

The Phoenix Controls Room Integrator is a flexible integration solution that seamlessly integrates critical airflow control devices to building automation networks.

- The Room Integrator's primary purpose is providing protocol translation and data integration between the company's environmental control systems to BACnet®-capable Building Automation Systems (BAS).
- The Room Integrator also performs bidirectional translation between room-level devices using the LonWorks® technology and the BAS utilizing either BACnet over IP or MS/TP to manage read requests and write commands.

The Room Integrator includes a web server and a number of features available through web pages for troubleshooting and commissioning devices in the space.

- Diagnostic displays are used by technicians to assess problems on the room devices, room network, or device itself. If remote access is provided, technicians can perform many troubleshooting tasks remotely - saving the time and expense of travel to fix a potentially minor issue.
- The Lab Verification feature is a set of web pages that field technicians use to perform field acceptance testing for one pressurization zone at a time. It forces the airflow to min and max settings as well as occupied/unoccupied set points, then captures the readings for reporting and archiving.
- The Test and Balance (TAB) feature is also a set of web pages that is used by third party verification experts to measure all airflows to ensure valves are flowing as intended. The TAB function can place several spaces in full heating or cooling so the balancer can check out the hot water and air handling systems. Balancers can enter the measured field data and save the data in a .csv format for use in their own reporting tool.



**RMI300 Room Integrator**

## FEATURES

- Embedded Power PC platform @ 400 MHz
- QNX Real-time Operating System
- Web User interface for device, network and platform diagnostics
- Up to 20 high-speed Celeris® devices or 20 low-speed LON devices per network channel; 2 LON network channels per Room Integrator
- Data Recovery Services prevents data loss during power interruptions
- 24 V power supply included
- Lab Verification function for field acceptance testing via password protected web pages
- Test and Balance function for third party balancers to verify valves work as intended via password protected web pages

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## SPECIFICATIONS

### Platform

- Power PC 405EX 400MHz processor
- 256 MB SDRAM & 128 MB Flash Memory
- Data Recovery Services with SRAM
- Real-time clock

### Operating System

- QNX RTOS
- Oracle Hotspot JAVA VM
- NiagaraAX 3.7.106 or later
- Niagara 4.0 Ready

### Communications

- 2 Ethernet Ports (RJ-45 Connectors) – 10/100 Mbps (LAN2 is disabled)
- 1 RS-232 Port (9 pin D-shell connector)
- 1 RS-485 non isolated port (3 Screw Connector on base board)
- 2 LON adapters 78 Kbps FTT 10 with LON driver installed
- BAS protocol: BACnet over Ethernet, or BACnet over IP, or BACnet over MS/TP
- BAS Implementation: Conformance Class 3 BIBBS-BBC (BACnet Building Controller)
- BAS data transfer rates (points per second): Read requests – 50 sustained, 100 peak; Write commands – 30 maximum
- Room network: ANSI 709.1 LonTalk protocol

### Integration Points

500 maximum

### Power Supply (DIN Rail Mounted)

- 24 VAC input (15 VA minimum)
- Dedicated UL listed Class A transformer, 50/60 Hz

### Operating Temperature Range

- Operating temperature range: 0-60°C (32°F to 140°F)

### Storage Temperature Range

0° to 70°C (32°F to 158°F)

### Operating Humidity Range

5 - 95% RH, non-condensing

### Chassis

- Construction: Plastic, din rail or screw mount chassis, plastic cover
- Cooling: Internal air convection
- Dimensions: 6.313" (160.4 mm) W x 4.820" (122.4 mm) H (including connectors) x 2.438" (61.9 mm) D

### Dimensions

RMI with Power Module: 10.35" (263 mm) L x 2.5" (62 mm) H x 4.1" (104 mm) W

### Approximate Weight:

RMI with Power Module: 25.9 oz (.73 kg)

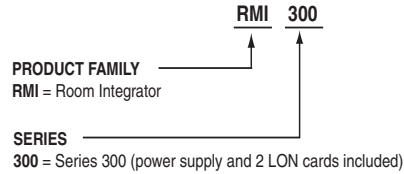
### Agency Listings

- RoHS Compliant
- UL 916
- C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 "Signal Equipment"
- CE
- FCC part 15 Class B
- C-tick (Australia)

