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ST-meM-LOG SE

Software for Data logger meM-LOG-SE

User Manual

Version 1.0

www.bmcm.de

bavarian measurement company munich

Contents

1 Overview

1.1 Introduction

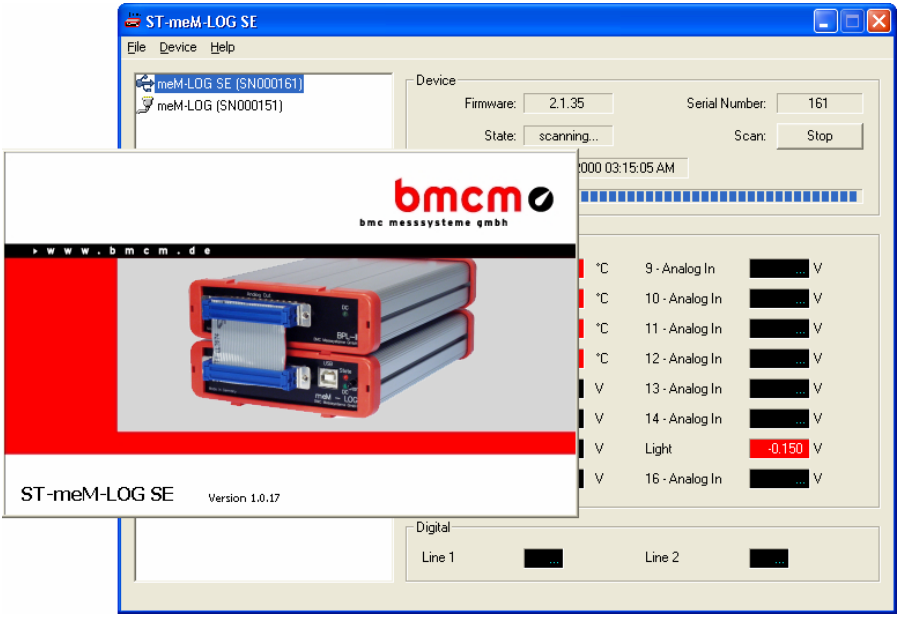

Fig. 1

The software **ST-meM-LOG SE** is an easy-to-use program under Windows® 7/XP for controlling the data logger meM-LOG-SE from BMC Messsysteme GmbH without any programming efforts. Following the common Windows® conventions, the lead-in period is drastically reduced. When developing the second version (SE: "Second Edition"), great emphasis was put on user-friendliness and reliability.

The connection between the PC and the data logger is realized via the serial (RS232) as well as the USB interface so that the advantages of both interfaces are available to the user. Data transmission, for example, is much faster with USB. On the other side, when using a serial connection, transmission of measuring data over long distances is possible. **ST-meM-LOG SE** manages both interfaces so that one

device (or several) can be connected to USB and another to the serial interface at the same time.

Up to 127 devices connected via USB can be operated with **ST-meM-LOG SE**. For serial connection of more than one logger, the serial interface RS485 must be used. This requires a converter between RS232 and RS485. In this case, 255 devices at the most can be connected.

Incoming live data of the analog and digital inputs of the selected device are continuously displayed as numerical values or digital levels (0 = *low*, 1 = *high*). The 16 analog channels are presented as physical quantities with physical unit and channel name within their adjusted measuring range.

Sampling of the channels is continuously done, or in a so-called *Alarm Mode*, in which only selected or all channels are stored if measuring values are beyond individually set alarm limits. Channel values leaving their normal range are displayed with a red marking in the *Live display*.

If *Loop Mode* has been chosen, a scan is not finished as usual when reaching the storage capacity, but old measuring data are overwritten.

Even a measurement which is still running can be read out up to the present moment. In *Loop Mode*, the memory is deleted in this case. Scanning for a long period of time is possible without any loss of data if measuring values are regularly read out.

Another important advantage is the possibility to fix the scan start to a certain date and time making personal presence at scan start unnecessary.

When reading out recorded data from the memory of the data logger, **ST-meM-LOG SE** writes files in file format **`*.txt`** or **`*.lfx`**, which can be displayed and analyzed in various programs for word processing (Notepad®, Wordpad®, Word® etc.) and spreadsheet (e.g. Excel®). Especially to mention is the direct storage as an **`*.lfx`** file, the file format of the professional data acquisition software NextView®4. It graphically displays signals runs, which can be processed by means of extensive analysis functions.

An installation program leads you in clear steps through the installation. It is available on our "Software Collection" CD included with delivery.

If using the data logger meM-LOG-SE with USB, please make sure to install the hardware driver before the installation of ST-meM-LOG SE. It is also provided on the "Software Collection" CD. For further details, please have a look at the meM-LOG-SE data sheet or the driver installation manual on CD.

1.2 BMC Messsysteme GmbH

BMC Messsysteme GmbH stands for innovative measuring technology made in Germany. We provide all components required for the measuring chain, from sensor to software.

Our hardware and software components are perfectly tuned with each other to produce an extremely user-friendly integrated system. We put great emphasis on observing current industrial standards, which facilitate the interaction of many components.

Products by BMC Messsysteme are applied in industrial large-scale enterprises, in research and development and in private applications. We produce in compliance with ISO-9000-standards because standards and reliability are of paramount importance to us - for your profit and success.

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1.4 New features of the "Second Edition"

With the revision of the data logger meM-LOG-SE in terms of hardware and firmware level, the operating program has been completely rewritten. The result was an entirely new software, surely deserving a new name, which is **ST-meM-LOG SE**. The "Second Edition" (version 1.0) features the following new functions:

- **User-friendliness**
  When designing the user interface and the menu structure, great emphasis was put on clearness and usability. For example, the configuration of the device for a scan is done in one dialog. Settings are directly made without needing to switch between too many windows or tab dialogs.

- **Displaying analog inputs as physical quantities**
  In contrast to simple analog voltages, incoming signal values are displayed now as physical quantities with name and unit as defined.

- **Live display provided with new functions**
  Saved measuring values are shown in *Continuous Mode* or in *Alarm Mode* (saving all channels in alarm) during a scan in the live display. Channel values that are not scanned are removed from the display. Alarm states are signalized by a red marking.

- **Offset adjustment**
  You can set an offset for each channel separately to calibrate the logger at 0V.

- **Showing the memory usage**
  A progress bar on the user interface continuously indicates the used space of the meM-LOG-SE memory also during a scan.

- **Read out measuring data in the background**
  Transmitting the stored measuring values to a measuring file even during a running scan is now possible in all operating modes.

- **Directly create measuring files**
  The conversion of a measurement file from **`txt`**-format into an **`lfx`**-file is not necessary anymore. You can choose to directly write the sampled data into a file with file format **`*.txt`** or **`*.lfx`**.

- **Alarm outputs optionally always on**
  In *Sleep Mode*, the alarm outputs of the data logger optionally keep their full functionality.

