

Inductive Automation Connectors

Ignition Real-time values

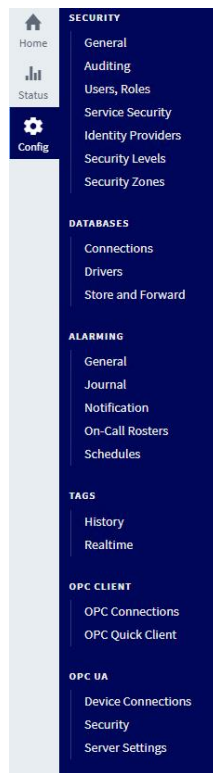
This connector is used to get real time data from Ignition using the Ignition OPC UA server.

Prerequisites

Verify OPC-UA Module

Ignition settings are available through a web browser. Open a web browser and navigate to:
localhost:8088

Log in to Ignition.



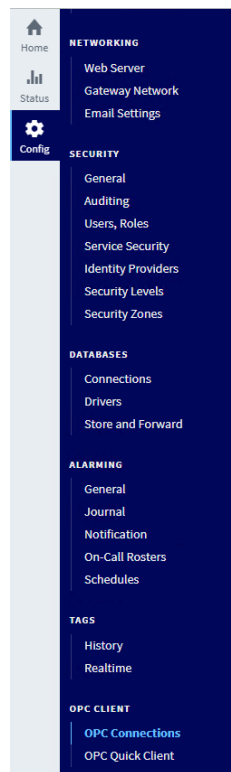
On the left, select **Config**, then under **OPC UA** select **Server Settings**.

Endpoint Configuration	
Bind Port	<input type="text" value="62541"/> <small>(default: 62,541)</small>
Bind Addresses	<input type="text" value="111.111.1.11"/> <small>(default: localhost)</small>
Endpoint Addresses	<input type="text" value="111.111.1.11,<hostname>,<localhost>"/> <small>(default: <hostname>, <localhost>)</small>
Security Policies	<input type="text" value="None"/> <small>(default: Basic256Sha256)</small>

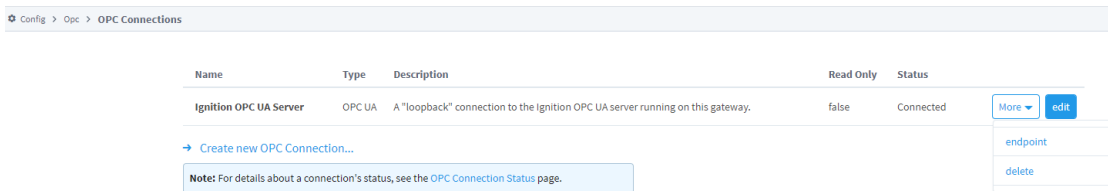
Authentication	
Anonymous Access Allowed	<input type="checkbox"/> <small>(default: false)</small>
User Source	<input type="text" value="opcua-module"/>

- Set the **Bind Address** to the IP address of the machine where the OPC UA server resides.

- Enter the same IP address as the first entry in the **Endpoint Address** field.
- Set **Security Policies** to those you wish to support.
- Click **Save Changes**.

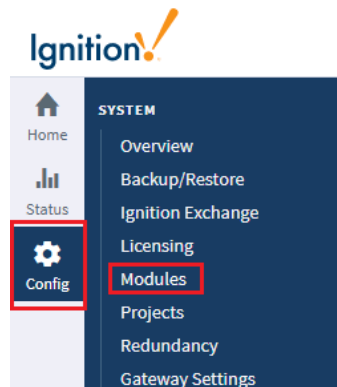


On the left, select **Config**. Under **OPC CLIENT** select **OPC Connections**.



Next to the **Ignition OPC UA Server**, expand the **More** drop-down list and select **endpoint**. If the **Endpoint URL** contains *localhost* replace it with the IP address of the machine where the OPC UA server resides.

- Click **Next three times**.
- Click **Finish**.
- Click **Save Changes**.



On the left, select **Config**, then under **SYSTEM** select **Modules**.

Inductive Automation

View Certificate

Name	Version	Description	License	State		
Alarm Notification	5.0.7 (b2019122014)	Provides alarm notifications via email	Trial	Running	More ▾	restart
Allen-Bradley Driver	5.0.7 (b2019122014)	Allen-Bradley driver suite for the OPC UA module.	Trial	Running	More ▾	restart
DNP3 Driver	3.0.7 (b2019122014)	A driver supporting DNP3 (Distributed Network Protocol) device.	Trial	Running	More ▾	restart
Enterprise Administration	3.0.7 (b2019122014)	A remote Gateway administration system, allowing you to manage Gateways and automate tasks from a single controller.	Trial	Running	More ▾	restart
Logix Driver	4.0.7 (b2019122014)	A driver for communicating with Allen-Bradley Logix5000 series PLCs, and includes firmware version 21 support	Trial	Running	More ▾	restart
Modbus Driver	6.0.7 (b2019122014)	A driver for communicating with devices via Modbus-TCP.	Trial	Running	More ▾	restart
Omron Driver	3.0.7 (b2019122014)	A driver for Omron NJ series PLCs.	Trial	Running	More ▾	restart
OPC-UA	8.0.7 (b2019122014)	Provides Ignition's OPC UA client and server functionality.	Trial	Running	More ▾	restart
OpcCom	5.0.7 (b2019122014)	Bridge that exposes COM based OPC-DA servers to the system.	Trial	Running	More ▾	restart
Perspective	1.0.7 (b2019122014)	A module that provides modern, responsive html based graphical interfaces for Ignition projects.	Trial	Running	More ▾	restart
Reporting	5.0.7 (b2019122014)	Adds reporting capability.	Trial	Running	More ▾	restart
SFC	4.0.7 (b2019122014)	Sequential Function Charts are customizable logic execution environments.	Trial	Running	More ▾	restart

Make sure the **State** for the *OPC-UA* module is *Running*. If it is not, click the button to **Start**.

Remote Communication

If XLReporter is not installed on the same machine as Ignition, the workstation must also have the OPC core components installed. To determine if the core components are installed verify the following file exists:

- 64 - bit OS C:\Windows\SysWow64\OPCEnum.exe
- 32 - bit OS C:\Windows\system32\OPCEnum.exe

If the components are not installed, they are provided in the tools folder of the installation or from www.opcfoundation.org.

