



Energy AnalytiX Reporting



APPLICATION NOTE

October 2015

Description: Guide to creating reports on Energy AnalytiX data.
General Requirement: General Knowledge of Energy AnalytiX, ReportWorX, and SQL.

Introduction

There are a few different ways that you can report on Energy AnalytiX data. The ways to do this would be to use ReportWorX Express, Project Reporting, the ReportWorX for Office App, or ReportWorX. These all provide different ways to show Energy AnalytiX data. In this application note, we will go through an example on how to use each of these methods to report on Energy AnalytiX data.

ReportWorX Express

ReportWorX Express is an Excel Add-in that allows the user to create reports from OPC DA and OPC HDA data in Microsoft Excel. ReportWorX Express can also be used to show Energy AnalytiX data (Consumption, Cost, Weather Data, and Meter Data) directly in Microsoft Excel. To find out more information about ReportWorX Express, look into the application note called ReportWorX Express – Quick Start.

Accessing Energy AnalytiX Data

1. Open up Excel and choose to install the ReportWorX Express Add-in.
2. Create a new blank workbook, and then go to the ReportWorX Express tab.
3. There are two reports that you can run to show Energy AnalytiX data, and they are the Energy Star Report and the Energy AnalytiX Report. For this example we will use the Energy AnalytiX option.
4. Once this option is selected, then the side ribbon will show, and then we can configure the information we would like to show in our report.
5. For this tab that shows Energy Data, we need to configure a few different parts of the window. Most of these settings are similar to other windows in ReportWorX Express, so these will not be covered.
6. For the data source option, select your Energy AnalytiX object (Meter, Energy Asset) that will be reported on. This can be found in the Data Browser by going to My Computer → Data Sources → Platform Services → Energy AnalytiX, and then selecting the appropriate asset.
7. Pick the start and end date for the data, and then choose the aggregates used for this data. Then choose your headers, and then click apply.

8. Now when Update is selected from the ribbon, the Energy AnalytiX data will populate the cells selected.

Project Reporting

Project Reporting will allow the user to create a report of all of their configured Assets that have Energy AnalytiX enabled, and other reports. These reports can be found as a part of Project Reporting, and to find out more information about Project Reporting. See the application note called *ProjectWorX – Automatic Project Documentation*.

Reporting on Configured Energy AnalytiX Data

1. First, open up Workbench Desktop, and select the ProjectWorX tab.
2. Make sure that Project Reporting is configured for your SQL server, and then click on the Home tab.
3. Select Configured Tags Report, and there will be a list of reports for Energy AnalytiX. Depending on the information needed, the user can select a different report.
4. For this example, we are selecting the Energy AnalytiX Overview report.
5. Then click Finish, and the report will start to generate on the Energy AnalytiX data.
6. Then in the Recent Tasks Panel, the report will show up in this list, and you can download this report to look at your Energy AnalytiX data.

ReportWorX 365

The ReportWorX for Office App is a standalone application that allows the user to run reports in either Office 2013 SP1 or in Office 365. This will allow the user to run reports, without having to run an ICONICS installation (either GENESIS64 or the ReportWorX Express standalone).

1. First, make sure that the ReportWorX 365 application is installed in your Excel instance.
2. Then type in the server name you would like to receive Energy AnalytiX data from and select the refresh button.
3. You should see a list of data sources to select from, and you can double click on Energy Data, and this will allow you to report on Energy AnalytiX data.
4. There are a few options to choose from, but for this example, we will use Energy Meters.
5. Double click on Energy Meters to bring up a new window to select the asset we would like to look at.
6. Choose your asset, and select your State Date, End Date, Time Aggregate, Day Aggregate, and if you want to look at



data from a specific day. The page size option limits the number of rows returned by the application, and if needed you can increase this.

7. Then select Insert Data and the data will be inserted where your cursor was in Excel.
8. You can go back and select a different Energy AnalytiX source (calculations, etc.) by selecting Back to return to the home page.

ReportWorX

Energy AnalytiX runtime views are populated with data based on Common Language Runtime (CLR) stored procedures integrated within the Energy AnalytiX runtime database. The same CLR stored procedures are available to ReportWorX, BridgeWorX, GridWorX, Data Mining OPC Server, Microsoft SQL Server Reporting Service, etc. To find out more information about the Runtime Views, Stored Procedures, and User Functions supported, please see the help files under the title CLR Reporting.

