Integration Guide

LonTalk® Integration to IntelliPak® Rooftop Units (RTU)

With Symbio™ 800 Controls

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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TRANE TECHNOLOGIES™

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

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Overview

Purpose

The purpose of this document is to provide instructions for integrating the Symbio™ 800700 controller into Non-Trane building automation systems. This document is targeted to system integrators and controls contractors.

Symbio™ 800700 Controller Overview

The Symbio™ 800700 controller has been installed, programmed, wired, commissioned, and tested in the factory prior to shipment. While some sensors and end devices are normally wired in the field, nearly all other wiring is factory-provided. Power for the controller is provided and connected from within the RTU control panel.

The RTUunit and associated controller can be applied as standalone or as part of a building automation system.

Note: *For communicating applications to third-party control systems, network communication wiring must be provided by others.*

Communication Options

The Symbio 800 controller supports the following communication protocol options for integration to either Trane or non-Trane control systems:

- BACnet TP
- BACnet Air-Fi
- BACnet IP
  - Ethernet
  - Wi-Fi
- Modbus RTU
- Modbus TCP
- LonTalk

For information pertaining to the integration of the Symbio 800 controller using either Modbus or BACnet communication, refer to the integration guides specific to those applications.

Units of Measure

The communicated LonTalk data of the Symbio™ 700 controller will be passed in the factory-configured units of measure, inch-pound (I-P) by default. The Symbio 700 mobile application allows the user to change and customize the Data Display Units Preferences.

The communicated data of the Symbio™ 800 controller will be passed in the factory-configured units of measure, either inch-pound (I-P) or the International System of Units (SI). The units of measure are selected as part of the unit order (the default selection is normally I-P). Should the units of measure need to be changed in the field, contact your local Trane representative.

The Symbio 800 controller provides a browser-based user interface for USB connection to the controller. One of the tools provided with that interface allows the user to change and customize the Data Display Units Preferences.

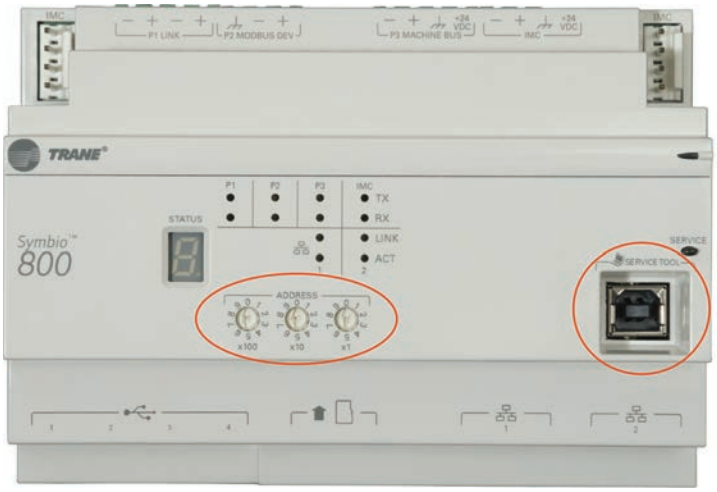
Important: *These adjustable settings are applied only to the units of measured displayed in the web interface, not the communicated interface.*

Regardless of the communicated (system) units of measure, the user may change the displayed units of measure on their smart device. These user preference units of measure are independent of the communicated units.

Communication Setup and Configuration

The Symbio™ 800 controller can be factory ordered with a specific protocol configuration and rotary address setting. If communication options were not specified, the Symbio™ 800 controller will be setup for BACnet TP communications at 76,800 bps with a rotary address setting of 000.

Figure 1. Symbio™ 800 rotary address and service tool port



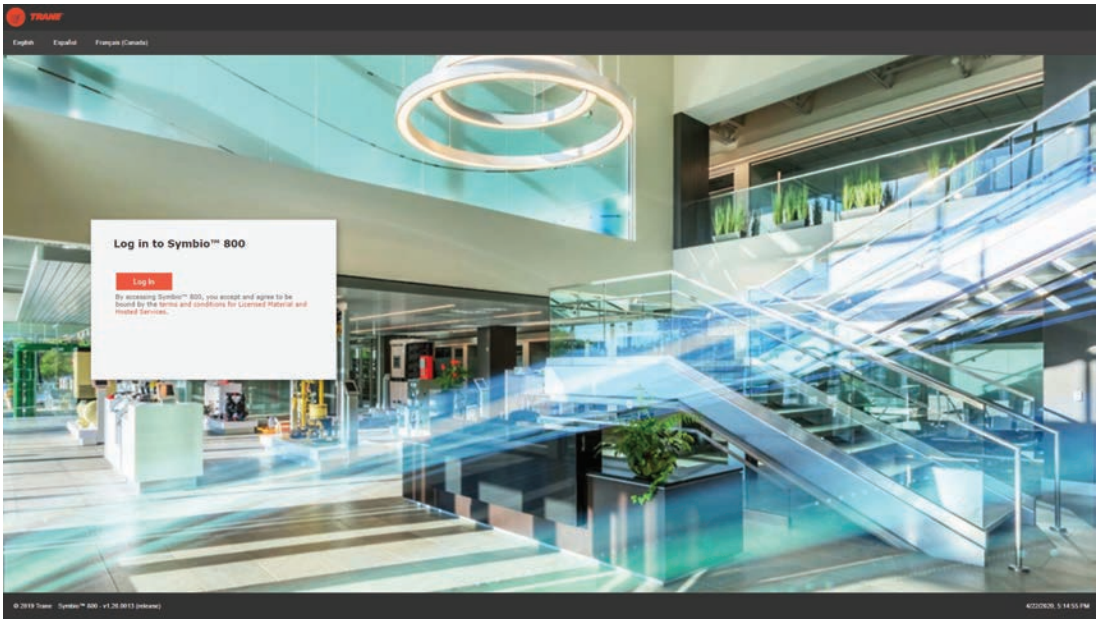
Service Tool for Symbio™ 800 Configuration

The service tool used to modify the Symbio™ 800 controller is a standard web browser. The Symbio™ 800 webpage is accessed by using a standard USB type A/B cable. Connect the USB cable between a laptop and the service tool port on the Symbio™ 800 controller (shown in Figure 1, p. 6).

Connecting to the Symbio™ 800 Web Interface

1. Connect a laptop to the Symbio™ 800 controller using a USB cable.
2. On the laptop, open a web browser to http://198.80.18.1/
3. When the Symbio™ 800 page displays, click **Log In**.

Figure 2. Symbio™ 800 log in screen



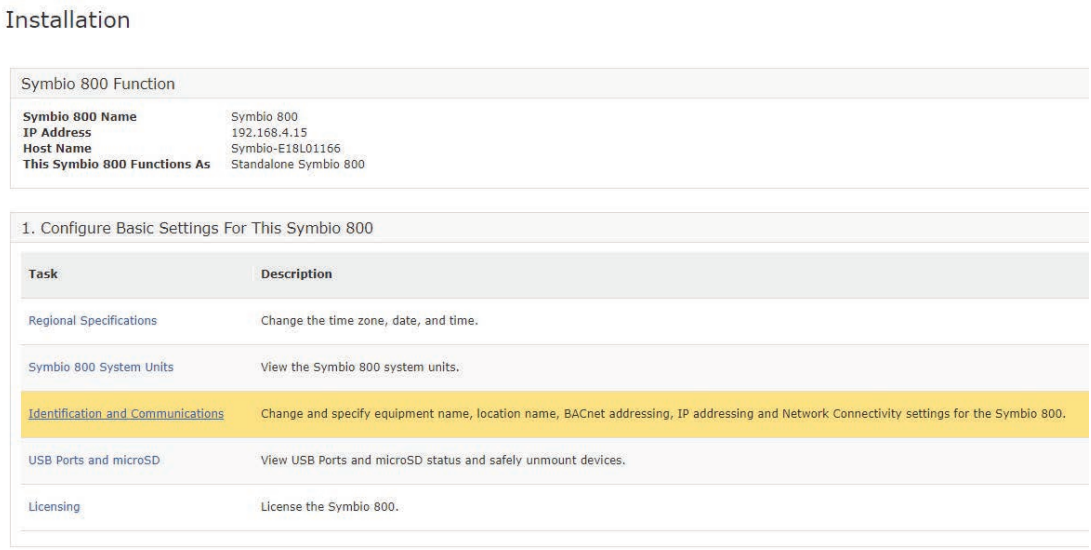
Note: *The Symbio™ 800 web interface can only be viewed using the USB connection. Ethernet port 1 and Ethernet port 2 will not allow access to the Symbio™ web server to meet IT security requirements.*

