Honeywell

TC300 Thermostat

BACnet Integration Guide

31-00646-01 | Rev. 11-23

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Waste Electrical and Electronic Equipment (WEEE)

WEEE: Waste Electrical and Electronic Equipment Directive	
	• At the end of the product life, dispose of the packaging and product in an appropriate recycling center. • Do not dispose of the device with the usual domestic refuse. • Do not burn the device.

FCC Part 15 compliant

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Regulation (EC) No 1907/2006

According to Article 33 of Reach Regulation, be informed that the substances listed below may be contained in these products above the threshold level of 0.1% by weight of the listed article.

Product/Part Code	Substance Name	CAS Number
Only TC300 thermostat mainboard CBA, thermostat wall plate board PCBA	Lead	7439-92-1
	Lead oxide	1317-36-8

Important Safety Information and Installation Precautions

Read all instructions.

Failure to follow all instructions may result in equipment damage or a hazardous condition. Read all instructions carefully before installing equipment.

When performing any work (installation, mounting, start-up), all manufacturer instructions and in particular the TC300 Commercial Thermostat Mounting Instructions (31-00642) are to be observed.

- TC300 Thermostat may be installed and mounted only by authorized and trained personnel.
- It is recommended that devices be kept at room temperature for at least 24 hours before applying power. This is to allow any condensation resulting from low shipping/storage temperatures to evaporate.
- Do not open TC300 Thermostat, as it contains no user-serviceable parts inside!
- Investigated according to United States Standard UL- 60730-1, and UL60730-2-9.
- Investigated according to Canadian National Standard(s) C22.2, No. 205-M1983 (CNL-listed).
- CE declarations according to LVD Directive 2014/35/EU and EMC Directive 2014/30/EU.
- Product standards are EN 60730-1 and EN 60730-2-9.
- TC300 Thermostat is Class B digital apparatus and complies with Canadian ICES-003.

Local codes and practices

Always install equipment in accordance with the National Electric Code and in a manner acceptable to the local authority that have jurisdiction.

Electrostatic sensitivity

This product and its components may be susceptible to electrostatic discharge (ESD). Use appropriate ESD grounding techniques while handling the product. When possible, always handle the product by its non-electrical components.

High voltage safety test

Experienced electricians, at first contact, always assume that hazardous voltages may exist in any wiring system. A safety check using a known, reliable voltage measurement or detection device should be made immediately before starting work and when work resumes.

Lightning and high-voltage danger

Most electrical injuries involving low-voltage wiring result from sudden, unexpected high voltages on normally low voltage wiring. Low voltage wiring can carry hazardous high voltages under unsafe conditions. Never install or connect wiring or equipment during electrical storms. Improperly protected wiring can carry a fatal lightning surge for many miles. All outdoor wiring must be equipped with properly grounded and listed signal circuit protectors, which must be installed in compliance with local, applicable codes. Never install wiring or equipment while standing in water.

Wiring and equipment separations

All wiring and controllers must be installed to minimize the possibility of accidental contact with other potentially hazardous and disruptive power and lighting wiring. Never place 24 VAC or communications wiring near other bare power wires, lightning rods, antennas, transformers, or steam or hot water pipes. Never place wire in any conduit, box, channel, duct, or other enclosure containing power or lighting circuits of any type. Always provide adequate separation of communications wiring and other electrical wiring according to code. Keep wiring and controllers at least six feet from large inductive loads (power distribution panels, lighting ballasts, motors, etc.). Failure to follow these guidelines can introduce electrical interference and cause the system to operate erratically.

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Safety Information as per EN60730-1

TC300 Thermostat is intended for commercial and residential environments.

TC300 Thermostat is an independently mounted electronic control system with fixed wiring.

TC300 Thermostat is used for the purpose of building HVAC control and is suitable for use only in non-safety controls for installation on or in appliances.

CHAPTER

1 INTRODUCTION

Topics covered

Scope of the document

The BACnet Integration document contains information related to BACnet Objects and the properties of the thermostat that help engineers to integrate and configure the settings via a BACnet tool. It also contains wiring and installation of the thermostat.

Reference documents

- TC300 Commercial Thermostat User Guide (31-00644)
- TC300 Commercial Thermostat Datasheet (31-00645)
- TC300 Commercial Thermostat Mounting Instructions (31-00642)
- TC300 Commercial Thermostat Pocket Guide(31-00648)
- TC300 Deco Plate Pocket Guide (31-00657)
- TC300 Safety Sheet (31-00643)
- TC300 Thermostat BACnet Integration Guide (31-00646)

Terms, Acronyms, and Abbreviations

Table 1 Terms, Acronyms, and Abbrevations

Term, Acronym, Abbreviation	Definition
UI	Universal Input
UIO	Universal Input/Output
DO	Digital Output
Cfg	Configuration
BAS	Building Automation System
ni	Network Input
no	Network Output
NC	Network Configuration

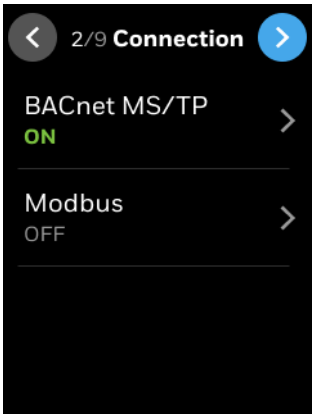
Setting up BACnet MS/TP

The BACnet MS/TP network can be configured while setting up the thermostat. Refer to the TC300 Commercial Thermostat User Guide - 31-00644 or follow the steps below.

To connect thermostat via BACnet MS/TP

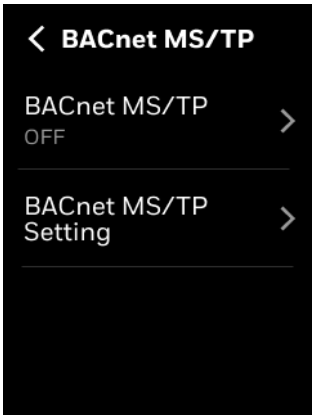
1. Swipe left from the Home page.
2. On the Quick access page, tap  > **Connection**.
   The Connection page appears.

Fig 1. BACnet MS/TP connection



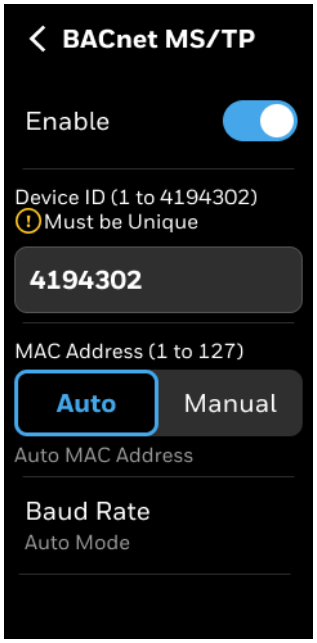
3. Tap the BACnet MS/TP.
   The BACnet MS/TP page appears.

Fig 2. BACnet MS/TP



4. Tap **BACnet MS/TP** and enable it.
   The BACnet MS/TP configuration page appears.

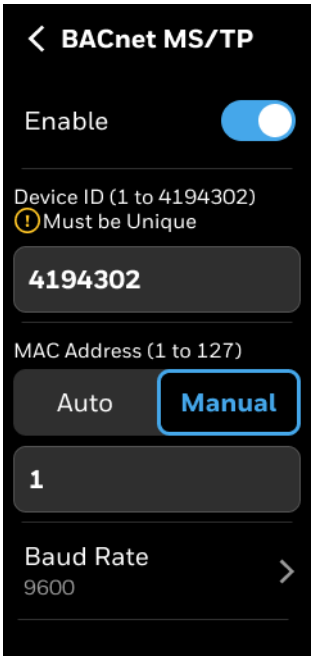
Fig 3. BACnet MS/TP



5. The device automatically adapts to the baud rate of the MS/TP network. You can also manually select the baud rate.
6. Enter a unique Device ID for the thermostat. It should be different from other TC300 thermostats.
7. Auto MAC addressing is enabled by default. The installer can also manually set a unique MAC address for the TC300.
8. To do manual configuration, tap **Manual**.

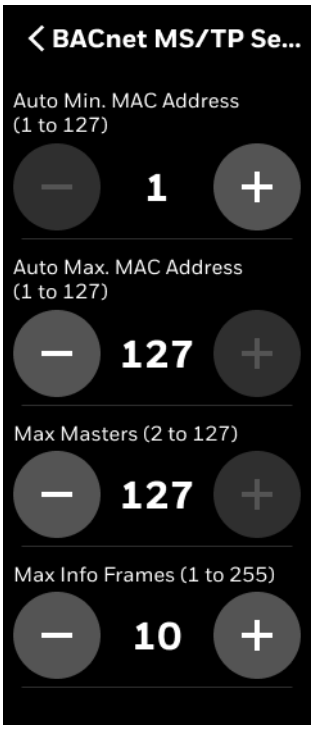
   A text box appears below to enter the MAC address.
9. Tap **Baud Rate,** to select a desired baud rate from the list.

Fig 4. Baud Rate



10. Tap the back arrow button to navigate back to BACnet MS/TP setting page.
11. Tap **BACnet MS/TP Setting.**
    The BACnet MS/TP setting page appears.

Fig 5. BACnet MS/TP Setting



12. Set the desired parameters and tap the back arrow button to navigate back to the connection page.

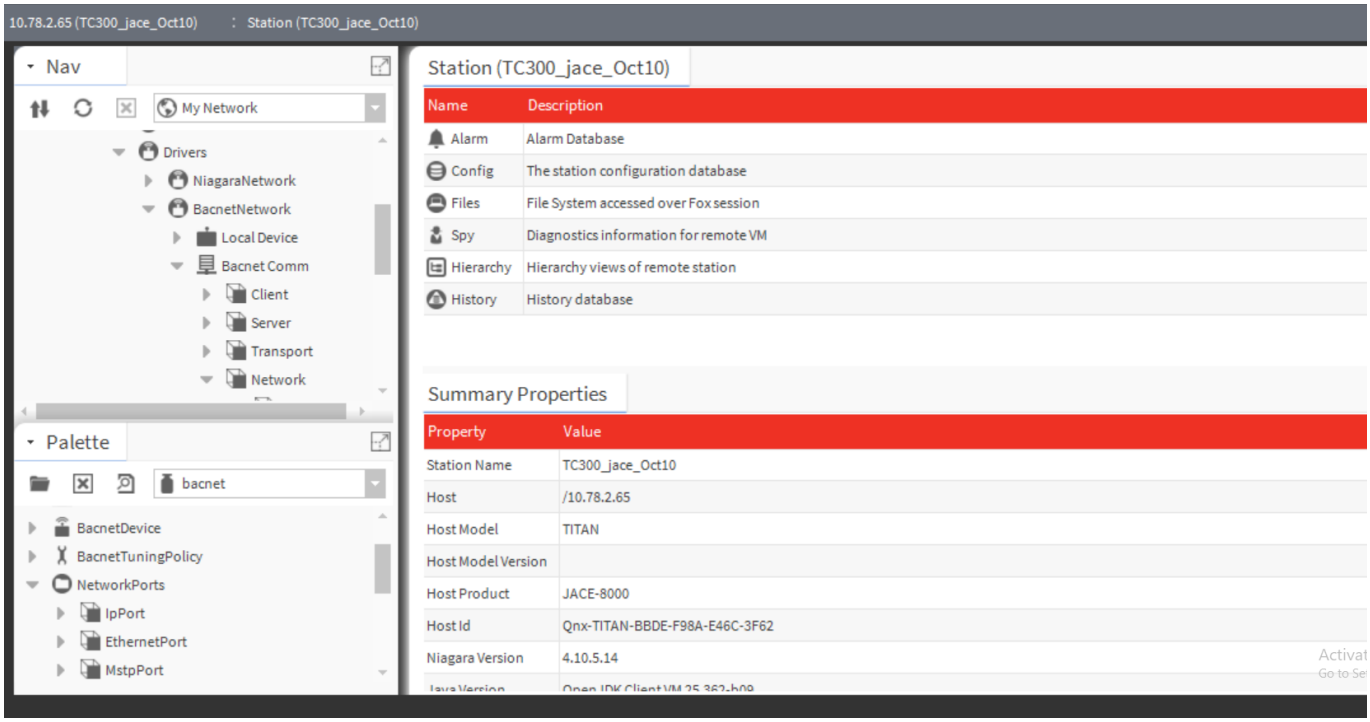
Note: *The TC300 will attempt to adapt to the baud rate of the MS/TP network in the first four minutes after startup or when MS/TP is enabled. If the baud rate could not be determined, for example, there is a single device on the network, then the TC300 will choose the default baud rate of 76,800 Kbps. The installer can manually change the baud rate to another value if desired.*

Adding a thermostat to the BACnet network

The following procedure explains adding the TC300 thermostat to a Bacnet network using the Niagara 4 workbench.

