

Database system for all COMET devices

**Manual for use:**

DBL Logger Program

DBM MS Logger Program

DBS Sensor Monitor

DBV Database Viewer

# Introduction

This database system is designed for collection and storage of data from COMET devices. It allows:

- Loading the database with data downloaded from data acquisition systems or dataloggers
- Online data collection from ethernet sensors and from data acquisition systems MS6, MS55
- compression of online collected data
- Backing up the database
- Viewing data from the database in tabular and chart format
- Print and PDF output as tables and charts as well
- Output table data to CSV (MS Excel compatible format)
- Viewing data from different devices at a time and their comparing on one chart
- Viewing online values from ethernet sensors and online values from data acquisition systems MS6 and MS55
- Acoustic and visual signalization of alarms <sup>NEW</sup>

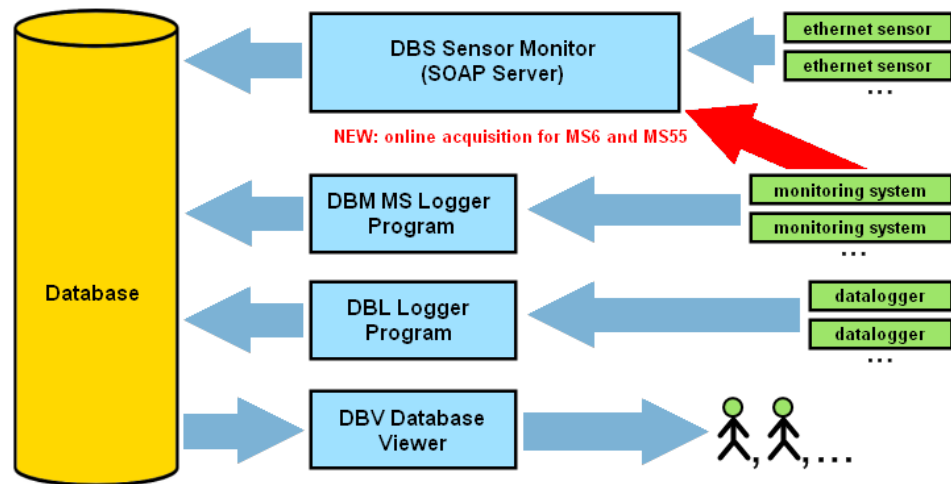
## **Actually it supports:**

- Acquisition systems: MS3+, MS4+, MS5, MS6 and MS55
- Dataloggers of series: Rxxxx, Sxxxx, Lxxxx
- Dataloggers with printer: T-PRINT, T-PRINT-2, G0221, G0841 and G0241
- Portable instruments COMMETER of series Dxxxx
- Ethernet sensors of series: Txxxx, Hxxxx, P85xx, P86xx, Txxxx-CO2, Hxxxx-CO2  
<sup>NEW</sup>

## **Attention:**

Primary data source of measured values from data acquisition systems and dataloggers are downloaded files. **Never delete original \*.msx , \*.mss and \*.msb files!**

System brief  
scheme:



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# 1 Preparation of database system

The database (the data store; place where all records are being saved) is the base of the system. It is necessary to install database server and create the database of the system on it. You can choose one from supported database servers.

## **These database servers are supported:**

- MySQL Database Server of version 5.0, 5.1 a 5.5  
1.1 Installation of MySQL database server
- Microsoft SQL Server of Versions 2005, 2008 and 2008 R2  
1.2 Installation of Microsoft SQL Server

## **1.1 Installation of MySQL database server**

Database system is able to work with MySQL database server of version 5.0 (from version 5.0.37), 5.1 a 5.5.

Installation instructions assume that MySQL server will be installed under operation system Windows XP, Vista, 7 or Server 2003/2008 and that there is not installed any instance of MySQL server on the computer yet.

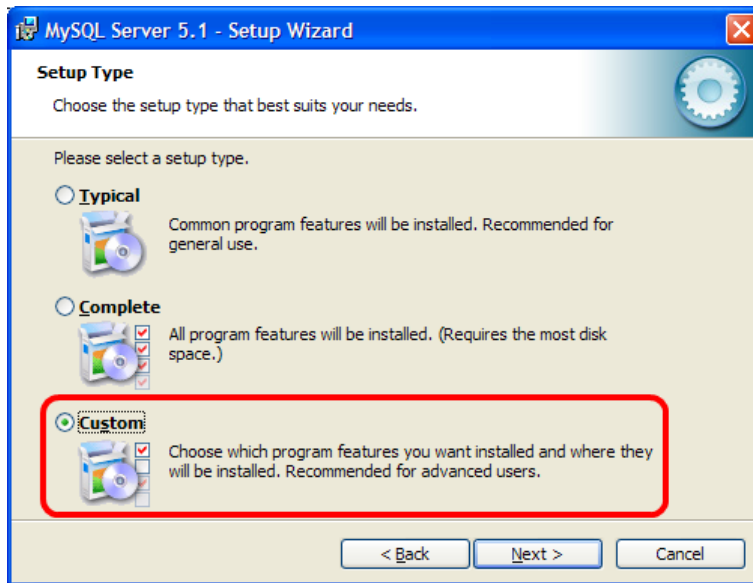
If there is already installed an instance of MySQL, you can skip this chapter and use that server. You will need to know the password for MySQL server administrator account (username: *root*).

Note: you must be logged as user with administrator rights (member of windows group *Administrators*).

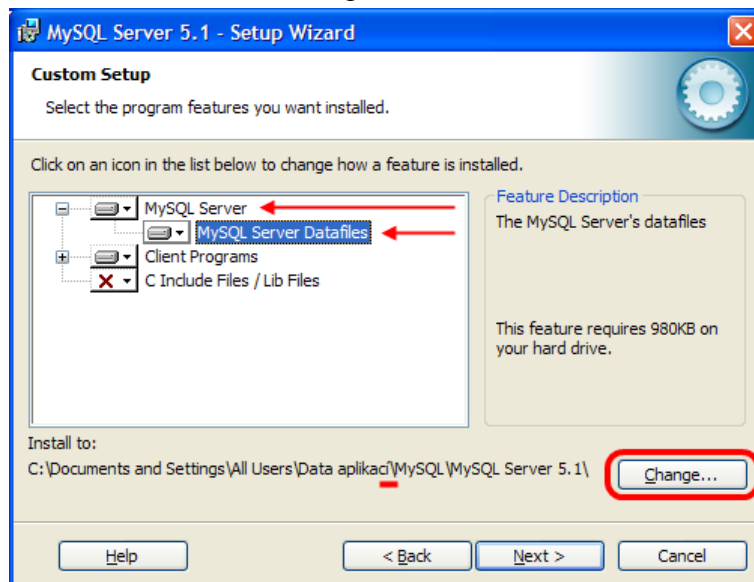
## **Step by step instructions how to install MySQL server:**

- 1) Download the installer of latest MySQL Community server from:  
<http://www.mysql.com/downloads/mysql/>  
Choose *MSI installer* either 32-bit or 64-bit according to your OS bit version.  
Older MySQL versions 5.1 and 5.0 you can find here:  
<http://www.mysql.com/downloads/mysql/5.1.html>
- 2) Lunch downloaded installer.

- 3) Skip the first welcome page by button *Next* to the page *Setup type*. Choose *Custom* type of installation and continue by the button *Next*.



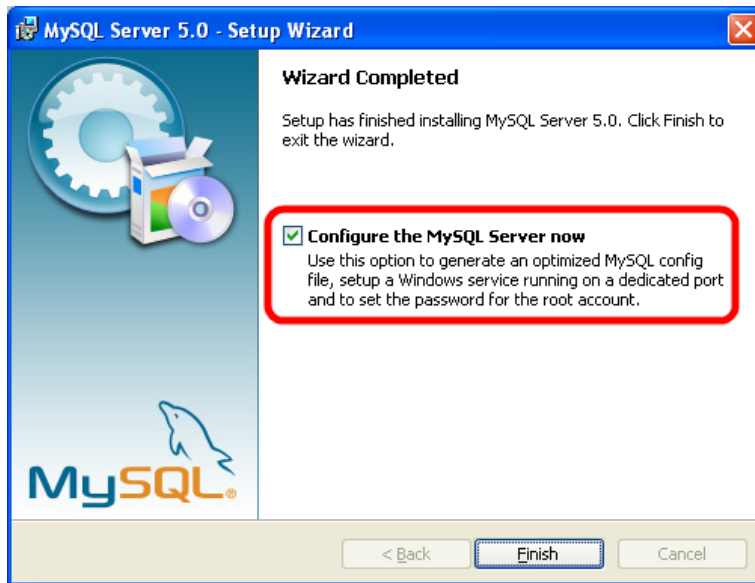
- 4) Check up path for installation and for data files location on page *Custom Setup*. Paths must not contain characters out of ASCII (e.g. German *ÄäÖöÜü* or Sweedish *å* etc.). Mysql installer doesn't work with character set and if some special characters is included in the path, then creation of MySQL service will crash with message „Error 0“. If there are other characters in the path then *a..z, A..Z, 0..9, (space)!'#\$%&'()\*+,-./:;<=>?@[\\]^\_`{|}~* change them!



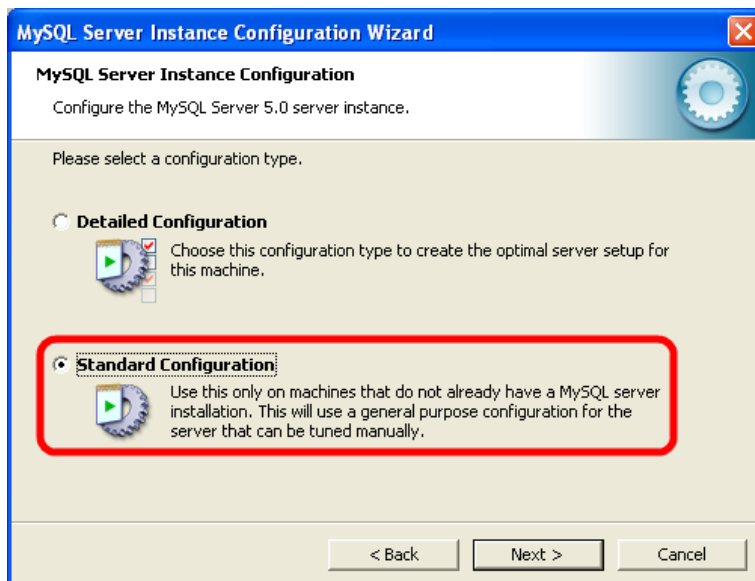
Finally, continue by clicking on the button *next*.

- 5) Confirm installation by the button *install* on the following page. The installation process will take a time now. Confirm continuation of the installation several times by *Next* button until you get to the page *Wizard completed*.

- 6) Check if the choice *Configure the MySQL Server now* is selected and continue by the button *Finish*.



- 7) Use button *Next* to skip welcome page of configuration wizard, then choose *Standard Configuration* and continue by the button *Next*.

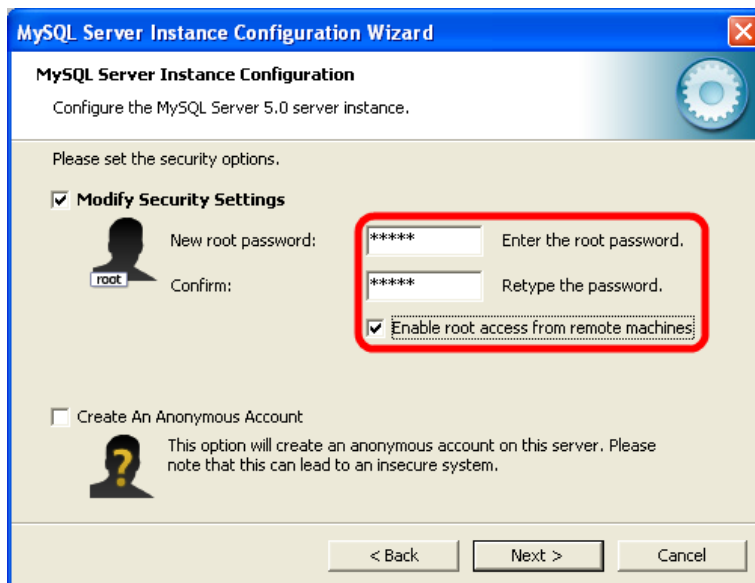




- 8) Leave everything without changes on the following page and continue by the button *Next*.



- 9) Create new password for MySQL server administrator account (its username will be *root*) and enter it here. Enable the access from other computers in the network for this account as well. **Make a note of the password because you will need it later!** Then click the button *Next*.



- 10) Run the configuration process by the button *Execute*. MySQL server installation is finished at the moment but there is still one step left: You have to allow TCP/IP port 3306 on the firewall to be able to connect to the database server from other computers in the network. Allow port 3306 – *MySQL standard port* on the firewall. How to do it you can read in chapter 7.1 Allowing TCP port on windows firewall. Also remember, that there can be other firewalls running on your computer and also some anti-virus programs contains firewalls.

## 1.2 Installation of Microsoft SQL Server

Database system is able to work with Microsoft SQL Server of versions 2005, 2008 and 2008 R2.

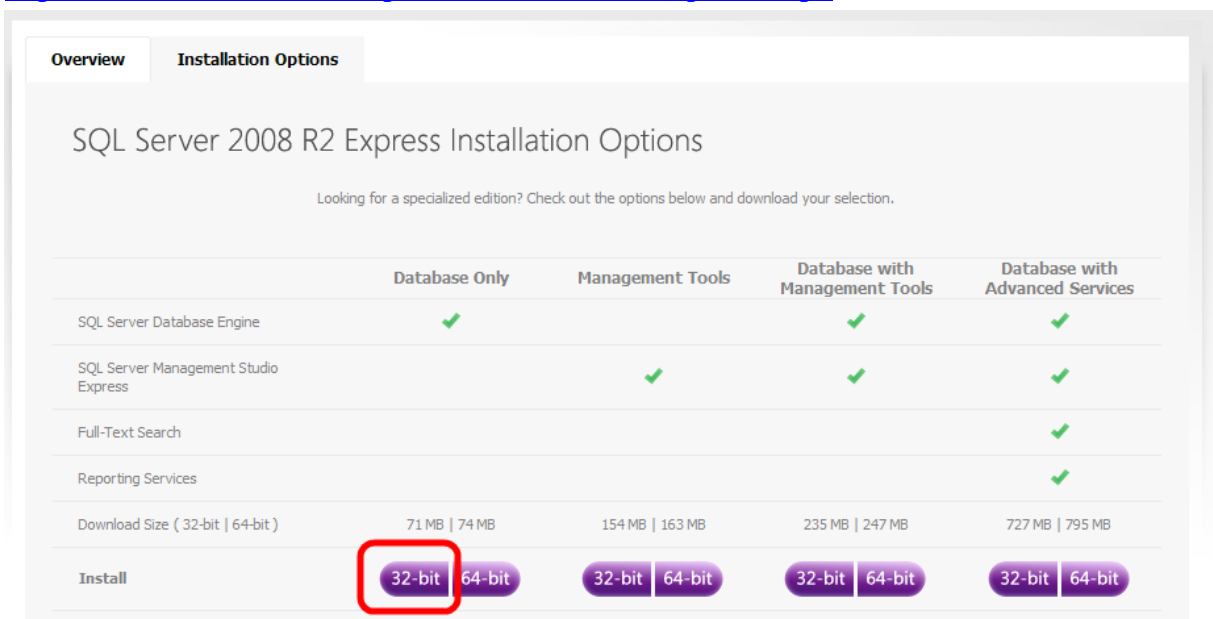
Installation instructions assume that Microsoft SQL server will be installed under operation system Windows XP, Vista, 7 or Server 2003/2008 and that there is not installed any instance of Microsoft SQL server on the computer yet.

If there is already installed an instance of supported Microsoft SQL server, you can skip this chapter and use that server. You will need to know the password for SQL server administrator account (username *sa*) or any other database account in *sysadmin* server role.

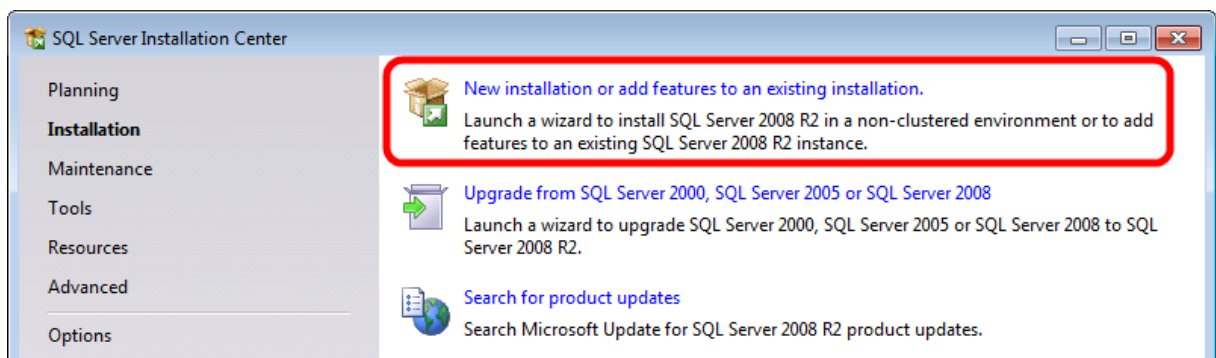
Note: you must be logged as user with administrator rights (member of windows group *Administrators*).

### Step by step instructions how to install Microsoft SQL server:

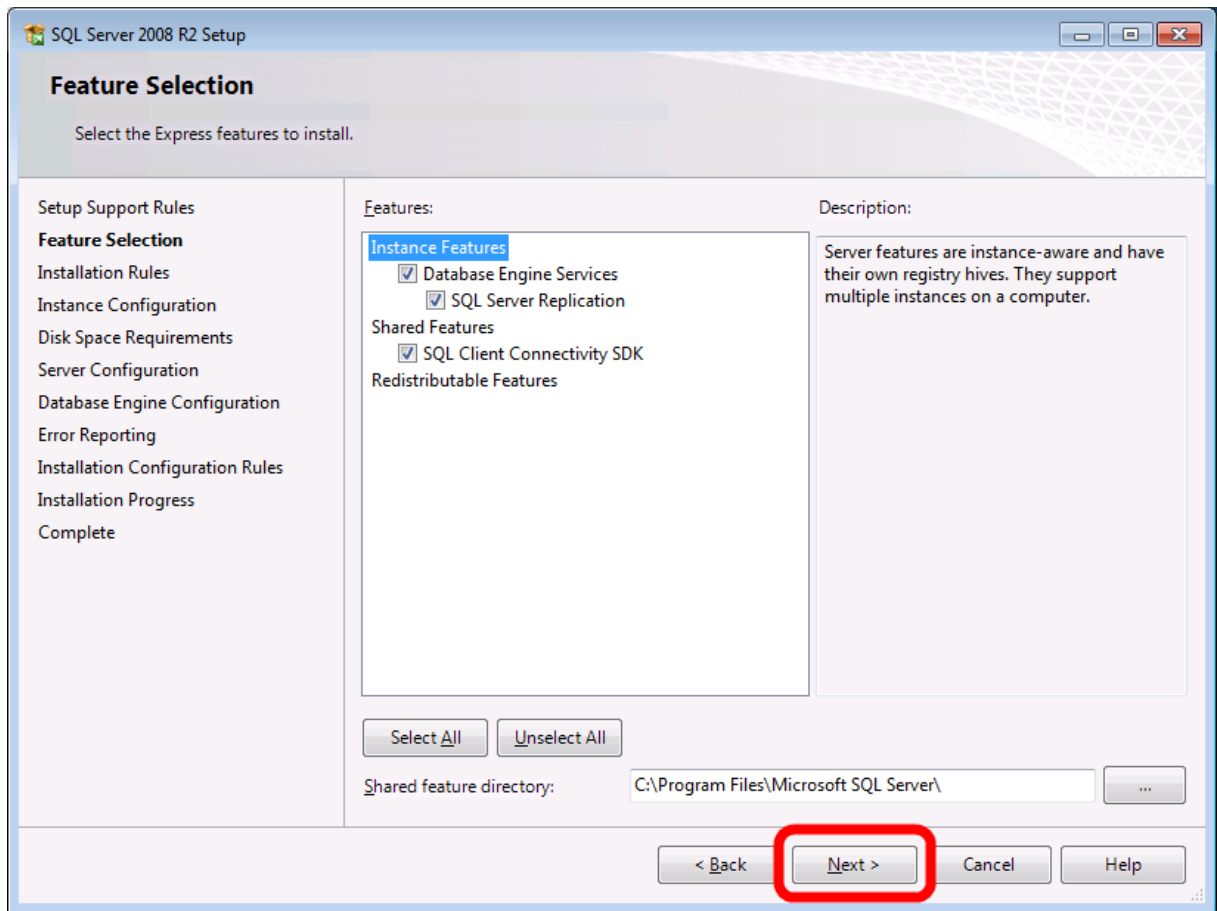
- 1) Download last Microsoft SQL Server release from:  
<http://www.microsoft.com/express/Database/InstallOptions.aspx>



- 2) Launch downloaded installer *SQLEXPR32\_x86\_ENU.exe*.
- 3) Choose *New installation*



- 4) After some processing you will get to the page *Licence Terms*. Confirm *I accept licence terms* check box and continue by clicking *Next* button.
- 5) On the following page *Feature Selection* leave everything as is and click the button *Next*.



- 6) On the page *Instance configuration* check *Default instance* and continue by clicking on the button *Next*.

SQL Server 2008 R2 Setup

### Instance Configuration

Specify the name and instance ID for the instance of SQL Server. Instance ID becomes part of the installation path.

Setup Support Rules  
Feature Selection  
Installation Rules  
**Instance Configuration**  
Disk Space Requirements  
Server Configuration  
Database Engine Configuration  
Error Reporting  
Installation Configuration Rules  
Installation Progress  
Complete

☒ **Default instance**  
☐ **Named instance:**

Instance ID:

Instance root directory:  ...

