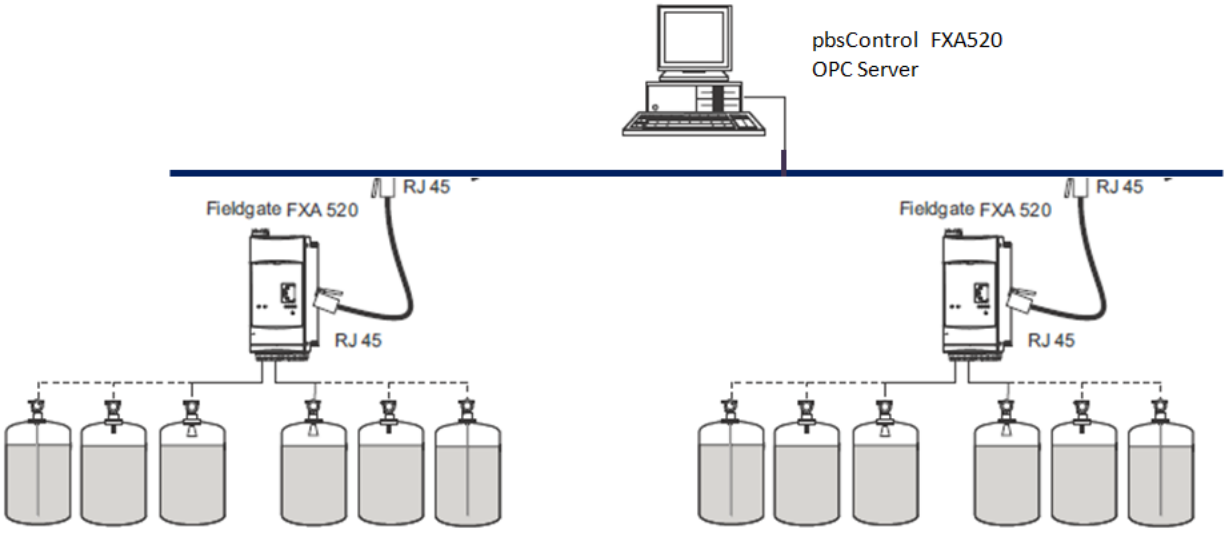
Introduction

pbsControl Developed OPC Server for E+H FieldGate FXA520 .

Fieldgate FXA520 is a HART Interface/Gateway with integrated web server that is used for remote acquisition of data from up to 30 measuring points. Two HART devices and two analog devices can be connected directly to it. Additional HART devices can be connected via the HART multidrop adapter FXN520 or via a HART multiplexer. When used in connection with the FXZ520 multiplexer module, it is also possible to access values provided by up to 28 4...20 mA and digital devices. The Fieldgate communicates with the host computer via Ethernet, telephone or GSM modem.



pbsControl FXA520 OPC server is only communicate through Ethernet to FXA520 Gateway .
pbsControl FXA250 OPC server can communicate to multiple Gateways in the same time .

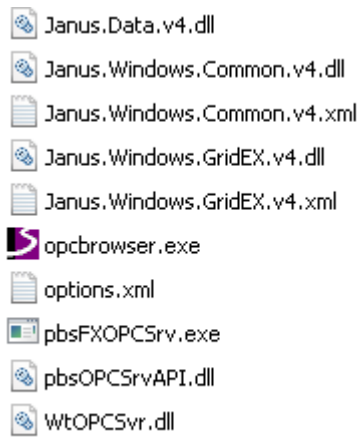
Installation

You can download pbsControl FXA520 OPC server from
http://www.pbscontrol.com/pbsProducts/pbsFXOPCSrv.zip link.

FXA OPC server needs Dot net Framework 2.0 and OPC 2.0 runtime kernel for proper running.
http://www.pbscontrol.com/util/OPC_Core2_Redistributable_2_30.msi

For installation of OPC Runtime kernel you should run as administrator, otherwise it couldn't modify windows registry.

After unzipping pbsFXOPCSrv.zip at any folder, you will see following files:



You need to run pbsFXOPCSrv.exe as administrator for first time to final OPC registration in windows Registry.

pbsOPCSrvAPI.dll and WtOPCSvr.dll are main OPC component files .

options.xml is active configuration file . Gateways parameters and Devices are defined in this file.

opcBrowser.exe is simple and free OPC Browser utility .

Janus_*.* are system files.

