JULY 2021

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CORPORATE UPDATE

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OFFICIAL RELEASE RCWebView® 3.14

- *RC-WebView 3.14 revolutionizes how you can display building data*
- *Insight: The road to a successful network architecture: Part 3*
- *Contact support*
- *Did you know? You can change MACH-ProView LCD display properties with Control-Basic*
- *RC-GrafxSet: Why you should incorporate contrast in design*
- *Safeguard school facilities with RC-Passport*
- *Upcoming training classes*
- *Featured promotional products*

(Click title to jump directly to article)

RC WebView® 3.14

Revolutionizes how you can display building data

The new release of RC-WebView® 3.14, our easy-to-use browser-based building management solution, completely revolutionizes how you can choose to display data. This new version of the software means you are no longer dependent on System Group graphics in RC-Studio®; you can now display live data using Navigation Groups in RC-WebView, saving you valuable setup time and providing endless flexibility.

"This release greatly empowers dealers to create enterprise-level dashboards using the new and improved Navigation Groups feature," says Mark Hatherly, product owner. Mark is pleased to announce that RC-WebView 3.14 is newly recertified as a BACnet Operator Workstation at BACnet revision 16.

With RC-WebView 3.14, you can add objects, keywords, and animations directly to a Navigation Group. This even includes HTML5 animations from RC-GrafxSet®. Previously, you had to use System Groups to display data for a single connected system; the new Navigation Groups feature transcends multiple building automation systems, allowing you to quickly and securely access data for an entire enterprise.

For example, you could add a Google Map to a Navigation Group (Figure 1) with pins that represent buildings in an enterprise, or choose to create interactive HVAC, lighting, and security graphics (Figure 2–4).

Mark Hatherly, RC-WebView product owner.

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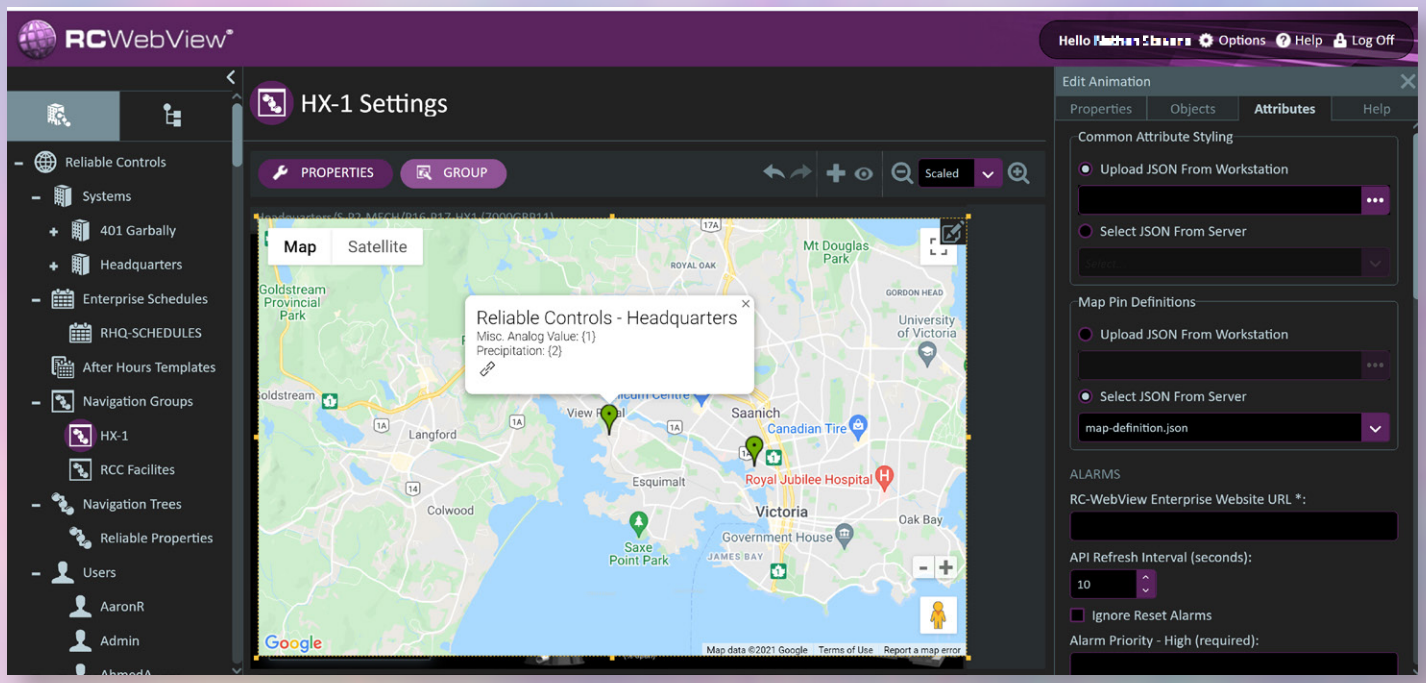

Figure 1: Live HTML5 Google Map animation.

Navigation Group support for HTML animations allows you to:

- **Upload new animations or select a previously uploaded animation in the gallery. (Figure 2)**
- **Drag an animation from the preview area in the Insert Animation pane and position it on the Navigation Group canvas. (Figures 3-4)**
- **Use the resize handles to change an animation's size and select whether to preserve its aspect ratio. (Figures 5-6)**

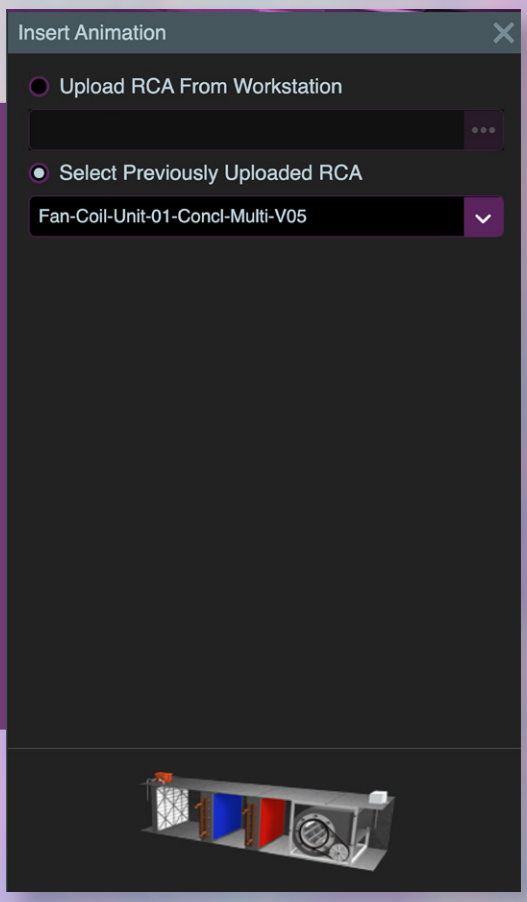

Figure 2: Insert Animation dialog box.

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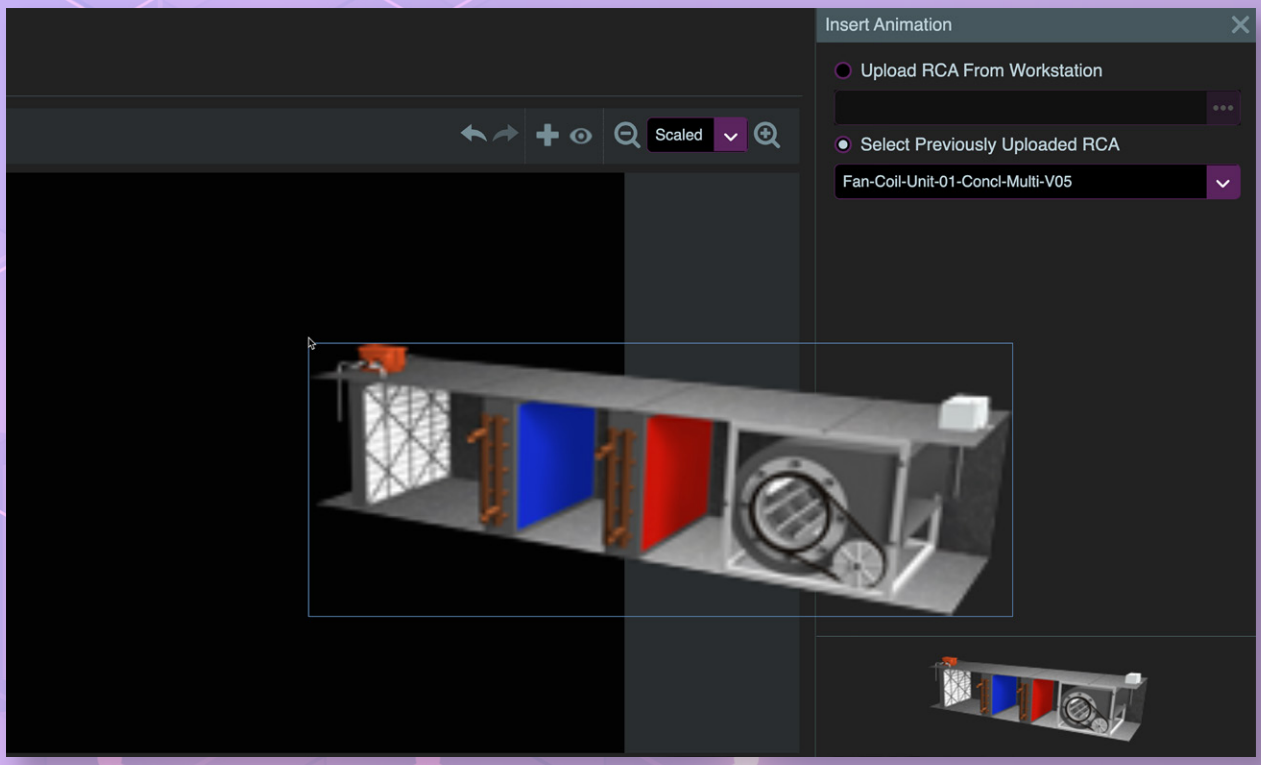

Figure 3: Drag animation to the Navigation Group canvas.

