

LN-PRG203-2, LN-PRG300-2, LN-PRG4x0-2, LN-PRG5x0-2

LN Series Free Programmable Controllers

Description

The LN Series Free Programmable Controllers are microprocessor-based free programmable controllers, designed to control various Heating, Ventilating, and Air Conditioning (HVAC) applications.

The Metasys® system 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.

Features

- configurable software - features LNS® plug-in that provides the ability to easily configure and program 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 128K Flash memory for the configuration and trending of up to 12,000 events, and a status indicator on each output.
- powerful control option - allows 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. 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 14 wireless inputs which allow you to create wire-free installations.



LN-PRG510 Controller

Repair Information

If the LN Series Free Programmable controllers fail to operate within their specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

Selection Chart

Code Number	Description
LN-PRG203-2	LONMARK certified Programmable Controller with 6 Universal Inputs (UIs), 5 Digital Outputs (DOs), 3 Universal Outputs (UOs), and LNS plug-in, 24 VAC, wireless enabled.
LN-PRG300-2	LONMARK certified Programmable Controller with 10 UI, 8 UO, and LNS plug-in, 24 VAC, wireless option.
LN-PRG400-2	LONMARK certified Programmable Controller with 12 UI, 12 UO, and LNS plug-in, 24 VAC, wireless option.
LN-PRG410-2	LONMARK certified Programmable Controller with 12 UI, 12 UO, Hands-Off-Auto (HOA) Switches, and LNS plug-in, 24 VAC, wireless option.
LN-PRG500-2	LONMARK certified Programmable Controller with 16 UI, 12 UO, and LNS plug-in, 24 VAC, wireless option.
LN-PRG510-2	LONMARK certified Programmable Controller with 16 UI, 12 UO, HOA Switches, and LNS plug-in, 24 VAC, wireless option.

Technical Specifications

LN-PRG203 (Part 1 of 2)

Product Code	LN-PRG203-2
Power Requirement	Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 1.85 A auto-reset fuse Typical Consumption: 18 VA with 2 triac outputs ON and 2 outputs with 20 mA load at 12 VDC Maximum Consumption: 25 VA
Ambient Storage Conditions	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
General	Processor: Neuron® 3150™, 8 bits, 10 MHz Memory: Nonvolatile Flash 64k (APB application); Nonvolatile Flash 128k (storage) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol 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) LONMARK Interoperability: Version 3.4 Device Class: Multi I/O Module LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open-Loop Sensor #3
Enclosure	Material: ABS type PA-765A Dimensions (with screws): 5.7 x 4.7 x 2.0 in. (144.8 x 119.4 x 50.8 mm) Shipping Weight: 0.97 lb (0.44 kg)

LN Series Free Programmable Controllers (Continued)

LN-PRG203 (Part 2 of 2)

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. FCC: This device complies with FCC rules part 15, subpart B, class B
Agency	UL Listed: UL916 Energy management equipment Material: UL94-5VA
Inputs	Universal software configurable Input Types: Digital: Dry Contact Pulse: Dry Contact; 500 milliseconds minimum ON/OFF Voltage: 0 to 10 VDC, Current: 4 to 20 mA with 249 ohms external resistor (wired in parallel), Resistor Support: Thermistor: Type 2 and Type 3 10k ohms (10k ohms at 25°C [77°F]) Range: -40 to 150°C (-40 to 302°F) Platinum: PT1000 1k ohm (1k ohms at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) PT100: 100 ohms (100 ohms at 0°C [32°F]) Range: -40 to 135°C (-40 to 275°F) Nickel: RTD Ni1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Potentiometer: Translation table configurable on several points Input Resolution: 16-bit analog/digital converter
Outputs	Digital: 24 VAC Triac, digital (on/off), PWM, or floating software configurable 0.5 A continuous 1.0 A at 15% duty cycle for a 10-minute period PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs minimum plus on/off: 500 milliseconds adjustable drive time period External or internal power supply (jumper selectable) Universal: 0-10 VDC, digital 0-12 VDC (on/off), PWM, or floating PWM control: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs minimum plus on/off: 500 milliseconds adjustable drive time period 60 mA maximum at 12 VDC (60°C [140°F]) minimum resistance 200 ohms Auto reset fuse 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter
Wireless¹	Communication: EnOcean® Wireless standard Number of Wireless Inputs: 14 (some sensors may require more than one wireless input) Supported Wireless Receivers: Wireless Receiver 315 (LN-WMOD315-0) and Wireless Receiver 868 (LN-WMOD868-0) Cable: Connector: 4P4C modular jack, Length: 3 ft (1 m)

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.

