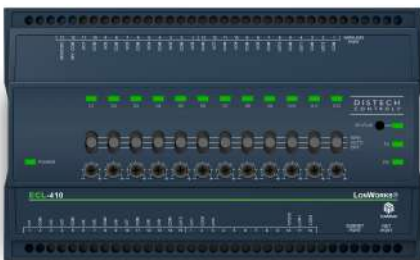


ECL-400 Series

LONMARK® Certified 24-Point
Programmable Controllers



Overview

The ECL-400 Series controllers are microprocessor-based programmable controllers designed to control various building automation applications such as air handling units, multi-zone applications, chillers, boilers, pumps, cooling towers, and roof top units.

The ECL-400 Series can also be used for lighting control applications. These controllers use the LonTalk® communication protocol and are LONMARK certified as a Static Programmable 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
- Models available with HOA switches and potentiometers are ideal for equipment testing or commissioning
- An optional full-color backlit display with jog dial provides direct access to a wide range of controller functions
- 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-453

Series	Model
ECL-	400: 24-Points, 15Vdc Power Supply, 12 UI, 12 UO
	403: 24-Points, 15Vdc Power Supply, 12 UI, 8 DO, 4 UO
	410: 24-Points, 15Vdc Power Supply, 12 UI, 12 UO, HOA
	413: 24-Points, 15Vdc Power Supply, 12 UI, 8 DO, 4 UO, HOA
	450: 24-Points, 15Vdc Power Supply, 12 UI, 12 UO, Color Display
	453: 24-Points, 15Vdc Power Supply, 12 UI, 8 DO, 4 UO, Color Display

Recommended Applications

Model	ECL-400 / 410 / 450	ECL-403 / 413 / 453
Roof Top		■
Air Handling Unit	■	■
Multi-Zone Application	■	
Chiller	■	■
Boiler	■	■
Cooling Tower	■	■

Objects List

Objects

Calendar Objects	2
Special events per calendar	50
Schedule Objects	8
Special events per schedule	10
PID Loop Objects	30

Constants

Boolean	124
Enumeration	62
Numeric	56

Variables

Boolean	124
Enumeration	54
Numeric	56
nciSetpoint	Yes
Total Network Variables	254

Network Variable Input (General Usage)

NVI Changeable Type, 35
Up to 31 Bytes¹

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

Network Variable Output (General Usage)

NVO Changeable Type, Up to 35
31
Bytes

Hardware Input Network Variable

nvoHwInput per Hardware Yes
Input

Hardware Output Network Variable

nviHwInput per Hardware Yes
Output
nvoHwInput per Hardware Yes
Output

Product Specifications

Power Supply Input

Voltage Range	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	3.0A
Power Consumption	22 VA typical plus all external loads ¹ , 60 VA max.

- 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.

Power Consumption	22 VA typical plus all external loads ¹ , 50 VA max.
Power Consumption	25 VA typical plus all external loads ¹ , 63 VA max.
Power Consumption	25 VA typical plus all external loads ¹ , 53 VA max.

- 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	Static Programmable Device

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

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain

Room Devices Support

Maximum combined number of devices per controller	12 ¹
Allure EC-Smart-View Series	Up to 12
Allure EC-Smart-Comfort Series	Up to 6
Allure EC-Smart-Air Series	Up to 6

1. A controller can support a maximum of 2 Allure sensor models equipped with a CO₂ sensor. Any remaining connected sensors must be without a CO₂ sensor.

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	72 MHz
Applications Memory	1 MB Non-volatile Flash
Storage Memory	2 MB Non-volatile Flash
RAM Memory	96 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock with rechargeable battery Network time synchronization is initially required
RTC Battery	20 hours charge time, 20 days recharge time Up to 500 charge/discharge cycles
Green LEDs	Power status & LAN Tx
Orange LEDs	Controller status & LAN Rx
Communication Jack	LON® audio jack

Wireless Receiver

Communication Protocol	EnOcean wireless standard ¹
Number of Wireless Inputs ²	28
Supported Wireless Receivers	Refer to the Open-to-Wireless Application Guide
Cable	Telephone cord
Connector	4P4C modular jack
Length (maximum)	2m (6.5ft)



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) ECL-400 / 403 / 410 / 413	4.7 × 7.7 × 2.03" (119.38 × 195.58 × 51.47 mm)
Dimensions (H × W × D) ECL-450 / 453	4.7 × 7.7 × 2.55" (119.38 × 195.58 × 64.68 mm)
Shipping Weight ECL-400 / 403 / 410 / 413	1.17lbs (0.53 kg)
Shipping Weight ECL-450 / 453	1.28lbs (0.58 kg)
Enclosure Material ¹	FR/ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995
Installation	Direct DIN-rail mounting or wall mounting through mounting holes (see figure above for hole positions)

