

LN Series Powered Fan Coil Unit (PFCU) Controller

Product Bulletin

LN-PFCUA-1, LN-PFCU-1

Code No. LIT-12011315
 Software Release 3.1
 Issued November 9, 2007

The LN Series Powered Fan Coil Unit (PFCU) is a microprocessor based fan coil unit controller designed to control any fan coil unit application. The PFCU controller uses the LonTalk® communication protocol and is LONMARK® certified using the fan coil functional profile #8501.

The PFCU controller is compatible with the LN-PSTAT Sensor, which is a communicating sensor with 2-line Liquid Crystal Display (LCD). Functionality includes setpoint adjustment, fan speed control, indoor temperature display, and occupancy state display.



Figure 1: LN-PFCUA-1 Controller

Table 1: Features and Benefits

Features	Benefits
Interoperability	Supports LONWORKS® technology for peer-to-peer communication between controllers.
Robust Hardware	Features a fire retardant plastic enclosure with a separable base plate that allows the base and connectors to be shipped to the site for installation while engineering is done elsewhere.
Software	Features an LNS® plug-in wizard for configuration and monitoring the software. You can easily configure all features, including input and output types and properties, heating and cooling stages, control variable speed fans and floating valves, and Proportional plus Integral plus Derivative (PID) control loops.

Applications

The PFCU Controllers allow you to control fan coil applications with up to four stages of cooling and heating. These controllers are designed to meet the requirements of two-pipe coil shared heating and cooling and four-pipe coil heating and cooling. The fan coil operations include cooling only, heating only, and cooling and heating. The valve applications can be digital, floating, or modulating.

Description

You can configure the LN PFCU Controllers by using LN-Builder 3 software. This configuration interface is designed to simplify complex programming and sequencing methods by prompting the user for the necessary configuration data. The controller automatically selects the operation sequence according to the input and output configurations and dynamically adapts itself to the network variables bound to the controller. Figure 2 shows the PFCU dimensions.

Plug-ins and Wizards

The PFCU controllers offer two plug-ins: LNS Monitoring Plug-in and LNS Configuration Plug-in.

LNS Monitoring Plug-in

The monitoring plug-in is a graphical user interface that monitors all device parameters including inputs, outputs, alarms, and device status. You do not need to create any graphics pages because you can launch it from any Graphical User Interface (GUI) that supports plug-in applications. The graphics dynamically adapt themselves to the configuration of the device as well as the real-time values being monitored.

LNS Configuration Plug-in

You can easily configure all the device's parameters including inputs, outputs, fan and valve settings, heating and cooling setpoints, among others. You can also enable and configure additional built-in features such as optimum start/stop, load shedding, frost protection, and slave operation mode.

