**GETTING THE LEAD OUT:**
Introducing sustainable manufacturing

**CONTINUOUS OPTIMIZATION:**
Achieving a higher level of building performance

www.reliablecontrols.com

# RUNtime

The Official Quarterly Newsletter of Reliable Controls® Corporation

Q3 - 2015

# Introducing RC-WebView® 3

## Web Server Software, Ideal for Progressive Facility Managers

ISO 9001 14001 QUALITY ENVIRONMENTAL ASSURANCE

Member of BACnet® International

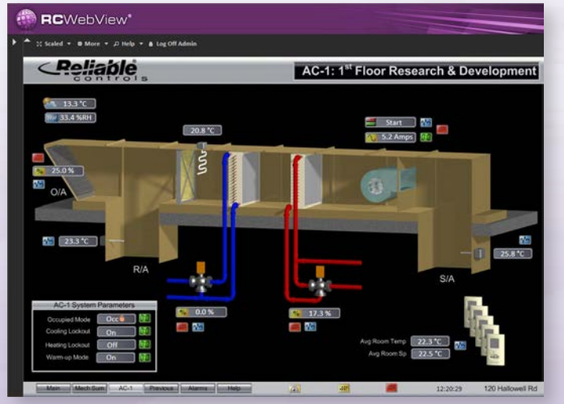
Reliable® controls

# WEB ACCESS FOR THE MASSES

Ideal for progressive facility managers, RC-Webview® provides web access for the masses.

RC-WebView from Reliable Controls is a powerful, BACnet®, Web server application that allows users to conveniently access any Internet-connected BACnet controls system configured with RC-Studio System Groups. The software meets or exceeds the BACnet Operator Workstation profile (B-OWS).

Using a modern browser, RC-WebView allows operators to view, edit, and override BACnet Inputs, Outputs, Variables, Schedules, Groups, and Alarms, as well as graph and print Trend and Runtime Logs. The powerful enterprise hub and scheduling features allow managers to link multiple independent systems together and push schedule changes across multiple facilities.




*Client View: Manage your buildings from any where on the globe.*

The Audit Trail feature helps identify who made changes to the system, when, where and why.

The Navigation Group feature allows users to create nested background image-maps that can be populated with multiple objects and links for seamless navigation. Links can be web URLs and RC-WebView visual elements, such as Groups, Schedules, other Navigation Groups, or Alarm Summaries.

Custom Navigation Trees can be created and assigned to different users allowing the GUI experience to be tailored to each individual user's role.

RC-WebView offers Enterprise Scheduling that includes parent/child and exception scheduling across multiple devices within multiple systems. Additionally, Block Scheduling allows existing schedules to be assigned as members of a named list that can be enabled and disabled according to a unique Block Schedule. These Block Schedules can can be saved, recalled and re-used at anytime.

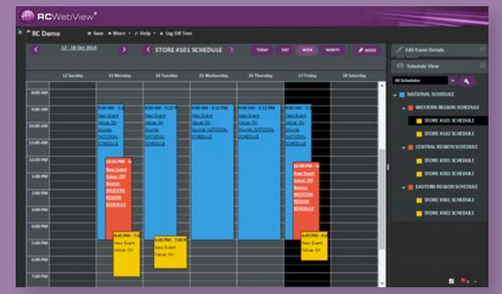
Administrators will appreciate the Active Directory capabilities of RC-WebView and its flexible permission controls for managing user accounts and accessibility.

Operators can view and edit objects and acknowledge alarms across the entire enterprise using a single log-in, eliminating the cumbersome need to log-in multiple times.

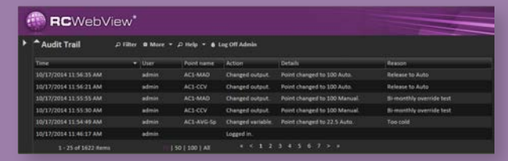
**Recommended server requirements include:**

- **Intel Xeon E3 series (64-bit)**
- **16 GB RAM**
- **1 GB hard disk space free**
- **Internet connection for software installation**
- **Gigabit Network Interface Card (server quality)**
- **Microsoft Windows Server 2012 R2 or newer**
- **Router with firewall enabled**
- **Maximum Configuration: 500 connections per server**

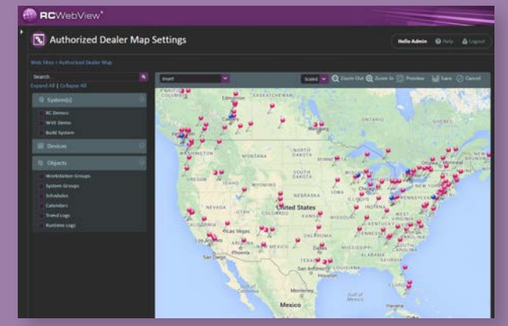
Designed to take full advantage of the latest web technologies and mobile platforms, RC-WebView provides an enduring BACnet Operator Workstation solution for single-building managers to senior managers of campuses and nation-wide portfolios.



