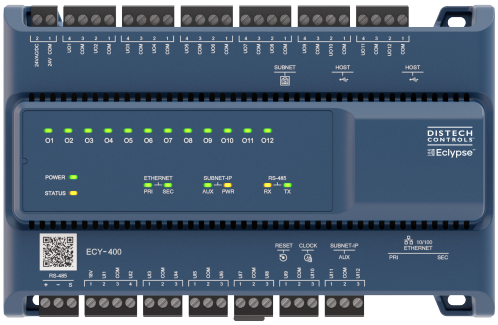
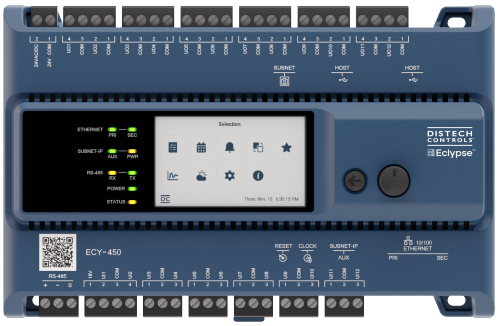
ECY-400 Series





Overview

The Eclypse™ 400 (ECY-400) Series controllers are designed to control various building automation applications such as air handling units, multi-zone applications, chillers, boilers, pumps, cooling towers, and roof top units. They support BACnet/IP communications and are listed BACnet Building Controllers (B-BC).

These programmable controllers are powered by Eclypse Facilities and include two years of Atrius Facilities - Organize. They feature an embedded visualization interface and web server, which enables web-based application configuration, scheduling, alarming, and logging. Control logic and graphic user interface can be customized as required for the application.

Features & Benefits

- More compact architecture and flexible installation. Can be mounted vertically or horizontally; perfect for panel retrofits or applications when limited horizontal space is available
- An optional full-color backlit display with jog dial provides direct access to a wide range of controller functions
- Flexible networking using options for isolated applications and fail-safe daisy-chaining applications. Two Ethernet ports and an AUX port can be configured to create separate networks.
- Software-configurable IOs reduce controller manipulation.
- Different communication protocols such as BACnet MS/TP, BACnet/SC, BACnet/IP, MQTT, Modbus RTU, Modbus TCP, and M-Bus are supported to ensure ease of communication, authentication, and error detection.
- Connectivity packs enable remote devices to be added to a connector in Eclypse Facilities to provide flexibility and expandability to customize your project needs.
- Readily supports Atrius Facilities that simplifies installation and maintenance of systems and increases the efficiency of building operations.

Model & Connectivity Selection

Model Selection

Example: ECY-*400-C25*

Series	Model	Connectivity
ECY-	*400*: 24-Points, 24VAC/DC Power Supply, 12 UI, 12 UO	*-C0*: default model if no connectivity is required
	450: 24-Points, 24VAC/DC Power Supply, 12 UI, 12 UO, Color display	*-C1 .... C50*: if connectivity is required (see table below)

Connectivity Packs

Connectivity packs enable remote devices to be added to a connector in Eclypse Facilities. A single pack adds x connections and x * 100 points of connectivity.

BACnet Network Values in EC-*gfx*Program are available without connectivity packs.

Connectivity		Device Ratios			
		1:1	2:1	8:1	100:1
Connectivity Pack	Connections (device loads)	BACnet Devices (IP or MS/TP)	Modbus devices (TCP/IP or RTU)	M-Bus devices[1]	Global point count
C1[2]	1	1	2	3	100
C3	3	3	6	3	300
C5	5	5	10	3	500
C10	10	10	20	3	1000
C25	25	25	50	3	2500
C50	50	50	100[3]	3	5000

[1]The maximum number of physical M-Bus meters is 3 when the ECY-MBUS module is connected to the controller's USB port.

[2]Minimum Connectivity Pack required to enable BACnet routing, MS/TP "Client", integration, use of RS485 port

[3]Modbus RTU limited to 32 devices/RS-485 port, 96 devices total

Depending on the connector, a device can consume a whole connection or a fraction of a connection.

