HYDROMETER
HYDRO-CENTER 2
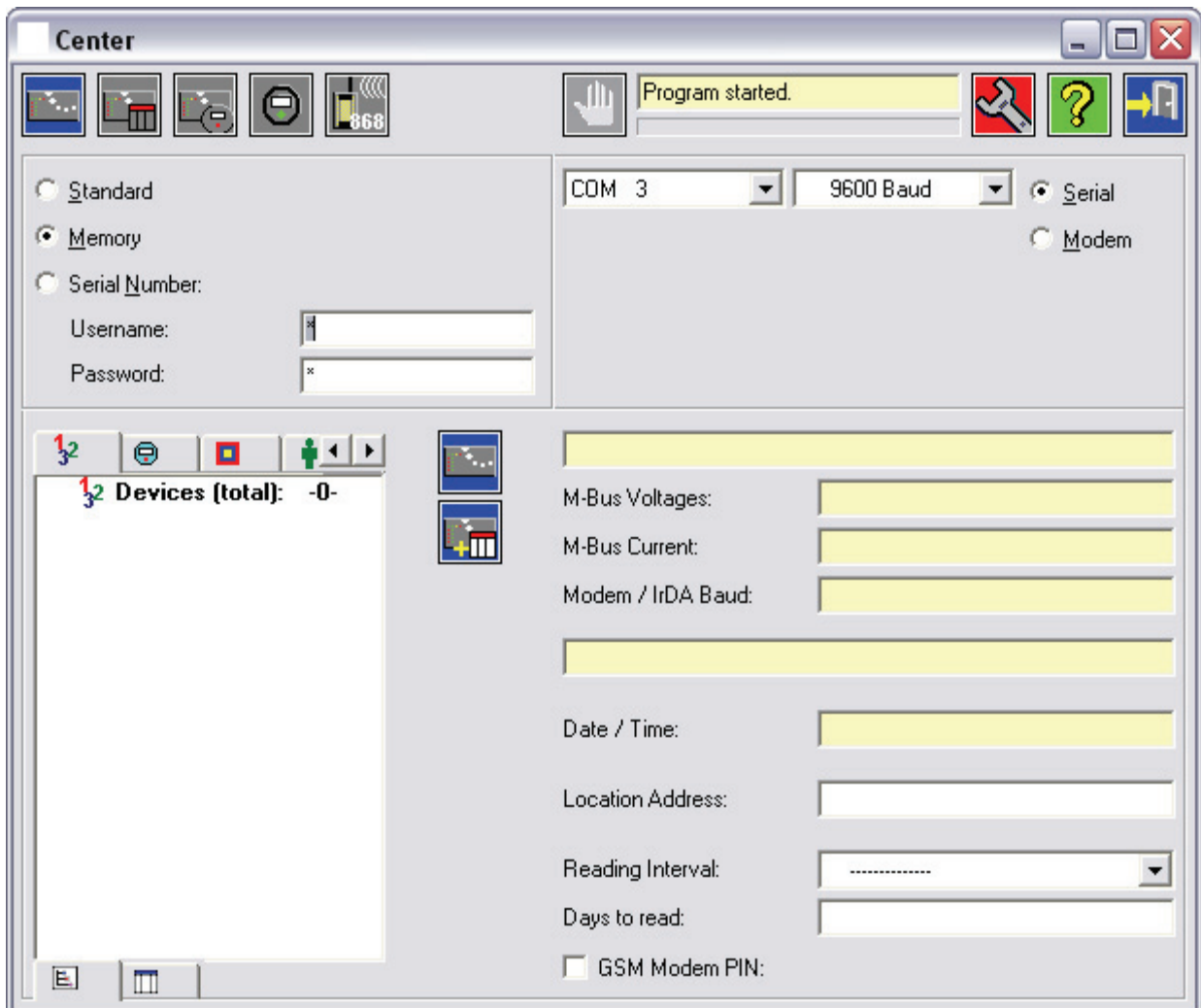
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Introduction

What is the HYDRO-CENTER 2 Software anyway?

The HYDRO-CENTER® range of M-Bus repeater / data logger is used to build up M-Bus networks for reading resource meters, like electricity meters, heat meters, water meters and more. With the accompanying HYDRO-CENTER 2 software the user is able to set the parameters of a HYDRO-CENTER, create a device list for automatic data logging, perform an M-Bus device search and many other things.

The HYDRO-CENTER 2 software may be used free of charge, but only in conjunction with a HYDRO-CENTER M-Bus repeater or data logger.

The HYDRO-CENTER 2 software runs with Windows® 2000 / XP.

System Requirements

The HYDRO-CENTER 2 software runs on a Pentium class PC computer with at least 256 MByte of free memory, Windows® 2000 / XP and approx. 50 MByte free hard disk space. Additionally, a free serial interface port must be available.

For establishing a remote connection a standard AT-command modem with serial interface must be available for your PC.

Software Installation

Insert the storage media containing the installation file of HYDRO-CENTER 2 into your PC (disk or CD-ROM). Start the installation file (HYDROCENTER2_Installation.exe).

Example (D:\ is the CD-ROM drive):

Start->Execute
D:\HYDROCENTER2_Installation.exe

The automatic installation proceeds. During the installation you are able to select the installation directory. The default setting of "c:\program files\hydrometer\" is recommended.

Start the HYDRO-CENTER 2 software: **Start->Programs->HYDRO-CENTER 2**

Alternatively, you may also double-click the program icon on your Windows® desktop.

Customer Support

HYDRO-CENTER 2 Software In General

Main Window
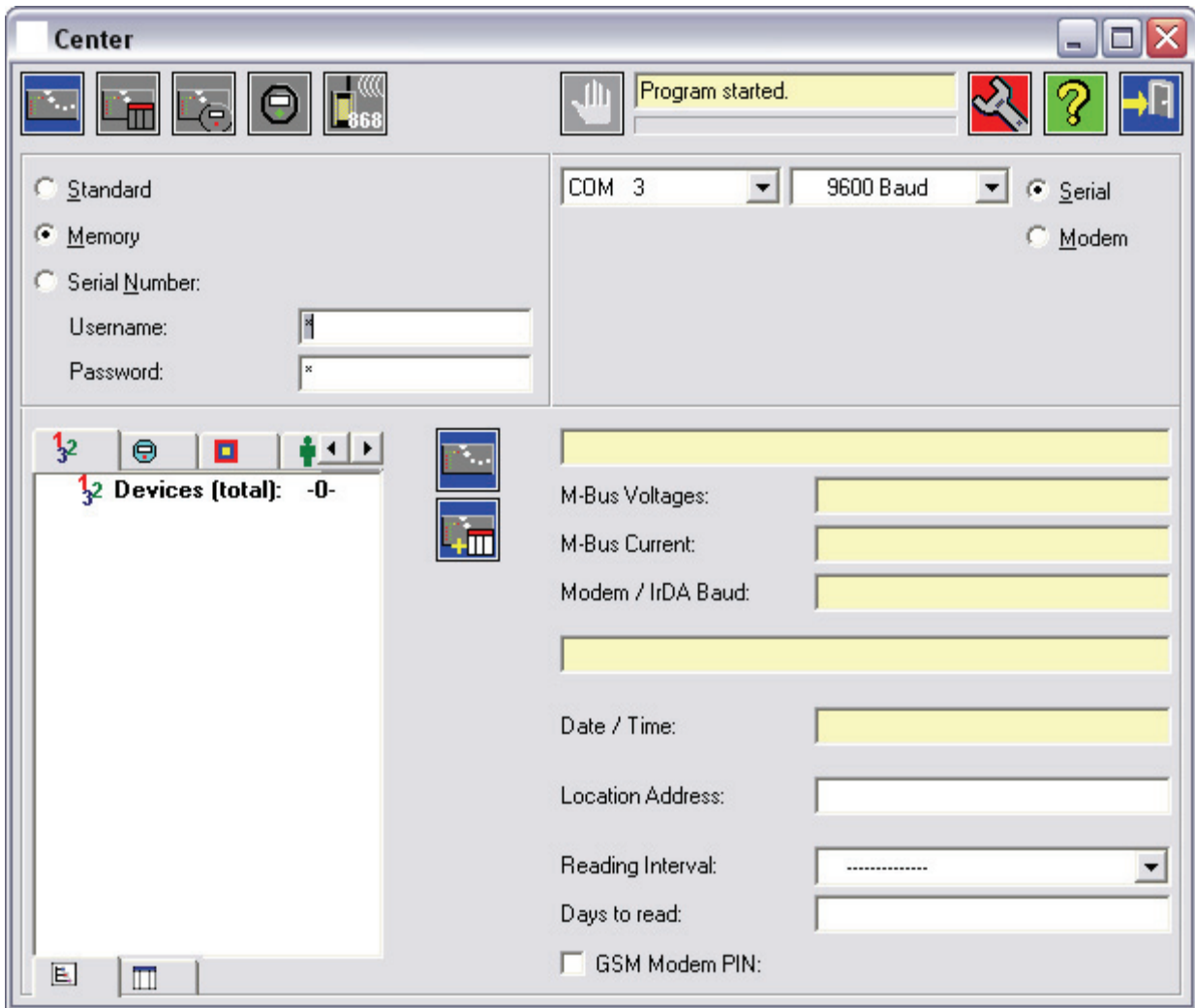
The software follows the Windows® standards for PC software.

For all the buttons on the windows there are short descriptions which will appear if you move the mouse pointer over the respective button and wait approx. one second without moving the mouse pointer or pressing a button.

Entry fields with a white background may be altered, entry fields with a yellow background are fixed and are used for displaying values only.

After the start of the program you see the window shown above which is roughly divided in three parts:

- Button bar

Here you find general functions of the program.

