MySQL-Front
Manual

Table of Contents

1   Introduction

MySQL-Front is a stand-alone MySQL front end tool that simplifies the creation and changing of any database object, adding and changing any database record and a lot of addition steps developing applications with database access in each developing language.

This program combines the ease of use with the powerful of a desktop application. There are several different visual elements to enable an easily navigation and fast changes. If the user don't know the Short Query Language (SQL) MySQL-Front overtake this - but it allows the user learning by seeing the used SQL statements. The simple and intuitive interface is easy to use for beginners of database without any SQL knowledge but it a allows a power user to do all he need in once.

The dialog based interface translated in more than 30 languages leaves out all the cryptic SQL statements. MySQL-Front enables the user to do what he wants to do - without bothering a lot of knowledge about incompatibilities the different MySQL version, wasting a lot of time with waiting of a database response or offering unusable features for the used MySQL implementation. It concentrates the focus directly to what the users wants to do: Developing his own database application.

All these features are summarized in one single and unique Windows application which makes it easy to find each small feature very fast - independed of the used Windows version, the navtive language of the user and the used MySQL installation.

2   Features

High-Degree of Compatibility:
- Supports MySQL databases starting with version 3.23
- Direct database access without using the MySQL DLL to reduce installing and connecting problems
- If desired, use of the MySQL DLL to access the database and thus compatible with future versions
- If the ISP prohibits external access to the database a HTTP tunnel can be used to have access the database nevertheless
- Full Drag&Drop and Copy&Paste support
- Intensive internal usage of the Windows API to make sure to be compatible with future Windows versions

Ease of Use:
- Windows-conformant use of all elements
- Clearly structured menu prompts
- Efficient use either via keyboard or with mouse only
- Data structure depiction same as in Windows Explorer
- Interactive dialogs to edit the entire data structures
- Data depiction within a customizable data grid
- Detailed manual
- Very fast because of efficient engineering and usage of the Windows API and the MySQL the multi statement support

Individual Configuration:
- Language settings (more than 30 languages available, unicode supported)
- Design settings
- Various options to configure the database connection
- Numerous program use settings

- Syntax highlighting with individual colors

Standard Database Editing:
- Create, change and delete databases, tables, views, procedures, functions, events, triggers, indices, fields and foreign keys
- Create, change and delete data inclusive. Memo / BLOB using a HEX editor
- Display graphics in BLOB data (BMP, GIF, JPEG, PNG and RTF)
- Full Unicode support for data and identifiers
- Table partitioning support

Data / Data Structure Import:
- SQL File
- Text File (CSV format)
- MS Access File
- MS Excel File
- ODBC (Open Database Connector)

Data / Data Structure Export:
- SQL File
- Text File (CSV format)
- HTML File
- XML File
- MS Excel File

Enhanced Database Manipulations:
- Detailed Search inside whole table(s) / database(s) with regular expressions
- Fast Search&Replace inside whole table(s) / database(s)
- Whole database / table transfer between two different servers
- Easy Synchronisation between two databases / tables

Database Administration:
- Overview and ending of single processes and the entire server
- Detailed server status overview
- Configuration of server variables
- Highly individualized user rights administration
- Security settings on host level
- Table maintenance support (check, analyze, optimize, repair and "flush tables")
- Showing server error log

Rapid development:
- All database objects can be created, changed and removed without writing any SQL statement
- Database queries can be developed with a visual query builder by Drag&Drop very fast
- Context sensitive help of the SQL in the SQL Editor
- Executing partial selected SQL statements in the SQL Editor
- Editing values in the result set of an executed query in the SQL Editor and Query Builder
- Management of user-defined SQL scripts
- The source of Stored Procedures, Stored Functions, Triggers and Events can be edit like in a text in the notepad - MySQL-Front handle the updates with a single key pressing

ER Modeling:
- Backward engineering
- Forward engineering

Efficient Troubleshooting:
- Distinct filtering and data sorting functions
- Logging of SQL queries sent to the database
- Display of source code of databases, tables, views, routines, events, triggers, users, hosts and processes
- Stored Procedures, Stored Functions, Triggers and Events can be executed for debugging with a single mouse click. Test data can be set and the result will be shown right beside the source code editor
- Printout of data, data structure and source code syntax highlighting
- Management of user-defined SQL scripts

3 Minimum Requirements

Software:
- Microsoft Windows: NT 4.0 SP5
- MySQL database 3.23.20
- HTTP Tunnel 42: Web server with PHP 4.1.0

Documentation:
- MySQL database manual

4 Installation / Uninstallation

Installation:
Launch the MySQL-Front_Setup.exe setup program and follow the instructions in your language. Defaults are offered for all configuration possibilities, which fine on almost all systems.

Uninstallation is just as simple:
Select the uninstall program from the start menu or the Windows Control Panel.

The setup program accepts optional command line parameters. These can be useful to system administrators, and to other programs calling the setup program.

`MySQL-Front_Setup.exe [Options]`

`/DIR="x:\dirname"`
Overrides the default directory name displayed on the Select Destination Location wizard page. A fully qualified pathname must be specified.

`/GROUP="folder name"`
Overrides the default folder name displayed on the Select Start Menu Folder wizard page.

`/NOICONS`
Instructs Setup to initially check the "Don't create any icons" check box on the Select Start Menu Folder wizard page.

`/SAVEINF="x:\filename"`
Instructs Setup to save installation settings to the specified file.
Don't forget to use quotes if the filename contains spaces.

/LOADINF="x:\filename"
> Instructs Setup to load the settings from the specified file after having checked the command line. This file can be prepared using the '**/SAVEINF=**' command as explained below.
> Don't forget to use quotes if the filename contains spaces.

5   Shareware

You may test and evaluate MySQL-Front free of charge for a free evaluation period of 30 days.

After the trial period is over, the program will work in the lite mode:
- The Object Browser is only usable as 'Read only'.
- It is not possible to insert new data records in the Data Browser.
- In the SQL Editor it's not longer possible to execute a part of the SQL code.

To use MySQL-Front for an unlimited time, the user has to purchase a license. By purchasing it all future updates are free, including major upgrades.

