

LN Series LN-VAVCF Controller

Product Bulletin

LN-VAVCF-2

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The LN Series LN-VAVCF controller uses the latest technology to provide more flexibility and reliability. The LN-VAVCF controllers can be programmed very easily using any LNS® based program, such as LN Builder. The LN-VAVCF controller features a drift-free differential pressure sensor that resists loss of accuracy over time due to dust particle accumulation.

The LN-VAVCF controller uses the LonTalk® communication protocol and is LONMARK® certified with the Sensor profile (#1) for input object and the Actuator profile (#3) for the output objects.



Figure 1: LN Series VAVCF Controller

Table 1: Features and Benefits

Feature	Benefit
Software	Features Network Variable Inputs and Outputs (NVI/NVOs) with changeable types and lengths. Supports fan-in binding for zoning applications. All objects (programming, schedule, real time clock) are configurable through their own LNS plug-in or with LN Graphical Programming Interface (GPI) software.
Hardware	Allows you to use any commercially available thermistor type (100 ohms to 100k ohms) and setpoint potentiometer type. Features an extremely accurate onboard airflow sensor for pressure independent single duct Variable Air Volume (VAV) applications. Can read differential pressure as small as 0.04 milli-inches.
Robust Communications Protocol	Complies with LONWORKS® technology for interoperability and peer-to-peer communication between controllers without the necessity of intermediary agents.
Free Programmable Object	Allows you to view all internal points using 10 UNVT and 15 values of each object. The LN-VAVCF controller offers many programming tools like Proportional plus Integral plus Derivative (PID), timers, and optimum start.
Wireless Functionality	Features an optional EnOcean® wireless receiver that you can use with a variety of wireless sensors and switches. The wireless receiver supports up to 14 wireless inputs, which allow you to create wire-free installations.

LN-VAVCF Controller Overview

The LN-VAVCF controller uses the free programmable plug-in, which allows you to easily use the graphical interface with the power and flexibility of a code editor and compiler. Johnson Controls® Free Programmable Plug-in uses a unique and simplified version of BASIC that is custom-made to suit any control requirements. Through the original combination of built-in functions and an easy to use Graphical User Interface (GUI), the LN-VAVCF controller offers you the very best in modular control programming.

Software Plug-ins

The plug-ins simplify complex programming and sequencing methods by prompting users for the necessary configuration data.

Free Programmable Plug-in

The Free Programmable Plug-in is unique in the Controls industry because it combines an easy to use graphical interface with the power and flexibility of a code editor and compiler. We added a new built-in commands have been added in the LN Series LN-VAVCF models of Free Programmable controllers, like the Square Root (SQRT) function that calculates the square root of a value

LNS LN Graphical Programming Interface (GPI) Plug-in

The LN Graphical Programming Interface Plug-in tool is a programming tool that allows for the building of control sequences by dragging and dropping block objects and then linking the objects with a simple click, select, and release. With a user-friendly interface and intuitive programming environment, GPI makes Heating, Ventilating, and Air Conditioning (HVAC) programming easier than ever.