Connector

To configure the connector to the Ignition OPC UA server, from the **Project Explorer** select **Data, Connectors**.

- Click **Add**
- Select **Inductive Automation, Ignition Real-time values**
- Click **OK**

OPC UA Settings

Connector Name: Ignition_UA_1

Server | Connection

Endpoint Filter: opc.tcp | Host Name: localhost | Port: 62541

Servers at Host: [Empty] | Find...

User Identity: anonymous | Select...

Security Profile: None | Best Available | Specific | Select...

Disable server certificate checks

Description: | Value: | Connect

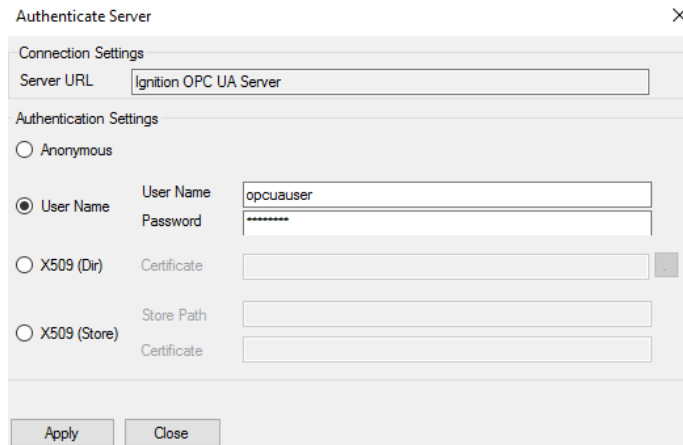
Apply | Close

Under the **Server** tab, for **Host Name**, select or enter the name or IP address of the machine where the server is running. For **Port** specify the **Bind Port** as configured in the **Ignition OPC UA Settings**. This is typically either *4096* or *62541*.

For **Servers at Host** click **Find** and then choose *Ignition OPC UA Server*.

If no servers populate or this times out, append */discovery* to the end of the **Port** number and click **Find** again. After selecting *Ignition OPC UA Server*, remove */discovery* from the port number field.

For **User Identity** click **Select** to specify.



For Ignition this can be either *Anonymous* or *User Name*. *Anonymous* can be used if the **Anonymous Access Allowed** setting is enabled in the **Ignition OPC UA Settings**.

Security Profile defines the endpoint to connect to for the Ignition OPC UA Server. Select the profile that matches the **Security Policies** set in the **Ignition OPC UA Settings**. To use a specific endpoint, select *Specific* and click the **Select** button.

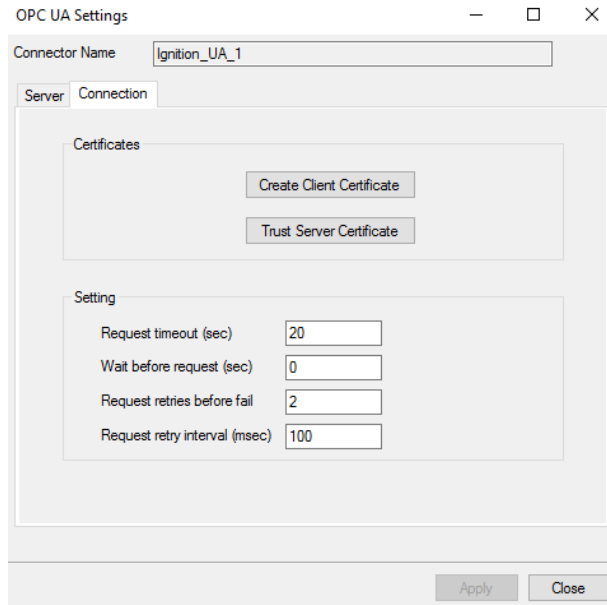
Click **Get Endpoints** to get the list of available endpoints, select the one that best fits with the server settings and click **OK**.

Click **Connect** to ensure connectivity. This may require an exchange of certificates between the client and the server. If prompted to exchange, click **Yes**. This action requires Windows administrator rights.

If the **Connect** fails, be sure that the client certificate is trusted by the server and then attempt to **Connect** again. For more information, see the *Trusted Clients* section below.

The **Disable server certificate checks** option can be used to bypass all the checks normally done against the certificate passed back from the OPC UA server. This is typically used if settings like the *Domain* or *Application URI* do not match what is expected but you would like to proceed with connection. Use this setting with caution as it disables many security features.

Under the **Connection** tab are **Certificate** options and general **Settings**.



The Client Certificate is automatically created on installation. If required, to recreate the certificate select **Create Client Certificate**. For most OPC UA servers, the default settings will be sufficient, but if the server requires more advanced certificate settings you can specify them with the **Advanced** button.

Trusted Clients

In some cases, the client must be accepted by the server to make requests. From within Ignition, select **Config, OPC UA, Security**.

Under the **Server** tab, in **Quarantined Certificates**, accept the client certificate listed.

Verify Data Communication

To verify communication to Ignition OPC UA, open the **Project Explorer** and select the **Tools** tab. Launch the **System Check** application.

- Click **Add**
- Choose the *Ignition OPC-UA Connector* from the dropdown list
- Click the pushbutton ([...]) next to **Items** to open the **Tag Browser** window.
- Select one or more tags, click **OK**
- Click **Start** to verify the communication

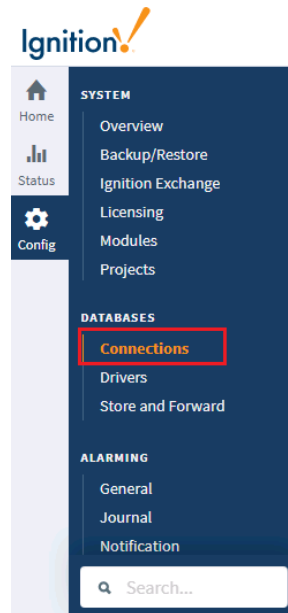
Ignition Historical values

This connector is used to get historical data from the Ignition Historical Tag Provider database.

