

new product INTRODUCTION



BAScontrol20 Firmware Release 3.1

The BAScontrol20 is a 20-point BACnet/IP Sedona Field Controller ideal for unitary control applications. It is considered an “open controller” in that it supports both BACnet/IP and Sedona Framework (SOX) protocols. It complies with the BACnet B-ASC device profile having eight universal inputs, four binary inputs, four analog outputs and four binary outputs (relay or triac). No licensing is required to purchase or use the product. It is a freely-programmable controller executing Sedona’s drag-and-drop methodology of assembling components onto a wire sheet to create applications. It can be programmed using Niagara Workbench or a third-party Sedona programming tool or configured for BACnet/IP remote I/O applications using a common web browser. Release 3.1 will be shipped with new BAScontrol20 orders with no change in product pricing.

To complement the standard Tridium-developed Sedona 1.2 components that reside in the unit, Contemporary Controls has developed more than 100 custom Sedona components. Unique to the BAScontrol20 are 48 Web Components that allow wire sheet data to be read and written from a common web browser. Besides the 20 real I/O points, 24 virtual points on the wire sheet can be read or written by a BACnet client. A new hardware-independent CControls Function Kit provides additional logic elements for expanded functionality along with sophisticated Psychrometric components.

Contemporary Controls has developed a free Sedona Backup and Restore utility called BASbackup that allows the system integrator the ability to completely

backup a Sedona project including wire sheet, web configuration, BACnet configuration, and kits without the need of the workbench tool.

The current version firmware on the BAScontrol20 is 3.0 and the new version is 3.1. With this release are new kits that can be easily installed on Workbench and BASbackup as a single bundle. The new kits support both 3.0 and 3.1 controllers. Some minor issues may exist for moving 3.0 programs over to 3.1 controllers but they can easily be resolved. There are no hardware changes on the BAScontrol20 and it is possible to re-flash existing controllers in the field by first contacting Contemporary Controls’ technical support. What follows is a list of new features in version 3.1.



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1. Virtual points increased from 8 to 24 points

Virtual points are wire sheet components that function as network variables in that they can be read by or written to from a BACnet client as a binary variable (BV) or an analog variable (AV). Since they are wire sheet components, they should be configured as wire sheet inputs or wire sheet outputs by the Workbench tool and not by web pages. However, BACnet configuration continues to be accomplished with web pages. Virtual points are now tagged VT01-VT24 and they have their own web page where the status of these points can be viewed and forced without the need of a Workbench tool.



2. Universal Input options expanded

Currently, the BAScontrol20's universal inputs support analog inputs, contact closure inputs, type II and type III 10kΩ thermistors and pulse inputs. More flexibility has been achieved to universal inputs with the addition of 20kΩ thermistor range and the ability to read resistance.

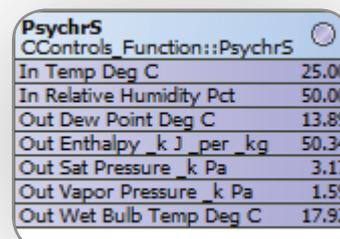
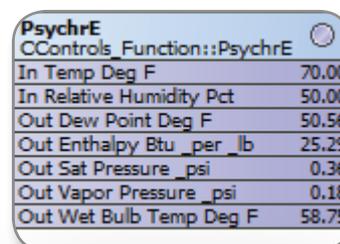
It is now possible to read 2-wire potentiometers from set point stations. An input choice called "resistance" has been added that can read a passive resistance in the 1-100 kΩ range. To accommodate set point face plates with linear graduations, it is recommended that the Sedona Linearize component is used to convert the non-linear resistance measurement to match the face plate readings.

Another change made was detection of an open thermistor which may produce an indeterminate state from the universal input component. The systems integrator is able to assign a default output to the universal input if an out-of-bounds situation occurs. In addition, a flag is set using the binary output of the universal input to provide an indication of this fault condition.

3. CControls Function Kit added

A new Function Kit expands the choice of AND, OR, NAND and NOR logic along with providing improved latching registers. The use of complementary outputs within the component ensures predictable logic execution.

Using dry-bulb and relative humidity (RH) as inputs, the Psychrometric components will output saturation pressure, vapor pressure, enthalpy, dew-point and wet-bulb temperatures. Two components exist – one for English and one for SI units.



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4. Additional Change-of-Value (COV) subscriptions

With version 3.0, the BAScontrol20 supported two binary and two analog subscriptions. Looking at recommended ASHRAE air-handler sequences it was decided to increase the number of binary subscriptions to 14 giving the 3.1 controller a total of two analog and fourteen binary subscriptions.