1.5 Quickstart

If connecting the data logger meM-LOG-SE to the USB interface, install the device driver located on the "Software Collection" CD first. For further information, please see the meM-LOG-SE data sheet or the driver installation manual (both on CD).

1.5.1 Installation

- Insert the "Software Collection" CD into your CD-ROM drive.
- If the Autorun function of your CD-ROM is selected, a CD starter in HTML file format automatically opens containing the provided documentation and software for meM-LOG-SE (otherwise click **`openhtml.exe`**).
- First select the category "Products" and then the data logger meM-LOG-SE listed under the USB interface.
- Start the installation by opening the item "ST-meM-LOG SE" (previous saving of the installation file is not necessary) on the meM-LOG-SE product page.
- Choose the program group to be displayed in the Windows® start menu and the directory, where the software can be started from.
- After the installation, restart your computer if necessary.

1.5.2 Operation

- Connect the data logger meM-LOG-SE to the serial or the USB interface and turn on the device.
- Start the software **ST-meM-LOG SE** by using the entry in the Windows® start menu ("Start/Programs/ST-meM-LOG SE") or open the respective directory path as indicated upon installation.
- Get a connection to the data logger(s) via the desired interface ("File/Find USB" or "File/Find COM"). As soon as all devices are found, the search can be cancelled early.
- To display or change the settings of the device, the relevant device must be selected on the left side of the user interface.
- All scan information is entered in the dialog "Scan Settings" (e.g. *Continuous Mode*, *Alarm Mode*, *Loop Mode*, sampling interval, scan start mode, selection, configuration and calibration of channels to be saved, alarm limits or levels etc.).
- The analog inputs are individually configured in the dialog "Scan Settings" (channel name, unit, offset, reference values). Each channel can be reset to a standard configuration. Incoming values are displayed with their adjusted physical quantity on the program screen of **ST-meM-LOG SE**.
- A scan starts by pressing the device button, by a programming command, at a defined date or by clicking on the "Start" button in the window screen. In the *Live display* saved channel values are displayed during a scan. Channels in alarm are marked in red.
- A scan is finished at full memory (not *Loop Mode*), by the device button, a programming command or by clicking on the "Stop" button in the window screen.
- Stored data in the meM-LOG-SE memory are read out with the command "Device/Read out and save samples" and written into a measuring file in file format **`*.txt`** or **`*.lfx`** to be used in word processing and spreadsheets programs (Notepad®, Wordpad®, Word®, Excel® etc.) as well as in the measuring software NextView®4 for data acquisition and processing with full functional range. In *Loop Mode*, stored data is removed from the memory. You can choose the directory path for the measuring files.

2 Installation and program start

2.1 System requirements

- PC with Windows® 7/XP
- 64MB RAM, 5MB free hard disk space

2.2 Installation

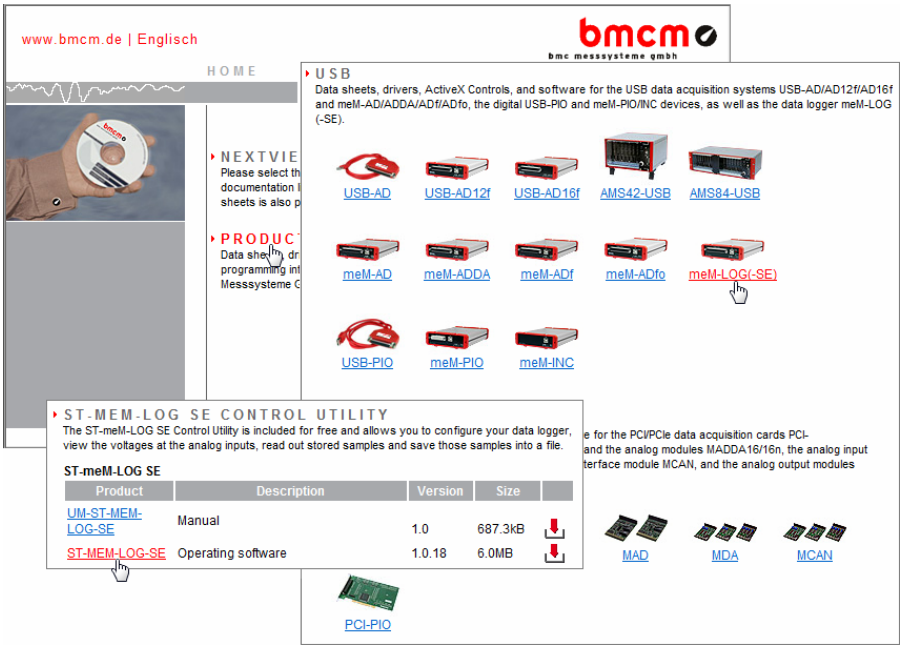

Fig. 2

Use the Software Collection" CD included with delivery for installation. Insert the CD into the CD-ROM drive. If the Autorun function of your CD-ROM is selected,

a CD starter in HTML file format automatically opens (otherwise click **`openhtml.exe`**) containing the provided documentation and software for meM-LOG-SE.

Click the entry "Products" to see the bmcm data acquisition hardware classified by the used interface and select the device "meM-LOG" under the USB interface. On the product page of the data logger, open the installation program by selecting the entry "ST-meM-LOG SE" in the section "ST-meM-LOG SE Control Utility".

If using the CD starter in HTML format, you can decide to directly open the installation program or to save it to disk. Both options are possible.

Some browsers require saving the installation program to hard disk before. In this case, you must explicitly start the installation program **`install.exe`** after copying.

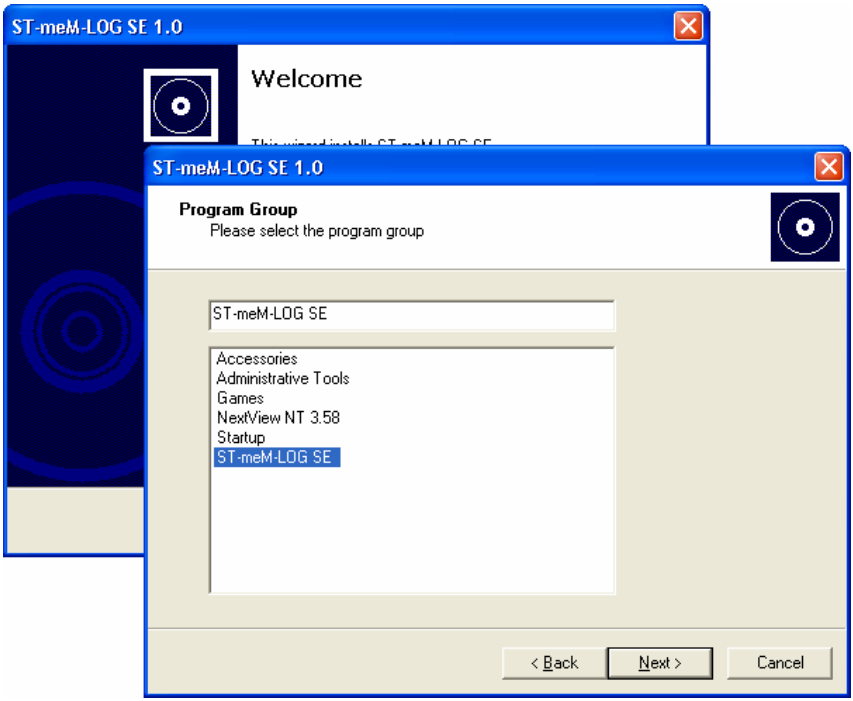

Fig. 3

An installation wizard guides you through installation step by step. The information filled-in can be changed at any time. Press the button "Next" to reach the next dialog, "Back" takes you one step backwards. The installation can always be aborted by clicking on "Cancel".

