



FRAMEWORX

The Affordable Platform with Limitless Possibilities
for Enabling Industrial Applications



Complete



Powerful



Cost-Effective

9.1 Demo Projects and Features Highlights



PROJECT HIGHLIGHTS

PROCESS

The Process Plant Demo shows you some of the features you can use in building your own Enterprise SCADA systems.

Highlights:

High Performance Graphics

Traditional Graphics

Animation and State

Alarms and Alarm History

Pop-Up Context Windows

Customizable Trend Charts

Reports

System & Project Info

ANDON

The Andon & Discrete Production Demo showcases some of the features you can use in building a real-time Andon / Discrete Production system.

Highlights:

- Animated Production Overview
- Interactive Controls
- Include ERP Data for Scrap Cost
- Andon & KPI Dashboards
- Efficient Alarm Management
- Alarms & Alarm History
- Maintenance Logbook
- Multiple Menu Options
- KPI, OEE, and Other Calculations

ASSETS

The Assets & Alarm Monitoring Demo showcases some of the features you might use in a global enterprise for monitoring remote plants and their assets and alarms.

Highlights:

- Interactive Map Integration
- Asset Trees & Templates
- Network Diagnostics
- KPI Dashboard Tiles
- Plant Overview
- Real-Time Performance Dashboard
- Simulation Interface
- 3D Interactive Images
- Machine Learning Integration
- Context-Related Popups
- Email, SMS, Voice Notifications
- Alarms / History / Audit Information

OEE

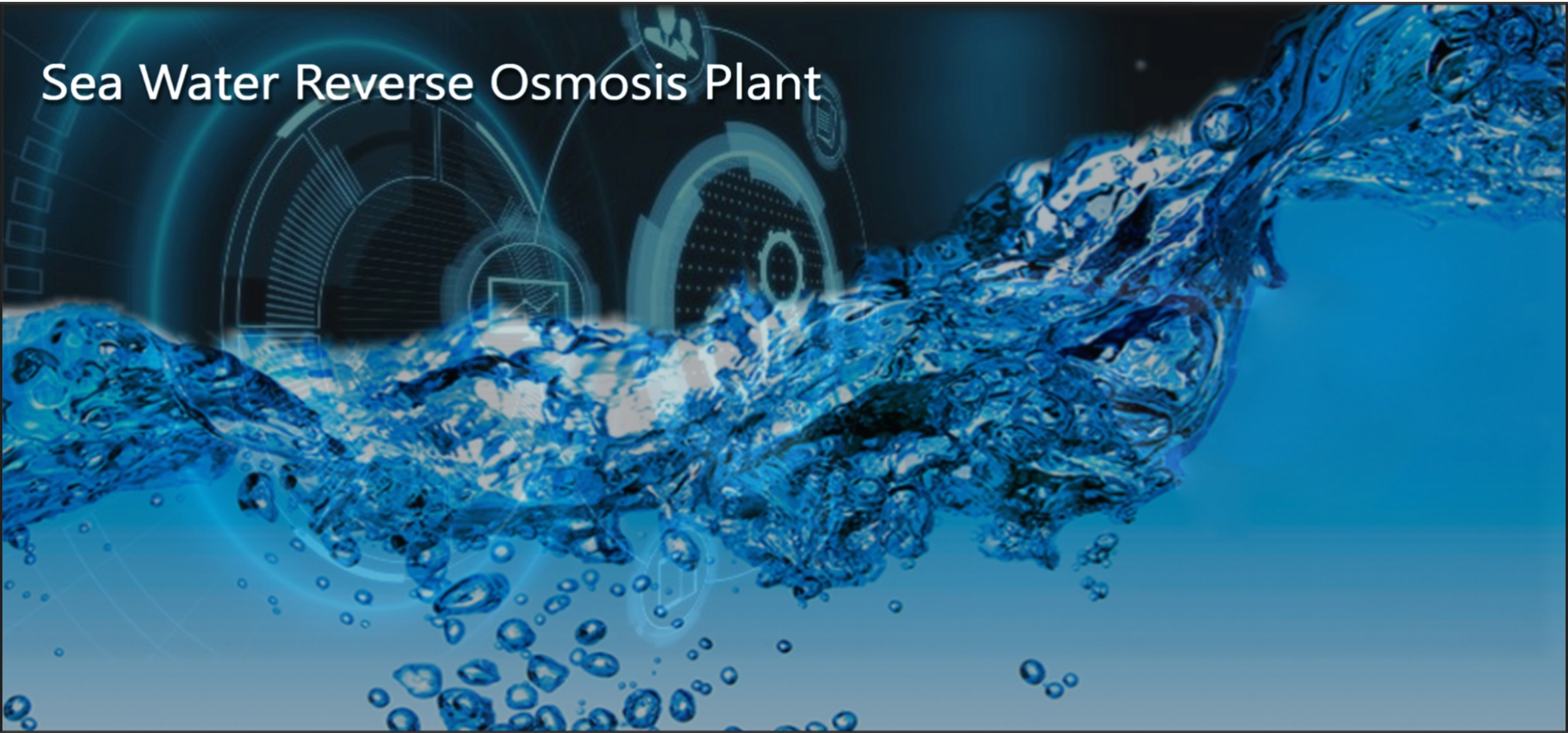
The "What is OEE?" Demo is a multi-faceted project.

- It teaches you what "OEE" is by example, and by giving you sliders to experiment with and see the impact each component has in real-time.
- It contains an animated bottling line with simulator that you can control – impacting your OEE!
- See examples of various errors on a production line that can impact your OEE components – Availability, Performance, and Quality
- See how easy reporting can be, including how to include charts and data grids

Highlights:

- Digital Twin Simulation
- Interactive "What is OEE" tutorial
- Multiple Menu options
- Realistic Bottling equipment animation with simulator – change how the machine performs!
- Drive values and animations using in-project controls (for bottling line speed and errors, OEE math, and interactive sliders)
- Example OEE Errors show off hover tool-tips
- Pop-Up Simulator Window
- Real-Time Reports and Charts

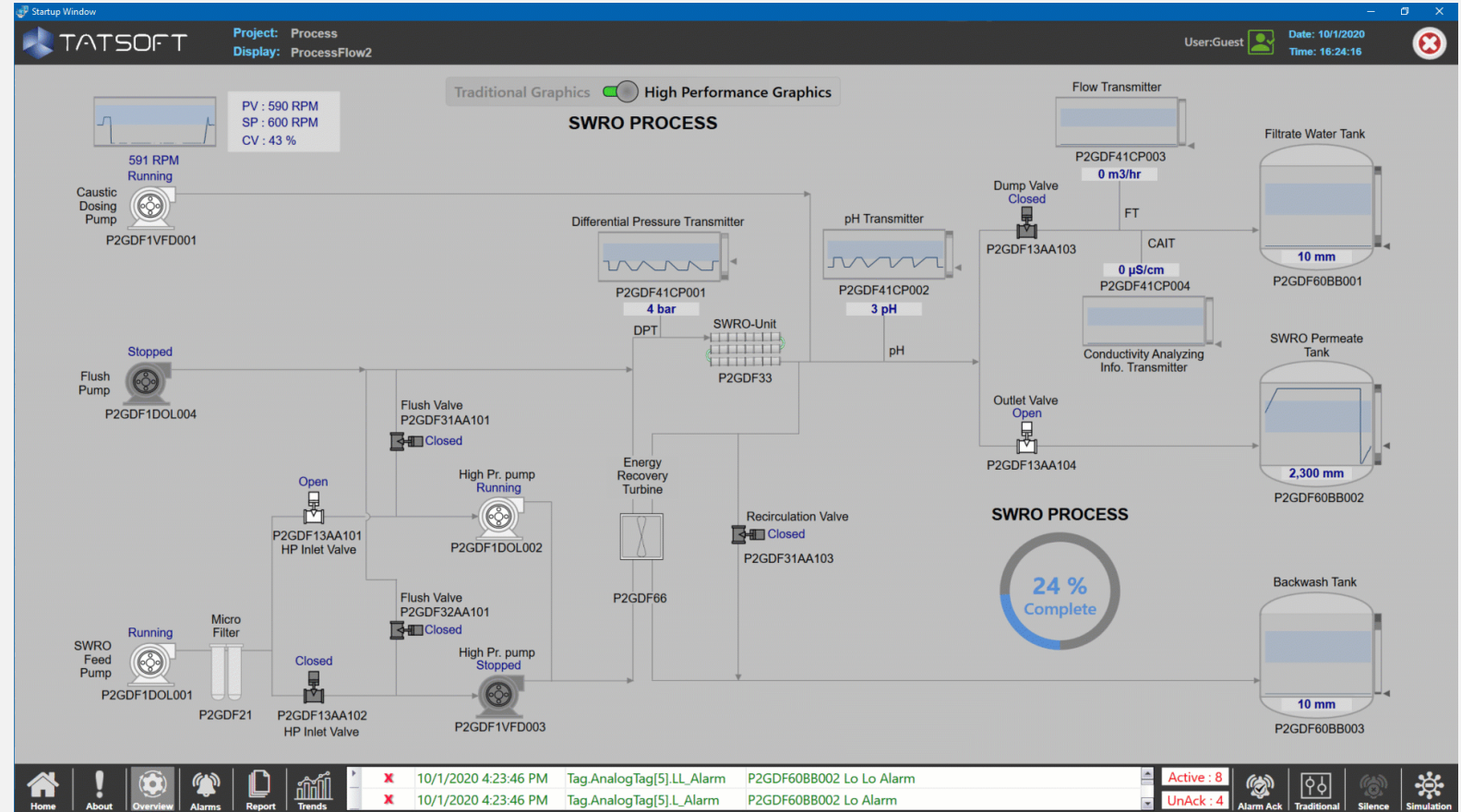
Sea Water Reverse Osmosis Plant

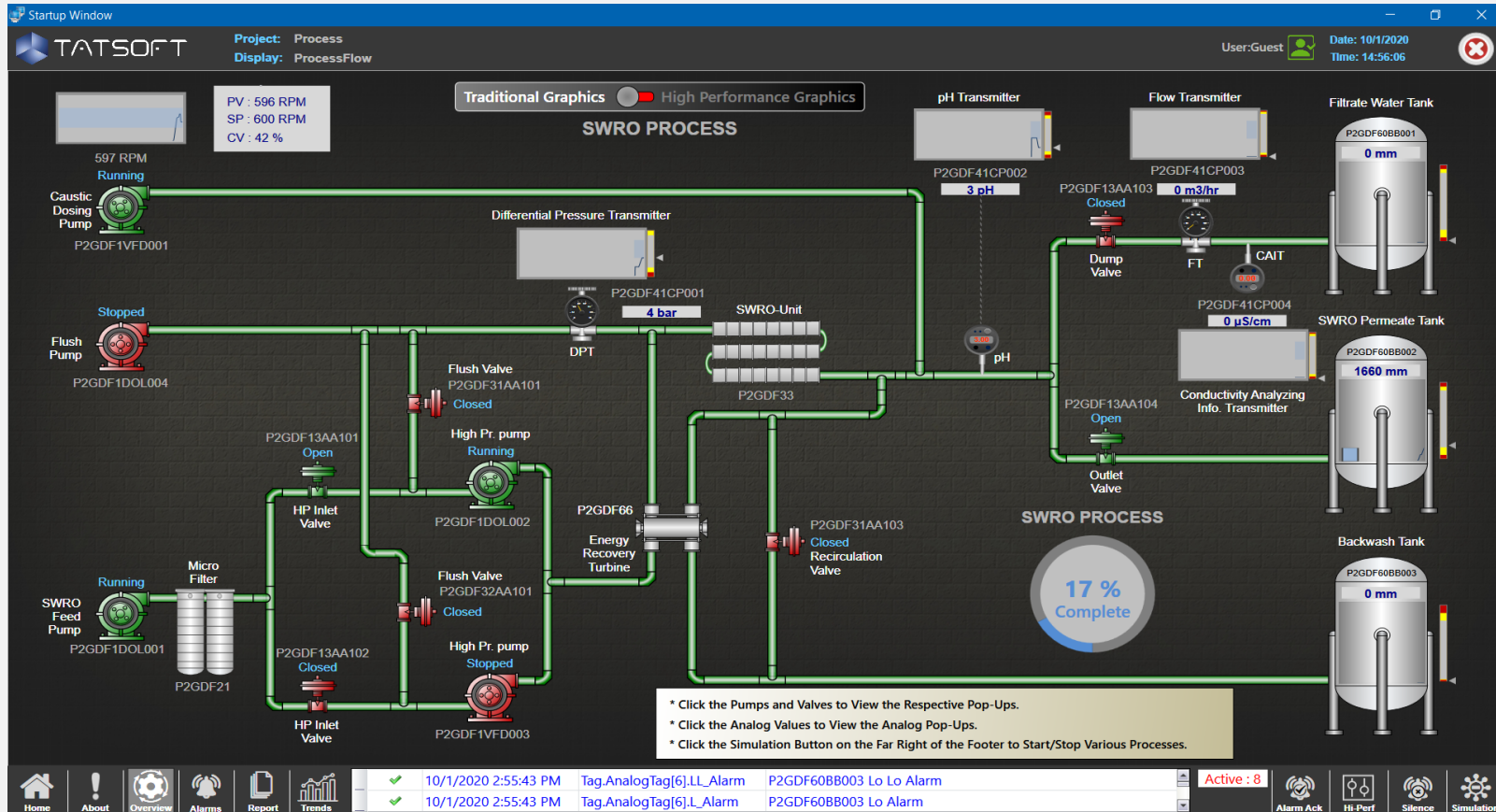


The Process Plant Demo shows you some of the features you can use in building your own Enterprise SCADA systems.

Highlights:

- High Performance Graphics
- Traditional Graphics
- Animation and State
- Alarms and Alarm History
- Pop-Up Context Windows
- Customizable Trend Charts
- Reports
- System & Project Info





Traditional Graphics and Powerful Symbols allow you to quickly create and customize your projects of any size.

