

THE *trend*

THE OFFICIAL QUARTERLY NEWSLETTER OF RELIABLE CONTROLS® CORPORATION



Power In.



Go Pro



Twenty five years after the first generation controllers were developed in 1986, the MACH-Pro series gives rise to the ultimate BACnet solution while still retaining the hallmarks of simplicity, flexibility, and superior value.

Gone are the days of the Burke System, the first generation Burke 1000 controller with its innovative 32 universal inputs and 32 universal outputs communicating on the Reliable Controls Protocol (RCP), a proprietary token bus. It gave way to MultiNet, the second generation system that ushered in the flexibility of IP and supporting multiple physical networks at the controller level, as well as modular and expandable I/O cards. In 1996 Reliable Controls announced its commitment to the new BACnet open protocol, and soon after in 1997, the third generation MACH-System emerged, with its family of blue steel MACH series controllers. The improved manufacturing methods of surface mount technology opened the door to a new industry best 5 year warranty. A novel strategy was needed to allow multiple protocol support while retaining ease of use, and value for the end-user. The decision to implement dual protocol support at the controller level was completely against the grain of current industry practices, and technically challenging to perform. The successful migration of the BACnet protocol “into” the existing MACH series firmware and software, while retaining backwards compatibility with RCP, provided the critical path end-users would need to continue benefiting from their installed MACH-Systems while moving forward with BACnet. The first BACnet multi-vendor installation was completed in 1998.

Nine years on, in 2007, the fourth generation MACH-Pro controllers began shipping. Universal I/O and removable connectors remain as hallmarks of the design. Technological advances have eliminated manual jumpers for inputs and replaced them with digital jumpers that automatically configure depending on the software range selected. Analog and TRIAC outputs, and socketed output modules are being superseded by single universal outputs with jumper-selectable TRIACs. The flexibility of expandable I/O cards remains but the ribbon cables of the past have been replaced by robust EIA-485 technology. The complexity associated with developing user interfaces and sharing them securely over the Internet has become dead-simple with the innovations of the MACH-ProWeb controller. And all along, the ability to retain backward compatibility has remained in the controller firmware and system software. The current versions of RC-Studio and RC-Toolkit can be used to program the latest controllers as well as the first Burke 1000 controller - of which the bulk of production units still remain operational in the field, providing continuing value, and generating an unprecedented return on investment.

Today, the next controller in the MACH-Pro series is currently undergoing Beta testing. It will communicate using the BACnet protocol exclusively. When the MACH-ProZone is officially released in early 2012 it will mark a significant milestone in the maturing of the BACnet protocol. BACnet is now delivering virtually all the functionality that could be afforded by the original Reliable Controls Protocol, and more. With the MACH-Pro series and BACnet protocol, we can now leave RCP behind, and for the foreseeable future, “Go with Pro” to achieve the traditional Reliable Control hallmarks of ease of use, flexibility, and superior value.

Enter the Pro Zone

With one eye focused on constant improvement and the other eye fixated on customer satisfaction, Reliable Controls® is very proud to introduce the MACH-ProZone™ (MPZ) controller. Not only does the MPZ have advanced BACnet functionality and over ten times the processing power of its predecessor, its new modular I/O design adds superior value and flexibility.

THE NEW MEMORY PARADIGM

The MACH-ProZone™ represents a new memory paradigm when compared to previous controllers. In previous models, every object and associated data had a predetermined mapping in the memory space. In the MPZ, memory is dynamic –

there is no predetermined memory space. In other words, memory is allocated at the instant a user programs an object, and the number of objects is restricted only by the remaining memory. This concept makes the controller tremendously versatile.

For example, in the older MACH-Zone™ controller, the number of Control-BASIC programs was limited to 4 programs no larger than 2 KB each. In the new MPZ, there is no limit to the number of programs. The size of each program is restricted to 3 KB each, instead of 2 KB.

The end-user may chose to have a single Control-BASIC program or many programs. Or, the choice could be made to have many Trend Logs, or variables, while maintaining only a few small Control-BASIC programs.

BACNET COMPLIANCE

The MACH-ProZone™ has a higher level of BACnet compliance than the older MZ controller and as a result will be listed as a BACnet Advanced Application Controller (the MZ was an application specific controller).

