

# **SMARTY m.Center**

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Doc.-No.: 8188AD001 version 3.1

## 1 Introduction

This document describes the installation and configuration of the necessary software and the usage of the SMARTY m.Center.

The SMARTY m.Center software consists of many components which will be specified in this document.

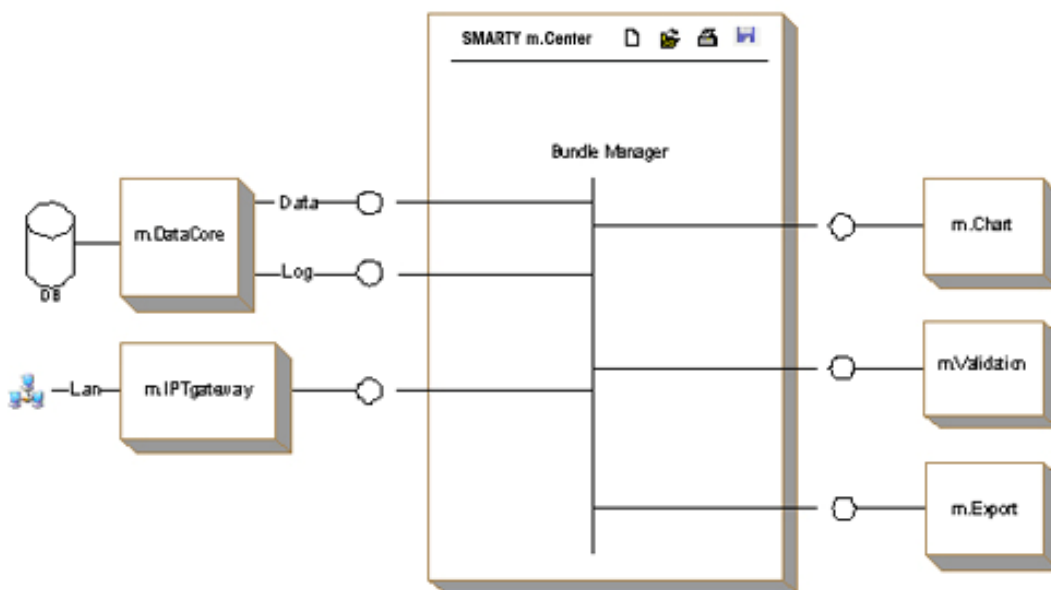


Figure 1: SMARTY m.Center Components

## 2 Installation

Multiple Components are required for the SMARTY m.Center to operate properly. The values recorded by the SMARTY m.Center software are stored in a database, which has to be additionally installed.

The requirements for the used computers are:

CPU: min. 2GHz (DualCore)

RAM: min. 2GB

free memory: ca. 1GB (SMARTY m.Center machine), > 250GB (MySQL machine)

### 2.1. MySql

As database for the recorded values MySQL Database Server is used. It can be installed on a separate machine.

#### 2.1.1. Database

The used database is MySQL 5.1 (source: <http://www.mysql.com/downloads/mysql/>). Install it with the default installation type ('Typical'). The request for a registration afterwards should be ignored.

After the installation the configuration is necessary. It can be accomplished following the setup or it can be called in the start menu (MySQL Server Instance Configuration Wizard):

If other versions of MySQL are already installed, choose the just installed Version (MySQL Server 5.1).

- select the detailed configuration type
- the server type depends on the usage of the database machine, 'Developer Machine' should match for simple cases, 'Server Machine' is recommended
- the usage of the database is 'Transactional Database Only'
- select the drive with the most free disk space
- in the next step the number of possible concurrent connections to the server are set, 'Online Transaction Processing (OLTP)' should be the best choice in most cases
- networking options: enable TCP/IP with port 3306 and add an firewall exeption, strict mode should be enabled too
- select the standard character set in the next step

- install MySQL as Windows service that is launched automatically with the os and include the bin folder to PATH
- in the last step a password is assigned to the user root: root1234<sup>1</sup>, allow the access from remote machines, an anonymous account is not required

After the installation of the SMARTY m.Center is finished, a new database user has to be created. This is done with the script `createUser.bat` from the installation folder of the SMARTY m.Center software or by the start menu entry ('create DB user').

**Remark:** The script can only be executed on a machine with MySQL installed!

### 2.1.1.1. Problems while configuring MySQL

On completion of the MySQL Configuration some errors have been observed. Solutions for the three mostly observed errors are listed in the table below:

<b>problem</b>	<b>solution</b>
<b>Error #2003:</b> can't connect to localhost	<p>Check the availability of the network interface. Possibly IPv6 is installed; it has to be uninstalled. Proceed as follows:</p> <ul style="list-style-type: none"> <li>• open the Network Connections (start → Control Panel → Network Connections)</li> <li>• choose the used network connection (e. g. Local Area Connection) and call its Properties from the context menu (right click)</li> <li>• choose from the list with the used item the entry for TCP/IP Version 6</li> <li>• click on Uninstall and confirm the following dialoges</li> <li>• close the property window</li> <li>• the computer is restarting</li> <li>• repeat the configuration of MySQL</li> </ul>
<b>Error #1045:</b> Access denied	<p>The password for the user 'root' was not set correctly. To solve this enter the following commands on the command line (start → Run: cmd)</p> <ul style="list-style-type: none"> <li>• <code>mysql -u root mysql</code></li> </ul>

<sup>1</sup> If another password is chosen, the scripts `createUser.bat` and `importDemoData.bat` in the installation folder of SMARTY m.Center have to be edited.