- Connection parameters

All the parameters necessary to establish a connection to the M-Bus repeater device.
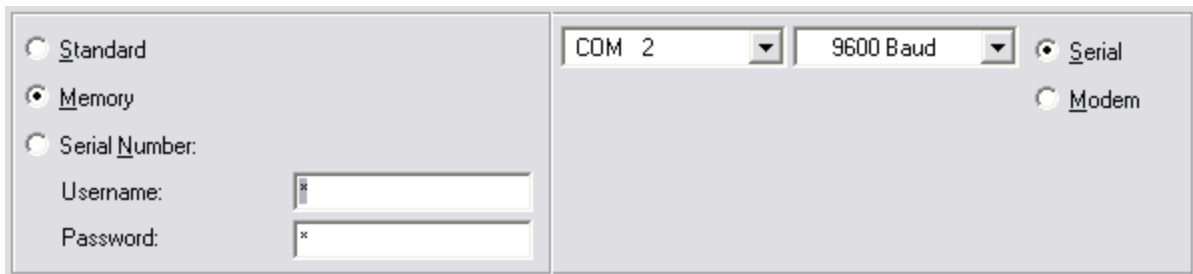
- Device list / parameters

On the left hand side there is the device list. The right hand side contains, depending on the currently selected view, the M-Bus repeater parameters, M-Bus device list parameters or the M-Bus device values.
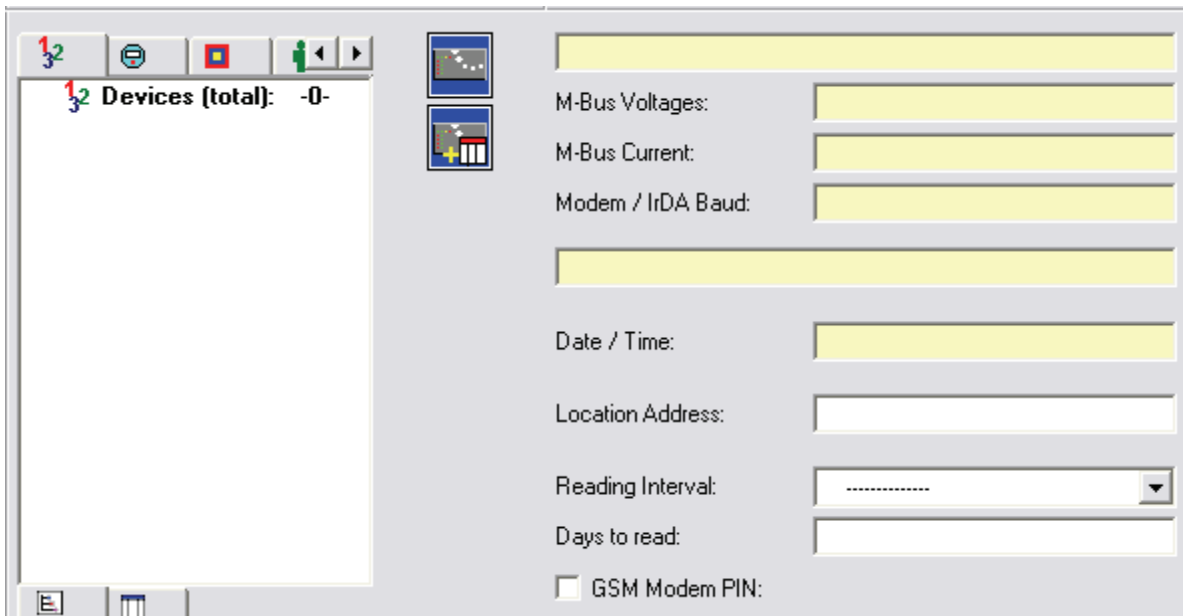
Button Bar

The button line contains several buttons to control general function of the program. From left to right:

Selects the parameter view on the main screen.

Selects the device list view on the main screen.

Selects the device reading view on the main screen.

Selects the immediate reading of M-Bus devices (also: programming of a new M-Bus primary address and baudrate).

Selects the M-Bus radio receiver (868 MHz or 434 MHz) reading.
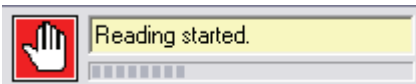
Interrupts a currently ongoing process (e.g. reading of the M-Bus repeater, reading of an M-Bus device, establishing a connection). This button is only active if a process is running.

Shows the dialog with the program settings (language, dial options, ...).
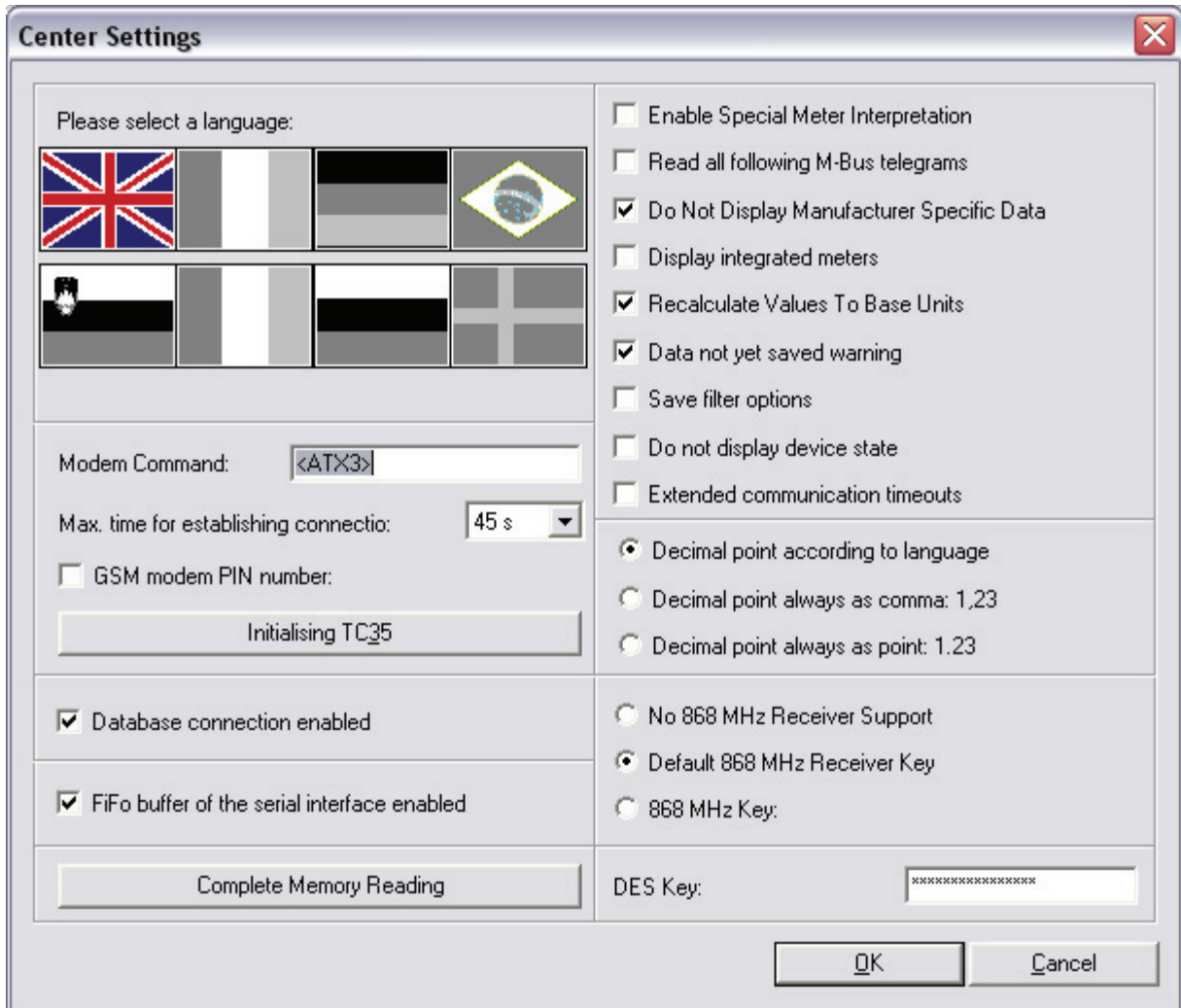
Shows the online help (this document).

Exits the program.

Program Settings

By pressing the program settings button the user may set several program parameters: [wrench icon]. The dialog beneath appears:

Center Settings

Please select a language:

[Language flag selection grid]

☐ Enable Special Meter Interpretation
☐ Read all following M-Bus telegrams
☑ Do Not Display Manufacturer Specific Data
☐ Display integrated meters
☑ Recalculate Values To Base Units
☑ Data not yet saved warning
☐ Save filter options
☐ Do not display device state
☐ Extended communication timeouts

Modem Command: `<ATX3>`

Max. time for establishing connectio: 45 s

☐ GSM modem PIN number:

Initialising TC35

○ Decimal point according to language
○ Decimal point always as comma: 1,23
○ Decimal point always as point: 1.23

☑ Database connection enabled

☑ FiFo buffer of the serial interface enabled

○ No 868 MHz Receiver Support
● Default 868 MHz Receiver Key
○ 868 MHz Key:

Complete Memory Reading

DES Key: ******************

OK   Cancel

By clicking on the appropriate flag the user may choose the program language. The new language will be used the next time the program is started.

This field is for adding additional modem initialization commands. The commands inserted here are always sent to the modem before the respective dial command with the phone number. The brackets around the command will put the string in the same command which is used for dialing, e.g.:

ATX3 will lead to a command sequence like:

```
ATX3            do not wait for calling tone
ATDT0123456789  dial phone number
```

<ATX3> will lead to a command sequence like:

```
ATX3DT0123456789  do not wait for calling tone + dial phone number
```

Especially internal modem may need the sequence where all the commands are put in one line (with brackets).

Default: <ATX3>
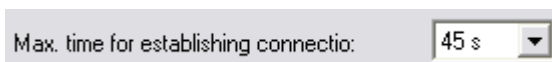
This parameter is used to determine the maximum allowed delay between dialing a phone number and the confirmation that the line is established. If the line is not established after the given delay, the program will hang up and try calling again up to 3 times. After three times not reaching the remote system the attempt is cancelled. If the connection establishing takes a rather long time you may increase this value:

Standard values: 30..90 seconds

Default: 45 s
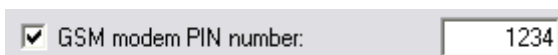
If you are using a GSM Modem on your PC you must enter the PIN number for accessing your phone card.

☐ GSM modem PIN number:

If you are using a standard analog or digital modem you must disable this checkbox.

Default: Not Checked

Initialising TC35

The Siemens TC35 GSM modems must be specifically initialized before using them. Connect a Siemens TC35 GSM modem to the respective COM port and press this button. The Siemens TC35 GSM modem will be programmed to function correctly with the system.

☑ Database connection enabled

If you want to export data or device lists directly to the data base of a resource management system, you have to enable this checkbox. If you have not got a resource management system you may disable this checkbox. In this case the program is not searching for an installed data base at program start and, therefore, it starts a little bit quicker.

Default: Checked

☑ FiFo buffer of the serial interface enabled

This setting determines if the FiFo buffer of the serial interface should be used or not. In general for Windows 98 and ME systems this checkbox should be enabled. For Windows NT, 2000, and XP systems this checkbox should be disabled. If you disable this checkbox you also have to disable the FiFo buffer setting of your serial COM port in the Windows settings:

Start -> Control Panel -> System -> Devices -> Device Manager -> Serial Ports -> COMx -> Setting

The dialog to find the FiFo buffer settings of your serial port may vary depending on your operating system.

