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How to Set Up and Configure the PI System

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How to set up and configure the PI system

Matt Donnelly

10-22-16

Purpose:

This paper is designed to help the next generation or the next individual to be able to set up/install/connect the PI system on a computer and create the working server for PI. Through the next parts it will be step by step instruction for doing this.

Procedure:

Because there is a lot of different parts of what this task entails it will be broken up into categories.

- First; The very first thing you will do is get a OSIsoft account. To do so go to the link https://techsupport.osisoft.com or get Matt to download the material needed The Next thing is in the top right corner you click sign in shown below
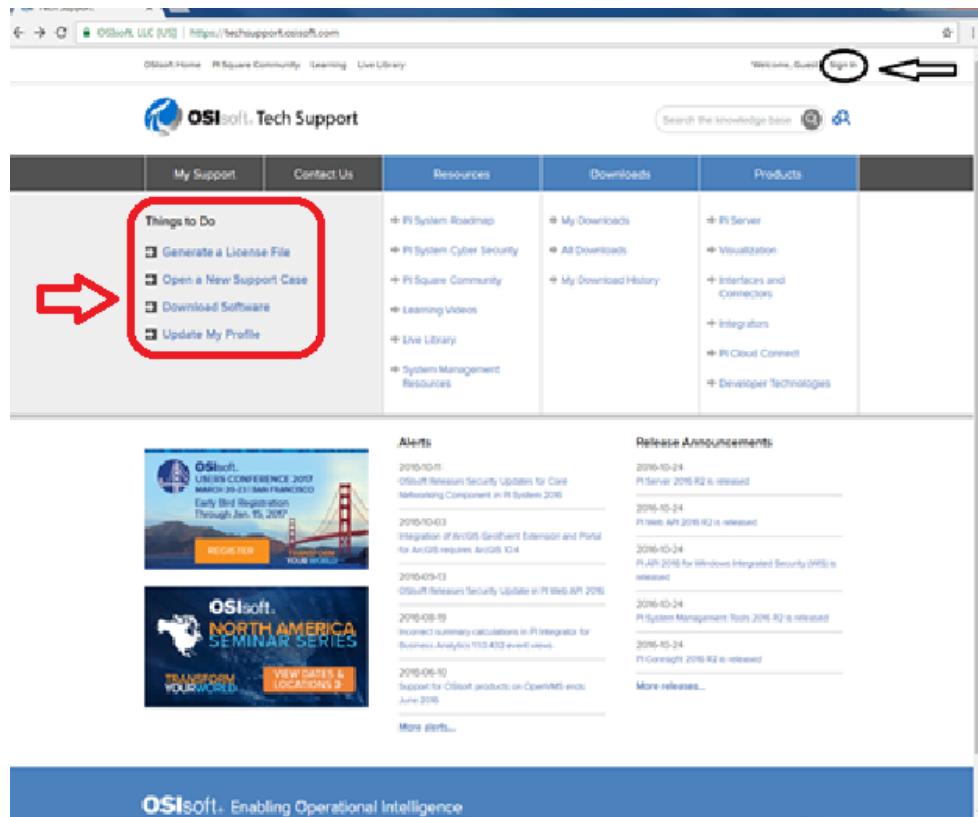

Figure 1

- The Next after that you need to scroll to the boom of page and go to Create New as shown below
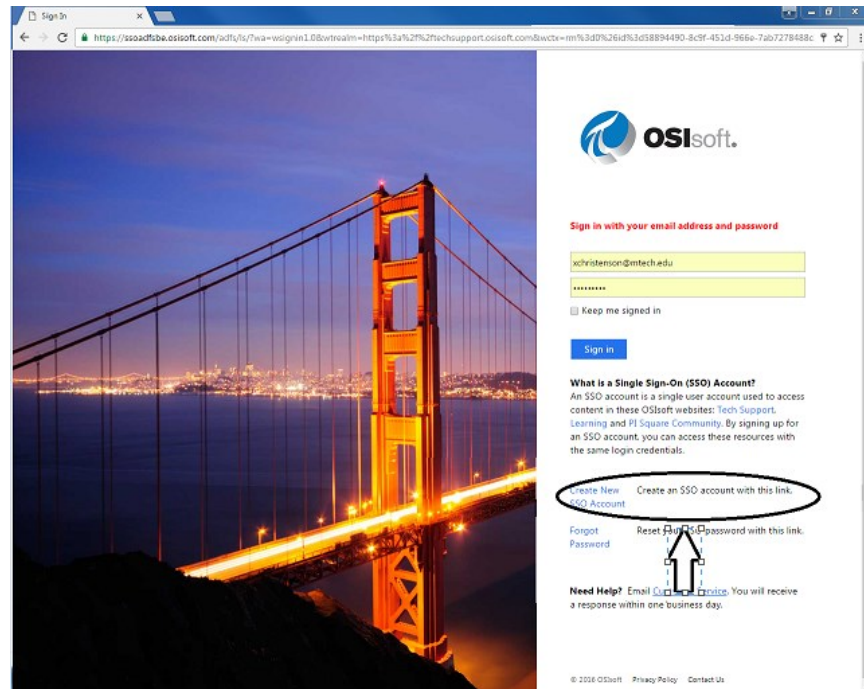

<div align="center">**Figure 2**</div>

- Then just follow the on-screen instruction for the set up. This will give you access to all the manuals and software available for the PI server plus access to PI square community.
- The next thing you will do is Follow the instructions highlighted in Red in **Figure 1.**
- This will lead you into generating a license file (Machine Signature File) then to a license file so that once that you have downloaded the Pi server and software you activate it attached in **Appendix a.** pages (18-21) of this attachment Is the directions for implementing this in case you must use another route as well or trouble shoot them.
- **Appendix a** is a very important starting point for all your questions or problem refer to this section

Next:

The next part is literally following the parts from **Appendix a**.

