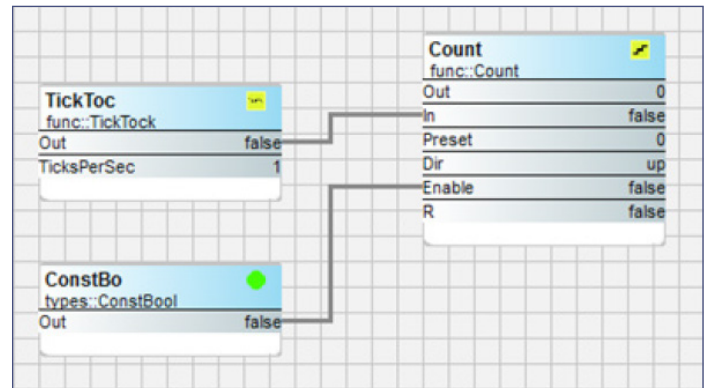
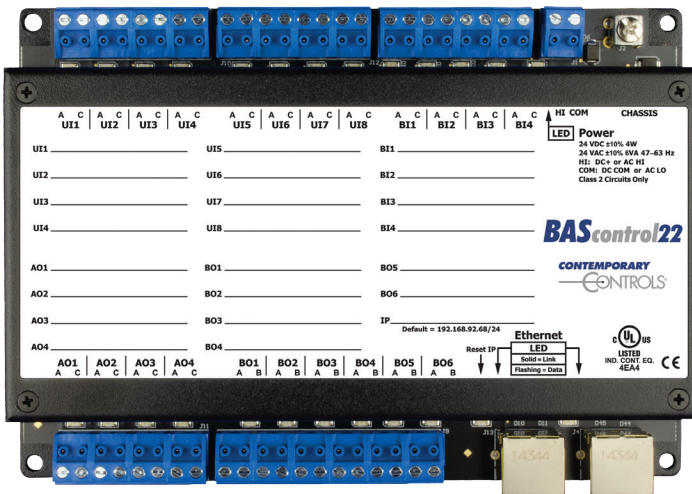


## Building Automation Training with BAScontrol22

- 22-point simple to use building automation unitary controller
- LEDs for each channel and Ethernet port
- Eight configurable universal inputs supporting analog voltage, thermistor, resistance, contact closure and pulse inputs
- 2 Ethernet connections for configuration and programming
- Utilizes simple, open source, Sedona drag and drop programming
- Free programming and backup tool
- Simple web page configuration
- Easy connection to Wi-Fi networks
- Free simulator program for homework assignments
- Communicates via BACnet to supervisor



The BAScontrol22 is an ideal controller for training technicians on programming DDCs and use of unitary building automation controllers. The BAScontrol22 provides eight universal inputs, four binary inputs, four analog outputs and six binary outputs (relay) which can be used for most unitary control applications. The BAScontrol22 has two 10/100 Mbps Ethernet connections which provide a simple connection to most PCs or a simple connection to a Wi-Fi network through a commonly available access point or Wi-Fi bridge. By having two Ethernet connections one can be used for the student's PC and one can connect to an Ethernet switch which interconnects all of the BAScontrol22 units in the classroom. Switches can be cascaded to support more

BAScontrol22 units. This would also allow the teacher's PC to communicate to all of the BAScontrol22 units for assistance and examination purposes.

Each port of the BAScontrol22 has an LED to indicate its current status. This can be helpful in providing feedback to the student regarding the current behavior of the unit.

The BAScontrol22 is configured via a simple password protected webpage which can operate with any standard browser. This allows the selection of the universal input types, such as 0-10V measurements, thermistor connections for temperature measurement, resistance measurements, contact closure or pulse inputs. The

BAScontrol22 inputs and outputs can also be monitored and overridden via the webpage.

For control the BAScontrol22 utilizes Sedona, a simple open source drag and drop programming language developed by Tridium, one of the leading vendors of building automation supervisors. Contemporary Controls provides a free editor for developing Sedona programs. This is the Sedona Application Editor (SAE). When using SAE the student will drag and drop components onto the screen and immediately see their effect. This “live” aspect of Sedona makes it one of the simplest to use languages for programming unitary controllers. Components are interconnected to create a control program and SAE will immediately show the result of the connections. There are over 100 types of components which can be used to create simple or complex control applications.

