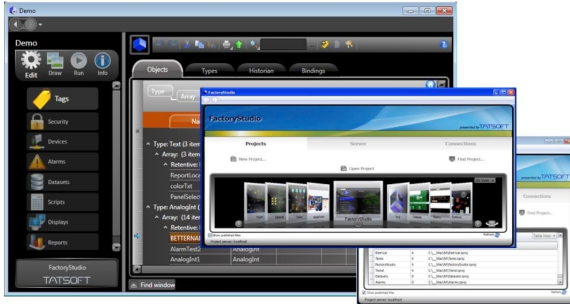


# Integrated Modules

## Unified Environment and modular configuration

FactoryStudio has a friendly and collaborative environment. Its multi-user and multi-project organization allows editing and running multiple simultaneous projects. All modules, from tag editing to display designer, are combined in a simple unified user interface.

In this section...



### Project Management Features:

FactoryStudio allows easy access to and editing of your projects.

#### Easy Project File Management

FactoryStudio projects are stored in an embedded-encrypted SQL database file. A SQL engine is included with FactoryStudio at no additional cost. This provides much more security and easier maintenance and deployment, compared to legacy systems where configuration files are spread across multiple folders and files.

#### Access Projects from Anywhere

Providing flexibility to meet your design and execution requirements, FactoryStudio can be configured to store and run projects from a USB stick, a local hard drive, a network server or a cloud server.

#### Synchronization and Import Tools

You can copy/paste any configuration table with Excel directly. Configuration from Rockwell™ PLC's, OSIsoft™ PI Systems, CSV files, XML files or DLL .NET assemblies can be easily mapped into projects with simple synchronization tools.

#### Concurrent Product Versions

Never again will you need to manage virtual machines or different computers with different versions of development software. FactoryStudio automatically enables the engineering environment that matches the version last used to edit a project. That prevents you from building something into the project that is not supported by the runtime environment, which can still be from a previous product version.

#### Intellisense

Tags and all application objects are presented to the user as you type, with full context validation. That makes the configuration process much faster and more reliable.

#### Manage Project Releases

Multiple project versions are easily managed thanks to the metadata information and the built-in management tools. FactoryStudio automatically tracks configuration changes, builds and project releases.



#### Multi-user and multi-project

Multiple users can work on the same project simultaneously.

## Tags and Templates

### TAT and Real-time Elements

Tags, Assets and Templates are not only the start of Tatsoft company name, they are also the core components to the real-time data models and the power of FactoryStudio. The FactoryStudio system has a built-in real-time, event driven, in-memory database, that manages the tags, assets and events in the application.

### Real-time Tag Types

A typical HMI-SCADA system has only basic tag types, such as numeric and messages. As FactoryStudio also targets IT and MES systems, it goes far beyond, supporting real-time entities that match all the SQL types and many .NET Framework entities, including Images and a complete DataTable in a single real-time tag.

### Dynamic Arrays and References

FactoryStudio was the first, and up to now the only, real-time system with built-in support for tri-dimensional dynamic arrays, lists and type-safe reference tags with dynamic assignments, creating reusable components on displays, symbols, reports, calculation and at any part of your project.



### Import and Synchronize

Tags and templates can be imported and automatically synchronized from various data sources including: XML and CSV files, OSIsoft™ PI System™ and PI AFTM, Rockwell™ ControlLogix program files and OPC servers.

### SQL Databases and .NET

The built-in tag types allow direct mapping to any SQL database or .NET variables.

