S7-1200/1500 TinyMySQL Client

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Contents

INFORMATION

LICENSE

REQUIREMENTS

- ✓ Basic knowledge of SQL
- ✓ Administrator's rights on target PC
- ✓ MySQL Server 5 or higher
- ✓ SIEMENS TIA PORTAL V13 SP1
- ✓ Any type of SIEMENS S7-1200/1500 PLC

LIBRARY TESTED FOR COMPATIBILITY WITH:
Port: 3306
Server: MySQL Community Server (GPL)
Version: 5.7.16-log
Login User: root
Current User: root@%
SSL: Disabled

Port: 3306
Server: (Ubuntu)
Version: 5.5.52-0ubuntu0.14.04.1
Login User: root
Current User: root@%
SSL: Disabled

DIFFERENCE BETWEEN FREE AND FULL VERSION OF LIBRARY.

There only one major difference, free version has hardcoded MySQL server credentials that you cannot change.

CLIENT CAPABILITIES/LIMITATION

Client library has following

Capabilities:

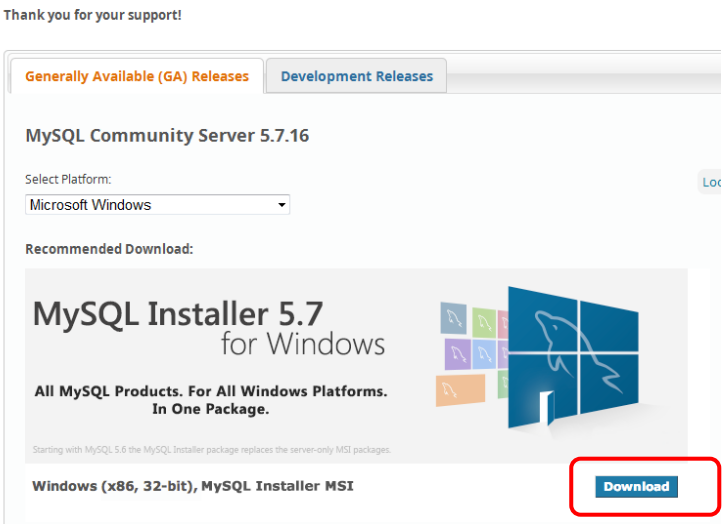
- SQL Server authentication protocol: v4.1
- SSL:no
- Host: can connect only using IP Address of the MySQL server.
- Supported commands: INSERT, UPDATE, DELETE.

Limitations:

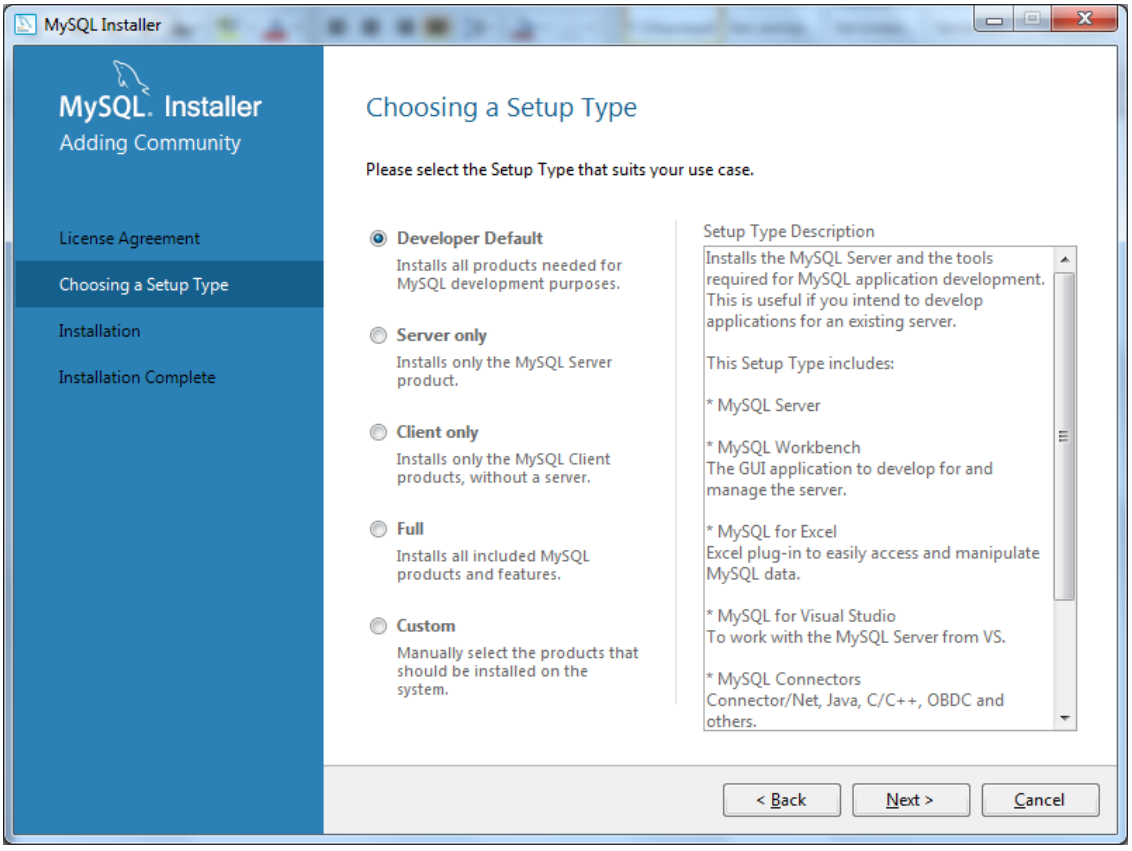
- SQL query MAX 254 characters long including white spaces.
- Not supported SELECT Query
- Free version has hardcoded server credentials
  user:root,
  pass:12345678,
  DB:Stats,
  Host:192.168.0.20

MYSQL BASIC SETUP.

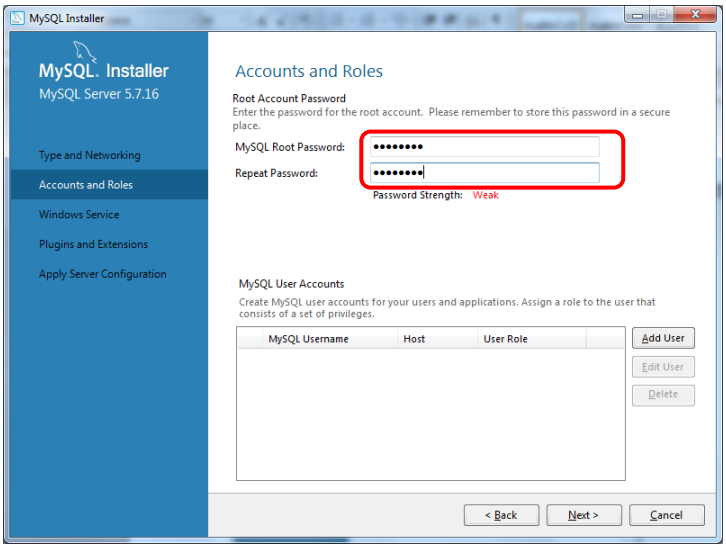
Before we start testing the library, we need to do a basic setup of MySQL server. In this example, I show how to setup server under windows. I believe those of you who know how to deal with Linux do not need any manual :)
So, first navigate to this link http://dev.mysql.com/downloads/mysql/ and download actual version of installer for your OS.



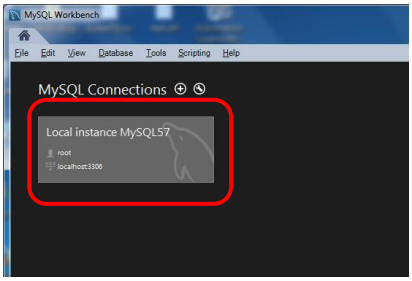
Run the installer and follow the wizard. I recommend leave all settings default.