Protocol Configuration

To access the Symbio 800 Protocol Configuration page:

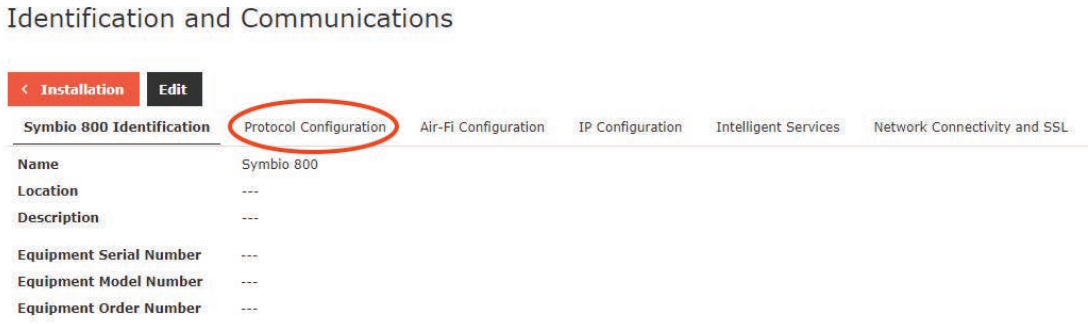
1. Connect to the Symbio 800 web interface.
2. On the left-hand navigation, click **Installation**.
3. Click **Identification and Communications**.

Figure 3. Identification and Communications



4. Click the **Protocol Configuration** tab.

Figure 4. Protocol Configuration



5. View the existing Protocol Configuration settings.

   Note: *There are no LonTalk communication parameters to edit.*

LonTalk Protocol Settings

The Symbio 800 controller supports LonTalk communications with the optional LonTalk module. The LonTalk module is din rail mounted and is connected to the Symbio 800 controller using USB.

Note: *The Symbio 800 rotary addresses are not used with LonTalk communications.*

Figure 5. LonTalk protocol configuration

1. Verify the LonTalk adapter connection status is **Connected**. If the adapter connection status is another state, verify the LonTalk adapter is connected to a Symbio 800 USB port.
2. Verify the Link Status is **Online**. If the Link Status is set to a different state, LonTalk network management software such as Trane's Rover software is needed to set the Link status to Online.
3. The Service Pin button will send a service pin message to the LonTalk network. A service pin will broadcast the Neuron ID to the LonTalk network so a LonTalk network management tool can find a device and set its Domain, Subnet, Node address.

LonTalk communication wire is connected to the LonTalk adapter. LonTalk does not require wire polarity but it is recommended that wire polarity be observed. Refer to the LonTalk standard for detailed information on LonTalk wiring.

All LonTalk devices must have a unique DSN address and must have the same Domain value. The Symbio 800 LonTalk adapter ships on the zero-length domain so it can be easily discovered by LonTalk network managers and tools.

Profile Definition and Network Variables

The following tables are sorted as follows:

- Tables are listed by unit/profile type and sorted by network variable number.
- Tables are sorted by name and provide a complete list of names, types, values/ranges, and descriptions.

Note: *Not all points are available to the user. The available data points are defined during self-configuration and are dependent on the type of equipment.*

Table 1. SCC Network Variable Inputs

NV#	Name	RecvHrtBt	SNVT	Description
37	nviApplicMode	♥	SNVT_hvac_mode	Heat Cool Mode Request
38	nviAuxHeatEnable	♥	SNVT_switch	Heat Auxiliary Enable
39	nviBldgStaticSP		SNVT_press_p	Building Static Pressure Setpoint
40	nviBldgStatPress	♥	SNVT_press_p	Building Static Pressure
41	nviComprEnable	♥	SNVT_switch	Compressor Cooling Enable BAS
42	nviCWFlow	♥	SNVT_switch	Condenser Water Flow BAS
43	nviDAClSP		SNVT_temp_p	Discharge Air Cooling Setpoint BAS
44	nviDAHtSP		SNVT_temp_p	Discharge Air Heating Setpoint BAS
45	nviDAReheatSP		SNVT_temp_p	Discharge Air Reheat Setpoint BAS
46	nviDehumEnable	♥	UNVT_switch_binary	Dehumidification System Enable BAS
47	nviEconEnable	♥	UNVT_switch_multistate	Economizer Enable BAS
48	nviEmergOverride		SNVT_hvac_emerg	Emergency Override BAS
49	nviHumEnable	♥	UNVT_switch_binary	Humidification Enable BAS
50	nviOAMinPos		SNVT_lev_percent	Economizer Minimum Position Setpoint
51	nviOccManCmd		SNVT_lev_percent	Occupancy Request
52	nviOccSchedule	♥	SNVT_lev_percent	Occupancy Request
53	nviOccSensor	♥	SNVT_occupancy	Occupancy Input BAS
54	nviOutdoorRH	♥	SNVT_lev_percent	Outdoor Air Relative Humidity BAS
55	nviOutdoorTemp	♥	SNVT_temp_p	Outdoor Air Temperature BAS

Table 1. SCC Network Variable Inputs (continued)

NV#	Name	RecvHrtBt	SNVT	Description
56	nviRTUConfig		SNVT_state	Rooftop Configuration
	nviRTUConfig.0		(MSB) Bit 0	Reserved
	nviRTUConfig.1		Bit 1	Cooling Lockout
	nviRTUConfig.2		Bit 2	Heating Lockout
	nviRTUConfig.3		Bit 3	Demand Limit Request BAS
	nviRTUConfig.4		Bit 4	Energy Consumption Reset
	nviRTUConfig.5		Bit 5	Supply Fan Compensation
	nviRTUConfig.6		Bit 6	PreCool Enable Command
	nviRTUConfig.7		Bit 7	Morning Warmup Enable Command
	nviRTUConfig.8		Bit 8	Supply Air Tempering Request BAS
	nviRTUConfig.9		Bit 9	Daytime Warmup Enable Command
	nviRTUConfig.10		Bit 10	Timed Override Request (with Bit 11)
	nviRTUConfig.11		Bit 11	Timed Override Request 00 Idle 01 On 10 Cancel 11 Invalid
	nviRTUConfig.12		Bit 12	Reserved
	nviRTUConfig.13		Bit 13	Reserved
	nviRTUConfig.14		Bit 14	Reserved
	nviRTUConfig.15		(LSB) Bit 15	Reserved
57	nviRequest		SNVT_obj_request	Reset Diagnostic Request
58	nviSetpoint		SNVT_temp_p	Space Temperature Setpoint BAS
59	nviSetptOffset	♥	SNVT_temp_p	Space Setpoint Offset BAS
60	nviSetptShift	♥	SNVT_temp_setpt	Space Setpoint Shift BAS
61	nviSpaceCO2	♥	SNVT_ppm	Space CO2 Concentration BAS
62	nviSpaceDehumSP		SNVT_lev_percent	Space Dehumidification Setpoint BAS
63	nviSpaceHumSP		SNVT_lev_percent	Space Humidity Setpoint BAS
64	nviSpaceRH	♥	SNVT_lev_percent	Space Relative Humidity BAS
65	nviSpaceTemp	♥	SNVT_temp_p	Space Temperature BAS
66	nviTraneVar2		UNVT_c5c	Manufacturer-defined

Table 2. SCC Network Variable Outputs

NV#	Name	SendHrtBt	SNVT	Description
67	nvoAlarmMessage		SNVT_str_asc	Diagnostic Last Message
68	nvoBldgStatPress	♥	SNVT_press_p	Space Static Pressure Active
69	nvoCondCap	♥	SNVT_lev_percent	Condenser Capacity
70	nvoCoolPrimary	♥	UNVT_switch_binary	Cooling Capacity Status

Table 2. SCC Network Variable Outputs (continued)

