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This manual walks you through the steps to set up a MySQL Server and cMT Database Server object, and then uses Microsoft Excel to read historical data from the HMI.

- cMT-SVR Models
- cMT3000 Models
- cMT-HDMI

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Overview

This user manual explains step by step how to install and set up a MySQL server on your PC, how to connect Excel to MySQL server, and how to design an EBPro project with a Database Server object to send data to the MySQL server.

The Database Server object is available for cMT Series Smart HMIs in EBPro V5.05.02 and later versions. The Database Server can synchronize sampled data and event logs to a remote MySQL server so that the user can use third-party software, such as Microsoft Office Excel, to manage the data on the server.

EBPro V6.00.01 adds the ability to query and display data from the MySQL server. The last section of this manual will cover the configuration of SQL Query and SQL Query Result Viewer objects.

Installing MySQL Server onto a PC

The SQL server used in the following demonstration is MySQL.

- 1. Download MySQL Workbench from this link: <u>http://dev.mysql.com/downloads/mysql/</u>
- 2. Click the [Download] button to download a Windows MySQL Installer MSI.

| Select Operating System: | | Looking for pr | evious GA |
|---|----------------|------------------|-------------|
| Microsoft Windows | ~ | versions? | |
| Recommended Download: | | | |
| MySQL Installer for Windows | 17 17 17 | E | |
| All MySQL Products. For All Windows Platforms. In One Package. | 1 | | |
| Starting with MyS2L5.6 the MyS2L Initialier package replaces the standalone MSI packages. | | | |
| Windows (x86, 32 & 64-bit), MySQL Installer MSI | | Go to Download I | Page > |
| Other Downloads: | | | |
| Windows (x86, 64-bit), ZIP Archive | 8.0.18 | 272.3M | Download |
| (mysql-8.0.18-winx64.zip) | MD5:3clfc0 | bc3368639d968fi | e5bf8afa23d |

The [Go to Download Page] button gives further download options.

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- 3. Open the downloaded .msi file to start installing MySQL.
- 4. Select [Custom] as the Setup Type.

Choosing a Setup Type

Please select the Setup Type that suits your use case.

O Developer Default

Installs all products needed for MySQL development purposes.

○ Server only

Installs only the MySQL Server product.

○ Client only

Installs only the MySQL Client products, without a server.

Full
 Installs all included MySQL products and features.

Custom

Manually select the products that should be installed on the system.

Setup Type Description

Allows you to select exactly which products you would like to install. This also allows to pick other server versions and architectures (depending on your OS).

Next >

Cancel

- 5. Select the following two products and click Next:
- 6. [MySQL Servers] » [MySQL Server] » [MySQL Servers x.x] » [MySQL Servers x.x.x X64/X86]
- 7. [Application] » [MySQL Workbench] » [MySQL Workbench -X64/x86]

Select Products and Features

Please select the products and features you would like to install on this machine.

| Filter: | | |
|---|-----------|---|
| All Software, Current GA, Any | | Edit |
| Available Products: | | Products/Features To Be Installed: |
| MySQL Servers Applications MySQL Connectors Documentation | ★4 | B- MySQL Server 8.0.18 - X64 B- MySQL Workbench 8.0.18 - X64 |

8. Click [Execute] to start installing the selected products. You may have to install failing requirements first.



A green check mark is displayed beside each successfully installed item.

| MySQL Installer | | | | | |
|--------------------------------------|--|------------------|----------|-------|--|
| MySQL. Installer Adding Community | Installation | | | | |
| | Press Execute to upgrade the following pro | ducts. Status | Progress | Notes | |
| Choosing a Setup Type | ⊘ 📐 MySQL Server 5.7.10 | Complete | - | | |
| Select Products and Features | 🥝 🛐 MySQL Workbench 6.3.6 | Complete | | | |

9. Set the TCP/IP Port Number and make note of it.

| MySQL. Installer | Type and Networking | | | | |
|-----------------------|---|---|--------------------|--------------------|----------------|
| MySQL Server 8.0.18 | Server Configuration Type | | | | |
| | Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance. | | | | s setting will |
| High Availability | Config Type: Develop | ment Computer | | | \sim |
| Type and Networking | Connectivity | | | | |
| Authentication Method | Use the following contr | ols to select how you we | ould like to conne | ct to this server. | |
| Platitetitetitetiteti | TCP/IP | Port: | 3306 | X Protocol Port | : 33060 |
| Accounts and Roles | 🗹 Open Wind | lows Firewall ports for n | etwork access | | |
| Windows Service | Named Pipe | Pipe Name: | MYSQL | | |
| Apply Configuration | Shared Memor | y Memory Name: | MYSQL | | |
| | Advanced Configuratio | n | | | |
| | Select the check box be and logging options for | low to get additional co this server instance. | nfiguration pages | where you can se | t advanced |
| | Show Advance | d and Logging Options | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | < Back | Next > | Cancel |

