Manual QUANTOFIX® Relax

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1. Introduction

Welcome and thank you very much for choosing our QUANTOFIX® Relax analysis.

The QUANTOFIX® Relax is a reflexion photometer for the analysis of QUANTOFIX® test strips from MACHEREY-NAGEL.

The measurements are carried out under standardized conditions. Results may be displayed, printed and sent to a computer. Instrumental evaluation eliminates potential sources of error inherent to visual evaluation. Results will not vary due to subjective color perception or different light sources. Additionally, errors resulting from manual result administration are avoided. Featuring a clear touch screen and intuitive user guidance, the QUANTOFIX® Relax is ideal for quick, efficient and comfortable work.

1.1 Technical description

The test strips is placed on a measuring slide with inbuilt reference pad, which is moved into the instrument along a fixed measurement head. While moving in and out of the instrument, the test strip is measured reflectometrically.

A pre-defined light source illuminates the test pad. A detection unit then measures the intensity of the reflected light at three different wavelengths. From this information, remission values are calculated. The timing of the measurements may vary depending on test strip and parameter. Using the remission values, the instrument can – in contrast to visual evaluation - show continuous values within the respective tests' measuring range. Once the result has been determined, it is displayed on the screen, printed and sent to the instrument's interface.

1.2 Technical specifications

Overview	Dimensions: 7.5 x 16 x 20 cm
	Weight: 710 g (without batteries and power pack)
	Power supply: Mains transformer (100–240 V Input, Output 9 V = 1,5 A alternativ)
	Battery operation with 6 mignon batteries 1,5 V (AA)
Measurement	Principle: reflection photometer
	Light source: 1 white LED
	Detector: RGB-detector
Operation	Touch screen: W x H: 57 x 57 mm
	Printer: thermo transfer
Interfaces	1 x USB
	1 x RS232 19200 Baud, 8 bit, N unidirectional
	1 x PS/2 for keyboard / barcode scanner
Memory	Capacity: 200 results
Accessories (optional)	PC keyboard: data entry
	barcode scanner: data entry
	Serial cable: PC connection
	Transport case

2. Safety precautions

2.1 Protective clothing

Depending on the test strip or sample, using the QUANTOFIX® Relax may entail handling chemicals and / or dangerous substances. In such cases, adhere to the safety measures provided within the test strip instructions, the in-house regulations of your place-of-work as well as to good laboratory practice.
If in doubt, we recommend to wear at least gloves, safety goggles and a lab coat.

2.2 Power connection

To ensure safe functioning of the instrument, only use the included power pack.

2.3 Housing damage

If the housing is damaged, the instrument needs to be repaired. Correct functioning and measurement results cannot be guaranteed anymore.

2.4 Cable break

In case of a broken cable, immediately stop using the instrument and replace the cable and power pack.

2.5 Improper use

The QUANTOFIX® Relax instrument is solely designed to read QUANTOFIX® test strips. Any other usage of the instrument is neither tested nor approved. In the event of improper use, any claim with regards to warranty and liability are void and of no effect.

2.6 Transport

To transport the instrument, the cardboard box from the initial shipment including the protective foamed plastic is well suited. Therefore, we recommend to keep the box. In case you do not have the original box anymore, use a large cardboard box and plenty of soft cushioning material, so that the instrument cannot shift during transport.
If you transport the instrument often, we offer a professional transport case (REF 930 889) with a premium foam inlay. The case allows you to safely carry the instrument and numerous boxes of text strips.

Pic. 1: Transport case

3. Instrument set-up

3.1 Set-up location

Only use the instrument in a suitable location. It should be positioned on a dry, clean, level, hard and horizontal surface. The operating temperature is between 5–40 °C, while the optimal temperature range for the instrument is between 18–25 °C. For optimal performance, the humidity should be between 20–80 %. Make sure to protect the instrument from drastic changes in temperature. Avoid positioning the instrument close to windows, hot plates, ovens etc. To ensure correct functioning and reliable results, the instrument should not be exposed to direct sunlight or other bright, focused light sources.
If the instrument underwent drastic temperature changes (e.g. during transport of shipment), it should not be operated prior to sufficient acclimatization. Also, we recommend not to use the instrument close to electrical fields (e.g. micro wave ovens, radio units etc.), as it may affect measurements.

3.2 Package content

Carefully take the instrument and all other parts out of the box. Check the package, instrument and all accessories for visible damage. If a part is damaged, please contact your distributor or the technical support *(see 18.5 Contact, p. 95)*. The following picture shows the complete package content. Check the shipment for completeness. If a part is missing, please contact your distributor or the technical support as well.

> Note: Keep the original box and the packaging material from the initial shipment to optimally protect the instrument in case of a return-shipment.


Pic. 2: Package content

① QUANTOFIX® Relax reflexion photometer

② Power pack 100–240 V, 47/63 Hz, 9V + Adapter

③ Printer paper

④ Manual

4. Quickstart

To start measurements right away, unpack the instrument and place it on a level, hard surface. Connect the power pack and turn on the instrument using the on/off switch (Pic. 4 (8)). Once the instrument has performed a self-test, the start display appears.

Pressing [Test:], you can choose the parameter to be measured. Once a parameter has been activated, use the test strip as described in the instructions. Then place the strip on the measurement slide. The instrument recognizes the test strip and starts the measurement automatically. A progress bar in the display shows the remaining reaction time. The result is displayed right after the measurement has been completed.

5. Initial operation

This chapter contains a description of the steps necessary to start-up the instrument.

Pic. 3: Instrument front

① Touch screen   ② Measurement slide   ③ Printer

5.1 Power connection

The shipment includes four adaptors to connect the power pack to different outlets. Clip the respective adaptor to the power pack. Once the power cord is connected to the "DC IN" port (7) and connected to an outlet, the QUANTOFIX® Relax is connected to the power supply.

Pic. 4: Instrument back

④ RS232 interface   ⑤ USB interface   ⑥ PS/2 port
⑦ Power connection   ⑧ On / Off switch

Alternatively, the instrument can run on standard AA batteries independent from the power network. The battery compartment is on the bottom side of the instrument. Pay attention to the pre-defined polarity when inserting the batteries (+/-).

Pic. 5: Instrument bottom

5.2 Interface

The instrument can be connected to a computer using either a serial or USB connection.

5.2.1 Serial interface

Protocol RS232 (Pic. 4 (4)), 19200 baud, 8 bit, no parity, connection plug arrangement:

Pin No.	Signal	Description	Direction
1	Nc	Not wired	
2	RxD	Data reception	Input
3	TxD	Senden	Output
4	Nc	Not wired	
5	GND	Signal ground	--
6	Nc	Not wired	
7	Nc	Not wired	
8	Nc	Not wired	
9	Nc	Not wired	

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5.2.2 USB interface

USB port type B (Pic. 4 (5)). Prevalent operating systems recognize the instrument as a serial interface. The driver for the interface component is available on the MACHEREY-NAGEL website (**www.mn-net.com**).

