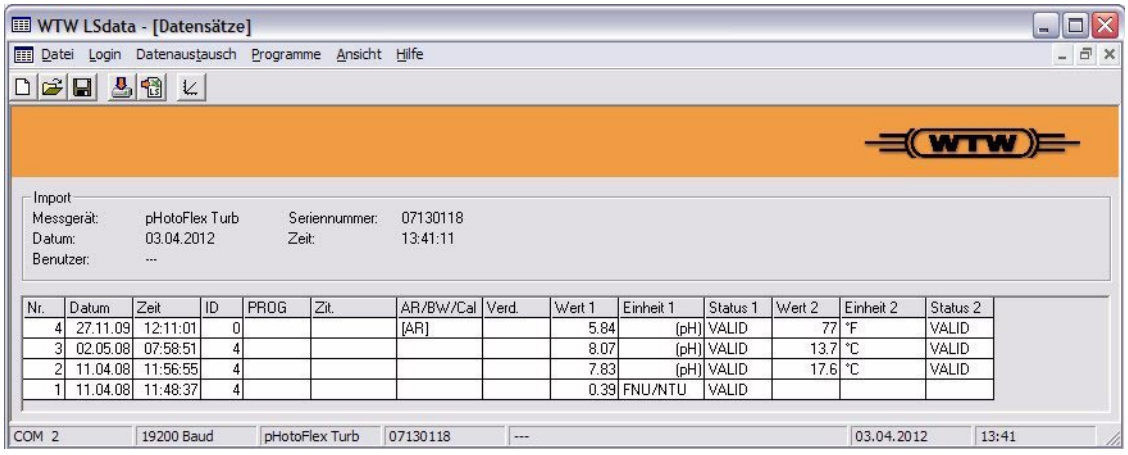
Operating manual

LSdata



PC software for data exchange with the meters

- pHotoFlex series
- Turb 430 series

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1 Introduction

The LSdata software enables to exchange data between meters and a PC.
The LSdata software recognizes the following meters:

- pHotoFlex series
  (pHotoFlex, pHotoFlex Turb, pHotoFlex pH, pHotoFlex STD)
- Turb 430 series (Turb 430 IR, Turb 430 T)

The connection between the meter and PC is established with the following steps:

- Connecting the meter (see section 1.1)
- Installing the LSdata software (see section 1.2)
- Starting the LSdata software (see section 2.1)

Depending on the meter, the following data can be exchanged:

pHotoFlex series	Turb 430 series
• **Read out measurement datasets** (see section 3.1) • **Store measurement datasets on the PC** (see section 3.2) • **Export measurement datasets to *.xls format (Microsoft Excel)** (see section 3.3) • **Read out calibration datasets** (see section 4.1) • **Store calibration datasets to the PC** (see section 4.3)	• **Read out measurement datasets** (see section 3.1) • **Store measurement datasets on the PC** (see section 3.2) • **Export measurement datasets to *.xls format (Microsoft Excel)** (see section 3.3) • **Read out calibration datasets** (see section 4.1) • **Store calibration datasets to the PC** (see section 4.3)
• **Read out programs** (see section 5.1) • **Create programs** (see section 5.2) • **Edit programs** (see section 5.4) • **Store programs on the PC and in the meter** (see section 5.5) • **Erase programs** (see section 5.6)	

1.1 Connecting the meter to the PC

To exchange data between the PC and meter, connect the meter to the PC in one of the following ways:

- directly (see section 1.1.1)
- via the LabStation LS Flex/430 (see section 1.1.2)

Information on cables and accessories is given in the operating manual of your meter.

1.1.1 Connecting the meter directly to a PC

1	Connect the meter with an interface (serial or USB) of the PC: – Serial COM interface: with AK 540/B connection cable (accessory) – USB interface: with AK 540/B connection cable (accessory) and USB adapter (accessory)

1.1.2 Connecting the meter to a PC via the LabStation LS Flex/430

1	Connect the LabStation LS Flex/430 with an interface (serial or USB) of the PC: – Serial COM interface: with zero modem cable (included in the scope of delivery of the LabStation LS Flex/430) – USB interface: with zero modem cable (included in the scope of delivery of the LabStation LS Flex/430) and USB adapter (accessory)
2	Place the meter in the LabStation LS Flex/430 (see LabStation LS Flex/430 operating manual).