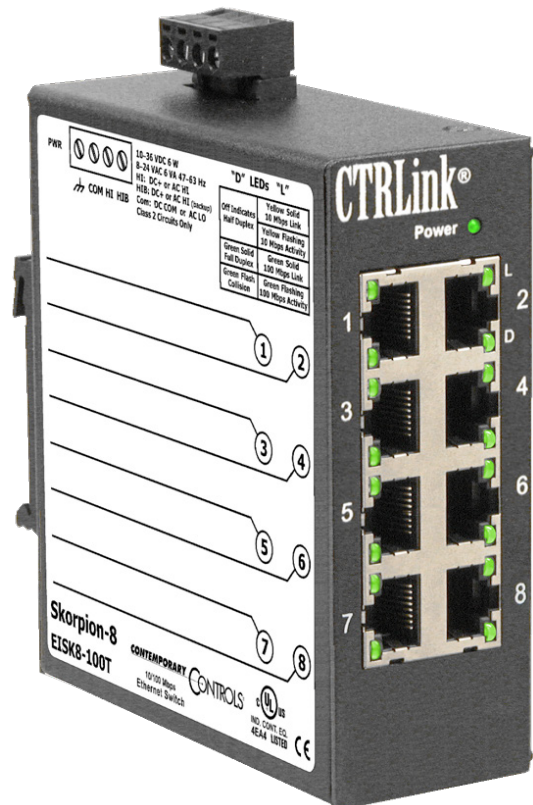
Contemporary Controls also offers a free Sedona simulator which allows the student to practice his Sedona programming without the need of a controller. The simulator acts as the BAScontrol22 and runs on his PC. SAE can run on the same PC and allows the student to create and test their Sedona applications outside of the classroom.

Contemporary Controls also offers a free tool for backing up the settings and Sedona application developed by the student into one zip file. This is the BASbackup application. This application can store the BAScontrol22 configuration and Sedona application which can be used for the student to backup their work or to hand in their assignment to the teacher.

The BAScontrol22 also communicates to head-end or building automation supervisors via BACnet. This ASHRAE standard is one of the most popular protocols for communications between controllers and supervisors. The BAScontrol22 provides 24 virtual objects which the BACnet supervisor can write to control set