5.2.3 Transmission protocol

Data is sent via the interfaces in cleartext. The received data relates to format of the print out.

5.2.4 Barcode scanner / keyboard

You can connect a keyboard and / or barcode scanner using the instruments PS/2 port (Pic. 4 (6)).

5.3 Inserting printer paper

To open the printer paper cover, press the little button above the touch screen. Move the printer paper cover backwards.

Pic. 6: Open printer paper cover

Pic. 7: Opened printer paper cover

Unroll appr. 10 cm (4″) of printer paper and place the printer paper into the chamber, so that the paper unrolls downwards and towards the touch screen.

Pic. 8: Insert printer paper

Close the printer paper cover with an audible click, so that the printer paper comes out from the chamber.

Pic. 9: Inserted printer paper

Note: Only use special thermal printer paper!

5.4 Switching on the instrument

You can find the On/Off switch (Pic. 4 (8)) on the back of the instrument. Turn on the instrument. Right after switching on, the instrument performs a self-test. The touch screen lights up and the start screen appears.

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6. Operation and user guidance

The instrument is designed for easy and intuitive use. Nevertheless, read the following paragraphs carefully to familiarize your self with the instrument's functions and user guidance.

6.1 Touch screen

All operations are carried out with a touch-sensitive screen. An external keyboard can be connected via the PS/2 interface *(see 5.2.4 Barcode scanner / keyboard, p. 62)*.

Note: Do not touch the touch screen with pointed or hard items.

6.2 Operating the user interface

Please note some basic rules for operating the instrument's user-interface:
• All framed buttons can be activated by touch
• To confirm changes or entries, you have to press ☐✓ when leaving the menu. If you leave menus pressing ☐✗, none of your changes or entries will be adopted.
There are three different categories of buttons.

6.2.1 Activity buttons

Framed activity buttons with a symbol or text initiate a certain activity. Among others, the following symbols are frequently used:
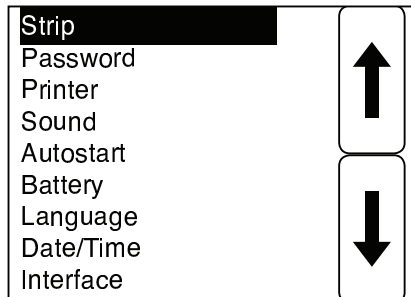
☐✗ – Leave the menu / cancel

☐✓ – Confirm an entry

☐🖶 – Prints display

↑↓ – scrolls in a list up or down

6.2.2 Lists

Within a list, the currently activated entry is highlighted. Only one entry can be activated within a list at a time. Using the arrow buttons *(see 6.2.1 Activity buttons, p. 64);* you can scroll through the list and activate the different entries. Confirm your selection pressing [✓]. Press [✗] to leave the list.

```
Strip
Password          ⬆
Printer
Sound
Autostart
Battery            ⬇
Language
Date/Time
Interface
```

6.2.3 Option fields

Option-fields consist of choice buttons. Choice-buttons are circles. If a choice-button is active, it is filled black. Within an option field, only one choice-button can be active.

```
⦿ Today
◯ All
◯ Date
```
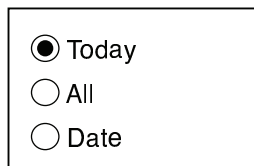
Touch a choice-button to activate it. Press [✓] to confirm and save your changes. If you leave menus that include option-fields by pressing [✗], none of your choices will be adopted.

6.2.4 Input menu

You have the option to insert some data into the instrument (e.g. Date / Time). The input-menu appears whenever you want to make such an entry.
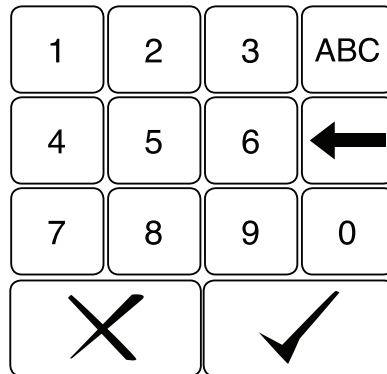
Above the input-buttons you will find a window which shows your new entry. You can enter upper case letters, or numbers. To switch between the options, press the button that shows the desired form of entry ([ABC] / [123]). Initially, the instrument is opting for capital letters. Once you make a change, the instrument remembers your last choice. If you open the input-menu again, the former choice is still active. For new entries touch a letter / number. To enter a different letter / number than the first one on the button, press the button repeatedly.

You can delete an entry by pressing [←]. Press [✓] to confirm and save your changes. If you leave the input-menu by pressing [X], none of your changes will be adopted.
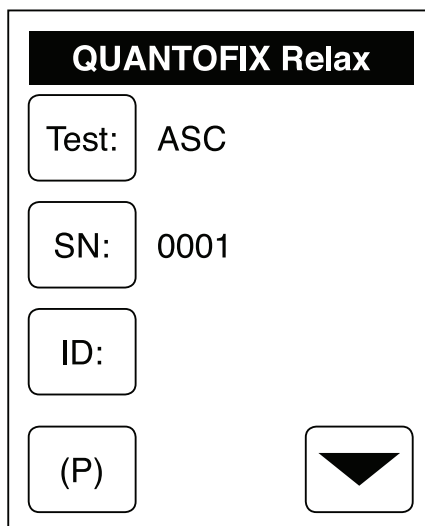
6.3 Stand-by mode

After three minutes idling, the instrument goes into stand-by mode and the measurement slide retracts into the housing. Pressing the touch screen re-activates the instrument and you get straight to the start screen. You can also activate the stand-by mode ahead of time by pressing [(P)] in the start screen.

Note: If the device is activated from the stand-by mode, it will always go to the start screen. Any changes in menus or changes in settings that have not been saved before the instrument went into stand-by mode will be lost.

7. Start screen

Once the instrument has been switched on and performed the self-test, the start-screen appears.

Display 1: Start screen

The start screen is the starting point for measurements and all other settings. It shows the currently activated test strip, the sequence number and sample ID (optional). (P) activates the stand-by mode. To get to the main menu, press ▼. A new menu with multiple options appears.

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8. Measurement preparation

The instrument can read different QUANTOFIX® test strips for different parameters and ranges. Depending on the test, the sample and measurement preparation may be different. The instructions of the test strips describe the necessary steps prior to measurement. Therefore, please read the package insert carefully to obtain accurate and reliable results.

Note: As described in the instructions, always shake off excess liquid from the test strip to get optimal results.

Note: Reaction times are pre-programmed into the instrument for every test. Therefore, put the test strip on the measurement slide immediately after immersing the strip into the sample and shaking of the excess liquid.

9. Measurements

The instrument is designed for the quick and easy measurement of test strips. The following points outline set-up options with regards to measurements as well as the actual measurement procedure.