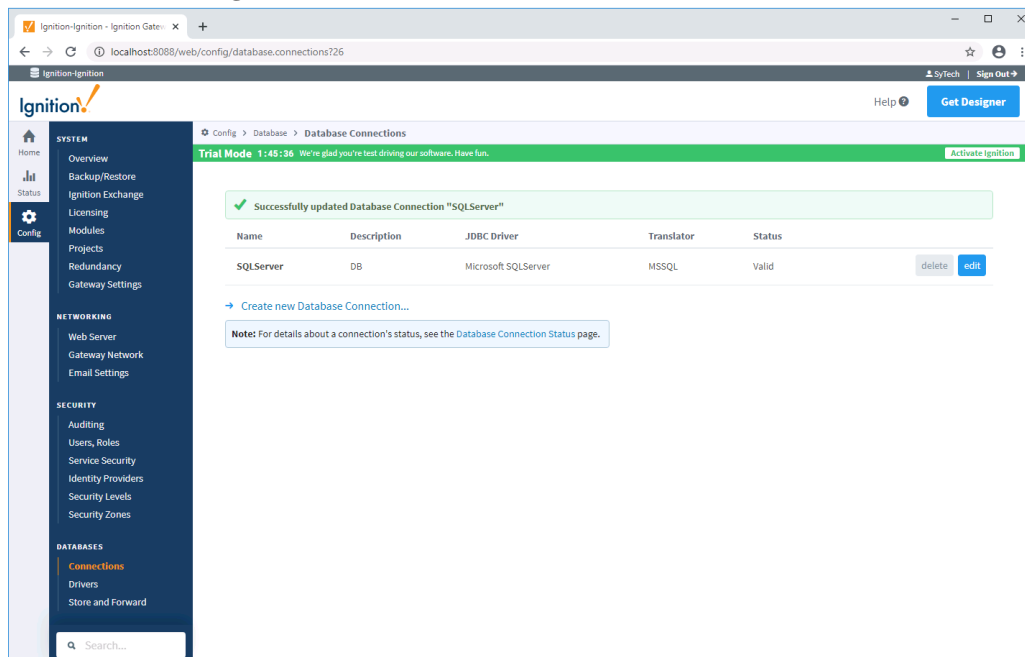
Set up Historical Value Log

Ignition settings are available through a web browser. Open a web browser and navigate to:
localhost:8088

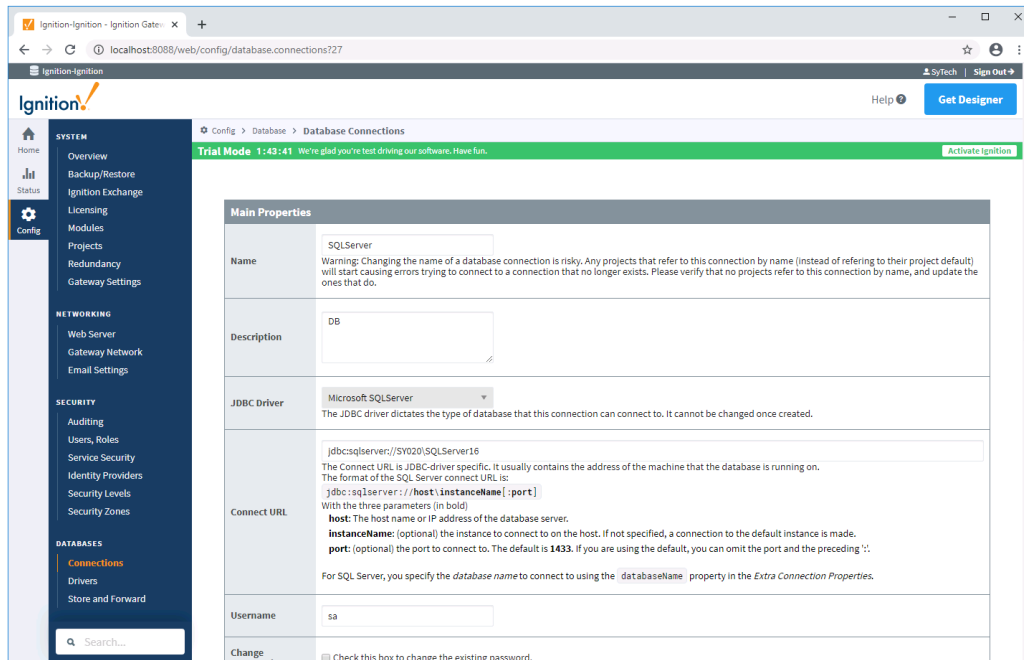
Log in to Ignition.



On the left, select **Config**, then under **Databases** select **Connections**.

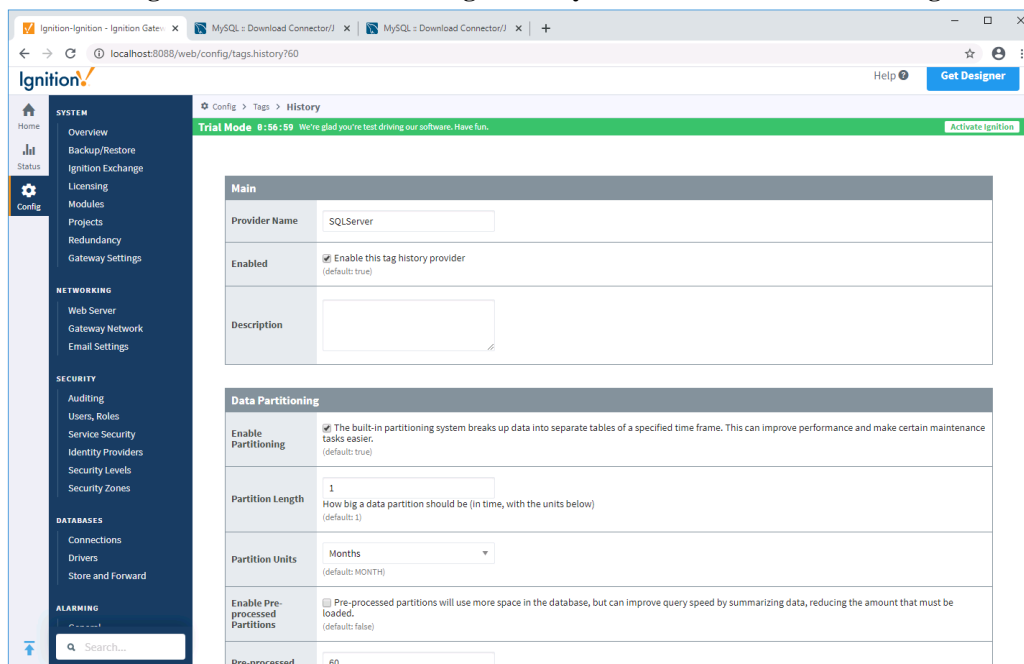


- Click *Create new Database Connection...*



Make the connection to an available database like MySQL or Microsoft SQL Server/SQL Server Express.

