outdoor air enthalpy sensor or network controller output (enthalpy calculated in another controller). When valid, this variable has priority over a locally wired sensor or calculated enthalpy value.

Valid Range

The valid range is 20 to 100 K-Joules/Kg. The value `0x7FFF` = 327.67 K-Joules/Kg will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (= 327.67 K-Joules/Kg). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Mixed Air Temperature Setpoint Input

`network input SNVT_temp_p nviMATSP;`

This input network variable is used to command a mixed air temperature setpoint from the network. When a valid value is present, this input has priority over any local mixed air temperature setpoint.

Valid Range

The valid range is -10°C to 50°C. The value `0x7FFF` = +327.67°C will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (=+327.67°C). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Return Air Temperature Input

```
network input SNVT_temp_p nviRATemp;
```

This input network variable is used to connect a network return air temperature sensor or network output from another controller. When a return air temperature sensor is locally wired to the controller, the `nviRATemp` has priority if a valid value is present.

Valid Range

The valid range is -10°C to 50°C. The value `0x7FFF` = +327.67°C will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (=+327.67°C). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Space Enthalpy Input

```
network input SNVT_enthalpy nviSpaceEnthalpy;
```

This input network variable is used to connect a network return air or space enthalpy sensor or network output from another controller. When a return air or space enthalpy sensor is locally wired to the controller, the `nviRAEnthalpy` has priority if a valid value is present.

Valid Range

The valid range is 20 to 100 K-Joules/Kg. The value `0x7FFF` = 327.67 K-Joules/Kg will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (= 327.67 K-Joules/Kg). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Space Temperature Input

```
network input SNVT_temp_p nviSpaceTemp;
```

This input network variable is used to connect a network space temperature sensor or network output from another controller. When a space temperature sensor is locally wired to the controller, the `nviSpaceTemp` has priority if a valid value is present.

Valid Range

The valid range is -10°C to 50°C. The value `0x7FFF` = +327.67°C will be handled as an invalid value.

Default Value

Default Value is `0x7FFF` (=+327.67°C). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Space Humidity Input

network input SNVT_lev_percent nviSpaceRH;

This input network variable is used to connect a network return air or space relative humidity sensor or network output from another controller. When a return air or space relative humidity sensor is locally wired to the controller, the nviSpaceRH has priority if a valid value is present.

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Humidification Enable Input

network input SNVT_switch nviHumEnable;

This input network variable is used to enable the humidification function in the controller. It is typically set by a supervisory node.

Valid Range

State	Value	Humidification
0	n/a	Disable
1	0	Disable
1	1-255	Enable
0xFF	n/a	Enable (Invalid)

Default Value

Default Value is Enable (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Space Humidification Setpoint Input

network input SNVT_lev_percent nviSpaceHumSP;

This input network variable is used to connect a network space humidity setpoint or network output from another controller. When valid, this input will have priority over any local space humidity setpoint.

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Dehumidification Enable Input

```
network input SNVT_switch nviDehumEnable;
```

This input network variable is used to enable the dehumidification function in the controller. It is typically set by a supervisory node.

Valid Range

State	Value	Dehumidification
0	n/a	Disable
1	0	Disable
1	1-255	Enable
0xFF	n/a	Enable (Invalid)

Default Value

Default Value is Enable (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Space Dehumidification Setpoint Input

```
network input SNVT_lev_percent nviSpaceDehumSP;
```

This input network variable is used to connect a network space dehumidification setpoint or network output from another controller. When valid, this input will have priority over any local space dehumidification setpoint.

Valid Range

The valid range is 0% to 100%. The value 0x7FFF = 163.835% will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=163.835%). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Discharge Air Dewpoint Setpoint Input

```
network input SNVT_temp_p nviDADewPointSP;
```

This input network variable is used to command a discharge air dewpoint setpoint from the network. When a valid value is present, this input has priority over any local discharge air dewpoint setpoint.

Valid Range

The valid range is -20°C to 30°C. The value 0x7FFF = +327.67°C will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=+327.67°C). This value will be adopted at power-up, until an update is received. This network variable input does not use the Receive Heartbeat function.

Condenser Water Temperature Input

network input SNVT_temp_p nviCWTemp;

This input network variable is used to connect a network condenser water temperature sensor or network output from another controller. When a condenser water temperature sensor is locally wired to the controller, nviCWTemp has priority if a valid value is present.

Valid Range

The valid range is -10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value.

Default Value

Default Value is 0x7FFF (=+327.67°C). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Condenser Water Flow Input

network input SNVT_switch nviCWFlow;

This input network variable indicates the system condenser water flow status. It is typically provided by either a network sensor or a supervisory controller. When a flow sensor is locally wired to the controller, nviCWFlow has priority if a valid value is present.

Valid Range

State	Value	Condenser Water Flow
0	n/a	No
1	0	No
1	1-255	Yes
0xFF	n/a	Invalid

Default Value

Default Value is Invalid (State = 0xFF). This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

Optional Network Variables - Outputs

Effective Discharge Air Temperature Setpoint Output

```
network output SNVT_temp_p nvoEffDATempSP;
```

This output network variable is used to monitor the effective discharge air temperature setpoint that the Discharge Air Controller is using for control, which may come from `nviDAHtSP`, `nviDAClSP`, `nciDAHtSP`, `nciDAClSP`, or a locally wired set point knob.