- **Download** all the required parts described in the **Appendix a**. pages (1-10) and install them per the installation plan outlined in **Appendix a.** I can't say it enough all the instructions for the installation and the order for this whole system plus the configuration and ports are literally in **Appendix a.** As found out by Matt Donnelly and I you need to have communication with PI is done on port 5450 which is described in detail in **Appendix a.** page (16)
- **Page 16 Appendix a** also talks about granting permissions for the server and data archives this is the important configuration files and notes that you should take down as you go **Figures 3,4**

Below

Installation worksheet

Parameter	Installation notes	Value for your deployment
SQL Server name	You can install SQL Express on the PI Data Archive computer if you have less than 10,000 assets. See Install PI AF.	
SQL Server edition (Express, Standard, or Enterprise)	Do not install SQL Server Standard or Enterprise on the PI Data Archive computer. See Install PI AF.	
SQL Server version	SQL Server Express, SQL Server Standard, or SQL Server Enterprise edition	
PI AF server name	This is the computer where the PI AF Server 2.x Application Service is installed. See Install PI AF.	
Operating system for PI Data Archive computer	Windows Server 2012 R2, including Windows Server Core installations, or Windows Server 2012, including Windows Server Core installations, or Windows Server 2008 R2 SP1, or later, but not including Windows Server Core installations	
PI Data Archive server name - primary	If you are not installing a collective, there will be a single PI Data Archive server name. See Record the PI Data Archive server names.	
PI Data Archive server name - secondary	If you are deploying your PI Data Archive in a collective. See Record the PI Data Archive server names.	
PI Data Archive server name - secondary	If you are deploying your PI Data Archive in a collective. See Record the PI Data Archive server names.	
PI Data Archive collective name	If you are deploying your PI Data Archive in a collective. See Record the PI Data Archive server names.	
Location of PI Data Archive license file (pilicense.dat)	See Generate a license activation file. During setup, you will need to browse to this license file for a new installation.	

Figure 3

Installation worksheet

Parameter	Installation notes	Value for your deployment
Location of temporary PI Data Archive license file (temporarylicense.dat)	See Generate license file for collectives.	
PI Data Archive installation directory (%PISERVER%)	For example: %ProgramFiles%\pi After the installation, the PISERVER environment variable will correspond to the installation directory. See Determine the disk volumes for your deployment.	
PIHOME installation directory	This is the directory where most 32-bit PI client applications are installed. See Determine the disk volumes for your deployment.	
PIHOME64 installation directory	This is the directory where most 64-bit PI client applications are installed. See Determine the disk volumes for your deployment.	
Location of event queues	Do not use %PISERVER%\dat. Do not use the drive where PI archives are stored. See Determine the disk volumes for your deployment.	
Location of PI archives	Do not use %PISERVER%\dat. Do not use the drive where PI event queues are stored. Make sure that the location of the Archive directory contains enough free space to create three archives. The location for archives is typically on the largest drive on the server. See Determine the disk volumes for your deployment.	

Figure 4

This check list is a great way to keep track of access/ permission files

- The next part is setting up interfaces and then knowing the difference about the asset and clients and so forth.
- First One we will talk about is the C37.118 interface this is the one that communicates with the SEL-421 internal PMU (Phasor Measurement Unit). The C37.118 is just a protocol to communicate to the PI Server the c37.118 uses TC/IP to configure this protocol the current setting is shown in the current settings list below **appendix b. SEL related stuff.**
- One other thing you will want to do is set up a way to test to see if you are connecting to your system is the PMU Tester the link for the free down load is below **figure 5.** Just google "PMU Connection Tester Free"
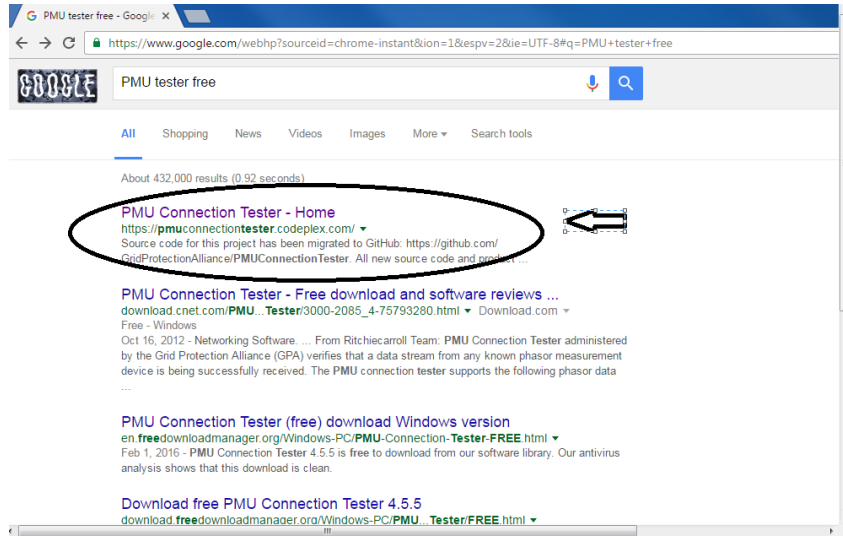
Figure 5
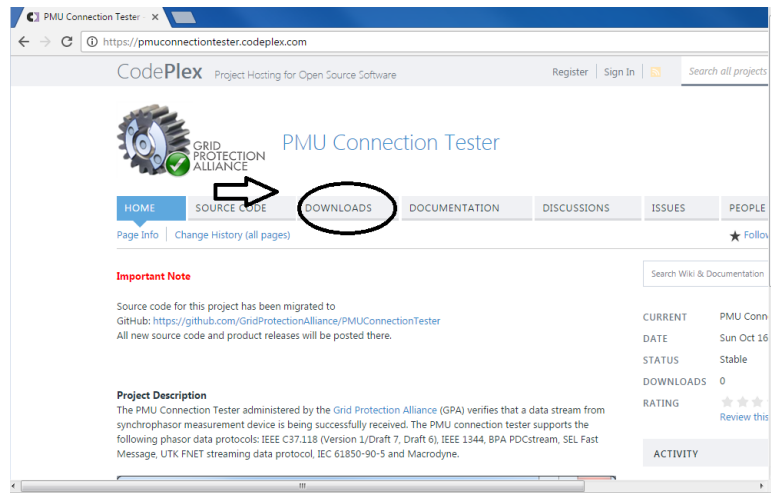
- Then go to downloads **Figure 6.**

Figure 6.

