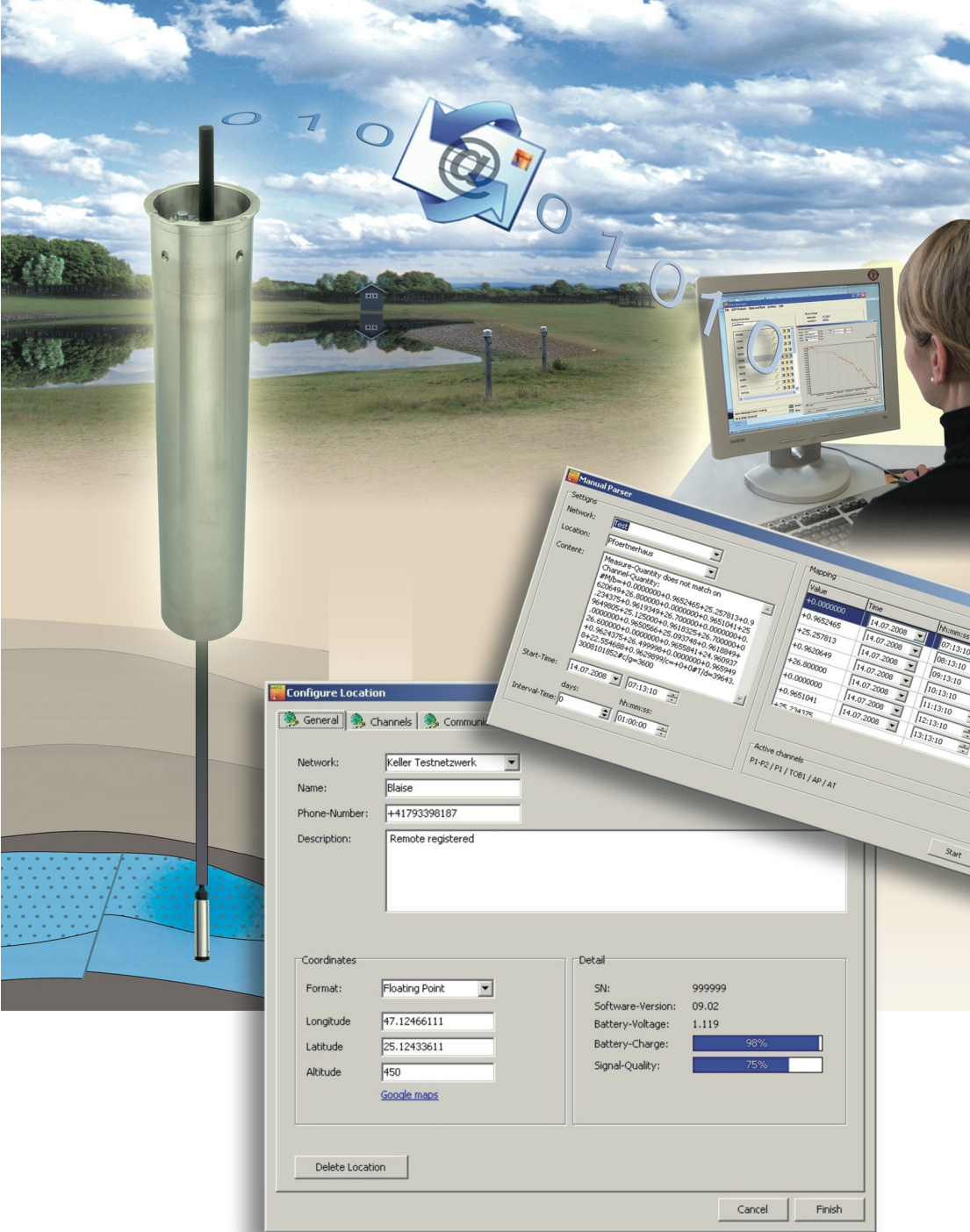


GSM-2 Datamanager Manual

Version 2.3.3, June 2010





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1 Environment

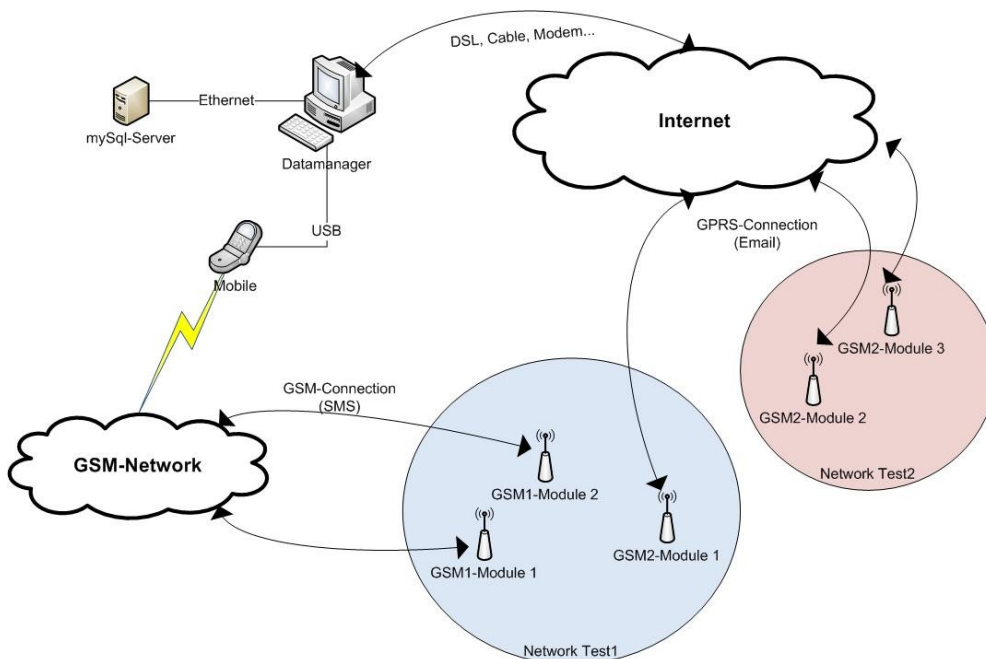


Figure [1] Environment of the GSM-2 Datamanager

The device installed in the field is called a GSM module. A location is a virtual GSM module in the Datamanager representing the real GSM module, including configuration, calculations and forwarding.

1.1 Principle of Data Management

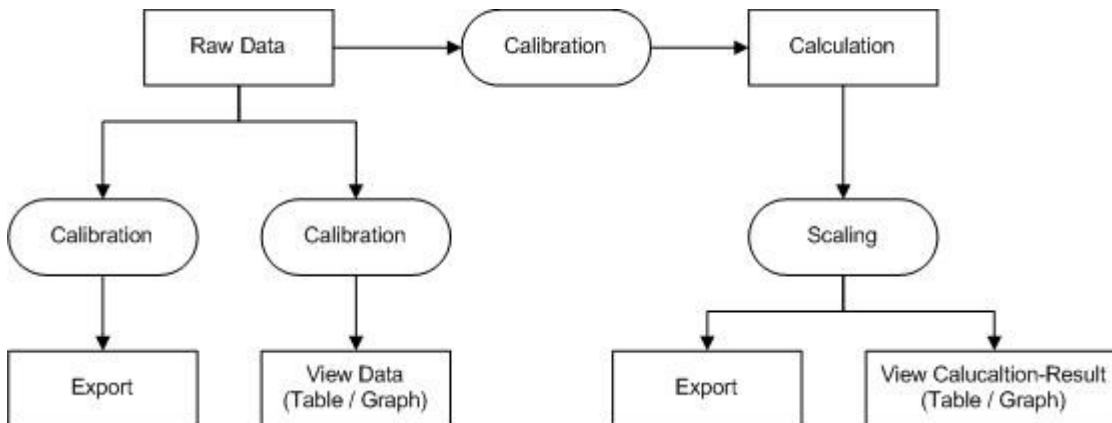


Figure [2] Principle of data management

The Datamanager receives and collects the raw data sent by the GSM modules and stores the raw data in a data-base. Each raw data value (measuring channel) is individually adjustable (calibration). Such calibration consists of a factor and an offset allowing the user to customize its influence on the raw data. The default values for the factor is "1" and for the offset "0".

Calculation: $Calibrated\ Value = Raw\ Data\ Value * Factor + Offset$

"Scaling" works the same as "Calibration", but its purpose is to convert the channel values into different units.



2 First Start

When the Datamanager is started for the first time, the application will guide you through the basic configuration steps required for proper operation. The desired database should be selected at the start of the basic configuration process. The Datamanager supports two types of database storage concepts: SQLite and MySQL.

SQLite is a software library that implements a self-contained, server-less, zero-configuration, transactional SQL database engine.

MySQL is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases.

By default the Datamanager uses the SQLite database engine to store all information (see 2).

We intentionally set the default selection to this database concept to simplify the installation of the Datamanager for the user, as no database server installation is required. SQLite is a lean solution for measuring applications with only a few GSM-2 modules and where only small to medium-sized data storage requirements are anticipated. SQLite is also suitable for a single stand-alone PC solution.

Operating the Datamanager in connection with MySQL requires the installation of or accessibility to a MySQL server (e.g. running on a network server). For more instructions concerning the installation of a MySQL server please refer to Section 10.1.

MySQL is the recommended database system for operating the Datamanager at a professional level. MySQL should be the preferred choice if you are planning to establish a larger GSM-2 measuring network or if you expect a high volume of raw data to be stored whilst monitoring the GSM-2 modules out in the field. We recommend MySQL due to better database administration and maintenance facilities with respect to reliable data back-up and integration into an existing IT environment.

The first system start and basic configuration process is divided up into several steps. The very first dialog outlines the question which database concept should be applied. The *Default* setting is the lean SQLite; the *Custom* setting will guide you through the access data configuration process for an up-and-running MySQL server (see 2).

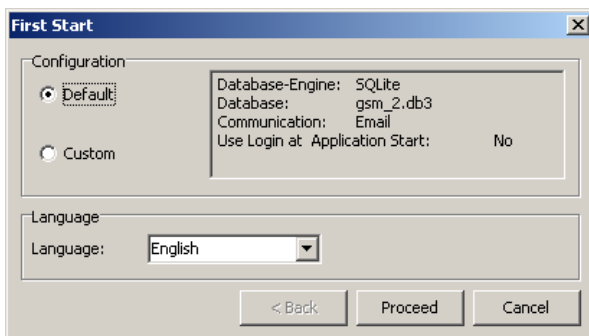


Figure [3] First start database concept and language selection.

2. Select the desired language

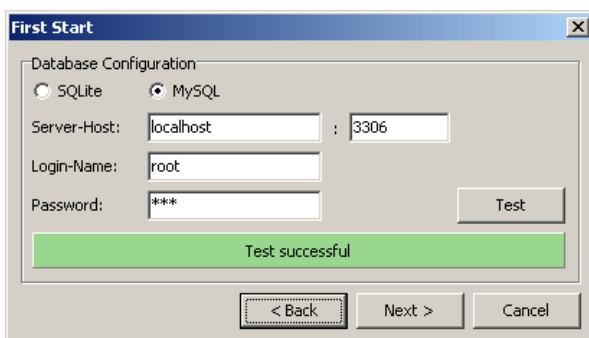


Figure [4] Custom configuration of MySQL server access and test of the connection to the server.

(custom configuration only)

1. For *Server-Host* you may use "localhost" which means that the MySQL server is running on the same PC where the Datamanager was installed. *Server-Host* can, of course, be any valid IP address or DNS name where the MySQL server is accessible.
2. Press the "Test" button to verify the access data settings. Datamanager then tries to establish the connection to the MySQL server.

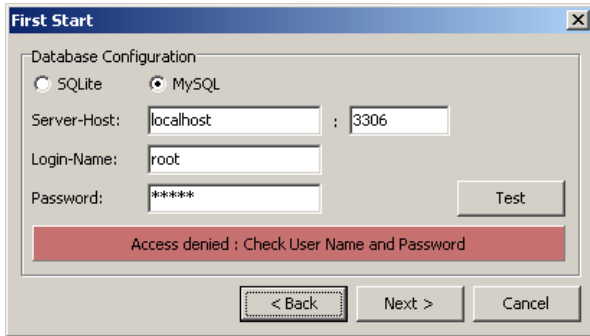


Figure [5] Testing the access to the MySQL server.

(custom configuration only)

A failed test will display the error message shown in 2. Incorrect access data settings or an absent MySQL server may be the reason for an unsuccessful test.

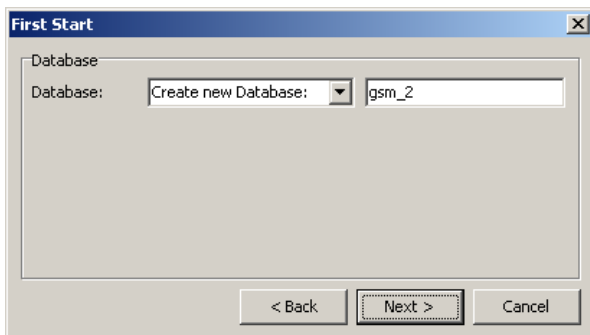


Figure [6] Specifying the MySQL database name.

(custom configuration only)

After the test has been completed successfully, choose an existing database or let the Datamanager create a new one. In the example shown in 2 the new database was named "gsm_2".

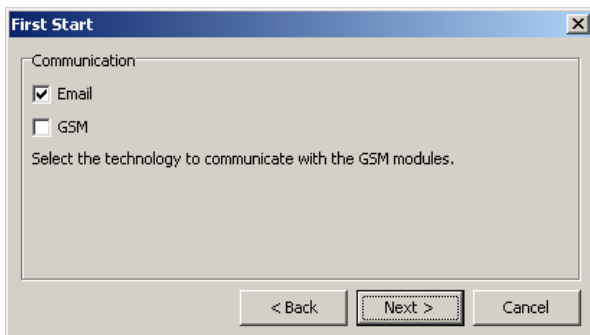


Figure [7] Communication technology email and SMS.

(custom configuration only)

Select the type of communication you wish to use for the transmission of measured data from the GSM modules to the Datamanager.

If you have selected at least one of the indicated communication types (Email, GSM), the email administration and/or the GSM configuration is displayed after the "First Start" dialog.

See Chapter 4 for further information concerning Email Configuration.

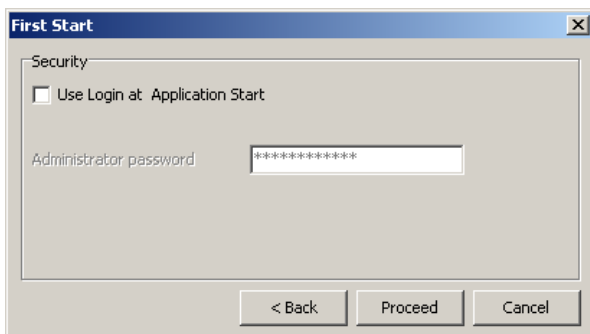


Figure [8] Login at application start.

(custom configuration only)

Activate "Use Login at Application Start" if the Datamanager should be protected by a password.



Depending on the selected communication technologies 2 the basic configuration steps will lead you to one of the following dialogs:

Technology email: for more information concerning email administration please refer to Chapter 4.

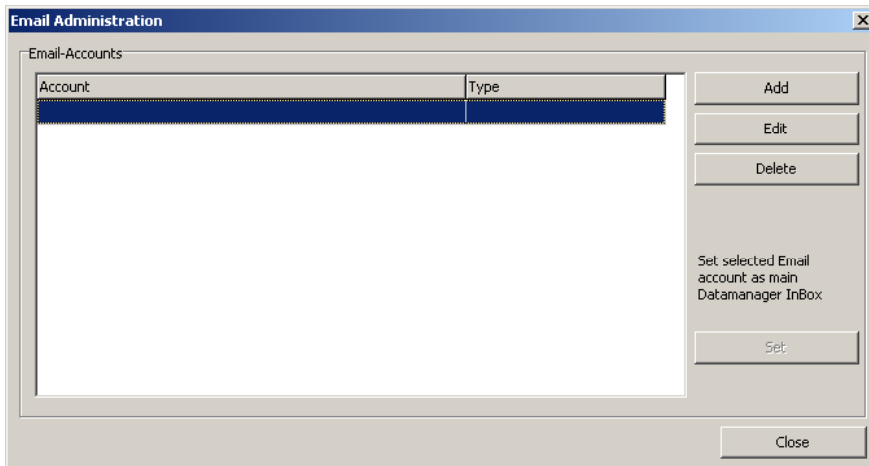


Figure [9] Email administration.

