Rockwell Automation

Innovation & Technology Forum

Connected Components Workbench™ Software Lab: CL06

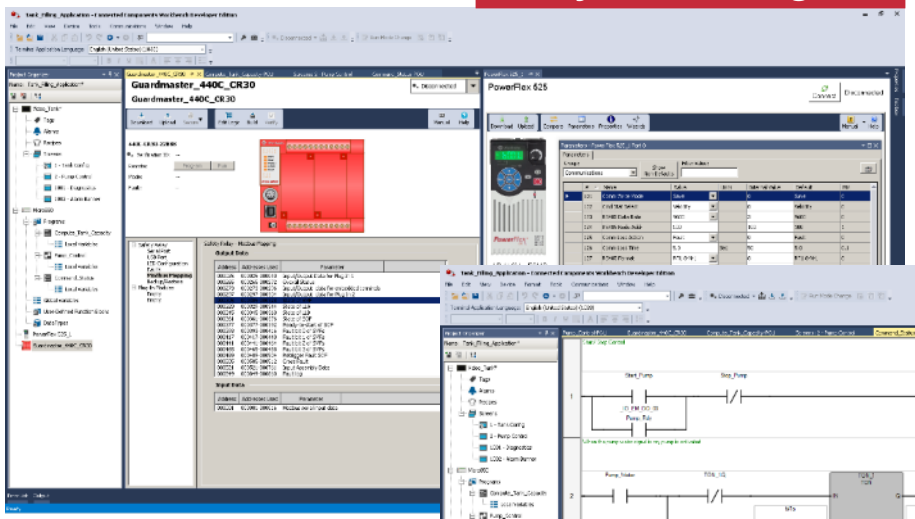
Peter Madarasz

Commercial Engineer

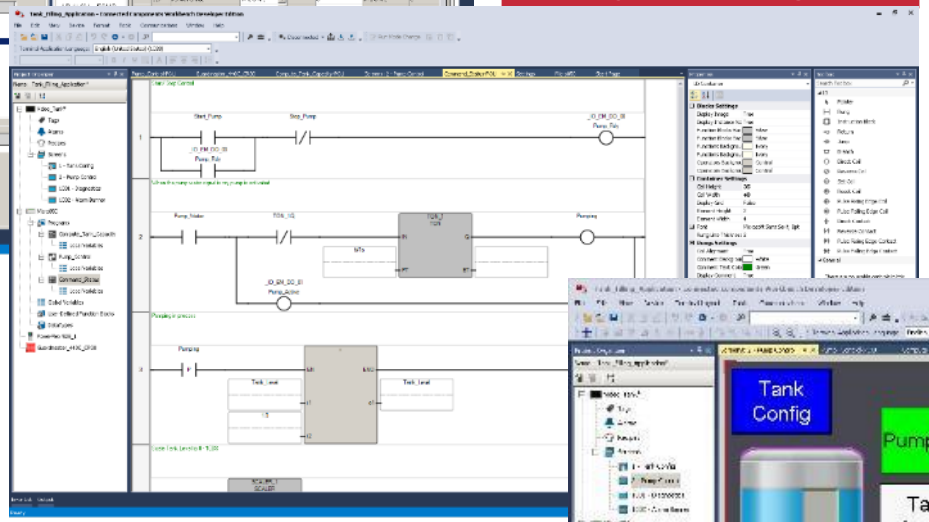
Connected Components Workbench™ Software

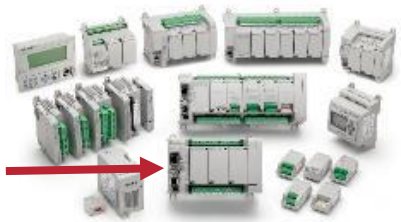
One Software Package for Device Configuration, Controller Programming and Integration with Human Machine Interface (HMI)

Easy to Configure

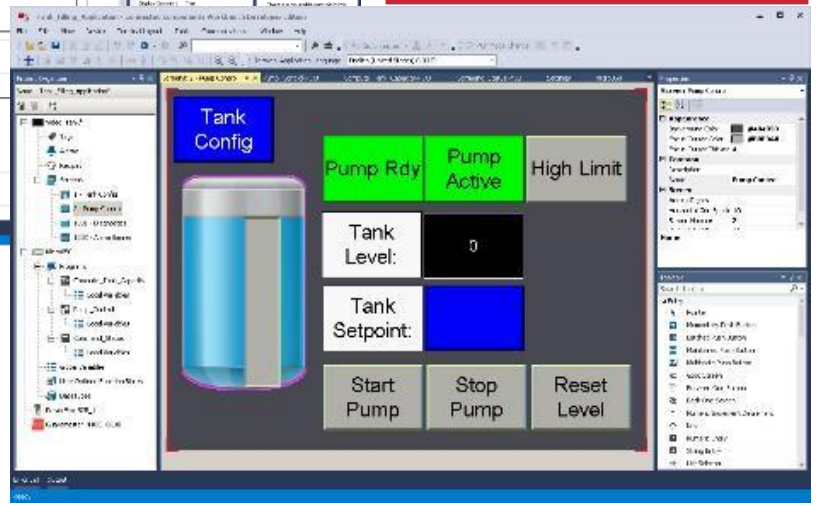


Easy to Program





Easy to Visualize



PowerFlex® Compact-class AC Drive Family

PowerFlex® Compact-class AC Drives deliver a *simple* and *cost-effective* solution for machine level, standalone control applications or simple system integration.

- Designed for ease of use, this general-purpose class of drives provides a compact package to optimize panel space and application versatility.
- Available in 0.2-22 kW or 0.25-30 Hp ratings

Micro800® Controller Family

Each controller is cost and performance optimized for specific applications

Performance/Features

Local I/O

12 pts.

Micro810®
Programmable relay replacer and timer
8 A relay outputs,
Analog inputs

20-36 pts.

Micro820®
For smaller standalone machines and remote automation

EtherNet/IP

Embedded Analog I/O

10-88 pts.

Micro830®
For standalone machines with motion

24-132 pts.

Micro850®
For standalone machines with motion, more I/O, and Ethernet connectivity.

EtherNet/IP

24-304 pts.

Micro870™
For larger standalone machines with motion, even more I/O, more memory and Ethernet connectivity.

EtherNet/IP

PanelView™ 800 Graphic Terminal Family

3 Sizes – 4”, 7”, 10”

Controllers Supported: MicroLogix™, Micro800® and CompactLogix™ 5370

High-resolution Display with light-emitting diode (LED) Backlight

Built-in Real Time Clock (RTC)

microSD™ for Data log, Recipe, File Transfer

Quick Lever Panel Mount

Class 1 Division 2 Certified

Landscape/Portrait Applications

Tactile Keypad (4”)

Virtual Network Computing (VNC) Server

Ethernet & Serial Communications

65K Colors Touch screen

IP65, NEMA 4X Rated

“Connected Components Machine”

Micro850® Programmable Logic Controller (PLC)

Kinetix® 3 Servo Drive

PowerFlex® 525 Variable Frequency Drive (VFD)

7-inch PanelView™ 800 Graphic Terminal (also known as HMI)

Software Comparison of Standard Versus Developer Editions

- Developer Edition is for machine developers to reduce their time to Design, Develop and Deliver
- Standard Edition is meant to be installed on many Personal Computers (PCs) to help ensure availability for simple debugging and configuring devices

	Standard Edition	Developer Edition
Price	Free for download	Contact local distributor or Rockwell Automation® Sales
Common environment to configure all your common devices	Yes	Yes
Project import/export	Yes	Yes
Archive manager	No	Yes
Micro800® Controller Programming		
IEC 61131-3 Ladder Diagram (LD), Function Block Diagram (FBD), and Structured Text (ST)	Yes	Yes
User-defined function block	Yes	Yes
Run mode change	No	Yes
User-defined data types	No*	Yes
Spy List Used	Existing lists	New lists can be created
Intellectual Property Protection	No**	Yes

** – Requires Developer Edition to create data types, which can be used in Standard Edition.*
***- Requires Developer Edition to create passwords, which can be used in Standard Edition.*

Lab Exercises – Micro800® Controllers

1. Create a new project, add a controller to the project and configure controller plug-in modules.

2. Add a drive to the project using Discover mode and configure the drive using a Startup Wizard.

3. Add a Ladder Diagram (LD) program, rename the program and create one rung of Ladder Logic to start/stop the motor.

4. Build, download and test the program.

5. Using Run Mode Change (RMC), add a Structured Text (ST) program to control motor speed, then test and accept the change.

6. Copy and paste a rung of Ladder Logic from Studio 5000 Logix Designer® software to Connected Components Workbench™ software.

Lab Exercises – PanelView™ 800 Graphic Terminals

7. Import completed controller project, add a graphic terminal and define tags using direct referencing.

8. Create a new graphic terminal screen with push buttons and numeric entry, then download and test the graphic terminal application.

