



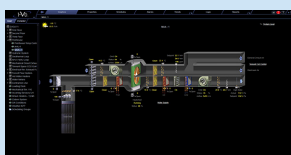
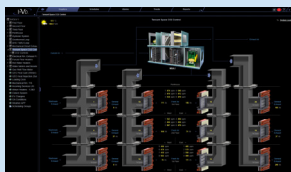
CASE STUDY



evolv1

CANADA'S FIRST ZERO CARBON OFFICE BUILDING RELIES ON CARRIER I-VU® BUILDING AUTOMATION SYSTEM FOR COMPREHENSIVE MANAGEMENT OF ALL BUILDING SYSTEMS

THE I-VU® BAS PROVIDES REAL-TIME MANAGEMENT THROUGH A GRAPHIC-RICH USER INTERFACE



To help meet sustainability goals, custom 3D graphics were created to provide a 360° view of all building systems.

Project Objectives

The Cora Group is a premier developer and manager of Class A office space predominantly within Canada's Waterloo Region. Situated in the heart of Waterloo's emerging IdeaQuarter is the Cora Group's innovative evolv1 building. Engineered and built to attract today's tech-savvy millennial workforce, their goal was to create a comfortable and energy-efficient urban office environment using state-of-the-art sustainable building principles.

evolv1 was constructed in accordance with LEED® Platinum principles, as the Cora Group wanted the building to achieve a net positive energy output, generating more energy than it consumes. To achieve this, evolv1's building automation system (BAS) needed to successfully integrate, monitor and manage existing heating, ventilating and air-conditioning (HVAC) equipment, as well as ancillary building systems. Additionally, the final solution would need to provide real-time 360° views of all systems while providing facilities staff centralized management from any location.

"From a controls and full building automation perspective, evolv1 was the most interesting and technically-challenging project that we've had to date."

– Kyle Mavin
HVACR/Controls Lead
Conestogo Mechanical Inc.
Carrier Controls Expert Contractor

The Solution

The Cora Group chose Conestogo Mechanical, Inc. as the local Carrier Controls Expert to meet the controls and BAS objectives for the evolv1 project. Conestogo was chosen based on its past reputation with other prominent Canadian buildings, and their ability to design and implement Carrier control solutions.

The installation features native BACnet control of mechanical equipment as well as BACnet integration to various systems throughout the building. The Carrier i-Vu® BAS was installed to provide centralized management of all equipment and systems from a single user interface. Custom 3D graphics were designed to give facilities staff real-time visibility and control from any location.



Synopsis

evolv1 is a uniquely modern 104,000 ft² building – the first zero carbon building constructed in accordance with LEED® Platinum principles and is the first multi-tenant building of its kind in Canada. Developed and managed by The Cora Group, evolv1's building goals included:

- Installing a non-proprietary, BACnet building automation system
- Selecting a BAS to integrate a wide variety of mechanical and building system components
- Achieving a net positive, zero carbon output facility
- Representing the very latest in building comfort, control and operating technologies

The Cora Group selected Conestogo Mechanical to recommend, design, configure, install, and maintain a complete BAS solution. "We have worked with them before and knew they had the resources," said Cora Chief Operating Officer, Adrian Conrad. To provide additional peace of mind to the Cora Group, Conestogo had the comprehensive BAS component and engineering support of the local Carrier Enterprise office.

When Conestogo officially came on board approximately two years prior to evolv1's completion, their mandate was to review the mechanical budget, create a full custom-designed graphics library to dynamically show— in real time—precisely how each monitored component is operating, provide value engineering and execute a successful BAS solution.

"From a controls and building automation perspective, evolv1 was the most interesting and technically-challenging project that we've had to date," said Kyle Mavin, Conestogo's HVACR/Controls Lead and a Carrier Controls Expert Contractor. "Creating a successful controls and BAS solution for a zero carbon, net positive and LEED Platinum certified building comes with its own inherent complexities. To address this, we integrated all third-party equipment/systems using BACnet IP and BACnet MS/TP," Mavin said.

The Carrier i-Vu® system monitors and controls:

- VRF synchronous electric heat pump chillers
- Geothermal open wells
- Cistern water
- Solar heating wall
- Solar heating wall and plenums
- Electric vehicle charging stations
- Separate hydronic loops
- Fan coils and condensers
- Fresh air make-up air unit
- Tenant space CO₂ levels
- Hot water heaters and boilers
- Mechanical room exhaust
- Refrigerant leak alarms
- Water meters and atrium air handler

In addition, native BACnet controllers including AppControllers, MPC XPs, and UC XPs were installed on various equipment in the building to monitor and control dampers, hot water and chilled water coils, pumps, valves, exhaust fans, vestibule heaters, and the reclaim water system, enabling hundreds of points of information to be transferred from the mechanical equipment into the i-Vu system.

As a result of the precise level of monitoring and control that i-Vu delivers, evolv1 generates more energy than it consumes and is the first building to earn the Zero Carbon Building – Design certification by the Canada Green Building Council (CaGBC) and the first-ever Zero Carbon award, also from the CaGBC.

A full graphics library was custom-designed to dynamically show precisely how each monitored component is operating. "With the detailed custom graphics and data we have through i-Vu Pro, our view into evolv1's energy management, resource consumption, comfort and any performance variance is immediate. Creating such an advanced, graphic-rich BAS that delivers precise control to attain extremely stringent sustainability goals was a rare and rewarding challenge. And i-Vu ties it all together," Mavin concluded.

Project Summary

LOCATION: Waterloo, Ontario / Canada

PROJECT TYPE: Building automation and controls

BUILDING SIZE: 104,000 ft²

FACILITY USAGE: Multi-Tenant Office Building

OBJECTIVES: Create a unique, modern, comfortable and energy-efficient urban office environment to be constructed in accordance with LEED Platinum principles and achieve a zero carbon, net positive energy output. Also integrate all building systems and manage them through a single web-based user interface.

CONTROLS: Carrier i-Vu Pro 7.0 building automation system (BAS), two i-Vu XT Routers, two MPC controllers and expanders, 44 Open App Controllers, 13 Open UCXP controllers with expanders, approximately 200 different sensors throughout the various systems.

MAJOR DECISION DRIVERS: Carrier i-Vu Pro 7.0 BAS capabilities seamlessly connects all systems and building components and controls with a single user interface.

UNIQUE FEATURES: Canada's first zero carbon multi-tenant office building; custom-designed algorithms to connect multi-language BAS components; high-end project-specific graphics

INSTALLATION DATE: 2018

For more information, contact your Carrier representative, call **1.800.CARRIER** or visit **carrier.com/commercial**