Technology SMS: a detailed description of SMS terminal configuration can be found in Chapter 8

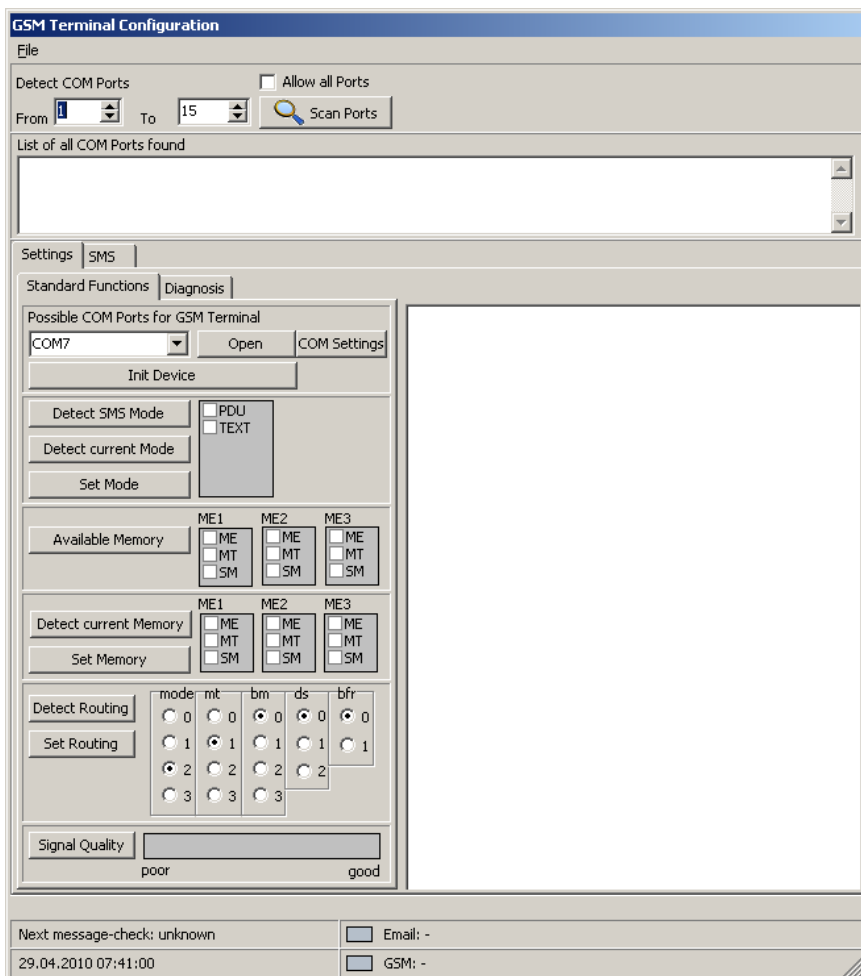


Figure [10] GSM terminal configuration.



After "First Start" is completed, the Datamanager shows the following main window:

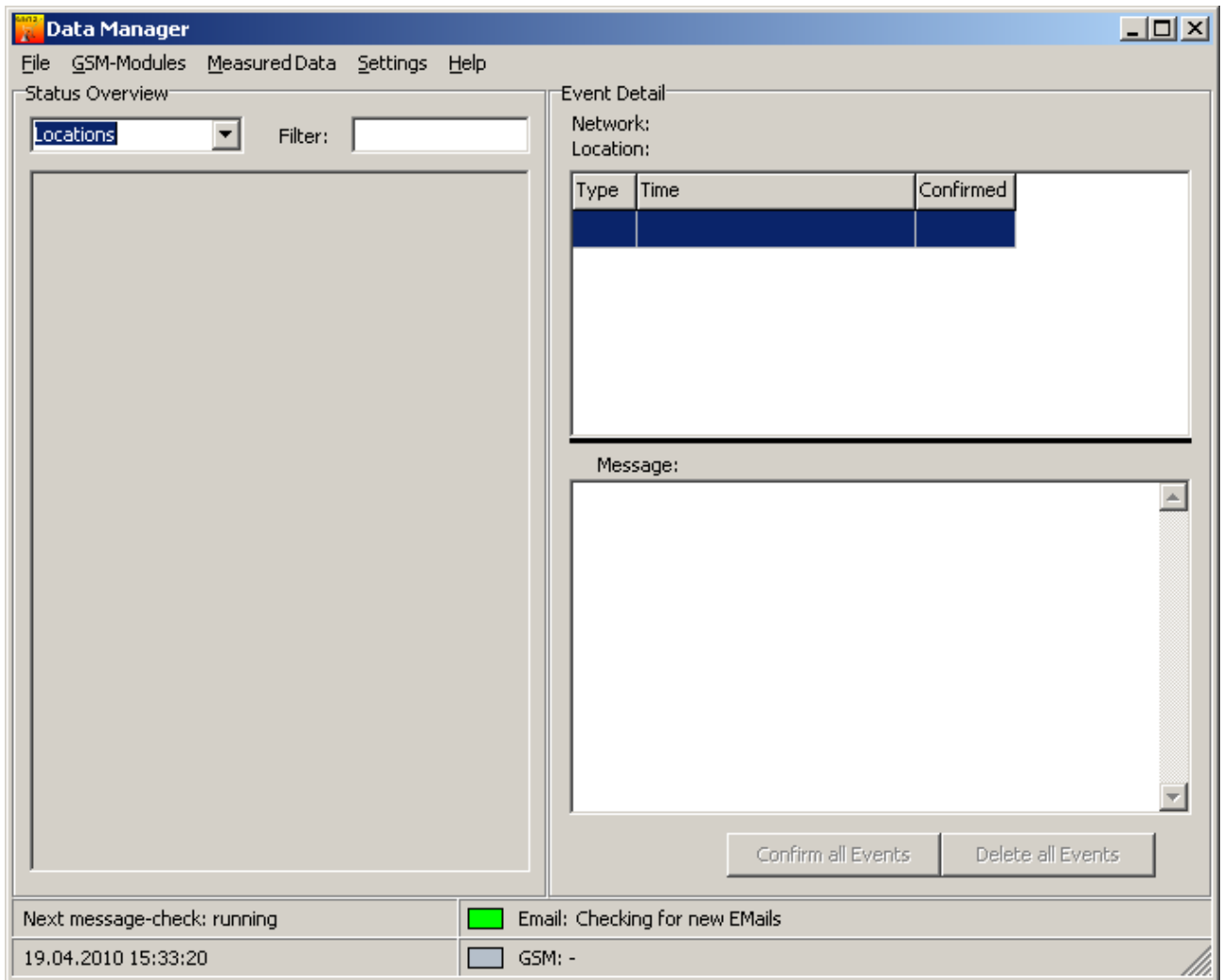


Figure [11] Datamanager main window.

If an email account is configured, the Datamanager will now receive messages (configurations and data) from the GSM modules. Additional settings can now be made in the Datamanager.

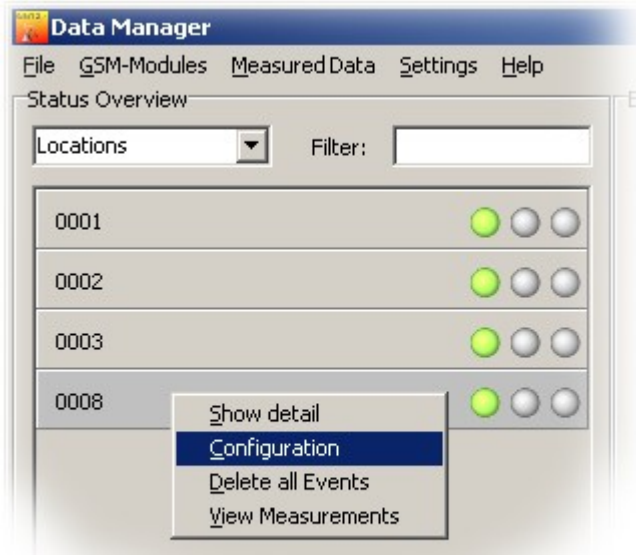


3 GSM Module Configuration

Changing the configuration of an existing location:

The figures below show two different ways of how to configure an existing location.

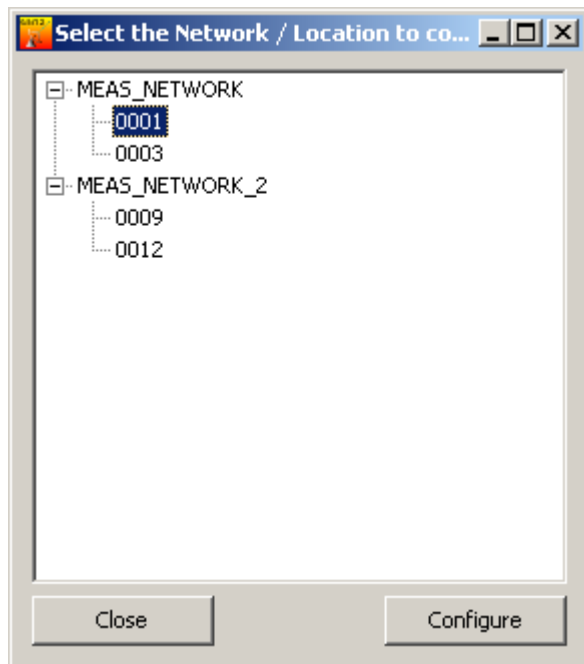
Context menu:



Right-click on the location you wish to configure and select "Configuration".

Figure [12] Context menu configuration of a registered location.

Datamanager main menu:



Select → "GSM Modules" → "Configure".

Select the location or the network you wish to configure.

Figure [13] Selecting a measuring location.

Adding a location:



To add a location, select → "GSM Modules" → "New" → "Location":

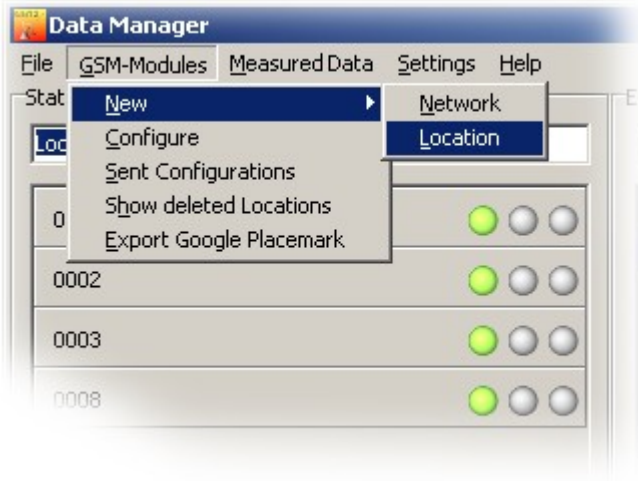


Figure [14] Main menu for manually adding a new measuring location

When a location is selected, the dialog shown in 3 allows you to examine and configure all the parameters that belong to the location in question.

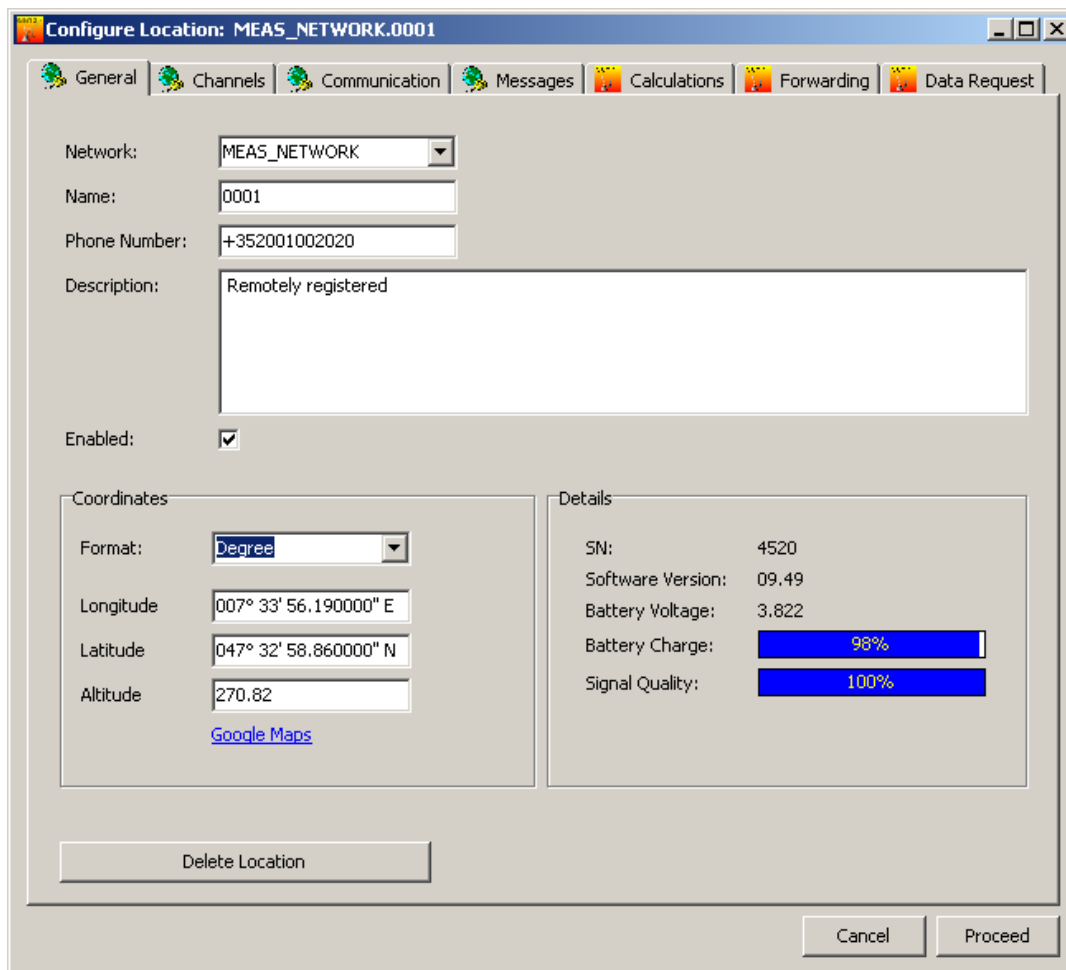



Figure [15] "Configure location" dialog



The configuration process is divided into two sections:



Tabs with the  symbol show the configuration of the GSM module. Changes executed here will send a configuration command (email) to the corresponding GSM module.

General

Network, name, phone number, description (coordinates of the location).

Channels

Configuration of the GSM type, enable/disable channels, calibration of each channel.

Communication

GPRS settings, email settings, SMS settings.

Messages

Configuration of the different message types.

These configurations correspond with the program GSM Setup. Read the GSM Setup manual for further information.



The following functions are for data processing and not for GSM-2 module configuration:

Calculations

Configuration of different calculations, i.e. water level etc.

Forwarding

Events like incoming emails can be forwarded to any recipient.

Data Request

Requests data from a GSM module.

3.1 Status Symbols

The GSM-2 modules can be configured remotely with the Datamanager if the firmware version of the GSM module is at least 07.18.

If you have version 07.18 or higher, any configuration changes will trigger the procedure of sending a special configuration change email to the corresponding GSM-2 module.

Note that if the version is lower than 07.18, any configuration changes will only take place within the Datamanager and the following window will be displayed.

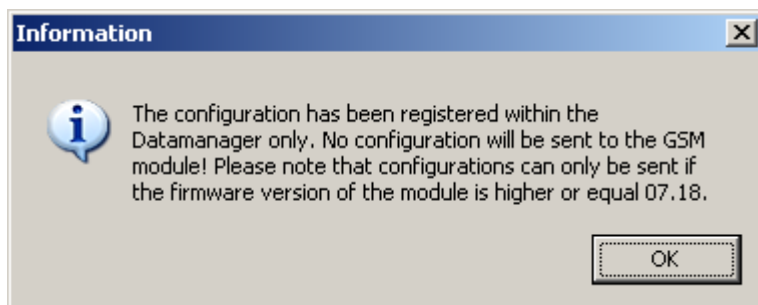


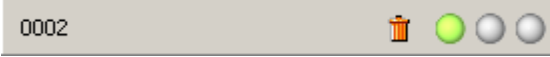



Figure [16] Configuration change information dialog .