- Then scroll down and click on the link to download the connection tester to install it to the system this it to see if your server is communicating back and forth over the TC/IP port that you configured. **Figure 7.**
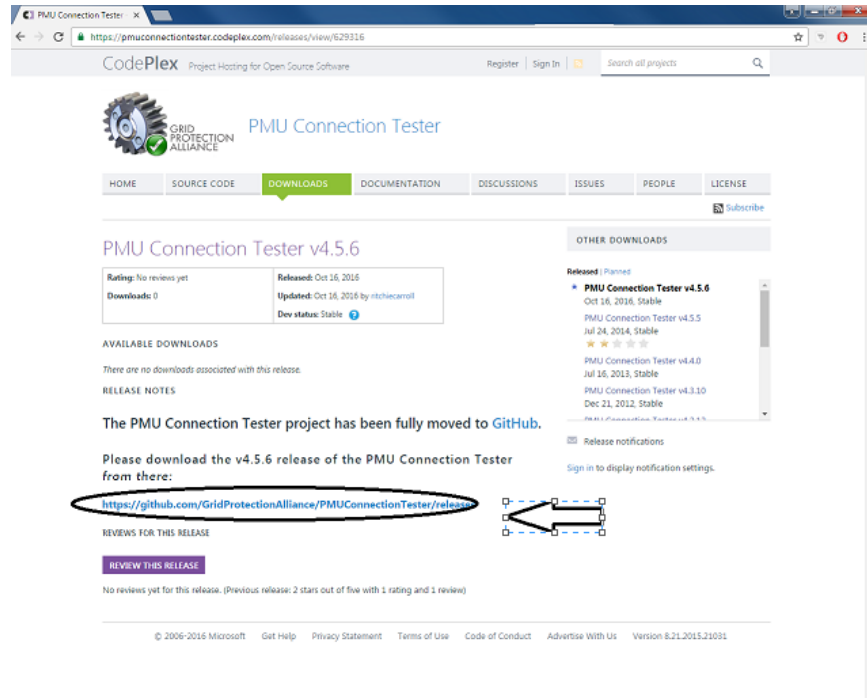
Figure 7

- A quick note you may need to register for this site but it is free.

NOW FOR THE TEST!

- Make sure the software for the things that are stated in the previous are connecting and running
- If all the downloaded software is working with each other than we may move on to adding interfaces
- Make sure that you use the Download the interfaces that are relevant to what you want to communicate to using the correct communication styles.
- For Example, the C37.118 interface lets the PI server communicate with the PMU inside the SEL-421 then PI uses that interface to read its data and make use of it for observation in, For example "Process Book" this is a powerful piece of software for implementing commands and viewing data collected. **SEE flash drive manual** for more about process book.

NOW

- The way I do things is between the "PI System Explorer " & "PI System Management Tools" the latter is the best in my opinion go to start menu and type PI system management tools and it should bring it up **figure 8**
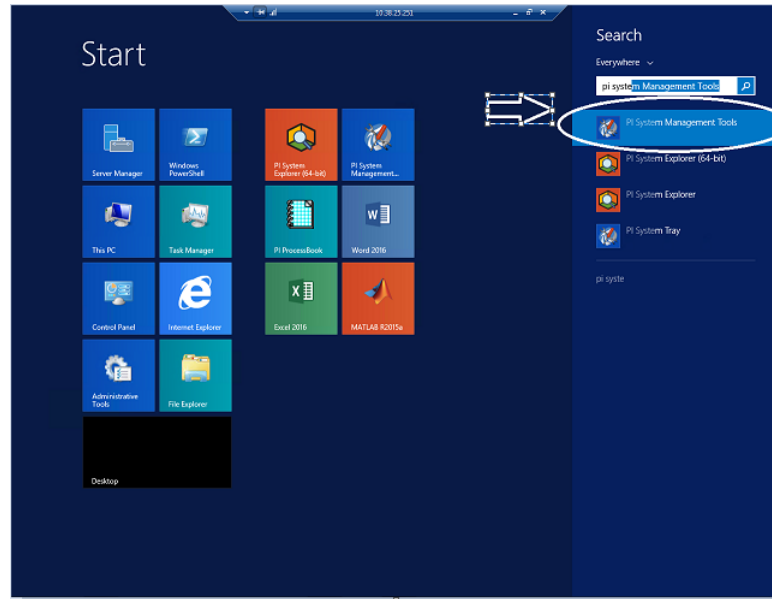
Figure 8

- Now when you click on "PI System Management Tools" you will see **figure 9** but to set up the interface you will click Tools and in the drop-down menu select "Interface Configuration Utility" **figure 9**
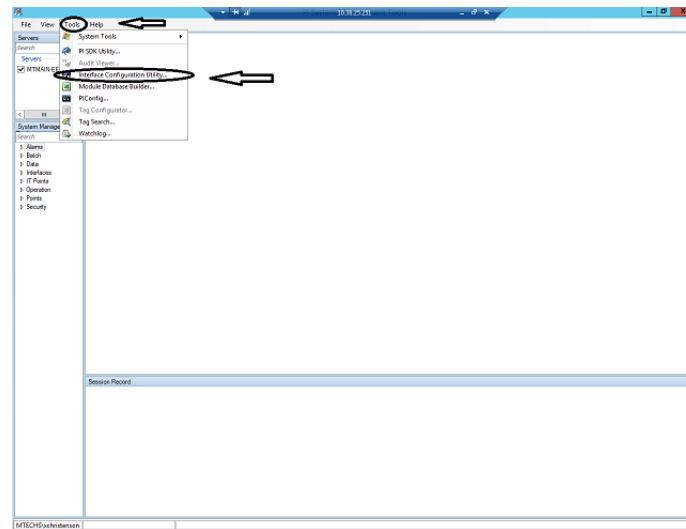

Figure 9

- Once you have done this click on the interface tab at the top right and in the drop-down menu select the "New Windows Interface Instance from EXE" **figure 10**
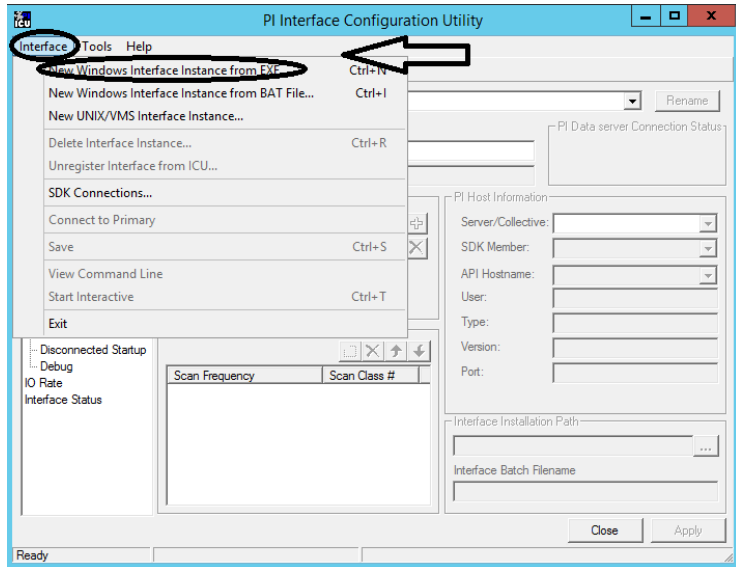
Figure 10

