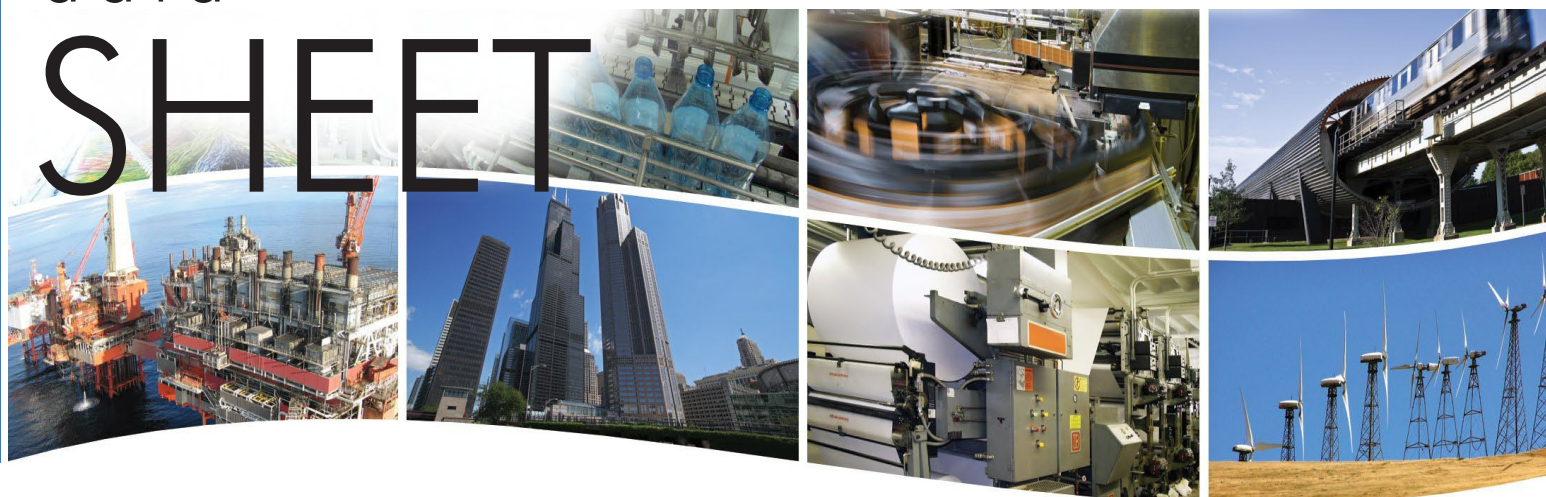# data
SHEET

BASview — a simple web-based graphical interface

BASview is a stand-alone, embedded, web-based graphical interface for building automation and process automation systems. It can be accessed from any web browser — providing client functionality to any BACnet/IP or Modbus TCP system. By using Contemporary Controls BASrouter or BASgateway products, additional protocols such as BACnet MS/TP and Modbus RTU and Modbus ASCII are supported. Additional USB modules are available which allow the BASview to communicate directly with MS/TP, Modbus RTU and LON devices.

The BASview is simple to install and use. A 10/100 Mbps Ethernet connection is all that is needed. Client features include animated graphic screens, scheduling, historical trending, runtime accumulation and alarm monitoring.

BASview will automatically toggle outputs and change setpoints on schedule, collect runtime and trend data, and monitor alarm conditions. As an embedded device, BASview uses Flash memory for internal storage instead of a hard disk to maintain its ruggedness. The BASview is totally self-contained, requiring no external PC or application for its use. Any number of web browser users can access the device. The only requirement is the installation of an Adobe Flash player in the browser. There are no other licensing requirements to use the product.

The BASview is ideal for small to medium buildings or processes that require a simple-to-use graphical interface with no licensing requirements.
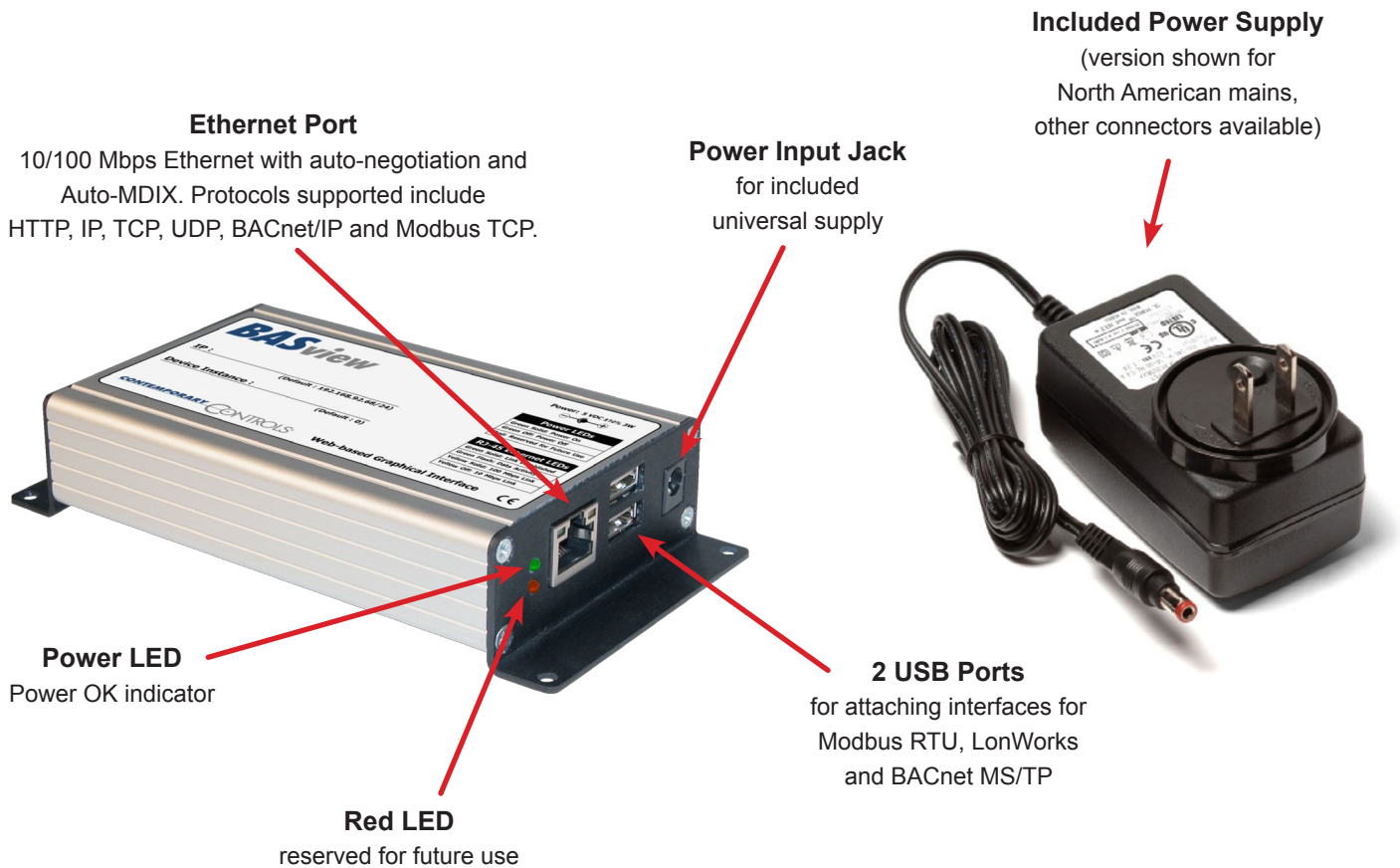
Features ...

