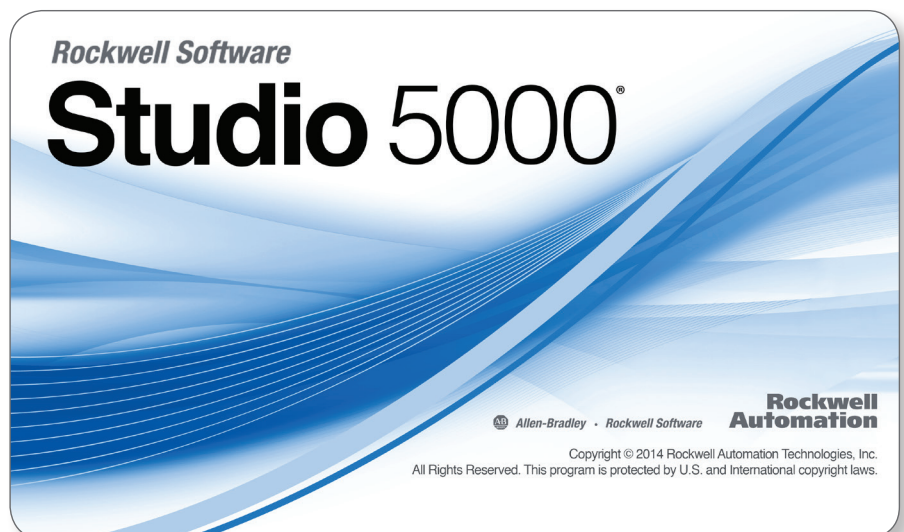
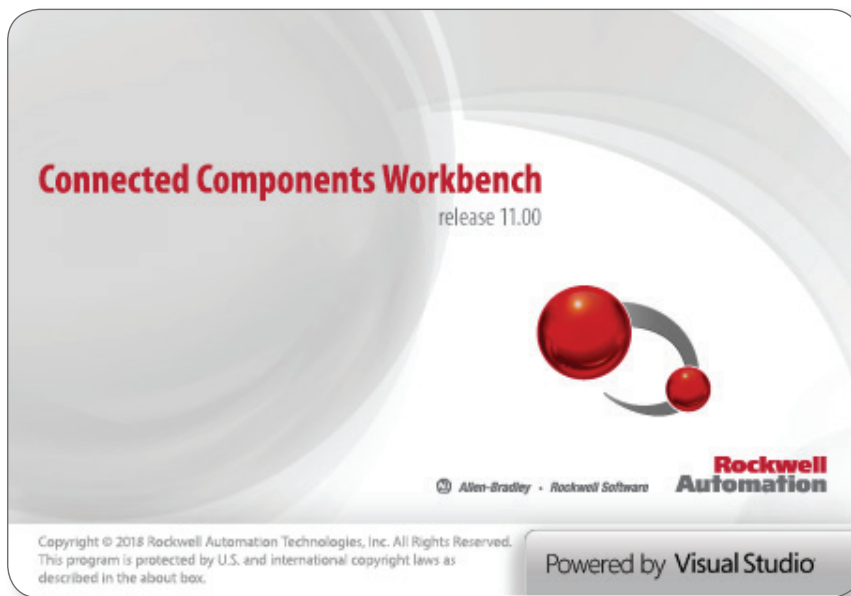


# Connected Components Workbench™ Software Guide for Studio 5000 Logix Designer® Software Users



Terminology and Workflow Comparison



LISTEN.  
THINK.  
SOLVE.™

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## Connected Components Workbench Software Terms in Studio 5000 Logix Designer Software

Connected Components Workbench™ Software	Studio 5000 Logix Designer® Software
Accept Changes	Accept Edits
Build	Verify and Assemble
CCWARC File	ACD File
Connect	Go Online
Connected	Online
Connection Browser	RSWho
Connection Path	Project Path
Discard Changes	Cancel Edits
Disconnect	Go Offline
Disconnected	Offline
Discover	Upload and Go Online
Download with Project Values	Download
Global Variable	Controller Tag
Lock	Force
Project Organizer	Controller Organizer
Run Mode Change (RMC)	Online Editing
Test Changes	Test Edits
Toolbox, Instruction Toolbar	Language Element Toolbar
Upload with Project Values	Upload
User-Defined Functions (UDFs)	Subroutine
User-Defined Function Blocks (UDFBs)	Add-On Instructions (AOIs)
Variable	Tag

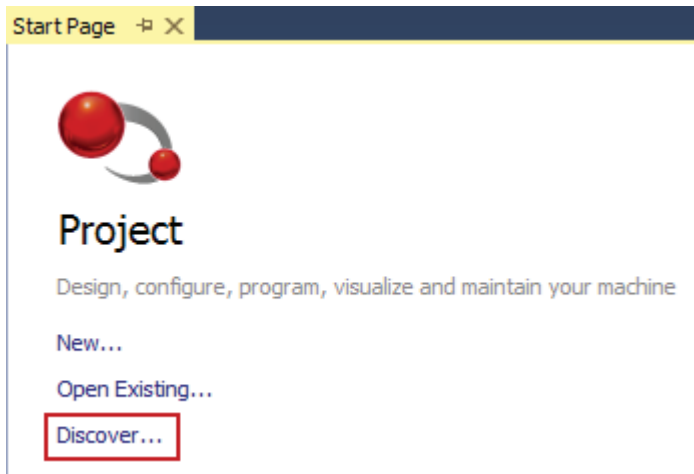
## Studio 5000 Logix Designer Software Terms in Connected Components Workbench Software

Studio 5000 Logix Designer Software	Connected Components Workbench Software
Accept Edits	Accept Changes
ACD File	CCWARC File
Add-On Instructions (AOIs)	User-Defined Function Blocks (UDFBs)
Cancel Edits	Discard Changes
Controller Organizer	Project Organizer
Controller Tag	Global Variable
Download	Download with Project Values
Force	Lock
Go Offline	Disconnect
Go Online	Connect
Language Element Toolbar	Toolbox
Offline	Disconnected
Online	Connected
Online Editing	Run Mode Change (RMC)
Project Path	Connection Path
RSWho	Connection Browser
Subroutine	UDF
Tag	Variable
Test Edits	Test Changes
Upload	Upload with Project Values
Upload and Go Online	Discover
Verify and Assemble	Build

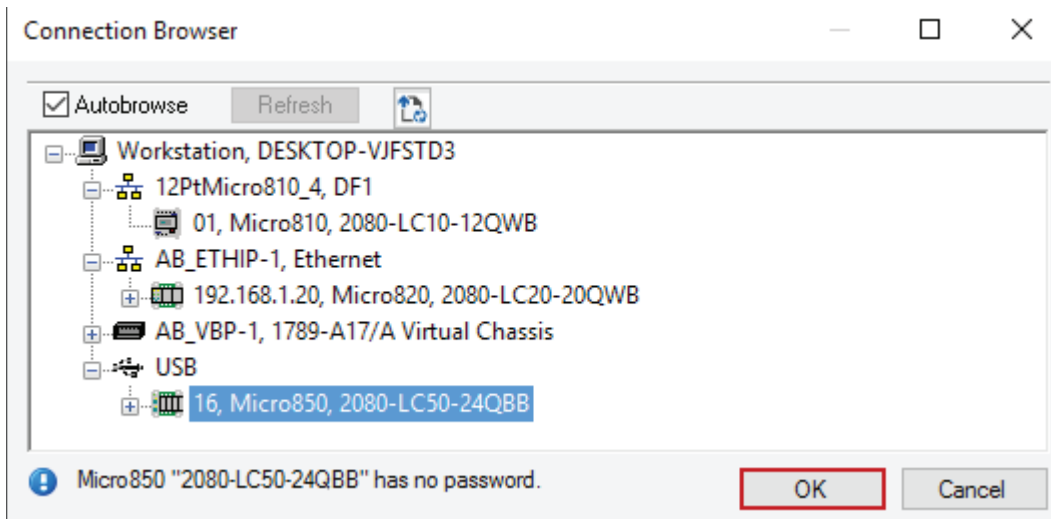
## Uploading from an Existing Controller for the First Time

The term Discover in Connected Components Workbench software is used for uploading from an existing controller for the first time.

1. Open **Connected Components Workbench** software (under All Programs/Rockwell Automation/CCW).
2. Click **Discover...** on the **Start Page**.

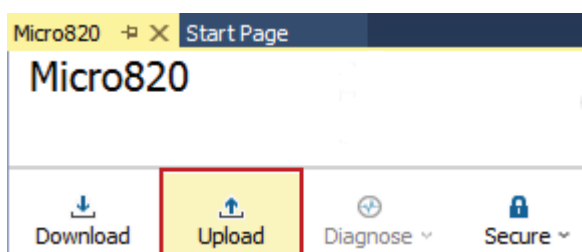


3. Find and click the desired Micro800® controller in the **Connection Browser** (RSWho) window, then click **OK**. Connect your PC to a Micro810® controller using a USB cable and a 2080-USBADAPTER; to a Micro820® controller via Ethernet; to a Micro830® controller via USB; and to a Micro850® or Micro870™ controller with either USB or Ethernet.

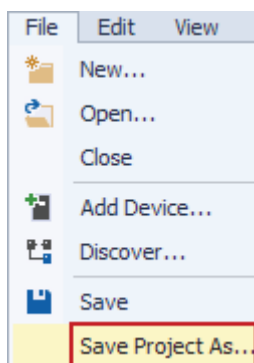


If you get a Connection Error popup window or if the upload fails because “The imported database version is more recent than the product database version.”, then most likely the controller was programmed with a newer version of Connected Components Workbench software. Update your Connected Components Workbench software to the latest version before trying again.

- The controller image will be uploaded into a new project, including any plug-in and expansion I/O modules physically found connected to the controller. If the project in the controller does not have all of those physical modules that are configured within the image, then you will get the following error message: “The current project content does not match the content in the connected controller. The software will not automatically go online (‘Connect’) with the controller.” In this case, the best thing to do is to follow up with an **Upload** from the controller, which will sync up the offline image with the online image. The software will then automatically go online (‘Connect’) with the controller.



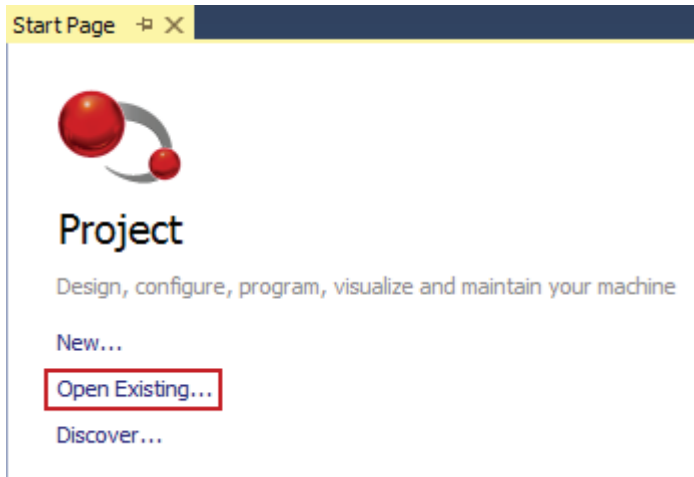
- You can save the offline project under a name of your choosing by selecting **File->Save Project As...**





## Opening an Existing Offline Project

A Connected Components Workbench software project consists of a ProjectName folder containing a number of subdirectory folders and files. They must all be present to open the ProjectName.ccwsln file.

1. Open **Connected Components Workbench** software (under All Programs/Rockwell Automation/CCW).
2. Click **Open Existing...** on the **Start Page**.



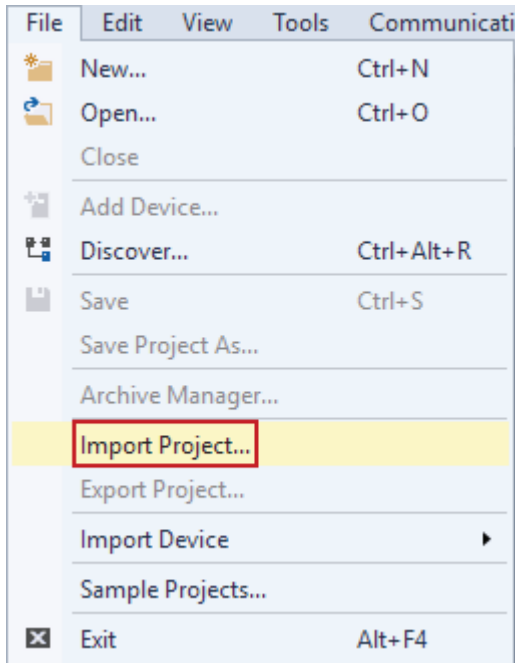
3. Browse to and double-click the desired controller project folder, then double-click the CCWSLN file within that folder to open the project.

Name ^	Date modified	Type
 Controller	3/8/2017 12:34 PM	File folder
 Project454.ccwsln	3/8/2017 12:34 PM	CCWSLN File

## Opening a Saved Offline Project

A Connected Components Workbench software CCWARC archive file is equivalent to a Logix ACD file in that the one file contains everything that you need to open up the Connected Components Workbench software project. However, you must import it first.

1. Open **Connected Components Workbench software** (under All Programs/Rockwell Automation/CCW).
2. Select **File->Import Project...** and browse to and double-click the desired \*.ccwarc file to import and open the project.

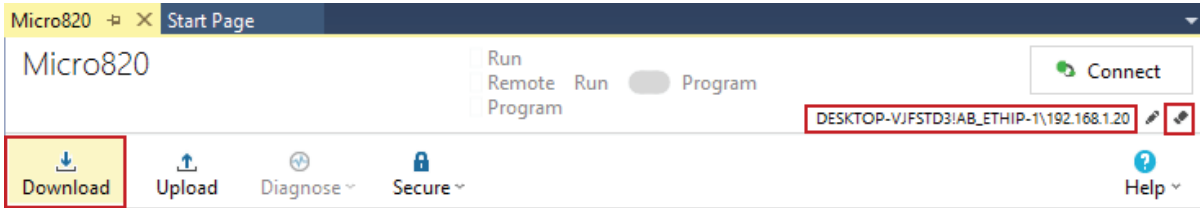


← TIP: It is recommended to use the single CCWARC archive file for copying and sharing projects, instead of copying the entire folder that contains the CCWSLN file.

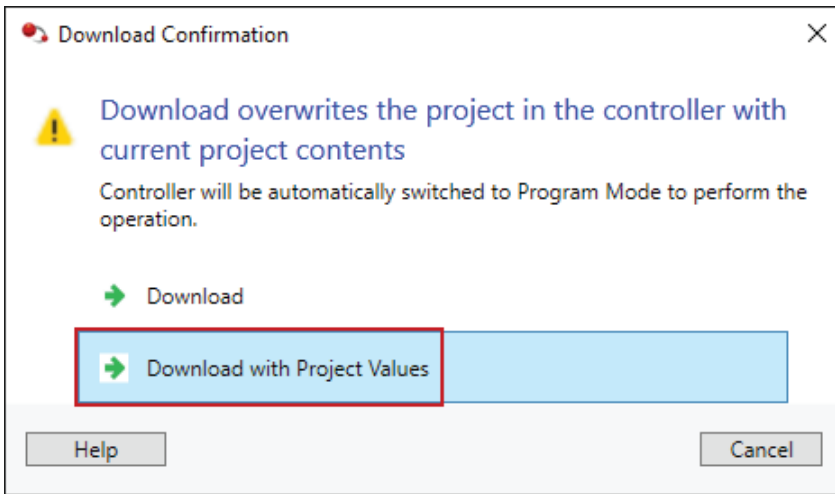


## Downloading an Offline Project to a Controller

1. With the offline project open and the Micro800 controller window displayed, check if there is a connection ('project') path displayed for the controller on the upper right-hand corner of the screen. If so, when you click **Download**, it will use that path to attempt to connect with the controller. If the path is no longer valid, click the eraser icon to delete it. Once the path is deleted, or if no path is displayed to begin with, click **Download** and the **Connection Browser (RSWho)** window will open for selecting the controller to download. The path will be updated automatically once you select the controller.



2. There are two options presented for downloading – with Project Values or without Project Values. Project Values are a snapshot of the values of each tag ('variable') when the project was last uploaded (assuming the upload used was 'Discover' or 'Upload with Project Values'). Any tag ('variable') may also be assigned an initial value, in which case the initial value is always used after a download. Any tag ('variable') that doesn't have an initial value is set to zero when **Download** (without Project Values) is selected. Unless you actually want to zero out every non-initialized tag ('variable'), click **Download with Project Values**.

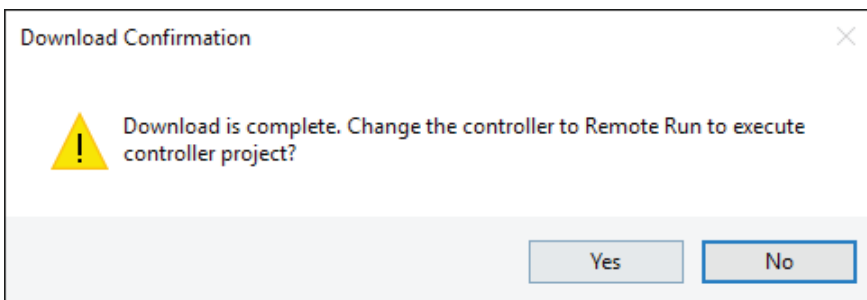


TIP: Downloading with Project Values is equivalent to the Studio 5000® behavior for downloading tag values, but it does take longer than without Project Values since almost all tags values must be downloaded. Using Initial Values on select tags and downloading without Project Values will decrease download time.

