



**Rockwell**  
**Automation**



# CCBB

## Simple Positioning Examples

PF40P StepLogic setup  
using DriveExplorer™

\*\*\* This document is for reference only\*\*\*


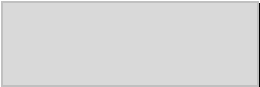


# Table of Contents

<i>Document Conventions</i>	4
<i>Equipment List</i>	5
<i>Objective</i>	6
<i>Configuration</i>	7
<i>Connecting the Equipment</i>	8
<i>Connecting the PowerFlex 40P with DriveExplorer</i>	9
<i>Resetting Defaults and Performing Autotune</i>	11
<i>Indexing Loop Using Incremental Moves</i>	14
<i>Tuning of the Position Regulator</i>	20
<i>Absolute Move with Multiple Steps</i>	21
<i>Homing Sequence</i>	23
<i>Absolute Move with Automatic Find Home Routine using a Sensor on a Conveyor</i>	25
<i>Absolute moves with digital input.</i>	26
<i>Absolute moves using Presets</i>	28

# Document Conventions

---

This style or symbol:	Indicates:
	<p>ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you:</p> <ul style="list-style-type: none"><li>• identify a hazard</li><li>• avoid the hazard</li><li>• recognize the consequences</li></ul>
Words shown in bold (e.g., <b>DriveExplorer</b> or <b>OK</b> )	<p>Any item or button that you must click on, or a menu name from which you must choose an option or command. This will be an actual name of an item that you see on your screen or in an example.</p>
Words shown in bold italics, enclosed in single quotes (e.g., ' <b>Controller1</b> ')	<p>An item that you must type in the specified field. This is information that you must supply based on your application (e.g., a variable).</p> <p>Note: When you type the text in the field, remember that you do not need to type the quotes; simply type the words that are contained within them (e.g., Controller1).</p>
	<p>The text that appears inside of this gray box is supplemental information regarding the lab materials, but not information that is required reading in order for you to complete the lab exercises. The text that follows this symbol may provide you with helpful hints that can make it easier for you to use this product. Most often, authors use this “Tip Text” style for important information they want their students to see.</p>

**Note:** If the mouse button is not specified in the text, you should click on the left mouse button.

# Equipment List

---

This list provides the user with CCBB components to complete a simple positioning system. Only the products marked with an asterisk (\*) will be needed for the examples in this document.

One (1) 22D-D2P3N104 PowerFlex 40P*
One (1) 1763-L16BBB MicroLogix 1100
One (1) 1203-USB*
One (1) PC with DriveExplorer Software (version 5.01 or later)*
One (1) 1606-XLS 24V power supply
One (1) 2711C-T6C PanelView C600

# Objective

---

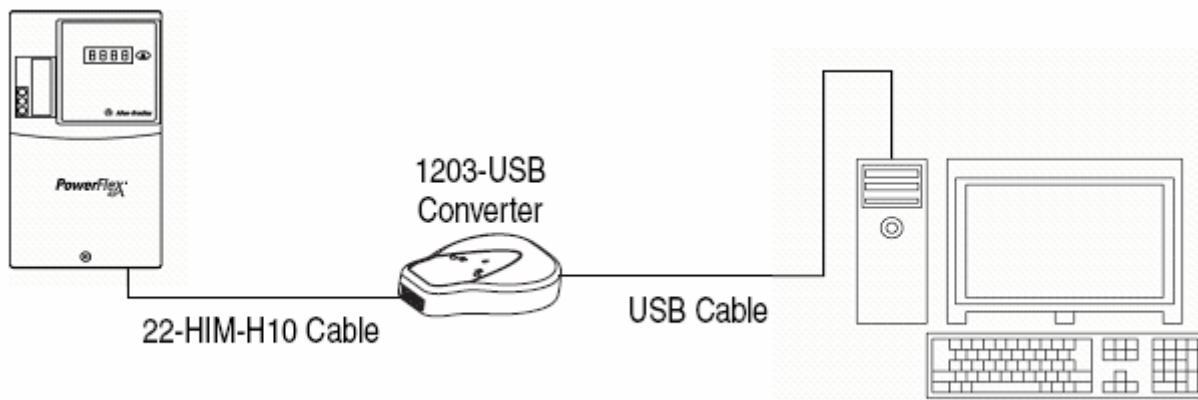
The follow configurations are provided for setting up the PowerFlex 40P in position control mode using StepLogic Setup Position Wizard within DriveExplorer software. Once created, establish communication between the drive, micrologix, and Pvc as outlined in the Position QS. This application example will simulate a smart position sequence where position, logic, and dwell time at position are dependent on the operations being performed on the work piece as it moves down an assembly line.

# Configuration

## Connecting the Drive to the Computer



**ATTENTION:** High Voltage Shock Hazards and Arc Flash Hazards Exist. Do not remove cover unless ALL power is removed. Verify this by checking if the Power switch is in the off position or by unplugging the drive demo. The front cover must be in place prior to applying power to the PowerFlex 40P demos. During this lab, do not remove the covers.



1. Install the 1203-USB Driver onto your PC included with the device.
2. Connect the USB cable to the Converter.
3. Connect the USB cable to computer USB port.
4. Connect the 22-HIM-H10 Cable to the Converter.
5. Remove the cover and connect the RJ485 connector to the DSI port on the PowerFlex 40P.
6. Turn on the PowerFlex 40P power, the Converter gets it power from the drive.

# Connecting the Equipment

---

1. With the power off, wire the motor and incoming power to the PF40P
2. Wire the encoder.
3. Apply appropriate 3 phase power to the drive.



# Connecting the PowerFlex 40P with DriveExplorer

1. Install DriveExplorer™ from the CD included with the 1203-USB device. If you want to control the drive or Autotune from the software you will need DriveExplorer Full.
2. Click the Windows Start button. From the resulting menu select **Programs > DriveExplorer Application > DriveExplorer**.