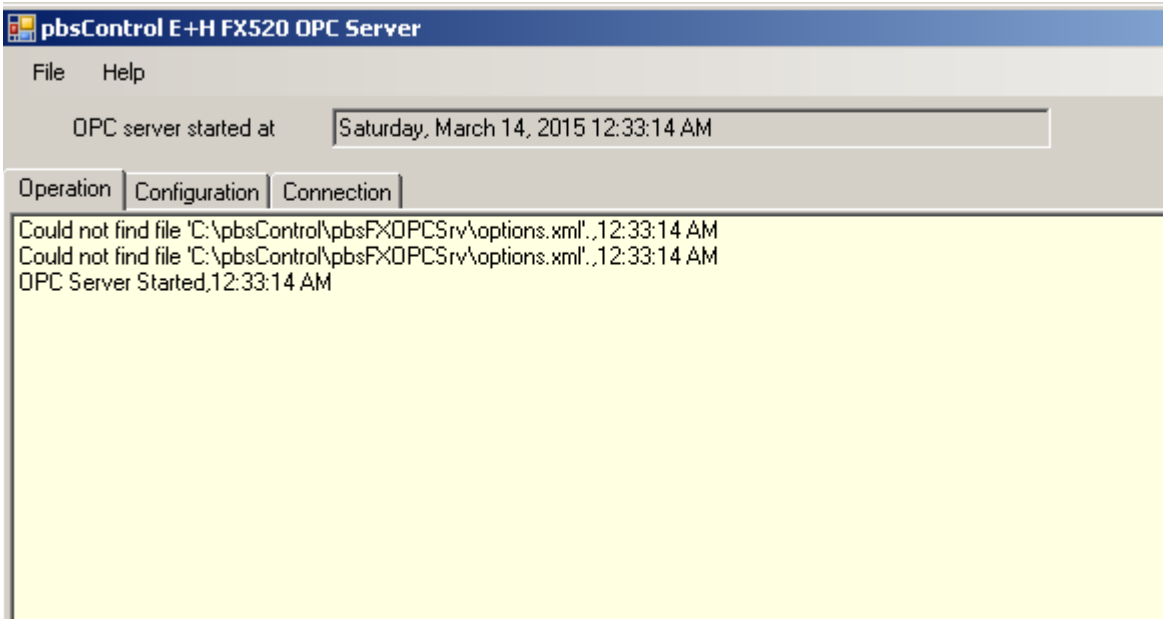
FXA OPC server can be run in Windows XP , Windows 7 , Windows Server 2008 and windows Server 2012 .

FXA OPC Server without license will run for 30 min for test purpose.

Configuration

OPC configuration and runtime is integrated into pbsFXOPCSrv.exe application.

When you run pbsFXOPCSrv.exe, at load time it is searching for options.xml file to find system configuration.

