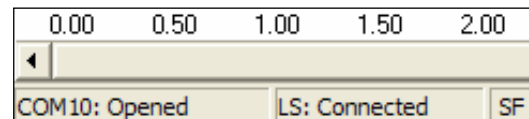## CONNECTION TO THE COMPUTER

Please connect the unit with your computer by using the special USB adapter cable. After you have started the software and the communication has been established the status line (below the time axis) will show the following information:

0.00	0.50	1.00	1.50	2.00

◄

COM10: Opened	LS: Connected	SF

COMxx: Opened   active COM port if a USB adapter cable is connected

LS/MS: Connected   successful communication with the connected unit

SF/ CF   selected optics mode (LS only)

> **Please use for a connection between the unit and a computer only the supplied USB adapter cable, as otherwise there will be no function. The connection cable supplied is <u>not</u> a standard USB cable!**

As long as the unit is connected to your computer it will be powered via the USB interface. In this case operation is also possible if no batteries are inside the unit. At digital communication the unit display shows the **HOLD** – mode but the unit is measuring continuously and is sending temperature data via the interface to the computer **[► Digital displays]**.

If you cannot establish a communication in spite of correct connection between unit and computer please choose the correct COM port under **Menu: Setup\Interface**. If the USB adapter cable is connected this port is marked **[Infrared Thermometer Adapter]**:

COM Port: [(active) COM10 | Infrared Thermometer Adapter (COM10) ▼]

OK   Cancel
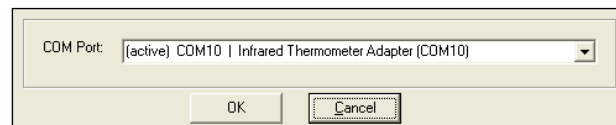
DATA LOGGER FUNCTIONS

To download the logger data from the unit please press the Logger -button [Menu: Measurement\ Download logger data]. All data from the logger will be displayed in an extra window as a table:

	Index	Date	Time	TObj	TObjMin	TObjMax	TObjAvg	TObjDiff	TInt	TExt	Hi Alarm	Lo Alarm	Eps	Name
1	1	14.10.2005	20:58:14	25,8°C	25,8°C	25,9°C	25,8°C	0,1°C	26,0°C	25,7°C	29,7°C	-40,0°C	0,946	PO00
2	2	14.10.2005	20:13:50	26,8°C	26,8°C	29,8°C	27,9°C	3,0°C	27,3°C	-----	28,7°C	-40,0°C	0,946	PO01
3	3	14.10.2005	20:58:24	26,0°C	25,6°C	26,0°C	25,8°C	0,4°C	26,0°C	25,7°C	29,7°C	-40,0°C	0,946	PO02
4	4	14.10.2005	20:58:28	25,7°C	25,6°C	25,8°C	25,7°C	0,2°C	26,0°C	25,8°C	29,7°C	-40,0°C	0,946	LH12
5	5	14.10.2005	20:58:58	25,5°C	25,5°C	25,8°C	25,6°C	0,3°C	26,0°C	25,9°C	29,7°C	-40,0°C	0,946	PO04
6	6	14.10.2005	20:17:20	599,6°C	29,2°C	600,5°C	538,2°C	571,3°C	27,2°C	-----	28,7°C	-40,0°C	0,947	PO05
7	7	14.10.2005	20:14:06	26,8°C	26,8°C	29,8°C	27,9°C	3,0°C	27,3°C	-----	28,7°C	-40,0°C	0,946	PO06
8	8	18.10.2005	13:16:46	22,3°C	22,0°C	23,0°C	22,4°C	1,0°C	25,6°C	-----	900,0°C	-40,0°C	1,000	PO07
9	9	19.10.2005	17:05:06	23,0°C	21,3°C	23,2°C	22,6°C	1,9°C	26,8°C	-----	900,0°C	-40,0°C	0,999	PO08
10	10	19.10.2005	17:05:12	23,0°C	21,3°C	23,2°C	22,6°C	1,9°C	26,8°C	-----	900,0°C	-40,0°C	0,999	PO09
11	11	19.10.2005	17:05:28	34,6°C	24,8°C	34,6°C	28,8°C	9,8°C	26,8°C	-----	900,0°C	-40,0°C	0,999	PO10
12	12	20.10.2005	13:50:46	24,6°C	24,2°C	26,0°C	24,5°C	1,8°C	27,1°C	-----	30,0°C	-40,0°C	1,000	PO11
13	13	20.10.2005	13:28:24	24,1°C	24,1°C	24,3°C	24,1°C	0,2°C	27,0°C	-----	29,1°C	-40,0°C	0,950	PO12
14	14	20.10.2005	13:51:12	51,1°C	21,0°C	51,2°C	37,3°C	30,2°C	27,1°C	-----	30,0°C	-40,0°C	1,000	PO13
15	15	20.10.2005	13:53:28	21,8°C	21,8°C	21,9°C	21,8°C	0,1°C	27,3°C	-----	30,0°C	-40,0°C	1,000	PP5L
16	16	20.10.2005	18:06:44	48,7°C	24,3°C	48,6°C	41,2°C	24,3°C	24,5°C	-----	30,0°C	-40,0°C	0,950	PO15
17	17	20.10.2005	18:08:48	-11,1°C	-11,4°C	4,8°C	-10,7°C	16,2°C	24,6°C	-----	30,0°C	10,0°C	0,950	PO16