SQL Server directory:

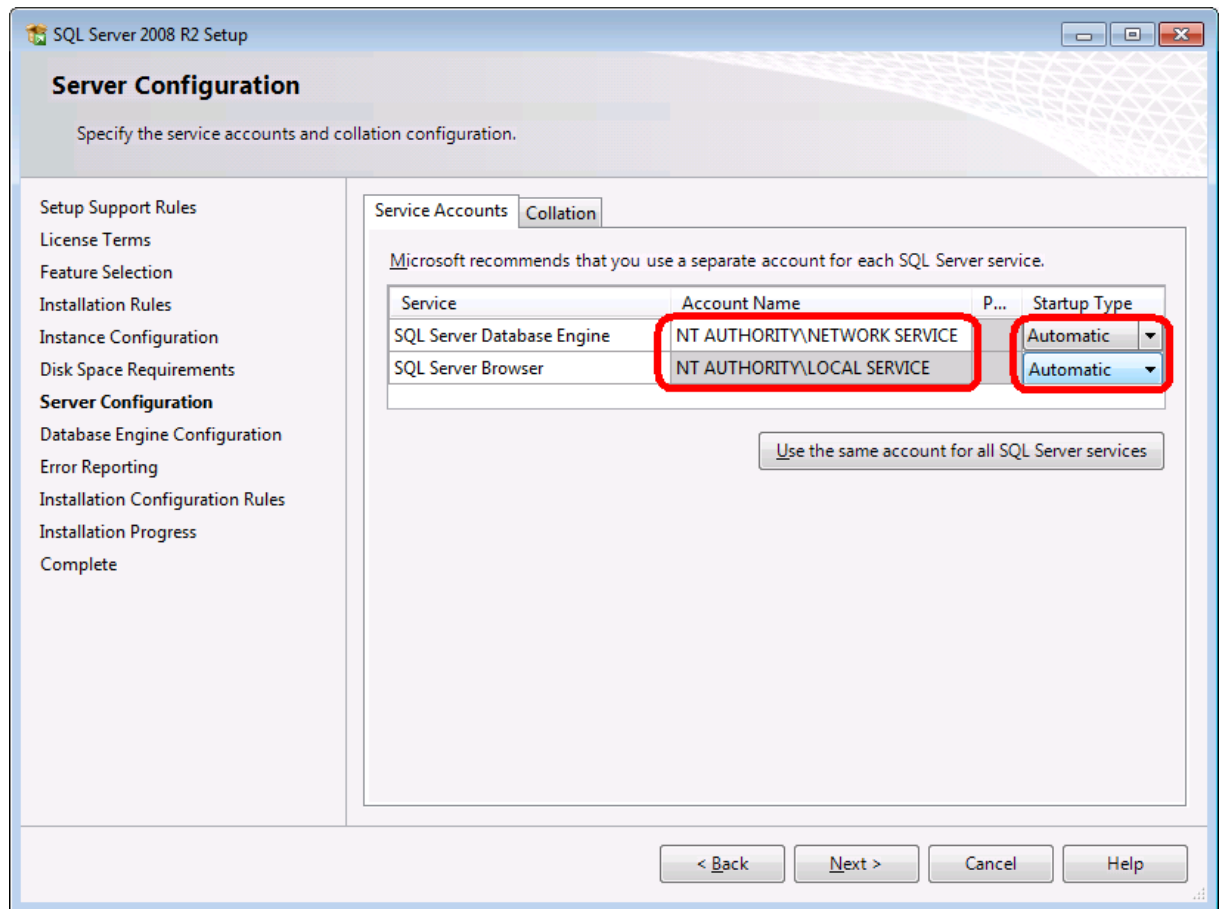
Installed instances:

Instance Name	Instance ID	Features	Edition	Version
---------------	-------------	----------	---------	---------

< Back **Next >** Cancel Help

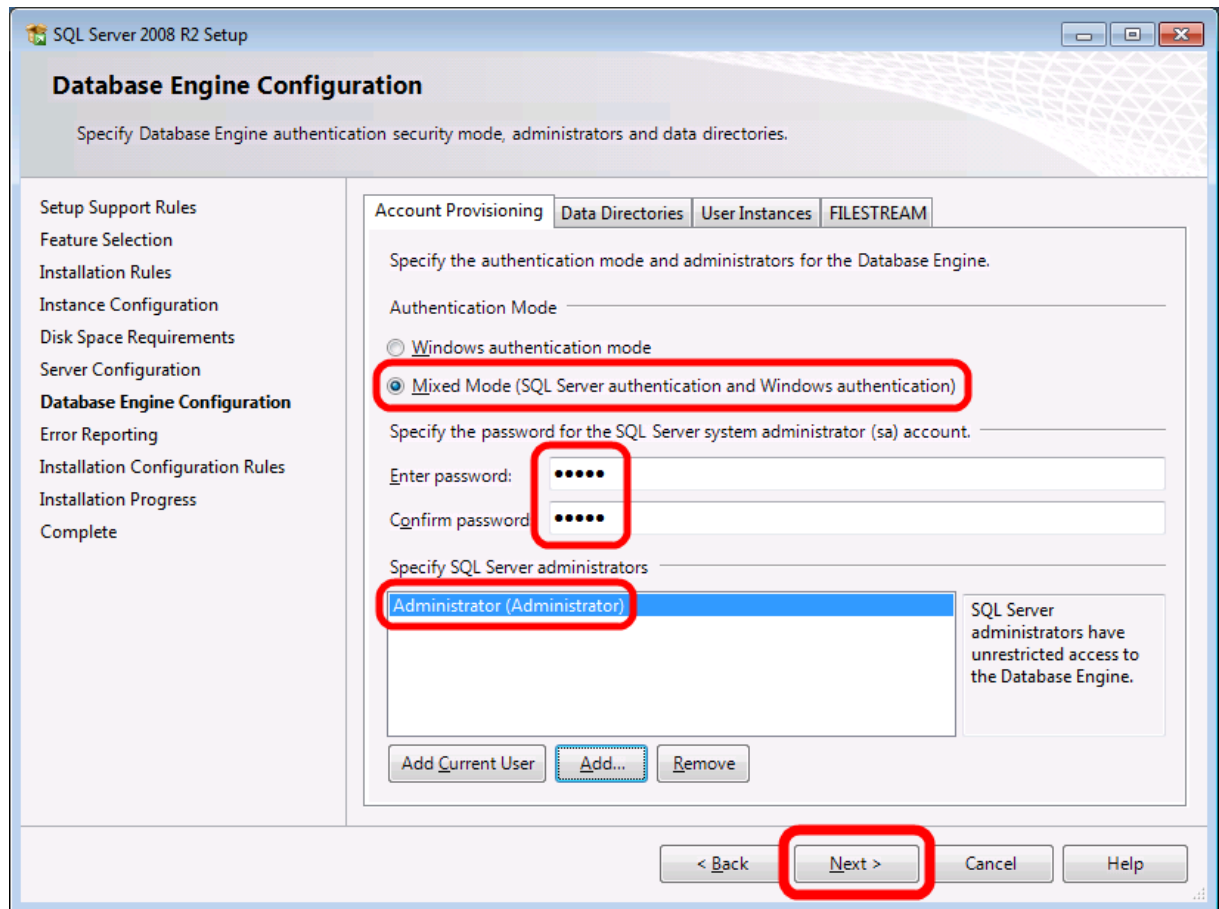
- 7) On following page *Server Configuration* set this:
- *NT AUTHORITY\NETWORK SERVICE* as account for SQL Server Database Engine
  - *NT AUTHORITY\LOCAL SERVICE* as account for SQL Server Browser
  - *Automatic* startup type for both services

Then continue by clicking *Next* button.

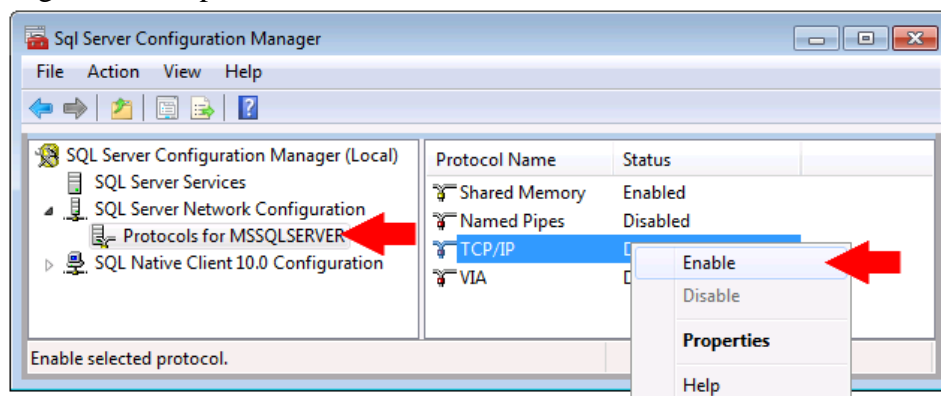


- 8) On the page *Database Engine Configuration* select *Mixed Mode* (you will be able to use both: windows accounts and username–password for connection to SQL server). Then create new password for SQL Server system administrator account (its username will be *sa*). **Make a note of the password because you will need it later!** Then you have to add one windows account which will also act as SQL server administrator (like *sa* SQL server account). It is recommended to add *local administrator* windows account.

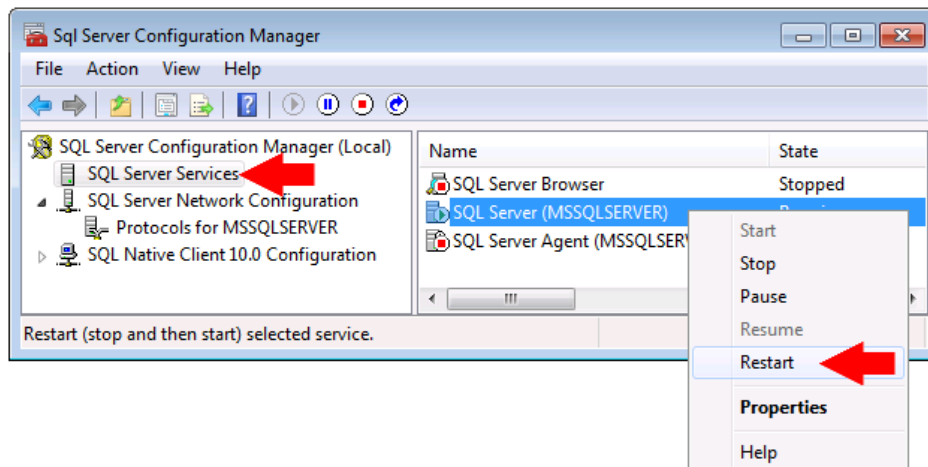
Continue by clicking on the button *Next*.



- 9) Skip the next page *Error reporting* by clicking the button *Next*.
- 10) Installation will spend some time now. Then click the button *Close* to finish the installation process.
- 11) Now it is needed to enable TCP/IP protocol for SQL Server (it enables to connect to the SQL Server from remote PCs – needed for Database Viewer).
  - a. *Run: Start → All programs → Microsoft SQL Server 2008 R2 → Configuration Tools → SQL Server Configuration Manager*
  - b. *Choose SQL Server Network Configuration → Protocols for MSSQLSERVER. Right-click on protocol TCP/IP and choose Enable*



- c. Finally it is needed to restart SQL server. Choose *SQL Server Services*. Right-click on the *SQL Server (MSSQLSERVER)* and choose *Restart*.



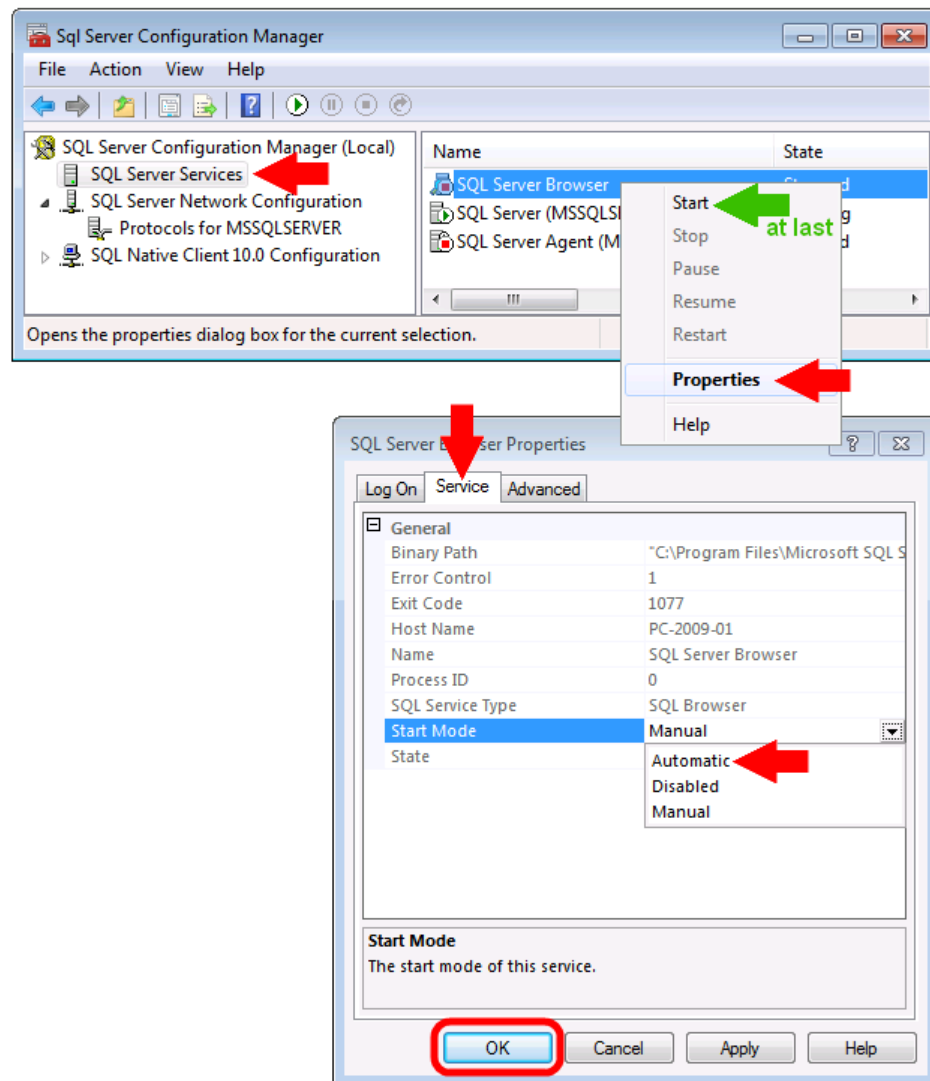
12) Another step is to enable SQL Server Browser.

This service will allow to search SQL Server instances by computer names (you will not need to now the TCP port of SQL Server)

**Note:** This step is not needed if you didn't forget to set *automatic* start type for SQL Server Browser during installation (step 7).

- a. If you have closed *SQL Server Configuration Manager* then open it again:  
*Run: Start → All programs → Microsoft SQL Server 2008 R2 → Configuration Tools → SQL Server Configuration Manager*
- b. Choose *SQL Server Services*. Right-click on the *SQL Server Browser* and choose *Properties*. Switch to the tab *Service*. Find *Start Mode* and select *Automatic*. Confirm by the button *OK*. Finally right-click on the *SQL Server Browser* again

and choose *Start*.



- 13) Finally, it is needed to allow TCP port for SQL Server and UDP port for SQL Server Browser on Windows firewall.
  - a. Since you follow these instructions, then You have only one instance of SQL Server on the computer and this instance standardly uses port 1433. So, allow the TCP port 1433 on windows firewall. How to do it you can read in chapter 7.1 Allowing TCP port on windows firewall.
- 14) SQL Server Browser uses UDP port 1434. Use instruction in 7.1 Allowing TCP port on windows firewall, but when you will enter port number don't forget to switch from TCP to **UDP**!

Also remember, that there can be other firewalls running on your computer and also some anti-virus programs contains firewalls.



## 2 Using program Database Administration Utility



The program *Database Administration Utility* is the utility for managing the database system. Primarily, you will use it for creation of the database in database server. Then you will have to use it for administrating user accounts. Not the least function of *Database Administration Utility* is configuring and controlling the SOAP server which serves as online collector of measured values from sensors and data acquisition systems. You can read about all *Database Administration Utility* functions in chapter 2.3 Functions of program Database Administration Utility

### 2.1 Installation of program Database Administration Utility

Installation is simple with help of the installer. It is strictly recommended to install the *Database Administration Utility* on the same computer where you have installed database server. Launch the installer and proceed through the installation.

Note: you must be logged as user with administrator rights (member of windows group *Administrators*).



### 2.2 Using Database Administration Utility for creation database on database server

Creating the database on database server is the primary function of the *Database Administration Utility*. Find the program icon and run it.

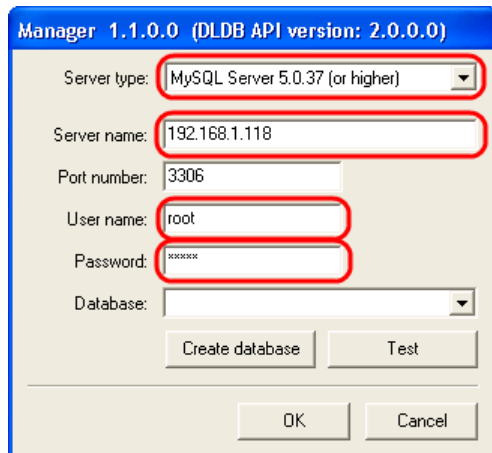


Login dialog will be displayed at first. Enter database connection parameters (more info

in chapter 7.2 Entering database connection parameters), but don't choose the *database* at this moment.

**If MySQL database server used:**

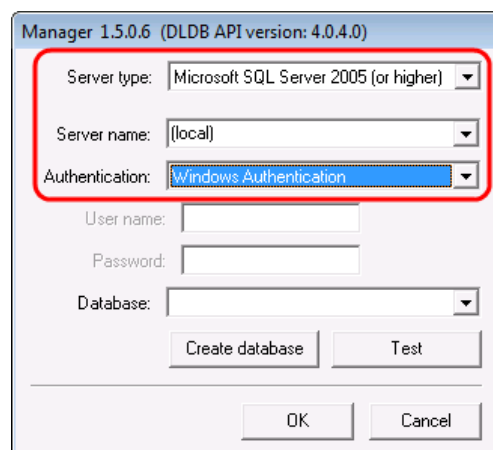
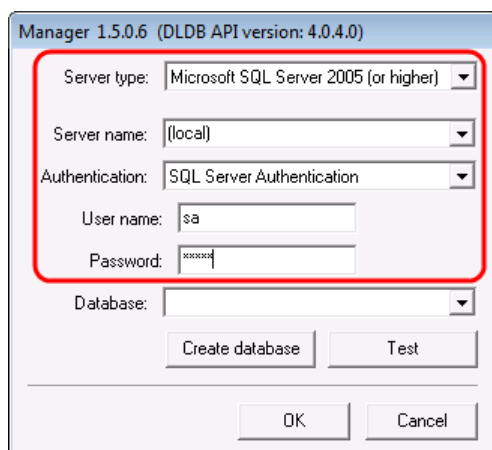
Enter **root** as the *User name* and as the *Password* enter the password that you entered during MySQL installation:



**If Microsoft SQL server used:**

Select *SQL Server Authentication*, enter **sa** as the *User name* and as the *Password* enter the password that you have entered during Microsoft SQL server installation.

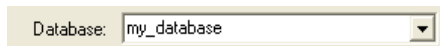
During installation you also added minimally one windows account into *database system administrators* list. If you have executed program under this user you can also use *Windows authentication* mode. If you choose this, then you will not enter *User name* and *password*.



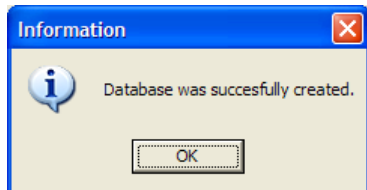
At this moment you can use button *Test* to verify if you have entered correct database connection parameters. If parameters are OK, then message *Database name is not entered* will be displayed. Otherwise the program will inform you that it is unable to log in the server.

If parameters are OK, create some database name and enter it into the field *Database*. Use characters *a..z*, *0..9* only and instead of character space use character underline „\_“.

Remember, number can not be the first character (valid examples: *test\_01*, *database\_system*,...)

A screenshot of a web form with a label 'Database:' followed by a dropdown menu. The dropdown menu is open, showing 'my\_database' as the selected option.

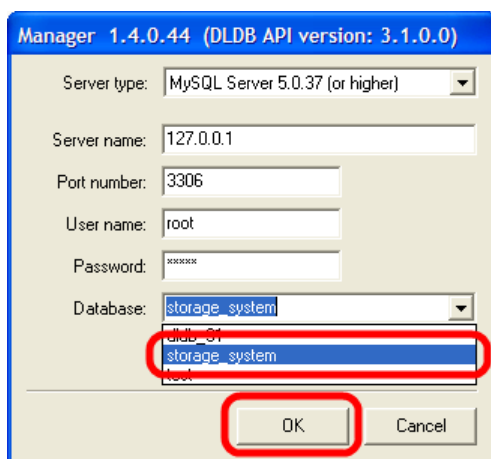
Click on the button *Create database* to execute creation process of the database. After successful creation of the database following message will be displayed:



Creation of the database is finished now.

## 2.3 Functions of program Database Administration Utility

In the previous chapter, we have used the program *Database Administration Utility* for creating new database only. Now and also at any time later you can reenter database connection parameters, choose already created database from *Database* list and press the *OK* button to get to the database administration. How to enter database connection parameters is explained in chapter 7.2 Entering database connection parameters.

A screenshot of the 'Manager' window (version 1.4.0.44, DLDB API version: 3.1.0.0). It contains fields for 'Server type' (MySQL Server 5.0.37 (or higher)), 'Server name' (127.0.0.1), 'Port number' (3306), 'User name' (root), 'Password' (masked), and 'Database' (storage\_system). A red rectangle highlights the 'Database' dropdown menu, which shows a list of databases including 'storage\_system'. Another red rectangle highlights the 'OK' button at the bottom.

It will allow you to:

- administrate users for database
- configure and control SOAP server
- set device and channels properties i.e. renaming.
- execute the backup and eventually upgrade the database (MySQL only)
- view database log
- delete data

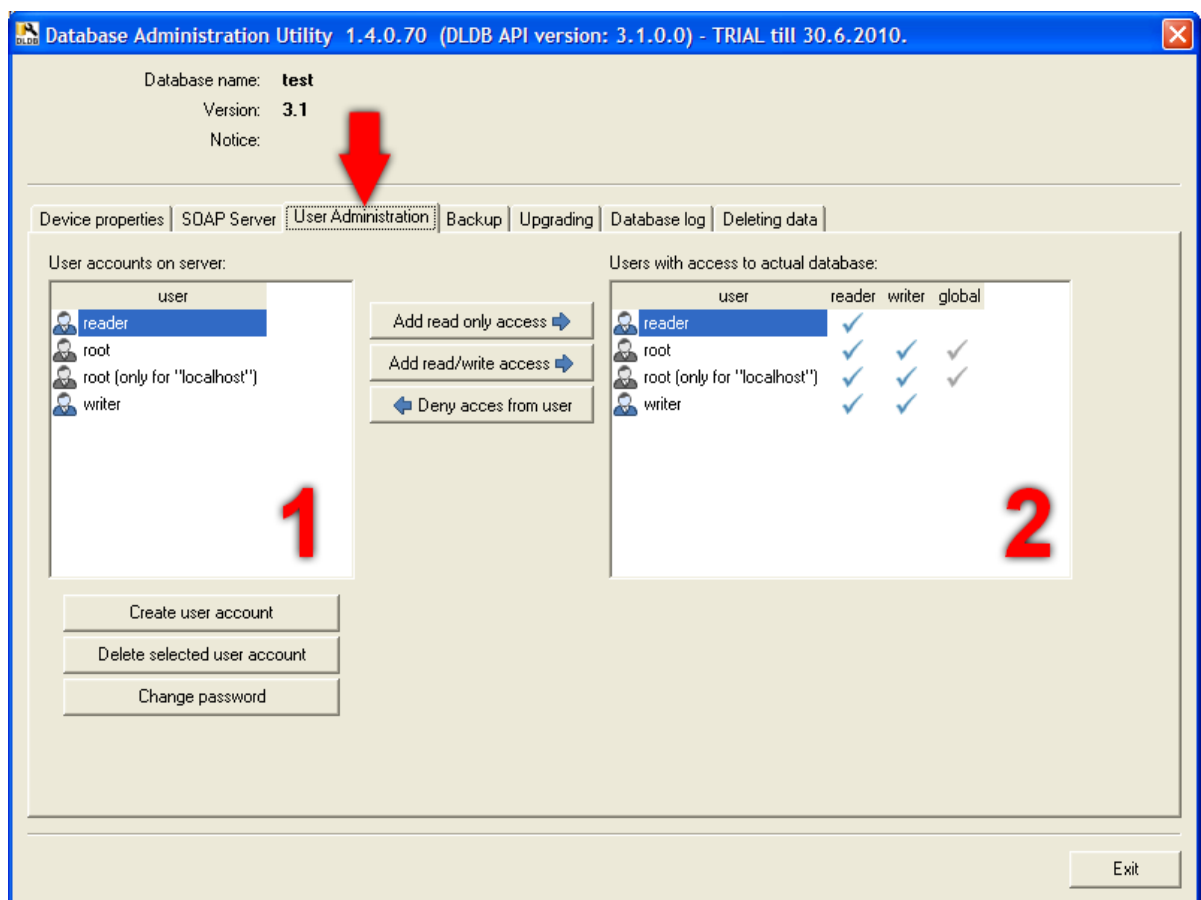
There are basic information about database at the top of the manager form: name, version

and eventually there can be some message (e.g. that the database should be upgraded to newer version). Tabs with manager functions are under these basic information:

### 2.3.1 User administration

You'll find this function on *User Administration* tab of the manager. It is advisable to create at least two users for database system: *writer* and *reader* and then to add them access rights this way: *writer* has rights for read and write, *reader* has rights only for reading.

The administration has two lists: *User accounts* (marked with number 1 on the picture below) and *Users with access to actual database* (marked with number 2 on the picture below).



*User accounts* list displays all user accounts on the database server. Below are buttons for creating new user, deleting existing user and changing the password for existing user. Be careful that you have selected known user (especially when deleting user or changing password) – program allows deleting and changing password for all users on server (except *root* and *sa* user).

The list *Users with access to actual database* displays users who can view or insert data into actual database. Next to the *User* column are columns *reader* and *writer*. If the user have in *reader* columns tick and don't have tick in *writer* column then this user has rights for

viewing the database only. If the user have tick in both *reader* and *writer* column then he has rights for viewing and also for inserting data to the database.

You can add *read-only* or *read/write* access rights to any existing user in *User accounts* list by buttons between this list: first select user in *User accounts* list and then click the button. You can also deny access rights for user who already have some rights to the database: first select the user in *Users with access to actual database list* and then click on the *Deny access from user* button.



If some user in *Users with access to actual database list* has gray tick in *global* column then this user has access rights globally. It means that the user has global rights for all databases on the server (e.g. user *root* on MySQL or user *sa* on MSSQL will be the one for sure, because *root/sa* user has all rights to all databases, because it is database server administrator). If another user than *root/sa* is in the list with global tick, then the only way to deny the access to the database for him, is to completely delete him from the database server by the button *Delete selected user account*. Remember, you must be sure that this user is not used in another project on SQL server!

If using Microsoft SQL Server installed with Windows authentication support only be twice carefull! You must not delete that *windows account* which you have added into *database system administrators* list during installation, because then there will be no *sysadmin* user and you will not be able to administrate the database and whole server.

### 2.3.2 SOAP Server

This function serves for configuring and controlling the SOAP server. SOAP server acts as online collector of measured data from ethernet sensors and data acquisition systems MS6 and MS55. It is the only way how to fill the database with measured data in case of sensors. In case of data acquisition systems it is possible to do the data collection online via SOAP server but also by downloading the record from device.

**Note:** To be able to configure and control the SOAP Server service you have to run *Database administration utility* with windows administrator privileges.

If SOAP Server Configuration is used for first time then the Server must be activated. Click the button *Activate full version* (the only one enabled on tab) and enter the license key:

If DBS Sensor Monitor was purchased then make the registration this way:

**Program Registration**

Company:

Key:

**LICENCE CARD**

Keep this licence card!

Program: **DBS Sensor Monitor**

Download: [www.cometsystem.cz/english/download-database.htm](http://www.cometsystem.cz/english/download-database.htm)

Database Viewer key: **????????** Number of licences: **1**

SOAP Service key: **????????** Number of licences: **1**

Manufacturer's authorization:

Rožnov pod Radhoštěm,

Software licence agreement  
among COMET SYSTEM, s.r.o. and the program user

If DBM MS Logger program was purchased then make the registration this way:

**Program Registration**

Company:

Key:

**LICENČNÍ KARTA**

Tuto licenční kartu pečlivě uschovejte!

