WALCHEM
An Iwaki America Company

Learn More about WIND version 8

Rename control algorithms to be relevant for the industrial market:
Some of the control algorithms had a name that was more appropriate for the cooling tower/boiler market, so these have been changed to names more appropriate for the general industrial water and wastewater treatment markets.

One-way Interlock-> Permissive Relay Interlock
Flow based feed-> Flow Based Control
DI following-> Activate on a DI
Feed with another relay-> Activate with another relay
Feed after another relay (%) -> Activate after another relay (%)
Feed after another relay (Fixed Time) -> Activate after another relay (Fixed Time)
Feed as % Time -> Activate as % Time
Daily timer-> 24 Hour Timer
Bleed volume based on makeup volume-> Flow Volume based on 2nd Flow Volume

Min/Max/Ave Feature Changes
The Min, Max and Ave that is displayed on the System Summary page used to be calculated using data points taken at 10 minute intervals. This was fine for the slow moving cooling tower and boiler systems, but many industrial applications parameters change more quickly. In version 8, the calculations are made using data points taken at 15 second intervals.

In addition, the Min/Max/Ave calculations will not include data that would make the calculations invalid, such as during calibration, during a probe wash or if you have selected that datalogging of a parameter should be suppressed by a particular event (like a no-flow DI state, for example).

Another change is that the Min/Max/Ave data are now available as parameters to be datalogged.

The Average will now be available as a parameter to graph when using the 1 Day or 7 Day views. This will be helpful for verifying that fast spikes in a process will be detected in the graph.

Graphs
The time between samples for the Last Hour view will be 15 seconds.

The Average of a parameter is now available to view in a graph in the 1 Day and 7 Day views. We have a limited number of data points that can be displayed, so we show one data point every 5 minutes in the 1 Day view and every 20 minutes in the 7 Day view. In order to be able to see when spikes in the value may have occurred but not recorded in the normal graph, the Average graph displays a rolling average over the time span between the data points. Any spike in the reading will show up as a bump in the average.

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Datalog Changes
In addition to Normal datalogging mode (where data is logged all the time) and Event triggered datalogging (where the parameters are not logging unless an alarm condition is in effect) we have added Datalog Suppression. In this case, data is not logged, graphed or calculated in the Min/Max/Ave if it is being suppressed.

Events that may Trigger or Suppress datalogging include all alarms, Interlock or Generic DI states, or relay on/off states. Each parameter now gets its own choice of triggers or suppressors.

Modbus Read and Write Capability
When the Modbus TCP option is purchased, not only can you have your HMI program request data from the controller, but you may also use the HMI program to change set points in the controller.

Pulse Proportional Control
Pulse proportional control allows you to directly connect a metering pump to the controller and pace the stroke frequency higher as the process value gets further from the set point. Two new relay card options have been added to the model codes: 4 pulse + 4 dry contact relays and 4 pulse + 4 powered relays.

Probe Wash relay control algorithm
The probe wash algorithm allows you to set scheduled relay activations to automatically open a valve or activate a pump to clean a sensor. During the wash time, and during a programmable time after the wash, the sensor readings are not logged, and control based on that sensor is suspended.

PID Control Mode
WIND now has PID control algorithms available for both relay and analog outputs.

In PID control mode, the controller reads an analog or sensor input, and the output responds to maintain the input value at the set point. The PID algorithm considers the error relative to the set point as well as the speed of correcting the error in calculating the analog output value. A time period and duty cycle are used to combine the PID algorithm with a time proportional response, allowing the output to respond according to the formula, then wait for feedback before altering its response.

In the case of discrete relay control where a relay turns on for specified time, the Output is calculated as a percentage of the time period.

In the case of 4-20mA Analog output control, the Output is calculated as a percentage of 4-20 mA output. The period and duty cycle are used to control how long the PID algorithm operates for and how often. The period defines a time (in seconds) that the user wishes to segment the PID control in to. The duty cycle defines how much of the period the PID control is actually performing its function – the rest of the time the output is held at the previously calculated value.

Output = (P_{gain} * current error) + (I_{gain} * integral) + (D_{gain} * derivative)

Counter Based Control algorithm
In Counter Based Control, the relay will activate for a programmable time after the DI selected counts a programmable number of contact closures.

In Range Output control algorithm
An In Range Output relay will activate when the selected sensor or analog input is between two set points. A single dead band is used on either end to delay deactivation as the process value goes outside the range.

A common application for this would be to open a valve if the process is in the desired range, as in dumping a batch wastewater treatment tank.

Out of Range Output control algorithm
An Out of Range Output relay will activate when the selected sensor or analog input is outside two set points. A single dead band is used on either end to delay deactivation as the process value goes inside the range.

A common use for this algorithm is to control a valve to isolate flow of water when the pH or other parameter of interest is outside an acceptable range.

Add On and Off Delays to On/Off Set point control algorithm
We've added flexibility to the On/Off Set Point algorithm, by allowing an On Delay and Off Delay.

The On Delay is helpful to add two chemical products sequentially based upon the same sensor input signal.

Redundant Sensor algorithm
The redundant sensor algorithm will allow the user to define a primary sensor to use for control and a backup sensor. If the primary sensor goes invalid, the backup sensor will automatically take over control, and the sensor error alarm will activate. If the sensors don't match each other within user-defined limits but both are valid readings, control will stop and an alarm will activate. If the backup sensor goes invalid while the primary sensor is OK, control continues but the sensor error alarm will activate. If both sensors are invalid, control stops and the sensor error alarms activate.

Each input (SI or AI or Paddlewheel DI) will have a radio button to select backup sensor function. When Backup is selected and submitted, the page redraws, and new fields appear:

Primary Sensor Assignment
Allowable Deviation from Primary Sensor Reading

Add makeup conductivity and manual temperature entry option to RSI/LSI calculation
We've changed the calculations used for LSI and RSI to make them more accurate. Instead of entering the *system* hardness and alkalinity, the user will enter the *makeup* hardness and alkalinity. The user can select the makeup sensor, or select it as Not Used and manually enter the makeup conductivity. The controller will calculate the system hardness and alkalinity: System Hardness = makeup hardness*(system conductivity/makeup conductivity) and System Alkalinity = makeup alkalinity*(system conductivity/makeup conductivity).

We have added the ability to select whether to use the system water temperature as reported by a sensor, or to manually enter the temperature. If there is no ATC on any sensor, then only manual entry will be possible.

Provide high-high alarm, and low-low alarms
New high-high and low-low alarms have been added to all sensor inputs, analog inputs, and paddlewheel rate inputs.

Add adjustable damping on all SI, AI and Paddlewheel DI
Damping is applied to the displayed (and used for control) reading by taking a running average of the readings of the input signal over the time frame specified by the damping setting (0-60 seconds).

Add generic and level type DI states to the event log
Function the same as existing feature for Interlock. If no active state is defined, 1 = closed, 0 = open.

Add DI_D, E and F Functionality
DI_D can be any type of input, while DI_E and DI_F can not be paddlewheel, contacting flow meter or generic counter.

Add a "Reset Defaults" button for all AI calibrations
A button to reset the analog input calibration to factory defaults is now available on the 4-20 mA Inputs page.