

# ECL-103

LONMARK® Certified 10-Point  
Programmable Controller



## Overview

The ECL-103 is a microprocessor-based programmable controller designed to control terminal units such as fan coil units, heat pump units, unit ventilators, and chilled ceilings. This controller uses the LonTalk® communication protocol and is LONMARK certified as an SCC Generic device, guaranteeing compatibility and interoperability with other manufacturers' LonMark certified controllers.



## Features & Benefits

- Flexible inputs and outputs support all industry-standard HVAC unitary applications
- Rugged hardware inputs and outputs eliminate the need for external protection equipment
- Supports EC-gfxProgram, making Building Automation System programming effortless
- Open-to-Wireless™ ready, supporting a wide variety of wireless sensors and switches and helping to reduce installation costs
- Supports the Allure™ Series Communicating Sensors, providing intelligent sensing and environmental zone control

# Model Selection

## Example: ECL-103

Series	Model
ECL-	<b>103:</b> 10-Point Controller, 15Vdc Power Supply, 4 UI, 4 DO, 2 UO

## Recommended Applications

Model	ECL-103
2 Pipe Fan Coil	■
2 Pipe Fan Coil with Changeover Sensor	■
4 Pipe Fan Coil	■
Heat Pump Unit	■
Unit Ventilator	■
Chilled Ceiling	■

## Objects List

### Objects

Calendar Objects	1
Special events per calendar	25
Schedule Objects	2
Special events per schedule	5
PID Loop Objects	8

### Constants

Boolean	124
Enumeration	62
Numeric	56

### Variables

Boolean	124
Enumeration	54
Numeric	56
nciSetpoint	Yes
Total Network Variables	170

### Network Variable Input (General Usage)

NVI Changeable Type, 50  
Up to 31 Bytes<sup>1</sup>

- Any type of Fan-In function is supported in combination with the "FOR" loop function.

### Network Variable Output (General Usage)

NVO Changeable Type, 50  
Up to 31 Bytes

### Hardware Input Network Variable

nvoHwInput per Hardware Input Yes

### Hardware Output Network Variable

nviHwInput per Hardware Output Yes  
nvoHwInput per Hardware Output Yes

## Product Specifications

### Power Supply Input

Voltage Range <sup>1</sup>	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	2.0A 3.0A (for triacs when using the internal power supply)
Power Consumption	10 VA typical plus all external loads <sup>2</sup> , 85 VA max (including powered triac outputs).

- 24VDC does not support DO (triac outputs).
- External loads must include the power consumption of any connected modules such as an Allure Series Communicating Sensor. Refer to the respective module's datasheet for related power consumption information.

### Communications

Communications	LonTalk Protocol
Transceiver	FT 5000 Free Topology Smart Transceiver
Channel	TP/FT-10; 78Kbps
LonMark Interoperability Guidelines	Version 3.4
Device Class	SCC Generic #8500

### LonMark Functional Profile

Input Objects	Open-Loop Sensor #1
Output Objects	Open-Loop Actuator #3
Node Object	Node Object #0
Real Time Clock	Real Time Keeper #3300
Scheduler	Scheduler #20020
Calendar	Calendar #20030
Programmable Device	Static Programmable Device #410
SCC Object	SCC Generic #8500

## Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum number of room devices supported per controller combined	4 <sup>1</sup>

1. A controller can support a maximum of 2 Allure sensor models equipped with a CO<sub>2</sub> sensor. Any remaining connected sensors must be without a CO<sub>2</sub> sensor.

## Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Applications Memory	384 kB Non-volatile Flash
Storage Memory	1 MB Non-volatile Flash
Memory (RAM)	64 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock without battery Network time synchronization is required at each power-up cycle before the RTC become available
Green LEDs	Power status & LAN Tx
Orange LEDs	Controller status & LAN Rx

## Wireless Receiver

Communication Protocol	EnOcean wireless standard <sup>1</sup>
Number of Wireless Inputs <sup>2</sup>	18
Supported Wireless Receivers	Refer to the Open-to-Wireless Application Guide
Cable	Telephone cord
Connector	4P4C modular jack
Length (maximum)	6.5ft (2m)



1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.

