PendoTECH OPC Server Configuration Instructions

1. Introduction

PendoTECH NFFSS, TFF, and VFDF control system software packages are available in two versions. The standard version and the OPC version with built in OPC server which publishes all data tags in real time. This allows customers to connect the PendoTECH control system to their facility's data historian and log all data to a central repository. The following technical note details the procedure for configuring the built in OPC client that is native to all OPC versions of PendoTECH control system software.

2. Ordering Instructions

The OPC version of the software must be requested at time of purchase and a separate line item will be created on the system quote if not included. It is possible to add the OPC functionality to an existing system if not acquired with the system. Please contact PendoTECH for further information.

3. Instructions

OPCenum is a program which scans your computers registry for active OPC servers. It is required to successfully run PendoTECH OPC software versions. It is not included with the installer for the software and thus must be downloaded manually.

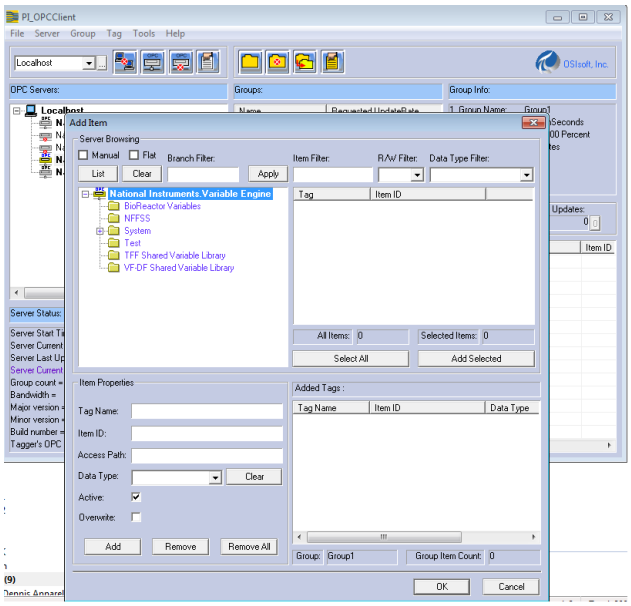
1. Download OPCenum
    a. OPCenum can be downloaded from the OPCFoundation.org and should be installed in the Windows\SysWOW64 directory (Windows 7) or latest Windows version
    b. Once OPCenum is installed it must be registered with the OS.
    c. Once OPCenum has been installed and registered, check the services and ensure that OPCenum is included as a service.
    d. Make sure the OPCenum service can be started without errors.

2. **NOTE:** The Logins for the OPC Client and Local Machine must be identical.

3. Selecting the proper product library. If the OPC Server cannot be on the Local Machine it will not be visible remotely.
    a. If everything has been properly configured (Access and Control Limits, Firewall, and File/Print Sharing) then the OPCenum will enumerate the OPC servers on the Local Machine.
    b. The operator should be able to see the following with an application such as PI_OPCClient, which is an OPC Data Access client.
    c. The OPC client running on the Local Machine should be able to see the following:
        i. National Insturments.Variable Engine
        ii. National Instruments.Variable Engine.1

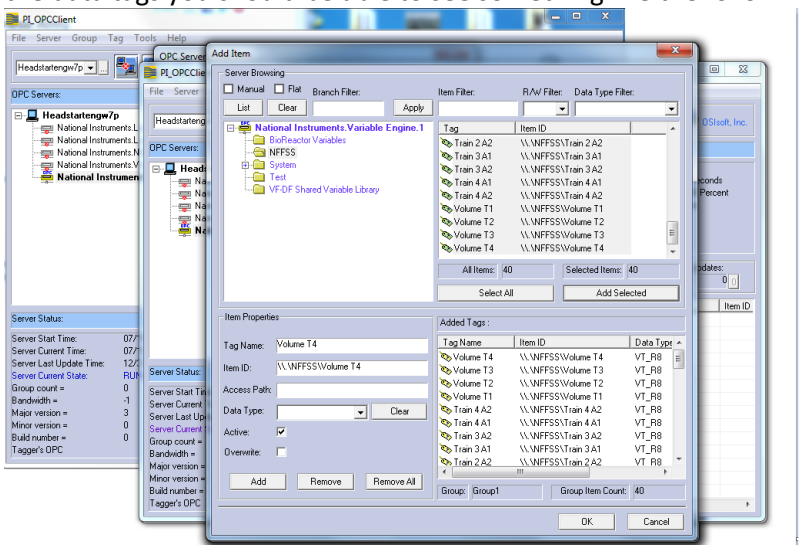
iii. National Instruments.LookoutOPCServer
iv. National Instruments.LookoutOPCServer.1