6   Contact

Developer:
> Nils Hoyer
> Hopfenweg 207
> 22851 Norderstedt

Internet:
> http://www.mysqlfront.de/

Special thanks for using external toolboxes:
- Cristian Nicola for DirectSQL
- SynEdit Development Team for SynEdit
- Markus Stephany for TMPHexEditor
- TurboPower Software for TurboPower LockBox
- Gustavo Huffenbacher Daud for TPNGImage
- Finn Tolderlund (Anders Melander) for TGIFImage

Special thanks for translations and generating the graphics depicted in the program 40.

7   Program

7.1   Files

7.1.1   Open Connection

Menu: File / Open Connection...

Opens a connection with a database.

See also:

Close 13
Sessions 37

7.1.2 Open

Menu: File / Open (only SQL Editor)

Opens a SQL script from a file.

See also:
Save 9
Recent files 9

7.1.3 Save

Menu: File / Save (only SQL Editor)

Saves a SQL script to a file.

See also:
Save as 9

7.1.4 Save as

Menu: File / Save as (only SQL Editor)

Saves a SQL script to a file and prompts for the file name.

See also:
Save 9

7.1.5 Recent files

Menu: File / Recent files (only SQL Editor)

Shows a list of recently used files.

See also:
Open 9

7.1.6 Import

7.1.6.1 SQL File

Menu: File / Import / SQL File

Executes all SQL queries from the specified file in the **selected** database.

SQL queries are executed directly without first loading the entire file into the SQL Editor. This means

the execution is much faster and saves system resources.

Error Handling: (Only CSV file)
Deactivates MySQL-Front error handling. This means data records are written to the database much faster.

Error show:
Only shows errors that occurred without informing the user explicitly.

Error Save in file:
Saves the sections with an error during importing to a file.

Important note:
Unfortunately the different MySQL version are not absolutely compatible. This means if you try to import a SQL file of MySQL 5.x to a 4.0 database this forces a lot of problems.

This is not a bug of MySQL-Front or a bug of MySQL. This is an incompatibility only.

To copy data from one MySQL to an other MySQL you can use Transfer feature 33.

7.1.6.2 Text File

Menu: File / Import / Text File

Imports data of a text format file to the **selected** table.

Use headline:
The first line of the import file contains the field names.

Separator:
Character used to separate the individual fields from one another.

Quote Character:
Characters used to enclose strings.

Existing data:
Existing rows will be replaced without any warning.

7.1.6.3 MS Access File

Menu: File / Import / MS Access file

Imports data of a table from a .mdb file to the **selected** database or **selected** table.

Existing data:
Existing rows will be replaced without any warning.

7.1.6.4 MS Excel File

Menu: File / Import / MS Excel file

Imports data of a table from a .xls file to the **selected** database or **selected** table.

Use headline:
    The first line of the import file contains the field names.

Existing data:
    Existing rows will be replaced without any warning.

7.1.6.5 ODBC Table

Menu: File / Import / ODBC Table

Imports data of a table to the **selected** table using ODBC.

Existing data:
    Existing rows will be replaced without any warning.

7.1.7 Export

7.1.7.1 SQL File

Menu: File / Export / SQL File

The **selected** data and their structures are exported to a SQL file. This conforms largely to the output of `mysqldump`.

Use this file to save the content of database to a file. This is rather practical for data backup or to send data, for example.

Include:
    Structure: Exports the data structure with `CREATE  TABLE` queries.
    Data: Exports the data.

Database:
    Create Database(s): Generates `CREATE  DATABASE` queries
    Select Database(s): Generates `USE  \`databasename\`` queries

Handle existing data:
    Drop before Create: Generates a corresponding `DROP` query before each `CREATE` query to delete any existing data.
    Complete Insert Queries: Generates `INSERT` queries for which the field name is also indicated for every field. (Only meaningful if data are not to be added to an existing table and if the existing table does not **exactly** correspond with the table to be exported.)

General:
    Include Comments: Adds comments to the file to make the file easier to read.
    Disable Keys: Deactivates foreign key verification while importing the file.
    Lock Tables: Prevents updates of other programs/users during the export.

Note:

Unfortunately the exported SQL file has no unlimited backward compatibility. This problem is present since a lot of different MySQL database versions, compilations and configurations does not allow to generate one SQL file which runs well on each different MySQL server.

To transfer data to a lower versioned MySQL server please use the Transfer[33] feature of MySQL-Front.

7.1.7.2 Text File

Menu: File / Export / Text File

The **selected** data and their structures are saved to a comma separated values text file.

These types of files are easily used by programs such as Excel.

This format used to be the default format to transfer table contents between different programs. This is more frequently done with XML files as well.

If several tables are selected, a file is created for each table.

Write Headlines:
  Generates a line containing the field names.

Separator:
  Specifies the separating character between the fields or a fixed column width for individual fields.

Quote Character:
  Character used to enclose all string fields.

7.1.7.3 HTML File

Menu: File / Export / HTML File

The **selected** data and their structures are saved to a file viewable with a Web browser.

This is useful to easily send data and their structures via email or show to other developers via Internet/Intranet.

The generated file uses the so-called cascading style sheet (CSS) to visually improve output. However, browsers without CSS also display the data – but in that case with less formatting.

BLOB field data are not exported since HTML cannot display these.

7.1.7.4 XML File

Menu: File / Export / XML File

The **selected** data and their structures are exported to an XML file.

The XML format increasingly develops into the default format for data transfer between different systems.

7.1.7.5 MS Excel File

Menu: File / Export / MS Excel File

The **selected** data and their structures are exported to a MS Excel file.

7.1.7.6 Diagram

Menu: File / Export / Diagram

The **selected** data (numeric columns) will be shown in a chart diagram for table fields.

7.1.8 Print

Menu: File / Print (requires Internet Explorer)

Prints the data and their structured of the current selection.

Options are identical with Export to HTML File 12 .

Tip:
Data can be exported to a PDF file using the PDF printer driver.

7.1.9 Close

Menu: File / Close

Closes the current tab (connection).

See also:
Close all 13

7.1.10 Close all

Menu: File / Close all

Closes all windows.

See also:
Close 13

7.1.11 Exit

Menu: File / Exit

Closes all open windows and exits the program.

See also:
    Close [13]

7.2 Edit

7.2.1 Undo

Menu: File / Undo (only SQL Editor)

Undo reverses the last change.

7.2.2 Redo

Menu: File / Redo (only SQL Editor)

Redo reverses the last undo.

7.2.3 Cut

Menu: Edit / Cut

Copies the current selection to the Windows Clipboard. Once the content of the Clipboard has been inserted somewhere the selection is deleted.

