

clarity 3 Programmable Controller

BACnet Application Specific (B-AAC)

DESCRIPTION

Taco Clarity3™ ASC series controllers are designed to operate unitary and terminal equipment. The integrated alarming, scheduling, and trending enable these BACnet Advanced Application Controllers to be powerful edge devices for the modern smart building ecosystem.

The factory-supplied programming covers common unitary applications. The controllers feature simple, menu-driven setup choices using an NS-100/200series digital sensor, which can be installed permanently as the room sensor or used temporarily as a technician's service tool.

Alternately, quick configuration of controller properties can be done using NFC (Near Field Communication) from a smart phone, tablet, or computer (using TacoVision Lite™ app) while the controller is unpowered.

The Ethernet-enabled models can also be configured by connecting an HTML5-compatible web browser to the built-in configuration web pages.

To meet the most demanding building automation custom requirements, these controllers are also fully programmable. Custom configuration and programming, with wizards for application programming selection/configuration, are enabled by Taco Vision software.

The Taco Programming software additionally provide the capability of creating custom graphical web pages (hosted on a remote web server) to use as a custom user-interface for the controllers.



clarity3™

APPLICATIONS

Can be used with the following types of unitary equipment:

- Air handling units (AHU)
- Chilled beams
- Constant air volume (CAV) with external actuator
- Fan coil units (FCU)
- Heat pump units (HPU)
- Roof top units (RTU)
- Unit ventilators
- Variable air volume (VAV) with external actuator

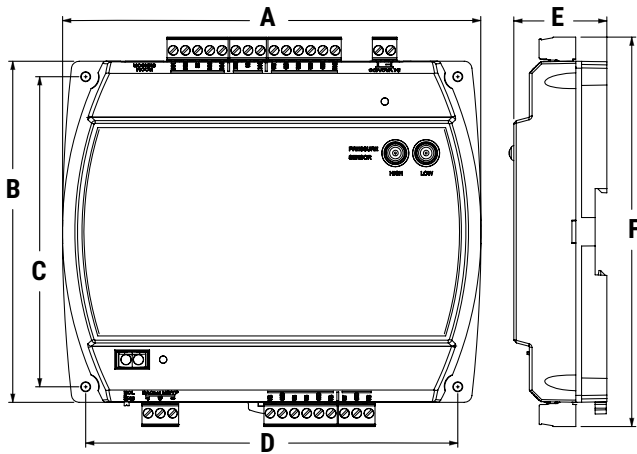
(Some applications require custom programming. See also [Sample Installation on page 5.](#))

MODELS



APPLICATIONS	INPUTS	OUTPUTS	FEATURES				MODEL
			Air Pressure Sensor (Input)	Real Time Clock (RTC)	Ethernet Port	MS/TP Port	
RTU, HPU, FCU, AHU, and unit ventilator	1 opt. air pressure sensor and 8 (total) standard: <ul style="list-style-type: none">• 2 analog (temp. sensor port)• 6 universal inputs (software configurable as analog, binary, or accumulator on terminals)	10 total: <ul style="list-style-type: none">• 6 triacs (binary)• 4 universal (software configurable as analog or binary)				✓	CLAR-ASC-1
				✓		✓	CLAR-ASC-1C
				✓	✓		CLAR-ASC-1C-IP
✓					✓	CLAR-ASC-1DP	
✓			✓		✓	CLAR-ASC-1DPC	
✓			✓	✓		CLAR-ASC-1DPC-IP	
VAV/CAV (with external tri-state actuator), RTU/ HPU static pressure monitoring/control							

SPECIFICATIONS



DIMENSIONS					
A	6.744 inches	171 mm	D	6.000 inches	152 mm
B	5.500 inches	140 mm	E	1.500 inches	38 mm
C	5.000 inches	127 mm	F	6.279 inches	159 mm

Inputs and Outputs

Inputs, Universal (6 on Terminal Blocks)

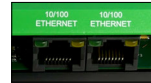
Universal inputs	Configurable as analog, binary, or accumulator objects
Termination	1K and 10K ohm sensors, 0–12 VDC, or 0–20 mA (without need for an external resistor)
Resolution	16-bit analog-to-digital conversion
Protection	Overvoltage protection (24 VAC, continuous)
Wire size	12–24 AWG, copper, in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

Input, Dedicated Room Sensor Port

Connector	Modular connector for STE-9xx1 series digital wall sensors or STE-6010/6014/6017 analog temperature sensors
Cable	Uses standard Ethernet patch cable up to 150 feet (45 meters)

Input, Integrated Air Pressure Sensor (BAC-9311)

Δ pressure range	0 to 2" wc (0 to 500 Pa)
Sensor accuracy	±4.5% of the reading or (when near zero) 0.0008" wc (0.2 Pa), whichever is greater (@ 25° C); internally linearized and temperature compensated
Connections	Barbed for 1/4 inch FR tubing



(Optional) Ethernet Ports (Changed from One to Two in 2016)