d. The only relevant items are National Instruments.Variable Engine and Engine.1 which are the same server. The OPCenum just enumerates them twice.
e. Select National Instruments.Variable Engine. The screenshot below shows an example of what the selection looks like when the National Instruments.Variable.Engine has been selected.



Product Library Selection

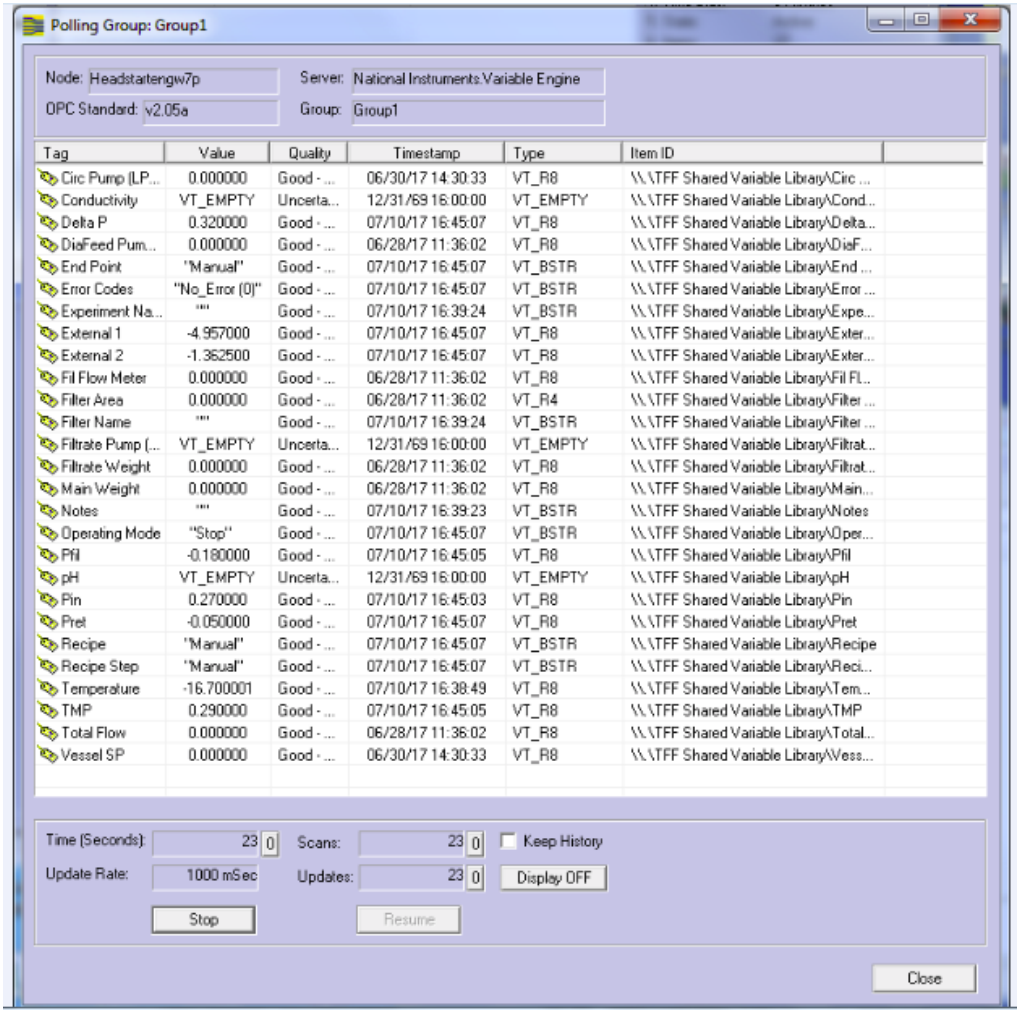
f. Select the Library of the product you want to connect to, for example NFFSS Shared Variable Library. Once the Library has been selected and you've setup the data tags you should be able to see something like the following:



Technical Note

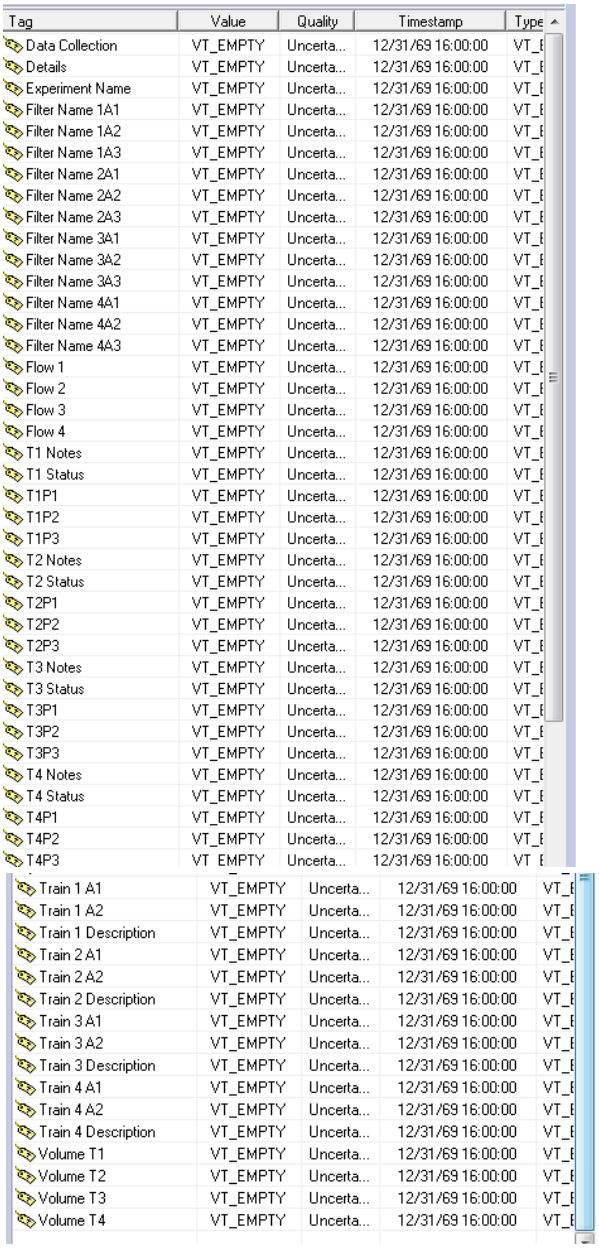
For the PressureMAT PMAT-GUI software there are a range if models available with different number of inputs and different combination of types. *Therefore, it was determined to publish different variables depending on the PMAT type selected, since this can vary significantly between PMAT models. Ultimately, a nested library system was implemented. There is a main library that publishes all of the variables common to all PMAT types, and then within that library are separate libraries for each PMAT type, which publishes the variables unique to that model. Customers who which to connect this version of the software to their OPC library will need to setup a connected for each PMAT type that they intend to use.*

When you select the TFF System you will see:



TFF Data Tags

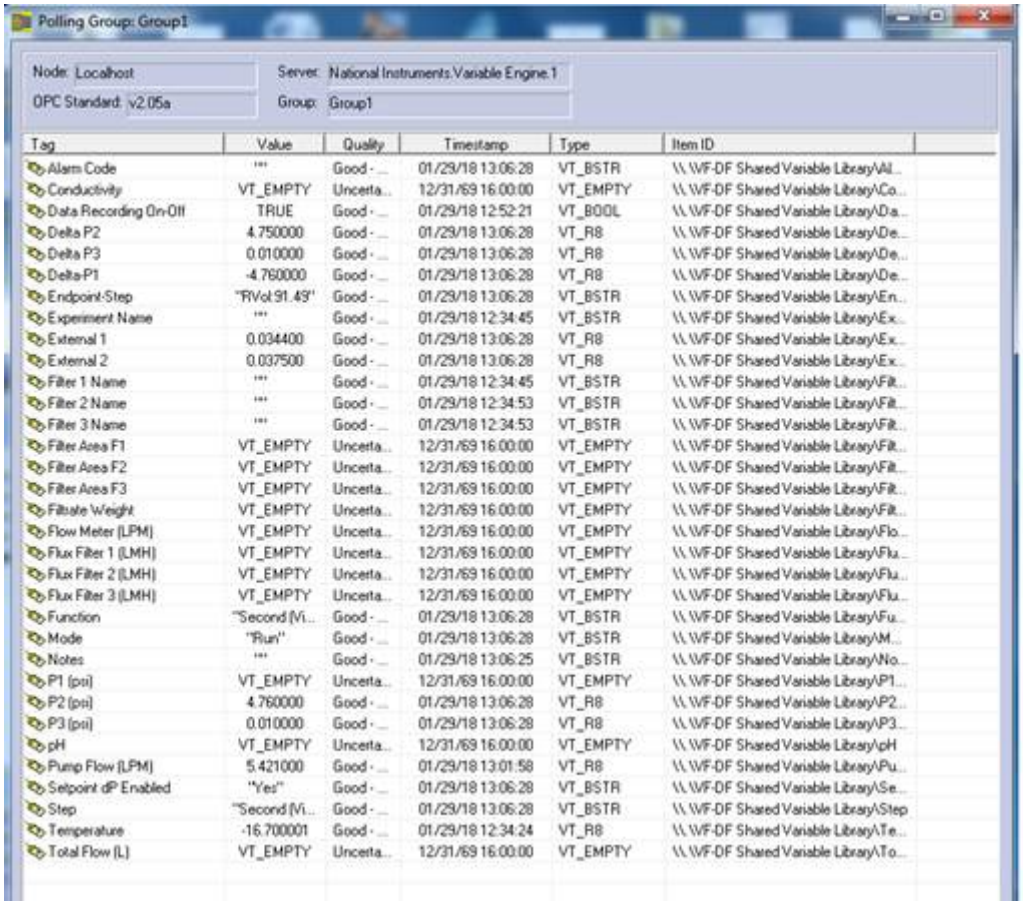
When you select the NFFSS System you will see:



Tag	Value	Quality	Timestamp	Type
Data Collection	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Details	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Experiment Name	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 1A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 1A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 1A3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 2A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 2A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 2A3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 3A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 3A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 3A3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 4A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 4A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Filter Name 4A3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Flow 1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Flow 2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Flow 3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Flow 4	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T1 Notes	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T1 Status	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T1P1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T1P2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T1P3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T2 Notes	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T2 Status	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T2P1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T2P2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T2P3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T3 Notes	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T3 Status	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T3P1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T3P2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T3P3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T4 Notes	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T4 Status	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T4P1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T4P2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
T4P3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 1 A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 1 A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 1 Description	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 2 A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 2 A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 2 Description	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 3 A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 3 A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 3 Description	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 4 A1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 4 A2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Train 4 Description	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Volume T1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Volume T2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Volume T3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E
Volume T4	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_E

