Kendall Connection Live
Logix & Studio 5000 Update

ControlLogix, CompactLogix, and V30 Overview
## Agenda

### Hardware
- Integrated Architecture®
- ControlLogix® Portfolio
- CompactLogix Portfolio
- Application Scenario’s

### Software
- Studio 5000 Integrated Design Environment Overview
- Studio 5000 Architect R2 Updates
- Studio 5000 Logix Designer v30 Updates
- Studio 5000 View Designer R3 Updates
- Studio 5000 Application Code Manager R2 Updates
Integrated Architecture Portfolio

Smarter Technology
Enhanced Productivity
Secure Environment

Control
- LOGIX

Motion
- KINETIX

Network Infrastructure
- STRATIX

Software
- STUDIO 5000

Operator Interface
- PANELVIEW

Distributed I/O
Condition Monitoring
- POINT – FLEX – ARMOR - DYNAMIX
Controller Product Positioning

Micro Control Platform
Micro800® Control System
- Low acquisition cost
- Just enough control
- Easy connectivity
- Simple programming tools

Integrated Architecture®
- Multiple control disciplines
- Flexible and scalable
- Real-time information enabled
- Integrated design environment

Programmable Logic Controllers

Small Control Platform
CompactLogix™ Control System
Large Control Platform
ControlLogix® Control System

Programmable Automation Controllers

Scalable • Engineering Collaboration • Device Integration
EtherNet/IP • Network Segmentation • Multi-discipline
Control Logix – Video
ControlLogix Portfolio

A scalable platform that provides real-time control on EtherNet/IP and helps ensure high usability and consistency for the entire system. High performance, standard and extreme environment control systems for Plant-wide Optimization and machine and equipment builder performance.

Addressing the needs of multi-discipline control...
ControlLogix Portfolio Positioning

Supports standard and extreme environments and integrated safety control

ControlLogix® 5570

On-Machine™ standard and safety control

On-Machine™ Controllers

1756 I/O Modules

Peer-to-peer, HART and Isolated I/O

Communication Modules

EtherNet/IP, ControlNet and DeviceNet networks

ControlLogix® 5580

High performance, increased capacity and motion performance

On-Machine™ standard and safety control

1756 I/O Modules

Communication Modules
ControlLogix 5580 Controller

- **High Performance**
  - 1 Gb Ethernet port supports integrated motion on Ethernet/IP

- **Onboard Display**
  - For enhanced diagnostics and troubleshooting

- **USB Port**
  - For easy programming, troubleshooting and firmware updates

- **Secure Digital Card**
  - Ships with 2 GB storage card providing optional storage for firmware, user program and tag data

- **Integrated Energy Storage**
  - No battery required
Future Proofing Your System

Enabling The Connected Enterprise

Enables faster system performance

ControlLogix® 5580
ControlLogix 5580

HIGH PERFORMANCE

- 1 gigabit (Gb) embedded Ethernet port
  - High-speed communication, I/O and Motion
- Decreased scan times for runtime performance
  - Core programming languages execute with the same performance
- Screw-to-screw performance increased with 5069 Compact I/O system
  - 1 Gb communications with controller and Distributed I/O

HIGH PERFORMANCE
ControlLogix 5580

INCREASED CAPACITY

- 45% increased application capacity
  - Future proof for application expansion
- Supports up to 256 axes of motion
  - Reduces the need for multiple controllers in complex applications
- Supports up to 300 EtherNet/IP nodes
  - Supports the increasing number of smart devices
## High Performance Logix Controllers
Right size your controller based on your application needs

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Memory</th>
<th>Nodes</th>
<th>Total Axes of Motion</th>
<th>Local I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1756-L81E</td>
<td>3 MB</td>
<td>60</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>1756-L82E</td>
<td>5 MB</td>
<td>80</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>1756-L83E</td>
<td>10 MB</td>
<td>100</td>
<td>256 (subject to node limit)</td>
<td>16</td>
</tr>
<tr>
<td>1756-L84E</td>
<td>20 MB</td>
<td>150</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>1756-L85E</td>
<td>40 MB</td>
<td>300</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

5580 (L8) ControlLogix
So where would this new L8 make sense????
ControlLogix® 5570 System

- Common control engine and development environment for a scalable solution
- High-performance platform for motion, process, discrete, safety, extreme temperatures and high-availability applications
- Standard and extreme environment versions
- Conformal coating
- Programming in multiple languages

1756 I/O

- Digital, analog and specialty formats
- Removable terminal blocks allow Removal and Insertion under Power

Safety Controllers

- Features and benefits of standard control with integrated safety up to SIL 3, PLe in the same chassis

Communication Modules

- Multiple network capabilities for standard and extreme environments
- Ethernet, DeviceNet and ControlNet networks

Redundancy Modules

- For high availability to help minimize downtime
### ControlLogix 5570 Controller

**5570 ControlLogix Controller**
- Standard, high-performance, scalable, multi-discipline control
- Conformal coating
- Programming in multiple languages