LN Series Free Programmable Controllers (Continued)

LN-PRG300 (Part 1 of 2)

Product Code	LN-PRG300-2
Power Requirement	Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 1.85 A auto-reset fuse Typical Consumption: 18 VA, all outputs with 20 mA load at 12 VDC Maximum Consumption: 33 VA
Ambient Storage Conditions	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
General	Processor: Neuron 3150, 8 bits, 10 MHz Memory: Nonvolatile Flash 64k (APB application), Nonvolatile Flash 128k (storage) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk protocol Clock: Real-time clock chip, CR2032 lithium battery (for clock) 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) LONMARK Interoperability: Version 3.4 Device Class: Multi I/O Module LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open-Loop Sensor #3
Enclosure	Material: ABS type PA-765-A Dimensions (with screws): 5.7 x 4.7 x 2.0 in. (144.8 x 119.4 x 50.8 mm) Shipping Weight: 0.86 lb (0.39 kg)
Agency	UL Listed: UL916 Energy management equipment 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.
Inputs	Universal software configurable Input Types: Digital: Dry Contact Pulse: Dry Contact, 500ms minimum ON/OFF Analog Voltage: 0 to 10 VDC, Analog current: 4 to 20 mA with 249 ohms external resistor (wired in parallel), Resistor Support: Thermistor: Type 2, Type 3 10k ohms (10k ohms at 25°C [77°F]) Range: -40 to 150°C (-40 to 302°F) Platinum: Pt1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) PT100: 100 ohms 1k ohm at 0°C [32°F] Range: -40 to 135°C (-40 to 275°F) Nickel: Ni1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Potentiometer: Translation table configurable on several points, Input Resolution: 16-bit analog/digital converter
Outputs	Quantity: 8 (software configurable) 0 to 10 VDC, digital 0 to 12 VDC (on/off), PWM, or Floating PWM output: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs minimum pulse on/off: 500 milliseconds adjustable drive time period 60 mA maximum at 12 VDC (60°C [140°F]) Minimum load 200 ohms Auto reset fuse 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter

LN Series Free Programmable Controllers (Continued)

LN-PRG300 (Part 2 of 2)

Wireless¹	Communication: EnOcean® Wireless standard Number of Wireless Inputs: 14 (some sensors may require more than one wireless input) Supported Wireless Receivers: Wireless Receiver 315 (LN-WMOD315-0) and Wireless Receiver 868 (LN-WMOD868-0) Cable: Connector: 4P4C modular jack, Length: 3 ft (1 m)
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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.

LN-PRG410 and LN-PRG400 (Part 1 of 2)

Product Codes	LN-PRG410-2 and LN-PRG400-2
Power Requirement	Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 3.0 A user-replaceable fuse Typical Consumption: 25 VA Maximum Consumption: 50 VA Power Supply: 15 VDC output used to power 4 to 20 mA inputs
Ambient Storage Conditions	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
General	Standard: LONMARK Functional Profile: SCC-VAV Controller #8502 Processor: Neuron 3150, 8 bits, 10 MHz Memory: Nonvolatile Flash 64k (APB application), Nonvolatile Flash 128k (storage) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk protocol Clock: Real-time clock chip, CR2032 lithium battery (for clock) 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) LONMARK Interoperability: Version 3.4 Device Class: Multi I/O Module LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open-Loop Sensor #3
Enclosure	Material: ABS type 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: 1.17 lb (0.53 kg)
Agency	UL Listed: UL916 Energy management equipment 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.
Inputs	Universal software configurable Input Types: Digital: Dry Contact Pulse: Dry Contact (500 milliseconds minimum ON/OFF) Analog Voltage: 0 to 10 VDC, Analog current: 4 to 20 mA with 249 ohms external resistor (wired in parallel), Resistor Support: Thermistor: Type 2, Type 3 10k ohms (10k ohms at 25°C [77°F]) Range: -40 to 150°C (-40 to 302°F) Platinum: Pt1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) PT100: 100 ohms 1k ohm at 0°C [32°F]) Range: -40 to 135°C (-40 to 275°F) Nickel: Ni1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Potentiometer: Translation table configurable on several points, Input Resolution: 16-bit analog/digital converter