10. Create your MySQL root password and make note of it. This example will use Maple Systems' default 111111 password.

| MySQL. Installer MySQL Server 8.0.18 | Accounts and Ro Root Account Password Enter the password for the place. | les root account. Pleas | e remember to stor | e this password in | n a secure |
|---|--|-------------------------------|----------------------|--------------------|------------|
| High Availability | MySQL Root Password: | | | | 0 |
| Type and Networking | Repeat Password: | | | | |
| Authentication Method | | | | | |
| Accounts and Roles | | | | | |
| Windows Service Apply Configuration | MySQL User Accounts Create MySQL user accou consists of a set of priviled | nts for your users ar jes. | nd applications. Ass | ign a role to the | user that |
| | MySQL User Name | Host | User Role | | Add User |
| | | | | | Edit User |
| | | | | | Delete |
| | | | < Back | Next > | Cancel |

11. The rest of the settings can remain default.



12. Click [Execute].



MySQL Server User Manual

Building the MySQL Database

After installing MySQL, a Schema must be created in MySQL to synchronize the HMI historical data.

1. Launch MySQL Workbench. Click the + icon to create a Database Server connection.

| MySQL Connections ⊡ 🛇 | | م |
|---------------------------------------|-----------------------------|---|
| Local instance MySQL80 | МуРС | |
| L root [™] localhost:3306 | L root 55 127.0.0.1:3306 | |

2. Enter [Connection Name], [Hostname], [Port], [Username], and use Port 3306.

| Connection Name: | MAG | Type a name for the connection |
|--------------------|----------------------|---|
| Connection Method: | Standard (TCP/IP) | Method to use to connect to the RDBMS |
| Parameters SSL | Advanced | |
| Hostname: | 127.0.0.1 Port: 3306 | Name or IP address of the server host - and TCP/IP port. |
| Username: | root | Name of the user to connect with. |
| Password: | Store in Vault Clear | The user's password. Will be requested later if it's not set. |
| Default Schema: | | The schema to use as default schema. Leave blank to select it later. |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Configure Server | Management | Test Connection Cancel OK |

3. When finished, your new connection will be shown on your workbench. Click the connection to open the settings window.



4. Click the 🔤 icon to create the Schema, enter the name of the Schema and click [Apply].



5. The program will prompt you to review the SQL Script. Click [Apply].



6. Then click [Finish].



7. Under Navigator, select [Users and Privileges].



8. Click [Add Account] and enter the user credentials in the [Login] tab. Click [Apply].

| MySQL Workbench | | | | _ | ٥ | × |
|--------------------------|--------------------------|------------------------|------------------|--|------------|----------|
| MyPC × | | | | | | |
| File Edit View Query | Database Server Tool | s Scripting Help | | | | |
| | F & F & Q | - | | 0 | a 🗖 | |
| | | | | | | |
| Query 1 Administration | | | | | | |
| Users and | Privileges | | | | | |
| User Accounts | Details for account new | user@% | | | | |
| User From H | c Login Account Limits A | Administrative Roles S | chema Privileges | | | |
| mysql.infoschema localho | 2 | | | Marine and the last second second second | | |
| mysql.session localho | Login Name: | maple | | to connect from different hosts. | same nan | ne |
| newuser % | 2 | | | | | |
| root localho | Authentication Type: | Standard | ~ | For the standard password and/or host ba | ased authe | enticati |
| | | | | select standard. | | |
| | Limit to Hosts Matching: | % | | % and wildcards may be used | | |
| | | | | | | |
| | Password: | ***** | | Type a password to reset it. | | |
| | | Weak password. | | | | |
| | Confirm Password: | ***** | | Enter password again to confirm. | | |
| | | Euroine Deer | | | | |
| | | Expire Pas | sword | | | |
| < | | | | | | |
| Add Account Delete | Refresh | | | Revert | Appl | у |
| Ready | | | | | | |