**Energy Storage Module**
- Battery not required
- Ships already installed in the controller

**Status indicators**
- Immediate status of communications, module health and I/O activity

**Ethernet Ports**
- Fast access and communication via Device Level Ring and Linear topologies
- Real-time I/O messaging and exchange
- Increased communication on EtherNet/IP

**USB Port**
- High performance and speed for easier programming and firmware updates

**Secure Digital (SD) card**
- Nonvolatile memory permanently stores user programs and tag data

**Three-position Keyswitch**
- Provides mode selection and added security
ControlLogix-XT 5570 Controller

5570 ControlLogix-XT Controller
- Same functionality as the 5570 standard controller in extreme environments

Three-position Keyswitch
- Provides mode selection and added security

Secure Digital (SD) card
- Nonvolatile memory permanently stores user programs and tag data

Ethernet Ports
- Fast access and communication via Device Level Ring and Linear topologies
- Increased communication over Integrated Motion on EtherNet/IP

Energy Storage Module
- Battery not required
- Ships already installed in the controller

ControlLogix XT System
- High-performance and multi-discipline control for extended protection in extreme environments -25...70 °C (-13...158 °F)
- Increased protection in ISA G3 environments

USB Port
- High performance and speed for easier programming and firmware updates
GuardLogix® Safety Controller
- Integrated safety control up to SIL 3, PLe, in the same chassis as standard controllers

Three-position Keyswitch
- Provides mode selection and added security

Secure Digital (SD) card
- Nonvolatile memory permanently stores user programs and tag data

Energy Storage Module
- Battery not required
- Ships already installed in the controller

USB Port
- High performance and speed for easier programming and firmware updates

GuardLogix-XT Safety Controller
- High-performance, safety control for extended protection in extreme environments -25...70 °C (-13...158 °F)
- Increased protection in ISA G3 environments

Safety Partner
- Satisfies SIL 3 safety requirements when installed to the right of the standard and XT controllers
Armor GuardLogix and Armor ControlLogix 5570

Armor™ ControlLogix® and Armor™ GuardLogix®
- Standard and safety On-Machine control up to SIL 3, PLe in an IP67-rated housing for dust and wash-down protection in harsher environments

Status indicators
- Four indicators provide immediate status about the controller’s health

Networks
- Two independent Ethernet network connectors provide network flexibility
- Dual ports allow Device Level Ring topology

Secure Digital (SD) card
- Nonvolatile memory permanently stores user programs and tag data

Power Supply
- Enables power for each device

USB Port
- High performance and speed for easier programming
1756 I/O Modules

I/O Offers:
- Local placement in the chassis for faster communication
- Distributed placement for field devices near the machine
- Produce/consume communication capabilities
- Removal and Insertion under Power
- Module-level fault reporting and field-side diagnostics
- 6,8,16 and 32-point options

Communication
- EtherNet/IP, DeviceNet and ControlNet networks via the backplane

Mounting Options Available:
- In-chassis
- Horizontal
- Vertical with derating

Chassis-based Format
- Mix and match wide range of module functionality
- Power supply and network adapters needed
- Uses intermediate wiring terminal

Types Available:
- Digital
- Analog
- HART
- 3rd-party
- Peer-to-Peer
1756 Communications Modules

1756 Communication Adapters
- Support communication bridging across multiple networks independent of controller
- Route messages through up to 4 chassis

Status indicators
- Provide ongoing status for adapter health

USB Port
- Offers high performance and speed for network connectivity

ControlNet Module
- A fully deterministic network
- Redundant media support
- Up to 64 connections and 99 devices
- Extreme environment support

EtherNet/IP Module
- Open, standard, information enabled, “future proof” networks
- Fast update rates of <1 ms for real-time control
- Up to 256 connections
- Embedded switch technology
- Extreme environment support

DeviceNet Module
- A simple, low-cost network hardware choice
- Power and signal in one cable
- Low-density I/O control
- Up to 64 devices on the network
A scalable Midrange Architecture control platform for smaller applications. One common control engine and design environment provides real-time networking with Integrated Safety and Integrated Motion on EtherNet/IP capabilities for machine and equipment builders.
CompactLogix Product Portfolio Positioning

- **Supports up to 2 axes of Integrated Motion on EtherNet/IP and POINT I/O™**
  - CompactLogix™ 5370 L1

- **Supports up to 4 axes of Integrated Motion on EtherNet/IP and 1769 I/O**
  - CompactLogix™ 5370 L2

- **Supports up to 16 axes of Integrated Motion on EtherNet/IP and 1769 I/O**
  - CompactLogix™ 5370 L3

- **Supports up to 20 axes of Integrated Motion on EtherNet/IP and 5069 I/O**
  - CompactLogix™ 5380

- **Integrated Safety and Integrated Motion in a Single Compact Controller**
  - Compact GuardLogix® 5370 Controller
CompactLogix™ 5380 Controller

Onboard Display
- Immediate status of comms, module health and I/O activity without opening Logix Designer

