



BACnet Client Controller Now With Haystack

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R&D Manager – Contemporary Controls

BASpi-BCC or BACnet “Facilitator”

- Raspberry Pi with communications board
- BCC main feature is BACnet client and server
- Can read/write BACnet points on the network
- Other BACnet clients can read/write its internal points
- Isolated MS/TP port
- Wi-Fi
- Ethernet
- 24VAC/VDC and DIN rail



BACnet Facilitator Programming

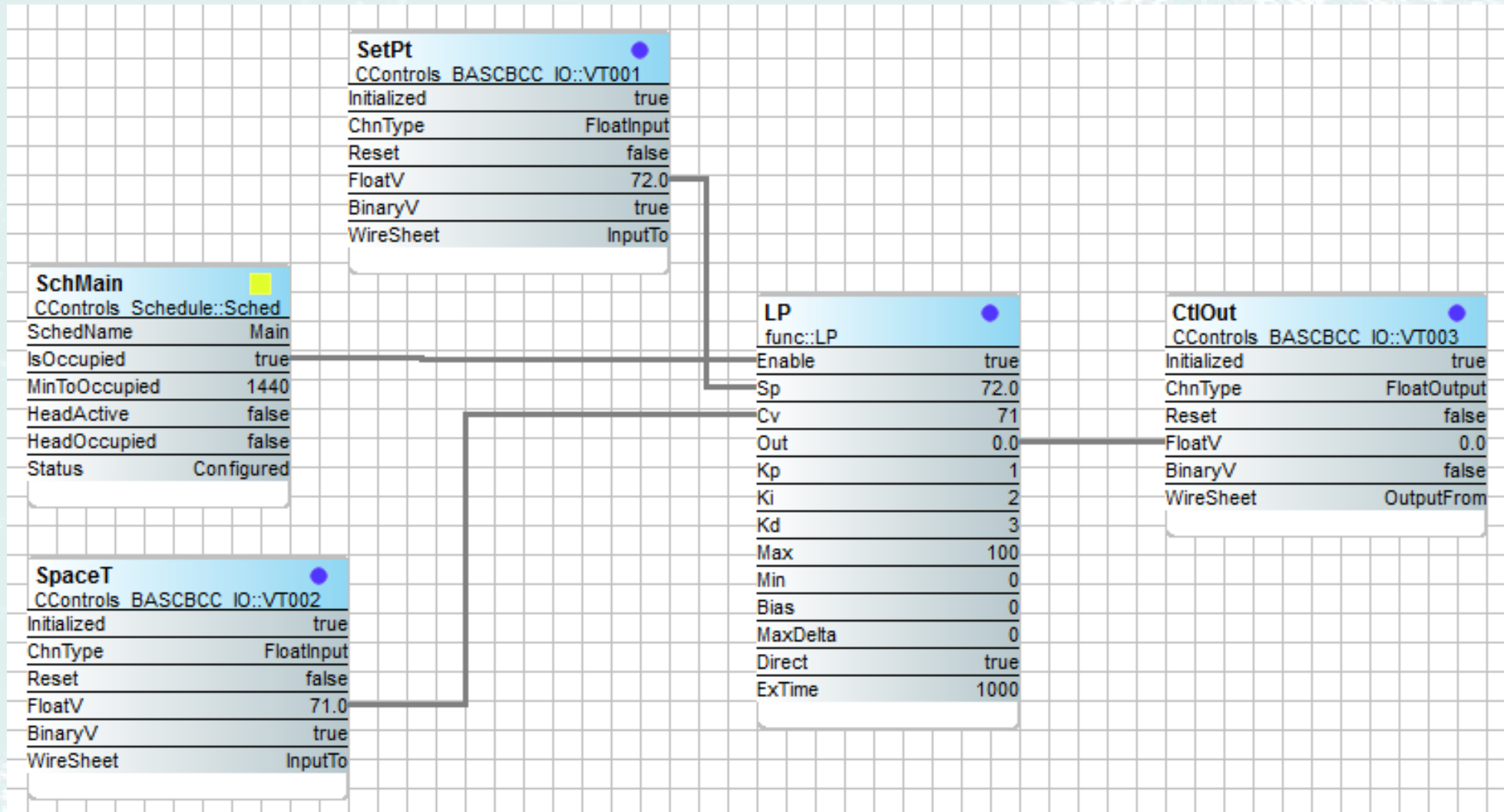


Sedona Programming

- Drag/Drop components
- Live programming
- Free Sedona editor
- Free Sedona emulator
- Palette with many component groups or kits
- More kits can be added

