AIRMASTER®

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AIRLINQ® - DIGITAL BMS

BMS module for LONWORKS®

Programming the Airlinq® BMS module for LONWORKS®

Featuring the following objects

- UFPTnodeObject (0)
- UFPTairHandlingUnit (8500)
- SFPToccupancySensor (1060)
- SFPTco2Sensor (1070)
- SFPThvacRelativeHumiditySensor[2] (1050)
- SFPThvacTempSensor[3] (1040)

In compliant with present LONMark® Functional Profiles.

NB! This manual must be read before programming the Airlinq® air handling unit. Compliance with the manual ensures correct use of this product.

NB! The manufacturer cannot be held liable for damage arising from use in contravention of these instructions.

NB! The manufacturer reserves the right to make changes without notice.

NB! This guide relates to the Airlinq® unit it accompanies plus all equipment.

Table of Contents

1   Overview

This document describes the profile for the user defined Air Handling Unit Controller object (AHU Object), and the user defined Node Object.

These two user defined objects in combination to several Sensor objects enable LON® control and supervision of the complete Air Handling Unit (AHU).

Implemented variables are described in this document.

Figure 1 Air Handling Unit (AHU)
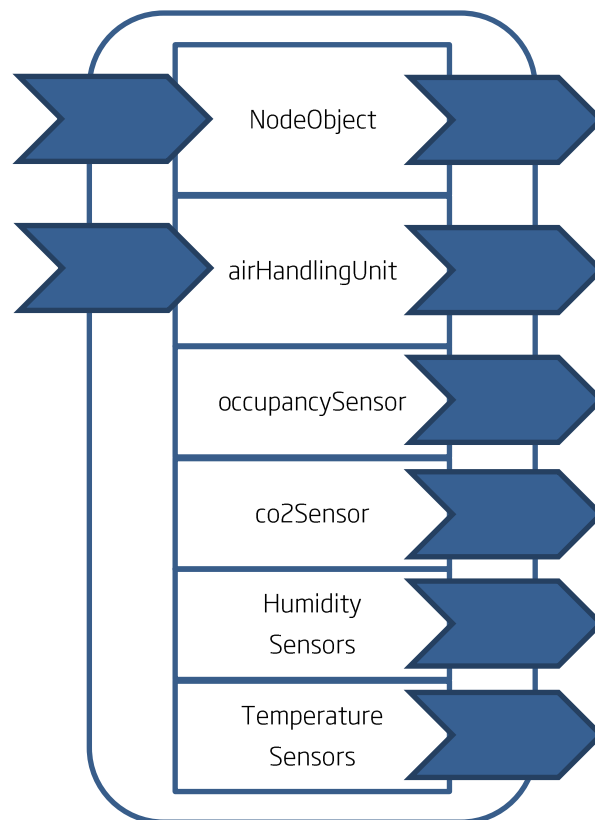
Figure 2 Node Concept as outlined to the LON® network