Enhanced Security
- Features digitally-signed controller firmware, controller-based change detection and logging and role-based access control
- Three-position mode switch adds a physical layer of security

Power
- Provides power via RTBs through external power supply installed on the controller

Ports
- Dual Configurable IP port supports DLR/Linear topologies or Multiple IP addresses for network separation between the machine level and the enterprise level

USB Port
- Provides easy programming, troubleshooting and firmware updates

5069 I/O
- Supports up to 31 local I/O modules
- Analog, digital, HSC, universal analog input, sourcing digital input, address reserve, field power distribution, relay output, sinking digital input
Small Control Platform

High Performance

Dual Configurable Port

CompactLogix™ 5380
CompactLogix™ 5380 Controller

HIGH PERFORMANCE

- Dual 1 gigabit (Gb) embedded Ethernet port
  - High-speed communication, I/O and Motion
- Decreased scan times for runtime performance
  - Core programming languages execute with the same performance
- Screw-to-screw performance increased with 5069 Compact I/O™ system
Up to 20% increased application capacity
- Future proof for application expansion
- Supports up to 32 axes of motion
- Supports up to 80 EtherNet/IP nodes
- Supports the increasing number of smart devices
- Supports up to 32 drives in a single controller
  - Increased performance for low axis machines
- Multiple course update rates
  - Three configurable rates enhance machine performance
- Advanced tuning with Load Observer and Tracking Notch Filter
  - Helps eliminate need to tune each axis and adapts to changing frequencies over time
- Digitally-signed and encrypted firmware
  - Helps protect against malicious intent
- Controller based change detection
  - Logging of changes allows added security
- Role-based access control to routines and Add-On Instructions
- Mode change switch
  - Adds a physical layer for security
# CompactLogix™ 5380 Feature Comparison

<table>
<thead>
<tr>
<th>Features</th>
<th>5370</th>
<th>5380*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall performance</td>
<td>1x</td>
<td>5x-20x</td>
</tr>
<tr>
<td>Memory</td>
<td>1 – 3 MB</td>
<td>0.6 – 4 MB</td>
</tr>
<tr>
<td>Screw to screw performance</td>
<td>3-4ms</td>
<td>&lt;500μs</td>
</tr>
<tr>
<td>Axis per controller</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Axis per ms (50% CPU loading)</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Number of unconnected buffers</td>
<td>40</td>
<td>256</td>
</tr>
<tr>
<td>Cached Message Buffers</td>
<td>32</td>
<td>256</td>
</tr>
<tr>
<td>Simultaneous messages</td>
<td>16</td>
<td>256</td>
</tr>
<tr>
<td>Integrated Motion on EtherNet/IP</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethernet packets/sec</td>
<td>10,000</td>
<td>128,000</td>
</tr>
<tr>
<td>Ethernet messaging (Class 3) msg/sec</td>
<td>400</td>
<td>2000x</td>
</tr>
<tr>
<td>Embedded Ethernet port</td>
<td>100M</td>
<td>1 Gb</td>
</tr>
<tr>
<td>Communications impact to application scan</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Integrated safety</td>
<td>Yes</td>
<td>Future</td>
</tr>
<tr>
<td>Support for 1734, 1794, 1769</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Support for 5069 Compact I/O™</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Data size = 32-bits / 1-DINT

## Catalog Number

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Memory Size</th>
<th>EtherNet/IP nodes</th>
<th>Integrated Motion on EtherNet/IP</th>
<th>Local I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>5069-L306ER(M)</td>
<td>600 KB</td>
<td>16</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>5069-L310ER(M)</td>
<td>1 MB</td>
<td>24</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5069-L310ER-NSE</td>
<td>1 MB</td>
<td>24</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>5069-L320ER(M)</td>
<td>2 MB</td>
<td>40</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>5069-L330ER(M)</td>
<td>3 MB</td>
<td>50</td>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td>5069-L340ER(M)</td>
<td>4 MB</td>
<td>55</td>
<td>20</td>
<td>31</td>
</tr>
</tbody>
</table>
CompactLogix 5370 System

CompactLogix™ System
- Compact, high performance, economical platform
- Common control engine and development environment for a scalable solution

CompactLogix™ Controllers
- High-performance, multi-discipline control for motion, process and safety applications
- Multi-language programming
- Communication bridging across multiple networks

Built-in Energy Storage Module
- No battery requirement

I/O Modules
- Rackless design for a low-cost solution
- Analog, digital and specialty modules offer built-in RTBs for easy connectivity to I/O sensors and actuators

Secure Digital (SD) card
- Simplified device replacement
- Easier initial configuration and deployment

Mount
- DIN rail or cabinet options available for design flexibility
CompactLogix 5370 L1 Controller

5370 L1 Standard Machine Controller
- Combines the Logix platform with the flexibility of POINT I/O™ for an economical solution
- Supports up to 2 axes Kinematics for simple articulated robotics

Three-position Mode Switch
- Mode selection for PROG, REM and RUN modes for easier operation