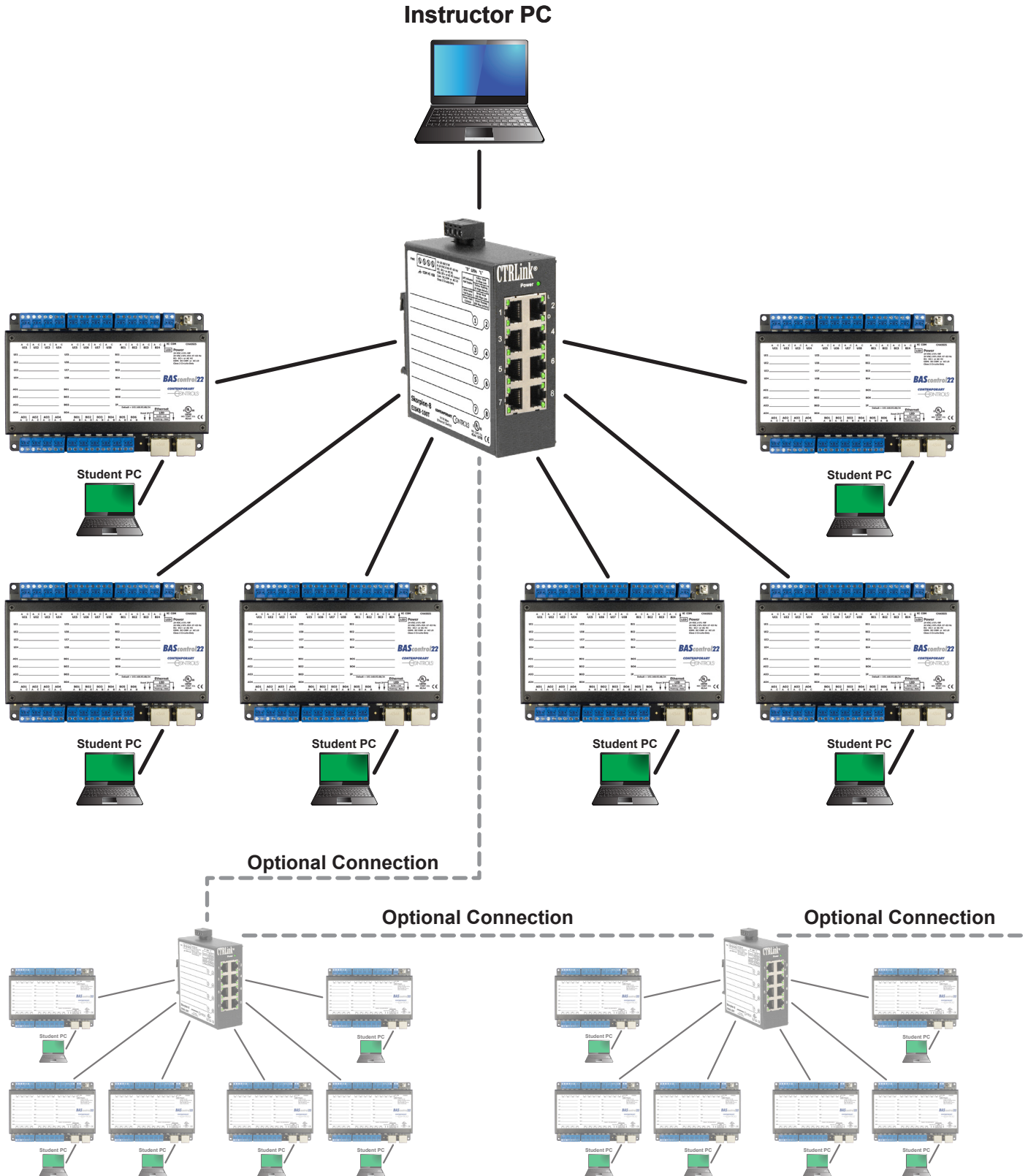
points in the BAScontrol22 or read to learn the status of the BAScontrol22. All of the 22 channels of the BAScontrol22 can also be controlled or read from the BACnet supervisor.

The Contemporary Controls EISK8-100T is ideal for interconnecting the BAScontrol22 units in the classroom. It is DIN rail mountable and 24VAC powered for simple installation and mounting in a standard building automation enclosure. This also represents what is commonly used in the field. The EISK8 units can be cascaded to interconnect all of the BAScontrol22 units in the classroom along with the instructor’s PC.



**EISK8-100T**

# Classroom Setup



## BAScontrol22 I/O Kit – BAScontrol22 platform specific components

AO1 – AO4	Analog output – analog voltage output point
BI1 – BI4	Binary input – binary input point
BO1 – BO6	Binary output – binary output point
ScanTim	Scan time monitor – records the min, max and average scan times
UI1 – UI4	Universal input – binary, analog voltage, thermistor, resistance or accumulator
UI5 – UI8	Universal input – binary, analog voltage, thermistor or resistance
UC1 – UC4	Retentive universal counters – up/down retentive counters
VT01 – VT08	Retentive virtual points – share retentive wire sheet data with BACnet/IP clients
VT09 – VT24	Virtual points – share wire sheet data with BACnet/IP clients

## BAScontrol22 Web Kit – BAScontrol22 platform specific components

WC01 – WC48	Web components – share wire sheet data with the BAScontrol22 web pages
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## Contemporary Controls Function Kit – Common to Sedona 1.2 compliant controllers