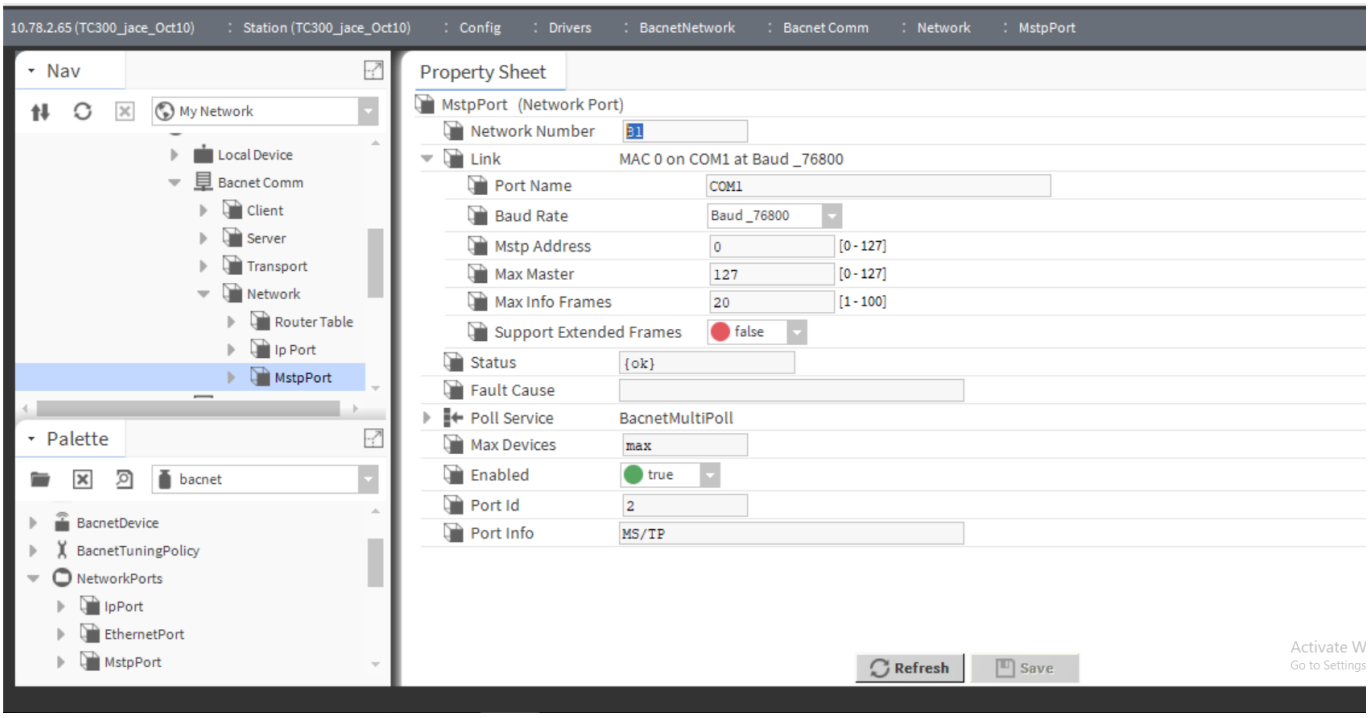
1. In the Niagara 4 workbench, create a new Station.
2. To configure the BACnet device, click **Station** > **Config** > **Drivers** > **BacnetNetwork** > **Local Device** in the Nav view.
   The property sheet of the local BACnet device appears in the right view.

Fig 6. Local Device Property Sheet



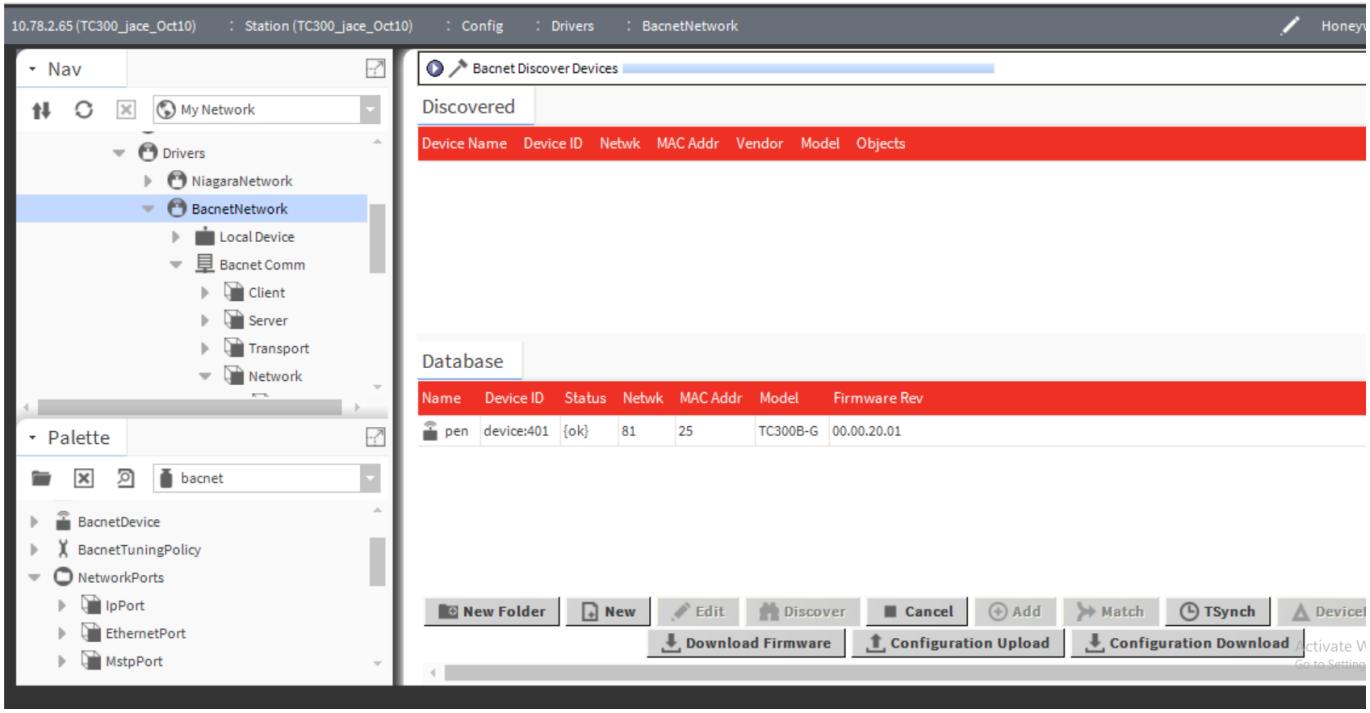
3. On the property sheet, change the **Object Id** to any other number instead of **-1** and click **Save**.
4. In the Nav view seen on the left, click **BACnet Comm** > **Network** > **MstpPort** > **Link.**
   The property sheet of the MSTP port page appears.

Fig 7. Selecting the Adapter Type



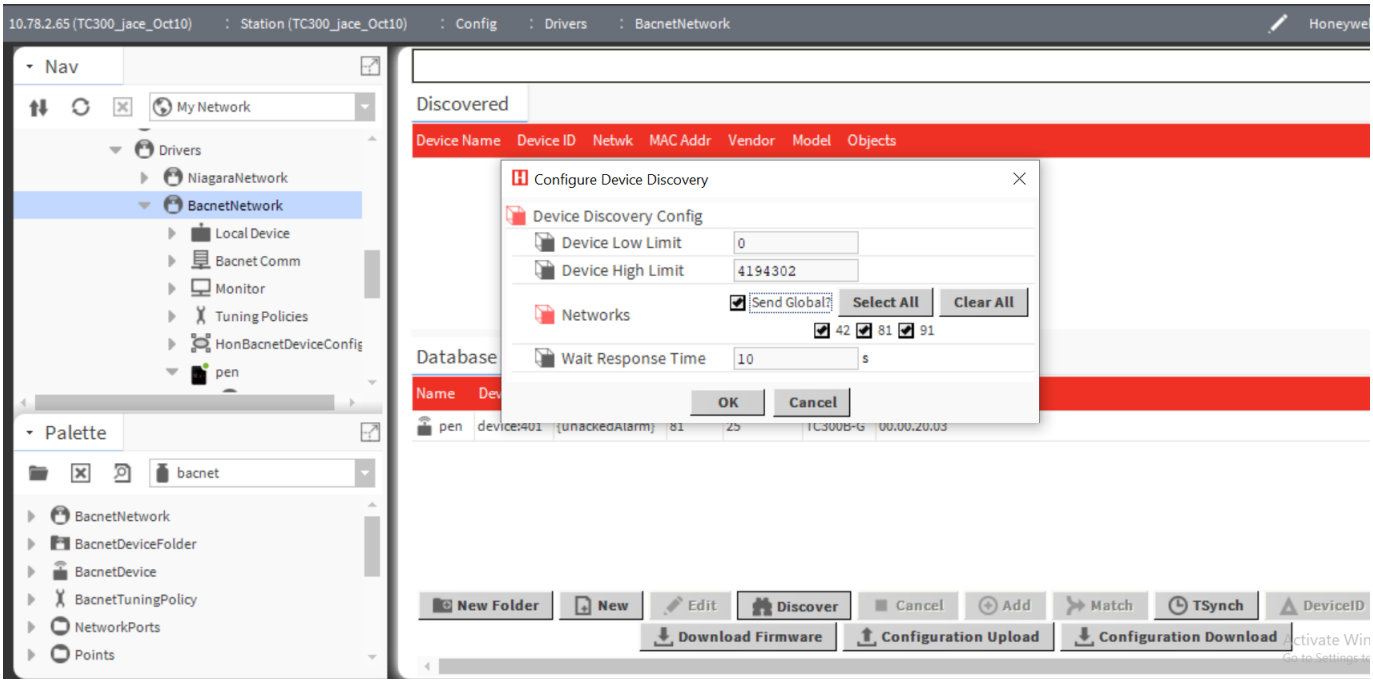
5. Select **Network Number**.
6. Select the **Baud rate** from the drop-down list.
7. Select the **Enabled** field to **True**.
8. Click **Save**.
9. In the Nav view, double click the **BacnetNetwork**.
   The BacnetNetwork discovery page appears.

Fig 8. Device Discovery Page



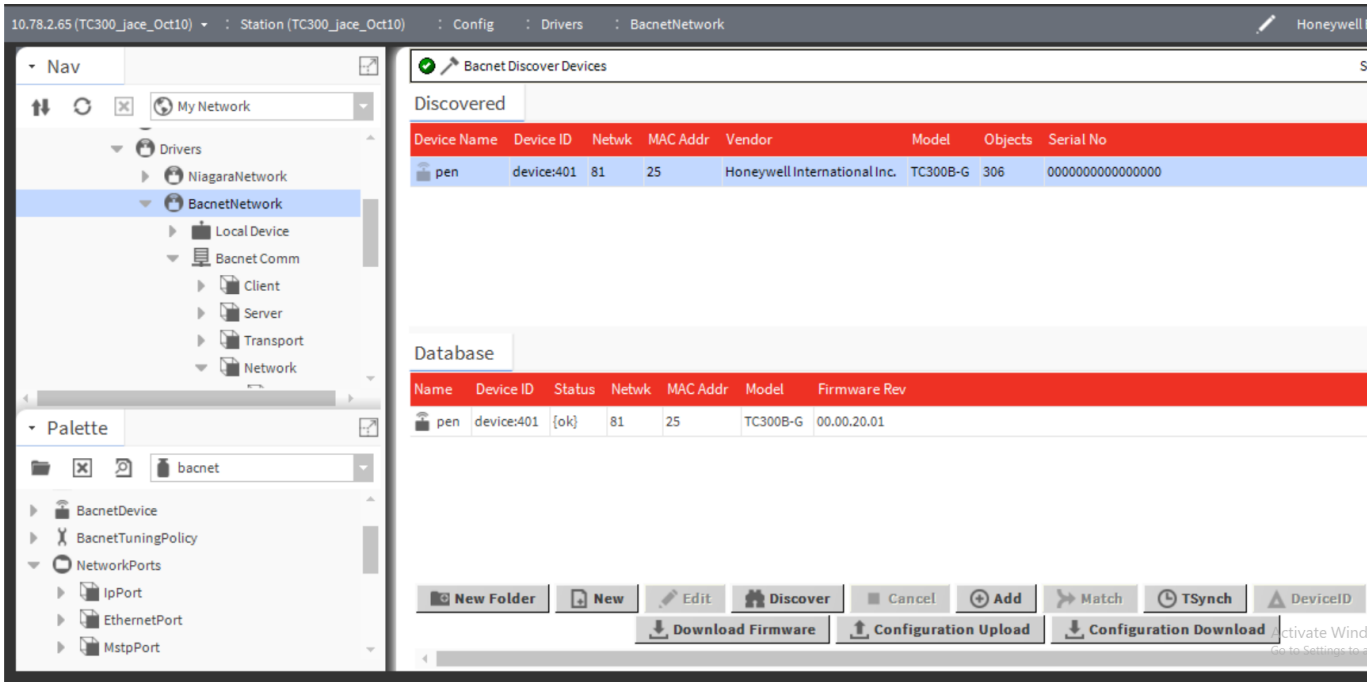
10. Click **Discover.**
    The Configure Device Discovery page appears.

Fig 9. Configure Device Discovery



11. Select the **Send Global** checkbox and click **OK**.
    The thermostat appears on the Discovered view page.

Fig 10. Adding the Discovered Device



12. Select the thermostat > click **Add** > then select the **Type** as **BACnet Device** from the drop-down list.

    The added thermostat appears on the Nav view under BacnetNetwork.

CHAPTER

2 WIRING AND INSTALLATION

Topics covered

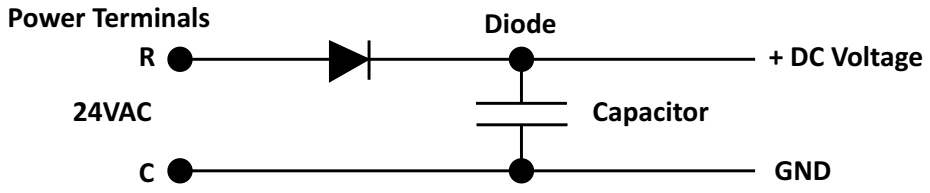
Power supply guidelines and requirements

The thermostat uses 24VAC power from a UL Listed Class-2 24VAC transformer, not provided. It also uses a half-wave rectifier to convert the AC power supply to onboard power. This enables multiple devices with half-wave power supplies to be powered from a single, grounded transformer.

Warning: Half wave devices and full wave devices must not use the same AC transformer.

You must maintain wiring polarity. Failure to do so can result in equipment damage. If the HVAC equipment has an internal circuit board that is powered by the same transformer that will power the Thermostat, verify that it is NOT full wave.

Fig 11. Power supply wiring connection



Power supply wire sizing

Long power supply wiring runs require selecting the wire gauge appropriately. If the wire gauge is inadequate the increased resistance and associated voltage drop may result in insufficient voltage supply to the Thermostat. The recommended wire gauge guidelines are as follows.

Min. Load: 4VA (all DOs OFF, No Sylk sensor).

If 14-18AWG wire is used for R, C terminal,

Max. Load: 4A, 96VA (all DOs ON).

If 20-22AWG wire is used for R, C terminal

Max. Load: 3A, 72VA (all DOs ON).

If 24-26AWG wire is used for R, C terminal,

Max. Load: 2A, 48VA (all DOs ON).

DO1, DO2, DO3, DIO1, and DIO2 all relay outputs are powered from the external transformer. The minimum load includes thermostat and analog outputs at full load (Max. 10V voltage output with 2K ohms load).

Every relay output is N.O. (Normally Open) contacts with a maximum switch rating of 24VAC @1A (24VA). The allowed maximum load is 96VA, which assumes all 5 relay output loads are powered from the transformer. Actual power requirements-depend on connected loads.