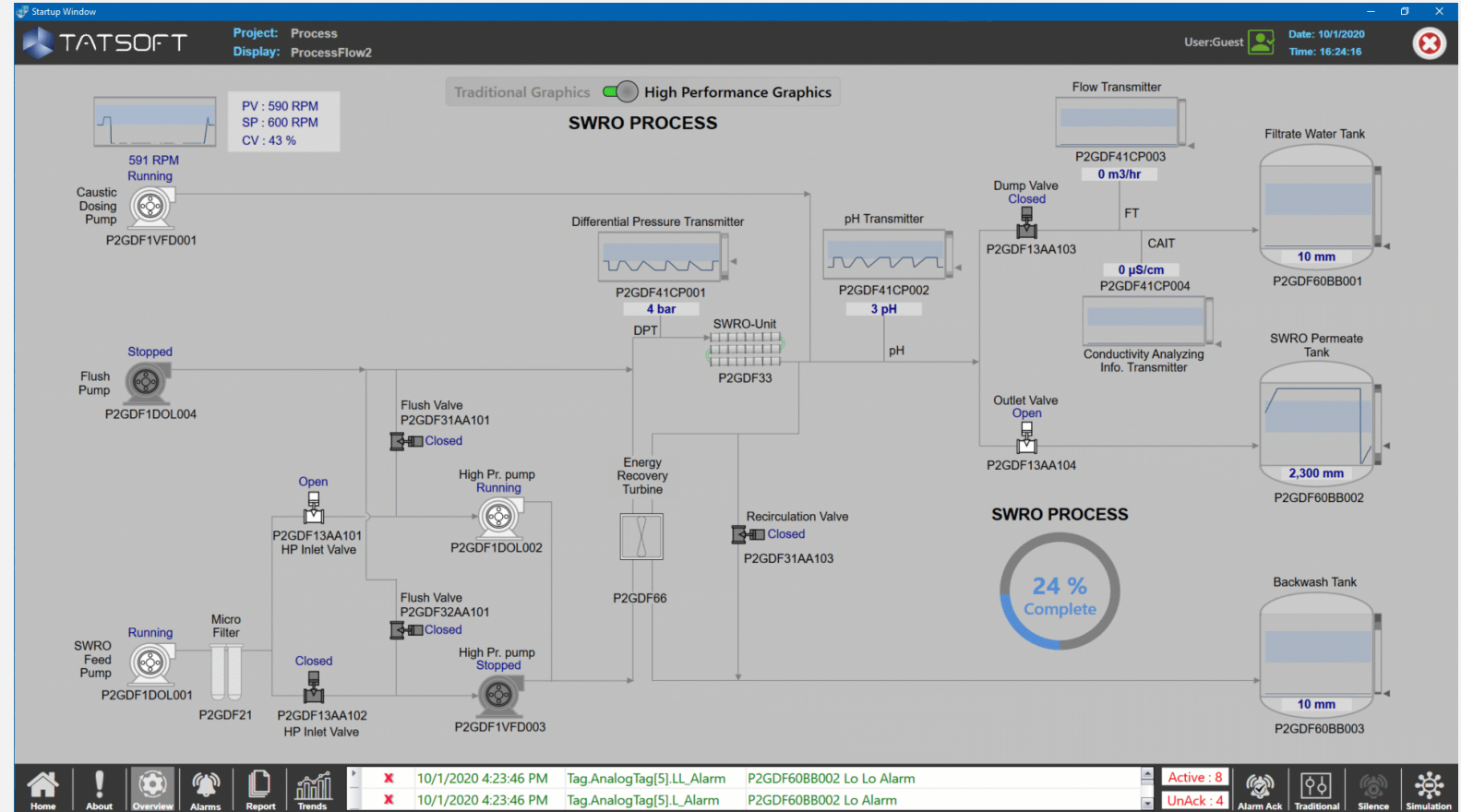
Build Enterprise software that runs on multiple platforms - Windows, Linux, iOS, and HTML5, all from the same engineering environment.



HIGH PERFORMANCE GRAPHICS

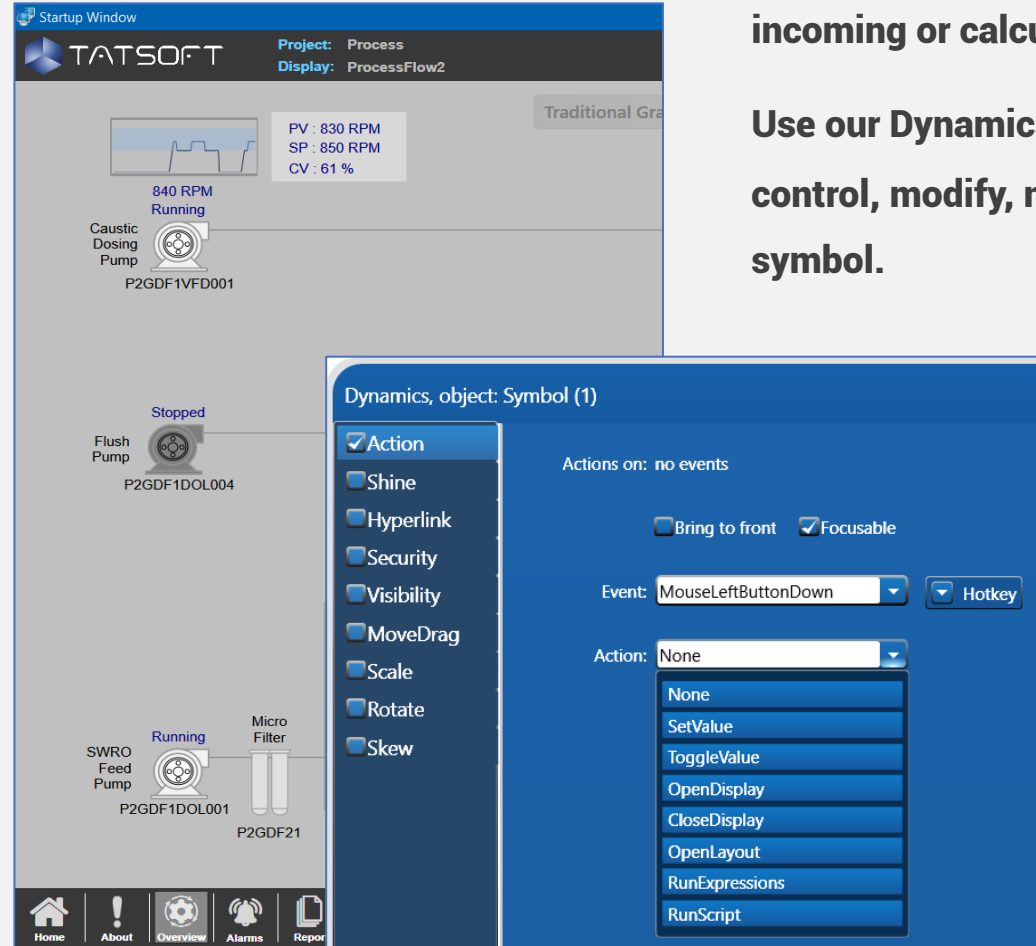
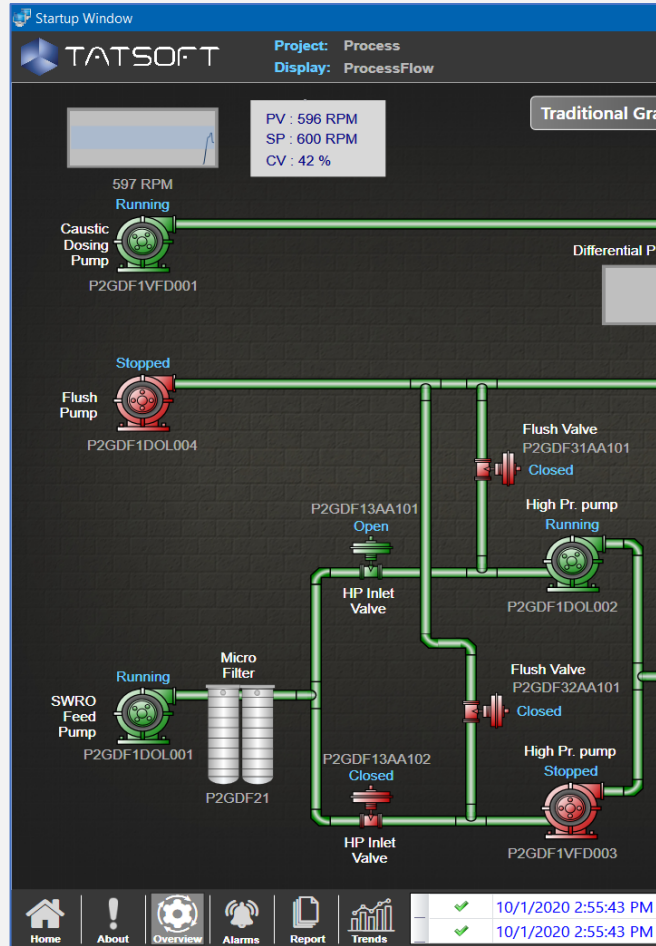
High Performance Graphics allows your operators to quickly find and focus on the issues they need to respond to in order to keep your processes running at top efficiency.

Easily modify symbols to include as little or much animation as you like.





ANIMATION AND STATE



Easily customize symbols to show state based on incoming or calculated values, in real-time.

Use our Dynamics menu to easily take an action, control, modify, move, hide and more for any symbol.



ALARMS AND ALARM HISTORY

Built in Alarm Management, Alarm History, Alarm Acknowledgement make alerting and recording your alarms super easy.

Easily customize what you want to show.

Show alarms on screen, or in a report

Acknowledge and / or Silence alarms

Use Alarms to alert maintenance, management, or anyone via options for on-screen messages, emails, SMS (text), even Voice Alerts – all built in!

The screenshot displays two overlapping windows of the TATSOFT Alarm Management interface. The top window shows the 'Active Alarms' view, and the bottom window shows the 'Alarm History' view. Both windows have a header with the TATSOFT logo, 'Project: Process', and 'Display: AlarmPage'. A toggle switch allows switching between 'Active Alarms' and 'Alarm History'.

Active Alarms View:

Ack	Active Time	Ack Time	TagName	Message
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			
✓	10/5/2020			

Alarm History View:

Ack	Active Time	Ack Time	TagName	Message
✗	10/5/2020 11:07:29 AM		Tag.AnalogTag[5].HH_Alarm	P2GDF60BB002 Hi Hi Alarm
✗	10/5/2020 11:07:23 AM		Tag.AnalogTag[5].H_Alarm	P2GDF60BB002 Hi Alarm
✓	10/5/2020 11:05:40 AM	10/5/2020 11:05:41 AM	Tag.AnalogTag[6].LL_Alarm	P2GDF60BB003 Lo Lo Alarm
✗	10/5/2020 11:05:40 AM		Tag.AnalogTag[6].LL_Alarm	P2GDF60BB003 Lo Lo Alarm
✗	10/5/2020 11:05:40 AM		Tag.AnalogTag[6].L_Alarm	P2GDF60BB003 Lo Alarm
✗	10/5/2020 11:05:40 AM		Tag.AnalogTag[5].LL_Alarm	P2GDF60BB002 Lo Lo Alarm
✓	10/5/2020 11:05:40 AM	10/5/2020 11:05:40 AM	Tag.AnalogTag[5].LL_Alarm	P2GDF60BB002 Lo Lo Alarm
✗	10/5/2020 11:05:40 AM		Tag.AnalogTag[5].L_Alarm	P2GDF60BB002 Lo Alarm
✓	10/5/2020 11:05:40 AM	10/5/2020 11:05:40 AM	Tag.AnalogTag[4].LL_Alarm	P2GDF60BB001 Lo Lo Alarm



POP-UP CONTEXT WINDOWS

Process Custom **SWRO Filling** Filtrate Filling Backwash Filling

Stop Start Reset

In the Sea Water Reverse Osmosis (SWRO) process, the Feed Pump. The semi-filtered water then passes through the HP Pumps, in order to generate pressure for the SWRO-Unit, where suspended particles are filtered out.

The Energy Recovery Turbine is used to maintain the pressure of the pumps. When the Pressure Drop (DP) value of the pumps run to increase the pressure. When the pressure drops, the Energy Recovery Turbine is used to maintain the pressure.

If the pressure drops, the Energy Recovery Turbine is used to maintain the pressure.

P2GDF13AA101 Properties
HP Inlet Valve-1

General
Status : Open

Interlock Status
Storage Tanks Not Full
Pressure Setpoint Ok

P2GDF41CP002 Properties
pH Analyzer **Real-time** Duration (hh:mm:ss) 00:05:00

Scale
Raw Min 0
Raw Max 32767
EU Min 0.0
EU Max 14.0

Set Point
Lo Lo 1.00
Lo 2.00
Hi 12.00
Hi Hi 13.00

Other
Unit pH

Safe Operation
Min 40 %
Max 80 %

10/5/2020 11:11:06 11:16:06

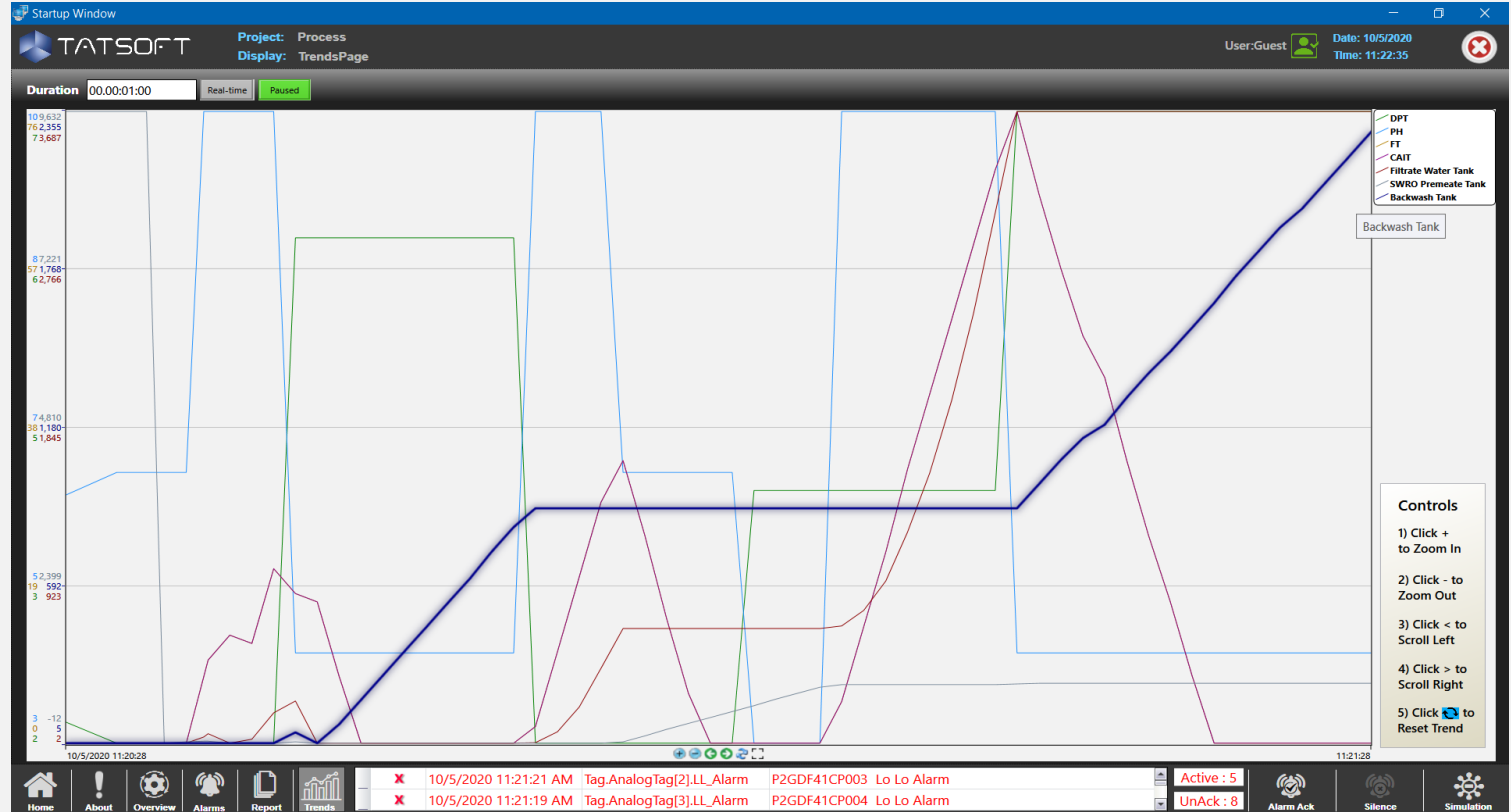
Easily provide context information via pop-ups, tool-tips, trends, charts, or entire screens.



