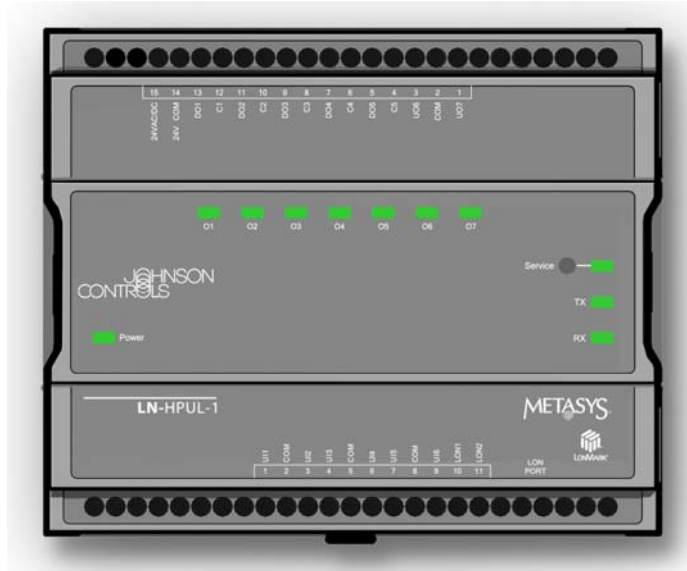


# Metasys® System LN Series Application Specific Controllers

The Metasys® system LN Series application specific controller family includes the Fan Coil Unit (FCUL), Rooftop Unit (RTUL), Heat Pump Unit (HPUL), and Unit Ventilator (UVL) controllers.

The Metasys system LN Series application specific controllers can be configured through any LONWORKS® Network Services (LNS®) compliant software with an easy-to-use LNS plug-in. The plug-in is designed to simplify complex programming and sequencing methods by prompting the user for the necessary configuration data. The controllers automatically select the operation sequence from the plug-in input and output configuration and from the network variables.

The Metasys system LN Series application specific controller family is built to meet rigorous quality standards. The complete family of controllers is designed for use with any LONWORKS network open and interoperable system.



**Figure 1: One Member of the Metasys System LN Series Application Specific Controller Family (LN-HPUL-1)**

Features and Benefits	
<input type="checkbox"/> <b>LONWORKS Network Compliant and Certified</b>	Complies with LONMARK® Interoperability guidelines Version 3.3. The controllers are based on Echelon® LONWORKS technology for peer-to-peer communication between controllers. Each controller qualifies for the LONMARK Functional Profile for each application.
<input type="checkbox"/> <b>Ability to Link Spare Input/Output (I/O) Points to Other Controllers on the Network; Stand-Alone Unit or Part of a Network System</b>	Provides great network flexibility and interaction
<input type="checkbox"/> <b>Variable Speed Fan Controlling</b>	Offers greater control options.
<input type="checkbox"/> <b>Powerful and Intuitive LNS Plug-In</b>	Provides easy customization of hardware I/O, control sequences and communication schemes.
<input type="checkbox"/> <b>64 K Flash Memory</b>	Offers large storage area for application setting and control sequences.

## Metasys System LN Series Application Specific Controllers

The Metasys system LN Series application specific controllers are microprocessor-based controllers designed to control almost any fan coil, rooftop, unit ventilator, or heat pump application. The controllers use the LONWORKS communication protocol and are LONMARK certified using the fan coil, rooftop, unit ventilator, or heat pump profile.

The Metasys system LN Series application specific controllers provide features such as Optimal Start, load shedding, frost protection, slave operation mode, and changeable type Network Variable (NV).

See Figure 2 for the dimensions of the Metasys system LN Series application specific controller family.

### Fan Coil Unit (FCUL) Controller

The Metasys system LN Series Fan Coil Unit controller has the following applications:

- two-pipe coil shared cooling and heating and four-pipe coil cooling and heating
- fan-coil applications including cooling only, heating only, and cooling and heating
- up to three stages of cooling or heating
- digital, floating, or modulating valves application
- support for a wide range of sensors and actuators

See Figure 3 for the LONMARK objects and network variables for the Fan Coil Unit controller.

### Rooftop Unit (RTUL) Controller

The Metasys system LN Series Rooftop Unit controller has the following applications:

- requirements met for any rooftop unit application with or without an economizer
- rooftop applications including mechanical stages, modulating valves, and floating outputs
- up to four stages of cooling or heating
- management for humidity control devices
- support for a wide range of sensors and actuators

See Figure 4 for the LONMARK objects and Network Variables for the Rooftop Unit controller.

### Heat Pump Unit (HPUL) Controller

The Metasys system LN Series Heat Pump Unit controller has the following applications:

- requirements met for any heat pump unit application
- heat pump applications including dual mode heat pumps, modulating valves, and water to refrigerant heat pumps
- up to four stages of cooling or heating
- support for a wide range of sensors and actuators
- defrost cycle for system maintenance
- dehumidification cycle

See Figure 5 for the LONMARK objects and Network Variables for the Fan Coil Unit controller.

### Unit Ventilator (UVL) Controller

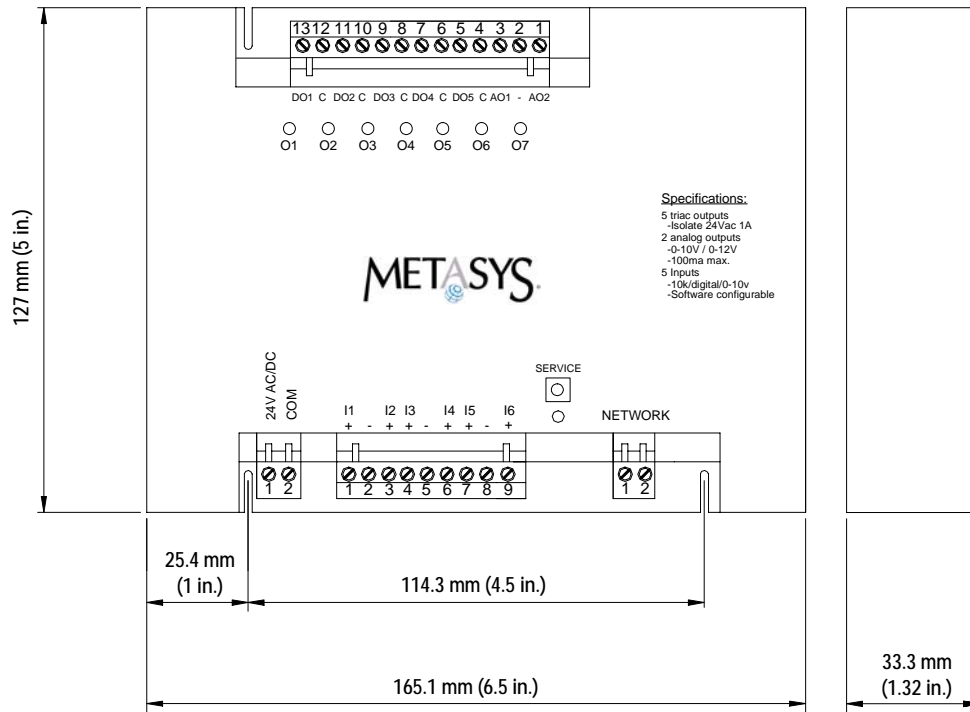
The Metasys system LN Series Unit Ventilator controller has the following applications:

- requirements met for any unit ventilator application
- combination hot and chilled water coil (two-pipe), separate hot and chilled water coils (four-pipe), hot water coil and direct-expansion coil, electric heating coil and chilled water or direct-expansion coil, gas fired furnace with direct expansion coil
- up to four stages of cooling (reversible) or heating
- support for a wide range of sensors and actuators
- dehumidification cycle

See Figure 6 for the LONMARK objects and Network Variables for the Fan Coil Unit controller.

