

A1-SDI Bluetooth®

Version V1 (8/2008)



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1 Please Read Before Using the Instrument

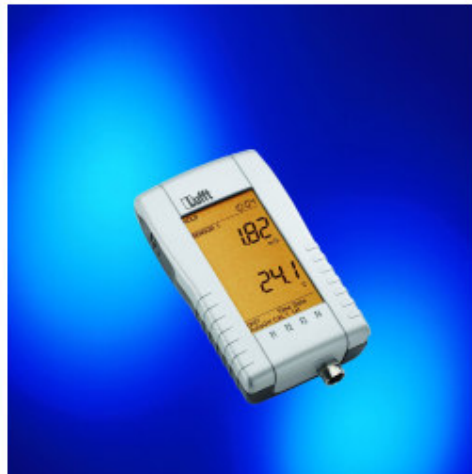


- Before using the instrument, please read the operating manual carefully and follow the instructions in every detail.
- Pay attention to the measurement ranges of the sensors (overheating can cause destruction).
- Pay attention to the storage and transport conditions (protect the instrument against direct solar radiation).
- Please refer to the data sheet for technical data and storage and transport conditions.

**Designated use:**

- The measuring instrument must only be operated within the range of the specified technical data. You can obtain this data on the Internet or from your local dealer.
- The measuring instrument must only be used under the conditions and for the purposes for which it was designed.
- The operating safety of the instrument can no longer be guaranteed if it is modified or converted.

2 A1-SDI with Bluetooth®



A1-SDI BT

The new, all-purpose display instrument for taking all types of physical measurements is outstanding due to the following features:

- SDI input – a large number of sensors are already available. (SDI = serial digital interface)
- Bluetooth® function
- Large, backlit display
- Simple, thumb-wheel operation
- Robust, attractive housing
- Low price

Instead of many measuring instruments for individual tasks, with the A1-SDI you now need only one measuring instrument for many tasks!

By connecting various SDI sensors, the different measurement values can be presented on the display. In doing so, the sensor can calculate measurements independently (absolute humidity, dew-point, flow velocity etc.) and transmit these to the measuring instrument. All of the calibration data are also stored directly in the SDI sensor.

The sensor is detected automatically when the A1-SDI is switched on.

Please note:

When changing the sensor, after removing the attached sensor please wait until the SenS message is displayed. You can then connect the sensor of your choice. The device detects the sensor automatically.

Details of the sensors already available can be obtained on the Internet or from your local dealer.

3 The Display



F1 F2 F3 F4

◀ Upper menu with date and time

◀ Measurement display and units of Sensor 1

◀ Measurement display and units of Sensor 2

◀ Lower configuration and calibration menu

4 Operation



THUMB-
WHEEL

In contrast to conventional portable measuring instruments, the A1-SDI does not have a keypad; rather it has what is known as a **“THUMB-WHEEL”** on the left hand side of the device.

The wheel can be moved up and down by 15° and can also be pressed in the middle.

The upper menu is selected by moving the wheel upwards. The lower configuration and calibration menu is selected by moving the wheel downwards.

The thumb-wheel must be pressed in the middle position to switch the instrument on and off and to confirm input values.

The 3 Positions of the **THUMB-WHEEL**

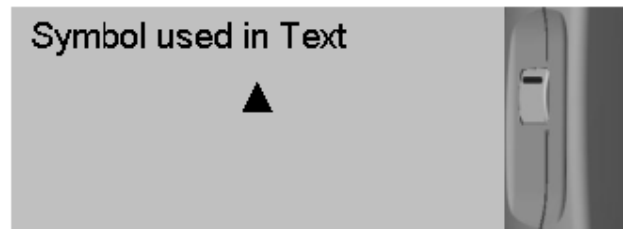


To switch on: Press for a short time

To switch on with light: Press for approx. 2 seconds

To switch off: Press for approx. 2 seconds (no menu activated)

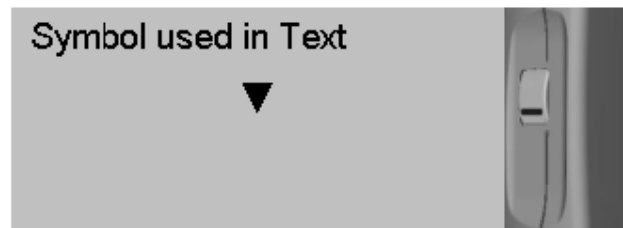
To delete the Min/Max memory: Press for a short time (in normal operation - no menu activated) or with confirmed function.



Activate upper menu with **HOLD MAX MIN AVG REC:**

Press for approx. 1 second.

Select with ▲, confirm with ▶, cancel with ▼ or do not press for 20 seconds.

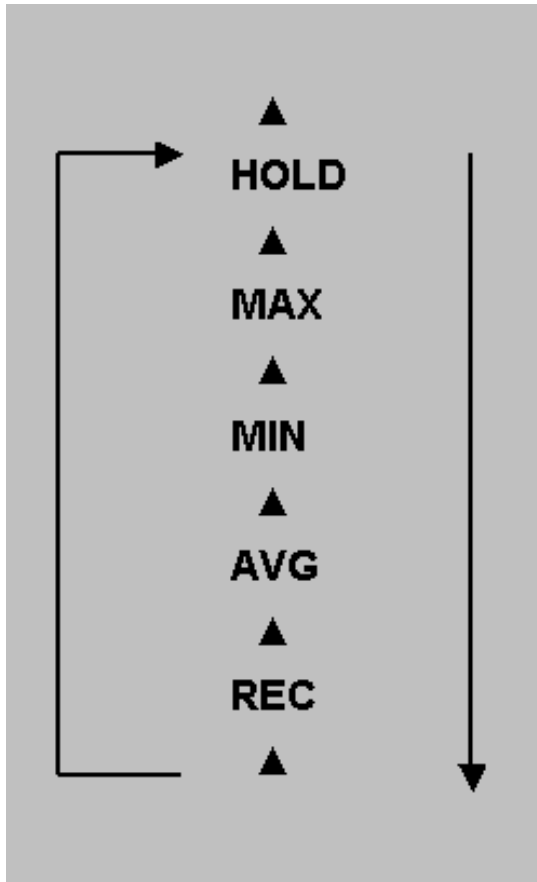


Activate lower configuration and calibration menu:

Press for approx. 1 second.

Select with ▼, confirm with ▶, cancel with ▲ or do not press for 20 seconds.

5 The Upper Menu



You can access the upper menu by pressing ▲ (approx. 1 second). You can select the following standard functions in the upper menu:

HOLD MAX MIN AVG REC

Selection is made using ▲, the selected function flashes and is confirmed with ►.