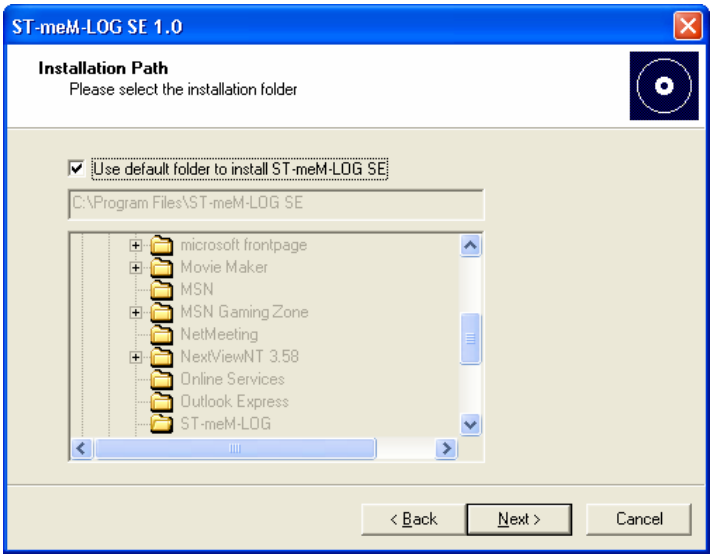

Fig. 4

After the "Welcome" screen, choose the program group in the Windows® Start menu, from where the software can be opened, and the directory, in which **ST-meM-LOG SE** will be installed.

To switch to another installation directory, uncheck the checkbox to activate the boxes below. Of course, the default settings "ST-meM-LOG SE" and "C:\Program Files\BMC Messsysteme\ST-meM-LOG SE" can be modified just as you like.

Afterwards you will be informed about required disk space and available storage capacity.

The installation can only be done correctly if enough disk space is available. If not, stop the installation for now and provide for sufficient storage capacity.

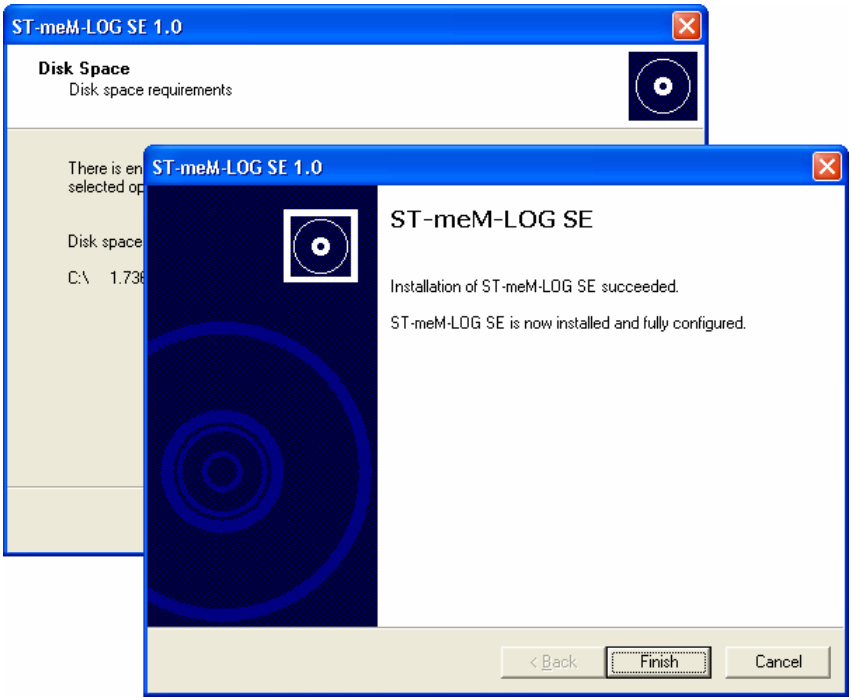

Fig. 5

After pressing the button "Next", the installation process starts and the required files are copied to hard disk. Restart your computer if necessary.

2.3 Program start

After successful installation, the new product group "ST-meM-LOG SE" is listed in the Windows® Start menu under "(All) Programs". It contains the operating program for the meM-LOG-SE data logger.

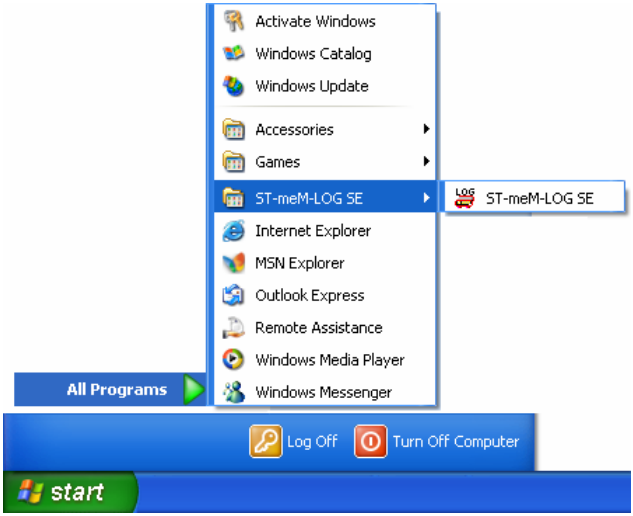

Fig. 6

To open the program, click on the item "ST-meM-LOG SE".

