ECB-203 Series

BACnet B-ASC 14-Point Programmable Controllers

Overview

The ECB-203 Series controllers are microprocessor-based programmable controllers designed to control units such as RTUs, FCUs, UVs, HPUs, AHUs, and chilled ceilings. This controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Application Specific Controllers (B-ASC).

Applications

These controllers meet the requirements of the following applications:

□ Rooftop Units
□ Fan Coil Units
□ Chilled Ceilings
□ Heat Pumps
□ Unit Ventilators
□ Small Air Handling Units

Features & Benefits

Flexible Inputs and Outputs

This controller has various input types including resistance, voltage, and digital-based ones. Moreover, it provides digital, floating, pulse width modulation, and proportional control outputs for valves, heating elements, fans, and lighting applications. This controller covers all industry-standard HVAC unitary applications.

Highly Accurate Universal Inputs

Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350,000 Ohms, as well as support for inputs requiring 0 to 10VDC or 0 to 20mA with an external resistor. This provides the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones.
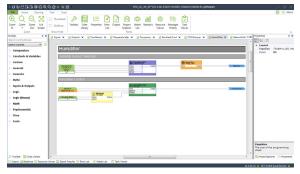
Rugged Inputs/Outputs

Rugged hardware inputs and outputs eliminate need for external protection components, such as diodes for 12V DC relays.

DISTECH CONTROLS™

Innovative Solutions for Greener Buildings™

Programmability

Supports Distech Controls' EC-*gfx*Program, which makes Building Automation System (BAS) programming effortless by allowing you to visually assemble building blocks together to create a custom control sequence for any HVAC / building automation application.

Increased Energy Efficiency

Improves energy efficiency when combined with:

☐ Motion detectors to automatically adjust a zone's occupancy mode from standby to occupied when presence is detected

☐ CO_2 sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants

☐ Light switches to control both lighting and a room's HVAC occupancy / standby mode setting

Open-to-Wireless™ Solution

Open-to-Wireless™

The controllers are Open-to-Wireless™ ready, and when paired with the Wireless Receiver, work with a variety of wireless battery-less sensors and switches, to reduce the cost of installation and minimize the impact on existing partition walls. For supported frequencies in your area, refer to the Open-to-Wireless Solution Guide.

Available with an optional Wireless Receiver that supports up to 24 wireless inputs to create wire-free installations.

Environmental Protection

The ECB-203 model with Environmental Protection has a conformal coating applied to its circuit board for an extra degree of protection for use in humid regions and it is ideal for enclosed roof-top unit applications.

Allure™ Series Communicating Sensor Support

These controllers work with a wide range of sensors, such as the Allure Series Communicating Sensors that are designed to provide intelligent sensing and control devices for increased user experience and energy efficiency.

☐ Allure EC-Smart-Vue sensors feature a backlit-display and graphical menus that provide precise environmental zone control, with any combination of the following: temperature, humidity, CO_2, and motion sensor.

☐ Allure EC-Smart-Comfort sensors feature colored LED indicators to provide user feedback, rotary knobs to adjust the setpoint offset and fan speed, and an occupancy override push button. This sensor can also be expanded with a combination of up to 4 add-on push button modules for lighting and shade/ sunblind control.

☐ Allure EC-Smart-Air sensors combine precise environmental sensing in a discreet and alluring enclosure for temperature, humidity, and CO_2.

Operator Interface

The ECB-253 model has a full-color backlit-display and a jog dial for turn and select navigation to access a wide range of internal controller functions:

- [ ] View and override values. The status is color coded to show if the value is overridden.
- [ ] Visually tune PID loops with system response graphing.
- [ ] View and modify schedules and calendars through a graphic interface. Also create or delete schedule events, special events, and calendar entries.
- [ ] Create a list of favorites to provide quick access to commonly-used values.
- [ ] Multi-User access management.
- [ ] Multilingual interface: English, French, German, etc.

UUKL Smoke Control System

The Distech Controls UUKL Smoke Control System is designed to protect occupants and buildings in the event of a building fire by maintaining tenable evacuation routes and containing smoke within the fire area. It is a unique Niagara^{AX}-based system that complies with the Underwriters Laboratories Inc® (UL) requirements for UL 864 UUKL 9th Edition Smoke Control Listing.