2. Functional-Block Details

NodeObject Functional Block

Mandatory Network Variables

nv1 — nviRequest SNVT_obj_request

nv2 — nvoStatus SNVT_obj_status

Optional Network Variables

#1 — nvoCondition SNVT_state

#8 — nviControlBasic SNVT_state

#2 — nvoAlarm2 SNVT_alarm2

#11 — nviNightCoolTemp SNVT_temp_p

#12 — nviNightCoolFlow SNVT_level_percent

#13 — nviNightCoolHiLm SNVT_temp_p

#14 — nviNightCoolLoLm SNVT_temp_p

#22 — nviAbsHumMinAcof SNVT_count_inc_f

#18 — nvoFilterDaysLft SNVT_count

#23 — nviAbsHumMinBcof SNVT_count_inc_f

#20 — nvoEffFlowSptPct SNVT_lev_percent

#24 — nviAbsHumMinCcof SNVT_count_inc_f

#21 — nvoControlStatus SNVT_state

#25 — nviAbsHumMaxAcof SNVT_count_inc_f

#18 — nvoFilterDaysLft SNVT_count

#26 — nviAbsHumMaxBcof SNVT_count_inc_f

#19 — nvoFileDirectory SNVT_address

#27 — nviAbsHumMaxCcof SNVT_count_inc_f

nv15 — nvoHostSWver SNVT_str_asc

#28 — nviFlowSetpoint SNVT_lev_percent

Configuration properties

Mandatory

Optional

#1 *SCPTdevMajVer* nciDevMajVer
#2 *SCPTdevMinVer* nciDevMinVer

Figure 9 UFPTnodeObject (0) Functional-Block Details

Table 1 Variable list, NodeObject

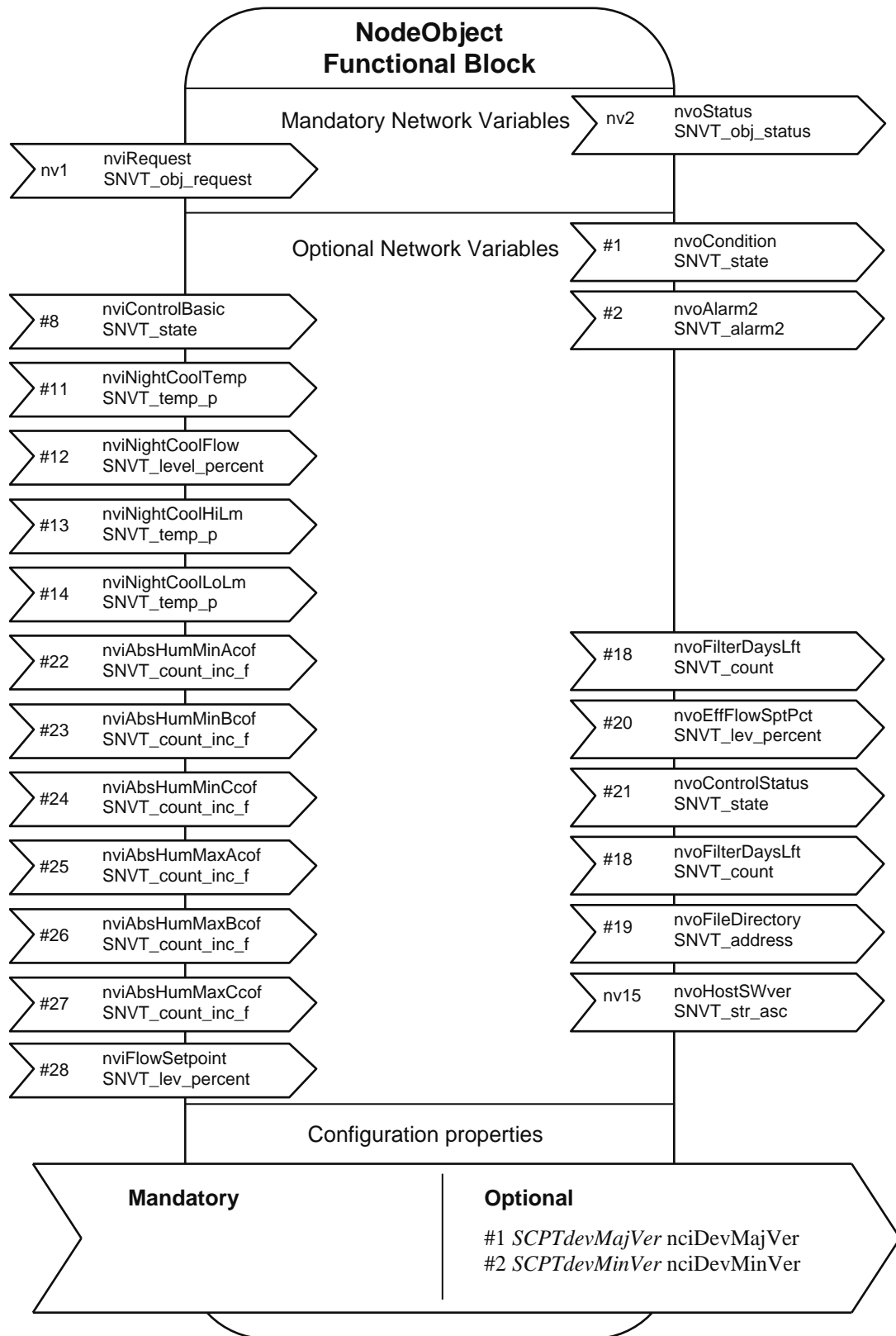| Man/ Opt	LON® var Name	RcvHtB SndHtB	SNVT / SCPT	FPT NV#	Class	BMS Name
O	nciDevMajVer	-	SCPTdevMajVer	#1	ReadOnly	
O	nciDevMinVer	-	SCPTdevMinVer	#2	ReadOnly	
M	nviRequest	-	SNVT_obj_request	|1	RAM	
M	nvoStatus	No	SNVT_obj_status	|2		
O	nviAbsHumMaxAcof	No	SNVT_count_inc_f	#25	EEPROM	Absolute humidity Max. A Coefficient
O	nviAbsHumMaxBcof	No	SNVT_count_inc_f	#26	EEPROM	Absolute humidity Max. B Coefficient
O	nviAbsHumMaxCcof	No	SNVT_count_inc_f	#27	EEPROM	Absolute humidity Max. C Coefficient
O	nviAbsHumMinAcof	No	SNVT_count_inc_f	#22	EEPROM	Absolute humidity Min. A Coefficient
O	nviAbsHumMinBcof	No	SNVT_count_inc_f	#23	EEPROM	Absolute humidity Min. B Coefficient
O	nviAbsHumMinCcof	No	SNVT_count_inc_f	#24	EEPROM	Absolute humidity Min. C Coefficient
O	nviControlBasic.bit0	No	SNVT_state	#8	EEPROM	Allow Start by Local External Start
	nviControlBasic.bit1	-	SNVT_state			Allow Start by Local PIR
	nviControlBasic.bit2	-	SNVT_state			Allow Start by Local CO2
	nviControlBasic.bit3	-	SNVT_state			Allow Start by Local Timer
	nviControlBasic.bit4	-	SNVT_state			Allow Start by Local Panel
O	nviFlowSetpoint	No	SNVT_lev_percent		EEPROM	Automatic Operation: Flow setpoint
O	nviNightCoolFlow	No	SNVT_lev_percent	#12	EEPROM	Night Cooling: Flow setpoint
O	nviNightCoolHiLm	No	SNVT_temp_p	#13	EEPROM	Night Cooling: High limit
O	nviNightCoolLoLm	No	SNVT_temp_p	#14	EEPROM	Night Cooling: Low limit
O	nviNightCoolTemp	No	SNVT_temp_p	#11	EEPROM	Night Cooling: IT setpoint
O	nvoAlarm2	No	SNVT_alarm2	#2		System Alarm
O	nvoCondition	No	SNVT_state	#1		System Condition
O	nvoControlStatus.bit0	No	SNVT_state	#21		External Start output
O	nvoEffFlowSptPct	Yes	SNVT_lev_percent	#20		Actual Flow Setpoint
O	nvoFileDirectory	-	SNVT_address	#19		
O	nvoFilterDaysLft	No	SNVT_count	#18		Filter, remaining service life
O	nvoHostSWver	No	SNVT_str_asc	#15		Software Version
						UTC seconds since 01-01-2008 00:00:00

airHandlingUnit Functional Block

Mandatory Network Variables

nv1 | nviSpaceTemp SNVT_temp_p

26 | nvoRoomTemp SNVT_temp_p
27 | nvoUnitStatus SNVT_hvac_status
#3 | nvoInletTemp SNVT_temp_p
#4 | nvoInletTempStpt SNVT_temp_p

Optional Network Variables

#25 | nviOccupancy SNVT_occupancy
#23 | nviInletTempStpt SNVT_temp_p
#21 | nviOpMode SNVT_hvac_mode
#24 | nviCO2 SNVT_ppm
nciSpaceCO2Lim[2] SNVT_ppm

#32 | nvoEffTempSetpt SNVT_temp_p
#9 | nvoBypassDamper SNVT_lev_percent
#27 | nvoHeater SNVT_lev_percent
#29 | nvoPreHeater SNVT_lev_percent
#28 | nvoCooling SNVT_lev_percent
#10 | nvoEvaporatTemp SNVT_temp_p
#26 | nvoExhaustTemp SNVT_temp_p
#20 | nvoOutsideTemp SNVT_temp_p
#12 | nvoExtAirFlow SNVT_flow
#30 | nvoSupplyAirFlow SNVT_flow
#18 | nvoTotalPwr SNVT_elec_kwh_l

Configuration properties

Mandatory

nciHvacType
nciSetpoints
nciSndHrtBt

Optional

nciLocation
nciPirHoldTime
nciRcvHrtBt
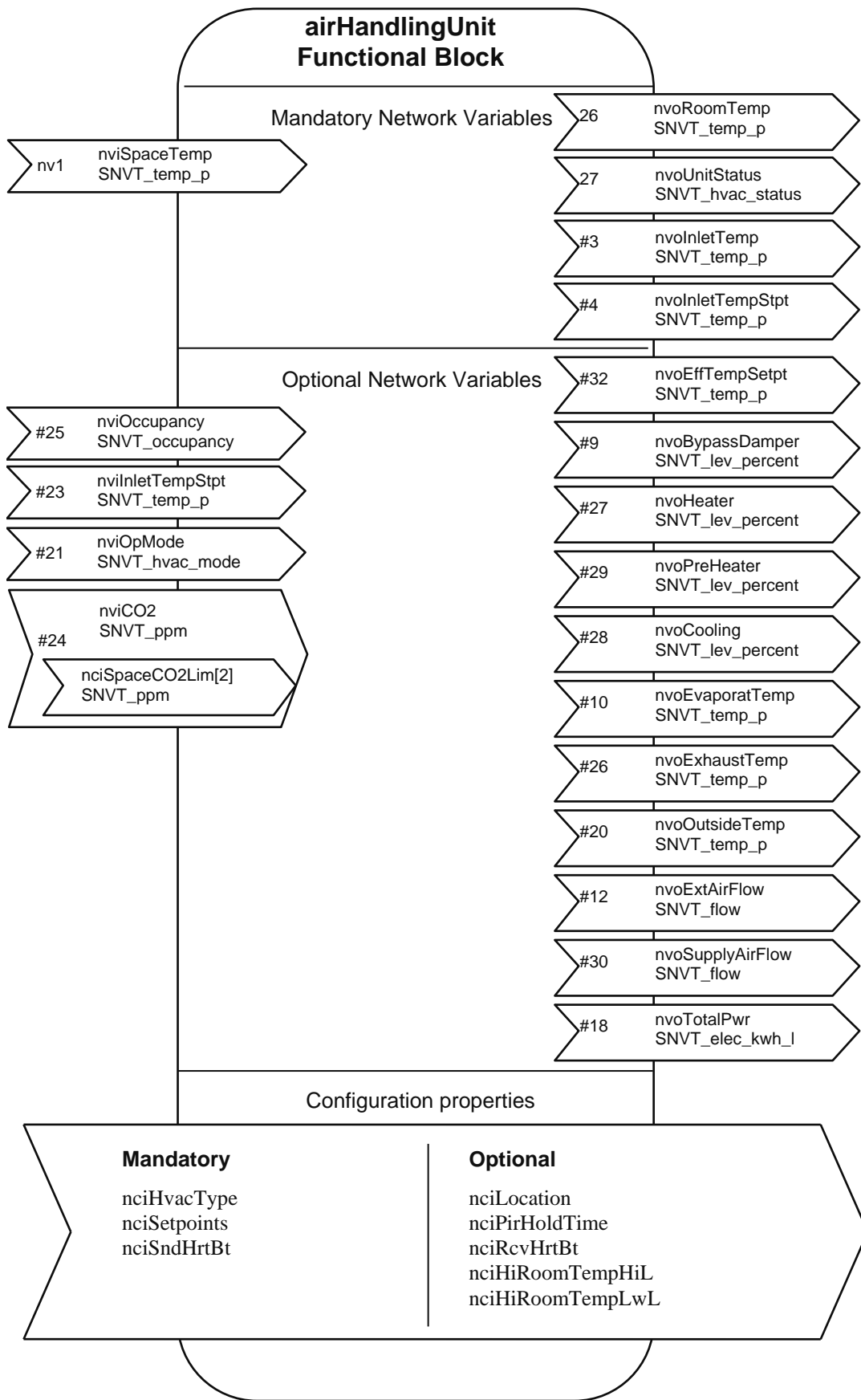nciHiRoomTempHiL
nciHiRoomTempLwL