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 ¹



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

ECL-450 and ECL-453 Display

Display Type	Backlit-color LCD
Display Resolution	400 W x 240 H pixels (WQVGA)
Effective Viewing Area (W × H)	2.4 × 1.4" (61.2 × 36.7mm) diagonal: 2.8" (71mm)
Menu Navigation	Jog dial turn, select navigation with Exit button

Universal Inputs (UI)

General

Input Type	Universal; software configurable
Input Resolution	16-Bit analog / digital converter
Power Supply Output	15VDC; maximum 240mA

Contact

Type	Dry contact
------	-------------

Counter UI1 to UI4:

Type	SO output compatible
Maximum Frequency	50Hz maximum
Minimum Duty Cycle	10milliseconds On / 10milliseconds Off

UI5 to UI10:

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

0 to 10VDC

Range	0 to 10VDC (40k Ω input impedance)
-------	--

0 to 5VDC

Range	0 to 5VDC (high input impedance)
-------	-------------------------------------

0 to 20mA

Range	0 to 20mA 249 Ω jumper configurable internal resistor
-------	--

Resistance/Thermistor

Range	0 to 350 K Ω
-------	---------------------

Supported Thermistor Types Any that operate in this range

Pre-configured Temperature Sensor Types:

Thermistor	10K Ω Type 2, 3 (10K Ω @ 77°F; 25°C)
Platinum	Pt1000 (1K Ω @ 32°F; 0°C)
Nickel	RTD Ni1000 (1K Ω @ 32°F; 0°C) RTD Ni1000 (1K Ω @ 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 200 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 60 mA at 12VDC (minimum load resistance 200 Ω)

PWM

Range	Adjustable period from 2 to 65 seconds
-------	--

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 60 mA at 10VDC (minimum load resistance 200 Ω)

0 to 20mA

Range	0 to 20mA
Type	Current source (jumper configurable)

HOA

Hand-Off-Auto switch When equipped. Supervision allows control logic to read the current HOA switch and potentiometer settings

Threshold Configurable

Potentiometer Voltage Range 0 to 12.5VDC

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

0 or 24VAC (On/Off)