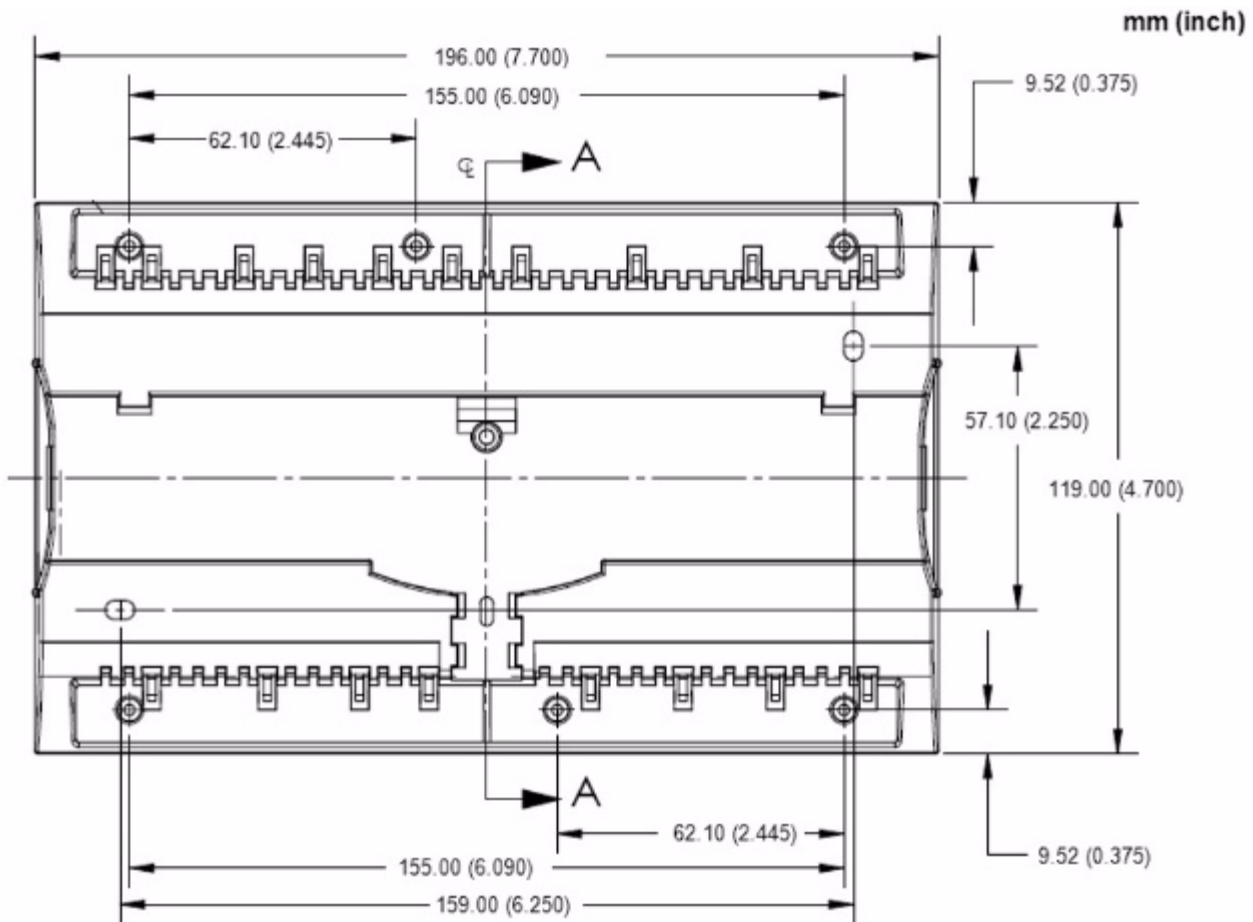


Figure 2: PFCU Controller Dimensions

Output Configuration and PFCU Controller Selection Guide

The LN Series PFCU controllers comprise two different devices, each having its own output configuration but all having identical input, power, environmental, and general specifications. Table 2 shows the information for the LN-PFCU-1 controller. Table 3 shows the information for the LN-PFCUA-1 controller.

Table 2: LN-PFCU-1 Controller

Outputs	8	
Output Types	3 Relay Contacts (Fan Speeds)	Up to 277 VAC, NO contacts 3 A (inductive or resistive) All share the same Common
	1 Relay Contact (Heater)	Up to 277 VAC, NO contact 3 A (inductive) and 10 A (resistive) Dedicated Common
	4 Digital	Triac 1.0 A @ 20.4 - 265 VAC External power supply with external fuse (4 A fast-acting, high breaking) One Common per pair of outputs

Table 3: LN-PFCUA-1 Controller

Outputs	10	
Output Types	3 Relay Contacts (Fan Speeds)	Up to 277 VAC, NO contacts 3 A (inductive or resistive) All share the same Common
	1 Relay Contact (Heater)	Up to 277 VAC, NO contact 3 A (inductive) and 10 A (resistive) Dedicated Common
	4 Digital	Triac 1.0 A @ 20.4 - 265 VAC External power supply with external fuse (4 A fast-acting, high breaking) One Common per pair of outputs
	2 Universal	0-10 VDC (linear), digital 0-12 VDC (on/off) or Pulse Width Modulation (PWM) 20 mA maximum at 12 VDC Maximum load 600 ohms
	Universal Output Resolution	10-bit digital/analog converter
	24 VAC Power Supply	24 VAC; $\pm 15\%$; 55 Hz 300 mA max (7.2 VA) @ 24 VAC