Dual Ethernet Ports
- Integrated Motion over EtherNet/IP for maximized scalability
- Device Level Ring and Linear topology support to help increase network resiliency

Embedded Power Supply and I/O
- Offers a smaller form factor for maximized cabinet space
- Local I/O expansion with POINT I/O

Secure Digital (SD) card
- Helps enable more simplified device replacement
- Includes up to 2 GB of storage for fast program save and restore

USB Port
- High performance and speed for programming and firmware updates

Increased Storage Capacity
- Offers up to 1 MB of user memory for increased storage capabilities

Status indicators
- Immediate status of communications, module health and I/O activity
CompactLogix 5370 L2 Controller

5370 L2 Small Machine Controller
- Combines the Logix platform with the flexibility of Compact I/O™
- Supports up to 4 axes of motion

Embedded power supply and I/O
- Maximized space and support for universal analog I/O
- Local I/O expansion with 1769 I/O

Dual Ethernet Ports
- Integrated Motion on EtherNet/IP
- Device Level Ring and Linear topologies

Secure Digital (SD) card
- Simplified device replacement
- Easier initial configuration and deployment

Universal Inputs/Outputs
- Increased configuration flexibility with Embedded Universal Analog inputs/outputs
- High-Speed Counter inputs for increased performance

Status indicators
- Immediate status of communications, module health and I/O activity
CompactLogix 5370 L3 Controller

5370 L3 Standard Machine Controller
- Control at the machine level for applications requiring smaller amounts of I/O
- Supports up to 16 axes of motion

Local Expansion Modules
- Supports up to 30 local expansion modules with 1769 I/O for increased functionality

Status indicators
- Immediate status of communications, module health and I/O activity

Added protection for hazardous environments
- No Stored Energy (NSE) version allows safe transport of controller
- Powered down controller has less than 200 uJ of residual energy stored in each component
- No consequences of arc or spark to cause an explosion in gaseous environment

USB Port
- High performance and speed for simplified programming and firmware updates

Secure Digital (SD) card
- Simplified device replacement
- Easy configuration and deployment

Dual Ethernet Ports
- Integrated Motion on EtherNet/IP
- Device Level Ring and Linear topologies
Compact GuardLogix 5370 Controller

Integrated Safety
- Integrated Safe Torque Off with Kinetix 5500 and PowerFlex 527
- Provides Integrated Safety up to SIL 3, PLe CAT 4

USB Port
- Provides easy programming, troubleshooting and firmware updates

Removable Secure Digital Card
- Allows easy, portable transfer of machine programs without software download

Dual Ethernet Ports
- Support Linear and Device Level Ring topologies
- Integrated Motion up to 16 axes
Compact GuardLogix®

- High performance integrated safety
- Standard, Safety, and Motion control
- Integrated Safety on EtherNet/IP
- Ease-of-use for SIL2, SIL3, PLe safety functions
- High Integrity Add-On Instruction

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Standard Memory</th>
<th>Safety Memory</th>
<th>Nodes</th>
<th>Integrated Motion on EtherNet/IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1769-L30ERMS</td>
<td>1 MB</td>
<td>0.5 MB</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>1769-L33ERMS</td>
<td>2 MB</td>
<td>1 MB</td>
<td>32</td>
<td>8</td>
</tr>
<tr>
<td>1769-L36ERMS</td>
<td>3 MB</td>
<td>1.5 MB</td>
<td>48</td>
<td>16</td>
</tr>
</tbody>
</table>

1oo2 Architecture
SIL3 (IEC61508) PLe (ISO13849)
CompactLogix™ 5480 Controller

Features and Benefits

- Three Ethernet ports – two configurable for dual IP addresses and varying speeds up to 1 Gb, supporting linear and Device Level Ring topologies.
- Redundant fan assemblies provide active cooling and can be replaced under power helping to maintain continuous operation.
- Diagnostic displays and status indicators provide immediate information about module health, Logix controller port and computer port health.
- External UPS connection provides optional battery backup for critical applications.
- Supports up to 31 local 5069 Compact I/O™ modules.
- USB device/host ports provide connectivity to remote devices and provide computer connection to external peripherals.

Expected Availability: Q2 2017

Rockwell Automation Integrated Architecture
5480 – Product Video
CompactLogix™ 5480 Controller
CompactLogix™ 5480 Controller
## CompactLogix™ 5480 Controller