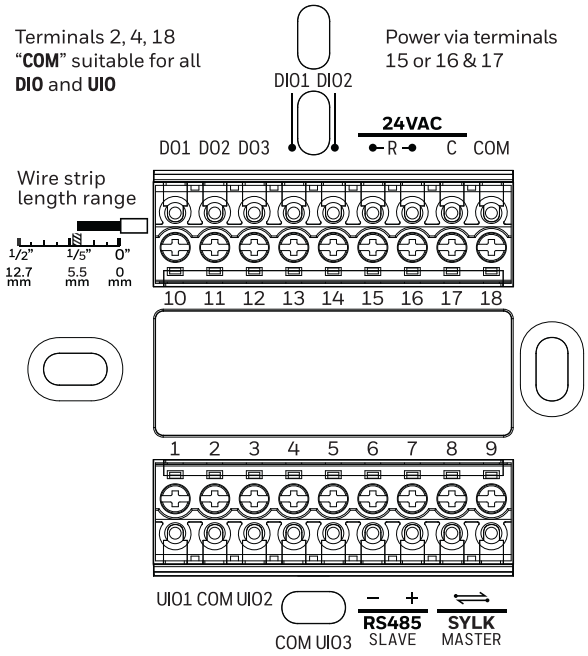
IMPORTANT

Use an UL Class 2 rated Transformer or a lesser capable transformer.

The 24VAC secondary leads are not interchangeable. Once a lead connects to the GND terminal, it is the grounded lead. Observe and maintain polarity for subsequent connections. The GND terminal provides a reference ground for the circuit board and communications wiring. Use 18AWG cable for best results.

Terminal identification

Fig 12. Thermostat terminal assignments



Do NOT wire the thermostat to line voltage.

Table 2 Terminal identification

Terminal Name	Terminal Label	Description
UIO1	UIO1	Universal input/output
COM	COM	Common
UIO2	UIO2	Universal input/output
COM	COM	Common
UIO3	UIO3	Universal input/output
RS485 SLAVE	-	BACnet/Modbus Communications
RS485 SLAVE	+	BACnet/Modbus Communications
SYLK MASTER	⇌	Sylk bus
SYLK MASTER	⇌	Sylk bus
DO1	DO1	Configurable relay output
DO2	DO2	Configurable relay output
DO3	DO3	Configurable relay output
DIO1	DIO1	Configurable relay output, configurable analog/relay input
DIO2	DIO2	Configurable relay output, configurable analog/relay input

Table 2 Terminal identification (Continued)

Terminal Name	Terminal Label	Description
24VAC POWER	R	24VAC power from Class2 transformer
24VAC POWER	C	24VAC common (Neutral) from Class2 transformer
COM	COM	Common

Wiring the wallplate

All wiring must comply with local electrical codes and ordinances. Supports 14-26AWG (0.2-1.5mm2 for solid or stranded, max 2.5mm2 for solid) wires. Follow equipment manufacturer wiring instructions when available. A letter code is located near each terminal for identification.

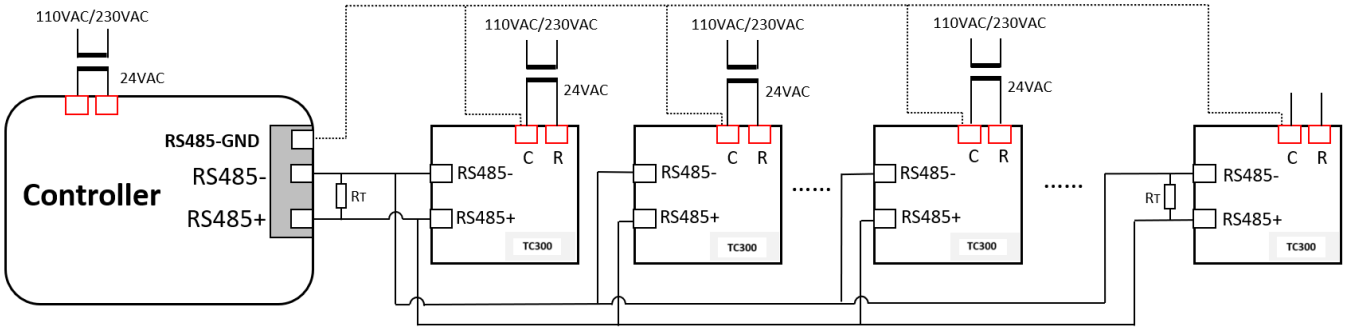
RS485 Interface cable Type

One or two pairs (depending on the application) of twisted pairs complying with EIA485 standard (level IV, 22AWG, solid core, non-shielded). e.g., J-Y-Y 2*2*0.8 or shielded wire.

An MSTP EIA-485 network shall use shielded twisted pair cable with a characteristic impedance between 100 and 130 ohms. Distributed capacitance between conductors shall be less than 100 pF per meter (30 pF per foot). Distributed capacitance between conductors and shield shall be less than 200 pF per meter.

Thermostat powered by separate transformer

Fig 13. Thermostat Powered by Separate Transformer



The TC300s are connected to controller powered by separate Transformer.

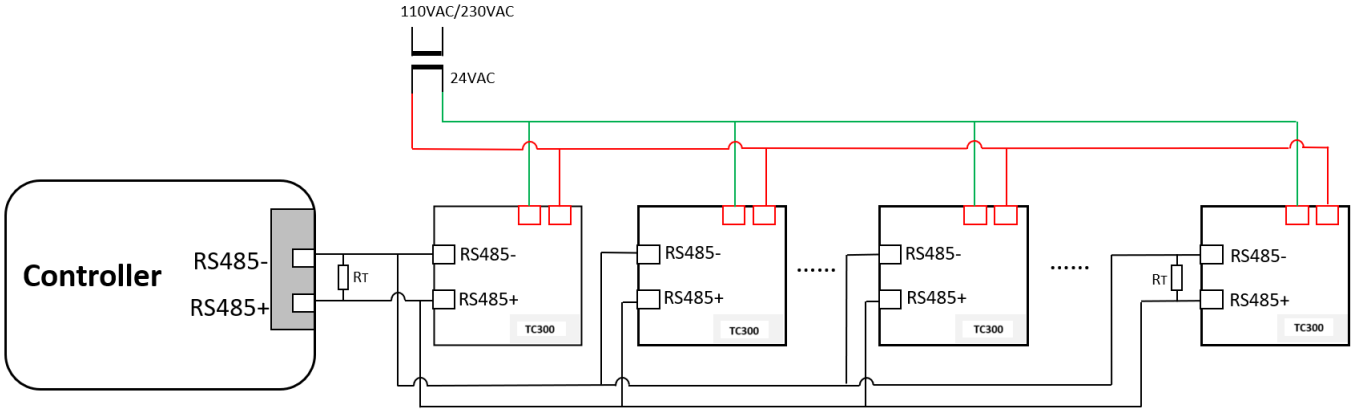
If the TC300's GND (C terminal) is connected to earth, the connection style must comply with the requirement in the case of sharing a public power transformer.

If any device in the network is connected to earth or not electrically isolated, connecting the C wire to the corresponding device's RS485 GND is recommended.

If shielding is used, the shielding of each individual bus segment should be separately connected at one end to the earth.

Thermostat powered by public transformer

Fig 14. Thermostat Powered by Public Transformer



If the controller shares the power transformer with TC300, the connection style depends on the power design of controller and please consult the technical support to avoid short circuit.

If TC300s are connected to a controller and share a public transformer, please make sure the 24VAC power wires are connected to the thermostats in the same sequence, as showed in the above figure. The red wire is connected to the C terminal and green wire is connected to the R terminal. Incorrect connection style can cause a short circuit.

If any device on the network is connected to earth ground or not electrically isolated, connecting the C wire to the corresponding device's RS485 GND is recommended.

If shielding is used, the shielding of each individual bus segment should be separately connected at one end to the earth.

CHAPTER 3

TERMINAL INPUT/OUTPUT AND IO CONFIGURATION

Topics covered

IO status

IO Assignment

Terminal input

Terminal output and network output

IO configuration

IO status

Table 3 IO status

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_UIO3	Analog Output	2006	-40 to 260	Universal Output shared to network.
no_UIO1	Analog Output	64	-40 to 260	Universal Output shared to network.
no_UIO2	Analog Output	63	-40 to 260	Universal Output shared to network.
no_DO1	Binary Output	74	Off=**0**, On=**1**	Digital Output shared to network.
no_DO2	Binary Output	75	Off=**0**, On=**1**	Digital Output shared to network.
no_DO3	Binary Output	76	Off=**0**, On=**1**	Digital Output shared to network.
no_DIO1	Binary Output	77	Off=**0**, On=**1**	Digital Output shared to network.
no_DIO2	Binary Output	78	Off=**0**, On=**1**	Digital Output shared to network.

IO Assignment

Table 4 IO assignment

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_UIO1	Multistate Value	26	1	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}

Table 4 IO assignment (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_UIO2	Multistate Value	27	1	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}
Cfg_UIO3	Multistate Value	2004	1	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}	enum{None=**1**, 6-wayValve=**2**, ModulatingCool=**3**, ModulatingHeat=**4**, ModulatingValve=**5**, VariableSpeedFan=**6**, DischargeAirSensor=**7**, DrainPanSensor=**8**, OccupancySensor=**9**, ProofofAirflow=**10**, PipeSensor=**11**, SpaceTempSensor=**12**, ChangeoverSwitch=**13**}
Cfg_DO1	Multistate Value	28	2	enum{None=**1**, HeatingOn/Off=**2**, HeatingFloatingOpen=**3**, CoolingFloatingOpen=**4**, ValveOn/Off=**5**, ValveFloatingOpen=**6**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, HeatStage1=**30**, ValveStage1=**32**}	enum{None=**1**, HeatingOn/Off=**2**, HeatingFloatingOpen=**3**, CoolingFloatingOpen=**4**, ValveOn/Off=**5**, ValveFloatingOpen=**6**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, HeatStage1=**30**, ValveStage1=**32**}

Table 4 IO assignment (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_DO2	Multistate Value	29	9	enum{None=**1**, HeatingFloatingClose=**7**, CoolingFloatingClose=**8**, CoolingOn/Off=**9**, ValveFloatingClose=**10**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, CoolStage1=**31**}	enum{None=**1**, HeatingFloatingClose=**7**, CoolingFloatingClose=**8**, CoolingOn/Off=**9**, ValveFloatingClose=**10**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, CoolStage1=**31**}
Cfg_DO3	Multistate Value	30	1	enum{None=**1**, CoolingFloatingOpen=**4**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, HeatStage1=**30**, CoolStage1=**31**}	enum{None=**1**, CoolingFloatingOpen=**4**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, HeatStage1=**30**, CoolStage1=**31**}
Cfg_DIO1	Multistate Value	31	1	enum{None=**1**, CoolingFloatingClose=**8**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, DischargeAirSensor=**18**, DrainPanSensor=**19**, OccupancySensor=**20**, ProofOfAirflow=**21**, PipeSensor=**22**, SpaceTempSensor=**23**, ChangeoverSwitch=**24**}	enum{None=**1**, CoolingFloatingClose=**8**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, DischargeAirSensor=**18**, DrainPanSensor=**19**, OccupancySensor=**20**, ProofOfAirflow=**21**, PipeSensor=**22**, SpaceTempSensor=**23**, ChangeoverSwitch=**24**}
Cfg_DIO2	Multistate Value	32	12	enum{None=**1**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, DischargeAirSensor=**18**, DrainPanSensor=**19**, OccupancySensor=**20**, ProofOfAirflow=**21**, PipeSensor=**22**, SpaceTempSensor=**23**, ChangeoverSwitch=**24**}	enum{None=**1**, ChangeoverValve=**11**, FanCommand=**12**, HighSpeedFan=**13**, MediumSpeedFan=**14**, LowSpeedFan=**15**, AuxiliaryHeat=**16**, DischargeAirSensor=**18**, DrainPanSensor=**19**, OccupancySensor=**20**, ProofOfAirflow=**21**, PipeSensor=**22**, SpaceTempSensor=**23**, ChangeoverSwitch=**24**}

Terminal input

Table 5 Terminal input

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
phy_ChangeOverSwitch	Binary Input	1	0	Close=**0,** Open=**1**	Changeover switch status
phy_DatSensor	Analog Input	1		-40 to 200 °F	Discharge air sensor output value
phy_DrainpanSensor	Binary Input	2	0	Off=**0**, On=**1**	Drain pan sensor status
phy_OccupancySensor	Binary Input	3	0	Standby=**0** Unoccupied=**1**	Occupancy sensor status
phy_ProofOfAirFlowSensor	Binary Input	4	0	Off=**0** On=**1**	Proof of air flow sensor status
phy_PipeSensor	Analog Input	2		-40 to 260 °F	Pipe sensor output value
phy_SpaceTempSensor	Analog Input	3		-40 to 150 °F	Space temperature sensor output value

Terminal output and network output

Table 6 Terminal output and network output

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_SixWay_Valve_Cooling	Analog Output	2001	0 to 100%	Six-way valve cooling control output
no_SixWay_Valve_Heating	Analog Output	2002	0 to 100%	Six-way valve Heating control output
no_Modulating_Cool	Analog Output	2003	0 to 100%	Modulating cool control output
no_Modulating_Heat	Analog Output	2004	0 to 100%	Modulating heat control output
no_VariableFan	Analog Output	2005	0 to 100%	Variable Fan control output
no_Auxiliary_Heat	Binary Output	2001	Off=**0**,On=**1**	Auxiliary heat control output
no_ChangeOverValve	Binary Output	2002	Off=**0**,On=**1**	Changeover valve control output
no_Cooling_Valve(On/Off)	Binary Output	2004	Off=**0**,On=**1**	Cooling on/off valve output status
no_Heating_Valve(On/Off)	Binary Output	2005	Off=**0**,On=**1**	Heating on/off valve output status

Table 6 Terminal output and network output (Continued)

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_Cooling_Floating_Open	Binary Output	2006	Off=**0**,On=**1**	Cooling floating valve open control output
no_Cooling_Floating_Close	Binary Output	2007	Off=**0**,On=**1**	Cooling floating valve close control output
no_Heating_Floating_Open	Binary Output	2008	Off=**0**,On=**1**	Heating floating valve open control output
no_Heating_Floating_Close	Binary Output	2009	Off=**0**,On=**1**	Heating floating valve close control output
no_High_Single_Speed_Fan	Binary Output	2010	Off=**0**,On=**1**	High speed fan on/off status
no_Low_Speed_Fan	Binary Output	2011	Off=**0**,On=**1**	Low speed fan on/off status
no_Medium_Speed_Fan	Binary Output	2012	Off=**0**,On=**1**	Medium speed fan on/off status
no_Modulating_Cooling_stage_1	Binary Output	2014	Off=**0**,On=**1**	Modulating cool stage1 on/off status
no_Modulating_Heating_stage_1	Binary Output	2015	Off=**0**,On=**1**	Modulating heat stage1 on/off status

