Module of the subsystem "DB" <MySQL>

Module:	MySQL
Name:	DB MySQL
Type:	DB
Source:	bd_MySQL.so
Version:	1.6.0
Author:	Savochenko Roman
Description:	DB module. It provides the support for DB MySQL.
License:	GPL

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Introduction

Module <MySQL> gives to the system OpenSCADA support of DB MySQL. MySQL database is a powerful multi-platform database available for free license. Manufacturer of MySQL database is the company MySQL AB http://www.mysql.com. The module is based on the library with API of the manufacturer of DB MySQL. The module allows you to perform operations over databases, tables and contents of tables.

1. Operations over the database

The operations of opening and closing of the database is supported, with the possibility of creating a new database when you open and delete existing at the close. In terms of the subsystem "DB" of system OpenSCADA opening of DB is its registration for further using of it in the system. It also supported the operation of requesting the list of tables in the database.

DB MySQL address by string of following type: *[<host>; <user>; <pass>; <bd>; <port>; <u_sock>]*. Where:
- *host* — the name of the host on which the database server MySQL works;
- *user* — the name of the user of database;
- *pass* — user password to access the database;
- *bd* — the name of the database;
- *port* — port to listen to by the database server (default is 3306);
- *u_sock* — the name of UNIX-socket in the case of local access to the database (/var/lib/mysql/mysql.sock).

In the case of local access to the database in the same host, you must use the UNIX socket. For example: *[;roman; 123456; OpenSCADA;;/var/lib/mysql/ mysql.sock]*

In the case of remote access to the database you must use the host name and port of the server of the database. For example: *[server.nm.org;roman;123456;OpenSCADA;3306]*

2. Operations over the table

The operations of opening and closing of the table with the possibility of creating a new table when you open and deleting the existing one at the closing, and also the operation of the requesting of the table's structure are supported.

3. Operations over the contents of the table

- scanning of the records of the table;
- request the values of these records;
- setting the values of these records;
- removing the records.

API of subsystem "DB" suppose the access to the contents of the table on the value of key(s) fields. Thus, the operation of request of the record implys the preset of key columns of the object TConfig, which will fulfill the request. Creating a new record(string) is the installation of the values of record, which does not exist.

The module allows you to dynamically change the structure of the database tables MySQL. Thus, in the event of a discrepancy of the table and the structure determined by record, the structure of the table will be set to the required structure of record. In the case of the request of the value of the record, and mismatching of the structures of record and the table there will be available only to the values of common elements of the record and table. The module does not track the order of the elements in the record and in the structure of the table!

The module is realised support multilanguage text variables. For fields with multilanguage text variable create the column of separated language in format **<FldID>#<lang>** (NAME#en). In this time the base column contain value for base language. The columns of separated languages created by needs, in time saving to DB and execution OpenSCADA in correspond language. If for work language value no present then will used value for base language.

The types of the elements of DB MySQL correspond to types of elements of system OpenSCADA in the following way:

The types of fields of the system OpenSCADA	Types of fields of DB MySQL
TFld::String	char (n), text, mediumtext
TFld::Integer	int (n), DATETIME [for fields with a flag TFld::DateTimeDec]
TFld::Real	double(n, m)
TFld::Boolean	tinyint(1)

4. Access rights

MySQL database provides a powerful mechanism for the separation of access, which is to selectively identify the access for user of the database to specific SQL-commands. The following table lists the operation over the database and the required access to the commands of these operations.

Operation	SQL-commands
Creation of the database and tables	CREATE
Deleting of the database and tables	DROP
Adding of records	INSERT
Deleting the values of records	DELETE
Getting the values of records	SELECT
Setting the values of records	UPDATE
Manipulation with the structure of the table	ALTER

5. Productivity of DB

Measurement of productivity of DB were carried out by the test "DB" of the module of system tests "SystemTests", by performing operations over the records of the structure: <name char (20), descr char (50), val double (10.2), id int (7), stat bool>.

Operation	K8–3000+, 384M, 120G, MySQL 5.0.51 (local)	MySQL 4.0.24 (remote)
Creation of the 1000 records (sec.):	0.67	0.99
Updating of the 1000 records (sec.):	0.67	1.33
Getting of the 1000 records (sec.):	0.38	0.49
Deleting of the 1000 record (sec.):	0.23	0.34