

PID Server

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PID Server

The PID Server PC utility enables you to auto-tune PID loops for both the Vision and M90/91 controller series. Although it is installed as part of the VisiLogic/U90 Setup, PID Server runs independently of other Unitronics software.

How Auto-tune works

The PID Server utility tunes a PID loop by temporarily disabling the PLC's PID function, and tuning the loop while the PC controls the PID output.

To enable a PID loop to be auto-tuned:

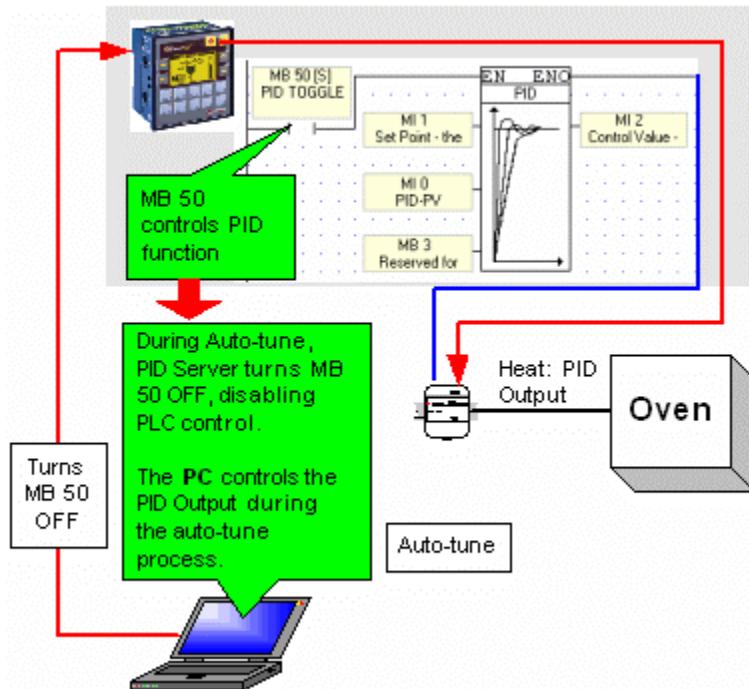
- The controller must be connected to the I/O module whose output feeds energy into PID system.
- The PC running PID Server must have an established communication link to the controller.
- The PID Server parameters must be linked to the same operands linked to the PLC's PID function.

Note ♦ PID Server will only work with Vision 3.73 and U90 3.70.
and higher projects saved with the most current version of VisiLogic. To update
older projects, open them with the current VisiLogic version and save them.

Vision Auto-tune

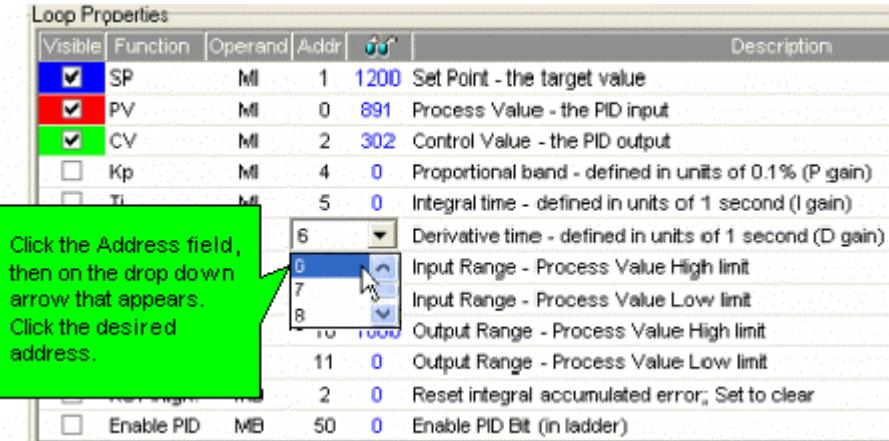
Before a PID loop can be auto-tuned:

- The OPLC must be connected to the I/O module whose output feeds energy into the PID-controlled system.
- The OPLC must be installed with a Ladder application that **contains a PID function; the function must be activated by an MB that is used only for that purpose**. When the loop is auto-tuned, the PID Server utility uses this MB to disable the PLC's PID function.
- The PC running PID Server must have an established communication link to the controller.
- The PID Server parameters must be linked to the same operands linked to the OPLC's PID function.

