Senseforce OPC UA Server Browser

Date: 12/30/2018

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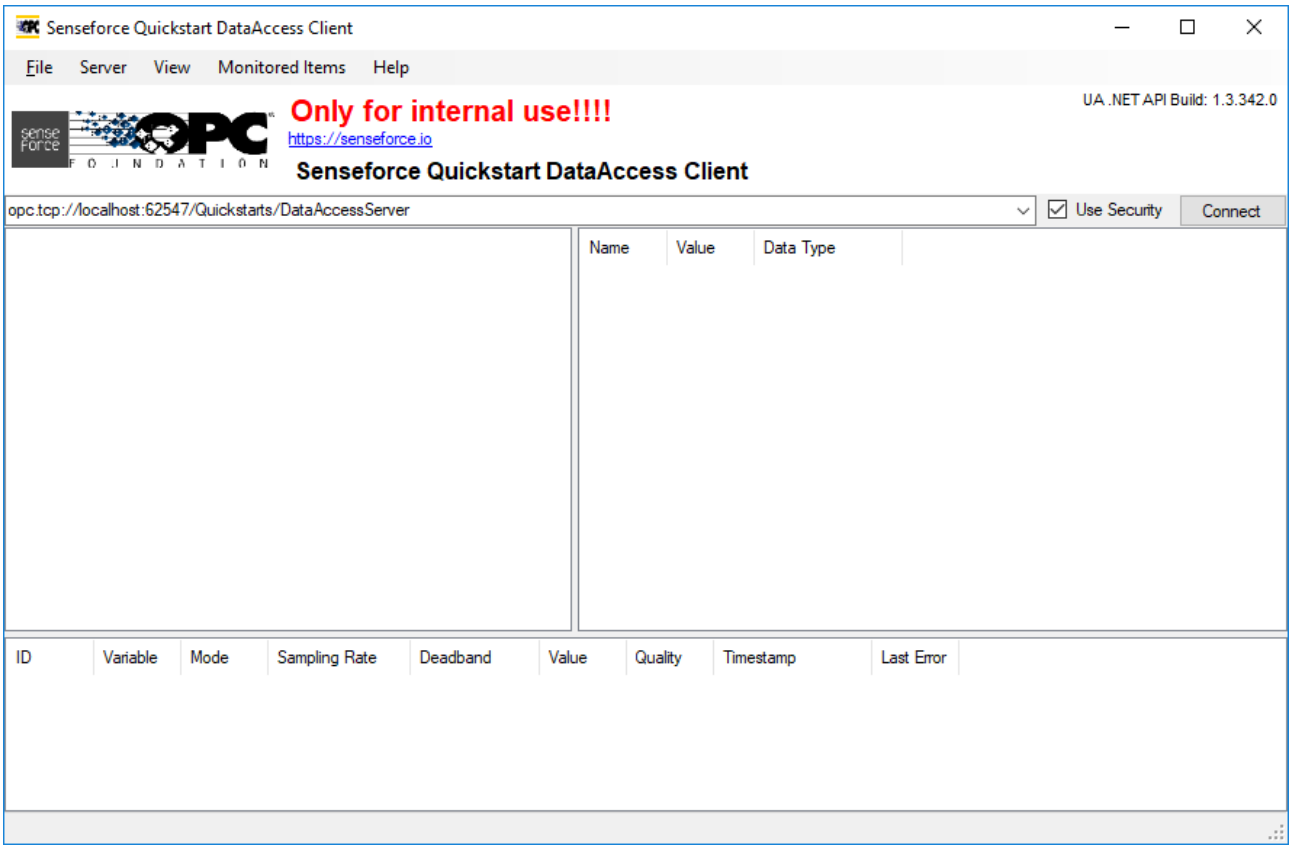
Configuring the LUNA OPC UA subscription XML configuration file manually may be very time consuming.