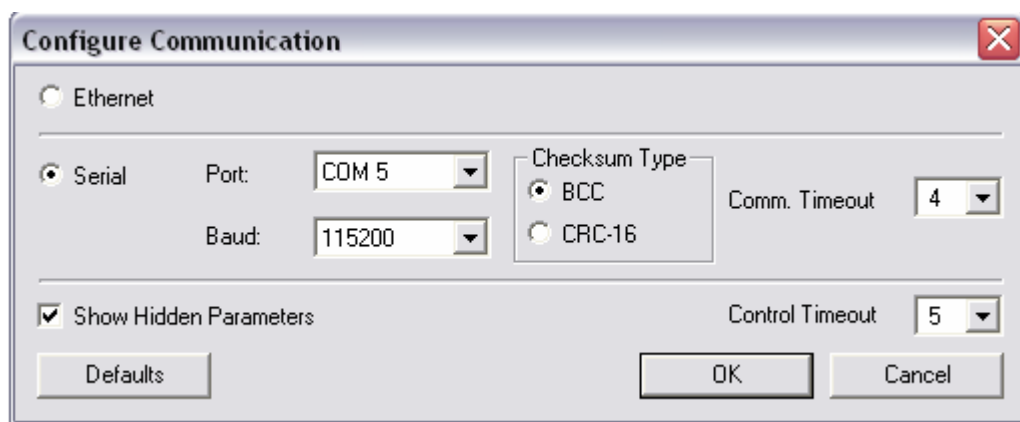
If there is a DriveExplorer shortcut on the desktop, you may double-click it to launch the application.



3. If the Danger dialog appears, read it and click **OK**.
4. Maximize the DriveExplorer window, so it fills the entire screen.

RSLink may compete for control of the computer's serial port. If RSLink is running, right-click on its icon in the service tray of the computer's task bar, and select **Shutdown RSLink**.

5. Click on Explore > Configure Communications. Modify the window as below. Port number may vary on different computers.

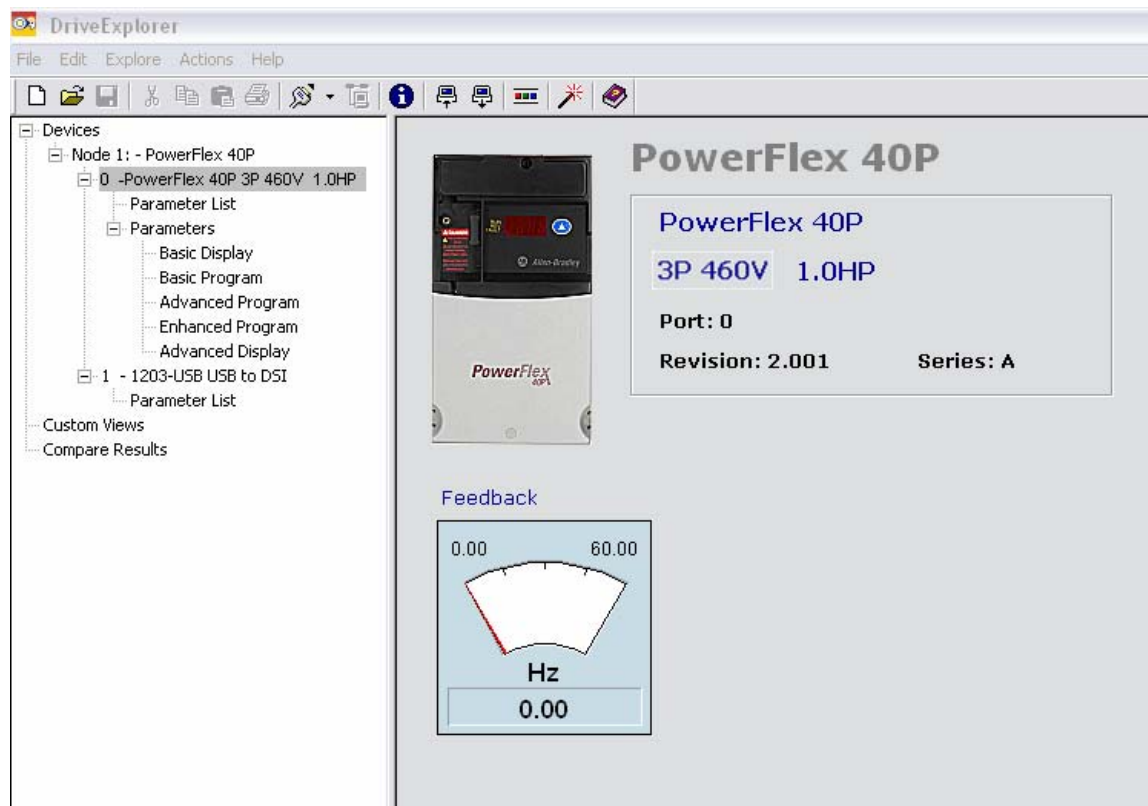


6. Click **OK**.
7. Click **Explore > Connect > Serial Point-to-Point** from the menu.

You can also click on the Connect to Serial Point-to-Point button.



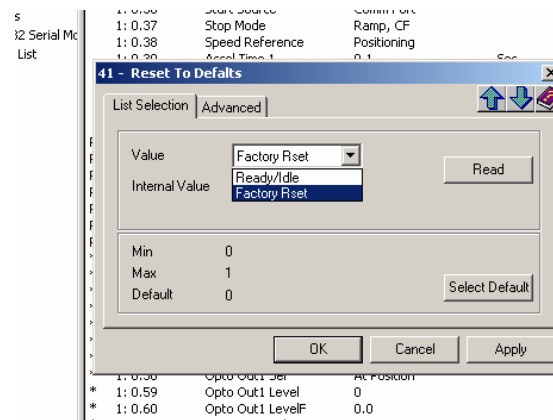
This PowerFlex 40P screen should appear.



- NOTE: If this screen does not appear, your communications may be configured improperly. Check 'Configure Communication' under Explore in the menu bar.