9. Use a Virtual Network Computing (VNC) client to operate the graphic terminal screens remotely from your PC.

10. Enable File Transfer Protocol (FTP) and see how to upload alarm history, data log and recipe files.

11. Explore printing configuration.

12. Configure and send an email with a screen print of the current screen when a button is pushed.

Lab Exercise #1

- Create a new project, add a controller to the project and configure controller plug-in modules.
- Pages 5-10, Steps 1-8
- 4 minutes

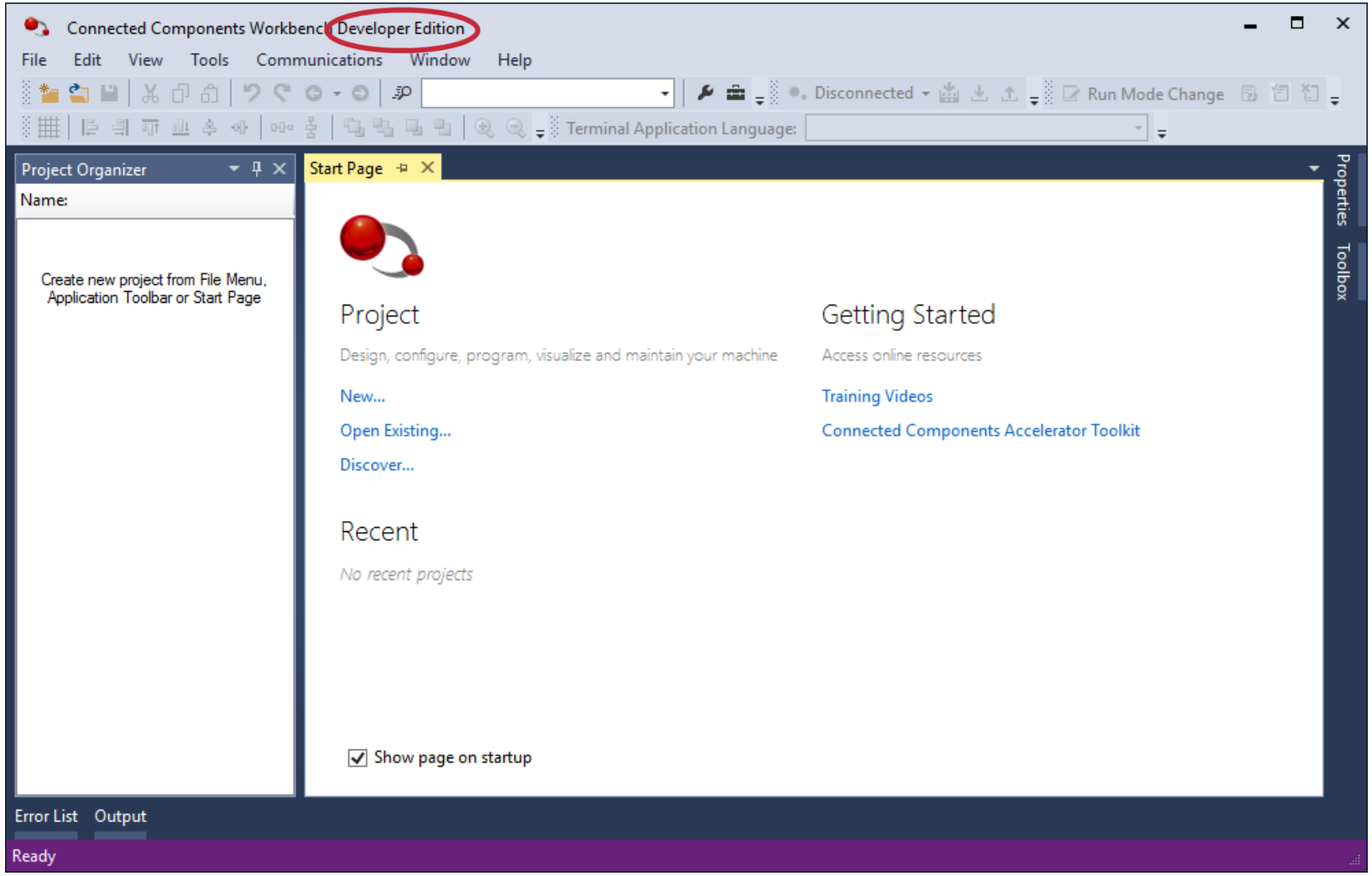
Pages 5-10, Steps 1-8

Connected Components Workbench™ Software

Start Page

Start Page provides

- Easy **Project** Navigation
  - Create ***New*** project from catalog list or network browse
  - ***Open Existing*** project
  - ***Discover*** – create new project uploaded from an existing device
- Helpful **Getting Started** with clickable links to online resources
- Convenient access to **Recent** projects that have been opened

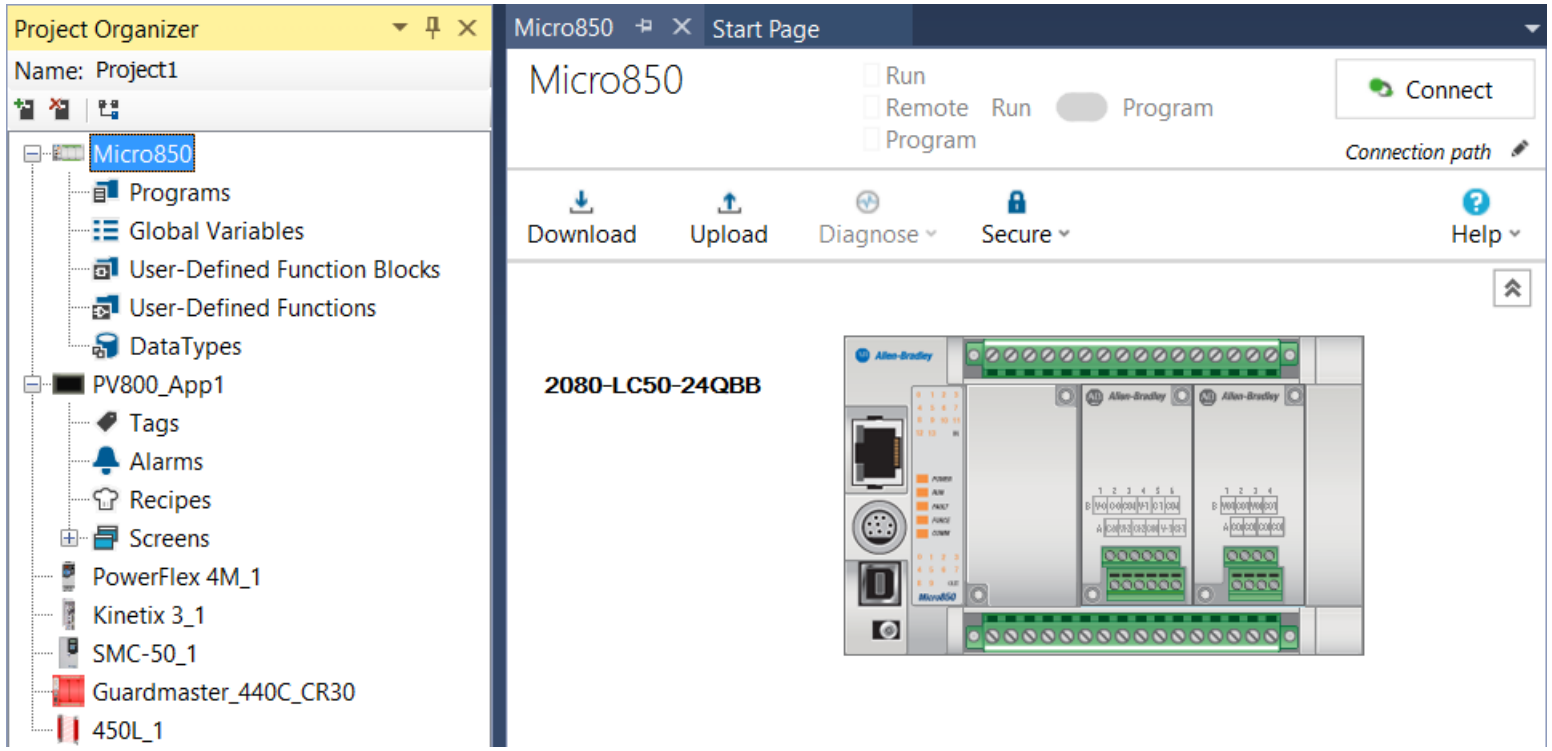


Connected Components Workbench™ Software

Project Organizer

- **Project Organizer** displays the devices in your project,
  - Controller,
  - Graphic terminal,
  - Drive(s),
  - Soft starter(s),
  - Safety relay, and/or
  - Light curtain(s),

  in an organized tree view.
- Double-click the device icon to display it in the workspace to the right.



