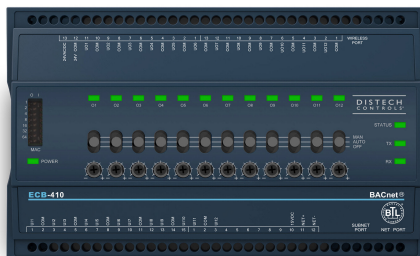
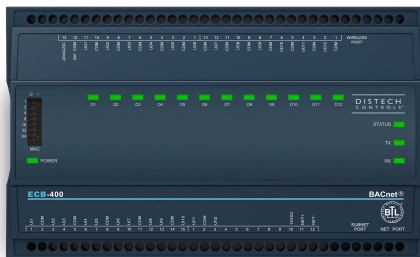


ECB-400 Series

BACnet B-AAC 24-Point
Programmable Controllers



Overview

The ECB-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 ECB-400 Series can also be used for lighting control applications. This controller uses the BACnet[®] MS/TP LAN communication protocol and is BTL[®]-Listed as BACnet Advanced Application Controllers (B-AAC).



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: ECB-453

Series	Model	Options
ECB-	400: 24-Points, 15Vdc Power Supply, 12 UI, 12 UO	UUKL: UL 864, 10 th Edition UUKL and California State Fire Marshal Listed ¹
	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	

1. The UL 864 UUKL Listed Smoke Control Equipment is used only in Distech Controls' UUKL smoke control system. For detailed specifications, requirements and procedures for installing and operating UUKL Listed equipment refer to the Distech Controls' UUKL Smoke Control documentation.

Recommended Applications

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

BACnet Objects List

BACnet Objects

Calendar Objects	2
Events per calendar	45
Schedule Objects	10
Special events per schedule	10
PID Loop Objects	30
Input Objects (AI, BI, MSI) ¹	64 ²
Output Objects (AO, BO) ¹	12 ³ (400 / 410 / 453 models) 4 ³ (403 / 413 / 453 models)
Alarm Notification Classes	5

1. Supports object internally-generated alarms (intrinsic reporting).
2. This consists of Hardware Inputs, Allure Series Communicating Sensor Inputs, and Open-to-Wireless Inputs.
3. This consists of Hardware Outputs.

Commandable Objects¹

BV Objects	20
MSV Objects	20
AV Objects	35

Non-Commandable Objects

BV Objects	55
MSV Objects	55
AV Objects	115

1. Supports object internally-generated alarms (intrinsic reporting).

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 ECB-400 / 410	22 VA typical plus all external loads ¹ , 60 VA max.
Power Consumption ECB-403 / 413	22 VA typical plus all external loads ¹ , 50 VA max.
Power Consumption ECB-450	25 VA typical plus all external loads ¹ , 63 VA max.
Power Consumption ECB-453	25 VA typical plus all external loads ¹ , 53 VA max.

1. 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

Communication Bus	BACnet MS/TP
BACnet Profile	B-AAC ¹
EOL Resistor	Built-in, jumper selectable
Baud Rates	9600, 19 200, 38 400, or 76 800 bps
Addressing	Dip switch or with an Allure EC-Smart-View Series Communicating Sensor

1. Refer to Distech Controls' Protocol Implementation Conformity Statement for BACnet.

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 (not supported by UUKL)	Up to 6
Allure EC-Smart-Air Series (not supported by UUKL)	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	BACnet 1/8" (3.5mm) stereo 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) ECB-400 / 403 / 410 / 413	4.7 × 7.7 × 2.03" (119.38 × 195.58 × 51.47 mm)
Dimensions (H × W × D) ECB-450 / 453	4.7 × 7.7 × 2.55" (119.38 × 195.58 × 64.68 mm)
Shipping Weight ECB-400 / 403 / 410 / 413	1.17lbs (0.53 kg)
Shipping Weight ECB-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
UL 864	UL 864, 10 th Edition, UUKL Listed Smoke Control Equipment (ECB-400 UUKL model only) ¹
California State Fire Marshal Listing	CSFM: 7300-2187:0100 (ECB-400 UUKL model only) ¹
CEC Appliance Database	Appliance Efficiency Program ²



1. For detailed specifications regarding the ECB-400 UUKL model, refer to the Distech Controls UUKL Smoke Control Design Guide.
2. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

ECB-450 and ECB-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
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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)
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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 249 Ω jumper configurable internal resistor
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Resistance/Thermistor

Range	0 to 350 K Ω
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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
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Thermal Actuator Management	Adjustable warm up and cool down time
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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
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Threshold	Configurable
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Potentiometer Voltage Range	0 to 12.5VDC
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Digital Outputs (DO)

General

Output Type	24VAC Triac; software configurable
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Maximum Current per Output	0.5A continuous 1A @ 15% duty cycle for a 10- minute period
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Power Source	External
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0 or 24VAC (On/Off)

Range	0 or 24VAC
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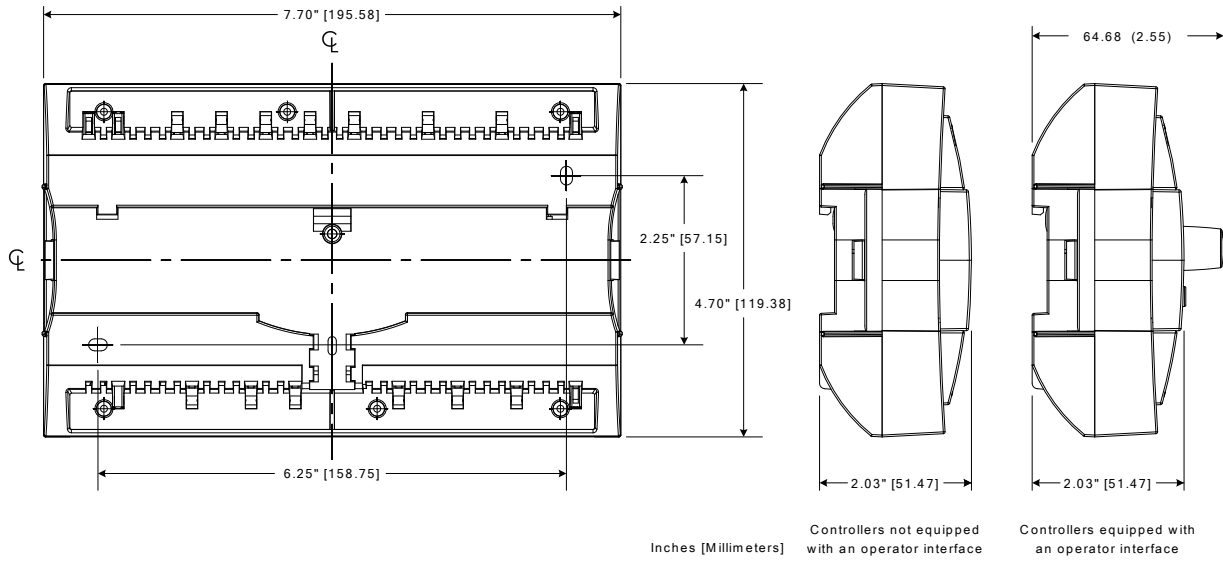
PWM

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

Dimensions



Inches [Millimeters] Controllers not equipped with an operator interface

Controllers equipped with an operator interface

Specifications subject to change without notice.

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