

# Database Data Group

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## Overview

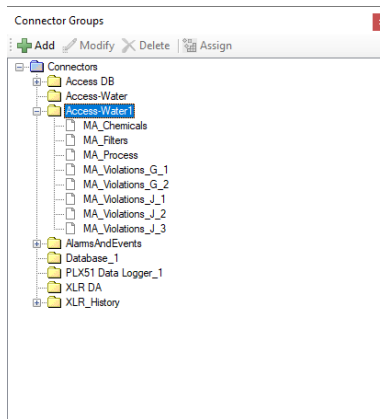
A **Database Data Group** is built with a Database connector, such as a SQL Server or Access, to extract raw or summary values from a database.

The database group builder interface consists of several tabs which, collectively build an SQL statement.

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## Quick Access

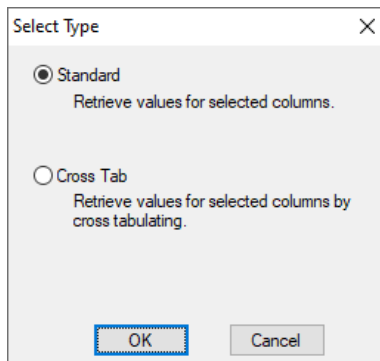
A direct access method to database groups is to use the **Connector Group** application for creating and modifying **Data Groups**. From the **Project Explorer** select the right-side **Tools** tab, under the **Connect** section open **Connector Groups** to display all the connectors defined for the project and the data groups that are using them.



If a data group references a connector that does not exist, it is displayed with a red image. In this case, the group can be re-assigned to a different connector by selecting **Assign** and choosing the new connector.

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## Group Builder



When creating a new database data group, the following group types are available:

- **Standard**

The output is arranged in columns by the selected table columns.

*For example:* A table in a database contains columns *DateAndTime*, *TagName* and *Value* so the output of a standard query produces:

DateAndTime	TagName	Value
1/1/05 12:00	Flow	100
1/1/05 12:00	Temp	200
1/1/05 12:00	Pressure	300
1/1/05 12:01	Flow	105
1/1/05 12:01	Temp	205
1/1/05 12:01	Pressure	305

- **Cross Tab**

The output is arranged in rows/columns by the values of the selected table columns.

*For example:* With the *TagName* as columns and *DateAndTime* as the rows, the data produces:

DateAndTime	Flow	Temp	Pressure
1/1/05 12:00	100	200	300
1/1/05 12:01	105	205	305

Switching the columns and rows produces:

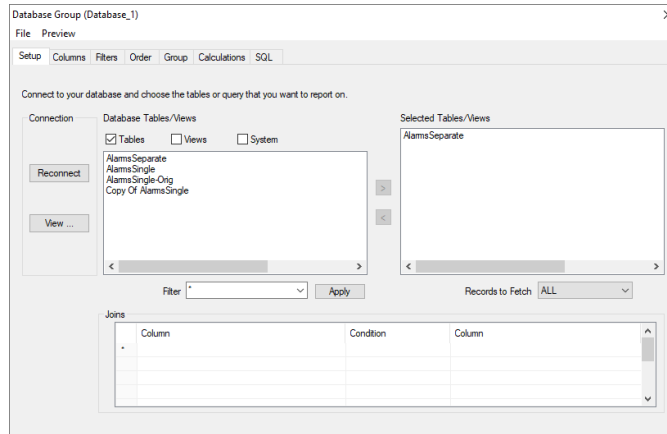
DateAndTime	1/1/05 12:00	1/1/05 12:01
Flow	100	105
Temp	200	205
Pressure	300	305

Additional sophistication can be added to the output by adding summary calculations. Instead of raw values, calculate summary values over the hour to produce:

Hour of DateAndTime	Flow Sum	Flow Avg	Temp Sum	Temp Avg	Pressure Sum	Pressure Avg
12	205.00	102.50	405.00	202.50	605.00	302.50

## Setup Tab

The **Setup** tab is used to select the table(s) and/or views from the database.



The **Reconnect** button can be used to retrieve the latest list of tables and/or views from the connector.

The **View** button displays the connection string used to connect to the database as created in the connector.

The available list can be filtered to show **Tables**, **Views**, **System Tables** or a combination thereof. In addition, a textual filter can be applied to help narrow down the list to the **Tables** and/or **Views** needed which can be helpful if the database has many to choose from.

The **Filter** supports the \* wildcard which can be used to narrow down the list. For example, if set to *ABC\**, only **Tables/Views** that start with *ABC* are listed. If set to *\*ABC\**, any **Table/View** that contains *ABC* are listed. If set to *\*ABC*, only **Tables/Views** that end with *ABC* are listed.

The number of records in the output can be limited by the **Records to Fetch** setting.

