

FEATURES

- Monitoring and controlling process parameters: temperature, conductivity, pH, spray pressure, conveyor status, tank levels
- Track chemical usage
- Automatic or timed feed of chemical pumps
- Automatic or timed opening of water valves
- Supervisory Control & Data Acquisition (SCADA)
 - Centralized workstation PC for monitoring
 - Monitored values are stored in trend logs that are easily exportable. Data is archived in SQL Server database for long-term history
 - System Alarms/Reports
- Real-time remote access
- Maintenance reminders (e.g. clean probes)

BENEFITS

- Reduction in water usage
 - Valve control on rinse stages
 - Rinse/halo control
 - Promotes contamination control in rinse stages
- Reduction in downtime
 - Automated control of washer conditions decreases line stoppages
 - Real-time data with alarms promote identification and analysis of potential problems
 - Monitoring of conveyor status provides reporting and analysis capability for line uptime
- Reduction in reject rates
 - Maintains optimal washer conditions, resulting in fewer rejected parts and less rework.
- Real-time information and alerts promote washer corrections to prevent defective parts
- Availability of historical information supports investigation into problem parts
- Reduced warranty costs
- Reduced gas usage via energy-saving mode when parts are not being processed

SYSTEM DASHBOARD



▶ The operator monitors the dashboard for potential problems – gauge turns red for values that have gone out of range per the line control plan.

▶ Status indicators at top of Dashboard for:

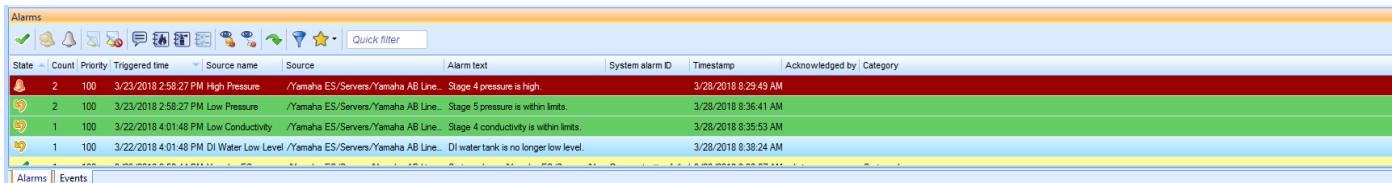
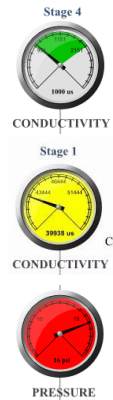
▶ Conveyor Status



