

Models:

OMC40: 40 Programmable Points	OMC40D: OMC40 with Display
OMC20: 20 Programmable Points	OMC20D: OMC20 with Display
OMC14: 14 Programmable Points	OMC14D: OMC14 with Display

Omni BEMS Controller

Overview

The Innotech Omni generation of Native BACnet BEMS Controllers are state of the art digital processing systems suitable for various types of control applications typically found in building management and process control.

High speed data processing technology, customisable multi protocol communication interfaces, combined with a fully user configurable input/output interface for field device connectivity allows for out-of-the-box project flexibility.

Omni's Programmable Points (UI/O) can be used universally as inputs or outputs.

Each Omni controller supports various industry standard protocols with enhanced capabilities including routing between networks and protocols.

Additional protocol and communications interfaces are supported via Omni Expansion Bay Modules.

Each controller has a feature rich embedded webpage providing user level controlled access to the device system configuration including, real time monitoring and trending, graphing, diagnostics, alarm status, log extraction and scheduling functions.

The optional Human Machine Interface (HMI) can be ordered with the Omni BEMS Controller or used externally via various mediums. The HMI is customisable during the configuration process and can display relevant live information as well as providing access to system settings.

Easily accessible USB ports offer a fast localised configuration interface and access to logged data.

Omni controllers are fully programmable via the Innotech Focus graphical programming interface.

Features

- 40, 20 or 14 Point (UI/O) models with the ability to use any point as an input or output, allowing greater flexibility
- Expandable via Omni Remote Expansion Modules
- UI/O update rates up to 500Hz (2ms)
- Individual UI/O LEDs for status indication and fault diagnostics
- Compatible with existing Innotech controller networks
- Optional customisable HMI with click-wheel navigation
- Colour coded pluggable terminals for easy identification
- Ethernet, RS-485 and USB communications
- Communication LEDs for all interfaces
- Protocol routing/conversion capability
- Battery backed Real Time Clock
- Easily programmed with Innotech Focus software
- Feature rich multi-platform Web server
- Polarity independent AC or DC Power Supply
- Dedicated Innotech Smart Sensor (ISS) communications
- Expansion port for additional protocol/communications (selected models only)
- User replaceable log data memory via MicroSD
- Reporting of controller and programmable point self-diagnostics



Applications

Omni BEMS Controllers offer a large array of programmable points to monitor and control all types of external plant and equipment.

Omni BEMS Controllers are ideal for HVAC, Building and Energy Management, automation as well as process control.

The creation of control strategies is made simple with the Focus engineering software. With it's powerful graphical programming interface, Focus allows the user to create a project-wide control strategy.

Typical applications include:

- Building Management and control
- Energy Management and Analysis
- Heating, Ventilation, Air-Conditioning & Refrigeration (HVAC & R)
- Process control
- Lighting control
- Monitoring and Data logging
- Protocol conversion or routing
- Distributed I/O points controller
- Cold/Freezer rooms
- Various OEM Applications

Installation

The controller should be installed in an environment that does not exceed the maximum operating parameters of the device. It should be mounted in a clean and dry environment free of vibration, and properly ventilated.

The controller should be mounted on DIN rail in cabinets approved for switchgear or industrial control equipment. Maximum terminal cable entry is 1.5mm².

Wiring should be done in accordance with Innotech connection diagrams, Installation Instructions and local bylaws or refer to your local distributor.

Connect the 24VAC/DC supply to the correct terminals on the controller. Wire the EARTH terminal of all controllers to a DIN rail earth terminal on the same rail, or the nearest earth stud.

All cable screens should connect to the same earth point unless otherwise stated in the Innotech Device Network Cabling Manual.

