

Database Management

User Guide - Version 8.105



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The **DBM** module is used for the management of Geotec databases, whether these are Access, Oracle, SQL Server or SQLite databases. DBM can be used for the following tasks:

- Create an empty database (paragraph 5);
- Update a database (paragraph 6);
- Transfer data (paragraph 7);
- Duplicate a site or a boring (paragraph 8);
- Delete data (paragraph 9);
- Produce the data dictionary (paragraph 10);
- Compare two databases (paragraph 11);
- Inventory one or two database(s) (paragraph 12);
- Repair / Compact a database (paragraph 13).

DBM is compatible with Microsoft Windows 7, 8 and 10. DBM uses the X3D graphic library created by Sobek Technologies Inc. for the management of the windows, connection to databases, etc.

1. Launching DBM



To open **DBM**, double-click on its icon. When DBM is first launched, the task “Create an empty database” is selected by default (Figure 1). In subsequent loadings, the last task used will be selected.

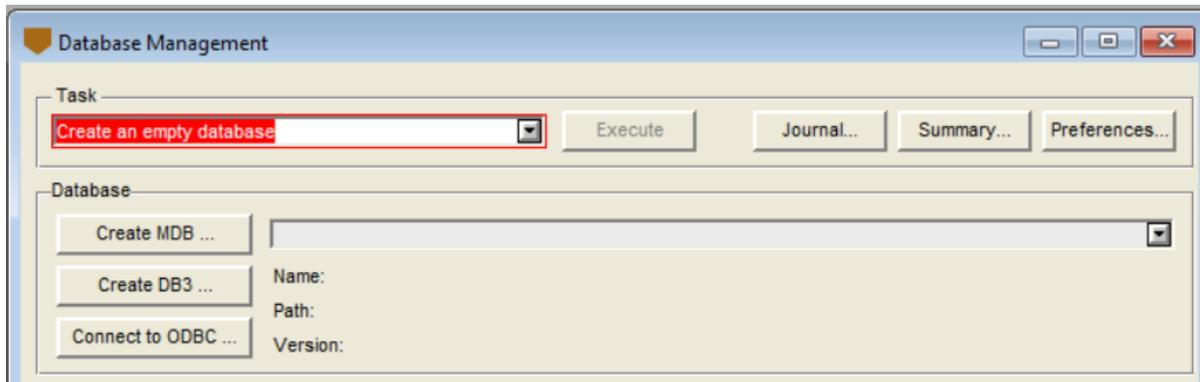


Figure 1 – Main window of DBM

1.1. Language of use

To change the language of use, go to the **Action** menu, then **Language**. In the sub-menu, select the language of use of the module, either English or French. All the labels in the windows and the various messages sent by X3D and the application will be in the language selected.

2. Preferences

In the **Action** menu, select **Preferences** to open the preferences editing window (Figure 2). It can also be opened from the main window with the **Preferences...** button.

2.1. Data transfer options

The **type of transfer** defines the speed of the transactions. Generally, **All tables (normal transfer)** is selected: all the tables are read before the transaction is done. For databases with a very large number of data, the user should select **Table by table (transfer with lots of data)**, which is slower but prevents the computer from lacking memory.

The user can define a **maximum number of sites to be transferred** in each loop. At the end of each loop, the database is disconnected and reconnected automatically, avoiding any possible lack of memory.

2.2. Journals and summaries

A journal is written during the execution of each task done by DBM. This journal reports the success or failure of the task as well as many other details. The journals are **.txt** text files named with the date and time, as **yyyy-mm-dd_hhmmss.txt**, and saved in the transactions folder.

A daily summary is created during the first task of the day and is updated as subsequent tasks are done. This file sums up all the tasks carried out and their success or failure. It is also a **.txt** file named with the date followed by **_Summary**, as **yyyy-mm-dd_Summary.txt**, and saved in the transactions folder.

When a task is finished, the journal is displayed in DBM with the default X3D editor, or with another text editor if one is selected in **Text editor for journals**.

Clicking on **Journal...** in the main window displays the content of the last journal produced.

Clicking on **Summary...** in the main window displays the content of the daily summary.

2.2.1. Transaction folder

In **Transaction folder**, select the directory where your journals and summaries will be saved. The directory can be changed by clicking on the button right of the field.