	<ul style="list-style-type: none"> <li>• set password for root@localhost=password('root1234');</li> <li>• flush privileges;</li> <li>• quit;</li> <li>• exit</li> </ul>
<b>Error #00800401F3:</b> Error adding firewall exception: Invalid string class, The installer must have been run with administrative privileges  Configuration is declared as successful afterwards.	No firewall is installed/activated. Usually this message can be ignored. Alternatively uncheck the checkbox for the firewall exception while configuring MySQL. If a firewall is installed subsequently, the firewall exception for TCP Port 3306 has to be set manually!  If this error message appears with installed and activated firewall, the exception has to be set manually too!

### 2.1.2. Connector

For the communication between SMARTY m.Center and the database the MySQL Connector<sup>2</sup> is required. It can be obtained for Microsoft Windows from <http://dev.mysql.com/downloads/connector/net/>. Select the installation type 'Typical' and deselect the registration request.

A reboot should be performed afterwards to apply the changes of the PATH-variable.

## 2.2. SMARTY m.Center

To install the SMARTY m.Center software, execute the provided Setup.exe. If necessary, the required .Net Framework will be installed too.

After the selection of a folder, the installation can be started.

If the MySQL database is launched on a different machine, a message appears which informs the user that no database was created. The connection to the database has to be configured (s. chap. 4.1) after the first start of the fullversion of the SMARTY m.Center.

If a database user has been created (script `createUser.bat` or start menu entry), as described in chap. 2.1.1, it is sufficient to change the host and the database name.

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<sup>2</sup> To install MySQL Connector, Microsoft .Net Framework 2.0 is required. If this is not already installed on the computer (s. Control Panel – Add or Remove Programs), the SMARTY m.Center software can be installed before the connector, because the SMARTY m.Center setup includes the .Net Framework.

## 2.3. Licensing

To use the full functionality of the software, it has to be licensed.

When starting the SMARTY m.Center, a request for a full version is generated and stored into a request file<sup>3</sup>. This file could be send to the after sales service, which creates a license and sends it back. Sending the file can be done by pressing the button 'Buy' in the about box.