<table>
<thead>
<tr>
<th>5069-L46ERMW</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time Control</td>
<td>Logix control engine</td>
</tr>
<tr>
<td>Open Operating System</td>
<td>Windows 10 IoT Enterprise (independent of the Logix control engine)</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel i7 2.4 GHz Quad</td>
</tr>
<tr>
<td>Storage</td>
<td>20 MB (Logix) Approx. 16 GB Free (OS)</td>
</tr>
<tr>
<td>SDRAM</td>
<td>5.75 GB (Windows)</td>
</tr>
<tr>
<td>GbE Ports (Logix)</td>
<td>3 (2 ports configurable for Dual IP or DLR)</td>
</tr>
<tr>
<td>GbE Ports (OS)</td>
<td>1</td>
</tr>
<tr>
<td>Monitor Interface</td>
<td>1 (DisplayPort) – supports standard converters for HDMI, DVI, VGA displays</td>
</tr>
<tr>
<td>USB Ports</td>
<td>1 Device Port (Logix) 2 USB 3.0 Host Ports (OS)</td>
</tr>
<tr>
<td>I/O</td>
<td>Supports up to 31 local 5069 Compact I/O™ Modules</td>
</tr>
</tbody>
</table>
Safety Line-Up
Compact GuardLogix® Safety Portfolio Positioning

Dedicated safety controller with EtherNet/IP connectivity with 16/8 safety I/O and 4 std outputs

- SmartGuard™ 600
- Compact GuardLogix 5370
- Armor GuardLogix 5570

On-Machine Safety Control with the Same Capabilities as the 1756 Safety Controller

- High Performance Integrated Safety for Standard, Safety and Motion Control

Integrated Safety and Integrated Motion in a Single Compact Controller
Product Positioning
Logix Controller Hardware
Current Generation

General Purpose

L1
CompactLogix 5370

L2

L3
CompactGuardLogix 5370

L3s

General Purpose w/Safety

CompactLogix 5380

High Performance

5069 Compact I/O

GuardLogix - 5570

ControlLogix - 5570

ControlLogix - 5580 (L8)
IO Update
I/O Update

5069 Compact I/O™
- Release 1: Nov 2015
  - 15 modules
- Release 2: Q4 CY2016
  - 4 modules + small network adapter
- CompactLogix™ 5380 Controllers
  - Full connectivity to 5069 Compact I/O™ both locally and remotely via adapter
- ControlLogix 5580 Controllers
  - Full connectivity to 5069 Compact I/O™ remotely via adapter

1734 Point I/O™
- 1734-4IOL IO-Link Master
  - 4 IO-Link devices
  - Supported by all POINT EtherNet/IP adapters
  - Parameterization of IO-Link devices are handled via Add-on Profile

Point Guard I/O™
- 1734-OBV2S bipolar safety output module
  - Two dual channel control circuits SIL3 and PLe rated
5069 Compact I/O™

**Release 1**

- IB6F-3W
- IB16F
- IB16
- OB16F
- OB16
- IF8
- IY4
- OF8
- OF4
- OX4I
- OW4I
- HSC2xOB4
- FPD
- ARM
- AEN2TR
- EtherNet/IP Adapter
- Input - 24Vdc
- Output - 24Vdc
- Input – Analog/Temperature
- Output – Analog
- Output – Relay Isolated
- High Speed Counter
- Field Power Distribution
- Address Reserve

**Release 2**

- IB6F-3W
- IB16F
- IB16
- OB16F
- OB16
- IF8
- IY4
- OF8
- OF4
- OX4I
- OW4I
- HSC2xOB4
- FPD
- ARM
- AENTR
- EtherNet/IP Adapter
- Input – 120/240Vac
- Output – 120/240Vac
- Output – 24Vdc
- Output – Relay

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5069-AENTR Highlights

Clear Module type and Product Catalog number

Isolated power supply board design with Removable Terminal Block

IP address label for quick reference of IP address

Front access RJ45 connector for easy access of Ethernet port

Easy to release Din Latches

Rotary switch for easy IP address setup

31 I/O modules in a single rack

High speed backplane of packet transfer rate of 4.4μs (511 byte packet)

High performance adapter in a smaller form factor, reduce customer panel space requirement
POINT IO-LINK Master

- The new 1734-4IOL IO-Link Master module enables connection of up to 4 IO-Link devices
- Parameterization of IO-Link devices are handled via Add-on Profile
- I/O wiring topologies between existing POINT terminal and IO-Link devices are maintained
- Supported by all POINT EtherNet/IP adapters
Control \ Compact Logix Quiz

1.) An OEM is building a new conveyor system for a plant with a large install-base of Compact Logix and has requested that the firmware be at the latest version of v20. Select a current controller that will be able to support this version of Logix.

a.) 1769-L32C
b.) 1769-L33ER

c.) 5069-L310ER

d.) None of the above
Control \ Compact Logix Quiz

2.) An end user has asked their OEM to remove the PC from their batching system. Their batching systems use FT View SE and the PC is typically the weakest link. Yes, the end user wants to run SE onboard with the Controller. The next order for this end user is sometime in the fall. Pick the controller with this ability to run SE.

   a.)  1769-L36ERM
   b.)  1769-L45
   c.)  5480 Compact Logix Series
   d.)  5069-L340ER

The correct answer is c.) 5480 Compact Logix Series.
Control \ Compact Logix Quiz

3.) You have reviewed a customer specification and noticed the customer will need to control 142 PowerFlex 527 drives from a single controller. What controller from the list below should you select?