Lab Exercise #2

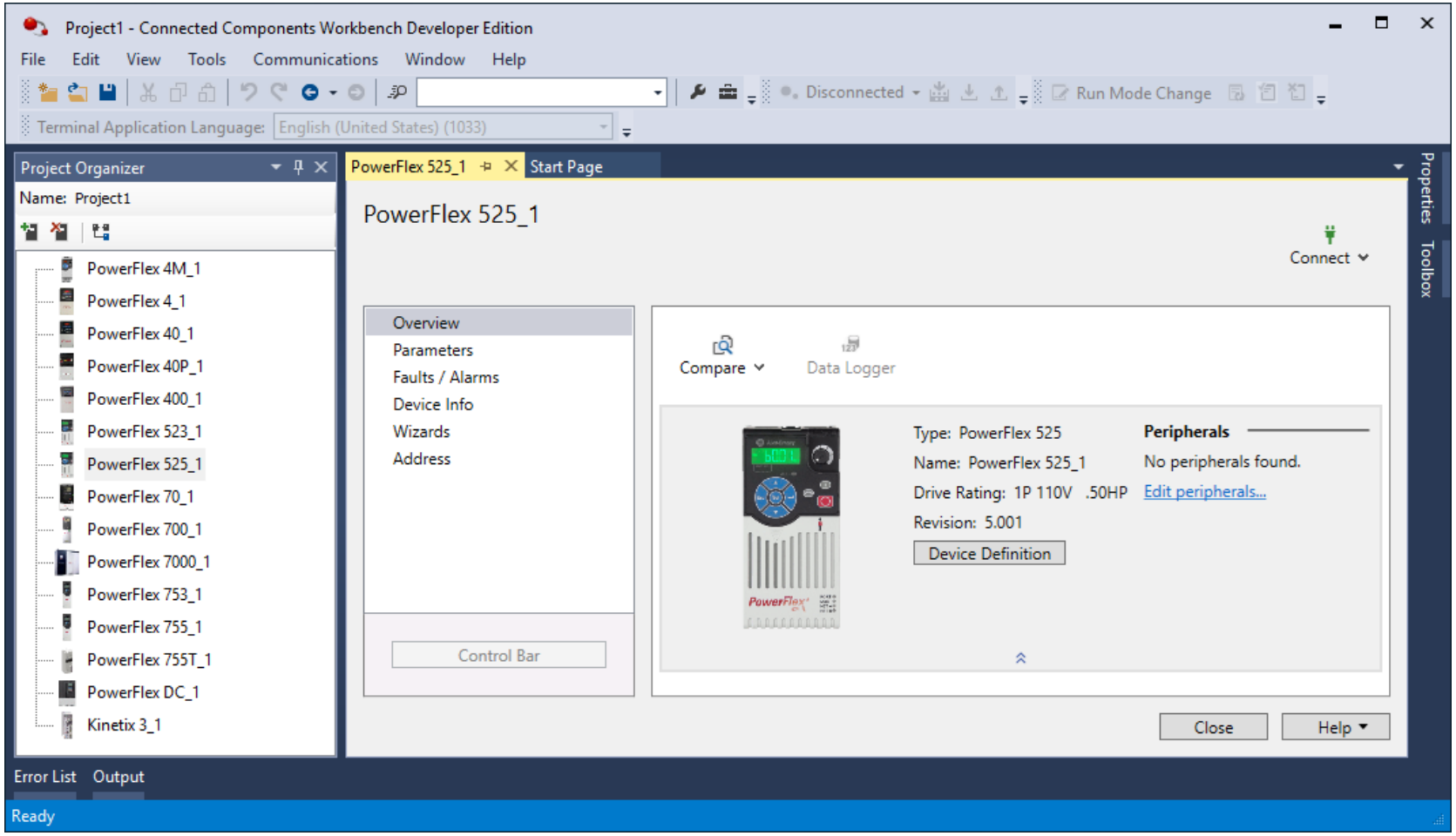
- Add a drive to the project using Discover mode and configure the drive using a Startup Wizard.
- Pages 11-19, Steps 9-23.
- 4 minutes

Pages 11-19, Steps 9-23

Connected Components Workbench™ Software

Drive Support

- Drive support is included for ***all*** PowerFlex® drive families and for the Kinetix® 3 servo drive.
- Wizards provide easy step-by-step drive configuration.
- View/edit parameters and view/clear faults.
- DeviceLogix™ editor is included for drives that support this embedded control capability.



Lab Exercise #3

- Add a ladder diagram program, rename the program and create one rung of Ladder Logic to start/stop the motor.
- Pages 20-31, Steps 24-47.
- 9 minutes

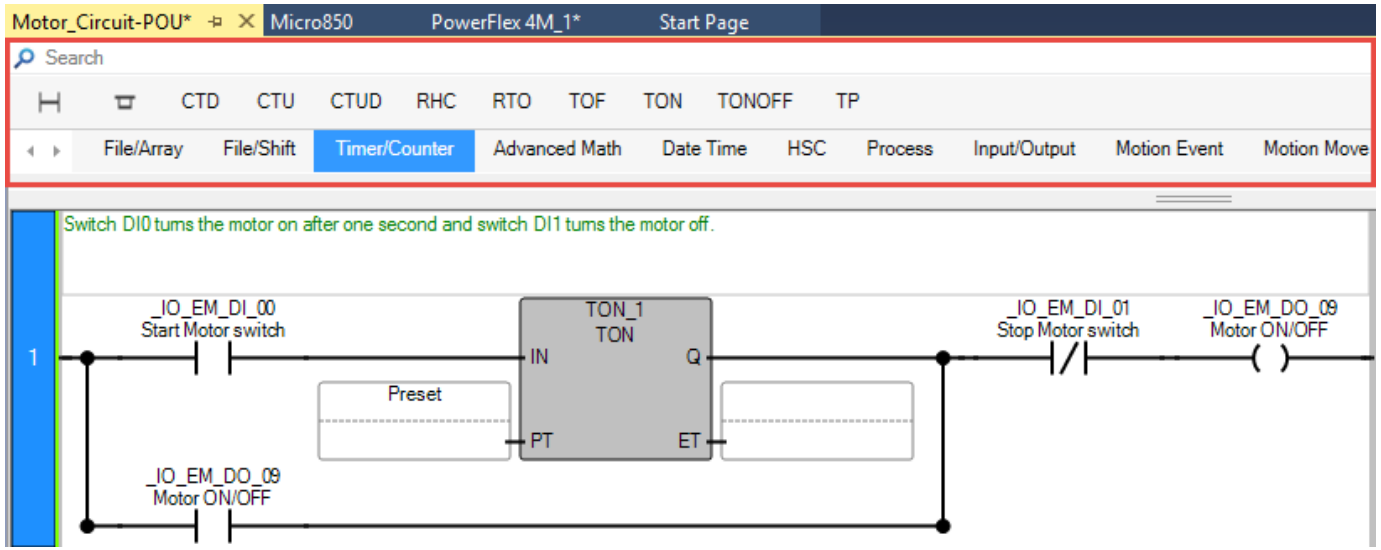
Pages 20-31, Steps 24-47

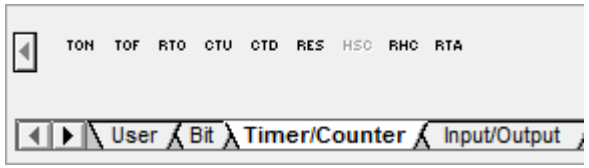
Connected Components Workbench™ Software

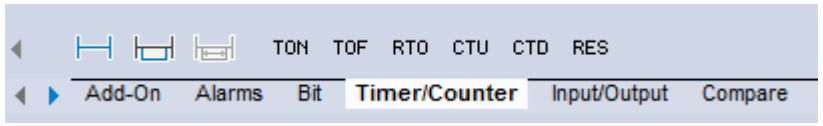
Ladder Logic Programming Using the New Instruction Library

- The **Instruction Library** groups over 150 instructions into 31 tabbed categories like Timer/Counter.

- This is very similar to the tabbed **Instruction Bar** in RSLogix 500® programming software and the **Language Element Toolbar** in Studio 5000 Logix Designer® software.



