



**Rockwell
Automation**

Innovation & Technology Forum

CL16 - Studio 5000 Logix Designer®: Advanced Lab

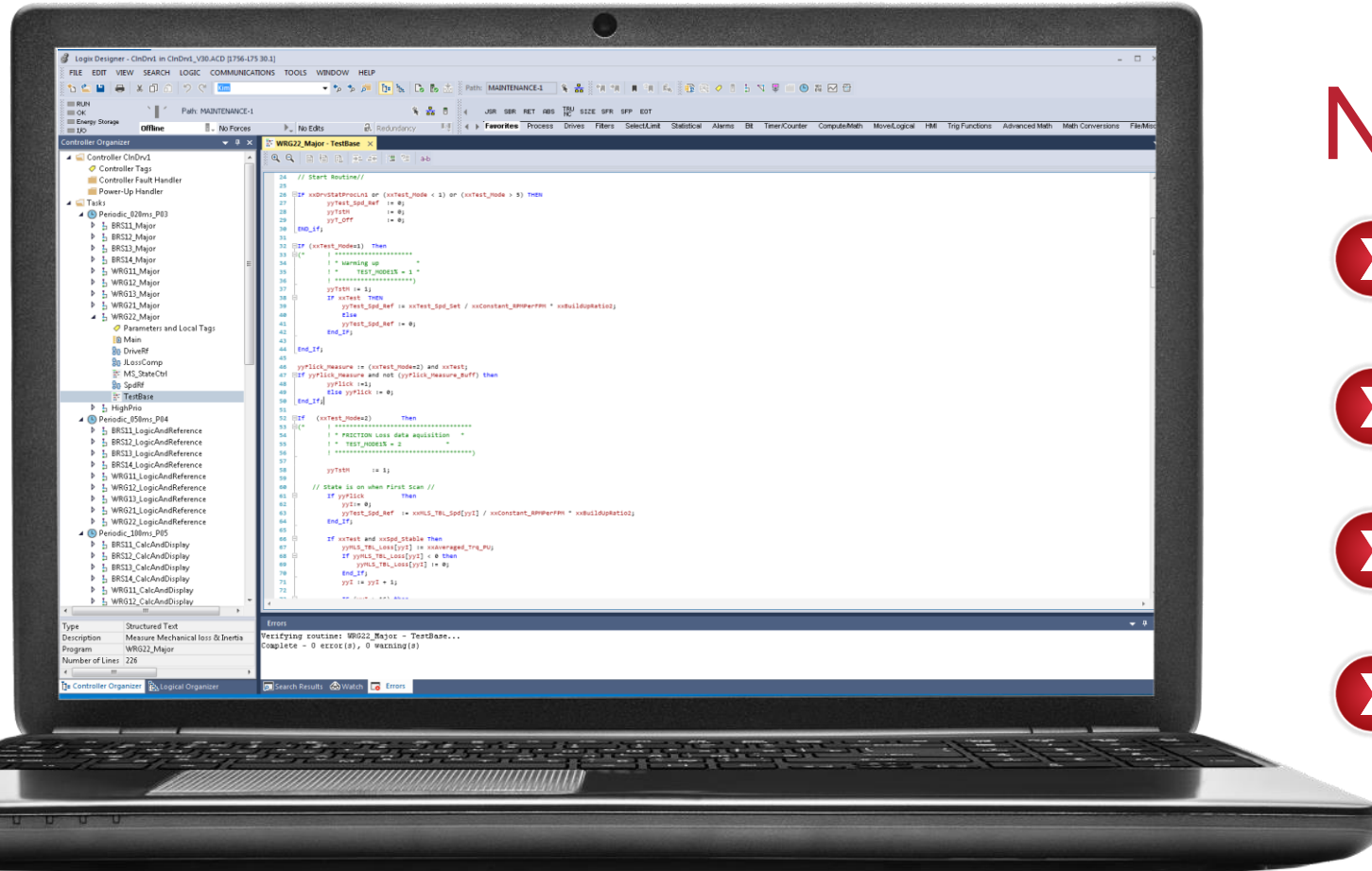
Lab Overview

Explore the Studio 5000® Design Environment

- Learn about new usability enhancements that are available within Studio 5000 Logix Designer®
- Learn how to improve efficiency using modular programming
- Learn about new features that enhance modular programming within Studio 5000 Logix Designer®
- Hands-On experience with version 31 of Studio 5000 Logix Designer®

Studio 5000 Logix Designer®

What's New?

