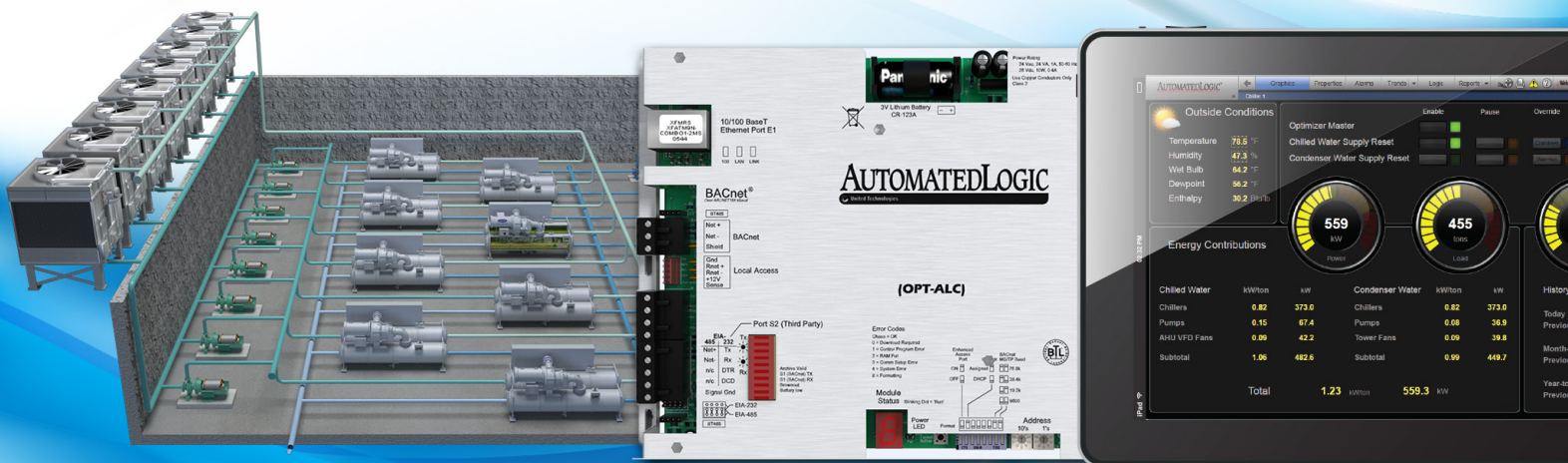


# WebCTRL® Optimization Solutions



## Chilled water system optimizer

The Automated Logic® chilled water system optimizer is a sophisticated, scalable, native BACnet optimization solution for chilled water plants. The chilled water system optimizer minimizes the energy use of the entire chilled water system, up to and including air handling units and other water side chilled water consumers. By providing optimized control of the chilled water and condenser water setpoints, the chilled water system optimizer can lower energy costs while also maintaining occupant comfort levels in the building. The chilled water system optimizer solution consists of a self-adapting control algorithm packaged in an application specific Automated Logic controller.



Patent pending: [US20150052919 A1](#)

### Key Features and Benefits

- **Intuitive** – Monitors and displays optimization metrics via integrated dashboard.
- **Scalable** – Designed to be used on plants of varying size, up to a maximum of eight chillers.
- **Flexible** – Works with the chilled water side alone, condenser water side alone, or both.
- **Comprehensive** – Can work with virtually any existing plant control system.
- **Dynamic** – Adapts automatically to changing environmental conditions and system changes over time. Senses total system energy usage including all plant room equipment and airside energy consumption.
- **Open** – Integrates easily via network communications with all mechanical and electrical equipment, regardless of brand.
- **Seamless** - Interfaces easily with the Automated Logic® PlantCTRL™ chiller plant solution enabling additional plant efficiency improvements.
- **Intelligent** – Adjusts chilled water and condenser water setpoints to achieve overall combined chiller plant and air-side energy savings.
- **Efficient** – Minimizes energy use over the entire chilled water system, including chilled water plant equipment and air-side chilled water consumers. Based on field tests<sup>1</sup>, potential energy savings from 3 - 15% are possible.
- **Non-disruptive** – Integrates to the existing plant control system, intelligently computing optimum chilled water and condenser water setpoints while continuously monitoring plant room and load-side energy consumption. Fail-safe logic is designed into the system so that the plant will revert to default setpoints in the event that optimized setpoints cannot be determined.
- **Affordable** – Lower first cost versus competitor offerings that require extensive plant analysis, system modeling, control system and mechanical system upgrades.

1- Optimizer algorithm was evaluated using modeling and computer driven simulations and tested in several field trial sites. Actual savings may vary depending on duration of use, plant size, equipment used, and the existing plant control strategy.

