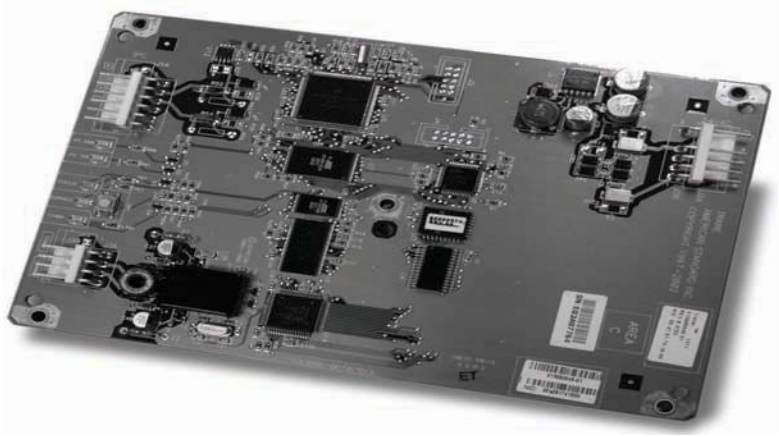
TRANE®

Programming Troubleshooting Guide

Tracer™ LCI-I

LonTalk® Communication Interface for IntelliPak™



Model Number: KIT09145

Used with:
Rooftop or Rooftop Air Handler (RT)
Commercial Self-Contained (CSC)
Fresh Air Unit (FAU)

May 2008 **RT-SVP06A-EN**

Preface

Literature Change History

RT-SVP06A-EN (March 2008)

Original issue of manual; provides programming and troubleshooting information.

One copy of the appropriate service literature ships inside the control panel of each unit.

Refer to the Table of Contents and Index for specific topics contained in this manual and supporting manuals.

Completion of "Start-Up" and "Test Mode" procedures before attempting to operate or service this equipment will minimize the risk of improper operation. These procedures are provided in the applicable Installation, Operation and Maintenance manual.

Note: *The procedures discussed in this manual should only be performed by qualified, experienced HVAC technicians.*

Introduction

This installation document contains information about the Tracer™ LonTalk® Communication Interface for IntelliPak™ (LCI-I) controller. This controller allows IntelliPak units to communicate on a Trane Comm5 or LonTalk network and is intended to be installed by a qualified System Integrator who is properly trained and experienced in LonTalk networks. The LCI-I utilizes an FTT-10A Free Topology transceiver, which supports non-polarity sensitive, free topology wiring, which allows the system installer to utilize star, bus, and loop architectures.

This controller works in standalone mode, peer-to-peer with one or more other units, or when connected to a Trane Tracer Summit or a 3rd party building automation system that supports LonTalk. The LCI-I controller is available as a factory or field-installed kit. The features and functions described in this manual apply to either option. This document details:

- field-installation instructions
- LonMark profile and variable support
- application information
- troubleshooting

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Table of Contents

Glossary

Active Setpoint
The setpoint which is currently being used for control. Occupied/unoccupied heating/cooling setpoints are selected per the unit mode and occupied/unoccupied switching functions.

AH
Air Handler

AIP
Analog Input Point

AOP
Analog Output Point

BAS
Building Automation System

BIP
Binary Input Point

BOP
Binary Output Point

Cfg
Configured

Compressor Protection Switch
A pressure switch installed on the suction line that prevents compressor operation below the switch's setpoint. The purpose is to prevent no-flow scroll compressor operation.

CV
Constant Volume

Control Band
The range of temperatures or pressures which would normally be maintained by the various control functions

CP
Configuration Property

CRC
Cyclic Redundancy Check

CSC
Commercial Self-Contained

CV
Constant Volume.

CW
Chilled Water.

DAC
[Lonmark®] Discharge Air Controller [profile]

DACX
[Trane] Discharge Air Controller Extension

Daytime Warmup
Applies to VAV units. Refers to a zone warm-up cycle that occurs when zone temp falls to a predetermined value.

Deadband
As applied to SA Temp Control, this refers to a range of temperature equally spaced above and below the SA Temp control point in which the control algorithm is satisfied. There is no adjustment of machine capacity within the Deadband.

Economizer Zone Temp Setpoint Suppression
A parameter used for setting the Zone Temp Setpoint at a lower value than the mechanical cooling zone temp setpoint

Emergency Stop
RTM binary input. Can be used for emergency shutdown of the unit by field-installed contacts. A diagnostic is produced when this input is open

ECEM
Exhaust / Comparative Enthalpy Module

External Auto/Stop
A binary input on the RTM that allows the use of a field-supplied switch to perform normal unit on/off action.

FAU
Fresh Air Unit

GBAS5 Module
Generic Building Automation System Module, 0-5vdc type.

GBAS10 Module
Generic Building Automation System Module, 0-10vdc type.

HGBP
Hot Gas Bypass

HI
Human Interface

HRTBT
Heat Beat

IGV
Inlet Guide Vanes

ICS
Integrated Comfort System

I/O
Inputs/Outputs

IPC
Interprocessor Communications

IPCB Module
Interprocessor Communications Bridge Module

IWC
Inches water column

KJ/Kg
kilojoules/kilogram

LCI-I Module
Trane LonTalk Communications Interface for IntelliPak Module

Low Ambient Compressor Lockout
A function which prevents compressor operation at low outdoor ambient temperatures.

l/sec
liters/second

LSB
Least Significant Byte

MAT
Mixed Air Temperature

MCM
Multiple Circuit Compressor Module

Minimum Position
Also known as Economizer Minimum Position

MSB
Most Significant Byte

MWU
Morning Warm Up -

NC
Normally Closed

NCI
Network Configuration [property] Input

NO
Normally Open

NSB
Night Setback - In this document, this term will apply to the control of the rooftop unit–with respect to heating and cooling operation–during unoccupied mode.

NV
Network Variable

NVI
Network Variable Input

NVO
Network Variable Output

Occupied Zone Low Temperature Limit Setpoint
The temperature that initiates Daytime Warm Up.

OA
Outdoor Air

OAD
Outdoor Air Damper

OA Reset
Outdoor Air Reset - Supply Air Temperature Reset based on Outdoor Air Temperature

Pa
Pascals

Purge
A function which causes zone air to be purged and replaced by outside air.

Reference Enthalpy
An outdoor enthalpy value above which economizing will be disabled.

RA
Return Air

Remote Human Interface
A human interface module design to be mounted remotely from the unit. There are some functional differences between a machine and remote mounted HI.

Reset Amount Maximum
The maximum amount of reset allowed.

Reset End Temperature
The temperature at which the max. reset amount will occur.

Reset Start Temperature
The temperature at which reset will begin.

RT
Rooftop

RTM
Rooftop Module - contains I/O for most air handling functions

Glossary

SCC
[Lonmark®] Space Comfort Controller [profile]

SCCX
[Trane] Space Comfort Controller Extension

SCM
Single Circuit Compressor Module

SCPT
Standard Configuration Property Type

SNVT
Standard Network Variable Type

Space Pressure
The pressure in the building as measured by the Space Pressure Transducer, referenced to local outside (atmospheric) pressure

SPID
Standard Program Identification

Statitrac
A trademark for control of space pressurization

SA
Supply Air, as in Supply Air Temperature, Supply Air Pressure.

Supply Air Pressure
The pressure in inches water column (IWC) of the supply duct plenum or outlet as measured by the Supply Air Pressure Transducer, referenced to local outside (atmospheric) pressure

Supply Air Pressure High Limit
A pressure limit to prevent unit casing and/or ductwork overpressurization

Supply Air Temperature Control Point
The revised value of supply air temperature setpoint after supply air temp reset has been applied.

Supply Air Temperature Low Limit
A CV-only function that limits the operation of the economizer to prevent too-cold supply air temperature.

Supply Air Temperature Reset
A function that shifts the SA Temp Setpoint an amount based on the value of another parameter–typically Zone Temp or Outdoor Air Temp. The purpose of this function is to lower unit capacity to better meet load requirements.

Supply Air Tempering
Turning ON heat when the supply air temperature drops below a preset value usually due to cold outside air being brought in to provide building ventilation.

TCI Module
Trane Communications Interface Module

UCM
Unit Control Modules - a SET of modules that provides logic to control the rooftop.

UCPT
User-defined Configuration Property Type

UNVT
User-defined Network Variable Type

VAV
Variable Air Volume

VCM
Ventilation Control Module

VOM
Ventilation Override Module

XIF
External Interface File

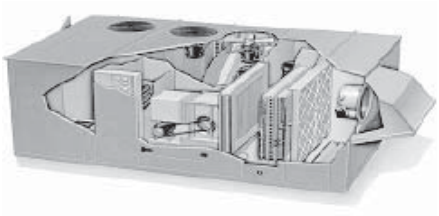
Zone Reset
Supply Air Temperature Reset based on Zone Temperaturei

General Information

Figure 1. Supported Products

IntelliPak™ Packaged Rooftops/Air Handler Units (Models S*HF, G, J/W*HB, C)

IntelliPak Commercial Self-Contained Units (Models SCWG/SCRG/SIRF/SIWF)



IntelliPak Fresh Air Units (FADA/FAHA)

Overview

This controller is part of a control system, made up of two or more additional controllers, which can be applied to three different packaged and split-system product families; a Rooftop or Rooftop Air Handler (RT), a Commercial Self-Contained (CSC) or a Fresh Air Unit (FAU). The following configurations are supported:

Table 1. LonMark Profile

	Constant volume space temperature control	Constant volume discharge air control	Variable air volume control
Product	**RT, CSC**	**FAU**	**RT, CSC**
Product	Airflow	System Control	LonMark profile
Rooftop	Constant Volume	Zone Temperature	Space Comfort Controller (SCC)
Rooftop	Variable Air Volume	Supply Air Temperature	Discharge Air Controller (DAC)
Self-Contained	Constant Volume	Zone Temperature	Space Comfort Controller (SCC)
Self-Contained	Variable Air Volume	Supply Air Temperature	Discharge Air Controller (DAC)
Fresh Air Unit	Constant Volume	Supply Air Temperature	Discharge Air Controller (DAC)

The LCI-I controller is available as a factory installed option or a field-installed kit. The features and functions described in this manual apply to either option.

Note: *Some unit features or functions described may not be available on all products. Some network features or functions described are manufacturer-defined, per the LonMark specification, and not available to a 3rd party building automation system or service tool. Certain network variables may require additional optional modules. Refer to the Network Variable Summary section and other appropriate product literature for more information.*

Table 2. LonMark product details

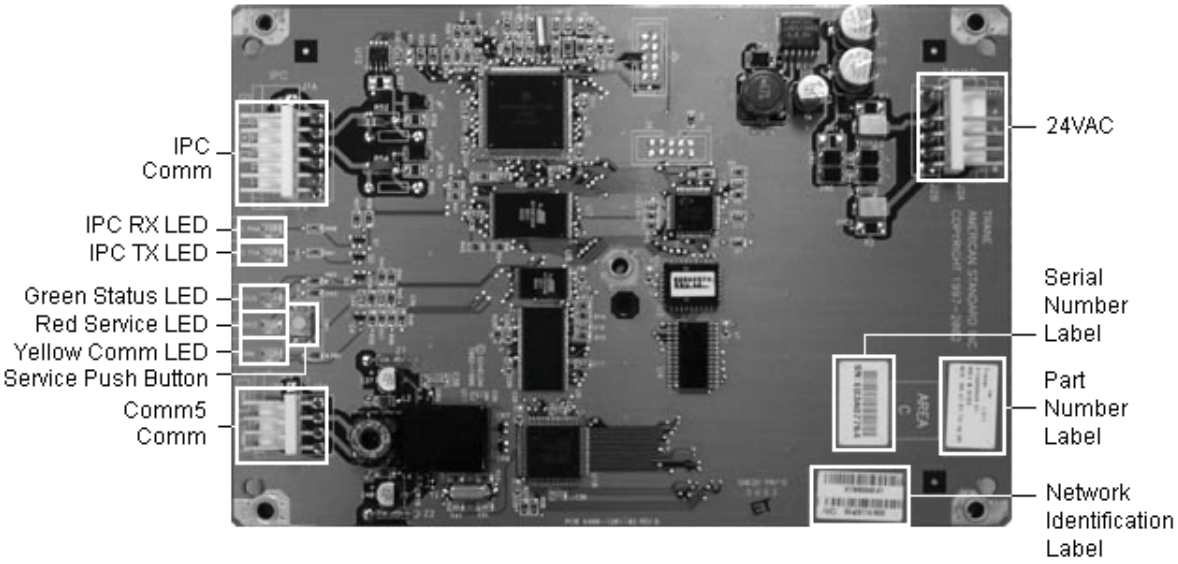
Manufacturer:	Trane
Product Datasheet (RT):	RT-PRG001-EN
Product Datasheet (CSC):	PKG-PRM001-EN
Product Datasheet (FAU):	FAXA-SLM001-EN
Device Class:	Discharge Air Controller
Communication Channel:	TP/FT-10 (ANSI/EIA-709.3)
Usage:	Commercial
LonMark Version:	3.2
LonMark Objects Supported:	0000 - Node Object 8500 - Space Comfort Controller 8610 - Discharge Air Controller
Standard Program ID:	8 0002A 560A 03 04 02
Node Self Doc String	&3.2@0,8500,8610;Tracer LCI-I
XIF File:	LCI-Lxif http://www.lonmark.org/products/prodinfo.cfm?ProductID=495

Table 3. Tracer™ LCI-I features and control modes

	Constant volume space temperature control	Constant volume discharge air control	Variable air volume control
Product	**RT, CSC**	**FAU**	**RT, CSC**
Fan control	On/Off	On/Off	Variable
Duct static pressure control	X		X
DX Cooling	X	X	X
Hydronic cooling	X	X	X
Electric heat 1	X	X	X
Hydronic heat	X	X	X
Gas heat 1	X	X	X
Ventilation control	X	X	X
Economizer damper	X	X	X
Warmup functions	X	X	X
Exhaust fan (on/off)	X	X	X
Dehumidification	X	X	X

1. X = supported feature or control mode available in product
2. Staged heat is not available during variable air volume control.

Figure 2. LCI-I controller board



Physical Specifications

Board dimensions:

Height: 5.5 inches (139.7 mm)

Width: 8.0 inches (203.2 mm)

Depth: 1.0 inches (25.4 mm)

Operating environment:

-40° to 70°C (-40° to 158°F)

5% to 95% relative humidity non-condensing

Storage environment:

-40° to 85°C (-40° to 185°F)

5% to 95% relative humidity non-condensing

UL Approval:

UL unlisted component

UL 873 Temperature Indicating and Regulating Equipment

CUL C22.2 No. 24-93 Temperature and Indicating and Regulating Equipment

LonMark Certification:

LonMark Application-Layer Interoperability Guidelines Version 3.2

Power requirements

18 to 32VAC (24VAC nominal)

Maximum VA = 3.3VA

50 or 60 HZ

Communications

The Tracer LCI-I controller communicates via Trane Comm5 protocol. Typically, a communication link is applied between unit controllers and a building automation system. Communication also is possible via Rover service tool. Peer-to-peer communication across controllers is possible even when a building automation system is not present.

You do not need to observe polarity for Comm5 communication links.

The controller provides four terminals (see figure 1) for the Comm5 communication link connections, as follows:

- Two terminals for communication to the board
- Two terminals for communication from the board to the next unit (daisy chain)

The Comm5 communications protocol allows peer to peer communications between controllers, which allows controllers to share information or data. A communicated variable input such as setpoint, space temperature, or outdoor air temperature has priority over a locally wired input to the controller.

For example: If the LCI-I controller has a wired outdoor air temperature sensor and Tracer Summit or another Comm5 controller sends it a communicated outdoor air temperature, the communicated value is used by the LCI-I controller. If a communicated input value is lost, the LCI-I controller reverts to using the locally wired sensor input.

Device addressing

Comm5 devices are given a unique address by the manufacturer. This address is called a Neuron ID. Each LCI-I controller can be identified by its unique Neuron ID, which is printed on a label on the controller (see figure 1.) The Neuron ID is also displayed when communication is established using Tracer Summit or Rover service tool. The Neuron ID format is 00-01-64-1C-2B-00.

LonTalk communication link wiring requirements

The LonTalk communications link is for connection to a Building LonTalk Network.

The Communications link wiring is dependent on the network architecture. It is recommended that a System Integrator refer to "LonWorks FTT-10A Free Topology Transceiver User's Guide" by the Echelon Corporation for proper wire selection. The physical limits are defined in Chapter 4, Network Cabling And Connection. This User's Guide is available on the Echelon Web page. A typical wire recommendation is Belden 85102, single twisted pair, stranded 19/29, unshielded, 150 C.

Wire characteristics

UCM communication-link wiring must be low capacitance, 18-gauge, shielded, twisted pair with stranded, tinned-copper conductors. For daisy chain configurations, limit the wire run length to 5,000 ft (1524 m). Truck and branch configurations are significantly shorter (see Figure 8). Comm5 wire length limitations can be extended through the use of a link repeater.

Wire capacitance (measured in picofarads/foot [pF/ft] or picofarads/meter [pF/m]) between conductors must be 23+/-2 pF/ft (72+/-6 pF/m).

Link configuration and termination

Communication-link wiring must use one of the following configurations:

- Daisy chain configuration (preferred), shown in Figure 3, p. 11
- Trunk and branch configuration, shown in Figure 4, p. 12

Daisy chain configuration for communication-link wiring (preferred configuration)

- Limit total wire length to 5,000 ft (1,524 m). (Comm5 wire length limitations can be extended through the use of a link repeater).
- See the following section on Termination resistance placement for Comm5 links.

Trunk and branch configuration for communication link wiring

- Total wire length for all branches is limited to 1,600 ft (500 m). (Comm5 wire length limitations can be extended through the use of a link repeater.)
- The maximum number of branches is ten.

Note: *See the following section on termination resistance placement for Comm5 links.*

Figure 3. Daisy chain configuration for communication-link wiring (preferred configuration)

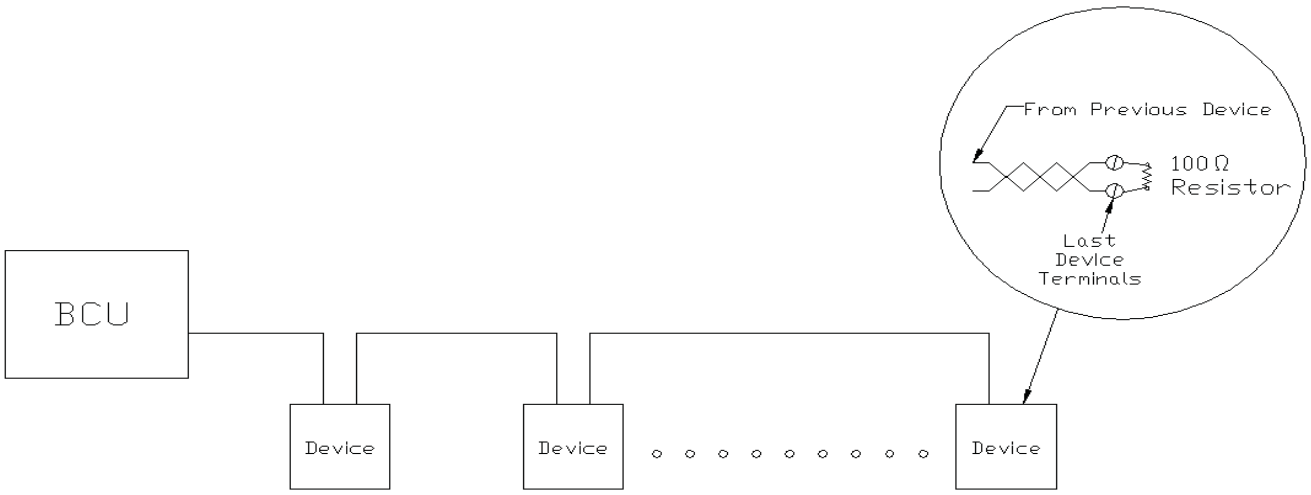
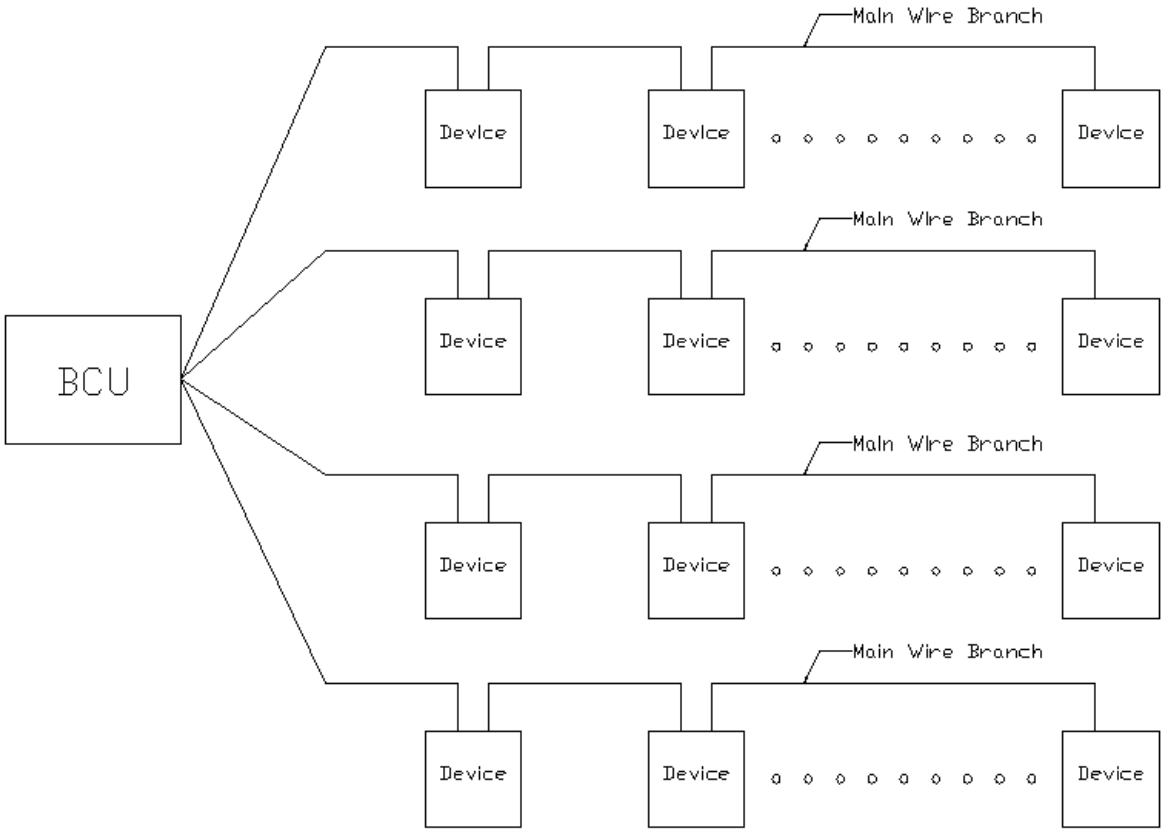


Figure 4. Trunk and branch configuration for communication link wiring)



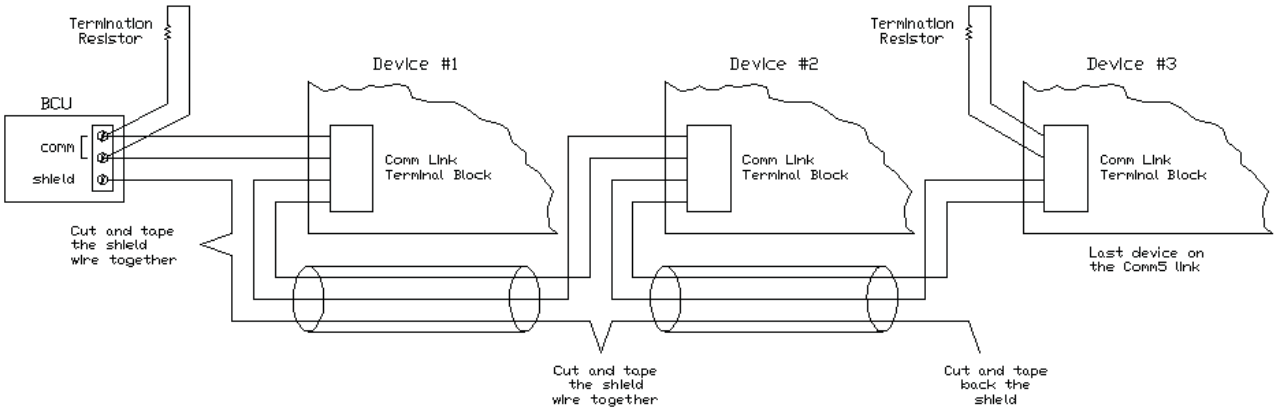
Termination resistance placement for Comm5 links

To correctly install a Comm5 link, termination resistors are required. For daisy chain configurations, the termination resistance (measured in ohms) must be 100 ohms at each end. For trunk and branch configurations, the termination resistance must be 50 ohms (use two termination resistors in parallel).

For correct termination placement, follow the guidelines below:

- Terminate the daisy chain configuration with a resistor at the extreme end of each wire.
- Terminate a trunk and branch configuration with a resistor or resistors placed at one point on the link. The termination resistance for trunk and branch configuration can be achieved by using two terminating resistors in parallel. While it is not necessary that the termination resistance be placed at the controller, it may be the most convenient.
- When terminating a trunk and branch configuration, it is best to terminate at the point where the branching occurs or at a point very close to it.
- If the link contains more than one type of wire, the link will probably have to be manually tuned. Trane recommends that only one type of wire be used for the Comm5 communication link.
- A set of as-built drawings or a map of the communication wire layout should be made during installation. Any sketch of the communication layout should feature the terminating resistor placement.

Figure 5. Daisy chain resistor placement



Recommended wiring practices

The following guidelines should be followed while installing communication wire.

- Comm5 is not polarity sensitive. Trane recommends that the installer keep polarity consistent throughout the site.
- Only strip away 2" maximum of the outer conductor of shielded cable.
- Make sure that the 24VAC power supplies are consistent in how they are grounded. Avoid sharing 24VAC between Comm5 UCMs.
- Avoid over-tightening cable ties and other forms of cable wraps. A tight tie or wrap could damage the wires inside the cable.
- Do not run Comm5 cable alongside or in the same conduit as 24VAC power.
- In an open plenum, avoid lighting ballasts, especially those using 277VAC.
- Do not use a trunk and branch configuration, if possible. Trunk and branch configurations shorten the distance cable can be run.

Network variable summary

The following section describes network variable support for both the DAC and SCC profiles, as well as "open" variables (utilizing SNVT/SCPT) from Trane Extensions. The three columns on the right indicate which variables are supported on which product(s). If a row is grayed out, the corresponding variable is not implemented or not used by the controller at this time. Refer to the Lonmark profiles for more details on standard network variables:

Space Comfort Controller (SCC):

http://www.lonmark.org/technical_resources/guidelines/docs/profiles/8500_20.pdf

Discharge Air Controller (DAC):

http://www.lonmark.org/technical_resources/guidelines/docs/profiles/8610_10.pdf

Refer to the Network Variable Details section for more information on the IntelliPak specific implementation.

Table 4. Node Information

Node Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
1	nviRequest	No	SNVT_obj_request	Status Request Input	X	X	X

Node Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
2	nvoStatus	No	SNVT_obj_status	Status Request Output	X	X	X

Node Configuration Properties

NV#	Name		SCPT Type	Description	RT	CSC	FAU
	nciDevMajVer		SCPTdevMajVer	Device Major Version Number	X	X	X
	nciDevMinVer		SCPTdevMinVer	Device Minor Version Number	X	X	X

Node Extension Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
	nvoAlarmMessage	No	SNVT_str_asc	Diagnostic Message	X	X	X
NV#	**Name**	**Recv HrtBt**	**SNVT Type**	**Description**	**RT**	**CSC**	**FAU**
	nvoClusterConfig	No	U16	master_slave_t	X		X

Node Network Variable Outputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
	nciDevBuildNum	No	U16	Software Build Number	X	X	X

Table 5. SCC Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
1	nviSpaceTemp	Yes	SNVT_temp_p	Space Temperature Input	X	X	
2	nviSetpoint	No	SNVT_temp_p	Temperature Setpoint Input (absolute)	X	X	
3	nviSetptOffset	Yes	SNVT_temp_p	Setpoint Offset Input	X	X	
4	nviSetptShift	Yes	SNVT_temp_setpt	Setpoint Shift Input	X	X	
5	nviOccSchedule	Yes	SNVT_tod_event	Occupancy Scheduler Input	X	X	
6	nviOccManCmd	No	SNVT_occupancy	Occupancy Override Input	X	X	
7	nviOccSensor	Yes	SNVT_occupancy	Occupancy Sensor Input	X	X	
8	nviApplicMode	Yes	SNVT_hvac_mode	Application Mode Input	X	X	
9	nviHeatCool	Yes	SNVT_hvac_mode	Heat/Cool Mode Input	X	X	
10	nviFanSpeedCmd	No	SNVT_switch	Fan Speed Command Input			
11	nviComprEnable	Yes	SNVT_switch	Compressor Enable Input	X	X	
12	nviAuxHeatEnable	Yes	SNVT_switch	Auxiliary Heat Enable Input	X	X	
13	nviEconEnable	Yes	SNVT_switch	Economizer Enable Input	X	X	
14	nviEnergyHoldOff	Yes	SNVT_switch	Energy Hold Off Input			
15	nviValveOverride	No	SNVT_hvac_overid	Water Valve Override Input			

Table 5. (continued) SCC Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
16	nviFlowOverride	No	SNVT_hvac_overid	Air Flow Override Input			
17	nviEmergOverride	No	SNVT_hvac_emerg	Emergency Override Input	X	X	
18	nviSourceTemp	Yes	SNVT_temp_p	Source Temperature Input			
19	nviOutdoorTemp	Yes	SNVT_temp_p	Outdoor Air Temperature Input	X	X	
20	nviSpaceRH	Yes	SNVT_lev_percent	Space Humidity Input	X		
21	nviOutdoorRH	Yes	SNVT_lev_percent	Outdoor Air Humidity Input	X	X	
22	nviSpaceCO2	Yes	SNVT_ppm	Space VOC or CO2 Sensor Input	X		
23	nviSpaceDewpt	Yes	SNVT_temp_p	Space Dew Point Temperature Input			
24	nviOutdoorDewpt	Yes	SNVT_temp_p	Outdoor Air Dew Point Temp. input			
25	nviAirflow	Yes	SNVT_flow	Air Flow Input			
53	nviHeatSrcTemp	Yes	SNVT_temp_p	Heat Source Temperature Input			
54	nviCoolSrcTemp	Yes	SNVT_temp_p	Cool Source Temperature Input			
55	nviHeatPriSlave	Yes	SNVT_lev_percent	Primary Heat Input for Slave Operation			
56	nviHeatSecSlave	Yes	SNVT_lev_percent	Secondary Heat Input for Slave Operation			
57	nviCoolPriSlave	Yes	SNVT_lev_percent	Primary Cool Input for Slave Operation			
58	nviCoolSecSlave	Yes	SNVT_lev_percent	Secondary Cool Input for Slave Operation			
59	nviOAMinPos	Yes	SNVT_lev_percent	Minimum Position OA Damper Input	X	X	
60	nviMinAirFlow	Yes	SNVT_lev_percent	Minimum Air Flow Setpoint Input			
61	nviMinAirFlowHt	Yes	SNVT_lev_percent	Minimum Heat Air Flow Setpoint Input			
62	nviAirFlowSetpt	Yes	SNVT_flow	Air Flow Setpoint Input			
63	nviTerminalLoad	Yes	SNVT_lev_percent	Terminal Load Input			

Table 6. SCC Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
26	nvoSpaceTemp	Yes	SNVT_temp_p	Effective Space Temperature Output	X	X	
27	nvoUnitStatus	Yes	SNVT_hvac_status	Unit Status Output	X	X	
28	nvoEffectSetpt	Yes	SNVT_temp_p	Effective Setpoint Output	X	X	
29	nvoEffectOccup	No	SNVT_occupancy	Effective Occupancy Output	X	X	
30	nvoHeatCool	Yes	SNVT_hvac_mode	Effective Heat/Cool Output	X	X	
31	nvoSetpoint	No	SNVT_temp_p	Local Setpoint Output	X	X	
32	nvoSetptShift	Yes	SNVT_temp_setpt	Local Setpoint Shift Output			
33	nvoFanSpeed	Yes	SNVT_switch	Fan Speed Output	X	X	
34	nvoDischAirTemp	No	SNVT_temp_p	Discharge Air Temperature Output	X	X	
35	nvoLoadAbs	No	SNVT_power	Absolute Power Consumption Output			
36	nvoLoadAbsK	No	SNVT_power_kilo	Absolute Power Consumption KW Output			
37	nvoTerminalLoad	Yes	SNVT_lev_percent	Terminal Load Output	X	X	
38	nvoHeatPrimary	Yes	SNVT_lev_percent	Primary Heat Output	X	X	
39	nvoHeatSecondary	Yes	SNVT_lev_percent	Primary Heat Output	X		
40	nvoCoolPrimary	Yes	SNVT_lev_percent	Primary Cool Output	X	X	
41	nvoCoolSecondary	Yes	SNVT_lev_percent	Secondary Cool Output			
42	nvoOADamper	Yes	SNVT_lev_percent	Outdoor Air Damper Output	X	X	
43	nvoSpaceRH	Yes	SNVT_lev_percent	Space Humidity Output	X	X	