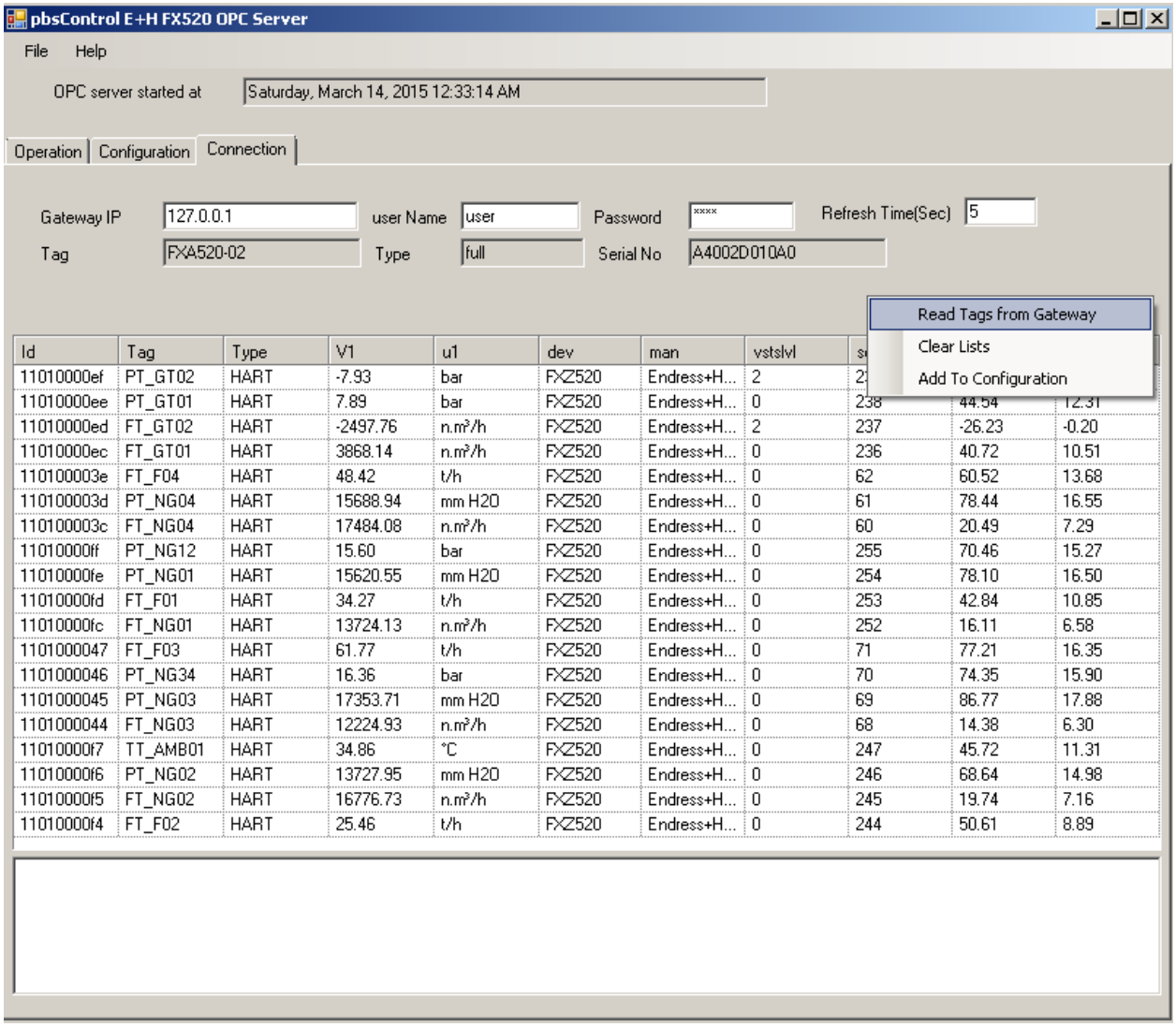


Connection Tab : for finding FXA Gateways and testing Devices and tags inside Gateways.

Configuration Tab : for Defining and saving final OPC configuration .

Operation Tab : shows OPC messages at runtime .

Connection Tab:



Id	Tag	Type	V1	u1	dev	man	vstslvl			
11010000ef	PT_GT02	HART	-7.93	bar	FXZ520	Endress+H...	2	2		
11010000ee	PT_GT01	HART	7.89	bar	FXZ520	Endress+H...	0	238	44.54	12.31
11010000ed	FT_GT02	HART	-2497.76	n.m³/h	FXZ520	Endress+H...	2	237	-26.23	-0.20
11010000ec	FT_GT01	HART	3868.14	n.m³/h	FXZ520	Endress+H...	0	236	40.72	10.51
110100003e	FT_F04	HART	48.42	t/h	FXZ520	Endress+H...	0	62	60.52	13.68
110100003d	PT_NG04	HART	15688.94	mm H2O	FXZ520	Endress+H...	0	61	78.44	16.55
110100003c	FT_NG04	HART	17484.08	n.m³/h	FXZ520	Endress+H...	0	60	20.49	7.29
11010000ff	PT_NG12	HART	15.60	bar	FXZ520	Endress+H...	0	255	70.46	15.27
11010000fe	PT_NG01	HART	15620.55	mm H2O	FXZ520	Endress+H...	0	254	78.10	16.50
11010000fd	FT_F01	HART	34.27	t/h	FXZ520	Endress+H...	0	253	42.84	10.85
11010000fc	FT_NG01	HART	13724.13	n.m³/h	FXZ520	Endress+H...	0	252	16.11	6.58
1101000047	FT_F03	HART	61.77	t/h	FXZ520	Endress+H...	0	71	77.21	16.35
1101000046	PT_NG34	HART	16.36	bar	FXZ520	Endress+H...	0	70	74.35	15.90
1101000045	PT_NG03	HART	17353.71	mm H2O	FXZ520	Endress+H...	0	69	86.77	17.88
1101000044	FT_NG03	HART	12224.93	n.m³/h	FXZ520	Endress+H...	0	68	14.38	6.30
11010000f7	TT_AMB01	HART	34.86	°C	FXZ520	Endress+H...	0	247	45.72	11.31
11010000f6	PT_NG02	HART	13727.95	mm H2O	FXZ520	Endress+H...	0	246	68.64	14.98
11010000f5	FT_NG02	HART	16776.73	n.m³/h	FXZ520	Endress+H...	0	245	19.74	7.16
11010000f4	FT_F02	HART	25.46	t/h	FXZ520	Endress+H...	0	244	50.61	8.89

Write Gateway IP, user name and password and right click on the screen. Select Read Tags from Gateway.