- Animated graphics
- Internally maintained schedules with sunrise/sunset and stagger offsets
- Trend collection, display and export
- Runtime accumulation with email notification
- Alarm condition monitoring with email notification
- Calculated point values (average, min, max, etc)
- Python programming language for controlling equipment
- Database of up to 100 users and 100 user groups
- Multiple simultaneous users
- Activity log for tracking important user actions
- Template system for quickly cloning points, graphics, devices or entire networks
- Calculations may be performed on data points
- Support for up to 2,000 tree nodes which can be any combination of points, graphics, trends, etc.
- No software licensing requirements

BASautomation®

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DS-BASVIEW0-BA3

BASview — Overview

The BASview is housed in a compact metal enclosure that is panel mounted. It requires a 5 VDC voltage source and is shipped with a universal mains input power supply. Internally powered by a 200 MHz ARM9 CPU, it has 64 MB SDRAM and 512 MB NAND flash memory for data storage. Besides the single Ethernet RJ-45 shielded connector, there are two USB ports reserved for proprietary I/O expansion. The device has a watchdog timer for automatic recovery and a battery-backed real-time clock. Simply connect the device to a BACnet/IP or Modbus TCP Ethernet network to access both BACnet and Modus compliant equipment. For non-Ethernet based equipment, BACnet MS/TP to BACnet/IP routers or Modbus serial to Modbus TCP routers can be used. By using Modbus serial to BACnet/IP gateways, the complete system can be treated as a BACnet system.

Any web browser that supports Adobe Flash player can access the BASview. Simultaneous users are also supported.

Included Power Supply
(version shown for
North American mains,
other connectors available)

Ethernet Port
10/100 Mbps Ethernet with auto-negotiation and
Auto-MDIX. Protocols supported include
HTTP, IP, TCP, UDP, BACnet/IP and Modbus TCP.

Power Input Jack
for included
universal supply

Power LED
Power OK indicator

2 USB Ports
for attaching interfaces for
Modbus RTU, LonWorks
and BACnet MS/TP

Red LED
reserved for future use

The User Home Page — Toolbar

Each user has access to a personal home page that contains a custom toolbar at the top and a device tree on the left side. Depending upon user rights, the user can add devices and points from the system being monitored and define services such as scheduling, trending and alarming. Up to 100 users can be authorized to belong into one of 100 possible user groups. User groups define the permission levels.

The toolbar at the top of the screen is used to access several features. The exact buttons displayed depend on the access permissions of the current users.

Home — Displays the "home" page of the current user. This will be the screen defined in the group to which the user belongs or the screen the user has selected in his personal settings.

Info Screen — Displays the Site Information page, which contains information about the site and the user's personal preference settings.

Logoff — Logs the current user out of the system and returns to the login screen.

User Database — Displays and allows editing of the user database.

User Groups Database — Displays and allows editing of the user groups database.

Administrator Menu — Contains a menu of advanced functions.

Alarm Database — Views the alarms stored in the alarm database. If any alarms are active, this button will flash and display the number of active alarms. Click the button to display the database and stop the flashing.

Runtime Status — Views current status of all runtimes. If there are runtimes over their limit, this button will flash and display the number of over-limit runtimes. Click the button to display the database and stop the flashing.

Tree View — Click to show or hide the Device Tree.

Help — Displays help for the currently displayed screen.

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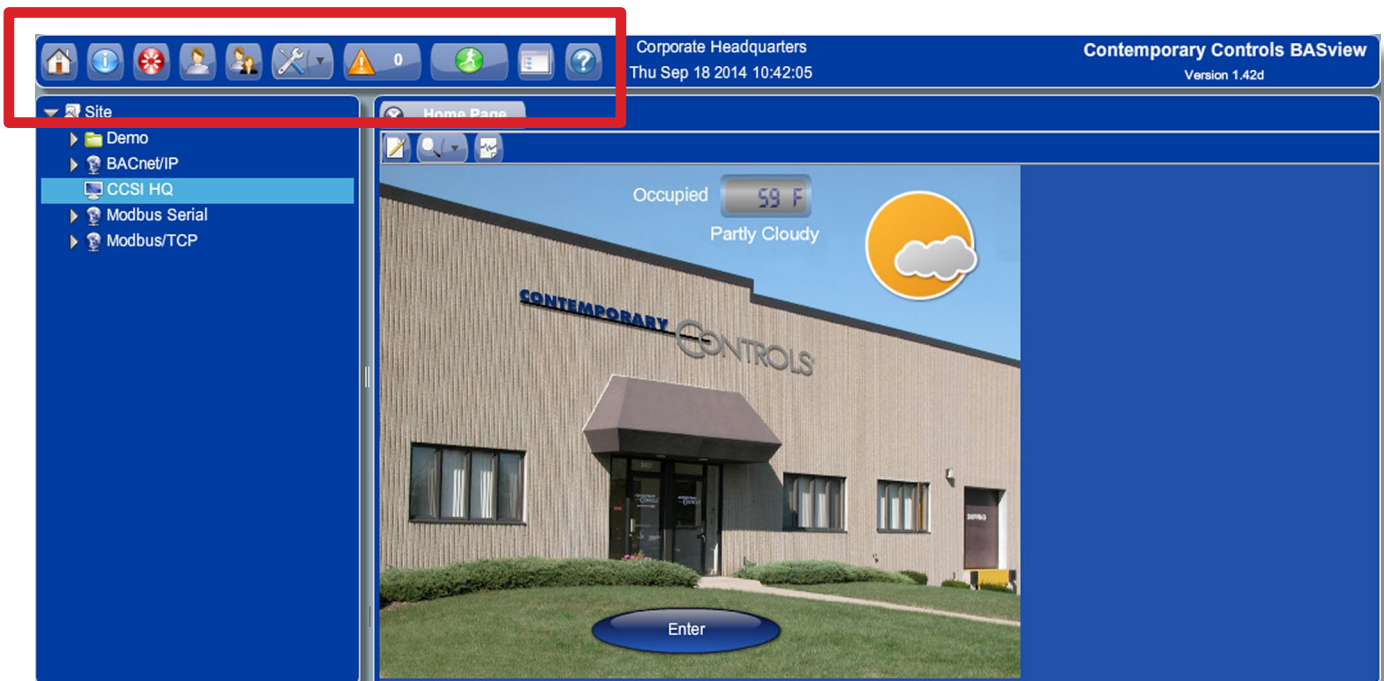
The User Home Page — Device Tree

The device tree appears on the left side of the main window. It displays all interactive items in the system. Each type of item is represented by one of the following icons:

Alarms — Monitors specified conditions and then generates alarm message and optional email alerts.