On the step Accounts and Roles enter as Root password 12345678

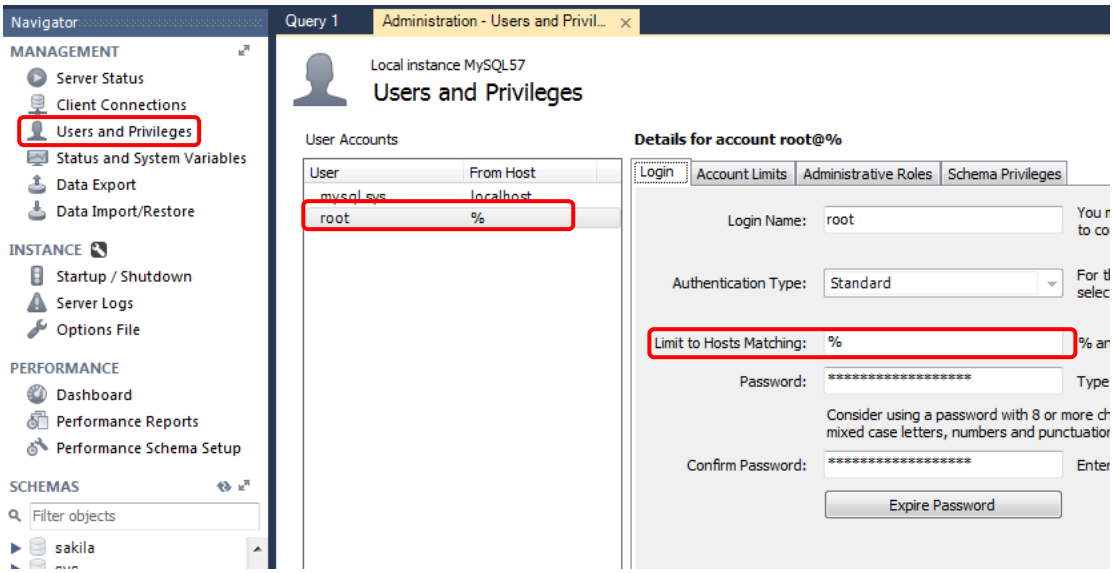


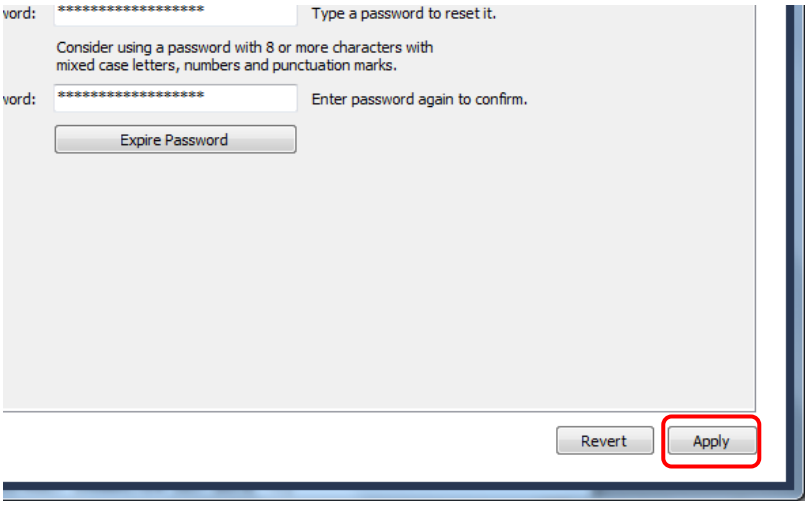
After finishing the wizard, launch the MySQL Workbench and connect to your server.