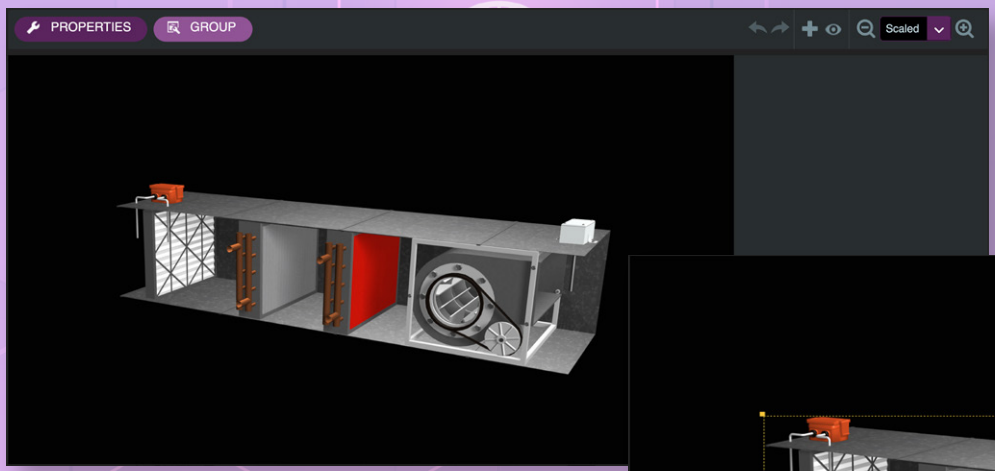

Figure 4: Animation secured in the Navigation Group canvas.

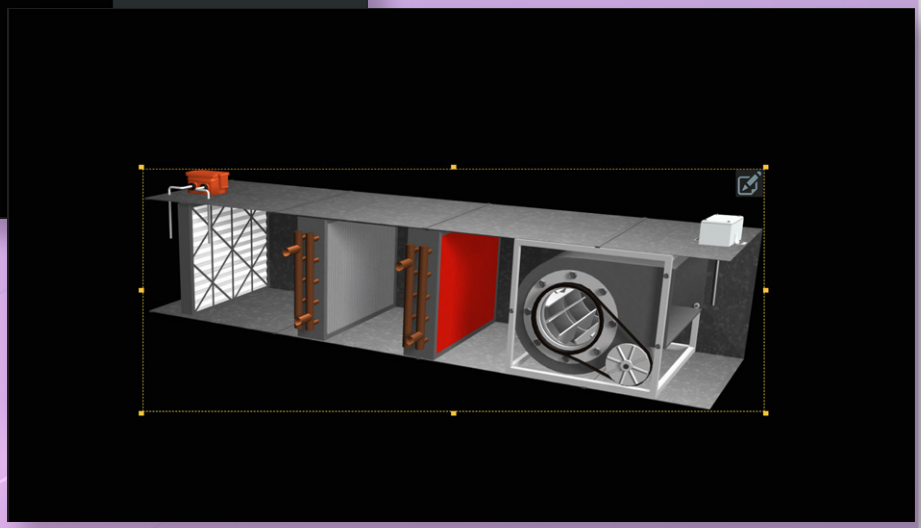

Figure 5: Resize animation in the Navigation Group canvas.

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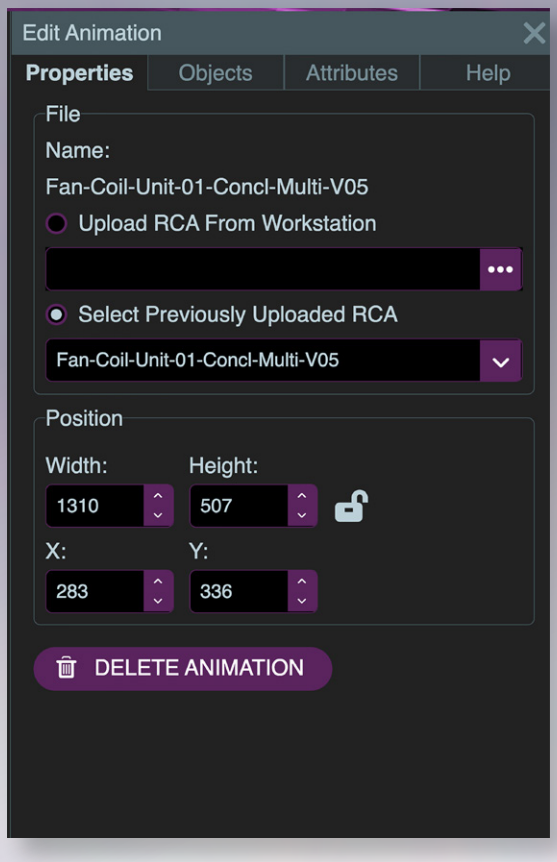

Figure 6: Edit Animation dialog box.

In addition, RC-WebView support for live data for BACnet- and RCP-protocol objects allows you to drag and reposition inputs, outputs, values, EnOcean values, BACnet Lighting Output objects, PID loops, and BACnet array indices on Navigation Groups.

The RC-WebView What You See Is What You Get (WYSIWYG) user interface matches the client-ready view of your Navigation Group as you build it (Figure 5). The ability to autosave your configuration as well the undo and redo capabilities in the WYSIWYG interface make it easier to design Navigation Groups. You can use the zoom in and zoom out controls, manually input a zoom percentage, or use the drop-down list to select **Scaled** or predefined percentage values.

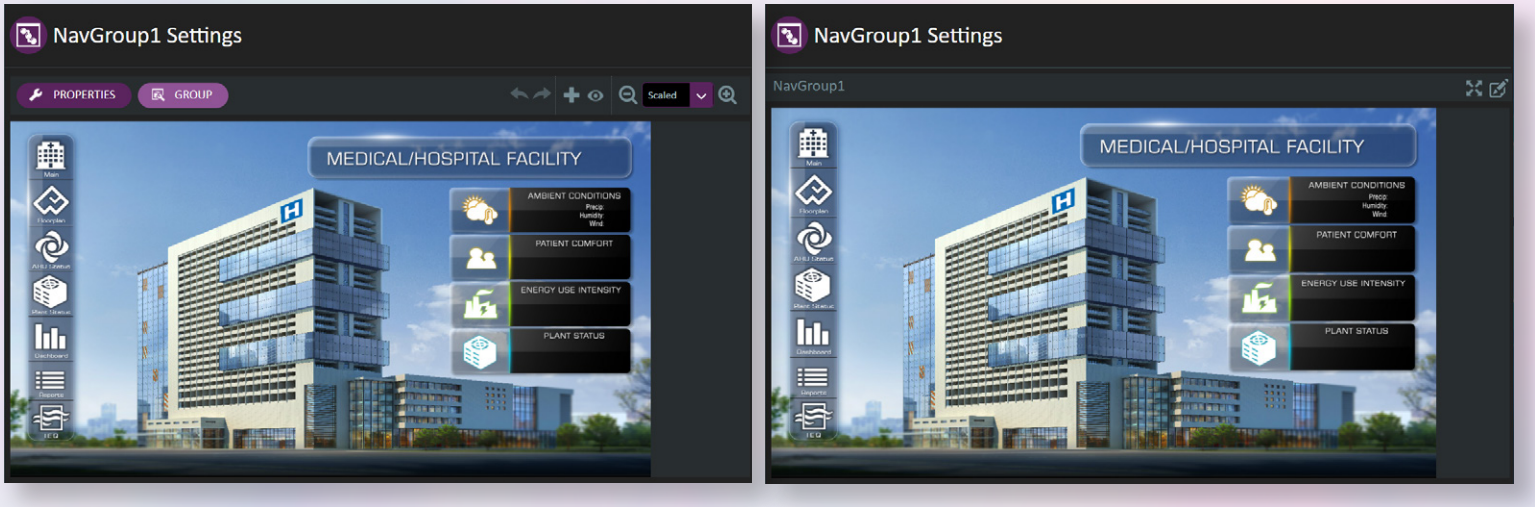

Figure 5: Navigation Group WYSIWYG view (left) and client view (right). Note the toolbar with undo/redo, scaling, and zoom controls in the WYSIWYG view.