- Now a window will pop up that says to "Browse to Interface executable (required):" click the browse tab on the right of that box it should bring up the interface file location and now click on the interface you want this example is the C37.118 **figure 11**
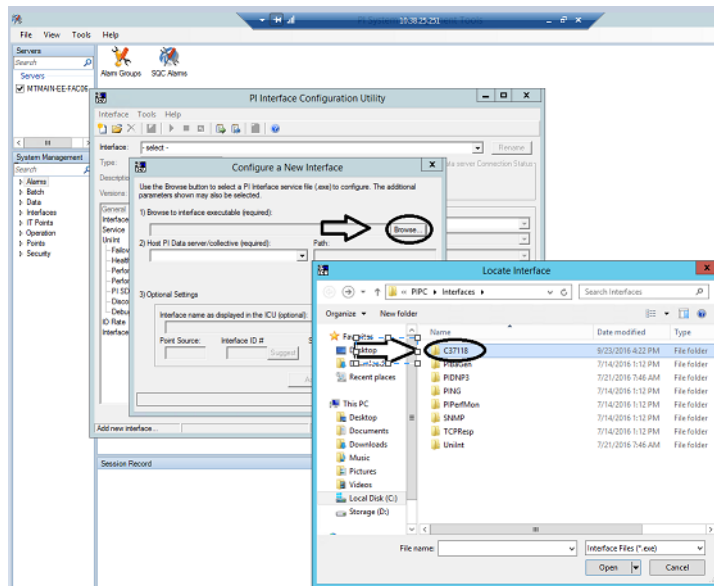
Figure 11

- Now click on the "PIC37118" **figure 12** this will add the PI interface to known drop down list in the pi archives and let you begin to configure the interface itself.
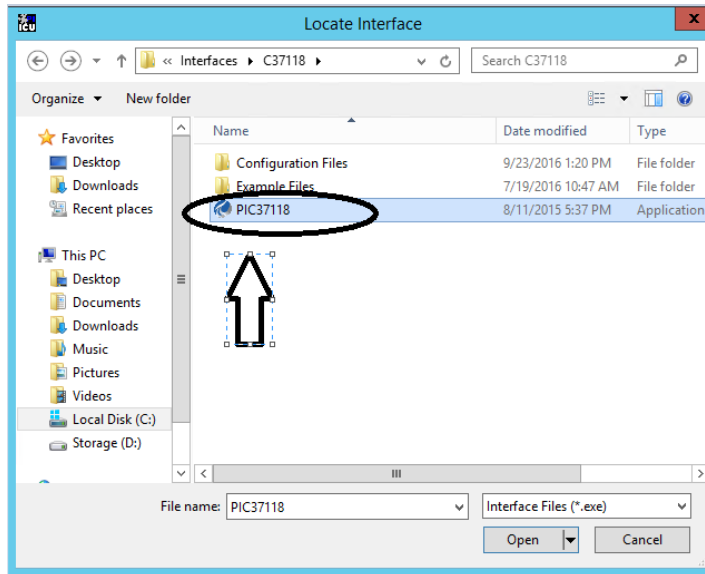
Figure 12

- Now it is applied to the list we can go into setting up the interface it self
- Back to the "PI System Management Tools"
- Once you have clicked on the "PI Configuration Utility" You will see **figure 13** now click on the arrow to the right of the box that is labeled Interface and select from the drop down menu your interface I'll show you the C37.118 for set up purposes **figure 13 ,** Refer to the **Flash drive C37.118 interface manual for more on this.**
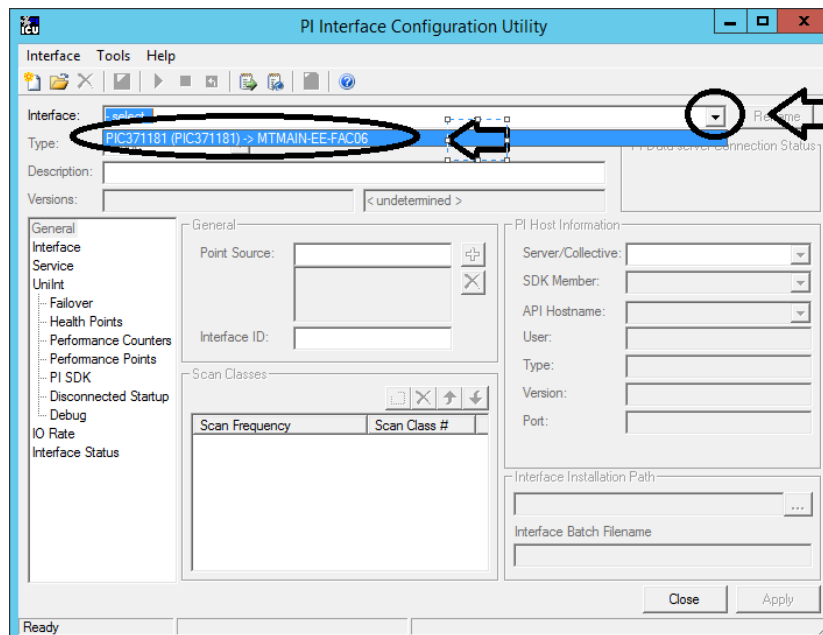