@AutomatedLogic

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We make data **big**™

Next level building automation engineered  
to help you make smart decisions.

# Chilled water system optimizer

## Specifications

Part#: OPT-ALC

BACnet Support:	Conforms to the BACnet Building Controller (B-BC) Standard Device Profile as defined in ANSI/ASHRAE Standard 135-2012 (BACnet) Annex L, Protocol Revision 9	
Communication Ports:	The following ports are available on the chilled water system optimizer: <b>10/100 BaseT Ethernet:</b> 10/100 Mbps port for BACnet/Ethernet, BACnet/IP, or Modbus® TCP/IP <b>BACnet Port:</b> EIA-485 port for ARCNET 156 kbps communications <b>Port S1:</b> EIA-232 or EIA-485 configurable port for BACnet MS/TP (9600 bps–76.8 kbps) <b>Port S2:</b> EIA-232 or EIA-485 configurable port for Modbus RTU and ASCII modes (9600 bps–76.8 kbps) <b>Local Access:</b> for system start-up and troubleshooting	
Microprocessor:	32-bit Motorola Power PC microprocessor with cache memory, Fast Ethernet controller, high-performance 32-bit communication co-processor, ARCNET communication co-processor, and I/O expansion CAN co-processor	
Memory:	16 MB non-volatile battery-backed RAM (12 MB available for use), 8 MB Flash memory, 32-bit memory bus	
Real-time clock:	Battery-backed real-time clock keeps track of time in event of power failure	
Battery	10-year Lithium CR123A battery retains the following data for a maximum of 720 hours during power outages: time, control programs, editable properties, schedules, and trends	
Status indicators:	LED status indicators for communications and low battery status. Seven-segment status display for running, error, and power status	
Router addressing:	Rotary dip switches for intuitive network addressing of module	
Protection:	Incoming power is protected by a replaceable 3 Amp Pico® fuse. Network connections are protected by non- replaceable internal solid-state polyswitches that reset themselves when the condition that causes a fault Incoming power is protected by a replaceable 3 Amp Pico® fuse. Network connections are protected by non- replaceable internal solid-state polyswitches that reset themselves when the condition that causes a fault returns to normal.  The power, network, input, and output connections are also protected against transient excess voltage/surge events lasting no more than 10 msec.	
Listed by:	UL-916 (PAZX), cUL-916 (PAZX7), FCC Part 15-Subpart B-Class A, CE	
Environmental operating range:	-20°F to 140°F (-29°C to 60°C); 10 to 90% relative humidity, non-condensing	
Power requirements:	24 Vac ±10%, 50-60 Hz, 24 VA, or 26 Vdc ±10%, 10 W	
Physical:	Rugged aluminum cover, removable screw terminal blocks	
Weight:	1.4 lbs. (0.64 kg)	
Dimensions:	<div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><d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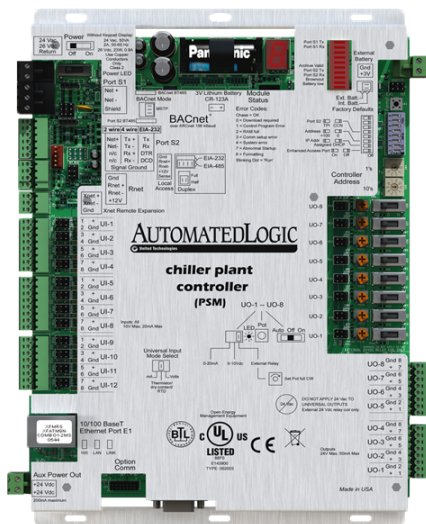
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**AUTOMATEDLOGIC**  
United Technologies

# PlantCTRL™ Chiller Plant Solution



## Factory-Engineered Plant Control



The Automated Logic® PlantCTRL™ controller is an integral component of the WebCTRL® building automation system.

This factory-engineered, cutting-edge control solution offers algorithms designed to provide control over all aspects of a chiller plant, coordinating the control of chillers, pumps and towers into a finely tuned, cohesive system.

The solution consists of a dedicated controller, I/O expanders, and a library of factory-engineered control programs that are specifically designed to cover the most common chiller plant configurations.

