Case study

SAIA BURGESS CONTROLS

Integrating Redundant Control into Quanta Computer's Datacenter

When Quanta Computer opted to convert part of its warehouse into an on-premises datacenter, it turned to Open Source Controls of Nashville, Tennessee to develop an effective and robust BMS solution, providing the perfect operating environment for its IT infrastructure.

The Background

Open Source Controls is a Nashville-based Master Systems Integrator, specializing in providing companies with customer-oriented building automation solutions that are open, interoperable and reliable. Quanta Computer, a global manufacturer of computers and computing equipment, asked Open Source to develop a redundant Building Management System that could provide precise control of a new local datacenter facility.

The Challenge

Datacenters have very specific environmental requirements. Servers must be consistently maintained at a controlled ambient temperature to ensure smooth operation, with ASHRAE guidelines recommending server room temperatures of 64.4 to 80.6 degrees Fahrenheit. Because server racks produce a lot of heat during operation, HVAC systems must be effective and adaptable to maintain a constant optimal temperature at all times.

Quanta Computer intended to convert part of its existing warehouse facility into an on-premises datacenter. This meant the environment inherently had higher humidity and ambient temperatures than a purpose-built datacenter space. As such, the company needed an easily configurable way of adjusting the air handling to effectively remove heat from the server racks. A standard HVAC controls solution couldn't deliver the required system redundancy.

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The Goal

Quanta Computer's local team required a resilient and scalable solution for their site IT infrastructure. The BMS solution needed to be customizable and responsive to changing levels of humidity, temperature and external environmental factors to guarantee optimal performance at all times.

The datacenter is critical to Quanta's IT operations. The BMS design therefore needed to offer parallel redundant control. In the event of a fault on one side of the system, the BMS would need to automatically switch over to the back-up controller without any disruption to system performance.

QronoX PLC
in electrical cabinet.

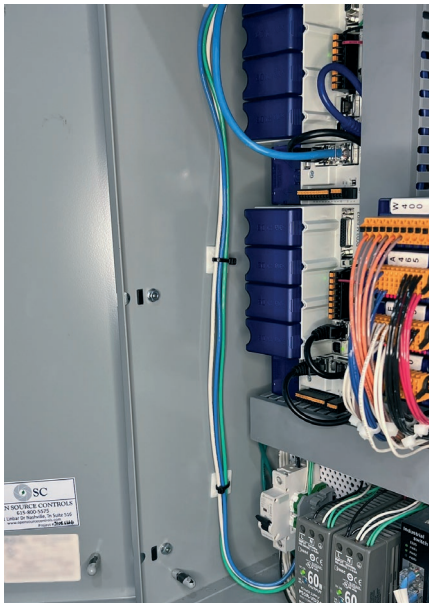
> Prior to now, the price and perceived complexity of PLC controls has been a barrier to use in projects such as this. With the value offered by the Saia PCD QronoX system, this is changing and the power and redundancy of the QronoX PLC seemed the ideal fit. The product is built like a cannon and the customer is ecstatic that we're able to integrate everything into one system.
>
> Willie Melton, Operations Manager
> Open Source

The Solution

Open Source consulted with Honeywell North America, who recommended the Saia PCD QronoX system by the Honeywell subsidiary Saia Burgess Controls (SBC), which was recently introduced into the North American market. SBC, acquired by Honeywell in 2012, is a Switzerland-based developer and manufacturer of modular PLC automation solutions. SBC belongs to the pioneers of the PLC industry, having launched its first programmable controls device in 1978. Since then, SBC has shipped well over a million PLCs to customers around the globe. These PLCs are built with a view for longevity and robustness and are used in a vast array of building, infrastructure and industrial applications.

The team at Open Source selected the Saia PCD QronoX PLC system, a high-performance, cost-effective PLC that offers seamless redundancy. The QronoX PLC, based on the Codesys PLC standard, boasts 1GB RAM, 2mS cycle time, 4GB Flash memory, support for up to 1023 I/O connections and flexible integration with numerous communication protocols.

With the support of the Honeywell application engineering team, Open Source's experts set up the network with several QronoX PLCs: a set of primary controllers for each of the datacenter's core processes – such as server temperature control, heat pumps and cooling systems - and back-up PLCs that can be automatically switched in if an error occurs. The project had tight deadlines. Thanks to the close design collaboration with the Honeywell team, the project was delivered within a month.



Control panel for data server cooling control. Redundancy controller for zero downtime.

Air handling control with redundancy to provide control for optimal operating temperatures for the servers.

Using Jace to tie the system together and provide a seamless GUI for the customer.

Result and Outlook

Fully integrated and flexible control
The QronoX PLC system makes it possible to implement sophisticated control strategies that consider multiple variables, such as temperature, humidity, occupancy, time of day and external weather conditions. The ability to customize and fine-tune the control algorithms also makes future expansion of the datacenter space easier to manage, minimizing network disruption and downtime.

Secure communication
The QronoX PLC conforms to Cyber Security Level 3 of the ANSI ISA 62443 standard.

A leading example
So far, this is the first time Quanta has integrated a PLC-based HVAC control system at one of their sites. The ease of integration and seamless redundancy in Open Source's system design has proven so valuable to the customer that the team is looking at how similar redundant solutions can be rolled out in other facilities.

Saia PCD QronoX System offers seamless redundancy and conforms to Cyber Security standards.

Facts overview

Market Segment
Datacenter

Challenge
Quanta Computer intended to convert part of its existing warehouse facility into an on-premises datacenter. A standard HVAC controls solution couldn't deliver the flexibility required.

Goal
The BMS solution needed to be customizable and responsive to changing levels of humidity, temperature and external environmental factors to guarantee optimal performance at all times.

Solution
Redundant BMS design with QronoX PLC to maintain a constant optimal temperature at all times.

If you have any questions, we are happy to help!

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