When the **MAX**, **MIN** or **AVG** function is flashing, the associated value (MIN, MAX or AVG) is displayed immediately. The current measurements are displayed when the **HOLD** or **REC** function is flashing.

A confirmed function is shown permanently on the display. If the function was confirmed, pressing ▲ takes you back to the upper menu. The function flashes again on the display. You can select another function by briefly pressing ▲.

You can cancel the menu with ▼ or by not pressing the thumb-wheel for 20 seconds.

HOLD: HOLD "freezes" the measurement value.

MAX: MAX represents the maximum value in the activated time period.

MIN: MIN represents the minimum value in the activated time period.

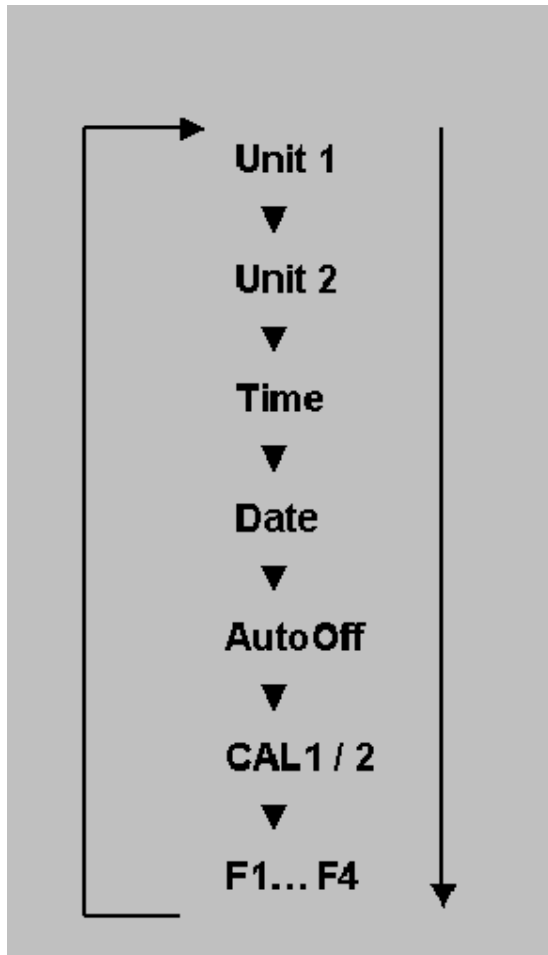
AVG: AVG represents the arithmetical mean value in the activated time period.

REC: REC enables the Bluetooth® module built into the portable measuring instrument. You can find more information on this in Section 7.

You can delete the MAX / MIN / AVG memory by:

- Switching the A1-SDI on or off
- Connecting or disconnecting the sensor
- Pressing ► for a short time in normal operation or with confirmed function
- Changing the unit of measurement (e.g. °C to °F)

The **HOLD**, **MAX**, **MIN** and **AVG** values are displayed on the corresponding sensor line instead of the current measurement value.



6 The Lower Menu

You can access the upper menu by pressing ▼ (approx. 1 second). You can select the following functions in the lower configuration and calibration menu:

UNIT1 UNIT2 Time Date AutoOff CAL 12 F1 F2 F3 F4

Selection is made using ▼, the selected function flashes and is confirmed with ►. The menu can be cancelled with ▲ or by not pressing the thumb-wheel for 20 seconds.

The lower menu functions depend partly on the sensor that is connected at the time. Additional menu functions can be provided alongside the standard functions already available, such as date, time and AutoOff, depending on the sensor that is connected at the time.

Elements that depend on the sensor are, for example, UNIT1 or UNIT2 to select the displayed unit, CAL xx calibration functions and, potentially, various arrow menus (F1 to F4).

UNIT1: UNIT1 allows you to select various units for the first sensor channel. The selected unit flashes and can be activated via ►. You can select the units with both ▲ and ▼. Unit1 can only be selected if the connected sensor supports at least 2 different units.

UNIT2: UNIT2 allows you to select different units for the second sensor channel. The selected unit flashes and can be activated via ►. You can select the units with both ▲ and ▼. UNIT2 can only be selected for SDI sensors, provided that their second channel supports at least 2 different units. For UNIT1/UNIT2, available units that can not be presented on the display are shown via the arrow menus (F1 to F4). You can find the relationship between indications F1 to F4 and the corresponding unit on your SDI sensor.

Please note:

The maximum value of the displayed mixture ratio in g/kg or gr/lb must not exceed 6000.

A digital display showing the time 12:00. The digits are black on a white background, and the display is underlined.

Time: Sets the time. Hours and minutes are entered consecutively. Selection can be made using ▲ and ▼; confirmation with ►.

A digital display showing the date 30.12. The digits are black on a white background, and the display is underlined.

Date: Sets the date. Day, month and year are entered consecutively. Selection can be made using ▲ and ▼; confirmation with ►.

A digital display showing the AutoOff period 00:59. The digits are black on a white background, and the display is underlined.

AutoOff: AutoOff sets the period in minutes for the automatic switch-off. If OFF (<1 minute) is selected the instrument will never switch off automatically. Selection can be made using ▲ and ▼; confirmation with ►.

Please note:

The automatic AutoOff function is disabled after confirming the **REC** function.



Important: Calibration should only be carried out by trained personnel using suitable calibration equipment.

Single-point calibration of SDI sensors such as combined temperature/relative humidity sensors and flow/temperature sensors



CAL1: CAL1 initiates single-point calibration on Channel 1. The symbols for Sensor 1 and Sensor 2 disappear from the display. The set-point value for Channel 1 is displayed in the upper area. The offset value for Channel 1 flashes in the lower area. This can be increased with ▲ and decreased with ▼. The offset value is confirmed with ►. The menu is then automatically terminated and CAL END appears on the display. A failed calibration is confirmed with CAL FAIL and must be repeated.

The factory settings can be obtained by setting the offset to 0.0.

CAL2: CAL2 initiates single-point calibration on Channel 2. The symbols for Sensor 1 and Sensor 2 disappear from the display. The set-point value for Channel 2 is displayed in the upper area. The offset value for Channel 2 flashes in the lower area. This can be increased with ▲ and decreased with ▼. The offset value is confirmed with ►. The menu is then automatically terminated and **CAL END** appears on the display. A failed calibration is confirmed with **CAL FAIL** and must be repeated.

The factory settings can be obtained by setting the offset to 0.0.

Important: Inputting the offset for relative humidity causes the characteristic curve to move in the direction of the zero point.