- ▷ CControls_BASCBCC_IO
- ▷ CControls_BASCBCC_Platform
- ▷ CControls_BASCBCC_Web
- ▷ CControls_BASCC_NETV
- ▷ CControls_Email
- ▷ CControls_Function
- ▷ CControls_Schedule
- ▷ basicSchedule
- ▷ datetimeStd
- ▷ func
- ▷ hvac
- ▷ logic
- ▷ math
- ▷ pricomp
- ▷ sys
- ▷ timing
- ▷ types

BASpi-BCC Sedona



BASpi-BCC BACnet Weather Facilitator

- Get weather data from cloud – use in Sedona or push to other BACnet devices
- Temperature, Humidity, Atmospheric Pressure, Wind speed and direction

The screenshot displays the 'Weather Configuration' web interface, which is organized into four main sections separated by red horizontal lines:

- Weather Configuration:** This section contains three input fields: 'Poll Rate' (set to 60), 'Units' (set to DegF), and 'API Key' (set to 2738d7eeec3). A 'Test' button is located to the right of the API Key field.
- Location Method:** This section provides two methods for location selection. The first method uses 'City Name' (Downers Grove, US) and 'City ID' (4890119). The second method, which is selected with a radio button, uses 'Latitude' (41.79) and 'Longitude' (-88.01). A 'US Zip Code' field (60515) is also present.
- Virtual Points:** This section contains four configuration blocks for virtual points: VRT07, VRT08, VRT09, and VRT10. Each block includes a 'Name' field, a 'Poll' checkbox, a 'BACnet Type' dropdown (set to ANALOG_VALUE), and a 'Property' dropdown. VRT07 is named 'wTemperature Point 7' with 'Temperature' as the property. VRT08 is named 'wPressure Point 8' with 'Pressure' as the property. VRT09 is named 'wHumidity Point 9' with 'Humidity' as the property. VRT10 is named 'Special_Virtual Point 10' with 'Latitude' as the property.
- Buttons:** At the bottom right of the interface are 'Close' and 'Submit' buttons.

BASpi-BCC BACnet IoT Facilitator

- Send BACnet points to Microsoft Azure cloud
- Can receive points from the cloud to use in Sedona or BACnet

Cloud Configuration

Poll Rate	Scope ID	Device ID	Primary Key
10	One00040A16	*****	*****

VRT04 Name: Occupancy_Zone_4 Poll: ☒ Type: BINARY_VALUE Direction: From Cloud	VRT05 Name: Occupancy_Zone_5 Poll: ☒ Type: BINARY_VALUE Direction: From Cloud	VRT06 Name: Occupancy_Zone_6 Poll: ☒ Type: BINARY_VALUE Direction: To Cloud
VRT07 Name: wTemperature_Point_7 Poll: ☒ Type: ANALOG_VALUE Direction: To Cloud	VRT08 Name: wPressure_Point_8 Poll: ☒ Type: ANALOG_VALUE Direction: To Cloud	VRT09 Name: wHumidity_Point_9 Poll: ☒ Type: ANALOG_VALUE Direction: To Cloud
VRT10 Name: Special_Virtual_Point_10 Poll: ☒ Type: ANALOG_VALUE Direction: To Cloud	VRT11 Name: Special_Virtual_Point_11 Poll: ☒ Type: ANALOG_VALUE Direction: From Cloud	VRT12 Name: Virtual_Point_12 Poll: ☒ Type: ANALOG_VALUE Direction: From Cloud

