T31 - What’s New in Studio 5000®
Design Software
Market Drivers and Priorities

**Market Drivers**

- System focus - demand for automation productivity, smart devices, and secure system
- Focus on engineering efficiency, code maintainability, and code reuse
- Evolution of emulation, simulation, modeling, collaboration, & data exchange
- Changing workforce and skillset
- Concerns over protecting Intellectual Property

**Priorities**

- Ease of use & maintenance
- System capabilities & workflows
- Modern programming methodologies
- Rapid project development & prototyping
- Library and version management
- Virtual Design capabilities
- System security

*Focused on Rapid Design, Re-use, Collaboration & Virtual Design*
# Studio 5000® Design Environment

<table>
<thead>
<tr>
<th>Role</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architect</td>
<td>Enables Simplified System Design and Data Exchange</td>
</tr>
<tr>
<td>Logix Designer</td>
<td>Collaborative System Programming and Configuration</td>
</tr>
<tr>
<td>View Designer</td>
<td>Highly Integrated HMI with Logix</td>
</tr>
<tr>
<td>Application Code Manager</td>
<td>System Reuse and Quickly Build Projects</td>
</tr>
<tr>
<td>Logix Emulate</td>
<td>Digital Design and Operator Training Systems</td>
</tr>
</tbody>
</table>
System Product Approach

PDM / PLM
mCAD
eCAD
P&ID
Simulation
OTS
Modeling

Engineering Tools

STUDIO 5000 ARCHITECT™
SYSTEM
STUDIO 5000 LOGIX DESIGNER ®
CONTROL
STUDIO 5000 VIEW DESIGNER ®
VISUALIZATION
STUDIO 5000 APPLICATION CODE MANAGER
LIBRARY MANAGEMENT
STUDIO 5000® LOGIX EMULATE™
DIGITAL DESIGN

EARLY DESIGN
SIZE, SELECT, PROCURE
CONFIGURE & BUILD
INSTALL & COMMISSION
OPERATE & MAINTAIN
Productive **System Design**

*Studio 5000 Architect* Enables Simplified System Design and Data Exchange
Current organizational structure is project-based
A project is represented for each server, panel, and controller on the layout

Devices supported include ControlLogix®, CompactLogix™, PowerFlex®, Kinetix®, Stratix®, POINT I/O™, FLEX™ I/O, and PanelView™ Plus
PC-based product support includes FactoryTalk® View SE and ME, FactoryTalk® Alarms and Events, and FactoryTalk Linx

Application Content
- Rockwell Automation Library of Process Objects bundled into Studio 5000 Architect
- Contains HMI and control application content

Project Explorer
- Displays all hardware devices in project and connects networking relationships between devices
- Configure runtime communication in FactoryTalk Linx® between HMI and control layer
- Project Explorer shows project structure for FactoryTalk® View applications and Studio 5000 Logix Designer projects

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Studio 5000 Architect®

What's New?

- Modernized User Interface
- Enhanced Data Exchange
- Expanded Devices Support
- 3RD PARTY APPLICATIONS
Studio 5000 Architect®
New AutomationML Interface for Data Exchange

Overview
Enhance capabilities for bi-directional exchange of data between Studio 5000 Architect and engineering tools
• Adoption of AutomationML for robust data exchange

AutomationML Benefits
• Scalable data exchange
• XML-based data exchange format
• International standard: IEC 62714
• Allows for a consistent data exchange along digital tool chains
• Neutral format aimed at eCAD and automation suppliers
Studio 5000 Logix Designer®

One Design Environment for All Disciplines
- Supports comprehensive design and maintenance of the automation control system

Collaborative Development
- Focused on delivering automation productivity, ease of use, and simplified workflows

Project Explorer to organize project
- Online & offline configuration, editing, and troubleshooting

Hardware configuration
- Multi-language support for Ladder, Structured Text, Sequential Function Chart, Function Block

Multi-discipline control including discrete, motion, drives safety, and process

Single Programming Environment for All Logix Controllers
Studio 5000 Logix Designer®
What’s New?

