

IB Manager

for InterBase and FireBird



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What is IB Manager?



EMS IB Manager is a high-performance tool for administering InterBase and FireBird. It provides an easy-to-use graphical interface for maintaining databases and database objects, managing table data, building SQL queries, administering users and their privileges, extracting, printing, and searching metadata, etc. IB Manager has a lot of unique features, such as: SP Debugger, Visual Query Builder, Export Data to 14 available formats and Import Data from most popular formats, BLOB Viewer/Editor, SQL Script processor and many more...

Version 3.0 features

New features – new name!

QuickDesk changes its name to IB Manager!

New, modern, and fully customizable user interface!

See Visual Options for details.

MDI Interface implemented

Microsoft Office Style - all program windows are child windows of the main window now

HTML Report Generator

Create a detailed HTML report about your database quickly

New Visual Query Builder

Full support of FB 1.x and IB 6.5 select enhancements

Plan Analyzer

Helping you easily understand the query optimization plans

Multilanguage support

Spanish, Italian and German localizations available, Dutch localization is coming soon

Backup and Restore Templates

Make backup and restore even more quickly

New Compare SQL Scripts Module

Working much better than the previous one

Data Export to PDF and MS Access

Two more popular formats added... and much more!

Other IB Manager features

Easy InterBase/FireBird object management:

- ✓ Creating/Dropping databases
- ✓ Creating/Dropping/Altering tables
- ✓ Creating/Dropping/Altering domains, procedures, triggers, generators, exceptions
- ✓ Creating/Dropping views and functions (UDFs)
- ✓ Support of all field types (including BLOBs)

- ✓ Viewing/Editing data in tables
- ✓ Creating/Dropping constraints and indices
- ✓ Creating/Dropping functions (UDF)
- ✓ Administering users and their privileges

Powerful tools to work with InterBase / FireBird server

Database Explorer featuring:

- ✓ Multiple database connections
- ✓ Registering/Unregistering databases allows work only with the databases required
- ✓ Project View allows combining database object with user items
- ✓ Powerful User Manager and Grant Manager

Easy-to-use wizards performing InterBase / FireBird services:

- ✓ Backup Database
- ✓ Restore Database
- ✓ Database Validation
- ✓ Database Statistics

SQL processing and watching tools, including:

- ✓ Multiple SQL Editors
- ✓ Script Executing (SQL Script)
- ✓ Visual Query Builder *
- ✓ SQL Monitor
- ✓ Powerful metadata printing module with the opportunity of customizing reports (fonts, colors, etc.) *
- ✓ Extracting metadata into text files or SQL Script editor
- ✓ Stored Procedure Debugger

Powerful data manipulation tools, including:

- ✓ Powerful BLOB Viewer/Editor with several types of viewing BLOB data *
- ✓ Export Data to MS Excel, MS Access, RTF (MS Word), HTML, PDF, XML, DBF, TXT, CSV, SYLK, DIF, LaTeX and Windows Clipboard *
- ✓ Import Data from MS Excel, MS Access, DBF, TXT and CSV *

And some other useful features, including:

- ✓ Third-party plugin support
- ✓ Customizable program options: windows, fonts, grid colors, etc
- ✓ Customizable editors: custom colors, fonts etc.
- ✓ Customizable toolbars for all program windows
- ✓ Object Templates
- ✓ Keyboard templates
- ✓ Powerful Visual Options Module
- ✓ Possibility of saving all the program settings
- ✓ Detailed Help System
- ✓ IB Manager Direct

And other useful tools, including TO-DO list for each database, External Tool Manager, etc.

See <http://www.ems-hitech.com/ibmanager/> for more information and latest news.

How to purchase and register IB Manager

For your convenience, we have contracted with RegSoft and ShareIt Companies to process orders you wish to make with your Visa, MasterCard, American Express and Discover. After registering you will receive the registered version within 48 hours by e-mail. Please make sure to include a valid e-mail address with your order.

ShareIt (<http://www.shareit.com>) accepts payments in US Dollars, Euro, Pound Sterlings, Japanese Yens, Australian Dollars, Canadian Dollars or Swiss Franks by Credit Card (Visa, MasterCard/Eurocard, American Express, Diners Club), Bank/Wire Transfer, Check or Cash.

RegSoft (<http://www.regsoft.com>) accepts payments in US Dollars by Credit Card (Visa, MasterCard/Eurocard, American Express, Discover), FAX, Postal Mail, TOLL-Free Phone or Purchase Order.

EMS IB Manager Professional (single license) - **\$195**

Share It! - <https://secure.element5.com/register.html?productid=141947&language=English>
RegSoft.com - <http://www.regsoft.net/purchase.php3?productid=30902>

EMS IB Manager Professional (site license) - **\$1495**

Share It! - <https://secure.element5.com/shareit/checkout.html?productid=143805>
RegSoft.com - <http://www.regsoft.net/purchase.php3?productid=30902&pc=4XD46>

EMS IB Manager Lite (single license) - **\$115**

Share It! - <https://secure.element5.com/register.html?productid=150990&language=English>
RegSoft.com - <http://www.regsoft.net/purchase.php3?productid=41065>

EMS IB Manager Lite (site license) - **\$895**

Share It! - <https://secure.element5.com/shareit/checkout.html?productid=150991>
RegSoft.com - <http://www.regsoft.net/purchase.php3?productid=53365&pc=F0505>

Other EMS Hitech Software



EMS MySQL Manager (<http://www.mysqlmanager.com>) provides powerful tools for MySQL Server administration and object management. Its Graphical User Interface (GUI) allows you to create/edit all MySQL database objects in a simple and direct way, run SQL scripts, manage users and administer user privileges, visually build SQL queries, extract, print, and search metadata, export/import data, view/edit BLOBs, and supplies many more services that will make your work with the MySQL server as easy as it can be...



EMS PostgreSQL Manager (<http://www.mysqlmanager.com>) is a powerful graphical tool for PostgreSQL administration and development. It makes creating and editing PostgreSQL database objects easy and fast, and allows you to run SQL scripts,

manage users and their privileges, build SQL queries visually, extract, print and search metadata, export data to 14 available formats and import them from most popular formats, view and edit BLOB fields, and many more...



EMS MySQL Utils (<http://www.mysqlutils.com>) are powerful data management utilities for MySQL Server, which make your work with the server much easier and faster. Currently MySQL Utils include MySQL Export - a powerful tool for MySQL data export, and MySQL Import - an utility for quick importing data to MySQL tables.



EMS PostgreSQL Utils (<http://www.pgsqlutils.com>) are powerful data management utilities for PostgreSQL Server, which make your work with the server much easier and faster. Currently PostgreSQL Utils include PostgreSQL Export - a powerful tool for PostgreSQL data export, and PostgreSQL Import - an utility for quick importing data to PostgreSQL tables.



EMS QuickExport Component Suite (<http://www.ems-hitech.com/quickexport>) is a set of native Delphi/C++Builder components for exporting your data to 12 most popular formats (MS Excel, MS Word (RTF), HTML, XML, TXT, CSV, SYLK, DIF, LaTeX, SQL and Windows Clipboard) for future viewing, modification, printing or web publication. There will be no need to spend your time for a tiresome data conversion - EMS QuickExport will do this task quickly and will give the result in the desired format.



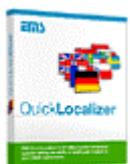
EMS QueryBuilder (<http://www.ems-hitech.com/querybuilder>) is powerful component intended for visual building SQL statement for SELECT clause. It enables you to use visual query building or representing the existing statements in your project on Delphi. The component can work with different databases (not only through BDE). It simplifies writing a large and complicated statement and allow making up SQL statement without knowledge of the SQL syntax.



EMS QuickImport Component Suite (<http://www.ems-hitech.com/quickimport>) allows you to import your data to the database from files in the most popular data formats. There will be no need to spend your time for a tiresome data conversion - **EMS QuickImport** will do this task quickly, irrespective of the source data format.



EMS ExcelReport (<http://www.ems-hitech.com/excelreport>) component is a powerful band-oriented generator of template-based reports in MS Excel. Easy-to-use component property editors allow you to create powerful reports in MS Excel quickly, easily and intuitively understandable. Now you can easily create reports, which can be edited, saved to file and viewed almost on any computer. ExcelReport supports Borland Delphi 5, 6, 7, and MS Office 97 SR-1, 2000, 2002 (XP).



EMS QuickLocalizer (<http://www.ems-hitech.com/quicklocal>) is an indispensable component suite for adding the ability of multilingual support to your Delphi applications. Using powerful component editors of this suite you can easily and quickly localize the properties of your project components within each form, generate the template of language file containing current values of component properties, manage the localization files, specify the components and properties to be localized and choose other localization options.

CHAPTER 1

GETTING STARTED

What do you need to start working with IB Manager

EMS IB Manager is developed for working with the InterBase Server, so first of all you need to have an InterBase client on your computer and you should have access to some local or remote InterBase server to work with IB Manager.

What is InterBase?

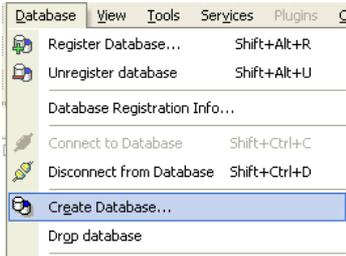
InterBase is an open source relational database that runs on Linux, Windows, and a variety of UNIX platforms. It is the same commercial database that Motorola, Nokia, Boeing, and the Boston Stock Exchange have used for many years. InterBase offers excellent concurrency, high performance, and powerful language support for stored procedures and triggers.

You can download the latest commercial version of InterBase from <http://www.interbase.com> or freely distributable InterBase 6.0 version from <http://mers.com>.

Also you can download the latest version of FireBird – the non-commercial relational database management system based on the InterBase open source code - from <http://www.ibphoenix.com>. Note, that though IB Manager is Windows-only program, InterBase/FireBird server can be installed at any platform.

Besides you need your computer to meet the minimal system requirements, i.e. Pentium 166 and 32 MB RAM.

Creating Database

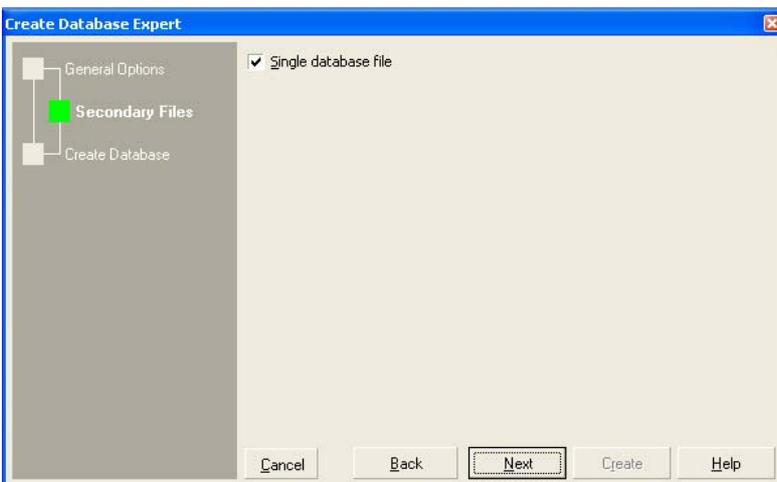


If you have no database on local or remote server, you can create new database right from IB Manager. To do this click button **Create Database** on the control panel or choose the menu item **Database | Create Database**.

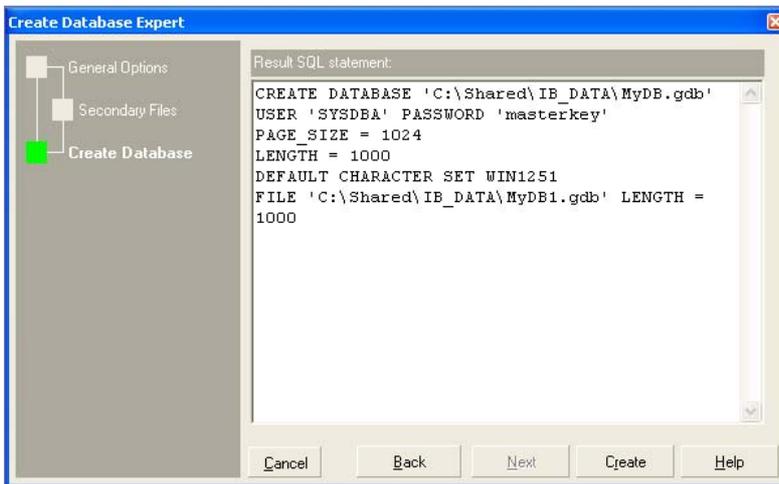
Below you see the first page of the **Create Database Expert** – ‘General Options’.



Set the full filename of the new database, user name and password, page size in bytes and the charset of the database characters (this parameter is used in connecting the database). Checkbox ‘Register after creating’ indicates that the **Register Database Dialog** will appear after the **Create Database Expert** finishes its work (uncheck it if you want to register the database later). Select the SQL Dialect (Dialect1 or Dialect3) and click ‘Next’.



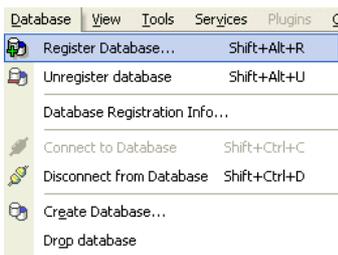
The checkbox ‘Single database file’ indicates that the database will be stored in one single file (default checked). If you want to store your database in multiple files, uncheck this option and set the names of the secondary files. Otherwise just skip this step and click ‘Next’.



Above is the result SQL statement for creating the new database. You can't edit it, but you click 'Back', return to the appropriate step and make the required changes.

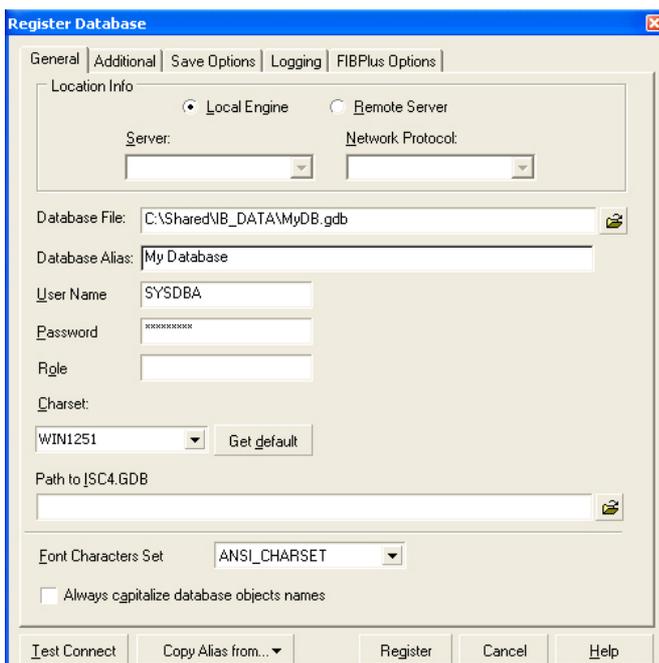
When you are done, click 'Create' to start compilation.

Registering and Connecting to Database



To make the database you created or an already existing database available for working in IB Manager, you should register it. If you created this database in IB Manager, and 'Register after creating' was checked, then the **Register database** window is displayed automatically, otherwise you should click button **Register Database** on the control panel or choose the menu item **Database | Register Database**.

Here is the 'General' tab of the **Register Database** window.



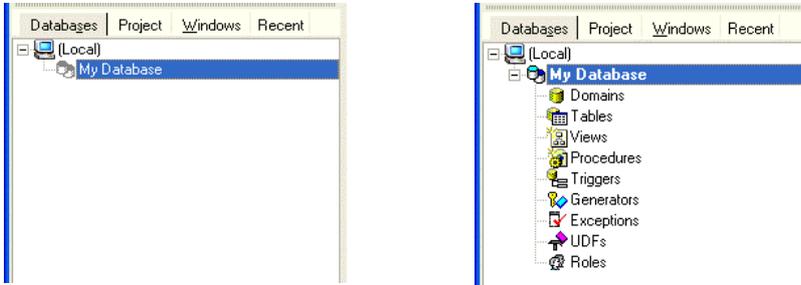
If the database is located on your computer then choose **Local Engine** on the 'Location Info' panel. Otherwise choose **Remote Server** and set the server name and the network protocol.

Set the database filename and its alias (choose any alias that suits you, e.g. 'My Database'); enter your user name, password and role (optional). Set the database charset (this parameter is used in connecting to the database). If you are going to work with users and their rights, you should set the path to the ISC4.gdb file, which contains the list of users, passwords and rights.

On the other tabs of the **Register Database** window you can set various database options and customize your work with the database.

When you are done, click 'Register'.

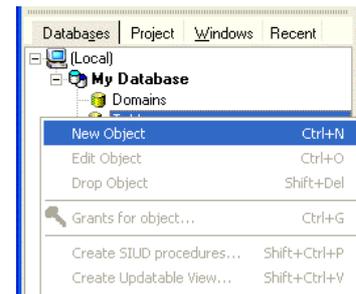
After the database is created and registered, its icon will appear in the **DB Explorer** window, on the 'Databases' tab (below left). Now to start working with the database, you should connect to it. Just double-click the database alias in the **DB Explorer** or click button 'Connect to Database'  to start connecting. If connection is successful, the 'Databases' tab of the **DB Explorer** changes its appearance in the following way (below right):



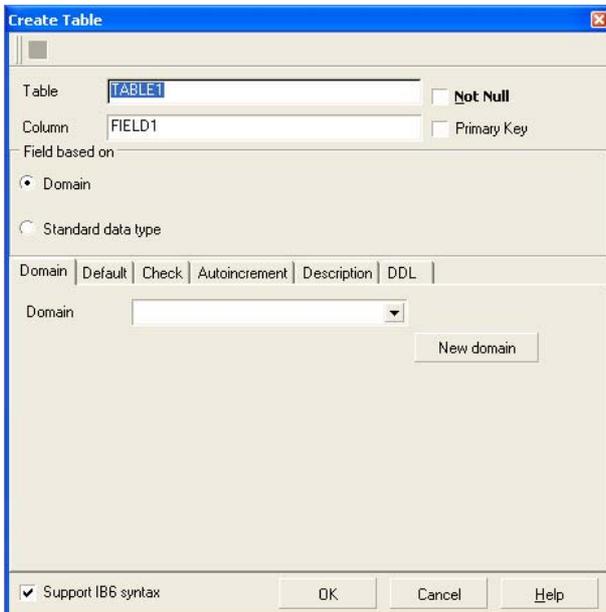
The database objects are visible now in the database tree and arranged by type ('Domains', 'Tables', 'Views', etc.). If the database was just created, these lists will be empty.

Creating Table

To create a table, select the 'Tables' branch in the database tree on the 'Databases' tab of the **DB Explorer**, right-click and choose item 'New object' from the popup menu.

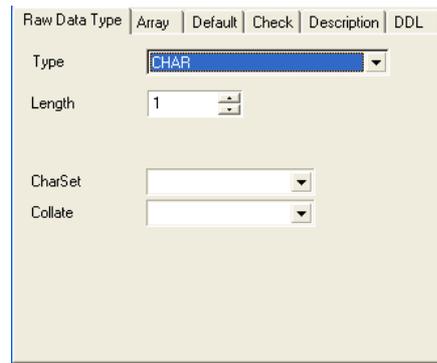
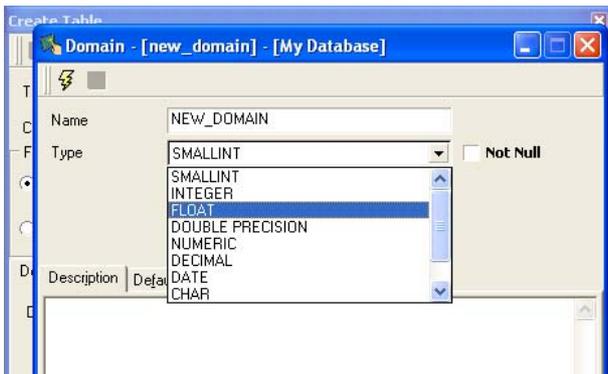


The **Create Table** dialog window will appear.



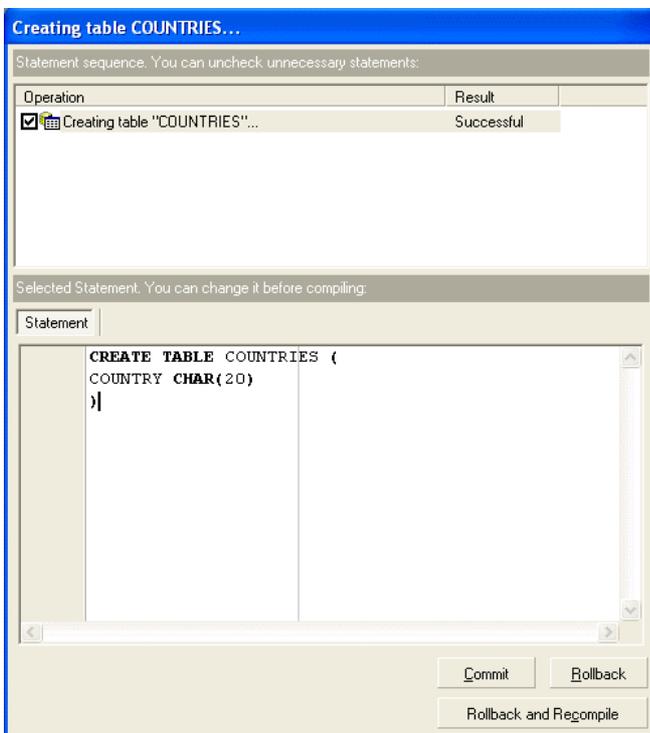
Set the table name in the 'Table' edit field and set the name of the first table field in the 'Column' edit field. To prohibit the NULL values for this field, check 'Not null', to create a primary key for this field, check 'Primary key'. Choose, whether the field is based on the domain or standard data type. In the first case you can choose the domain in the 'Domains' tab or click button 'New domain' and create new domain in the **Domain Editor**.

Set the domain name, choose data type for the domain and click button 'Compile'  to create the domain.



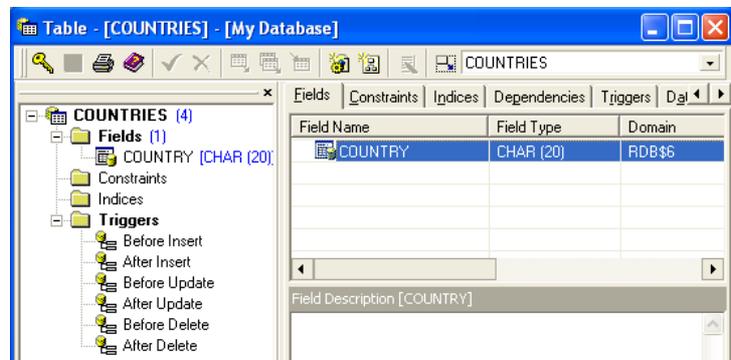
If you choose 'Standard data type', then just select data type on the 'Raw Data Type' tab. For some of the types additional parameters should be set, e.g. length, charset and collate for CHAR data type.

Click 'OK' when done. The **Compile Window** will appear.



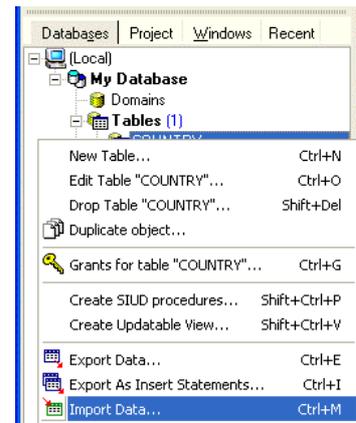
In the upper part of it you see the list of operations and compilation results for these operations (in our case there will be only one operation – 'Creating table "<Table_Name>"...') and, if everything was correct, the result of its compilation will be 'Successful'; in the lower part you see the SQL statement for the selected operation, which can be edited, if necessary. Click 'Commit' to confirm creating the table, click 'Rollback' to cancel creating, or click 'Rollback and Recompile' to recompile the edited SQL statement.

The created table will appear in the database tree on the 'Databases' tab of the **DB Explorer** and it will be opened in the **Table Editor**, so you can start working with it: create new fields, constraints, indices and triggers, edit table data, import and export data and so on.

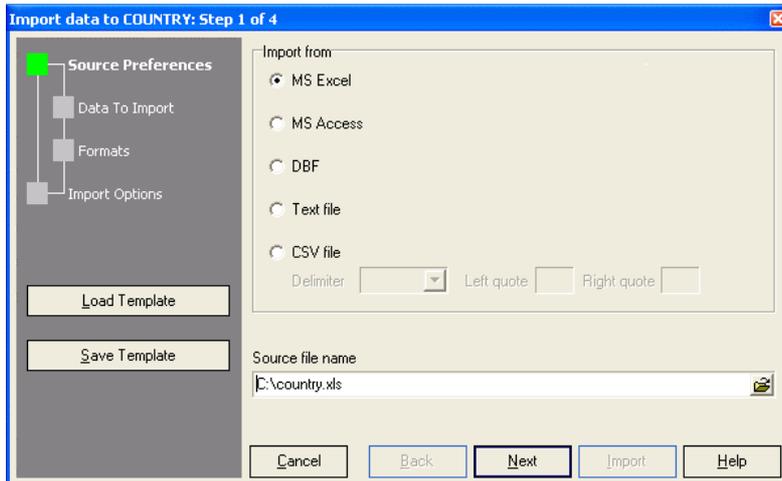


Importing Data

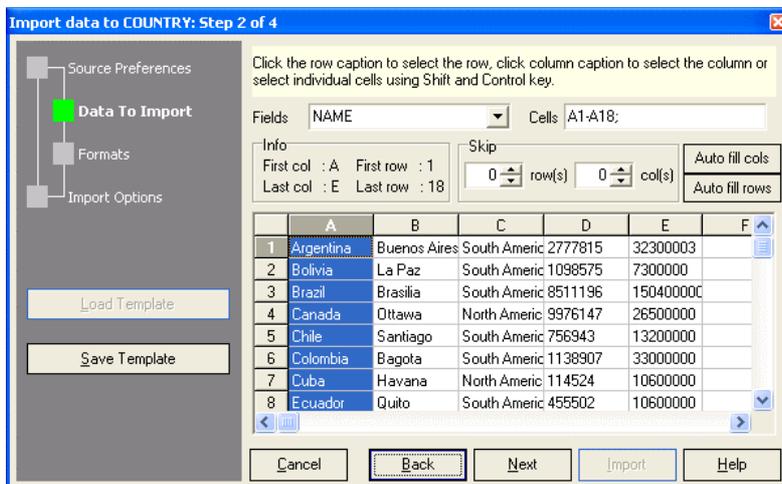
To import data to the table from the MS Excel, DBF, TXT or CSV file, select the table in the **DB Explorer**, right-click and choose item 'Import Data' from the popup menu.



Then follow the instructions of the **Import Data Wizard**.

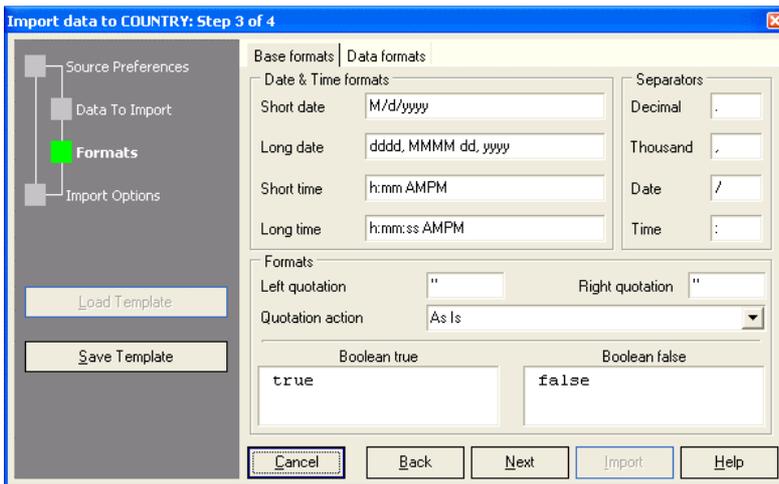


First select the type of the source file and set the filename in the 'Source Filename' edit field. Then set the correspondence between the source table columns and the database table fields.