Figure 13

- Once selected you may give a description in the description box the point source box must be whatever you named it. In our case, it was "PMU1" also the interface id box must be whatever interface to that machine is in this case we only have one PMU interface that has only one machine connected to it so we only have one interface id this will go up if you have more machines using the same style of interface but different machines. To get different data make sure it is the same as the machine ID because it will not communicate otherwise.
- If you will notice that in the left column in the GUI it has stuff for different menus that is where you will configure some of the ports four your interface **figure 14** this part will look different depending on your interface setup ours was named for our XML file to distinguish the configuration setting of the interface when clicking all of the things shown in **figure 14** you will notice that we have a file named for our interface this is the XML file that pi uses. In a startup, you must create this **See flash dive C37.118 manual "setup"** this is showing you ours
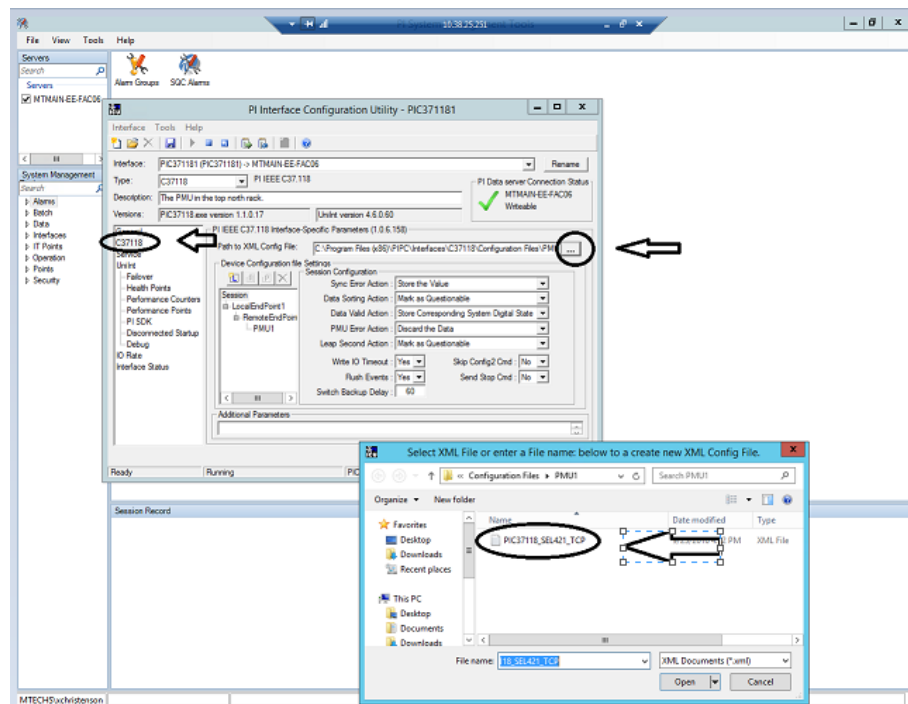

Figure 14

- Once that is done make sure your settings match the above for session configuration then click "LocalEndPoint1" for our interface this is the setting for us. **Figure 15.** Make sure your ports for communication our set to your style of communication ours is port 4700 TCP DATA not the CMD
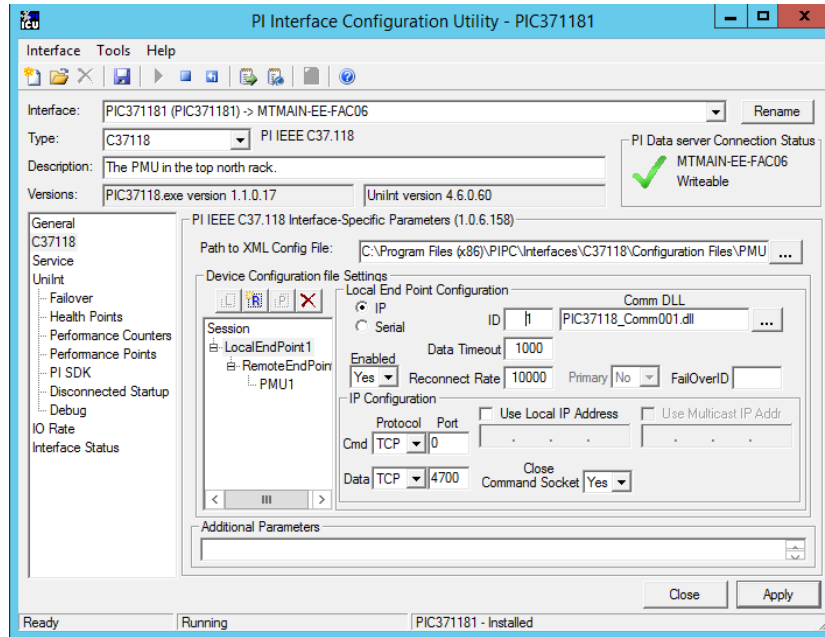
Figure 15

- Now click the "RemoteEndPoint" make sure the "ID Code box" is set to the machine id, in our case it is 1 also make sure your "Remote Data Port" & "Remote Cmd port" our set correctly for your machine and make sure the machine "IP Address is entered in for your machines IP Address **Figure 16.**
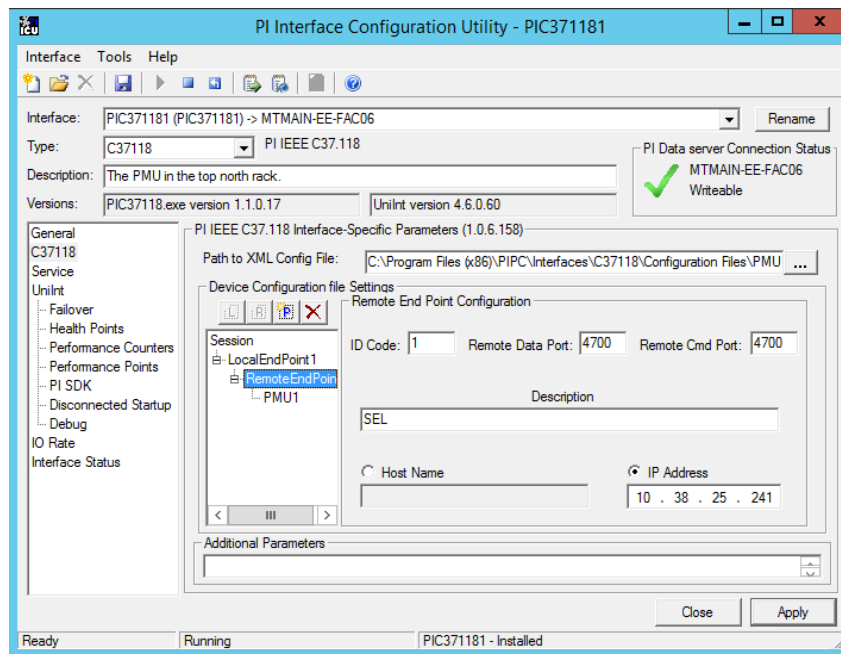