## Mechanical

Dimensions (H × W × D)	5.2 × 7.1 × 2.13" (133 × 180 × 54 mm)
Dimensions with terminal block covers (H × W × D)	5.2 × 7.7 × 2.13" (133 × 195 × 54 mm)
Shipping Weight	0.92lbs (0.42 kg)
Enclosure Material <sup>1</sup>	FR/ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995

1. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive

## Environmental

Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	-4°F to 122°F (-20°C to 50°C)
Relative Humidity	0 to 90% Non-condensing

## Standards and Regulation

CE Emission	EN61000-6-3: 2007; A1:2011
CE Immunity	EN61000-6-1: 2007
FCC	Compliance with FCC rules part 15, subpart B, class B
UL Listed (CDN & US)	UL916 Energy management equipment
CEC Appliance Database	Appliance Efficiency Program <sup>1</sup>



1. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

## Universal Inputs (UI)

### General

Input Type	Universal; software configurable
Input Resolution	16-Bit analog / digital converter
Power Supply Output	15VDC; maximum 80mA

### Contact

Type	Dry contact
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### Counter

Type	Dry contact
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	500ms On / 500ms Off

### 0 to 10VDC

Range	0 to 10VDC (40kΩ input impedance)
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### 0 to 5VDC

Range	0 to 5VDC (high input impedance)
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### 0 to 20mA

Range	0 to 20mA 249Ω external resistor wired in parallel
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### Resistance/Thermistor

Range	0 to 350 KΩ
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Supported Thermistor Types Any that operate in this range

### Pre-configured Temperature Sensor Types:

Thermistor	10KΩ Type 2, 3 (10KΩ @ 77°F; 25°C)
Platinum	Pt1000 (1KΩ @ 32°F; 0°C)
Nickel	RTD Ni1000 (1KΩ @ 32°F; 0°C) RTD Ni1000 (1KΩ @ 69.8°F; 21°C)

## Universal Outputs (UO)

### General

Output Type	Universal; software configurable
Output Resolution	10-bit digital to analog converter
Output Protection	Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay Output is internally protected against short circuits
Load Resistance	Minimum 600 Ω for 0-10VDC and 0-12VDC outputs Maximum 500 Ω for 0-20mA output
Auto-reset fuse	Provides 24VAC over voltage protection

### 0 or 12VDC (On/Off)

Range	0 or 12VDC
Source Current	Maximum 20 mA at 12VDC (minimum load resistance 600Ω) <sup>1</sup>

1. Relays equipped with coil that consume between 20 and 35mA can be used with up to 2 Universal Outputs when the 15V Power Supply Output is de-rated to supply 50mA maximum current.

### PWM

Range	Adjustable period from 2 to 65 seconds
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Thermal Actuator Management Adjustable warm up and cool down time

### Floating

Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable

### 0 to 10VDC

Range	0 to 10VDC
Source Current	Maximum 20 mA at 10VDC (minimum load resistance 600Ω)

## Digital Outputs (DO)

### General

Output Type	24VAC Triac; software configurable
Maximum Current per Output	0.5A continuous 1A @ 15% duty cycle for a 10-minute period
Power Source	External or internal power supply (jumper selectable)

### 0 or 24VAC (On/Off)

Range	0 or 24VAC
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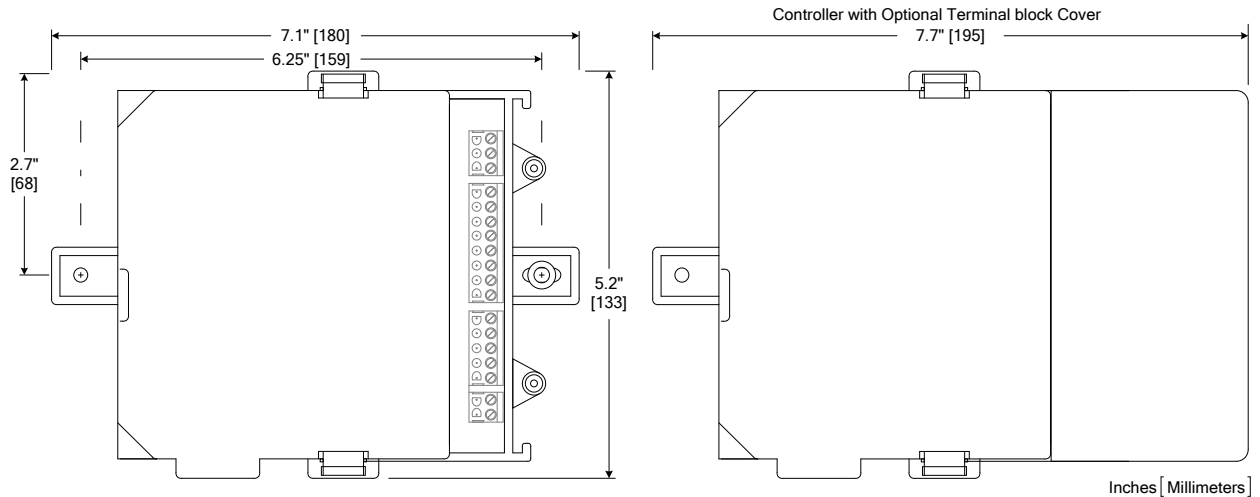
### PWM