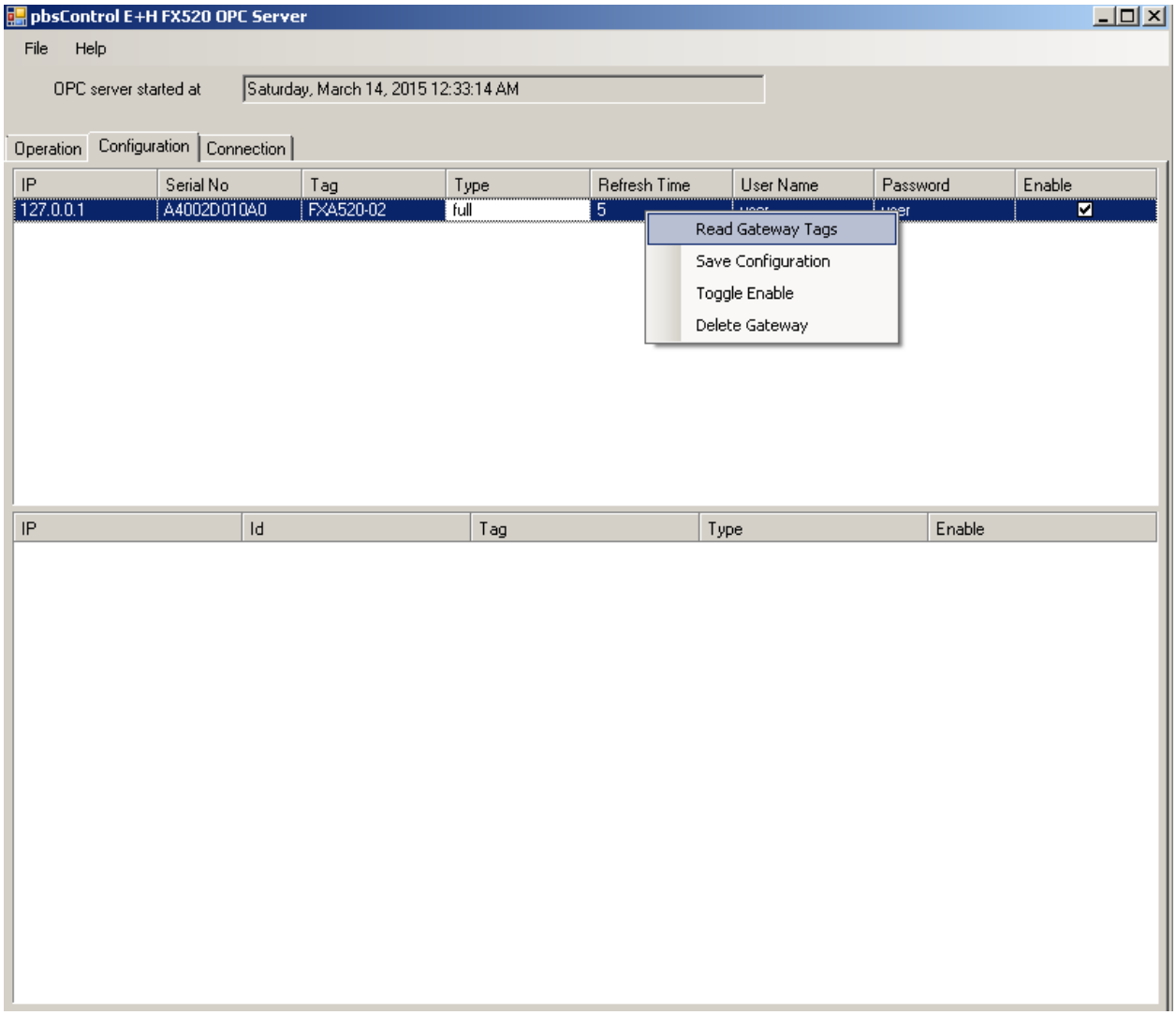
OPC will read all devices which are defined in the gateway and shows current value of important tags for testing.

Fill Refresh Time (in Sec) and select “Add to Configuration”.

Refresh time is period of reading devices data from gateway by OPC Server.