Figure 16

- Last click for setting up the interface click "PMU1" or whatever you named it this is for our case make sure the id code is the same as well. **Figure 17**
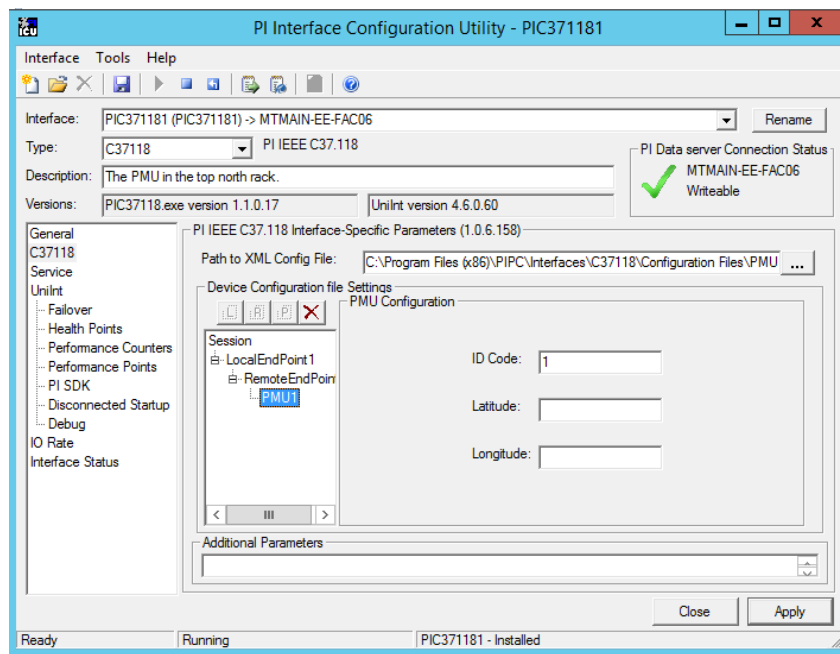

Figure 17

- Now click apply and exit the interface configuration utility to restart the interface then we may add "Tags and Points" & configure our setup for this interface.
- Now going back into "pi system management tools" you will see in the left side of the screen some selectable files select the one that says points and then point builder **figure 18.**
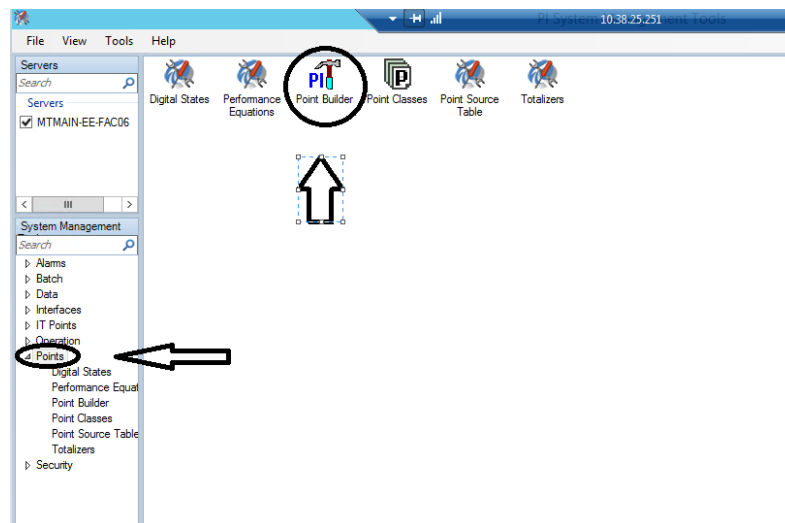

Figure 18

- Now setting up the points and tags for this part you will be setting up the actual name of the tag (which is the description of the what you are trying to use for data collection) **Figure 19** is the start to this this will be different for any interface depending also on what you are doing with the connection for it. In the name spot. Name it something that is relevant to what and where it is doing it is a good idea because there is a lot of things in the tag list. Make sure to select all appropriate settings for your interface and for the point source make sure it is the same as your point source for the interface you are dealing with
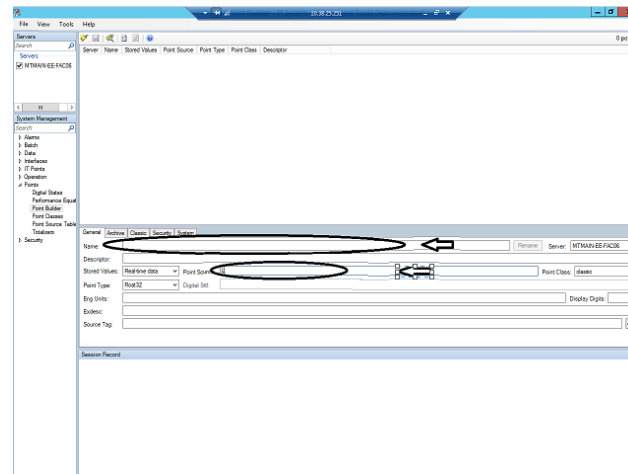

Figure 19

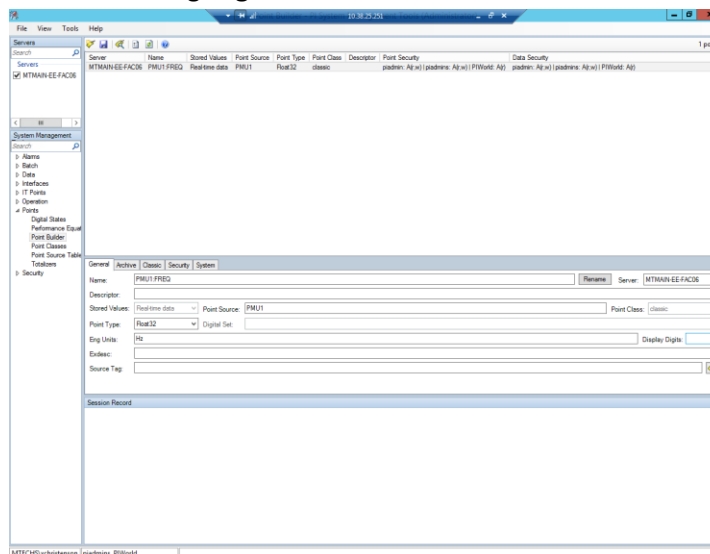- In our case these are those settings **figure 20**

Figure 20

- The next part is setting up your settings for scan class we found that we had to do this with frequency to gather around 28 per second **Figure 21**
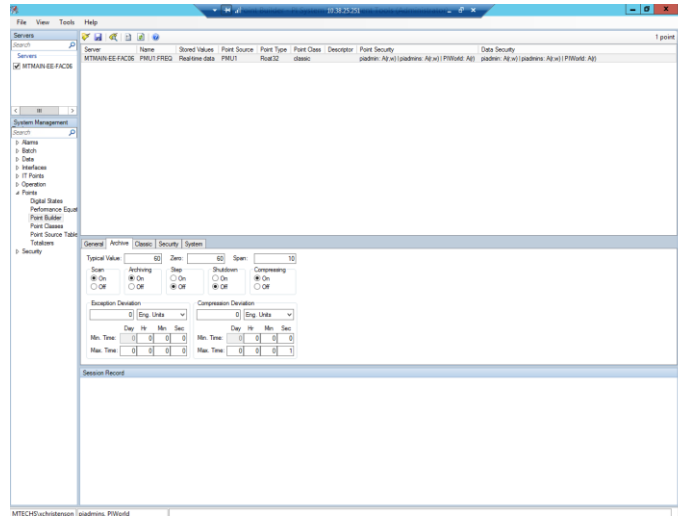
Figure 21

