



# Conquest BAC-5900 Series

## BACnet General Purpose Controllers (B-AAC)

### DESCRIPTION

BAC-5900 series controllers are designed to control building systems and HVAC 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 controllers feature simple, menu-driven setup choices using an STE-9000 series 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 or tablet (using KMC Connect Lite app) while the controller is unpowered.

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 KMC Connect software and the KMC Converge app for Niagara<sup>AX</sup> Workbench.

KMC Converge and TotalControl 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.



### APPLICATIONS

Can be used with the following types of equipment:

- 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 5.](#))

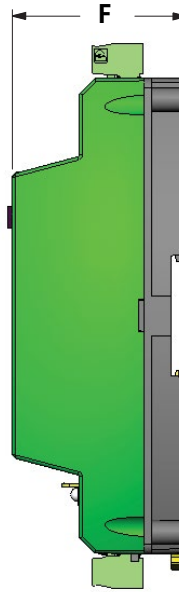
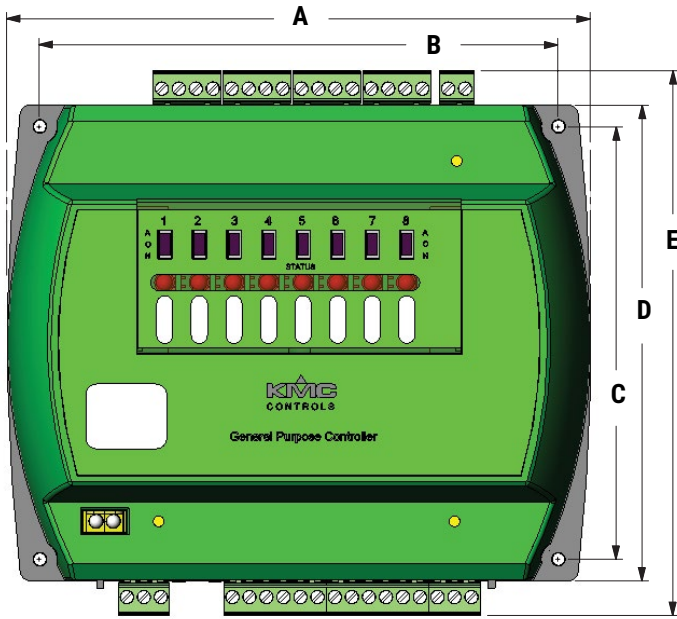
### MODELS

APPLICATIONS	INPUTS*	OUTPUTS*	FEATURES		MODEL
			Real Time Clock (RTC)	Ethernet Port	
AHU, chillers, boilers, cooling towers, pumps, lighting, FCU, HPU, RTU, unit ventilators, other HVAC	10 total: • 2 analog (temperature sensor port) • 8 universal inputs (software configurable as analog, binary, or accumulator on terminals)	8 universal: • Software configurable as analog or binary • Override boards give additional options**	✓		BAC-5901C
			✓	✓	BAC-5901CE

\*Up to four (8 x 8) CAN-5901 I/O expansion modules can be used with BAC-5900 series controllers to provide up to (internal and external) 42 inputs and 40 outputs.

\*\*HPO-6700 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 CAN-5901.

# SPECIFICATIONS



DIMENSIONS		
<b>A</b>	6.750 inches	171 mm
<b>B</b>	6.000 inches	152 mm
<b>C</b>	5.000 inches	127 mm
<b>D</b>	5.500 inches	140 mm
<b>E</b>	6.300 inches	160 mm
<b>F</b>	2.012 inches	51 mm

## 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, 4–20 mA (without need for an external resistor), or pulse counting (passive or active up to 12 VDC) to 50 Hz
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 Temperature Sensor Port

Connector	Modular connector for STE-9x1 series digital wall sensors or STE-6010/6014/6017 analog temperature sensors
Cable	Uses standard Ethernet patch cable up to 150 feet (45 meters)

### 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
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

MS/TP	One EIA-485 port (removable terminal block) for BACnet MS/TP, operating (autobaud) up to 115.2 kilobaud (9.6, 19.2, 38.4, 57.6, 76.8, or 115.2 kilobaud); max. length of up to 4,000 feet (1,200 meters) of 18 AWG shielded twisted-pair (45 pf/ft); use repeaters for longer distances
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Ethernet	On “E” model only, one 10/100BaseT Ethernet connector for BACnet IP and Ethernet 802.3 (ISO 8802-3); segmentation supported
Temp. sensor	Modular STE connection jack for STE-9000 series digital sensors and STE-6010/6014/6017 analog sensors
Expansion	One CAN serial bus connection (terminal block) for daisy-chaining I/O expansion modules up to 200 feet from the controller via standard shielded twisted-pair wire
Auxiliary	One serial port with mini Type B connector (reserved for future use)

## Configuration and Programming Tools

KMC TOOL	SETUP PROCESS		
	Configuration	Programming (Control Basic)	Web Page Graphics*
STE-9xx1 NetSensor	✓		
NFC**	✓		
Connect	✓	✓	
TotalControl	✓	✓	✓
Converge app for Niagara <sup>AX</sup> WorkBench	✓	✓	✓

\*Custom graphical user-interface web pages can be hosted on a remote web server, but not in the controller.