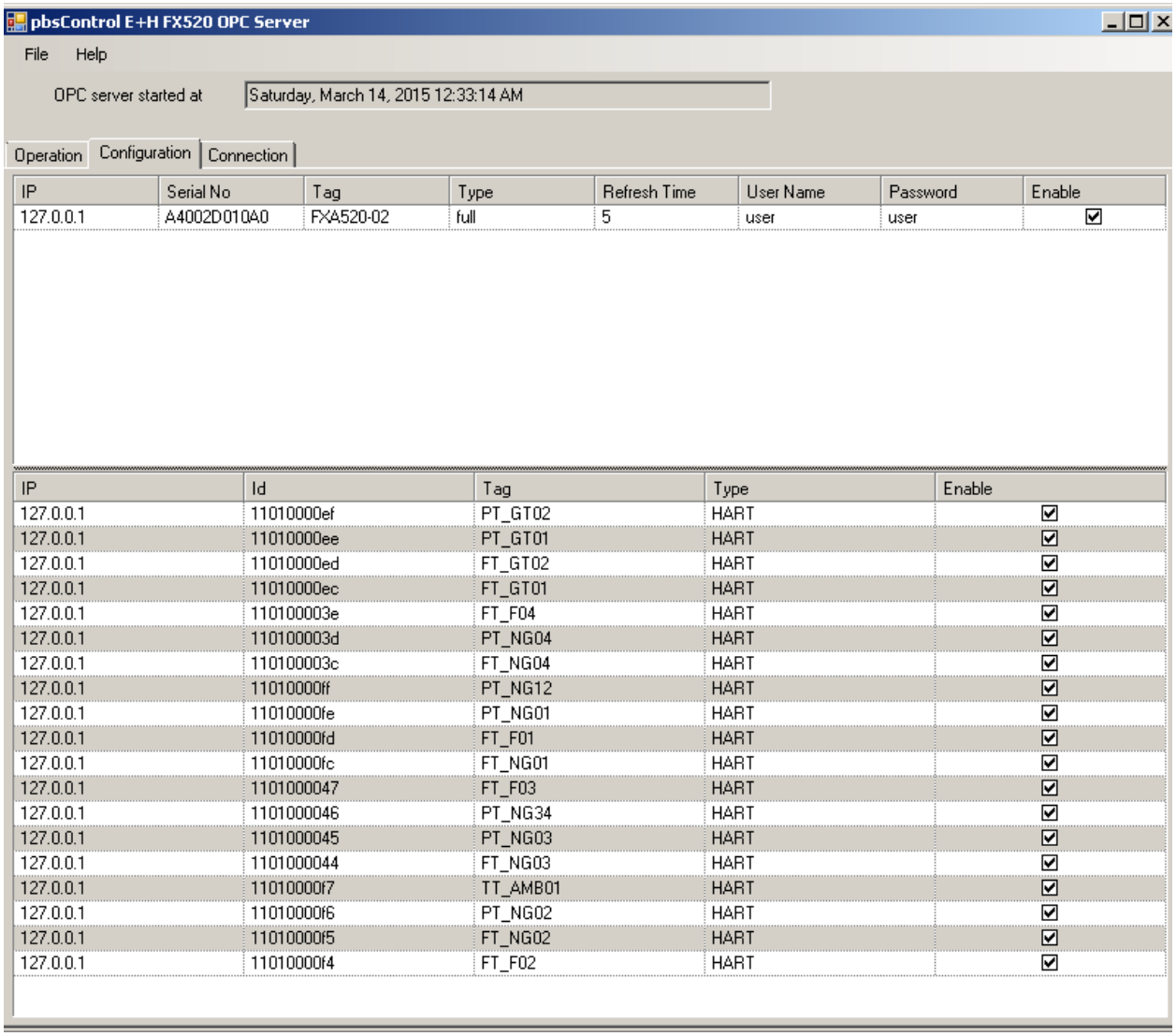
You should repeat above sequence for all FXA520 gateways and add them to configuration.

Configuration Tab



When you add a gateway to configuration, it will add to project gateway list. Our primary key is Gateway IP address.

Again right click on selected Gateway, and Execute “read Gateway Tags”.



