GETTING STARTED

CHAPTER 1

In This Chapter...

Introduction

Purpose of this Manual

Thank you for purchasing the AutomationDirect Productivity®1000 Programmable Controller (CPU) family of products. This hardware user manual provides information that will help you install, set up, program, troubleshoot, and maintain your Productivity1000 CPU system. The manual includes information that is critical to the safety of the personnel who will install and use the controller and to the machinery, processes, and equipment controlled by the CPU.

The manual also includes important information about power and signal wiring, mounting of the CPU, and configuring the CPU system.

About Getting Started

If you are familiar with Programmable Controllers in general, then following the simple steps in this first chapter may be all you require to start being productive using a Productivity1000 CPU system. After you have completed the steps, your Productivity1000 controller will be running the ladder logic project that you programmed.

Online Help Files and Other Documentation

The Productivity1000 programming software, Productivity Suite, is available as a download from our website.

See http://www.automationdirect.com/products/pseries.html.

The Productivity Suite software includes searchable online help topics covering all aspects of the software, instruction set, module setup, and communications.

In addition, each power supply, CPU, and I/O module includes an installation insert.

Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. If you cannot find the solution to your particular application, or if for any reason you need technical assistance, please call us at:

1–770–844–4200

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find information about our company and specific technical information about a wide array of our products.

http://www.automationdirect.com

Conventions Used

NOTE: *When you see the "note pad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. Notes represent information that may make your work quicker or more efficient. The word NOTE in boldface will mark the beginning of the text.*

WARNING: When you see the "exclamation point" icon in the left-hand margin, the paragraph to its immediate right will be a warning. This information could prevent injury, loss of property, or even death in extreme cases. Any warning in this manual should be regarded as critical information that should be read in its entirety. The word WARNING in boldface will mark the beginning of the text.
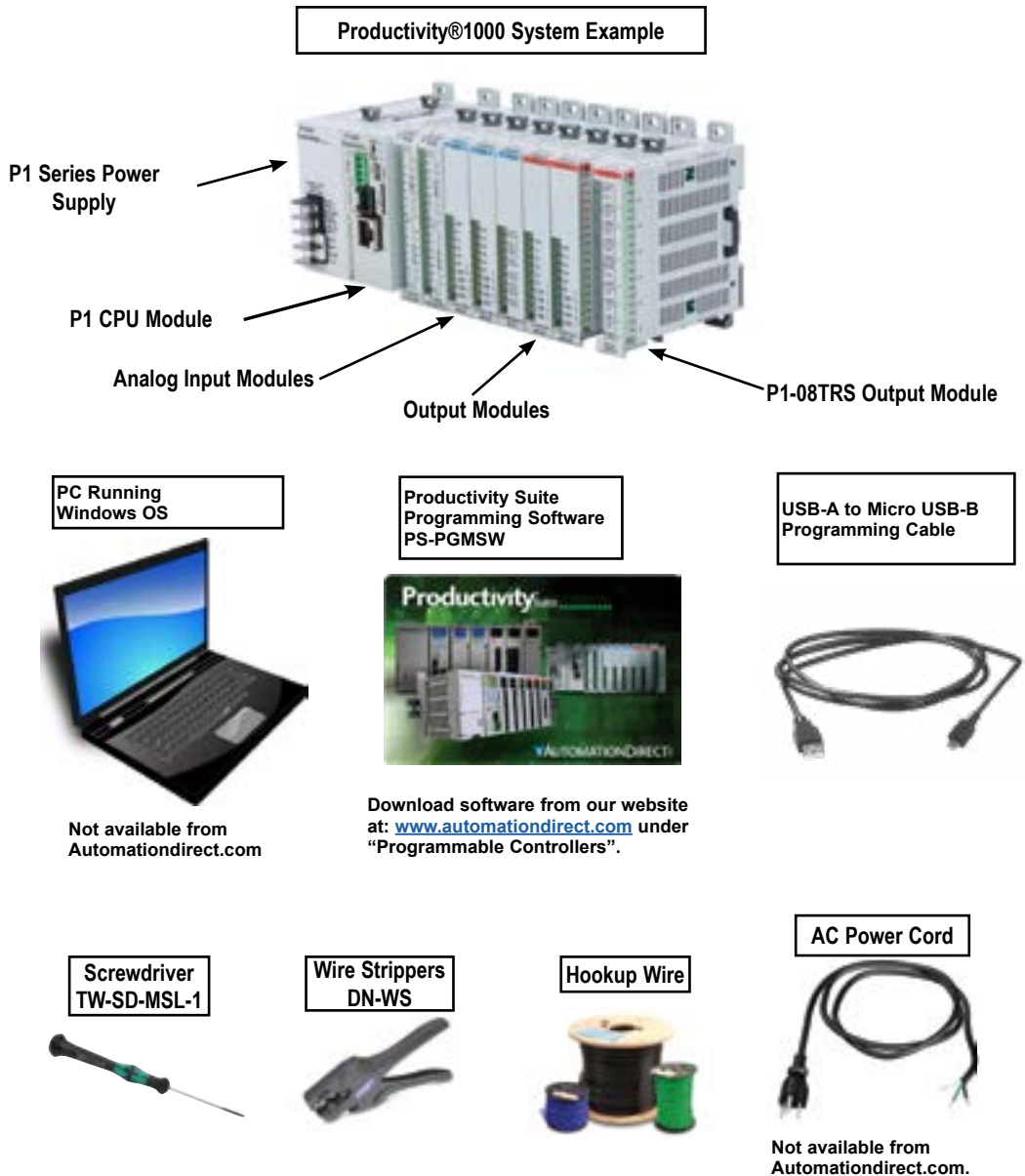
Key Topics for Each Chapter

The beginning of each chapter will list the key topics that can be found in that chapter.