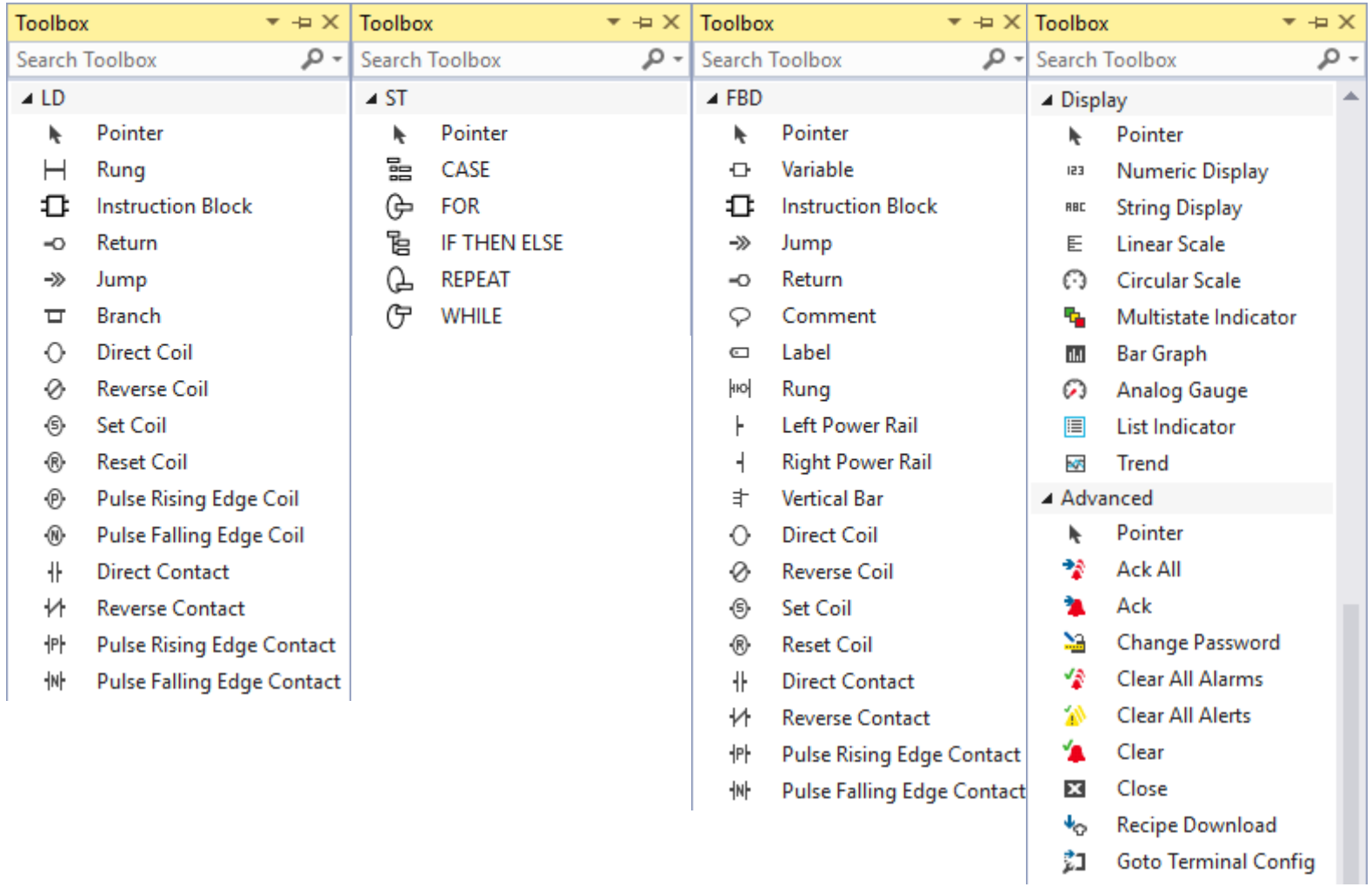




Connected Components Workbench™ Software

Toolbox

- An alternative to the **Instruction Library** for Ladder Logic is the **Toolbox**.
- There are editor-specific toolbox contents for
  - Ladder Diagram (LD)
  - Structured Text (ST)
  - Function Block Diagram (FBD)
  - Graphic Terminal Screens



Lab Exercise #4

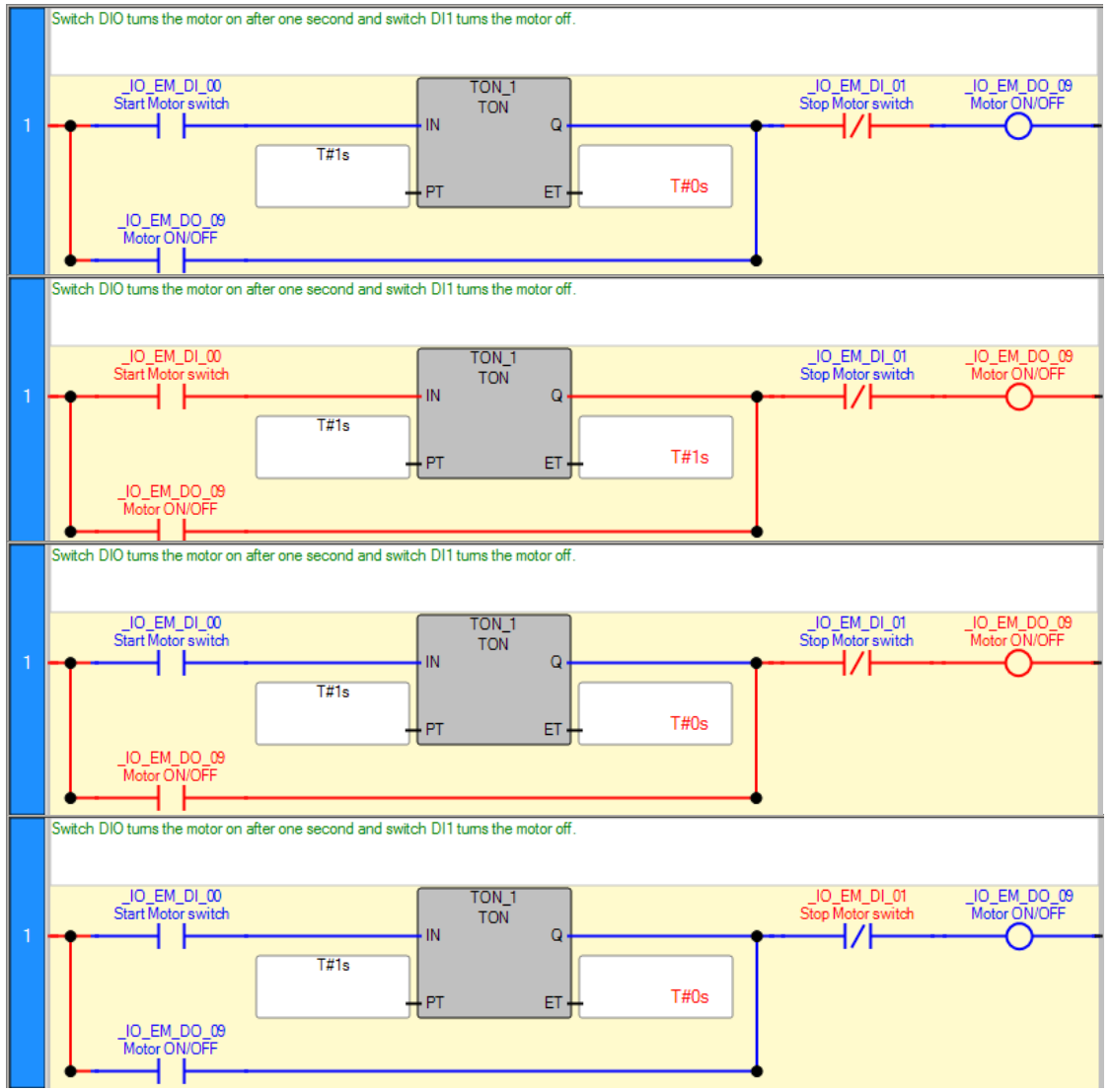
- Build, download and test the program.
- Pages 32-37, Steps 48-58.
- 4 minutes

Pages 32-37, Steps 48-58

Connected Components Workbench™ Software

Ladder Logic Programming

- Turn and hold the Start Motor switch for 1 second.
- The TON ‘Q’ output turns on when the timer is done – that is, the Preset/ Programmed Time (‘PT’) input equals the Elapsed Time (‘ET’) output.
- The motor output turns on and the branch seals the start circuit so that the Start Motor switch can be released.
- The Stop Motor switch interrupts the circuit and turns off the motor output.



Lab Exercise #5

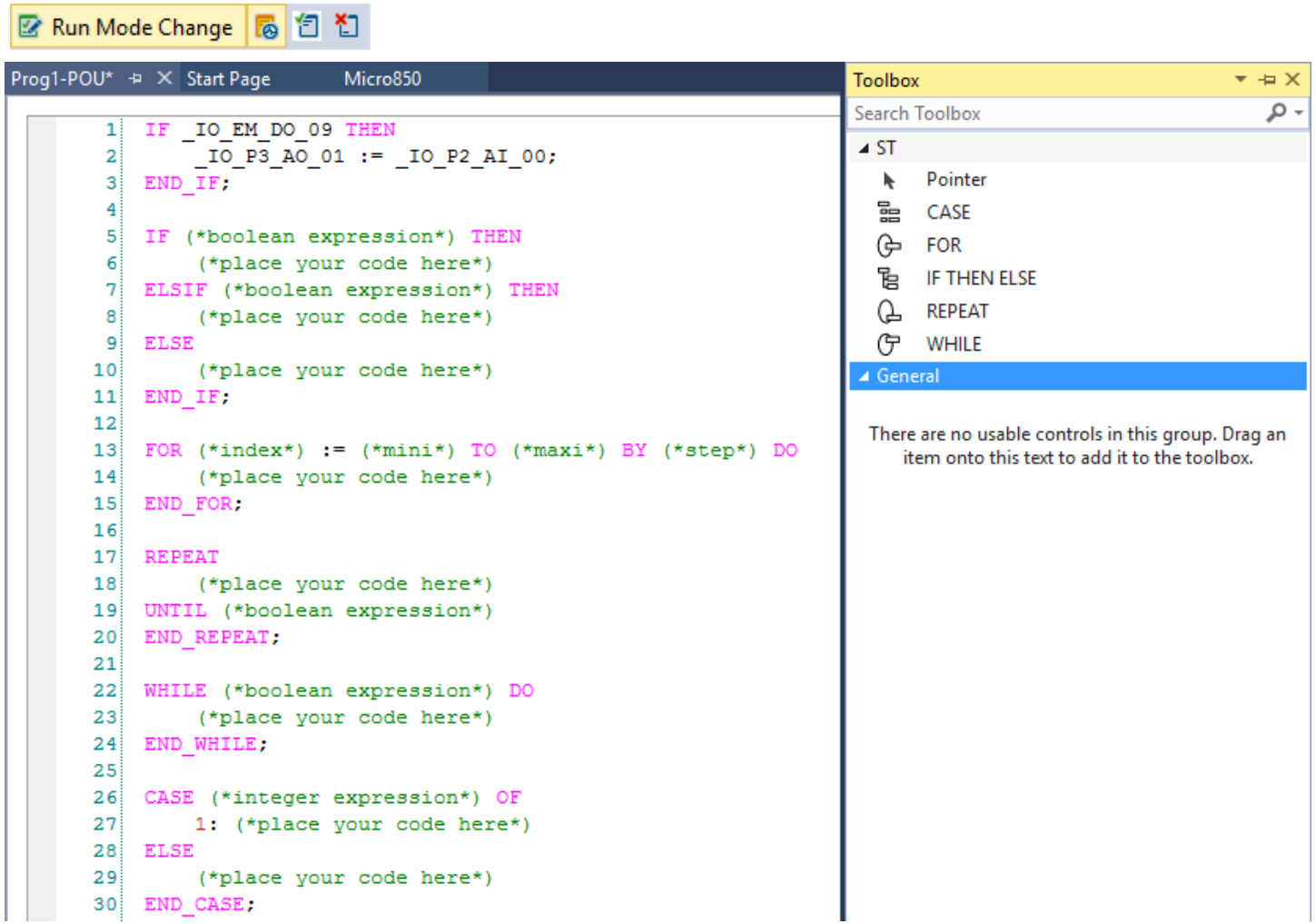
- Using Run Mode Change (RMC), add a Structured Text (ST) program to control motor speed, then test and accept the change.
- Pages 38-45, Steps 59-75.
- 8 minutes