E.g. for MS Excel, select the table field from the 'Fields' list, then select the corresponding source table cells or type the range manually. Repeat this for each database table field.

On the 'Base formats' tab of Step 2 (below left) you can set such options as: decimal and thousand separators, date formats, quotation marks and actions and Boolean representation. Also you can define different data formats for the database table fields on the 'Data formats' tab.



On the last step (above right) you can change the import options: commit options (choose how often the COMMIT statement should be inserted), record options (default all records imported) and log options (enabling and showing the error log).

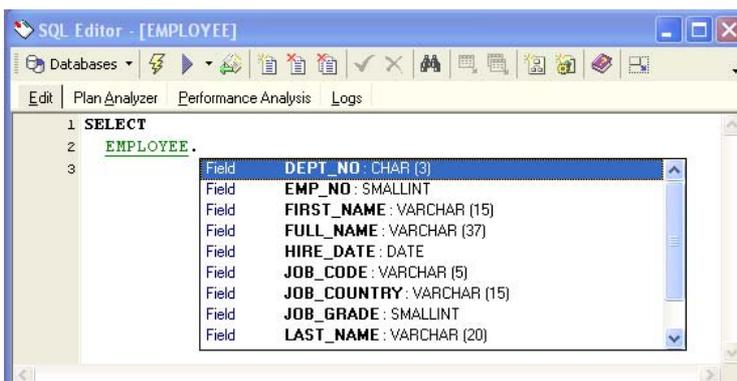
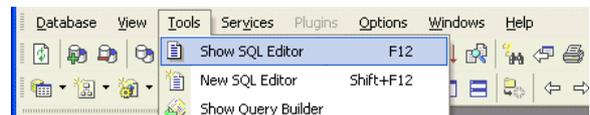
When you are done, click 'Execute' to start import.

Building Query

In IB Manager you can build and execute query either in **SQL Editor** by writing and compiling SQL code, or visually, using **Visual Query Builder**.

Building query in SQL Editor

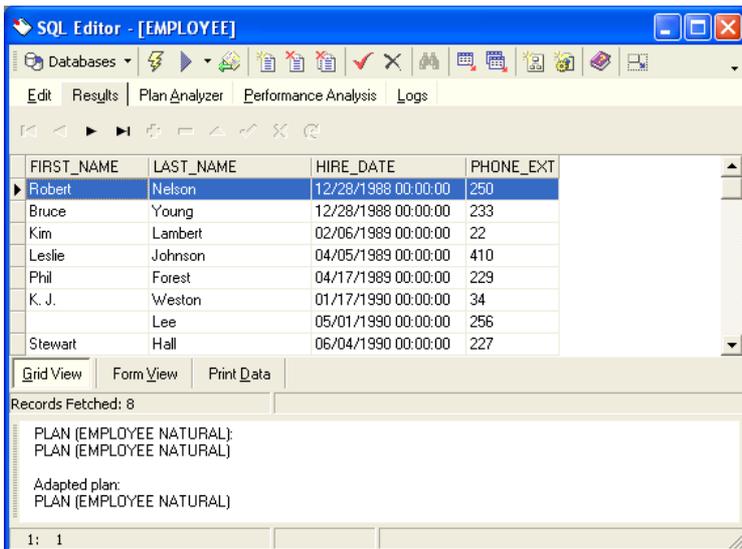
To run **SQL Editor**, click button **SQL Editor** on the control panel or choose the menu item **Tools | SQL Editor**.



Type in the SQL code for the query in the 'Edit' area. The IBM Manager **Quick Code** (analogue of the Code Insight in Delphi IDE) will help you to make this process fast and to avoid the misprints.

After you finish writing the code, press **Ctrl+F9** or click button 'Prepare Query'  on the toolbar to compile the query. If there are any errors in code, then the incorrect line will be selected and the

message error will appear in the bottom window. If everything is correct, then the query will be successfully compiled and ready for execution, and the query plan will be displayed at the bottom window:



To execute the query press F9 or click button 'Execute' on the toolbar. The 'Results' tab will be activated, where you can view the results of the query.

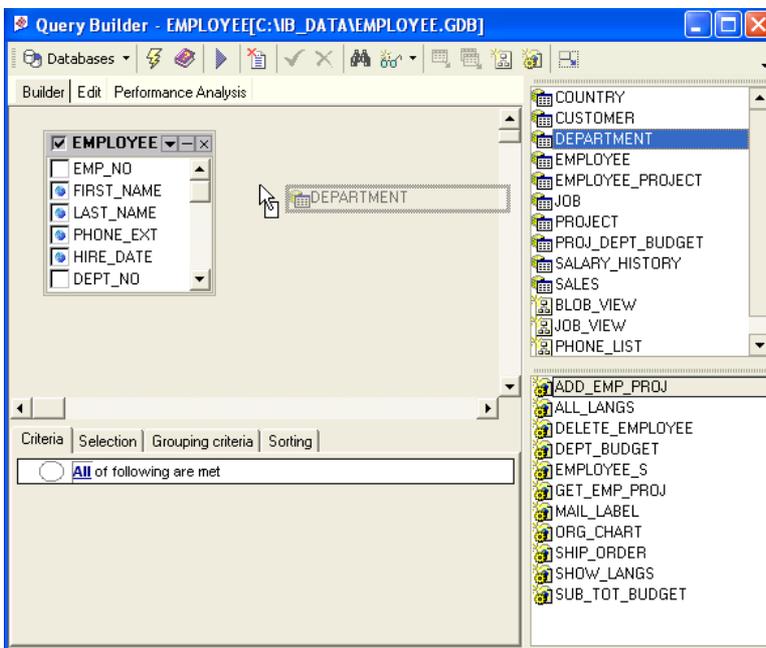
These data can be exported or printed.

Building query in Visual Query Builder



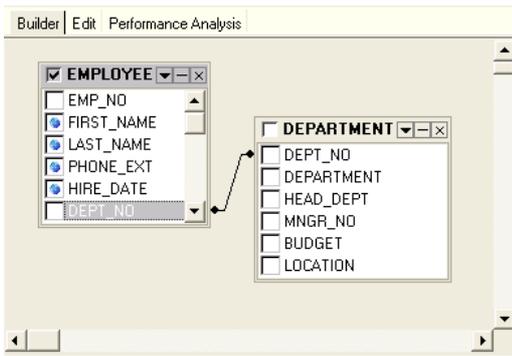
To run Visual Query Builder click button **Query Builder** on the control panel or choose the menu item **Tools | Query Builder**.

Build your query on the 'Builder' tab.



Drag the table from the table list (at the right) to the 'Builder' area or double-click the table. The table will appear on the **Builder** area with the list of its fields. Check the fields (click the check-box at the left of the field name or double-click the field) to include them into the query.

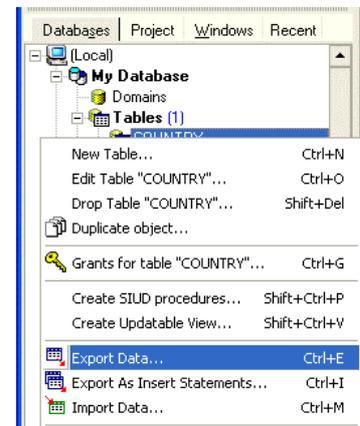
If you want to link the fields in two tables, place another table on the 'Builder' area and drag one field to another to set the link between them.



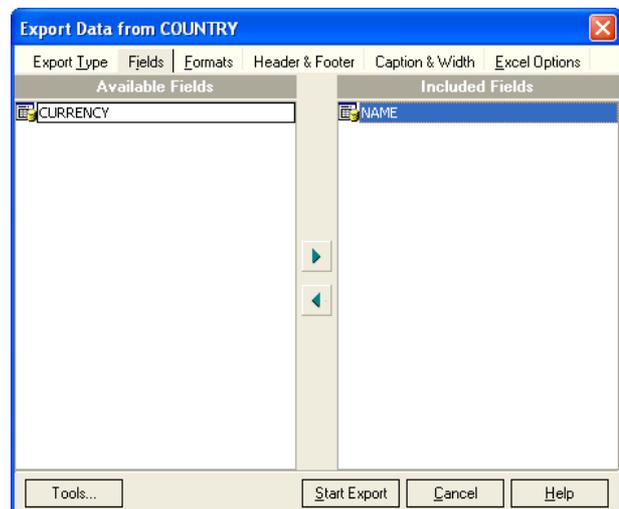
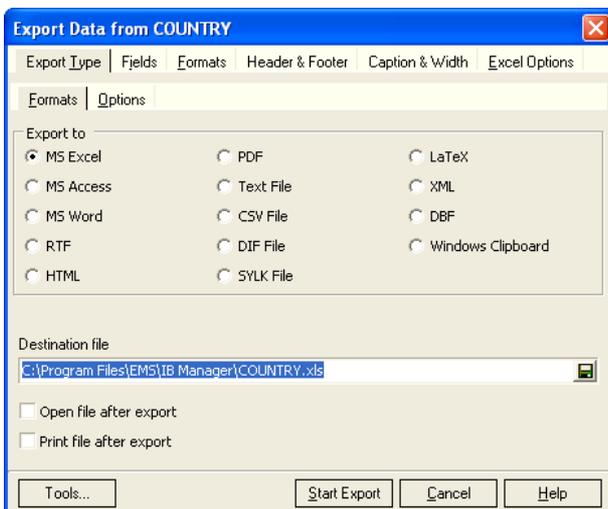
Now press Ctrl+F9 or click button 'Compile' ⚡ on the toolbar to compile the query or press F9 or click button 'Execute' ▶ on the toolbar to execute the query and view its results in the 'Results' area.

Exporting Data

You can export data from table, view or query result to any of 12 available formats (MS Excel, MS Word, RTF, HTML, TXT and more). To call for **Export Data Dialog**, select the table in the **DB Explorer**, right-click and choose item 'Export Data' from the popup menu or open the 'Data' (or 'Results') tab of the **Table Editor (View Editor, SQL Editor or Query Builder)**, click button 'Export Data' 📄 on the toolbar or right-click and choose item 'Export Data'.

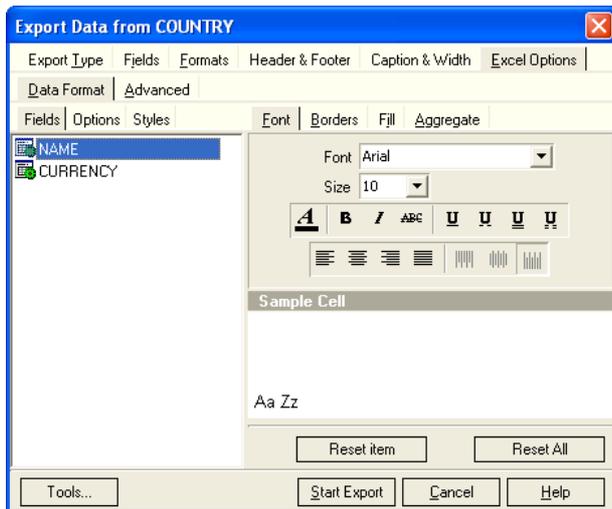


On the 'Export Type' tab (below left) choose the file type to export data to and set the filename in the 'Destination file' edit field. Check 'Open file after export' to open the result file in the appropriate program right after export. Then select the fields to export on the 'Fields' tab (below right) by moving them from the 'Available Fields' list to the 'Included Fields'.



To move the field from one list to another double-click it or select it (use *Ctrl* or *Shift* to select multiple fields) and click button > or <. To move all the fields click button >> or <<.

Set the format options on the 'Formats' tab, set column captions for the result table on the 'Captions' tab and set the options for the definite file type if necessary (e.g. 'Excel Options').



When you are done click 'Start Export' to start export.

If 'Open file after export' was checked, the result file will be opened in the appropriate program.

FAQ

Please read this page attentively if you have questions about EMS IB Manager.

Q: I am a registered user of EMS QuickDesk. How can I upgrade to a new version of IB Manager?

A: According to our **Upgrade Policy** (<http://www.ems-hitech.support.ems.ru/license-pol.phtml>) you can make upgrade from version 2.XX to version 3.01 for half a price. If you are a registered user of the 2.XX version you have to pay only 50 percent of the announced price to buy the version 3.01.

After you upgrade to version 3.01 you will receive all the IB Manager upgrades labeled 3.01 up to 3.99 as they are released for free.

Q: How can I register EMS IB Manager?

A: All the information about purchasing EMS IB Manager can be found at <http://www.ems-hitech.com/ibmanager/purchase.phtml>.

Q: Where can I download a trial version of EMS IB Manager?

A: You can always download the latest version of EMS IB Manager at <http://www.ems-hitech.com/ibmanager/download.phtml>.

Q: How does the trial version of EMS IB Manager differ from the registered version?

A: The trial version of EMS IB Manager is fully functional. You can use it for evaluation purposes for a period of 30 days following the initial installation.

Q: What benefits shall I acquire if I register EMS IB Manager?

A: As a registered user you will have a right to obtain a technical support, to receive information about all the product updates and to have free in-line upgrades and full version upgrades for half a price. Also your suggestions will be taken into consideration in developing the new versions of IB Manager. And at last we will thank you very much for your help in developing the product.

Q: What is the difference between Professional and Lite editions of IB Manager?

A: EMS IB Manager Lite Edition is just the same powerful tool for InterBase/FireBird Server administration and database management but it is inexpensive and a bit less functional. IB Manager Lite does not support the following features available in Professional Edition:

Stored Procedure Debugger;
BLOB Viewer/Editor;
Export Data Dialog;
Import Data Wizard;
Visual Query Builder;
Visual Database Designer;
Print Metadata;
To-Do-List;
Third-Party Plugin Support.

Thus if are sure that you will not ever need these features you can save \$80 and purchase Lite Edition, otherwise you better buy the fully functional edition of IB Manager.

Q: What is the difference between single and site licenses of IB Manager?

A: If you buy a single license of IB Manager you will get only one registered copy of the product without a right of giving it to anyone else. If you buy a site license then you will be able to make copies and give them to as many people as you want, but within the only one organization. Buying a site license is reasonable if you need to supply with our software all your company stuff or some company department stuff. In such case you can buy a site license instead of buying single licenses for each person and save a bunch of money.

Q: What discounts can I get buying EMS IB Manager?

A: You can get significant discounts if you simultaneously purchase several copies of IB Manager. Each additional copy will be cheaper than the previous.

If you are a representative of some academic institution and you want to use IB Manager for educational purposes then you can buy an Academic License that is much cheaper than the standard license. See our License page (<http://www.ems-hitech.com/license-pol>) for details or send us a written request at ibmanager@ems-hitech.com.

Q: What do I need to start working with EMS IB Manager?

A: First of all you must have an InterBase/FireBird Client installed on your computer and you must be connected to some local or remote InterBase/FireBird server to work with IB Manager. You can download client and server from MER Systems Inc, <http://mers.com>. The direct URL is http://mers.com/ib_wi_os_tIB6_0_1_6.exe (download is free). Just execute this file and you will have InterBase/FireBird client and server installed on your computer.

Besides you need your computer to satisfy the system requirements of IB Manager. IB Manager runs on Windows 95/98/Me/NT4/2000/XP and Pentium 166, 32 Mb RAM is recommended.

Q: I need to work with several servers, located on different computers, is single license OK?

A: If you work with these servers from one single computer, then a single license is OK. But if you have several clients installed on different computers, you have to buy a license for each client or buy a site license.

Q: How can I import data to the table?

A: To import data to the table open the proper table from the DB Explorer. Open the 'Data' tab in the Table Editor and click the button 'Import Data' on the control panel or choose 'Import Data' from the popup menu. Then follow the instructions of the Import Data Wizard.

Q: How can I export data from the table (view)?

A: To export data from the table (view) open the proper table (view) from the DB Explorer. Open the 'Data' tab in the Table Editor (View Editor) and click the button 'Export Data' on the control panel or choose 'Export Data' from the popup menu. Then fill in the forms of the Export Data Dialog.

Q: How can I edit create/edit my BLOB fields?

A: To create/edit a BLOB field, open the proper table from the DB Explorer. Open the 'Data' tab in the Table Editor and click the button 'BLOB Editor' on the control panel or right-click on the BLOB-field column in the grid and choose 'Edit BLOB' from the popup menu. Now you can create/edit BLOB fields in the BLOB Viewer/Editor window.

Q: I can't modify DDL. Why?

A: The 'DDL' tab of all the object editors is read-only. It displays the SQL text of the operations you carry over the table on the tabs 'Fields', 'Indices', etc. To modify this text you can copy it to the clipboard and modify it using SQL Script Editor.

Q: Is registered copy of EMS IB Manager is locked to the definite computer?

A: No, we do not lock registered copies of our products to user's hardware ID, so if you change your hardware it will not cause any problems with using your registered copy of IB Manager.

If you still have any questions, write us to ibmanager@ems-hitech.com.

CHAPTER 2

DATABASE MANAGEMENT

Basic Database Operations

Create Database

To create a new database, click button **Create Database**  on the control panel or choose the menu item **Database | Create Database**. This will activate the **Create Database Expert** window, which will help you to set the parameters of the new database.

Drop Database

You can drop a database if it is registered. To drop the database, select it in the **DB Explorer**, and then choose the menu item **Database | Drop Database**. The database file will be deleted.

Register Database

Register Database dialog window is called automatically after creating the database, if option **Register After Creating** was checked. You can also activate this window by clicking button **Register Database**  on the control panel (or **DB Explorer** panel) or choosing the menu item **Database | Register Database**.

Unregister Database

To unregister the database, click button **Unregister Database**  on the control panel (or **DB Explorer** panel) or choose the menu item **Database | Unregister Database**.

Connect to Database

You can set connection with database if it is registered.

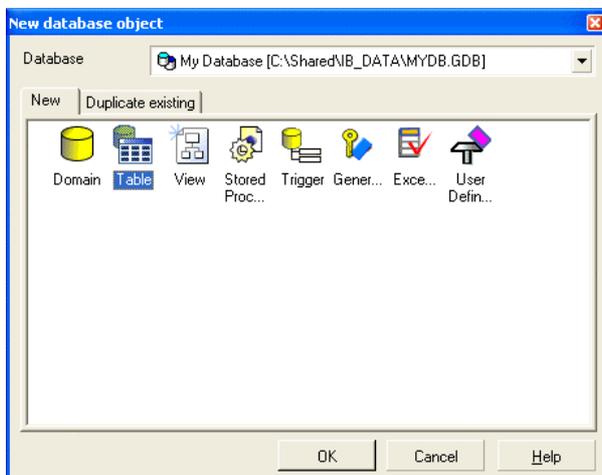
To connect to the database, select its alias in the **DB Explorer** window, then either double-click it or click button **Connect to Database**  on the control panel (or **DB Explorer** panel), or choose the menu item **Database | Connect to Database**.

After that you will be prompted for username and password, and if they are OK, then the connection with the database will be set.

Disconnect from Database

To disconnect from the database, select its alias in the **DB Explorer** window, then click button **Disconnect from Database**  on the control panel (or **DB Explorer** panel), or choose the menu item **Database | Disconnect from Database**.

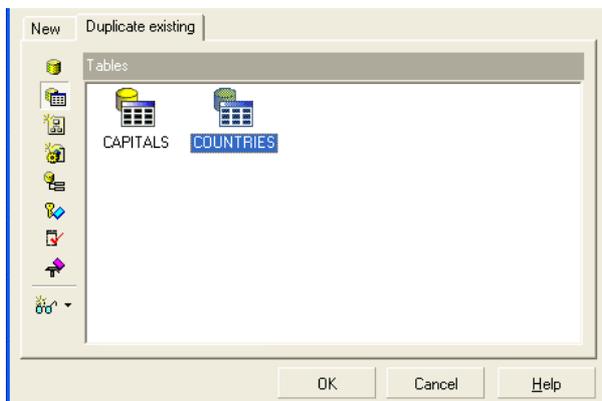
Create Database Object



To create a new object, select the required object group in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then choose the database and the object type in the **New Database Object** dialog window.

Then the proper editor window will be activated (see chapter **Object Editors** for details). Set the necessary object parameters, then click button **Compile**  to start creating the new object (or set the table name and the first table field properties, then click 'OK' in the **Create Table Dialog**). The

Compile Window will appear where you will be able to view and edit the result SQL statement for creating the new database object. Commit the transaction, and if it is successful, the new object with the parameters you set will be created.



You can also create a new object with the same parameters as one of the existing objects has. Select the object in the **DB Explorer**, right-click and choose **Duplicate Object** from the popup menu or choose the menu item **Database | Duplicate Object** and then choose the database and the object to duplicate in the **New Database Object** dialog window.

Button  allows you to change the view mode ('Large Icons', 'Small Icons', 'List' or 'Details').

Edit Database Object

To edit the existing database object, select the required object in the **DB Explorer** window, right-click and choose **Edit Object <Object_Name>**. Edit the object parameters in the proper editor window (see chapter **Object Editors** for details), then click button **Compile** .

Window will appear, where you will be able to view and edit the result SQL statement for changing the object parameters. Commit the transaction, and if it is successful, the database object parameters will be changed.

Note: **Table Editor** is activated in the same way, but it works not like other object editors.

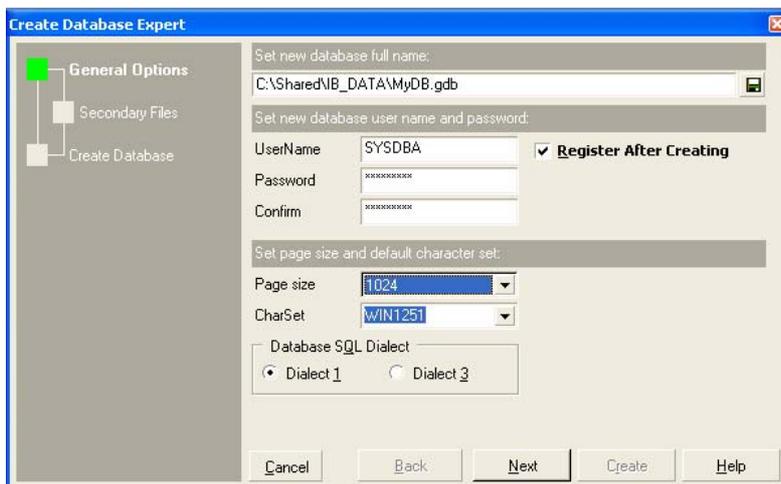
Drop Database Object

To drop the database object, select the required object in the **DB Explorer** window, right-click and choose **Drop Object <Object_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the object will be dropped.

Create Database Expert

The process of creating the database consists of three steps.

General Options



Fill in the edit fields:

Set new database full name – set the full name of the new database, including server access protocol and full name of database file. E.g. if you use protocol TCP/IP to access server "myserver" and you want to create database "mydatabase" in folder "bases" on disc C, you should fill this edit field this way: myserver:c:\bases\mydatabase.gdb. If you use protocol NetBEUI, then myserver\c:\bases\mydatabase.gdb.

User Name – set the name, by which you are registered on the server.

Password – set the password for connecting the database server.

Confirm - type the password again to avoid misprints.

Page Size – set the database page size in bytes.

Charset – set the coding of symbols for the database. This parameter is used when connecting to the database.

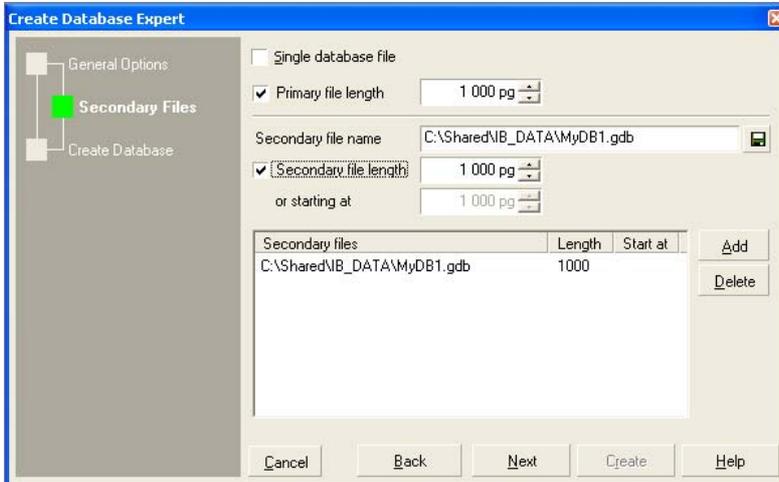
Database SQL Dialect - choose Dialect1 or Dialect 3.

To register the new database right after creating, check **Register After Creating** (default checked). Click 'Next' to continue.

Secondary files

If you want your database to be stored only in one file, check **Single Database File** (default checked).

To set secondary files uncheck **Single Database File**.



Now you can edit the secondary file parameters, such as:

Primary file length - set the primary file length in page.

Secondary file name - set the full name of the secondary file. Type the file name in the edit field and click 'Add'. The secondary file will be added to the list. To delete the secondary file from the list, select it in the list and click 'Delete'.

Secondary file - set the secondary file length in pages or

Starting at - set the number of pages to start the new file.

Click 'Next' to continue.

Create Database

In the field **Result SQL Statement** you will see SQL-text, creating new database with the parameters you set. If you want to change something before creating the database, edit the generated SQL-text or return to the needed step and change the parameters within the expert. To cancel creating database, click 'Cancel'.

When you are done, click 'Create'. If all the parameters were set correctly, new database will be created. If 'Register After Creating' was checked IB Manager will start to register the created database.

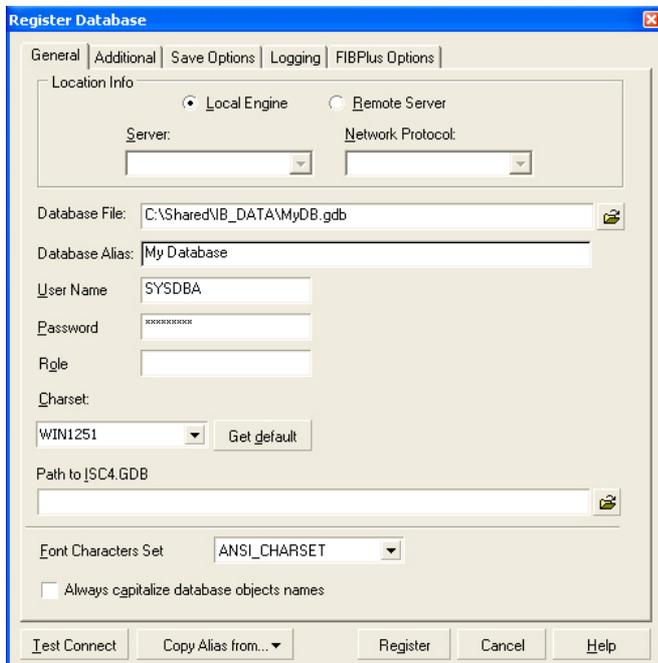
Register Database Dialog

Register Database Dialog allows you to set the database registration parameters and various database options.

These parameters and options are divided into the following categories:

General

Location Info – the location of server, containing the database you are registering. If it is a local drive, choose Local Engine. If it is remote computer, choose Remote Server and set server and a net protocol. (*Hint: you can register database located on your computer in IB Manager by double-clicking the database file in Windows Explorer. This will automatically run IB Manager and open this dialog window.*)



Database File – set the full database file name.

Database Alias - type here any proper database alias (e.g. Customers or My Test Database). This alias will be displayed in the **DB Explorer** window.

User Name – enter the name, by which you are registered on server.

Password – enter the password for connecting to the database server.

Role – enter your InterBase role to connect to the database.

Charset – set the coding of symbols for the database. This parameter is used when connecting to the database and, as a rule, should correspond to the character set, used on creating the database.

Path to isc4.gdb – set the path to the database file, which contains the lists of users, their

passwords and rights. This parameter is not obligatory, but if you are going to work with rights and users, it must be set.

Font Characters Set – set the coding of symbols for the visual IB Manager elements: data grids, editors etc.

Always Capitalize database object names - if this option checked, IB Manager automatically capitalizes all database object names. Recommended for working with InterBase 5.x.

Additional

DB Explorer

Show Table Subobjects - if this option is checked, additional branches with indices and triggers concerning the given table will be created in the **DB Explorer** tree for each table. Using this option increases time of loading and updating **DB Explorer** a bit.

Show System Tables - if this option is checked, systems tables will also be shown in **DB Explorer** tree.

Show System Generated Domains - if this option is checked, the domain list in the **DB Explorer** will also include system domains, i.e. the domains, which names start with 'RDB\$'.