Program: **DBM MS Logger Program**

Download: [www.cometsystem.cz/download-database.htm](http://www.cometsystem.cz/download-database.htm)

Klíč: **????????** Počet licencí: **1**

Potvrzení výrobce:

Rožnov pod Radhoštěm,

Licenční ujednání  
mezi firmou COMET SYSTEM, s.r.o. a uživatelem programu

Tento program je poskytován držiteli autorských práv s následujícím licenčním ujednáním. Získáním, používáním nebo kopírováním tohoto programu souhlasíte, že jste si toto licenční ujednání přečetli(a), porozuměli(a) mu a budete

**Database Administration Utility 1.4.0.69 (DLDB API version: 3.1.0.0) - TRIAL till 30.6.2010.**

Database name: **test**

Version: **3.1**

License:

Device properties | **SOAP Server** | User Administration | Backup | Upgrading | Database log | Deleting data

Service status: **Service is running.**

Listening TCP port: **80**

User Account: **writer**

Processing threads count: **8**

Control the service:

Service event log: \* Double click on row to see details.

Type	Date time	Message
Information	22.06.2010 08:54:27	Service started...
Information	21.06.2010 08:29:30	Service started...
Information	21.06.2010 06:47:07	Service started...
Information	18.06.2010 13:47:25	Service started...
Information	18.06.2010 09:16:43	Service started...
Information	17.06.2010 15:20:10	Service started...
Information	17.06.2010 15:19:26	Service stopped...
Information	16.06.2010 14:44:51	Service started...

You can check if SOAP server is running or stopped on the top of the page. There are configuration parameters below and then buttons for controlling the SOAP server. At the bottom is the list of events. This list can prompt you to solve problems.

Use the button *Reconfigure* for the server configuration. Configuration wizard will be executed where you will be asked for entering *listening TCP port*, *database account* and *processing thread count*.

Port 80 is recommended as *listening TCP port*, but you have to be sure, that there is no other application using this port on the computer. Especially HTTP server like Apache or IIS use this port (port 80 is standard for HTTP). Finally remember to allow entered TCP port on firewall (explained in chapter 7.1 Allowing TCP port on windows firewall)!

As *database account* you have to use account with *read/write* privileges (explained in chapter 2.3.1 User administration). Leave the value 8 in *Processing thread count*. Increasing this value leads to increasing the SOAP server performance, but it is the question of tuning SQL server.

Buttons *Start*, *Stop* allows you to control the SOAP server. When you start the service you should check the SOAP server diagnostic by clicking on the button *Diagnostic*.

### 2.3.3 Device / channels properties

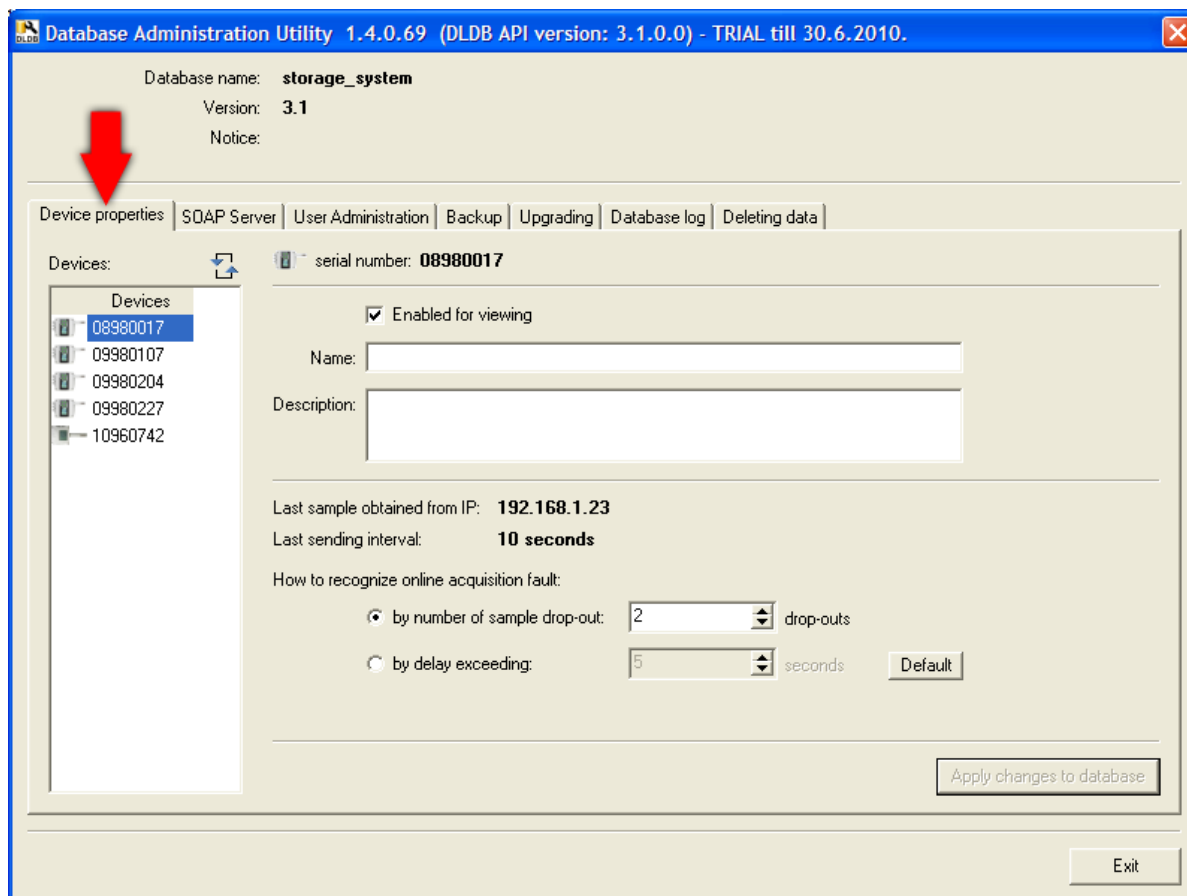
This tool primarily allows you to rename devices and its channels. You can give user-friendly name to any device/channel in the database. This name will be displayed everywhere in *Database Viewer* where device serial number / channel technical label was displayed before.

Another function is enabling / disabling devices and channels for viewing. For example, when you cancel monitoring from some device and you don't want to see this device and its values in *Database Viewer*, then switch off *Enabled for viewing* checkbox.

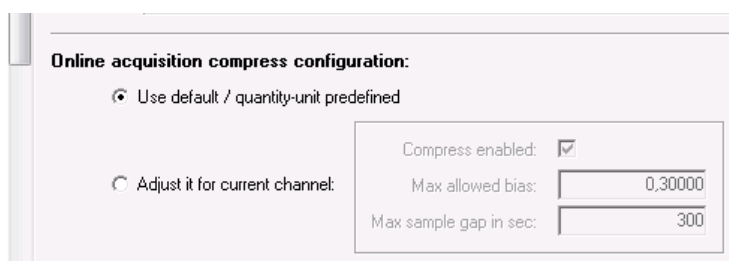
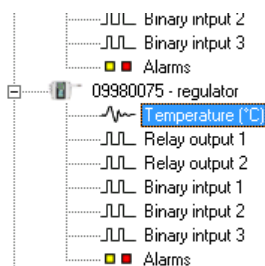
The setting *How to recognize online acquisition fault* applies only online monitoring via SOAP Server. This sample frequency delay is here due to used SOAP protocol, which rely on HTTP and TCP/IP protocol. If you make the online data collection from sensors / data acquisition systems via internet then samples from sensors will probably never come exactly on time.

For example when some sensor has sending interval 10 seconds and this settings is set to 2 *drop-outs* by default then samples which came in times: 12:00:00; 12:00:10; 12:00:20 are considered to be correct logging. But when samples came in times: 12:00:00; 12:00:14; 12:00:50 then interrupted logging will be recognized between 2<sup>nd</sup> and 3<sup>rd</sup> sample. In most cases default settings is acceptable and don't need to be changed.

You can get useful information about sensor location in the network from *Last sample obtained from IP*.



When you have chosen channel of sensor of channel of data acquisition system, then you are able to adjust compression configuration for current channel – select *Adjust it for current channel*. When you left *Use default / quantity-unit predefined* selected then compression configuration will be inherited from global configuration. See 2.3.8 Online acquisition compression settings to read more about this topic.

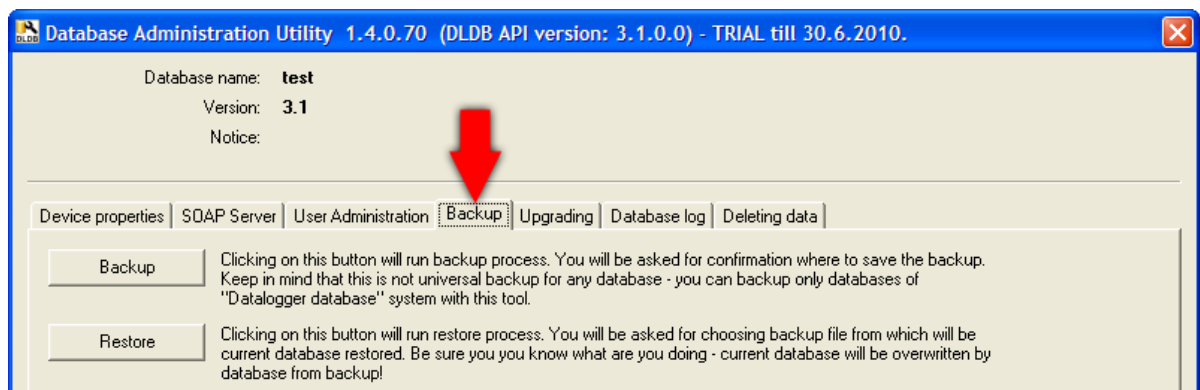


## 2.3.4 Backing up and restoring

You'll find this function on *Backup* tab of the manager. Backing up / restoring is only available for MySQL Server. When using MSSQL we recommend to use *Microsoft SQL Server Management Studio*.



### **If MySQL database server used:**



Use the button *Backup* to backup the database. Backing up process can takes a few minutes (it depends on how much data are in the database and on hardware). It is recommend to run the backup when no user is using the database.



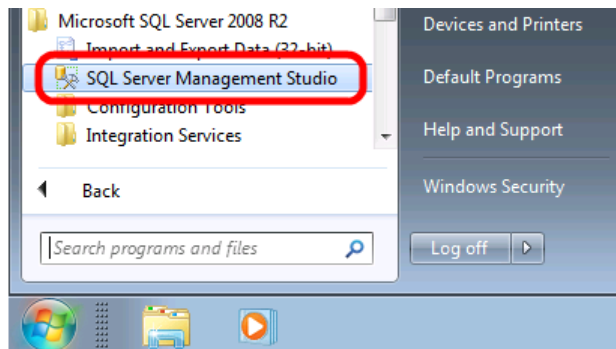
The button *Restore* can be used to restore the database. Keep in mind that this will overwrite existing database completely, so be careful! Also, all users must be disconnected from the database. If you're not sure that there is no user using the database then you, for example, can run the manager on the machine with database server and disconnect the machine from the network or something similar: disallowing database port on firewall, disabling TCP/IP communication on MySQL server, etc.

The best way how to restore the database is not to overwrite existing database but to create new one (described in chapter 2.2 Using Database Administration Utility for creation database on database server) and restore from backup into this data empty database.

### **If Microsoft SQL Server used:**

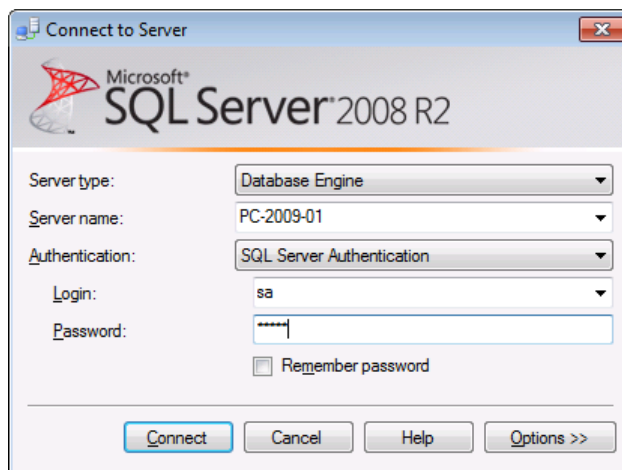
In case of *Microsoft SQL Server* there is no tool for backing up in *Database Administration Utility*. *Microsoft SQL Server Management Studio* enables you to make backing up the best way. There is also option to set scheduled backing up in studio (unfortunately not in Express version which is free).

To run the studio go to the *Start* → *All programs* → *Microsoft SQL Server 2008 R2* → *SQL Server Management Studio*.



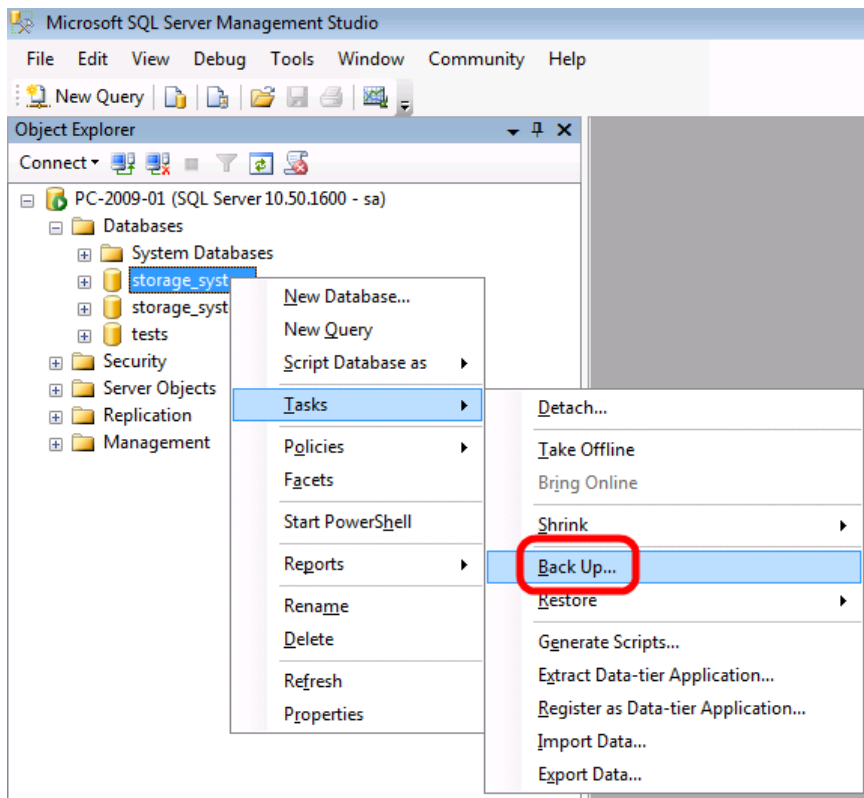
If it is not there, then you have to install it first. About installation you can read in chapter 7.3 Microsoft SQL Server Management Studio installation.

The first what the studio will ask you to will be entering connection parameters. The form is quite similar as from *Database Administration Utility*, so connect with *sa* (system administrator) account:

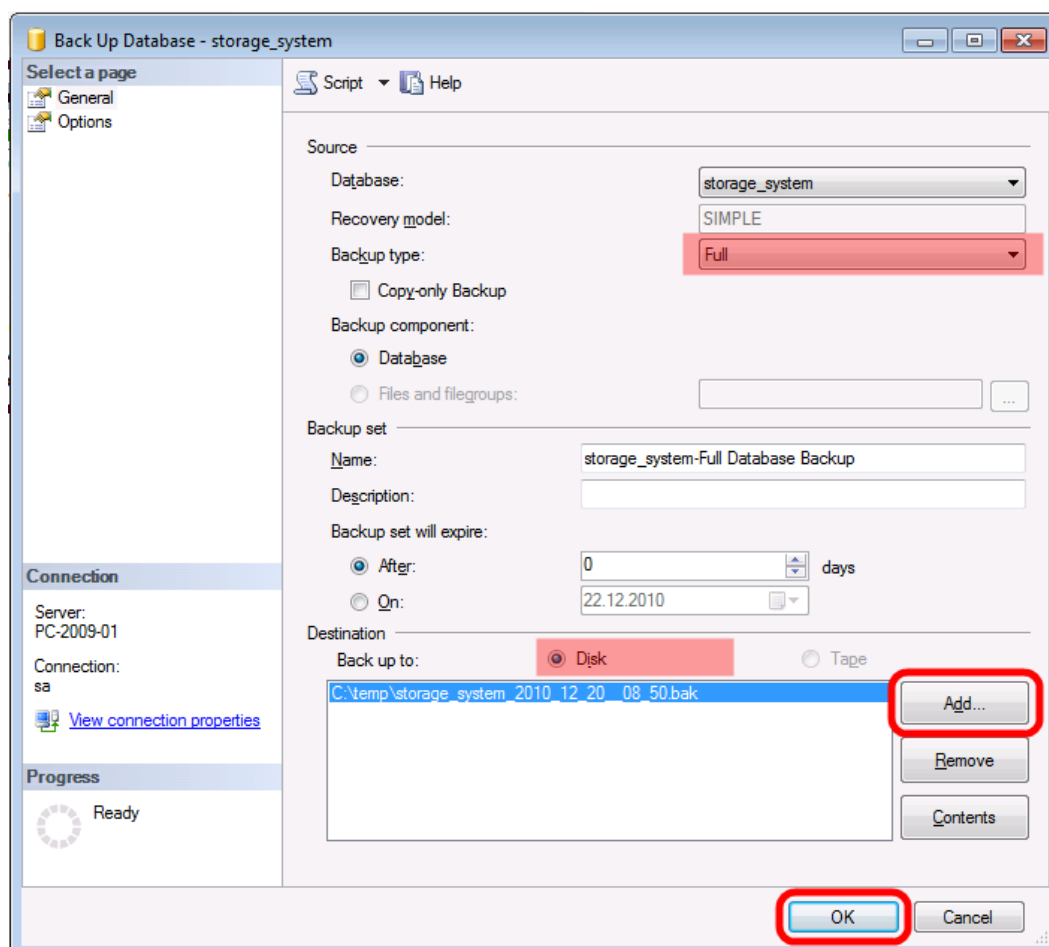


### **How To Backup with Microsoft SQL Server Management Studio**

Find you database in *Object Viewer*, right-click on it, choose *Tasks* and then *Backup Up*....

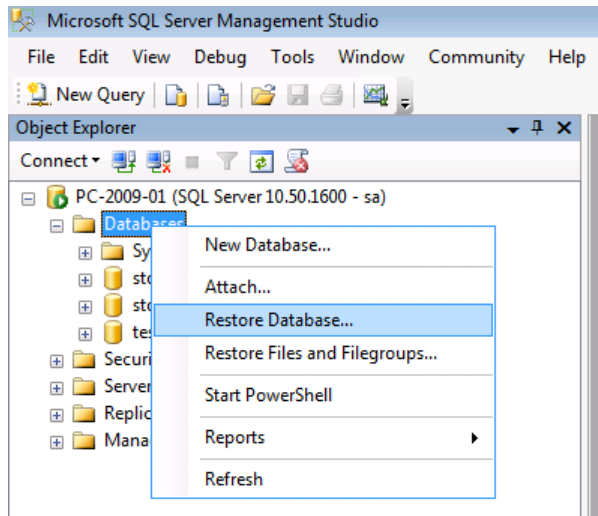


In *Backup Up* form click the *Add* button to enter the file where the backup will be stored. Then click the button *OK* to proceed the backup.



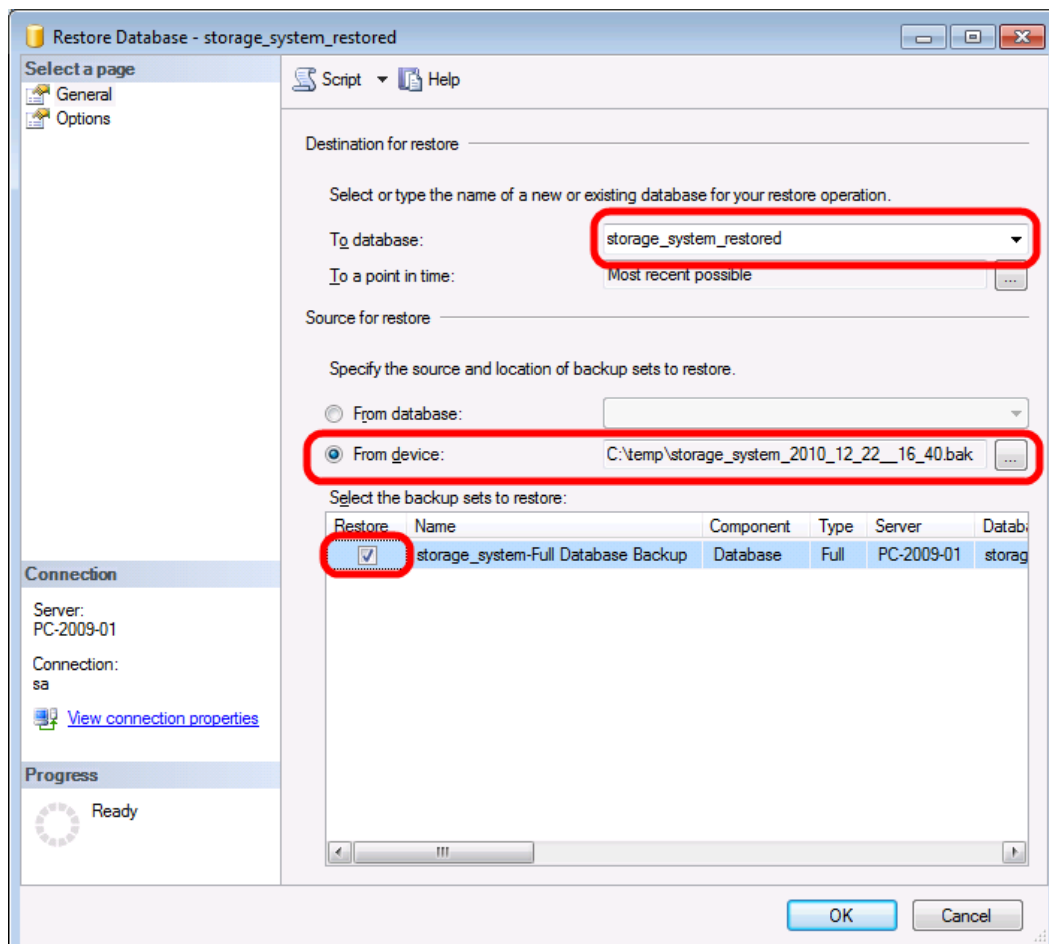
## How To Restore with Microsoft SQL Server Management Studio

In the *Object Explorer* right-click on the *Databases* node and select *Restore Database....*



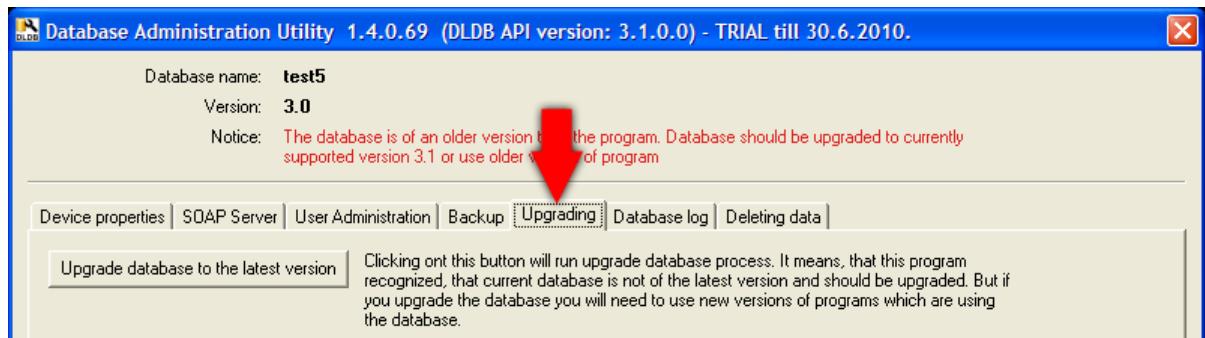
On the *Restore Database* form enter new database name, select *From device* and search file from the restoration is to be done. Then confirm restoration by checking column *Restore* in the grid and click the button *OK*.

If you have selected to restore to existing database then you have to go to page *Options* and confirm *Overwrite the existing database*.



### 2.3.5 Upgrading

You'll find this function on *Upgrading* tab of the manager.



When you get newer version of *Database Administration Utility* then it is possible that this version of program supports newer version of the database. In this case the manager will inform you in the *Notice* label that the database is of an older version and that the database should be upgraded. If this happens then you'll find the button *Upgrade database to the latest version* on *Upgrading* tab enabled.

**It is strictly recommended to backup the database before executing upgrade process!** More info about backing up is in chapter 2.3.4 Backing up and restoring.