IO configuration

Table 7 IO configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_OccSensChar	Binary Value	31	0	NormallyOpen=**0**, NormallyClosed=**1**	Occupancy sensor input characteristics selection
Cfg_AirFlwStsChar	Binary Value	33	0	NormallyOpen=**0,** NormallyClosed=**1**	Airflow status input characteristics selection
Cfg_UISensCalOffset_DATemp	Analog Value	185	0 °F	-10 to 10 °F	Universal input discharge air temperature calibration offset
Cfg_SpcSensChar	Multistate Value	372	3	enum{ NTC10KTypeII=**1**, NTC10KTypeIII=**2**, NTC20K=**3**}	Space temperature Sensor characteristic selection
Cfg_UISensCalOffset_SpcTemp	Analog Value	1464	0 °F	-10 to 10 °F	Space temperature calibration offset

Table 7 IO configuration (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_ModHeatMin_Output	Analog Value	1475	2 V	0 to 9 V	Minimum output voltage when modulating heating is enabled
Cfg_ModHeatAction	Binary Value	380	0	Direct=**0**, Reverse=**1**	Modulating heat polarity selection
Cfg_ModCoolMin_Output	Analog Value	1476	2 V	0 to 9 V	Minimum output voltage when modulating cooling is enabled
Cfg_ModCoolAction	Binary Value	381	0	Direct=**0**, Reverse=**1**	Modulating cool polarity selection
Cfg_VarSpeedFanType	Multistate Value	373	2	enum{0-10V=**1**, 2-10V=**2**}	Variable fan speed type characteristic selection
Cfg_ModHeatMax_Output	Analog Value	1477	10 V	1 to 10 V	Maximum voltage on heating output.
Cfg_ModCoolMax_Output	Analog Value	1478	10 V	1 to 10 V	Maximum voltage on cooling output.
Cfg_PipeSensChar	Multistate Value	2005	3	enum{ NTC10KTypeII=**1**, NTC10KTypeIII=**2**, NTC20K=**3**}	Pipe sensor type
Cfg_DASensChar1	Multistate Value	503	3	enum{ NTC10KTypeII=**1**, NTC10KTypeIII=**2**, NTC20K=**3**}	Discharge air sensor type
Cfg_LeakDetectorSensorChar	Binary Value	455	1	NormallyOpen=**0**, NormallyClosed=**1**	Leak detector/Drain pan sensor characteristics

CHAPTER

4 ALERT

Topics covered

Alerts

Alert configuration

Alerts

Table 8 Alerts

Name	BACnet Object Type	BACnet Object Instance	Range	Description
AlarmPriority_ProofofAirFlow	Binary Value	2002	Inactive=**0**, Active=**1**	Supply fan status mismatch alarm & priority.
AlarmPriority_SpaceFreezeProtect	Binary Value	2049	Inactive=**0**, Active=**1**	If space temperature has dropped below 43 **°F** and after 120 seconds of delay, high priority alarm is created.
AlarmPriority_UnknownTime	Binary Value	2050	Inactive=**0**, Active=**1**	Time lost alarm
AlarmPriority_TempSens	Analog Value	2081	{**BIT0**=INACTIVE, **BIT1**=HIGH, **BIT2**=MEDIUMN_ONBOARD, **BIT3**=MEDIUMN_REMOTE, **BIT4**=MEDIUMN_SYLK}	**High Priority:** 1. Only local sensor configured & even if any one of the on-board temperature sensors is in alarm 2. Only Remote sensor configured & TR40 sensor connected to Sylk address 2 is giving null value. 3. Configured as multi sensor & both the remote sensor & on-board configured sensor has failed. **Medium priority:** 1. Configured as Multi sensor & only the on-board sensor has failed. but getting reliable value from the Sylk sensors. 2. Configured as multi sensor & only one of the Sylk sensor has failed with values available from other Sylk sensors (If configured) or on-board sensor. When a valid network temperature is available, then the high priority alarms will be considered as medium priority alarm.

Table 8 Alerts (Continued)

Name	BACnet Object Type	BACnet Object Instance	Range	Description
AlarmPriority_HumSens	Analog Value	2082	{**BIT0**=INACTIVE, **BIT1**=HIGH, **BIT2**=MEDIUMN_ONBOARD, **BIT4**=MEDIUMN_SYLK}	**High Priority:** 1. Only local sensor configured & on-board humidity sensor is in alarm 2. Only Remote sensor configured & TR40 sensor connected to Sylk address 2 is giving null value and digital output is configured for Humidification and Dehumidification. 3. Configured as multi sensor & both the remote sensor & on-board configured sensor has failed. **Medium priority:** 1. Configured as Multi sensor & only the on-board sensor has failed. but getting reliable value from the sylk sensors. 2. Configured as multi sensor & only the sylk sensor has failed with values available from on-board sensor. When a valid network humidity is available, then the high priority alarms will be considered as medium priority alarm.
Alarm_SylkCommFailure	Multistate Value	2036	enum{Normal=**1**, SylkAddr2Fail=**2**, SylkAddr3Fail=**3**, SylkAddr4Fail=**4**, SylkAddr5Fail=**5**, SylkAddr10Fail=**10**, ManySylkFail=**16**}	Sylk communication failure alarm. If more than one Sylk sensor has failed, then 'ManySylkFail' alarm would be generated & installer has to check the BACnet points related to all Sylk sensors to understand which sensor has failed.

Table 8 Alerts (Continued)

Name	BACnet Object Type	BACnet Object Instance	Range	Description
AlarmPriority_SpcTempHl_Lolimit	Analog Value	2084	{**BIT0**=INACTIVE, **BIT1**=HIGH, **BIT2**=MEDIUMN_ONBOARD, **BIT3**=MEDIUMN_REMOTE, **BIT4**=MEDIUMN_SYLK}	**High priority**: All space temperatures are out of range. No other resource can be used. **Medium priority**: Some of the space temperatures are out of range, other resource can be used for controlling.
AlarmPriority_DATempAlarm_Fault	Multistate Value	2029	enum{ Inactive=**1**, Medium=**2**, High=**3**}	**High priority**: Discharge air sensor failure. **Medium priority**: Discharge air sensor out of range.
Alarm_PipeSensorFailure	Multistate Value	2030	enum{ Inactive=**1**, Active=**3**}	Pipe sensor failure occur.
Alarm_PipeSensorTempHeatOrCoolThreshold	Analog Value	2085	{Inactive=**0**, Active=**1**}	For 2 pipe single coil heat & cool: water temperature is not suitable for heating/ cooling.
Alarm_RoomTempTrendFailure	Binary Value	2051	Inactive=**0**, Active=**1**	Room temperature changing trend is reversed with system operating mode.
Alarm_CHWDrainPanSensor	Binary Value	2052	Inactive=**0**, Active=**1**	Alarm occurs when condensation leak alarm/ pan drain sensor alarm detects
Alarm_PipeSensorOutofRange	Multistate Value	2031	enum{Inactive=**0**, Active=**1**}	Pipe sensor temperature out of range.

Alert configuration

Table 9 Alert configuration

Name	BACnet Object Type	BACnet Object Instance	Range	Description
Cfg_ProofofAirFlowAlarm	Analog Value	2088	{**BIT0**=PrimaryheatingandcoolingOnOff, **BIT1**=PopUpOnHomeScreen, **BIT2**=Acknowledged, **BIT3**=AuxiliaryheatOnOff}	Bit 0 False – Will not turn off Heat/Cool Outputs when alarm is triggered, Bit 0 True – Turn off Heat/Cool Outputs when alarm is triggered, Bit 3 False – Will not turn off Auxiliary heat Outputs when alarm is triggered. Bits3 True – Turn off Auxiliary heat Outputs when alarm is triggered
Cfg_RoomTempTrendFailure	Analog Value	2098	{**BIT0**=ShutdownalldigitaloutputsOnoff, **BIT1**=PopUpOnHomeScreen,**BIT2**=Acknowledged}	BIT 0 False - Don't shut down all digital outputs, BIT 0 True - Shut down all digital outputs.
Cfg_DrainPanSensorAlarm	Analog Value	2100	{**BIT0**=ShotdownCooling, **BIT1**=PopUpOnHomeScreen, **BIT2**=Acknowledged, **BIT3**=ShotdownHeat, **BIT4**=ShotdownFanWhenInVentilationMode}	Bit0 False - Don't shut down Cooling when alarm occurs, Bit0 True - Shut down cooling when alarm occurs, Bit3 False - Don't shut down Heating when alarm occurs. Bit3 True - Shut down Heating when alarm occurs, Bit4 False - Fan will run in ventilation mode when alarm occurs, Bit4 True - Fan will not run in ventilation mode when alarm occurs.

CHAPTER

5 NETWORK OUTPUT

Topics covered

Network outputs

Schedule

Sylk sensor reading

Network outputs

Table 10 Network outputs

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_CoolCtrl_RunTimeAccumulate	Analog Value	2026	0 to 270737 hours	Outputs the actual run time of cooling control.
no_LocalOccSensState	Multistate Value	2013	enum{Occupied=**1**, Unoccupied=**2**, Unused=**3**}	Local occupancy sensor state.
no_AuxHeatTermLdOut	Analog Value	2027	-200 to 0%. Default is 0%	Terminal load for auxiliary heat.
no_EffOccState	Multistate Value	2014	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**}	Effective occupancy state.
no_CoolStg1_RunTimeAccumulate	Analog Value	2028	0 to 270737 hours	Outputs the actual run time of cooling stage 1
no_HeatCtrl_RunTimeAccumulate	Analog Value	2029	0 to 270737 hours	Outputs the actual run time of heating control.
no_HeatStg1_RunTimeAccumulate	Analog Value	2030	0 to 270737 hours	Outputs the actual run time of heating stage 1
no_Fan_RunTimeAccumulate	Analog Value	2031	0 to 270737 hours	Outputs the actual run time of Fan.
no_OccupancyState	Binary Value	2015	Unoccupied=**0**, Occupied=**1**	System is in occupied/ unoccupied state.
no_DaHilimit	Binary Value	2016	Off=**0**, On=**1**	Discharge Air High Limit output: DAT heating lockout flag
no_IsHeatDisable	Binary Value	2018	Off=**0**, On=**1**	Heating enabled/ disabled.
no_IsFanOnly	Binary Value	2019	Off=**0**, On=**1**	Fan only mode enabled/ disabled.
no_EffSp	Analog Value	2032	40 to 120 °F	Effective setpoint
no_EffTempMode	Multistate Value	2015	enum{ CoolMode=**1**, ReheatMode=**2**, HeatMode=**3**, EmergencyHeat=**4**, Off=**5**, Ventilation=**6**}	Effective temperature mode
no_SystemDisable	Binary Value	2020	Off=**0**, On=**1**	System disable.
no_DehumActive	Binary Value	2021	Inactive=**0**, Active=**1**	Dehumidification Active/ Inactive
no_BypassState	Binary Value	2022	NoBypass=**0**, Bypass=**1**	Bypass state output

Table 10 Network outputs (Continued)

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_ManualOverride	Multistate Value	2016	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, Null=**5**}	Manual override
no_EffOccSensState	Multistate Value	2017	enum{ Occupied=**1**, UnOccupied=**2**, Unused=**3**}	Effective occupancy sensor state
no_CoolDaLolimit	Binary Value	2023	Normal=**0**, LoLimit=**1**	Discharge air high limit output: DAT cooling lockout flag
no_CoolTermLdOut	Analog Value	2036	0 to 200%	Terminal load for cooling
no_IsCoolDisable	Binary Value	2025	Enable=**0**, Disable=**1**	Cooling enabled/ disabled.
no_HeatTermLdOut	Analog Value	2038	-200 to 0%	Terminal load for heating
no_FanStart	Binary Value	2026	Off=**0**, On=**1**	Fan start command
no_DaTemp	Analog Value	2040	-40 to 200 °F	Discharge air temperature
no_PipeTemp	Analog Value	2041	-40 to 260 °F	Pipe sensor temperature
no_EffSchCurrentState	Multistate Value	2018	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Current schedule state to network.
no_EffSchNextState	Multistate Value	2019	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Next schedule state to network.
no_EffTUNCOS	Analog Value	2042	0 to 11520 minutes	TUNCOS is the difference between the future change in event & current event in minutes to the network.
no_OverrideRemTime	Analog Value	2043	0 to 1080 minutes	This point gives out the exact remaining time for the bypass to reset once the system is in override condition.
no_CtrlSpaceTemp	Analog Value	2044	-40 to 150 °F	Control space temperature output (Only for testing purpose)

Table 10 Network outputs (Continued)

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_RecoveryStatus	Binary Value	2030	Normal=**0**, Recovery=**1**	This point gives out when the system is in recovery mode.
no_TermLdOut	Analog Value	2045	-200 to 200%	Common terminal load output for heating and cooling. This is an output showing the terminal load, which is a percentage between -200% and +200% based on the control output level. Negative values indicate heating load and positive values indicate cooling load.
no_EffDATSp	Analog Value	2046	40 to 150 °F	Effective discharge air control setpoint
no_SpaceTemp	Analog Value	2001	-40 to 150 °F	Space Temperature
no_SpaceHumidity	Analog Value	2002	0 to 100%RH	Space Humidity
no_EffHeatSp	Analog Value	2003	40 to 120 °F	Effective Heating Setpoint
no_EffCoolSp	Analog Value	2004	40 to 120 °F	Effective Cooling Setpoint
no_SetpointSts	Multistate Value	2001	enum{Occupied=**1**, Unoccupied=**2**, Temporary=**3**, Standby=**4** Permanent=**5**}	When the setpoint is adjusted by user, no_setpoints shifts to 'Temporary'. When the setpoint is not adjusted it will represent the current system state.
no_GenericAlarm	Binary Value	2035	Inactive=**0**, Active=**1**	General alarm flag

Schedule

Table 11 Schedule

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
no_ScheduleCurrentState	Multistate Value	2027		enum{ Occupied=**1**, Unoccupied=**2**, Tempporty=**3**, Standyby=**4**}	Current schedule state
no_ScheduleNextState	Multistate Value	2028		enum{ Occupied=**1**, Unoccupied=**2**, Tempporty=**3**, Standyby=**4**}	Next schedule state
no_ScheduleTimeToNext	Analog Value	2021		1 to 11520 minutes	Time to next schedule state