The device ratios are the following using a C5 connectivity pack (refer to table above):

- BACnet (1:1) = 5 BACnet with C5
- Modbus (2:1) = 10 Modbus with C5
- M-Bus[1] (8:1) = 40 M-Bus with C5

How to calculate connectivity

Connectivity packs are cumulative but only one pack can be ordered with a controller. More packs can be added afterwards in the field. The following shows how to calculate the connectivity needed:

6 BACnet + (3 Modbus ÷ 2) + (6 M-bus ÷ 8) = 8.25

Select C10 (10 connections, 1000 points)

To assist in calculating the required connectivity, contact your RSM for more details or refer to the price list if available.

Accessories

Eclypse Wi-Fi Adapter	Wi-Fi Adapter for Eclypse Connected Controllers.
Eclypse Open-To-Wireless™ Adapter	EnOcean communication protocol adapter for Eclypse Connected Controllers.

[1]Some physical M-Bus meters can include more than 1 virtual M-Bus device. Since each virtual M-Bus device has its own M-Bus address on the M-Bus network, the Connectivity Pack will count the number of virtual devices, rather than the number of physical M-Bus meters. It is therefore recommended to check whether the M-Bus meters that will be connected to the controller include virtual M-Bus devices, and, if so, how many, before choosing a Connectivity Pack license.

ECx-Subnet-Adapter	Required for daisy-chaining the ECx-Display or the EC-Multi-Sensor with other subnet devices
RTC Battery Adapter	Adapter to add a size CR2032 coin cell battery (not included)

Recommended Applications

Model	ECY-400 / 450
Air Handling Unit	■
Multi-Zone Application	■
Chiller	■
Boiler	■
Cooling Tower	■

Product Specifications

Power Supply Input (24VAC)

Input Voltage Range	24VAC; ±15%; Class 2
Power Consumption	100VA maximum; internal and external loads included 12VA typical, no load
Recommended Transformer Size	100VA
Frequency Range	50 to 60Hz

Power Supply Input (24VDC)

Input Voltage Range	24VDC; ±15%; Class 2
Power Consumption	60W maximum; internal and external loads included[1] 5W typical, no load
Recommended Power Supply Size	60W

[1]Powering external devices through the Subnet-IP does not work if input supply is in VDC.

Current Limits

Power Supply Input	4A (internal fuse)
18V	240mA
Subnet-IP	180mA (10W)
Subnet	450mA (6.75W)
USB 2.0	500mA per port

Communications

Ethernet Connection Speed	10/100 Mbps
Cable Type	Cat 5e, 8 conductor twisted pair (unshielded)
Addressing	IPv6, IPv4, or Hostname
BACnet Profile	BACnet Building Controller (B-BC))
BACnet Listing	BTL (B-BC)
BACnet Interconnectivity	BBMD forwarding capabilities BACnet MS/TP to BACnet/IP and BACnet/SC routing
BACnet Transport Layer	IP, BACnet/SC & MS/TP (optional)
Web Server Protocol	HTML5
Web Server Application Interface	REST API
BACnet MS/TP or Modbus RTU	1 × RS-485 serial communications ports
RS-485 Wiring	1-pair + Common/shield
RS-485 EOL Resistor	Built-in
RS-485 Baud Rates	9600, 19 200, 38 400, or 76 800 bps
RS-485 Addressing	Controller's Web Configuration Interface
Modbus TCP	Devices must be on the same subnet
Wireless Adapter	Optional, USB Port Connection
Wi-Fi Communication Protocol	IEEE 802.11g/n
Wi-Fi Network Types	Client, Access Point, Hotspot

Subnetwork

Communication	RS-485
Cable Type	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum number of standard room devices supported per controller combined[1]	12
Allure EC-Smart-Vue Series[2]	12
Allure EC-Smart-Comfort Series	6
Allure EC-Smart-Air Series[2]	6
EC-Multi Sensor	4
ECx-Light-4 / ECx-Light-4D / ECx-Light-4DALI / ECx-Light-DALI-A	2

ECx-Blind-4 / ECx-Blind-4LV / ECx-Blind-4SMI / ECx-Blind-4SMI-LoVo	2
Maximum number of Bluetooth low energy room devices per controller combined [3]	6
Allure UNITOUCH™	2
EC-Multi-Sensor-BLE	4

[1]For more details about supported quantities, see the Product Selection Tool available in Builder: https://builder.distech-controls.com.