3 Operation

3.1 General information

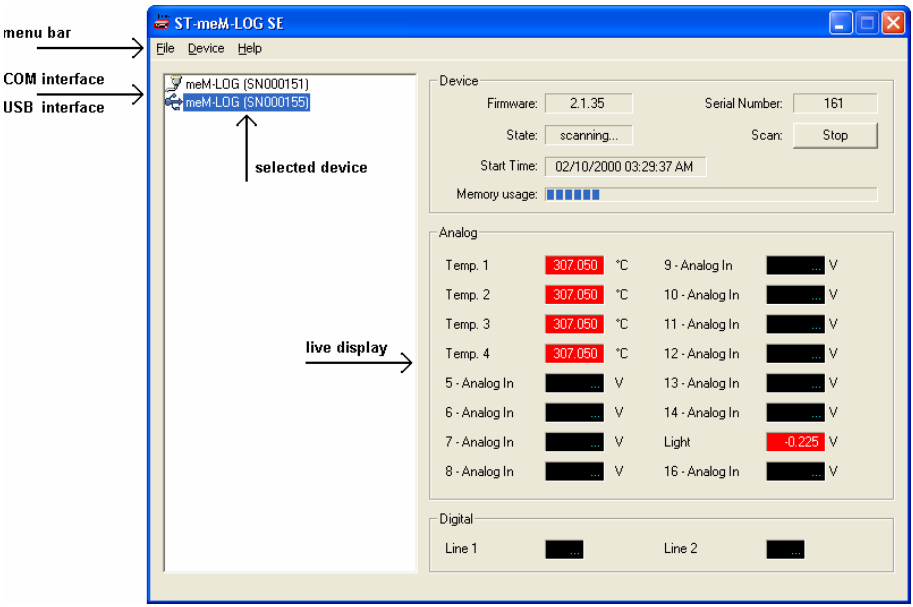

Fig. 7

The user interface follows the common Windows® conventions. If you click on the items of the menu bar, a menu opens with the accompanying commands, which are opened or executed by mouse click. According to the Windows® conventions, **ST-meM-LOG SE** can also be operated by keyboard.

All devices that have been found are listed with their serial number in the left window. Small icons preceding the devices illustrate the interface connection.

 COM interface

 USB interface

To display and modify the current settings of a data logger, the device must be selected.

On the right-hand side, the upper section shows general information about the selected device (*Firmware*, *Serial Number*), the current measurement (*State*, *Start Time*, *Memory Usage*) and a button to start or stop a scan.

3.2 Live display

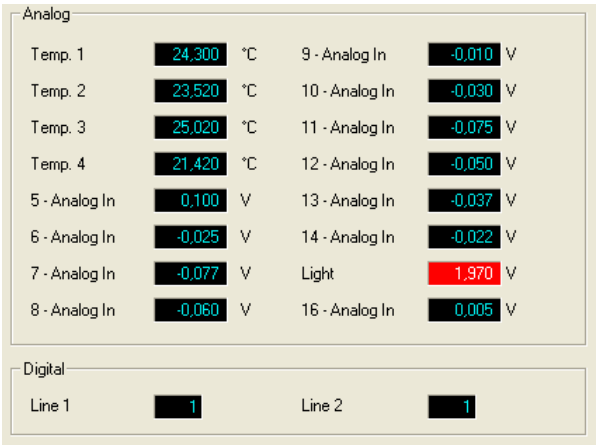

Fig. 8

The incoming values of the data logger selected on the left are continuously displayed in an online display as numerical values.

In addition, the *Channel Settings* of the 16 analog inputs (see "Channel Settings", p. 32) are included in the display so that the live data are presented as physical values with the respective unit and channel name. Channel values that are outside their adjustable normal range (in *Alarm Mode*) are highlighted in red (see "Setting the alarm limits", p. 34). The analog inputs to be saved are displayed (exception: no displaying in *Alarm Mode* if saving alarmed channels only) during a running scan.

The two digital lines show the level of the channel (*high* = 1, *low* = 0). If no signals are connected at the digital channels, they are always *high*.

3.3 Menu items in ST-meM-LOG SE

Menu	Command	Function
File	*Find USB*	get a connection to meM-LOG-SE data loggers which have been plugged in at the USB interface and then turned on (see "USB connection", p. 21)
	Find COM	get a connection to meM-LOG-SE data loggers which have been plugged in at the COM interface and are turned on (see "COM connection", p. 22); settings for COM interface and search preferences are possible
	Exit	exit program
Device	*Scan Settings*	make settings concerning a scan (e.g. sampling interval, start, operating mode, storage mode, *Alarm Mode*; see p. 25); configuration and calibration of analog inputs (channel name, unit, offset, reference values to convert voltages into physical quantities; see p. 32)
	Device Settings	for serial operation: setting address and baud rate of the device (see p. 24)
	Load / Save Scan Settings	save settings for a scan set-up in the dialog "Scan Settings" or load a previously stored configuration (File format **`*.ini`**; see p. 37)
	Read out and save samples	read out measuring data from the meM-LOG-SE memory and write them into a file with file format **`*.lfx`** or **`*.txt`** (see p. 36)
Help	*Contents*	online help of **ST-meM-LOG SE** (keyboard command: F1)
	About	displays the "About" window of **ST-meM-LOG SE** including the version number; close by mouse click

3.4 Interface settings and search of devices

To communicate with a data logger, **ST-meM-LOG SE** must find the device at the selected interface first.

After the successful search, the devices found are listed in the white box on the left of the user interface. **ST-meM-LOG SE** always shows the last device configuration, which is stored by the software in relation to the serial number.

- **Different devices can be connected in parallel via USB and via the serial interface. ST-meM-LOG SE administrates both interfaces at the same time.**
- **ST-meM-LOG SE does not communicate with one device via USB and the serial interface at the same time. In this case, the already connected logger will not be found via the other interface when searching the device.**

3.4.1 USB connection

- **Connect the logger to USB and turn it on. If necessary, also provide for external power supply.**
- **The USB device driver must be installed. Otherwise, Windows® cannot find meM-LOG-SE.**

With the command "Find USB..." (menu "File"), **ST-meM-LOG SE** starts to scan the USB interface and displays all connected and installed devices that are switched on in the white box on the left of the program screen. 127 devices at the maximum can be detected by the USB bus.

The USB icon in front of the devices found visually illustrates the interface used.

To be able to distinguish between several loggers, the serial number, placed on the outside of the device, is additionally displayed.

3.4.2 COM connection

- **Please make sure that the DAQ hardware is turned on and operable. If necessary, connect the logger to an external power supply.**
- **Connect meM-LOG-SE to the serial interface RS232.**

If using the serial interface RS232, the devices are found by selecting the command "Find COM..." (menu "File"). A dialog opens in which you can modify the settings for the COM interface and the search.

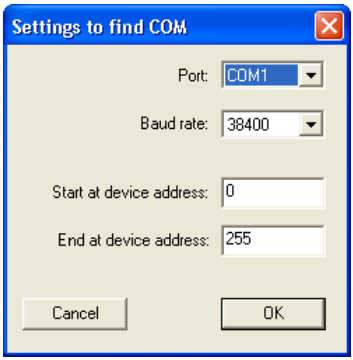

Fig. 9

Entry	Function
Port:	select the serial connection used (e.g. COM1)
Baud rate:	transmission rate of the PC for serial commands and data in kbps
Start / End at device address	first and last device address for the search

If the baud rate of the PC shown in this dialog is not the same as of the device, the data logger will not be found. The default device setting is the fastest baud rate possible (38400kbps). To change the baudrate, open the "Device Settings" dialog in **ST-meM-LOG SE** (menu "Device", see p. 24).