## Dimensions

Figure 2 shows the Metasys system LN Series application specific controller dimensions.



**Figure 2: Metasys System LN Series Application Specific Controller Dimensions**

# LONMARK Objects and Network Variables

## Fan Coil Unit (FCUL) Controller

Figure 3 shows the Fan Coil Unit (FCUL) controller LONMARK objects and network variables.



Figure 3: Metasys System LN Series Fan Coil Unit (FCUL) Controller—LONMARK Objects and Network Variables

## Rooftop Unit (RTUL) Controller

Figure 4 shows the Rooftop Unit (RTUL) controller LONMARK objects and network variables.

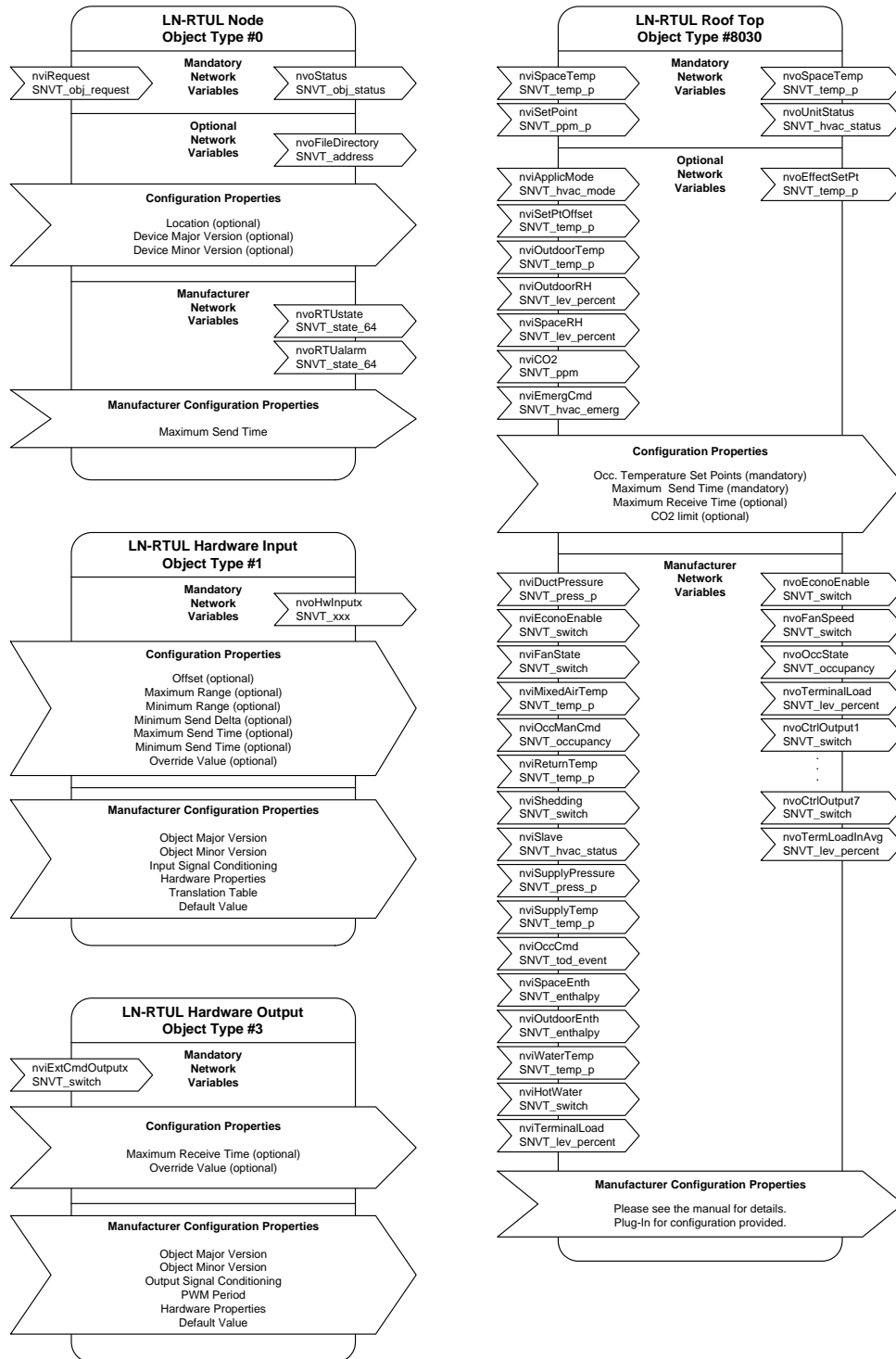
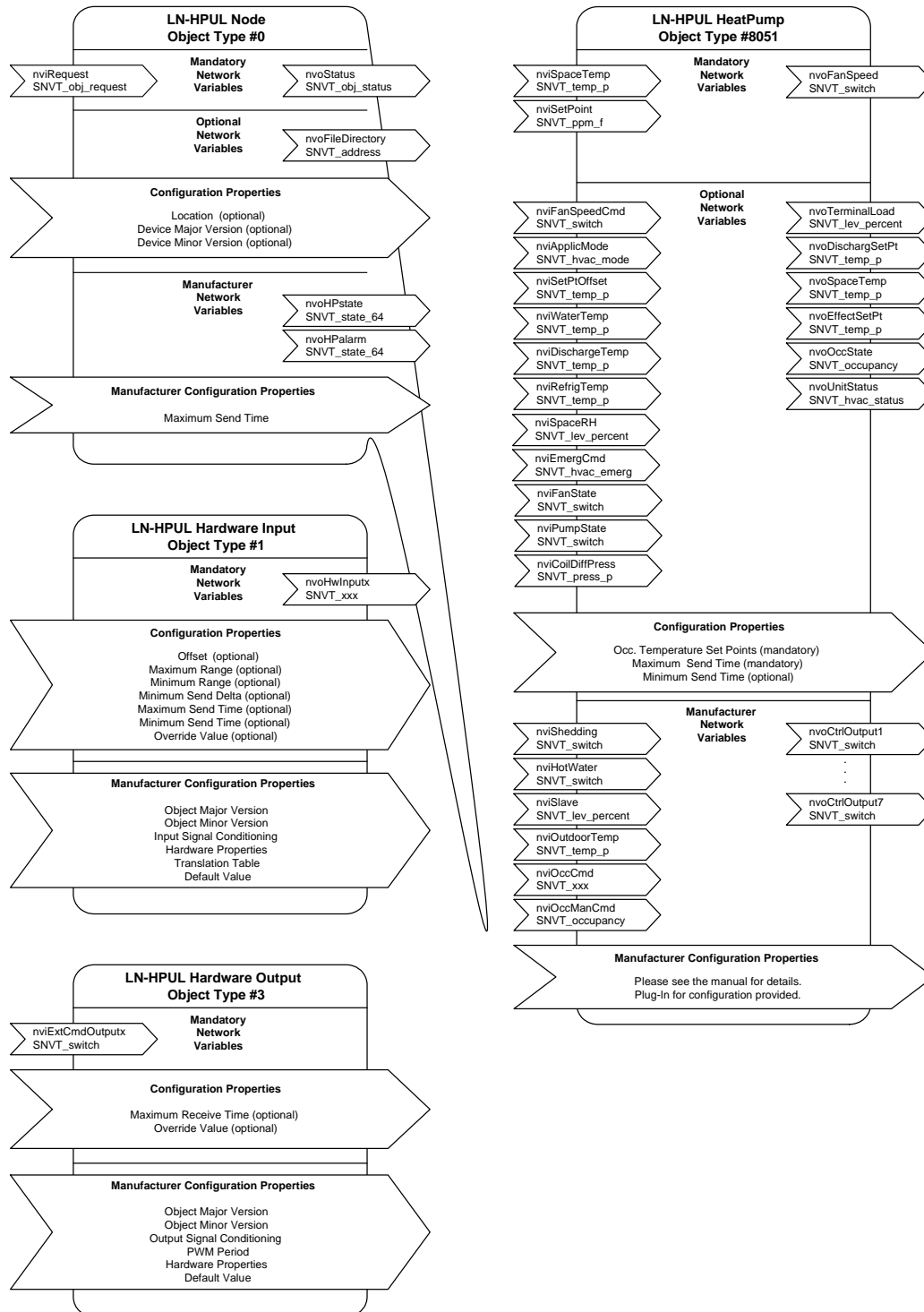