For the data transmission between the meter and PC to be as quick as possible, we recommend to set the baud rate on the meter as high as possible (19200 Baud) in the menu, *Configuration* / *System* / *Interface* / *Baud rate*.

1.2 Installing LSdata

CD-ROM

The provided CD-ROM includes:
- the LSdata software
- the operating manual of the LSdata software

Hardware requirements (PC)

For the installation of the LSdata software, the following is required:
- a PC with CD-ROM drive
- one of the following operating systems:
  - Windows XP
  - Windows Vista
  - Windows 7.

Hardware requirements (meter)

For the data transmission between the meter and PC, the following is required additionally:
- suitable meter (see chapter 1 INTRODUCTION)
- meter pHotoFlex series: firmware version 1.80 or higher
- meter Turb 430: firmware version 1.60 or higher
- LabStation LS Flex/430 with connection cable between LabStation and PC
  (included in the scope of delivery of the LabStation LS Flex/430)
  or
  connection cable between the meter and the PC (AK 540/B)
- USB adapter if necessary (accessory)



Firmware of our meters is continuously being further developed. The latest firmware version can be downloaded from the WTW sites on the Internet.

Instructions on how to update the firmware are given in the operating manual of your meter.

Information on accessories is given in the operating manual of your meter.

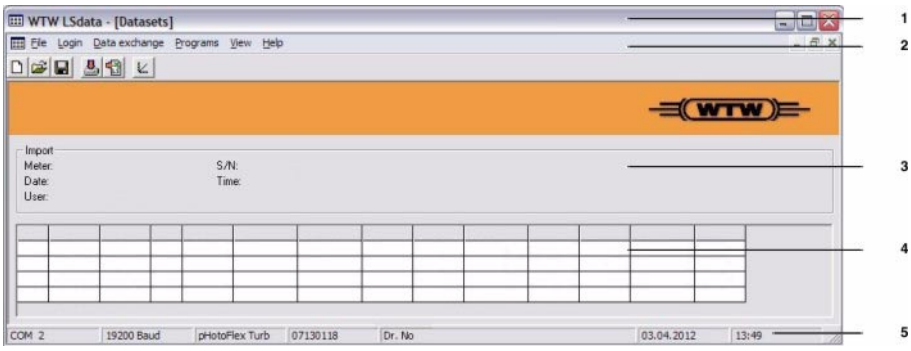
Installation

1	Start the LSdata installation program.
2	To go on, follow the user guidance.

2 Executing the program

2.1 Starting LSdata

1	Start the LSdata software on the PC (Start / Programs / WTW / LSdata). The *Login* window opens.
2	Enter a name in the *User* field. This name indicates the user operating the LSdata program.
3	Highlight an operating mode in the operating modes selection field: ● *Searching for meter...*: a connected meter ready for operation is searched ● *Work offline*: no connected meter is searched
4	With OK start the LSdata program in the selected operating mode. The LSdata - [*Datasets*] window opens with an empty measured value table. Here you can ● display, store or export datasets (see chapter 3 DATASETS). Fill the table with measured values: – by importing them from a meter or – by opening a file in the *.csv format stored with LSdata ● start the window for the administration of user-defined programs (methods) (see chapter 5 USER-DEFINED PROGRAMS)



1	**Menu line**
2	**Tool bar** *New*: Open new table sheet (for data import from meter) *Open*: Open file *Save*: Store file in *.csv format *Import datasets*: Import datasets from the connected meter *Export as .xls*: Export datasets to the *.xls format for easier processing with Microsoft Excel. *User defined programs*: Open window for editing user-defined programs
3	**Information on the displayed measurement data** *Date*, *Time*, *User*, *Meter*, *Serial number* This information names the time at which the measurement data was imported from the meter and the user who imported the data.
4	**Datasets** Table cells for measurement datasets
5	**Status line with current information** ● Interface ● Baud rate ● Meter ● Series number of the meter ● User currently logged in ● Date ● Time

2.2 Login

While the LSdata program is running, you can:
- change the user name (see section 2.2.1)
- switch from offline to online operation (see section 2.2.2)
- establish a data connection with alternating meters (see section 2.2.2).

2.2.1 Changing the user name

With the *Change user* function you can change the user name while the LSdata program is running.

