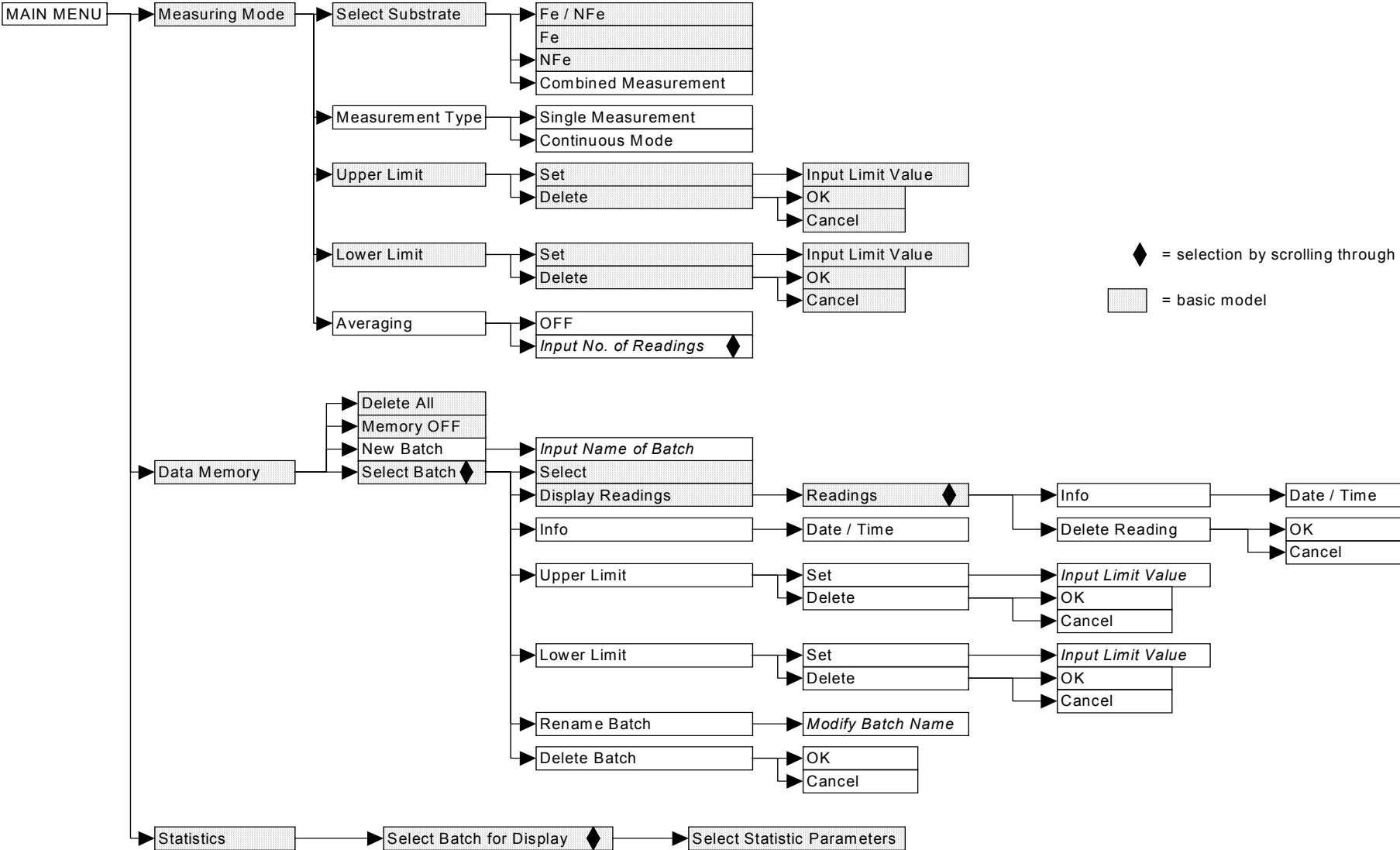