BACnet is an exclusive trademark of ASHRAE

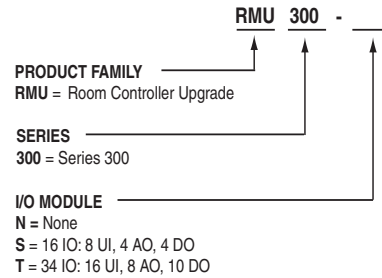
LonMark is a registered trademark of Echelon Corporation

## ORDERING GUIDE



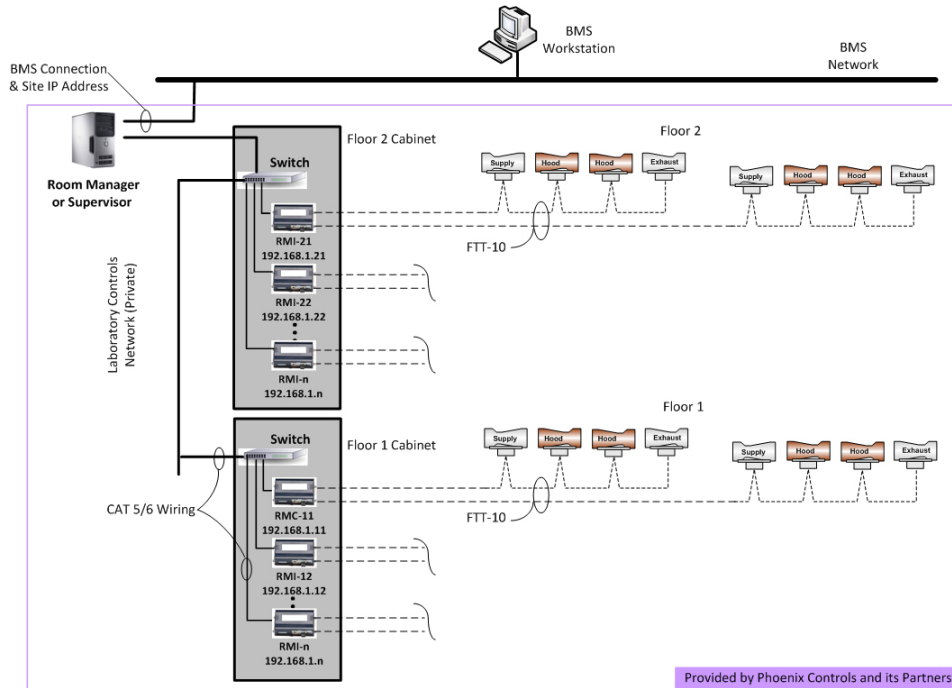
### Room Controller Upgrade Information

Converts RMI300 to full RMC300, refer to the Room Controller product data sheet for full details.

