

LN Series Free Programmable LN-PRG6x0-12 Controllers and LN Series Input/Output (I/O) Extension Modules

Description

The LN Series Free Programmable LN-PRG600-12 and LN-PRG610-12 Controllers are microprocessor-based and designed to control various building systems, such as multi-zone air handling units and central plant applications. The LN-PRG6x0-12 controllers use the LonTalk® communication protocol.

The controllers work with sensors, including the LN Series Communicating Sensors, to control and monitor indoor temperature and fan speed, and to adjust the setpoint.

The LN-PRG6x0-12 controllers support up to two Input/Output (I/O) extension modules that operate on a separate subnetwork, providing the LN-PRG6x0-12 controllers with up to 40 universal inputs and 36 universal outputs.

The LN-PRG6x0-12 controllers are built to meet rigorous quality standards and are designed for use with any LONWORKS® network open and interoperable system.

Features

- Configurable Software features an LNS® plug-in that provides the ability to easily configure inputs, outputs, and sequence options. Configured device complies with LONMARK® Space Comfort Control (SCC) profile for interoperability with other LonMark devices. Also features more than 60 network variables.

- Robust Hardware features a fire-retardant plastic enclosure, a 1 MB Flash memory for the configuration and trending of up to 12,000 events, and a status indicator on each output.
- Powerful Control Options allow easy configuration of all features, including input types, output types, heating and cooling stages, variable airflow, and Proportional plus Integral plus Derivative (PID) loops. The controller supports four input types: space temperature, setpoint adjustment, duct temperature, and occupancy bypass or window contacts.
- Wireless Functionality features an optional EnOcean® wireless receiver (LN-WMOD315-0 or LN-WMOD868-0) that you can use with a variety of wireless sensors and switches. The wireless receiver (LN-WMODxxx-0) supports up to 28 wireless sensors, which allow you to create wire-free installations.

Applications

The LN Series Free Programmable LN-PRG6x0-12 Controllers and LN Input/Output Extension Modules provide digital modulation, floating modulation, and Pulse Width Modulation (PWM), and proportional control for valves, pumps, heating elements, fan, and lighting applications. The LN-PRG610-12 controller also offers Hand-Off-Auto (HOA) switches and potentiometers for output manual override.



LN-PRG6x0-12 Controllers and I/O Extension Modules

The LN Series Free Programmable LN-PRG6x0-12 Controllers can be programmed using the LN Graphical Programming Interface (GPI) Plug-in with LN Builder software.

Repair Information

If the LN Series Free Programmable LN-PRG6x0-12 Controller fails to operate within specifications, replace the unit. For a replacement unit, contact the nearest Johnson Controls® representative.

Selection Chart

Product Code Number	Description
LN-PRG600-12	LONMARK® Certified Programmable Controller with 16 Universal Inputs (UI), 12 Universal Outputs (UO), and LNS Plug-in, 24 VAC, Wireless Option
LN-PRG610-12	LONMARK Certified Programmable Controller with 16 UI, 12 UO, Hand-Off-Auto (HOA) Switches, and LNS Plug-in, 24 VAC, Wireless Option
LN-IOE400-0	I/O Extension Module for LN-PRG6x0-2 with 12 UI, 12 UO, 24 VAC
LN-IOE410-0	I/O Extension Module for LN-PRG6x0-2 with 12 UI, 12 UO, 24 VAC, HOA Switches
LN-IOE420-0	I/O Extension Module for LN-PRG6x0-2 with 12 UI, 24 VAC

Technical Specifications

LN Series Free Programmable LN-PRG6x0-12 Controllers (Part 1 of 3)	
Product Codes	LN-PRG610-12 and LN-PRG600-12
Power Requirement	Voltage: 24 VAC/DC; ±15%, 50/60 Hz, Class 2 Protection: 3.0 A user-replaceable fuse Power Consumption: 22 VA typical plus all output loads Maximum Consumption: 60 VA
Environmental	Operating Temperature: 0 to 50°C, (32 to 122°F) Storage Temperature: -20 to 50°C, (-4 to 122°F) Relative Humidity: 0 to 90%