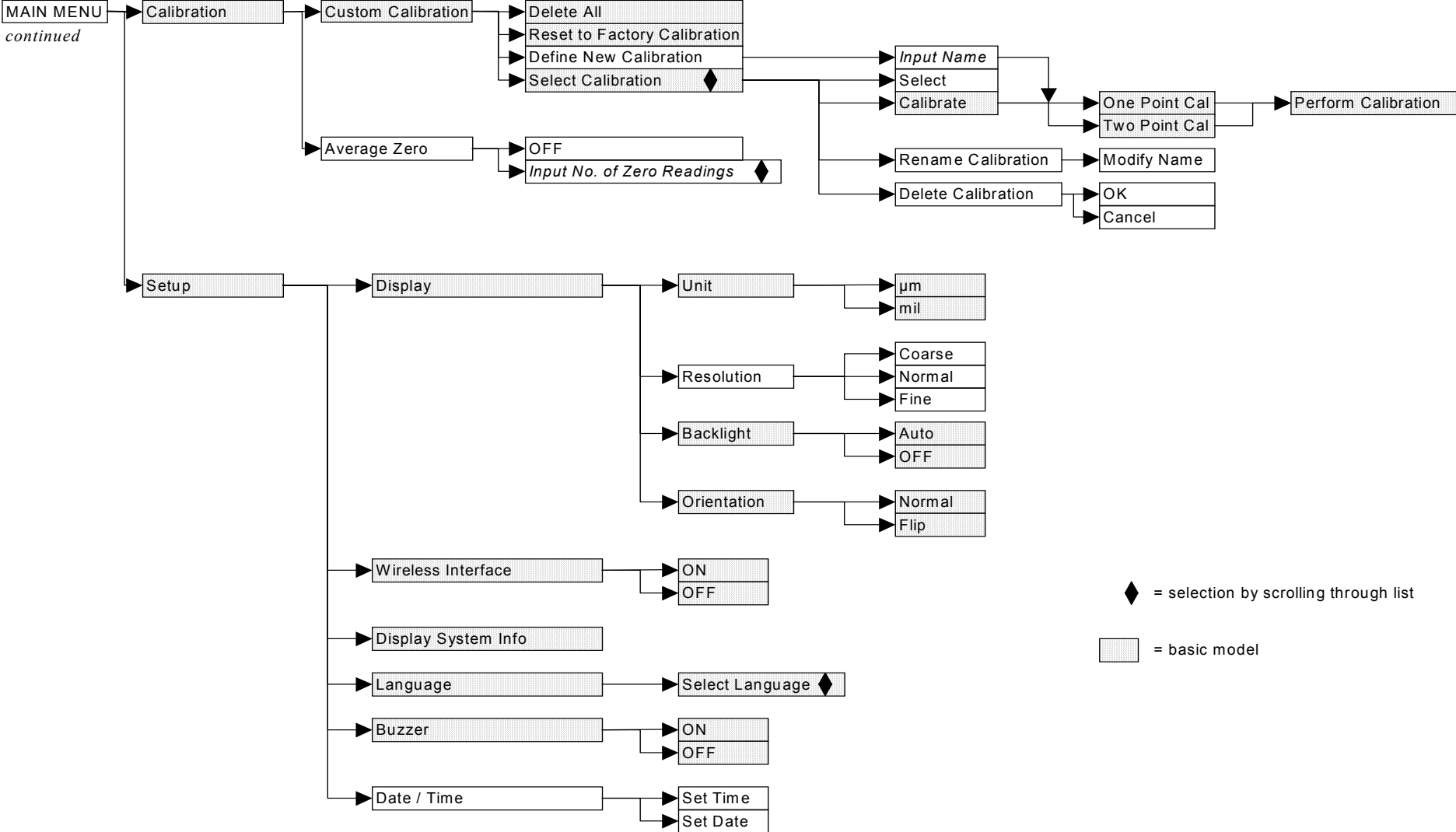