TIP: To preserve a tag value in the controller from being overwritten or zeroed during download, use the download Data Protection feature accessible by right-clicking on the controller in the project organizer. Data Protection has precedence over Initial Value and Project Value.

TIP: During download, Data Protection has precedence over Initial Value, which then has precedence over Project Value.

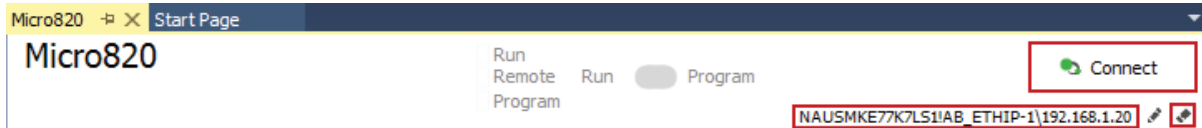
3. When the download is completed, a window to change the controller to run mode pops up (whether the controller was previously in run mode or not). Click **Yes** or **No**. The software will automatically go online with the controller at this point.



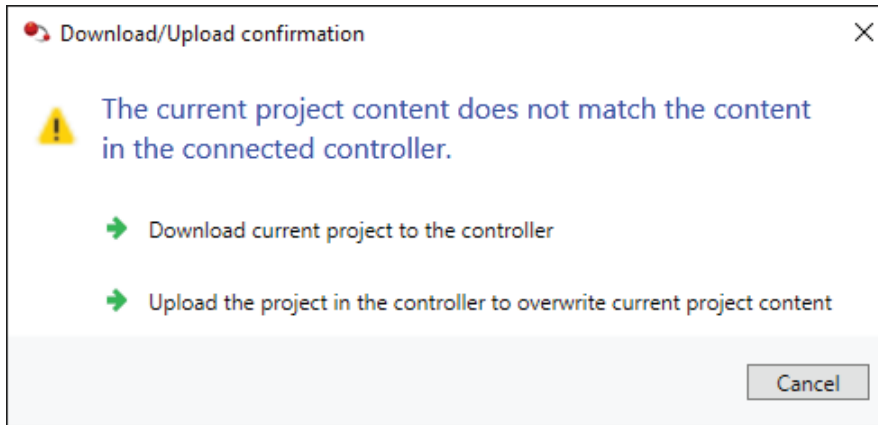
## Going Online with a Controller

The Connected Components Workbench software term for going online with a controller is Connect.

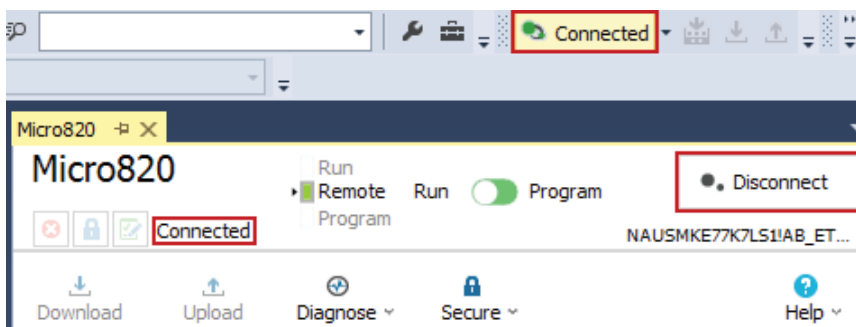
1. With the offline project open, check if there is a project ('connection') path displayed for the controller. If so, when you click **Connect**, it will use that path to attempt to connect with the controller. If the path is no longer valid, click the eraser icon to delete it. Once the path is deleted, or if no path is displayed to begin with, click **Connect** and the **Connection Browser** (RSWho) window will open for selecting the controller to go online with. The path will be updated automatically.



2. If there are any differences between the offline project and the online project, the **Download/Upload confirmation** window will appear. Choose between downloading the current offline project to the controller or uploading the online project and saving it as the offline project.



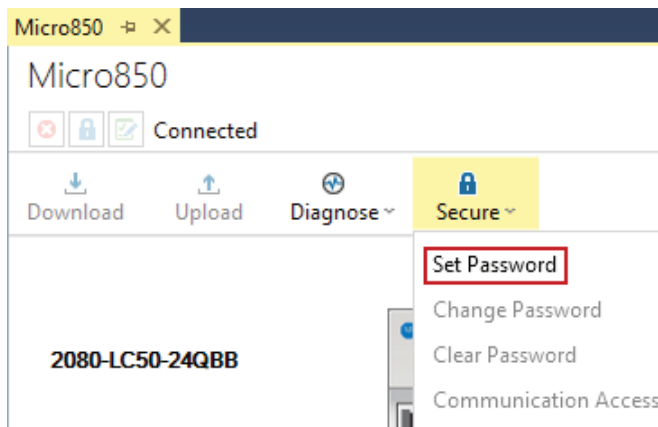
3. When you are online ('Connected') with the controller, note where the **Connected** text is displayed and where the button to **Disconnect** (i.e., to go back offline) is.



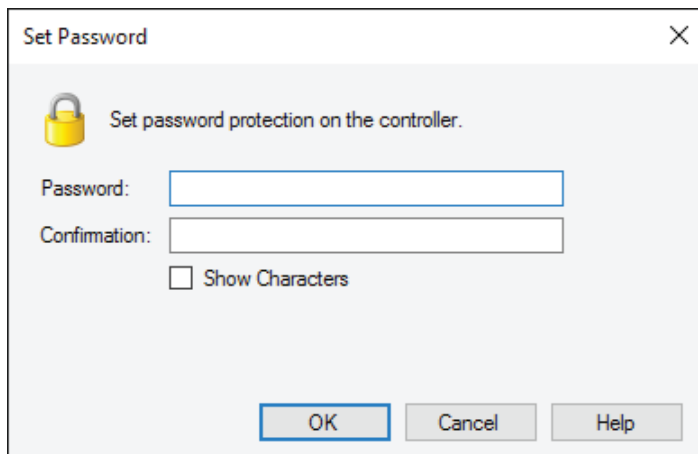
## Password Protecting Future Controller Access

Once online (“Connected”), the controller can be password protected, if desired. This prevents unauthorized users from accessing the configuration and programming in the Micro800 controller unless they first enter the password, which consists of 8 to 32 characters in length. Valid characters are uppercase and lowercase letters, numbers, spaces, and symbols found on the keyboard. This password does not protect the offline file from edits or viewing. For this, you must separately apply passwords to individual programs and/or UDFBs.

1. While online with the controller, click **Secure** and select **Set Password**.



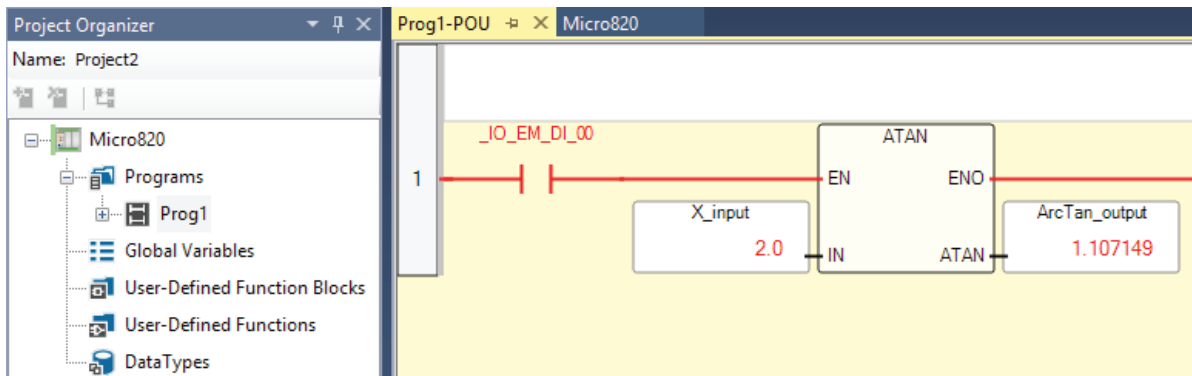
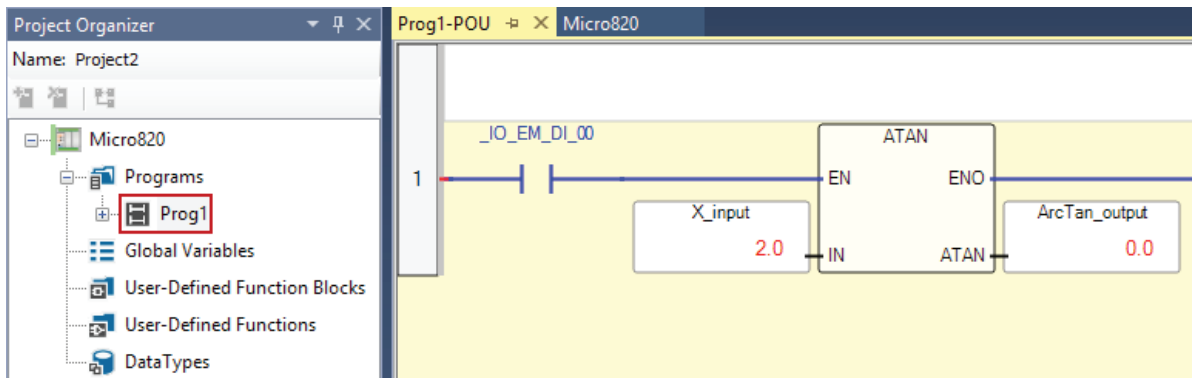
2. Enter **Password**, reenter the password in **Confirmation** and click **OK**.



## Online Monitoring of Programs and Tags

The Connected Components Workbench software term for Online is Connected.

1. Once online with the controller, double-click the program name icon under **Project Organizer** of the program that you want to monitor. Blue is the rung color that is used to indicate that the rung logic is false and red is the rung color that is used to indicate that the rung logic is true.



2. To monitor the tag values in list format, double-click any tag name to bring up the **Variable Monitoring** window. Program tags are listed under the **Local Variables** tab and user-created controller tags are listed under the User **Global Variables** tab.

The screenshot shows the 'Variable Monitoring' window. It has three tabs: 'User Global Variables - Micro820', 'Local Variables - Prog1', and 'System Variables'. The 'User Global Variables - Micro820' tab is active. The window contains a table with the following data:

Name	Logical Value	Alias
X_input	2.0	
ArcTan_output	1.107149	

A 'Close' button is located at the bottom right of the window.

- To open a separate screen of all local program tags, double-click the **Local Variables** icon under the program name in the **Project Organizer**.

Name	Logical Value
X_input	2.0
ArcTan_output	1.107149



- To open a separate screen of all global controller tags, double-click the **Global Variables** icon under the program name in the **Project Organizer**.

Name	Logical Value
_IO_EM_DO_00	<input type="checkbox"/>
_IO_EM_DO_01	<input type="checkbox"/>
_IO_EM_DO_02	<input type="checkbox"/>
_IO_EM_DO_03	<input type="checkbox"/>
_IO_EM_DO_04	<input type="checkbox"/>
_IO_EM_DO_05	<input type="checkbox"/>

## Forcing I/O

The Connected Components Workbench software term for Force is Lock.

1. While monitoring the I/O tags under Global Variables, click the **Lock** checkbox for each I/O tag that you want to force on or off. For outputs, check the **Physical Value** checkbox to force the output on and uncheck the **Physical Value** checkbox to force the output off. The output LEDs for forced outputs on the Micro800 controller will correspond to the forced value. For inputs, check the **Logical Value** checkbox to force the input on and uncheck the **Logical Value** checkbox to force the input off. The input LEDs for forced inputs on the Micro800 controller will correspond to the actual input value, not the forced value.

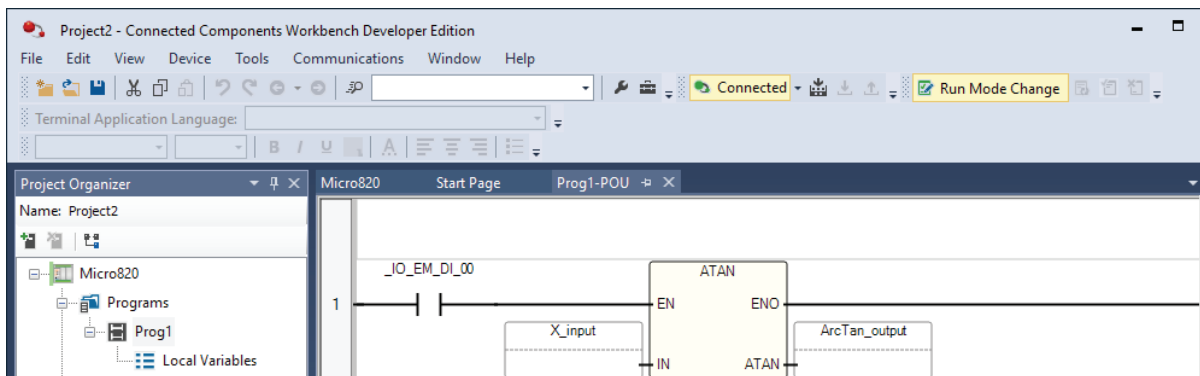
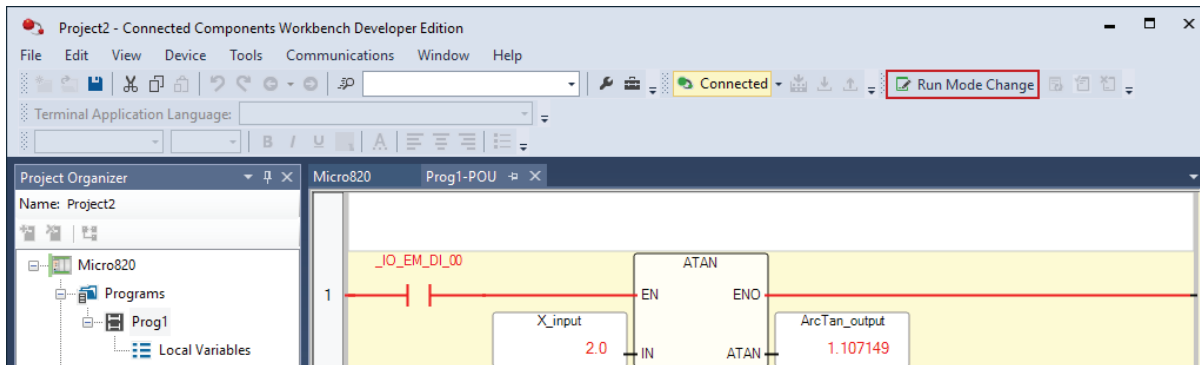
Name	Logical Value	Physical Value	Lock
 			
_IO_EM_DO_06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
_IO_EM_DI_00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
_IO_EM_DI_01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The FORCE LED on the Micro800 is on whenever there is at least on I/O point being forced. All forces are cleared after power cycle.

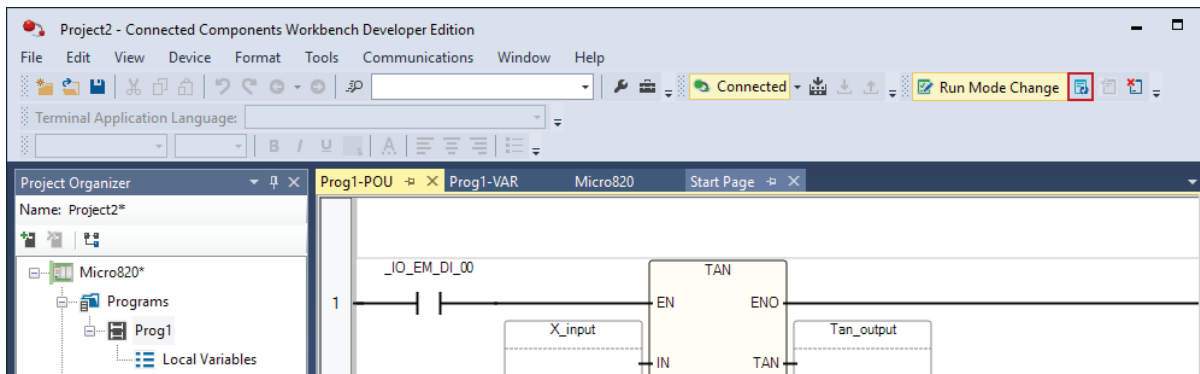
## Making Online Edits

The Connected Components Workbench software term for Online Editing is Run Mode Change (RMC).