a.) 1756-L72
b.) 1769-L36ERM
c.) 1756-L55
d.) 1756-L85E
Control \ Compact Logix Quiz

4.) An OEM is building a machine with multiple safety zones so a Safety Processor will be used. The block point or highest level of firmware allowed in the plant is v28. The customer has expressed interest in using a CompactLogix. Which processor would be the likely choice for this new machine?

a.) 1768-L43S
b.) 1756-L72S
c.) 1769-L33ERMS

-  

d.) None of the above
5.) You are building a 2 Axis control system with 16DC Inputs and 12DC Outputs which controller will work?

a.) 1769-L18ERM
b.) 1769-L27ERM
c.) 5069-L306ERM
d.) All of the above
Studio 5000 v30
5 Minute Break
Studio 5000®
Simplifying your design journey
An intuitive design and configuration software suite with multiple components
Engineering Tools

- PDM / PLM
- mCAD
- eCAD
- P&ID
- Simulation
- OTS
- Modeling

Integrated Development Environment

Control

Visualization

Information

Early Design

Sizing, Select, Procure

Configure & Build

Install & Commission

Operate & Maintain
Centralized system configuration and management

EXCHANGE DATA
- Start from other design artifacts
- Incorporate existing control and visualization projects
- Reduce configuration time by leveraging automation system project templates and content

LAYOUT & CONFIGURE
- Layout your control, visualization, and communications network
- Configure devices from central location
- Build automation projects

MANAGE & VIEW
- Centralized access to projects
- Launch your control and visualization projects
- Quickly search across your automation system
Studio 5000 Architect R2
Release Summary

- Enhanced Data Exchange
- Refreshed User Interface
- Expanded Device Support
Collaborative Data Exchange
Data Exchange Capabilities Enables Bi-Directional Synchronization

- Synchronizes data transfer of Hardware configuration and Point Tags (Alias Tags)
- Allows for automated schematic updates
- Improves start-up time helping ensure electrical drawings are perfectly matched to I/O assignments
Studio 5000 Architect™
Refreshed User Interface

- Modernize user interface to align with Studio 5000 and improve user experience
  - Reduce complexity for device selection and constructing graphical layout
  - Modernize look and feel in order to grow alignment across Studio 5000 tools
  - Improve user experience for multi-device and application content workflows
Studio 5000 Architect™
Expanded Device Support

- Expand device families to better align with Studio 5000 Logix Designer
- Tight alignment with Studio 5000 Logix Designer to reduce time to configure devices across multiple controllers
- Expand drives and motion devices to deliver a more complete system configuration
Studio 5000 Logix Designer v30
Release Summary

- **Hardware Support:**
  - CompactLogix 5380
    - 5069-L350ER(M)
    - 5069-L380ER(M)
    - 5069-L3100ER(M)
  - CompactLogix 5480
    - Family introduction
  - PowerFlex 750 Series
    - CIP Safety Safe Torque Off (STO)
  - Kinetix VPC motor support

- **Software Features:**
  - ControlLogix and CompactLogix 5x80 Family of Controllers
    - String to Literal Binary Comparison
    - Licensed Based Content Protection
  - ControlLogix and CompactLogix 5x70 Family of Controllers
    - Controller Based Audit Log
  - Notable Mentions
    - Workstation Options - Verification Options
    - ST Editor Smart Header Updates
    - Trend Editor Updates
    - Studio 5000 simplified installation
  - Windows 10 & Server 2016 support
String to Literal Binary Compare
Increased programming productivity through better string management

- Ladder Editor Support
  - Literal to String Tag Comparison
  - EQU, NEQ, LES, GRT,
  - LEQ, GEQ
- Structured Text Editor Support
  - String to Literal Comparison
    - IF Name = ‘spare’ THEN...
    - Done:= (Name >= ‘Logix’)

### Diagram

#### For this comparison

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Use this operator</th>
<th>Optimal data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal</td>
<td>-</td>
<td>DINT, REAL, string</td>
</tr>
<tr>
<td>Less than</td>
<td>&lt;</td>
<td>DINT, REAL, string</td>
</tr>
<tr>
<td>Less than or equal</td>
<td>&lt;=</td>
<td>DINT, REAL, string</td>
</tr>
<tr>
<td>Greater than</td>
<td>&gt;</td>
<td>DINT, REAL, string</td>
</tr>
<tr>
<td>Greater than or equal</td>
<td>=&gt;</td>
<td>DINT, REAL, string</td>
</tr>
<tr>
<td>Not equal</td>
<td>&lt;&gt;</td>
<td>DINT, REAL, string</td>
</tr>
</tbody>
</table>
Upon creation of a new Structured Text routine the following `<tags>` are automatically replaced within the pre-formatted header:

- `<Company Information>`
- `<Developer Name>`
- `<Date>`
- `<Routine Name>`
- `<Description>`

```plaintext
// Copyright (c) Rockwell Automation
---
// Routine: MasterState
// Author: RA-INT\CWCom0
// Created: 6/10/2016
---
// Description: Master State Control Routine for Line
//
// History: 0.1
```
License Based Content Protection
Protect your Intellectual Property and prevent copying of control code