The Datamanager monitors the status of all measuring locations. Different symbols are used to display the current status of a measuring location and its configuration:

	<p><u>Spanner</u></p>	<p>The "Spanner" symbol shows up if a new configuration is sent to the location.</p>
	<p><u>Sleep</u></p>	<p>The "Sleep" symbol shows up if the GSM-2 module does not acknowledge the configuration for a configurable time period.</p>
	<p><u>Trash</u></p>	<p>The "Trash" symbol shows up if the GSM-2 module has discarded the sent configuration.</p>
	<p><u>? Graph</u></p>	<p>The "? Graph" symbol shows up if data is requested from the GSM-2 module and the Datamanager has not received it yet.</p>

To display any pending configuration, you may double-click (or right-click) the symbol.

Three traffic lights indicate the status of the GSM-2 module:

	<p><u>Green light</u></p>	<p>Everything is OK.</p>
	<p><u>Orange light</u></p>	<p>The sign changes to orange if there are missing messages.</p>
	<p><u>Red light</u></p>	<p>The GSM-2 module has sent an alarm message.</p>
	<p><u>No light</u></p>	<p>Location is not active.</p>

3.2 Calculations

The tab "Calculations" shows your defined calculations. Here, you can define that...

- data is converted and displayed as a water level
- overflow is calculated
- units are changed
- offset is added to the values
- gain is applied (scaling)

Any changes applied here will be adapted by the Datamanager immediately and a configuration email sent to the GSM-2 module for data alignment.



Following an example of adding a water level calculation:

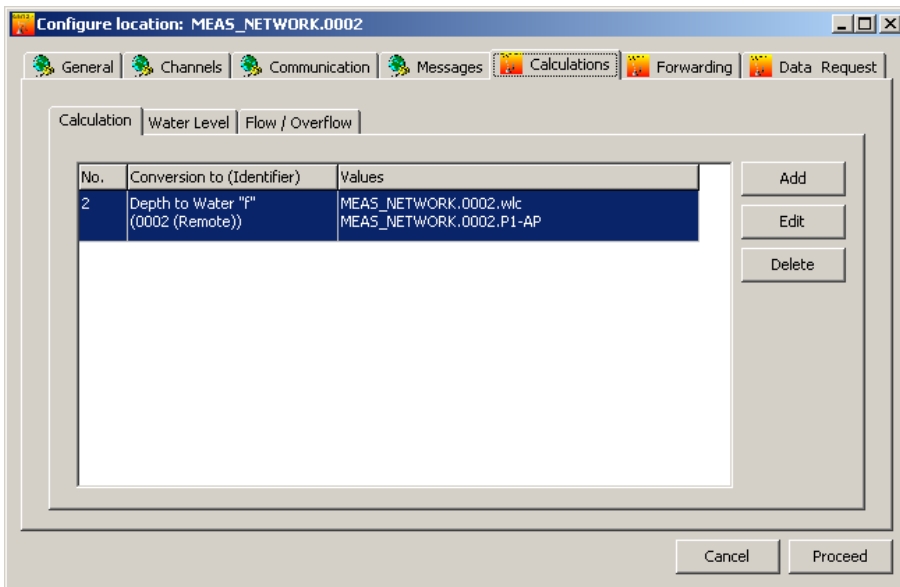


Figure [17] Adding a calculation

Activate the "Calculation" tab and then press the button "Add".

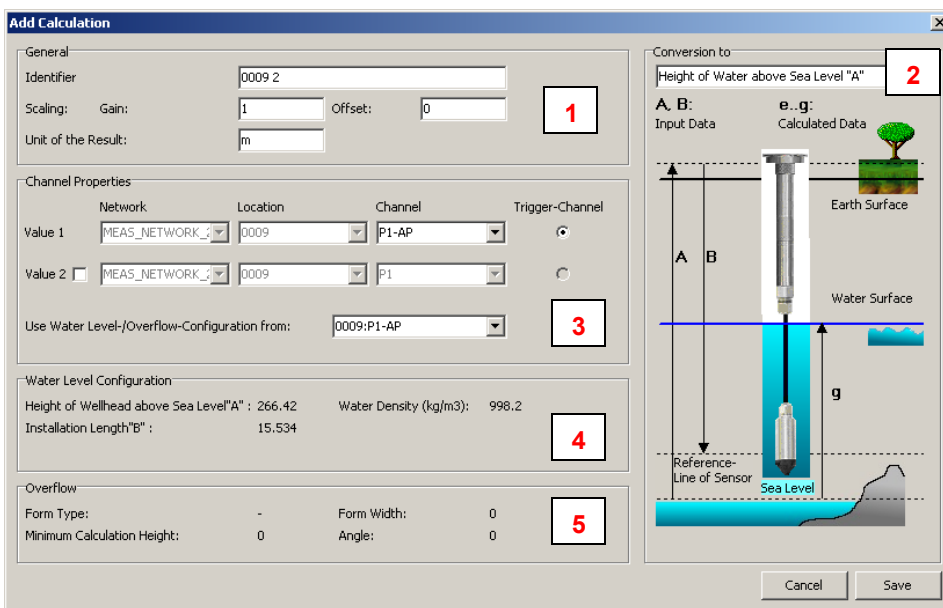


Figure [18] Configuring a calculation

Number	Description	
1	"Identifier" "Scaling Gain/Offset" "Unit of the Result"	<p>You can assign any name to the new calculation. The default values are Gain=1 and Offset=0 The calculation result has a physical unit</p> <p>Note : You can use the Gain and Offset parameter to obtain the physical unit which fulfils your requirements. The scaling is performed on the calculated value. The Datamanager always uses ISO standard units: Length is measured in m and pressure is measured in bar. The Datamanager carries out the calculation based on the raw data measured in</p>



		ISO physical units. A scaling on each calculated value can be executed. For example, you would like that calculations yield results measured in mm-water column the appropriate Gain would be 1000 because 1 m is equal to 1000 mm.
2	"Conversion to"	<p>You may choose one of the available conversions from the combobox. These are:</p> <ul style="list-style-type: none"> • Height of Water "e" • Depth to Water "f" • Height of Water above Sea Level "A" • Overflow (Poleni) • Overflow (Thomson) • Flow (Venturi) • Scaling <p>Note: Choose "Scaling" if you wish to apply the scaling with "Gain" and "Offset" only to the raw data. This might be the case if the measuring channel provides a physical value not representing a pressure, e.g. a voltage from a measuring gauge connected to the voltage input of the GSM-2 module.</p>
3	"Channel Properties"	<p>For water level calculations you will need a pressure difference. The pressure difference between water pressure and ambient pressure eliminates the influence of atmospheric variations due to weather changes. The default setting for calculating the relative water pressure is "P1-AP" so the pressure difference arises from the measurement of pressure gauge 1 in the water minus the value measured by the on-board barometer in the GSM-2 module.</p> <p>Please note that this setting depends on the actual hardware connected to the GSM-2 module! If a relative pressure transmitter is connected the correct setting would be P1 only, because the relative pressure transmitter measures the pressure difference between water pressure and ambient pressure.</p> <p>The Datamanager allows you to calculate the pressure difference based on measuring values from two different locations. This can be helpful if there are absolute pressure transmitters connected to the GSM-2 module and the barometric pressure should be obtained from a different location. Enabling the checkbox "Value 2" activates the comboboxes "Network", "Location" and "Channel" which allow you to choose the second measuring location. In such configurations the radio group "Trigger-Channel" can be active for either "Value 1" or "Value 2". The setting of the "Trigger-Channel" determines which measuring value initiates the calculation of pressure differences. Please bear in mind that "Value1" and "Value2" do not necessarily arrive simultaneously at the Datamanager. There is a time tolerance which can be adjusted to ensure that only reasonable pressure differences will be calculated. It is not expedient to calculate a pressure difference based on values measured on different days, for instance. In Chapter 5 5.1 you will find further explanations concerning the adjustment of the "Time band for calculations"</p>
4	"Water Level Configuration"	For reference only; all relevant parameters concerning the water level configuration are displayed in this group box.
5	"Overflow"	The important parameters for overflow calculation according the formulas of Poleni or Thomson are shown in the group box "Overflow".



3.3 Remote Configuration of Water Level, Overflow and Calculation

The initial configuration of the GSM-2 modules is carried out on-site during installation with the help of the programming software "GSM Configuration". All parameters required for carrying out water level or overflow calculations can be adjusted during start-up in the field, where the operator has the opportunity to validate the settings in the software via manual measurements to achieve reliable operation and monitoring of the measuring location. All settings can be sent by a configuration email to the Datamanager which then processes the email content. The Datamanager registers new measuring locations or updates the parameterization of an existing, previously registered measuring location. The settings for water level calculations represent a part of such a parameterization and the Datamanager automatically adds a calculation as if the calculation had been added manually, as specified above in Section 3.2.

3.4 Water Level Configuration

The Datamanager offers access to all installation parameters and settings of any registered measuring location as shown in 3.4.

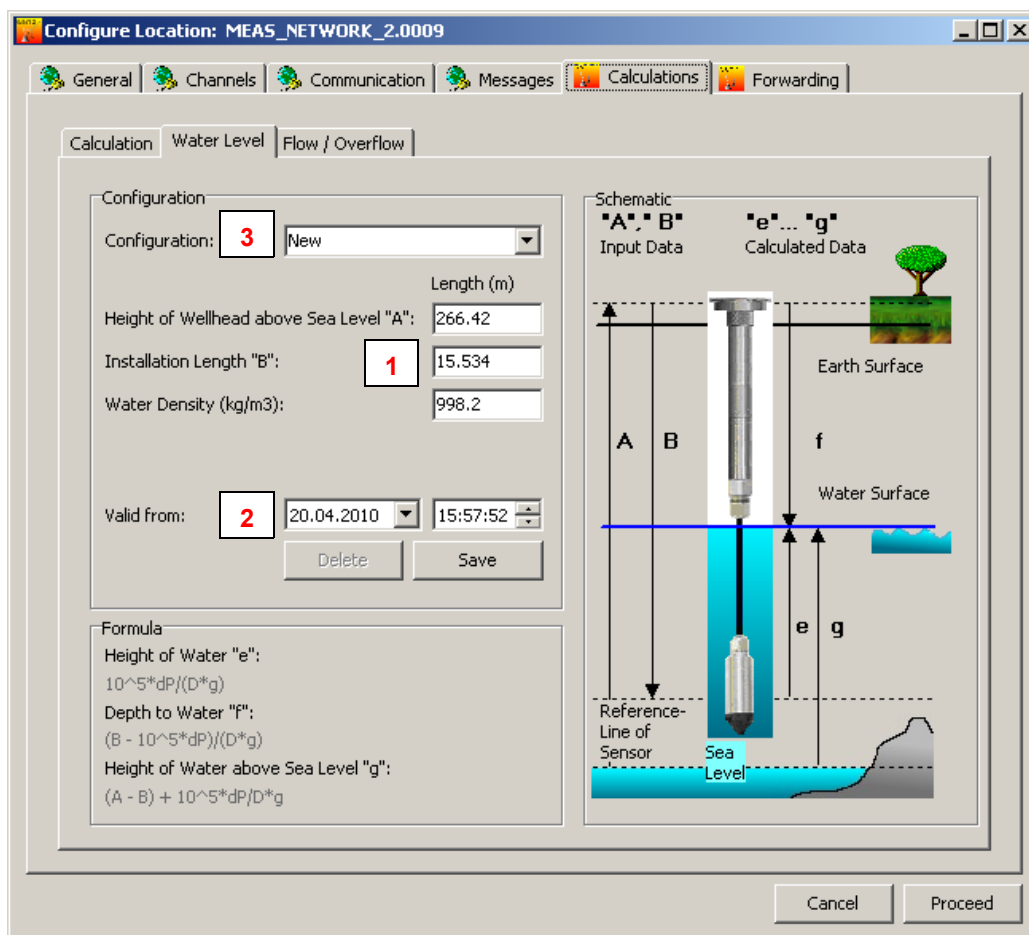


Figure [19] Water level configuration



Number	Description	
1	"Height above Sea Level" "Installation Length" "Water Density"	Altitude information is required if you wish to relate the calculated water level to the sea level (see 3.2 – "Conversion to"). "Installation Length" is the total length of the system measured from the reference line of the sensor up to the reference plane on which the water levels should be correlated. Information about the density is required to derive level heights from pressure. 998.2 kg/m ³ is the density of water at normal condition (20° C and pressure of 1 bar). Note that sea water has a higher density.
2	"Valid from"	Datamanager maintains the chronology of the water level configuration. That means that the settings are linked to the date and time of validity. This is important whenever the settings are changed over the duration of monitoring the measuring location. Otherwise, water level calculations would lead to wrong results if measurement values from the past are combined with a parameterization which was not yet valid at that time! It is highly recommendable to add a new water level parameterization with a new date and time of validity whenever adjustments of e.g. "Installation Length" are required! In the combobox marked with 3 select the item "new" to assign a new set of water level parameters with its date and time of validity.
3	"New" Configuration	There can be several sets of water level parameterizations with the date and time of validity assigned to one measuring location. Please read the description "Valid from" for a better understanding.

3.5 (Over)Flow Configuration

The Datamanager supports three different types of calculations for flow and overflow respectively. Overflow calculations based on the formulas of *Poleni* or *Thomson* and flow can be measured with a Venturi tube. Applying the Poleni or Thomson formula depends on the layout of the monitored spillway.

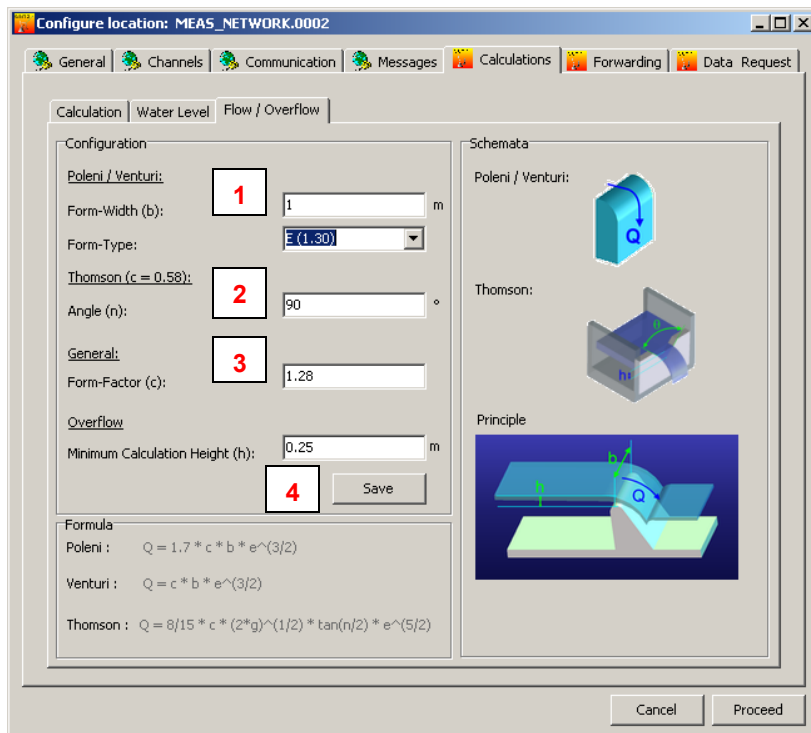


Figure [20] Flow and overflow calculations according to Poleni or Thomson.

Number	Description
--------	-------------



1	"Poleni / Venturi"	Specify the width measured in m and the appropriate form type
2	"Thomson"	Enter the angle measured in degrees (°) of the Thomson spillway or V-Notch weir
3	"General"	Specify the form factor
4	"Overflow"	For reliable measurements a minimum calculation height has to be specified. The minimum calculation height represents the threshold when the water flow over the weir complies with well-defined hydraulic conditions and Poleni's formula yields reasonable results. Only heights equal to or greater than the minimum calculation height will be taken into consideration for flow level calculations.