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Did you know you can effectively use RC-WebView in large deployments?

With RC-WebView, your customers can efficiently manage many BACnet internet-connected buildings of any size over the internet without compromising performance. Many Authorized Dealers have deployed RC-WebView at very large sites that include dozens of buildings. Users access these large deployments the same way they would a single system: by logging on to their Enterprise Website via a browser.

In Western Canada, SERV-ALL Mechanical Services installed RC-WebView to control 154 sites in Edmonton. In Burnaby, Houle has a couple of installations with over 100 connected buildings. In Eastern Canada, Setpoint Building Automation deployed RC-WebView at a site with 127 buildings. In the Central United States two very impressive RC-WebView deployments include one with Unify Energy Solutions out of Texas that controls approximately 2,400 connected buildings and another Authorized Dealer, EMC, with 2,650 buildings connected over a wide region.

In all these installations, RC-WebView gives users scalable visibility and control at a glance, saving them time with the ability to handle alarms in bulk, schedule a campus full of buildings in the time it would take to schedule one building, define user roles using a credential or directory server, and more. For your next big deployment, considering implementing RC-WebView to simplify the task of managing a large number of building and users.

Also new in version 3.14 is the Alarm History Cleanup feature, which empowers you to manually clean up old alarm notifications as needed or schedule recurring cleanups that keep your database at a manageable size. Without a mechanism to remove expired alarm notifications, database size could increase beyond the maximum 10 GB allowed with SQL Server Express, the default RC-WebView database.

Click **Clean Up Alarm History** in the toolbar when you view the Alarm History worksheet to set an automatic cleanup schedule or to manually remove entries using the Cleanup Configuration dialog box (Figure 7). The user permission Clean Up Alarm History needs to be enabled for this option to be available.

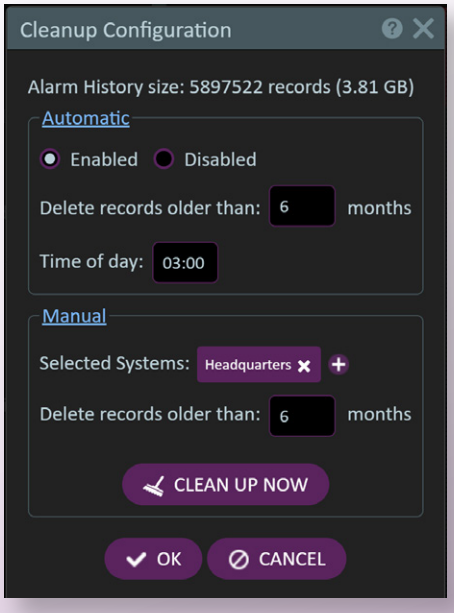

Figure 7: Cleanup Configuration dialog box.

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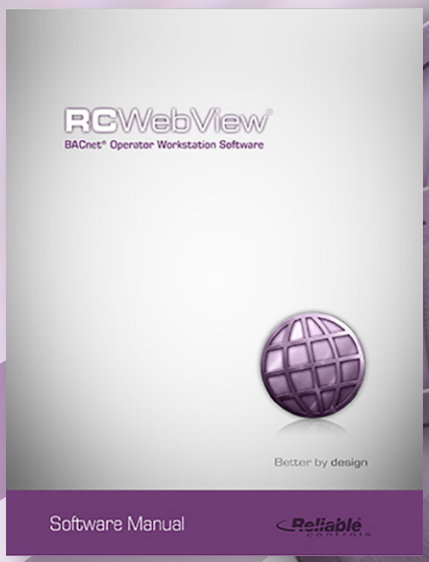
"Our team is responsive to dealers' most requested features, and we strive to deliver flexible, dependable software that satisfies our dealer network and their customers," says Mark. In addition to the high level of integration between HVAC, security, and lighting systems, building sustainability demands the use of technology that supports scalable, secure data communications. RC-WebView provides a single sign-on architecture and a comprehensive approach to security—no matter how many different BACnet devices you deploy or buildings you control.

To learn about how to add objects, keywords, and animations to an Navigation Groups, or about RC-WebView support for live data in Navigation Groups, please refer to the *RC-WebView Software Manual*.



Purchase RC-WebView 3.14
or renew your subscription today.

Using white papers to engage prospects and gain respect

Are you familiar with the white papers on our website? Did you know they can help you build credibility and trust with current and prospective customers? White papers have the power to influence almost any type of B2B executive who is considering the purchase of a new, complex, expensive product or service for their business.

Our *Accountable Operational Technology* white paper aims to educate about how RC-WebView is purpose built to be a key component of a Title 21 CFR Part 11 environment. Part 11 of the Code of Federal Regulations establishes requirements for electronic records and signatures in processes and facilities regulated by Title 21, and it has significant implications for pharmaceutical, medical device, biologic, and biotech industries, where compliance is a commercial imperative. This white paper leverages our authority to persuade the reader into adopting RC-WebView as part of a Title 21 CFR Part 11–validated system for FDA-regulated process and indoor environmental control.

Our *Data Strategy white paper* advocates about the impact of data analytics on energy efficiency and building performance in today's world. Integrated fault detection and diagnostics FlexTiles™ and RC-Reporter® can bring much-needed context to the vast data available to building professionals. What makes this white paper great is it promises concrete value to the reader (efficient operations, educated decisions, opportunities for improvement, reduced operating costs, reduced greenhouse gas emissions, and more) backed by cutting-edge technology and actionable advice.

Our white papers are a useful way to share the combined experiences of authors with over 30 years in the building controls industry. Download and share one or both of these papers—and others we may develop in future—to teach people about Reliable Controls and demonstrate our expertise and accountability in the industry.

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insight

The road to a successful network architecture: Part 3

Enterprise-level communication network

In this third and final installment in our series on building a successful network architecture, we introduce the proper infrastructure required for an enterprise-level communication network. The enterprise-level communication network includes the communication required to combine multiple buildings into a single site and is useful in different vertical markets. An enterprise-level communication network may exist to combine multiple commercial offices into a single enterprise portfolio, multiple buildings on a campus into a single school district, or any other combination where a single building is part of a larger network of buildings or systems. The enterprise-level communication network is comprised of routers, servers, and other services designed to deliver enterprise-wide control, management, analytics, and monitoring. In the modern built environment, multiple sites often include multiple BACnet systems. For facility-level integration, a solution that combines multiple facilities that use multiple third-party vendors can be a bit intimidating, but if you focus on properly designing an enterprise-level communication network, creating a common interoperable BACnet wide area network solution is easy.

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Common methods to develop enterprise-level communication networks have evolved since the introduction of the digital direct control system. Although still quite common, BACnet Broadcast Management Devices and BACnet Distribution Tables in enterprise-level communication networks can be difficult to set up and maintain for both IT experts and control professionals. Proper communication protocols and ports must be defined throughout the implementation, and security and network health are often compromised in pursuit of an interoperable solution. In modern enterprise-level communication networks, RC-RemoteAccess® resolves these concerns and is a key component in wide area networking, access, and management.

An enterprise-level communication network can quickly grow to include multiple sites, hundreds or thousands of controlled devices, and an enormous amount of building automation data. The need for a simple, flexible, sustainable enterprise user interface is paramount. RC-Archive® and RC-WebView are designed to provide maximum value at the enterprise level. Consider a group of commercial buildings managed by a property manager. The ability to action improvements or decide where capital improvements are need by analyzing data and ranking buildings by key performance indicators is a great benefit realized and actioned using RC-Reporter. These products allow for robust, reliable enterprise-level communication networks that are a practical solution to historical enterprise problems.

When you begin to design an enterprise-level communication network, it is important to understand the potential capabilities of your system. In the Reliable Controls recommended architecture, an enterprise-level communication network can include up to 512 networks, 64,300 devices, and 5,128,000 system objects. Recalling the recommended architecture of a field-level communication network we discussed in part 1, and further expanding into the building-level communication network in part 2, you can now begin to fully appreciate the design intent of a properly implemented enterprise-level communication network. You can easily implement the topology of a home network on a building-level communication network into an enterprise-level communication network. In Figure 1, BACnet/IP1 works as a functional home network on a local area network. BACnet/IP1 and BACnet/IP2 are enabled on one controller per domain that connects two networks.