Model Specification

Controller Name	Omni C40	Omni C20	Omni C14
Processor Speed	800MHz	800MHz	600MHz
Programmable Points (UI/O)	40	20	14
Non Volatile Memory	128KB	128KB	8KB
Real-time Clock	Yes	Yes	Yes
RS-485 Ports	3	3	2
Ethernet - 100BASE-T	2	2	1
8GB MicroSD for Logging	Yes	Yes	Yes
HMI (on-board)	Optional	Optional	Optional
HMI (External)	Optional	Optional	No
USB-A (Host)	Yes	Yes	No
USB-Mini B (PC Link)	Yes	Yes	Yes
Innotech Smart Sensor RS-485 Comms	Yes	Yes	No
Field Supply 24VDC	Yes	Yes	No
Expansion Port	Yes	Yes	No
Omni U10 Support (Total Devices)	5	1	0
UI/O Point Processing Limit	90	30	14
Web Server	Yes	Yes	Yes
Protocol Routing	Yes	Yes	Yes
BACnet Broadcast Management Device	Yes	Yes	Yes
Max. Power per UI/O	0.5W	0.5W	0.5W
Max. IO System Power	20W	10W	7W

i The real-time clock battery is user replaceable but should only be replaced by qualified Innotech service technicians. The battery is located in the expansion bay on all models.

The MicroSD card also contains PDF documents. For the latest documents, visit www.innotech.com.au.

The optional on-board HMI module can only be installed by qualified Innotech service technicians.

General Specifications

PROCESSOR	
CPU	ARM Cortex A8
POWER SUPPLY REQUIREMENTS	
Power Input	24VAC ±20% or 24VDC (18VDC to 35VDC)
Recommended Transformer Ratings	(per controller)
Omni C40	40VA
Omni C20	20VA
Omni C14	15VA
Power Consumption	6W to 30W (model & load dependent)
24VDC Supply Output (C40 & C20 Models Only)	Unregulated, isolated 24VDC output, ~1.5W, 65mA max, overload protected.

i Polarity independent supply wiring.
The power supply is full wave rectified to reduce transformer stress.
The controller's earth terminal must be connected at all times.

The operating voltage must meet the requirements of Safety Extra Low Voltage (SELV) to EN60730. The transformer used must be a class 2 safety transformer in compliance with EN60742 and be designed for 100% duty. It must also be sized and fused in compliance with local safety regulations.

ENVIRONMENTAL

Operating Temperature -10° to 50°C non-condensing
14° to 122°F non-condensing

Storage Temperature -20° to 60°C non-condensing
-4° to 140°F non-condensing

INSTALLATION ORIENTATION

Horizontally mounted DIN rail on a vertical surface.
Allow a minimum 20mm (40mm recommended) gap between the end of the terminal plug and cable ducts.

ENCLOSURE

Housed in a rectangular case suitable for DIN rail mounting. Housing moulded from flame retardant plastics recognised by UL as UL94-V0.

Colour Blue/Black

Dimensions

Omni C40	W 280mm x H 93.4mm x D 80mm (11.02" x 3.68" x 3.15")
Maximum Dimensions (with HMI and Terminals)	W 280mm x H 113.44mm x D 87.9mm (11.02" x 4.47" x 3.46")
Omni C14 and C20	W 180mm x H 93.4mm x D 80mm (7.09" x 3.68" x 3.15")
Maximum Dimensions (with HMI and Terminals)	W 180mm x H 113.44mm x D 87.9mm (7.09" x 4.47" x 3.46")

APPROVALS AND LISTINGS

EN61326:2013 Class A for CE & RCM Labelling
Title 47 CFR, Part 15 Class A for FCC Marking
UL Listed to UL916, File Numbers PAZX.E242628, PAZX7.E242628
Listed by BTL

BATTERY

Contains a Lithium Type Battery, Dispose of Properly.
(In accordance with local regulations)

- Type: CR-2032 Lithium (user replaceable)
- Nominal voltage: 3 Volts
- Shelf life: 5 Years, dependent on ambient temperature

i Caution: Risk of explosion if battery is replaced by an incorrect type.

COMMUNICATIONS	
Ethernet	100Base-T
RS-485 Comms Inputs	Up to 115kbps (with EOL)
ISS Comms	Innotech Smart Sensor Comms

DEFAULT SETTINGS FOR COMMS CHANNELS

Comm1	RS-485	No Default Set
Comm2	RS-485	No Default Set
ⁱ 2 Comm3	RS-485	No Default Set
	IP Address	192.168.2.100
	Application	Transport Port
Ethernet A	Local / Remote Communications	TCP/UDP 20000
	Local Communications	UDP 47808
	Web Server	TCP 80
ⁱ 1 Ethernet B	Switch Mode	

DEFAULT ADDRESSES

Innotech	1
BACnet	2100

CONFIGURING / MONITORING / COMMUNICATIONS

ⁱ 2 USB Host (A Type Connector)	High Speed 480Mbps → Supported Peripherals such as HMI and Flash Drive. (200mA load max)
ⁱ 6 USB Device (Mini-B Type)	High Speed 480Mbps → Computer Connection Virtual IP Address: 169.254.2.100
ⁱ 2 Expansion Port	Card slot located in the expansion bay for optional modules.