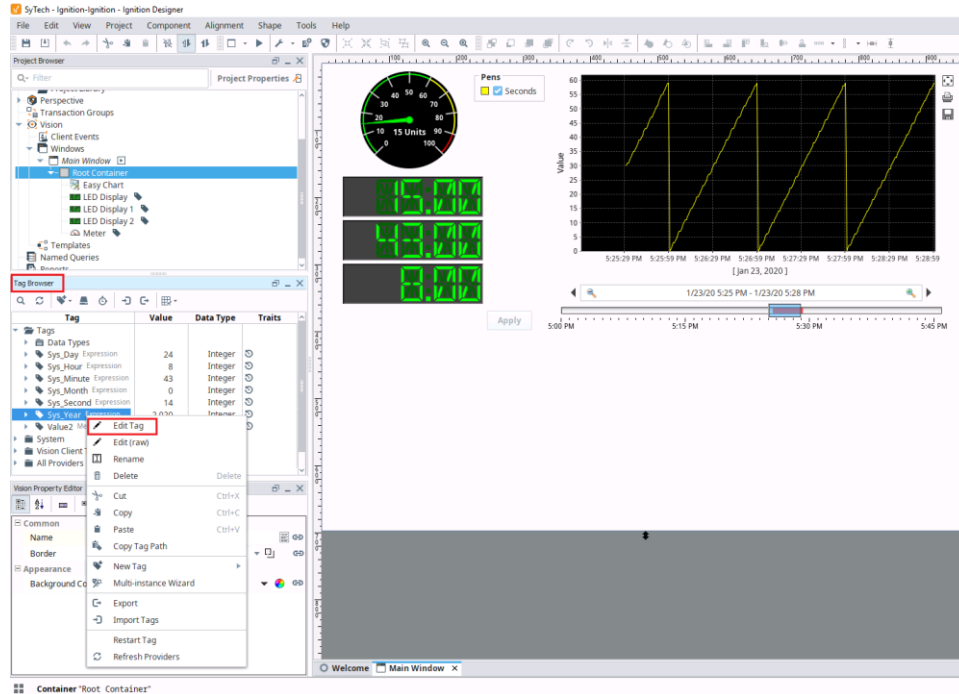
Under the **Configure** tab, on the left, click **Tags, History** and create a new **Historical Tag Provider**.



Inductive Automation recommends enabling **Partitioning** to make data retrieval faster. This is supported by **XLReporter** at any **Unit** and **Length** available.

Enable Tag History

Select the **Design Launcher** from the program group and launch the project.



Under the **Tag Browser** panel select each tag to log historically, right click and select **Edit Tag**.

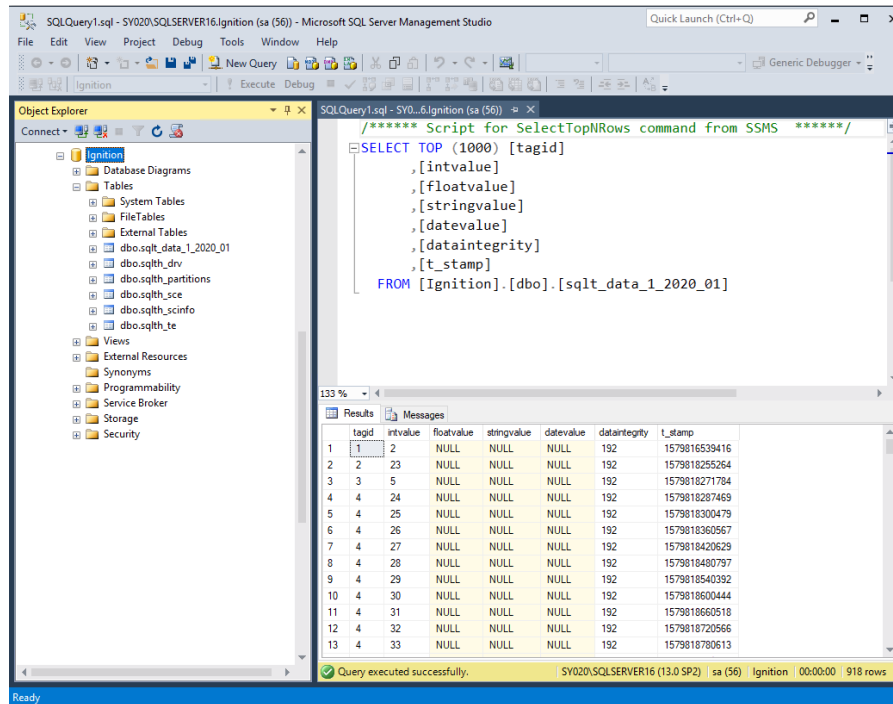
History	
History Enabled	true
Storage Provider	SQLServer
Deadband Style	Auto
Deadband Mode	Absolute
Historical Deadband	0.01
Sample Mode	On Change
Min Time Between Samples	1
Min Time Units	Seconds
Max Time Between Samples	0

- Select the **History** category on the left
- Set **History Enabled** to *true*.
- Set **Storage Provider** to the database connection configured. Click **Apply** when finished.

Prerequisites

Verify Database

Open the database configured as the database connector using the tool provided by the database vendor. If the database is Microsoft SQL Server or SQL Server Express, the **SQL Server Management Studio** is provided. If the database is **MySQL**, the **MySQL Workbench** is provided. Open the application and connect to the database.



Expand the Database configured for the history logs, then expand **Tables**. Right-click the *sqlth_te* and *sqlt_data* table with the most recent date on it and choose **Select Top 1000 Rows**.

If no data is returned contact Inductive Automation technical support and correct these issues.

SQLite Considerations

XLReporter does not support connections to Ignition History when it is configured to log to SQLite. Inductive Automation does not recommend SQLite for production systems as a historian database.

Connector

To configure the connector, from the **Project Explorer** select **Data, Connectors**.