Close   Open File...   Save as ...   Clear Logger ...

LS Data from device

Columns in the logger table (red = LS only)

Index	serial number
Date	date of measurement (LS)/ download (MS)
Time	time of measurement (LS)/ download (MS)
TObj	object temperature
TObj Min	min. object temperature
TObj Max	max. object temperature
TObj Avg	average object temperature
TObj Diff.	difference between TObj Min and TObj Max
TInt	internal unit temperature
TExt	t/c temperature (if connected)
Hi-Alarm	High-Alarm value
Lo-Alarm	Low-Alarm value
Eps	emissivity
Name	material or position name

Logger temperatures, on which the set **High-Alarm** value has been exceeded, will be shown in the table **red and bold**.
Logger temperatures, on which the set **Low-Alarm** value has been fallen below, will be shown in the table **blue and bold**.

Save as...	opens an explorer window to save the logger data on your computer **[*.lgg]**
Open File...	opens an explorer window to open existing logger files [1]
Clear Logger...	After confirmation of the security query all logger data inside the unit will be deleted [unit display shows: **CLR**].

The status line inside the data logger window (beneath the table) shows the location and file name of the current data.

[1] The logger file can also be opened and edited with any text editor or Microsoft Excel.

Time Stamp (LS only)

If you store data inside your LS for the first time (after insertion of the batteries), an internal timer will be started automatically. When connected to a computer the timer will be synchronized with the computer time. Thus, every logger entry is stored with date and time of the measurement.

Please store the logger data on your computer before you change the batteries. Otherwise an exact assignment of the time of measurement is not possible (Restart of the timer).

MATERIAL AND LOCATION NAMES (LS ONLY)

You can assign descriptions to each logger position by choosing between 20 predefined descriptions or defining own descriptions. The table of the predefined descriptions can be edited with the software.

To open the table please press the Names button **[Menu: Device\ Material and location names]**. Then mark the entry which you would like to edit with the cursor and enter the desired name. The maximum length is **four digits**. The following character set can be used: **[A...Z] [0...9] [-/<>] [Space]**.

No.		
1	SURF	
2	ENG	
3	HEAT	
4	HOT	
5	COOL	
6	COLD	
7	WARM	
8	WALL	
9	ALU	
10	BRIC	
11	CARB	
12	CERA	
13	CU	
14	GLAS	
15	ICE	
16	IRON	
17	PVC	
18	RUBB	
19	STEE	
20	WOOD	

OK
Cancel
Standard
Move entry:
Up
Down
Valid characters:
[A..Z], [0..9]
[-/<>], [Space]

> If a wrong input is made (no character/ more than 4 characters/ invalid character) the position number in the table appears red and the table cannot be closed with OK .

OK   saves the changed table inside the LS

Standard   loads the standard table (factory default) in the connected unit

Up   moves the selected entry up

Down   moves the selected entry down

DIGITAL DISPLAYS

If the unit is connected to your computer and you start the
software, the current temperature TObj will be shown as
digital display (top right).

You can add additional displays for the internal temperature TInt and the temperature of a connected t/c probe
TExt [Menu: View\ Digital displays].
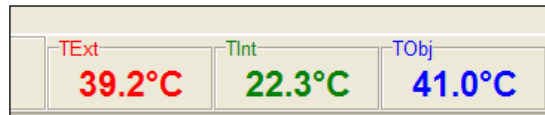
The once selected displays will also appear after a restart of the software. The **size** can be changed if you put
the mouse cursor on the line beneath the display and pull it down. The buttons of the tool bar will also be
moved (depending on the display size).