Two-point calibration of relative humidity



CAL 2 L



CAL2L, CAL2H: The lower adjustment value can be calibrated in the CAL2L menu and the upper adjustment value can be calibrated in the CAL2H menu. The lower value must be within the range from 10% to 40% RH (preferably 33% RH) and the upper value within the range from 60 to 90% RH (preferably 76% RH). A two-point calibration outside these ranges is not possible. The maximum offset per point is +/- 10% RH and can be input in steps of 0.1%.

Important: In principle, two-point calibrations should be carried out by accredited laboratories.

The factory settings can be obtained by setting the offset to 0.0.

7 Bluetooth® Function

7.1 General

Thanks to the built-in Bluetooth® module, the A1-SDI is able to provide wireless transmission of current measurements over a distance of up to 30 m (in the open) to a PC or laptop, for further evaluation using SmartGraph software.

The Windows-compatible SmartGraph software, which is included in the scope of delivery, provides comprehensive representation and easy recording of measurement data. Presentation of measurement data in tabular or graphic form, printout and export functions, and zoom and scrolling tools for graphic evaluation are all available. An audible signal sounds in the event of a Bluetooth® transmission error.

The sampling rate for data recording in Smartgraph is individually configurable from 1sec ... 1440 min. The timestamp is assigned by the PC clock.

Please note:

- Frequent transmission of data from Bluetooth® to SmartGraph and high sampling rates reduce battery life
- Obstacles such as walls and other electronic devices may disrupt Bluetooth® data transmission
- Smartgraph displays measurements rounded to one decimal point
- System requirement for SmartGraph: Windows XP, Windows 2000. SmartGraph is also compatible with Windows Vista, however in Vista it must be installed under c:/SmartGraph and not as suggested in the setup program under c:/Programs/SmartGraph
- Not all SmartGraph menus are available for the A1-SDI (SmartGraph also supports other Lufft products).

- If your PC/laptop has a built-in Bluetooth® module, we recommend that you purchase a model CN-521 USB-Bluetooth® adapter from SiteCom for your PC/laptop.

7.2 Setting Up a Bluetooth® Connection

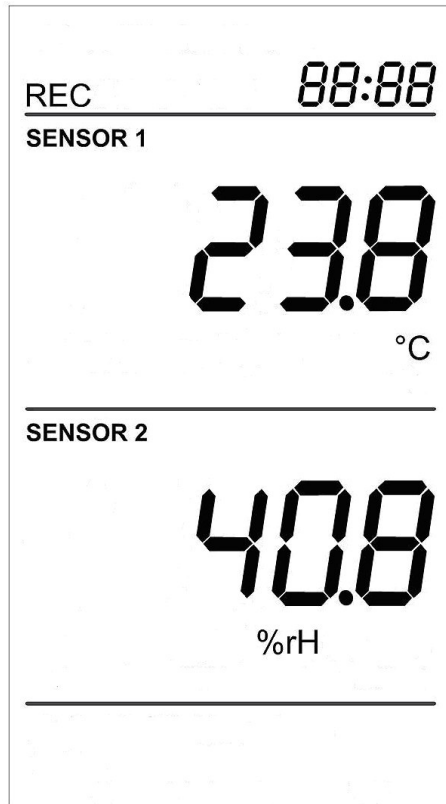
Before the first transmission of measurement data can be made from the portable measuring instrument to a PC/laptop, the Bluetooth® connection must be set up between the devices. The following sections of the operating instructions describe the steps to be taken in order to build the connection:

- Section 7.2.1: Using a CN-521 USB-Bluetooth® adapter from SiteCom.
- Section 7.2.2: Using a built-in USB-Bluetooth® module on your PC/laptop.
- Using a USB-Bluetooth® adapter from a different manufacturer. Please read the manufacturer's operating instructions. Please note that the connection to the A1-SDI is made by way of SPP profiles. Select the automatic connection option.

After setting up the Bluetooth® connection you can proceed to Section **7.3 Bluetooth® Data Transmission Using SmartGraph.**

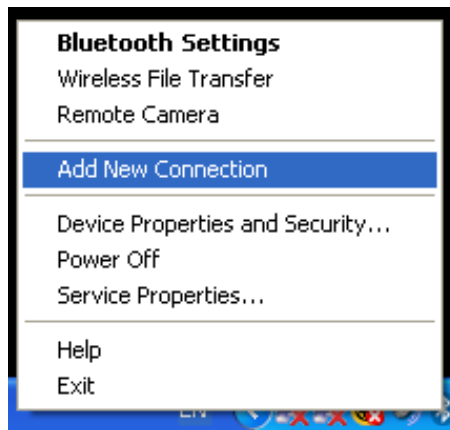
7.2.1 Setting Up a Bluetooth® Connection Using SiteCom


Bluetooth® Software

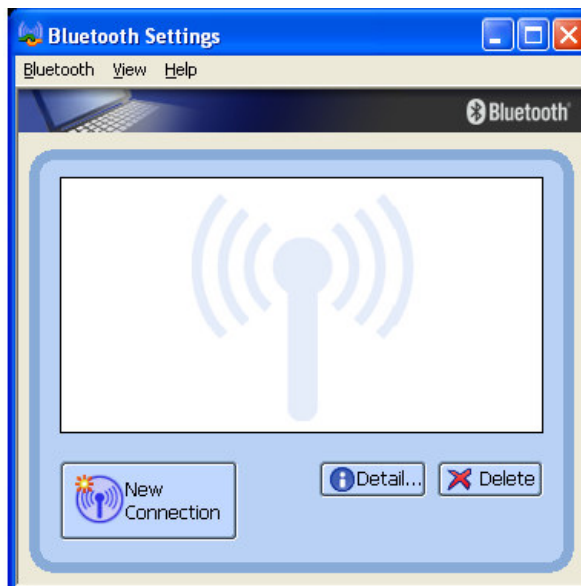


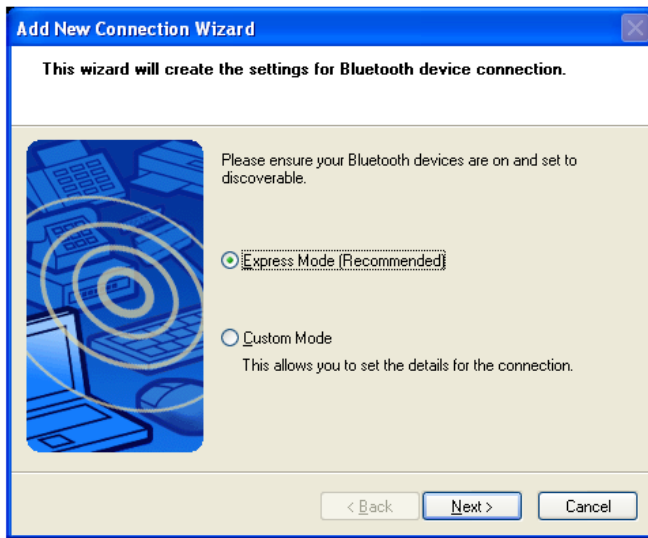
Please follow the instructions below to set up the Bluetooth® connection between the portable measuring instrument and the PC/laptop with the aid of SiteCom Bluetooth® software:

1. Install the appropriate software for your CN-521 PC USB-Bluetooth® adapter. (You will find the Bluetooth® software and instructions on the installation CD).
2. Activate the **REC** function on the portable measuring instrument. After the message **BLUE On** appears on the portable measuring instrument display, the Bluetooth® module built into the instrument is switched on and ready. Please note that the **REC** indicator ceases to flash after the **REC** function has been activated.

