

LN Free Programmable PRG 600 Series Controllers and Input/Output (I/O) Extension Modules

Product Bulletin

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LN-PRG600-2, LN-PRG610-2, LN-IOE400-0,
LN-IOE410-0, LN-IOE420-0

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The LN Free Programmable PRG 600 Series Controllers are microprocessor-based free programmable controllers, designed to control various building systems, such as multi-zone air handing units and central plant applications. The 600 Series controllers use the LonTalk® communication protocol.

The PRG 600 Series controllers support up to 2 Input/Output extension modules that operate on a separate sub-network, providing the PRG 600 Series controller with up to 40 universal inputs and 36 universal outputs.

The LN Series Free Programmable controllers product family is built to meet rigorous quality standards. The complete family of Metasys® system LN Series controllers is designed for use with any LONWORKS® network open and interoperable system.



Figure 1: LN PRG 610 Controller and I/O Extension Module

Table 1: Features and Benefits

Features	Benefits
Configurable Software	Features an LNS® plug-in that provides the ability to easily configure inputs, outputs, and sequence options. You can use either LN GPI software or LN Builder to configure your controller.
Robust Hardware	Features a fire retardant plastic enclosure, a 1 MB Flash memory for the configuration and a status indicator on each output.
Powerful Control Options	Allow you to easily configure all features, including input types, output types, heating and cooling stages, variable airflow, and Proportional plus Integral plus Derivative (PID) loops.
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 28 wireless inputs which allow you to create wire-free installations.

LN Free Programmable 600 Series Controllers and I/O Extension Modules Overview

The LN Free Programmable 600 Series Controllers and I/O Extension Modules provide digital, floating, and Pulse Width Modulation (PWM), and proportional control for valves, pumps, heating elements, fan, and lighting applications. The LN-PRG610 controller also offers Hand-Off-Auto (HOA) switches and potentiometers for output manual override.

The LN Free Programmable 600 Series Controller line can be programmed using the LN Graphical Programming Interface (GPI) Plug-in with LN Builder 3.2 software.

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.

LNS LN-Scheduler Plug-in

The LN-Scheduler plug-in allows you to easily configure a weekly-based schedule and a special day schedule for holidays. Easily add and remove the special day event in and from the calendar by a simple click of the mouse.

Dimensions

Figure 2 shows the dimensions for the LN Free Programmable PRG 600 Series Controllers and Input/Output (I/O) Extension Modules.

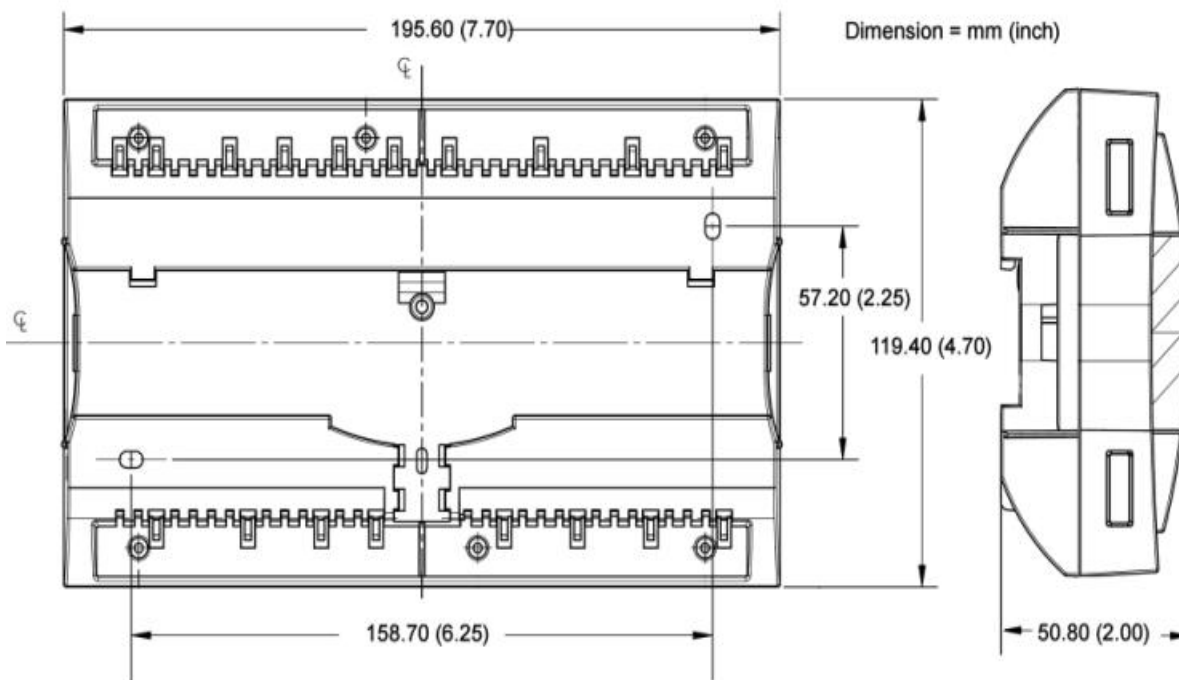


Figure 2: LN Free Programmable PRG 600 Series and I/O Extension Module Dimensions, mm (in.)