IP	Serial No	Tag	Type	Refresh Time	User Name	Password	Enable
127.0.0.1	A4002D010A0	FXA520-02	full	5	user	user	☑

IP	Id	Tag	Type	Enable
127.0.0.1	11010000ef	PT_GT02	HART	☑
127.0.0.1	11010000ee	PT_GT01	HART	☑
127.0.0.1	11010000ed	FT_GT02	HART	☑
127.0.0.1	11010000ec	FT_GT01	HART	☑
127.0.0.1	110100003e	FT_F04	HART	☑
127.0.0.1	110100003d	PT_NG04	HART	☑
127.0.0.1	110100003c	FT_NG04	HART	☑
127.0.0.1	11010000ff	PT_NG12	HART	☑
127.0.0.1	11010000fe	PT_NG01	HART	☑
127.0.0.1	11010000fd	FT_F01	HART	☑
127.0.0.1	11010000fc	FT_NG01	HART	☑
127.0.0.1	1101000047	FT_F03	HART	☑
127.0.0.1	1101000046	PT_NG34	HART	☑
127.0.0.1	1101000045	PT_NG03	HART	☑
127.0.0.1	1101000044	FT_NG03	HART	☑
127.0.0.1	11010000f7	TT_AMB01	HART	☑
127.0.0.1	11010000f6	PT_NG02	HART	☑
127.0.0.1	11010000f5	FT_NG02	HART	☑
127.0.0.1	11010000f4	FT_F02	HART	☑

Top List, is list of Project gateways and bottom list is devices inside one gateway.

When you click on one gateway -at top list- , you can see List of devices for that gateway in bottom list.

Right click on Top and bottom list, you can make that element enable or disable.

When a gateway is disabled, OPC server will define its tags inside OPC Database, but it is not start communicate with disabled gateway.

When a device is disabled, OPC server will not define its tags inside OPC Database.

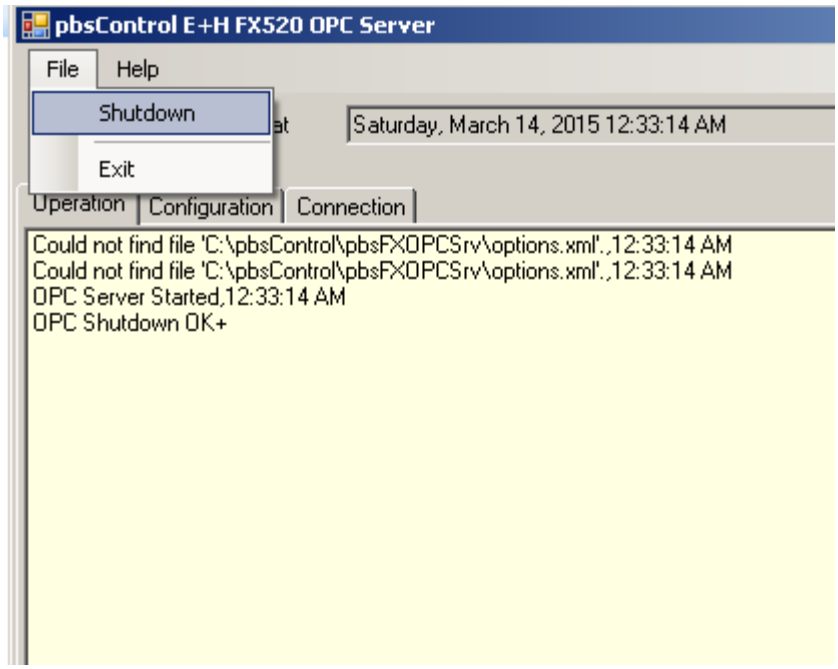
For deleting a gateway from list, right click on selected gateway and execute “Delete Gateway”.

For saving configuration right click on gateway List and execute “Save Configuration”.

Every time you save configuration, OPC will get a back up of options.xml file and will copy on same OPC directory. Backup format name is options_N.bak

N is a equal to DateTime.Now.ToFileTime() function .

For shutdown OPC, open File menu and execute Shutdown OPC.



If no other OPC clients are connected to OPC server, it will show “OPC Shutdown OK +“ messages in Operation tab list .

If any other OPC client is connected to OPC server, then it is not possible to shutdown OPC Server and it will show “OPC clients are connected to OPC Server”.

So you need to stop OPC clients first and after that shutdown OPC Server.

For closing OPC server, after shutdown of OPC, you can open file menu and execute Exit Command.

If OPC is shutdown before properly, then it will close.

When you run again OPC server, it will read options.xml file and define all gateways, devices and tags inside OPC database and start to communicate with enable Gateways.