NV#	Name	SendHrtBt	SNVT	Description
71	nvoCprsrsRunning	♥	SNVT_state	Compressor Status
	nvoCprsrsRunning.0		(MSB) Bit 0	Validity of bit 8
	nvoCprsrsRunning.1		Bit 1	Validity of bit 9
	nvoCprsrsRunning.2		Bit 2	Validity of bit 10
	nvoCprsrsRunning.3		Bit 3	Validity of bit 11
	nvoCprsrsRunning.4		Bit 4	Validity of bit 12
	nvoCprsrsRunning.5		Bit 5	Validity of bit 13
	nvoCprsrsRunning.6		Bit 6	Validity of bit 14
	nvoCprsrsRunning.7		Bit 7	Validity of bit 15
	nvoCprsrsRunning.8		Bit 8	Compressor 1A Status
	nvoCprsrsRunning.9		Bit 9	Compressor 1B Status
	nvoCprsrsRunning.10		Bit 10	Compressor 1C Status
	nvoCprsrsRunning.11		Bit 11	Compressor 1D Status
	nvoCprsrsRunning.12		Bit 12	Compressor 2A Status
	nvoCprsrsRunning.13		Bit 13	Compressor 2B Status
	nvoCprsrsRunning.14		Bit 14	Compressor 2C Status
	nvoCprsrsRunning.15		(LSB) Bit 15	Compressor 2D Status
72	nvoCWFlow	♥	SNVT_switch	Condenser Water Flow Status
73	nvoCWPump	♥	SNVT_switch	Condenser Water Pump Status
74	nvoCWTemp	♥	SNVT_temp_p	Condenser Water Temperature
75	nvoDAReheatSP	♥	SNVT_temp_p	Discharge Air Reheat Setpoint Active
76	nvoDehumidifier	♥	SNVT_switch	Dehumidification Control Status
77	nvoDischAirTemp	♥	SNVT_temp_p	Discharge Air Temperature
78	nvoEffectOccup	♥	SNVT_occupancy	Occupancy Status
79	nvoEffectSetpt	♥	SNVT_temp_p	Space Temperature Setpoint Active
80	nvoEffSpaceHumSP	♥	SNVT_lev_percent	Space Humidity Active
81	nvoEREABPDamper	♥	SNVT_lev_percent	Energy Recovery Exhaust Air Bypass Damper Position
82	nvoERFrostAvoid	♥	SNVT_switch	Energy Recovery Frost Avoidance Status
83	nvoERLvgExhTemp	♥	SNVT_temp_p	Energy Recovery Leaving Exhaust Temperature Status
84	nvoEROABPDamper	♥	SNVT_lev_percent	Energy Recovery Outdoor Air Bypass Damper Status
85	nvoERPreheat	♥	SNVT_switch	Energy Recovery Preheat Status
86	nvoERStatus	♥	SNVT_switch	Energy Recovery Status
87	nvoExhDamper	♥	SNVT_lev_percent	Exhaust Damper Position
88	nvoExhFanOnOff	♥	SNVT_switch	Exhaust Fan Output Status
89	nvoExhFanStatus	♥	SNVT_switch	Exhaust Fan Speed Status
90	nvoFanSpeed		SNVT_switch	Fan Speed Status

Table 2. SCC Network Variable Outputs (continued)

NV#	Name	SendHrtBt	SNVT	Description
91	nvoFDD		SNVT_state	Fault Detection and Diagnostics
	nvoFDD.0		(MSB) Bit 0	Diagnostic: Not Economizing When Should Be
	nvoFDD.1		Bit 1	Diagnostic: Economizing When Should Not
	nvoFDD.2		Bit 2	Diagnostic: Excessive Outdoor Air Flow
	nvoFDD.3		Bit 3	Diagnostic: Mixed Air Low Temperature Cycle
	nvoFDD.4		Bit 4	Diagnostic: Mixed Air Temperature Sensor Failure
	nvoFDD.5		Bit 5	Diagnostic: Outdoor Air Damper Not Modulating
	nvoFDD.6		Bit 6	Diagnostic: Outdoor Air Temperature Sensor Failure
	nvoFDD.7		Bit 7	Diagnostic: Return Air Temperature Sensor Failure
	nvoFDD.8		Bit 8	Diagnostic: Supply Air Temperature Sensor Failure
	nvoFDD.9		Bit 9	Reserved
	nvoFDD.10		Bit 10	Reserved
	nvoFDD.11		Bit 11	Reserved
	nvoFDD.12		Bit 12	Reserved
	nvoFDD.13		Bit 13	Reserved
	nvoFDD.14		Bit 14	Reserved
	nvoFDD.15		(LSB) Bit 15	Reserved
92	nvoHeatCool	♥	SNVT_hvac_mode	Heat Cool Mode Status
93	nvoHeatPrimary	♥	SNVT_lev_percent	Heating Capacity Primary Status
94	nvoHeatSecondary	♥	SNVT_lev_percent	Heating Capacity Secondary Status
95	nvoHumidifier	♥	SNVT_lev_percent	Humidification Capacity Status
96	nvoLocalCWTemp	♥	SNVT_temp_p	Condenser Water Temperature Local
97	nvoLocalSpaceTmp	♥	SNVT_temp_p	Space Temperature Local
98	nvoMixedAirTemp	♥	SNVT_temp_p	Mixed Air Temperature Local
99	nvoOADamper	♥	SNVT_lev_percent	Outdoor Air Damper Position
100	nvoOAEnthalpy	♥	SNVT_enthalpy	Outdoor Air Enthalpy Active
101	nvoOAFlow	♥	FNVT_flow	Outdoor Air Flow Active
102	nvoOutdoorRH	♥	SNVT_lev_percent	Outdoor Air Humidity Active
103	nvoOutdoorTemp	♥	SNVT_temp_p	Outdoor Air Temperature Active
104	nvoRATemp	♥	SNVT_temp_p	Return Air Temperature
105	nvoRetFanOnOff	♥	SNVT_switch	Return Fan Output Status
106	nvoRetFanPress	♥	SNVT_press_p	Return Fan Air Pressure
107	nvoRetFanStatus	♥	SNVT_switch	Return Fan Speed Status

Table 2. SCC Network Variable Outputs (continued)

NV#	Name	SendHrtBt	SNVT	Description
108	nvoRTUStatus	♥	SNVT_state	Rooftop Status
	nvoRTUStatus.0	♥	(MSB) Bit 0	Unit Running State
	nvoRTUStatus.1	♥	Bit 1	Emergency Stop
	nvoRTUStatus.2	♥	Bit 2	External Auto Stop Input Status
	nvoRTUStatus.3	♥	Bit 3	Condensate Overflow Input
	nvoRTUStatus.4	♥	Bit 4	Timed Override Status (with Bit 5)
	nvoRTUStatus.5	♥	Bit 5	Timed Override Status 00 Idle 01 On 10 Cancel
	nvoRTUStatus.6	♥	Bit 6	Precool Mode Status
	nvoRTUStatus.7	♥	Bit 7	Morning Warmup Running
	nvoRTUStatus.8	♥	Bit 8	Supply Air Tempering Status
	nvoRTUStatus.9	♥	Bit 9	Daytime Warmup Running
	nvoRTUStatus.10	♥	Bit 10	Reserved
	nvoRTUStatus.11	♥	Bit 11	Compressor Lockout Status
	nvoRTUStatus.12	♥	Bit 12	Coil Frost Protection Status, Circuit 1
	nvoRTUStatus.13	♥	Bit 13	Coil Frost Protection Status, Circuit 2
	nvoRTUStatus.14	♥	Bit 14	Rapid Restart Status
	nvoRTUStatus.15	♥	(LSB) Bit 15	Reserved
109	nvoSetpoint	♥	SNVT_temp_p	Space Temperature Setpoint Local
110	nvoSpaceCO2	♥	SNVT_ppm	Space CO2 Concentration Active
111	nvoSpaceEnthalpy	♥	SNVT_enthalpy	Return Air Enthalpy Active
112	nvoSpaceRH	♥	SNVT_lev_percent	Space Humidity Active
113	nvoSpaceTemp	♥	SNVT_temp_p	Space Temperature Active
114	nvoStartsRunTmA	♥	UNVT_starts_runtime	Starts - Compressor 1A
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
115	nvoStartsRunTmB	♥	UNVT_starts_runtime	Starts - Compressor 1B
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
116	nvoStartsRunTmC	♥	UNVT_starts_runtime	Starts - Compressor 1C
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
117	nvoStartsRunTmD	♥	UNVT_starts_runtime	Starts - Compressor 2A
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
118	nvoStartsRunTmE	♥	UNVT_starts_runtime	Starts - Compressor 2B
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time

Table 2. SCC Network Variable Outputs (continued)

