Reporting from FactoryTalk® View SE

XLReporter generates Excel based reports from Rockwell Automation® FactoryTalk® View SE from real time process values, historical logs and alarm archives.

The purpose of this document is to describe how to set up FactoryTalk View SE for **XLReporter**.

Process Data

XLReporter can take snapshots of the process values and add them to an existing report worksheet, periodically or on event. To prevent excessive build-up of information in a single worksheet, new workbooks and worksheets can be created automatically.

XLReporter gets real time data from FactoryTalk applications such as RSLinx® Enterprise and FactoryTalk View SE through the FactoryTalk Gateway application. This application also allows access to elements of the FactoryTalk Services Platform including FactoryTalk Directory.

The scope of access of **XLReporter** can be set using the **FactoryTalk Gateway Configuration**.

Before you Begin

If you are on a remote computer that has no installed Rockwell Automation products, you must install the **Remote OPC Client** provided with the FactoryTalk Gateway installation.

This sets up all remote connectivity so that **XLReporter** can access FactoryTalk Gateway remotely.

Creating a Real Time Data Connector

To connect **XLReporter** to real time data in FactoryTalk, you will first need to create a **Connector**. To do this, open **XLReporter's Project Explorer,** and open **Connectors** from the **Data** tab. In **Connectors**, select **Add**, and select **Rockwell Automation, FactoryTalk Gateway Real-Time values.**

Connectors for FactoryTalk Gateway require a **Primary Server**. If FactoryTalk Gateway is on a remote machine, the **Node** must be specified. The **Node** can be selected from the drop down list or manually entered as a machine name or IP address. Otherwise, set the **Node** to *local*.
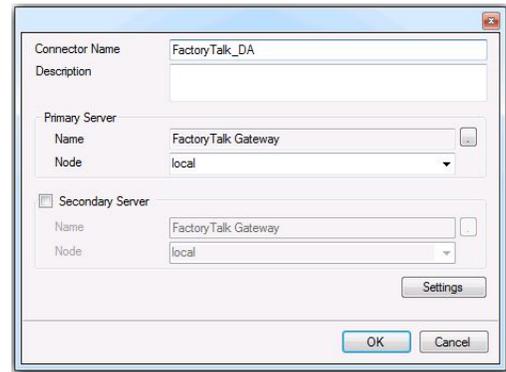

When connecting to FactoryTalk Gateway, the **Primary Server Name** should be *FactoryTalk Gateway*.

Verifying the Data Connector

To verify that the **Data Connector** is functional, open **XLReporter's Project Explorer**. From the **Tools** tab start the **System Check** application and select the **Connector** tab.

Select **Add, choose your FactoryTalk Gateway Connector from the dropdown list**, and click the pushbutton (**[…]**) next to **Items** to open the **Tag Browser** window.

Select a tag and verify that they update with the current value using **Start** in the **System Check** window.
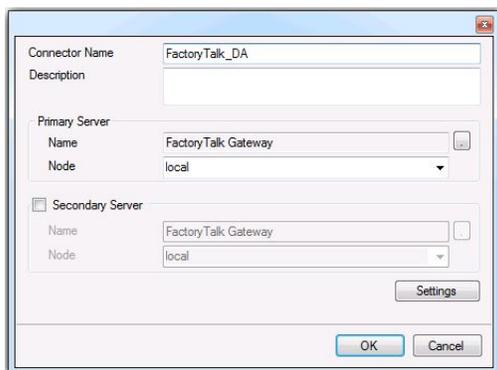
Historical Data

With process data stored in a database, the variety of reports that can be produced by **XLReporter** increases many fold.

In addition to raw values, informative metrics such as run times and statistics are obtained by simply selecting the tags and time frame of interest. e.g. hourly average, maximum and minimum for each hour of the day.

XLReporter performs raw calculations and time weighted calculations. The time weighted calculations would be used when the data is not logged periodically e.g. logging on change.

FactoryTalk View SE logs historical data by defining a data log model. A data log model can be configured to log data to a **File Set** which is a set of files each containing data over a certain period of time or to an **ODBC database** such as Microsoft SQL Server. Both formats are supported.