Show System Generated Triggers - if this option is checked, the trigger list in the **DB Explorer** will also contain system triggers created automatically by IB for the realization of 'CHECK VALUE...' restrictions.

SQL Editor

Show System Tables into Performance Analysis - if this option is checked, the information of the system table queries will be displayed on the 'Performance Analysis' page of the **Table Editor**.

InterBase 6.0/FireBird options

Support InterBase 6.0 features - if this option is checked, the InterBase 6.0/FireBird opportunities are supported, e.g. database objects are modified by new SQL commands, not by direct modifying of DB system tables. If you have InterBase 5.x or earlier version installed, uncheck this option.

Do not use Services API (backup, security and so on) - if this option is checked, API services are not used.

Quote identifiers if they are reserved words – if this option is checked, then the quotation marks will be added automatically to all the identifiers, spelled as InterBase reserved words.

Allow editing of triggers for System Tables - if this option is checked, you may edit triggers for System Tables.

Save Options

SQL Save Options - a directory to store the **SQL Editor** data.

Enable Quick Save every <...> minutes - if this option is checked, SQL Editor content will be saved automatically by the time specified in this option.

Extract Metadata Default Directory - a directory to store the extracted metadata. Used by the **Extract Metadata Expert**.

Directory of Grant Templates - a directory to store the templates of access grants.

Default Directory for Export Data - a default directory for exporting data. Used by the **Export Data Dialog**.

Logging

Metadata Changes

Enable Logging Metadata Changes - if this option is checked, you should set the metadata log-file name, where information about changing metadata will be stored.

Metadata Log File - full metadata log-file name.

SQL Editor

Enable Logging SQL Editor - if this option is checked, the event journal for SQL Editor is kept.

SQL Editor Log File - full SQL Editor log-file name.

FIBPlus Options

Enable boolean fields support - if this option is checked, boolean fields are supported.

Set required fields in grid - if this option is checked, then you should set values for all NOT NULL table fields.

Set calculated fields as read-only - if this option is checked, you will not be able to change the calculated field values.

Get default values for fields - if this option is checked, IB Manager will automatically get the default field values from the database server.

Get record count beforehand - if this option is checked, IB Manager will automatically calculate the number of records in table or query. The according information will be displayed in the status bar.

Trim Char Fields in Grids - if this option is checked, the final spaces in fields of the CHAR type will be trimmed during the editing process.

Auto Commit Transactions - if this option is checked, IB Manager will automatically commit transactions, otherwise you will have to do it manually.

Protected Edit (block record while editing) - if this option is checked, IB Manager blocks the record you are editing so that other users can't edit this record. This helps to avoid conflicts of collective access to the database.

Click 'Test Connect' to test the connection with database. If the connection is successful, message 'Connected!' will appear, otherwise - an error message.

You can copy the registration parameters from an already registered database. Click 'Copy Alias From' and choose the alias from the drop-down database list. The registration parameters will be automatically set as in the chosen database.

When you are done, click 'Register' and the database will be registered.

In the **DB Explorer** window, on 'Databases' tab you will see a new branch with the alias of the registered database. You can view a short list of the registration parameters, aiming to it with the cursor.

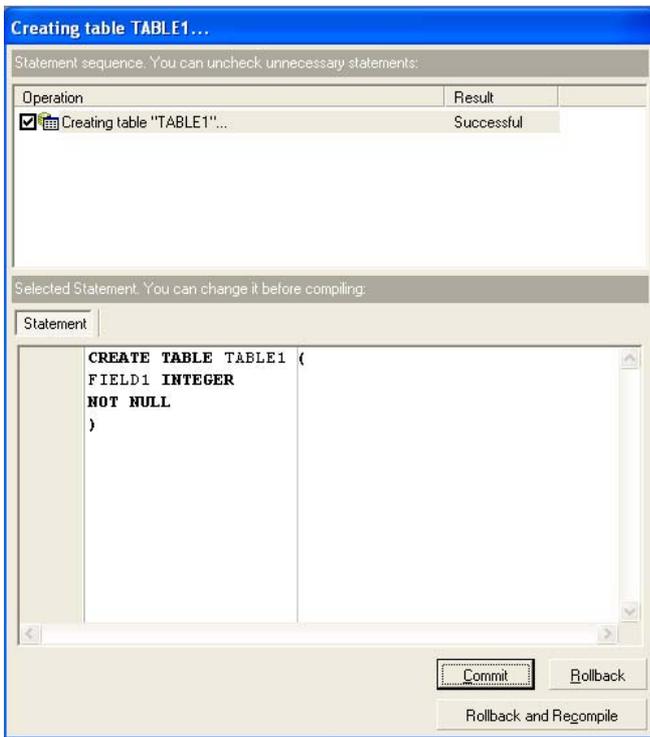
Compile Window

IB Manager compilation window is performed for step-by-step control of executing transactions, tracing the errors and editing SQL statements during their compilation.

The compilation window appears any time the transaction is executed, both when the compilation is successful and when there were errors in compilation. If you want this window to appear only in case of error, choose **Options | Environment Options** and uncheck option **Confirm successful compilation** (default checked) on the **Preferences** page.

Window title contains information about the operation executed, e.g. 'Creating table TABLE1...!'

Statement Sequence - this area displays a list of operations, executed within the current transaction. For each operation the proper statement and the compilation result are displayed: 'Successful' in case of successful compilation or 'Error' in case of error. You can uncheck some statements so that they would not be included into the final transaction compilation. *Note! Some statements are necessary for successful executing the transaction and unchecking them may cause an error.*



Selected Statement - if the 'Statement' button is dropped, in this area you can view and edit SQL text, corresponding to the selected statement. In case of error in compilation the 'Error' button also becomes available, by clicking which you can view the compilation error description.

The 'Rollback' button allows you to return to the previous stage (editor window or **DB Explorer**).

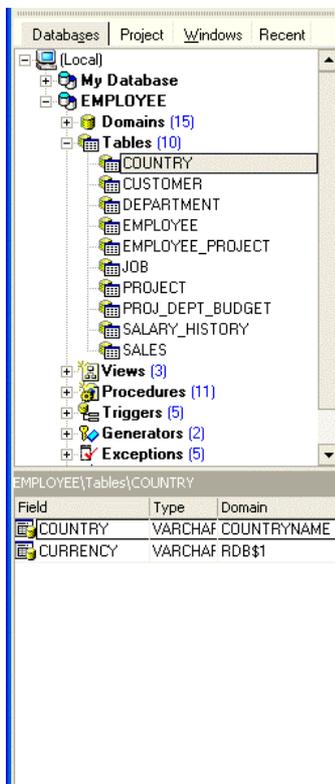
'Rollback and Recompile' calls for recompilation with the changes you made in the **Statement Sequence** list and in the SQL text of the statements.

The 'Commit' button fixes the executed statements. Click it to commit the current transaction. This button is available only if there were no errors in compilation.

CHAPTER 3

DATABASE EXPLORER

About DB Explorer



DB Explorer is the basic navigation window for working with databases and database objects.

Its control panel and popup menu allow you to perform various metadata and data operations, such as: registering and connecting to the database, creating, editing and dropping database objects, exporting and importing data and so on.

DB Explorer tabs allow you to access all the registered databases and database objects ('Databases' tab), create your own projects to work only with the selected objects ('Projects' tab), access any of the IB Manager active windows ('Windows' tab) and recently edited objects ('Recent' tab). For easier navigation between the objects each tab has its own object tree.

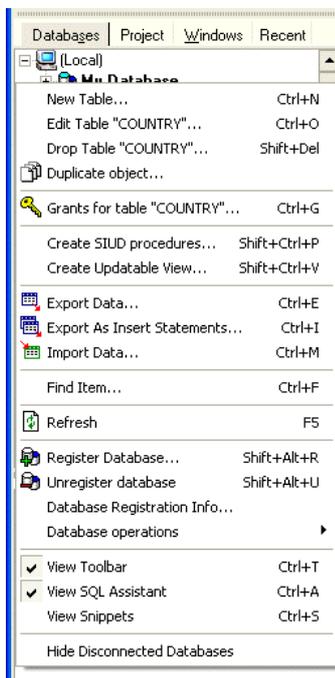
The **SQL Assistant** area gives you short information for each database or database objects, e.g. object description or list of its subobjects.

DB Explorer Toolbar

This toolbar is visible only in old floating-windows mode of IB Manager. In the new MDI mode these buttons are available on the main window toolbar.

-  Refresh - this button refreshes the object tree (F5).
-  **Register Database** (Shift+Alt+R) - this button allows you to register the database.
-  **Unregister Database** (Shift+Alt+U) - this button allows you to unregister the current database.
-  **Connect to Database** (Shift+Ctrl+C) - this button allows you to connect to the selected database.
-  **Disconnect from Database** (Shift+Ctrl+D) - this button allows you to disconnect from the selected database.
-  - this button activates menu with the following items available:
 -  **View Table Subobjects** - if this button is dropped, table subobjects are displayed.
 -  **DB Explorer Page Mode** (Ctrl+P) – this button switches the **DB Explorer** view mode: if the button is dropped, the ‘Projects’ page is always displayed at the right of the window. This allows you to drag the objects from one area to another.
 -  **Show Servers** - if this button is dropped, database servers are displayed in the DB Explorer window.

DB Explorer Popup Menu



New Object – this item activates the proper object editor window, which allows you to create a new object of the selected type.

Edit Object – this item activates the proper editor window, which allows you to edit the selected object.

Drop Object – this item allows you to drop the selected object.

 **Duplicate Object** – this item allows you to create a new object with the same properties as of the selected object.

 **Grants for Object** – this item activates the **Grant Manager** window, which allows you to set, view and edit object access grants.

Create SUID procedures - for tables only. This item activates the **SUID Procedure Editor** window, which allows you to create Select, Insert, Update, Delete procedures for the selected table.

Create Updatable View – for tables only. This item allows you to create a view for the selected table.

 **Export Data** - for tables only. This item activates the **Export Data Dialog**, which allows you to export the selected table to the file.

 **Export Data As Insert Statements** - for tables only. This item activates the **Export Data As Insert Dialog**, which allows you to export the selected table to the SQL script as INSERT statements.

 **Import Data** - for tables only. This item activates the **Import Data Wizard**, which allows you to import data to the selected table from file.

Used By - for domains only. This item allows you to view the list of the database objects, which use the current domain.

Find Item – this item allows you to find an object in the object tree by first characters of its name.

 **Refresh** – this item refreshes the object tree.

 **Register Database** – this item allows you to register the database.

 **Unregister Database** – this item allows you to unregister the current database.

Database Registration Info – this item activates the **Database Registration** window, which allows you to view and edit database registration parameters.

Database Operations - activates the submenu of the database operations (connect/disconnect, backup/restore, properties/statistics/validation, and bring online/shutdown).

View Toolbar - if this option is checked, the **DB Explorer** control panel is visible.

View SQL Assistant - if this option is checked, the **SQL Assistant** area is visible.

Hide Disconnected Databases - if this option checked, databases not connected to server are not displayed in the object tree.

For the **Projects** page such items are also available:

Create User Item From Clipboard – this item allows you to create new user item, enclosed in selected. Item data will be pasted from the clipboard; item name will be requested in the dialog window.

Copy User Item To Clipboard – this item allows you to copy the user item data to the clipboard.

DB Explorer Tabs

Databases

This page contains all the registered databases. If connection to the database is set, its object tree is built (main branches - domains, tables, views, procedures, triggers, generators, exceptions, UDFs, roles), and its icon and alias are colored.

If database contains objects of some of these types, the name of the according branch is bold and the number of enclosed elements is displayed at the right.

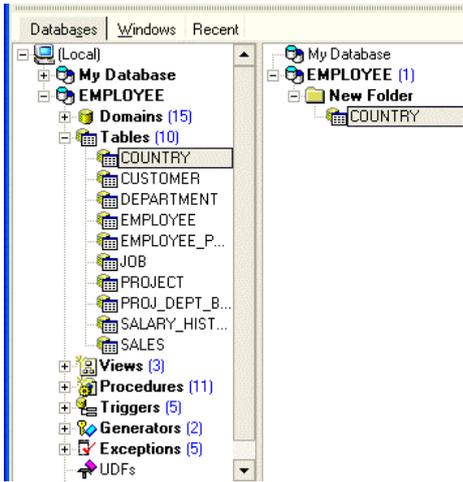
The list of the enclosed elements for the selected branch is displayed in the **SQL Assistant** area. If certain database object is selected (domain, table, view, procedure, trigger, generator, exception, UDF, role), some information about this object will be displayed in the **SQL Assistant** area.

Double-clicking the object activates the proper editor window.

Projects

This page is provided for working with the selected database objects. You can place objects from the database object tree and queries from **SQL Editor** here.

To move the objects from the tree switch the **DB Explorer** view mode, using button  or pressing Ctrl+P. Now **Project** page is always displayed at the right of the window and you can drag objects from the **Databases** page. To add query from the **SQL Editor**, select the text in the editor window and drag it to the folder, created in advance. To create a folder or a subfolder, right-click the object name and choose 'New Folder' or 'New Subfolder' in accordance.



You can also add a database object to the subfolder you created via popup menu. Right-click the subfolder and choose 'Add Database Object'. Select the type of the object you want to add using buttons at the right panel (e.g. 'Show Triggers', 'Show Exceptions'). When you click a button, all the available objects of this type will be displayed in the main window.

 **View Style** - use this button to change the view mode (large icons, small icons, list, or detail). Choose the one you need and double-click it or click 'OK'.

If you need to find the **Project** tree object in the **Databases** tree, right-click the object and choose item 'Find Object in Database Tree'. **Databases** tab will be displayed, and the object you need will be selected.

Windows

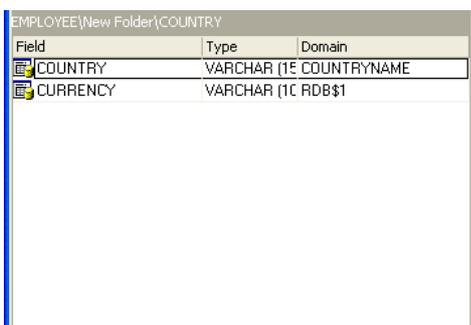
This page displays the tree of all the opened IB Manager windows. Editor windows are displayed in the proper database tree. Windows that are common in the program (e.g. **Events List** or **SQL Script**) will be placed above the database branches. Clicking the window caption makes this window visible, and keeps **DB Explorer** active; double clicking makes the window visible and active.

The popup menu allows you to close the selected window, close all database windows, or close all the windows except the main window and **DB Explorer**.

Recent

This page displays a list of recently (in the current work session) opened database objects. This list is common for all the databases. Next to the object name the database name is displayed. Double-click the object to edit it in the proper editor window.

SQL Assistant Area



This area helps you to work with the **DB Explorer** window, displaying the additional information about the selected object or group of objects.

If you select a server on the 'Databases' tab of the **DB Explorer**, **SQL Assistant** will display the list of the registered databases, where those you are connected to, will be bold. Double-clicking the database alias in the **SQL Assistant** area will start connecting you to the database or disconnecting you from it.

If you select a database in the **DB Explorer**, **SQL Assistant** will display the list of the database object groups and a number of objects for each group. Selecting an object group in the **DB Explorer** will display the list of objects in the **SQL Assistant**. Double-clicking the object name in the **SQL Assistant** will make the object available for editing in the proper editor window. Right-clicking the object or group of objects (selected with the *Ctrl* or *Shift* buttons) allows you to edit or drop the selected objects.

Selecting a domain, a trigger or an UDF in the **DB Explorer** will display its SQL code in the **SQL Assistant**, selecting a table or a view will display its field list and selecting a procedure - a list of the procedure parameters.

If you check the proper **SQL Assistant** options in the **Environment Options** on **Tools: DB Explorer** page, then selecting a generator in **DB Explorer** will display its value in **SQL Assistant** and selecting an exception will display an exception message.

To sort the database objects in ascending or descending order, just click the column header. The arrow in the column header indicates the sorting order, click once more to change it.

CHAPTER 4

DATABASE OBJECTS

Domains

A domain is a column definition template, global to the database, upon which actual column definitions in tables may be based.

If there are columns in the database table or in several database tables, having the same properties, it is useful to describe such column type and its behavior as a domain, and then correspond each of these columns to this domain.

New domain

To create a new domain, select the 'Domains' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'Domain' in the **New Database Object** dialog window.

Then the **Domain Editor** is activated. Set the domain name and data type in the proper fields. Note that domain name and array are available only on creating the domain and can't be changed later.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear where you will be able to view and edit the result SQL statement for creating the new domain. Commit the transaction, and if it is successful, the new domain with the parameters you set will be created.

Edit domain

To edit the existing domain, select the domain in the **DB Explorer** window, right-click and choose **Edit Domain <Domain_Name>**. Edit the domain parameters in the **Domain Editor**, then click button **Compile** ⚡. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the domain parameters. Commit the transaction, and if it is successful, the domain parameters will be changed.

Drop domain

To drop the domain, select the domain in the **DB Explorer** window, right-click and choose **Drop Domain <Domain_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the domain will be dropped.

Tables

Relational databases store all their data in tables. A table is a data structure consisting of an unordered set of horizontal rows, each containing the same number of vertical columns. The intersection of an individual row and column is a field that contains a specific piece of information. Much of the power of relational databases comes from defining the relations among the tables.

New table

To create a new table, select the 'Tables' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'Table' in the **New Database Object** dialog window.

Set the table name and set the name and the data type of the first table field in the **Create Table** dialog.

After you click 'OK', the **Compile Window** will appear where you will be able to view and edit the result SQL statement for creating the new table. Commit the transaction, and if it is successful, the new table with the parameters you set will be created.

Edit table

To edit the existing table, select the table in the **DB Explorer** window, right-click and choose **Edit Table <Table_Name>**. In the **Table Editor** you will be able to create fields, constraints and indices for the table, edit table data and so on.

Drop table

To drop the table, select the table in the **DB Explorer** window, right-click and choose **Drop Table <Table_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the table will be dropped

Views

A view of data is based on one or more underlying tables in the database. The rows to return are defined by the SELECT statement that lists columns from the source tables. Only the view definition is stored in the database; a view does not directly represent physically stored data. It is possible to perform select, project, join, and union operations on views as if they were tables.

New view

To create a new view, select the 'Views' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'View' in the **New Database Object** dialog window. You can also use button **Create New View**  on the control panel.

Then the **View Editor** is activated. On the 'SQL' page of the editor an empty view template is automatically created:

```
CREATE VIEW "NEW VIEW" (  
)  
AS  
SELECT  
FROM  
WHERE
```

Fill this template in the following way: set the name of the new view instead of "NEW VIEW", set the names of the view columns in brackets (separate them by commas), set the source table fields after the SELECT statement, set the table to select data from after the FROM statement and set the condition for selection (field name, logical expression and value) after the WHERE statement.

Example:

```
CREATE VIEW SNOW_LINE (CITY, STATE, SNOW_ALTITUDE)  
AS  
SELECT CITY, STATE, ALTITUDE  
FROM CITIES  
WHERE ALTITUDE > 5000;
```

To edit the template, choose the menu item **Options | Templates...**, then select the 'Views' branch and edit the 'View text' template.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear where you will be able to view and edit the result SQL statement for creating the new view. Commit the transaction, and if it is successful, the new view with the parameters you set will be created.

Edit view

To edit the existing view, select the view in the **DB Explorer** window, right-click and choose **Edit View <View_Name>**. Edit the view parameters in the **View Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL

statement for changing the view parameters. Commit the transaction, and if it is successful, the view parameters will be changed.

Drop view

To drop the view, select the view in the **DB Explorer** window, right-click and choose **Drop View** <View_Name>. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the view will be dropped.

Stored Procedures

A stored procedure is a self-contained program written in InterBase procedure and trigger language, and stored as part of a database's metadata. Stored procedures can be invoked directly from applications, or can be substituted for a table or view in a SELECT statement. Stored procedures can receive input parameters from and return values to applications and can execute on the server.

New procedure

To create a new procedure, select the 'Procedures' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'Procedure' in the **New Database Object** dialog window. You can also use button **Create New Procedure**  on the control panel.

Then the **Procedure Editor** is activated. On the 'Edit' page of the editor an empty procedure template is automatically created:

```
CREATE PROCEDURE "NEW PROCEDURE"  
AS  
BEGIN  
/* Procedure body */  
    SUSPEND;  
END
```

Fill this template in the following way: set the name of the new procedure instead of the "NEW PROCEDURE" (this name must be unique among procedure, table, and view names in the database) and describe the operations to be performed by the procedure after the BEGIN statement. To add the input parameters to the procedure, set the parameters and their types in brackets after the procedure name (<param1> <param_type>, <param2> <param_type>, etc). To add the procedure output parameters, add RETURNS before AS and set the output parameters and their types in brackets in the same way.

The SUSPEND statement is used in the SELECT procedures: it suspends execution of procedure until next FETCH is issued by the calling application and returns output values, if any, to the calling application. This statement is not recommended for executable procedures.

Example (this procedure computes total, average, smallest, and largest department budget by head department):

```
CREATE PROCEDURE SUB_TOT_BUDGET (HEAD_DEPT CHAR(3))  
RETURNS (tot_budget DECIMAL(12, 2), avg_budget DECIMAL(12, 2),  
        min_budget DECIMAL(12, 2), max_budget DECIMAL(12, 2))  
AS
```

```

BEGIN
    SELECT SUM(BUDGET), AVG(BUDGET), MIN(BUDGET), MAX(BUDGET)
        FROM DEPARTMENT
        WHERE HEAD_DEPT = :head_dept
        INTO :tot_budget, :avg_budget, :min_budget, :max_budget;
SUSPEND;
END

```

To edit the template, choose the menu item **Options | Templates...**, then select the ‘Procedures’ branch and edit the ‘Procedure text’ template. You can also hide the procedure header in the procedure text by unchecking option ‘Show Procedure Header in the Text of Procedure’ on the **Tools: Stored Procedure** page of the **Environment Options** (menu item **Options | Environment Options**).

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear where you will be able to view and edit the result SQL statement for creating the new procedure. Commit the transaction, and if it is successful, the new procedure with the parameters you set will be created.

Edit procedure

To edit the existing procedure, select the procedure in the **DB Explorer** window, right-click and choose **Edit Procedure <Procedure_Name>**. Edit the procedure parameters in the **Procedure Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the procedure parameters. Commit the transaction, and if it is successful, the procedure parameters will be changed.

Drop procedure

To drop the procedure, select the procedure in the **DB Explorer** window, right-click and choose **Drop Procedure <Procedure_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the procedure will be dropped.

Triggers

A trigger is a self-contained program associated with a table or view that automatically performs an action when a row in the table or view is inserted, updated, or deleted.

The trigger is never called directly. Instead, when an application or user attempts to INSERT, UPDATE, or DELETE a row in a table, any triggers associated with that table and operation automatically execute, or fire. Triggers defined for UPDATE on non-updatable views fire even if no update occurs.

New trigger

To create a new trigger, select the ‘Triggers’ branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select ‘Trigger’ in the **New Database Object** dialog window. You can also use button **Create New Trigger**  on the control panel.

Then the **Trigger Editor** is activated. Set the basic trigger parameters on the 'Trigger' page of the editor in the following way:

set the trigger name in the 'Name' edit field;

select the trigger type from the 'Type' drop-down list (this type specifies the table operation: INSERT, UPDATE or DELETE, and specifies whether the trigger fires before or after this operation);

select the table, which this trigger corresponds to, from the 'For Table' drop-down list;

set the position of the trigger (this is needed if there are several triggers for the same table of the same type; trigger positions specify the order of their firing).

Then describe the operations to be performed on the trigger firing after BEGIN in the trigger template:

```
AS
BEGIN
  /* Trigger body */
END
```

Example (this trigger makes correlated updates to the SALARY_HISTORY table when a change is made to an employee's salary in the EMPLOYEE table):

Trigger: 'SAVE_SALARY_CHANGE'

Table 'EMPLOYEE'

Type: AFTER UPDATE

```
AS
BEGIN
  IF (OLD.SALARY <> NEW.SALARY) THEN
    INSERT INTO SALARY_HISTORY
      (EMP_NO, CHANGE_DATE, UPDATER_ID, OLD_SALARY, PERCENT_CHANGE)
      VALUES (OLD.EMP_NO, 'now', USER, OLD.SALARY,
        (NEW.SALARY - OLD.SALARY) * 100 / OLD.SALARY);
END
```

To edit the template, choose the menu item **Options | Templates...**, then select the 'Triggers' branch and edit the 'Trigger text' template.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating the new trigger. Commit the transaction, and if it is successful, the new trigger with the parameters you set will be created.

Edit trigger

To edit the existing trigger, select the trigger in the **DB Explorer** window, right-click and choose **Edit Trigger <Trigger_Name>**. Edit the trigger parameters in the **Trigger Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the trigger parameters. Commit the transaction, and if it is successful, the trigger parameters will be changed.

Drop trigger

To drop the trigger, select the trigger in the **DB Explorer** window, right-click and choose **Drop Trigger** <Trigger_Name>. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the trigger will be dropped.

Generators

A generator is a sequential number that can be automatically inserted in a column with the GEN_ID() function. A generator is often used to ensure a unique value in a PRIMARY KEY, such as an invoice number, that must uniquely identify the associated row.

A database can contain any number of generators. Generators are global to the database, and can be used and updated in any transaction. InterBase does not assign duplicate generator values across transactions.

New generator

To create a new generator, select the 'Generators' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'Generator' in the **New Database Object** dialog window. You can also use button **Create New Generator**  on the control panel.

Then the **Generator Editor** is activated. Set the generator name and its value in the proper fields.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating the new generator. Commit the transaction, and if it is successful, the new generator with the parameters you set will be created.

Edit generator

To edit the existing generator, select the generator in the **DB Explorer** window, right-click and choose **Edit Generator** <Generator_Name>. Edit the generator parameters in the **Generator Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the generator parameters. Commit the transaction, and if it is successful, the generator parameters will be changed.

Drop generator

To drop the generator, select the generator in the **DB Explorer** window, right-click and choose **Drop Generator** <Generator_Name>. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the generator will be dropped.

Exceptions

Exceptions are user-defined errors and messages to use in stored procedures and triggers.

When raised by a trigger or a stored procedure, the exception:
terminates the trigger or procedure in which it was raised and undoes any actions performed (directly or indirectly) by it;
returns an error message to the calling application.

Exceptions may be trapped and handled with a WHEN statement in a stored procedure or trigger.

New exception

To create a new exception, select the 'Exceptions' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'Exception' in the **New Database Object** dialog window. You can also use button **Create New Exception**  on the control panel.

Then the **Exception Editor** is activated. Set the exception name and message text in the proper edit fields.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating the new exception. Commit the transaction, and if it is successful, the new exception with the parameters you set will be created.

Edit exception

To edit the existing exception, select the exception in the **DB Explorer** window, right-click and choose **Edit Exception <Exception_Name>**. Edit the exception parameters in the **Exception Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the exception parameters. Commit the transaction, and if it is successful, the exception parameters will be changed.

Drop exception

To drop the exception, select the exception in the **DB Explorer** window, right-click and choose **Drop Exception <Exception_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the exception will be dropped.

UDFs

An UDF (user-defined function) is a database function written entirely in a host language to perform data manipulation tasks not directly supported by InterBase. Executed on the server.

UDFs give you the possibility to create your own functions (like count) and integrate them in the database itself. Each UDF is arranged as a function, belonging to DLL. Thus, one dynamically loaded library consists of one function at least.

New UDF

To create a new UDF, select the 'UDFs' branch in the **DB Explorer** window, right-click and choose **New Object** from the popup menu or choose the menu item **Database | New Object** and then select 'UDF' in the **New Database Object** dialog window. You can also use button **Create New UDF**  on the control panel.

Then the **UDF Editor** is activated. Set the basic UDF parameters on the 'UDF' page of the editor in the following way:

set the name of the UDF to use in the SQL statements in the 'Name' edit field (this name can be different from the name of the function specified as 'Entry Point');

specify the name of the UDF in the source code as stored in the UDF library in the 'Entry Point' edit field;

set the file name identifying the library that contains the UDF in the "Library Name" edit field; the library must be placed in `ib_install_dir/UDF` or the complete pathname to the directory, including a drive letter in the case of a Windows server, must be listed in the InterBase configuration file;

specify the return value data type in the 'Returns' edit field;

choose whether the return value should be passed by value or by reference by selecting the appropriate item from the 'By' drop-down list; if you select 'Reference (FREE IT)', the memory of the return value will be freed after the UDF finishes running;

set the data types of the input parameters in the 'Input Parameters' list; click 'Add' to add a parameter, click 'Remove' to remove one.