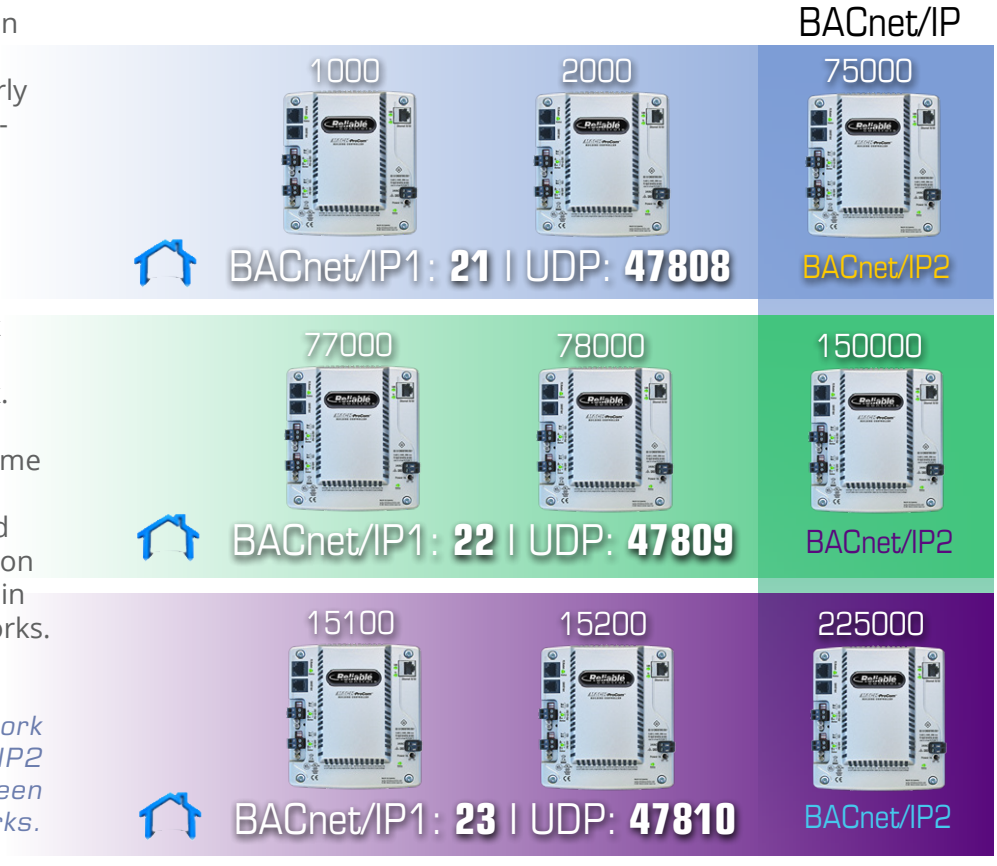

Figure 1: A local area network on BACnet/IP1. BACnet/IP2 functions as a bridge between networks.

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Figure 2 depicts the concept of the home network on a local area network configured on BACnet/IP1. From here you can use BACnet/IP2 to create a network dedicated to connecting domains. Notice how controllers 75000, 150000, and 225000 are all configured on BACnet/IP2 for network 19 and UDP port 47800. This configuration allows traffic to flow only to the devices that require the information, preventing any network bottlenecks where traffic may be slowed due to increased bandwidth.

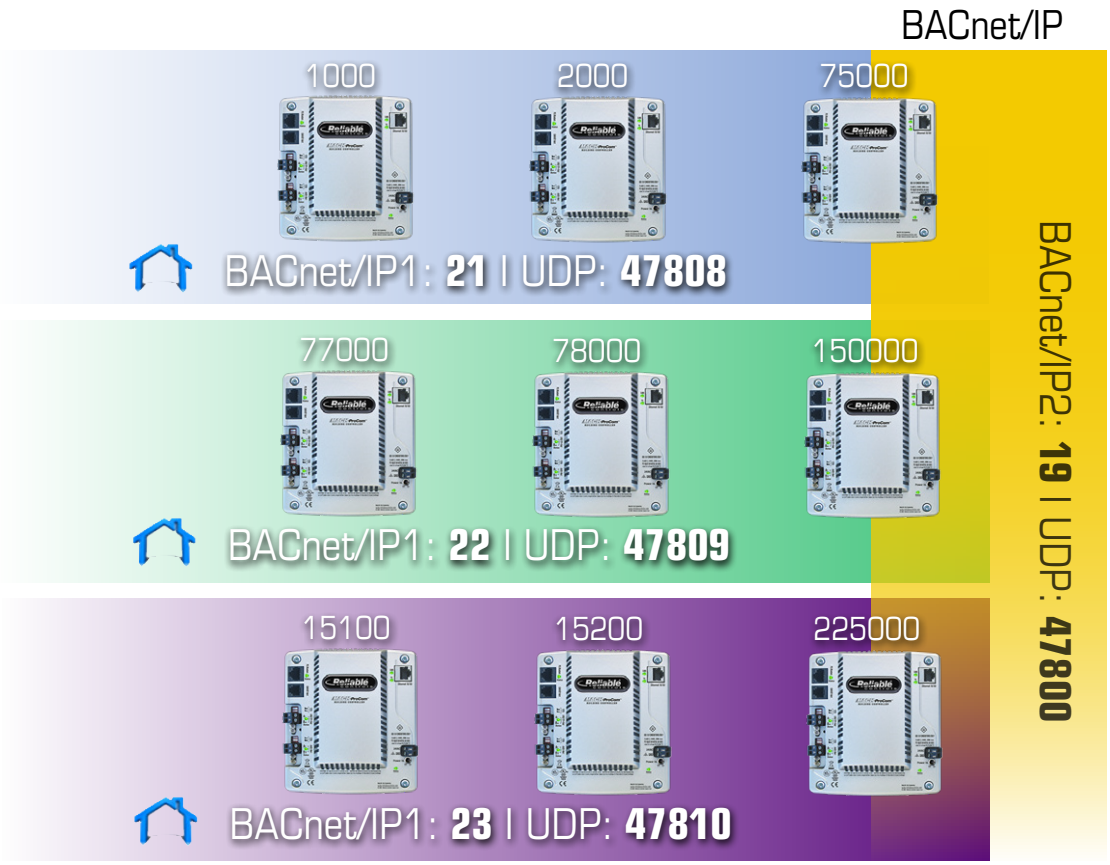

Figure 2: Home network on the BACnet/IP 1 local area network. BACnet/IP2 connects to the local BACnet/IP network on BACnet/IP1 and the BACnet/IP internetwork on BACnet/IP2.

In Figure 3, BACnet/IP1 is configured as the home network on a local area network. BACnet/IP2 is not used, but rather all domains are connected via RC-RemoteAccess. This simple configuration creates a BACnet Virtual Private Network (B/VPN) on controllers 75000, 150000, and 225000. In this way all domain traffic (building to building) is securely transmitted via the B/VPN.

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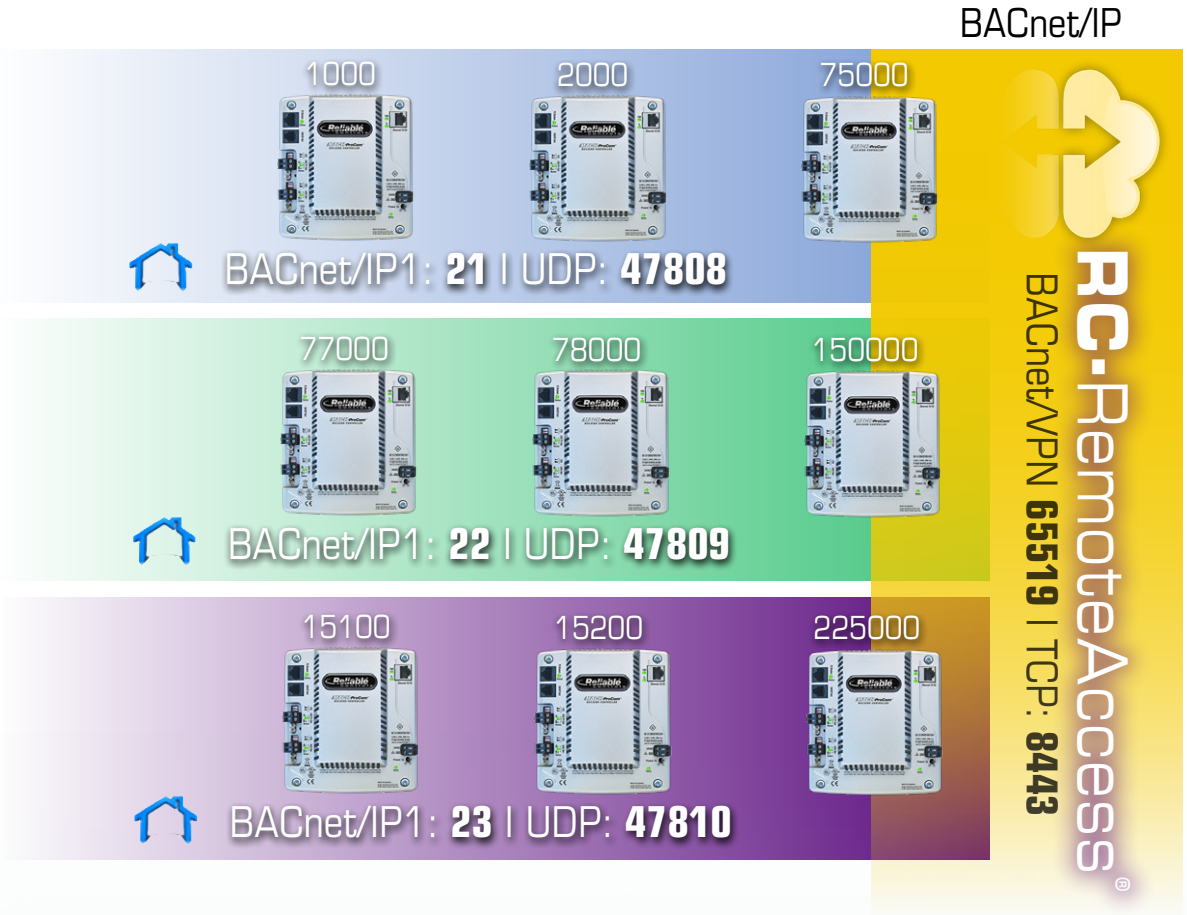