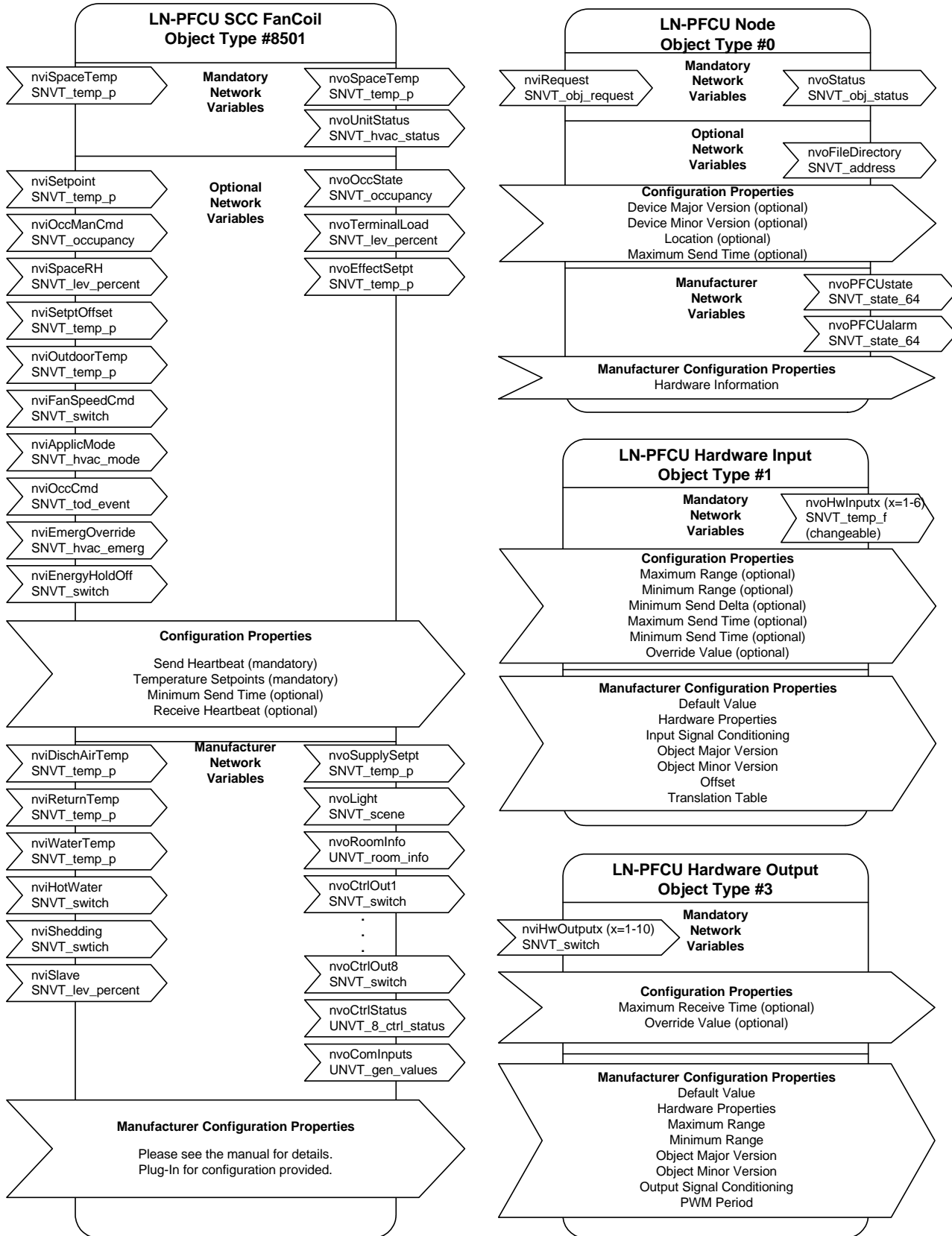
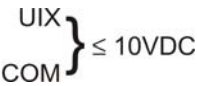