STARTING THE MEASUREMENT

To start a measurement, please press the Start button in the tool bar
[Menu: Measurement\ Start].
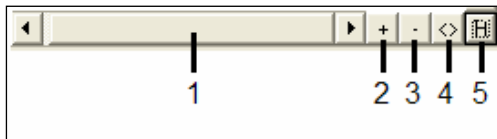
Control elements of the time axis:

1   Scroll bar
2   Zoom in (increase)
3   Zoom out (decrease)
4   Whole range
5   H: Hold/ C: Continue
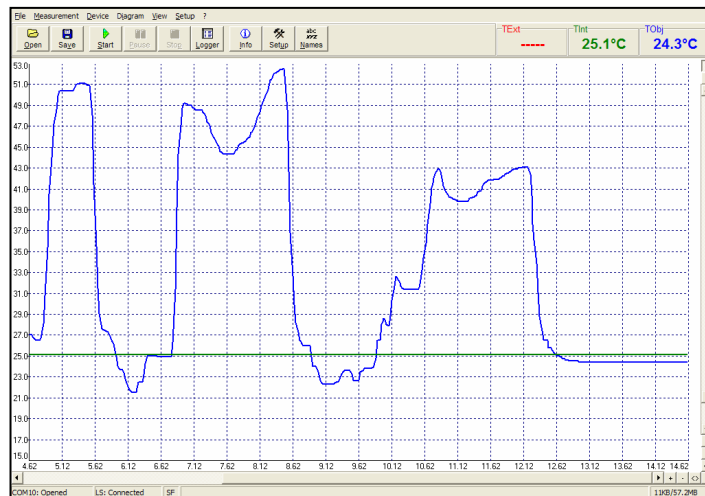
FREEZE MODE

Any activation of a control element of the time axis will stop the further actualization of the measurement graph. The measurement itself continues in the background. To return to the current measurement graph please press the Pause button **[Menu: Measurement\ Pause]** or C .

During the stopped status any part of the diagram can be selected with the Time scroll bar . With the zoom in-button + these parts can be stretched (enlarged) and with the zoom out-button – clinched (minimized).

SCALING OF THE TEMPERATURE AXIS

With **global scaling** the temperature range of the diagram will automatically be adapted to the respective peak values. The range will remain as set during the whole measurement.

With **local scaling** the temperature range of the diagram will be adapted dynamically to the respective peak values. After the respective peak has left the diagram in the further process of the measurement, the range will be readapted. This option enables an optimum display of the temperature graph.

A **manual scaling** can be done at any time using the control elements of the temperature axis.

Control elements of the temperature axis:

1	Global auto scaling
2	Local auto scaling
3	Scroll bar
4	Zoom in (increase)
5	Zoom out (decrease)
6	Whole range
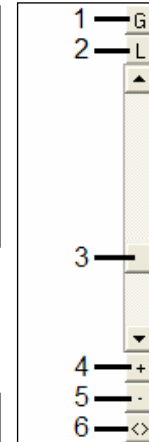
Activation of the desired option:

Control elements (temperature axis) or [Menu: Diagram].

STOP MEASUREMENT

To stop the current measurement please press the Stop button **[Menu: Measurement\ Stop]**.
The Save button **[Menu: File\ Save as]** opens an explorer window to select destination and file name
[file type: *.dat].

SAVING OF DATA

The menu item options **[Menu: Setup\ Options]** enables the following settings for data protection:

Warning if unsaved data exist	if activated, each Stop and new Start will be followed by the query: **There is unsaved Data. Save now?** [Default setting: activated]

☑ Warning if unsaved data exist
☐ Force data saving after "stop"

Decimal separator
◉ System
○ User defined

OK
Cancel

Force data saving after „stop"	if activated, after each Stop an explorer window for saving the data will be opened automatically.
Decimal separator	**System** uses the computer system based separator for saving the data. If you want to use a **user defined** (which may be helpful for further use of the data files with other applications) you can enter the desired separator in the according field.
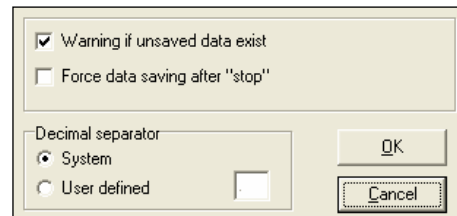
If none of both options is activated, a new measurement will be started after termination of one measurement and pressing of the Start button.
In this case the former data are deleted!