- In the next part click "Classic" then name the "Instrument Tag" this is a machine spec term this is how the machine defines this term it must be the exact same way for the Tag this defines the parameter that you are studying for this interface and machine in the C37.118 interface there is a lot of things to monitor **See Flash drive manual C37.118** for the other characteristics to the interface. But notice the location settings also this is done exactly as it must be. **Figure 22**
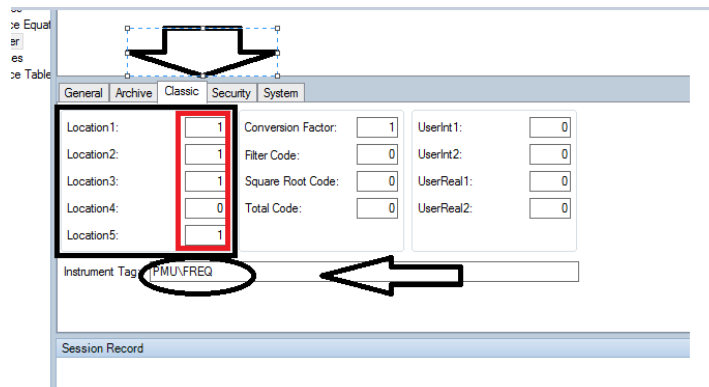

Figure 22

- The part after is how you give permission to users for this interface or deny permission to this interface **Figure 23**
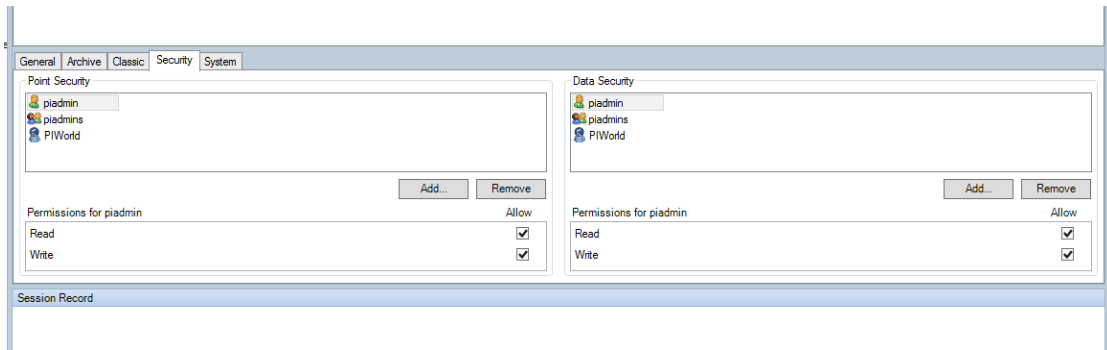
Figure 23

- That is it for the interface set up now restart the system manager and it should be accessible click the icon that looks like a tag with a magnifying glass it then search for your tag it should be there **Figure 24**
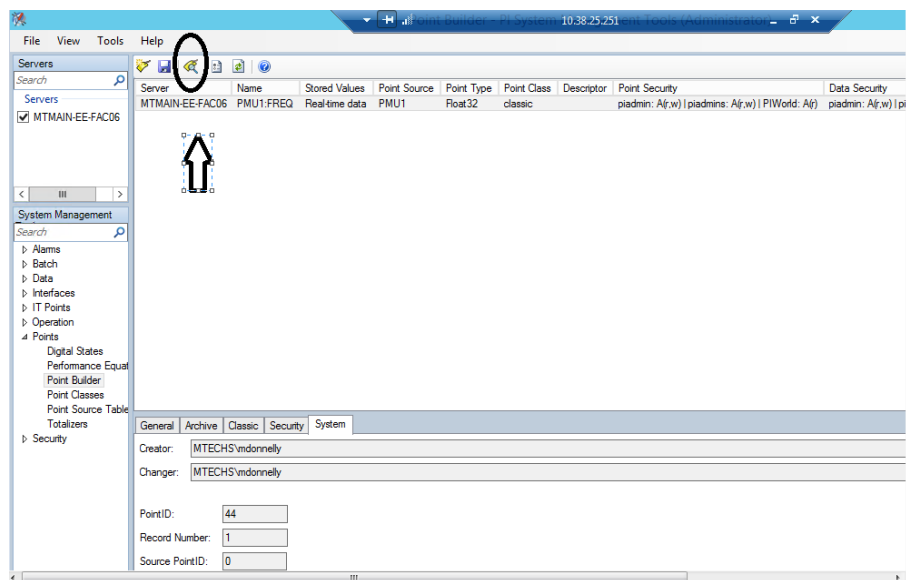

Figure 24

Now I will show you how to use "Process book" This is one of the most important tools for PI because this is how you read data from the archives and how you can visually see the data. Process book can also be used to command processes as well that is done with a GUI of process book by writing VBA (visual basic for applications) into process book.

- Now on our PI we have process book on the system and in main 314 on my computer the latter is how we will view it.

- So after downloading and installing "Process Book" click on this icon **Figure 25** or search it in the start menu to find it and click on the icon
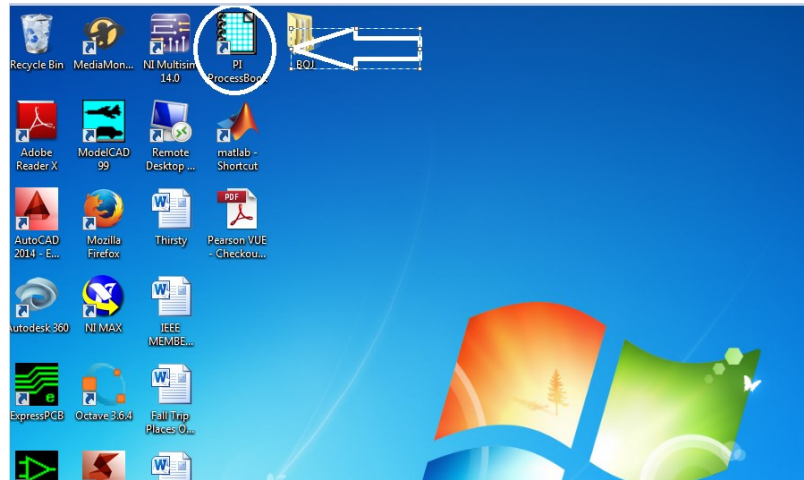