NV#	Name	SendHrtBt	SNVT	Description
119	nvoStartsRunTmF	♥	UNVT_starts_runtime	Starts - Compressor 2C
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
120	nvoStatus	♥	SNVT_obj_status	Local Setpoint Control
121	nvoSucRfgtPrsC1	♥	SNVT_press_f	Suction Refrigerant Pressure, Circuit 1
122	nvoSucRfgtPrsC2	♥	SNVT_press_f	Suction Refrigerant Pressure, Circuit 2
123	nvoSucRfgtTmpC1	♥	SNVT_temp_p	Suction Refrigerant Temperature, Circuit 1
124	nvoSucRfgtTmpC2	♥	SNVT_temp_p	Suction Refrigerant Temperature, Circuit 2
125	nvoDschRfgtPrsC1	♥	SNVT_press_f	Discharge Refrigerant Pressure, Circuit 1
126	nvoDschRfgtPrsC2	♥	SNVT_press_f	Discharge Refrigerant Pressure, Circuit 2
127	nvoDisSatRfgTmp1	♥	SNVT_temp_p	Discharge Refrigerant Temperature, Circuit 1
128	nvoDisSatRfgTmp2	♥	SNVT_temp_p	Discharge Refrigerant Temperature, Circuit 2
129	nvoAirFlowPctC1	♥	SNVT_lev_percent	Air Flow Percentage, Circuit 1
130	nvoAirFlowPctC2	♥	SNVT_lev_percent	Air Flow Percentage, Circuit 2
131	nvoTerminalLoad	♥	SNVT_lev_percent	Unit Energy Demand
132	nvoTraneVar9		UNVT_c5s	Manufacturer-defined
133	nvoUnitCurrent	♥	UNVT_3phase_current	Unit Current Per Line
	nvoUnitCurrent (bytes 1-2)	♥	SNVT_amp_ac	Current L1, in Amps
	nvoUnitCurrent (bytes 3-4)	♥	SNVT_amp_ac	Current L2, in Amps
	nvoUnitCurrent (bytes 5-6)	♥	SNVT_amp_ac	Current L3, in Amps
	nvoUnitCurrent (bytes 7-8)	♥		Invalid
	nvoUnitCurrent (bytes 9-10)	♥		Invalid
	nvoUnitCurrent (bytes 11-12)	♥		Invalid
134	nvoUnitPower	♥	SNVT_power_f	Unit Power Consumption
135	nvoUnitStatus	♥	SNVT_hvac_status	Unit Status
	nvoUnitStatus (byte 1)	♥	.mode	Mode Status
	nvoUnitStatus (bytes 2-3)	♥	.heat_output_primary	Heating Capacity Primary Status
	nvoUnitStatus (bytes 4-5)	♥	.heat_output_secondary	Heating Capacity Secondary Status
	nvoUnitStatus (bytes 6-7)	♥	.cool_output	Cooling Capacity Status
	nvoUnitStatus (bytes 8-9)	♥	.econ_output	Economizer Status
	nvoUnitStatus (bytes 10-11)	♥	.fan_output	Supply Fan Speed Status
	nvoUnitStatus (byte 12)	♥	.in_alarm	In Alarm
136	nvoUnitVoltage	♥	UNVT_3Phase_volt	Unit Voltage
	nvoUnitVoltage (bytes 1-2)	♥	SNVT_volt_ac	Voltage AB
	nvoUnitVoltage (bytes 3-4)	♥	SNVT_volt_ac	Voltage BC
	nvoUnitVoltage (bytes 5-6)	♥	SNVT_volt_ac	Voltage CA

Table 3. SCC Configuration Parameters

NV#	Name	SNVT/UNVT, SCPT/UCPT	Description
0	nciBldgStaticSP	SNVT_press_p	Space Static Pressure Setpoint
1	nciBypassTime	SNVT_time_min	Occupied Bypass Time
2	nciCabinetStyle	UCPT_cabinet_style	Cabinet Style*
3	nciCool	UCPT_cool_type	Cool Type*
4	nciCRC	UCPT_crc	Manufacturer-defined*
5	nciDAClSP	SNVT_temp_p	Discharge Air Cooling Setpoint
6	nciDAHtSP	SNVT_temp_p	Discharge Air Heating Setpoint
7	nciDAReheatSP	SNVT_temp_p	Discharge Air Reheat Setpoint
8	nciDevBuildNum	U16	Device Build Number
9	nciDeviceConfig	UCPTdeviceConfig	Manufacturer-defined*
10	nciDevMajVer	SCPTdevMajVer	Software Major Version
11	nciDevMinVer	SCPTdevMinVer	Software Minor Version
12	nciEconConfigTyp	UCPT_econo_config_type	Economizer Decision Method*
13	nciEconVent	UCPT_OA_type	Economizer Type Identifier*
14	nciERFrostAvodSP	UCPT_ERFrostAvoidSP	Energy Recovery Frost Avoidance Temp Setpoint*
15	nciExhaustConfig	UCPT_exhaust_cfg	Exhaust Enable Position Setpoint*
16	nciExhRet	UCPT_ER_type	Exhaust Or Return Fan Type*
17	nciFanOperation	SCPTfanOperation	Supply Fan Configuration Command
18	nciHvacType	SNVT_hvac_type	HVAC Unit Type Identifier
19	nciLocation	SNVT_str_asc	Location Label
20	nciMinOAFlowSP	SNVT_flow	Outdoor Air Minimum Flow Setpoint BAS
21	nciMinOutTm	SNVT_time_sec	Minimum Send Time
22	nciOAEnthSP	SNVT_enthalpy	Economizer Outdoor Air Enthalpy Enable Setpoint BAS
23	nciOAMinPos	SNVT_lev_percent	Outdoor Air Damper Minimum Position
24	nciPreheat	UCPT_heat_type	Preheat Type Identifier*
25	nciRcvHrtBt	SNVT_time_sec	Receive Heartbeat
26	nciRefrigType	UCPT_refrig_type	Refrigeration Type Identifier*
27	nciReheat	UCPT_heat_type	Reheat Type Identifier*
28	nciRetFanPressSP	SNVT_press_p	Return Fan Air Pressure Setpoint
29	nciSetpoints	SNVT_temp_setpt	Occupancy Temperature Setpoints
			Occupied Cool Setpoint
			Occupied Standby Cooling Setpoint
			Unoccuiped Cooling Setpoint
			Occupied Heating Setpoint
			Occupied Standby Heating Setpoint
			Unoccupied Heating Setpoint
30	nciSndHrtBt	SNVT_time_sec	Send Heartbeat Time
31	nciSpaceCO2Lim	SNVT_ppm	Space CO2 High Limit
32	nciSpaceCO2LowLm	SNVT_ppm	Space CO2 Low Limit*
33	nciSpaceHumSP	SNVT_lev_percent	Space Humidification Setpoint

Table 3. SCC Configuration Parameters (continued)

NV#	Name	SNVT/UNVT, SCPT/UCPT	Description
34	nciSupplyFan	UCPT_fan_type	Supply Fan Type Identifier*
35	nciUntryType	UCPT_large_equip_type	Unitary Type Identifier*
			Model Information
			Cooling Source Size
			Heating Source Size
			Number of Circuits
			Number of Compressors, Circuit 1
			Number of Compressors, Circuit 2
36	nciOATSP	SNVT_temp_p	Economizer Outdoor Air Enable Setpoint BAS

* Manufacturer defined

Table 4. DAC Network Variable Inputs

NV#	Name	Recv HrtBt	SNVT	Description
42	nviApplicMode	♥	SNVT_hvac_mode	Heat Cool Mode Request
43	nviBldgStaticSP		SNVT_press_p	Space Static Pressure Setpoint BAS
44	nviBldgStatPress	♥	SNVT_press_p	Space Static Pressure BAS
45	nviCWFlow	♥	SNVT_switch	Condenser Water Flow BAS
46	nviDAClSP		SNVT_temp_p	Discharge Air Cooling Setpoint BAS
47	nviDADewPointSP		SNVT_temp_p	Discharge Air Dewpoint Setpoint
48	nviDAHtSP		SNVT_temp_p	Discharge Air Heating Setpoint BAS
49	nviDAReheatSP		SNVT_temp_p	Discharge Air Reheat Setpoint BAS
50	nviDehumEnable	♥	SNVT_switch	Dehumidification Enable Command
51	nviDuctStaticSP		SNVT_press_p	Duct Static Pressure Setpoint BAS
52	nviDuctStatPress	♥	SNVT_press_p	Duct Static Pressure BAS
53	nviEconEnable	♥	SNVT_switch	Economizer Airside Enable BAS
54	nviEmergOverride		SNVT_hvac_emerg	Emergency Override BAS
55	nviHumEnable	♥	SNVT_switch	Humidification Command
56	nviMinOAFlowSP		SNVT_flow	Outdoor Air Minimum Flow Setpoint BAS
57	nviOAMinPos		SNVT_lev_percent	Economizer Minimum Position Setpoint BAS
58	nviOccManCmd		SNVT_occupancy	Occupancy Input
59	nviOccSchedule	♥	SNVT_tod_event	Occupancy Request
60	nviOutdoorRH	♥	SNVT_lev_percent	Outdoor Air Humidity BAS
61	nviOutdoorTemp	♥	SNVT_temp_p	Outdoor Air Temperature BAS
62	nviPriCoolEnable	♥	SNVT_switch	Cooling Capacity Enable
63	nviPriHeatEnable	♥	SNVT_switch	Heat Primary Enable BAS