Figure 10 UFPTairHandlingUnit (8500) Functional-Block Details

Table 2 Variable list, airHandlingUnit Object

Man/ Opt *	LON® var Name	RcvHtB SndHtB	SNVT / SCPT	FPT NV#	Class	BMS Name
O	nciCO2Limit[1]	-	SNVT_ppm	#4	EEPROM	CO2, Minimum
O	nciCO2Limit[2]	-	SNVT_ppm	#4	EEPROM	CO2, Maximum
O	nciHiRoomTempHiL	-	SNVT_temp_p	#2	EEPROM	High Room Temperature, High limit
O	nciHiRoomTempLwL	-	SNVT_temp_p	#1	EEPROM	High Room Temperature, Low limit
M	nciHvacType	-	SCPThvacType	|20	ReadOnly	
O	nciLocation	-	SCPTLocation	#7	EEPROM	
O	nciPirHoldTime	-	SNVT_time_sec	#3	EEPROM	PIR Afterrun Time
O	nciRcvHrtBt	-	SCPTmaxRcvTime	#6	EEPROM	
M	nciSetpoints	-	SCPTsetPnts	|2		
M	nciSndHrtBt	-	SCPTmaxSendTime	|1	EEPROM	
O	nviCO2	Yes	SNVT_ppm	#24	RAM	Automatic Operation: CO2 input
O	nviInletTempStpt	No	SNVT_temp_p	#23	RAM	Automatic Operaion: IT setpoint
O	nviOccupancy	Yes	SNVT_occupancy	#25	RAM	
O	nviOpMode	Yes	SNVT_hvac_mode	#21	RAM	Automatic Operation: Start
M	nviSpaceTemp	-	SNVT_temp_p	|1	RAM	
O	nvoBypassDamper	Yes	SNVT_lev_percent	#9		Bypass Damper percent
O	nvoCooling	Yes	SNVT_lev_percent	#28		Comfort Cooling percent
O	nvoEffTempSetpt	Yes	SNVT_temp_p	#32		Actual Inlet Temperature setpoint
O	nvoEvaporatTemp	Yes	SNVT_temp_p	#10		Evaporator Temperature
O	nvoExhaustTemp	Yes	SNVT_temp_p	#26		Exhaust Temperature at Ventilation Unit
O	nvoExtAirFlow	Yes	SNVT_flow	#12		Extraction Flow
O	nvoHeater	Yes	SNVT_lev_percent	#27		Comfort Heater percent
M	nvoInletTemp	Yes	SNVT_temp_p	#3		Inlet Temperature
M	nvoInletTempStpt	Yes	SNVT_temp_p	#4		
O	nvoOutsideTemp	Yes	SNVT_temp_p	#20		Outside Temperature
O	nvoPreHeater	Yes	SNVT_lev_percent	#29		Pre Heater percent
M	nvoRoomTemp	Yes	SNVT_temp_p	|26		Room Temperature
O	nvoSupplyAirFlow	Yes	SNVT_flow	#30		Supply Flow
O	nvoTotalPwr	Yes	SNVT_elec_kwh_l	#18		Energy Meter
M	nvoUnitStatus	Yes	SNVT_hvac_status	|27		System Operating Mode

*)   M = mandatory, O = optional

Some of the CP's are implemented as Network Input Config for optimal availability by non-LNS tools.
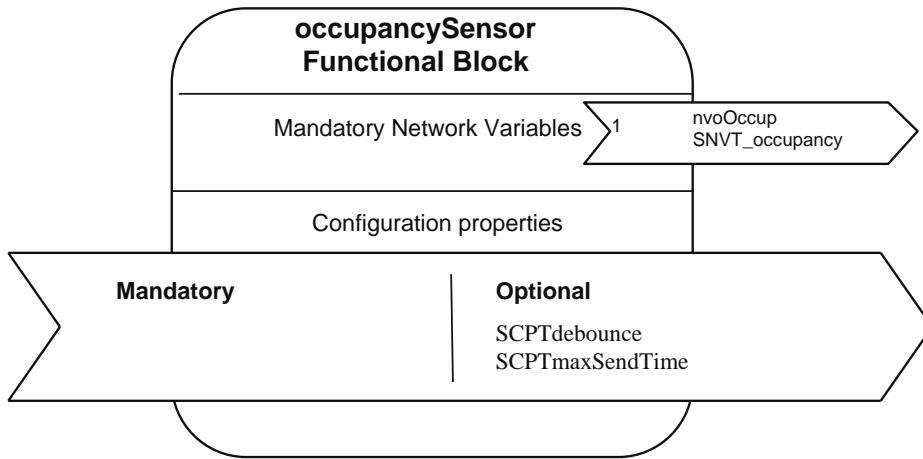
Figure 11 SFPToccupancySensor (1060) Functional-Block Details

Table 3 Variable list, occupancySensor Object

Man/ Opt *	LON® var Name	RcvHtB SndHtB	SNVT / SCPT	FPT NV#	Class	BMS Name
M	nvoOccup	Yes	SNVT_occupancy	|1		PIR output
O	nciDebounce	-	SCPTdebounce		EEPROM	
O	nciHeartBeat	-	SCPTmaxSendTime		EEPROM	