Figure 3: BACnet/IP1 configured as the home network on a local area network, with domain traffic connected via RC-RemoteAccess.

The ability to create simple, effective network architecture in today's built environment requires a thorough understanding of networking principles. The sample architectures in this three-part series provided you with the knowledge you need to seamlessly integrate not only field- and building-level communication networks but also enterprise-level communication networks. Properly implemented, these strategies will give your customers the peace of mind that the valuable data they interact with daily are not only secure but also readily available like never before. The road to network success is built with intent, one step at a time. With this intent you can truly create systems that are better by design.

Better by design™

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To ensure the highest level of support, please contact us at...

helpdesk@reliablecontrols.com

helpdesk is the best way to email the Technical Support team when you are experiencing technical difficulties with Reliable Controls system hardware or software.

aengineering@reliablecontrols.com

aengineering is the ideal way to contact the Application Engineering team for support with system design, specification compliance, solution development, Control-BASIC, and third-party integration.

If you need help, remember...

we've got your back.

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A moment in the eForum could save you hours of troubleshooting.

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People and technology you can rely on™

Did you know? You can change MACH-ProView™ LCD display properties with Control-BASIC.

When Reliable Controls released EQUIPMENTview for the MACH-ProView LCD in January 2020 with firmware version 8.26.5, it revealed a whole new world of possibilities for your graphical user interfaces. Now you can create customized Views and choose from thousands of RC-GrafxSet assets to bring your ideas to life and build something unique and intuitive for your customers. Before EQUIPMENTview, you may not have had much chance to interact with the user interface properties on the MACH-ProView, but now this is something you'll want to master to set your work apart from the competition.

The MACH-ProView LCD has two types of user interface objects: a Configuration object or a View object. A Configuration object controls system-wide properties, like the degree unit, color theme, or screen brightness. A View object, on the other hand, manages properties for specific Views. These objects also have slightly different syntax. A Configuration object always has an object type of 149 and an instance of 7; a View object always has an object type of 153, but the instance number is the row number of your View in the Views worksheet. When your program is local to the controller, you will access the value of the object with the following code: `[ObjectType]Instance:PropertyID`—for example, `[149]7:1279` for the Configuration object Change Active View Request.

Let's see what that looks like in the Control-BASIC editor in RC-Studio. Refer to the "User interface BACnet properties" topic in the *MACH-ProView User Guide* for a complete list of properties.

If you want to control the brightness of the LCD backlight, you could use the statement in Figure 1 in a control program to write a value to the brightness property, property ID 1208:

```
10 REM SET LED BACKLIGHT BRIGHTNESS TO 30%
20 [149]7:1208 = 30
```

Figure 1: System Group in RC-Studio.

Maybe you want to change the color theme based on time of day. You could do something like Figure 2.

```
30 REM CHANGE TO DARK THEME AFTER NOON
40 IF+ TIME > 12:00:00 THEN [149]7:1211 = 1 ELSE [149]7:1211 = 0
```

Figure 2: Change theme using property ID 1211. 0 = white background and blue foreground, 1 = black background and blue foreground. Choose from eight theme options.

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The first two examples show how you can write to an object, but what if you just want to read one? Let's check the current View using the Query Active View property, property ID 1280 (Figure 3).

```
50 REM CHECK ACTIVE VIEW
60 MPV-CURRENT-VIEW = [149]7:1280
```

Figure 3: Property ID 1280 returns the row number of the current View displayed on the MACH-ProView LCD.

The last property we'll look at is a View object called Hide Top Menu on Entry (:1334). First, what is the Top menu, and why would you want to hide it? The Top menu displays on the LCD anytime you switch between Views. In Figure 4, the Top menu is element 1.

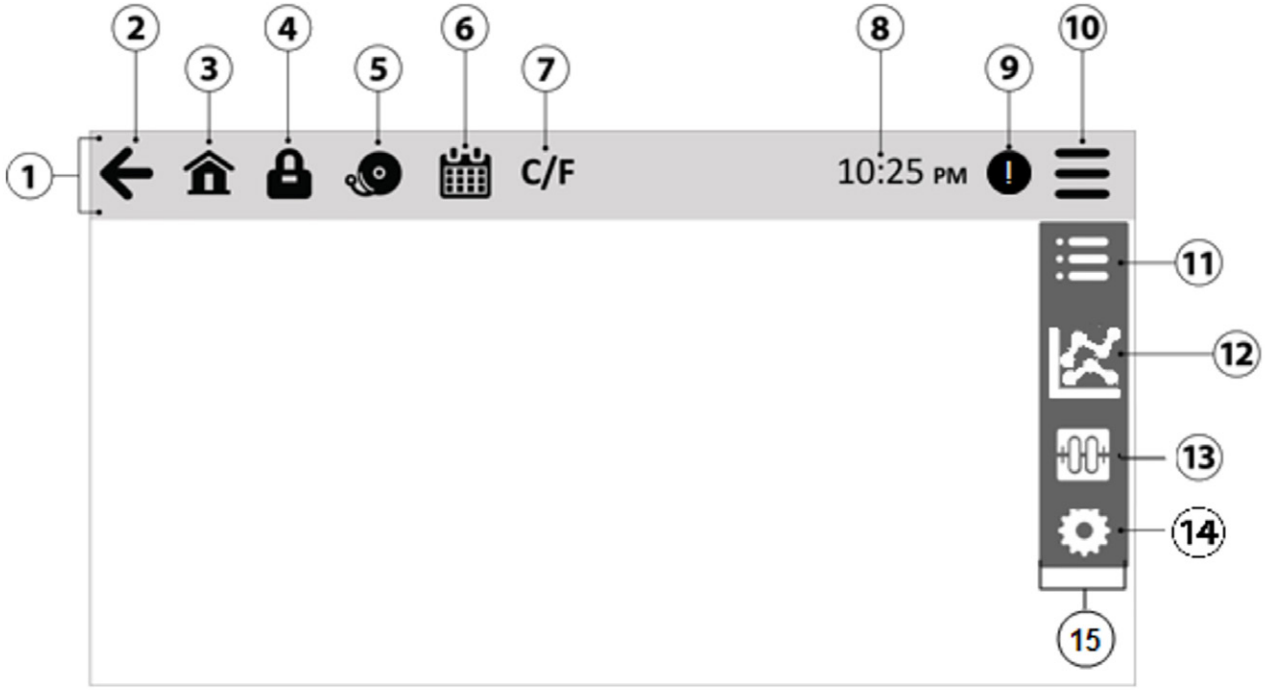

Figure 4: MACH-ProView LCD navigation interface.

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If you are at the controller and changing Views, you might need the Top and Side menus. However, if you are *programmatically* switching Views using custom Control-BASIC code, then displaying the Top menu each time a program changes a View may not be desirable behavior. There are two ways to hide the Top menu; keep in mind both methods are per View instance and not system-wide like a Configuration object. To suppress the Top menu of a View using Control-BASIC, use the following syntax (Figure 5):

```
10 REM HIDE TOP MENU FOR VIEW 19
20 [153]19:1334 = TRUE
```

Figure 5: Hide the Top menu when you switch to View 19 using property ID 1334.