See also:
    Delete [14]

7.2.4 Copy

Menu: Edit / Copy

Copies the current selection to the Windows Clipboard.

See also:
    Copy to file [15]

7.2.5 Paste

Menu: Edit / Paste

Inserts the content of the Clipboard to the selected location.

See also:
    Paste from file [15]

7.2.6 Delete

Menu: Edit / Delete

Deletes the current selection.

See also:
    Cut [14]

7.2.7 Select all

Menu: Edit / Select all

Highlights (selects) all elements.

7.2.8 Copy to File

Menu: Edit / Copy to File

Copies the current selection to a file.

See also:
    Copy [14]
    Copy to Script [15]
    Paste from File [15]

7.2.9 Paste from File

Menu: Edit / Paste from File

Inserts the content (of a file) to the selected location.

See also:
    Paste [14]
    Paste From File [15]
    Copy To File [15]

7.2.10 Copy to Script

Menu: Edit / Copy to Script

Copies the current selection to a file in a script folder.

The folder locations can be configured in the Global settings [35].

See also:
    Copy [14]
    Copy to File [15]
    Paste from File [15]

7.2.11 Paste from Script

Menu: Edit / Paste from Script

Inserts the content (of a file in a script folder) to the selected location.

The folder locations can be configured in the Global settings [35].

See also:
Paste [14]
Paste from File [15]
Copy to Script [15]

7.2.12 Rename

Menu: Edit / Rename

Renames the current selection.

7.3   Search

7.3.1 Search

Menu: Search / Search

Searches for a character string.

See also:
Search Next [16]

7.3.2 Replace

Menu: Search / Replace

Searches for a character string and then replaces this string with a different character string.

See also:
Search Next [16]

7.3.3 Search Next

Menu: Search / Search Next

Repeats the last search.

See also:
Search [16]
Replace [16]

7.4 View

7.4.1 Object Browser

Menu: View / Object Browser

Switches the view to the data structure.

Inside the Object Browser the structure of the database with all object like tables, field, indices etc will be shown. MySQL-Front offers only the features the related MySQL database version allows in the context. All other features are disabled and hidden to help the user to figure out what is possible and what not without requesting the database.

Note:

The Object Browser forwards all changes to the Data Browser automatically.

Changes generated by the SQL statements executed in the SQL Editor will not be overtaken automatically, since MySQL-Front can't parse all sent SQL statements and the MySQL doesn't informs client applications like MySQL-Front about any changes.

With the Refresh 22 or the Refresh all 22 feature the user can update the Object Browser easily.

7.4.2 Data Browser

Menu: View / Data Browser

Switches the view to the data.

The Data Browser show the content of a table or a view inside a data grid like known from MS Excel.

The number of records to be received can be **limit**. An **offset** can be set for the first record to be shown.

It's possible to reduce the numbers or records fetched from the database by a limit count or by an optional filter. The **filter** will be sent as WHERE clausel in the SELECT query.

A quick **search** field offers an easy to use way to get all records with a search value.

Binary large objects (BLOB) values will be shown as an image (GIF, JPG, BMP or PNG), as RTF text or inside a hex editor.

7.4.3 Object IDE

Menu: View / Object IDE

Switches the view to an integrated development environment for Views, Stored Procedures, Stored Functions, Triggers and Events.

The Object IDE allows to edit the source for Procedure and Function / the execute statement for

Views, Triggers and Events easily. You can edit the code like know from a normal text editor.

To update the changes one click to the toolbar is needed only. This will remove the previous existing object and creating a new one if the MySQL database does not allow a changing of the existing one.

For the case a creating of the updated source is not possible (because of invalid changes) the previous existing object will be re-created automatically.

To **test a Procedure / Function** you have a line with the input parameters below the source code area. For each parameter an input field is given - related to the field type definition of the source code. The result of the function executing and the output values of the INOUT and OUT parameters will be shown as a result set at the bottom of the Object IDE.

For Procedures with multiple result sets a tab for each single result set will be shown.

To **test a Trigger** below the source code area there is one single row of the table fields values. You can enter values to use one button for the main trigger events: INSERT, REPLACE, UPDATE and DELETE. Since a Trigger cannot show an output (wether a result set nor parameters) you have to check the working of the trigger by yourself with the SQL Editor or Data Browser. Please don't forget to update the view of it after executing the trigger.

To **test an Event** SQL-Front stores the statement of the Event in a Stored Procedure temporary, executes this Procedure and remove it again. Like the triggers also an Event doesn't have an output.

7.4.4   Query Builder

Menu: View / Query Builder

Switches the view to a visual builder of SQL queries.

The main window can be divided into the following parts:
- The Query Building Area is the main area where the visual representation of query will be displayed. This area allows you to define source database objects and derived tables, define links between them and configure properties of tables and links.
- The Columns Pane is located below the query building area. It is used to perform all necessary operations with query output columns and expressions. Here you can define field aliases, sorting and grouping, and define criteria.
- The Query Tree Pane is located at the left. Here you may browse your query and quickly locate any part of it.
- The page control above the query building area will allow you to switch between the main query and sub-queries.
- The small area in the corner of the query building area with the "Q" letter is the union sub-query handling control. Here you may add new union sub-queries and perform all necessary operations with them.

To add a table to the query please drag&drop it from the navigator.

To remove an object from the query, select it and press the Del key or simply click the Close button in the object header.

You may change the properties of each object added to the query by right clicking the object and

selecting the Edit... item from the drop-down menu or simply by double-clicking the object header.

To create a link between two objects (i.e. join them) you should select the field by which you want to link the object with another and drag it to the corresponding field of the other object. After you finish dragging, a line connecting the linked fields will appear.

The join type created by default is INNER JOIN, i.e. only matching records of both tables will be included in the resulting dataset. To define other types of joins you should right click the link and select the Edit... item in the drop down menu or simply double-click it to open the Link Properties dialog. This dialog allows you to define join type and other link properties.

To remove a link between objects, right-click the link line and select the Remove item in the drop-down menu.

The easiest way to add a field to the list of query output fields is to check the checkbox at the left of the field name in the Query Building Area. To include all the fields of the object you should click the checkbox at the left of the asterisk item of the object.

Another way is to select a field name from the drop-down list of the Expression column in the Columns Pane. And the most common way is to write any valid expression in the Expression column in the Columns Pane.