Table 6. (continued) SCC Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
44	nvoOutdoorRH	Yes	SNVT_lev_percent	Outdoor Air Humidity Output	X	X	
45	nvoOutdoorTemp	Yes	SNVT_temp_p	Outdoor Air Temperature	X	X	
46	nvoSpaceCO2	Yes	SNVT_ppm	Space CO2 Sensor Output	X	X	
47	nvoSpaceDewPt	Yes	SNVT_temp_p	Space Dewpoint Temperature Output			
48	nvoHumidifier	Yes	SNVT_lev_percent	Humidifier Output	X		
49	nvoEnergyHoldOff	Yes	SNVT_switch	Energy Hold Off Output			
50	nvoEffectFlowSP	No	SNVT_flow	Effective Air Flow Setpoint Output			
51	nvoFlowSetpoint	Yes	SNVT_lev_percent	Flow Control Damper Setpoint Output			
52	nvoAirflow	Yes	SNVT_flow	Air Flow Output			
64	nvoMixedAirTemp	Yes	SNVT_temp_p	Mixed Air Temperature Output	X	X	
65	nvoLocalSpaceTmp	Yes	SMVT_temp_p	Local Space Temperature Output	X	X	
66	nvoEffFlowSPHeat	No	SNVT_flow	Effective Air Flow Heat Setpoint Output			
67	nvoFlowSPHeat	Yes	SNVT_lev_percent	Flow Control Damper Heat Setpoint Output			
68	nvoAirFlowHeat	Yes	SNVT_flow	Air Flow Heat Output			
69	nvoSatStatus	No	SNVT_state	Saturation Status Output			

Table 7. SCC Configuration Properties

NV#	Name	SNVT Type	Description	RT	CSC	FAU
1	nciSndHrtBt	SNVT_time_sec	Send Heartbeat	X	X	
2	nciSetpoints	SNVT_temp_setpt	Occupancy Temperature Setpoints	X	X	
3	nciMinOutTm	SNVT_time_sec	Minimum Send Time	X	X	
4	nciRcvHrtBt	SNVT_time_sec	Receive Heartbeat	X	X	
5	nciLocation	SNVT_str_asc	Location Label	X	X	
6	nciBypassTime	SNVT_time_min	Local Bypass Time	X	X	
7	nciManualTime	SNVT_time_min	Manual Override Time			
8	nciOAMinPos	SNVT_lev_percent	Outdoor Air Damper Minimum Position	X	X	
9	nciSpaceCO2Lim	SNVT_ppm	Space CO2 Limit	X	X	
10	nciSpaceRHSetpt	SNVT_lev_percent	Space Humidity Setpoint	X	X	
11	nciNumValve	SNVT_count	Number of Heating/Cooling Valves			
12	nciDuctArea	SNVT_area	Duct Area			
13	nciNomFlow	SNVT_flow	Nominal Air Flow			
14	nciFlowGain	SNVT_multiplier	Air Flow Measurement Gain			
15	nciMinFlow	SNVT_flow	Minimum Air Flow			
16	nciMaxFlow	SNVT_flow	Maximum Air Flow			
17	nciMinFlowHeat	SNVT_flow	Heating Minimum Air Flow			
18	nciMaxFlowHeat	SNVT_flow	Heating Maximum Air Flow			
19	nciMinFlowStdby	SNVT_flow	Standby Minimum Air Flow			
20	nciHvacType	SNVT_hvac_type	HVAC Unit-Type Identifier	X	X	
21	nciFanOperation	(none)	Fan Operation	X	X	
23	nciUnitMinFlow	SNVT_flow	Unit Minimum Air Flow			

Table 7. (continued) SCC Configuration Properties

NV#	Name	SNVT Type	Description	RT	CSC	FAU
24	nciUnitMaxFlow	SNVT_flow	Unit Maximum Air Flow			
25	nciMinFlwStdbyHt	SNVT_flow	Standby Heating Maximum Air Flow			
26	nciUnitMnFlwStdby	SNVT_flow	Standby Unit Minimum Air Flow			
27	nciFlowOffset	SNVT_flow	Air Flow Offset			
28	nciDuctAreaHeat	SNVT_area	Heating Duct Area			
29	nciNomFlowHeat	SNVT_flow	Heating Nominal Flow			
30	nciFlowGainHeat	SNVT_multiplier	Heating Air Flow Measurement Gain			
31	nciNumDampers	SNVT_count	Number of Air Flow Dampers			
32	nciMinFlowUnitHt	SNVT_flow	Unit Heating Minimum Flow			
33	nciSatTime	SNVT_time_min	Saturation Time			

Table 8. SCC Extension Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
	nviBldgStatPress	Yes	SNVT_press_p	Building Static Pressure Input	X	X	
	nviCWFlow	Yes	SNVT_switch	Condenser Water Flow Input		X	
	nviBldgStaticSP	No	SNVT_press_p	Building Static pressure Setpoint Input	X	X	
	nviDAReheatSP	Yes	SNVT_temp_p	Discharge Air Reheat Setpoint	X		
	nviDehumEnable	Yes	SNVT_switch	Dehumidification Enable Input	X		
	nviHumEnable	Yes	SNVT_switch	Humidification Enable input	X		
	nviSpaceDehumSP	No	SNVT_lev_percent	Dehumidification Setpoint Input	X		
	nviSpaceHumSP	No	SNVT_lev_percent	Space Humidification Setpoint Input	X		

Table 9. SCC Extension Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
	nvoEnterWaterTmp	Yes	SNVT_temp_p	Incoming Water Temperature	X	X	
	nvoMATemp	Yes	SNVT_temp_p	Mixed Air Temperature Output	X		
	nvoExhFanStatus	Yes	SNVT_switch	Exhaust Fan Status Output	X	X	
	nvoExhFanOnOff	Yes	SNVT_switch	Exhaust Fan on/off control output	X	X	
	nvoBldgStatPress	Yes	SNVT_press_p	Building Status Pressure Output	X	X	
	nvoCWFlow	Yes	SNVT_switch	Condenser Water Flow Output		X	
	nvoCWPump	Yes	SNVT_switch	Condenser Water Pump Output		X	
	nvoOAEnthalpy	Yes	SNVT_enthalpy	Outdoor Air Enthalpy Output	X	X	
	nvoOccSchedule	Yes	SNVT_Tod_Event	A structure to report the Occupancy Mode of the controller	X	X	
	nvoRATemp	Yes	SNVT_temp_p	Return Air Temperature Output	X	X	
	nvoSpaceEnthalpy	Yes	SNVT_enthalpy	Space Enthalpy Output	X	X	
	nvoCondCap	Yes	SNVT_lev_percent	Condenser Capacity Output	X	X	
	nvoCWTemp	Yes	SNVT_temp_p	Condenser Water Temperature Output	X	X	
	nvoDAReheatSP	Yes	SNVT_temp_p	Discharge Air Reheat Setpoint	X		
	nvoDehumidifier	Yes	SNVT_switch	Dehumidification Status Output	X		
	nvoEffSpaceDHSP	Yes	SNVT_lev_percent	Effective Space Dehumidification Setpoint Output	X		
	nvoEffSpaceHumSP	Yes	SNVT_lev_percent	Effective Space Humidification Setpoint Output	X		
	nvoEREABPDamper	Yes	SNVT_lev_percent	Energy Recovery Exh Bypass Damper Output	X		
	nvoERFrostAvoid	Yes	SNVT_switch	Energy Recovery Frost Avoidance Output	X		
	nvoERLvgExhTemp	Yes	SNVT_temp_p	Energy Recovery Leaving Exh Temp Output	X		
	nvoEROABPDamper	Yes	SNVT_lev_percent	Energy Recovery OA Bypass Damper Output	X		
	nvoERPreheat	Yes	SNVT_switch	Energy Recovery Preheat On/Off Control Output	X		
	nvoERStatus	Yes	SNVT_switch	Energy Recovery Status Output	X		
	nvoExhDamper	Yes	SNVT_lev_percent	Exhaust Damper Control Output	X	X	
	nvoLocalCWTemp	Yes	SNVT_temp_p	Local Condenser Water Temperature	X	X	
	nvoRetFanOnOff	Yes	SNVT_switch	Return Fan On/Off Control Output	X		
	nvoRetFanPress	Yes	SNVT_press_p	Return Fan Pressure Output	X		
	nvoRetFanStatus	Yes	SNVT_switch	Return Fan Status Output	X		

Table 10. SCC Extension Configuration Properties

NV	Name	SNVT Type	Description	RT	CSC	FAU
	nciExhaustConfig	SNVT_lev_percent	Exhaust enable position	X	X	
	nciBldgStaticSP	SNVT_press_p	Building Static Pressure Setpoint	X	X	
	nciCoolLockout	SNVT_temp_p	Cooling lockout temperature setpoint	X	X	
	nciDAReheatSP	SNVT_temp_p	Discharge Air Reheat Setpoint	X		
	nciMinOAFlowSP	SNVT_flow	Minimum outdoor air flow setpoint.	X	X	
	nciOAEnthSP	SNVT_enthalpy	Outdoor Air Enthalpy Setpoint	X	X	
	nciOAFlowCalib	SNVT_multiplier	Outdoor Air Flow Calibration	X	X	
	nciRetFanPressSP	SNVT_press_p	Return Fan Pressure Setpoint	X		
	nciSpaceHumSP	SNVT_lev_percent	Space Humidification Setpoint	X		
	nciERFrostAvoidSP	SNVT_temp_p	Energy Recovery Frost Avoidance Setpoint	X		

Table 11. DAC Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
1	nviOccSchedule	Yes	SNVT_tod_event	Occupancy Scheduler Input	X	X	X
2	nviOccManCmd	No	SNVT_occupancy	Occupancy Override Input	X	X	X
3	nviApplicMode	Yes	SNVT_hvac_mode	Application Mode Input	X	X	X
4	nviEmergOverride	No	SNVT_hvac_emerg	Emergency Override Input	X	X	X
5	nviDuctStatPress	Yes	SNVT_press_p	Duct Static Pressure Input	X	X	X
6	nviDuctStaticSP	No	SNVT_press_p	Duct Static Pressure Setpoint Input	X	X	
7	nviDAClSP	No	SNVT_temp_p	Discharge Air Cooling Setpoint Input	X	X	X

Table 12. (continued) DAC Network Variable Inputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
8	nviDAHtSP	No	SNVT_temp_p	Discharge Air heating Setpoint Input	✓	X	X
9	nviSupFanCap	Yes	SNVT_lev_percent	Supply Fan Capacity Input			
10	nviExhFanCap	Yes	SNVT_lev_percent	Exhaust Fan Capacity Input			
11	nviRetFanCap	Yes	SNVT_lev_percent	Return Fan Capacity Input			
12	nviFanDiffSP	No	SNVT_lev_percent	Fan Differential Setpoint Input			
13	nviBldgStatPress	Yes	SNVT_press_p	Building Static Pressure Input	X	X	X
14	nviBldgStaticSP	No	SNVT_press_p	Building Static Pressure Setpoint Input	X	X	X
15	nviPriCoolEnable	Yes	SNVT_switch	Primary Cool Enable Input	X	X	X
16	nviPriheatEnable	Yes	SNVT_switch	Primary Heat Enable Input	X	X	X
17	nviEconEnable	Yes	SNVT_switch	Economizer Enable Input	X	X	X
18	nviOAMinPos	No	SNVT_lev_percent	Outdoor Air Minimum Position Input	X	X	X
19	nviMinOAFlowSP	No	SNVT_flow	Minimum Outdoor Air Flow Setpoint Input	X	X	X
20	nviOutdoorTemp	Yes	SNVT_temp_p	Outdoor Air Temperature Input	X	X	X
21	nviOutdoorRH	Yes	SNVT_lev_percent	Outdoor Air Humidity Input	X	X	X
22	nviOAEnthalpy	Yes	SNVT_enthalpy	Outdoor Air Enthalpy Input			
23	nviMATSP	No	SNVT_temp_p	Mixed Air Temperature Setpoint Input			
24	nviRATemp	Yes	SNVT_temp_p	Return Air Temperature Input			
25	nviSpaceEnthalpy	Yes	SNVT_enthalpy	Space Enthalpy Input			
26	nviSpaceTemp	Yes	SNVT_temp_p	Space Temperature Input	X	X	X
27	nviSpaceRH	Yes	SNVT_lev_percent	Space Humidity Input			X
28	nviHumEnable	Yes	SNVT_switch	Humidification Enable Input	X		
29	nviSpaceHumSP	No	SNVT_lev_percent	Space Humidification Setpoint Input	X		
30	nviDehumEnable	Yes	SNVT_switch	Dehumidification Enable Input	X		X
31	nviSpaceDehumSP	No	SNVT_lev_percent	Space Dehumidification Setpoint Input			X
32	nviDADewpointSP	No	SNVT_temp_p	Discharge Air Dewpoint Setpoint Input			X
33	nviCWTemp	Yes	SNVT_temp_p	Condenser Water Temperature Input			
34	nviCWFlow	Yes	SNVT_switch	Condenser Water Flow Input		X	
35	nvoDischAirTemp	Yes	SNVT_temp_p	Discharge Air Temperature Output	X	X	X
36	nvoUnitStatus	Yes	SNVT_hvac_status	Unit Status Output	X	X	X
37	nvoEffDATempSP	Yes	SNVT_temp_p	Effective Discharge Air Temperature Setpoint Output	X	X	X
38	nvoDuctStatPress	Yes	SNVT_press_p	Duct Static Pressure Output	X	X	X

Table 12. (continued) DAC Network Variable Inputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
39	nvoEffDuctStatSP	Yes	SNVT_press_p	Effective Duct Static Pressure Setpoint Output	X	X	X
40	nvoHeatCool	Yes	SNVT_hvac_mode	Efective Heat/Cool Output	X	X	X
41	nvoApplicMode	Yes	SMVT_hvac_mode	Application Mode Output	X	X	X
42	nvoEffectOccup	Yes	SNVT_occupancy	Effective Occupancy Output	X	X	X
43	nvoSupFanStatus	Yes	SNVT_switch	Supply Fan Status Output	X	X	X
44	nvoSupFanOnOff	Yes	SNVT_lev_percent	Supply Fan On/Off Control Output	X	X	X
45	nvoSupFanCap	Yes	SNVT_lev_percent	Supply Fan Capacity Output			
46	nvoExhFanStatus	Yes	SNVT_switch	Exhaust Fan Status Output	X	X	X
47	nvoExhFanOnOff	Yes	SNVT_switch	Exhaust Fan On/Off Control Output	X	X	X
48	nvoExhFanCap	Yes	SNVT_lev_percent	Exhaust Fan Capacity Output			
49	nvoExhDamper	Yes	SNVT_lev_percent	Exhaust Damper Control Output	X	X	X
50	nvoRetFanStatus	Yes	SNVT_switch	Return Fan Status Output	X		
51	nvoRetFanOnOff	Yes	SNVT_switch	Return Fan On/Off Control Output	X		
52	nvoRetFanCap	Yes	SNVT_lev_percent	Return Fan Capacity Output			
53	nvoRetFanPress	Yes	SNVT_press_p	Return Fan Pressure Output	X		
54	nvoBldgStatPress	Yes	SNVT_press_p	Building Static Pressure Output	X	X	X
55	nvoEconEnabled	Yes	SNVT_switch	Economizer Enabled Output	X	X	X
56	nvoOADamper	Yes	SNVT_lev_percent	Outdoor Air Damper Output	X	X	X
57	nvoOAFlow	Yes	SNVT_flow	Outdoor Air Flow Output	X	X	X
58	nvoLocalOATemp	Yes	SNVT_temp_p	Local Outdoor Air Temperature Output	X	X	X
59	nvoOutdoorTemp	Yes	SNVT_temp_p	Outdoor Air Temperature Output	X	X	X
60	nvoLocalOARH	Yes	SNVT_lev_percent	Local Outdoor Air Humidity Output	X	X	X
61	nvoOutdoorRH	Yes	SNVT_lev_percent	Outdoor Air Humidity Output	X	X	X
62	nvoOAEnthalpy	Yes	SNVT_enthalpy	Outdoor Air Enthalpy Output	X	X	X
63	nvoCoolPrimary	Yes	SNVT_lev_percent	Primary Cooling Output	X	X	X
64	nvoHeatPrimary	Yes	SNVT_lev_percent	Primary Heating Output	X	X	X
65	nvoMATemp	Yes	SNVT_temp_p	Mixed Air Temperature Output	X	X	X
66	nvoSpaceTemp	Yes	SNVT_temp_p	Space Temperature Output	X	X	X
67	nvoRATemp	Yes	SNVT_temp_p	Return Air Temperature Output	X	X	X
68	nvoSpaceRH	Yes	SNVT_lev_percent	Space Humidity Output	X	X	X
69	nvoSpaceEnthalpy	Yes	SNVT_enthalpy	Space Enthalpy Output	X	X	X
70	nvoEffSpaceHumSP	Yes	SNVT_lev_percent	Effective Space Humidification Setpoint Output	X		
71	nvoHumidifier	Yes	SNVT_lev_percent	Humidification Status Output	X		
72	nvoEffSpaceDHSP	Yes	SNVT_lev_percent	Effective Space Dehumidification Setpoint Output	X		X
73	nvoDehumidifier	Yes	SNVT_switch	Dehumidification Status Output	X		X
74	nvoEffDADewPtSP	Yes	SNVT_temp_p	Effective Discharge Air Dewpoint Setpoint Output			X
75	nvoDADewPoint	Yes	SNVT_temp_p	Discharge Air Dewpoint Temperature Output			X
76	nvoCondCap	Yes	SNVT_lev_percent	Condenser Capacity Output	X	X	X
77	nvoLocalCWTemp	Yes	SNVT_temp_p	Local Condenser Water Temperature Output	X	X	
78	nvoCWTemp	Yes	SNVT_temp_p	Condenser Water Temperature Output	X	X	
79	nvoCWFlow	Yes	SNVT_switch	Condenser Water Flow Output	X	X	
80	nvoCWPump	Yes	SNVT_switch	Condenser Water Pump Output	X	X	

Table 13. DAC Configuration Properties

SCPT UCPT Index	Name	SNVT Type	Description	RT	CSC	FAU
49	nciSndHrtBt	SNVT_time_sec	Send Heartbeat	X	X	X
183	nciDAClSP	SNVT_temp_p	Discharge Air Cooling Setpoint	X	X	X
184	nciDAHtSP	SNVT_temp_p	Discharge Air Heating Setpoint	X	X	X
60	nciSetpoints	SNVT_temp_setpt	Occupancy Temperature Setpoints	X	X	X
52	nciMinOutTm	SNVT_time_sec	Minimum Send Time	X	X	X
48	nciRcvHrtBt	SNVT_time_sec	Receive Heartbeat	X	X	X
17	nciLocation	SNVT_str_asc	Location Label	X	X	X
34	nciBypassTime	SNVT_time_min	Local Bypass Time	X	X	X
	nciMaxSupFanCap	SNVT_lev_percent	Maximum Supply Fan Capacity			
	nciMinSupFanCap	SNVT_lev_percent	Minimum Supply Fan Capacity			
	nciMaxRetFanCap	SNVT_lev_percent	Maximum Return/Exhaust Fan Capacity			
	nciMinRetFanCap	SNVT_lev_percent	Minimum Return/Exhaust Fan Capacity			
189	nciDuctStatSP	SNVT_press_p	Duct Static Pressure Setpoint	X	X	X
	nciMaxDuctStatSP	SNVT_press_p	Maximum Duct Static Pressure Setpoint			
	nciMinDuctStatSP	SNVT_press_p	Minimum Duct Static Pressure Setpoint			
192	nciDuctStatLim	SNVT_press_p	Duct Static Pressure Limit	X	X	X
193	nciBldgStaticSP	SNVT_press_p	Building Static Pressure Setpoint	X	X	X
	nciRetFanPressSP	SNVT_press_p	Return Fan Pressure Setpoint	X		
	nciFanDiffSP	SNVT_lev_percent	Fan Differential Setpoint			
	nciMALowLimitSP	SNVT_temp_p	Mixed Air Low Limit Setpoint			
	nciMATSP	SNVT_temp_p	Mixed Air Temperature Setpoint			
23	nciOAMinPos	SNVT_lev_percent	Outdoor Air Damper Minimum Position	X	X	X
198	nciMinOAFlowSP	SNVT_flow	Minimum Outdoor Air Flow Setpoint	X	X	X
67	nciOAFlowCalib	SNVT_multiplier	Outdoor Air Flow Calibration	X	X	X
46	nciOAInletArea	SNVT_area	Outdoor Air Inlet Area			
199	nciOATSP	SNVT_temp_p	Outdoor Air Temperature Setpoint	X	X	
200	nciOAEnthSP	SNVT_enthalpy	Outdoor Air Enthalpy Setpoint	X	X	X
	nciTempDiff	SNVT_temp_p	Economizer Enable Differential Temperature Setpoint			
202	nciExhStartPos	SNVT_lev_percent	Exhaust Enable Position	X	X	X
	nciSpaceHumSP	SNVT_lev_percent	Space Humidification Setpoint	X		
36	nciSpaceDehumSP	SNVT_lev_percent	Space Dehumidification Setpoint	X		
204	nciDADewPointSP	SNVT_temp_p	Discharge Air Dewpoint Setpoint			X
	nciMaxDAClSP	SNVT_temp_p	Maximum Discharge Air Cooling Setpoint			
	nciMinDAClSP	SNVT_temp_p	Minimum Discharge Air Cooling Setpoint			
	nciMaxDAHtSP	SNVT_temp_p	Maximum Discharge Air Heating Setpoint			
	nciMinDAHtSP	SNVT_temp_p	Minimum Discharge Air Heating Setpoint			
209	nciCoolLockout	SNVT_temp_p	Cooling Lockout Temperature Setpoint	X	X	X
	nciHeatLockout	SNVT_temp_p	Heating Lockout Temperature Setpoint			
	nciCoolResetEn	SNVT_switch	Cooling Reset Enable	X	X	X
	nciHeatResetEn	SNVT_switch	Heating Reset Enable	X	X	X

Table 14. DAC Extension Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
	nviDAReheatSP	Yes	SNVT_temp_p	Discharge Air Reheat Setpoint	X		
	nviSpaceCO2	Yes	SNVT_ppm	Space CO2 Sensor Input	X		

Table 15. DAC Extension Network Variable Outputs

NV#	Name	Send HrtBt	SNVT Type	Description	RT	CSC	FAU
	nvoTerminalLoad	Yes	SNVT_lev_percent	Terminal Load output	X	X	X
	nvoLocalDSPress	Yes	SNVT_press_p	Local Duct Static Pressure Output	X	X	X
	nvoSpaceCO2	Yes	SNVT_ppm	Space CO2 Sensor Output	X	X	X
	nvoEnterWaterTmp	Yes	SNVT_temp_p	Entering Water Temperature Output		X	
	nvoDAReheatSP	Yes	SNVT_temp_p	Discharge Air Reheat Setpoint			X
	nvoOADewpoint	Yes	SNVT_temp_p	Outdoor Air Dewpoint			X
	nvoEREABPDamper	Yes	SNVT_lev_percent	Energy Recovery Exhaust Air Bypass Damper Position Output	X		
	nvoERFrostAvoid	Yes	SNVT_switch	Energy Recovery Frost Avoidance State	X		
	nvoERLvgExhTemp	Yes	SNVT_temp_p	Energy Recovery Leaving Exhaust Temp Output	X		
	nvoEROABPDamper	Yes	SNVT_lev_percent	Energy Recovery Outside Air Bypass Damper Position Output	X		
	nvoERPreheat	Yes	SNVT_switch	Energy Recovery Preheat On/Off Control Output	X		
	nvoERStatus	Yes	SNVT_switch	Energy Recovery Status Output	X		
	nvoHeatSecondary	Yes	SNVT_lev_percent	Secondary Heat Output	X		X

Table 16. Product Extension Network Variable Outputs

NV#	Name	Recv HrtBt	SNVT Type	Description	RT	CSC	FAU
	nvoMasterSlave1	Yes		Master Slave Output #1 (bound on cluster slaves)	X		
	nvoMasterSlave2	Yes		Master Slave Output #2 (bound on cluster slaves)	X		

Table 17. DAC Extension Configuration Properties

NV#	Name	SNVT Type	Description	RT	CSC	FAU
	nciHvacType	SNVT_hvac_type	HVAC Unit Type Identifier	X	X	X
	nciDaytime	SNVT_Temp_p	Daytime Warmup Initiate Setpoint	X	X	
	nciDaytimeTerm	SNVT_Temp_p	Daytime Warmup Terminate Setpoint	X	X	
	nciDAReheatSP	SNVT_Temp_p	Discharge Air Reheat Setpoint	X		X
	nciERFrostAvoidSP	SNVT_Temp_p	Energy Recovery Frost Avoidance Setpoint	X		
	nciSpaceCO2Lim	SNVT_ppm	Space CO2 High Limit Setpoint	X	X	X

Network Variable Input Definitions

The network variable input definitions are listed alphabetically by the nviName. When an NVI is invalid, the unit will decide proper operation based on its local inputs.

Application Mode Input, nviApplicMode

network input SNVT_hvac_mode nviApplicMode; SCC and DAC profile

Used to coordinate the controller with any supervisory controller. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Refer to Appendix Table 44, p. 95 for more details on how nviApplicMode is utilized. Default service type = unacknowledged.

IntelliPak FAU products will only use HVAC_AUTO, HVAC_OFF, HVAC_FAN_ONLY and HVAC_NUL. IntelliPak RT and CSC products will only use HVAC_AUTO, HVAC_HEAT, HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, HVAC_PRE_COOL, HVAC_COOL, HVAC_OFF, HVAC_FAN_ONLY and HVAC_NUL. HVAC_NUL is treated the same as HVAC_AUTO. All other enumerations are defined as HVAC_AUTO for IntelliPak products. For the HVAC_FAN_ONLY enumeration, heating and cooling are locked out and will override nviAuxHeatEnable, nviComprEnable, nviPriCoolEnable, and nviPriHeatEnable. HVAC_DEHUMIDIFICATION (14) is not supported in nviApplicMode by IntelliPak products, as dehumidification is only activated by setpoints and space conditions. The unit should be unoccupied before sending the HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL.

For IntelliPak Rooftop or CSC products, when nviApplicMode = HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL, refer to the table below for network variable interaction.

Valid Range

Type	FAU Range	RT/CSC Range	Invalid Value
U08	0 = HVAC_AUTO 1 = HVAC_HEAT (HVAC_AUTO) 2 = HVAC_MRNG_WRMUP (HVAC_AUTO) 3 = HVAC_COOL (HVAC_AUTO) 4 = HVAC_NIGHT_PURGE (HVAC_AUTO) 5 = HVAC_PRE_COOL (HVAC_AUTO) 6 = HVAC_OFF 7 = HVAC_TEST (HVAC_AUTO) 8 = HVAC_EMERG_HEAT (HVAC_AUTO) 9 = HVAC_FAN_ONLY 10 = HVAC_FREE_COOL (HVAC_AUTO) 11 = HVAC_ICE (HVAC_AUTO) 12 = HVAC_MAX_HEAT (HVAC_AUTO) 13 = HVAC_ECONOMIZING (HVAC_AUTO) 14 = HVAC_DEHUMIDIFICATION (HVAC_AUTO) 15 = HVAC_CALIBRATE (HVAC_AUTO) 16 to 255 = HVAC_NUL	0 = HVAC_AUTO 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE 5 = HVAC_PRE_COOL 6 = HVAC_OFF 7 = HVAC_TEST (HVAC_AUTO) 8 = HVAC_EMERG_HEAT (HVAC_AUTO) 9 = HVAC_FAN_ONLY 10 = HVAC_FREE_COOL (HVAC_AUTO) 11 = HVAC_ICE (HVAC_AUTO) 12 = HVAC_MAX_HEAT (HVAC_AUTO) 13 = HVAC_ECONOMIZING (HVAC_AUTO) 14 = HVAC_DEHUMIDIFICATION (HVAC_AUTO) 15 = HVAC_CALIBRATE (HVAC_AUTO) 16 to 255 = HVAC_NUL	0xFF = HVAC_NUL

Note 1: HVAC_NUL is treated the same as HVAC_AUTO.

Table 18. Network Variable Interaction

Network Variable	nviApplicMode = HVAC_MRNG_WRMUP (SCC units or DAC units with modulating gas, hydronic, or Intellipak II staged electric heat) [1]	nviApplicMode = HVAC_MRNG_WRMUP (DAC units with staged gas or electric heat) [2]	nviApplicMode = HVAC_PRE_COOL	nviApplicMode = HVAC_NIGHT_PURGE
nviAuxHeatEnable	honored	honored	overridden to disabled	overridden to disabled
nviComprEnable	overridden to disabled	overridden to disabled	honored	overridden to disabled
nviEconEnable	overridden to disabled	overridden to disabled	honored	honored
nviOAMinPos	overridden to zero	overridden to zero	overridden to zero	overridden to zero
nviOccManCmd	overridden to occupied	overridden to occupied	overridded to occupied	overridden to occupied
nviOccSchedule	overridden to occupied	overridden to occupied	overridden to occupied	overridden to occupied
nviOccSensor	overridden to occupied	overridden to occupied	overridden to occupied	overridden to occupied
nviPriCoolEnable	overridden to disabled	overridden to disabled	honored	overridden to disabled
nviPriHeatEnable	honored	honored	overridden to disabled	overridden to disabled
nvoApplicMode	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE
nvoEffectOccup	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED	OC_UNOCCUPIED [4]
nvoHeatCool	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE
nvoOccSchedule	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED	OC_UNOCCUPIED [4]
nvoUnitStatus.mode	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE

Note 1: The Morning Warmup function must be disabled at the human interface General Unit Functions Setup Submenu.
Note 2: The Morning Warmup function must be enabled at the human interface General Unit Functions Setup Submenu.
Note 3: If the unit was unoccupied or off before receiving HVAC_MRNG_WRMUP and the space temperature is below the morning warmup setpoint, the unit will transition into it's native morning warmup mode and report HVAC_MAX_HEAT, otherwise it will report HVAC_MRNG_WRMUP.
Note 4: Although the communicated occupancy indicates unoccupied mode, as expected, the unit is actually in occupied mode, which is displayed at the human interface. This is required since the IntelliPak unit controller design only provides duct static pressure control and economizing to the discharge air temperature setpoint in occupied modes.

Auxiliary Heat Enable Input, nviAuxHeatEnable

network input SNVT_switch nviAuxHeatEnable; SCC profile (see nviPriHeatEnable)

A structure used by space temp controllers to enable or disable or limit any type of mechanical heat on the heat output. A discharge air controller uses nviPriHeatEnable. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For all IntelliPak CSC products and older IntelliPak RT products (LCI-I software version 13.x or lower and/or HEAT software version 10 or lower), this is a binary enable/disable input. For newer IntelliPak RT products (LCI-I software version 14.x or higher and HEAT software version 11.x or higher), the percent enabled is also supported. Heating can also be locked out by setting nviApplicMode or nviHeatCool to HVAC_FAN_ONLY (or HVAC_NIGHT_PURGE or HVAC_PRE_COOL with LCI-I software version 14.x or higher.)

Valid Range

State	Value	Equivalent Percent	Heat Output Operation
0	any value	0.0%	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Enabled, 1 – 100%
1	200 to 255	100.0%	Enabled, no limit
0xFF (invalid value) or 2 to 127 or -128 to -2	any value	100.0%	Enabled, no limit (invalid)

Building Static Pressure Setpoint Input, nviBldgStaticSP

network input SNVT_press_p nviBldgStaticSP; SCCX and DAC profile

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. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

IntelliPak products must have the 100% power exhaust with Statitrac option for nviBldgStatPress to be utilized. Newer IntelliPak RT products (VCM 4.x and higher and LCI-I software version 14.x and higher) support a lower (negative) building pressure setpoint range. For SCC units controlled by Tracer Summit, nviBldgStaticSP (if present) may be overridden by a Trane proprietary profile extension variable.

Range, 8 Pa to 74 Pa (RT1, CSC, FAU)-49 Pa to 74 Pa (RT2)	Invalid Value, 0x7FFF = 32767 Pa

Building Static Pressure Input, nviBldgStatPress

network input SNVT_press_p nviBldgStatPress; SCCX and DAC profile

Used to connect a network building static pressure sensor 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. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

IntelliPak products must have the 100% power exhaust with Statitrac option for nviBldgStatPress to be utilized. Newer IntelliPak RT products (ECEM 11.x and higher and LCI-I software version 14.x and higher) support an expanded pressure range.