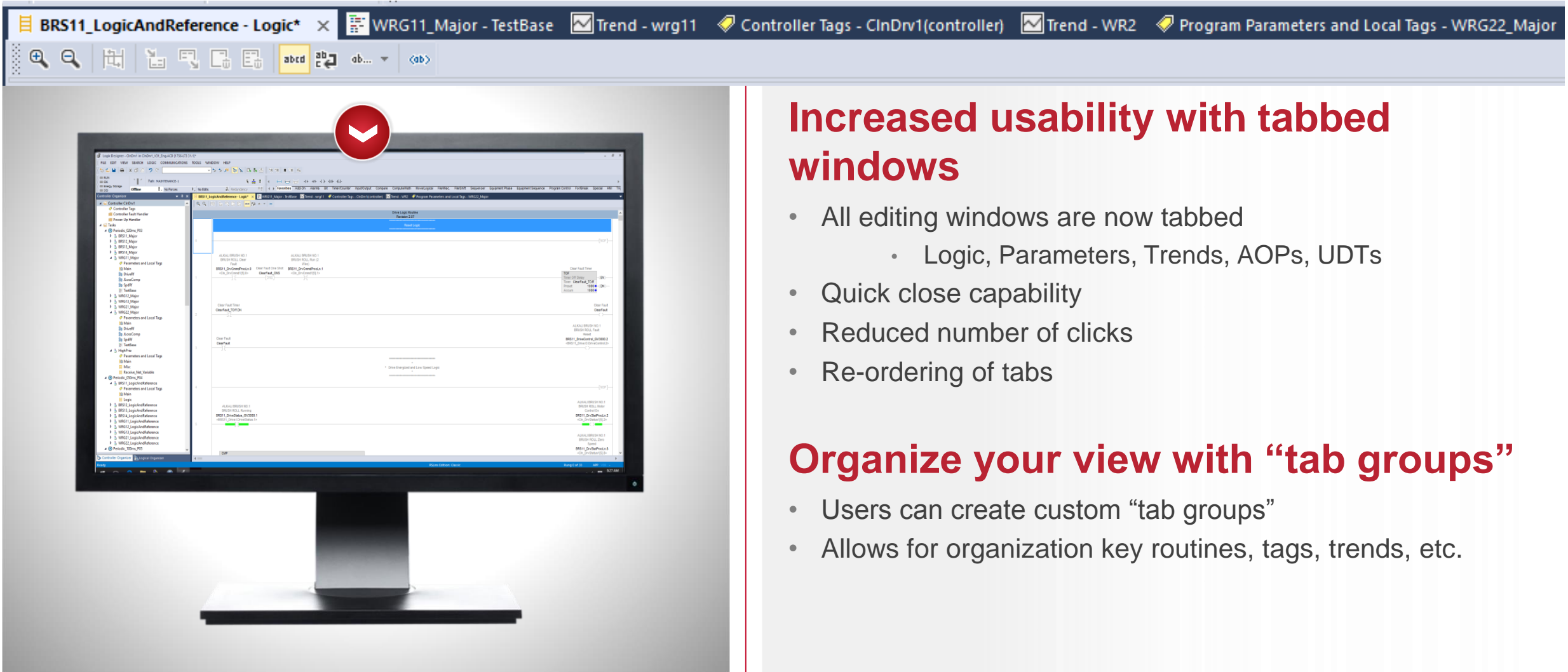


NEW RELEASE

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

Modernized User Interface

Tabbed Windows



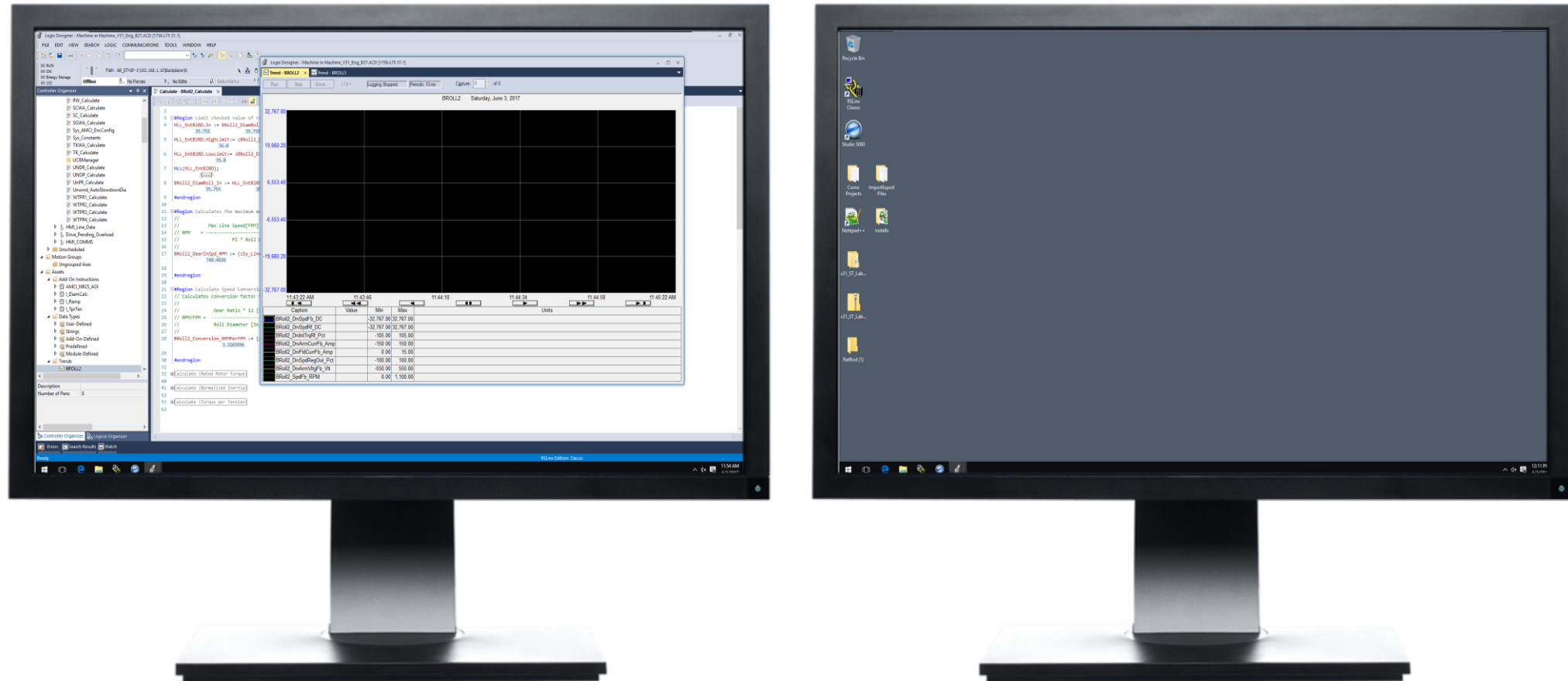
Increased usability with tabbed windows

- 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”

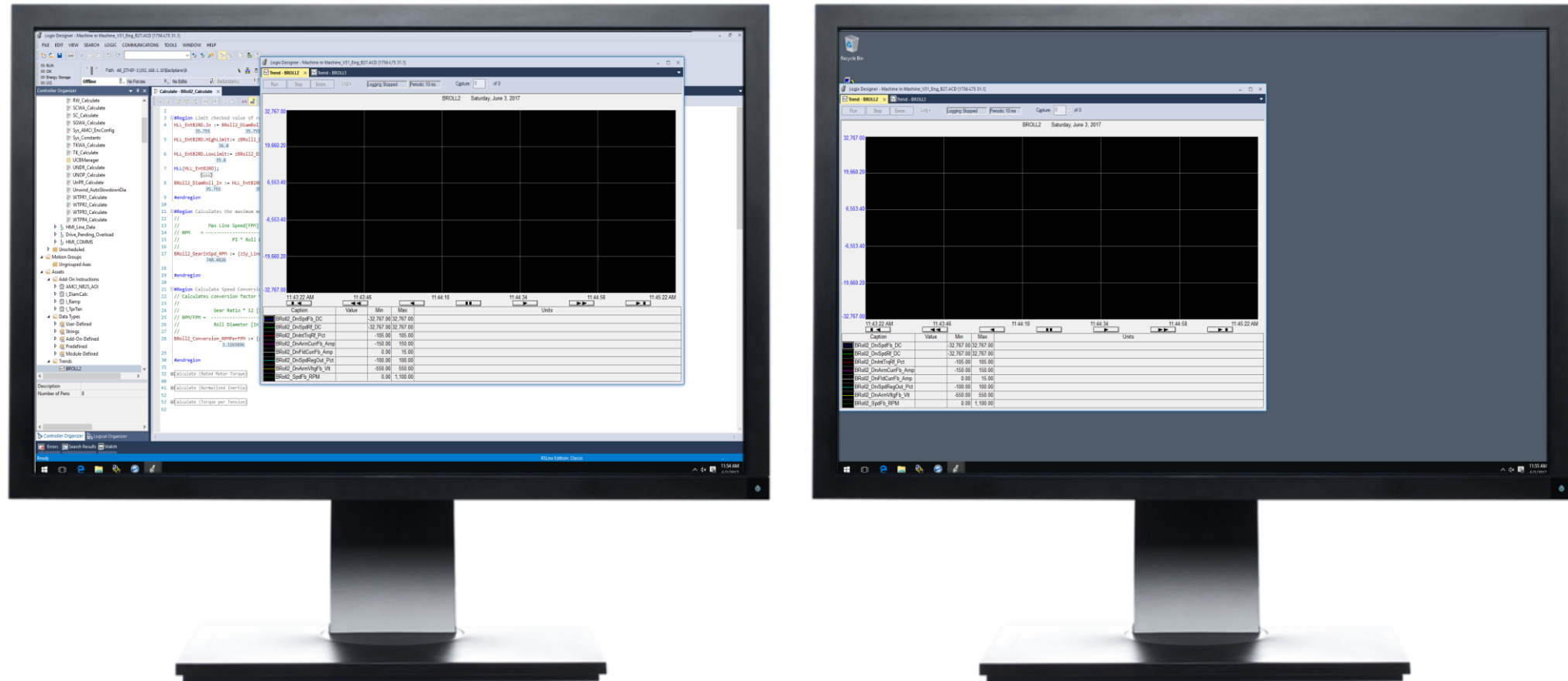
- Users can create custom “tab groups”
- Allows for organization key routines, tags, trends, etc.