9. In the [Administrator Roles] tab select all the roles and privileges.

| MySQL Workbench | | | - 0 × |
|--|---|---|---|
| File Edit View Query | Database Server Tools Scripting | g Help | © |
| User Accounts | rivileges Details for account maple@% | | |
| User From Ha | Login Account Limits Administrative | Roles Schema Privileges | |
| mysql.infoschema localho: mysql.session localho: mysql.sys localho: root localho: | Role DBA MaintenanceAdmin ProcessAdmin UserAdmin SecurityAdmin MonitorAdmin DBDesigner ReplicationAdmin BackupAdmin | Description grants the rights to perform all tas grants rights needed to maintain a rights needed to assess, monitor, grants rights to create users login rights to manage logins and grant minimum set of rights needed to r grants full rights on all databases rights to create and reverse engin rights needed to setup and manag minimal rights needed to backup | Global Privileges ALTER ALTER ROUTINE CREATE ROUTINE CREATE TABLESPACE CREATE TABLESPACE CREATE USER CREATE USER CREATE VIEW DELETE DROP EVENT C |
| < | | Revoke All Privileges | |
| Add Account Delete | Refresh | | Revert Apply |
| Created account 'maple@%' | | | |

10. Click [Apply] when finished.

Creating a Database Object in the EBPro Project File

This section goes through the Database Server configuration in EBPro. This configuration is already done in the cMT_SQL_Database_Server.cmtp sample project, which we will use to generate data to sync to our MySQL database and display in Excel.

- 1. Open the cMT_SQL_Database_Server.cmtp project file in EBPro. In the main menu, click [Data/History] » [Database Server].
- 2. The General tab lists the Database Server parameters. In this example, we will be using on-line/offline simulation mode on our PC, so we set the Database Server IP to 127.0.0.1. In real world situations, you will use the IP address of the remote PC running your MySQL database.

| Database Server | | × |
|------------------------|--|---|
| General Status/Control | | |
| Comment : [| | |
| Server system : | MySQL 🔻 | |
| [| Use IP 👻 | |
| IP : [| 127 . 0 . 0 . 1 | |
| Port : | 3306 Central and the second se | |
| Username : | maple | |
| Password : | 111111 | |
| Database name : | maple | |

3. In the Status/Control tab, you can set the Status and Control Addresses. The status addresses can display the connection status with SQL server on the HMI, and the control addresses can be used to change connection parameters dynamically on the HMI.

4. The [Sync to database] for both the Data Sampling object and the Event Log object is used to synchronize the historical data to the Database Server.

| Data Sampling Object | |
|--|--|
| Comment : Sampling mode | History file Enable All records in one file Customized file handling File name : Datalog |
| Read address Device : Local HMI Address : LW Data Record | Save to HMI memory (10000 limited) US8 disk SD card |
| Data Format Data length : 6 word(s) Hold address Image: Constraint of the second s | Sync. to database ☐ Enable Database : 1, 127.0.0,1 ✓ |
| Device : Local HMI V Settings Address : LB V 20 | |
| Control address Enable Device : Local HMI Settings Address : LW 20 16-bit Unsigned * Control command : 1 [clear], 2 [sync.], 3 [sync. and clear], 4 [clear and restore log index], 5 [recover freeze state] | Preservation limit (1 ~ 1000 days) Auto sync. periodically Enable status address |
| | OK Cancel |

Event (Alarm) Log

| Category : | All [0] | | | × | Edit category name n | napping | |
|-----------------|----------|------------|------------|--------------|----------------------|---------|--------|
| | | | | | | | |
| No. Category | Text | Mode | Condition | Read address | Notification address | Buzzer | e-Mail |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Control address | | | | | | | |
| Enable | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| History files | | | | | | | |
| Enable | | | | | | | |
| Save to | | | | | | | |
| HMI memory | ory (100 | JOO limite | ed) | | | | |
| O USB disk | | | | | | | ard |
| | | | | | | | |
| Sync to datab | ase | _ | | | | _ | |
| Enable | | | Database : | 1. 127.0.0.1 | | | ~ |

5. If a Control Address is enabled in the Data Sampling and Event Logs, the following values will produce the referenced commands.

Value of 1: This will clear the sampled data in the HMI.

Value of 2: This will synchronize the historical data to the SQL server.

Value of 3: This will synchronize the historical data to the SQL server and clear the sampled data in the HMI.