Figure 3: LONMARK Objects and Network Variables - LN-PFCU Controllers

Technical Specifications

LN-PFCU Controllers

Power Requirements	Voltage: 85 - 265 VAC; 50-60 Hz, over voltage category II, pollution degree 2 Protection: 2.0 A fast-acting, high breaking capacity fuse Maximum Consumption: LN-PFCUA-1: 20 VA maximum, LN-PFCU-1: 33 VA maximum Double-insulation devices
Ambient Storage Conditions	Operating Temperature: 0 to 50°C (32 to 122°F) - indoor use Storage Temperature: -20 to 70°C (-4 to 158°F) Relative Humidity: 0 to 90% noncondensing Altitude: <2,000 m
General	Standard: LONMARK Functional Profile: Fan Coil Controller #8501 Processor: Neuron® 3150®; 8 bits; 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Communication: LonTalk Protocol Transceiver: FT-X1 Channel: TP/FT-10, 78 kbps Status Indicator: Green LED: power status and LON TX Orange LED: service and LON RX Communication Jack: LON audio jack mono 1/8 in. (3.5 mm)
Enclosure (Housing)	Material: ABS PA-765A Dimensions with Screws: 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm) Shipping Weight: 1.08 lb (0.49 kg) Installation: Moulded DIN-rail mounting bracket integrated into enclosure or through the mounting holes on the back plastic.
Inputs	Quantity: 8 Input Types: Universal (software configurable) Analog Voltage: 0 to 10 VDC, Accuracy ±0.5% Analog Current: 4 to 40 mA with 249 ohms external resistor (wired in parallel) Accuracy ±0.5% Digital: Dry Contact Resistor Support Thermistor: Type 2 and Type 3 10k ohms, Range: -40 to 150°C (-40 to 302°F), Accuracy: ±0.5°C, ±0.9°F Resolution: 0.1 to 0.18° F (10k ohms to 10k ohms supported using translation table Platinum: RTD 1k ohm Range: -40 to 150°C (-40 to 302°F), Accuracy: ±1.0°C, ±1.8°F PT100: 100 ohms Range: -40 to 150°C (-40 to 302°F) Accuracy: ±1.0°C, ±1.8°F Potentiometer: Translation table configurable on several points, accuracy ±0.5% Input Resolution: 16-bit analog/digital converter Measurement Category: CAT II <div style="text-align: right;">  </div>

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Controls Group
507 E. Michigan Street
Milwaukee, WI 53202

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LX Series Powered Fan Coil Unit (PFCU) Controller

Product Bulletin

LX-PFCUA-1, LX-PFCU-1

Code No. LIT-12011496

Issued June 22, 2009

The LX Series Powered Fan Coil Unit (PFCU) is a microprocessor-based fan coil unit controller designed to control any fan coil unit application. The PFCU controller uses the LonTalk® communication protocol and is LONMARK® certified using the fan coil functional profile #8501.

The PFCU controller is compatible with the LN-PSTAT Sensor, which is a communicating sensor with 2-line Liquid Crystal Display (LCD). Functionality includes setpoint adjustment, fan speed control, indoor temperature display, and occupancy state display.



Figure 1: LX-PFCUA-1 Controller

Table 1: Features and Benefits

Features	Benefits
Interoperability	Supports LONWORKS® technology for peer-to-peer communication between controllers.
Robust Hardware	Features a fire retardant plastic enclosure with a separable base plate that allows the base and connectors to be shipped to the site for installation while engineering is done elsewhere.
Software	Features a wizard for configuring the software. You can easily configure all features, including input and output types and properties and heating and cooling stages.

Applications

The PFCU Controllers allow you to control fan coil applications with up to four stages of cooling and heating. These controllers are designed to meet the requirements of two-pipe coil shared heating and cooling and four-pipe coil heating and cooling. The fan coil operations include cooling only, heating only, and cooling and heating. The valve applications can be digital, floating, or modulating.

Description

You can configure the LX-PFCU Controllers by using LX Wizards software. This configuration interface is designed to simplify complex programming and sequencing methods by prompting the user for the necessary configuration data. The controller automatically selects the operation sequence according to the input and output configurations and dynamically adapts itself to the network variables bound to the controller. Figure 2 shows the PFCU dimensions.