3.6 Message Forwarding

Information or alarm notification messages are bound to a location and can be forwarded to any email address or phone number.

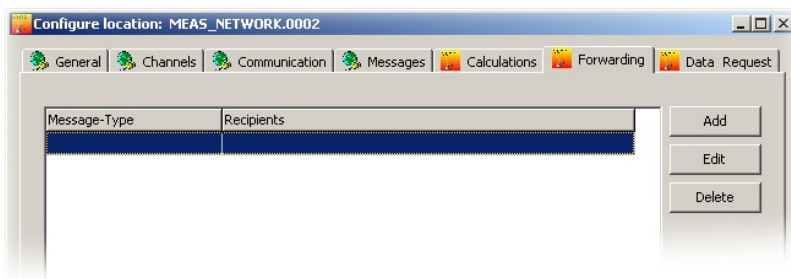


Figure [21] Message forwarding as a part of a location's configuration

Press "Add" to specify a new message forwarding rule or "Edit" to view or modify an existing forwarding rule. The dialog window as shown in 3.6 will be displayed.

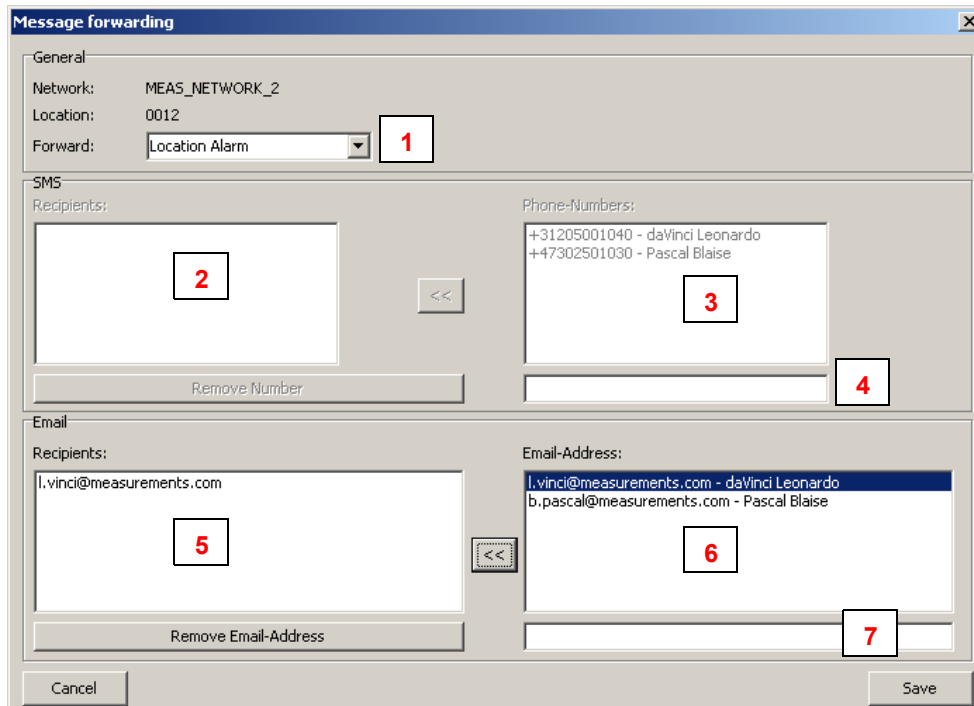


Figure [22] Definition of a message forwarding rule



Number	Description	
1	"General"	<p>Select the desired forwarding type:</p> <p><i>Location Alarm:</i> Alarm messages initiated by the GSM-2 module.</p> <p><i>Location Info:</i> Information messages initiated by the GSM-2 module.</p> <p><i>Datamanager Alarm:</i> Alarm messages initiated by the Datamanager or GSM-2 module.</p> <p><i>Datamanager Info:</i> Information messages initiated by the Datamanager or GSM-2 module.</p>
2	"SMS Recipients"	The listed recipients will receive the forwarded messages per SMS
3	"Phone Numbers"	<p>The list "Phone Numbers" shows all the available phone numbers which have been previously registered in the context user administration. See Section 7.8 for more information concerning the user administration.</p> <p>Press the "<<" button to shift the selected number to the list of recipients.</p>
4		<p>Here, you may enter any phone number.</p> <p>Press the "<<" button to shift the number to the list of recipients.</p>
5	"Email Recipients"	The listed recipients will get the forwarding messages per email.
6	"Email Address"	<p>The list "Email Address" shows all available addresses previously registered in the context user administration. See Section 7.8 for more information concerning the user administration.</p> <p>Press the "<<" button to shift the selected email address to the list of recipients.</p>
7		<p>Here, you may enter any email address.</p> <p>Press the "<<" button to shift the address to the list of recipients.</p>

To delete an item in the list of either "SMS Recipients" or "Email Recipients", select the item and press either the button "Remove Number" or "Remove Email Address".

Press the button "Save" to proceed and close the dialog window.



3.7 Data Request

GSM-2 modules driven with a firmware version higher than or equal to 09.09 are able to record measured data like a data logger. Datamanager allows you to request the recorded data from such GSM-2 modules. The Datamanager application generates a data request email and sends it to the GSM-2 module in question asking for measured data within a specified time period.

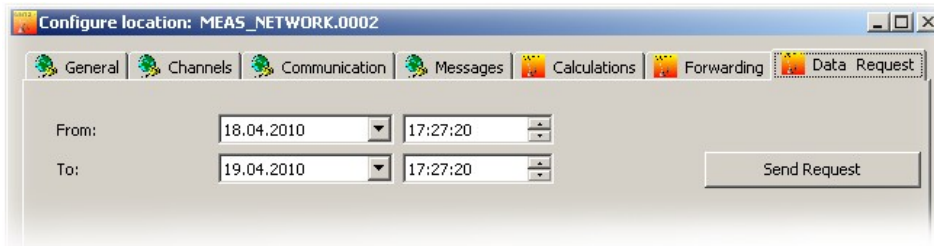


Figure [23] Data Request functionality of the Datamanager

Specify the desired period with the help of the date and time input fields "From" and "To" and then press the button "Send Request".

Note: The GSM-2 module can send a maximum of 10 emails (approx. 2000 items of measured data). If you need more data, initiate an additional data request once you have received the data of the previous one.



4 Email Configuration

The following procedure describes how an email account is created in order to receive data sent by the GSM-2 module.

In the Datamanager main menu, select "Settings" and then "General" to call up the dialog window shown in 4.

Enable the option "Use Email" and press "OK"

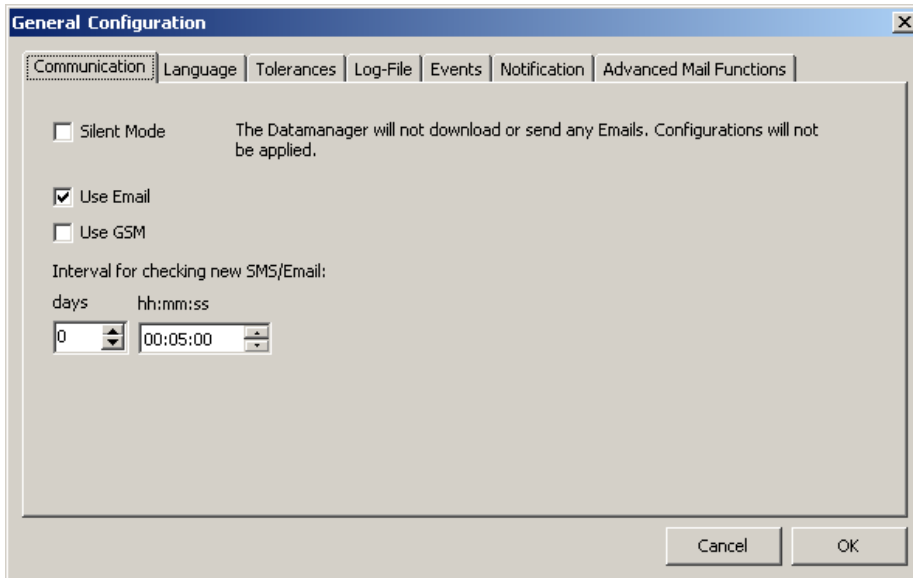


Figure [24] General settings -> Communication

Select "Settings" and then "Email" in the Datamanager's main menu to call up the configuration dialogs of an email account.

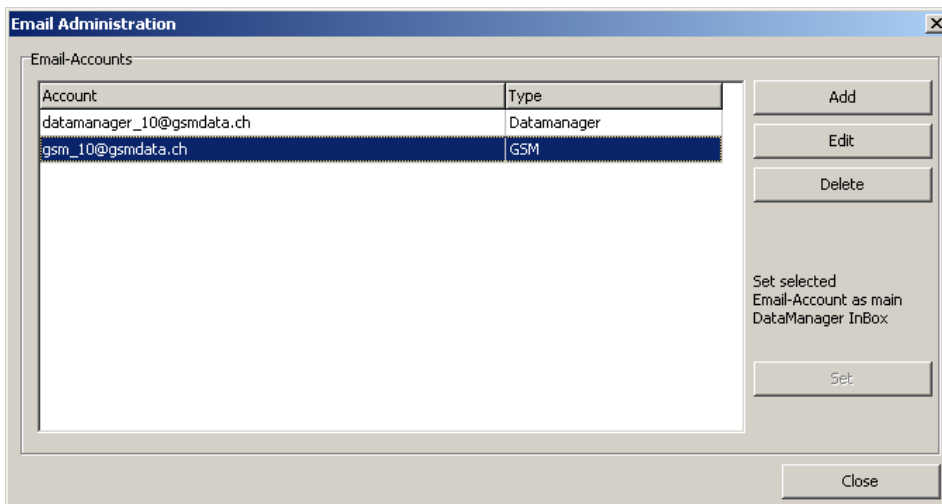


Figure [25] Email administration.

Press the button "Add" to create a new email account or "Edit" to view and modify a previously created account.

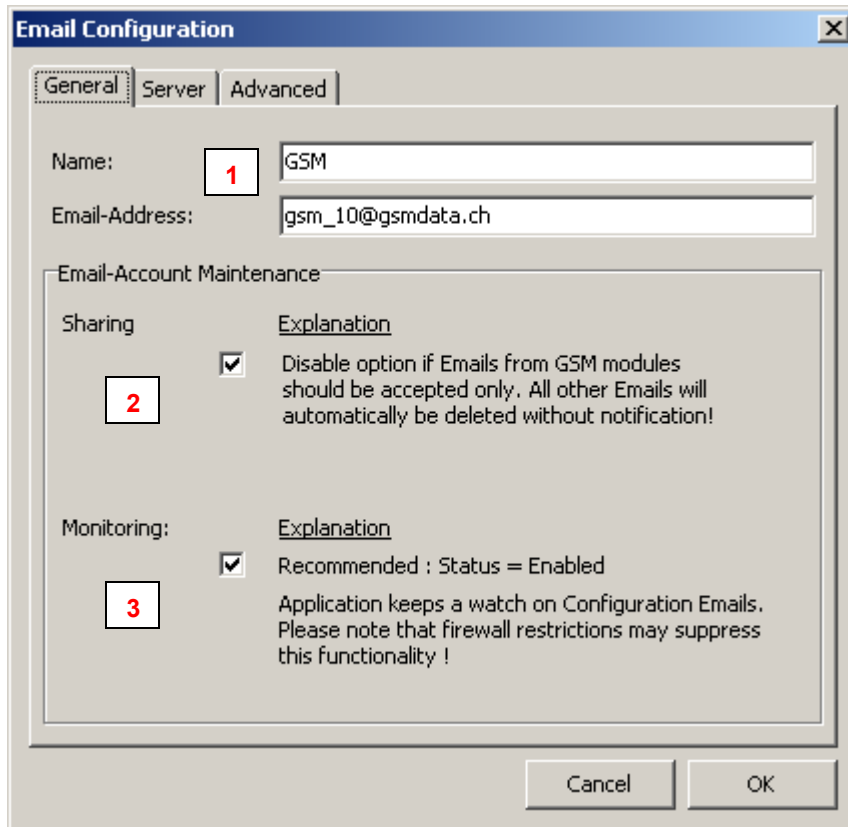


Figure [26] Email configuration and account maintenance

Number	Description	
1	"Name"	You should assign a suitable name to the email account. The name is used for organization only and has no direct relation to the settings and access data of the account.
	"Email Address"	Enter a valid email address.
2	"Sharing"	The Datamanager has advanced email account maintenance functionalities. The "Sharing" option allows you to determine how the email account should be maintained. When you disable the option "Sharing", the Datamanager will automatically delete all emails which do not originate from a GSM-2 module (subject and structure clearly determine the GSM-2 modules' email). Disabling the option "Sharing" is recommended if the email account is designated to be used for GSM-2 only. The advantage is that spam emails, for instance, will automatically be deleted.
3	"Monitoring"	Datamanager supervises the email account(s) which are used by the GSM-2 modules to receive configuration emails. Datamanager automatically deletes acknowledged configuration emails and cleans the account from undesired spam emails. The advantage of this option is that a GSM module (which checks the account for new configurations and then downloads all the email headers of such an account) can save battery power by avoiding unnecessary traffic.

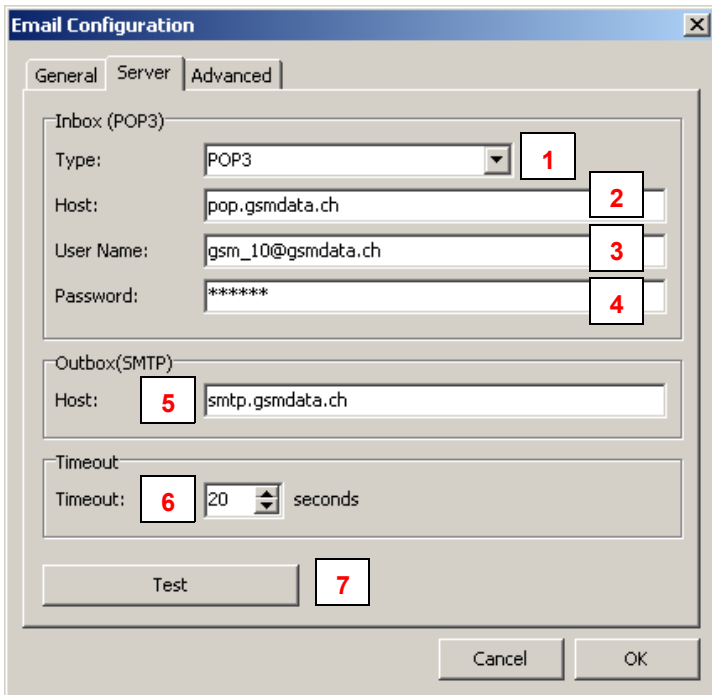


Figure [27] Email configuration mail server and access data

Number	Description	
1	"Inbox Type"	Select the appropriate mail server type. POP3 (post office protocol is standard selection) The Datamanager supports the IMAP (Internet Message Access Protocol) also for receiving measurements – <i>but only for receiving messages!</i> Note: <i>The GSM-2 modules support the POP3 protocol only! The GSM-2 modules are able to login to a POP server only!</i>
2	"Host"	Server name for the email Inbox
3	"User Name"	Authentication on a mail server requires a user name
4	"Password"	Authentication on a mail server also requires a password
5	"Outbox (SMTP)"	Server name of the outgoing Mailbox. The server supports the SMTP protocol (Simple Mail Transfer Protocol)
6	"Timeout"	Duration measured in seconds Datamanager waits on the answer of the mail server confirming a successful login. When answer is still outstanding when the timeout duration elapses Datamanager quits login procedure by throwing a timeout exception.
7	"Test"	Press the "Test" button to carry out a test with the current settings. See below 4

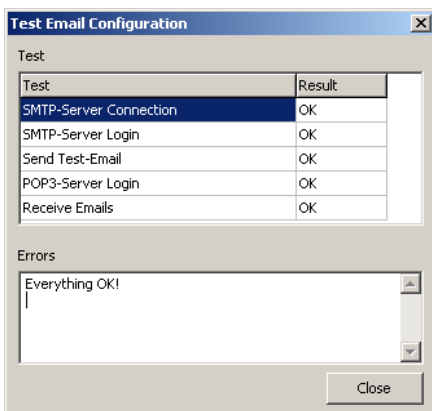


Figure [28] Test email configuration



5 Additional Settings

5.1 General Configuration

The main menu command "Settings" -> "General" calls up the configuration dialog as shown below in 5.1.

