

New and Improved in 9.1



Welcome to our New and Improved in 9.1 Highlights List!

For a quick highlight of some of the features and benefits included in 9.1, click the links below.

Detailed docs are in the menu to the left.

Existing customers with a support contract can head over to support.tatsoft.com to submit a ticket.

Join our [forum](#). Ask questions. Leave feedback, ideas, or anything else relevant.

Grab the latest software ([Download Page](#)) and let us know what you think. We are here for you! - The Tatsoft Team

Top Features

- [Responsive Dashboards](#)
- [Themes](#)
- [High Performance Graphics](#)
- [Visual SQL Query Builder](#)
- [Python Integration](#)
- [Project Templates](#)
- [MQTT Broker, Clients, SpB](#)
- [Industrial Icons Font](#)
- [Multi-Screen Engineering](#)

Additional Features

- [Multi-Monitor Support](#)
- [Driver Highlights](#)
- [Simulator Driver](#)
- [Remote Engineering & Multi-User Collaborative Development](#)
- [Auto-Start SmartClient](#)
- [Linux Runtime Improvements](#)
- [Secure Multi-Port Gateway](#)
- [Sparklines in DataGrids](#)
- [Dynamic Cell Color in Reports](#)
- [Tags - Finding & Renaming](#)
- [Finding and Removing Unused Tags, Devices, & More](#)

Responsive Dashboards



Find Detailed Docs Here: [Responsive Dashboards](#)

Dashboards quickly convey volumes of data in a compact and easily accessible format.

- Responsive layouts allow your dashboard to intelligently resize based on your viewing device.
- Easily drag & drop panels to display Grids, Trend Charts, Pie Charts, Bar Charts, Gauges, and more.
- Add any Symbol Library object – built-in or one of your own creation.
- Create groups to control responsive behavior for the entire group of items separate from the overall page.
- Create dashboards for both .NET and HTML5 clients from the same engineering environment.
- Supports our new Project Themes for quick styling!



Themes

 Find Detailed Docs Here: [Themes](#)

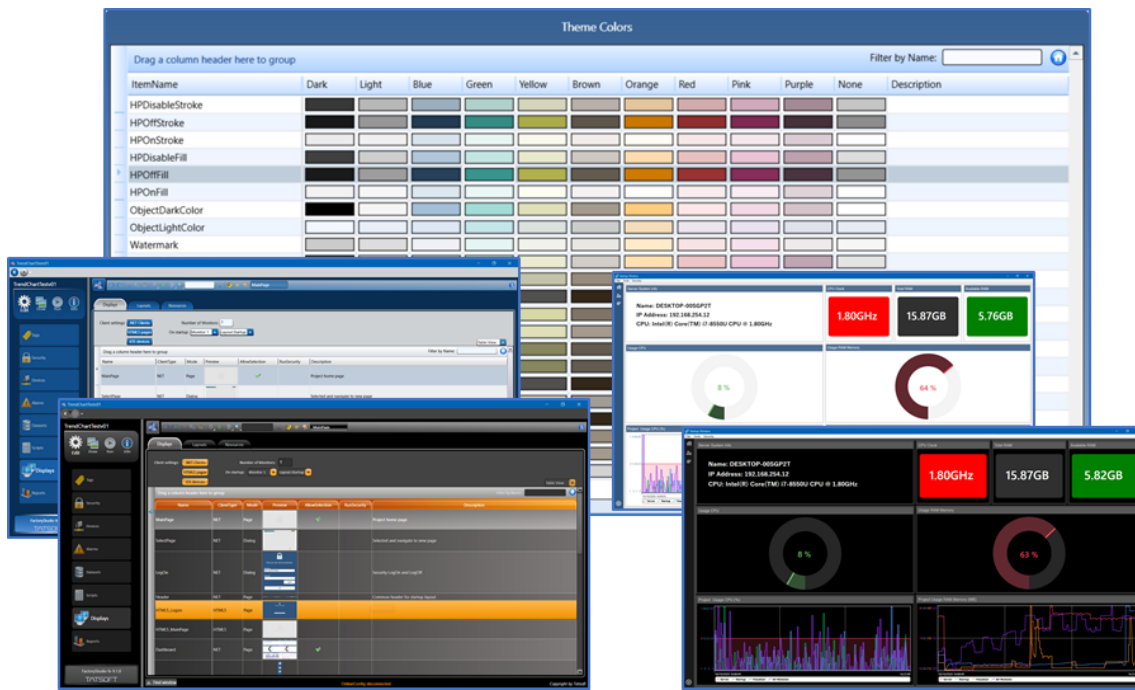
We support both Engineering Environment Themes and Project Themes!

Engineering Environment Themes


- Choose from multiple themes for the style you like best (have a favorite color scheme?), or to suit your viewing environment (dark mode anyone?)
- Open multiple projects or multiple copies of the same project with a different theme each, making it easier and faster to identify which project you are working on or referencing.

Project Themes

- With our new theme selector, users can easily pick a theme that best suit their environment or visual preferences.
- Easily build your own theme or use one of our prebuilt themes.
- Is there any item or even an entire screen you do not want to have default theme? A simple checkbox allows you to change it.



High Performance Graphics

 Find Detailed Docs Here: [High Performance Graphics](#)

High Performance Graphic symbols and an intelligent HPG Alarm symbol are New in 9.1!

We have also updated the Symbol Library menu to make it quicker to find High Performance or Standard style symbols.