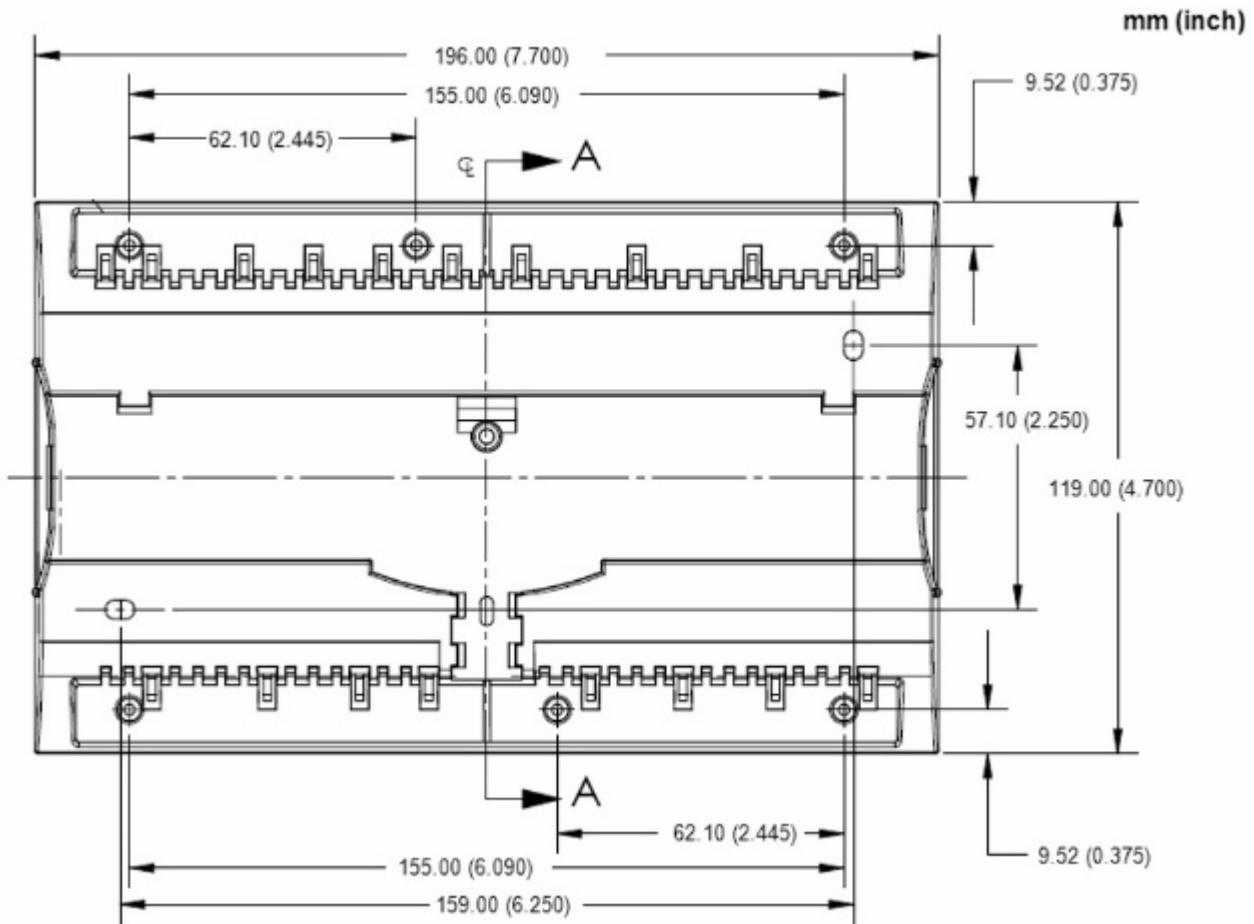


Figure 2: PFCU Controller Dimensions

Output Configuration and PFCU Controller Selection Guide

The LX Series PFCU controllers comprise two different devices, each having its own output configuration but all having identical input, power, environmental, and general specifications. Table 2 shows the information for the LX-PFCU-1 controller and LX-PFCUA-1 controller.