- Click **Add**
- Select **Inductive Automation, Ignition Historical Values**
- Click **OK**

The 'Ignition Historical values' dialog box contains the following fields and options:

- Connector Name:** Ignition_History_1
- Description:** (empty text box)
- Primary Server:**
 - Name:** 192.168.9.45\sqlserver16
 - User:** sa
- Secondary Server:**
 - Name:** (empty text box)
 - User:** (empty text box)
- Settings:** (button)
- OK** and **Cancel** (buttons)

Primary Server

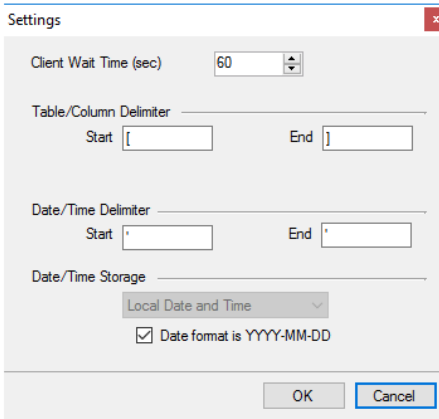
This defines a connection to the database where Ignition is logging historical data. A browse button [...] is provided to define.

Secondary Server

These settings define the (optional) secondary Ignition to connect to if a connection to the **Primary Server** fails.

Settings

The **Settings** button opens the **Settings** dialog that defines characteristics of the database that are used to retrieve data.



The screenshot shows a 'Settings' dialog box with the following fields and options:

- Client Wait Time (sec): 60
- Table/Column Delimiter: Start [] End]
- Date/Time Delimiter: Start ' ' End ' '
- Date/Time Storage: Local Date and Time (dropdown), Date format is YYYY-MM-DD
- Buttons: OK, Cancel

Typically, these settings are defaulted correctly for the **Primary Server**.

If queries timeout, increase the **Client Wait Time**.

The delimiter and timestamp settings are typically filled in automatically for the database and can be modified for other databases.

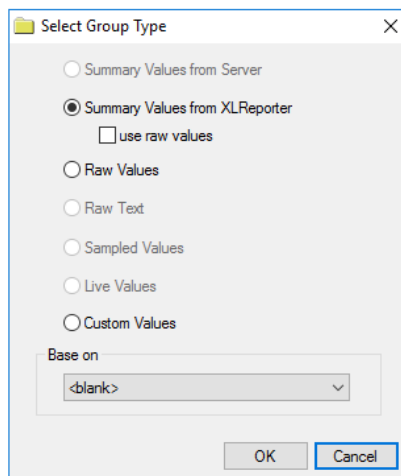
The **Date/Time Storage** settings define how timestamps are stored in the database. Using this setting the timestamps are manipulated when data is retrieved so that local timestamps are submitted in and returned.

Many databases require the Date format to be **YYYY-MM-DD** so that no interpretation needs to occur based on the Region settings of the Windows Operating System. It is recommended to always have this option checked.

Data Group

The following describes the historical data group settings specific to the **Ignition Historical Values** connector.

Group Types



The screenshot shows a 'Select Group Type' dialog box with the following options and settings:

- Summary Values from Server
- Summary Values from XLReporter
 - use raw values
- Raw Values
- Raw Text
- Sampled Values
- Live Values
- Custom Values
- Base on: <blank> (dropdown)
- Buttons: OK, Cancel

The following group types are available:

Summary Values from XLReporter

This group type retrieves sampled values from the database and performs calculations on those samples for reporting.

By default, summary values are calculated time weighted, and values are propagated based on the last known value. However, to change this so that summary values are calculated strictly on the data returned check **use raw values**.

Raw Values

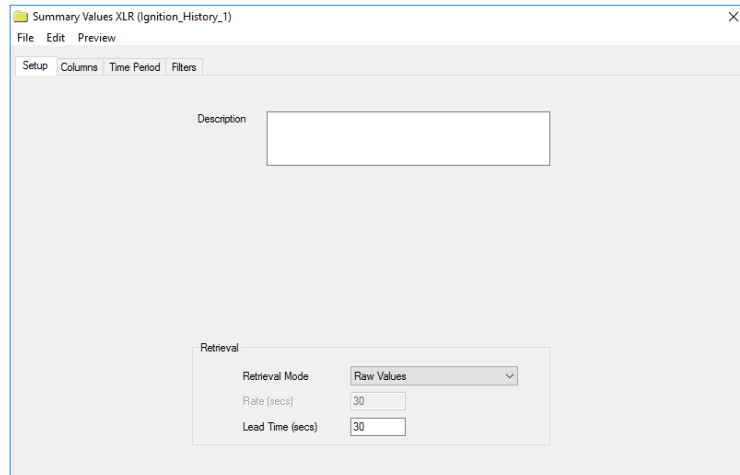
This group retrieves every value logged to the database between the start and end time specified.

Custom Values

This option opens the Database Group builder where a query can be configured to retrieve data from any table in the database.

Group Settings

Setup Tab



Retrieval (Summary Values for XLReporter Group)

The **Retrieval** settings define how data is retrieved for the calculations selected for the group. The following settings are available:

- **Retrieval Mode**
This setting defines how data is retrieved from the historian. For Ignition only *Raw Values* are available.
- **Lead Time**
The amount of time (in seconds) to retrieve data before the start time.

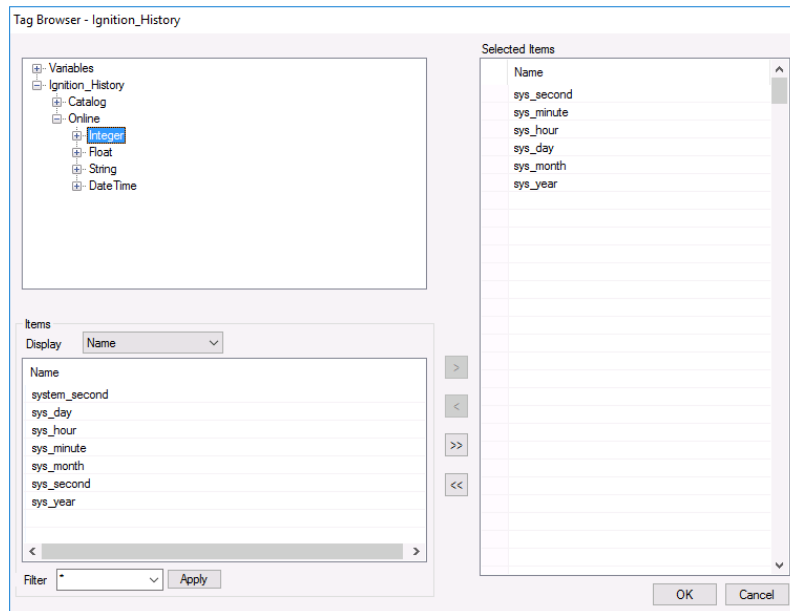
Verify the Data Connector

From the **XLReporter Project Explorer** select, **Tools, Connector Groups**.