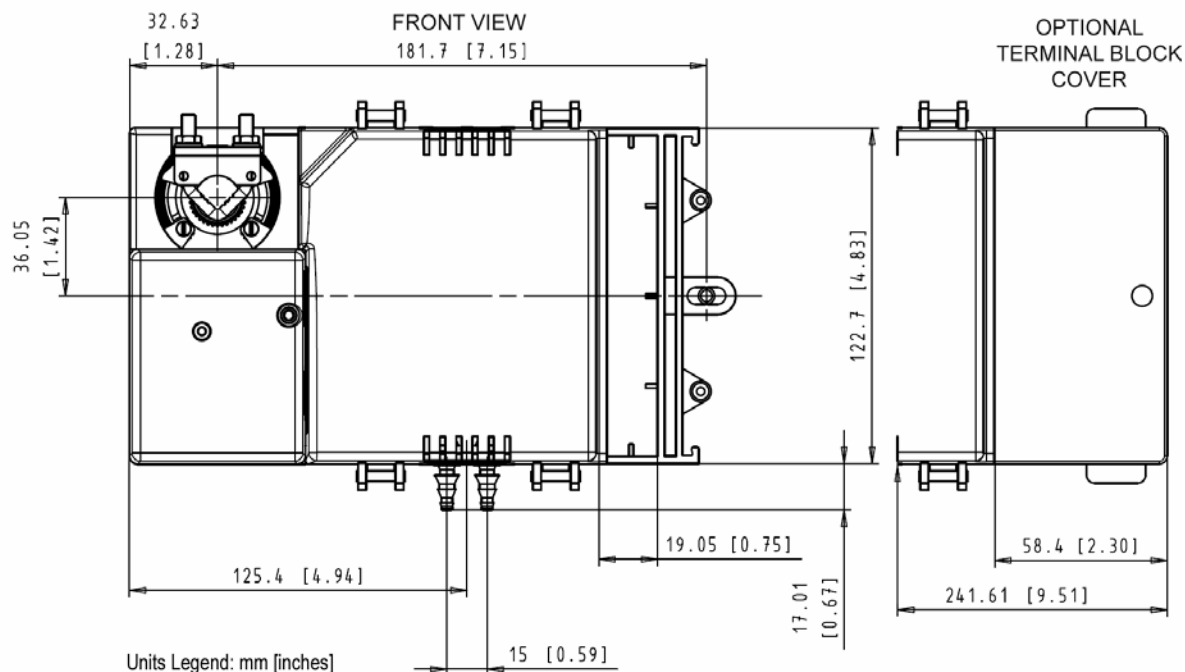


Figure 2: LN-VAVCF Dimensions, mm (in.)

LONMARK Objects and Network Variables

Figure 3 shows the LN-VAVCF LONMARK Objects and Network Variables when you program the controller with LN GPI software. Figure 4 shows the LN-VAVCF LONMARK Objects and Network Variables when you use LN Free Programmable Plug-in.