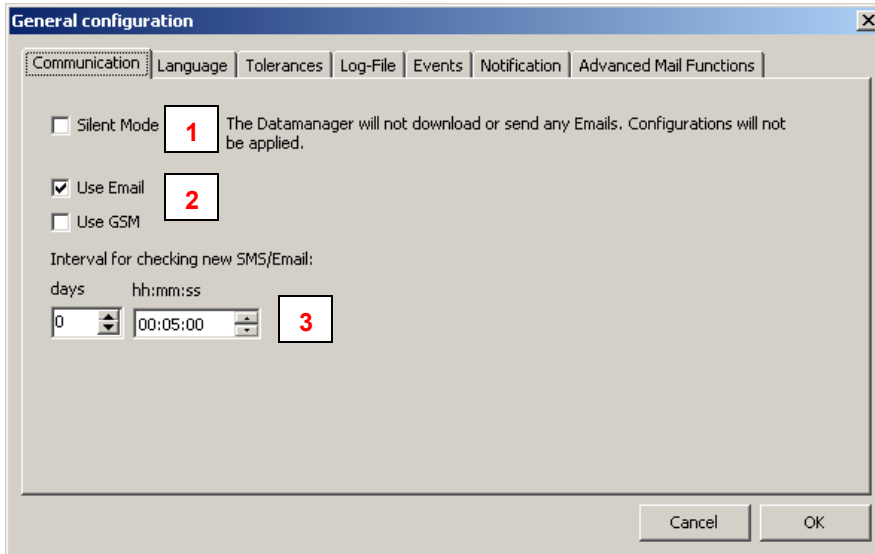


Figure [29] General configuration settings

Number	Description	
1	"Silent Mode"	Please see Section 7.2 for description of "Silent Mode"
2	"Use email" "Use GSM"	"Use email": Enables the communication by email "Use GSM": Enables the communication by SMS (requires a GSM modem connected to your PC)
3	"Interval for checking SMS/Email"	Enter the interval in which the Datamanager checks for new data (Email/SMS).

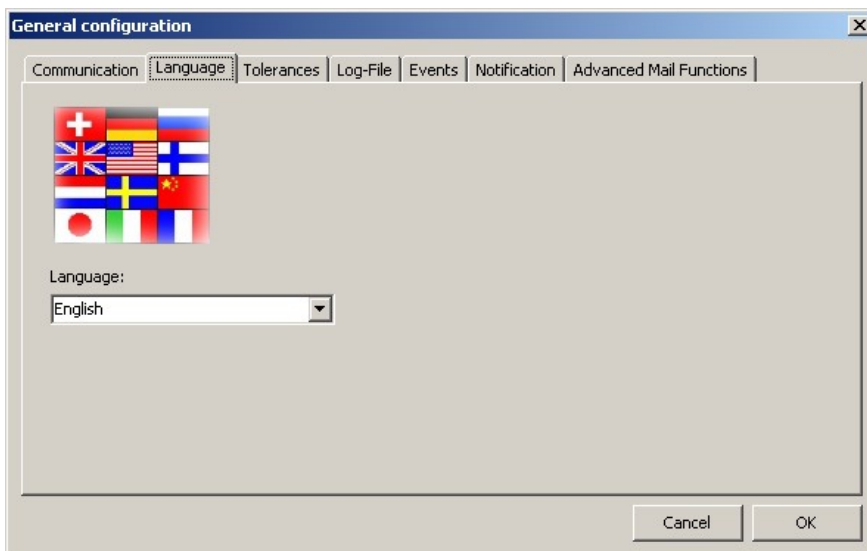


Figure [30] Language settings

Select the desired language.

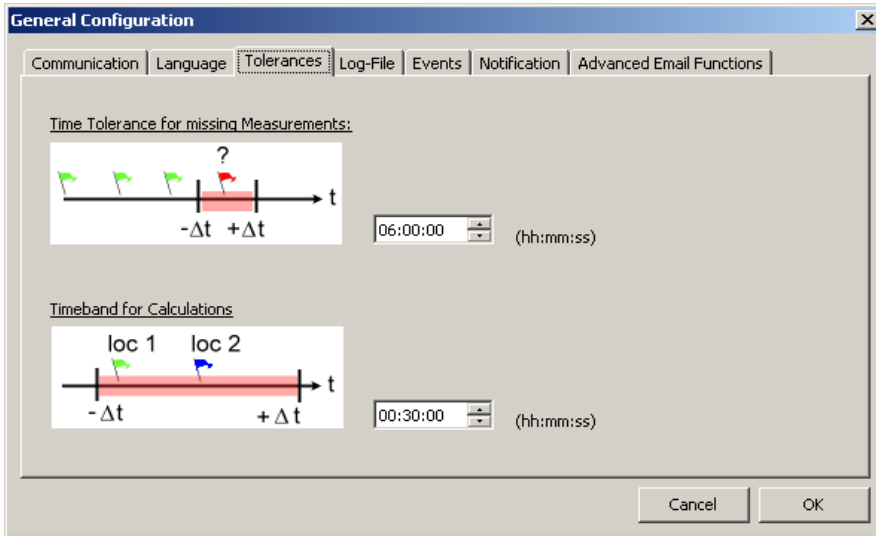


Figure [31] Time tolerance settings

Number	Description	
1	"Time tolerance for missing messages"	The "Time tolerance for missing messages" defines how long the Datamanager waits for expected data from the locations. If no data is received within the specified time, Datamanager creates an info event which informs the user that data is overdue.
2	"Time band for calculations"	The "Time band for calculations" defines the maximum time difference between two measurements, i.e. P1 (level sensor) & AP (air pressure) so that a calculation can be executed (this is only relevant if the data comes from two different locations). Also see Section 3.2 Calculations "Channel Properties"

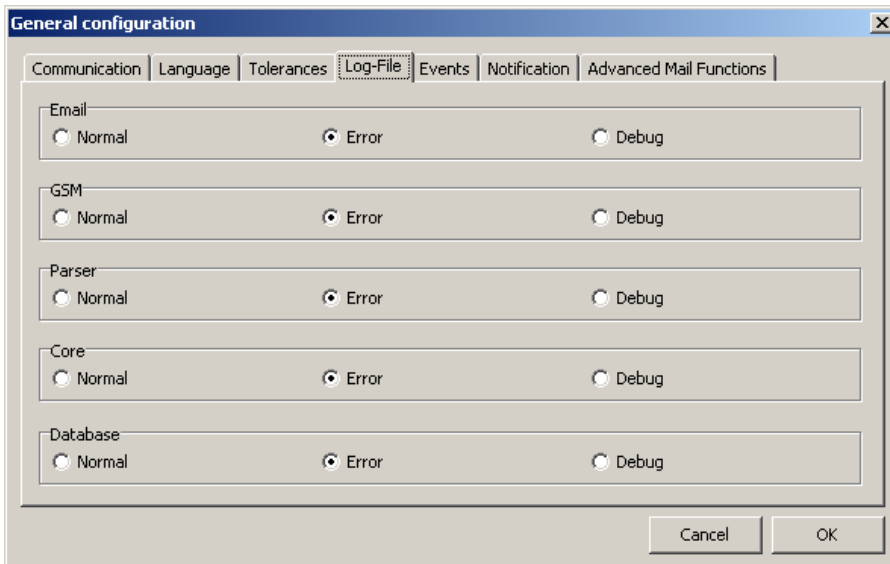


Figure [32] Log file settings

The Datamanager creates a continuous log file when active.

In the tab "Log-File" you can define three different levels:

Normal: Only important messages are registered.

Error: The log file states which errors occurred (in addition to the "Normal"-messages)

Debug: All possible messages are written into the log file (note that this creates a large log file size).

"Error" setting is recommended.

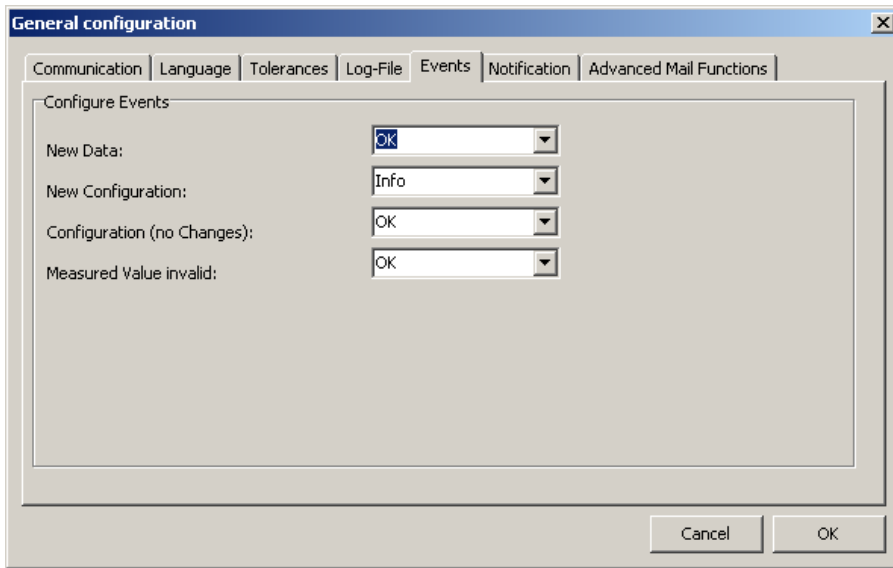


Figure [33] Setting events and how they are displayed

In the tab "Events" you can define for each incoming message (email or SMS) which event type should be displayed:

- OK: Leaves the traffic light on green.
- Info: Turns the traffic light to orange.

Events	Description
New Data	New data (Email/SMS) processed.
New Configuration	New email with configuration arrived.
Configuration (no changes)	An email with an already known configuration arrived.
Measuring Value invalid	The measuring data is not within the specified range.

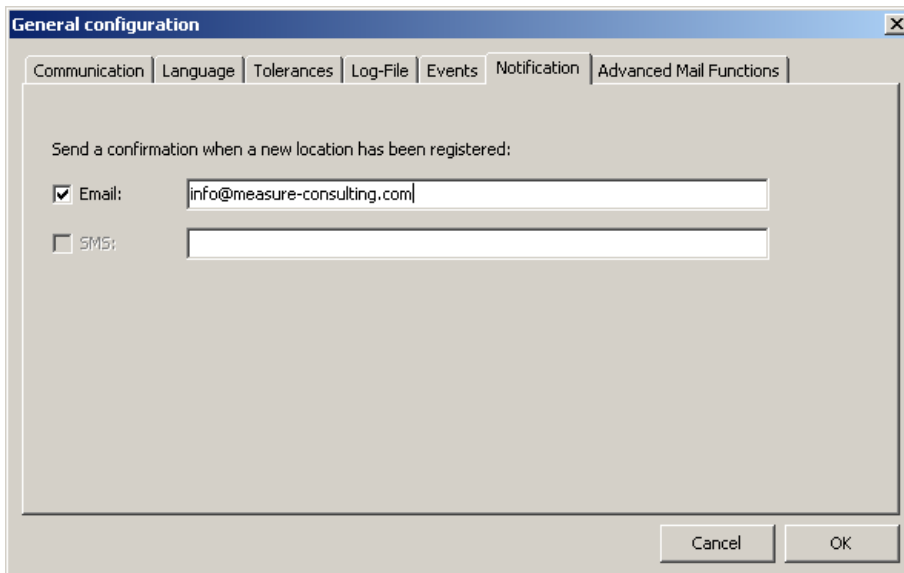


Figure [34] Setting notification by email or SMS

The Datamanager allows you to send a notification to any email address or phone number whenever a registration email is received by the Datamanager. Enable the appropriate checkbox and enter a valid recipient.

Note: Sending SMS requires a GSM modem connected to your PC!



6 Export Data

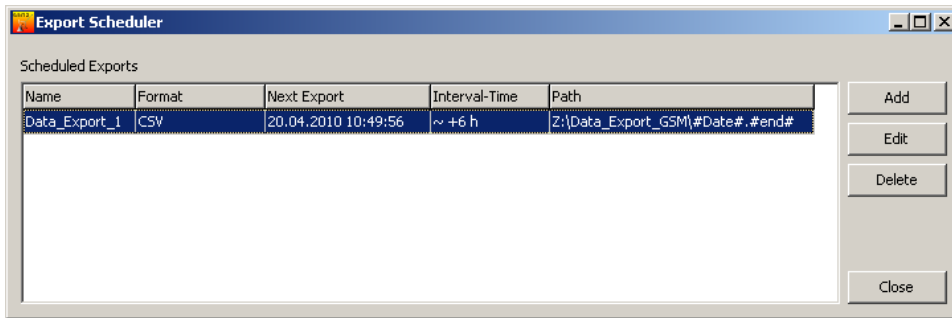


Figure [35] Export Scheduler for exporting data for other applications

The Datamanager offers several export filters to make the measurements or calculated values available to other applications. The application maintains a list of independent data export rules or tasks. In the Datamanager main menu, choose the commands "Measured Data" → "Export Scheduler" to call up the list as shown above in 6 . Each item in the list of the Export Scheduler consists of a customizable name, the indicator which export filter should be applied, the date and time when the scheduler will carry out the data export, the time interval of recurrent data export and, finally, the path where the data should be stored.

Export Filter	Description
CSV	The CSV export filter generates a text-based output file where the data is arranged in a vector. If more than one measuring channel was selected for data export, the channel data is grouped in sections which follow one another. CSV = Comma-Separated Values
CSV-2	The CSV-2 export filter also generates a text file. In contrast to the CSV filter exported data will be arranged in a matrix, where each column represents data from a measuring channel.
Delft FEWS	The Delft FEWS export filter generates an XML file according to the Delft FEWS published interface. The exported data is treated as Time Series and satisfies the Delft FEWS XML Schema and Namespaces.
HYDRAS	The HYDRAS export filter generates text-based files which are suitable for the auto-import functionalities of Hydras. The files contain an XML-like header describing the measuring location and channel as follows: <STATION>0000000706</STATION><SENSOR>0010</SENSOR> The data is structured in tabulator-separated columns: <i>Date TAB Time TAB Value</i>
Overflow	The Datamanager is able to calculate an "Overflow Report" based on the settings described in Section 3.5
External Application	The Datamanager can launch any external software or batch file script in connection with CMD.exe. In this context KELLER offers an FTP uploader program which allows you to upload exported data files on any FTP server.

Follow the steps described below to add and configure a new data export task in the Export Scheduler's list..



Figure [36] Configuring a data export rule: export format and export category

Number	Description	
1	"Export to"	Select the appropriate export format. The description of available export formats can be found in the table above; see Export Filter
2	"Single Export"	Two categories of data export are available. "Single Export" and "Recurrent Export", whereby the single export is carried out only once and the recurrent export will become an Export Scheduler list item and will be performed periodically. Note: the option must be disabled to create a recurrent export rule.
3	"Name"	Any name can be assigned to a recurrent data export for easier distinction.
4	"Data"	Select which data should be taken into consideration for data export. "New Data" means that only new measurements (since the last recurrent export has been carried out) will be shown in the data export file. "All Data" forces the Datamanager to export all available data from a measuring location.

