



PEOPLE YOU CAN RELY ON:
Employee Profile Feature

URBAN, SUSTAINABLE NORTH:
Gillam Town Centre



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RUNtime

The Official Quarterly Newsletter of Reliable Controls® Corporation

Q4 - 2016

Enhance Your Cybersecurity

Introducing the MACH-System™ Hardening Guide:
IT Security Best Practices for your Building Automation System

Celebrating

30
YEARS

of EXCELLENCE



Best Practices

ENHANCE YOUR CYBERSECURITY

Best Practices for Hardening Your MACH-System™

The purpose of securing a building control system is to preserve the confidentiality, integrity, and availability of data. Unauthorized access to a control system and its data could be used to exploit operating information, cause tenant discomfort, interrupt facility operations, and even contribute to equipment or facility damage. Reliable Controls provides Authorized Dealers with the MACH-System Hardening Guide, a new engineering manual that uses fundamental engineering principles for IT security. Using public standards, it establishes best practices to ensure the secure design, development, and operation of a Reliable Controls MACH-System.

The fundamental principles and steps outlined in the MACH-System Hardening Guide are designed to contribute to an appropriately secure MACH-System, which can be incorporated into an organization's security policy with confidence and assurance. The guide presents a total of 20 best practice principles organized into four different categories:

- 6 Define user roles and permissions**
- 7 Enable auto sign-off after inactivity**

System Configuration

A building control system, which uses existing IT infrastructure should not inherently weaken the security of the IT system or security of systems similarly connected. To ensure that a MACH-System can be deployed as a component of a trusted network follow these best practices:

- 8 Deploy only on trusted networks**
- 9 Use non-standard ports**
- 10 Use data transmission encryption**
- 11 Deploy a BACnet® Virtual Private Network (B/VPN)**
- 12 Create dedicated building control networks**
- 13 Perform periodic system audits**
- 14 Make a contingency and a recovery plan**

Server Configuration

Understanding the fundamental activities required to maintain the security of a server is essential in hardening a system. The MACH-System Hardening Guide demonstrates how to implement the following best practices:

- 15 Secure the server operating system**
- 16 Secure the server software**
- 17 Maintain the security of the server**

20 Best Practice Hardening Principles

User Authentication

Authentication is the procedure by which the eligibility of an operator or process is established by the system, ensuring that data cannot be accessed, modified, or destroyed by an untrusted source. Best practices to harden user authentication include:

- 1 Disable public users**
- 2 Change default passwords**
- 3 Assign unique credentials for each user and process**
- 4 Use strong passwords**
- 5 Enforce a password management policy**

External Factors

Several external factors can be combined with the fundamentals to create a layered approach to protection, which increases the difficulty of attacking or accessing the system. Follow these best practices to maximize the resilience of your system:

- 18 Implement physical security**
- 19 Use virtual private networks**
- 20 Provide proper user training**

Each section of the MACH-System Hardening Guide, available to Reliable Controls Authorized Dealers, details the concepts behind the individual principles and the methodology for MACH-System deployment. The manual includes informative appendices, providing additional information about IT security fundamentals as well as MACH-System applications, services, protocols, and ports. There is also a sample, role-based security policy, a hardening checklist, and a continuity of service matrix.

Building owners and facility managers have grown to accept and expect instant access to and control of the complex systems, which manage their facilities. Segregated, standalone systems have evolved to enable sophisticated integration within the IT infrastructure. Many systems are inherently designed to be interoperable, focusing on the ease of transparent data sharing between devices and vendors. This emphasis on open data transmission is not necessarily synergistic with network security. Fortunately, adhering to IT

security standards that are well beyond the best practices for the industry is easier than ever before for Reliable Controls Authorized Dealers.