Multi-Monitor Support



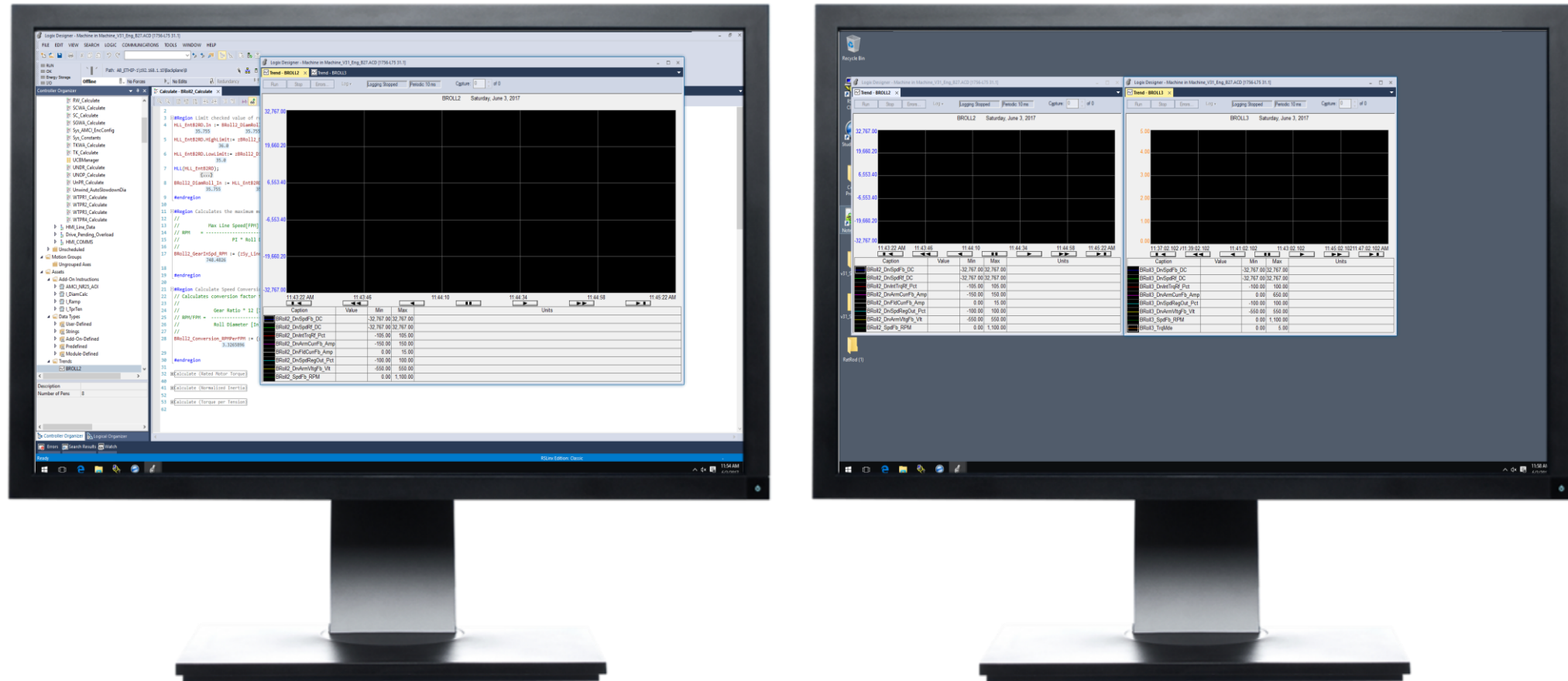
Organize your view the way that you like in a productive manner

