Fundamental PI Instruction Manual

Using PI to Track and Trend Data

<u>Abstract</u>

The purpose of this manual is to provide fundamental knowledge on how to use PI ProcessBook and various features of PI. Some features of Microsoft Excel pertaining to PI are also covered to provide ease of access and additional utilization. The features of PI covered in this manual include: activating PI DataLink in Excel, adding PI tags and values to Excel, creating new displays in PI, and trending data in PI ProcessBook.

Revision

Revision	Authors	Date Revised
Rev.0	Stephanie Marshall, Amy Feng, Paul Hagadone, Daniel LaForest	February 24, 2015

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PI-1.0: Set up PI Datalink Add-Ins in Excel

Program: Excel **Procedure:**

Click on "File"

- Click on "Options"
- Click on "Add-Ins" from the left panel

 \Box From the "Manage" dropdown menu located on the bottom of the page

- Select "COM Add-ins"
- Click "GO"

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□ From the COM Add-Ins window

- Check the "PI DataLink" checkbox
- Click "OK"

COM Add-Ins	2 ×
Add-Ins available:	ОК
Image: PI DataLink PI DataLink (Legacy)	Cancel
PI DataLink Notifications PIBVExcel PLDRILL_connect	<u>A</u> dd
Power View Image: Constraint of the second secon	₹ <u>R</u> emove
Location: file:\\C:\Program Files (x86)\PIPC\Excel\OSIsoft.PIDataLink.UI.vsto vstolocal	
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"" "PI DATALINK" will appear in the ribbon tool bar

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PI-1.1: Add PI Tags to Excel

Screen: Excel

Procedure:

Click on "Search" from toolbar

 \Box Select the "steam.we.mtu.edu" server to search

 \Box In the top search bar, type in "*T*"

□ Select the tag you want

- Click "OK"
- The tag will show up in the highlighted cell

Tips: Can search both numbers or letters separately, just add "*" to the beginning (i.e. "T*15*") to narrow search results if you know what you are searching for

Search			
Home ▼ @ steam.we.mtu.edu			२ ×
Filters	Data item Usteam.we.mtu.edu\CDT158	Description Atmospheric Tower OH Vapor	
	\\steam.we.mtu.edu\TIC150/PID1/MODE.ACTUAL \\steam.we.mtu.edu\TIC150/PID1/OUT.CV \\steam.we.mtu.edu\TIC150/PID1/PV.CV	Overheads Quality Controller, Primary - Mode Overheads Quality Controller, Primary - Output D-100 Temp @ 4/5th Ht.	
Point source *	\\steam.we.mtu.edu\TIC150/PID1/SP.CV \\steam.we.mtu.edu\TIC151/PID1/MODE.ACTUAL \\steam.we.mtu.edu\TIC151/PID1/OUT.CV	Overheads Quality Controller Primary Setpoint Reflux Heater Temp Controller Mode Reflux Heater Temp Controller Output	
Engineering units *	 \\steam.we.mtu.edu\TIC151/PiD1/PV.CV \\steam.we.mtu.edu\TIC151/PiD1/SP.CV 	Reflux Heater Temp @ E-106 Outlet Reflux Heater Temp Controller Setpoint	
Extended descriptor			
Instrument tag *			
Location 1	Root path length:	Insert root paths in:	
Point type	Minimum Maximum	Drop-down list	
Search completed (9 found)		OK	Cancel .:

PI-1.2: Get PI Data in Excel over a Time Range

Screen: Excel

Procedure:

 \Box Insert the tag

 \square Manually enter the Start Time for the corresponding tag

□ Manually enter the End Time for the corresponding tag

1				
2		1/27/2015 10:33	1/27/2015 10:34	
23	\\steam.we.mtu.edu\TI136/AI1/PV.CV			
24	\\steam.we.mtu.edu\TIC126/PID1/PV.CV			
25				
6				
27	\\steam.we.mtu.edu\TI133/AI1/PV.CV			
8	\\steam.we.mtu.edu\TI132/AI1/PV.CV			
9				

PI-1.3: Import PI Values to Excel

Screen: Excel

Procedure:

Click on "Sampled Data" from the "PI DATALINK" ribbon

 \Box In the "Sampled Data" panel

• Select "Data Item"