Calculations — Reads the value of one or more points and performs a calculation on them. For example, averaging several temperatures.

Devices — Any physical device, panel or I/O unit in the system.

Drivers — A physical network or logical grouping of devices based on the protocol they use. For example, an entire LonWorks network is a single driver.

Folders — Used to help organize other items. Folders may contain other folders.

Graphics — Used to display information from the system and to control equipment.

Links — Used to access other units, web pages or other web content.

Points — Any physical or logical control point on a device. Inputs, outputs, setpoints and variables on a device are all considered "points".

Programs — Allows simple programs to be written for controlling setpoints, outputs and other points.

Runtimes — Monitors specified conditions and accumulates the amount of time the conditions are true, and generates a message and optional email alerts when a limit is reached.

Schedules — Allows for control of several points based on the time of day.

Site — The root item from which all other items branch.

Trends — Automatically records point values at specified intervals to allow for later viewing.
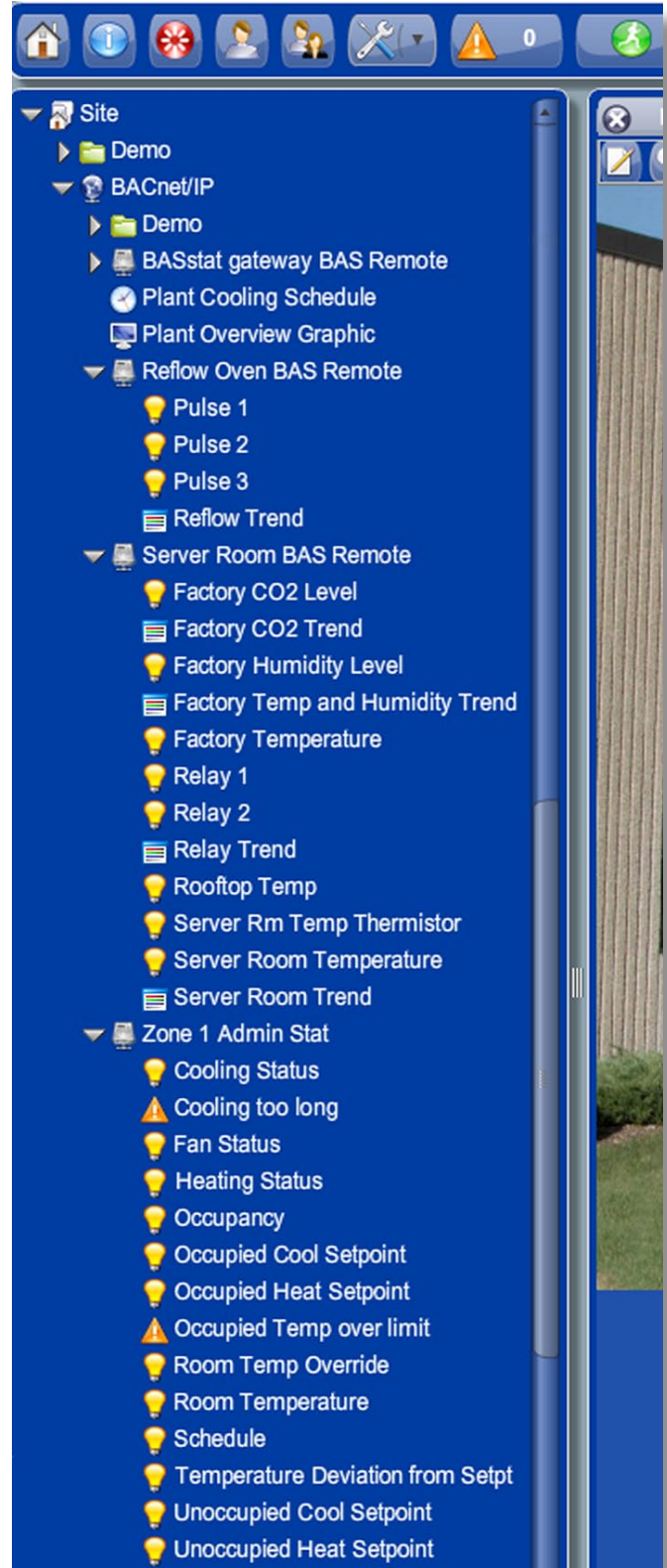
Configuring a System

The first step in the configuration process is to add a driver based on the network protocol being monitored. There are five possible resident drivers and multiple drivers can be loaded, if desired.

BACnet/IP and *Modbus TCP* are Ethernet-based and thus require no additional hardware. These can be used with external Modbus serial to Modbus TCP routers such as the BASremote or BASgateway or BACnet MS/TP to BACnet IP routers such as the BASrouter.

The BASview supports direct connection to Modbus RTU and MS/TP networks using the modules shown to the right. Connection to LonWorks devices can be achieved with the BASview LonWorks USB module.

After the interface has been chosen, the appropriate network driver is selected under the *Site* icon on the device tree.

Physical devices are then added to the device tree under the appropriate network driver. Using a network protocol that supports discovery (such as BACnet), devices and their objects can be found with a simple *Scan* command. Objects can be scanned to find all points within a device. You have the option to add those points that are found — but there is no requirement to use all points. Once devices and points are entered, the appropriate icons appear in the device tree. These points can now be referenced using BASview's built-in services.
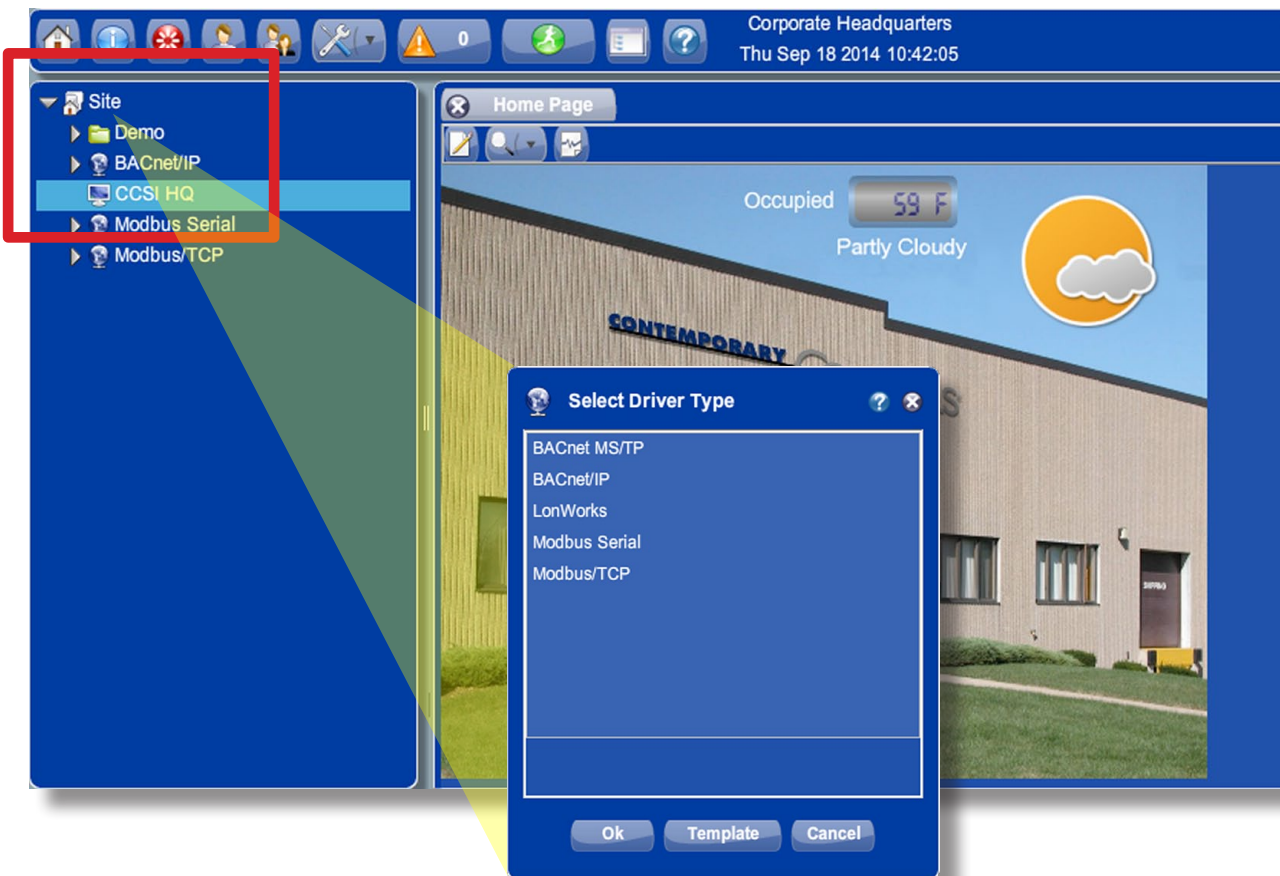
Scheduling