Controller Models

Table 2 shows the available controller models and I/O extension modules within this series.

Table 2: Controller Models

Controller Features	LN-PRG600-2	LN-PRG610-2	LN-IOE400-0	LN-IOE410-0	LN-IOE420-0
Points	28	28	24	24	24
Universal Inputs	16 ¹	16 ¹	12	12	12
Wireless Inputs ²	28	28	14	14	14
15 VDC Power Supply	X	X	X	X	X
HOA Switch and Potentiometer		X	-	X	-
Number of I/O extension Modules	2	2	-	-	-
Universal Outputs	12	12	12	12	0

1. The first four inputs are software configurable for pulse counting up to 50 Hz and are compatible with an SO rate (optically-isolated) output.
2. Available when optional Wireless Receiver is connected to the controller.

Selection Chart

Table 3: Selection Chart

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

Technical Specifications


LN Free Programmable PRG 600 Series Controllers (Part 1 of 3)

Product Code	LN-PRG600-2 and LN-PRG610-2
Power Requirement	Voltage: 24 VAC/DC; ±15%, 50/60 Hz, Class 2 Protection: 3.0A user-replaceable fuse Power Consumption: 22 VA typical plus all output loads Maximum Consumption: 65 VA
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

LN Free Programmable PRG 600 Series Controllers (Part 2 of 3)

General	<p>Processor: STM32 (ARM Cortex™ M3) MCU, 32 bit</p> <p>Processor Speed: 72 MHz</p> <p>Memory: 1 MB Nonvolatile Flash (applications), 2 MB Nonvolatile Flash (storage) 96 kB RAM</p> <p>Media Channel: TP/FT-10; 78 Kbps</p> <p>Communication: LonTalk® protocol</p> <p>Status Indicator: Green LED - power status and LAN TX, Orange LED - service and LAN RX</p> <p>Communication Jack: TP/FT-10; 78 Kbps, 1/8 in (3.5 mm)</p> <p>LONMARK Interoperability: Version 3.4</p> <p>Device Class: Static Programmable Device</p> <p>LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open - Loop Sensor #3, Real Time Clock: Real Time Keeper #3300, Scheduler: Scheduler #20020, Calendar: Calendar #20030, Programmable Device: Static Programmable Device #410</p>
Enclosure	<p>Material: FR/ABS</p> <p>Dimensions (with screws): 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm)</p> <p>Shipping Weight: 1.17 lb (0.53 kg)</p>
Inputs	<p>Input Types: universal software configurable</p> <p>Voltage: 0 to 10 VDC (40k ohm input impedance) 0 to 5 VDC (high input impedance)</p> <p>Current: 0 to 20 mA with 249 ohm jumper configurable internal resistor, Digital: dry contact</p> <p>Pulse: UI1 to UI4; 50 Hz maximum; Minimum 10 ms On/10 ms Off, dry contact UI5 to UI6: 1 Hz maximum; Minimum 500 ms On/500 ms Off, dry contact</p> <p>Resistor Support: 0 to 350k ohms. All thermistor types that operate within this range are supported. The following temperature sensors are pre-configured:</p> <p>Thermistor:</p> <p> Type 2 and Type 3 10k ohm (10k ohm at 25°C [77°F])</p> <p>Platinum:</p> <p> PT1000 1k ohm (1k ohm at 0°C [32°F])</p> <p>Nickel:</p> <p> RTD Ni1000 (1k ohm at 0°C [32°F]) RTD Ni1000 (1k ohm at 21°C [69.8°F])</p> <p>Input Resolution: 16-bit analog/digital converter</p> <p>Power Supply Output: 15 VDC; maximum 320 mA (16 inputs x 20 mA each)</p>
Outputs	<p>Universal: 0-10 VDC linear, digital 0 to 12 VDC (on/off), PWM, floating, or 0 to 20 mA (jumper configurable to 4 to 20 mA); software configurable. Built-in snubbing diode to protect against back EMF, for example when used with a 12 VDC relay.</p> <p>PWM control: adjustable period from 2 seconds to 15 minutes</p> <p>Floating control:</p> <p> minimum plus on/off: 500 ms adjustable drive time period</p> <p>Hands-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)</p> <p>Load Resistance: minimum resistance 200 ohms for 0 to 10 VDC and 0 to 12.5 VDC, maximum 500 ohm for 0 to 20 mA output</p> <p>Auto reset fuse</p> <p> 60 mA at 60°C (140°F) 100 mA at 20°C (68°F)</p> <p>Output Resolution: 10-bit digital/does analog converter</p>