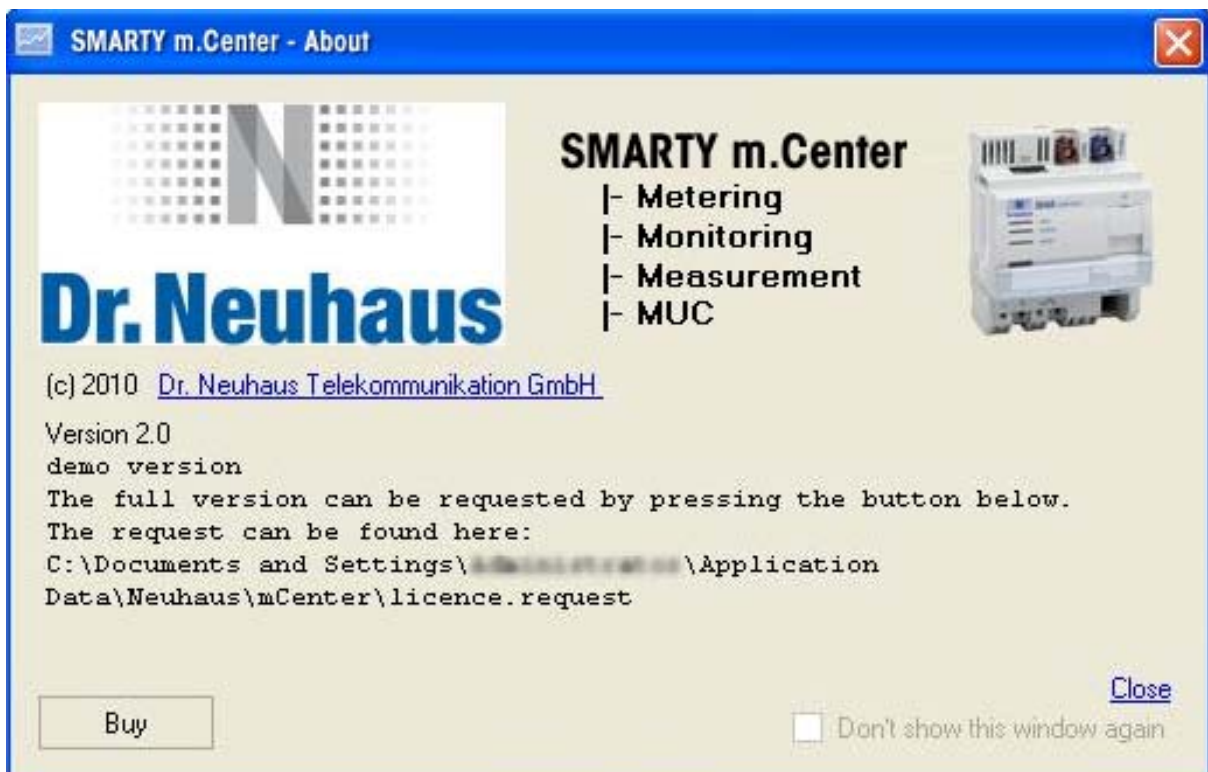


Figure 2: About box

The license will be written into the Windows registry and is valid for the user and the machine from which the license request file has been created.

### 2.3.1. Limitations for demo version

Without licensing the SMARTY m.Center software only less functionality is available. These limitations are listed below:

- 30 days trial version

<sup>3</sup> The request file is placed in a directory in the user space. This directory is hidden by default. To access this directory type the full path into the address bar of the explorer or enable the option to show hidden files: choose Tools->'Folder Options...' -> View->'Show hidden files and folders' from the explorer menu.

- the About box is shown on every startup
- no simulation
- no validation
- export: saves max. 500 datasets, meters are only saved as csv-files
- limitation of the entries in the log database to 1000
- limitation of the entries in the logger window to 100
- deactivation of the filter for source and level in the logger window
- fixed connection details for the database
- deactivation of the filter and automatic refresh in the alive map
- limitations for setting the timespan in the device history overview
- only one push connection allowed

To fill the local database with demo data, call the script from the start menu, which imports the data. With this data the user is able to explore the functionality of the SMARTY m.Center software.



### **3 Components**

The SMARTY m.Center software consists of multiple components:

1. the main application – the basis of all other components
2. the data management for measuring values and log information
3. a component for the connection to the devices
4. a component for validation
1. a component for the data-export

#### **3.1. MainFrame**

The main window of SMARTY m.Center connects the functionality of all bundles/services. The services integrate themselves in the menu, the context menu or in one part of the main window. If applicable, further windows will be embedded by some services.

#### **3.2. m.DataCore**

The component m.Datacore collects push data, delivered from m.IPTgateway and also log information from all services. Push data and log information are stored in separate databases.

This is done by two services: a storage service and a logger service.

The database of the storage service is used for the data collection and also the data visualisation. It can be located on an arbitrary machine.

The log database is located on the same machine as the SMARTY m.Center.

#### **3.3. m.IPTgateway**

The m.IPTgateway consists of the Tsc3Service, which connects to one or more TSC3. Over these connections push information is received. The push information contains device information, measured values or device infrastructure information that shows the connections between single devices.

#### **3.4. m.Chart**

m.Chart provides the possibility to display the collected data.

The visualisation contains the single datasets and measured values and also the status of the devices. The links between the devices is shown too.

For displaying the measured values the user can revert to a list of these values or to a diagram.

### **3.5. m.Validation**

The m.Validation component verifies the collected push data.

The validation can be performed for every meter.

It collects general, statistical information about the meter and, if possible, tries to detect abnormalities in the datasets, for example:

1. datasets with negative time difference
2. a timespan between two datasets that is greater or smaller than the average timespan with consideration of a specific tolerance
3. meter with wrong or missing details in their general information

### **3.6. m.Export**

m.Export provides the possibility to save the data of a device/meter in a new file. This file can be interpreted by other tools like Excel.

The data of every meter can be exported as xml file or csv file.

## 4 Usage

### 4.1. Database usage

To save the recorded measured values permanently, a connection to the MySQL database server has to be established.

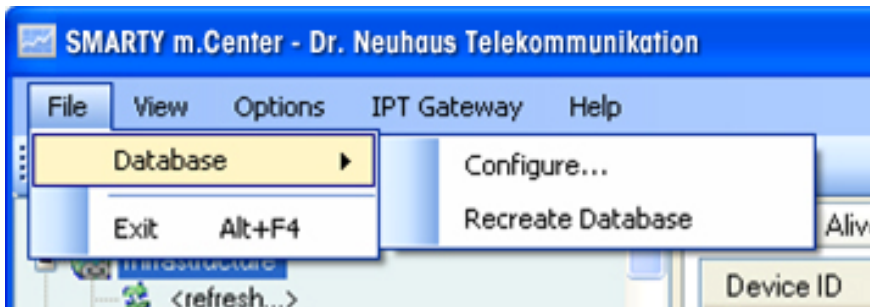


Figure 3: database configuration

A connection to the storage database requires four details:

1. the host name or ip address of the machine with the MySQL storage database
2. the database user name
3. the password for the database user
4. the name of the database

Furthermore the user has the possibility to recreate the database with the configured parameters

**Attention:** All data collected so far in this database will be erased!

The visualization of the log data is done by calling the logger window from the menu. In the logger window it is possible to remove the entries from the log database.