A downside to this method is the setting may not persist through a power cycle of the controller. If you want to make sure the Top menu stays hidden even after a power cycle of the controller, use the Read/Write BACnet Properties dialog box in RC-Studio (Figure 6).

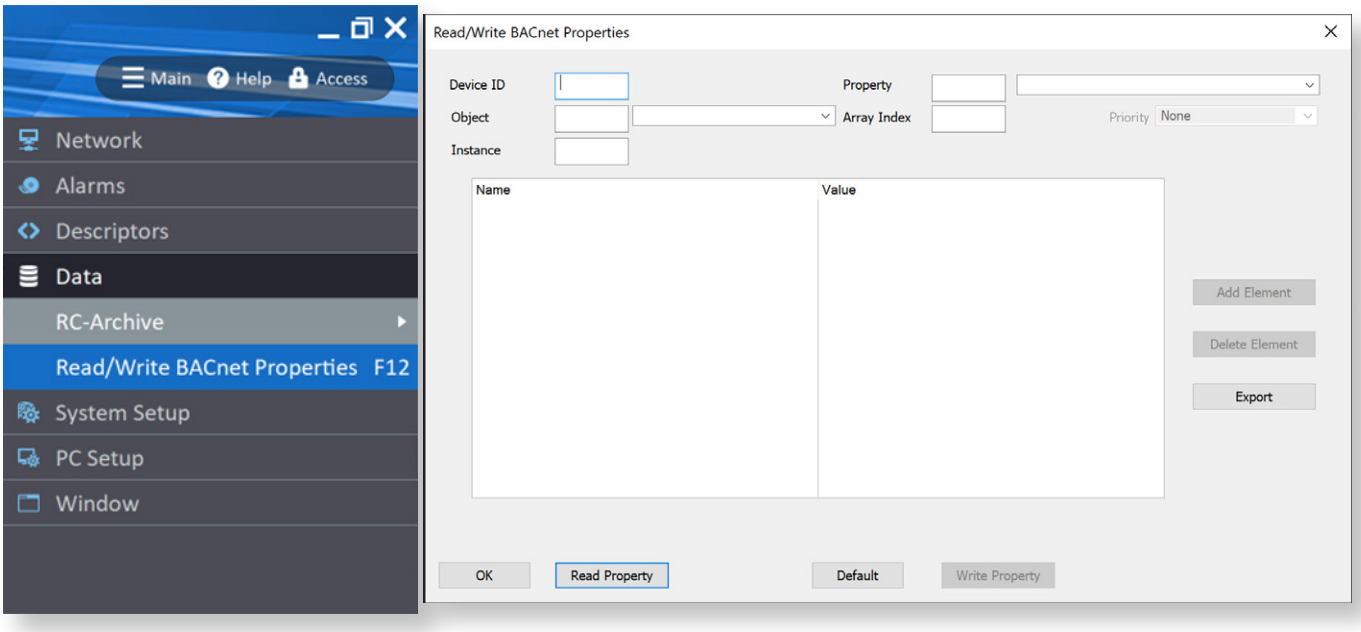

Figure 6: Left: Access the Read/Write BACnet Properties dialog box in the Main menu. Right: Read/Write BACnet Properties dialog box.

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Enter in the device ID of your controller. Next, enter the object (153), followed by the instance of your View, and last, the property (1334). Click **Read Property** to produce the result you see in Figure 7.

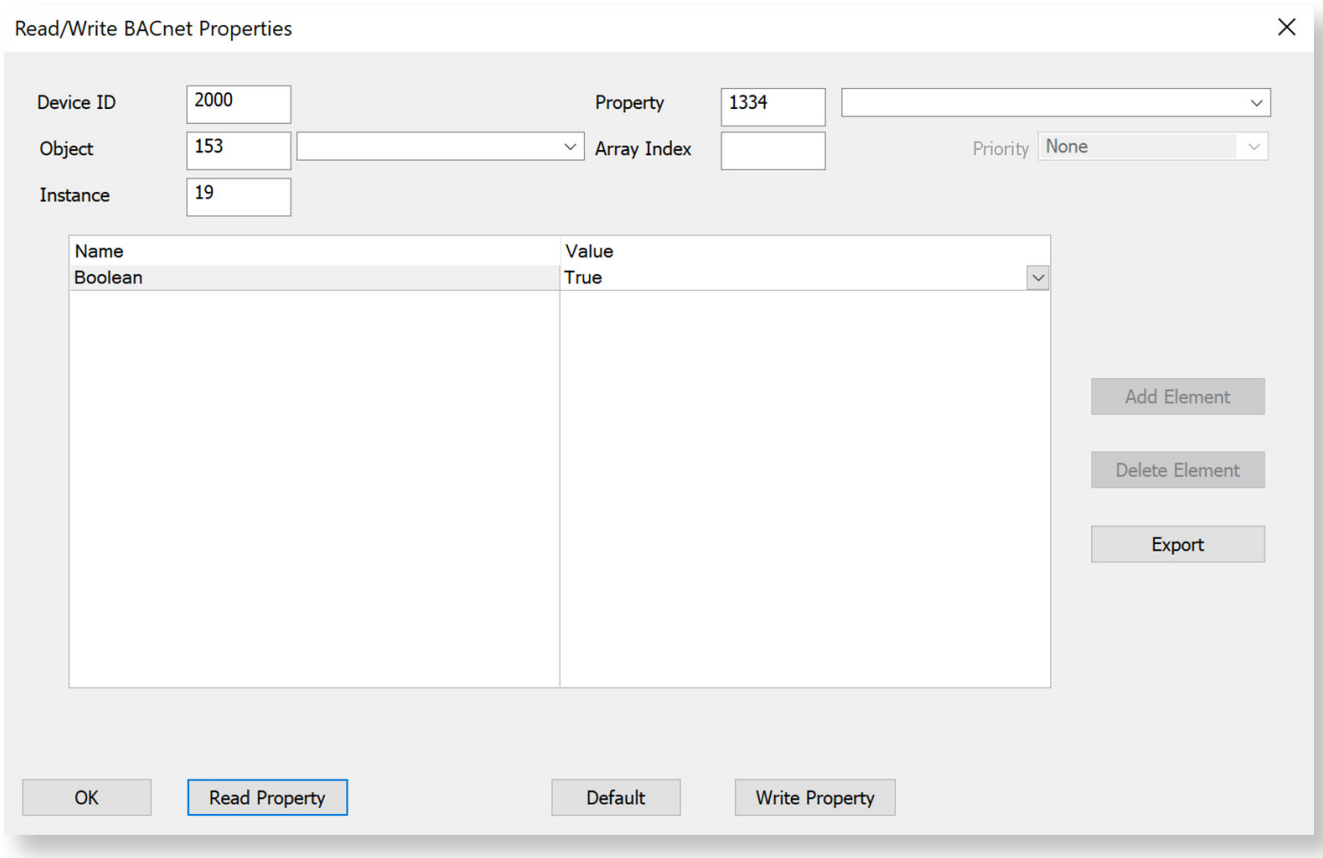

Figure 7: Read/Write BACnet Properties dialog box.

To suppress the Top menu for the selected View (19), the Value should be True. If you want the Top menu to show when you switch screens, change the Value to False using the drop-down list, and click **Write Property** to save it to the controller.

Check out the complete list of BACnet properties for the MACH-ProView LCD in the user guide. If you've got any cool EQUIPMENTview tricks you've learned, share them in the EQUIPMENTview section of eForum—we love to see all the unique applications our Authorized Dealers dream up.

In next month's issue of the *Resource*, we'll put these BACnet properties to use adding some interesting complications to your EQUIPMENTview creations on the MACH-ProView LCD. Stay tuned!

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RC-GrafxSet

Why you should incorporate contrast in design

Animation size verses visible area

"The Web is fundamentally designed to work for all people, whatever their hardware, software, language, culture, location, or physical or mental ability. When the Web meets this goal, it is accessible to people with a diverse range of hearing, movement, sight, and cognitive ability." —W3C.

This statement is true not just for the web but also for any interface on a screen designed for human interaction.

Different standards and laws for accessibility are in place across the world, with guidelines on everything from keyboard navigation to color use. An easy accessibility standard to achieve is ensuring color contrast.

Animation size verses visible area

Contrast is a key design element, used to attract attention and create a visual hierarchy; you can achieve this using color, shape, size and direction. While contrast encompasses more than just color, color is the simplest way to apply it and often more practical in simple or limited layouts.

High-contrast design goes beyond designing in black and white; though that can be a good starting point, add color as well for contrast, relief, and visual identity. Identify what color choices best help your users focus on the information conveyed. Always remember: Color looks different on different screens and at different resolutions. Low-contrast colors can be hard to read or even impossible for people with color blindness or visual impairment.

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A couple of great online tools are available to test colors and their contrast when combined. Check out WebAIM, Colorable (Figure 1), and Contrast Ratio. The goal of these tools is to help you calculate whether your background color and text color contrast enough to ensure readability.