Therefore, the Senseforce OPC UA Server Browser (Senseforce Quickstart DataAccess Client) was created. The Tool is based on the OPC Foundation's OPC UA Quickstart DataAccess client which can be found here: https://github.com/OPCFoundation/UA-.NET

T[1]he software license to apply is found here: https://opcfoundation.org/license/gpl.html

Make sure to have the `Opc.Ua.CertificateGenerator.exe` either installed in `C:\Program Files (x86)\OPC Foundation\UA 1.02\Sample Applications` or directly located in the same folder as Senseforce.DataAccessClient.exe.



1 https://github.com/OPCFoundation/UA-.NET

1 Step-By-Step Instructions

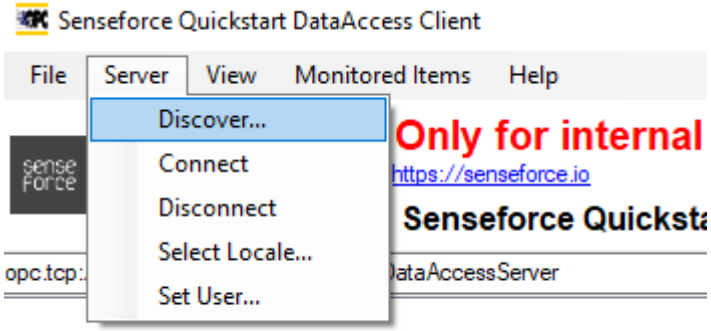
Basic instructions for creating OPC UA subscriptions using the Senseforce Quickstart DataAccess Client

1. Optional: Set username and password for connecting with the OPC UA server. Open the file "Senseforce.DataAccessClient.exe.config" with your xml editor.
   Change Username and Password in the "userSettings"-Section

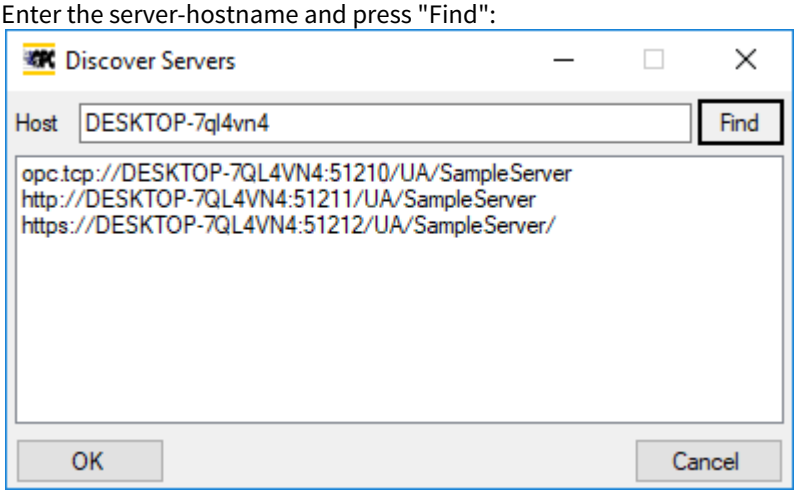
```
<userSettings>
 <Quickstarts.DataAccessClient.Properties.Settings>
  <setting name="Username" serializeAs="String">
   <value>Andreas</value>
  </setting>
  <setting name="Password" serializeAs="String">
   <value>123</value>
  </setting>
 </Quickstarts.DataAccessClient.Properties.Settings>
</userSettings>
```

   To connect with user "Anonymous" simply comment/delete the username/password section.