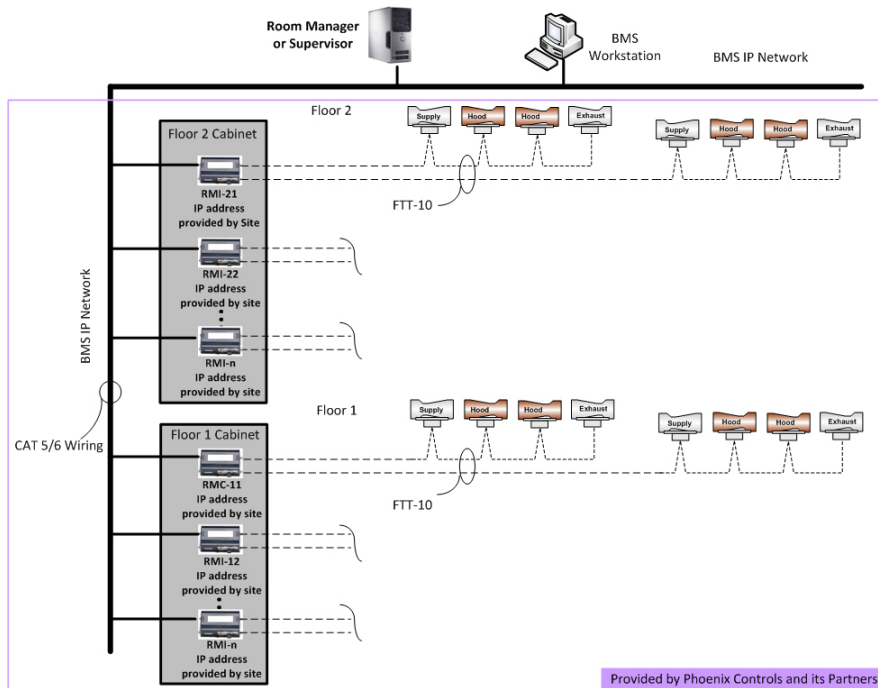


# APPLICATIONS

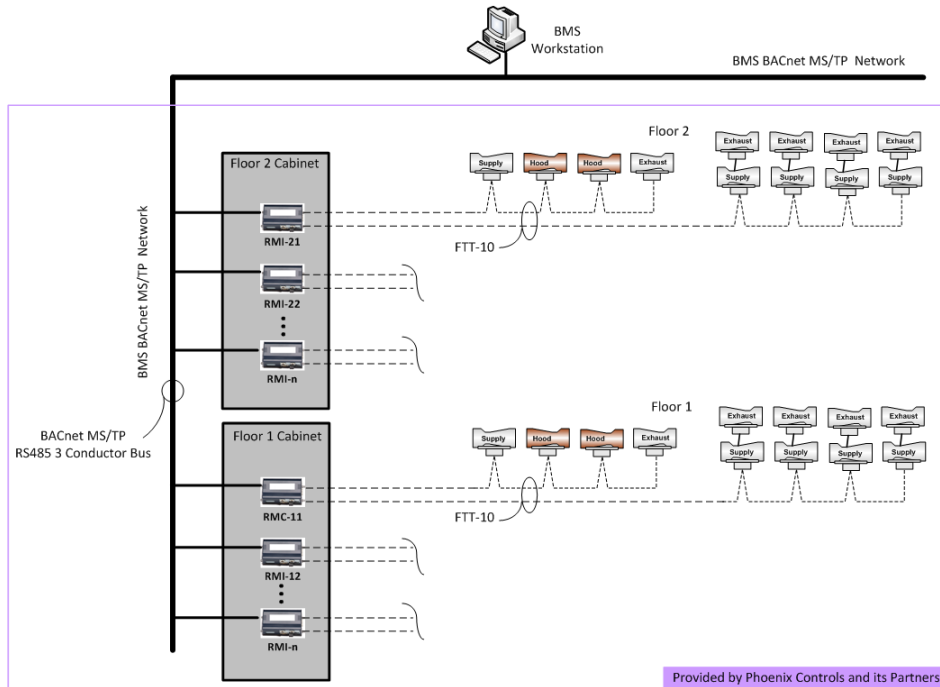
## Single IP Connection to Building Automation Network



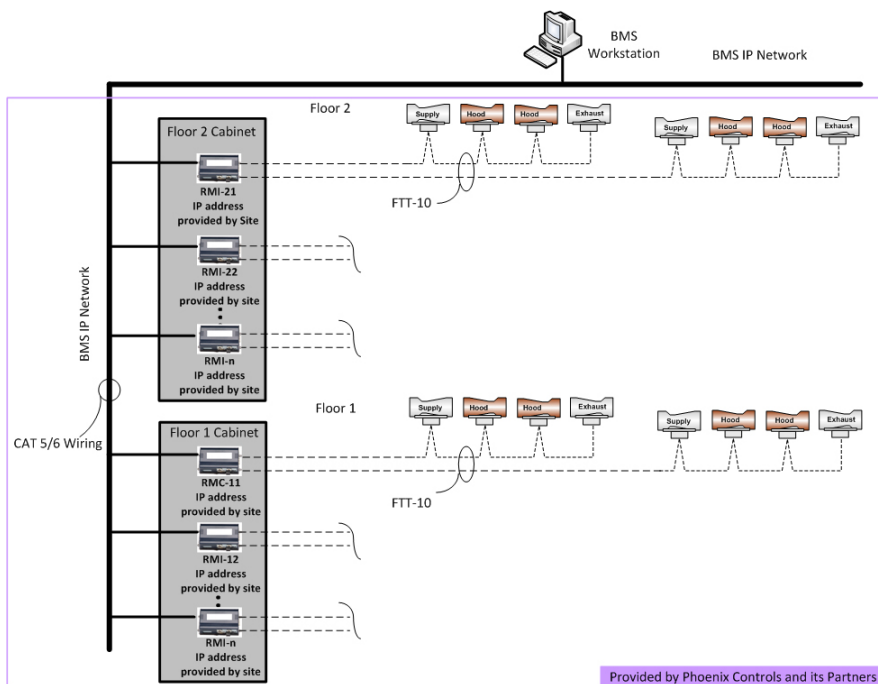
## Multiple IP Connections to Building Automation Network