In addition to the standard interfaces to RC-Studio® 2.0 and the MACH-ProWeb™ controller the MACH-ProZone™ supports the following BACnet functionality: Alarms, Schedules, Trend Logs, Runtime Logs, Programs, Loops, and System Groups. All of the above are in addition to inputs, outputs, and variables (which constitute the only BACnet visible items in the controller).

With the release of the MACH-ProZone™ controller, Reliable Controls® will be leading the BACnet pack and will be the first to release a product with the new BACnet Global Group object (used for implementing System Groups).



MODULAR I/O

The MACH-ProZone™ is available in the following 4 base models:

- MPZ44 – 4 universal inputs, 4 universal outputs
- MPZ84 – 8 universal inputs, 4 universal outputs
- MPZ48 – 4 universal inputs, 8 universal outputs
- MPZ88 – 4 universal inputs, 8 universal outputs

Removable connectors are standard. TRIAC selectable outputs are standard. Most models can be combined with optional real-time clock and optional expanded memory for enhanced trend logging.

New Dealers

Major Geothermal

Wheat Ridge,
CO,
United States

ESS Chill Water Systems

Mexicali,
Baja California,
Mexico

Beijing Gao Chi Xun Jie Technology Company

FengTai District,
Beijing,
China

Maintenance Controls & Engineering Scotland

Clydebank,
Scotland,
United Kingdom

DDC Terms Wiki

If you or a colleague need to clarify the meaning of a common term in our industry, a new wiki has been posted to the Reliable Controls website in the Customer Support Center.

The DDC Terms Wiki is a comprehensive, easy-to-use glossary of HVAC-specific terminology peppered with a sampling of important networking terms that may come in handy at work or at play.

To locate the DDC Terms Wiki, in the Customer Support Center navigate to Technical > DDC Terms Wiki.

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C - D

Term	Description
CAL	Calendar
Calendar	A database element, or object, that contains a list of dates and times.
Class 2 circuit	Electrical code specifying a circuit that is supplied by a power source that is not a Class 1 circuit.
Client	A device that initiates a service request.
Closed Loop	Control Loop or strategy in which a control signal, or Corrective Action , is generated by a Controller that measures the output of a process, or Corrective Action , and compares it to a Setpoint (input) to generate a Control Signal (output). Element Relationships in a Closed Loop Control System:

control point (setpoint)

feedback



Singapore



Our dealer meets us in our hotel lobby, a block away from Singapore's landmark Raffles Hotel, named after the founder of Singapore, Sir Stamford Raffles – the man who put Singapore on the map as a lucrative spice trading port for the East India Company in 1819. Our hosts are appropriately dressed for the hot and humid Singaporean April morning. They are about to whisk us off to visit four different clients across the Garden City, so we can help them advance the closing of an impressive list of large controls projects. We jump into the back seat of their compact car and dart off into the morning traffic, joining the throng of commuters in this city state of 5 million people.

As we navigate the serpentine freeways it becomes increasingly clear that this is not your typical concrete and blacktop metropolis. Sure, it has all the expected glass skyscrapers, factories, and housing developments, but they all appear to be infused with “luxuriant greenery”. Plants are everywhere. Lush Brazilian rain trees line the freeways and boulevards. Beautiful flowering vines hang between the commercial buildings. Huge planters ring the courtyards and frame the lobbies. Garden and park spaces seem to pop-up everywhere and inhibit your view, like you are in a forest, but within a city. Although the traffic is heavy, you really don't seem to be bothered by it, because you're driving through green.

In the 1960's, the Singapore government recognized that in order to sustain foreign investment and retain the human capital required to continue its pace of economic growth, it would need to enact a harmonious environmental strategy aimed at making its inhabitants feel good about their city. The vision was to create a “clean and green” state by restoring the deforestation that took place during the construction of the city, and to substantially increase the plant and wildlife biodiversity throughout the state over a protracted period of time. The goal was to not just develop gardens and parks within the city, but to incorporate nature on such a pervasive scale that the city would reside within a garden. By adopting such measures as planting heat-tolerant trees and shrubs along all major roadways, introducing biodiversity into an expanded 300 park plan, setting aside 4 large nature reserves around the state, and promoting rooftop and ground level community gardens for high-rise public housing complexes, after 40 years of strong political will and sweat, the people of Singapore have effectively achieved their goal.