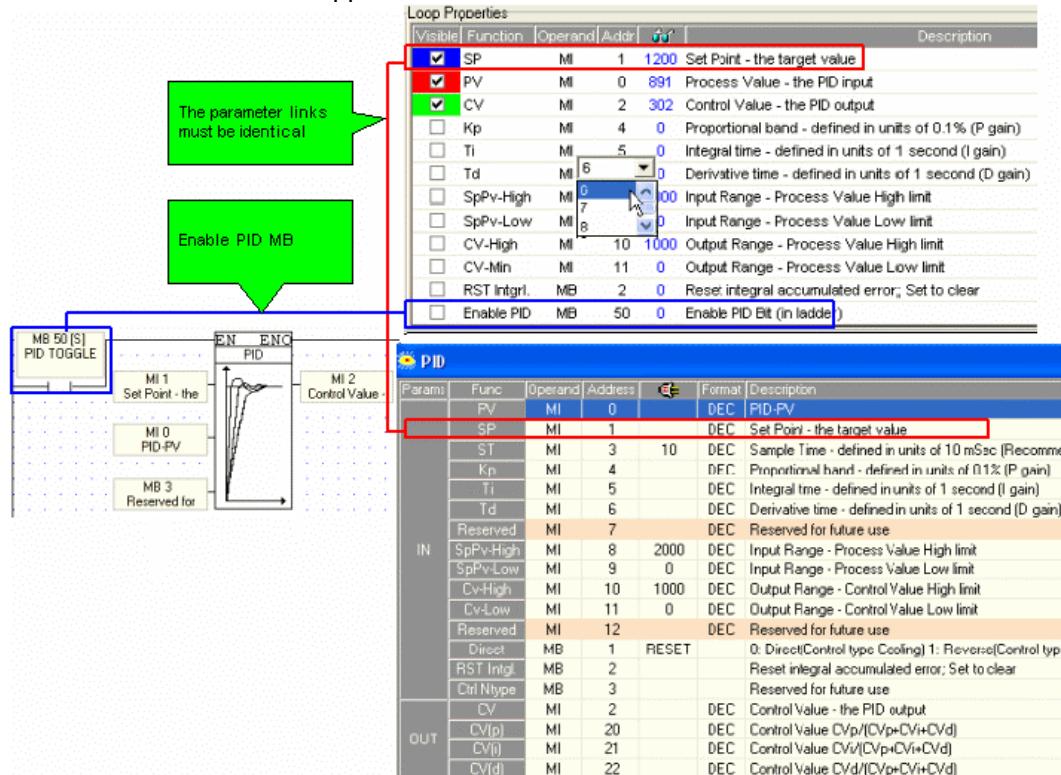


Auto-tuning with PID Server (Vision)

1. Start PID Server from:
 - within VisiLogic via the menu bar, Tools> PID Server,
or
 - within Windows via Start>Programs>Unitronics> PID Server.
2. Click on the New File icon to create a new PID loop Auto-tune file.
3. Locate Loop Properties in the lower right-hand part of the screen.
Link all of the parameters to the same operands used in the PID function within the Ladder application. To link a parameter, click on the Address field and select the desired address.

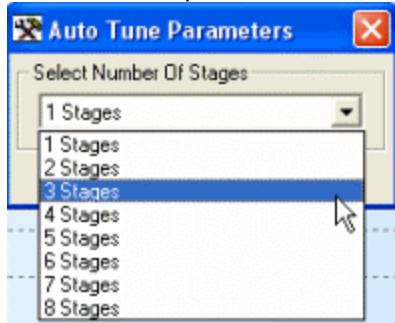


The last parameter is the Enable PID bit, which must be the MB used to activate the PID function within the Ladder application.