CUSTOMIZABLE TREND CHARTS

Powerful chart customizations are made easy with Tatsoft's trend chart configuration interface.

Built-in date selectors, zoom-in/out, highlight pen, show/hide pens, multiple-axes and more!



Startup Window

TATSOFT Project: Process Display: ReportPage User: Guest Date: 10/5/2020 Time: 11:23:37

From 10/05/2020 11:06 AM To 10/05/2020 11:08 AM Run Report Print Report Default Data

Process Parameters Information

10/5/2020 11:23:25
DESKTOP-005GP2T
192.168.254.12

From : 2020-10-05 11:06:08 To : 2020-10-05 11:08:38, Data rate (10 Sec)

Date & Time	P2GDF41CP001 (0-10 bar)	P2GDF41CP002 (0-14 ph)	P2GDF41CP003 (0-225 m3/hr)	P2GDF41CP004 (0-400 uc/cm)	P2GDF608B001 (0-10000 mm)	P2GDF608B002 (0-10000 mm)	P2GDF608B003 (0-5000mm)
10/5/2020 11:08:34.953 AM	2	6	0	0	0	9590	0
10/5/2020 11:08:31.577 AM	2	3	0	0	0	9590	0
10/5/2020 11:08:04.925 AM	4	3	0	0	0	9590	0
10/5/2020 11:08:00.326 AM	2	3	0	0	0	9590	0
10/5/2020 11:07:34.921 AM	2	6	0	0	0	9590	0
10/5/2020 11:07:24.906 AM	4	3	0	0	0	9140	0
10/5/2020 11:07:14.905 AM	4	3	0	0	0	8260	0
10/5/2020 11:07:04.891 AM	4	3	0	0	0	7270	0
10/5/2020 11:06:54.877 AM	2	6	0	0	0	6390	0
10/5/2020 11:06:44.874 AM	2	6	0	0	0	5510	0
10/5/2020 11:06:34.874 AM	2	6	0	0	0	4630	0
10/5/2020 11:06:24.864 AM	4	3	0	0	0	3750	0
10/5/2020 11:06:14.859 AM	4	3	0	0	0	2760	0

TATSOFT, LLC PROCESS DEMO APPLICATION

1 of 1

Home About Overview Alarms Report Trends

✖ 10/5/2020 11:21:21 AM Tag.AnalogTag[2].LL_Alarm P2GDF41CP003 Lo Lo Alarm Active : 5
✖ 10/5/2020 11:21:19 AM Tag.AnalogTag[3].LL_Alarm P2GDF41CP004 Lo Lo Alarm UnAck : 8

Alarm Ack Silence Simulation

Easily generate reports on-demand or on a schedule.

Include real-time up-to-date charts and data grids when the reports are run.

Easily customize the report layout to meet regulatory layouts.

View, Save, or e-mail reports – all from within your project!



SYSTEM & PROJECT INFORMATION

Access project and client information easily from within your project. Any item in a client, server, or project is easily usable and viewable as you need.

You could use this information to help drive security (for example, who can see what), track connections (IP, Computer name, etc), and more!

The screenshot shows a software window titled 'About' with a close button in the top right corner. The window is divided into two main sections: 'Project Information' and 'Computer Information'. The 'Project Information' section lists the following details: Name: Process; Path: C:\Users\... \Downloads\Project - Process\; Description: Sample Process Plant; Last modified: 9/17/2020 7:29:56.825 AM; Build: 6. The 'Computer Information' section lists: Network name: [redacted]; IP: 192.168.254.12; Project Version: fs-2018.1.48.

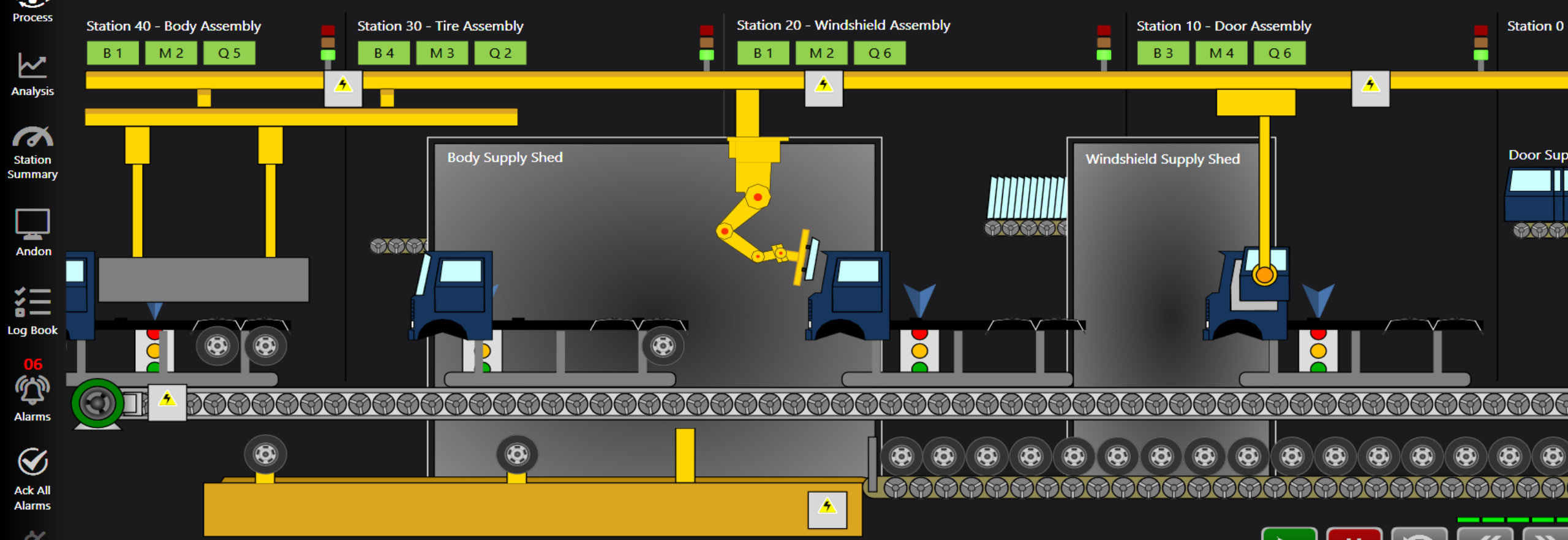
Project Information	
Name:	Process
Path:	C:\Users\... \Downloads\Project - Process\
Description:	Sample Process Plant
Last modified:	9/17/2020 7:29:56.825 AM
Build:	6

Computer Information	
Network name:	[redacted]
IP:	192.168.254.12
Project Version:	fs-2018.1.48



ANDON & DISCRETE PRODUCTION

Move Top Home Process Analysis Station Summary Andon Log Book Alarms Ack All Alarms Silence Alarms	OEE 86%	Availability 88%	Performance 100%	Quality 98%	Set Speed 5 JPM	Actual Speed 5 JPM Running	Actual Production 355	Target Production 2400	Stoppage Co 9
---	------------------------------	---------------------------------------	---------------------------------------	----------------------------------	----------------------------------	---	--	---	--------------------------------



To Simulate Operator Box Click on Icon, Available in Each Station

Start	Pause	Reset	Slow	Fast



ANDON & DISCRETE PRODUCTION

The Andon & Discrete Production Demo showcases some of the features you can use in building a real-time Andon / Discrete Production system.

Highlights:

- Animated Production Overview
- Interactive Controls
- Include ERP Data for Scrap Cost
- Andon & KPI Dashboards
- Efficient Alarm Management
- Alarms & Alarm History
- Maintenance Logbook
- Multiple Menu Options
- KPI, OEE, and Other Calculations





ANIMATED PRODUCTION OVERVIEW



Animated representations of your production make it easy to keep an eye on production in real-time.

Animate a work cell, line, or even an entire plant.

Easily mimic real-time production movement, state, and error conditions.

Create Simulation Controls to mimic real-life situations to enhance training and show the impact various scenarios have on output and profitability.



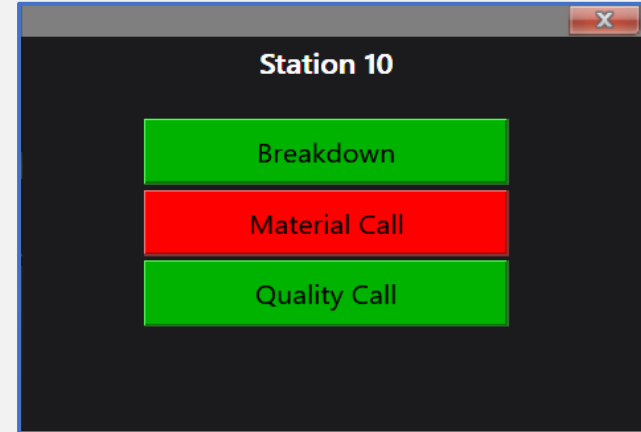
INTERACTIVE CONTROLS

Build intuitive Interactive Controls to improve the efficiency and quality of your operations.

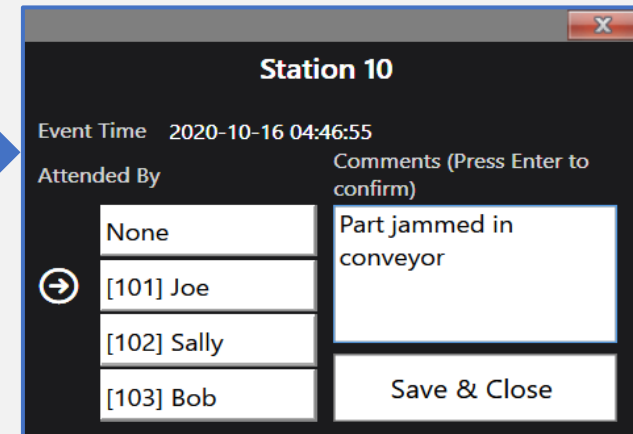
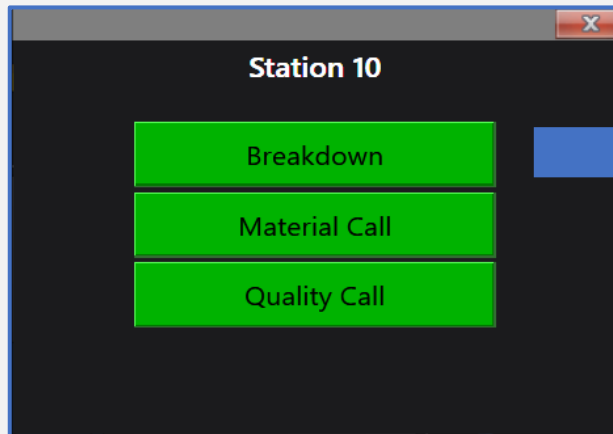
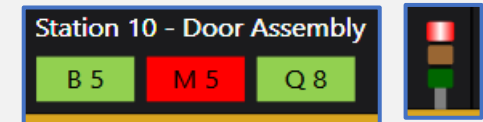
Reflect real-time conditions such as machine & product location, fault conditions, operator boxes, stack lights, and more.

Control your operations via touch on desktop, mobile, and browser.

Easily build industrial software solutions across many platforms, including Windows, Linux, iOS, and HTML5, all from the same Engineering Environment.