   (If the config-file is not available, make sure to install the latest version of the OPC UA server browser).
2. Start `Senseforce.DataAccessClient.exe`
3. Discover your server endpoint:

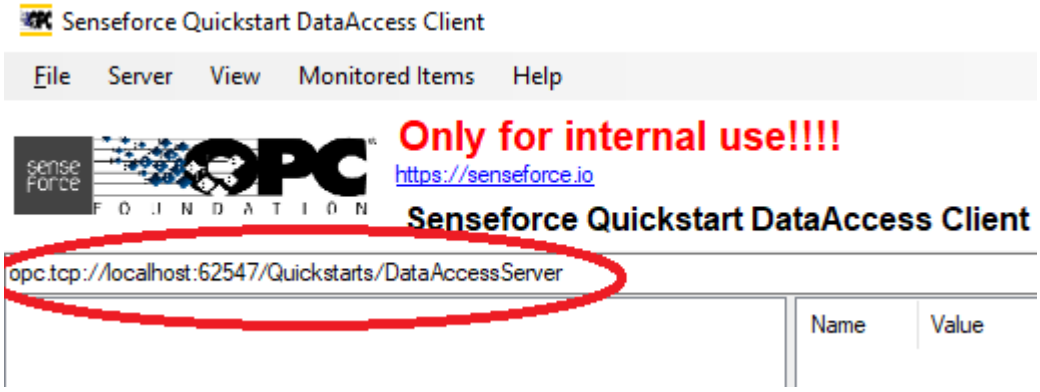


   a. Enter the server-hostname and press "Find":



   b. Select the endpoint you want to connect to and press "OK"

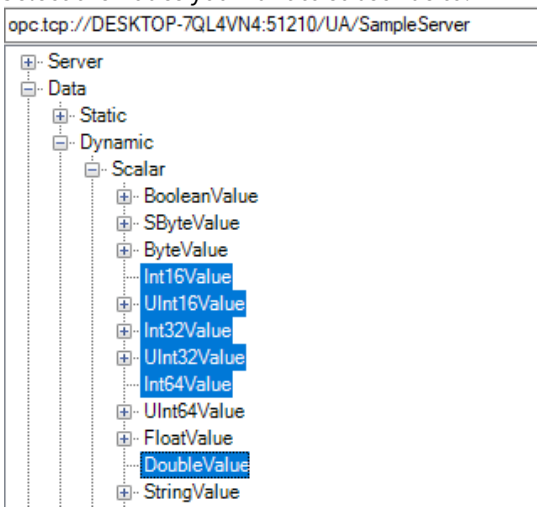
4. Alternatively directly enter the fully qualified endpoint-descriptor:



5. Press "Connect".
6. After successfully connecting to the server, the server's address space will be displayed on the left.

   a. **Troubleshooting**: If the connection fails, make sure to check the servers IP address and check, if the certificate of the server browser is trusted by the OPC UA server and the servers certificate is trusted by the OPC UA server browser. See the Luna manual for more details on certificate handling.

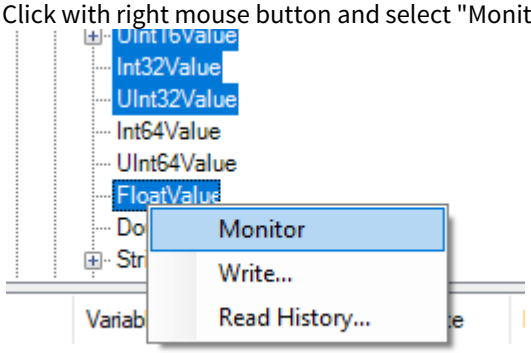
7. Select the nodes you want to subscribe to.



a. Use SHIFT to mark several elements at once.
b. Use STRG to subsequently select several elements at once.