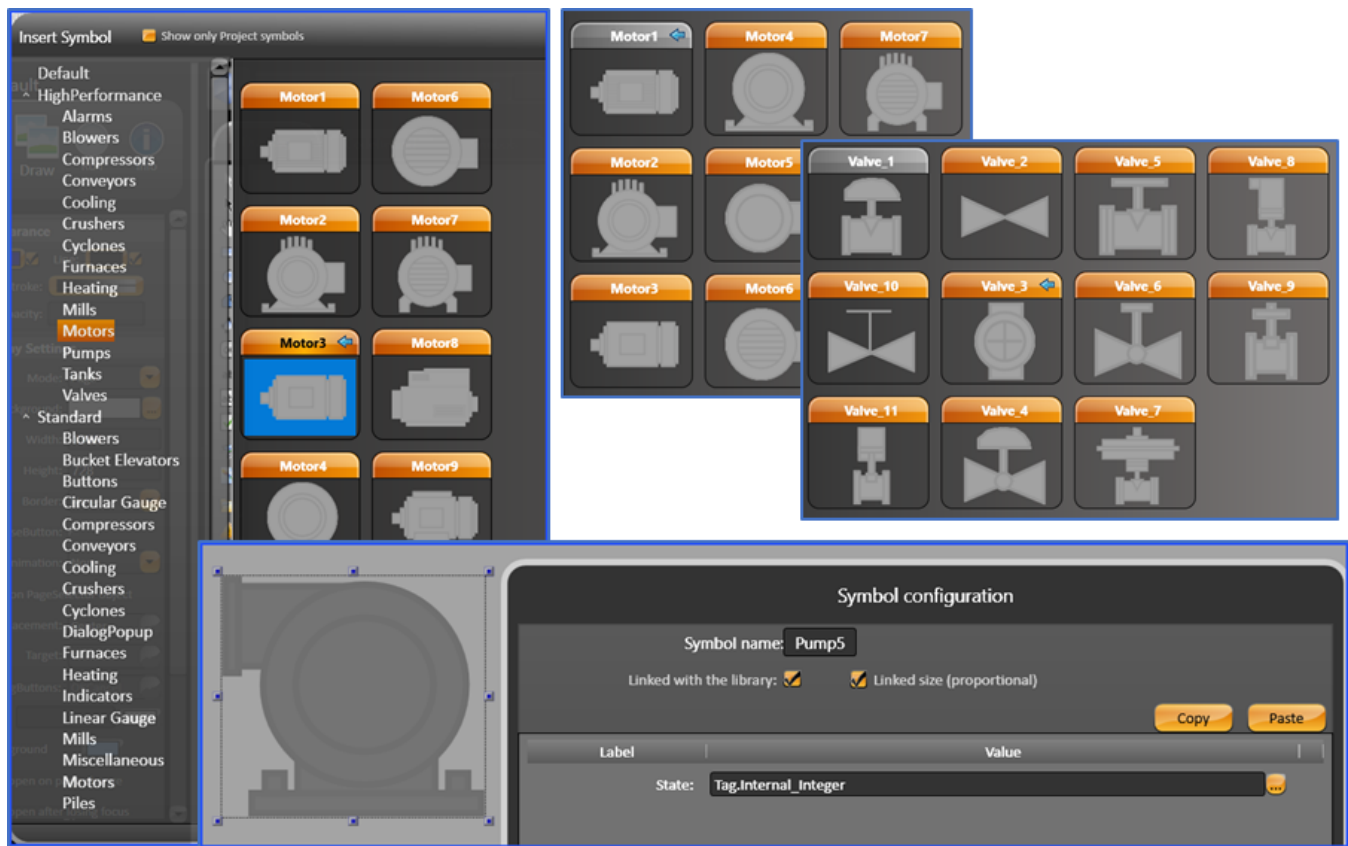
All our symbol objects are vector based, so they resize intelligently across all displays.

Also, since you can create displays for both .NET and HTML5, we are making sure you can use our Symbols in BOTH display types – you get the same experience regardless of your user display needs.


Our symbols are powerful objects that have ability to contain multiple data references ("input parameters"), making them easy to replicate and use for multiple purposes, while easily linking them to data-driven actions (such as showing color, running/off states, etc.).

You can also make your own symbols with any data links you want built in. You can tie them to a datatype. For instance, if you want a pump object to appear every time you drag an integer datatype onto the screen, you can!

You can also make your own data types! You could make a pump data type with sub-parameters and link it to a symbol. Dropping the **PumpUDT** on the screen will bring ALL your data parameters with it – automatically!

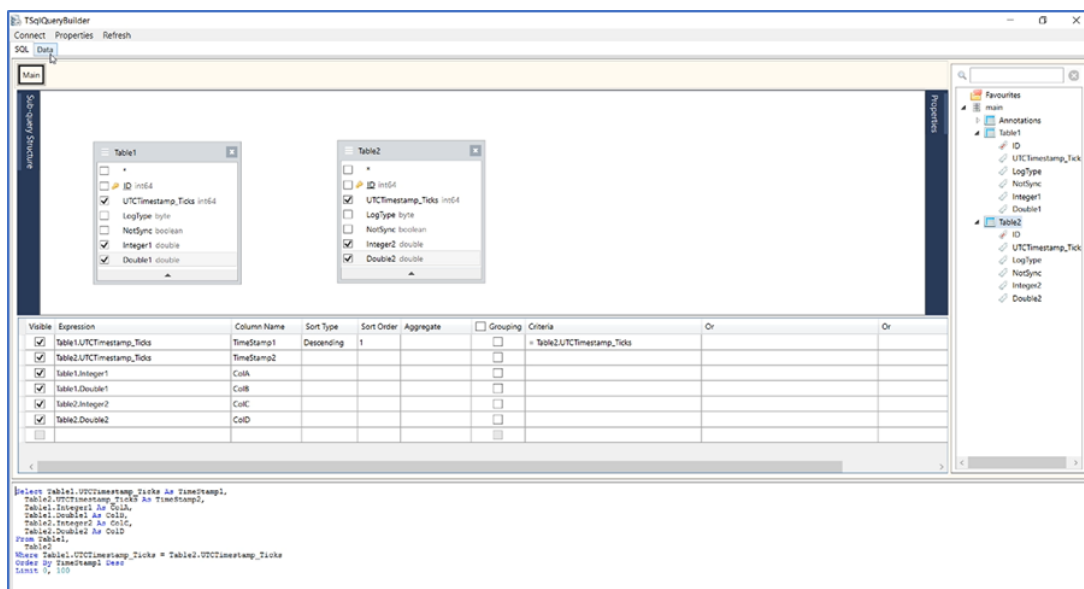


Visual SQL Query Builder

 Find Detailed Docs Here: [Visual SQL Query Builder](#)

Our **Visual SQL Query Builder** allows you to preview and rapidly connect, build, and test your SQL queries before using them in your project.