Select the *Ignition historical connector* and then select **Add**.

- Set the **Type Raw Values** and click **OK**.

On the **Columns** tab of the group, select the tag **Name(s)**.



Select **Preview**, pick a *Start* date and click **Refresh**.

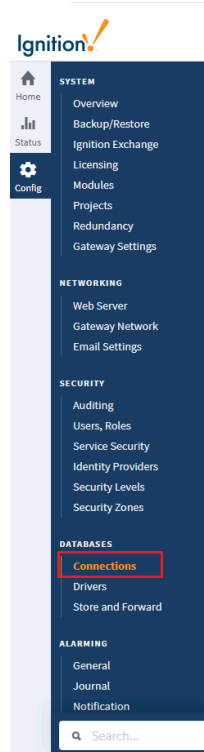
Ignition Transaction Group values

This connector is used to get historical data from an Ignition Transaction Group.

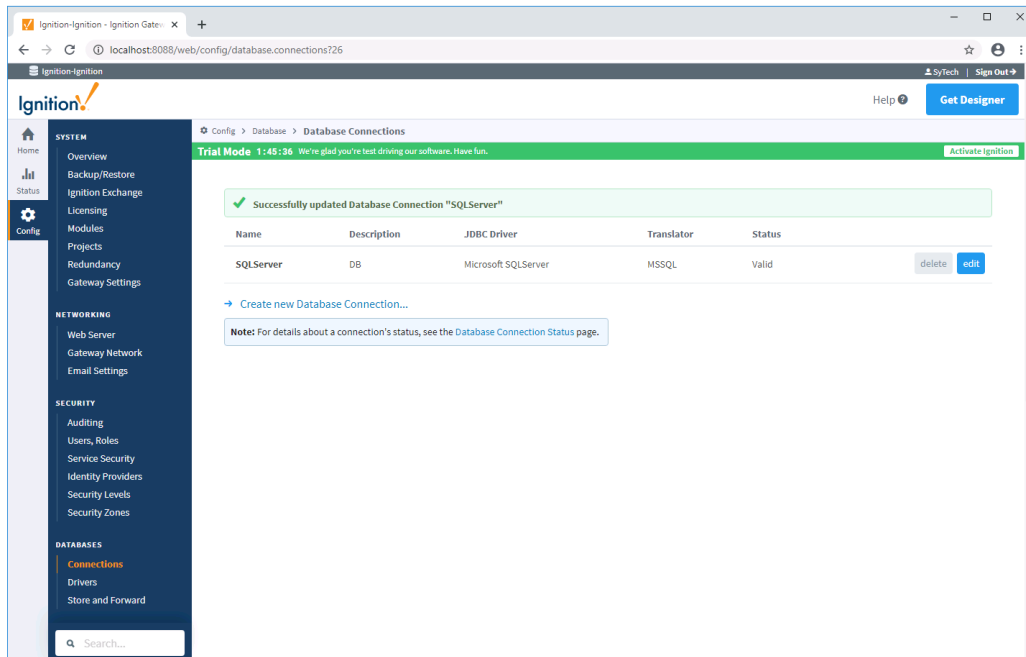
Set up Historical Value Log

Ignition settings are available through a web browser. Open a web browser and navigate to:
localhost:8088

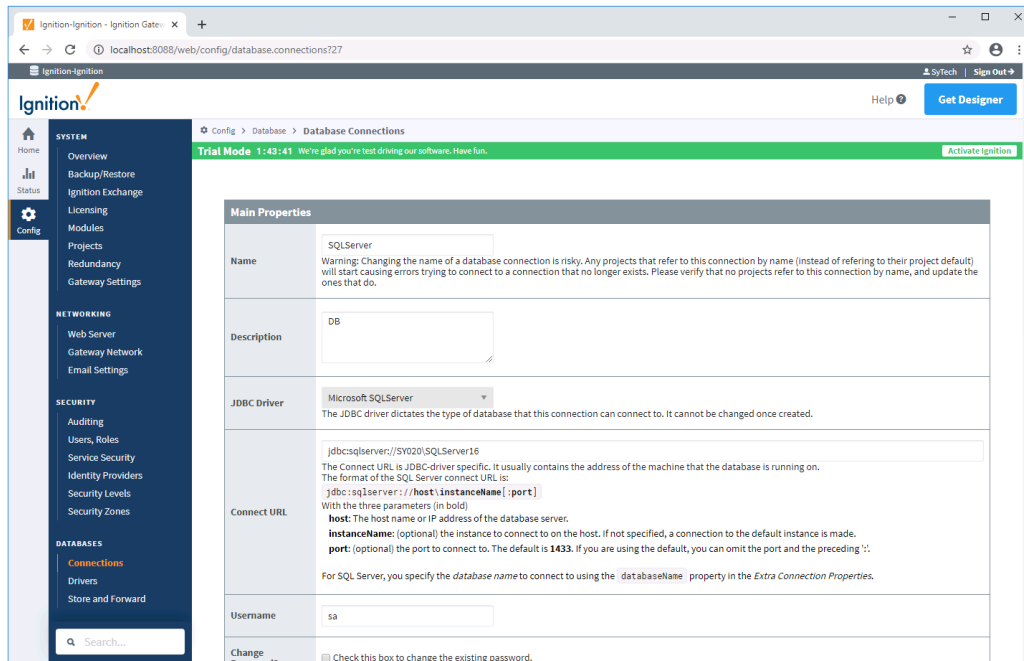
Log in to Ignition.



On the left, select **Config**, then under **Databases** select **Connections**.