The list of the supported views is found in the GENESIS64 Help, accessible from within Workbench Desktop.

To open the Help, click on the blue question mark (?) on the top right of Workbench Desktop or on any 'Help' or question mark button within any open configuration properties. Then, navigate within the Table of Contents to Workbench SL → Energy AnalytiX → Energy AnalytiX Runtime Options → CLR Reporting.

A complete description for the "EA_GetStandardCalculationValues" CLR stored procedure is included below as an example that will be used in this application note.

Using EA_GetStandardCalculationValues

We will configure and run a report in ICONICS ReportWorX using Energy AnalytiX Data and "EA_GetStandardCalculationValues" CLR stored procedure.

The following example assumes you have already configured Energy AnalytiX and have logged energy data. We also anticipate you have at least some familiarity with ICONICS ReportWorX from the BizViz suite.

EA_GetStandardCalculationValues

EA_GetStandardCalculationValues retrieves standard calculations data.

Syntax:

EA_GetStandardCalculationValues(int catalogAssetID, bool retrieveChildren, string calculationName, DateTime startDate, DateTime endDate, short timeAggregate, short dayAggregate, short dayOfWeek, int meterTypeID)

Parameters:

- **catalogAssetID:** The a=Asset catalog based ID.
- **retrieveChildren:** A flag to indicate if child assets' data should be retrieved.
- **calculationName:** The calculation's internal name (i.e., "Consumption").
- **startDate:** The start date of data retrieval.
- **endDate:** The end date of data retrieval.
- **timeAggregate:** The time period aggregate for data retrieval. Values are: Base Interval = 0 (not currently available), Hour = 1, Day = 2, Week = 3, Month = 4, Year = 5, Entire Interval = 6.
- **dayAggregate:** The day aggregate for data retrieval. Values are: All Days = 0, Week days Only = 1, Weekends Only = 2, Specific Day = 3.
- **dayOfWeek:** The specific day for data retrieval. Values are: Sunday = 0, Monday = 1, Tuesday = 2, Wednesday = 3, Thursday = 4, Friday = 5, Saturday = 6. It is used only if the *dayAggregate* is set to 3.
- **meterTypeID:** The meter type ID for data retrieval.

Result set:

- CatalogAssetEntryID, SqlDbType.Int
- EnergyAssetEntryID, SqlDbType.Int
- AssetName, SqlDbType.NVarChar, 255
- CostCenterID, SqlDbType.Int
- CostCenterName, SqlDbType.NVarChar, 256
- MeterTypeID, SqlDbType.Int
- MeterTypeName, SqlDbType.NVarChar, 128
- RateModelID, SqlDbType.Int
- CalculationID, SqlDbType.Int
- CalculationName, SqlDbType.NVarChar, 64
- CalculationDisplayName, SqlDbType.NVarChar, 256
- IsRollup, SqlDbType.Bit
- IsDerived, SqlDbType.Bit
- StartDate, SqlDbType.DateTime
- EndDate, SqlDbType.DateTime
- Value, SqlDbType.Float
- UnitsID, SqlDbType.Int
- UnitDisplayName, SqlDbType.NVarChar, 64
- FullSetOfData, SqlDbType.Bit
- Status, SqlDbType.SmallInt
- ErrorCode, SqlDbType.SmallInt
- AverageValue, SqlDbType.Float
- MaxValue, SqlDbType.Float
- MinValue, SqlDbType.Float



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Creating a new report template

1. Open ReportWorX configurator
2. Create a new Report Template and name it **tmp_EA_GetStdCalcVal**
3. Open report template, excel will launch with an empty worksheet

Creating a new connection to database

4. Right-click on cell and select **Connect to new Data Source** → **Open Database**.
5. In the Database Connection Configuration Wizard create a new connection to the **Energy AnalytiX** database.
6. Once you create connection string you will be able to create a **Database Query**.
7. Click on **Edit** button and select **Store Procedure Call**.