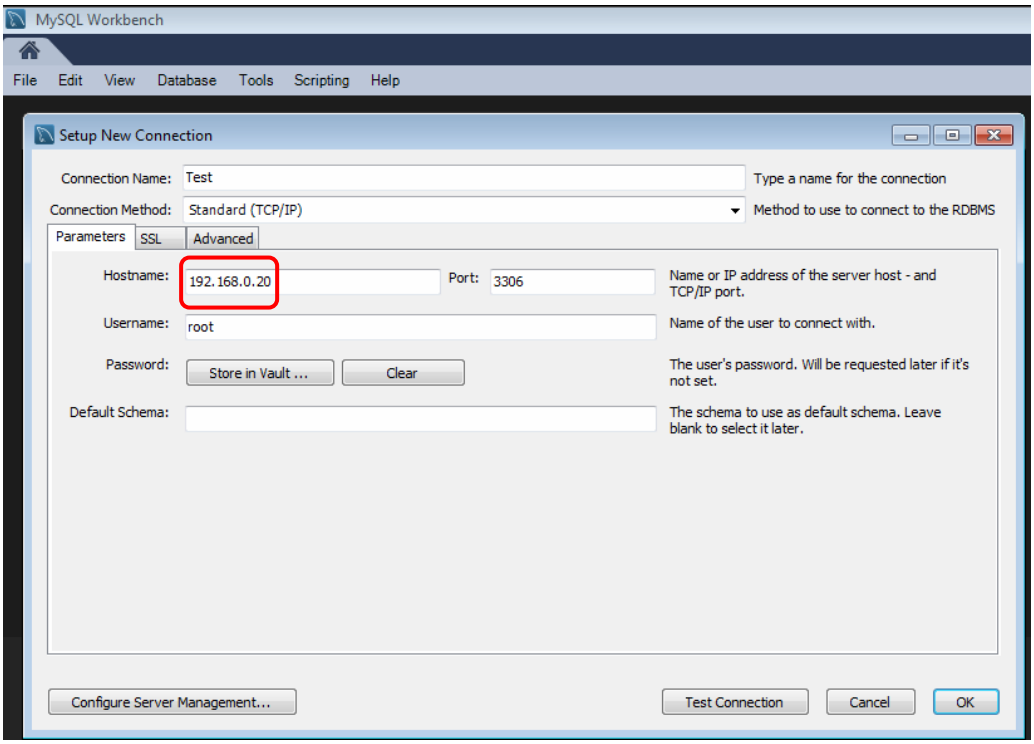
On next step we need change user permissions. Because by default, user is allowed to connect only from localhost.

Click Users and Privileges, then in user list select root and change Limit to Hosts Matching from localhost to %. This means that user can connect from any host. For stronger security you can type something like this 192.168.0.% in this case user can connect from any ip that starts with 192.168.0.





After modifying setting press Apply button. Now test if everything is Ok. Close MYSQL Workbench, open again, add new connection as Hostname type your local IP and try connect.

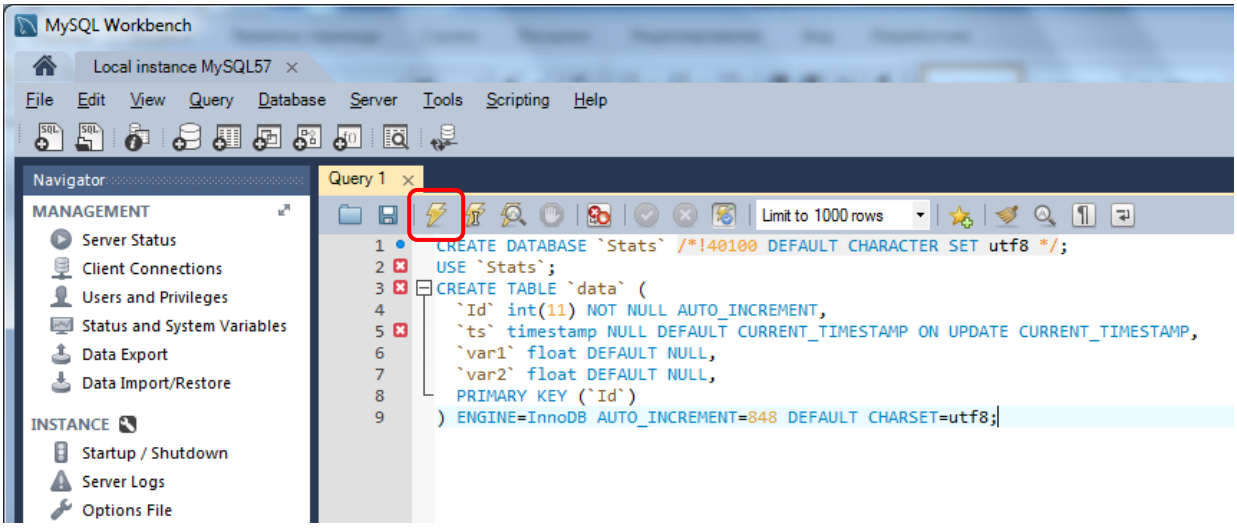


If connection successful, we can start creating Database and table.