Before you begin...

It is recommended that the following items be available to make this short step-by-step introduction to the Productivity1000 System go smoothly.

Productivity®1000 System Example

P1 Series Power Supply

P1 CPU Module

Analog Input Modules

Output Modules

P1-08TRS Output Module

PC Running Windows OS

Not available from Automationdirect.com

Productivity Suite Programming Software PS-PGMSW

Download software from our website at: www.automationdirect.com under "Programmable Controllers".

USB-A to Micro USB-B Programming Cable

Screwdriver TW-SD-MSL-1

Wire Strippers DN-WS

Hookup Wire

AC Power Cord

Not available from Automationdirect.com.

Productivity Suite System Requirements

Productivity Suite, a Windows-based programming software, is available as a FREE download at https://www.automationdirect.com/support/software-downloads#main-content Please check our website for this product's current operating system requirements.

NOTE: USB or Ethernet cable is also required for communications between PC and CPU.

Step 1: Install Programming Software

1. Download the latest version of the Productivity Suite Programming Software from the Automationdirect website, or insert the Productivity Suite Programming Software USB thumb drive into your PC USB port.

2. By default Productivity Suite will be saved in the "Download" folder as a ".zip" file.
   - Right Click on the ProSuite_xxx.zip file in the Download folder.
   - Choose "Extract All" from the drop-down menu. A popup box will open.
   - Select the "Browse" button and navigate to the folder where you prefer to store the program.
   - Click on "Select Folder" button and in the next box choose "Extract".

NOTE: See the Productivity Suite Installation and Productivity Suite Startup topics for additional details if needed.

3. Navigate to the choosen folder and double click on the ProSuite ".exe" file.

4. The "Setup Wizard" window (shown below) will appear. Select Next.

5. Carefully read the software license agreement. If you agree to the terms and conditions of this agreement, select the "I accept the terms of the License Agreement" and then the "Next" button.

6. The "Destination Folder" window will open next. The default loaction will appear in the text box: C:\Program Files\AutomationDirect\Productivity Suite <Software Version>. Should you desire a different folder choose:

    a. Browse: This option allows you to select another folder for installation.

If the installer detects a previous version of Productivity Suite on your PC, there is another option available with this window:
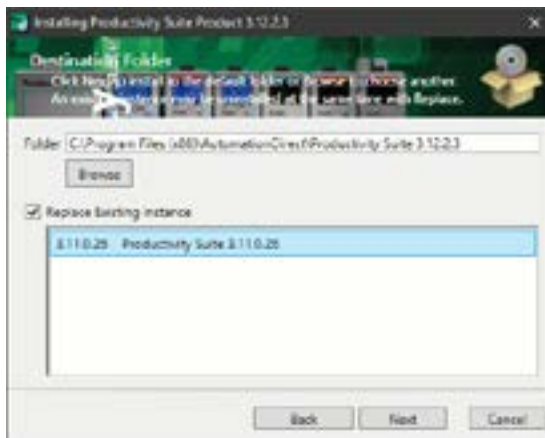
    b. Replace Existing Instance: This option allows you to uninstall the previous version of the software and install the new version in its place. If you check this option, select the version in the window that you want to delete. Click "Next" to continue.

7. Once you have selected the install folder or after deleting any previous instances, click "Install" to begin the installation.
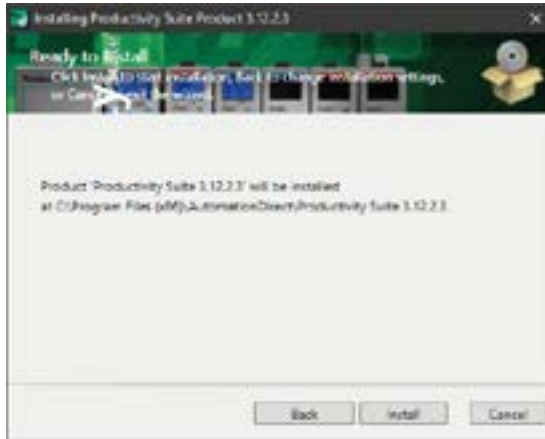
A status window will appear displaying the status of the installation.
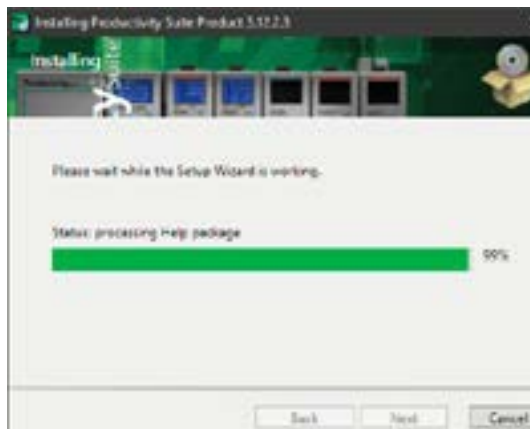
A shortcut icon will automatically be placed on the Desktop during installation.

8. The next screen to appear contains the Release Notes for this version of the Productivity Suite software. This is an opportunity to review the software version release notes. You may read these before selecting the "Next" button.

9. The Installation is now complete. Select "Done".

Step 2: Launch Programming Software

After installing the Productivity Suite Programming Software, PS-PGMSW, launch the software by double clicking the desktop Productivity Suite Icon. Or from the PC's 'Start' menu, select Productivity Suite x.x.x.x.
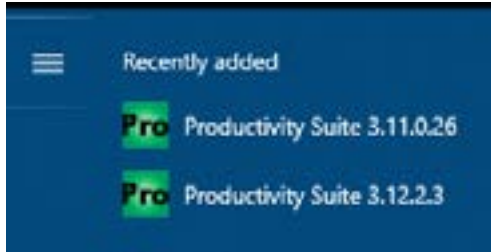
The Productivity Suite Programming Software will start up and display the Main Window as shown here.