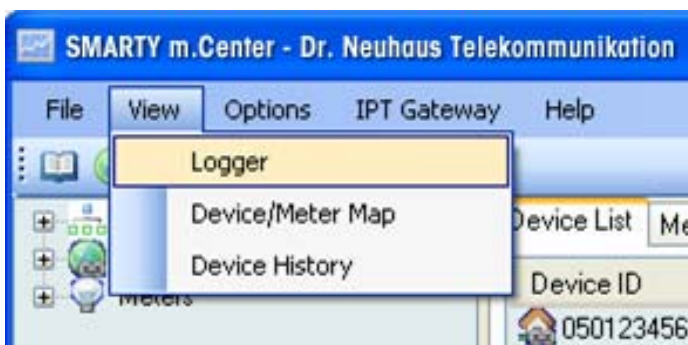


Figure 4: calling the logger window

#### 4.1.1. Database backup

To perform a database backup, use the start menu entry 'save database', which calls a script<sup>4</sup> that saves the database into a single file.

The script can only be executed on a machine with MySQL installed!

Five parameters are needed: the hostname of the database server, the database name, the database user, its password and backup file.

The first four parameters can be found in the configuration dialog in the SMARTY m.Center software (s. chap. 4.1).

The name of the backup file is arbitrary. Note, that it is written in a folder on which the actual user has the permission to write.

#### 4.1.2. Restoring the database

To restore a database backup, use the start menu entry 'restore database', which calls another script<sup>5</sup> that performs the restoring.

The script can only be executed on a machine with MySQL installed!

Five parameters are needed: the hostname of the database server, the database name, the database user, its password and backup file.

The first four parameters can be found in the configuration dialog in the SMARTY m.Center software (s. chap. 4.1).

The name of the backupfile has to be the same as used on the backup (s. chap. 4.1.1).

## 4.2. **Configuration of the data input**

A push connection can be adjusted from the menu.

All available push connections are shown on the left side of the main window.

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<sup>4</sup> The script (`backupDB.bat`) is located in the program folder of the SMARTY m.Center software and can be called from the command line as follows:

```
$backupDB.bat host username password DBName backupfile
```

<sup>5</sup> The script (`restoreDB.bat`) is also located in the program folder of the SMARTY m.Center software and can be called from the command line as follows:

```
$restoreDB.bat host username password DBName backupfile
```

The user is able to connect/disconnect to every push connection. To adjust the configuration of a push connection, six parameters are required:

1. ip address of the TSC3
2. port of the TSC 3
3. gate name
4. password of the gate
5. push target name
6. connect automatically on service start

The connection status is shown on the right side of the main window and by the icon of the particular connection.

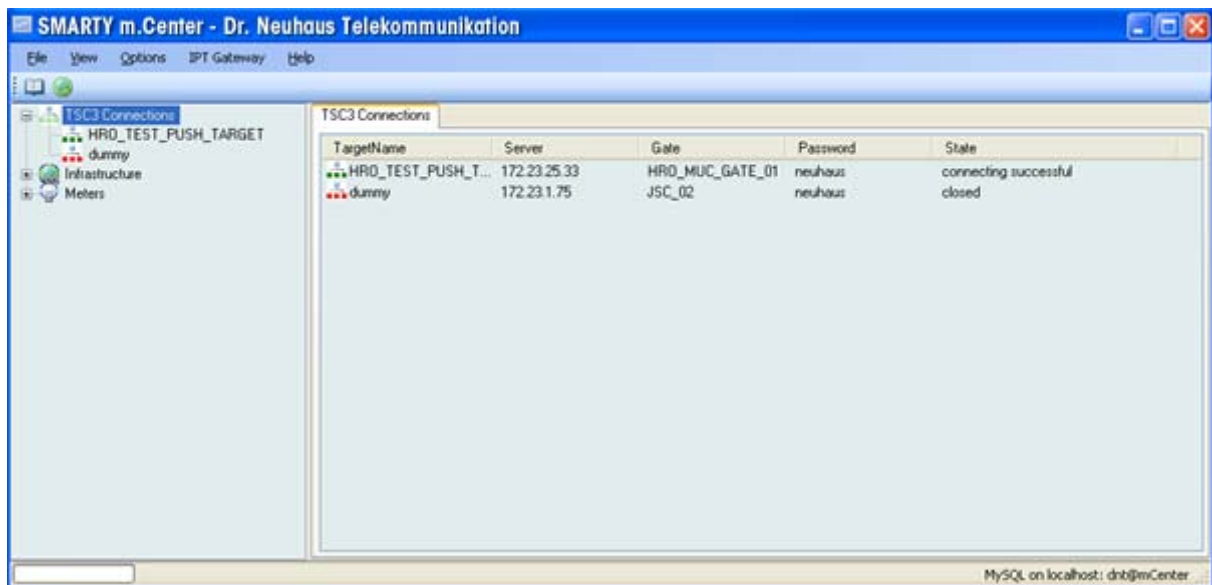


Figure 5: connection status

If a connection is selected, further details are shown.