Table 2: LX-PFCU Controller Selection Chart

Code Number	Description
LX-PFCU-1	14-point Powered Fan Coil Unit Configurable Controller, 6 Universal Inputs (UIs), 4 digital relay outputs (up to 277 VAC), 4 digital (triac) outputs (up to 265 VAC)
LX-PFCUA-1	16-point Powered Fan Coil Unit Configurable Controller, 6 Universal Inputs (UIs), 4 digital relay outputs (up to 277 VAC), 4 digital (triac) outputs (up to 265 VAC), 2 Universal Outputs (UOs)

Repair Information

If the LX Series Powered Fan Coil Unit controller fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

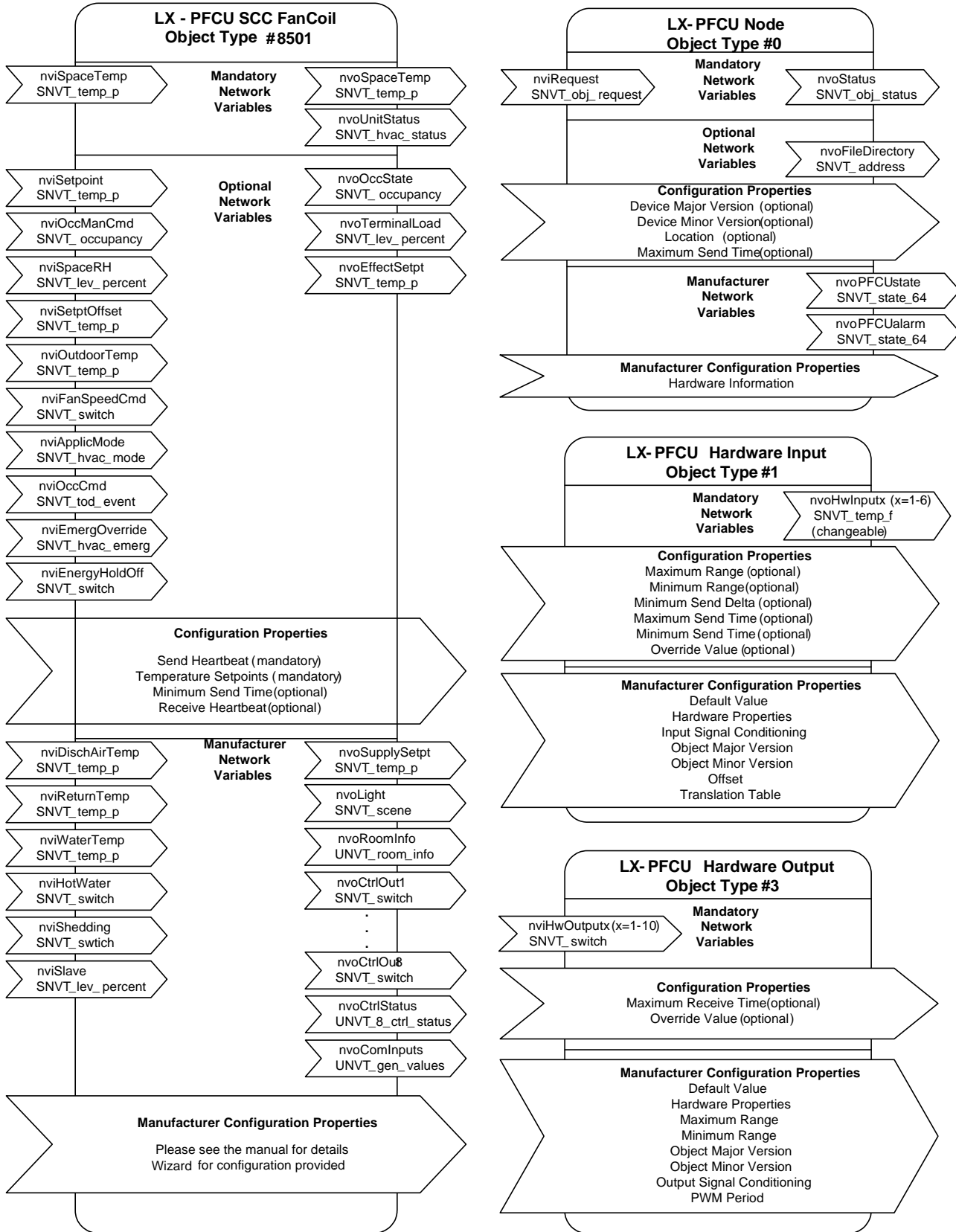


Figure 3: LONMARK Objects and Network Variables - LX-PFCU Controllers

Technical Specifications

LX-PFCU Controllers (Part 1 of 2)