9.1 Parameter selection

The instrument cannot detect different test strips for different parameters or ranges automatically. Therefore, initially you have to activate the test strip you want to measure. The currently activated test is displayed in the start screen next to the |Test:| button. Always make sure that the test strip you are using corresponds to the activated test.

To activate a particular test for a measurement, press |Test:|. A new screen appears which includes up to 5 pre-defined tests *(see 13.1.1 Favorites, p. 80)*. To activate one of these favorites, press the corresponding button. The start screen appears and the desired test is activated and is displayed next to the |Test:| button.

To activate a test that is not part of the favorites list, press [...]. A list with all available tests appears. Use the arrows to select a test. Press [✓] to confirm your selection, the start screen appears and the desired test is activated and is displayed next to the |Test:| button. If you leave the list by pressing [✗], your selection is not adopted.

Generally, the instrument saves the last used test and keeps it activated in the start screen.

9.2 Sequence number

|SN:| shows a continuous number for every measurement for a given day. The counter starts at 0001. To change the sequence number, press |SN:|. The input menu appears and you can enter the desired number.

For every new day, the sequence number is set back to 0001.

9.3 Sample ID

|ID:| shows the sample ID for the next measurement. To enter or change the sample ID, press |ID:|. The input menu appears and you can enter the desired sample ID. Once you enter the sample ID, [ ] appears. You can lock the sample ID by pressing [ ], [x] appears. The following measurements are then always run and saved using the same sample ID. Using the search mode *(see 11.2 Search, p. 74)*, you can retrieve the results from the instrument memory. Pressing [x] twice removes the lock. You can also enter the sample ID using a barcode scanner or a keyboard *(see 5.2.4 Barcode scanner / keyboard, p. 62)*.

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Note: You have to enter both sequence number and sample ID before you begin the measurement. Changing or adding a sequence number and / or sample ID to a result after the measurement is not possible.

9.4 Measurement procedure

Measuring test strips with QUANTOFIX® Relax is very easy. To start a measurement, simply place the test strip on the test strip slide with the test pad facing upwards and forward. The end of the test strip has to touch the end of the slide's recess. A sensor (little gap within the slide) detects the test strips and starts the measurement automatically.

Pic. 10: Position strip

Pic. 11: Push strip forward

Note: It is important to place the test strip at the far end of the slide's recess. You can easily move the strip forward on the recess using your finger (make sure to not touch the test field!).

A progress bar appears showing the remaining reaction time. After a few seconds, the test strip is drawn into the instrument's housing. After the measurement, the slide moves out of the housing again and the result is displayed in the screen. The measured test strip can be discarded into the domestic waste.
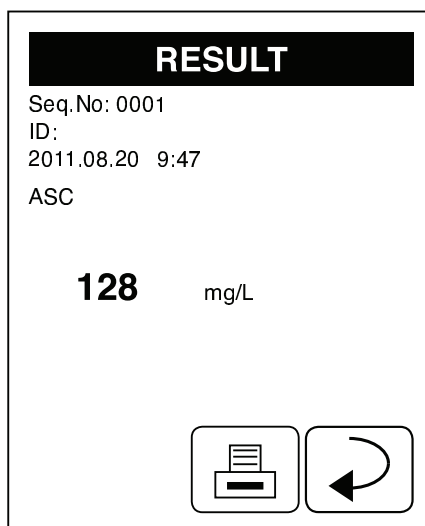
Display 2: Result

Note: The reaction time is dependant on the test and programmed into the instrument. Therefore, different tests have different waiting times. In general though, the time to wait is hardly ever longer than 60 seconds.

Note: If the autostart function is disabled, you have to start a measurement pressing [icon] *(see 13.5 Autostart, p. 85).*

10. Main menu

Once you press ⏷ in the start screen, the main menu appears. Within the main menu are three options. 🗎 allows you to display, search and delete stored data.

📝 enables quality control measurements with special MN control strips.

🔧 gets you to the instrument settings.
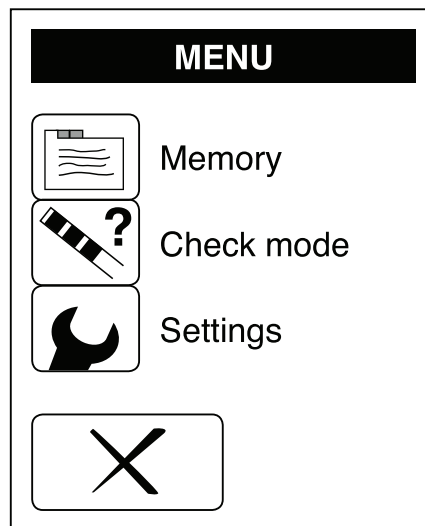
Display 3: Main menu

11. Memory

The QUANTOFIX® Relax saves up to 200 results in an internal memory. If the memory is completely full, a new data set will replace the oldest data set in the memory.
Press ▼ in the start screen and 📋 in the main menu to get to the memory menu.

MEMORY MODE

📄 List

📄 Search

🗑 Clear

✕
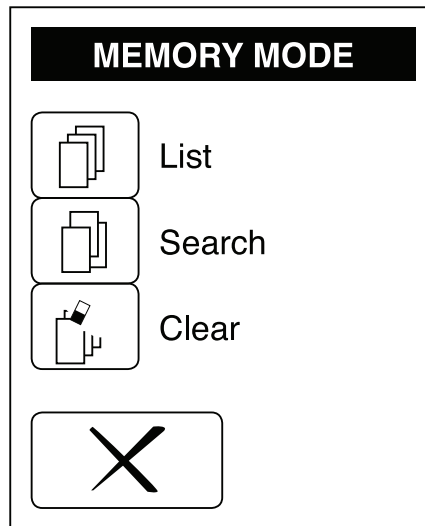
Display 4: Memory

Within the memory menu, you have three different options. You can display a complete list with all data sets, search for specific data sets or delete the entire memory.

11.1 Memory list

Press 📄 to display all data sets in the memory. A new screen appears, showing the result for the latest measurement. The results are always sorted according to the measurement date. The heading shows the number of the currently displayed data sets and the total number of data sets within the memory.

Memory 1/63

Seq.No: 0001
ID:
2011.08.20 9:47
ASC

445   204

← → 🖥 🖨 ↩
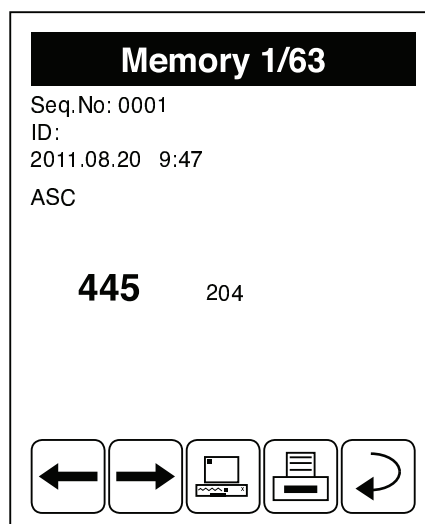
Display 5: Memory entry

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For the respective result, sequence number, sample ID, measurement date/time, test and the actual result are displayed. On the bottom side of the screen are 5 activity buttons.