Range, -69 Pa to 124 Pa (RT1, CSC, FAU) 166 Pa to 166 Pa (RT2)	Invalid Value, 0x7FFF = 32767 Pa

Compressor Enable Input, nviComprEnable

network input SNVT_switch nviComprEnable; SCC profile (see nviPriCoolEnable)

A structure used by space temp controllers to enable or disable or limit any type of mechanical cooling on the cool output. A discharge air controller uses nviPriCoolEnable. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For all IntelliPak CSC and FAU products and older IntelliPak RT products (LCI-I software version 13.x and lower and/or SCM software version 7.x or lower or MCM software version 14.x or lower), this is a binary enable/disable input. For newer IntelliPak RT products (LCI-I software version 14.x or higher and SCM software version 8.x or higher or MCM software version 15.x or higher), the percent enabled is also supported. Cooling can also be locked out by setting nviApplicMode or nviHeatCool to HVAC_FAN_ONLY (or HVAC_MRNG_WRMUP or HVAC_NIGHT_PURGE with LCI-I software version 14.x or higher.).

Valid Range

State	Value	Equivalent Percent	Cool Output Operation
0	any value	0.0%	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Enabled, 1 – 100%
1	200 to 255	100.0%	Enabled, no limit
0xFF (Invalid Value) or 2 to 127 or -128 to –2	any value)	100.0%	Enabled, no limit (invalid)

Condenser Water Flow Input, nviCWFlow

network input SNVT_switch nviCWFlow; SCCX and DAC profile

Indicates the system condenser water flow status provided by a network sensor or network output from another controller. When valid, nviCWFlow will have priority over any locally provided condenser water flow status. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time.

Default service type = unacknowledged.

Only IntelliPak products with water-cooled condenser and/or water-side economizer utilize nviCWFlow.

Valid Range

State	Value	Equivalent Percent	Condenser Water Flow	Meaning
0	any value	0%	No	water is not flowing
1	0	0%	No	water is not flowing
1	1 to 199	100%	Yes	water is flowing
1	200-255	100%	Yes	water is flowing
0xFF (invalid value), 2 to 127, -128 to -2	00 (invalid value)	n/a	invalid	invalid, use local water flow switch (if installed)

Dehumidification Enable Input, nviDehumEnable

network input SNVT_switch nviDehumEnable; SCCX and DAC profile

Used to enable the dehumidification function in the controller. It is typically set by a supervisory node. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

IntelliPak products with a dehumidification option utilize nviDehumEnable and only to enable/disable dehumidification. Enabling dehumidification does not force the unit to actively dehumidify, since dehumidification is activated by setpoint and space conditions.

Valid Range

State	Value	Humidification	Meaning
0	any value	Disabled	no dehumidification
1	0	Disabled	no dehumidification
1	1 to 255	Enabled	dehumidification
0xFF (default)	any value	Enabled (invalid)	controller decides

Discharge Air Cooling Setpoint Input, nviDACISP

network input SNVT_temp_p nviDACISP; DAC profile

Used to set the discharge air cooling setpoint of the controller. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Range, 6.11 C to 60 C, 43 F to 140 F	Invalid Value, 0x7FFF = 327.67 C

Discharge Air Dewpoint Setpoint Input, nviDADewPointSP

network input SNVT_temp_p nviDADewPointSP; DAC profile

Used to set the discharge air dewpoint setpoint of the controller. When valid, this input will have priority over any locally provided discharge air dewpoint setpoint. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Only IntelliPak FAU products with the dehumidification option utilize nviDADewPointSP. IntelliPak Rooftop dehumidification is activated by setpoint (nviSpaceDehumSP) and space conditions.

Range, 7.22 C to 23.89 C, 45 F to 75 F	Default, 0x7FFF = 327.67 C	Invalid Value, 0x7FFF = 327.67 C

Discharge Air Heating Setpoint Input, nviDAHtSP

network input SNVT_temp_p nviDAHtSP; DAC profile

This input network variable is used to set the discharge air reheat setpoint. Default service type = unacknowledged.

Range, 4.44 C to 82.22 C, 40 F to 180 F	Default, 0x7FFF = 327.67 C	Invalid Value, 0x7FFF = 327.67 C

Discharge Air Reheat Setpoint Input, nviDAReheatSP

network input SNVT_temp_p nviDAReheatSP; SCCX and DACX profile

This input network variable is used to set the discharge air reheat setpoint. Default service type = unacknowledged. Only IntelliPak FAU and IntelliPak Rooftop products with a modulating dehumidification option utilize nviDAReheatSP.

Range, 8.89 C to 48.89 C, 48 F to 120 F (FAU) 18.34 C to 26.66 C, 65 F to 80 F (RT)	Default, 0x7FFF = 327.67 C	Invalid Value, 0x7FFF = 327.67 C

Duct Static Pressure Setpoint Input, nviDuctStaticSP

network input SNVT_press_p nviDuctStaticSP; DAC profile

Used to set the duct static pressure setpoint of the controller. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

IntelliPak FAU products have a constant volume airflow, do not control duct static pressure, and do not utilize this value.

Range, 175 Pa to 1071 Pa, 0.7 to 4.3 IWC (RT, CSC, FAU) 175 Pa to 1270 Pa, 0.7 to 5.1 IWC (RT2)	Default, 0x7FFF = 32767 Pa	Invalid Value, 0x7FFF = 32767 Pa

Duct Static Pressure Input, nviDuctStatPress

network input SNVT_press_p nviDuctStatPress; DAC profile

Used to connect a duct static pressure sensor or network output from another controller. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

IntelliPak RT and CSC products use this for duct static pressure control, but continue to use the factory-installed sensor for high limit protection. IntelliPak FAU products have a constant volume airflow, do not control duct static pressure, and do not utilize this value. Newer IntelliPak RT products (VCM 4.x and higher and LCI-I software version 14.x and higher) support an expanded pressure range.

Range, 0 Pa to 1245 Pa, 0 to 5 IWC (RT, CSC, FAU) 0 Pa to 1967 Pa, 0 to 7.9 IWC (RT2)	Default, 0x7FFF = 32767 Pa	Invalid Value, 0x7FFF = 32767 Pa

Economizer Enable Input, nviEconEnable

network input SNVT_switch nviEconEnable; SCC and DAC profile

A structure used to enable and disable economizer operation. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For IntelliPak products, only the air-side economizer is enabled or disabled. For products with LCI-I software version 14.x or higher, nviEconEnable is overridden when nviApplicMode or nviHeatCool (SCC) is set to HVAC_MRNG_WRMUP, or HVAC_NIGHT_PURGE.

Table 19.

State	Value	Economizer	Meaning
0	any value	Disabled	no economizing
1	0	Disabled	no economizing
1	1 to 255	Enabled	economizing is the first stage of cooling
0xFF (invalid value) or 2 to 127 or -128 to -2	00 (invalid value)	Auto (invalid)	controller decides if economizing is possible

Emergency Override Input, nviEmergOverride

network input SNVT_hvac_emerg nviEmergOverride; SCC and DAC profile

Used to command the device into different emergency modes. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

For IntelliPak products, the emergency override input has a lower priority than ventilation override requests from the Ventilation Override Module (VOM) (if installed), the Local Human Interface Stop button, and the Emergency Stop input. Emergency override is initialized to EMERG_NUL on power up. The range 6 through 254 is manufacturer-defined to be EMERG_NUL. If a VOM module is installed and an emergency override is requested, the VOM binary output is closed.

Valid Range

Type	Range	Invalid Value
U08	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 5 = EMERG_FIRE: Input from fire pull box/system. SHUTDOWN all unit functions 6 to 255 = EMERG_NUL: Invalid mode (same as EMERG_NORMAL)	255 = 0xFF = HVAC_NUL

Heat/Cool Mode Input, nviHeatCool

network input SNVT_hvac_mode nviHeatCool; SCC profile

Used to coordinate the space temp controller with any node that may need to control the heat/cool changeover of the unit. This input is overridden by nviApplicMode unless nviApplicMode is HVAC_AUTO, HVAC_TEST, or HVAC_NUL. If nviApplicMode is HVAC_AUTO or HVAC_NUL, then nviHeatCool determines the Effective Mode of the Unit. Refer to Appendix Table 44, p. 95 for more information on how nviHeatCool is utilized.

Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For IntelliPak Rooftop or CSC products, the enumerations HVAC_TEST, HVAC_EMERG_HEAT, HVAC_FREE_COOL, HVAC_ICE, HVAC_ECONOMIZING, HVAC_DEHUMIDIFICATION, HVAC_NUL, and the range 15 to 254 are manufacturer-defined to be the same as HVAC_AUTO. The unit should be unoccupied before sending the HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL.

For IntelliPak FAU products, the enumerations HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, HVAC_PRE_COOL, HVAC_TEST, HVAC_EMERG_HEAT, HVAC_FREE_COOL, HVAC_ICE, HVAC_ECONOMIZING, HVAC_DEHUMIDIFICATION, HVAC_NUL, and the range 15 to 254 are manufacturer-defined to be the same as HVAC_AUTO.

For the HVAC_FAN_ONLY enumeration, heating and cooling are locked out. IntelliPak products do not honor HVAC_DEHUMIDIFICATION as dehumidification is activated by setpoint and space conditions.

For IntelliPak Rooftop or CSC products with LCI-I software version 14.x or higher, when nviApplicMode = HVAC_AUTO or HVAC_NUL and nviHeatCool = HVAC_MRNG_WRMUP,

HVAC_NIGHT_PURGE, or HVAC_PRE_COOL, refer to the table below for network variable interaction.

Valid Range

Type	Range		Invalid Value
U08	0 = HVAC_AUTO 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE 5 = HVAC_PRE_COOL 6 = HVAC_OFF 7 = HVAC_TEST (HVAC_AUTO) 8 = HVAC_EMERG_HEAT (HVAC_AUTO)	9 = HVAC_FAN_ONLY 10 = HVAC_FREE_COOL (HVAC_AUTO) 11 = HVAC_ICE (HVAC_AUTO) 12 = HVAC_MAX_HEAT 13 = HVAC_ECONOMIZING (HVAC_AUTO) 14 = HVAC_DEHUMIDIFICATION (HVAC_AUTO) 15 = HVAC_CALIBRATE (HVAC_AUTO) 16 to 255 = HVAC_NUL	255 = HVAC_NUL

Note 1: HVAC_NUL is treated the same as HVAC_AUTO.

Network Variable Interaction

Network Variable	**nviApplicMode = HVAC_AUTO or HVAC_NUL and nviHeatCool = HVAC_MRNG_WRMUP** (SCC units or DAC units with modulating gas, hydronic, or Intellipak II staged electric heat) [1]	**nviApplicMode = HVAC_AUTO or HVAC_NUL and nviHeatCool = HVAC_MRNG_WRMUP** (DAC units with staged gas or electric heat) [2]	**nviApplicMode = HVAC_AUTO or HVAC_NUL and nviHeatCool = HVAC_PRE_COOL**	**nviApplicMode = HVAC_AUTO or HVAC_NUL and nviHeatCool = HVAC_NIGHT_PURGE**
nviAuxHeatEnable	honored	honored	overridden to disabled	overridden to disabled
nviComprEnable	overridden to disabled	overridden to disabled	honored	overridden to disabled
nviEconEnable	overridden to disabled	overridden to disabled	honored	honored
nviOAMinPos	overridden to zero	overridden to zero	overridden to zero	overridden to zero
nviOccManCmd	overridden to occupied	overridden to occupied	overridden to occupied	overridden to occupied
nviOccSchedule	overridden to occupied	overridden to occupied	overridden to occupied	overridden to occupied
nviOccSensor	overridden to occupied	overridden to occupied	overridden to occupied	overridden to occupied
nviPriCoolEnable	overridden to disabled	overridden to disabled	honored	overridden to disabled
nviPriHeatEnable	not overridden	not overridden	overridden to enabled	overridden to disabled
nvoApplicMode	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE
nvoEffectOccup	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED
nvoHeatCool	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE
nvoOccSchedule	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED	OC_OCCUPIED
nvoUnitStatus.mode	HVAC_MRNG_WRMUP	HVAC_MAX_HEAT [3]	HVAC_PRE_COOL	HVAC_NIGHT_PURGE

Note 1: The Morning Warmup function must be disabled at the human interface General Unit Functions Setup Submenu.
Note 2: The Morning Warmup function must be enabled at the human interface General Unit Functions Setup Submenu.
Note 3: If the unit was unoccupied or off before receiving HVAC_MRNG_WRMUP and the space temperature is below the morning warmup setpoint, the unit will transition into it's native mornimg warmup mode and report HVAC_MAX_HEAT, otherwise it will report HVAC_MRNG_WRMUP.

Humidification Enable Input, nviHumEnable

network input SNVT_switch nviHumEnable; SCCX and DAC profile

Used to enable the humidification function in the controller. It is typically set by a supervisory node. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Only IntelliPak RT products with RTM software version 24.x or higher and LCI-I software version 14.x and higher utilize nviHumEnable to control a binary output connected to a field-supplied humidification device. Enabling humidification does not force the unit to actively humidify, since

humidification is activated by setpoint and space conditions (refer to nviSpaceRH and nviSpaceHumSP.)

Valid Range

State	Value	Humidification	Meaning
0	any value	Disabled	no humidification
1	0	Disabled	no humidification
1	1 to 255	Enabled	humidification
0xFF (default)	any value	Enabled (invalid)	controller decides

Master Slave Input 1, nviMasterSlave1

network input nviMasterSlave1; Product Extension profile

First of two inputs used by a slave unit to allow control by a master unit in a multi-unit cluster. Before a unit will become a slave, nviMasterSlave1 and nviMasterSlave2 must be bound and nvoMasterSlave1 and nvoMasterSlave2 must be unbound. Once a unit is a slave, all control data comes from the master unit and all other NVIs are ignored. All NVOs are still processed as usual. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Clustering is currently supported only in IntelliPak Rooftop products.

Master Slave Input 2, nviMasterSlave2

network input nviMasterSlave2; Product Extension profile

Second of two inputs used by a slave unit to allow control by a master unit in a multi-unit cluster. Before a unit will become a slave, nviMasterSlave1 and nviMasterSlave2 must be bound and nvoMasterSlave1 and nvoMasterSlave2 must be unbound. Once a unit is a slave, all control data comes from the master unit and all other NVIs are ignored. All NVOs are still processed as usual. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Clustering is currently supported only in IntelliPak Rooftop products.

Minimum Outdoor Air Flow Setpoint Input, nviMinOAFlowSP

network input SNVT_flow nviMinOAFlowSP; DAC profile

Used to set the 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. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Range, 0 to 28,317 liters/sec	Invalid Value, 0xFFFF = 65,535 liters/sec

Outdoor Air Minimum Position Input, nviOAMinPos

network input SNVT_lev_percent nviOAMinPos; SCC and DAC profile (see nviTraneVar1)

Used to set the minimum outdoor air damper position. When a valid value is present, this input has priority over any local minimum outdoor air damper position setpoint. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

For IntelliPak FAU products without a return air damper, minimum position requests below 25% are ignored. nviOAMinPos is overridden when nviApplicMode or nviHeatCool (SCC) is set to HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL. nviOAMinPos can be overridden by Trane proprietary profile extension variables.

For SCC units controlled by Tracer Summit, nviOAMinPos (if present) may be overridden by a Trane proprietary profile extension variable.

Range, 0% to 100%	Invalid Value, 0x7FFF = +163.835%

Occupancy Override Input, nviOccManCmd

network input SNVT_occupancy nviOccManCmd; SCC and DAC profile

Used to manually command the controller into different occupancy modes. This input is used in conjunction with nviOccSchedule and nviOccSensor (if installed) to determine the effective occupancy mode. nviOccSchedule appears in both SCC and DAC profiles, nviOccSensor in SCC profile only. Default value will be adopted at power-up. Does not use the receive heartbeat function. Should not be bound to a send heartbeat nvo. Refer to Table 24, p. 84, Effect of Occupancy Commands on the Controller for more details on how nviOccManCmd is utilized. Default service type = unacknowledged.

For IntelliPak products, there is no time-out for nviOccManCmd, it is not heartbeated, and the value is not preserved when power is lost (it is always initialized to OCC_NUL on power-up.) nviOccManCmd enumerations of OC_UNOCCUPIED and OC_STANDBY can be bypassed. Pressing the zone sensor module Timed Override On button (if installed) can change the effective occupancy from unoccupied to standby or bypass. The bypass timer is set to the value in nciBypassTime whenever nviOccManCmd equals OC_BYPASS or the local zone sensor Timed Override On request is received. After the bypass timer is set to nciBypassTime, the controller begins counting down to zero. The bypass timer is cleared to zero whenever nviOccManCmd does not equal OC_BYPASS or the local zone sensor with Timed Override Cancel request is received. If nciBypassTime is set to zero, it disables the OC_BYPASS enumeration for nviOccManCmd and nviOccSchedule. The human interface displays "Occupied TOV" when placed in bypass by a local zone senor with Timed Override On button and "Occupied" when placed in bypass by nviOccManCmd, nviOccSchedule, or nviOccSensor.

For IntelliPak products, the values 4 through 254 are manufacturer-defined to be OC_NUL.

Type	Range	Default
U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS 3 = OC_STANDBY 4 to 255 = OC_NUL	255 = OC_NUL (value not available)

Occupancy Scheduler Input, nviOccSchedule

network input SNVT_tod_event nviOccSchedule; SCC and DAC profile

A structure used to command the controller into different occupancy modes on schedule. This input is used in conjunction with nviOccSensor and nviOccManCmd (if installed) to determine the effective occupancy mode. nviOccManCmd appears in both SCC and DAC profiles, nviOccSensor in SCC profile only. Invalid values will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Refer to Table 24, p. 84, Effect of Occupancy Commands on the Controller for more details on how nviOccSchedule is utilized. Default service type = unacknowledged.

For IntelliPak products, there is no time-out for nviOccManCmd, it is not heartbeated, and the value is not preserved when power is lost (it is always initialized to OCC_NUL on power-up.) nviOccManCmd enumerations of OC_UNOCCUPIED and OC_STANDBY can be bypassed. Pressing the zone sensor module Timed Override On button (if installed) can change the effective occupancy from unoccupied to standby or bypass. The bypass timer is set to the value in nciBypassTime whenever nviOccManCmd equals OC_BYPASS or the local zone sensor Timed Override On request is received. After the bypass timer is set to nciBypassTime, the controller begins counting down to zero. The bypass timer is cleared to zero whenever nviOccManCmd does not equal OC_BYPASS

or the local zone sensor with Timed Override Cancel request is received. If nciBypassTime is set to zero, it disables the OC_BYPASS enumeration for nviOccManCmd and nviOccSchedule. The human interface displays "Occupied TOV" when placed in bypass by a local zone senor with Timed Override On button and "Occupied" when placed in bypass by nviOccManCmd, nviOccSchedule, or nviOccSensor.

See nvoEffectOccup for a complete description of how unit occupancy is determined.

nviOccSchedule is overridden when nviApplicMode or nviHeatCool (SCC) is set to HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL.

For IntelliPak products, the values 4 through 254 are manufacturer-defined to be OC_NUL.

Structure Definition

Description	req/opt	Type	Range	Invalid Value
current state	required	U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 3 = OC_STANDBY 2, 4 to 255 = OC_NUL	FF = 255 = OC_NUL (value not available)
next state	optional	U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 3 = OC_STANDBY 2, 4 to 255 = OC_NUL	FF = 255 = OC_NUL (value not available)
time to next state	optional	SNVT_time_min (U16)	0 to 65,534 minutes	0000 minutes (disabled)

note: Highlighted items are **NOT** used by the controller and have not affect on its operation. They are still present and can be written to and polled.

Occupancy Sensor Input, nviOccSensor

network input SNVT_occupancy nviOccSensor; SCC profile

Used to indicate the presence of occupants in the controlled space. This input is used in conjunction with nviOccSchedule and nviOccManCmd (if installed) to determine the effective occupancy mode. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Refer to Table 24, p. 84, Effect of Occupancy Commands on the Controller for more details on how nviOccSensor is utilized. Default service type = unacknowledged.

For IntelliPak products, there is no time-out for nviOccManCmd, it is not heartbeated, and the value is not preserved when power is lost (it is always initialized to OCC_NUL on power-up.) nviOccManCmd enumerations of OC_UNOCCUPIED and OC_STANDBY can be bypassed. Pressing the zone sensor module Timed Override On button (if installed) can change the effective occupancy from unoccupied to standby or bypass. The bypass timer is set to the value in nciBypassTime whenever nviOccManCmd equals OC_BYPASS or the local zone sensor Timed Override On request is received. After the bypass timer is set to nciBypassTime, the controller begins counting down to zero. The bypass timer is cleared to zero whenever nviOccManCmd does not equal OC_BYPASS or the local zone sensor with Timed Override Cancel request is received. If nciBypassTime is set to zero, it disables the OC_BYPASS enumeration for nviOccManCmd and nviOccSchedule. The human interface displays "Occupied TOV" when placed in bypass by a local zone senor with Timed Override On button and "Occupied" when placed in bypass by nviOccManCmd, nviOccSchedule, or nviOccSensor.

See nvoEffectOccup for a complete description of how unit occupancy is determined.

nviOccSensor is overridden when nviApplicMode or nviHeatCool (SCC) is set to

HVAC_MRNG_WRMUP, HVAC_NIGHT_PURGE, or HVAC_PRE_COOL.

Type	Range	Invalid Value
U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 to 255 = OC_NUL	255 = OC_NUL (value not available)

Outdoor Air Humidity Input, nviOutdoorRH

network input SNVT_lev_percent nviOutdoorRH; SCC and DAC profile

The outdoor air humidity in percent. 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. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For IntelliPak products, the outdoor air humidity input is limited to 10 - 90%.

Range, 10% to 90%	Invalid Value, 0x7FFF = 163.835%

Outdoor Air Temperature Input, nviOutdoorTemp

network input SNVT_temp_p nviOutdoorTemp; SCC and DAC profile

The outdoor air dry bulb temperature provided by either a network outdoor air temperature sensor or another controller. When an outdoor air temperature sensor is locally wired to the controller, the nviOutdoorTemp has priority if a valid value is present. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Range, -39.94 C to 93.38 C, -39.9 F to 200.1 F	Invalid Value, 0x7FFF = 327.67 C

Primary Cool Enable Input, nviPriCoolEnable

network input SNVT_switch nviPriCoolEnable; DAC profile (see nviComprEnable)

A structure used by a discharge air controller to enable or disable or limit mechanical cooling on the cool output. A space temp controller uses nviComprEnable. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For all IntelliPak CSC and FAU products and older IntelliPak RT products (LCI-I software version 13.x or lower and/or SCM software version 7.x or lower or MCM software version 14.x or lower), this is a binary enable/disable input. For newer IntelliPak RT products (LCI-I software version 14.x or higher and SCM software version 8.x or higher or MCM software version 15.x or higher), the percent enabled is also supported. Cooling can also be locked out by setting nviApplicMode to HVAC_FAN_ONLY (or HVAC_MRNG_WRMUP or HVAC_NIGHT_PURGE with LCI-I software version 14.x or higher.)

Valid Range

State	Value	Equivalent Percent	Cool Output Operation
0	any value	0.0%	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Enabled, 1 – 100%
1	200 to 255	100.0%	Enabled, no limit
0xFF (invalid value) or 2 to 127 or –128 to -2	00 (invalid value)	100.0%	Enabled, no limit (invalid)

Primary Heat Enable Input, nviPriHeatEnable

network input SNVT_switch nviPriHeatEnable; DAC profile (see nviAuxHeatEnable)

A structure used by a discharge air controller to enable or disable or limit mechanical heat on the heat output. A space temp controller uses nviAuxHeatEnable. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For all IntelliPak CSC and FAU products and older IntelliPak RT products (LCI-I software version 13.x or lower and/or HEAT software version 10.x or lower), this is a binary enable/disable input. For newer IntelliPak RT products (LCI-I software version 14.x or higher and HEAT software version 11.x or higher), the percent enabled is also supported. Heating can also be locked out by setting nviApplicMode to HVAC_FAN_ONLY (or HVAC_NIGHT_PURGE or HVAC_PRE_COOL with LCI-I software version 14.x or higher.)

Valid Range

State	Value	Equivalent Percent	Heat Output Operation
0	any value	0.0%	Disabled
1	0	0.0%	Disabled
1	1 to 199	0.5 to 99.5%	Enabled, no limit
1	200 to 255	100.0%	Enabled, 1- 100%
0xFF (default) or 2 to 127 or -128 to -2	any value	100.0%	Enabled, no limit (invalid)

Status Request Input (response comes from Status Request Output), nviRequest

network input SNVT_obj_request nviRequest; Node profile

Provides the mechanism to request a particular mode for a particular object within a node. Invalid value will be adopted at power-up or until an update is received. Does not use the receive heartbeat function. Responses are set via nvoStatus. Default service type = unacknowledged.

Structure Definition

Description	Type	bytes	Range	Valid	Meaning	Invalid Value
object ID	U16	2	0 to 65535	0 1 2 3 to 65535	node object SCC object DAC object invalid	65535
object request	U08 enum	1	0 to 255	see below	see below	255
	Length	3				

Object Request field enumeration definition

enum	Object Request Mode	Meaning	Controller Interpretation
0	RQ_NORMAL	enable object and remove override	report object status
1	RQ_DISABLED	disable object	ignore object request, invalid request
2	RQ_UPDATE_STATUS	just report object status	report object status
3	RQ_SELF_TEST	perform object self test	ignore object request, invalid request
4	RQ_UPDATE_ALARM	update alarm status	ignore object request, invalid request
5	RQ_REPORT_MASK	report status bit mask	report status bit mask
6	RQ_OVERRIDE	override object	ignore object request, invalid request
7	RQ_ENABLE	enable object	ignore object request, invalid request
8	RQ_RMV_OVERRIDE	remove object override	ignore object request, invalid request
9	RQ_CLEAR_STATUS	clear object status	report object status
10	RQ_CLEAR_ALARM	clear object alarm	ignore object request, invalid request
11	RQ_ALARM_NOTIFY_ENABLED	enable alarm notification	ignore object request, invalid request
12	RQ_ALARM_NOTIFY_DISABLED	disable alarm notification	ignore object request, invalid request
13	RQ_MANUAL_CTRL	enable object for manual control	ignore object request, invalid request
14	RQ_REMOTE_CTRL	enable object for remote control	ignore object request, invalid request
15	RQ_PROGRAM	enable programming of special configuration properties	ignore object request, invalid request
16	RQ_CLEAR_RESET	clear reset notification flag	ignore object request, invalid request
17	RQ_RESET	execute reset sequence of object	ignore object request, invalid request
18 to 255	RQ_NUL	value not available	ignore object request, invalid request

note: Highlighted requests are **NOT** supported by the controller. These requests will generate an nvoStatus transmission with the invalid_request bit set.

Table 20. Node Object Behavior in Response to Object Request

Request Code	Node Object Behavior
normal	The Request does not change the state of the object. The Status of the object is sent via nvoStatus. See nciApplication for a description of how to determine the unit type and which profile is supported.
update status	Status of the node object is sent via nvoStatus. The status bits of the node object (with the exception of invalid_request and invalid_id) are defined to be the inclusive OR of the status bits of all the other objects in the node, SCC and DAC in this case.
report mask	Send a mask of supported status bits via nvoStatus. A one bit in the mask means that the node may set the corresponding bit in nvoStatus when the condition defined for that bit occurs. A zero means that the bit will never be set by the node.
clear status	No status bits cleared. Status of the object is sent via nvoStatus.
clear alarm	Clears most latching diagnostics. Re-sends automatically resetting diagnostics if no latching diagnostics are present.
NUL	Ignore object request.

Table 21. SCC and DAC Object Behavior in Response to Object Request

Request Code	SCC and DAC Object Behaviour (one of these will be out_of_service)
normal	The Request does not change the state of the object. The Status of the object is sent via nvoStatus. The out_of_service object sets the out_of_service and disabled bits. See nciApplication for a description of how to determine the unit type and which profile is supported.
update status	Status of the object is sent via nvoStatus. The out_of_service object sets the out_of_service and disabled bits.
report mask	Send a mask of supported status bits via nvoStatus. A one bit in the mask means that the node may set the corresponding bit in nvoStatus when the condition defined for that bit occurs. A zero means that the bit will never be set by the node. The out_of_service object sets the out_of_service and disabled bits.
clear status	No status cleared. Status of the object is sent via nvoStatus. The out_of_service object sets the out_of_service and disabled bits.
clear alarm	Clears most latching diagnostics. Re-sends automatically resetting diagnostics if no latching diagnostics are present.
NUL	Ignore object request.

Temperature Setpoint Input (absolute), nviSetpoint

network input SNVT_temp_p nviSetpoint; SCC profile

Used to allow the space setpoints for the occupied and standby modes to be changed. If nviSetpoint, nviSetptOffSet and/or nviSetptShift are used together, the result on the effective setpoints is additive. Default value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Refer to Table 47, p. 113, Space Setpoint Arbitration, for more details on how nviSetpoint is utilized by IntelliPak products.

Range, 10°C to 35°C, 50°F to 95°F	Default, 0x7FFF = 327.67°C	Invalid Value, 0x7FFF = 327.67°C

Setpoint Offset Input, nviSetptOffset

network input SNVT_temp_p nviSetptOffset; SCC profile

Used to shift the effective occupied and standby temperature setpoints. All occupied and standby setpoints will be shifted upward (+) or downward (-) by the value of nviSetptOffset. If nviSetpoint, nviSetptOffSet and/or nviSetptShift are used together, the result on the effective setpoints is additive.

Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Refer to Table 47, p. 113, Space Setpoint Arbitration, for more details on how nviSetptOffset is utilized by IntelliPak products.

Range, -10°C to +10°C, -18°F to 18°F	Invalid Value, 0x7FFF = 327.67°C

Setpoint Shift Input, nviSetptShift

network input SNVT_temp_setpt nviSetptShift; SCC profile

A structure used to shift the effective occupied, standby, and unoccupied setpoints upward (+) or downward (-) by the corresponding value of nviSetptShift. If nviSetpoint, nviSetptOffSet and/or nviSetptShift are used together, the result on the effective setpoints is additive.

Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Refer to Table 47, p. 113, Space Setpoint Arbitration, for more details on how nviSetptShift is utilized by IntelliPak products.

Structure Definition

Description	Type	Range	Invalid Value
occupied_cool	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C
standby_cool	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C
unoccupied_cool	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C
occupied_heat	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C
standby_heat	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C
unoccupied_heat	SNVT_temp_p	-10°C to +10°C, -18°F to 18°F	0x7FFF=+327.67°C

Space CO2 Sensor Input, nviSpaceCO2 [nviSpaceIAQ]

network input SNVT_ppm nviSpaceCO2; SCC and DACX profile

Used to measure the space CO2 in PPM. The unit can also have a locally wired CO2 sensor. When a local space CO2 value is available to the controller, the nviSpaceCO2 has priority if a valid value is present. Default value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Range, 50 to 2200 PPM	Default, 0xFFFF = 65,535 PPM	Invalid Value, 0xFFFF = 65,535 PPM

Space Dehumidification Setpoint Input, nviSpaceDehumSP

network input SNVT_lev_percent nviSpaceDehumSP; SCCX and DAC profile

Used to connect a network space dehumidification setpoint or network output from another controller. When a local space dehumidification setpoint is available to the controller, the nviSpaceDehumSP has priority if a valid value is present. Invalid value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Only IntelliPak FAU DAC products and IntelliPak Rooftop products with the dehumidification option utilize nviSpaceDehumSP, which is mapped to both the Occupied and Unoccupied Dehumidification Setpoints.

10% to 90% (FAU) 40% to 65% (RT)	0x7FFF = 163.835%

Space Humidification Setpoint Input, nviSpaceHumSP

network input SNVT_lev_percent nviSpaceHumSP; SCCX and DAC profile

Used to connect a network space humidity setpoint or network output from another controller. When a local space humidity setpoint is available to the controller, the nviSpaceHumSP has priority if a valid value is present. Default value will be adopted at power-up, until an update is received. Does not use the receive heartbeat function. Default service type = unacknowledged.

Only IntelliPak RT products with RTM software version 24.x or higher and LCI-I software version 14.x and higher utilize nviSpaceHumSP, which is mapped to both the Occupied and Unoccupied Humidification Setpoints, to control a binary output connected to a field-supplied humidification device (also refer to nviHumEnable and nviSpaceRH.

Range, 20% to 50%	Default, 0x7FFF = 163.835%	Invalid Value, 0x7FFF = 163.835%

Space Humidity Input, nviSpaceRH

network input SNVT_lev_percent nviSpaceRH; SCC and DAC profile

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. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

Range, 0% to 100% (FAU) 10% to 90% RT	Default, 0x7FFF = 163.835%	Invalid Value, 0x7FFF = 163.835%

Space Temperature Input, nviSpaceTemp

network input SNVT_temp_p nviSpaceTemp; SCC and DAC profile

Used to connect a network space temperature sensor or network output from another controller. If nviSpaceTemp has a valid value, it will have priority over a locally wired space temperature sensor. Invalid value will be adopted at power-up and in case of not receiving an update within the specified receive heartbeat time. Default service type = unacknowledged.

For IntelliPak products, nviSpaceTemp is utilized for occupied and unoccupied zone control, as well as morning warm up and daytime warm up. For IntelliPak Rooftop DAC products with the dehumidification option, it is also used for the Dehumidification Override Zone Temperature (critical zone).

Range, -39.94°C to 93.38°C, -39.9°F to 200.1°F	Invalid Value, 0x7FFF = 327.67°C

Network Variable Output Definitions

The network variable output definitions are listed alphabetically by the nvoName.