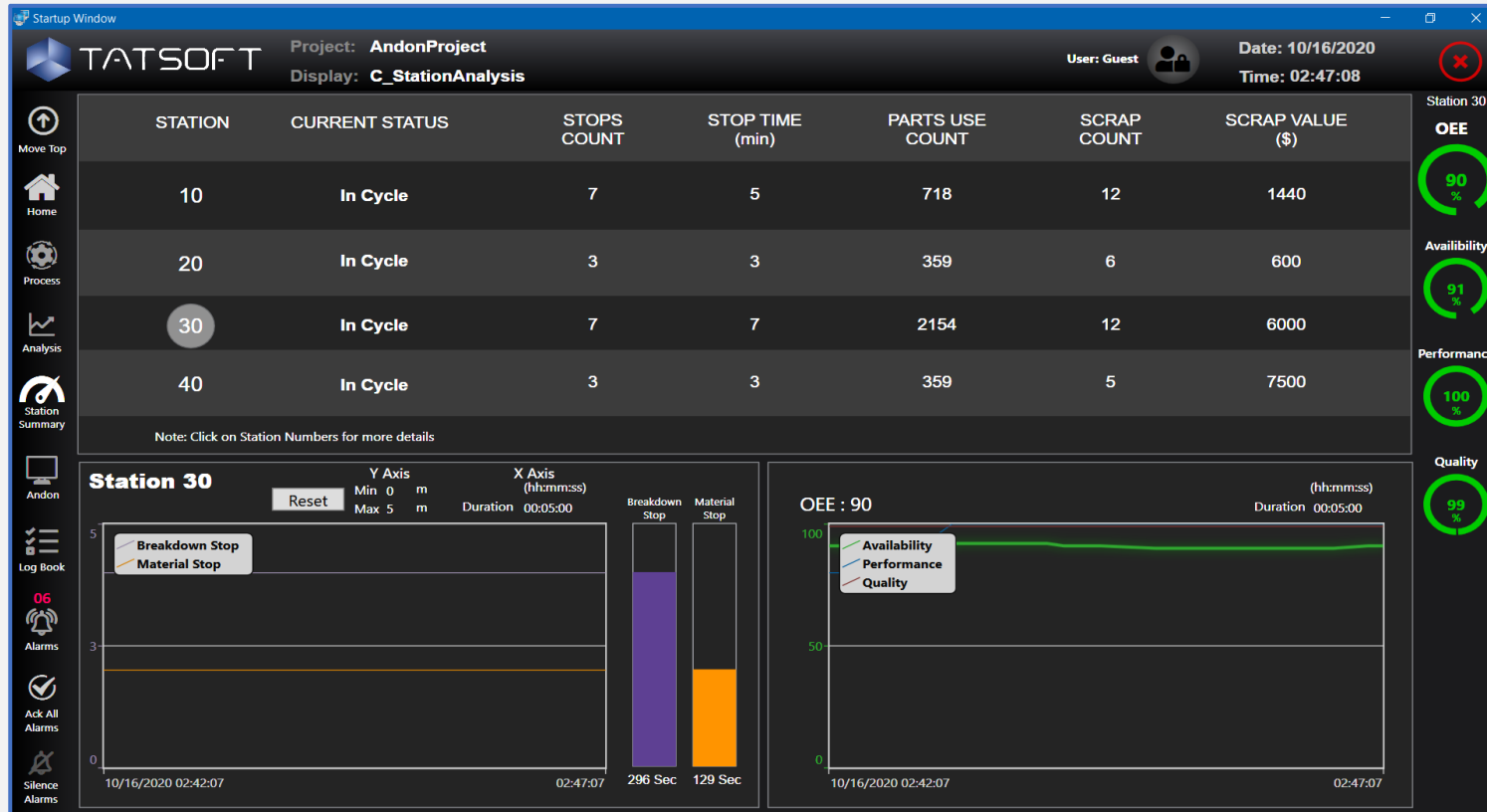


To Simulate Operator Box Click on  Icon, Available in Each Station





INCLUDE ERP DATA FOR SCRAP COST



Easily integrate data from any system: e.g. ERP, WMS, CMMS, LIMS, CRM, database, historian, and PLCs.

Use our built-in visual SQL Query Builder to build and test your SQL Queries and verify data before adding it to your project.

Improve employee engagement by adding relevant extra-production data such as scrap cost or lost opportunity value (e.g. Downtime caused # of pallet losses during shift.)

Use ERP data with production data to help determine what maintenance should fix next based on cost, profit loss potential, etc.



ANDON & KPI DASHBOARDS

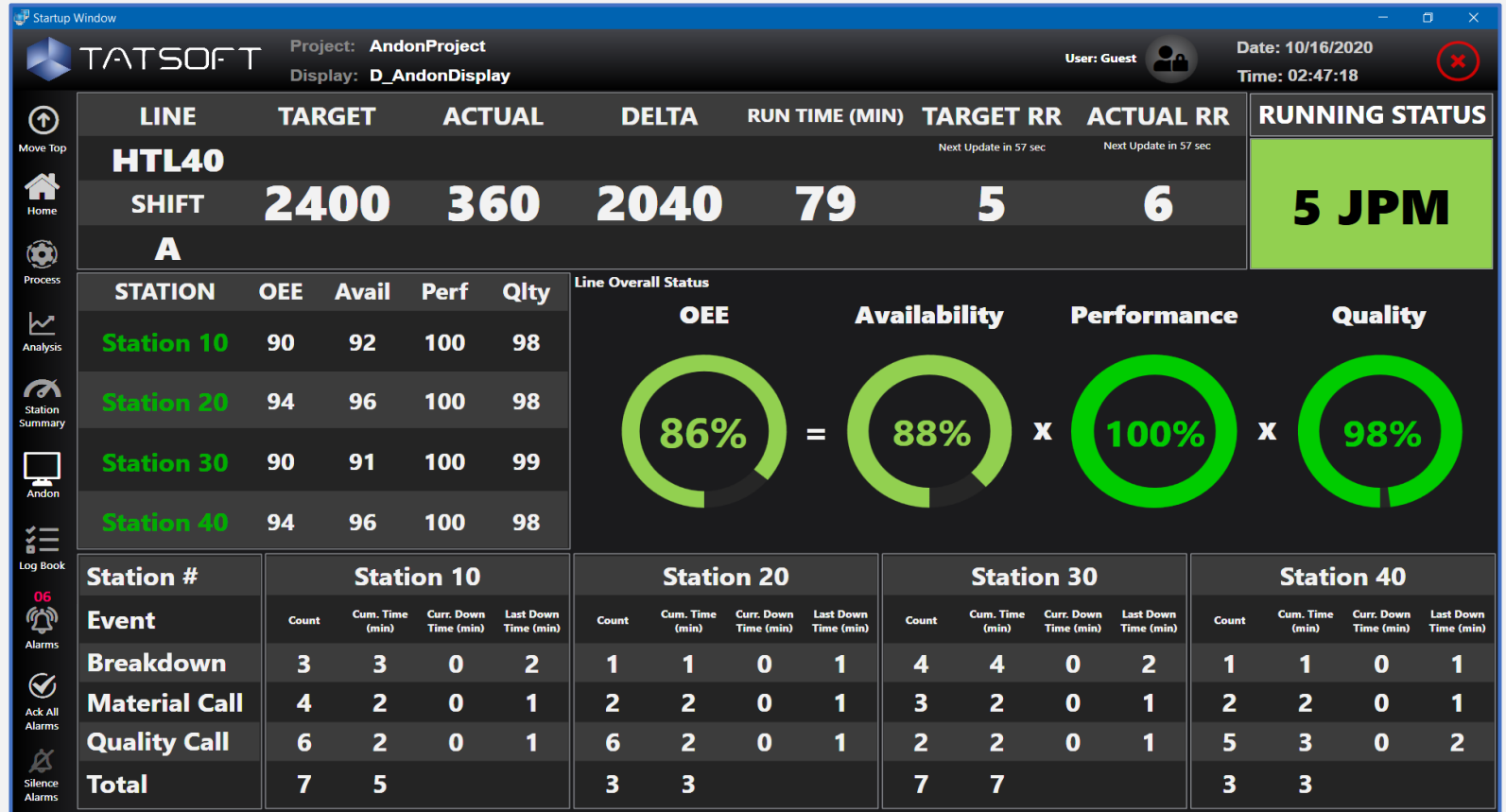
With an Andon / KPI Dashboard, whether overhead, on your phone, or at your desk, get a quick glance at the stats you need anytime.

Easily define KPI gauge color bands to quickly show when things are running great...or not.

Keep the entire team on the same page with how things are going, at a glance.

Help foster friendly team competition by displaying multi-line stats in one overview.

Make it easy to spot who's having a great run so you can congratulate them!





EFFICIENT ALARM MANAGEMENT

No Alarms Active



Alarms

Acknowledge All Alarms



Ack All Alarms

Alarm Sounds ON



Silence Alarms



Alarms



Ack All Alarms



Silence Alarms

5 Active, Unacknowledged Alarms

Acknowledge All Alarms

Alarm Sounds OFF

Make it easy to see, respond, and control alarm messages from any screen.

This project showcases 4 alarm management features all from the menu so you can manage things regardless of what other screen you may be using.

Visual symbols and colors help identify when there are alarms, and shows you a count of how many unacknowledged alarms there are.

Easily silence alarms or even acknowledge them all at once.

And the color and size effects help you know when you've enabled the "silence alarms" feature.



ALARMS & ALARM HISTORY

FactoryStudio has built-in Alarm Management, Alarm History, and Alarm Acknowledgement making alerting and recording your alarms super easy.

Quickly customize what you want to show.

Show alarms on screen, or in a report.

Trigger actions based on an alarm(s).

Maximize screen space with multiple Alarm panel types.

Several of our Pre-Built Project Templates have Alarm displays and footers already built for you. Your Welcome!

Easily Acknowledge and / or Silence alarms.

Historize Alarms, Acknowledgements, messages, how long it took to acknowledge, and more.

Use our built-in database to use alarms right out-of-the-box. Or use it as a store-and-forward system to your own Historian. Or both!

Startup Window Project: AndonProject User: Guest Date: 10/16/2020 Time: 02:48:47
Display: F_AlarmDisplay

Active Alarms Alarm History

Ack	Active Time	TagName	Message
X	10/16/2020 2:45:13 AM	Tag.Station30.MaterialCallPB	Material Sortage at Station-30
X	10/16/2020 2:44:10 AM	Tag.Station30.BreakdownPB	Machine Breakdown at Station-30
X	10/16/2020 2:43:55 AM	Tag.Station20.QualityCallPB	Poor Material Quality at Station-20
X	10/16/2020 2:42:36 AM	Tag.Station10.BreakdownPB	Machine Breakdown at Station-10
X	10/16/2020 2:41:20 AM	Tag.Station10.MaterialCallPB	Material Sortage at Station-10
X	10/16/2020 2:41:10 AM	Tag.Station10.QualityCallPB	Poor Material Quality at Station-10

Startup Window Project: AndonProject User: Guest Date: 10/16/2020 Time: 02:49:20
Display: F_AlarmDisplay

Active Alarms Alarm History

Ack	Active Time	TagName	Ack Time	Message
X	10/16/2020 2:45:13 AM	Tag.Station30.MaterialCallPB		Material Sortage at Station-30
X	10/16/2020 2:44:10 AM	Tag.Station30.BreakdownPB		Machine Breakdown at Station-30
✓	10/16/2020 2:43:55 AM	Tag.Station20.QualityCallPB	10/16/2020 2:48:52 AM	Poor Material Quality at Station-20
X	10/16/2020 2:43:55 AM	Tag.Station20.QualityCallPB		Poor Material Quality at Station-20
X	10/16/2020 2:43:46 AM	Tag.Station20.QualityCallPB		Poor Material Quality at Station-20
X	10/16/2020 2:42:36 AM	Tag.Station10.BreakdownPB		Machine Breakdown at Station-10
X	10/16/2020 2:41:20 AM	Tag.Station10.MaterialCallPB		Material Sortage at Station-10
X	10/16/2020 2:41:10 AM	Tag.Station10.QualityCallPB		Poor Material Quality at Station-10
X	10/16/2020 2:40:17 AM	Tag.Station10.QualityCallPB		Poor Material Quality at Station-10
X	10/16/2020 2:40:08 AM	Tag.Station10.QualityCallPB		Poor Material Quality at Station-10
✓	10/15/2020 10:10:48 AM	Tag.Station30.QualityCallPB	10/15/2020 10:10:57 AM	Poor Material Quality at Station-30
X	10/15/2020 10:10:48 AM	Tag.Station30.QualityCallPB		Poor Material Quality at Station-30
✓	10/15/2020 10:10:43 AM	Tag.Station20.MaterialCallPB	10/15/2020 10:10:57 AM	Material Sortage at Station-20
X	10/15/2020 10:10:43 AM	Tag.Station20.MaterialCallPB		Material Sortage at Station-20
✓	10/15/2020 10:10:24 AM	Tag.Station10.BreakdownPB	10/15/2020 10:10:57 AM	Machine Breakdown at Station-10
X	10/15/2020 10:10:24 AM	Tag.Station10.BreakdownPB		Machine Breakdown at Station-10



MAINTENANCE LOGBOOK

Startup Window

TATSOFT Project: AndonProject User: Guest Date: 10/16/2020
Display: E_MaintenanceLogBook Time: 02:47:42

Refresh

Maintenance Log Book

Date & Time	Station Name	Station Description	Event On Time	Event Off Time	Technician ID	Technician Name
10/16/2020 1:48:14.136 AM	Station 10	Door Assembly Machine	2020-10-16 01:48:14	2020-10-16 01:50:14	101	Joe
10/16/2020 1:48:14.757 AM	Station 30	Tire Assembly Machine	2020-10-16 01:48:14	2020-10-16 01:51:14	102	Sally
10/16/2020 2:43:09.073 AM	Station 10	Door Assembly Machine	2020-10-16 02:42:36	2020-10-16 02:43:09	101	Joe
10/16/2020 2:45:06.293 AM	Station 30	Tire Assembly Machine	2020-10-16 02:44:10	2020-10-16 02:45:06	102	Sally

10/16/2020 02:47:38
DESKTOP-005GP2T
192.168.254.12

Tech ID Tech Details

101	Joe
102	Sally
103	Bob

Tech Details Edit

Service Critical SetPoints

Station-10

10	12
----	----

Station-20

10	12
----	----

Station-30

10	12
----	----

Station-40

10	12
----	----

TATSOFT LLC. PROCESS DEMO APPLICATION

1 of 1

Description	Vendor	Purchase Date	Service Status	Event Count	Service Required Message	Edit
Station-10 Door Assembly Machine	Acme	08-14-2010	●	3	Status OK: Healthy	Edit
Station-20 Windshield Assembly Machine	Acme	08-14-2010	●	1	Status OK: Healthy	Edit
Station-30 Tire Assembly Machine	Acme	08-14-2010	●	4	Status OK: Healthy	Edit
Station-40 Body Assembly Machine	Acme	08-14-2010	●	1	Status OK: Healthy	Edit

Reporting is built-in to help you with building things like a maintenance logbook, shift report, monthly overview, even regulatory reports.

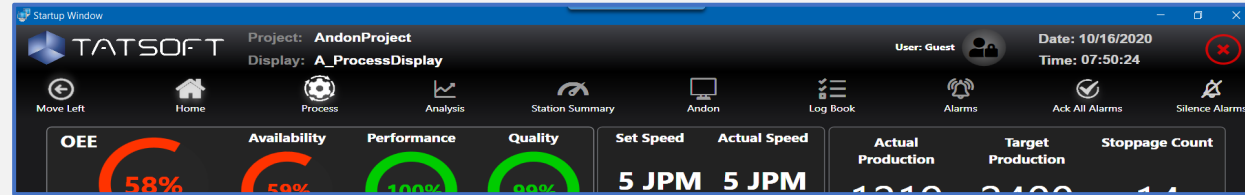
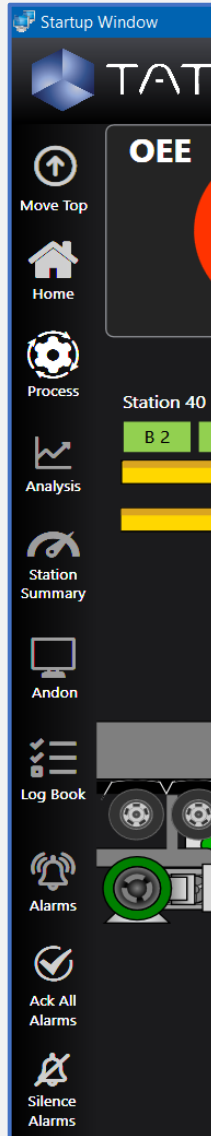
Embed dynamically created charts and data tables.