# Resetting Defaults and Performing Autotune

1. Select Parameter List in the left file structure window of DriveExplorer.
2. Within the Linear List, double-click on parameter 41 [Reset To Defaults] and select **Factory Reset**. Click **OK**.



3. The Drive will fault and display a Flashing F048 Fault, indicating that the drive has been reset to its factory default state. **Push and hold the Display Scroll/ Fault Reset Button for about 3 seconds to clear the active fault.** Alternately, the fault can be reset by the stop button on the Control Bar.



**Display Scroll & Fault Reset Button**

Performing a dynamic Autotune on the 40P connected to the motor will provide optimum performance for controlling the motor in both positioning and speed control modes.

4. Enter motor data needed for the Autotune:

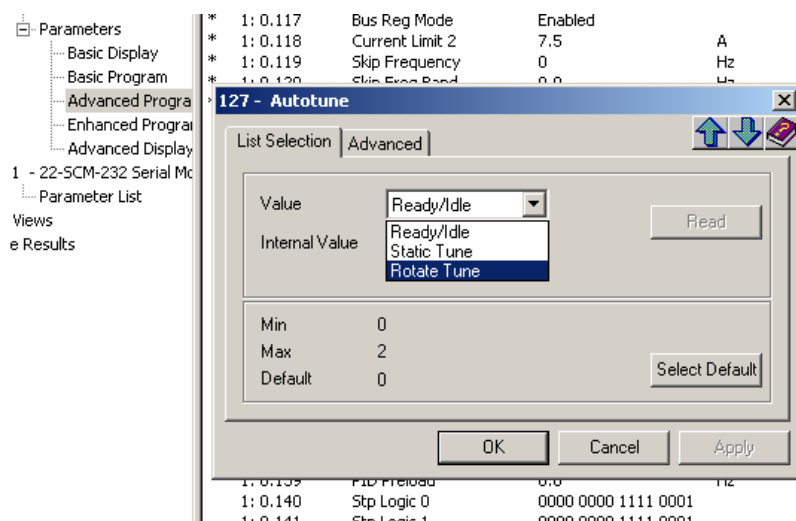
Set the value of parameter P126 [Motor NP Amps] to 1.7 (Amps). This matches the motor on the conveyor demo.


**NOTE:** If the motor is different than a 4 pole motor, you must also set parameter E217 [Motor NP Poles] in the Enhanced Program Group to the proper number of poles

5. To perform the dynamic Autotune, double-click parameter A127 [Autotune] (located in the Advanced Program Group).

Select **Rotate Tune** for the value of the parameter.

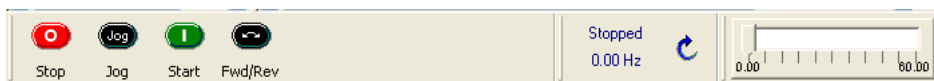
Click **OK** to continue




6. Launch the Control Bar by clicking this button  on the tool bar of DriveExplorer.

If the Danger dialog appears, read it and click **OK**.


The control bar should appear at the bottom of the DriveExplorer window.



7. Click Start  to perform Autotune, the drive will run up to 45Hz, and then decelerate to a stop when Autotune is complete.

The Autotune algorithms energize the motor and makes measurements. The algorithms use these measurements to make parameter settings, which account for motor losses, like IR drop. These settings improve the drive's control of the motor, making for more accurate speed and position control.

A Rotate tune provides better results than a Static tune. A Static tune provides good results when it is not possible to perform a Rotate tune.


8. You cannot run the Position StepLogic Wizard while the Control Bar is active.
9. After Autotune is complete, disable the Control Bar by clicking this button  again.

Click **Yes** in the resulting dialog window.

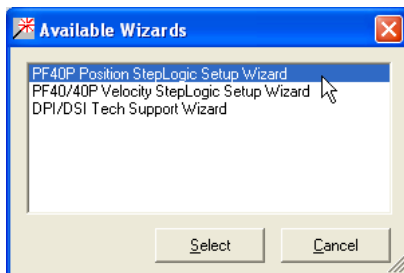
The Control Bar should disappear from the bottom of the DriveExplorer window.

# Indexing Loop Using Incremental Moves

Use the Position StepLogic Wizard to configure a PowerFlex 40P for a basic index positioning application.

1. Launch the Wizard Browser by clicking this button  on the tool bar of DriveExplorer

**❗ IMPORTANT:** You cannot launch the wizards with the control bar active. You must shut down the control bar to access the wizards.



Select **PowerFlex 40P Position StepLogic Setup Wizard** in the resulting window, and then click **Select**. You will see the following Dialog box appear:



2. Click on **Next**.

Click on the **Select Positioning** button, and then change the settings to match the figure shown below:

**PowerFlex 40P Position StepLogic Setup Wizard - (2 of 12)**

Wizard Step

- ✓ Welcome
- ✓ **Common Settings 1\***
- Common Settings 2
- Position Step 0
- Position Step 1
- Position Step 2
- Position Step 3
- Position Step 4
- Position Step 5
- Position Step 6
- Position Step 7
- Pending Changes

### Common Settings 1

To activate the Position StepLogic function:  
[Speed Reference] = "Positioning"  
[Reverse Disable] = "Rev Enable"  
[Motor Fdbk Type] = "Quadrature"

Speed Reference:  **Select Positioning**

Reverse Disable:

Motor Fdbk Type:

Enter the desired values for each Acceleration/Deceleration time and the Max Frequency

Acceleration1:  Sec    Deceleration1:  Sec

Acceleration2:  Sec    Deceleration2:  Sec

Max Frequency:  Hz

#### Digital Inputs

**Select Typical Settings**

Digital In 1:

Digital In 2:

Digital In 3:

Digital In 4:

#### Digital Outputs

**Select Typical Settings**

Relay Out Sel:

Opto Out1 Sel:

Opto Out2 Sel:

The "Select Typical Settings" buttons select a digital I/O configuration that will work with a typical Positioning application. You can use them for quick setup. The Positioning Parameters, Digital Input, and Relay Output Selections can be set manually using the drop down boxes but for this exercise the defaults are appropriate.