Sylk sensor reading

Table 12 Sylk sensor reading

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_SylkAddr2Temp	Analog Value	223	-40 to 150 °F	TR40-H-CO2: Temperature (May also use models TR40, TR40-H, TR40-CO2, TR40-H-CO2)
no_SylkAddr2Hum	Analog Value	224	0 to 100% RH	TR40-H-CO2: Humidity (May also use models TR40, TR40-H, TR40-CO2, TR40-H-CO2)
no_SylkAddr2CO2	Analog Value	225	0 to 2000 ppm	TR40-H-CO2: CO2. (May also use models TR40-CO2, TR40-H-CO2)
no_SylkAddr3Temp	Analog Value	226	-40 to 150 °F	Address 3 TR40: Temperature
no_SylkAddr4Temp	Analog Value	227	-40 to 150 °F	Address 4 TR40: Temperature
no_SylkAddr5Temp	Analog Value	228	-40 to 150 °F	Address 5 TR40: Temperature
no_SylkAddr10Temp	Analog Value	235	-40 to 200 °F	Address 10 C7400S: Temperature
no_SylkAddr10Hum	Analog Value	236	0 to 100% RH	Address 10 C7400S: Humidity

CHAPTER

6 APPLICATION CONFIGURATION

Topics covered

Auxiliary heat configuration

Table 13: Auxiliary heat configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_AuxiliaryHeatEnable	Binary Value	2039	0	Off=**0**, On=**1**	Auxiliary heat enable
Cfg_HeatPmp_AuxMode	Multistate Value	2003	1	enum {Peripheral=**1**, Supplemental=**2**}	Auxiliary heat type
Cfg_AuxiliaryHeatPeriperalDroop	Analog Value	2018	0 °F	0 to 5 °F	Peripheral aux heat droop
Cfg_AuxiliaryHeatSupplementalDroop	Analog Value	2019	2 °F	0 to 5 °F	Supplemental aux heat droop
Cfg_AuxHeat_FanOnOff	Binary Value	2001	1	Off=**0**, On=**1**	Fan run on/Off when aux heat on

Cooling configuration

Table 14 Cooling configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Cool_Tr	Analog Value	41	4 **Δ°F**	0 to 30 **Δ°F**	Cooling throttling range
Cfg_Cool_It	Analog Value	42	2500 seconds	0 to 5000 seconds	Cooling integral time 0 = disable (i.e., proportional only)
Cfg_Cool_DischLoLimSp	Analog Value	47	45 °F	-40 to 60 °F	Discharge air temperature low limit setpoint.

Deadband

Table 15 Deadband

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Thermostat_Deadband	Analog Value	101	3 °F	2 to 9 °F	Temperature differential between heat and cool setpoint

Dehumidification Configuration

Table 16 Dehumidification configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_DehumEnable	Binary Value	2040	0	Off=**0**, On=**1**	Enable/disable dehumidification
Cfg_Dehum_SpaceRHHighLimit	Analog Value	48	65%RH	30 to 100%RH	Space relative humidity (RH) high limit setpoint.
Cfg_Dehum_OverCool_Offset	Analog Value	2022	-2 °F	-5 to -1 °F	Dehumidification over cool offset
Cfg_Dehum_StageReHeatOpEn	Binary Value	133	0	Disable=**0**, Enable=**1**	Staged reheat operation enable
Cfg_DehumAuxHeatForReheat	Binary Value	2041	0	Disable=**0**, Enable=**1**	Aux heat reheat enable

Fan configuration

Table 17 Fan configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanType	Multistate Value	12	1	enum{SingleSpeed=**1**, TwoSpeed=**2**, ThreeSpeed=**3**, VariableSpeed=**4**}	Fan can be configured as single speed, two speed or as a variable speed fan.
Cfg_FanRunOffDelayCool	Analog Value	39	0 seconds	0 to 180 seconds	Fan run on time after all cooling terminal turns off.
Cfg_FanRunOnDelayHeat	Analog Value	40	30 seconds	0 to 30 seconds	Fan run on delay time after heating terminal turns on.
Cfg_FanRunOffDelayHeat	Analog Value	2017	120 seconds	0 to 180 seconds	Fan run on time after all heating terminal turns off

Table 17 Fan configuration (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanCoilManualSpeedSel	Multistate Value	583	1	enum{Auto=**1**, Low=**2**, Medium=**3**, High=**4**, Off=**5**, Circulate=**6**}	Fan speed
Cfg_FanConfig	Analog Value	2087	15	{**BIT1**=Auto, **BIT2**=Manual, **BIT3**=Circulate}	Fan configuration. BIT1 Auto must be set as 1, manual and circulate can be set as 1 or 0.

Fan speed

Table 18 Fan speed

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanCoilTwoSpeedVentMode	Multistate Value	585	1	enum{Low=**1**, High=**2**}	Fan speed for ventilation mode
Cfg_FanCoilThreeSpeedVentMode	Multistate Value	586	1	enum{Low=**1**, Medium=**2**, High=**3**}	Fan speed for ventilation mode
Cfg_FanCoilTwoSpeedType	Multistate Value	581	2	enum{ MultipleOutputsAtATime=**1** OneOutputAtATime=**2**}	Two speed fan output type
Cfg_FanCoilThreeSpeedType	Multistate Value	582	2	enum{ MultipleOutputsAtATime=**1** OneOutputAtATime=**2**}	Three speed fan output type
Cfg_VarSpeedFan_VentSpeed	Analog Value	1470	20%	0 to 100%	Variable speed fan speed for ventilation mode
Cfg_VarSpeedFan_CoolMinSpeed	Analog Value	1468	20%	0 to 100%	Variable speed fan min speed for cool
Cfg_VarSpeedFan_CoolMaxSpeed	Analog Value	1469	100%	0 to 100%	Variable speed fan max speed for cool
Cfg_VarSpeedFan_HeatMinSpeed	Analog Value	1473	10%	0 to 100%	Variable speed fan min speed for heat
Cfg_VarSpeedFan_HeatMaxSpeed	Analog Value	1474	50%	0 to 100%	Variable speed fan max speed for heat

Heating configuration

Table 19 Heating configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Heat_Tr	Analog Value	54	4 **Δ°F**	0 to 30 **Δ°F**	Heating throttling range.
Cfg_Heat_It	Analog Value	55	2500 seconds	0 to 5000 seconds	Heating integral time 0 = disable (i.e., proportional only)
Cfg_Heat_DischHiLimSp	Analog Value	61	150 °F	60 to 200 °F	Discharge air temperature high limit setpoint

CHAPTER

7 COMMON CONFIGURATION

Topics covered

Control

Table 20 Control

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Control_MainSensor	Multistate Value	9	1	enum{ LocalSensor=**1**, RemoteSensor=**2**, Multi-Sensor=**3**}	Temperature/ Humidity sensor selection
Cfg_Control_PowerupDelay	Analog Value	14	10 seconds	0 to 300 seconds	Initial delay to start control after power cycle.

Equipment

Table 21 Equipment

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Mod_StgHt1En	Binary Value	35	0	Disable=**0**, Enable=**1**	Modulating heat stage mode
Cfg_Heat_ModHtEnMinOut	Analog Value	96	20 %	0 to 100%	Modulating heat minimum output when enabled
Cfg_FanCoilFourPipeSingleCoilType	Multistate Value	87	1	enum{Regulating&Change Over=**1**, 6-WayValve=**2**}	Four pipe single coil valve type
Cfg_ChangeoverSwitchPolarityType	Multistate Value	2033	0	enum{Closedwithheat=**1**, Closedwithcool=**2**}	Changeover switch polarity type
Cfg_2PipeSingleCoilHeat&CoolSysModChangeoverType	Multistate Value	2034	1	enum{PipeSensor=**1**, NetworkInput=**2**, ChangeoverSwitch=**3**}	2 pipe single coil heat & cool system mode changeover method
Cfg_Mod_StgCl1En	Binary Value	377	0	Disable=**0**, Enable=**1**	Modulating cool use stage 1 as enabled
Cfg_Cool_ModClEnMinOut	Analog Value	1461	20 %	0 to 100%	Modulating cool minimum output when enabled

Table 21 Equipment (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanCoilType	Multistate Value	575	1	enum{4PipeDualCoil=**1**, 4PipesingleCoil=**2**, PipeSingleCoil=**3**}	Fan coil type
Cfg_FanCoilHtgType	Multistate Value	576	2	enum{None=**1**, OnOff=**2**, Floating=**3**, Modulating=**4**}	4 pipe dual coil heating valve type, 4 pipe single coil/ 2 pipe single coil valve type
Cfg_FanCoilClgType	Multistate Value	577	2	enum{None=**1**, OnOff=**2**, Floating=**3**, Modulating=**4**}	4 pipe dual coil cooling valve type
Cfg_FanCoilHtgDriveTime	Analog Value	1721	90 seconds	0 to 240 seconds	4 pipe dual coil floating heating drive time, 4 pipe single coil/2 pipe single coil valve drive time
Cfg_FanCoilClgDriveTime	Analog Value	1722	90 seconds	0 to 240 seconds	4 pipe dual coil floating cooling drive time
Cfg_FanCoilTwoPipeSingleCoil Type	Multistate Value	580	1	enum{Heat&Cool=**1**, HeatingOnly=**2**, CoolingOnly=**3**}	2 pipe single coil type
Cfg_FanCoilHtgDriveType	Multistate Value	578	1	enum{Direct=**1**, Reverse=**2**}	4 pipe dual coil floating heating drive type, 4 pipe single coil/2 pipe single coil floating valve drive type
Cfg_FanCoilClgDriveType	Multistate Value	579	1	enum{Direct=**1**, Reverse=**2**}	4 pipe dual coil floating cooling drive time
Cfg_FanCoilHtgFloatingSyncE n	Binary Value	453	1	Disable=**0**, Enable=**1**	4 pipe dual coil floating heating sync enable, 4 pipe single coil/2 pipe single coil floating valve sync enable

Table 21 Equipment (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanCoilClgFloatingSyncEn	Binary Value	462	1	Disable=**0**, Enable=**1**	4 pipe dual coil floating cooling sync enable
Cfg_FanCoilOnOffClgVlvChar	Binary Value	459	0	NormallyClosed=**0**, NormallyOpen=**1**	4 pipe dual coil on/off cooling valve characteristic
Cfg_FanCoilonOffHtgVlvChar	Binary Value	458	0	NormallyClosed=**0**, NormallyOpen=**1**	4 pipe dual coil on/off heating valve characteristic, 4 pipe single coil/2 pipe single coil on/off valve characteristic
Cfg_Cool_valvefloatEnMinOut	Analog Value	2007	5%	0 to 100%	4 pipe dual coil floating Cooling valve minimum output when enabled
Cfg_Heat_valvefloatEnMinOut	Analog Value	2008	5%	0 to 100%	4 pipe dual coil floating heating valve minimum output when enabled, 4 pipe single coil/2 pipe single coil floating valve minimum output when enabled
Cfg_ChangeOverValveType	Binary Value	2036	0	EnergizeOnHeat=**0**, EnergizeOnCool=**1**	4 pipe single coil changeover valve type
Cfg_SixwayValveOutput	Binary Value	2037	1	0-10V=**0,** 2-10V=**1**	6-way valve type
Cfg_SixwayValveDriveType	Binary Value	2038	0	Direct=**0**, Reverse=**1**	Six way valve direct/reverse enable flag
Cfg_SixwayValveHeatingMinOutput	Analog Value	2066	2 V	0 to 10 V	6-way valve heat min output

Table 21 Equipment (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_SixwayValveHeatingMaxOutput	Analog Value	2067	5.7 V	0 to 10 V	6-way valve heat max output
Cfg_SixwayValveCoolingMinOutput	Analog Value	2068	6.3 V	0 to 10 V	6-way valve cool min output
Cfg_SixwayValveCoolingMaxOutput	Analog Value	2069	10 V	0 to 10 V	6-way valve cool max output

General

Table 22 General

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Thermostat_TstUnitSel	Binary Value	136	0	Fahrenheit=**0**, Celsius=1	Thermostat unit definition (Imperial/ Metric)
Cfg_BrandType	Multistat e Value	505	1	enum{Honeywell=**1** Alerton=**2**, None=**3**}	Vendor ID and Vendor name will be changed when modify brand type.

Home

Table 23 Home

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_StdbyConfig	Binary Value	2034	0	StandbyAsUnoccupied =**0**, StandbyAsOccupied=**1**	Standby action
Cfg_Thermostat_ClAdjStPt	Analog Value	256		-45 to 45 °F	Temporary cool setpoint adjustment from User or from the supervisor.
Cfg_Thermostat_HtAdjStPt	Analog Value	257		-45 to 45 °F	Temporary heat setpoint adjustment from user or from the supervisor.

Indoor temperature limits

Table 24 Indoor temp limits

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_SpcAlarm_TempHighLim	Analog Value	254	90 °F	90 to 150 °F	Space temperature alarm high limit
Cfg_SpcAlarm_TempLowLim	Analog Value	255	45 °F	0 to 60 °F	Space temperature alarm low limit
Cfg_DaTAlarm_TempHighLim	Analog Value	332	140 °F	70 to 180 °F	Discharge air temperature alarm high limit
Cfg_DATAlarmTempLowLim	Analog Value	333	45 °F	35 to 65 °F	Discharge air temperature alarm low limit
Cfg_PipeTempHeatThreshold	Analog Value	2070	80 °F	70 to 90 °F	Pipe sensor threshold for heating

Table 24 Indoor temp limits

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_PipeTempCoolThreshold	Analog Value	2071	60 °F	45 to 65 °F	Pipe sensor threshold for cooling
Cfg_PipeTempHighLimit	Analog Value	2072	180 °F	70 to 220 °F	Pipe temperature alarm high limit
Cfg_PipeTempLowLimit	Analog Value	2073	40 °F	30 to 60 °F	Pipe temperature alarm low limit
Cfg_PipeSpaceHeatTempOffset	Analog Value	2074	5 °F	5 to 10 °F	2 pipe single coil hybrid control space temperature offset for heating
Cfg_PipeSpaceCoolTempOffset	Analog Value	2075	-5 °F	-10 to -5 °F	2 pipe single coil hybrid control space temperature offset for cooling

Multi sensor

Table 25 Multi sensor

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_ZoneMultiSens_Control	Multistate Value	130	1	enum{ Average=**1** Min=**2**, Max=**3**, Smart=**4**}	Main control sensor configuration
Cfg_ZoneMultiSens_Sens1_Wt	Analog Value	33	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 1 is the local onboard temperature sensor.
Cfg_ZoneMultiSens_Sens2_Wt	Analog Value	34	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 2 is the remote TR40 Sylk temperature sensor with Addr 2.
Cfg_ZoneMultiSens_Sens3_Wt	Analog Value	35	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 3 is the remote TR40 Sylk temperature sensor with Addr 3.
Cfg_ZoneMultiSens_Sens4_Wt	Analog Value	36	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 4 is the remote TR40 Sylk temperature sensor with Addr 4.
Cfg_ZoneMultiSens_Sens5_Wt	Analog Value	37	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 5 is the remote TR40 Sylk temperature sensor with Addr 5.