Even color specific cells based on any criteria you want at the time the report is generated.

Use our built-in email component to send a report for any situation, automatically or at the push of a button.



MULTIPLE MENU OPTIONS



FactoryStudio makes it quick and easy to use our pre-built menus, or to create your own!

New in 9.1 is our “Industrial Icon” font – making adding an icon as easy as typing a single letter – complete with font size and color control!

Our Layout feature makes it easy to place a menu wherever it makes the most sense for your application – top, left, bottom, right – just a click away.

The Andon project features 2 menus as one possibility – starts on the left, and has the option to move to the top as well!



KPI, OEE, AND OTHER CALCULATIONS



Key Performance Indicators (KPIs) are an important business tool for quickly gathering information to help speed up decision making.

With FactoryStudio you can include any calculations you need, when and where you need them.

Business metrics, OEE, JPM, Takt Time, Cycle Time, Days Worked Safe, MTTR, MTBF, even Predictive Maintenance numbers.

Show them with or without graphics, such as gauges, bar charts, trends, data grids, even enlarge them when you hover over them if you want!

Build your own library of calculations, or link to external systems for the data.

Have data from your in-house Python Machine Learning libraries – we can access that too!

We make it easy to get the data you want and display it when and where you want.



ASSETS & ALARM MONITORING

Display Assets and Alarms

Asset Monitoring Alarms

OVERVIEW CEMENT PLANT THERMAL POWER PLANT ORE HANDLING PLANT ALARMS 4

- Plants
 - P01_Cement Plant
 - P02_Thermal Power Plant
 - P03_Ore Handling Plant

Legend

- Normal
- Alarm Condition
- Critical / Fault Condition

Asset Details

Total	Connected	Healthy
03	03	03
P01 Cement Plant	950 ms	Ok
P02 Power Plant	675 ms	Ok
P03 Ore Plant	520 ms	Ok

Last Update on : 10/17/2020 00:28:46

Area

Name: P03_Ore Handling Plant
 Location: Minnesota
 Latitude: 47.42296
 Longitude: -92.94040

Ore Handling Plant

- Ore Pit ●
- Grinding ●
- Classification ●
- Flotation ●
- Dam Area ●

** Click the blinking red alarm light to be taken to an interactive 3D map of this area.

Cement Plant : Production Rate Actual Vs Plan

Actual: 350 kg/h
 Planned: 400 kg/h

87 %
 Current Production Rate

Availability Utilization: 100 % / 58 %

Th. Power Plant : Generation Rate Plan Vs Actual

Actual: 480 MW
 Planned: 500 MW

96 %
 Current Generation Rate

Availability Utilization: 100 % / 88 %

OHP : Production Rate Plan Vs Actual

Actual: 104 kg/h
 Planned: 181 kg/h

57 %
 Current Production Rate

Availability Utilization: 75 % / 34 %



ASSETS & ALARM MONITORING

The Assets & Alarm Monitoring Demo showcases some of the features you might use in a global enterprise for monitoring remote plants and their assets and alarms.

Highlights:

- Interactive Map Integration
- Asset Trees & Templates
- Network Diagnostics
- KPI Dashboard Tiles
- Plant Overview
- Real-Time Performance Dashboard
- Simulation Interface
- 3D Interactive Images
- Machine Learning Integration
- Context-Related Popups
- Email, SMS, Voice Notifications
- Alarms / History / Audit Information

The screenshot displays the TATSOFT Asset Alarm Monitoring interface. At the top, it shows the project name 'AssetAlarmMonitoring', user 'User:Guest', and date '10/17/2020'. The main navigation bar includes 'Asset Monitoring Alarms', 'OVERVIEW', 'CEMENT PLANT', 'THERMAL POWER PLANT', 'ORE HANDLING PLANT', and 'ALARMS 5'. The left sidebar contains an asset tree for 'Plants' with sub-items: P01_Cement Plant (Cement Mill, Cement Silo, Kiln, Pre-Calciner, Raw Mill), P02_Thermal Power Plant, and P03_Ore Handling Plant. Below the tree is a legend for status: Normal (green), Alarm Condition (yellow), and Critical / Fault Condition (red). The 'Asset Details' table shows 3 total, 3 connected, and 3 healthy assets, with a list of plants and their connection times and health status.

The central map shows a world map with a red dot in North America and a green dot in South America. The right side features three KPI tiles:

- Cement Plant : Production Rate Actual Vs Plan**: Current Production Rate is 60% (297 kg/h actual vs 490 kg/h planned), Availability Utilization is 85% and 49%.
- Th. Power Plant : Generation Rate Plan Vs Actual**: Current Generation Rate is 96% (480 MW actual vs 500 MW planned), Availability Utilization is 100% and 88%.
- OHP : Production Rate Plan Vs Actual**: Current Production Rate is 57% (104 kg/h actual vs 181 kg/h planned), Availability Utilization is 75% and 34%.



INTERACTIVE MAP INTEGRATION

Adding interactive maps to your solution immediately adds value and context to any project.

Create a wide variety of Geographics Information Systems (GIS), for solutions such as:

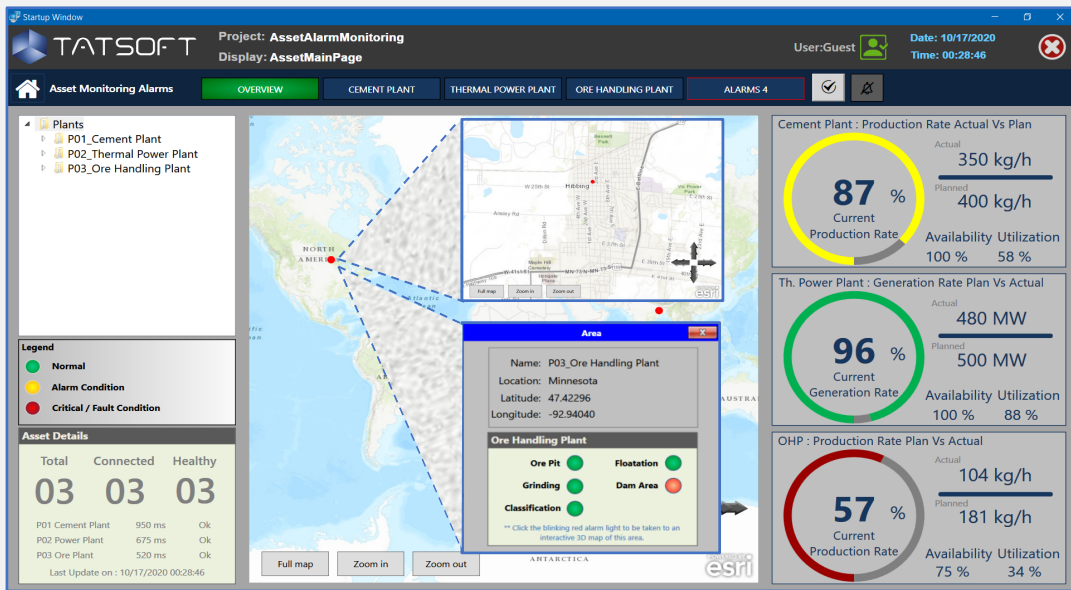
- Global or Regional Information Systems
- Network Operations Centers (NOCs)
- Transportation Management Centers
- Dispatch Solutions
- Truck and Asset Tracking (with IIOT sensors)
- Employee Tracking
- Oil / Water Remote Field Operations Centers

Use maps from ESRI or Google.

Full support for adding interactive Points of Interest (POI) and zoom.

Add dynamic, real-time assigned color to represent things such as state or value.

Click a POI to trigger an action, such as map drill in, or context pop-up.





ASSET TREES & TEMPLATES

Asset Modeling is a powerful concept for increasing the amount of “knowledge”, “context”, and “relationship” to any piece of data.

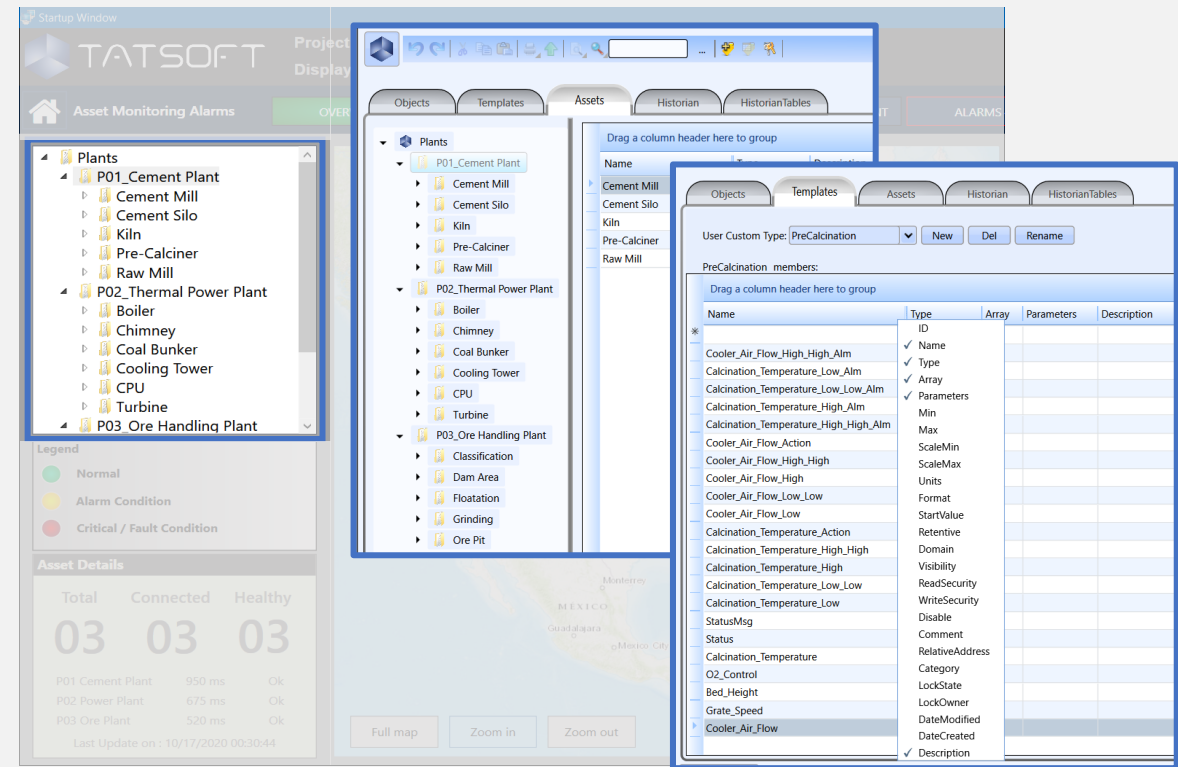
Use our built-in Template creator to define custom user data types and relationships and enable time and costs savings - from project creation to end user applications, business intelligence, and machine learning.

Easily tie those templates to an object, like a pump symbol, and everywhere you use that object ALL the related template context and data INSTANTLY comes with it, allowing you to rapidly build powerful applications for any need.

Visualize your asset structure in a familiar “file-tree” format and assign context and other data types to any item.

We also support a direct connection to OSIsoft's PI & PI AF (Asset Framework) – allowing you to see and interact with your existing AF from within your projects easily.

Using Asset Trees helps ALL your end users get the data and understanding they need without having to know things like underlying PLC tag names and structures, or guessing at needed context, such as units on a number, or location of an asset.





The screenshot displays three overlapping windows from the TATSOFT Network Diagnostics software:

- TraceWindow - AssetAlarmMonitoring:** A table showing log messages with columns for Date Time, Type, Module Name, Info 1, Info 2, and Message. The messages are filtered by 'RichClient' and 'TCPServer'.
- Property Watch - AssetAlarmMonitoring:** A window showing the 'Object Properties' for a selected 'Server' object. It lists various properties like Tag, Security, Permission, Policy, RuntimeUser, User, Alarm, Area, AuditTrail, Group, Item, PriorityItem, QueryActive, Redundancy, StoreAndForward, Device, AccessType, Channel, Node, Dataset, DB, File, Query, Table, ComputerIP, and ComputerName.
- Module Information - AssetAlarmMonitoring:** A window showing a tree view of modules and a table of their details. The table has columns for #, IP, Module Name, Time, and User.

Use our built-in diagnostic tools to help monitor the health of your communications, systems and network.

All diagnostic data is also available within your project via the tag namespace, making it nearly effortless to access and use this valuable information.

Information about your connections to networks, databases, and historians, as well as metadata about those items, in addition to your tasks, scripts, reports, and alarms can help you manage, trend, alert, and report on the health and performance of your systems.

Trigger notifications and alert the right people the first time and every time with our handy alarming and email functionality.