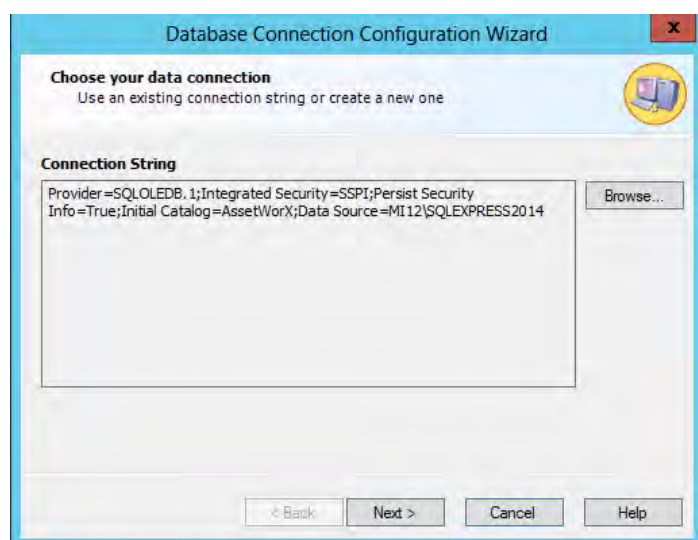


Figure 1 - The Database Connection Wizard

8. Select the **EA_GetStandardCalculationValues** CLR Stored Procedure.

Configuring Stored Procedure Parameter Values

We will define three different parameter types depending on the parameter usage.

- Manually enter a value
- Automatically evaluate an expression
- Select from a dynamic list of values

The **Procedure Parameters** are already populated in the **SQL Command Designer** dialog.

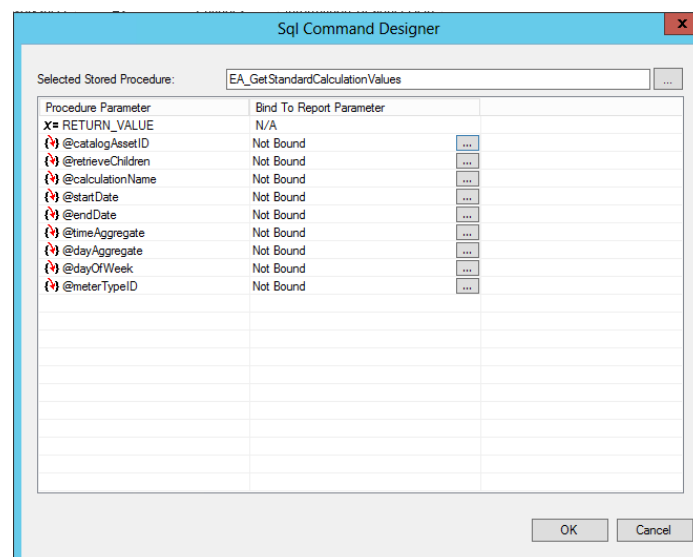


Figure 2 - The SQL Command Designer

Manually entering a value - Binding to Report Parameters

1. We will define a **Parameter Type** with name "**Manually enter a value**" for the following three procedure parameters in the bullet list below.

• Manual Parameter value bullet list:

- @retrieveChildren = 0
- @startDate = 8/28/2013 4:00:00 AM (select the date)
- @endDate = 8/28/2025 4:00:00 AM (select today's date)

NOTE: All input date parameters are in local time format. The CLR stored procedures internally convert to UTC time, retrieve the data, and send the results to the client in local time format.

2. We also have to enter text into the **Web Prompt** field.



- **Manual Web Prompt:**

- @retrieveChildren = Include children assets (1=yes, 0=no):
 - @startDate = Enter Start Date:
 - @endDate = Enter End Date:
3. Within the "Configure the parameter properties" dialog, enter the **Default value:** as defined in the previous bullet list.

Automatically evaluate an expression - Binding To Report Parameters

1. We will define a **Parameter Type** with name " **Automatically evaluate an expression**" for the following procedure parameters in the bullet list.

- **Automatic Parameter value bullet list:**

- @calculationName = Consumption
- @timeAggregate = 1
- @dayAggregate = 0
- @dayOfWeek = 0

Within the "Configure the parameter properties" dialog, enter the **Constant value:** as defined in the previous bullet list.