ST-meM-LOG SE searches for the internal device address, which is set to 1 ex works and which must be between 0 and 255 (device number 0 reserved for configuration purposes). To shorten the search in case of high device addresses, we recommend to limit the search interval.

During the search process, the number of detected devices is displayed. As soon as all devices to be used are found, the search can be cancelled early.

The icon in front of the found devices visually illustrates the serial interface used.

255 devices at the maximum per COM interface can be operated with **ST-meM-LOG SE**. The serial connection of more than one device is possible via the RS485 interface which requires a converter to the RS232 interface.

3.4.3 Troubleshooting

If the hardware has not been detected, please check the following possibilities:

- meM-LOG-SE switched off
  → switch on device (red LED on)
- device low on battery
  → charge accumulator, connect external power supply
- connecting cable damaged
  → replace cable

- selected interface not available
  → install interface or select another interface
- if using the USB interface:
  – hardware driver not installed
    → make up for the installation of the device driver
- if using the serial interface:
  – wrong interface selected or interface not existing (e.g. COM2)
    → test interface connection
  – serial connection cable is not a null modem cable (cross-wired!)
    → use null modem cable (e.g. ZUKA-SER9)
  – transmission rate of interface and device different
    → adjust baud rate of device and interface
    (see "COM connection", p. 22 and "Device Settings", p. 24)

3.5 Device Settings

Fig. 10

The current device parameters of the selected logger are shown in the dialog "Device Settings". Although they only concern the serial connection, changes can be done via the USB interface.

Entry	Function
Device address:	internal device address, adjustable within the interval 0..255 (0: reserved for configuration)
Baud rate:	transmission rate of the device at serial connection in kbps

If meM-LOG-SE is connected at the serial interface, **ST-meM-LOG SE** detects the device on the basis of its device address, which can be changed in this dialog. Ex works, it is set to 1.

The baud rate determines the rate meM-LOG-SE is sending and receiving serial commands and data.

- **If the transmission rates of device and interface are not the same, a connection to the logger is not possible.**
- **If you decide to change the baud rate, it will be different from the interface configuration afterwards. It is removed from the list on the left, as with this setting it cannot be reached via the serial interface anymore.**
- **To display the device in ST-meM-LOG SE again, it must be searched with the new baud rate (see "COM connection", p. 22).**
- **The device settings are stored in the data logger.**

3.6 Scan Settings

To prepare a scan (recorded measurement), the settings are done in the dialog "Scan Settings" (menu "Device") showing the last configuration of the selected device.

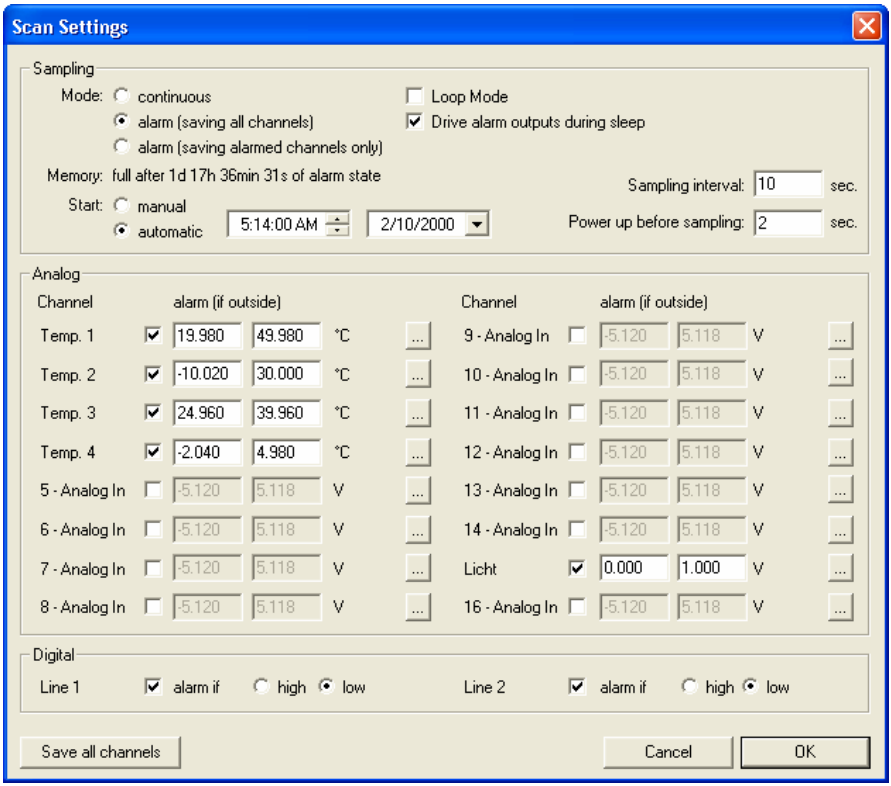

Fig. 11

Entry	Function
Operating mode (Continuous / Alarm):	Store continuously (*Continuous Mode*) or only in case of alarm (*Alarm Mode*): In *Alarm Mode*, either all scanned channels are saved (2. option) or only the ones that left their normal range (3. option; see p. 28).
Loop Mode:	When reaching the storage capacity, the scan is finished or data stored in the beginning are overwritten step by step (see p. 28).
Drive alarm outputs during sleep:	If using the alarm outputs, they keep their full functionality in *Sleep Mode* also if this option is selected (attention: increased energy consumption!; see p. 28).
Memory:	in *Continuous Mode*: maximum duration possible for a scan until scan stops; in *Loop Mode*: after this period of time, recorded data stored in the meM-LOG-SE memory will be overwritten (see p. 30)
Start:	way to start a scan with **ST-meM-LOG SE** (see p. 31)
Sampling interval:	time interval (in seconds) between sampling; adjustable between 0.01sec. .. 65535sec. (= 18h 12min 15sec., see p. 28)
Power up before sampling:	time (in seconds) before sampling the next measuring value, when meM-LOG-SE leaves the energy saving *Sleep Mode* and activates all functions; adjustable between 0sec. .. <sampling interval> (see p. 30)
Alarm (if outside):	*Alarm Mode* only: Enter lower and upper limit of the acceptable range. If signal values are beyond this range, the alarm state is signalized in the *Live display* and the sampled values are saved (see p. 34).
Channel Settings:	channel-by-channel configuration of analog inputs (name, unit, offset, reference values, see p. 32)

- **The settings of the dialog "Scan Settings" can be saved in a configuration file (command "Device / Save Scan Settings") and be loaded at any time (command "Device / Load Scan Settings"). That means, the configuration can be restored when connecting the logger to another PC or if using another device (see "Configuration and measuring files", p. 37).**
- **The scan settings are stored in the data logger except for the channel settings which are stored in ST-meM-LOG SE with reference to the serial number.**

3.6.1 Operating mode (*Continuous* / *Alarm*)

The signals are stored either continuously since scan start (*Continuous Mode*) or only when a defined normal range (see "Setting the alarm limits", p. 34) has been left (*Alarm Mode*) or a digital level has been reached. As soon as the sampled values are within the acceptable range, the storage is temporarily interrupted.