For detailed specifications, requirements, and procedures for installing, wiring, and operating UUKL Listed equipment, refer to the Distech Controls UUKL Listed documentation on SmartSource: Smoke Control Design Guide (05DI-UGULDES-10) and the Smoke Control Application Guide (05DI-UGULAPP-10).

Model Selection

Model	ECB-203	ECB-203 with Environmental Protection	ECB-253	ECB-203 UUKL
Points	14-Point Controller	14-Point Controller	14-Point Controller with Color Display	14-Point Controller
Universal hardware inputs	6	6	6	6
Wireless inputs[1]	24	24	24	24
15 Vdc Power Supply	■	■	■	■
Digital (triac) outputs	5	5	5	5
Universal outputs	3	3	3	3
Operator interface: interactive color display to monitor and override controller parameters			■	
Environmental protection (conformal coating)		■		
UL 864, 9th Edition, UUKL Listed Smoke Control Equipment[2]				■
California State Fire Marshal Listed				■

1. All controllers are Open-to-Wireless ready. Available when an optional Wireless Receiver is connected to the controller. Some wireless sensors may use more than one wireless input from the controller.
2. 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 on SmartSource.

Recommended Applications

Model	ECB-203	ECB-203 with Environmental Protection	ECB-253	ECB-203 UUKL
Rooftop Unit	■	■		■
2 Pipe Fan Coil	■		■	
2 Pipe Fan Coil with Changeover Sensor	■		■	
4 Pipe Fan Coil	■		■	
Heat Pump Unit	■	■	■	
Unit Ventilator	■		■	
Small Air Handling Unit	■		■	■
Chilled Ceiling	■		■	
Exhaust Fan	■			■

BACnet Objects List

BACnet Objects List	
BACnet Calendar Objects	1
☐ Special events per calendar	25
BACnet Schedule Objects	2
☐ Special events per schedule	5
BACnet PID Loop Objects	8
BACnet BV Objects:	
☐ Commandable	10
☐ Non-Commandable	40
BACnet MSV Objects:	
☐ Commandable	10
☐ Non-Commandable	40
BACnet AV Objects:	
☐ Commandable	25
☐ Non-Commandable	75

Product Specifications

Power Supply Input

Voltage Range	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	2.0A

Power Consumption:
- ECB-203 — 14 VA typical plus all external loads[1], 23 VA max.
- ECB-253 — 17 VA typical plus all external loads[1], 26 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-ASC[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-Vue Series Communicating Sensor

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

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Memory	384 kB Non-volatile Flash (applications)
	1 MB Non-volatile Flash (storage)
	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
Status Indicator	Green LEDs: power status & LAN Tx
	Orange LEDs: controller status & LAN Rx
Communication Jack	BACnet 1/8" (3.5mm) stereo audio jack

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum Number of Allure Series Communicating Sensors combined	4[1]

- Allure EC-Smart-Vue Series — Up to 4
- Allure EC-Smart-Comfort (except UUKL model) — Up to 4
- Allure EC-Smart-Air Series (except UUKL model) — Up to 4

1. A controller can support a maximum of two Allure Series Communicating Sensor models equipped with a CO_2 sensor. The remaining connected Allure Series Communicating Sensor models must be without a CO_2 sensor.

Wireless Receiver[1]

Communication Protocol ——————————————————— EnOcean wireless standard

Number of Wireless Inputs[2] ——————————————————————— 24

Supported Wireless Receivers ——————————— Refer to the Open-to-Wireless Solution Guide