### Assets and Categories

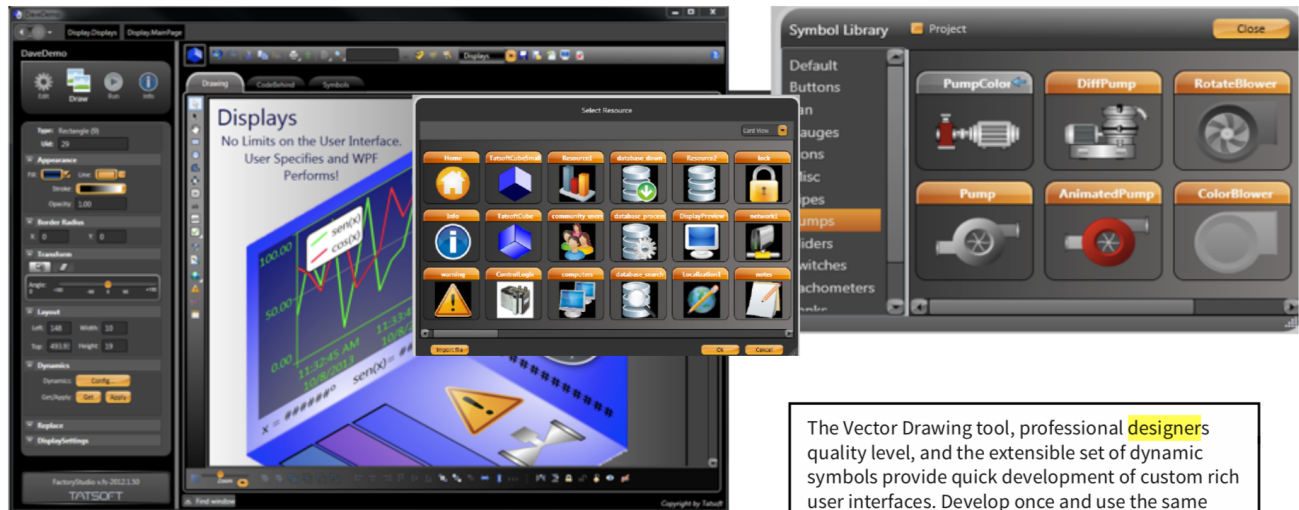
Organize your project with categories and assets. An asset is composed of tags and other application objects connected to your process hierarchy. FactoryStudio allows implementation of ISA 95 modeling specifications, which can be essential in large systems.

### Templates

Templates are user-defined structures, similar to .NET classes, allowing composition and hierarchy. Besides the built-in basic types, real-time tags can be created based on templates that reflect physical assets, which speed up and simplify the application development.

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## Graphical Displays



The Vector Drawing tool, professional **designers** quality level, and the extensible set of dynamic symbols provide quick development of custom rich user interfaces. Develop once and use the same display on desktops, web and mobile clients.

## Advanced Graphical Technology

FactoryStudio is the first complete product where all of the configuration and execution tools are pure Windows Presentation Foundation, the latest graphical technology from Microsoft. WPF uses the full potential of the current graphics cards and computers, providing superior quality and performance.

## Dynamic 3D Models

Connect real-time tags to control properties in 3D models created with 3DMax or other systems that supports the .3DS extension.

## Smart Symbols

Smart Symbols are asset and template based reusable graphical components, with runtime dynamics or static binding and centralized management. The symbols can keep a live link with the library, so you can modify the symbol only once and automatically apply to all displays.

## Code Behind and Expressions

Develop code behind, using C# or VB.NET, or HTML5/Javascript, expressions on dynamic animations and client-side event-driven scripts, providing flexible customization.

## Deployment Scenarios

FactoryStudio is based on a unified-package architecture, so the server is always the standard FactoryStudio software. However, all FactoryStudio modules such as Scripts, Device, Historian, Database, etc. may be placed on different computers, in a distributed system context. The server computers can run in different Operating Systems, connecting to many options of client visualization stations, allowing flexible deployment scenarios.

## From Standalone to World-Wide

The FactoryStudio family of products is uniquely designed to provide the most reliable, flexible, and powerful application development platform. Whether you are building an application to run on a small device with very limited amount of I/O, to run on a production line or a commercial building, or looking to provide information across the globe to those that need it, on any device, anywhere.



### High degree of scalability and performance

The same configuration tool can create applications for desktops, mobile, HTML5, and embedded devices.

## Data Aggregation from multiple locations

FactoryStudio is the perfect platform to collect data from multiple locations to a centralized location. Hundreds to thousands of distributed FactoryStudio nodes, provide the process data acquisition, and publish data to a cloud server, or to the corporate office.

## Touch Panel Applications

Customizable on-screen keyboard, multi- touch support, momentary buttons and other features deliver rich touch panel systems.

## Unique set of Dynamic Animations

Unique new dynamics, such as opacity, shine and skew, combined with move, scale, color change, rotate, and others, applied to any object, provide the most comprehensive set of animations. No more difficult laborious workarounds dealing with drawing tools created on top of legacy graphics systems.