2.2.2. Information in journals

When **List non-inserted data in the journal** is checked, any record not inserted into the destination database due to an error is listed in the journal. The primary key of each record not inserted is listed.

When **Write ODBC error messages in the journal** is checked, error messages returned by ODBC when trying to insert records into the destination database will be written in the journal. This option makes it easier to find the faulty value

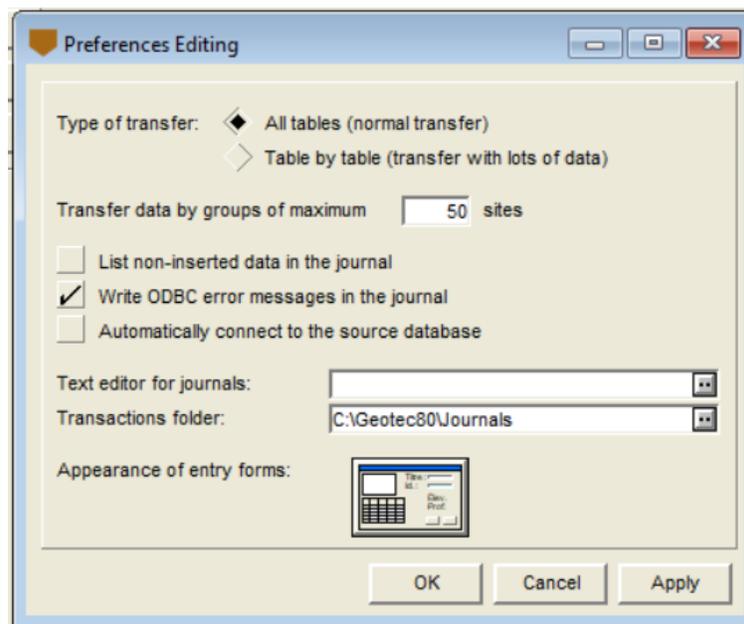


Figure 2 – Preferences editing window

2.3. Other preferences

When **Automatically connect to the source database** is checked, the connection to the last source database used by DBM is done automatically when the program is launched.

The user can modify the appearance of the entry forms used by Geotec, by clicking on the button next to the label **Appearance of entry forms**. Chapter 6 of the X3D guide presents this editing window for the appearance of the entry forms.

3. Preselection filter

For certain tasks, the user can apply a preselection filter to limit the number of sites or borings represented in the selection table at the bottom of the main DBM window.

The preselection filters are “**Region number**”, “**Site number**”, “**Boring number**”, “**Project number**”, “**Contract number**”, “**Group number**” and “**Domain (longitude, latitude)**”. The selection is done in the scrolling list associated to the **Type** field of the **Preselection filter** zone.

The preselection conditions remain valid as long as they are not changed or deleted. To delete a filter, select the element “No filter” in the scrolling list associated to the **Type** field.

3.1. Filter by region, site, boring, project or contract

The filter by region number and the filter by site number apply to the sites. The user can then check the desired sites to see their borings, axes and samples.

Figure 3 shows the preselection filter by boring number; it is similar for the filter by project or contract number. The user chooses the numbers in the scrolling list, and clicks **Apply**. The contract (or project) number is for the boring. The borings returned are then displayed in the bottom table. Several values can be selected if they are separated by “;”. The replacement characters “%” (replace several characters) and “_” (replace one character) can be used. The “!” can be used to exclude values from the results.

The screenshot shows a dialog box titled "Preselection filter". It contains a dropdown menu for "Type" set to "Boring number". To the right, there is a text input field labeled "Boring number:" containing the value "21F%". An "Apply" button is located to the right of the input field.

Figure 3 – Preselection filter by boring number

3.2. Filter by group number

The filter by group number applies to the active tab. The selections available in the scrolling list are those saved in the SEL_SITE, SEL_BORING, SEL_SAMPLE and SEL_AXIS tables respectively.

3.3. Filter by domain

Figure 4 shows the preselection filter “**Domain (longitude, latitude)**”. When this filter is selected, enter the four values of minimum and maximum longitudes and latitudes defining the domain that limits the preselection of the borings and click **Apply**. The borings within this domain are displayed in the bottom table.