Table 4. DAC Network Variable Inputs (continued)

NV#	Name	Recv HrtBt	SNVT	Description
64	nviRTUConfig		SNVT_state	Rooftop Configuration
	nviRTUConfig.0		(MSB) Bit 0	Reserved
	nviRTUConfig.1		Bit 1	Cooling Lockout
	nviRTUConfig.2		Bit 2	Heating Lockout
	nviRTUConfig.3		Bit 3	Demand Limit Request BAS
	nviRTUConfig.4		Bit 4	Energy Consumption Reset
	nviRTUConfig.5		Bit 5	Supply Fan Compensation
	nviRTUConfig.6		Bit 6	PreCool Enable Command
	nviRTUConfig.7		Bit 7	Morning Warmup Enable Command
	nviRTUConfig.8		Bit 8	Supply Air Tempering Request BAS
	nviRTUConfig.9		Bit 9	Daytime Warmup Enable Command
	nviRTUConfig.10		Bit 10	Timed Override Request (with Bit 11)
	nviRTUConfig.11		Bit 11	Timed Override Request 00 Idle 01 On 10 Cancel 11 Invalid
	nviRTUConfig.12		Bit 12	Reserved
	nviRTUConfig.13		Bit 13	Reserved
	nviRTUConfig.14		Bit 14	Reserved
	nviRTUConfig.15		(LSB) Bit 15	Reserved
65	nviRequest		SNVT_obj_request	Reset Diagnostic Request
66	nviSpaceCO2	♥	SNVT_ppm	Space CO2 Concentration BAS
67	nviSpaceDehumSP		SNVT_lev_percent	Space Dehumidification Setpoint BAS
68	nviSpaceHumSP		SNVT_lev_percent	Space Humidification Setpoint BAS
69	nviSpaceRH	♥	SNVT_lev_percent	Space Humidity BAS
70	nviSpaceTemp	♥	SNVT_temp_p	Space Temperature BAS
71	nviTraneVar2		UNVT_c5c	Manufacturer-defined

Table 5. DAC Network Variable Outputs

NV#	Name	Send HrtBt	SNVT	Description
72	nvoAlarmMessage		SNVT_str_asc	Diagnostic Last Message
73	nvoApplicMode	♥	SNVT_hvac_mode	Application Mode Output
74	nvoBldgStatPress	♥	SNVT_press_p	Space Static Pressure Active
75	nvoCondCap	♥	SNVT_lev_percent	Condenser Capacity
76	nvoCoolPrimary	♥	SNVT_lev_percent	Cooling Capacity Status

Table 5. DAC Network Variable Outputs (continued)

NV#	Name	Send HrtBt	SNVT	Description
77	nvoCprsrsRunning	♥	SNVT_state	Compressor Status
	nvoCprsrsRunning.0	♥	(MSB) Bit 0	Validity of bit 8
	nvoCprsrsRunning.1	♥	Bit 1	Validity of bit 9
	nvoCprsrsRunning.2	♥	Bit 2	Validity of bit 10
	nvoCprsrsRunning.3	♥	Bit 3	Validity of bit 11
	nvoCprsrsRunning.4	♥	Bit 4	Validity of bit 12
	nvoCprsrsRunning.5	♥	Bit 5	Validity of bit 13
	nvoCprsrsRunning.6	♥	Bit 6	Validity of bit 14
	nvoCprsrsRunning.7	♥	Bit 7	Validity of bit 15
	nvoCprsrsRunning.8	♥	Bit 8	Compressor 1A Status
	nvoCprsrsRunning.9	♥	Bit 9	Compressor 1B Status
	nvoCprsrsRunning.10	♥	Bit 10	Compressor 1C Status
	nvoCprsrsRunning.11	♥	Bit 11	Compressor 1D Status
	nvoCprsrsRunning.12	♥	Bit 12	Compressor 2A Status
	nvoCprsrsRunning.13	♥	Bit 13	Compressor 2B Status
	nvoCprsrsRunning.14	♥	Bit 14	Compressor 2C Status
	nvoCprsrsRunning.15	♥	(LSB) Bit 15	Compressor 2D Status
78	nvoCWFlow	♥	SNVT_switch	Condenser Water Flow Status
79	nvoCWPump	♥	SNVT_switch	Condenser Water Pump Status
80	nvoCWTemp	♥	SNVT_temp_p	Condenser Water Temperature
81	nvoDAReheatSP	♥	SNVT_temp_p	Discharge Air Reheat Setpoint Active
82	nvoDehumidifier	♥	SNVT_switch	Dehumidification Control Status
83	nvoDischAirTemp	♥	SNVT_temp_p	Discharge Air Temperature
84	nvoDuctStatPress	♥	SNVT_press_p	Duct Static Pressure Active
85	nvoEconEnabled	♥	SNVT_switch	Economizer Entering Water Temperature Active
86	nvoEffDADewPtSP	♥	SNVT_temp_p	Discharge Air Dewpoint Temperature Setpoint Active
87	nvoEffDATempSP	♥	SNVT_temp_p	Discharge Air Temperature Setpoint Active
88	nvoEffDuctStatSP	♥	SNVT_press_p	Duct Static Pressure Setpoint Active
89	nvoEffectOccup	♥	SNVT_occupancy	Occupancy Status
90	nvoEffSpaceHumSP	♥	SNVT_lev_percent	Space Humidity Active
91	nvoEREABPDamper	♥	SNVT_lev_percent	Energy Recovery Exhaust Air Bypass Damper Position
92	nvoERLvgExhTemp	♥	SNVT_temp_p	Energy Recovery Leaving Exhaust Temperature Status
93	nvoEROABPDamper	♥	SNVT_lev_percent	Energy Recovery Outdoor Air Bypass Damper Status
94	nvoERPreheat	♥	SNVT_switch	Energy Recovery Preheat Status
95	nvoERStatus	♥	SNVT_switch	Energy Recovery Status
96	nvoExhDamper	♥	SNVT_lev_percent	Exhaust Damper Position
97	nvoExhFanOnOff	♥	SNVT_switch	Exhaust Fan Output Status
98	nvoExhFanStatus	♥	SNVT_switch	Exhaust Fan Speed Status

Table 5. DAC Network Variable Outputs (continued)

NV#	Name	Send HrtBt	SNVT	Description
99	nvoFDD	♥	SNVT_state	Fault Detection and Diagnostics
	nvoFDD.0	♥	(MSB) Bit 0	Diagnostic: Not Economizing When Should Be
	nvoFDD.1	♥	Bit 1	Diagnostic: Economizing When Should Not
	nvoFDD.2	♥	Bit 2	Diagnostic: Excessive Outdoor Air Flow
	nvoFDD.3	♥	Bit 3	Diagnostic: Mixed Air Low Temperature Cycle
	nvoFDD.4	♥	Bit 4	Diagnostic: Mixed Air Temperature Sensor Failure
	nvoFDD.5	♥	Bit 5	Diagnostic: Outdoor Air Damper Not Modulating
	nvoFDD.6	♥	Bit 6	Diagnostic: Outdoor Air Temperature Sensor Failure
	nvoFDD.7	♥	Bit 7	Diagnostic: Return Air Temperature Sensor Failure
	nvoFDD.8	♥	Bit 8	Diagnostic: Supply Air Temperature Sensor Failure
	nvoFDD.9	♥	Bit 9	Reserved
	nvoFDD.10	♥	Bit 10	Reserved
	nvoFDD.11	♥	Bit 11	Reserved
	nvoFDD.12	♥	Bit 12	Reserved
	nvoFDD.13	♥	Bit 13	Reserved
	nvoFDD.14	♥	Bit 14	Reserved
	nvoFDD.15	♥	(LSB) Bit 15	Reserved
100	nvoHeatCool	♥	SNVT_hvac_mode	Heat Cool Mode Status
101	nvoHeatPrimary	♥	SNVT_lev_percent	Heating Capacity Primary Status
102	nvoHeatSecondary	♥	SNVT_lev_percent	Heating Capacity Secondary Status
103	nvoHumidifier	♥	SNVT_lev_percent	Humidification Capacity Status
104	nvoLocalCWTemp	♥	SNVT_temp_p	Condenser Water Temperature Local
105	nvoLocalDSPress	♥	SNVT_press_p	Duct Static Pressure Local
106	nvoLocalOARH	♥	SNVT_lev_percent	Outdoor Air Relative Humidity Local
107	nvoLocalOATemp	♥	SNVT_temp_p	Outdoor Air Temperature Local
108	nvoMATemp	♥	SNVT_temp_p	Mixed Air Temperature Local
109	nvoOADamper	♥	SNVT_lev_percent	Outdoor Air Damper Position
110	nvoOADewpoint	♥	SNVT_temp_p	Outdoor Air Dewpoint
111	nvoOAEnthalpy	♥	SNVT_enthalpy	Outdoor Air Enthalpy Active
112	nvoOAFlow	♥	SNVT_flow	Outdoor Air Flow Active
113	nvoOutdoorRH	♥	SNVT_lev_percent	Outdoor Air Humidity Active
114	nvoOutdoorTemp	♥	SNVT_temp_p	Outdoor Air Temperature Active
115	nvoRATemp	♥	SNVT_temp_p	Return Air Temperature
116	nvoRetFanOnOff	♥	SNVT_switch	Return Fan Output Status
117	nvoRetFanPress	♥	SNVT_press_p	Return Fan Air Pressure
118	nvoRetFanStatus	♥	SNVT_switch	Return Fan Speed Status