NOTE: The recommended minimum screen size for the Productivity Suite Software is 1920 X 1080 pixels.

Click on the 'Start a New Project' in the Start Productivity dialog box to open a programming window.

The Programming Window is divided into menus and toolbars that work together to make project development as simple as possible.
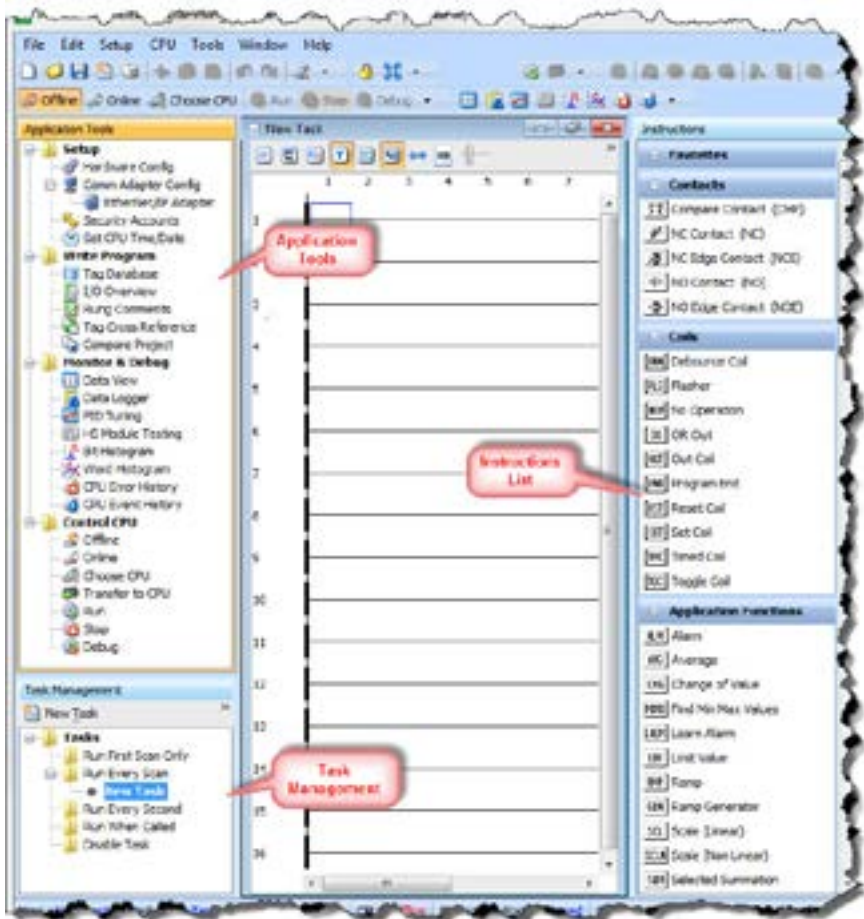
Online Help

It is essential that you use the Productivity Suite online Help to familiarize yourself with the software. Keep it open on your desktop and refer to it frequently as you build your system. Click on the toolbar Help button to open the Help file.

Step 3: Install Hardware

The Productivity®1000 CPU system components snap together to form a configured CPU in minutes. See Chapter 5, Installation and Wiring, for more detailed hardware installation information. What follows are the basic steps:

1. Connect power supply to CPU (after removing the optional power connector).

Align Power Supply
Connector and pilot
pins slide onto
P1 CPU module.

Remove Optional
Power Connector
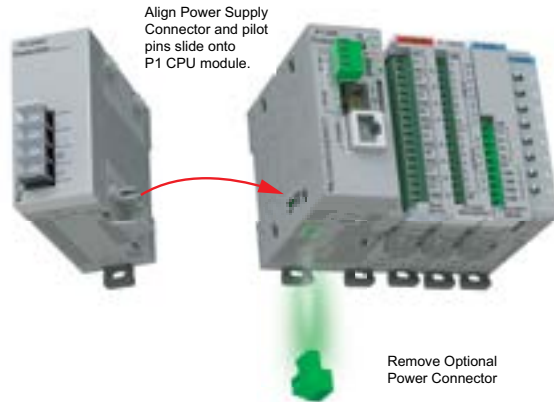
NOTE: Optional Power Connector must be removed before connecting a Productivity1000 Power Supply. This precludes connection of two separate power supplies.

2. OR use an appropriately fused alternate power source, connectting directly to CPU Optional Power Connector terminals.

2 Amps
Slow Blow

Use ADC
Part # S5062-R

G⏚
0V
24VDC

G⏚
0V
24VDC
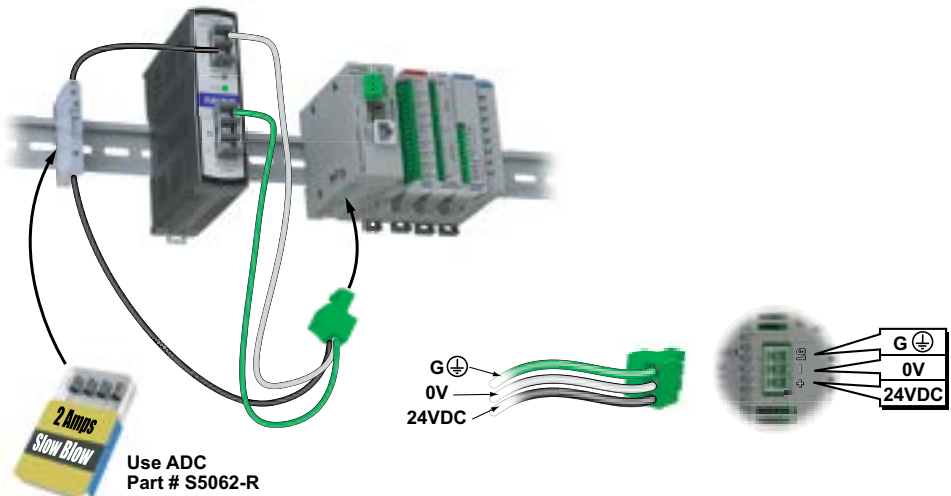
3. Install I/O Modules and engage locking tabs.