Schedules allow for control of several points based on the time of day within a seven-day week. A schedule is active if the current time of day falls within one of its specified time periods. Up to 32 points can be controlled by a schedule. An active and inactive value are defined for each point. For example, the schedule is active from 8 am to 6 pm and a setpoint is modified to 72°F during active periods and to 78°F during inactive periods.

Each day of the week has a horizontal bar where time periods are displayed. These settings can be changed if the current user access permits it. Above the bars is a header that displays the time of day the mouse is pointing to as it is moved over the bars, or — if the mouse is pointing at an existing time period — the header shows

the starting and ending time for that period. Time intervals are normally 15 minutes, but that can be changed if needed.

Schedules are easily created using mouse drag-and-drop movements. Daily entries can be easily copied to other days. Exceptions to the rule — such as holidays — can be entered to override the schedule.

The points list displays all points affected by this schedule — the active/inactive values of each point and the number of seconds by which to offset the changing of this point. Offsets allow points to be staggered on or off to minimize demand spikes and to sequence equipment in the proper order.

Trending

Trends automatically record point values at specified intervals of time to allow for later viewing. Up to six points may be specified for a trend. Both a graphical line chart and a tabular text view are available per trend. A pop-up calendar makes it easy to choose the date and time. An option allows you to export your data.

Using the *Chart* option, two charts can be displayed simultaneously using the same time base. The vertical axis shows the value of the variable being trended with the horizontal axis displays time. Both scales are automatically adjusted to fit the data currently displayed. Usually, the analogue values are shown on the top chart and the digital values on the bottom chart. A divider bar between the two charts can be moved for better viewing. Up to six variables can be trended on

the two charts. In the background a grid shows where the value and time scales intersect. With the mouse hovering over the intersection of a chart line and a grid line, information about the value of the variable at that time is displayed.

The *Data* tab displays the same data as the chart, but in a tabular text format. The first column is the date/time of the reading. Each point is then listed in order, from left to right. Any column header can be clicked to sort the data by that field. Clicking the header a second time will reverse the sort order. If there is more data than can fit on the screen, a scroll bar will appear to allow scrolling through the data. A mouse wheel may also be used to scroll.

DS-BASVIEW0-BA3

Alarming

Using alarming, the operator can be notified when points assume a particular condition. Up to six conditions can be used to enable a particular alarm. Alarms are logged based upon time of occurrence and can be saved for up to one year. When an alarm condition returns to the normal state, they are automatically cleared.

The alarm editor allows editing of alarm conditions, messages and email recipients. Creating an alarm condition is very easy to do. The user creates an alarm by first right-clicking on the device to be monitored in the device list which opens up the alarm editor. Then the point to be monitored is then simply dragged to the condition window in the alarm monitor. At this time, up to six conditions can be used to enable the alarm. An activation alarm text message is then entered, and if desired, a clear alarm text message can be entered. If

this alarm notice is to be sent by email to an associate or a group of associates, there is a box to enter the proper email address or addresses. The alarm is then applied and scanning for the alarm begins. To eliminate any nuisance alarms, where short-term alarm conditions can be tolerated, a time window can be assigned to the condition logic.

On the Toolbar is an Alarm icon that flashes when active conditions exist. By clicking the icon, the alarm log can be viewed and the flashing of the icon ceases. The Alarm icon will continue to display the number of alarms that are active but the alarm log will give detail to the specifics of each alarm. Alarms are stored for one year and are grouped into months. A large alarm log can be filtered by month or can be finely sorted using a filter.
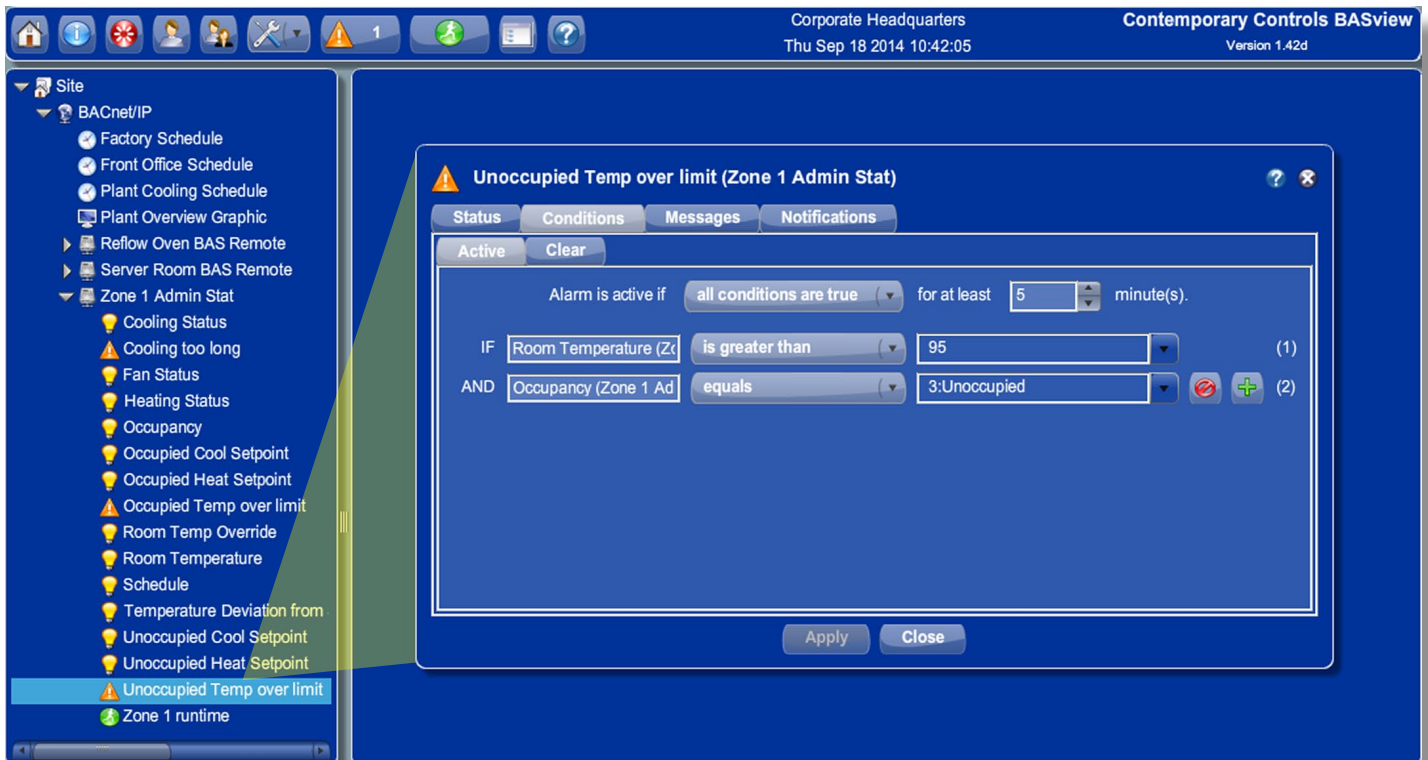
Runtime Monitoring