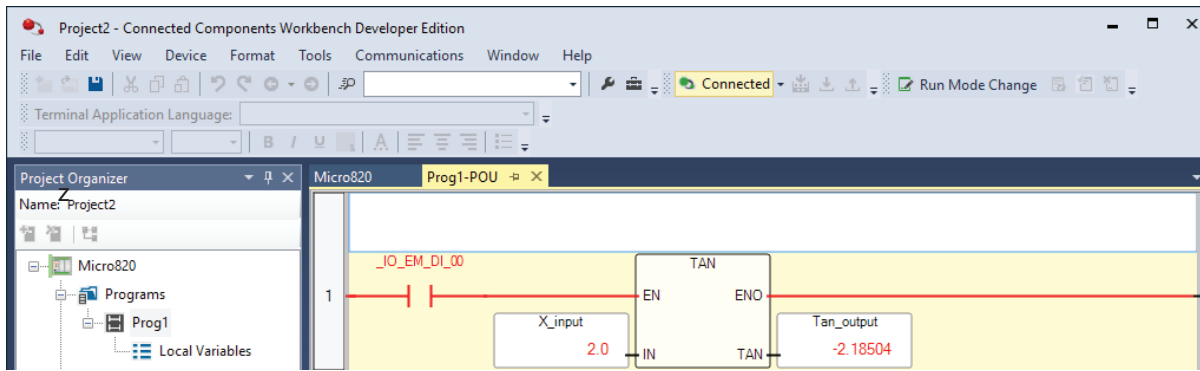
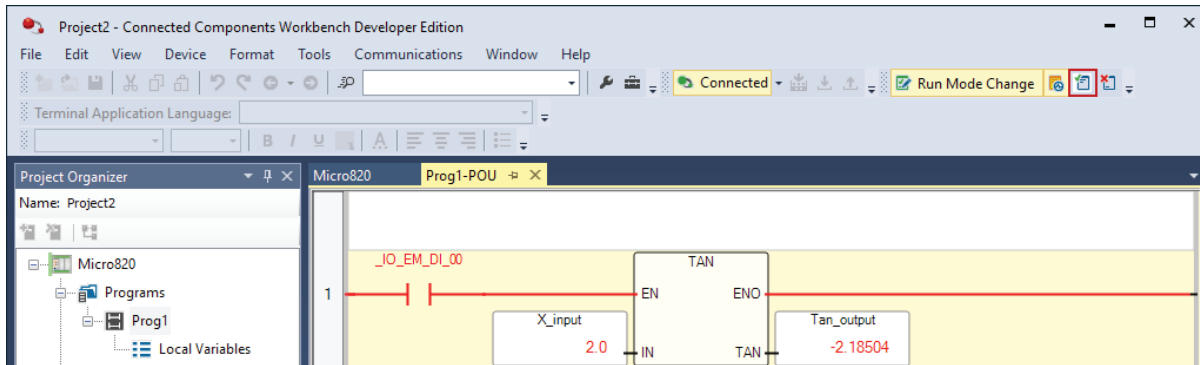
1. While monitoring the ladder program, click the **Run Mode Change** icon. The ladder program will change to appear as if it is offline, even though the software is still online ('Connected').



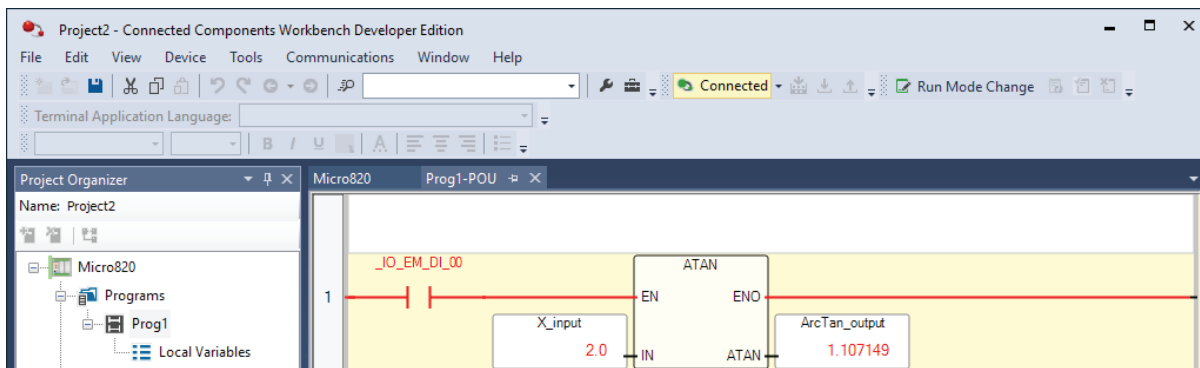
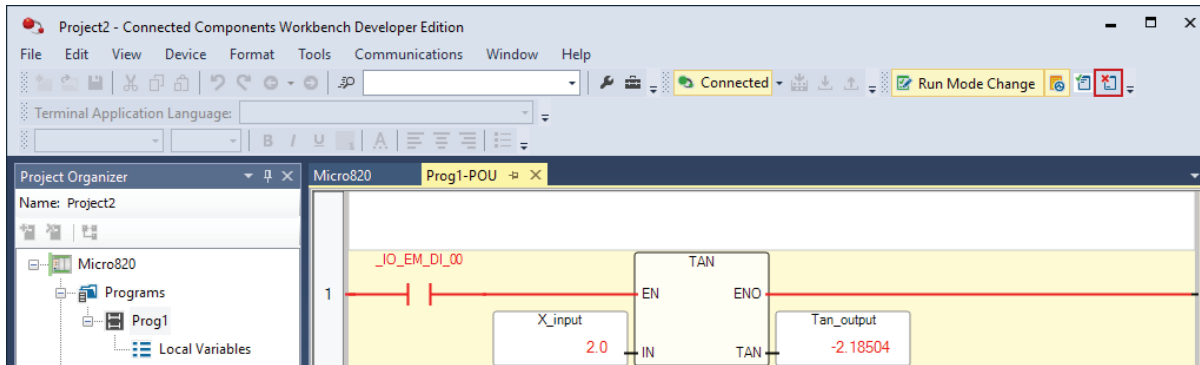
2. Make your desired changes to the logic and/or tags, then test edits by clicking the **Test Changes** icon to the immediate right of **Run Mode Change**.



3. To assemble the online edits to make the change permanent, click the **Accept Changes** icon to the right of the **Test Changes** icon.



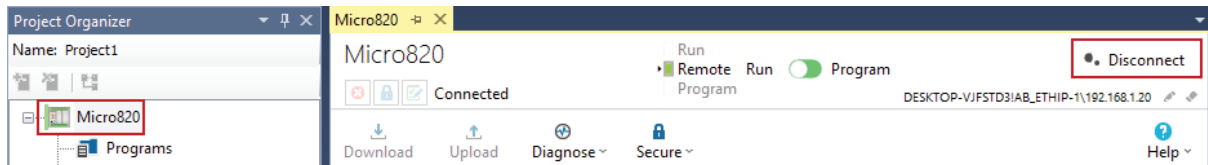
4. To cancel the online edits to undo the changes, click the **Discard Changes** icon to the far right of **Run Mode Change**.





## Going Offline from a Controller

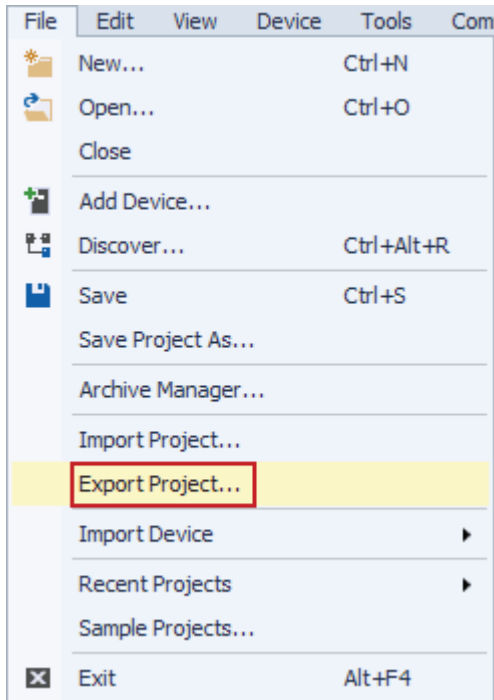
1. Double-click the Micro800 controller icon under **Project Organizer** to bring up the **Micro800** window. Click the **Disconnect** button on the upper right-hand corner of the screen to go offline.



## Saving an Offline Project

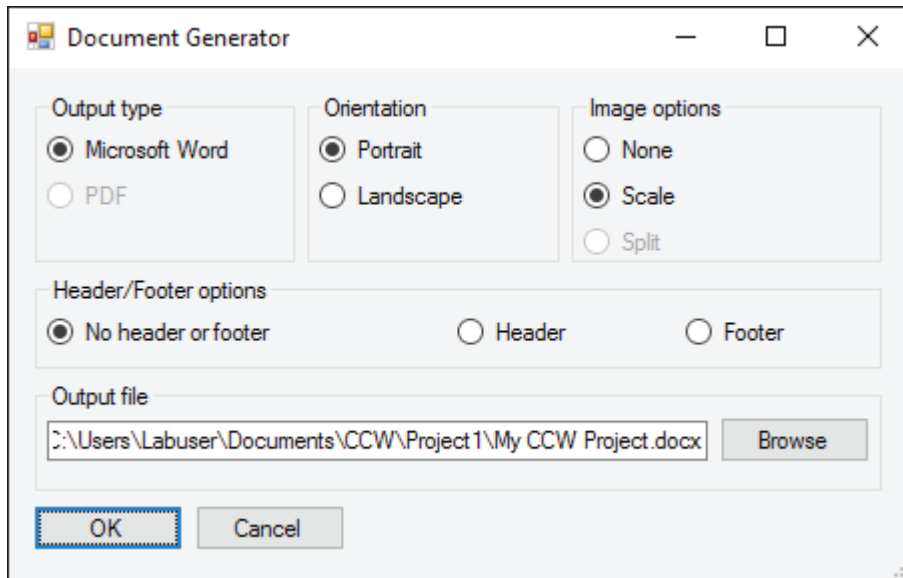
A Connected Components Workbench software CCWARC archive file is equivalent to a Logix ACD file in that the one file encapsulates the entire Connected Components Workbench software project. However, you must export the project to save it in this file format.

1. Select **File->Export Project...**, browse to the desired directory and enter a file name (which will be given a .ccwarc extension) to save ('archive') the project to.



## Generating a Project Printout

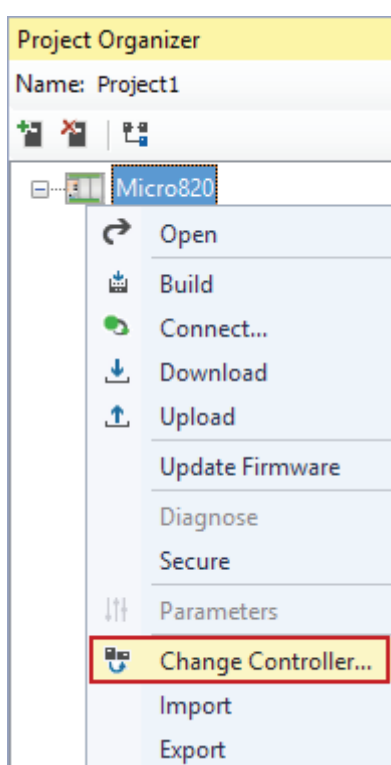
1. Select **Device->Document Generator (print)**. The only options are what is shown on this screen.



## Changing the Offline File Controller Catalog Number and/or Version


You can upgrade the controller project version for the existing controller catalog number to match the installed version of Connected Components Workbench software. Alternatively, you can change to another controller catalog number at the same controller project version as the installed version of Connected Components Workbench software. Unlike Logix, the controller firmware version does not need to match the controller project version, but it does have to be greater than or equal to it.

1. Open **Connected Components Workbench** software (under All Programs/Rockwell Automation/CCW).
2. Open an existing project.
3. Right click the Micro800 controller icon under **Project Organizer** and select **Change Controller...**


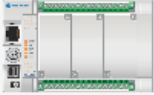


4. Enter another **Target Project Name** and/or **Controller Name** from the defaults offered. Select your preferred **Controller Type** (catalog number) and click **OK**.

Controller Change ✕

 Changing the controller type will modify, delete and invalidate controller configuration that is not valid for the new target controller.

	Current	Target
Project Name:	Project1	<input type="text" value="Project1_1"/>
Controller Name:	Micro850	<input type="text" value="Micro820"/>
Controller Type:	2080-LC50-24QBB	<input type="text" value="2080-LC20-20QWB"/>
Controller Project Version:	9	10

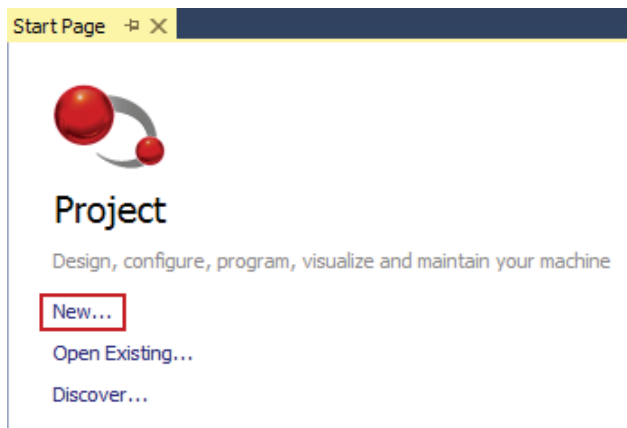


Show Detail Comparison

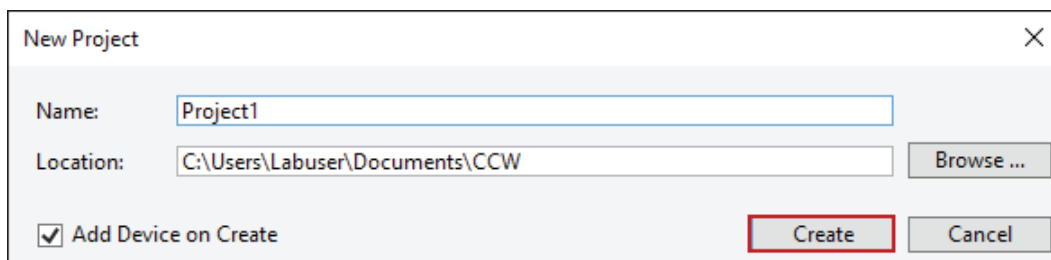
## Creating a New Controller Project

↳ Select the Controller Catalog Number and Version

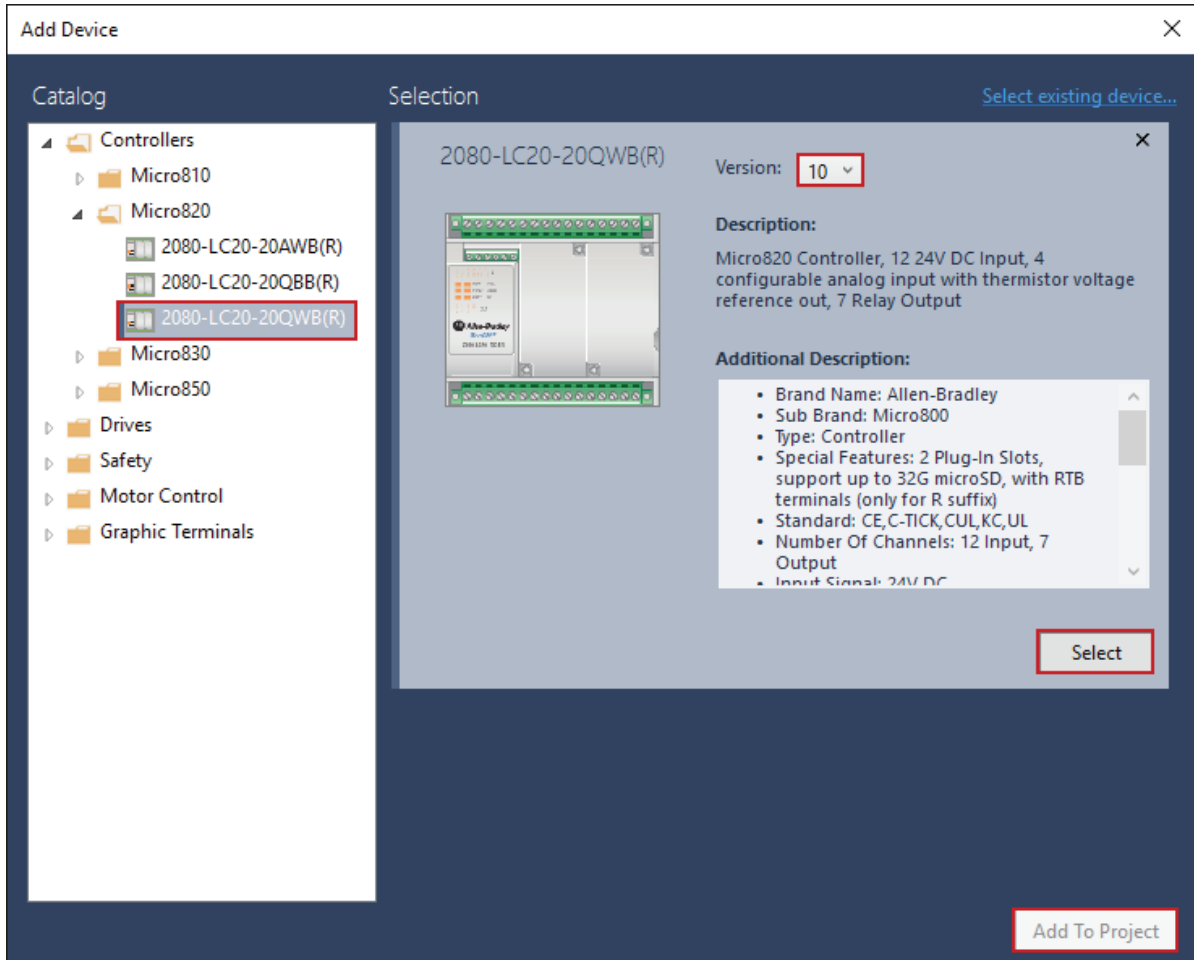
1. Open **Connected Components Workbench** software (under All Programs/Rockwell Automation/CCW).
2. Click **New...** on the **Start Page**.