Step One:

With latch in "locked" position, align connectors on the side of each module and stack by pressing together. An audible click indicates lock is engaged.
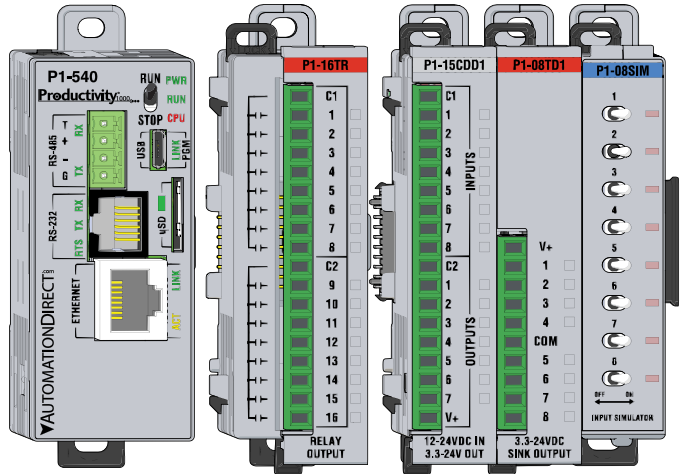
Step Two:

To unstack modules, pull locking latch up into the unlocked position and then pull modules apart.

WARNING: Explosion hazard – Do not connect, disconnect modules or operate switches while circuit is live. Productivity®1000 System does not support Hot Swapping!

4. Connect appropriate wiring to the power supply (P1-01AC) and I/O (P1-08TRS module) in
   this example.

P1-01AC
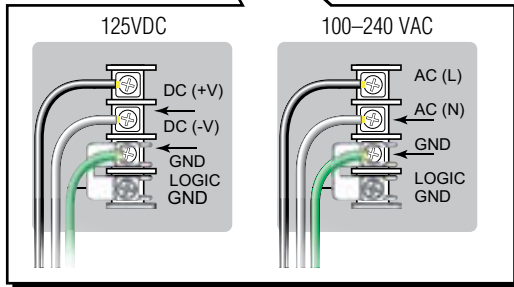
The power supply and load
are connected through a
DC or AC current source.

5. Connect USB cable. Use a Micro USB cable with a Type A
   and Micro Type B connectors as shown below.
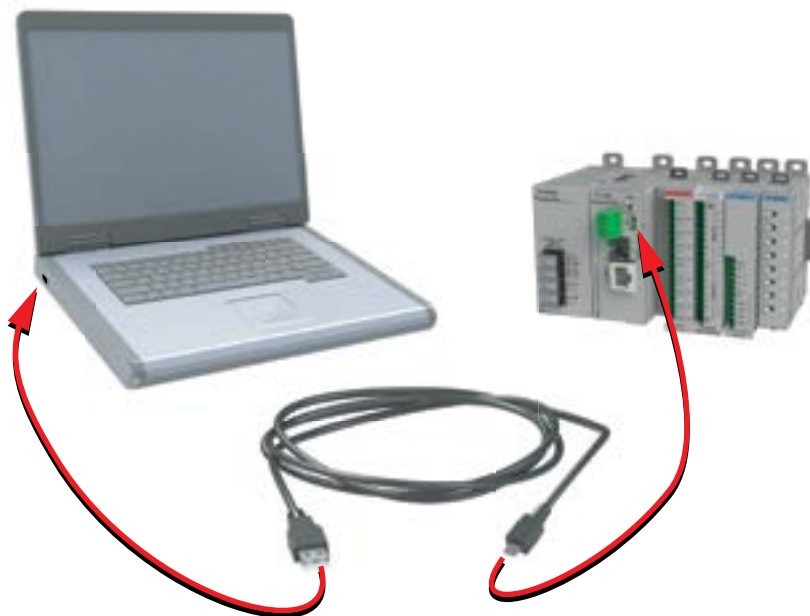
Step 4: Apply Power to CPU

Ensure proper wiring and the correct voltage is available before connecting wiring to the power supply. Once this is verified, connect power to the power supply. Once power is applied, the CPU will perform a self evaluation and verification. See Chapters 2 and 5 of this manual for more power supply and I/O wiring information.

Step 5: Establish PC to CPU Communications

Select "Choose CPU" icon on the CPU Toolbar and the dialog box shown below will appear.
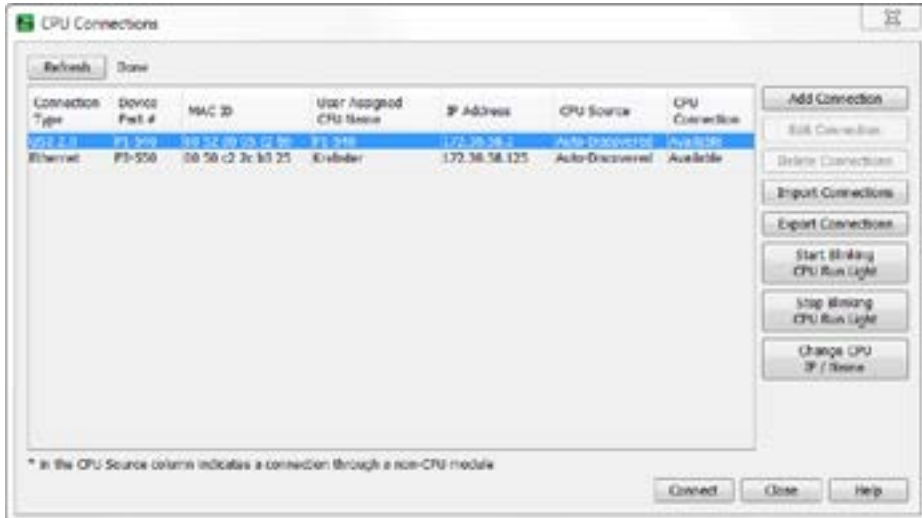
Highlight the installed CPU listed in the dialog box and select "Connect".