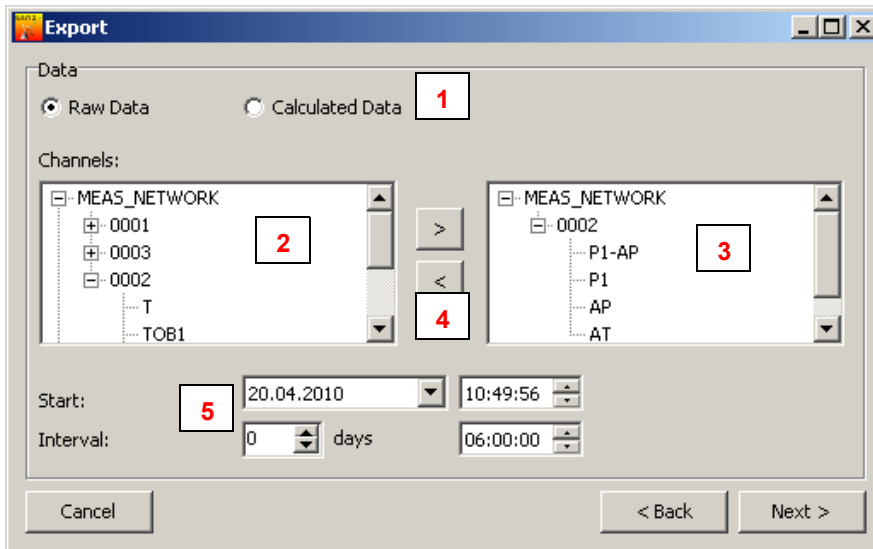


Figure [37] Configuring a data export rule: selecting the measuring location, channels and data type

Number	Description	
1	"Raw Data" "Calculated Data"	"Raw Data" means that the data export should contain the raw measured values. "Calculated Data" will produce exported data sourced from a calculation, e.g. a calculated water level. For further information concerning calculations please refer to Section 3.2
2	Tree view of available measuring locations and their channels	The tree view on the left-hand side shows all the available measuring locations and the corresponding measuring channels. Choose the desired channels.
3	Tree view of selected measuring channels	The tree view on the right-hand side shows the selected channels and the corresponding measuring location.
4	Move left / move right	The two buttons marked with "<" and ">" can be used to move a selected tree node from one tree view to the other. This helps to include or exclude channels from the selection of exported channel data. Note: Double-clicking on a tree node has the same effect as pressing the buttons "<" or ">"
5	"Start" "Interval"	For recurring exports you should specify the Start Date and Time for the first planned data export and the desired time interval for periodically exporting data.

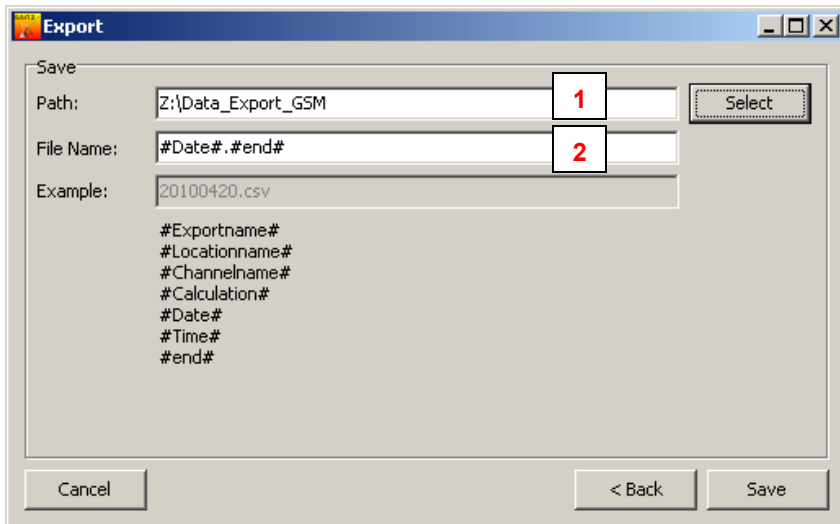


Figure [38] Configuring a data export rule: definition of filename and export path

Number	Description	
1	"Path"	Press the button "Select" to browse for a valid export path
2	"FileName"	The filename can be customized with the help of the listed variables marked with #. You may combine these variables together with any characters between the #variables# . In the Field "Example" you can see what the resulting file name will look like.



7 Features of the Datamanager

7.1 Import Measurements from IDC/DX5-Files

The following procedure describes how you can import measuring values from data loggers into the database of the Datamanager. Files ending with .idc or .dx5 were generated by the Logger software (Keller software for reading data from data loggers).

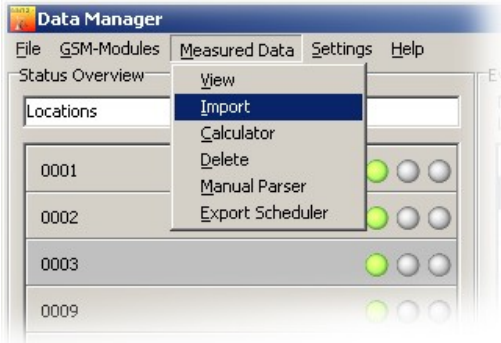


Figure [39] Data import from LoggerDCX

In the Datamanager's main menu, select the command "Measured Data" → "Import"

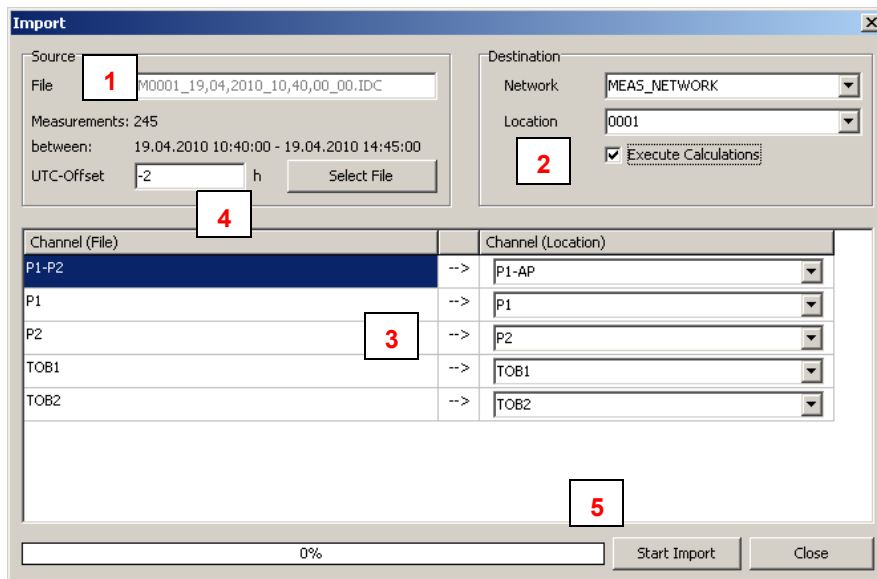


Figure [40] Import data: source file and assignment to an existing measuring location

Number	Description	
1	"File"	Press "Select File" to open a file dialog and select the IDC or DX5 file with measured data
2	"Network" "Location" "Execute Calculations"	The Datamanager does not know the existing measuring location to which the data from file should be assigned. Select "Network" and "Location" and mark the "Execute Calculations" option if needed. With "Execute Calculations" you can define whether the Datamanager should carry out the calculations available for the selected location. The Datamanager executes the calculations simultaneously while importing the data from the source file.
3	"Channel (File)" / "Channel (Location)"	"Channel (File)" on the left-hand side shows you which measuring channels were found in the source file for import. "Channel (Location)" on the right-hand



		side shows all the available channels of the selected measuring location. Map channels as required.
4	"UTC-Offset"	<i>Important !</i> Please note that Datamanager treats <i>internally</i> all timestamps in UTC (Universal Time Coordinated formerly Greenwich Mean Time GMT) but displays them adjusted to the local time according to the time zone settings of your PC. <i>Data which originates from LoggerDCX does not contain information about UTC Offset</i> that's why the appropriate UTC Offset has to be adjusted manually in order to define in which time zone the LoggerDCX has been collecting data.
5	"Start Import"	Proceed with "Start Import".

7.2 Silent Mode

The Datamanager can be set to silent mode. In this mode, no emails or SMS are sent or received and the data in the database remains unchanged.

However, silent mode does allow you to display existing data and configurations and to carry out data exports.

To enable silent mode, select → "Settings" → "General" and activate the checkbox on the first tab named "Silent Mode".

7.3 Calculator

The calculator is used to carry out a (pre-defined) calculation of measured values within a definable time period. The calculator can be useful if an existing calculation is subject to changes or a new calculation has been assigned to a measuring location. Of course, the availability of raw data is a prerequisite in order to execute Calculations.

In the Datamanager's main menu, select "Measured Data" → "Calculator".

The warning shown below appears every time you open the calculator to prevent the accidental execution of calculations.

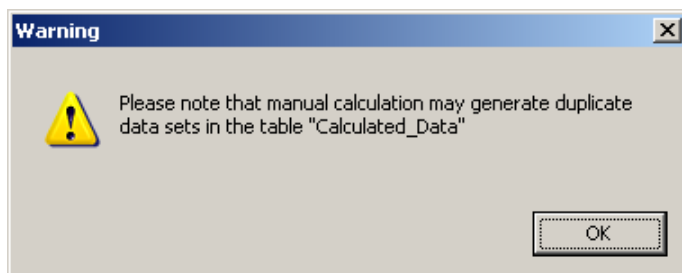


Figure [41] Warning dialog when executing the calculator

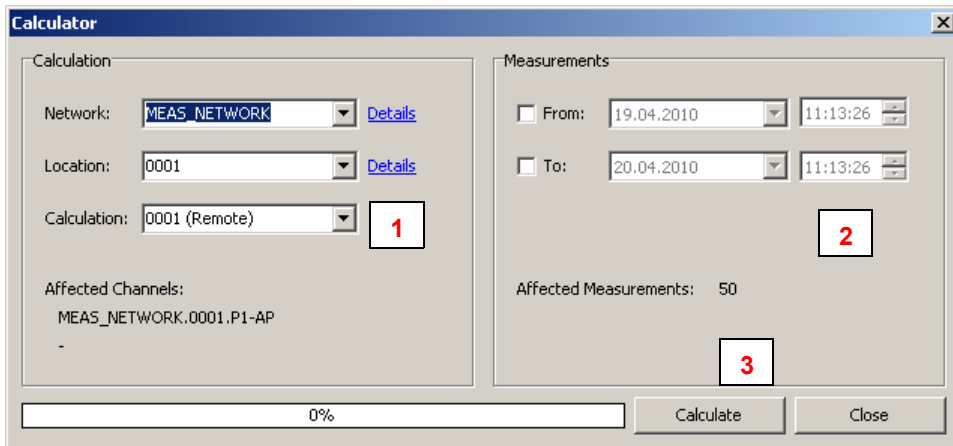


Figure [42] Calculator

Number	Description	
1	"Network" "Location" "Calculation"	You need to specify from which Network and Location the raw measurement data should be selected to perform the calculation(s) The combobox shows all calculations belonging to the selected Location. Each calculation is represented by its name. See "Identifier" in Section 3.2 for further information concerning calculations and their definition.
2	"From" / "To"	Specify the desired time period.
3	"Calculate"	Proceed with "Calculate".

7.4 Manual Parser

If an error message has been created by the Datamanager, the manual parser is used to analyse the incoming data and to split the measurements into individual channels. This allows measured values to be assigned manually to the corresponding location.

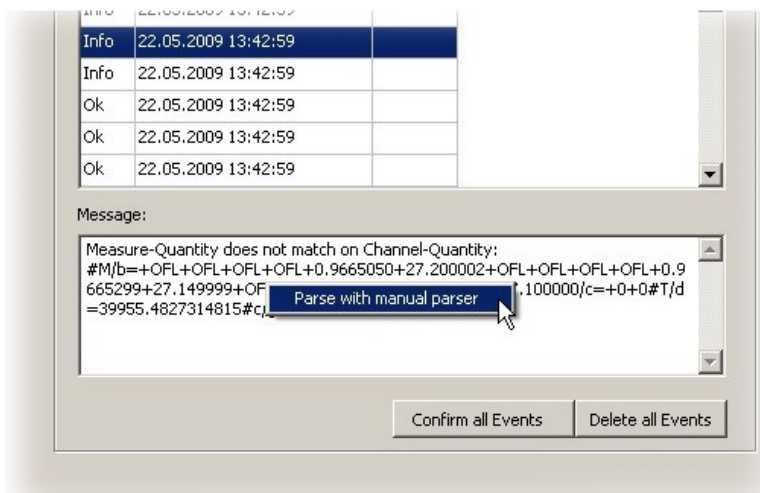


Figure [43] Info message: handling with manual parser

A right-click on the "Message" allows you to start the manual parser.

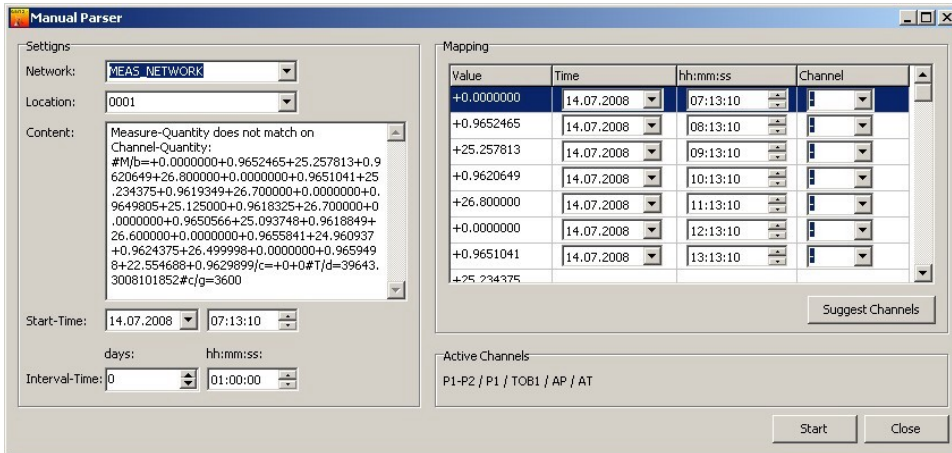


Figure [44] Manual parser

Under "Network" and "Location", select the appropriate measuring location to which the content of the "Message" belongs.

Paste the "Message" as shown in 7.4 in the Textbox named "Content".

Specify the time of the first measurement and the interval between measurements.

In the table "Mapping" on the right-hand side you should check the time-stamp of each measurement and assign it to a channel.

Click "Suggest Channels" to automatically assign the values to the measuring channels.

7.5 Manual Data Maintenance - Deleting Data Sets

Any data in the Datamanager's underlying database can be deleted by hand. In the Datamanager main menu, select the commands "Measured Data" → "Delete" to call up the dialog window shown below in 7.5.

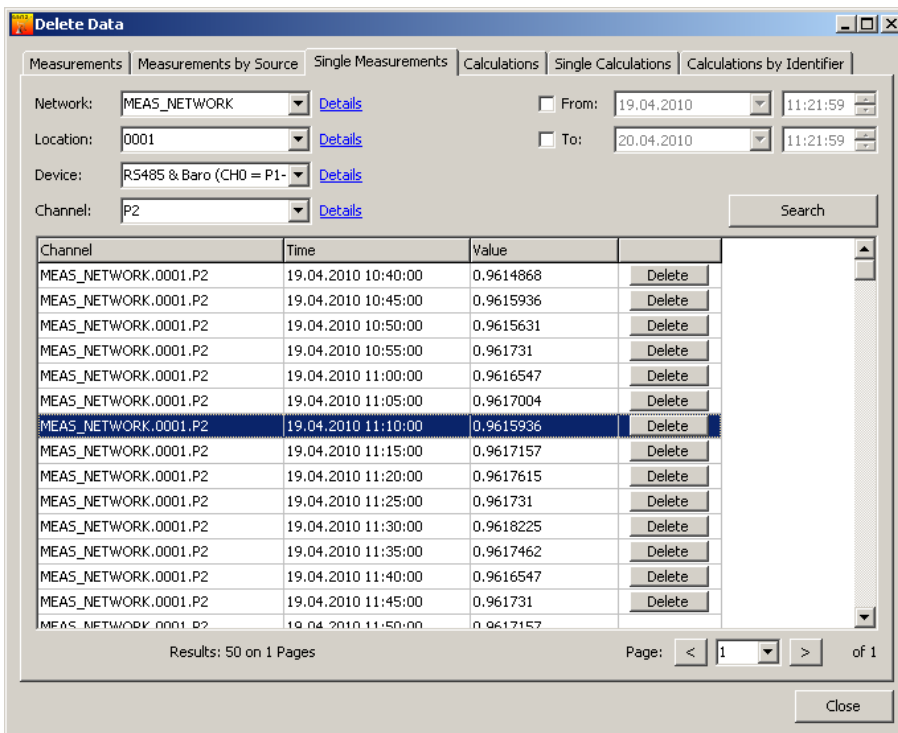


Figure [45] Manual data maintenance - deleting data sets

The Datamanager offers several methods of deleting data sets in the database. The table below shows a list of the different methods.