*Enterprise Schedule: A hierarchical scheduling system*

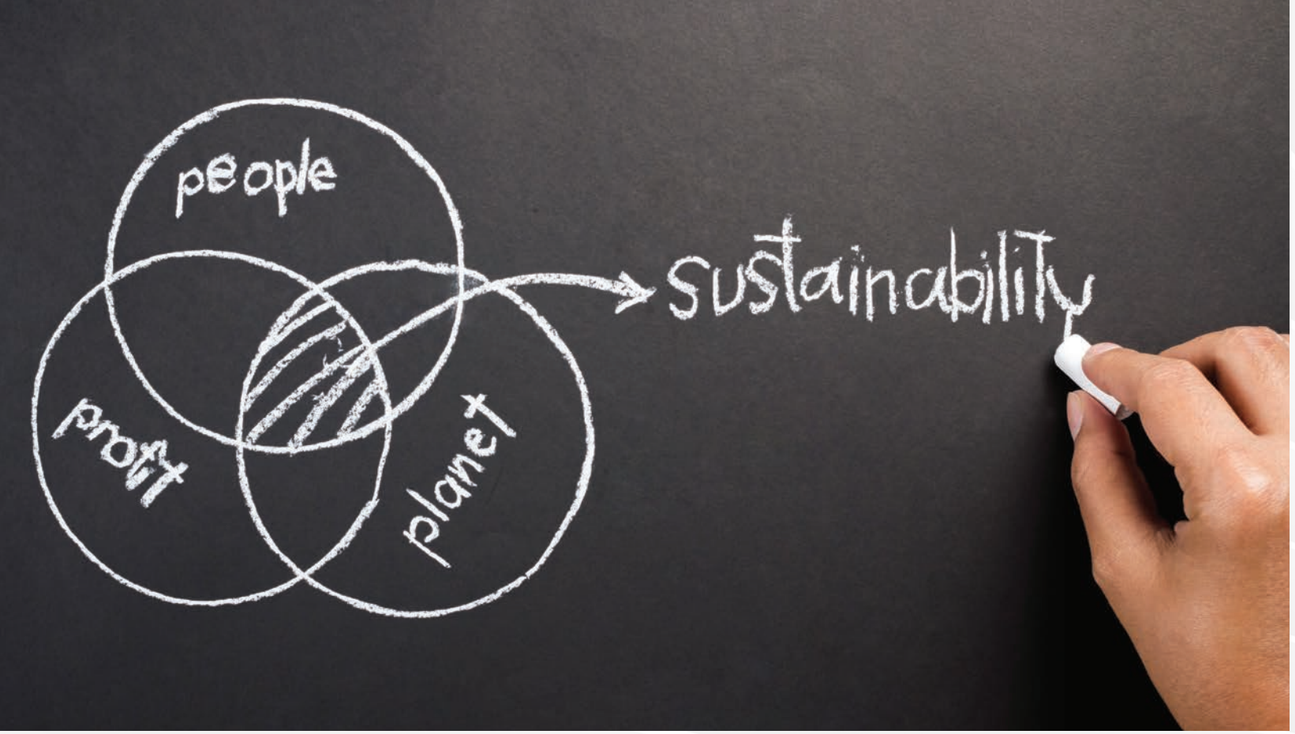


*Audit Trail: Logs all changes made by users*



*Navigation Group: Access entire system from one location*

RCWebView®
BACnet® Operator Workstation Software




# Getting the Lead Out

## Reliable Controls introduces sustainable manufacturing initiatives for all non-legacy products.

In today's world of high-tech electronics manufacturing, there are many companies that continue to operate without realizing the potential financial and environmental benefits of implementing and sharing sustainable business practices.