When initially going Online with the CPU, a pop-up window will notify you of a project. difference between the CPU and the PC. Select "No, Use PC Project" command button.
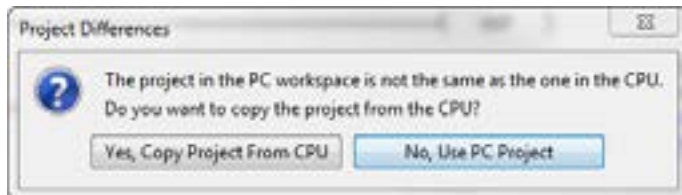
Step 6: Open/Read Hardware Configuration

Before we create a project we must configure the hardware so we'll have default input and output tags for use in our project. With the CPU in "STOP" Mode, select Hardware Configuration under Application Tools and the following screen opens.
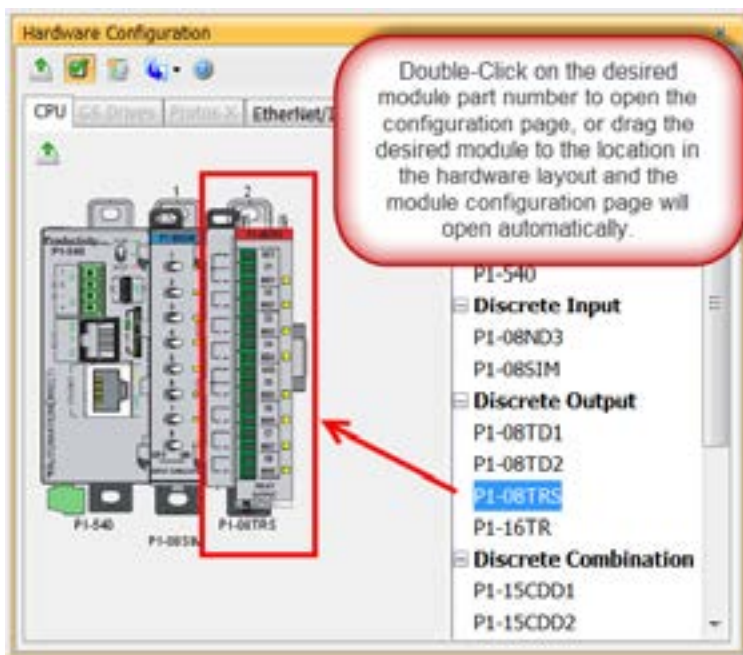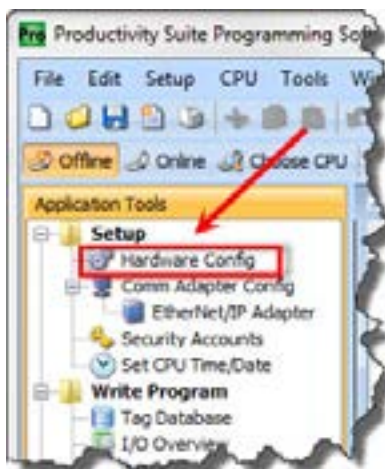
The Module Configuration screen shows the user tag names for all eight I/O points. Select "OK".
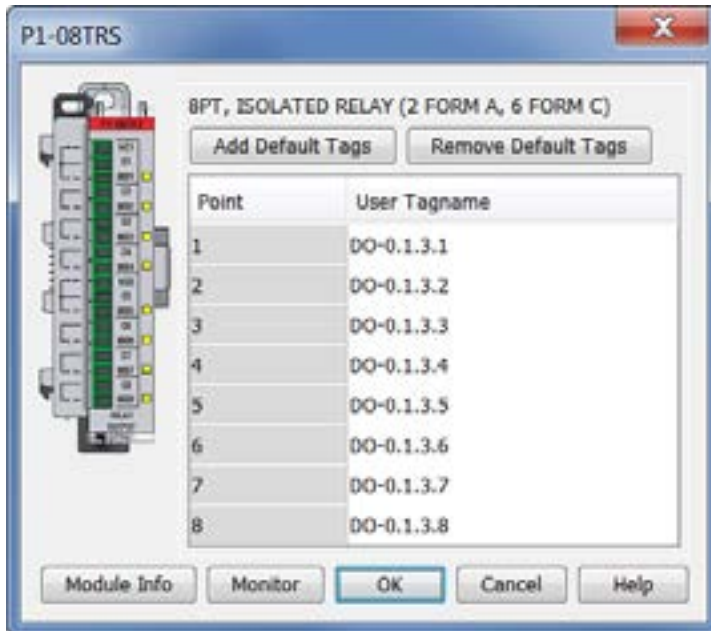
Step 7: Create a Project

We will start a new project by entering a simple ladder logic program in the order that follows.

Rung #1

Select the "END" position on Rung #1 with your cursor. From the Instruction List on the right, scroll down to Counters/Timers section and double click on the Simple Timer (STMR) instruction. The "Simple Timer" instruction is automatically placed on the selected rung and the Simple Timer (STMR) dialog box pops up.