When you are done, click button **Compile**  on the editor toolbar. The **Compile Window** will appear where you will be able to view and edit the result SQL statement for creating the new UDF. Commit the transaction, and if it is successful, the new UDF with the parameters you set will be created.

Edit UDF

To edit the existing UDF, select the UDF in the **DB Explorer** window, right-click and choose **Edit UDF <UDF_Name>**. Edit the UDF parameters in the **UDF Editor**, then click button **Compile** . The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for changing the UDF parameters. Commit the transaction, and if it is successful, the UDF parameters will be changed.

Drop UDF

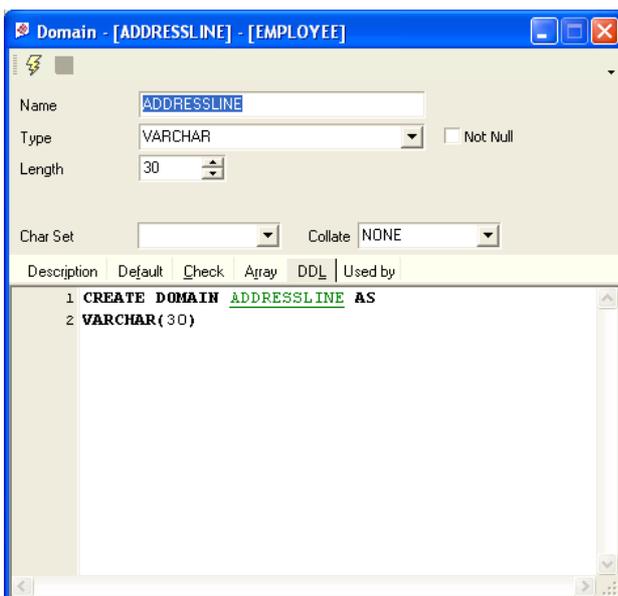
To drop the UDF, select the UDF in the **DB Explorer** window, right-click and choose **Drop UDF <UDF_Name>**. Then confirm dropping in the dialog window and commit the transaction in the **Compile Window**. If the transaction is successful, the UDF will be dropped.

CHAPTER 5

OBJECT EDITORS

Domain Editor

In the **Domain Editor** window you can set and edit various domain parameters.



Basic Parameters

Name – the domain name; it must be unique among the domain names in the database. Note that you can set the domain name only on creating the domain, and you can't change it later.

Type – the domain data type; for some of the types, additional parameters should be set, such as: 'Length' and 'Scale' for NUMERIC and DECIMAL types, 'Length', 'Char Set' and 'Collate' for CHAR and VARCHAR types, 'Sub Type', 'Segment Size' and 'Char Set' for BLOB.

Not Null - if this option is checked, the data of the fields, based on this domain, can't be NULL.

Additional Parameters

Description – on this page you can set the text, containing the description of the current domain. This description can be saved by clicking button **Save Description**  on the toolbar.

Default – on this page you can set the default values, which will be used in filling the fields, based on the current domain.

Check – on this page you can set CHECK constraints, i.e. conditions that must be true for inserts and updates to the field, based on the current domain, e.g. VALUE>=10. The CHECK constraint cannot reference any domain or column.

Array - this page displays the quantity of the domain dimensions and their size. Note that you can set these parameters only on creating the domain, and you can't change them later. This page is unavailable for BLOB data type.

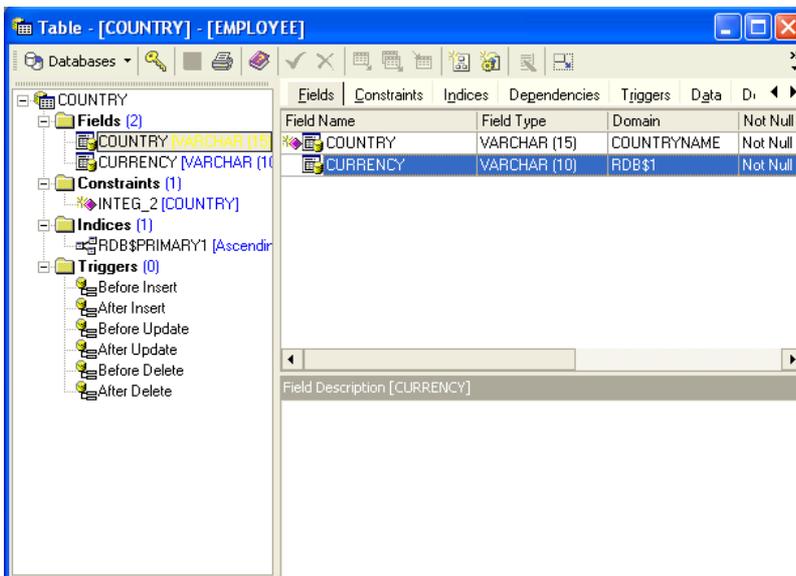
DDL – this page displays the SQL text, generated after compilation, which describes the operations over the current domain. This text can't be edited, but it can be copied to the clipboard.

Used by - this page is available only when editing domain and unavailable when creating. Here you can view tables, which use this domain, and table fields, based on the domain. You can't change anything here: these parameters are set when creating and editing tables.

Click button **Compile** ⚡ to start the process of compilation. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating or editing the domain. Commit the transaction, and if it is successful, the domain parameters will be changed.

Table Editor

Table Editor is one of the basic IB Manager tools. It gives you large opportunities for working with the database tables: creating and editing table fields, constraints and indices, managing table data, create triggers for table and so on.



'Fields' Tab

All table fields and their properties are displayed on the **Fields** page in form of a grid. The following properties are displayed for each field: field name, type, and domain; if the field is not null; default and computed sources of the field (if any). Fields, included into the primary key are marked with an icon. In the edit field at the bottom of the window you can set the description of the current field.

To create a new field, right-click in the grid and choose item 'New Field' from the popup menu, then set the parameters of the new field in the **Field Editor**.

To edit the existing field, select it in the grid, right-click and choose item 'Edit Field' from the popup menu, then edit the field properties in the **Field Editor**. You can also activate **Field Editor** by double-clicking the field.

To drop a field, select it in the grid, right-click and choose item 'Drop Field' from the popup menu.

Field Editor

Set the field name in the 'Column' edit field. Check option 'Not Null' to forbid the field taking the NULL values, and check 'Primary Key' to include this field into the primary key.

Choose what the field is based on: domain, standard data type or 'Computed by' expression.

If you choose **Domain**, then select the existing domain from the drop-down menu on the 'Domain' tab or create the new domain for the field by clicking the button 'New domain'.

If you choose **Standard data type**, then select the type of the field from the drop-down menu on the 'Raw data type' tab; for some of the types, additional parameters should be set, such as:

'Length' and 'Scale' for NUMERIC and DECIMAL types, 'Length', 'Char Set' and 'Collate' for CHAR and VARCHAR types, 'Sub Type', 'Segment Size' and 'Char Set' for BLOB.

If you choose '**Computed by' expression**, then set the expression to calculate the field value using other field values on the 'Computed by' tab.

Set the other parameters of the field, if necessary:

- ✓ **Array** (raw data type fields only) – set the quantity of the field dimensions and their size. Click 'Add dimension' to add a dimension to the field array and set its size; to delete a dimension, select it in the list and click 'Delete dimension'.
- ✓ **Default** – set the default value of the field.
- ✓ **Check** – set CHECK constraints, i.e. conditions that must be true for inserts and updates to the field.
- ✓ **Autoincrement** – this tab allows you to create a generator, trigger or a procedure wrapper to simulate an autoincrement field;
- ✓ **Description** – set optional text, containing the description of the new field;

DDL – this page displays the SQL text, generated after compilation, which describes operations over the current field. This text can't be edited, but it can be copied to the clipboard.

'Constraints' Tab

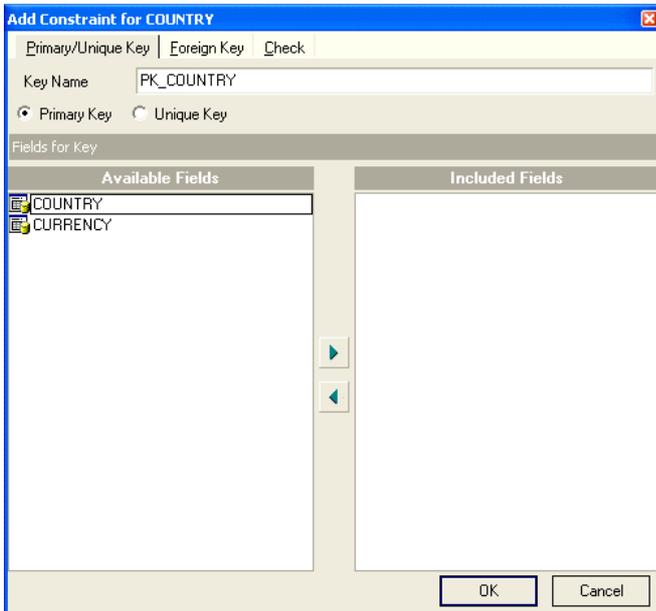
All table constraints and their properties are displayed on the **Constraints** page in form of a grid. For each constraint the following properties are displayed: name, type (Primary/Unique Key, Foreign Key, Check Constraint), condition, FK Table, FK Field, Update Rule, Delete Rule.

To create a new constraint, right-click in the grid and choose item 'New Constraint' from the popup menu, then set the parameters of the new constraint in the **Constraint Editor**.

To edit the existing constraint, select it in the grid, right-click and choose item 'Edit Constraint' from the popup menu, then edit the constraint properties in the **Constraint Editor**. You can also activate **Constraint Editor** by double-clicking the constraint.

To drop a constraint, select it in the grid, right-click and choose item 'Drop Constraint' from the popup menu.

Constraint Editor



The table constraints can be of the following types: **Primary/Unique key**, **Foreign key**, and **Check**. Create them on the appropriate tabs of the editor. If you edit a constraint, only one tab (corresponding to the type of the constraint) will be visible in the editor.

The following constraint parameters are available on the 'Primary/Unique key' tab:

- ✓ **Key Name** - name of the key, it must be unique for the current database.
- ✓ **Primary key/Unique key** - this switch sets the key type.
- ✓ **Fields for key** – to include fields to the key, move the fields from the 'Available Fields' list to the 'Included fields' by

double-clicking or dragging them. To remove the fields from the key, move them back in the same way. You can also use buttons >, < to move the selected fields (multiple fields are selected by *Ctrl* or *Shift*).

These parameters are set on the 'Foreign key' tab:

- ✓ **Foreign Key Name** - name of the foreign key, it must be unique for the current database.
- ✓ **Foreign Table** – select the foreign table for the key from the drop-down list of the database tables.
- ✓ **Available Fields/Included Fields** - to include fields to the key, move the fields from the 'Available Fields' list to the 'Included fields' by double-clicking or dragging them. To remove the fields from the key, move them back in the same way. You can also use buttons >, < to move the selected fields (multiple fields are selected by *Ctrl* or *Shift*).
- ✓ **On Delete Rule, On Update Rule** - choose a rule for changing the foreign key in case of primary key change (separately on deleting and updating a record). The following variants are possible: NO ACTION - does not change the foreign key; may cause the primary key update to fail due to referential integrity checks; CASCADE - for ON DELETE, deletes the corresponding foreign key; for ON UPDATE, updates the corresponding foreign key to the new value of the primary key; SET NULL - sets all the columns of the corresponding foreign key to NULL; SET DEFAULT - sets every column of the corresponding foreign key to its default value in effect when the referential integrity constraint is defined; when the default for a foreign column changes after the referential integrity constraint is defined, the change does not have an effect on the default value used in the referential integrity constraint.

On the 'Check' tab you can set the permissible values for the current field. Entering a new value to the column fails if the value does not meet the condition.

Check Constraint Name - name of a constraint, it must be unique for the current database.

Check Constraint Text - constraint text, setting the permissible values for the current field, e.g. VALUE>=10.

'Indices' Tab

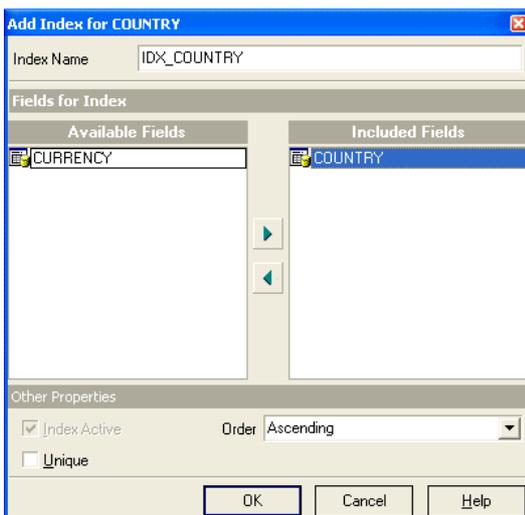
All table indices and their properties are displayed on the **Indices** page in form of a grid. For each index the following properties are displayed: name, included fields, uniqueness, activity, and sorting direction.

To create a new index, right-click in the grid and choose item 'New Index' from the popup menu, then set the parameters of the new index in the **Index Editor**.

To edit the existing index, select it in the grid, right-click and choose item 'Edit Index' from the popup menu, then edit the index properties in the **Index Editor**. You can also activate **Index Editor** by double-clicking the index.

To drop an index, select it in the grid, right-click and choose item 'Drop Index' from the popup menu.

Index Editor



In this window you can create indices and change the parameters of duplicate indices. You can change the structure of the index fields, moving the fields from one part of the window to another using buttons > and <, by double-clicking or dragging indices.

You can also choose ascending or descending field sorting type from the drop-down list, activate or deactivate index by checking or unchecking option 'Index Active', and make index unique by checking 'Unique' option.

'Data' Tab

On the **Data** page the table data are displayed. They can be viewed in three modes (chosen by clicking the according button at the bottom of the window):

- ✓ **Grid View** - view data as a grid;
- ✓ **Form View** - view data as a form: there is only one record displayed at the time, to view another record use the navigation buttons.
- ✓ **Print Data** - view data in WYSIWYG mode, ready for printing. The acquired query can be saved to file and/or printed.

To navigate data, use buttons above the grid. To edit record data, just click in the appropriate cell.

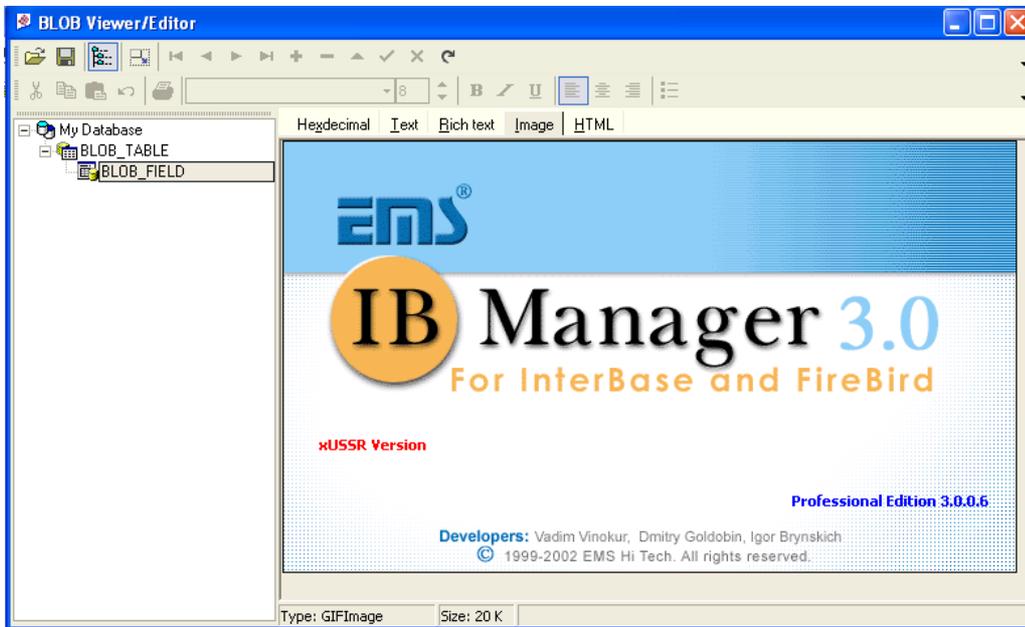
To edit BLOB data, click button  on the toolbar, or right-click in the grid and choose item 'Edit BLOB' in the popup menu.

You can also export these data to file ('Export Data' item in the popup menu or button  on the toolbar), export them as INSERT statement to the SQL Script ('Export as Insert' item in the popup

menu or button  on the toolbar), or import data to the table from MS Excel, DBF, TXT or CSV file ('Import Data' item in the popup menu or button  on the toolbar).

BLOB Viewer/Editor

If there are BLOB fields in the table, you can edit them, using the **BLOB Viewer/Editor**. The editor is called by clicking button **BLOB Editor**  on the control panel.



The window of the editor is divided into two areas: object tree area and data view/edit area. In the object tree you can view the current database and the database table, edited field belongs to, and in the data area you can view BLOB data in different formats by choosing the proper tab ('Hexadecimal', 'Text', 'Rich Text', 'Image' and 'HTML').

Data, performed as **Image** or **HTML** are not available for editing. **Image** tab supports the following image formats: bitmaps, WMF, icons, JPEG and GIF.

The toolbar of the editor allows you to load and save files (buttons **Load from File**  and **Save to File** ) , navigate through records (the navigation panel is the same as on the 'Data' tab of the **Table Editor**) and provide various tools for editing text.

When you are done editing BLOB, just confirm the changes you made and close the editor.

BLOB Viewer/Editor is available only in the Professional Edition of IB Manager.

Other Table Editor Tabs

The **Dependencies** page displays the dependencies of the current table. On the left you can see a tree of objects, depending on the current table. On the right - similar tree of objects, the table depends on. The objects in each of them can be of the following types: tables, views, procedures, triggers, and exceptions. For each object the list of fields, dependence is set on, is displayed: in the left tree it is the list of the current table fields, in the right it is the list of object fields. At the bottom of the window you can see SQL text, describing the object, selected in one of the upper areas. Double-clicking the object name activates the proper editor window.

The **Triggers** page contains the list of the triggers for the current table, i.e. triggers that fire before or after some operation, executed over the current table. The triggers are divided into six categories: Before Insert, After Insert, Before Update, After Update, Before Delete, and After Delete. To add a trigger, right-click the trigger category or the existing trigger and choose item 'New trigger' from the popup menu. The popup menu of the trigger also allows you to edit, drop or set the trigger inactive. Double-clicking the trigger name activates the **Trigger Editor** window. At the bottom of the window the SQL text, describing the selected trigger, is displayed.

On the **Description** page you can set the table description that can be any optional text. The description can be saved by clicking button **Save Description**  on the toolbar.

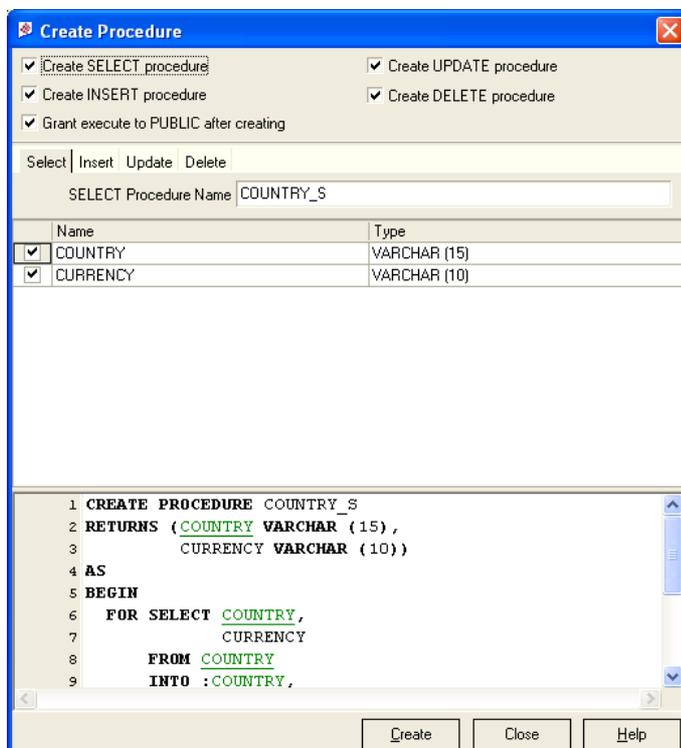
The **DDL** page displays the SQL text, describing all the operations over the current table: creating the table itself, its fields, constraints, indices and triggers. This text can't be edited, but it can be copied to the clipboard.

To set the grants for the current table click button **Grants**  on the toolbar to activate the **Grant Manager** window.

To print the table metadata (fields, constraints, indices, etc.) click button **Print Metadata**  on the toolbar.

To commit or rollback the current transaction, click button **Commit Transaction**  or **Rollback Transaction**  in accordance.

Create SUID Procedures from Table



You can create SUID procedures right from the **Table Editor** by clicking button **Create Procedure**  on the toolbar.

The **SUID Procedure Editor** allows you to create Select, Update, Insert and Delete procedures for the current table. Using flags at the top of the window, you choose what procedures you want to create.

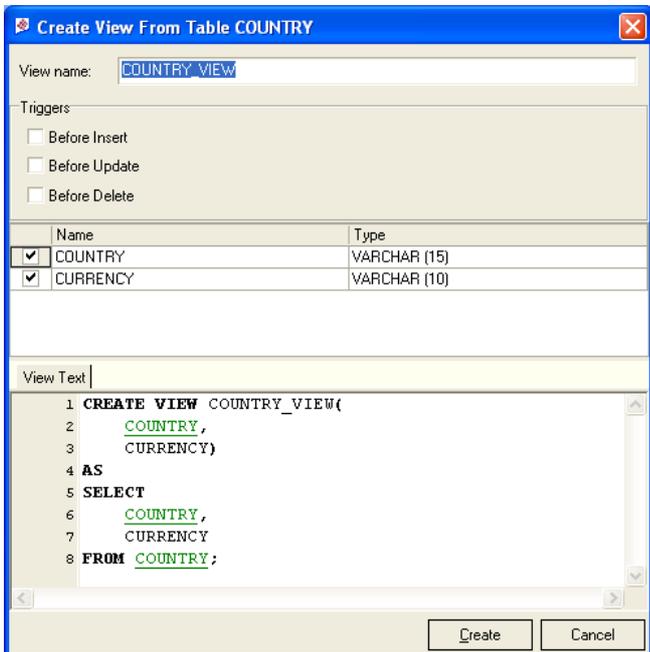
Option 'Grant execute to PUBLIC after creating' makes the procedures available for all users after creating.

On the procedure type tabs you can change the procedure name, number of the table fields included, and the SQL code for creating the procedure.

Click 'Create' when you are done.

Create View from Table

You can create a view right from the **Table Editor** by clicking button **Create View from Table**  on the toolbar.

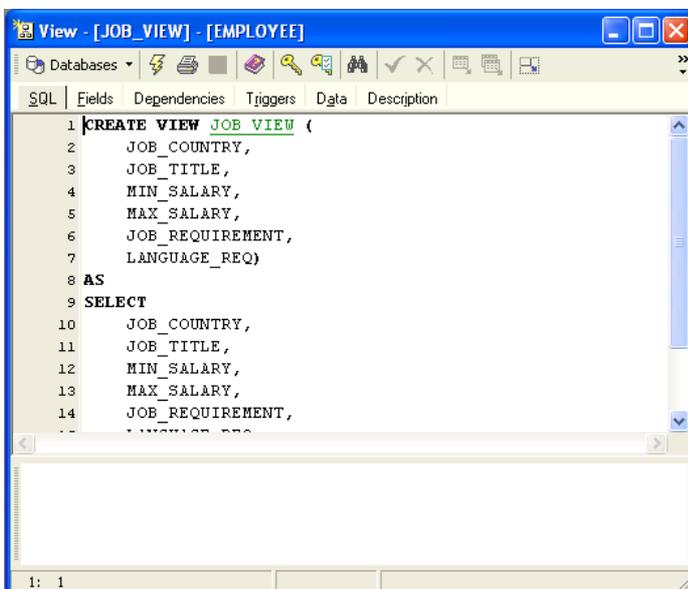


The **Create View from Table** window allows you to create a view automatically for the certain fields of the current table. To select the fields for the view check the proper check boxes in the field list. All the changes you make are displayed in the 'View Text' panel at the lower part of the window. You can also edit the view text in this panel if necessary.

To create 'Before Insert', 'Before Update' and 'Before Delete' triggers for a view check the proper check boxes at the upper part of the window. As you check them the according tabs will appear at the lower part of the window, e.g. 'Before Update Trigger', where you can view and edit the trigger text if necessary.

Click 'Create' when you are done.

View Editor



View Editor allows you to create new views and edit the existing ones.

The basic view parameters are set on the **SQL** tab as SQL text for creating the view: the list of the view fields is set in brackets after the view name, the list of the selected fields is set after the **SELECT** statement and the condition for the selection is set after the **WHERE** statement.

The **Fields** page contains the properties of the view fields in form of a grid. The following properties are displayed: the field name, type, and domain, if the field is not null, and the default and computed sources of the field (if any). Fields, included into the

primary key are marked with an icon. In the edit field at the bottom of the window you can set the description of the current field.

Clicking the column title sorts fields by the current parameter or changes the sorting direction. Right-clicking activates the popup menu, which allows you to change the field order or copy the field name list to the clipboard.

The **Dependencies** page displays the dependencies of the current view. On the left you can see a tree of objects, depending on the current view. On the right – a similar tree of objects, which the

view depends on. The objects in each of them can be of the following types: tables, views, procedures, triggers, and exceptions. At the bottom of the window you can see the SQL text, describing the object, selected in one of the upper areas. Double-clicking the object name activates the proper editor window.

The **Triggers** page contains the list of the triggers for the current view, i.e. triggers that fire before or after some operation, executed over the current view. The triggers are divided into six categories: Before Insert, After Insert, Before Update, After Update, Before Delete, and After Delete. To add a trigger, right-click the trigger category or the existing trigger and choose item 'New trigger' from the popup menu. The popup menu of the trigger also allows you to edit, drop or set the trigger inactive. Double-clicking the trigger name activates the **Trigger Editor** window. At the bottom of the window the SQL text, describing the selected trigger, is displayed.

On the **Data** page the view data are displayed. They can be viewed in three modes (chosen by clicking the according button at the bottom of the window):

- ✓ **Grid View** - view data as a grid;
- ✓ **Form View** - view data as a form: there is only one record displayed at the time, to view another record use the navigation buttons.
- ✓ **Print Data** - view data in WYSIWYG mode, ready for printing. The acquired query can be saved to file and/or printed.

These data can't be edited, but can be exported ('Export Data' item in the popup menu or button  on the toolbar) or exported as INSERT statement to the SQL Script ('Export as Insert' item in the popup menu or button  on the toolbar).

On the **Description** page you can set the view description that can be any optional text. The description can be saved by clicking button **Save Description**  on the toolbar.

To set the grants for the current view click button **Grants**  on the toolbar to activate the **Grant Manager** window, or button **Autogrants**  to start the process of setting grants automatically (in this case IB Manager will look through the view text and automatically grant access for the view to the depended objects and grant access for the objects, which the view depends on, to the view).

To print the view metadata (fields, dependencies, DDL and description) click button **Print Metadata**  on the toolbar.