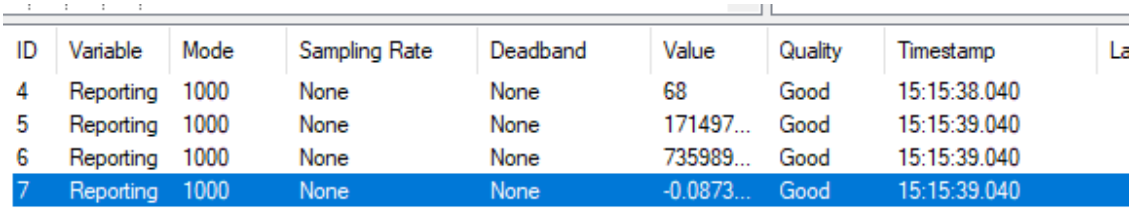
> ⓘ If you use the SHIFT or STRG key to select several elements at once make sure to keep the key pressed while pressing the right mouse button. Otherwise the right mouse button will only highlight the element which is directly below the mouse arrow.

8. Click with right mouse button and select "Monitor" to add the node(s) to your subscription.



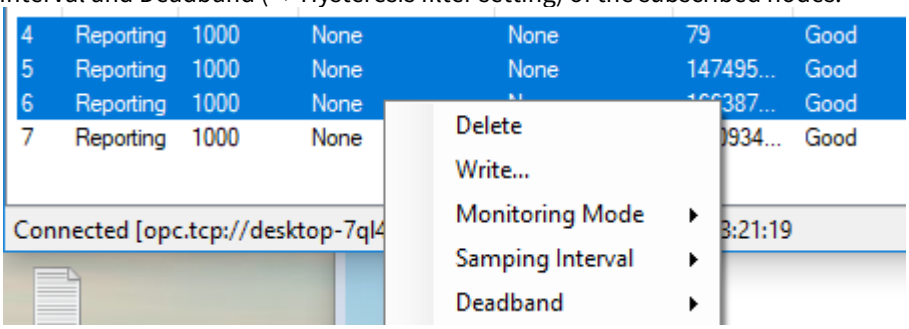
> ⓘ If you use the SHIFT or STRG key to select several elements at once make sure to keep the key pressed while pressing the right mouse button. Otherwise the right mouse button will only highlight the element which is directly below the mouse arrow.

a. All subscribed nodes can be seen in the lower section of the tool:

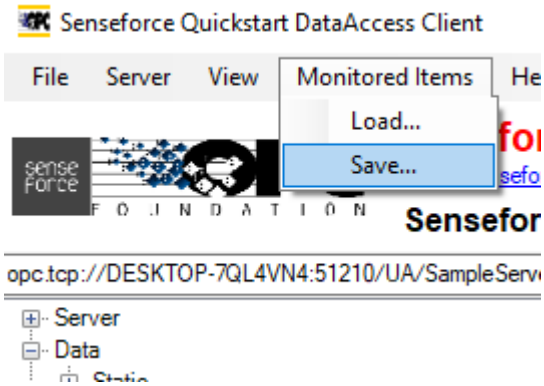


ID	Variable	Mode	Sampling Rate	Deadband	Value	Quality	Timestamp
4	Reporting	1000	None	None	68	Good	15:15:38.040
5	Reporting	1000	None	None	171497...	Good	15:15:39.040
6	Reporting	1000	None	None	735989...	Good	15:15:39.040
7	Reporting	1000	None	None	-0.0873...	Good	15:15:39.040

b. You cann press the "Monitor"-button several times to add nodes to already created subscriptions.
c. Right-clicking on one (or more) of the subscribed nodes allows to set the Monitoring Mode, Sampling Interval and Deadband (→ Hysteresis filter setting) of the subscribed nodes.



9. If all the nodes are added to the subscription, press "Monitored Items" and "Save..." to persist the subscription:


Senseforce Quickstart DataAccess Client
File
Server
View
Monitored Items
He
Load...
Save...
Sensefor
opc.tcp://DESKTOP-7QL4VN4:51210/UA/SampleServ
Server
Data

2 Manually editing subscriptions

Subscriptions are saved as xml-files, allowing to manually edit all the subscription parameters. As described above, subscribed node-settings can be altered during subscription process (Monitoring Mode, Sampling Interval and Deadband), but global subscription settings are not supported by the tool. Opening the saved xml-file with an xml/text-editor allows to edit these parameters.
The most important parameters to edit may be:

- DisplayName
- PublishingInterval
- MaxMessageCount
- MaxNotificationsPerPublish
- KeepAliveCount
- LifeTimeCount

(But it also works perfectly fine with the default values for many Senseforce-related applications)

2.1 Manually adjust the sampling interval

The OPC UA sampling interval is set to 1000ms per default. To change the sampling interval of individual subscription elements, simply recognize the "monitored item" you need to set and change the "SamplingInterval"-setting of the according element.