# BACnet MS/TP Building Automation Network



# Multiple IP Connections to Building Automation System

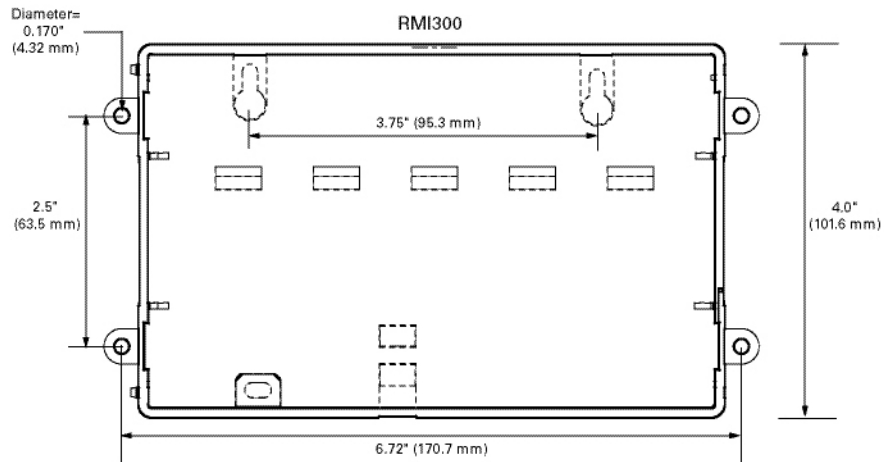


# INSTALLATION

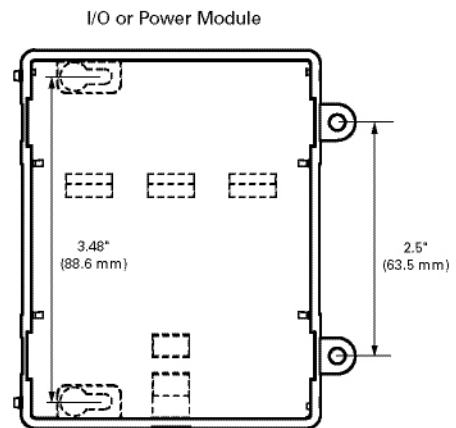
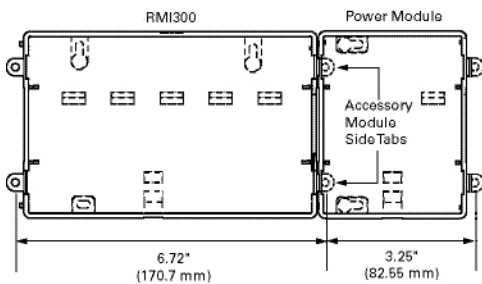
## Mounting Instructions

- You can mount the RMI300 device in any orientation. Removing the cover to accomplish the work is unnecessary.
- Mounting on a 35 mm wide DIN rail is recommended and preferable to tab mounting. The base and power supply modules have a molded DIN rail slot and locking clip. Mounting on a DIN rail ensures accurate alignment of connectors between all modules.
- To tab mount (wall mount), use screws in the mounting tabs provided and any end-connected accessory (see the following figure).