To remove a field from the list of query output fields you should uncheck the checkbox at the left of the field name in the Query Building Area or you may remove it by unchecking the Output column checkbox.

Such operations as removing lines from the Columns Pane or re-ordering output fields are available by right clicking on the leftmost gray column via the drop-down menu.

The output field's aliases may be defined in the Alias column of the Columns Pane.

To enable sorting of output query fields you should use the Sort Type and Sort Order columns of the Columns Pane. The Sort Type column allows you to specify the way the fields will be sorted - in the Ascending or Descending order. The Sort Order column allows you to setup the order in which fields will be sorted, if more than one field will be sorted. To disable sorting by some field you should clear the Sort Type column for this field.

It's also possible to create or edit a SQL query directly. This will overtake all changes into the visual query builder.

7.4.5   SQL Editor

Menu: View / SQL Editor

Switches the view to the SQL Editor.

The SQL Editor allows to write one or multiple SQL statements and execute the directly. The result sets of queries will be shown below to syntax highlighting editor.

It's possible to execute all statements at once, execute the marked code or the execute the SQL statement where it cursor is located in.

To get help about the SQL commands MySQL-Front offers a context sensitive SQL help. Just pressing <F1> to get a help to the keyword the cursor is located.

Attension:

All changes sent to the database by using the SQL Editor will not be overtaken automaticly inside MySQL-Front. The Refresh All [22] feature has to be called to update MySQL-Front.

Note:

To get the context sensitive help of the SQL statements the MySQL has to support the HELP feature. This requires MySQL version 4.1 or higher. Additional the help tables of the mysql database has to be filled. This can be made by executing the fill_help_tables.sql script attached with the MySQL database installation. To do this you need full access to the mysql database or you have to ask the database administrator to fill this tables.

7.4.6 Diagram

Menu: View / Diagram

Graphical diagram of table relationships.

Tables can be added from the Navigator [20] with Drag&Drop or Cut&Paste or by the context menu of the diagram. Foreign Keys will be added automaticly.

Tables and Foreign Keys can be moved with the mouse.

A <Shift+LeftClick> to a foreign key line adds a further edge into it. Unneeded edges will be removed automaticly.

Note:

Tables with Foreign Key are supported only.

7.4.7 Location Bar

Menu: View / Address Bar

MySQL-Front offers the same navigation as with Web Browsers with the help of URLs. This can significantly speed up searches with many databases / tables.

Favorites also use these addresses (URI format). It is also possible to call MySQL-Front by using a URL. This means links from the Windows start menu or other programs can be directly setup to connect with a specific view within MySQL-Front.

This also functions the other way around. Addresses of other programs can also be entered into MySQL-Front. For example, entering http://www.sql-front.com/ opens the homepage of MySQL-Front in the Web Browser.

7.4.8 Sidebar

7.4.8.1 Navigator

Menu: View / Sidebar / Navigator

Shows/hides the navigator.

7.4.8.2 Favorites

Menu: View / Sidebar / Favorites

Frequently used addresses can be saved as Favorites within MySQL-Front similar to the function found in other programs such as Web Browsers.
Views are thereby loaded much faster.

7.4.8.3 Files

Menu: View / Sidebar / Files

Shows/hides the files like the Windows Explorer.

7.4.8.4 SQL Editor History

Menu: View / Sidebar / SQL Editor History

Shows/hides the executed commands of the SQL Editor.

Note:
  Single commands execution will be listed only.

7.4.9 SQL Log

Menu: View / SQL Log

Shows/hides the log of the executed SQL queries.

Each update of the log requires time. Logs should thus only be displayed if you are really interested in the sent queries.

In case of importing, it is recommended to always hide the log to increase speed.

7.4.10 Details

Menu: View / Details

The order, visibility and width of any columns in the data grid can be changed in this separate dialog box.

Note:
  The order of columns can also be changed by dragging a column header in the data grid with the mouse.

  The visibility of a single column can also be changed via the context menu (<Right-Click>) of the column header of the data grid.

  The maximal width of a column can be defined in the global settings.

7.4.11 Refresh

Menu: View / Refresh

Updates and redraws the right side of the current window of the database.

See also:
Refresh All 22

7.4.12 Refresh all

Menu: View / Refresh all

Updates and redraws the entire window of the database. This means all elements of the current window are updated.

Note:
If several windows of the same session are open, update and redraw also includes these other windows.

See also:
Refresh 22

7.5 Favorites

7.5.1 Add

Menu: Favorites / Add

The current view (address) is added to the list of Favorites. An individual name can be indicated for each Favorite. (Assignment of identical names is not permitted.)

The format of the address will be described here 22.

See also:
Properties 22

7.5.2 Properties

Menu: Favorites / Properties

The Favorites view is used to edit Favorites. A unique name can be indicated for each Favorite.

Format of the address:
mysql://username:password@www.myserver.com:3306/databasename/tablename/

Addresses starting with "mysql://" refer to MySQL-Front. MySQL-Front passes other addresses to the respectively linked program.
The username / password is not needed since it will be stored in the session.

The server has to be the same like the server of the session.

There are some additional parameter possible:
    Data Browser:
        limit: Number of records
        filter: Filter of the SELECT query to get the data

    SQL Editor:
        file: Filename to open

It's also possible to start MySQL-Front with a address as parameter. In this case the servername / username will be needed to detect the correct session.

7.6 Database

7.6.1 New

7.6.1.1 Database

Menu: Database / New / Database

Creates a new database.

The individual settings are described in the MySQL manual.

Note:
    MySQL does not permit subsequent database name changes.

7.6.1.2 Table

Menu: Database / New / Table

Creates a new table in the selected database.

The individual settings are described in the MySQL manual.

7.6.1.3 View

Menu: Database / New / View

Creates a new view in the selected database.

The individual settings are described in the MySQL manual.

Note:
    MySQL version 5.0.1 and higher is needed.

7.6.1.4 Procedure

Menu: Database / New / Procedure

Creates a new stored procedure in the selected database.

The individual settings are described in the MySQL manual.

Note:
MySQL version 5.0.4 and higher is needed.

7.6.1.5 Function

Menu: Database / New / Function

Creates a new stored function in the selected database.

The individual settings are described in the MySQL manual.

Note:
MySQL version 5.0.4 and higher is needed.

7.6.1.6 Event

Menu: Database / New / Event

Creates a new event in the selected database.

The individual settings are described in the MySQL manual.

Note:
MySQL version 5.1.6 and higher is needed.