6. These are the relevant settings to direct data to your MySQL database. Now we will run the project in online simulation mode to generate data for the MySQL database to be displayed in Excel in the next section.

| cMT \ | Viewer (| Simulation) | | | 2017 | 7-05-04 15:57 | :17 | × • • |
|-------|----------|--------------|------------|---------------|-----------------|---------------|--------|--------------------------------------|
| D | ata | abas | se Se | rver | | | | |
| Г | No | Time | Date | 16 hit Signed | 32 bit Unsigned | 32 bit float | String | |
| ŀ | 0. Q | 14:56:13 | 04/05/2017 | | 80 | 150 | Sung | Data sampling control |
| ŀ | 8 | 14:56:12 | 04/05/2017 | 8 | 70 | 400 | н | |
| ŀ | 7 | 14:56:12 | 04/05/2017 | 7 | 60 | 350 | G | |
| ŀ | 6 | 14:56:10 | 04/05/2017 | 6 | 50 | 300 | F | Clear |
| ŀ | 5 | 14:56:09 | 04/05/2017 | 5 | 40 | 250 | E | Clears the sampled data in HMI |
| | 4 | 14:56:08 | 04/05/2017 | 4 | 30 | 200 | D | |
| | 3 | 14:56:07 | 04/05/2017 | 3 | 20 | 150 | С | Sync |
| | 2 | 12:02:34 | 03/05/2017 | 69 | 680 | 3450 | 0 | - Oyne |
| | 1 | 12:02:33 | 03/05/2017 | 68 | 670 | 3400 | N | Synchronizes data to the SQL server. |
| | | | | | | | | Hold Pause sampling data. |
| | | | | | | | | SQL server settings |

 Allow the project to generate some data, and then click the [Sync] button to synchronize the data to the MySQL database. If the sync has succeeded, three tables will have been generated in the database with the following name format: <HMI Name>_<DATALOG NAME>_data.

Synchronizing the MySQL Database to Microsoft Office Excel

Connecting Microsoft Office Excel to MySQL requires the ODBC Connector (Open Database Connectivity). This section explains how to set the communication parameters in ODBC Connector and Excel.

- 1. Visit the MySQL website and download the ODBC Connector: https://dev.mysql.com/downloads/connector/odbc/
- 2. Excel is a 32-bit based software, so we will need the Windows (x86, 32-bit) version.

| Windows (x86, 32-bit), MSI Installer | 5.3.4 | 7.0M | Download |
|---|----------|---------------------------|-------------------|
| (mysql-connector-odbc-5.3.4-win32.msi) | MD5: 55d | 218e0ce52eb4ecc841fd109a | 3c4c1 Signature |
| Windows (x86, 64-bit), MSI Installer | 5.3.4 | 7.2M | Download |
| (mysql-connector-odbc-5.3.4-winx64.msi) | MD5: 00e | abf41ad133d852e8065b6c4b) | bo£72 Signature |
| Windows (x86, 32-bit), ZIP Archive | 5.3.4 | 7.6M | Download |
| (mysql-connector-odbc-noinstall-5.3.4-win32.zip) | MD5: £86 | ba746a1b7253470eac443d5d | 11541 Signature |
| Windows (x86, 64-bit), ZIP Archive | 5.3.4 | 7.8M | Download |
| (mysql-connector-odbc-noinstall-5.3.4-winx64.zip) | MD5: 383 | ceOd51beaba5f07401b63f85 | bc0b4 Signature |

Install the downloaded connector and open Data Sources (ODBC). If you are running Windows 64bit, go to C:\Windows\SysWOW64\odbcad32.exe to run the ODBC connector once installed.



3. Click [Add] to create a new data source and select "MySQL ODBC 8.0 Unicode Driver".



| ODBC | Data Source Administrator (3 | 2-bit) | × |
|----------------------------|------------------------------|--|--------------------------------------|
| User DSN | Create New Data Source | | × |
| User Data Name | | Select a driver for which you want to set up a data s | iource. |
| dBASE Excel F MS Acc | | Name Microsoft Paradox Driver (*.db) Microsoft Paradox-Treiber (*.db) Microsoft Text Driver (*.bt; *.csv) Microsoft Text-Treiber (*.bt; *.csv) MySQL ODBC 8.0 ANSI Driver MySQL ODBC 8.0 Unicode Driver SQL Server < | 1 1 1 1 ε ε 1 × |
| | | < Back Finish C | er. A |
| | | OK Cancel App | Help |

