

### DESCRIPTION

Taco Clarity<sup>3</sup> CLAR-EM-FPC series input/output expansion modules are designed for use with CLAR-FPC series controllers. Multiple EM-FPC's can be connected to a controller via a CAN bus. Each EM-FPC supports up to eight inputs and eight outputs. For example, a CLAR-FPC with four connected EM-FPC's could access up to (internal and external) 42 inputs and 40 outputs connected via terminal blocks.



### APPLICATIONS

I/O expansion modules for CLAR-FPC series controllers can be used with equipment such as:

- Air handling units
- Boilers
- Chillers
- Pumps
- Cooling towers
- Roof top units
- Heat pump units
- Fan coil units
- Unit ventilators
- Other HVAC and building automation system equipment

(See also [Sample Installation on page 4.](#))



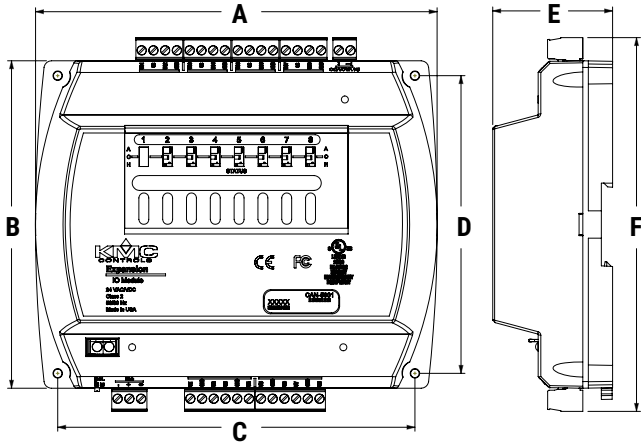
### MODELS

APPLICATIONS	INPUTS	OUTPUTS*	MODEL
I/O Expansion	8 universal (software configurable as analog, binary, or accumulator)	8 universal <ul style="list-style-type: none"> <li>• Software configurable as analog or binary</li> <li>• Override boards give additional options**</li> </ul>	CLAR-EM-FPC

\*Up to four (8 x 8) CLAR-EM-FPC I/O expansion modules can be used with BAC-5900 series controllers to provide up to (internal and external) 42 inputs and 40 outputs.

\*\*ACC-7700 series output override board series provide (triac, NC/NO relays, 4–20 mA, adjustable 0–10 VDC) options for devices that cannot be powered from a standard universal output. The boards can also be used with the CLAR-FPC.

# SPECIFICATIONS



DIMENSIONS		
<b>A</b>	6.744 inches	171 mm
<b>B</b>	5.500 inches	140 mm
<b>C</b>	6.000 inches	152 mm
<b>D</b>	5.000 inches	127 mm
<b>E</b>	2.012 inches	51 mm
<b>F</b>	6.279 inches	159 mm

TERMINAL COLOR CODE	
<b>Black</b>	24 VAC Power
<b>Gray</b>	CAN Communications
<b>Green</b>	Inputs/Outputs

## Inputs and Outputs

### Inputs, Universal (8 on Terminal Blocks)

Universal inputs	Configurable as analog, binary, or accumulator objects
Termination	1K and 10K ohm sensors, 0–12 VDC, or 0–20 mA (without need for an external resistor)
Resolution	16-bit analog-to-digital conversion
Protection	Overvoltage protection (24 VAC, continuous)
Wire size	12–24 AWG, copper, in removable screw terminal blocks

### Outputs, Universal (8 on Terminal Blocks)

Universal outputs	Configurable as an analog (0 to 12 VDC) or binary object (0 or 12 VDC, on/off); alternately, an output override board is installed for devices that cannot be powered from a standard universal output
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Power/protection	Each short-circuit protected universal output capable of driving up to 100 mA (at 0–12 VDC) or 300 mA total for all outputs
Resolution	12-bit digital-to-analog conversion
Wire size	12–24 AWG, copper, in removable screw terminal blocks

## Communication Ports

Expansion	One CAN serial bus connection (terminal block) for daisy-chaining I/O expansion modules up to 200 feet (61 meters) from the controller via standard shielded twisted-pair wire
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## Configuration Tools

Via CLAR-FPC	Taco Programming Tools
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## Hardware Features

### Processor, Memory, and Clock

Processor	32-bit ARM® Cortex-M4
Memory	Configuration parameters are stored in nonvolatile memory; auto restart on power failure

### Indicators and Isolation

LED indicators	Power/status and CAN communication
Communication bulbs	One CAN communications bulb assembly indicates reversed polarity and isolates circuit
Switch	EOL (end of line) for CAN bus

## Installation

### Power

Supply voltage	24 VAC (50/60 Hz) or 24 VDC; -15%, +20%; Class 2 only; non-supervised (all circuits, including supply voltage, are power limited circuits)
Required power	14 VA, plus external loads
Wire size	12–24 AWG, copper, in a removable screw terminal block

### Enclosure and Mounting

Weight	14 ounces (0.4 kg)
Case material	Green and black flame retardant plastic
Mounting	Direct mounting to panels or DIN rails

### Environmental Limits

Operating	32 to 120° F (0 to 49° C)
Shipping	-40 to 160° F (-40 to 71° C)
Humidity	0 to 95% relative humidity (non-condensing)

## Warranty, Protocol, and Approvals

### Warranty

KMC Limited Warranty 5 years (from mfg. date code)

### Protocol

CAN CAN (Controller Area Network) bus on terminals

### Regulatory Approvals

UL	UL 916 Energy Management Equipment listed
CE	CE compliant (pending)
RoHS	RoHS compliant (pending)
FCC	FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A*

\*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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## ACCESSORIES

NOTE: For accessory details, see the respective product data sheets and installation guides.

### Miscellaneous Hardware

**HPO-9901** Controller replacement parts kit with terminal blocks and DIN clips

### Output Override Boards

<b>ACC-7701</b>	Triac output w/ zero-cross switching (AC only)
<b>ACC-7702</b>	0–10 VDC analog with adjustable override potentiometer
<b>ACC-7703</b>	Relay, NO contacts (AC/DC)
<b>ACC-7704</b>	4–20 mA DC current loop with adjustable override potentiometer
<b>ACC-7705</b>	Relay, NC contacts (AC/DC)

## SUPPORT

Additional resources for installation, configuration, application, operation, programming, upgrading, and much more are available on the web at [www.tacocomfort.com](http://www.tacocomfort.com).