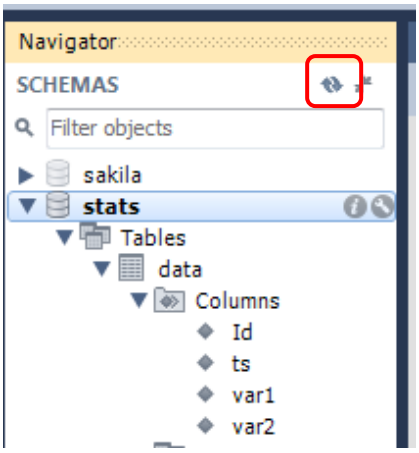
Copy/paste code below into Query tab and press execute button

```
CREATE DATABASE `Stats` /*!40100 DEFAULT CHARACTER SET utf8 */;

USE `Stats`;
CREATE TABLE `data` (
  `Id` int(11) NOT NULL AUTO_INCREMENT,
  `ts` timestamp NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  `var1` float DEFAULT NULL,
  `var2` float DEFAULT NULL,
  PRIMARY KEY (`Id`)
) ENGINE=InnoDB AUTO_INCREMENT=848 DEFAULT CHARSET=utf8;
```



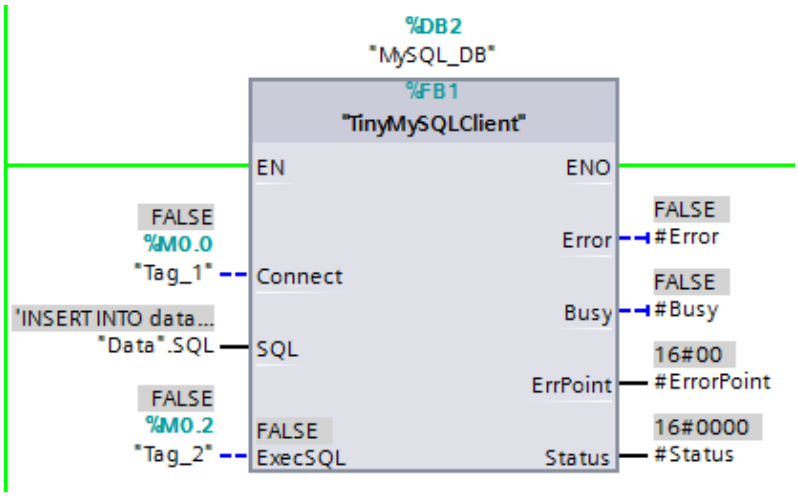
This script will create database Stats and table data. Press refresh SCHEMAS on navigator tab, there should be structure like in picture below.



If you get this, then MySQL server is ready for testing.

LIBRARY INTERFACE

Normally in ladder logic block looks like this



Description of each i/o

Name	DataType	Interface type	Description
Connect	Bool	Input	Value TRUE at the input establish connection to MYSQL server, FALSE - Disconnect. You should hold it TRUE as long as you need connection.
SQL	String	Input	SQL Query text
ExecSQL	Bool	InOut	Set to TRUE for executing Query at SQL input. Flag will reset by the block after execution.
Error	Bool	Out	Error flag. Means that some error occurred inside the block.
Busy	Bool	Out	The block is currently busy. Connect, disconnect, send or receive operation in progress.
ErrPoint	Byte	Out	Indicates which step generates an error. Use in conjunction with status output
Status	Word	Out	Error code

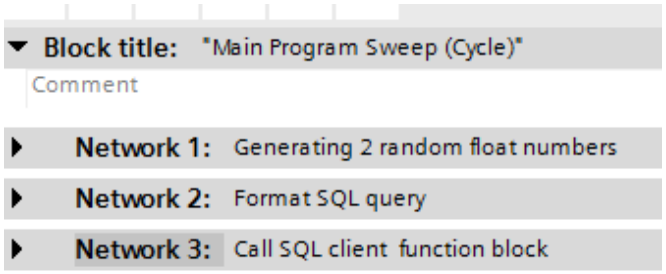
Relations between **ErrPoint** and **Status** outputs.