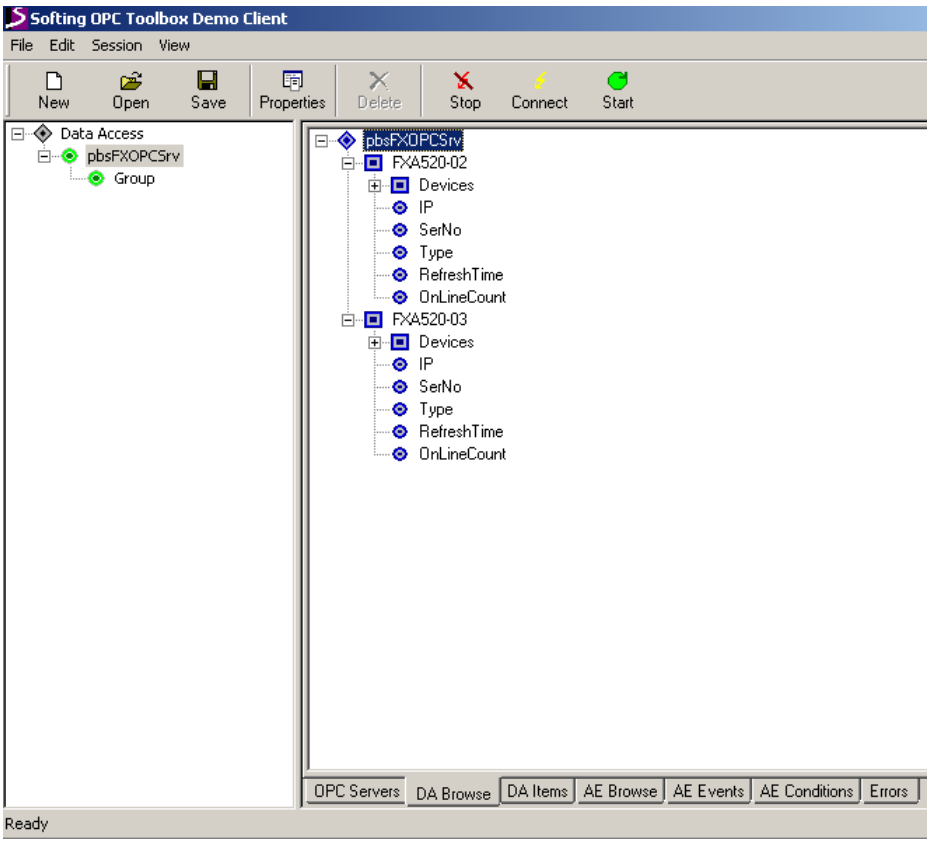
OPC Runtime

You can connect to OPC Server by OPC Browser software's and look at OPC server tags. There is a free OPC Browser utility (opcbrowser.exe) inside FXA520 OPC Server Directory.run it and connect to OPC server as following:

pbsControl FXA520 OPC Server Name and GUID is :

Right click on server name and execute "Add Server"

After OPC connected, you can see OPC server name in left panel in green color. Click on DA Browse and you can see generated OPC tags.



There is a parent tag for each Gateway. Parent Tag name is name of Gateway.

Item	Value	Quality
FXA520-03.IP	localhost	GOOD
FXA520-03.SerNo	A4002D010A0	GOOD
FXA520-03.Type	full	GOOD
FXA520-03.RefreshTime	5	GOOD
FXA520-03.OnLineCount	92	GOOD

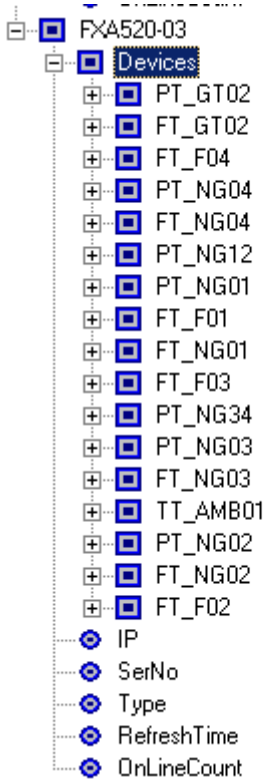
{GatewayName}.IP = IP address of Gateway

{GatewayName}.SerNo = Serial Number of Gateway

{GatewayName}.Type = Type of Gateway

{GatewayName}.RefreshTime = Period time of reading data from gateway by OPC server in sec .

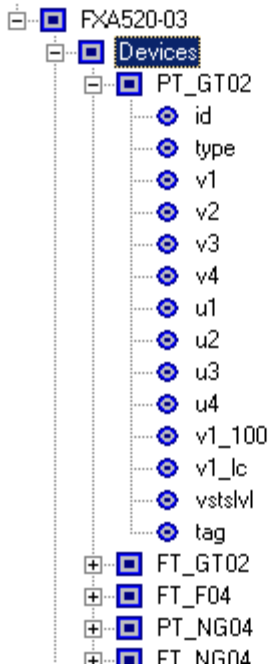
{GatewayName}.OnLineCount = Number of times that OPC Server is reading data from Gateway . its value increase sequentially from 0 until 32000 then will change to 0 again .