Table 25 Multi sensor (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_ZoneMultiHumSens_Control	Multistate Value	77	1	enum{ Average=**1** Min=**2**, Max=**3**, Smart=**4**}	Humidity sensor configuration
Cfg_ZoneMultiSens_HumSens1_Wt	Analog Value	181	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 1 is the local onboard Humidity sensor
Cfg_ZoneMultiSens_HumSens2_Wt	Analog Value	180	10	0 to 10	A weighted average allows individual sensors to have more influence on the average calculation. Sensor 2 is the remote TR40 Sylk humidity sensor with Addr 2.

Occupancy setpoints

Table 26 Occupancy setpoints

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Setpoints_OccHeatSp	Analog Value	7	68 °F	40 to 99 °F	Occupied heating setpoint
Cfg_Setpoints_OccCoolSp	Analog Value	4	76 °F	40 to 99 °F	Occupied cooling setpoint
Cfg_Setpoints_StbyHeatSp	Analog Value	8	65 °F	40 to 99 °F	Standby heating setpoint
Cfg_Setpoints_StbyCoolSp	Analog Value	5	80 °F	40 to 99 °F	Standby cooling setpoint
Cfg_Setpoints_UnOccHeatSp	Analog Value	9	55 °F	40 to 99 °F	Unoccupied heating setpoint
Cfg_Setpoints_UnOccCoolSp	Analog Value	6	85 °F	40 to 99 °F	Unoccupied cooling setpoint

Purge

Table 27 Purge

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_PipePurgeTime	Analog Value	2025	5 minutes	0 to 5 minutes	Pipe purge duration
Cfg_PipePurgeInterval	Analog Value	2079	0.5 hours	0.5 to 2 hours	Pipe purge interval
Cfg_ValveCycle	Multistate Value	2025	1	enum{ 1min/24hours=**1**, 2min/24hours=**2**, Disable=**3**}	Valve cycle type
Cfg_TimeOut	Analog Value	2080	4 hours	1 to 4 hours	When heating keeps working for timeout time check whether pipe temperature meet pipe sensor threshold.
Cfg_HybridControlEnableHeat	Binary Value	2053	1	Off=**0**, On=**1**	2 pipe single coil heat hybrid control enable flag
Cfg_HybridControLEnableCool	Binary Value	2054	1	Off=**0**, On=**1**	2 pipe single coil cool hybrid control enable flag

Table 27 Purge (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_CoolTimeOut	Analog Value	2101	4 hours	1 to 4 hours	When heating/cooling keep working for timeout time check whether pipe temperature meet pipe sensor threshold.

Recovery setpoint configuration

Table 28 Recovery setpoint configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Recovery_MaxCoolRampRate	Analog Value	18	6 °F/hr	0 to 20 °F/hr	Maximum cooling setpoint ramp
Cfg_Recovery_MaxHeatRampRate	Analog Value	22	8 °F/hr	0 to 36 °F/hr	Maximum cooling setpoint ramp

Discharge air control

Table 29 Discharge air control

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_FanCoilSupTempHtgSp	Analog Value	1723	85 °F	75 to 180 °F	Discharge air control maximum heating setpoint.
Cfg_FanCoilSupTempClgSp	Analog Value	1724	55 °F	40 to 80 °F	Discharge air control minimum cooling setpoint.
Cfg_FanCoilDATSpEnSwitch	Binary Value	454	0	Off=0, On=1	Discharge air control enable flag
Cfg_FanCoilDATHeatOffset	Analog Value	2009	0 **Δ°F**	0 to 90 **Δ°F**	Discharge air control heating initial offset
Cfg_FanCoilDATCoolOffset	Analog Value	2010	0 **Δ°F**	0 to 40 **Δ°F**	Discharge air control cooling initial offset
Cfg_DaT_Ctrl_Cool_Tr	Analog Value	2011	6 **Δ°F**	0 to 30 **Δ°F**	Discharge air control cooling throttling range
Cfg_DaT_Ctrl_Cool_It	Analog Value	2012	300 seconds	0 to 5000 seconds	Discharge air control cooling integral time
Cfg_DaT_Ctrl_Heat_Tr	Analog Value	2014	6 **Δ°F**	0 to 30 **Δ°F**	Discharge air control heating throttling range
Cfg_DaT_Ctrl_Heat_It	Analog Value	2015	300 seconds	0 to 5000 seconds	Discharge air control heating integral time

Sylk calibration offsets

Table 30 Sylk calibration offsets

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_LocalSensCalOffset_Temp	Analog Value	23	0 °F	-10 to 10 °F	Local onboard temperature sensor calibration offset
Cfg_LocalSensCalOffset_Hum	Analog Value	103	0%RH	-10 to 10%RH	Local onboard humidity sensor calibration offset
Cfg_SylkCalOffset_SylkBus2Temp	Analog Value	24	0 °F	-10 to 10 °F	TR40_2/ TR-21 temperature calibration offset
Cfg_SylkCalOffset_SylkBus2RH	Analog Value	25	0%RH	-10 to 10%RH	TR40_2 humidity calibration offset
Cfg_SylkCalOffset_SylkBus2CO2	Analog Value	100	0 °F	-100 to 100 ppm	TR40_2 CO2 calibration offset
Cfg_SylkCalOffset_SylkBus3Temp	Analog Value	26	0 °F	-10 to 10 °F	TR40_3 temperature calibration offset
Cfg_SylkCalOffset_SylkBus4Temp	Analog Value	27	0 °F	-10 to 10 °F	TR40_4 temperature calibration offset

Table 30 Sylk calibration offsets (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_SylkCalOffset_SylkBus5Temp	Analog Value	28	0 °F	-10 to 10 °F	TR40_5 Temperature calibration offset
Cfg_SylkCalOffset_SylkBus10Temp	Analog Value	31	0 °F	-10 to 10 °F	C7400S Discharge Air Temperature calibration offset
Cfg_SylkCalOffset_SylkBus10RH	Analog Value	32	0 %RH	-10 to 10%RH	C7400S Discharge Air Humidity calibration offset

Sylk sensor configuration

Table 31 Sylk sensor configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Sylk_SylkBus2Type	Multistate Value	2032	1	enum{ TR40=**1**, TR50=**2**}	Sylk bus addr-2 device type
Cfg_Sylk_SylkBus2En	Multistate Value	85	1	enum{ NotConfigured=**1**, TempOnly=**2**, TempHum=**3**, TempHumCO2=**4**, TempCO2=**5**}	Sylk bus addr-2 device enable/ disable
Cfg_Sylk_SylkBus3En	Binary Value	147	0	Disable=**0**, Enable=**1**	Sylk bus addr-3 device enable/ disable
Cfg_Sylk_SylkBus4En	Binary Value	148	0	Disable=**0**, Enable=**1**	Sylk bus addr-4 device enable/ disable
Cfg_Sylk_SylkBus5En	Binary Value	149	0	Disable=**0**, Enable=**1**	Sylk bus addr-5 device enable/ disable
Cfg_Sylk_SylkBus10En	Binary Value	153	0	Disable=**0**, Enable=**1**	Sylk bus addr-10 device enable/ disable

Wall module configuration

Table 32 Wall module configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_Thermostat_SysSwitch	Multistate Value	8	1	enum{Auto=**1**,Cool=**2**, Heat=**3**, Ventilation=**4**, Off=**5**}	The system switch may be used by the contractor or occupant to change the operation of the unit.
Cfg_Thermostat_BypOverrideTime	Analog Value	10	180 minutes	0 to 1080 minutes	Unoccupied override time
Cfg_Thermostat_TempOffSpLimit	Analog Value	102	30 °F	0 to 45 °F	This point is used to limit the range of user adjustable setpoint.
Cfg_Thermostat_MinCoolSp	Analog Value	12	50 °F	50 to 99 °F	Minimum cool setpoint of thermostat
Cfg_Thermostat_MaxHeatSp	Analog Value	13	90 °F	40 to 90 °F	Maximum heat setpoint of thermostat
Cfg_Thermostat_SystemConfig	Analog Value	2023	15	{**BIT0**=Auto, **BIT1**=Heat&Cool **BIT2**=Ventilation **BIT3**=Off}	To limit available user configurable options. BIT 3 Off must be set as 1.
Cfg_Thermostat_Override	Binary Value	135	0	OverrideOff=**0**,OverrideOn=**1**	Thermostat bypass override
Cfg_TstatOverrideType	Multistate Value	2035	2	enum{ Permanent=**1**,Temporary=**2**}	Thermostat override type

Network

Table 33 Network

Name	BACnet Object Type	BACnet Object Instance	Range	Description
no_mstpHeaderCrcError	Analog Value	2005		The number of header CRC errors in received frames
no_mstpDataCrcErr	Analog Value	2006		The number of data CRC errors in received frames
ni_mstpClearErr	Binary Value	174	Unclear=**0**, Clear=**1**	Write to 1 and then 0 will clear header CRC and data CRC count.

CHAPTER

8 NETWORK INPUTS

Topics covered

Fail detect

Network fail detect is used to detect when a network input has not been updated from the network for a period. When the network input has not been updated after about 5 minutes, the network input will return to a default value, typically 'Invalid'. The Fail detect is enabled when configured for the network variable and the network input is bound using a network tool. For the Global thermostat controller, the Fail detect for each network input is enabled based on the information given in this chapter.

Some network inputs are desired to have the Fail detect enabled when they are not bound using a network tool. This is useful for sharing sensor data across multiple controllers using the Global thermostat gateway which allows the control to fall back to a predetermined action when the network input has not been updated after a period (e.g., communication is lost). A configuration flag called FDWhenNotBound allows the network input to provide fail detection when it is not bound. For the Global thermostat controller, FDWhenNotBound for each network input is enabled based on the table below.

Fail Detect Enable: This is the time until the IRM controller is notified of a failure on this point.

True: If the parameter has not received an update from the IRM network source in the Fail detect time, then an alarm is generated, and the Present Value is set to Invalid.

Fail Detect Fallback Value Select: The value that should be set to 'Out' (when failure is detected), if the Fail Detect 'Enable' is True and the Fail Detect 'Fallback Value' is set to "Fixed Value". The Fail Detect only works if "In" is NULL and Fail. Detect 'Enable' is set to true.

'Update Rate' - Update interval in seconds within which 'Present Value' should get written over BACnet periodically. 'Present Value' not written within this interval will result in failure and 'Out' will be set with the value as configured in 'Fallback Value'.

Fallback Value:

- "InvalidValue" - 'Out' is set as NULL,
- "LastknownGoodValue" - If the last 'Out' value was not NULL then 'Out' is retained as it is, otherwise, the value from the 'Default Value' parameter goes to Out.
- "FixedValue" - "Fail Detect Fixed Value" value goes to 'Out'. 'Enable' - Set it to true to enable the Fail detection feature.
- Note - This feature enables monitoring of periodic updates of a function block over the network.

Fail Detect Delay: Fail detect time depends on the update rate configured.

False: False means the object retains the last value that was written to it until an IRM network source changes it or the IRM controller has a power outage or reset

Tuning Policy

It defines the rules for evaluating both write requests, which is to writable proxy points, as well as the acceptable “freshness” of read requests that result from polling. It includes standard tuning policy properties and additional properties related to client-side usage of the BACnet Subscribe COV service.

Note: If the controller supports COV, it is recommended to use this feature, it will optimize the bandwidth of the controller. IRM NX controller supports up to 20 points for COV. Since there a is a limitation in the Niagara framework on the COV feature, it is recommended to configure only up to 20 points and the rest of the points for polling. IRM Bacnet Device comes with default IRM Tuning policy which enables COV feature. Whenever you perform BACnet Network discover for IRM BACnet device tool automatically create IRM Tuning Policy.

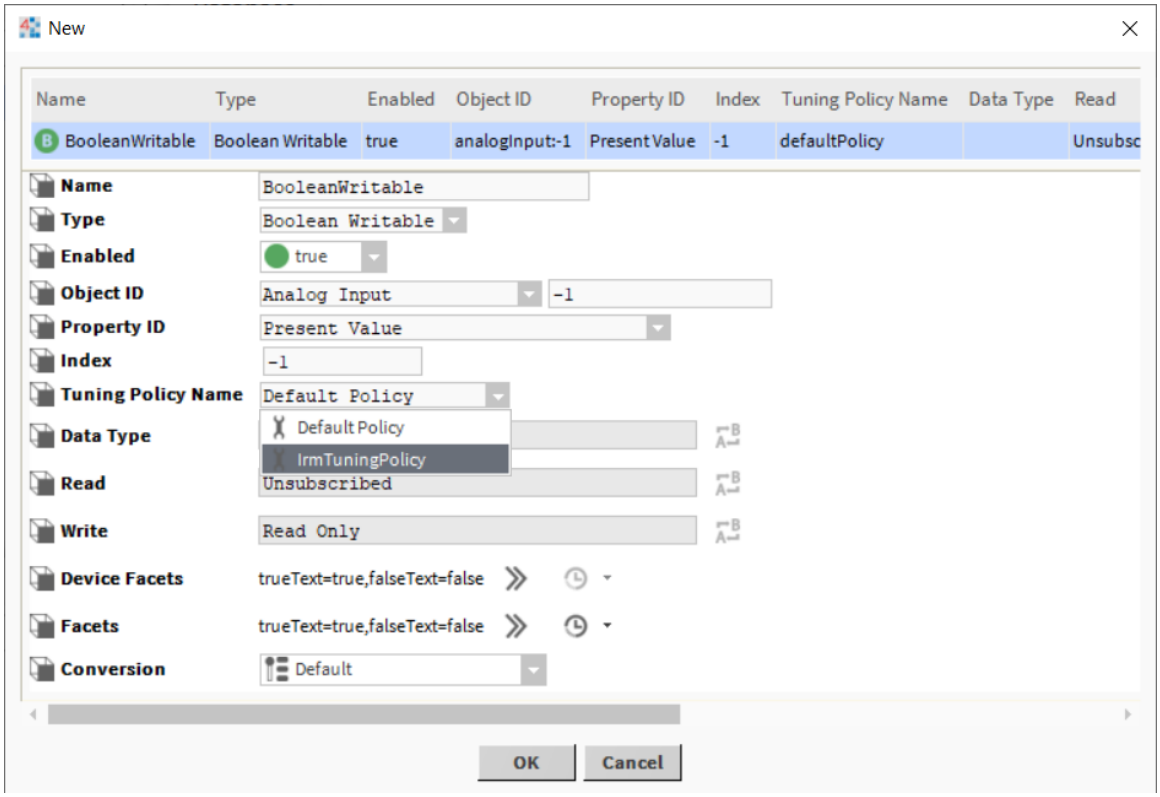
It is recommended to categories critical and less critical points, based on that you can assign the policy to all the different points. So that the critical points can be polled more frequently, and less critical points can be polled less frequently, this configuration helps to optimize the bandwidth.