4. Set the communication parameters:

| My | MySQL Connector/ODBC Data Source Configuration X | | | | | |
|------------------|--|----------------------|--|--|--|--|
| M <u>i</u> Co | usqu onnector/ODB | c 🔤 | | | | |
| | Connection Parameters | \$ | | | | |
| | Data Source Name: | SQLConnector | | | | |
| | Description: | | | | | |
| | TCP/IP Server: | localhost Port: 3306 | | | | |
| | O Named Pipe: | | | | | |
| | User: | maple | | | | |
| | Password: | ••••• | | | | |
| | Database: | maple V Test | | | | |
| | Details >> | OK Cancel Help | | | | |

5. Click [OK]. Your new data source has been created.

| S ODBC E | Data Source A | Administrat | tor (32-bi | t) | | | | | > |
|--------------------|---|------------------|---|---------|--------------------|-------|------------|-------|------|
| User DSN | System DSN | File DSN | Drivers | Tracing | Connection Pooling | g A | bout | | |
| User Data | Sources: | | | | | | | | |
| Name | | Platform | Driver | | | | | Add. | |
| dBASE Excel Fil | Files les | 32-bit 32-bit | Microsoft Access dBASE Driver (*.dbf, *.ndx, *.r Microsoft Excel Driver (*.xls, *.xlsx, *.xlsm, *.xlsb | | | | r.r Isb | Remo | ve |
| MS Acci SQLCon | MS Access Database 32-bit Microsoft Access Driver (*.mdb, *.accdb) SQLConnector 32/64-bit MySQL ODBC 5.3 Unicode Driver | | | | | | Configu | re | |
| | | | | | | | | | |
| < | | | | | | | > | | |
| | An ODBC User data source stores information about how to connect to the indicated data provider. A User data source is only visible to you and can only be used on this computer. | | | | | | | | |
| | | | | | OK Ca | ancel | | Apply | Help |

6. Open Excel, go to the [Data] tab and select [Connections].



- 7. Click [Add] to build a new connection.
- 8. Click [Browse for More...].

| xisting | Connections | 7 🗙 |
|----------|--|-----|
| Select a | <u>C</u> onnection: | |
| Show: | All Connections | |
| Conr | ection files on the Network «No connections found» | |
| Conr | ection files on this computer <no connections="" found=""></no> | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

9. Go to C:\Users\user\Documents\My Data Sources and select [Connect to New Data Source].



- 10. In the Data Connection Wizard window, select [ODBC DSN].
- 11. Select the previously created data source.

| Data Connection Wizard | | ? <mark>×</mark> |
|--|---------------------|------------------|
| Connect to ODBC Data Source Choose the ODBC data source you | want to connect to. | * |
| <u>O</u> DBC data sources: | | |
| Excel Files MS Access Database SQLConnector | * | |

12. Select the items to be connected:

Data Sampling: <HMI NAME>_<DATALOG NAME>_data Event Log: <HMI NAME>_event

| Data Connection Wizard | | | | | ? 💌 | |
|---|-------------|----------|---------|----------------|----------------|--|
| Select Database and Table Select the Database and Table/Cube which contains the data you want. | | | | | | |
| Select the database that contains the data you want: maple | | | | | | |
| <u> <u> </u> <u> C</u>onnect to a specific table: </u> | | | | | | |
| Name | Description | Modified | Created | Type | | |
| Hostname_datalog_data | | | | TABLE | | |
| hostname_datalog_data_format | | | | TABLE | | |
| hostname_datalog_data_section | | | | TABLE | | |
| | | | | | | |
| • | m | | | | , | |
| | Cancel | | Back | <u>N</u> ext > | <u>E</u> inish | |

- 13. Click the [Finish] button.
- 14. Go to the [Data] tab and select [Existing Connections]. INSERT PAGE LAYOUT FORMULAS HOME DATA Connections ĝ. A -0 ŵ LC Properties From From From From Other Refresh Existing ZA. C Edit Links All + Access Web Text Sources + Connections Get External Data Connections
- 15. Select the previously built connection.