Press ⬅ and ➡ to choose between different data sets. Additionally, you may press 🖨 to print the displayed data set or press 💻 to send the data to a PC. Press ↩ to get to the memory menu.

11.2 Search

Press 🗐 to search the memory for specific results. To do so, you can freely combine three search criteria (test, date, parameter). To start a search, all criteria need to be defined.

11.2.1 Test

Press TEST to determine the type of test strip that generated the result you are looking for. Once you press the activity button, a new screen with a list of all available tests appears.

STRIP TYPE

ASC
H2O2 25
H2O2 100
H2O2 1000
NO2
PAA 50
PAA 500
PAA 2000
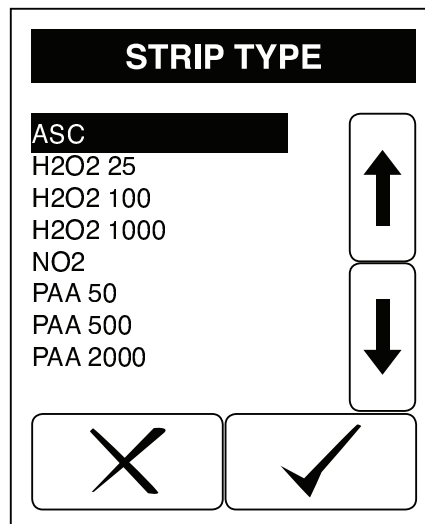
Display 6: Test selection

Use the arrow buttons to choose the test you are looking for. Press ✓ to confirm your selection. Your selection will appear in the search menu. If you leave the list by pressing ✗ , your selection is not adopted.

11.2.2 Day

Press $\boxed{\text{DAY}}$ to select results from a particular day. Once you press the activity button, an option field with three choice buttons appears.
If you press "Today" only results from the current day will be searched and selected.
The choice button "All" selects all data sets, irrespective of the date.
The choice button "Date" allows you to select a specific date on which the result you are looking for was measured. Press "Date" and confirm with $\boxed{\checkmark}$.
A list with all dates on which measurements have been performed appears. Use the arrow buttons to scroll through the list and press $\boxed{\checkmark}$ if you have found the desired date. Your selection will appear in the "SEARCH" menu. If you leave the list by pressing $\boxed{\times}$, your selection is not adopted.
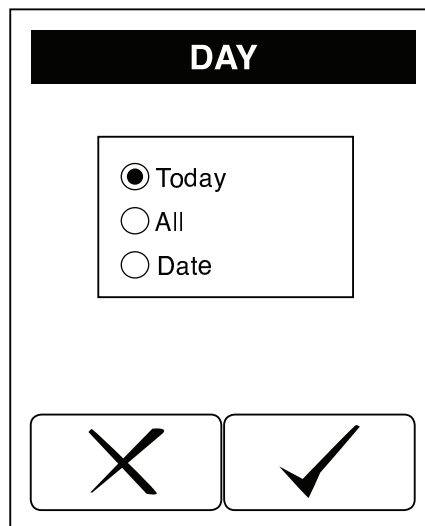
Display 7: Date selection

11.2.3 Parameter

Press ⌐PAR⌐ to define additional search criteria for sorting through the memory. You can search for sample ID, sequence number, not printed and not sent data sets. As soon as you press ⌐PAR⌐, a list with all options appears.
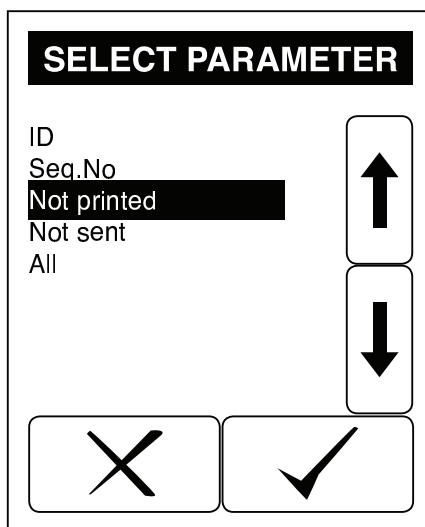

Display 8: Parameter selection

Use the arrow buttons to scroll through the list and press ⌐✓⌐ if you have found the desired criterion. In the case of sample "ID" and "Seq.No", the input menu appears so that you can enter the respective number. If you chose "all", no specific criteria are selected.
Press ⌐✓⌐ to confirm your selection. Your selection will appear in the search menu. If you leave the list by pressing ⌐✗⌐, your selection is not adopted.

11.2.4 Process search results

Once you have made a selection for all search criteria, the [✓] appears in the search menu. To start the search press [✓]. A new screen with three different activity buttons appears. The heading shows the number of results selected given by your search criteria. Press [🖶] to print, [💻] to send and [○] to display the data sets selected.

If you leave the menu by pressing [✗], you go straight back to the memory menu.
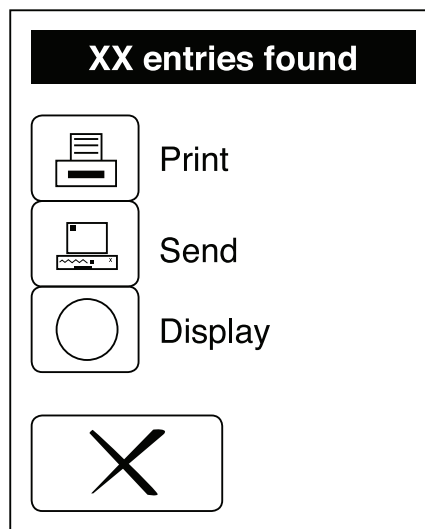
Display 9: Select options for search results

11.3 Delete

Within the memory menu, you can also delete the entire memory. To delete the memory, press [🗑] and confirm the following security question with [✓].

Note: Deleting the memory is irrevocable. Make sure that no relevant data is left in the memory before you delete all entries.

