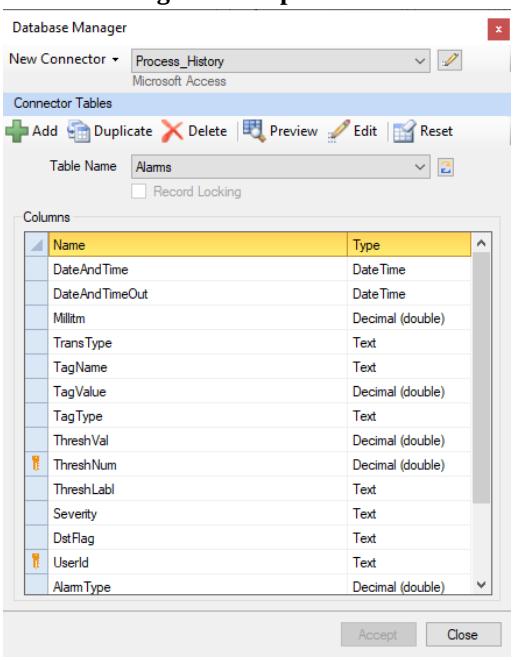
Database Manager

Overview

The **Database Manager** is used to manage tables and columns in a database without needing to know SQL programming. It can be used to create the tables required for **Data Entry Forms** or simply to edit/preview the contents of a database.

The application is opened from the **Tools** tab of the **Project Explorer** by selecting **Database, Manager** or from **Tools, Database Manager** in **Template Studio**.



Database Terminology

A database stores information in **Tables**. Each Table contains **Columns** and **Rows** (also referred to as Records) of data. Each Column has a name and a type, e.g., if a column called *TagName* is used to hold tag names, it would be of type Text.

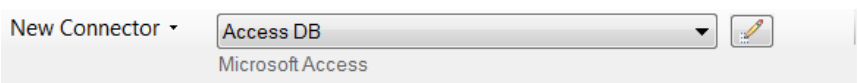
Columns can also be indexed to improve searches for records e.g., by indexing a column called *TagName*, a search for a specific tag is greatly improved because of the efficiency added to the database due to the indexing.

User Interface

The interface manages a **Connector** and each **Table** it contains.

Connector

At the top of the display is where either an existing connector is selected, or a new connector is created.



Click **New Connector** and select **Database** (general database), **Form** (database that contains tables used in data entry forms) or **Analytic** (database that contains tables for analytics.

If a connector has already been defined, select it from the drop-down list to show all its tables.

The **Run Database Script** button  is provided to run a database script file. Database script files must reside in the **Data** directory of the project and have the extension *.dbc*.
An example script is provided called *createtables.dbc* which shows the *CREATE TABLE* syntax for the supported database formats and data types is provided. This file can be edited in notepad or any other text editing application.

Table

Select a **Table Name.** The first column shows an image of a key for any column that is indexed. A black key indicates that the column has a unique index whereas an orange key indicates a non-unique index. In the grid, are the **Columns** of the table, showing the **Name** and the **Type**.

For a new table, right click on the row to assign/unassign an index (note that this option is not enabled for an existing table). The Database Manager supports two types of column indexes:

- **Unique**
  Column value cannot duplicate. A search for a value in this column will return no more than one record.
- **Non-unique**
  Column value can be duplicated. A search for a value in this column will can potentially return more than one record

To edit the **Name**, select the cell and change its content. To edit the **Type**, click a row and select from the list.

Note that editing is not supported for all connectors.

The **Types** supported are:

- **DateTime**
  Use for date and time stamps.
- **Byte**
  Use for whole numbers that range from 0 to 255.
- **Number**
  Use for whole numbers that range from -32,768 to 32,767.
- **Number (long)**
  Use for whole numbers that range from -2,147,483,648 to 2,147,483,647.
- **Text**
  Use for textual data. Up to 255 characters can be stored in the column.
- **Text (wide)**
  Use for columns that store textual data in wide format. This must be used if Unicode characters such as Chinese or Japanese are used. Up to 255 characters can be stored in the column.
- **Decimal**
  Use for numeric values with decimals (e.g., floating point values) with up to 7 significant digits.
- **Decimal (double)**
  Use for numeric values with decimals (e.g., floating point values) with up to 15 significant digits.
- **Currency**
  Use for currency values. It is recommended that cells linked to columns of this type are formatted to display currency in Excel.

New columns can be added to the grid by entering the information on the bottom row. Existing columns can be deleted from the grid by right clicking the row and selecting **Delete** or by selecting the row and pressing **Delete** on the keyboard.

With a **Table Name** selected, a number of table operations are provided:

- **Add**
  Add a table to the database. When selected, the **Table Name** changes from a drop-down list of tables to a text box where the new table name is entered, and the **Columns** grid is cleared. Edits are not saved until **Accept** is pressed. Press the **Refresh** pushbutton to switch the text box back to the dropdown list.
- **Duplicate**
  Add a table to the database based on an existing table's structure only. When selected, the **Table Name** changes from a drop-down list of tables to a text box where a new table name can be entered. The columns of the original table remain in the **Columns** grid as a starting point for the new table.
- **Delete**
  Delete the selected table in **Table Name** from the database.
- **Preview**
  Open the **Preview** dialog to display the top 100 records stored in **Table Name**. If the table has a column named *DateAndTime*, records are ordered by *DateAndTime* in descending order (newest to oldest).
- **Edit**
  Open the **Edit** dialog to display the top 100 records stored in the **Table Name**. Add new rows to a table by entering the values on the edit row (last row) and clicking OK. This option should be used with care since it will add information to the table.
- **Reset**
  Clear all the rows from the selected table in **Table Name**. When selected, a confirmation of the number of rows deleted is shown.
- **Record Locking**
  This setting is only available for **Form** connectors. When this option is checked an *xlrLock* column is automatically added to the table. Use this option if the table is intended for a Data Entry Form that prevents users from editing the records once they have been locked. Once checked this setting cannot be edited.

Table and Column Restrictions

Naming Convention

The following guidelines should be considered when dealing with databases:

- Table and column names should not begin with a number.
- Table names should not start with the letters *lu*.
- Table and column names cannot match the reserved words of SQL. A list of reserved words can be found at http://msdn.microsoft.com/en-us/library/ms189822.aspx
- Table and column names should be less than 64 characters long.
- Table and column names should not contain a period (.), exclamation point (!), accent grave (`), pipe (|), single quote (‘), double quote (“), comma (,), asterisk (*), colon (:) or square brackets ([and]).
- Table and column names should not lead with a space.
- The column name *DateAndTime* is a reserved name. If you use this as a column name you will not be able to modify or delete it once the table is created.

Database Limitations

Microsoft Access

- A table should have no more than 127 columns configured as only 127 columns can be updated at one time.
- The database is restricted to 2GB in size. Once this limit is reached no more records may be inserted to the database until records are purged.
- Support for *accdb* database requires the appropriate Microsoft Access Database Engine OLE-DB provider.