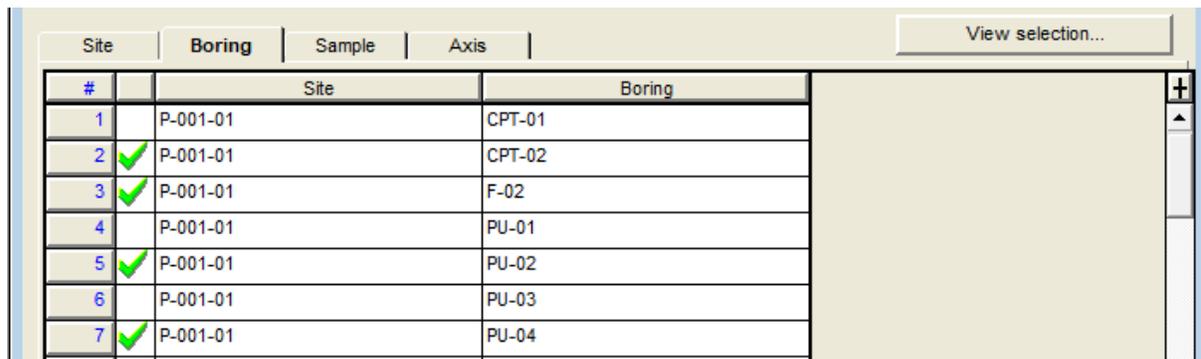
The screenshot shows a dialog box titled "Preselection filter". The "Type" dropdown is set to "Domain (longitude, latitude)". To the right, there are two columns: "Longitude:" and "Latitude:". Under each column, there are two input fields labeled "Min:" and "Max:".

Figure 4 – Preselection filter by domain

4. Selection of sites, borings, samples and axes

Certain tasks can be applied only to specific sites, borings, samples and/or axes. A selection table (Figure 5) is displayed at the bottom of main window of DBM, if applicable based on the task selected. The table shows records when a database is connected.

To select a record in the table, click in the field to the right of the row number; a green checkmark appears. To select a series of continuous rows, check the first row of the series, hold down the **[Shift]** key, then check the last row of the series. To select all or unselect all, double-click in the header (without a label) of the column of green checkmarks.



#	Site	Boring	
1	P-001-01	CPT-01	
2	P-001-01	CPT-02	✓
3	P-001-01	F-02	✓
4	P-001-01	PU-01	
5	P-001-01	PU-02	✓
6	P-001-01	PU-03	
7	P-001-01	PU-04	✓

Figure 5 – Selection table of sites, borings, samples and axes

The **Site** tab is always present and shows all the sites contained in the connected database.

Depending on the task selected, the **Boring**, **Sample** and **Axis** tabs can also be present. They remain empty until at least one site is selected. Similarly, if no boring is selected, the Sample tab will be empty.

When you click on the Boring, Sample or Axis tab after a selection, all records associated to that selection will be displayed in the table and will be selected with a green checkmark. The user can unselect the records that should not be taken into account for the selected task.

Use the button **View selection** to verify the selected records in a text file.

4.1. Archiving

Archived sites and borings are indicated either with a **red checkmark** or with a **red crossed circle** in the cell right of their row number.

When we see the **red checkmark**, it is possible to select the row (example, for the transfer and duplication).

When we see the **red crossed circle**, it is not possible to select the row (example, for data deletion).

5. Create an empty database

The creation of an empty database consists in creating a database with Geotec structure, with tables, fields, constraints and relations, but no record, except for the tables of lists that will have default records used in the scrolling lists of several Geotec entry forms.

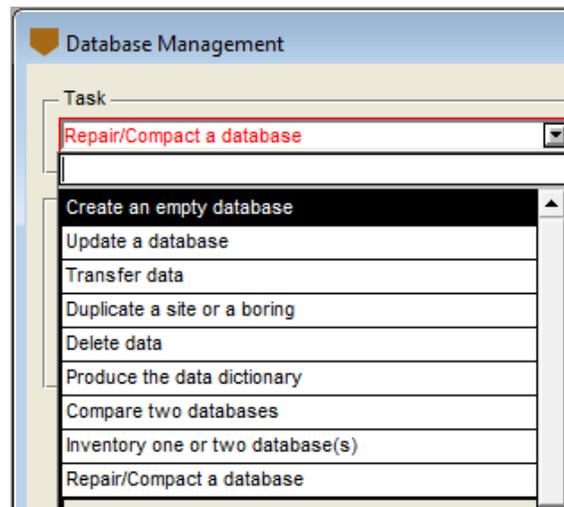


Figure 6 – List of tasks

To create an empty database:

1. Select **Create an empty database** in the scrolling list of tasks (Figure 6).
2. To create a Microsoft Access database: Click on **Create MDB**.
 - a. In the file saving window, select the desired directory.
 - b. Enter the name of the database to create; **Geotec810** is suggested by default
 - c. Click Save.
 - d. The complete name will be shown in the disabled field.
3. To create an SQLite database (for Geotab application): Click on **Create DB3**.
 - a. In the file saving window, select the desired directory.
 - b. Enter the name of the database to create; **Geotec810** is suggested by default
 - c. Click Save.
 - d. The complete name will be shown in the disabled field.
4. To create the Geotab structure for an SQL Server or Oracle database: Click on **Connect to ODBC**. An instance must already exist, as well as an ODBC link with connection alias to connect to this database.
 - a. The database connection window is displayed (figure 7).
 - b. Enter the username, password and the connection alias defined for your ODBC link.

- c. If the connection is successful, the expression **DNS=connection-alias** is shown in the disabled field, the alias in **Name**, Microsoft SQL Server or Oracle in **Path**. Version 7.400 and language French are shown but will be modified after executing the task.

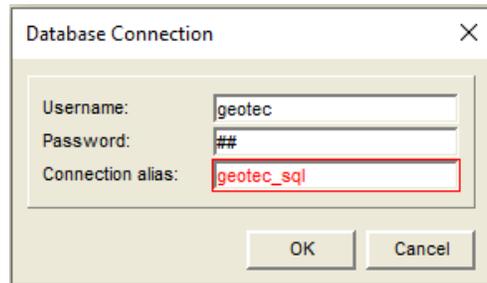


Figure 7 – Connection window for an SQL Server or Oracle database

5. Click **Execute** in the main window; the selection window of tables to process opens (figure 8).
6. Choose the **language of the data dictionary** (French or English).
7. Choose the group(s) of tables or views to create:
 - a. The **exploration** and **general** tables are always created.
 - b. The **tunnel construction** tables (for monitoring during tunnel construction – with Pro module only).
 - c. The **dam design** tables (for earth and rockfill retaining structures – with Dam module only).
 - d. The **quality control** tables (for lab and in-situ tests for quality control of aggregates – Lab module).
 - e. The default **views**. They are displayed in blue at the end of the table, and can be deselected one by one if desired.
8. Click **OK** to execute the task.

When the creation is done, the journal is displayed, showing the database name, its version, the language of its dictionary, as well as the list of tables and views created.