The setting is in milliseconds. (Setting it to "0" means sampling as fast as supported by the OPC UA server)

```
<MonitoredItems>
  <MonitoredItem>
    <DisplayName>Esb1Istpos_Mm</DisplayName>
    <StartNodeId>
      <Identifier>ns=7;s=PC-Station.WinLC RTX.QS_IstdatKop_DB.Esb1Istpos_Mm</Identifier>
    </StartNodeId>
    <RelativePath i:nil="true" />
    <NodeClass>Variable_2</NodeClass>
    <AttributeId>13</AttributeId>
    <IndexRange i:nil="true" />
    <Encoding i:nil="true" />
    <MonitoringMode>Reporting_2</MonitoringMode>
    <SamplingInterval>0</SamplingInterval>
    <Filter i:nil="true" />
    <QueueSize>1</QueueSize>
    <DiscardOldest>true</DiscardOldest>
  </MonitoredItem>
  <MonitoredItem>
    <DisplayName>Esb1Sollpos_Mm</DisplayName>
    <StartNodeId>
      <Identifier>ns=7;s=PC-Station.WinLC RTX.QS_IstdatKop_DB.Esb1Sollpos_Mm</Identifier>
    </StartNodeId>
    <RelativePath i:nil="true" />
    <NodeClass>Variable_2</NodeClass>
    <AttributeId>13</AttributeId>
    <IndexRange i:nil="true" />
    <Encoding i:nil="true" />
    <MonitoringMode>Reporting_2</MonitoringMode>
    <SamplingInterval>0</SamplingInterval>
    <Filter i:nil="true" />
    <QueueSize>1</QueueSize>
    <DiscardOldest>true</DiscardOldest>
  </MonitoredItem>
  <MonitoredItem>
    <DisplayName>Esb1GeswAkt_MMin</DisplayName>
    <StartNodeId>
      <Identifier>ns=7;s=PC-Station.WinLC RTX.QS_IstdatKop_DB.Esb1GeswAkt_MMin</Identifier>
    </StartNodeId>
    <RelativePath i:nil="true" />
    <NodeClass>Variable_2</NodeClass>
    <AttributeId>13</AttributeId>
    <IndexRange i:nil="true" />
    <Encoding i:nil="true" />
    <MonitoringMode>Reporting_2</MonitoringMode>
    <SamplingInterval>0</SamplingInterval>
    <Filter i:nil="true" />
    <QueueSize>1</QueueSize>
    <DiscardOldest>true</DiscardOldest>
  </MonitoredItem>
```

Please make sure to not change the "SamplingInterval"-setting of the "DefaultItem"!

To change several elements at once, simply use the "search and replace" functionality of your xml editor.

2.2 Manually adjust the filter settings for your xml nodes

OPC UA implements powerful hysteresis filter settings.

To add a filter to a specific monitored item, simply remove the section "<Filter i:nil="true" />" with

```
<Filter i:type="DataChangeFilter">
  <Trigger>StatusValue_1</Trigger>
  <DeadbandType>1</DeadbandType>
  <DeadbandValue>1</DeadbandValue>
</Filter>
```

Change "DeadbandValue" to any absolute hysteresis value you desire (eg. changing DeadbandValue to 10 means only values which changed by at least 10 compared to previous values are recognized).

Please note, that the filter setting needs to be allowed by the OPC UA server!