Two options are possible for the *Alarm Mode*. In case of alarm, you can either save all channels selected in the lower section of the "Scan Settings" dialog or only inputs which exceeded their normal range (analog) or reached their digital level (digital). In this case, choose the third option "alarm (saving alarmed channels only)". In *Alarm Mode*, saved channels values are only displayed in the *Live display* during a scan if all selected channels are saved.

- **If using the digital alarm outputs or relay contacts, check the option "Drive alarm outputs during sleep" to guarantee full power of the alarm outputs also during the energy-saving *Sleep Mode*.**
- **Digital channels are completely saved in case of alarm.**
- **If saving alarmed channels only and a digital line is alarmed, always the first selected analog input is saved, too, as the digital channels are "hidden" in the analog inputs.**

Compared to the *Continuous Mode* (2 Bytes / measuring value), in *Alarm Mode* the used memory space per measuring value is higher (7 Bytes / measuring value), because the relative time relating to the scan start is also stored.

3.6.2 Loop Mode

Two types of memories can be chosen for meM-LOG-SE: Either sampled data is written into the memory one by one. A scan is finished at the latest if the memory is full.

Fig. 12

Or, if you select the *Loop Mode* option and you reach the storage capacity, storage will continue at the beginning of the memory so that previously saved measuring data will be overwritten.

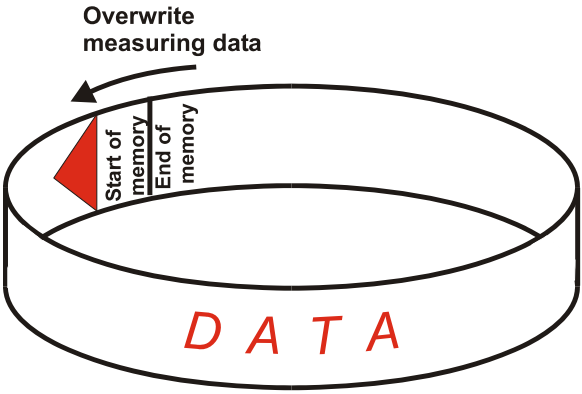

Fig. 13

In this case, you can read out the memory contents in the meantime even during a running scan (see "Read out and save samples", p. 36) to avoid any loss of data. The measuring data of the memory are then deleted until the moment of reading out.

3.6.3 Sampling interval

Sampling is done within an interval of [0.01sec. .. 65535sec. (=18h 12min 15sec.)]. If the sampling interval is less than 1sec. (sampling frequency: [1Hz..100Hz]), the device is in a so-called *Fast Mode*. In this case, the sampling interval can be chosen in steps of hundredths. In the other case, with a sampling interval of more than one second (*Normal Mode*), it can be set in steps of seconds.

The sampling frequency results from the sampling interval (sampling frequency = 1/sampling interval) and is therefore between $1.5259*10^{-5}$Hz and 100Hz.

3.6.4 Power up before sampling

In order to extend the operating time of the accumulator, meM-LOG-SE is provided with a so-called *Sleep Mode*. If neither a command comes in nor a value is scanned, it switches into this energy-saving mode.

The *Sleep Mode* is only available in *Normal Mode* with sampling intervals of 1sec. and more. Please make sure, **ST-meM-LOG SE** has been closed, too.

To optimize the operating time of the logger, it makes sense to use the smallest value possible when leaving the energy-saving mode and regaining full functioning before the next sampling. On the other side, it must be long enough so that connected sensors or measuring amplifiers can reach their optimum operating temperature. The integer values must be in the range of [0sec., 1sec., .. , <sampling interval>].

3.6.5 Scan duration

The entry "Memory" stands for the measurement duration indicating how long a measurement in *Continuous Mode* lasts if the scan has not been stopped earlier (see "Start or stop a scan", p. 35). In *Alarm Mode* (saving all channels), it is the sum of stored alarm states (see Fig. 16: a+b+c+d+e+f+g).

This value depends on how much memory space resulting from the current settings is required. The shorter the sampling interval (see p. 29) and the more channels are saved (see p. 31), the smaller is the maximum scan duration possible. Please also note that the memory usage per measuring value differs in *Continuous Mode* (2 Bytes/measuring value) and *Alarm Mode* (7 Bytes/measuring value, see p. 28).

When exceeding the displayed time in *Loop Mode* (see "*Loop Mode*", p. 28), old measuring values stored in the meM-LOG-SE memory are overwritten step by step.

3.6.6 Start mode

A scan with the data logger meM-LOG-SE begins in **ST-meM-LOG SE** either manually by pressing the start button on the user interface or at a certain date and time.

A great advantage of the second option is that the personal presence at scan start is not necessary anymore. The recording automatically starts when reaching the selected date and time. Please note that the internal time of the PC is used.

To set the time of scan start, click on the value to be changed and directly enter the numbers or go up or down one step by using the arrow buttons.

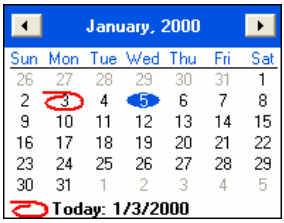

Fig. 14

Setting the date is also possible via keyboard or by means of a small calendar, which is opened when clicking on the arrow on the right. The date edged in red shows the present day, the date of the scan start is selected (background colored). If you click on another day, the scan start is postponed. To set month and year, click on the respective entry in the title bar. To switch from one month to the other, click on the left or right arrow button.

If the measurement starts at a certain point of time in the future, the logger is waiting for scan start after finishing the scan settings. This is shown on the **ST-meM-LOG SE** user interface at the entry "State". If a date in the past has been set, the scan starts right away when leaving the dialog "Scan Settings".

3.6.7 Selection of channels to be saved

The channels checked represent the analog and digital channels that are stored during a scan. They can be selected or deselected by clicking on the check box. If

you press the button "Save all channels", all channels are selected by one single mouse click.

- **Only save channels that are needed in order to produce clear measuring files, save memory space and extend the scan duration.**
- **If a digital input is saved, at least one analog input has to be stored, too, as digital channels are "hidden" in the analog channels.**

3.6.8 Channel Settings

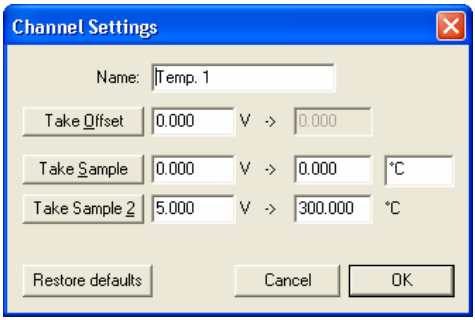

Fig. 15

Name, unit and reference values can be given for each channel separately.