[2]A controller can support a maximum of 2 Allure sensor models equipped with a CO_2 sensor. Any remaining connected sensors must be without a CO_2 sensor.

[3]A mixed architecture with standard room devices and Bluetooth low energy enabled devices is not recommended.

Open-to-Wireless Adapter

Communication Protocol	EnOcean wireless standard[1]
Connector Type	USB
Number of Wireless Inputs	Unlimited[2]

[1]Available when an optional external Eclypse Open-to-Wireless Adapter is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.

[2]Wireless inputs will only be limited by physical distance between the EnOcean devices and the Eclypse Open-to-Wireless Adapter.

Subnet-IP

Subnet-IP Connection Speed	10/100 Mbps
Cable Type	Cat 5e, 8 conductor twisted pair
Subnet-IP Voltage	55VDC (software-enabled)[1]

[1]Powering external devices through the Subnet-IP does not work if input supply is in VDC.

Hardware

Processor	Sitara ARM processor
CPU Speed	1GHz
Memory	4GB Non-volatile Flash (applications & storage) 512MB RAM
Co-processor[1]	STM32 (ARM Cortex M0+) MCU 32-bit
MCU Speed	64 MHz
MCU Memory	512KB Non-volatile Flash (system) 144KB RAM
Real Time Clock (RTC)	Real Time Clock with rechargeable battery Supports SNTP network time synchronization
RTC Battery	20 hours charge time, 20 days discharge time Up to 500 charge / discharge cycles MS621T coin cell battery; an adapter is available to add a size CR2032 coin cell battery with the external connector
Ethernet	3 switched RJ-45 Ethernet ports (Supported Protocols: BACnet/IP, Modbus TCP, NTP, and REST) Primary and secondary Ethernet ports with integrated fail-safe for daisy-chain operation
USB Connections	2 × USB 2.0 Ports
RS-485 Serial Communications	Screw terminals (Supported Protocols: BACnet MS/TP or Modbus RTU)
Subnet	RJ-45
Green LED	Power status, I/O, Ethernet Traffic, Subnet-IP AUX, and RS-485 TX
Orange LED	Controller status, Subnet-IP PWR, RS-485 RX

[1]Dedicated for IO control and MSTP

Environmental

Operating Temperature [1]	*ECY-400*: -40 to 158°F (-40 to 70°C)[2] *ECY-450*: -4 to 122°F (-20 to 50°C)[3]
Storage Temperature	*ECY-400:* -40 to 185°F (-40 to 85°C) *ECY-450:* -22 to 176°F (-30 to 80°C)
Relative Humidity	0 to 90% non-condensing
Ingress Protection Rating	IP20
Nema Rating	1

[1]Some applications may be limited at high operating temperatures.

[2]For controllers not equipped with an operator interface, the internal temperature must not exceed 185°F (85°C).

[3]For controllers equipped with an operator interface, the internal temperature must not exceed 158°F (70°C).

Mechanical

Dimensions (H × W × D)	*ECY-400:* 4.79 ×7.32 × 2.46" (121.60 × 186.00 × 62.58 mm) *ECY-450:* 4.79 ×7.32 × 2.91" (121.60 × 186.00 × 73.91 mm)
Shipping Weight	1.40lbs (0.64kg)
Mounting	DIN rail or screw mounting
Enclosure Material	Flame retardant/Polycarbonate (FR/PC)
Enclosure Rating[1]	Plastic housing, UL94-5VB flammability rating