Range	Adjustable period from 2 to 65 seconds
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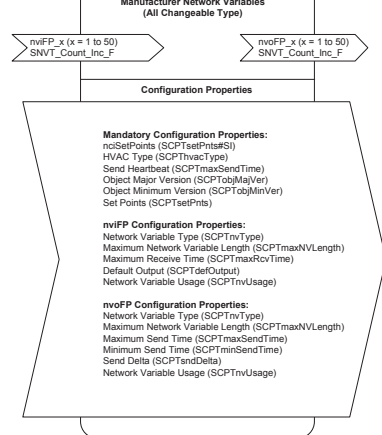
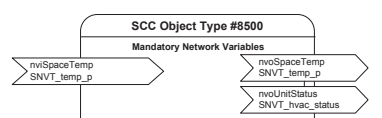
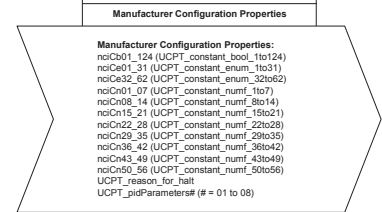
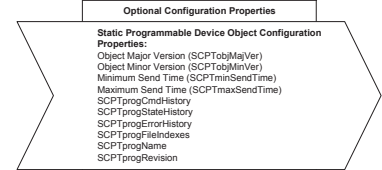
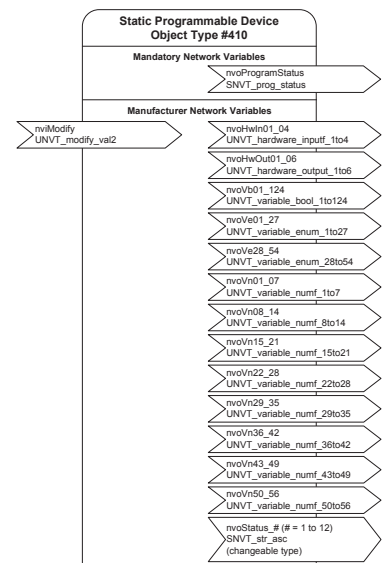
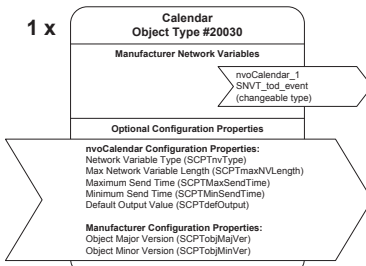
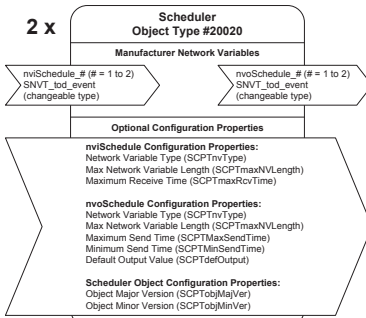
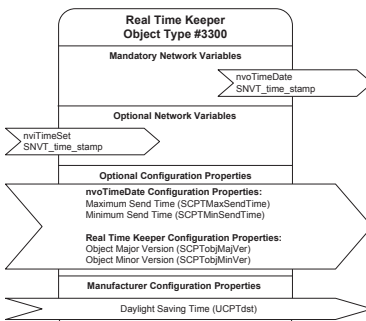
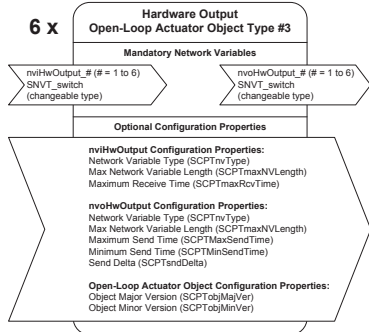
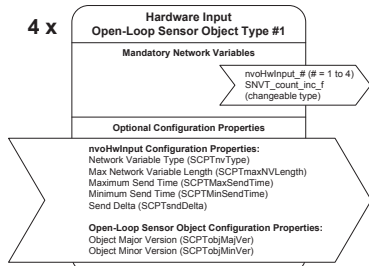
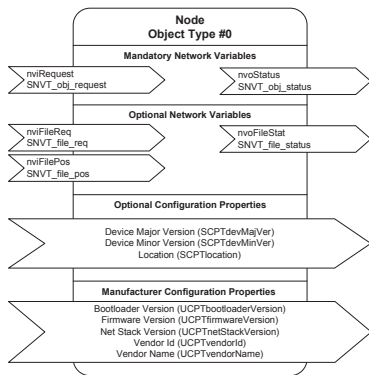
### Floating

Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable
Power Source	External or internal power supply (jumper selectable)

## Dimensions



# Functional Profile



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