12. Check mode

The check mode allows you to check the correct functioning of instrument using special control strips. You can order the control strips from MACHEREY–NAGEL (REF 913 470).
Once you press [✎?] , the instrument asks you to insert the control strip. The measurement of the control strip starts automatically as soon as the strip is placed on the slide. Once the measurement has been completed, the measured values are immediately displayed or printed. The values are so called remission values for the pre-colored test pads on the control strip. These values have to be compared to a set of standard values from the control strip instructions. For additional information on the control strips, please consult the package insert, or contact MACHEREY-NAGEL directly.
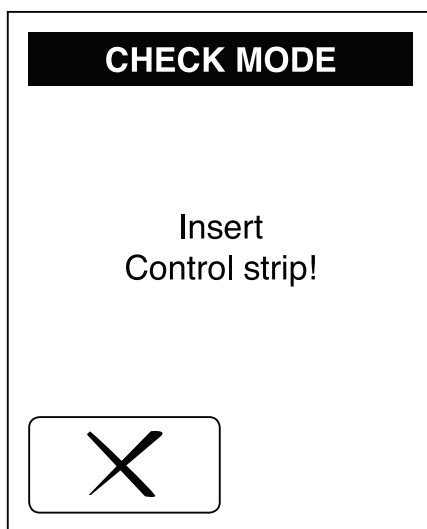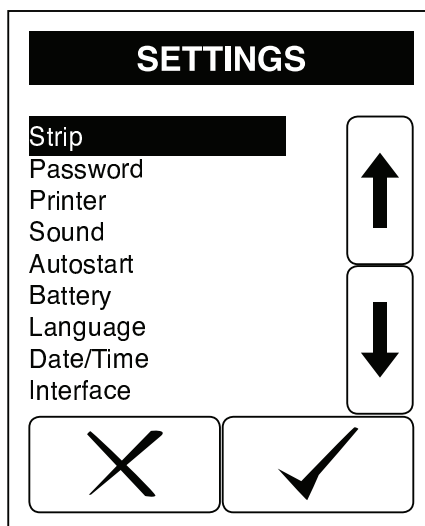

Display 10: Insert control strip

13. Settings

The "Settings" menu allows you to adjust the instrument to your personal requirements. Press [▼] in the start screen and then [🔧] in the main menu to get to the settings.
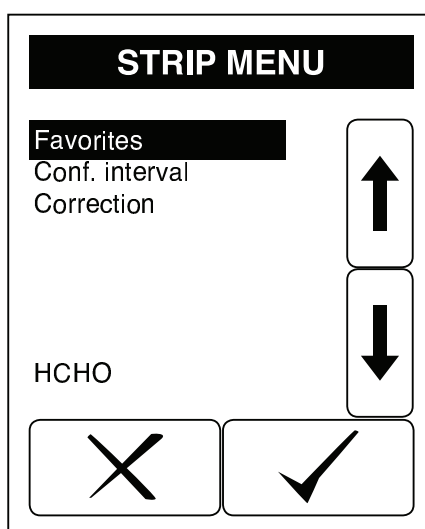Use the arrow buttons to choose an entry and confirm your choice with [✓].

Display 11: Settings

13.1 Test strips

Within the "Test strip" menu there are three more options. Favorites allow you to define test strips for the "Favorites" menu *(see 13.1.1 Favorites, p. 80)*. Additionally, you can activate or disable the confidence interval message in the display. The option "Correction" allows for the adjustment of the factory-provided parameter calibration to account for matrix effects and interferences during the analysis.

Display 12: Strip menu

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Use the arrow buttons to choose an entry and confirm your choice with [✓].
If you press [✗] you get back to the settings.

13.1.1 Favorites
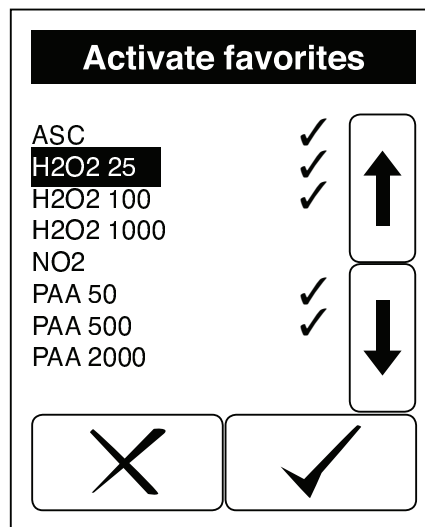
You can define up to 5 different test strips as favorites. These favorites are saved and will appear in the "Favorites" menu. You can access the favorite's selection menu via [Test:] in the start screen *(see 9. Measurements, p. 69)*. The favorites option allows you to pre-define your most frequently used tests, so that you can quickly and easily switch between test strips.

Display 13: Activate favorites

The menu shows a list with all tests and parameters that are programmed for evaluation in the instrument. On the left side of the screen, you can see the test names. On the right hand side of the name, directly next to the arrow buttons, you can see a confirmation symbol, given the respective test has been marked as a favorite in the first place.
To select a test as a favorite, go to the test using the arrow buttons and press [✓]. The confirmation symbol appears behind the test, it has been included into the favorite menu. You can deactivate parameters from the favorite list in the same way.
The favorite list can include only 5 tests. If there are already 5 tests activated within the list, you have to deactivate a test first in order to choose a new favorite. To leave the menu, press [✗], and you will get back to the start screen.

13.1.2 Confidence interval

Naturally, test strip results are subject to slight deviations even when they are generated photometrically. For every test there is a percentage based confidence interval in which the true value can be found. The instrument can optionally display the confidence interval (in +/- percent) underneath the result after every measurement. To activate or deactivate the confidence interval, respectively, choose the desired choice button from the option field and confirm with ☐✓. If you press ☐✗, none of your selections is adopted.
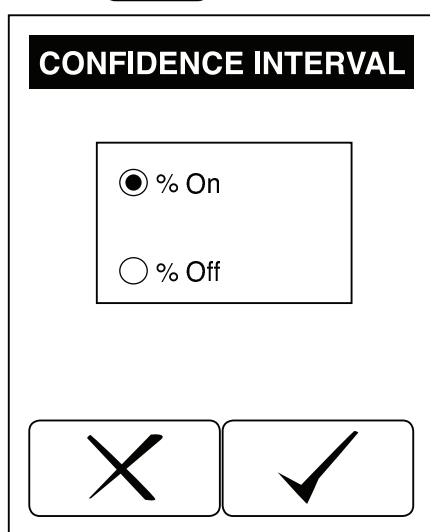
Display 14: Confidence interval   Display 15: Activated confidence interval
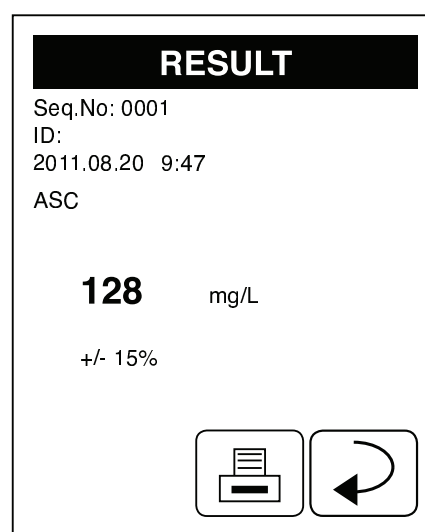
13.1.3 Correction

The correction mode allows for the adjustment of the MACHEREY-NAGEL parameter calibration and affects the result in terms of an additional calculation step. The menu offers the opportunity of correcting the result with a linear correction function.

ATTENTION:
Faulty measurement results due to manipulated calibration are the sole responsibility of the operator of the equipment!