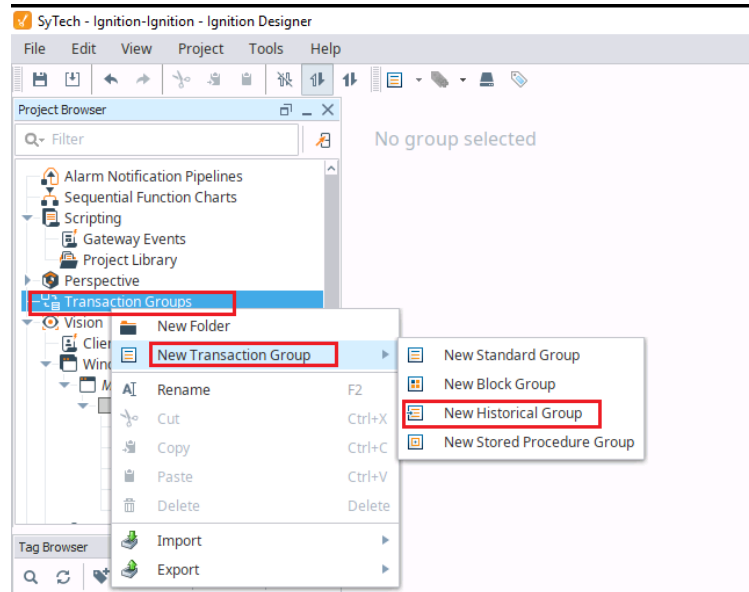
- Click *Create new Database Connection...*



Make the connection to an available database like MySQL or Microsoft SQL Server/SQL Server Express.

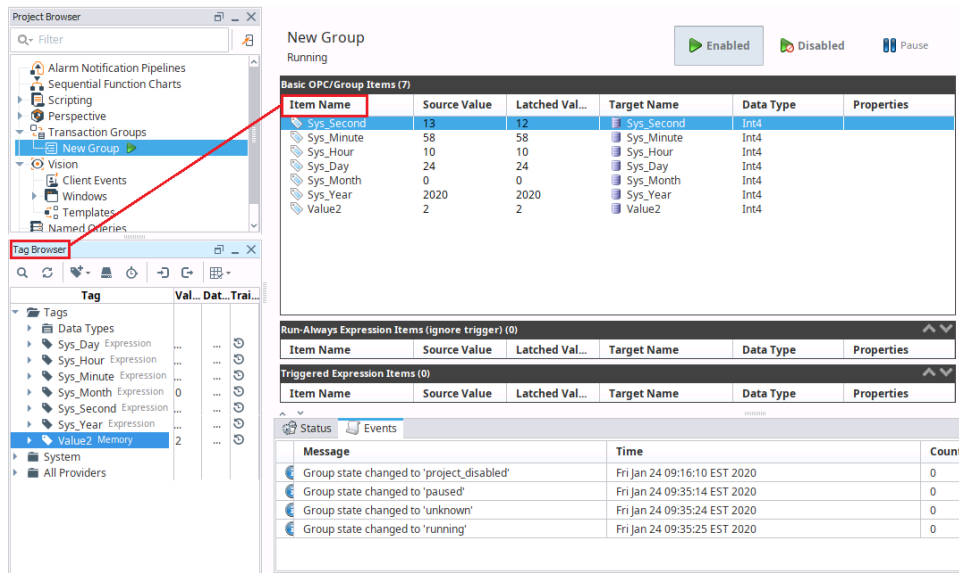
Set up Transaction Group

Select the **Design Launcher** from the program group and launch the project.



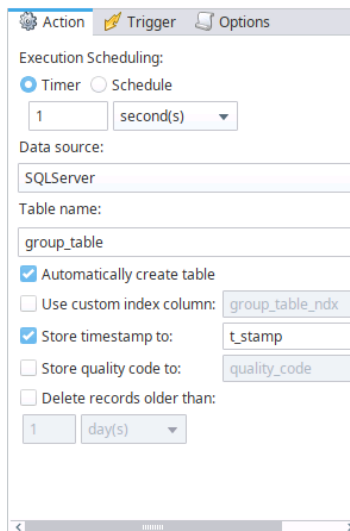
Under the **Project Browser** panel, right click **Transaction Groups** and select **New Transaction Group**, **New Historical Group**.

- Enter a **Name**.
- Click **Create Group**.



To add tags to the **Transaction Group**, drag and drop the tags from the **Tag Browser** panel of the **Ignition Designer**.

Under the **Action** tab on the right,




- Set **Execution Scheduling** to the rate at which data should be collected for the group.
- Set **Data source** to the database connection configured.
- Set **Table name** to the name of the table to log to in the database.
- If the table specified does not exist, check **Automatically create table** to ensure it is created in the database.
- Check **Start timestamp** to and leave the setting as *t_stamp*.

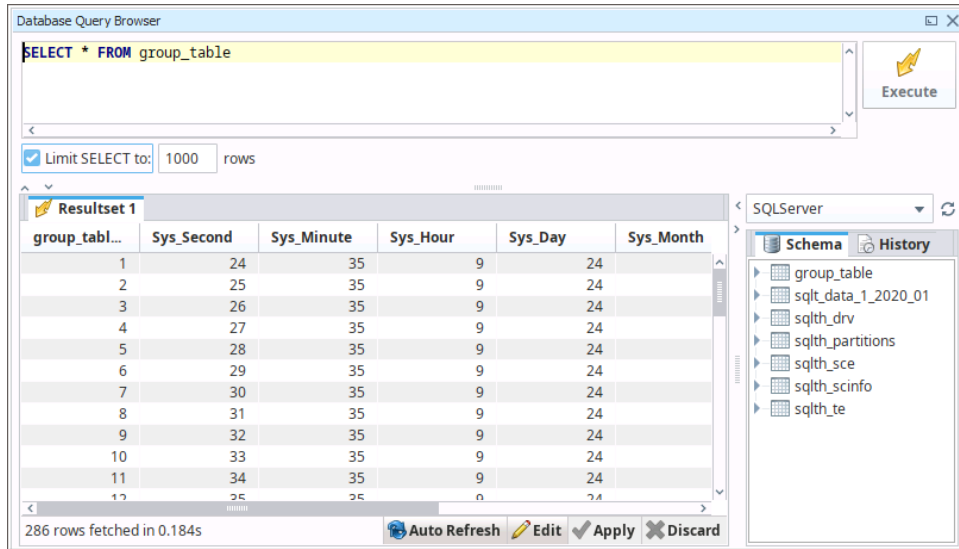
Click **Enabled** when finished.

Prerequisites

Verify Data Log

Select the **Design Launcher** from the program group and launch the project. Under the **Project Browser** panel, open the transaction group.

Under **Table name**, click the browse database option  .