Default: Checked

Complete Memory Reading

By clicking on this button the data logger memory of the M-Bus data logger device is read completely in binary form. This is only useful for finding errors and debugging tasks (for developers).

☑ Enable Special Meter Interpretation

Some meters need special commands to be read correctly. You may enable or disable the sending of special commands.

Default: Checked

☐ Read all following M-Bus telegrams

Some meters want to return more than one M-Bus telegram if requested. In this case a special flag in the answer from an M-Bus is set, meaning that the software should send another request to get the following telegram(s). Some M-Bus meters have got up to 40 following telegrams, therefore, the reading of the complete answer of these devices may take a long time. If this option is checked, the request for following telegrams is always obeyed and all following telegrams of a meter are read. If this option is not checked only the first two following telegrams (making a total of three telegrams) are read to save time.

Default: Not Checked

☑ Do Not Display Manufacturer Specific Data

Some meters return manufacturer specific data (not interpretable by M-Bus) in their standard M-Bus response. This data is displayed as a series of HEX numbers and usually not useful for the user. Therefore, the display of manufacturer specific data may be disabled.

Default: Checked

☐ Display integrated meters

If an M-Bus meter has got integrated meters (that is additional counter inputs for additional meter values, e.g. heat meter with two additional pulse inputs for cold and warm water) than these integrated meters may be displayed as separate devices in the device list.

Default: Not Checked

☑ Recalculate Values To Base Units

In the M-Bus standard physical units with a multiplier, like 10 KWh, 100 MWh, are defined. If this option is checked the program recalculates these units and all non standard units automatically to their respective base units (e.g. 123 10 Wh becomes 1,23 kWh).

Default: Checked

☑ Data not yet saved warning

Displays a warning message if there are still not yet saved data in the program while the user exits the program. The user may than return to the program and save the data or continue exiting the program.

Default: Checked

☐ Save filter options

Saves the currently selected filter settings for displaying the meter data. For displaying meter data the user may select filter options (only certain values, only the first two, three, four, … values of a meter). By default these filter options are reset every time the user reads a meter. If this checkbox is selected the filter options are kept, even if the program is closed.

Default: Not Checked

☐ Do not display device state

If this option is enabled the device status of M-Bus devices from the header of the M-Bus telegram is not displayed. Many M-Bus devices are not using the device status coding and, therefore, the display of the device status may be disabled.

Default: Not Checked

☐ Extended communication timeouts

If the standard communication timeouts are too short, that is the user often encounters communications problems, this options may be enabled. For long distance modem connections and serial connections which are transmitted using a serial to LAN converter, it could be better to enable this options. This option has got three possible settings going from normal timeout behavior to extreme long timeout waiting time.

Default: Not Checked

◉ Decimal point according to language
○ Decimal point always as comma: 1,23
○ Decimal point always as point: 1.23

While saving read M-Bus telegrams to a XLS text file, the decimal point is, by default, set according to the selected program language (e.g. a dot in English, a comma in German). However, if the calculation program, which is importing these files, is not using the same decimal point setting, the meter values are not imported correctly. With this option the user may force the export of meter values to use a defined decimal point (dot or comma), regardless of the language setting of the program.

Default: Decimal point according to language

○ No PRIOS Support
○ Default PRIOS Key
◉ PRIOS Key: [******]

Supports PRIOS radio meters. If the PRIOS support is enabled the software will automatically add functions to search for PRIOS radio meters and for automatic interpretation of them. All the radio communication is decrypted, therefore, to encrypt it, the software needs a encryption key. Depending on whether you are using the default PRIOS key or a user defined key, you must select the appropriate option and enter an encryption key, if necessary.

Default: No PRIOS Support

NOTE: If this option is set to – No PRIOS Support - then the button for accessing the M-Bus radio receiver functions is not displayed on the main page.
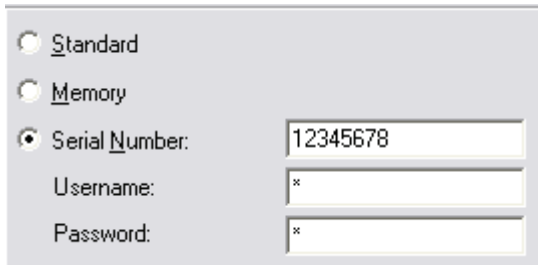
DES Key: [****************]

Supports the reading of radio meters which are sending DES encrypted data telegrams. For automatic decryption of these meters enter the DES key in hexadecimal form (e.g. 45A13F….).

Default: No DES key

Connection Parameters

An M-Bus repeater may be addressed in three different ways, depending on the selection on the left hand side of this part of the window:

Standard (Default):	All M-Bus repeater (repeater and data logger) connected to the M-Bus will answer. This is the default setting, since usually only one M-Bus repeater is present.
Memory:	Only M-Bus repeater memory devices (data logger) connected to the M-Bus will answer. This setting is useful if there is a large M-Bus network with one or more M-Bus repeater used as bus amplifier. In this case the Standard setting will cause M-Bus collisions since the data logger and the repeater will answer simultaneously.
Serial Number:	Only the M-Bus repeater with the given serial number will answer. If there is more than one M-Bus repeater memory (data logger) connected to the M-Bus only this setting will work, otherwise more than one M-Bus repeater will answer causing a bus collision. In this case the user has to fill in the serial number of the M-Bus repeater (number on top of the housing).
Username / Password:	For accessing the M-Bus repeater data logger memory values the correct password must be entered. By default:
Username:	**0**
Password:	**0**

The password is only protecting the M-Bus repeater memory values (device list, logged data). The standard M-Bus repeater functions (reading an M-Bus device, …) are always available.

Communication Parameters

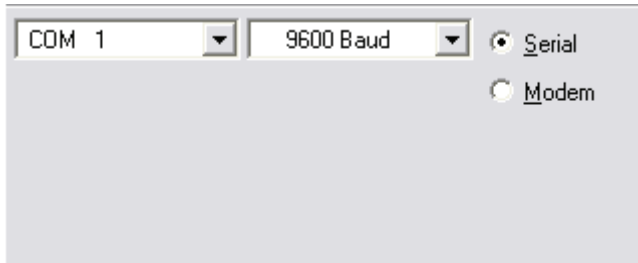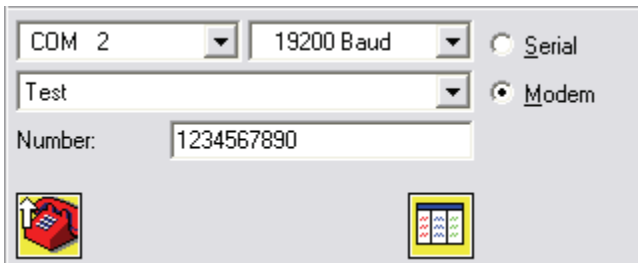On the right hand side of this part of the window there are the communication settings. One distinguishes between a direct serial connection (Serial) and a connection using a dial-up modem connection (Modem).

Serial: For the direct serial connection the user must connect the M-Bus repeater connector marked PC with the accompanying serial cable to a free serial port of the PC (usually COM1 or COM2). Select the correct COM port and the correct transmission speed from the list. The given transmission speed is the speed used to talk with the M-Bus repeater itself, therefore you may always use the fastest speed (9600 baud). Do not use any other transmission speeds for the direct serial communication.

Standard values: COM1 and 300, 2400 or **9600** baud.

Modem: If you want to establish a remote connection to a M-Bus repeater using a dial-up phone connection, you must connect a standard AT-command modem to a free serial port of your PC. Alternatively, internal PC modems may also be used if there is a virtual port driver installed for them (that is that the modem may be used like any other external serial modem using serial COM port commands).

Standard values: COM1 and 9600 or **19200** baud

Use only 9600 or 19200 baud as transmission speeds over modem. Additionally, the user has to enter the phone number to call or select an entry of the phone number list. In this case the respective phone number is automatically inserted.

Establishing a Telephone Connection

- To establish a phone connection with a remote M-Bus repeater the user has to fill in the correct communication parameters as described in the previous chapter (COM port, transmission speed, phone number).

- Afterwards he presses the connect button

- The display changes as indicated below. For interrupting the dialing process the user may click the Break button (may not work immediately but within few seconds). Additionally, a small indicator (blue rectangle) shows that the user is working over a phone line.
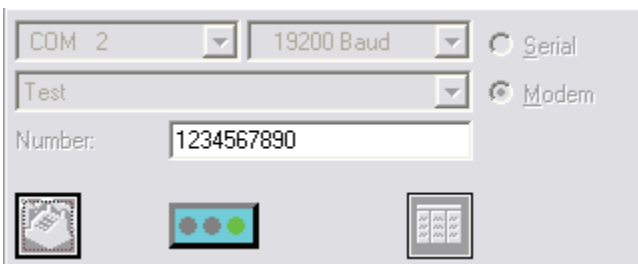
- If the connection is established the display changes once more as indicated below. From now on the user may communicate with the remote M-Bus repeater and its M-Bus meters.
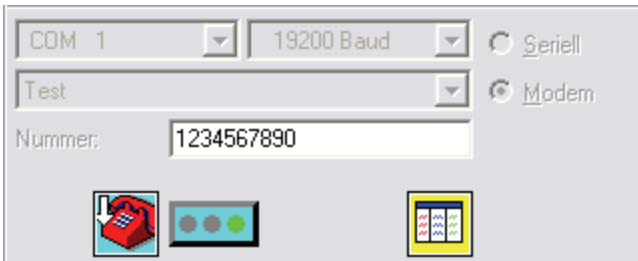
- To hang up the line the user presses the respective button.

List of Phone Numbers

The program has got a tool for managing phone numbers. By pressing the respective button the user may edit his list of phone numbers.