### Key Features and Benefits

#### Features

- Supports library-driven programming using EquipmentBuilder. Quickly choose from a library of factory-engineered and tested control programs that are specifically designed to cover the most common chiller plant configurations, eliminating the need for custom logic
- Supports EIKON® graphical programming tool, an object oriented tool that provides complete flexibility for any custom control sequence that you need
- Supports live, visual displays of control logic, which uses real time operational data and aids in optimizing and troubleshooting system operations
- Embedded trends and alarms provide insight on chiller plant performance and also aid in system troubleshooting and maintenance
- Supports 20 I/O points on the controller, and up to (6) MEX I/O expansion modules in panel configuration or remotely mounted up to 100 ft away for scalable solutions (164 I/O total)

#### Chiller Plant Dashboards

- Pre-configured screens for both air-cooled and watercooled plants
- Graphical and numeric energy use data
- Default screens for 8 chiller plants; larger plants are easily accommodated
- Metric and imperial units, as well as local currency values are also supported

#### System Benefits

- Compatible with any manufacturer's air or water cooled chillers
- Supports integration to chiller plant equipment using BACnet and Modbus® protocols
- Responds to the building load, automatically starting, staging and stopping the plant, resetting the chilled water supply temperature, and matching tonnage produced to the tonnage required by the building



The WebCTRL® building automation system gives you the ability to understand your building operations and analyze the results. The WebCTRL system integrates environmental, energy, security and safety systems into one powerful management tool that allows you to reduce energy consumption, increase occupant comfort, and achieve sustainable building operations. Our web-based platform allows building managers to control and access information about their HVAC, lighting, central plant and critical processes on premises or remotely at any time of day.



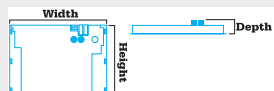


# PlantCTRL™ Chiller Plant Solution

## Specifications



BACnet Support:	Conforms to the BACnet Advanced Application Controller (B-AAC) Standard Device as defined in BACnet 135-2001 Annex L. Tested to Protocol Revision 9	
Communication Ports:	<b>Ethernet:</b> (10/100Mbps) for LAN/BACnet IP/Modbus TCP/IP communications <b>EIA-485:</b> for ARCNET 156 Kbps or BACnet MS/TP (9600 baud to 76.8 Kbps) <b>EIA-232/485:</b> DIP-switch selectable port for Modbus® or LonWorks® communication <b>Local access:</b> for system start-up and troubleshooting (115.2 kbps) <b>Rnet:</b> for ALC communicating room sensors and ALC touchscreen interface <b>Xnet:</b> (500 Kbps) for MEX I/O expansion modules	
Universal Inputs:	Twelve configurable universal inputs with 14-bit A/D resolution. Supported input types include: 0-5 Vdc, 0-10 Vdc, 0-20 mA, Thermistor (10 kOhm Type II), 1 kOhm RTD (Platinum, Nickel or Balco), and Dry Contact All inputs support pulse counting up to 40 cycles per second (25 mSec minimum pulse).	
Universal Outputs	Eight universal outputs are jumper configurable as 0-10 Vdc, or 0-20 mA with 12-bit D/A or 24 Vdc @ 50 mA relay drive. HOA (hand/off/auto) switches for all outputs, including potentiometer for manual adjustment of analog outputs.	
Expansion:	Six MEX I/O expansion modules can be connected - one mounted directly on top of the controller, mounted locally in a stack configuration or remotely mounted up to 100 ft away.	
Microprocessor:	Powerful 32-bit Motorola Power PC microprocessor. High-performance 32-bit communication co-processor. I/O expansion CAN co-processor	
Memory:	32-bit memory bus structure, 8 Mbyte FLASH memory, 16 Mbyte RAM battery-backed	
Battery:	CR123A has life of 10 years with 720 hours of cumulative power outage	
Real-time Clock:	Battery-backed real-time clock keeps track of time in event of power failure	
Status Indicators:	LED status indicators for EIA-232/485 communication and low battery status. Seven-segment status display for running, error, and power status	
Controller Addressing:	Rotary dip switches for intuitive network addressing	
Protection:	Built-in surge and transient protection circuitry for power, communications and I/O	
Listed by:	UL916 (PAZX), cUL-916 (PAZX7), CE, FCC Part 15 - Subpart B - Class A	
Environmental Operating Range:	0°F to 140°F (-18°C to 60°C); 0 to 90% relative humidity, non-condensing	
Power Requirements:	24 Vac $\pm$ 10%, 50-60 Hz, 50 VA, or 26 Vdc $\pm$ 10%, 23 W NOTE: Power consumption will increase when Equipment Touch or other accessories are attached.	
Physical:	Rugged aluminum cover, removable screw terminal blocks.	
Weight:	1.7 lb. (0.8 kg)	
Dimensions:	Overall Width: 7-1/2 in. (19 cm) Height: 11-5/16 in. (28.7 cm) Depth: 1-1/4 in. (3.2 cm)	Mounting Holes Width: 5 in. (12.7 cm) Height: 10-7/8 in. (27.6 cm)



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United Technologies

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