

**WAGO-I/O-PRO 32 Library**

# WagoLibMySql\_03.lib

The library „WagoLibMySql\_03.lib“ provide function blocks to communicate with MySQL-Database-Servers version 4.1 and above.

The principal item of this library are function blocks “Execute” and “Query”.

Function block “MySql\_Execute” is designed for all SQL-Statements who do not respond with a resultset, such as INSERT, UPDATE, DELETE, CREATE, ALTER, DROP and so, who just return OK or ERROR.

Function block “MySql\_Query” is designed for SQL-SELECT-Statements who respond with a resultset. The resultset are stored in an optimized format, use function “MySql\_GetStringValue()” to convert field data into any IEC-Type.

This library make extensive use of global variables to allow optimize memory usage depending customer requirements.

## Content

<b>WagoLibMySql_03.lib</b>	<b>3</b>
MySql_Login .....	3
MySql_Execute .....	5
MySql_Query .....	7
MySql_GetStringValue .....	9
MySql_Logout .....	10



# WagoLibMySql\_03.lib

## MySql\_Login

WAGO-I/O-PRO Library elements			
Category:		Communication	
Name:		MySql_Login	
Type:	Function	Function block X	Program
Library name:		WagoLibMySql_03.lib	
Used Libraries		SysLibSocket.lib, WagoLibSHA1.lib	
Applicable to:		All EthernetControllers(except 750-842, 750-843)	
Inputparameters:	Data type:	Comments:	
sHost	STRING	IP or hostname where MySQL-server is working	
uiPort	UINT	TCP-Port where MySQL-server is listening, Default: 3306	
sUsername	STRING_	Name of database account	
sPassword	STRING	Password of database account	
sDatabase	STRING	Name of schema to use initially - Optional parameter	
In-/Out parameters:	Data type:	Comments:	
oMySql	MySql_Context	Structure for keeping login and status informations	
xStart	BOOL	Start execution on a rising edge and reset internally when done or on timeout	
Outputparameters:	Data type:	Comments:	
diError	DINT	Numeric return value - more readable in hex (For details see below)	
sStatus	STRING (200)	Textual description of current state or error	
xConnected	BOOL	TRUE: when database connection is established	
Graphic display:			
<div><div>MySql_Login</div><div><div>sHost</div><div>diError</div></div><div><div>uiPort</div><div>sStatus</div></div><div><div>sUsername</div><div>xConnected</div></div><div><div>sPassword</div><div></div></div><div><div>sDatabase</div><div></div></div><div><div>oMySql</div><div>▷</div></div><div><div>xStart</div><div>▷</div></div></div>			

## WAGO-I/O-PRO Library elements

**Function description:**

This function is used to connect to a MySQL-Server.

The Handshake (when client connects):

Server Sends To Client: Handshake Initialisation Packet

Client Sends To Server: Client Authentication Packet

Server Sends To Client: OK Packet, or Error Packet

RetVal dwError:

16#00000000 => 'SUCCESS'

16#80001001 => 'TCP-ERROR: DNS-Request failed, could not retrieve servers IP address'

16#80001002 => 'TCP-ERROR: Could not convert servers IP address into dotted format'

16#80001003 => 'TCP-ERROR: "SysSockCreate()" fails - Could not get socket'

16#80001004 => 'TCP-ERROR: Switching to none blocking mode fails'

16#80001005 => 'TCP-ERROR: "SysSockRecv()" returns 0. Socket was "gracefully closed"'

16#80001006 => 'TCP-ERROR: "SysSockSend()" returns 0. Socket was "gracefully closed"'

16#80001007 => 'TCP-ERROR: "SysSockSend()" returns -1'

16#80004001 => 'PARAM-ERROR: '

16#80004002 => 'PARAM-ERROR: "MySql.sHost" not assigned'

16#80004003 => 'PARAM-ERROR: "MySql.sUser" not assigned'

16#80005001 => 'MYSQL-ERROR: Library requires protocol version 10 or above . Server support only version x'