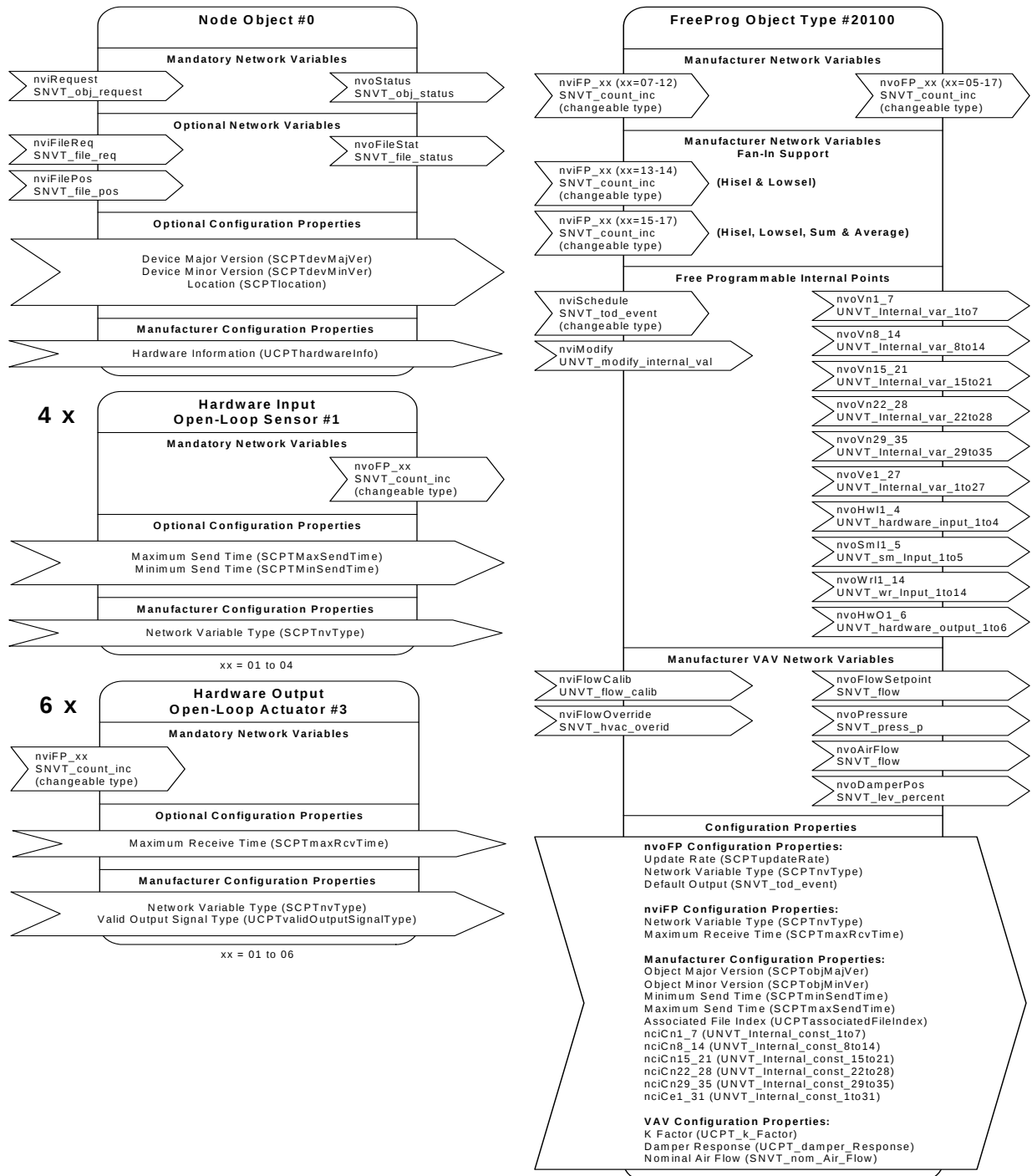


Figure 3: GPI LONMARK Objects and Network Variables--LN-VAVCF

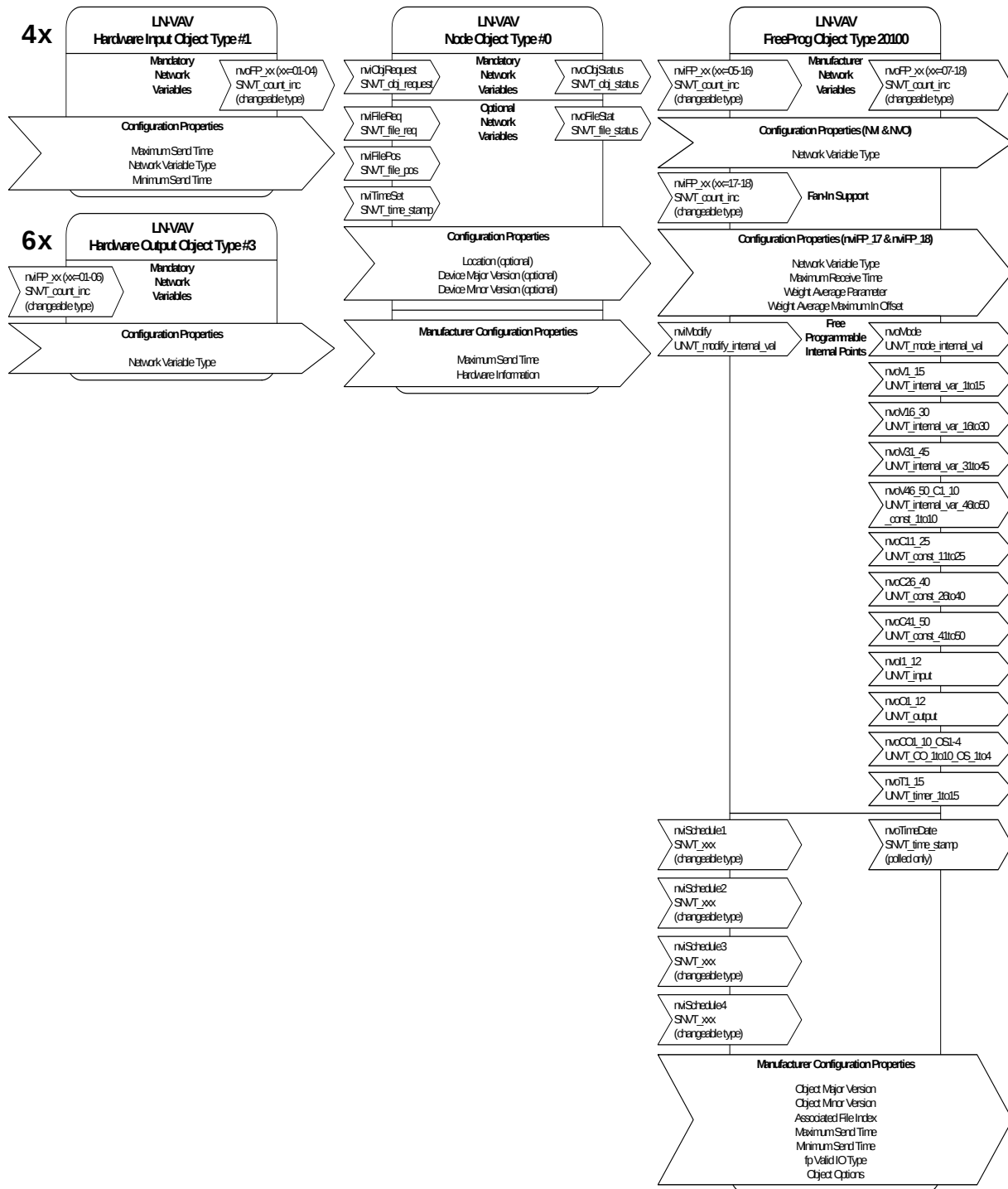


Figure 4: LN Free Programmable Plug-in: LONMARK Objects and Network Variables--LN-VAVCF