3. Enter your desired project name or accept the default name and click **Create**.



4. Select the catalog number for your controller, choose the desired project **Version** (typically the latest, but does not have to be. The latest software also supports all earlier versions of projects, and the latest controller firmware also supports all earlier versions of projects), click **Select** and click **Add To Project**.



## ↳ Configure the Communication Parameters

1. On the Micro800 controller page, click **Ethernet** and/or **Serial Port** to configure the desired communication settings.

The screenshot displays the Micro820 configuration web interface. At the top, there is a navigation bar with 'Micro820' and 'Start Page'. Below this, there are icons for 'Download', 'Upload', 'Diagnose', and 'Secure'. The main content area features a product image of an Allen-Bradley Micro820 2080-LC20-20QWB controller. On the left, a sidebar menu lists various configuration options, with 'Ethernet' highlighted in red. The main panel is titled 'Controller - Ethernet' and includes a 'Diagnose' button. Under 'Ethernet Settings', there are two sections: 'Internet Protocol (IP) Settings' and 'Port Settings'. The IP settings section has radio buttons for 'Obtain IP address automatically using DHCP' (selected) and 'Configure IP address and settings'. Below these are input fields for 'IP Address', 'Subnet Mask', and 'Gateway Address'. A checked checkbox 'Detect duplicate IP address' is also present. The Port Settings section has radio buttons for 'Port State: Enabled' (selected) and 'Disabled', along with a checked checkbox 'Auto-Negotiate Speed and Duplex Mode'. At the bottom, under 'EtherNet/IP', there is a checked checkbox 'Inactivity Timeout' with a value of '120' and the unit 'sec'.

Micro820 Start Page

Micro820

Download Upload Diagnose Secure

2080-LC20-20QWB

Controller

- General
- Memory
- Startup
- Serial Port
- Ethernet**
- Interrupts
- Modbus Mapping
- Real Time Clock
- Embedded I/O
- Memory Card
- Remote LCD
- Data Log
- Recipe

Plug-in Modules

- < Empty >
- < Empty >

Controller - Ethernet

Diagnose

**Ethernet Settings**

**Internet Protocol (IP) Settings**

Obtain IP address automatically using DHCP

Configure IP address and settings

IP Address:

Subnet Mask:

Gateway Address:

Detect duplicate IP address

**Port Settings**

Port State:  Enabled  Disabled

Auto-Negotiate Speed and Duplex Mode

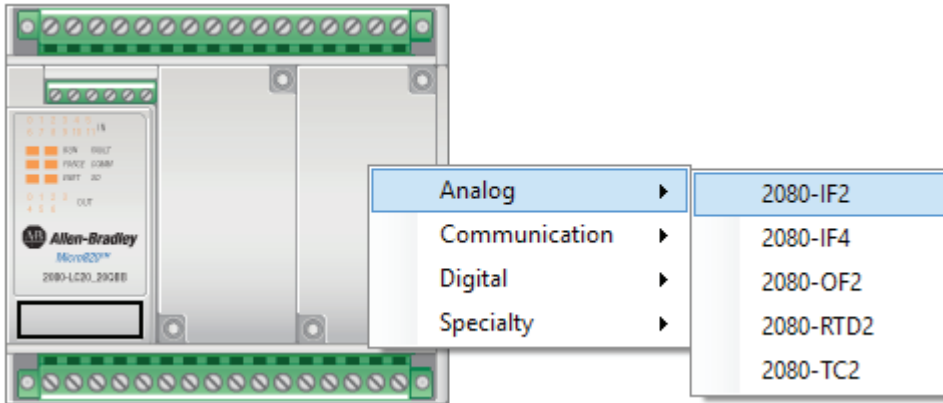
**EtherNet/IP**

Inactivity Timeout  sec

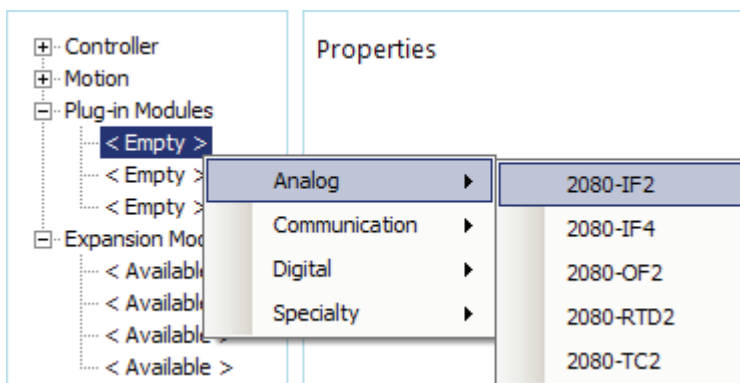


↳ Add and Configure Any Plug-in and/or Expansion Modules

1. Right-click the blank plug-in or expansion module slot on the controller graphic and select the module to add.

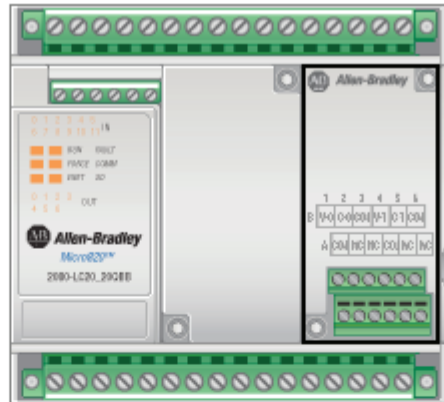


2. Alternatively, from the menu you can right-click either an **< Empty >** slot under Plug-in Modules or an **< Available >** slot under **Expansion Modules** (Micro850 or Micro870 controller) and select the module to add.



3. Once you have added the module, the module configuration selections will appear.

**2080-LC20-20QWB**



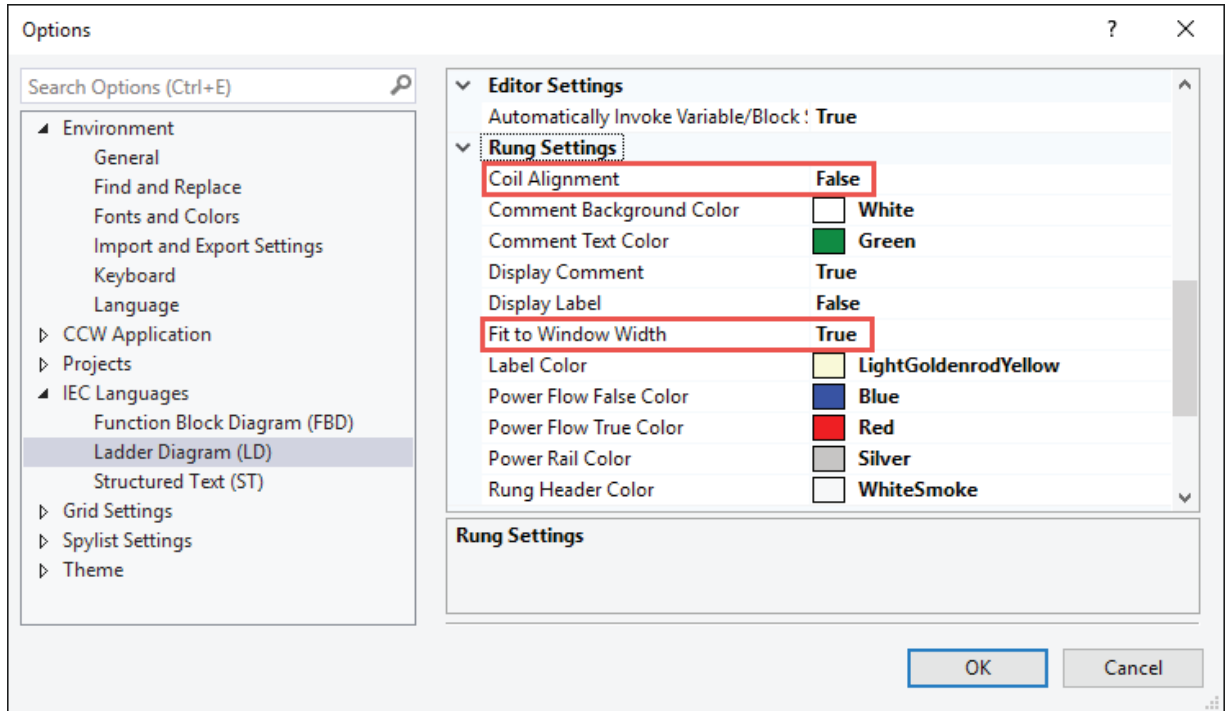
- [-] Controller
  - ... General
  - ... Memory
  - ... Startup
  - ... Serial Port
  - ... Ethernet
  - ... Interrupts
  - ... Modbus Mapping
  - ... Real Time Clock
  - ... Embedded I/O
  - ... Memory Card
  - ... Remote LCD
  - ... Data Log
  - ... Recipe
- [-] Plug-in Modules
  - ... < Empty >
  - [-] 2080-IF2
    - ... Configuration

### 2080-IF2 - Configuration

Channel	Input Type	Frequency	Input State
0	Current	50 Hz	Enabled
1	Current	50 Hz	Enabled

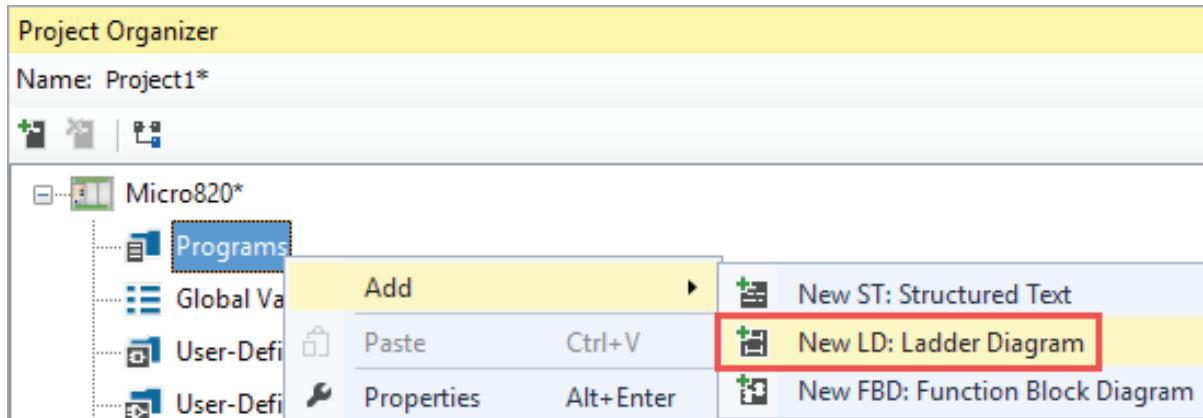
## ↳ Verify Rung Settings for Optimal Viewing

1. Under Tools\Options, verify that the Ladder Diagram Rung Settings for Coil Alignment is set to False and for Fit to Window Width is set to True.



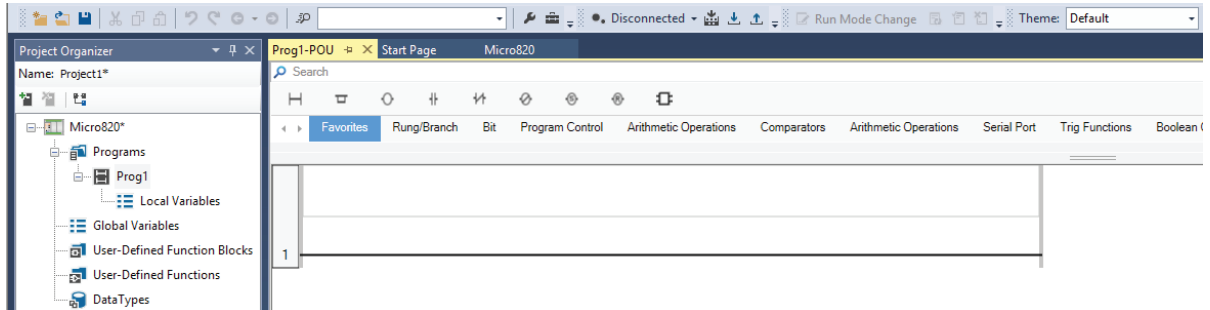
↳ Add a New Ladder Program

1. Under **Project Organizer**, right-click **Programs** and select **Add->New LD: Ladder Diagram**.



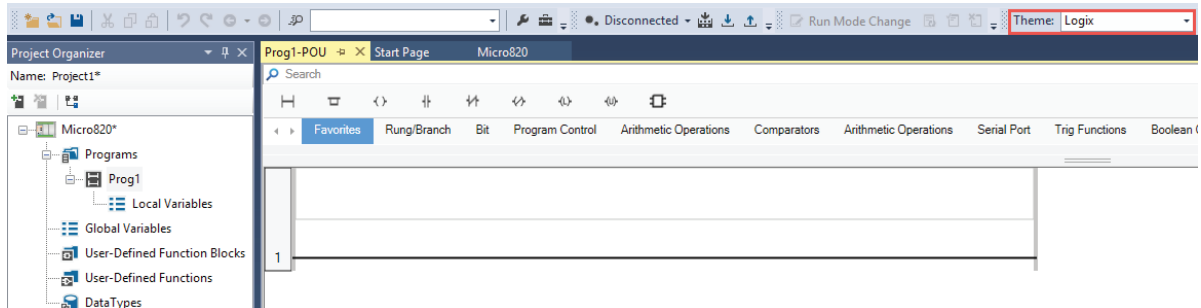
## ↳ Open a Ladder Program

1. Double-click the ladder program name, such as default name **Prog1** (which can be renamed), and the ladder program will open up with one blank rung.

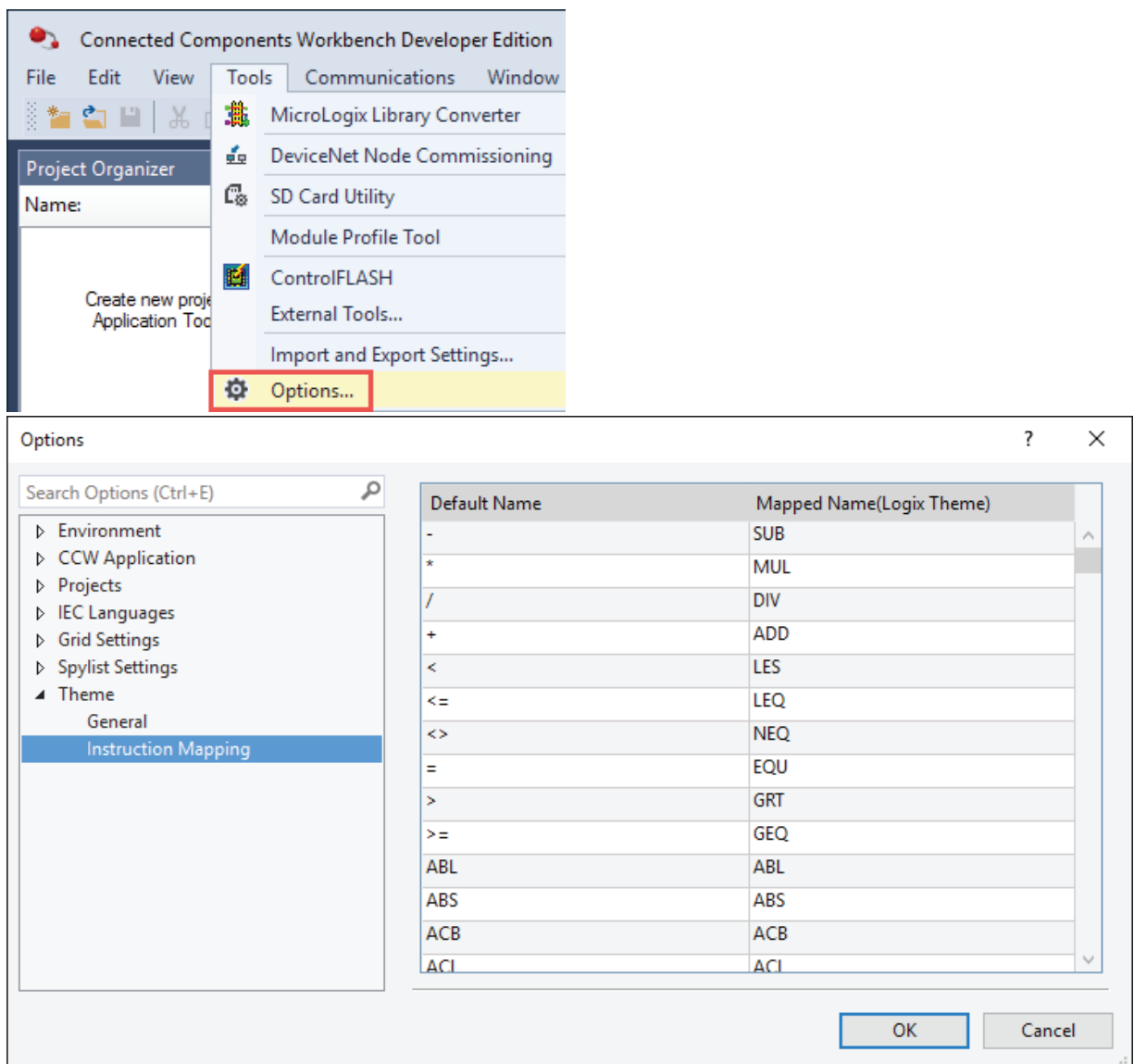


## ↳ Select Logix Theme and View Instruction Mapping

1. Use the **Theme** dropdown box to change the theme from **Default** to **Logix**. This theme will use Logix names and symbols for all ladder instructions that have the same functionality as Logix instructions.