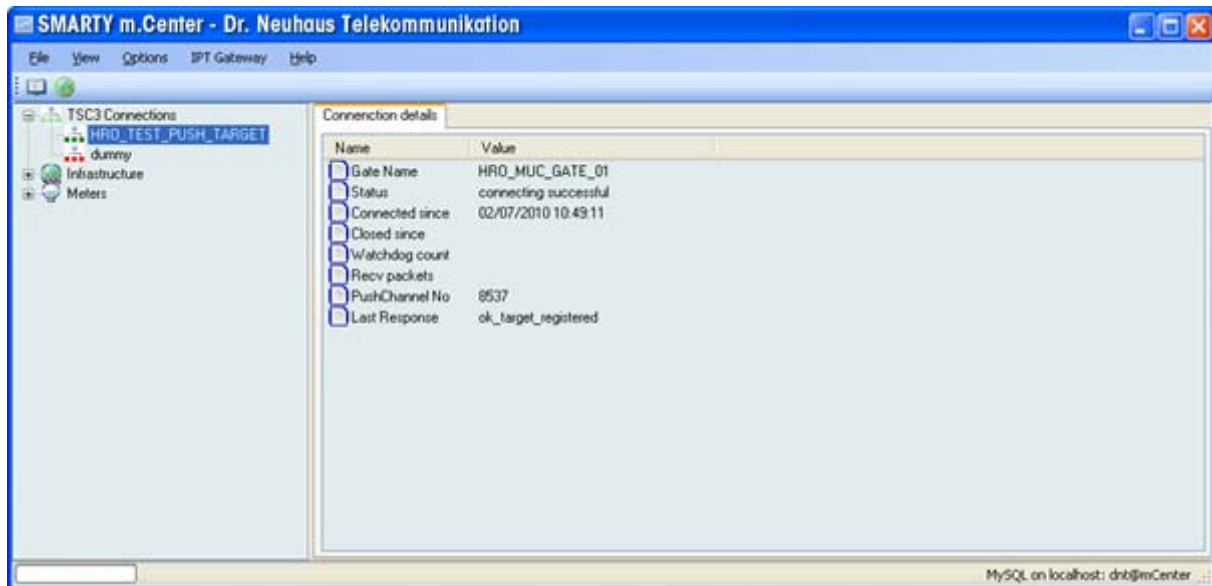


Figure 6: connection details

#### 4.2.1. Import of infrastructure data

Information about the infrastructure of the devices can not only be retrieved from the push connections. It's also possible to import them from a cvs-file. With a context menu entry on the infrastructure node on the left side of the main window a suitable csv-file can be selected. The data stored in this file will be inserted into the database afterwards.

#### 4.3. **Data visualisation**

By selecting the 'Meters' node, an overview of all meter stati is shown. The colored squares represent single meters. The color depends on the last received measuring value. This allows the user to identify devices/meter which havn't sent data for a long time.