Data Logging

MicroSD Slot	8GB Class 10 MicroSD card supplied
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PROTOCOLS

- Innotech on IP
- Innotech REM Comms
- Innotech RS-485 Net Comms
- Innotech RS-485 Global Comms
- BACnet MS/TP
- BACnet/IP

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EXPANSION BAY MODULES

Isolated RS-485 (1 channel)

HUMAN MACHINE INTERFACE (HMI)- Optional

ⁱ 3 On-board HMI LCD Display (backlit)	128 x 64 pixels monochrome graphical display (white)
Menu Navigation and Parameter Input	<ul style="list-style-type: none"> • Click wheel with push action • Back/Escape Button
ⁱ 4 Factory Programmed Buttons	Two

LED INDICATORS

Comms LEDs for RS-485	Red - Tx Green - Rx
ISS Traffic LED	Green
UI/O - Digital Output	Orange
UI/O - Fault	Orange Flash
Warning LED (on HMI)	Orange
Alarm LED (on HMI)	Red

Heartbeat LED

Status OK	Green Flash
Fault	Red Flash
ⁱ 5 Request	Orange Flash
Power Fail	Slow Orange Flash

Web Server

The Omni Web Server allows access to user programmed variables, schedules, system settings, log data (with export function), alarms, access control and real-time configuration monitoring and trends.

To access the web server, enter the IP address of the Omni Controller in your web browser, ensuring your device is on the same range.



The Omni Web Server uses HTML5 and requires no additional plugins, ensuring compatibility across multiple web browsers.

Omni HMI Operation

Refer to the Omni User Instructions.

FCC Class A Notice


This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:


1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note - This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Modifications to this device, may void the authority granted to the user by the FCC to operate this equipment.

- ⁱ 1 Used as a network switch for computer or additional device connection.
- ⁱ 2 Available on Omni C40 & C20 models only.
- ⁱ 3 The optional Omni HMI is a "plug-in" component, which includes a click wheel, buttons and LEDs. The module can only be installed by qualified Innotech service technicians.
- ⁱ 4 A Button - Watch Page Menu
B Button - Notifications / Alarms
- ⁱ 5 Shown when upgrading, during config transfer, initialising etc.
- ⁱ 6 The Mini-B USB connection allows programming from iComm using a Virtual TCP connection, as well as access to the Omni web server.

PROGRAMMABLE POINT (UI/O) SPECIFICATIONS	
Current Loop Input	
Range	0mA to 20mA
Resolution	12bit @ 4096 steps
Accuracy	±1.5% of reading @ 20°C (68°F)
Drift	±150ppm/°C

Current/Voltage Input	
Current/Voltage Input (CVT)	
• 333mVAC RMS type with internal burden resistor ONLY	
 CONNECTION OF STANDARD CURRENT TRANSFORMERS INSTEAD OF CVTs TO ANY UIO TERMINAL WILL CAUSE IRREPAIRABLE DAMAGE TO THE OMNI BEMS CONTROLLER AND PRESENT RISK OF ELECTROCUTION.	

Digital Input And Pulse Counter	
Max Pulse Count Frequency @ 2V Amplitude	100kHz
Max Digital Input Response Rate	½ block cycle rate
Max Digital Input Voltage	12VDC
 Contact pulse counting mode is suitable for electronic switches only, unless adequately de-bounced.	