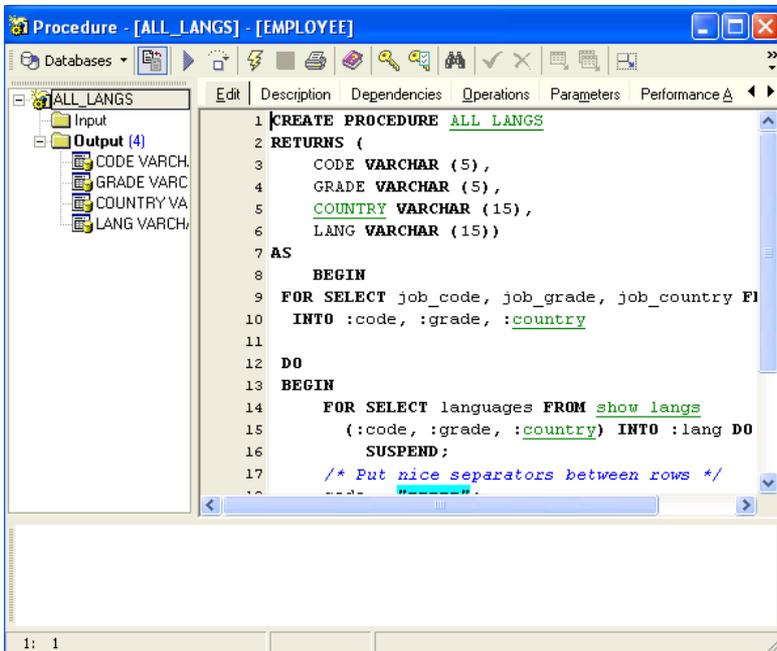
To commit or rollback the current transaction, click button **Commit Transaction**  or **Rollback Transaction**  in accordance.

When you are done, click button **Compile**  on the toolbar to start the process of compilation. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating the new view. Because of there is no such operation in InterBase as ALTER VIEW, if you edit the existing view, it will be dropped, and the new one with the parameters you set will be created. Commit the transaction, and if it is successful, the view parameters will be changed.

Procedure Editor

Procedure Editor allows you to create new stored procedures and to edit the existing ones.

Procedure Editor Tabs



The basic parameters of the stored procedure are set on the **Edit** tab as SQL text for creating the procedure: the input parameters are set in brackets after the procedure name, the output parameters are set in brackets after the RETURNS statement, and the procedure body written in InterBase procedure and trigger language, is bracketed by BEGIN and END statements.

On the **Description** page you can set the procedure description that can be any optional text. The description can be saved by clicking button **Save Description**  on the toolbar.

The **Dependencies** page displays the dependencies of the current procedure. On the left you can see a tree of objects, depending on the current procedure. On the right – a similar tree of objects, which the procedure depends on. The objects in each of them can be of the following types: tables, views, procedures, triggers, and exceptions. At the bottom of the window you can see the SQL text, describing the object, selected in one of the upper areas. Double-clicking the object name activates the proper editor window.

The **Operations** page displays the list of operations, executed in the procedure. The following properties of the operation are displayed: operation type; name of the target table, and the proper statement in InterBase procedure and trigger language.

The **Parameters** page contains the input and the output parameters, used by the procedure. For each parameter its name, data type and parameter type (Input or Output) are displayed. In the bottom of the window you can view and edit the description of the selected parameter. Using the **Export Metadata** function of the popup menu, you can also export the parameter list to file.

The **Performance Analysis** page displays the information about the procedure output. To make it available you should execute the procedure at least once (by clicking the **Execute**  button on the toolbar or pressing F9). Clicking the according buttons at the bottom of the window switches the following categories: **Reads**, **Updates**, **Deletes**, **Inserts**, **Summary**. In **Summary** mode you can copy the analysis results to the clipboard. The following information is also displayed: query time, computer memory use, and statements executed. You can sort the information, displayed in a grid, by clicking the column titles.

The **Results** page becomes available only after executing the procedure. On this page you can view

data, acquired while executing the current procedure. They can be performed in the following view modes (chosen by clicking the according button at the bottom of the window):

- ✓ **Grid View** - view data as a grid;
- ✓ **Form View** - view data as a form: there is only one record displayed at the time, to view another record use the navigation buttons.
- ✓ **Print Data** - view data in WYSIWYG mode, ready for printing. The acquired query can be saved to file and/or printed.

These data can't be edited, but can be exported ('Export Data' item of the popup menu or button  on the toolbar) or exported as INSERT statement to the SQL Script ('Export as Insert' item of the popup menu or button  on the toolbar).

To set the grants for the current procedure click button **Grants**  on the toolbar to activate the **Grant Manager** window, or button **Autogrants**  to start the process of setting grants automatically (in this case IB Manager will look through the procedure text and automatically grant access for the procedure to the depended objects and grant access for the objects, which the procedure depends on, to the procedure).

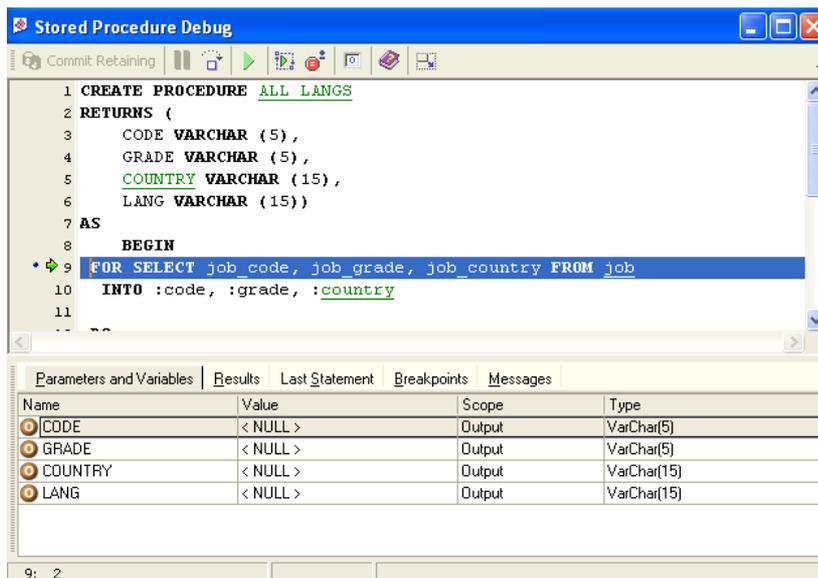
To print the procedure metadata (fields, dependencies, DDL and description) click button **Print Metadata**  on the toolbar.

To commit or rollback the current transaction, click button **Commit Transaction**  or **Rollback Transaction**  in accordance.

To compile the procedure click button **Compile**  on the toolbar. To execute the procedure click button **Execute** .

Stored Procedure Debugger

To fix the errors in the procedure code and to optimize the procedure work you can debug the procedure step-by-step before compilation, using the **Stored Procedure Debugger**. To activate the debugger, click button **Debug Procedure**  on the toolbar.



At the top area you can view and edit the procedure text. The blue spots at the left of the window indicate the statements, executed by the procedure; the green arrow indicates the current statement.

To start executing the procedure step-by-step press F8. To reset executing the procedure press Ctrl+F2. To add a breakpoint to the current statement press Ctrl+F8.

The **Parameters and Variables** tab displays the list of input and output procedure parameters

(indicated by the proper icon) with their values and types.

The **Results** tab displays the list of RETURNS variables. After executing the procedure it also displays their values.

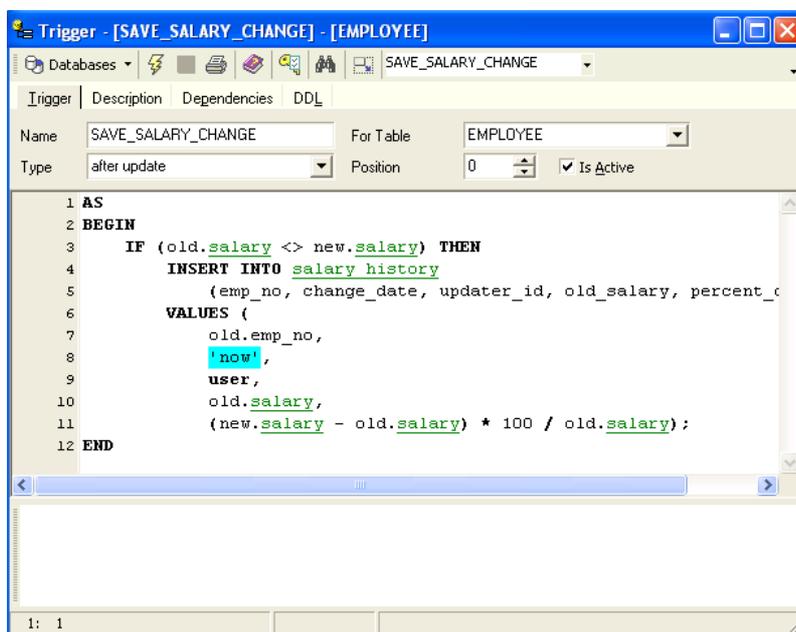
The **Last Statement** tab displays the last executed statement, the statement execution plan and the execution time.

The **Breakpoints** tab displays the procedure breakpoints: the breakpoint line, statement and the number of its passes. You can add a breakpoint to the current statement by pressing Ctrl+F8.

The **Messages** tab displays various **Stored Procedure Debugger** messages.

Stored Procedure Debugger is available only in the Professional Edition of IB Manager.

Trigger Editor



Trigger Editor allows you to create new triggers and edit the existing ones.

The basic trigger parameters are set on the **Trigger** tab. Those are:

- ✓ **Name** – the name of the trigger; it must be unique to the database.
- ✓ **Type** - conditions of the trigger firing, i.e. table operation for firing (Insert, Update or Delete) and the firing time (before or after the operation is performed).
- ✓ **For Table** - table or view name, the trigger is created for.
- ✓ **Position** - defines the order of

firing triggers on the same event. It must be an integer between 0 and 32.767, inclusive. Lower-number triggers fire first, thus trigger with the default position (0) will be the first trigger to fire. Note that triggers for a table need not be consecutive; the same action triggers with the same position number will fire in random order.

The trigger body consists of an optional list of local variables and their data types and a block of statements in InterBase procedure and trigger language, bracketed by BEGIN and END. These statements are performed when the trigger fires.

The **Dependencies** page displays the list of objects, depending on the current trigger. The depended objects are displayed in form of a tree with the following branches available: Tables, Views, Procedures, Triggers, and Exceptions. You can choose an object in this tree, and the proper SQL text will be displayed at the bottom of the window (it is unavailable for editing but available for copying).

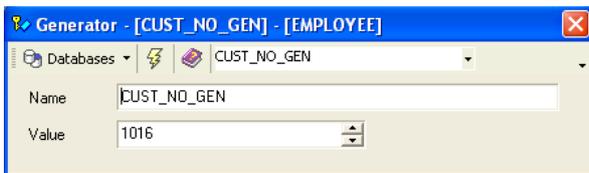
On the **Description** page you can set an optional text, containing description of the current trigger. To save this description, click button **Save Description**  on the toolbar.

The **DDL** tab displays the SQL text, generated after compilation, which describes the operations over the current trigger. This text can't be edited, but it can be copied to the clipboard.

To set grants for the trigger automatically, click button **Autogrants**  on the toolbar. IB Manager will look through the trigger text and automatically give access grants for the trigger to the objects, which depend on the trigger.

When you are done, click button **Compile**  to start the process of compilation. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating or editing the trigger. Commit the transaction, and if it is successful, the trigger parameters will be changed.

Generator Editor



Generator Editor allows you to create new generators and to edit the existing ones.

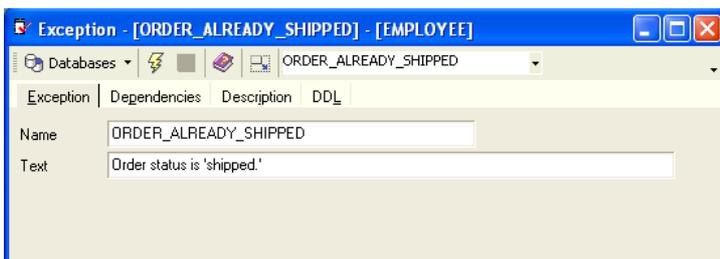
The generator parameters are set in the following edit fields:

- ✓ **Name** – the name of the generator; it must be unique to the database.
- ✓ **Value** - generator starting value; must be Integer from -2^{exp31} to $2^{exp31}-1$.

When you are done, click button **Compile**  on the toolbar to create the generator or to set new generator value. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating or editing the generator. Commit the transaction, and if it is successful, the generator parameters will be changed.

Exception Editor

Exception Editor allows you to create new exceptions and edit the existing ones.



The basic exception parameters are set on the **Exception** tab. Those are:

- ✓ **Name** – the name of the exception; it must be unique to the database.
- ✓ **Text** – the text of the message, displayed when exception is raised. Maximum string length is 78 characters.

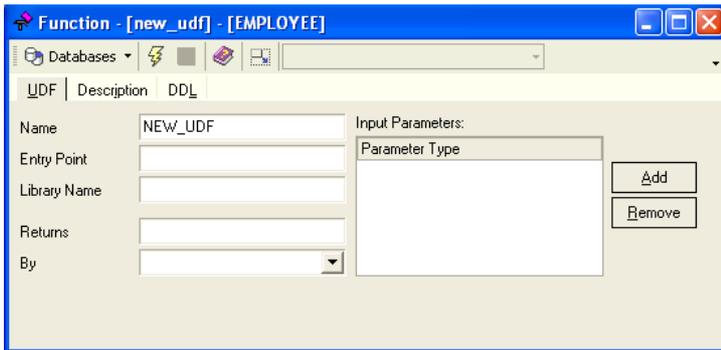
The **Dependencies** page displays the list of objects, depending on the current exception. The depended objects are displayed in form of a tree with the following branches available: Tables, Views, Procedures, Triggers, and Exceptions. You can choose an object in this tree, and the proper SQL text will be displayed at the bottom of the window (it is unavailable for editing but available for copying).

On the **Description** page you can set an optional text, containing description of the current exception. To save this description, click button **Save Description**  on the toolbar.

The **DDL** tab displays the SQL text, generated after compilation, which describes the operations over the current exception. This text can't be edited, but it can be copied to the clipboard.

When you are done, click button **Compile** ⚡ on the toolbar to start the process of compilation. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating or editing the exception. Commit the transaction, and if it is successful, the exception parameters will be changed.

UDF Editor



UDF Editor allows you to create new UDFs (user-defined functions) and edit the existing ones.

The basic UDF parameters are set on the **UDF** tab. Those are:

- ✓ **Name** – the name of the UDF to use in the SQL statements (this name can be different from the name of the

function specified as 'Entry Point').

- ✓ **Entry Point** - the name of the UDF in the source code as stored in the UDF library.

Library Name - the file name identifying the library that contains the UDF; the library must be placed in `ib_install_dir/UDF` or the complete pathname to the directory, including a drive letter in the case of a Windows server, must be listed in the InterBase configuration file.

Returns - the return value data type.

By – the way to pass the return value – by value or by reference; if you select 'Reference (FREE IT)', the memory of the return value will be freed after the UDF finishes running.

Input Parameters - the data types of the input parameters; click 'Add' to add a parameter, click 'Remove' to remove one.

On the **Description** page you can set an optional text, containing description of the current UDF. To save this description, click button **Save Description** 📄 on the toolbar.

The **DDL** tab displays the SQL text, generated after compilation, which describes the operations over the current UDF. This text can't be edited, but it can be copied to the clipboard.

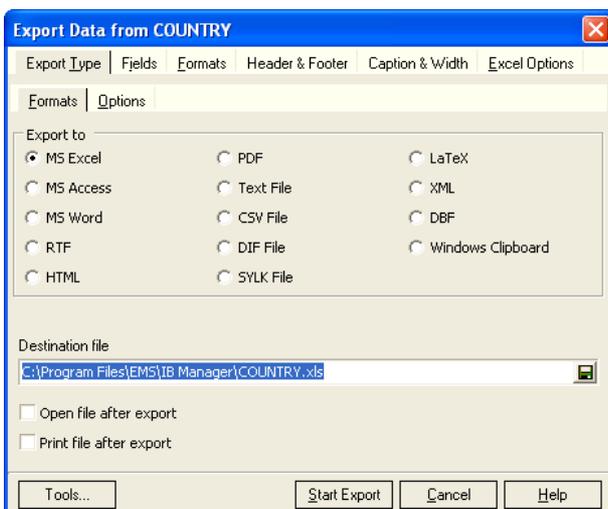
When you are done, click button **Compile** ⚡ on the toolbar to start the process of compilation. The **Compile Window** will appear, where you will be able to view and edit the result SQL statement for creating or editing the UDF. Commit the transaction, and if it is successful, the UDF parameters will be changed.

CHAPTER 6

DATA MANIPULATION

Export Data Dialog

You can export data from table, view, procedure or query result to any of 14 available formats (MS Excel, MS Access, MS Word, RTF, HTML, PDF, TXT and more). **Export Data Dialog** is a very powerful tool, allowing you to export data easily and quickly, and set various export options. It is based on **EMS QuickExport Component Suite** (check <http://www.ems-hitech.com/quickexport/> for details).



To call the **Export Data Dialog**, select the table in the **DB Explorer**, right-click and choose item 'Export Data' from the popup menu or open the 'Data' ('Results') tab of the **Table Editor** or **View Editor (SQL Editor or Query Builder)**, click button 'Export Data'  on the toolbar or right-click and choose item 'Export Data'.

On the 'Export Type' tab choose the file type to export data to and set the filename in the 'Destination file' edit field (use button  to browse for files). Check 'Open file after export' to open the result file in the appropriate program right after export and check 'Print file after export'

to print the result file using your default printer settings.

If you don't want all the fields to be exported, select the fields to export on the 'Fields' tab. Note, that if your table contains BLOB fields, they will be not exported default.

To choose the fields for export, move them from the 'Available Fields' list to the 'Included Fields' one. To move the field from one list to another double-click it or select it (use *Ctrl* or *Shift* to select multiple fields) and click button > or <. To move all the fields click button >> or <<.

On the 'Formats' tab you can change the formats of the exported fields, if necessary. You can also define your own formats for numeric and Date/Time fields, using the 'User' tab. These fields (if there are any in your table) are available in the list. Choose the format of the field from the drop-down list of the 'Formats' column and edit it if necessary. You can see the example of the result value if the 'Sample' column.

The default column captions in the result table correspond to the field names of the source table, but you can edit these captions on the 'Captions' tab of the dialog, if necessary. This tab is unavailable for DBF export type.

The last tab of the dialog contains specific options for the selected export type. The following options are available:

HTML Options

- ✓ **Preview.** This tab allows you to define the colors of various elements of the result HTML document, such as: default font color, header font color, table font color, background colors and link colors. To change the color of some element, just click this element and set the color you need. You can also use various HTML templates to make the result document look in the way you need. Select a template from the **Template** drop-down list or click 'Load template' to browse for templates. If you have changed some HTML elements manually and you like the result, you can save it as a template for future using by clicking 'Save as template' button.
- ✓ **Basic.** This tab allows you to define the title of the result document and set the mode of the CSS (Cascade Style Sheets) using. The default CSS using is internal, but you can set to external and define your own CSS file in the **CSS file name** edit field.
- ✓ **Advanced.** On the **Body options** panel you can set the default font name of the result document and set the document background. In the **Advanced attributes** edit field you can define any attribute values for the HTML tag <BODY>.
 - The **Table options** panel allows you to define such attributed as **Cell padding**, **Cell Spacing** and **Border**. In the **Advanced attributes** edit field you can define any attribute values for the HTML tag <TABLE>.
 - The **Multi-file export** panel allows you to export your data not to a single HTML document, but to a number of documents. Check option **Use multi-file export** to enable this mode and define the maximum number of records in each result file in the appropriate edit field.

Excel Options

- ✓ **Data Format.** This tab allows you to set a specific formatting for each exported field (**Fields** list) or result file element, e.g. header, captions, etc. (**Options** list) or custom strip style, applied to the result rows or columns (**Styles** list). Set the font properties for the selected element on the **Font** tab, set cell borders, their types and colors on **Borders** tab and set the fill pattern and its color on **Fill** tab. For data fields you can also add an aggregate function to be calculated over the field data on the **Aggregate** tab.
- ✓ **Advanced Format.** This tab allows you to define headers and footers of the result document pages (the default page header is page number).

Access Options

✓ Table Name

Set the name of the Access table, which already exists or needs to be created.

✓ Create Table if it does not exist in the database

Checked option creates the table with the given name in the result Access database.

PDF Options

Select the document font in the list at the left ('Header Font', 'Caption Font', 'Data Font', 'Footer Font') and set its properties at the right - font name, encoding, size and color. The 'Sample' box shows how the selected element will look like in the result PDF document.

✓ Grid Options

Set options for displaying the table in the result PDF document.

RTF Options

This tab is available only if the chosen export type is MS Word or RTF. It allows you to define properties of the default document font and row header font.

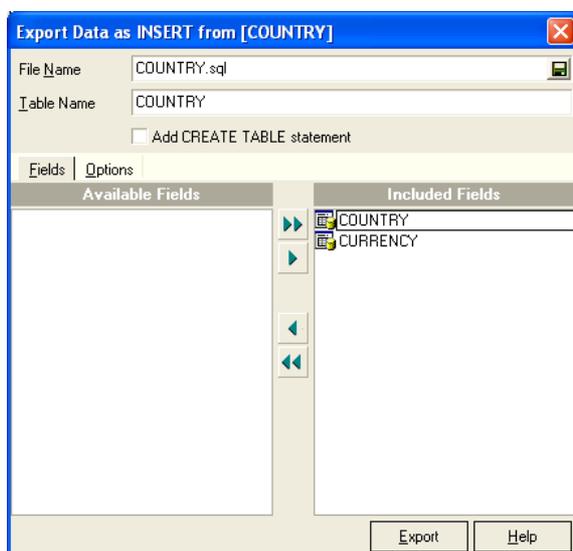
XML Options

This tab allows you to set the encoding of the result XML document and define if the result document will be standalone by checking/unchecking the 'Standalone' option.

When you are done click 'Start Export' to start export. If 'Open file after export' was checked, the result file will be opened in the appropriate program; if 'Print file after export' was checked, the result file will be printed.

Export Data Dialog is available only in the Professional Edition of IB Manager.

Export Data as INSERT Dialog



You can export data from table or query result as SQL statement INSERT to the SQL script. After that you'll be able to execute this script and load all the exported data to another table. This can be useful for data transfer, e.g. from one database to another.

To call the **Export Data as INSERT Dialog**, select the table in the **DB Explorer**, right-click and choose item 'Export Data as INSERT' from the popup menu or open the 'Data' ('Results') tab of the **Table Editor** or **View Editor (SQL Editor or Query Builder)**, click button 'Export Data as INSERT Statements'  on the toolbar or right-click and choose item 'Export As INSERT'.

First of all you should set the filename for the result

script in the 'File Name' edit field (use button  to browse for files). The default file name corresponds to the source table name and has the extension 'sql'.

The field 'Table Name' contains the name of the table to use in the result INSERT statement (e.g. INSERT into 'countries'). This name does not result the source table, it changes only the result SQL statement.

The 'Add CREATE TABLE statement' option inserts the SQL statement CREATE TABLE <table_name> to the result script before the INSERT statement. The name of the created name is defined in the 'Table Name' edit field. After checking this option the 'Create Table' tab becomes visible and active, where you can edit the statement.

On the 'Fields' tab the list of fields for export is set. All the table fields are included to the 'Included Fields' list default; if you don't want some fields to be exported, move them back to the 'Available Fields' list. To move the field from one list to another double-click it or select it (use *Ctrl* or *Shift* to select multiple fields) and click button > or <. To move all the fields click button >> or <<.

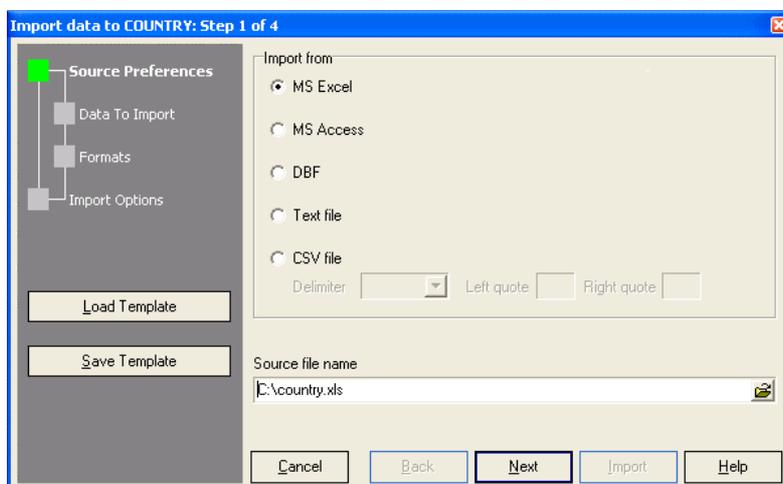
The 'Options' tab allows you to define the following export options:

- ✓ **Replace non-print characters in strings with spaces** - if this option is checked, all the non-print symbols will be replaced with spaces in the created file.
- ✓ **Insert 'COMMIT' after each ... records** - this option allows you to define the number of records, after exporting which the COMMIT statement will be automatically inserted to the created file.
- ✓ **Load script into Script Editor after export** - if this option is checked, the created file will be opened in the **Script Editor** after export.

When you are done, click 'Export' to start export. If 'Load script into Script Editor after export' was checked, the result SQL file will be opened in the **SQL Script Editor**.

Export Data as INSERT Dialog is available only in the Professional Edition of IB Manager.

Import Data Wizard



You can import data to the table from MS Excel, DBF, TXT or CSV file, using the **Import Data Wizard**. This wizard is a very powerful tool, allowing you to import data easily and quickly, and set various import options. It is based on the **EMS QuickImport Component Suite** (check <http://www.ems-hitech.com/quickimport/> for details).

To activate the **Import Data Wizard**, select the table in the **DB Explorer**, right-click and choose item 'Import Data' from the popup menu or open the 'Data' tab of the **Table Editor**, click button

Import Data  on the toolbar or right-click in the grid and choose item 'Import Data' in the popup menu.

First of all you should choose the file type and set the filename of the source file (use button  to browse for files). If you choose 'Import from CSV' then you should also select the character, delimiting columns in the source table. Click 'Next' to proceed to the next step.

Step 1 of the wizard allows you to set the correspondence between the source table columns and the database table fields. It varies for each import type.

Import from Excel

Select the database table field from the 'Fields' drop-down list and select the cells to import to this field in the grid. To select column or row in the grid, just click its caption. You can also set this value manually in the 'Cells' edit field. Then select the next field and set the cells for this field. If the source table columns (or rows) and the database table fields are ordered in the same way, you can set the correspondence automatically by clicking button 'Auto fill cols' (or 'Auto fill rows'). The first table field will correspond to the first source table column (or row), second field to the second column (row), etc. If the first rows (or columns) of the source table contains data, not intended for import, you can skip them by setting the appropriate value in the 'Skip ... row(s)' (or 'Skip ... col(s)') edit field.

Import from Access

On the first step select the data source for import - MS Access table or SQL query. If you choose import from a table, then you should select a table name from the list, if you choose to import from a query, you should set the query SQL text in the lower area, e.g.:

```
SELECT Name, Capital FROM COUNTRY WHERE CONTINENT='South America'
```

On the second step select the table field from the 'Table fields' list. Then select the corresponding field in the '<TABLE_NAME>' or 'Custom query' list.

Click button 'Add' to link these fields. These fields are added to the list at the bottom of the window. Repeat these operations for each table field. If you want to remove the accordance you set, select the linked fields in the bottom list and click button 'Remove'.

Auto fill

Use this button to set the correspondence between the Access fields and the table fields automatically. It is convenient if they are ordered in the same way. First Access field corresponds to the first table field, second Access field to the second table field, etc. If quantity of the Access fields exceeds quantity of the table fields, then the last fields have no correspondence.

Import from DBF

First select the database field from the 'Table fields' list. Then select the corresponding field in the '<table_name>.dbf' list.

Click button 'Add' to link these fields. These fields will be added to the list at the bottom of the window. Repeat these operations for each database table field. If you want to remove the accordance you set, select the linked fields in the bottom list and click button 'Remove'. If the source table fields and the database table fields are ordered in the same way, you can set the correspondence automatically by clicking button 'Auto fill'. First field of the source table will correspond to the first field of the database table, second field to the second field, etc.

Import from TXT

First select the database table field from the 'Fields' drop-down list. Then set two separator lines to delimit the source table column. Click to add a separator, double-click to delete one. Drag separators to change the column width. You can also set the column starting position and the column width manually in the edit fields 'Pos' and 'Size'. When you set the separators correctly, proceed to another field and repeat these operations for each database table field. If you don't want some first rows of the source table to be imported set the number of such rows in the 'Skip ... first line(s)' edit field.