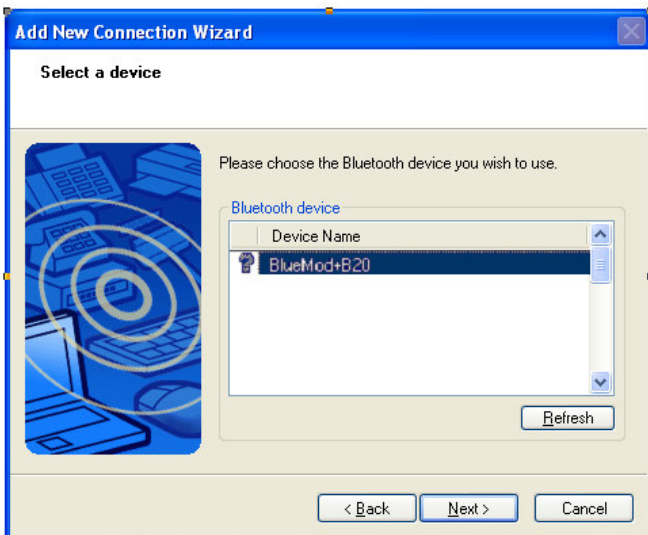


3. Plug the Bluetooth®-USB adapter into your PC. The SiteCom Bluetooth® symbol in the Windows tray turns white . Click on the Bluetooth® symbol with the right mouse button and in the context menu select **Add new Connection**.
4. The **Bluetooth Settings** dialog window is displayed. In the dialog field, click on **New Connection**. The **Add New Connection Wizard** starts.

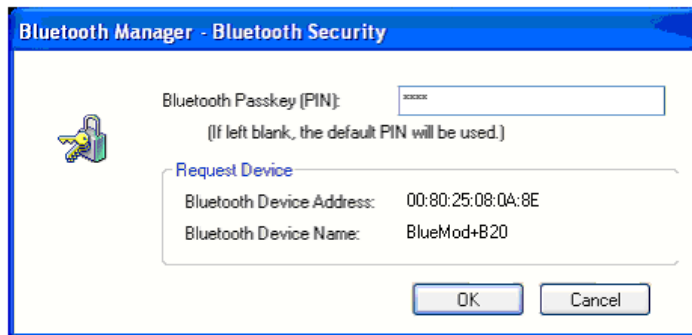




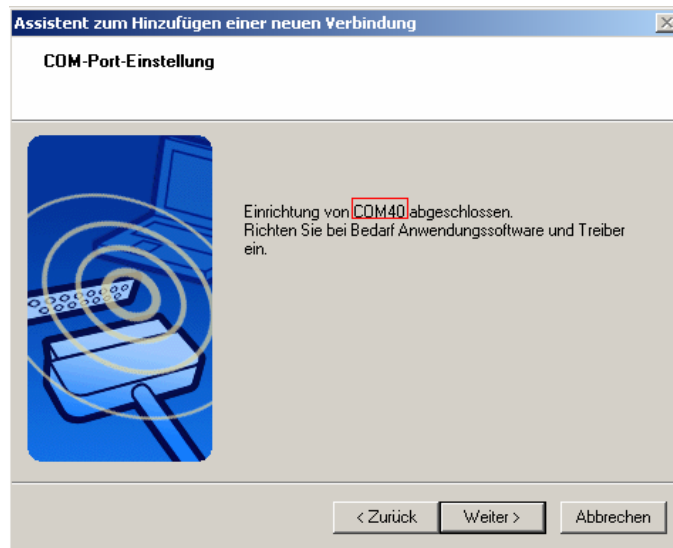
5. Select **Express Mode** and click **Next**. A device detection check is carried out. This may take a few seconds. A list of all detected Bluetooth® devices is then displayed.



6. Click on **BlueMod+B20**, which is then color-highlighted, after that click **Next**.



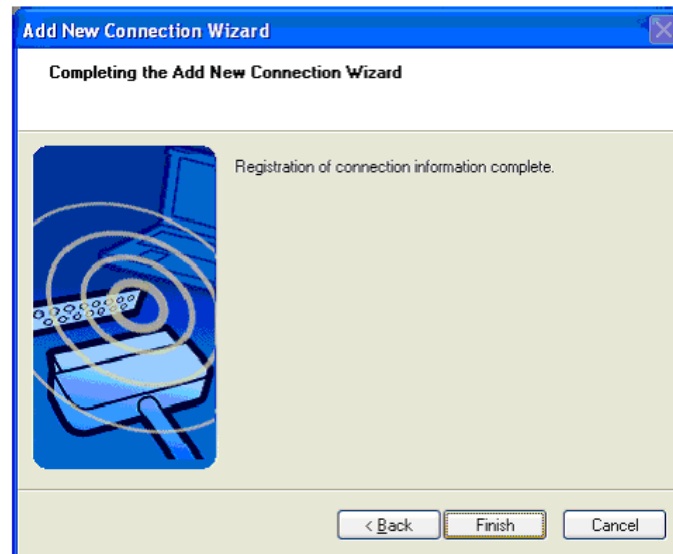
7. If authentication is requested (Passkey/PIN), please enter **0000** and click OK.



