Practical Hands-On Application of Security to Industrial Control Systems

Rod Shearer
Agenda

- Logix Family Overview
- Introduce Studio 5000 Software
- New Hardware
- Hands On Lab
Integrated Architecture™ and the PAC - Programmable Automation Controllers
ControlLogix L7x Hardware Overview

- Faster CPU
- Enhanced SDRAM memory
- On-board 4-character display
- USB 2.0 port
CompactLogix 5370 Hardware Overview

Scalable Controllers to Best Meet Application Needs

L1

2.5x faster than L3x predecessor

Integrated Motion options available

L2

L3
Introducing Studio 5000 Engineering and Design Environment

-PRESENT-

Logix Designer (V21)
Programming and configuration for Logix controllers.

-FUTURE-

View Designer (V22)
Graphical design environment for View 5000 HMIs.
Studio 5000 Software

- New Rockwell Engineering and Design environment
- Programming and configuration for the Logix5000™ family of controllers
  - Built on the familiar user-friendly interfaces and workflows of RSLogix 5000 V20 and prior
  - Uses well known Microsoft Windows interface
- Improve development efficiencies leading to increased productivity and shorter design cycles
- One intuitive tool and environment
- System-wide development environment
- Foundation for future design tools
Pre-V21 Project Documentation Storage

Comments/Descriptions Stored on PC

Controller
CPU
User Memory

Engineering PC .ACD

Comments/Descriptions
- Rung
- Tag
- UDT
- AOI
- Task
- Program
- Routine

Ladder.Logic
Function_Block_Diagram
Sequential_Function_Chart
Structured_Text
NEW V21 Project Documentation

Storage in controller

Controller

CPU

User Memory

New Memory (Non-Volatile)

Storage is Completely Independent of User Memory Space

New Memory (Non-Volatile)

Comments Descriptions
Alarm Log 10K Alarms
Extended Tag Properties

Ladder Logic
Function Block Diagram
Sequential Function Chart
Structured Text

Comments Descriptions
Alarm Log 10K Alarms
Extended Tag Properties
Logix Extended Tag Properties

Decreased Troubleshooting Time & Faster Time to Market

T101.Level
T101.Level.@Min
T101.Level.@Max
Updated FT A&E Alarm State Model

- Shelve = Shelved
- Suppress = Suppressed By Design
- Disable = Out Of Service

Simplifies Application Creation to Easily follow ISA 18.2 Recommendations

Shelving Function for Alarms

Reduce Costly Mistakes by Assuring Alarms are Noticed

IN ALARM
Click to Shelve
Shelved

IN ALARM
Click to Shelve
Shelved
Selectively Apply Duration to ALMA

Increase Productivity by Eliminating Nuisance Alarms

High High Limit
High Limit
Temperature
Time
Min Duration To Trigger

Input Level

<table>
<thead>
<tr>
<th>Limit</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>High High</td>
<td>0.0</td>
</tr>
<tr>
<td>High</td>
<td>0.0</td>
</tr>
<tr>
<td>Low</td>
<td>0.0</td>
</tr>
<tr>
<td>Low Low</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Minimum Duration: 1000 ms
New Controller Based Alarm Log

High Availability of Alarming Data Reduces Material Losses

Circular File Stores Alarm Transitions

Communications Loss

FT View 6.x and 7.x
New Hardware
Introducing ControlLogix Peer-to-Peer I/O

Expanded Application Capabilities

1756-OB16IEF

1756-LSC8xIB8I

1756-IB16IF

Shipping Today!
What is Peer-to-Peer I/O Control?

Peer-to-Peer I/O Control is **output** actuation based on **input** data, independent of the programmable automation controller (PAC).

Throughput dramatically reduced!
Energize outputs within 50μS of input peer pre-conditions being met.

Trigger an Event Based Task
Single Input OR a Combination of Inputs

Simple Flowmeter / Solenoid Valve Control

Time-Proportioned Control Applications

Glue Gun Control

Variable Pulse train to Heating Element

Temp Feedback to Analog Input

Heated Vessel
3M Cogent Systems, Inc.

- Global biometric identification solutions provider to governments, law enforcement agencies, and commercial enterprises.

- Manufactures:
  - Automated Fingerprint Identification Systems
  - Biometric ID facial, fingerprints and iris
  - Livescan & Fingerprint Capture Devices
  - Applicant Processing

- Connectivity: OPC, Ethernet, RS232, USB, and Bluetooth
Controller Support Roadmap

<table>
<thead>
<tr>
<th>Controller</th>
<th>Firmware Available</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V18</td>
<td>V19</td>
<td>V20</td>
<td>V21</td>
</tr>
<tr>
<td>1756-L61, L62, L63, L64, L65</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No Firmware</td>
</tr>
<tr>
<td>1756-L61S, L62S, L63S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1768-L43, L45 1768-L43S, L45S</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No Firmware</td>
</tr>
<tr>
<td>1769-L23-QBFC1B, L23E-QB1B, L23E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QBFC1B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ControlLogix</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>L7 Family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CompactLogix</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>L1ER, L2ER, L3ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V20 is in extended maintenance mode
### Operating System Support

<table>
<thead>
<tr>
<th>Operating Systems</th>
<th>V18</th>
<th>V19</th>
<th>V20</th>
<th>V21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Server 2003</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Server 2008</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vista</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Windows 7</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Knowledgebase Answer ID 67020
“RSLogix 5/500/5000 on Windows Vista and Windows 7”
Performing a System Upgrade or Creating a New System

- Customer upgrades a system component. An example would be moving her system from V16 to V17

- What other devices must be upgraded?

What other devices in the system are affected?

Controller moving from V16 to V17

Are other software upgrades needed?

Will this break any part of the system?
NEW Compatibility Management Web Site

Reduce Time to Market and Mitigate Risk

- http://www.rockwellautomation.com/compatibility/#/scenarios
  - Identifies compatibility of firmware versions
  - Easier to locate downloads
  - Easier to locate release notes or other companion documents.

- Multi-Product Compare
  I need to upgrade one or more products and I want to check compatibility between the new product(s) and the other product(s) in my system.

- Replace a Product
  I need to replace a product in my system, and I need to know whether it can be replaced with a different product version.

- Feature Support
  View the products related to a selected product or system feature.
Lab Overview

- Explore new features in Studio 5000 V21
- Hands On Lab: FactoryTalk Security

Learn how to protect your ControlLogix™ Programmable Automation Controller (PAC) against emerging security threats using FactoryTalk® Security technology.

ControlLogix
1756-L75 Demo box
FactoryTalk Security

Who can carry out what actions upon which secured resources and from where?

Secure Software Studio 5000, FactoryTalk, etc

Secure Networks & Hardware