Senturus Analytics Connector

User Guide

Cognos to Power BI

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Overview

This guide describes how the Senturus Analytics Connector is used from Power BI after it has been configured.

Please refer to the *Senturus Analytics Connector Installation Guide* for instructions on installing and configuring the Analytics Connector.

The Analytics Connector is designed for Power BI and has been tested against different versions, including both Power BI Desktop and Power BI Gateway on Windows starting with the August 2018 release. For optimal stability and performance, it is recommended that you keep your Power BI software fully updated.

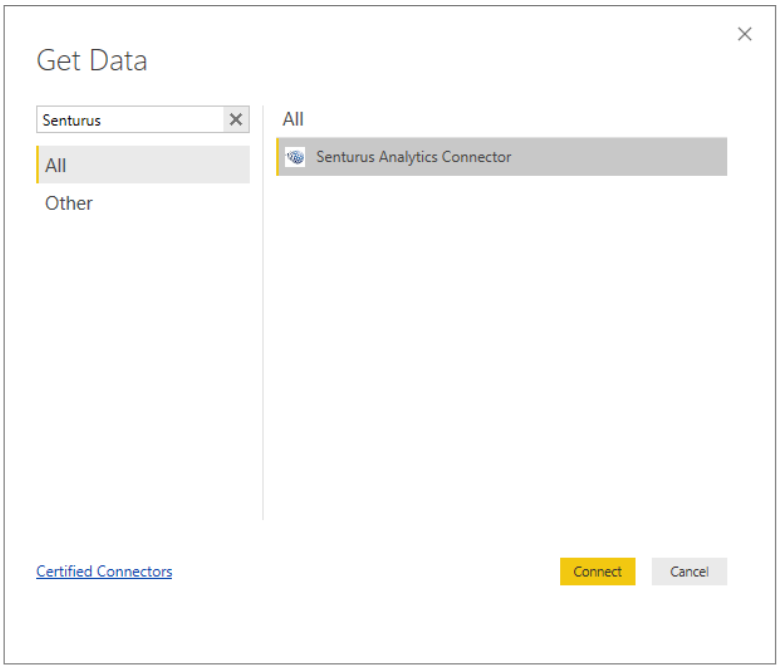
Connecting to Cognos from Power BI Desktop

The Analytics Connector can be accessed from Power BI by using our Custom Data Connector. This Custom Data Connector enables DirectQuery capabilities, which means queries are passed at run time to the Cognos system for execution under the current user's credentials.

To begin, open Power BI Desktop and select **Get Data**.

Find the Senturus Analytics Connector in the list.

Click **Connect**.

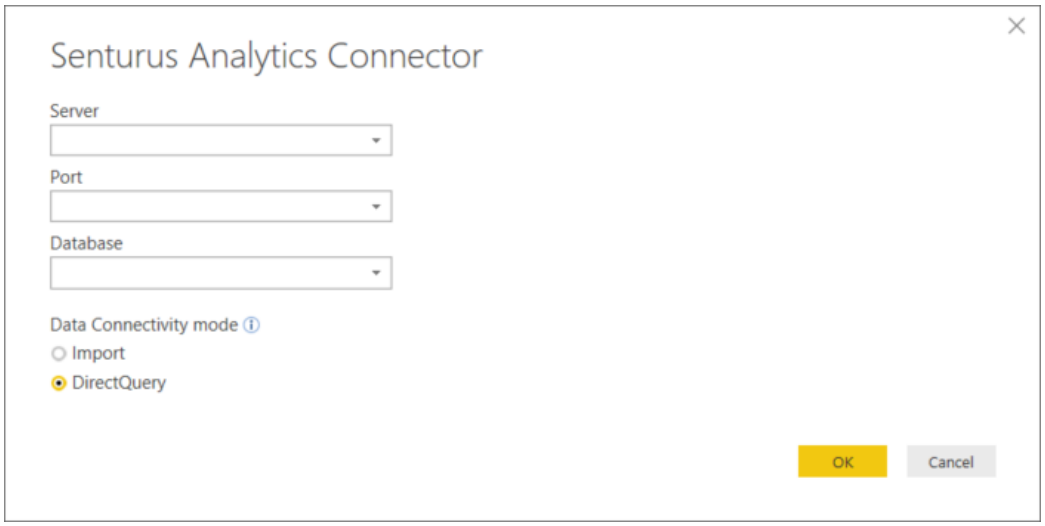


Power BI will display a dialog where you can select the Server, Port, Database, and Data Connectivity modes.

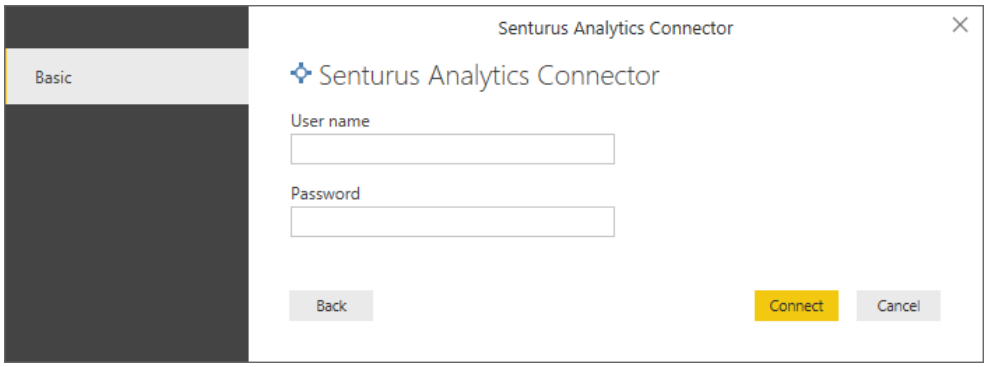
The Server, Port and Database lists are pulled from the configuration information in the DataSourceConfig.xml file under the server's Analytics Connector installation folder.

For the **Data Connectivity** mode, select *DirectQuery*.

Click **OK**.



An authentication dialog will appear. Type in your Cognos credentials, then click **Connect**.



NOTE: Power BI desktop will securely store these credentials and skip this dialog if you select the same Server and Database in a future connection.