NEW RELEASE

- Common look and feel across all Studio 5000® applications
- Modernization of programming language editors
- Improved workflows for multi-monitors, tabbed views, quick navigation
- Clearly convey state and identification of errors
Modernized User Interface
Tabbed Windows

Increased usability with tabbed windows
• All editing windows are now tabbed
• Logic, Parameters, Trends, AOPs, UDTs
• Quick-close capability
• Reduced number of clicks
• Re-ordering of tabs

Organize your view with “tab groups”
• Users can create custom “tab groups”
• Allows for organization key routines, tags, trends, etc.
Multi-Monitor Support

Organize your view *the way that you like* in a productive manner
Multi-Monitor Support

Organize your view the way that you like in a productive manner
Multi-Monitor Support

Organize your view the way that you like in a productive manner
Logix Designer® Code Editors
Standard Indication of Errors Makes Troubleshooting Easy

Clear indication of where the error exists in the code editors
Logix Designer® Error Window
New Message Filtering Capabilities

Filter capability added to the error window for quick identification
Overview
A modernized structured text editor packed with features for productive programming and editing
- Line numbers and bookmarks
- Descriptive tool tips and syntax highlighting
- Multi-line select and mouse scrolling
- Change and verify bars
- Collapsible code segments
- Inline value monitoring
- Code snippets and smart indent capabilities

Benefits
- Modern programming capabilities
- Increased productivity
- Efficient code development and editing
How does this work?

- Type in a keyword like “for”
- Press ‘Tab’ key
  - The associated code snippet will be inserted with placeholders
  - Hover tool tips provide placeholder information
- More productive structured text design experience
Editor Improvements: Function Block

Overview
Improvements to Function Block editor for increased usability
- Default sheet size changed to 11x17 (V30)
- Ability to change sheet size while online
- Incremental routing algorithm updates
- Forcing I/O tags from Context Menu
- Direct operand value modification

Benefits
- Level-setting editor experiences across all editors for consistent and efficient workflows
IEC-61800-5-2 › Adjustable speed electrical power drive systems

• New “Drive Safety” Instructions (8)
  - SFX (Safe Feedback Scaling)
  - SS1 (Safe Stop 1)
  - SS2 (Safe Stop 2)
  - SOS (Safe Operating Stop)
  - SLS (Safely Limited Speed)
  - SLP (Safely Limited Position)
  - SDI (Safe Direction)
  - SBC (Safe Brake Control w/ external brake)

Supported in 5580 and 5380 Only
(3) New Kinematics Instructions

- MCTO - Motion Coordinated Transform with Orientation
- MCTPO - Motion Calculate Transform Position with Orientation
- MCPM - Motion Coordinated Path Move

Increasing Kinematics Support in:

- TCP (Tool Center Point)
- Geometry (Delta robot 5-Axis)
- Data-driven 6 axes interpolation
- Queue length

Supported in 5580, 5480, and 5380 Only
Logix Tag-Based Alarms
New Alarming Capabilities for Streamlined Workflows

Overview
Logix Designer V31 adds new alarming functionality in the controller. With the new Logix Tag-Based Alarming, alarms can now be defined on “tags” or “structures” in the controller with periodic evaluation.

Benefits
• No need to add an instruction; simplified design workflows inside Studio 5000 Logix Designer®
• No addition programming required – alarms automatically sent to FactoryTalk® Alarms and Events
• New alarm manager provides a single place to configure
• Small memory footprint – great for applications that have high alarm counts
• Alarm definitions allow for increased modularity
• Supports bulk generation of alarms via XML import/export

Supported in 5580, 5480, and 5380 Only
Logix Tag- Based Alarms
Adding an Alarm to a “Non-Structured” Tag

- Right click on a “tag”
- Select “Add Alarm” from context menu
- Name the alarm and add configuration parameters
- Select “OK”
- Alarm can now be seen in the new alarm manager and is active in controller
Logix Tag-Based Alarms
Adding an Alarm to any Structure of Tags

- Right click on a “structure”
- Select “Add Alarm Definition” from context menu
- Name and configure the new alarm definition
- Select “OK”
- Alarm definition can now be seen in the new alarm manager and is active in controller
Logix Tag-Based Alarms
Adding an Alarm to Any Structure of Tags – Ex. UDTs and AOIs

Every structure instance will now have an alarm. Alarm instances can now be customized!
Content Protection

Studio 5000 Logix Designer® Security Options for Protecting your Intellectual Property
Studio 5000 Logix Designer Security
Summary of IP Protection Capabilities