7.6.1.7 Index

Menu: Database / New / Index

Creates a new index in the selected table.

The individual settings are described in the MySQL manual.

7.6.1.8 Field

Menu: Database / New / Field

Creates a new field in the selected table.

The individual settings are described in the MySQL manual.

7.6.1.9 Foreign Key

Menu: Database / New / Foreign Key

Creates a new foreign key in the selected table.

The individual settings are described in the MySQL manual.

Note:
　　Table Engine Type "InnoDB" or "Falcon" is needed.

7.6.1.10　Trigger

Menu: Database / New / Trigger

Creates a new trigger in the selected database.

The individual settings are described in the MySQL manual.

Note:
　　MySQL version 5.0.10 and higher is needed.

7.6.1.11　Host

Menu: Database / New / Host

Creates a new host.

The individual settings are described in the MySQL manual.

7.6.1.12　User

Menu: Database / New / User　(only with MySQL version 4.0 and higher)

Creates a new user.

The individual settings are described in the MySQL manual.

7.6.2　Remove

7.6.2.1　Database

Menu: Database / Remove / Database

Removes the selected database including all therein contained tables.

7.6.2.2　Table

Menu: Database / Remove / Table

Removes the selected table.

7.6.2.3　View

Menu: Database / Remove / View

Removes the selected view.

7.6.2.4 Routine

Menu: Database / Remove / Routine

Removes the selected routine (procedure or function).

7.6.2.5 Event

Menu: Database / Remove / Event

Removes the selected event.

7.6.2.6 Index

Menu: Database / Remove / Index

Removes the selected index.

7.6.2.7 Field

Menu: Database / Remove / Field

Removes the selected field.

7.6.2.8 Foreign Key

Menu: Database / Remove / Foreign Key

Removes the selected foreign key.

Note:
MySQL version 4.0.13 and higher is needed.

7.6.2.9 Trigger

Menu: Database / Remove / Trigger

Removes the selected trigger.

7.6.2.10 Host

Menu: Database / Remove / Host

Removes the selected host.

7.6.2.11 Process

Menu: Database / Remove / Process

Ends the selected process.

7.6.2.12 **User**

Menu: Database / Remove / User (only with MySQL version 4.0 and higher)

Removes the selected user.

7.6.3 **Properties**

7.6.3.1 **Server**

Menu: Database / Properties / Server

General:
  Displays additional information about the database server such as version and uptime.

  The character set / collation settings are the global settings of the database.

Processes:
  Additional process status information yields an overview over all database processes.
  It is possible to end and close individual processes.

SQL Log: (On MySQL 5.1 with enabled log option only.)
  Executed SQL statements.

Slow SQL Statements: (On MySQL 5.1 with enabled slow query log option only.)
  Slow executed SQL statements.

Status:
  Displays an overview of the detailed database status. Please consult the MySQL manual for
  additional information.

Variables:
  Displays an overview of the variables of the database. Many variables can be modified (insofar as
  permitted by the database).

Users:
  Displays a list of the users.

Hosts:
  Displays a list of the host restrictions.

Extras: (This is available if the shutdown feature is supported by the used connection type and the
user have the SUPER right only.)
  The database can be closed.

Errors Messages: (This is available if the database is located on "localhost" only.)

Displays the error log of the database.

7.6.3.2 Database

Menu: Database / Properties / Database

Changes the properties of the current database.

The individual settings are described in the MySQL manual.

7.6.3.3 Table

Menu: Database / Properties / Table

Changes the properties of the current table.

The individual settings are described in the MySQL manual.

Note:
This feature can be called for several tables at once. To mark several tables in the Object Browser you have to mark them by <Shift+Click>, <Ctrl+Click>, <Shift+Space> or <Ctrl+Space>.

7.6.3.4 View

Menu: Database / Properties / View

Changes the properties of the current view.

The individual settings are described in the MySQL manual.

7.6.3.5 Routine

Menu: Database / Properties / Routine

Changes the properties of the current routine.

The individual settings are described in the MySQL manual.

7.6.3.6 Event

Menu: Database / Properties / Event

Changes the properties of the current event.

The individual settings are described in the MySQL manual.

7.6.3.7 Index

Menu: Database / Properties / Index

Changes the properties of the current index.

The individual settings are described in the MySQL manual.

7.6.3.8 Field

Menu: Database / Properties / Field

Changes the properties of the current field.

The individual settings are described in the MySQL manual.

Note for TimeStamp fields:
The default value <INSERT-TimeStamp> means the current time while inserting a new record (CURRENT_TIMESTAMP).
The default value <UPDATE-TimeStamp> means the current time while updating an existing record (CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP).

7.6.3.9 Foreign Key

Menu: Database / Properties / Foreign Key

Displays the properties of the current foreign key.

The individual settings are described in the MySQL manual.

7.6.3.10 Trigger

Menu: Database / Properties / Trigger

Changes the properties of the current trigger.

The individual settings are described in the MySQL manual.

7.6.3.11 Host

Menu: Database / Properties / Host

Changes the properties of the current host.

The individual settings are described in the MySQL manual.

7.6.3.12 User

Menu: Database / Properties / User (only with MySQL version 4.0 and higher)

Changes the properties of the current user.

The individual settings are described in the MySQL manual.

7.6.3.13 Variable

Menu: Database / Properties / Variable

Changes the properties of the current variable.

The individual settings are described in the MySQL manual.

7.6.4   Insert new record

Menu: Database / Insert new Record (only Data Browser)

Adds a new record at the current position.

7.6.5   Delete record

Menu: Database / Delete Record (only Data Browser)

Removes the selected record.

7.6.6   Edit record

Menu: Database / Edit

Edits the current record.

Changes are automatically applied to the database when switching the record or when exiting the data browser.

7.6.7   Run

Menu: Database / Run (only SQL Editor)

Executes all queries of the SQL Editor.

If the SQL Editor contains several queries, these are sent to the database one after the other.

The result of the last query is displayed if necessary.

Note:
Larger scripts in the form of a file can be imported directly (and thus quicker) when using Import from a SQL File 9 .

If you do not want to change the SQL script, you should import instead of using the SQL Editor.

See also:
Run Selection 30

7.6.8   Run Selection

Menu: Database / Run Selection (only SQL Editor)

Executes the current/selected query of the SQL Editor. This is useful for testing individual sections of a script.