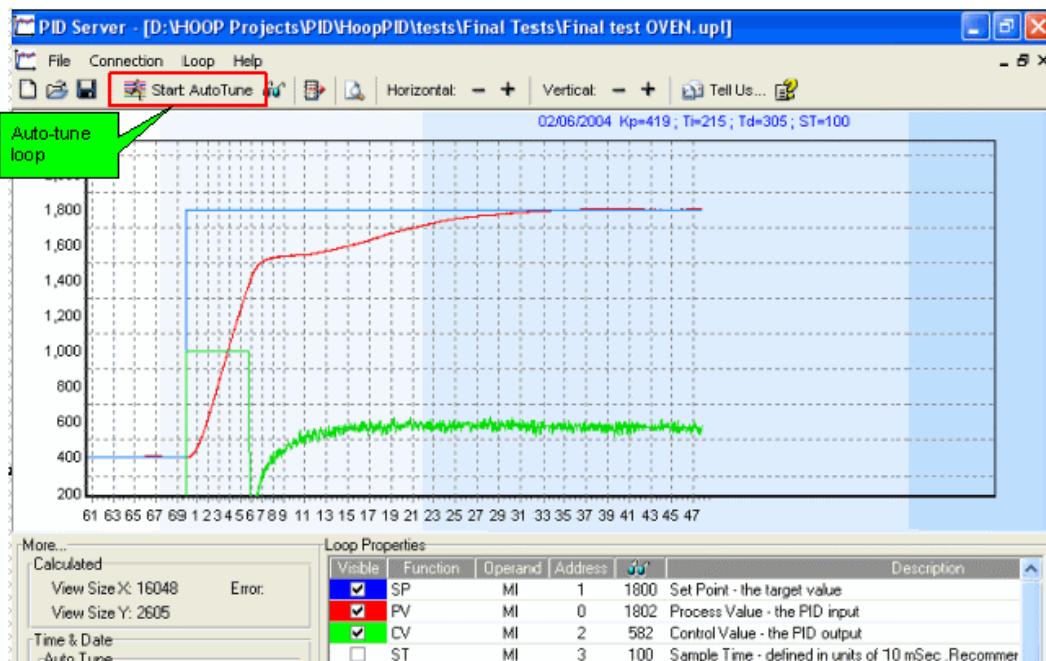
4. From the Connection menu, click OPLC model, and then select your controller type.
5. From the Connection menu, click Communication - PC Settings, and select the appropriate settings.
6. Click the Auto-tune icon. The Stages box opens.

7. Click on the drop-down arrow to select the number of desired Stages, which is the number of samples that Autotune will use in order to analyze the system.



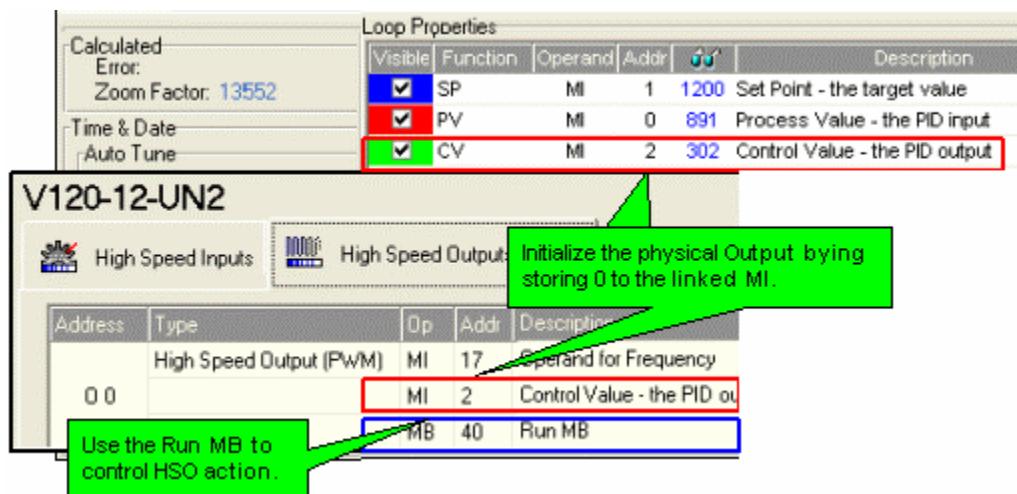
8. Click OK; the PID Server utility begins to run.

Note that by checking the Visible option in Loop Properties, you cause PID Server to display a color-coded graphical representation of the Auto-tune process.