The false perception of "it is cheaper and simpler with higher quality" to continue using leaded soldering practices still exists despite its inaccuracy. The challenge to adopting sustainable manufacturing processes is in seeing the benefits of changing this outdated philosophy and embracing the possibility that there is a better way; a way of operating that is better for the environment, your team, your neighbours, and your bottom line, amongst many other things.

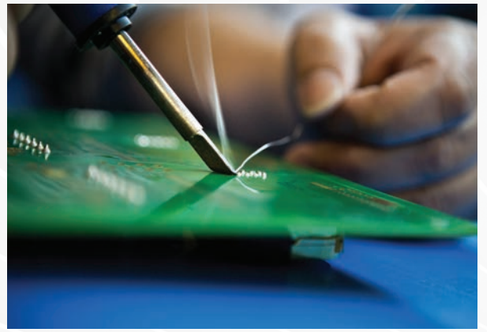
Reliable Controls saw this vision several years ago and subsequently made a conscious decision to fully commit to the "People, Planet, and Profit" philosophy. The company was growing and needed more space, and hence started an engineering effort to design a new Leadership in Energy & Environmental Design (LEED®) Platinum certified annex. Today, the company operates out of the very facility, which achieved LEED Platinum certification in November of 2013.

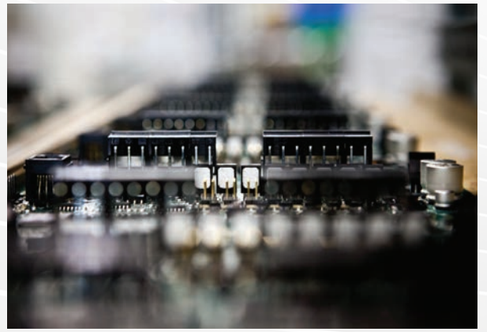
It was only natural that these environmental efforts be carried forward throughout the organization and the philosophy was integrated into the company management system. By continually improving internal processes, setting objectives, measuring performance, and changing behaviors, ISO14001 certification was achieved in 2014.

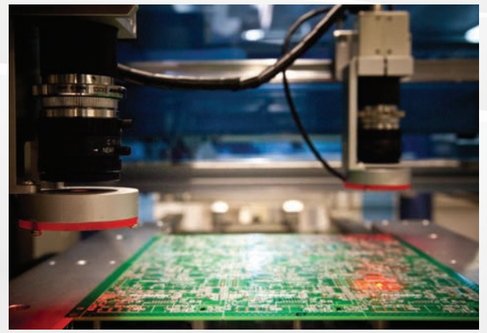
Reliable Controls hasn't stopped at just that... In an effort to continually improve, the company initiated significant operational changes such as lean manufacturing. The latest initiative modifies the manufacturing line by removing solder containing lead. This may sound simple, but it is a goliath task that requires re-organization, new capital equipment, and a significant amount of due-diligence, planning, employee retraining, and of course, serious product testing.

The company's next goal in operation is to achieve a red-list free status, committing to ensure that none of the following harmful materials are contained in its products or processes: asbestos, cadmium, chlorinated polyethylene and chlorosulfonated polyethlene, chloroflurocarbons (CFCs), chloroprene (neoprene), formaldehyde (added), halogenated flame retardants, hydrochlorofluorocarbons (HCFCs), lead (added), mercury, petrochemical fertilizers and pesticides, phthalates, polyvinyl chloride (PVC), and wood treatments containing creosote, arsenic, or pentachlorophenol.

Today, Reliable Controls is proud to say that its operation is completely lead-free and it continues to grow the sustainability solutions offered by its worldwide Authorized Dealer network.







**LEAD FREE**

# ENTERPRISE SOLUTIONS

*Managing multiple buildings with many end users is a challenge for clients in sectors such as education, healthcare, government, banking, retail and hospitality. Thankfully, for end users of the MACH-System, Reliable Controls and its Authorized Dealer network offer excellent enterprise solutions.*

RCRemoteAccess™ Virtual Private BACnet® Network Software — Better by design™

## SECURITY

Enterprise clients, by the nature of their business are large and spread out, and therefore have a commensurate amount of risk. Solutions that function with encryption and minimal holes in the firewalls are preferred.

***RC-RemoteAccess** secures all communications by imposing authentication and system identifier credentials with 256-bit encryption. A single inbound port services multiple independent systems.*

RCWebView® BACnet® Operator Workstation Software — Better by design™

## USER ADMINISTRATION

Clients who have hundreds or even thousands of buildings have a burden to administer the users who require access to the building automation system. These clients want an enterprise solution that ties into their existing user authentication service which is managed by their IT department. Typically this authentication service employs an Active Directory schema.