See also:
Run 30

7.6.9 Empty

Menu: Database / Empty

Empties the data of the selected element (removes all records for a table or sets the field to NULL).

7.6.10 Automatic Commit

Menu: Database / Automatic Commit

Enables / disables the automatic commit in the MySQL database.

More descriptions about this feature are given in the MySQL manual.

Notes:
A lot of engine types like MyISAM does not support the non automatic commit.
A the most changes of the database objects like field / table structure doing an hidden commit. So it's not possible to rollback after this changes.

See also:
Commit 31
Rollback 31

7.6.11 Commit

Menu: Database / Commit

Commits the pending changes into the database.

More descriptions about this feature are given in the MySQL manual.

See also:
Automatic Commit 31
Rollback 31

7.6.12 Rollback

Menu: Database / Rollback

Rollback the pending changes from the database.

More descriptions about this feature are given in the MySQL manual.

See also:
Automatic Commit 31
Commit 31

7.7 Extras

7.7.1 Search

Menu: Extras / Search

MySQL-Front offers a data Search function within whole databases.

Searching requires significant resources if tables are large. The actual amounts vary depending on numerous different factors.

Search for:
    Value / pattern for which to search

Search options:
    Case sensitive: Capital/small letters are not adjusted.
    Whole values: Only values completely matching the search pattern are considered.
    Regular expression: Search using regular expressions.

See also:
    Search 16
    Replace 32

7.7.2 Replace

Menu: Extras / Replace

MySQL-Front offers a data Search&Replace function within whole databases. Depending on the applied search mask/criteria, data within the database can be replaced in part or as a whole.

Search&Replace requires significant resources if tables are large. The actual amounts vary depending on numerous different factors.

Search for:
    Old value / pattern for which to search

Replace with:
    New value / new pattern

Search options:
    Case sensitive: Capital/small letters are not adjusted.
    Whole values: Only values completely matching the search pattern are considered.
    Regular expression: Search using regular expressions.

Backup:
    A table can be generated before synchronization. This table will be assigned the name of the respective table with the extension "_bak". Already existing copies with this extension are overwritten without warning.

A backup copy is generated completely within the database. Creating backups can use significant resources of the database if tables are large.

Warning:
Existing data are changed and cannot be restored during replacing.
User or program errors are always a possibility.
Data backups are therefore important and should be created frequently!

See also:

7.7.3   Transfer

Menu: Extras / Transfer

MySQL-Front transfers (copy) whole databases / tables to different server / database.

If you want to transfer a table you have to select the table in the left side. After this you have to select the destination database on the right.

To transfer a database please select it on the left - and select the destination session on the right.

It's also possible to transfer several tables at once by selecting the tables with Ctrl-Left-Click with the mouse.

Structure:
    The data structure (objects) will be transferred.

Data:
    The data will be transferred.

Existing Data:
    Allows to update existing records. (Requires identical primary key definition for Source and Destination).

Disable Keys:
    Foreign key will be disabled while transfer. This could be needed to allow circular foreign keys.

Lock Tables:
   Tables will be locked while transfer is running. No other application can change a value in this time.

Error Handling:
    If the Error Handling will be ignored the data will be transfered by the `LOAD DATA INFILE` statement. This is the smallest SQL overhead - all data will be transfered with one single (bug big) database request.

    This does not allow a individual error handling.

7.7.4   **Synchronize**

Menu: Extras / Synchronize

MySQL-Front allows the synchronization of different tables. The primary index is used to identify the data. This means that tables can be synchronized only with a primary index.
The objects of the table(s) (fields / indices) are identified with the column names.
Foreign keys are not transferred during the synchronization.

You can synchronize two different tables on different (or the same) session.

Otherwise it's possible to synchronize two databases or two entire sessions. But it's not recommended to synchronize two sessions, since this encloses the "mysql" database.

What:
   Either the data structure (objects) and/or the data can be synchronized.

Direction:
   Only the table(s) identified as slaves are modified.

Update existing objects:
   The settings (e.g. data type) of existing object is updated.

Existing data:
   Existing data are updated (overwritten) without any warning.

Ignore Foreign Keys:
   Foreign keys are deactivated during synchronization. Please consult the MySQL manual for a description of advantages and disadvantages of this functionality.

Lock Tables:
   A table being synchronized is locked to other users / programs during the synchronization process. Please consult the MySQL manual for a description of advantages and disadvantages of this functionality.

Backup:
   A table can be generated before synchronizing data. This table will be assigned the name of the respective table with the extension "_bak". Already existing copies with this extension are overwritten without warning.
   A backup copy is generated completely within the database. Creating backups can use significant resources of the database if tables are large.

Warning:
Existing data are changed during synchronization and cannot be restored.
User or program errors are always a possibility.
Data backups are therefore important and should be created frequently!

7.7.5 Table Service

Menu: Extras / Table Service

The MySQL database offers some maintenance features for table.

The detailed workings are described in the MySQL manual.

7.8 Settings

7.8.1 Global settings

Menu: Settings / Global Settings

This is where all of the settings for the program itself are configured. Included are language, design, and user level, for example.

View:
Language:
  Selects the language used in MySQL-Front. (This does not apply to database messages.)
Skin:
  Selects the appearance (icons) of MySQL-Front.

Tabs:
  Selects if the tab bar is always visible or if it will be hided while not 2 or more tabs are opened.

Navigator:
  Shows the System Tools (Hosts, Processes, Stati, Users, Variables). Alternatively this features
  are implemented in the properties dialog of the server.

Files:
User data:
  Indicates the folder of the user-defined MySQL data files.

File types: associate:
  .sql:
    Links files with the .sql extension with MySQL-Front in Windows Explorer.
  mysql://
    Links URI (Unified Resource Identifier) starting with "mysql://" with MySQL-Front in the
    whole Windows system. This allows to open (and execute) SQL files from the local system
    or from any address in the Internet.

Data Browser:
Data Font:
  Indicates the font used to display data in data tables.
NULL values:
  Indicates the background color and a font for NULL values.
Maximal column width:
  Wide data fields can be limited as specified so that several columns are visible on screen at

once.

Memo data in grid:

Describes wether the content of text fields is also displayed within the data table.

Data in grid:

Describes wether the content of BLOB and Memo fields is also displayed within the data grid. (Only meaningful if text is saved within the BLOB fields. The latter is not intended by MySQL – but is still done by a few users.)