Michael Chipley, Ph.D., a veteran cybersecurity consultant to the US federal government and National Institute of Standards and Technology (NIST), suggests the following external factors: "restricting access to building controls and devices", creating a "building control system... segregated from the rest of the network", and "replacing Internet access with a virtual private network". Virtual private networks (VPNs) are, of course, a traditional protection; however, VPNs are a broad stroke measure, and a standard

An RC-RemoteAccess B/VPN is the preferred method for hardening BACnet internetworks, delivering unprecedented BACnet security without requiring special IT configuration.

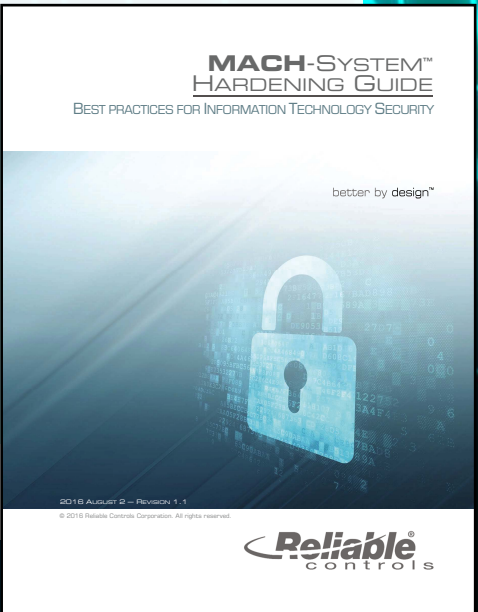
VPN configuration can be exploited to access parts of the network that were not intended to be accessible. The new Reliable Controls RC-RemoteAccess® software overcomes the vulnerabilities introduced by standard VPNs

and creates a purpose-built, device-level, encrypted B/VPN. An RC-RemoteAccess B/VPN is the preferred method for hardening BACnet internetworks, delivering unprecedented BACnet security without requiring special IT configuration.

Better by design™

Empowered with the MACH-System Hardening Guide and RC-RemoteAccess software, Reliable Controls Authorized Dealers are ideally positioned to leverage their experience and expertise, to establish clear assurance and resolute confidence that the MACH-System is truly better by design.

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Employee Profile



PEOPLE YOU CAN RELY ON

Dave Percy: Sr. Systems Administrator, Facility Manager

Harley enthusiast. Fly fisherman. Traveler. Carpenter. Audio/visual (AV) expert. Business owner. Microsoft entrepreneur and certified technologist. As a seasoned business owner, Dave Percy spent a few decades on a few different paths before he found his way to Reliable Controls in 2009, starting in a temporary role as the company's 70th employee. His skills and experience, combined with a strong personal interest in technology, make Dave an excellent fit for Reliable Controls. His multi-faceted background is ideal for the role of Senior Systems Administrator and Facility Manager.

Dave has thrived in his role, now a permanent fixture on the management team, where he supports a mix of almost 140 local and remote end users, managing the performance of all systems, as well as managing many aspects of the

Reliable Controls LEED® Platinum certified HQ Annex and original, connected facility.

Outside of work, Dave is an avid Harley Davidson enthusiast, not only riding to work on a regular basis, but also going as far as attending the Sturgis Motorcycle Rally. This American motorcycle rally is held annually in South Dakota, and has evolved into one of the largest meetings for motorcycle enthusiasts from around the world, typically with over half a million attendees. Dave's father was in the air force, and Dave lived in France for three years as a child, and perhaps as a result of his early experience, has maintained this interest in travel. In addition to his trips to the USA, Dave has traveled to Egypt, Europe, Venezuela, Costa Rica, and Thailand.

While Dave is originally from Kelowna, BC, where

he started in carpentry, owned and operated a stereo store, and started his Microsoft business, he and his wife tired of the Interior's summer heat and moved to the coast, now residing in Victoria. As a resident of Vancouver Island, Dave's hobbies, aside from motorcycles, include home renovations and fishing - specifically fly fishing using a technique called spey casting, which is usually used for fishing large rivers for salmon. Sure enough, he frequently travels "up-island" to catch salmon on the island's Northern rivers near Campbell River, but in typical West coast fashion, also has a boat in Victoria where he fishes the local ocean waters for salmon and halibut.