LN Series Free Programmable Controllers (Continued)

LN-PRG410 and LN-PRG400 (Part 2 of 2)

Outputs	Software and jumper configurable 0 to 10 VDC, digital 0 to 12 VDC (on/off), PWM, or Floating¹ PWM output: adjustable period from 2 seconds to 15 minutes Floating control: requires two consecutive outputs minimum pulse on/off: 500 milliseconds adjustable drive time period 60 mA maximum at 12 VDC (60°C [140°F]) Minimum load 200 ohms Auto reset fuse 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter Power Supply Output: 15 VDC, maximum 240 mA
Wireless²	Communication: EnOcean® Wireless standard Number of Wireless Inputs: 14 (some sensors may require more than one wireless input) Supported Wireless Receivers: Wireless Receiver 315 (LN-WMOD315-0) and Wireless Receiver 868 (LN-WMOD868-0) Cable: Connector: 4P4C modular jack, Length: 3 ft (1 m)

1. Available when programmed with LN GPI software.

2. 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.

LN-PRG510 and LN-PRG500 Controllers (Part 1 of 2)

Product Codes	LN-PRG510-2 and LN-PRG500-2
Power Requirement	Voltage: 24 VAC/DC; +/- 15%, 50/60 Hz, Class 2 Protection: 3.0 A user-replaceable fuse Typical Consumption: 25 VA all outputs with 20mA load at 12 VDC and 15 VDC output 80mA (4 x 20 mA) Maximum Consumption: 50 VA
Ambient Storage Conditions	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
General	Standard: LONMARK Functional Profile: SCC-VAV Controller #8502 Processor: Neuron 3150, 8 bits, 10 MHz Memory: Nonvolatile Flash 64k (APB application), Nonvolatile Flash 64k (storage) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk protocol Transceiver: FTX-1 LONMARK Interoperability: Version 3.4 Device Class: Multi I/O Module LONMARK Functional Profile: Input Objects: Open-Loop Sensor #1, Output Objects: Open-Loop Sensor #3
Enclosure	Material: LEXAN® 500R (GE) Dimensions (with screws): 3.74 x 7.68 x 2.82 in. (95 x 195 x 72 mm) Shipping Weight: 1.76 lb (0.80 kg)
Agency	UL Listed: UL916 Energy management equipment 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.

LN Series Free Programmable Controllers (Continued)

LN-PRG510 and LN-PRG500 Controllers (Part 2 of 2)

Inputs	Universal software configurable Input Types: - Digital: Dry Contact - Pulse: Dry Contact Analog Voltage: 0 to 10 VDC, Accuracy: $\pm 0.5\%$, Analog current: 4 to 20 mA with 249 ohms external resistor (wired in parallel), Resistor Support: - Thermistor: Type 2, Type 3 10k ohms (10k ohms at 25°C [77°F]) Range: -40 to 150°C (-40 to 302°F) - Platinum: - Pt1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) - PT100: 100 ohms 1k ohm at 0°C [32°F]) Range: -40 to 135°C (-40 to 275°F) - Nickel: Ni1000 (1k ohm at 0°C [32°F]) Range: -40 to 150°C (-40 to 302°F) Potentiometer: Translation table configurable on several points Input Resolution: 16-bit analog/digital converter
Outputs	Universal 0 to 10 VDC, digital 0 to 12 VDC (on/off), 0-20 mA, PWM, or floating¹ - PWM output: adjustable period from 2 seconds to 15 minutes - Floating control: requires two consecutive outputs - minimum pulse on/off: 500 milliseconds - adjustable drive time period 60 mA maximum at 12 VDC (60°C; 140°F) - Minimum load 200 ohms - Auto reset fuse 60 mA at 60°C (140°F) 100 mA at 20°C (68°F) Output Resolution: 10-bit digital/analog converter Power Supply Output: 15 VDC, maximum 240 mA
Wireless²	Communication: EnOcean® Wireless standard Number of Wireless Inputs: 14 (some sensors may require more than one wireless input) Supported Wireless Receivers: Wireless Receiver 315 (LN-WMOD315-0) and Wireless Receiver 868 (LN-WMOD868-0) Cable: Connector: 4P4C modular jack, Length: 3 ft (1 m)

1. Available when programmed with LN GPI software.

2. 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.