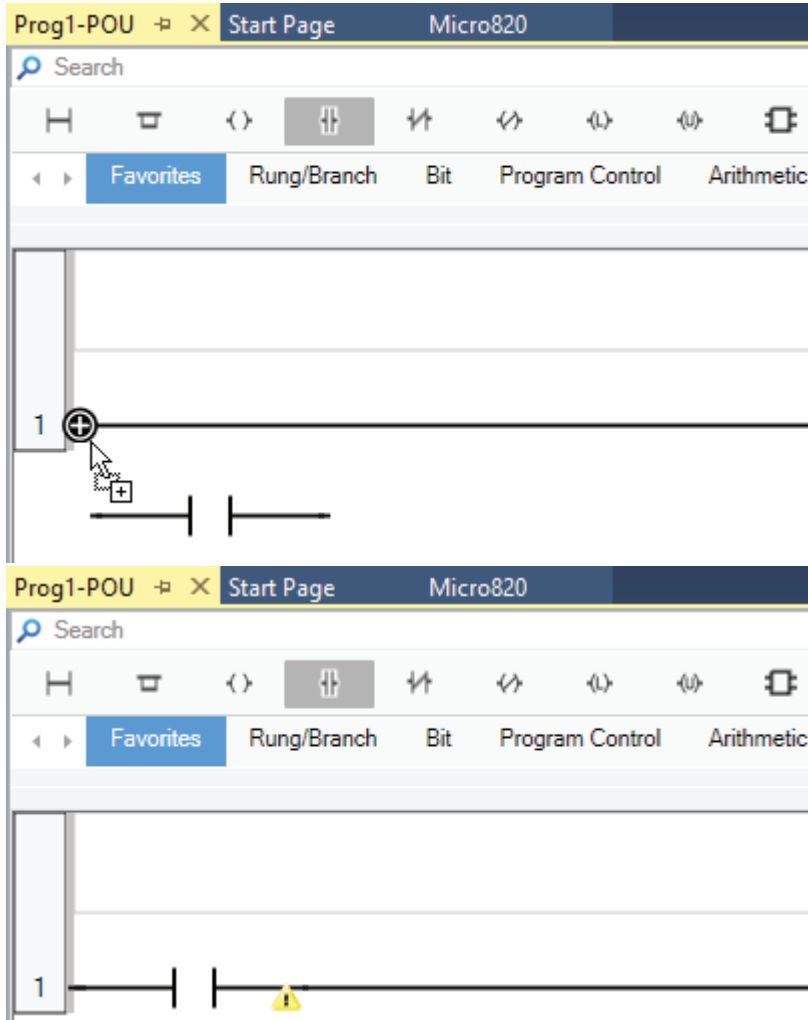


2. An instruction mapping table of Default Names to Logix Theme Names can be found under Tools->Options->Theme->Instruction Mapping.



↳ Add a Ladder Instruction on a Rung

1. From the **Instruction Library** directly above the ladder rung, click and drag a ladder instruction (like **Direct Contact** in the Favorites group) down to the rung until a '+' appears where the instruction is to be placed, then release the mouse button.



## ↳ Assign a Tag to a Ladder Instruction

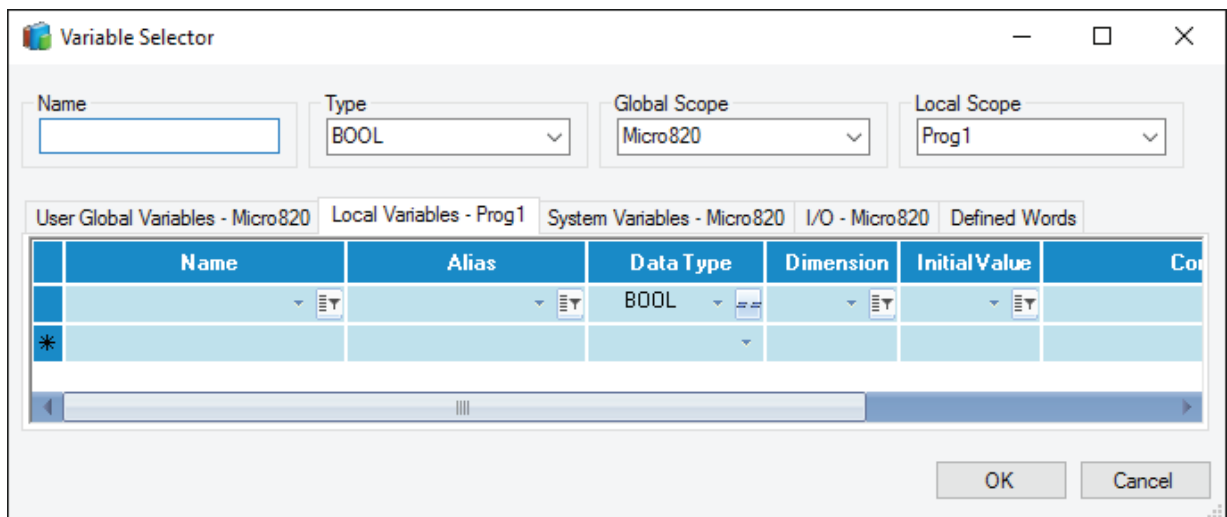
The Connected Components Workbench software term for Tag is Variable.

1. After placing the instruction, the **Variable Selector** window opens to allow you to select an existing tag ('variable') or to create a new one. The **System Variables – Micro800** and **I/O – Micro800** tabs contain the default system and I/O controller tags. **The Local Variables - <program name>** tab contains user-created tags that are scoped to this program. **The User Global Variables – Micro800** tab contains user-created tags that are controller scoped.

To select an existing tag, click the appropriate tab, click the desired tag and click **OK**.

To create a tag, click either the **User Global Variables** or **Local Variables** tab to select whether the new tag will be globally scoped or locally scoped.

Enter in the new tag name in the **Name** box and click **OK**.



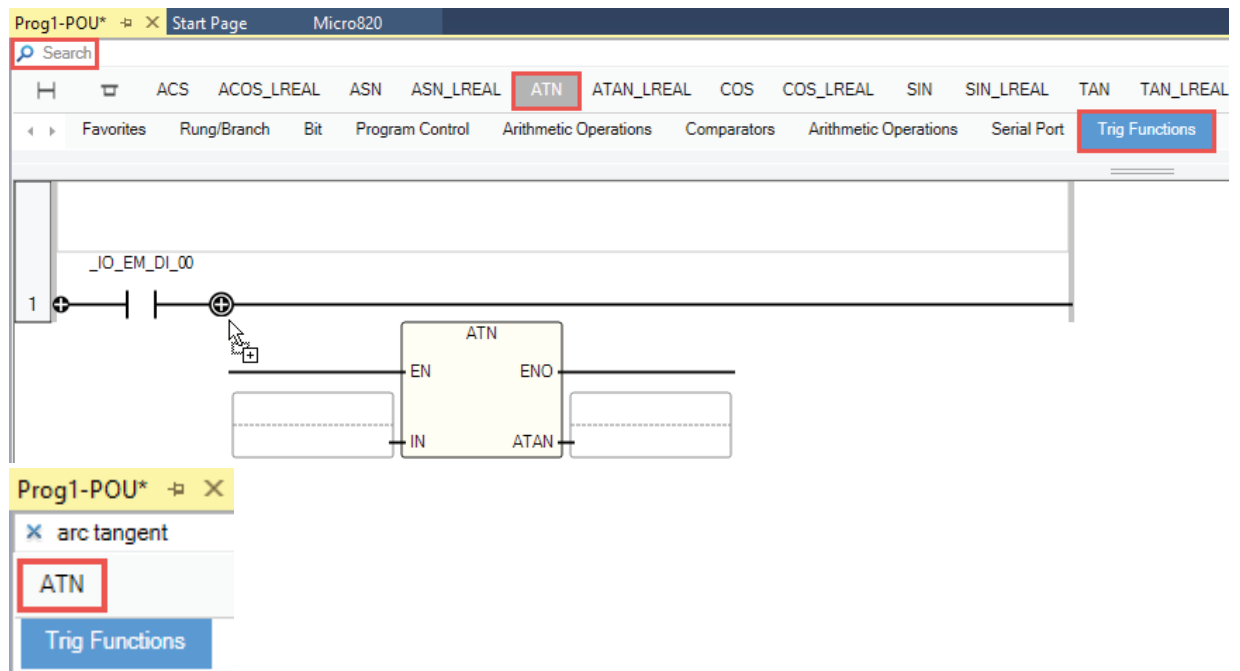
TIP: Ctrl+R can be used to toggle off the automatic prompting from the Variable Selector which is more similar to Studio 5000. The bottom status bar will indicate either "Manual-Input Enable" or "Auto-Input Enable". Manual input of the tag name is useful when it is desired to enter just the instructions first and assigning tags later.



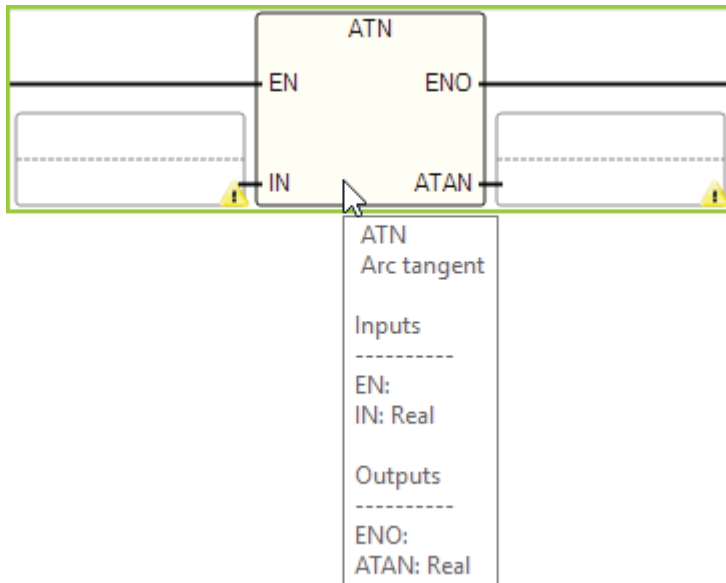
## ↳ Add an Instruction Block on a Rung and Assign Its Input and Output Parameters

1. Select the program group in the **Instruction Library** that contains the instruction name you want. Click and drag the instruction down to the rung until a '+' appears where the instruction is to be placed, then release the mouse button.

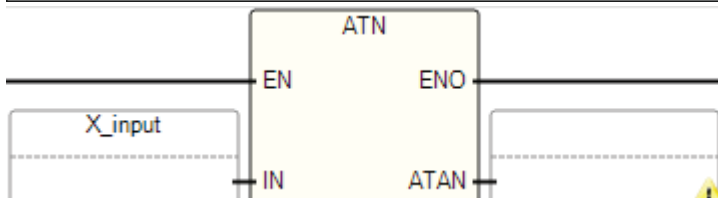
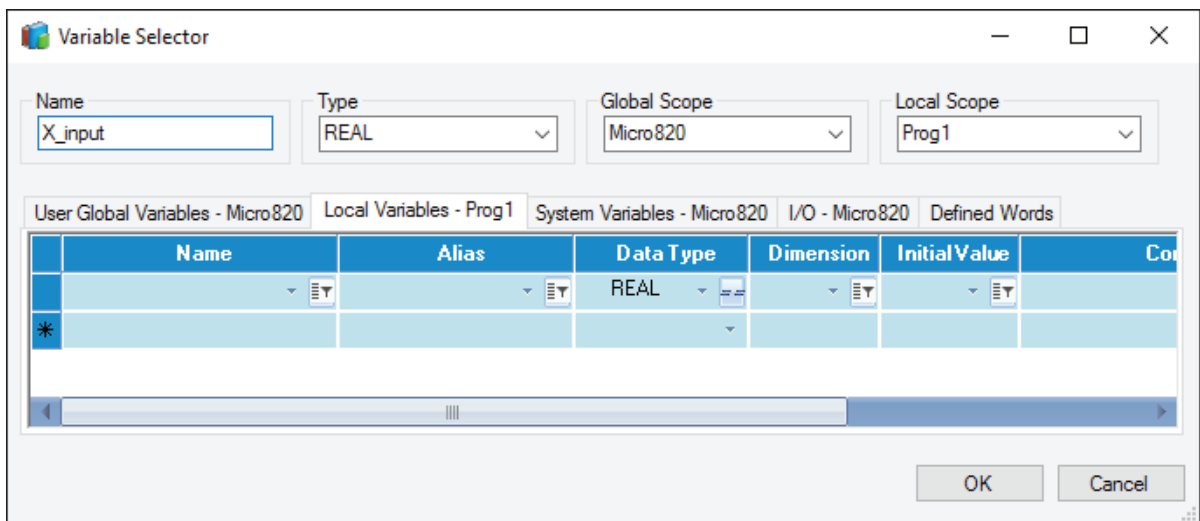
Alternatively, you can double-click the name of the instruction in the **Instruction Library** to place it on the rung after the last instruction. If you don't know which program group to find the instruction in, use the **Search** box to find the instruction.



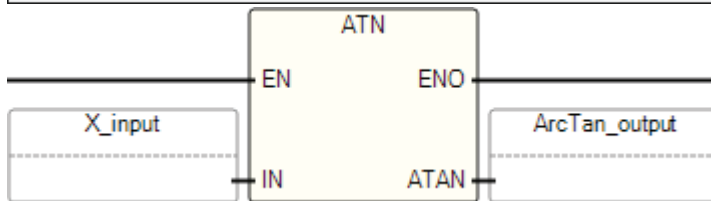
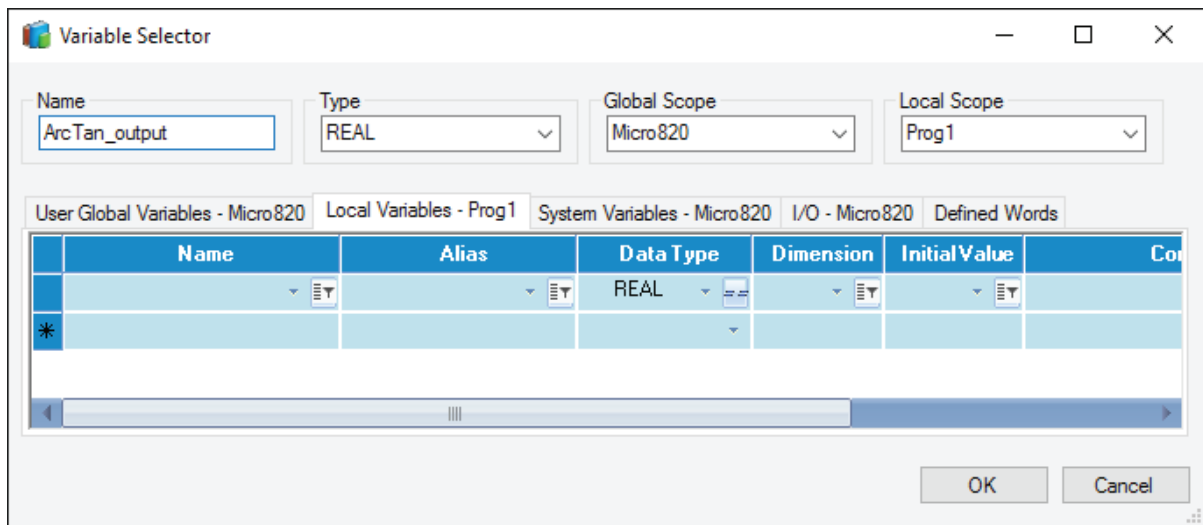
- Hovering the mouse cursor over the instruction will identify the data types of the input and output parameters. For Arc Tangent, both parameters must be of data type REAL.



- Double-click the lower half of the input parameter box to bring up the **Variable Selector** screen. From here, you can select an existing REAL tag ('variable') or create one and click **OK**.