Figure 4: Metasys System LN Series Rooftop Unit (RTUL) Controller—LONMARK Objects and Network Variables

## Heat Pump Unit (HPUL) Controller

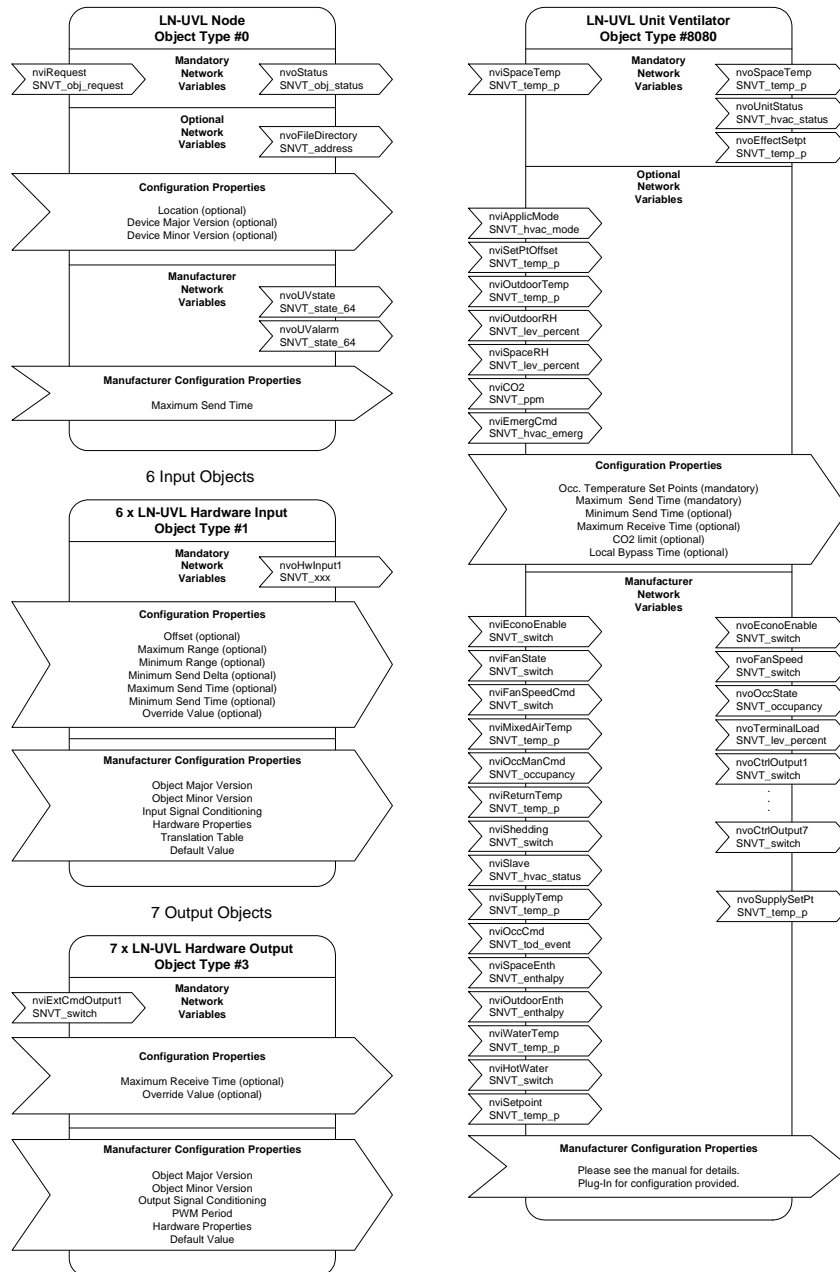
Figure 5 shows the Heat Pump Unit (HPUL) controller LONMARK objects and network variables.



**Figure 5: Metasys System LN Series Heat Pump Unit (HPUL) Controller—LONMARK Objects and Network Variables**

## Unit Ventilator (UVL) Controller

Figure 6 shows the Unit Ventilator (UVL) controller LONMARK objects and network variables.



**Figure 6: Metasys System LN Series Unit Ventilator (UVL) Controller—LONMARK Objects and Network Variables**

## Technical Specifications

### Metasys System LN Series Fan Coil Unit (FCUL) Controller

<b>Product</b>	Metasys System LN Series Fan Coil Unit Controller (LN-FCUL-1)
<b>Power</b>	Voltage: 24 VAC, $\pm 15\%$ , 50/60 Hz or 24 VAC* Typical Consumption: 5 VA Maximum Consumption: 10 VA Protection: 1.35 Ampere Auto-Reset Fuse *must be powered by a 24 VAC, Class 2 power supply
<b>Environmental</b>	Operating Temperature: 0°C to 70°C, 32°F to 158°F Storage Temperature: -20°C to 70°C, -4°F to 158°F Relative Humidity: 0 to 90% Noncondensing
<b>General</b>	Standard: LONMARK Functional Profile Fan Coil Unit #8020 Processor: Neuron@ 3150@; 8 bits; 10MHz Memory: Flash 64 K (APB application and configuration properties) Communication: LonTalk@ Protocol Media Channel: TP/FT-10; 78 kbps Transceiver: Echelon Free Topology Transceiver (FTT-10) Enclosure Material: Metal 18 AWG Dimensions: 127 mm x 165 mm x 33 mm (5 in. x 6.5 in. x 1.3 in.) Weight: 0.67 kg (1.48 lbs) Safety: CSA and UL Listed
<b>Inputs</b>	Number: 6 Universal Software Configurable Digital: Dry Contact Voltage: 0-10 VDC, Accuracy $\pm 0.5\%$ Current: 4-20 mA with 500 ohm external resistor Resistor: Thermistor Type 2, Type 3, 10k ohm Range -40 to 125°C; -40 to 257°F Accuracy: $\pm 0.5^\circ\text{C}$ ; $\pm 0.9^\circ\text{F}$ Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: 10K ohm Up to 16 point translation table configuration Input Resolution: 12 bits analog/digital converter
<b>Outputs</b>	Number: 7 5 Digital: Triac 1.0 Ampere at 24 VAC External Power Supply 2 Tri-mode Analog: 0-10 VDC (linear), PWM or digital 0-12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse: 60 mA @ 60°C; 140°F; 100 mA @ 20°C; 68°F Analog Output Resolution: 8 bits digital/analog converter