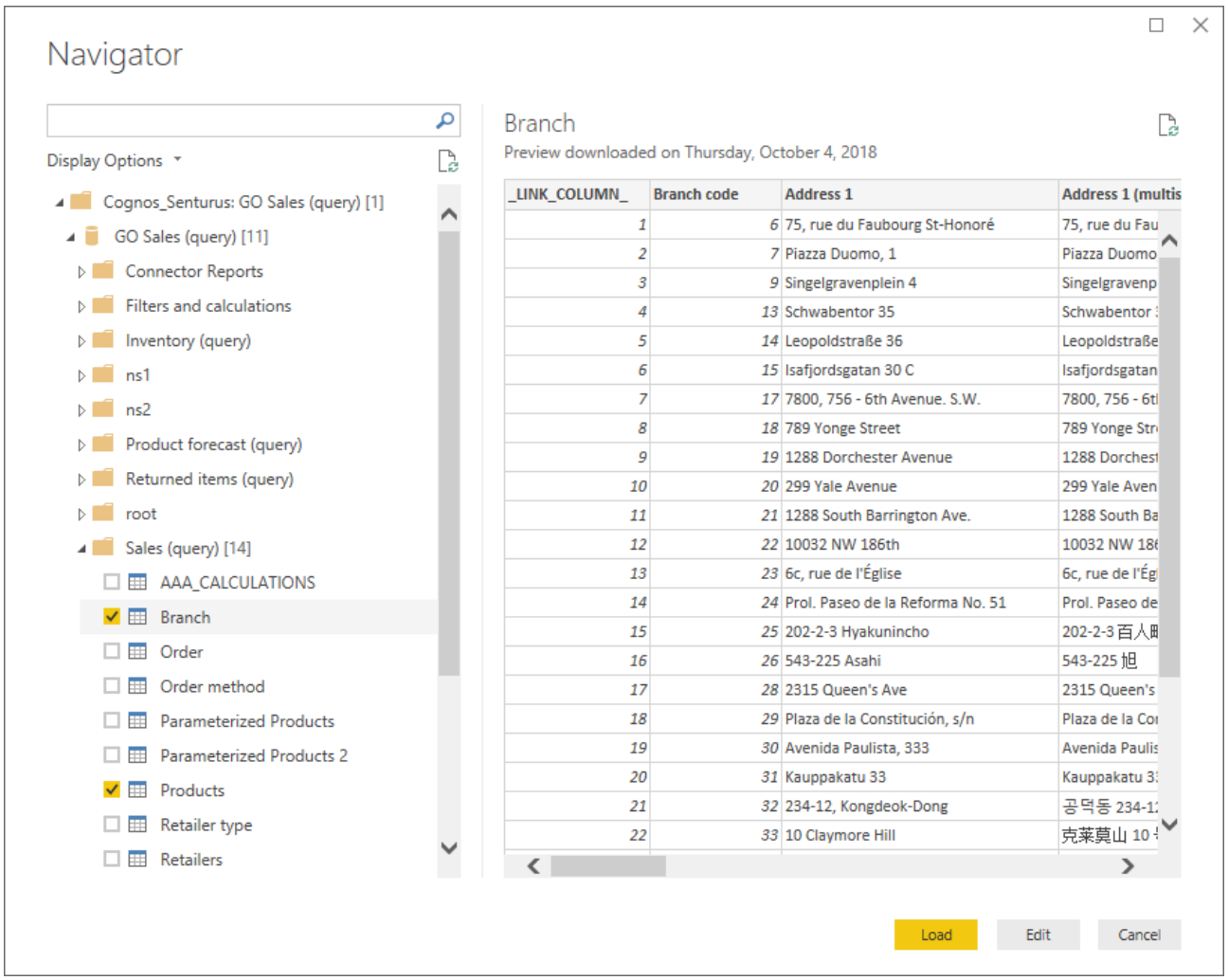
To manage or delete the stored authentication information, go to **File → Options and settings → Data source settings**.

Working with Tables

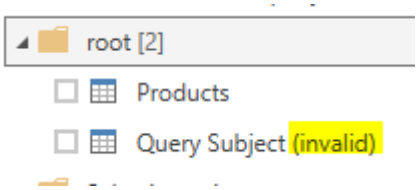
Once connected to the Senturus Analytics Connector data source, the **Navigator** window will display.

Select the tables you wish to include.

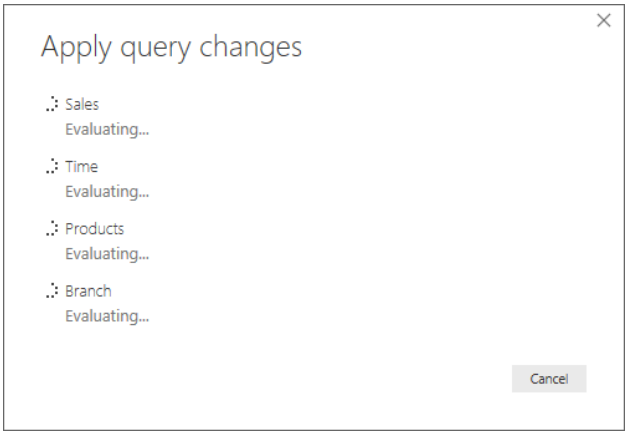
Click **Load**.



NOTE: If you have duplicate columns configured in a package, the table containing the duplicated column will be marked as “(invalid)” and will be unusable in your data source. You will need to correct your Cognos model to resolve a duplicate column issue. Review the java.log file found at {Analytics Connector Install Folder} \ Log for the name of the duplicated column.



Power BI will then inspect the selected tables for column information.



When complete, navigate to the Relationships view using the left navigivation bar.

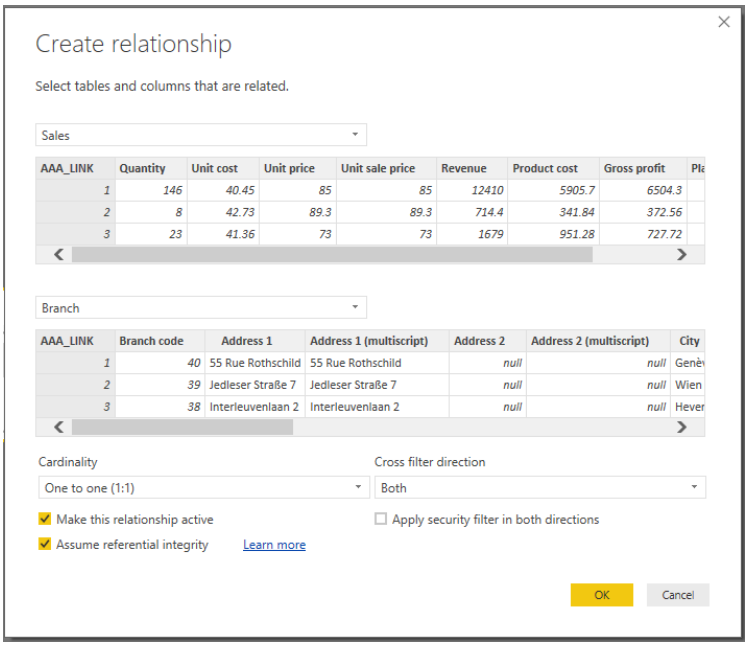
Power BI requires relationships between the tables, but Cognos typically does not present primary key and foreign keys at the business user view.

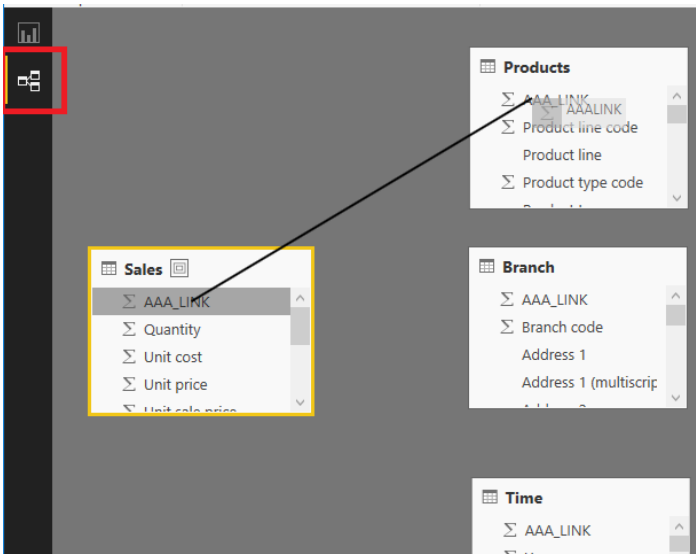
The Analytics Connector injects AAA_LINK columns into the tables so you can build relationships between the tables. The Analytics Connector ignores these columns when passing queries to Cognos to execute.