Insert a new telephone number into the phone list. The dialog beneath appears:
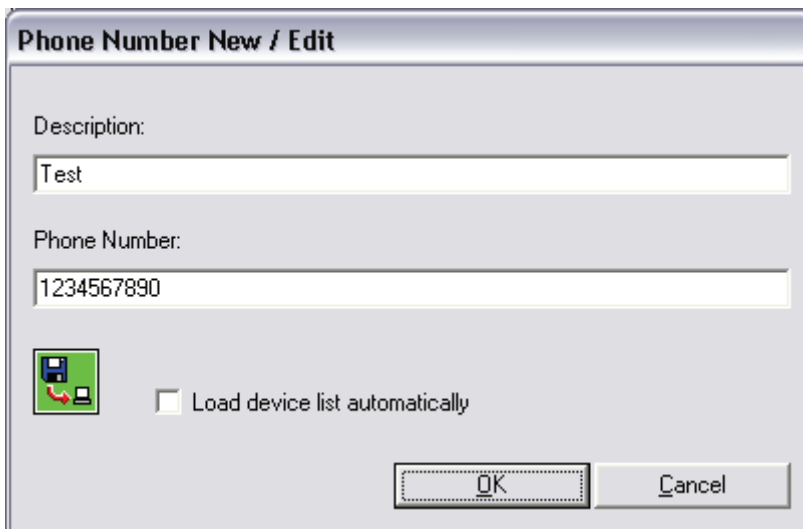
Here the user may enter the description for the telephone number, which is usually the description of the location of the M-Bus repeater, and the phone number itself. Additionally, the user may assign a specific device list to this phone number. Then every time the respective phone number description is selected from the main window the device list is loaded, automatically. This feature is useful if the device list for the respective remote M-Bus repeater contains a lot of meters and the user does not want to download it all the time from the M-Bus repeater device itself.

- Assign the currently shown device list (main window) to the respective phone number:

- Remove the assigned device list for a phone number:

- For updating a device list for a respective phone number, the user has to call the **Phone Number New / Edit** dialog and press the device list assignment button once more:

Edit an existing phone number entry. Click on a phone list entry and press this button to change the phone number or its description. Alternatively, the user may also double click the respective phone list entry.

Delete an existing phone number entry. To delete more than one phone list entry, the user may select multiple entries from the phone number list (using the ALT or CTRL key while marking entries) and delete them at once.

Load a phone number list from a file. The user imports an existing phone number list from a file.

Store a phone number list into a file. To save the list of phone numbers, the user may export it to a file.

Exit this dialog.

Device List

The device list contains all the devices assigned to an M-Bus repeater and is usually also stored within the M-Bus repeater memory (if it has got memory). There are two different forms of displaying this list, in tree form and in list form:
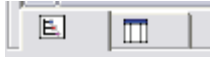
Show device list in tree form (better hierarchical sort structure).

Show device list in list form (better arbitrary selection of devices)

Device List: Tree View
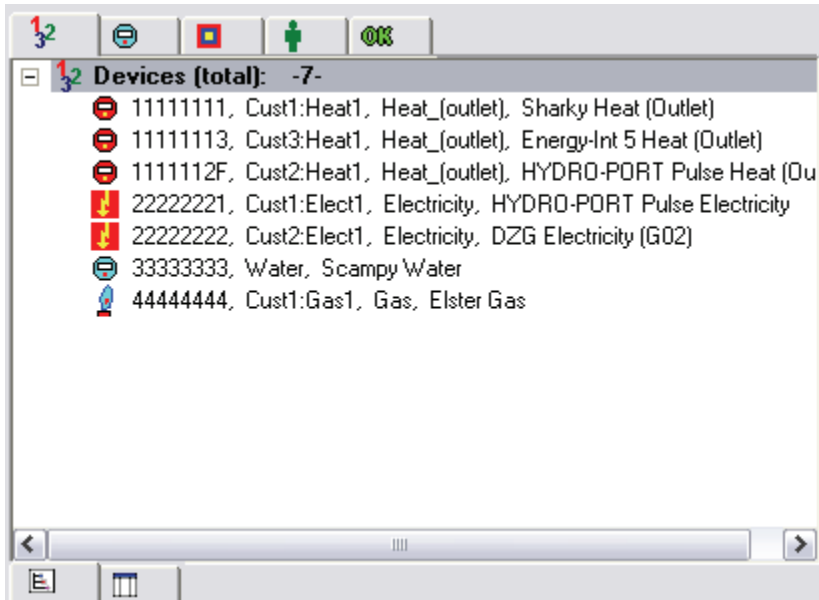
The device list may be sorted using 5 different sort criteria. Depending on the sort criteria the device list entries are containing different information:

Serial Number
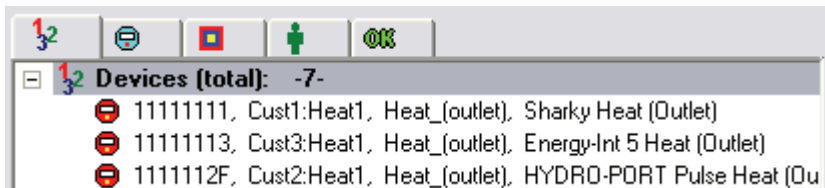
All the meters in the device list are sorted alphanumerically ascending according to their serial number (M-Bus secondary address). The entry line contains the serial number, the user defined description, the medium, and the device type.
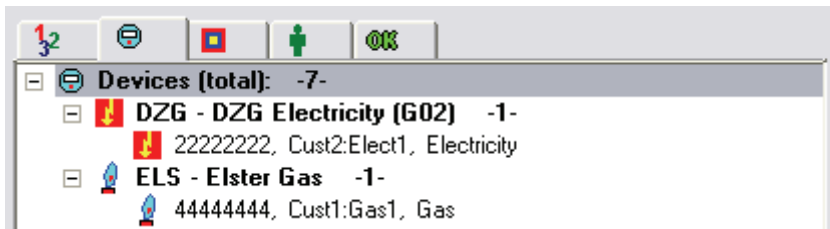
Device Types

All different device types in the device list are sorted alphanumerically ascending. Below the device type entry there are all the meters belonging to the respective type.

The device type entry contains the manufacturer, the device type and the number of devices of that type in the device list, e.g.:

HYD – ENERGY-HEAT (Outlet)   -1-

Manufacturer: HYD (Hydrometer)
Device Type: ENERGY-HEAT
Number: 1 device of this type in the device list

Media
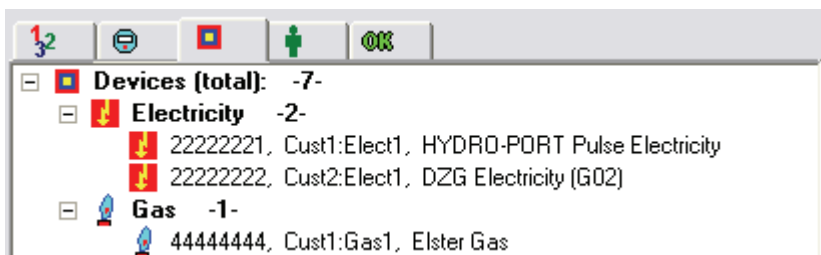
All different device media are sorted alphanumerically ascending. Below the media entry there are all the meters measuring the respective media.

The media entry contains the media and the number of devices measuring this media in the device list, e.g.:

Electricity   -2-

Media: Electricity
Number: 2 devices measuring this media are present

Customer
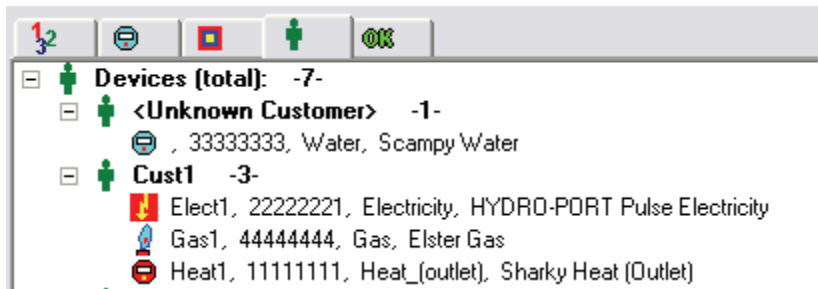
The M-Bus repeater device list has got a description field which may contain 18 characters max. The M-Bus repeater device list has not got another field for a customer description, however, if the user enters a description like cust1:desc1 the first part before the colon (':') is used as customer and the second part after the colon as description. Therefore, it is also possible to sort the devices according to customers. Devices in the list which has not got a description at all, or a description with no colon in it, are listed under <Unknown Customer>.

The customer entry contains the customer name and the number of devices belonging to this customer, e.g.:

Cust1   -3-

Customer: Cust1

Number: 3 devices belonging to this customer

Read / Not Read Devices
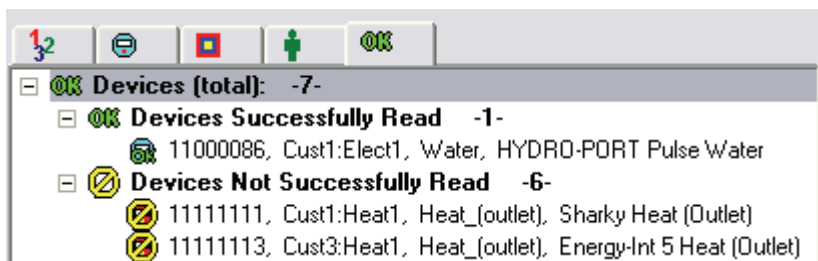
The last sort option is according to devices not yet read, read with success or read without success. The read / not read devices sort option contains three different headers: 'Devices Not Read', Devices Read' and 'Devices Not Successfully Read', e.g.:

Devices Successfully Read   -1-

Devices Not Successfully Read   -6-

One device was read successfully, 6 devices were not read successfully.

Device List: List View

The device list in list view form contains the same information than in tree view form. However, the disadvantage is, that the tree view form shows the sort criteria better. The advantage is, that the user can multiple select devices (using the ALT or the CTRL keys). This is especially useful if the user wants to read out arbitrarily some of the devices in the device list. This is not possible in tree view.
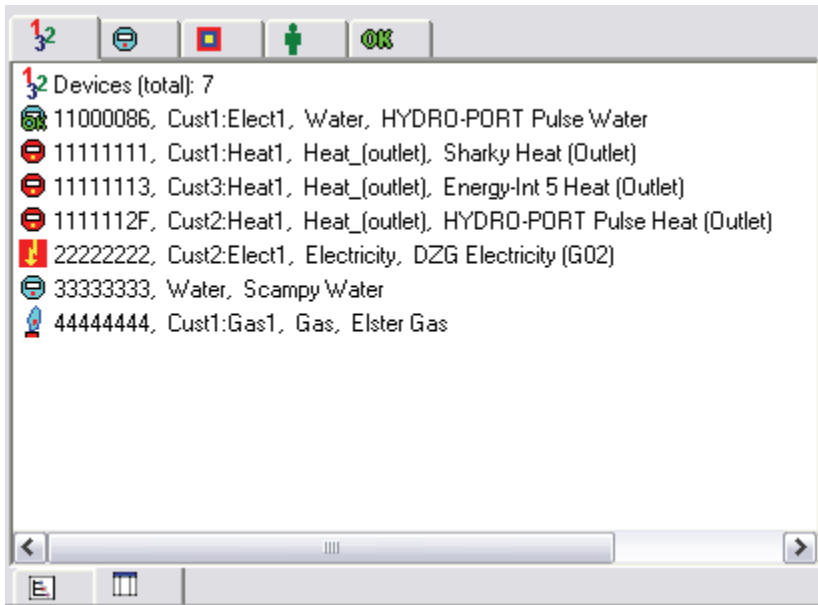

As with the tree view the device list may be sorted using 5 different sort criteria. Depending on the sort criteria the device list entries are containing different information, however, these are exactly the same as for the tree view.