As Dave's role has grown over the years, so have his responsibilities. He purchases all software and hardware, configures backups, manages servers and computer ordering, ensures updates are completed in a timely fashion, and monitors the network systems. Dave must be reactive to mitigate any issues that could arise. Keeping the head office up and running is of utmost importance, as it houses virtually every department within the company, from Research and Development to Production and Shipping, to Marketing.

Reflecting on specific challenges in his role, Dave cites "keeping everyone happy, doing a balancing act to meet expectations, maintain costs, and keeping everything up and running without downtime". Supporting end users around the globe certainly has its challenges, often because of time zones differences. For example, to support the Regional Sales team in Asia Pacific, requests for assistance can appear on a Sunday, which is, of course, Monday morning in Australia, so Dave frequently makes himself available to respond to

urgent calls and requests.

In addition to his systems administration work, Dave also has a slew of facility management responsibilities, including managing contractors when external facility support is required, running the facility's systems, and addressing ongoing maintenance issues and requests. His experience in carpentry helps in building management, providing him with the skills to read drawings and have an understanding of how buildings are constructed and operated.

Dave's experience in the AV industry is another major boon to his position at Reliable Controls. Owning a stereo store for a decade while living in Kelowna provided him with ample opportunity to gain skills in that field, and as a result, he manages all AV equipment, including cameras and projectors, and also specifies components and service for the company. In addition, Dave manages the set-up of AV equipment for Interconnect, the biennial event for Reliable Controls Authorized Dealers, where he liaises with contractors to ensure all requirements are met for this major event.

Next up for Dave is an implementation of *high availability server clustering*, wherein if a server fails, the next one in line takes care of the workload.

The dynamic team at Reliable Controls is a diverse group of people that is passionate about their work. Dave's role as a successful Sr. Systems Administrator and Facility Manager is key to enabling that passion, ensuring that Reliable Controls remains the people and technology you can rely on.



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Celebrating

30 YEARS

of EXCELLENCE



For 30 years, Reliable Controls has been committed to excellence in the building controls industry. Our business objective is to be the best in terms of quality, dependability, and customer satisfaction. Thank you for purchasing our products and working with our worldwide network of Authorized Dealers for all these years.

Reliable Controls provides simple, flexible, and sustainable products and solutions to 200 Authorized Dealers in 30 countries around the world. The company has come a long way, growing into an internationally recognized firm with world-class quality and exceptional customer service. The right people with the right processes and the right outlook determine the long-term success of a company. We have been very fortunate over the decades to have maintained a good balance in all those areas.



RELIABLE CONTROLS MEMBERSHIPS

Proud Member of Numerous Industry Associations



ENERGY STAR®

Reliable Controls is committed to continually improving our management of energy resources, which reduces both operating costs and related forms of pollution. We are proud to be part of the family of businesses who have joined with ENERGY STAR.



US Green Building Council

The US Green Building Council (USGBC) is committed to transforming the way our buildings are designed, constructed, and operated through LEED®, the top third-party verification system for sustainable structures around the world.



Canada Green Building Council

The Canada Green Building Council (CaGBC) is a not-for-profit, national organization that has been working since 2002 to advance green building and sustainable community development practices in Canada. Reliable Controls has been a member since 2005.



BACnet® International

BACnet International is an industry association that facilitates the successful use of the BACnet protocol in building automation and control systems through interoperability testing, educational programs, and promotions. The BACnet standard was developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE®).



BACnet® Interest Group Europe

The BACnet Interest Group Europe (BIG-EU) is the European trade association for the application of the global BACnet standard ISO 16484-5. BACnet is the only vendor-independent communication protocol, which is specifically designed for building automation.