## RMI300 Tab Mounting Dimensions



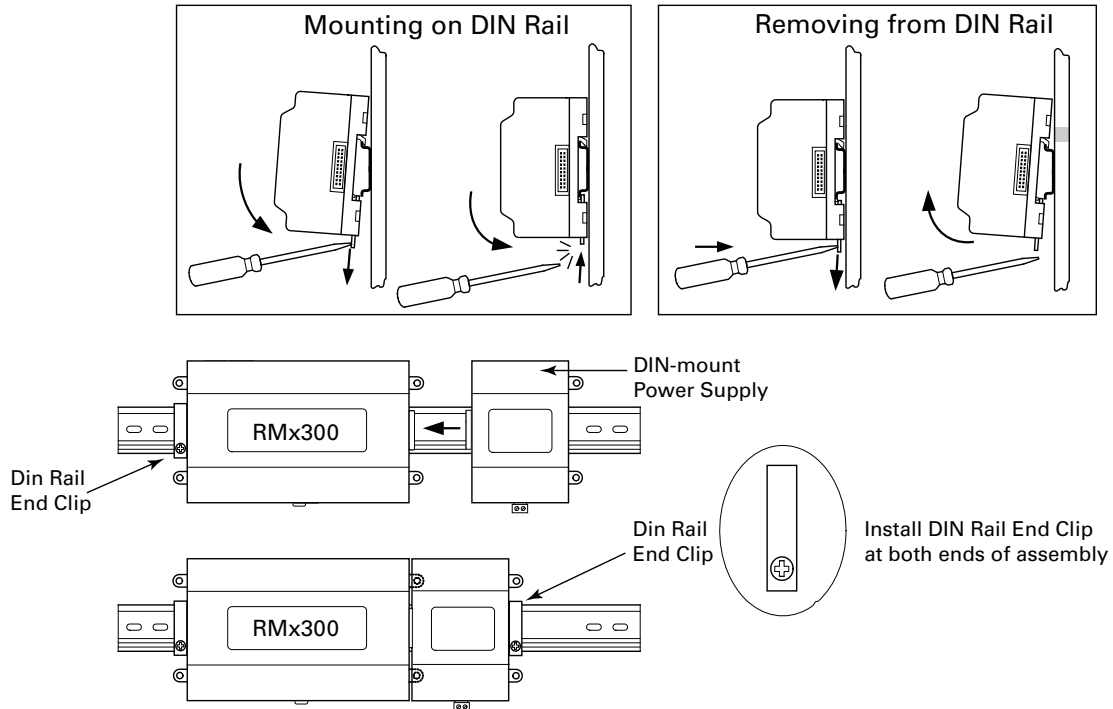
### Unit-to-Unit Distance Between Tab Centers



### NOTE:

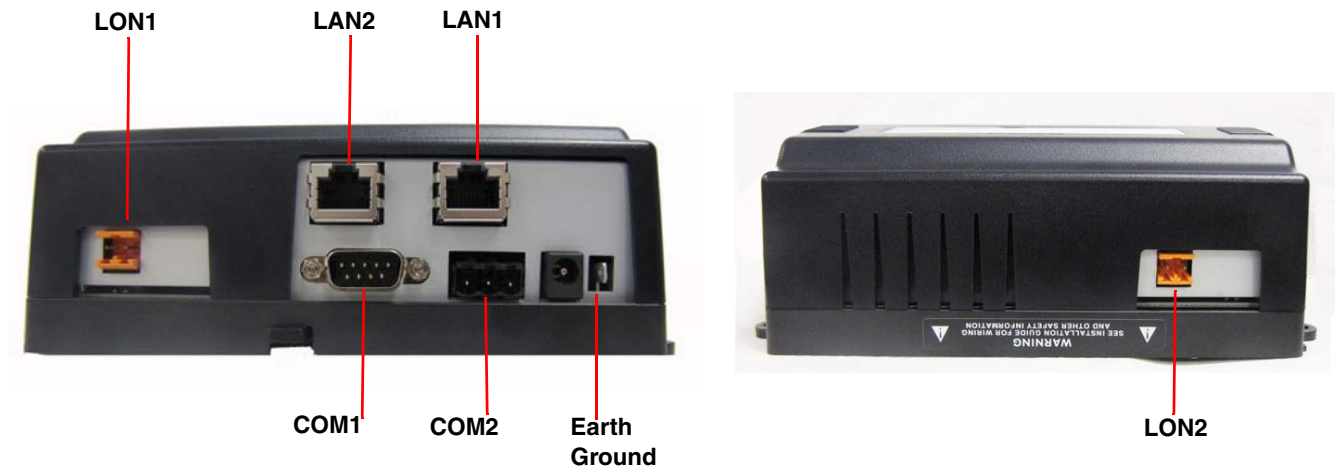
1. Verify all measurements before drilling, document drawings may not be to scale.
2. If you are mounting accessory modules, future removal/replacement is simplified if you do not install screws in the accessory module side tabs of the controller.

## Device and Accessory DIN Rail Mounting Details



## WIRING

Refer to the network diagrams in the previous Applications section and the connector locations in the following picture.



## Overview

Make electrical connections in the following order using the detailed instructions that follow.

1. Connect the communications cable.
2. Apply power to the unit.

## Phoenix Controls Wiring Recommendations

- Use cables recommended by Phoenix Controls.
- Follow good wiring practices:
  - Do not run the signal cable in the same conduit or wireway as the power cables.
  - If the signal cable must cross power cables, it is best to do so at a 90-degree angle.
  - Shield or drain wires, if required, should be wrapped with insulating tape to prevent contact with exposed conductors or contacts.
  - Prior to connecting cables, provide strain relief for them to prevent damage to the controller.
  - Maintain a consistent color code or polarity all the way through the wiring system.
- Local and national electrical codes take precedence.
- Consult the project-specific wiring diagrams for exact details.