 If you click this button on the right, you can make settings in the dialog "Channel Settings". The currently set parameters of this channel are displayed.

Entry	Function
Name:	channel name of the analog input used in the *Live display* and in the measuring file
Offset:	sets the voltage value measured at 0V to 0V
Unit:	unit of the measured physical quantity
Take Sample / Take Sample 2:	declaration of known reference values for the conversion of voltages into their physical values

Press the button "Restore defaults" to reset the configuration of the displayed channel to its standard settings.

3.6.8.1 Channel name and unit

Useful and additional information about the sampled signal is given by the channel name and unit of the measured quantity. The *Live display* shows the channel name and the incoming values are represented with their physical unit.

The naming of channel and unit is especially attractive when using the signal files with the data acquisition software NextView®4 (see "*.lfx", p. 37), in which this information is included and presented together with the signals in the displays.

3.6.8.2 Channel calibration

Short-circuit the input and press the button "Offset" to set the measured voltage to 0V.

For the calibration of sensors or if using measuring amplifiers, two known reference values are required. They determine how the actually sampled and displayed physical value results from the measured voltage value.

Successively send a known reference signal and set the demanded physical value in relation to the measured voltage value (Press button "Take Sample / Take Sample 2") or simply insert two reference values according to the documentation of your sensor or measuring amplifier. The preset offset automatically adjusts to the physical quantity.

The converted values are correctly displayed in the *Live display* and in the measuring file with their corresponding unit.

3.6.9 Setting the alarm limits

If the device is in *Alarm Mode*, the limits for the alarm case must be defined in addition. This is only possible for channels to be saved (see "Selection of channels to be saved", p. 31).

The alarm limits or levels are set for each stored channel separately. For a better overview, the analog inputs are displayed with their channel number and unit defined in the dialog "Channel Settings" (see "Channel name and unit", p. 33).

The values for the alarm range are set as physical quantities according to their conversion (see "Channel calibration" , S. 33), if set, and not as simple voltage values.

If the measured analog signal values are outside the defined interval or if the digital channels reach the indicated level (*high* / *low*), measuring data are stored until they are in the normal range again. Default setting of the alarm limits are the borders of the measuring range (as voltage values: -5.120V and 5.118V) so that the alarm state is not reached in *Alarm Mode* if the limits have not explicitly been set. If the limits are identical, the respective channel will always be saved.

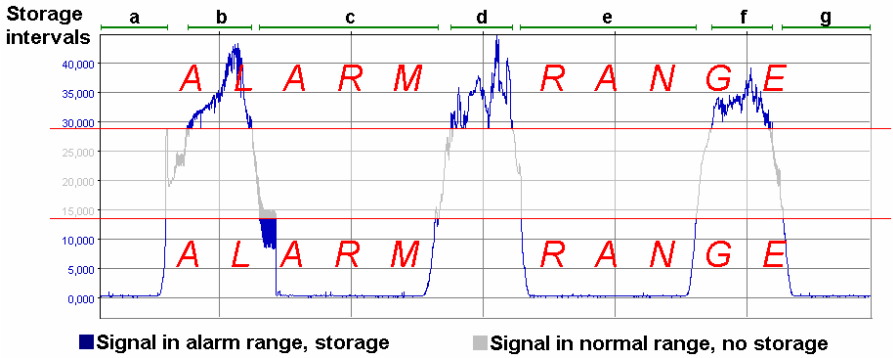

Fig. 16

- **If a digital line is in alarm, always the first analog input, checked to be stored, is saved, too, as the digital channels are "hidden" in the analog**

channels. If the alarmed channels are saved only, the first analog channel is saved as well in this case, even if itself didn't leave the normal range.

- **In the *Live display*, analog inputs in alarm are marked in red (if saving all selected channels).**

3.7 Start or stop a scan

As mentioned before, there are different ways of starting a scan with meM-LOG-SE (see "Start mode", p. 31). In **ST-meM-LOG SE**, a measurement is started by pressing the "Start" button of the user interface or by defining an exact point of time.

A scan is finished either at full memory (not in *Loop Mode*), insufficient power supply, by a programming command, turning off the logger or pressing the "Stop" button in **ST-meM-LOG SE**.

- **When starting a scan in ST-meM-LOG SE, the meM-LOG-SE memory will be deleted in *Continuous Mode*. If measurement data is already in the memory, a warning will be displayed.**
- **During a scan, configuration settings for the sampling device cannot be made.**

3.8 Read out and save samples

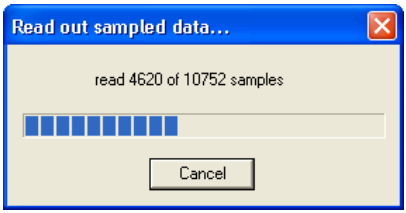

Fig. 17

As soon as measuring values are stored in the meM-LOG-SE memory, they are ready to be read out even during a running scan. As long as the memory contents are not deleted, they can be read out several times. Data transmission is started by the command "Read out and save samples..." (menu "Device").

Name and directory path of the measuring file can be defined as desired. Two types of file formats are available (**`*.lfx`** and **`*.txt`**), which can be chosen for storage providing for a variety of possibilities of signal processing. In NextView®4, for example, the signals are presented as graphs and can be analyzed by means of mighty mathematical functions. In Excel®, Word®, Wordpad® or Notepad®, the measuring values are displayed as tabulated numerical values.

- **Configuration settings for a device are not possible while reading out samples.**
- **In *Loop Mode*, the memory of the data logger is deleted when reading out. During a running scan, the samples are removed from the memory until the moment of reading out.**
- **Compared to a serial connection, reading out data via USB is much faster especially at a high number of samples.**

If you cancel the reading out of samples early, **ST-meM-LOG SE** does not write a measuring file. In this case and after complete transmission (not in *Loop Mode*), the measuring data are kept in the memory and can be read out again at any time

until they are deleted or overwritten. In *Loop Mode*, the data is lost if reading out or saving is cancelled early.

3.9 Configuration and measuring files

3.9.1 *.ini

With the command "Save Scan Settings..." (menu "Device"), **ST-meM-LOG SE** produces a configuration file, saving the parameters set in the dialogs "Channel Settings" and "Scan Settings". Name and directory path of this configuration file can be defined as desired. The file is saved in file format **`.ini`** and can be displayed in an editor like Notepad® or Wordpad®.

A previously stored measuring configuration is loaded into **ST-meM-LOG SE** using the command "Load Scan Settings..." so that a configuration is easily restored when using a different PC or meM-LOG-SE device. The configuration file can be stored in any directory you like.

If you load the configuration on another PC, it can only be opened if using the same decimal notation (either point or comma).

3.9.2 *.lfx

If the measuring values are saved with file format **`*.lfx`**, the signals can be visualized as graphs and analyzed in the professional software for data acquisition and processing NextView®4.