16. Select the beginning data location



17. Go to the [Data] tab and select [Connections]. Select the connection and open its [Properties] settings window. In the [Usage] tab, select [Refresh every * minutes].

| onnection | name: | anle hosto | ame datalog data |
|--------------------------------------|--------------------------------|-------------------|---------------------------------------|
| Description | | iapie nosu i | anne_datalog_data |
| | | | |
| Usage | Definition | 1 | |
| Refresh co | ontrol | | |
| Last Ref | reshed: | | |
| 🔽 Enab | le back <u>g</u> ro | ound refree | sh |
| Refre | sh every | 5 🌲 | minutes |
| 🔽 Refre | sh data w | hen <u>o</u> peni | ing the file |
| R | emove <u>d</u> at orkbook | a from the | external data range before saving the |
| Refre | sh this co | nnection o | on Refresh <u>A</u> ll |
| OLAP Serv | er Formatt | ing | |
| Retrieve connect | the follow ion: | /ing forma | its from the server when using this |
| Num | ber Forma | t 📃 Fill (| Color |
| Font | Style | Text | Color |
| | Through | | |
| OLAF DI | | of records | to retrieve: |
| Maximu | m number | | |
| Maximu | m number | | |
| Maximu Language | m number eve data a | nd errors i | n the Office display language when |
| Maximu Language Retri avail | m number eve data a able | nd errors i | in the Office display language when |

18. Now the Excel worksheet will display historical data from the cMT series HMI when it is synchronized to MySQL.

| 1 | A | В | C | D | E |
|---|--------------|------------------|-----------------|-----------------|-----------------|
| 1 | data_index 💌 | time@timestamp 💌 | data_format_0 💌 | data_format_1 💌 | data_format_2 💌 |
| 2 | 5384 | 1453915082 | -0.906303167 | 0.714389682 | -0.330768824 |
| З | 5385 | 1453915082 | -0.953719914 | 0.807743073 | -0.449516267 |
| 4 | 5386 | 1453915083 | -0.976301134 | 0.863846481 | -0.526046038 |
| 5 | 5387 | 1453915083 | -0.99619323 | 0.937895536 | -0.635889471 |
| 6 | 5388 | 1453915083 | -1 | 0.980105877 | -0.705340028 |
| 7 | 5389 | 1453915084 | -0.991442561 | 1.032004952 | -0.802969456 |

Configuring an SQL Query Object

The SQL Query object can exchange data with a MySQL database. Before enabling SQL Query, a Database Server object must be configured in EBPro.



Click [Data/History] » [SQL Query] to open the settings dialog box. Click New to create a new object.

| s | QL Query | | × |
|---|------------------|-----------------|------|
| | Name | Database server | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | New Delete Setti | ngs | Exit |

General Tab

| | | | | | Advanced Mode | | | | | |
|---------|---------------------|--------------------|-------------|----------|-----------------|--|--|--|--|--|
| Command | Description : SQL q | uery 1 | | | | | | | | |
| | Database : 1. 192 | .168.2.96 [world] | | | | | | | | |
| | Table name : count | Ŋ | | | | | | | | |
| | Schema | | | | | | | | | |
| | PLC : Local HI | 41 | •][| Settings | | | | | | |
| | Address : LW | - 100 | | | | | | | | |
| | Name | Description | Primary key | Address | Address forma | | | | | |
| | 1 Code | char(3) | ٥ | LW-100 | String | | | | | |
| | 2 Name | char(\$2) | 0 | LW-102 | String | | | | | |
| | 3 Continent | enum('Asia','Europ | 0 | LW-128 | String | | | | | |
| | 4 SurfaceArea | float(10,2) | 0 | LW-129 | String | | | | | |
| | 5 Population | int(11) | 0 | LW-136 | 32-bit Unsigned | | | | | |
| | 6 LifeExpectancy | float(3,1) | 0 | LW-138 | 32-bit Float | | | | | |
| | 7 Code2 | char(2) | 0 | LW-140 | String | | | | | |
| | ۰ (m) | | | | | | | | | |
| | New D | Import from server | | | | | | | | |

| Setting | Description |
|---------------|--|
| Advanced Mode | When selected, advanced mode allows you to manually enter syntax in the Command tab to control the MySQL database. Note: Once Advanced Mode is selected, it is not possible to go back to General Mode. |
| Description | User's description about this query. |
| Database | Select the source database to read from. |
| Table Name | Enter the name of the query table. |
| Schema | Click [New] to add an entry. The data read from database will be written to the corresponding address specified in the schema. You must manually set Address Format for each entry. Note: A Primary Key should contain only numeric values. |