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



## Metasys System LN Series Rooftop Unit (RTUL) Controller

<b>Product</b>	Metasys System LN Series Rooftop Unit Controller (LN-RTUL-1)
<b>Power</b>	Voltage: 24VAC, $\pm 15\%$ , 50/60 Hz or 24 VAC* Typical Consumption: 5 VA Maximum Consumption: 10 VA Protection: 1.35 Ampere Auto-Reset Fuse *must be powered by a 24 VAC, Class 2 power supply
<b>Environmental</b>	Operating Temperature: 0°C to 70°C, 32°F to 158°F Storage Temperature: -20°C to 70°C, -4°F to 158°F Relative Humidity: 0 to 90% Noncondensing
<b>General</b>	Standard: LONMARK Functional Profile Rooftop Unit #8030 Processor: Neuron 3150; 8 bits; 10MHz Memory: Flash 64 K (APB application and configuration properties) Communication: LonTalk Protocol Media Channel: TP/FT-10; 78 kbps Transceiver: Echelon Free Topology Transceiver (FTT-10) Enclosure Material: Metal 18 AWG Dimensions: 127 mm x 165 mm x 33 mm (5 in. x 6.5 in. x 1.3 in.) Weight: 0.67 kg (1.48 lbs) Safety: CSA and UL Listed
<b>Inputs</b>	Number: 6 Universal Software Configurable Digital: Dry Contact Voltage: 0-10 VDC, Accuracy $\pm 0.5\%$ Current: 4-20 mA with 500 ohm external resistor Resistor: Thermistor Type 2, Type 3; 10k ohm Range -40 to 125°C; -40 to 257°F Accuracy: $\pm 0.5^\circ\text{C}$ ; $\pm 0.9^\circ\text{F}$ Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: 10K ohm Up to 16 point translation table configuration Input Resolution: 12 bits analog/digital converter
<b>Outputs</b>	Number: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0-10 VDC (linear), PWM or digital 0-12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse: 60mA @ 60°C; 140°F; 100mA @ 20°C; 68°F Analog Output Resolution: 8 bits digital/analog converter

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*

## Metasys System LN Series Heat Pump Unit (HPUL) Controller

<b>Product</b>	Metasys System LN Series Heat Pump Unit Controller (LN-HPUL-1)
<b>Power</b>	Voltage: 24VAC, $\pm 15\%$ , 50/60Hz or 24 VAC* Typical Consumption: 5 VA Maximum Consumption: 10 VA Protection: 1.35 Ampere Auto-Reset Fuse *must be powered by a 24 VAC, Class 2 power supply
<b>Environmental</b>	Operating Temperature: 0°C to 70°C, 32°F to 158°F Storage Temperature: -20°C to 70°C, -4°F to 158°F Relative Humidity: 0 to 90% Noncondensing
<b>General</b>	Standard: LONMARK Functional Profile Heat Pump Unit #8051 Processor: Neuron 3150; 8 bits; 10 MHz Memory: Flash 64 K (APB application and configuration properties) Communication: LonTalk Protocol Media Channel: TP/FT-10; 78 kbps Transceiver: Echelon Free Topology Transceiver (FTT-10) Enclosure Material: Metal 18 AWG Dimensions: 127 mm x 165 mm x 33 mm (5 in. x 6.5 in. x 1.3 in.) Weight: 0.67 kg (1.48 lbs) Safety: UL Listed
<b>Inputs</b>	Number: 6 Universal Software Configurable Digital: Dry Contact Voltage: 0-10 VDC, Accuracy $\pm 0.5\%$ Current: 4-20 mA with 500 ohm external resistor Resistor: Thermistor Type 2, Type 3, 10k ohm Range -40 to 125°C; -40 to 257°F Accuracy: $\pm 0.5^\circ\text{C}$ ; $\pm 0.9^\circ\text{F}$ Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: 10K ohm Up to 16 point translation table configuration Input Resolution: 12 bits analog/digital converter
<b>Outputs</b>	Number: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0-10 VDC (linear), PWM or digital 0-12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse: 60mA @ 60°C; 140°F; 100mA @ 20°C; 68°F Analog Output Resolution: 8 bits digital/analog converter

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*

## Metasys System LN Series Unit Ventilator (UVL) Controller

<b>Product</b>	Metasys System LN Series Unit Ventilator Controller (LN-UVL-1)
<b>Power</b>	Voltage: 24VAC, $\pm 15\%$ , 50/60Hz or 24 VAC* Typical Consumption: 5 VA Maximum Consumption: 10 VA Protection: 1.35 Ampere Auto-Reset Fuse *must be powered by a 24 VAC, Class 2 power supply
<b>Environmental</b>	Operating Temperature: 0°C to 70°C, 32°F to 158°F Storage Temperature: -20°C to 70°C, -4°F to 158°F Relative Humidity: 0 to 90% Noncondensing
<b>General</b>	Standard: LONMARK Functional Profile Unit Ventilator #8080 Processor: Neuron 3150; 8 bits; 10MHz Memory: Flash 64 K (APB application and configuration properties) Communication: LonTalk Protocol Media Channel: TP/FT-10; 78 kbps Transceiver: Echelon Free Topology Transceiver (FTT-10) Enclosure Material: Metal 18 AWG Dimensions: 127 mm x 165 mm x 33 mm (5 in. x 6.5 in. x 1.3 in.) Weight: 0.67 kg (1.48 lbs) UL Listed
<b>Inputs</b>	Number: 6 Universal Software Configurable Digital: Dry Contact Voltage: 0-10 VDC, Accuracy $\pm 0.5\%$ Current: 4-20 mA with 500 ohm external resistor Resistor: Thermistor Type 2, Type 3; 10k ohm Range -40 to 125°C; -40 to 257°F Accuracy: $\pm 0.5^\circ\text{C}$ ; $\pm 0.9^\circ\text{F}$ Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: 10K ohm Up to 16 point translation table configuration Input Resolution: 12 bits analog/digital converter
<b>Outputs</b>	Number: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0-10 VDC (linear), PWM or digital 0-12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse: 60mA @ 60°C; 140°F; 100mA @ 20°C; 68°F Analog Output Resolution: 8 bits digital/analog converter

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



**Controls Group**  
507 E. Michigan Street  
P.O. Box 423  
Milwaukee, WI 53201

Published in U.S.A.  
[www.johnsoncontrols.com](http://www.johnsoncontrols.com)

# LX Series Application-Specific Controllers

## Product Bulletin

LX-FCUL-1, LX-RTUL-1, LX-HPUL-1, LX-UVL-1

Code No. LIT-12011494

Issued June 22, 2009

The LX Series application-specific controller family includes the Fan Coil Unit (FCUL), Rooftop Unit (RTUL), Heat Pump Unit (HPUL), and Unit Ventilator (UVL) controllers.

The LX Series application-specific controllers can be configured in FX Workbench with easy-to-use wizards. The wizards are designed to simplify complex programming and sequencing methods by prompting the user for the necessary configuration data. The controllers automatically select the operation sequence from the wizard input and output configuration and from the network variables.

The LX Series application-specific controller family is built to meet rigorous quality standards. The complete family of controllers is designed for use with any LONWORKS® network open and interoperable system.