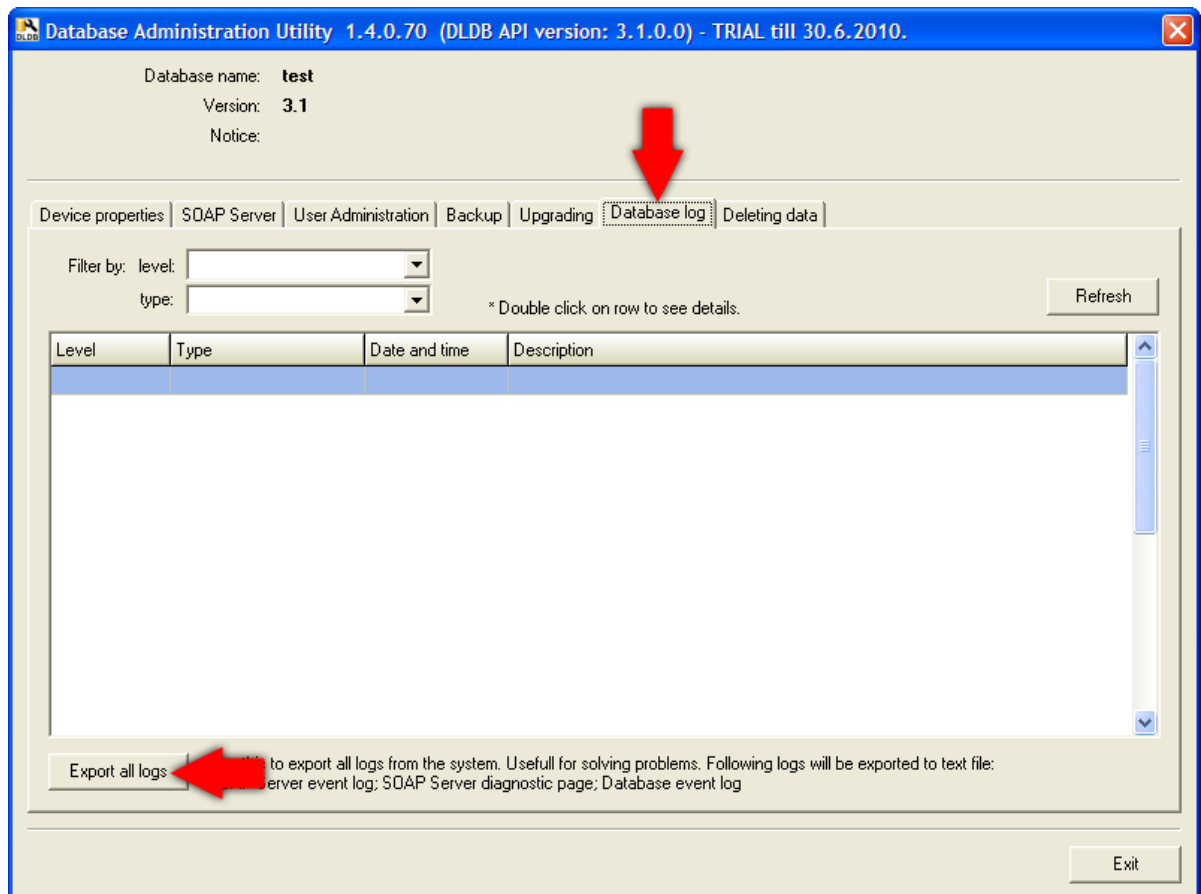


Another think you have to figure out before upgrading is that after the upgrade the database will be of an newer version and other programs which currently uses the database (*DBV Database Viewer*, *DBM MS Logger Program*, *DBL Logger Program*) will not be able to connect to this newer database. Hence you will have to reinstall all programs to their newer version, so get all installers before running upgrade or don't run the upgrade at all.

### 2.3.6 Database log

It is viewer of the database system log table. Errors during inserting data into the database are logged here especially. If any problem occurs then information from this table should help us to solve it.

Also, there is the button *Export all log*. If you would be solving some problem with our support, you probably will be demanded to generate the log by this button and send it to us.



### 2.3.7 Deleting / compressing data

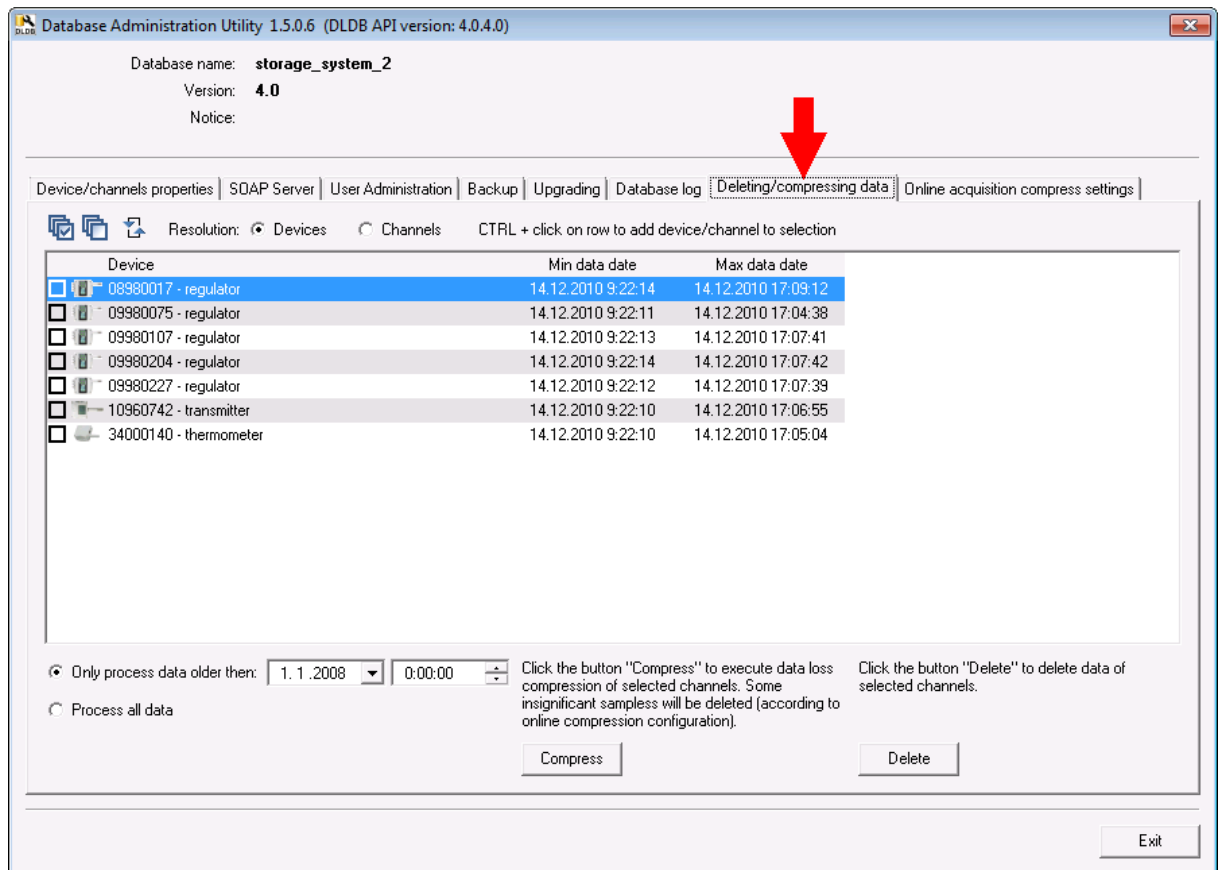


This tool allows you to delete or compress data in the database. Be careful when using this tool, because changes done by it are irreversible!

You can switch between two kinds of resolution:

- *resolution on devices* allows you to delete / compress data from selected devices (i.e. when you select *process all data*, then whole device will be deleted from the database)
- *resolution on channels* allows you to delete / compress data only from selected channels.

To select the row use CTRL + Click on the row. Under the grid there you can choose if you want to *process all data* or *process only data older then* entered date-time. Finally use button *delete* to proceed deletion or button *compress* to proceed compression.



If compression task was chosen, then compression will be done according to online acquisition compression settings (See chapter: 2.3.8 Online acquisition compression settings). But there is one exception: Option *Store values of all channels when storage of one is needed* will be ignored and data will be compressed as if this option would be disabled.

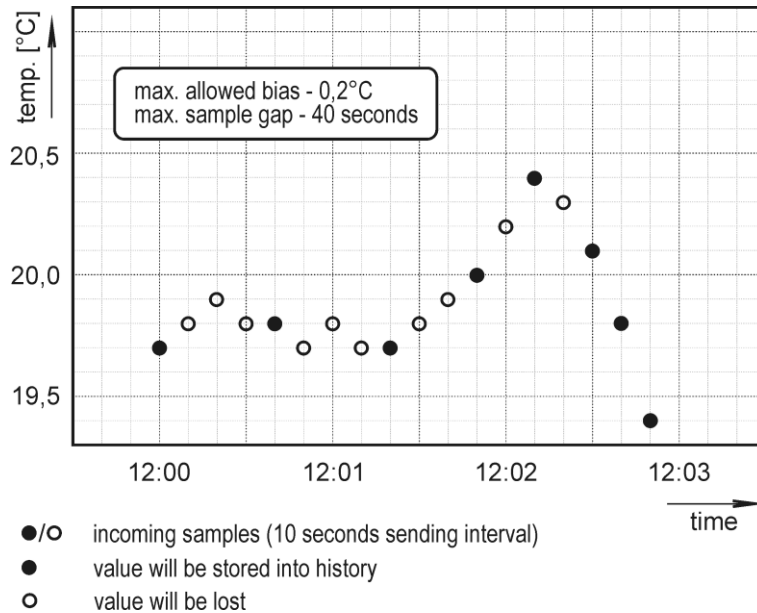
Additionally to compression: If whatever selected channel is channel of data acquisition system obtained by record download or channel of datalogger, then data of these channels will be left unchanged. The compression is only applicable for channels generated by online data collection via SOAP Server (thus all sensors' channels and online channels of data acquisition systems MS6 and MS55).

## 2.3.8 Online acquisition compression settings

You can find this function on the tab *Online acquisition compress setting*. This compression applies only to online acquisition from sensors and online data collection from acquisition systems. It will not influence data obtained by downloading record in any way. Data-loss compression should be better title, because it works in such a way that insignificant data samples are not stored into history.

It is very useful to use this compression because it reduce amount of data stored into the database. If the compression is enabled, then it is able to set minimal sending interval of SOAP messages in sensors without worrying that the database size will grow rapidly. Minimal sending interval (10 seconds) guarantee that there will be the most fresh values in *online data monitor* (3.4 Viewing online data)

There are compression settings where maximum allowed analog value bias and maximum sample gap must be set. If new incoming value is inside bias interval from the last stored sample and if the last stored sample is not older then maximum sample gap then this new sample will not be stored:



On the tab *Online acquisition compression settings* you can enable / disable compression and adjust its configuration for each quantity-unit combination separately.

Database Administration Utility 1.5.0.6 (DLDB API version: 4.0.4.0)

Database name: **storage\_system\_2**  
Version: **4.0**  
Notice:

Device/channels properties | SOAP Server | User Administration | Backup | Upgrading | Database log | Deleting/compressing data | **Online acquisition compress settings**

**Global switch for online acquisition compression:** ☒ **Compression enabled**

Store values of all channels when storage of one is needed: ☒ \* involve better look of table format view but worse compression  
\*\*\* doesn't apply for backward compression with "Deleting/compressing data" tool in this utility

Quantity (Unit)	Is compression enabled?	Analog bias	Max. gap	Is default?
Temperature (°C)	No	0.3000000	300 s	Yes
Temperature (°F)	No	0.3000000	300 s	Yes
Relative humidity (%)	No	1.0000000	300 s	Yes
Computed value - Absolute humidity (g/m <sup>3</sup> )	No	0.3000000	300 s	Yes
Computed value - Specific humidity (g/kg)	No	0.3000000	300 s	Yes
Computed value - Mixing proportion (g/kg)	No	0.3000000	300 s	Yes
Computed value - Specific enthalpy (kJ/kg)	No	0.3000000	300 s	Yes
Computed value - Dew point (°C)	No	0.3000000	300 s	Yes
Computed value - Dew point (°F)	No	0.3000000	300 s	Yes
Pressure (hPa)	No	0.3000000	300 s	Yes
Pressure (PSI)	No	0.0030000	300 s	Yes

☒ Use default

☐ Adjust it for selected Quantity (Unit):

Compress enabled: ☒

Max allowed bias:

Max sample gap in sec:

Apply changes to database

Exit

Another option there is *Store values of all channels when storage of one is needed*. If this



option is selected, then when any channel of the device needs to be stored according to the compression settings then all channels of the device are stored. It involves better look of table format view but a little worse compression level.

This feature is not applicable on backward compression with *Deleting/compressing data* tool on previous tab.

Example: *Store values of all channels when storage of one is needed* **disabled**:

Date and time	23		
	Temperature (°C)	Relative humidity (%)	Absolute humidity (g/m <sup>3</sup> )
08.12.2010 14:01:31		44,3	
08.12.2010 14:02:21	24,5		
08.12.2010 14:02:41			
08.12.2010 14:04:11			10,0
08.12.2010 14:06:31		44,4	
08.12.2010 14:07:21	24,6		
08.12.2010 14:07:41			
08.12.2010 14:09:11			10,1
08.12.2010 14:09:51		44,7	
08.12.2010 14:10:11		44,2	
08.12.2010 14:10:31		44,7	
08.12.2010 14:12:21	24,6		
08.12.2010 14:12:41			

Example: *Store values of all channels when storage of one is needed* **enabled**:

Date and time	08980017 - regulator		
	Temperature (°C)	Relative humidity (%)	Absolute humidity (g/m <sup>3</sup> )
10.12.2010 15:45:14	22,7	38,2	7,7
10.12.2010 15:47:45	22,7	38,7	7,8
10.12.2010 15:47:55	22,7	38,4	7,8
10.12.2010 15:48:15	22,7	38,9	7,9
10.12.2010 15:51:05	22,7	39,3	7,9
10.12.2010 15:53:15	22,6	39,6	8,0
10.12.2010 15:53:25	22,6	39,3	7,9
10.12.2010 15:53:45	22,6	39,6	8,0
10.12.2010 15:56:55	22,6	40,0	8,1
10.12.2010 16:01:55	22,6	40,1	8,1
10.12.2010 16:03:25	22,7	40,7	8,2
10.12.2010 16:03:36	22,7	41,8	8,5
10.12.2010 16:03:46	22,8	40,8	8,3

You can also set acquisition compression configuration for particular channel in the database. These settings you will find in channel settings, see: 2.3.3 Device / channels properties.

## 3 Using program Database Viewer



The program *Database Viewer* serves for viewing data from the database. You can view records from the database as tables and charts. You can print and export to PDF as tables and charts. Also, you can export table data to CSV (useful for processing in MS Excel).

Great deal of this database system is that you can view records of any channel and any device, which are stored in the database, all at once and compare it on one chart.

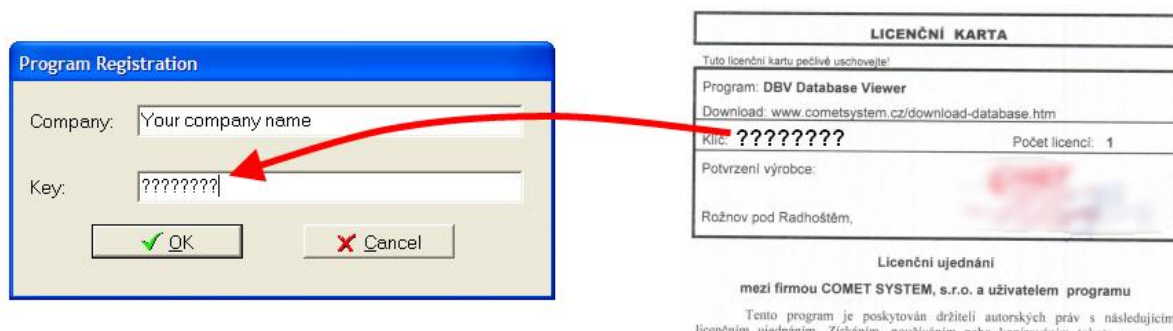
When using online data acquisition via SOAP Server (this applies to sensors and data acquisition systems MS6 and MS55) then *Database Viewer* offers online visualization of actual values and alarms.

### 3.1 Installation of Database Viewer

You can install *Database Viewer* on whatever computer in local network where is the computer with database server or directly on this computer. To install it, run *Database Viewer* installer on the computer where you want to use it.

Note: you must be logged as user with administrator rights (member of windows group *Administrators*).

When the program is first time executed, then it will need to enter licence key:



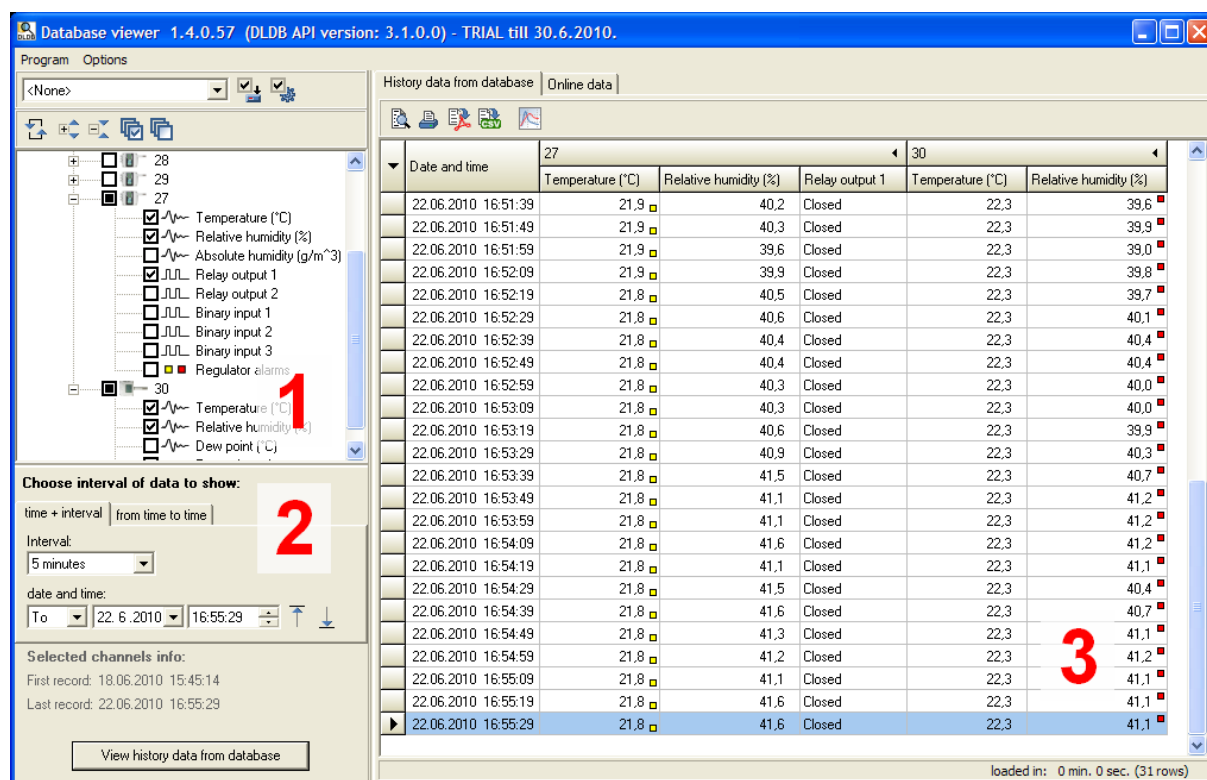
### 3.2 Database connection parameters settings

You have to set database connection parameters before using *Database Viewer*. This settings are located in program *Menu* → *Program* → *Connection Settings*. How to enter connection parameters is described in chapter 7.2 Entering database connection parameters. You can use the user with *read-only* access to the database.

### 3.3 Viewing history data from database

This chapter describes how to view history data from database. You have to do four simple steps to obtain requested history data view from the database:

- 1) Switch to the tab *History data from database*
- 2) Choose channels whose records you want to view
- 3) Choose interval – time boundaries, data will be displayed within them
- 4) Click on the button *View history data from database* – data will be displayed as table




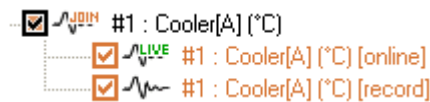
#### 3.3.1 How to choose channels whose data are to be viewed

*Tree view*, which is marked by number 1 on previous picture, provides it. The tree of devices and their channels, which are in the database, is displayed here after launching the viewer or clicking on the button *Refresh*. Any channel can be added into channels which are to be viewed by enabling the field next to the channel:








- ☒ analog channel
- ☒ binary channel
- ☒ alarm channel
- ☒ online analog and binary channel. Channels, whose data are collected online via SOAP server, are marked with sign “LIVE”. All channels of sensors and channels of data acquisition systems MS6 and MS55 whose data collection is online via

SOAP server will be marked this way.

-  the channel joined from online channel and record channel
  - this channel is generated automatically when there is simultaneously running online acquisition via SOAP server and filling from record (downloading from device memory and export downloaded data to the database via program for acquisition systems)
  - actually, this channel is online channel and displays data obtained via online acquisition. But in case, when online acquisition was interrupted (e.g. due to ethernet network crash), missing data are appended with data downloaded from record.
  - If it is needed to analyze channels from which joined channel originate from, then these channels are accessible at lower level:





Clicking on field at device level selects / unselects all channels of the device:

- ☐  datalogger device (eventually datalogger with printer or portable instrument COMMETER)
- ☐  acquisition system device
- ☐  sensor device – P85xx ethernet thermometers
- ☐  sensor device – Txxxx series (Temperature, Relative Humidity, Pressure)
- ☐  sensor device – Hxxxx series (Temperature, Relative Humidity, Pressure + Relay output and Binary input)
- ☐  sensor CO2 device – Txxxx series (Temperature, Relative Humidity, CO2)
- ☐  sensor CO2 device – Hxxxx series (Temperature, Relative Humidity, CO2 + Relay output)

### 3.3.2 Choosing of interval

This provides area for interval selection, which is marked by number 2 on the picture above. Use this to set time boundaries of data to be viewed. You have two options how to choose the interval:

- by entering one date-time and selecting length of the interval. In addition, it is possible to choose whether requested interval shall start from or end to the selected date.
- By entering two date-times as *from – to* boundaries

You can use additional buttons to set a date-time to the first  or the last  sample

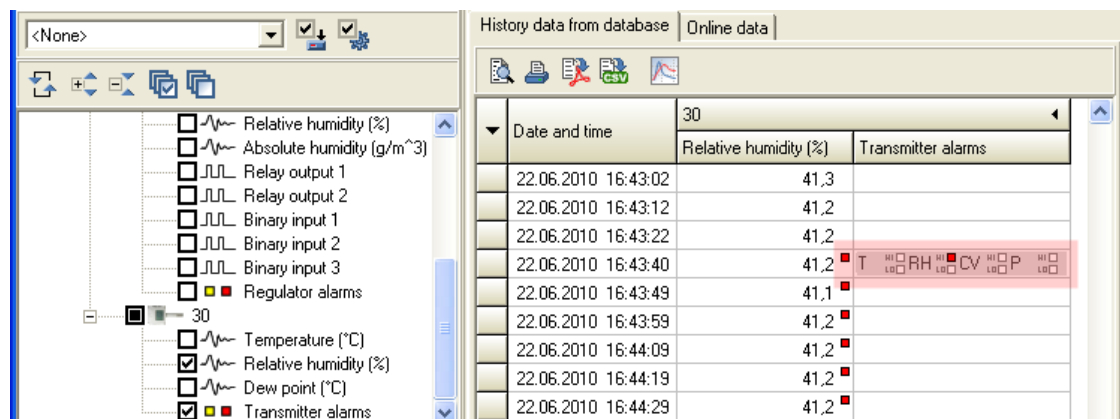
date-time of data from selected channels in *Tree view*.

Finally, clicking on the button *View history data from database* will launch the process of mining data from the database. This can take a short time or several minutes. It depends on the amount of data which was selected (too many channels, too wide interval). This also depends on hardware equipment. The program executes counting of selected data before execution of mining data from the database. There are preset amount boundaries, when the program warns and stops data mining process. This is useful in case of MySQL server, because MySQL server doesn't support interruption of running SQL statement.

### 3.3.3 Displayed data

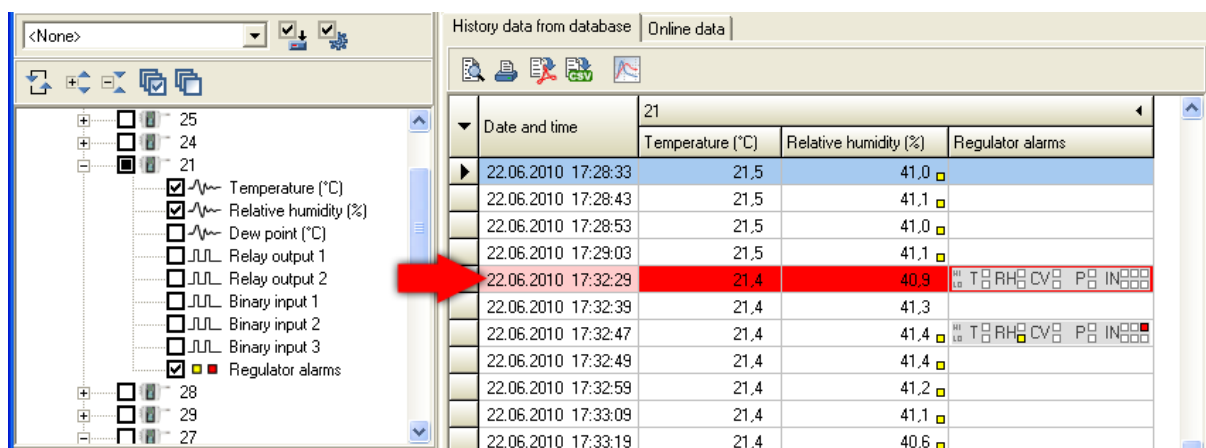
This is labeled by number 3 on the picture above. You can view data in table format here. Data are sorted chronologically from the oldest to the newest samples within selected interval. First column of every view displays date-time of samples. The other columns displays data of selected channels. There can be displayed red/yellow square next to the analog or binary value, which informs that high/low alarm was on.