Please note: Deleted data cannot be restored! The methods described in the table below cover irrevocable operations within the data base!

Title	Description
"Measurements"	Raw data can be deleted based on queries where the filter properties can be influenced regarding date and time, location and measuring channel. Data sets which satisfy the query can first be visualized in a table view and deleted upon request.
"Measurements by Source"	<p>"Measurements by Source" means that it is possible to select data for deletion according to the source of the raw data. The source can be:</p> <ul style="list-style-type: none"> - a specific email address - a phone number - a file from which raw data was previously imported <p>Additionally, it is possible to apply a date and time restriction. In other words, it is again a query with search criteria based on data source, for instance an email address, and a time band (from – to). First, you can filter the raw data with such a query and, if necessary, delete the selected raw data sets in one step. Of course, the application first asks you to confirm the Delete operation.</p>
"Single Measurements"	This method does not use a query to filter the raw data. "Single Measurements" allows the manual deletion of single raw data sets
"Calculations"	Data - in this case calculated data – can be deleted by selecting data sets which were generated by a distinct calculation assigned to a certain measuring location. The search criteria consists of a calculation name and again a time band (from – to) regardless of location and network
"Single Calculations"	This method is the analogous procedure to "Single Measurements". "Single calculations" allows you to delete single data sets from calculated data.
"Calculations by Identifier"	"Calculations by Identifier" offers you the option to delete calculated data based on the calculation name only.



7.6 Delete Locations

For administration purpose it is necessary to have functions that help maintain the measurement network. The first function which should now be discussed is how to delete a location.

The Datamanager does not delete the information relating to a location and all corresponding raw data and calculated data in one step. First, the information will only be marked as deleted - the data still remains in the database. The Datamanager simply hides all information from a deleted location. If necessary, a deleted location can be restored at a later date. Restoring a deleted location is described in Section 7.7.

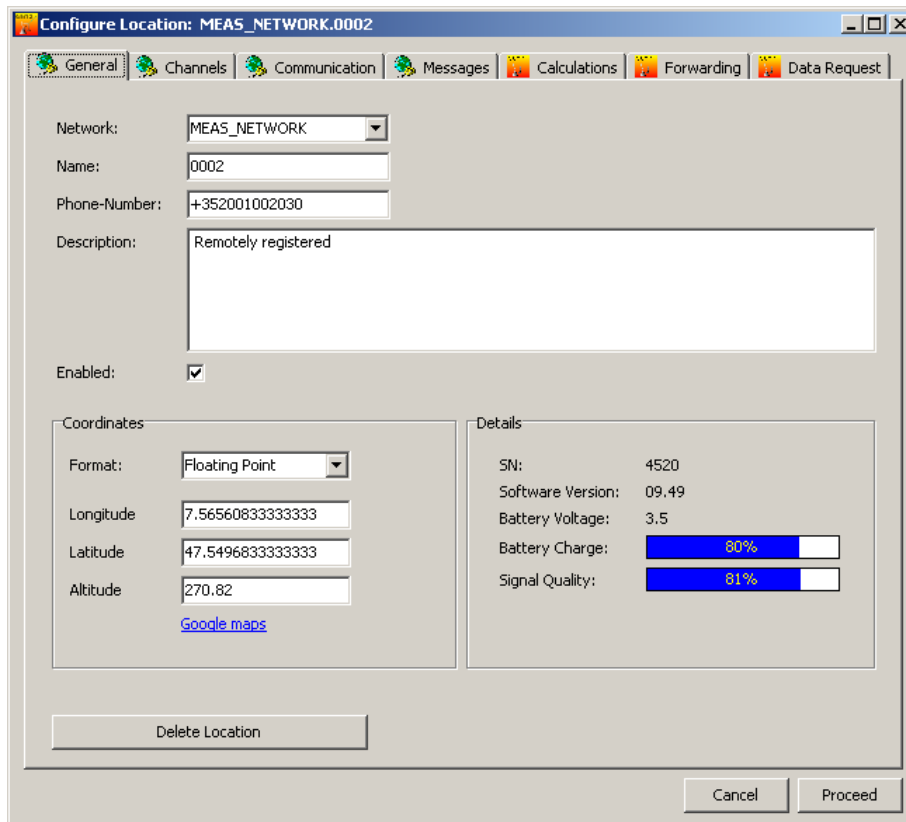


Figure [46] Deleting an existing location

To call up the dialog box shown in 7.6 above, select the command "GSM modules" → "Configure" from the Datamanager's main menu.

Select the location you wish to delete. In the tab "General", click on the "Delete Location" button to delete the selected location.

Note:

If a location is deleted, a copy of the phone number is written into the description text corresponding to the location.

The location becomes inactive and is hidden. The phone number, which has the function of a unique identifier of any location, is now free to be used by a new location.

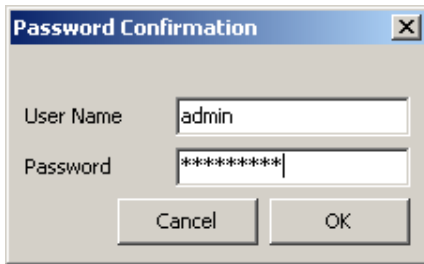


Figure [47] Password confirmation during the procedure of deleting a location

For security reasons, the Datamanager requests the password of the current user before it sets all information belonging to the selected location "as deleted".

The standard user name is "admin" and the standard password is "defaultpw".

7.7 Restore Locations

To restore a deleted location, call up → "GSM modules" → "Show deleted". All deleted locations are now displayed and can be selected to be restored.

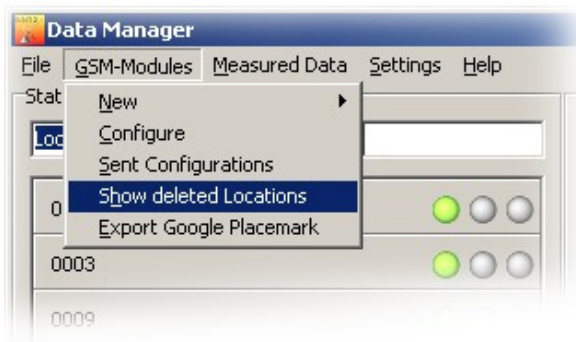


Figure [48] The Datamanager main menu command "Show deleted locations"

Open the configuration of the deleted location by right-clicking on the location as shown in 7.7 below.



Figure [49] Accessing the configuration of a location marked as deleted

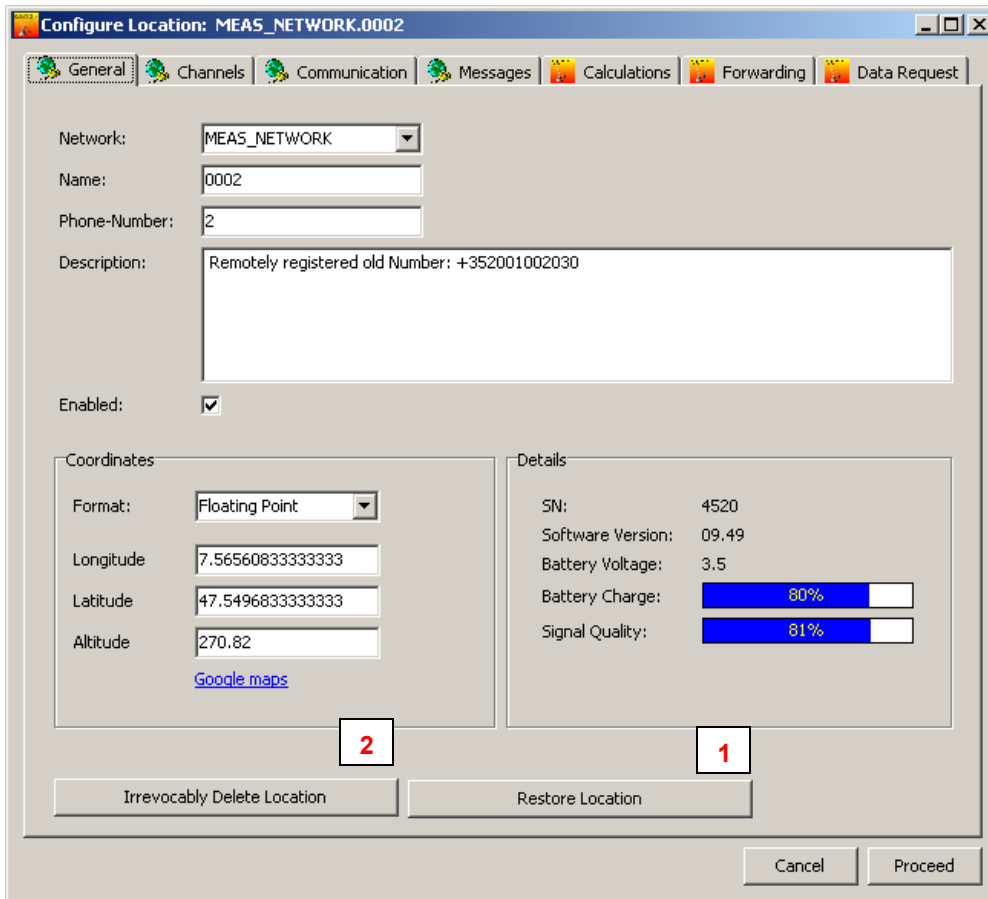


Figure [50] Restore or irrevocably delete a location

Number	Description	
1	"Restore Location"	Reactivates the location Attention: You have to enter a valid phone number in the field "Phone Number"! Valid means that this phonenumber is not yet occupied by another measuring location.
2	"Irrevocably Delete Location"	Attention: All data in the data base will be deleted. All information belonging to the selected location will be lost!



7.8 User Administration

Selecting → "Settings" → "User" opens the user administration form. Here, you can define different users and their privileges. Check the option "Enable User Administration" if you want to enable "User Administration" the dialog box.

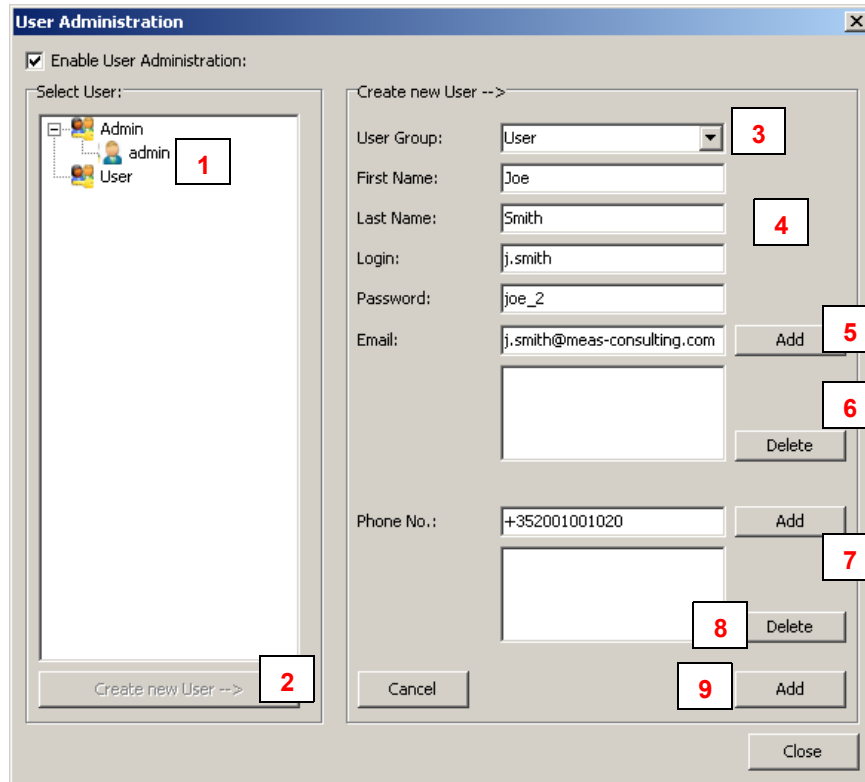


Figure [51] User administration

Number	Description	
1	"Select User"	Tree view showing all registered users
2	"Create new User"	Press the button "Create new User" to add a data set to store the user data.
3	"User Group"	From the "User Group" combobox, select either "Admin" or "User" as required. All members from the group "User" have restricted access privileges. They are only allowed to view data but not to manipulate or delete any data. Members of the group "Admin" have full access. Only these users can delete data or change configurations.
4		Personal data of the user plus login information for authentication.
5	"Add"	You can add any number of different email addresses to a user. Press "add" to fill the list with valid email addresses.
6	"Delete"	Select any email address in the list and then "delete" to remove the address from the list.
7	"Add"	You can add one or several phone numbers to a user account. Press the "add" button to add the phone number visible in the edit field "Phone No" to the list.
8	"Delete"	Removes a selected phone number from the list.
9	"Add"	Adds the information belonging to the user and stores it in the data base

7.9 Login



At start-up, the Datamanager asks for your user name and password.

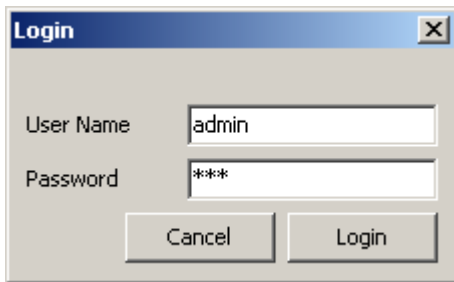


Figure [52] Login dialog at start-up

The standard user name is "admin"; the standard password is "defaultpw". Proceed with "Login".

Note: If you press "Cancel", the Datamanager will work as usual, but you have no access to configurations.

7.10 Database Backup/Recovery

To back up the entire database (configurations and measurements), select → "Settings" → "Data Base".

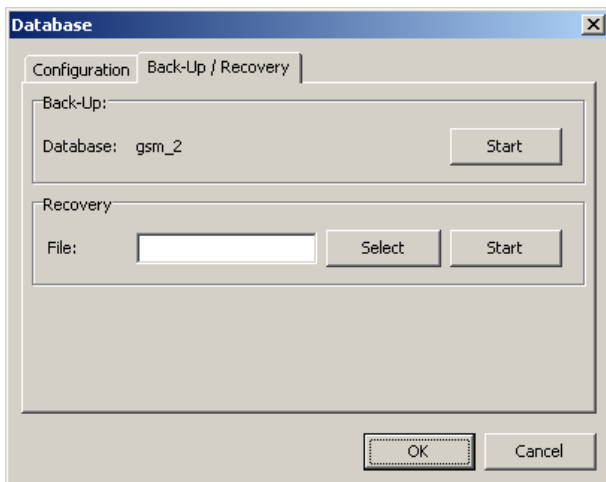


Figure [53] Backup / recovery functions

Select the "Back-Up / Recovery" tab.

Start the back-up by pressing the "Start" button in the Back-Up field. This will generate a text file (back-up file) which can be imported to any MySQL-data base.

Pressing "Select" will open a file dialog where you can select a back-up file.

Press the "Start" button in the recovery field to start recovery.

Note: Depending on the quantity of data and the computer's hard disc performance, the back-up or recovery may take an extended period of time.



8 GSM Terminal Configuration

The Datamanager allows you to use a GSM terminal for sending and receiving SMS. The GSM terminal needs to be connected to a serial port of the computer on which the Datamanager is installed. For reliable operation it is recommendable to use a GSM terminal for industrial applications and environments.

The main menu command "Settings" → "GSM Terminal" calls up the dialog window as shown below.