Alarm Message Text Output, nvoAlarmMessage

network output SNVT_str_asc nvoAlarmMessage; Node Extension profile

Used to communicate the diagnostics in the controller as they occur. See the section titled IntelliPak Alarms for more details on what nvoAlarmMessage sends. The format will be as follows: "s nnnnnnnnnnnnnnnnnnnnnnnnnnnnn"

s Indicates the severity of the diagnostic. There are five possibilities. There is an ASCII space between s and the first n.

- P = normal, last reset resulted from a power up
- 0 = normal, last reset was not from power up
- 1 = informational message (handle at next scheduled routine maintenance)
- 2 = service required (handle at normal rates during normal working hours)
- 3 = critical alarm (handle now, cost is no object)

n Represents 29 ASCII characters that form the human readable message. The last n must be null (0x00). Can be less than 29 n's, but not more.

For IntelliPak products, the language selected for transmitting nvoAlarmMessage may be different than the language selected for the human interface(s). Some messages transmitted by nvoAlarmMessage are not displayed as diagnostics at the human interface(s). See the note after the following table for more details.

Table 22. IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
	Normal	Normal	Normal	P	No	"P Normal" is required to be transmitted upon power up, before any current/active alarms to notify Tracer Summit that controller has power up reset all control data.	no	n/a
	Normal	Normal	Normal	0	No	No diagnostics present, no diagnostic bits set.	no	n/a
1	RTM Zone Temp Sensor Failure	Fallo sensor temp zona RTM	Defaut capt RTM temp zone	2	Yes	auto	yes	[0:6:0:7]
2	Supply Air Temp Sensor Fail	Fallo sensor temp air sum	Defaut capt temp air souffle	2	Yes	auto	yes	[0:6:0:6]
3	if unit type = RT or CSC RTM Aux Temp Sensor Failure else (FAU) SA Drying Temp Sensor Fail	Fallo sensor temp aux RTM	Fallo sensor temp secado	Defaut capt temp auxil. RTM	Defaut capt temp sechage RTM	2	Yes	auto
4	OA Temperature Sensor Fail	Fallo sensor temp AE	Defaut capt temp AE	2	Yes	auto	yes	[0:6:0:4]
5	Mode Input Failure	Fallo entrada modo	Defaut mode entree	1	No	auto	yes	[0:6:0:3]
6	Occ Zone Cool Setpoint Fail	Fallo ajuste enfr zona ocup	Defaut pt regl refr zone occ	2	Yes	auto	yes	[0:6:0:2]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
7	Occ Zone Heat Setpoint Fail	Fallo ajuste calef zona ocup	Defaut pt regl chal zone occ	2	Yes	auto	yes	[0:6:0:1]
8	Supply Air Press Sensor Fail	Fallo sensor presion air sum	Defaut capt press air alim	2	Yes	auto	yes	[0:6:0:0]
9	OA Humidity Sensor Failure	Fallo sensor humedad AE	Defaut capt humidite AE	2	Yes	auto	yes	[0:6:1:7]
10	Emergency Stop	Parada emergencia	Arret d'urgence	2	Yes	manual	yes	[0:6:1:6]
11	Supply Fan Failure	Fallo vent sum	Defaut vent soufflage	2	Yes	manual	yes	[0:6:1:5]
12	Exhaust/Return Fan Failure	Fallo vent descarga/ regreso	Defaut vent extraction/retour	2	Yes	manual	yes	[0:6:1:4]
13	Lvg Evap Temp Sensor - Ckt1	Sensor temp evap lvg-Cto 1	Capt temp evap lvg-Crt 1	2	Yes	auto	yes	[0:6:1:3]
14	Lvg Evap Temp Sensor - Ckt2	Sensor temp evap lvg-Cto 2	Capt temp evap lvg-Crt 2	2	Yes	auto	yes	[0:6:1:2]
15	Low Pressure Ctl Open - Ckt1	Ctrl pres baja abierto-Cto 1	Ctrl basse press ouvert-Crt1	2	Yes	manual	yes	[0:6:1:1]
16	Low Pressure Ctl Open - Ckt2	Ctrl pres baja abierto-Cto 2	Ctrl basse press ouvert-Crt2	2	Yes	manual	yes	[0:6:1:0]
17	Condenser Temp Sensor - Ckt1	Fallo sensor temp cond-Cto 1	Defaut capt temp cond-Crt 1	2	Yes	auto	yes	[0:6:2:7]
18	Condenser Temp Sensor - Ckt2	Fallo sensor temp cond-Cto 2	Defaut capt temp cond-Crt 2	2	Yes	auto	yes	[0:6:2:6]
19	Compressor Trip - Ckt1	Desconex comp - Cto 1	Disjonct compresseur - Crt 1	2	Yes	manual	yes	[0:6:2:5]
20	Compressor Trip - Ckt2	Desconex comp - Cto 2	Disjonct compresseur - Crt 2	2	Yes	manual	yes	[0:6:2:4]
21	HEAT Aux Temp Sensor Fail	Fallo sensor temp aux calef	Defaut capt temp auxil chaud	2	No	auto	yes	[0:6:2:3]
22	Low Air Temp Limit Trip	Desc lim inf temp aire	Decl limit inf temp air	2	Yes	manual	yes	[0:6:2:2]
23	Heat Failure	Fallo calor	Defaut chauffage	1	No	info	yes	[0:6:2:1]
24	Unocc Zone Cool Stpnt Fail	Fallo ajuste enfr zona desoc	Panne pt cons refr zone inoc	2	No	auto	yes	[0:6:2:0]
25	Unocc Zone Heat Stpnt Fail	Fallo ajuste cale zona desoc	Panne pt cons chal zone inoc	2	No	auto	yes	[0:6:3:7]
26	SA Duct Press Setpoint Fail	Fallo ajuste presion air sum	Panne pt cons press air alim	2	Yes	auto	yes	[0:6:3:6]
27	Space Pressure Setpoint Fail	Fallo ajuste presion espacio	Defaut pt cons press inter	2	No	auto	yes	[0:6:3:5]
28	Space Pressure Sensor Fail	Fallo sensor presion espacio	Defaut capt press inter	2	No	auto	yes	[0:6:3:4]
29	Return Air Temp Sensor Fail	Fallo sensor temp air retorn	Defaut capt temp air retour	2	Yes	auto	yes	[0:6:3:3]
30	if unit type = RT or CSC Return Air RH Sensor Failureelse (FAU) Zone Humidity Sensor Failure	Fallo sensor hum air retorno Fallo sensor humedad zona	Defaut capt humidite RA Defaut capt humidite zone	2	Yes	auto	yes	[0:6:3:2]
31	Auto - SA High Press Limit	Auto - limite pres est AS	Lim press stat AA reencl aut	2	Yes	manual	yes	[0:6:3:1]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Configi nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
32	Man - SA High Press Limit	Man - limite pres est AS	Lim press stat AA reencl man	2	Yes	auto	yes	[0:6:3:0]
33	SCM Communications Failure	Fallo comunicaciones SCM	Defaut communications SCM	2	Yes	auto	yes	[0:6:4:7]
34	MCM Communications Failure	Fallo comunicaciones MCM	Defaut communications MCM	2	Yes	auto	yes	[0:6:4:6]
35	HEAT Communications Failure	Fallo cominic modulo calef	Defaut communic mod chaud	2	Yes	auto	yes	[0:6:4:5]
36	ECEM Communications Failure	Fallo comunicaciones ECEM	Defaut communic ECEM	2	Yes	auto	yes	[0:6:4:4]
37	GBAS 0-5 VDC Comm Failure	Fallo com mod GBAS 0-5 VCC	Defaut comm mod GBAS 0-5 VCC	1	No	auto	yes	[0:6:4:3]
38	Comm5 I/F Module Comm Fail	Fallo com modulo LCI-I	LCI-I Echec Comm Module	2	Yes	This bit is set by the RTM when the RTM detects an IPC failure. The IPC failure might be intermittent. The LCI will transmit nvoAlarmMessage if this bit is set. (auto)	yes	[0:6:4:2]
39	BAS/Network Comm Fail	Fallo com BAS/Red	BAS/Reseau Echec Comm	2	Yes	The LCI sets TCI packet 2 byte 17 bit 0 and clears TCI packet 2 byte 17 bit 2 when all comm 5 failure criteria have been met. See below for requirements. RTM then sets this bit. (auto)	yes	[0:6:4:1]
40	NSB Panel Communication Fail	Fallo com panel NSB	Defaut comm coffret NSB	1	No	auto	yes	[0:6:4:0]
41	RTM EEPROM Failure	Error almac datos modulo RTM	Defaut EEPROM RTM	1	No	info	yes	[0:6:5:7]
42	Unit HI Communications Fail	Fallo com unidad HI	Defaut comm avec unite IH	1	No	auto	yes	[0:6:5:6]
43	VOM Communications Failure	Fallo comunicaciones VOM	Defaut communic VOM	2	No	auto	yes	[0:6:5:5]
44	Compressor Contact Fail-Ckt1	Fallo contactor comp - Cto 1	Defaut contacteur comp-Crt 1	2	Yes	manual	yes	[0:6:5:4]
45	Compressor Contact Fail-Ckt2	Fallo contactor comp - Cto 2	Defaut contacteur comp-Crt 2	2	Yes	manual	yes	[0:6:5:3]
46	SA Temp Cool Setpoint Fail	Fallo ajuste enfr temp AS	Defaut pt regl refr air alim	2	Yes	auto	yes	[0:6:5:2]
47	SA Temp Heat Setpoint Fail	Fallo ajuste cale temp AS	Defaut pt regl chal air alim	2	Yes	auto	yes	[0:6:5:1]
48	Dirty Filter	Filtro sucio	Filtre sale	1	No	info	no	[0:6:5:0]
49	NSB Zone Temp Sensor Fail	Fallo sensor temp zona NSB	Defaut capt temp zone NSB	1	No	auto	yes	[0:6:6:7]
50	VOM Mode A Active	Ventilacion anulacion Modo A	Annulation vent mode A	1	No	info	yes	[0:6:6:6]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
51	VOM Mode B Active	Ventilacion anulacion Modo B	Annulation vent mode B	1	No	info	yes	[0:6:6:5]
52	VOM Mode C Active	Ventilacion anulacion Modo C	Annulation vent mode C	1	No	info	yes	[0:6:6:4]
53	VOM Mode D Active	Ventilacion anulacion Modo D	Annulation vent mode D	1	No	info	yes	[0:6:6:3]
54	VOM Mode E Active	Ventilacion anulacion Modo E	Annulation vent mode E	1	No	info	yes	[0:6:6:2]
55	CO2 Sensor Failure	Fallo sensor CO2	Defaut capteur CO2	2	Yes	auto	yes	[0:6:6:1]
56				n/a	No	no msg - internal flag	no	[0:6:6:0]
57	VCM Aux Temp Sensor Failure	Fallo sensor aux temp VCM	Defaut capt temp aux VCM	1	No	auto	yes	[0:6:7:7]
58	Blocked Air Return	Aire retorno bloqueado	Retour air bloque	1	No	manual	yes	[0:6:7:6]
59	If RT1, CSC or FAU: Velocity Press Sensor Fail If RT2: Vel Press Sensor (Rear) Fail	Fallo sensor pres velocidad Fallo sensor (trasero) veloci	Defaut capt press vitesse Defaut capt (arrière) vitesse	2	No	auto	yes	[0:6:7:5]
60	VCM Communications Failure	Fallo comunicaciones VCM	Defaut communications VCM	2	No	auto	yes	[0:6:7:4]
61	WSM Communications Failure	Fallo comunicaciones WSM	Defaut communications WSM	2	Yes	auto	yes	[0:6:7:3]
62	Compressor Trip - Ckt 3	Desconex comp - Cto 3	Disjonct compresseur - Crt 3	2	Yes	auto	yes	[0:6:7:2]
63	Compressor Trip - Ckt 4	Desconex comp - Cto 4	Disjonct compresseur - Crt 4	2	Yes	auto	yes	[0:6:7:1]
64	Exh Fan VFD Bypass Enabled	Deriv AFV vent descar activa	Derv EVF vent extrac active	1	No	auto	yes	[0:6:7:0]
65	Cond Temp Sensor Fail - Ckt3	Fallo sensor temp cond-Cto 3	Defaut capt temp cond-Crt 3	2	Yes	auto	yes	[0:27:8:7]
66	Cond Temp Sensor Fail - Ckt4	Fallo sensor temp cond-Cto 4	Defaut capt temp cond-Crt 4	2	Yes	auto	yes	[0:27:8:6]
67	Ent Cond Wtr Tmp Sensor Fail	Fallo sensor agua cond ent	Panne capt temp eau cond ent	2	Yes	auto	yes	[0:27:8:5]
68	WSM MA Temp Sensor Failure	Fallo sensor temp air mezcla	Defaut capt temp air mel WSM	2	No	auto	yes	[0:27:8:4]
69	Enter Water Temp Sensor Fail	Fallo sensor temp agua ent	Defaut capt temp eau entree	2	Yes	auto	yes	[0:27:8:3]
70	Water Flow Failure	Fallo flujo agua	Defaut deb eau	2	No	auto	yes	[0:27:8:2]
71	Supply Fan VFD Bypass Enable	Deriv AFV vent sum activa	Derv EVF vent alim active	1	No	auto	yes	[0:27:8:1]
72	High CO2 Level	Nivel CO2 alto	Niv CO2 eleve	2	Yes	auto	yes	[0:27:8:0]
73	Low Pressure Ctl Open - Ckt4	Ctrl presion baja abi-Cto 4	Ctrl basse press ouvert-Crt4	2	Yes	auto	yes	[0:27:9:7]
74	Low Pressure Ctl Open - Ckt3	Ctrl presion baja abi-Cto 3	Ctrl basse press ouvert-Crt3	2	Yes	auto	yes	[0:27:9:6]
75	Compressor Contact Fail-Ckt4	Fallo contactor comp - Cto 4	Defaut contacteur comp-Crt 4	2	Yes	manual	yes	[0:27:9:5]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
76	Compressor Contact Fail-Ckt3	Fallo contactor comp - Cto 3	Defaut contacteur comp-Crt 3	2	Yes	manual	yes	[0:27:9: 4]
77	Evap Temp Sensor Fail - Ckt4	Fallo sensor temp evap-Cto4	Defaut capt temp evap-Crt 4	2	Yes	auto	yes	[0:27:9: 3]
78	Evap Temp Sensor Fail - Ckt3	Fallo sensor temp evap-Cto3	Defaut capt temp evap-Crt 3	2	Yes	auto	yes	[0:27:9: 2]
79	Cond Press Sensor Fail-Ckt 2	Fallo sensor pren cond-Cto 2	Defaut capt press cond-Crt 2	2	Yes	auto	yes	[0:27:9: 1]
80	Cond Press Sensor Fail-Ckt 1	Fallo sensor pren cond-Cto 1	Defaut capt press cond-Crt 1	2	Yes	auto	yes	[0:27:9: 0]
81	RTM Zone Humidity Sensor Fail	Fallo sensor hum zona RTM	Defaut capt RTM hum zone	2	Yes	auto	yes	[0:27:10 :7]
82	Ent Evap Temp Sensor -Ckt1	Sensor temp evap ent-Cto 1	Capt temp evap ent-Crt 1	2	Yes	auto	yes	[0:27:10 :6]
83	Ent Evap Temp Sensor -Ckt2	Sensor temp evap ent-Cto 2	Capt temp evap ent-Crt 2	2	Yes	auto	yes	[0:27:10 :5]
84	Ent Evap Temp Sensor -Ckt3	Sensor temp evap ent-Cto 3	Capt temp evap ent-Crt 3	2	Yes	auto	yes	[0:27:10 :4]
85	Ent Evap Tmp Sensor - Ckt4	Sensor temp evap ent-Cto 4	Capt temp evap ent-Crt 4	2	Yes	auto	yes	[0:27:10 :3]
86	Morning Warmup Setpoint Fail	Fallo ajuste manana calienta	Defaut pt regl MWU	2	Yes	auto	yes	[0:27:10 :2]
87	Min Position Setpoint Fail	Fallo ajuste posicion minima	Defaut pt regl min position	2	Yes	auto	yes	[0:27:10 :1]
88	Econ Drybulb Setpoint Fail	Fallo ajuste econ drybulb	Defaut pt regl econ drybulb	2	Yes	auto	yes	[0:27:10 :0]
89	Min OA Flow Setpoint Fail	Fallo ajuste flujo min OA	Defaut pt regl flux min OA	2	Yes	auto	yes	[0:28:8: 7]
90	Recovery Lvg Exh Sensor Fail	Fallo sensor recuper lvg exh	Default capt retablis lvg exh	2	Yes	auto	yes	[0:28:8: 6]
91	Energy Recovery Wheel Fail	Fallo rueda recuper energía	Defaut retablis d'energie	2	Yes	auto	yes	[0:28:8: 5]
92	Cond Sump Level Fail	Fallo sumid cond nivel	Defaut sump niveau	2	Yes	auto	yes	[0:28:8: 4]
93	Cond Sump Min Level Fail	Fallo sumid cond nivel min	Defaut sump niveau min	2	Yes	auto	yes	[0:28:8: 3]
94	Cond Water Pump Fail (man)	Fallo bomba agua cond (man)	Default pompe cond eau (man)	2	Yes	auto	yes	[0:28:8: 2]
95	Cond Water Pump Fail (auto)	Fallo bomba agua cond (auto)	Default pompe cond eau (auto)	2	Yes	auto	yes	[0:28:8: 1]
96	Cond Water Temp Sensor Fail	Fallo sensor temp agua cond	Default capt temp cond eau	2	Yes	auto	yes	[0:28:8: 0]
97	Reheat Sat Cond Temp Sensor	Fallo sensor tmp cond rechauf	Defaut capt temp cond recal	2	Yes	auto	yes	[0:28:9: 7]
99	GBAS 0-10 VDC Comm Failure	Fallo com mod GBAS 0-10 VCC	Defaut comm mod GBAS 0-10 VCC	1	No	auto	yes	[0:28:9: 5]
100	If FAU: SA Drying Setpoint Failure If RT or RT2: Reheat Head Press High Limit	Fallo pto fjcion secdo AS Recal prensa límite alto	Defaut val sechage AA Rechauf presse haute limite	2	Yes	auto	yes	[0:28:9: 4]
101	Improper Airflow for Dehumid	Corriente aire impropia dehum	Flux air déplacé dehumid	2	Yes	manual	yes	[0:28:9: 3]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
102	SA Reheat Setpoint Failure	Fallo pto fjcion reclnt AS	Defaut val rechauf AA	2	Yes	auto	yes	[0:28:9:2]
103	Unocc Dehum Setpoint Fail	Fallo pto fjcion dehum dsoc	Defaut val dehum inocc	2	Yes	auto	yes	[0:28:9:1]
104	Occ Dehum Setpoint Failure	Fallo pto fjcion dehum ocp	Defaut val dehum occup	2	Yes	auto	yes	[0:28:9:0]
105	Unocc Humid Setpoint Fail	Fallo pto fjcion humid dsoc	Defaut val humid inocc	2	Yes	auto	yes	[0:28:10:7]
106	Occ Humid Setpoint Fail	Fallo pto fjcion humid ocp	Defaut val humid occup	2	Yes	auto	yes	[0:28:10:6]
107	MDM Communications Failure	Fallo comunicaciones MDM	Defaut communications MDM	2	Yes	auto	yes	[0:28:10:5]
109	Dirty Final Filter	Filtro final sucio	Filtre final sale	1	No	info	no	[0:28:10:3]
110	Dirty Recovery Prefilter	Filtro recuperacion sucio	Filtre retablissement sale	1	No	info	no	[0:28:10:2]
112	Vel Press Sensor (Front) Fail	Sensor pres (frente) vel	Capt press (devant) vel	2	Yes	auto	yes	[0:28:10:0]
113	High Superheat - Ckt 1	Sobrecalente alto - Cto 1	Haute surchauffe - Crt 1	2	Yes	info	yes	[0:29:8:7]
114	Low Refrigerant Charge Ckt 1	Carga refrigerante baja Cto 1	Charge basse refrig Crt 1	2	Yes	manual	yes	[0:29:8:6]
115	High Superheat - Ckt 2	Sobrecalente alto - Cto 2	Haute surchauffe - Crt 2	2	Yes	info	yes	[0:29:8:5]
116	Low Refrigerant Charge Ckt 2	Carga refrigerante baja Cto 2	Charge basse refrig Crt 2	2	Yes	manual	yes	[0:29:8:4]
117	High Superheat - Ckt 3	Sobrecalente alto - Cto 3	Haute surchauffe - Crt 3	2	Yes	info	yes	[0:29:8:3]
118	Low Refrigerant Charge Ckt 3	Carga refrigerante baja Cto 3	Charge basse refrig Crt 3	2	Yes	manual	yes	[0:29:8:2]
119	High Superheat - Ckt 4	Sobrecalente alto - Cto 4	Haute surchauffe - Crt 4	2	Yes	info	yes	[0:29:8:1]
120	Low Refrigerant Charge Ckt 4	Carga refrigerante baja Cto 4	Charge basse refrig Crt 4	2	Yes	manual	yes	[0:29:8:0]
122	MPM Communications Failure	Fallo comunicaciones MPM	Defaut communications MPM	2	Yes	auto	yes	[0:29:9:6]
123	TPM Communications Failure	Fallo comunicaciones TPM	Defaut communications TPM	2	Yes	auto	yes	[0:29:9:5]
124	Return Plenum Press Sensor	Fallo sensor presion regreso	Defaut capt press retour	2	Yes	auto	yes	[0:29:9:4]
125	Ret Press High Limit (Man)	Vuelva prensa límite alto man	Ret presse haute limite man	2	Yes	manual	yes	[0:29:9:3]
126	Ret Press High Limit (Auto)	Vuelva prensa límite alto auto	Ret presse haute limite auto	2	Yes	auto	yes	[0:29:9:2]
245	Invalid Unit Configuration	Config Invalida de la Unidad	Config d'unite invalide	1	No	if Unit_State [0:18:2] = 1 = check config.	yes	[0:18:2]

Table 22. (continued) IntelliPak LCI-I nvoAlarmMessage diagnostic summary

IPC Index #	NvoAlarmMessage text (English)	NvoAlarmMessage text (Spanish)	NvoAlarmMessage text (French)	Trane Alarm Level	Config nci Device Config	Description	set alarm, novStatus, nvoUnit Status	IPC packet byte, bit
246	Maintenance Required	La conservacion Requirio	Maintenance exigee	1	No	Generated by the LCI.See the "Fan Run Hours" section of nvoTraneVar7 and nciPersonality2 for a complete description of this function.	no	n/a
247	Unit Communications Failure	Fallo comunicaciones unidad	Defaut communic avec unite	2	Yes	Generated by the LCI. This is IPC failure as detected by the LCI.- Only generated after having good IPC comm.- This message will be sent if the LCI does not receive any RTM tokens for 3 minutes.- The green status LED will flash, 0.25 sec ON, 2.00 sec OFF.- This is the initial state of the green status LED.	yes	n/a
253	Unit Stopped at Local HI	La unidad detuvo a local HI	Arret unite a local HI	1	No	Transmitted whenever the Local_HI_Command_Byte in the RTM is equal to 1 (Stop).	no	[0:6:18:0]
254	Unit Stopped at Remote HI	La unidad detuvo a remoto HI	Arret unite a distance HI	1	No	Transmitted whenever the Remote_HI_Command_Byte in the RTM is equal to 1 (Stop).	no	[0:6:19:0]
255	RTM External Stop	Parada externa RTM	Arret externe RTM	1	No	Transmitted whenever the External_Stop_Command bit in the RTM is set.	no	[0:17:18:7]

Note: *The following messages transmitted in nvoAlarmMessage are not diagnostics messages at the human interface(s). They were included for remote indication as to why a unit was not cooling or not running:*
Invalid Unit Configuration (indicated at top-level status screen)
Maintenance Required (Trane Summit only, Trane proprietary)
Unit Communications Failure (LCI has lost communications with the RTM)
Unit Stopped at Local HI (indicated at top-level status screen)
Unit Stopped at Remote HI (indicated at top-level status screen)
RTM External Stop (indicated at top-level status screen)

When Transmitted, significant change	**Update Rate,** no faster than configured minimum send time	**Default Service Type,** unacknowledged

Application Mode Output, nvoApplicMode

network output SNVT_hvac_mode nvoApplicMode; DAC profile

Used to control the mode of other controllers, such as a VAV box controller. Will typically send a value of HVAC_AUTO except in certain modes where an override of other controllers is required.

IntelliPak FAU products report HVAC_COOL when dehumidifying. IntelliPak DAC Rooftop products require full airflow during dehumidification and therefore report HVAC_MAX_HEAT, to drive VAV boxes wide open, instead of HVAC_DEHUMIDIFICATION. Refer to the Appendix, Table 44, p. 95 Effect of Application Mode and Heat/Cool Mode Unit Operation for more details on how nvoApplicMode is determined.

Range	Meaning	When Transmitted	Update Rate	Default Service Type
0 = HVAC_AUTO	fully automatic	significant change or heartbeat	no faster than config min send time send heartbeat time	unacknowledged
1 = HVAC_HEAT	heating only			
2 = HVAC_MRNG_WRMUP	Morning Warmup			
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, Mfr. Defined			
8 = HVAC_EMERG_HEAT				
9 = HVAC_FAN_ONLY	No Heat/Cool Functions Operate			
10 = HVAC_FREE_COOL				
11 = HVAC_ICE				
12 = HVAC_MAX_HEAT	maximum flow heating			
13 = HVAC_ECONOMY				
14 = HVAC_DEHUMIDIFICATION				
15 = HVAC_CALIBRATE				
255 = HVAC_NUL	invalid			

Note: Highlighed items are not sent by the controller.

Building Static Pressure Output, nvoBldgStatPress

network output SNVT_press_p nvoBldgStatPress; SCCX and DAC profile

Used for monitoring the current value of building static pressure that the controller is using.

IntelliPak products must have the 100% power exhaust with Statitrac option for nvoBldgStatPress to be valid.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-167 Pa to 167 Pa -0.67 to 0.67 inches WC	0x7FFF = 32,767 Pa	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Cluster Configuration, nvoClusterConfig

network input config master_slave_t nvoClusterConfig; Node Ex profile

Used to indicate the current cluster configuration of the controller. Typically reported to a supervisory controller or another controller. May be used by a service tool to determine cluster configuration.

For IntelliPak products, the enumerations in the range 15 to 254 and MSC_NUL are manufacturer-defined to be the same as MSC_UNKNOWN.

Valid Range - The following cluster configuration types can be selected.

Range	Meaning	When Transmitted	Update Rate	Default Service Type
0 = MSC_UNKNOWN	Unit's cluster status is unknown	significant change	no faster than config	unacknowledged
1 = MSC_SLAVE	Unit is a slave in a cluster		min send time	
2 = MSC_MASTER	Unit is a master in a cluster			
3 to 254	unused (invalid)			
0xFF = MSC_NUL	invalid			

Condenser Capacity Output, nvoCondCap

network output SNVT_lev_percent nvoCondCap; SCCX and DAC profile

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

For IntelliPak CSC products with the water-cooled condenser option, nvoCondCap reflects the condenser water valve status. For all other IntelliPak products (including Intellipak Rooftop products with the evaporative condensing option), nvoCondCap reflects the condenser fan status.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.00%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Condenser Water Flow Output, nvoCWFlow

network output SNVT_switch nvoCWFlow; SCCX and DAC profile

Transmits the current status of the condenser water flow sensor for monitoring.

Only IntelliPak products with a water-cooled or evaporative condenser will transmit nvoCWFlow. For products with an evaporative condenser, nvoCWFlow indicates the state of the sump fill valve.

Valid Range

State	Value	Equivalent Percent	Condenser Water Flow Status
0	0	0%	No Flow
1	200	100%	Flow
0xFF	0	n/a	Invalid or Not Installed

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Condenser Water Pump Output, nvoCWPump

network output SNVT_switch nvoCWPump; SCCX and DAC profile

Transmits the current state of the Condenser Water Pump output for monitoring or control.

Only IntelliPak products with a water-cooled or evaporative condenser and/or a water-side economizer will transmit nvoCWPump. For products with an evaporative condenser, nvoCWPump indicates indicates if the sump pump is active (proved.)

Valid Range

State	Value	Equivalent Percent	Condenser Water Pump Status
0	n/a	0%	Pump Off
1	200	100%	Pump On
0xFF	0	n/a	Invalid or Not Installed

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Condenser Water Temperature Output, nvoCWTemp

network output SNVT_temp_p nvoCWTemp; SCCX and DAC profile

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.

Only IntelliPak products with a water-cooled or an evaporative condenser and/or water-side economizer will transmit nvoCWTemp. For IntelliPak products with an evaporative condenser, nvoCWTemp indicates the temperature of the sump water.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to -93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Discharge Air Dewpoint Temperature Output, nvoDADewPoint

network output SNVT_temp_p nvoDADewPoint; DAC profile

Indicates the current value of the discharge air dewpoint temperature.

Only IntelliPak FAU products transmit nvoDADewPoint.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.96°C to -93.33°C -39.93°F to 200°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Discharge Air Reheat Setpoint Output, nvoDAReheatSP

network output SNVT_temp_p nvoDAReheatSP; SCCX and DACX profile

This output network variable indicates the current value of the discharge air reheat setpoint in C.

Only IntelliPak FAU products and IntelliPak Rooftop products with the dehumidification option transmit nvoDAReheatSP.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
8.89°C to 48.89°C (FAU) 48°F to 120°F (FAU) 15.55°C to 32.22°C (RT) 60°F to 90°F (RT)	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Dehumidification Status Output, nvoDehumidifier

network output SNVT_switch nvoDehumidifier; SCCX and DAC profile

Reflects the current status of dehumidification control for monitoring.

IntelliPak FAU products transmit nvoDehumidifier and it is manufacturer-defined to be a binary enabled (200%) or disabled (0%) decision. IntelliPak Rooftop products with the modulating dehumidification option transmit nvoDehumidifier and report 0-100% capacity.

Valid Range

State	Value	Equivalent Percent	Dehumidification Status
0	0	0%	Disabled
1	200	0.5% to 100%	Enabled and Active
0xFF	0	0%	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Discharge Air Temperature Output, nvoDischAirTemp

network output SNVT_temp_p nvoDischAirTemp; SCC and DAC profile

Used to monitor the unit discharge air temperature.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.96°C to 93.33°C -39.93°F to 200°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Duct Static Pressure Output, nvoDuctStatPress

network output SNVT_press_p nvoDuctStatPress; DAC profile

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.

IntelliPak FAU products have a constant volume airflow and do not control duct static pressure.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0 Pa to 1245 Pa 0 to 5 inches WC (FAU, CSC, RT1) 0 to 1990 Pa 0 to 7.99 iwc (RT2)	0x7FFF = 32,767 Pa	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Economizer Enabled Output, nvoEconEnabled

network output SNVT_switch nvoEconEnabled; DAC profile (see SCCX and DACX nvoTraneVar7)

A structure used to report the current Enable/Disable status of the discharge air controller economizer. A space temp controller uses nvoTraneVar7. See the spec for a complete description of when the economizer is enabled and disabled.

nvoEconEnabled is the enable/disable status of the economizer. It is defined in the profile as "binary". If the economizer is enabled, it reports (1, 200). If the economizer is disabled, it reports (0,

0). If there is no economizer, it reports (0xFF, 0). Commentary: It does not match nvoUnitStatus.econ_output. It does not show position in percent.

IntelliPak products can have both an air-side economizer and a water-side economizer. Either or both can be enabled or disabled independent of the other. If only the air-side or only the water-side economizer is installed then the status of that economizer is reported. If both air-side and water-side economizers are installed, the status of the water-side economizer is reported. IntelliPak Rooftop products that have a 0-25% motorized OA damper always report disabled.

Valid Range

State	Value	Equivalent Percent	Economizer Status
0	any	0%	Disabled
1	200	100%	Enabled
0xFF	any	n/a	Invalid or Not Installed

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Discharge Dewpoint Setpoint Output, nvoEffDADewPtSP

network output SNVT_temp_p nvoEffDADewPtSP; DAC profile

Used to monitor the effective discharge air dewpoint setpoint that the Discharge Air Controller is using for control.

Only IntelliPak FAU products transmit nvoEffDADewPtSP.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
7.22°C to 23.89°C 45°F to 75°F	0x7FFF = 327.67°C	significant change or bound heartbeat	no faster than configured minimum send time	unacknowledged

Effective Discharge Air Temperature Setpoint Output, nvoEffDATempSP

network output SNVT_temp_p nvoEffDATempSP; DAC profile

Used to monitor the effective discharge air temperature setpoint that the controller is using for control. It may come from nviDAHtSP, nviDAClSP, nciDAHtSP, nciDAClSP, or a locally wired setpoint input.

All IntelliPak products report the currently or last utilized cooling or heating setpoint. IntelliPak Rooftop products with the dehumidification option report the Active Supply Air Reheat Setpoint during dehumidification. IntelliPak FAU products in drying mode report the Active Supply Air Reheat Setpoint (minus the Primary Heat Reheat Setpoint Suppression if the primary heat reheat is active.)