Image Coming Soon

TERMINAL COLOR CODE	
Black	24 VAC/VDC Power
Gray	MS/TP Communications
Green	Inputs and Outputs

Outputs, Universal (4 on Terminal Blocks)

Universal outputs	Configurable as an analog (0 to 12 VDC) or binary object (0 or 12 VDC, on/off)
Power/protection	Each short-circuit protected universal output capable of driving up to 100 mA (at 0–12 VDC) or 100 mA total for all outputs
Resolution	12-bit digital-to-analog conversion
Wire size	12–24 AWG, copper, in removable screw terminal blocks

Outputs, Triac (6 Binary)

Triac outputs	Optically isolated zero-crossing triac output configured as a binary object
Power	Maximum switching 24 VAC at 1.0 A for each output; maximum total for controller is 3.0 A
Wire size	12–24 AWG, copper, in removable screw terminal blocks

Communication Ports

MS/TP (optional)	One EIA-485 port (removable terminal block) for BACnet MS/TP, operating at 9.6, 19.2, 38.4, 57.6, or 76.8 kilobaud; max. length of up to 4,000 feet (1,200 meters) of 18 AWG shielded twisted-pair, no more than 51 pf/ft (167 pf/m); use repeaters for longer distances
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Ethernet (optional)	On “E” models only, two 10/100BaseT Ethernet connectors for BACnet IP, Foreign Device, and Ethernet 802.3 (ISO 8802-3); segmentation supported; up to 328 ft (100 m) between controllers (using T568B Category 5 or better cable)
NFC	NFC (Near Field Communication) up to 1 inch (2.54 cm) from the top of the enclosure
Room sensor	Modular STE connection jack for STE-9000 series digital sensors and STE-6010/6014/6017 analog sensors
Auxiliary	One serial port with mini Type B connector (reserved for future use)

Configurability

OBJECTS*	MAXIMUM #
Inputs and Outputs	
Analog, binary, or accumulator input	8 for CLAR-ASC-1 9 for CLAR-ASC-1DP
Analog or binary output	10
Values	
Analog value	120
Binary value	80
Multi-state value	40
Program and Control	
Program (Control Basic)	10
PID loop	10
Schedules	
Schedule	2
Calendar	1
Logs	
Trend log	20
Trend log multiple (must be created)	4 (default 0)
Alarms and Events	
Notification class	5
Event enrollment	40
*Configuration allows creation and deletion of objects (maximum number of objects shown). The number and configuration of default objects depends on the selected application. See also the PIC statement for all supported BACnet objects.	

Configuring, Programming, and Designing

SETUP PROCESS			TACO CONTROLS TOOL
Config-uration	Programming (Control Basic)	Web Page Graphics*	
✓			Clarity NetSensor
✓			Internal configuration web pages in Ethernet
✓			Taco Vision Lite™ (NFC) app***
✓	✓		Taco software
✓****	✓****	✓	Taco GCE Software
**Custom graphical user-interface web pages can be hosted on a remote web server, but not in the controller. **Clarity Ethernet-enabled “IP” models with the latest firmware can be configured with an HTML5 compatible web browser from pages served from within the controller. For information, see the Clarity Ethernet Controller Configuration Web Pages Application Guide.			

Hardware Features

Processor, Memory, and Clock

Processor	32-bit ARM® Cortex-M4
Memory	Programs and configuration parameters are stored in nonvolatile memory; auto restart on power failure
RTC	Real time clock with (capacitor) power backup for 72 hours (“C” model only) for network time synchronization or full stand-alone operation

Indicators and Isolation

LED indicators	Power/status and MS/TP communication or Ethernet status
MS/TP bulbs	One network bulb assembly indicates reversed polarity and isolates circuit
Switch	EOL (end of line) for MS/TP

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	8 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 on 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

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

BACnet Protocol

Standard	Meets or exceeds the specifications in ANSI/ASHRAE BACnet Standard 135-2010 for Advanced Application Controllers
Type	BTL-certified as a B-AAC controller type

Regulatory Approvals

UL	UL 916 Energy Management Equipment listed
CE	CE compliant
RoHS 2	RoHS 2 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. (NFC operation meets FCC compliance while the controller is in an unpowered state.)

ACCESSORIES

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

Network Communications

BACROUTER	Single port router
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Room Sensors, Analog

CLAR-RS-W	Temperature sensor, white
CLAR-RS-W-SP	Sensor with rotary setpoint dial, white
CLAR-RS-W-SP/OR	Sensor with rotary setpoint dial and override button, white

Room Sensors, Digital (LCD Display)

NS-100/200 Series	Taco Clarity NetSensor digital room temp. sensors for viewing and configuration and optional humidity, occupancy, and CO ₂ sensing (see STE-9000 series data sheet for options)
HPO-9001	NetSensor distribution module (future release)

SUPPORT

Additional resources for installation, configuration, application, operation, programming, upgrading, and much more are available on the web at www.tacocomfort.com.