The current user name is indicated in the status line.
LSdata stores the user name in all files that are created with LSdata. LSdata indicates the user name under which a file was created with LSdata and stored on the PC.

1	Select the menu item, *Login / Change user*.
2	Enter a new user name.
3	Confirm with OK. The new user name is accepted (status line).

2.2.2 Searching a connected meter

With the *Search meter* function you can switch from offline to online operation and establish the data connection with alternating meters while the LSdata program is running.

1	If necessary, disconnect the old meter and connect a new meter.
2	Select the menu item, *Login / Search meter*. A connected meter ready for operation is searched.

3 Datasets

With the LSdata software, the datasets stored in the meter can be
- displayed (see section 3.1)
- stored on the PC as a *.csv file (see section 3.2)
- exported to the PC as an *.xls file (see section 3.3)

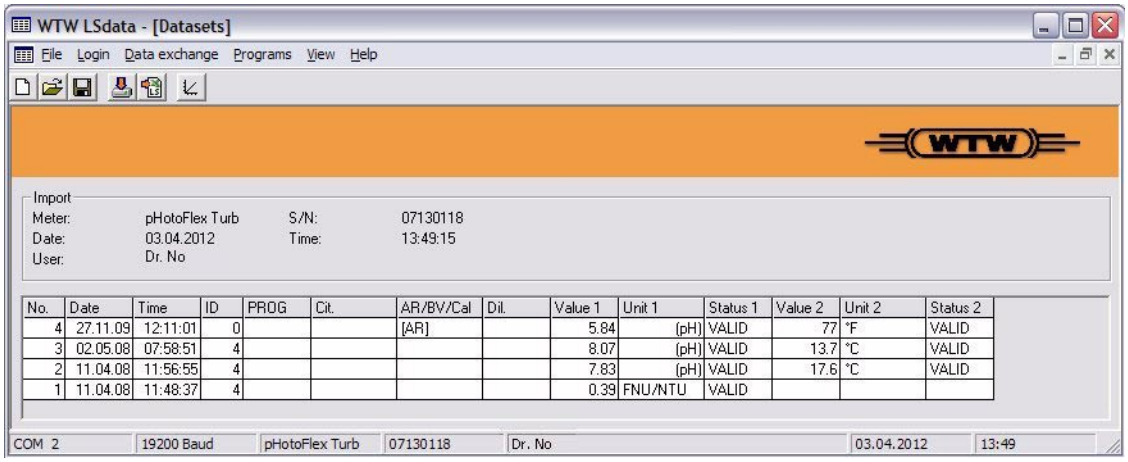
3.1 Displaying datasets

Two options are available:
- Downloading datasets from the meter
- Reading in datasets from a *.csv file

Downloading datasets from the meter

Stored datasets can be downloaded from the connected meter and viewed in the LSdata program.

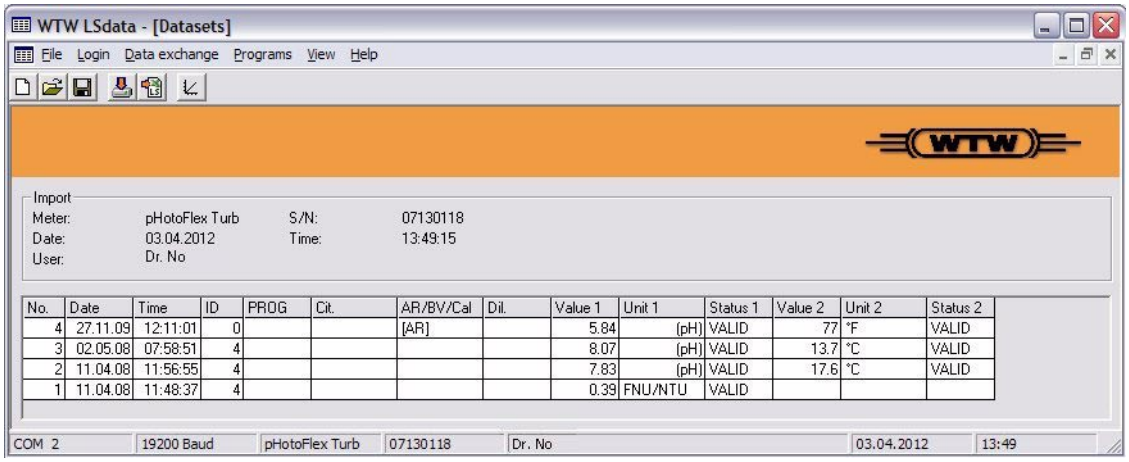
1	If necessary, create a new table with *File / New*. A table that is already open is closed.
2	Select the menu item, *Data exchange* / *Import*. All datasets are loaded from the connected meter into the LSdata software and displayed as a table.