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

Standards and Regulations

CE Emission and CE Immunity	EN 63044-5-1 (2019) EN 63044-5-2 (2019)
FCC	Compliance with FCC rules part 15, subpart B, class B
ICES Compliance	ICES-003
UL Listed (CDN & US)	UL916 Energy management equipment

ECY-450 LCD Display

Display Type	Backlit-color LCD
Display Resolution	400 W x 240 H pixels (WQVGA)

Effective Viewing Area (W × H)	2.26 × 1.36” (57.3 × 34.54mm) diagonal: 2.63” (66.9mm)
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	18VDC; maximum 240mA
Auto-reset fuse	Provides 24VAC over voltage protection

Contact

Type	Dry Contact

Pulse/Counter

UI1 to UI4

Pulse Input	SO output compatible
Maximum Frequency	100HZ maximum
Minimum Duty Cycle	5ms On / 5ms Off

UI5 to UI12

Type	Dry Contact
Maximum Frequency	1HZ maximum
Minimum Duty Cycle	500ms On / 500ms Off

0 to 10VDC

Range	0 to 10VDC (40kΩ input impedance)

0 to 5VDC

Range	0 to 5VDC (high input impedance)

0 to 20mA

Internal Resistor	249 ohm
External Resistor	249 ohm

Resistance/Thermistor

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

Pre-configured Temperature Sensor Types:

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

Universal Outputs (UO)
General

Output Type	Universal; software configurable
Output Resolution Converter	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 to 12VDC (On/Off)

Range	0 to 12VDC
Source Current	Maximum 60mA at 12VDC (minimum load resistance 200Ω)