Command Tab

| SQL Query | |
|--------------------|--|
| General Command | Control address PLC: Local HMI Address: LW 0 |
| | Command ID : LW-0 Row selection : LW-1 Status : LW-2 Error code : LW-3 Error message : LW-4 (64 words) |
| | Command Command ID Description |
| | |
| | |
| | |
| | |
| | OK Cancel |

| Setting | Description |
|-----------------|---|
| Control address | Designate five consecutive registers to execute commands and show results. When importing the table from database, four commands will exist by default in the Command table: Create, Read, Update, and Delete |

| Status Value | Meaning |
|--------------|---|
| 0 | Normal |
| 1 | Query result exceeds 1000 records. Using LIMIT clause can constrain the number of rows in one page. |

| Error Code | Meaning |
|------------|---|
| 0 | No errors |
| 1 | Unknown error |
| 2 | Invalid command |
| 3 | Database Server is not connected |
| 4 | Argument cannot be read |
| 5 | Cannot write and output |
| 6 | Incorrect number of arguments |
| 7 | Error in MySQL, please read error message |
| 8 | Unsupported datatype |
| 9 | Number of columns exceeds the limit |
| 10 | Number of rows exceeds the limit |
| 11 | Inside error |

Advanced Mode

| General | Control address | | | | | | | |
|---------|-----------------|-------------|--------------|-------|----------------|---|--|--|
| Command | PLC : Local HMI | | | | | Settings | | |
| | Address : | .W | • | 200 | | | | |
| | Command | ID: LW-200 | | | | | | |
| | Row selection | on: LW-201 | | | | | | |
| | Stat | us: LW-202 | | | | | | |
| | Error co | de: LW-203 | | | | | | |
| | Error messag | ge: LW-204 | (32 words) | | | | | |
| | Command | | | | | | | |
| | Command ID | Description | No. of argun | nents | No. of outputs | Action | | |
| | 1 | Create | 6 | | 0 | INSERT INTO country(Code, Continent, SurfaceArea, | | |
| | 2 | Read | 0 | | 7 | SELECT Code, Name, Continent, SurfaceArea, Popula | | |
| | 3 | Update | 7 | | 0 | UPDATE country SET Code = '\${1}', Continent = '\${3} | | |
| | 4 | Delete | 1 | | 0 | DELETE FROM country WHERE Name = '\${1}'; | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | _ | | | | |
| | New | Delete | Settings | i | Сору | Paste | | |

In Advanced Mode, [No. of arguments], [No. of outputs], and [Action] columns can be found in the Command table. Click [New] or [Settings] to open the **SQL Query Command** window.

Query Tab

| Query | Command ID : | 5 |
|----------|---------------|--|
| Argument | Description : | Update |
| | | |
| | SQL Query : | Opdate country SET Name = '#(2)', Continent = '#(3), SurraceArea = "#(4)', |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | · |
| | | ✓ Discard result |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| Setting | Description |
|--|---|
| Command ID | Specify the ID number used to give this command. |
| Description Enter the description of this command. | |
| SQL Query | Enter the syntax for this command. An argument should be enclosed in braces: \${argument no.} |
| Discard result | When selected, the result of executing this command will not be shown in SQL Query Result Viewer object. This checkbox can be selected for commands that are done directly to the database that do not require a result, such as INSERT INTO, UPDATE, DELETEetc. |

Argument Tab

| L Query Com | mand | - (|
|-------------|------------------------------------|-------|
| Crister | | |
| Query | PLC name Address Address format | |
| vrgument | Local HME LW-300 String (2) | |
| | 2 Local HMI LW-328 String (10) | |
| | 3 Local HML LW-338 32-bit Float | |
| | 4 Local HMI LW-340 32-bit Unsigned | |
| | 5 Local HMI LW-342 32-bit Float | |
| | 6 Local HMI LW-344 String | |
| | | |
| | New Delete Settings | |
| | ОК Са | incel |

If an argument is used in the syntax of a command in [Query] tab, the system will refer to the address specified in this tab according to the argument number enclosed in \${argument no.}.

| | a contract of the last | ante Autoress | Address tormat | | |
|----------|------------------------|---------------|-----------------|--|---|
| Argument | Local | HMT LW-200 | String (7) | | |
| Output | Local | | String (2) | | |
| | 2 Local | HIVE LVV-302 | string (20) | | |
| | 3 Local | HMI LW-328 | String (10) | | |
| | 4 Local | HMI LW-338 | 32-bit Float | | |
| | 5 Local | HMI LW-340 | 32-bit Unsigned | | |
| | 6 Local | HMI LW-342 | 32-bit Float | | |
| | 7 Local | HMI LW-344 | String | | 1 |
| | | | te Settions | | |

Output Tab

After reading database, the result will be stored in the addresses specified in this tab.