**Password**
Source Protection

Limited permissions to identify users that can only “view” or “not view” content

**FactoryTalk® Security**

Provides a centralized authority to verify identity of each user and grant or deny user's requests to perform a particular set of actions on resources within the system

**License**
Source and Execution

Most robust, scalable security solution that permits who can view, edit, or export content
License Source & Execution Protection
Secure Hardened IP Protection of Content

Most secure protection possible for intellectual property

License Source and Execution

USE CASE

SOLUTION

REQUIRES

USER TYPE

Activated Secure Device
Subscription to License Portal

END USER
REstricted Access
OEM Engineer
CONTROLLED ACCESS
OEM Developer
FULL ACCESS

LEVEL OF SECURITY
MODERATE

HIGHEST

END USER

OEM Engineer

OEM Developer

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CIP Energy Support
CIP Energy Object Backed Tags in Logix Designer

Overview
CIP Energy base and electrical energy object-backed tags in Logix Designer

Benefits
• Consistent objects between CIP Energy compatible devices and Logix object-backed tags
• Dialog windows to aid the user in entering CIP Energy object configuration values
• First step in greater integration of CIP Energy in Logix Designer
• Following Industry ODVA CIP Energy Standard
High **Performance** Controllers

*Studio 5000 Logix Designer®*  Support for the New Additions to Integrated Architecture
GuardLogix® & Compact GuardLogix
New Controller Support in V31
Scalable Safety Options
New SIL/PL Options are Configurable

Pick your GuardLogix® controller
Scalable Safety Options

What if My Application Needs SIL3/PLe?

Scalable safety options that meets your needs: SIL2/PLd and SIL3/PLe

- Greater flexibility matching the safety required levels
- Potential gain of rack space if going from SIL3/PLd to SIL2/PLe
- Cost reduction by not needing a safety partner when only SIL2/PLe is needed

Easily modify safety level from Controller Properties Safety Tab

- Safety Levels: SIL2/PLd and SIL3/PLe
Simplified **System Integration**

*Studio 5000 View Designer* Provides Tight Integration with Logix Controllers
Studio 5000 View Designer™

- New design editor focused on ease of use
- Scalable vector graphics automatically adjust objects and screens to any terminal size
- Create custom, reusable add-on graphics to more efficiently build your applications

**INTUITIVE DESIGN**

- Logix-based alarms are automatically available on the PanelView™ 5500
- Logix tag extended property support helps develop richer content

**ENHANCED INTEGRATION WITH LOGIX**

- Project Explorer to organize project
- Searchable toolbox for all project elements
- Tag browser to search and select Logix tags
- Property pane to configure objects
- Graphical design of screens
- Graphics explorer to find and select elements

**LOGIX-VIEW INTEGRATION SIMPLIFIES DEVELOPMENT AND IMPROVES RUNTIME**
PanelView™ 5300 for smaller applications

Data logging & historical trending

Test run a project with emulator

Optimized integration with Logix for efficient HMI design
Studio 5000 View Designer™

What's New?

PDF viewer | VNC support | Load from removable media

- Optimized integration with Logix for efficient HMI design
• **Overview**
  - Easily monitor and troubleshoot Rockwell Automation devices from your PanelView 5000. Initial set of faceplates include:
    - CIP Motion Drives
      - Kinetix 5700, 5500, 6500, 350 & PowerFlex 527, 755
    - Variable Frequency Drives
      - PowerFlex 755, 753, 525
      - ArmorStart 284E, ST 284E, LT 294°
    - E300 Electronic Overload Relay
    - Starters
      - SMC-50 Soft Starters
      - ArmorStart 280E, 281E, ST 281E, LT 290E, LT 291E
    - Enhanced PID instruction
      - Faceplates will be available via PCDC
      - Additional faceplates will continue to be added.
Productive Library Management

Studio 5000 Application Code Manager Enables Efficient Project Development
**Application Code Manager**

- **Combine control, visualization, historical, and alarm management into one library object**
- **Centralized repository for easy access and version management**

**PUBLISH LIBRARY OBJECTS**

- Easily generate your standardized application code in bulk to configure projects
- Users don’t need to understand the library object dependency structure; the tool manages the dependencies per the librarian’s rules
- Out-of-the-box integration enables simple and fast bulk deployment of the Library of Process Objects and Machine Builder Library