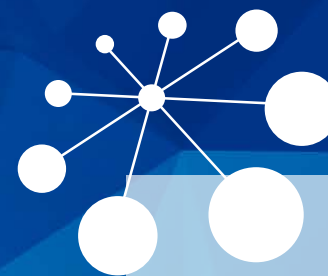
EnOcean Alliance

The EnOcean Alliance develops and promotes self-powered wireless monitoring and control systems for sustainable buildings by formalizing the interoperable wireless standard.



ASHRAE®

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability within the industry.



THE EMERGING URBAN, SUSTAINABLE NORTH

Award-Winning Gillam Town Centre: Building Community

Reliable Controls Authorized Dealer Tri-Star Automation, Inc., implemented a BACnet® solution for Gillam Town Centre, a multi-phase, multi-year, multi-programmed project in Gillam, Manitoba, South of Churchill. The population of this small, urban settlement is expected to more than triple in the next 15-20 years.

Manitoba Hydro is providing funding for the project with the investment reflecting the anticipated growth of the town. Two dams are slated for construction over the next twenty years and Gillam has been dubbed the “epicenter of Manitoba’s burgeoning hydroelectric economy”. Resulting changes to the road infrastructure will shorten the three-hour drive from Thompson by half, providing easier access for both residents and tourists.

As a mixed use development, Gillam Town Centre was conceived with an aim to establish an urban core to create a close community while curbing residential sprawl. The concept was to replace an existing mall with a new, livable core specifically developed for Gillam. Phase One of the project consisted of redevelopment of the city center to build higher density and mixed-use urban infrastructure in the town core, including long-stay townhouses and short-stay dormitory-style residential units. If, as expected, the Gillam Town Centre reduces flights and road trips out of Gillam for services previously unavailable, it will greatly increase the sustainability of the area.

Further strengthening the core of Gillam, is the creation of a new main street that previously did not exist. Strong retail corners are located at the junctions of the newly created intersections. Main floor commercial units of the new construction are capped by two-story, townhouse-style apartments, which are geared

towards attracting families and professionals to the town.

Tri-star Automation installed a MACH-ProWeb controller for the operator workstation (OWS), which resides on a BACnet IP network along with a MACH-ProSys controller for chiller control. The MACH-ProWeb controller has its own dedicated Internet connection. MACH-ProZone and SMART-Space controllers reside on a single, BACnet MS/TP subnet.

Mechanically, each space is served by one or more fan coils. Cooling is provided by a central chiller plant and a distributed chilled water system. The fan coils are equipped with controlled electric heaters. Fresh air is provided to the building by two heat recovery ventilators (HRVs), equipped with electric heating coils and humidifiers. Humidity is controlled by the SMART-Space controller’s built-in humidity sensors throughout the building, crawlspace, and ventilation systems.

This project is unique not only due to its remote location, but also because the soffits of the building are utilized for sprinkler piping. The soffits are heated through fan coils located in the crawlspace and the temperature in



Design rendering by Peter Sampson Architecture Studio

the soffits is controlled and alarmed to avoid freezing. Remote access was critical in the commissioning stage of the project. Full Internet access to the system and OWS was utilized for technicians to tune and troubleshoot the system remotely.

The design of the Gillam Town Centre received a Canadian Architect Award of Merit for Peter Sampson Architecture Studio and Calnitsky Associates Architects, who came up with the concept. The jurors described the project as “very nuanced, realistic, and carefully considered with the city as to what kind of spaces they can actually sustain... they’ve focused on building community and in doing so, they are creating a town center and framework that has the potential to serve their residents well into the future.”

The uniqueness of the design of the mechanical system combined with thorough commissioning procedures has allowed this system to run essentially flawlessly from the turnover date.