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

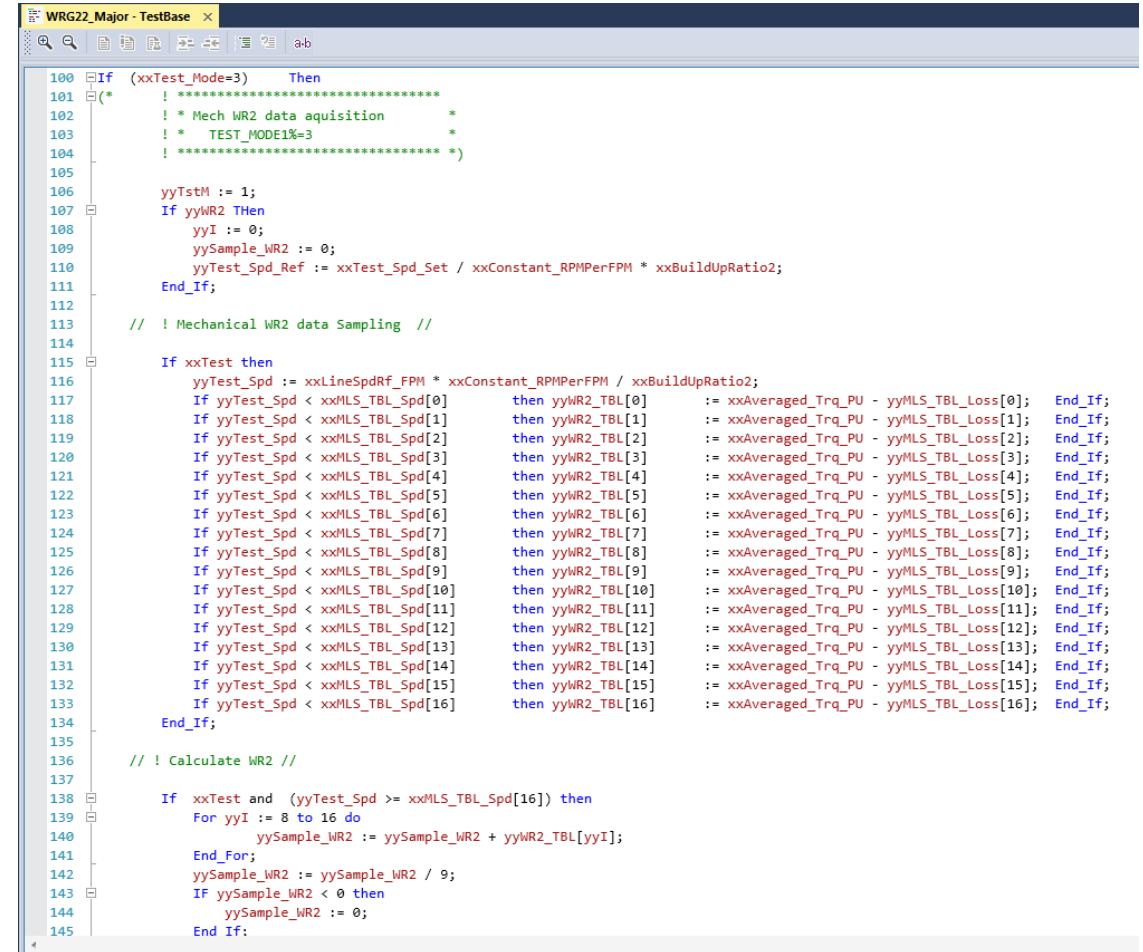
Editor Improvements

Structured Text

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



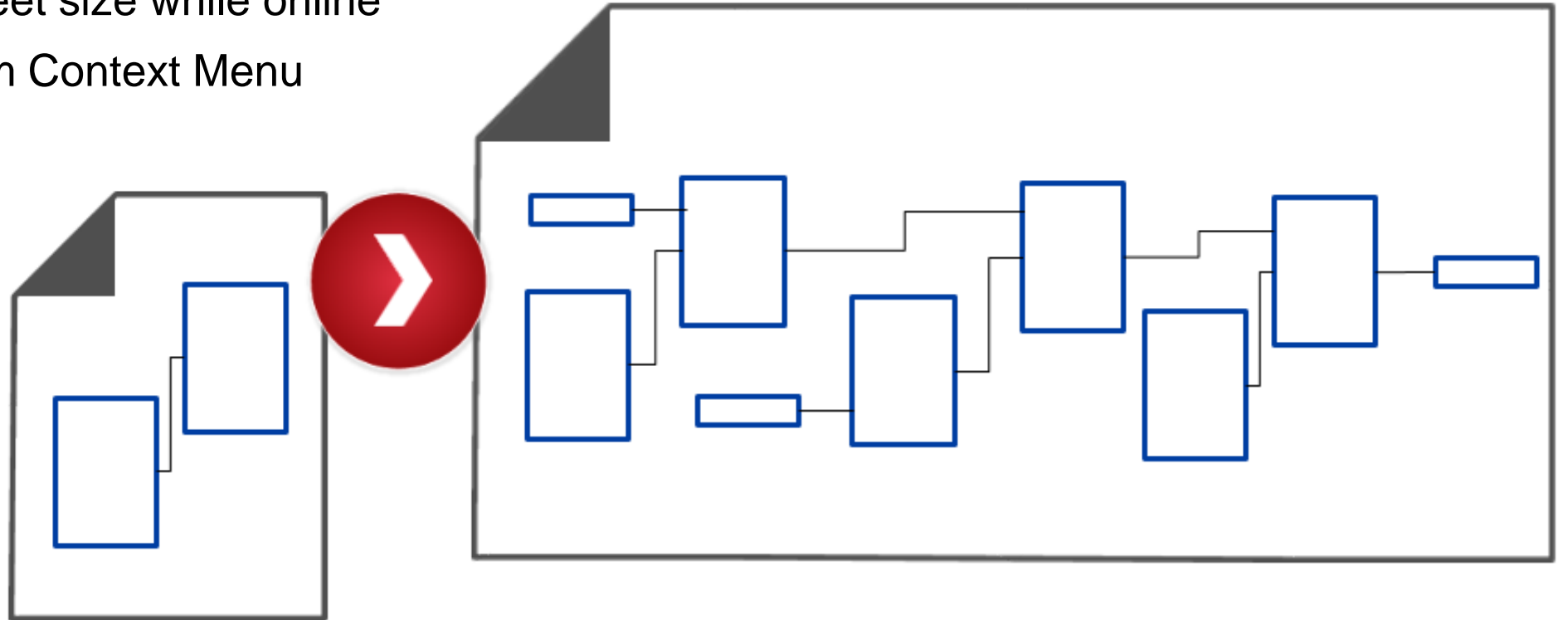
```
100 If (xxTest_Mode=3) Then
101 (*
102 ! *****
103 ! * Mech WR2 data acquisition *
104 ! * TEST_MODE1%=3 *
105 ! *****
106
107 yyTstM := 1;
108 If yyWR2 Then
109 yyI := 0;
110 yySample_WR2 := 0;
111 yyTest_Spd_Ref := xxTest_Spd_Set / xxConstant_RPMPerFPM * xxBuildUpRatio2;
112 End_If;
113
114 // ! Mechanical WR2 data Sampling //
115
116 If xxTest then
117 yyTest_Spd := xxLineSpdRf_FPM * xxConstant_RPMPerFPM / xxBuildUpRatio2;
118 If yyTest_Spd < xxMLS_TBL_Spd[0] then yyWR2_TBL[0] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[0]; End_If;
119 If yyTest_Spd < xxMLS_TBL_Spd[1] then yyWR2_TBL[1] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[1]; End_If;
120 If yyTest_Spd < xxMLS_TBL_Spd[2] then yyWR2_TBL[2] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[2]; End_If;
121 If yyTest_Spd < xxMLS_TBL_Spd[3] then yyWR2_TBL[3] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[3]; End_If;
122 If yyTest_Spd < xxMLS_TBL_Spd[4] then yyWR2_TBL[4] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[4]; End_If;
123 If yyTest_Spd < xxMLS_TBL_Spd[5] then yyWR2_TBL[5] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[5]; End_If;
124 If yyTest_Spd < xxMLS_TBL_Spd[6] then yyWR2_TBL[6] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[6]; End_If;
125 If yyTest_Spd < xxMLS_TBL_Spd[7] then yyWR2_TBL[7] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[7]; End_If;
126 If yyTest_Spd < xxMLS_TBL_Spd[8] then yyWR2_TBL[8] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[8]; End_If;
127 If yyTest_Spd < xxMLS_TBL_Spd[9] then yyWR2_TBL[9] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[9]; End_If;
128 If yyTest_Spd < xxMLS_TBL_Spd[10] then yyWR2_TBL[10] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[10]; End_If;
129 If yyTest_Spd < xxMLS_TBL_Spd[11] then yyWR2_TBL[11] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[11]; End_If;
130 If yyTest_Spd < xxMLS_TBL_Spd[12] then yyWR2_TBL[12] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[12]; End_If;
131 If yyTest_Spd < xxMLS_TBL_Spd[13] then yyWR2_TBL[13] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[13]; End_If;
132 If yyTest_Spd < xxMLS_TBL_Spd[14] then yyWR2_TBL[14] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[14]; End_If;
133 If yyTest_Spd < xxMLS_TBL_Spd[15] then yyWR2_TBL[15] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[15]; End_If;
134 If yyTest_Spd < xxMLS_TBL_Spd[16] then yyWR2_TBL[16] := xxAveraged_Trq_PU - yyMLS_TBL_Loss[16]; End_If;
135 End_If;
136
137 // ! Calculate WR2 //
138
139 If xxTest and (yyTest_Spd >= xxMLS_TBL_Spd[16]) then
140 For yyI := 0 to 16 do
141 yySample_WR2 := yySample_WR2 + yyWR2_TBL[yyI];
142 End_For;
143 yySample_WR2 := yySample_WR2 / 9;
144 If yySample_WR2 < 0 then
145 yySample_WR2 := 0;
146 End_If;
```