Create relationships from fact tables to dimension tables using **One to One (1:1)** joins as described below.

NOTE: It is very important that you create the relationships as described so that Power BI sends the appropriate queries to Cognos!

Start by dragging the *AAA_LINK* column in the fact table to the *AAA_LINK* table in the dimension table.



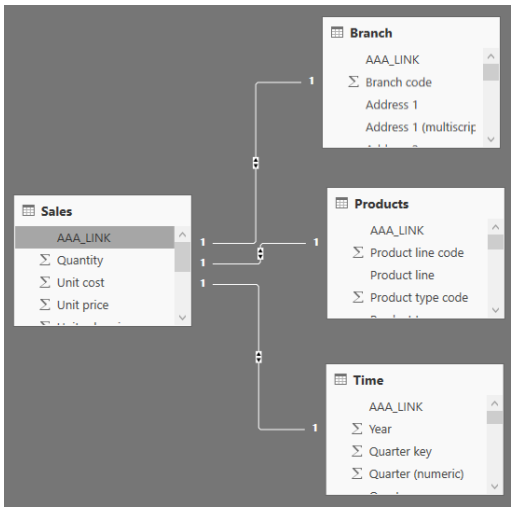


In the **Create Relationship** dialog, change the cardinality to *One to one (1:1).*

Change the Cross filter direction to *Both*.

Check the box next to *Assume referential integrity*.

Click **OK**.

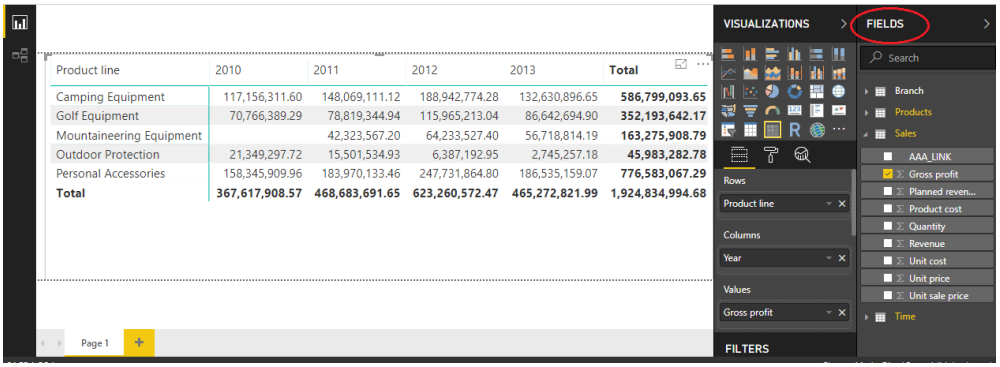


Repeat these steps until the fact table has relationships to all dimension tables.

If you have multiple fact tables, create a relationship to one or more of the dimension tables. The key is that the other fact tables are joined to the model and not isolated. Redudant relationships will be created as inactive relationships and are not necessary.

Change to the **Report** view.

Use the columns under the **Fields** tab to create your report.

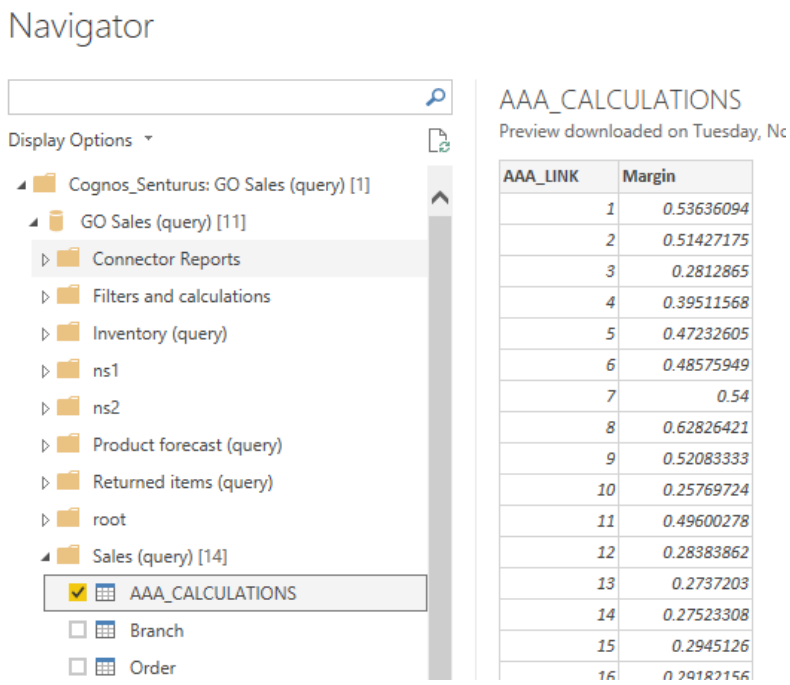


Working with Calculations

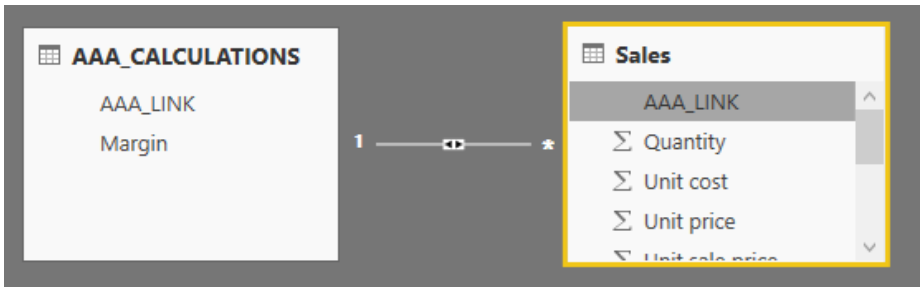
The Analytics Connector supports working with Cognos Calculations in Power BI.

The calculations table name can be changed using the Configuration Utility. The *Standalone Calculation Table Name* setting must be set to *AAA_CALCULATIONS* as Power BI does not work with tables that begin with an underscore.

Select the *AAA_CALCULATIONS* table along with the other tables for your data set.



The table will also contain a link column. This special calculation table is joined to other tables in the data set using the link column as described in *Working with Tables*.