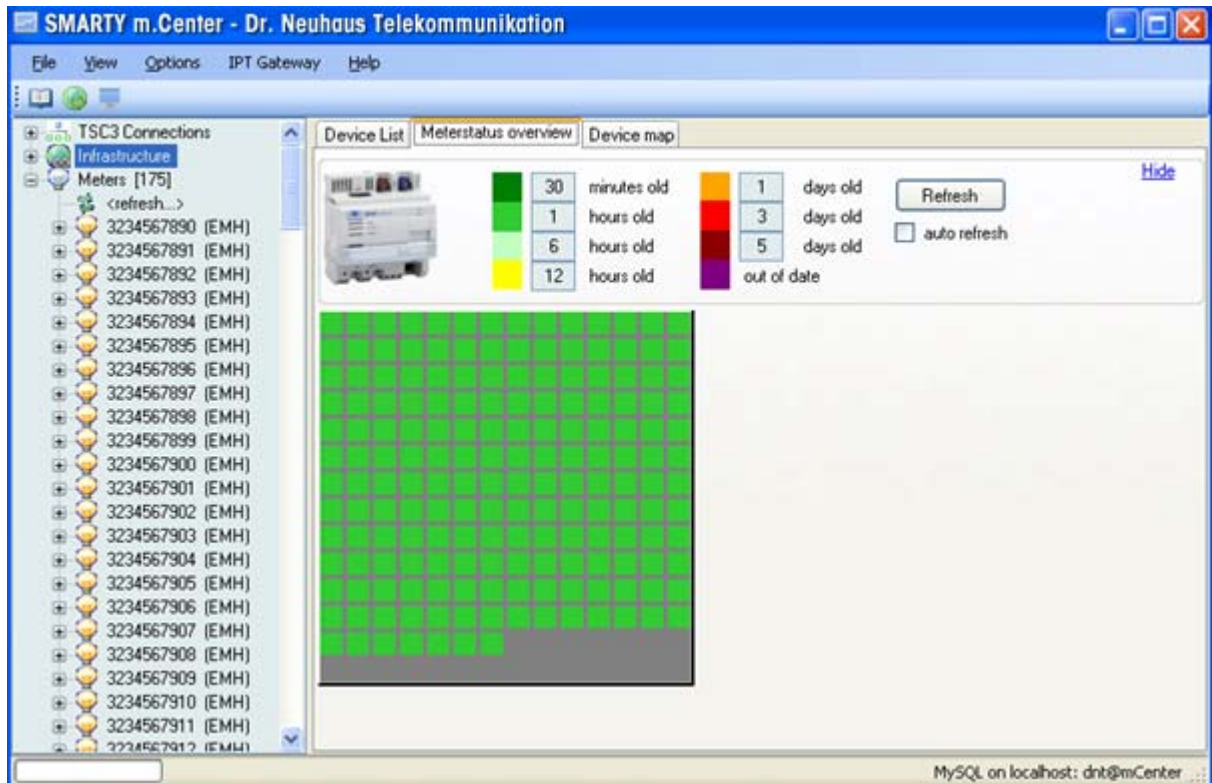


Figure 7: overview

If the cursor is moved on a single square, details for the associated meter are shown.

By double clicking on this square, the associated meter is selected on left side of the main window.

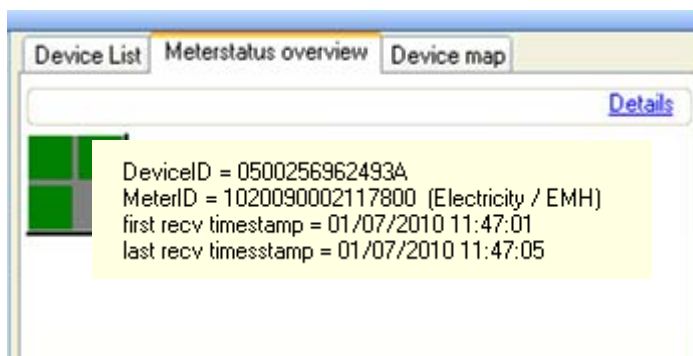


Figure 8: details in overview

After selecting a meter all datasets within the dedicated range of time are shown.



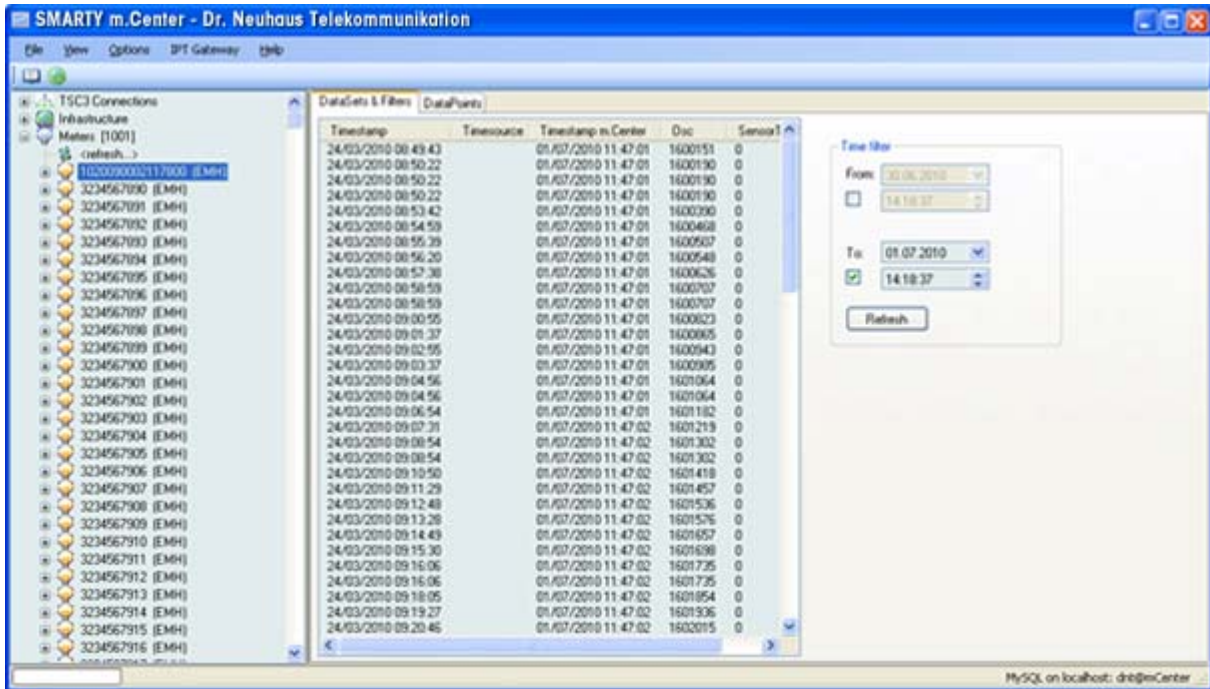


Figure 9: list of datasets with filter

A list of the datapoints of all datasets within the dedicated range of time and also a diagram of this datapoints is shown by selecting DataPoints.