KPI DASHBOARD TILES

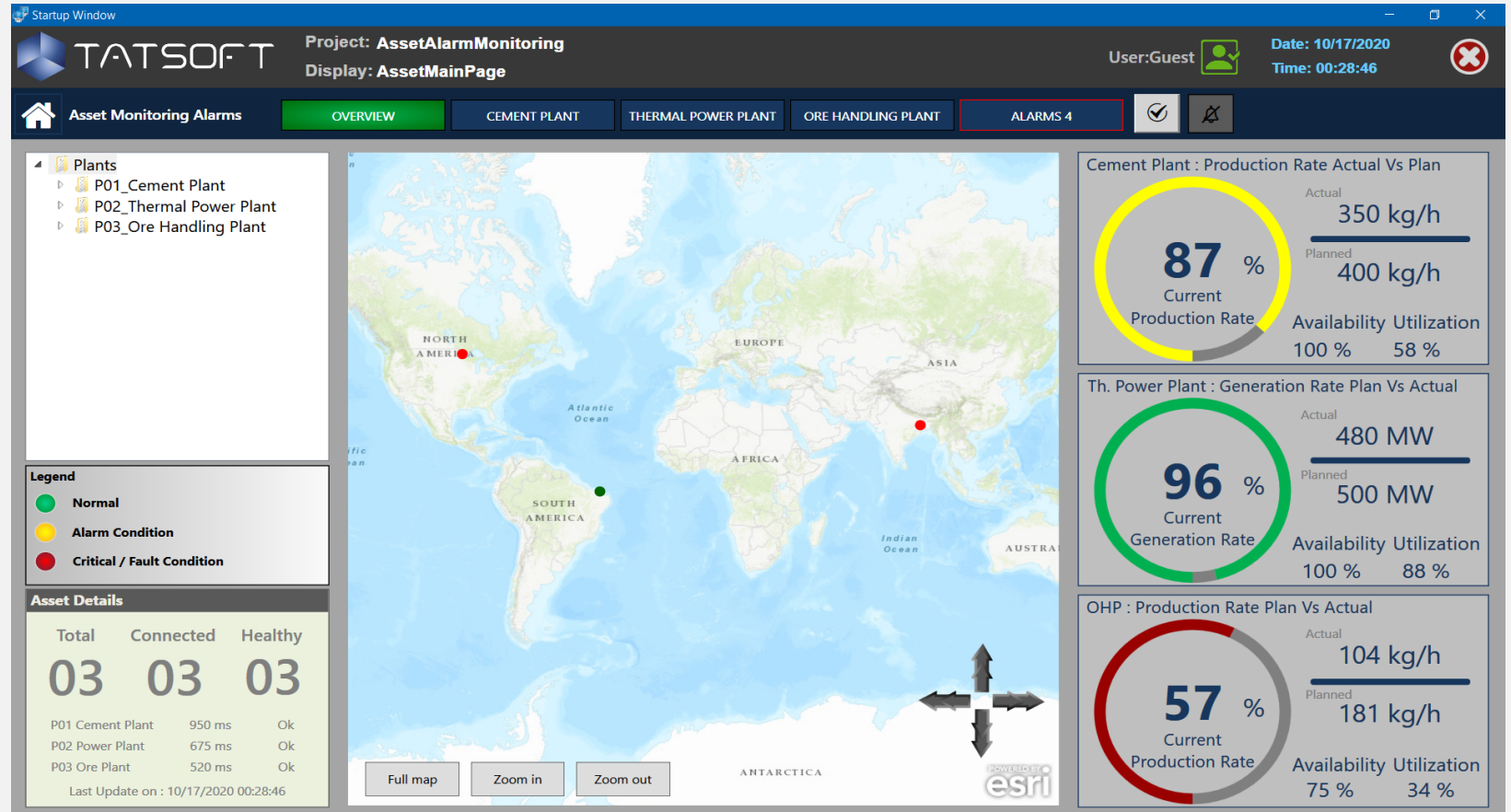
With a KPI Dashboard Tile, whether overhead, on your phone, or at your desk, get a quick glance at the stats you need anytime.

Easily define KPI gauge color bands to quickly show when things are running great...or not.

Keep the entire team on the same page with how things are going, with just a glance.

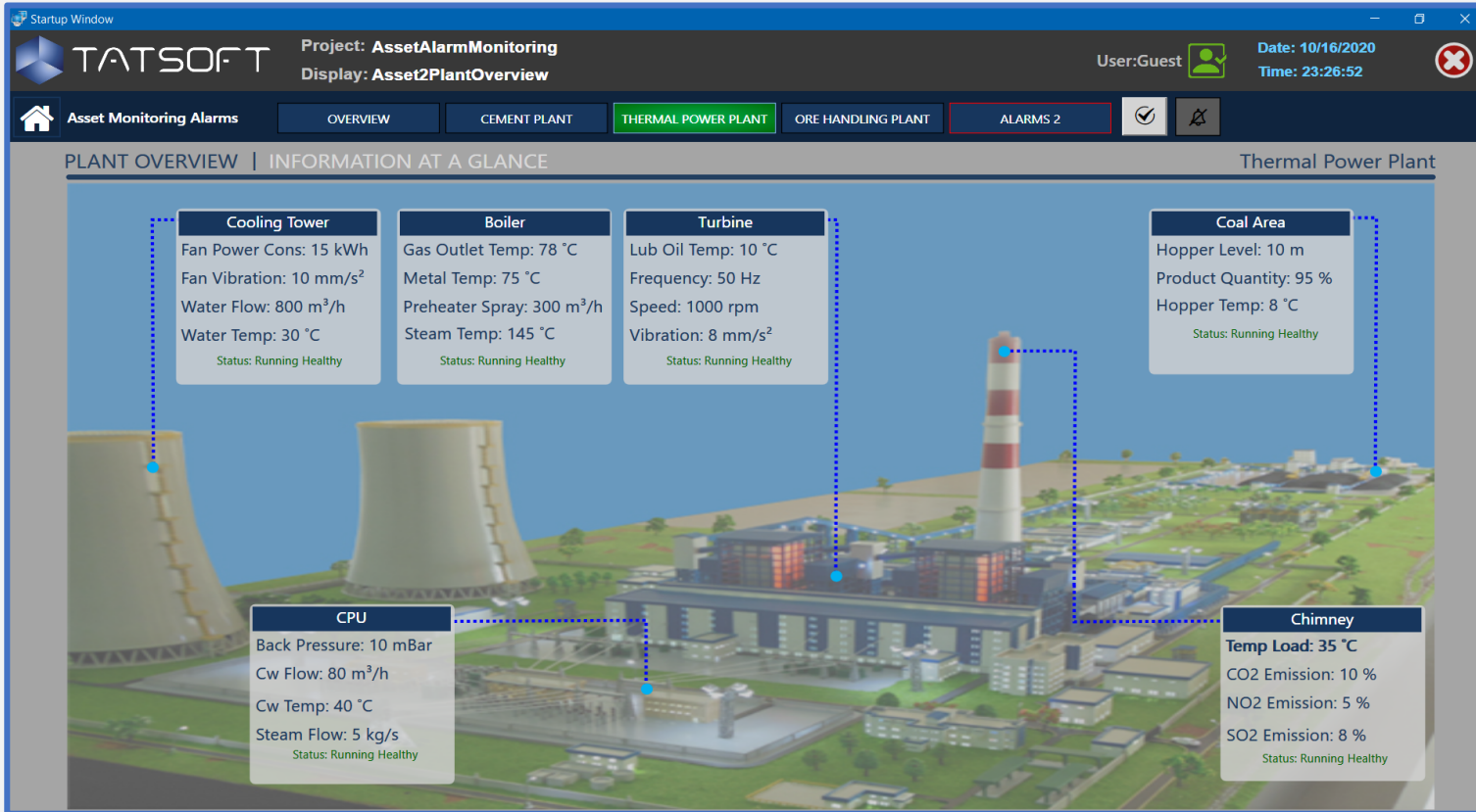
Help foster friendly team competition by displaying multi-line stats in one overview.

Make it easy to spot who's having a great run so you can congratulate them, or who's in need of additional help to get up and running again.





PLANT OVERVIEW



A plant overview screen is a great way to keep a holistic view on your entire operation.

Whether for a global enterprise, or a single line at the plant, use an overview screen to see KPIs and view relevant information such as state and status.

Display relevant external data such as weather, traffic delays, and current utility energy costs.

Drill in for more details by clicking on areas of interest or data tiles.

Use drawings, real images, and even embed live camera feeds.

Great for NOCs and conference rooms.

REAL-TIME PERFORMANCE DASHBOARD

Dashboards are a great way to keep a pulse on your plant(s) – especially when they are driven by real-time data.

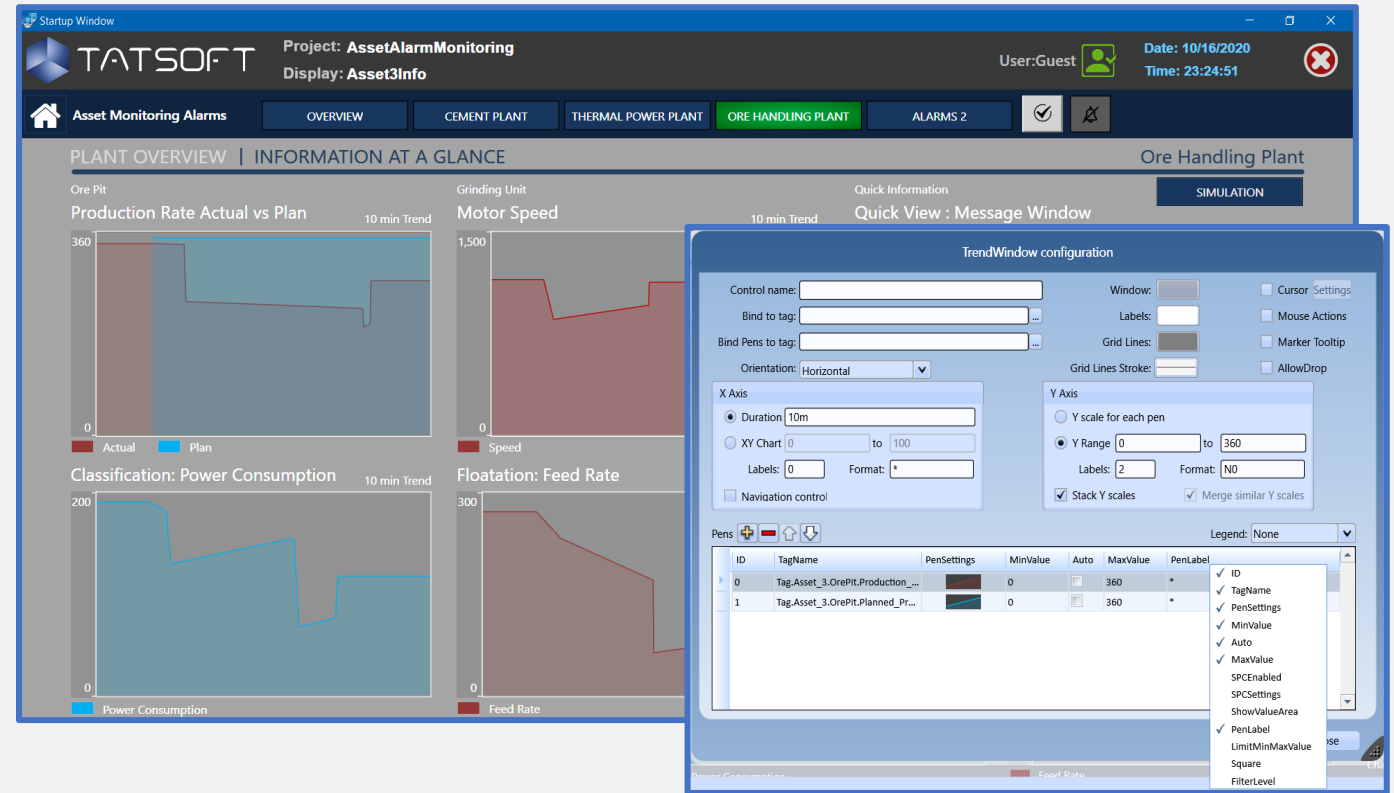
FactoryStudio, powered by FrameworkX, gives you the secure and reliable connections you need to any device, any database, any historian, any other system (such as ERP, CMMS, WMS, etc)

Help improve your business by bringing staff actionable information at a glance.

Quickly build tiles and charts to convey important real-time data. Even embed a sparkline chart in a data grid, giving you both current values and historical performance in one small and efficient location.

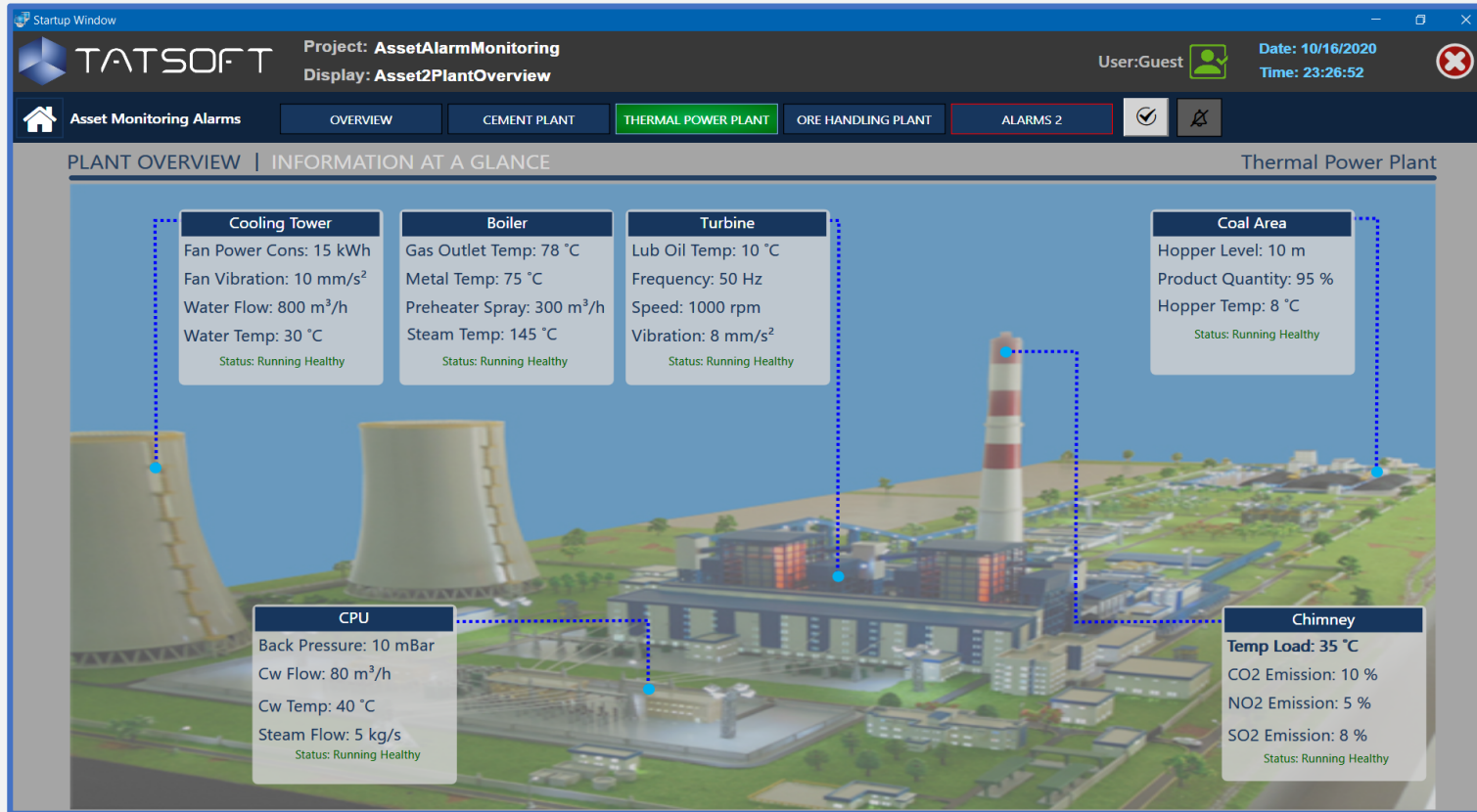
Our powerful and very customizable trend charts give you lots of options to build the types of content you need.