***RC-WebView** supports Active Directory making user credential management a one-time configuration to the IT database.*

RCToolkit™ Communications Configuration Software — Better by design™

## PROTOCOL INTEGRATION

As building control systems monitor and control many different devices, a variety of 3rd party products may require integration. A solid building automation and control network protocol provides a strong foundation for integration, however support for other enduring protocols is a plus.

***RC-Toolkit** allows the Reliable Controls MACH-System to integrate the following protocols: BACnet IP, BACnet Ethernet, BACnet MS/TP, BACnet PTP, Modbus RTU (Master or Slave), Modbus TCP (Master or Slave), HTTP1.1, SMTP, and SNMP.*

## EFFICIENT and ACCESSIBLE

With many end users accessing the system with varying needs and varying skill levels, the interfaces to the enterprise system must be efficiently navigated and accessible through a variety of means.

***myControl app** offers a number of easy-to-use mobile device views and is just one example of the many intuitive and completely customizable interfaces from Reliable Controls.*

Reliable® controls Authorized Dealer

## CONSISTENCY OF DEPLOYMENT

The broader the installed base, the more likely it will require multiple contractors to install and service the system. Having a broad network of factory trained authorized installing contractors and programmers ensures a consistency in the deployment and maintanence across the enterprise.

***Reliable Controls Authorized Dealers** provide a network of some 200 factory trained and certified contractors in over 30 countries around the world. Visit www.reliablecontrols.com/sales to locate a certified Authorized Dealer near you.*

## DATA ACQUISITION

Archived trend and runtime data is critical in optimising the operations of individual systems within the enterprise and represents the foundation of performance reporting.

***RC-Archive*** *is an enterprise solution specifically designed to record long-term historical logs from any Internet-connected BACnet control system, anywhere in the world.*

## NETWORK SCALABILITY

Typical enterprise clients have many buildings (small and large) spread out over broad geographic regions. This could be many buildings across the city, or many cities across the country, or many countries around the globe. All cases require a distributed solution that is highly scalable, and requires minimal setup and maintenance.

***RC-RemoteAccess*** *connects multiple independent Reliable Controls BACnet IP devices, dynamically, into a single networked system over the Internet. The network can scale to the maximum size permitted by the BACnet protocol.*

## CHANGES en MASSE

Once operational optimizations have been identified from performance reporting, changes to schedules and sequences of operations need to be deployed easily and thoroughly en masse.

***Enterprise Scheduling*** *in RC-WebView allows managers to push operational changes across multiple buildings and time-zones with just a single touch.*

## PERFORMANCE REPORTING

Senior facility managers need a powerful and flexible tool to extract intelligence from the enormous amounts of data gathered from their buildings.

***RC-Reporter*** *is a fully customizable, server based application that allows managers and consultants to analyse the trend and runtime data from RC-Archive and generate professional performance reports quickly and easily.*

## SUSTAINABILITY

Enterprise clients typically have a large footprint, and that being the case, are often concerned about minimizing their environmental impact while maintaining a healthy and productive workplace. Partnering with like-minded businesses helps grow the momentum of sustainability.

***Reliable Controls' Headquarters Annex*** *located in Victoria, British Columbia, Canada, was certified as a LEED Platinum facility on November 13, 2013. The Annex and adjoining manufacturing plant are both ISO9001 and ISO14001 certified.*





# New Dealers

New Reliable Controls Authorized Dealers include:

**Pittsburgh Controls & Consulting**
Moon Township, PA, USA

**Climate Systems**
Colorado Springs, CO, USA

**Heli Cool HACR Ltd.**
Fernie, BC, Canada

**Integrity Controls and Test & Balance Inc.**
Doral, FL, USA

**Legend Control Systems**
Savage, MN, USA

**Mechanical Air Concepts**
Miami, FL, USA

**MS Automation & Engineering**
Dhaka, Mohammedpur, Bangladesh

**Redi Services LLC.**
Lyman, WY, USA

# Trade Shows

Visit Reliable Controls at these upcoming trade shows:

**2015 AIRAH Townsville**
August 27, 2015
Townsville, Queensland, Australia

**2015 MCE Asia Mostra Convegno Expocomfort**
September 2–4, 2015
Marina Bay Sands, Singapore

**2015 AIRAH Canberra**
September 8, 2015
Hyatt, Canberra, ACT, Australia

# Continuous Optimization

## Continuous monitoring and analysis of building performance helps to achieve a high level of optimization

Continuous optimization is designed to help commercial building owners identify and correct energy wasting operational faults.