LN Series Free Programmable LN-PRG6x0-12 Controllers and LN Series Input/Output (I/O) Extension Modules (Continued)

LN Series Free Programmable LN-PRG6x0-12 Controllers (Part 2 of 3)	
General	Processor: STM32 (ARM Cortex™ M3) MCU, 32 bit Processor Speed: 72 MHz Memory: 1 MB Nonvolatile Flash (applications), 2 MB Nonvolatile Flash (storage) 96 KB RAM Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Transceiver: FT 5000 Free Topology Smart Transceiver Status Indicator: Green LED - power status and LON TX, Orange LED - service and LON RX Communication Jack: LON® mono audio jack LONMARK® Interoperability: Version 3.4 Device Class: Static Programmable Device LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open - Loop Sensor #3, Node Object: #0, Real Time Clock: Real Time Keeper #3300, Scheduler: Scheduler #20020, Calendar: Calendar #20030, Programmable Device: Static Programmable Device #410
Enclosure	Material: FR/ABS Dimensions (with screws): 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm) Shipping Weight: 1.17 lb (0.53 kg)
Inputs	Input Types: universal software configurable Voltage: 0 to 10 VDC (40k ohm input impedance) 0 to 5 VDC (high input impedance) Current: 0 to 20 mA with 249 ohm jumper configurable internal resistor Digital: dry contact Pulse: UI1 to UI4; 50 Hz maximum; Minimum 10 ms on/10 ms off, SO output compatible; UI5 to UI12: 1 Hz maximum; Minimum 500 ms on/500 ms off, dry contact Resistor: 0 to 350k ohms. All thermistor types that operate within this range are supported. The following temperature sensors are pre-configured: Thermistor: Type 2 and Type 3 10k ohm (10k ohm at 25°C [77°F]) Platinum: PT1000 1k ohm (1k ohm at 0°C [32°F]) Nickel: RTD Ni1000 (1k ohm at 0°C [32°F]) RTD Ni1000 (1k ohm at 21°C [69.8°F]) Input Resolution: 16-bit analog/digital converter Power Supply Output: 15 VDC; maximum 200 mA (16 inputs x 20 mA each)
Outputs	Universal: 0 to 10 VDC linear; digital (on/off), PWM, or floating (0 to 12 VDC) 0 to 20 mA (jumper configurable); software configurable. Built-in snubbing diode to protect against back EMF, for example, when used with a 12 VDC relay. PWM control: adjustable period from 2 to 65 seconds Floating control: minimum plus on/off: 500 ms adjustable drive time period HOA, Hand-Off-Auto switch (when equipped), hand position potentiometer range 0 to 12.5 VDC 60 mA maximum at 12 VDC (60°C; 140°F) Load Resistance: minimum resistance 200 ohm for 0 to 10 VDC and 0 to 12 VDC, maximum 500 ohm for 0 to 20 mA output Auto reset fuse: 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter
Wireless ¹	Communication: EnOcean® Wireless standard Number of Wireless Inputs: 28² Supported Wireless Receivers: LN-WMOD315-0 and LN-WMOD868-0 Telephone Cord Cable Connector: 4P4C modular jack, Length: 6.5 ft (2 m)
LN Series Communicating Sensors	Communication: RS-485 Number of sensors per controller: up to 12, in daisy-chain configuration Cable: Cat 5e, 8 conductor twisted pair Connector: RJ-45
Electromagnetic Compatibility	CE Emission: EN61000-6-3: 2007 Generic standards for residential, commercial, and light-industrial environments (pending). CE Immunity: EN61000-6-1: 2007; Generic standards for residential, commercial, and light-industrial environments (pending). FCC: This device complies with FCC rules part 15, subpart B, class B (pending).