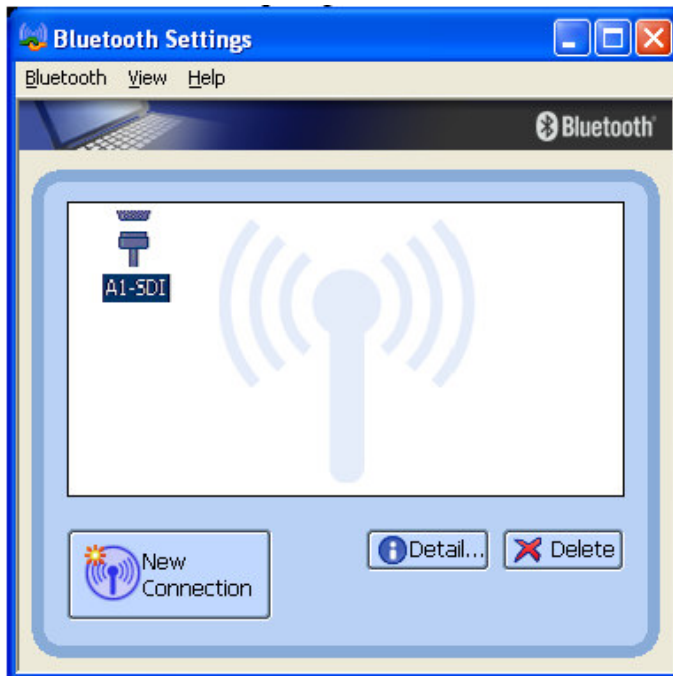
8. If the setup was successful, the COM port for the connection between the portable measuring instrument and the PC/laptop is now configured. **Make a note of the COM port number**, as you will need this later for SmartGraph, and click **Continue**.



9. You can change the connection name BlueMod+B20, to A1-SDI for example. Enter the new name and click **Next**.

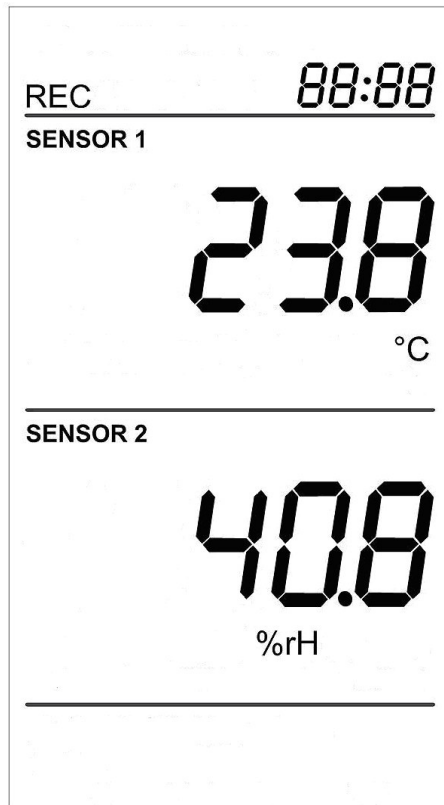


10. Following successful registration of the connection information, click **Finish** to close the Wizard.



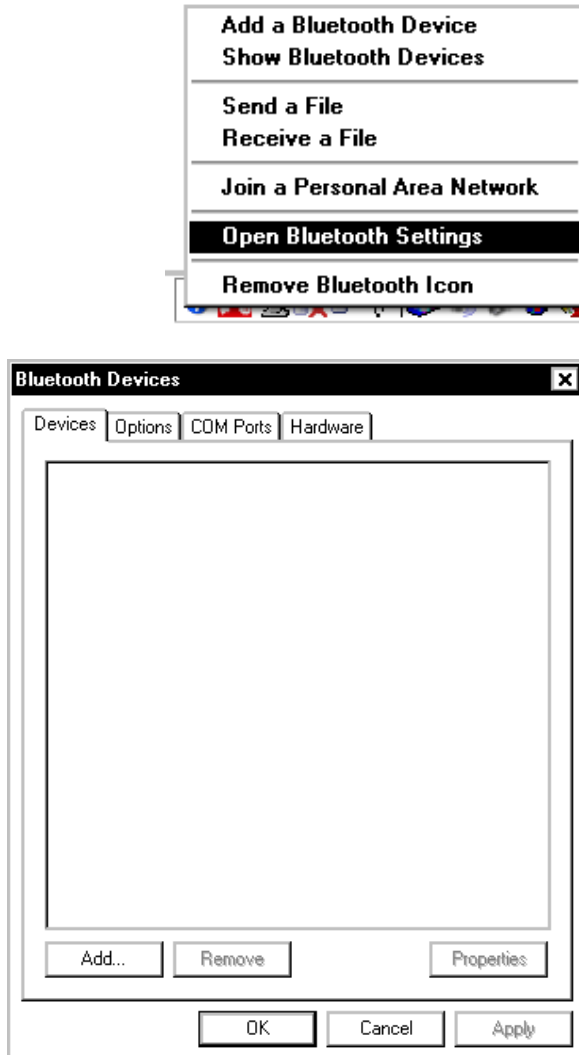
11. The **A1-SDI** connection is shown in the **Bluetooth Settings** option display. You can now close the **Bluetooth Settings** window.

7.2.2 Setting Up a Bluetooth® Connection Using the Microsoft Bluetooth® Device Wizard




Please follow the instructions below to set up the Bluetooth® connection between the portable measuring instrument and the PC/laptop with the aid of the Microsoft Bluetooth® Device Wizard:

1. Make sure that the built-in Bluetooth® adapter in your PC/laptop is turned on and ready. In many PCs/laptops there is a switch or software setting to turn the complete radio electronics on or off. (Read the operating instructions on your PC/laptop)
2. Activate the **REC** function on the portable measuring instrument. After the message **BLUE On** appears on the portable measuring instrument display, the Bluetooth® module built into the instrument is turned on and ready.

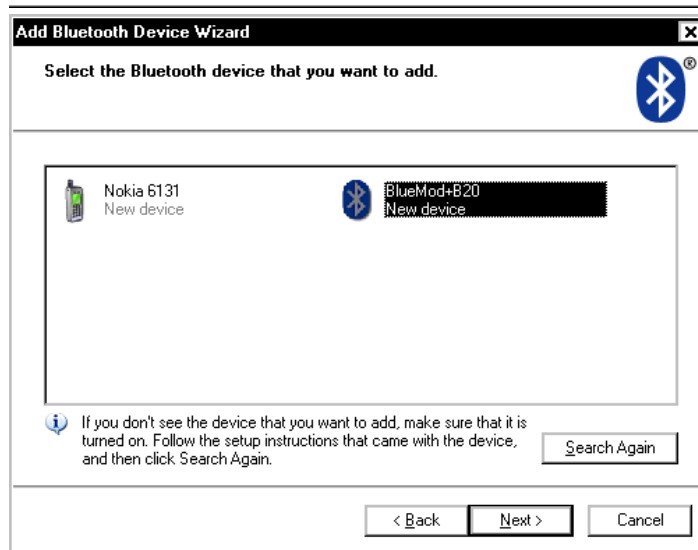


Please note that the **REC** indicator ceases to flash after the **REC** function has been activated.