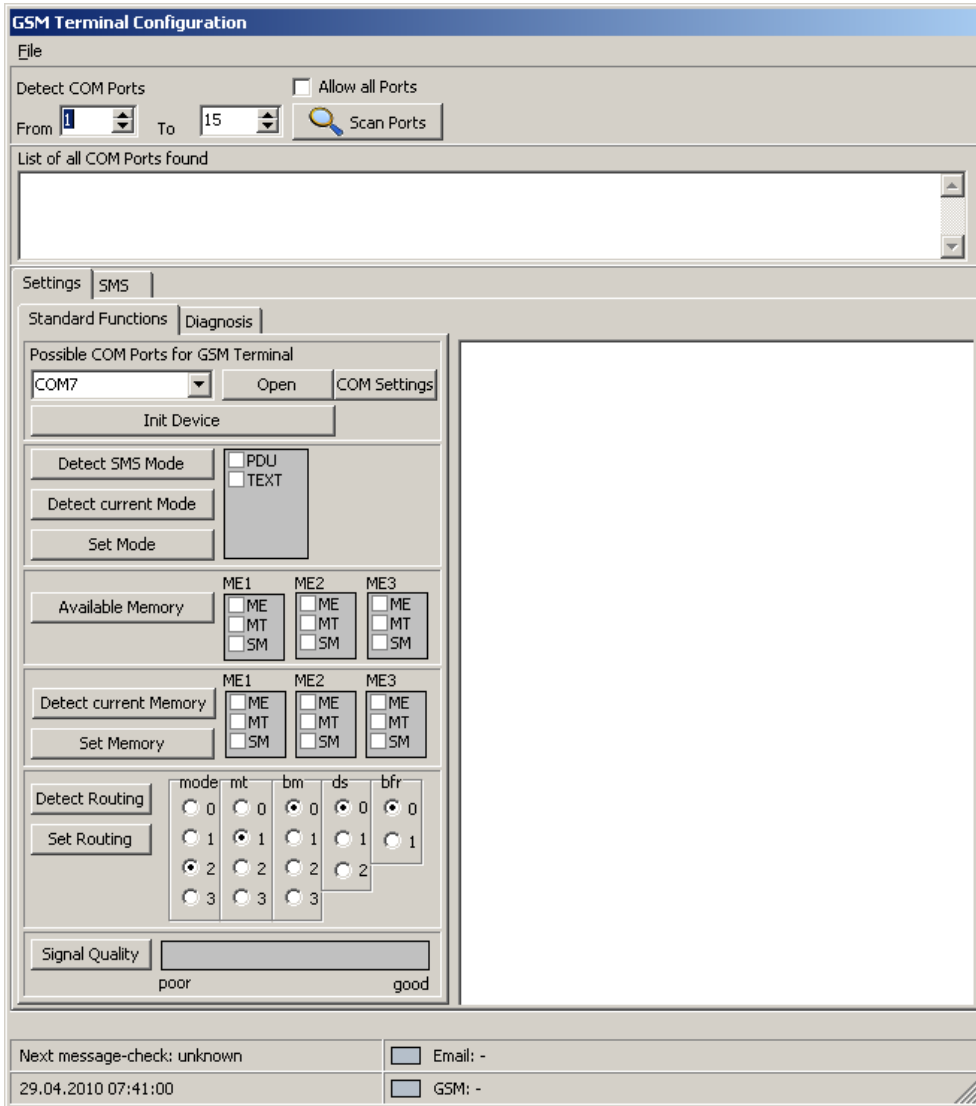


Figure [54] GSM terminal configuration

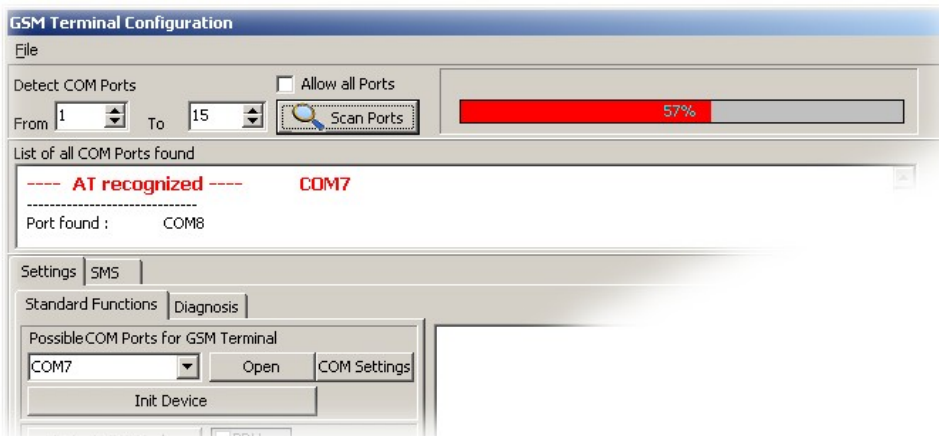


Figure [55] Serial communication with connected GSM terminal

The figure above shows the configuration dialog during serial port scanning.

The settings in the edit fields "From" and "To" allow you to specify the port numbers that should be checked if a connected GSM terminal can be detected. This is helpful when you already know the port number on which the GSM terminal was connected.

"Allow all Ports" enables you to scan all of the computer's serial ports.

The example above shows the successful recognition of a GSM terminal on port number 7. When it scans serial ports the Datamanager tries to send specific "AT" commands to the connected hardware. Whenever a device answers with "AT OK" the Datamanager assumes that the connected device is a GSM Terminal.

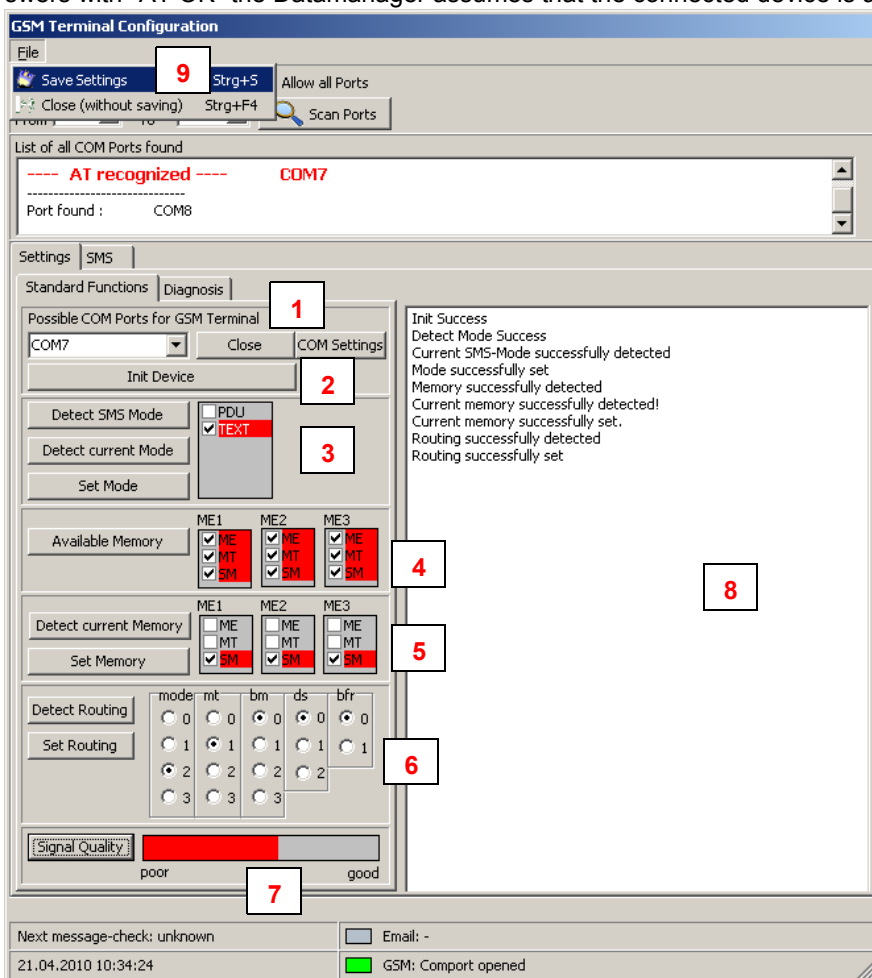


Figure [56] Configuration of a GSM terminal



Number	Description	
1	"Com Ports" "Open / "Close"	If the Datamanager successfully recognizes a GSM terminal it automatically selects the corresponding port number in the combobox. The "Open/Close" button changes its caption according to the state of the serial port. Press "Open" to activate the COM port for communication.
2	"Init Device"	Press "Init Device" to initialize the connected hardware. The Datamanager sends a set of specific commands to the device to establish proper communication and to wake up the hardware. In the text box marked with the number 8 you can see the test results of the different procedures executed by pressing the buttons.
3	"PDU / Text Mode"	Press "Detect SMS Mode" to check which operation mode is supported by the connected hardware. There are two different operation modes possible: PDU and/or text mode. "Detect current Mode" shows which mode is currently active. "Set Mode" will send the appropriate command to the hardware to set the operation mode according to the selected check box "PDU" or "TTEXT"
4	"Available Memory"	You can detect which types of memory are available. For descriptions of what "ME" "MT" and "SM" stand for, please refer to the information provided by the manufacturer of the connected hardware.
5	"Detect current Memory" " Set Memory"	This function allows you to detect which memory usage settings are currently active in the hardware. Use "Set Memory" to assign memory settings according to the selections of the checkboxes "ME1" to "ME3"
6	"Detect Routing" "Set Routing"	Detect Routing checks the currently active routing settings of the connected hardware. "Set Routing" writes the selection of the radio group selectors to the hardware. The routing supported depends on the hardware. Please refer to the manufacturer's manuals and descriptions.
7	"Signal Quality"	Press the button "Signal Quality" to check the field strength. Poor signal quality may disturb the transmission of an SMS. For reliable operation it is necessary to have the best possible signal quality.
8	"Text Box"	This text box lists all of the test results. The example shows the results after successful completion of each test.
9	"Save Settings" "Close without saving"	Close the configuration dialog by clicking on "Save Settings" if you wish to permanently store the selected configuration. "Close without saving" just closes the dialog but does not store the settings.

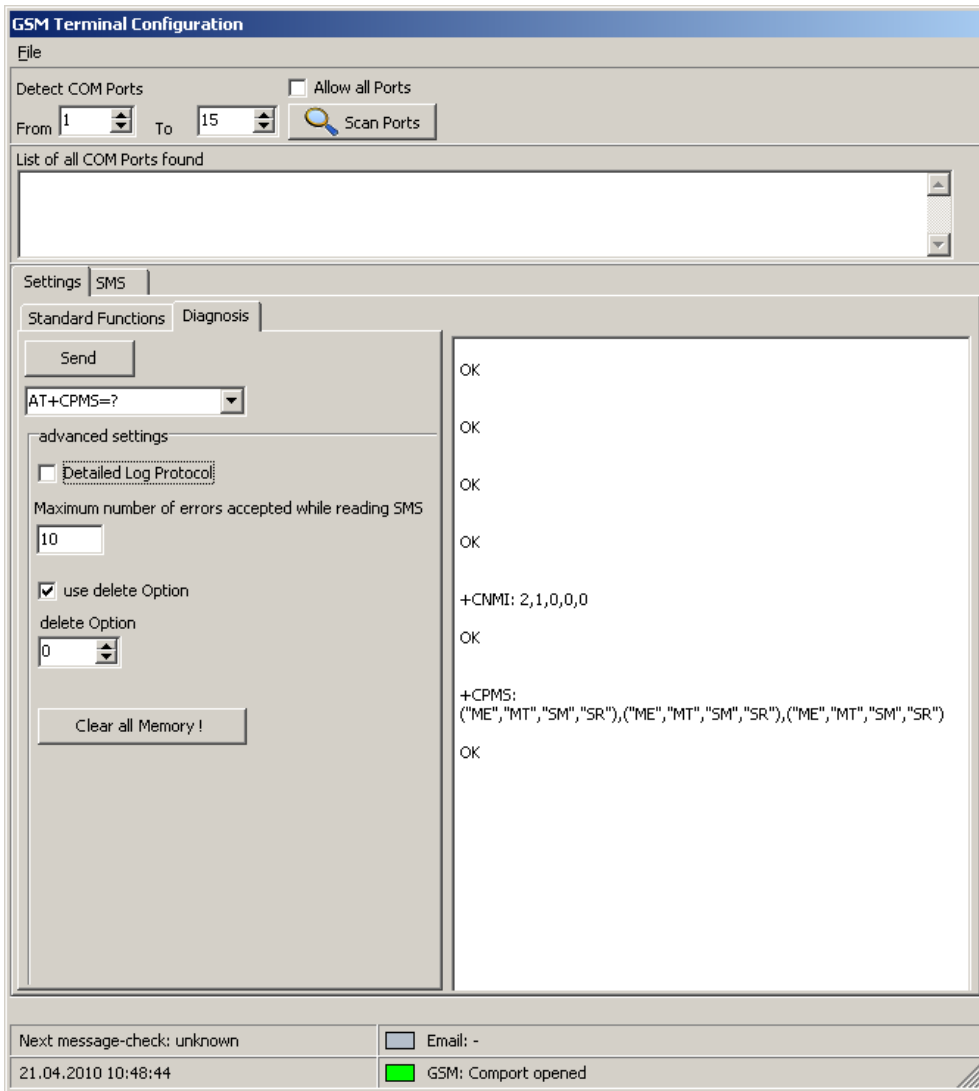


Figure [57] Configuration of a GSM terminal – diagnosis

Use the "Diagnose" tab to send single commands to the hardware for analysis and low level tests for trouble shooting.

The combobox contains a set of standard commands which you can choose for testing. Please note there are powerful commands which can have a far-reaching impact on the connected hardware and its behaviour. Please first refer to the manufacturer's manual and description before you send any of these commands to the hardware!

"Maximum number of errors accepted while reading SMS"

Depending on the memory management of the connected hardware it is sometimes necessary to increase this number. SMS are usually stored in a stack in the memory of the hardware. Each place can be accessed by its number. When the Datamanager tries to read an SMS from a place number where no SMS is available the hardware can answer with an error. If this error counter is set to 10, as in the example, the Datamanager checks place numbers 1 to 10. If there are no SMS available, the Datamanager will stop the procedure. If a new SMS were at place number 12 it would not be recognized. Memory management is highly hardware-specific. In the event of problems with SMS reception, it may be necessary to carry out tests while adapting the error counter.

The "Delete Option" setting is also very specific to the connected hardware. It is not possible to describe here which setting should be applied for the hardware you intend to use. Please refer to the manufacturer's manual.



9 Differences between GSM-1 and GSM-2

Feature	GSM-1	GSM-2
Communication	By SMS only	By SMS and email
Configuration	<p>Datamanager and GSM module must be configured separately.</p> <p>No remote configuration supported.</p>	<p>Version 7.12: Same as GSM-1</p> <p>Version \geq 7.15: Remote registration supported (from GSM-2 to the Datamanager).</p> <p>Version \geq 7.18: Remote configurations supported (bi-directional)</p> <p>Version \geq 08.15 Type 4 and 5 in "Hardware Settings Connected Device" (see Operating Manual GSM-2) supported.</p> <p>Version \geq 09.07 Type 6 and 7 in "Hardware Settings Connected Device" (see Operating Manual GSM-2) supported.</p> <p>Version \geq 09.09 Integrated record and event logging function.</p>



10 Database

The Datamanager supports two types of database (must be set upon program start):

- MySQL:
Requires an active MySQL database running on the same computer or on a remote server.
- SQLite:
No additional configuration or installation required. The entire database consists of a single file.

10.1 Installing MySQL

The MySQL server can be installed on any PC with network access.

To download the MySQL setup, go to <http://dev.mysql.com/downloads/>

Choose the latest version of the community server and download the "Windows Essentials (x86)" for a computer running Windows XP or Vista.

We recommend downloading the MySQL GUI Tools as well. The GUI Tools are very helpful for server administration (e.g. for running back-ups, user and access privilege administration, troubleshooting and monitoring).

10.2 Installing the Database Server (Windows)

Run the MySQL setup file and follow the instructions. Always proceed with the "Next"-button without changing any values (default settings).

Note: be sure to remember the password given to the root user!

Choose "Configure MySQL-Server now" to carry out the initial configuration.



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