Cable ————————————————————————————— Telephone cord

☐ Connector —————————————————————————— 4P4C modular jack

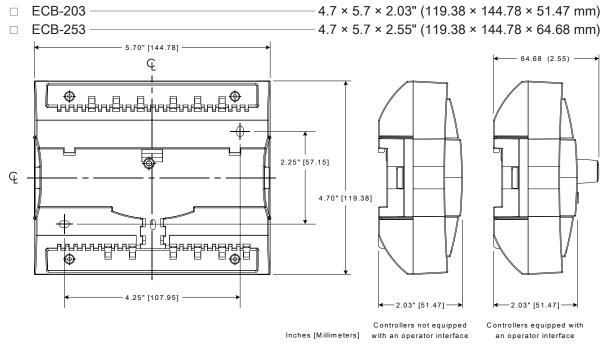☐ Length (maximum) ——————————————————————— 6.5ft (2m)
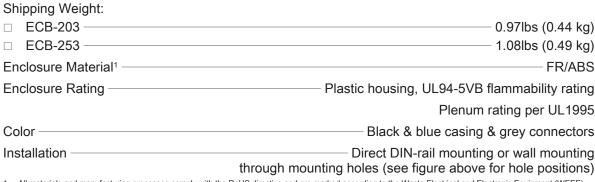
enocean®

1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Solution 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-203 ——————————————— 4.7 × 5.7 × 2.03" (119.38 × 144.78 × 51.47 mm)

☐ ECB-253 ——————————————— 4.7 × 5.7 × 2.55" (119.38 × 144.78 × 64.68 mm)

Inches [Millimeters]

Controllers not equipped with an operator interface

Controllers equipped with an operator interface

Shipping Weight:

☐ ECB-203 ——————————————————————————— 0.97lbs (0.44 kg)

☐ ECB-253 ——————————————————————————— 1.08lbs (0.49 kg)

Enclosure Material[1] ————————————————————————————— FR/ABS

Enclosure Rating ——————————————— Plastic housing, UL94-5VB flammability rating

Plenum rating per UL1995

Color ——————————————————————— Black & blue casing & grey connectors

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:
- ☐ ECB-203 -40°F to 158°F (-40°C to 70°C)
- ☐ ECB-253 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 Regulations

CE:
- ☐ Emission ———————————— EN61000-6-3: 2007; A1:2011; Generic standards for residential, commercial and light-industrial environments
- ☐ 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

UL Listed (CDN & US) ———————————— UL916 Energy management equipment

UL 864 ———————————— UL 864, 9th Edition, UUKL Listed Smoke Control Equipment (ECB-203 UUKL model only)[1]

California State Fire Marshal Listing ———————————— CSFM: 7300-2187:0100 (ECB-203 UUKL model only)[1]

CEC Appliance Database ———————————— Appliance Efficiency Program[2]

1. For detailed specifications regarding the ECB-203 UUKLmodel, 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-253 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)

2.8" (71mm) diagonal

Menu Navigation ———————————— Jog dial turn, select navigation with Exit button

Specifications - Universal Inputs (UI)

General

Input Type ———————————— Universal; software configurable

Input Resolution ———————————— 16-bit analog / digital converter

Power Supply Output ———————————— 15VDC; maximum 120mA

Contact

Type ———————————— Dry contact

Counter

Type ———————————— Dry contact

Maximum Frequency ———————————— 1Hz maximum,

Minimum Duty Cycle ———————————— 500milliseconds On / 500milliseconds Off

0 to 10VDC

Range ———————————————————————————— 0 to 10VDC (40kΩ input impedance)

0 to 5VDC

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

0 to 20mA

Range ———————————————————————————— 0 to 20mA

———————————————————————————— 249Ω external resistor wired in parallel

Resistance/Thermistor

Range ———————————————————————————— 0 to 350 KΩ

Supported Thermistor Types ————————————————— Any that operate in this range

Pre-configured Temperature Sensor Types:

☐ Thermistor ————————————— 10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC)

☐ Platinum ——————————————————— Pt1000 (1KΩ @ 32ºF; 0ºC)

☐ Nickel ——————————————— RTD Ni1000 (1KΩ @ 32ºF; 0ºC)

——————————————— RTD Ni1000 (1KΩ @ 69.8ºF; 21ºC)

Specifications - 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 200Ω)

PWM

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

Thermal Actuator Management ——————————— Adjustable warm up and cool down time

Floating

Minimum Pulse On/Off Time ————————————————————— 500milliseconds

Drive Time Period ———————————————————————————— Adjustable

0 to 10VDC

Voltage Range ———————————————————————————— 0 to 10VDC linear

Source Current ————————— Maximum 60 mA at 10VDC (minimum load resistance 200 Ω)

Specifications - Digital Output (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 65seconds

Floating

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

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