Reading in datasets from a *.csv file

Datasets stored on the PC with LSdata can be read in again.

1	Select the menu item, *File / Open...*.
2	Select the storage location and name of the file.
3	Open the selected file with Open. The datasets are displayed as a table.



3.2 Storing datasets

Datasets are stored in *.csv format.
Files in *.csv format can be

- opened with any text editor
- imported to a spread sheet (e.g. Microsoft Excel)
- read with LSdata to be able to export them to the *.xls format for processing with Microsoft Excel.

1	Display the measurement data (see section 3.1).
2	Select the menu item, *File / Save As...*.
3	Select the storage location and name of the file.
4	Store the file with *Save*. The list of datasets is stored on the PC as a *.csv file.

3.3 Exporting datasets

You can export datasets to the *.xls file format in order to process them or print them out with Microsoft Excel.

1	Display the measurement data (see section 3.1).
2	Select the menu item, *Data exchange* / *Export (.xls)*. The store dialog box opens up.
3	Select the storage location and name of the file.
4	Store the file with *Save*. The list of datasets is stored on the PC as an *.xls file.



Files in the *.xls format cannot be read in again in the LSdata software.

4 Calibration data

With the LSdata software, you can:

- Display the calibration data stored in the meter (see section 4.1)
- Add the lot data of turbidity standards (see section 4.2)
- Store the calibration data stored in the meter to the PC as a *.csv file (see section 4.3)
- Print the calibration data stored in the meter with the aid of the PC (see section 4.4)

4.1 Displaying calibration data

You can:

- Download calibration data from the meter
- Read calibration data from a*.csv file

Download calibration data from the meter

You can download calibration data from the connected meter and view them in the LSdata program.

1	Select the menu item, *Data exchange* / *Calibration records* / *pH* or *Turbidity*. The selected calibration data are downloaded from the connected meter to the LSdata software and displayed.





Read calibration data from a*.csv file

You can read calibration data that was stored to the PC with LSdata.

1	Select the menu item, *Data exchange* / *Calibration records* / *pH* or *Turbidity*. The selected calibration data are read from the connected meter and displayed by the LSdata software.
2	Open the "Open" dialog box with *Open file*.
3	Select the storage location and name of the file.
4	Open the selected file with *Open*. The calibration data are displayed

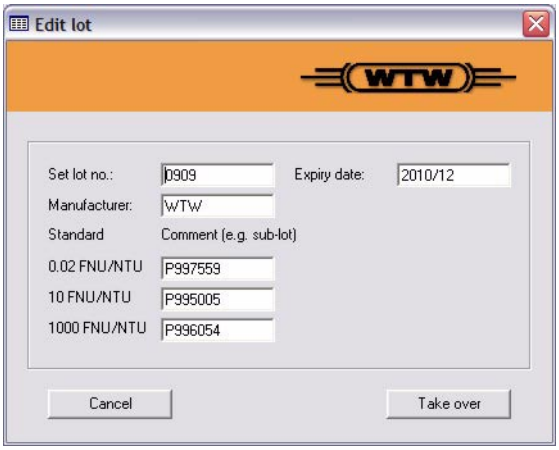
4.2 Complementing calibration data of turbidity measurements (*Edit lot*)

To document the turbidity measurement calibration data, you can add the lot data of the used turbidity standards to the calibration record.

1	Select the menu item, *Data exchange* / *Calibration records* / *Turbidity*. The selected calibration data are read from the connected meter and displayed by the LSdata software.



2	Open the input window for the lot data with *Edit lot*.
3	Enter the lot data (*Set lot no.*, *Expiry date*, *Manufacturer*, *Comment (e.g. sub-lot)*).



4	Confirm the lot data with *Take over*. The input window is closed. The entered lot data are displayed with the calibration data.

The added lot data are not stored in the meter.
Store the calibration data together with the added lot data to the PC (see section 4.3).