1. Enter 'T1_SP' into the Preset Value field.

2. Enter 'T1_CURVAL' into the Current Value field.

3. Enter 'T1_DN' into the Done field.
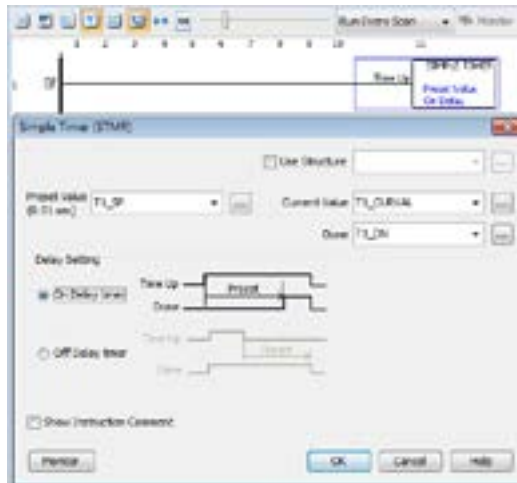
4. Select "OK".

The Define Tags dialog box opens.

5. Enter preset time value of 300 (ms) into "Initial Value" field for Tag T1_SP. Select OK.
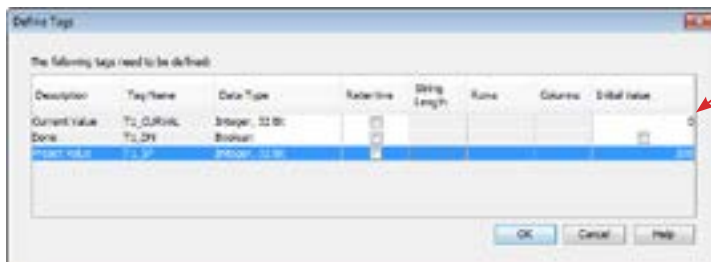
Place the cursor on the first position on Rung #1 as shown below. In the Instruction List on the right, scroll up to Contacts section and double click on "NO Contact (NO)". A NO Contact (NO) is placed at this rung position and a dialog box pops up.

1. Enter 'T1_Start' into the text box.

2. Select OK.

- The Define Tags dialog box opens. Select "OK".
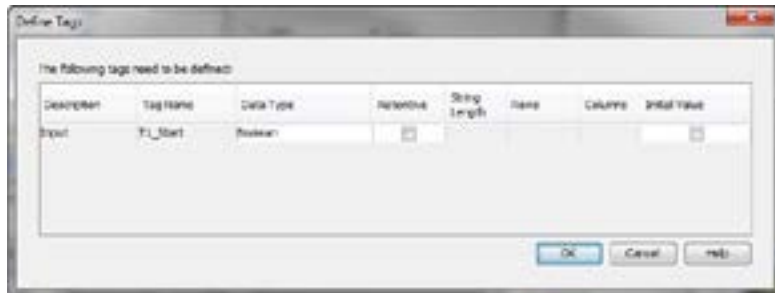
With the cursor on Rung #1, to the right of contact 'T1_Start', we are going to begin drawing a branch circuit. Under the Edit drop down menu, select "Wire", then select "Down". Notice that a wire has been added.
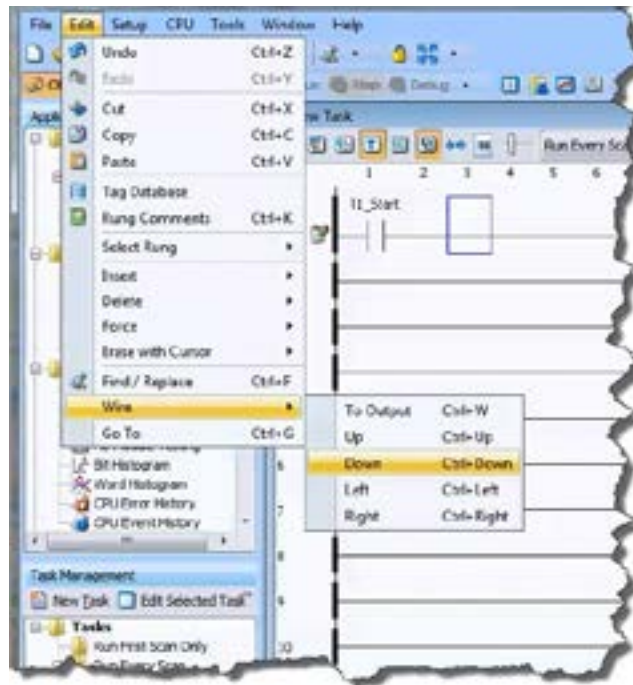
NOTE: *There is also a wire Erase With Cursor tool in the Edit drop down menu that is used to erase any lines that were created using the Wire tools.*

Next we'll draw a wire to the left. Under the Edit drop down menu, select "Wire", then select "Left".
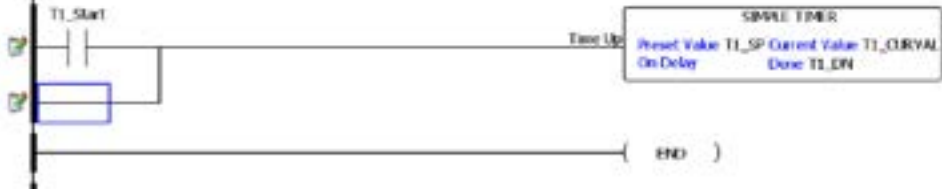
Next we'll add another normally-open contact. Place the box cursor on the first position on the newly created SubRung #1. From the Instruction list, click & drag a Contact (NO) into this box. A NO Contact (NO) dialog box pops up.

1. Enter 'T1_Manual' into the field.
2. Select "OK".

The **Define Tags** dialog box opens. Select "OK".

Rung #2

Next we'll add another normally-open contact at the start of Rung #2. Click & drag a "NO Contact (NO)" into this box. A NO Contact (NO) dialog box pops up.