Editor Improvements

Function Block

Improvements to Function Block editor for increased usability

- Default sheet size changed to 11x17 landscape (V30)
- Ability to change sheet size while online
- Forcing I/O tags from Context Menu

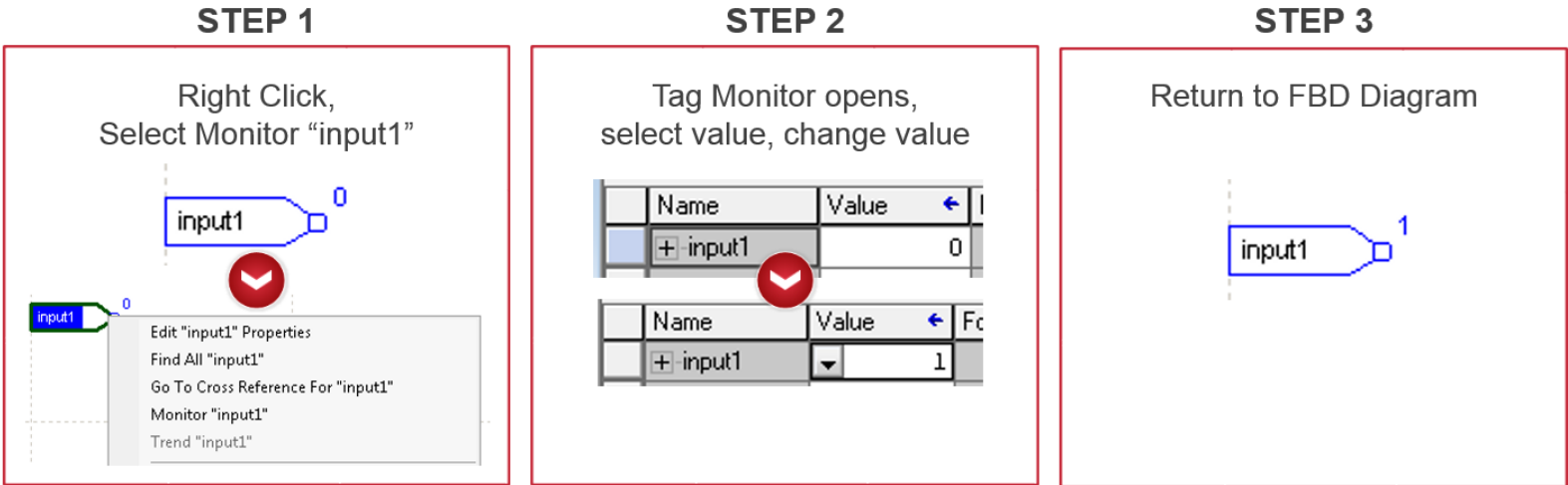


Editor Improvements

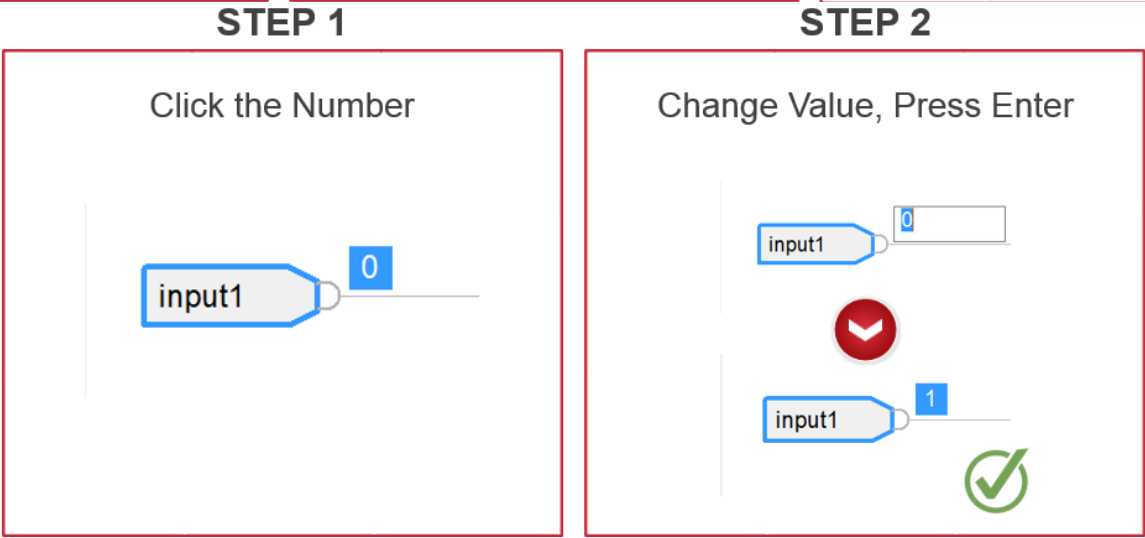
Function Block

Change Input Value Workflow

Before

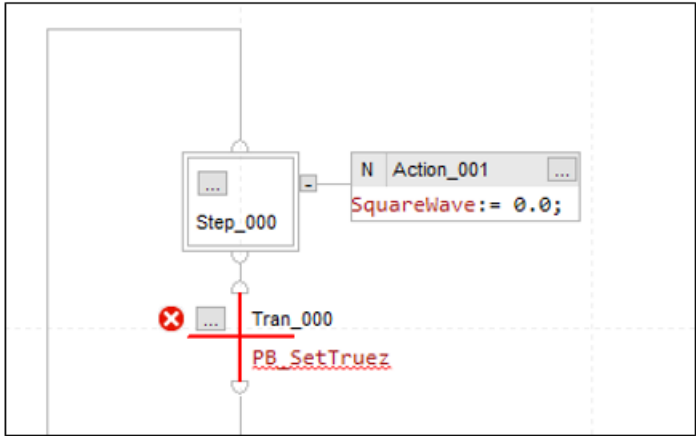
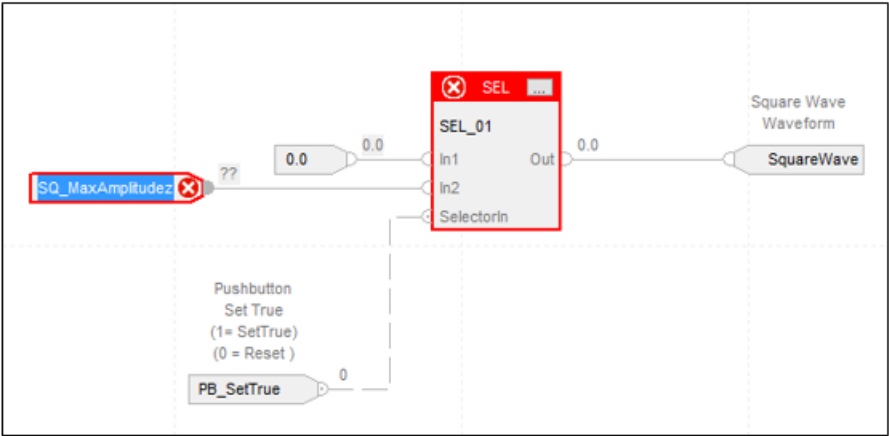