**Figure 1: One Member of the LX Series Application-Specific Controller Family (LX-HPUL-1)**

**Table 1: Features and Benefits**

Features	Benefits
<b>LONWORKS Network Compliant and Certified</b>	Complies with LONMARK® Interoperability guidelines Version 3.4. The controllers are based on Echelon® LONWORKS technology for peer-to-peer communication between controllers. Each controller qualifies for the LONMARK Functional Profile for each application.
<b>Ability to Link Spare Input/Output (I/O) Points to Other Controllers on the Network; Stand-Alone Unit or Part of a Network System</b>	Provides great network flexibility and interaction.
<b>Variable Speed Fan Controlling</b>	Offers greater control options.
<b>Powerful and Intuitive Wizards</b>	Provides easy customization of hardware I/O, control sequences, and communication schemes.
<b>64 K Flash Memory</b>	Offers large storage area for application setting and control sequences.

## LX Series Application-Specific Controllers Overview

The LX Series application-specific controllers are microprocessor-based controllers designed to control almost any fan coil, rooftop, unit ventilator, or heat pump application. The controllers use the LONWORKS communication protocol and are LONMARK certified using the fan coil, rooftop, unit ventilator, or heat pump profile.

The LX Series application-specific controllers provide features such as Optimal Start, load shedding, frost protection, slave operation mode, and changeable type Network Variable (NV).

See Figure 2 for the dimensions of the LX Series application-specific controller family.

### **Fan Coil Unit (FCUL) Controller**

The LX Series Fan Coil Unit controller has the following applications:

- two-pipe coil shared cooling and heating and four pipe coil cooling and heating
- fan-coil applications including cooling only, heating only, and cooling and heating
- up to three stages of cooling or heating
- digital, floating, or modulating valves application
- support for a wide range of sensors and actuators

See Figure 3 for the LONMARK objects and network variables for the Fan Coil Unit controller.

### **Rooftop Unit (RTUL) Controller**

The LX Series Rooftop Unit controller has the following applications:

- requirements met for any rooftop unit application with or without an economizer
- rooftop applications including mechanical stages, modulating valves, and floating outputs
- up to four stages of cooling or heating

- management for humidity control devices
- support for a wide range of sensors and actuators

See Figure 4 for the LONMARK objects and Network Variables for the Rooftop Unit controller.

### **Heat Pump Unit (HPUL) Controller**

The LX Series Heat Pump Unit controller has the following applications:

- requirements met for any heat pump unit application
- heat pump applications including dual mode heat pumps, modulating valves, and water to refrigerant heat pumps
- up to four stages of cooling or heating
- support for a wide range of sensors and actuators
- defrost cycle for system maintenance
- dehumidification cycle

See Figure 5 for the LONMARK objects and Network Variables for the Fan Coil Unit controller.

### **Unit Ventilator (UVL) Controller**

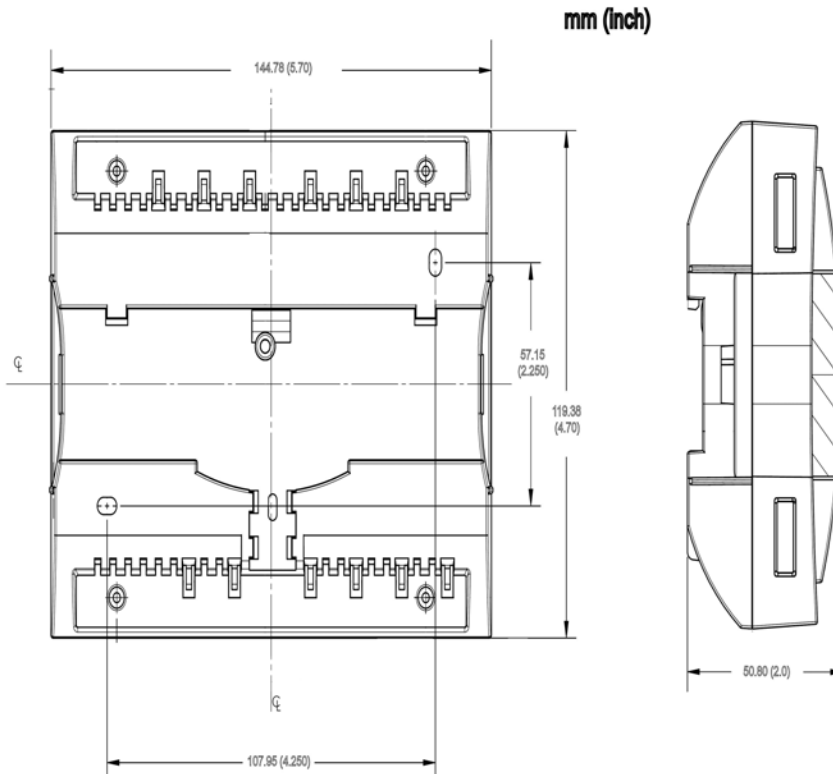
The LX Series Unit Ventilator controller has the following applications:

- requirements met for any unit ventilator application
- combination hot and chilled water coil (two-pipe), separate hot and chilled water coils (four-pipe), hot water coil and direct-expansion coil, electric heating coil and chilled water or direct-expansion coil, gas fired furnace with direct expansion coil
- up to four stages of cooling (reversible) or heating
- support for a wide range of sensors and actuators
- dehumidification cycle

See Figure 6 for the LONMARK objects and Network Variables for the Fan Coil Unit controller.

## Dimensions

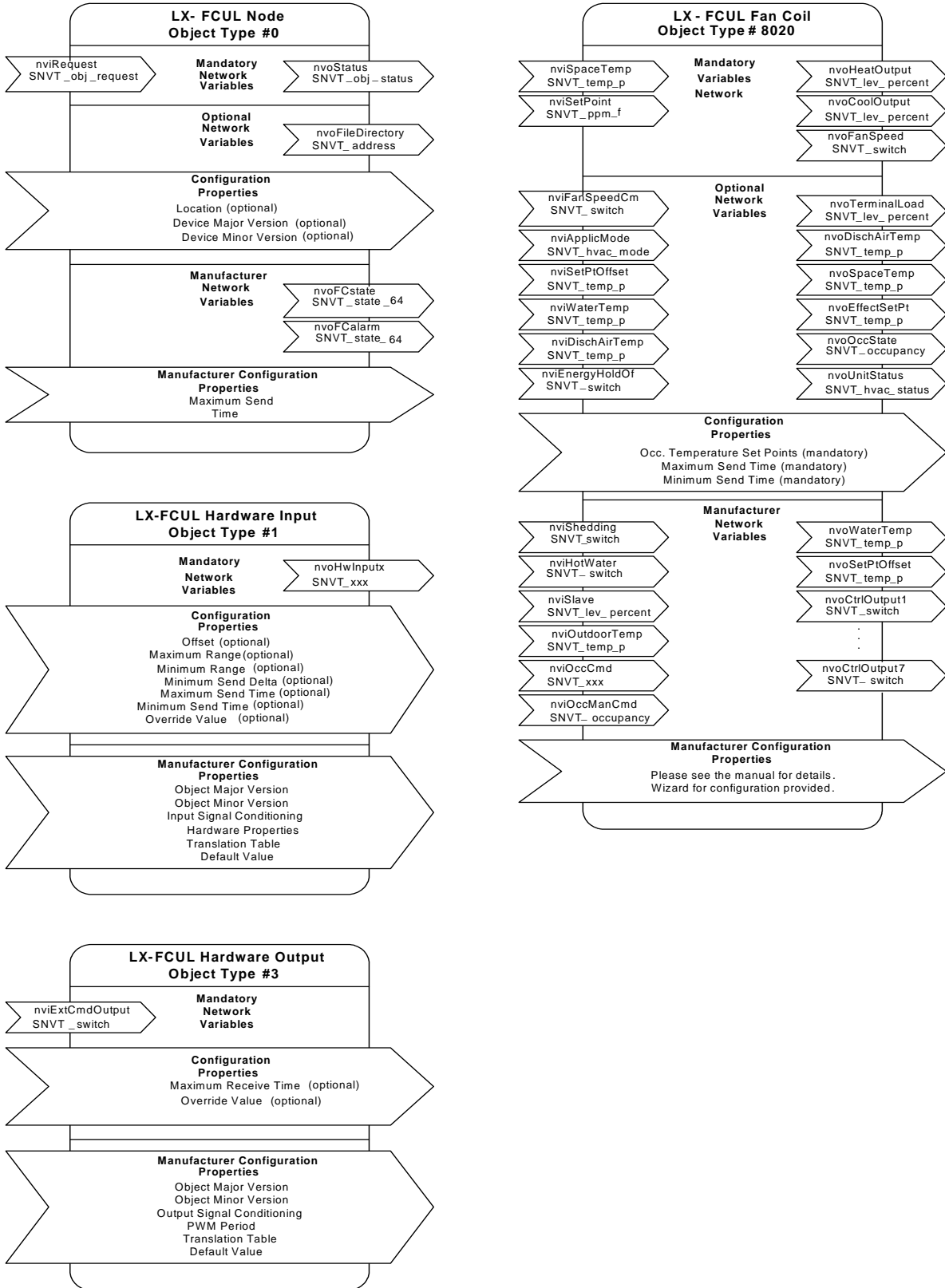
Figure 2 shows the dimensions for the LX application-specific controllers..



