



# Automation Solutions

Meeting Today's Water Treatment Automation Challenges



**EquipSolutions**®



## The Automation Challenge

Automation is such a broad and encompassing topic, that it's understandable to not even know where to begin. In industrial water treatment, automation spans from dedicated cooling tower or boiler controllers, to specialized controllers, to full-blown PLCs (programmable logic controllers). It's easy to feel uneasy about what to select and where to turn for advice and the best solution.

That's where EquipSolutions can help. For the past 15 years, EquipSolutions has focused solely on listening to our customers' water treatment needs and providing appropriate solutions. We've added the technical expertise to assist our clients through the process of understanding alternatives, then providing the resources, personnel, products and services to get the job done well.

Meeting your precise application needs . . . that's where the rubber meets the road. There's a lot to think through, including; application specifics, the environment, what's worked / failed in the past (and why), identifying inputs/outputs, selecting a control methodology, and data communications needs, just to name a few.

The following pages will walk you through a variety of approaches to addressing your automation challenges. This is intended as a primer. We sincerely hope that you will reach out to us for a consultation to address your specific needs. As we have done with many of our clients, we look forward to working with you to understand your application, share best practices, and provide a solution that meets your current and future automation needs.



Modern industry relies on computers to handle everything from automation to networking.



Unfortunately, it's often difficult to find viable control system solutions off the shelf. While modern industry has many unique needs, it puts a great deal of stress on the control system itself. A regular desktop computer cannot fulfill all these needs. Fortunately, there are PLCs.

## Selecting the right approach . . .

### The PLC Approach

PLCs are used in various industrial applications such as primary metals, automobile, chemical industries and the energy sector. The use of PLCs dramatically increases based on the development of the various technologies where they are applied.

Custom software is the best product to ensure functionality and ease of use for your exact application needs. However, custom software development is not always



A PLC is a control system that utilizes use-made commands to control input and output from various devices. It's a great tool for applications due to its flexibility. Since user commands control how the system directs output devices, this system can work in just about any kind of application.

PLCs offer several key advantages for industries relating to the water management and water treatment sector. They are a more compact computing solution, compared to large installations of relays and timers, which makes it easier to troubleshoot and track down errors. A PLC executes it's logic or program in a deterministic manner, meaning, it will consistently produce the same output every time it executes the code, similar to mathematics, etc. This is why PLCs are chosen and can be trusted to control critical and precise operations. The other key advantage of PLCs is the almost unlimited input/output capabilities.

A PLC is a digital computer that can be programmed to control manufacturing processes, robotic devices, assembly lines, water treatment and numerous other applications that require process fault diagnosis.

PLCs have been implemented worldwide as highly reliable automation controllers that are suitable for rugged environments. These were first developed to replace hard-wired relays, timers and sequences.

The design and implementation of custom automation projects has become a significant component of our business. At EquipSolutions, we consider ourselves to be PLC experts.



## PLC application examples

A PLC is typically selected for heavier industrial applications where a higher or unlimited Input/Output count and custom control algorithms are required to meet the application needs such as:

- Poultry & Beef Processing
- Food & Beverage
- Oil & Gas
- Pulp & Paper
- Water Treatment
- Mining Industry
- Glass Industry
- Steel Industry
- Cement Manufacturing
- Power / Electric Utility





## Walchem W900 Approach

The Walchem web-based controller (W900) is one of the latest additions to our equipment line. This controller is an excellent fit for the many chemical treatment applications associated with the water treatment & paper industries.

Data logging is becoming a major concern within many industries today. Accurate data logging is now generating the same level of interest as energy efficiency and operational benefits.

The W900 controller has a flexible multi- input/output platform, a wide range of analytical sensor measurement capabilities, and an extensive assortment of integrated communications and data handling features to meet the needs of the water treatment and paper industries.

The controller offered by EquipSolutions is unlike any other online industrial chemical dosing controller. It fully integrates the functions of a transmitter, PLC, data logger, and auto-dialer into a rugged, industrial. NEMA 4X package.

The controller's local interface touch-screen is accessible on the front panel, and the waterproof USB connectors and power switch are mounted on the bottom of the controller. This enables the operator to utilize all the capabilities of the controller, even when installed in a wet or corrosive environment, without opening the door and compromising the NEMA rating.

The software has the same user-friendly look and feel as any typical web page and can be accessed using a standard web browser. The controller offers a wide range of control algorithms which include 4- 20 mA proportional control, time proportional control, set point on/off control, high speed and event triggered data logging, flexible alarm relays, one-way interlocks, and the ability to select which parameters are included on the front LCD.

The controller can be accessed in several ways including, USB, Ethernet (LAN), Internet, Wi-Fi, Modbus or Modem.

As an option, the W900 controller can be programmed to communicate directly with the plant DCS. The communication protocol will be Modbus TCP over an Ethernet Cat. 5 or Cat 6E cable. The entire EquipSolutions controller memory map can be transmitted to the plant DCS and used to populate DCS screens created by our customers. We can assist with the Modbus TCP/IP memory map addressing structure and integration process if required.



## Walchem W900 application examples

A W900 would typically be selected for light industrial applications where a lower or fixed I/O count is required to meet the application needs such as:

- Water Treatment Applications (with flexible but fixed I/O)
- Cooling tower
- Boiler
- Influent & Effluent
- pH Neutralization
- Reverse Osmosis
- Dissolved Solids Removal
- Process Water
- Product Cleaning
- Defoamer
- Clean In Place



## Walchem W600 application examples

Similar to W900 but for smaller applications A W600 would typically be selected for light industrial or commercial applications where a very low or fixed I/O count is required to meet the application needs such as:

- Water Treatment Applications (with flexible but limited I/O)
- Cooling tower
- Boiler
- Influent & Effluent
- Dissolved Solids Removal
- Product Cleaning
- Defoamer

## Crius NA Controller Approach:

The CRIUS NA controller offers more specialized sensor connections, more functionality and more flexibility with a color screen and optional built in 4G modem. The CRIUS NA controller is a great fit for diverse applications requiring very accurate process variable measurement.