1. In the empty tag field press the down arrow on the right to
   open a drop-down list; scroll down and select 'T1_DN'.

2. Select "OK".
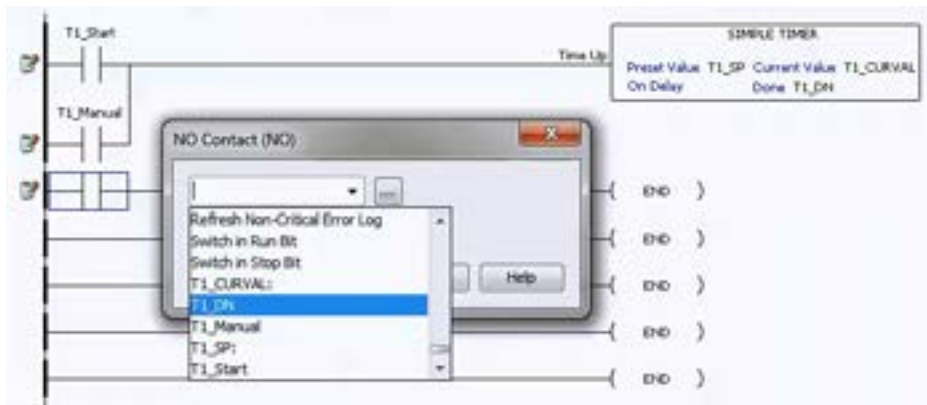
Next we'll add an Out coil at the end of the rung. Place the cursor at the end of the rung. From the Instructions list Coil section, double click on an "Out Coil (OUT)". An Out Coil (OUT) is placed on the rung and a dialog box pops up.

1. In the tag field press the down arrow on the right to open a
   drop-down list; scroll down and select 'DO-0.1.2.1'.

2. Select OK.
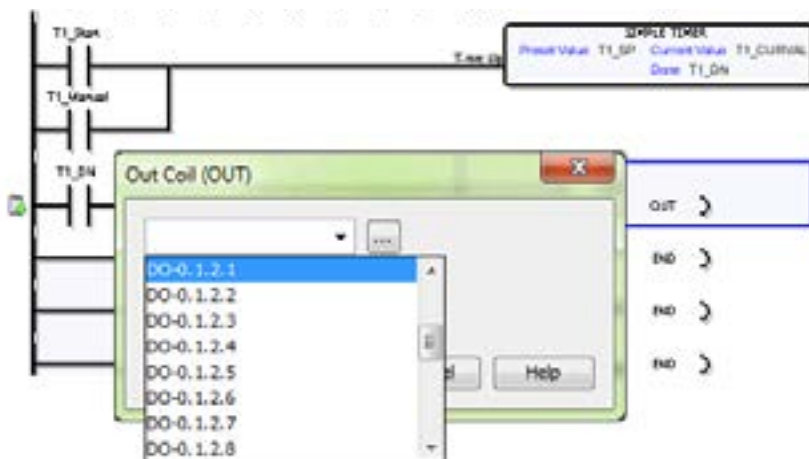
The ladder program now looks like this. When either of the T1 contacts are energized, the timer starts. When it times out, contact T1_DN energizes and turns on the rung 2 output.
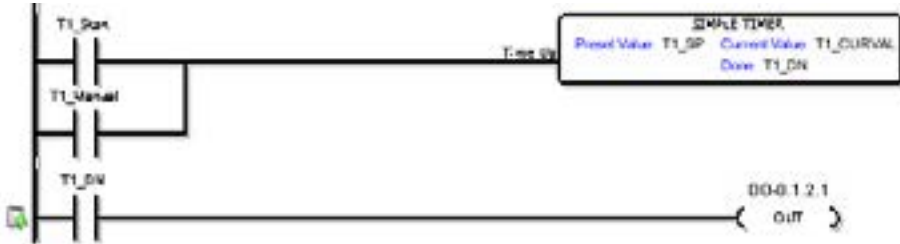
Step 8: Save Project

Save the project by opening the File drop-down menu and selecting Save Project.
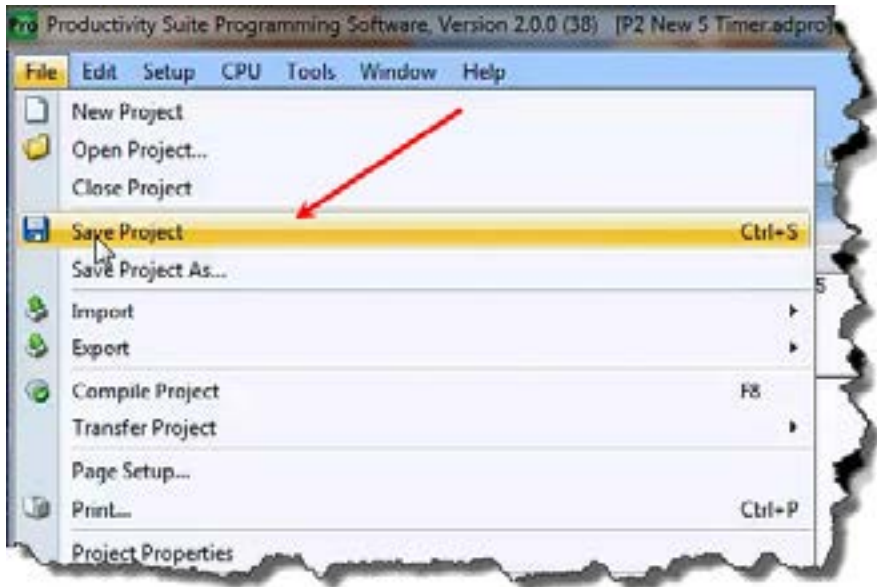
Step 9: Write Project to CPU

Next we will transfer the project to the CPU. Transfer Project is accessed by selecting Transfer Project from the File Menu.

