L14 - Experience Connected Components Workbench™ Software to Develop Your Basic Standalone Machine Application
Connected Components Workbench™ Software
Connected Components Workbench™ Software
Single Software for All Your Component Devices

Easy to Configure

Easy to Program

Easy to Visualize
Compact PowerFlex® 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.
- 0.2–22 kW / 0.25–30 Hp
Micro800® Controller Family

Each controller is cost and performance optimized for specific applications

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

Micro820®
For smaller standalone machines and remote automation

Micro830®
For standalone machines with motion

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

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

Performance/Features

Local I/O

12 pts.
Micro810®

10-88 pts.
Micro830®

20-36 pts.
Micro820®

24-132 pts.
Micro850®

24-296 pts.
Micro870™
PanelView™ 800 Graphic Terminal Family

- Controllers Supported: MicroLogix™, Micro800® and CompactLogix™ 5370
- High-resolution Display with light-emitting diode (LED) Backlight
- Built-in Real-time Clock
- microSD™ for Datalog / Recipe / File Transfer
- Quick Lever Panel Mount
- Class 1 Division 2 Certified
- Landscape / Portrait Applications
- 3 Sizes – 4”, 7”, 10”
- Virtual Network Computing (VNC) Server
- Ethernet & Serial Communications
- 65K Colors Touch screen
- IP65, NEMA 4X Rated
- Tactile Keypad (4”)
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“Connected Components Machine”

- Micro850® Controller (PLC)
- Kinetix® 3 Servo Drive
- PowerFlex® 4M Variable Frequency Drive (VFD)
- 7-inch PanelView™ 800 Graphic Terminal (HMI)
## Connected Components Workbench™ Software

### Comparison of Standard Versus Developer Editions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Standard Edition</th>
<th>Developer Edition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price</strong></td>
<td>Free for download or on DVD</td>
<td>Contact local distributor or Rockwell Automation® Sales</td>
</tr>
<tr>
<td>Common environment to configure all your component devices</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Project import/export</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Archive manager</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Micro800® Controllers Programming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- IEC 61131-3 ladder diagram, function block diagram, and structured text programming languages</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- User-defined Function Blocks (UDFBs)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Run Mode Change (RMC)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>- User-defined Data Types (UDTs)</td>
<td>Use UDTs</td>
<td>Create/Edit/Use UDTs</td>
</tr>
<tr>
<td>- Spy Lists (custom data monitors)</td>
<td>Use Spy Lists</td>
<td>Create/Edit/Use Spy Lists</td>
</tr>
<tr>
<td>- Intellectual Property Protection (passwords)</td>
<td>Use passwords</td>
<td>Create/Edit/Use passwords</td>
</tr>
</tbody>
</table>

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

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 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, add a Structured Text (ST) program to control motor speed, then test and accept the change.

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

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

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

Extra – Demo of controlling machine remotely from a cell phone using VNC
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
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
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 on 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 9-21.
- 4 minutes
Pages 11-19, Steps 9-21

04:00
Connected Components Workbench™ Software

Drive Support

- Drive support is included for all PowerFlex® drive families, as well as 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 20-29, Steps 22-40.
- 9 minutes
**Connected Components Workbench™ Software**

**Ladder Logic Programming**

- **Toolbox** displays icons for items that you can add to programs. You can either drag and drop or copy and paste these items into the design workspace.

- The LD Toolbox lists the elements, like contacts and coils, that are used to program rungs of ladder logic.

- Dropping an Instruction Block on a rung brings up the Instruction Block Selector, which lists over 150 additional instructions that you can choose from, like Timer ON-delay (TON).
There is 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 30-35, Steps 41-51.
- 4 minutes
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, add a Structured Text (ST) program to control motor speed, then test and accept the change.
- Pages 36-43, Steps 52-68.
- 8 minutes
RMC allows changes to be made to a running controller without interruption.

Structured Text 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® and simplifies complicated computations.
The programs in Project Organizer can be a mixture of Ladder Diagram, Structured Text and Function Block Diagram.

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

- Import completed controller project, add a graphic terminal and define tags using direct referencing.
- Pages 44-54, Steps 69-100.
- 7 minutes
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 #7

- Create a new graphic terminal screen with push buttons and numeric entry, then download and test the terminal application.
- Pages 55-71, Steps 101-167.
- 18 minutes
Pages 55-71, Steps 101-167
Toolbox and Properties windows are all you need to easily create your application screens.
Lab Exercise #8

- Use a Virtual Network Computing (VNC) client to operate the graphic terminal screens remotely from your PC.
- Pages 72-77, Steps 168-187.
- 5 minutes
Connected Components Workbench™ Software
Virtual Network Computing (VNC)

- Configure VNC server on PanelView™ 800 terminal for view-only and/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 terminal firmware will clear the passwords.

### VNC Settings

<table>
<thead>
<tr>
<th>Server:</th>
<th>Enable / Disable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access:</td>
<td>View-Only / Control</td>
</tr>
<tr>
<td>View-Only:</td>
<td>Reset Password</td>
</tr>
<tr>
<td>Status:</td>
<td></td>
</tr>
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![VNC Settings](image.png)
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 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.
Demo of Controlling Machine Remotely from a Cell Phone Using VNC
Thank You!