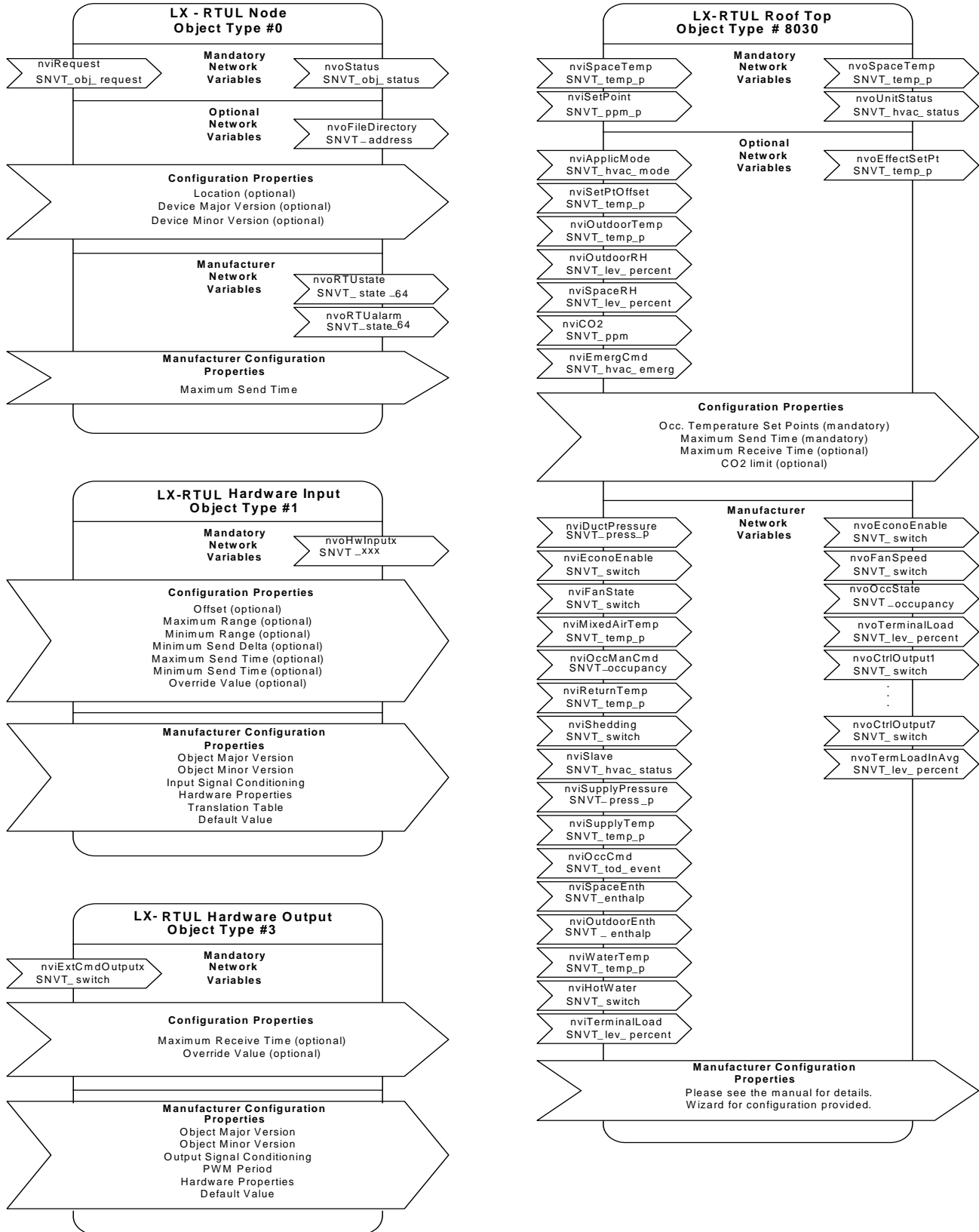
**Figure 2: LX Series Application Specific Controller Dimensions**

### ***LONMARK Objects and Network Variables***

The following figures show the LONMARK Objects and Network Variables for the Application-Specific Controllers when you use the LX wizards.