The first step in continuous optimization is ensuring facility operators have access to the effective tools that are used to monitor performance and identify where improvements can be made.

The next step involves re-commissioning, which consists of activities that optimize building energy use through the identification and implementation of low-cost operational improvements.

Reliable Controls software is designed to help with continuous optimization:

RC-Archive is used to continuously download mechanical and electrical system logs into an SQL database, delivering a robust record of performance from any Internet-connected BACnet® facility.

RC-Reporter is software that extracts intelligence from the archived building data and helps facility managers make better informed operational decisions in order to optimize energy savings.

RC-WebView is designed to provide convenient access to multiple facilities and can push operational changes and improvements across the entire enterprise.

In British Columbia, Canada, the province-wide utility, BC-Hydro, operates a continuous optimization program that has yielded impressive results. According to their study, on average, buildings that completed the investigation phase of the process show an 8.3% overall cost reduction. The top ten measures found by the program includes:

- *Reduce equipment runtime*
- *Optimize economizer operation*
- *Eliminate simultaneous heating and cooling*
- *Optimize supply air temperature*
- *Optimize temperature setpoints*
- *Eliminate unnecessary lighting hours*
- *Optimize ventilation rates*
- *Volume control for pumps and fans*
- *Eliminate leaking/by passing valves*
- *Add/optimize chilled water temperature reset*

After re-commissioning is complete, successful operators review and analyze archived information and reports in order to study their building and recommend energy efficiency improvements to track building performance.

Part of this analysis includes reviewing documentation and performing diagnostic monitoring and functional testing along with implementation of simple repairs and continued verification for success.

**The benefits of and effective continuous optimization program includes:**

- *Better understanding of building energy use*
- *Finding new ways to save energy without investing in expensive new equipment*
- *Learning how you can continue to maintain those energy savings over time*
- *Setting and tracking energy efficiency targets and quantify energy savings*
- *Improving internal energy reporting systems*
- *Saving both energy and money*

The results of continuous optimization programs are impressive due to the ability to make adjustments based on measurable data and effective reporting. A focus on continuous optimization is ideal for conservation measures, including retrofits (i.e.: upgrades to lighting hardware), operational adjustments (i.e.: lighting control schedule), and behavioral (i.e.: occupant awareness to turn off lights after leaving a room).

In short, continuous optimization is an ideal way for building owners and operators to achieve cost effective energy savings.