AAA_CALCULATIONS
AAA_LINK
Margin
1
*
Sales
AAA_LINK
Quantity
Unit cost
Unit price

Working with Parameterized Tables

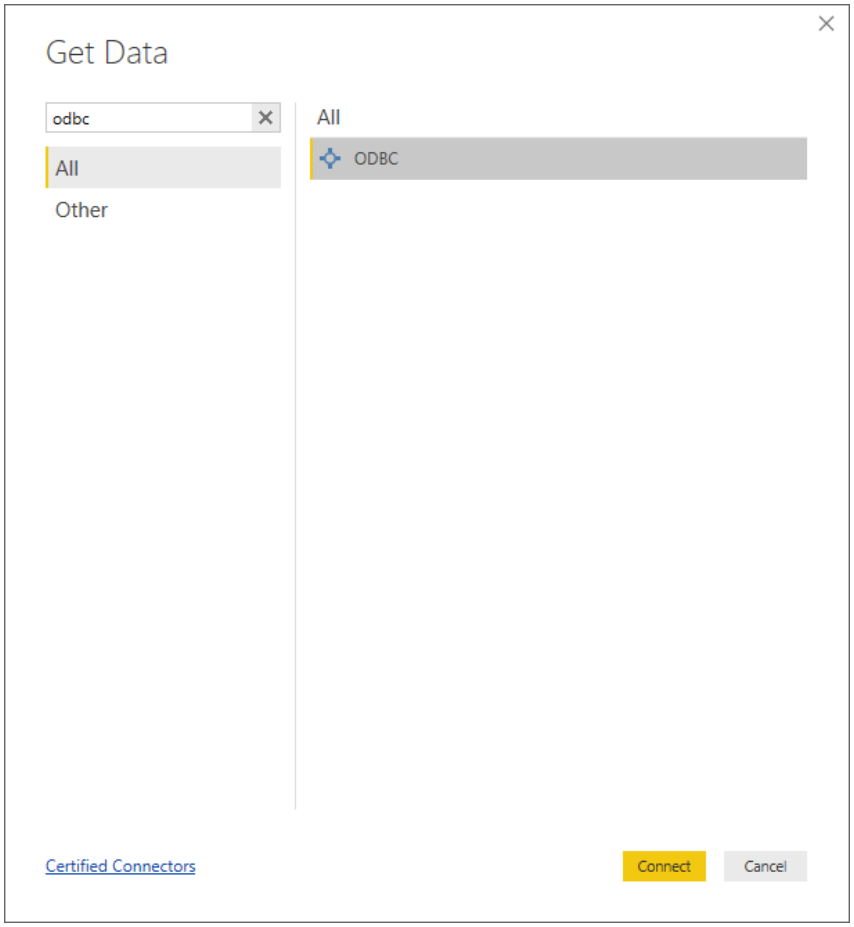
The Analytics Connector supports working with Cognos parameterized tables in Power BI.

To use a parameterized table in a Power BI report and pass parameter values, you must first set up a DSN. For information on how to setup a DSN, see the *Senturus Analytics Connector Installation Guide*.

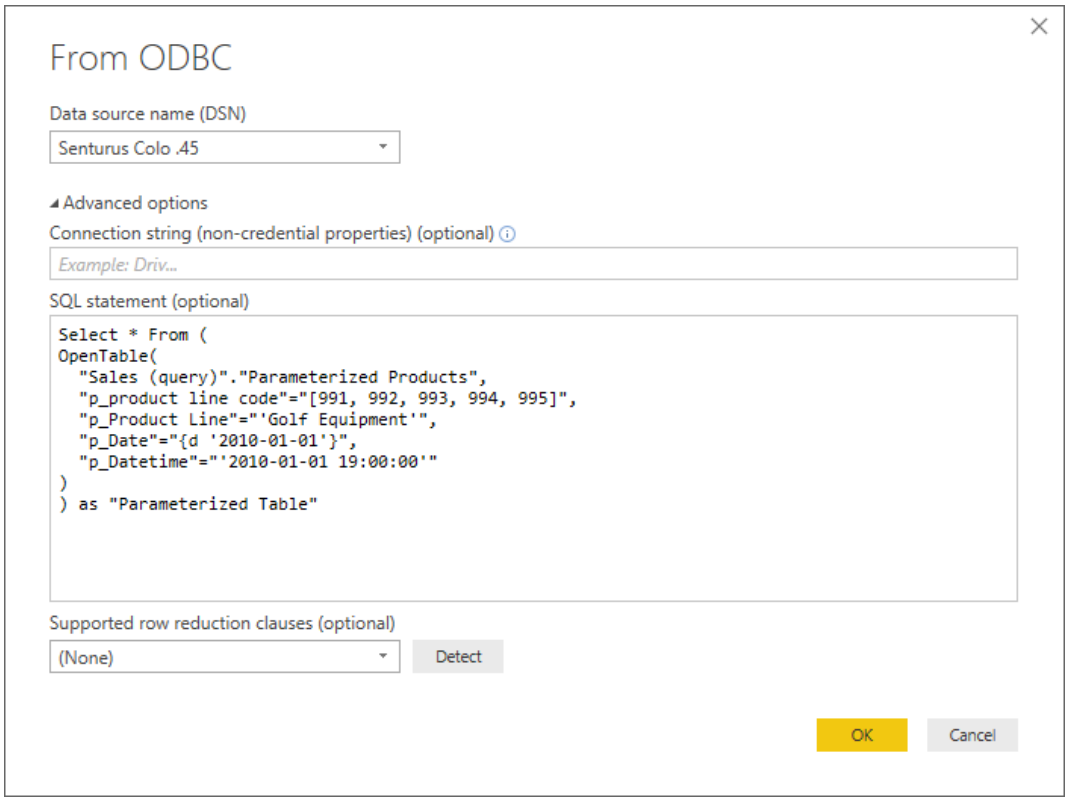
To begin, open Power BI Desktop and select **Get Data**.

Find the *ODBC* data source in the list.

Click **Connect**.



The *From ODBC* dialog will display.



Using the *OpenTable* function, you can pass parameters to a parameterized Cognos table.

The first parameter is *"[schema name]"."[table name]"* of the Cognos parameterized table. This is followed by zero or more Cognos parameter name-value pairs separated by commas.

Example passing static valued parameters:

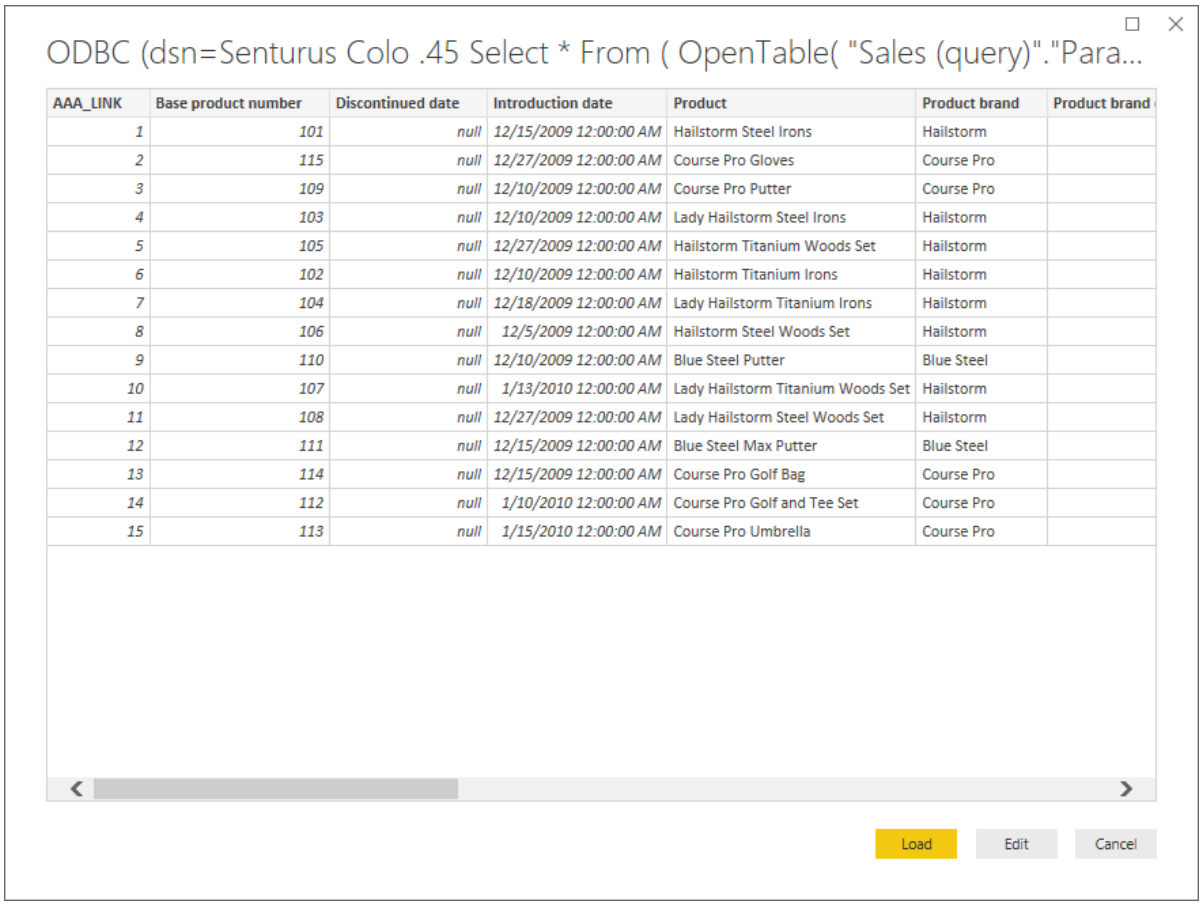
```
Select * From (
OpenTable(
  "Sales (query)"."Parameterized Products",
  "p_product line code"="[991, 992, 993, 994, 995]",
  "p_Product Line"="'Golf Equipment'",
  "p_Date"="{d '2010-01-01'}",
  "p_Datetime"="'2010-01-01 19:00:00'"
)
) as "Parameterized Table"
```

Select the appropriate DSN from the list.

Place the query in the SQL statement section of the *From ODBC* dialog.

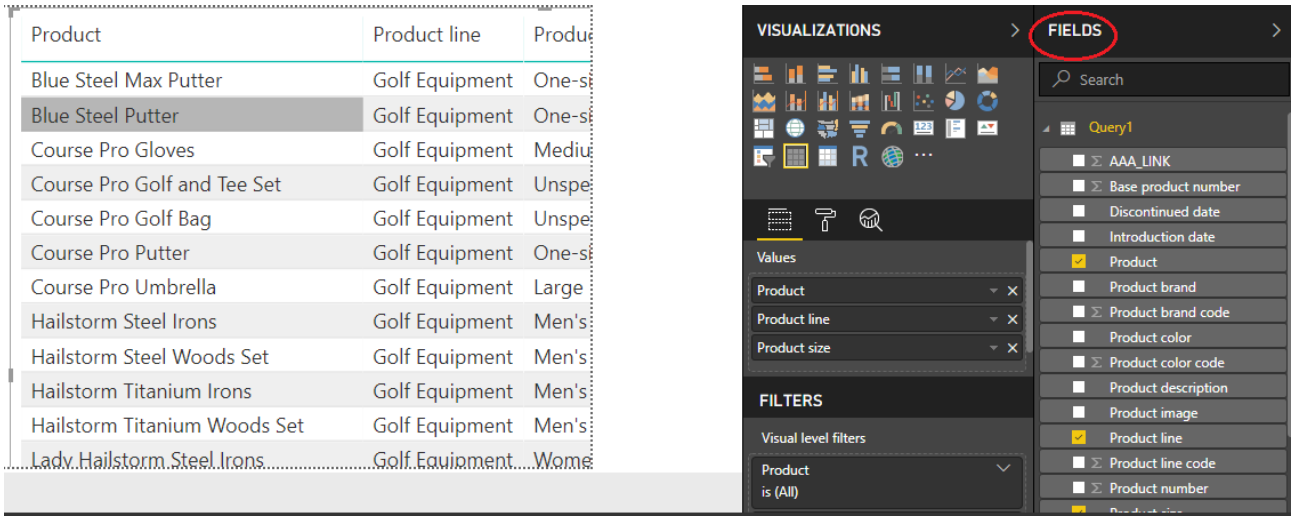
Click **OK**.

A preview of the table will display. Click **Load**.



AAA_LINK	Base product number	Discontinued date	Introduction date	Product	Product brand	Product brand
1	101	null	12/15/2009 12:00:00 AM	Hailstorm Steel Irons	Hailstorm	
2	115	null	12/27/2009 12:00:00 AM	Course Pro Gloves	Course Pro	
3	109	null	12/10/2009 12:00:00 AM	Course Pro Putter	Course Pro	
4	103	null	12/10/2009 12:00:00 AM	Lady Hailstorm Steel Irons	Hailstorm	
5	105	null	12/27/2009 12:00:00 AM	Hailstorm Titanium Woods Set	Hailstorm	
6	102	null	12/10/2009 12:00:00 AM	Hailstorm Titanium Irons	Hailstorm	
7	104	null	12/18/2009 12:00:00 AM	Lady Hailstorm Titanium Irons	Hailstorm	
8	106	null	12/5/2009 12:00:00 AM	Hailstorm Steel Woods Set	Hailstorm	
9	110	null	12/10/2009 12:00:00 AM	Blue Steel Putter	Blue Steel	
10	107	null	1/13/2010 12:00:00 AM	Lady Hailstorm Titanium Woods Set	Hailstorm	
11	108	null	12/27/2009 12:00:00 AM	Lady Hailstorm Steel Woods Set	Hailstorm	
12	111	null	12/15/2009 12:00:00 AM	Blue Steel Max Putter	Blue Steel	
13	114	null	12/15/2009 12:00:00 AM	Course Pro Golf Bag	Course Pro	
14	112	null	1/10/2010 12:00:00 AM	Course Pro Golf and Tee Set	Course Pro	
15	113	null	1/15/2010 12:00:00 AM	Course Pro Umbrella	Course Pro	

You can now use the columns from the **Fields** tab to build the report.