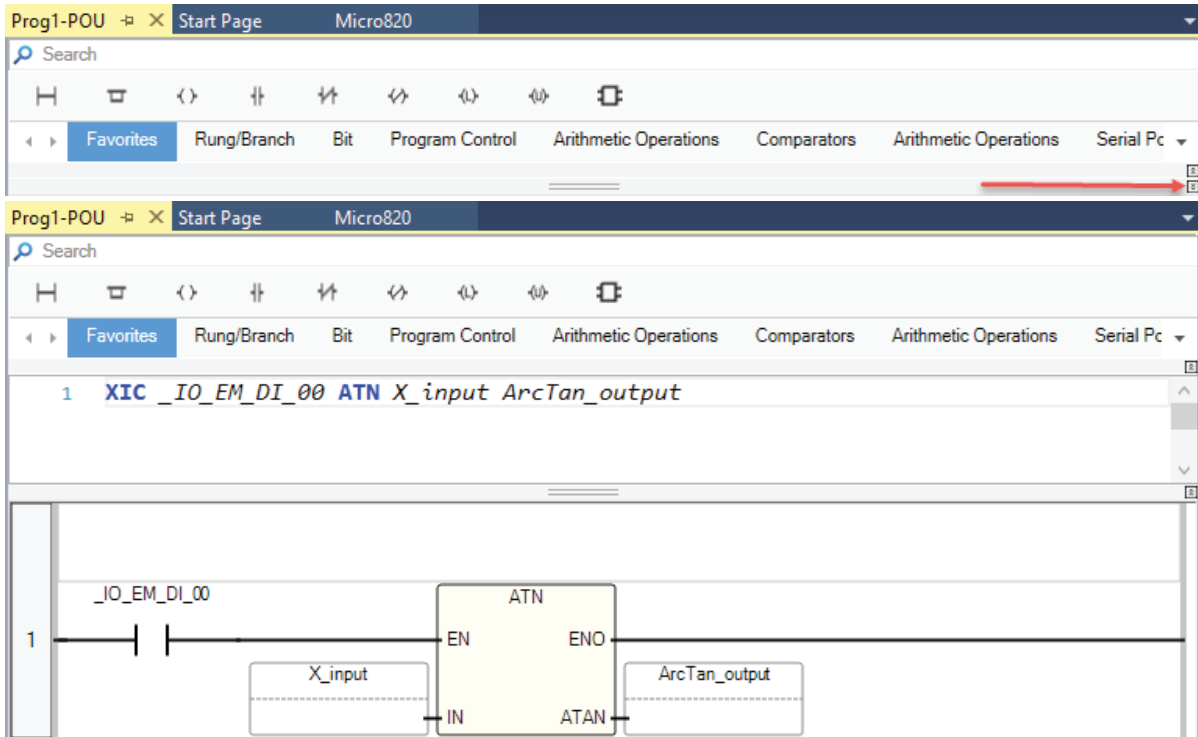


- Similarly, double-click the lower half of the output parameter box to bring up the **Variable Selector** screen. From here, you can select an existing REAL tag ('variable') or create one and click **OK**.

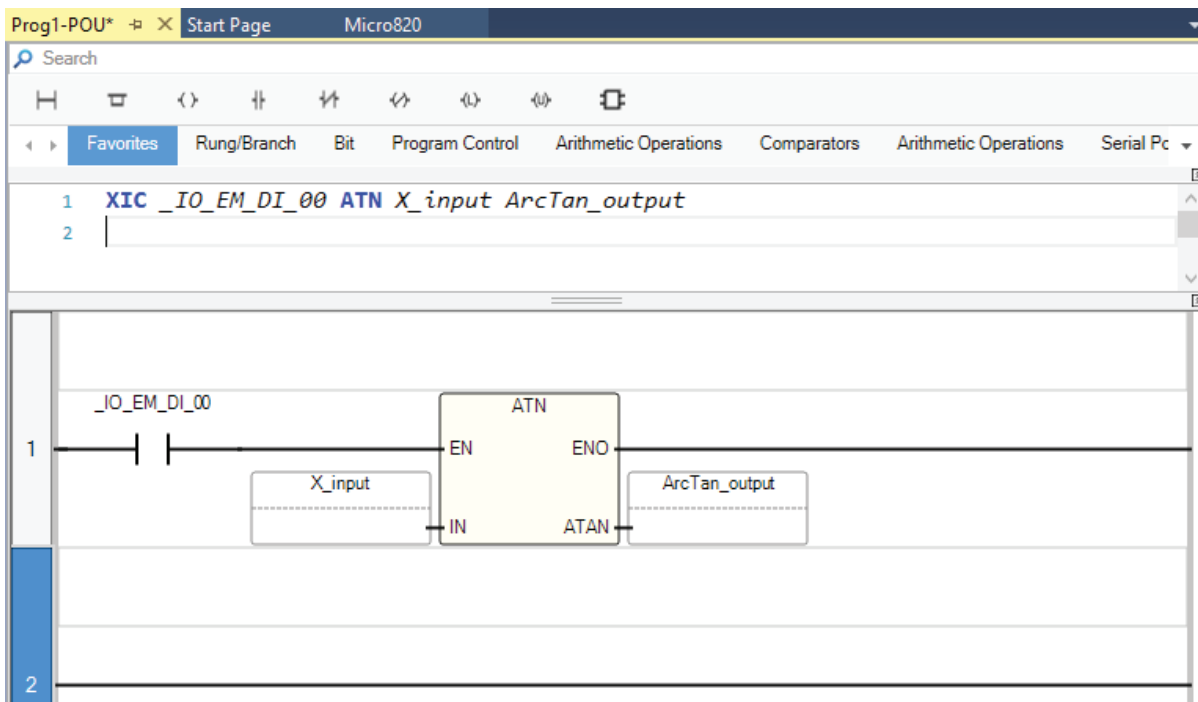


## ↳ Add a Rung and Ladder Instructions Using LD Text Input

1. Click the LD Text Input toggle to expand the LD Text Input window. The instruction text for rung 1 is displayed.



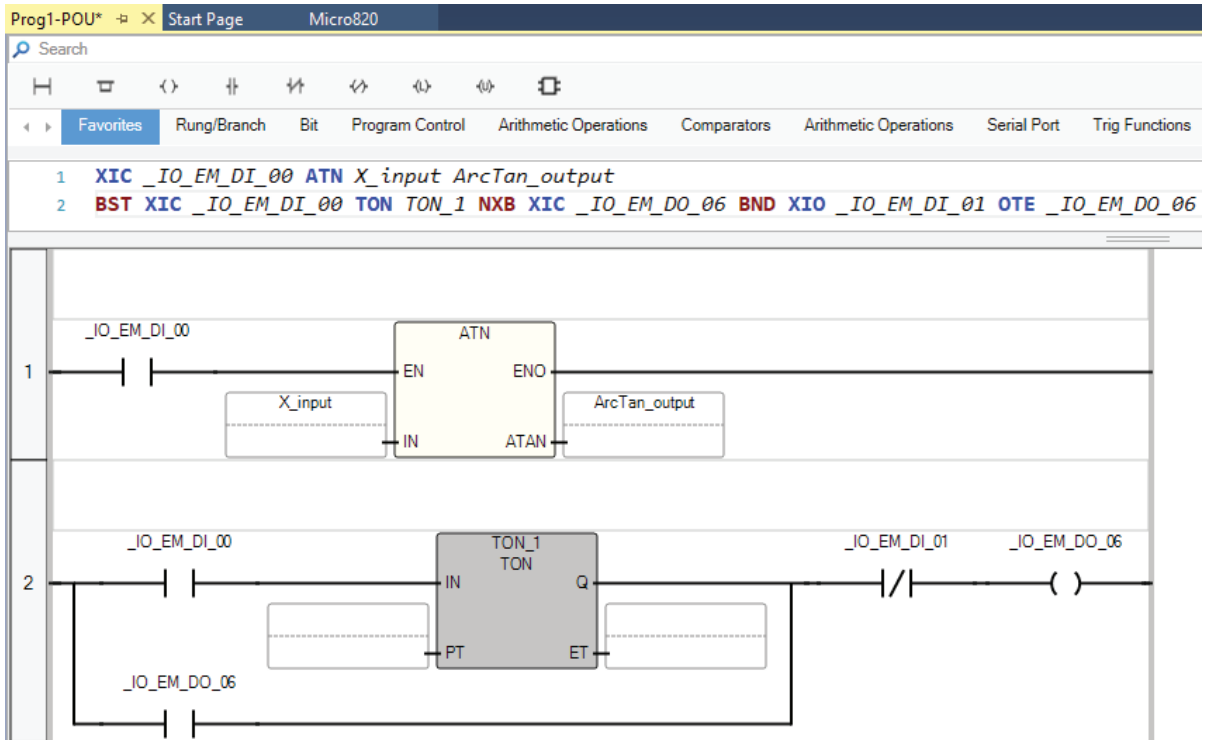
2. Place your cursor at the end of the rung 1 text and press **Enter** to create rung 2.



3. In the blank text box next to 2, type in: "BST XIC \_IO\_EM\_DI\_00 TON TON\_1 NXB XIC \_IO\_EM\_DO\_06 BND XIO \_IO\_EM\_DI\_01 OTE \_IO\_EM\_DO\_06" to program rung 2.

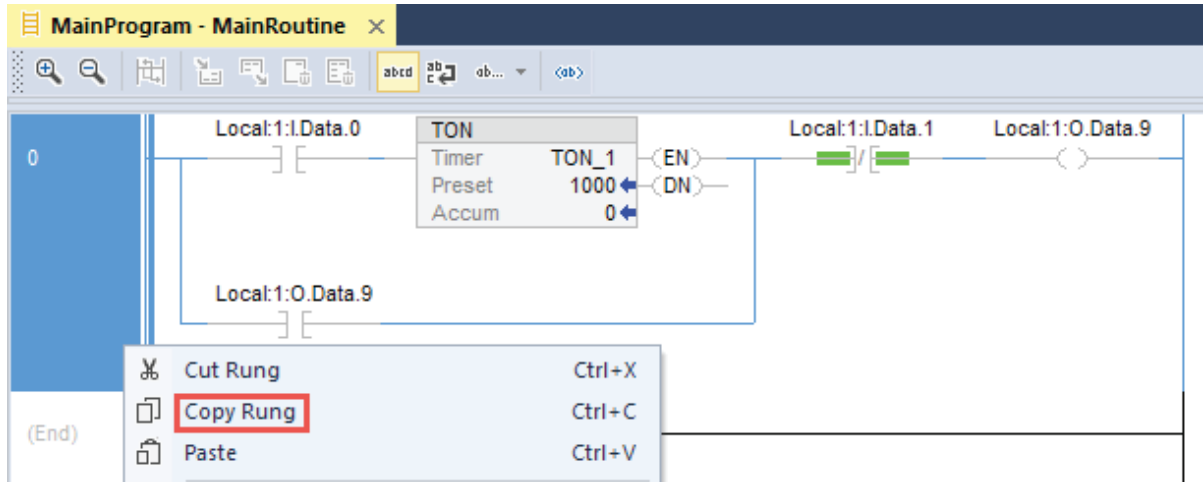
BST – Branch Start  
 XIC – Examine If Closed (Direct Contact)  
 TON – On-delay Timer  
 NXB – Next Branch  
 BND – Branch End  
 OTE – Output Energize (Direct Coil)

TIP: To make it easier to enter the correct syntax for a branch, auto-completion is available if TAB key is pressed after typing "BST". Auto-completion for a branch will insert a "BST NXB BND"

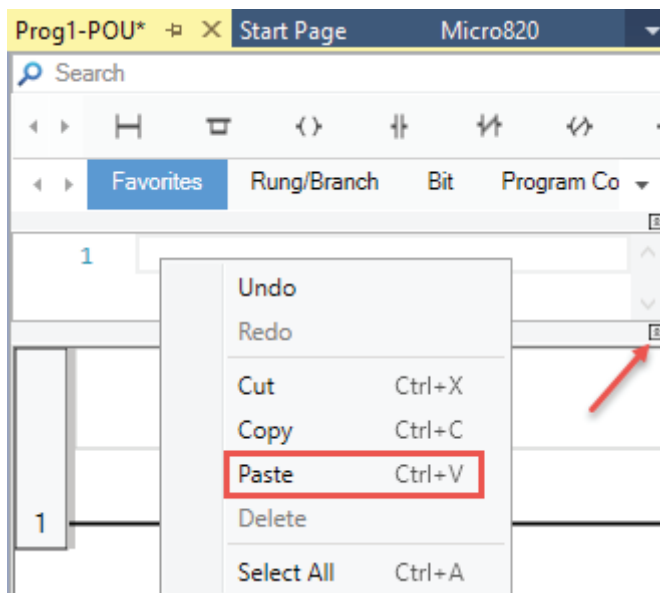


↳ Copy and Paste a Ladder Rung from Studio 5000

1. Right-click the desired rung within Studio 5000 and select **Copy Rung**.

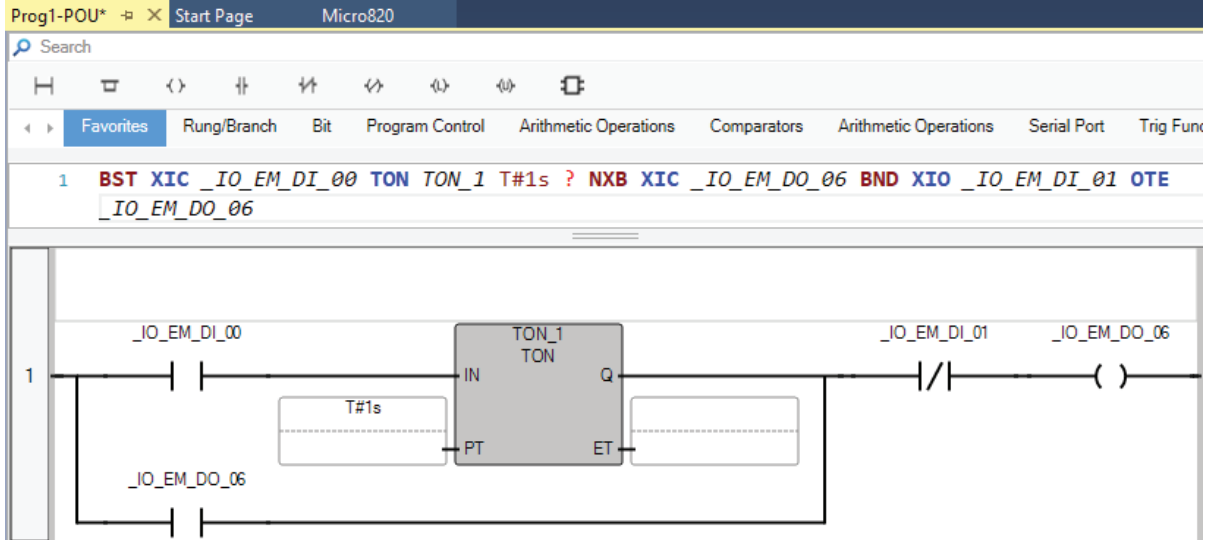
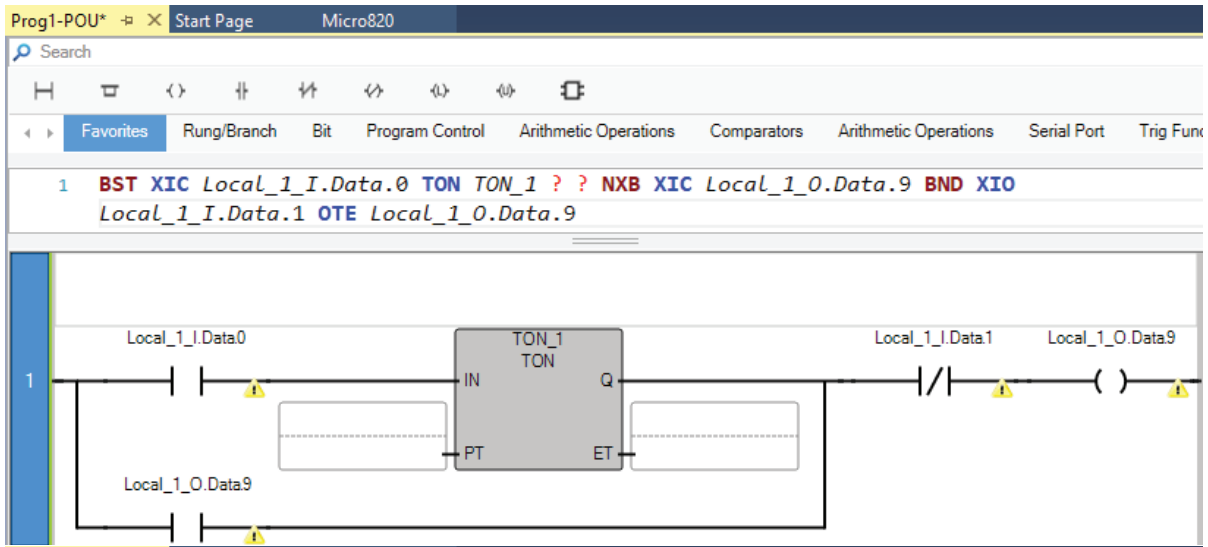


2. With the LD Text Input window expanded (see toggle where the arrow below is pointing to), right-click within the box to the right of '1' and click **Paste**.



TIP: Logix instructions such as NOP, SBR, INT, JSR and AFI are not supported in V11 Feature Pack. These instructions will appear as undeclared variables and assigned as input or output of an instruction. For more information, refer to Knowledgebase: 1074704 "Modify I/O tags to match Micro800 format and create any missing tags".

↳ Continued from Copy and Paste a Ladder Rung from Studio 5000



↑

TIP: Multiple rungs of ladder logic can be pasted by selecting more than one rung before copying.