Table 5. DAC Network Variable Outputs (continued)

NV#	Name	Send HrtBt	SNVT	Description
119	nvoRTUStatus	♥	SNVT_state	Rooftop Status
	nvoRTUStatus.0	♥	(MSB) Bit 0	Unit Running State
	nvoRTUStatus.1	♥	Bit 1	Emergency Stop
	nvoRTUStatus.2	♥	Bit 2	External Auto Stop Input Status
	nvoRTUStatus.3	♥	Bit 3	Condensate Overflow Input
	nvoRTUStatus.4	♥	Bit 4	Timed Override Status (with Bit 5)
	nvoRTUStatus.5	♥	Bit 5	Timed Override Status 00 Idle 01 On 10 Cancel
	nvoRTUStatus.6	♥	Bit 6	Precool Mode Status
	nvoRTUStatus.7	♥	Bit 7	Morning Warmup Running
	nvoRTUStatus.8	♥	Bit 8	Supply Air Tempering Status
	nvoRTUStatus.9	♥	Bit 9	Daytime Warmup Running
	nvoRTUStatus.10	♥	Bit 10	Reserved
	nvoRTUStatus.11	♥	Bit 11	Compressor Lockout Status
	nvoRTUStatus.12	♥	Bit 12	Coil Frost Protection Status, Circuit 1
	nvoRTUStatus.13	♥	Bit 13	Coil Frost Protection Status, Circuit 2
	nvoRTUStatus.14	♥	Bit 14	Rapid Restart Status
	nvoRTUStatus.15	♥	(LSB) Bit 15	Reserved
120	nvoSpaceCO2	♥	SNVT_ppm	Space CO2 Concentration Active
121	nvoSpaceEnthalpy	♥	SNVT_enthalpy	Return Air Enthalpy Active
122	nvoSpaceRH	♥	SNVT_lev_percent	Space Humidity Active
123	nvoSpaceTemp	♥	SNVT_temp_p	Space Temperature Active
124	nvoStartsRunTmA	♥	UNVT_starts_runtime	Starts - Compressor 1A
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
125	nvoStartsRunTmB	♥	UNVT_starts_runtime	Starts - Compressor 1B
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
126	nvoStartsRunTmC	♥	UNVT_starts_runtime	Starts - Compressor 1C
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
127	nvoStartsRunTmD	♥	UNVT_starts_runtime	Starts - Compressor 2A
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
128	nvoStartsRunTmE	♥	UNVT_starts_runtime	Starts - Compressor 2B
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time

Table 5. DAC Network Variable Outputs (continued)

NV#	Name	Send HrtBt	SNVT	Description
129	nvoStartsRunTmF	♥	UNVT_starts_runtime	Starts - Compressor 2C
		♥	SNVT_count_f	Starts
		♥	SNVT_time_f	Run Time
130	nvoStatus	♥	SNVT_obj_status	Local Setpoint Control
131	nvoSucRfgtPrsC1	♥	SNVT_press_f	Suction Refrigerant Pressure, Circuit 1
132	nvoSucRfgtPrsC2	♥	SNVT_press_f	Suction Refrigerant Pressure, Circuit 2
133	nvoSucRfgtTmpC1	♥	SNVT_temp_p	Suction Refrigerant Temperature, Circuit 1
134	nvoSucRfgtTmpC2	♥	SNVT_temp_p	Suction Refrigerant Temperature, Circuit 2
135	nvoDschRfgtPrsC1	♥	SNVT_press_f	Discharge Refrigerant Pressure, Circuit 1
136	nvoDschRfgtPrsC2	♥	SNVT_press_f	Discharge Refrigerant Pressure, Circuit 2
137	nvoDisSatRfgTmp1	♥	SNVT_temp_p	Discharge Refrigerant Temperature, Circuit 1
138	nvoDisSatRfgTmp2	♥	SNVT_temp_p	Discharge Refrigerant Temperature, Circuit 2
139	nvoAirFlowPctC1	♥	SNVT_lev_percent	Air Flow Percentage, Circuit 1
140	nvoAirFlowPctC2	♥	SNVT_lev_percent	Air Flow Percentage, Circuit 2
141	nvoSupFanOnOff	♥	SNVT_switch	Supply Fan Output Status
142	nvoSupFanStatus	♥	SNVT_switch	Supply Fan Speed Status
143	nvoTraneVar9		UNVT_c5s	Manufacturer-defined
144	nvoUnitCurrent	♥	UNVT_3phase_current	Unit Current Per Line
	nvoUnitCurrent (bytes 1-2)	♥	SNVT_amp_ac	Current L1, in Amps
	nvoUnitCurrent (bytes 3-4)	♥	SNVT_amp_ac	Current L2, in Amps
	nvoUnitCurrent (bytes 5-6)	♥	SNVT_amp_ac	Current L3, in Amps
	nvoUnitCurrent (bytes 7-8)	♥		Invalid
	nvoUnitCurrent (bytes 9-10)	♥		Invalid
	nvoUnitCurrent (bytes 11-12)	♥		Invalid
145	nvoUnitPower	♥	SNVT_power_f	Unit Power Consumption
146	nvoUnitStatus	♥	SNVT_hvac_status	Unit Status
	nvoUnitStatus (byte 1)	♥	.mode	Mode Status
	nvoUnitStatus (bytes 2-3)	♥	.heat_output_primary	Heating Capacity Primary Status
	nvoUnitStatus (bytes 4-5)	♥	.heat_output_secondary	Heating Capacity Secondary Status
	nvoUnitStatus (bytes 6-7)	♥	.cool_output	Cooling Capacity Status
	nvoUnitStatus (bytes 8-9)	♥	.econ_output	Economizer Status
	nvoUnitStatus (bytes 10-11)	♥	.fan_output	Supply Fan Speed Status
	nvoUnitStatus (byte 12)	♥	.in_alarm	In Alarm
147	nvoUnitVoltage	♥	UNVT_3Phase_volt	Unit Voltage
	nvoUnitVoltage (bytes 1-2)	♥	SNVT_volt_ac	Voltage AB
	nvoUnitVoltage (bytes 3-4)	♥	SNVT_volt_ac	Voltage BC
	nvoUnitVoltage (bytes 5-6)	♥	SNVT_volt_ac	Voltage CA