Figure 25

- After you open it to find your tag you will need to set up a link with the server this is done by clicking on file then on the drop-down menu click connections then click that the set up the connection to the server this is done by the name the system has then the port for the system **Figure 26**
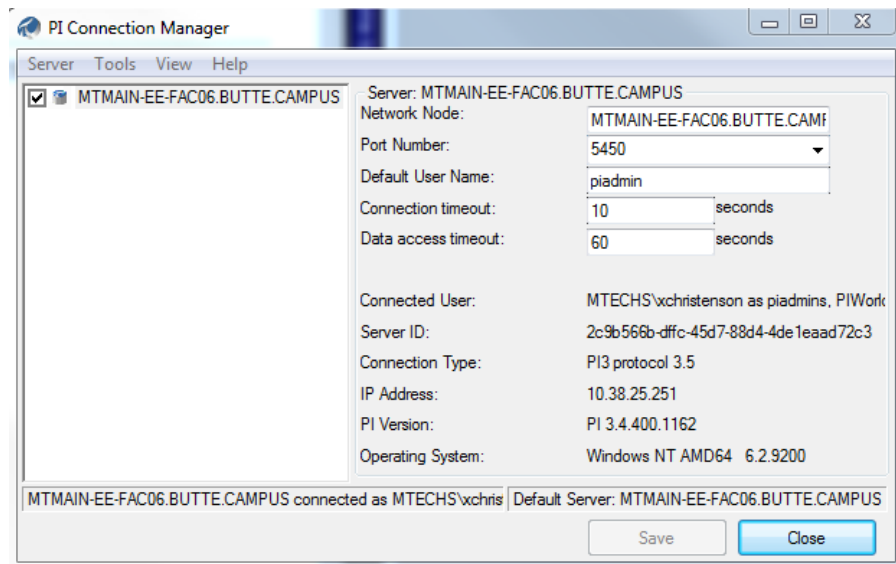

Figure 26

- Make sure it is connected to the server after you set it up
- Now if you want to view graphically you must just select to the little graph looking thing and Tag search and look for your tag it will produce a graph back to when the data archive started recording it **Figure 27**
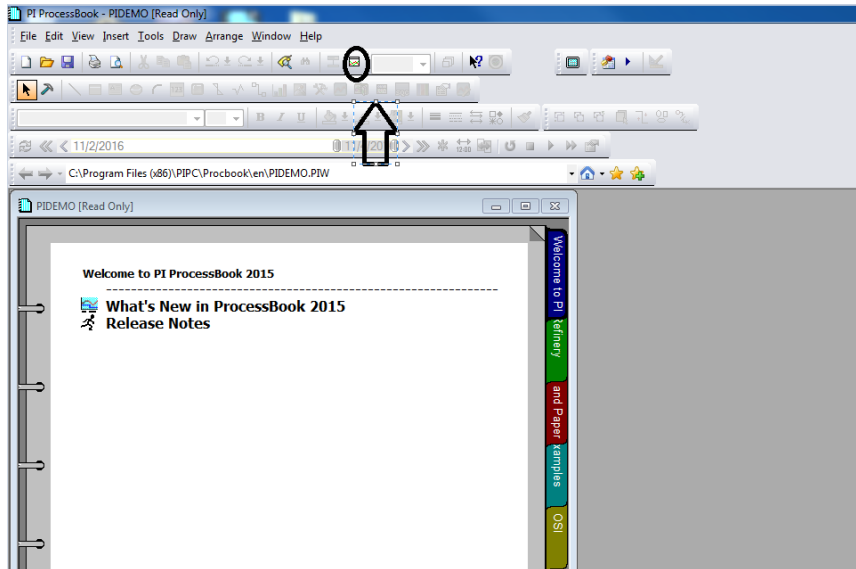
Figure 27
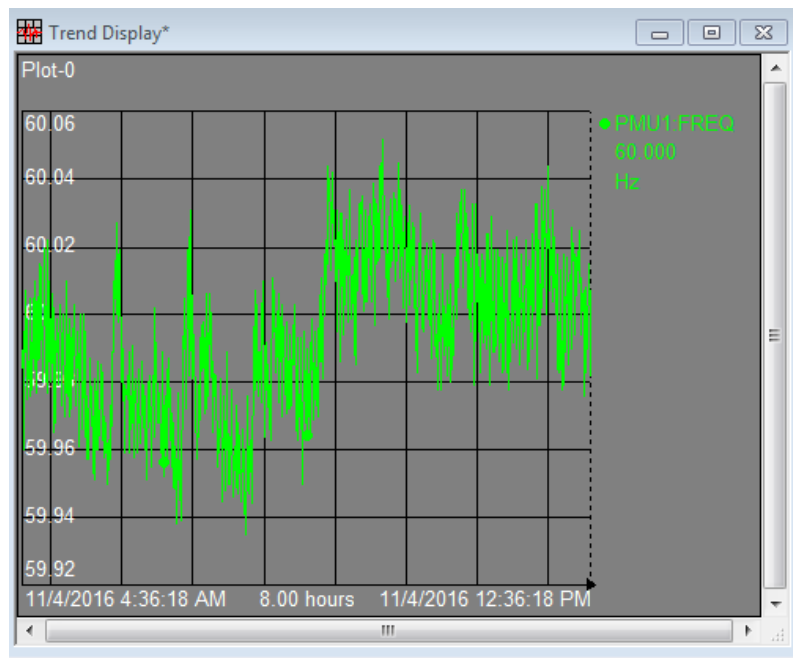
- Here is frequency data plot **Figure 28**

Figure 28

- For the server, currently in use and the parameters that it is currently set on is

OSIsoft PI SERVER PASSWORDS AND IP ADDRESSES RELATED

PASSWORD FOR SERVER

- SERVERNAME
  MTMAIN-EE-FAC06
- Mtechee-1

PI Server IP

- 10.38.25.251

SEL RELATED STUFF

SEL-421 IP (TOP LEFT CORNER FACING THE SOUTH WALL)

Port

4700

4713

SEL-412 top left corner facing south wall

IP FOR THE SEL-421

- 10.38.25.241

C37118 RELATED STUFF

- Point Source -> PMU1
- Interface ID -> 1
- Device ID CODE of SEL 421 -> 1
- PORT -> 4700

PI INSTALATION ID

- ID -> 2505450
- XML file name for C37118
  C37118_data

COMPUTER IN MAIN 312

- IP-> 10.38.25.19
- CLIENT -> mtse-ge-ws02

TESTING STUFF

- PI host port 5450/ 5457

Appendix a.