Open

OPENING OF FILES

To open a saved file please press the button **Open** **[Menu: File\ Open]**. You can select the desired file in the newly opened explorer window **[file type: *.dat]**.
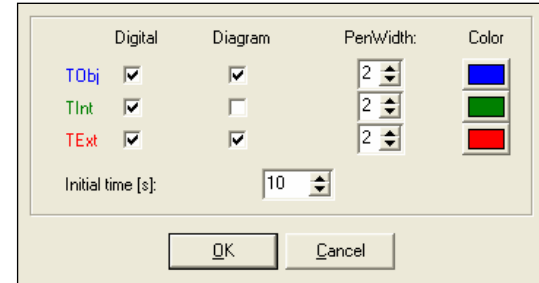
> **The data files can also be opened and edited with any text editor or with Microsoft Excel.**

DIAGRAM SETTINGS

The menu item Settings **[Menu: Diagram\ Settings]** enables the selection of the following diagram options:

Digital	Selection which signals should be displayed as digital display
Diagram	Selection which signals should be displayed as graph **[TObj, TInt, TExt]**
Pen Width	Pen width of the temperature graphs **[1...5]**
Color	Color of the temperature graph and digital displays
Initial time	Time frame on the x-axis, which should be displayed at the beginning of a measurement

MEASUREMENT CONFIGURATION

The menu item **[Menu: Measurement\ Settings]** opens the following dialog:

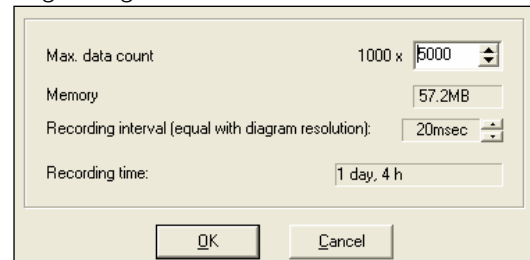|		
Max. data count	Limitation of the maximum number of data values – when achieved the measurement will be stopped	

Memory   Memory, calculated from the max data count value (will also be displayed in the status line)

Recording interval   Time between single data **[1ms...10s]**

Recording time   maximum time of measurement, calculated from **Max data count** and **Recording interval**

A change of the parameter Max data count will have influence on the Memory and Recording time.
A change of the parameter Recording interval will have influence on the Recording time only.

DEVICE SETUP

The button Setup **[Menu: Device\ Setup]** opens a dialog
window for setting up the following parameters of the unit:

Emissivity	Backlight
High alarm	Laser
Low alarm	Buzzer
Ext. Ambient Temp.	Lock mode
Temperature unit	Flip mode

red = LS only

The first activation of **Ext. Ambient Temp.** will initiate this
feature inside the LS unit. From this time the feature will
appear in the **Setup Menu 2** on the unit, also if deactivated again in the device setup **[► Ambient Temperature Compensation]**.

A reset of the unit to the factory default values **[► Reset]** will delete the display of this function during operation **[Setup Menu 2]**.

To load the factory default settings into the unit please press the Factory Default button (same functionality as ► **Reset**). An additional query avoids a reset of the unit by mistake.

> A change of parameters will be taken over from the connected unit *immediately* and vice versa.

DEVICE INFORMATION

The button Info **[Menu: Device\ Device Info]** will display the
following unit-specific information:

Device type	Description from the manufacturer
Firmware Rev.	Revision number of the internal software
Hardware Rev.	Revision number of the internal hardware
Serial No.	Serial number of the unit
IR Temperature range	Measurement range (IR)

Device type:	LS
Firmware Rev.:	0.036
Hardware Rev.:	0.004
Serial No.:	5100062
IR Temperature range:	-40.0°C .. 900.0°C

OK

FILE MENU
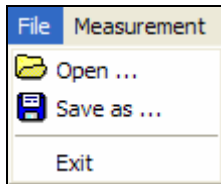
Open ...	To open saved logger files (*.lgg) or temperature files (*.dat)
Save as…	To save temperature files
Exit	To exit the program