- A solution for customers to protect the design and execution of Logix content
  - Source Protection: Control who can view and edit the source code of objects
  - Execution Protection: Control which controllers these objects can be executed in, and helps prevent the duplication of code in an unauthorized machine

Supported in the ControlLogix 5580 and CompactLogix 5380 Controllers
Source Protection – Protect sensitive code
Allows only authorized users are able to view or modify protected code

- Routines and Add-On Instructions can be encrypted by an authorized user in Studio 5000 Logix Designer (Ladder and Structured Text Only)

- Only authorized users can view or modify encrypted content
  - Authorized users must have a secured USB device with a Rockwell Automation Activation and access granted to them from their license “administrator” via their web portal

- Programs that contain encrypted content can be uploaded/downloaded to a controller by any user authorized to access the controller; however, the encrypted content can not be viewed or modified
Execution Protection
Prevent the duplication of code in an unauthorized machine

- Help prevent the unwanted copying of code via uploading a program from one controller and downloading to another by restricting the code to run only in “authorized” controllers
- Content owners have the ability to secure protected code to run only when a secured SD (with a license obtained from their web portal) is located in a controller
I/O Tree Import Export

**Single Module Import Export Capability**

- I/O Tree Import / Export Module

- The L5x file (.xml) can be stored and then later imported into project with module configuration settings.
Select 1756 profiles (48 profiles - see slide notes for list) converted from Classic to AOP
  - New look and feel
  - Localized in all languages
- Provide consistent user experience
- Will work with Studio 5000 V20 or higher and Windows 7 or newer
- Classic profiles will be automatically converted to AOP when opening an older project
- Will be posted on PCDC shortly after Logix Designer V30 is released
Add-on Profiles (AOP) Bundle Install

- Provides easy access to all of the available device profiles without having to install the latest Studio 5000 Logix Designer
- Includes all profiles (700+) delivered with Studio 5000 Logix Designer versions V10.01 through V29.01
  - Release notes lists profiles, with device firmware and Studio 5000 Logix Designer V compatibility
  - Select third party profiles are also included
- Installs on Windows 7 and newer OS only
- Available for download from PCDC now
  - No Tech Connect contract is required
- A bundle release is planned at every major release
Missing Add-on Profiles Notification with Context

- Missing an Add-on Profile prevents users to configure, diagnose and maintain a device
  - Since device identification information is not provided, user experience is affected
- Starting with Studio 5000 Logix Designer V30, we will provide full device identification information
- For Rockwell Automation devices, we will also provide link to download site for ease of use
  - Users can then easily search, download and install missing profile
- Greatly improves user experience
Trend Editor
Better user experience for trend creation

Before

New Trend - Add/Configure Tags
Scope:
Scope:
Select tag:
Type Here

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>hi</td>
<td>INT</td>
</tr>
</tbody>
</table>

After

Look Ahead Takes you here

No Typing or Look Ahead

Scroll to find Your tag
Design editor focused on ease of use
Includes simplify alarming, shared tags, and high speed jog control

Logix-View integration simplifies development and improves runtime
Studio 5000 View Designer R3 Updates

- HMI functionality
  - Add-on graphics (AOG):
    - Create and instantiate AOGs
    - Browse to AOG properties when creating an AOG
  - Multi-version support
    - Multiple versions of Logix controllers (V27 and later)
    - Multiple versions of Studio 5000 View Designer
  - Browse into screen property members when creating a re-usable screen
  - Copy screens with parameters between Designer instances
  - Configurable popup background color
  - Windows 10 support
  - Navigation menu captions
  - Project properties as a modal dialog
  - Runtime language switching

- Logix integration.
  - AOG properties tied to Logix data types
  - Language switch Logix extended tag properties (descriptions, etc.) and Logix alarm messages
  - Expanded hardware support
  - ControlLogix 5580 and CompactLogix 5380 controller support – V29 and later (Delivered first in V2.03)
ControlLogix 5580 and CompactLogix 5380 controller support

- Support for ControlLogix 5580 and CompactLogix 5380 in the V2.03 release of Studio 5000 View Designer
  - Controller firmware must be V29 or later
- Two HMI to Controller Path configuration options:
  - Select “Direct” option for controllers directly connected to Ethernet
  - Select Slot number for an architecture that uses an Ethernet module
- Browsing for the HMI to Controller Path automatically configures the correct Slot option
Add-On Graphics (AOG)

- Create your own Toolbox graphic elements by combining existing elements
- Add-On Graphics (AOGs) can have custom properties linked to Logix data types
- AOGs reside in their own Add-On Graphics folder in the Toolbox
- Changes made to an AOG definition are propagated to all instances
- Reuse AOGs within and across projects to save development time

Create AOGs under the Assets folder in Project Explorer

Create your custom properties for the AOGs tied to Logix data types.