Technical Specifications

LN-VAVCF (Part 1 of 2)

Product Code	LN-VAVCF-2
Power Requirements	Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 3 A user-replaceable fuse for triac when using the internal power supply Consumption: 18 VA; triac outputs (2 valves at 4 VA) and 2 outputs with 20 mA load at 12 VDC Maximum Consumption: 70 VA if internal power supply is used
Ambient Storage Conditions	Ambient Operating Temperature: 0 to 50° C (32 to 122° F) Ambient Storage Temperature: -20 to 50° C (-4 to 122° F) Ambient Storage Conditions: 0 to 90% noncondensing
General	Processor: Neuron® 3150™, 8 bits, 10 MHz Memory: Non-volatile Flash 128k (storage) Non-volatile Flash 64k (APB application) Media Channel: TP/FT-10, 78 Kbps Communication: LonTalk® protocol LONMark Interoperability: Version 3.4 Device Class: Multi Input/Output (I/O) Module LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open-Loop Sensor #3
Enclosure (Housing)	Material: FR/ABS Resin Dimensions (with screws): 4.8 x 8.4 x 2.5 in. (12.7 x 214.3 x 63.0 mm) Shipping Weight: 2.30 lbs (1.05 kg)
Inputs	Universal, software configurable Input Types: Voltage: 0 to 10 VDC Digital: Dry Contact, Analog current: 4-20 mA with 249 ohms external resistor Resistor Support: Thermistor: 10 ohms Type, 2, 3 (1k ohms at 25°C [77°F]) Range: -40 to 150°C (-40 to 302°F) Platinum: Pt1000 (1k ohms at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Pt100 (1k ohms at 0°C, 32°F) Range: -40 to 150°C (-40 to 302°F) Nickel: RTD Ni1000 (1k ohms at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Potentiometer: translation table configurable on several points Differential Pressure: Range 0 to 250 Pa (0 to 1 in. H ₂ O) Resolution: 0.000162 mill-in. H ₂ O Accuracy: $\pm 3\%$ full scale Input Resolution: 16-bit analog/digital converter

LN-VAVCF (Part 2 of 2)

Outputs	Digital: 24 VAC Triac, digital (on/off), PWM, or floating¹, software configurable 0.5 A continuous PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs¹ Minimum pulse on/off: 500 milliseconds Adjustable drive time period External or Internal power supply (jumper selectable) Digital LED occupancy output: 0-10 VDC dedicated output for occupancy sensor LED Maximum 20 mA Universal: 0-10 VDC linear, digital 0-12 VDC (on/off), floating or PWM PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs¹ Minimum pulse on/off: 500 milliseconds Adjustable drive time period 20 mA max at 12 VDC, Minimum load 600 ohms Output Resolution: 10-bit digital/analog converter
Damper Actuator	Torque: 35 in-lb, 4 N·m Degree of Rotation: 95° adjustable Fits Shaft Diameter: 5/16 to 3/4 in. (8.5 to 18.2 mm)
Wireless Receiver	Communication: EnOcean wireless standard² Wireless Inputs: 14³ Wireless Receivers: Wireless Receiver 315, Wireless Receiver 868 Cable: telephone cord, connector: 4P4C modular jack, length: 6.5 ft (2 m)
Electromagnetic Compatibility	CE Emission: EN61000-6-3: 2007; generic standards for residential, commercial, and light-industrial environments CE Immunity: EN61000-6-1: 2007; generic standards for residential, commercial, and light-industrial environments
Compliance	UL Listed (US and CDN): UL916 Energy Management Equipment Material: UL94-5VA

1. Floating only available when controller is programmed with LN GPI software.
2. Available when an optional external Wireless Receiver is connected to the controller. Refer to the LN Wireless Location Guide for a list of supported EnOcean wireless modules.
3. Some wireless sensors may use more than one input from the controller.

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.

Federal Communication Commission (FCC) Compliance Statement

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 that may cause undesired operation. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Warning: Changes or modifications to this unit not expressly approved by Johnson Controls, Inc. could void the user authority to operate the equipment.

Canadian Compliance Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Industrie Canada.



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