

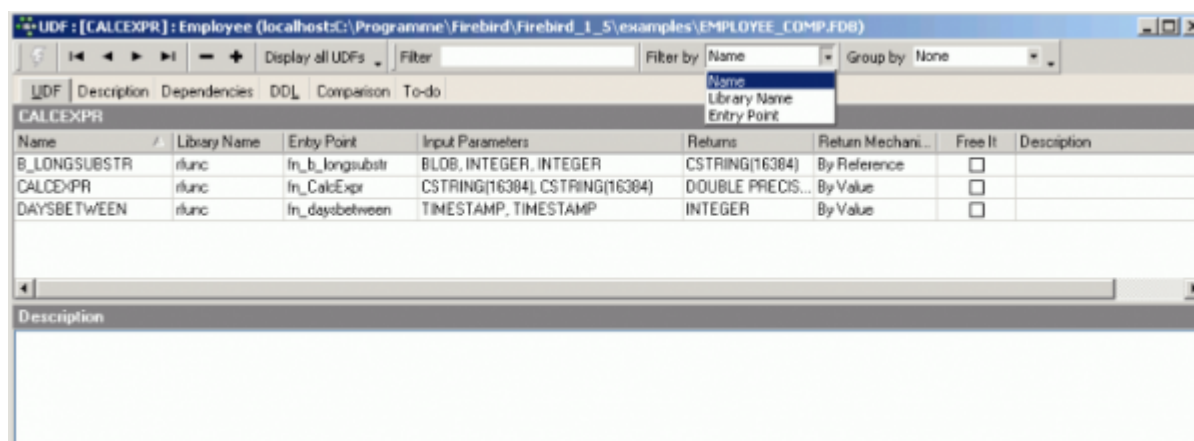
User-Defined Function

A user-defined function (UDF) is used to perform tasks that Firebird/InterBase® can't. It is an external database function written entirely in another language, such as C++ or Pascal, to perform data manipulation tasks not directly supported by Firebird/InterBase®.

UDFs can be called from Firebird/InterBase® and executed on the server. These functions can exist on their own or be collected into libraries. UDFs offer the possibility to create your own functions (such as SUBSTR) and integrate them in the database itself. Each UDF is arranged as a function, belonging to a DLL (Linux: .SO). Thus one dynamically loaded library consists of at least one function.

UDFs can be incorporated into the database using the IBExpert [DB Explorer](#), IBExpert [SQL Editor](#), or IBExpert [Script Executive](#).

UDF Editor



The IBExpert UDF Editor displays those UDFs inserted into the list, by double-clicking on the UDF name in the [DB Explorer](#), or alternatively using the navigation icons in the editor toolbar to insert single or all UDFs. The grid display can also be filtered or grouped if wished. The grid displays key information, including *name*, *library*, *entry point*, *input parameters*, *returns*, *return mechanism* (drop-down list of options), whether *freed* (checkbox), and *description*. Further information is displayed on the [Description](#), [Dependencies](#), [DDL](#), [Comparison](#) and [To-Do](#) pages.

UDF definitions are database dependent and not server dependent, i.e. they need to be registered for each database individually. Since InterBase® 6/Firebird, the libraries need to be stored in the Firebird/InterBase® UDF folder. This is not critical when working with older InterBase® versions.

Please refer to the [DECLARE EXTERNAL FUNCTION](#) statement for details of incorporating UDFs in Firebird/InterBase®.

It is important to note that the majority of UDFs, when used in a WHERE condition, prevent indices being used during execution.

New to Firebird 2.0: The following is a summary of the major changes, the details of which can be found in the [Firebird 2.0.4 Release Notes](#) in the [External functions \(UDFs\)](#) chapter:

- [Ability to signal SQL NULL via a null pointer](#)
- [UDF library diagnostic messages improved](#)
- [UDFs added and changed](#)
 - [IB_UDF_rand\(\) vs IB_UDF_srand\(\)](#)
 - [IB_UDF_lower](#)
- [General UDF changes](#)
 - [Build changes](#)

and [ALTER EXTERNAL FUNCTION](#) in the [Firebird 2.1 Release Notes](#).

An ideal example of a UDF library is [RFunc](#) (written in C++) containing over 80 UDFs (although some of these are only applicable for older InterBase® versions or for different SQL dialects). It is available for both Windows and Linux platforms in English and Russian and can be downloaded free of charge from <https://www.ibexpert.com/download/udf/>. [FreeUDFLib](#) is an example of a UDF library written in Delphi, and can also be downloaded from this link.

For further functions please refer to [IBEBlock Functions](#) and the Firebird documentation: *Firebird built-in functions*.