Close Submit

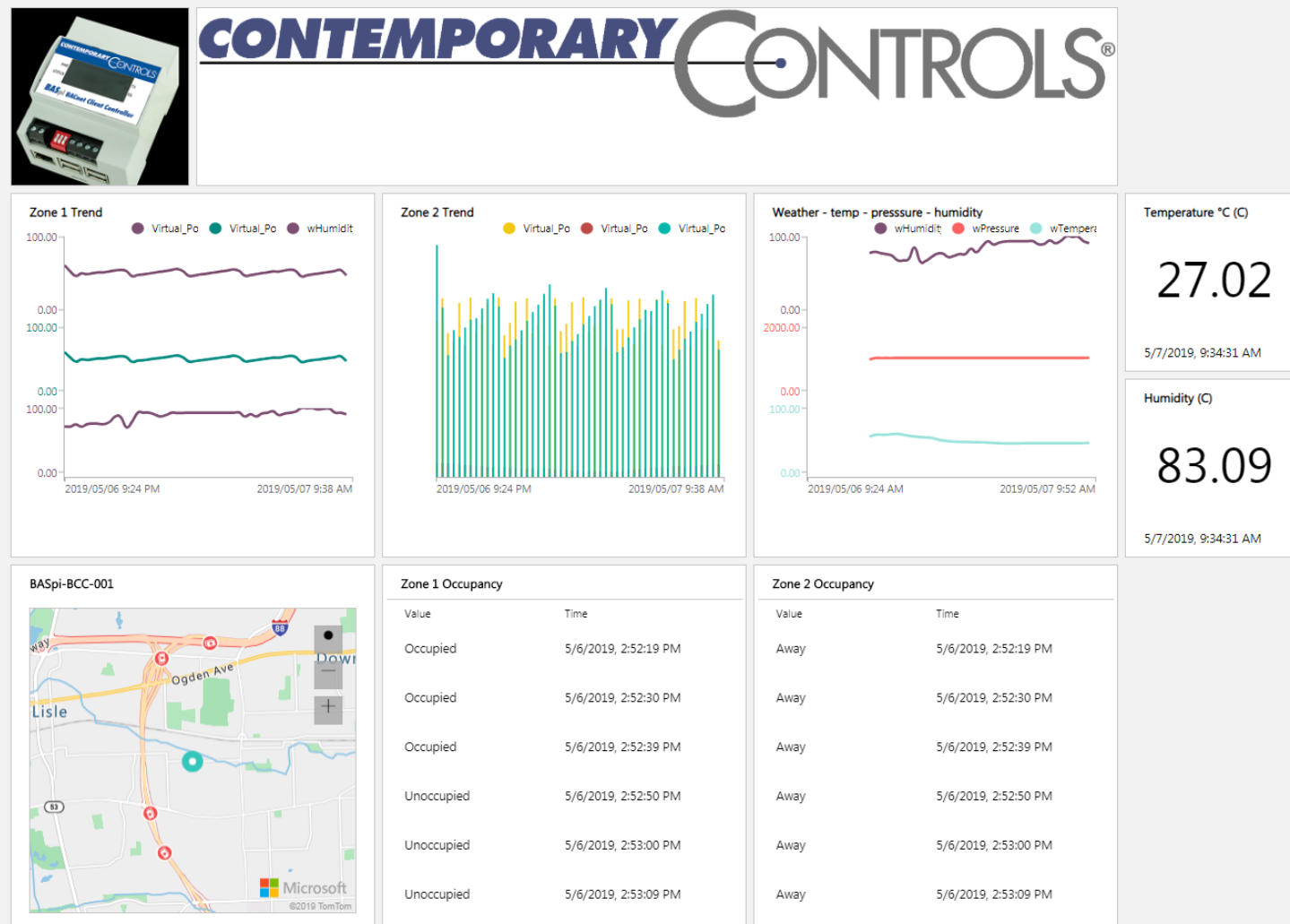


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Azure IoT Central and BCC

- Simple to use
- Trends
- Alarm emails
- Adjust settings on BCC from Azure – analog and binary
- Dashboard
- First 5 devices free on IoT Central



BASpi-BCC Time Facilitator

- Real-Time clock
- NTP
- Daylight savings
- Uses BACnet TimeSync to send time to network
- Sunrise/Sunset calculation for Sedona

System Time

Year

Month

Day

Hour

Minute

Sunrise/Sunset

Latitude

Longitude

Sunrise 4:38 AM

Sunset 6:58 PM

NTP Configuration

☒ NTP Enabled

NTP Server

Time Zone

Refresh (Days)

NTP Success

DST Configuration

☒ DST Enabled

DST ON

DST OFF

Month

Day of Month

Hour

BASpi-BCC Schedule Facilitator

- Multiple Schedules
- 7 day schedule with exceptions
- Sedona Schedule components
- Schedule can be used to control external devices over BACnet

The screenshot displays the 'BASpi-BCC Schedule Facilitator' interface. At the top, there are three tabs: 'Current Schedule', 'Default Schedule', and 'Events'. The 'Current Schedule' tab is active. Below the tabs, there are two columns: 'Occupied' and 'Unoccupied'. A red horizontal line separates the header from the data rows. The data rows represent the days of the week from Sunday to Saturday. Each day has two input fields for times, one for 'Occupied' and one for 'Unoccupied'. A checkbox is located between the two time input fields for each day. The 'Status' field is set to 'Configured'. A 'Close' button is located at the bottom right of the window.