- Connect, build, and test queries previously with a visual interface in the same design environment – no need to install or open additional software.
- Previously select databases, tables, and columns.
- Previously create relationships (joins) between entities.
- Every visual item and action build the SQL query for you in real-time.
- Test your query in the builder to verify you are getting the data you want before using the query in your project.
- Is everything working as you please? Copy and paste your new query wherever you need — and you are assured it will work because you have already tested it!



Python Integration

 Find Detailed Docs Here: [Python Integration](#)

Our **Python** Integration opens a great way to extend your projects with **Python**. Vastly increase the power and reach of your existing **Python** code by easily integrating it with **FactoryStudio**!

- Supports **ANY** version of Python (3.x and 2.x).
- Access the **Python** namespace from within **FactoryStudio** Scripts, Tasks, and CodeBehind.
- Execute (call) your **Python** code from within your projects (even NumPy, Matplotlib, etc).
- Create **Python** code that can interact with your **FactoryStudio** project!
- Create a task that executes your external **Python** code and passes parameters both ways — everything without a single line of code in your project
- Schedule your task to trigger at set times or execute it as a function of a trigger. (e.g. Event-based triggers)
- Machine Learning and AI integration made easy

BONUS: We already support C#, VB.NET, and JavaScript!

Now with



pythonTM

Already Supporting...



Project Templates

Pre-built Project Templates get you started faster by building the solutions you need.

- Pre-defined displays AND layouts.
- Multiple Template types include:
- Blank Project
- Default Project
- TrendChart Project
- TrendChart with Alarm Pages Project
- TrendChart with Alarm Pages and Alarm Footer
- Redundancy Project

Each project includes the items above.

- Pre-built menus and headers

1. Blank Project

- Logon Dialog
- Several Themes
- Header page navigation using Industrial Icons
- Empty Main Page
- Layout with Header and Main Page

4. TrendChart and Alarm Project

Contains all in the **TrendChart** Project – Plus:

- Alarm Online and Alarm Historical Page
- Alarm Data Template

2. Default Project

Contains all in the **Blank** Project – Plus:

- Server Information page using the Dashboard Page
- System Information Template and Scripts
- System Information Data Historian configuration

5. TrendChart and Alarm Footer Project

Contains all in the **TrendChart and Alarm** Project – Plus:

- Alarm Footer Page

3. TrendChart Project

Contains all in the **Default** Project – Plus:

- UI data Template
- TrendChart Page
- TrendChart Data Templates

6. Redundancy Project

Contains all in the **TrendChart and Alarm** Project – Plus:

- Redundancy Information Page

MQTT Broker and Clients

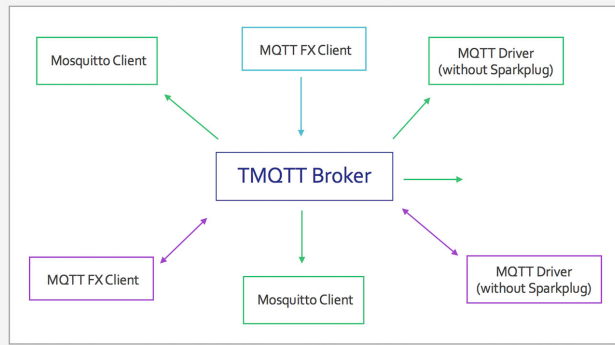


Find Detailed Docs Here: [MQTT Broker](#) and Here: [MQTT And Azure IoT](#)

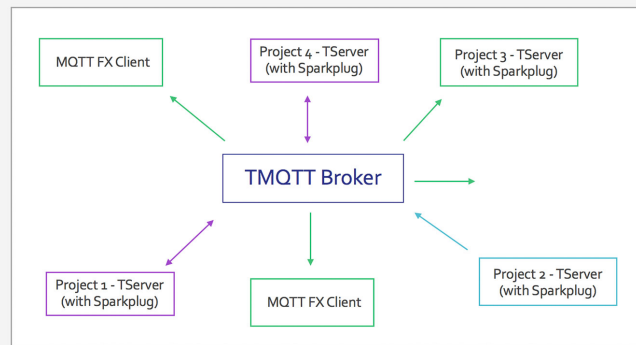
Our included MQTT broker and clients help you get connected safely, securely, and economically to a wide and growing variety of devices and systems.

- Run our broker on its own or tied to a project.
- Tied to a project, our MQTT broker can also expose all project namespaces and properties.
- Our broker supports BOTH **Sparkplug B** clients AND original MQTT clients, which does not use **Sparkplug B** specification such as **Mosquitto**
- Publish/Subscribe with ease – great for data-constrained or cost-constrained networks.
- Great for use as an Edge of Network gateway or communications hub.

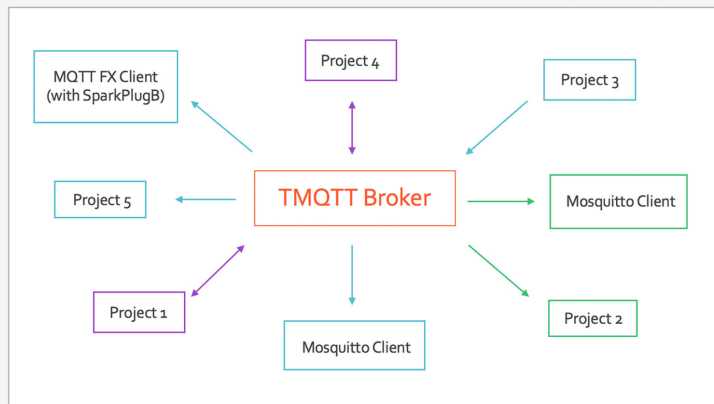
SIMPLE GATEWAY



CONNECTED TO RUNTIME PROJECT




GATEWAY + CONNECTED TO RUNTIME PROJECT



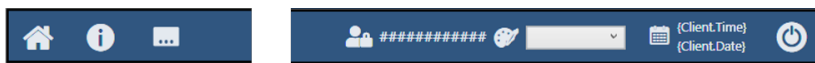
- Publish and Subscribe
- Subscribe Only
- Publish Only