Table 6. DAC Network Configuration Parameters

0	nciBldgStaticSP	SNVT_press_p	Space Static Pressure Setpoint
1	nciBypassTime	SNVT_time_min	Occupied Bypass Time
2	nciCabinetStyle	UCPT_cabinet_style	Cabinet Style*
3	nciCool	UCPT_cool_type	Cool Type*
4	nciCoolResetEn	SNVT_switch	Cooling Reset Type Status
5	nciCRC	UCPT_crc	Manufacturer-defined*
6	nciDAClSP	SNVT_temp_p	Discharge Air Cooling Setpoint
7	nciDADewpointSP	SNVT_temp_p	Discharge Air Dewpoint Setpoint
8	nciDAHtSP	SNVT_temp_p	Discharge Air Heating Setpoint
9	nciDAReheatSP	SNVT_temp_p	Discharge Air Reheat Setpoint
10	nciDaytime	SNVT_temp_p	Daytime Warmup Initiation Setpoint
11	nciDevBuildNum	U16	Device Build Number
12	nciDeviceConfig	UCPTdeviceConfig	Manufacturer-defined*
13	nciDevMajVer	SCPTdevMajVer	Software Major Version
14	nciDevMinVer	SCPTdevMinVer	Software Minor Version
15	nciDuctStatSP	SNVT_press_p	Duct Static Pressure Setpoint
16	nciEconConfigTyp	UCPT_econo_config_type	Economizer Decision Method*
17	nciEconVent	UCPT_OA_type	Economizer Type Identifier*
18	nciERFrostAvodSP	UCPT_ERFrostAvoidSP	Energy Recovery Frost Avoidance Temp Setpoint*
19	nciExhRet	UCPT_ER_type	Exhaust Or Return Fan Type*
20	nciExhStartPos	SNVT_lev_percent	Exhaust Enable Position Setpoint
21	nciHeatResetEn	SNVT_switch	Heating Reset Type Status
22	nciHvacType	SNVT_hvac_type	HVAC Unit Type Identifier
23	nciLocation	SNVT_str_asc	Location Label
24	nciMinOAFlowSP	SNVT_flow	Outdoor Air Minimum Flow Setpoint
25	nciMinOutTm	SNVT_time_sec	Minimum Send Time
26	nciOAEnthSP	SNVT_enthalpy	Economizer Outdoor Air Enthalpy Enable Setpoint
27	nciOAMinPos	SNVT_lev_percent	Outdoor Air Damper Minimum Position
28	nciOATSP	SNVT_temp_p	Economizer Enable Minimum Outdoor Air Temperature Setpoint
29	nciPreheat	UCPT_heat_type	Preheat Type Identifier*
30	nciRcvHrtBt	SNVT_time_sec	Receive Heartbeat
31	nciReheat	UCPT_heat_type	Reheat Type Identifier*
32	nciRetFanPressSP	SNVT_press_p	Return Fan Air Pressure Setpoint
33	nciRefrigType	UCPT_refrig_type	Refrigeration Type Identifier*
34	nciSetpoints	SNVT_temp_setpt	Occupancy Temperature Setpoints
			Occupied Cool Setpoint
			Occupied Standby Cooling Setpoint
			Unoccuiped Cooling Setpoint
			Occupied Heating Setpoint
			Occupied Standby Heating Setpoint
			Unoccupied Heating Setpoint
35	nciSndHrtBt	SNVT_time_sec	Send Heartbeat Time

Table 6. DAC Network Configuration Parameters (continued)

36	nciSpaceCO2Lim	SNVT_ppm	Space CO2 High Limit
37	nciSpaceCO2LowLm	SNVT_ppm	Space CO2 Low Limit*
38	nciSpaceDehumSP	SNVT_lev_percent	Space Dehumidification Setpoint
39	nciSpaceHumSP	SNVT_lev_percent	Space Humidification Setpoint
40	nciSupplyFan	UCPT_fan_type	Supply Fan Type Identifier*
41	nciUntryType	UCPT_large_equip_type	Unitary Type Identifier*
			Model Information
			Cooling Source Size
			Heating Source Size
			Number of Circuits
			Number of Compressors, Circuit 1
			Number of Compressors, Circuit 2

*Manufacturer defined

Appendix A. Arbitration

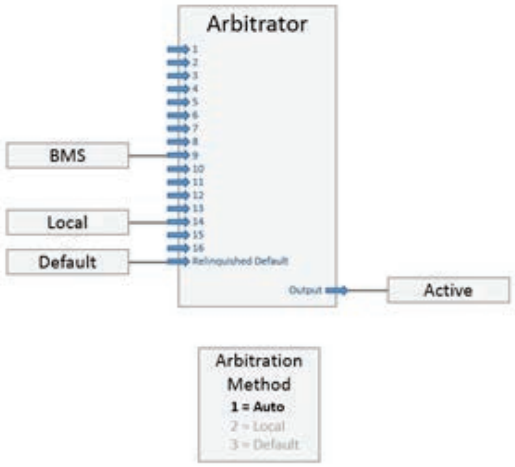
The Symbio™ 800 controller includes arbitration logic for several points. For each read/write point designated as “BAS”, an associated “Arbitration” point determines the behavior of that communicated data compared to the local hardwired (or wireless) sensor and a default value.

As shown in Figure 6, p. A–1, the arbitrator considers all possible sources of the provided data, including Building Management Systems (BMS), local, and default. Each potential source is defined at a pre-determined, fixed priority. When the arbitration method is selected as full/auto, the BMS value is used instead of the local or default values.

The point designator with the arbitrator suffix includes the full priority array, allowing the user to see the value associated with all potential sources considered in the logic. The active point reflects the result of the arbitration logic.

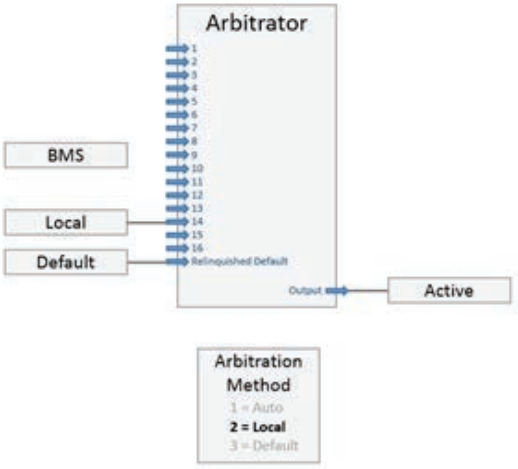
Because the arbitrated points are normally associated with sensors, the default value is invalid, meaning the value must be provided either by the BMS or the local sensor.

Figure 6. Arbitration method - full/auto



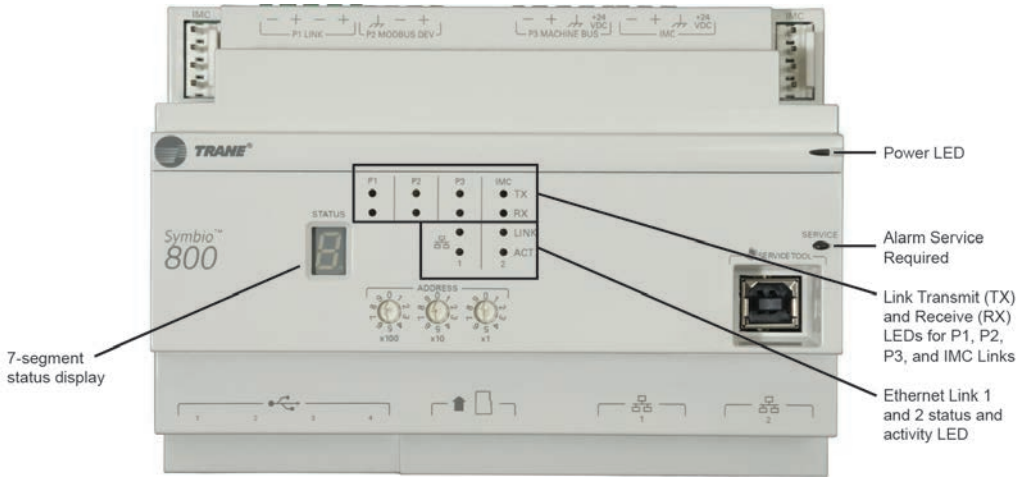
When the Arbitration Method is selected as local, the BMS value is ignored and local value is used instead. Though the arbitration logic still considers all inputs, any values sent by the BMS are effectively ignored.