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By selecting the correction menu four values appear, that can be edited by choosing each of them. Selecting this function always affects the parameter displayed in the strip menu *(see 13.1 Test strips, p. 79)*.

```
┌─────────────────────────────┐
│          HCHO               │
│                             │
│  ┌──────────┐  ┌──────────┐ │
│  │ A= 1.000 │  │ B= 0.000 │ │
│  └──────────┘  └──────────┘ │
│  ┌──────────┐  ┌──────────┐ │
│  │ C= 0.000 │  │ D= 0.000 │ │
│  └──────────┘  └──────────┘ │
│                ┌──────────┐ │
│                │  Reset   │ │
│                └──────────┘ │
│                             │
│  ┌──────────┐  ┌──────────┐ │
│  │    ✗     │  │    ✓     │ │
│  └──────────┘  └──────────┘ │
└─────────────────────────────┘
```

Display 16: Correction

The meaning of the values A to D is as follows:

A = gradient of the correction function
B = y-axis intercept of the correction function
C = new lower measurement limit
D = new upper measurement limit

Confirming your entry with [✓] stores the settings. If you press [✗], none of your selections is adopted. By pressing the "Reset"-button the values will be set back to factory settings.
Once you select one of these values, the input menu appears and you can enter a value (Restrictions: The value for A must be > 0. Value D must be bigger than value C, if values C and D are equal to zero, the factory-provided measuring range will be adjusted depending upon the entered values for A and B).

Set A value

14_

1	2	3	.
4	5	6	←
7	8	9	0
✗			✓
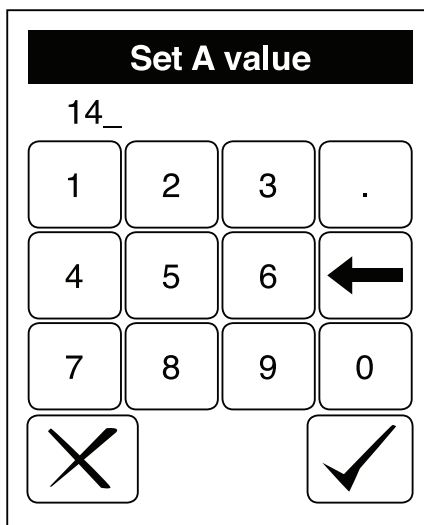
Display 17: Enter correction value

Confirming your entry with [✓] stores the value. If you press [✗], the former value will be kept.

The modification of a parameter will be indicated with a star in the parameter list display as well as on the result display and printout. Also the result in the memory will contain this indication, which cannot be removed by resetting the values to factory-settings.
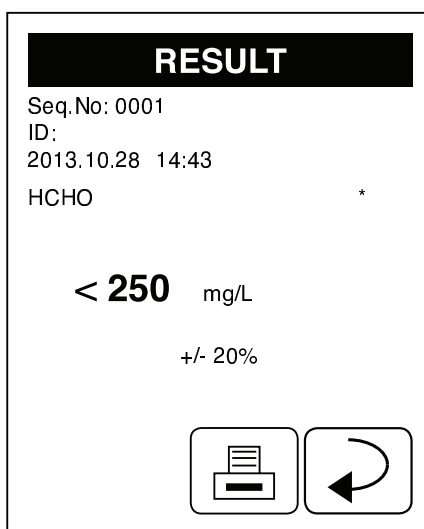
RESULT

Seq.No: 0001
ID:
2013.10.28 14:43
HCHO   *

< 250   mg/L

+/- 20%

Display 18: Result window

13.2 Password

You can protect access to the instrument settings using a password, thus restricting the number of user who can access the settings. To install a password, press "On" in the option field and confirm with [✓]. If you press [✗], none of your selections is adopted.

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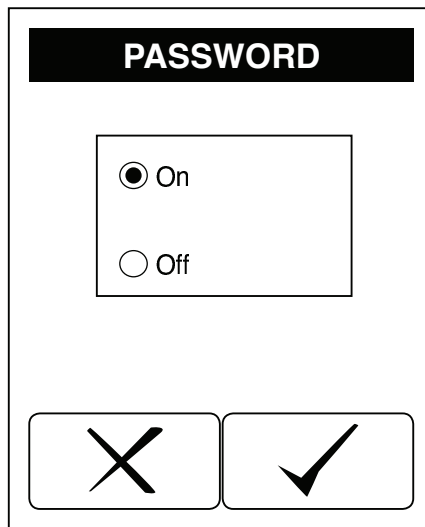
Display 19: Password

The input menu appears and you can enter a password. Once you leave the settings and then go back again, the instrument requires the respective password.

13.3 Printer

In the printer menu, you can disable or enable the printer. Press the respective choice button in the option field and confirm with ☑. If you press ☒, none of your selections is adopted.
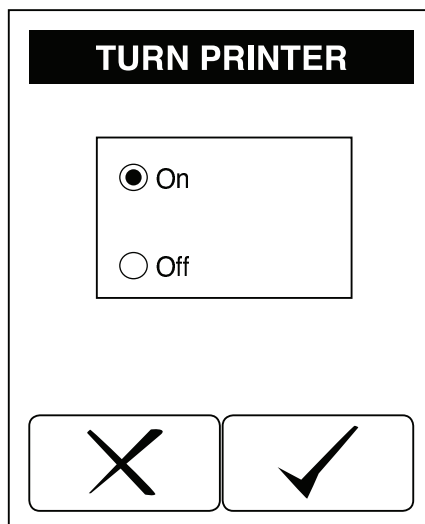
Display 20: Printer

13.4 Sound

In the "sound" menu, you can disable or enable the instrument sound. Press the respective choice button in the option field and confirm with ⟨ ✓ ⟩. If you press ⟨ ✗ ⟩, none of your selections is adopted.

SOUNDS

◉ On

○ Off

✗   ✓

Display 21: Sound

13.5 Autostart

The instrument has an autostart function *(see 9. Measurements, p. 69)*, which detects a test strip on the slide and automatically starts the measurement process.

In the autostart menu, you can disable or enable the autostart. Press the respective choice button in the option field and confirm with ⟨ ✓ ⟩. If you press ⟨ ✗ ⟩, none of your selections is adopted.