Equipment can be easily monitored to notify you that preventive maintenance is needed — such as filter changing — or to determine high duty-cycles that could point to control problems.

Setting up runtimes is similar to setting up alarms. With the runtime editor you can define up to six conditions

that determine if a runtime accumulates. You can check the runtime status, define the runtime notification message, and determine who is notified when a runtime limit has been reached.

To view the status of all runtimes, a report can display the accumulated results of the various runtimes.
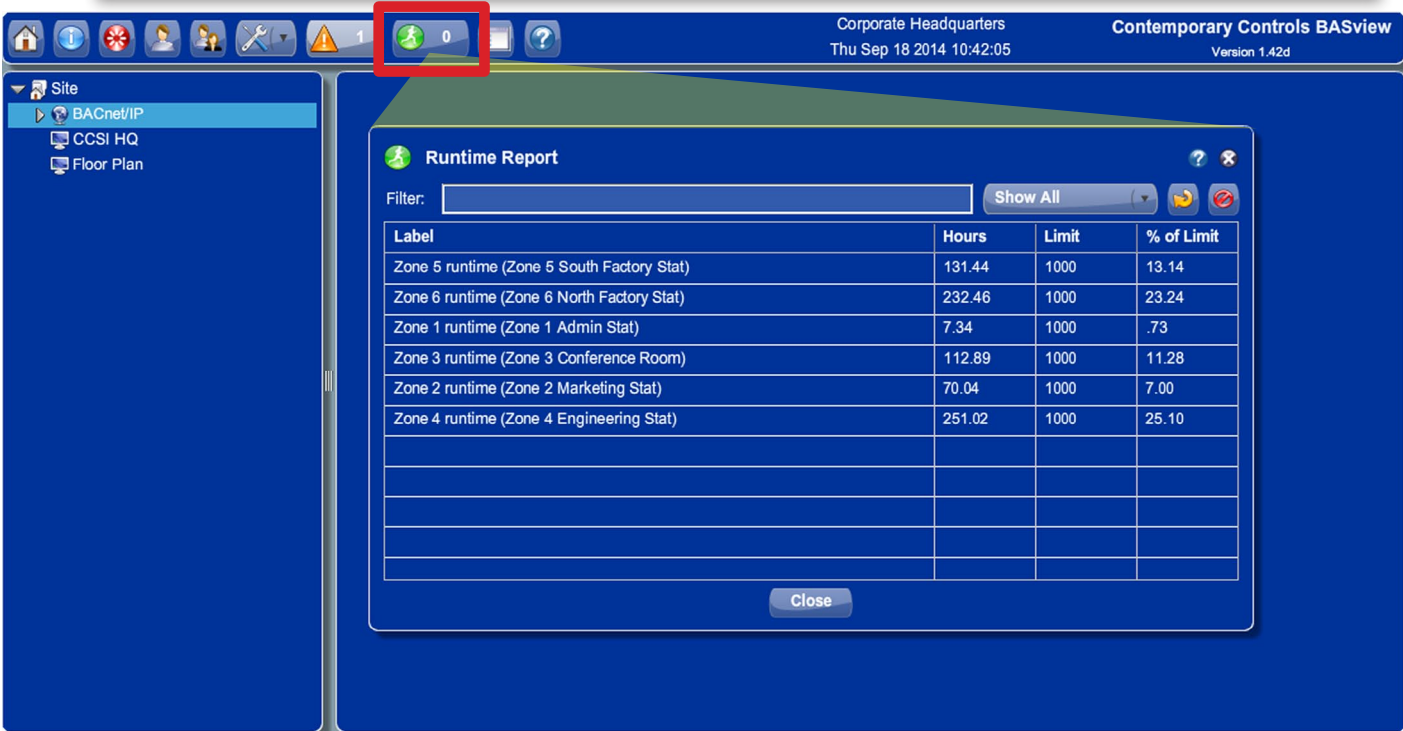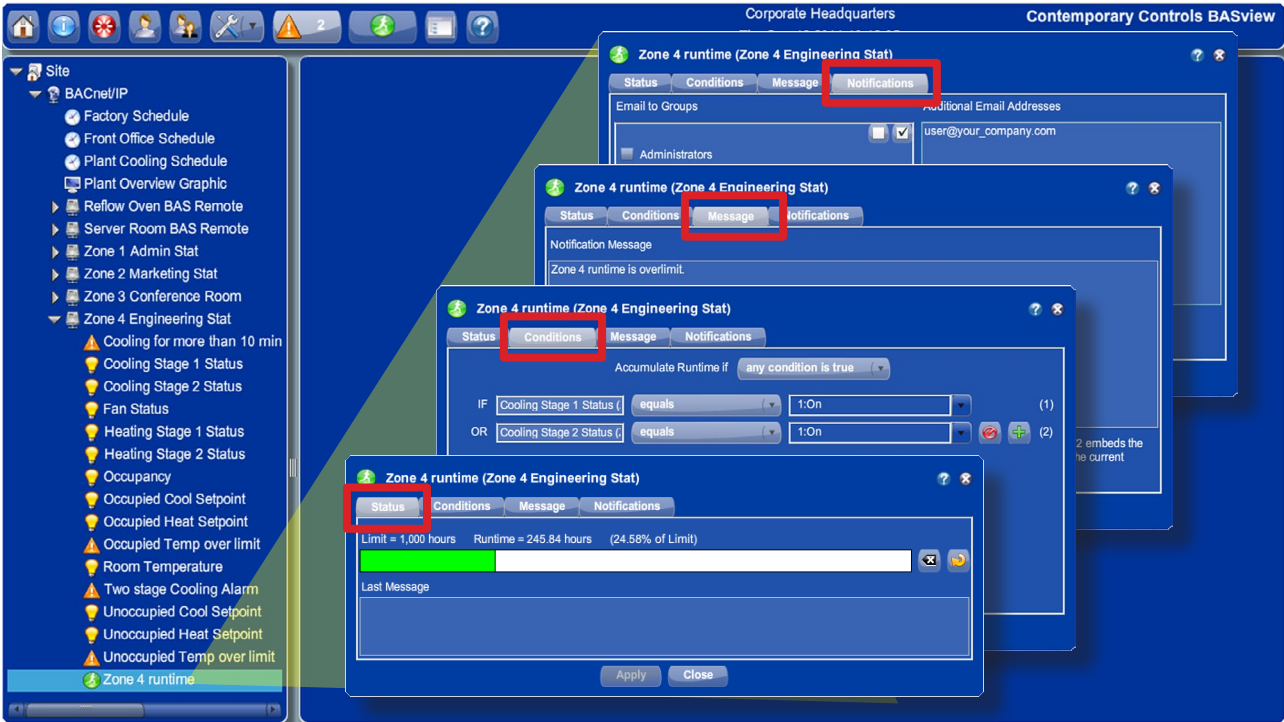
Performing Calculations