Pages 38-45, Steps 59-75

Connected Components Workbench™ Software

Run Mode Change (RMC) and Structured Text (ST)

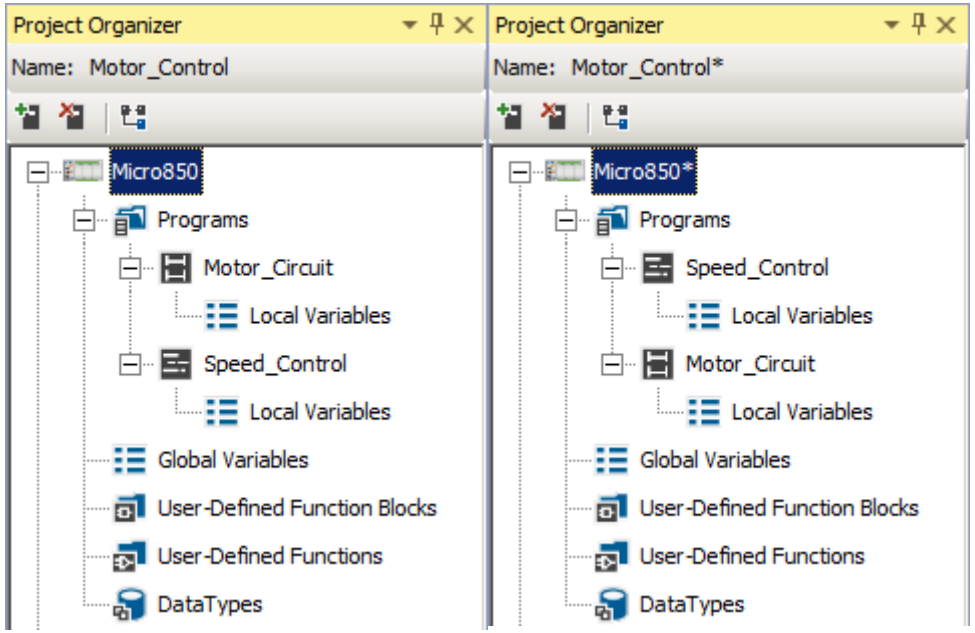
- RMC allows changes to be made to a running controller without interruption.
- ST is similar to high-level computer programming languages and includes common constructs such as
  - IF THEN ELSE
  - FOR
  - REPEAT UNTIL
  - WHILE
  - CASE
- ST is the most memory efficient programming language for Micro800® controllers and simplifies complicated computations.



Connected Components Workbench™ Software

Program Execution

- The programs in Project Organizer can be a mixture of Ladder Diagram (LD), Structured Text (ST) and Function Block Diagram (FBD).
- The programs are executed in the order they appear from top to bottom.
- You can click and drag a program to another position to change the order of execution.



Lab Exercise #6

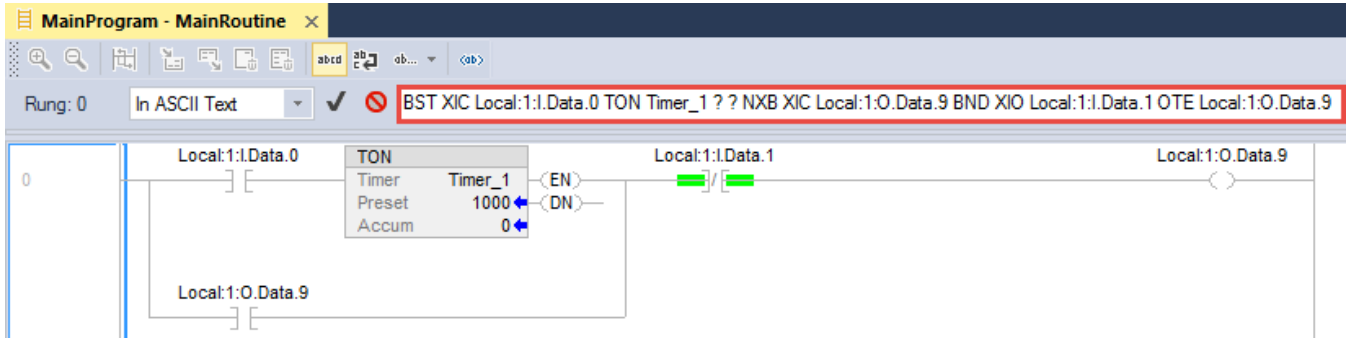
- Copy and paste a rung of Ladder Logic from Studio 5000 Logix Designer® software to Connected Components Workbench™ software.
- Pages 46-51, Steps 76-87.
- 5 minutes

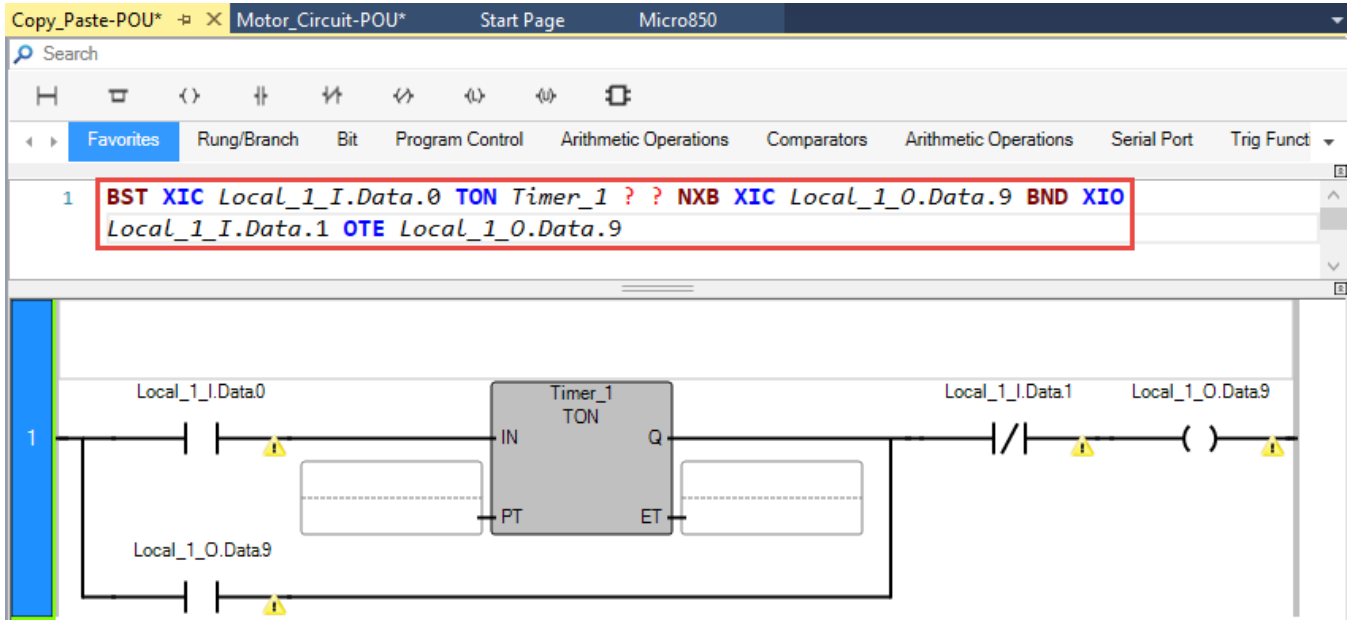
Pages 46-51, Steps 76-87

Connected Components Workbench™ Software

Copy and Paste Rungs from Studio 5000 Logix Designer®

- Common ASCII nomenclature facilitates copying single or multiple rungs of Ladder Logic between different programming software packages.
- I/O naming convention varies between controller families, so I/O address assignments require updating after pasting.
- Variables used that don't exist must be created within the receiving software.
- Some ladder instructions are unique to a controller family.