AUTOSTART

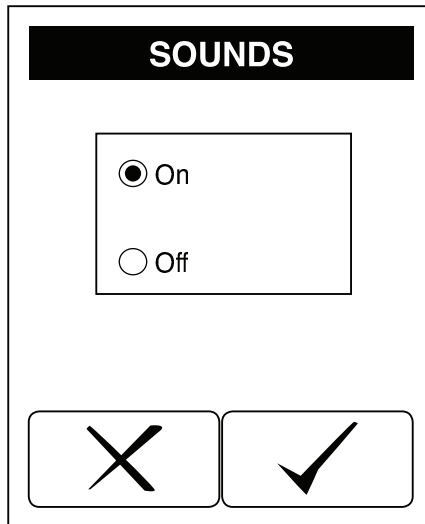◉ On

○ Off

✗   ✓
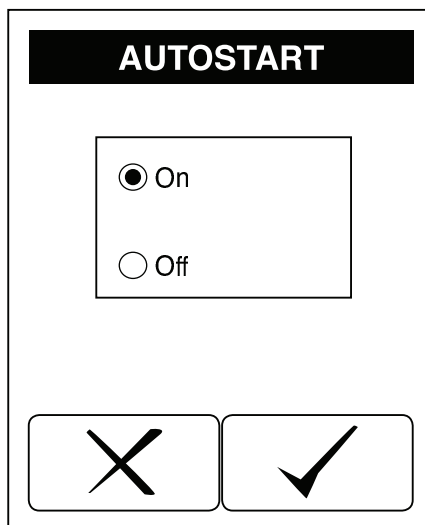
Display 22: Autostart

If the autostart function is disabled, the start screen shows ⌈ 🪵 ⌉. In this case you have to press the activity button to start a measurement *(see 9. Measurements, p. 69)*
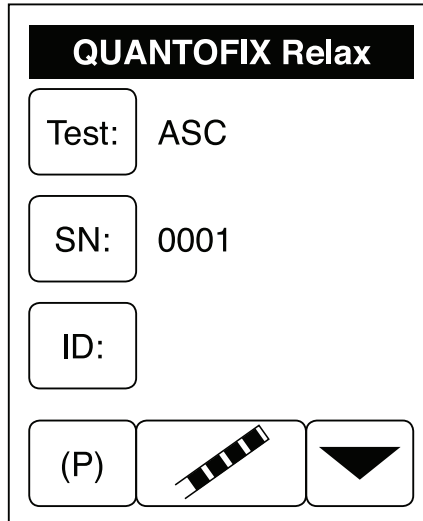
Display 23: Deactivated autostart

13.6 Battery

You can make some adjustments to conserve energy. Within the menu you will find to option fields. Here you can enable or disable the screen's backlight function and the printer. Press the respective choice button(s) and confirm with ⌈ ✓ ⌉. If you press ⌈ ✕ ⌉, none of your selections is adopted.
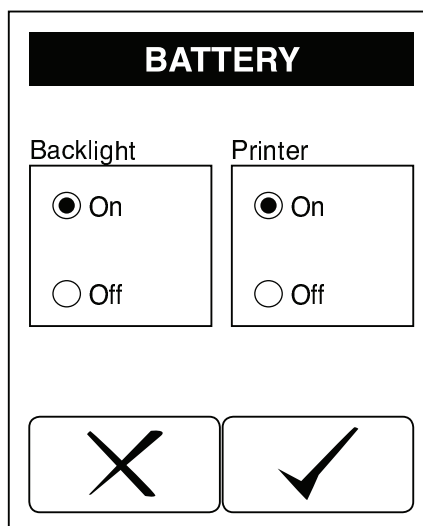
Display 24: Battery

13.7 Language

The instrument can be set to 9 different languages. In the "Language" menu, you can choose between the different languages. The menu contains a list of all languages available. To activate a particular language, select the language using the arrow buttons and confirm with [✓]. The instrument changes the language automatically and goes back to the settings menu. If you press [✗], none of your selections is adopted.
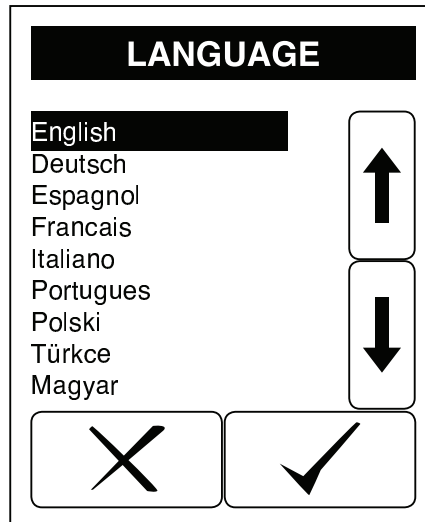
Display 25: Language

13.8 Date / Time

In the "Date / Time" menu, you can adjust the date, the date format, the time and the time format.
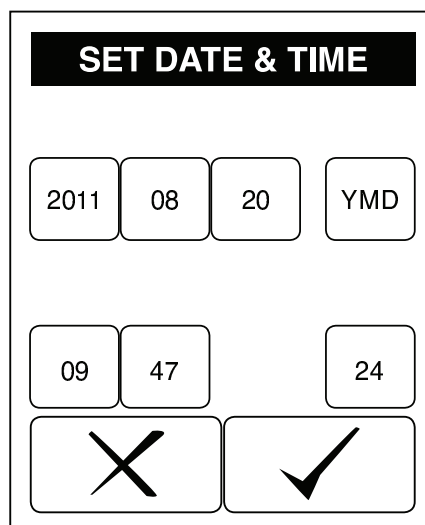
Display 26: Date / Time

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There are three activity buttons for the date (upper row) and two activity buttons the time (lower row). Once you press one of the activity buttons, the input menu opens and you can make the necessary adjustments. To change the year, you only have to insert the last two digits (e.g. 11 for 2011).

You can set the date to three different formats. An activity button shows the currently active format. To change the format, press the activity button. The date is adjusted automatically.

Date format

YMD	Year - Month - Day	2011-08-20
DMY	Day . Month . Year	20.08.2011
MDY	Month / Day / Year	08/20/2011

You can change the time format between 12 and 24 hours. To make the respective adjustment, press the activity button at the right end of the row. If you chose the 12 hour format, an additional activity button appears to set am or pm. Confirm your entry with ✓. If you press ✗, none of your selections is adopted.

13.9 Interface

In the "Interface" menu, you can disable or enable the instrument's interface. The instrument can send data only if the interface is enabled. Press the respective choice button in the option field and confirm with ✓. If you press ✗, none of your selections is adopted.

13.10 Customization

In the "Customization" menu, you can personalize the first two lines of a result print-out with a specific text. Once you select the menu item, the input menu appears and you can enter the text for the first line (24 characters max.). Confirm your entry with [✓]. The input menu appears again to enter the text for the second line. Confirm again with [✓]. If you press [✗], none of your selections is adopted.
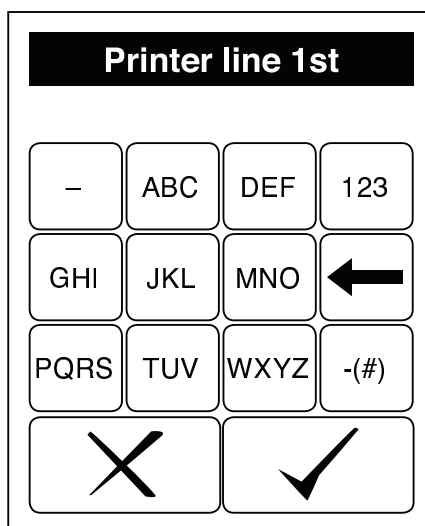
Display 27: Customization

13.11 Reaction time

In the "Reaction time" menu, you can decide whether the instrument will wait for the strips reaction time before starting a measurement. By default, the reaction time is enabled. The reaction time is then shown as a progress bar once the strip is placed on the strip holder.