To assign a policy

Step 1. Add points from the IRM point discovery manager.

Step 2. While configuring the point, assign the tuning policy from the drop-down list.

Fig 15. Adding IRM Tuning Policy



Another way to access these properties is by expanding **BacnetNetwork** > **Tuning Policies** or double-clicking **Default Policy**.

Fig 16. Tuning Policy - Default Policy

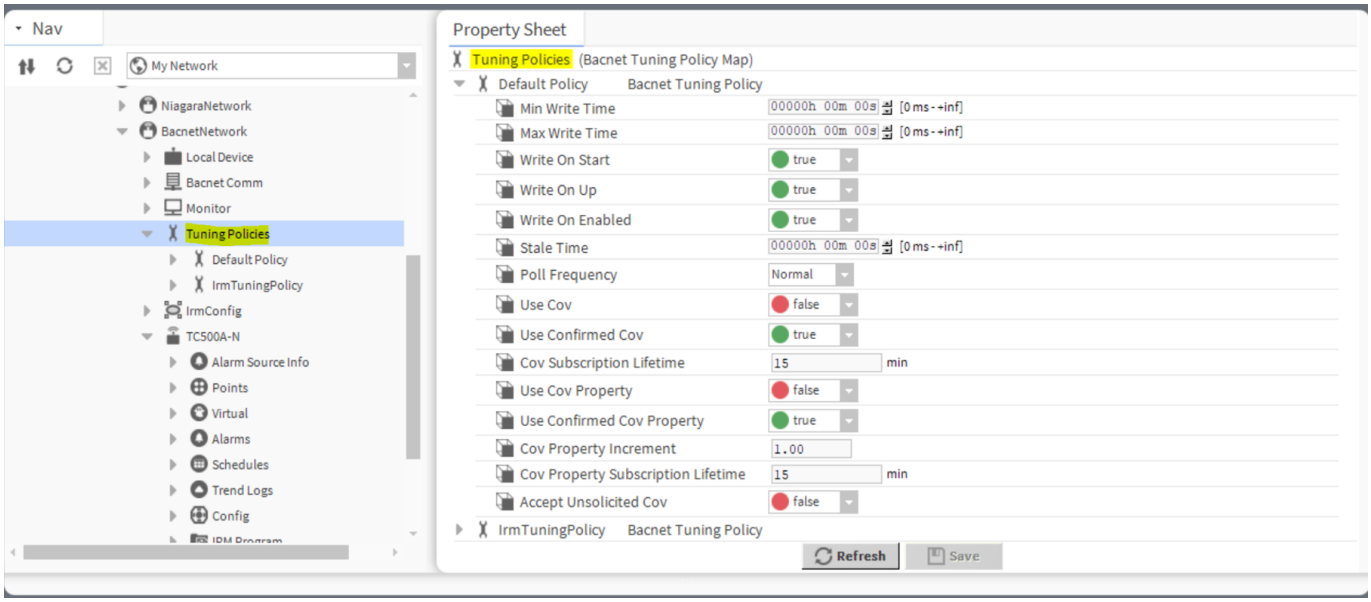
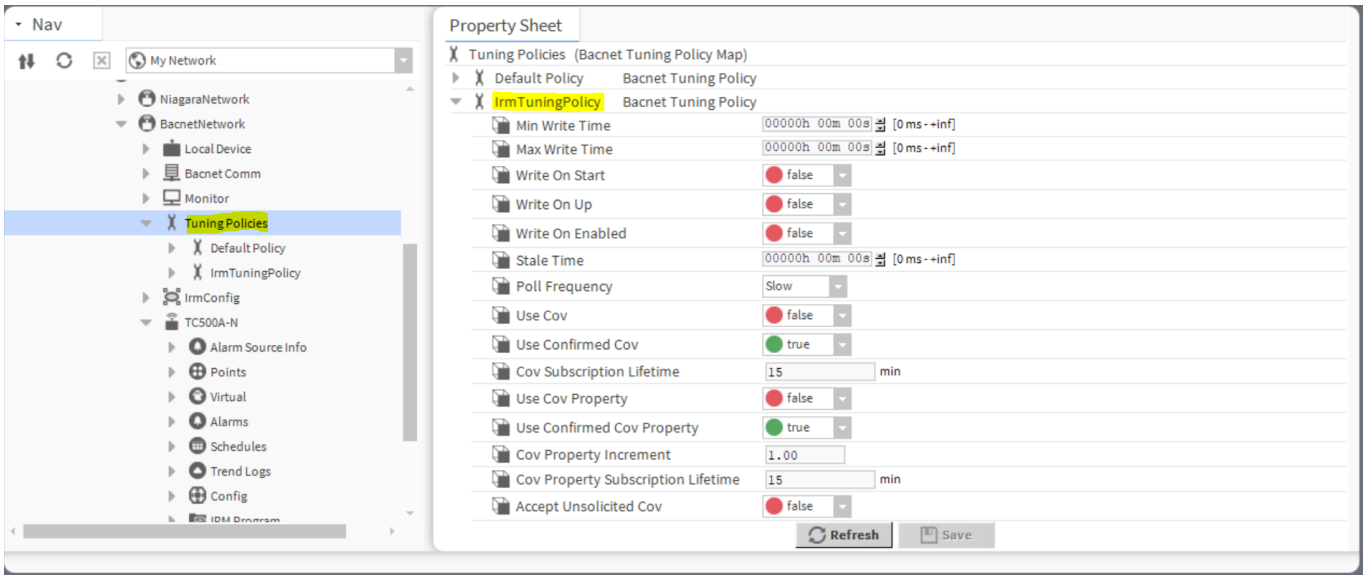


Fig 17. Tuning Policy Property Sheet



Network inputs

Table 34 Network inputs

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
ni_NetSchCurrentState	Multistate Value	1	5	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Current schedule state from network.
ni_NetSchNextState	Multistate Value	2	5	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Next schedule state from network.
ni_NetTUNCOS	Analog Value	1		0 to 11520 minutes	TUNCOS is the difference between the future change in event & current event in minutes.
ni_ApplicationMode	Multistate Value	3	1	enum{Auto=**1**, Cool=**2**, Heat=**3**, FanOnly=**4**, Off=**5**}	Effective application mode from network. This value will not be persisted over a power cycle.
ni_BypassState	Binary Value	1	0	Disable=**0**, Enable=**1**	Net bypass input to enable bypass timer
ni_OccupancySensorState	Multistate Value	6	5	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Network occupancy sensor state
ni_ShutdownState	Binary Value	4	0	Normal=**0**, Shutdown=**1**	System shutdown input from network.
ni_SpaceRH	Analog Value	80		0 to 100% RH	Space humidity network input
ni_SpaceTemp	Analog Value	104		-40 to 150 °F	Space temperature network input
ni_RunTimeReset	Multistate Value	38	1	enum{ Normal=**1**, FanReset=**2**, CoolReset=**3**, HeatingReset=**4**}	Runtime accumulate reset network input.
ni_DATemp	Analog Value	2024		-40 to 200 °F	Discharge air temperature network input
ni_PipeTempMode	Multistate Value	2012	1	enum{ NoUse=**1**, Cool=**2**, Heat=**3**}	Pipe temperature mode network input

Network sensor configuration

Table 35 Network sensor configuration

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
Cfg_NetOccSenFailDetEn	Binary Value	159	1	Disable=**0**, Enable=**1**	Occupancy sensor fail detect enable
Cfg_NetOccSenFailFalbck	Analog Value	262	2	InvalidValue(Null)=**0**, LastKnownGoodValue=**1**, FixedValue=**2**	Occupancy sensor fail detect fallback
Cfg_NetOccSenFailFxdVal	Multistate Value	2021	5	enum{Occupied=**1**, Unoccupied=**2**, Bypass=**3**, Standby=**4**, NoOverride=**5**}	Occupancy sensor fail detect fallback value
Cfg_NetOccSenFailDetDly	Analog Value	263	300 seconds	0 to 3600 seconds	Occupancy sensor fail detect delay
Cfg_NetShtdwnFailDetEn	Binary Value	164	1	Disable=**0**, Enable=**1**	Shut down fail detect enable
Cfg_NetShtdwnFailFalbck	Analog Value	273	2	InvalidValue(Null)=**0**, LastKnownGoodValue=**1**, FixedValue=**2**	Shut down fail detect fallback
Cfg_NetShtdwnFailFxdVal	Binary Value	165	0	Normal=**0**, Shutdown=**1**	Shut down fail detect fallback value
Cfg_NetShtdwnFailDetDly	Analog Value	274	300 seconds	0 to 3600 seconds	Shut down fail detect delay

Service mode

Table 36 Service mode

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
ni_ServiceModeEn	Binary Value	6	0	NoOverride=**0**, Service=**1**	Service mode network input to felicitate installer during commissioning/ maintenance to shut down all equipment.
ni_ServiceFan	Multistate Value	2026	1	enum{ Off=**1**, On=**2**, Low=**3**, Medium=**4**, High=**5**}	Fan speed configuration network input for single/ two/three speed fan when service mode is enabled.

Table 36 Service mode (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
ni_ServiceFanSpeed	Analog Value	85	0 %	0 to 100%	Fan speed configuration network input for variable speed fan when service mode is enabled.
ni_ServiceHeatOnOff	Binary Value	2042	0	Off=**0,** On=**1**	On/Off heat valve status network input when service mode is enabled.
ni_ServiceCoolOnOff	Binary Value	2043	0	Off=**0,** On=**1**	On/Off cool valve status network input when service mode is enabled.
ni_ServiceHeatFloating	Multistate Value	2022	1	enum{ Off=**1**, Open=**2**, Close=**3**}	Floating heat valve status network input when service mode is enabled.
ni_ServiceCoolFloating	Multistate Value	2023	1	enum{ Off=**1**, Open=**2**, Close=**3**}	Floating cool valve status network input when service mode is enabled.
ni_ServiceModulatingHeat	Analog Value	2076	0%	0 to 100%	Modulating heat valve status network input when service mode is enabled.
ni_ServiceModulatingCool	Analog Value	2077	0%	0 to 100%	Modulating cool valve status network input when service mode is enabled.
ni_ServiceSixWayValve	Analog Value	2078	0 V	0 to 10 V	Six way valve status network input when service mode is enabled.
ni_ServiceAuxHeat	Binary Value	2044	0	Off=**0,** On=**1**	Auxiliary heat status network input when service mode is enabled.
ni_ServiceChangeOver	Binary Value	2045	0	Off=**0,** On=**1**	Changeover valve status when service mode is enabled
ni_ServiceHeatStage1	Binary Value	19	0	Off=**0,** On=**1**	Heat stage 1 configuration network input when service mode is enabled.
ni_ServiceCoolStage1	Binary Value	2046	0	Off=**0,** On=**1**	Cool stage 1 configuration network input when service mode is enabled.
ni_ServiceValveStage1	Binary Value	2047	0	Off=**0,** On=**1**	Modulating valve stage 1 configuration network input when service mode is enabled.

Table 36 Service mode (Continued)

Name	BACnet Object Type	BACnet Object Instance	Default Value	Range	Description
ni_ServiceValveOnOff	Binary Value	2048	0	Off=**0,** On=**1**	Modulating valve configuration network input when service mode is enabled.
ni_ServiceValveFloating	Multistate Value	2024	1	enum{ Off=**1**, Open=**2**, Close=**3**}	Floating valve configuration network input when service mode is enabled.
ni_ServiceValveModulating	Analog Value	2086	0	0 to 100	Modulating valve configuration network input when service mode is enabled.