Controlling the Physical Output

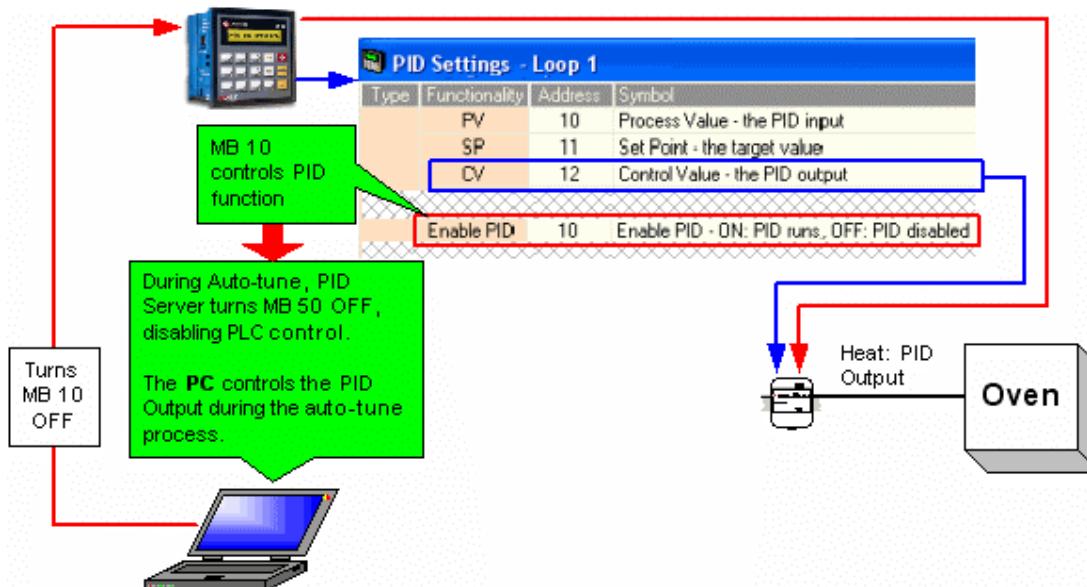
Before beginning auto-tune, you may want to control and initialize the actual physical output that feeds energy into the PID-controlled system. If, for example, you are using a V120-12-UN2, you can suspend the action of a high-speed output by using Ladder Logic to turn off the Output's Run MB, and initialize the output by storing 0 into the linked MI in the Ladder program.



M90/91 Auto-tune

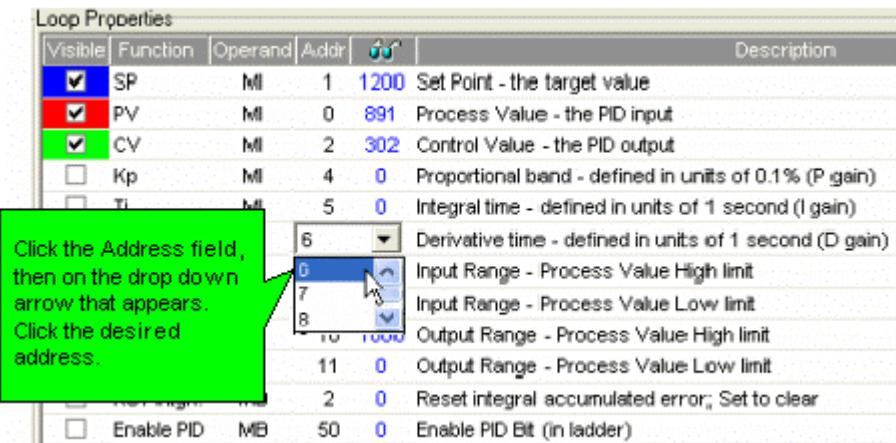
Before a PID loop can be auto-tuned:

- The OPLC must be connected to the I/O module whose output feeds energy into the PID-controlled system.
- The OPLC's Ladder application must **contain a PID function that is activated by an MB that is used only for that purpose**. When the loop is auto-tuned, the PID Server utility uses this MB to disable the PLC's PID function.
- The PC running PID Server must have an established communication link to the controller.
- The PID Server parameters must be linked to the same operands linked to the PLC's PID function.



Auto-tuning with PID Server (M90/91)

1. Start PID Server from:
 - within VisiLogic via the menu bar, Tools> PID Server,
 - or
 - within Windows via Start>Programs>Unitronics> PID Server.
2. Click on the New File icon to create a new PID loop Auto-tune file.
3. Locate Loop Properties in the lower right-hand part of the screen.
Link all of the parameters to the same operands used in the PID function within the U90Ladder application. To link a parameter, click on the Address field and select the desired address.