Figure 7. Arbitration method - local



Appendix B. Symbio™ 800 Controller Display

Figure 8. Symbio™ 800 controller display and LEDs



7–Segment status display

Table 7. Codes for 7–segment display segment

Code	Description
U0.	Waiting for USB drives to mount
U2.	Checking signature on the .scfw file
U3.	Checking software maintenance plan
U4.	Reformatting main filesystem (clearing database)
U5.	Beginning update
U12.	Searching for .scfw files on USB drive(s)
U51.	Updating main firmware
U54.	Updating FPGA image
U55.	Updating U-boot image
U57.	Updating recovery partition

Note: *A code starting with an "F" indicates a failure, and requires Trane Service to resolve the issue.*

P1 Link — BACnet TP or Modbus RTU

- RS-485 daisy chain
- Used for connection to a primary controller

Figure 9. P2 Modbus device (factory installed Modbus server devices)

Note: *The P2 link is intended for factory devices only and should not have any other devices added this link.*

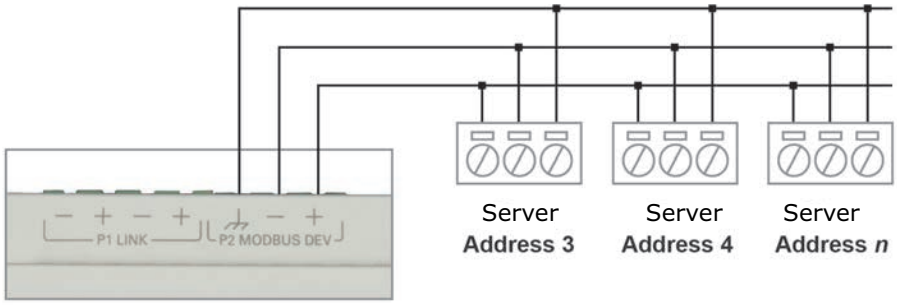


Figure 10. P3 machine bus (global bus — internal communication bus)

Note: *The P3 link is intended for factory devices only and should not have any other devices added this link.*

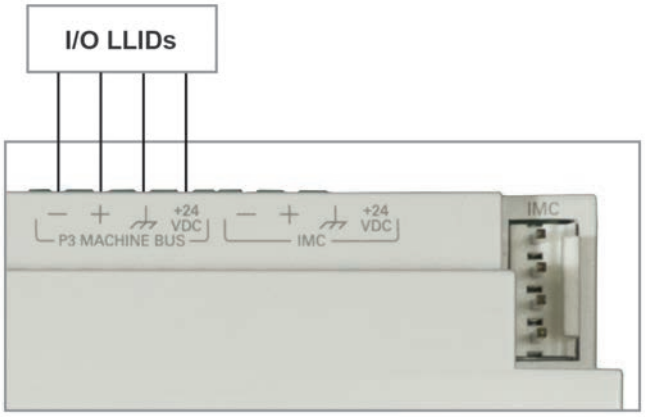
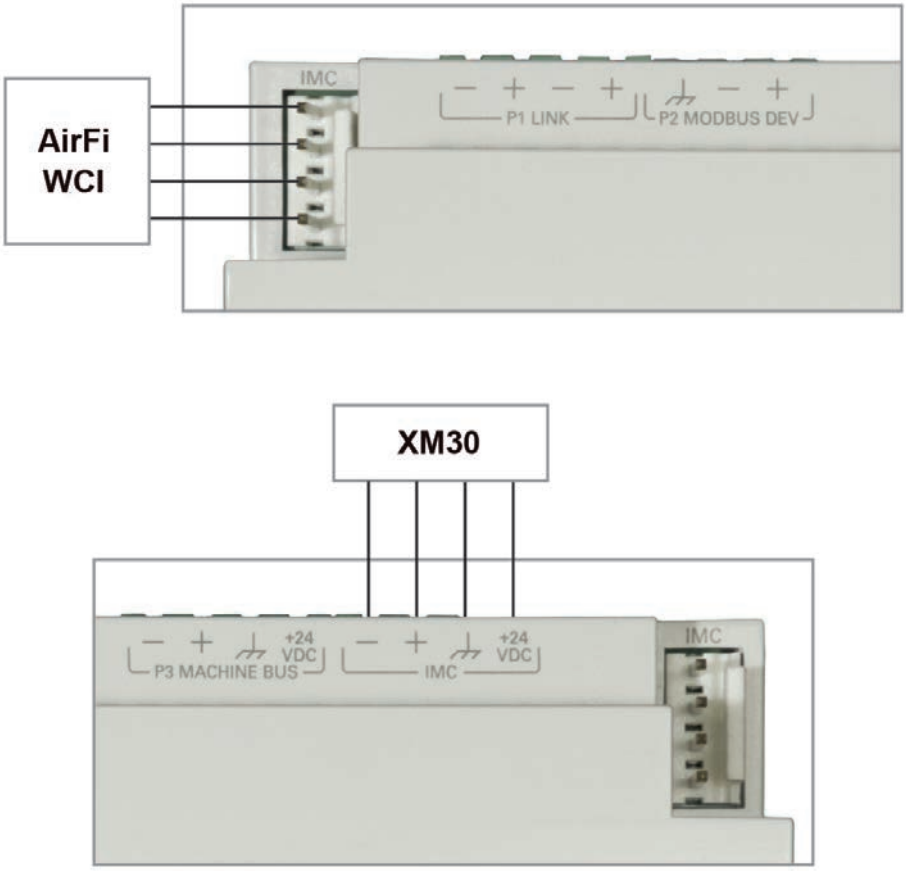
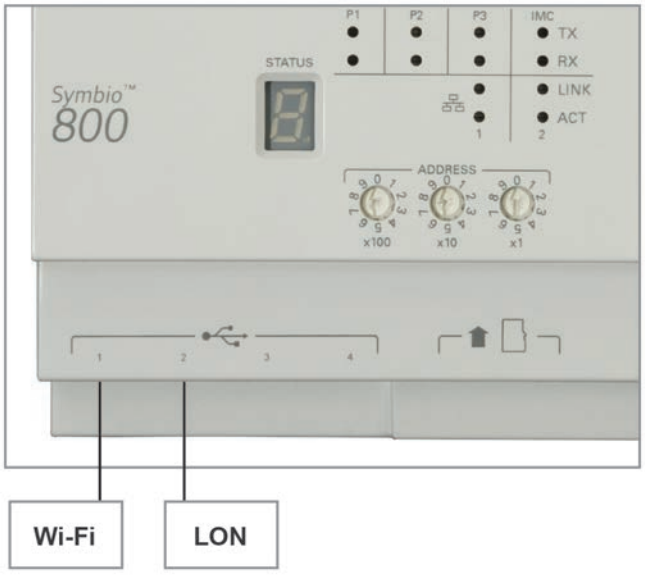


Figure 11. IMC link terminations for optional Air-Fi and expansion module (XM30)



For more information on Expansion Module wiring reference BAS-SVX46 – Expansion Module Installation Operation and Maintenance Manual.*

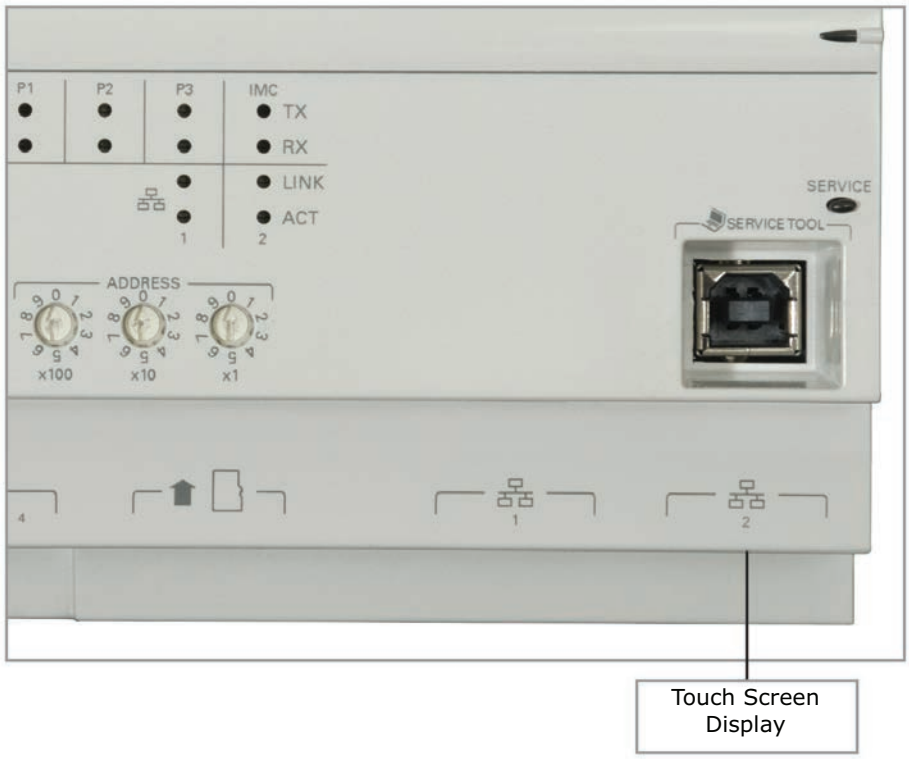
Figure 12. (4) USB connectors



The controller automatically detects devices on any of the ports (not port specific). The controller ships with all ports enabled, but they can be disabled via the Web interface.

Note: *The USB ports are not to be used for any devices that are not Trane approved, such as cellular phones.*

Figure 13. Ethernet port 2



Note: *Ethernet Port 2 is for use with the Touch Screen display only. Communication to other devices is not supported.*

Notes

Trane - by Trane Technologies (NYSE: TT), a global innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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