Industrial Icons Font

 Find Detailed Docs Here: [Industrial Icons](#)

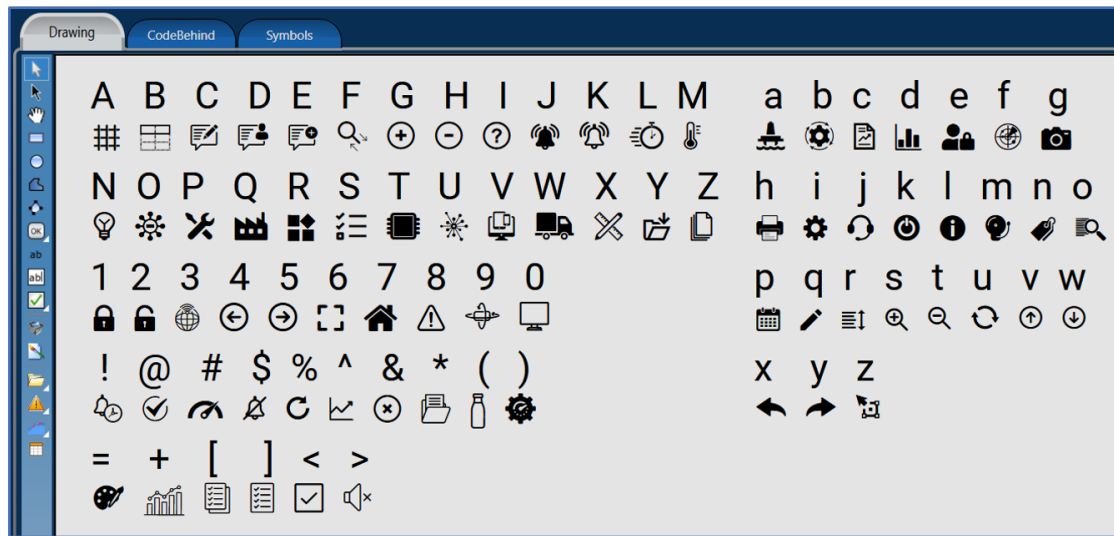
Our Industrial Icons Font makes it easy and quick to add modern looking icons to your projects.

- Create consistent and modern layouts.
- Save time by using an icon font rather than a jpeg/png from the web.
- Common icons are included such as Home, Alarms, Warnings, Chart, Gauge, Settings, Search, and more!
- Easy and smooth resizing since the icon is actually a font!



(Above) Using icons in the default Header

(Below) Entire list from our Industrial Icons font

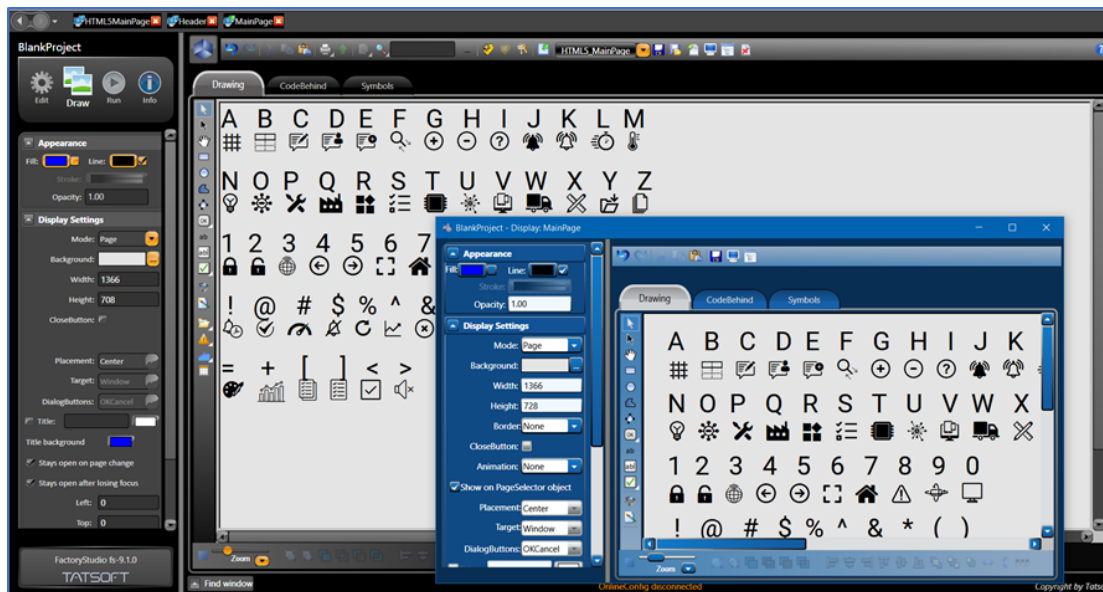


Multi-Screen Engineering

Find Detailed Docs Here: [Multi-Screen Engineering](#)

Multi-Screen Engineering improves development speed.

- Open multiple displays and scripts at the same time.
- Copy/Paste between .NET and HTML5 Displays (as shown below!)
- Change themes between the separate windows.
- Makes code and display comparison easier and faster.
- Bonus: The Displays and Scripts Breadcrumb (shortcut) bar at the top now allows you to remove a shortcut to help keep your desktop lean and clean.