Calculations read points from one or more devices and perform a calculation on them — such as average, minimum or maximum. Custom calculations may also be used. Calculations may be used on graphics, trends, alarms and even other calculations — just like physical points. Points must be dragged from the device tree and dropped in the points list. Every point that will be part of the calculation is dropped. The order of the points is generally not important unless a custom function is used. For example, to average three temperatures, drag the three temperature points to the point list and select "Average". Custom functions are also supported by selecting "Custom" and entering a calculation in the "Post-function Calculation" window. The post-function calculation is used to perform an additional calculation on the result of the function, or to specify a custom function.

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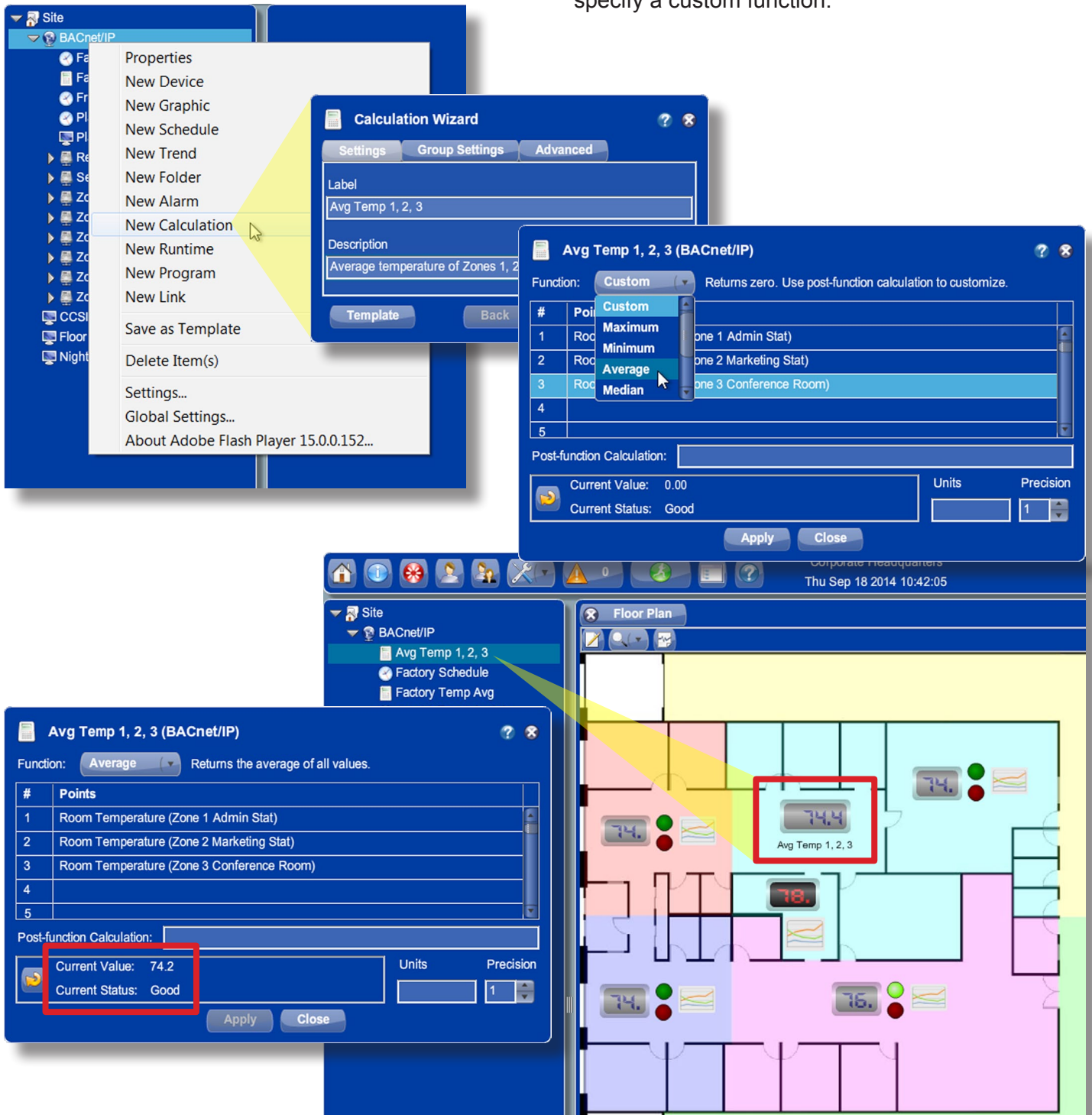
Graphics

To obtain a more understandable view of the process or equipment, graphics with embedded tags and values are created for viewing in a browser window.

Graphics are used to display system information and to control equipment. Edit mode is only available to users given permission to edit graphics. Several Components are available -- including text labels, check boxes, animations, etc. To add an item to a graphic, drag it from the device tree to the graphic area — then a dialog appears for choosing a component to use with the item. To change the point attached to a component, drag the new point from the device tree and drop it on the component. Components may be copied and pasted between graphics.