Power Requirements	Voltage: 85 to 265 VAC; 50-60 Hz, over voltage category II, pollution degree 2 Protection: 2.0 A fast-acting, high breaking capacity fuse Maximum Consumption: LX-PFCUA-1: 20 VA maximum, LX-PFCU-1: 33 VA maximum Double-insulation devices
Ambient Conditions	Operating Temperature: 0 to 50°C (32 to 122°F) - indoor use Storage Temperature: -20 to 70°C (-4 to 158°F) Relative Humidity: 0 to 90% noncondensing Altitude: <2,000 m
General	Standard: LONMARK Functional Profile: Fan Coil Controller #8501 Processor: Neuron® 3150®; 8 bits; 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Communication: LonTalk Protocol Transceiver: FT-X1 Channel: TP/FT-10, 78 kbps Status Indicator: Green LED: power status and LON TX Orange LED: service and LON RX Communication Jack: LON audio jack mono 1/8 in. (3.5 mm)
Enclosure (Housing)	Material: ABS PA-765A Dimensions with Screws: 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm) Shipping Weight: 1.08 lb (0.49 kg) Installation: Moulded DIN-rail mounting bracket integrated into enclosure or through the mounting holes o-n the back plastic.
Inputs	Quantity: 6 Input Types: Universal (software configurable) Analog Voltage: 0 to 10 VDC Analog Current: 4 to 20 mA with 249 ohm external resistor (wired in parallel) Digital: Dry Contact Pulse: Dry Contact, 500 milli-seconds minimum ON/OFF Resistor Support Thermistor: Type 2 and Type 3 10K ohm, Range: -40 to 150°C (-40 to 302°F), Platinum: Pt1000 (1K ohm) Range: -40 to 150°C (-40 to 302°F), PT100: 100 ohm Range: -40 to 135°C (-40 to 275°F) Potentiometer: Translation table configurable on several points Input Resolution: 16-bit analog/digital converter Measurement Category: CAT II

LX-PFCU Controllers (Part 2 of 2)

Outputs	<p>PFCU Quantity: 8 3 Digital Relay Contacts: Up to 277 VAC Normally Open (NO) Contacts Fan Speeds: 3 A (inductive or resistive), All share the same common 1 Digital Relay Contact: Up to 277 VAC NO contacts Heater: 3 A (inductive) and 10 A (resistive), Dedicated common 4 Digital: 1 A at 20.4 4 to 265 VAC Triac (digital - on/off, floating or PWM) PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs Min pulse on/off: 500 milli-seconds Adjustable drive time period Protect the outputs with an external 4 A fast-acting, high-breaking fuse 1 common per pair of outputs</p> <p>PFCUA Quantity: 10 3 Digital Relay Contacts: Up to 277 VAC Normally Open (NO) Contacts Fan Speeds: 3 A (inductive or resistive), All share the same common 1 Digital Relay Contact: Up to 277 VAC NO contacts Heater: 3 A (inductive) and 10 A (resistive), Dedicated common 4 Digital: 1 A at 20.4 4 to 265 VAC Triac (digital - on/off, floating or PWM) PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs Min pulse on/off: 500 milli-seconds Adjustable drive time period Protect the outputs with an external 4 A fast-acting, high-breaking fuse 1 common per pair of outputs</p> <p>2 Universal: 0 to 10 VDC linear, digital 0 to 12 VDC (on/off), PWM or floating PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs Min pulse on/off: 500 milli seconds Adjustable drive time period 20 mA maximum at 12 VDC Minimum resistance 600 ohm Output Resolution: 10-bit digital/analog converter Onboard 24 VAC output: 24VAC; ±15%, 50Hz, 300mA max (7.2VA) at 24 VAC</p>
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