Sensor Input	
Supports	Thermistor NTC, Thermistor PTC
Ranges	Selectable
Resolution	12bit @ 4096 steps
Accuracy	±1.5% of reading @ 20°C (68°F)
Drift	±150ppm/°C

Voltage Input	
Ranges - 0 to 10VDC	Selectable
Resolution	12bit @ 4096 steps
Limits	-0.5V to 12.5VDC
Accuracy	±1.5% of reading @ 20°C (68°F)
Drift	±150ppm/°C


Current Loop Output	
Range	0mA to 20mA
Resolution	12bit @ 4096 steps
Maximum Output Voltage	9VDC @ 20mA
Accuracy	±1.5% of reading @ 20°C (68°F)
Drift	±150ppm/°C


Digital Duty Cycle Output	
Frequency Range	60mHz to 976Hz
Duty Cycle Resolution	14bit (16383 steps)
Duty Cycle Range	0 to 100%
Switch Modes	As per Digital Output specifications

Digital Pulse Output	
Pulse Width Range	10µs to 268s
Pulse Resolution	16bit (65535 steps)
Switch Modes	As per Digital Output specifications

Digital Output		
Switch Modes		
Toggle Switching (Auto)	On = 12VDC	Off = 0V
High Side Switching	On = 12VDC	Off = Open
Low Side Switching	On = 0V	Off = Open
Switch Current	Refer to note	

Protection	
Inrush and short circuit protected	Response time: 64µs

-  For High Side and Toggle Switching modes, maximum available power is limited (45mA).
For Low Side Switching, each channel can switch 200mA.

-  Caution must be used when using Low Side Switching. For more information, contact your Innotech representative.

Voltage Output	
Range	0V to 10VDC
Resolution	12bit @ 4096 steps
Impedance	~80Ω
Maximum Current	10mA
Accuracy	±1.5% of reading @ 20°C (68°F) & $R_{load} > 10k\Omega$
Drift	±150ppm/°C

License Statement

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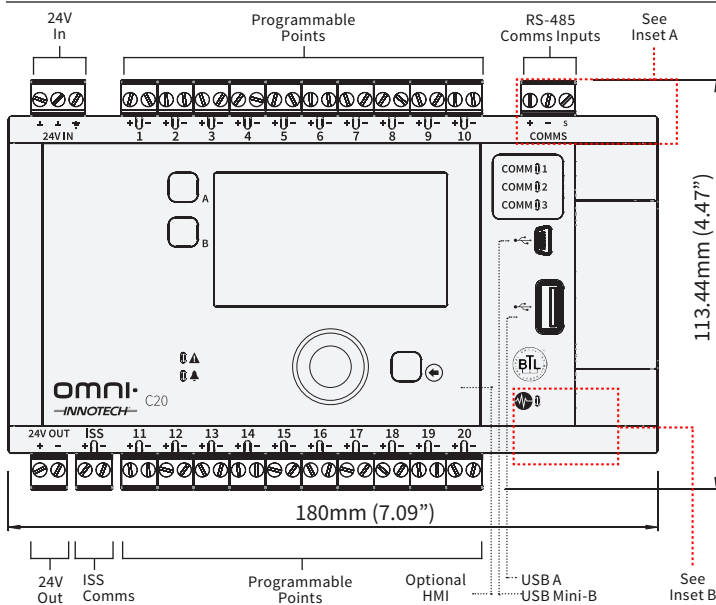
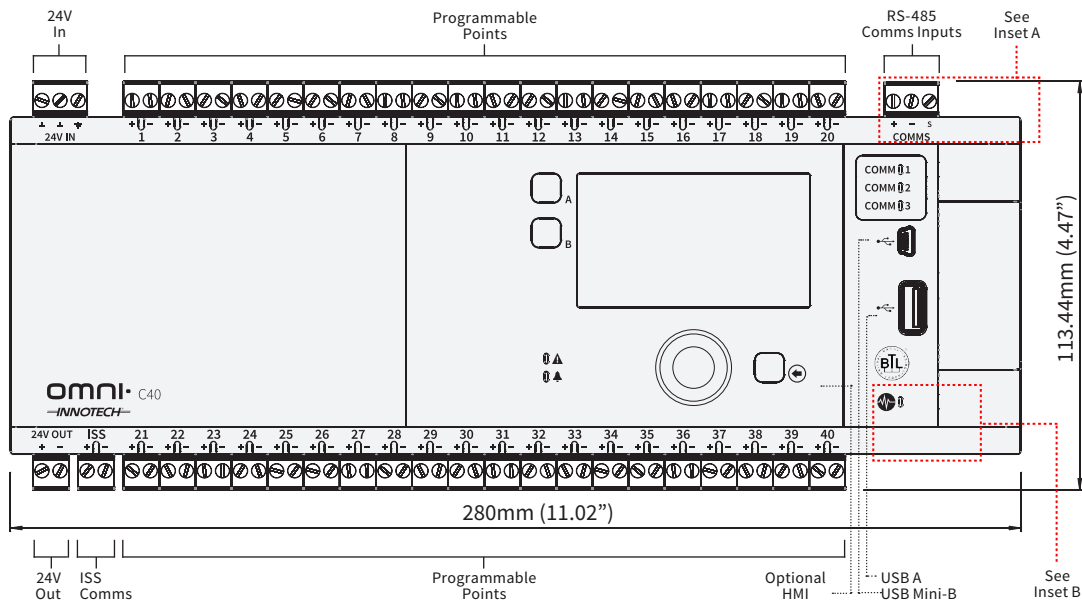
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- are provided together in this product's built-in web interface (Device Info / Legal Information Page)
- can be downloaded at www.innotech.com.au