Typical Range

Typical Range is 0 °C to 70 °C.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (`nciSndHrtBt`) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (`nciMinOutTm`) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Duct Static Pressure Output

```
network output SNVT_press_p nvoDuctStatPress;
```

This output network variable is used for monitoring the effective duct static pressure that the controller is using for control. This value will reflect either the network input `nviDuctStatPress` or the value from the locally wired duct static pressure sensor, as defined by the manufacturer.

Typical Range

The typical range is 0 Pa to 2500 Pa. The value `0x7FFF` = 32,767 Pa will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (`nciSndHrtBt`) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (`nciMinOutTm`) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Duct Static Pressure Setpoint Output

network output SNVT_press_p nvoEffDuctStatSP;

This output network variable is used to monitor the effective duct static pressure setpoint that the Discharge Air Controller is using for control. This value may come from nviDuctStaticSP, nciDuctStatSP, or a locally wired set point knob.

Typical Range

The typical range is 0 Pa to 1250 Pa.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Heat/Cool Output

network output SNVT_hvac_mode nvoHeatCool

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 Discharge Air Controller to coordinate the operation of multiple units. The heat/cool mode is determined by nviApplicMode and logic in the controller. The “mode” value reported in nvoUnitStatus is typically the same as nvoHeatCool, except when nviApplicMode is HVAC_TEST.

Valid Range

1 = HVAC_HEAT:	Heating only
2 = HVAC_MRNG_WRMUP:	Morning warm-up
3 = HVAC_COOL:	Cooling only
4 = HVAC_NIGHT_PURGE:	Free cooling
5 = HVAC_PRE_COOL:	Morning cool-down
6 = HVAC_OFF:	No operation allowed
7 = HVAC_TEST:	Special test mode, manufacturer-defined
8 = not used	
9 = HVAC_FAN_ONLY:	No heating or cooling functions operate
10 = not used	
11 = not used	
12 = HVAC_MAX_HEAT	Maximum flow heating
0xFF = HVAC_NUL:	Invalid

All other enumerations will be interpreted as manufacturer-defined.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Application Mode Output

network output SNVT_hvac_mode nvoApplicMode;

This output network variable is used to control the mode of other controllers such as a VAV box controller. This output will typically send a value of HVAC_AUTO except in certain modes where an override of other controllers is required. The function of this output is manufacturer-defined, based on the application of the Discharge Air Controller.

Valid Range

0 = HVAC_AUTO:	Full automatic operation - manufacturer defined
1 = HVAC_HEAT:	Heating only
2 = HVAC_MRNG_WRMUP:	Morning warm-up
3 = HVAC_COOL:	Cooling only
4 = HVAC_NIGHT_PURGE:	Free cooling
5 = HVAC_PRE_COOL:	Morning cool-down
6 = HVAC_OFF:	No operation allowed
7 = HVAC_TEST:	Special test mode, manufacturer-defined
8 = not used	
9 = HVAC_FAN_ONLY:	No heating or cooling functions operate
10 = not used	
11 = not used	
12 = HVAC_MAX_HEAT	Maximum flow heating
0xFF = HVAC_NUL:	Invalid

All other enumerations will be interpreted as manufacturer-defined.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Occupancy Output

network output SNVT_occupancy nvoEffectOccup;

This output network variable transmits the current Occupancy mode of the Discharge Air Controller for monitoring. The occupancy mode is determined by a combination of input network variables and logic in the controller, as defined by the controller manufacturer. An example of how the Effective Occupancy Output could be determined from various inputs is shown in the table below.

Valid Range

- 0 = OC_OCCUPIED: The Discharge Air Controller should operate in the occupied mode as defined by the manufacturer.
- 1 = OC_UNOCCUPIED: The Discharge Air Controller should operate in the unoccupied mode as defined by the manufacturer.
- 2 = OC_BYPASS: The Discharge Air Controller should operate in the occupied mode for a period of time defined by nciBypassTime.
- 3 = OC_STANDBY: The Discharge Air Controller should operate in the standby mode as defined by the manufacturer.

Effective Occupancy Output (example application)

nviOccManCmd	nviOccSchedule²	nvoEffectOccup
OC_OCCUPIED	Don't Care	OC_OCCUPIED
OC_UNOCCUPIED	Don't Care	OC_UNOCCUPIED
OC_BYPASS ¹	OC_OCCUPIED	OC_OCCUPIED
	OC_UNOCCUPIED	OC_BYPASS ¹
	OC_STANDBY	OC_BYPASS ¹
	OC_NUL	OC_OCCUPIED
OC_STANDBY	Don't Care	OC_STANDBY
OC_NUL	OC_OCCUPIED	OC_OCCUPIED
	OC_UNOCCUPIED	OC_UNOCCUPIED
	OC_STANDBY	OC_STANDBY
	OC_NUL	OC_OCCUPIED
<p>Notes:</p> <p>1 OC_BYPASS can be initiated by either nviOccManCmd or a local input. nvoEffectOccup will only be OC_BYPASS for the duration of the Local Bypass Time (nciBypassTime), until re-initiated by either a transition of the local input or an update to nviOccManCmd.</p> <p>2 For nviOccSchedule, this refers to the "current state" field.</p>		

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Supply Fan Status Output

```
network output SNVT_switch nvoSupFanStatus;
```

This output network variable reflects the actual status of the supply fan for monitoring.