Cand2	Two-input Boolean product – two-input AND/NAND gate with complementary outputs
Cand4	Four-input Boolean product – four-input AND/NAND gate with complementary outputs
Cand6	Six-input Boolean product – six-input AND/NAND gate with complementary outputs
Cand8	Eight-input Boolean product – eight-input AND/NAND gate with complementary outputs
Cmt	Comment – comment field up to 64 characters
Cor2	Two-input Boolean sum – two-input OR/NOR gate with complementary outputs
Cor4	Four-input Boolean sum – four-input OR/NOR gate with complementary outputs
Cor6	Six-input Boolean sum – six-input OR/NOR gate with complementary outputs
Cor8	Eight-input Boolean sum – eight-input OR/NOR gate with complementary outputs
CtoF	°C to °F – Celsius to Fahrenheit Temperature Conversion
Dff	“D” Flip-Flop – D-style Edge-triggered Single-bit Storage
FtoC	°F to °C – Fahrenheit to Celsius Temperature Conversion
HLpre	High – Low Preset – defined logical true and false states
PsychrE	Psychrometric Calculator – English Units
PsychrS	Psychrometric Calculator – SI Units
SCLatch	Set/Clear Latch – single-bit level-triggered single-bit data storage

## Sedona Components

### HVAC Group

<b>LSeq</b>	Linear Sequencer — bar graph representation of input value
<b>ReheatSeq</b>	Reheat sequence — linear sequence up to four outputs
<b>Reset</b>	Reset — output scales an input range between two limits
<b>Tstat</b>	Thermostat — on/off temperature controller

### Scheduling Group

<b>DailySc</b>	Daily Schedule Boolean — two-period Boolean scheduler
<b>DailyS1</b>	Daily Schedule Float — two-period float scheduler
<b>DateTime</b>	Time of Day — time, day, month, year

### Function Group

<b>Cmpr</b>	Comparison math — comparison (<=>) of two floats
<b>Count</b>	Integer counter — up/down counter with integer output
<b>Freq</b>	Pulse frequency — calculates the input pulse frequency
<b>Hysteresis</b>	Hysteresis — setting on/off trip points to an input variable
<b>IRamp</b>	IRamp — generates a repeating triangular wave with an integer output
<b>Limiter</b>	Limiter — Restricts output within upper and lower bounds
<b>Linearize</b>	Linearize — piecewise linearization of a float
<b>LP</b>	LP — proportional, integral, derivative (PID) loop controller
<b>Ramp</b>	Ramp — generates a repeating triangular or sawtooth wave with a float output
<b>SRLatch</b>	Set/Reset Latch — single-bit data storage
<b>TickTock</b>	Ticking clock — an astable oscillator used as a time base
<b>UpDn</b>	Float counter — up/down counter with float output

### Priority Group

<b>PrioritizedBool</b>	Prioritized boolean output — highest of sixteen inputs
<b>PrioritizedFloat</b>	Prioritized float output — highest of sixteen inputs
<b>PrioritizedInt</b>	Prioritized integer output — highest of sixteen inputs

### Types Group

<b>B2F</b>	Binary to float encoder — 16-bit binary to float conversion
<b>ConstBool</b>	Boolean constant — a predefined Boolean value
<b>ConstFloat</b>	Float constant — a predefined float variable
<b>ConstInt</b>	Integer constant — a predefined integer variable
<b>F2B</b>	Float to binary decoder — float to 16-bit binary conversion
<b>F2I</b>	Float to integer — float to integer conversion
<b>I2F</b>	Integer to float — integer to float conversion
<b>L2F</b>	Long to float — long integer to float conversion
<b>WriteBool</b>	Write Boolean — setting a writable Boolean value
<b>WriteFloat</b>	Write Float — setting a writable float value
<b>WriteInt</b>	Write integer — setting an integer value

## Logic Group

<b>ADemux2</b>	Analog Demux — Single-input, two-output analog de-multiplexer
<b>And2</b>	Two-input Boolean product — two-input AND gate
<b>And4</b>	Four-input Boolean product — four-input AND gate
<b>ASW</b>	Analog switch — selection between two float variables
<b>ASW4</b>	Analog switch — selection between four floats
<b>B2P</b>	Binary to pulse — simple mono-stable oscillator (single-shot)
<b>BSW</b>	Boolean switch — selection between two Boolean variables
<b>DemuxI2B4</b>	Four-output Demux — integer to Boolean de-multiplexer
<b>ISW</b>	Integer switch — selection between two integer variables
<b>Not</b>	Not — inverts the state of a Boolean
<b>Or2</b>	Two-input Boolean sum — two-input OR gate
<b>Or4</b>	Four-input Boolean sum — four-input OR gate
<b>Xor</b>	Two-input exclusive Boolean sum — two-input XOR gate