Datatype Conversions

The following table illustrates the allowable datatype conversions when reading from a MySQL database. If conversion cannot run properly, error code 5 will be set. For example, when converting MySQL's INT into EBPro's 16-bit Unsigned, if the value exceeds the limit of 16-bit Unsigned, error code 5 will show.

| MySQL Data Format | Allowable EBPro Datatypes |
|-------------------|---------------------------|
| TINYINT | 16/32-bit BCD |
| SMALLINT | 16/32-bit HEX |
| MEDIUMINT | 16/32-bit Binary |
| INT | 16/32-bit Signed |
| BIGINT | 16/32-bit Unsigned |
| BIT | |
| FLOAT | 32-bit Float |
| DOUBLE | |
| DECIMAL | |
| DATETIME | String |
| CHAR | |
| VARCHAR | |
| BINARY | |
| VARBINARY | |
| BLOB | |
| TINYBLOB | |
| MEDIUMBLOB | |
| LONGBLOB | |
| TEXT | |
| TINYTEXT | |
| MEDIUMTEXT | |
| LONGTEXT | |

Configuring the SQL Query Result Viewer

The SQL Query Result Viewer shows the results obtained by running SQL Query. Click [Data/History] » [SQL Query Result Viewer] to open the settings dialog box to configure the viewer parameters.



| General | Security | Shape | | | | | | |
|---------|--------------|----------------------------|------|--|--|--|--|--|
| Co | mment : | | | | | | | |
| SQL | Query : | 1: General Mode 🔻 | | | | | | |
| | Style : | Crystal 🔻 | | | | | | |
| Styl | e Color : | | | | | | | |
| Text - | | | | | | | | |
| | Font : | Arial [Arial] [Droid Sans] | - | | | | | |
| | Size : | 12 - | | | | | | |
| | Color : | | | | | | | |
| Ca | ption | | | | | | | |
| т | ext size : | 16 🔹 | | | | | | |
| Te | Text color : | | | | | | | |
| | | Filter enabled | | | | | | |
| | | OK Cancel | Help | | | | | |

| Setting | Description |
|--------------------|---|
| Comment | User's comment about this result viewer |
| SQL Query | Select an existing SQL Query to show its result. |
| Style/ Style Color | Select a style and a color for this result viewer. |
| Text | Set the font, font size, and font color for the text shown in this result viewer. |
| Caption | Set the font size and font color for the caption of this result viewer |
| Table | This group box opens when selecting Default as style. The attributes of the query |
| | table can be configured. |
| Filter enabled | When selected, the user can enter keywords in the SQL Query Result Viewer to |
| | search for specific text. |

| Query Command Description | | | | | | | | | | | | | |
|---------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--|--|--|--|
| Enter filter keyword here | | | | | | | | | | | | | |
| col 1 | col 2 | col 3 | col 4 | col 5 | col 6 | col 7 | col 8 | col 9 | col 10 | | | | |
| data 3-1 | data 3-2 | data 3-3 | data 3-4 | data 3-5 | data 3-6 | data 3-7 | data 3-8 | data 3-9 | data 3-10 | | | | |
| data 2-1 | data 2-2 | data 2-3 | data 2-4 | data 2-5 | data 2-6 | data 2-7 | data 2-8 | data 2-9 | data 2-10 | | | | |
| data 1-1 | data 1-2 | data 1-3 | data 1-4 | data 1-5 | data 1-6 | data 1-7 | data 1-8 | data 1-9 | data 1-10 | | | | |

MySQL Server User Manual

References

- 1. MySQL requires .NET Framework 4.0, available here: https://www.microsoft.com/zh-tw/download/details.aspx?id=17718
- 2. MySQL requires Visual C++ Redistributable Packages for Visual Studio 2013, available here: https://www.microsoft.com/en-US/download/details.aspx?id=40784
- 3. Click <u>here</u> for download link of cMT Database Server Demo Project or visit our support center at <u>https://www.maplesystems.com/cgi-bin/download/sample.asp</u>

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