Background:

Inside the data grid every second line gets a light gray background. This can be helpfull to read the data inside the grid.

Current line:

The background of current line can be highlighted. This makes it easier to see the current line and all values on a wide data grid.

Editor:

SQL Font:

Indicates the font used by the SQL Editor.

Line Numbers:

Shows line numbers.

Auto. Indent:

Automatic Indent is enabled.

Tabulator:

Allows the usage of the <Tab> key.

Tab in spaces:

Each tabulator (from the file of the keyboard) will be translated to spaces.

Tab Width:

Numbers of chars for the tabulator.

Right Edge:

Shows line on the right to help the user not to use too large lines.

Code Completition:

Activates the code completition popup window in the SQL Editor. The time for showing the popup help can be entered in Milliseconds (ms).

Current line:

The background of current line can be highlighted. This makes it easier to see the current line on a wide screen.

SQL Log:

Font:

Indicates the font used in the SQL log.

Time:

Shows the local time when the query has been sent to the database.

Result:

Shows the result of the SQL query sent to the database.

Errors:

Shows received errors from the database.

Lines:

MySQL-Front requires more time and system resources for a large log. It is thus recommended limiting the size of the log.

Updates:

MySQL-Front is able to check automatically whether a program update is available.

See also:
Sessions 37

7.8.2 Sessions

Menu: Settings / Sessions

In MySQL-Front, settings relevant to database linkages are saved in "sessions". Each session contains various connection-related settings such as server, user, and password as well as numerous additional settings such as selection of utilized databases or caching settings.

This means it might also be advisable, in certain situations, to create different sessions for a database connection (e.g., one with caching and one without).

(To edit / delete a session you have to close all open windows of this session before.)

Common:
Name:
Specifies the name of the session used to identify the session in MySQL-Front.

Connection:
Server:
Address of the server hosting the database. The server is described with a domain name or an IP address.

To connect via the "MySQL" Named Pipe the Server has to be ".".
Port:
Port number of the database (usually 3306).
Connection Type:
Indicates the type of database access. "Built-in" access is usually possible. For reasons of compatibility, the use of a vendor library might be necessary. This library is supplied together with the MySQL database.
Some ISPs do not permit access to the database from external computers. This problem can be circumvented with the use of HTTP tunnels 42.
Character Set:
Used character set. If not set the default character set of the database will be used.

Login:
User:
Database server user name.
Password:
Database server password.
Database:
Utilized databases (several are separated with ",").

Startup:
This SQL queries will be executed after connection by this application immediately.

FTP Server:
The FTP Server will be used to uploading the HTTP Tunnel script.

Server:
  Address of the server hosting the HTTP tunnel script. The server is described with a domain
  name or an IP address.
Port:
  Port number of the database (usually 21).

User:
  FTP server user name.
Password:
  FTP server password.

Path:
  Relative path of the FTP server to the HTTP tunnel script.
  Attention:
  The name of the tunnel script is not a part of this path - it will be taken from the "HTTP Tunnel"
  field from the "Connection" tab automatically.

See also:
  Global Settings

7.8.3   Import

Menu: Settings / Import

Loads all settings (session and global settings) from a file.

To use this option please close all windows before.

See also:
 Export

7.8.4   Export

Menu: Settings / Export

Saves all settings (session and global settings) to a file. This means that these setting can also be
transferred to another computer or restored after a hard drive crash.

Note:
This file also contains the passwords for the sessions. The file should therefore be safeguarded
appropriately.

See also:
  Import

7.9   Help

7.9.1   Index

Menu: Settings / Sessions

Displays the content of help for MySQL-Front.

Inside the SQL Editor a context sensitive help of the current SQL language element will be shown if the used MySQL database supports the HELP query.

7.9.2 Homepage

Menu: Help / Homepage

Opens the Internet homepage MySQL-Front in a web browser.

The homepage offers current information about the program, updates, and the opportunity to order a registered version.

7.9.3 Forum

Menu: Help / Forum

Opens the internet forum of MySQL-Front in a web browser.

7.9.4 MySQL Manual

Menu: Help / Forum

Opens the internet manual of the MySQL in a web browser.

Note:
This works only, if the MySQL database supports the HELP statement as well and if the result of it contains valid URLs to the manual.

The MySQL manual is not a part of MySQL-Front. It will be offered by MySQL AB.

7.9.5 Install Update

Menu: Help / Install Update (needs a running internet connection)

MySQL-Front can install updates automatically. This requires the MySQL-Front is exited, which is why all open sessions have to be closed.
The update itself runs fully automatic until MySQL-Front is restarted.

Note:
Inside the Global Settings 37 you can configure automatic checkings for available updates.

7.9.6 Registration

Menu: Help / Registration (unregistered only)

Registers the installed MySQL-Front version.

After ordering, you will receive an email with the licensing key.

Copy and paste the licensing key into this input window. The MySQL-Front version installed on this computer is then registered.

Another option is to save the licensing key in the file `MySQL-Front.key` and store this file in the same directory as `MySQL-Front.exe` (e.g., when installing `MySQL-Front_Setup.exe`). The licensing key now does not have to be entered manually.

7.9.7 Info

Menu: Help / Info

Opens a window containing information about MySQL-Front.

Info:
    Displays information about the installed version and the applicable copyright.

License:
    Displays information about the used licensing key:
    - Name of the license holder
    - Number of licenses
    - Generation of the licensing key

Appreciations:
    Displays the names of individuals that participated in MySQL-Front (insofar as desired).

8   FAQ

8.1   How to Start

How to start after installing MySQL-Front?
    You are prompted to create a so-called session 37 when launching MySQL-Front for the first time.

The following informations are usually required for a session:
    - Server (Connection tab)
    - User (Login tab)
    - Password (Login tab)

Please ask your database administrator (often your ISP / Web hoster) for this information.

For using a database on your local computer mostly you have to use the following values:
    - Server: "localhost"
    - User: "root"

Do not enter a password or specify a database.

Can I run MySQL-Front from a USB device without installing it on a local system?
    Yes, you need to store some files to your USB device:

- `MySQL-Front.exe` from your program folder
- `MySQL-Front.key` a text file with your licence key (please create it manually)

- `Desktop.xml` an empty text file

If you execute `MySQL-Front.exe` on a system without an installation of MySQL-Front it will store all settings inside the same folder like `MySQL-Front.exe`.