16#80005002 => 'MYSQL-ERROR: <Message from server>

16#80005003 => 'MYSQL-ERROR: Invalid or unexpected response from server'

16#80005004 => 'MYSQL-ERROR: Function "MySql\_Scramble()" returns with error'

16#80004001 => 'TIMEOUT: <actual processed step in state machine>'

## MySql\_Execute

WAGO-I/O-PRO Library elements			
Category:	Communication		
Name:	MySql_Execute		
Type:	Function	Function block X	Program
Library name:	WagoLibMySql_03.lib		
Used Libraries	SysLibSocket.lib, WagoLibSHA1.lib		
Applicable to:	All EthernetControllers(except 750-842, 750-843)		
Inputparameters:	Data type:	Comments:	
asSqlCommand	ARRAY [0..uBound] OF STRING (Length)	SQL Statement who do not return a result set	
In-/Out parameters:	Data type:	Comments:	
oMySql	MySql_ Context	Structure for keeping login and status informations	
xStart	BOOL	Start execution on a rising edge and reset internally when done or on timeout	
Outputparameters:	Data type:	Comments:	
diError	DINT	Numeric return value - more readable in hex (For details see below)	
sStatus	STRING (200)	Textual description of current state or error	
Graphic display:			
<div><div>MySql_Execute</div><div><div>asSqlCommand</div><div>diError</div></div><div><div>oMySql ▸</div><div>sStatus</div></div><div><div>xStart ▸</div></div></div>			
Function description:			
This function block is used to send SQL statements to server who do not respond with result sets, such as:     INSERT, UPDATE, DELETE, ALTER, DROP, ...			
RetVal diError:			
16#00000000 => 'SUCCESS'			
16#80001005 => 'TCP-ERROR: "SysSockRecv()" returns 0. Socket was "gracefully closed"'			
16#80001006 => 'TCP-ERROR: "SysSockSend()" returns 0. Socket was "gracefully closed"'			
16#80001007 => 'TCP-ERROR: "SysSockSend()" returns -1'			
16#80005002 => 'MYSQL-ERROR: <Message from server>			
16#80005003 => 'MYSQL-ERROR: Invalid or unexpected response from server'			
16#80005005 => 'MYSQL-ERROR: Not connected with database, LOGIN before use'			
16#80004001 => 'TIMEOUT: <actual processed step in state machine>'			

## WAGO-I/O-PRO Library elements

Remarks for "asSqlStatement":

You can modify the "length" and number of elements in "asSqlStatement" by hiding libraries global constants with global constants of same name in your project:

- gcMySql\_iSqlUpperBound:

Defines the UpperBound of "asSqlStatement", to provide an SQL statement as "ARRAY [0..UpperBound] OF STRING(Size)"

- gcMySql\_iSqlLength:

Defines the Size in byte of an array element of "asSqlStatement", to provide an SQL statement as "ARRAY [0..UpperBound] OF STRING(Size)".

All non numeric SQL param values must be "quoted" with an apostroph(').

Because apostroph(') is also CoDesys-String-Start-End-Identifier.

To use a apostroph(') inside a CoDeSys-String type \$27 or \$'

Example:

```
(* Prepare SQL-Insert-Statement *)
asSqlStatement1[0] := 'INSERT INTO atable ';
asSqlStatement1[1] := '( aBool, aByte, aWord, aDint, aReal, ';
asSqlStatement1[2] := ' aString, aDT, aTime, aUdint ) ';
asSqlStatement1[3] := 'VALUES ';
asSqlStatement1[4] := '( TRUE, 17, 32333, 1111111, 1.42, ';
asSqlStatement1[5] := ' $'Hallo$', $'2010-08-13 11:56:42$', ';
asSqlStatement1[6] := ' $'13:12:57$', 62222 )';
asSqlStatement1[7] := ' '; (* End of SQL-Statement *)
```

Restriction: - Maximum length for identifiers are 250 bytes!