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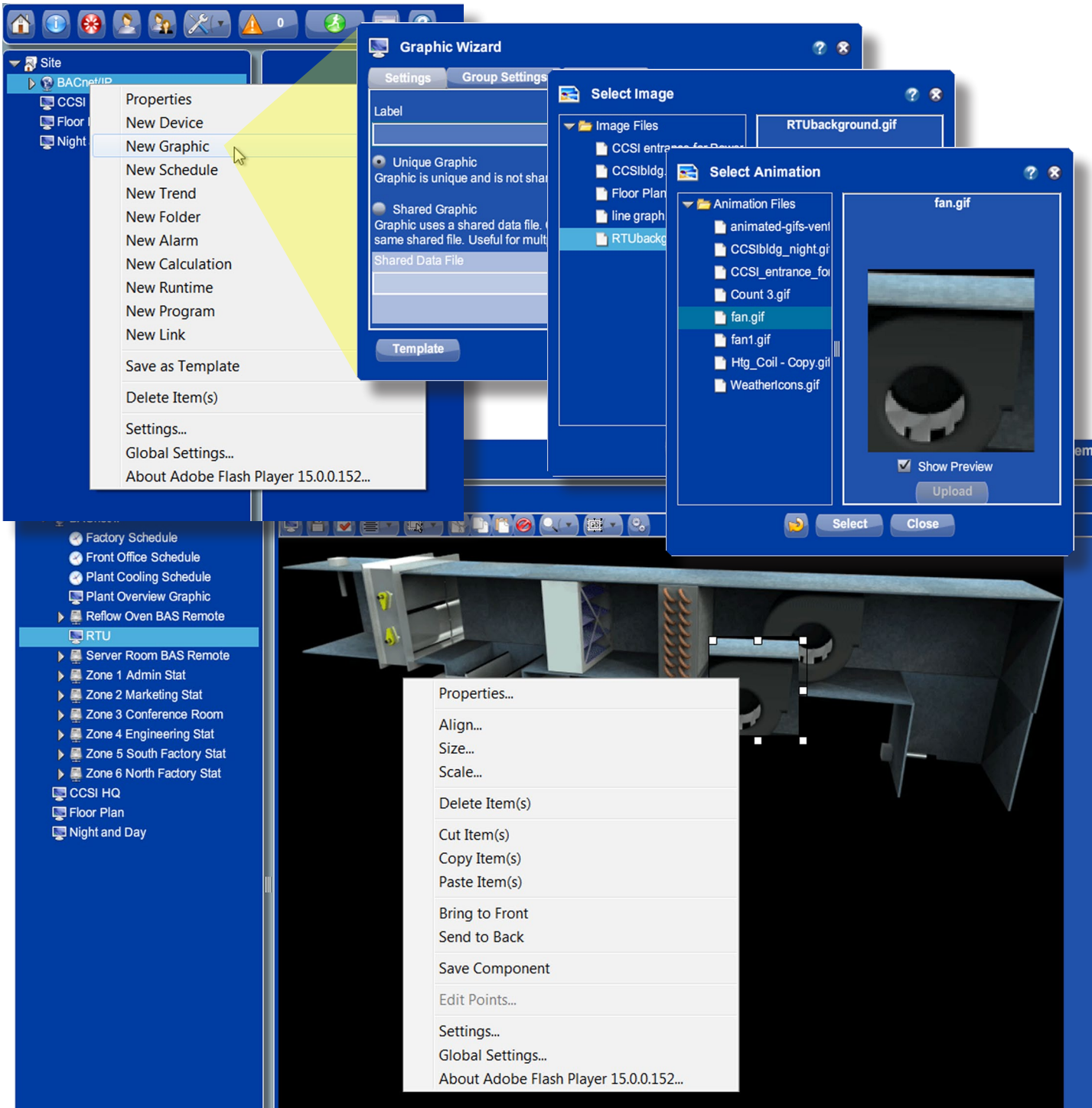
Templates

Templates are a powerful tool to make system setup easier. Any item in the device tree may be saved as a template. That item can then be quickly recreated without worrying about the details.

For example, a temperature setpoint for the first floor may be defined, including a label, description, modify limits and calculations to convert from Fahrenheit to Celsius. It may then be saved as a template. Use the saved template to create a similar setpoint for the second floor, changing the name and address to distinguish the new setpoint from the old.

Saving a driver, device or folder as a template saves all sub-items in the tree as a single template. It may then be restored to quickly duplicate it.

For example, in the illustration below, the entire BACnet/IP network — all points, graphics, schedules, alarms, etc.

under the BACnet/IP driver — will be copied into the created template. Then you can create a **second** BACnet/IP network with a new driver, but using the template created from the original driver — in essence, copying the original network. Then only the new addressing will need changing to make the new item functional. This can save an immense amount of time and work.

When a new item is created from a template, the new item uses the template **as it exists at that time**. Changing a template later will have no effect on items previously created from it.

Also, it is important to fully test an item before duplicating it as a template. Otherwise, mistakes in the original item will need to be corrected in the duplicate item — perhaps taking much effort.
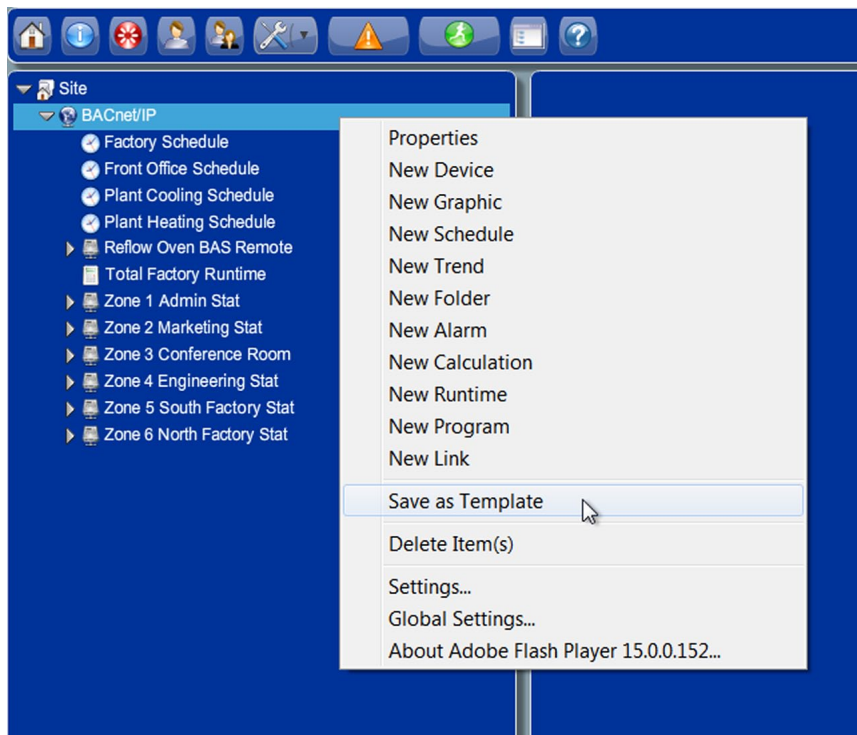
Python Programming

If the schedule or calculation feature is not sufficient, you can use the BASview's programming feature to add one or many programs to control connected BACnet, Modbus, LON devices — or re-calculate data from these devices. The BASview utilizes the simple Python programming language for its user programs. This language is similar to BASIC and provides standard *if-then-else* and *loop* operations. The BASview also provides special functions to read/write points within connected devices, functions for time and date, and other useful functions. Data between programs can also be shared. Each user program can execute on a timed basis or upon demand. Comments are also supported.