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
4.44°C to 60°C 40°F to 140°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Duct Static Pressure Setpoint Output, nvoEffDuctStatSP

network output SNVT_press_p nvoEffDuctStatSP; DAC profile

Used to monitor the effective duct static pressure setpoint that the controller is using for control. This value may come from nviDuctStaticSP, nciDuctStatSP, or a locally wired setpoint input.

IntelliPak FAU products have a constant volume airflow and do not control duct static pressure.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
249 Pa to 1072 Pa 1.0 to 4.3 iwc (RT1, CSC, FAU) 174 Pa to 1270 Pa 0.7 to 5.1 iwc (RT2)	0x7FFF = 32,767 Pa	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Occupancy Output, nvoEffectOccup

network output SNVT_occupancy nvoEffectOccup; SCC and DAC profile

Used to indicate the current occupancy of the controller. This information is typically reported to a supervisory controller, or provided to another controller to coordinate the operation of multiple units. The occupancy mode is determined by a combination of optional input network variables and logic in the controller, as defined by the controller manufacturer. Network variables which can impact the occupancy state of the controller are nviOccManCmd (SCC/DAC), nviOccSchedule (SCC/DAC), and nviOccSensor (SCC only). The unit is always in one of the four possible occupancy states. Refer to Table 24, p. 84, Effect of Occupancy Commands on the Controller for more details on how nvoEffectOccup is utilized.

For IntelliPak products, there is no time-out for nviOccManCmd, it is not heartbeated, and the value is not preserved when power is lost (it is always initialized to OCC_NUL on power-up.) nviOccManCmd enumerations of OC_UNOCCUPIED and OC_STANDBY can be bypassed. Pressing the zone sensor module Timed Override On button (if installed) for less than 8 seconds can change the effective occupancy from unoccupied or standby to bypass. The bypass timer is set to the value in nciBypassTime whenever nviOccManCmd equals OC_BYPASS or the local zone sensor Timed Override On request is received. After the bypass timer is set to nciBypassTime, the controller begins counting down to zero. The bypass timer is cleared to zero whenever nviOccManCmd does not equal OC_BYPASS or the local zone sensor with Timed Override Cancel request is received. If nciBypassTime is set to zero, it disables the OC_BYPASS enumeration for nviOccManCmd and nviOccSchedule. If nciBypassTime is set to zero, it does not disable the TOV Request or TOV Cancel Request in nvoTraneVar7. The human interface displays "Occupied TOV" when placed in bypass by a local zone senor with Timed Override On button and "Occupied" when placed in bypass by nviOccManCmd, nviOccSchedule, or nviOccSensor. Pressing the zone sensor module Timed Override On button for more than 8 seconds will cause the LCI-I controller to broadcast a Service Pin Message (Neuron ID and Program ID.)

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS 3 = OC_STANDBY 4 to 255 not used	always valid	significant change send heartbeat time	no faster than configured min send time send heartbeat time	unacknowledged

Effective Setpoint Output, nvoEffectSetpt

network output SNVT_temp_p nvoEffectSetpt; SCC profile

Used to monitor the effective space temperature setpoint which may depend on nciSetpoints, nvoEffectOccup, nviSetpoint, nviSetpointOffset, nviSetptShift, nciPersonality2, nvoHeatCool, and

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

Refer to Table 47, p. 113, Space Setpoint Arbitration, for more details.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
10.00°C to 32.33°C 50°F to 90°F	0x7FFF	significant change send heartbeat time	no faster than configured min send time send heartbeat time	unacknowledged

Effective Space Dehumidification Setpoint Output, nvoEffSpaceDHSP

network output SNVT_lev_percent nvoEffSpaceDHSP; SCCX and DAC profile

Reflects the effective Space High Limit Humidity Setpoint for monitoring.

Only IntelliPak FAU products and IntelliPak Rooftop products with the dehumidification option transmit nvoEffSpaceDHSP.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
10% to 90% (FAU) 40% to 65% (RT)	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Space Humidification Setpoint Output, nvoEffSpaceHumSP

network output SNVT_lev_percent nvoEffSpaceHumSP; SCCX and DAC profile

Reflects the effective Space Low Limit Humidity Setpoint for monitoring.

Only IntelliPak Rooftop products transmit nvoEffSpaceHumSP. These products have both occupied and unoccupied humidification setpoints. If humidification is disabled, the invalid value is transmitted.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
20% to 50%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Entering Water Temperature, nvoEnterWaterTmp

network output SNVT_temp_p nvoEnterWaterTmp; SCCX and DACX profile (formerly nvoTraneVar5)

Used to report the entering temperature of water used for heating or cooling by the controller.

Only IntelliPak CSC products with a water-cooled condenser and/or a water-side economizer transmit nvoEnterWaterTmp.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to 93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured min send time send heartbeat time	unacknowledged

Energy Recovery Exhaust Air Bypass Damper Output, nvoEREABPDamper

network output SNVT_lev_percent nvoEREABPDamper; SCCX and DACX profile

Reflects the current status of the Energy Recovery Exhaust Air Bypass Damper output for monitoring or control.

Only IntelliPak Rooftop products with the Energy Recovery option report nvoEREABPDamper.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Energy Recovery Frost Avoidance Status Output, nvoERFrostAvoid

network output SNVT_switch nvoERFrostAvoid; SCCX and DACX profile

Reflects the current status of the Energy Recovery Frost Avoidance function for monitoring. When the Energy Recovery Exhaust temperature falls below the frost avoidance setpoint, the controller initiates a frost avoidance sequence (modulates the outside air bypass damper to maintain setpoint, and/or energizes a preheater.)

Only IntelliPak Rooftop products with the Energy Recovery option report nvoERFrostAvoid and only reflects the enabled or disabled state of the frost avoidance function.

Valid Range

State	Value	Equivalent Percent	Frost Avoidance Status
0	n/a	0%	Disabled (inactive)
1	0	0%	Disabled (inactive)
1	200	100%	Enabled (active)
1	201-255	n/a	Invalid
0xFF	n/a	n/a	Invalid or Not Installed

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Energy Recovery Leaving Exhaust Temperature, nvoERLvgExhTemp

network output SNVT_temp_p nvoERLvgExhTemp; SCCX and DACX profile

Used to report the Energy Recovery Leaving Exhaust temperature used by the controller.

Only IntelliPak Rooftop products with the Energy Recovery option transmit nvoERLvgExhTemp.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to 93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Energy Recovery Outside Air Bypass Damper Output, nvoEROABPDamper

network output SNVT_lev_percent nvoEROABPDamper; SCCX and DACX profile

Reflects the current status of the Energy Recovery Outside Air Bypass Damper output for monitoring or control.

Only IntelliPak Rooftop products with the Energy Recovery option transmit nvoEROABPDamper.

Valid Range

State	Value	Equivalent Percent	Preheat Status
0	n/a	n/a	Off (inactive)
1	0	0.0%	Off (inactive)
1	1 to 200	0.5 to 100%	On and Active
0xFF	n/a	n/a	Invalid or Not Installed

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Energy Recovery Status Output, nvoERStatus

network output SNVT_switch nvoERStatus; SCCX or DACX profile

A structure used to report the current status of the Energy Recovery output for monitoring.

Only IntelliPak Rooftop products with the Energy Recovery option transmit nvoERStatus and the Value field always reports 0% or 100%.

Valid Range

State	Value	Equivalent Percent	Energy Recovery Status
0	n/a	0%	Off (inactive)
1	0	0%	Off (inactive)
1	1 to 200	0.5 to 100%	On and Active
0xFF	n/a	n/a	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Exhaust Damper Control Output, nvoExhDamper

network output SNVT_lev_percent nvoExhDamper; SCCX and DAC profile

Reflects the current status of the Exhaust Damper output for monitoring or control.

x = do not care	0x7FFF (invalid)

Exhaust Fan On/Off Control Output, nvoExhFanOnOff

network output SNVT_switch nvoExhFanOnOff; SCCX and DAC profile

A structure used by a discharge air controller to control a communicating exhaust fan motor drive.

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% (note 2)	ON	0.5 to 99.5% (note 2)
1	200	100% (note 1)	ON	100% (note 1)
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Exhaust Fan Status Output, nvoExhFanStatus

network output SNVT_switch nvoExhFanStatus; SCCX and DAC profile (see SCCX and DACX nvoTraneVar7)

A structure used to report the current status of the exhaust fan.

For IntelliPak units that do not have Statitrac installed, when State is 1, Value will always be 0% or 100%.

Valid Range

State	Value	Equivalent Percent	Actual Fan State	Actual Fan Capacity
0	0	n/a	OFF	n/a
1	0	0.0%	OFF	n/a
1	1 to 199	.5 to 99.5% (note 1)	ON	.5 to 99.5% (note 1)
1	200	100%	ON	100%
0xFF	0	n/a	Invalid	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Fan Speed Output, nvoFanSpeed

network output SNVT_switch nvoFanSpeed; SCC profile (see nvoSupFanOnOff and nvoSupFanStatus)

A structure used by a space temp controller to report the current supply fan speed. A discharge air controller uses nvoSupFanOnOff and nvoSupFanStatus.

Valid Range

State	Value	Equivalent Percent	Actual or Requested Fan State	Actual or Requested Fan Speed
0	n/a	n/a	Off	n/a
1	0	0%	Off	0%
1	200	100%	On	High or 100%
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Heat/Cool Output, nvoHeatCool

network output SNVT_hvac_mode nvoHeatCool; SCC and DAC profile

Used to indicate the current heat/cool mode of the controller. Typically reported to a supervisory controller or another controller. May be used to coordinate the operation of multiple units.

See the description of the mode field of nvoUnitStatus for more details on how nvoHeatCool is determined. IntelliPak FAU products report HVAC_COOL during dehumidification and do not report HVAC_NIGHT_PURGE or HVAC_PRE_COOL. IntelliPak Rooftop products with the dehumidification option report HVAC_DEHUMDIFICATION during dehumidification.

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0 = HVAC_AUTO	always valid	significant change or heartbeat time	no faster than config min send time send heartbeat time	unacknowledged
1 = HVAC_HEAT				
2 = HVAC_MRNG_WRMUP				
3 = HVAC_COOL				
4 = HVAC_NIGHT_PURGE				
5 = HVAC_PRE_COOL				
6 = HVAC_OFF				
7 = HVAC_TEST				
8 = HVAC_EMERG_HEAT				
9 = HVAC_FAN_ONLY				
10 = HVAC_FREE_COOL				
11 = HVAC_ICE				
12 = HVAC_MAX_HEAT				
13 = HVAC_ECONOMY				
14 = HVAC_DEHUMIDIFICATION				
15 = HVAC_CALIBRATE				
0xFF = HVAC_NUL				

Note: Highlighted enumerations are not sent by the controller.

Primary Heat Output, nvoHeatPrimary

network output SNVT_lev_percent nvoHeatPrimary; SCC and DAC profile

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.).

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Secondary Heat Output, nvoHeatSecondary

network output SNVT_lev_percent nvoHeatSecondary; SCC and DACX profile

Reflects the current level of the secondary heat output (when present) or can be used to control a remote secondary heat source (valve, electric heat, etc.).

For IntelliPak FAU products and Intellipak Rooftop products with the dehumidification option, nvoHeatSecondary reports the active reheat capacity

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Humidification Status Output, nvoHumidifier

network output SNVT_lev_percent nvoHumidifier; SCC and DAC profile

Reflects the current level of the humidifier output for monitoring.

Only IntelliPak Rooftop products with RTM software version 24.x or higher and LCI-I software version 14.x and higher transmit nvoHumidifier. The humidification algorithm controls a binary output for a field-supplied humidifier and therefore nvoHumidifier always reports either 0% or 100%.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Local Condenser Water Temperature Output, nvoLocalCWTemp

network output SNVT_temp_p nvoLocalCWTemp; SCCX and DAC profile

Indicates the current value of a locally wired condenser water temperature sensor.

Only IntelliPak products with a water-cooled or an evaporative condenser transmit nvoLocalCWTemp. For IntelliPak products with an evaporative condenser, nvoLocalCWTemp indicates the temperature of the sump water.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to 93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Local Duct Static Pressure Output, nvoLocalDSPress

network output SNVT_press_p nvoLocalDSPress; DACX profile (see nvoDuctStatPress)

Used for monitoring the local duct static pressure sensor that the controller is using.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0 Pa to 1245 Pa 0 to 5 iwc (RT1, CSC, FAU) 0 Pa to 1990 Pa 0 to 7.99 iwc (RT2)	0x7FFF = 32,767 Pa	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Local Outdoor Air Humidity Output, nvoLocalOARH

network output SNVT_lev_percent nvoLocalOARH; DAC profile

Indicates the value of a locally wired Outdoor Air Relative Humidity sensor.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
10% to 100%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Local Outdoor Air Temperature Output, nvoLocalOATemp

network output SNVT_temp_p nvoLocalOATemp; DAC profile (see nvoOutdoorTemp)

Used to monitor the locally wired outdoor air temperature of a discharge air controller.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.96°C to 93.33°C -39.93°F to 200°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Local Space Temperature Output, nvoLocalSpaceTmp

network output SNVT_temp_p nvoLocalSpaceTmp;SCC profile

Value of hardwired input. Can be used for averaging or monitoring.

When a large area is to be controlled with multiple units the effective space temperature should be shared by all units to prevent unequal loading / fighting. This requires a method to average the temperatures near each unit. This variable also can provide a means to monitor local conditions if a communicated space temperature is being used. This is not intended as a way of using the hardwired input as a general purpose input when nviSpaceTemp is present.

For IntelliPak products, when nviSpaceTemp is invalid, nvoLocalSpaceTmp will equal one of the following values, in this order, based on sensor source assignments at the human interface:

1. Monitor Temperature Source
2. Morning Warm Up Temperature Source during Morning Warm Up
3. Unoccupied Zone Temperature Source during unoccupied mode
4. Occupied Zone Temperature Source
5. invalid.

If nviSpaceTemp is valid, the local sensor source becomes BAS/NETWORK and nvoLocalSpaceTmp will be invalid, unless a sensor source is assigned to Monitor Temperature Source at the human interface.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-15°C to 50°C 5°F to 122°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Master Slave Output 1, nvoMasterSlave1

network output nvoMasterSlave1; Product Extension profile

First of two outputs used by a master unit to control the slave unit(s) in a multi-unit cluster. Before a unit will become a master, nvoMasterSlave1 and nvoMasterSlave2 must be bound and nviMasterSlave1 and nviMasterSlave2 must be unbound. Once a unit is a master, all control data is sent to the slave unit(s) and nviMasterSlave1 and nviMasterSlave2 are ignored. All other NVIs and all NVOs are still processed as usual.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
see structure definition	see structure definition	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Master Slave Output 2, nvoMasterSlave2

network output nvoMasterSlave2; Product Extension profile

Second of two outputs used by a master unit to control the slave unit(s) in a multi-unit cluster. Before a unit will become a master, nvoMasterSlave1 and nvoMasterSlave2 must be bound and nviMasterSlave1 and nviMasterSlave2 must be unbound. Once a unit is a master, all control data is sent to the slave unit(s) and nviMasterSlave1 and nviMasterSlave2 are ignored. All other NVIs and all NVOs are still processed as usual.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
see structure definition	see structure definition	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Mixed Air Temperature Output, nvoMATemp

network output SNVT_temp_p nvoMATemp; SCCX and DAC profile (see nvoTraneVar7) (see nvoMixedAirTemp)

Used to monitor the mixed air temp being used by the controller. Also reported as part of the nvoTraneVar7 structure.

IntelliPak products with a Ventilation Control Module (VCM) and a customer-supplied sensor connected to the VCM Aux Temp input or IntelliPak CSC products with a water-side module (WSM) will transmit nvoMATemp.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to 93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Mixed Air Temperature Output, nvoMixedAirTemp

network output SNVT_temp_p nvoMixedAirTemp; SCC profile (see nvoTraneVar7) (see nvoMATemp)

Used to monitor the mixed air temp being used by the controller. Also reported as part of the nvoTraneVar7 structure.

IntelliPak products with a Ventilation Control Module (VCM) and a customer-supplied sensor connected to the VCM Aux Temp input or IntelliPak CSC products with a water-side module (WSM) will transmit nvoMixedAirTemp.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.94°C to 93.38°C -39.9°F to 200.1°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Occupancy Scheduler Output, nvoOccSchedule

network output SNVT_tod_event nvoOccSchedule; SCCx and DACx profile

A structure used to report the occupancy modes of the controller.

All IntelliPak products only support the current state field and reports OC NUL for the next state field and zero (0) for the time to next state field.

Structure Definition

Description	req/opt	Type	Range	Default
current state	required	U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS 3 = OC_STANDBY 4 to 255 = OC_NUL	255 = OC_NUL (value not available)
next state	optional	U08	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS 3 = OC_STANDBY 4 to 255 = OC_NUL	255 = OC_NUL (value not available)
time to next state	optional	SNVT_time_min (U16)	0 to 65,534 minutes	0 minutes (disabled)
Note: Highlighted items are NOT used by the controller. They will always be reported as invalid.				

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Damper Output, nvoOADamper

network output SNVT_lev_percent nvoOADamper; SCC and DAC profile

Reflects the current position of the outdoor air damper (if hardwired) or as a request to a remote outdoor air damper.

For IntelliPak FAU products, the outside air damper position will always be valid. For IntelliPak Rooftop and CSC products, the outside air damper position will only be valid if the unit has an economizer installed.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Dewpoint Output, nvoOADewpoint

network output SNVT_temp_p nvoOADewpoint; DACX profile

This output network variable indicates the current value of the outdoor air dewpoint temperature. This value can be measured or calculated.

Only IntelliPak FAU products transmit nvoOADewpoint

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-3.89°C to 29.44°C 25°F to 85°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Enthalpy Output, nvoOAEnthalpy

network output SNVT_enthalpy nvoOAEnthalpy; SCCX or DAC profile

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.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
23.26 to 81.41 Kilojoules/Kilogram 10 to 35 BTU/lb-m	0x7FFF = 327.67 Kilojoules/Kilogram	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Flow Output, nvoOAFlow

network output SNVT_flow nvoOAFlow; DAC profile

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

Only IntelliPak products with a Ventilation Control Module (VCM) transmit nvoOAFlow.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0 to 30,677 liters/sec	0xFFFF = 65,535 liters/sec	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Humidity Output, nvoOutdoorRH

network output SNVT_lev_percent nvoOutdoorRH; SCC and DAC profile

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

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
10% to 90.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Outdoor Air Temperature Output, nvoOutdoorTemp

network output SNVT_temp_p nvoOutdoorTemp; SCC and DAC profile

Used to monitor the outdoor air temperature being used by the controller. This value will reflect the network input nviOutdoorTemp (if valid) or the value from a locally wired sensor.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.96°C to 93.33°C -39.93°F to 200°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Return Air Temperature Output, nvoRATemp

network output SNVT_temp_p nvoRATemp; SCCX and DAC profile

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.

For IntelliPak products, nviRATemp is not supported, so nvoRATemp always reflects the sensor connected to the ECEM module, if it is valid. IntelliPak RT or CSC products with an air-side economizer and comparative enthalpy, or an IntelliPak FAU product with zone RH reference or the sensor is assigned to a function will transmit valid values for nvoRATemp.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-39.96°C to 93.33°C -39.93°F to 200°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Primary Cool Output, nvoCoolPrimary

network output SNVT_lev_percent nvoCoolPrimary; SCC and DAC profile

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

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Return Fan On/Off Control Output, nvoRetFanOnOff

network output SNVT_switch nvoRetFanOnOff; SCCX and DAC profile

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. The structure and definition of nvoRetFanOnOff is exactly the same as nvoRetFanStatus.

Only IntelliPak Rooftop products with the return fan option transmit nvoRetFanOnOff. For IntelliPak Rooftop products with a constant speed return fan option, nvoRetFanOnOff always report 0% or 100%. For IntelliPak Rooftop products with a variable speed return fan option, nvoRetFanOnOff always reports between 0% and 100%. If a VAV with IGV/VFD unit is configured without statitrac, nvoRetFanOnOff will report invalid (this is an invalid unit configuration.)

Valid Range

State	Value	Equivalent Percent	Actual or Requested Fan State	Actual or Requested Fan Speed
0	n/a	n/a	Off	n/a
1	0	0.0%	Off	0%
1	1 - 199	0.5 to 99.5%	On	0.5 to 99.5%
1	200	100%	On	100%
0xFF	n/a	n/a	Invalid	Invalid

Note: 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	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Return Fan Pressure Output, nvoRetFanPress

network output SNVT_press_p nvoRetFanPress; SCCX and DAC profile

Used for monitoring the local return fan pressure sensor that the controller is using.

Only IntelliPak Rooftop products with a variable speed return fan option transmit nvoRetFanPress and it reports the return plenum pressure.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-174 Pa to 872 Pa -0.7 to 3.5 inches WC	0x7FFF = 32,767 Pa	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Return Fan Status Output, nvoRetFanStatus

network output SNVT_switch nvoRetFanStatus; SCCX and DAC profile

A structure used to report the current return fan speed.

Only IntelliPak Rooftop products with the return fan option transmit nvoRetFanStatus. For IntelliPak Rooftop products with a constant speed return fan option, nvoRetFanStatus always reports 0% or 100%. For IntelliPak Rooftop products with a variable speed return fan option, nvoRetFanStatus always reports between 0% and 100%. If a VAV with IGV/VFD unit is configured without statitrac, nvoRetFanStatus will report invalid (this is an invalid unit configuration.)

Structure Definition

Description	Type	bytes	Range
value	U08	1	0 to 200 = return fan speed
state	S08	1	0 = return fan off, ignore value field 1 = return fan on, value field holds return fan speed 0xFF = return fan not present, ignore value field
	Length	2	

Discharge air controller, return fan

Control%	bop	State	Value	Equivalent Percent	Return Fan State	Return Fan Capacity
not running	off	0	0	0.0%	off	0.0%
0.0%	off	1	0	0.0%	off	0.0%
100%	on	1	200	100%	on	100%
not present	off	0xFF	200	100%	not present	100%

When Transmitted
significant change
send heartbeat time

Update Rate
no faster than configured minimum send time
send heartbeat time

Default Service Type
unacknowledged

Local Setpoint Output, nvoSetpoint

network output SNVT_temp_p nvoSetpoint; SCC profile

Used to monitor the locally wired space temperature setpoint. If this setpoint is not locally wired, the output will send the invalid value.

Refer to Table 47, p. 113, Space Setpoint Arbitration, for more details.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
10°C to 29.4°C 50°F to 85°F	0x7FFF = 327.67°C	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Space CO2 Sensor Output, nvoSpaceCO2

network output SNVT_ppm nvoSpaceCO2; SCC and DACX profile

Used to indicate the space CO2 concentration in ppm from a locally wired CO2 sensor.

Only IntelliPak products with a Ventilation Control Module (VCM) installed and CO2 Reset or Demand Controlled Ventilation enabled will transmit nvoSpaceCO2.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0, 50 to 2000 ppm	0xFFFF = 65,535	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Space Enthalpy Output, nvoSpaceEnthalpy

network output SNVT_enthalpy nvoSpaceEnthalpy; SCCX and DAC profile

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.

For IntelliPak products, nviSpaceEnthalpy is not supported, so nvoSpaceEnthalpy reports an LCI-I calculated value, using nvoSpaceRH and nvoSpaceTemp (if both are available.) nvoSpaceRH equals nviSpaceRH, if valid, the local space humidity or return air humidity, if available. nvoSpaceTemp equals nviSpaceTemp, if valid, or the local active space temperature, if available. Note that the local active space temperature may periodically change, based on the current unit mode and sensor source selections (see the section titled "Space Temperature Output Arbitration" for more information.) For accurately calculated enthalpy values, care must be taken by the installer to locate the active humidity and temperature sources in close proximity.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
20 to 100 K-Joules/Kg	0x7FFF = 327.67 K-Joules/Kg (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Space Humidity Output, nvoSpaceRH

network output SNVT_lev_percent nvoSpaceRH; SCC and DAC profile

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.

If nviSpaceRH is invalid, only IntelliPak products with the dehumidification option or the humidification sensor option or an air-side economizer and comparative enthalpy (ECEM module) or an IntelliPak FAU product with zone RH reference will transmit valid values for nvoSpaceRH. For IntelliPak Rooftop products, if both the dehumidificaion or humidification option and the comparative enthalpy options are present, the humidity sensor selected for humidity control source is used.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
0% to 100.0%	0x7FFF = 163.835% (not present)	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Effective Space Temperature Output, nvoSpaceTemp

network output SNVT_temp_p nvoSpaceTemp; SCC and DAC profile

Used to monitor the effective space temperature that the controller is using. If the input nviSpaceTemp has a valid value, this output will echo the value of the input. If a valid value for nviSpaceTemp does not exist, the locally wired sensor value is used. If neither value is available, the output will send the invalid value.

For IntelliPak products, if nviSpaceTemp is invalid, nvoSpaceTemp will equal one of the following values, in this order, based on sensor source assignments at the human interface:

6. Monitor Temperature Source
7. Occupied Zone Temperature Source (FAU units actively drying in occupied via primary heat reheat with reheat reset set to zone)
8. Unoccupied Zone Temperature Source (FAU units actively drying in unoccupied via primary heat reheat with reheat reset set to zone)
9. Morning Warm Up Temperature Source during Morning Warm Up

10. Daytime Warm Up Temperature Source during Daytime Warm Up (DAC units only)
11. Unoccupied Zone Temperature Source during unoccupied mode
12. Zone Reset Temperature Source (DAC units with cooling reset set to outside air or heating reset set to outside air or zone)
13. Occupied Zone Temperature Source (SCC units only)
14. invalid.

For IntelliPak FAU units, if Reset Type for SA Heating is set to "Zone and OA" the active reset type being used by the unit will be dynamic and based on environmental conditions. If the temperature sensor assigned to the Zone Reset function falls below the SA Heating Zone Reset Start Temp the Active Heating Reset Type will be set to "Zone" and nvoSpaceTemp will be set to the value of the zone temp sensor chosen for Zone Reset. Otherwise the Active Heating Reset Type reverts to "OA" and nvoSpaceTemp will be set invalid.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-15°C to 50°C 5°F to 122°F	0x7FFF = 327.67°F	significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Status Request Output (response to Status Request Input), nvoStatus

network output SNVT_obj_status nvoStatus; Node profile

This nvo is a list of bits fields that indicate the status of the objects in the node. Sent in response to nviRequest or poll or heartbeat. Poll does not update nvoStatus, you will not see a change in the alarm bit, for example. Only nviRequest and heartbeat update nvoStatus.

structure definition, 6 bytes

field	type	report mask	byte	bit	meaning
object id	U16		0, 1		0 = node object 1 = SCC object 2 = DAC object 3 to 65535 = undefined object
invalid_id	bit	0	2	7	1 means requested ID is not implemented in this node (mandatory)
invalid_request	bit	0	2	6	1 means request for unimplemented function (mandatory)
disabled	bit	1	2	5	1 means object disabled
out_of_limits	bit	0	2	4	1 means object exceeded alarm limits
open_circuit	bit	0	2	3	1 means open circuit detected
out_of_service	bit	1	2	2	1 means object not functional
mechanical_fault	bit	0	2	1	1 means mechanical fault detected
feedback_failure	bit	0	2	0	1 means feedback signal not received
over_range	bit	0	3	7	1 means max range exceeded
under_range	bit	0	3	6	1 means min range exceeded
electrical_fault	bit	0	3	5	1 means electrical fault detected
unable_to_measure	bit	0	3	4	1 means I/O line failure
comm_failure	bit	0	3	3	1 means network communications failure
fail_self_test	bit	0	3	2	1 means self-test failed

structure definition, 6 bytes (continued)

field	type	report mask	byte	bit	meaning
self_test_in_progress	bit	0	3	1	1 means self-test in progress
locked_out	bit	1	3	0	1 means node is on-line, but normal operation is prevented
manual_control	bit	1	4	7	1 means actuator under local control
in_alarm	bit	1	4	6	1 means object is in alarm (see nvoAlarmMessage)
in_override	bit	0	4	5	1 means object is overridden
report_mask	bit	1	4	4	1 means status is an event mask (set for RQ_REPORT_MASK)
programming_mode	bit	0	4	3	1 means object is in program mode
programming_fail	bit	0	4	2	1 means object programming has failed
alarm_notify_disabled	bit	0	4	1	1 means object alarm disabled
reserved1	bit	0	4	0	not defined
reserved2	8 bits	00	5	all	not defined

Note: Highlighted fields are NOT supported by the controller, they will always be 0 in nvoStatus.

invalid_id

A status of invalid_id is reported whenever an nviRequest is received for an object id that is not implemented in the node. Invalid_id is mandatory and is always present and is not set in the report mask.

invalid_request

A status of invalid_request is reported whenever an nviRequest is received for an non-implemented function. Invalid_request is mandatory and is always present and is not set in the report mask.

disabled

A status of disabled is reported if a valid object request code is received for the disabled object. The node object is never disabled. The SCC object is disabled when the LCI unit type is FAU, CSC DAC, or RT DAC. The DAC object is disabled when the LCI unit type is CSC SCC or RT SCC. See nciApplication for details on how the LCI unit type and supported profile is determined.

The disabled and the out_of_service bits are always both set at the same time in the IntelliPak unit.

out_of_service

A status of out_of_service is reported if a valid object request code is received for the out_of_service object. The node object is never out_of_service. The SCC object is out_of_service when the LCI unit type is FAU, CSC DAC, or RT DAC. The DAC object is out_of_service when the LCI unit type is CSC SCC or RT SCC. See nciApplication for details on how the LCI unit type and supported profile is determined.

locked_out

A status of locked out is reported if a valid object request code is received for the locked out object. The node object is never locked out. The DAC and SCC objects are

locked out when one or more circuits are locked out due to 1) Demand Limit, 2) Frost Protection, 3) Low Ambient, or 4) Low Condenser Water temp (CSC water-cooled condenser or Rooftop evaporative condenser only). See nciApplication for details on how the LCI unit type and supported profile is determined.

manual_control

A value of TRUE is reported if the controller is under local control. Tracer Summit will use this bit to indicate whether the IntelliPak unit is in local or remote control.

in_alarm

A value of TRUE is reported if the controller has a diagnostic condition. See nvoAlarmMessage for the list of IntelliPak diagnostics that set this bit and nvoUnitStatus in_alarm bit.

report_mask

Report_mask status is used to document the optional status bits that are supported by the object. The obj_request code RQ_REPORT_MASK causes the object to respond with a mask of supported optional status bits via nvoStatus. A ONE in the mask means that the object may set the corresponding optional bit in the object status when the condition defined for that optional bit occurs. A ZERO means that the optional bit will never be set by the object. When reporting status in response to a RQ_REPORT_MASK, the report_mask bit will be set to distinguish this from other forms of status. The invalid_id and invalid_request bits are mandatory and are not set in the report_mask status.

When Transmitted

nvoStatus is transmitted whenever a request is received on the nviRequest input and as one of the heartbeat nvo's. The node object status is sent during the first heartbeat nvoStatus transmission. Then either the SCC object status or the DAC object status is sent during the second heartbeat nvoStatus transmission, depending on which profile is being used. And then the cycle repeats.

Update Rule

The application must update the status such that a poll of the status following the request returns a reasonable value.

Update Rate, send heartbeat time	Default Service Type, acknowledged

Supply Fan On/Off Control Output, nvoSupFanOnOff

network output SNVT_switch nvoSupFanOnOff; DAC profile

A structure used by a discharge air controller to control a communicating supply fan motor drive.

IntelliPak products do not support nvoSupFanCap, therefore nvoSupFanOnOff will always show both the state and the speed of the fan. On units without Inlet Guide

Vanes (IGV) or a Variable Frequency Drive (VFD) installed, when State is 1, Value will always be 0% or 100% (0 or 200).

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% (note 2)	ON	0.5 to 99.5% (note 2)
1	200	100% (note 1)	ON	100% (note 1)
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Supply Fan Status Output, nvoSupFanStatus

network output SNVT_switch nvoSupFanStatus; DAC profile (see nvoFanSpeed)

A structure used to report the current supply fan speed of a discharge air controller. A space temp controller uses nvoFanSpeed.

On IntelliPak products without Inlet Guide Vanes (IGV) or a Variable Frequency Drive (VFD) installed, when State is 1, Value will always be 0% or 100% (0 or 200).

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 199	0.5 to 99.5% (note 1)	ON	0.5 to 99.5% (note 1)
1	200	100%	ON	100%
0xFF	n/a	n/a	Invalid	Invalid

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Terminal Load Output, nvoTerminalLoad

network output SNVT_lev_percent nvoTerminalLoad; SCC and DACX profile

Indicates the current heat/cool energy demand of the unit. Positive values indicate that cooling energy is required (or in use) by the controller, while negative values indicate that heating energy is required (or in use) by the controller. . The actual determination of the value of nvoTerminalLoad is manufacturer-defined. One typical method is to report the output of the heating/cooling control algorithm.

Another method is to report only the heating/cooling energy required from a central source, such as a water loop or air handling unit.

Valid Range

Range	Invalid	When Transmitted	Update Rate	Default Service Type
-100.0% to 100.0% heating to cooling	always valid	significant change	no faster than configured minimum send time	unacknowledged

Unit Status Output, nvoUnitStatus

network output SNVT_hvac_status nvoUnitStatus; SCC and DAC profile

A structure used to report controller status.