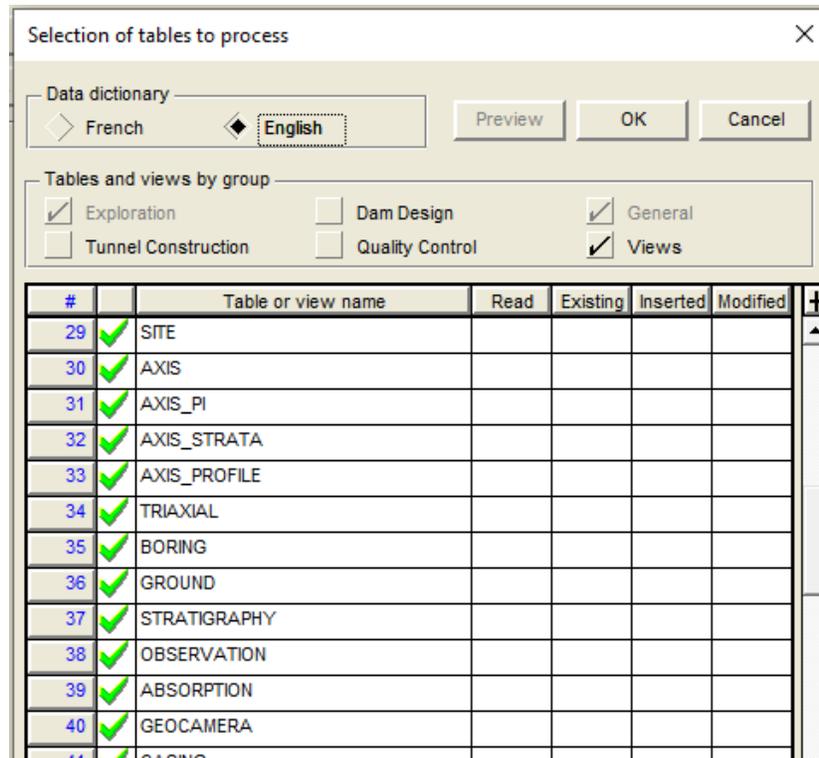


Figure 8 – Selection of tables to process

6. Update a database

The database update consists in integrating the modifications to the database structure done in a new Geotec version. The modifications can include: additions of new tables or fields, modification of lengths or types of fields, renaming existing tables or fields. Any table or field added by the user will be kept.

During the update, the modifications are made directly in the file connected. For Access files, a backup is automatically done by DBM, and the copy is named: *filename_bak.mdb* in the same folder as the connected file. For Oracle or SQL Server databases, please make a copy before updating.

SQLite databases cannot be updated.

To update a database:

1. Select **Update a database** in the scrolling list of tasks (Figure 6).
2. Select the database to update.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database** section.
 - b. To update a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To update an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of the connected database are shown under the Database field.

3. Click **Execute** in the main window; the selection window of tables to process opens (figure 8).
4. The window shows the tables and views present in the connected database.
 - a. The existing tables are always updated.
 - b. The groups of tables not present in the database can be added by selecting their checkbox,
 - c. The views can be recreated if needed by selecting them.
5. Click **OK** to execute the task.

When the update is done, the journal is displayed, showing all the changes.

7. Transfer data

The data transfer consists in copying selected data from one database to another without deleting them from the source database.

To transfer data:

1. Select **Transfer data** in the scrolling list of tasks (Figure 6).
2. Select the **source database**, from which data are copied.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Source database** section.
 - b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
 - d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.
3. Select the **destination database**, into which data will be copied.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Destination database** section.
 - b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
 - d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of the connected databases are shown under the Source database and Destination database fields.

4. Apply a preselection filter, if desired (paragraph 3).
5. Select the desired sites, borings, samples and axes for the transfer in the table at the bottom of the main window (paragraph 4).

- a. The transfer is done from the level selected by the tab. For example, if the user is in the Sample panel when executing the task, data transferred will only be those associated to the samples (samples and lab tests).
 - b. To verify what will be transferred, click on **View selection**.
6. Click **Execute** in the main window; the selection window of tables to process opens (Figure 9) and shows the tables present in the connected database.
- a. At least one group of tables must be selected – Exploration by default
 - b. The data from tables with a green checkmark will be transferred.
 - c. The data from tables with a red circle will not be processed. To select them, select the checkbox of the group of tables at the top of the window.
 - d. You can deselect tables by clicking on their green checkmark. Their data will be not processed.