If alarm channel of any device is displayed then you can see that there aren't its values in every sample. It is because there are displayed only changes of alarms. For example, you can see alarm channel of Hxxxx sensor on the picture below. There is only one sample in alarm channel when alarm of Temperature channel arose. Alarm channel shows states of all alarms in device at the sample date and time.



Date and time	Relative humidity (%)	Transmitter alarms
22.06.2010 16:43:02	41,3	
22.06.2010 16:43:12	41,2	
22.06.2010 16:43:22	41,2	
22.06.2010 16:43:40	41,2	T
22.06.2010 16:43:49	41,1	
22.06.2010 16:43:59	41,2	
22.06.2010 16:44:09	41,2	
22.06.2010 16:44:19	41,2	
22.06.2010 16:44:29	41,2	

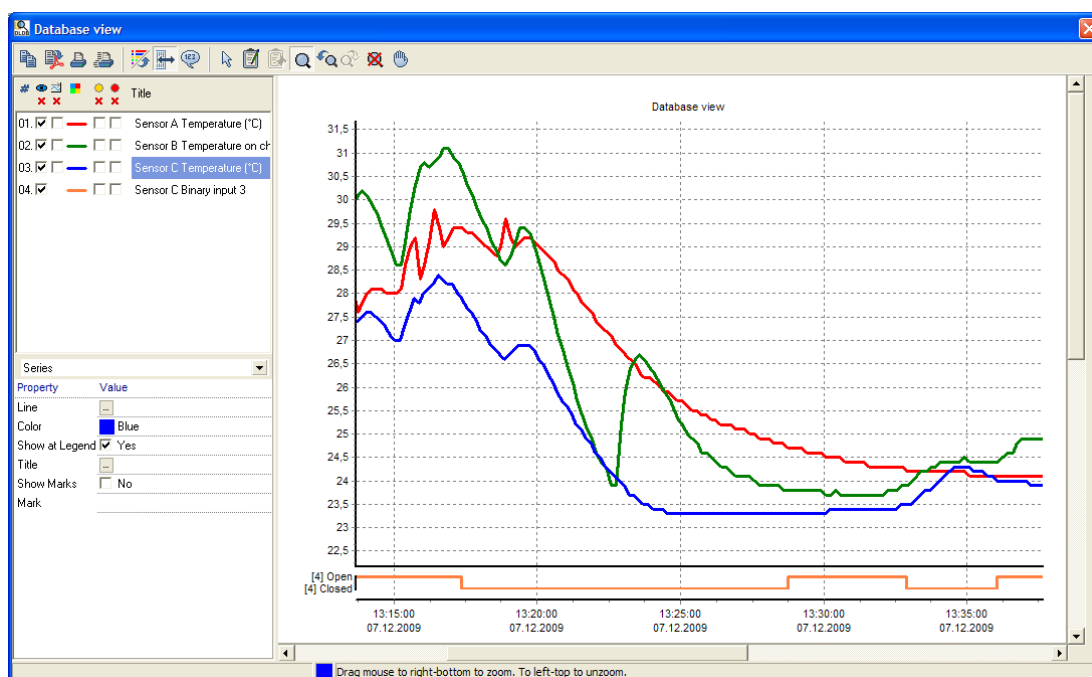
If monitoring is interrupted (i.e. sensor is disconnected from the network and then connected back again) then whole row of starting sample (first sent sample after sensor reconnection) is marked by red color. See example on the picture below.



To print with preview, print or export viewed data to the PDF, CSV use these buttons:



To switch from table view to chart view use button . You will be able to view, and also print, viewed data as graphical visualization in curves:



Click the button: to show statistic of currently viewed data. Information about record count, minimal, maximal and average value on each channel will be showed. The statistic is only elementary at this moment (in case of analog channels error values are not excluded from calculation and in case of binary channels only count of samples is calculated). Extending of this feature is planed for the future.

### 3.4 Viewing online data

*Database Viewer* has very useful tool *Online Data Monitor*. It allows you to watch

actually measured values and alarms' states from devices which sends its data online to SOAP server. These devices are P85xx, Txxxx and Hxxxx ethernet sensors and data acquisition systems MS6 and MS55.



Fresh	Device	Channel	Value	Alarm	Date of sample	Sample age	Warning message
✓	21	Temperature (°C)	21.1		22.06.2010 17:58:21	6s	
✓	21	Relative humidity (%)	40.2		22.06.2010 17:58:21	6s	Device alarm is on!
✓	21	Dew point (°C)	7.1		22.06.2010 17:58:21	6s	
✓	21	Relay output 1	Closed		22.06.2010 17:58:21	6s	
✓	21	Relay output 2	Open		22.06.2010 17:58:21	6s	
✓	21	Binary input 1	Open		22.06.2010 17:58:21	6s	
✓	21	Binary input 2	Open		22.06.2010 17:58:21	6s	
✓	21	Binary input 3	Open		22.06.2010 17:58:21	6s	Device alarm is on!
✓	28	Temperature (°C)	Error		22.06.2010 17:58:23	4s	Device alarm is on!
✓	28	Relay output 1	Open		22.06.2010 17:58:23	4s	
✓	28	Relay output 2	Open		22.06.2010 17:58:23	4s	

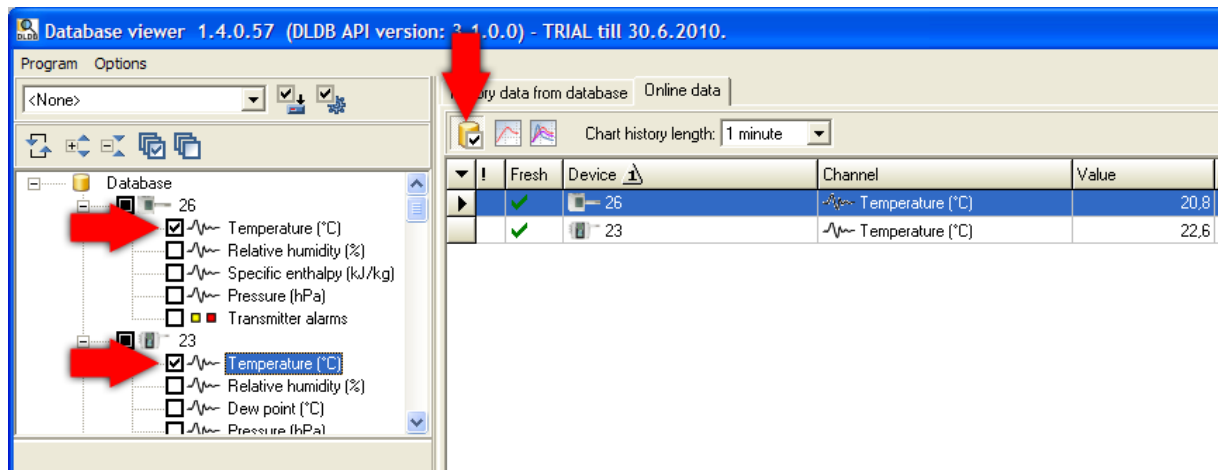
Click on the tab *Online data* to switch to this tool. If any *Online* device ever sent measured data to the database system, then there will be its last values visible. Every row in the table represents last value from one channel of the device. For example you can see values from channels of sensors named “21” and “28” on the picture above.

Note: When program is switched to *Online data*, then area for interval selection is hidden, because it has no use in this mode.



Columns of the *Online data* table have following meanings:

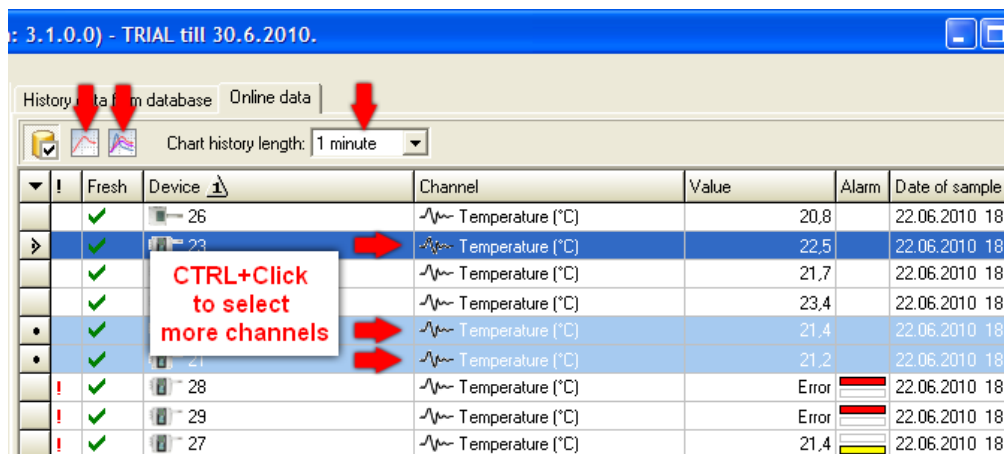
- Column “!” informs about any warning. Type of the warning is written in column *Warning message*. For example it can be that the data aren't fresh (it means that it's too long from the time when the device lastly send values), or that the channel is in alarm state.
- Column *Fresh* displays green tick if the value is fresh. Otherwise whole row is grayed.
- Columns *Device* and *Channels* display device serial number or renamed name (devices can be renamed, see 2.3.3 Device / channels properties) and channel type.
- Column *Value* displays lastly measured analog value or state of binary channel.
- Column *Alarms* informs about alarm on the channel. If red rectangle higher in the cell is displayed then channel is in high alarm state. If yellow rectangle lower in the cell is displayed then channel is in low alarm state.
- Column *Date of sample* informs about time and date when the sample was measured. Additionally next column *Sample age* shows elapsed time since date of sample to last online table refresh. Note: Online table refreshes every 5 seconds.

If too many rows are in the table then you can use filtering. Select channels which you want to watch from *Tree view* and switch filter button from  to . For example, there is online table filtered on temperature channels of both devices on the picture bellow.





You can also see online chart of selected channels. This chart will be changing online as new values will income to the system. First choose *chart history length*, then click *Online chart* button:

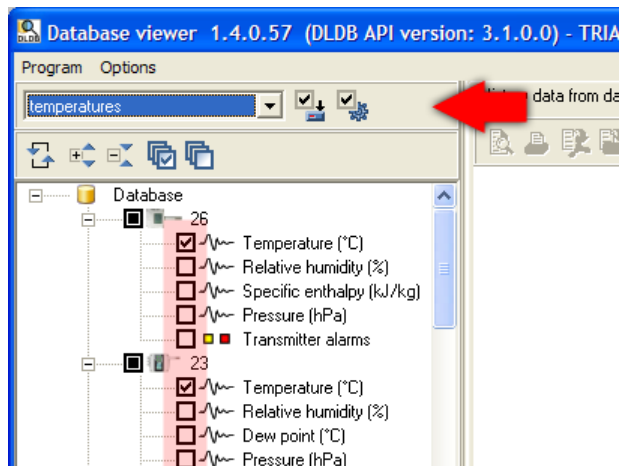
- Use  to see online chart of selected channel / channels (to select more channels use CTRL + Click on the row in grid)
- Use  to see online chart for all channels in the grid.



### 3.5 Presets of selected channels

This tool allows you to save current selection of channels and reuse it later. Click on the button  to save current selection. You will be asked for entering selection name. You're also able to export/import presets to/from file. This can be useful when you want to move presets to another *Database Viewer* on another computer. Use button  to open export/import manager.





### 3.6 Sorting of device in device-channels tree

You can choose between two options:

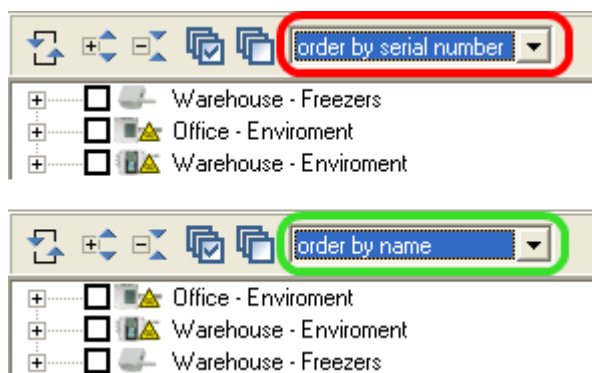
#### Sort by serial number

Devices will always be sorted by serial number in this case and also in the case when device name was renamed via program Database Administration Utility and serial number is not showing. This is default and only one sorting in DB API versions older than 6.0.

#### Sort by name

The sorting is always by name in this case.

Sorting by name can be suitably used for organizing devices into groups. When devices are renamed with added prefixes identifying the group (e.g. sensor location) then devices which belongs to the same group will be sorted side by side. Illustration:



Note: To rename device use program Database Administration Utility, see chapter 2.3.3 Device / channels properties.

### 3.7 Showing information about online device

Information about online device will be showed by clicking with right button on the

device in devices-channels tree. These information will be showed:

- From what IP address was lastly sent SOAP message = current IP address of the device.
  - o Attention, this is valid when devices and SOAP Server are located in the same network only. Otherwise mentioned IP address will point on gateway to outer network only.
- Click the button *Go to WEB* to show device web pages in the browser.
  - o In this case it must also be valid that viewer is executed on the computer located in the same network as SOAP Server and devices.
- Sample rate – interval of sending measured data (configured in the device)
- Max. freshness – measured value is considered to be fresh (actual) if the time from last received sample will not exceed specified count of seconds. Max. freshness is 2.5 multiple of sample rate. You can change this value for every device in program Database Administration Utility (see chapter 2.3.3 Device / channels properties).

### 3.8 Acoustic and visual alerting of alarm states

Database Viewer can inform about occurred alarm state by playing sound and “blinking”. This alerting applies for online acquisition only. Alerting will be on if at least one channel in the table of online values is in alarm state, if instead of measured value is ERROR showd (this can happened for example when the probe is pulled out from sensor) or in the case when measured values of any device are not current (online acquisition was interrupted, e.g.: device was disconnected from the network).

You can choose between two alerting behavior:

#### **Alerting is on until the user confirms current state with button “Confirm”**

After the user press the button “Confirm” the alerting is off and stay off until any new alarm will occur for example on some another channel or until some of confirmed alarms is of and on again.

#### **Alerting is on throughout till any alarm occurs**

The button “Confirm” is not visible in this case. This behavior can be undesirable when alarm occurs on any channel all the time, user knows about this alarm and is not cardinal.

To know more about how to enable and configure acoustic and visual alerting see chapter 3.9.2 Acoustic and visual alerting settings.

#### 3.8.1 Problem with long-term disconnected online devices

In case when some device was sending its data into database but the device is

disconnected now, then last measured data are visible in the table of online values and are marked as not fresh (inactive – gray colored). This situation leads to permanent activation of alarming and it can be bothering, because measured values from this device are not interesting for the user no longer.

You can solve this by disabling the device for viewer: Run Database Administration Utility, on the tab Device/channels properties select demanded device and disable the choice *Enabled for viewer*.

If you are sure you will not need data from this device anytime in the future, then you can delete whole device and its data from the database: Database Administration Utility, the tab *Deleting and compressing data*.

## 3.9 Viewer settings

You'll find it in *Menu → Options → Viewer settings*.

### 3.9.1 Time shift settings

Tab *Online Acquisition*, group *Time shift settings*.

This setting applies only to data from devices which haven't got time generator (acquisition from these devices is online and the SOAP service assigns the time to each incoming sample). These devices are Txxxx, Hxxxx, P85xx sensors and online acquisition from acquisition systems MS6 and MS55.

The program automatically shifts the time to current locale but you can adjust it to manual shift towards UTC time.

### 3.9.2 Acoustic and visual alerting settings

Tab *Online acquisition*, group *Alerting settings*.

Alerting is activated by enabling at least one of choices *Acoustic alerting* and *Visual alerting*.

After enabling choice *Acoustic alerting* you must select either system sound (sounds from operating system) or choose sound file \*.wav, which is about to be played during alerting.

After enabling choice *Visual alerting* red rectangle with text „>>>Alarm <<<” will be showed in upper part of viewer during alerting. Visual alerting can be high lighten by choice *Red panel is blinking*. To prevent that user will not notice that alarm occurred due to minimized viewer, enable the choice *Application icon in tray is blinking*.

Last choice is switching alerting behavior. Explanation of alerting behavior you can find in chapter 3.8 Acoustic and visual alerting of alarm states.

### **3.9.3 Print settings**

Tab *Others*, group *Print settings*.

After enabling choice *Ink saving print of data in table* it will be used less highlights on the background.

### **3.9.4 Visibility of extra columns at online data**

Tab *Others*, group *Visibility of extra columns at online data*.

You can enable / disable visibility of some columns in table of online values.

## 4 Using database system with dataloggers

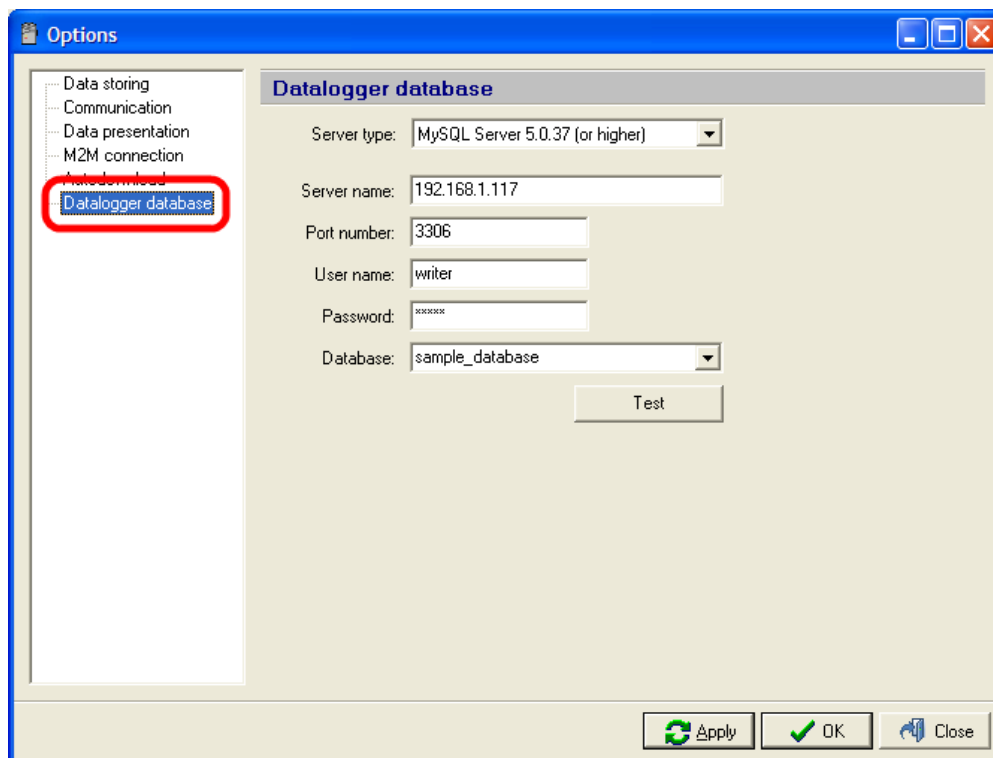


Database system supports dataloggers of series: Rxxxx, Sxxxx, Lxxxx, dataloggers with printer: T-PRINT, T-PRINT-2, G0221, G0841 and G0241 and portable instruments COMETER of series Dxxxx.

The program for dataloggers provides both: data insertion to the database and viewing the data. The first what is needed is to set database connection parameters.

### 4.1 Database connection parameters settings in program for dataloggers

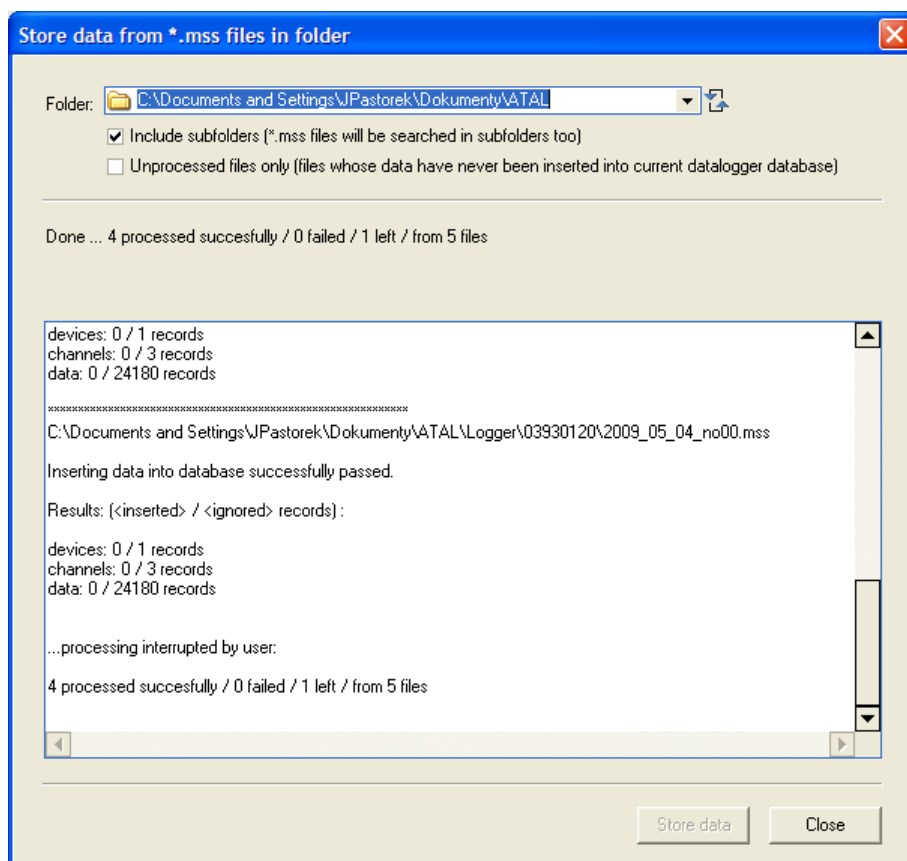
This settings is located in program options *Menu*→*File*→*Options* on page *Database system*. How to enter parameters is explained in chapter 7.2 Entering database connection parameters.



## 4.2 Storing data from dataloggers into database

You can store currently opened data in the program for dataloggers into the database by clicking on the command in menu: *Menu* → *File* → *Add current file to database*. There are “opened data” in the program when they are downloaded from the device or after opening them from \*.mss file.

Second option is mass storing of data into the database from \*.mss files in directory. This tool is located in: *Menu* → *File* → *Fill database from directory*.



Drop down choosing dialog *Folder* and choose the directory where \*.mss files, from which you want to store data into the database, are placed. There is info window under choosing parameters where you can see how many files has program found.

You can also enable the choice *Include subfolders* - then \*.mss files will be searched in subdirectories of selected directory too.

If you enable the choice *Unprocessed files only* then only files, which weren't processed yet, will be included into the storing process. When any file is stored into the database then its filename with full path is stored into the database as the source. Therefore the system is able to detect if data from the file were stored into the database or not. It is not needed to enable this choice – system is able to detect duplicate records and forbids insertion of duplicate records into the database. It means that if any record exists in the database (record is identified by device, channel and time) then no new record with the same identification will be inserted.

By clicking on the button *Store data* storing process is executed. Above the info window you can see information about how many files are already processed, how many files processing failed and how many files left. There are detailed information about processing of one file in the info window.

Storing process can be interrupted by clicking on the button *Interrupt*. After clicking on this button processing of current file will be finished and then storing process will stop.

### **4.3 Viewing data from database in program for dataloggers**

*Database Viewer* is located in *Menu → Show → Database viewer*. More info how to use the *Database Viewer* is explained in chapter 3.3 Viewing history data from database.

## 5 Using database system with data acquisition systems



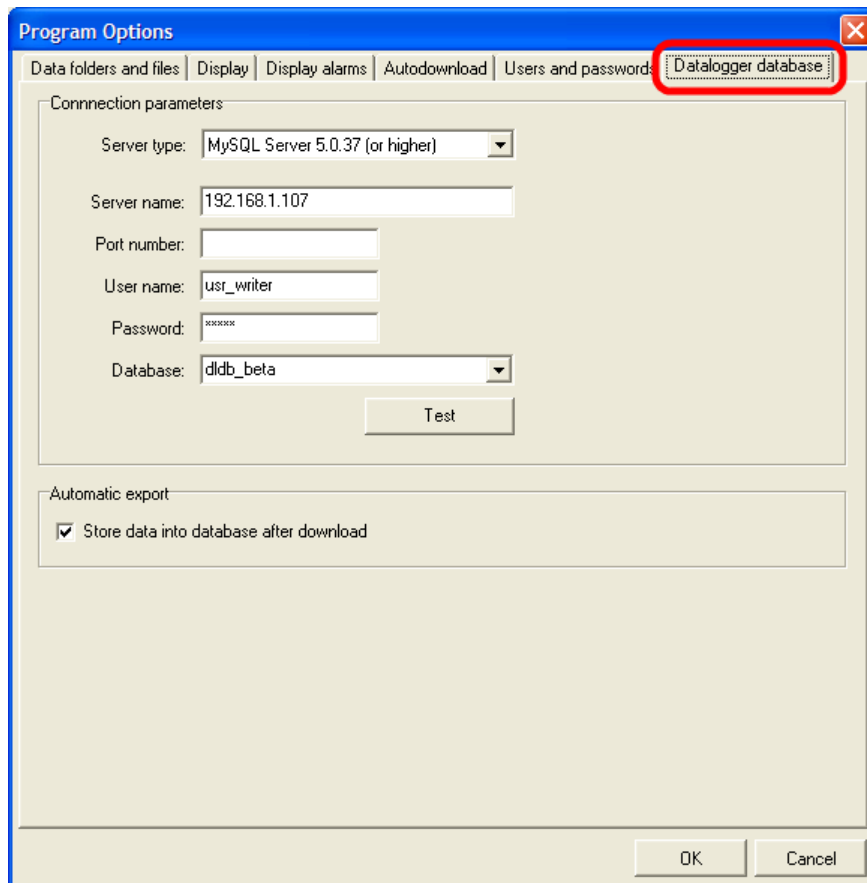
Working with database system in the program for data acquisition system is similar as in the program for dataloggers. Program also provides both functions: data insertion and data viewing. Also, the first thing to do is to set database connection parameters.