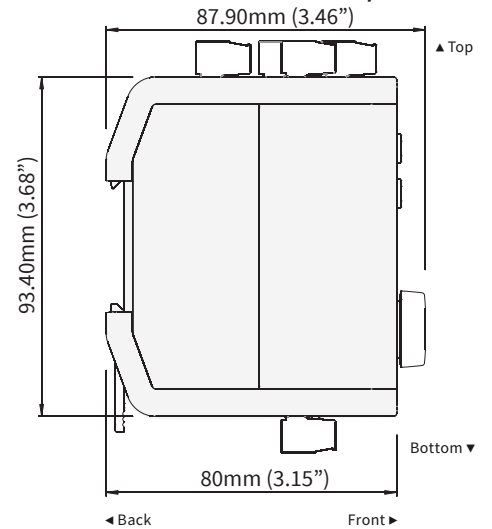
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Omni Controller Dimensions & Parts Identification

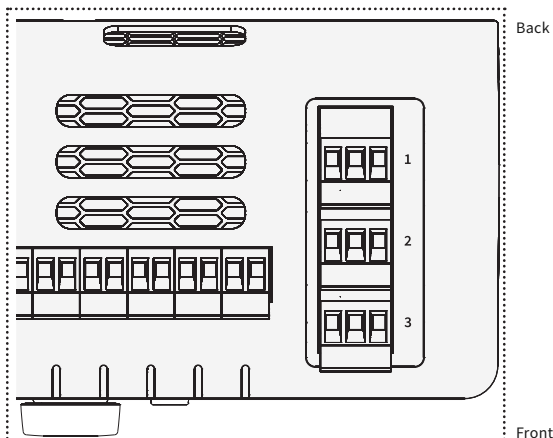
i Optional HMI Shown in all images



End Dimensions for C40/C20

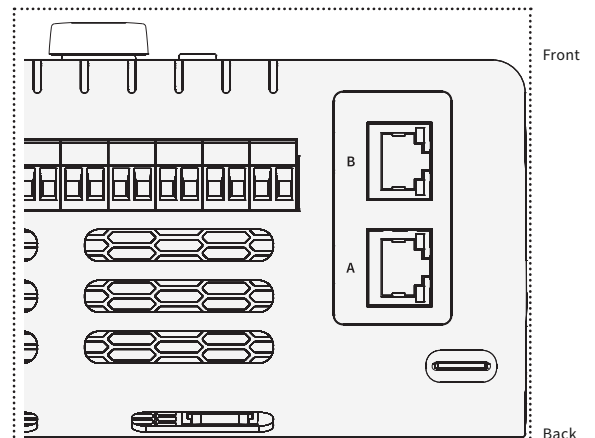


Inset A



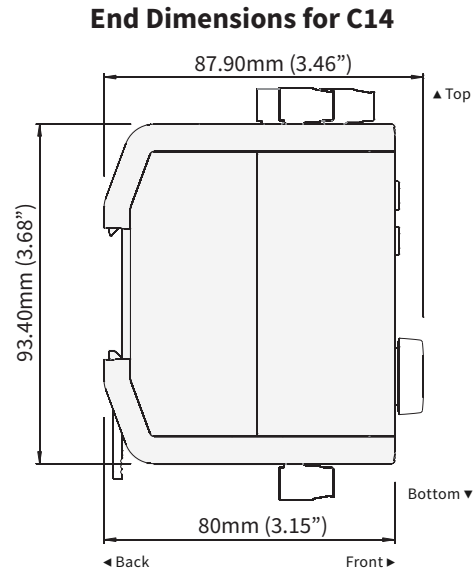
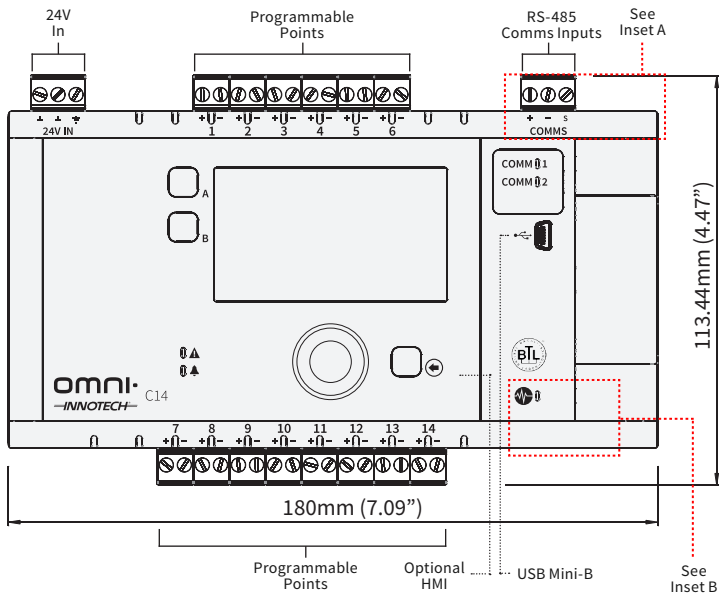
i When mounted on DIN rail, the RS-485 Comms port(s) are located on the **top** of the controller.

Inset B

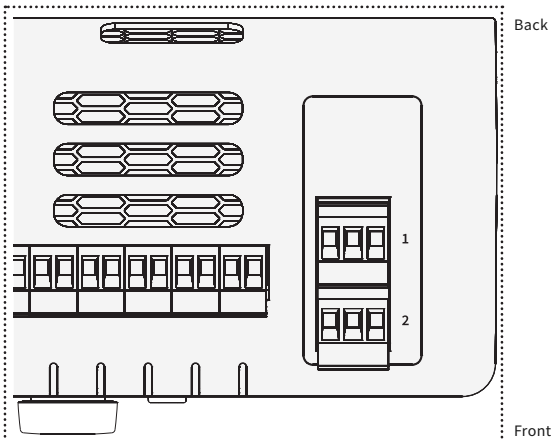


i When mounted on DIN rail, the Ethernet RJ45 port(s) and MicroSD slot are located on the **bottom** of the controller.

Omni C14 Controller Dimensions and Parts Identification

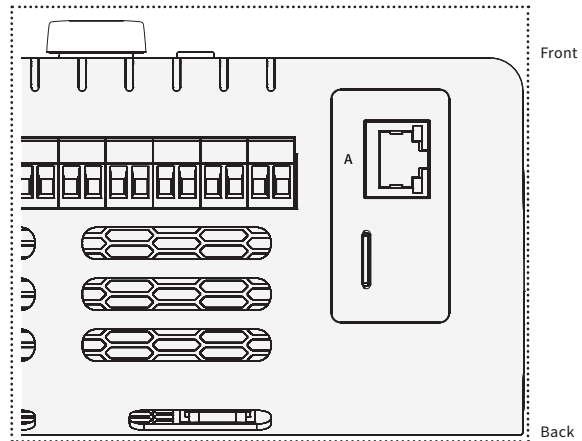


Inset A



i When mounted on DIN rail, the RS-485 Comms port(s) are located on the **top** of the controller.

Inset B



i When mounted on DIN rail, the Ethernet RJ45 port(s) and MicroSD slot are located on the **bottom** of the controller.

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