8.2 Connection Problems

MySQL-Front reports connection problems: "Can't connect to MySQL server on 'www.server.com' (10060)". What can I do?
- Check the network connection to the server.
- Check your Internet connection and your firewall.
- Find out and solve other problems why MySQL-Front is not able to create a network connection to the database server.
- Read the MySQL manual: http://dev.mysql.com/doc/mysql/en/Can_not_connect_to_server.html

I get the error message from the database: "**Access denied for user: username@123.yourprovider.com" (1044). What can I do?**
Please be sure to enter exactly the login information (user, password **and** database) you received from your database administrator (often your ISP).

If this does not help you, please contact your ISP and ask if you are allowed to login from your local client to the database on your account. Frequently, the ISP does not permit this. In this case, you may be able to connect by using a HTTP Tunnel 42 or a SSH Tunnel 42.

Additional information is listed in the MySQL manual: http://dev.mysql.com/doc/mysql/en/Access_denied.html

MySQL-Front reports connection problems #1130: "Host '123.yourprovider.com' is not allowed to connect to this MySQL server". What can I do?
Some database administrators (ISPs) permit access to the MySQL database not from all computers due to reasons of security. This means MySQL-Front cannot access the database normally.

This problem can be circumvented with the usage of so-called HTTP Tunnel 42 or a SSH Tunnel 42.

See also:
SSH Tunnel 42
HTTP Tunnel 42

8.3 Using the Program

How can I sort the data in the Data Browser or the result of the SQL Editor?
Click on the grid header (not possible for Text / BLOB fields). If a limit is set in the Data Browser, data are re-queried from the database – or data is sorted within MySQL-Front.

How can I sort the Data Browser / SQL Editor by multiple columns?
Please use the <Ctrl> or <Shift> key while clicking on the title of the column. With this, the clicked column will be used before (<Ctrl>) / after (<Shift>) the existing column inside the sort order.

How can I copy some records from the Data Browser / Result of the SQL Editor into the clipboard?
Please mark the records in the data grid by <Shift+LeftClick> and <Ctrl+LeftClick>. After this you can press <Ctrl+C> to copy the records into the clipboard.

After I've executed some statements in the SQL Editor the Navigator and the Object Browser will not been updated. Why?
MySQL-Front can not parse and analyze all statements and the Database does not inform client program about any changes. Because of this MySQL-Front can't recognize which changes you've forced by your manually SQL statements.

When I press the refresh button, navigation is not actualized. Why?
The "Refresh" button updates only the right side to speed up this process.

If you want to refresh the navigator please select the View / Refresh All menu.

How can I step back after an update?
Please just install the version you want to have. This will overwrite a newer version.

Does MySQL-Front work with Wine on Linux systems?
Unfortunately Wine is still (version 1.1.9) very buggy, so you have to use original Windows DLLs to run MySQL-Front under Wine.

8.4   SSH Tunnel

What is a SSH tunnel and how does it work?
Please refer the MySQL manual:
http://dev.mysql.com/doc/mysql/en/windows-and-ssh.html

See also:
HTTP Tunnel 42

8.5   HTTP Tunnel

What is a HTTP tunnel and how does it work?
Some ISPs permit access to the MySQL database only from the Web server due to reasons of security. This means MySQL-Front cannot access the database normally (error: Access denied).

This problem can be circumvented with the use of so-called HTTP tunnel.
Install the PHP script `libMySQL.php` (attached with the program) on the Web server (e.g. via FTP upload). Then select the connection type "HTTP tunnel" within the session and specify the respective HTTP URL of this libMySQL.php script on your web server.

MySQL-Front converts the database query into an HTTP request and sends this request to the PHP script on the Web server. (The script can access the database since it is, same as the other scripts, located on the Web server.) The PHP script then converts the reply of the database and sends it as the HTTP result back to MySQL-Front.

Security note:
All login informations (user and password) will be transfered as plain text to the HTTP server. To get more security MySQL-Front supports HTTPS. By using HTTPS all communication between MySQL-Front and the web server will be encoded by SSL.

Important note:
Since PHP doesn't support to use resources in sessions each single database request opens a new database process and close them after receiving the single response. Because of this by using the HTTP Tunnel the database is not be able to remember any session settings like variables, rollback or something like this.

See also:
SSH Tunnel [42]
Sessions [37]

8.6   Translations

I would like to translate MySQL-Front into another language. Am I allowed to do so?
Yes, indeed you are welcome. All language files are stored in the folder:
`C:\Program Files\MySQL-Front\Languages`
English is the original language. Just copy this file and translate it into the language of your choice.

The program "Ini Translator", http://initranslator.sourceforge.net/ is a small but effective program to create and edit translations.

It would be great for other users, if you would offer your specific translation together with MySQL-Front. Please contact the developer of this for further informations.

8.7   Known Bugs

Are there any errors known exist in MySQL-Front?
Unfortunately, yes:
* Date values are supported up from the 02/Jan/0001 only.
* Unsigned Bigint values are supported up to 63 bit only (values > 9223372036854775807 are not supported).

Inside the MySQL database / tools there are some bugs which are not implemented in MySQL-Front:
* MySQL-Front does not support this invalid values (f. e. '00' as month or day, '2000-02-31').
* The MySQL client (`mysql.exe`) is not able to handle `CREATE PROCEDURE` / `CREATE FUNCTION` / `CREATE TRIGGER` / `CREATE EVENT` queries with a the delimiter ";" inside the body. Because of this the MySQL client needs to use the work-a-round with a `DELIMITER` statement. This `DELIMITER` statement is a statement for the MySQL client only - it's **not** a valid SQL statement. MySQL-Front does not have this problem and it does not implement this work-a-round with the `DELIMTER` statement.
* The MySQL client (`mysql.exe`) uses the pseudo statement `SET NAMES` to configure the character set communication between itself and the database. Since MySQL-Front is able to configure this setting like a standard application handle settings this pseudo statement is not implemented completely to speedup the program.

Some wrong handlings seems to be program bugs - but they are problems of handling only:
* Error while importing SQL files: Please check the content of the SQL file. Maybe this SQL file is not written for the MySQL database or not for the used MySQL database version.
* All changes sent to the database by using the SQL Editor will not be overtaken automaticly inside MySQL-Front. The Refresh All [22] feature has to be called to update MySQL-Front.

Index

- A -

- C -

- D -

- E -

- F -

- G -

- H -

- I -

- K -

- L -

- M -

- N -

- O -

- P -