The channels are displayed with their converted physical quantity with name and unit, as defined in the dialog "Channel Settings". The complete functional range of NextView®4 is available for analysis purposes.

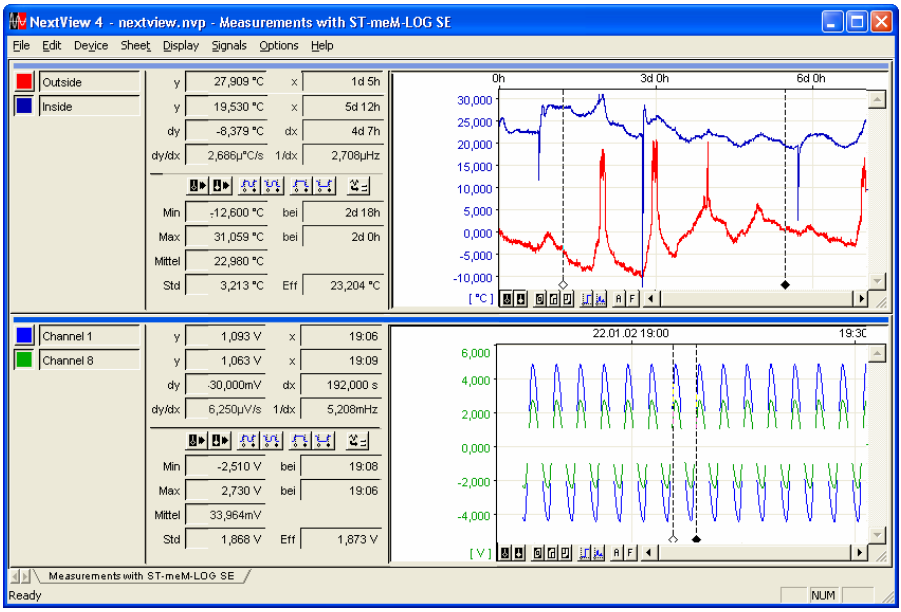

Fig. 18

3.9.3 *.txt

When reading out samples from the logger memory (see "Read out and save samples", p. 36), you can choose to save them in a text file. In this case, it is possible to integrate the measuring values in an Excel® or Word® file, or edit them with the standard text editors Notepad® or Wordpad® of the Windows® Start menu ("Start/Programs/Accessories").

The upper section shows internal information and the *Channel Settings* of the stored channels. The measuring values are displayed in a TAB separated list in the lower section. Next to the continuously numbered samples, the following two columns display date and time. Then the values of the stored analog inputs and finally the digital levels are listed (0 = *low*, 1 = *high*).

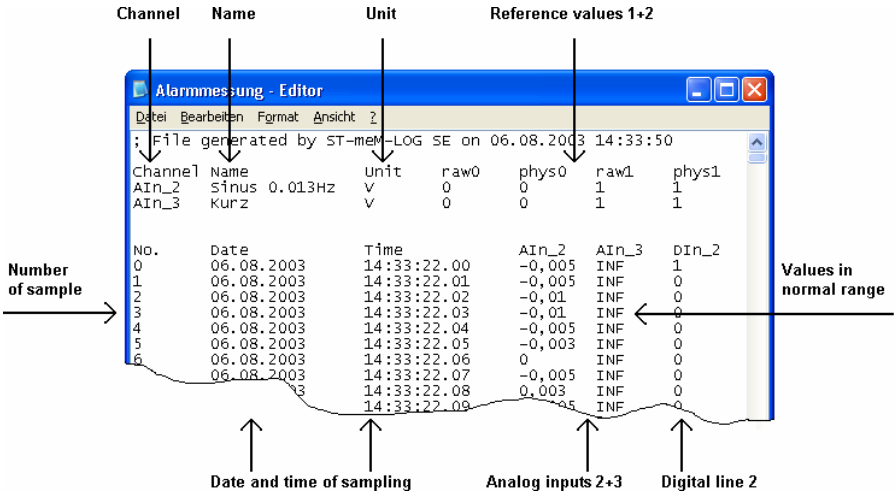

Fig. 19

If only channels in alarm are saved (see "Operating mode (Continuous / *Alarm)*", p. 28), the value **INF** appears at all channels which are scanned but which are within their normal range (analog channels only). Regarding digital lines, the digital states are always saved.

4 Glossary

Alarm Mode

In *Alarm Mode*, measuring values are only saved if they left their defined limits. In this case, either all channels to be saved are stored or only channels that are in state of alarm. Alarm states are signalized in the live display and the digital alarm outputs become active.

Alarm outputs

Two digital alarm outputs (*active high/low*) and relay connectors are provided at the 15-pole Sub-D socket of the data logger. In *Alarm Mode*, they become active in case of alarm. If using the alarm channels, you can prevent these connections from shutting down in *Sleep Mode* by selecting the respective option in the "Scan Settings" dialog.

Baud rate

Transmission rate for serial commands and data in kbps

Continuous Mode

In contrast to the *Alarm Mode*, continuous storage of all channels to be saved beginning from the scan start

Device address

This address is stored in the internal device software and is used to find the data logger via a serial connection. If must be within 0 and 255, and ex works it is set to 1.

Device driver

The device driver provides for the connection between device and PC on hardware level. Concerning the meM-LOG-SE, the installation is only necessary if connecting via USB.

Fast Mode

Unlike in *Normal Mode*, you can reach sampling frequencies of up to 100Hz in *Fast Mode*. These can be set in steps of hundredths in the range of 0.01sec. to 1sec. If you sample faster than 1Hz, meM-LOG-SE does not turn to *Sleep Mode*.

Firmware

Internal device software

Live data

As long as a scan has not been started yet, incoming measuring values are transmitted from the device to **ST-meM-LOG SE** but not saved.

Loop Mode

If the storage capacity has been reached at a scan, sampling is not stopped as usual but old measuring data are continuously overwritten. If reading out samples during a running scan, these are removed from the memory.

Memory space

In *Continuous Mode*, 2 Bytes per measuring value are occupied in the 512kB memory, in *Alarm Mode*, 7 Bytes per measuring value.

Normal Mode

In *Normal Mode*, the maximum sampling frequency is 1Hz and can be set in steps of seconds (also see *Fast Mode*).

Scan

Stored measurement

Serial number

The serial number is continuously assigned ex works and edited on the test report on the housing of the data logger.

Sleep Mode

The data logger turns off the external power supply, the alarm outputs, the serial and the USB interface 1 min. after switching on the device. Before the next sampling or if shortly pressing the device button (app. 1sec.), the device is activated. As long as ST-meM-LOG is running and connected to a data logger, or the logger is in *Fast Mode*, the connected data

logger does not turn to this energy-saving mode. Shutting down the alarm outputs while sleeping can be prevented in the "Scan Settings" dialog.

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