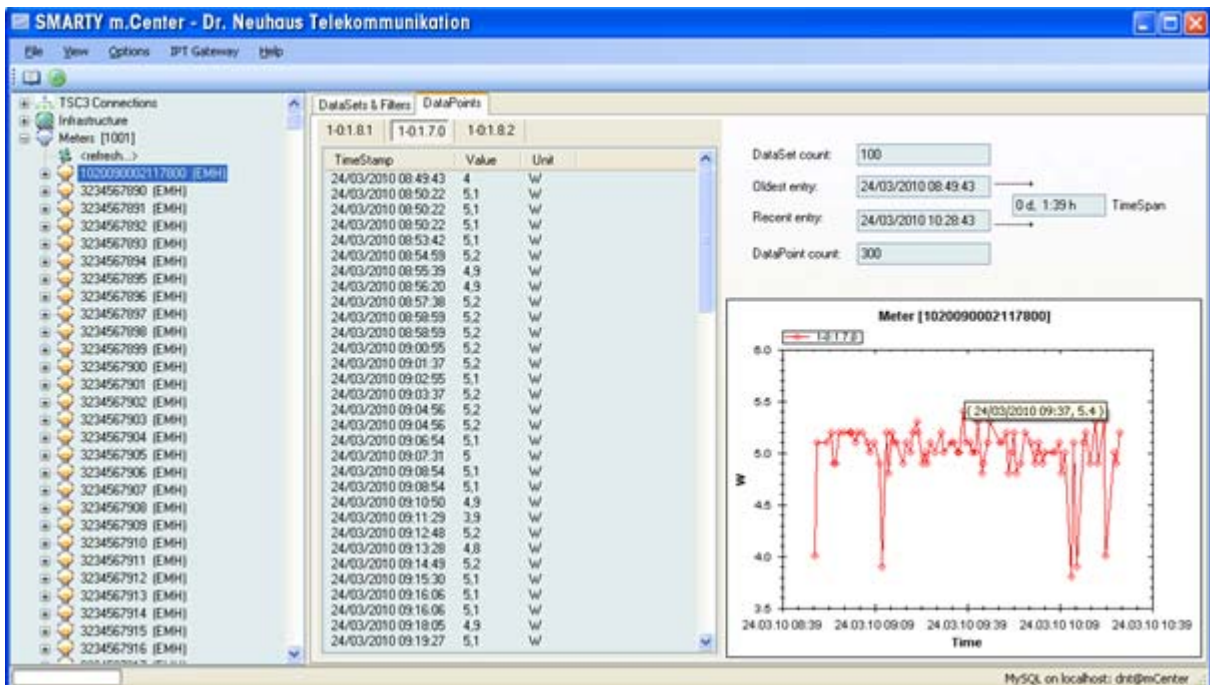


Figure 10: list of datapoints with graph



While showing the data, new data can be collected. To show the new collected data, double click on the sing node in the tree on the right side called <refresh...>. This requests the database for actual data.

Additionally to the measured values of the meters, device lists are sent. These lists contain information about the devices dedicated to one superior device (e. g. ZDUE-DC-MUC). It is differentiated between visible and active devices.

All devices recognized by the superior device within one day are visible devices. Devices that have been activated for data receiving are called active devices.

The device lists provide information about the status of the sub-devices, due to the number of notifications within a specified timespan.

The display of the device lists can be found by selecting node 'Infrastructure' on the left side of the main window and afterwards the tab 'Device map' on the right side.