\*\*Near Field Communication via enabled smart phone or tablet and running the KMC Connect Lite app.

## Configurability

OBJECTS*	DEFAULT #	MAXIMUM #
<b>Inputs and Outputs</b>		
Analog, binary, or accumulator input	10	40**
Analog or binary output	8	40**
<b>Values</b>		
Analog value	50	500
Binary value	50	500
Multi-state value	5	150
<b>Program and Control</b>		
Program (Control Basic)***	10	40
PID loop	8	60
<b>Schedules</b>		
Schedule	5	50
Calendar	5	32
<b>Logs</b>		
Trend log (single point)	32	100
Trend log (multiple points)	8	60
Runtime log	8	60
<b>Alarms and Events</b>		
Notification class	5	60
Event enrollment	5	250

\*Configuration allows creation and deletion of objects (default and maximum number of objects shown). See PIC statement for all supported BACnet objects.  
 \*\*With I/O expansion modules.  
 \*\*\*Initial Control Basic programming requires KMC Connect, TotalControl, or Converge app for Niagara<sup>AX</sup> Workbench.

## 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, MS/TP and CAN communication, and Ethernet status
MS/TP bulbs	One network bulb assembly indicates reversed polarity and isolates circuit
Switches	EOL (end of line) for MS/TP and CAN bus

## Installation

### Power

Supply voltage	24 VAC/VDC (-15%, +20%), 50/60 Hz, Class 2 only; non-supervised (all circuits, including supply voltage, are power limited circuits)
Required power	14 VA, plus external loads

### 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)

## Protocols and Regulatory Approvals

### 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

### CAN Protocol

CAN	CAN (Controller Area Network) bus on terminals
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### Regulatory

UL	UL 916 Energy Management Equipment (pending)
BTL	BACnet Testing Laboratory listed as Advanced Application Controller (B-AAC) (pending)
CE	CE compliant (pending)
RoHS	RoHS compliant (pending)
SASO	SASO PCP Registration KSA R-103263 (pending)
FCC	FCC Class B, Part 15, Subpart B and complies with Canadian ICES-003 Class B (pending)*

\*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.

### Expansion and Output Override Boards

<b>HPO-670x</b>	Output override (triac, NC/NO relays, 4-20 mA) board series for devices that cannot be powered from a standard universal output
<b>CAN-5901</b>	I/O expansion module, 8 x 8

### Misc. Hardware

<b>HCO-1102</b>	Steel control enclosure, 10.1 x 2.4 x 7.1 inches (257 x 62 x 181 mm)
<b>HPO-0055</b>	Replacement network bulb assembly (pack of 5)

### Network Communications

<b>BAC-5051</b>	Single port router
<b>KMD-5567</b>	Network surge suppressor

### Temperature Sensors, Analog

<b>STE-6010W</b>	Temperature sensor, white
<b>STE-6014W</b>	Sensor with rotary setpoint dial, white
<b>STE-6017W</b>	Sensor with rotary setpoint dial and override button, white

NOTE: Other STE-6000 series sensors are not fully compatible with the dedicated sensor port. However, various other models can be used with the screw terminals. See the STE-6000 series data sheet for more information. For digital sensor information, see the STE-9000 series data sheet.

NOTE: To order the STE-601x sensor with light almond color instead of white, drop the W on the end of the model number (e.g., STE-6010W is white and STE-6010 is light almond).

## SUPPORT

Additional resources for installation, configuration, application, operation, programming, upgrading and much more are available on the KMC Controls web site ([www.kmccontrols.com](http://www.kmccontrols.com)). To see all available files, log-in to the KMC Partners site.



## Temperature Sensors, Digital (LCD Display)

### STE-9000 Series

NetSensor digital room temp. sensors for viewing and configuration and optional humidity, occupancy, and CO<sub>2</sub> sensing (see STE-9000 series data sheet for options)

### HPO-9001

NetSensor distribution module

## Transformers, 120 to 24 VAC

### XEE-6111-050

50 VA, single-hub

### XEE-6112-050

50 VA, dual-hub

## SAMPLE INSTALLATION