MEASUREMENT MENU
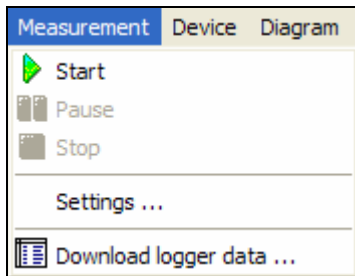
Start	To start the measurement
Pause	To freeze the continuous diagram actualization
Stop	To stop the measurement
Settings...	Opens the window: **Measurement configuration**
Download logger data...	Download of logger data from the unit to the computer

DEVICE MENU
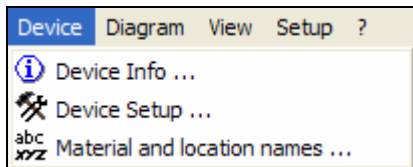
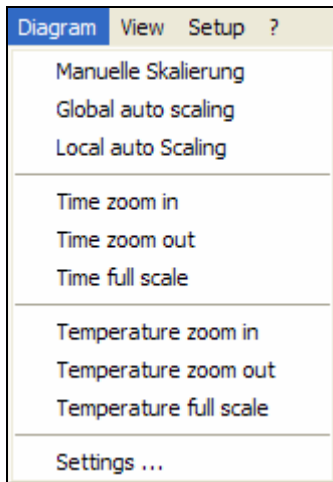|	
Device Info...	Shows information about the connected unit (firmware revision etc.)
Device Setup...	Opens the window: **Device setup** (for setting of parameters like emissivity, backlight, alarms etc.)
Material- and location names...	To show and edit the material table from the unit

DIAGRAM MENU

Diagram | View | Setup | ?

- Manuelle Skalierung
- Global auto scaling
- Local auto Scaling

- Time zoom in
- Time zoom out
- Time full scale

- Temperature zoom in
- Temperature zoom out
- Temperature full scale

- Settings …

|	
Manual Scaling	Manual scaling of the temperature axis
Global auto scaling	The temperature range of the diagram will be adapted automatically to the respective peak values. The range will stay in this setting during the whole measurement.
Local auto scaling	The temperature range of the diagram will be adapted dynamically to the respective peak values. After the respective peak has left the diagram the range will be readapted.

Time zoom in	A selected part of the diagram will be stretched (enlarged).
Time zoom out	A selected part of the diagram will be clinched (minimized).
Time full scale	Shows the whole time range of the measurement.
Temperature zoom in	To scale up a part of the temperature axis
Temperature zoom out	To scale down a part of the temperature axis
Temperature full scale	Shows the whole temperature range
Settings...	Opens the window: **Diagram settings** to select digital displays, temperature graphs, pen width and color of graphs

VIEW MENU
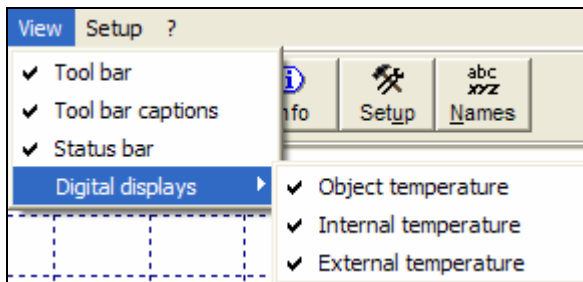
|	
Tool bar	To show or fade out the tool bar
Tool bar captions	To show or fade out the captions of the tool bar
Status bar	To show or fade out the status bar
Object temperature	Display of the current object temperature **[TObj]**
Internal temperature	Display of the current internal unit temperature **[Tint]**
External temperature	Display of the current t/c probe temperature **[TExt]** (if connected)

SETUP MENU
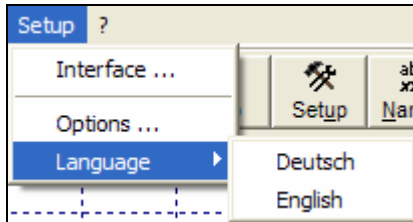
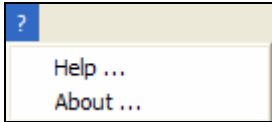**Interface...**   Interface setup (selection of the right COM port on your computer)
Options...   Opens the window: **Options** to setup options for data saving
Language   To select the desired language

HELP MENU

Help...   To open the help file
About...   To show the software version installed on your computer