The purpose of the occupancySensor object is an opportunity to use the unit wired PIR sensor for other services in the building. The scheme below shows the mechanism, as well as the possibility to control the AHU from a LON® based PIR sensor.
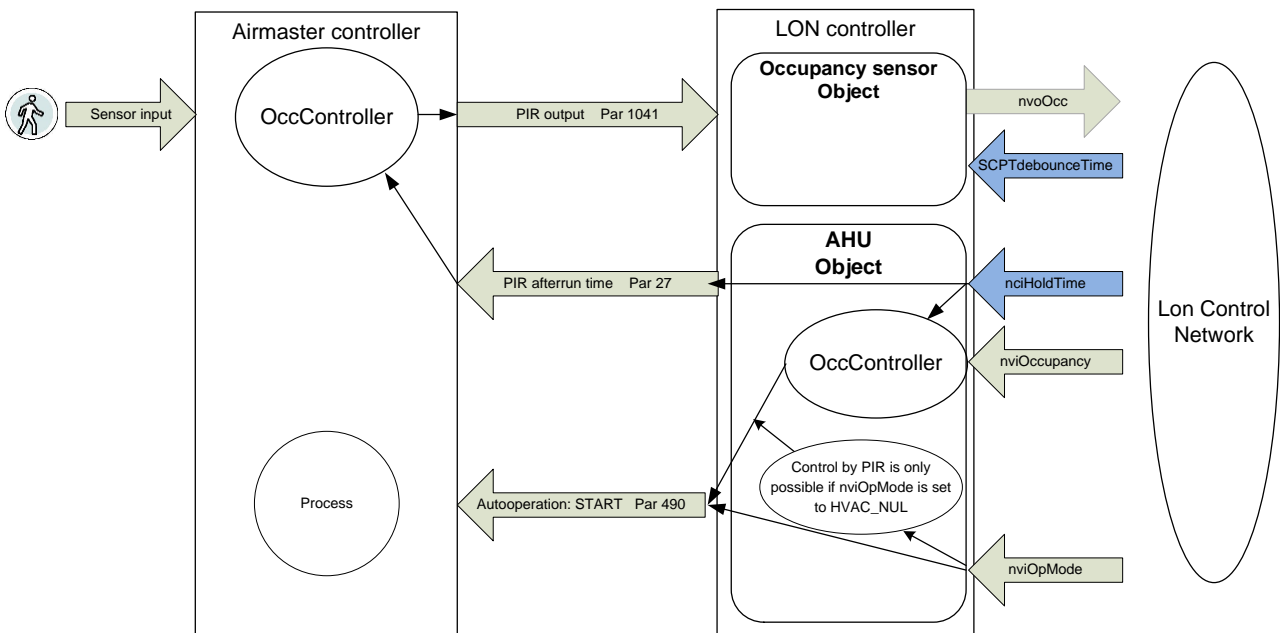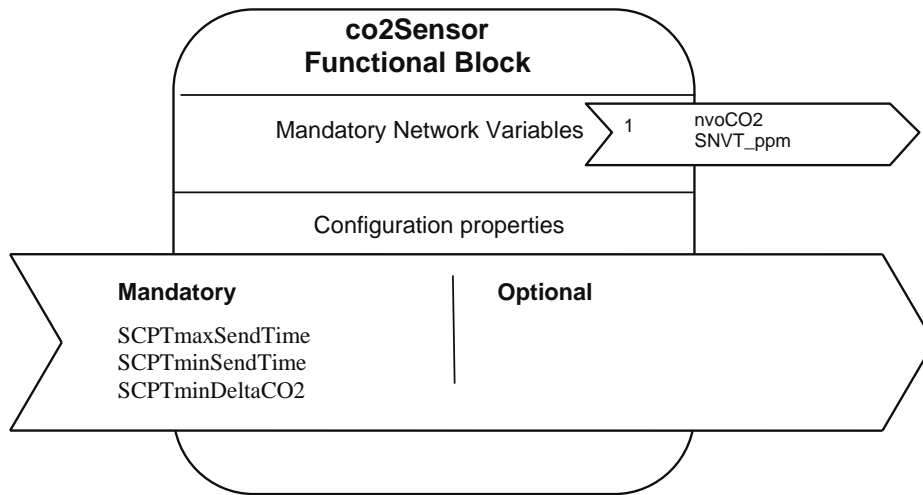
Figure 12 SFPTco2Sensor (1070) Functional-Block Details

Man/ Opt	LON® var Name	RcvHrtBt/ SndHrtBt	SNVT / SCPT	FPT NV#	Class	BMS Name
M	nvoCO2	Yes	SNVT_ppm	|1		CO2 output
M	nciMinSendTime	-	SCPTminSendTime		EEPROM	
M	nciMaxSendTime	-	SCPTmaxSendTime		EEPROM	
M	nciCO2MinDelta	-	SCPTminDeltaCO2		EEPROM	

The purpose of the CO2Sensor object is an opportunity to use the Air Quality Sensor for other services in the building.

2 x

Figure 13 SFPThvacRelativeHumiditySensor (1050) Functional-Block Details

Fb Idx	M /O	LON® var Name	RvHtBt/ SdHtBt	SNVT / SCPT	FPT NV#	Class	BMS Name
0	M	nciRHMinDelta_1	-	SCPTminDeltaRH		EEPROM	
1	M	nciRHMinDelta_2	-	SCPTminDeltaRH		EEPROM	
0	M	nciRHmnSndTim_1	-	SCPTminSendTime		EEPROM	
1	M	nciRHmnSndTim_2	-	SCPTminSendTime		EEPROM	
0	M	nciRHMxSndTim_1	-	SCPTmaxSendTime		EEPROM	
1	M	nciRHMxSndTim_2	-	SCPTmaxSendTime		EEPROM	
0	M	nvoRelativHum_1	Yes	SNVT_lev_percent	|1		Rel. Humidity, outside
1	M	nvoRelativHum_2	Yes	SNVT_lev_percent	|1		Rel. Humidity, inside

hvacTemperatureSensor Functional Block

Mandatory Network Variables

1 nvoHVACTemp
SNVT_temp_p

Configuration properties

Mandatory

SCPTminSendTime
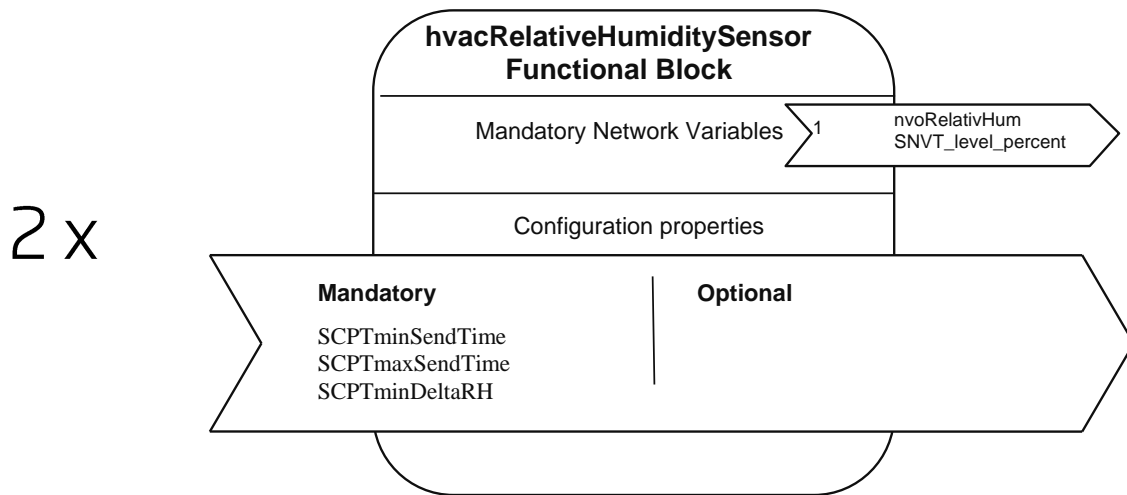SCPTmaxSendTime
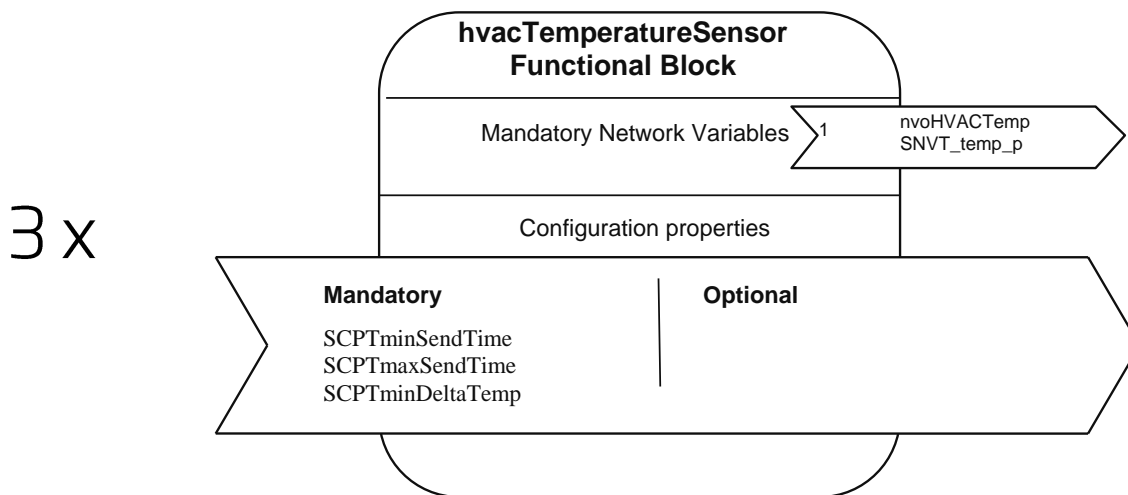SCPTminDeltaTemp