▶ DI Tank Low Level Sensor

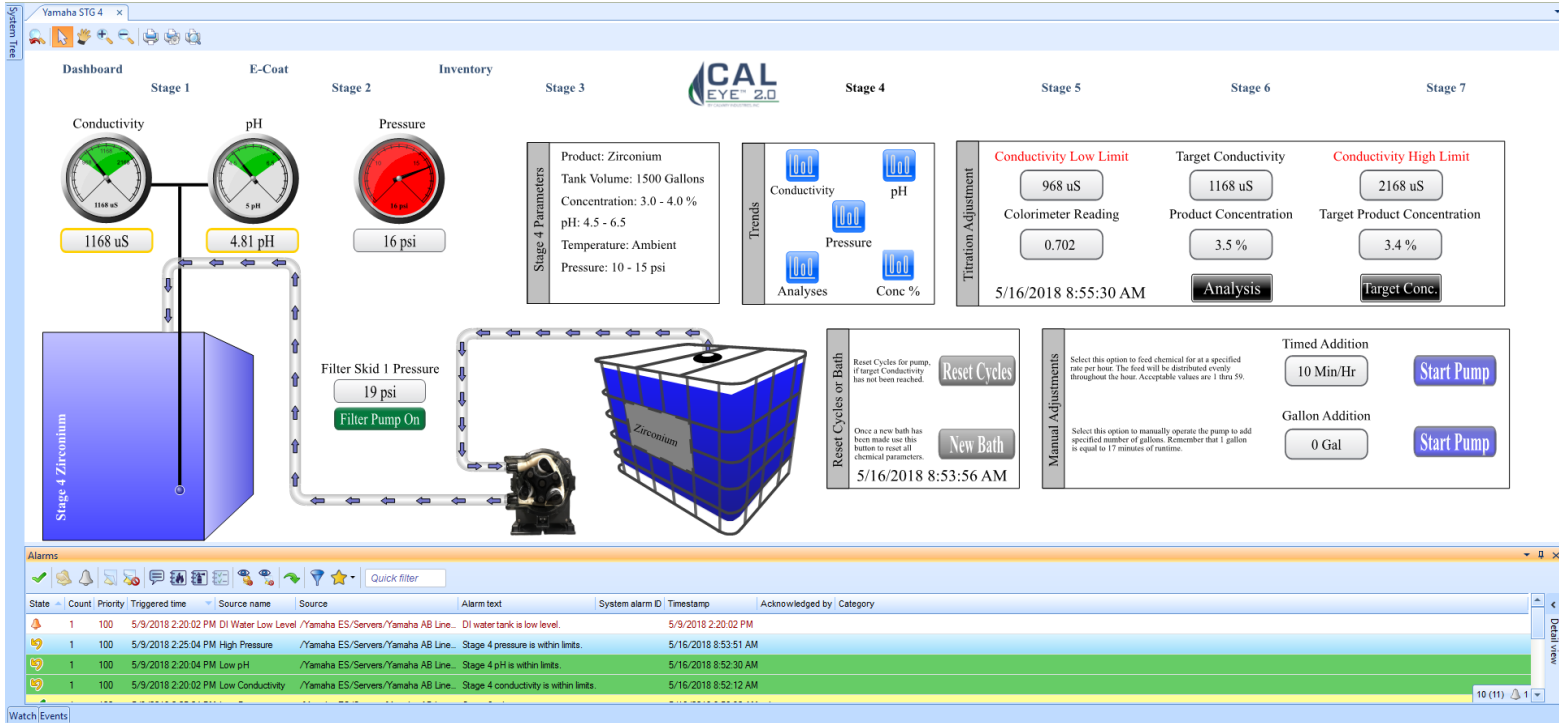


▶ Master Control On/Off switch



▶ Alarms panel at bottom of screen alerts of conditions that require attention. System reminders also appear in bottom panel (e.g. clean probes)

DETAIL SCREEN



Stage 4 Parameters

- Product: Zirconium
- Tank Volume: 1500 Gallons
- Concentration: 3.0 - 4.0 %
- pH: 4.5 - 6.5
- Temperature: Ambient
- Pressure: 10 - 15 psi

Titration Adjustment

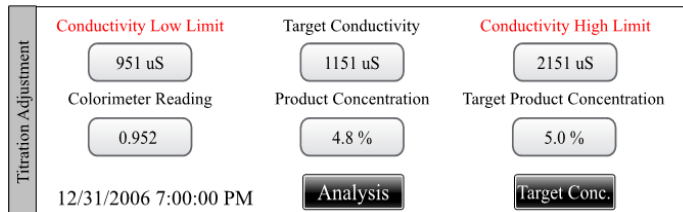
- Conductivity Low Limit: 968 uS
- Target Conductivity: 1168 uS
- Conductivity High Limit: 2168 uS
- Colorimeter Reading: 0.702
- Product Concentration: 3.5 %
- Target Product Concentration: 3.4 %
- 5/16/2018 8:55:30 AM
- Analysis
- Target Conc.

Manual Adjustments

- Timed Addition: 10 Min/Hr **Start Pump**
- Gallon Addition: 0 Gal **Start Pump**

State	Count	Priority	Triggered time	Source name	Source	Alarm text	System alarm ID	Timestamp	Acknowledged by	Category
1	100	100	5/9/2018 2:20:02 PM	DI Water Low Level	/Yamaha ES/Servers/Yamaha AB Line...	DI water tank is low level.		5/9/2018 2:20:02 PM		
1	100	100	5/9/2018 2:25:04 PM	High Pressure	/Yamaha ES/Servers/Yamaha AB Line...	Stage 4 pressure is within limits.		5/16/2018 8:53:51 AM		
1	100	100	5/9/2018 2:20:04 PM	Low pH	/Yamaha ES/Servers/Yamaha AB Line...	Stage 4 pH is within limits.		5/16/2018 8:52:30 AM		
1	100	100	5/9/2018 2:20:02 PM	Low Conductivity	/Yamaha ES/Servers/Yamaha AB Line...	Stage 4 conductivity is within limits.		5/16/2018 8:52:12 AM		

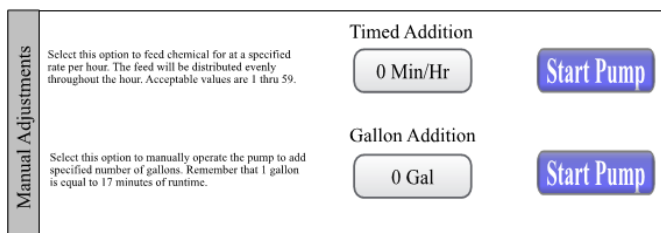
- ▶ Operator enters the titration/analysis on this screen. The data is used to calculate product concentration in the stages. The information is stored in a trend log.



Titration Adjustment

- Conductivity Low Limit: 951 uS
- Target Conductivity: 1151 uS
- Conductivity High Limit: 2151 uS
- Colorimeter Reading: 0.952
- Product Concentration: 4.8 %
- Target Product Concentration: 5.0 %
- 12/31/2006 7:00:00 PM
- Analysis
- Target Conc.