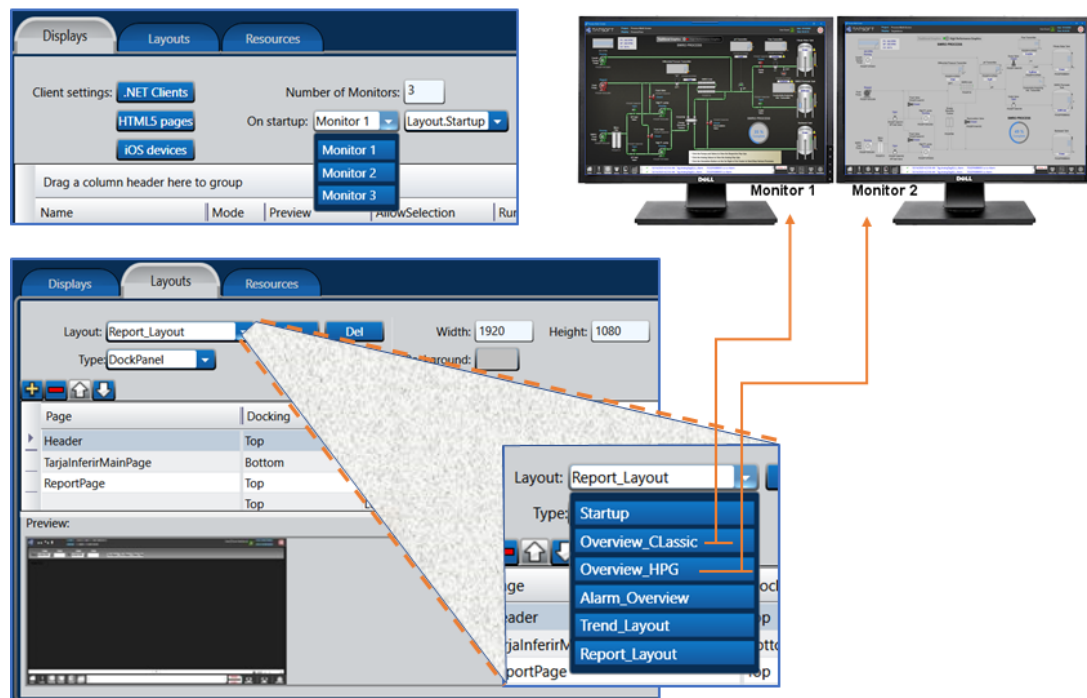
Multi-Monitor Support

Create your projects to support multiple monitors.

Perfect for creating enterprise NOC, other Operations Control Room layouts, or even just dual-screen desktops.

Easily design different layouts for each screen.

Quickly specify which layout you want to appear on which screen.



Driver Highlights

Connectivity is a key feature of the **FrameworkX** platform and **FactoryStudio**.

- Simplify your architecture by removing standalone communication solutions (e.g. **Kepware** / **Matrikon**)
- Easily setup a communications hub to support comms and logic between practically any device, any database, any historian, anywhere.
- On-Premises or to/from the cloud – we have you covered!
- Some supported popular drivers / protocols include the list presented below.
- **MQTT Broker** and OPC Server are both built-in!
- Our team has created over 200 drivers throughout the years — so if you need something, we either have it or we can help you build it with our **Communication Driver Toolkit**.

A-B / Rockwell

- ControlLogix/CompactLogix
- MicroLogix / Serial MicroLogix
- PLC5/SLC

ABB (Bailey) INFI90**Beckhoff**

- TwinCAT PLC/IO devices

BACnet**DNP 3.0****GE Fanuc devices**

- Ethernet using SRTP protocol

Genisys & MicroLok Plus

- TCP/IP Master/Slave
- Serial

IEC drivers

- IEC-61850 Master
- IEC-870-5-101 Master
- IEC-870-5-104 Master / Server

Mitsubishi devices

- Melsec-FX (MelsecQ 1E Frame)
- Series Q

Modbus

- TCP/IP and RS-232, RTU and ASC for both Modbus master / slave protocols

MQTT

- Broker
- Clients (Original & Sparkplug B)

National Instruments

- DataSocket - LabVIEW

OMRON

- Master using FINS & CIP Commands

OPC

- UA / DA / HDA
- OPC Server also built-in!

OSIsoft PI / AF**SNMP****Siemens**

- S7 devices
- Siemens Simatic/TI505 devices

WITS

- Level 0 Pason - TCP/IP, UDP and RS232
- Level 0 Passive - TCP/IP, UDP and RS232

Simulator Driver

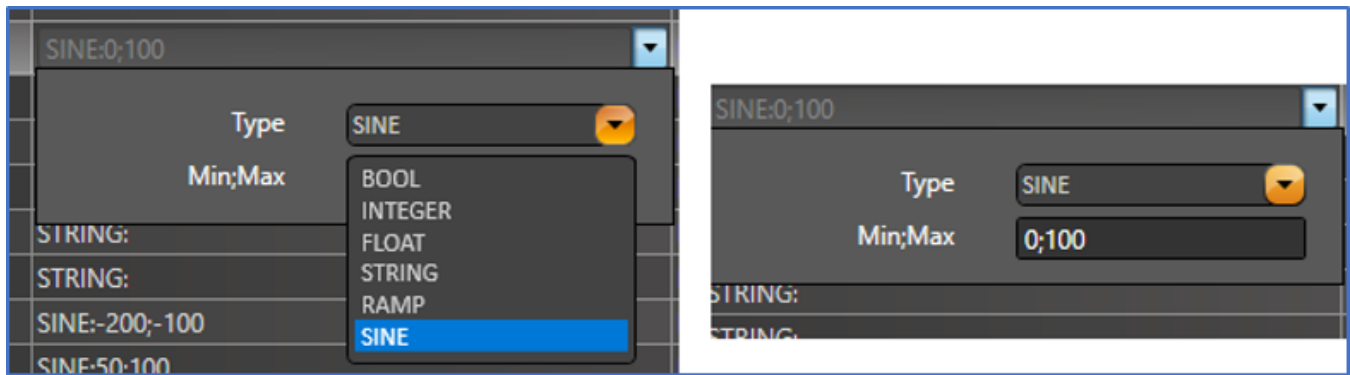
Find Detailed Docs Here: [Simulator Driver](#)

Our new Simulator Driver gives you many options for data types and ranges, and it gives you control over which simulation values you can generate.

Pick from a list of data types (including Strings!) and set the Min & Max values you would like the data types to range through.

Do you want to simulate a real-world analog device and its response to a 4-20mA varying current? You can!