**ATTENTION:** Motor Feedback type must be set to Quadrature (or Quad Check with FRN 2.0 and greater) for Positioning Mode. All other feedback modes may be used in Velocity Control mode.

Click **Next**.

3. On the Common Settings 2 window, you configure the Position Mode, the feedback device and the Find Home Frequency. In addition, you tell the drive how many counts there are per unit, in this case we will set the units up to equal one motor revolution.

Change the settings to match those show below:

The screenshot shows the 'Common Settings 2' window of the PowerFlex 40P Position StepLogic Setup Wizard. The window title is 'PowerFlex 40P Position StepLogic Setup Wizard - (3 of 12)'. On the left, a 'Wizard Step' list includes 'Welcome', 'Common Settings 1\*', 'Common Settings 2\*' (selected), 'Position Step 0', 'Position Step 1', 'Position Step 2', 'Position Step 3', 'Position Step 4', 'Position Step 5', 'Position Step 6', 'Position Step 7', and 'Pending Changes'. The main area is titled 'Common Settings 2' and contains the following settings:

- Pos Mode:** A dropdown menu set to 'Step Logic'.
- Encoder PPR:** A text box containing '250'.
- Motor NP Poles:** A text box containing '4'.
- Find Home Freq:** A text box containing '10.0'.
- Find Home Dir:** A dropdown menu set to 'Forward'.
- Counts Per Unit:** A text box containing '1000'.

On the right, there is a 'Tuning Parameters' section with the following settings:

- Pos Reg Gain:** A text box containing '3.0'.
- Pos Reg Filter:** A text box containing '8'.
- Ki Speed Loop:** A text box containing '2.0'.
- Kp Speed Loop:** A text box containing '0.5'.

At the bottom right, there are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish >>'.

With this Quadrature encoder, one motor revolution (1024 PPR \* 4 for Quadrature Encoder = 4096 counts/revolution)

Click **Next**.

4. Position Step windows allow you to configure each Step in the StepLogic Program. When in the Positioning Mode, StepLogic allows for up to 8 preset positions to be defined and the time base and/or logic criteria needed to transition from Step to Step in any order.

On Action tab for Step 0:

- Set Position, in user defined units, to 5
- Set Time to 5 seconds
- Set the Preset Frequency to 30 Hz

5. Select a command type, or move type to Incremental.



This will cause the 40P to move 5 user defined counts from its current position.

PowerFlex 40P Position StepLogic Setup Wizard - (4 of 12)

Wizard Step

- ✓ Welcome
- ✓ Common Settings 1
- ✓ Common Settings 2
- ✓ Position Step 0
- Position Step 1
- Position Step 2
- Position Step 3
- Position Step 4
- Position Step 5
- Position Step 6
- Position Step 7
- Pending Changes

### Position Step 0

Position: 5 Units  Time: 5.0 Sec

Preset Frequency: 30.00 Hz

Action | Logic

Select the desired direction from home: Forward

Select the acceleration and deceleration rates to use: Accel/Decel 1

Select the desired state for the logic output: Off

Select the desired type of command: Incremental

Step: 0 1 2 3 4 5 6 7

Position

Time (Sec)

Logic

	step 0	step 1	step 2	step 3	step 4	step 5	step 6	step 7
Next:	step 0	step 1	step 2	step 3	step 4	step 5	step 6	step 7
Jump:	---	---	---	---	---	---	---	---
Position:	Incremental	Absolute	Absolute	Absolute	Absolute	Absolute	Absolute	Absolute

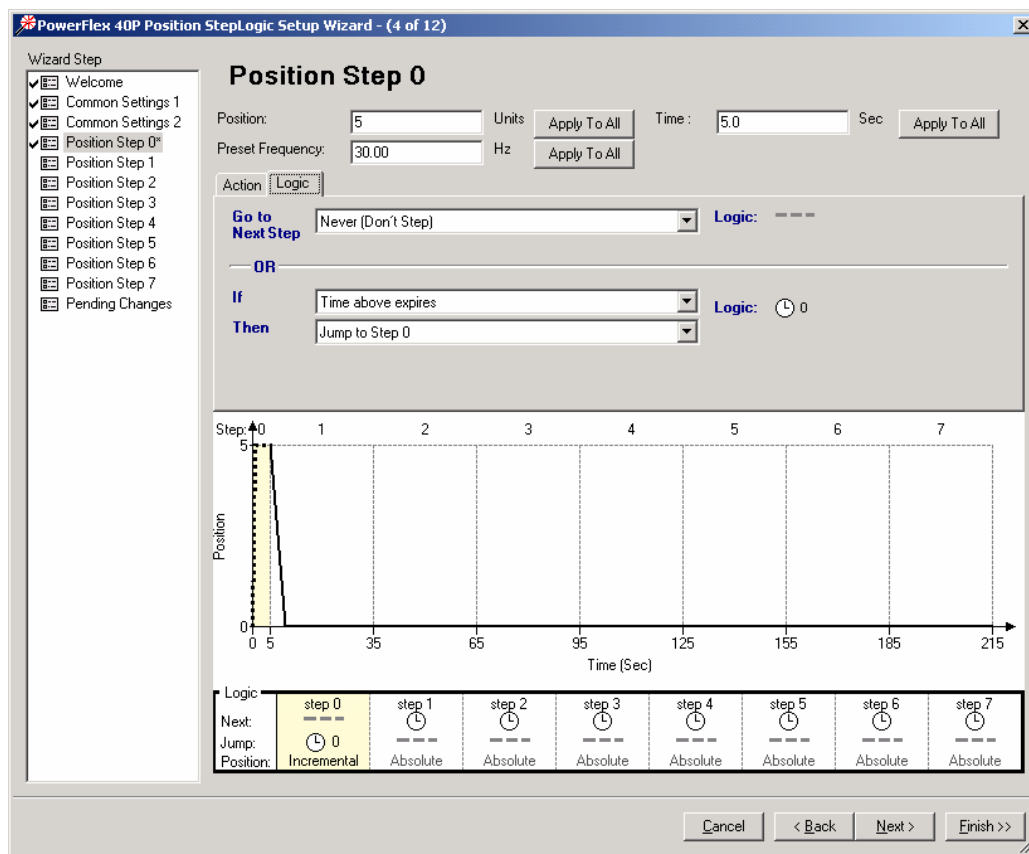
**TIP:** The default setting for direction, acceleration and deceleration, and logic output are acceptable for this exercise, however, they can be changed here if needed.