NFFSS Data Tags

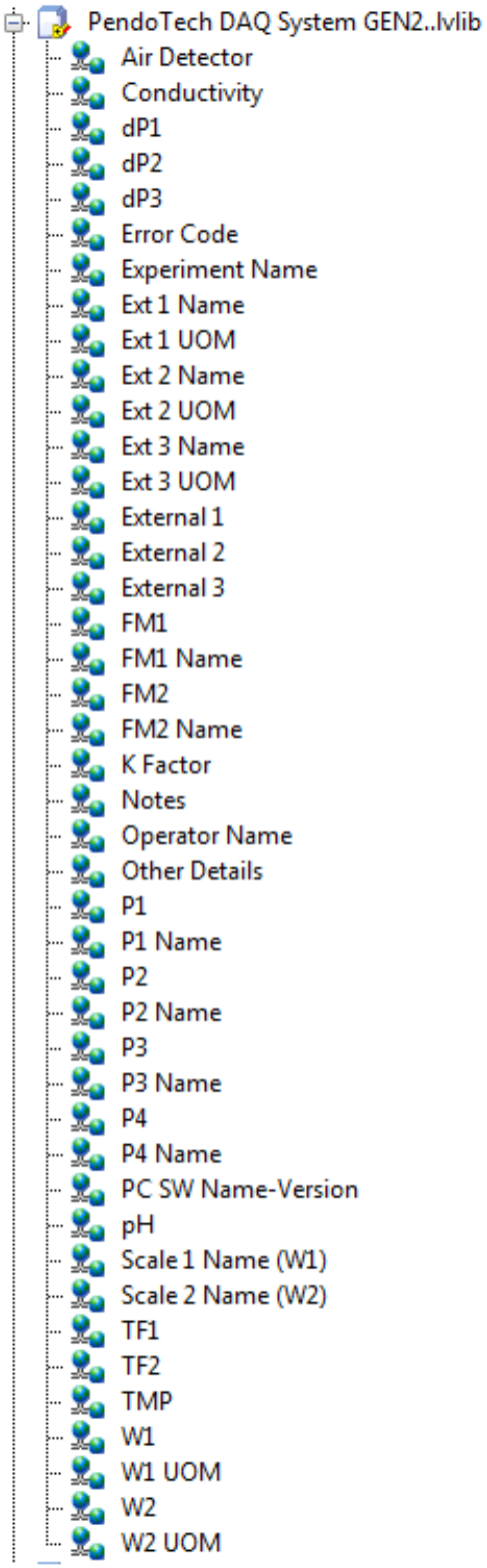
When you select the VFDF System you will see:



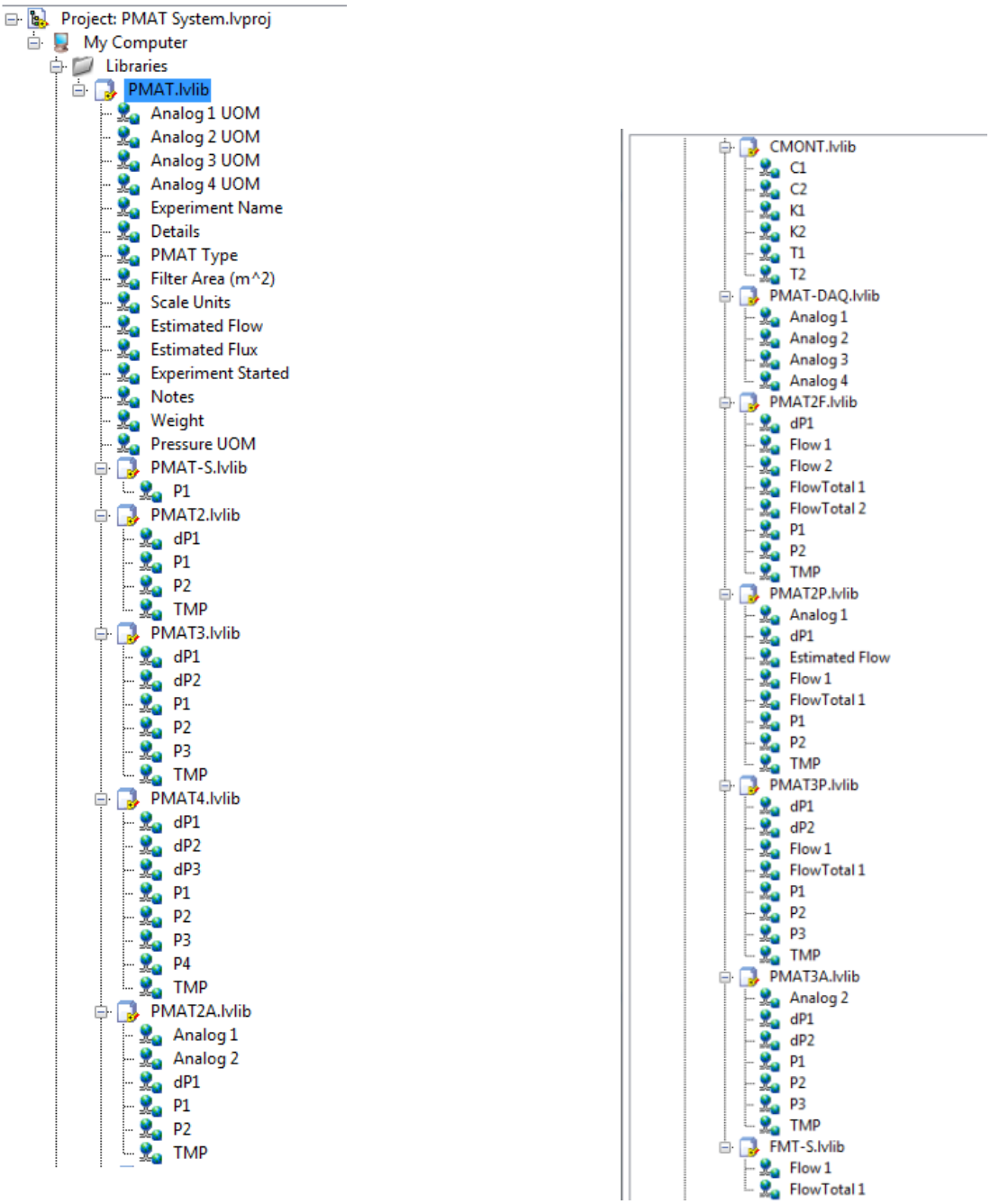
Tag	Value	Quality	Timestamp	Type	Item ID
Alarm Code	""	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\Al...
Conductivity	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Co...
Data Recording On-Off	TRUE	Good - ...	01/29/18 12:52:21	VT_BOOL	\\.\WF-DF Shared Variable Library\Da...
Delta P2	4.750000	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\De...
Delta P3	0.010000	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\De...
Delta P1	-4.760000	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\De...
Endpoint Step	"RVol 91.49"	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\En...
Experiment Name	""	Good - ...	01/29/18 12:34:45	VT_BSTR	\\.\WF-DF Shared Variable Library\Ex...
External 1	0.034400	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\Ex...
External 2	0.037500	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\Ex...
Filter 1 Name	""	Good - ...	01/29/18 12:34:45	VT_BSTR	\\.\WF-DF Shared Variable Library\Filt...
Filter 2 Name	""	Good - ...	01/29/18 12:34:53	VT_BSTR	\\.\WF-DF Shared Variable Library\Filt...
Filter 3 Name	""	Good - ...	01/29/18 12:34:53	VT_BSTR	\\.\WF-DF Shared Variable Library\Filt...
Filter Area F1	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Filt...
Filter Area F2	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Filt...
Filter Area F3	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Filt...
Filtrate Weight	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Filt...
Flow Meter (LPM)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Flo...
Flux Filter 1 (LMH)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Flu...
Flux Filter 2 (LMH)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Flu...
Flux Filter 3 (LMH)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\Flu...
Function	"Second (Vi...	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\Fu...
Mode	"Run"	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\M...
Notes	""	Good - ...	01/29/18 13:06:25	VT_BSTR	\\.\WF-DF Shared Variable Library\No...
P1 (psi)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\P1...
P2 (psi)	4.760000	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\P2...
P3 (psi)	0.010000	Good - ...	01/29/18 13:06:28	VT_R8	\\.\WF-DF Shared Variable Library\P3...
pH	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\pH
Pump Flow (LPM)	5.421000	Good - ...	01/29/18 13:01:58	VT_R8	\\.\WF-DF Shared Variable Library\Pu...
Setpoint dP Enabled	"Yes"	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\Se...
Step	"Second (Vi...	Good - ...	01/29/18 13:06:28	VT_BSTR	\\.\WF-DF Shared Variable Library\Step
Temperature	-16.700001	Good - ...	01/29/18 12:34:24	VT_R8	\\.\WF-DF Shared Variable Library\Te...
Total Flow (L)	VT_EMPTY	Uncerta...	12/31/69 16:00:00	VT_EMPTY	\\.\WF-DF Shared Variable Library\To...