Lab Exercise #7

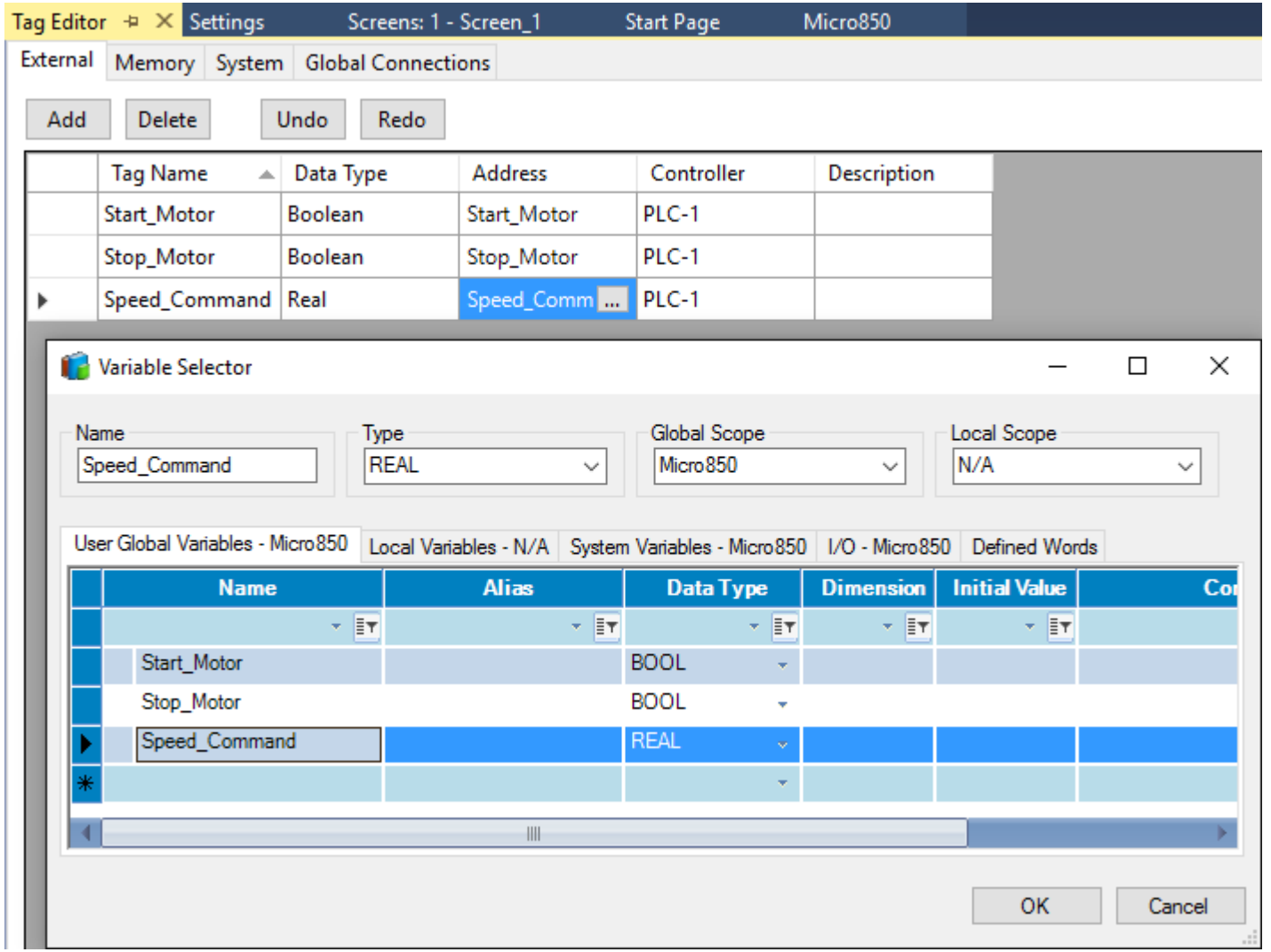
- Import completed controller project, add a graphic terminal and define tags using direct referencing.
- Pages 52-62, Steps 88-119.
- 7 minutes

Pages 52-62, Steps 88-119

Connected Components Workbench™ Software

Tag Browsing

Tag browsing of variable addresses that exist in the Micro800® project makes it easy to configure new HMI tags.



Lab Exercise #8

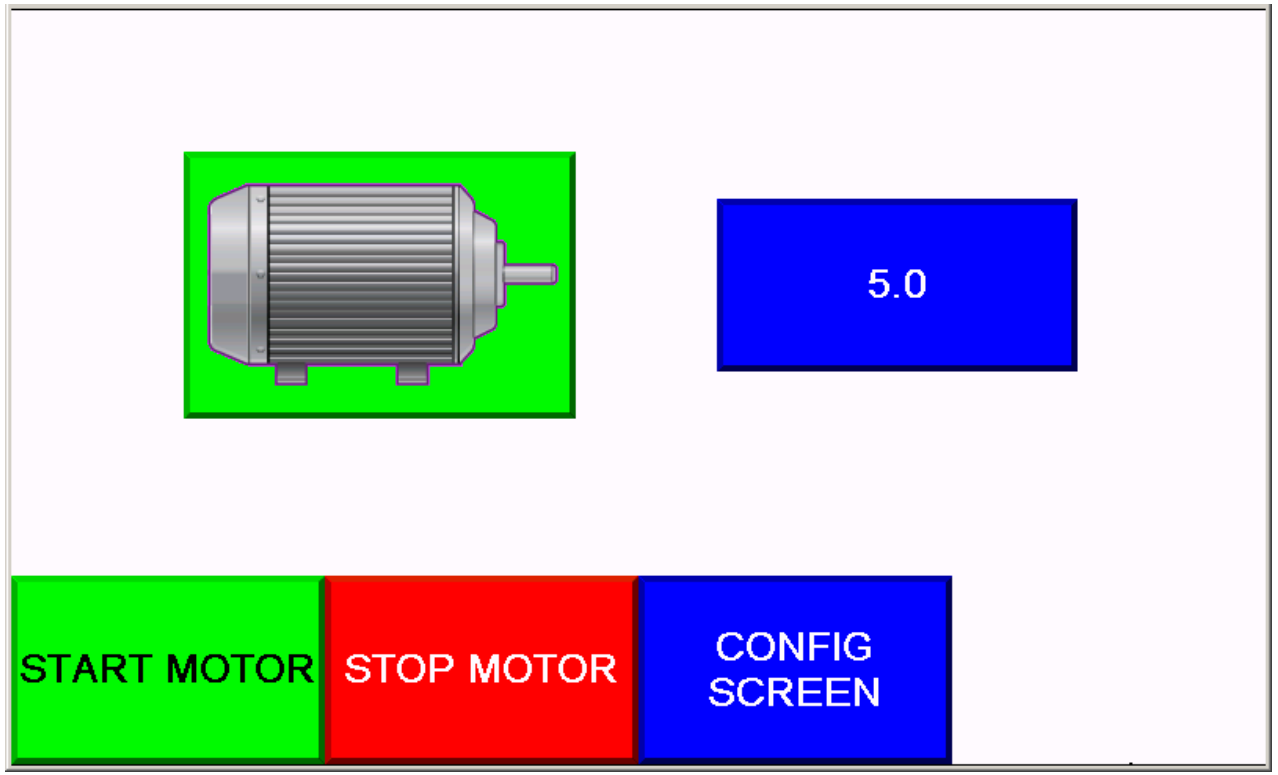
- Create a new graphic terminal screen with push buttons and numeric entry, then download and test the graphic terminal application.
- Pages 63-79, Steps 120-186.
- 18 minutes

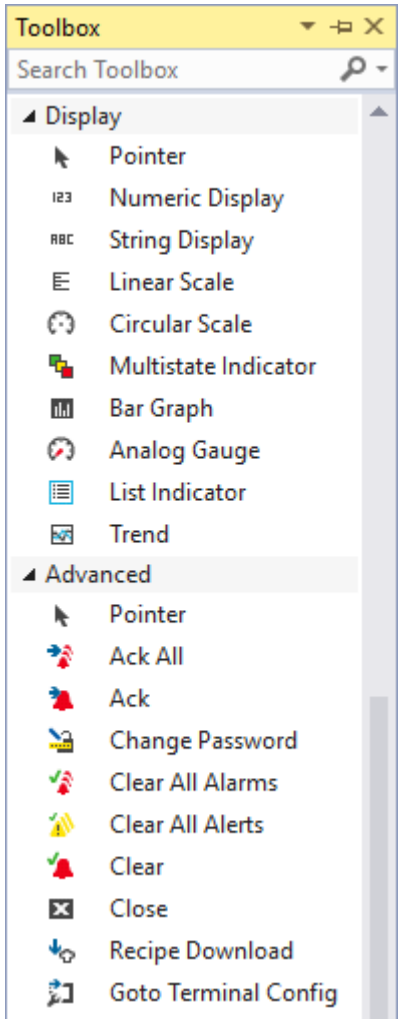
Pages 63-79, Steps 120-186

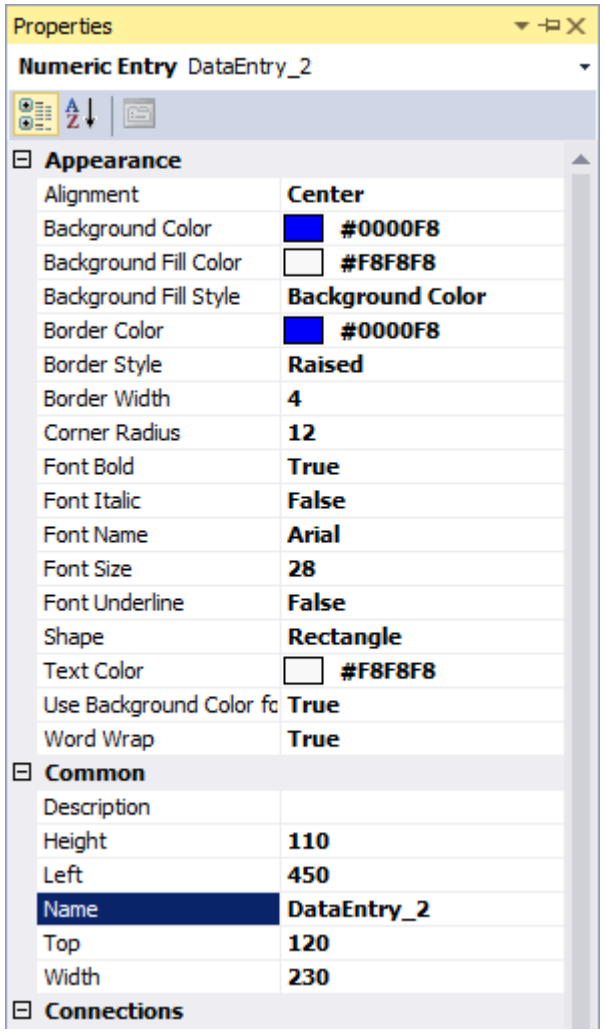
Connected Components Workbench™ Software