ErrPoint	Status	Description
1	TCON Error value	Error generated by TCON function. Refer to Siemens manual.
2	TSEND Error value	Error generated by TSEND function. Refer to Siemens manual.
3	TRCV Error value	Error generated by TRCV function. Refer to Siemens manual.
4	1	Login failed. Check our MySQL server credentials (username, password, dbname) and try again.
4	2	SQL Query error. Check your SQL syntax.

On each error, except SQL Query error, you need reconnect to the server by triggering Connect input.

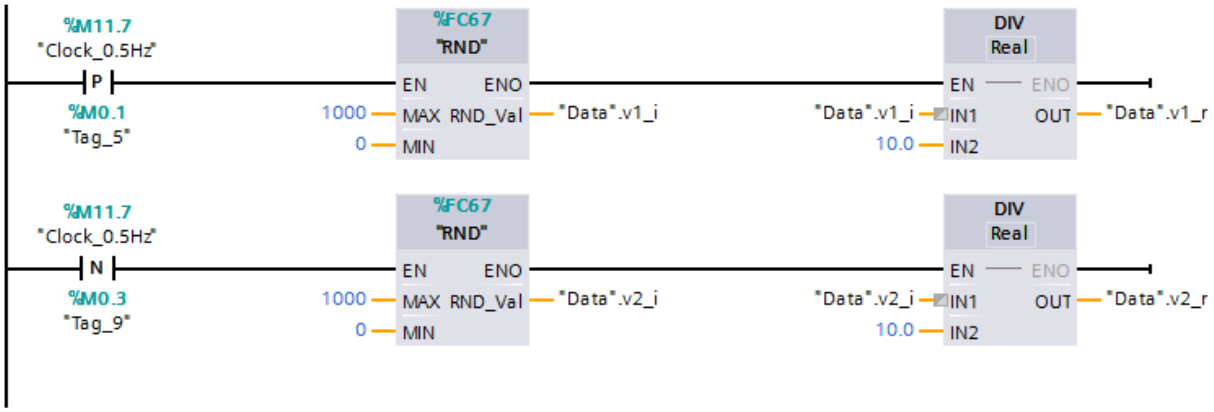
USING DEMO PROJECT

Demo project consist of 3 networks.



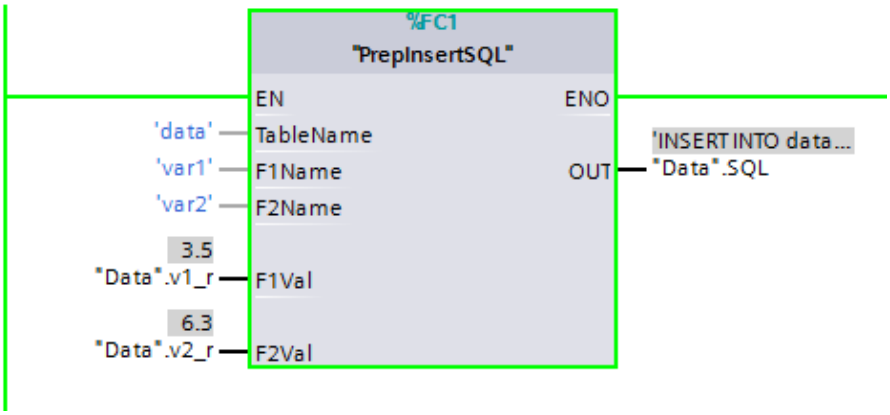
Network #1

Network used for generating each two seconds two random float values in range 0-100.



Network #2

This block combines an SQL query string. This can be done in more elegant way using s7-1500 series PLC, because there is some advanced instructions for string manipulations. Anyway, variant below will work for both of them. How realize this functionality is up to you.



Network #3

Here we call MySQL client block. As we can see if client successfully connected all outputs should be in zero state. Now when set marker M0.2, query at input SQL will be send to server and executed. If everything ok, all outputs remains in zero state.