Click on the **Logic** tab.

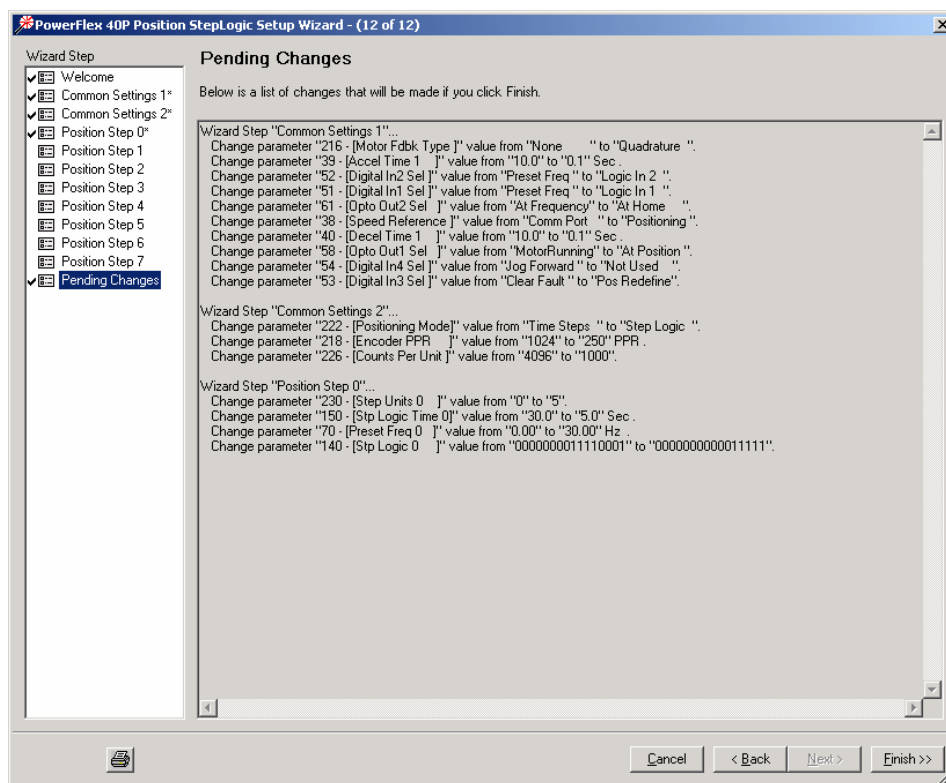
The Logic tab defines two conditions: 1.) Condition to **Go To Next Step** and 2) An **IF** Condition that will **Then** cause a jump to another step. These two conditions are logically **ORed**.


6. On Logic tab for Step 0:

- Select **Never [Don't Step]** in the “Go to Next Step” drop down Box. This means the drive will never go to the next step, but instead will only jump according to the **IF Then** logic programmed for this Step setup next.
- Set logic evaluation in “If” statement drop down box to **Time above expires**. This means the drive will jump to some step after time expires (five seconds in this case).
  1. Then set logic action if true in “Then” drop down box to **Jump to step 0**. This means the drive will jump back to Step 0 after the time expires.





Click **Pending Changes**, this will show you a list of parameters that will change based on the settings you made in the StepLogic wizard. This will show the Change from settings to Change to settings for record.



Note: You can push the  icon on the lower left hand of this dialog box and print these changes to include in documentation for the application troubleshooting or documentation in the field.

Click **Finish**. The wizard will write your changes to the drive.

- Launch the Control Bar by clicking this button  on the tool bar of DriveExplorer.
- Watch the motor shaft rotate. This represents a work piece indexing through the application you just programmed.
- Click the start  on the control bar to run the Indexing program. The program will continue to run until you push stop.
- The motor shaft should begin incrementing 5 units every 5 seconds. Notice the performance of the move. The shaft will slow down and creep into final position. This can be improved by tuning the position regulator

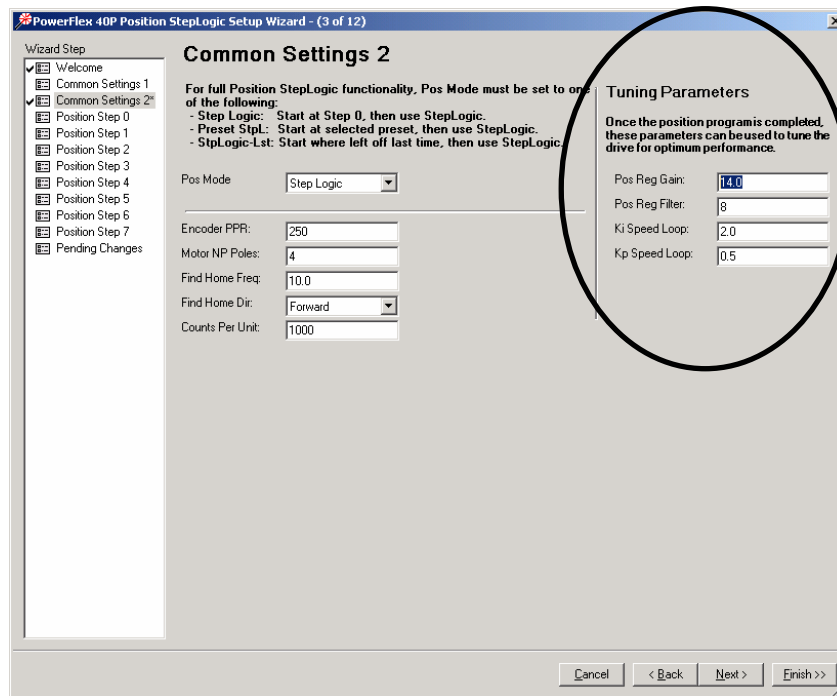
# Tuning of the Position Regulator

The Position Regulator Gain, parameter E247 [Pos Reg Gain], is located in the Enhanced Program Group. This is a single adjustment for increasing or decreasing the responsiveness of the position control regulator. For faster response, the gain should be increased and for slower response it should be decreased. The default value is 3 and will result in stable but slow response in most applications.