VFDF Data Tags

When you select the PendoTECH DAQ System you will see:



PendoTECH DAQ Data Tags



PMAT-GUI Tags

4. The OPC server will communicate with OPC DA Clients versions 2.0, 2.5, and 3.0.

5. Ensure sure the PC GUI Software is running as it is the running the OPC server. The data tags will not be published if the local machine is not running the control system software.

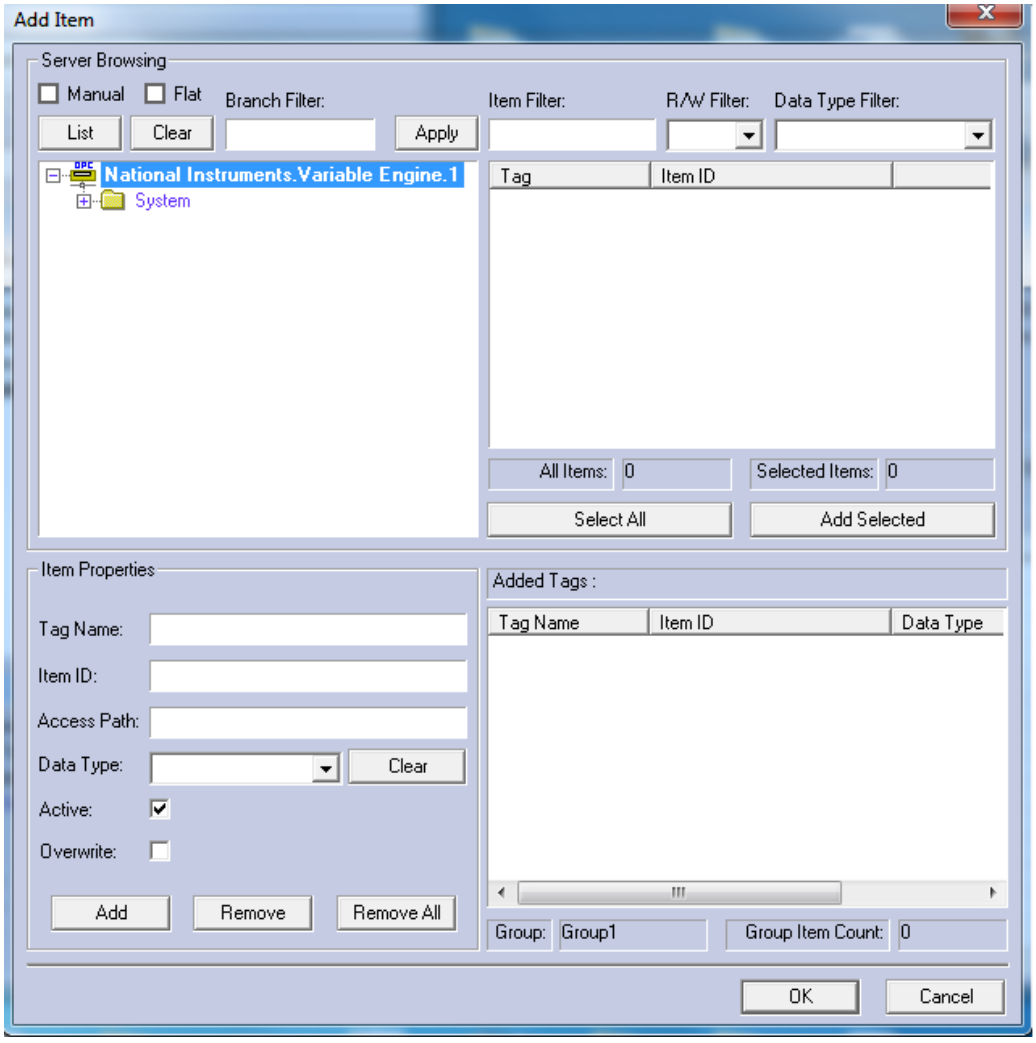
NOTE: the OPC Server starts when the (PendoTECH) Application software starts. The OPC Server will continue to publish data until the Application is exited. The OPC Server is already running when an "Experiment" is started. The OPC Server is still running when the Experiment is ended. The OPC Server is running as long as the Application is running.