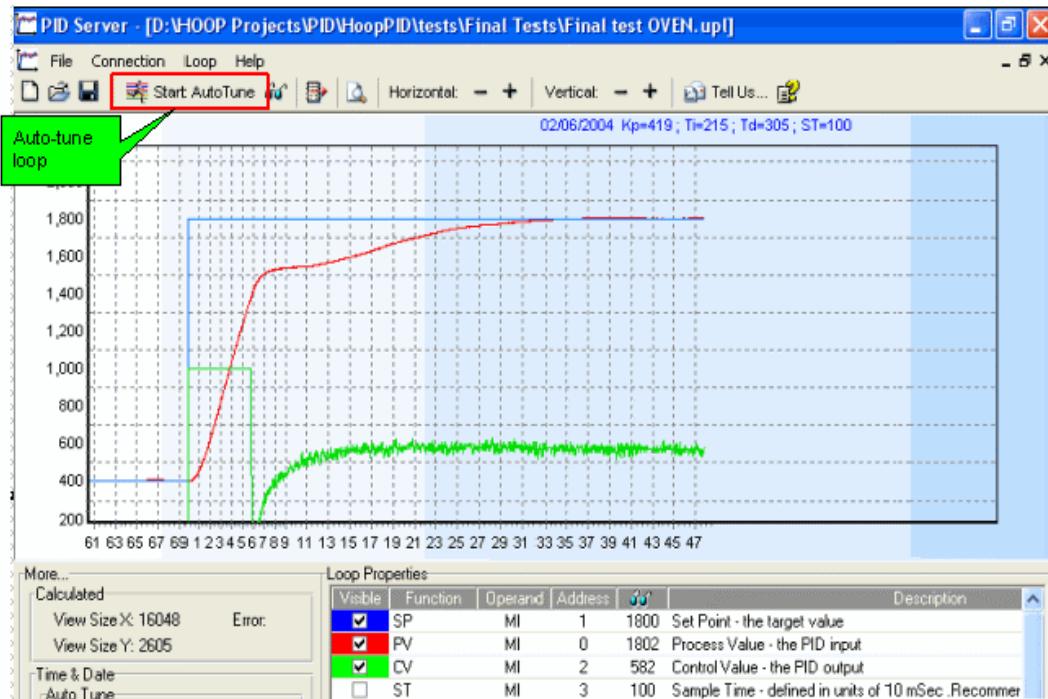


The last parameter is the Enable PID bit, which must be the MB used to activate the PID function within the U90Ladder application.

The screenshot shows two dialog boxes. The top one is 'Loop Properties' with the 'Enable PID' row selected. The bottom one is 'PID Settings - Loop 1' with the 'Enable PID' row highlighted. A red callout box points from the 'Enable PID MB' field in the properties dialog to the 'Enable PID' row in the settings table. Another green callout box points to the 'Enable PID MB' field with the text: 'The parameter links must be identical'.

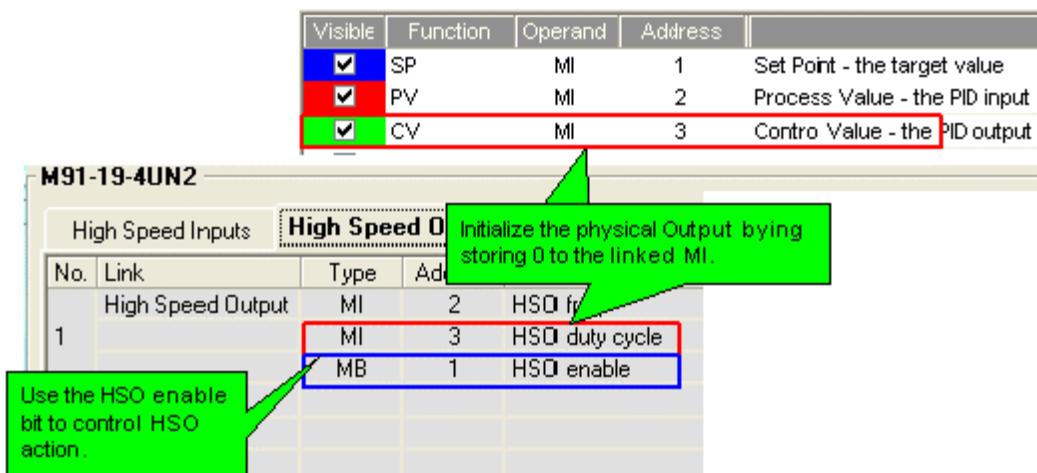
Type	Functionality	Address	Symbol
MI	PV	10	Process Value - the PID input
	SP	11	Set Point - the target value
	CV	12	Control Value - the PID output
	ST	13	SampleTime - defined in units of 10 mSec (Recommended value=100)
	Kp	14	Proportional band - defined in units of 0.1%
	Ti	15	Integral time - defined in units of 1 second
	Td	16	Derivative time - defined in units of 1 second
	Reserved	17	Reserved for future use
	SpPv	18	Process Value high limit - the maximum PV input value
		19	Process Value low limit - the minimum PV input value
CV	20	Control Value high limit - the maximum CV output value	
	21	Control Value low limit - the minimum CV output value	
	Reserved	22	Reserved for future use
		23	Reserved for future use
Enable PID	10	Enable PID - ON: PID runs, OFF: PID disabled	
Direct	11	Action: 0=Reverse(Heating), 1=Direct(Cooling)	
RST Intgl	12	Reset integral accumulated error - ON: Clear, OFF: Continue	