Newly, database system supports online data collection via SOAP Server for data acquisition systems MS6 and MS55. It is advisable for these devices to have running simultaneously online data acquisition and downloading from device record via autodownload function in the program for data acquisition systems. Hence it is guaranteed that it is possible to watch currently measured values via database viewer and in addition to it data will be backwardly loaded to the database from record in device in case of online acquisition drop out (online acquisition can fail for example due to ethernet network failure).

### 5.1 Database connection parameters settings in program for data acquisition systems

These settings are located in program options *Menu → File → Options* on page *Database system*. How to enter parameters is explained in chapter 7.2 Entering database connection parameters.





There is additional settings *Automatic export* located under the *Connection parameters* settings. If the *Automatic export* is enabled then downloaded data will be stored into the database after downloading them from the device (.

## 5.2 Storing data from data acquisition systems into database

Storing data into the database is absolutely the same as in the program for dataloggers with only one exception: data files of acquisition systems has this format: \*.msx. To understand this topic please read chapter 4.2 Storing data from dataloggers into database.

When data acquisition systems MS6 and MS55 are used then it is possible to launch online data acquisition via SOAP Server. To launch online acquisition is needed:

- 1) Prepare SOAP Server. SOAP Server servers for collecting measured data which data acquisition system sends online (as frequently as big time interval was choosed) via SOAP protocol. Because the preparation of SOAP Server is topic which is common for online acquisition from data acquisition systems and also for sensors, then you can read about it in appendixes, chapter: 7.4 Preparation of SOAP Server (data entry for online data acquisition from sensors and data acquisition systems MS6 and MS55)
- 2) Configure SOAP settings in data acquisition system device (the device needs to have information about SOAP server location where the device shall send SOAP

messages. More about it you can read in following chapter 5.2.1 Configuration of SOAP settings in data acquisition system.

Database system supports online data acquisition from MS6 and MS55 devices with minimal firmware version of ethernet interface **6-5-1-1.1985**. It is possible to find firmware version on device web pages:

The screenshot shows a web browser window with the address bar displaying 'Web 192.168.1.25/status.html'. The page title is 'MS55Preview' with a date '05.10.2011' and a serial number 's/n: 11550001'. On the left, a 'Main menu' contains links for 'Channels', 'System status' (highlighted with a red circle), and 'About'. The main content area is titled 'System status' and contains two sections: 'Global' and 'Firmware version'. The 'Global' section includes a table with the following data:

Serial number	11550001
Device type	MSNew
Relay board	not installed
RS485 input	not installed

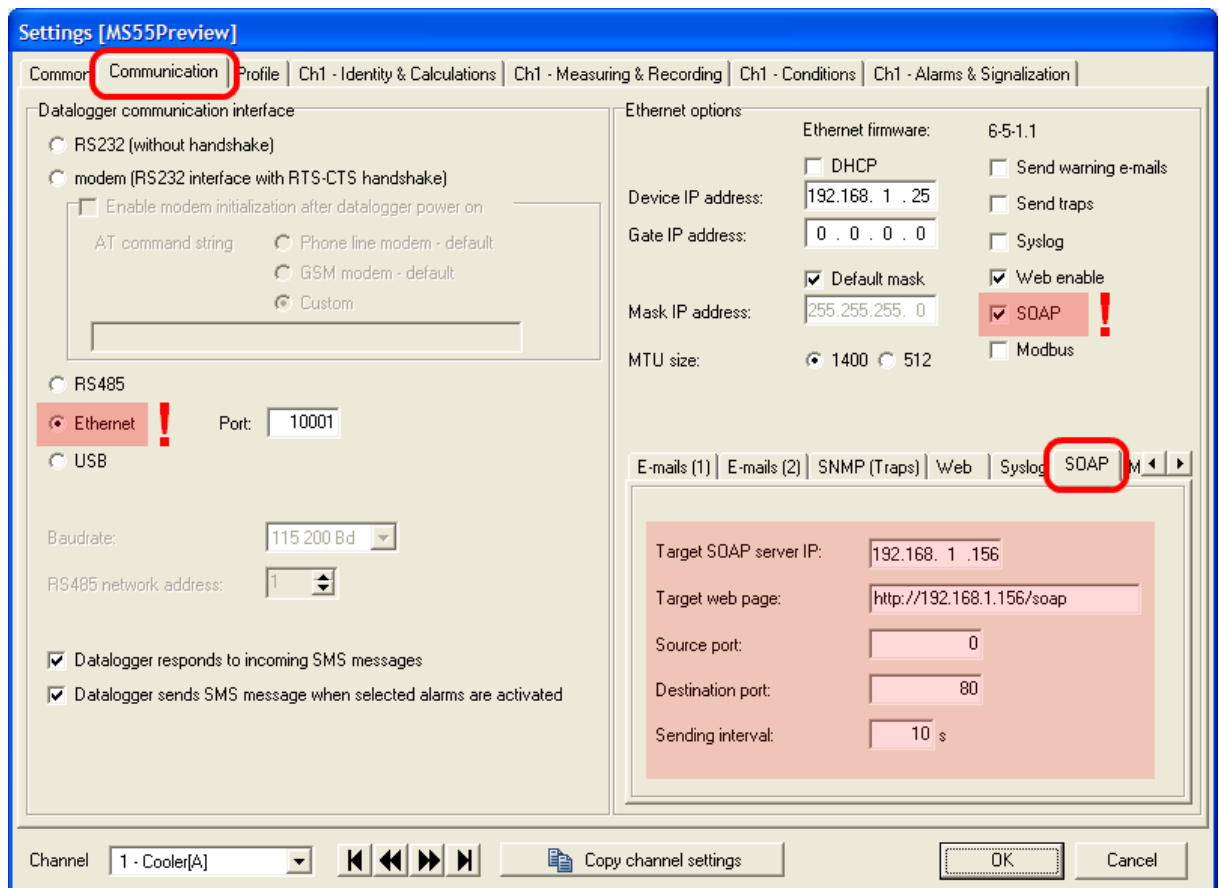
The 'Firmware version' section includes a table with the following data:

Measuring engine	5.5.03
Ethernet version	6-5-1-1.1985
Web version	1.6

The 'Ethernet version' value '6-5-1-1.1985' is highlighted with a red circle.

### 5.2.1 Configuration of SOAP settings in data acquisition system

Enter the configuration of demanded device in program from data acquisition systems:  
*Menu → Configuration → Datalogger settings* and switch to the tab *Communication*.



Note in advance: online data acquisition is based on SOAP protocol, which is running on ethernet network. Hence communication interface of the device must be switch to *Ethernet* mode and device must be connected to ethernet network where SOAP Server is accessible of course.

Enable the choice *SOAP* on the right side of the window. Edit fields for SOAP configuration will be enabled and you can find them lower under the tab *SOAP*.

To the field *Target SOAP server IP* enter its IP address. This address you can find out with help of SOAP Server diagnostic (*Database Administration Utility* → *tab SOAP Server* → *button Diagnostic*).

As *Target web page* enter the text composed of SOAP server IP address and string“/soap”:

`http://<IP_address>/soap`

As the source port enter 0 and as the destination port enter *listening TCP port* of the SOAP server (if you went in accordance with this manual then it is 80).


Finally, choose *sending interval*. You can enter minimally 10 seconds, but we alert you, that entering short interval will lead to rapid growing of the database if compression of online acquisition is not enabled (see chapter 2.3.8 Online acquisition compression settings).

When compression is not enabled we recommend to use short intervals (10 s) only when tuning data acquisition. But when you are sure that acquisition works well, reconfigure all

devices settings and set *sending interval* minimally on 60 seconds. But recommended are values longer than 300 seconds (5 minutes).

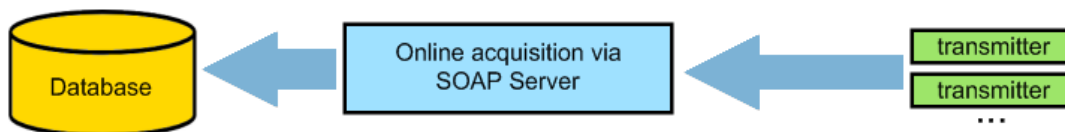
This is everything you have to set up so click the button *OK* to save changes to the device. From this moment the device will start sending SOAP messages to SOAP service. If you entered short interval, e.g. 10 seconds, then it can take up to half of minute until the first value will be sent.

### 5.3 Viewing data from database in program for acquisition systems

*Database Viewer* is located in *Menu → Show → Database viewer*. You can also use icon  in toolbar. More info how to use the *Database Viewer* is explained in chapter 3.3 Viewing history data from database.

## 6 Using database system with sensors

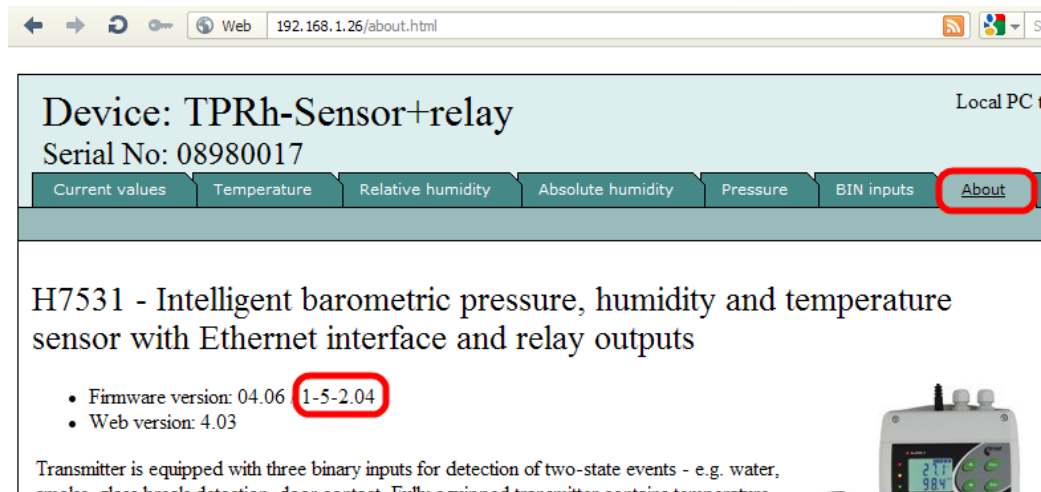
Database system also supports sensors with ethernet output. The advantage is that data acquisition from sensors is online and automatic. This means that you don't need to download data from the device manually like in case of dataloggers. Ethernet sensors periodically send measured values to the database via SOAP protocol. Hence, there have to be SOAP Server running, which captures messages sent from sensors and stores them to the database.



Database system supports ethernet sensors of series Tx5xx, Hx5xx a P85xx with this minimal firmware version of ethernet interface:

- Tx5xx, Hx5xx: **1-5-2.02**
- Tx5xx-CO2, Hx5xx-CO2: **1-5-3.0**
- P85xx, P86xx: **4-5-1.20**

It is possible to find firmware version on sensor web pages:

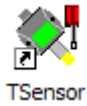


### 6.1 Preparing SOAP Server (data entry for online data acquisition)

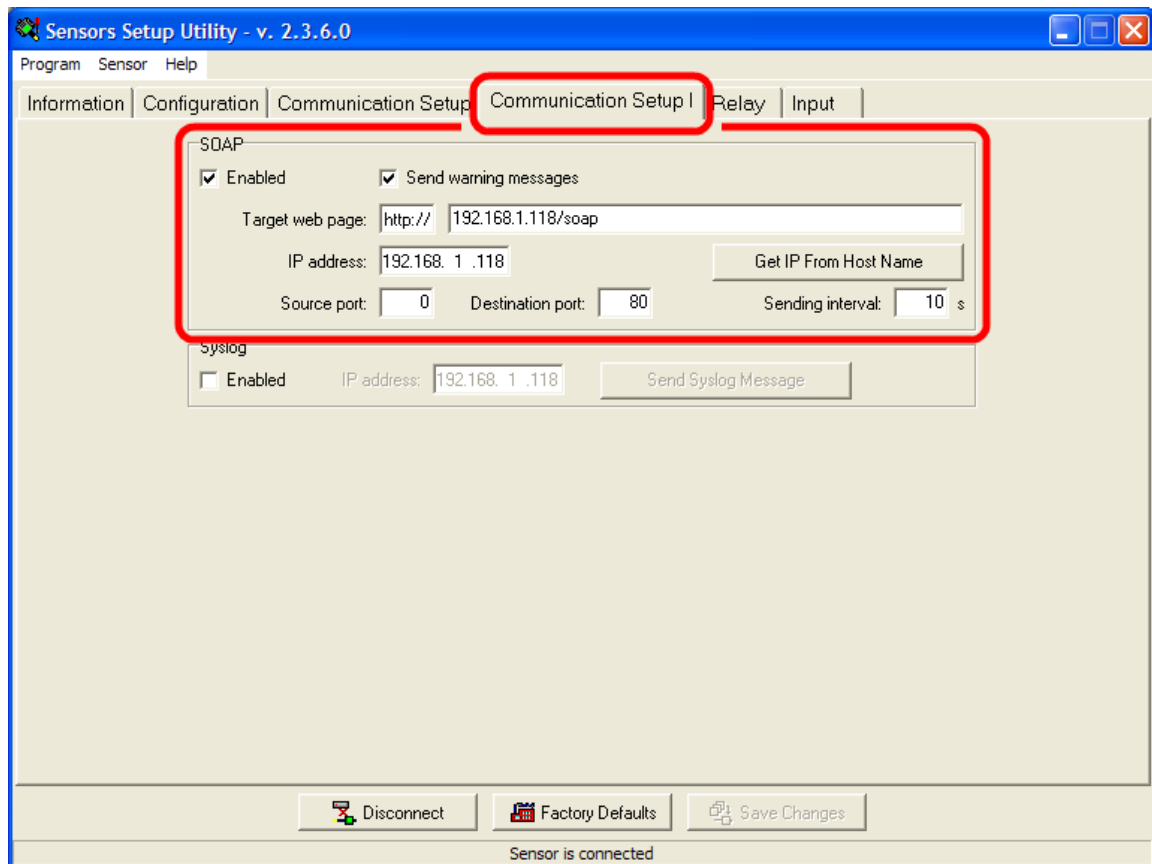
Because the preparation of SOAP Server is topic which is common for online acquisition from data acquisition systems and also for sensors, then you can read about it in appendixes, chapter: 7.4 Preparation of SOAP Server (data entry for online data acquisition from sensors and data acquisition systems MS6 and MS55).

## 6.2 Sensor settings

Now, when the SOAP server is ready, the last step to do is to set sensors to send measured values to the SOAP service. You have to use configuration program for sensors – *Tsensor*.



Establish the connection with the ethernet sensor and choose the tab *Communication Setup I*. There is SOAP settings of the sensor:



As *Target web page* enter the text composed of SOAP server IP address and string"/soap":

<http://<IP address>/soap> (do not enter string "http://", its already predefined)

Then click the button *Get IP from host name* – it will automatically fill the field *IP address*. As the source port enter 0 and as the destination port enter *listening TCP port* of the SOAP server (if you went in accordance with this manual then it is 80).

Finally, choose *sending interval*. You can enter minimally 10 seconds, but we alert you, that entering short interval will lead to rapid growing of the database. We recommend you to use short intervals (10 s) only when tuning data acquisition. But when you are sure that acquisition works well, reconfigure all devices settings and set *sending interval* minimally on

60 seconds. But recommended are values longer than 300 seconds (5 minutes).

The good help, how to set SOAP settings, is on the SOAP server diagnostic page. There is *Example of SOAP settings* with real values (IP and port of the SOAP server) displayed:

#### Examples of SOAP settings configurable in device via TSensor program

Example for network interface with IP 192.168.1.117:

Target web page:	<input type="text" value="http://"/>	<input type="text" value="192.168.1.117/soap"/>
IP address:	<input type="text" value="192.168.1.117"/>	
Source port:	<input type="text" value="0"/>	Destination port: <input type="text" value="80"/>
Sending interval:		<input type="text" value="60"/> s

You should enter all parameters as in this example. Only setting of *Sending interval* is up to you

This is everything you have to set up in the sensor. Click the button *Save changes*. From this moment the sensor will start sending SOAP messages to SOAP service. If you entered short interval, e.g. 10 seconds, then it can take up to half of minute until the first value will be sent.

## 6.3 Viewing data from database

For viewing the database use standalone program *Database Viewer*. All information about this program are in chapter 3 Using program Database Viewer.

# 7 Appendixes

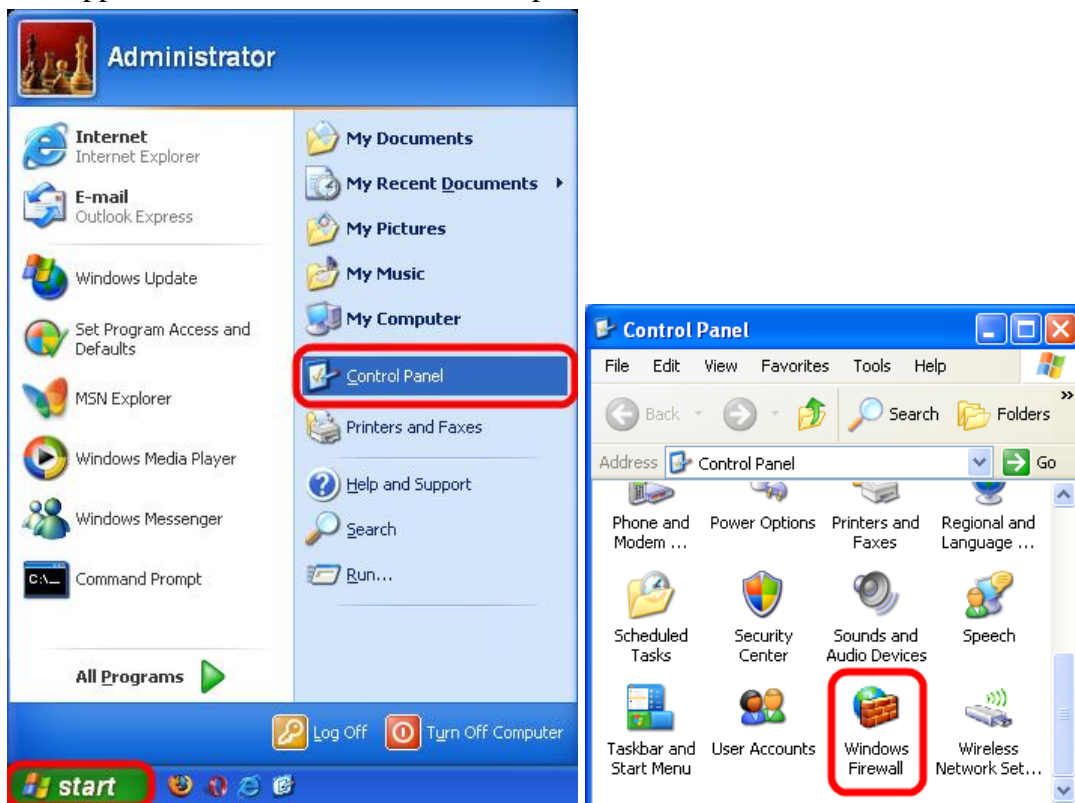
## 7.1 Allowing TCP port on windows firewall

Following subchapters guides you how to allow TCP port on Windows firewall. First chapter 7.1.1 explains it for Windows XP. Following chapter explains it 7.1.2 for Windows 7 (or Vista).

**Attention:** Not only Windows firewall can be running on the computer. Also, for example some antivirus programs includes own firewalls. If this is the case then allowing port on this firewall or disabling whole firewall is needed too.

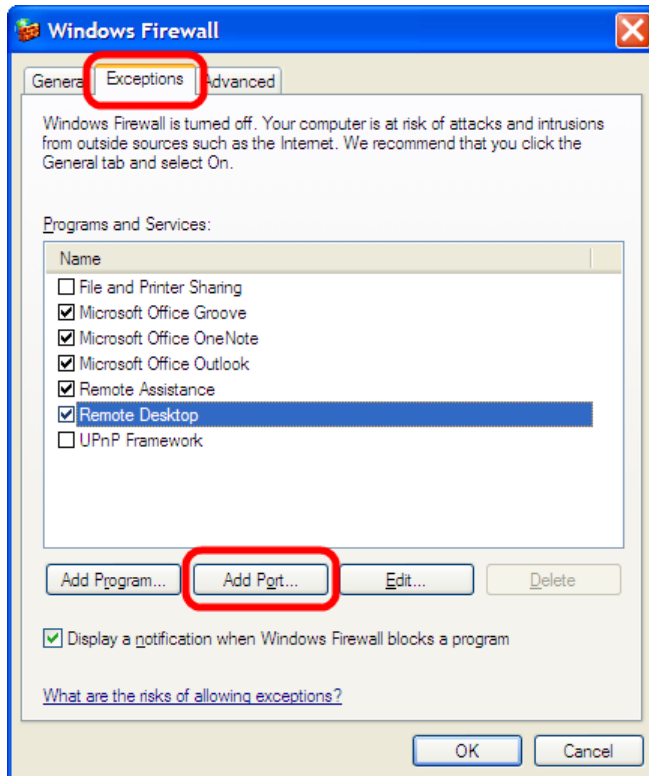
### 7.1.1 Allowing TCP port on Windows XP firewall

- 1) Run applet Windows firewall in Control panel:





- 2) Switch to the page *Exceptions* and click on the button *Add port*.

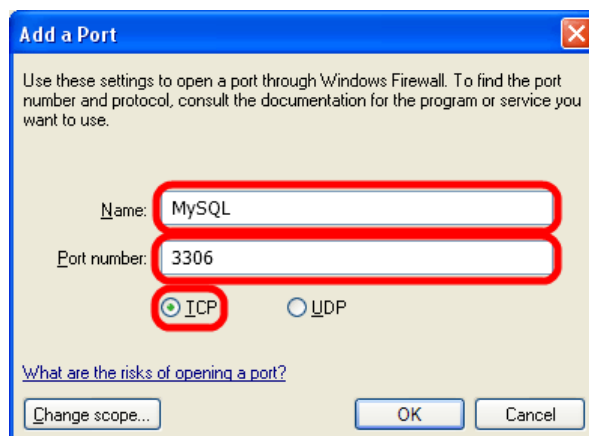


- 3) Enter exception name (it's up to you what name you think up) into the field *Name*. Then enter the port number which is to be allowed into the field *Port number*. Finally, left the choice *TCP* selected.