Range	0 or 24VAC
-------	------------

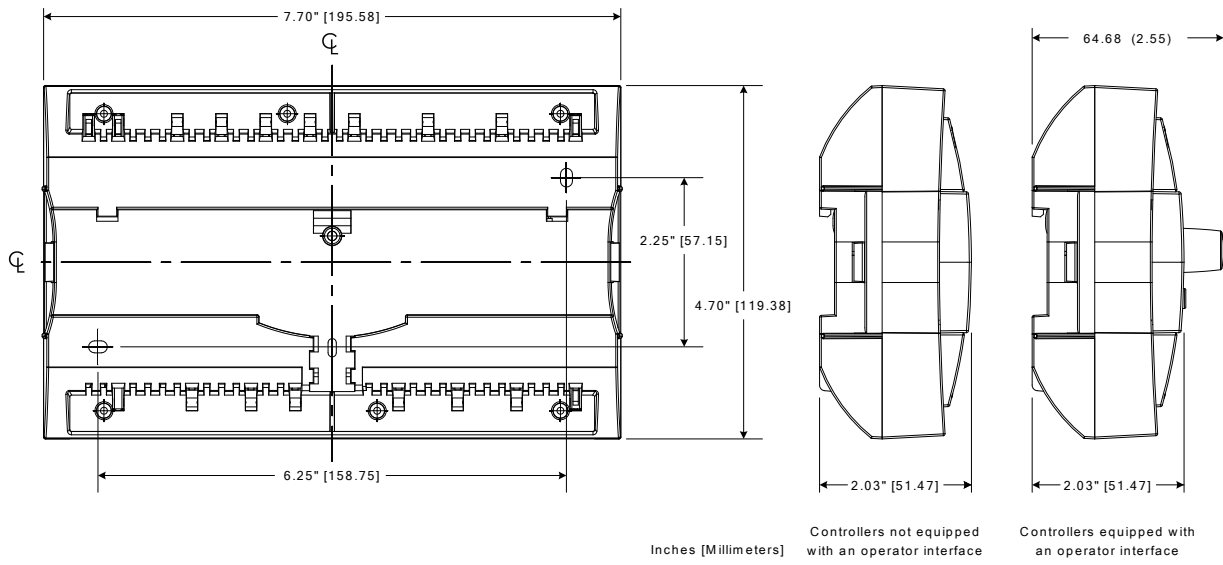
PWM

Range	Adjustable period from 2 to 65 seconds
-------	--

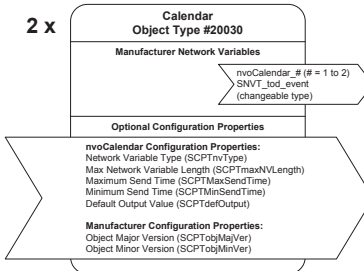
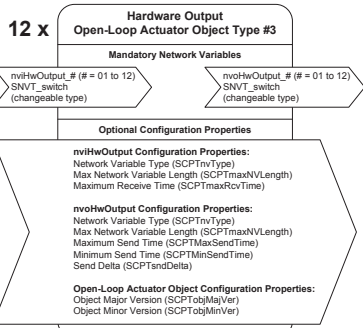
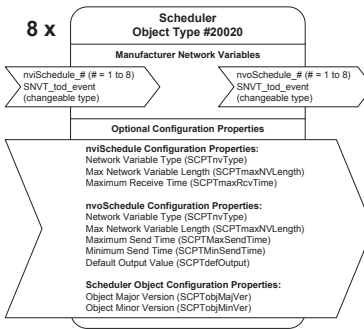
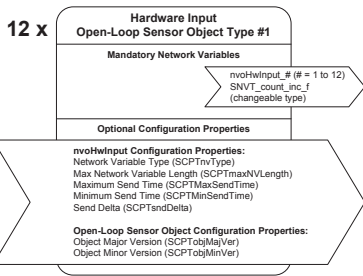
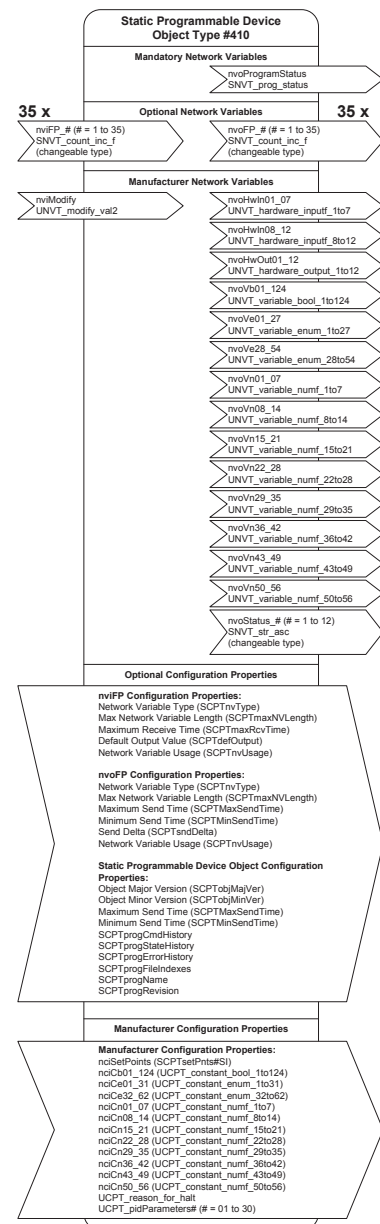
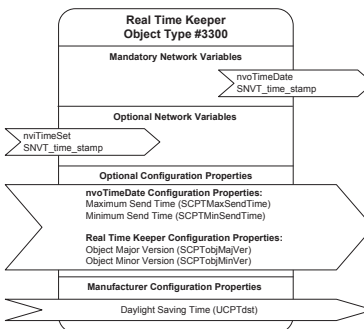
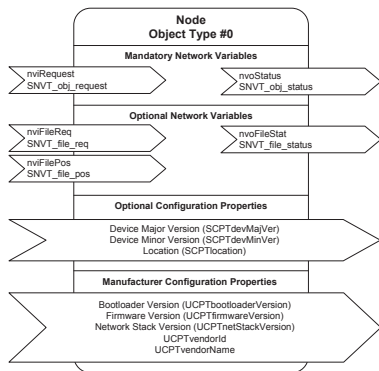
Floating

Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable
Power Source	External

Dimensions



Functional Profile



Specifications subject to change without notice.

Distech Controls, the Distech Controls logo, Innovative Solutions for Greener Buildings, EC-Net, ECO-Vue, Allure, and Open-To-Wireless are trademarks of Distech Controls Inc.; Lon-Works, LON, and LNS are registered trademarks of Echelon Corporation; BACnet is a registered trademark of ASHRAE; BTL is a registered trademark of the BACnet Manufacturers Association; Niagara™ Framework is a registered trademark of Tridium, Inc.; EnOcean is a registered trademark of EnOcean GmbH. All other trademarks are property of their respective owners.

©, Distech Controls Inc., 2012 - 2022. All rights reserved.
 Global Head Office - 4205 place de Java, Brossard, QC, Canada, J4Y 0C4 - EU Head Office - ZAC de Sacuny, 558 avenue Marcel Mériex, 69530 Brignais, France