## Timing Group

<b>DlyOff</b>	Off delay timer — time delay from a “true” to “false” transition of the input
<b>DlyOn</b>	On delay timer — time delay from an “false” to “true” transition of the input
<b>OneShot</b>	Single Shot — provides an adjustable pulse width to an input transition
<b>Timer</b>	Timer — countdown timer

## Math Group

<b>Add2</b>	Two-input addition — results in the addition of two floats
<b>Add4</b>	Four-input addition — results in the addition of four floats
<b>Avg10</b>	Average of 10 — sums the last ten floats while dividing by ten thereby providing a running average
<b>AvgN</b>	Average of N — sums the last N floats while dividing by N thereby providing a running average
<b>Div2</b>	Divide two — results in the division of two float variables
<b>FloatOffset</b>	Float offset — float shifted by a fixed amount
<b>Max</b>	Maximum selector — selects the greater of two inputs
<b>Min</b>	Minimum selector — selects the lesser of two inputs
<b>MinMax</b>	Min/Max detector — records both the maximum and minimum values of a float
<b>Mul2</b>	Multiply two — results in the multiplication of two floats
<b>Mul4</b>	Multiply four — results in the multiplication of four floats
<b>Neg</b>	Negate — changes the sign of a float
<b>Round</b>	Round — rounds a float to the nearest N places
<b>Sub2</b>	Subtract two — results in the subtraction of two floats
<b>Sub4</b>	Subtract four — results in the subtraction of four floats
<b>TimeAvg</b>	Time average — average value of float over time

The screenshot displays the BAScontrol22 web interface with the following sections:

- Universal Inputs:** UI1 (0.004), UI2 (0.000), UI3 (0.001), UI4 (0.000), UI5 (0.001), UI6 (0.003), UI7 (0.000), UI8 (0.005).
- Binary Inputs:** BI1 (0), BI2 (0), BI3 (0), BI4 (0).
- Analog Outputs:** AO1 (0.000), AO2 (0.000), AO3 (0.000), AO4 (0.000). Note: AO1 is highlighted in green.
- Binary Outputs:** BO1 (0), BO2 (0), BO3 (0), BO4 (0), BO5 (0), BO6 (0).

Navigation buttons at the bottom include: System Config, System Status, Set Time, Virtual Points, Web Components, and Restart Controller. An Auto Refresh OFF indicator is also present.

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 Firmware Revision 3.2 : Web Page Revision 6.1.2  
 NOTE: A GREEN label indicates that the I/O point has been placed on the wire sheet.

BAScontrol22 Web Page

## Ordering Information

Model	Description
BASC-22R	BAScontrol with 22 I/O points, includes 6 relay outputs
EISK8-100T	8 ports 10/100 Mbps Skorpion switch

United States	China	United Kingdom	Germany
<b>Contemporary Control Systems, Inc.</b> 2431 Curtiss Street Downers Grove, IL 60515 USA  Tel: +1 630 963 7070 Fax: +1 630 963 0109 <a href="mailto:info@ccontrols.com">info@ccontrols.com</a>	<b>Contemporary Controls (Suzhou) Co. Ltd</b> 11 Huoju Road Science & Technology Industrial Park New District, Suzhou PR China 215009  Tel: +86 512 68095866 Fax: +86 512 68093760 <a href="mailto:info@ccontrols.com.cn">info@ccontrols.com.cn</a>	<b>Contemporary Controls Ltd</b> 14 Bow Court Fletchworth Gate Coventry CV5 6SP United Kingdom  Tel: +44 (0)24 7641 3786 Fax: +44 (0)24 7641 3923 <a href="mailto:info@ccontrols.co.uk">info@ccontrols.co.uk</a>	<b>Contemporary Controls GmbH</b> Fuggerstraße 1 B 04158 Leipzig Germany  Tel: +49 341 520359 0 Fax: +49 341 520359 16 <a href="mailto:info@ccontrols.de">info@ccontrols.de</a>
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