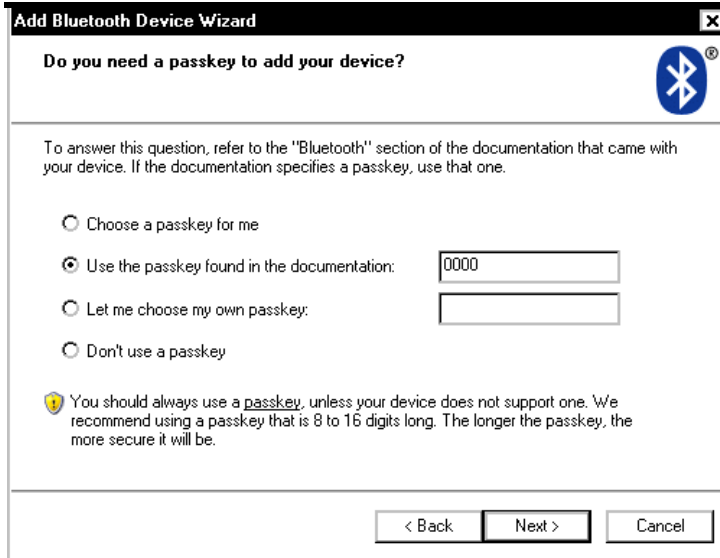
3. Plug the Bluetooth®-USB adapter into your PC. The Bluetooth® symbol  appears in the Windows tray on the desktop. If the Bluetooth® symbol is not displayed, select the Bluetooth Devices option under **Start -> Settings -> System Control** and under the Options tab turn on the **Show the Bluetooth icon in the notification area** switch.
4. With the right mouse button, click the Bluetooth® symbol and in the context menu select **Open Bluetooth Settings**. The **Bluetooth Devices** dialog window is then displayed. In the dialog field, please click **Add**.



5. In the Wizard, check the **My device is set up and ready to be found** button and click **Next**. The program searches for other Bluetooth® devices that are within range.



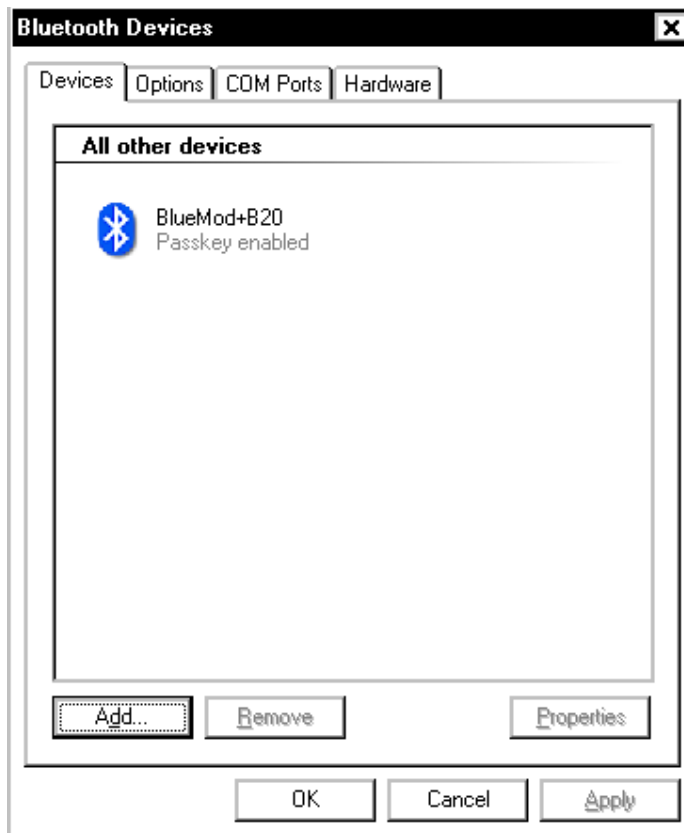
6. A list of all detected Bluetooth® devices is displayed. Click **BlueMod+B20**, which is then color-highlighted. Then click **Next**.



7. If authentication is requested (passkey), please enter **0000** and click **Next**.



8. If the setup was successful, 2 COM ports are now configured for the connection between the portable measuring instrument and the PC/laptop. Make a note of the “**Outgoing COM port**” number, as you will need this later for SmartGraph. Click **Finish**.



9. The **BlueMod+B20** connection is shown in the **Bluetooth Devices** option display. You can now close the **Bluetooth Devices** window.

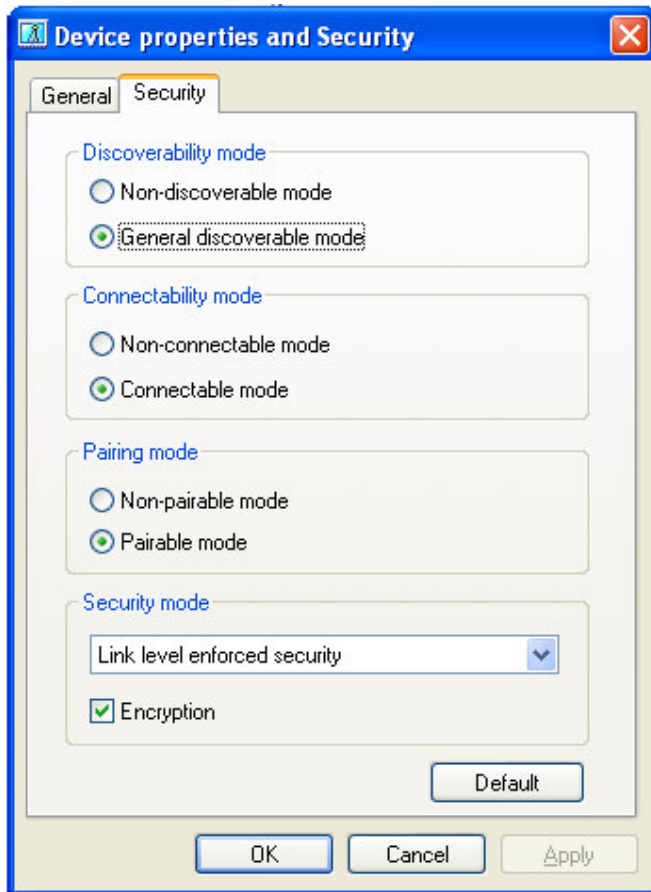
7.2.3 Troubleshooting the Connection Setup

Possible causes of a failed connection setup are:

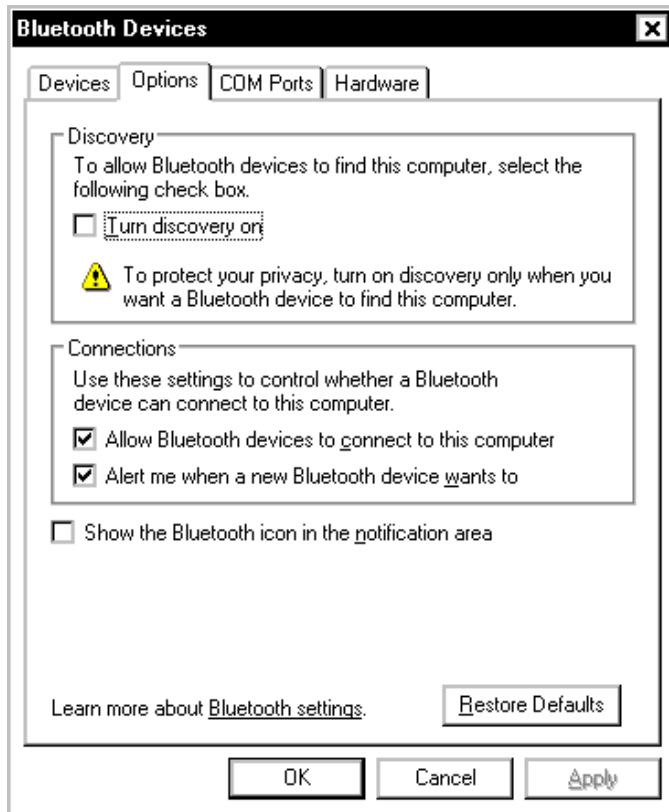
- Bluetooth® module not enabled in portable measuring instrument
- Bluetooth® adapter not connected to PC
- Bluetooth® module not enabled in PC/laptop (if Bluetooth® module is built into PC/laptop)
- The portable measuring instrument is outside the range (the range may be reduced in buildings, e.g. by reinforced concrete walls).
- The device is in the vicinity of other devices which may cause radio frequency interference (e.g. microwaves, cordless telephones).
- An incorrect PIN was entered or the time limit on PIN entry was exceeded and the connection was broken.

The following troubleshooting actions can be taken:

1. Please disable the **REC** function on the portable measuring instrument by quitting the upper menu.
2. If you are using an external USB-Bluetooth® adapter, disconnect it from the PC.
3. Reduce the distance between your PC/laptop and the portable measuring instrument.
4. Make sure there are no electrical devices, such as cordless telephones, in the vicinity.
5. Please make sure that your computer is connectable. You can check this as follows:



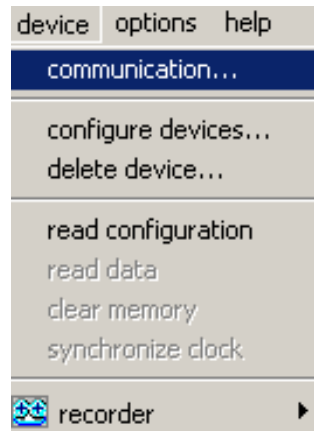
- If you use the SiteCom Wizard to add Bluetooth® devices, please click with the right mouse button on the Bluetooth® symbol and in the context menu **Device properties and Security**, under the **Security** tab, check that **Connectable mode** and **Pairable mode** are selected. Please repeat the connection setup procedure from step 2 (see Section 7.2.1).



- If you use the Windows Wizard to add Bluetooth® devices, make sure that the checkbox **Allow Bluetooth devices to connect to this computer**, under the **Options** tab, is enabled. Please then repeat the connection setup procedure (see Section 7.2.2).

7.3 Bluetooth® Data Transfer Using SmartGraph

Please install the enclosed SmartGraph software on your PC.

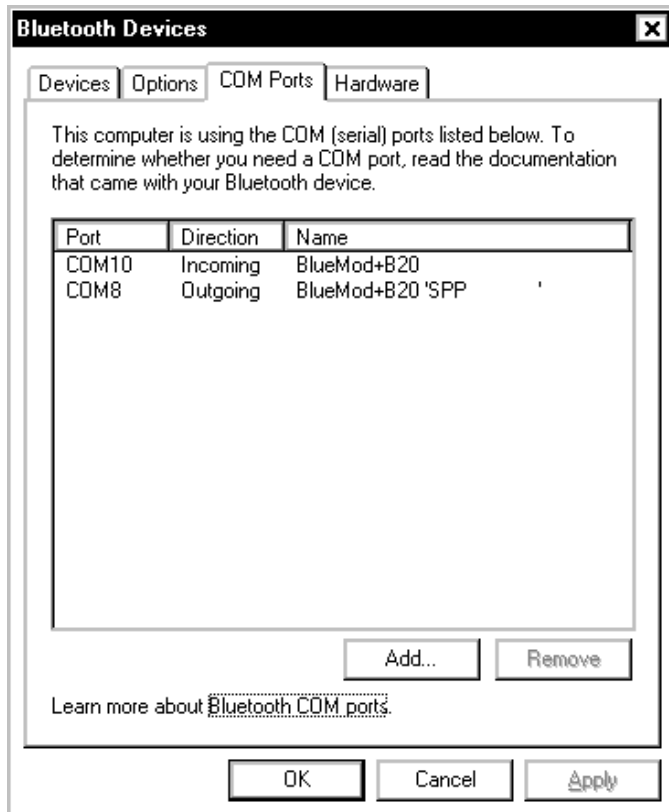


Please follow the instructions below on the first occasion that you transfer data to SmartGraph:

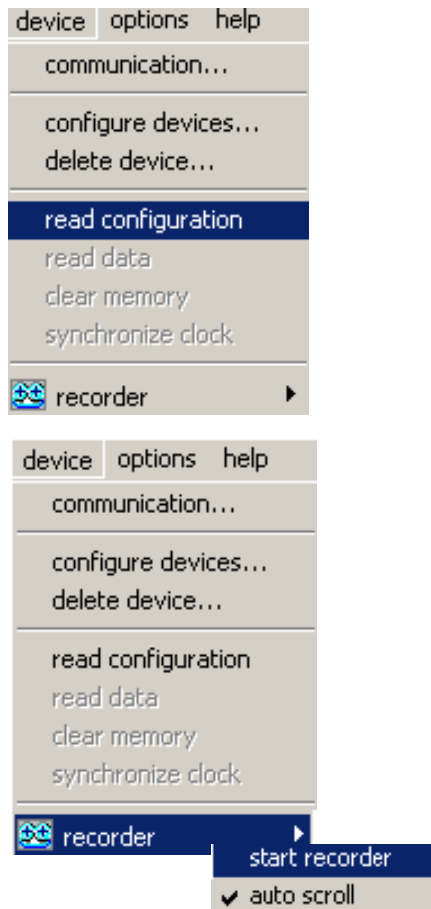
1. Activate the **REC** function on the portable measuring instrument. After the message **BLUE On** appears on the portable measuring instrument display, the Bluetooth® module built into the instrument is turned on and ready. Please note that the **REC** indicator ceases to flash after the **REC** function has been activated.
2. Start SmartGraph on your PC/laptop.
3. If you are using an external USB-Bluetooth® adapter, please make sure that it is plugged into the PC.