Valid Range

State	Value	Equivalent Percent	Actual Fan State	Actual Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 200	0.5 to 100%	ON	0.5 to 100%
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Supply Fan On/Off Control Output

network output SNVT_switch nvoSupFanOnOff;

This output network variable is used to start and stop the supply fan. It is typically used to interface with a variable speed motor drive. If it is used as the sole interface to the motor drive, it will contain the on/off as well as the speed signal. If it is used in conjunction with nvoSupFanCap, then this output should only be used for on/off control (see note 1).

Valid Range

State	Value	Equivalent Percent	Requested Fan State	Requested Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 199	0.5 to 99.5%	ON	0.5 to 99.5%
1	200	100% (note 1)	ON	100% (note 1)
0xFF	n/a	n/a	Invalid	Invalid

Note 1: When this output is used in conjunction with nvoSupFanCap to interface to a variable speed motor drive, the value should be set to 200 (100%) whenever the fan is requested to be On. The fan speed will be defined by nvoSupFanCap.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Supply Fan Capacity Output

network output SNVT_lev_percent nvoSupFanCap;

This output network variable is used to command the supply fan speed or capacity. It is typically used to interface with a variable speed motor drive.

Valid Range

The valid range is 0 % to 100 % of supply fan capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Exhaust Fan Status Output

network output SNVT_switch nvoExhFanStatus;

This output network variable reflects the actual status of the exhaust fan for monitoring.

Valid Range

State	Value	Equivalent Percent	Actual Fan State	Actual Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 200	0.5 to 100%	ON	0.5 to 100%
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Exhaust Fan On/Off Control Output

network output SNVT_switch nvoExhFanOnOff;

This output network variable is used to start and stop the exhaust fan. It is typically used to interface with a variable speed motor drive. If it is used as the sole interface to the motor drive, it will contain the on/off as well as the speed signal. If it is used in conjunction with nvoExhFanCap, then this output should only be used for on/off control (see note 1).

Valid Range

State	Value	Equivalent Percent	Requested Fan State	Requested Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 199	0.5 to 99.5%	ON	0.5 to 99.5%
1	200	100% (note 1)	ON	100% (note 1)
0xFF	n/a	n/a	Invalid	Invalid

Note 1: When this output is used in conjunction with nvoExhFanCap to interface to a variable speed motor drive, the value should be set to 200 (100%) whenever the fan is requested to be On. The fan speed will be defined by nvoExhFanCap.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Exhaust Fan Capacity Output

network output SNVT_lev_percent nvoExhFanCap;

This output network variable is used to command the exhaust fan speed or capacity. It is typically used to interface with a variable speed motor drive.

Valid Range

The valid range is 0 % to 100 % of exhaust capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Exhaust Damper Control Output

network output SNVT_lev_percent nvoExhDamper;

This output network variable reflects the current status of the Exhaust Damper output for monitoring or control.

Valid Range

The valid range is 0 % to 100 % of Exhaust Damper stroke. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Return Fan Status Output

network output SNVT_switch nvoRetFanStatus;

This output network variable reflects the actual status of the return fan for monitoring.

Valid Range

State	Value	Equivalent Percent	Actual Fan State	Actual Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 200	0.5 to 100%	ON	0.5 to 100%
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Return Fan On/Off Control Output

network output SNVT_switch nvoRetFanOnOff;

This output network variable is used to start and stop the return fan. It is typically used to interface with a variable speed motor drive. If it is used as the sole interface to the motor drive, it will contain the on/off as well as the speed signal. If it is used in conjunction with nvoRetFanCap, then this output should only be used for on/off control (see note 1).

Valid Range

State	Value	Equivalent Percent	Requested Fan State	Requested Fan Capacity
0	n/a	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 199	0.5 to 99.5%	ON	0.5 to 99.5%
1	200	100% (note 1)	ON	100% (note 1)
0xFF	n/a	n/a	Invalid	Invalid

Note 1: When this output is used in conjunction with nvoRetFanCap to interface to a variable speed motor drive, the value should be set to 200 (100%) whenever the fan is requested to be On. The fan speed will be defined by nvoRetFanCap.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Return Fan Capacity Output

network output SNVT_lev_percent nvoRetFanCap;

This output network variable is used to command the return fan speed or capacity. It is typically used to interface with a variable speed motor drive.

Valid Range

The valid range is 0 % to 100 % of return fan capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Return Fan Pressure Output

network output SNVT_press_p nvoRetFanPress;

This output network variable reflects the current value of the return fan static pressure for monitoring.