5. Increased performance and larger application memory space

With single-chip microcontrollers, there is always concern for sufficient RAM and ROM space. The BAScontrol20 is BACnet/IP compliant with a B-ASC profile. It has a resident Sedona Virtual Machine (SVM) with an application program (app.sab) stored in flash memory but executes the application out of RAM. It is the RAM space that is critical so every buffer memory space was studied to free up as much RAM as possible. More RAM had to be provided for increased COVs and virtual points but gains were made in other places thus providing a net 6 kB gain in memory space. This allows for at least a 200 Sedona component wire sheet.

6. More informative web pages

Much of the configuration of the BAScontrol20 is via web pages. With the addition of 16 more virtual points, it was decided to move all 24 virtual points to a separate page. Configured virtual points will now show the BACnet name up to the limit of the display along above the value of the point. The virtual point tag just

to the left of the point value will remain unchanged. However, by hovering over the tag it can be learned if the point is configured as a “Read from Wire Sheet” or a “Write to Wire Sheet.” The points that are placed on the wire sheet will have their tags shown with the color green indicating that they are active and are available for communicating to a BACnet client. The VT01-08 points are stored in persistent memory and will be saved during power outages less than seven days. The VT09-24 points are not in persistent memory.

All 20 physical input/output points appear on the main web page. If the I/O component has been placed on the wire sheet, the point tag will turn green. Hovering over the point tag will verify the type of configuration and hovering above the point value will show the BACnet name truncated to fit the space. This is especially helpful in understanding the configuration of universal inputs.

Web components are unique to the BAScontrol20 providing a means to set parameters on a wire sheet or for reading parameters from a wire sheet using a common web browser. A total of 48 web components exist and limits can be placed on those components that are configured as inputs to the wire sheet. These minimum and maximum values are set in the web component but the values can be viewed on the web components web page. Limit values associated with web components configured as outputs are ignored.

The screenshot displays the BAScontrol20 web interface with four main sections: Universal Inputs, Binary Inputs, Analog Outputs, and Binary Outputs. Each section contains a list of points with their current values and status indicators (checkboxes).

Universal Inputs		Binary Inputs		Analog Outputs		Binary Outputs	
UI1	Indoor Temperature 76.290°F	UI5	Universal Input 5 0.001	BI1	Occupancy Ovr. 0	AO1	Analog Output 1 0.000
UI2	Outdoor Temperature 60.240°F	UI6	Universal Input 6 0.008	BI2	Binary Input 2 0	AO2	Direct Control Vent. 2.000
UI3	Damper Position 0.007	UI7	Universal Input 7 0.006	BI3	Binary Input 3 0	AO3	Occ Damper 10.000
UI4	Universal Input 4 0.001	UI8	Universal Input 8 0.003	BI4	Binary Input 4 0	AO4	Fan 0.000
						BO1	Heat 1 0
						BO2	Heat 2 0
						BO3	Cool 1 0
						BO4	Cool 2 0

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System Configuration System Status Set Time Virtual Points Web Components Restart Controller

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7. Network Time Server can be found by domain name

If Internet access is possible, the BAScontrol20 will have its time set from a pool of NTP servers instead of relying upon one fixed IP address. With version 3.1, domain naming services (DNS) is supported with the opportunity to make two DNS entries. It is recommended to use the domain name pool. ntp.org as the time server assuring a server will be found. Daylight Savings Time (DST) continues to be supported and if time is to be maintained in the absence of an Internet connection, time can be set manually and it will be backed up for up to seven days upon a loss of power.

8. Improved Universal Counter (UC) component

The UC component differs from the two other Sedona counters in that its count output is retained up to seven days in persistent memory which is ideal for run-time calculations. The UC component has been designed to meet or exceed the capabilities of the volatile Sedona counters.

9. The BASbackup utility is easier to use and not dependent upon the Workbench tool

BASbackup is a Java program that allows the system integrator to completely backup and restore a Sedona project including wire sheet, web configuration, BACnet configuration, and kits into one zip file without the need of the Workbench tool. The program is free and it no longer needs access to the Component Bundle residing in Workbench.

System Time		NTP Configuration	
Year	2015	NTP	ENABLED
Month	January	NTP Server	130.149.17.21
Day	21	Time Zone	Central:UTC-6
Hour	12	NTP Refresh (Days)	1
Minute	46	DST Configuration	
PM	<input checked="" type="checkbox"/>	Daylight Saving	ENABLED
<small>If enabled, the NTP server will be queried and the time will set at startup, and again after each refresh period.</small>		DST ON	March
		DST OFF	November
		Day of Month	2nd SUN
		Hour	2
NTP Success			

Although the BAScontrol20 is a freely-programmable controller, it can be used as a configurable controller by loading in a Sedona application and configuring the application using just configuration web pages. The use of the 48 Web Components makes this possible greatly increasing the flexibility of the controller to adapt to either a freely-programmable or configuration-only environment. Contemporary Controls continues to develop wire sheet applications and components for its customers.

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