↑

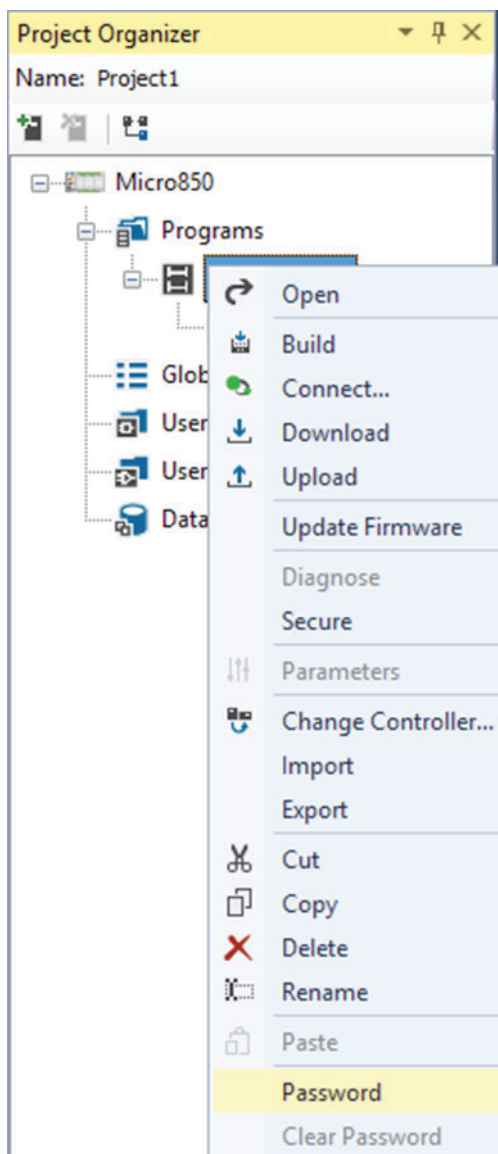
TIP: ASCII text input will allow multiple output coils in series to be entered which cannot be entered using the graphical editor. Although Studio 5000 supports this, Micro800 currently does not, and the output of the coil will always be TRUE.



## ↳ Password Protect Program, If Desired

To prevent unauthorized viewing and editing of the program, both offline and online, you can assign a password to it. Passwords must contain 1 to 8 alphanumeric characters – no spaces or special characters are allowed. Assigning, changing and clearing program passwords require Connected Components Workbench Developer Edition software.

1. Right-click the program name and select **Password**.






2. Enter **New Password**, reenter the password in Confirm Password and click **OK**.

Set Password - Motor\_Circuit

New Password

Confirm Password



3. In the future, any time the program is opened, whether offline or online, you will be prompted to enter the **Password**. After entering password, click **OK** to proceed.

Enter Password - Motor\_Circuit

The feature you are trying to access is password-protected.  
Please enter the password.

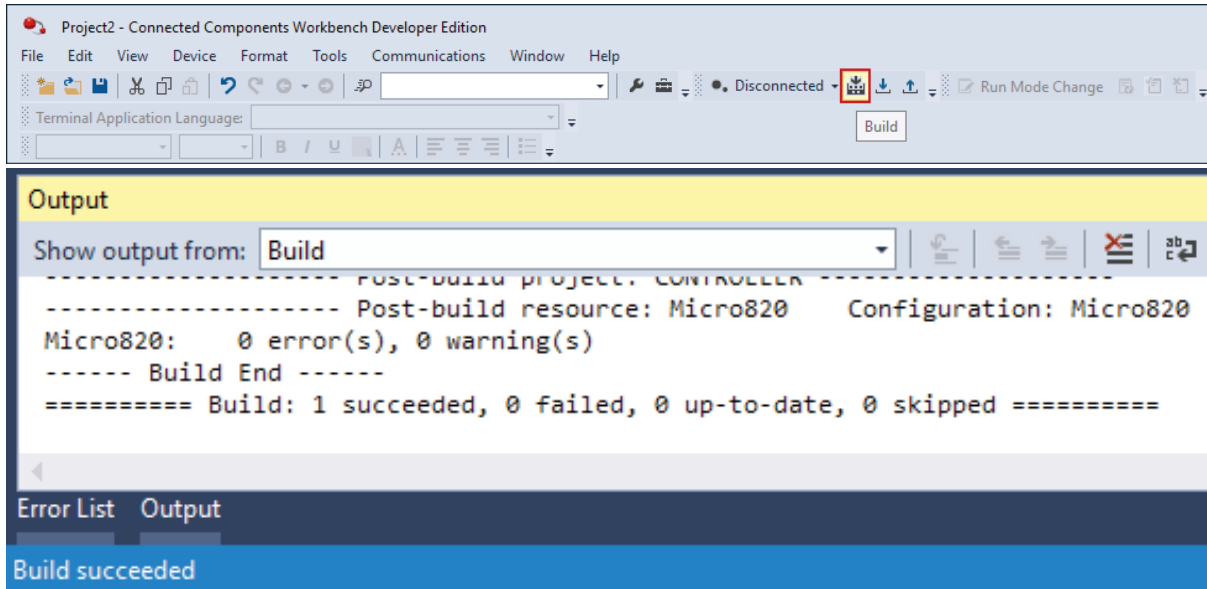
Password



## ↳ Verify Controller Before Downloading

The Connected Components Workbench software term for Verify Controller is Build.

1. Click the **Build** icon to verify the controller project. Build success or failure is displayed in the **Output** window at the bottom of the screen. Only a project that has been successfully built can be downloaded to a controller.

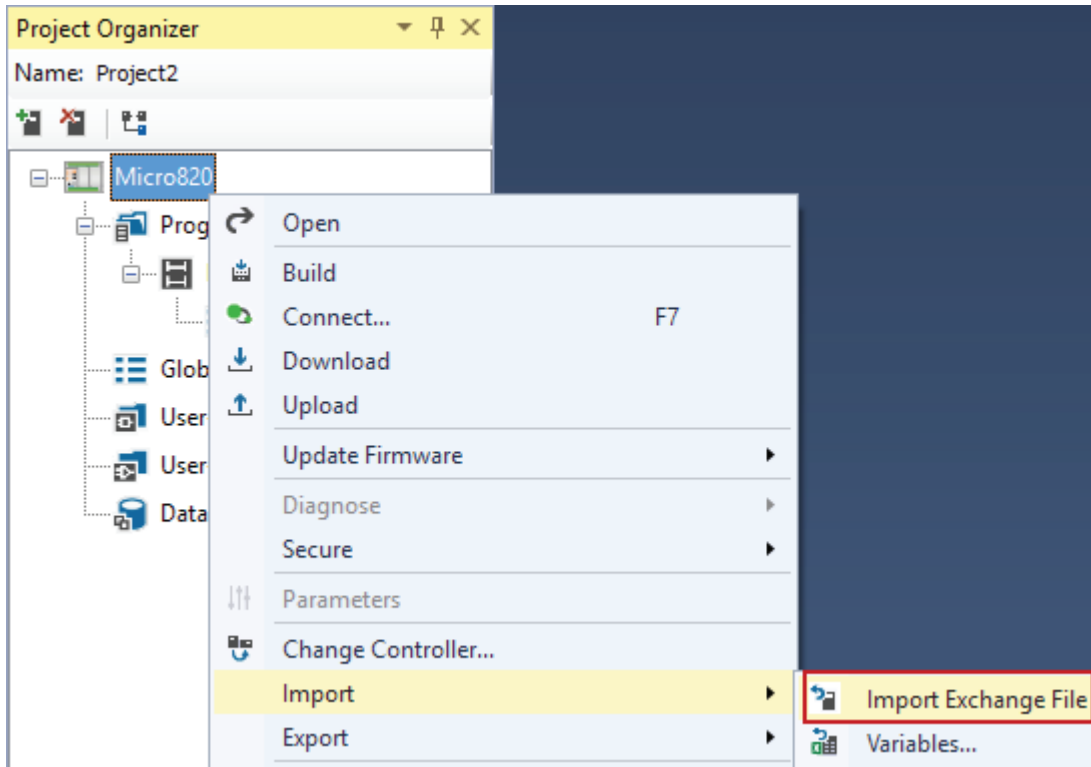


2. If the build fails, review the error list to determine what needs to be corrected, attempt to fix it and then rebuild again. Repeat this process until the build succeeds.

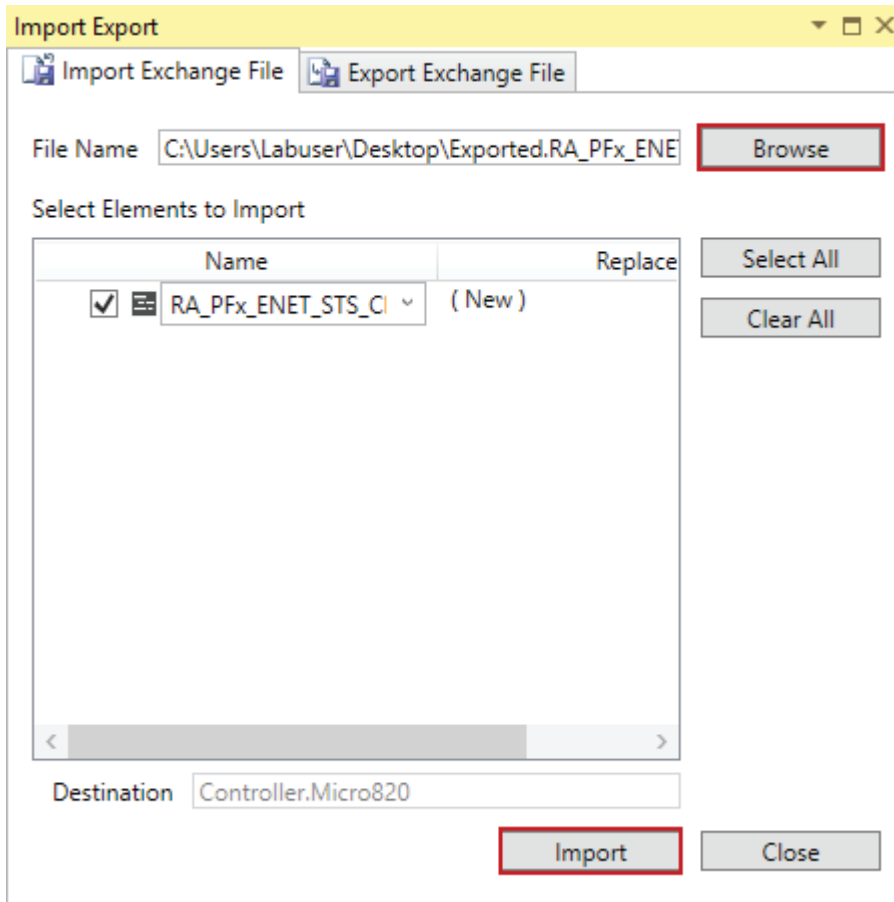
## Importing an Add-On Instruction (AOI) or Subroutine to a Project

The Connected Components Workbench software term for an AOI is UDFB and for a subroutine is UDF.

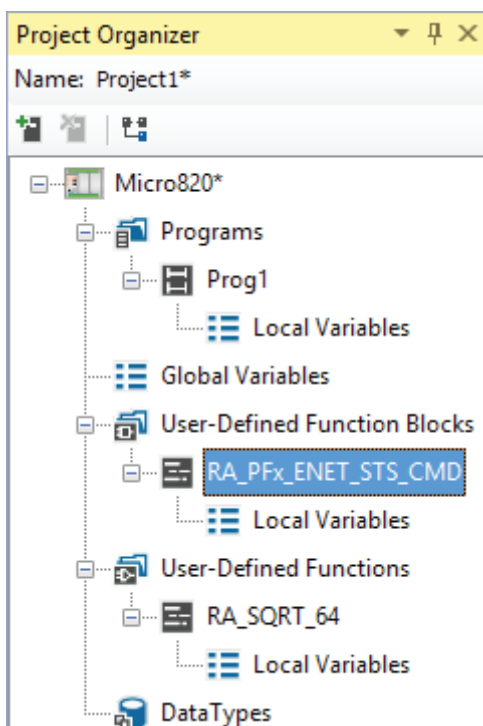
1. Right-click the Micro800 controller icon under **Project Organizer** and select **Import -> Import Exchange File**.



2. Click **Browse**, browse to and select the desired UDFB file, then click **Import**.



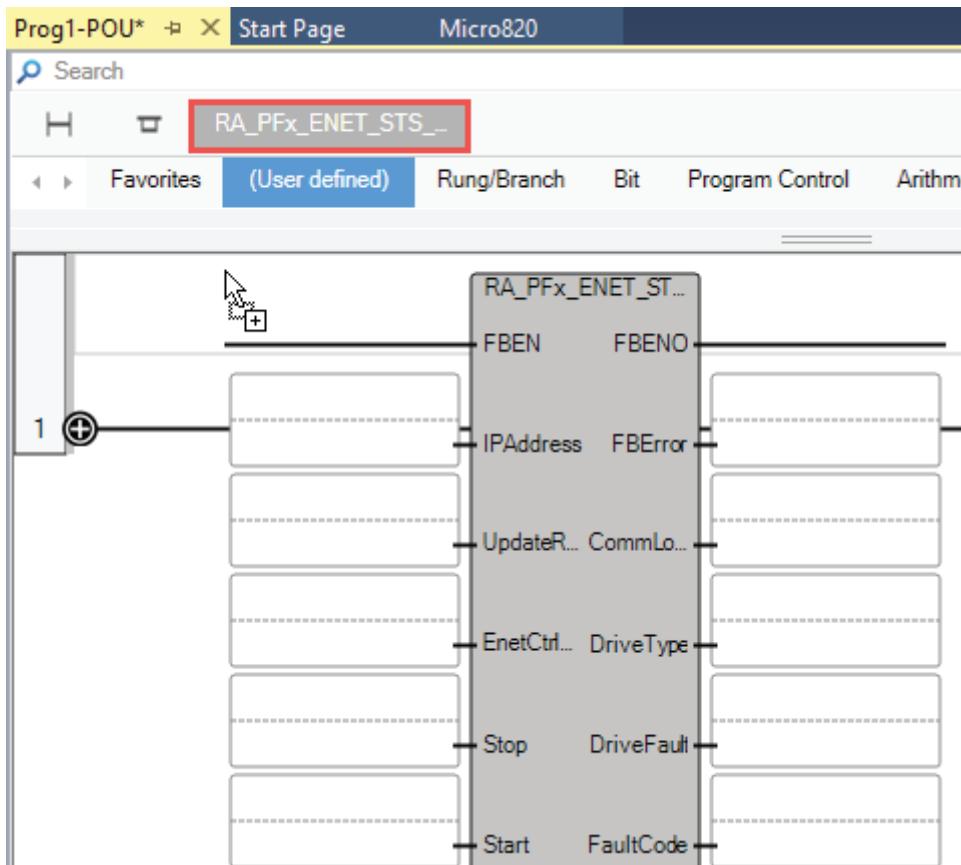
3. Imported AOIs and subroutines will be listed in the **Project Organizer** under **User-Defined Function Blocks** for AOIs and **User-Defined Functions** for subroutines.



## Using an AOI or Subroutine in a Program

The Connected Components Workbench software term for an AOI is UDFB and for a subroutine is UDF.

1. Once an AOI or subroutine is imported into a project, its name is listed in the **(User defined)** group. Select the **(User defined)** group, click the AOI or subroutine name and then drag and drop the AOI or subroutine onto the rung. There is no separate Jump to Subroutine (JSR) instruction needed for UDFs.



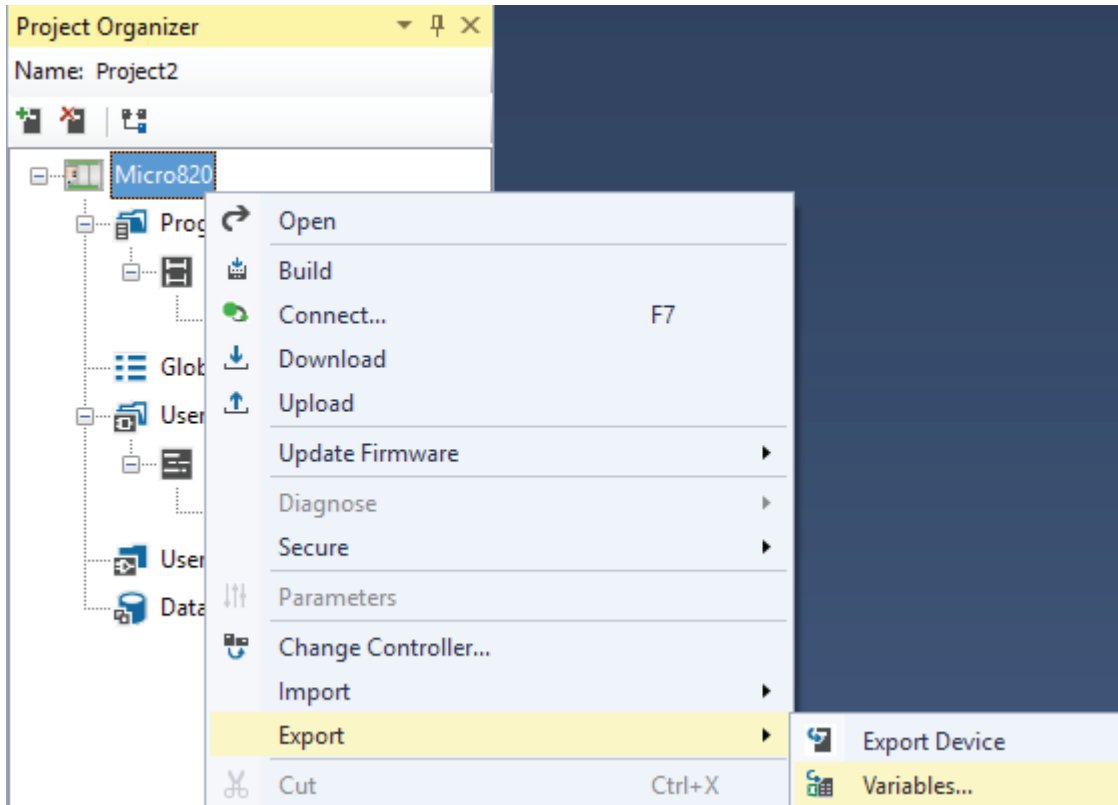
2. Assign tags ('variables') to the instruction input and output parameters.