	Occupied		Unoccupied
Sunday	Vacant	☒	Vacant
Monday	8:30	☐	18:30
Tuesday	8:00	☐	18:00
Wednesday	8:00	☐	18:00
Thursday	8:00	☐	18:00
Friday	8:30	☐	16:00
Saturday	8:00	☐	12:00

Vacant

Revert Submit

Close

Sched
CControls_Schedule::Sched

SchedName	TEST
IsOccupied	true
MinToOccupied	1440
HeadActive	false
HeadOccupied	false
Status	Configured

Times are entered as hour and minutes in the form 'HHMM' in 24 hour format.

Examples:
8:30 AM is entered as 830
8:30 PM is entered as 2030

BASpi-BCC Email Facilitator

- Can send multiple emails – triggered by Sedona logic
- Each email message can contain data from 3 wiresheet values
- Each email can also contain any point in the device

Email Configuration

Account

Server: smtp.gmail.com

From: test

Port: 587

User Name: username@gmail.com

Password:

Messages

Message ID#: Boiler

To: name@domain.com

CC: name1@domain.com

Subject: Boiler is too hot

Body: Boiler is currently {{SV1}} and this is over our limit. The room temperature is {{SV2}} and the set point is {{VT1}}.

Close

Email

CControls_Email::Email

MessageID	Boiler
Sv1	201.32
Sv2	72.53
Sv3	10.2
Trigger	false
Reset	false
Status	Success

BASpi-BCC REST API

- Expandable
- Run your own Linux applications in BCC and can read/write internal or external BACnet points or other BCC features
- Examples in Python and Node.js



BASpi-BCC Haystack Facilitator

- Now adding Haystack
- Haystack server
- BACnet points from network into Haystack client
- Haystack histories
- Can configure tags or bring in pre-defined tags via backup feature

Haystack Configuration

Equipment	Points
VT1	
Display Text: Virtual Point 1	
Kind: Number	
Units: FAHRENHEIT	
Type: sp	
Point Tags	
fcu	
fan	

BASpi-BCC Haystack Facilitator

- Haystack tags
- Select from drop down
- Add value if applicable

The screenshot displays the 'Haystack Configuration' window with two tabs: 'Equipment' and 'Points'. The 'Points' tab is active. A modal dialog titled 'Edit Point Tag' is open, featuring a 'Tag' dropdown menu and a 'Value' input field. The 'Tag' dropdown is open, showing a list of tags including 'fcu', 'elec', 'elecHeat', 'elecMeterLoad', 'elecMeterRef', 'elecPanel', 'elecPanelOf', 'elecReheat', 'enable', 'energy', 'entering', 'enum', 'equip', 'equipRef', 'evaporator', 'exhaust', 'export', 'faceBypass', 'fan', 'fanPowered', and 'fcu' (which is highlighted at the bottom). The 'Value' field is empty. An 'Update' button is located below the 'Value' field. In the background, a table of configuration points is visible, with columns for 'Tag' and 'Value', and icons for deleting and editing entries.

BASpi-BCC Haystack tags in Niagara

The screenshot shows the 'Edit' dialog for a device in Niagara 4. The device is 'BASpi-FCU1-a', type 'N Haystack Number Point', with ID '@BASpi-FCU1-a', enabled, and facets 'units=V'. The tuning policy is 'defaultPolicy'. The 'Haystack Tags' sub-dialog is open, showing the following tags:

Tag	Value
id	BASpi-FCU1-a
curVal	1.0
dis	BASpi-FCU1-a
equipRef	BASpi-FCU1
fan	✓
fcu	✓
his	✓
kind	Number
point	✓
siteRef	BASpi
tz	Chicago
unit	V

The 'Imported Tags' field in the main dialog contains the following JSON: `{tz:"Chicago" point dis:"BASpi-FCU1-a" fan his cur`

BASpi-BCC Haystack in Niagara





BASpi-BCC BACnet Client Controller BACnet Facilitator

Come to our booth for a demonstration

Thank you for your attention