## Power and Grounding

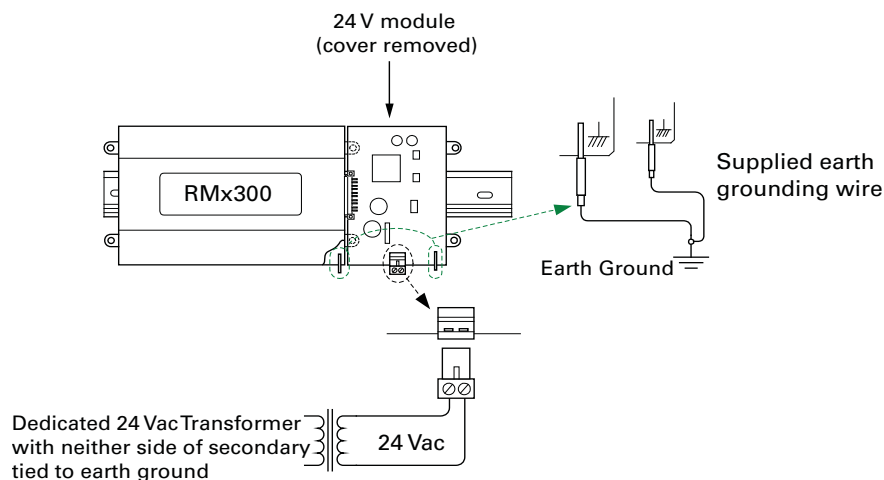
### 24 VAC Power module (supplied)

Use the 24 V module to power the device from a dedicated Class 2, 24 Vac transformer.



If you are powering from a 24 V transformer, do not power any other equipment with it except other RMIs/RMCs. Otherwise, conducted noise problems may result. Also, do not ground either side of the transformer's 24 V secondary.

### 24 V Module Ground Connections



Located at the bottom of the 24 V module is a 2-position power connector and earth ground spade lug. Connect supplied grounding wire from the earth ground lug on the controller, as well as ground wire for each accessory module, to a nearby earth grounding point.

### Grounding the 24 V Power Module

Step	Description
1	Connect the supplied earth ground wire to a nearby earth ground point.
2	Unplug the power connector plug from the module.
3	Make connections to it as shown in the figure above.
4	Do not plug 24 V power into the module (reinsert connector plug) until all other mounting and wiring is completed.

### BACnet IP/Ethernet Communications

- Connect one end of the BACnet/Ethernet (CAT-5) cable to the LAN1 RJ-45 connector on the bottom of the RMI.
- Connect the other end of the CAT-5 cable to any available building Ethernet connection or hub.
- The network cable connecting the RMI to the network may not exceed 328 feet (100 meters).

### BACnet MS/TP

RS-485 MS/TP is connected to COM2, twisted shielded pair:

<b>Terminal</b>	S	+	-
<b>Pin</b>	1	2	3

NOTE: For all other wiring details see *MKT-0364 RMC and RMI Installation Guide*.