Typical Range

The typical range is -25 to 100 Pa. The value 0x7FFF = 32,767 Pa will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Building Static Pressure Output

```
network output SNVT_press_p nvoBldgStatPress;
```

This output network variable reflects the current value of the building static pressure for monitoring.

Typical Range

The typical range is -125 to 125 Pa. The value 0x7FFF = 32,767 Pa will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Economizer Enabled Output

```
network output SNVT_switch nvoEconEnabled;
```

This output network variable reflects the current Enable/Disable status of the economizer for monitoring.

Valid Range

State	Value	Economizer Status
0	n/a	Disabled
1	200	Enabled
0xFF	n/a	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Outdoor Air Damper Output

network output SNVT_lev_percent nvoOADamper;

This output network variable reflects the current level of the outdoor air damper or injection fan capacity output for monitoring or control.

Valid Range

The valid range is 0 % to 100 % of the outdoor air damper range. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Outdoor Air Flow Output

network output SNVT_flow nvoOAFflow;

This output network variable indicates the current value of the outdoor Air Flow for monitoring. This value will reflect the network input nviOAFflow if it is valid or the value from a locally wired air flow sensor.

Typical Range

The typical range is 0 to 50,000 l/sec. The value 0xFFFF = 65,535 l/sec will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Local Outdoor Air Temperature Output

network output SNVT_temp_p nvoLocalOATemp;

This output network variable indicates the value of a locally wired Outdoor Air Temperature sensor.

Typical Range

The typical range is -40°C to 70°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Outdoor Air Temperature Output

network output SNVT_temp_p nvoOutdoorTemp;

This output network variable indicates the current value of the outdoor air temperature for monitoring. This value will reflect the network input nviOutdoorTemp (if valid) or the value from a locally wired sensor.

Typical Range

The valid range is -40°C to 70°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Local Outdoor Air Humidity Output

network output SNVT_lev_percent nvoLocalOARH;

This output network variable indicates the value of a locally wired Outdoor Air Relative Humidity sensor.

Valid Range

The valid range is 0 % to 100 % relative humidity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Outdoor Air Humidity Output

network output SNVT_lev_percent nvoOutdoorRH;

This output network variable indicates the current value of the outdoor air humidity for monitoring. This value will reflect the network input nviOutdoorRH (if valid) or the value from a locally wired sensor.

Valid Range

The valid range is 0 % to 100 % relative humidity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Outdoor Air Enthalpy Output

network output SNVT_enthalpy nvoOAEnthalpy;

This output network variable indicates the current value of the outdoor air enthalpy. This output will reflect the value of nviOAEnthalpy (if valid), or the value may be calculated by the controller or measured by a hardwired input.

Typical Range

The typical range is 20 to 100 K-Joules/Kg. The value 0x7FFF = 327.67 K-Joules/Kg will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Primary Cooling Output

network output SNVT_lev_percent nvoCoolPrimary;

This output network variable reflects the current level of the primary (mechanical) cooling capacity. It can be used for monitoring or to control a remote cooling actuator.

Valid Range

The valid range is 0 % to 100 % of the primary cooling capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Primary Heating Output

network output SNVT_lev_percent nvoHeatPrimary;

This output network variable reflects the current level of the primary heating capacity. It can be used for monitoring or to control a remote heating actuator.

Valid Range

The valid range is 0 % to 100 % of the primary heating capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Mixed Air Temperature Output

network output SNVT_temp_p nvoMATemp;

This output network variable indicates the current value of the mixed air dry bulb temperature.

Typical Range

The typical range is -10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Space Temperature Output

network output SNVT_temp_p nvoSpaceTemp;

This output network variable indicates the current value of the space temperature for monitoring. This value will reflect the network input nviSpaceTemp (if valid) or the value from a locally wired sensor.

Typical Range

The valid range is -10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Return Air Temperature Output

network output SNVT_temp_p nvoRATemp;

This output network variable indicates the current value of the return air temperature for monitoring. This value will reflect the network input nviRATemp (if valid) or the value from a locally wired sensor.

Typical Range

The typical range is -10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Space Humidity Output

network output SNVT_lev_percent nvoSpaceRH;

This output network variable indicates the current value of the space relative humidity for monitoring. This value will reflect the network input nviSpaceRH (if valid) or the value from a locally wired sensor.

Valid Range

The valid range is 0 % to 100 % relative humidity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Space Enthalpy Output

network output SNVT_enthalpy nvoSpaceEnthalpy;

This output network variable indicates the current value of the space enthalpy. This output will reflect the value of nviSpaceEnthalpy (if valid), or the value may be calculated by the controller or measured by a hardwired input.

Typical Range

The typical range is 20 to 100 K-Joules/Kg. The value 0x7FFF = 327.67 K-Joules/Kg will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Space Humidification Setpoint Output

network output SNVT_lev_percent nvoEffSpaceHumSP;

This output network variable reflects the effective Space Low Limit Humidity Setpoint for monitoring.

Valid Range

The valid range is 0 % to 100 % RH. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Humidification Status Output

network output SNVT_lev_percent nvoHumidifier;

This output network variable reflects the current level of the humidifier output for monitoring.