LN Free Programmable PRG 600 Series Controllers (Part 3 of 3)


Wireless Receiver¹		Communication: EnOcean® Wireless standard Number of Wireless Inputs: 28 ² Supported Wireless Receivers: LN-WMOD315-0 and LN-WMOD868-0 Telephone Cord Cable: Connector: 4P4C modular jack, Length: 3 ft (1 m)
Enclosure		Material: UL94-5VA
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.
	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.	

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.

Input/Output (I/O) Extension Modules (Part 1 of 2)

Product Code	LN-IOE400-0, LN-IOE410-0, LN-IOE420-0
Power Requirement	<p>Voltage: 24 VAC/DC; ±15%, 50/60 Hz, Class 2</p> <p>Protection: 3.0A user-replaceable fuse</p> <p>Power Consumption: 400/410: 50 VA maximum, 22 VA typical on all loads 420: 16 VA maximum, 10 VA typical on all loads</p>
Ambient Storage Conditions	<p>Ambient Operating Temperature: 0 to 50°C, (32 to 122°F)</p> <p>Ambient Storage Temperature: -20 to 50°C, (-4 to 122°F)</p> <p>Ambient Relative Humidity: 0 to 90% noncondensing</p>
Hardware	<p>Processor: STM32 (ARM Cortex M3) MCU, 32 bit, 64 MHz</p> <p>Memory: 64 kB nonvolatile Flash (applications and storage), 20 kB RAM</p> <p>Status Indicator: Green LEDs - power status and Sub-Network TX, Orange LEDs - service and Sub-Network RX</p>
Enclosure	<p>Material: FR/ABS</p> <p>Dimensions (with screws): 7.7 x 4.7 x 2.0 in. (195.6 x 119.4 x 50.8 mm)</p> <p>Shipping Weight: 1.17 lb (0.53 kg)</p>
Electromagnetic Compatibility	<p>CE Emission: EN61000-6-3: 2007 Generic standards for residential, commercial, and light-industrial environments.</p> <p>CE Immunity: EN61000-6-1: 2007; Generic standards for residential, commercial, and light-industrial environments.</p>
Enclosure	Material: UL94-5VA
Inputs	<p>Input Types: universal; software configurable</p> <p>Voltage: 0 to 10 VDC (40k ohms input impedance), 0 to 5 VDC (high input impedance)</p> <p>Current: 0 to 20 mA with 249 ohm jumper configurable internal resistor</p> <p>Digital: dry contact</p> <p>Pulse: 1 Hz maximum 500 ms On/500 ms Off, dry contact</p> <p>Resistor Support: 0 to 350k ohms All thermistor types that operate in this range are supported. The following temperature sensors are pre-configured:</p> <p>Thermistor: Type II and Type III 10k ohm (10k ohm at 25°C [77°F])</p> <p>Platinum: PT1000 1k ohm (1k ohms at 0°C [32°F])</p> <p>Nickel: RTD Ni1000 (1k ohm at 0°C [32°F]) RTD Ni1000 (1k ohm at 21°C [69.8°F])</p> <p>Input Resolution: 16-bit analog/digital converter</p> <p>Power Supply Output: 15 VDC; maximum 240 mA (12 inputs x 20 mA each)</p>

Input/Output (I/O) Extension Modules (Part 2 of 2)

Outputs (LN-IOE400-0 and LN-IOE410-0 Modules Only)		<p>Universal: 0 to 10 VDC linear, digital 0 to 12 VDC (on/off), PWM, floating, or 0 to 20 mA (jumper configurable); software configurable</p> <p>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.</p> <p>PWM control: adjustable period from 2 seconds to 15 minutes</p> <p>Floating control: minimum plus on/off: 500 ms adjustable drive time period</p> <p>Hands-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)</p> <p>Load Resistance: minimum resistance 200 ohm for 0 to 10 VDC and 0 to 12 VDC outputs, maximum 500k ohm for 0 to 20 mA output</p> <p>Auto reset fuse: 60 mA at 60°C (140°F) 100 mA at 20°C (68°F)</p> <p>Output Resolution: 10-bit digital/analog converter</p>
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.

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.



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