Run the application for each of the following gain settings. Accessing parameter E247 [Pos Reg Gain] from the linear list, change its value to 8, then to 20 then to 14. You will notice that below 14, the motor shaft creeps into position and above 14 it overshoots and reverses into position. Therefore, 14 is the optimum setting for this setup. Leave this set at 14 for the remainder of the lab.

Now go to parameter E230 [Step Units 0] via the Parameter List and change the units for this incremental move. Note that the drive allows this to be changed while running and executes the new position on the next move. This provides a flexible solution that allows dynamic position commands over communication networks.

**Note:** You can also access the position tuning parameters using the StepLogic Setup Wizard and the Common Settings 2 tab



1. Stop the drive by clicking the stop  button.

# Absolute Move with Multiple Steps

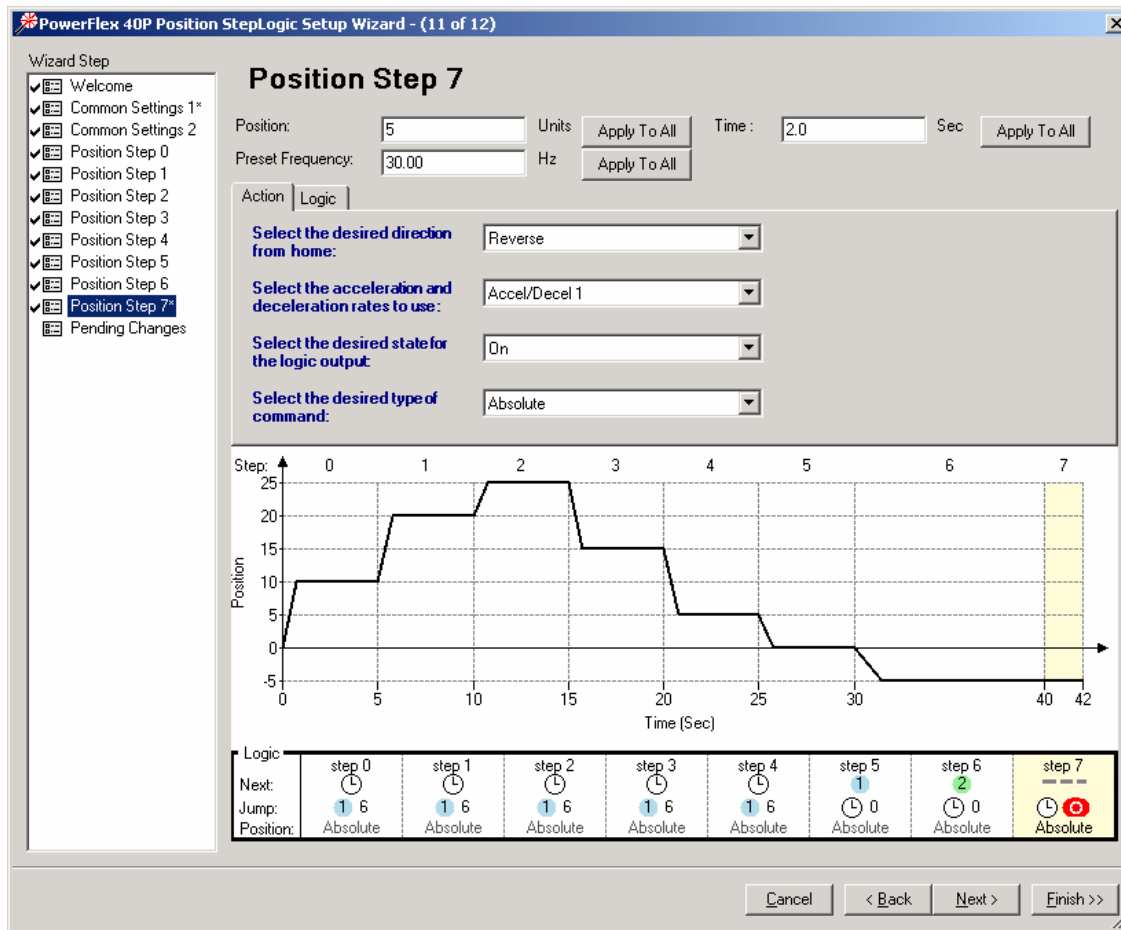
Example set up of an 8 Position StepLogic program using Absolute moves with time and digital input based logic. Unlike Incremental moves, Absolute moves are always referenced to “home”.

1. Follow the same Procedure located in step 4 of the first exercise to program this application using the Position StepLogic Setup Wizard.
2. Change the Digital Output Relay Out Sel to StepLogic Out on the Common Settings One Tab. Use this to indicate when the application has shut down due to a fault condition.
3. Proceed to setup the Position Steps to match the table below.

**TIP:** You can select each step by simply clicking on the graph and use your mouse to drag the lines on the graph to modify the time and position for each step.