## TYPICAL POINTS AVAILABLE FOR INTEGRATION

Recommended for Integration	Point Name	Description	Data Type	Writable?
<b>Alarm Points (available on any node)</b>				
	COM_FAILURE	LVC Neuron chip has lost communications	Binary	Read only
	SENSOR_FAILURE	LVC has detected a sensor failure on an input	Binary	Read only
*	JAM_ALARM	The valve is unable to reach the commanded set point	Binary	Read only
*	FLOW_ALARM	The pressure switch detected low static pressure	Binary	Read only
	UI_1_ALARM	UI 1 is configured as an alarm input	Binary	Read only
	UI_2_ALARM	UI 2 is configured as an alarm input	Binary	Read only
	UI_3_ALARM	UI 3 is configured as an alarm input	Binary	Read only
	DI_1_ALARM	DI 1 is configured as an alarm input	Binary	Read only
<b>Flow Points (available on any node)</b>				
*	EFF_VLV_CMD	Effective valve flow command	Analog	Read only
*	EFF_VLV_FLOW_FDBK	Effective flow feedback from valve	Analog	Read only
<b>Points Associated with a Hood Valve</b>				
*	BROKEN_SASH_CABLE	Alarm indicating sash sensor cable is broken	Binary	Read only
*	HOOD_OVERRIDE	Alarm indicating emergency override function on the fume hood monitor is active	Binary	Read only
*	SASH_HEIGHT_ALARM	Alarm indicating sash input signal exceeds maximum sash height set point	Binary	Read only
	AUXILIARY_AIR_SETPT	Tracking supply valve (MAV) flow set point	Analog	Read/write
	INVERSE_GEX_SETPT	Tracking inverse general exhaust valve (GEX) set point	Analog	Read/write
*	FACE_VELOCITY	Calculated face velocity	Analog	Read only
*	SASH_OPEN_PERCENT	Calculated Sash Opening (0-100%)	Analog	Read only
	SASH_SWITCH_STATE	Sash switch status (hood open or closed)	Binary	Read only
*	USER_STATUS_STATE	Fume hood normal or standby (setback) mode	Binary	Read only
<b>Points Associated with Occupancy Control</b>				
*	OCCUPANCY_CMD	Commanded occupancy state (occupied/unoccupied/standby)	Multi-state	Read/write
	BYPASS_TIME_REMAIN	Time remaining for occupancy override mode (bypass)	Analog	Read only
*	EFF_OCC_MODE	Present occupancy state (occupied/unoccupied/standby/bypass)	Multi-state	Read only
<b>Points Associated with Emergency Mode Control</b>				
	EMER_MODE_1	Alarm indicating emergency mode 1 is available	Binary	Read only
	EMER_MODE_2	Alarm indicating emergency mode 2 is available	Binary	Read only
	EMER_MODE_3	Alarm indicating emergency mode 3 is available	Binary	Read only
	EMER_MODE_4	Alarm indicating emergency mode 4 is available	Binary	Read only
*	EFF_EMER_MODE	Present emergency mode state (none, 1, 2, 3 or 4 active)	Multi-state	Read only
*	EMER_MODE_CMD	Commanded emergency mode state (1, 2, 3 or 4)	Multi-state	Read/write
<b>Points Associated with Humidity Control</b>				
*	EFF_HUMIDITY_SETPT	Effective humidity set point	Analog	Read only
	HUMIDITY_DEMAND	Relative humidity command	Analog	Read only
	HUMIDITY_SETPT	Humidity control set point	Analog	Read/write
*	SPACE_HUMIDITY	Relative humidity present value	Analog	Read only
<b>Points Associated with Temperature Control</b>				
*	OCC_COOL_SETPT	Cooling set point in the occupied mode	Analog	Read/write
*	OCC_HEAT_SETPT	Heating set point in the occupied mode	Analog	Read/write
*	UNOCC_COOL_SETPT	Cooling set point in the unoccupied mode	Analog	Read/write
*	UNOCC_HEAT_SETPT	Heating set point in the unoccupied mode	Analog	Read/write