In 2005 the city state launched “Green Mark” its sustainable building initiative. It is less stringent than LEED but generally the goals are the same. The intent is within 3 years all government operated buildings will be Green Mark compliant. This means growing opportunities for those in the building controls and building services industry. And for our first stop, this is precisely what the Deputy Manager of one of Singapore's largest development /construction firms wants. The Deputy Manager very much liked the notable project profiles we discussed, and our intent to expand our Victoria head office with a new LEED Platinum wing. The meeting concludes with our dealer receiving the green light on a BCA Green Mark pilot project.

At our second sales meeting we arrive at a large industrial campus for a world-leading, American diesel engine/heavy equipment manufacturer. Our dealer currently services the existing controls systems at two of the factories on this campus and is expecting a purchase order to install Reliable Controls® in a third facility. We meet with the Facility Supervisor and his Associate Director to

A Visionary City In A Garden

discuss their corporate mandate for improving energy efficiency by 25%, across the entire campus, by the year 2020. The supervisor is stressed because he is behind in one of his construction projects. The Director, more relaxed, has a very good report with our dealer and discusses the scheduling of POs. This manufacturer is busy and growing, and at the same time improving their efficiency with Reliable Controls®.



The early afternoon heat is pressing down on our heads so intensely that it actually pushes us sideways, toward the treed perimeter of the parking lot. We gladly take the long, shady route to reach the lobby entrance of our third customer, a large internationally-renowned, Japanese chemical research company. The Facility Manager meets us in the lobby, and after clearing security and donning plastic baggies over our shoes, he leads us upstairs into a large brightly lit, air-conditioned boardroom. The technical discussion that follows, focuses on the desire to use Apples' iPhone and iPad as a user interface to the existing Reliable Controls® installation, and the need to convince the company's IT management to modify the corporate policy to allow this to happen. I ask the Facility Manager why our dealer was given the opportunity to install Reliable Controls®. His reply is one that is often heard. “Simple,” he says, “the other guys could not give us the good service. We brought your dealer in 2 years ago, and even though the product was new to us, it was easy to learn, and the service they provide is very good.”

Our fourth and last customer visit was with a massive electronics contract assembly house. Think of them as the Celestica of South East Asia. In order to get to the front entrance, you had to practically squeeze your way between the stacks of large metal shipping containers that were waiting for their turn to be shuttled to the loading docks. “In another few months,” our dealer explains, “the ground level parkade will be fully designated to shipping containers, and car parking will no longer be allowed in this area.” The factory is a large glass building complete with 10m high glass atrium lobby, with security levels to match. Once we are allowed access to the secure side of the lobby, we are lead into a tiny glass walled meeting room just off to the side, but clearly in plain view of anyone entering the building. It felt like we were in a four person fish bowl. In walks the Assistant Manager, slim, dark, and not really saying much. Our dealer nods for us to begin. I hardly have any room to manoeuvre; the four of us crouched around a 1 sqm glass table, in a glass bowl, with no curtains. We go through the whole presentation and the Assistant Manager just watches, then frowns and nods. He says nothing, no comments, no questions, no positive body language. Clearly this was not going to be a good meeting. As we reach the end of our hastily presented slideshow, and begin describing the three main hallmarks of Reliable Controls® - Simple, Flexible, and Economical, the Assistant Manager all of a sudden raises his hand and slams it down on the glass table and exclaims, “I couldn't agree more. If the BAS interface is not user friendly it will not be used!” And then quickly and passionately he begins elaborating on how confusing and difficult it is to navigate with the competition's product, and how happy he was with the performance of the Reliable Controls® MACH-System that was installed by our dealer. It was a terrifying and terrific meeting.

Later on that evening, in Little India, as our dealer was ladling out the fish head curry onto our banana leaves and rice, he said, “You know, I'm really very, very surprised. We've been servicing that customer for many, many months, and many times I passed the Assistant Manager in the hallways of the office, and he would hardly ever look my way or say hello. I've never heard him talk so much, as he did today”. And in my mind, it became clear to me, it doesn't really matter what country you are in, facility managers are passionate about performance, and they'll tell you all about it. You just need to show them you can see through their eyes.





Medica Centre: MACH-Pro Integration

Rega Controls, an authorized Reliable Controls® dealer in Sydney Australia, recently concluded a new construction project – the Medica Centre. The first of its kind in Australia, 17-storey building (9 stories above grade, 8 stories below) is a combination of a fully outfitted private hospital, GP and specialist doctors' offices with retail outlets at street level.