Serial Number
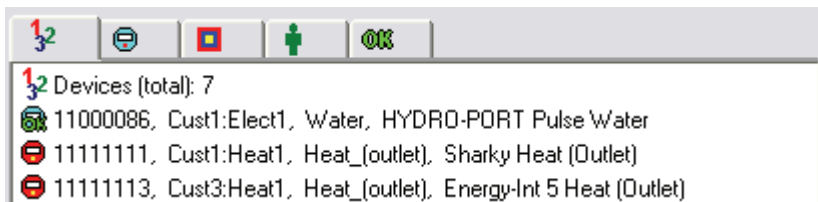
All the meters in the device list are sorted alphanumerically ascending according to their serial number (M-Bus secondary address). The entry line contains the serial number, the user defined description, the medium, and the device type.
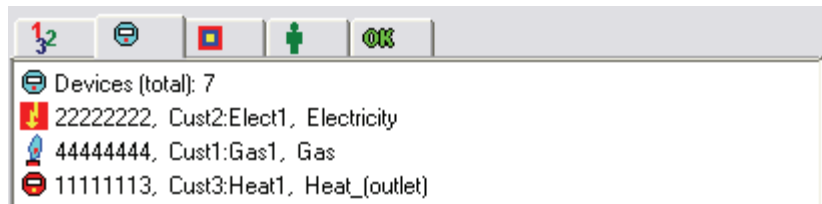
Device Types

All different device types in the device list are sorted alphanumerically ascending.

Media
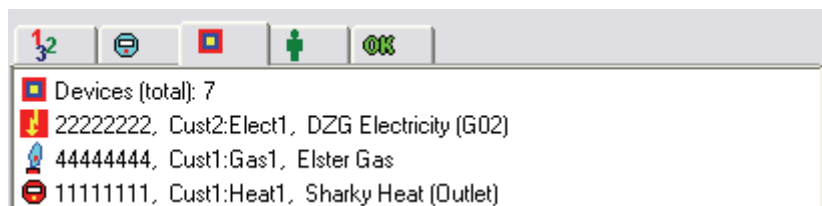
All different device media are sorted alphanumerically ascending.

Customer
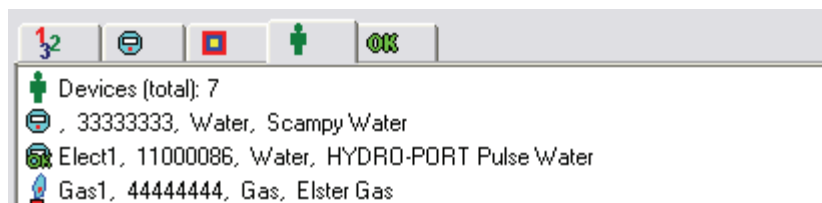
The M-Bus repeater device list has got a description field which may contain 18 characters max. The M-Bus repeater device list has not got another field for a customer description, however, if the user enters a description like cust1:desc1 the first part before the colon (':') is used as customer and the second part after the colon as description. Therefore, it is also possible to sort the devices according to customers.

Read / Not Read Devices
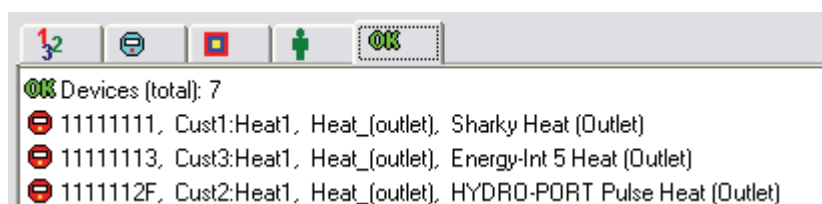
The last sort option is according to devices not yet read, read with success or read without success.

Parameter

By selecting the parameter view button from the button bar the main window shows the internal parameters of the M-Bus repeater. After starting the software, when there was not yet a reading, the parameter fields are empty and only two buttons are available.

Read internal state parameters
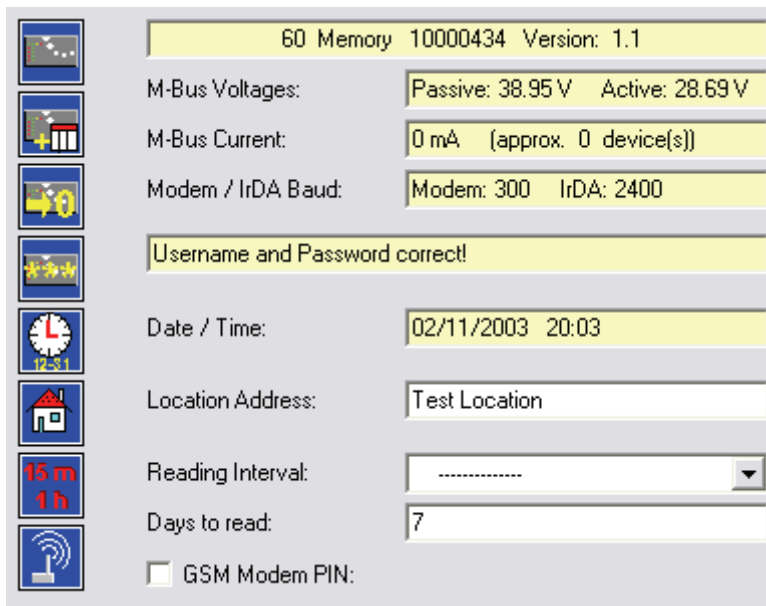
 Reads the internal parameters of the M-Bus repeater. After the reading is completed the parameter fields are filled with the current values.

Read internal state parameters and device list

 Reads the internal parameters of the M-Bus repeater and, additionally, its device list. If the device list is not too long, that is if the loading of the device list from the M-Bus repeater does not take too long, this should be the standard button to use for making the first contact to an M-Bus repeater.

If the parameter reading was successful the parameter fields are filled with the current values:

	60 Memory 10000434 Version: 1.1
M-Bus Voltages:	Passive: 38.95 V Active: 28.69 V
M-Bus Current:	0 mA (approx. 0 device(s))
Modem / IrDA Baud:	Modem: 300 IrDA: 2400
	Username and Password correct!
Date / Time:	02/11/2003 20:03
Location Address:	Test Location
Reading Interval:	-------------- ▼
Days to read:	7
☐ GSM Modem PIN:	

60 Memory 10000434 Version: 1.1

The connected M-Bus repeater supports 60 devices, has got the serial number 10000434, and its firmware version is 1.1.

Reads the internal parameters of the M-Bus repeater. After the reading is completed the parameter fields are filled with the current values.

Reads the internal parameters of the M-Bus repeater and, additionally, its device list. If the device list is not too long, that is if the loading of the device list from the M-Bus repeater does not take too long, this should be the standard button to use for making the first contact to an M-Bus repeater.

Reset data logger memory

Resets the data logger memory of the M-Bus repeater. All the data yet collected are definitely lost. The M-Bus repeater needs approx. 10 seconds for resetting itself. During this time it is not responding. A current phone connection will be terminated if the user selects this command.

Set new password

Programs the access code to the data logger memory of the M-Bus repeater. The default user name / password combination is both times 0. However, to protect the internal memory it is advisable to use an access code different from the default values.

By clicking this button the dialog beneath appears. The user has to enter two times a new username and a new password, respectively. Username and password may only consist of numerical digits. If

you want to use the M-Bus repeater in conjunction with an additional resource management software, the length of username and password together may not exceed 9 digits.

The current M-Bus voltages are displayed. Some M-Bus repeater (25 devices) are not supporting the display of the M-Bus voltages. In that case this field will be empty.

The current M-Bus current. Each M-Bus device draws a current of 1.5 mA, therefore, it is possible to approximately calculate the number of M-Bus devices connected to the bus.

By using a telephone connection or an optical IrDA connection the baud rate from the PC to the M-Bus repeater or to the modem, respectively, is fixed. Therefore, the M-Bus baud rate, at which the meters are requested, differs from the communication baud rate.

The status line shows the result of the last parameter reading request of the M-Bus repeater. If you are encountering any errors during read out, please check the status line for any error messages displayed.

Set date / time

Date / Time:	02/11/2003 20:03

The internal date and time of the M-Bus repeater. Date and time are only updated after a reading of the M-Bus repeater.

By pressing this button the internal clock of the M-Bus repeater is set according to the clock of the PC. It is not possible to enter date nor time.

Set new location address

Location Address:	Test Location

The user may give the M-Bus repeater an arbitrary name for classification purposes. This field may contain up to 25 characters.

By pressing this button the currently shown location address is programmed into the M-Bus repeater.

Set new reading interval

Reading Interval:	-------------- ▼
Days to read:	--------------
☐ GSM Modem PIN:	1 m
	5 m
	15 m
	1 h

This list contains the possible reading intervals for the automatic data logging function of the M-Bus repeater. Possible values are:

-------------   (no automatic data logging)

1 Minute

5 Minutes

15 Minutes

1 Hour

3 Hours

6 Hours

12 Hours

24 Hours

1 Day

1.x + 15.x   (The 1st and 15th day of each month at 00:00 o'clock).

If enabled the M-Bus repeater will read all the devices in its device lists automatically using the given interval. The reading starts always on the minute / on the hour (e.g. 00:00, 00:05, 00:10, …).

Days to read:	7

This values gives the number of days to read from the data logger memory if the data memory of the M-Bus repeater is requested. The data memory of the data logger may contain a large amount of data

which the user does not want to load or which he has already loaded. Therefore, it is possible to limit the reading to the number of days programmed here. The counting starts always from the latest day and refers only to days really stored into the data logger (e.g. while using the 1st and 15th of each month as reading interval, only the 1st and the 15th count as one day. Therefore, the setting 4 days to read will read the values of the last two months).

To read all the data logger memory the user has to enter 0.

By pressing this button the currently shown reading interval and the currently shown number of days to read are programmed into the M-Bus repeater.