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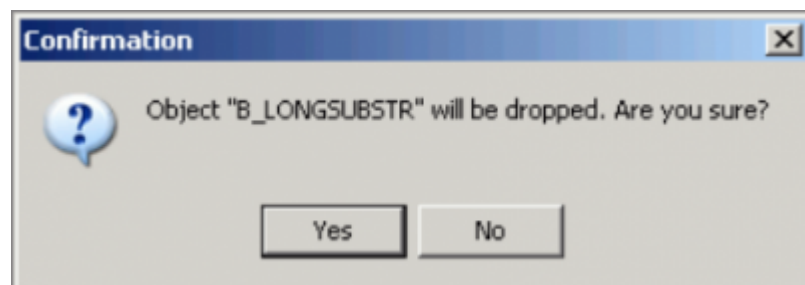
Drop external function/drop UDF

The `DROP EXTERNAL FUNCTION` command removes the declaration of the UDF, specified by an additional parameter, from the database.

The dropped function can no longer be reached by the database, as the relevant reference to the UDF library is deleted. However the UDF still exists in the UDF library, so that it can still be used by other databases.

In IBExpert, a UDF can be dropped from the [DB Explorer](#) by selecting the UDF to be deleted and using the right-click menu item *Drop UDF* or [Ctrl + Del].

IBExpert asks for confirmation



before finally dropping.

The SQL syntax is:

```
DROP EXTERNAL FUNCTION <external_function_name>
```

An exception can be altered by its creator, the `SYSDBA` user, and any users with operating system root privileges.

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RFunc

RFunc is a UDF library containing over 80 UDFs (although some of these are only applicable for older InterBase® versions or for different SQL dialects). It is available for both Windows and Linux platforms in English and Russian. It can be downloaded free of charge from <https://www.ibexpert.com/download/udf/>. The most up-to-date version of this library can found at <https://rfunc.sourceforge.net/>.

It represents a set of user's (UDF) string, bit, numerical functions, and can also be used for operations with `DATES` and `TIME` and blobs. Also contains `PARSER`, i.e. calculator of expressions.

InterBase® 4.2, 5.x, 6.x, 7.0 (Windows 9x, NT, 2000) and InterBase® 5.x, 6.x, 7.0 (Linux) or Firebird are supported. The library is written in C++ and is delivered with source codes.

RFunc installation

The ZIP-file should be selected (Windows or Linux; English or Russian) and downloaded.

Windows installation

1. The RFUNC.DLL file needs to be copied into a folder:

- Variant 1: `<IB_path>IB_path\bin` (for IB6: `IB_path\UDF`), where `IB_path` is the path to a folder, in which Firebird/InterBase® is installed (recommended).
- Variant 2: `Windows\System` (for Windows 9x) or `WinNT\System32` (Windows NT, 2k).

2. only for IB 5.x: copy `ib_util.dll` file from `<IB_path>\Lib` to `\Bin`.

If several versions of InterBase® servers are installed on one computer, it is necessary to use the RFunc library appropriate to the installed client IB (`GDS32.DLL`).

It is recommended before starting the Firebird/InterBase® server to substitute `GDS32.DLL` appropriate to the version of the server.

Linux installation

IB 5.x:

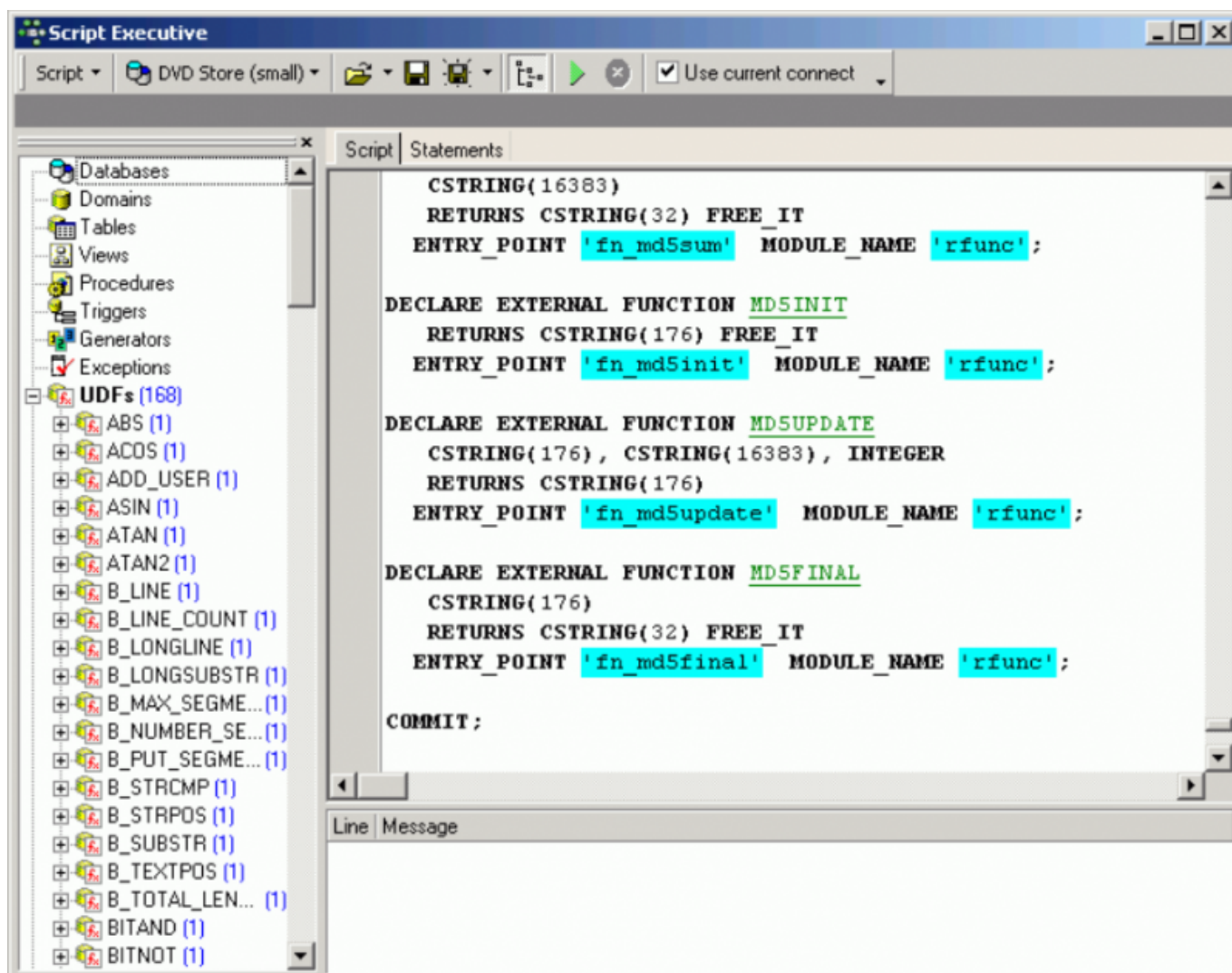
- Variant 1: Copy the RFunc file into directory `/usr/lib`.
- Variant 2: Copy the RFunc file into any directory, for example, `/home/rFunc`. Create the

reference to the library by using the `\ln -s /home/rFunc/rfunc /usr/lib/rfunc\` command. The user should own the right to create references in the directory `/usr/lib`.

InterBase® 6-7 und Firebird (Windows und Linux):

Copy the RFunc file into directory \UDF.

The rfuncx.sql (x = InterBase® version; use rfunc6.sql for all Firebird versions) script, found in the UDF\sql directory, should then be copied into the IBExpert [Script Executive](#) (found in the Tools menu), and executed [F9]. A database connection must exist, as UDF libraries need to be registered for each database (i.e. they are database-dependent and not server-dependent).



It is then necessary to disconnect and reconnect to the database so that the full list of RFunc UDFs can be viewed in the DB Explorer under the DB object branch *UDF*.

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FreeUDFLib

FreeUDFLib is a free UDF library (October 1998) containing many useful UDFs for use with InterBase® 4.2 and 5.0 under the Win32 platforms (unfortunately no UNIX support with this). It is written entirely in Delphi and all source code is provided.

It can be downloaded free of charge from <https://www.ibexpert.com/download/udf/>.

Everything in this release is completely free. However, it's not a **PUBLIC DOMAIN**. Please refer to the [license.txt](#), included in the **ZIP** file for more information on licensing.

FreeUDFLib installation

After unzipping **FreeUDFLib.zip**, copy **FreeUDFLib.dll** to the Firebird/InterBase® bin or udf directory, for example: **C:\Program Files\InterBase Corp\InterBase\bin**, **C:\Program Files\Borland\InterBase\udf\bin** or **C:\Program Files\Firebird\udf\bin**.

The **ext_funcs.sql** script should then be copied into the IBExpert **Script Executive** (found in the **IBExpert Tools menu**), and executed using [F9]. A database connection must exist, as UDF libraries need to be registered for each database (i.e. they are database-dependent and not server-dependent). If necessary, use the Script Executive menu item *Add CONNECT statement* to connect to the desired database, before executing.

It is then necessary to disconnect and reconnect to the database so that the full list of FreeUDF external functions can be viewed in the **DB Explorer** under the DB object branch **UDF**.

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