After



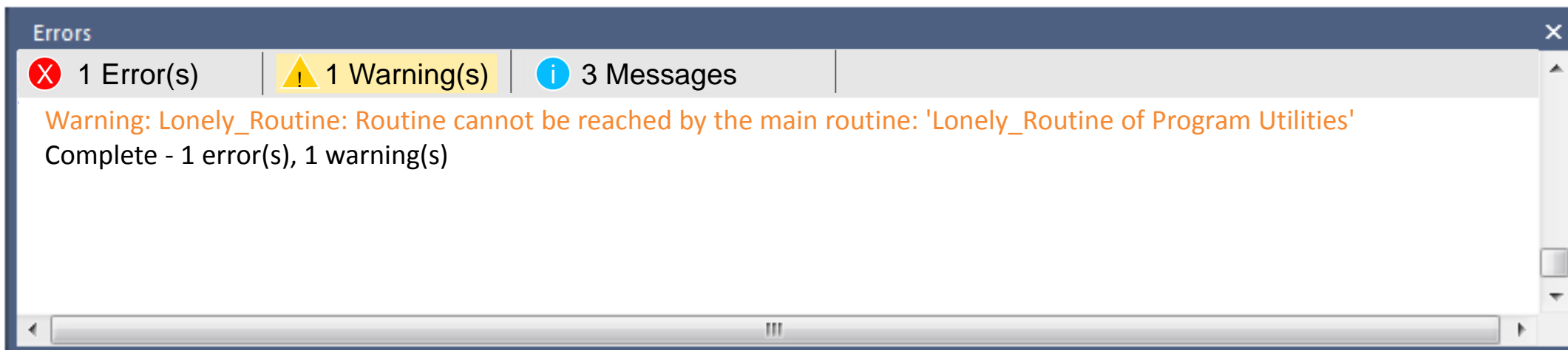
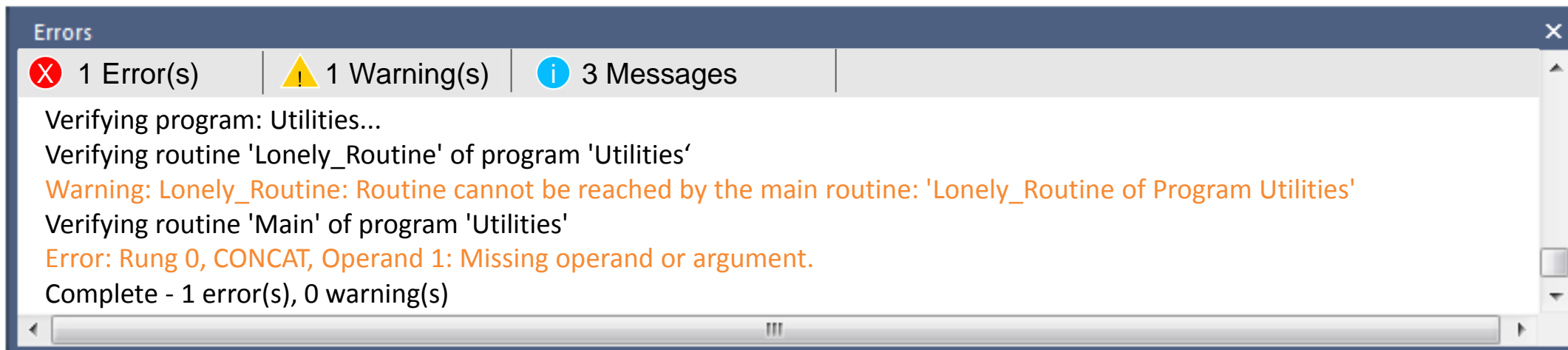
Editor Improvements

Standard Indication of Errors



Logix Designer Error Window

New Message Filtering Capabilities



Studio 5000 Logix Designer®

User Interface Refresh and Usability Enhancements

- In the lab we will review the following Usability Enhancements from v28 and greater:
 - Delete a Program without having to Unschedule
 - Automatically Insert a Header in a Structured Text Routine
 - Detect a Lonely Routine with Verify
 - New On-Line Power Rail Display
 - V31 Enhancements

Program Parameters

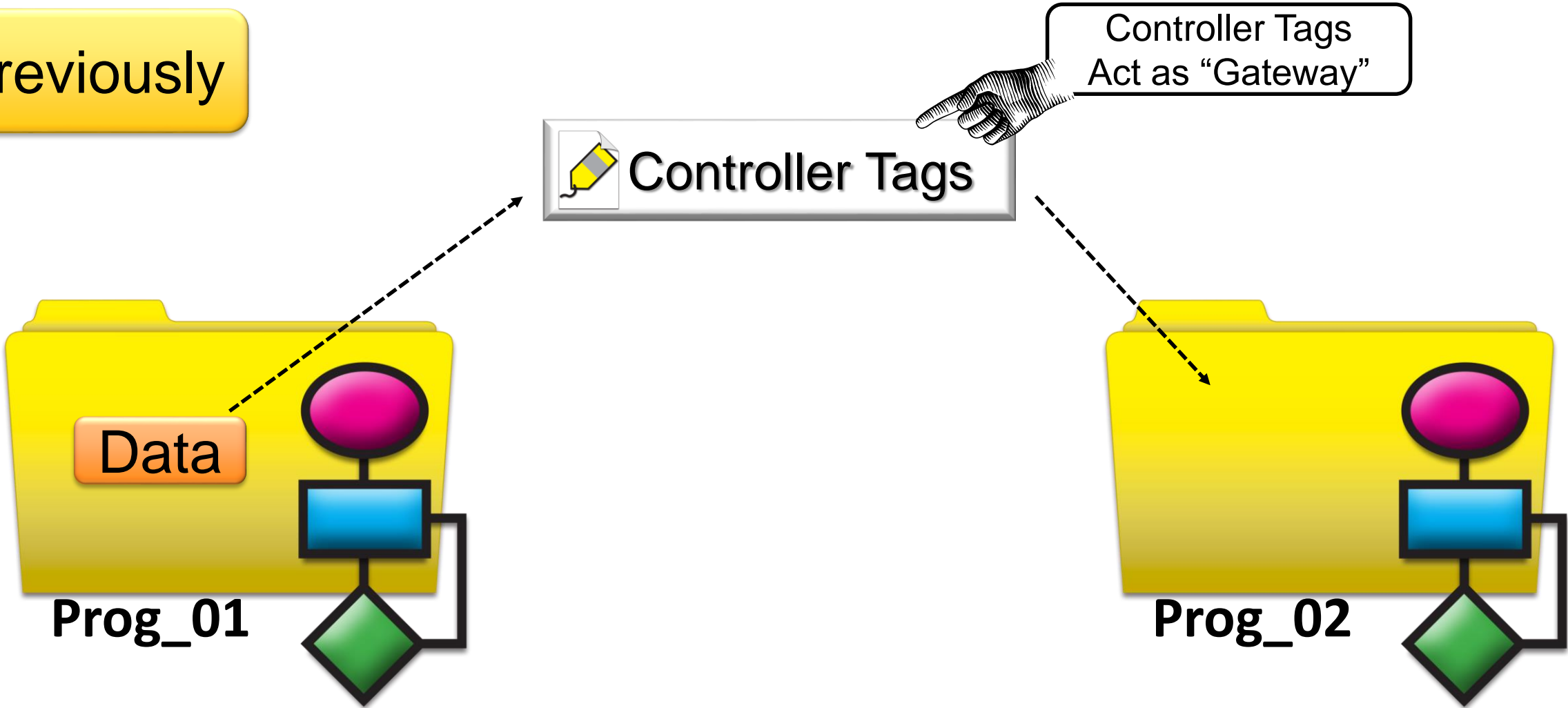
What are they?