RUNtime

From Concept to Reality

PROJECT TYPE:

New Construction

INSTALLATION TYPE:

Chiller, Fan Coil Unit, Humidifier, Dual-Core, High-Efficiency HRV, Perimeter Soffit Heating

TOTAL AREA:

27,000 m² (290,628 ft²)

EQUIPMENT INSTALLED:

1 MACH-ProWebSys™, 2 MACH-ProSys™, 2 MACH-ProPoint-IO™, 1 MACH-ProZone™-88, 25 SMART-Space Controllers

NETWORK:

EIA-485, Ethernet

INTEGRATION:

BACnet®

TOTAL SYSTEM POINTS:

225 points



NEW DEALERS

New Reliable Controls Authorized Dealers

ANSO, SRL

Santo Domingo, Dominican Republic
www.ansosa.com

Austec Cairns

Redlynch, QLD, Australia
www.austecelectrical.com.au

D-Tech Pte Ltd

Singapore

Ecsys Sistemas Spa

Santiago Chile
www.ecsys.cl

GJN Technology Group

Montevideo, Uruguay
www.gjntech.com

Integra Control

Santiago, Chile
www.integracontrol.cl

Intelligent Building Controls Ltd.

Dublin, Ireland
www.intelcontrols.com

Reliable Automation Systems

Billings, MT, USA
www.midlandmechanicalmt.com

UPM Group Building Solutions

San Juan, Puerto Rico
www.upmpr.com



TRADE SHOWS

Visit Reliable Controls at these Upcoming Trade Shows

Critical Facilities Summit

October 3-5, 2016
Booth #612
Charlotte Convention Center
Charlotte, NC, USA

Greenbuild Expo 2016

October 5-7, 2016
Booth #1120
Los Angeles Convention Center
Los Angeles, CA, USA

IFMA World Workplace

October 5-7, 2016
Booth #920
San Diego Convention Center
San Diego, CA, USA

ERAPPA

October 16-19, 2016
Scotiabank CCN
Niagara Falls, ON, Canada

AIRAH 2016

October 27, 2016
Adelaide Entertainment Centre
Adelaide, Australia

PM Expo

November 30 - December 2
Booth #1826
Metro Toronto Convention Centre
Toronto, ON, Canada



PITT ST. CAPITAL CENTRE

SYDNEY, AUSTRALIA

CORPORATE

INCREASED CONTROL

Capital Centre, an office tower in Sydney, Australia, located within the Sydney Hilton Hotel, is an eight-floor tower with services independent of the hotel. Mechanical services and the ancillary plant and equipment serving the office towers were last refurbished in 2006; however, in the years following, there were issues with reliability and operating costs, which gradually escalated to undesirable and unsustainable levels. The system had also reached the end of its product support life.

PROJECT DETAILS

The solution implemented for this project is a fully native, BACnet® compliant building management system using Reliable Controls hardware and software. The mechanical elements of this project include three chillers, three cooling towers, eight AHUs, 280 VAVs, two boilers, and 12 pumps. The project's future viability was further ensured through the installation of an optic fiber backbone installed from the basement lead point of attachment, through to the plant room. High speed, CAT 6 cabling was reticulated to their respective controllers. New controllers were installed at each VAV throughout the building and networked to the new dedicated floor controllers.

A variety of strategies was implemented to optimize control and reduce energy, noise levels, and wear and tear. Stability was added and attention was given to improving operating conditions and reliability. Building performance improvements included the reduction in drafts in zone spaces, self-optimized airflow management, energy consumption reduction, increased comfort conditions, including temperature and stability. Chilled water plant control system improvements resulted in reduced variations in water temperature, the anticipation of load requirements, minimized operation of the bypass valve and unnecessary pump energy waste, and significantly improved chiller reliability.

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



PROJECT TYPE:

Retrofit

TOTAL AREA:

15,429 m² (166,078 ft²)

EQUIPMENT INSTALLED:

1 MACH-ProWebCom™

17 MACH-ProCom™

8 MACH-Pro2™

268 MACH-Air™

8 MACH-Zone™

RC-Archive®

MEASURABLE IMPROVEMENTS:

Energy Savings: \$54,024/yr

Service Call Reduction Savings: \$62,500/yr

Total Operating Cost Reduction: \$116,524/yr

Return on Investment: 4 years

Energy Consumption Reduction: 67%

RELIABLE CONTROLS® DEALER:

Environmental Automation