**BUILD APPLICATIONS**

- Library Designer is integrated into Studio 5000 Logix Designer
- Flexible library authoring – structuring reusable content the way you want it
- Allows the librarian to manage dependencies between library objects, easily share and manage common objects

**DESIGN LIBRARY OBJECTS**

- Configure the library object instance
- No programming needed
- Export to Excel for bulk configuration

Easily add, edit, project content by library object

Leverage Rockwell Automation libraries for easy project creation, or create your own

**Leverage Rockwell Automation libraries for easy project creation, or create your own**
Create Highly Reusable Library Content

Step 1: Create Content to be Libraried

Logix Designer

FactoryTalk View

FactoryTalk Historian

FactoryTalk Alarms & Events

Step 2: Group and Parametrize Library Content

Parametrize
• Create Parameters to get information from the user
• Manage Naming (tasks, programs, routines, tags and IO modules)
• Manage Descriptions: tags, rungs, etc.
• Set tag values
• Conditional Inclusions of content
• Usage (once or include many)
• Share common comments, etc.

Step 3: Publish

Motor
Valve
PID
Labeling
Weighing
...
Build Project Content
Easily Deploy Project Content Through Configuration – No Programming!

Step 1:
Create a Project

Step 2:
Select Library Object and Configure via Parameters . . . . Repeat or Export / Import

Step 3:
Generate
Overview

- New licensing model, including a no-cost “Lite Edition”
- Easily add, edit, or delete project content by a Library Object, aka “Class View”
- Enhanced management of dependencies between library objects
- Instantiate content into existing Logix Designer projects

Benefits

- Rapid application development by leveraging library content (provided or custom)
- Facilitates continuous re-use of IP and aids to enforce standards
- Automatic content generation for:
  - Logix Designer
  - FactoryTalk® View SE/ME (displays)
  - FactoryTalk® Historian
  - FactoryTalk® Alarms & Events
Studio 5000 Application Code Manager
Libraries Provided by Rockwell Automation

Machine Builder Libraries
PCDC search “Machine Builder Libraries”

Process Object Library
PCDC search “Process Library”
We have an OEM (who asked not to be named) using Application Code Manager Standard Edition and is reporting close to 10x time savings vs. the manual programming.”
Emulation & The Digital Twin

Studio 5000 Logix Emulate® Enables Virtual Commissioning and Operator Training
Digital Design Overview

*Increases design productivity and reduce risk with virtual design*

- **Machine Prototyping**: Easily design and build next generation machines with confidence.
- **Throughput Analysis**: Optimize throughput with simple, real-time 3D simulation of complex dynamic processes.
- **Virtual Commissioning**: Design, test, validate, and commission machines or SKUs before they are put into service.
- **Operator Training Systems**: Reduce risk and improve operations by training workforce in a safe, virtual environment.
Introducing the Virtual Plant
Simulate Your Plant

REAL WORLD

Human Machine Interface:
FactoryTalk View SE/ME
View Designer

Control System:
ControlLogix platform

Remote I/O, Devices

Actuators, Sensors

VIRTUAL WORLD

All on one PC:
FactoryTalk View SE/ME
Studio 5000 View Designer

Software in the Loop (SiL)

Hardware in the Loop (HiL)

Rockwell Automation PartnerNetwork™ & other 3rd party vendors

SIMULATION OF DEVICES

SIMULATE BUSINESS PROCESSES ACROSS ENTERPRISE WITH ARENA® SOFTWARE→→→
**Overview**

- Snapshot/Restore functionality enables the ability to restore process to an instant in time for situational training
- Data interface provides robust mechanism to inject simulated process control dynamics into the system
- Enables ability to halt/resume execution of the controller for pausing a process

**Benefits**

- Create a safe classroom environment for operators to learn the system
- Enable more robust system testing to verify design and implementations before commissioning
- Prove out process and/or system design changes without impact to the running system

Enables powerful operator training capabilities by connecting an emulated control system to high fidelity process simulators
MATLAB Simulink® Integration
Model-Based Design with Simulink PLC Coder™

Overview
Studio 5000 integrates with the Simulink® modeling environment, enabling you to design and implement a control system on Logix5000™ controllers. With Simulink, you can model and simulate a controller, and generate IEC 61131 structured text for import into Studio 5000 Logix Designer.