Select "To CPU" from the Transfer Project menu.
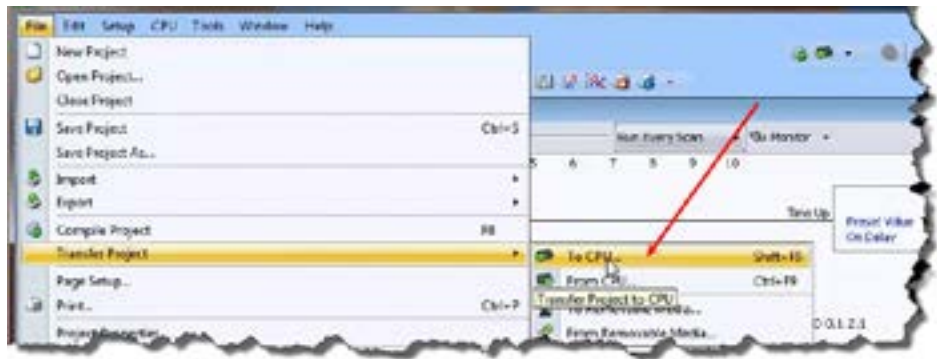
The project will then be Transferred to the CPU from the PC. During the transfer a status window will open displaying the process.
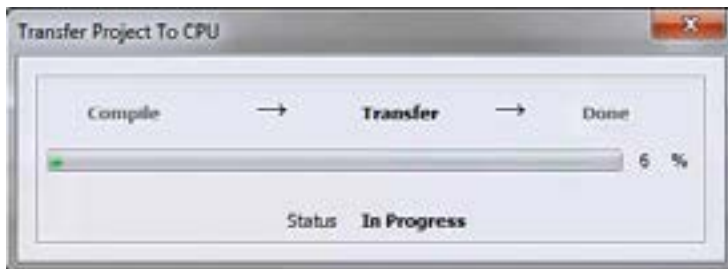
Step 10: Place CPU in RUN Mode

Next, verify the Run/Stop switch on the CPU faceplate is placed in the Run position and then place the CPU in RUN mode on the Productivity Software Toolbar so the ladder logic program executes.

NOTE: If the Run/Stop switch on the CPU is in the Stop position, the Run button on the Programming Software Toolbar will be disabled.

Step 11: Test the Project Using Monitor Mode

In this next step, use the Monitor Mode and Data View to test the ladder logic program. Select Monitor Mode from the top of the Ladder Logic screen to display the status of Boolean and Integer Tags.

Using Data View, the Tag values can be viewed or manipulated for testing the project. The Data View window can be accessed by selecting Data View from the Tools Menu of the Main Menu.

For the Simple Timer Instruction, a Monitor button is provided that, when selected, will load the tags associated with the instruction into Data View.
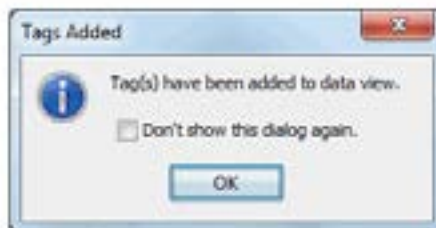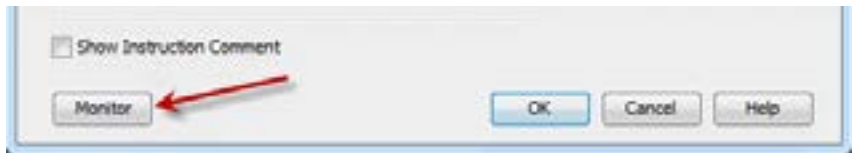
The tags will be placed in a separate Tab titled New Task - STMR as seen below.
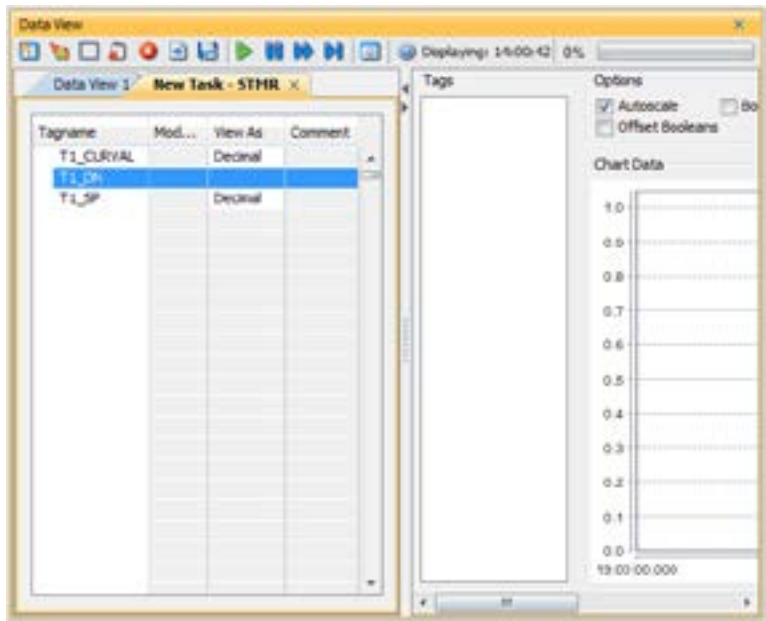
The remaining tagnames in the Ladder Logic can be added to the Data View window by clicking on a blank area in the Tagname column. This will display a drop down menu where the tags can be selected. Scroll down the list and select the tags to be added.

Once all of the tagnames have been added, they can now be monitored and manipulated. See the Data View help file topic for additional details if needed.

NOTE: *Force must be enabled for a Tag in the Tag Database before Force can be used in Data View.*