## MySql\_Query

WAGO-I/O-PRO Library elements			
Category:	Communication		
Name:	MySql_Query		
Type:	Function	Function block X	Program
Library name:	WagoLibMySql_03.lib		
Used Libraries	SysLibSocket.lib, WagoLibSHA1.lib		
Applicable to:	All EthernetControllers(except 750-842, 750-842)		
Inputparameters:	Data type:	Comments:	
asSqlCommand	ARRAY [0..uBound] OF STRING (Length)	SQL SELECT-Statement who return a result set	
In-/Out parameters:			
oMySql	MySql_ Context	Structure for keeping login and status informations	
xStart	BOOL	Start execution on a rising edge and reset internally when done or on timeout	
stResultSet	MySql_ ResultSet	Structure who contains raw query response data after succesful execution.	
Outputparameters:	Data type:	Comments:	
diError	DINT	Numeric return value - more readable in hex (For details see below)	
sStatus	STRING (200)	Textual description of current state or error	
Graphic display:			
<div><div>MySql_Query</div><div><div>asSqlCommand</div><div>oMySql ▸</div><div>xStart ▸</div><div>stResultSet ▸</div></div><div><div>diError</div><div>sStatus</div></div></div>			
Function description:			
<p>This function block is used to send SQL "SELECT" statements to server who respond with result sets.</p> <p>Example:</p> <pre>(* Prepare SQL-SELECT-Statement *) asSqlStatement1[0] := 'SELECT * ' asSqlStatement1[1] := 'FROM tablename ' asSqlStatement1[2] := 'WHERE ' asSqlStatement1[3] := ' name = \$27Meyer\$27 ' asSqlStatement1[4] := "; (* End of SQL-Statement *)</pre>			

## WAGO-I/O-PRO Library elements

Remarks for "asSqlStatement":

You can modify the "length" and number of elements in "asSqlStatement" by hiding libraries global constants with global constants of same name in your project:

- gcMySql\_iSqlUpperBound:

Defines the UpperBound of "asSqlStatement", to provide an SQL statement as "ARRAY [0..UpperBound] OF STRING(Size)"

- gcMySql\_iSqlLength:

Defines the Size in byte of an array element of "asSqlStatement", to provide an SQL statement as "ARRAY [0..UpperBound] OF STRING(Size)".

All non numeric SQL param values must be "quoted" with an apostroph(').

Because apostroph(') is also CoDesys-String-Start-End-Identifier.

To use a apostroph(') inside a CoDeSys-String type \$27 or \$'

RetVal dwError:

16#00000000 => 'SUCCESS'

16#80001005 => 'TCP-ERROR: "SysSockRecv()" returns 0. Socket was "gracefully closed"'

16#80001006 => 'TCP-ERROR: "SysSockSend()" returns 0. Socket was "gracefully closed"'

16#80001007 => 'TCP-ERROR: "SysSockSend()" returns -1'

16#80001008 => 'TCP-ERROR: Receive buffer too small - increase '

16#80005002 => 'MYSQL-ERROR: <Message from server>

16#80005003 => 'MYSQL-ERROR: Invalid or unexpected response from server'

16#80005005 => 'MYSQL-ERROR: Not connected with database, LOGIN before use'

16#80005006 => 'MYSQL-ERROR: Result set has more columns then defined in "gcMySql\_dwMaxColumnCount"'

16#80005007 => 'MYSQL-ERROR: Unsupported value for "column count", provided as 64-bit value(8 bytes) in "Result-Set-Header-Packet" '

16#80005008 => 'MYSQL-ERROR: Unsupported value for "column count", provided as 24-bit value(3 bytes) in "Result-Set-Header-Packet" '

16#80005009 => 'MYSQL-ERROR: Unsupported value for "column count", provided as 16-bit value(2 bytes) in "Result-Set-Header-Packet" '

16#8000500A => 'MYSQL-ERROR: Length of identifier in column "x" exceed maximum of 250 bytes'

16#8000500B => 'MYSQL-ERROR: Identifier for "fieldname" in column "x" exceed maximum of "gcMySql\_dwMaxIdentifierLength";

16#8000500C => 'MYSQL-ERROR: Length of row data exceed maximum of "gcMySql\_dwMaxRowSize"

16#8000500D => 'MYSQL-ERROR: Number of received rows exceed maximum of "gcMySql\_dwMaxRowCount" - Some rows are ignored'

16#80004001 => 'TIMEOUT: <actual processed step in state machine>'

Restriction:

- Maximum length for identifiers are 250 bytes!