Or do you prefer to use a range that was 0-25 mA so you can simulate a wire break with 0 mA? Because you can too!



Example Points Configuration

TagName	Node	Address	DataType	AccessType	Modifiers
MySine	SimulatorNode	SINE:-50;50	Native	Read	
MyRamp	SimulatorNode	RAMP:0;100	Native	Read	
MyString	SimulatorNode	STRING:	Native	Read	StringLength=5
MyBool	SimulatorNode	BOOL:	Native	Read	
MyInt	SimulatorNode	INTEGER:0;10	Native	Read	
MyFloat	SimulatorNode	FLOAT:-500;-100	Native	Read	

Remote Engineering & Multi-User Collaborative Development



Find Detailed Docs Here: [Remote Engineering and Multi-User Collaborative Development](#)

Work Faster

Speed up development by having a developers/engineers team working simultaneously in the same project — no need for merging or importing!

Work Safer

FactoryStudio also supports Remote Engineering allowing you to have developers utilize a central shared repository and edit a project even when remote (not logged into the project server itself).

As long as the developers are on the same network, they can get to their projects, keeping your server safer by reducing the number of people who need to log into it directly and remotely.

of Concurrent Users Allowed – Check your license...

The screenshot shows the 'License' tab of a software interface. It is divided into three main sections: 'Projects', 'Server', and 'License'. The 'License' section contains the following information:

- License Media: Softkey (with a Refresh button)
- License Type: Eng_Run
- Product Version: [icon]
- Product Family: Enterprise
- Product Model: Unlimited
- Serial Number: [icon] [10 Remote licenses allowed]
- Offline Activation (with a help icon):
 - Get site code
 - Load license key
- Online Activation:
 - Activate
 - Deactivate
- License expires in 22 days
- Runtime clients:
 - Desktop Clients (.NET or Web): 10
 - Mobile Clients (iOS or Web): 10
- Engineering (highlighted with a red box):
 - Engineering Users: 10
 - Communication Points: Unlimited
 - Standard Protocols, PI, DNP, IEC-61850, DNP3s, Bacnet, Bailey, WITS0, WITSXML, IEC-60870-5-101, IEC-60870-5-104, IEC-60870-5-104S, IEC-60870-5-101S

Auto-Start SmartClient

 Find Detailed Docs Here: [Auto-Start SmartClient \(watchdog application\)](#)

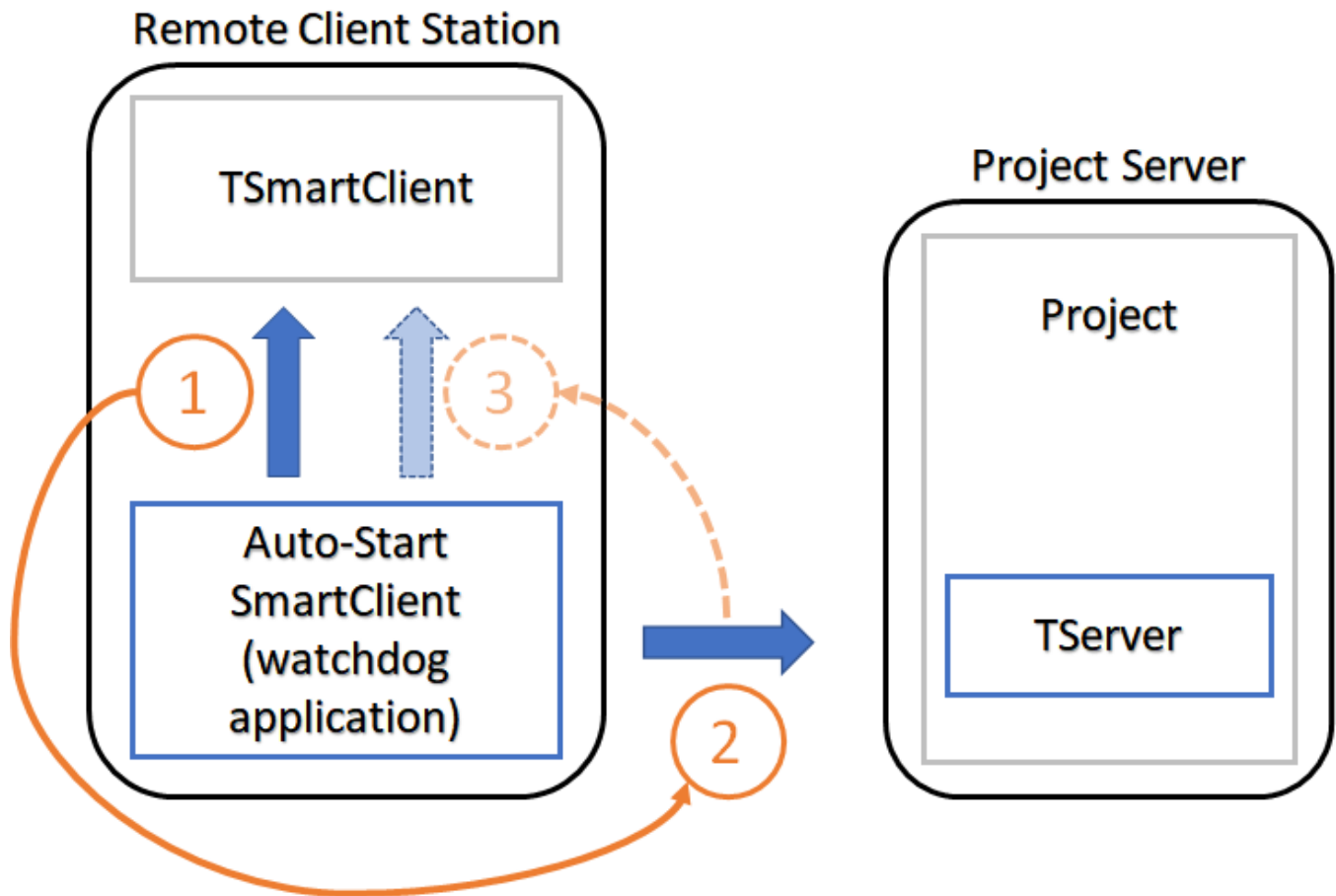
Helping to deliver maximum uptime for your users, the **Auto-Start SmartClient (ASSC)** is a self-healing watchdog application that helps ensure your remote SmartClient applications are always up and running.