If you disable the reaction time, the instrument draws the strip into the housing immediately and starts the measurement irrespective of the strip's individual reaction time. Hence, you need to place the strip onto the strip holder as soon as the reaction time has run out. In such a way, you can potentially generate a higher strip throughput.

To activate / deactivate the reaction time, press the respective choice button in the option field and confirm with [✓]. If you press [✗], none of your selections are adopted. The switched off reaction time will be indicated with a hash on the result display and printout.

13.12 Print settings

The last menu item print settings allows you to print an overview over the adjustments made settings. Select the entry using the arrow buttons and press [✓]. The overview is printed automatically.

14. Connecting external devices

The instrument can be connected to a barcode scanner and / or keyboard as well as to a computer. If connected to a computer, the instrument can only send, but not receive data (unidirectional communication).

14.1 Barcode scanner and keyboard

Both barcode scanner and keyboard can be connected via the PS/2 port. Using a barcode scanner or keyboard enables you to enter sample IDs or to make entries in open input fields.

14.2 Computer

You can connect the instrument to a computer using its USB or RS/232 interface *(see 5.2 Interface, p. 61)* To read data from the instrument, you need a current terminal program. For further information regarding connection to computers or laboratory information systems, please contact you distributor or MACHEREY-NAGEL directly *(see 18.5 Contact, p. 95)*.

15. Quality control

The instrument performs a self-calibration whenever it is turned on. Therefore, in general, the instrument does not need to be calibrated. To check instrument performance, we recommend to run multiple standard measurements with known concentrations within the tests range. If such results are not within the test's confidence interval, *(see 13.1.2 Confidence interval, p. 81)* please contact your distributor or MACHEREY-NAGEL directly *(see 18.5 Contact, p. 95)*. For additional quality control assessments, you can also use the instrument's check mode and special control strips *(see 12. Check mode, p. 78)*.

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16. Cleaning and maintenance

To ensure correct functioning of the instrument for a long time, the instrument needs to be cleaned and maintained carefully. Generally, the instrument has to be turned off and disconnected from the power supply, before you start cleaning it.

16.1 Daily cleaning

The test strip slide has to be cleaned every day as to ensure the correct functioning of the instrument.
Carefully remove the transport slide. To do so, pull on the upper black plastic cover. Rinse the slide with clear water, if necessary, you can use some mild cleaning agent as well. To disinfect the slide, you can use alcohol based disinfectants (70–85 % ethanol or isopropanol). After disinfection, rinse the slide with water again. Also clean the metal part of the transport slide. To fit the plastic cover on the metal part again, simply push the plastic cover onto the metal part. You can push the entire slide completely into the housing to ensure a proper fir of metal part and plastic cover.

Note: Do not clean the transport tray in a dish-washer!

16.2 Weekly cleaning

Housing and touch screen should be cleaned at least once a week.
Wipe the housing with a damp cloth. If necessary, you can use a mild cleaning agent. Then, dry the housing with a soft cloth. Make sure that no water penetrates the housing or gets into the printer. To clean the touch screen, use a soft, lint-free cloth. If necessary you can use special LCD cleaning fluid, which is commercially available.

Note: Never use aggressive, organic solvents such as acetone for cleaning the instrument. We recommend isopropanol for cleaning and disinfection.

17. Error messages

If you cannot solve a problem with the instructions in the table, please contact your distributor or MACHEREY-NAGEL directly *(see 18.5 Contact, p. 95)*.
Error messages are displayed as cleartext and are self explanatory.

Error Message	Source	Solution
"Remove strip"	Test strip has not been removed from slide after measurement in the auto start mode	Remove test strip and start new measurement
"Wrong position"	Strip has not been pushed to the far end of the slide	Start a new measurement and push the strip to the end of the slide
"No paper"	There is no paper left or the printer cover is still open	Insert new paper and close printer cover
"Battery empty"	Empty batteries	Change batteries or connect to an outlet.
"Instrument doesn't start"	No power or power connection broken	Check if all connections are correctly set and if the outlet is working.

18. Service

18.1 Spare parts and accessories

Description	REF
Reflectometer QUANTOFIX® Relax suitable for evaluation of QUANTOFIX® test strips incl. power supply, adapter, manual and 1 roll of printer paper	913 46
Case for reflectometer QUANTOFIX® Relax, for individual combination with QUANTOFIX® Relax, 3 rolls of printer paper, 6 QUANTOFIX® tubes, 6 batteries, power supply and accessories	930 889
Printer paper for QUANTOFIX® Relax	930 65
Barcode scanner for QUANTOFIX® Relax	930 74

18.2 Disposal

Disposal according to EU-directive 2002/96/ EG. In accordance with EU-directive 2002/96/EG, MACHEREY-NAGEL takes back old instruments and disposes off them free of charge.

Note: Disposal via public collection systems is prohibited. For disposal, please contact your local MACHEREY-NAGEL partner.

18.3 Warranty

The guarantee period is 24 months. The original commercial invoice serves as the guarantee card and must be presented in case of a claim during the given period. The guarantee is not valid in cases of improper handling and the guarantee does not cover defects caused by the external power supply. The guarantee is limited to repairs of defective parts or, in our sole discretion, replacement with a brand new and defect-free instrument. Any guarantee claims made or alleged do not influence the total guarantee period of 24 months. The right of withdrawal does not exist. Further claims are excluded and these especially include claims for compensation caused by direct or indirect damages. Additionally our current Terms and Conditions for the Sale of Goods as printed on price lists shall apply.

18.4 General usage comments

Only use the instrument as instructed to analyze QUANTOFIX® test strips. Please do not open the instrument or make any other unauthorized modifications. The instrument is a highly sensitive measuring device with high accuracy for the reflectometric evaluation of QUANTOFIX® test strips. During the production process, first all optical components are adjusted with especially designed tools. Subsequently, technical experts calibrate the gauge head. Unauthorized modifications or opening the instrument in an inappropriate way can result in maladjustments of the gauge head, or similar damage, which in turn can lead to wrong results.

Note: Due to the reasons stated above, MACHEREY-NAGEL declines any responsibility for the correct functioning of the instrument if it has been opened or used improperly and objects to any warranty claims made in such a case. MN's warranty and liability obligations as to Product(s) or to any party on account thereof shall be void and of no effect if the Product(s) or any part thereof have been subject to unauthorized change, abuse, misuse, accident or alteration, unauthorized application or installation not in compliance with the Product(s) specifications as set forth in the product leaflets / instructions hereof ("Unauthorized Action") and such Unauthorized Action resulted in the non-conformance or defect of the Product(s).

18.5 Contact

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