Selecting a Database

If you plan on setting up the data log model to an **ODBC database**, you must determine which database to log to. The choice of database is usually governed by the number of the process values, the frequency at which they are being stored and the period the values have to remain in the archive before they are purged.

Examples of databases are Oracle Database 11g, Microsoft Access, SQL Server, SQL Server Express and Oracle MySQL. The SQL Server Express and MySQL are designed to handle larger databases than Access and are available on the Internet at no cost. Oracle Database and SQL Server would be used for large databases.

Note for Microsoft Access users. When selecting Access as the database, an empty Access database can be created off-line and moved to the target system avoiding the need for an Access license on the target system.

Creating a Data Source Name (DSN)

For the **ODBC database**, FactoryTalk View SE uses a data source name (DSN) to reference the database it is using to store its information. The DSN should be defined before any history configuration is performed in the FactoryTalk View SE.

To create a DSN, from **XLReporter's Project Explorer**, under the **Tools** tab, select **Database, DSN Settings**.

Click the **System DSN** tab to display all the currently configured DSNs on the system. Click **New** to create a new System DSN.
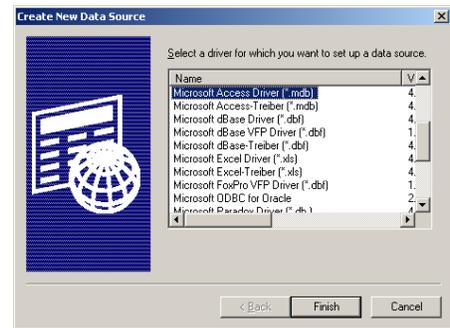

Create new Data Source

Select the driver for the database to which FactoryTalk View SE will log data. Based on the driver selected, complete the DSN setup.

Defining Data Log Models

To create a data log model, select the **Data Log Models** icon under the **Data Log** folder in the Explorer or drag the icon into the workspace.

On the **Setup** tab type a **Description** and **Log File Identifier String**. The log file identifier string is used to name the files in the **File Set** or the backup file for **ODBC database** if, for some reason, logging to the database is not possible.
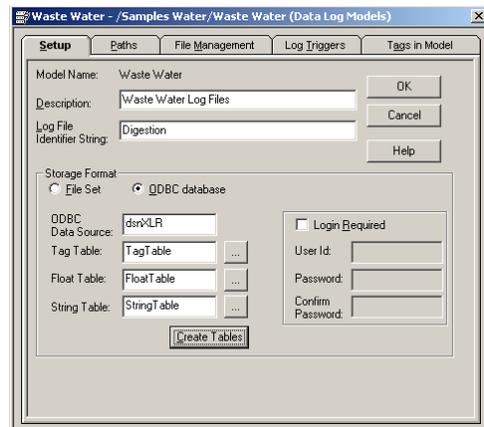
Data Log Model Setup

For **ODBC database**, in the event values are logged to the backup file (*.OBF), the command **DataLogMergeToPrimary** can be used to merge the values in the file back to the database as follows:

> **DataLogMergeToPrimary** *file specification*

where *file specification* is a relative or absolute reference to the data log model name. If the model name has a space in it, enclose the name in quotes. For example, "Waste Water".

Set the **Storage Format** to either format. For **ODBC database,** set **ODBC Data Source** with the DSN name created previously. If the database requires the user log in, check **Login Required** and specify the **User Id** and **Password** to log into the specific database. Click **Create**

Tables to create the *TagTable*, *FloatTable* and *StringTable* tables in the database.

The settings on the **Paths** tab depend on the **Storage Format** specified. For File Set, the Primary Path defines where the files are stored. For **ODBC database**, set **ODBC backup path**, if required. The total number of characters and spaces allowed for the path and name is 255.

The settings on the **File Management** tab depend on the **Storage Format** specified. For **File Set**, specify how often you want new files crated and if you wish to delete old files. For **ODBC database**, specify a time period after which records in the database will be purged.

On the **Log Triggers** tab, specify how the logging of tag values will be triggered i.e. periodically, on change or on demand. The on demand option will log data when the **DataLogSnapshot** command is issued. This command can be given anywhere that other commands and macros can be. For example, it could be typed in the command line, or specified as the action for an event. If you specify **Periodic** or **On Change**, you can still use on demand logging whenever it is appropriate.