Populate the AOG definition with content from the Toolbox

Drop an AOG instance on a screen by double-clicking or drag-drop out of the Toolbox just like any other element.
Runtime language switching

- Use a language switch command to switch to any of the other languages in the project on the PanelView 5500

  - The language switch will also switch the language strings from the Logix controller:
    - Extended tag properties
    - Alarm messages
Export/Import Languages

- From a menu command in Studio 5000 View Designer, export all text strings displayed to the operator
  - Specify the current language you used while creating your screens
  - All project language strings are exported, including any languages already defined
  - Export is in a `.xlsx` format easily opened in Excel.
    - Optionally, the export can be done to a `.txt` file if desired
- You can add additional columns to the language file for additional languages
- Importing the language file then makes those languages part of the project
- Specify the default language and download to the PanelView 5500
Configure the default language

- Once language strings are imported, configure the default language to use in your project in Project Properties. The default language:
  - Will be used when the HMI is started.
  - Will be used as the “fall-back” language if a translation is missing for another language.
- On download, you can change the default language if desired.
Multi-version support

- Run multiple versions of Studio 5000 View Designer side-by-side to easily support multiple projects and terminal runtime versions.
- Automatically launch the correct version of Studio 5000 View Designer when a .vpd file is double-clicked in Windows Explorer.
- Choose the desired version number when creating a new project.
- Built-in conversion of projects created with older versions of Studio 5000 View Designer.
  - Reuse older projects in a newer version of View Designer
  - Prompt for conversion when an older project is opened in a newer version.
  - Automatic backup of project prior to conversion
- Supports multiple versions of Logix controllers (V27 and later).
Navigation menu captions

- Provides a separate navigation menu caption property which allows the use of spaces, multi-line, and Unicode characters.
  - Allows the menu captions to be much more readable.
  - Allows language switching the navigation menu captions.

The shortcut name must support the common IEC61131-3 naming rules used for all project resources.

The caption name defaults to the shortcut name but can be modified to add spaces, up to two lines, and Unicode characters.

The V2 navigation menu without the caption property for comparison.

The navigation menu then becomes much more readable.
Project Properties changed to a modal dialog
More intuitive interface to configure a controller reference

In V2, the Project Properties dialog was a tab in the screen development space.

Usability testing showed that users often didn’t see the “Apply” which is needed to allow browsing for Logix tags.

In V3, the Project Properties dialog is now a traditional dialog separate from the screen development space.

As a modal dialog, the user is forced to hit OK or Apply before proceeding.

The tab choices were also changed to be clearer and provide inline help text.
Studio 5000 Application Code Manager

- Engineering Design Tool:
  - Rapid application development
  - Leverages Library Content (provided or custom)
  - Facilitates continuous re-use of IP / enforce standards

- Auto content generation for:
  - Logix Designer
  - FactoryTalk® View
  - FactoryTalk® Alarm and Events
  - FactoryTalk® Historian
**DESIGN**
- Library Designer is integrated into Logix Designer
- Flexible library authoring, structuring reusable content the way you want

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

**BUILD**
- Easily generate your standardized application code
- Bulk configure projects
- Leverage Rockwell Automation provided libraries (OEM building blocks)

Maximize reuse and quickly build projects
Design & Publish Library
Static content transforms into dynamic library content

Step 1:
Create Content to be libraried

Step 2:
Group and Parametrize Library Content

Step 3:
Publish

Logix Control Code
Alarms & Events
FactoryTalk® View
FactoryTalk® Historian
Build Project Content
Easily deploy project content through configuration – No Programming!

Step 1:
Select objects from library

Step 2:
Configure via Parameters

Step 3:
Generate

Build Project Content
Easily deploy project content through configuration – No Programming!

Step 1:
Select objects from library

Step 2:
Configure via Parameters

Step 3:
Generate
Studio 5000 Application Code Manager

Release Summary

Software Updates:

- Aligned to Studio 5000 Logix Designer Controller and Logical Organizer views
- Easily add, edit, delete project content by its class view
- Instantiate into an existing Studio 5000 Logix Designer project
- Streamlined workflows to publish and modify existing library objects
- Enhanced management of dependencies between library objects

Compare Tool Library Object support:

- Easily see differences when publishing a new version of a library object
Out-of-the-box integration enables simple and fast bulk deployment of the Process Objects v3.50.02 library.

Simply download, configure, and generate all of your application content.

No coding, no copy and paste, no more errors due to manual steps!

Save time and money while also reducing your project risks.
Installation Enhancements and Windows 10

V30 Updates
Simplified Installation
Common Installer provides for a simplified installation

Rockwell Automation product installs look the same and have a common workflow

• **Install Now**
  - No choices, no unnecessary clicking
  - An unobtrusive EULA
  - Default Products and Options
  - Default language English, but can change
  - No other screens, save for progress and complete

• **Customized Install**
  - Choose your Language
  - Choose your Products
  - Choose where to Install
Windows 10

- Studio 5000 supports installing and running on Windows 10
  - Limited touch support
Studio 5000 V30 – Questions?