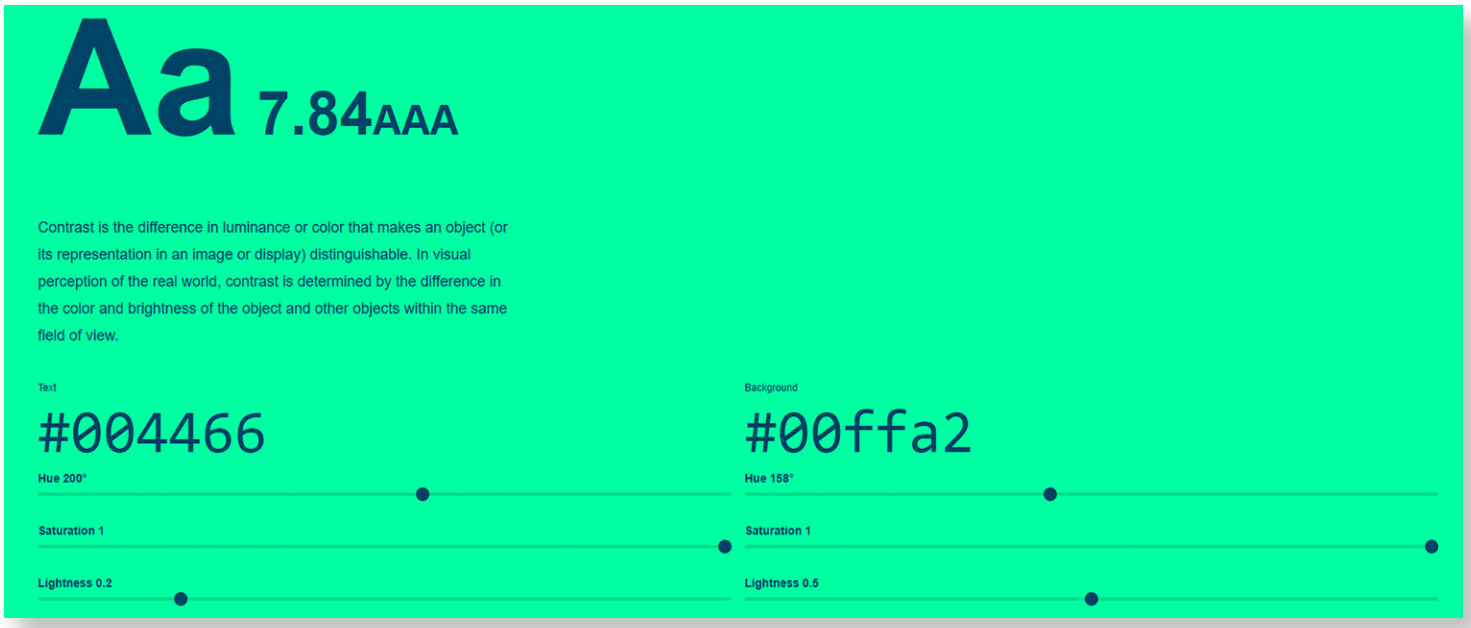

Figure 1: Colorable is a great tool for refining colors to ensure solid contrast.

Color scheme

Ask yourself some questions about the information you want to convey before you choose colors.

- Is your content primarily text? A light background is a good choice to make it easy for readers to concentrate on the words.
- Is your content primarily visual? A dark or bright background may make images pop.
- Who is the target market? Middle-aged to older folk prefer a light background, younger audiences find dark backgrounds more stylish, and teenagers and younger prefer brightly colored backgrounds.

Whatever the background color, your text should be a contrasting color that is easy to read; since it stands out, it should be pleasant on the eyes. System and Navigation Groups do not generally have continuous text to read; we need not tell you that red or yellow text on a black background can be horrible to read!

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High-contrast design

High-contrast design started as a Windows accessibility feature to increase text legibility and improve readability. This feature makes elements easier to see, reduces eye strain, and helps people with light sensitivity. In high-contrast mode, pastel colors, for example, may disappear entirely.

W3C's Web Content Accessibility Guidelines provide standards for color contrast, from A (low) to AAA (high) (Figure 2). AA is considered the industry standard, with color contrast as a 4.5:1 ratio between text/images and background. Use Colorable to test the ratio of any two colors.

Background \ Text	#FFFFFF	#F2F2F2	#DDDDDD	#CCCCCC	#888888	#404040	#000000	#2F78C5	#0F60B6	#398EEA
White #FFFFFF		Text DNP 1.1	Text DNP 1.3	Text DNP 1.6	Text AA18 3.5	Text AAA 10	Text AAA 21	Text AA 4.5	Text AA 6.2	Text AA18 3.3
#F2F2F2	Text DNP 1.1		Text DNP 1.2	Text DNP 1.4	Text AA18 3.1	Text AAA 9.2	Text AAA 18.7	Text AA18 4	Text AA 5.5	Text AA18 3
#DDDDDD	Text DNP 1.3	Text DNP 1.2		Text DNP 1.1	Text DNP 2.6	Text AAA 7.6	Text AAA 15.4	Text AA18 3.3	Text AA 4.5	Text DNP 2.4
#CCCCCC	Text DNP 1.6	Text DNP 1.4	Text DNP 1.1		Text DNP 2.2	Text AA 6.4	Text AAA 13	Text DNP 2.8	Text AA18 3.8	Text DNP 2.1
#888888	Text AA18 3.5	Text AA18 3.1	Text DNP 2.6	Text DNP 2.2		Text DNP 2.9	Text AA 5.9	Text DNP 1.2	Text DNP 1.7	Text DNP 1
Charcoal #404040	Text AAA 10	Text AAA 9.2	Text AAA 7.6	Text AA 6.4	Text DNP 2.9		Text DNP 2	Text DNP 2.2	Text DNP 1.6	Text AA18 3
Black #000000	Text AAA 21	Text AAA 18.7	Text AAA 15.4	Text AAA 13	Text AA 5.9	Text DNP 2		Text AA 4.6	Text AA18 3.3	Text AA 6.2
Effective on Extremes #2F78C5	Text AA 4.5	Text AA18 4	Text AA18 3.3	Text DNP 2.8	Text DNP 1.2	Text DNP 2.2	Text AA 4.6		Text DNP 1.3	Text DNP 1.3
Effective on Lights #0F60B6	Text AA 6.2	Text AA 5.5	Text AA 4.5	Text AA18 3.8	Text DNP 1.7	Text DNP 1.6	Text AA18 3.3	Text DNP 1.3		Text DNP 1.8
Ineffective #398EEA	Text AA18 3.3	Text AA18 3	Text DNP 2.4	Text DNP 2.1	Text DNP 1	Text AA18 3	Text AA 6.2	Text DNP 1.3	Text DNP 1.8	

Figure 2: Examples of color combinations that work (A to AAA) and those that do not pass (DNP) color contrast standards.

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Large font (18 pixels and above) should have a higher contrast. Colors vary according to their size; a small area of color may not look the same as a large area of color, so two variants of the color may work better for different sizes (Figure 3).

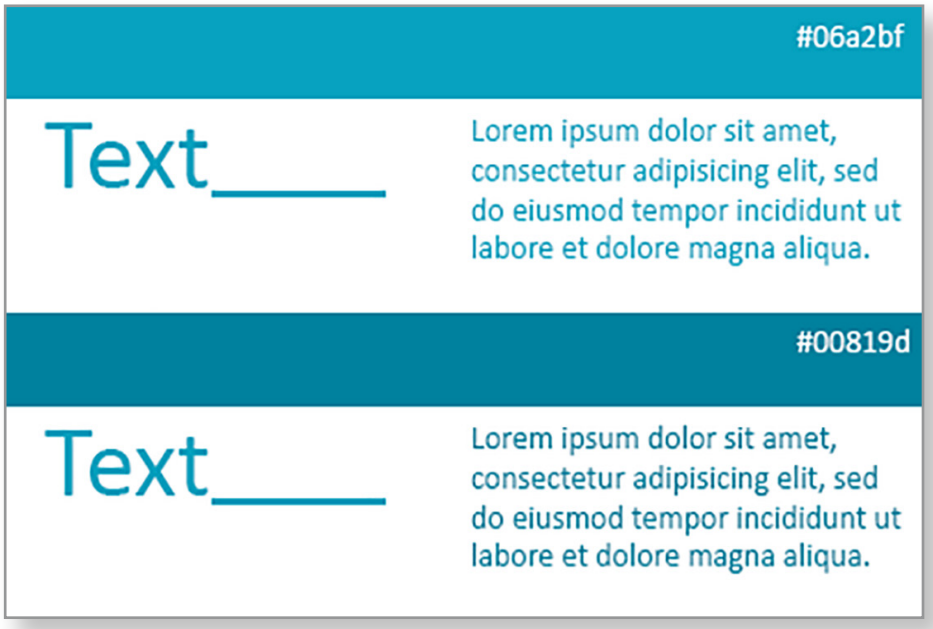

Figure 3: The top half of the figure uses the same color blue for all elements. Notice how the small font looks lighter and the large color strip brighter. The bottom half uses a different, darker blue for the small text and large color strip, with the result that the colors look more consistent.