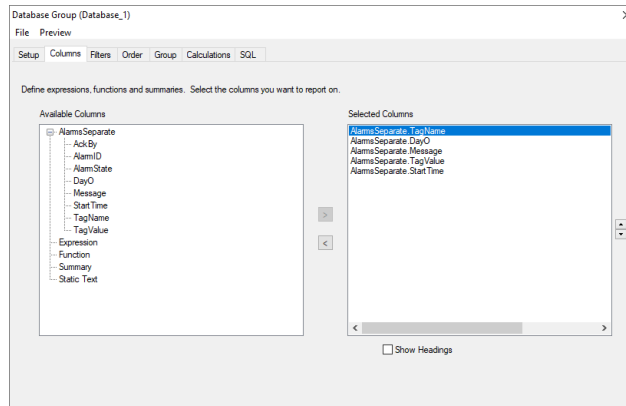
When more than one table/view is selected, the **Joins** indicates the relationship between them. For complex joins between many tables the user is advised to create a View in the database and use that directly. The following join conditions are supported:

- **Inner Join**  
This produces as many records as there are records where there is a match between the joined column values.
- **Left Join**  
This produces as many records as there are in the left table, producing null values for the column values from the right table on the records where there is no match on the join columns.
- **Right Join**  
This produces as many records as are in the right table, producing null values for the column values from the left table on the records where there is no match on the join columns.
- **Full Outer Join**  
This produces as many records as there are when there is a match in the left **OR** right (table2) table columns.

## Columns Tab

The **Columns** tab is used to select the columns used in the output of the group.

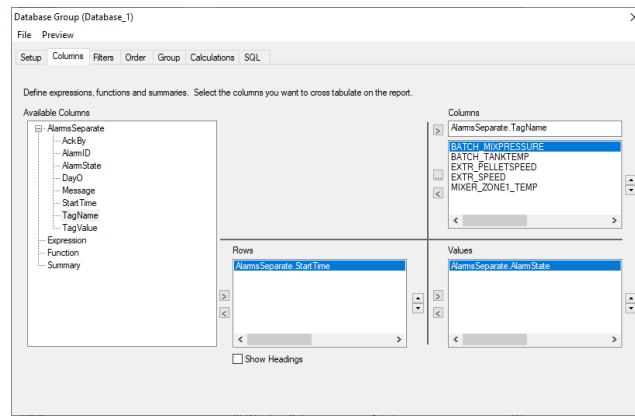
### Standard Group



Use the arrow buttons to move columns from the **Available Columns** list to the **Selected Columns** list. To move the position of a column in the selected list, use the up/down arrow pushbutton.

Enable **Show Headings** to have the headings included in the output.

## Cross Tab Group



From the **Available Columns**, make a selection for **Columns** and then using the browse [...], pushbutton, indicate the values that will determine the columns of the output.

From the **Available Columns**, make a selection for **Rows** to indicate the rows of the output and make a selection for **Values** to indicate the content of the output.

Enable **Show Headings** to have the headings included in the output.

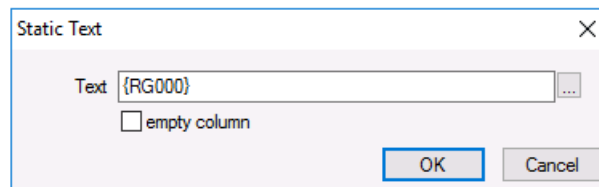
### Expression/Summary and Calculations

These items in the **Available Columns** list provide the capability to derive new columns from the existing by applying functions and calculations. To add an item, highlight one of **Expression**, **Summary** or **Function** then right click and select **Add Item** to open the appropriate dialog.

### Static Text

This option is only available with **Standard** Groups.

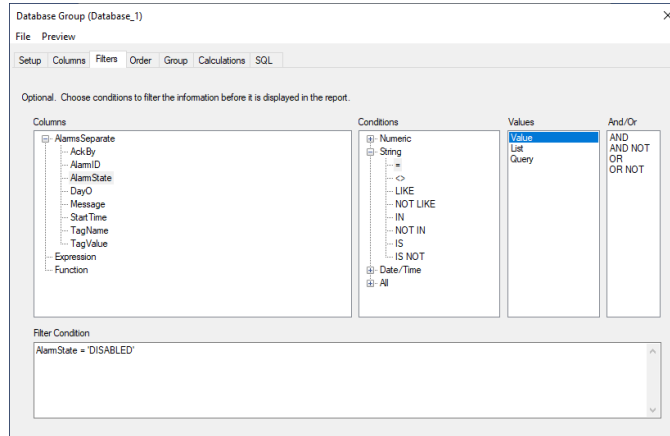
This item in the **Available Columns** list provides the capability to display a static text expression alongside the fields returned from the database. To add an item, highlight **Static Text**, right click, and select **Add Item**.



This feature can be used, for example, to display the units *GPM* adjacent to a field representing gallons-per-minute. It can also be used to display **Variables**, e.g. *{RG000}* or *{Units}* or can be used to just return an empty column from the group (to account for a formula in the worksheet).