- “Argument that is exposed for external access by a program”
 - Program tags now accessible outside of the program
- Feature introduced in V24
- Types
 - Input
 - Output
 - InOut
 - Public
- Conceptually similar to Add-On Instructions
- Key Benefits
 - Online editable
 - Direct linking between Programs
 - Enhances modularity of Programs

Program Parameters

Program to Program Communications – Before

Previously

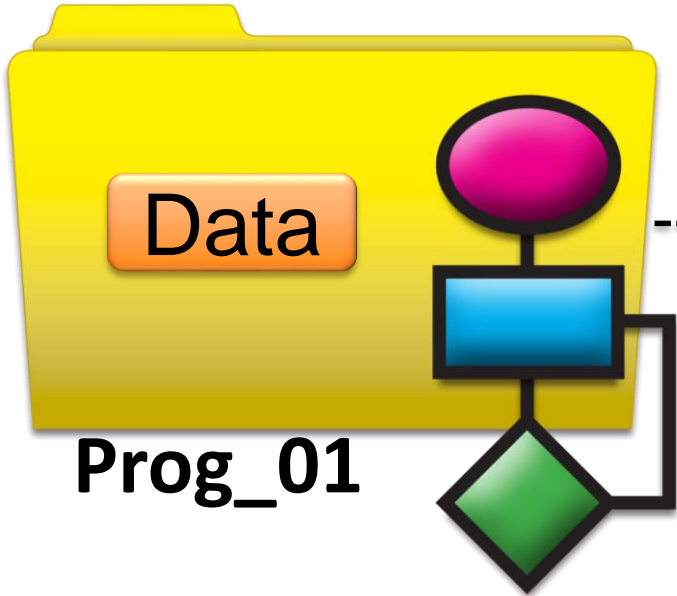


Program Parameters

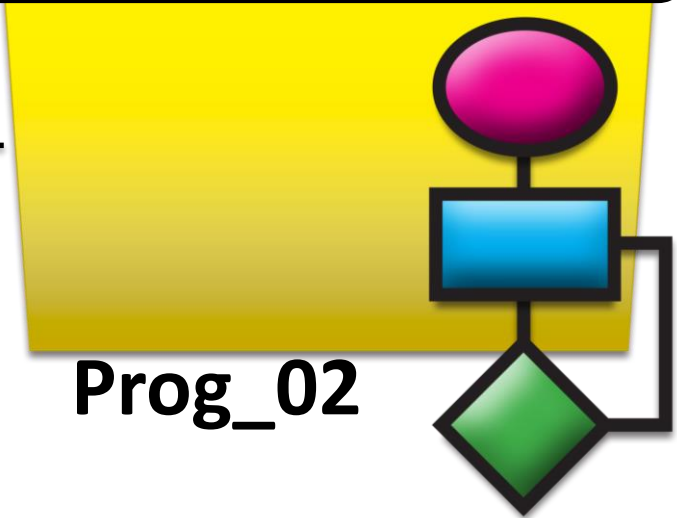
Program to Program Communications – After

NEW

 Controller Tags

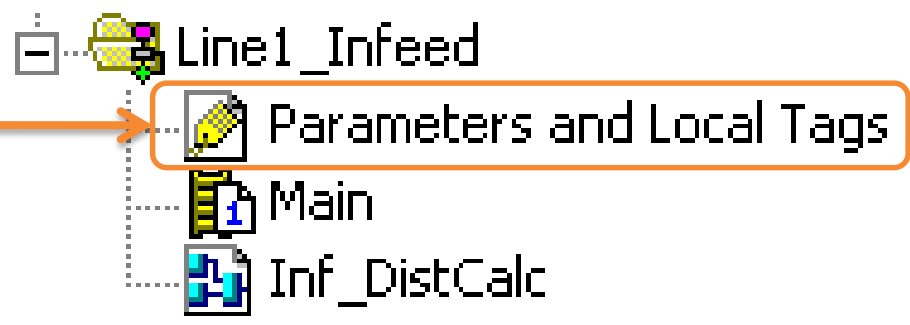
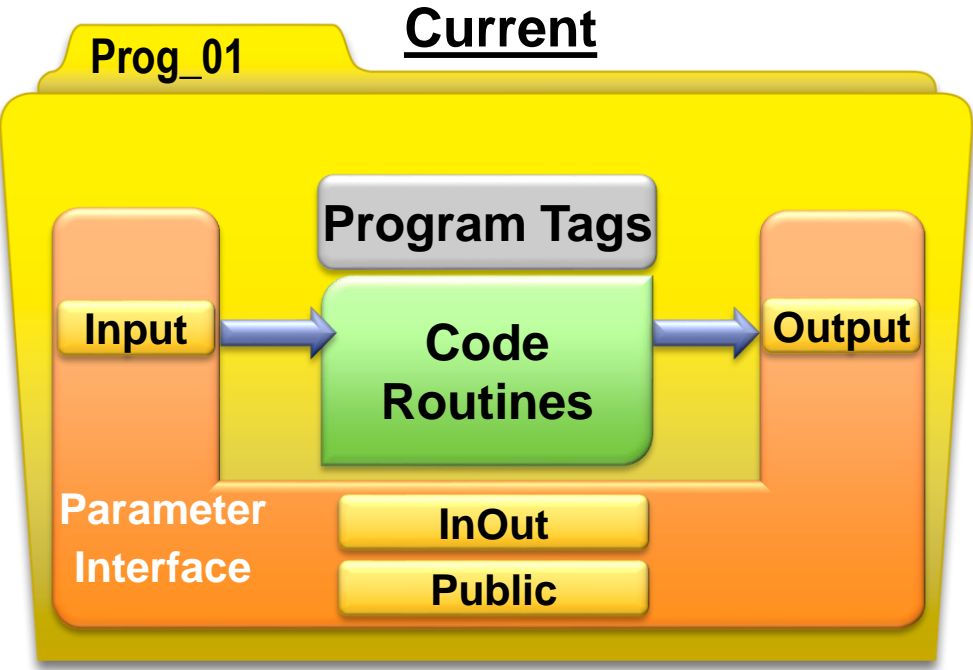
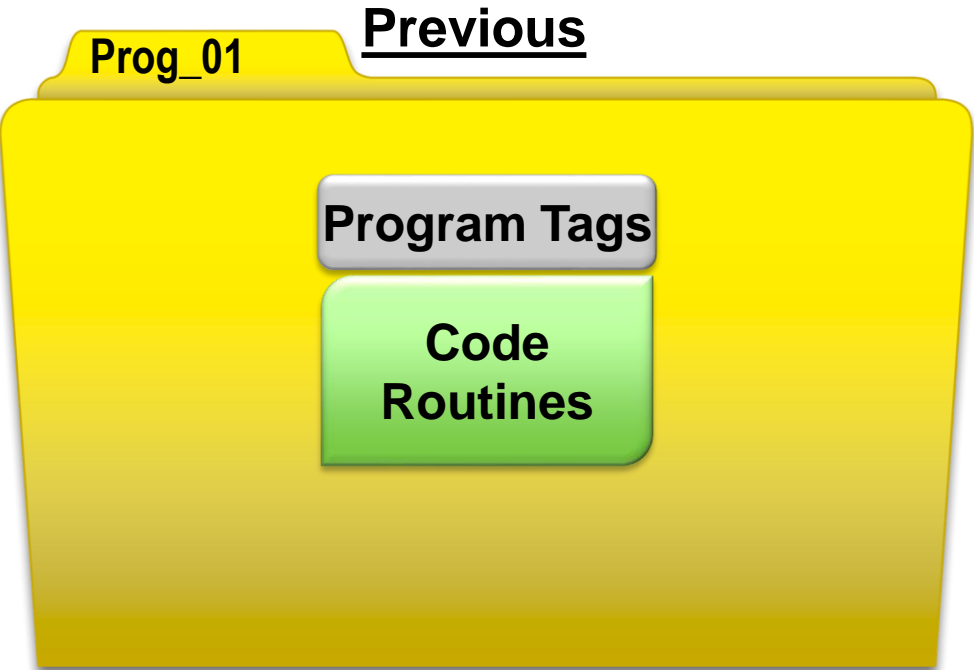


