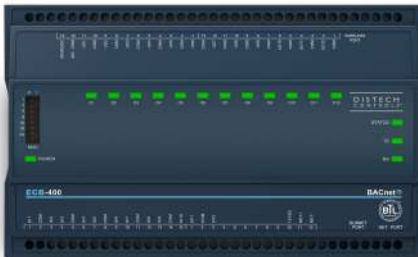


ECB-400 Series

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 |
|------|-------------|

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 |
|-------|------------|

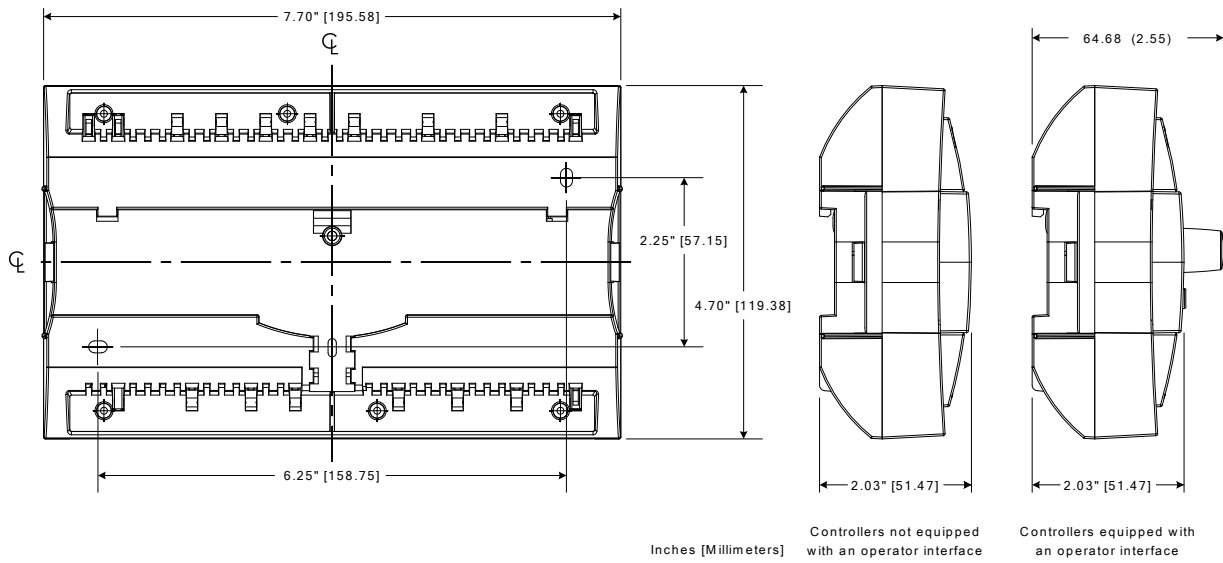
PWM

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

Floating

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

Dimensions



Specifications subject to change without notice.

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