- Maximum length for field data are 500 bytes (TEXT, VARCHAR, ...!)



## MySql\_GetStringValue

WAGO-I/O-PRO Library elements			
Category:	Communication		
Name:	MySql_GetStringValue		
Type:	Function X	Function block	Program
Library name:	WagoLibMySql_03.lib		
Used Libraries	SysLibSocket.lib, WagoLibSHA1.lib		
Applicable to:	All EthernetControllers(except 750-842, 750-843)		
Inputparameters:	Data type:	Comments:	
iRow	INT	Row to process, start with index 1 for the first row	
iCol	INT	Column to process, start with index 1 for the first column.	
In-/Out parameters:	Data type:	Comments:	
stQueryResult	MySql_ResultSet	Structure who contains raw query response data	
sValue	STRING (500)	Value of interesst (as STRING) or error message	
Outputparameters:	Data type:	Comments:	
diError	DWORD	Numeric return value - more readable in hex (For details see below)	
Graphic display:			
<div><div>MySql_GetStringValue</div><div><div>iRow</div><div>iCol</div><div>stQueryResult ▶</div><div>sValue ▶</div></div></div>			
Function description:			
This function convert the requested field data into a IEC61131 data type and returns it as string.			
RetVal			
16#00000000 => 'SUCCESS'			
16#80006001 => 'PARAM-ERROR: Invalid param "row" - First row start on index 1. ;			
16#80006002 => 'PARAM-ERROR: Invalid param "col" - First col start on index 1. ;			
16#80006003 => 'PARAM-ERROR: Requested row do not exist in "stQueryResult";			
16#80006004 => 'PARAM-ERROR: Requested col do not exist in "stQueryResult";			
16#80006005 => 'CONVERT-ERROR: Length of col "x" exceed max of 500bytes;			
16#80006006 => 'CONVERT-ERROR: Field "x" use unsupported 8byte style for length informations';			
16#80006007 => 'CONVERT-ERROR: Unknown MySQL-Data-Type: "x";			
16#80006008 => 'CONVERT-ERROR: Unsupported MySQL-Data-Type: "x";			

## MySql\_Logout

WAGO-I/O-PRO Library elements			
Category:	Communication		
Name:	MySql_Logout		
Type:	Function	Function block X	Program
Library name:	WagoLibMySql_03.lib		
Used Libraries	SysLibSocket.lib, WagoLibSHA1.lib		
Applicable to:	All EthernetControllers(except 750-842, 750-843)		
Inputparameters:	Data type:	Comments:	
In-/Out parameters:	Data type:	Comments:	
oMySql	MySql_Context	Structure for keeping login and status informations	
xStart	BOOL	Start execution on a rising edge and reset internally when done or on timeout	
Outputparameters:	Data type:	Comments:	
diError	DINT	Numeric return value - more readable in hex (For details see below)	
sStatus	STRING (500)	Textual description of current state or error	
Graphic display:			
<div><div>MySql_Logout</div><div><div>oMySql▷</div><div>diError</div></div><div><div>xStart▷</div><div>sStatus</div></div></div>			
Function description:			
This function is used to disconnect from a connected MySQL-Server			
RetVal dwError:			
16#00000000 => 'SUCCESS'			
16#80001006 => 'TCP-ERROR: "SysSockSend()" returns 0. Socket was "gracefully closed"			
16#80001007 => 'TCP-ERROR: "SysSockSend()" returns -1'			
16#80004001 => 'TIMEOUT: <actual processed step in state machine>'			