4. Under the **device -> communication** menu heading, please select the COM port number that was assigned to you when you set up the connection between the portable measuring instrument and the PC/laptop (see Section 7.2) and click **OK**. If you have forgotten the number, you can find it as follows:
 - If you use the SiteCom Wizard to add Bluetooth® devices, click with the right mouse button on the Bluetooth® symbol and in the context menu select **Bluetooth Settings**. In the option field under Bluetooth Settings, click the **A1-SDI** connection generated earlier, which is then color-highlighted. Now click the **Detail** button. A dialog window is then displayed, **Details of A1-SDI**, where you can view the COM port number (port name).





- If you use the Windows Wizard to add Bluetooth® devices, click with the right mouse button on the Bluetooth® symbol and in the context menu select **Open Bluetooth Settings**. On the Devices tab under Bluetooth Devices, click on the connection generated earlier, **BlueMod+B20**, which is then color-highlighted. Then click the **COM Ports** tab. Under device -> communication, please select the COM port number marked “**SPP**” with “**Outgoing**” data direction for the connection to the A1-SDI.



5. Under the **device** menu heading, select the **read configuration** command. The current configuration of the connected A1-SDI is read. Please note: Not all SmartGraph menus are available for the A1-SDI (SmartGraph also supports other Lufft products).
6. Answer “YES” to the question which follows, about whether you want to change the device.
7. Under the **device -> recorder** menu heading, please check that the **auto scroll** function is enabled.
8. Please start the recorder function via the **device -> recorder -> start recorder** menu heading or the corresponding button in the Tools list . Current measurement data from the connected A1-SDI instrument are polled, displayed and stored, in cycles, via this function. The  symbol is displayed in the status bar while the recorder is running.

9. The current measurement data from the portable measuring instrument are displayed in the table, initially with a time interval of 10 seconds.

10. You can break off transmission of the data from the portable measuring instrument via the **device -> recorder -> stop recorder** menu heading or the corresponding button from the Tools list .

11. To re-start data transmission, select **device -> recorder -> start recorder** or the corresponding button from the Tools list .

12. If you want to quit SmartGraph, stop the recorder, if it is active, and then close the program via **file -> exit**. After quitting the program please do not forget to disable the **REC** function in the portable measuring instrument.

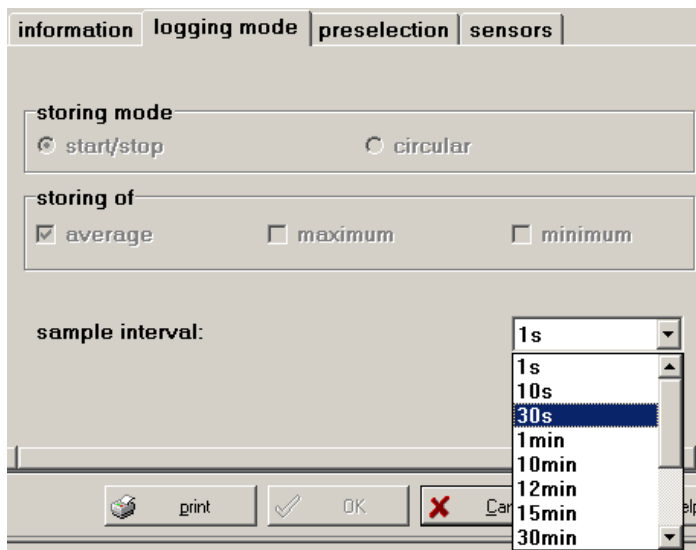
For further data transmission in SmartGraph, it is not necessary for the configuration to be re-read or for the COM port number to be set up again. The last used COM port number is selected automatically. The recorder can be started immediately.


Please note:

- The SmartGraph program should always be started in the following sequence: First enable the **REC** function in the portable measuring instrument (the **BLUE On** message is displayed briefly), then start the SmartGraph program.
- After quitting the SmartGraph program please do not forget to disable the **REC** function on the portable measuring instrument.

- Before connecting a new sensor to the A1-SDI or changing the unit of measurement in the A1-SDI, please quit the SmartGraph program and proceed as follows:
 - When changing the sensor, after removing the attached sensor please wait until the **Sens** message is displayed. You can then connect the sensor of your choice. The device detects the sensor automatically.
 - Enable the **REC** function on the portable measuring instrument.
 - Start the SmartGraph program.
 - If you no longer need the stored data from the old sensor, you can delete it with the **delete device** command under the **device** menu heading.
 - Start the recorder. Please note that (unless you deleted the measurement data from the previously connected sensors) working with different sensors increases the number of charts and columns in the table.

7.3.1 Additional SmartGraph Settings



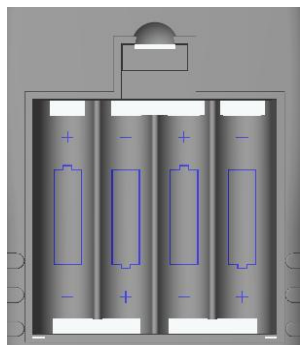
- In SmartGraph you can change the time interval for online recording with the recorder. To do this, first stop the recorder. Select the desired sampling rate via **device -> configure devices -> logging mode**. When setting the sampling rate please remember that high sampling rates reduce battery life.
- The corresponding buttons on the toolbar  serve to navigate in the date/time area (X axis). You should disable the **auto scroll** function if you want to use the above functions or to enlarge/reduce the content of the graphics window while the recorder is running.

You can find more information on SmartGraph at www.lufft.de or in the SmartGraph online manual.

7.3.2 SmartGraph Troubleshooting

- Make sure that the Bluetooth® adapter is connected to your computer. (This step is not necessary if Bluetooth® technology is already built into your PC/laptop.)
- If your PC is equipped with a built-in Bluetooth® device, please make sure that the Bluetooth® module is turned on.
- Check that the **REC** function is enabled in the A1-SDI.
- Check that you selected the correct Com port number.
- Check via **Help -> Info** that you are using the correct version of SmartGraph (V4.0 and later).
- Please quit the SmartGraph program and disable the **REC** function on the portable measuring instrument. Then re-enable the **REC** function and restart SmartGraph.

8 Changing the Batteries



When "BAT" is displayed the batteries must be changed. Open the battery cover on the rear of the instrument. Remove the empty batteries and replace them with new ones.

Please use only high quality alkaline batteries type IEC LR6 AA. Do not use rechargeable batteries!

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Please note that the date and time are lost when you change the batteries. Please reset the date and time after changing the batteries.

9 Service and Calibration



Clean the instrument with a damp cloth when necessary. Use clean water, not detergent, to dampen the cloth.