1. The ASSC periodically checks to ensure the **TSmartClient** is running.
2. If not, then the ASSC checks to see if it can reach the Project on the Project Server.
3. And if it can, the ASSC will restart the **TSmartClient** automatically for you!

{A SmartClient application is just one of the many ways you can start a client application, and it's one of the easiest.

Just point at the server URL and you are done. No need to install other software – the SmartClient takes care of it all for you.

Now the Auto-Start SmartClient watchdog application makes sure your SmartClient is always up and running.}



Linux Runtime Improvements

Having supported projects that run in Linux environments for years, we continue to make improvements to ensure your project experience in the Linux environment will be as close to the .NET experience as you can get.


You can design your projects once and ensure your end users will get the same experience regardless of which platform they use.

(We also support Windows, iOS, and Android and Web via HTML5 – all from the same project, and all at the same time!)

Just like our Multi-OS support, we are multi-language too! Projects support C#, VB.NET, JavaScript, and Python 2.x/3.x)



Secure Multi-Port Gateway

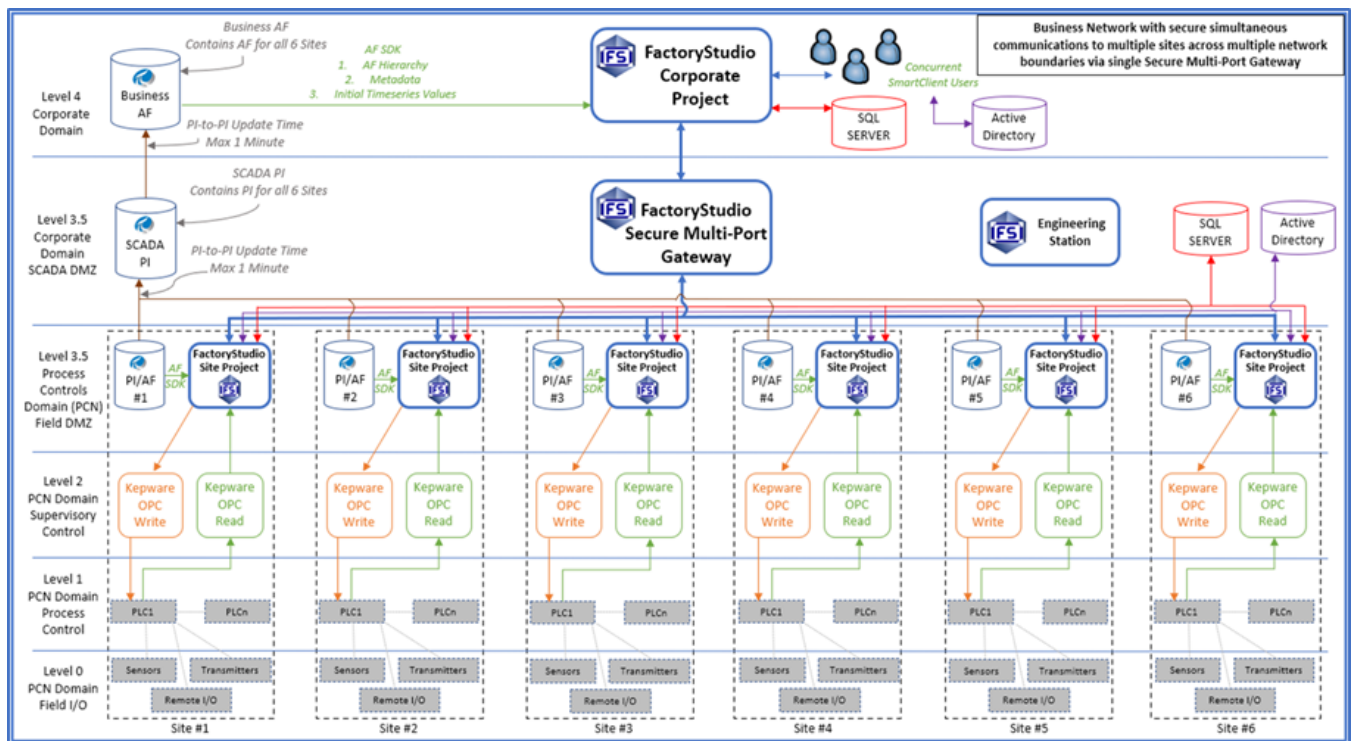
 Find Detailed Docs Here: [Secure Multi-Port Gateway](#)

Ensure secure communications between multiple projects, nodes, or other systems you want to communicate with via our Secure Multi-Port Gateway.

Setup 1-to-1 communications to a single site, or setup 1-to-many communications for multiple sites running into the same “master” project.

In the example below, we created a business level project that can send requests to any site of a group, and all the traffic is handled via our Secure Multi-Port Gateway.

Our Secure Multi-Port Gateway ensures safe data communications by only allowing the traffic that is supposed to go from point A to Point B, Point A to Point E, etc., all while keeping the sites apart from each other.



Sparklines in DataGrids



Find Detailed Docs Here: [Sparklines in DataGrids](#)

Tiny but mighty!

Sparklines, powerful and tiny charts, are now embeddable in a DataGrid (Table).

Would you like to show a quick visual of past data or performance right next to the current value? Now you can!

Use Sparkline trends right next to current values for improved context and possible indicator of where things are heading.







Styling

Available in 4 styles, you can show your mighty-mini-charts using Line, Area, Bar, or WinLoss formats.