Optional

3 x

Figure 14 SFPThvacTempSensor (1040) Functional-Block Details

Fb Idx	M /O	LON® var Name	RvHtBt/ SdHtBt	SNVT / SCPT	FPT NV#	Class	BMS Name
0	M	nciTempMnDelta_1	-	SCPTminDeltaTemp		EEPROM	
1	M	nciTempMnDelta_2	-	SCPTminDeltaTemp		EEPROM	
2	M	nciTempMnDelta_3	-	SCPTminDeltaTemp		EEPROM	
0	M	nciTempMnSndTm_1	-	SCPTminSendTime		EEPROM	
1	M	nciTempMnSndTm_2	-	SCPTminSendTime		EEPROM	
2	M	nciTempMnSndTm_3	-	SCPTminSendTime		EEPROM	
0	M	nciTempMxSndTm_1	-	SCPTmaxSendTime		EEPROM	
1	M	nciTempMxSndTm_2	-	SCPTmaxSendTime		EEPROM	
2	M	nciTempMxSndTm_3	-	SCPTmaxSendTime		EEPROM	
0	M	nvoHVACTemp_1	Yes	SNVT_temp_p	|1		Condenser Temperature
1	M	nvoHVACTemp_2	Yes	SNVT_temp_p	|1		Outside Temperature at Ventilation Unit
2	M	nvoHVACTemp_3	Yes	SNVT_temp_p	|1		General Purpose Temperature

3.   Detailed Variable Description

In the following only variables are described, which are specific in relation to this document purpose. For variables which are belonging to the LONMARK® objects SFPToccupancySensor (1060), SFPTco2Sensor (1070), SFPThvacRelativeHumiditySensor (1050), SFPThvacTempSensor (1040), and the mandatory nv's for the NodeObject, please refer to the LONMARK® International homepage: www.lonmark.org where the respective Functional Profiles are available for downloads.

4. NodeObject - Optional Network Variables

4.1. Night Cooling IT Setpoint

```
network input sd_string("Night
Cooling IT setpoint") eeprom
SNVT_temp_p nviNightCoolTemp = 1600;
```

Purpose
This input network variable is used to set the Fixed Inlet Temperature during Night Cooling.

BMS Group
Optional Setting.

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

Default Value
Default Value is 16,00°C. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.2. Night Cooling High Limit

```
network input sd_string("Night Cooling
High limit") eeprom SNVT_temp_p
nviNightCoolHiLm = 2600;
```

Purpose
This input network variable is used to set the temperature limit "Daytime temperature to initiate Night Cooling".

BMS Group
Optional Setting.

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

Default Value
Default Value is 26,00°C. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.3. Night Cooling Low Limit

```
network input sd_string("Night Cooling
Low limit") eeprom SNVT_temp_p
nviNightCoolLoLm = 2300;
```

Purpose
This input network variable is used to set the temperature limit "Daytime temperature to maintain Night Cooling".

BMS Group
Optional Setting.

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

Default Value
Default Value is 23,00°C. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.4. Night Cooling Flow Setpoint

```
network input sd_string("Night Cooling
Flow setpoint") eeprom SNVT_lev_percent
nviNightCoolFlow = 20000;
```

Purpose
This input network variable is used to set the Fixed Airflow during Night Cooling.

BMS Group
Optional Setting.

Valid Range
The valid range is 0 - 100%. The value 0x7FFF=+327.67% will be handled as an invalid value.

Default Value
Default Value is 100%. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.5. Control Basic Parameter Settings

```
network input sd_string("Control Basic
parameter settings") eeprom SNVT_state
nviControlBasic;
```

Purpose
This input network variable is used for basic control settings. Five different Boolean states can be set by the variable.

The following commands are enabled when State is TRUE:

State.bit0:   Allow Start by External Start

State.bit1:   D-BMS Start by PIR

State.bit2:   D-BMS Start by CO2

State.bit3:   D-BMS Start by built in Timer

State.bit4:   D-BMS Start by Panel

BMS Group
Control Basic.

Valid Range
When using this parameter be aware of the bit order. Each bit of this 16bit variable is presented as a State parameter. State.bit0 is the MSB in the variable.

Default Value
State.bit0:   Allow Start by External Start
              Default: TRUE

State.bit1:   D-BMS Start by PIR
              Default: TRUE

State.bit2:   D-BMS Start by CO2
              Default: TRUE

State.bit3:   D-BMS Start by built in Timer
              Default: FALSE

State.bit4:   D-BMS Start by Panel
              Default: TRUE

The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class

EEPROM

Configuration Consideration
None specified.

4.6. Delta Absolute Humidity Minimum A-Coefficient

```
network input sd_string("Delta absolute
humidity minimum A-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMinAcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -9,999 to +9,999.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.7. Delta Absolute Humidity Minimum B-Coefficient

```
network input sd_string("Delta absolute
humidity minimum B-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMinBcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -9,999 to +9,999.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.8. Delta Absolute Humidity Minimum C-Coefficient

```
network input sd_string("Delta absolute
humidity minimum C-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMinCcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -99,99 to +99,99.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.9.   Delta Absolute Humidity Minimum A-Coefficient

```
network input sd_string("Delta absolute
humidity maximum A-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMaxAcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -9,999 to +9,999.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.10.   Delta Absolute Humidity Minimum B-Coefficient

```
network input sd_string("Delta absolute
humidity maximum B-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMaxBcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -9,999 to +9,999.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.11. Delta Absolute Humidity Maximum C-Coefficient

```
network input sd_string("Delta absolute
humidity maximum C-coefficient") eeprom
SNVT_count_inc_f nviAbsHumMaxCcof = {0,
0x00, 0, 0x00, 0x0000};
```

Purpose
This input network variable is used to set the Delta absolute humidity minimum A-coefficient.

BMS Group
Optional Setting.

Valid Range
The valid range is -99,99 to +99,99.

Default Value
Default Value is 0,0. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Storage Class
This network variable is to be treaded as a configuration variable for infrequent update, and will be maintained when node is reset.

Configuration Consideration
None specified.

4.12. Automatic Operation Flow Setpoint

```
network input sd_string("Automatic
Operation Flow setpoint")
SNVT_lev_percent nviFlowSetpoint = 0;
```

Purpose
This input network variable is used to set the Digital BMS airflow in Automatic Operation.

BMS Group
Control.

Valid Range
The valid range is 0 - 100%. The value 0x7FFF=+327.67% will be handled as an invalid value.

Default Value
Default Value is 0%.

Storage Class
This network variable will NOT be maintained when node is reset.

Configuration Consideration
None specified.

4.13. System Alarm