Instruction Manual QuaNix® 8500



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1 General

The gauges of the QuaNix® 8500 family, together with the corresponding probes, constitute a modular system. The handheld gauges and the probes can be arbitrarily combined. The probes can be used integrated in the gauge as well as attached to it via adapter cable. This enables the user to choose the optimum measuring configuration for his application.

The gauge options can not only be set using the simple menu. With the QuaNix®-Software all options can be comfortably preset on the PC and finally downloaded into the gauge.

A wireless interface is used for the data exchange between gauge and PC.

2 Change of Probes


The probes or the housing of the adapter cable lock in when inserted in the gauge. To remove them from the gauge press the button on the rear side of the gauge and pull the probe or the adapter out.


After inserting a probe the gauge displays information about type of probe, serial number and number of software version.


These data can be called anytime by pressing key ▼ when the gauge is in the normal display mode.

3 Power Supply and Change of Batteries

The QuaNix® 8500 gauge is powered by 2 batteries AA (1.5 V) alkaline, or 2 rechargeable batteries AA (1.2 V). Please note that the capacity of the rechargeable batteries is significantly lower.

Step 1:  A change of batteries is advisable. However quite a number of measurements can still be taken. The EL-backlight is still active.

Step 2:  (small symbol) Measurements can still be taken. The EL-backlight is deactivated.

Step 3:  (large symbol in center of display) No more measurements can be taken.

During change of batteries menu settings and all readings in the memory remain stored.

Important: Only setting of date and time can get lost, when the change of batteries takes longer than about 2 minutes.

Note: Empty batteries should be disposed of properly. If possible, please use the special services of your council.

4 Handling

The gauge switches on automatically when the probe is placed on the surface of the object under test. It can also be switched on by one of the keys of the keypad. If the probe is not used for longer than about 30 seconds the gauge switches off again.

Place the probe evenly on the object under test. On bent surfaces use the V-grooves aligned parallel to the axis of curvature to insure that the probe is vertically placed to the surface.

An error message will be displayed when the probe is placed incorrectly. For measurements beyond the measuring range the gauge will display "Infi".

Do not take measurements on magnetized parts. Magnetic fields can influence the results. Also electro-magnetic fields can influence the NFe-measurements.

5 Setting of Zero Reference

When using the probe for the first time, after a battery exchange, with varying applications, or after a long period the probe was not used, it is necessary to take a zero reference.

Press the ▲- key. Then place the probe on one of the reference plates in the case or on an appropriate uncoated Fe- or NFe-substrate. A control number is shown in the display. Then lift the probe off by minimum 5 cm (2"). After a second control number appears shortly in the display, it switches to 0.0µm (mil). The control numbers are not of importance for the user. The process of zero adjustment is completed now.

Note: The zero reference can also be set by placing the probe first and then pressing the ▲- key.

Regarding zero adjustment on rough surfaces see § 7.1.2.

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6 Measuring Mode

The gauge offers different options to select the measuring mode.

Setting of the measuring mode can be done following the normal menu sequence (see § 7.2.1). **The setting can also be accessed directly using the key ◀ when the menu is not activated.**

Fe or NFe-Mode: For those applications with clearly defined type of substrate the measuring mode can be fixed to Fe or NFe respectively.

Fe / NFe-Mode: For applications with varying substrates (Fe- and NFe-substrates) the Fe/NFe-mode should be set.

For example if the substrate changes from steel to aluminum and the probe is placed on the new surface for the first time, the gauge displays the message "No Fe-substrate – repeat". When the probe is placed again the new measurement is taken with the NFe-mode.

The procedure is accordingly when changing from a non-ferrous to a ferrous substrate.

When being switched on the gauge starts with the measuring mode, which was used before switch off.

Combined Mode: This mode can be used when for example an object made from steel is galvanized with zinc and then painted. The gauge displays the thickness of the zinc coating and the paint separately.

IMPORTANT: In the combined mode the NFE-substrate must have a minimum thickness of 50 µm (2 mil) in order to give correct readings.

7 Menu

The Structure of the menu is shown on the first two pages of the instruction manual. It contains all possible options. Depending on the version of the gauge only part of these options is available. However the procedures to handle the available options remains the same.

Function of the keys in the menu mode:

- ▶ Activation of the menu, call of the next menu level, selection of the menu item
- ◀ Backspace, cancellation of a function
- ▲ , ▼ scrolling through the list within a menu level

The current menu item is indicated by a dark background.

- mark of activated menu item

The menu mode is left after a short actuation of the probe tip. The gauge returns to the normal display mode.

7.1 Calibration

The probe is supplied with a factory calibration, which provides correct readings for most of the applications. This calibration is stored in the probe and can not be changed by the user.

Special calibrations can be set for those applications where the readings are not within specified tolerance or a higher accuracy within a certain range is required.

Depending on the gauge version, up to 100 special calibrations can be set and stored. Each calibration can be individually named.

7.1.1 User-Specific Calibration

7.1.1.1 Delete All User-Specific Calibrations

When confirming this option by pressing key ▶ all specific calibrations are deleted.

The probe is reset to the factory calibration.

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7.1.1.2 Factory Calibration

When confirming this option by pressing key ► the probe is reset to the factory calibration. The gauge returns to the normal measuring mode.

7.1.1.3 Creation of a New User-Specific Calibration

When activating the option "New Calibration" the number of the new calibration is displayed, e.g.

>C 004 <

The cursor highlights the first sign. This number can be selected by holding key ► until the cursor moves to "OK". After confirmation by pressing key ► the new calibration can be defined as described in § 7.1.1.5.2.