Valid Range

The valid range is 0 % to 100 % of humidification capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Space Dehumidification Setpoint Output

network output SNVT_lev_percent nvoEffSpaceDHSP;

This output network variable reflects the effective Space High Limit Humidity Setpoint for monitoring.

Valid Range

The valid range is 0 % to 100 % RH. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Dehumidification Status Output

network output SNVT_switch nvoDehumidifier;

This output network variable reflects the current status of dehumidification control for monitoring.

Valid Range

State	Value	Dehumidification Status
0	n/a	Disabled
1	0	Enabled and Inactive
1	1-200	Enabled and Active
0xFF	n/a	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Effective Discharge Air Dewpoint Setpoint Output

network output SNVT_temp_p nvoEffDADewPtSP;

This output network variable is used to monitor the effective discharge air dewpoint setpoint that the Discharge Air Controller is using for control.

Typical Range

Typical Range is -20 °C to 30 °C.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Discharge Air Dewpoint Temperature Output

```
network output SNVT_temp_p nvoDADewPoint;
```

This output network variable indicates the current value of the discharge air dewpoint temperature.

Typical Range

The typical range is -20°C to 30°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Condenser Capacity Output

```
network output SNVT_lev_percent nvoCondCap;
```

This output network variable reflects the current value of the condenser capacity control output for monitoring. This output variable can be used to provide condenser fan status for air cooled units or water valve status for water cooled units.

Valid Range

The valid range is 0 % to 100 % of condenser capacity. The value 0x7FFF = +163.835% will be sent as an invalid value.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Local Condenser Water Temperature Output

```
network output SNVT_temp_p nvoLocalCWTemp;
```

This output network variable transmits the value of a locally wired Condenser Water Temperature sensor.

Typical Range

The typical range is 10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Condenser Water Temperature Output

```
network output SNVT_temp_p nvoCWTemp;
```

This output network variable indicates the current value of the condenser water temperature for monitoring. This value will reflect the network input nviCWTemp (if valid) or the value from a locally wired sensor.

Typical Range

The typical range is 10°C to 50°C. The value 0x7FFF = +327.67°C will be handled as an invalid value in case of a sensor failure.

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Condenser Water Flow Output

network output SNVT_switch nvoCWFlow;

This output network variable transmits the current status of the condenser water flow sensor for monitoring.

Valid Range

State	Value	Condenser Water Flow Status
0	n/a	No Flow
1	200	Flow
0xFF	n/a	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Condenser Water Pump Output

network output SNVT_switch nvoCWPump;

This output network variable transmits the current state of the Condenser Water Pump output for monitoring or control.

Valid Range

State	Value	Condenser Water Pump Status
0	n/a	Pump Off
1	1-200	Pump On
0xFF	n/a	Invalid

When Transmitted

This variable is transmitted immediately when its value has changed significantly. Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time (nciSndHrtBt) configuration value.

Update Rate

This value will be updated no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used (manufacturer-defined).

Default Service Type

The default service type is unacknowledged.

Mandatory Configuration Properties

Send Heartbeat

```
network input config SNVT_time_sec nciSndHrtBt;
```

This configuration property defines the maximum period of time that expires before the specified network variable outputs will automatically be updated. The specific method for sending heartbeat updates is manufacturer-defined.

Network variable outputs can be defined in 2 categories for the use of send heartbeat, based upon whether they are specified for send heartbeat in the Network Variable Outputs Table, as shown below:

Network Variable Output	Specified for Send Heartbeat in Table?	Result: Use Send Heartbeat?
Category 1	Yes	Yes
Category 2	No	Manufacturer-defined

Valid Range

The valid range is any value between 0.0 sec and 6,553.4 sec. Setting `nciSndHrtBt = 0.0` disables the Send Heartbeat mechanism.

Typical Default Value

0 (no automatic update)

SCPT Reference

SCPTmaxSendTime (49)

Discharge Air Cooling Setpoint

```
network input config SNVT_temp_p nciDAClSP;
```

This configuration property defines a default Discharge Air Cooling setpoint for the Discharge Air Controller.

Typical Range

0°C to 30°C

Typical Default Value

13°C

SCPT Reference

SCPTdACISP (TBD)

Discharge Air Heating Setpoint

```
network input config SNVT_temp_p nciDAHtSP;
```

This configuration property defines a default Discharge Air Heating setpoint for the Discharge Air Controller.

Typical Range

10°C to 70°C

Typical Default Value

40°C

SCPT Reference

SCPTdAHtSP (TBD)

Optional Configuration Properties

Occupancy Temperature Setpoints

```
network input config SNVT_temp_setpt nciSetpoints;
```

This configuration property defines the space temperature setpoints for the various heat, cool and occupancy modes. The specific use of these setpoints is manufacturer-defined. Some possible applications include using the unoccupied setpoints for setback/setup strategies and/or using the occupied heating setpoint for a morning warmup sequence.

The values of the individual setpoints within `nciSetpoints` must be kept in ascending order as follows: `unoccupied_heat ≤ standby_heat ≤ occupied_heat ≤ occupied_cool ≤ standby_cool ≤ unoccupied_cool`.