On the **Tags in Model** tab, specify which tags will be logged. The maximum number of tags that can be logged by one data log model is 10,000.

Setting up Data Logging

To configure a data log model to start in FactoryTalk View SE, access the **HMI Properties** dialog.
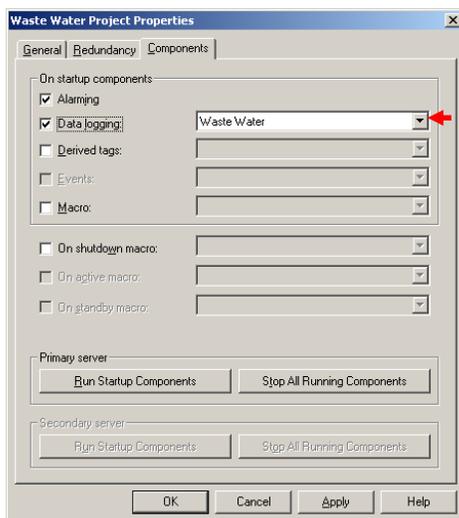
HMI Properties – Enable Data Logging

Under the **Components** tab, check **Data Logging** and select the specific data log model to start from the list. If more than one data log model needs to be started, they can be started by issuing the command:

DataLogOn *file specification*

where *file specification* is a relative or absolute reference to the data log model name. If the model name has a space in it, enclose the name in quotes. For example, "Waste Water".

This command can be issued from the command line or from a startup or login macro.

Note that in FactoryTalk View SE, a HMI server can have up to 20 data log models running at one time.

Creating a Historical Data Connector

To connect **XLReporter** to a FactoryTalk log model database, you will first need to create a **Connector**. To do this, open **XLReporter's Project Explorer,** and open **Connectors** from the **Data** tab. In **Connectors**, select **Add**.

For data log models logged to a **File Set**, select **Rockwell Automation, FactoryTalk View Data File(s)**.
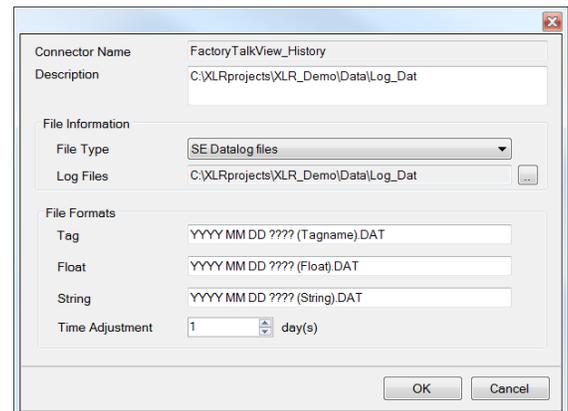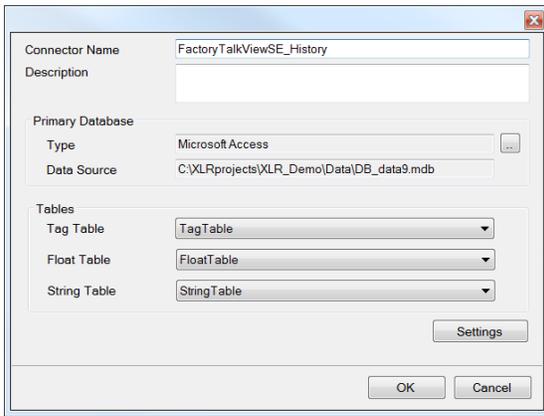

Connectors for FactoryTalk View SE to a **File Set** require the **File Type** set as *SE Datalog files* and **Log Files** set to the folder where the data log model is storing the file set.

Once the **Log Files** folder is specified the **File Formats** are defaulted based on the files found in the folder with keywords replacing date values for the year, month and day.

When **XLReporter** attempts to read data from the file set, it determines which files are needed and then consolidates them to a single entity. It assumes that data is stored starting at midnight. However, if this is not the case, the **Time Adjustment** setting can be used to tell **XLReporter** to consider more files when consolidating. This adjustment is subtracted from the start date of the request.