The number can be modified to an individual name with up to 8 alphanumeric signs. This modification can be done when the new number is displayed. Each position can be adjusted with the keys ▲ and ▼ until the desired sign appears. The sign is confirmed by pressing key ►. The cursor moves on to the next position.

A correction of previously set signs can be done anytime by pressing the backspace key ◀.

7.1.1.4 Selection of User-Specific Calibration

On this menu level all specific calibrations are listed below the option "New Calibration". To scroll through the list use the keys ▲ and ▼. By pressing key ► the corresponding menu is opened. The activated calibration is marked by a dot right to the name.

7.1.1.4.1 Activation of User-Specific Calibration

The selected calibration is activated by pressing ►.

A warning is displayed, when this calibration has not yet been performed. In this case the menu moves on to the list from which one of the two calibration procedures can be selected (see following §§).

7.1.1.4.2 Calibration

Prior to performing a calibration it is recommended to set the zero reference on the corresponding uncoated substrate.

Two types of calibration are available:

7.1.1.4.2.1 One-Point-Calibration

With a one-point calibration the accuracy of the probe can be optimized in the vicinity of an expected coating thickness.

To do so a test shim with a thickness of about the same as the expected coating thickness is placed on the uncoated substrate. Then the probe is placed on the shim. The displayed reading can be adjusted up or down to the thickness of the shim by pressing ▲ or ▼.

The adjustment of the calibration is confirmed and activated by pressing key ►. The gauge returns to the normal measuring mode.

7.1.1.4.2.2 Two-Point-Calibration

A two-point calibration is used to optimize the probe for a certain range of coating thickness.

As a first step place a test shim with a thickness close to the lower limit of the coating thickness range on the uncoated substrate. Then place the probe on the shim. Adjust the reading to the thickness of the shim using the keys ▲ and ▼ until the reading shows the thickness of the shim. The adjustment is terminated by pressing the key ►.

In a second step place a test shim with a thickness close to the upper limit of the coating thickness range on the uncoated substrate. Then place the probe on the shim. Adjust the reading to the thickness of the shim using the keys ▲ and ▼ until the reading shows the thickness of the shim. The adjustment is terminated by pressing the key ►, and the calibration is activated.

After the second step the gauge returns to the normal measuring mode.

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7.1.1.4.3 Rename User-Specific Calibration

Modification of the name of a calibration is done as described in § 7.1.1.2.

After changing the name the gauge automatically moves back to menu item of § 7.1.1.4.

7.1.1.4.4 Delete User-Specific Calibration

After pressing key ► the display shows "OK" and "Cancel" respectively. When confirming "OK" the user-specific calibration is deleted.

7.1.2 Average Zero Reference on Rough Surfaces (BMR)

On rough substrate surfaces the zero readings will vary from one spot to the next. This variation increases with increasing roughness.

This option allows the user to find an average zero reference. Select a number of zero readings that need to be taken before the gauge calculates the average zero (Base Metal Reading / BMR). This value is stored and used to determine the coating thickness on the corresponding coated substrate.

When pressing the key ► in the menu "Average Zero" the options "OFF" and "Value" show up.

The option "OFF" resets the gauge to a single zero reading.

When selecting the option "Value" the number of zero readings for the BMR calculation can be set using the keys ▲ and ▼. The number is confirmed by pressing key ►.

7.2 Measuring Mode

7.2.1 Selection of Substrate

In addition to the normal Fe- and NFe-mode the gauge provides a combination mode. In this mode both measurements, Fe and NFe, are taken at the same time.

This combined measurement can be helpful when a metal coating (e.g. zinc, chromium) on a ferrous substrate is coated e.g. by lacquer.

Important: The non-ferrous metal coating must have a minimum thickness of 50 µm (2 mil).

7.2.2 Single Measurement / Continuous Measurement

Beside the single mode the gauge can also be set to a continuous mode. In the continuous mode the gauge performs repeated measurements in short intervals as long the probe is placed on the surface.

The continuous mode is indicated by the symbol ○.

7.2.3 Upper Limit

7.2.3.1 Setting of Upper Limit

After pressing key ► the last reading is displayed, if no limit was set before. Otherwise the current value is displayed.

The upper limit is set by pressing ▲ or ▼ and confirmed with ►.

A reading exceeding the upper limit is indicated by the symbol ▲ and an acoustical signal.

7.2.3.2 Delete Upper Limit

After pressing key ► the options "OK" and "CANCEL" appear on the display. With the confirmation of the selection "OK" the upper limit is deleted. When selecting "CANCEL" the limit remains unchanged.