Multi-pen, historized annotations, and multi-axis options are just the start.





PLANT OVERVIEW



A plant overview screen is a great way to keep a holistic view on your entire operation.

Whether for a global enterprise, or a single line at the plant, use an overview screen to see KPIs and view relevant information such as state and status.

Display relevant external data such as weather, traffic delays, and current utility energy costs.

Drill in for more details by clicking on areas of interest or data tiles.

Use drawings, real images, and even embed live camera feeds.

Great for NOCs and conference rooms.



SIMULATION INTERFACE

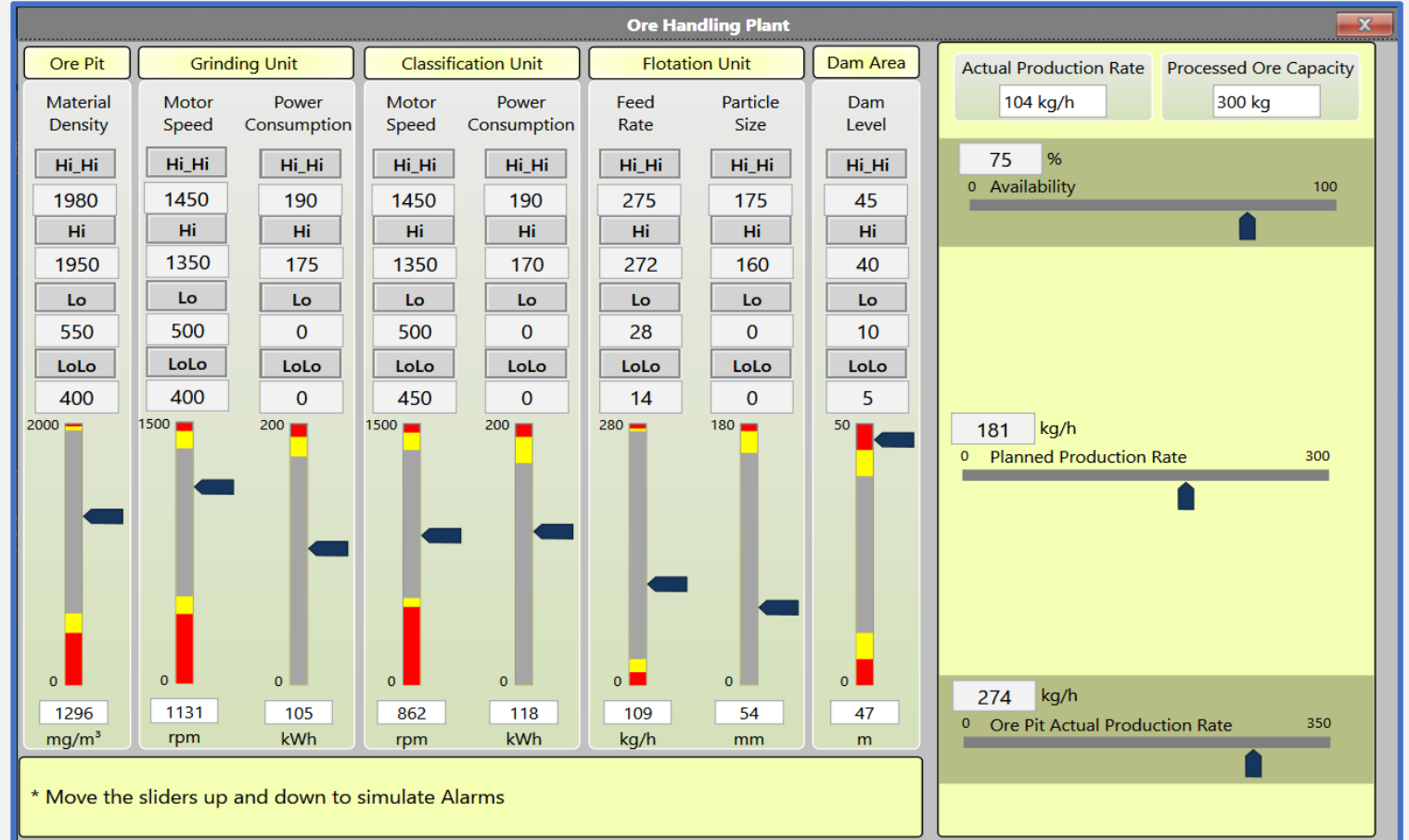
Build Simulators to view and interact with systems.

Great for training and digital twins to simulate real-life scenarios in a safe environment.

Help users get used to new controls, equipment, or changes to processes.

Connect to historical data to run through past situations for Root Cause Analysis.

Experiment with various combinations of settings to help identify the real drivers of performance and process control.





Supporting 3D files gives you another level of interaction and context to your users.

Connect real-time tags to control properties in 3D models, such as turning things on and off, and seeing it updated automatically in your drawing.

Easily click to change camera views to gain another perspective.

Build simulations, train employees, or build an overview of where equipment is at currently.

Built on top of Microsoft's WPF native graphics capability gives you outstanding "bare metal" performance for a great experience.



MACHINE LEARNING INTEGRATION

FactoryStudio supports machine learning and artificial intelligence (ML/AI) solutions via direct Code Behind, Scripting, and integration with external ML/AI solutions built with Python.

Build predictive and prescriptive maintenance and operations solutions to help keep your operators and supervisors as close to that "golden batch" / "golden run" as possible.

Use ML to pre-plan expected downtime, such as for a catalyst or heat exchanger.

Python and ML/AI integration are also featured in Tatsoft's RIGDAP solution, built with FactoryStudio, in use for hundreds of wells worldwide, for customers such as Apache, Chevron, and Hess.

Cement Plant Notification/Prediction Log Book Refresh Delete

Date & Time	Notification Message	Prediction Message
10/16/2020 11:29:00.590 PM		Kiln Vibration is Rising. System may trip after 70 Sec. Please press reset button.
10/16/2020 11:28:50.590 PM		Kiln Vibration is Rising. System may trip after 20 Sec. Please press reset button.
10/16/2020 11:28:40.637 PM		Kiln Vibration is Rising. System may trip after 90 Sec. Please press reset button.
10/16/2020 11:27:49.060 PM	Productivity Rate of Change is 87 %	
10/16/2020 12:18:56.104 AM	Productivity Rate of Change is -22 %	
10/16/2020 12:18:55.978 AM	Productivity Rate of Change is 122 %	
10/16/2020 12:18:17.666 AM	Quality Down By 6% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.511 AM	Quality Down By 11% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.417 AM	Quality Down By 15% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.292 AM	Quality Down By 17% Reducing Production Rate for 10 min May Improve The Quality	

1 of 3

This area show the upcoming changes of critical parameter to predict the fault.

NOTIFICATION 04 PREDICTION +

- ⚠ Kiln Pressure is Dropping. System May Trip After 0 Sec. Please Press Reset Button.
- ⚠ Kiln Pressure is Dropping. System May Trip After 13 Sec. Please Press Reset Button.



CONTEXT-RELATED POPUPS

Area

Name: P03_Ore Handling Plant
Location: Minnesota
Latitude: 47.42296
Longitude: -92.94040

Ore Handling Plant

Ore Pit ● Floatation ●
Grinding ● Dam Area ●
Classification ●

** Click the blinking red alarm light to be taken to an interactive 3D map of this area.

Cement Plant Notification/Prediction Log Book

Date & Time	Notification Message	Prediction Message
10/16/2020 11:29:00.590 PM		Kiln Vibration is Rising. System may trip after 70 Sec. Please press reset button.
10/16/2020 11:28:50.590 PM		Kiln Vibration is Rising. System may trip after 20 Sec. Please press reset button.
10/16/2020 11:28:40.637 PM		Kiln Vibration is Rising. System may trip after 90 Sec. Please press reset button.
10/16/2020 11:27:49.060 PM	Productivity Rate of Change is 87 %	
10/16/2020 12:18:56.104 AM	Productivity Rate of Change is -22 %	
10/16/2020 12:18:55.978 AM	Productivity Rate of Change is 122 %	
10/16/2020 12:18:17.666 AM	Quality Down By 6% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.511 AM	Quality Down By 11% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.417 AM	Quality Down By 15% Reducing Production Rate for 10 min May Improve The Quality	
10/16/2020 12:18:17.292 AM	Quality Down By 17% Reducing Production Rate for 10 min May Improve The Quality	

Easily create Pop-Ups or entire screens to appear when needed to help drill down for more info, or be taken to new areas.

Instead of just being flat, text-based pop-ups, FactoryStudio gives you all the same tools for a pop-up as for a full desktop screen – meaning you can make interacting with them intuitive and powerful.

In this example the map component has an interactive point of interest that opened the “Area” pop-up, which itself has a clickable area to be taken to the 3D view of the specific sub-area.

Great for providing extra functionality when and where you want it, and keeping it out of the way when you don't.



EMAIL, SMS, VOICE NOTIFICATIONS

Sending alerts and reports are easy with our variety of Email, SMS (Text), and Voice (Text to Speech) Components.

Define when and to whom information should go, and send it on a schedule, like a report, or on demand from the push of a button.

Need to notify the maintenance group that a machine is down? Click!

Time to send that Shift Report to the manager? Click!

Want to ensure the daily report is sent out to the team? Well, you could click, but we'd recommend scheduling that one

Whether you "say" it or send it you can be sure to get your message across.

The screenshot shows the 'Components' tab in the TATSOFT interface. It features a table with columns for Name, Preview, Source, and a description. An 'Email Server Configuration' dialog box is overlaid on the right, showing fields for SMTP (smtp.gmail.com), Port (587), From, Password, and a 'Test' button. Below these fields, there is a section for 'On alarm events' with a toggle switch for 'Send email is Off' and a 'To:' field.

Name	Preview	Source		
AlarmPage		[Cloud]		
ExportCSV		[Cloud]		
AlarmTexttoSpeech		[Cloud]		
ReportViewPage		[Cloud]	1.1	Reportview Page to view...
TrendPageBasic		[Cloud]	1.1	Trend Page with basic con...
RedundancyPage		[Cloud]	1.1	Redundancy Page for mon...

ALARMS / HISTORY / AUDIT INFORMATION

The screenshots show the TATSOFT AssetAlarmMonitoring software interface. The top window displays a summary of active alarms with columns for Ack, Active Time, Ack Time, State, Value, Limit, Priority, and Message. The middle window shows a detailed view of the alarm history with an additional Duration column. The bottom window shows a full view of the alarm history with an additional UserName column.

Ack	Active Time	Ack Time	State	Value	Limit	Priority	Duration	UserName	Message
X	10/17/2020 12:06:12 AM		Active	1	0	0		Guest	Cement Silo Level Very High
✓	10/16/2020 11:57:38 PM	10/17/2020 12:26:50 AM	Acknowledge	1	0	0	00:29:12	Guest	Cement Silo Level High
X	10/16/2020 11:57:38 PM		Active	1	0	0		Guest	Cement Silo Level High
X	10/16/2020 11:24:41 PM		Active	1	0	0		Guest	Ore Plant Dam level Very High
X	10/16/2020 11:24:38 PM		Active	1	0	0		Guest	Ore Plant Dam level High
✓	10/16/2020 11:06:10 PM	10/16/2020 11:13:17 PM	Acknowledge	1	0	0	00:07:07	Guest	Ore Plant Classification Power Consumption High
X	10/16/2020 11:06:10 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption High
✓	10/16/2020 11:06:10 PM	10/16/2020 11:13:17 PM	Acknowledge	1	0	0	00:07:07	Guest	Ore Plant Classification Power Consumption Very High
X	10/16/2020 11:06:10 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption Very High
X	10/16/2020 12:16:01 AM		Active	1	0	0		Guest	Cement Plant Kiln Pressure Very Low
X	10/16/2020 12:15:48 AM		Active	1	0	0		Guest	Cement Plant Kiln Pressure Low
X	10/16/2020 12:15:36 AM		Active	1	0	0		Guest	Cement Plant Kiln Pressure Low
X	10/16/2020 12:15:17 AM		Active	1	0	0		Guest	Cement Plant Kiln Vibration High
X	10/15/2020 6:57:03 PM		Active	1	0	0		Guest	Cement Silo Level Very High
X	10/15/2020 6:48:29 PM		Active	1	0	0		Guest	Cement Silo Level High
✓	10/15/2020 5:57:02 PM	10/15/2020 6:25:38 PM	Acknowledge	1	0	0	00:28:36	Guest	Ore Plant Classification Power Consumption High
X	10/15/2020 5:57:02 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption High
✓	10/15/2020 5:57:02 PM	10/15/2020 6:22:04 PM	Acknowledge	1	0	0	00:25:01	Guest	Ore Plant Classification Power Consumption Very High
X	10/15/2020 5:57:02 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption Very High
X	10/15/2020 5:54:54 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption High
X	10/15/2020 5:54:54 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption Very High
X	10/15/2020 5:54:10 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption High
X	10/15/2020 5:54:10 PM		Active	1	0	0		Guest	Ore Plant Classification Power Consumption Very High

FactoryStudio has built-in Alarm Management, Alarm History, and Alarm Acknowledgement making alerting and recording your alarms super easy.

Quickly customize what you want to show.

Show alarms on screen, or in a report.

Trigger actions based on an alarm(s).

Maximize screen space with multiple Alarm panel types.

Several of our Pre-Built Project Templates have Alarm displays and footers already built for you. Your Welcome!

Easily Acknowledge and / or Silence alarms.

Historize Alarms, Acknowledgements, messages, how long it took to acknowledge, and more.

Use our built-in database to use alarms right out-of-the-box. Or use it as a store-and-forward system to your own Historian. Or both!



WHAT IS OEE?