Set GSM modem PIN number

☐ GSM Modem PIN:

☑ GSM Modem PIN: 1234

If a remote M-Bus repeater is connected to a GSM modem, the M-Bus repeater must know the PIN number of the telephone card to access the GSM modem. In this case the user must select the checkbox and enter the PIN number of the telephone card in the GSM modem connected to the M-Bus repeater at the remote site. If the M-Bus repeater is connected to a standard analog or digital modem, or the M-Bus repeater is connected directly to the PC, this checkbox must be disabled.

The gray field on the right hand side of the PIN number serves as indicator for the signal strength of the GSM connection. This value is only available for certain M-Bus repeater. Furthermore, this value is only read once after a restart of the M-Bus repeater. Therefore, to get a current value, the user should connect to the remote M-Bus repeater, hang up after establishing a connection, and connect again. Due to the fact that the M-Bus repeater resets itself after a remote connection, the indicated signal strength is up to date at the second connection.

By pressing this button the currently shown GSM PIN / GSM PIN setting is programmed into the M-Bus repeater.

Device List Editing

By selecting the device list view button from the button bar the main window shows the device list editing functions. The device list can be stored into an M-Bus repeater with memory for automatic data logging. M-Bus repeaters without memory may not store a device list. In this case the device list may be stored into a file.

Device parameter

To automatically read a device it must be described by its parameters:

Usually all modern M-Bus meters are using the M-Bus Standard addressing mode. Therefore, do not change this setting. However, for older (fixed mode) devices, select Old Addressing

There are several M-Bus addressing modes available:

If you want to use the so called Primary Address, you must enter the devices primary address in the range from 0 to 250.

The standard mode is Secondary Address where the 8 digit serial number of the device and its device type parameters (manufacturer code, generation code, medium code) are used to address it. Fill in the serial number as secondary address and select a device type from the list of known devices.

The secondary addressing mode with the 8 digit fabrication number is similar to the standard secondary addressing, except that the fabrication number is also used. Very few devices are supporting this addressing mode.

The customer addressing mode uses a 12 digit customer address and a 12 digit customer number to address the device. Very few devices are supporting this addressing mode.

The radio data logger addressing mode is used if there are radio data logger with M-Bus connections installed. The radio data logger have got an internal primary address in the range of 0 to 250 which must be entered at the appropriate field. The other parameters are the same as for standard secondary addressing.

The STX bus mode is similar to the primary addressing mode, except that meters of a specific manufacturer are addressed.

Apart from the addressing mode there are the following parameters to specify for each device:

Select the transmission speed (baud rate) to be used for requesting the device. Usually, this value is 300 baud or 2400 baud. After selecting a device type this field is automatically filled. Therefore, you should not change the default value.

Some devices need an additional M-Bus command sent in front of the M-Bus request. You may enter the command here (using HEX figures, e.g. 68 03 03 68 …). Several predefined M-Bus commands are available from the list. Usually the correct M-Bus command is inserted automatically by selecting the appropriate device type, therefore, you should not change this entry.

For each device the user may enter a 18 digit / character text which is used as description of the device. If the following convention is used, the devices in the device list may also be sorted by their customer names, respectively:

Cust:Description   Customer name and device description are divided by a colon.

Examples:

Flat1 Meter2   customer: unknown, description: Flat1 Meter2

Cust1:Meter1   customer: Cust1, description: Meter1

The user must not necessarily follow this convention, he may use the description field as it is. However, if he does, he has got the advantage of sorting the device list by customer names.

Read device list

Reads the device list of an M-Bus repeater (only with memory). Click this button if you want to read the stored device list from an M-Bus repeater with memory. This is automatically done if you have pressed

the button at the parameter page.

Write device list

Saves the displayed device list to an M-Bus repeater (only with memory).

After every change made to the device list, it must be saved to the M-Bus repeater, otherwise the changes will not be activated !

Add a new device to the list

Inserts a new device into the device list. If the user wants to manually add a new device to the device list he has to follow the following sequence:

1. Press

2. A new device is added to the device list and you notice that the button line is cleared leaving only two new buttons which are used to confirm the adding of a new device to the device list or to cancel the process:

3. Enter all the device parameter

4. To confirm the adding of a new device to the device list click either this button or, if you are at the entry field for the device description (last entry line), press the Enter key. If you press the Enter key at the device description line everything is prepared to directly enter another device. To cancel all entries press , in this case the device is not added to the device list and all entries are discarded.
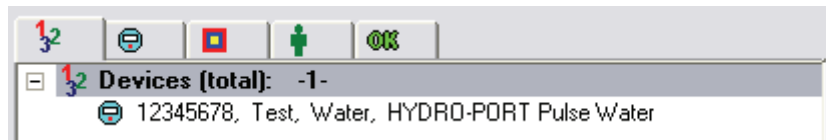
5. If you want to add another device, press the button again (start at point 1), or, as described at point 4, click into the description field of the device and press the Enter key.

After every change made to the device list, it must be saved to the M-Bus repeater, otherwise the changes will not be activated !

Remember to first press after that you may start to enter the device parameters. If you start entering device parameters without having pressed the new device button, the parameters are lost or, worse, an existing device parameter set is overwritten !

Editing the device parameters of an existing device

For editing the device parameters of a device already existing in the device list you must click on the device in the device list (select the device) and start editing the parameters shown. As soon as you leave the appropriate entry field the new device parameter is taken.

After every change made to the device list, it must be saved to the M-Bus repeater, otherwise the changes will not be activated !

Delete device

Deletes a device. If you want to remove a device from the device list, select its entry and press this button.

If you want to delete more than one device at once you may click the topic of the devices in the device list (e.g. all devices of certain meter type).

If you want to arbitrarily delete several devices from the list you have to change the device list view from tree view to list view . Then it is possible to use the multiple selection ability of the list (ALT or CTRL key and clicking the devices to delete).

After every change made to the device list, it must be saved to the M-Bus repeater, otherwise the changes will not be activated !

Compare device list

Compares the currently loaded device list in the program with a device list saved to a file. After pressing this button the dialog for selecting a file appears. If the user has selected a file and confirmed the selection dialog, a comparison of the two device lists is made. The result window may look like the window beneath:
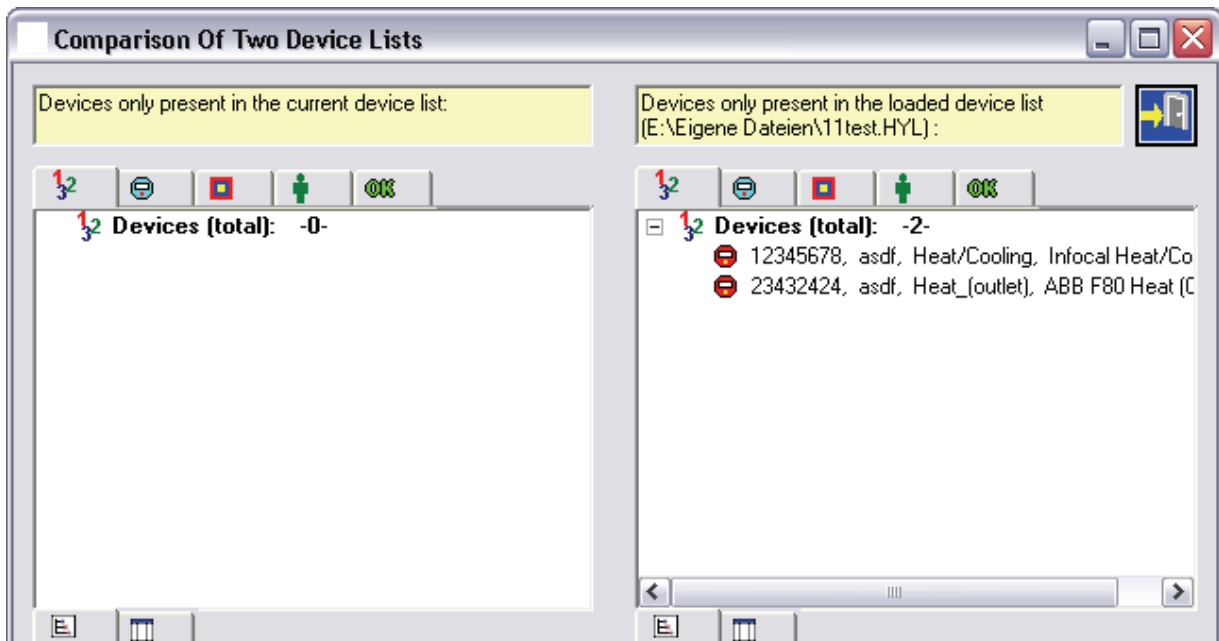
Export device list to a resource management software

Exports the device list to the data base of a resource management software. This button is only enabled if a data base of a resource management software was found at program start and if the appropriate option (Database connection allowed) at the settings dialog is enabled.

For exporting a device list follow the sequence beneath:

1. Press

2. Enter username and password to access the resource management software (**this username and password is usually different from the username and password for accessing the M-Bus repeater memory**).

3. Select the appropriate options from the upcoming option dialog:

```
                        Select the devices to be exported.
  ○ Export all devices in the device list.
  ● Export all devices which are not yet present in the database (recommended).
  ○ Export only selected devices.
  ○ Export only selected devices which are not yet present in the database.
```

You may opt for exporting all devices or only the devices selected from the device list. Additionally, the software may perform a check for already existing devices. In this case all devices already present in the data base of the resource management software will not be exported.

```
              Please state if you wish to check all devices before doing the export.
        NOTE: Without a device check it is not guaranteed that the export will be correct!
  ● Check devices before doing the export (recommended).
  ○ Do not check devices.
```

You may opt for checking all devices before exporting them or not. Checking all devices means that the software tries to read every device once (a connection to the devices is necessary). **This option is strongly recommended since only then you will be sure that all exported parameters are correct.** However, the process of checking all devices may take some time if there are a lot of devices to export, therefore, you may also opt for omitting this process (not recommended).

```
              Would you like to enter the TAG IDs and descriptions manually or automatically?
  ● Enter TAG ID and description manually (recommended).
  ○ Automatic entry (TAG ID = serial number, description = measured medium).
```

Usually you have to enter the so called TAG ID (meter value number) and description of the meter value to export manually. TAG ID and description are used to recognize the respective meter value. Therefore, it is recommended to use a scheme for entering TAG ID and meter number. However, if you do not want to enter the meter value TAG ID and description, manually, you may opt for inserting them automatically by the software. In this case you may alter them later on in your resource management software.

```
              Please select the reading interval of the devices (default setting recommended).
  ○ Every Minute
  ● Every 5 minutes or every 15 minutes
  ○ Every hour or less frequently
```

Select the appropriate reading frequency for the devices to export.