Examples of standard port which you may need to allow:

Name: **MySQL**      Port number: **3306**

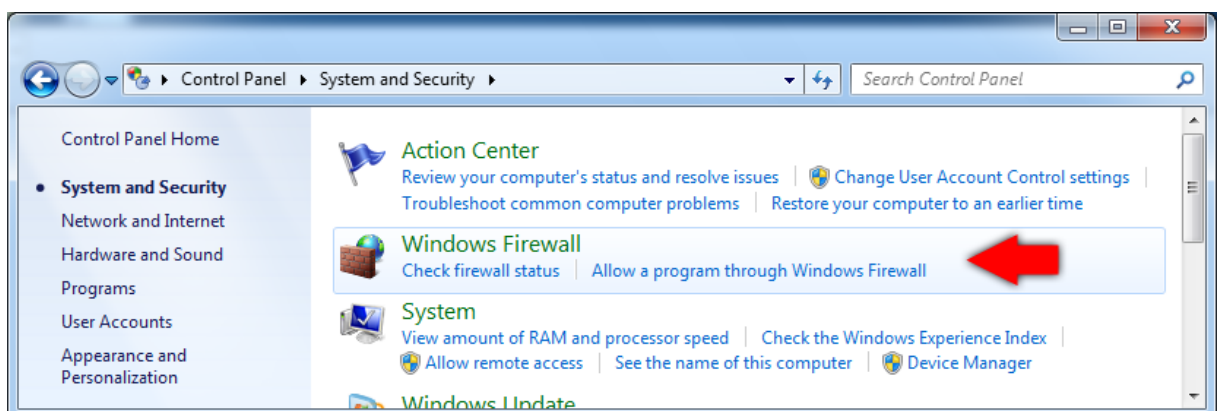
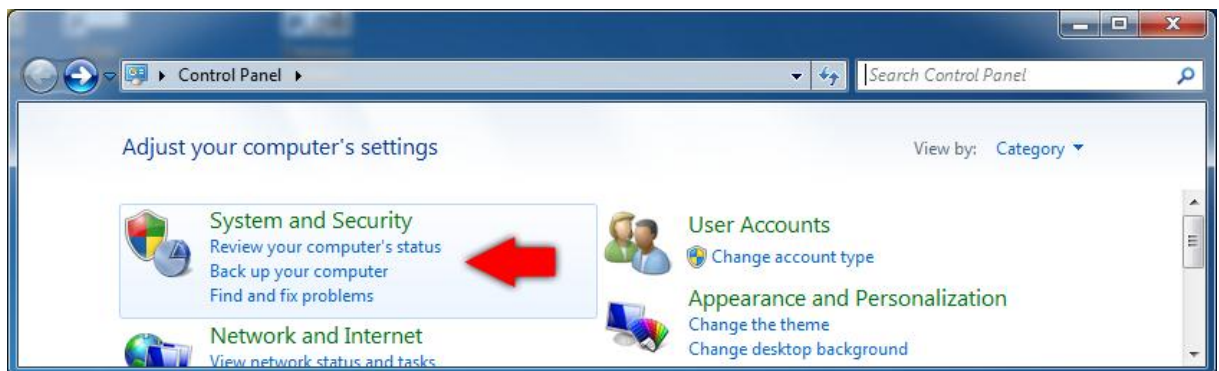
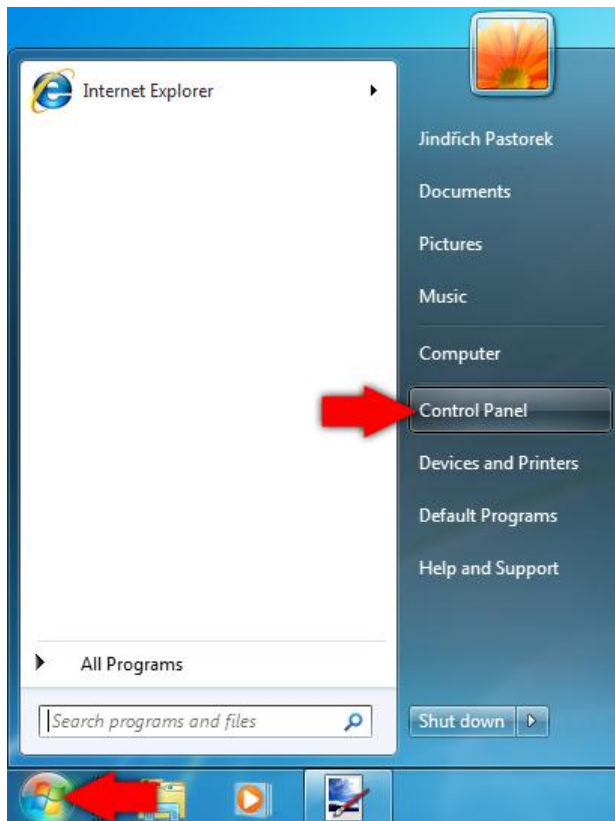
Name: **HTTP**      Port number: **80**



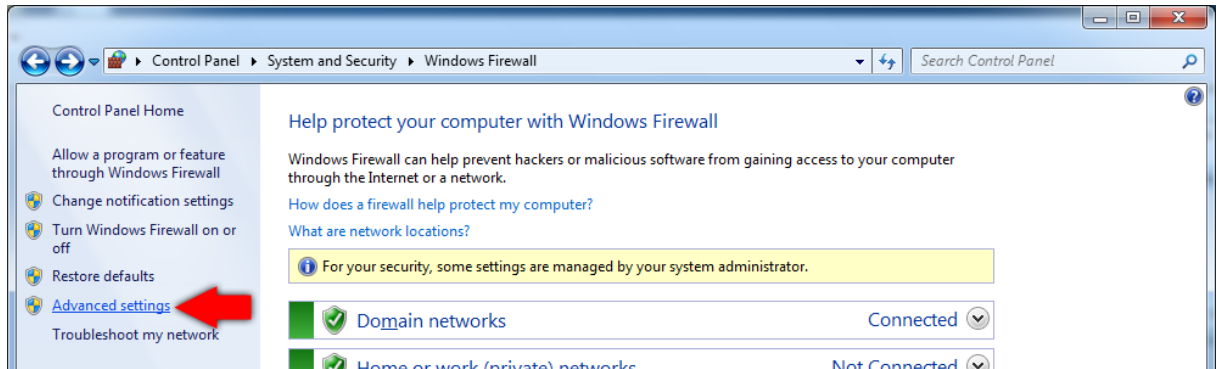
- 4) Confirm by the button *OK* and exit the applet *Windows firewall* by the button *OK* again.

## 7.1.2 Allowing TCP port on Windows 7 (or Vista) firewall

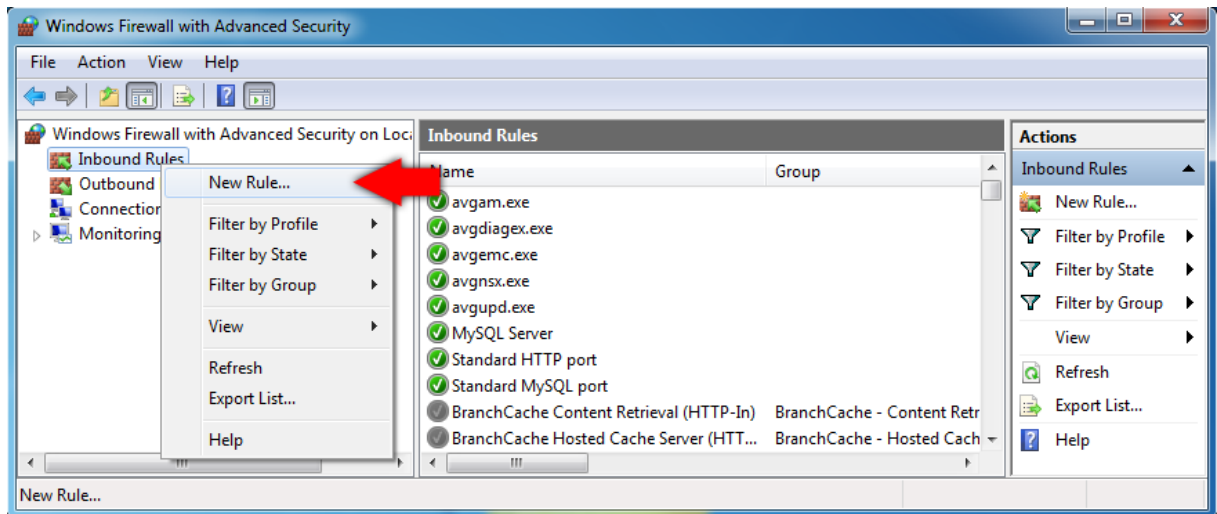
- 1) Run applet Windows Firewall in Control Panel:



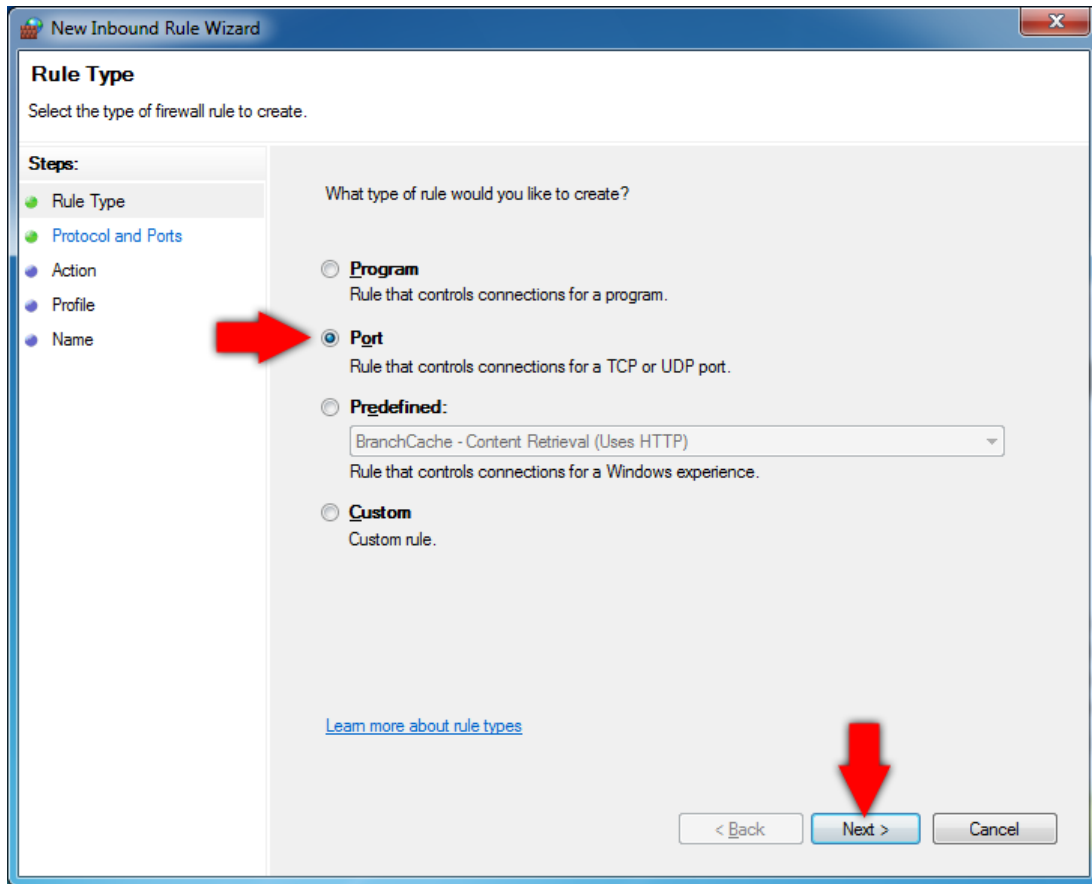
2) Choose advanced settings in Windows Firewall:



3) Left-click on *Inbound Rules* and choose *New Rule...*



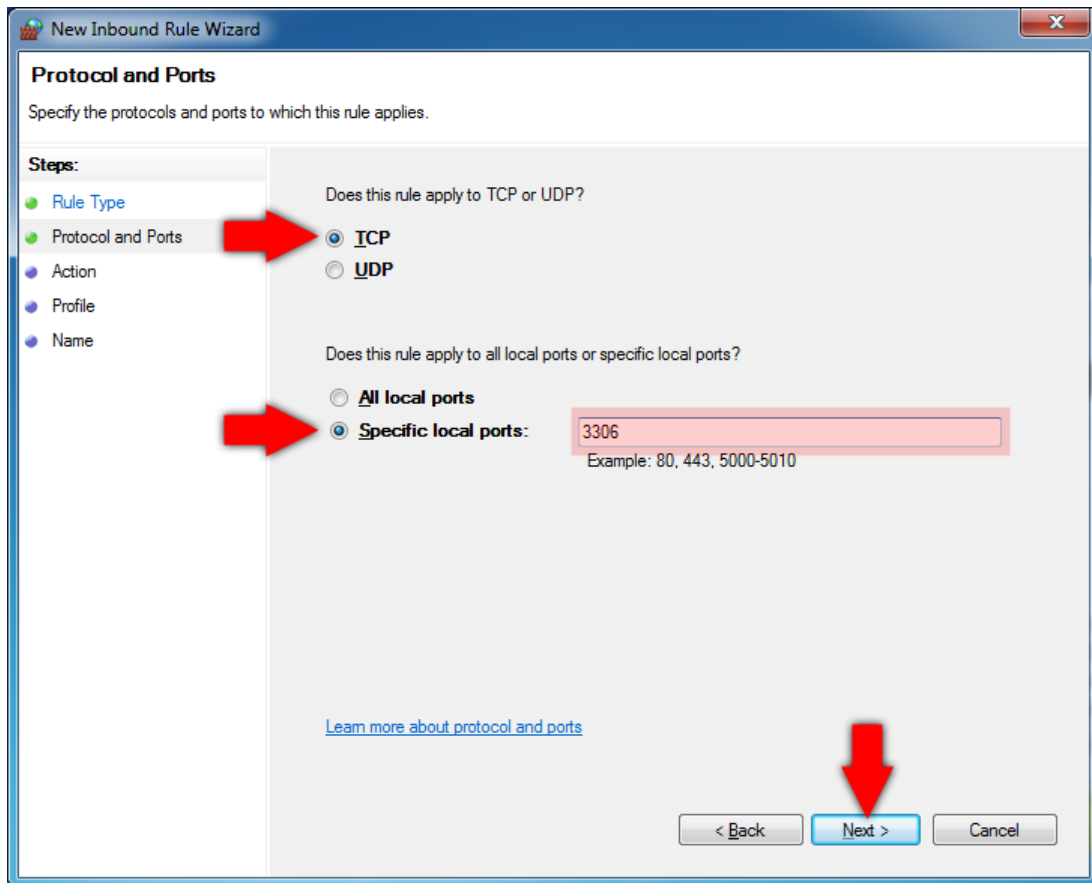
- 4) Choose *Port* as the type of rule on the first page of *New Inbound Rule Wizard*. Then click the button *Next*.



- 5) Left the choice *TCP* selected. Enter the port number which is to be allowed into the field *Specific local ports*. Examples of standard port which you may need to allow:

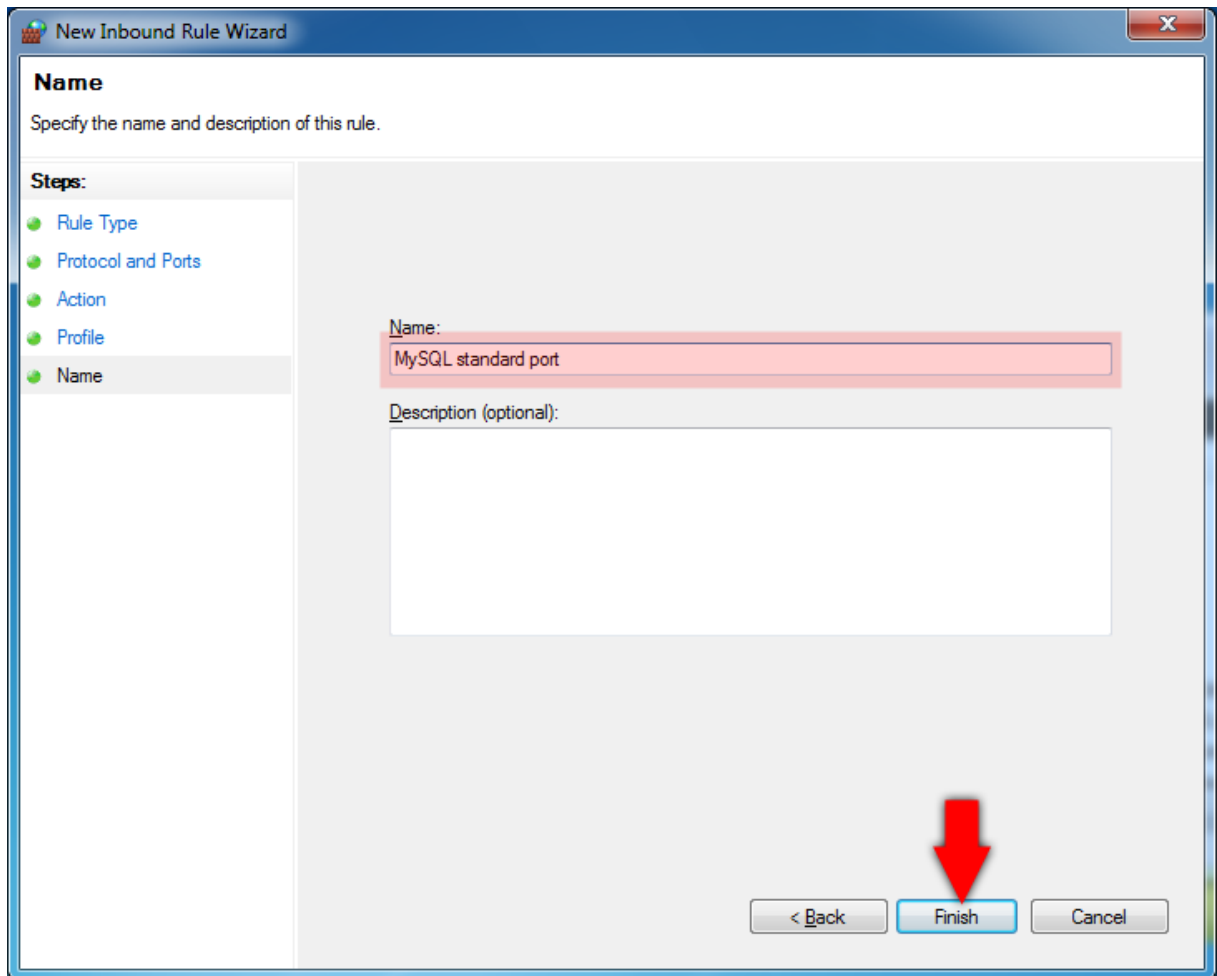
Name: **MySQL**      Port number: **3306**

Name: **HTTP**      Port number: **80**



- 6) Skip following two pages without changes with the button *Next* until you get to the page *Name*. Enter exception name (it's up to you what name you think up) into the field *Name*.

Finally click the button *Finish*.



## 7.2 Entering database connection parameters

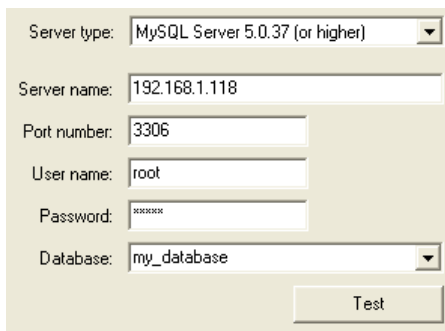
Every program which works with database system needs to have entered database connection parameters to establish connection with the database server. Programs have the same interface for entering these parameters. How to use it is explained once at this chapter for all programs.

The first thing is to choose which *Server type* to use. You can choose between MySQL Server and Microsoft SQL Server.

Continue reading demanded section:

- - 7.2.1 Entering connection parameters for MySQL Server
- - 7.2.2 Entering connection parameters for Microsoft SQL Server

## 7.2.1 Entering connection parameters for MySQL Server



The screenshot shows a dialog box for entering MySQL connection parameters. The fields are as follows:

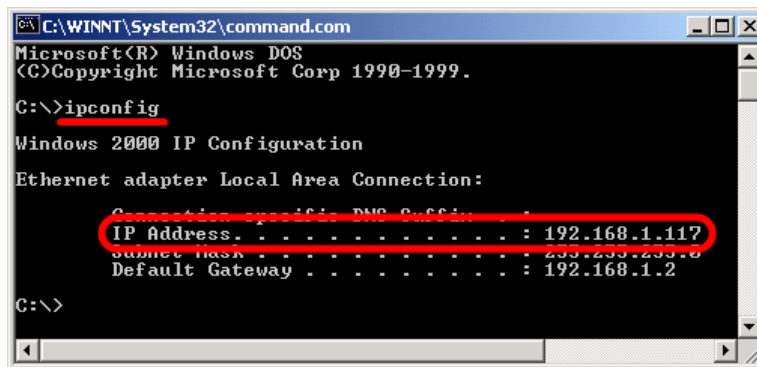
Field	Value
Server type:	MySQL Server 5.0.37 (or higher)
Server name:	192.168.1.118
Port number:	3306
User name:	root
Password:	XXXXXXXX
Database:	my_database

A "Test" button is located at the bottom right of the dialog box.

- **Server name:**

As server name enter IP address of the computer where the MySQL server was installed. If the database server is installed on actual computer you can enter (and is recommended to enter) IP address *127.0.0.1*.

IP address can be found out by executing command *ipconfig* in the command line:



```
C:\WINNT\System32\command.com
Microsoft(R) Windows DOS
(C) Copyright Microsoft Corp 1990-1999.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.1.117
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.2

C:\>
```

- **Port number:**

MySQL uses TCP port 3306 by default. So left **3306** here.

- **User name:**

When you are logging in *Database Administration Utility* program, you have to use database server administrator account, so enter the text **root**. *Root* is the username of database server administrator account and its password you have entered during MySQL installation.

When you enter parameters in the other programs, enter the username of *read-only* or *read/write* user account. How to create these accounts is explained in chapter 2.3.1 User administration.

It is sufficient to use *read-only* user in *Database Viewer* program, but you have to use *read/write* user in the other applications. For example, if you use *read-only* user in program for dataloggers, then data insertion will be disallowed.

- **Password:**

Enter the password for the user.

- **Database:**

Drop down the list and choose the database. Also, you can type in database name. Typing in database name will be useful when creating new database.

Whenever you want, you can use button *test* to verify entered parameters. Program will try to connect, verify rights and check the database. Then it will show test result, for example that:

- parameters are ok and entered database is accessible for reading and writing
- the server is unreachable (probably there is not any MySQL server running on computer identified by *Server name*)
- the program cannot log in with entered user name and password
- the database doesn't exists
- etc.

## 7.2.2 Entering connection parameters for Microsoft SQL Server

- **Server name:**

Drop down the list to search available SQL Servers on the network. SQL servers are identified by computer names where they are installed. In case of the demanded server is not found, you can type in name of the computer where is SQL Server located manually.

*Note:* If more then one instance of SQL Server is installed on the computer, then second and following instances are named this way: `computer_name\instance_name`

To find computer name, right click on the *Computer* icon and see *Computer Name*.

If word (*local*) is in the list then it means SQL server on current computer.

- **Authentication:**

If you choose *SQL Server Authentication*, then you must enter SQL user name and password.

If you choose *Windows Authentication*, then currently logged windows user will be authenticated.



- **User name:**  
Enter SQL user name.
- **Password:**  
Enter the password for the SQL user.
- **Database:**  
Drop down the list and choose the database. Also, you can type in database name. Typing in database name will be useful when creating new database.

### **Security levels of database accounts**

- **Database server administrator**

You have to use this one when you work with *Database Administration Utility*. Since you have chosen *SQL Server Authentication*, then it is user *sa*. The password you have created during *SQL Server* installation.

If you choose *Windows Authentication* then it is needed that *local administrator* windows account was added to *SQL Server Administrators* list during *SQL Server* installation.

Technically, the user must be member of *sysadmin* SQL Server role.

- **Account with *read/write* rights to the database**

This type of account can read and write to the database and you can create it with *Database Administration Utility* on *User Administration* tab.

You will need to use this account for SOAP Server, in DBM MS Program and DBL Logger Program, because these software stores data to the database.

- **Account with *readonly* rights to the database**

This type of account you can use in *Database Viewer*, because this program only read from the database. Again, you create it with *Database Administration Utility* on *User Administration* tab.

Whenever you want, you can use button *test* to verify entered parameters. Program will try to connect, verify rights and check the database. Then it will show test result, for example that:

- parameters are ok and entered database is accessible for reading and writing
- the server is unreachable (probably there is not any Microsoft SQL server running on computer identified by *Server name*)
- the program cannot log in with entered user name and password
- the database doesn't exists

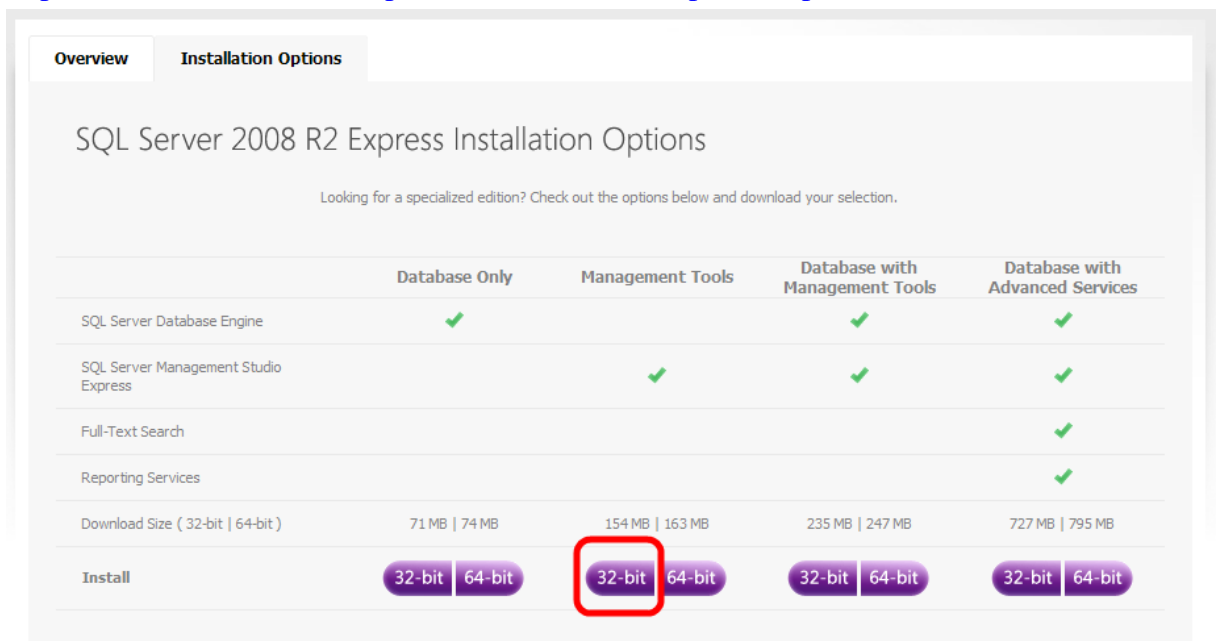
- etc.