Recommended for Integration	Point Name	Description	Data Type	Writable?
	STNDBY_COOL_SETPT	Cooling set point in the standby mode	Analog	Read/write
	STNDBY_HEAT_SETPT	Heating set point in the standby mode	Analog	Read/write
*	EFF_TEMP_SETPT	Average of the cooling and heating set points	Analog	Read only
*	OCC_TEMP_SETPT	Occupied temperature set point	Analog	Read/write
	OCC_TOFFSET_SETPT	Occupied temperature set point offset for cooling and heating	Analog	Read/write
*	AVG_SPACE_TEMP	Average of temperature sensor inputs used for control	Analog	Read only
*	OFFSET_LVR_ENABLE	Enables or disables temperature offset lever	Binary	Read/write
	OFFSET_LVR_PERCENT_OF_RANGE	Scaling value (0 to 100%) of the configured offset lever set point range	Analog	Read/write
	AUX_TEMP_SETPT	Auxiliary temperature control set point	Analog	Read/write
	EFF_AUX_TEMP_SETPT	Effective auxiliary temperature control set point	Analog	Read only
	AUX_TEMP_CMD_STATE	Auxiliary temperature control demand output (on/off)	Analog	Read only
	AUX_TEMP_CMD_VALUE	Auxiliary temperature control demand output (0 to 100%)	Analog	Read only
	COOLING_DEMAND	Cooling demand output (-100% = cooling)	Analog	Read only
	HEATING_DEMAND	Heating demand output (+100% = heating)	Analog	Read only
	DUCT_TEMP	Present value of duct sensor (not used for control)	Analog	Read only
	DSCHRG_AIR_TEMP	Present value of discharge air temperature sensor	Analog	Read only
	DSCHRG_TEMP_SETPT	Discharge air temperature set point for thermal anticipatory control	Analog	Read only
	HEAT_DELIVERED	Present value of thermal energy (BTU) delivered to the space	Analog	Read only
*	TEMP_CTRL_MODE	Reports current temperature control state	Multi-state	Read only
	HVAC_MODE_OVERRIDE	Allows BMS to override temperature control to one of eight states	Multi-state	Read/write
<b>Points Associated with Zone Balance</b>				
	DIVERSITY_ALARM	Total exhaust has exceeded diversity alarm threshold	Binary	Read only
	OFFSET_SETPT	Zone offset set point	Analog	Read/write
*	OFFSET	Calculated zone offset	Analog	Read only
	OCC_MIN_SETPT	Occupied minimum ventilation flow set point	Analog	Read/write
*	UNOCC_MIN_SETPT	Unoccupied minimum ventilation flow set point	Analog	Read/write
*	TOTAL_ZONE_SUPPLY	Total of all networked and non-networked supply devices	Analog	Read only
*	TOTAL_ZONE_EXHAUST	Total of all network and non-network exhaust devices	Analog	Read only
	TOTAL_CNST_VOL_EXH_FLOW	Entered value of constant volume exhaust devices	Analog	Read only
	TOTAL_CNST_VOL_SUP_FLOW	Entered value of constant volume supply devices	Analog	Read only
	TOTAL_ADD_EXH_FLOW	Total of all hard-wired (non-networked) exhaust devices	Analog	Read only
	TOTAL_ADD_SUP_FLOW	Total of all hard-wired (non-networked) supply devices	Analog	Read only
<b>Points Associated with Pressure Control</b>				
*	SENSOR_FAILURE	Alarm indicating the pressure sensor is functioning or has failed	Binary	Read only
*	ZONE_PRES_ALARM	Alarm indicating over or under pressure alarm condition	Binary	Read only
*	EFF_PRES_SETPT	The set point to which the pressure control system will control	Analog	Read only
*	ZONE_PRES_DIF	Present value of the measured zone differential pressure	Analog	Read only
	ZONE_PRES_ABS	Present value of the measured zone absolute pressure	Analog	Read only
	POC_STATE	Present state of progressive offset control function	Multi-state	Read only
*	PRES_WARN_SETPT	Set point value for the over or loss of pressure warning function	Analog	Read/write
*	PRES_ALARM_SETPT	Set point value for the over pressure alarm function	Analog	Read/write
	FRZ_TIME_SETPT	Set point for duration of freeze mode if door remains open	Analog	Read/write
	FRZ_TIME_REMAIN	Time remaining before freeze mode terminates	Analog	Read only
	FRZ_MODE_OFFSET_SETPT	Set point for an alternate offset when the freeze mode is active	Analog	Read/write
<b>Network Inputs/Outputs (I/Os)</b>				
	REMOTE_AO_0	User configurable analog output for non-network device	Analog	Read only
	REMOTE_AO_1	User configurable analog output for non-networked device	Analog	Read only
	REMOTE_AO_2	User configurable analog output for non-networked device	Analog	Read only

Recommended for Integration	Point Name	Description	Data Type	Writable?
	REMOTE_DO_0	User configurable digital output for non-networked device	Binary	Read only
	REMOTE_DO_1	User configurable digital output for non-networked device	Binary	Read only
	REMOTE_AI_0	User configurable analog input for non-networked device	Analog	Read/write
	REMOTE_AI_1	User configurable analog input for non-networked device	Analog	Read/write
	REMOTE_AI_2	User configurable analog input for non-networked device	Analog	Read/write
	REMOTE_AI_3	User configurable analog input for non-networked device	Analog	Read/write
	REMOTE_AI_4	User configurable analog input for non-networked device	Analog	Read/write
	REMOTE_DI_0	User configurable digital input for non-networked device	Binary	Read/write
	REMOTE_DI_1	User configurable digital input for non-networked device	Binary	Read/write
	REMOTE_DI_2	User configurable digital input for non-networked device	Binary	Read/write
Table Notes: * LabCompact, LabFull, Zone Valve each have only one nviRemoteDO and one nviRemoteDI.				

## SPARE PARTS

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Part Number	Description
PRT-250-240-055	Replacement power supply
PRT-896-000-007	Replacement LON board
PRT-800-250-005LF	FTT10 End-Of-Line