For IntelliPak CSC and RT products, the electric heat capacity reported in the "heat_output_primary" field is divided equally between the number of stages available. This may or may not reflect the actual capacity step for a given stage. This was done because of the number of variations in capacity steps due to model number variations, line voltage, wiring, and sizes of heater elements.

Unlike nvoEconEnabled, nvoUnitStatus.econ_output shows percent open. nvoEconEnabled is the enable/disable status of the economizer and is defined in the profile as "binary" (does not show percent.) If the economizer is enabled, it reports (1, 200). If the economizer is disabled, it reports (0, 0). If there is no economizer, it reports

(0xFF, 0). IntelliPak Rooftop products with a 0-25% motorized OA damper always report disabled.

Structure Definition for nvoUnitStatus

Description	Type	bytes	Range	Meaning
mode (nvoHeatCool)	SNVT_hvac_mode	1	0 = HVAC_AUTO 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE 5 = HVAC_PRE_COOL 6 = HVAC_OFF 7 = HVAC_TEST 8 = HVAC_EMERG_HEAT 9 = HVAC_FAN_ONLY 10 = HVAC_FREE_COOL 11 = HVAC_ICE 12 = HVAC_MAX_HEAT 13 = HVAC_ECONOMY 14 = HVAC_DEHUMID 15 = HVAC_CALIBRATE 0xFF = HVAC_NUL	This field will report the same value as nvoHeatCool.
heat_output_primary	SNVT_lev_percent	2	0 to 100%, 0x7FFF = invalid	Status position of heat output
heat_output_secondary	SNVT_lev_percent	2	0 to 100%, 0x7FFF = invalid	Status position of secondary heat (condenser reheat status)
cool_output	SNVT_lev_percent	2	0 to 100%, 0x7FFF = invalid	Status position of cool output
econ_output (nvoOADamper or nvoEconEnabled)	SNVT_lev_percent	2	0 to 100%, 0x7FFF = invalid	Status position of installed economizer. Report WS Econ cmd if only WSE installed. Report AS Econ if ASE only or both ASE and WSE. Report invalid (0x7FFF) if no economizer is installed.
fan_output	SNVT_lev_percent	2	0 to 100%, 0x7FFF = invalid	Status supply fan speed See the table below for details on how the fan speed is reported in the fan_ouput field of nvoUnitStatus for both SCC and DAC units.
in_alarm (nvoStatus)	U08	1	0 = no alarm 1 to 254 = alarm present 255 = alarming disable	See nvoAlarmMessage for which alarms set this bit and the alarm bit in nvoStatus.
	Length	12		

note: Highlighted items are **NOT** used by the controller. They will always be reported as invalid.

When Transmitted	Update Rate	Default Service Type
significant change send heartbeat time	no faster than configured minimum send time send heartbeat time	unacknowledged

Configuration Property Definitions

(implemented as configuration network variables)

The configuration property definitions are list alphabetically by the nciName.

Building Static Pressure Setpoint, nciBldgStaticSP

network input config SNVT_press_p nciBldgStaticSP; type 3, level 1 DAC profile

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

Range, 8 to 74 Pa, 0.03 to 0.3 I WC (RT1, CSC, FAU) -49 to 74 Pa, -0.20 to 0.30 IWC (RT2)	Default Value, 20 Pa, 0.08 inches WC	SCPT Reference, SCPTbuildingStaticPressureSetpoint (193)

Local Bypass Time, nciBypassTime

network input config SNVT_time_min nciBypassTime; type 2, level 1 SCC and DAC profile

Maximum time that the controller can be in occupied bypass mode following a single Bypass request from either a local switch or nviOccManCmd.

Valid Range

Range, 0 to 240 minutes, 0 disables	SCC Default, 120 minutes	DAC Default, 0 minutes	SCPT Reference, SCPT bypass Time (34)

Cooling Lockout Temperature Setpoint, nciCoolLockout

network input config SNVT_temp_p nciCoolLockout; type 3, level 1 DAC profile

Defines the outdoor air temperature cooling lockout setpoint for the controller. When the outdoor air temperature is below this value, mechanical cooling will be disabled.

Range, -28.88°C to 26.66°C, -20°F to 80°F	Default Value, 10°C, 50°F	SCPT Reference, SCPTcoolingLockout (209)

Cooling Reset Enable, nciCoolResetEn

network input config SNVT_switch nciCoolResetEn; type 3, level 1 DAC profile

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

IntelliPak products can be configured at the human interface to have "none", "zone" or "outside air" reset of the discharge air cooling setpoint. Therefore, the interpretation of the value range allows selection between the two reset types: 0 = disabled, 1-100 = outdoor air reset, 101-255 = zone reset, The invalid value (0xFF) also enables zone reset.

Default Value, Disabled	SCPT Reference, SCPTcoolingResetEnable (211)

Structure Definition

Description	Type	bytes	Range
value	U08	1	0 = disabled (none) 1-100 = enabled (outdoor air) 101-255 = enabled (zone)
state	S08	1	0 = disabled, ignore value field 1 = value field determines state 0xFF = enabled [zone] (invalid), ignore value field (default)
	Length	2	

Discharge Air Cooling Setpoint, nciDAClSP

network input config SNVT_temp_p nciDAClSP; type 3, level 1 DAC profile

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

Range,4.5°C to 32.22°C, 40°F to 90°F (RT/CSC) 6.11°C to 60°C, 43°F to 140°F (FAU)	Default Value, 12.78°C, 55°F	SCPT Reference, SCPTdischargeAirCoolingSetpoint (183)

Discharge Air Dewpoint Setpoint, nciDADewPointSP

network input config SNVT_temp_p nciDADewPointSP; type 3, level 1 DAC profile

Defines the default discharge air dewpoint setpoint for the Discharge Air Controller.

Only IntelliPak FAU products utilize nciDADewPointSP.

Range, -20°C to 30°C, -4°F to 86°F 140°F (FAU)	Default Value, 15°C, 59°F	SCPT Reference, SCPTdischargeAirDewpointSetpoint (204)

Discharge Air Heating Setpoint, nciDAHtSP

network input config SNVT_temp_p nciDAHtSP; type 3, level 1 DAC profile

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

Range, 4.5°C to 82.22°C, 40°F to 180°F	Default Value, 37.78°C, 100°F	SCPT Reference, SCPTdischargeAirHeatingSetpoint (184)

Discharge Air Reheat Setpoint, nciDAReheatSP

network input config SNVT_temp_p nciDAReheatSP; type 3, level 1 SCCX and DACX profile

The discharge air reheat sequence will start when the discharge air temp falls below the nciDAReheatSP setpoint. The value of nciDAReheatSP must be greater than the value of nciDADewPointSP by at least 3 F.

Only used by IntelliPak Rooftop and FAU products with the dehumidification option.

Valid Range, 8.89°C to 48.89°C, 48°F to 120°F (FAU) 18.4°C to 26.66°C, 65°F to 80°F (RT)	Default Value, 22.22°C, 72°F (FAU) 21.11°C, 70°F (RT)	UCPT Reference, UCPT_DAReheatSP

Daytime Warm Up Initiate Setpoint, nciDaytime

network input config SNVT_temp_p nciDaytime; type 3, level 1 DACX profile

When the space temperature gets below the daytime warm up initiate setpoint, the daytime warm up sequence will start. The value of nciDaytime will always be at least 1.67 C (3 F) below the value of nciDaytimeTerm.

The DACX profile extension specifies Level 2, implemented as Level 1 for IntelliPak units. See nciDaytimeTerm.

Valid Range, 10°C to 30.56°C, 50°F to 87°F	Default Value, 19.44°C, 67°F	UCPT Reference, UCPT_Daytime

Daytime Warm Up Termination Setpoint, nciDaytimeTerm

network input config SNVT_temp_p nciDaytimeTerm; type 3, level 1 DACX profile

When the space temperature gets above the daytime warm up termination setpoint, the daytime warm up sequence will end. The value of nciDaytimeTerm will always be at least 1.67 C (3 F) above the value of nciDaytime.

Valid Range, 11.67°C to 32.22°C, 53°F to 90°F	Default Value, 21.67°C, 71°F	UCPT Reference, UCPT_DaytimeTerm

Energy Recovery Frost Avoidance Setpoint, nciERFrostAvoidSP

network input config SNVT_temp_p nciERFrostAvoidSP; type 3, level 1 SCCX and DACX profile

This configuration property defines a default Energy Recovery Frost Avoidance setpoint for the controller. When the Energy Recovery Exhaust temperature falls below the frost avoidance setpoint, the controller initiates a frost avoidance sequence (modulates the outside air bypass damper to maintain setpoint, and/or energizes a preheater.)

Only IntelliPak II Rooftop products with the Energy Recovry option utilize nciERFrostAvoidSP.

Range, -17.77°C to 4.44°C, 0°F to 40°F	Default Value, -2.77°C, 27°F	SCPT Reference, UCPT_ERFrostAvoidSP

Exhaust Enable Position, nciExhaustConfig

network input config SNVT_lev_percent nciExhaustConfig; type 3, level 1 SCCX profile (see nciExhStartPos)

Defines the exhaust enable outdoor air damper position setpoint for a space temp controller. A discharge air controller uses nciExhStartPos.

IntelliPak products ignore values greater than 100% (101% does not disable exhaust.)

Typical Range, 0% to 100%, 101% disables	Default Value, 25%	UCPT Reference, UCPT_exhaust_cfg

Device Build Version Number, nciDevBuildNum

network input config unsigned int nciDevBuildNum; type 1, level 1 Node Ex profile

This configuration property defines the build version number for the device and is read only. It cannot be written.

Valid Range

SCPT	SCPT Index	Valid Range	Default Value
UCPTdevBuildNum	U16	2	2

Device Major Version Number, nciDevMajVer

network input config unsigned short nciDevMajVer; type 1, level 1 Node profile

This configuration property defines the major version number for the device and is read only. It cannot be written. This number stays in sync with the SPID. This number is the same for all nodes with the same SPID.

Valid Range

SCPT	SCPT Index	Valid Range	Default Value
SCPTdevMajVer	165	2	2

Device Minor Version Number, nciDevMinVer

network input config unsigned short nciDevMinVer; type 1, level 1 Node profile

This configuration property defines the minor version number for the device and is read only. It cannot be written. It matches the application software part number extension.

Valid Range

SCPT	SCPT Index	Valid Range	Default Value
SCPTdevMinVer	166	14	14

Duct Static Pressure Limit, nciDuctStatLim

network input config SNVT_press_p nciDuctStatLim; type 3, level 1 DAC profile

This configuration property defines the Duct Static Pressure Limit for the Discharge Air Controller. This limit is used for equipment protection.

For IntelliPak products, a manual diagnostic occurs after 3 successive high duct static limit trips.

Range, 300 to 1170 Pa, 1.2 to 4.7 inches WC (RT1, CSC, FAU) 300 to 1419 Pa, 1.2 to 5.7 inches WS (RT2)	Default Value, 1000 Pa, 4 inches WC	SCPT Reference, SCPTductStaticPressureLimit (192)

Duct Static Pressure Setpoint, nciDuctStatSP

network input config SNVT_press_p nciDuctStatSP; type 3, level 1 DAC profile

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

For IntelliPak FAU equipment, nciDuctStatSP is implemented (stored in non-volatile memory), but is not utilized by the unit (does not perform duct static pressure control.)

Range, 250 Pa to 1071 Pa, 1.0 to 4.3 iwc (RT1, CSC, FAU) 175 Pa to 1270 Pa, 0.7 to 5.1 iwc (RT2)	RT1, RT2 = 500 Pa, 2.0 inches WC CSC, FAU = 375 Pa, 1.5 inches WC	SCPT Reference, SCPTductStaticPressureSetpoint (189)

Exhaust Enable Position, nciExhStartPos

network input config SNVT_lev_percent nciExhStartPos; type 3, level 1 DAC profile (see nciExhaustConfig)

Defines the exhaust enable outdoor air damper position setpoint for a discharge air controller. A space temp controller uses nciExhaustConfig

IntelliPak products ignore values greater than 100% (101% does not disable exhaust.)

Range, 0% to 100%, 101% disables	Default Value, 25%	SCPT Reference, SCPTexhaustEnablePosition (202)

Fan Operation, nciFanOperation

network input config fan_operation_t nciFanOperation; type 3, level 1 SCC profile

An enumerated value specifying fan operation during occupied and occupied standby. Fan operation during unoccupied is manufacturer defined.

For IntelliPak equipment, nciFanOperation specifies the default fan operation in occupied mode. It can be overridden during supply fan bypass (CSC products only) or by fan switches on zone sensors or night-setback panels (if so equipped) Only enumerations 0=HVF_CONTINUOUS and 1=HVF_CYCLE are supported. Unsupported enumerations are ignored.

Valid Range

Valid Range, 0 = HVF_CONTINUOUS = Fan runs continuously 1 = HVF_CYCLE = Fan cycles with heating and cooling 2 = HVF_CON_CYCLE = Fan runs continuous in occupied, cycles with heating and cooling in standby 3 = HVF_CYCLE_HEAT = Fan cycles with heating only 4 = HVF_CYCLE_COOL = Fan cycles with cooling only 0xFF = HVF_NUL	**Default Value,** 1 (Fan cycles with heating and cooling)	**SCPT Reference,** SCPTfanOperation (260)

Heating Reset Enable, nciHeatResetEn

network input config SNVT_switch nciHeatResetEn; type 3, level 1 DAC profile

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

IntelliPak products can be configured at the human interface to have "none", "zone" or "outside air" reset of the discharge air heating setpoint. Therefore, the interpretation of the value range allows selection between the two reset types: 0 = disabled, 1-100 = outdoor air reset, 101-255 = zone reset, The invalid value (0xFF) also enables zone reset.

Default Value, Disabled	SCPT Reference, SCPTheatingResetEnable (212)

Structure Definition

Description	Type	bytes	Range
value	U08	1	0 = disabled (none) 1 – 100 = enabled (outdoor air) 101-255 = enabled (zone)
state	S08	1	0 = disabled, ignore value field 1 = value field determines state 0xFF = enabled [zone] (invalid), ignore value field (default)
	Length	2	

HVAC Unit Type Identifier, nciHvacType

network input config SNVT_hvac_type nciHvacType; type 1, level 255 SCC and DACX profile

This configuration property is not used by the controller for any purpose. It is used to identify the type of HVAC unit that is being controlled. Although the HVAC Unit Type can be read via the network, it typically should not be changed. The configuration property SCPThvacType should be declared using the device_specific_flg so that it can be protected by the network configuration tool to avoid inadvertent modification in the field by the installer. The use of the device_specific_flg will also allow devices to have a common *.XIF file where the only network interface difference is the value of this configuration property. If it is changed, the user must verify the application for the selected HVAC Unit Type.

Valid Range

0 = HVT_GENERIC = Generic 1 = HVT_FAN_COIL = Fan Coil 2 = HVT_VAV = Variable Air Volume Terminal 3 = HVT_HEAT_PUMP = Heat Pump 4 = HVT_ROOFTOP = Rooftop Unit 5 = HVT_UNIT_VENT = Unit Ventilator 6 = HVT_CHILL_CEIL = Chilled Ceiling 7 = HVT_RADIATOR = Radiator 8 = HVT_AHU = Air Handling Unit 9 = HVT_SELF_CONT = Self-Contained Unit	**Default Value,** 4 = Rooftop Unit	**SCPT Reference,** SCPThvacType (169)

Location Label, nciLocation

network input config SNVT_str_asc nciLocation; type 2, level 1 SCC and DAC profile

Can be used to provide more descriptive physical location information than can be provided by the Neuron Chip's 6 byte location string.

For IntelliPak products, the default value is "Tracer LCI-I IntelliPak".

Range, Any NULL terminated ASCII string of 31 bytes total length.	Default Value, Tracer LCI-I IntelliPak	SCPT Reference, SCPTlocation (17)

Minimum Outdoor Air Flow Setpoint, nciMinOAFlowSP

network input config SNVT_flow nciMinOAFlowSP; type 3, level 1 SCCX and DAC profile

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

Range, 0 to 27,606 liters/sec, 0 to 58,500 cfm	Default Value, 1038 liters/sec, 2200 cfm	SCPT Reference, SCPTminOutdoorAirFlowSetpoint (198)

Minimum Send Time, nciMinOutTm

network input config SNVT_time_sec nciMinOutTm; type 2, level 1 SCC and DAC profile

This is the minimum period of time between any two send on delta nvo transmissions. nciMinOutTm is only used by send on delta. nciMinOutTm is not used by the send on heartbeat function. If nciMinOutTm = 0xFFFF (6,553.5 secs), the invalid value, the controller will use the default value, 2.5 secs, for the minimum send time. If nciMinOutTm = 0, there is no minimum time requirement between send on delta transmissions. Send on delta transmissions happen as fast as possible when nciMinOutTm = 0.

Range, 0 to 6,553.4 sec	Default Value, 2.5 seconds	SCPT Reference, SCPTminSendTime (52)

Outdoor Air Enthalpy Setpoint, nciOAEnthSP

network input config SNVT_enthalpy nciOAEnthSP; type 3, level 1 DAC profile

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

For IntelliPak equipment, nciOAEnthSP is used when comparative enthalpy option is not installed (or when comparative enthalpy option is installed and reference enthalpy is selected as the fail_over and the return air temperature and/or return air humidity sensors fail.)

Range, 44.2 to 65 K-Joules/Kg, 19-28 btu/lb	Default Value, 58 K-Joules/Kg, 25 btu/lb	SCPT Reference, SCPToutdoorAirEnthalpySetpoint (200)

Outdoor Air Flow Calibration, nciOAFlowCalib

network input config SNVT_multiplier nciOAFlowCalib; type 3, level 1 DAC profile

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

For IntelliPak products, this is the Minimum OA Flow Calibration Gain (which can be set from 0.5 to 1.5 at the human interface Outside Air Ventilation Setup submenu.) There is also a Minimum OA Flow Calibration Offset which is also only accessible from the human interface.

For IntelliPak II products with two airflow measurement stations, polling nciOAFlowCalib reports the rear (opposite service side) station, while writing nciOAFlowCalib updates both stations. If independent calibration is required, it must be performed at the human interface.

Range, 0.500 to 1.500	Default Value, 1.000	SCPT Reference, SCPTsensConstVAV (67)

Outdoor Air Damper Minimum Position, nciOAMinPos

network input config SNVT_lev_percent nciOAMinPos; type 3, level 1 SCC and DAC profile

Defines a default Minimum Outdoor Air Damper Position setpoint for the controller. This input is overridden by nviOAMinPos, if valid.

For IntelliPak FAU products without a return air damper, default minimum positions below 25% are ignored.

0% to 100%	Default Value, RT and CSC default = 15% FAU default = 100%	SCPT Reference, SCPTminRnge (23)

Outdoor Air Temperature Setpoint, nciOATSP

network input config SNVT_temp_p nciOATSP; type 3, level 1 DAC profile (see nciEconConfig)

Defines the airside economizer outdoor air temperature enable setpoint for a discharge air controller. A space temp controller uses nciEconConfig. A discharge air controller may also use the economizing enable point field of nciEconConfig (one will overwrite the other.

Range 10°C to 60°C, 50°F to 140°F	Default Value, 23.88°C, 75°F	hysteresis 2.78°C, 5°F	SCPT Ref SCPToutdoorAirTempSetpoint (199)

Receive Heartbeat, nciRcvHrtBt

network input config SNVT_time_sec nciRcvHrtBt; type 2, level 1 SCC and DAC profile

Used to control the maximum time that elapses after the last update to an nvi before the controller starts to use its default values. If nciRcvHrtBt = 0xFFFF (invalid), the controller will use the default value, 900 secs, for the receive heartbeat time. A heartbeated nvi will revert to its "invalid" value in one to two receive heartbeat times after its last valid reception. There is one receive heartbeat timer to handle all of the heartbeated nvi's. If nciRcvHrtBt = 0 (disable), heartbeated nvi's will never revert to their "invalid" values.

Valid Range

Range, 0 to 6,553.4 sec, 0 disables **Default Value,** 900 seconds **SCPT Reference,** SCPTmaxRcvTime (48)

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	Yes
Category 3	No	Don't care	No

Return Fan Pressure Setpoint, nciRetFanPressSP

network input config SNVT_press_p nciRetFanPressSP; type 3, level 1 DAC profile

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

IntelliPak Rooftop products configured with a return fan use this for the maximum return plenum pressure setpoint.

Range, 25 to 622 Pa, 0.1 to 2.5 inches WCDefault Value, 300 Pa, 1.2 inches WCSCPT Reference, SCPTreturnFanStaticPressureSetpoint (194)

Range, 25 to 622 Pa, 0.1 to 2.5 inches WC	Default Value, 300 Pa, 1.2 inches WC	SCPT Reference, SCPTminRnge (23)

Occupancy Temperature Setpoints, nciSetpoints

network input config SNVT_temp_setpt nciSetpoints; type 4, level 1 SCC and DAC profile

A structure to define the space temperature setpoints. 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.

Refer to Table 47, p. 113, Space Setpoint Arbitration, for implementation details.

Structure Definition, SCPT Reference, SCPTsetPnts (60)

Description	nci Type	Type	Supported Range	Default	bytes
occupied cooling setpoint	3	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	23.33°C, 74°F	2
occupied standby cooling setpoint	2	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	25.56°C, 78°F	2
unoccupied cooling setpoint	3	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	29.44°C, 85°F	2
occupied heating setpoint	3	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	21.67°C, 71°F	2
occupied standby heating setpoint	2	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	19.44°C, 67°F	2
unoccupied heating setpoint	3	SNVT_temp_p	10°C to 32.22°C, 50°F to 90°F	15.56°C, 60°F	2
total length:					12

Send Heartbeat, nciSndHrtBt

network input config SNVT_time_sec nciSndHrtBt; type 2, level 1 SCC and DAC profiles

This is the maximum period of time that will expire before each bound heartbeated nvo will be automatically updated once. The controller will divide the number of heartbeated nvos into the configured send heartbeat time to determine how often to send one heartbeated nvo. The heartbeated nvos will be sent in a round robin fashion. Only the bound nvo's will actually be transmitted on the comm 5 link. The configured minimum send time (nciMinOutTm) is ignored. If nciSndHrtBt = 0x7FFF (6,553.5 secs), the invalid value, the controller will use the default value, 300 secs, for the send heartbeat time.

Valid Range

Valid Range, 0 to 6,553.4 sec, 0 disables **Default Value,** 300 sec **SCPT Reference,** SCPTmaxSendTime (49)

Nvos can be defined in 2 categories for the use of the send heartbeat function as shown in the table below.

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

Space CO2 Limit, nciSpaceCO2Lim

network input config SNVT_ppm nciSpaceCO2Lim; type 3, level 1 SCC profile

Defines a high limit CO2 setpoint for the controlled space. The controller ventilation functions, in response to this limit, are manufacturer defined.

For IntelliPak products, with TRAQ sensors, that provide a CO2 Reset function, nciSpaceCO2Lim correlates to the CO2 Reset Max setpoint, which defines the CO2 level which provides the most reset (increase) to the Minimum OA CFM setpoint.

For IntelliPak products that provide a Demand Control Ventilation function, nciSpaceCO2Lim correlates to the Default Design Minimum CO2 Setpoint, which defines the CO2 level which opens the TRAQ dampers to the Design Minimum OA Flow Setpoint (for units with TRAQs) or opens the OA Damper to the Design Minimum OA Damper Setpoint (for units without TRAQs.)

IntelliPak products do not support disabling reset or Demand Controlled Ventilation by sending a value of zero. nciSpaceCO2Lim cannot be set lower than 150 ppm, or lower than nciSpaceCO2LowLm + 100 ppm or greater than 2000 ppm.

Range, 150 to 2000 ppm, 0 disables	Default Value, 1000 ppm	SCPT Reference, SCPTlimitCO2 (42)

Space Dehumidification Setpoint, nciSpaceDehumSP

network input config SNVT_lev_percent nciSpaceDehumSP; type 3, level 1 DAC profile (see nciSpaceRHSetpt)

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

IntelliPak Rooftop products with the dehumidification option use nciSpaceDehumSP for both the default occupied dehumidification setpoint and the default unoccupied dehumidification setpoint. IntelliPak FAU products use nciDADewpointSP for the occupied dehumidification setpoint and nciSpaceDehumSP for the default unoccupied dehumidification setpoint The occupied and unoccupied setpoints can be set independently from the human interface. When polled, nciSpaceDehumSP may report different values based on the current unit occupancy. When nciSpaceDehumSP is written, both setpoints are changed. SCC products use nciSpaceRHSetpt.

Range, 0% to 100% (FAU), 40% to 65% (RT)	Default Value, 60%	SCPT Reference, SCPThumSetpt (36)

Space Humidification Setpoint, nciSpaceHumSP

network input config SNVT_lev_percent nciSpaceHumSP; type 3, level 1 DAC profile

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

Only Intellipak Rooftop products with the humidification option utilize nciSpaceHumSP. it is used for both the occupied and unoccupied humidification setpoint and is limited to the range 20% to 50%. The occupied and unoccupied setpoints can be set independently from the human interface. When polled, nciSpaceHumSP may report different values based on the current unit occupancy. When nciSpaceHumSP is written, both setpoints are changed.

Range, 20% to 50%	Default Value, 30%	SCPT Reference, SCPTspaceHumSetpoint (203)

Space Humidity Setpoint, nciSpaceRHSetpt

network input config SNVT_lev_percent nciSpaceRHSetpt; type 3, level 1 SCC profile (see nciSpaceDehumSP)

This configuration property defines a high humidity setpoint for the controlled space. The controller dehumidifcation functions, in response to this limit, are manufacturer-defined.

All SCC IntelliPak Rooftop products with the dehumidification option use nciSpaceRHSetpt for the default occupied and unoccupied dehumidification setpoints. Note: IntelliPak products are limited to a range from 40% to 65%. The default value is 60%, instead of the profile recommended 0%. Values below 40% are clamped to 40%, therefore a value of 0% does not disable dehumidification, as recommended in the SCC profile (see nviDehumEnable or, if using Tracer Summit™, the proprietary occ/unocc enable/disable function. Values above 65% are clamped to 65%. The occupied and unoccupied setpoints can be set independently from the human interface. When polled, nciSpaceRHSetpt may report different values based on the current unit occupancy. When nciSpaceRHSetpt is written, both setpoints are changed. DAC products use nciSpaceDehumSP.

Range, 40 to 65%	Default Value, 60%	SCPT Reference, SCPThumSetpt (36)

Sequence of Operation

Sequence of Operation

The Tracer LCI-I is a configurable controller. All of the controller's sequences of operation are predefined with no need for programming the controller. Configurable parameters are provided to allow user adjustments to the controller's operation. For example, the minimum occupied outdoor air damper position can be changed.

All configuration parameters are set to defaults predetermined through extensive unit testing in several different operating conditions. The factory default settings are also based on the unit configuration and ordering information.

The Tracer LCI-I controller is configurable to operate in one of three air handling modes of operation:

- constant volume (CV) space temperature control
- constant volume (CV) discharge air temperature control
- variable air volume (VAV) discharge air temperature control

For constant volume space temperature control operation (also called cascade control), the Tracer LCI-I controller requires both a space temperature and discharge air temperature sensor. In this control mode, the controller compares the space temperature to the space heat/cool setpoint to generate a discharge air temperature setpoint. The controller modulates its heating or cooling outputs to control the discharge air temperature to the discharge air temperature setpoint. This calculated discharge air temperature setpoint is the desired discharge air temperature (supply air temperature) that the unit must deliver to maintain space temperature at the space heating or cooling setpoint.

The space temperature can be hardwired to RTM module's Zone Temp input (10k OHM thermistor only) or can be communicated to the controller via Comm5. Similarly, cooling and/or heating setpoint(s) can be provided via a hardwired zone sensor, a night setback panel, a Comm5 communicated value, or by using the stored default setpoints in the controller.

The discharge air temperature must be a hardwired analog input to the RTM module (10k OHM thermistor only).

The Tracer LCI-I controller can be configured to operate in a constant volume discharge air temperature control mode. The controller only requires a discharge air sensor (10k OHM thermistor only) to operate in this mode. Constant volume discharge air temperature control modulates the heating or cooling outputs to maintain the discharge air temperature at the discharge air temperature setpoint.

When the Tracer LCI-I controller is configured for variable air volume (VAV) discharge air temperature control, the controller maintains a discharge air temperature according to the cool/heat discharge air setpoint, and duct static pressure at the duct static pressure setpoint. The controller maintains duct static pressure by modulating the supply fan's inlet guide vanes (IGV) or the variable frequency drive (VFD).

The duct static pressure input can either be hardwired or communicated to the controller via Comm5. If both a communicated value and a hardwired duct static pressure value exists, the communicated value has precedence. Similarly, the duct static pressure setpoint can either be configured (default) or communicated. If a communicated value is present, the communicated value has precedence.

If a space temperature input is provided to the controller when configured as constant volume discharge air control or variable air volume control, the controller can be configured to use the space temperature to perform morning warmup and daytime warmup functions. Morning or daytime warmup functions allow the controller to automatically change to heating if space temperature is less than the heating setpoint. Morning or daytime warmup functions cannot be initiated through a communicated request.

Other temperature inputs, such as mixed air temperature or outdoor air temperature, aid the controller's ability to maintain comfort and protect the unit.

Active heating and cooling setpoints are affected by the controller's occupancy mode. Valid occupancy modes for the three different control modes are shown below.

Table 23. Tracer LCI-I occupancy modes of operation

Constant volume space temperature control	• Occupied (default) • Unoccupied • Occupied standby • Occupied bypass
Constant volume discharge air temperature control	• Occupied (default) • Unoccupied • Occupied bypass
Variable air volume discharge air temperature control	• Occupied (default) • Unoccupied • Occupied bypass

The controller occupancy mode is determined by either a zone sensor, night setback panel, changeover switch or via a communicated request (from a system-level controller or another peer controller).

Power up sequence

When 24VAC power is initially applied to the Tracer LCI-I controller and UCM, the following sequence occurs:

- Red Service LED and green Status LED blink intermittently.
- Internal unit communications begins (IPC TXA and RXA LEDs blink)
- Green Status LED turns on solid.
- Unit will remain in local (standalone) control until Comm5 control data is received. Note: The unit must also be changed from LOCAL to BAS/NETWORK (remote) control in the Human Interface (HI) Setup menu.
- Power-up control wait feature is applied.The controller waits 300 seconds to allow ample time for the communicated control data to arrive. If after 300 seconds, the controller has not received any communicated control data, the unit assumes local (standalone) operation.
- Normal operation begins.

Service test cannot be initiated until the power up sequence has completed. Refer to the Service Test section of the Programming and Troubleshooting Guide.

Occupied and Unoccupied Operation

The valid occupancy modes of the Tracer LCI-I controller are:

Occupied

Normal operating mode for occupied spaces or daytime operation.

Unoccupied

Normal operating mode for unoccupied spaces or nighttime operation.

Occupied Standby

Constant volume mode used to reduce the heating and cooling demands during the occupied hours when the space is vacant or unoccupied. For example, the controller may use occupied standby mode for a classroom while the students are out of the room.

Occupied Bypass

Mode used for timed override conditions. For example, if the controller is in unoccupied mode and someone presses the On button on the zone sensor or night setback panel, the controller is placed in occupied bypass mode for 120 minutes (adjustable) or until someone presses the Cancel button on the zone sensor.

The occupancy mode can be hardwired to the controller via the occupancy binary input or communicated to the controller.

Determining the occupancy mode

The occupancy of the controller is determined by evaluating the combination of three potential communicating inputs, as well as the hardwired occupancy input and the occupied bypass timer. Three different communicating inputs affect the controller occupancy mode:

- Occupancy—manual command
- Occupancy—schedule
- Occupancy—sensor

These inputs provide maximum flexibility, but the number of inputs you decide to use varies with the application and the features available in your building automation system.

Occupancy—manual command. Some communicating devices may request occupancy based on the information communicated in the network variable nvoOccManCmd. Trane systems and zone sensors do not communicate this information to the controller, but the Tracer LCI-I controller accepts this network variable as communicated input nviOccManCmd.

Occupancy—schedule. Building automation systems normally communicate an occupancy request using the occupancy—schedule input. The Tracer LCI-I controller accepts communicated occupancy schedule as a network variable input nviOccSchedule.

Occupancy—sensor. Some occupancy sensors may be equipped with the ability to communicate an occupancy mode to the controller. In such devices, network variable input nviOccSensor is used to communicate occupancy to the controller. Trane systems and zone sensors do not currently send this variable. The hardwired occupancy input of this controller is handled as if it is a communicated occupancy sensor input. When both a hardwired input and a communicated input exist, the communicated input is used.