CHAPTER

9 CALENDAR & SCHEDULE

Topics covered

Calendar

Schedule

Calendar

Table 37 Calendar

Name	BACnet Object Type	BACnet Object Instance	Description
Calendar	Calendar	1	

Schedule

Table 38 Schedule

Name	BACnet Object Type	BACnet Object Instance	Description
OccSchedule	Schedule	2	1:Occupied, 2:UnOccupied, 4:StandBy

CHAPTER

10 BACNET GUIDELINES FOR TC300

Topics covered

Situational BACnet guidelines for TC300

TC300 proprietary properties list

List of all BACnet objects

Situational BACnet guidelines for TC300

Table 39: BACnet guidelines for TC300

Feature	Limitation / Behavior	Description	Workaround
Schedule / Holiday	Calendar object is not supported	Calendar object is not supported and calendor reference is not supported by schedule object in TC300.	NA
Schedule	Schedule does not work properly if effective period and default output is written from Niagara	The schedule default output is set to Unoccupied mode. User should not change this property over BACnet. The schedule effective period is enabled always. User should not change this property over BACnet.	Makes sure default output and effective period set as true in Skip writes facets
Schedule	Modes supported by TC300 are 1, 2 and 4	Modes and corresponding Enum values are 1:Occupied; 2-Unouucpied; 4- Standby.	NA
Schedule	Special / Holiday events are supported for the 3 years duration.	Special / Holiday can create more than 3 years in Niagara, but TC300 supports only for 3-year duration	NA
Schedule	Users must write special events in order when using Niagara	When users writing special event/ holiday by Niagara, they must sequentially issue it in the order of 1, 2, 3...	NA
Device Object	Unsupported object and service is claimed in the device object capabilities	NA	NA
Alarm	Unsupported Intrinsic Alarm Property is being exposed in the objects	Intrinsic alarms are not supported by TC300.	NA
COV	COV not supported	TC300 does not support COV way of notifying values to the supervisor.	NA
NUMBER OF APDU RETRIES	NumberOfApduRetries is not writable.	NA	
DAY LIGHT SAVING	Unable to write Daylight savings from Niagara to TC300	Unable to write Daylight savings from Niagara to TC300	Set the daylight saving from TC300 HMI
Output Object Read / Write	Set operation on AO, BO & MSO is writing values to the priority-16 instead of relinquish default	NA	NA

TC300 proprietary properties list

Table 40 Device

Note: BACnet object type for object is Device.					
Name	**Data Type**	**Property Identifier**	**Default Value**	**Range**	**Description**
Bootloader version	String	1026			Bootloader version

Table 40 Device (Continued)

Note: BACnet object type for object is Device.					
Name	**Data Type**	**Property Identifier**	**Default Value**	**Range**	**Description**
MSTP min auto mac	Unsigned	1028	1	1 to 127	MSTP auto mac address minimal value
MSTP max auto mac	Unsigned	1029	127	1 to 127	MSTP auto mac address maximum value
MSTP disable auto mac	Boolean	1030	0	Enable=**0**, Disable=**1**	MSTP auto mac disable
MSTP baud rate	Unsigned	1226		enum{B2BR_9600 = **1**, B2BR_19200 = **2**, B2BR_38400 = **3**, B2BR_57600 = **4**, B2BR_76800 = **5**, B2BR_115200 = **6**}	MSTP baud rate
Temp units	Enumerated	1237	0	Fahrenheit=**0**, Celsius=**1**	Thermostat unit definition (Imperial/ Metric)
GUI brightness	Unsigned	1240	80%	20 to 100%	GUI brightness
Contractor name	String	1246			Contractor name
Contractor telephone number	String	1247			Contractor telephone number
Device Configured	Boolean	1249	0	Not Configured=**0**, Configured=**1**	Device is configured or not
Display Options	Unsigned	1250	0x67	{**BIT1**=Time, **BIT2**=Schedule Status, **BIT5**=Indoor CO2, **BIT6**=IndoorHumidity}	Display options
Time Format	Enumerated	1252	0	12 hour=**0**, 24 hour=**1**	Time format
Basic User Permission	Unsigned	1253	0xFFFF	{**BIT1**=System Mode, **BIT2**=Override, **BIT3**=Alert View, **BIT5**=Temp. Unit, **BIT12**=Brightness, **BIT15**=FanSpeedConfig}	Basic user permission
Advanced User Permission	Unsigned	1254	0xFFFF	{**BIT0**=Setpoint, **BIT6**=Schedule}	Advanced user permission
Visitor Permission	Unsigned	1257	0xFFFF	None	Visitor permission
Brand Type	Unsigned	1280	1	enum{Honeywell=**1**, Alerton=**2**, None=**3**}	Brand type configuration

List of all BACnet objects

phy_SpaceTempSensor
phy_PipeSensor
phy_DatSensor
no_UIO3
no_VariableFan
no_Modulating_Heat
no_Modulating_Cool
no_SixWay_Valve_Heating
no_SixWay_Valve_Cooling
no_UIO1
no_UIO2
Cfg_CoolTimeOut
Cfg_DrainPanSensorAlarm
Cfg_RoomTempTrendFailure
Cfg_ProofofAirFlowAlarm
Cfg_FanConfig
ni_ServiceValveModulating
Alarm_PipeSensorTempHeatOrCoolThreshold
AlarmPriority_SpcTempHI_Lolimit
AlarmPriority_HumSens
AlarmPriority_TempSens
Cfg_TimeOut
Cfg_PipePurgeInterval
ni_ServiceSixWayValve
ni_ServiceModulatingCool
ni_ServiceModulatingHeat
Cfg_PipeSpaceCoolTempOffset
Cfg_PipeSpaceHeatTempOffset
Cfg_PipeTempLowLimit
Cfg_PipeTempHighLimit
Cfg_PipeTempCoolThreshold
Cfg_PipeTempHeatThreshold
Cfg_SixwayValveCoolingMaxOutput
Cfg_SixwayValveCoolingMinOutput
Cfg_SixwayValveHeatingMaxOutput
Cfg_SixwayValveHeatingMinOutput
no_EffDATSp
no_TermLdOut

no_CtrlSpaceTemp
no_OverrideRemTime
no_EffTUNCOS
no_PipeTemp
no_DaTemp
no_HeatTermLdOut
no_CoolTermLdOut
no_EffSp
no_Fan_RunTimeAccumulate
no_HeatStg1_RunTimeAccumulate
no_HeatCtrl_RunTimeAccumulate
no_CoolStg1_RunTimeAccumulate
no_AuxHeatTermLdOut
no_CoolCtrl_RunTimeAccumulate
Cfg_PipePurgeTime
ni_DATemp
Cfg_Thermostat_SystemConfig
Cfg_Dehum_OverCool_Offset
no_ScheduleTimeToNext
Cfg_AuxiliaryHeatSupplementalDroop
Cfg_AuxiliaryHeatPeriperalDroop
Cfg_FanRunOffDelayHeat
Cfg_DaT_Ctrl_Heat_It
Cfg_DaT_Ctrl_Heat_Tr
Cfg_DaT_Ctrl_Cool_It
Cfg_DaT_Ctrl_Cool_Tr
Cfg_FanCoilDATCoolOffset
Cfg_FanCoilDATHeatOffset
Cfg_Heat_valvefloatEnMinOut
Cfg_Cool_valvefloatEnMinOut
no_mstpDataCrcErr
no_mstpHeaderCrcError
no_EffCoolSp
no_EffHeatSp
no_SpaceHumidity
no_SpaceTemp
Cfg_FanCoilSupTempClgSp
Cfg_FanCoilSupTempHtgSp
Cfg_FanCoilClgDriveTime
Cfg_FanCoilHtgDriveTime

Cfg_ModCoolMax_Output
Cfg_ModHeatMax_Output
Cfg_ModCoolMin_Output
Cfg_ModHeatMin_Output
Cfg_VarSpeedFan_HeatMaxSpeed
Cfg_VarSpeedFan_HeatMinSpeed
Cfg_VarSpeedFan_VentSpeed
Cfg_VarSpeedFan_CoolMaxSpeed
Cfg_VarSpeedFan_CoolMinSpeed
Cfg_UISensCalOffset_SpcTemp
Cfg_Cool_ModClEnMinOut
Cfg_DATAlarmTempLowLim
Cfg_DaTAlarm_TempHighLim
Cfg_NetShtdwnFailDetDly
Cfg_NetShtdwnFailFalbck
Cfg_NetOccSenFailDetDly
Cfg_NetOccSenFailFalbck
Cfg_Thermostat_HtAdjStPt
Cfg_Thermostat_ClAdjStPt
Cfg_SpcAlarm_TempLowLim
Cfg_SpcAlarm_TempHighLim
no_SylkAddr10Hum
no_SylkAddr10Temp
no_SylkAddr5Temp
no_SylkAddr4Temp
no_SylkAddr3Temp
no_SylkAddr2CO2
no_SylkAddr2Hum
no_SylkAddr2Temp
Cfg_UISensCalOffset_DATemp
Cfg_ZoneMultiSens_HumSens1_Wt
Cfg_ZoneMultiSens_HumSens2_Wt
ni_SpaceTemp
Cfg_LocalSensCalOffset_Hum
Cfg_Thermostat_TempOffSpLimit
Cfg_Thermostat_Deadband
Cfg_SylkCalOffset_SylkBus2CO2
Cfg_Heat_ModHtEnMinOut
ni_ServiceFanSpeed
ni_SpaceRH

Cfg_Heat_DischHiLimSp
Cfg_Heat_It
Cfg_Heat_Tr
Cfg_Dehum_SpaceRHHighLimit
Cfg_Cool_DischLoLimSp
Cfg_Cool_It
Cfg_Cool_Tr
Cfg_FanRunOnDelayHeat
Cfg_FanRunOffDelayCool
Cfg_ZoneMultiSens_Sens5_Wt
Cfg_ZoneMultiSens_Sens4_Wt
Cfg_ZoneMultiSens_Sens3_Wt
Cfg_ZoneMultiSens_Sens2_Wt
Cfg_ZoneMultiSens_Sens1_Wt
Cfg_SylkCalOffset_SylkBus10RH
Cfg_SylkCalOffset_SylkBus10Temp
Cfg_SylkCalOffset_SylkBus5Temp
Cfg_SylkCalOffset_SylkBus4Temp
Cfg_SylkCalOffset_SylkBus3Temp
Cfg_SylkCalOffset_SylkBus2RH
Cfg_SylkCalOffset_SylkBus2Temp
Cfg_LocalSensCalOffset_Temp
Cfg_Recovery_MaxHeatRampRate
Cfg_Recovery_MaxCoolRampRate
Cfg_Control_PowerupDelay
Cfg_Thermostat_MaxHeatSp
Cfg_Thermostat_MinCoolSp
Cfg_Thermostat_BypOverrideTime
Cfg_Setpoints_UnOccHeatSp
Cfg_Setpoints_StbyHeatSp
Cfg_Setpoints_OccHeatSp
Cfg_Setpoints_UnOccCoolSp
Cfg_Setpoints_StbyCoolSp
Cfg_Setpoints_OccCoolSp
ni_NetTUNCOS
phy_ProofOfAirFlowSensor
phy_OccupancySensor
phy_DrainpanSensor
phy_ChangeOverSwitch
no_Modulating_Heating_stage_1

no_Modulating_Cooling_stage_1
no_Medium_Speed_Fan
no_Low_Speed_Fan
no_High_Single_Speed_Fan
no_Heating_Floating_Close
no_Heating_Floating_Open
no_Cooling_Floating_Close
no_Cooling_Floating_Open
no_Heating_Valve(On/Off)
no_Cooling_Valve(On/Off)
no_ChangeOverValve
no_Auxiliary_Heat
no_DIO2
no_DIO1
no_DO3
no_DO2
no_DO1
Cfg_HybridControL_EnableCool
Cfg_HybridControlEnableHeat
Alarm_CHWDrainPanSensor
Alarm_RoomTempTrendFailure
AlarmPriority_UnknownTime
AlarmPriority_SpaceFreezeProtect
ni_ServiceValveOnOff
ni_ServiceValveStage1
ni_ServiceCoolStage1
ni_ServiceChangeOver
ni_ServiceAuxHeat
ni_ServiceCoolOnOff
ni_ServiceHeatOnOff
Cfg_DehumAuxHeatForReheat
Cfg_DehumEnable
Cfg_AuxiliaryHeatEnable
Cfg_SixwayValveDriveType
Cfg_SixwayValveOutput
Cfg_ChangeOverValveType
no_GenericAlarm
Cfg_StdbyConfig
no_RecoveryStatus
no_FanStart

no_IsCoolDisable
no_CoolDaLolimit
no_BypassState
no_DehumActive
no_SystemDisable
no_IsFanOnly
no_IsHeatDisable
no_DaHilimit
no_OccupancyState
AlarmPriority_ProofofAirFlow
Cfg_AuxHeat_FanOnOff
Cfg_FanCoilClgFloatingSyncEn
Cfg_FanCoilOnOffClgVlvChar
Cfg_FanCoilonOffHtgVlvChar
Cfg_LeakDetectorSensorChar
Cfg_FanCoilDATSpEnSwitch
Cfg_FanCoilHtgFloatingSyncEn
Cfg_ModCoolAction
Cfg_ModHeatAction
Cfg_Mod_StgCl1En
ni_mstpClearErr
Cfg_NetShtdwnFailFxdVal
Cfg_NetShtdwnFailDetEn
Cfg_NetOccSenFailDetEn
Cfg_Sylk_SylkBus10En
Cfg_Sylk_SylkBus5En
Cfg_Sylk_SylkBus4En
Cfg_Sylk_SylkBus3En
Cfg_Thermostat_TstUnitSel
Cfg_Thermostat_Override
Cfg_Dehum_StageReHeatOpEn
Cfg_Mod_StgHt1En
Cfg_AirFlwStsChar
Cfg_OccSensChar
ni_ServiceHeatStage1
ni_ServiceModeEn
ni_ShutdownState
ni_BypassState
Alarm_SylkCommFailure
Cfg_TstatOverrideType

Cfg_2PipeSingleCoilHeat&CoolSysModChangeoverType
Cfg_ChangeoverSwitchPolarityType
Cfg_Sylk_SylkBus2Type
Alarm_PipeSensorOutofRange
Alarm_PipeSensorFailure
AlarmPriority_DATempAlarm_Fault
no_ScheduleNextState
no_ScheduleCurrentState
ni_ServiceFan
Cfg_ValveCycle
ni_ServiceValveFloating
ni_ServiceCoolFloating
ni_ServiceHeatFloating
Cfg_NetOccSenFailFxdVal
no_EffSchNextState
no_EffSchCurrentState
no_EffOccSensState
no_ManualOverride
no_EffTempMode
no_EffOccState
no_LocalOccSensState
ni_PipeTempMode
Cfg_PipeSensChar
Cfg_UIO3
Cfg_HeatPmp_AuxMode
no_SetpointSts
Cfg_FanCoilThreeSpeedVentMode
Cfg_FanCoilTwoSpeedVentMode
Cfg_FanCoilManualSpeedSel
Cfg_FanCoilThreeSpeedType
Cfg_FanCoilTwoSpeedType
Cfg_FanCoilTwoPipeSingleCoilType
Cfg_FanCoilClgDriveType
Cfg_FanCoilHtgDriveType
Cfg_FanCoilClgType
Cfg_FanCoilHtgType
Cfg_FanCoilType
Cfg_BrandType
Cfg_DASensChar1

Cfg_VarSpeedFanType
Cfg_SpcSensChar
Cfg_ZoneMultiSens_Control
Cfg_FanCoilFourPipeSingleCoilType
Cfg_Sylk_SylkBus2En
Cfg_ZoneMultiHumSens_Control
ni_RunTimeReset
Cfg_DIO2
Cfg_DIO1
Cfg_DO3
Cfg_DO2
Cfg_DO1
Cfg_UIO2
Cfg_UIO1
Cfg_FanType
Cfg_Control_MainSensor
Cfg_Thermostat_SysSwitch
ni_OccupancySensorState
ni_ApplicationMode
ni_NetSchNextState
ni_NetSchCurrentState
Application_Image
Firmware_Image
Calendar
OccSchedule
N_DdcCommand_2
N_DdcCommand_1
N_DdcCommand_0

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