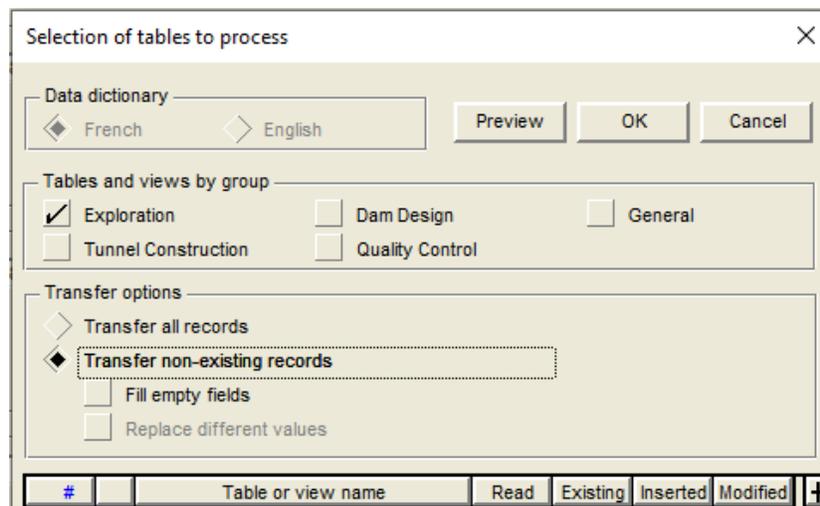


Figure 9 – Selection of tables to process for data transfer

7. Select the desired **transfer options**:
- a. **Transfer all records**: all records will be transferred. If records with the same keys already exist in the destination database, they will be rejected and ODBC error messages will be indicated in the journal.
 - b. **Transfer non-existing records**: only records whose keys do not exist in the destination database will be transferred.
 - i. **Fill empty fields**: records that already exist in the destination database will be updated only for their empty fields.
 - ii. **Replace different values**: records that already exist in the destination database will be updated for all the fields whose values are different between the source and the destination databases. No replacement is done by a null value.
8. Click **Preview** to see the results of the data transfer without executing the transfer.
- a. The **Read** column indicates the number of records read in each table of the source database.

- b. The **Existing** column indicates the number of records already existing in the destination database from those to be transferred. With Transfer all records, this column shows NA.
 - c. The **Inserted** column indicates the number of records that will be inserted in each table of the destination database. With Transfer all records, this column shows NA.
 - d. The **Modified** column indicates the number of records that will be modified in each table of the destination database, in other words, a record where the value of at least one field is modified. With Transfer all records or Transfer non-existing records, this column shows NA.
9. Click **OK** to execute the task.
 10. Accept the transfer message, which indicates the number of sites, borings, samples or axes that will be transferred along with their dependant records.

When the transfer is done, the journal is displayed, showing the details for each table. The same type of information as with the Preview is indicated.

- **Read** indicates the number of records read in each table of the source database.
- **Existing** indicates the number of records already existing in the destination database from those transferred. With Transfer all records, this column shows NA because there is no key verification.
- **Inserted** indicates the number of records inserted in each table of the destination database.
- **Modified** indicates the number of records modified in each table of the destination database, in other words, a record where the value of at least one field was modified. This column is filled only with options Fill empty fields and Replace different values.
- **Fields modified** indicates the number of fields modified in each table of the destination database, in other words, the number of fields whose value was modified. This column is filled only with options Fill empty fields and Replace different values.

WARNING: If one of the databases is of version prior to the version of DBM, some information may be lost during the exportation. It is best to previously update the databases involved in the exportation.

WARNING: If a site contains archived borings, they are not automatically selected when the Site is checked. The archived borings can still be checked and exported.

8. Duplicate a site or a boring

The duplication consists in copying a site or a boring with all its dependant records, in the same database.

To duplicate a site or a boring:

1. Select **Duplicate a site or a boring** in the scrolling list of tasks (Figure 6).
2. Select the **database** in which a site or a boring is to be duplicated.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database** section.

- b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
- c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
- d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of the connected database are shown under the Database field.

3. Apply a preselection filter, if desired (paragraph 3).
4. Select the site or boring to duplicate in the table at the bottom of the main window (paragraph 4). To select a boring, you must first select the site of the boring. Only one site or boring can be duplicated at once. All data belonging to the selected site or boring will be duplicated.
5. Click **Execute** in the main window.
6. In the box (Figure 10), enter the **number** of the new site or boring, and click OK.

The characters allowed are the numbers 0 to 9, the letters A to Z, the parentheses (), the point ., the dash - or the underscore _. Accents and other characters cannot be used.



Figure 10 – Duplicate a site or boring

When the duplication is done, the journal is displayed, showing the number of records duplicated in each table. The journal is similar to the transfer journal (see paragraph 7).

9. Delete data

The data deletion consists in deleting sites, borings, samples or axes with all their dependant records from the database.

When deleting, an Access database is created as backup in the transaction folder (paragraph 2.2.1). All data that will be deleted are transferred to this backup database beforehand. The backup data is named **Geotec_date_time_Deleted.mdb**.

To delete data:

1. Select **Delete data** in the scrolling list of tasks (Figure 6).
2. Select the **database** from which data will be deleted.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database** section.

- b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
- c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
- d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of the connected database are shown under the Database field.