You can also join parameterized tables with other tables in one Power BI data source. These tables will also join using the generated Link Columns. Example advanced query:

```
Select
  "Products"."Product line",
  "Products"."Product type",
  Sum("Sales"."Revenue") as "Revenue"
From
  OpenTable(
    "Sales (query)"."Parameterized Products",
      "p_product line code"="[991, 992, 993, 994, 995]",
      "p_Product Line"=" 'Golf Equipment'",
      "p_Date"="{d '2010-01-01'}",
      "p_Datetime"="'2010-01-01 19:00:00'"
  ) as "Products"
  join "Sales (query)"."Sales" as "Sales"
    on ("Products"."AAA_LINK" = "Sales"."AAA_LINK")
Group by "Products"."Product line"
```

Cont’d

Working with Reports

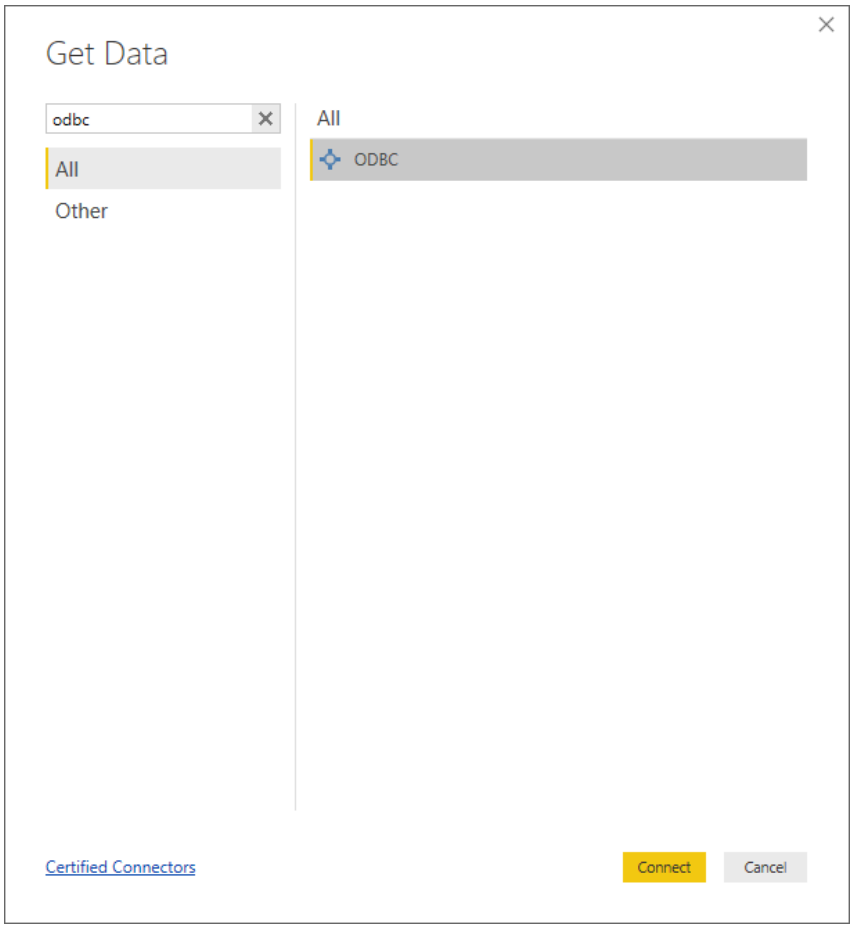
The Analytics Connector supports working with Cognos reports in Power BI.

To use a parameterized table in a Power BI report and pass parameter values, you must first setup a DSN. For information on how to setup a DSN, see the *Senturus Analytics Connector Installation Guide*.

To begin, open Power BI Desktop and select **Get Data**.

Find the *ODBC* data source in the list.

Click **Connect**.



The *From ODBC* dialog will display.

Using the *RunReport* function, you can pass parameters to a Cognos report.

The first parameter is *"[schema name]"."[report name]"* of the Cognos report. This is followed by zero or more Cognos parameter name-value pairs separated by commas.

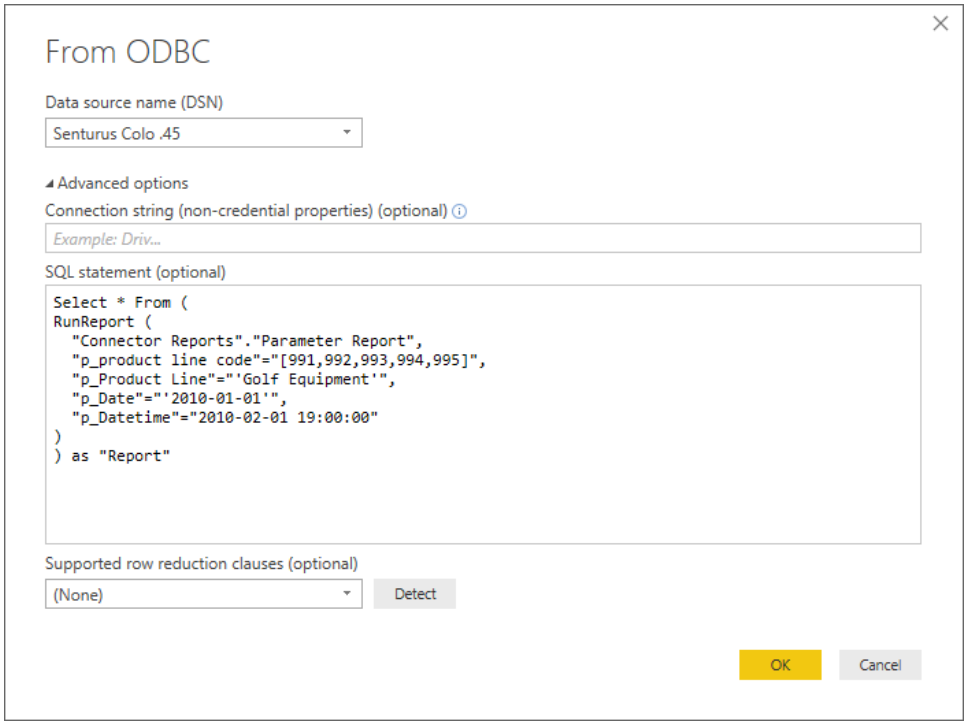
Example passing static valued parameters:

```
Select * From (
RunReport (
  "Connector Reports"."Parameter Report",
  "p_product line code"="[991,992,993,994,995]",
  "p_Product Line"="'Golf Equipment'",
  "p_Date"="'2010-01-01'",
  "p_Datetime"="2010-02-01 19:00:00"
)
) as "Report"
```

Select the appropriate DSN from the list.