Import from CSV

If the delimiter you have defined on the first step was found in the source table, then you will find the table columns already separated and delimited. Select the database table field from the 'Fields' drop-down list. Then click the corresponding source table column or set the 'Col' value manually. Repeat these operations for each database table field. If the source table fields and the database table fields are ordered in the same way, you can set the correspondence automatically by clicking button 'Auto fill'. First field of the source table will correspond to the first field of the database table, second field to the second field, etc. If you don't want some first rows of the source table to be imported set the number of such rows in the 'Skip ... first line(s)' edit field.

On the step 2 of the wizard you can edit the formats of the imported fields.

On the 'Base Formats' tab the following format options are available:

- ✓ **Decimal separator** - set a character, which delimits the decimal parts of the imported numbers.
- ✓ **Thousand separator** - set a character, which separates the digit groups in the imported numbers.
- ✓ **Short date format, Long date format, Short time format, Long time format** - use these edit fields to set the date and time formats.

- ✓ **Left quotation** - set a character or a number of characters, which denote quoting in the imported strings.
- ✓ **Right quotation** - set a character or a number of characters, which denote unquoting in the imported strings.
- ✓ **Quotation action** - you can select 'Add' to add quotation marks to each imported string or 'Remove' to remove all the quotation marks from the imported strings. 'As Is' saves the original quotation marks.

- ✓ **Boolean true** - set some variants of TRUE value representation in the imported table, e.g. 'Yes' or '+'. Use new line for each new variant.
- ✓ **Boolean false** - set some variants of FALSE value representation in the imported table, e.g. 'No' or '-'. Use new line for each new variant.

On the 'Data Formats' tab you can customize the format of each imported field in case when additional formatting is required. Select the field in the 'Field Name' list and set its format in the proper edit fields.

Generator - use 'Value' edit field to set the initial value of the autoincrement field and set the step of the autoincrement field in the 'Step' field. If it is 0 then the value of the generator will be ignored.

Constant - use 'Value' edit field to set the constant value of the field.

Default - set the value, which will be understood as NULL to set the default value in the 'Null' edit field and set the default value of the NULL field in the 'Default' field.

Quotation

- ✓ **Left quotation** - set a character or a number of characters, which denote quoting in the imported string.
- ✓ **Right quotation** - set a character or a number of characters, which denote unquoting in the imported string.
- ✓ **Quotation action** - you can select 'Add' to add quotation marks to the imported string, 'Remove' to remove all the quotation marks from the imported string or 'As is' to save the original quotation marks.

String conversion

- ✓ **Char case** - set the case of the imported string. 'As is' saves the original string case, 'Upper' sets the whole string to upper case, 'Lower' sets the whole string to lower case, 'UpperFirst' sets the first letter of the string to upper case, 'UpperFirstWord' sets the first letter of each word to upper case.
- ✓ **Char set** - set the char set of the imported string to ANSI or OEM. 'As is' saves the original string char set.

On the last step of the wizard the following import options are set:

- ✓ **Commit after done** - check this option to commit the transaction after import is finished.
- ✓ **Commit after ... records** - set a number of records, after importing which the transaction shall be committed.
- ✓ **Import all records** - check this option to import all records from the source table.
- ✓ **Import only ... first record(s)** - if you don't want all the records to be imported, set a number of records to import them from the source file. In this case only this number of records (beginning from the first one) will be imported.

Note, that on each step of the wizard you can use buttons 'Load Template' and 'Save Template' on the left panel, which allow you to save/restore all the import settings (file type and name, field correspondence, format options, etc.) to/from the template file. This is very useful, if you often use the same import configuration: you don't have to choose fields or edit field formats on each import session – you can simply load a previously saved template and skip all the unneeded steps.

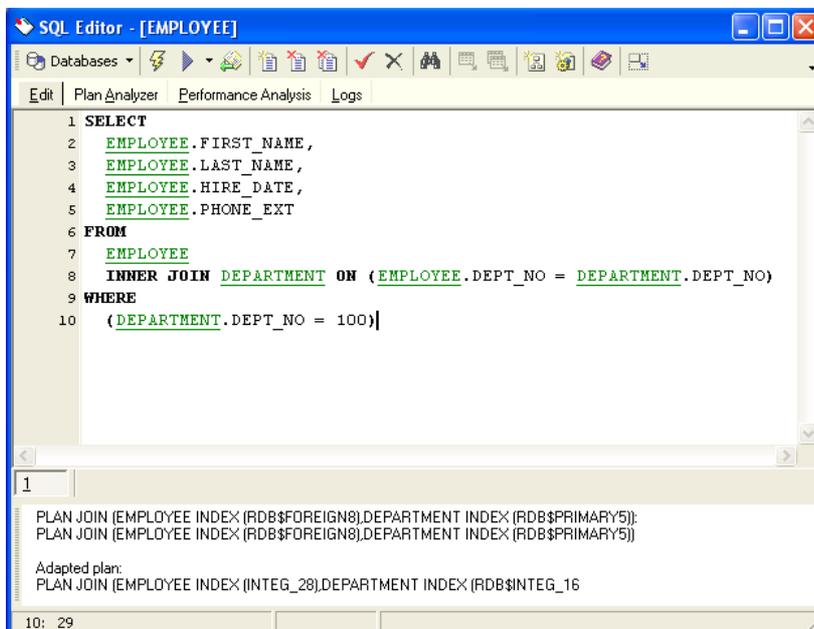
When you are done, click 'Finish' to start import.

Import Data Wizard is available only in the Professional Edition of IB Manager.

CHAPTER 7

DATABASE TOOLS

SQL Editor



SQL Editor is the basic IBM Manager tool for creating and executing database queries. It allows you to create and edit SQL text for the query, prepare and execute queries and view the results of execution.

'Edit' Tab

The **Edit** area is provided for working with the text of the query. For your convenience the Quick Code system is enabled, i.e. when you type first word symbols in the SQL text editor you are offered some variants for the word completion in a popup list

(analogue of the **Code Insight** in **Delphi IDE**). You can activate these popup lists yourself by pressing the following key combinations:

Ctrl+Space	All SQL keywords and database objects
Ctrl+Alt+S	SQL glossary

Ctrl+Alt+T	Table list
Ctrl+Alt+P	Procedure list
Ctrl+Alt+V	View list
Ctrl+Alt+E	Exception list
Ctrl+Alt+U	UDF list
Ctrl+Alt+G	Generator list
Ctrl+Alt+M	Procedure parameter list
Ctrl+Alt+D	Domain list
Ctrl+Alt+F	Field list

Database objects are highlighted in the text. You can open the proper object editor by clicking the object name in the text, holding button *Ctrl* pressed on the keyboard.

The popup menu of the edit area contains standard functions for working with the text (Cut, Copy, Paste, Find, Replace, Toggle Bookmarks, etc) and also functions for processing the whole query, which allow you to execute/prepare query, save/load query to/from file, and preview/print query.

When the query text is ready, click button **Prepare Query**  on the toolbar or press Ctrl+F9 to check the query text for errors. If there are any errors in the query text, these errors will be displayed in the bottom area of the editor window, and the text line, containing the first error, will be marked with a purple line.

If the text is correct, you can execute the query by clicking button **Execute** on the toolbar. This will display the **Results** page.

'Results' Tab

This page becomes available after the query is executed. It displays the result data returned by the query. They can be viewed in three modes (chosen by clicking the according button at the bottom of the window):

- ✓ **Grid View** - view data as a grid;
- ✓ **Form View** - view data as a form: there is only one record displayed at the time, to view another record use the navigation buttons.
- ✓ **Print Data** - view data in WYSIWYG mode, ready for printing. The acquired query can be saved to file and/or printed.

These data can't be edited, but can be exported ('Export Data' item in the popup menu or button  on the toolbar) or exported as INSERT statement to the SQL Script ('Export as Insert' item in the popup menu or button  on the toolbar).

The status bar displays the number of records, acquired while executing the query.

Other SQL Editor Tabs

The **Performance Analysis** page displays the information of the query output. To make it available you should execute query at least once. Clicking the according buttons at the bottom of the page switches the following modes: **Reads, Updates, Deletes, Inserts, Summary**. In the **Summary** mode you can copy the analysis results to the clipboard. The following information is also displayed: time, required for the queries; computer memory use; statements executed. You can sort information, displayed in a grid, by clicking the column titles.

On the **Logs** page information of all the executed statements, including queries and carried out transactions, is displayed. In the comment bar execution date and time are displayed.

To select the database for the query, click button **Select a Database**  on the toolbar and select the required database from the drop-down list of the available databases. The alias of the selected database will be displayed in the window caption.

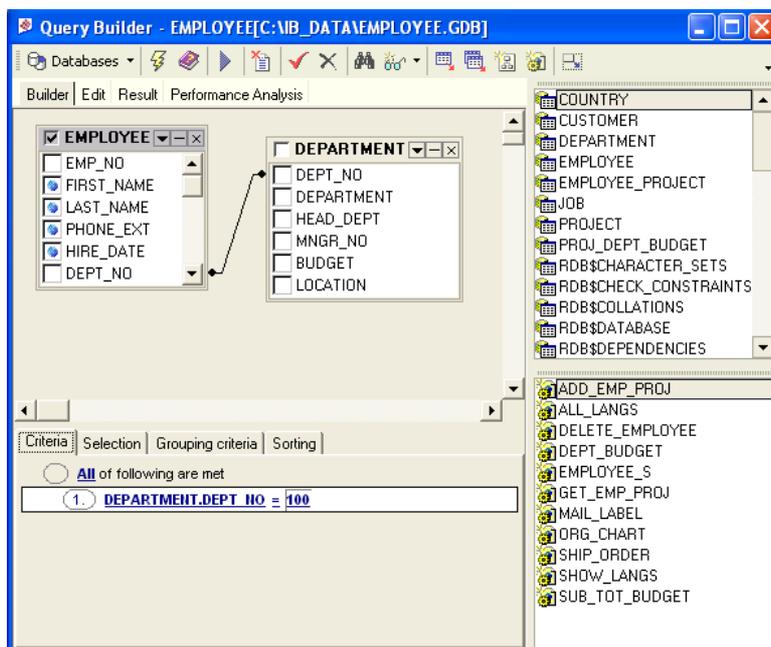
To create new query, click button **New Query**  on the toolbar. The clear query will be available on the 'Edit' page (note, that the old query will not be deleted; you can activate it using button with the query number at the bottom of the edit area).

To delete the current query, click button **Delete Current Query**  on the toolbar; to delete all the queries, click button **Clear All History** .

To commit or rollback the current transaction, click button **Commit Transaction**  or **Rollback Transaction**  in accordance.

To create a procedure or a view for the current query, click button **Create Procedure**  or **Create View from Table**  in accordance.

Visual Query Builder



Visual Query Builder is provided for visual building database queries. It allows you to create and edit queries without knowledge of SQL, prepare and execute queries, and view the results of the execution.

Building Query

The main area of the **Query Builder** is the **Builder** area. Here you can build your query by placing the database objects (tables, views and procedures) on the area, selecting the required data and setting links between objects.

To add a table, a view or a procedure to the query, choose the required object in the table or procedure list at the right, then double-click it or drag it to the **Builder** area. The selected object will appear on the **Builder** area with the list of its fields (or procedure parameters). To include an object field (or a procedure output parameter) to the query, click at the left of the field name in the list or double-click it to set the blue icon next to the field name. To include all the fields, set a flag at the left of the object alias. To remove the fields from the query, uncheck the fields; to remove the object, close it by clicking the button 'x' next to the object alias. To edit the object alias, double-click the alias.

To associate database objects by two fields, just drag one field from the object list to another. This will set a link between these objects by the selected fields. When you drop a field, a line will appear

between the linked fields. You can view and edit the properties of object association. To do that, aim cursor to the link line. A hint, containing the association condition, will appear. To edit the properties, double click the line or right-click and choose **Properties** item from the popup menu. A dialog window will appear, where you can change the association condition by choosing it from the list (=, >, <, >=, <=, <>). Also you can check or uncheck **Include all from <object_name>** option for each object, included into the association. Click 'OK' to confirm the changes you made. To drop a link between objects, right-click on the link line and choose **Delete Link** item from the popup menu. To delete all the links of some object, click button '-' next to the object alias. To insert a point to the link line, right-click on the line and choose **Insert Point** item from the popup menu. A new point will appear, using which you can move the link line. It doesn't cause any changes in the query but makes the diagram performing more obvious and the visual building handler.

Setting Query Properties

To set other query properties, use tabs at the lower part of the window.

On the **Criteria** page you can set the selection conditions. To add a condition, click button at the left and select 'Add condition' in the popup menu. Edit the condition by clicking its parts and setting their values. Clicking the button at the left of the condition string activates the popup menu, which allows you to add a new condition of the same enclosure level, add a new enclosure level, delete the current condition, open or close the condition, if it is composite. A simple condition string contains three fields: an argument, a condition and a second argument (if required for the condition). Clicking each field allows you to set its value. Clicking the argument field allows editing it as a text field. You can set a table name or a definite value in this field. Right-clicking the field in the edit mode activates the popup menu, which contains the **Insert Field** function (also called by Shift+Enter). This function allows you to choose a field from the list of all the table fields, available in the query. Clicking the condition field activates the popup menu, where you choose the condition you need. The way of proceeding the condition is set in the upper string of the area (All, Any, None, or Not all of the following are met). Click the underlined word to change it.

The **Selection** page displays the output fields of the query. It allows you to edit the names of the query output fields, set their displaying order and set the aggregate functions (SUM, MIN, MAX, AVG, and COUNT) for each field. To remove the field from the list, right-click the field row and choose 'Delete current row' from the popup menu. To change the input query field, double click it and then type the field name on the keyboard or choose it from the drop-down list. To change the output query field name, double click it and type the field name on the keyboard. To set the aggregate function for the field, double click the field row in the **Aggregate** column and then type the function name on the keyboard or choose it from the drop-down list. If you check option 'Include only unique records' then the repeated records will not be included into the query result.

On the **Grouping Criteria** page you can set the conditions for grouping the query records. They are set in the same way as the selection conditions (see above). These conditions will be included into the HAVING statement of the current query.

Set the way of sorting the query records on the **Sorting** page. The field list at the left represents all the output query fields; the list at the right contains fields, by which the query records will be sorted. To move the field from one list to another, drag the selected field or use buttons 'Add' and 'Remove'. To change the sorting order, select a field in the right list and move it using buttons 'Up' and 'Down'. To change the sorting direction, select a field in the right list and switch the direction (Ascending, Descending) using button 'A..Z'/'Z..A'.

When the query is ready, click button **Prepare Query**  on the toolbar or press Ctrl+F9 to check the query for errors. If there were any errors in building the query text, you will get the appropriate message, describing the error. If everything is correct, you can execute the query by clicking button **Execute**  on the toolbar. This will display the **Results** page.

'Results' Tab

This page becomes available after the query is executed. It displays the result data returned by the query. They can be viewed in three modes (chosen by clicking the according button at the bottom of the window):

- ✓ **Grid View** - view data as a grid;
- ✓ **Form View** - view data as a form: there is only one record displayed at the time, to view another record use the navigation buttons.
- ✓ **Print Data** - view data in WYSIWYG mode, ready for printing. The acquired query can be saved to file and/or printed.

These data can't be edited, but can be exported ('Export Data' item in the popup menu or button  on the toolbar) or exported as INSERT statement to the SQL Script ('Export as Insert' item in the popup menu or button  on the toolbar).

The status bar displays the number of records, acquired while executing the query.

Other Query Builder Tabs

On the **Edit** page the query text is automatically generated while you build query. You can edit this text according to the rules of SQL, and all the changes will be displayed on the other pages of the **Query Builder**.

The **Performance Analysis** page displays the information of the query output. To make it available you should execute query at least once. Clicking the according buttons at the bottom of the page switches the following modes: **Reads, Updates, Deletes, Inserts, Summary**. In the **Summary** mode you can copy the analysis results to the clipboard. The following information is also displayed: time, required for the queries; computer memory use; statements executed. You can sort information, displayed in a grid, by clicking the column titles.

To select the database for the query, click button **Select a Database**  on the toolbar and select the required database from the drop-down list of the available databases. The alias of the selected database will be displayed in the window caption.

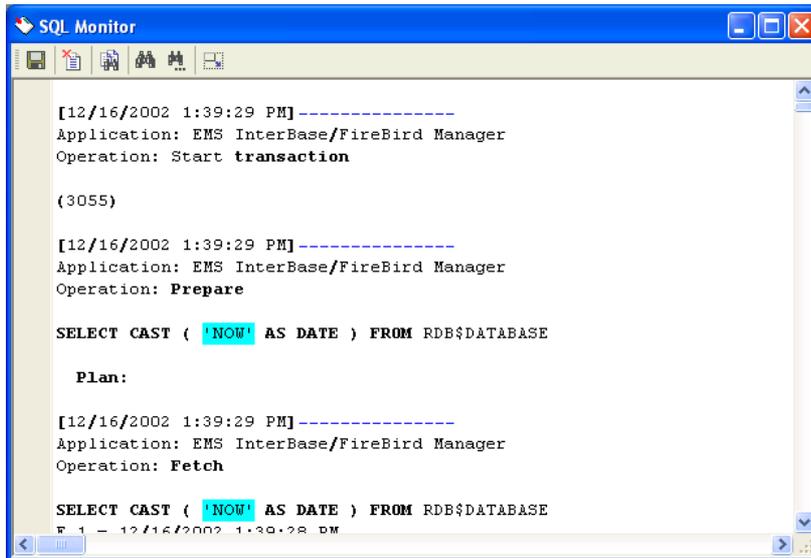
To commit or rollback the current transaction, click button **Commit Transaction**  or **Rollback Transaction**  in accordance.

To clear the current query, click button **Clear Current Query**  on the toolbar.

To hide the table or the procedure list at the right of the window, click button 'View' on the toolbar and uncheck the appropriate item in the drop-down menu.

To create a procedure or a view for the current query, click button **Create Procedure**  or **Create View from Table**  in accordance.

SQL Monitor



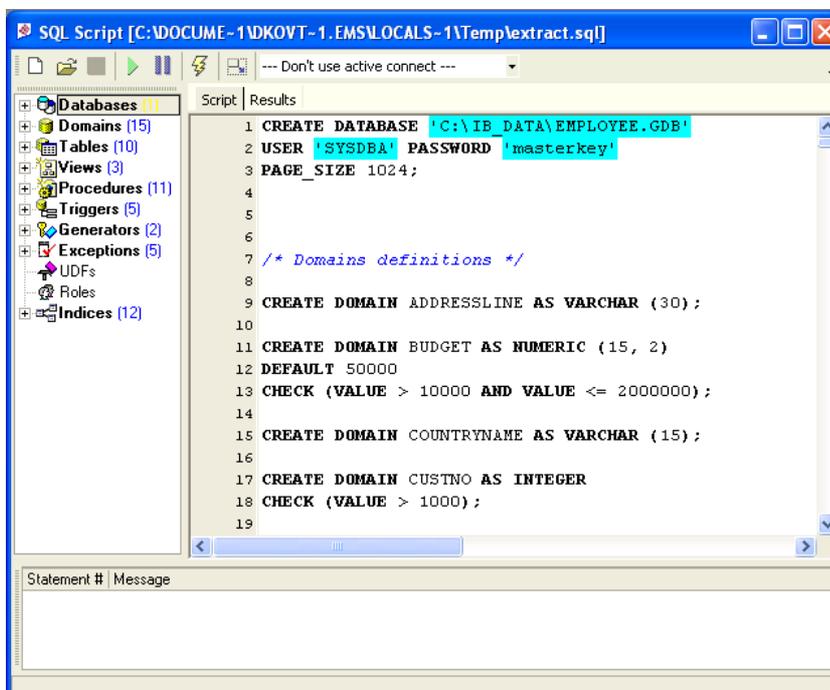
SQL Monitor allows you to view the SQL code of all the operations executed over databases and database objects in IB Manager. The content of the window can't be edited, but can be copied to the clipboard, saved to the text file or printed.

To save the content, click button **Save**  on the toolbar.

To clear the content, click button **Clear Content**  on the toolbar.

The popup menu of **SQL Monitor** provides standard functions for searching text in the window, copying it to the clipboard and printing the content of the window.

SQL Script Editor



Using this editor, you can view, edit and execute SQL scripts.

In the **Script** area you can view and edit the SQL script text. You can use quick code to fasten this process: when you type the first word symbols in the edit area, you are offered some variants for the word completion in a popup list (analogue of the **Code Insight** in **Delphi IDE**).

The popup menu of the edit area contains standard functions for working with the text (Cut, Copy, Paste, Find, Replace, Toggle Bookmarks, etc) and also functions for processing the script, which allow you to

save/load script to/from file, and preview/print query.

The **Object Explorer** at the left of the window displays the tree of objects, used in the current script and allows you to get to the needed script fragment quickly by clicking the object in the tree.

To change the database for the script, use the drop-down menu on the toolbar. If you choose '-Don't use active connect-' then the executed script must contain statement CREATE DATABASE or CONNECT TO DATABASE.

To load the script from the *.sql file, click button **Open Script File**  on the toolbar; to save script, click **Save Script** . To create the new script, click button  on the toolbar.

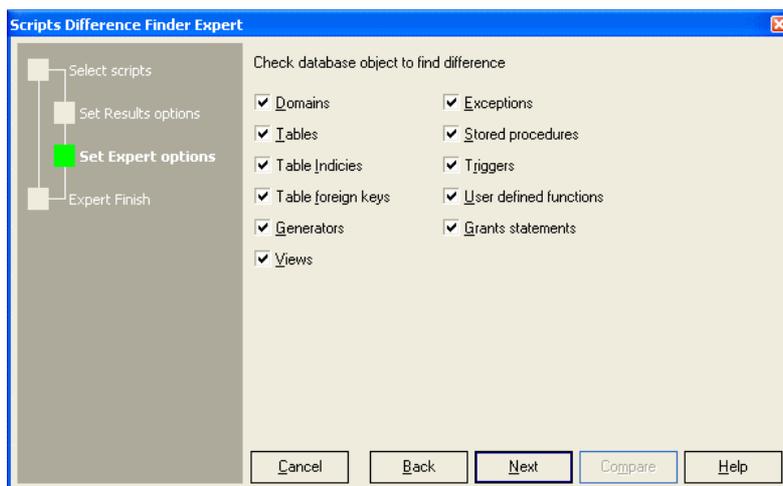
To execute the script, click button **Execute** . You can also execute script right from the file without opening it by clicking button **Execute Script from File** . To stop executing script, click button **Stop Script** .

The results of executing the script are displayed on the **Results** page. This text can't be edited, but can be copied to the clipboard.

The errors in executing the script are displayed in the bottom area of the window. The popup menu of this area allows you to copy the selected error message or to copy all the error messages.

If you want the script to be aborted on errors, check option 'Abort Script on Error' in the **Environment Options** window on **Tools: SQL Script** page. In the case of successful executing the script you will receive message, informing you about the execution time.

Compare SQL Scripts



The **Script Difference Finder Expert** guides you through the process of comparing the database scripts, allowing you to reveal the differences in the different database objects.

Select Scripts

On this page you should set paths for the target and etalon script files in the proper edit fields (you can use buttons .

Set Results Options

On this page you should set the path to the result script file (default C:\PROGRAM FILES\EMS\IB Manager\results.sql) and to the text file, containing warnings, acquired while comparing the scripts (default C:\PROGRAM FILES\EMS\IB Manager\warnings.txt). You can use buttons  to fasten this process.

Option 'Load the result file into SQL Script Editor' allows you to load the result file into the **SQL Script Editor** right after the comparing is finished.

Set Expert Options

On this page you should check the checkboxes of the database objects, in which you want to find the difference.

Expert Finish

On this page you can view the database objects, being compared. Click 'Compare' to start comparing the scripts.

Monitor of Tables Altering

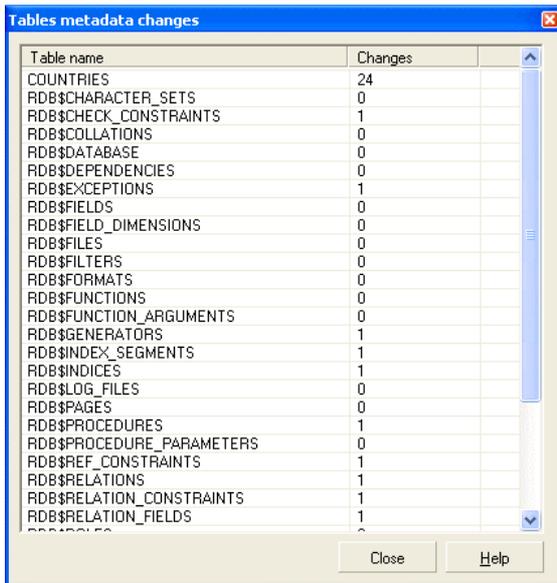
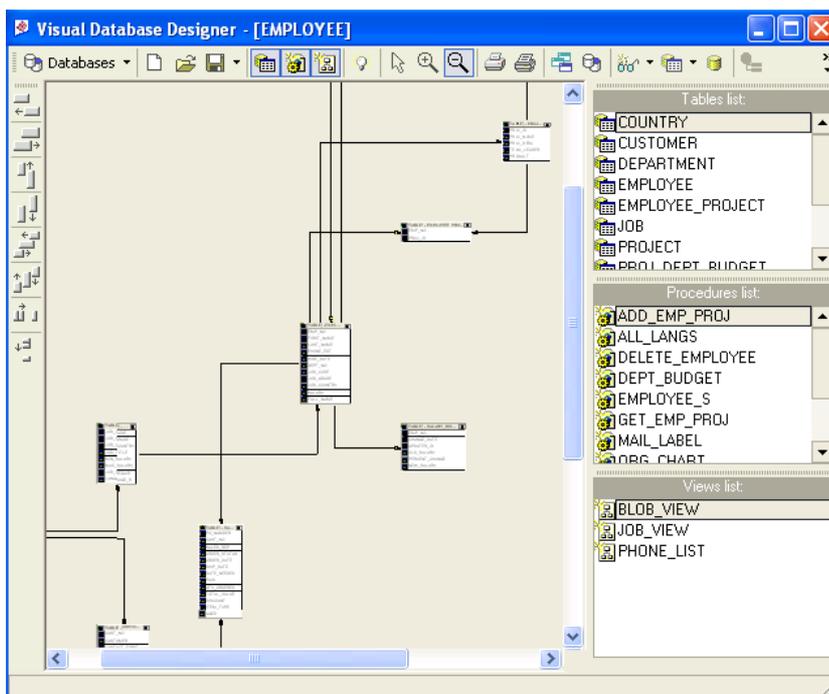


Table name	Changes
COUNTRIES	24
RDB\$CHARACTER_SETS	0
RDB\$CHECK_CONSTRAINTS	1
RDB\$COLLATIONS	0
RDB\$DATABASE	0
RDB\$DEPENDENCIES	0
RDB\$EXCEPTIONS	1
RDB\$FIELDS	0
RDB\$FIELD_DIMENSIONS	0
RDB\$FILES	0
RDB\$FILTERS	0
RDB\$FORMATS	0
RDB\$FUNCTIONS	0
RDB\$FUNCTION_ARGUMENTS	0
RDB\$GENERATORS	1
RDB\$INDEX_SEGMENTS	1
RDB\$INDICES	1
RDB\$LOG_FILES	0
RDB\$PAGES	0
RDB\$PROCEDURES	1
RDB\$PROCEDURE_PARAMETERS	0
RDB\$REF_CONSTRAINTS	1
RDB\$RELATIONS	1
RDB\$RELATION_CONSTRAINTS	1
RDB\$RELATION_FIELDS	1

This window allows you to view the number of changes in table and view metadata. InterBase allows editing table or view metadata up to 255 times, after reaching this limit backup and restoring the database is recommended.

Visual Database Designer



Visual Database Designer is provided for visual management of the database objects. It allows you create, edit and drop tables and table fields, set links between tables, edit and drop procedures and views, and so on.

To call the designer select the **Tools | Visual Database Designer** menu item.

On the right of the window lists of database objects: tables, procedures, and views are placed. To display these lists drop the buttons on the control panel **Show Available Tables**, **Show Available Procedures**, and

Show Available Views accordingly. To add an object to the diagram, double-click its alias in the list or drag it to the main area. Then the object will appear in the main area with the list of all its

fields (or procedure parameters). You can change the display mode of the object by clicking button **<Object_Type> menu** in the object caption (e.g. **Table menu** in the table caption) and selecting the proper item from the drop-down menu. Item 'Captions only' displays only the object caption; 'Short' displays object with the list of object fields; 'Full' displays also the field type and domain. Checking 'Autosize' locks the object size. To remove the object from the diagram, click button 'r' in the object caption.