```
network output sync sd_string("System
Alarm") SNVT_alarm_2 nvoAlarm2;
```

Purpose

This output network variable is used to report System Alarm status. The reported alarms are presented as structured variables as described below.

The System Alarm variable, which only shows status for one alarm at a time, is typical to be bound to a BMS or SCADA system, where the event driven alarm data is to be stored and handled in an alarm log.

Please refer to the description of SNVT_alarm2 at http://types.lonmark.org

BMS Group

Sysinfo.

Typical Range

Structure

Alarm type	Alarm type (alarm type names). Alarm condition reported by this update
Supported types	AL_DEBUG [-11] Debug information (not an alarm) AL_NO_CONDITION [0] No alarm condition present AL_TOT_SVC_ALM_1 [2] Total/service interval alarm 1 (component requires service or maintenance) AL_LOW_LMT_CLR_1 [5] Alarm low limit alarm clear 1 AL_HIGH_LMT_CLR_1 [7] Alarm high limit alarm clear 1 AL_LOW_LMT_ALM_1 [9] Alarm low limit alarm 1 AL_HIGH_LMT_ALM_1 [11] Alarm high limit alarm 1 AL_ERROR [31] Other error condition
Priority level	Priority level (priority level names). Priority level of the alarm reported by this update
Supported levels	PR_NUL [-1] Invalid Value PR_LEVEL_0 [0] Lowest alarm priority level PR_8 [9] HVAC Alarms (BACnet Priority 8)
Alarm time	Alarm time (seconds). Alarm time in seconds since 2000-01-01T00:00:00Z (the 0 hour of 1 January 2000, Coordinated Universal Time)
Milliseconds	Milliseconds (milliseconds). Alarm time in milliseconds since the second specified by the alarm_time field
Sequence number	Sequence number (count). Sequence number for this update. Incremented by one for each update from an alarm source. Wraps to zero after reaching 255. An alarm receiver can use the sequence number to detect missed alarm messages.
Description	Description (array of 22 characters). Alarm description with NUL terminator.

Default Value

N/A.

Configuration Consideration

This variable should not be polled infrequently since immediate updated may be missed. A bound connection is to be preferred.

When Transmitted

This value will be updated immediately in events of alarms update with a timestamp and a sequence number.

Default Service Type

There is no default service specified.

4.14. System Condition

```
network output sd_string("System
Condition") SNVT_state nvoCondition;
```

Purpose
This output network variable is used to report the System Condition. Tree different Boolean states are used by the variable.

The following conditions are Active when State is TRUE:

State.bit0: Low Temp Process
Default: FALSE

State.bit1: High Temp Process
Default: FALSE

State.bit2: Condensation Process
Default: FALSE

BMS Group
Sysinfo.

Typical Range
When reading this parameter be aware of the bit order. Each bit of this 16bit variable is presented as a State parameter. State.bit0 is the MSB in the variable.

Default Value
N/A.

Configuration Consideration
N/A.

When Transmitted
The variable is transmitted immediately when its value has changed.

Default Service Type
There is no default service specified.

4.15. Control Basic Settings Output

```
network output sd_string("Control Basic
settings") SNVT_state nvoControlStatus;
```

Purpose
This output network variable is used to report Control status. One Boolean state is used by the variable.

The following input sensor is "ON" when State is TRUE:

State.bit0:   Manual Start   Default: FALSE

BMS Group
Sensor.

Typical Range
When reading this parameter be aware of the bit order. Each bit of this 16bit variable is presented as a State parameter. State.bit0 is the MSB in the variable.

Default Value
N/A.

Configuration Consideration
N/A.

When Transmitted
The variable is transmitted immediately when its value has changed.

Default Service Type
There is no default service specified.

4.16. Filter Remaining Service Life

```
network output sd_string("Filter
remaining service life") SNVT_count
nvoFilterDaysLft;
```

Purpose
This output network variable is used to report remaining service life of filters in days.

BMS Group
Sysinfo.

Typical Range
The typical range is 0 to 1000.

Default Value
N/A.

Configuration Consideration
N/A.

When Transmitted
The variable is transmitted immediately when its value has changed.

Default Service Type
There is no default service specified.

4.17. Actual Flow Setpoint

```
network output sd_string("Actual flow
setpoint") SNVT_lev_percent
nvoEffFlowSptPct;
```

Purpose
This output network variable is used to report the current Flow Setpoint.

BMS Group
Sysinfo.

Typical Range
The typical range is 0 to 100%.

Default Value
N/A.

Configuration Consideration
N/A.

When Transmitted
The variable is transmitted immediately when its value has changed. Additionally, this network variable may also (if configured) be transmitted as a heartbeat output on a regular basis as dictated by the AHU object Maximum Send Time (nciSndHrtBt) configuration value.

Default Service Type
There is no default service specified.

4.18. Airmaster Controller Software Version

```
network output sd_string("AirMaster Contr
Software Version") SNVT_str_asc
nvoHostSWver;
```

Purpose
This output network variable is used to report the Software release number of the Airmaster controller.

The variable is presented as an ASCII character string.

BMS Group
Sysinfo.

Typical Range
N/A.

Default Value
N/A.

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

When Transmitted
The variable is transmitted immediately when its value has changed.

Default Service Type
There is no default service specified.

4.19. CP File Directory Address

```
network output sd_string("CP
FileDirectory Address") SNVT_address
nvoFileDirectory =
(SNVT_address)&FileDirectory;
```

Purpose
This output network variable is used to report the Address for file directory containing descriptors for configuration parameter files.

For more details, see Configuration Properties within the LONMARK® Application-Layer Interoperability Guidelines.

Typical Range
N/A.

Default Value
FS_NUL.

Configuration Consideration
N/A.

When Transmitted
N/A.

Default Service Type
There is no default service specified.

5. NodeObject – Configuration Properties

5.1. Device Major Version

```
const SCPTdevMajVer cp_family
nciDevMajVer;
```

Purpose
This configuration property provides the major version number of the LON® device. The major version number will be incremented when the network interface for the device changes.

Valid Range
The variable is a read only.

Typical Default Value
N/A.

Configuration Requirements/Restrictions
None.

SCPT Reference
SCPTdevMajVer (165)

5.2. Device Minor Version

```
const SCPTdevMajVer cp_family
nciDevMajVer;
```

Purpose
This configuration property provides the minor version number of the LON® device. The minor version number will be incremented when the network interface remains the same, but the device has a different behavior.

Valid Range
The variable is a read only.

Typical Default Value
N/A.

Configuration Requirements/Restrictions
None.

SCPT Reference
SCPTdevMinVer (166)

# 6.	Air Handling Unit - Mandatory Network Variables

## 6.1.	Space Temperature Input

```
network input sd_string("The controller
may use the built in sensor") SNVT_temp_p
nviSpaceTemp;
```

Purpose
This input network variable is used to connect an external space temperature sensor to the node. It is mandatory to the profile, but it does not have to be bound to a sensor node if the AHU Controller node itself provides a locally wired space temperature sensor. In any case, 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 0x0000 (=0,00°C). This value will be adopted at power-up.

Configuration Consideration
This network variable is subject to the receive heartbeat time, nciRcvHrtBt.

## 6.2.	Room Temperature Output

```
network output sd_string("Room
Temperature") SNVT_temp_p nvoRoomTemp;
```

Purpose
This output network variable is used to monitor the RT - Room Temperature which the AHU Controller is using for control. It is measured by the build in temperature sensor.

BMS Group
Sensor.

Typical Range
The typical range is -50°C to 100°C.

Default Value
N/A.

Configuration Considerations
None.

When Transmitted
The variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

6.3. System Operating Mode Output

```
network output sd_string("System
Operating Mode") SNVT_hvac_status
nvoUnitStatus;
```

Purpose

This output network variable is available to report the AHU 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.

BMS Group

Sysinfo.

Valid Range

Mode: The valid range is described in the table below:

-1 = HVAC_NUL (default value)

0 = HVAC_AUTO (Started)

4 = HVAC_NIGHT_PURGE (Night cooling)

6 = HVAC_OFF (Stopped)

7 = HVAC_TEST (Filter Test Running)

9 = HVAC_FAN_ONLY (Stopping / Starting)

13 = HVAC_ECONOMY (Holiday Mode)

15 = HVAC_CALIBRATE (Filter Calibration)

The value of 'mode' is determined by the values of nviApplicMode, nviOccupancy, and logic in the controller.

heat_output_primary: 0-100%, 0x7FFF (INVALID)

heat_output_secondary: 0-100%, 0x7FFF (INVALID)

cool_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.

Default Value

Mode: -1 =   HVAC_NUL.

heat_output_primary: 0x7FFF (INVALID)

heat_output_secondary: 0x7FFF (INVALID)

cool_output: 0x7FFF (INVALID)

econ_output: 0x7FFF (INVALID)

fan_output: 0x7FFF (INVALID)

in_alarm: 0 means there is no alarm.

Configuration Considerations

None.

When Transmitted

This variable is transmitted immediately when its value has changed. 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.

Default Service Type

There is no default service specified.

6.4.   Inlet Air Temperature Setpoint Output