- ▶ The system adds chemical and opens water valves as necessary to keep stage concentration within control parameters
- ▶ Other stages operate on timed addition of chemical and water as needed



Manual Adjustments

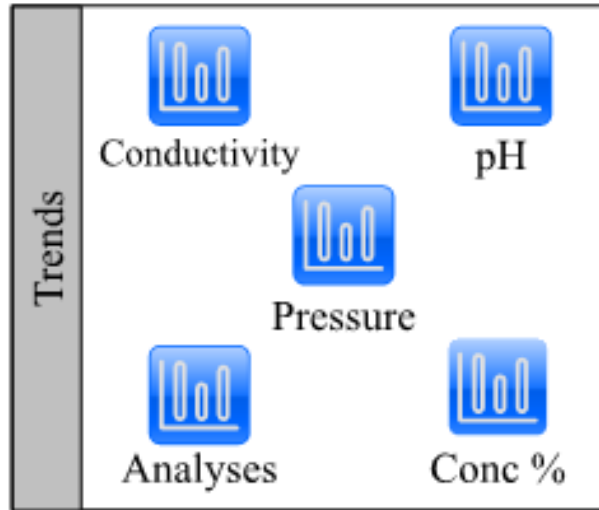
Select this option to feed chemical for at a specified rate per hour. The feed will be distributed evenly throughout the hour. Acceptable values are 1 thru 59.

Timed Addition: 0 Min/Hr **Start Pump**

Gallon Addition: 0 Gal **Start Pump**

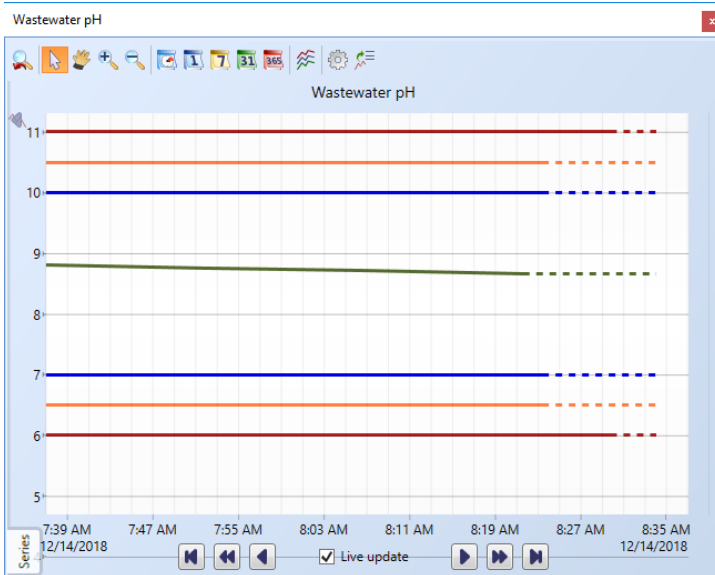
Select this option to manually operate the pump to add specified number of gallons. Remember that 1 gallon is equal to 17 minutes of runtime.

TRENDS



- ▶ Trends can be viewed by clicking the blue trend buttons on the Detail Screens
- ▶ More trends are available in the system tree when logged in with supervisor credentials

Wastewater pH Trend Log




Stage 1 Titration Log

Stg 1 mL - Change of Value Trend Log List (Titration Log)


Time stamp	Value	Events	Comment	User
3/20/2018 8:24:36 AM	12.50			
3/20/2018 6:40:50 AM	13.90			
3/19/2018 2:20:47 PM	12.00			
3/19/2018 2:20:36 PM	13.00			
3/19/2018 2:20:23 PM	14.00			
3/19/2018 2:19:37 PM	15.00			
3/19/2018 2:18:28 PM	18.10			
3/19/2018 10:39:06 AM	11.50			
3/19/2018 10:10:12 AM	10.00			
3/19/2018 9:28:08 AM	11.24			
3/19/2018 8:17:47 AM	3.15			
3/19/2018 8:13:01 AM				admin

REPORTS



Chemical Usage Report

Chemical Stage 1	Date	Chemical Used (GL)
	Mar 19, 2018	13.62806
	Mar 20, 2018	26.23171
Total		39.85977



Conveyor Run Data - Last 7 Days (SAMPLE DATA)

Daily Runtime Totals	
Date	Run Time (hours)
Mar 19, 2018	9
Report Total Runtime (hours)	

Conveyor Events			
Date Time Stamp	Run Status	Operator Comment	
Mar 19, 2018 7:00 AM	RUNNING		
Mar 19, 2018 10:00 AM	STOPPED		
Mar 19, 2018 10:05 AM	RUNNING		
Mar 19, 2018 11:00 AM		Break	
Mar 19, 2018 1:00 PM	STOPPED		
Mar 19, 2018 1:25 PM	RUNNING		
Mar 19, 2018 1:30 PM		Conveyor Issue	
Mar 19, 2018 4:30 PM	STOPPED		

- ▶ Three reports are configured at start-up:
 - ▶ Top System Alarms Weekly Report
 - ▶ Monthly Chemical Usage Report
 - ▶ Weekly Runtime Report

NETWORK & REMOTE ACCESS

- ▶ Network and Internet connectivity provides:
 - ▶ Viewing dashboard from any PC on local network (with the required login credentials)
 - ▶ Emailed alarms
 - ▶ Emailed reports
 - ▶ Remote support

Add-On Features

- ▶ Parts tracking by hour, shift, month, and year
- ▶ Control oven temperatures
- ▶ Control line speed
- ▶ Customized reports
- ▶ Powder, Liquid, E-Coat monitoring/reporting