Emergency features include a backup generator that will run the facility for 72 hours. The building is wired with essential and non-essential loads, separate essential and non-essential switchboards, and employs a backup water system that includes 30,000 liters potable and 30,000 liters non-potable as well as 145,000 liters of water for fire protection held onsite.

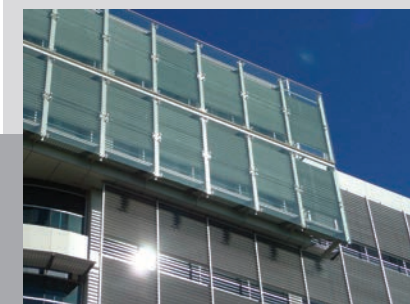
The onsite mechanical equipment consists of 3 chillers, 3 cooling towers, 2 boilers, steam boilers, 28 Air Handling Units, 14 Fan Coil Units, 14 water cooled package units, and 166 VAV boxes.

By providing the right mix of technical expertise, knowledge, and manpower, Rega Controls was instrumental in providing solutions to the many issues faced throughout this project. One of the

There were a few other challenges on the project such as maintaining a finite differential pressure setpoint across the chiller vessels. If the pressure were to drop 3 kPa below the setpoint, the chiller would go into fault, which would be acceptable in a standard project. However, because the Medica Centre employs chilled pipes with no three-way valves at the end of the lines in the AHUs, it proved difficult to maintain pressure levels. Through the tireless efforts of Rega Controls project engineer Nicholas Virgen, Rega played a major role in stabilizing the system by calling on the flexibility of the Reliable Controls® MACH-System to fine tune the controls and ultimately create a workable solution.

Another unique aspect of the project proved to be maintaining a consistent environment in the operating theatres. The operating theatre temperature had to be exactly at setpoint – there was no tolerance for any disparity. All the VAVs on the project had to maintain temperature within +/- 0.5 degrees. In addition to this, the building had to be maintained at 5 Pascals relative to the atmospheric pressure.

To date, Reliable Controls® products installed on the Medica Centre project include: 3 MACH-ProCom™, 10 MACH1™, 10 MACH-ProPoint™ Input, 10 MACH-ProSys™, 42 MACH-ProPoint™ controllers, 100 SPACE-Sensor™ Temperature sensors, 110 SPACE-Sensor™ Temperature sensors with occupancy and lighting sensors, 166 MACH-Air™ Halomo VAV boxes along with software licenses for RC-Studio® 2.0 and RC-WebView™ 2.0.



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major issues faced was obtaining accurate readings from the air balancing for the variable air volume.



THE CLOUD (RUGBY WORLD CUP 2011)

AUCKLAND, NEW ZEALAND

HOSPITALITY

AUCKLAND'S PARTY CENTRAL

Nearly two rugby fields in length (190 m), the government funded structure known as "The Cloud" is a purpose built entertainment facility, built exclusively for the 2011 Rugby World Cup for a price tag of 10 million dollars. Known in Auckland, New Zealand as the 2011 Rugby World Cup "Party Central", this venue is located on Auckland's Queen's Wharf where it will feature New Zealand fine food, wine, technology, fashion, art, design, and agriculture.

PROJECT DETAILS

The Cloud is a temporary, re-locatable, tensioned membrane structure built using a combination of glass, steel, and PVC. This unique structure is air-conditioned by two temper zone PA4800 packaged air-conditioning units supplying tempered air into the sub-mezzanine bar and mezzanine VIP areas.

One challenge with this installation was to get the job completed within a short time frame as there was only a 2 month period from when the building frame was ready to the facility's opening day in September 2011. After the system was installed and operating, another challenge was maintaining the desired temperature setpoints in a building made mostly out of glass and PVC.

The Reliable Controls MACH-System installed in The Cloud is a standalone, web-based system that gives the end-user a simple, easy interface for scheduling the air-conditioning when events are held in the building.

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



PROJECT TYPE:

Retrofit

INSTALLATION TYPE:

CO2 Monitoring, HVAC, Package Air Conditioning

TOTAL AREA:

3,400 m² (37,000 ft²)

EQUIPMENT INSTALLED:

**1 MACH-ProWebSys™
 2 MACH-ProPoint™
 2 SPACE-Sensor™ Temperature**

NETWORK:

Internet

TOTAL SYSTEM POINTS:

45 points

RELIABLE CONTROLS® DEALER:

Callander Control

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