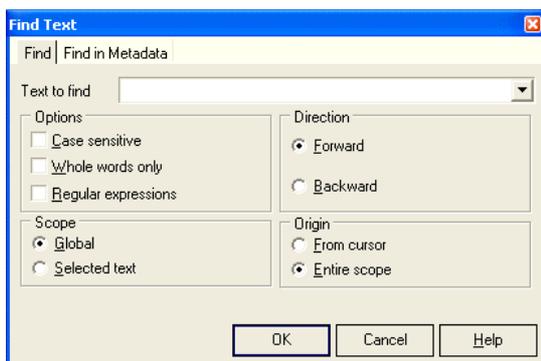
Clicking the object caption makes this object active. To select multiple objects, use button *Shift* or move mouse with the left button pressed to select the objects you need. Double-clicking the object caption activates the proper object editor. Right-clicking the object caption activates the popup menu, which allows you to hide object (remove it from the diagram), refresh object, edit current object in the proper object editor or drop object. The table popup menu also allows you to create a table and to create a constraint for the table in the **Constraint Editor**. Right-clicking in the field list of the table activates popup menu, which allows you to add a new field, edit the selected field in the **Field Editor**, drop the selected field and set the selected fields (multiple fields can be selected with the *Ctrl* button) as primary key. Checking item 'Visible' in the popup menus of table and view lists or procedure parameters makes the field available for printing (default checked).

Right-clicking in the main area activates the popup menu, which allows you to arrange objects (this sets the zoom value automatically so that the objects fit in the main area best), add all the database objects to the diagram (**Reverse Engineer**) and create a new table. If there are objects selected in the area, you can drop all these objects or hide them, if there is an object selected, you can also edit it, if there is a table selected, the 'Create Link' item is available, which allows you to create a constraint for the table.

To create a foreign key for the table, drag one of the table fields to the field from another table. The **Constraint Editor** will be activated with all the parameters set for creating a foreign key by these keys.

Buttons at the left of the window allow you to align the diagram objects in the way you like.

Find Text Dialog



This dialog allows you to search for the needed text in any edit or view area of IB Manager, e.g. in a query text or object DDL.

Set the text to find in the 'Text to Find' edit field.

Set the following search options:

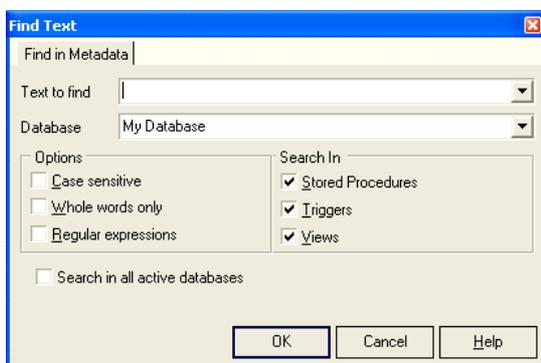
- ✓ **Case Sensitive** - if this option is checked, symbol case is taken into consideration when searching.
- ✓ **Whole words only** - if this option is checked, only whole words, which accord to the given sample, are searched.

- ✓ **Regular Expressions** - this option recognizes regular expressions in the search string.
- ✓ **Directions** - using this switch you can set the search direction you need (forward or backward).
- ✓ **Scope** - this switch allows you to choose the search area: the whole text or just the selected.
- ✓ **Origin** - this switch allows you to set the search mode: from the cursor position (in the set direction) or from the beginning (the end) of the text.

When all the options are set, click 'OK'. If the needed text is found, it will be selected in the edit or view area. If the text wasn't found, a message window 'String not found!' will appear.

If the dialog was activated from the editor window, an additional page for searching in metadata will appear.

Search in Metadata



This dialog allows you to find the needed database metadata quickly.

Set the text to find in the 'Text to Find' edit field. Select the database from the 'Database' drop-down list or check option 'Search in all active databases' to search all the databases.

Set the following search options:

- ✓ **Case Sensitive** - if this option is checked, symbol case is taken into consideration when searching.
- ✓ **Whole words only** - if this option is checked, only whole words, which accord to the given sample, are searched.
- ✓ **Regular Expressions** - this option recognizes regular expressions in the search string.
- ✓ **Search In** - here you can enable or disable searching in the database objects (Stored Procedures, Triggers, and Views) by setting the according flags.
- ✓ **Search in all active databases** - if this option is checked, all the active databases will be searched. In this case **Database** select field will be blocked.

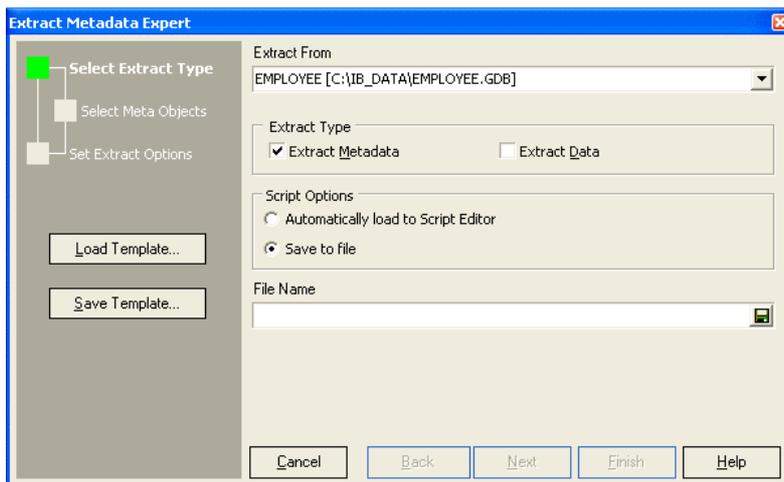
When all the options are set, click 'OK'. If the required text was found, the report window **Search in Metadata** [text to find] will appear. It contains the tree of current database objects, where the given text is met. You can select the object and its text will be displayed in the view area. The enclosed object branches allow you to go to the fragment, containing the needed text, quickly. The area content can be selected and copied to the clipboard.

Extract Metadata Expert

Using the **Extract Metadata Expert** you can extract the database metadata and table data.

Select Objects

Select Extract Type. On this step you choose the database, from which data will be extracted, and the extracted data type (metadata or table data). Also you have to choose, if the extract results should be loaded into the **Script Editor** automatically or they should be saved into the file (in this case you should set the file name). When you are done, click 'Next' to continue.



Select Meta Objects. This page will be available only if you choose **Extract Metadata**. Here you should choose metadata to be extracted. To choose the objects you need select the database object type from the drop-down list and move objects from one part of the window to another, using buttons, by double-clicking or dragging them. The **Extract All** option allows you to extract all the metadata from the database. If you want to return to the previous page, click 'Back'.

Select Data Objects. This page will be available only if you choose **Extract Data**. Here you should choose the tables, which data should be extracted. To choose a table, move it from one part of the window to another, using buttons, by double-clicking or dragging it.

Set Extract Options. On this step you should set the extract options.

General Options

Generate 'create database' statement - if this option is checked, the statement 'create database' will be added to the generated SQL script.

Include Password in 'connect' and 'create database' statements - if this option is checked, the password will be included into the statements 'connect' and 'create database'.

Metadata options

Generate Drop statements - if this option is checked, the 'Drop' statements will be added to the generated SQL script.

Set Generators - this option allows you to set generators in the extracted metadata.

Include Object Descriptions - this option allows you to include object descriptions into the extracted metadata. Note that if you check this option, the result script will be possible for executing only by IB Manager, because there is no statement 'Describe' in the standard InterBase.

Include Privileges - this option allows you to include privileges into the extracted metadata.

Data Options

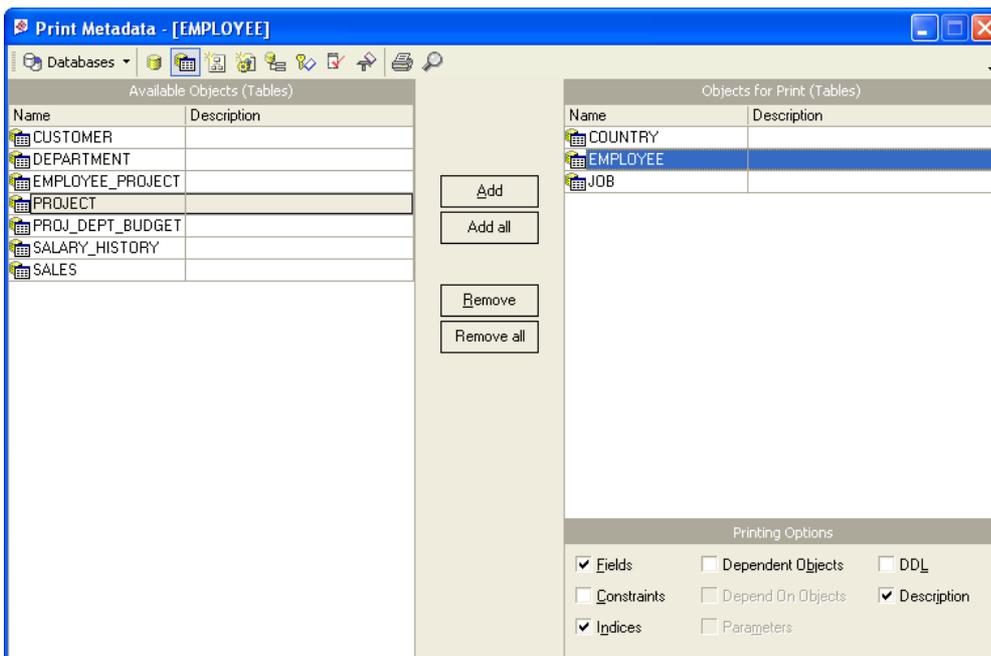
Commit after ... records option allows you to set the number of records after extracting of which auto commit will be executed.

You can save the extract configuration (extract type, meta and data objects, extract options) for future use as a template. Just click button **Save Template**  on the left panel and set the template name. Next time you will be able to configure your extract quickly by clicking the button **Load Template**  and choosing the appropriate previously saved template.

When you are done, click 'Extract'.

Print Metadata

This window allows you to print the metadata of any database object. Select the type of the database objects to print (Tables, Procedures, Views, etc.), using buttons on the toolbar. Move the objects from the list **Available...** to the list **...for Print**, using buttons 'Add', 'Add all', 'Remove' and 'Remove all', by double-clicking or dragging them (multiple objects can be selected using buttons *Ctrl* and *Shift*).

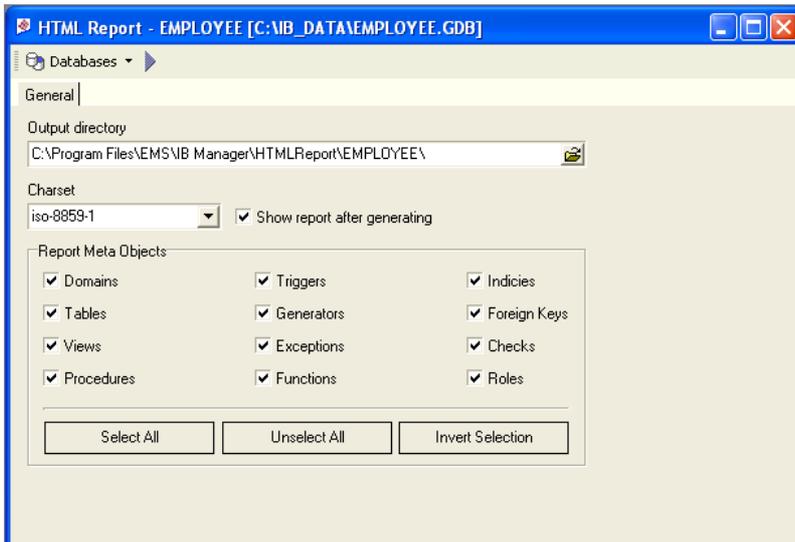


To print the required database object metadata, select the object in the **...for Print** list and check the metadata to print at the bottom of the window. You can check a group of objects using the *Ctrl* and *Shift* buttons and check metadata for all the selected objects.

Button **Print**  on the control panel prints the selected metadata; button **Preview**  enables the metadata preview mode.

Print Metadata is available only in the Professional Edition of IB Manager.

HTML Report



HTML Report allows you to generate a detailed HTML report about the selected database metadata.

To call the **HTML Report** window select the **Tools | HTML Report** menu item.

- ✓ **Output directory** - select the directory for storing the result HTML files.
- ✓ **Charset** - set the character set for the result files.

- ✓ **Show report after generating** - this option opens the result report in your default browser after generating.
- ✓ **Report Meta Objects** - select the objects to include in the report - domains, triggers, etc.
- ✓ **Select All** - selects all the objects for report.
- ✓ **Unselect All** - unselects all the objects.
- ✓ **Invert Selection** - makes the selected objects unselected and vice versa.

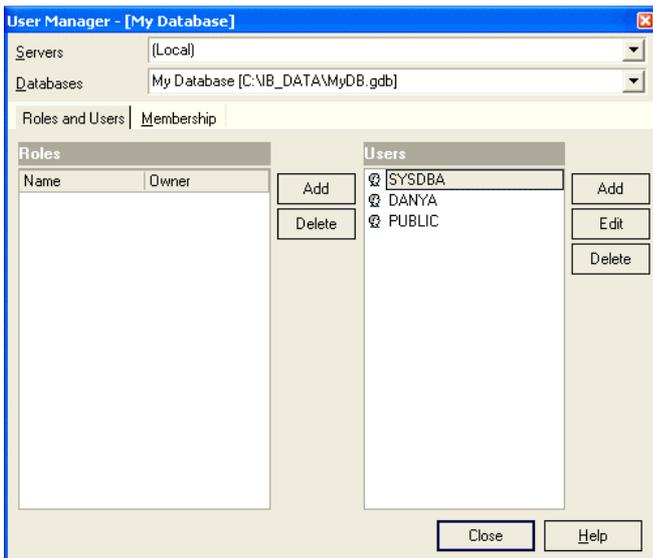
To select a database for report, click the **Databases** button on the toolbar. To start reporting click the **Generate HTML Report** button on the toolbar. The report *.html files are created in the **Output Directory**. If **Show report after generating** checked, the index file is opened in your default browser after generating.

User Manager

User Manager is provided for administrating database users and their roles. Using the drop-down lists you should choose server and database you want to administrate.

'Roles and Users' Tab

In the left part of the window you can add new roles and delete existing ones, using buttons 'Add' and 'Delete'. In the right part you can define new users, edit their properties and delete them. When creating or deleting a role a window with the proper SQL statement will appear. You can edit this statement if necessary. Click 'Commit' to confirm creating or deleting a role, 'Rollback' to cancel it or 'Rollback and Recompile' to recompile with the changes you made.



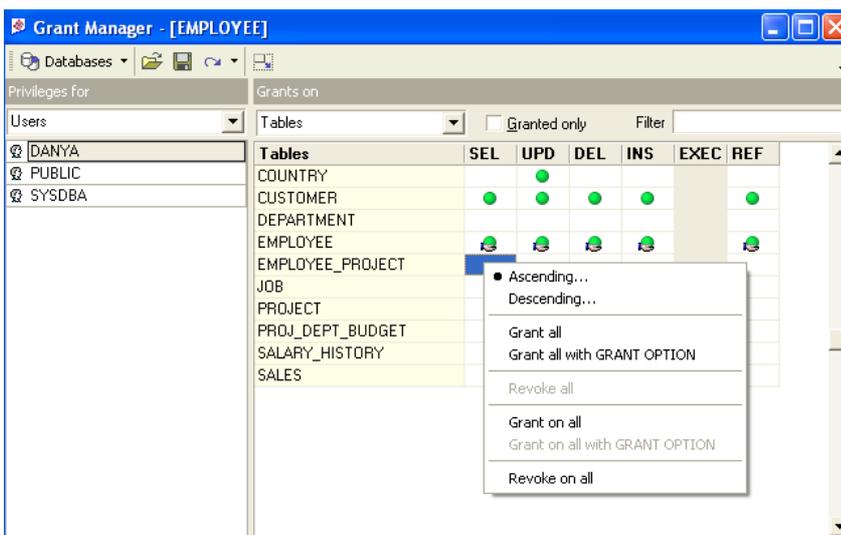
'Membership' Tab

On this page you can give the necessary roles to the users. Select the user name in the left part of the window ('Users') and move the role you want to give to this user from the middle part ('Not Member of') to the right ('Member of'), using buttons >, <, >>, <<, by double-clicking or dragging it.

Note! To create, edit and delete users and roles you should have the rights of server administrator.

Grant Manager

The **Grant Manager** allows you to set the access grants for users, roles and database objects.



Choose the database to set the access for from the drop-down list at the top of the window you. Then choose the type of object (User, Role, View, Trigger or Procedure), to set the privileges for from the drop-down list 'Privileges for', and choose the type of object, to set the access grants on, from the drop-down list 'Grants on'.

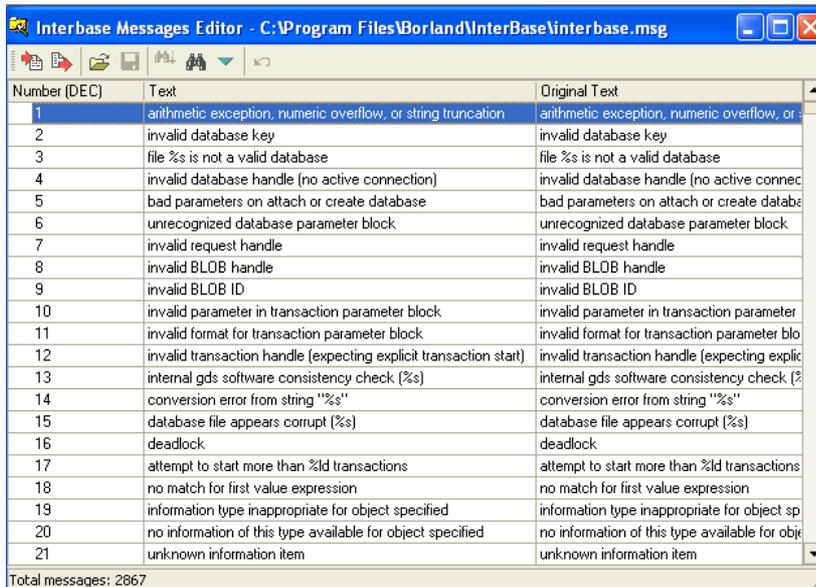
The object grants are displayed in the grid, where rows are the database objects and the

columns are the operations (Select, Update, Delete, Insert, Execute and Reference). The green icon in the grid means that the access is granted for the current operation over the database object. To set the access grants, right-click in the cell you need and select 'Grant' or 'Revoke' from the pop-up menu.

If you check option 'Granted only', then only the granted objects will be displayed in the grid. You can also use filter in the upper right corner of the window to display only the objects you need. E.g. to display objects, which names begin from 'c' letter, type 'c' in the filter edit field.

To fasten the process of setting the access grants you can use the grant templates. Click button **Save**  on the 'Grant Templates' panel to save the current access configuration. To load the template file, click button **Load** , then click 'Apply' to apply the loaded template.

Localize IB Messages



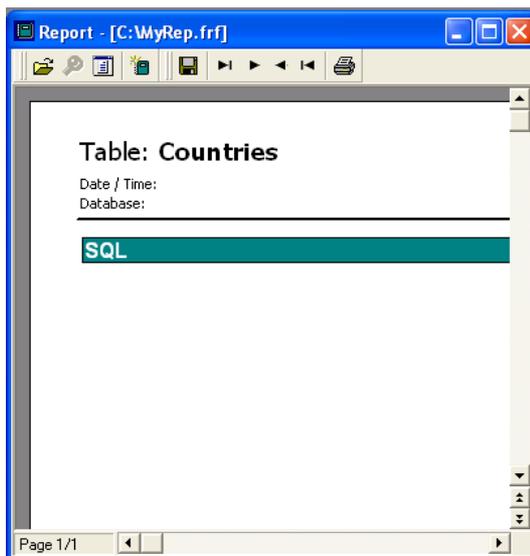
This window allows you to translate the InterBase messages to your native language. The messages are displayed in form of a grid, where the first column is the message number, the second is the message text, available for editing, and the third – the original message text. Double clicking the message text activates the editor window. Clicking the first column caption switches the message number format from decimal to hexadecimal.

You can load IB messages from file using button **Open Message File**  on the toolbar or import them from the text file using button **Import from Text** .

After you are done editing the messages, you can save them to file using button **Save Messages**  on the toolbar, or export them to the text file using button **Export To Text** .

Other toolbar buttons and the popup menu of this window allow you to find the message text quickly, go to the message with the given number and revert the message text to the original.

Report Manager



Report Manager allows you to create and edit reports. The window of **Report Manager** is divided into two parts: object explorer area, using which you can open saved reports quickly, (you can close it if you don't need it) and view area.

To create a new report, click button **New Report**  on the toolbar, then design your report in the FastReport report designer.

To load a report from file, click button **Open Report from File**  on the toolbar. To edit this report using FastReport click button **Design Report** .

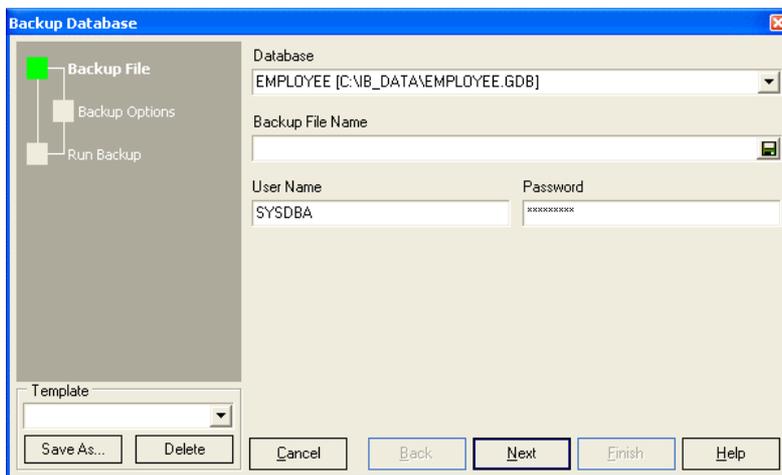
When you are done editing the report, you can save it to file, using button **Save Prepared Report**  on the toolbar, or print it by clicking button **Print Report** . To preview the report before printing click **Show Report** .

Using navigation buttons on the control panel you can switch the report pages. Clicking right mouse button in the report view area activates popup menu, using which you can change the view scope.

CHAPTER 8

DATABASE SERVICES

Backup Database



The **Backup Database Wizard** allows you to create a reserve copy of the database, saving it to file. To activate the wizard choose the menu item **Services | Backup Database**.

In this window three pages are available: **Backup File**, **Backup Options** and **Run Backup**. On the **Backup File** page you should choose the database you want to backup from the drop-down list and set the file name to save the database

to. When you are done with it you can start backup by clicking 'Backup' or go to the options page by clicking 'Next'.

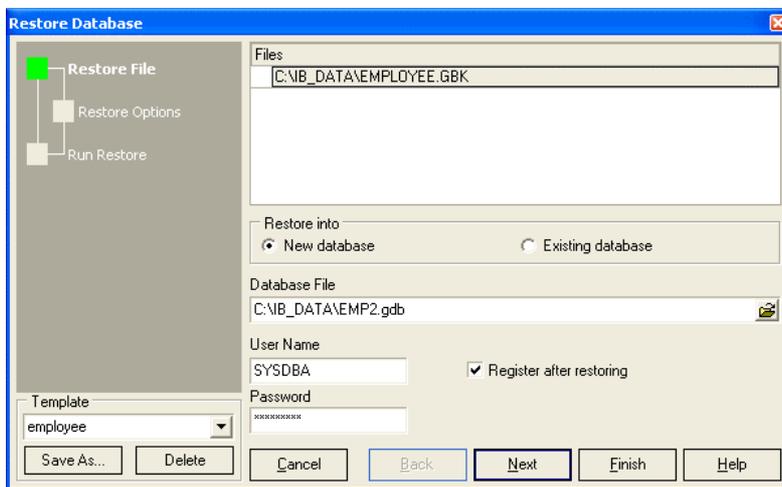
Backup Options

- ✓ **Ignore check sum** - if this option is checked, wrong check sums of the database header pages, where the database connection properties are stored, will be ignored in backup.
- ✓ **Ignore transaction in Limbo** - if this option is checked, transactions in limbo, i.e. transactions, that can't be defined as executed or aborted, are ignored in backup.

- ✓ **Backup Metadata only** - if this option is checked, only database metadata will be saved into the file.
- ✓ **Garbage collection** - if this option is checked, garbage collection will be executed in backup.
Old metadata description - if this option is checked, old metadata descriptions will be included to the reserve database.
- ✓ **Convert to Tables** - this option allows you to convert database data to tables in backup.
- ✓ **Format** - this option allows you to choose the data format for the reserve database.
- ✓ **Verbose** - if this option is checked, you will receive an extended report about the current database backup process. You also can choose if this report will be displayed on screen or saved to file.

When you are done, you can return to the previous page by clicking 'Back' or start backup by clicking 'Backup'. **Run Backup** page will be activated, where the backup course will be displayed.

Restore Database



The **Restore Database Wizard** allows you to restore the database, saved in advance, from file. To activate the wizard choose the menu item **Services | Restore Database**.

In this window three pages are available: **Restore File**, **Restore Options** and **Run Restore**.

On the **Restore File** page you should define a file or a number of files to restore the database from. You can do it by double clicking the grid row

at the top of the window and set the full file name (you can also use button ) . Then you should choose if the data would be restored to the new database or to the existing one. If you choose **New database**, you should set the database file name ) , if **Existing Database** - select the database from the drop-down list. Set the user name and the password in the proper edit fields at the bottom of the window. Now you can start restoration by clicking 'Restore' or go to the options page by clicking 'Next'.

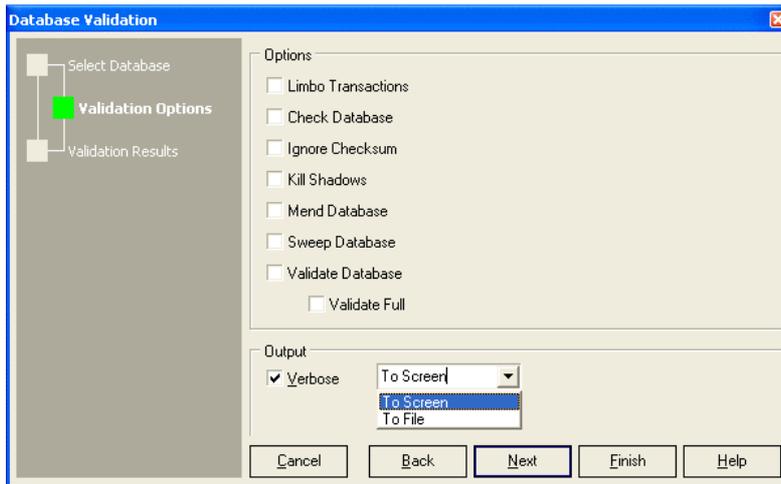
Restore options

- ✓ **Deactivate indexes** - if this option is checked, database indices will be deactivated while restoring.
- Don't recreate shadow files** - if this option is checked, shadow files will not be recreated while restoring.
- Don't enforce validity conditions** - if this option is checked, database validity conditions will not be restored.
- ✓ **Commit after each table** - if this option is checked, IB Manager will commit work after restoring each table.
- ✓ **Replace existing database** - if this option is checked, the restored database will replace the existing one.
- ✓ **Page size** - database page size in bytes.

- ✓ **Verbose** - if this option is checked, you will receive an extended report about the current database restoration process. You also can choose if this report will be displayed on screen or saved to file.

When you are done, you can return to the previous page by clicking 'Back' or start restoration by clicking 'Restore'. **Run Restore** page will be activated, where the restoration course will be displayed.

Database Validation



The **Database Validation Wizard** allows you to validate the database for verifying the integrity of data structures. To activate the wizard choose the menu item **Services | Database Validation**.

In this window three pages are available: **Select Database**, **Validation Options** and **Validation Results**. On the first page select a database to validate from the drop-down list. Now you can start retrieving by clicking 'Validate' or go to the options page by clicking 'Next'.