For data log models logged to a **ODBC database**, select **Rockwell Automation, FactoryTalk View SE Historical Values.**

Connectors for FactoryTalk View SE to an **ODBC database** require a **Primary Database**. The connection to the database can be made using the same DSN used in the log model configuration in FactoryTalk. However, the connector can be linked directly to either an Access or SQL Server database as well through **Database Connect**. If required, specify the necessary logon credentials for the database. If the tables in the database are using non-default names, select the proper tables for tags, float values, and string values in the connector settings.
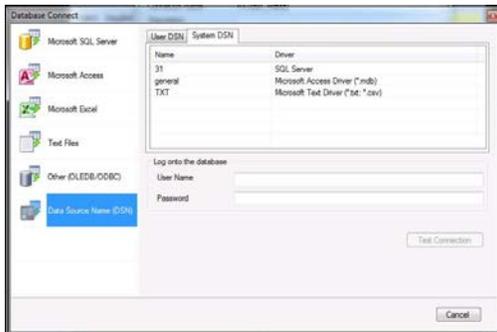
Verifying the Historical Data Connector

Create a **Connector Group** to verify that data can be retrieved from the connector. **Connector Groups** are designed in **Project Explorer, Tools, Connector Groups**. Select your FactoryTalk historical connector and then select **Add.** Select the **Type** and click **OK**.

On the **Columns** tab of the group, select the tag **Name** and **Calculation** for each tag in the group.

On the **Time Period** tab, select the **Start Time**, **End Time** and **Interval** for the group. By default this is set to one hour intervals over the current day.

On the **Filters** tab, select tags by which to filter the results returned by the group. The **Criteria** conditions specified are combined with an OR relationship horizontally, and an AND relationship vertically.

With FactoryTalk View, **Server Filtering** is also available. This can be done as a single filter condition that applies to all tags in the group, or a filter on the **Marker**

column in the float and string tables in the log model database. Refer to your FactoryTalk View SE documentation for more information on the significance of values in the Marker column.

If the group type is **Raw Values**, then server filtering can also be performed using the **Status** column. This means that values that have been marked with the qualities **Good, Communication Error, Stale Value, Uninitialized Tag, or Disabled** can be discretely included or excluded from the data returned by the connector group.

The **Preview** pushbutton at the upper-left of the history group display can be pressed to preview the result of the current configuration.


Preview

Preview displays the data exactly the same way it will be written into the report. Notice that the data is displayed in a wide format despite it being logged in a narrow format in the database.

Alarm Data

Any tag in FactoryTalk View SE can be configured in the **HMI Tags** to generate an alarm whenever it exceeds specified limits. The resulting alarms are stored in log files (dBase format, *.dbf) and can be viewed using the **SE HMI Tag Alarm Log Viewer**. However, for **XLReporter** to use alarm data in a report, the alarms need to be logged to a database.

Setting up Alarm Logging

Use the **SE HMI Tag Alarm Log Setup** display to set up how often log files will be created and deleted. You can also use the **SE HMI Tag Alarm Log Setup** tool to set up automatic logging to a central ODBC compliant database.
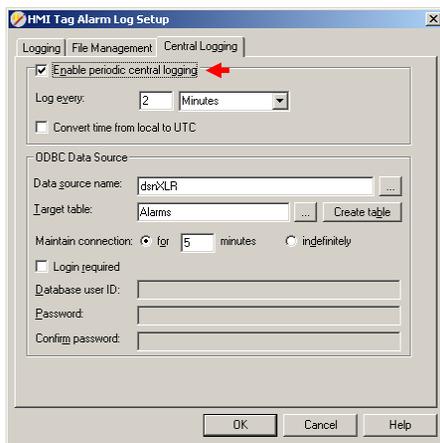
HMI Tag Alarm Log Setup

Check **Enable periodic central logging**. The **Data source name** should be set to a configured DSN that defines the database where the alarm data will be logged. To configure, refer to the *Configuring a Data Source Name (DSN)* section of this document.

If you wish to log the alarms in the native format (dBase format, *.dbf), you will need to manually export the alarm log file to a database at runtime to make it available for **XLReporter**. To do so, issue the command:

AlarmLogSendToODBC *datasource targettable [/Wn] [/U username] [/P password]*

Where:
datasource is a valid ODBC data source name (DSN).
targettable is the name of the table in the database where the alarms will be exported.
/W is an optional parameter that specifies how long the connection to the database will be maintained.
/U username is an optional parameter that specifies the user ID to connect to the database (if required).
/P password is an optional parameter that specifies the password for that user ID to connect to the database (if required).