Benefits
- Model and simulate your control system using Simulink models and Stateflow® charts
- Detect design errors early and reduce physical prototyping time and cost
- Generate IEC 61131 structured text from the same control algorithm model using Simulink PLC Coder™ targeted for Logix Designer
- Download the structured text as an Add-On Instruction (AOI) into Logix Designer
Communications Evolution

Studio 5000 Adoption of FactoryTalk® Linx
Introducing FactoryTalk® Linx™

Overview

- Name changed to appropriately reflect FactoryTalk® Linx™ as the premier communications service included with FactoryTalk® software portfolio

- Revised name for FactoryTalk® Linx™ Gateway provides a closer tie between the communications service and purchased OPC option

*RSLinx® Classic and FactoryTalk® Live Data retain original names*
FactoryTalk® Linx™ Communications
Studio 5000 Adoption

Overview
• FactoryTalk® Linx™ V6.00 added network browsing component and communications services for Studio5000 Logix Designer
• Choose which Linx™ edition for online interactions
• Driver configuration integrated in network browser
• Enhanced usability, topology search and auto EDS upload
• Large 4,000 byte connection for download operations

Benefits
• Reduces steps and time required to configure network drivers
• Streamlines network setup and system navigation
• Shorter download time over Wi-Fi and remote connections gives faster startup and system recovery
FactoryTalk® Linx™ OPC UA Connector

Overview

- New connector adds OPC® UA communications for FactoryTalk® software
- OPC UA data definitions merged into FactoryTalk® Live Data namespace
- OPC UA TCP data exchange vs. OPC DA DCOM

Benefits

- Nothing new to buy, simply update FactoryTalk® Linx to version 6.00
- Permits FactoryTalk® Software to interface with third-party data servers
- More productive system namespace browsing
- TCP enhances capacity and stability
**Overview**

- FactoryTalk® Linx™ Gateway adds ability to server data to OPC UA clients
- Uses FactoryTalk® Linx™ high performance, distributed server capabilities
- Browse service to deliver controller data definitions to external OPC Clients
- OPC UA uses TCP vs. DCOM from OPC DA

**Benefits**

- Included with new version for existing owners of FactoryTalk® Linx™ Gateway
- Scalable from single station to multi-server systems
- Provides third-party software access to Rockwell Automation® controllers
- TCP enhances capacity and stability
FactoryTalk® Linx™
Allows Support of EtherNet/IP Process Devices

Overview
• Communications Device Type Manager (DTM) bridging EtherNet/IP capable process devices to hosting Field Device Tool (FDT) applications
• Compatible with FactoryTalk® AssetCentre and Endress + Hauser FieldCare software products
• Coexists with the existing Rockwell Automation portfolio of modules DTM, which are required for HART, FF and PA process devices
• Leverages Rockwell Automation communications software products
• Users can choose to use RSLinx® Classic or FactoryTalk® Linx™
• Free of charge – available now from PCDC

Benefits
• Delivers a modern, easy-to-use communications solution for customers adopting EtherNet/IP based process instruments
• Improved user experience
New ControlFLASH Plus™ Functionality
Improved, Productivity, Usability and Scalability

Overview
• New generation firmware update tool with a modern and simple UI for better firmware management
• Allows for multiple devices flash operations
• Optional connectivity to Product Compatibility and Download Center (PCDC) targeted for R2
• Firmware revisions template support

Benefits
• Improves productivity by allowing shorter time to update multiple devices
• Easy access to latest firmware releases and release notes for improved device firmware lifecycle management (R2)
• Easily apply firmware standards
• Can coexist with existing ControlFLASH

First release targeted for end of Q1 CY2018
Product Compatibility and Download Center
FactoryTalk® Network Manager™

Overview
New easy-to-use network management software from Rockwell Automation:
- Discovers plant floor network (EtherNet/IP and CIP™) and provides many enhanced topology views
- Provides real-time capture of alarms and events, configuration, backup, and export capabilities
- Allows for creation of configuration templates

Benefits
- More easily deploy, commission, and maintain your control system networks
- Simplifies management and troubleshooting activities
Thank You!