There are many devices for a gateway.

{GatewayName}.Devices.{DeviceName} = Device OPC Tag Name

There are following Tags for a Device:



{GatewayName}.Devices.{DeviceName}.id = Device id

{GatewayName}.Devices.{DeviceName}.type = Device type

{GatewayName}.Devices.{DeviceName}.v1 = Primary Value

{GatewayName}.Devices.{DeviceName}.v2 = Secondary Value

{GatewayName}.Devices.{DeviceName}.v3 = Tertiary Value

{GatewayName}.Devices.{DeviceName}.v4 = Quaternary Value

{GatewayName}.Devices.{DeviceName}.u1 = unit of Primary Value

{GatewayName}.Devices.{DeviceName}.u2 = unit of Secondary Value

{GatewayName}.Devices.{DeviceName}.u3 = unit of Tertiary Value

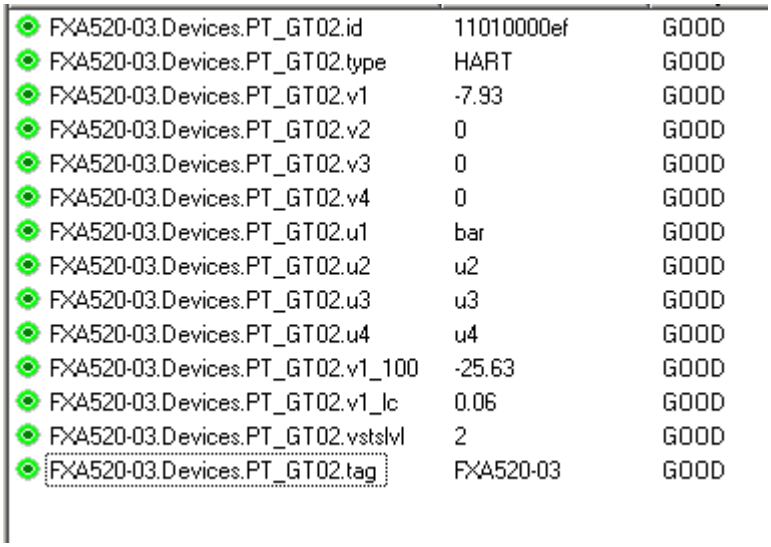
{GatewayName}.Devices.{DeviceName}.u4 = unit of Quaternary Value

{GatewayName}.Devices.{DeviceName}.v1_100 = Primary Value percentage of Range

{GatewayName}.Devices.{DeviceName}.v1_lc = primary value loop current

{GatewayName}.Devices.{DeviceName}.vstslvl = Error Level of Response (0: ok , 1: warning, 2: error (according to HART6-Spec)

{GatewayName}.Devices.{DeviceName}.tag = Device name



FXA520-03.Devices.PT_GT02.id	11010000ef	GOOD
FXA520-03.Devices.PT_GT02.type	HART	GOOD
FXA520-03.Devices.PT_GT02.v1	-7.93	GOOD
FXA520-03.Devices.PT_GT02.v2	0	GOOD
FXA520-03.Devices.PT_GT02.v3	0	GOOD
FXA520-03.Devices.PT_GT02.v4	0	GOOD
FXA520-03.Devices.PT_GT02.u1	bar	GOOD
FXA520-03.Devices.PT_GT02.u2	u2	GOOD
FXA520-03.Devices.PT_GT02.u3	u3	GOOD
FXA520-03.Devices.PT_GT02.u4	u4	GOOD
FXA520-03.Devices.PT_GT02.v1_100	-25.63	GOOD
FXA520-03.Devices.PT_GT02.v1_lc	0.06	GOOD
FXA520-03.Devices.PT_GT02.vstslvl	2	GOOD
FXA520-03.Devices.PT_GT02.tag	FXA520-03	GOOD

OPC Runtime Specification

OPC Version = DA 2.0

Number of FieldGate = No limitation.

Number of devices inside a Fieldgate = No Limitation.

OPC Server Name = pbsFXOPCsrv

Supported Tags for a device = v1 , v2 , v3 v4 , u1 , u2 , u3 , u4 , v1_100 , v1_lc , vsts1v1