4.3 Storing calibration data

Calibration data are stored with the file extension, *.csv.
Files with the file extension *.csv can be

- opened with any text editors
- imported to a spreadsheet (such as Microsoft Excel)
- read by LSdata.

1	Display the calibration data (see section 4.1).
2	Open the "Save as" dialog box with *Save as file*.
3	Select the storage location and name of the file.

4	Save the file with *Save*. The calibration data are stored to the PC as a *.csv file together with the added lot data.

4.4 Printing calibration data

1	Display the calibration data (see section 4.1).
2	Download the calibration record to the standard printer of the PC with *Print*.

Sample printout

Calibration record - Turbidity
02.04.2010 15:17:00

Meter: pHotoFlex Turb
S/N: 05250580
User: ---

Date: 01.04.2010
Time: 10:25:43
Interval: 90 Day(s)

Set lot no.: 0909
Expiry date: 2010/12
Manufacturer: WTW
0.02 FNU/NTU: P997559 OK
10 FNU/NTU: P995005 OK
1000 FNU/NTU: P996054 OK

5 User-defined programs



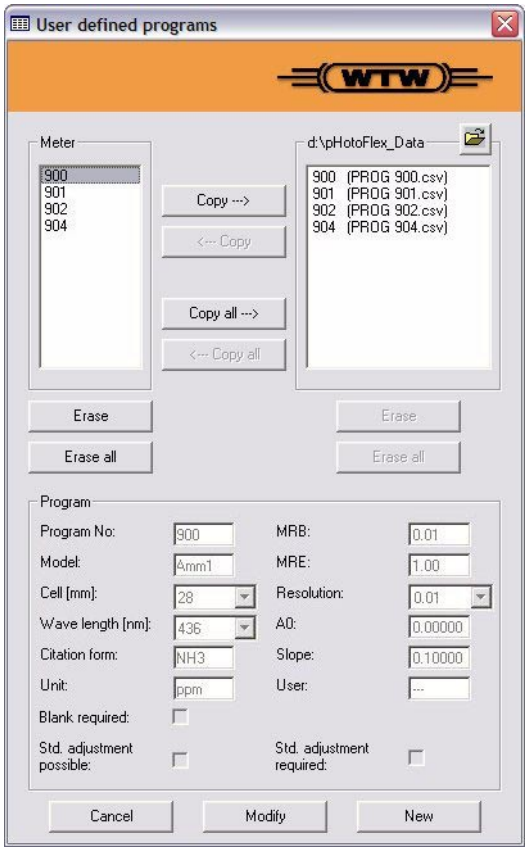
This chapter describes exclusively functions for photometric applications of the pHotoFlex and pHotoFlex Turb meters.

With the LSdata software, user-defined programs (methods) for photometric tests can be

- downloaded from the meter (see section 5.1)
- administrated on the PC and meter
  - newly created (see section 5.2)
  - modified (see section 5.4)
  - erased (see section 5.6)
  - stored (section 5.5)

5.1 Displaying user-defined programs

1	In the LSdata - [*Datasets*] window, select the menu item, *Programs / User Defined Programs*. The *User Defined Programs* window opens.



The active working directory is displayed.
All user-defined programs stored in the meter are automatically displayed in the *Meter* selection field.
All user-defined programs stored in the specified directory on the PC are automatically displayed in the file selection field.
The program data of the marked program is displayed in the *Program* selection field.

Here you can

- create a new user-defined program (see section 5.2)
- edit an existing program (see section 5.4).

2	If necessary, change the working directory.

5.2 Creating new user-defined programs

1	If necessary, highlight an existing program as the basis for the new program in the *Meter* group field or the file selection field.
2	In the *User Defined Programs* window, use *New* to open the *New program* window. The new program is filled with the data of the selected program. The next free number is entered as the program number. If no program is highlighted, a new program is created with standard values.



Data	Possible entries (examples)
Program No:	900 ... 999
Model:	Any name (max. 5 characters)
Cell [mm]:	13, 16 or 28
Wave length [nm]:	436, 517, 557, 594, 610 or 690
MRB: (measuring range begin)	e.g. 0.05
MRE: (measuring range end)	e.g. 8.00
A0 (offset):	e.g. 0.0
Slope:	e.g. 1.0

Data	Possible entries (examples)
Resolution:	0.0001, 0.001, 0.01, 0.1, 1, 2, 5, 10 or 100
Citation form:	e.g. PO4-P (max. 9 characters)
Unit:	e.g. mg/l (max. 7 characters)
Blank required:	☑/☐
Standard adjustment possible:	☑/☐ (for pHotoFlex STD, pHotoFlex pH)
Standard adjustment required:	☑/☐ (for pHotoFlex STD, pHotoFlex pH)

The next free program number is entered in the program number field. In the *Program* group field, you can freely modify all fields except the user name.