3. Apply a preselection filter, if desired (paragraph 3).
4. Select the sites, borings, samples and axes to delete in the table at the bottom of the main window (paragraph 4).
 - a. The deletion is done from the level selected by the tab. For example, if the user is in the Boring panel when executing the task, all data associated to the selected borings will be deleted (in situ tests, samples, stratigraphy, etc.).
 - b. To verify what will be deleted, click on **View selection**.
5. Click **Execute** in the main window.
6. Accept the deletion message, which indicates the number of sites, borings, samples or axes that will be deleted along with their dependant records.

When the deletion is done, the journal is displayed, showing the creation of the backup database, the transfer of the data to be deleted into the backup database, and the number of records deleted in each table.

WARNING: If a site is archived, it is not possible to delete it.

WARNING: If a site contains archived borings, they will be deleted ONLY if the user remains in the Site tab without clicking on the Boring tab. Otherwise, the archived borings will not be deleted.

10. Produce the data dictionary

The data dictionary details the structure of a Geotec database (tables, fields, constraints, relationships):

- The 1st section lists the tables and views in the database, as well as the fields belonging to each table (or view), their attribute (key, required, calculated), their type and their format.
- The 2nd section lists the foreign keys, i.e. the parent table and its fields that are in relation with the current table.

In Geotec, the data entered in the fields of the foreign key must be present in the parent table to be valid.

- The 3rd section lists the primary keys. The fields of the primary keys define each record as unique. The combination of the fields of the primary key cannot be repeated.
- For Oracle, SQL Server and SQLite databases, the check constraints are also listed in a 4th section, and include the uppercase constraints on some values.

To produce the data dictionary of a database:

1. Select **Produce the data dictionary** in the scrolling list of tasks (Figure 6).
2. Select the **database**.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database** section.
 - b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
 - d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of the connected database are shown under the Database field.

3. Click **Execute** in the main window.

When the task is done, the journal is displayed showing the data dictionary.

11. Compare two databases

The user can compare the structure of two databases, for example to know if an update is necessary.

To compare two databases:

1. Select **Compare two databases** in the scrolling list of tasks (Figure 6).
2. Select the **databases 1** and **2**.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database 1** and **2** sections.
 - b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
 - d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.

The name, path, version and language of both connected databases are shown under the Database 1 and 2 fields.

3. Click **Execute** in the main window.

When the task is done, the journal is displayed showing the comparison report.

12. Inventory one or two database(s)

The inventory consists in showing the number of records in each table of one or two databases.

1. Select **Inventory one or two database(s)** in the scrolling list of tasks (Figure 6).
2. Select the 1st **database** to inventory.

- a. The last 10 databases used are available by clicking on the list button in the field of the **Database 1** section.
 - b. To select a Microsoft Access database, click **Open MDB** and select the desired file.
 - c. To select an SQLite database (from Geotab), click **Open DB3** and select the desired file.
 - d. To select an SQL Server or Oracle database, click **Connect to ODBC** (Figure 7) and enter the 3 information.
3. If desired, select a 2nd database to inventory, the same way.

The name, path, version and language of the 1st connected database are shown under the Database 1 field, same thing for the 2nd database if applicable.

4. Click **Execute** in the main window.

When the task is done, the journal is displayed showing the number of records in each table. The difference and the sum of the number of records for each table are also indicated, if two databases are inventoried.

13. Repair / Compact a database

DBM can repair corrupted databases and compact databases to reduce their dimension. This task applies only to Microsoft Access databases.

WARNING: The repair and compaction are done directly in the file. Please create a backup of your file before executing the task.

To repair and compact a database:

1. Select **Repair/Compact a database** in the scrolling list of tasks (Figure 6).
2. Select the **Microsoft Access database** to compact and repair.
 - a. The last 10 databases used are available by clicking on the list button in the field of the **Database** section.
 - b. Click **Open MDB** and select the desired file.

The name, path, version and language of the connected database are shown under the Database field.

3. Click **Execute** in the main window.

When the task is done, the journal is displayed showing the result of the repair and compaction.

14. Edit, Window and Help menus

None of the options of the **Edit**, **Window** and **Help** menus is specific to DBM. The detailed description of these menus is done the X3D guide.