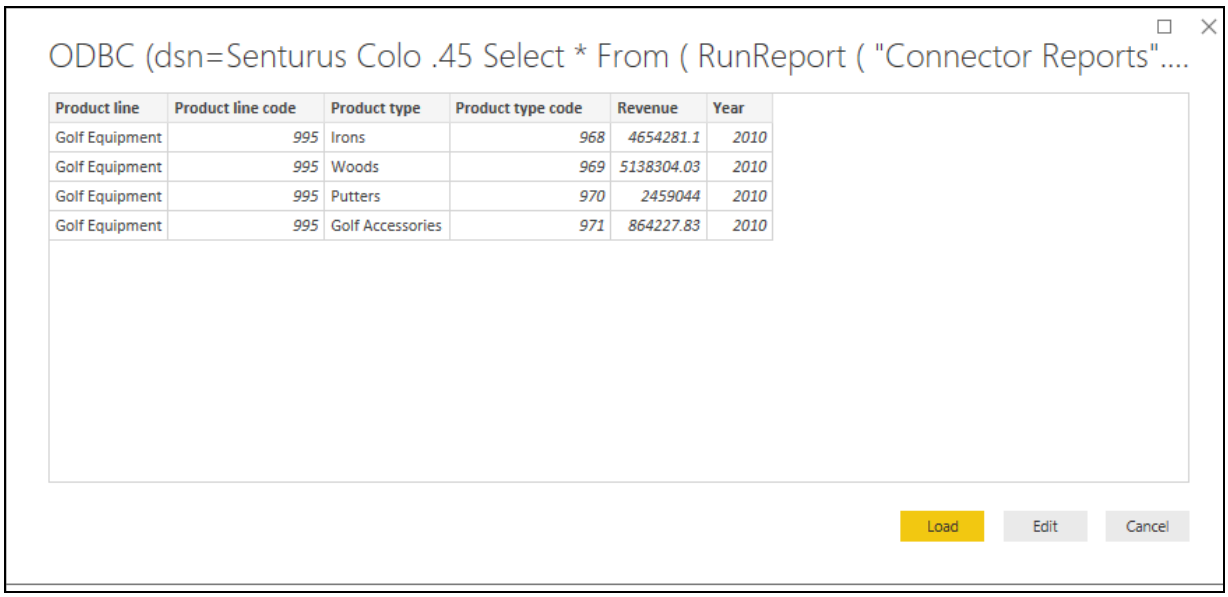
Place the query in the SQL statement section of the *From ODBC* dialog.

Click **OK**.



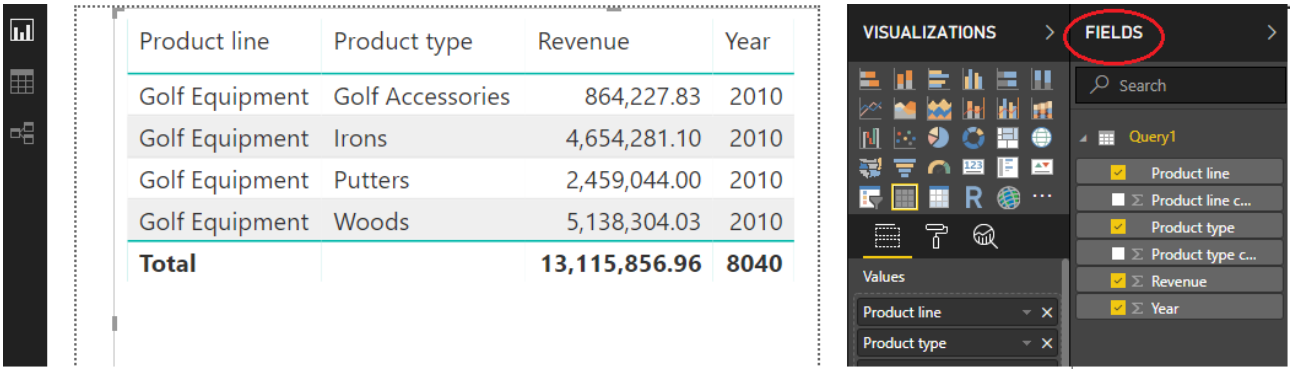
A preview of the report will display.

Click **Load**.



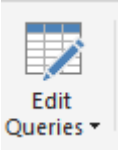
Product line	Product line code	Product type	Product type code	Revenue	Year
Golf Equipment	995	Irons	968	4654281.1	2010
Golf Equipment	995	Woods	969	5138304.03	2010
Golf Equipment	995	Putters	970	2459044	2010
Golf Equipment	995	Golf Accessories	971	864227.83	2010

You can now use the columns from the **Fields** tab to build the report.



Working with Power BI Parameters

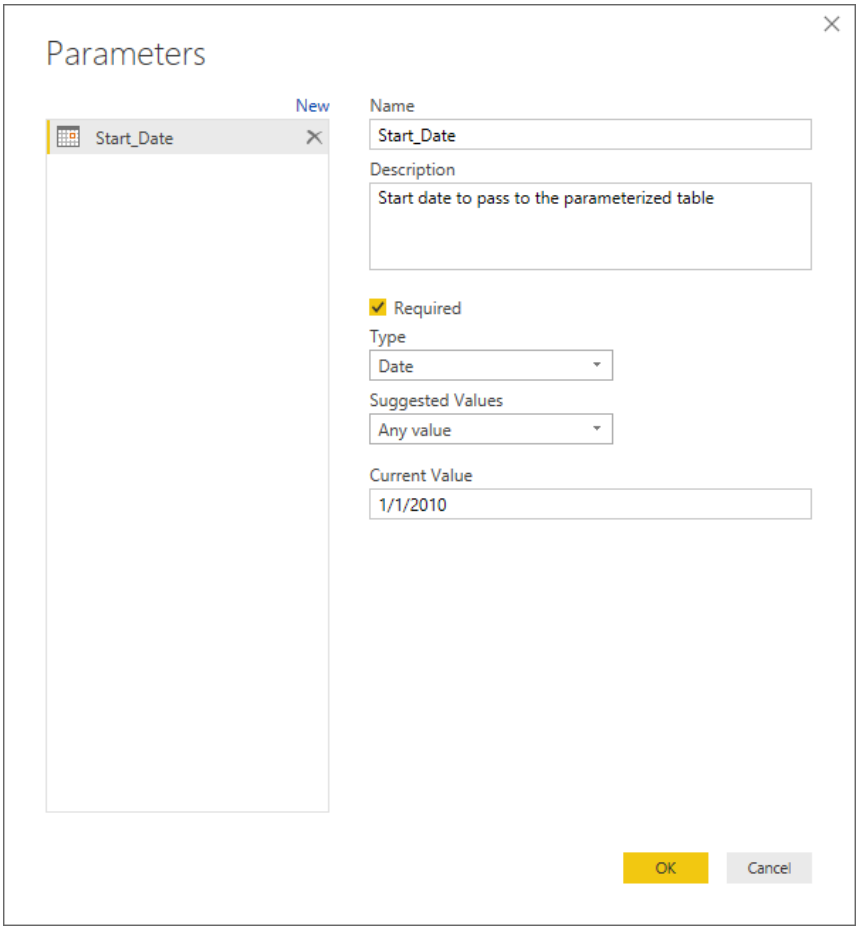
In your Power BI ODBC queries, you can replace the static values with Power BI parameters to create dynamic values that can be easily changed.



After configuring a *Parameterized Table* or *Report* query, click **Edit Queries** to bring up the Power Query Editor.

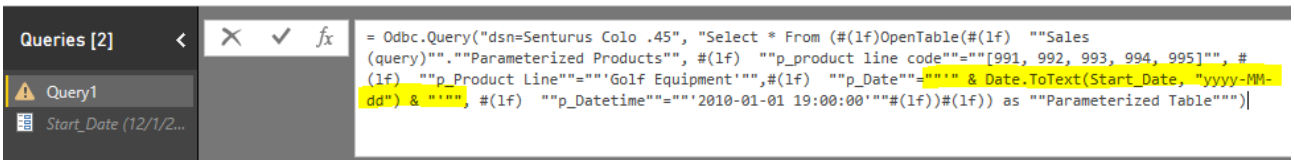
Click **Manage Parameters** to display the **Parameters** dialog.