You can determine and enter the *Slope* and *A0* (offset) calibration data yourself or have them calculated from the calibration value pairs by the LSdata program (see section 5.3).

3	If necessary, use *Calibration >>* to extend the *New program* window by the entry of the calibration value pairs and calculate the *Slope* and *A0* (see section 5.3).
4	Store the new program on the PC and/or meter with *Send to meter* and/or *Save as file*.

If in any field nothing has been entered, an error message occurs when the data is transmitted to the connected meter.

If a program is already stored under the selected number, a security prompt appears before the program is overwritten.

5.3 Calibrating user-defined programs

To determine the *Slope* and offset (*A0*) calibration data for user-defined programs, at least three standard solutions (prepared by yourself) with different concentrations are required (see section 5.3.1).

For each standard solution, measure the respective absorbance value and note the concentration and the measured absorbance value in the table as a value pair (see section 5.3.2).

From the value pairs (concentration - absorbance), the LSdata program then calculates the calibration data, *Slope* and offset (*A0*) (see section 5.3.3).

5.3.1 Preparing the standard solutions

If you prepare standard solutions yourself, please observe the following notes:

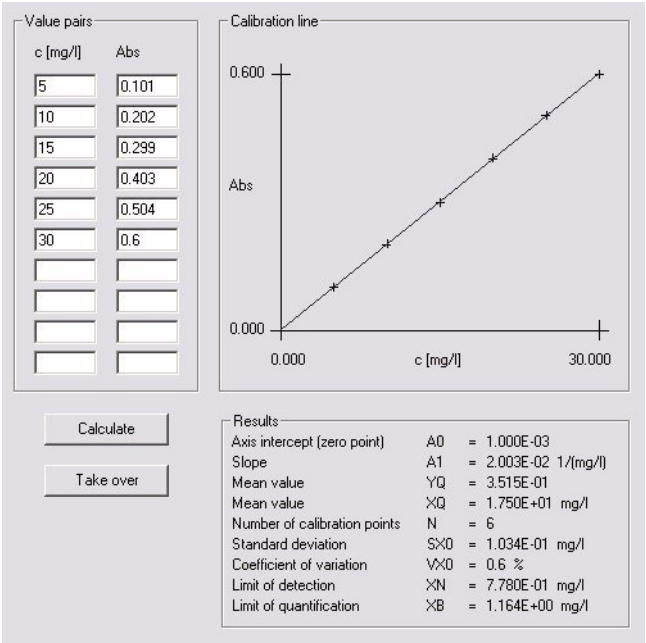
- The accuracy when preparing the standard solutions has a direct effect on the precision of the calibration line!
- The precision of the calibration line increases with an increasing number of standard solutions.
- The absorbance of the standard solutions should cover the entire measuring range of the photometer (- 0.2 ... + 2 absorbance units) (see also operating manual of the pHotoFlex or pHotoFlex Turb).
- The concentrations of the standard solutions should be evenly distributed over the entire measuring range.

5.3.2 Determining value pairs

1	Prepare at least three standard solutions with different concentrations (see section 5.3.1).
2	For each standard solution (at least three), measure the respective absorbance and note it down as a value pair (concentration c [mg/l] - absorbance).
3	Calculate the calibration data (see section 5.3.3).

5.3.3 Calculating calibration data with LSdata

1	Determine the value pairs (see section 5.3.2).
2	In the *New program* window, use *Calibration >>* to extend the window by the *Value pairs* group field for the entry of the calibration value pairs.
3	Enter at least three value pairs for the concentration (c [mg/l]) and the respective absorbance value (Abs).
4	Use *Calculate* to automatically calculate the calibration data *Slope* and *A0* from the entered value pairs. The result is displayed as a graphic in the *Calibration line* group field. In the *Results* group field, further information on the calculated calibration line is displayed (see page 24).



5	With *Take over* transfer the calculated *Slope* and *A0* calibration data to the *Program* group field. The calibration data (*Slope* and *A0*) are taken over in the program data.