```
network output sd_string("Ecco
nviInletTempStpt") SNVT_temp_p
nvoInletTempStpt;
```

Purpose

This output network variable is used to monitor the Inlet air temperature setpoint as specified by the nviInletTempSetpt network variable.

Typical Range

The typical range is 10°C to 35°C.

Default Value

The default value of SNVT_temp_p.

Configuration Considerations

None.

When Transmitted

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

Default Service Type

There is no default service specified.

6.5.   Inlet Temperature Output

```
network output sd_string("Inlet
Temperature") SNVT_temp_p nvoInletTemp;
```

Purpose

This output network variable is used to monitor the IT Inlet temperature.

BMS Group

Sensor.

Typical Range

The typical range is 0°C to 100°C.

Default Value

The default value of SNVT_temp_p.

Configuration Considerations

None.

When Transmitted

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

Default Service Type

There is no default service specified.

7.   Air Handling Unit - Optional Network Variables

7.1.   Application Mode Input

```
network input sd_string("HVAC_AUTO __
HVAC_NIGHT_PURGE__HVAC_FAN_ONLY")
SNVT_hvac_mode nviOpMode = HVAC_NUL;
```

Purpose
This network variable input is used to coordinate the AHU Controller with any supervisory controller.

BMS Group
Control.

Valid Range

0 =   HVAC_AUTO (Digital BMS automatic ventilation request)

4 =   HVAC_NIGHT_PURGE (Digital BMS nightcool request)

6 =   HVAC_OFF (No unit operation)

13 =   HVAC_ECONOMY (Digital BMS Holiday mode ventilation request)

0xFF =   HVAC_NUL (invalid value, same as HVAC_OFF. Enable control by the nviOccupancy input)

All other enumerations will not be handled.

Default Value
The default value is HVAC_NUL. This value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time.

Configuration Considerations
This network variable is subject to the receive heartbeat time, nciRcvHrtBt (if defined). If the nviOpMode is not updated from the LON® network within the defined amount of time, the input value will shift to the default value HVAC_NUL.

7.2.   Automatic Operation IT Setpoint

```
network input sd_string("Automatic
Operation IT setpoint") SNVT_temp_p
nviInletTempStpt;
```

Purpose
This input network variable is used to allow the Digital BMS temperature to be changed via the network.

BMS Group
Control.

Valid Range
The valid range is 8°C to 40°C. The value 0x7FFF=+327.67°C will be handled as an invalid value.

Default Value
Default Value is 0x0000 (= 0,00°C). This value will be adopted at powerup.

This network variable input does not use the Receive Heartbeat function.

Configuration Considerations
None specified.

7.3. Occupancy Sensor Input

```
network input SNVT_occupancy nviOccupancy
= OC_NUL;
```

Purpose
This input network variable is used to indicate the presence of occupants in the controlled space. It is typically sent by an occupancy sensor. This input can be chosen instead of using the AHU Controller hardwired occupancy sensor.

The Automatic Start-Stop of the AHU is normally controlled by the nviOpMode. By setting the nviOpMode to the invalid value 'HVAC_NUL', the Occupancy Sensor Input can be used to control the operation modes in between HVAC_AUTO and HVAC_OFF.

BMS Group
Control.

Valid Range
0 =   OC_OCCUPIED: The occupancy sensor is indicating that there ARE occupants in the space.

1 =   OC_UNOCCUPIED: The occupancy sensor is indicating that there are NO occupants in the space.

0xFF = OC_NUL: This is the initial value after power-up and it remains until another value is received. It is used to indicate that this network variable input is invalid or unused. OC_NUL is equivalent to OC_UNOCCUPIED.

All other enumerations are not handled.

Default Value
The default value is OC_NUL. This value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time.

Configuration Considerations
This network variable is subject to the receive heartbeat time, nciRcvHrtBt (if defined). If the nviOccupancy is not updated from the LON® network within the defined amount of time, the input value will shift to the default value OC_NUL.

7.4. Automatic Operation CO2 Input

```
network input sd_string("Automatic
Operation CO2 input") SNVT_ppm nviCO2;
```

Purpose
This input network variable measures the space IAQ with either a CO2 or VOC sensor. Both sensors measure levels in PPM.

BMS Group
Control.

Valid Range
The valid range is 0 to 5000 PPM. The value 0xFFFF = 65,535 will be handled as an invalid value.

Command the value 0 will disable CO2 control.

Default Value
Default Value is 0 (CO2 control disabled). This value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time.

Configuration Considerations
This network variable is subject to the receive heartbeat time, nciRcvHrtBt (if defined). If the nviOpMode is not updated from the LON network within the defined amount of time, the input value will shift to the default value.

7.5. Actual Inlet Temperature Setpoint Output

```
network output sd_string("Actual Inlet
Temperature setpoint") SNVT_temp_p
nvoEffTempSetpt;
```

Purpose
This output network variable is used to monitor the effective temperature setpoint which may depend on nviInletTempStpt, nviOpMode, and any local setpoint adjustment.

BMS Group
Control.

Typical Range
The typical range is 0°C to 100°C.

Default Value
The default value of SNVT_temp_p.

Configuration Considerations
None.

When Transmitted
The variable is transmitted immediately when its value has changed. 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.

Default Service Type
None specified.

7.6. Outside Air Temperature Output

```
network output sd_string("Outside
Temperature") SNVT_temp_p nvoOutsideTemp
```

Purpose
This output network variable is used to monitor the outside air temperature if the unit controller provides a hardwired temperature sensor for this purpose.

BMS Group
Sensor.

Typical Range
The typical range is -50°C to 100°C.

Default Value
0x0000.= 0,00°C

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.7. Evaporator Temperature Output

```
network output sd_string("Evaporator
Temperature") SNVT_temp_p
nvoEvaporatTemp;
```

Purpose
This output network variable is used to monitor the temperature of the Evaporator air that leaves the room, if the unit controller provides a hardwired temperature sensor for this purpose.

BMS Group
Sensor.

Typical Range
The typical range is -50°C to 100°C.

Default Value
0x0000.= 0,00°C

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.8. Exhaust Air Temperature Output

```
network output sd_string("Exhaust
Temperature at Ventilation Unit")
SNVT_temp_p nvoExhaustTemp;
```

Purpose
This output network variable is used to monitor the temperature of the Exhaust air that leaves the AHU, if the unit controller provides a hardwired temperature sensor for this purpose.

BMS Group
Sensor.

Typical Range
The typical range is -50°C to 100°C.

Default Value
0x0000.= 0,00°C

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.9. Comfort Heater Percent Output

```
network output sd_string("Comfort Heater
percent") SNVT_lev_percent nvoHeater;
```

Purpose
This output network variable reflects the current level of the primary heat output (if hardwired) or can be used to control a remote primary heat source (valve, compressor, etc.).

BMS Group
Sysinfo.

Typical Range
The valid range is 0% to 100% of primary heat capacity

Default Value
0x0000; = 0,00%.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.10. Bypass Damper Percent Output

```
network output sd_string("Bypass Damper
percent") SNVT_lev_percent
nvoBypassDamper;
```

Purpose
This output network variable reflects the current level of the Bypass Damper in percent.

BMS Group
Sensor.

Typical Range
The valid range is 0% to 100% of primary heat capacity

Default Value
0x0000; = 0,00%.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.11. Comfort Cooling Percent Output

