

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 multimonitors, tabbed views, quick navigation



DY

Modernization of programming language editors

Clearly convey state and identification of errors



3

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. |



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Multi-Monitor Support

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



Multi-Monitor Support

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



Multi-Monitor Support

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



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

```
WRG22_Major - TestBase
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 100 ⊡If (xxTest Mode=3)
                               Then
               | **********************************
 101 (*
 102
               ! * Mech WR2 data aquisition
 103
               ! * TEST MODE1%=3
                104
 105
 106
               yyTstM := 1;
 107
               If yyWR2 THen
 108
                   yyI := 0;
 109
                   yySample WR2 := 0;
 110
                   yyTest_Spd_Ref := xxTest_Spd_Set / xxConstant_RPMPerFPM * xxBuildUpRatio2;
 111
               End If;
 112
 113
           // ! Mechanical WR2 data Sampling //
 114
 115
               If xxTest then
 116
                   yyTest_Spd := xxLineSpdRf_FPM * xxConstant_RPMPerFPM / xxBuildUpRatio2;
 117
                   If yyTest_Spd < xxMLS_TBL_Spd[0]</pre>
                                                            then yyWR2_TBL[0]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[0]; End_If;
 118
                   If yyTest_Spd < xxMLS_TBL_Spd[1]</pre>
                                                            then yyWR2_TBL[1]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[1];
                                                                                                                                End If;
 119
                   If yyTest_Spd < xxMLS_TBL_Spd[2]</pre>
                                                            then yyWR2_TBL[2]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[2];
                                                                                                                                End_If;
 120
                   If yyTest_Spd < xxMLS_TBL_Spd[3]</pre>
                                                            then yyWR2_TBL[3]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[3];
                                                                                                                                End_If;
 121
                   If yyTest_Spd < xxMLS_TBL_Spd[4]</pre>
                                                            then yyWR2_TBL[4]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[4];
                                                                                                                                End_If;
 122
                   If yyTest_Spd < xxMLS_TBL_Spd[5]</pre>
                                                            then yyWR2_TBL[5]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[5];
                                                                                                                                End_If;
 123
                   If yyTest_Spd < xxMLS_TBL_Spd[6]</pre>
                                                            then yyWR2_TBL[6]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[6];
                                                                                                                                End_If;
 124
                   If yyTest_Spd < xxMLS_TBL_Spd[7]</pre>
                                                            then yyWR2_TBL[7]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[7];
                                                                                                                                End_If;
 125
                   If yyTest_Spd < xxMLS_TBL_Spd[8]</pre>
                                                            then yyWR2_TBL[8]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[8];
                                                                                                                                End If:
 126
                   If yyTest_Spd < xxMLS_TBL_Spd[9]</pre>
                                                            then yyWR2_TBL[9]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[9];
                                                                                                                                End_If;
 127
                   If yyTest_Spd < xxMLS_TBL_Spd[10]</pre>
                                                            then yyWR2_TBL[10]
                                                                                   := xxAveraged_Trq_PU - yyMLS_TBL_Loss[10]; End_If;
                                                            then yyWR2_TBL[11]
 128
                   If yyTest_Spd < xxMLS_TBL_Spd[11]</pre>
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[11]; End_If;
 129
                   If yyTest_Spd < xxMLS_TBL_Spd[12]</pre>
                                                            then yyWR2_TBL[12]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[12]; End_If;
 130
                   If yyTest Spd < xxMLS TBL Spd[13]</pre>
                                                            then yyWR2_TBL[13]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[13]; End_If;
 131
                   If yyTest_Spd < xxMLS_TBL_Spd[14]</pre>
                                                            then yyWR2_TBL[14]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[14]; End_If;
 132
                   If yyTest Spd < xxMLS TBL Spd[15]</pre>
                                                            then yyWR2_TBL[15]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[15]; End_If;
 133
                   If yyTest_Spd < xxMLS_TBL_Spd[16]</pre>
                                                            then yyWR2_TBL[16]
                                                                                    := xxAveraged_Trq_PU - yyMLS_TBL_Loss[16]; End_If;
 134
               End If;
 135
 136
           // ! Calculate WR2 //
 137
 138 🗄
               If xxTest and (yyTest_Spd >= xxMLS_TBL_Spd[16]) then
 139
                   For yyI := 8 to 16 do
 140
                           yySample_WR2 := yySample_WR2 + yyWR2_TBL[yyI];
 141
                   End_For;
 142
                   yySample WR2 := yySample WR2 / 9;
 143
                   IF yySample_WR2 < 0 then
 144
                       yySample_WR2 := 0;
 145
                    End If:
```



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





Function Block





Standard Indication of Errors





Logix Designer Error Window

New Message Filtering Capabilities

| Errors | × |
|---|---|
| 😢 1 Error(s) 🛛 🛕 1 Warning(s) 🛑 3 Messages | * |
| Verifying program: Utilities Verifying routine 'Lonely_Routine' of program 'Utilities' Warning: Lonely_Routine: Routine cannot be reached by the main routine: 'Lonely_Routine of Program Utilities' Verifying routine 'Main' of program 'Utilities' | |
| Error: Rung 0, CONCAT, Operand 1: Missing operand or argument. | |
| Complete - 1 error(s), 0 warning(s) | - |
| | • |
| Errors | × |
| 1 Error(s) | * |
| Warning: Lonely_Routine: Routine cannot be reached by the main routine: 'Lonely_Routine of Program Utilities' Complete - 1 error(s), 1 warning(s) | |
| | |
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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



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 to Program Communications – Before





Program to Program Communications – After





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





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





Innovation & Technology Forum

Thank you