## 7.3 Microsoft SQL Server Management Studio installation

### Step by step instructions how to install Microsoft SQL Server Management Studio Express

- 1) Download the installer from:

<http://www.microsoft.com/express/Database/InstallOptions.aspx>

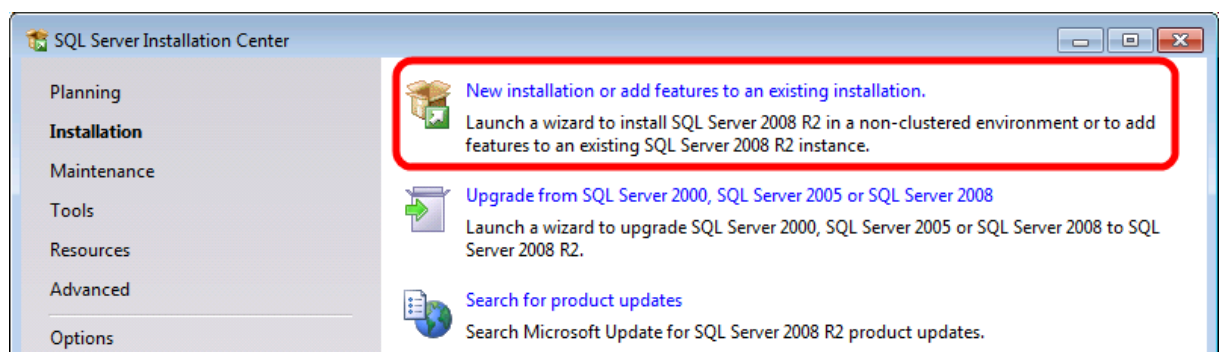


SQL Server 2008 R2 Express Installation Options

Looking for a specialized edition? Check out the options below and download your selection.

	Database Only	Management Tools	Database with Management Tools	Database with Advanced Services
SQL Server Database Engine	✓		✓	✓
SQL Server Management Studio Express		✓	✓	✓
Full-Text Search				✓
Reporting Services				✓
Download Size ( 32-bit   64-bit )	71 MB   74 MB	154 MB   163 MB	235 MB   247 MB	727 MB   795 MB
Install	32-bit 64-bit	32-bit 64-bit	32-bit 64-bit	32-bit 64-bit

- 2) Launch downloaded installer *SQLManagementStudio\_x86\_ENU.exe*.
- 3) Choose *New installation*



SQL Server Installation Center

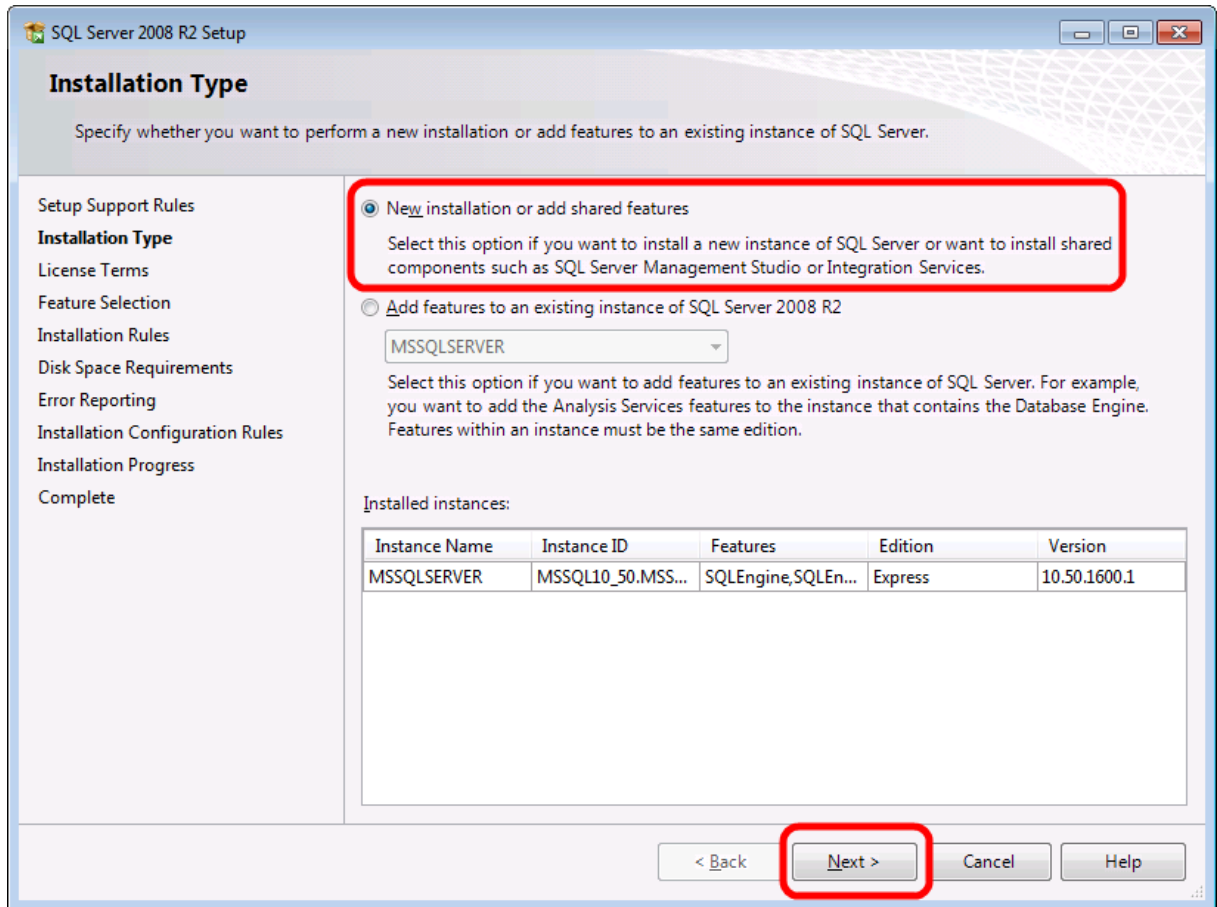
Planning  
**Installation**  
 Maintenance  
 Tools  
 Resources  
 Advanced  
 Options

**New installation or add features to an existing installation.**  
 Launch a wizard to install SQL Server 2008 R2 in a non-clustered environment or to add features to an existing SQL Server 2008 R2 instance.

**Upgrade from SQL Server 2000, SQL Server 2005 or SQL Server 2008**  
 Launch a wizard to upgrade SQL Server 2000, SQL Server 2005 or SQL Server 2008 to SQL Server 2008 R2.

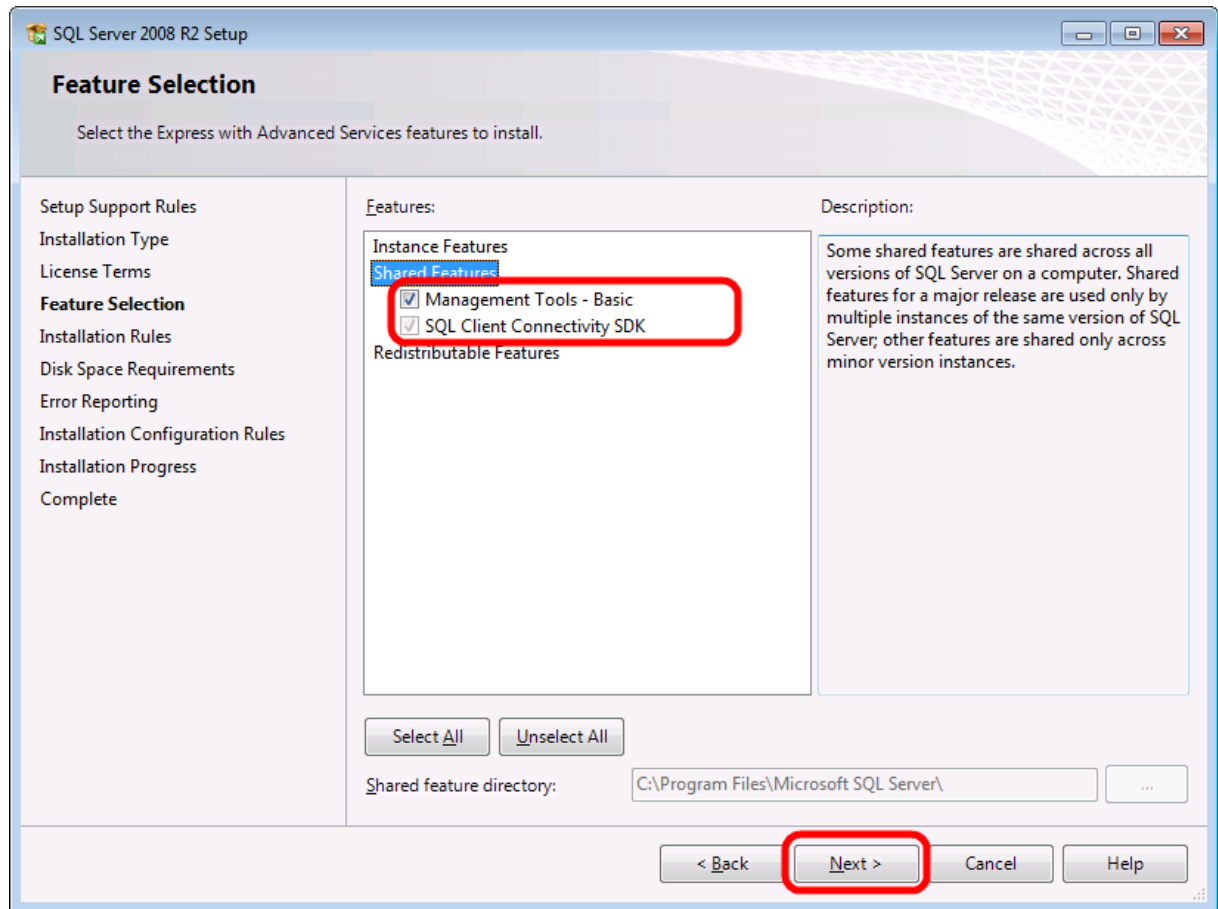
**Search for product updates**  
 Search Microsoft Update for SQL Server 2008 R2 product updates.

- 4) Choose *New installation or add shared features* and then click the *Next* button.



- 5) On the following page accept license terms and click the *Next* button.

- 6) On the page *Feature Selection* select *Management Tools – Basic*. If *SQL Client Connectivity SDK* is not selected, select it too. Then click the *Next* button.



- 7) Skip the next page *Error reporting* by clicking the button *Next*.
- 8) Installation will spend some time now. Then click the button *Close* to finish the installation process.

## 7.4 Preparation of SOAP Server (data entry for online data acquisition from sensors and data acquisition systems MS6 and MS55)

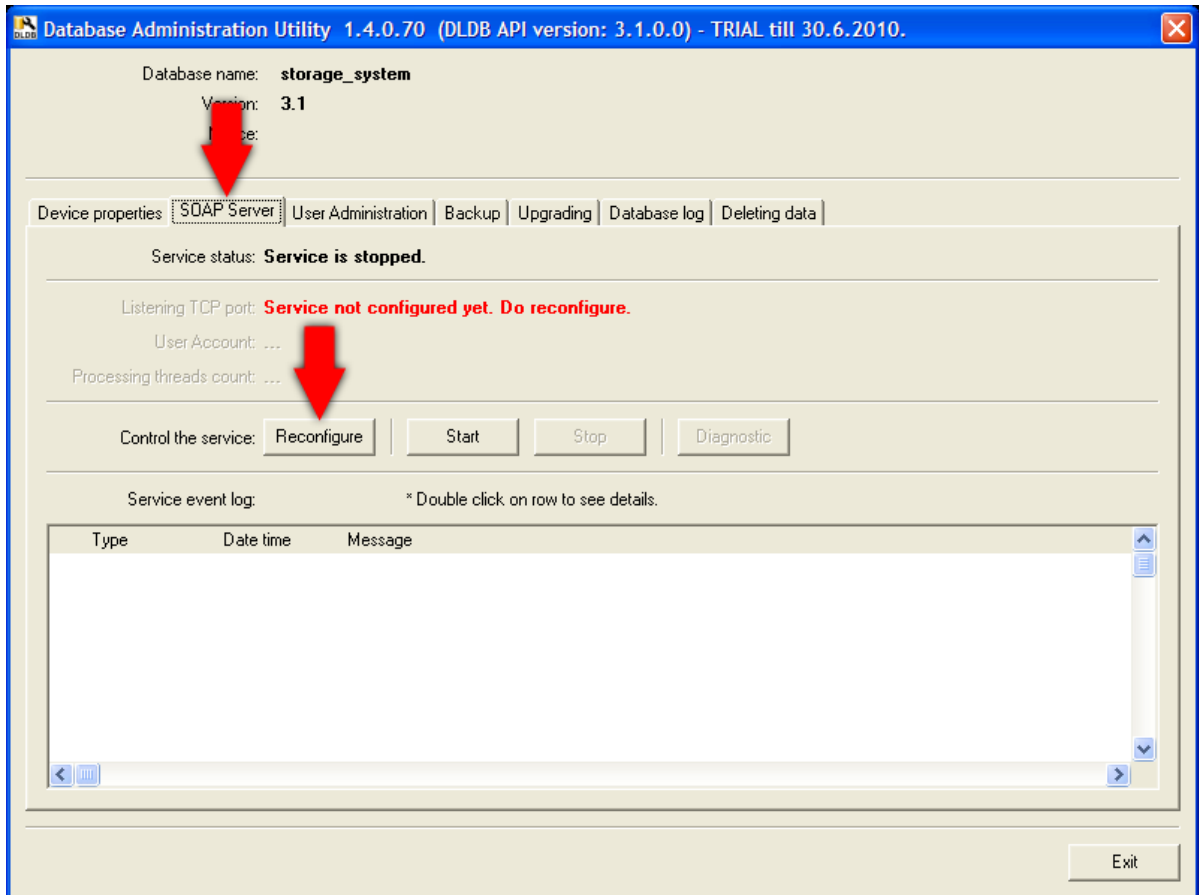
The SOAP server was placed on the computer during installation of the *Database administration utility*. It is only needed to configure and start it.

**Attention!** To be able to configure and control the SOAP Server service you have to run *Database administrator utility* with windows administrator privileges.

### Step by step instructions how to configure and start SOAP server:

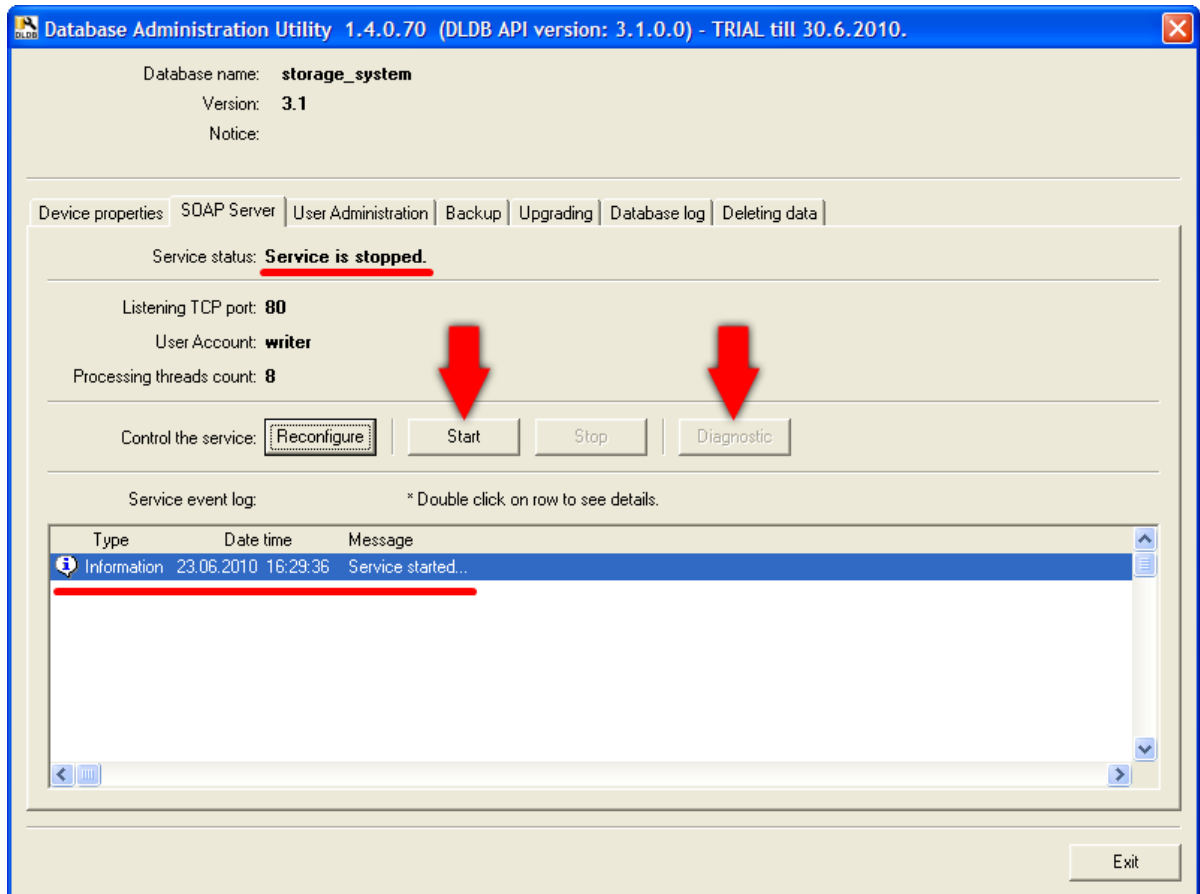
- 1) Connect to your database with program *Database Administration Utility* and switch to the tab *SOAP Server*.

Press the button *Reconfigure* to run configuration wizard

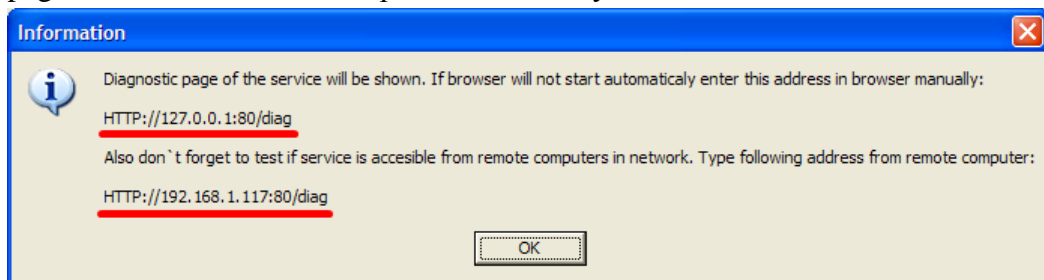


- 2) On the first page of the wizard enter *listening TCP port*. **80** is recommended value, but you have to be sure, that there is no other application using this port on the computer. Especially HTTP server like Apache or IIS uses port 80 because 80 is standard for HTTP. If this is the case then another recommended port is 8080. Finally click the *Next* button. Program will check if the port is occupied and if so, program will ask you for reentering the port.
- 3) On next page you have to enter database user account. This account must have *read/write* access to the database. About database user accounts you can read in chapter 2.3.1 User administration. Finally click the *Next* button.
- 4) On last page leave the value **8** for *Processing thread count*. Increasing this value leads to increasing the SOAP server performance, but it is the question of tuning SQL server. Finally click the *Finish* button
- 5) Configuration wizard is finished and the SOAP server is configured at this moment. Now, you have to allow listening TCP port on the firewall. Allow port **80** – *HTTP standard port* on the firewall (or **8080** if you used this one). How to do it you can read in chapter 7.1 Allowing TCP port on windows firewall. Also remember, that there can be other firewalls running on your computer and also some anti-virus programs contains firewalls.

- 6) Since you have the port allowed, go back to the *Database administration utility* and press the button *Start* to start the SOAP server.
- 7) Wait until the Service status is *Service is running*. You can see new message in *Service event log*: *Service: Service started...*

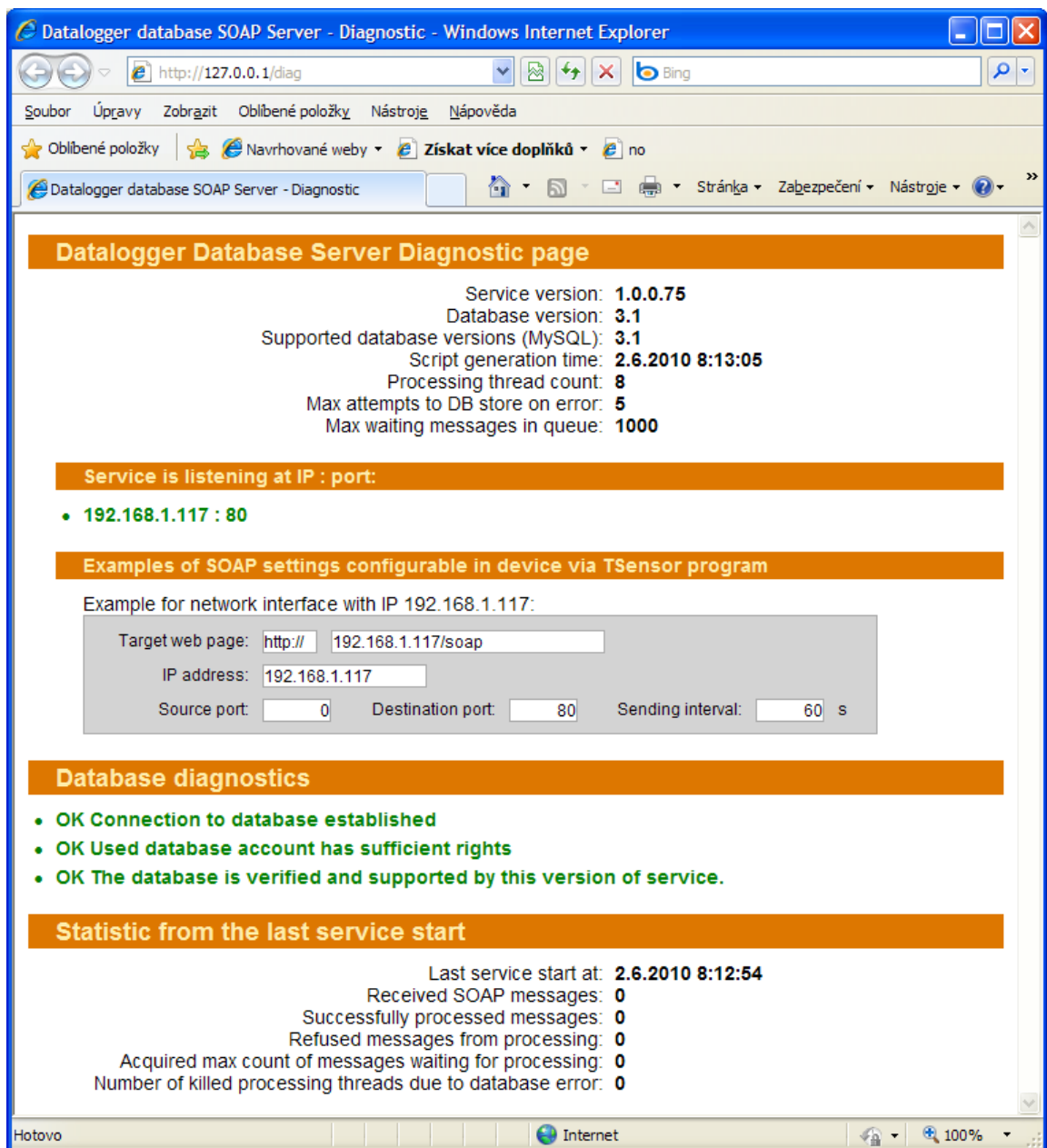


Click the button *Diagnostic* to verify if the SOAP server is well running and well configured. Diagnostic page will be opened in the default web browser. Before it, you will see the dialog with HTTP addresses, which tells you how to get to the diagnostic page if the browser doesn't open automatically.

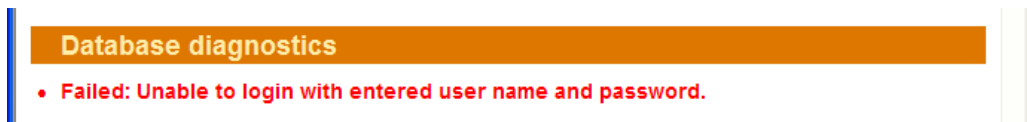


The second HTTP address guides you to open diagnostic page on remote computer. Go to some another computer in the network and open second HTTP address in browser on that computer. This will verify, that SOAP server is accessible and not blocked by firewall.

If the SOAP server is well configured, then there are no warnings highlighted with red color on the diagnostic page and the diagnostic page should look like this one:



If i.e. you have configured the SOAP server with incorrect database user account, then the diagnostic page will inform you about this:



If diagnostic page opened on local and also on remote computer doesn't show any warnings, than you have successfully prepared the SOAP server. At this moment, you only have to configure devices to send its measured values to this SOAP server.

Configure sensors via program *Tsensor* – configuration program for sensors and transducers. Data acquisition systems you must configure via *DBM MS Logger* program.

There is *Example of SOAP settings* in program *Tsensor* on the diagnostic page (this

settings looks similar in the program *DBM MS Logger program*):

**Examples of SOAP settings configurable in device via TSensor program**

Example for network interface with IP 192.168.1.117:

Target web page:	<input type="text" value="http://"/>	<input type="text" value="192.168.1.117/soap"/>
IP address:	<input type="text" value="192.168.1.117"/>	
Source port:	<input type="text" value="0"/>	Destination port: <input type="text" value="80"/>
Sending interval:		<input type="text" value="60"/> s

You should enter all parameters as in this example. Only setting of *Sending interval* is up to you. You can enter minimally 10 seconds, but we alert you, that entering short interval will lead to rapid growing of the database if compression of online acquisition is not enabled (see chapter 2.3.8 Online acquisition compression settings).

If compression of online acquisition is not enabled then we recommend to use short intervals (10 s) only when tuning data acquisition. But when you are sure that acquisition works well, reconfigure all devices settings and set *sending interval* minimally on 60 seconds. But recommended are values longer than 300 seconds (5 minutes).