ΑΑ	В	C	D	E	F	G	н	I	J	K	L		Compled Data
19													Sampled Data
21													Data item
22	1/27/2015 10:33	1/27/2015 10:34											
23 \\steam.we.mtu.edu\TI136/AI1/PV.CV													Expression
24 \\steam.we.mtu.edu\TIC126/PID1/PV.CV													Root path (optional)
25													
27 \\steam.we.mtu.edu\TI133/AI1/PV.CV													Data item(s)
28 \\steam.we.mtu.edu\TI132/AI1/PV.CV													Sheet1%SAS12:SAS13
29													Start time
31													'Sheet1'ISB\$11
32													End time
55													"Sheet1%C\$11
35													Time interval
36													1 m
37													Filter expression (optional)
39													
10													Mark as filtered
41													
42													Output cell
43													'Sheet11\$B\$23
44													Show time stamps
45													Column
46													D Parts
4/ AQ													
40												v	OK Apply

□ In the "Data item(s)" field

• Input/Select the desired PI tags

□ In the "Start time" field

• Input/Select the start time in the tag

□ In the "End time" field

• Input/Select the end time in the tag

Tips: Can drag more than one tag at a time to the field, by selecting more than one cell

□ In the "Time Interval" field

• Input/Select the desired frequency that Excel exports data Time: Time Interval: 1m = 1 minute 1s = 1 second 1d = 1 day 1M = 1

Tips: Time Interval: 1m = 1 minute, 1s = 1 second, 1d = 1 day, 1M = 1 month

□ In the "Output cell" field

- Select the desired cell to output
- Click "OK"
- The values will be displayed

8				
9				
10				
11		1/27/2015 10:33	1/27/2015 10:34	
12	\\steam.we.mtu.edu\TI136/AI1/PV.CV	143.5726929	142.1006927	
13	\\steam.we.mtu.edu\TIC126/PID1/PV.CV	169.3482513	168.9866638	
14				
15		1/27/2015	1/27/2015	
16	\\steam.we.mtu.edu\TI133/AI1/PV.CV	210.750061	210.7730103	
17	\\steam.we.mtu.edu\TI132/AI1/PV.CV	211.7588348	211.779007	
18				

PI-1.4: Refreshing PI Data in Excel

Screen: Excel Procedure:

In Excel

- Click F9
- Wait for Excel to refresh

PI-2.0: Create New ProcessBook in PI

Screen: PI ProcessBook

Procedure:

Click on "File"

- Click on "New"
- Select "ProcessBook Entry"
- Click "OK"

□ In the Define ProcessBook Entry window

- Fill in the "Label" field
- Select "Display" in the Type field

Tips:

Display – Graphic display

Text – Information Only, no live data

Link/ OS Command – Link provide link feature to shared users, OS is for use in external program

Choose "1" for the "Level" field

- Click "OK"
- A new process book created will be displayed

Tips:

- 1 original ProcessBook
- 2 Sub-ProcessBook, break down of the original PorceeBook



<u>PI-2.1: Build Equipment in PI ProcessBook</u>

Screen: PI ProcessBook

Procedure:

Select a ProcessBook created/existed

□ In the ProcessBook editing window

- Click on the "Symbol Library" 🎒 icon on the toolbar
- Drag a box on the display screen
- The symbol library window will be displayed



Tips:

- 1. The size of the box a user drag will be the size of the equipment once selected
- 2. To resize the equipment, switch the mode "Run" to "Build", by selecting the "Build" icon from the toolbar



3. User can use either "Run" or "Build" mode to continue building the ProcessBook

□ In the Symbol Library window

- Select a category from the Category list
- Choose a symbol icon from the selected category
- Click "OK



For example, to create a chemical processing tower

- \square Select the "Chemical" category
- □ Select the "Chemical Process Tower" symbol icon
- Click "OK"

Symbol Library - Evaporation process				- 2.9						X
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Boilers = Buildings Chemical	Ļ	Ô		P <u>-</u>						
Computer Hardware Computer Keys Containers										
Controllers										
	ОК		Cancel		Options				Help	

PI-2.2: Add Values to PI ProcessBook

Screen: PI ProcessBook

Procedure:

□ In the ProcessBook edit window

- Click on the "Value" 📴 icon from the toolbar
- Drag next to or on the equipment
- A Define Value window will be displayed