NOTE: Please notice that parameter @calculationName has the data type STRING and other three parameters has data type INTEGER.

Select from a dynamic list of values - Binding To Report Parameters

1. We will define a **Parameter Type** with name " **Select from a dynamic list of values**" for the following two procedure parameters in the bullet list,

- **Select Parameter value bullet list:**

- @meterTypeID = Selected from a list
- @catalogAssetID = Selected from a list

2. We also have to enter text into the **Web Prompt** fields.

- **Select Web Prompt:**

- @meterTypeID = Select a Meter Type:
 - @catalogAssetID = Select Asset:
3. Within the "Configure the parameter properties dialog", we would have to implement the following steps:

For @meterTypeID parameter:

- Use the **Connection String** as we created earlier
- In the Simple Query connect to EA_CurrentMeterTypes view
- From the list of Column Names select MeterTypeID and MeterTypeName
- As the Default Value, select the Electric type entry
- Click **OK** until you return to the **SQL Command Designer** dialog

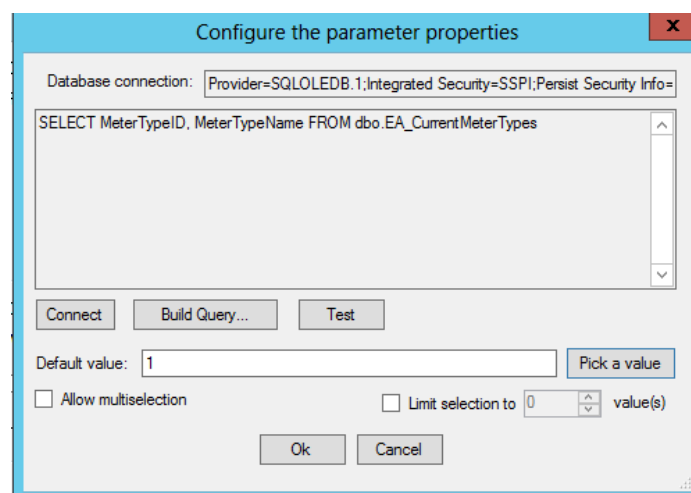


Figure 3 - Parameter Properties with created query

For @catalogAssetID parameter:

- Use the **Connection String** as we created earlier
- In the Simple Query connect to ASC_EquipmentView view
- From the list of **Column Names** select **ID** and **Name**
- As the **Default Value**, select the equipment of your choice
- Click **OK** until you return to the **SQL Command Designer** dialog