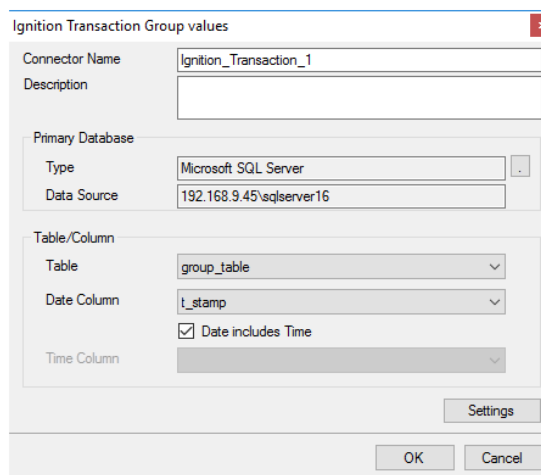
- Enter a simple query to test like:
`SELECT * FROM GroupTable`
Where *GroupTable* is the Table name as set under the **Action** tab of the group.
- Select **Execute** for the on the transaction table.

If no data is returned contact Inductive Automation technical support and correct these issues.

Connector

To configure the connector, from the **Project Explorer** select **Data, Connectors**.

- Click **Add**
- Select **Inductive Automation, Ignition Transaction Group values**
- Click **OK**



Primary Database

These settings define the connection to the database where the Ignition Transaction Group is configured to log data. Use the browse button [...] to define.

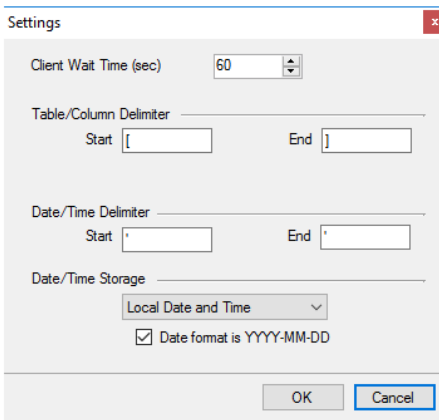
Table/Column

Once the Primary Database is configured, set **Table** to the database table containing the Transaction Group data.

Date Column should always be set to *t_stamp* with **Date includes Time** checked.

Settings

The **Settings** button opens the **Settings** dialog that defines characteristics of the database that are used to retrieve data.



The screenshot shows a 'Settings' dialog box with the following fields and options:

- Client Wait Time (sec):** A spinner box set to 60.
- Table/Column Delimiter:** Two input boxes labeled 'Start' and 'End'. The 'Start' box contains '[' and the 'End' box contains ']'.
- Date/Time Delimiter:** Two input boxes labeled 'Start' and 'End'. Both boxes are empty, with single quote characters visible on the left and right sides of the boxes.
- Date/Time Storage:** A dropdown menu set to 'Local Date and Time' and a checked checkbox labeled 'Date format is YYYY-MM-DD'.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Typically, these settings are defaulted correctly for the **Primary Server**.

If queries timeout, increase the **Client Wait Time**.

The delimiter and timestamp settings are typically filled in automatically for the database and can be modified for other databases.

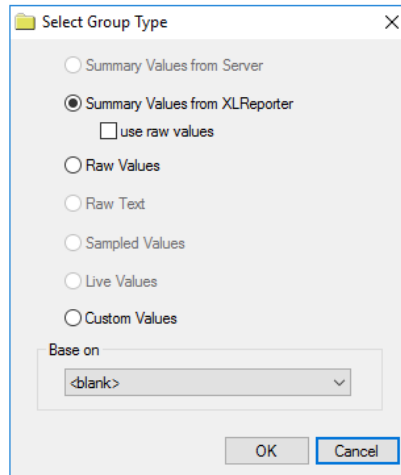
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Raw Values

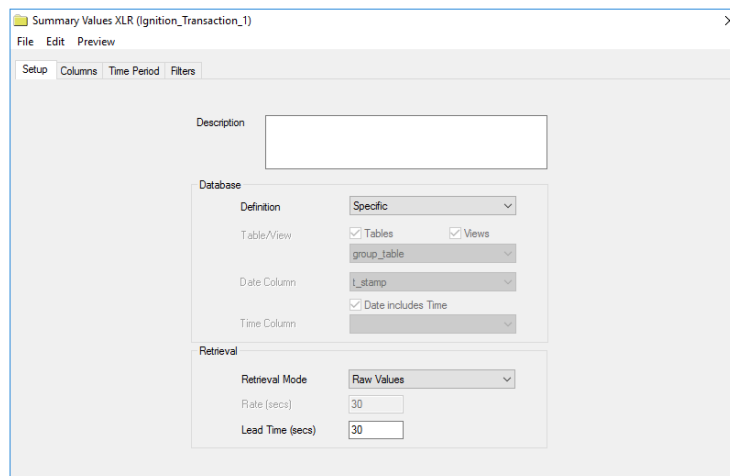
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Group Settings

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Retrieval (Summary Values for XLReporter Group)

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- **Retrieval Mode**
This setting defines how data is retrieved from the historian. For Ignition only *Raw Values* are available.
- **Lead Time**
The amount of time (in seconds) to retrieve data before the start time.

Filters Tab

If the **Perform by Server** option is checked, any filter configured in this tab is put into the *WHERE* clause of the query sent to the database to retrieve data for the group. Otherwise, the configured filtering is performed by the reporting engine after the values are returned. It is recommended to leave this setting checked as the performance is much better.

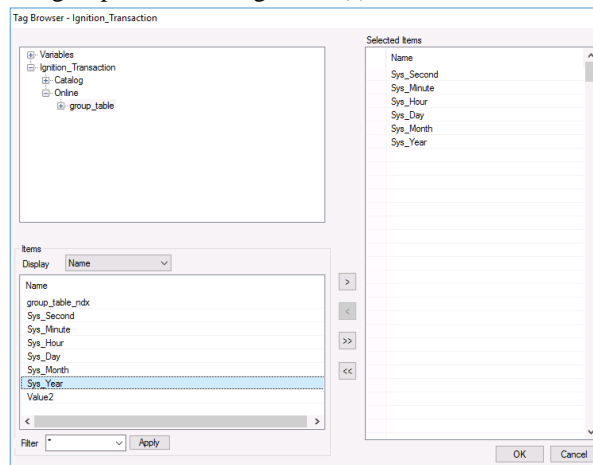
Verify the Data Connector

From the **XLReporter Project Explorer** select, **Tools, Connector Groups**.

Select the *Ignition Transaction Group connector* and then select **Add**.

- Set the **Type Raw Values** and click **OK**.

On the **Columns** tab of the group, select the tag **Name(s)**.



Select **Preview**, pick a *Start* date and click **Refresh**.

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