Direct Communication
Between Program Folders



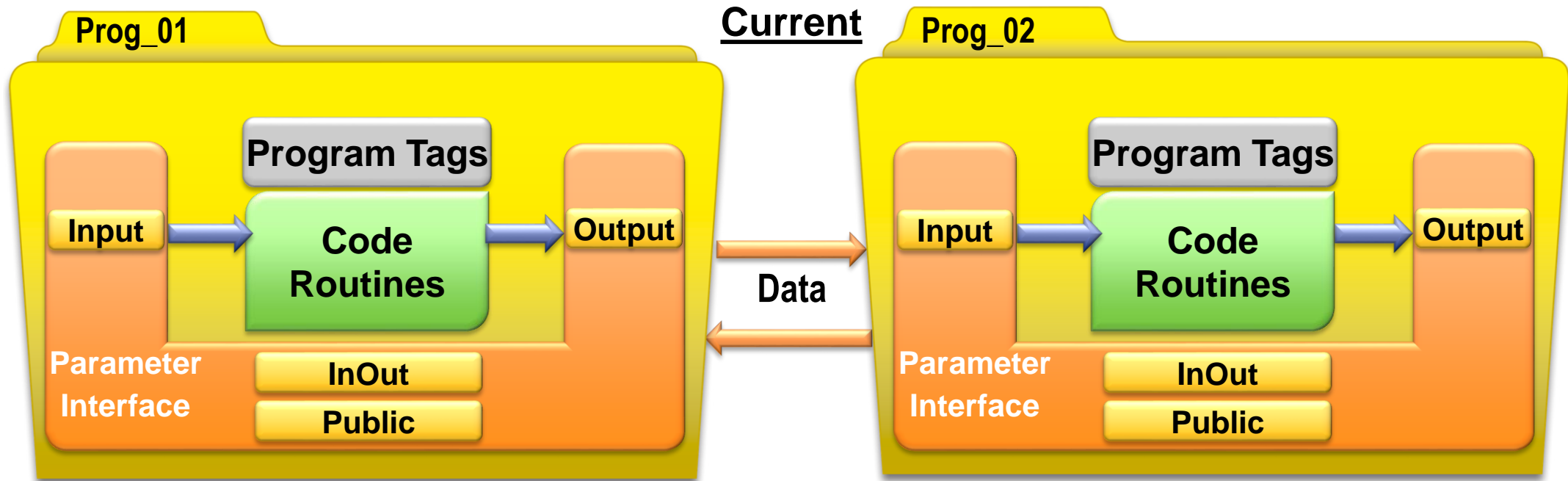
Program Parameters

The Composition of a Program (Before and After)



Program Parameters

Conceptual Block Diagram



Why Add a Parameter Interface?

- Better understanding of interaction between programs
- Allow direct communication between programs
- Introduce a larger modular object in Logix Designer

V24

Advanced Topics Labs

- Lab 1 – Usability Enhancements
 - Preview of new features in V31.
 - Review of new usability enhances that are included in version 28 and greater
- Lab 2 - Logical Organizer
 - The Logical Organizer lets you organize your Logix application any way you would like without affecting the application execution
- Lab 3 - Compare and Merge Tool
 - Updated for compatibility with the new features of Studio 5000 Logix Designer®
- Lab 4 - Add-On Instruction Access to Module Object
 - New Logix feature to allow one Add-On Instruction to be accessing the module object
 - New GSV Module Object Path Attribute
- Lab 5 - Partial Import Online
 - A utility that allows the user to view/handle collisions, rename items and configure connections

Advanced Topics Labs

- Lab 6 - Program Parameters
 - Code modules at the Program level linked together by clearly defined input and output parameters
- Lab 7 - Add-On Instructions (AOI)
 - Create AOI
 - Reusing an AOI
 - AOI signatures
- Lab 8 - Using an SD Card with a Logix Controller
 - Hands on example of reading and writing data to the SD Card from a Logix application
 - Have one of the instructors give you an SD Card before starting the lab.
- Lab 9 - Logix Controller Change Log
 - Examples of what is logged
 - How to read the log file on the SD card

Pick and Choose Your Lab Sections

*The Lab allows the users to run only the sections they are interested in.
Lab Sections can be run in any order.*

- You can run any lab section you would like
 - You can skip lab sections (they do not build on each other)
- Estimated lab completion times are located in the Table of Contents
 - By using these estimated lab completion times, users can gauge how many of the labs they can complete for the allotted time available
- Maximize YOUR benefit
 - Recommend to skip labs that you are familiar with
 - If a lab is not interesting or applicable to you, skip it

There is not enough time in this session to complete all of the labs



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Thank you