 \Box In the Define Value window

- Enter the tag name if known
- Otherwise, click "Tag Search" to choose a tag
- Choose General for the "Number" field under the "Format" section
- Check "Show Units" checkbox
- Click "OK"

Tips:

- 1. Tag tag description number on display
- 2. Time stamp time stamp reading for the tag on display

Define Value Server: steam.we.n	ntu.edu 🔻	Tag Search
Format		Custom Placeholders
Number:	Tag:	Time stamp:
Sample:		Show Units
ОК	Cancel	Help

For example, to search for the "D-100 Temp @ 4/5th Ht." tag \Box Search for "*T*150*" in the "Tag Mask" field

Choose "D-100 Temp @ 4/5th Ht." tag

/ Tag Search	10-8 A	
Basic Search Advanced Search A	Alias Search	
PI Server:	Point Type: Point Class:	Favorites 🕨
steam.we.mtu.edu		Connections
Lag Mask: *T*150*	Point Source: Engineering Units:	Search
<u>D</u> escriptor:	Value: 💽	Abort
		Reset
Server: Tag: steam.we TIC150/PID1/MODE.AC	Descriptor: T Overheads Quality Controller, Primary Mode	Select All
steam.we TIC150/PID1/OUT.CV steam.we TIC150/PID1/PV.CV steam.we TIC150/PID1/SP CV	Overheads Quality Controller, Primary Output D-100 Temp @ 4/5th Ht. Overheads Quality Controller Primary Setpoint	Pt. Attr
		Pt. Values
-		ОК
		Cancel
		Help
Ready	List Count: 4	Percent 100 %

□ A tag with values will be displayed for the equipment created

□ Once all equipment is created

- Click on the "Connector" 🕒 icon
- Click on the first equipment and drag the connector to the next equipment in the process



PI-2.3: Trend Data in PI ProcessBook

Screen: PI ProcessBook

Procedure:

 \Box In the ProcessBook edit window

- Click on the "Trend" ^I icon from the toolbar
- Drag onto the display screen
- A Define Trend window will be displayed

□ In the Define Trend window

- Enter the tag name if known
- Otherwise, click "Tag Search" to choose a tag
- Click "OK"

For example, to search for the "D-100 Temp @ 4/5th Ht." tag and the "Reflux Flow" tag

□ Search for "*T*150*" in the "Tag Mask" field

Choose "D-100 Temp @ 4/5th Ht." tag

□ Search for "*F*163*" in the "Tag Mask" field

 \Box Choose "Reflux Flow tag

Define Trend				X
General Display Format Trace Format Layout				
Plot Name:				
Plot-0	•	New Plot		Delete Plot
Tags in Plot:		🛅 🗙 🦻	t i	Server :
	ve.mtu.edu(11C150/P1D1	/FV.CV		Tag Search 🔹
				Custom Placeholders
Scale Single S	cale 🔘 Mul'	tiple Scales		Logarithmic
Max:	Autorange	•		Regression Line
Min:	Autorange	▼ F	ormat:	Database 👻
Plot Time				
Start:	*-8 Hour	-	Style:	Full time stamp 🔻
End:	*	•		
			ОК	Cancel Help

 \Box A trend for the tags selected will be displayed

Tips:

- 1. Arrows below the grind lines can be used to filter historical time stamp
- 2. In "Run" mode, hover over the trend line, a pop up window will be displayed with the tag values, time stamp, and set points



PI-2.4: Trend Tags on an Existing PI ProcessBook

Screen: PI ProcessBook

Procedure:

□ Open an existing PI ProcessBook

- Click on an existing tag
- The tag will be highlighted with a red box

Tips:

To trend multiple tags at once, hold the "control" key and click on the desired tags

□ With the hightlighted tag

- Click on the "Trend Display" 🖻 icon from the toolbar
- A trend window will be displayed

Tips:

If the data does not display over the same range, click on the y-axis to create multiple scales, a Trend Scale window will be displayed

□ In the Trend Scale window

- Choose "Multiple Scale" from the Scale section
- Click "OK"



For example, create trend for the Temperature tag from TIC-150, and Output tag from TIC-163

□ Select the temperature tag from TIC-150 and output tag from TIC-163

Click on the "Trend Display" icon to build trends