```
network output sd_string("Comfort Cooling
percent") SNVT_lev_percent nvoCooling;
```

Purpose
This output network variable reflects the current level of the primary cool output (if hardwired), or can be used to control a remote mechanical cooling source.

BMS Group
Sysinfo.

Typical Range
The valid range is 0% to 100% of primary cool capacity

Default Value
0x0000; = 0,00%.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.12. Pre Heater Percent Output

```
network output sd_string("Pre Heater
percent") SNVT_lev_percent nvoPreHeater;
```

Purpose
This output network variable reflects the current level of the Pre Heater output (if hardwired) or can be used to control a remote heat source (valve, compressor, etc.).

BMS Group
Sysinfo.

Typical Range
The valid range is 0% to 100% of primary heat capacity

Default Value
0x0000; = 0,00%.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.13. Supply Air Flow Output

```
network output sd_string("Supply Flow")
SNVT_flow nvoSupplyAirFlow;
```

Purpose
The output network variable is used to indicate the measured supply air flow.

BMS Group
Sysinfo.

Typical Range
The valid Range is 0 to 65,534 liters/sec. The value have to be multiplied by 3,6 to get it from L/sec -> M3/h

Default Value
0.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.14. Extraction Air Flow Output

```
network output sd_string("Extraction
Flow") SNVT_flow nvoExtAirFlow;
```

Purpose
The output network variable is used to indicate the measured Extraction air flow.

BMS Group
Sysinfo.

Typical Range
The valid Range is 0 to 65,534 liters/sec. The value have to be multiplied by 3,6 to get it from L/sec -> M3/h

Default Value
0.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

7.15. Total Power Consumption Output

```
network output sd_string("Energy Meter
(KWh_l)") SNVT_elec_kwh_l nvoTotalPwr;
```

Purpose
The output network variable is used to indicate the accumulated value for used electrical energy in Kilowatt hour.

BMS Group
Sysinfo.

Typical Range
The valid Range is 0 to 32767 KWh. With a resolution at 0,1.

Default Value
N/A.

Configuration Considerations
None.

When Transmitted
This variable is transmitted immediately when its value has changed. 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.

Default Service Type
There is no default service specified.

8. Air Handling Unit - Configuration Properties

8.1. Send Heartbeat (Mandatory)

```
network input cp SCPTmaxSendTime
nciSndHrtBt;
```

Purpose
This configuration property defines the maximum period of time that expires before the specified network variable outputs will automatically be updated.

It is only used for Network variable outputs which are specified for send heartbeat in the Network Variable Outputs Table.

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.

Default Value
0 (no automatic update).

Configuration Requirements/Restrictions
None.

SCPT Reference
SCPTmaxSendTime (49)

8.2. Occupancy Temperature Setpoints (Mandatory)

```
SCPTsetPnts cp_family nciSetpoints;
```

Purpose
This configuration property is mandatory for the profile, but it is not used by the Airmaster controller.

Valid Range and Default Values
N/A.

Configuration Considerations
N/A.

SCPT Reference
SCPTsetPnts (60)

8.3. HVAC Unit-Type Indentifier (Mandatory)

```
const SCPThvacType cp_family
cp_info(device_specific) nciHvacType;
```

Purpose
This configuration property is mandatory to indicate the primary application and equipment type for the space comfort controller type.

Valid Range and Default Values
5 = HVT_UNIT_VENT.

Configuration Considerations
N/A.

SCPT Reference
SCPThvacType (145)

8.4.   Location Label (Optional)

```
SCPTlocation cp_family nciLocation;
```

Purpose

This configuration property can be used to provide the location of the functional block (or device), where p is the functional-block index. The above code declaration is for providing the location of the functional block.

Valid Range

Any NULL-terminated ASCII string up to 31 bytes of total length (including NULL). The string must be truncated if the length does not allow the 31st character to be the NULL (0x00).

Default Value

The default value is an ASCII string containing 31 NULLs (0x00).

Configuration Requirements/Restrictions

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

SCPT Reference

SCPTlocation (17)

8.5.   High Room Temperature Hi Limit (Optional)

```
network input cp SCPThighLimTemp
nciHiRoomTempHiL;
```

Purpose

This configuration property sets the High room-temperature limit for the process.

BMS Group

Optional Setting.

Valid range

The valid range is 0°C to 50°C. (SNVT_temp_p)

Default Value

0x09c4.= 25,00°C. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Configuration Requirements/Restrictions

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

Since this CP can be overridden from the AHU controller, it is recommended to upload CP's to LNS tools (like e.g. LONMAKER® Browser) which normally will retrieve CP values from the database related from default template values.

SCPT Reference

SCPThighLimTemp (123)

8.6. High Room Temperature Low Limit (Optional)

```
network input cp SCPTlowLimTemp
nciHiRoomTempLwL;
```

Purpose
This configuration property sets the Low room-temperature limit for the process.

BMS Group
Optional Setting.

Valid range
The valid range is 0°C to 50°C. (SNVT_temp_p)

Default Value
0x0960.= 24,00°C. The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Configuration Requirements/Restrictions
This CP has no modification restrictions (no_restrictions). It can be modified at any time.

Since this CP can be overridden from the AHU controller, it is recommended to upload CP's to LNS tools (like e.g. LONMAKER® Browser) which normally will retrieve CP values from the database related from default template values.

SCPT Reference
SCPThighLimTemp (123)

8.7. PIR Hold Time (Optional)

```
network input cp cp_info(offline)
SCPTholdTime nciPirHoldTime;
```

Purpose
This configuration property defines the amount of time the PIR start signal continuous to be active after last non-presence detection (un-occupancy).

This configuration is used for both the 'Start via PIR' functionality in the LON® device AHU-controller, and for the PIR sensor function in the Airmaster controller when used with the hardwired PIR sensor.

It is recommended to set this property to a minimum value when the hardwired PIR sensor is used in the LON® network for other purpose.

BMS Group
Optional Setting.

Valid Range
The valid range is 0 to 6553 seconds (1:49 hour:min). (SNVT_time_sec)

Default Value
1800 seconds (00:30 hour:min) The initial value will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Configuration Requirements/Restrictions
Since this CP can be overridden from the AHU controller, it is recommended to upload CP's to LNS tools (like e.g. LONMAKER® Browser) which normally will retrieve CP values from the database related from default template values.

SCPT Reference
SCPTholdTime (91)

8.8. CO2 Limits (Optional)

```
network input cp SCPTlimitCO2
nciCO2Limit[2u];
```

Purpose
This configuration property defines an array of 2 CO2 limits.

Index[1], MinCO2 limit: CO2 concentration above this level, will cause a positive override of the flow

Index[2], MaxCO2 limit: When reach this CO2 level a maximum air flow is initiated.

BMS Group
Optional Setting.

Valid Range
The valid range is 0 to 5000 ppm. (SNVT_ppm)

Default Value
{500, 1000}. The initial values will be retrieved from the AHU controller and loaded into the variable after a reset of the node. An update of this variable will be maintained in the AHU controller non volatile memory as well.

Configuration Requirements/Restrictions
Since these CP's can be overridden from the AHU controller, it is recommended to upload CP's to LNS tools (like e.g. LONMAKER® Browser) which normally will retrieve CP values from the database related from default template values.

SCPT Reference
SCPTlimitCO2 (42)

8.9. Receive Heartbeat (Optional)

```
network input cp SCPTmaxRcvTime
nciRcvHrtBt;
```

Purpose
This configuration property is used to control the maximum time that elapses after the last update to a specified network variable input before the Space Comfort Controller starts to use its default values.

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)

Configuration Requirements/Restrictions
None.

SCPT Reference
SCPTmaxRcvTime (48)

9. Power-Up State

There is no immediate network action on Power-up State.

10. Boundary and Error Conditions

None specified.

11. Additional Considerations

None specified.

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