Text or images that are purely decorative do not need to meet contrast standards, and brand logos are exempt.

Figure 34 depicts dark and light versions of the same interface using high-contrast rules. The large areas of white and black look less harsh if they are slightly "off color"—introducing a bit of color to black, white, or gray livens them up. Other elements pick up certain colors and vary the intensity for visual variety. The red in Figure 4 provides a strong contrast. However, sometimes contrast is distracting. Test this by feeling if your eyes jump around from element to element on the screen. If they do, your graphic lacks a key focal point.

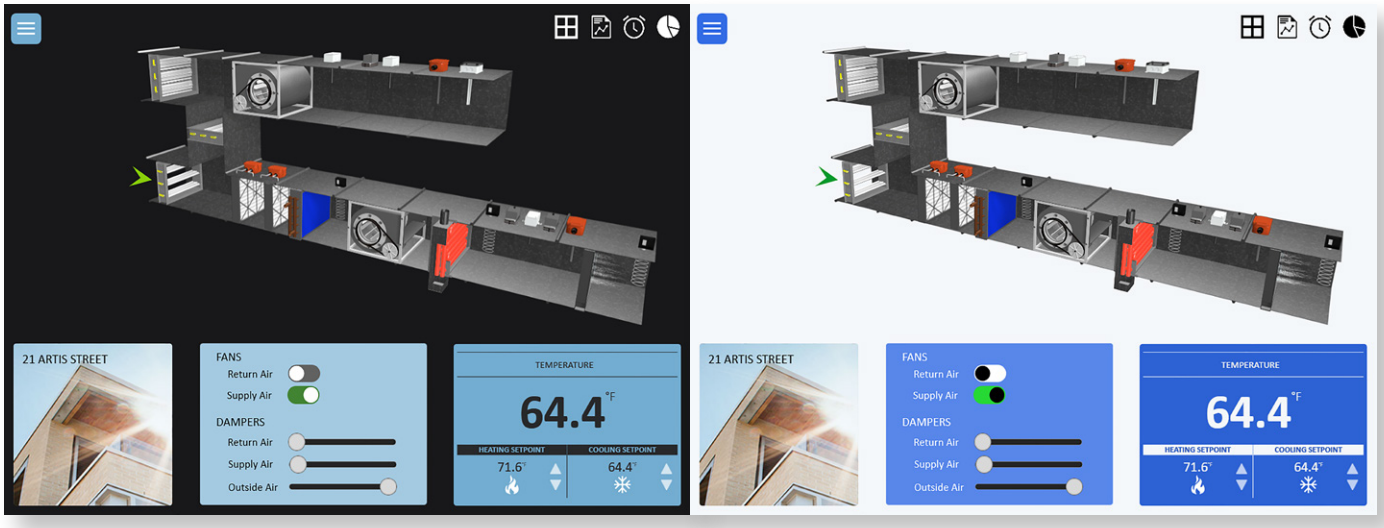

Figure 4: Dark and light versions of the same interface using high-contrast rules.

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It may be hard to limit yourself and think strictly in these terms, but next time you design a layout, consider your users' age and special needs to improve their experience. Make your color choices less personal and more about inclusivity.

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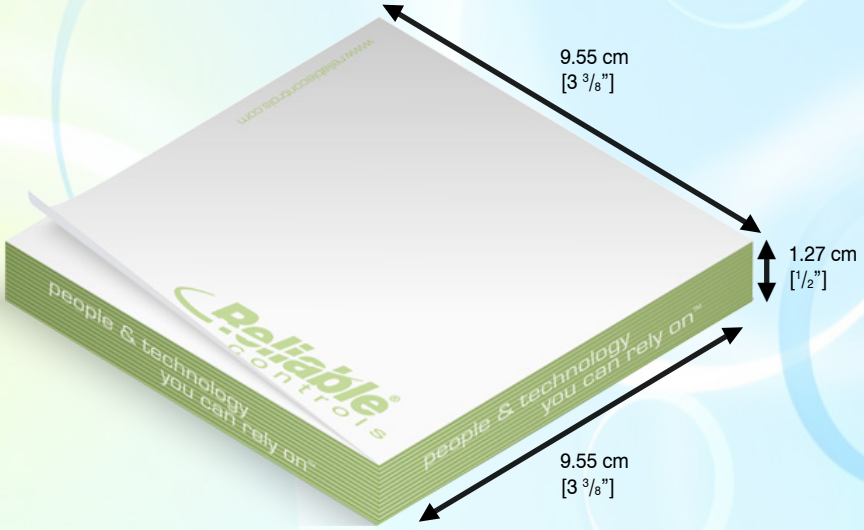

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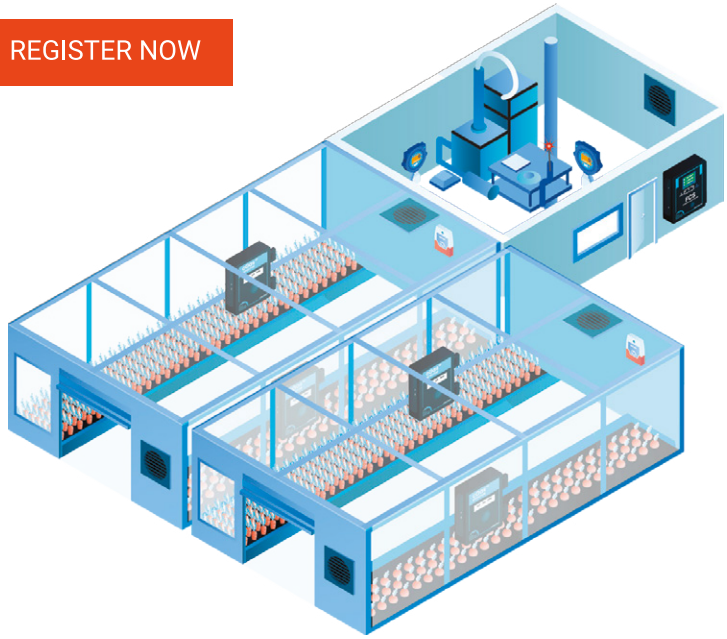

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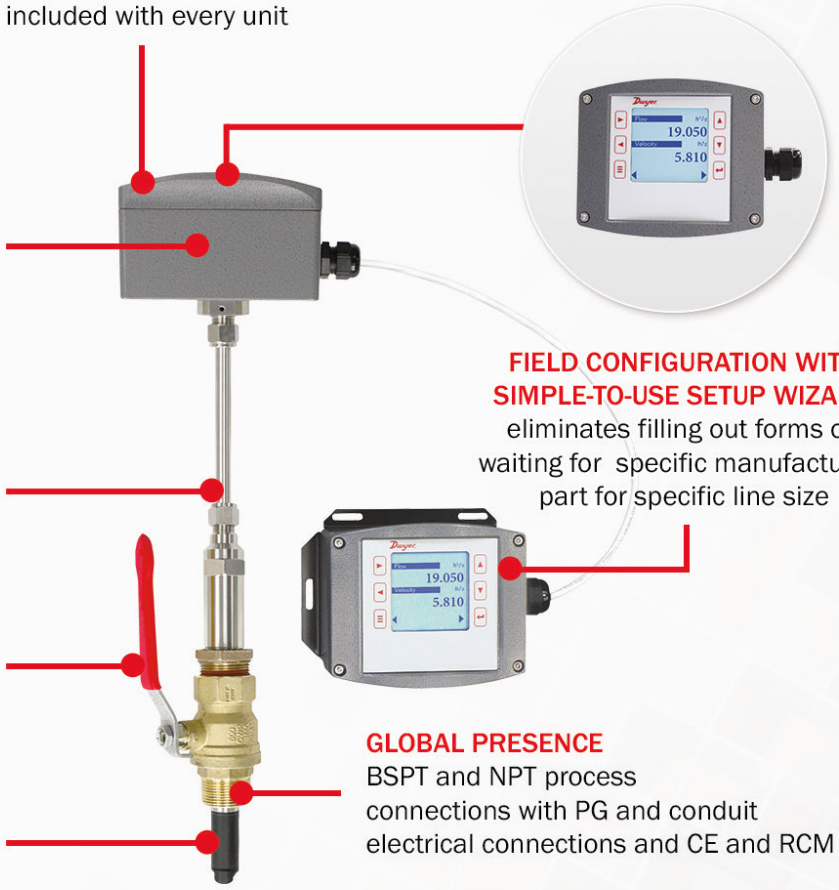

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