Typical Range and Default Values

	Minimum	Maximum	Default
<code>occupied_cool</code>	10°C	35°C	23 °C
<code>standby_cool</code>	10°C	35°C	25 °C
<code>unoccupied_cool</code>	10°C	35°C	28 °C
<code>occupied_heat</code>	10°C	35°C	21 °C
<code>standby_heat</code>	10°C	35°C	19 °C
<code>unoccupied_heat</code>	10°C	35°C	16 °C

SCPT Reference

SCPTsetPnts (60)

Minimum Send Time

```
network input config SNVT_time_sec nciMinOutTm;
```

This configuration property defines the minimum period of time between automatic network variable output transmissions. The specific use of `nciMinOutTm` is manufacturer-defined. For example, it can be applied to some network variable outputs (such as sensor values) but not to all network variable outputs.

Although this configuration property is optional, it must be provided if the minimum send time function is used in the controller. If this configuration property is not present, the controller cannot use the minimum send time function.

Valid Range

The valid range is any value between 0.0 sec and 6,553.4 sec. Setting `nciMinOutTm = 0.0` disables the Minimum Send Time mechanism.

Typical Default Value

0 (no minimum send time)

SCPT Reference

SCPTminSendTime (52)

Receive Heartbeat

```
network input config SNVT_time_sec nciRcvHrtBt;
```

This configuration property is used to control the maximum time that elapses after the last update to a specified network variable input before the Discharge Air Controller starts to use its default values. Network variable inputs can be defined in 3 categories for use of receive heartbeat, based upon whether they are specified for receive heartbeat in the Network Variable Inputs Table and whether they are bound, as shown below:

Network Variable Input	Specified for Receive Heartbeat in Table?	Bound?	Result: Use Receive Heartbeat?
Category 1	Yes	Yes	Yes
Category 2	Yes	No	Manufacturer-defined
Category 3	No	Don't Care	No

Valid Range

The valid range is any value between 0.0 sec and 6,553.4 sec. Setting `nciRcvHrtBt = 0.0` disables the Receive Heartbeat mechanism.

Typical Default Value

0 (no failure detect)

SCPT Reference

SCPTmaxRcvTime (48)

Location Label

```
network input config SNVT_str_asc nciLocation;
```

This configuration property can optionally be used to provide more descriptive physical location information than can be provided by the Neuron Chip's 6 byte location string. The location relates to the object and not to the node.

Valid Range

Any NULL terminated ASCII string of 31 bytes total length.

Typical Default Value

The typical default value is an ASCII string containing all zeros (“\0”).

SCPT Reference

SCPTlocation (17)

Local Bypass Time

```
network input config SNVT_time_min nciBypassTime;
```

This configuration property defines the maximum amount of time that the controller can be in the Bypass (occupancy) mode following a single Bypass request from either a local (hardwired) bypass switch or nviOccManCmd. Additional Bypass requests can restart the timer.

Typical Range

The typical range is 0 to 240 minutes (4 hours). Setting nciBypassTime = 0 disables the Bypass function.

Typical Default Value

0 (no bypass allowed)

SCPT Reference

SCPTbypassTime (34)

Maximum Supply Fan Capacity

```
network input config SNVT_lev_percent nciMaxSupFanCap;
```

This configuration property defines the Maximum Supply Fan Capacity setpoint for the Discharge Air Controller. It is used in a manufacturer-specified way to limit the supply fan capacity.

Valid Range

0% to 100%

Typical Default Value

100%

SCPT Reference

SCPTmaxSupFanCap (TBD)

Minimum Supply Fan Capacity

```
network input config SNVT_lev_percent nciMinSupFanCap;
```

This configuration property defines the Minimum Supply Fan Capacity setpoint for the Discharge Air Controller. It is used in a manufacturer-specified way to limit the supply fan capacity.

Valid Range

0% to 100%

Typical Default Value

0%

SCPT Reference

SCPTminSupFanCap (TBD)

Maximum Return/Exhaust Fan Capacity

```
network input config SNVT_lev_percent nciMaxREFanCap;
```

This configuration property defines the Maximum Return/Exhaust Fan Capacity setpoint for the Discharge Air Controller. It is used in a manufacturer-specified way to limit the fan capacity.

Valid Range

0% to 100%

Typical Default Value

100%

SCPT Reference

SCPTmaxREFanCap (TBD)

Minimum Return/Exhaust Fan Capacity

```
network input config SNVT_lev_percent nciMinREFanCap;
```

This configuration property defines the Minimum Return/Exhaust Fan Capacity setpoint for the Discharge Air Controller. It is used in a manufacturer-specified way to limit the fan capacity.

Valid Range

0% to 100%

Typical Default Value

0%

SCPT Reference

SCPTminREFanCap (TBD)

Duct Static Pressure Setpoint

```
network input config SNVT_press_p nciDuctStatSP;
```

This configuration property defines a default Duct Static Pressure setpoint for the Discharge Air Controller.