Optional communications packages allow Profibus, Modbus ASCII, Modbus RTU, Modbus TCP and others.

The CRIUS NA controller is equipped with the capability to connect to four sensors of any type with appropriate analog outputs and relays. If more than four sensors are required, up to three additional blind Crius units can be linked together to expand the I/O count. The three additional expansion units will share the same display and communications.

CRIUS has developed improved accuracy with sensors, electronics and accessories. Pairing amperometric sensor technology with an open flowcell, to remove pressure variations, has demonstrated success in a variety of applications including:

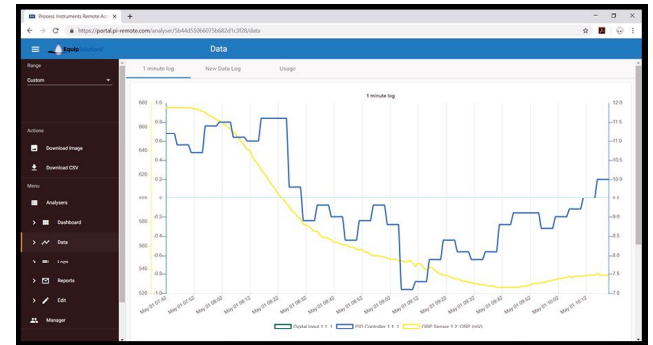
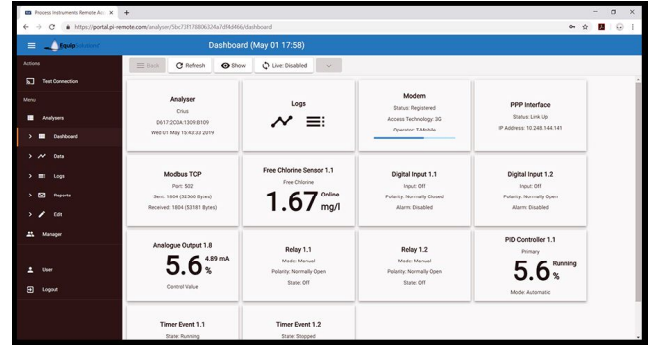
- Free & Total Chlorine
- Peracetic Acid
- Chlorine Dioxide
- Ozone

CRIUS has also demonstrated success in harsh environments, specifically fibrous and high solids waters. The Automatic Sensor Cleaning System consists of a large flow cell that automatically empties on a user selectable time basis. The repeated flushing of the housing and sensor helps prevent the build-up of solids and prolongs the life of the sensor and reduces maintenance. For waxy or fatty build-ups warm water can be used to flush the sensors.



Equipped with data-logging as standard and multiple PID loops as options, the CRIUS NA controller is very able to control complex water treatment processes at a competitive cost.

The CRIUS NA controller can provide all users with their own login credentials, and with three levels of instrument and remote access security.



## CRIUS NA application examples

A CRIUS NA controller would typically be selected for light industrial applications requiring specialized sensors with extremely accurate process variable measurement and where a lower or fixed I/O count is required to meet the application needs such as:

- Applications requiring specialized sensor with extremely accurate measurement (with flexible but limited I/O)
- Food Processing (poultry, beef, pork)
- Food & Beverage
- Swimming Pools & Spas
- Potable Water Treatment
- Hotels & Resort
- Leather Industry
- Travel Industry
- Clean In Place

# Automation Selection Guidelines

## Level 1 - Walchem 600/900

Standard boiler applications  
Standard cooling water applications  
Remote communication & reporting  
Flexible but fixed I/O



## Level 2 - CRIUS NA Controller

Broad selection of specialty sensors  
Paired amperometric sensors & flowcell  
Autoflush for harsh environments  
Advanced communications protocols



## Level 3 - PLC

Custom control algorithms  
Select any sensor / control technology  
Virtually unlimited I/O  
Worldwide proven experience





## Design & Engineering

EquipSolution's Automation team of skilled and experienced designers work efficiently to meet automation systems' design requirements within the water treatment industry by listening to the customer first.

Our design team includes: electrical and mechanical engineers, tool and die makers, and machine builders. These talented individuals are supported by a mechanical build team of machinists, millwrights, assemblers and developers to ensure a great design every time. All machine design is done with Solidworks.

The electrical systems design team includes electrical engineers supported by senior level controls programmers, developers and electricians.



## EquipSolutions Capabilities Summary

In Summary, when it comes to your automation and control, remote monitoring, analog and digital radio signal transmission, and secure data transfer needs, EquipSolutions can do it all.

EquipSolutions preparing to launch a new Digital Portal that will include remote monitoring, service and support for our customers. This will ensure that your process and application will run smoothly and efficiently.

When our customers have a process or application problem, we take pride in making it our problem as well. We will help our customers work through any technical issue that relates to their process or application and provide the additional knowledge required to address the issue at hand.

At EquipSolutions we always go the extra mile to ensure customer satisfaction.

### EquipSolutions

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#### EquipSolutions

From supplying a part to designing a custom engineered system, we work collaboratively with our clients to meet and exceed their operational and economic objectives.



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