Position Step	Move Profile		Action		Time (sec)	Selected Move Type	Logic			
	Position	Preset Frequency	Desired Output	Direction			Go to Next Step	OR	If	Then
0	10	30	Off	Forward	5	Absolute	When above Time expires		Logic In1 is On	Jump to Step 6
1	20	30	Off	Forward	5	Absolute	When above Time expires		Logic In1 is On	Jump to Step 6
2	25	30	Off	Forward	5	Absolute	When above Time expires		Logic In1 is On	Jump to Step 6
3	15	30	Off	Forward	5	Absolute	When above Time expires		Logic In1 is On	Jump to Step 6
4	5	30	Off	Forward	5	Absolute	When above Time expires		Logic In1 is On	Jump to Step 6
5	0	30	Off	Forward	5	Absolute	If Logic In1 is On		Time above expires	Jump to Step 0
6	5	30	Off	Reverse	10	Absolute	If Logic In2 is On		Time above expires	Jump to Step 0
7	5	30	On	Reverse	2	Absolute	Never [Don't Step]		Time above expires	End Normal Stop

- When complete, your application should like the following in the Position StepLogic Setup Wizard:



- Click Finish (and Yes to the pop up dialog box if it appears)
- Displaying Step Status on the drive:
  - For trouble shooting it is recommended that you display the StepLogic Status on the 40P display. To do this, you first need to expand the parameters you can view.
  - Via the Parameters list, Enhanced Program Group, locate and double click on parameter E201 [LED Display Opt] and select Basic Display and click Ok.
  - Now scroll via the blue scroll button on the 40P until you get to d028
  - This will now show you what step the drive is presently in.

# Homing Sequence

Follow these steps to home the conveyor:

1. From the Linear List, locate and double click on parameter E248 [Enh Control Word] and check Pos Redefine and click Ok. This will reset the home position to the current position.

Note: This can also be done by programming a Digital Input to Pos Redefine.

2. Verify that it has been homed by looking to see that the Opto 2 lamp on the front of the conveyor illuminates. This indicates that the current position is home.



You can also verify that it is at home by viewing A308 [Units Traveled H] and A309 [Units Traveled L], they should both read 0 when the drive has been homed.

3. Open the Enhanced Control Word and uncheck Pos Redefine, and click Ok.

Note: Failure to uncheck this bit will cause the encoder counts to remain at zero.




**ATTENTION:** The drive does not automatically clear any of the bits in parameter 248 [Enh Control Word]. If these bits are left on unintentionally or if digital inputs are left on, commanding home or some other unintended function, undesired operation can occur. Be sure to reset these bits and verify the digital input status before starting.

4. Launch the Control Bar by clicking this button  on the tool bar of DriveExplorer.
5. Place a block at the end of the conveyor, opposite the Motor. This represents the work piece indexing through the application you just programmed.
6. Click the start  button on the control bar to run the Indexing program.
7. While the application is running, you can observe the current position in user defined units by viewing parameters E308 [Units Traveled H] and E309 [Units Traveled L]. The drive will

cycle through Steps 0 through 5 based solely on time.

8. Recall that in your application program you created logic based moves for each Position Step, Logic In1 and Logic In2. These inputs can be controlled by digital inputs, parameter E248 [Enh Control Word], or through the Position version of the Control Word over DSI if you have FRN 2.01 or greater.. In this exercise we will use the Enhanced Control Word.

In order to access the Control and Status word bit definitions for position you need to parameter E249 [Cmd Stat Select] to "1" Position. Default setting is to match PowerFlex 40.

1. Open E248 [Enh Control Word], Check Logic In 1, and then click Apply. This will cause the application to jump to Step 6 and then restart at Step 0. This could represent a reset in the process. Uncheck Logic In 1 and then click Apply.
  2. Check Logic In1 again and then click Apply. Then, check Logic In2 and then click Apply. This will cause the application to end and the drive will stop. This could represent a fault and shut down of the process. Note the Relay Out pilot light will illuminate when this state is reached providing the operator with some indication that the application has faulted.
9. Stop the drive by clicking the stop  button.





# Absolute Move with Automatic Find Home Routine using a Sensor on a Conveyor

Manually homing via the “Pos Redefine” function may work in some applications, but many applications will need a more automated method of finding and resetting home upon power up. This example demonstrates how to add automatic homing functions to the program provided in the previous example.

1. Configure the hardware to locate a home limit and max travel limit. Place a sensor on the conveyor machine. This will represent the application “home.”
2. Place another sensor on the conveyor several feet away from the first. This will represent the application travel limit.
3. Using the parameter list while on line with Drive Explorer, program the following parameters:

Parameter	Setting
A052 [Digital In2 Sel]	Home Limit
E202 [Digital Term 3]	Find Home
E224 [Find Home Dir]	Reverse

4. Place a block in the middle of the conveyor near the motor end.
5. Based on parameter E202 [Digital Term 3], this input has been reprogrammed as a “Find Home” input.
6. Start the drive, by clicking the start  button. This initiates a Find Home command. The drive will now run in the reverse direction until it crosses the “Home Limit” input. Once there, it will pause about 1 second and then stop. The drive is now at home and the position has been reset to zero. You can verify this by checking parameters E308 [Units Traveled H] and E309 [Units Traveled L].
7. Disable the “Find Home” command by toggling the switch and restart the drive. The drive should again move through the positions based on this new home. Remember that the second sensor is wired as “Logic In1”. Allow a big block to move past this sensor and note the behavior. This second sensor is looking for an over travel, and when activated, the StepLogic program will jump to Step 7 and stop the drive. This could represent a fault condition and a required operator reset. Stop the drive by clicking the stop  button.

Note: The PowerFlex 40P supports incremental encoders only, therefore, if absolute position is required in the application regardless of power cycling, a homing routine like position redefine or find home will need to be run every time the drive is powered down and up again.