- Home
- What is OEE ?
- Bottling Line
- Availability
- Performance
- Quality
- Reporting
- Collapse Menu

Bottling Line



Availability
93.75%

Performance
85.00%

Quality
89.87%

OEE
71.61%



Design Cycle Time 3.16 Sec
Last Cycle Time 3.72 Sec

Bottles Good: 869
Bad: 98

Simulation



WHAT IS OEE?

The “What is OEE?” Demo is a multi-faceted project.

- It teaches you what “OEE” is by example, and by giving you sliders to experiment with and see the impact each component has in real-time.
- It contains an animated bottling line with simulator that you can control – impacting your OEE!
- See examples of various errors on a production line that can impact your OEE components – Availability, Performance, and Quality
- See how easy reporting can be, including how to include charts and data grids

Highlights:

- Digital Twin Simulation
- Interactive “What is OEE” tutorial
- Multiple Menu options
- Realistic Bottling equipment animation with simulator – change how the machine performs!
- Drive values and animations using in-project controls (for bottling line speed and errors, OEE math, and interactive sliders)
- Example OEE Errors show off hover tool-tips
- Pop-Up Simulator Window
- Real-Time Reports and Charts

What is OEE ?

OEE (Overall Equipment Effectiveness) is a metric for measuring manufacturing productivity and effectiveness. It is calculated by multiplying the percentages of Availability, Performance, and Quality.

An OEE score of 100% would mean your plant ran 100% of the time when scheduled, at the full speed of the machinery, with only good parts produced.

OEE (Overall Equipment Effectiveness)

AVAILABILITY	< 75%	85%	95%	100%
PERFORMANCE	< 75%	85%	95%	100%
QUALITY	< 75%	85%	95%	100%

Calculating OEE

Availability	73.52%
Performance	73.52%
Quality	73.52%
OEE	39.74%

Total Shift Operating Time (Example: 8 hour (480 minute) shift)

Total Shift Operating Time	480 min
Planned Shift Operating Time	480 min
Planned Shutdown	0 min
Operating Time	343 min
Down Time Loss	127 min
NET Operating Time	252 min
Speed Loss	91 min
% of Good Parts	73.52 %
Quality Loss	26.48 %

OEE analysis starts with Plant Operating Time then subtracting planned non productive times, minus: machine events that stop production, and machine operating less than the maximum possible speed, and machine pieces that do not meet quality standards.



DIGITAL TWIN SIMULATIONS

Shift Machine Parameters

Shift Info
Short breaks @ min = 5.00 min
Meal break @ min = 15.0 min

Line Speed 84 %
- +

Downtime 36min
Equipment Failure

Machine Info ** Max PPM 19
Pieces per minute PPM

Bad Every 10
9.0% 91%



Digital Twins can help speed your R&D and Training initiatives.

- Build Digital Twins with high-speed graphics to simulate your processes.
- Mimic real-time processes.
- Simulate various conditions.
- Test operator responses to simulated scenarios.
- Train operators on new processes ahead of time.
- Train new operators on proper operations while letting them safely experiment with simulated controls and system responses – and see its impact on the business.



Build interactive learning applications to help train users. A great way to create content for all the users in your enterprise or plant, on the same system used to deliver that content.

You could:

- Deliver specific content to users based on Active Directory integrated Roles and Groups
- Ensure staff was up to speed on new changes prior to rollout
- Track user engagement
- Graphically explain new processes and concepts
- Collect user feedback
- Add annotations to charts and chart history

What is OEE ?

OEE (Overall Equipment Effectiveness) is a metric for measuring manufacturing productivity and effectiveness.

It is calculated by multiplying the percentages of Availability, Performance, and Quality.

An OEE score of 100% would mean your plant ran 100% of the time when scheduled, at the full speed of the machinery, with only good parts produced.

OEE (Overall Equipment Effectiveness)

	0% Bad	46% Low	60% Typical	85% World Class	100% Perfect
AVAILABILITY	< 75%	85%	95%	100%	
PERFORMANCE	< 75%	85%	95%	100%	
QUALITY	< 75%	85%	95%	100%	

i World Class OEE for discrete manufacturing plants is generally considered 85% or better. 40% is low, 65% is typical.

i Anything less than 100% is calculated as the amount done compared to the maximum possible (e.g. good parts / total parts).

Total Shift Operating Time (Example: 8 hour (480 minute) shift)
480 min

Planned Shift Operating Time
480 min

Operating Time
388 min

NET Operating Time
231 min

% of Good Parts
96.58 %

Planned Shutdown
0 min

Down Time Loss
92 min

Speed Loss
157 min

Quality Loss
3.42 %

OEE analysis starts with Plant Operating Time then subtracting planned non productive times, minus: machine events that stop production, and machine operating less than the maximum possible speed, and machine pieces that do not meet quality standards.

Calculating OEE

Availability **80.79%**

Performance **59.53%**

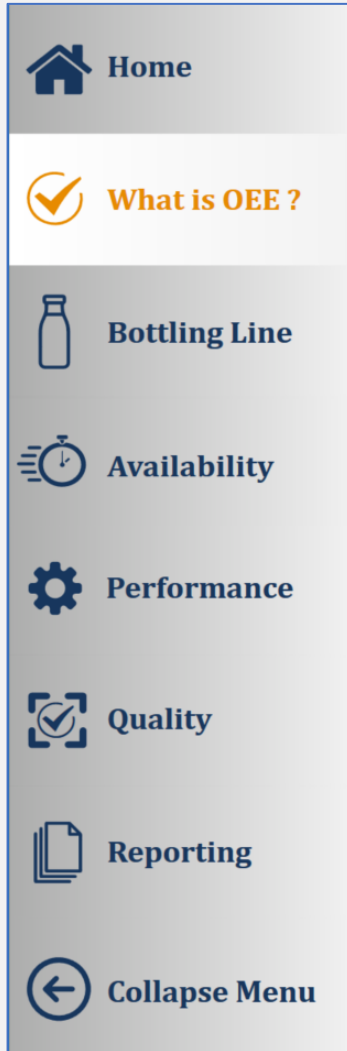
Quality **96.58%**

OEE **46.45%**

Try the sliders to see how it affects OEE



MULTIPLE MENU STYLES



EXPANDED



COLLAPSED

Easily build any menu style you need – even multiple menu styles in the same project.

Our “What is OEE” demo project shows off both an expanded and collapsed menu style.

Place menus on any side you want.

Control menu access, or even specific button access (and visibility!) via integrated Active Directory and/or built-in user security.

Use our default menu(s) or easily build your own.

Build intelligent menus that show different options depending on the screen, context, or even condition as needed.



Make your projects as realistic as you need – whether you need our included High Performance “flat/grey/white” graphics or want to create a life-like replica of your processes.

Update your animation based on real-time PLC values or use a simulator.

Visualize real time status, state, and quality.

Use native fast graphic capabilities

Bottling Line



Availability

92.50%

Performance

84.21%

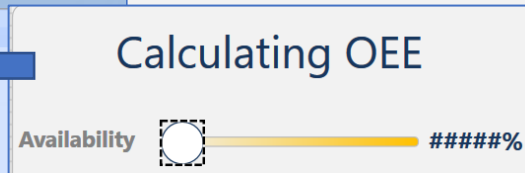
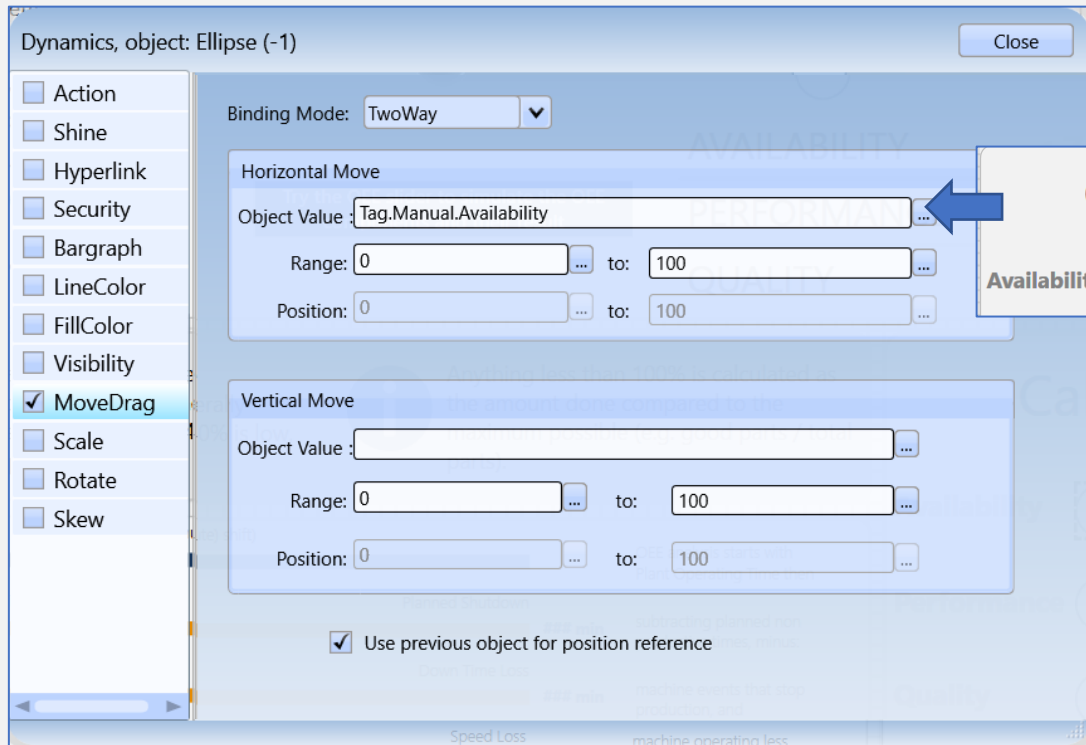
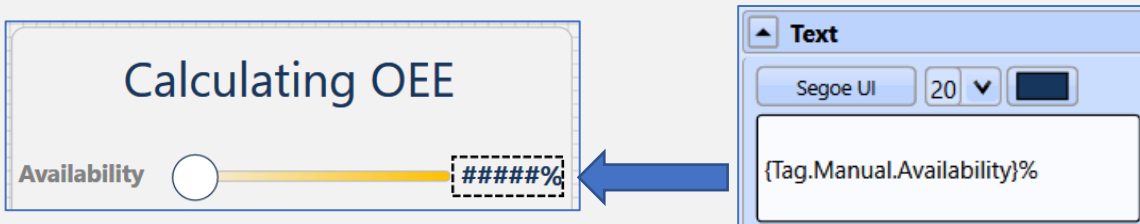
Quality

90.62%

OEE

70.59%





Easily connect and control your project, plant, and enterprise with real-time, secure communications.

Drive system responses via on-screen controls as you'd expect (such as with buttons and sliders)

Easily update text, values, tags, graphics, and more a few simple clicks.

Make use of the power in our Dynamics control window to modify how something looks or reacts easily.

Copy dynamics from one object to another for fast project creation and reduced errors.



TOOL TIPS AND HOVER ACTIONS

With a variety of actions supported on many components you can easily get a viewer's attention when you need to...

... or use things like "hover" tool-tips to keep distractions out of the way except when needed.

Enlarge items, make them glow, make them move, make them appear/disappear, and more!

OEE Demo by TATSOFT

File Tools Security

TATSOFT Project: What_is_OEE Display: Availability

Date: 10/6/2020 Time: 01:52:13 User: Guest

Home

What is OEE ?

Bottling Line

Availability

Performance

Quality

Reporting

Collapse Menu

Availability

93%

480 min Total Shift Operating Time

460 min Planned Shift Operating Time

424 min Operating Time

357 min NET Operating Time

90.64 % % of Good Parts

Planned Shift Loss 20 min

Down Time Loss 36 min

Speed Loss 67 min

Quality Loss 9.36 %

Availability = Operating time (424 min) / Planned Shift Operating Time (460 min)

Down Time Losses

Breakdowns

- Tooling Failures
- Unplanned Maintenance
- General Breakdowns
- Equipment Failure

Setup and Adjustments

- Setup/Changeover
- Material Shortages
- Operator Shortages
- Major Adjustments
- Warm-Up Time

Material Shortages
Missing bottle cap, waiting for stock to arrive

** Mouseover ⚠ for more information

The image shows a simulation interface for a machine. The main screen displays 'Shift Machine Parameters' with sections for 'Shift Info' (Short breaks: 1 @ 5, Meal break: 1 @ 15), 'Line Speed 84 %', 'Downtime 36min' (Equipment Failure), 'Machine Info' (Pieces per minute: 16 PPM, Max PPM 19), and 'Bad Every 10' (9.0% to 91%). A 'Display Settings' popup is open, showing options for Mode (Page), Background (Page), Width (Popup), Height (Dialog), and Border (none). A 'New Display' dialog is also open, showing 'Display name: Page2', 'Description:', and radio buttons for client types (.NET Smart Client, HTML5 Client, iPad/iPhone Native iOS Native Client) and default views (Landscape, Portrait).

Maximize screen space by creating content that shows up only when you need it!

Create the type of screen you need for any situation, from a popup to an entire page.

Use Pop-Ups, as an example, for important items that don't need to always be around – whether that's a context-relevant chart, report, dialog box, simulation control, login, and more!

FactoryStudio, powered by FrameworkX, gives you the flexibility you need to create projects of any size – from a multi-site Enterprise application to a single screen HMI or embedded system.

Design for multiple platform - Windows, Linux, HTML5, iOS - all from the same engineering environment.



REAL-TIME REPORTS AND CHARTS

Easily generate reports on-demand or on a schedule.

Include real-time up-to-date charts and data grids when the reports are run.

Easily customize the report layout to meet regulatory layouts.

View, Save, or e-mail reports – all from within your project!

OOE Demo by TATSOFT

File Tools Security

TATSOFT Project: What_is_OEE Display: Reporting

Date: 10/6/2020 Time: 02:09:37 User: Guest

Home

What is OEE ?

Bottling Line

Availability

Performance

Quality

Reporting

Collapse Menu

OEE Reports

OOE is a "best practices" metric measured to monitor and improve the effectiveness of your manufacturing processes.

REPORT FOR LAST RUN

TATSOFT 10/6/2020 2:09:28.000 AM

Downtime Analysis

Downtime Cause	Downtime in Minutes	Downtime by Count
Component Jams	5	1
Equipment Failure	16	2
Operator Shortages	15	1

Downtime Counts and Time

Drag column titles here to group data

Events	Downtime	Total Time
1	Component Jams	5 min
2	Equipment Failure	16 min
1	Operator Shortages	15 min

Clear all Downtimes Update