## Images, Colors and Transparency

Images are added to the project database for centralized management, low and hi resolution versions of the image are automatically created, optimizing the project. Transparency, alpha color, image brushes, all designer tools are there.

## Advanced Controls

All Windows controls are included, as well web browser, child-displays, doc viewer and many others. Add WPF controls to extended functionality, such as scheduler controls, Gantt or live video cameras. Legacy Active-X controls can also be used for compatibility.

## Multiple User Security

User security can use Application Security, Windows Authentication (Active-Directory), or WS-Federation concurrently, mapping to the same application server.

## Security and Redundancy



**Designed to deliver world-class mission-critical applications**

Redundancy switch time and high volume data was tested to meet rigorous offshore requirements.

### Group and User Permissions

Total flexibility to define privileges based on groups or specific users. Permissions can be global or tied to a specific display, object or input action.

### Runtime Users

Dynamically create users and store credentials in SQL databases. Get users from Active-Directory or third party system for integrated security or unified login.

### User Policies

Identification policies, session duration, control, automated logoff, e-sign, audit-trail and a complete set of user management features are available.

### FDA and NERC Regulated Applications

FactoryStudio allows delivering applications in conformance with Title 21 CFR Part 11 and it was designed following the applicable recommendations from NERC, such as the CIP-007-1-Cyber Security-System Management.

### Security at the Core Level

Security must be implemented at the core, not applied externally. FactoryStudio modules have built-in security related components designed from the core.

### Hot-standby Fault-tolerant Servers

Reliable, easily configurable redundancy, for seamless failover; FactoryStudio automatically initializes and continues to synchronize the primary and secondary server. The Device communication channels are also easily setup for redundant physical networks and redundant PLC nodes.

### Database Redundancy

The Alarm and Historian database can be assigned to a third-party external cluster or replicated automatically when running on the FactoryStudio servers.

### Project Configuration Synchronization

Engineering tools provide features to simplify configuration and updates in redundant scenarios.

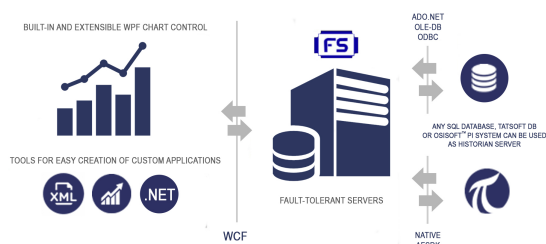
### Hot-swapping

Redundant or stand-alone servers allows dynamic switching of project versions, without interrupting service for connected clients and keeping the real-time database loaded.

### Redundancy at the Core Level

Real-Time tags, Devices, Alarms, Historian, Scripts, Clients, all modules were designed from the ground up to meet redundancy and hot-swapping requirements.

## Trend and Historian



FactoryStudio offers a complete solution for plotting data, using historian information, displaying trend charts and more. This module includes:

- Storage and Replication
- Store and Forward
- Universal Time and Daylight Saving
- Process Analysis and Batch Systems
- Vertical and XY plots available
- Annotations and Alarms Overlay
- Real-time Online Charts
- Customize and Save at Runtime
- Snapshots, Tables and Reports of all trend charts
- OSIsoft™ PI System Database

## Device and Interfaces



### Infrastructure designed from the Core

FactoryStudio performs real-time optimization, blocking addresses to maximize the use of the communication channel.

### Native Communication Drivers

Connectivity is a key FactoryStudio feature, therefore many native communication drivers to a variety of industry standard protocols and PLCs are included. New drivers are continuously added to the standard distribution of FactoryStudio.

### OPC Client and Server Support

FactoryStudio is in full compliance with the OPC Server and Client specifications. For any protocol not included with the product, the OPC client provides all the necessary integration.

### Remote Data Servers

Data acquisition and drivers, native or OPC, can run on remote computers, for instance to get data from RS-232 devices or to eliminate the requirement for DCOM OPC configuration.

### OPC Data Server FactoryStudio Station

FactoryStudio can be deployed as a stand-alone OPC Data Server, using the native protocols and providing data to other systems through its OPC Server interface.

### Automatic Synchronization

A Tag Import Wizard and automatic definition synchronization is provided for OPC Servers, Rockwell ControlLogix L5K files, CSV files, Beckhoff TwinCAT, OSIsoft PI System and PI AFTM; new wizards are continuously being added.