Information in the *Results* group field

In the *Results* group field, the following information on the calculated calibration line is displayed:

- *Axis intercept (zero point)* [A0]:
  Deviation of the calibration line from the coordinates zero point in the y direction
- *Slope* [A1]:
  Slope of the calibration line
- *Mean value* [YQ / XQ]:
  Mean value of the measured absorbance values [A/mg/l]
- *Number of calibration points* [N]:
  Number of the value pairs used for calculation
- *Standard deviation* (process standard deviation) [SX0]:
  Standard deviation of the concentration values from the mean value (66 % of the values are within the range of the mean value ± process standard deviation)
- *Coefficient of variation* (process variation coefficient) [VX0]:
  Percentage standard deviation of the concentration values from the mean value
- *Limit of detection* [XN]:
  Between the detection limit and quantification limit, qualitative determination is possible only
- *Limit of quantification* [XB]:
  Lower limit of quantitative determination

5.4 Editing user-defined programs

The field for the program number is secured against changes. All other fields can be freely modified (see section 5.2).

1	Highlight a program in the *Meter* group field or in the file selection field.
2	Open the window for editing a program in the *User Defined Programs* with *Modify*. The *Modify* window opens. The displayed program data can all be modified.



The entries for modification correspond to the entries when creating a new program.
The *Slope* and *A0* (offset) calibration data can also be calculated in the LSdata program (see section 5.3).

3	If necessary, extend the *New program* window by the entry of the calibration value pairs with *Calibration >>* and calculate *Slope* and *A0* (see section 5.3).
4	Store the new program on the PC and/or meter with *Send to meter* and/or *Save as file*.



If any fields are not or incorrectly filled, it is not possible to store the data in the connected meter. An error message occurs.

5.5 Storing user-defined programs

You have the following options of storing user-defined programs.

- in the LSdata - [*Datasets*] window with
  - *Copy --->*
  - *<--- Copy*
  - *Copy all --->*
  - *<--- Copy all*
- when editing or creating programs with
  - *Send to meter* (see section 5.2)
  - *Save as file* (see section 5.4).

1	Highlight a program in the *Meter* group field or in the file selection field.
2	Using *Copy --->* or *<--- Copy*, store the program from the meter on the PC or vice versa. or Using *Copy all --->* or *<--- Copy all*, store all programs from the meter on the PC or vice versa.

5.6 Erasing user-defined programs

You have the following options of erasing user-defined programs:

- in the LSdata - [*Datasets*] window with
  - *Erase*
  - *Erase all*

1	Highlight a program in the *Meter* group field or in the file selection field.
2	Erase the program from the meter and/or PC with *Erase*.

Glossary

The glossary briefly explains the meaning of the specialist terms. However, terms that should already be familiar to the target group are not described here.

A0 (offset) see Blank value (reagent blank value)

Blank value (reagent blank value) The evaluation of the photometric measurement always refers to the comparison value of a sample without the substance to be determined (reagent blank value). Thus the influence of the basic absorbance of the reagents on photometric measurement is compensated for.

CSV File format for the exchange of data between spreadsheets such as Microsoft Excel and other programs.
A CSV file (**C**haracter **S**eparated **V**alues) contains table elements that are separated by certain characters, e.g. a semicolon.

Measured value The measured value is the special value of a measured parameter to be determined. It is given as a combination of the numerical value and unit (e.g. 3 m; 0.5 s; 5.2 A; 373.15 K).

Method A method comprises a chemical detection procedure and special method data (calibration line) that is required to evaluate the measurement results.
How to carry out the method up to measuring with the photometer is described in the analysis specification.
The pHotoFlex contains a database with methods (programs). Furthermore, user-defined methods can be entered in the database as well.
The Methods (programs) are stored under a program number.

Offset (A0) see Blank value (reagent blank value)

Program In the pHotoFlex, methods with the relevant method data are stored as programs.
Programs are called up via the assigned program number.

Slope The slope of a linear calibration function.

Standard solution The standard solution is a solution where the measured value is known by definition. It is used to calibrate a measuring system.

Test sample Designation of the test sample ready to be measured. Normally, a test sample is made by processing the original sample. The test sample and original sample are identical if the test sample was not processed.

XLS File format of the Microsoft Excel spreadsheet.

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