Screen Creation

- Toolbox and Properties windows are all you need to create your application screens easily







Lab Exercise #9

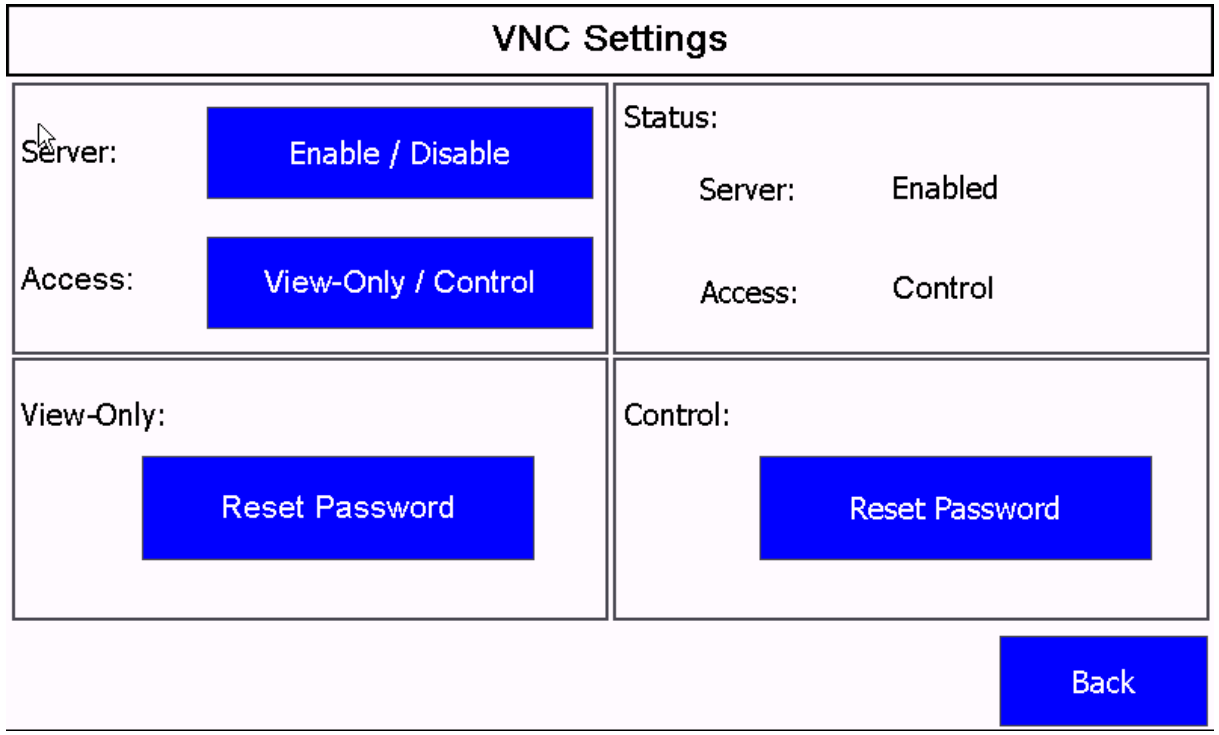
- Use a Virtual Network Computing (VNC) client to operate the graphic terminal screens remotely from your PC.
- Pages 80-85, Steps 187-206.
- 5 minutes

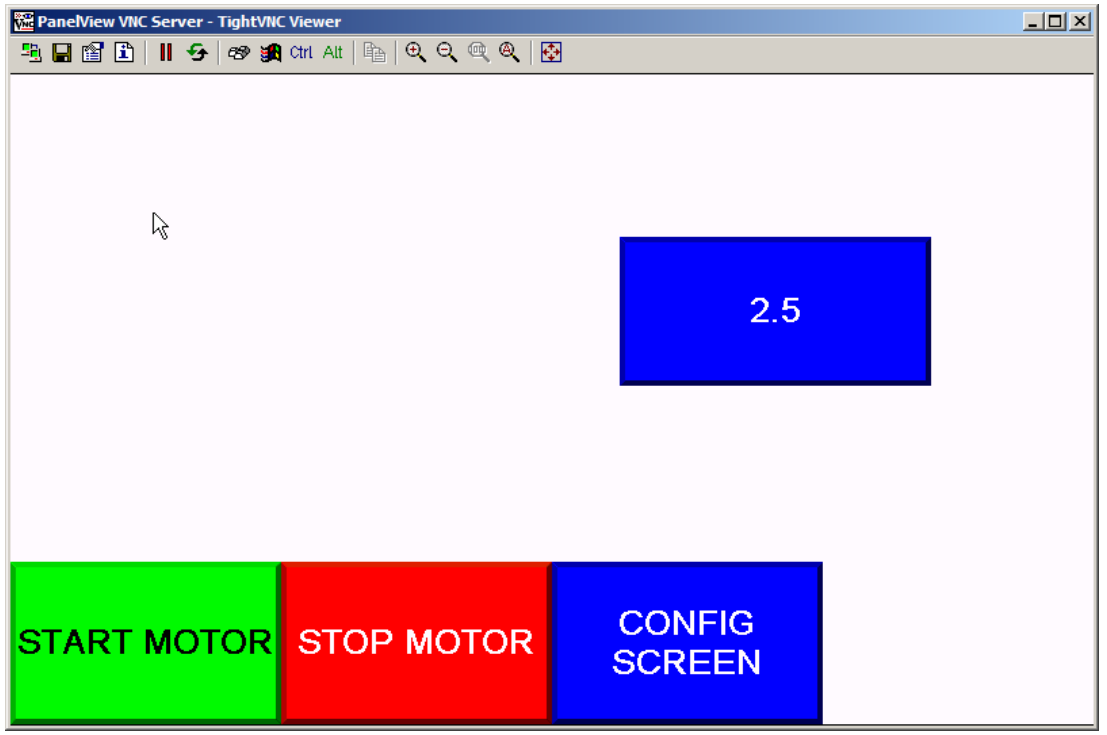
Pages 80-85, Steps 187-206

Connected Components Workbench™ Software

Virtual Network Computing (VNC)

- Configure VNC server on PanelView™ 800 graphic terminal for view-only or control access.
- Use widely available VNC client software to connect from PC, tablet or mobile phone (one at a time).
- If a password is forgotten, then re-flashing the graphic terminal firmware will clear the passwords.





Connected Components Workbench™ Software

Virtual Network Computing (VNC)

- **Guidelines for using VNC**
  - It is recommended that you only enable the view-only access to the graphic terminal. Enabling control access increases the security risk if the password is compromised.
  - Only one active VNC connection is supported.
  - Terminate the VNC connection before performing a firmware update as it may interfere with the process.
  - The mouse action “press and hold” is not supported over VNC.
- **Recommended VNC Clients**
  - Tight VNC: for PC/Laptop
  - Real VNC: for mobile and tablet (iOS and Android), PC/Laptop
  - Mocha VNC: for mobile and tablet (iOS, Android, Windows)
  - Ultra VNC: for PC/Laptop

See the PanelView™ 800 User Manual (2711R-UM001) for more detailed guidelines and recommended VNC Client configuration.

Lab Exercise #10

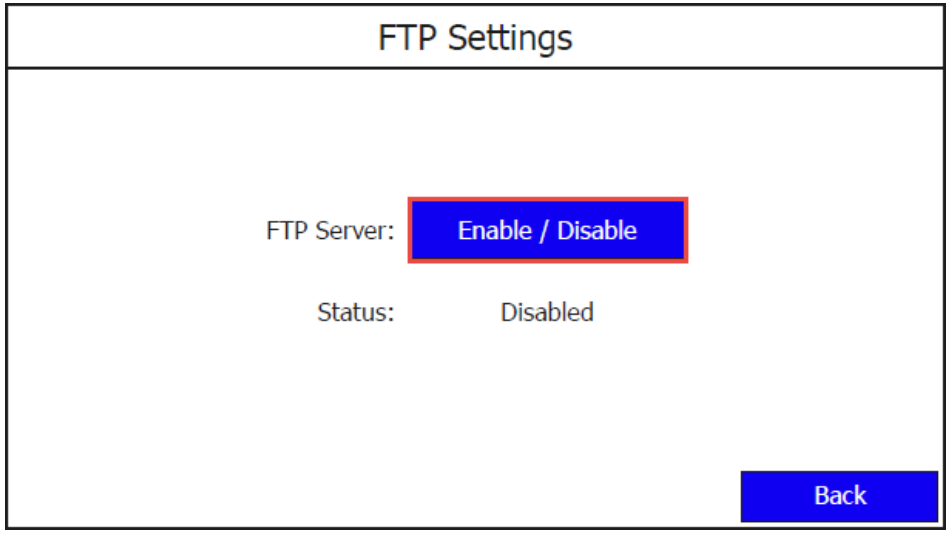
- Use File Transfer Protocol (FTP) to connect to your graphic terminal via web browser or PC file explorer.
- Pages 86-89, Steps 207-212.
- 5 minutes