7.2.4 Lower Limit

Selection and deleting of the lower limit is performed in the same way as described in § 7.2.3.

A reading smaller than the lower limit is indicated by the symbol ▼ and an acoustical signal.

7.2.5 Averaging of Readings

With large variations in coating thickness or to meet the requirements of a test standard the gauge can be programmed to calculate and display / store an average coating thickness from a predefined number of measurements.

To activate the averaging the number of measurements must be set in the next menu level by pressing ▲ or ▼. The selected number must be confirmed with ►.

This mode is indicated by the sign \bar{x} .

When measuring in the averaging mode the actual reading is displayed together with a counter for the remaining readings until the average is displayed at normal size.

7.3 Memory Mode

With this option the memory mode is switched on or off. Also configuration and handling of the batches is controlled.

After pressing key ► the cursor moves to the active item of the following menu level:

- "OFF", if the memory mode is switched off or
- the active batch in the memory mode

7.3.1 Delete Entire Memory

The entire memory is deleted when confirming this menu item by pressing key ►.

7.3.2 ON / OFF of Memory Mode

To set the gauge to the memory mode either a new batch must be created or an already existing one must be selected and activated with ►.

By selecting "OFF" the memory mode is switched off.

7.3.3 Creating a New Batch

After pressing key ► the number of the new batch is displayed, e.g.

> B 0005 <

The cursor highlights the first digit.

The number can be accepted by holding the key ► pressed until the cursor moves to "OK". The new batch is confirmed by pressing key ►. It is added to the list and marked as active batch. Then the gauge returns to the normal display mode. Global limits activated before the new batch was created, will also be used in the new batch.

When the number appears the new batch can also be given an individual name with max. 8 digits. Each of the possible digits can be set to an alphanumeric sign using the keys ▲ and ▼. The sign is confirmed by pressing key ►.

Each digit can be modified using the backspace key ◀.

NOTE: When creating a new batch after other batches (e.g. B 0001, B 0002) have been deleted, the new number will be e.g. B 0003. Only after deleting the entire memory the number will restart with B0001.

7.3.4 Selection / Configuration of a Batch

When selecting this menu item with the gauge set to memory mode the cursor marks the active batch.

A new batch can be selected by scrolling with the keys ▲ and ▼.

7.3.4.1 Activation of a Batch

When selecting menu item "SELECT" and then pressing the key ► the selected batch is activated. The gauge returns to the normal display mode.

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7.3.4.2 Display of Readings of a Batch

When confirming the item "Show Readings" the list of readings stored in the batch is displayed. Scrolling through the list is done with the keys ▲ and ▼.

7.3.4.2.1 Information About a Reading

Information about date and time when a highlighted reading was taken can be viewed via the following menu "INFO".

7.3.4.2.2 Delete a Reading

With this menu item a single reading in the batch can be deleted.

7.3.4.3 Information About Batch

The item "INFO" returns information about date and time when the batch was created, and how many readings it contains.

7.3.4.4 Limits

Upon starting this function the gauge displays the limits stored with the batch. If no limits are set in the batch, the gauge displays the last reading.

Upper and lower limits can be set for each batch individually using the same procedure as described in §§ 7.2.3 and 7.2.4.

The modified limits are used in the active batch instead of the global limits.

7.3.4.5 Rename a Batch

Renaming a batch is done in the same way as described in § 7.3.3.

7.3.4.6 Delete a Batch

The entire batch can be deleted when calling the delete function and finally confirming the procedure by pressing the key ►.

7.4 Statistics

The gauge calculates the following parameters:

- Average
- Standard deviation
- Maximum
- Minimum

Within the menu for the statistics two display modes are used:

- a) In the memory mode two statistical parameters of the active batch can be displayed. These parameters are updated with each new reading added to the batch.
- b) When calling the statistics of a non-active batch all parameters are displayed.

When entering this menu, the list of all batches is displayed.

7.4.1 Selection of Statistical Parameters of the Active Batch to be Displayed

After selecting the active batch and pressing key ► the list of statistical parameters is displayed. With the keys ▲ and ▼ the individual parameters can be selected and be activated by pressing key ►.

NOTE: As a maximum 2 parameters can be activated to be displayed !

To leave this menu item press the (backspace-) key ◀. For an immediate return to the normal display mode just press the probe tip shortly.

7.4.2 Display of Statistics of not activated Batches

When selecting a non-active batch using keys ▲ and ▼ and confirming the selection with key ► all statistical parameters of this batch are displayed in a popup-window.