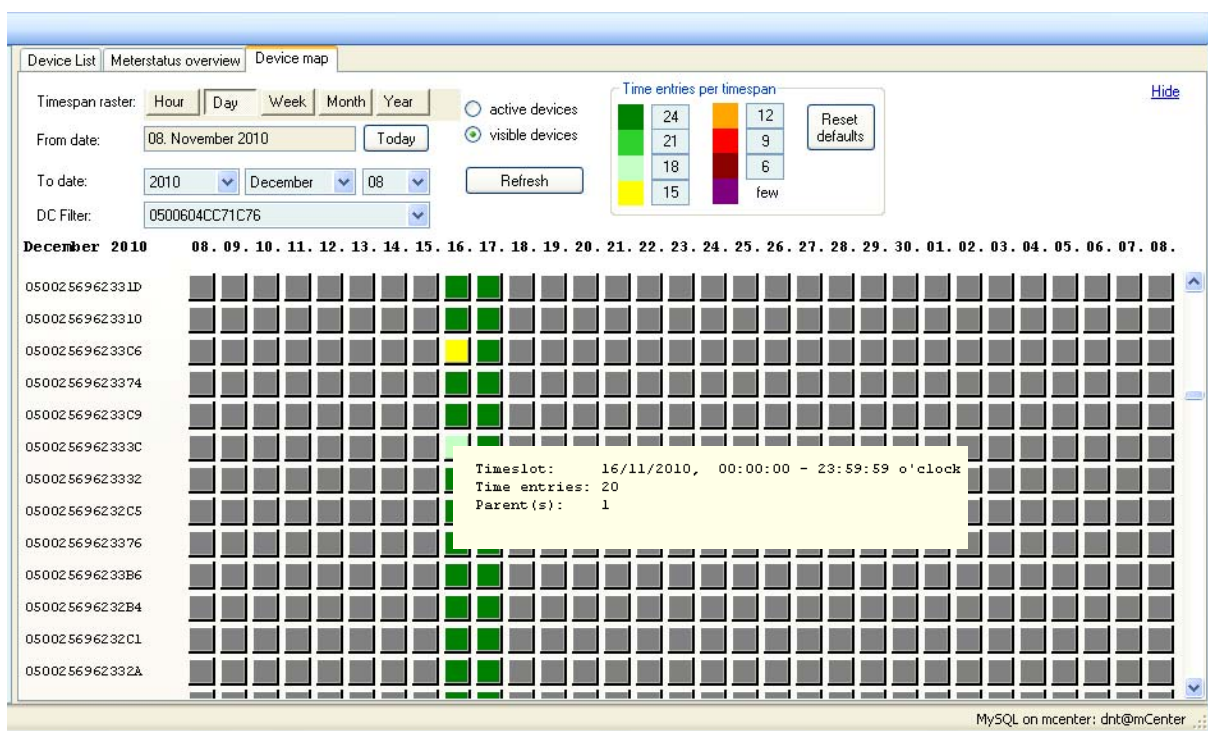


Figure 11: Device list history

For displaying the device history adjust the end date and the timespan raster. It is also necessary to select either active devices or visible devices. To reduce the number of displayed devices, they can be filtered. Afterwards all subdevices of the selected DC are shown.

The color of the blocks describes the number of notifications for one device within the timespan, represented by the block.

To get detailed information, move the cursor over a square or over the device id.

To search for a specific device in the tree on the left side, open the context menu (right click) on one element of the 'Infrastructure' node to start the search feature.



Figure 12: start of the search

A dialog will be opened where to insert the server id to search for. It is also possible to leave some characters of the server id out to retrieve possibly more results (s. Figure 13).

If one or more matching server ids are found, one of them can be selected. After closing the dialog the tree opens up to the place where the device with the selected server id is located.

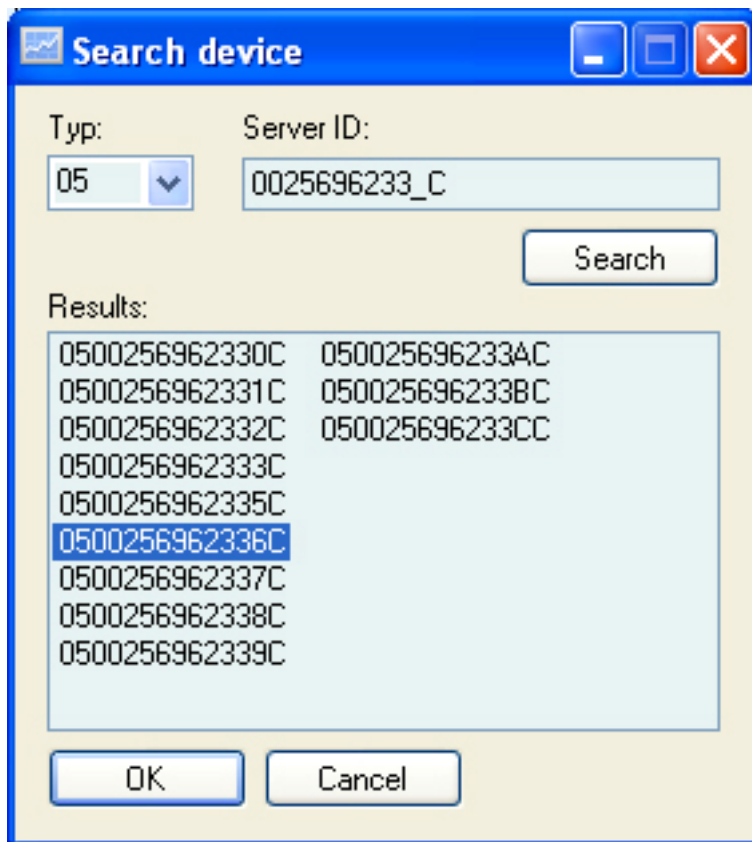


Figure 13: search dialog

#### 4.4. Data post processing

After collection data into the database the user is able to continue the processing of the data.

On the one hand the measured values can be validated. To do that, the user has to select the 'Validate'-Command from the context menu of a meter on the left side of the main window. The report, created by the call of this command, contains general information of the meter and the datasets, shown within the filtered timerange. Afterwards this report can be saved to a file.

On the other hand the meter data can be exported to a separate file. This is also done by a command from the context menu: 'Export...'. It is possible to save the meter data as csv- or as xml-file to continue the processing with external tools (e. g. Excel).