Furthermore, we cannot disconnect the OPC Server from the PendoTECH Application.

One possible solution would be just to leave the application open. Also possible is the configuration to have the PendoTech Software Application to startup with the PC. The Tags would be stale until the users responds to the dialog box on whether to search for the control system connected.

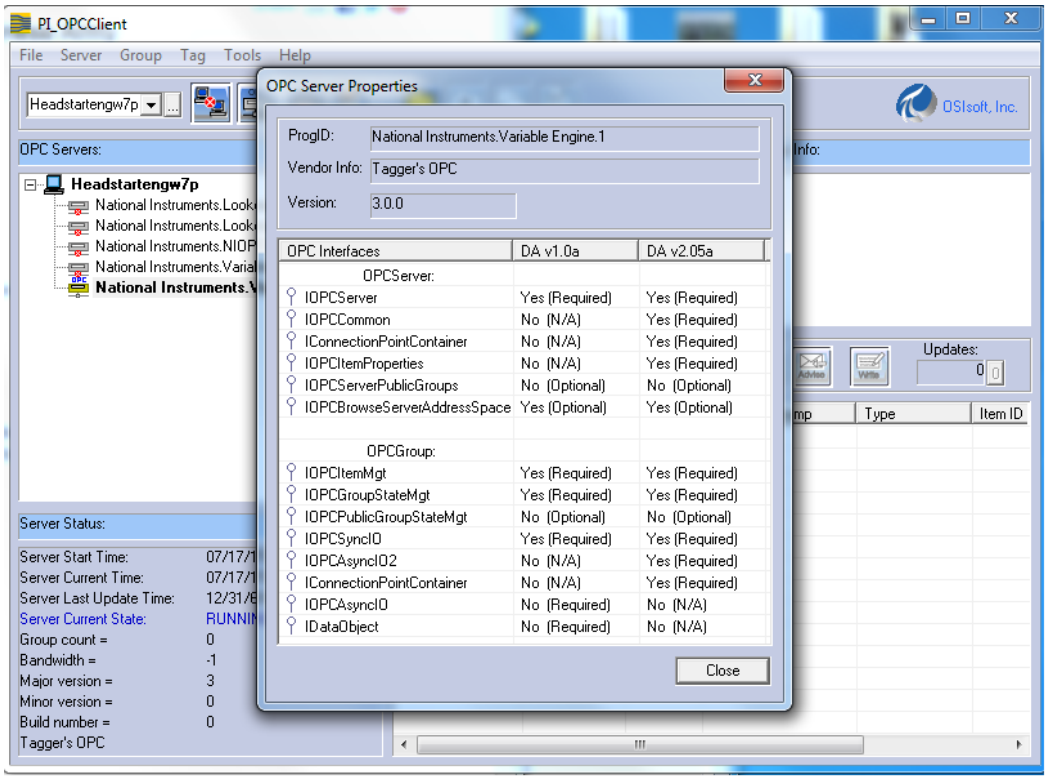
4. Appendix A- View When System Not Running

The screenshot below shows what the National Instruments.Variable Engine screen will look like if the PendoTECH Control system software is not running on the PC hosting the OPC server, or running the incorrect application (non-OPC version). The PendoTECH applications that support OPC functionality all have a .OPC suffix after the version number.



Variable Engine Screen when Control System Software Not Running

5. Appendix B- View of OPC Server Properties



OPC Server Properties