Because the internal point names can be somewhat complex, the BASview provides a simplified version of

the point names used in programming. Simply drag a point from the point tree and drop it onto the points table and the BASview will assign a simplified name for the user program. These names will begin with the '@' symbol to help differentiate them from the variable names in the user program.

The real strength of the programming feature lies in the BASview's program debug feature. This allows you to write your program and debug it directly from the webpage of the BASview. Errors discovered in the user program will also be displayed in the debug webpage. Press the *Debug* tab and you will see the current status of the variables in the program. Also, all user debug print messages will appear in the bottom portion of the screen.

HTML Pages — Access the BASview from your Smart Phone

Although the BASview interface inherently requires Flash-enabled access, it also includes a mobile interface that can be used with any HTML supported device. You can use an Android phone/device or an iPhone/iPad to check various functions within the BASview. The mobile interface cannot show you graphics or trends, but it can show you the status of various points monitored by the BASview. It can also show you active alarms.

Authentication
for secure access

Corporate Headquarters
Contemporary Controls BASview
Username
Password
Login
(Switch to Flash Interface)
JavaScript and "cookies" must be enabled in your browser.
Contemporary Controls BASview (Version 1.42d)

Device Tree
access all BASview nodes

Corporate Headquarters
Contemporary Controls BASview
Main Alarms Logout

- aSP_Main
- BAC2
- **BACnet/IP**
- BASview
- Boiler
- CCSI HQ
- FCU
- Floor Plan
- **Modbus**
- Night and Day1
- Override test
- Ramp
- RTU
- SP_Zone1
- SP_Zone2
- SP_Zone3
- SP_Zone4
- SP_Zone5
- SP_Zone6
- test
- test
- test program
- time
- VAV+FAN test
- VAV2

Note: Only 1 graphic may be open at a time.
Contemporary Controls BASview (Version 1.42d)

Active Alarms
check and confirm all alarm conditions

Corporate Headquarters
Contemporary Controls BASview
Main Alarms Logout

Active Alarms

Date	Message
Fri Oct 11 15:56:22 2013	Zone 4 air conditioning on for 30 minutes

Contemporary Controls BASview (Version 1.42d)

Graphic Report
check the status of any graphic element

Corporate Headquarters
Contemporary Controls BASview
Main Alarms Logout

Graphic: CCSI HQ

Name	Value	Status	Manual	Parent	Type
Cooling Trend	0	Good	Auto	Heat Cool Plant	Trend
Floor Plan	0	Good	Auto		Graphic
Heating Trend	0	Good	Auto	Heat Cool Plant	Trend
Outside Air Condition	30	Good	Auto	BAS Remote Weather Server	Point
Outside Air Temperature	75.00 F	Good	Auto	BAS Remote Weather Server	Point
Outside Humidity	43 %	Good	Auto	BAS Remote Weather Server	Point
Status Trend	0	Good	Auto	Heat Cool Plant	Trend

Contemporary Controls BASview (Version 1.42d)

Application Example — Minimal Building Integration

For small systems or processes, the BASview can interface directly to LON, Modbus RTU and BACnet MS/TP through the use of USB port serial interfaces. The BASview has two USB-A ports — allowing the simultaneous use of two of the three available USB

interface modules. In the example shown below, the BASview is communicating via the Ethernet port to support BACnet devices and also continuously servicing the two serial interfaces.

USB Modules for Various Interfaces

Three USB interfaces are available for attaching to LON, Modbus RTU and BACnet MS/TP networks. All interfaces share the specifications listed to the right. Individual specifications are listed below. A 1.8 m USB cable is supplied with each interface.

Operating Temperature	0°C to 60°C
Storage Temperature	–40°C to 85°C
Relative Humidity	90%, non-condensing
Protection	IP30
USB Port	USB 2.0, Type B

BASV-MSTP   USB Module for BACnet MS/TP Networks

USB Power Demand	50 mW (typical)		
Network Connection	EIA-485, 1 network load, 9.6 – 78.6 kbps, 1200 m (max)		
Compliance	ANSI/ASHRAE 135 (ISO 16484-5), RoHS		
LEDs	Power	Green:	On = USB power OK
	Data	Red:	Flashing = Activity
Dimensions	91.4 x 78.7 x 30.5 mm (3.6 x 3.1 x 1.2 inches)		

**10-pin Connector
Pin Assignments**

Pin	Function
1	Ground
2	MS/TP+
3	MS/TP–
all others	N/C

(DB-9 Connector reserved for future use.)

BASV-MOD   USB Module for Modbus RTU Networks

USB Power Demand	450 mW (typical)		
Network Connection	EIA-485, ¼ network load, 250 kbps (max), 1 kV isolation		
Compliance	ISO/IEC 8482:1993, modbus.org V1.02, RoHS		
LEDs	Power	Green:	On = USB power OK
	RX	Green:	Flashing = Activity
	TX	Green:	Flashing = Activity
Dimensions	104.2 x 53.3 x 25.4 mm (4.1 x 2.1 x 1 inches)		

BASV-LON   USB Module for LonWorks TP/FT-10 Networks

USB Power Demand	450 mW (typical)		
Network Connection	TP/FT-10 LonWorks, 78.13 kbps, CAT5, 450 m (max)		
Compliance	ANSI/CEA-709.3 (ISO/IEC 14908-2)		
LEDs	Power	Green:	On = USB power OK
	RX	Green:	Flashing = Activity
	TX	Green:	Flashing = Activity
Dimensions	104.2 x 53.3 x 25.4 mm (4.1 x 2.1 x 1 inches)		

CONTEMPORARY CONTROLS

Specifications

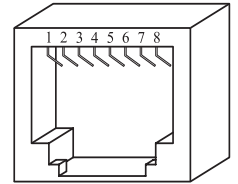|	
Power Requirements	100–240 VAC, 10 W
Operating Temperature	0°C to 60°C
Storage Temperature	–40°C to 85°C
Relative Humidity	0–95%, non-condensing
Protection	IP30
Ethernet Port	IEEE 802.3 10/100 Mbps data rate 10BASE-T, 100BASE-TX physical layer 100 m (max) CAT5 cable length
USB Ports	USB 2.0, Type A
LEDs	Power Green: On = power OK
	Ethernet Green: On = Link; Flashing = Activity Yellow: On = 100 Mbps; Off = 10 Mbps
Regulatory Compliance	CE Mark; CFR 47, Part 15 Class A; RoHS

Mechanical Drawing

All dimensions are in mm.

152   78   70   144   Ø = 4   30

RoHS✓

Connector Pin Assignments

Ethernet

Pin	Function
1	Signal 1
2	Signal 2
3	Signal 3
4	N/C
5	N/C
6	Signal 4
7	N/C
8	N/C

1 2 3 4 5 6 7 8

Ordering Information

Model	RoHS	Description
BASV-1	✔	Web-based graphical interface, wall-mount power supply included

Accessories

Model	RoHS	Description (1.8 m (6 ft) USB cable included)
BASV-MSTP	✔	USB module for BACnet MS/TP interface
BASV-MOD	✔	USB module for Modbus interface
BASV-LON		USB module for LonWorks interface (not RoHS compliant)