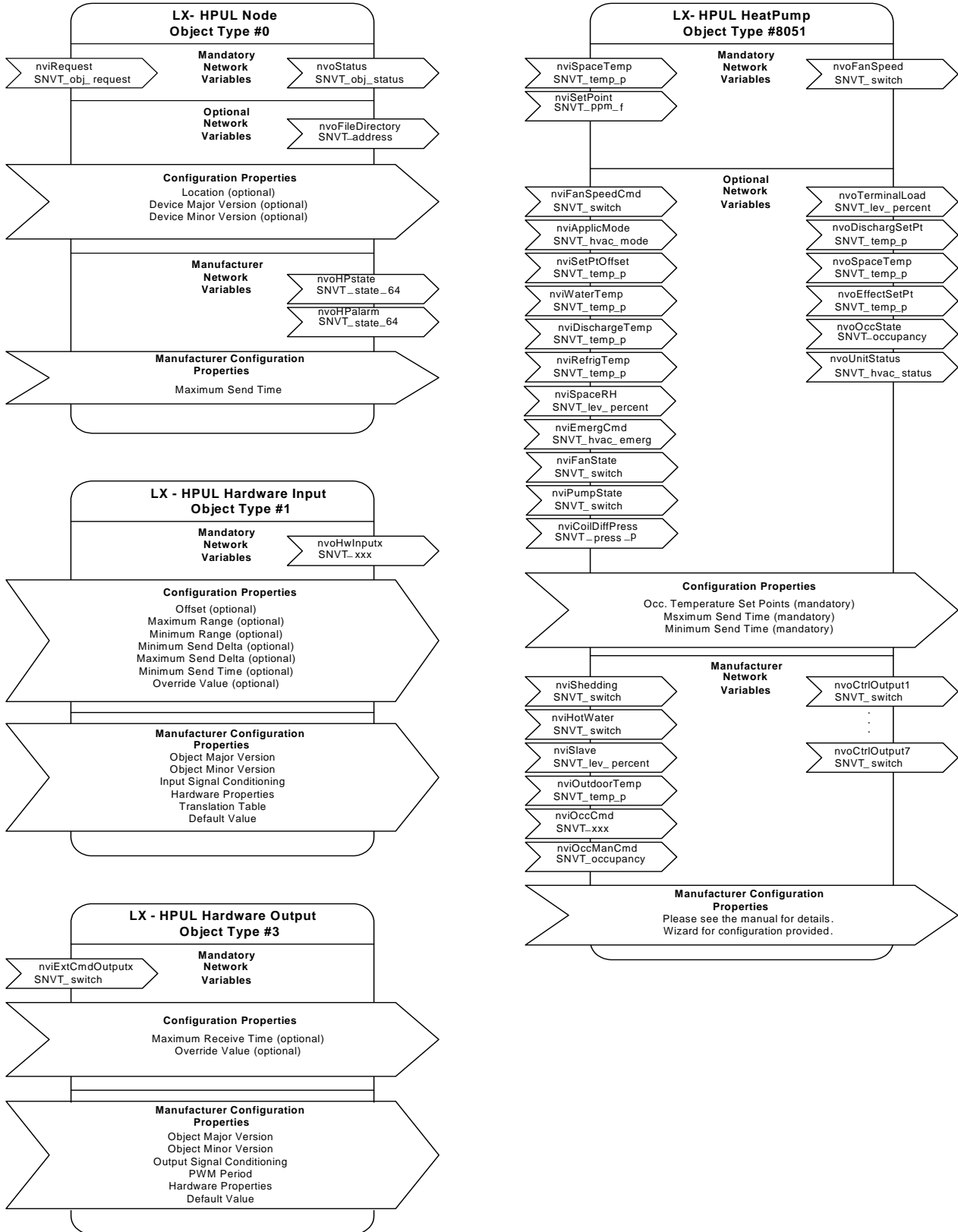


**Figure 3: LX-Series FCUL LONMARK Objects and Network Variables (LX-FCUL-1)**

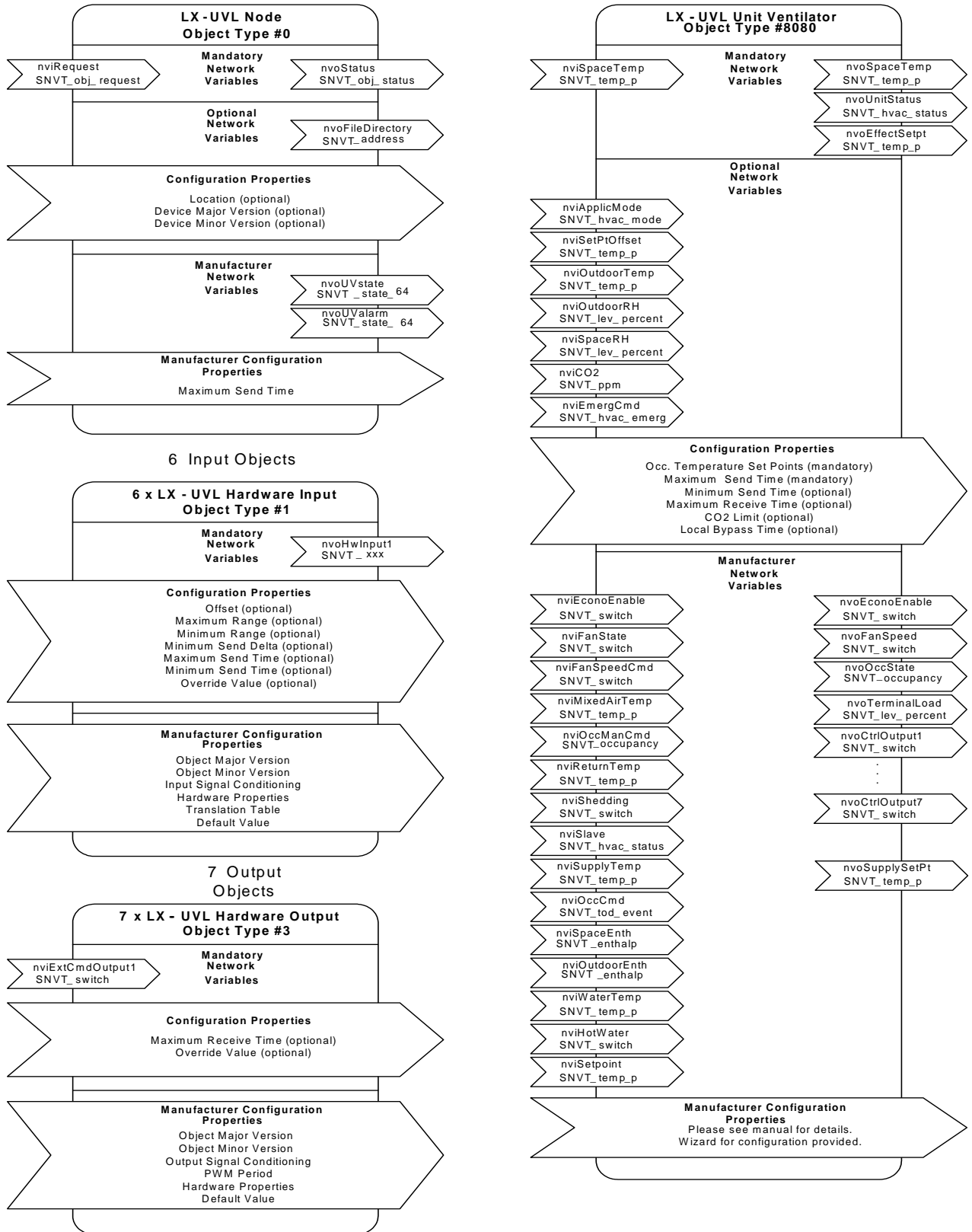


**Figure 4: LX RTUL LONMARK Objects and Network Variables (LX-RTUL-1)**





**Figure 5: LX HPUL LonMARK Objects and Network Variables (LX-HPUL-1)**



**Figure 6: LX UVL LONMARK Objects and Network Variables (LX-UVL-1)**

## Technical Specifications

### LX Fan Coil Unit Controller LX-FCUL-1

<b>Product Code</b>	LX-FCUL-1
<b>Power Requirement</b>	Voltage: 24 VAC/DC; $\pm 15\%$ , 50/60 Hz, Class 2 (must be powered by a 24 VAC, Class 2 power supply) Protection: 1.35 A auto-reset fuse Consumption: 6 VA Maximum Consumption: 15 VA
<b>Ambient Conditions</b>	Ambient Operating Temperature: 0 to 70°C (32 to 158°F) Ambient Storage Temperature: -20 to 70°C (-4 to 158°F) Ambient Relative Humidity: 0 to 90% noncondensing
<b>General</b>	Standard: LONMARK Functional Profile Fan Coil Unit #8020 Processor: Neuron® 3150®, 8-bit, 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Communication Jack: LON audio jack mono 1/8 in. (3.5 mm) Transceiver: Echelon Free Toplogy Transceiver (FT-X1)
<b>Enclosure</b>	Material: ABS PA-765A Dimensions: 144.8 x 119.4 x 50.8 mm (5.7 x 4.7 x 50.8 in.) Shipping Weight: 0.77 lb (0.35 kg)
<b>Inputs</b>	Quantity: 6 universal software configurable Input Types: Digital: Dry Contact Voltage: 0 to 10 VDC, Accuracy $\pm 0.5\%$ Current: 4 to 20 mA with 500 ohm external resistor Resistor Support: Thermistor: Type 2 and Type 3 10k ohm Range: -40 to 125°C, (-40 to 257°F) Accuracy: $\pm 0.5^\circ\text{C}$ ; $\pm 0.9^\circ\text{F}$ Resolution: 0.1°C; 0.18°F Potentiometer: translations table configurable on several points, accuracy $\pm 0.5\%$ Up to 16 point translation table configuration Input Resolution: 12-bit analog/digital converter
<b>Outputs</b>	Quantity: 7 5 Digital: Triac 1.0 A at 24 VAC external power supply 2 Universal: 0 to 10 VDC (linear), PWM or digital (0 to 12 VDC) PWM output: adjustable period from 2 seconds to 15 minutes 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse 60 mA at 60°C; 140°F, 100mA at 20°C; 68°F Analog Output Resolution: 8-bit digital/analog converter
<b>Compliance</b>	UL 916 Energy Management Equipment, material UL94-5VA

### LX Rooftop Unit Controller LX-RTUL-1 (Part 1 of 2)

<b>Product Code</b>	LX-RTUL-1
<b>Power Requirement</b>	Voltage: 24 VAC/DC; $\pm 15\%$ , 50/60 Hz, Class 2 Protection: 1.35 A auto-reset fuse Consumption: 6 VA Maximum Consumption: 15 VA

**LX Rooftop Unit Controller LX-RTUL-1 (Part 2 of 2)**

<b>Ambient Conditions</b>	Ambient Operating Temperature: 0 to 70°C, (32 to 158°F) Ambient Storage Temperature: -20 to 70°C, (-4 to 158°F) Ambient Relative Humidity: 0 to 90% noncondensing
<b>General</b>	Processor: Neuron® 3150®, 8-bit, 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Transceiver: Echelon Free Toplogy Transceiver (FT-X1)
<b>Enclosure</b>	Material: ABS PA-765A Dimensions: 144.8 x 119.4 x 50.8 mm (5.7 x 4.7 x 50.8 in.) Shipping Weight: 0.77 lb (0.35 kg)
<b>Inputs</b>	Quantity: 6 universal software configurable Input Types: Digital: Dry Contact Voltage: 0 to 10 VDC, Accuracy ± 0.5% Current: 4 to 20 mA with 500 ohm external resistor Resistor Support: Thermistor: Type 2 and Type 3 10k ohm Range: -40 to 125°C, (-40 to 257°F) Accuracy: ± 0.5°C; ± 0.9°F Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: 10K ohm Up to 16 point translation table configuration Input Resolution: 12-bit analog/digital converter