Typical Range

0 Pascals (Pa) to 2500 Pa

Typical Default Value

500 Pa

SCPT Reference

SCPTductStatSP (TBD)

Maximum Duct Static Pressure Setpoint

```
network input config SNVT_press_p nciMaxDuctStatSP;
```

This configuration property defines the Maximum Duct Static Pressure setpoint for the Discharge Air Controller.

Typical Range

0 Pa to 2500 Pa

Typical Default Value

1000 Pa

SCPT Reference

SCPTmaxDuctStatSP (TBD)

Minimum Duct Static Pressure Setpoint

```
network input config SNVT_press_p nciMinDuctStatSP;
```

This configuration property defines the Minimum Duct Static Pressure setpoint for the Discharge Air Controller.

Typical Range

0 Pa to 2500 Pa

Typical Default Value

100 Pa

SCPT Reference

SCPTminDuctStatSP (TBD)

Duct Static Pressure Limit

```
network input config SNVT_press_p nciDuctStatLim;
```

This configuration property defines the Duct Static Pressure Limit for the Discharge Air Controller. This limit is used for equipment protection. Typically, if the duct static pressure exceeds this limit, unit operation will be stopped.

Typical Range

0 Pa to 4000 Pa

Typical Default Value

1500 Pa

SCPT Reference

SCPTDuctStatLim (TBD)

Building Static Pressure Setpoint

```
network input config SNVT_press_p nciBldgStaticSP;
```

This configuration property defines the Default Building Static Pressure setpoint for the Discharge Air Controller.

Typical Range

-100 Pa to 100 Pa

Typical Default Value

25 Pa

SCPT Reference

SCPTbldgStaticSP (TBD)

Return Fan Pressure Setpoint

```
network input config SNVT_press_p nciRetFanPressSP;
```

This configuration property defines the Return Fan Static Pressure setpoint for the Discharge Air Controller.

Typical Range

0 Pa to 50 Pa

Typical Default Value

10 Pa

SCPT Reference

SCPTretFanPresSP (TBD)

Fan Differential Setpoint

```
network input config SNVT_lev_percent nciFanDiffSP;
```

This configuration property defines the default setpoint for the percent capacity difference between the supply and return fans. The return fan will be controlled to maintain this differential in capacity below the supply fan.

Typical Range

0% to 50%

Typical Default Value

10%

SCPT Reference

SCPTfanDiffSP (TBD)

Mixed Air Low Limit Setpoint

```
network input config SNVT_temp_p nciMALowLimitSP;
```

This configuration property defines the mixed air low limit setpoint for the Discharge Air Controller.

Typical Range

-20°C to 40°C

Typical Default Value

7°C

SCPT Reference

SCPTmALowLimitSP (TBD)

Mixed Air Temperature Setpoint

```
network input config SNVT_temp_p nciMATSP;
```

This configuration property defines the default mixed air temperature setpoint for the Discharge Air Controller.

Typical Range

-20°C to 40°C

Typical Default Value

11°C

SCPT Reference

SCPTmATSP (TBD)

Outdoor Air Damper Minimum Position

```
network input config SNVT_lev_percent nciOAMinPos;
```

This configuration property defines a default Minimum Outdoor Air Damper Position setpoint for the Discharge Air Controller.

Typical Range

0% to 100%

Typical Default Value

10%

SCPT Reference

SCPTminRnge (23)

Minimum Outdoor Air Flow Setpoint

```
network input config SNVT_flow nciMinOAFlowSP;
```

This configuration property defines the default minimum outdoor air flow setpoint for the Discharge Air Controller.

Typical Range

0 to 50,000 l/sec

Typical Default Value

0 l/sec

SCPT Reference

SCPTminOAFlowSP (TBD)

Outdoor Air Flow Calibration

```
network input config SNVT_multiplier nciOAFlowCalib;
```

This configuration property defines the gain for the outdoor air flow calibration for the Discharge Air Controller.

Typical Range

0.000 to 2.000

Typical Default Value

1.000

SCPT Reference

SCPTsensConstVAV (67)

Outdoor Air Inlet Area

```
network input config SNVT_area nciOAIInletArea;
```

This configuration property defines the Area of the Outdoor Air Inlet for the Discharge Air Controller. This value is used to determine the outdoor air flow.

Typical Range

0 to 10 square meters

Typical Default Value

0 square meters

SCPT Reference

SCPTductArea (46)

Outdoor Air Temperature Setpoint

```
network input config SNVT_temp_p nciOATSP;
```

This configuration property defines the airside economizer outdoor air temperature enable setpoint for the Discharge Air Controller.

Typical Range

0°C to 50°C

Typical Default Value

10°C

SCPT Reference

SCPToATSP (TBD)

Outdoor Air Enthalpy Setpoint

```
network input config SNVT_enthalpy nciOAEnthSP;
```

This configuration property defines the default airside economizer outdoor air enthalpy enable setpoint for the Discharge Controller.