Validation options

- ✓ **Transactions in Limbo** - if this option is checked, the database is checked on transactions in limbo, i.e. transactions, that can't be defined as executed or aborted.
- ✓ **Check Databases**
- ✓ **Ignore Checksum** - a checksum is a page-by-page analysis of data to verify its integrity. A bad checksum means that a database page has been randomly overwritten (for example, due to a system crash).
- ✓ **Verbose** - if this option is checked, you will receive an extended report about the current database backup process. You also can choose if this report will be displayed on screen or saved to file.

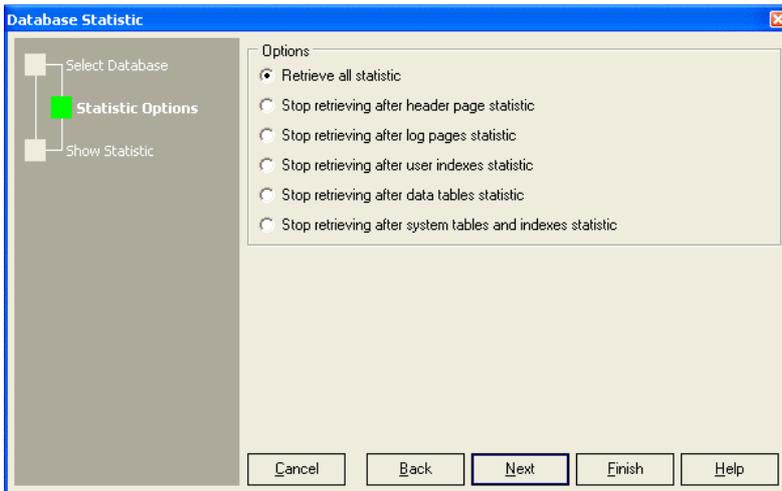
When you are done, you can return to the previous page by clicking 'Back' or start validation by clicking 'Validate'. **Validation Results** page will be activated, where the validation course will be displayed.

Database Statistics

The **Database Statistics Wizard** allows you to retrieve the database statistics. To activate the wizard choose the menu item **Services | Database Statistics**.

In this window three pages are available: **Select Database**, **Statistic Options** and **Show Statistics**. On the first page you should choose the database, which statistics you want to retrieve, from the

drop-down list. Then you can start retrieving by clicking 'Get Statistic' or go to the options page by clicking 'Next'.

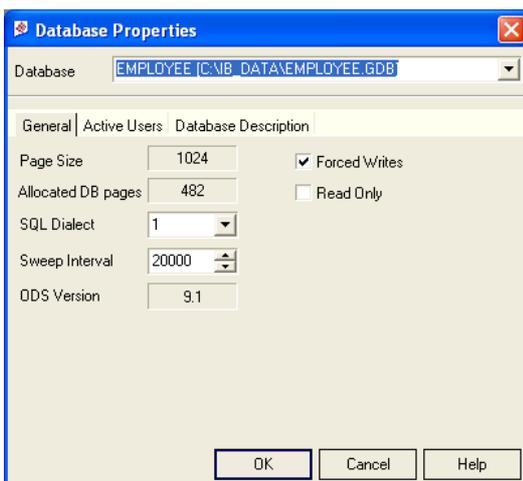


Statistic Options page allows you to choose, if all the database statistics will be retrieved (**Retrieve all statistic**) or retrieving will be stopped after header page statistics, log pages statistics, user indices statistics, data tables statistics or system tables and indexes statistics (chosen by selecting the proper item).

When you are done, you can return to the previous page by clicking 'Back' or start retrieving by clicking 'Get Statistics'. **Show statistics** page

will be activated, where the retrieved statistics will be displayed.

Database Properties



The **Database Properties** window allows you to view the database properties and edit some of them. To activate this window choose the menu item **Services | Database Properties**.

First select the database from the drop-down list at the top of the window.

On the **General** tab the following database properties are displayed:

Page Size - database page size in bytes;
Allocated DB pages - number of pages in database;
SQL Dialect (available for editing) - SQL dialect

version used;

Sweep Interval (available for editing) - number of transactions, after executing which automatic garbage collection is carried out;

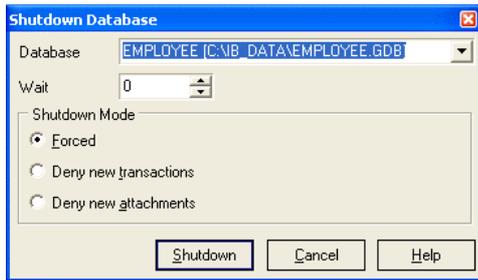
ODS Version - database on disc structure version.

Options **Forced Writes** and **Read Only** allow you to enable the mode of forced writing data on disc and to make database available read-only.

On the **Active Users** you can view the list of database users, active at the moment.

On the **Database Description** tab you can view and edit database description.

Shutdown Database



The **Shutdown Database** window allows you to switch to the one-user database connection mode. To activate this window, choose the menu item **Services | Shutdown Database**.

First select the database from the drop-down list at the top of the window. Then set the period of time, after expiring of which the shutdown will be executed, and choose the shutdown mode.

Forced - in this mode all the transactions, still active by the stated time, will be forcedly aborted and all the users will be forcedly disconnected.

Deny new transactions - in this mode all the transactions must be executed by the stated time. Starting of any new transactions is blocked. If there are some transactions still active by the stated time, database shutdown will not be executed.

Deny new attachments - in this mode all the active user attachments must finish their work by the stated time. If there are some attachments still active by the stated time, database shutdown will not be executed.

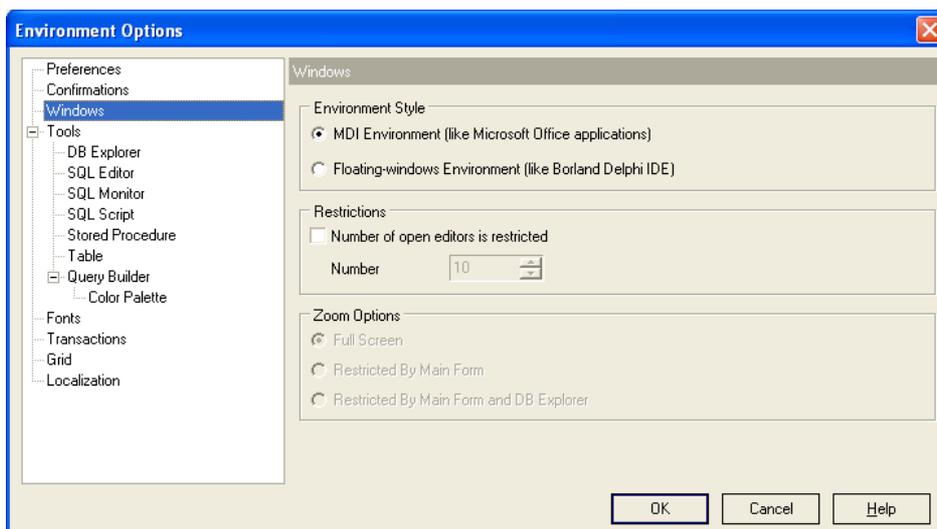
When you are done, click 'Shutdown' to shutdown the database.

To bring the database back online, choose the menu item **Services | Bring Database Online...**

CHAPTER 9 IB MANAGER OPTIONS

Environment Options

This window allows you to set the general IB Manager options.



Confirmations

- ✓ **Confirm saving of object** - if this option is checked, the program requires confirmation each time you want to save changes in database object.
- ✓ **Confirm exit from editor** - if this option is checked, the program asks you to confirm exit from the editor, if you have made any changes.

- ✓ **Confirm dropping object** - if this option is checked, the program requires confirmation for dropping database object.
- ✓ **Confirm exit from IB Manager** - if this option is checked, the program requires confirmation when you want to exit IB Manager.
- ✓ **Confirm successful compilation** - if this option is checked, the program requires confirmation of the successful compilation.

Windows

- ✓ **Restrictions** - this option allows you to set the number of object editors (table, procedure, etc.) that can be opened at a time.
- ✓ **Zoom options** - this option allows you to set the window maximization size: full screen, restricted by main form, restricted by main form and DB Explorer.

Tools

- ✓ **Control Toolbar Buttons Action** - this option allows you to choose the reaction on clicking buttons on the control panel. If you choose **Create New Object**, then the new database objects will be created on clicking these buttons, if you choose **Show Last Object**, then the last viewed database objects will be opened for editing.
- ✓ **Set grants when compiling** - if this option is checked, IB Manager will automatically set access grants for the database objects, used by the current, when compiling.
- ✓ **Automatic Show Object Explorer** - if this option is checked, Object Explorer is displayed default when editing tables and stored procedures.
- ✓ **Automatic Expand Dependencies** - if this option is checked, the object tree on Dependencies tab in Object Editor opens up default.
- ✓ **Word Wrap in Editors of Object Description** - this option enables automatic word wrap in database object descriptions.

Tools: DB Explorer

- ✓ **Show Object Descriptions** - if this option is checked, database object descriptions are displayed in the DB Explorer object tree.
- ✓ **Place System Objects in Separate Node** - if this option is checked, system objects (tables, domains, triggers) are displayed in the DB Explorer object tree as separate nodes.
- ✓ **Show Value of Generator in List** - if this option is checked, generator values are displayed in generator list in the SQL Assistant area.
- ✓ **Show Text of Exception in List** - if this option is checked, exception texts are displayed in exception list in the SQL Assistant area.

Note, that enabling these options will slower building the DB Explorer object tree a bit.

Tools: SQL Editor

- ✓ **Fetch All** - if this option is checked, all the records according to the query will be extracted from the table, if unchecked - only those, displayed on **Results** tab in the **SQL-Editor** window.
- ✓ **Show Query Plan** - if this option is checked, query plan is displayed at the bottom of the **SQL-Editor** window.
- ✓ **Substitute Constraints in Query Plan** - if this option is checked, constraints are not displayed in query plan.
- ✓ **Execute Selected Text Separately** - if this option is checked, only the selected text will be executed in **SQL-Editor**. If no text is selected the whole query is executed.

Tools: SQL Monitor

This page allows you to choose operations, which codes are displayed in the SQL Monitor window. Enabled option Show Time of Operation displays the time required for the operation in the SQL Monitor window.

Tools: SQL Script

- ✓ **Abort Script on Error** - if this option is checked, script execution aborts when an error occurs.
- ✓ **Rollback on Abort** - this option is available only if **Abort Script on Error** is checked. This option evokes automatic rollback on script execution abort.

Tools: Stored Procedure

- ✓ **Show Procedure Header in the Text of Procedure** - if this option is checked, the procedure header is displayed in the stored procedure editor.
- ✓ **Recompile Dependencies** - if this option is checked, database objects, depending on the procedure, are automatically recompiled on changing the procedure's dependencies.
- ✓ **Always Open the Edit Tab** - if this option is checked, **Edit** tab is opened default on activating **Procedure Editor**.

Tools: Tables

- ✓ **Always Open the Fields Tab** - if this option is checked, **Fields** tab is opened default on activating **Table Editor**.
- ✓ **Change Tab by Click Object Explorer** - this option allows you to change tabs in **Table Editor** from the Object Explorer window.

Enhanced Options

- ✓ **Enable Sounds** - this option enables IB Manager sound effects.
- ✓ **Label Options** - using these options you can set such label properties as color, 3D, bevel and others.

Fonts

Here you can set the font parameters, used by IB Manager.

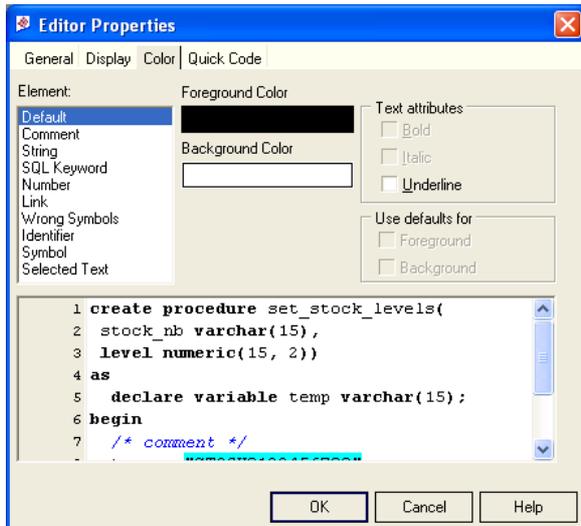
Transactions

Here you can set additional Data and Metadata transaction properties of connecting to server.

Grids

Here you can set the table data display properties: cell colors, data display format, string length, text of the Null value field, font color and the others.

Editor Options



This window allows you to set the parameters of viewing and editing the SQL statements within IB Manager.

General

- ✓ **Auto Indent** - if this option is checked, each new indentation will be the same as previous when editing SQL text.
- ✓ **Insert Mode** - if this option is checked, insert symbols mode is default on.
- ✓ **Use Syntax Highlight** - this option enables syntax highlight in the object editor window.
- ✓ **Find Text at Cursor** - if this option is checked, **Text to Find** field in the **Find Text Dialog**

window is automatically filled with the text, cursor set on.

- ✓ **Always Show Hyperlinks** - if this option is checked, hyperlinks are displayed in the editor window. To open link click with button Ctrl pressed.
- ✓ **Show Number of Lines** - if this option is checked, line numbers are displayed in the SQL text editor window.
- ✓ **Tab Stops** - this option allows you to define the tab length, used when editing text.
- ✓ **Undo Limit** - this option defines maximum number of changes, you will be able to undo.

Display

- ✓ **Visible Margin** - this option makes the right text margin visible.
- ✓ **Visible Gutter** - this option makes the gutter visible in the editor window.
- ✓ **Right Margin** - this option defines the position of the right text margin in the editor window.
- ✓ **Gutter Width** - this option defines the gutter width in the editor window.
- ✓ **Editor Font, Size** - using these options you can choose editor font and its size.

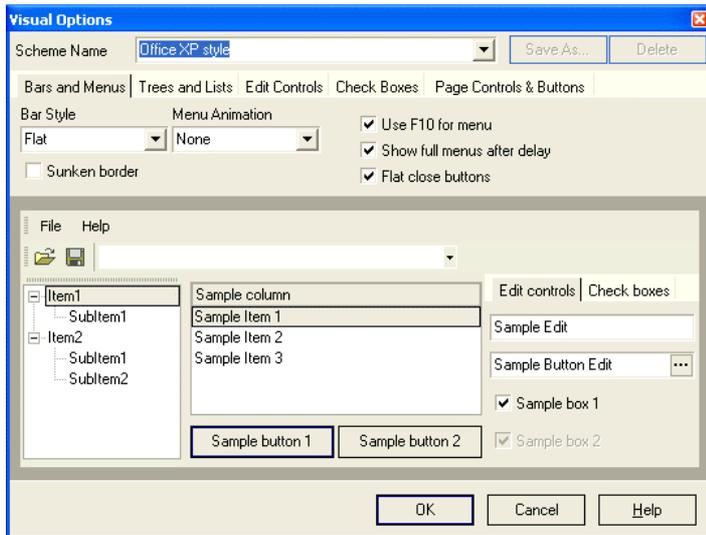
Color

On this tab you can set font and background colors and attributes of the text, editor uses to mark out different text fragments: default, comments, strings, SQL keywords, numbers, links, wrong symbols, identifiers, symbols, and selected text.

Quick Code

- ✓ **Code Completion** - if this option is checked, then when you type first word symbols in the SQL text editor you are offered some variants for the word completion in a popup list (analogue of the **Code Insight** in **Delphi IDE**). The popup list will appear at a time, defined by **Delay** option.
- ✓ **Code Parameters** - if this option is checked, IB Manager automatically offers you procedure parameter list after the procedure name and left bracket.
- ✓ **Delay** - using this option you can change the time, at which the popup list will appear.
- ✓ **Code Case** - this option allows you to change the case of the automatically inserted words.
- ✓ **Use Keyboard Templates** - this option allows you to use keyboard templates for faster typing regularly met expressions.
- ✓ **Emulate Typewriting** - this option defines the delay of the symbols displaying.

Visual Options



This window allows you to customize the application interface style to your liking.

Scheme - select the interface scheme you like: Classic Windows or Windows XP style.

You can create your own interface schemes by customizing any visual options you like on the appropriate tabs ('Bars and Menus', 'Trees and Lists', 'Edit Controls', 'Check Boxes' and 'Page Controls') and clicking the button 'Save'. You can also delete your own scheme by clicking 'Delete'. 'Classic Style' and 'Windows XP'

schemes can't be deleted.

All the customizing you make is displayed on the 'Sample' panel.

Bars and Menus

- ✓ **Bar Style** - choose the style of displaying the application toolbars. Check the 'Sunken border' option to change the panel display style.
- ✓ **Menu Animation** - choose the style of animating the menu items. Use options at the right to customize the application menus.

Trees and Lists

- ✓ **Look and Feel** - choose the style of flattening the application trees and lists.
 - ✓ **Tree Lines Style** - choose the style of displaying the application tree lines.
 - ✓ **Border Style** - choose to display or not the borders of the application trees and lists.
- Use options at the right to customize the object selection in the application trees and lists.

Edit Controls

- ✓ **Border Style** - choose the style of displaying the borders of the application controls.
 - ✓ **Button Style** - choose the style of displaying the application buttons.
 - ✓ **Button Transparency** - choose the style of displaying the transparent buttons.
 - ✓ **Edges** - check the edges to display in the application controls.
- Use also 'Hot Track' and 'Shadow' options to customize the application control view in accordance.

Check Boxes

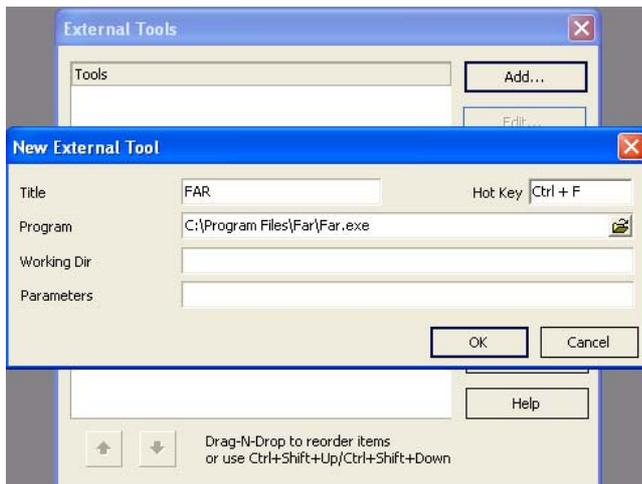
- ✓ **Border Style** - choose the style of displaying the borders of the application check boxes.
 - ✓ **Button Style** - choose the style of displaying the check box buttons.
 - ✓ **Button Transparency** - choose the style of displaying the transparent check box buttons.
 - ✓ **Edges** - check the edges to display in the application check boxes.
- Use also 'Hot Track' and 'Shadow' options to customize the application check box view in accordance.

Page Control

✓ **Tab style** - choose the style of displaying the application tabs.

Use also 'Multiline pages' and 'Hot track' options to customize the application tab view in accordance.

External Tools



This window allows you to define new tools for working with IB Manager. To add a new tool click 'Add', set the tool name and the path to the application (you can use the button ). You can define a hot key to access the tool quickly, its working directory and other properties, if necessary.

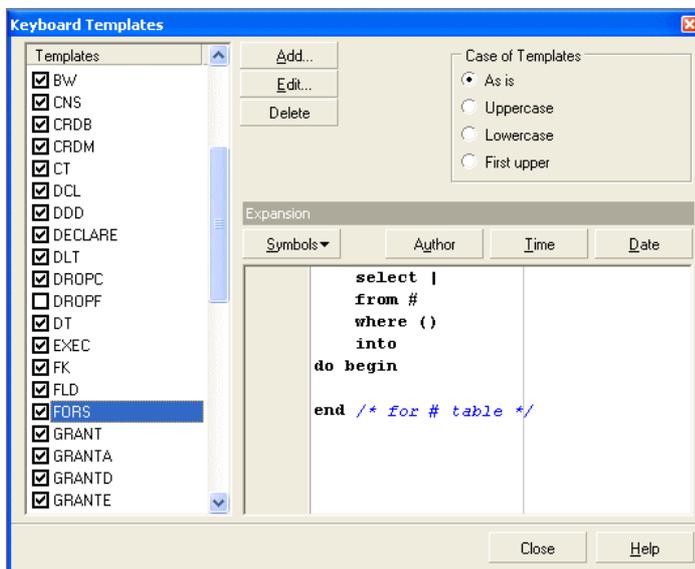
You can edit or delete the existing tools using buttons 'Edit' and 'Delete' and also you can change the order of the created tools using buttons and the bottom of the window, by dragging the or by pressing Shift+Ctrl+Up, Shift+Ctrl+Down. The created tools become

available in the **Tools** menu.

Events Options

This window allows you to define the registered IB events for the database, chosen from the drop-down list at the top of the window. Check **Registered** to display only registered events.

Keyboard Templates



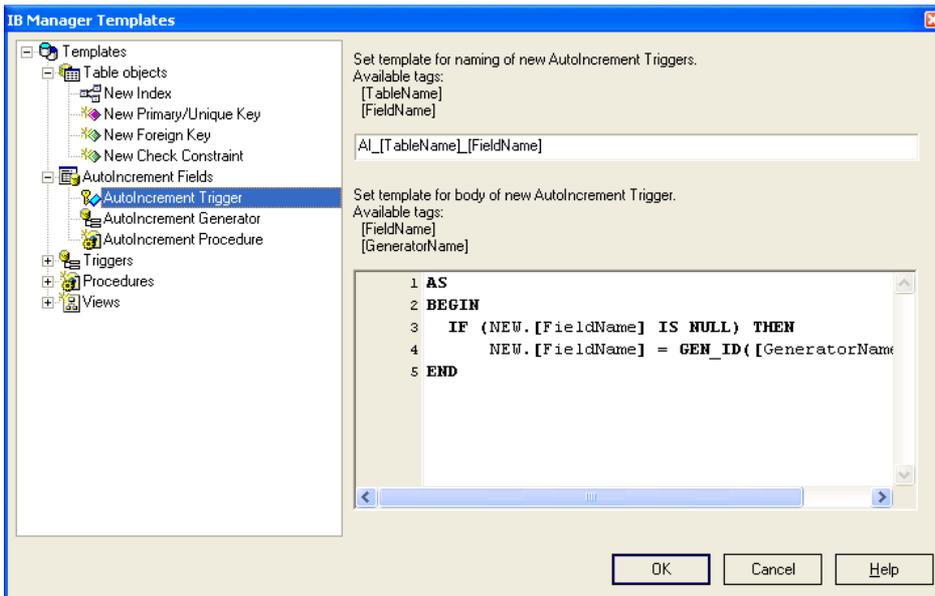
This window allows you to create new keyboard templates for quicker typing regular met expressions and to edit the existing ones.

You can deactivate the existing template by choosing it from the list at the left of the window and removing flag from its name. Also you can edit template name, using button 'Edit', delete a template, using button 'Delete' and edit template expression in the right part of the window. For faster editing you can use the 'Symbols' menu and buttons 'Author', 'Time', 'Date'.

To add a new template, click 'Add', set the template name and define the template expression. In the upper left corner of the window you can choose the case of the template expression.

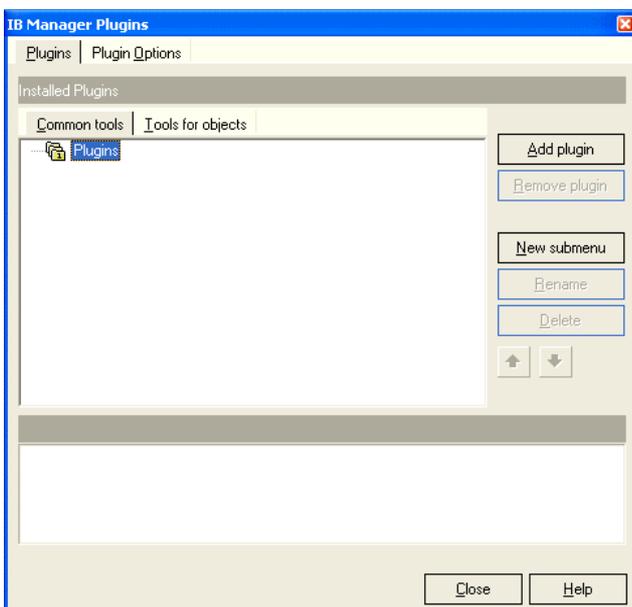
Templates

This window allows you to edit naming the newly created database objects and to edit SQL code templates for creating some of them.



To edit a newly created object name template, choose the object in the tree at the right of the window and edit the name, it will get after creating, in the edit field in the left part of the window. If you choose Autoincrement Trigger, Autoincrement Procedure, Trigger Text, Procedure Text or View Text, you will also be able to edit the SQL code template for the procedure of their creating.

Plugins Options



This window allows you to install new plugins for working with IB Manager.

'Plugins' Tab

On this tab the installed plugins are displayed. They are divided into the **Common tools**, that are plugins, performed for working with the program as a whole, and **Tools for objects**, performed for working with database objects. At the bottom of the window the description of the selected plugin is displayed. To install a new plugin, click button 'Add plugin' and select a file, where the plugin is stored. Using button 'Remove plugin' you can uninstall the selected plugin. Using buttons at the right of the window

you can also create, rename, delete and change the order of subfolders in **Plugins** tree to access the plugins easier.

'Plugin Options' Tab

On this tab the information about the selected plugin is displayed.

- ✓ **Plugin is a common tool** flag means, that the selected plugin is performed for working with the program as a whole.
- ✓ **Plugin is built in object editor** flag means, that the selected plugin is built-in to the database object editor (table, procedure, view, etc.).
- ✓ **Plugin has options dialog** flag means, that the options of the selected plugin will be available for editing when you will work with this plugin.
- ✓ **Unload plugin after executing** flag means, that the selected plugin will be automatically unloaded after executing.

At the right of the window the list of object editors is displayed, where those, available for the selected plugin, are checked.

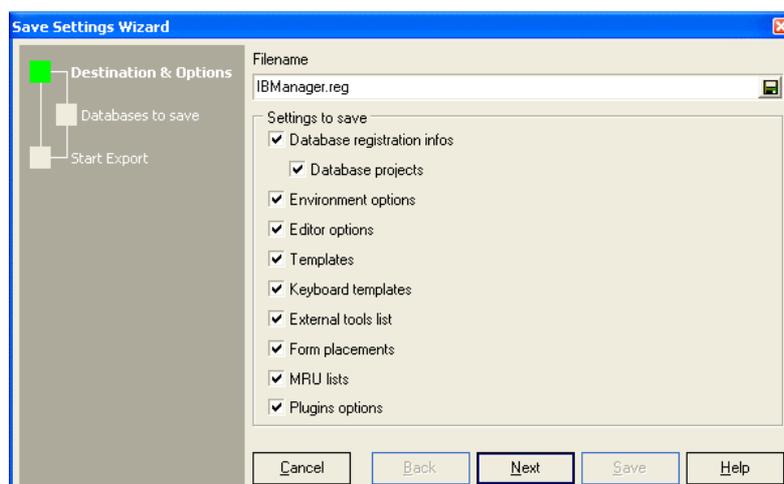
At the bottom of the window you can edit the menu item and define a hot key for faster access to the plugin or to the plugin option window.

Place button on toolbar option places a button for activating plugin to the control panel.

Third-party plugin support is available only in the Professional Edition of IB Manager.

Save Settings Wizard

Save Settings Wizard allows you to export all or partial IB Manager settings to single *.reg file, which you can apply to IB Manager installed on another machine or use to backup previous settings.



Step 1 - Destination & Options

Filename to export - specify a *.reg file, to save IB Manager setting to. Set the following options:

The options of this tab specify the information saved to the result file, e.g. database registration information, Environment Options, etc.

Step 2 - Databases to save

Available - a list of databases with

settings available for export.

Selected - a list of databases to export their settings.

To move the database from one list to another double-click it or select it (use *Ctrl* or *Shift* to select multiple databases) and click button > or <. To move all the databases click button >> or <<.

Step 3 - Start Export

This page is activated automatically on clicking button 'Save'. It displays the exporting process (**Exporting log**).

Select Program Language



The **Select Language** dialog allows you to select a language for IB Manager localization. To call this window select the **Options | Select Program Language** menu item.

Select the language from the list of available languages, set on the 'Localization' tab of Environment Options. In the current version the following localizations are available: English (set as default), German, Italian and Spanish. Choose your native language from the list and click 'OK'.