Table 24. Effect of Occupancy Commands on the Controller (In the Table below, X = Any State)

Local/Remote Control	Local Timed Override	Local Occupancy Command	Unit Type	nviApplicMode	nviHeatCool (SCC)	Occupancy Manual Command nviOccManCmd 2	Occupancy Schedule nviOccSchedule	NSB Panel Input Status	NSB Occupancy Request	Occupancy Sensor nviOccSensor 2 (SCC only)	RTM Occupancy Binary Input	LCI internalbypass 1	Controller's Effective Occupancy	Unit Occupancy Mode
Local	Yes	X	X	X	X	X	X	X	X	X	X	X	Bypass	Occ
Local	No	Occ	X	X	X	X	X	X	X	X	X	X	Occ	Occ
Local	No	Unocc	X	X	X	X	X	X	X	X	X	X	Unocc	Unocc
Remote	X	X	RT or CSC	MRNG WRMUP	X	X	X	X	X	X	X	X	Occ	Occ
Remote	X	X	RT or CSC	NIGHT PURGE	X	X	X	X	X	X	X	X	Unocc	Occ
Remote	X	X	RT or CSC	PRE-COOL	X	X	X	X	X	X	X	X	Occ	Occ
Remote	X	X	RT or CSC (SCC)	AUTO or NUL	MRNG WRMUP	X	X	X	X	X	X	X	Occ	Occ
Remote	X	X	RT or CSC (SCC)	AUTO or NUL	NIGHT PURGE	X	X	X	X	X	X	X	Unocc	Occ
Remote	X	X	RT or CSC (SCC)	AUTO or NUL	PRE-COOL	X	X	X	X	X	X	X	Occ	Occ
Remote	X	X	X	X	X	Occ 1	X	X	X	X	X	X	Occ	Occ
Remote	X	X	X	X	X	Unoc 1	X	X	X	X	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	Unoc 1	X	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	Byp 1	Occ	X	X	X	X	X	Occ	Occ
Remote	X	X	X	X	X	Byp 1	Unocc	X	X	X	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	Byp 1	Unocc	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	Byp 1	Standby	X	X	X	X	zero	Standby	Occ
Remote	X	X	X	X	X	Byp 1	Standby	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Valid	Occ	X	X	X	Occ	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Valid	Unocc	X	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	Byp 1	NUL	Valid	Unocc	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	Occ	X	X	Occ	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	Unocc	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	Unocc	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	NUL	Occ	X	Occ	Occ
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	NUL	Unocc	zero	Unocc	Unocc
Remote	X	X	X	X	X	Byp 1	NUL	Invalid	X	NUL	Unocc	not zero	Bypass	Occ
Remote	X	X	X	X	X	Stdby 1	X	X	X	X	X	zero	Standby	Occ
Remote	X	X	X	X	X	Stdby 1	X	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	Occ	X	X	Occ	X	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	Occ	X	X	Unocc	X	zero	Standby	Occ
Remote	X	X	X	X	X	NUL 1	Occ	X	X	Unocc	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	Occ	X	X	NUL	Occ	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	Occ	X	X	NUL	Unocc	zero	Standby	Occ

Table 24. Effect of Occupancy Commands on the Controller (In the Table below, X = Any State)

Local/Remote Control	Local Timed Override	Local Occupancy Command	Unit Type	nviApplicMode	nviHeatCool (SCC)	Occupancy Manual Command nviOccManCmd 2	Occupancy Schedule nviOccSchedule	NSB Panel Input Status	NSB Occupancy Request	Occupancy Sensor nviOccSensor 2 (SCC only)	RTM Occupancy Binary Input	LCI internalbypass 1	Controller's Effective Occupancy	Unit Occupancy Mode
Remote	X	X	X	X	X	NUL 1	Occ	X	X	NUL	Unocc	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	Unocc	X	X	X	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	NUL 1	Unocc	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	Standby	X	X	X	X	zero	Standby	Occ
Remote	X	X	X	X	X	NUL 1	Standby	X	X	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	Occ	X	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	Unocc	X	zero	Standby	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	Unocc	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	NUL	Occ	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	NUL	Unocc	zero	Standby	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Occ	NUL	Unocc	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Unocc	X	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	NUL 1	NUL	Valid	Unocc	X	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	Occ	X	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	Unocc	X	zero	Unocc	Unocc
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	Unocc	X	not zero	Bypass	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	NUL	Occ	X	Occ	Occ
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	NUL	Unocc	zero	Unocc	Unocc
Remote	X	X	X	X	X	NUL 1	NUL	Invalid	X	NUL	Unocc	not zero	Bypass	Occ

Notes:

1. The bypass timer is set to the value in nciBypassTime every time one of the following occurs:
1) receive nviOccManCmd = bypass
2) receive timed override ON request from the local zone sensor module
After the bypass timer is set to nciBypassTime, it counts down to zero.
The bypass timer is cleared to zero every time one of the following occurs:
1) receive nviOccManCmd = (occupied or unoccupied or standby or undefined)
2) receive timed override CANCEL request from the local zone sensor module
To disable the network bypass timer, set nciBypassTime to zero. This disables the nviOccManCmd and nviOccSchedule OC_BYPASS enumeration. This does not disable the local bypass timer, used by the zone sensor with timed override button, which is hard-coded to be three hours. However, if nciBypassTime is set to zero and either nviOccManCmd or nviOccSchedule are set to OC_BYPASS, the local zone sensor timed override button is disabled.

2. nviOccSensor is SCC only. The DAC profile uses the NUL rows in this column.

Emergency override modes

The Tracer LCI-I controller can be placed into emergency override via the communication link. Emergency override allows a building automation system such as Trane Tracer Summit to pressurize, depressurize, or purge the air from a building space. It can also be used to shut down the controller's operation of the unit.

The emergency override command influences the controller's supply fan, inlet guide vanes, exhaust fan, exhaust dampers, outdoor air damper, heat, Occ/Unocc relay, ventilation override relay, and outdoor air preheater state to create the desired condition, as shown in the table below.

The Tracer LCI-I controller can be placed into emergency override via the communication link. Emergency override allows a building automation system such as Trane Tracer Summit to pressurize, depressurize, or purge the air from a building space. It can also be used to shut down the controller's operation of the unit.

The emergency override command influences the controller's supply fan, inlet guide vanes, exhaust fan, exhaust dampers, outdoor air damper, heat, Occ/Unocc relay, ventilation override relay, and outdoor air preheater state to create the desired condition, as shown in Table 25, p. 86.

Table 25. Emergency override commands

Command	Supply Fan	Inlet Vanes	Exhaust Fan	Exhaust Dampers	OA Damper	Heat	Unocc Relay	V.O. Relay	OA Preheat
Pressurize	On	Open	Off	Closed	Open	Off	On	On	Off
Depressurize	Off	Closed	On	Open	Closed	Off	On	On	Off
Purge	On	Open	On	Open	Open	Off	On	On	Off
Shutdown	Off	Closed	Off	Closed	Closed	Off	On	On	Off
Fire	Off	Closed	Off	Closed	Closed	Off	On	On	Off

Configuration

Configurable parameters

The Tracer LCI-I controller is factory configured and commissioned with fixed sequences of operation. All of the controller's configuration parameters are predefined and loaded based upon the unit configuration. Some "as-built" configuration parameters are adjustable only at the human interface. Tracer Summit or the Trane Rover service tool provides access to these parameters to make adjustments to the controller's operation.

The Tracer LCI-I contains configuration parameters for the unit type to select the type of control mode, cooling source, heating source, and outdoor air damper. Refer to Table 26. The control mode selects the desired unit operation: constant volume space temperature control, constant volume discharge air temperature control, or variable air volume control.

Table 26. Tracer LCI-I unit type configuration parameters

Control mode	Temperature control
• Constant volume • Constant volume • Variable air volume	• Space temperature • Discharge air • Discharge air

Table 27. Heating and cooling source

Cooling source	Heat source	Heat type[1]	Outdoor air damper
None	Gas	Staged	None
Hydronic	Electric	Modulating	Outdoor air damper
DX coil	Hot water		
	Steam		
	External		

Table 28. Outdoor air damper

Parameter	Valid range	Default value
Occupied outdoor damper minimum position	0 to 100%	15%
Occupied standby damper minimum position (Note 1)	0 to 100%	15%
Economizer enable temperature (dry bulb)	50°F to 140°F (10°C to 60°C)	75°F (23.9°C)

Table 29. Exhaust fan or damper

Parameter	Valid Range	Default value
Exhaust fan enable setpoint (Note 1)	0 to 100%	25%

Table 30. Local zone sensor switch

Parameter	Valid Range	Default
Local fan/system switch	Enable or disable	Disable

Notes: The exhaust fan is energized when the outdoor air damper is equal to or greater than the exhaust fan enable setpoint. The exhaust fan is turned off when the outdoor air damper is less than the exhaust fan enable setpoint.

Table 31. Space temperature setpoints

Default setpoint	Valid range	Default value
Occupied heating setpoint	50 to 90°F (10 to 32.22°C)	71°F (21.67°C)
Occupied cooling setpoint	50 to 90°F (10 to 32.22°C)	74°F (23.33°C)
Occupied standby heating setpoint	50 to 90°F (10 to 32.22°C)	67°F (19.44°C)
Occupied standby cooling setpoint	50 to 90°F (10 to 32.22°C)	78°F (25.56°C)
Unoccupied heating setpoint	50 to 90°F (10 to 32.22°C)	60°F (15.56°C)
Unoccupied cooling setpoint	50 to 90°F (10 to 32.22°C)	85°F (29.44°C)
Heating setpoint low limit[1]	40 to 115°F (4.44 to 46.11°C)	40°F (4.44°C)
Cooling setpoint low limit[1]	40 to 115°F (4.44 to 46.11°C)	40°F (4.44°C)
Heating setpoint high limit[1]	40 to 115°F (4.44 to 46.11°C)	104°F (40°C)
Cooling setpoint high limit[1]	40 to 115°F (4.44 to 46.11°C)	104°F (40°C)
Local setpoint	Disable or enable	Enable

Note:
1. The heating and cooling setpoint high and low limits only apply to the occupied and occupied standby setpoints and are never applied to the unoccupied setpoints.

Table 32. Discharge air temperature control setpoints and setpoint limits

Setpoint	Valid range	Default value
Discharge air cooling setpoint	40°F to 90°F (4.4°C to 32.2°C)	55°F (12.9°C)
Discharge air heating setpoint	40°F to 180°F (4.4°C to 82.2°C)	100°F (37.8°C)

Table 33. Daytime warmup differential temperature

Setpoint	Valid range	Default value
Daytime Warmup Initiate Setpoint	50°F to 87°F (10°C to 30.56°C)	67°F (19.44°C)
Daytime Warmup Terminate Setpoint	53°F to 90°F (11.67°C to 32.22°C)	71°F (21.67°C)

Notes:
1. When the space temperature is below the daytime warm-up initiate setpoint, the daytime warmup sequence is initiated.
2. When the space temperature is above the daytime warm-up terminate setpoint, the daytime warmup sequence is terminated.

Table 34. Duct static pressure

Parameter	Valid range	Default value
Duct static pressure setpoint (RT2)	.7 to 5.1 Inches WC (175 to 1070 Pa)	2.0 inches WC (500 Pa)
Duct static pressure setpoint (RT1, CSC, FAU)	1 to 4.3 inches WC (250 to 1071 Pa)	1.5 inches WC (375 Pa) if CSC or FAU, 2.0 inches WC (500 Pa) if RT1.

Table 35. Timers

Parameter	Valid range	Default value
Power up control wait	0 to 6,553.4 seconds	0 seconds
Maintenance required time setpoint (based on fan run hours)	0 to 10,000 hours	0 hours
Occupancy bypass timer[1]	0 to 240 minutes (1 minute resolution)	120 minutes (SCC) 0 minutes (DAC)

Note:
1. The occupied bypass time is used for timed override applications when a building automation system is not present or when the building automation system does not send the occupied (override) request. The timed override timer is maintained in the LCI-I controller. When the timed override is applicable, the controller reports Occupied Bypass as its effective occupancy mode.

Table 36. Diagnostic alarm level

Parameter	Valid range	Default value
Diagnositic alarm level [1]	Service required Critical alarm	Service required

Note:
1. For a list of alarm messages that can be configured as service required or critical alarm diagnostics, refer to the Alarm Messages section. The diagnostics cannot be individually configured.

Application Information

Location Identifier

The Tracer LCI-I includes unit configuration for a location identifier. The maximum length of the location identifier is 30 characters. You can modify this identifier and easily identify the unit based on its physical location.

Standalone

Occupied/unoccupied

You can utilize the RTM module's occupancy input to switch between occupied and unoccupied modes of operation. The standalone controller switches to occupied mode when the input is open.

Timed override

The range for the timed override bypass time is 0 to 240 minutes (configurable, nciBypassTime). The default value for the bypass time is 120 minutes for SCC units and 0 minutes for DAC units.

The controller's space temperature analog input generates timed override On and Cancel requests in the following manner. The controller interprets a momentary short of the space temperature analog input as a timed override On request. The controller always accepts this timed override On request and resets the bypass time. The controller only changes to occupied bypass if the controller is in either the unoccupied or occupied standby mode. The controller stays in the occupied bypass mode for the occupied bypass time or until someone presses the zone sensor's Cancel button.

The controller interprets a momentary fixed resistance of 1.5K OHM on the space temperature analog input as a timed override Cancel request. The controller always accepts the Cancel request and sets the bypass time to zero. The controller only acts on a Cancel request during occupied bypass.

Morning warmup and daytime warmup

If the Tracer LCI-I controller is configured for constant volume discharge air temperature control or variable air volume control, a space temperature sensor can be wired to the controller to provide the morning warmup and daytime warmup sequence of operation. The space temperature and setpoint inputs are used by the controller to determine if heating or cooling air should be supplied to the space.

In heating, the controller creates a supply air temperature according to the configured discharge air heating setpoint or communicated discharge air heating setpoint input. In cooling, the controller maintains a supply air temperature according to the configured discharge air cooling setpoint or communicated discharge air cooling setpoint input. If a valid communicated discharge air setpoint exists, the controller uses the communicated value.

Configuration

Use the human interface to modify any of the controller's configuration parameters. Refer to the current Programming and Troubleshooting Guide for more information.

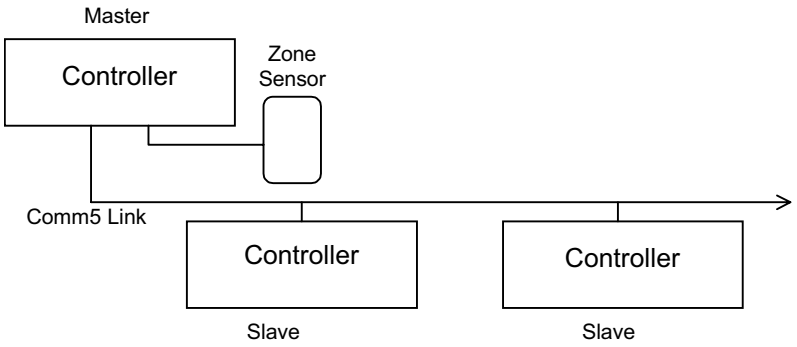
Setpoint operation

Standalone unit controllers can use several different setpoint sources; the local zone sensor or night setback panel input, Generic Building Automation System (GBAS) module, or the default (HI keypad) setpoints (nciSetpoints).

Standalone peer-to-peer

Tracer LCI-I controllers allow peer-to-peer (also referred to as master/slave) data communication. Data such as space temperature, setpoint, and occupancy can be shared from a master control to a peer control with or without the presence of Tracer Summit.

Table 37. Emergency override commands



Occupied/unoccupied

The standalone controller uses the binary input to switch between occupied and unoccupied.

The master controller (the unit controller with the hardwired occupancy input) in peer-to-peer communication can send its occupancy mode to one or more slave controllers (so they all track each other's occupancy mode). For these applications, you must use Rover service tool to set up the controller. Refer to the Rover service tool product literature for more information.

Timed override

Peer-to-peer timed override requires at least two controllers. The first controller, commonly referred to as the master, passes occupancy information to other controllers, commonly referred to as slaves.

The master controller's zone sensor generates timed override On and Cancel requests in the following manner. The master controller interprets a momentary short (greater than 3 seconds) on the space temperature input as a timed override On request. During unoccupied mode, the On request places the master controller in occupied bypass mode until the three hour (not configurable) occupied timer expires or until someone presses the zone sensor Cancel button. When the master controller's occupancy mode is communicated to one or more slave controllers, the slave controllers echo the master's occupancy mode, including both On and Cancel requests.

The controller interprets a momentary fixed resistance (greater than 3 seconds) of 1.5K OHM by the space temperature input as a timed override Cancel request. During occupied bypass mode, the controller uses a Cancel request to return the controller to unoccupied mode.

Setpoint operation

Controllers sharing information peer-to-peer, also referred to as master/slave, can share a variety of data, including the heating/cooling setpoint (communicated from a master to a slave).

Each controller derives its effective setpoint and default setpoints (including deadbands between setpoints) from the setpoint input (hardwired or communicated). To make sure the peer-to-peer setpoint application results in identical setpoints for each communicating controller, each controller must have exactly the same default setpoints.

The standalone master controller derives its setpoint from either the local hardwired setpoint input (if present) or from its default setpoints. Peer-to-peer applications often require the use of one hardwired setpoint to be shared across two or more controllers. You can achieve this by wiring the adjustable setpoint (typically included as a part of the Trane zone sensor module) to one controller-defined as the master. Next, use Rover to set up the master and one or more slaves to share that setpoint. For this application, each communicating controller uses the same setpoint.

Troubleshooting

Red Service LED

Table 38. Red Service LED activity

Red LED Activity	Description
LED is off continuously after power is applied to the controller.	Normal operation.
LED is on continuously, even when power is first applied to the controller.	Someone is pressing the Service push button or the controller has failed.
LED flashes approximately once every second.	LCI-I has been unconfigured. Use Rover service tool to restore the unit to normal operation. See note below.

Service push button

The Service push button (also known as Service Pin) is located on the left center board edge of the Tracer LCI-I controller. It can be used to install the controller in a communication network. Pressing the service push button will cause the LCI-I controller to broadcast it's Neuron ID and Program ID. Refer to the Rover service tool product literature for more information.

Note:

1. If the Service push button is held down for more than 15 seconds, the controller will un-install from the communication network (unconfigured state) and will no longer control the unit. This mode is indicated by the red Service LED flashing once every second. Refer to the previous section on Red Service LED for more information. Use the Rover service tool or another network management tool to restore the unit to normal operation. Refer to the Rover product literature for more information.

Green Status LED

The green status LED is normally used to indicate whether or not the controller is powered On (24VAC).

Table 39. Green Status LED activity

Green LED activity	Description
LED is on continuously.	Power on (normal operation).
LED blinks (one blink). (¼ second on 2 seconds off; continuously)	The controller has lost IPC communications for more than three minutes.
LED blinks (two blinks). (¼ second on, ¼ second off, ¼ second on, 2¼ seconds off; continuously)	The controller needs application code or is waiting for it to download.[1]
LED blinks (¼ second on, ¼ second off for 10 seconds).	Wink mode[1]
LED off.	Power is off. Controller failure. Test button is pressed.

Note:

1. The Wink feature allows you to identify a controller. By sending a request from Rover service tool, you can request the controller to wink (blink on and off as a notification that the controller received the signal). The green LED blinks (1/4 second on, 1/4 second off for 10 seconds) during Wink mode. This Wink response is available both when the LCI-I node is configured and when it is unconfigured.

Yellow Comm LED

The yellow Comm LED blinks at the rate the controller receives Comm5 communication. The yellow LED does not blink when the controller is transmitting communication data.

Table 40. Yellow COMM LED activity

Yellow LED activity	Description
LED off continuously.	The controller is not detecting any communication (normal for standalone applications).
LED blinks or flickers.	The controller detects communication (normal for communicating applications, including data sharing).
LED on continuously.	Abnormal condition or extremely high traffic on the link.

Yellow IPC RXA and IPC TXA LED

The yellow IPC RXA LED blinks at the rate the controller receives IPC communication (internal to the unit.) The yellow IPC RXA LED does not blink when the controller is transmitting IPC communication data. The yellow IPC TXA LED blinks at the rate the controller transmits IPC communications (internal to the unit.) The yellow IPC TXA LED does not blink when the controller is receiving IPC communication data.

Table 41. Yellow IPC RXA and TXA LED activity

Yellow LED activity	Description
LED off continuously.	The controller is not detecting any communication (abnormal for any application).
LED blinks or flickers.	The controller detects communication (normal for any application.)
LED on continuously.	Abnormal condition or controller failed.

Service test

Service test mode allows the operator or technician to designate the state of various unit components, which may be turned on or off or set to a percent and the start time delay for the test. Service can only be initiated at the local (unit-mounted) human interface. See the Programming and Troubleshooting Guide for more information.

Required inputs for unit operation

The following locally wired sensor or communicated inputs are required for each listed control function. If any one of the sensors does not exist, the controller operates the control function.

Table 42. Required sensors

Control function	Sensor(s) required to be present - wired sensor or communicated value	Controller operation if input is not present
Variable air volume control	▪ Duct static pressure ▪ Discharge air temperature	▪ Diagnostic shutdown ▪ Diagnostic shutdown
Discharge air temperature control	▪ Discharge air temperature	▪ Diagnostic shutdown
Space temperature control	▪ Space temperature ▪ Discharge air temperature	▪ Diagnostic ▪ Diagnostic
Economizer operation	▪ Outdoor air temperature	▪ Economizer disabled

Diagnostics

Three different types of diagnostics are generated by the Tracer LCI-I controller to help you troubleshoot abnormal unit operation.

Table 43. Diagnostic types

Alarm	The controller shuts down the unit to protect the unit and avert possible damage, or the controller cannot operate until the diagnostic condition is corrected.
Service required	The controller disables certain sequences of operation only and attempts to maintain unit operation. For example, if the outdoor air temperature sensor fails or is not wired, the Tracer LCI-I controller disables (does not allow) economizer operation.
Informational	This type of diagnostic does not affect controller operation.

Notes:

1. When a local temperature/pressure sensor or setpoint has failed after being valid, the controller generates a diagnostic to indicate the sensor or setpoint loss condition. The controller automatically clears the diagnostic once a valid sensor or setpoint value is present (non-latching diagnostic).
2. If the local outdoor air temperature sensor fails and a communicated value is not present, the outdoor air damper is opened to minimum position and economizer operation is disabled.
3. A space temperature failure diagnostic disables morning and daytime warmup sequence of operation when the controller is configured for constant volume discharge air control or variable air volume control.
4. Some diagnostic messages can be configured as a service required or critical alarm using Tracer Summit or Rover service tool.
5. See nvoAlarmMessage for a list of diagnostic messages.

Translating multiple diagnostics

The controller senses and records each diagnostic independently of other diagnostics. It is possible to have multiple diagnostics present simultaneously. The diagnostics are reported in the order they occur. Non-latching diagnostics automatically reset when the input is present and valid.

Resetting diagnostics

A reset clears any latching diagnostics and allows the controller to try to run the unit normally. If the latching condition is still present, the controller immediately shuts down the unit. A reset will reset a unit that is running normally. A reset is similar to cycling power to the unit. Unit diagnostics can be reset from the local or remote human interface, by cycling power to the unit, or by sending a request through the LCI-I controller.

There are many ways to reset unit diagnostics:

1. Local human interface
2. Remote human interface
3. Cycling power to the controller
4. Sending a reset request through the LCI-I controller via nviRequest enumeration 10 to the correct DAC/SCC object or node.

Cycling power

When the controller's 24VAC power is turned off, then on, the unit cycles through a power up sequence. By default, the controller attempts to reset all diagnostics at power up. Diagnostics present at power up and those that occur after power up are handled according to the defined unit diagnostics sequences (see the previous Diagnostics table).

Appendix

Table 44. Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	Platform ID	Unit_State	Main State	Primary Control State	nviApplicMode (SCC/DAC)	nviHeatCool (SCC)	Supply Fan Status	Gas Heat Type	Drying Mode	Heat Type	System Control	Heat/Cool Mode	nvoHeatCool nvoUnitStatus.mode (DAC / SCC)	nvoApplicMode (DAC Only)	Unit Operation[1]
open	X	X	X	X	X	X	X	X	X	X	VAV w IGV or VAV wo IGV	X	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	reset	X	X	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	check config	X	X	X	X	X	X	X	X	X	X	HVAC_NUL	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	emerg stop	X	X	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	mfg override	X	X	X	X	X	X	X	X	X	X	HVAC_TEST	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	**Platform ID**	**Unit_State**	**Main State**	**Primary Control State**	**nviApplicMode (SCC/DAC)**	**nviHeatCool (SCC)**	**Supply Fan Status**	**Gas Heat Type**	**Drying Mode**	**Heat Type**	**System Control**	**Heat/Cool Mode**	**nvoHeatCool nvoUnitStatus.mode (DAC / SCC)**	**nvoApplicMode (DAC Only)**	**Unit Operation[1]**
X	X	main	reset	X	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	unused	X	X	X	X	X	X	X	X	X	HVAC_NUL	HVAC_NUL	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	service test	X	X	X	X	X	X	X	X	X	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Dependent on test Configuration
X	X	main	ventilation override	X	X	X	Not Requested	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	ventilation override	X	X	X	X	staged	X	gas	VAV w IGV or VAV wo IGV	heat	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	ventilation override	X	X	X	X	staged	X	gas	CV	heat	HVAC_HEAT	not applicable	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	ventilation override	X	X	X	X	modulated	X	gas	X	heat	HVAC_HEAT	HVAC_HEAT	Fan Enabled Heat enabled Cooling Enabled Damper Enabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	**Platform ID**	**Unit_State**	**Main State**	**Primary Control State**	**nviApplicMode (SCC/DAC)**	**nviHeatCool (SCC)**	**Supply Fan Status**	**Gas Heat Type**	**Drying Mode**	**Heat Type**	**System Control**	**Heat/Cool Mode**	**nvoHeatCool nvoUnitStatus.mode (DAC / SCC)**	**nvoApplicMode (DAC Only)**	**Unit Operation[1]**
X	X	main	ventilation override	X	X	X	X	X	X	electric	VAV w IGV or VAV wo IGV	heat	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	ventilation override	X	X	X	X	X	X	electric	1=CV	heat	HVAC_HEAT	not applicable	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	ventilation override	X	X	X	X	X	X	hydronic external heat or heat pump	X	heat	HVAC_HEAT	HVAC_HEAT	Fan Enabled Heat enabled Cooling Enabled Damper Enabled
X	X	main	primary control	start delay	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	unit stop	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	mode off	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	Platform ID	Unit_State	Main State	Primary Control State	nviApplicMode (SCC/DAC)	nviHeatCool (SCC)	Supply Fan Status	Gas Heat Type	Drying Mode	Heat Type	System Control	Heat/Cool Mode	nvoHeatCool nvoUnitStatus.mode (DAC / SCC)	nvoApplicMode (DAC Only)	Unit Operation[1]
X	X	X	primary control	X	MWU	X	X	X	X	X	CV	X	HVAC_MRNG _WRMUP [2]	not applicable	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	MWU	X	X	X	X	X	VAV wo IGV	X	HVAC_MRNG _WRMUP [2]	HVAC_MRNG _WRMUP [2]	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	MWU	X	X	staged	X	gas	VAV w IGV	X	HVAC_MAX_H EAT	HVAC_MAX_ HEAT	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	MWU	X	X	modulating	X	gas	VAV w IGV	X	HVAC_MRNG _WRMUP	HVAC_MRNG _WRMUP	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	MWU	X	X	X	X	hydronic external heat or heat pump	VAV w IGV	X	HVAC_MRNG _WRMUP	HVAC_MRNG _WRMUP	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	IPak I	X	primary control	X	MWU	X	X	X	X	electric	VAV w IGV	X	HVAC_MRNG _WRMUP [1]	HVAC_MRNG _WRMUP [1]	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	**Platform ID**	**Unit_State**	**Main State**	**Primary Control State**	**nviApplicMode (SCC/DAC)**	**nviHeatCool (SCC)**	**Supply Fan Status**	**Gas Heat Type**	**Drying Mode**	**Heat Type**	**System Control**	**Heat/Cool Mode**	**nvoHeatCool nvoUnitStatus.mode (DAC / SCC)**	**nvoApplicMode (DAC Only)**	**Unit Operation[1]**
X	IPak II	X	primary control	X	MWU	X	X	X	X	electric	VAV w IGV	X	HVAC_MRNG _WRMUP [1]	HVAC_MRNG _WRMUP [1]	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	Purge	X	X	X	X	X	X	X	HVAC_NIGHT _PURGE	HVAC_NIGHT _PURGE	Fan Enabled Heating Disabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	PreCool	X	X	X	X	X	X	X	HVAC_PRE_C OOL	HVAC_PRE_C OOL	Fan Enabled Heating Disabled Cooling Enabled Damper Disabled
X	X	X	primary control	X	Auto or NUL	MWU	X	X	X	X	CV	X	HVAC_MRNG _WRMUP	not applicable	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	Auto or NUL	Purge	X	X	X	X	CV	X	HVAC_NIGHT _PURGE	not applicable	Fan Enabled Heating Disabled Cooling Disabled Damper Disabled
X	X	X	primary control	X	Auto or NUL	PreCool	X	X	X	X	CV	X	HVAC_PRE_C OOL	not applicable	Fan Enabled Heating Disabled Cooling Enabled Damper Disabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	Platform ID	Unit_State	Main State	Primary Control State	nviApplicMode (SCC/DAC)	nviHeatCool (SCC)	Supply Fan Status	Gas Heat Type	Drying Mode	Heat Type	System Control	Heat/Cool Mode	nvoHeatCool nvoUnitStatus.mode (DAC / SCC)	nvoApplicMode (DAC Only)	Unit Operation[1]
X	X	main	primary control	Not Start Delay, Unit Stop, or Mode Off	Fan Only	X	X	X	X	X	X	X	HVAC_FAN_ONLY	HVAC_AUTO	Fan Enabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	Not Start Delay, Unit Stop, or Mode Off	Auto or NUL	Fan Only	X	X	X	X	X	X	HVAC_FAN_ONLY	not applicable	Fan Enabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	mwu	X	X	X	X	X	X	CV	X	HVAC_MRNG_WRMUP	not applicable	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	main	primary control	mwu	X	X	X	X	X	X	VAV w IGV or VAV wo IGV	X	HVAC_MRNG_WRMUP	not applicable	Fan Enabled Heating Enabled Cooling Disabled Damper Disabled
X	X	main	primary control	dwu	X	X	X	X	X	X	VAV w IGV or VAV wo IGV	X	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heating Enabled Cooling Disabled Damper Enabled
X	X	main	primary control	system diag	X	X	X	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	**Platform ID**	**Unit_State**	**Main State**	**Primary Control State**	**nviApplicMode (SCC/DAC)**	**nviHeatCool (SCC)**	**Supply Fan Status**	**Gas Heat Type**	**Drying Mode**	**Heat Type**	**System Control**	**Heat/Cool Mode**	**nvoHeatCool nvoUnitStatus.mode (DAC / SCC)**	**nvoApplicMode (DAC Only)**	**Unit Operation[1]**
X	X	main	primary control	unoccupied	X	X	Not Requested	X	X	X	X	X	HVAC_OFF	HVAC_AUTO	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	unoccupied	X	X	X	X	drying	X	CV	X	HVAC_DEHUMID	HVAC_DEHUMID	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	unoccupied	X	X	X	X	X	X	CV	heat	HVAC_HEAT	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	unoccupied	X	X	X	X	X	X	CV	cool	HVAC_COOL	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	unoccupied	X	X	X	X	X	X	VAV w IGV or VAV wo IGV	X	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	vav occupied	X	X	X	X	drying	X	X	X	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	Platform ID	Unit_State	Main State	Primary Control State	nviApplicMode (SCC/DAC)	nviHeatCool (SCC)	Supply Fan Status	Gas Heat Type	Drying Mode	Heat Type	System Control	Heat/Cool Mode	nvoHeatCool nvoUnitStatus.mode (DAC / SCC)	nvoApplicMode (DAC Only)	Unit Operation[1]
X	X	main	primary control	vav occupied	X	X	X	staged	X	gas	X	heat	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	vav occupied	X	X	X	modulated	X	gas	X	heat	HVAC_HEAT	HVAC_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	vav occupied	X	X	X	X	X	electric	X	heat	HVAC_MAX_HEAT	HVAC_MAX_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	vav occupied	X	X	X	X	X	hydronic external heat or heat pump	X	heat	HVAC_HEAT	HVAC_HEAT	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	vav occupied	X	X	X	X	X	X	X	cool	HVAC_COOL	HVAC_COOL	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	Platform ID	Unit_State	Main State	Primary Control State	nviApplicMode (SCC/DAC)	nviHeatCool (SCC)	Supply Fan Status	Gas Heat Type	Drying Mode	Heat Type	System Control	Heat/Cool Mode	nvoHeatCool nvoUnitStatus.mode (DAC / SCC)	nvoApplicMode (DAC Only)	Unit Operation[1]
X	X	main	primary control	cv occupied	X	X	Not Requested	X	X	X	X	X	HVAC_OFF	not applicable	Fan Disabled Heating Disabled Cooling Disabled Damper Disabled
X	X	main	primary control	cv occupied	X	X	X	X	drying	X	X	X	HVAC_DEHUMID	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	cv occupied	X	X	X	staged	X	gas	X	heat	HVAC_HEAT	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	cv occupied	X	X	X	modulated	X	gas	X	heat	HVAC_HEAT	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	cv occupied	X	X	X	X	X	electric	X	heat	HVAC_HEAT	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled

Table 44. (continued) Effect of Application Mode and Heat/Cool Mode on Unit Operation (In the table below, X = Any State)

Input	Input	Input		Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output
VAV Box Cmd	**Platform ID**	**Unit_State**	**Main State**	**Primary Control State**	**nviApplicMode (SCC/DAC)**	**nviHeatCool (SCC)**	**Supply Fan Status**	**Gas Heat Type**	**Drying Mode**	**Heat Type**	**System Control**	**Heat/Cool Mode**	**nvoHeatCool nvoUnitStatus.mode (DAC / SCC)**	**nvoApplicMode (DAC Only)**	**Unit Operation[1]**
X	X	main	primary control	cv occupied	X	X	X	X	X	hydronic external heat or heat pump	X	heat	HVAC_HEAT	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled
X	X	main	primary control	cv occupied	X	X	X	X	X	X	X	cool	HVAC_COOL	not applicable	Fan Enabled Heating Enabled Cooling Enabled Damper Enabled

Note: The outputs in the Unit Operation column are based on the inputs of nviApplicMode and nviHeatCool. Though the output may say “Enabled”, the actual function may be disabled by various Ventilation Override Modes or lockout sources (low ambient lockout, supply air low limit, fan proving, demand limit, etc).