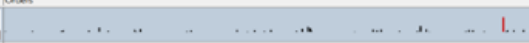




Line

First Name	Last Name	Title	Country	Photo	Orders
Nancy	Devolio	Sales Representative	USA		
Andrew	Fuller	Vice President, Sales	USA		
Janet	Leverling	Sales Representative	USA		



Area

First Name	Last Name	Title	Country	Photo	Orders
Nancy	Devolio	Sales Representative	USA		
Andrew	Fuller	Vice President, Sales	USA		
Janet	Leverling	Sales Representative	USA		

Bar

First Name	Last Name	Title	Country	Photo	Orders
Nancy	Devolio	Sales Representative	USA		
Andrew	Fuller	Vice President, Sales	USA		
Janet	Leverling	Sales Representative	USA		

WinLoss

First Name	Last Name	Title	Country	Photo	Orders
Nancy	Devolio	Sales Representative	USA		
Andrew	Fuller	Vice President, Sales	USA		
Janet	Leverling	Sales Representative	USA		

Dynamic Cell Color in Reports



Find Detailed Docs Here: [Dynamic Cell Colors in Reports](#)

Improve your reports with Dynamic Cell Colors. Calculated at run-time, you can vary the cell color of your report tables, making them deliver even more value faster.

Great for regulatory reporting as well as a quick visual history of when values were in or out of acceptable ranges.

Wish you could quickly spot areas that need attention in the shift report? Now you can!

Spend more time fixing issues and celebrating wins instead of staring at numbers trying to figure out what is great, or not-so-great, about that last run.

Easily turn this...

First Name	Last Name	Age	State	Country
John	Brown	40	Texas	USA
Mary	Jane	35	Texas	USA
Peter	Parker	17	Texas	USA
Bruce	Wayne	45	Texas	USA
Clark	Kent	25	Sao Paulo	Brazil



...into this!

First Name	Last Name	Age	State	Country
John	Brown	40	Texas	USA
Mary	Jane	35	Texas	USA
Peter	Parker	17	Texas	USA
Bruce	Wayne	45	Texas	USA
Clark	Kent	25	Sao Paulo	Brazil

Tags - Easy Finding & Renaming

Find and Teleport

Need to locate every place a tag is used in your system? **FactoryStudio** got you covered! Find, sort, and filter to easily locate the tag(s) of interest and ALL locations where it(they) exists.

Then, double-click to go right to where the tag is used, whether in a display or even a line of code!

Bonus:

This also works for finding other things such as: Alarms, Displays, Reports, Scripts, Devices, Datasets, Historian Tables, and User Created Data Types (UDTs/Templates)

Powerful Renaming

Have you ever wished you could rename a tag in just ONE place, and EVERY place that tag was used in your project would automatically update?

FactoryStudio makes it possible!

Even rename a PART of a tag structure with our powerful templates. (e.g. Rename "**Revs**" to "**RPM**" in a tag structure such as: "**Area1.Line3.Wrap2.Motor5.Revs.Count**")

Left Screenshot: UseCount Tab

Refresh button is circled with a yellow '1'.

ObjectName	UseCount
Script.Class.AssetsServer	3
Script.Class.Effects	8
Script.Class.EmailFromServer	2
Tag.AlarmSwitch	10
Tag.Asset_1	917
Tag.Asset_2	818
Tag.Asset_3	758
Tag.Asset_Area	37
Tag.Asset_mouseover	7
Tag.AssetAlarms_AdmServer	38
Tan.AssetAlarms.Assets	54

Find results:

ObjectName	TableReference	TableID	Line
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 46
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 47
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 48
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 49
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 51
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 54
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 55
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	t0_TTrendChart
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	t2_TTrendChart

Right Screenshot: CodeBehind Tab

Method: DisplayOpening

Run DisplaysOpen every: 100 ms

Line 51 is circled with a yellow '3'.

```

40 {Tag.Asset_1.NewPrediction_Flag=1;}
41
42 if ({Tag.Asset_1.NewPrediction_Flag==1})
43 {
44     Tag.Asset_1.PredictionText[3]=Tag.Asset_1.PredictionText[2];
45     Tag.Asset_1.PredictionText[2]=Tag.Asset_1.PredictionText[1];
46     Tag.Asset_1.PredictionText[1]=Tag.Asset_1.PredictionText[0];
47     Tag.Asset_1.PredictionText[0]=Tag.Asset_1.PredictionText[4];
48     if ({Tag.Asset_1.NotificationSwitch!=1} && {Tag.Asset_1.PredictionCount<4})
49     {Tag.Asset_1.PredictionCount++;}
50
51     Tag.Asset_1.UICTimeStepTicks = #Client.UtcNow.Ticks ;
52     #Dataset.Table.Asset1PredictionLog.InsertCommand();
53     Tag.Asset_1.PredictionText[4]=**;
```

Find results:

ObjectName	TableReference	TableID	Line
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 46
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 47
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 48
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 49
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 51
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 54
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	Line 55
Tag.Asset_1	EditDisplaysDisplaysContents	Asset1Info	t0_TTrendChart_Tag

Finding and Removing Unused Tags, Devices, & More

Find Detailed Docs Here: [Finding and Removing Unused Tags, Devices & More](#)

The cleanup of your project is important during both project creation and maintenance

Having unused items in your project makes troubleshooting, maintenance, and understanding your project more difficult and error prone.

We make it easy and safe to find and remove many unused items:

- Tags
- Devices
- User Created Types
- Reports
- Datasets
- Historian Tables

Now you can easily find if you have made any of the above, forgot to hook them up, have not used them yet, or do not need them at all.

UseCount

CrossReference

UnusedObjects

Refresh

Remove...

Drag a column header here to group

Module	ObjectName
Device.Channel	Device.Channel.IndraCo
Report	Report.reportTest
Tag	Tag.teste5
Tag	Tag.teste6
Tag	Tag.teste7
Tag	Tag.teste8
Tag	Tag.teste9

UseCount

CrossReference

UnusedObjects

Refresh

Remove...

Drag a column header here to group

Module	ObjectName
Device.Channel	Device.Channel.IndraControl
Report	
Tag	
Tag	
Tag	
Tag	
Tag	

Manager

?

Are you sure want to remove the selected object(s)?

1) If you are using the objects as reference tags via Link property or in scripts or expressions via 'TK.GetObjectValue' method then it is highly recommended cancel this operation.

2) Undo operation will not be possible after removing.

Yes

No