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

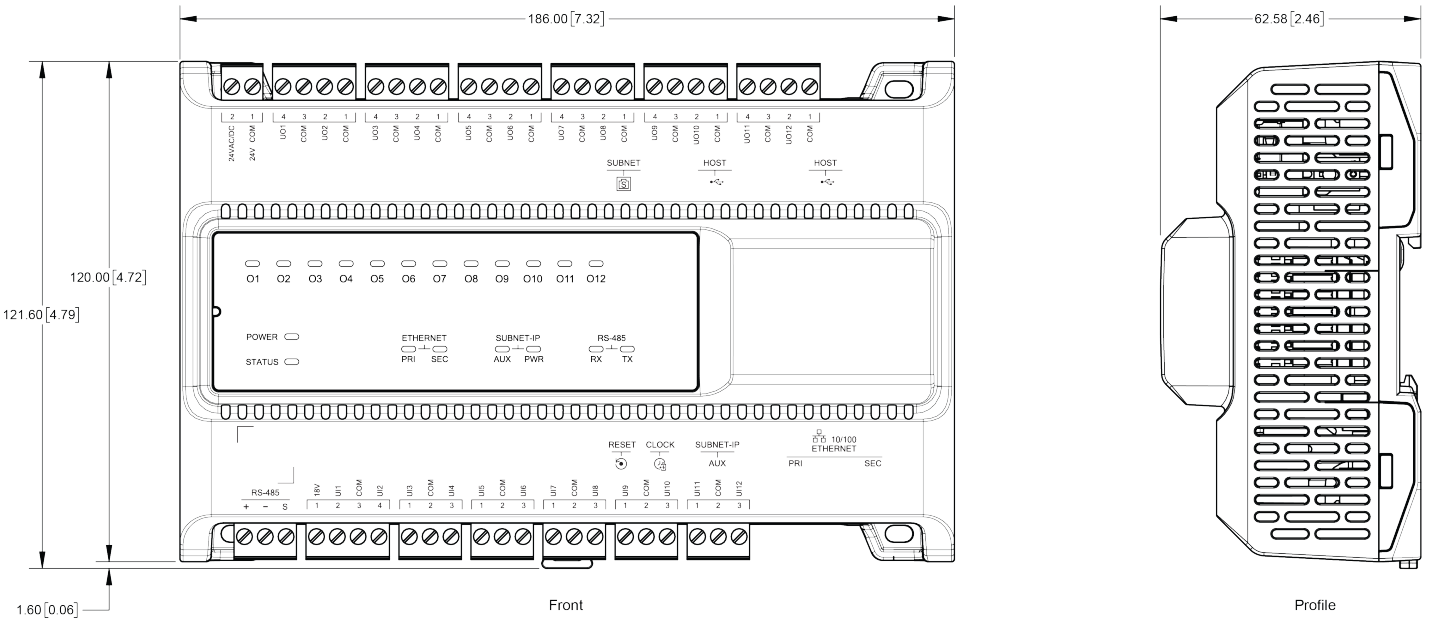
0 to 10VDC

Range	0 to 10VDC

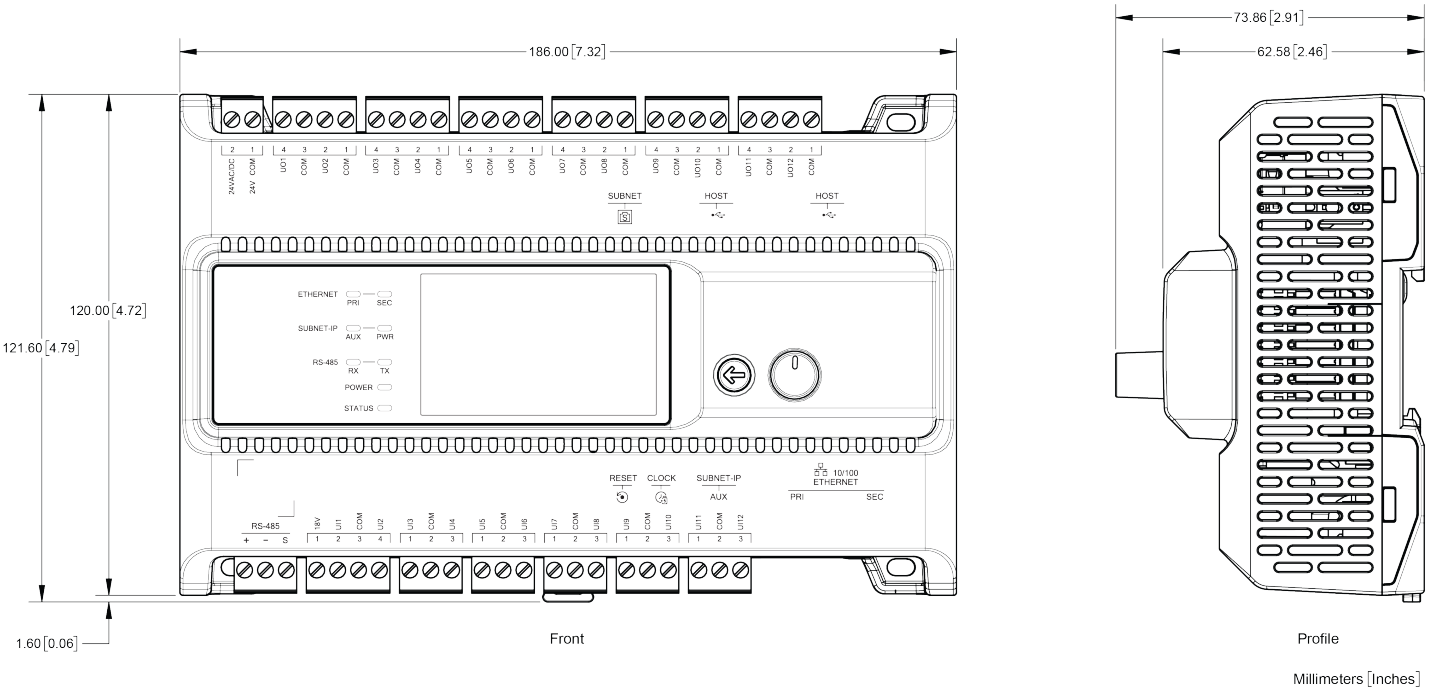
0 to 20mA

Range	0 to 20mA
Type	Current source

Dimensions



Controllers not equipped with an operator interface



Controllers equipped with an operator interface