Typical Range

25 to 80 K-Joules/Kg

Typical Default Value

40 K-Joules/Kg

SCPT Reference

SCPToAEnthSP (TBD)

Economizer Enable Differential Temperature Setpoint

```
network input config SNVT_temp_p nciTempDiff;
```

This configuration property defines the differential between entering (mixed) air temp and entering condenser water temp to enable economizer operation for the Discharge Air Controller.

Typical Range

0°C to 10°C

Typical Default Value

5°C

SCPT Reference

SCPTtempDiff (TBD)

Exhaust Enable Position

```
network input config SNVT_lev_percent nciExhStartPos;
```

This configuration property defines the exhaust enable outdoor air damper position setpoint for the Discharge Air Controller.

Typical Range

0% to 100%

Typical Default Value

25%

SCPT Reference

SCPTexhStartPos (TBD)

Space Humidification Setpoint

```
network input config SNVT_lev_percent nciSpaceHumSP;
```

This configuration property defines the default space humidification setpoint for the Discharge Air Controller.

Valid Range

0% to 100%

Typical Default Value

30%

SCPT Reference

SCPTspaceHumSP (TBD)

Space Dehumidification Setpoint

```
network input config SNVT_lev_percent nciSpaceDehumSP;
```

This configuration property defines the default space dehumidification setpoint for the Discharge Air Controller.

Valid Range

0% to 100%

Typical Default Value

60%

SCPT Reference

SCPTHumSetpt (36)

Discharge Air Dewpoint Setpoint

```
network input config SNVT_temp_p nciDADewPointSP;
```

This configuration property defines the default discharge air dewpoint setpoint for the Discharge Air Controller.

Typical Range

-20°C to 30°C

Typical Default Value

15°C

SCPT Reference

SCPTdADewPtSP (TBD)

Maximum Discharge Air Cooling Setpoint

```
network input config SNVT_temp_p nciMaxDAClSP;
```

This configuration property defines the maximum discharge air cooling setpoint for the Discharge Air Controller. It is used to limit the discharge air cooling setpoint determined by the discharge air temperature reset function.

Typical Range

0°C to 30°C

Typical Default Value

20°C

SCPT Reference

SCPTmaxDAClSP (TBD)

Minimum Discharge Air Cooling Setpoint

```
network input config SNVT_temp_p nciMinDAcLSP;
```

This configuration property defines the minimum discharge air cooling setpoint for the Discharge Air Controller. It is used to limit the discharge air cooling setpoint determined by the discharge air temperature reset function.

Typical Range

0°C to 30°C

Typical Default Value

10°C

SCPT Reference

SCPTminDACISP (TBD)

Maximum Discharge Air Heating Setpoint

```
network input config SNVT_temp_p nciMaxDAHtSP;
```

This configuration property defines the maximum discharge air heating setpoint for the Discharge Air Controller. It is used to limit the discharge air heating setpoint determined by the discharge air temperature reset function.

Typical Range

10°C to 70°C

Typical Default Value

50°C

SCPT Reference

SCPTmaxDAHtSP (TBD)

Minimum Discharge Air Heating Setpoint

```
network input config SNVT_temp_p nciMinDAHtSP;
```

This configuration property defines the minimum discharge air heating setpoint for the Discharge Air Controller. It is used to limit the discharge air heating setpoint determined by the discharge air temperature reset function.

Typical Range

10°C to 70°C

Typical Default Value

30°C

SCPT Reference

SCPTminDAHtSP (TBD)

Cooling Lockout Temperature Setpoint

```
network input config SNVT_temp_p nciCoolLockout;
```

This configuration property defines the outdoor air temperature cooling lockout setpoint for the Discharge Air Controller. When the outdoor air temperature is below this value, mechanical cooling will be disabled.

Typical Range

-10°C to 20°C. A value of 327.67°C (invalid) will disable this function.

Typical Default Value

10°C

SCPT Reference

SCPTcoolLockout (TBD)

Heating Lockout Temperature Setpoint

```
network input config SNVT_temp_p nciHeatLockout;
```

This configuration property defines the outdoor air temperature heating lockout setpoint for the Discharge Air Controller. When the outdoor air temperature is above this value, heating will be disabled.

Typical Range

0°C to 40°C. A value of 327.67°C (invalid) will disable this function.

Typical Default Value

20°C

SCPT Reference

SCPTheatLockout (TBD)

Cooling Reset Enable

```
network input config SNVT_switch nciCoolResetEn;
```

This configuration property is used to enable/disable the discharge air temperature cooling reset control for the Discharge Air Controller.

Valid Range

State	Value	Cooling Reset
0	n/a	Disabled
1	0	Disabled
1	1-255	Enabled
0xFF	n/a	Enabled (Invalid)

Typical Default Value

Disabled.

SCPT Reference

SCPTcoolResetEn (TBD)

Heating Reset Enable

```
network input config SNVT_switch nciHeatResetEn;
```

This configuration property is used to enable/disable the discharge air temperature heating reset control for the Discharge Air Controller.

Valid Range

State	Value	Heating Reset
0	n/a	Disabled
1	0	Disabled
1	1-255	Enabled
0xFF	n/a	Enabled (Invalid)

Typical Default Value

Disabled.

SCPT Reference

SCPTheatResetEn (TBD)