4. From the Connection menu, click OPLC model, and then select your controller type.
5. From the Connection menu, click Communication - PC Settings, and select the appropriate settings.
6. Click the Auto-tune icon. The PID Server utility begins to run.
Note that by checking the Visible option in Loop Properties, you cause PID Server to display a color-coded graphical representation of the Auto-tune process.



Controlling the Physical Output

Before beginning auto-tune, you may want to control and initialize the actual physical output that feeds energy into the PID-controlled system. If, for example, you are using an M91-12-UN2, you can suspend the action of a high-speed output by using Ladder Logic to turn off the Output's HSO Enable MB, and initialize the output by storing 0 into the linked MI in the Ladder program.



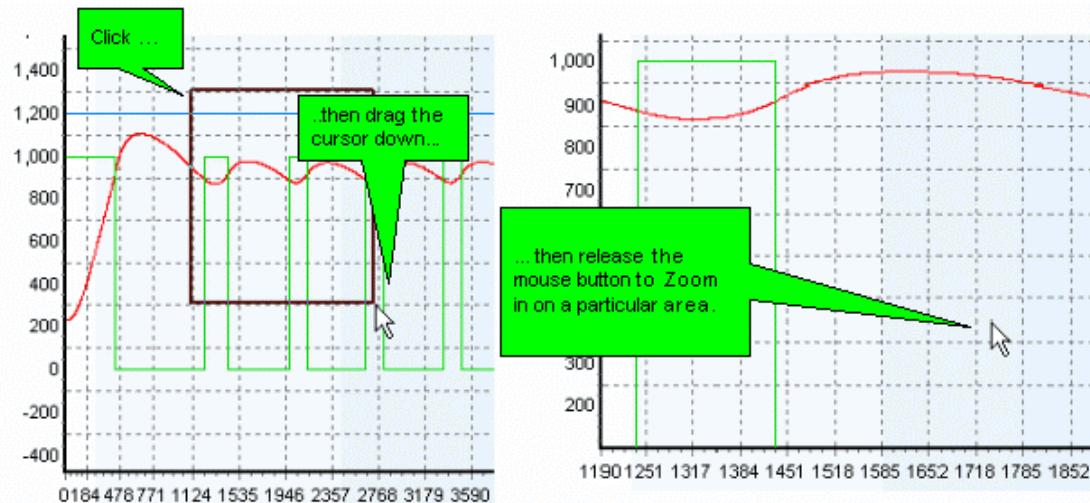
PID Server Features

Saving File Parameters

Whenever you click the Save icon, the file is saved as a .upl file. This file may be opened by any PC running PID Server. .upl files include the Loop Properties parameter links, comments, and PID auto-tune data up to the time that you click Save. If you wish to save only the Loop Properties without the data, by creating them, clicking Save, and storing the file.

Zoom

Click, then drag the cursor down, then release the mouse button to Zoom in on a particular area.



Click and drag the cursor up to reverse the Zoom effect.



Increase/Decrease Display View Size

Click the + icon on the toolbar to increase the graph sample size; click the - icon to decrease it.

Export

Located on the Loop menu, Export enables you to either export the auto-tune data to Excel, or to save a .bmp file of the auto-tune graph.

Comments

The Comment field is located in the lower left-hand corner of the PID server window. Any text you enter here is saved together with the .upl file.



What's this ?

Our mission is to make automation simple and efficient. Unitronics' R&D has developed and field-tested PID Server in order to provide you with fast, easy loop tuning.

To enable us to fine-tune PID Server to suit a broad range of PID applications, we would appreciate your using the 'Tell Us' feature. Clicking 'Tell us' will create an email with an attached copy of your auto-tune and PID process.

If possible, before you send the email, please take a moment to put the details of your application in the body of the email.

Note that in Windows XP, Windows will display the following dialog box; simply click yes to send the message to Unitronics.