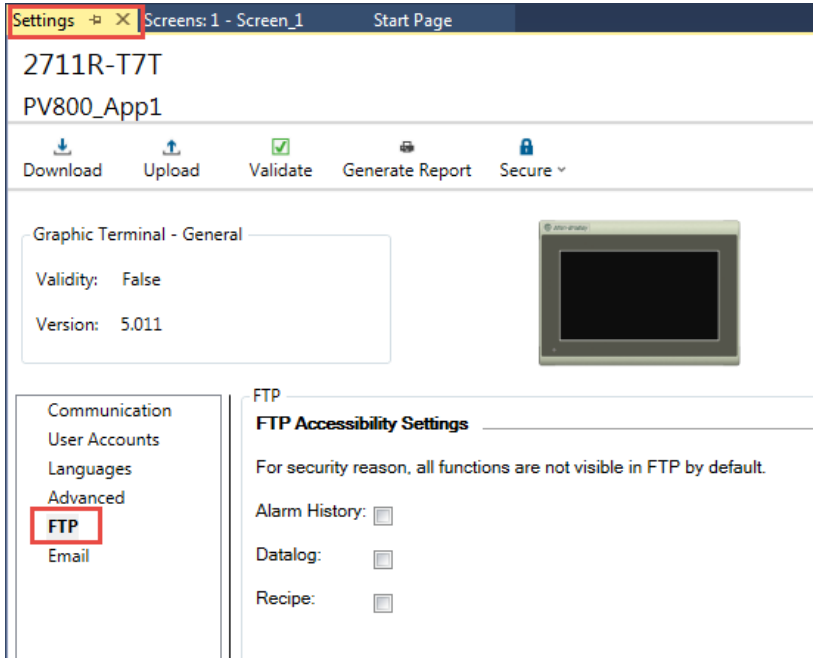
Pages 86-89, Steps 207-212

Connected Components Workbench™ Software

File Transfer Protocol (FTP)

- Configure FTP on PanelView™ 800 graphic terminal for read-only access.
- Allows access to Alarm History, Data log, and Recipe folders on the graphic terminal.
- Supports one connection at a time.





Lab Exercise #11

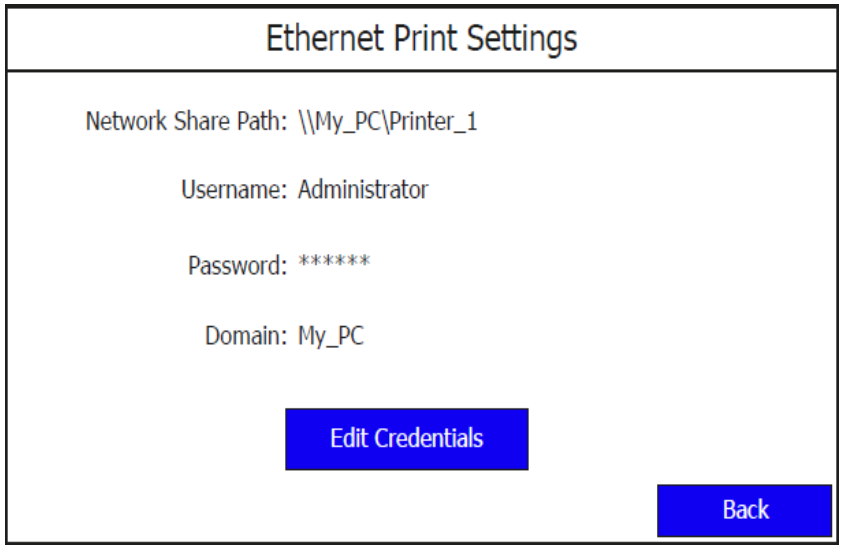
- Configure Print: To print either the current screen or alarm history from your graphic terminal.
- Pages 90-93, Steps 213-225.
- 5 minutes

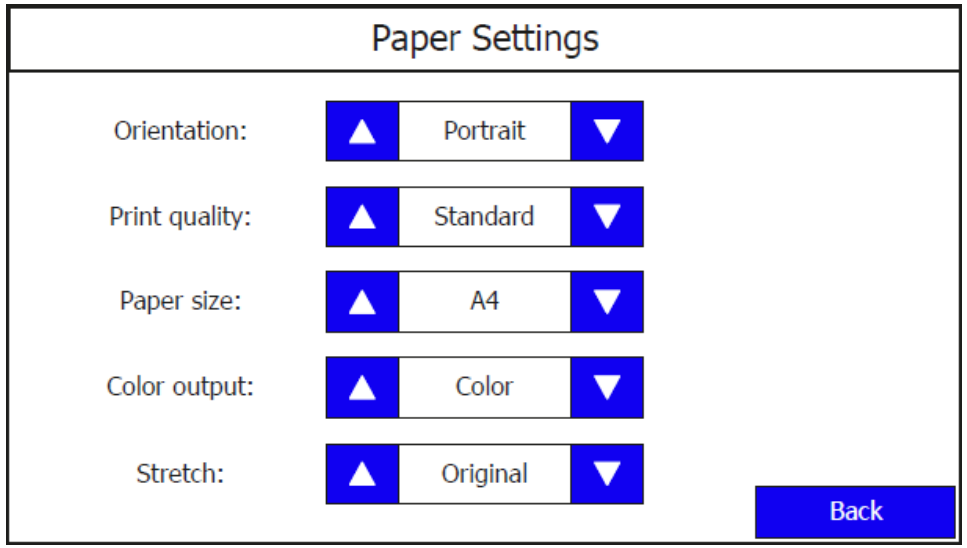
Pages 90-93, Steps 213-225

Connected Components Workbench™ Software

Printing

- Configure Print on PanelView™ 800 graphic terminal to print either current screen or alarm history.
- Works via Ethernet over print server or direct USB print.
- Only printers using PCL 5 protocol are supported.





PCL refers to Printer Command Language (PCL)

Lab Exercise #12

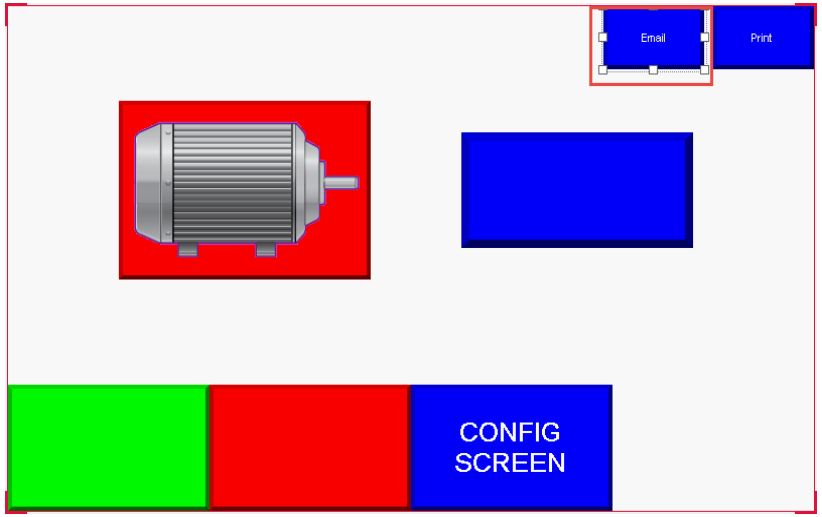
- Configure and send an email from the graphic terminal.
- Pages 94-97, Steps 226-236.
- 9 minutes

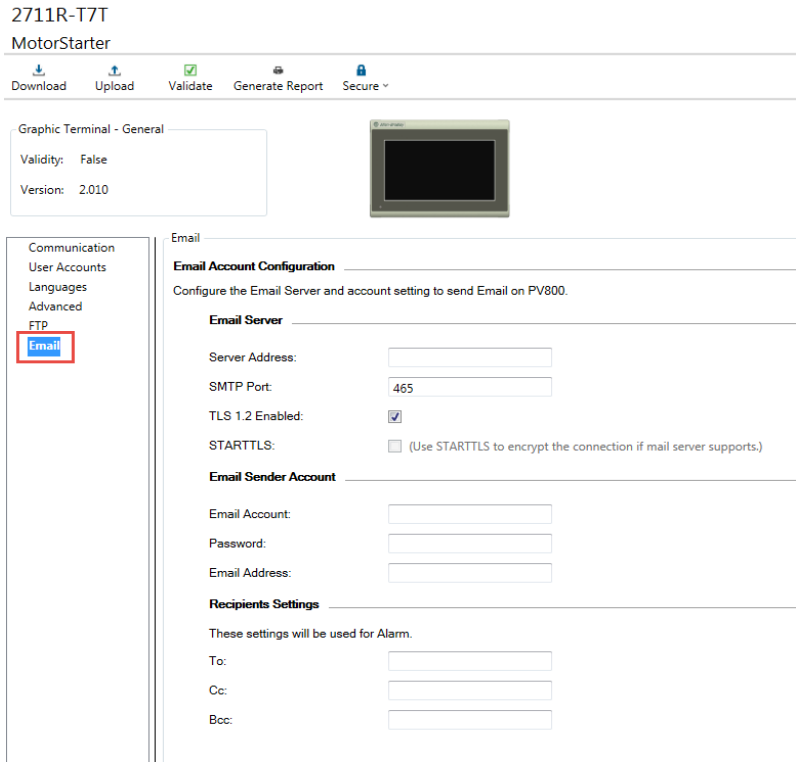
Pages 94-97, Steps 226-236

Connected Components Workbench™ Software

Sending an Email

- Configure email on PanelView™ 800 graphic terminal to send attachments such as screenshot of current screen or data log file.
- Can be configured to send an email when an alarm is triggered or manually using the ‘email’ button.





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Thank you

Contact me via LinkedIn! – **Peter Madarasz**