## Process Isolation and Multi-threading

Data communication runs in its own .NET domain, with a WCF layer to isolate the drivers from the main real-time database. Multiple threads are created to each protocol and device node for maximum performance.

## Diagnostics Tools

Complete set of testing, deployment and diagnostics tools provides fast and reliable application development and installation.

## Built-in Performance Monitoring

Statistics on system messages, success and error messages, dynamic blocks created, cycle time and execution time on each block are generated to allow the fine tuning of high performance applications.

## Dynamic Addressing

Everything in the driver configuration, from the station node IP to the address and tag mapping can be changed online using the project script itself. Create standard applications capable of having the runtime setup to the specific conditions where it is being deployed.

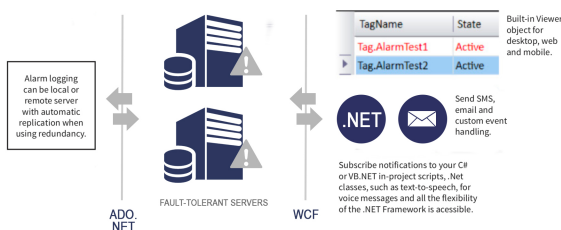


### Partial list of supported manufacturers and protocols

ABB,  
Altus,  
DNP 3.0,  
Ecom  
/KOYO,  
Fatek  
/Facon,  
GE,  
IEC-61850,  
IEC-870-5-  
101 and  
104,  
Matsushita,  
Mitsubishi,  
Modbus,  
MQTT,  
National  
Instruments  
Omron,  
Reliance,  
Rockwell,  
Siemens,  
Simatic/TI  
505,  
Smar,  
SNMP,  
TwinCAT  
/Beckhoff,  
Unity Pro,  
WITS,  
and more.

## Alarms and Events

- Real-time Alarm Processing
- Audit Trail and Alarm Areas
- Multi-platform Alarm Visualization Component
- Notification Subscription
- Store and Forward
- Automated translations
- Storage and Replication in local and remote databases
- OSIsoftTM PI EFTM Event Frames
- Universal Time and Daylight Saving always considered, for accurate time-stamps

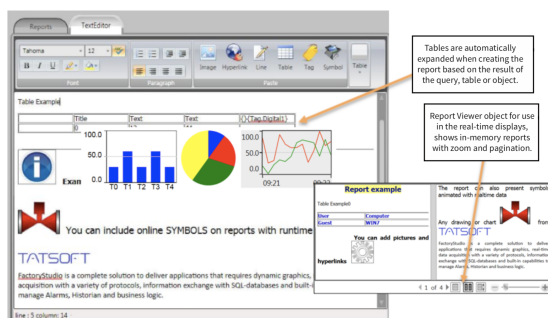


## Reporting and Data Access



### Built-in tools and open interfaces for custom solutions

Reports can be saved in multiple formats: Text (ASCII or Unicode), HTML, XPS and PDF!



### Built-in Report Designer

FactoryStudio includes a user-friendly simple Report layout editor integrated with the engineering workspace. The rich text format uses underlying XAML flow document technology from WPF, Windows Presentation Foundation; that enables the inclusion of graphics and flexible formatting.

### Runtime Display Snapshots

The runtime displays can be opened in background or saved to image files, allowing you to create rich graphic snapshot reports. Current displays and layouts also can be printed or saved as an image to disk.

### Report Append and Text Data Logging

The report generator ability to append files, based on the project configuration and real-time tags, can be used to create CSV and text logging files for scenarios that require the information to be created as time goes by, such as batch reports and shift reports.

### Dynamic Graphical Symbols

Any symbol from the real-time displays can be included in the Report. The dynamic behavior of the symbol, such as color, text output, and rotation, are all updated using the current tag values when generating the report. User controls, like Trend and Bar charts can be added as well.

### Tables and Queries

The contents of database tables and queries can be added to the reports. The queries and report generation execute in isolated processes, not interfering with the real-time processing.

### Data Access Toolkit

A complete .NET Data Access library is available to create custom reporting solutions or to integrate with Microsoft Office, SQL server reporting services or other vendors tools. A COM model API is also available to be used from Excel VBA and JavaScript applications.