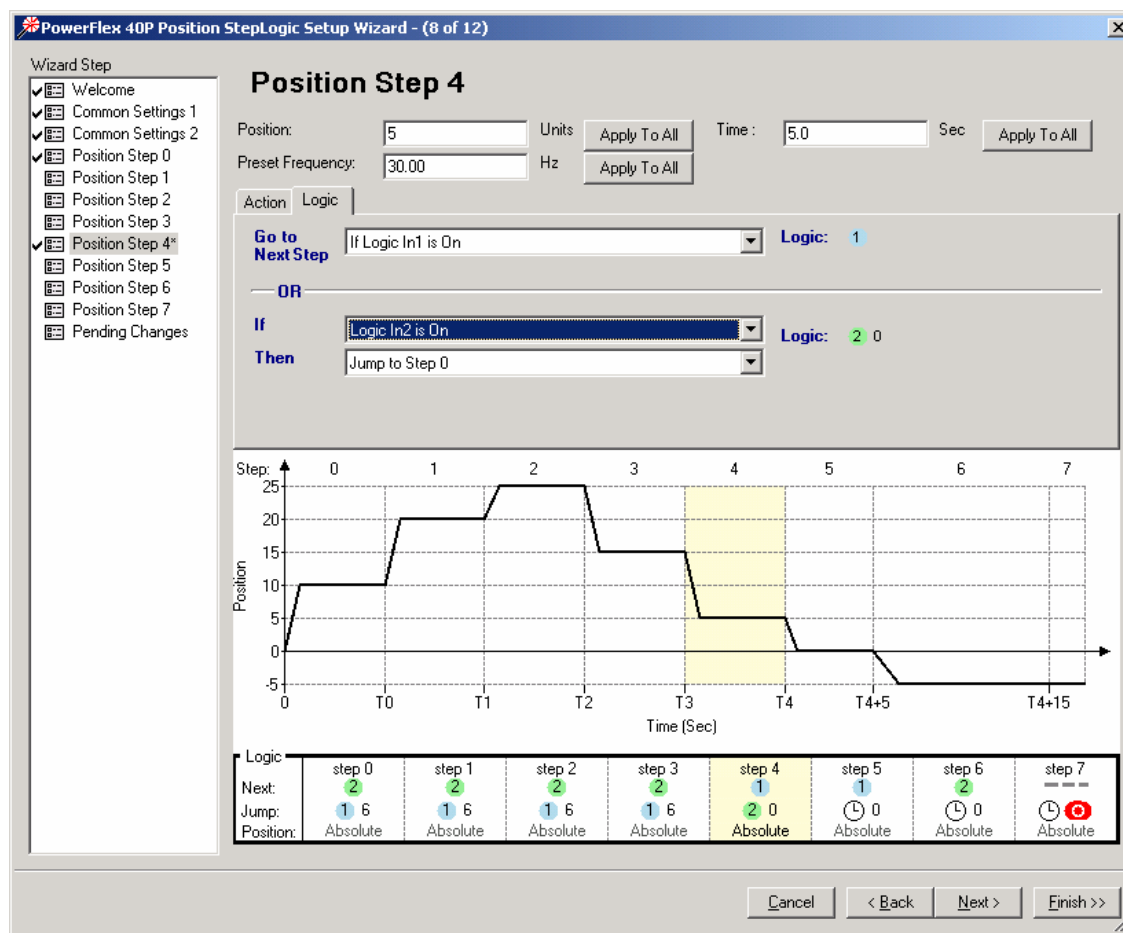
# Absolute moves with digital input.



Some applications require the machine operator to be able to toggle between steps. This example shows how you could modify the previous StepLogic program to achieve this functionality.

Starting with the program created in the last exercise, modify the routine so that it moves through Steps 0 through 5 based on the status of the “Direction” input. Remember, on the PowerFlex 40P the Digital Terminal 03 can be programmed for any digital input function, including Logic In1 and Logic In2.

Note: Only one Digital Input can be programmed for Logic In1 or In2 at a time, therefore, you will need to change the Digital In 2 to Not Used on Common Settings 2 tab in the Wizard or via the parameter list.

1. When complete, your StepLogic program should look like this:



2. Start the drive, by clicking the start  button from the control bar
3. Toggle the input switch that you programmed as LogicIn 2 and watch the block move through positions 0-4 as programmed in the StepLogic program.
4. Note: Logic In1, which you can toggle with the Enhanced Control Word, will still result in resetting the application as before
5. Stop the drive by clicking the stop  button

# Absolute moves using Presets

Some applications require the ability to select one of the pre-programmed Position Steps via digital inputs or over the network. This application will show how you can use the Preset Position digital input truth table to achieve this functionality.

1. Starting with the program you created in the last exercise, modify the routine so that it moves through Steps 0 through 7 based on the direct control of the preset inputs.
2. Program three digital inputs as Presets.

A51 [Digital In1 Sel ]	Preset Freq (just Preset in FRN 2.01 or greater)
A52 [Digital In2 Sel ]	Preset Freq (just Preset in FRN 2.01 or greater)
A53 [Digital In3 Sel ]	Preset Freq (just Preset in FRN 2.01 or greater)

3. Change E222 [Positioning Mode] to Preset Input



Note: In this mode, the drive ignores the Other StepLogic commands and jumps between the 8 preset positions based on the status of the Preset Inputs per an input truth table.

4. 3 Digital Input Truth Table:

0 = Off, and 1 = On

Input State of Digital In 1 (I/O Terminal 05 when A051 = 4)	Input State of Digital In 2 (I/O Terminal 06 when A052 = 4)	Input State of Digital In 3 (I/O Terminal 07 when A053 = 4)	Freq Source	Position Source (when P038 = 9)	Accel / Decel Parameter Used <sup>(2)</sup>
0	0	0	A070	E230	[Accel Time 1] / [Decel Time 1]
1	0	0	A071	E232	[Accel Time 1] / [Decel Time 1]
0	1	0	A072	E234	[Accel Time 2] / [Decel Time 2]
1	1	0	A073	E236	[Accel Time 2] / [Decel Time 2]
0	0	1	A074	E238	[Accel Time 1] / [Decel Time 1]
1	0	1	A075	E240	[Accel Time 1] / [Decel Time 1]
0	1	1	A076	E242	[Accel Time 2] / [Decel Time 2]
1	1	1	A077	E244	[Accel Time 2] / [Decel Time 2]

Note: E230 = Position Step One, E232 = Position Step 2, etc

5. Set the three Input switches to move to Position 4
6. Start the drive, by clicking the start  button from the control bar to move to that Position.
7. Stop the drive by clicking the stop  button
8. Repeat the process for other steps.

Note: In FRN 2.01 and greater, Presets are supported via the Position based Control Word allowing for Preset Command control over communications.