Parameter Name	Variable Name	Data Type
RA_PFx_ENET_STS_CMD	RA_PFx_ENET_STS_CMD	String
RA_PFx_ENET_STS_CMD_1	RA_PFx_ENET_STS_CMD_1	String
<b>Status &amp; Control of PF4x or PF</b>		
<b>Inputs</b>		
FBEN	FBEN	Bool
IPAddress	IPAddress	String
UpdateRate	UpdateRate_ms	UInt
EnetCtrl	EnetCtrlTO_sec	UInt
Stop	Stop	Bool
Start	Start	Bool
Jog	Jog	Bool
ClrFault	ClrFault	Bool
SetFwd	SetFwd	Bool
SetRev	SetRev	Bool
SpeedRef	SpeedRef	Real
AccelTime	AccelTime1	Real
DecelTime	DecelTime1	Real
<b>Outputs</b>		
FBENO	FBENO	Bool
FBError	FBError	Bool
CommLoss	CommLoss	Bool
DriveType	DriveType	String
DriveFault	DriveFault	Bool
FaultCode	FaultCode	UInt
Ready	Ready	Bool
Active	Active	Bool
CmdFwd	CmdFwd	Bool
CmdRev	CmdRev	Bool
AtRef	AtRef	Bool
CmdSpeed	CmdSpeed	Real
CmdSpd	CmdSpd	Real
SpeedFeedback	SpeedFeedback	Real
OutputCurrent	OutputCurrent	Real
DCBusVoltage	DCBusVoltage	Real
OutputVoltage	OutputVoltage	Real

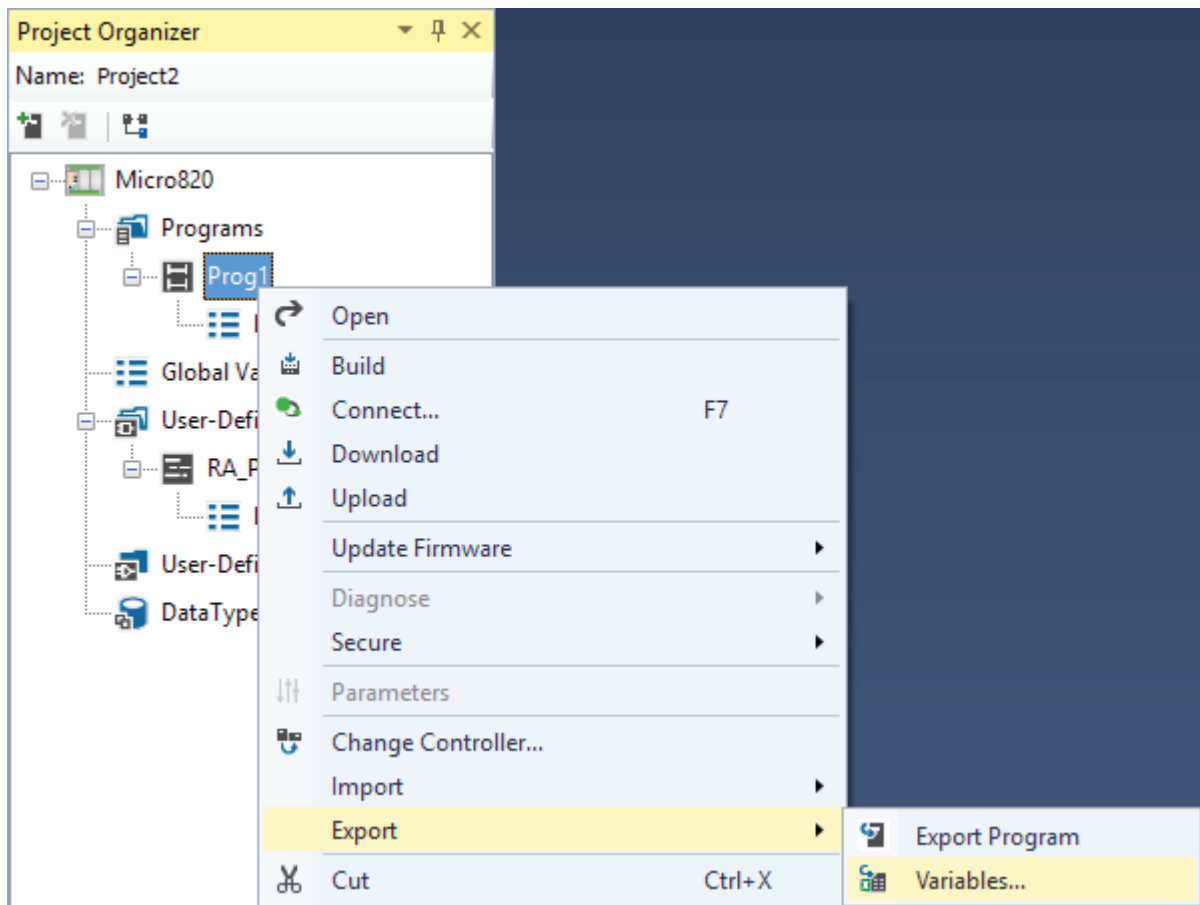
## Exporting and Importing Tags

The Connected Components Workbench software terms for Controller Tags are Global Variables, while Local Tags are called Local Variables.

1. Export Controller Tags by right-clicking the Micro800 controller icon under **Project Organizer**, selecting **Export**, then **Variables**. Browse to the desired directory and enter in a file name to save it under (in Microsoft Excel format) and click **Save**.

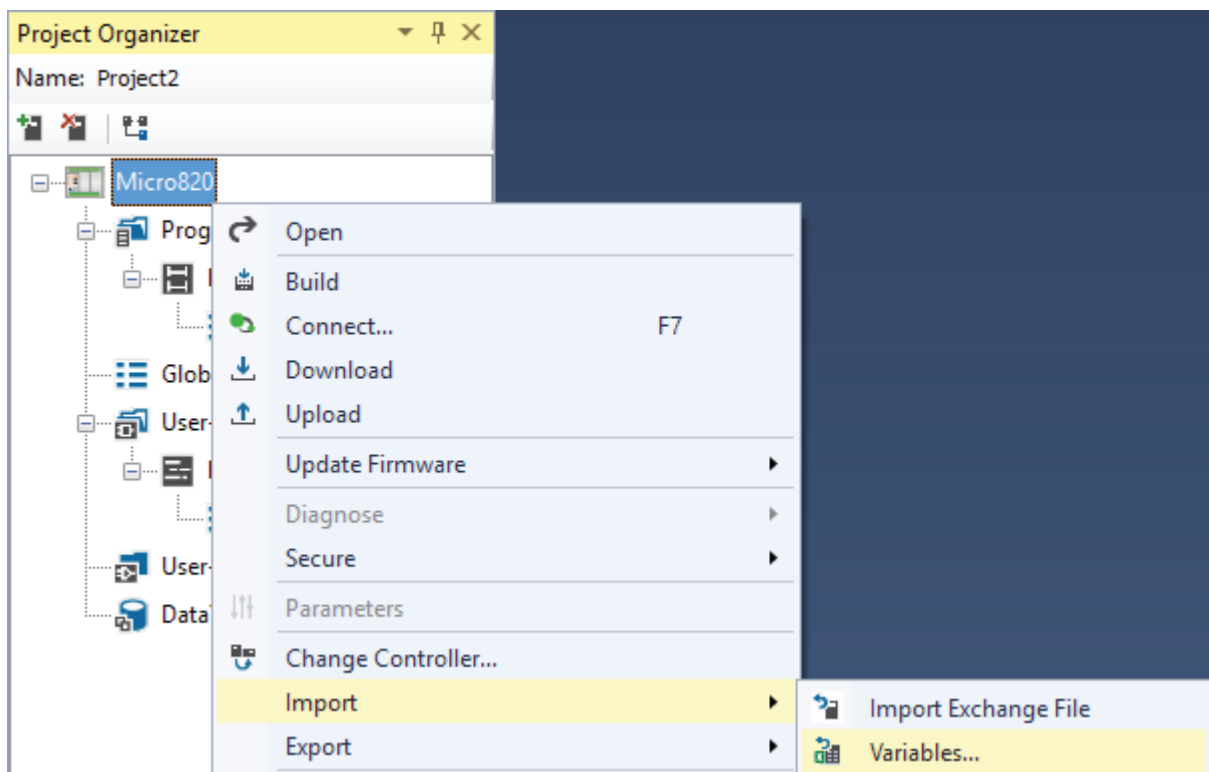


- Export Local Tags by right-clicking the desired Program's icon under **Project Organizer**, selecting **Export**, then **Variables**. Browse to the desired directory and enter in a file name to save it under (in Microsoft Excel format) and click **Save**.

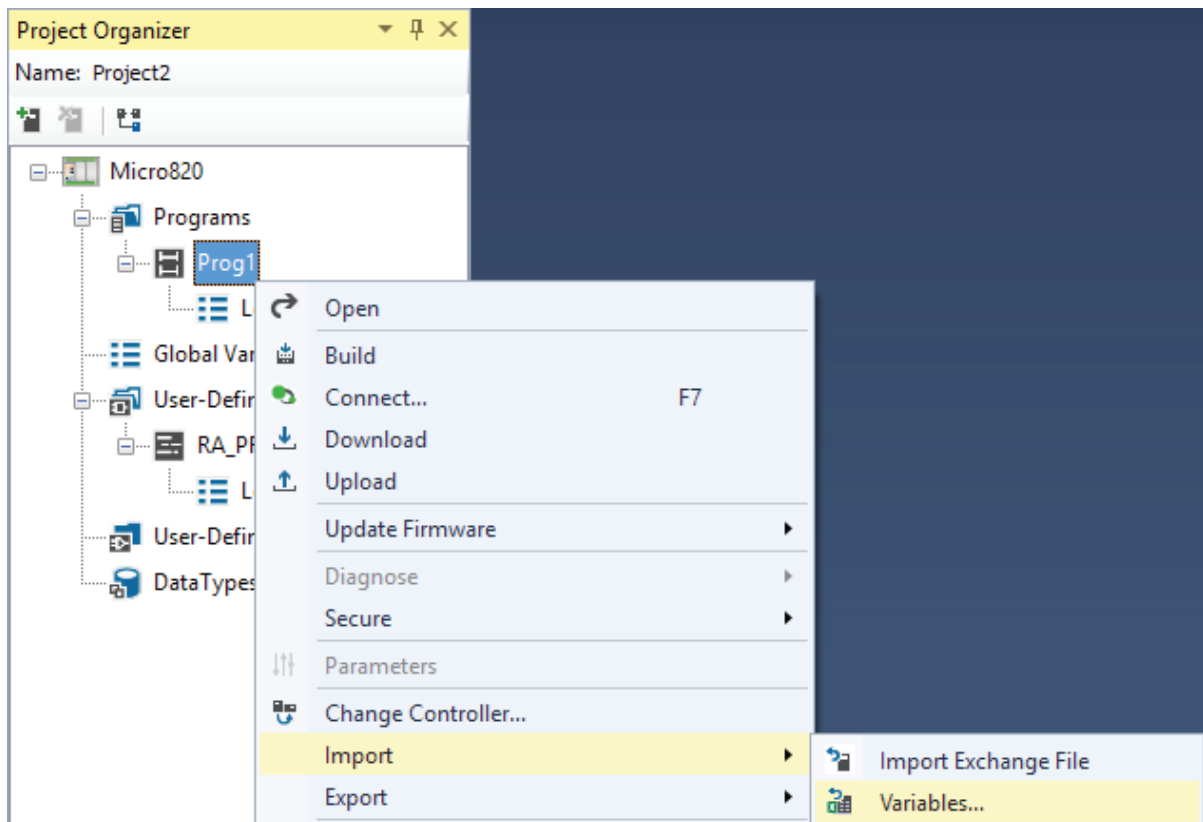




3. Import Controller Tags by right-clicking the Micro800 controller icon under **Project Organizer**, selecting **Import**, then **Variables**. Browse to the desired directory and file name (in Microsoft Excel format) and click **Open**.

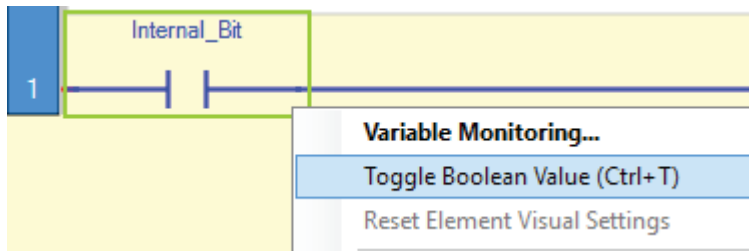


4. Import Local Tags by right-clicking the desired Program's icon under **Project Organizer**, selecting **Import**, then **Variables**. Browse to the desired directory and file (in Microsoft Excel format) and click **Open**.



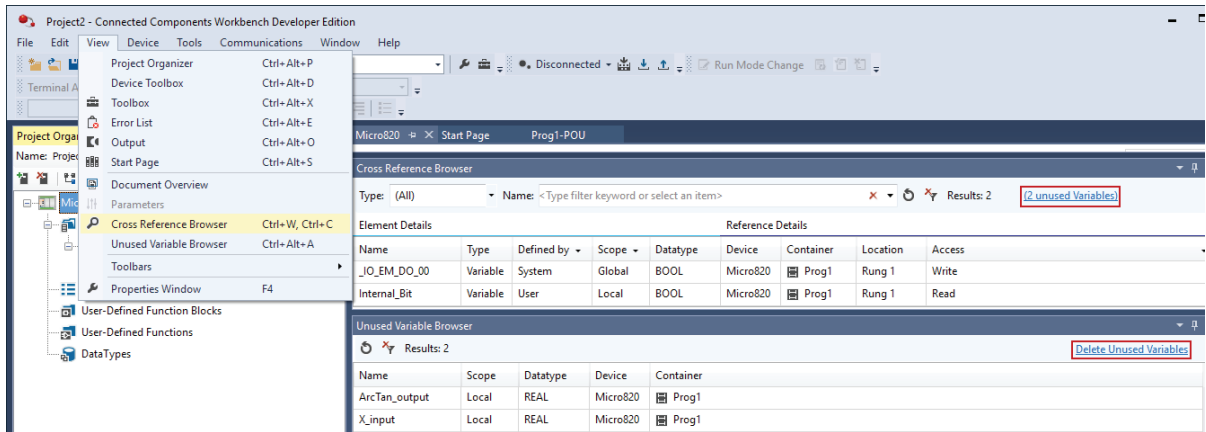
## Keyboard Toggle Bit Shortcut

1. While online with the controller and with a bit instruction selected (as indicated by the bright green box surrounding the instruction), use **Ctrl+T** to toggle the instruction bit between off and on (as well as through the **Toggle Boolean Value** menu selection).



# Cross Referencing Tags

1. Select **View->Cross Reference Browser** to find where tags ('variables') are being used. Click (**x unused Variables**) to bring up the **Unused Variable Browser**, which includes a one-click **Delete Unused Variables** selection.



## Renaming Tags

- Existing tags ('variables') that are renamed are automatically updated everywhere the tag is assigned within the logic.

The image displays two screenshots of a software interface, likely a PLC programming environment, demonstrating the automatic update of a tag name.

The top screenshot shows a logic editor window titled "Micro820 Prog1-POU Start Page". The logic contains a coil labeled "Internal\_Bit". To the right, a variable declaration table titled "Prog1-VAR" lists variables: X\_input (REAL), ArcTan\_output (REAL), and Internal\_Bit (BOOL). The "Internal\_Bit" entry is highlighted with a blue selection bar.

The bottom screenshot shows the same logic editor window, but the coil is now labeled "Internal\_Bit\_to\_Toggle". The variable declaration table to the right has been updated: the "Internal\_Bit" entry has been replaced by "Internal\_Bit\_to\_Toggle" (BOOL), while the other variables remain the same. This demonstrates that the software automatically updates the tag name in the logic when it is renamed in the variable declaration table.

## Data Types

Connected Components Workbench supports more native data types than Studio 5000 for Integers and Reals and has differences when it comes to the BOOLEAN data type.

1. Connected Components Workbench supports unsigned integers (8-bit USINT/BYTE, 16-bit UINT/WORD, 32-bit UDINT/DWORD, 64-bit ULINT/LWORD).
2. Connected Components Workbench supports 64-bit double precision real (LREAL).
3. Connected Components Workbench BOOLEAN occupies one byte of data. Studio 5000 BOOLEAN occupies four bytes of data, or can also be part of an integer as a single bit.

## Appendix A – Additional Micro800 Controller Instruction Set Resources

1. Micro800 Programmable Controllers General Instructions Reference Manual  
([http://literature.rockwellautomation.com/idc/groups/literature/documents/rm/2080-rm001\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/rm/2080-rm001_-en-e.pdf))
2. MicroLogix™ 1000 Controllers to Micro800 Controllers Migration Guide  
([http://literature.rockwellautomation.com/idc/groups/literature/documents/rm/2080-rm002\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/rm/2080-rm002_-en-e.pdf))

For more information on software specifications and supported products, visit  
[rockwellautomation.com/global/go/ccw](http://rockwellautomation.com/global/go/ccw)

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