4. Click on the next button to proceed to the next step.

5. For each device found there will appear a dialog similar to the one displayed beneath:

6. You may now select the meter values to export by checking or un-checking the blue buttons on the left hand side of the meter value descriptions. Additionally, you have to enter a unique TAG ID and

a unique description for each meter value you would like to export. Click on the next button to proceed to the next device. To skip the rest of the devices you may also click on the skip button

 .

7. After exporting the last device you may assign all devices to a communication process. Here you may enter the name of a new communication process or, if existent, select a communication process from the list.

Load a device list from a file

Loads a previously stored device list from a file. After pressing this button the file selection dialog appears and the user may select a device list file to load. The file extension of the device list files is always .HYL.

After every change made to the device list, it must be saved to the M-Bus repeater, otherwise the changes will not be activated !

Save device list to a file

Saves the current device list into a file. Press this button, enter or select a filename and press save. The file extension for device list files is always .HYL. In addition to this .HYL file a file with .XLS extension with the same name is created. The .XLS file contains the device list in readable text format (text divided by tabulators) which can be directly opened by EXCEL.

Device Reading

By selecting the device reading view button from the button bar the main window shows the M-Bus device reading functions. Apart from simply reading one or more devices the user may also read the data logger memory of an M-Bus repeater, perform an M-Bus search for connected M-Bus devices and export the read values to a file. All read values may be displayed and exported in different formats.

Time point	Value	Unit	
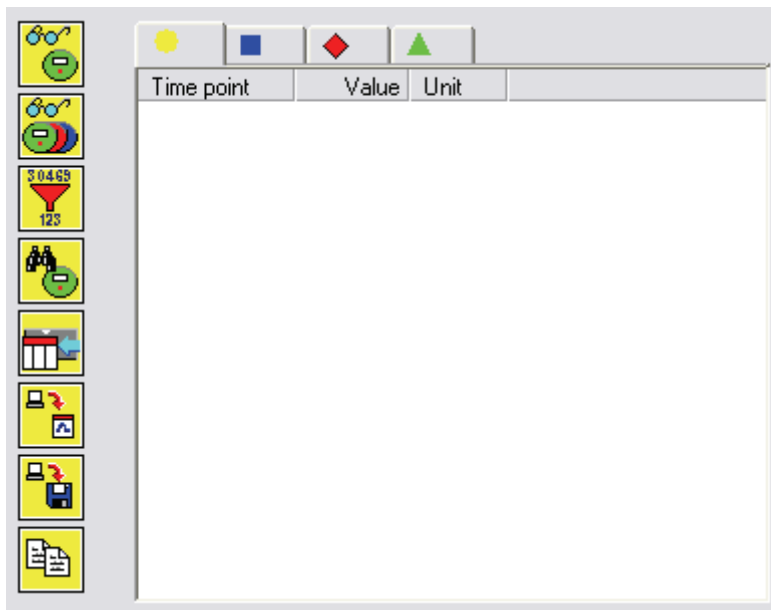
Read M-Bus device(s)

Select one or more devices from the device list by clicking them and press this button to read. In tree view you may only select one device or you may select a complete group of devices to read by clicking on the respective topic. Multiple selection is not possible, however, you may use the list view of the device list to multiple select devices for reading.

Read data logger memory

The data logger memory of the M-Bus repeater is read. Only the number of **Days to read** set by the user will be read from the data logger memory.

Filter options

After reading one or more devices or after reading the data logger memory the display will show all the values of all the devices read (without filter).

Device filtering:

However, if you want to view only selected devices, click on the respective device entry in the device list. Then only the values of these devices are shown. To remind you that a filter is active the warning beneath is displayed.
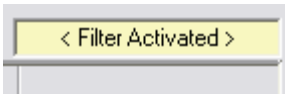
For removing the filter you have to click the entry **Devices (total)** in the device list.
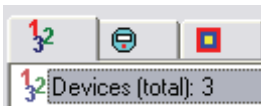
Value filtering:

For only showing certain values of the devices you may use this button to call the filter options.
The dialog beneath will appear:

From the list **Displayed Values** the user may select the device values he would like to see. Possible options are:

<All Values>	Default setting, no filter is used
<Principal Values>	Only the principal values of a device are shown. Principal values are e.g. the energy count, temperatures and volume of a heat meter, the energy count of an electricity meter, the volume count of a water meter, …
<Principal Values with Integrated Meters>	Same as above, but the integrated meters of a device are also displayed.

<Billing Values>	Only values for meter billing are shown. Billing values are e.g. the energy count, and volume of a heat meter, the energy count of an electricity meter, the volume count of a water meter, …
<Billing Values with Integrated Meters>	Same as above, but the integrated meters of a device are also displayed.
<Billing Values – Energy Only>	Only values for energy meter billing are shown. Energy billing values are e.g. the energy count of a heat meter, the energy count of an electricity meter, …
< Billing Values with Integrated Meters – Energy Only>	Same as above, but the billing values of integrated meters are also shown.
1 Value	Only the first value in the M-Bus telegram of a device is shown
2 Values …	

Additionally, the user may select a time span for the values to be displayed. Only device values read within the given start / end time will be displayed.

Do not forget to reset the filter options if you want to view the complete reading again. Especially if you have enabled the option to save the filter options from the settings dialog you should carefully watch if filtering is enabled or not.
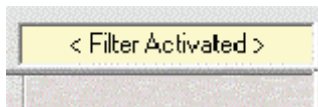
M-Bus device search

Performs an M-Bus device search. By clicking this button the dialog beneath appears where the user may select several search options:

If you are still using old M-Bus devices which uses a different addressing scheme you may enable the old addressing button. By default you should always use **M-Bus Standard**.

You may select the addressing for the M-Bus search. By default you should always use **Secondary Address**.

Enter the search baud rate (by default **2400 baud**). Additionally, the user may opt for a fast or an intense search.

Fast Search: If there was no answer for a particular address during device search, the software will immediately proceed with the next address (1 attempt in total).

Intense Search: If there was no answer for a particular address during device search, the software will try this address another two times (3 attempts in total).

The intense search is recommended always. However, if that takes too long and less reliable results are OK for you, you may also use the fast search.

If you are only looking for one particular device type you may use this option to limit the search to the device type selected.

If a search for the complete address range takes too long, or you have encountered M-Bus collision trouble during the full search you may use this option to narrow in the address range to search.

You may enter an address or a so called wildcard address by using the character 'F' as place holder for any digit of the address.

Please remember that the **start address is included** in the search, but the **end address is excluded** from the search. Therefore, in the example given above, all addresses up to 1999999 are searched. The address 2000000 is excluded. The same goes if you use 2FFFFFF as end address (all addresses beginning with 2 will not be searched).

Add found devices to device list

After a successful device search all the devices found are not automatically added to the main device list of the program. Instead, the found devices are listed separately. To add them to the main device list you have to press this button. The option dialog beneath appears:

First of all you may add all found devices or only the devices selected to the main device list. After that you may also opt for comparing the found devices and the devices already in the main list. Depending on the filter option, all devices, only devices with different serial number (address), only devices with different serial number (address) and different device type (manufacturer, medium, generation), or only devices which are completely different are added to the main device list.

Export device values read

All read device values may be exported to a resource management software by clicking this button. It is only available if a resource management software data base is found during program start and if the option **Database Connection Allowed** from the settings dialog is enabled.

Note that if any filter options are activated only the filtered device values will be exported.

Save device values read to a file

All device values shown in the list are exported to a text file (tabulator separated columns) with the file extension .XLS. This file may be opened e.g. by EXCEL. The export format is exactly the same as used for the list display.

Note that if any filter options are activated only the filtered device values will be exported.

Copy device values read to clipboard

All device values shown in the list are copied to the clipboard. From there they may be pasted to another application like EXCEL or WORD. The copy format is exactly the same as used for the list display.

Note that if any filter options are activated only the filtered device values will be copied.

Value display formats

The read device values may be displayed in four different formats. The fourth format is only to be used for the binary export to a resource management software.

Standard view:

All values of the devices are simply listed using the sequence of their appearance in the M-Bus telegram, respectively.

Tabular format 1:

All values of the devices are listed with their respective time points in tabular form. By using the filter options the user may exclude values from the list.

Tabular format 2:

All values of the devices are listed with their respective time points in tabular form. This format is similar to the first tabular format, however, there are more parameter of the device shown. By using the filter options the user may exclude values from the list.

Data base export format:

The M-Bus telegrams of all devices are shown in raw binary format. This format is only useful for exporting the data to a file. The file is then later used to import the data to the data base of a resource management software.

General Device Reading

By selecting the general device reading view button from the button bar the main window shows the following functions:

- Programming of a new M-Bus primary address (only standard M-Bus command)
- Programming of a new M-Bus baudrate (standard M-Bus command)
- M-Bus device reading by entering a primary address
- M-Bus device reading by entering a secondary address
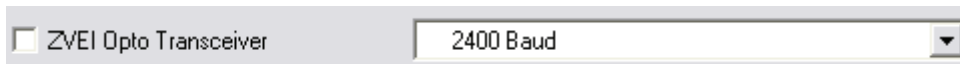
In the topmost line the baudrate to use is set, additionally, the option for using an opto transceiver is available. The opto transceiver may only be used with the programming of a new primary address or with the immediate primary or secondary address reading of a device. The baudrate programming function ignores the opto transceiver setting.

This function alters the primary address of an M-Bus device, if the device in question is supporting the standard M-Bus primary address changing command. The above set baudrate is used as communication speed, optionally, the device may be programmed using an opto transceiver instead of an M-Bus repeater. The entry field with the current address must be filled with the current primary address of the device (entry field contains 3 digits or less) or the secondary address of the device (entry field contains more than 3 digits). The broadcast address 254 may also be used if there is only one device connected to the M-Bus repeater or if an opto transceiver is used.

For M-Bus devices which are not supporting the automatic communication speed detection (autobaud), this function sets a new communication speed. It is only possible to set the baudrate for the entire M-Bus network using the broadcast address 254 (with answer) or 255 (without answer). Preferably, the broadcast address 255 without answer should be used to avoid extended bus collisions if more than one device is connected to the M-Bus. However, for devices not supporting or not recognizing the broadcast address 255 the address 254 must be used.

Primary Address:

A direct reading of an M-Bus device using the given primary address is started. An eventual answer from the M-Bus device is displayed in the meter value list beneath (same display formats as for the device reading using the device list). The communication speed is given by the selection above. Optionally, an opto transceiver may be used (see above). If only one device is connected to the M-Bus repeater or if the communication is going over an opto transceiver, then the M-Bus broadcast address 254 may also be used.