Create a new parameter.

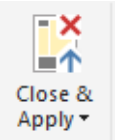


Next, edit the query to include the parameter in the SQL statement. You may need to format non-text data types using M language functions in order to append them to the statement.

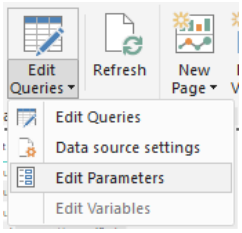
The below example formats a date parameter to text and appends it to the SQL statement.



NOTE: Double quotes must be escaped by using two sets of double quotes.



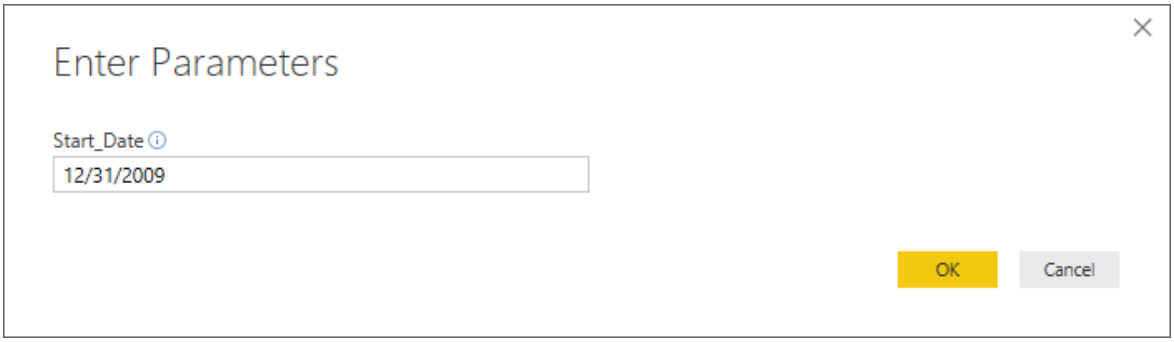
Click **Close & Apply**.



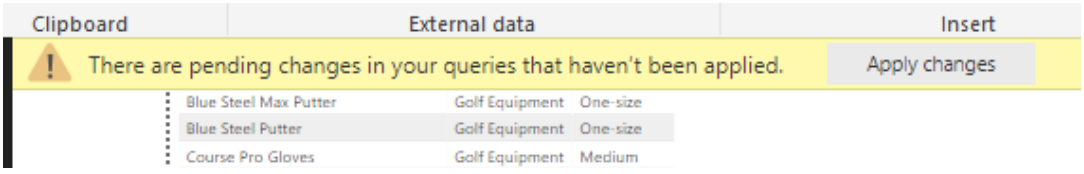
To change the Parameter value(s), select *Edit Parameters* under **Edit Queries**.

The **Enter Parameters** dialog will display with a list of configured parameters and their values.

Fill in new values and click **OK**.



Click **Apply Changes** if the data does not refresh.



Technical Reference

Limitations

Power BI has a limitation of 2 million rows of data for extract and 1 million rows of data for DirectQuery.

Function Syntax

Syntax

Both OpenTable and RunReport function adopt following syntax:
OpenTable ("Schema Name"."Table/Report Name"(, "Parameter"="value", …))

The first parameter is a table identifier, using standard SQL syntax. All identifiers are case insensitive and the schema name can be omitted if the table name is unique cross schemas.

Any additional parameters are name-value pairs, separated by commas. Name and values should be surrounded by double quotation marks.

Parameters

Use parameter name in place of "Parameter" for the Cognos connector.

Values

All values should follow SQL/ODBC standard.

Only plain string representation is allowed for numeric values. Formatted representations such as **1,200.00** with thousand separators, **(15)** for -15, or **50%** for .5 are not supported.

For string values, single quotation marks are used around the value. For example, 'Golf Equipment' or 'Sam''s Club'.

For date/time/timestamp values, use the ODBC standard format. For example {d '2010-01-01'} or ISO 8601 standard format, 'YYYY-MM-DD' for date, 'hh:mm:ss' for time and 'YYYY-MM-DD hh:mm:ss' for timestamp.

Character escaping

Certain characters must be escaped.

For single quotes within a string value, use two single quotes to escape a single quote inside the string.

Double quotes in parameter name and values need to be escaped with two double quotes.

Passing multiple values to a parameter

A Cognos parameter may accept multiple values, for example [Product line code] in (?p_Product line code?). To specify multiple values in your function, put multiple values in a pair of square brackets ([]) and separate each value by a comma (,) just like CSV format.

Supported ODBC Features

All identifiers (catalog, schema, table and column names) are case insensitive. This ODBC driver supports 15 Cognos data types. Refer to the data type mapping in following table.

Cognos Data Type	ODBC Data Type	Max Length/Precision	Note
int16	smallInt	5	
int32	integer	10	
int64	bigInt	19	
float32	real	7	
float64	double	15	
decimal	decimal	38	
character	char	8000	
characterLength16	varchar	8000	
nChar	nchar	4000	
nVarChar	nvarchar	4000	
date	date	10	
time	time	8	no milliseconds
datetime	timestamp	19	no milliseconds
textBlob	varchar	8000	mapped to varchar
unknown	varchar	8000	mapped to varchar

This driver has been tested against SQL Server, DB2 and Oracle databases (relational and DMR model). It may not support all data types/functions for other databases.

This driver only supports a) packages with one data source or b) packages with multiple data sources. However, all database connections are of the same type (e.g. SQL Server native connection). It may work for other packages, but some functions may fail.

ODBC features supported by this driver

Numeric, string, date/time, null literals

Cast/convert

Simple calculation (+, -, *, /, and %)

String concatenate\And, or, not logical operators

Comparison (<, >, =, <=, >=, !=, between, not between, in, not in, like, not like)

Is null, is not null

Case (if else) statement

Parenthesis

Sub queries

Functions supported by this driver

Aggregate function: AVERAGE, AVG, COUNT, MAX, MAXIMUM, MIN, MINIMUM, SUM, TOTAL.

Numeric functions: ABS, ACOS, ASIN, ATAN, CEILING, COS, COT, DEGREES, EXP, FLOOR, LOG, LOG10, MOD, POWER, RADIANS, ROUND, SIGN, SIN, SQRT, TAN, TRUNCATE.

Date and timestamp functions: CURRENT_DATE, CURRENT_TIMESTAMP, DAY, DAYNAME, DAYOFMONTH, DAYOFWEEK, DAYOFYEAR, HOUR, MINUTE, MONTH, MONTHNAME, QUARTER, SECOND, TIMESTAMPADD, TIMESTAMPDIFF, WEEK, YEAR.

Character functions: ASCII, CHAR, CHAR_LENGTH, CHARACTER_LENGTH, CONCAT, LCASE, LCASE, LEFT, LOCATE, LTRIM, LTRIM, REPLACE, RIGHT, RTRIM, RTRIM, SPACE, SUBSTR, SUBSTRING, TRIM, TRIM, UCASE, UCASE.
Others: CONVERT, IFNULL

CONTACT US

The latest version of the Analytics Connector along with related documentation and contact information can be found at https://www.senturus.net/connector-download/.

If you have any additional questions, please contact us at CustomerSupport@senturus.com.