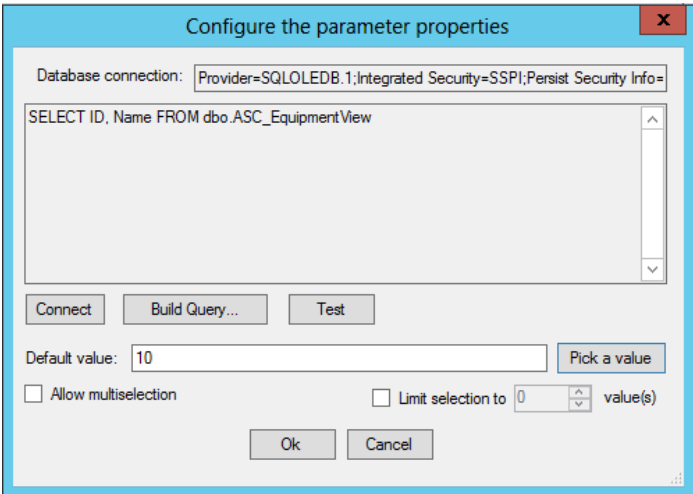


Figure 4 - Parameter Properties with created query

4. In **Parameter Browser** dialog you can change the Order of appearance in the Web Interface for parameters.

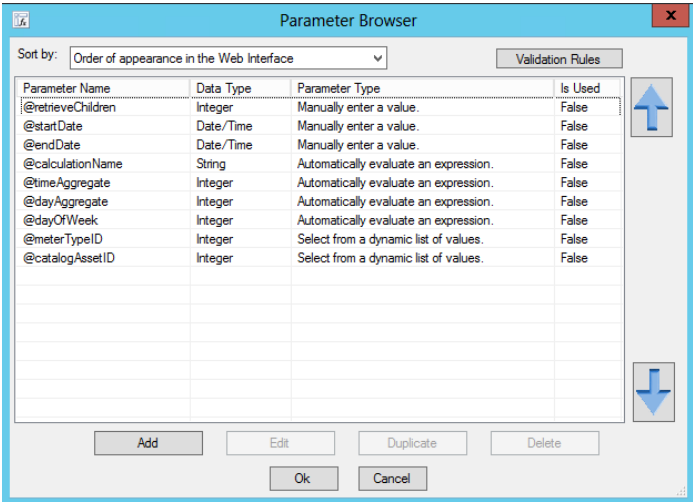


Figure 5 - Parameter Browser

Finishing the Database Connection Configuration Wizard
Your parameters should look similar to the following figure:

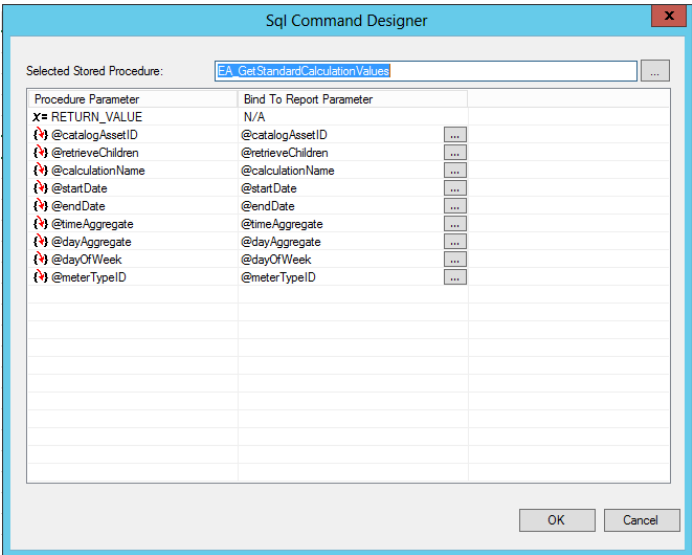


Figure 6 - The final configured parameters

9. Click **OK**. You'll see the following message.

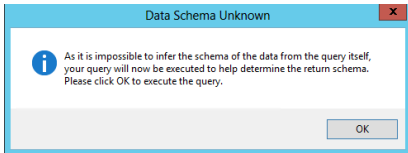


Figure 7 - Information dialog about Data Schema

10. Click **OK** to proceed.
11. This opens the **Parameter Values** window.

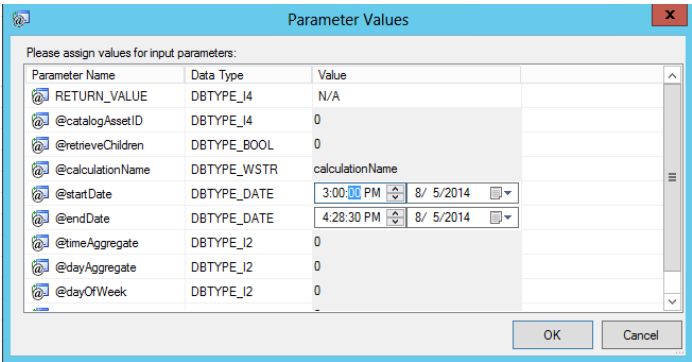


Figure 8 - The parameter values window

12. Click **OK**. This returns you to the Database Connection Configuration Wizard dialog.



13. Click **Next** to continue.

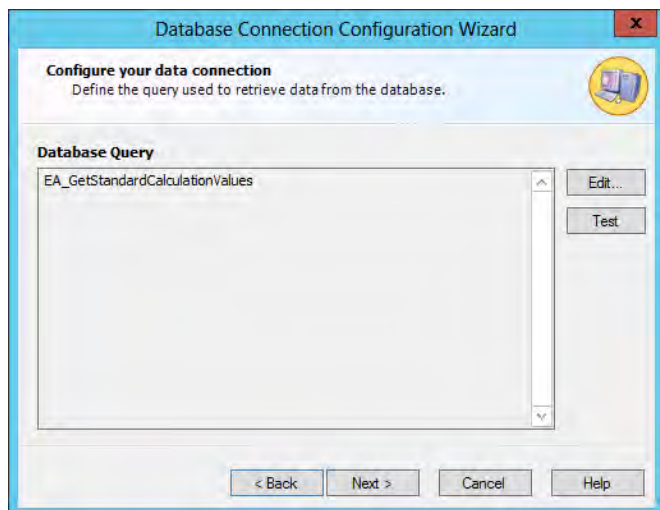


Figure 9 - The Database Connection Wizard dialog

14. Click **Finish**.

Defining the Report Layout in Excel

Although you could work with the window at the current size, we suggest resizing the **Layout Manager** window wider so you can view and work with more cells easily.

The columns in row 10 were automatically defined by ReportWorX based on the columns in the SQL Server database table(s).

As shown in the following figure we will select the column names from the drop down list according to the definitions below.

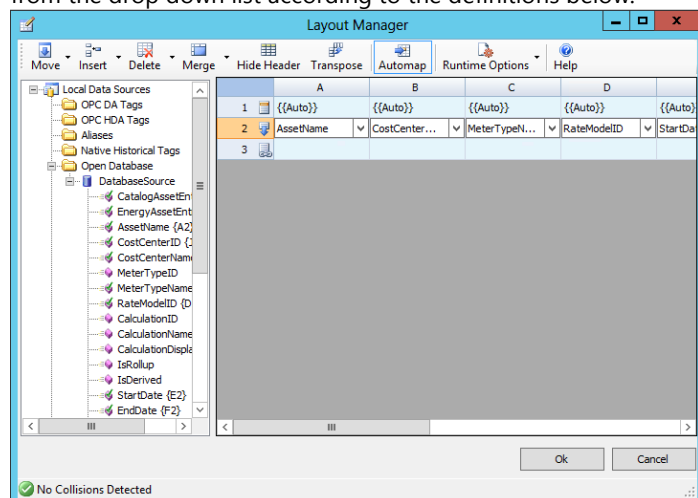


Figure 10 - The layout manager

1. Set the column definitions.

• Report column definitions:

- A = AssetName
- B = CostCenterName
- C = MeterTypeName
- D = RateModelID
- E = StartDate
- F = EndDate
- G = Value
- H = AverageValue
- I = MaxValue
- J = MinValue

NOTE: Make sure that "Auto Expand" option is selected under Runtime Options.

2. Close Layout manager
3. Save Report Template with "Always commit changes on Save" and return to ReportWorX Configurator

Creating a Report

1. In ReportWorX configurator create new report named "**rpt_EA_GetStdCalcVal**"
2. Assign the recently created template "**tmp_EA_GetStdCalcVal**" to this new report and click Apply.
3. Enable the report via "Enabled" checkbox and click Apply.
4. Start ReportWorX Engine via traffic light.

NOTE: You can also select new/existing "Redirector Action" which allows you to store the file on the disk, send report via email or print it on your printer.

Run Report

Now your report is ready to be executed. For execution you can use Unified Web Interface from the BizViz suite or ReportWorX Executor via PortalWorX-SL as it is necessary to manually type and select parameters for the report.

NOTE: Before executing the report through the ReportWorX Executor in PortalWorX-SL, it might be necessary to add your SQL server instance in the 'SQL Server Setup' application, available in ICONICS Tools.



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The screenshot shows the 'ReportWorX Executor' window with the report name 'rpt_EA_GetStdCalcVal'. The 'Importance' is set to 'Normal'. The 'Execute' button is circled in red. Below the 'Execute' button, there are three 'Description' fields with values '0', '8/5/2014 3:00 PM', and '8/5/2014 8:00 PM'. The 'Meter Type' is set to 'Electric Meter' and the 'Catalog AssetID' is set to 'Room 1'.

Figure 11 - Executing the report via PortalWorX-SL

After that you should see message below and you can open the report by clicking on the link:

The screenshot shows the 'ReportWorX Executor' window with the message 'Report 'rpt_EA_GetStdCalcVal' completed successfully. Click here to view the report'. Below the message is a button labeled 'Execute another report'.

Figure 12 - "Report completed successfully" message.