Starting Alarm Logging

To configure a data log model to start in FactoryTalk View SE, access the **HMI Properties** dialog.

Under the **Startup** tab, check **Alarming**.

Alternatively, alarm logging can be enabled by specifying the command:

AlarmOn

This command can be issued from the command line or from a startup or login macro.

Creating an Alarms Connector

In **Project Explorer, Data, Connectors**, create a new connector by selecting **Add, Rockwell Automation, FactoryTalk View SE Alarms**. Select the database where your alarms are stored. Then, select the **Table** where alarm data is stored, and select the column used to timestamp the alarms as your **Date Column**.
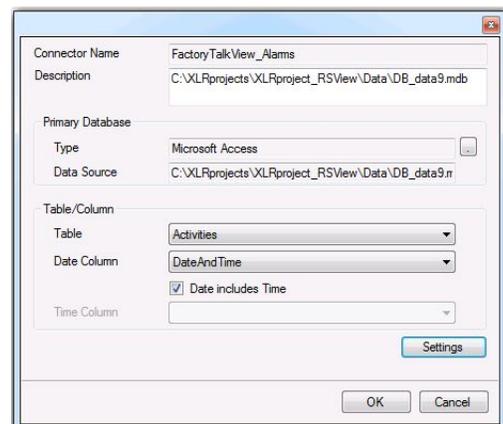
Verifying the Alarms Connector

In **Project Explorer, Tools, Connector Groups**, select your FactoryTalk alarms connector and then select **Add** to add a new connector group.

On the **Columns** tab of the group dialog, select alarm data from the columns available in the table.

On the **Time Period** tab, select the Start Time and End Time for the group as well as restricting the total number of alarms returned. By default this is set to the first 60 alarms over the current day.

Under the **Filters** tab, specify additional filtering to limit the type or amount of alarms returned.

To retrieve data using your configured settings, select **Preview.** In the **Preview** window, use the data picker to select a date/time, and use **Refresh** to retrieve data.

Troubleshooting

If you are experiencing issues connecting to or retrieving data from FactoryTalk Gateway with **XLReporter**, you can use the OPC Test Client provided by Rockwell Software to test the OPC server.

The **OPC Test Client** is opened from the **Rockwell Software** program group under **RSLinx, Tools, OPC Test Client**.
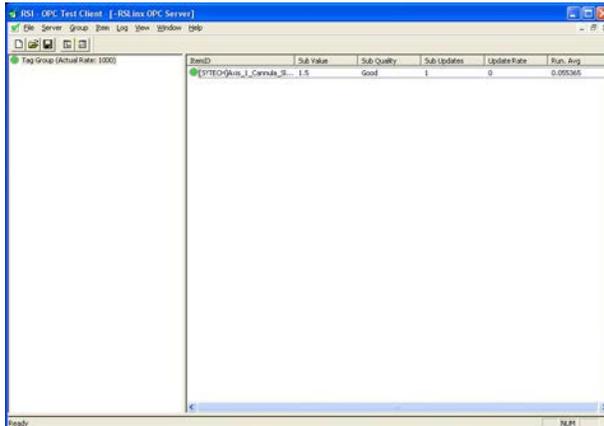
OPC Test Client

To connect, select **Server, Connect.** This opens the **Select an OPC Server** window. Choose *FactoryTalk Gateway* and click **OK**.

Select **Group, Add Group**. Enter a **Group Name** and click **OK**.

Select **Item**, **Add Item** to open the **Add OPC Item window**. Select a tag by navigating in the lower left list, selecting a tag on the lower right list and clicking **Add**. When finished, click **Done** to return to the **OPC Test Client** window.

All of the selected tags appear along with their real time values, type, quality, and timestamp.

If at any point you experience an issue with this client, it is an indication that there is something wrong with the FactoryTalk Gateway server, since now two OPC clients have demonstrated issues.

At this point, contact Rockwell Automation technical support to troubleshoot and correct these issues.

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