Secondary Address:

A direct reading of an M-Bus device using the given secondary address is started. An eventual answer from the M-Bus device is displayed in the meter value list beneath (same display formats as for the device reading using the device list). The communication speed is given by the selection above. Optionally, an opto transceiver may be used (see above). For any arbitrary digit of the secondary address the character **- F -** may be used. For example, the address 9FFFFFFF tries to read all devices with a secondary address starting with 9.

An M-Bus device read by direct reading will be added to the main device list. The export to the main device list is not equal to the fact that the device in question is also exported to the device list of the M-Bus repeater. To do so the respective function for writing the device list of the M-Bus repeater must be used.

M-Bus Radio Receiver

The M-Bus radio receiver captures the radio telegrams of PRIOS radio modules (868 MHz or 434 MHz). The last radio telegram, respectively, of a maximum of 1000 radio modules are stored within the internal memory of the M-Bus radio receiver. The reading of this radio data is done by M-Bus commands. To address a certain radio module within the M-Bus radio receiver the secondary selection with fabrication number is used. The secondary address is related to the radio module itself (serial number, manufacturer code, generation and medium), the fabrication number contains the serial number of the M-Bus receiver from which the radio telegram is to be retrieved. By using this addressing scheme it is clearly defined from which M-Bus radio receiver the radio data should be read, even though one specific radio module may be captured by more than one M-Bus radio receiver.

The data transmitted by the radio modules are encrypted, therefore, without the appropriate decryption key the meter values cannot be retrieved:

By default, the Default PRIOS key should be used. Only if the a self-defined encryption key is used the PRIOS key is to be entered directly. **If the option No PRIOS Support is selected, the button for accessing the M-Bus radio receiver functions does not appear on the main window.**

At the beginning the screen with the M-Bus receiver functions looks like the example shown beneath:

If there is one or more M-Bus radio receiver connected to the M-Bus repeater, the button for retrieving the internal state values is used. Before pressing this button the serial number of the M-Bus radio receiver in question and the baudrate to use must be entered.

If there is only one M-Bus radio receiver connected to the M-Bus the entry field with the serial number may stay blank.

The M-Bus radio receiver may communicate using 2400 baud or 9600 baud, however, it is not capable of automatic baudrate detection (autobaud). If the communication speed is not properly selected, the M-Bus radio receiver will not answer. Therefore, if the current communication speed of an M-Bus radio receiver is not known, the user should try both speeds (2400 and 9600 baud).

The factory default setting for the communication speed is 2400 baud. However, for a faster transmission, especially for the device list, it is advised to change the baudrate to 9600 baud (see beneath) if the M-Bus network cable length permits.

After a successful reading the main windows shows the configuration of the M-Bus radio receiver:
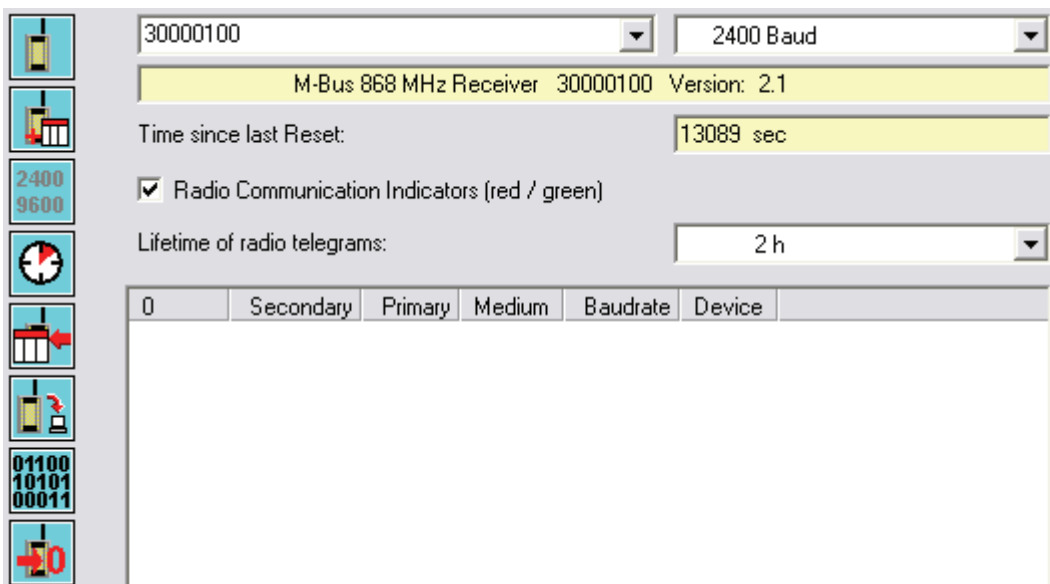
Apart from the serial number and the baudrate, the firmware version and the time in seconds from the last restart of the M-Bus radio receiver are shown. The radio communication indicators (green and red LED, blinking for a successfully or an erroneously received radio telegram) may be switched on or off.

The lifetime of radio telegrams is the maximum allowed time for a radio device to stay in the M-Bus receiver device list, if there is not a more recent radio telegram received. With this option all radio devices no longer emitting for one reason or another (having been switched off or replaced) are discarded from the device list, therefore, the device list is not containing obsolete radio modules.

 Using this button the device list of the M-Bus radio receiver is retrieved and shown in the device list (this may take up to 30 seconds with 2400 baud):

16	Secondary	Primary	Medium	Baudrate	Device
? 0000	12345678	253	Other	9600	\<Unknown Device Type\>
0001	40800782	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0002	45111534	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0003	45111536	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0004	45111537	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0005	45111538	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0006	45111544	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0007	45111617	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0008	45111619	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0009	45111620	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0010	45200420	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>
0011	45200425	253	Heat_Cost_Alloc.	9600	\<Unknown Device Type\>

The leftmost column contains the number of the radio device, the other columns containing the secondary address, the primary address (always 253 since it is only virtual), the measured medium, the baudrate and the device type.

 The M-Bus radio receiver is able to communicate with 2400 baud or 9600 baud, however, it is not supporting the automatic detection of the communication speed (autobaud). With this button the communication speed of the M-Bus radio receiver is changed from one baudrate to the other (depending on the baudrate currently selected). The factory default setting for the communication speed is 2400 baud. In general it is advised to change the speed to 9600 baud, if the M-Bus network cable length permits. With 9600 baud the communication times are reduced.

 Using this button the maximum lifetime of a radio module within the device list of the M-Bus radio receiver is set. A radio device will be discarded from the device list if the M-Bus receiver has not received a radio telegram within the given interval of time. The default setting is 2 hours, intervals from 1 hour to 18 hours may be set. Additionally, the lifetime checking of radio modules in the device list may be switched off.

 A device list retrieved from the M-Bus radio receiver can be added (exported) to the main device list of the program. This process is the same as for adding found devices to the device list after an M-Bus device search. Once added to the main device list, the meter values of the radio modules can be read the same way as for any other standard M-Bus device. The radio modules can also be written the internal device list of the M-Bus repeater, allowing the automatic time controlled logger reading of radio modules.

 Using this button the complete content of the M-Bus radio receiver memory is retrieved and written to a local file. This function is only used for testing and debugging purposes and should not be used during standard operation.

 The internal firmware of the M-Bus radio receiver may be updated using this button. Usually, the M-Bus radio receiver is delivered with the most recent firmware version, however, if there will be improvements in the firmware it is possible to update older M-Bus radio receiver to the latest firmware version. Before using this button the user should verify:

- the communication speed should be set to 9600 baud, the update process takes than approximately 5 minutes.

- if the update process fails, it can be repeated as often as necessary. However, once programmed to firmware update mode, the M-Bus radio receiver stays in firmware update mode until the update process is completed, it is no longer possible to receive radio telegrams nor to read the device list.

- before starting the firmware update the user should verify if the firmware version to be programmed is more recent than the firmware version of the M-Bus receiver in question. It is possible to downgrade to an older version of the firmware version. If the firmware versions are equal it is not necessary to do a firmware update.

 The internal device list of the M-Bus radio receiver is cleared. Additionally, the M-Bus radio receiver is reset. Afterwards, the device list is built up from scratch with the radio modules received after the reset.

Trouble Shooting

No communication with the M-Bus repeater

If there is no communication between the computer and the M-Bus repeater or the M-Bus devices, please check the following points:

- the correct type of the communication (serial, modem)

- serial port (COM1, COM2, …)

- communication speed (usually 2400 or **9600** baud for direct serial communication and 9600 or **19200** baud for modem communication)

- addressing the M-Bus repeater:

    - Standard, if there is only one M-Bus repeater (with or without memory) connected

    - Memory, if there is only one M-Bus repeater with memory but more M-Bus repeater without memory connected, **any M-Bus repeater without memory will not answer**.

    - Serial number, if there are more than one M-Bus repeater with memory connected. In this case the addressing by using the serial number of the M-Bus repeater is mandatory.

- the connection between the computer and the M-Bus repeater (PC connector) or the modem, respectively

- the connection between the M-Bus repeater and the M-Bus devices

If the problem persists you may also try to switch off the FiFo buffer of the serial port :

- At the program settings dialog deselect the option **FiFo buffer of the serial interface enabled**:

☐ FiFo buffer of the serial interface enabled
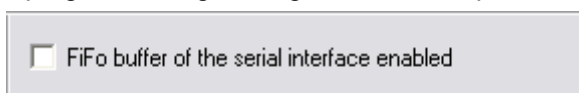
- Additionally you have to switch off the FiFo buffer for the respective serial port at the system configuration of Windows (Start -> Control Panel -> System)

- Click on "Device Manager"

- Double click on "Connections (COM and LPT)"

- Double click on the serial port you would like to modify

- Click on "Interface Settings"

- Click on "Extended"

- Deactivate the FiFo buffer for the serial port completely

- The description of the dialogs may vary depending on the Windows version you are using.

Both steps described here are always necessary (switching off the FiFo in the program and in Windows).

Afterwards it is mandatory to restart Windows, even though there might not be a message.

Other Communication Problems

Another possibility to correct communication problems is the option Extended Communication Timeouts, which can also be found at the program settings dialog:

☐ Extended communication timeouts

If this option is enabled, the program uses extended delays while waiting for a communication answer. This can improve the communication in the following cases:

- if the communication is done over a telephone line and the M-Bus repeater is very far away from the central .
- if the communication is done using a serial to LAN converter. A serial to LAN converter is used to transmit the serial interface signals to a remote M-Bus receiver which is connected to the LAN. Very different communication answering times may appear depending on the load of the LAN network.

The only disadvantage of selecting this option is the extended duration of a communication.