Table 45. Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
> 0	X	X	X	X	X	X	X	X	X	local	heat	stop	auto
0	enable	auto	FAU	DAC	AUTO	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	FAU	DAC	OFF	n/a	X	n/a	n/a	local	heat	stop	auto
0	enable	auto	FAU	DAC	FAN_ONLY[4]	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	FAU	DAC	X	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	RT/CSC	DAC	AUTO	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	RT/CSC	DAC	HEAT	n/a	X	n/a	n/a	remote	heat	auto	auto
0	enable	auto	RT/CSC	DAC	MWU	n/a	X	n/a	n/a	remote	heat	auto	on
0	enable	auto	RT/CSC	DAC	COOL	n/a	X	n/a	n/a	remote	cool	auto	auto
0	enable	auto	RT/CSC	DAC	PURGE	n/a	X	n/a	n/a	remote	cool	auto	on
0	enable	auto	RT/CSC	DAC	PRECOOL	n/a	X	n/a	n/a	remote	cool	auto	on
0	enable	auto	RT/CSC	DAC	OFF	n/a	X	n/a	n/a	local	heat	stop	auto
0	enable	auto	RT/CSC	DAC	FAN_ONLY[4]	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	RT/CSC	DAC	X	n/a	X	n/a	n/a	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	AUTO	auto	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	AUTO	Heat or MAX HT	X	X	X	remote	heat	auto	auto
0	enable	auto	RT/CSC	SCC	AUTO	MWU	X	X	X	remote	heat	auto	on
0	enable	auto	RT/CSC	SCC	AUTO	COOL	X	X	X	remote	cool	auto	auto
0	enable	auto	RT/CSC	SCC	AUTO	PURGE	X	X	X	remote	cool	auto	on
0	enable	auto	RT/CSC	SCC	AUTO	PRECOOL	X	X	X	remote	cool	auto	on
0	enable	auto	RT/CSC	SCC	AUTO	OFF	X	X	X	local	heat	stop	auto
0	enable	auto	RT/CSC	SCC	AUTO	FAN_ONLY[4]	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	AUTO	X	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	HEAT	X	X	X	X	remote	heat	auto	auto
0	enable	auto	RT/CSC	SCC	MWU	X	X	X	X	remote	heat	auto	on
0	enable	auto	RT/CSC	SCC	COOL	X	X	X	X	remote	cool	auto	auto
0	enable	auto	RT/CSC	SCC	PURGE	X	X	X	X	remote	cool	auto	on

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	enable	auto	RT/CSC	SCC	PRECOOL	X	X	X	X	remote	cool	auto	on
0	enable	auto	RT/CSC	SCC	OFF	X	X	X	X	local	heat	stop	auto
0	enable	auto	RT/CSC	SCC	FAN_ONLY[4]	X	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	X	auto	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	X	Heat or MAX HT	X	X	X	remote	heat	auto	auto
0	enable	auto	RT/CSC	SCC	X	MWU	X	X	X	remote	heat	auto	on
0	enable	auto	RT/CSC	SCC	X	COOL	X	X	X	remote	cool	auto	auto
0	enable	auto	RT/CSC	SCC	X	PURGE	X	X	X	remote	cool	auto	on
0	enable	auto	RT/CSC	SCC	X	PRECOOL	X	X	X	remote	cool	auto	on
0	enable	auto	RT/CSC	SCC	X	OFF	X	X	X	local	heat	stop	auto
0	enable	auto	RT/CSC	SCC	X	FAN_ONLY[4]	X	X	X	local	heat	auto	auto
0	enable	auto	RT/CSC	SCC	X	X	X	X	X	local	heat	auto	auto
0	enable	on	FAU	DAC	AUTO	n/a	X	n/a	n/a	local	heat	auto	on
0	enable	on	FAU	DAC	OFF	n/a	X	n/a	n/a	local	heat	stop	on
0	enable	on	FAU	DAC	FAN_ONLY[4]	n/a	X	n/a	n/a	local	heat	auto	on
0	enable	on	FAU	DAC	X	n/a	X	n/a	n/a	local	heat	auto	on
0	enable	on	RT/CSC	SCC	AUTO	AUTO	X	X	X	local	heat	auto	on
0	enable	on	RT/CSC	SCC	AUTO	Heat or MAX HT	X	X	X	remote	heat	auto	on
0	enable	on	RT/CSC	SCC	AUTO	MWU	X	X	X	remote	heat	auto	on
0	enable	on	RT/CSC	SCC	AUTO	COOL	X	X	X	remote	cool	auto	on
0	enable	on	RT/CSC	SCC	AUTO	PURGE	X	X	X	remote	cool	auto	on
0	enable	on	RT/CSC	SCC	AUTO	PRECOOL	X	X	X	remote	cool	auto	on
0	enable	on	RT/CSC	SCC	AUTO	OFF	X	X	X	local	heat	stop	on
0	enable	on	RT/CSC	SCC	AUTO	FAN_ONLY[4]	X	X	X	local	heat	auto	on
0	enable	on	RT/CSC	SCC	AUTO	X	X	X	X	local	heat	auto	on
0	enable	on	RT/CSC	SCC	HEAT	X	X	X	X	remote	heat	auto	on
0	enable	on	RT/CSC	SCC	MWU	X	X	X	X	remote	heat	auto	on
0	enable	on	RT/CSC	SCC	COOL	X	X	X	X	remote	cool	auto	on

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	enable	on	RT/CSC	SCC	PURGE	X	X	X	X	remote	cool	auto	on
0	enable	on	RT/CSC	SCC	PRECOOL	X	X	X	X	remote	cool	auto	on
0	enable	on	RT/CSC	SCC	OFF	X	X	X	X	local	heat	stop	on
0	enable	on	RT/CSC	SCC	FAN_ONLY[4]	X	X	X	X	local	heat	auto	on
0	enable	on	RT/CSC	SCC	X	X	X	X	X	local	heat	auto	on
0	disable	X	FAU	DAC	AUTO	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	FAU	DAC	OFF	n/a	X	n/a	n/a	local	heat	stop	auto
0	disable	X	FAU	DAC	FAN_ONLY[4]	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	FAU	DAC	X	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	RT/CSC	DAC	AUTO	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	RT/CSC	DAC	HEAT	n/a	X	n/a	n/a	remote	heat	auto	auto
0	disable	X	RT/CSC	DAC	MWU	n/a	X	n/a	n/a	remote	heat	auto	on
0	disable	X	RT/CSC	DAC	COOL	n/a	X	n/a	n/a	remote	cool	auto	auto
0	disable	X	RT/CSC	DAC	PURGE	n/a	X	n/a	n/a	remote	cool	auto	on
0	disable	X	RT/CSC	DAC	PRECOOL	n/a	X	n/a	n/a	remote	cool	auto	on
0	disable	X	RT/CSC	DAC	OFF	n/a	X	n/a	n/a	local	heat	stop	auto
0	disable	X	RT/CSC	DAC	FAN_ONLY[4]	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	RT/CSC	DAC	X	n/a	X	n/a	n/a	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	AUTO	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	AUTO	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	AUTO	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	AUTO	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	AUTO	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	AUTO	precool	X	X	remote	cool	auto	on

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	disable	X	RT/CSC	SCC	AUTO	AUTO	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	AUTO	FAN_ONLY[4]	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	Heat or MAX HT	X	X	cycling	remote	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	Heat or MAX HT	X	X	continuous	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	MWU	X	X	X	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	COOL	X	cycling	X	remote	cool	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	COOL	X	continuous	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	PURGE	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	PRECOOL	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	OFF	X	X	X	local	heat	stop	auto
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	FAN_ONLY[4]	fan only	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	X	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	X	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	X	cool	cycling	X	local	heat	auto	auto

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	disable	X	RT/CSC	SCC	AUTO	X	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	AUTO	X	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	X	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	AUTO	X	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	AUTO	X	fan only	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	HEAT	X	X	X	cycling	remote	heat	auto	auto
0	disable	X	RT/CSC	SCC	HEAT	X	X	X	continuous	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	MWU	X	X	X	X	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	COOL	X	X	cycling	X	remote	cool	auto	auto
0	disable	X	RT/CSC	SCC	COOL	X	X	continuous	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	PURGE	X	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	PRECOOL	X	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	OFF	X	X	X	X	local	heat	stop	auto
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	FAN_ONLY[4]	X	fan only	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	AUTO	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	disable	X	RT/CSC	SCC	X	AUTO	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	AUTO	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	AUTO	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	AUTO	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	AUTO	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	AUTO	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	AUTO	fan only	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	Heat or MAX HT	X	X	cycling	remote	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	Heat or MAX HT	X	X	continuous	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	X	MWU	X	X	X	remote	heat	auto	on
0	disable	X	RT/CSC	SCC	X	COOL	X	cycling	X	remote	cool	auto	auto
0	disable	X	RT/CSC	SCC	X	COOL	X	continuous	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	PURGE	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	PRECOOL	X	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	OFF	X	X	X	local	heat	stop	auto
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	off or test or nul	X	X	local	heat	auto	auto

Table 45. (continued) Determination of Heat/Cool mode, Fan Request, and Run Request (In the table below, X = Any State)

Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Output	Output	Output	Output
Power up Control Wait Time	Local Switch Enable	Local Fan Mode	Unit Type	Profile	nviApplicMode	nviHeatCool (SCC)	nvoHeatCool	Fan Config Cooling	Fan Config Heating	Local/ Remote Heat/Cool Arb.	Remote Heat/ Cool Request	Remote Auto/ Stop Request	Remote Fan Mode Request
0	disable	X	RT/CSC	SCC	X	FAN_ONLY[4]	fan only	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	X	Heat or MWU or Max HT	X	cycling	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	X	Heat or MWU or Max HT	X	continuous	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	X	cool	cycling	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	X	cool	continuous	X	local	heat	auto	on
0	disable	X	RT/CSC	SCC	X	X	purge	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	X	precool	X	X	remote	cool	auto	on
0	disable	X	RT/CSC	SCC	X	X	off or test or nul	X	X	local	heat	auto	auto
0	disable	X	RT/CSC	SCC	X	X	fan only	X	X	local	heat	auto	auto
X	X	X	X	X	X	X	X	X	X	local	heat	auto	auto

Notes:

1. See the section titled "Local Fan Mode Arbitration" for more information on determining local fan mode arbitration.
2. Per the SCC profile, nviApplicMode overrides nviHeatCool, unless nviApplicMode is HVAC_AUTO, HVAC_TEST, or HVAC_NUL (for IntelliPak units, HVAC_TEST and HVAC_NUL are treated as HVAC_AUTO.) If nviApplicMode is HVAC_AUTO, then nviHeatCool determines the effective mode of the unit.
3. nviApplicMode (and/or nviHeatCool) with an unsupported enumeration (other than 0, 6 or 9 for FAU and other than 0, 1, 3, 6 or 9 for RT/CSC) is treated as HVAC_AUTO.
4. See nviAuxHeatEnable (SCC), nviComprEnable (SCC), nviPriCoolEnable (DAC) and nviPriHeatEnable (DAC) for more information on cooling and heating lockout arbitration.

Table 46. Local Fan Mode Arbitration (X = any state)

Input	Input	Input	Input	Input	Input	Input	Input	Output
Occupancy Command	**System Control**	**Supply Fan Bypass[1]**	**System On/Off Status**	**NSB Panel Input Status**	**NSB Fan Request**	**Zone Sensor Fan Request**	**Default Supply Fan Mode**	**Local Fan Mode Arb**
Occ	VAV w/ IGV/VFD or VAV w/o IGV/VFD	Bypass	1 = On	X	X	X	X	On
Occ	VAV w/ IGV/VFD or VAV w/o IGV/VFD	X	X	X	X	X	X	Auto
Occ	CV	X	X	Valid	On	X	X	On
Occ	CV	X	X	Invalid	X	On	X	On
Occ	CV	X	X	Invalid	X	Invalid	On	On
X	X	X	X	X	X	X	X	Auto

Note: Supply Fan Bypass column is CSC only.

Table 47. SCC Space Setpoint Arbitration

Default Occ Zone Cooling Setpoint Source Default Occ Zone Heating Setpoint Source Default Unocc Zone Cooling Setpoint Source Default Unocc Zone Heating Setpoint Source RTM Cooling Setpoint RTM Heating Setpoint NSB Occ Zone Cooling Setpoint [1] NSB Occ Zone Heating Setpoint [1] NSB Unocc Zone Cooling Setpoint NSB Unocc Zone Heating Setpoint Default Occ Zone Cooling Setpoint Default Occ Zone Heating Setpoint Default Unocc Zone Cooling Setpoint Default Unocc Zone Heating Setpoint GBAS 0-5V Occ Zone Cooling Setpoint GBAS 0-5V Unocc Zone Cooling Setpoint GBAS 0-5V Occ Zone Heating Setpoint GBAS 0-5V Unocc Zone Heating Setpoint GBAS 0-10V Occ Zone Cooling Setpoint [2] GBAS 0-10V Unocc Zone Cooling Setpoint [2] GBAS 0-10V Occ Zone Heating Setpoint [2] GBAS 0-10V Unocc Zone Heating Setpoint [2]	→
1) Local Setpoint Arbitration from IPC bus based on Default Occ Zone Cooling Setpoint Source: **localOccCool** = RTM Cooling Setpoint **localOccCool** = NSB Occ Zone Cooling Setpoint [1] **localOccCool** = Default Occ Zone Cooling Setpoint **localOccCool** = GBAS 0-5V Occ Zone Cooling Setpoint **localOccCool** = GBAS 0-10V Occ Zone Cooling Setpoint based on Default Unocc Zone Cooling Setpoint Source: **localUnoccCool** = RTM Cooling Setpoint **localUnoccCool** = NSB Unocc Zone Cooling Setpoint **localUnoccCool** = Default Unocc Zone Cooling Setpoint **localUnoccCool** = GBAS 0-5V Unocc Zone Cooling Setpoint **localUnoccCool** = GBAS 0-10V Unocc Zone Cooling Setpoint based on Default Occ Zone Heating Setpoint Source: **localOccHeat** = RTM Heating Setpoint **localOccHeat** = NSB Occ Zone Heating Setpoint [1] **localOccHeat** = Default Occ Zone Heating Setpoint **localOccHeat** = GBAS 0-5V Occ Zone Heating Setpoint **localOccHeat** = GBAS 0-10V Occ Zone Heating Setpoint based on Default Unocc Zone Heating Setpoint Source: **localUnoccHeat** = RTM Heating Setpoint **localUnoccHeat** = NSB Unocc Zone Heating Setpoint **localUnoccHeat** = Default Unocc Zone Heating Setpoint **localUnoccHeat** = GBAS 0-5V Unocc Zone Heating Setpoint **localUnoccHeat** = GBAS 0-10V Unocc Zone Heating Setpoint	

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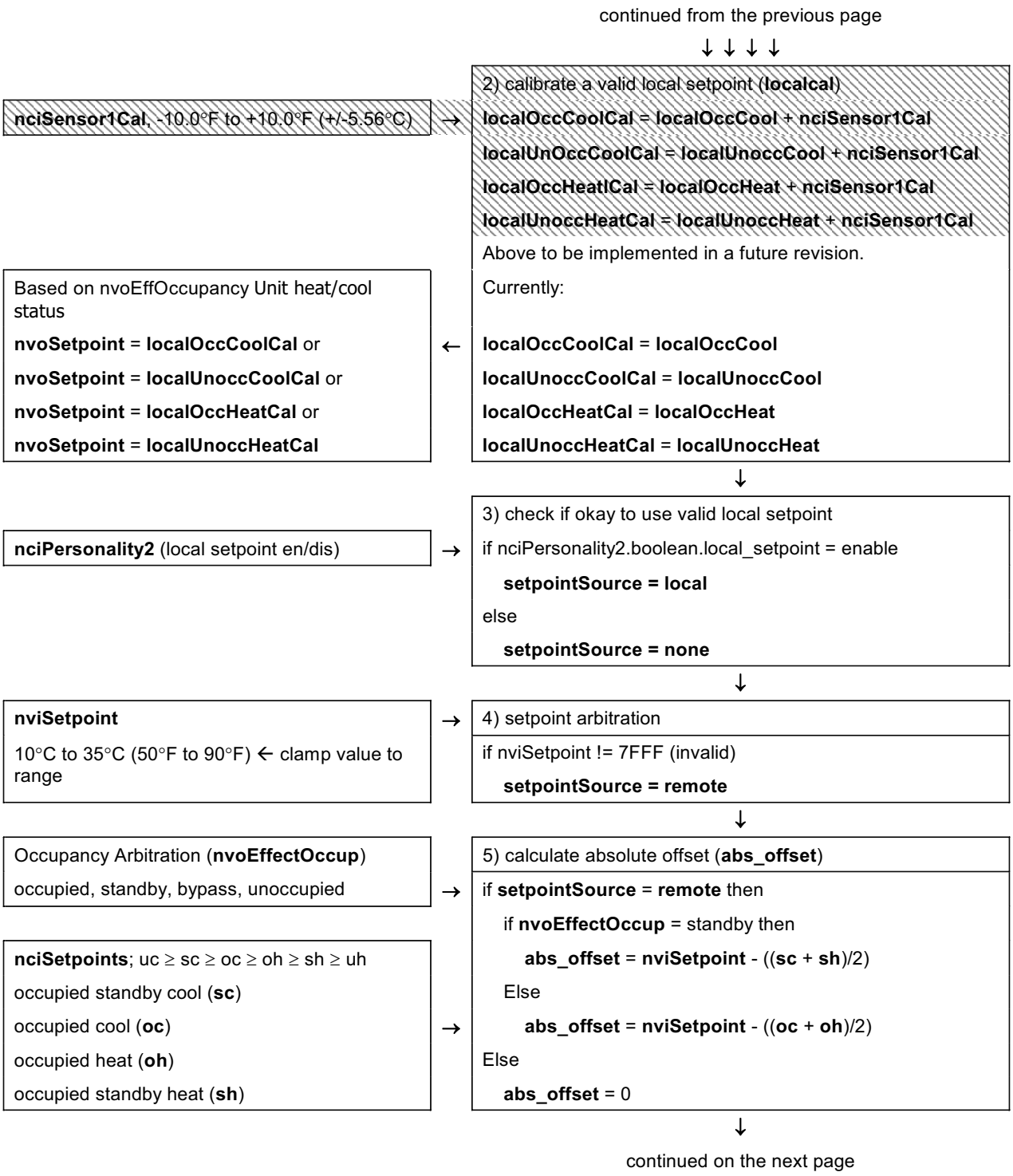
Notes:
1. NSB Occ Zone Cooling Setpoint and NSB Occ Zone Heating Setpoint are not communicated internally by the RTM. Therefore, for these two cases, we must fall back to using Default Occ Zone Cooling Setpoint and Default Occ Zone Heating Setpoint, respectively.
2. At the time of this writing, the GBAS 0-10V module is not available.
3. When a local temperature/pressure sensor or setpoint has failed after being valid, the controller generates a diagnostic to indicate the sensor or setpoint loss condition. The controller automatically clears the diagnostic once a valid sensor or setpoint value is present (non-latching diagnostic).
4. If the local outdoor air temperature sensor fails and a communicated value is not present, the outdoor air damper is opened to minimum position and economizer operation is disabled.
5. A space temperature failure diagnostic disables morning and daytime warm-up sequence of operation when the controller is configured for constant volume discharge air control or variable air volume control.
6. Some diagnostic messages can be configured as a service required or critical alarm using Tracer Summit or Rover service tool.
7. See nvoAlarmMessage for a list of diagnostic messages.

(continued) SCC Space Setpoint Arbitration



(continued) SCC Space Setpoint Arbitration

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nciSetpoints; uc ≥ sc ≥ oc ≥ oh ≥ sh ≥ uh		6) apply **abs_offset** to occupied setpoints
unoccupied cool (**uc**)	→	if **setpointSource** = **local**
occupied standby cool (**sc**)	→	**uc** = **see Local Unoccupied Setpoint Arbitration table**
occupied cool (**oc**)	→	**scao** = **see Local Occupied Setpoint Arbitration table**
occupied heat (**oh**)	→	**ocao** = **see Local Occupied Setpoint Arbitration table**
occupied standby heat (**sh**)	→	**ohao** = **see Local Occupied Setpoint Arbitration table**
unoccupied heat (**uh**)	→	**shao** = **see Local Occupied Setpoint Arbitration table**
Order enforced by Rover service tool:		**uh** = **see Local Unoccupied Setpoint Arbitration table**
115°F ≥ **uc** ≥ **sc** ≥ **oc** ≥ **oh** ≥ **sh** ≥ **uh** ≥ 40°F		else // **remote** or **none**
46.11°C ≥ **uc** ≥ **sc** ≥ **oc** ≥ **oh** ≥ **sh** ≥ **uh** ≥ 4.44°C		**uc** = **uc**
		scao = **sc** + **abs_offset**
		ocao = **oc** + **abs_offset**
		ohao = **oh** + **abs_offset**
		shao = **sh** + **abs_offset**
		uh = **uh**
		Setpoints are not limited
		(however, **uc** ≥ **scao** ≥ **ocao** ≥ **ohao** ≥ **shao** ≥ **uh**)

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		7) apply **nviSetptOffset** to occupied setpoints
		uc = **uc**
		sco = **scao** + **nviSetptOffset**
		oco = **ocao** + **nviSetptOffset**
nviSetptOffset	→	
10°C ≥ offset ≥ -10°C (+/-18°F)		**oho** = **ohao** + **nviSetptOffset**
		sho = **shao** + **nviSetptOffset**
		uh = **uh**
		Setpoints are not limited
		(however, **uc** ≥ **sco** ≥ **oco** ≥ **oho** ≥ **sho** ≥ **uh**)

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(continued) SCC Space Setpoint Arbitration

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nviSetptShift		8) apply **nviSetptShift** to all setpoints
10°C ≥ **uc_shift** ≥ -10°C (+/-18°F)	→	**ucs** = **uc** + **uc_shift**
10°C ≥ **sc_shift** ≥ -10°C (+/-18°F)	→	**scs** = **sco** + **sc_shift**
10°C ≥ **oc_shift** ≥ -10°C (+/-18°F)	→	**ocs** = **oco** + **oc_shift**
10°C ≥ **oh_shift** ≥ -10°C (+/-18°F)	→	**ohs** = **oho** + **oh_shift**
10°C ≥ **sh_shift** ≥ -10°C (+/-18°F)	→	**shs** = **sho** + **sh_shift**
10°C ≥ **uh_shift** ≥ -10°C (+/-18°F)	→	**uhs** = **uh** + **uh_shift**
		Setpoints are not limited
		(however, in no particular order now)

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		9) limit occupied setpoints
nciPersonality2		**ucs** = **ucs**
cool setpoint high limit (**csphl**)	→	**csphl** ≥ **scl** ≥ **cspll**
cool setpoint low limit (**cspll**)	→	**csphl** ≥ **ocl** ≥ **cspll**
heat setpoint high limit (**hsphl**)	→	**hsphl** ≥ **ohl** ≥ **hspll**
heat setpoint low limit (**hspll**)	→	**hsphl** ≥ **shl** ≥ **hspll**
115°F ≥ range ≥ 40°F (46.11°C to 4.44°C)		**uhs** = **uhs**

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10) These are the six active space setpoints.
uca = active unoccupied cool setpoint
sca = active standby cool setpoint
oca = active occupied cool setpoint
oha = active occupied heat setpoint
sha = active standby heat setpoint
uha = active unoccupied heat setpoint

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(continued) SCC Space Setpoint Arbitration

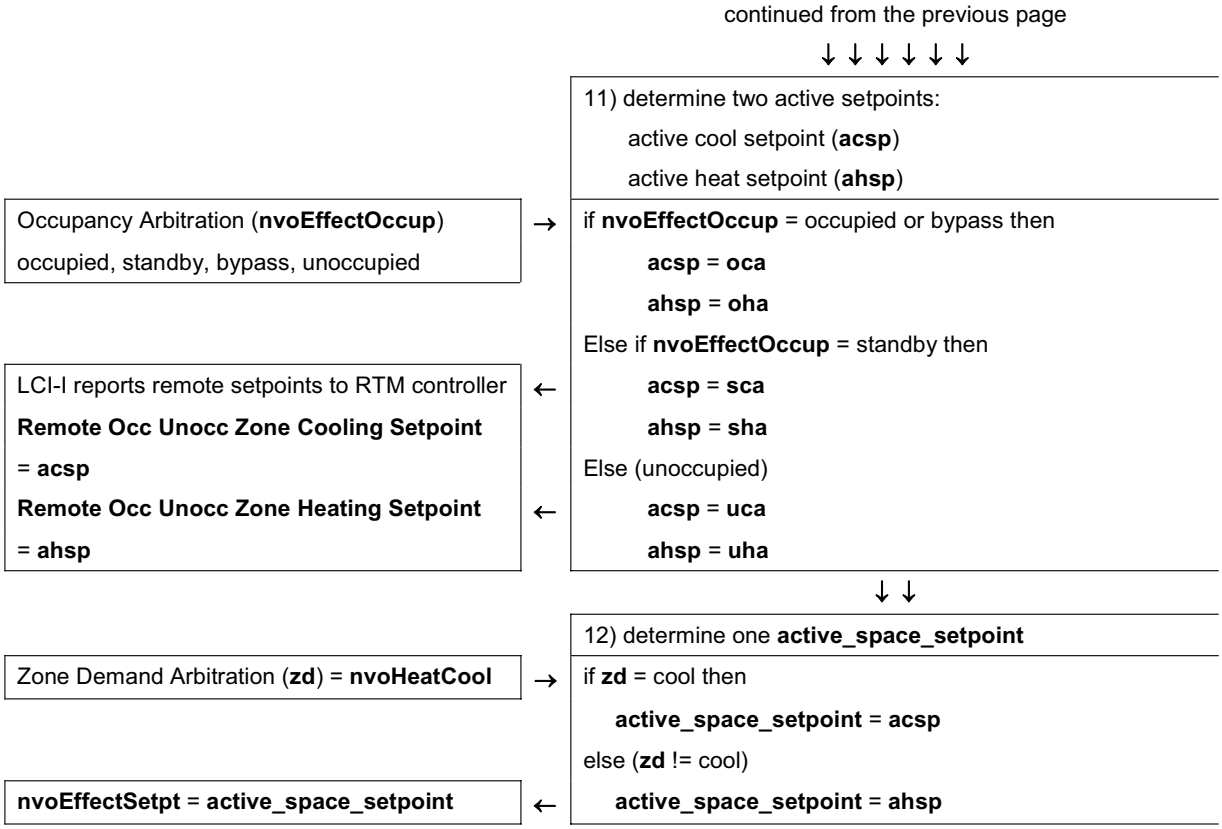

Table 48. Local occupied setpoint arbitration

Input	Input	Input	Input	Output
Default Occ Zone Cooling Setpoint Source	Default Occ Zone Heating Setpoint Source	RTM Zone Sensor Cooling Setpoint	RTM Zone Sensor Heating Setpoint	Local Occupied Setpoints[1,2,3]
0 = RTM	0 = RTM	OK	not present or failed	scao = localOccCoolCal + cso ocao = localOccCoolCal ohao = localOccCoolCal - do shao = localOccCoolCal - do - hso
0 = RTM	0 = RTM	not present or failed	OK	scao = localOccHeatCal + do + cso ocao = localOccHeatCal + do ohao = localOccHeatCal shao = localOccHeatCal - hso
0 = RTM	0 = RTM	not present or failed	not present or failed	scao = nciSetpoints.standby_cool ocao = nciSetpoints.occupied_cool ohao = nciSetpoints.occupied_heat shao = nciSetpoints.standby_heat
0 = RTM	0 = RTM	OK	OK	scao = localOccCoolCal + cso ocao = localOccCoolCal ohao = localOccHeatCal shao = localOccHeatCal - hso
X	X	X	X	scao = localOccCoolCal ocao = localOccCoolCal ohao = localOccHeatCal shao = localOccHeatCal

Notes:
1. deadband_occupied (do) = nciSetpoints.occupied_cool - nciSetpoints.occupied_heat
2. heat_standby_offset (hso) = nciSetpoints.occupied_heat - nciSetpoints.standby_heat
3. cool_standby_offset (cso) = nciSetpoints.standby_cool - nciSetpoints.occupied_cool

Table 49. Local unoccupied setpoint arbitration

Input	Input	Input	Input	Output
Default Unocc Zone Cooling Setpoint Source	Default Unocc Zone Heating Setpoint Source	RTM Zone Sensor Cooling Setpoint	RTM Zone Sensor Heating Setpoint	Local Unoccupied Setpoints
RTM	RTM	not present or failed	not present or failed	uc = nciSetpoints.unoccupied_cool uh = nciSetpoints.unoccupied_heat

Space Temperature Output Arbitration

The following arbitration logic applies to the following network variables:

- nvoLocalSpaceTmp (SCC only)
- nvoSpaceTemp (SCC)
- nvoSpaceTemp (DAC)Resetting diagnostics

nvoSpaceTemp (SCC and DAC)

nviSpaceTemp	nvoSpaceTemp (SCC and DAC)
valid	nviSpaceTemp
invalid	Local Space Temp Arbitration (see table below)

nvoLocalSpaceTmp (SCC)

nvoLocalSpaceTmp (SCC)
Local Space Temp Arbitration (see table below)

Table 50. Local space temp arbitration

Input	Input	Input	Output
If:	Temp Sensor Source	and Temp Sensor is	Local Space Temp Arbitration
Monitor Temp Source has been selected	Monitor Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	Monitor Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	Monitor Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	Monitor Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	Monitor Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid

(continued) Local space temp arbitration

Input	Input	Input	Output
If:	**Temp Sensor Source**	**and Temp Sensor is**	**Local Space Temp Arbitration**
Unit Type = FAU and Drying Mode = Active and Reheat Reset Type = Zone and Unit State = VAV Occupied	Occ Zone Temp Source = RTM	OK	Occ Zone Temp
		Failed	Invalid
	Occ Zone Temp Source = NSB	OK	Occ Zone Temp
		Failed	Invalid
	Occ Zone Temp Source = RTM Aux	OK	Occ Zone Temp
		Failed	Invalid
	Occ Zone Temp Source = MWU	OK	Occ Zone Temp
		Failed	Invalid
	Occ Zone Temp Source = ECEM	OK	Occ Zone Temp
		Failed	Invalid
	Occ Zone Temp Source is not one of the above	X	Invalid
Unit Type = FAU and Drying Mode = Active and Reheat Reset Type = Zone and Unit State = Unoccupied	Unocc Zone Temp Source = RTM	OK	Unocc Zone Temp
		Failed	Invalid
	Unocc Zone Temp Source = NSB	OK	Unocc Zone Temp
		Failed	Invalid
	Unocc Zone Temp Source = RTM Aux	OK	Unocc Zone Temp
		Failed	Invalid
	Unocc Zone Temp Source = MWU	OK	Unocc Zone Temp
		Failed	Invalid
	Unocc Zone Temp Source = ECEM	OK	Unocc Zone Temp
		Failed	Invalid
Unit State = MWU	MWU Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	MWU Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	MWU Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	MWU Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	MWU Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid

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(continued) Local space temp arbitration

Input If:	Input Temp Sensor Source	Input and Temp Sensor is	Output Local Space Temp Arbitration
Unit State = DWU	DWU Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	DWU Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	DWU Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	DWU Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	DWU Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid
Unit State = Unoccupied	Unocc Zone Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	Unocc Zone Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	Unocc Zone Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	Unocc Zone Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	Unocc Zone Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid
Unit Control = VAV and Active Cool Reset Type = Zone or Active Heat Reset Type = Outdoor Air or Zone	Zone Reset Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	Zone Reset Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	Zone Reset Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	Zone Reset Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	Zone Reset Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid
Unit Control = CV	Occ Zone Temp Source = RTM	OK	RTM Zone Temp
		Failed	Invalid
	Occ Zone Temp Source = NSB	OK	NSB Temp
		Failed	Invalid
	Occ Zone Temp Source = RTM Aux	OK	RTM Aux Temp
		Failed	Invalid
	Occ Zone Temp Source = MWU	OK	MWU Temp
		Failed	Invalid
	Occ Zone Temp Source = ECEM	OK	Return Air Temp
		Failed	Invalid

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