## Filters Tab

The **Filters** tab is used to define a filter for the output.



The filter can be defined either by manually entering it under **Filter Condition** or by selecting items under **Columns**, **Conditions** and **Values**. Once the **Value** is specified, the settings appear in **Filter Condition**. To add multiple conditions, use **And/Or**.

The filtering conditions are: =, <>, >, >=, <, <=, LIKE, NOT LIKE, BETWEEN, NOT BETWEEN, DURATION, IN, NOT IN, IS and IS NOT.

The filter value can be fixed or be a variable enclosed in { }.

Note that if the **Condition** *IS* or *IS NOT* is selected, the **Value** list just contains *NULL*. This allows for the *IS NULL* and *IS NOT NULL* filters to be configured.

## Order Tab

The **Order** tab is used to define the ordering of the output.

## Group Tab

The **Group** tab is used to define the grouping of the output. Note that this is used when there are summary columns configured on the **Columns** tab.

## Calculations Tab

The **Calculation** tab is used to define the client-side calculations which will appear as sub totals and grand totals in the output given by the **Scope**.

### Scope

#### Grand

**Grand** provides a calculation for the entire set of data returned. For example, if the group returns temperature records over the day, this can be used to calculate the minimum and maximum temperature over the day.

#### Sub

**Sub** provides subtotal calculations based on the column selected. The columns listed are all of those set up under the **Order** tab. This will provide a calculation after each distinct value for the selected column.

If a *datetime* column is selected, additional date options become available (*XLRyear*, *XLRmonth*, *XLRday*, *XLRhour*, *XLRminute*, *XLRsecond*).

For example, if the group returns the timestamp and temperature records over the day, **Sub** can be used along with the *XLRhour* of the timestamp to calculate the minimum and maximum of the temperature over each hour of the day.

### Calculation

#### Type

The calculation to perform. The following are available:

- total
- minimum
- maximum
- average
- count

#### On

The column to perform the calculation on.

## SQL Tab

### SQL Statement

If the query is constructed using on the previous tabs, the **SQL statement** parameter displays the SQL statement based on the settings.

### Custom Query

An alternate approach to designing the query is to use the **SQL tab** exclusively. If the query has not been formed by the previous tabs, the **SQL Statement** is editable so that a query may be manually entered using any SQL syntax acceptable by the database engine underlying the Connector.

### Stored Procedure

A stored procedure is a set of SQL statements with an assigned named that can be run by issuing an **EXEC** or **EXECUTE** command.

Stored procedures are processed by **XLReporter** in two ways, depending upon the configuration of the procedure.

If the stored procedure is used to populate a table in the database, the procedure must be executed in the **Stored Procedure** parameter so that the table can be queried by the statement in the **SQL Statement** parameter. At the runtime of the data group, the stored procedure is processed first, followed by the SQL statement.

If the stored procedure returns a record set directly, then the stored procedure must be executed in the **SQL Statement** parameter. With this approach, the results of the stored procedure are returned to the Data Group, and then to an underlying report in the same way as a standard SQL statement/query.

To run a stored procedure, the syntax is:

*EXEC stored procedure name [parameter=value],[parameter=value]*

Where:

- *stored procedure name* is the name of stored procedure configured in the database.
- *parameter=value* is the parameter/value pair for any parameter defined for the stored procedure. The value can be hard coded text, an **XLReporter** variable or **Name Type** keyword.

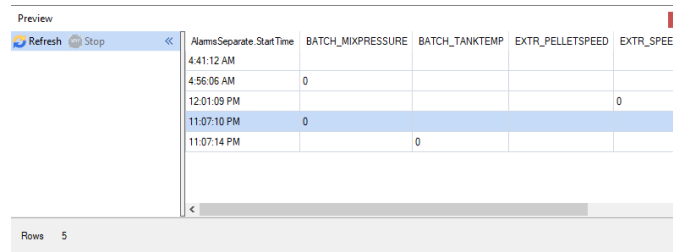
## References

When a data group to a database is used it may appear with the *.sql* extension. This indicates that the connector for the group is a history or analytic connector and not a general database connector.

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## Preview

**Preview** is opened from the **Preview** menu option. To preview the output of the group settings, click the **Refresh** pushbutton.



AlarmsSeparate.StartTime	BATCH_MIXPRESSURE	BATCH_TANKTEMP	EXTR_PELLETSPEED	EXTR_SPEED
4:41:12 AM				
4:56:06 AM	0			
12:01:09 PM				0
11:07:10 PM	0			
11:07:14 PM		0		

Multiple instances of **Preview** can be opened to compare data.

If the group contains **Variables**, they are listed in the display so that values can be specified.

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## Variables

When variables are used in database data groups, their usage becomes more flexible since the variables can be given a value when it is deployed.

The following database group settings can be specified as a variable:

- Static Text
- Filter Conditions
- Stored Procedures

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