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LN Series Free Programmable LN-PRG6x0-12 Controllers (Part 3 of 3)	
	United States: UL Listed: UL916 Energy management equipment Material ³ : UL94-5VA
	Canada: UL Listed: UL916 Energy management equipment Material ³ : UL94-5VA
	Europe: CE Mark – Johnson Controls, Inc. declares that the products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.

1. Available when an optional external Wireless Receiver is connected to the controller. Some wireless inputs may use more than one wireless input from the controller.
2. Some wireless modules may use more than one wireless input from the controller.
3. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive.

LN Input/Output (I/O) Extension Modules (Part 1 of 2)	
Product Code	LN-IOE400-0, LN-IOE410-0, LN-IOE420-0
Power Requirement	Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 3.0A user-replaceable fuse Power Consumption: 400/410: 50 VA maximum, 22 VA typical on all loads 420: 16 VA maximum, 10 VA typical on all loads
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 Relative Humidity: 0 to 90% noncondensing
Hardware	Processor: STM32 (ARM Cortex M3) MCU, 32 bit, 64 MHz Memory: 64 kB non-volatile Flash (applications and storage), 20 kB RAM Status Indicator: Green LEDs - power status and Sub-Network TX, Orange LEDs - service and Sub-Network RX
Enclosure	Material: FR/ABS Dimensions (with screws): 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm) Shipping Weight: 1.17 lb (0.53 kg)
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.
Enclosure	Material: UL94-5VA
Inputs	Input Types: universal; software configurable Voltage: 0 to 10 VDC (40k ohm input impedance), 0 to 5 VDC (high input impedance) Current: 0 to 20 mA with 249 ohm jumper configurable internal resistor Digital: dry contact Pulse: 1 Hz maximum 500 ms on/500 ms off, dry contact Resistor Support: 0 to 350k ohm. All thermistor types that operate in this range are supported. The following temperature sensors are pre-configured: Thermistor: Type II and Type III 10k ohm (10k ohm at 25°C [77°F]) Platinum: PT1000 1k ohm (1k ohm at 0°C [32°F]) Nickel: RTD Ni1000 (1k ohm at 0°C [32°F]) RTD Ni1000 (1k ohm at 21°C [69.8°F]) Input Resolution: 16-bit analog/digital converter Power Supply Output: 15 VDC; maximum 240 mA (12 inputs x 20 mA each)

LN Series Free Programmable LN-PRG6x0-12 Controllers and LN Series Input/Output (I/O) Extension Modules (Continued)

LN Input/Output (I/O) Extension Modules (Part 2 of 2)		
Outputs (LN-IOE400-0 and LN-IOE410-0 Modules Only)		Universal: 0 to 10 VDC linear, digital 0 to 12 VDC (on/off), PWM, floating, or 0 to 20 mA (jumper configurable); software configurable PWM control or 0 to 20 mA (jumper configurable): 4 to 20 mA software configurable. Built-in snubbing diode to protect against back EMF, for example when used with a 12 VDC relay. PWM control: adjustable period from 2 seconds to 15 minutes Floating control: minimum plus on/off: 500 ms adjustable drive time period Hand-Off-Auto (HOA) switch (when equipped): hand position potentiometer range 0 to 12.5 VDC 60 mA maximum at 12 VDC (60°C/ 140°F) Load Resistance: minimum resistance 200 ohm for 0 to 10 VDC and 0 to 12 VDC outputs; maximum 500k ohms for 0 to 20 mA output Auto reset fuse: 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter
	Compliance	United States UL Listed, File E107041, CCN PAZX, Under UL 916, Energy Management Equipment FCC Compliant to CFR 47, Part 15, Subpart B, Class A
		Canada UL Listed, File E107041, CCN PAZX7, Under CAN/CSA C22.2 No. 205, Signal Equipment Industry Canada, ICES-003
		Europe CE Mark – Johnson Controls, Inc., declares that the products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.