<b>Outputs</b>	Quantity: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0 to 10 VDC (linear), PWM or digital 0 to 12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse 60 mA at 60°C;140°F, 100mA at 20°C; 68°F Analog Output Resolution: 8-bit digital/analog converter

**LX Heat Pump Unit Controller (LX-HPUL-1) (Part 1 of 2)**

<b>Product Code</b>	LX-HPUL-1
<b>Power Requirement</b>	Voltage: 24 VAC/DC; ±15%, 50/60 Hz, Class 2 Protection: 1.35 A auto-reset fuse Consumption: 6 VA Maximum Consumption: 15 VA
<b>Ambient Conditions</b>	Ambient Operating Temperature: 0 to 70°C, (32 to 158°F) Ambient Storage Temperature: -20 to 70°C, (-4 to 158°F) Ambient Relative Humidity: 0 to 90% noncondensing
<b>General</b>	Processor: Neuron® 3150®, 8-bit, 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Transceiver: Echelon Free Toplogy Transceiver (FTT-10)

**LX Heat Pump Unit Controller (LX-HPUL-1) (Part 2 of 2)**

<b>Enclosure</b>	Material: ABS PA-765A Dimensions: 144.8 x 119.4 x 50.8 mm (5.7 x 4.7 x 50.8 in.) Shipping Weight: 0.77 lb (0.35 kg)
<b>Inputs</b>	Quantity: 6 universal software configurable Input Types: Digital: Dry Contact Voltage: 0 to 10 VDC, Accuracy $\pm 0.5\%$ Current: 4 to 20 mA with 500 ohm external resistor Resistor Support: Thermistor: Type 2 and Type 3 10k ohm Range: -40 to 125°C, (-40 to 257°F) Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: Up to 16 point translation table configuration Input Resolution: 12-bit analog/digital converter
<b>Outputs</b>	Quantity: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0 to 10 VDC (linear), PWM or digital 0 to 12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse 60 mA at 60°C;140°F, 100mA at 20°C; 68°F Analog Output Resolution: 8-bit digital/analog converter

**LX Unit Ventilator Controller (LX-UVL-1) (Part 1 of 2)**

<b>Product Code</b>	LX-UVL-1
<b>Power Requirement</b>	Voltage: 24 VAC/DC; $\pm 15\%$ , 50/60 Hz, Class 2 Protection: 1.35 A auto-reset fuse Consumption: 6 VA Maximum Consumption: 15 VA
<b>Ambient Conditions</b>	Ambient Operating Temperature: 0 to 70°C, (32 to 158°F) Ambient Storage Temperature: -20 to 70°C, (-4 to 158°F) Ambient Relative Humidity: 0 to 90% noncondensing
<b>General</b>	Processor: Neuron® 3150®, 8-bit, 10 MHz Memory: Nonvolatile Flash 64k (APB application and configuration properties) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Transceiver: Echelon Free Toplogy Transceiver (FTT-10)
<b>Enclosure</b>	Material: ABS PA-765A Dimensions: 144.8 x 119.4 x 50.8 mm (5.7 x 4.7 x 50.8 in.) Shipping Weight: 0.77 lb (0.35 kg)

## LX Unit Ventilator Controller (LX-UVL-1) (Part 2 of 2)

<b>Inputs</b>	Quantity: 6 universal software configurable Input Types: Digital: Dry Contact Voltage: 0 to 10 VDC, Accuracy $\pm 0.5\%$ Current: 4 to 20 mA with 500 ohm external resistor Resistor Support: Thermistor: Type 2 and Type 3 10k ohm Range: -40 to 125°C, (-40 to 257°F) Resolution: 0.1°C; 0.18°F Min/Max linear configuration Potentiometer: Up to 16 point translation table configuration Input Resolution: 12-bit analog/digital converter
<b>Outputs</b>	Quantity: 7 5 Digital: Triac 1.0 A at 24 VAC External Power Supply 2 Tri-mode Analog: 0 to 10 VDC (linear), PWM or digital 0 to 12 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Maximum load 200 ohm Auto reset fuse 60 mA at 60°C;140°F, 100mA at 20°C; 68°F Analog Output Resolution: 8-bit digital/analog converter

*The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls® office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



**Building Efficiency**  
507 E. Michigan Street, Milwaukee, WI 53202

*Johnson Controls® is a registered trademark of Johnson Controls, Inc.  
All other marks herein are the marks of their respective owners. © 2009 Johnson Controls, Inc.*