| | | | BEFORE CONTINUOUS OPTIMIZATION | | | | | | RESULTS AFTER IMPLEMENTATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sample Size | Size | Annual Utility Cost | | | Annual Energy Consumption | | | Implement. Cost | Energy Savings | | | Simple Payback |
| | | | Elec. | Fuel | Total | Elec. | Fuel | Total | | Elec. | Fuel | Total | |
| | | ($ft^2$) | ($/ft2.yr) | ($/ft2.yr) | ($/ft2.yr) | (kWh/$ft^2$.yr) | (MJ/$ft^2$.yr) | (ekWh/$ft^2$.yr) | ($/$ft^2$) | (% kWh) | (% GJ) | (%$) | Years |
| Building Type | | Average | Average | Average | Average | Average | Average | Average | Average | Average | Average | Average | Average |
| Large School | 93 | 113,136 | $0.64 | $0.44 | $1.08 | 7.3 | 41.6 | 18.9 | $0.17 | 6.4% | 11.4% | 9.6% | 2.1 |
| Shopping Mall | 3 | 375,333 | $1.24 | $0.15 | $1.39 | 22.7 | 75.1 | 43.6 | $0.09 | 3.5% | 17.7% | 4.5% | 1.5 |
| Medium Office | 31 | 73,098 | $1.52 | $0.38 | $1.90 | 21.6 | 30.2 | 30.0 | $0.40 | 7.8% | 13.1% | 10.9% | 2.6 |
| Univ./College | 100 | 117,603 | $0.96 | $0.67 | $1.63 | 17.4 | 65.3 | 35.5 | $0.46 | 9.1% | 17.7% | 13.4% | 2.7 |
| Large Hotel | 6 | 359,167 | $1.31 | $0.72 | $2.03 | 21.4 | 38.8 | 32.2 | $0.25 | 6.0% | 10.9% | 10.1% | 1.2 |
| Large Office | 53 | 240,516 | $1.50 | $0.56 | $2.06 | 25.4 | 46.1 | 38.2 | $0.28 | 6.1% | 14.5% | 8.5% | 2.1 |
| Recreation | 10 | 142,478 | $1.49 | $1.36 | $2.85 | 23.6 | 111.7 | 54.7 | $0.37 | 8.7% | 10.5% | 12.5% | 1.4 |
| Hospital | 57 | 221,655 | $1.22 | $2.76 | $3.98 | 19.1 | 281.0 | 97.1 | $0.30 | 5.3% | 10.1% | 8.0% | 1.7 |
| Restaurant | 3 | 34,962 | $3.22 | $0.79 | $4.00 | 43.6 | 54.8 | 58.9 | $0.76 | 13.8% | 1.0% | 10.6% | 2.6 |
| Extended Care | 11 | 60,160 | $0.97 | $1.33 | $2.29 | 16.7 | 112.1 | 47.9 | $0.43 | 5.8% | 14.2% | 12.1% | 1.7 |
| Large Non-food Retail | 1 | 113,975 | $1.76 | $0.17 | $1.94 | 27.9 | 16.4 | 32.5 | $0.13 | 6.0% | 4.5% | 8.5% | 1.8 |
| Museum | 1 | 311,803 | $1.04 | $- | $1.04 | 19.1 | - | 19.1 | $0.32 | 8.9% | n/a | 9.7% | 2.2 |
| Food Retail (e.g. supermarkets, grocery stores) | 21 | 133,211 | $2.73 | $0.43 | $3.15 | 42.1 | 45.0 | 54.7 | $0.02 | 5.6% | 2.7% | 7.3% | 0.1 |
| **Overall** | **394** | **152,195** | **$1.24** | **$0.75** | **$2.00** | **20.1** | **73.3** | **40.5** | **$0.26** | **5.8%** | **9.5%** | **8.3%** | **1.6** |

people & technology
you can rely on™

# IKEA Centennial

## Centennial, Colorado, USA

Retail

### Geothermal Retrofit

*Centennial IKEA, a two-year old building, had most equipment close to catastrophic failure due to initial improper control and design.*

### Project Details

Major Geothermal of Wheat Ridge, Colorado successfully completed this project to retrofit Centennial IKEA and its large, geothermal/ice storage central plant. The building was unable to maintain comfort during high cooling load conditions because ice making did not function, and geothermal heat pumps and related equipment had been cycled to the point of component failure.

The solution for this project included a MACH-ProWebCom and six MACH-ProSys controllers on the local LAN. The MACH-ProSys controllers were fully loaded with MPP-I/O modules and applied to the central geothermal/ice plant. Additional mechanical equipment included 26 air handling units, 20 stages of geothermal HP (600 tons), and 60 sequenced valves.

Major Geothermal performed this complete retrofit using the existing infrastructure, resulting in all issues solved and comfort restored to the original design conditions. Factory OEM controllers on the geothermal heat pumps had an unacceptable failure rate, so were retrofitted with MACH-ProZone controllers. This included all safety lock-out circuitry. This resulted in reliable operation for the heat pumps and eliminated false safety trips while improving the equipment protection. The significant reduction in runtime saved on both energy and equipment degradation.

This project received international attention from IKEA corporate, as the decision to replace the existing BAS with a new system was not an easy one. The modular nature of the MACH-Pro controllers allowed for the re-use of existing control enclosures and wiring, which helped the job to be completed with no downtime.

To learn more about projects using Reliable Controls® visit
www.reliablecontrols.com/projects/overview

**Project Type:**
**Retrofit**

**Installation Type:**
**Boiler, CO2 Monitoring, Fan Coil Unit, Geothermal, Heatpump, Lighting, VAV, Thermal Ice Storage**

**Total Area:**
**37,161 m² (400,000 ft²)**

**Equipment Installed:**
**1 MACH-ProWebCom™**
**6 MACH-ProSys™**
**11 MACH-ProAir™**
**13 MACH-ProZone™**
**25 MACH2™**
**1 MACH-Pro2™**
**10 MACH-Stat™**

**Network:**
**EIA-485, Ethernet**

**Integration:**
**BACnet®, MODBUS**

**Total System Points:**
**2,027+**

**Reliable Controls® Authorized Dealer:**
**Major Geothermal**

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