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7.5 Gauge-Setup

7.5.1 LC-Display

7.5.1.1 Unit of Readings

The readings can be displayed either in μm or in mil (standard setting: μm).

The unit can be selected by using keys ▲ or ▼. The selection is confirmed by pressing key ►.

7.5.1.2 Resolution

The resolution of the readings can be adapted to the application. E.g. on surfaces with high roughness the resolution should be reduced because of the higher variance of the readings. The resolution can be "coarse", "normal" or "fine".

7.5.1.3 Backlight

In the "AUTO"-mode the backlight is turned on for about 7 seconds when a measurement is taken.

The backlight can be switched off permanently selecting "OFF".

Switching off the backlight extends battery life time.

7.5.1.4 Orientation

Orientation of the display can be adapted to the handling of the gauge.

E.g. when the probe is attached to the gauge via adapter cable and the gauge is put down on a table the display can be flipped by 180° so that reading the display is the same as if the gauge were handheld.

To set the display orientation press key ► to enter the selection. With keys ▲ or ▼ select "Normal" or "Flip" and confirm with key ►.

Note: Functions of the keys ▲ and ▼ respectively ◀ and ▶ are exchanged. This allows the user to operate the keys with the gauge lying on the table as he is used to.

This menu item is left by pressing the (backspace-)key ◀.

7.5.2 Wireless Interface

When the wireless interface is active the gauge can receive commands and inputs from the QuaNix[®]-Software. E.g. the gauge can be programmed for different applications via the interface (see § 8). Also updates of the software of gauge and probes can be loaded through the interface (see § 10).

The active interface is indicated by the symbol Ψ in the upper right corner of the display and a blinking red light on the keypad (also when the gauge is switched off).

When data are sent via the wireless interface the red LED of the keypad is flashing.

The interface can be switched off for power saving when it is not used.

7.5.3 System-Information

The following information is displayed:

- Serial number of the gauge
- Software/Hardware-version of the gauge
- Memory in use (in %)

7.5.4 Language


The gauge can store 3 different languages. As a standard English and German are already stored in the gauge. To download additional languages see § 9.

To change the language, call the list of languages and scroll to the desired language with the keys ▲ or ▼, then press ► to confirm.

7.5.5 Buzzer

The buzzer can be switched on and off.

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With the buzzer in the off mode the display shows the symbol .

7.5.6 Date / Time

The gauge has an internal clock so that with each reading and batch time and date can be stored.

Setting of date and time can be required

- after a change of batteries, lasting longer than about 2 minutes
- after change between winter and summer time
- change of time zone

7.5.6.1 Setting of Time

Setting of time is menu guided in the display. Values are modified by using keys ▲ and ▼. Setting of hour and minutes are confirmed by pressing key ►.

Corrections can be done by stepping back with key ◀.

7.5.6.2 Setting of Date

Setting of the date is done in the same way as that of the time.

8 Setting of the Gauge Options via QuaNix[®]-Software

The settings described in § 6 can also be programmed and downloaded into the gauge using the QuaNix[®]-Software. Especially the input of names for specific calibrations and batches is done in a much easier way with this tool.

The wireless interface dongle must be connected to the PC and the QuaNix[®]-software needs to be started. In the gauge the wireless interface must be activated (see § 7.5.2).

When the software has identified the gauge, all available menu options and their settings are displayed in the software menu "Gauge Settings" or can be downloaded from the gauge by clicking on "Download Settings from the Gauge".

Now all settings of the gauge can be performed on the monitor and be rechecked. When all selections have been done the modified settings will be transferred to the gauge by clicking on "Transfer Settings to Gauge".

9 Download of a New Language into the Gauge

A new language can be downloaded into the gauge using the "LanguageEditor" of the QuaNix[®]-software.

The LanguageEditor provides a table containing the complete set of commands and notes that can be displayed.





10 Update of Software in Gauge and Probes

The software in the gauge and the probes can be updated by the user. As a result of our continuous product improvement updates of the software of gauge and probe are made available to our customers on our homepage www.automation.de.

After downloading the updates to the PC they can be loaded into the gauge or the probe via the wireless interface.

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11 Symbols used in the Display

- Fe measurement on steel or iron substrate
- NFe measurement on non-magnetic substrate
- Error handling error
- Infi measurement beyond range, wrong substrate
- ▲ upper limit exceeded
- ▼ lower limit exceeded
- \bar{x} average
- σ standard deviation
- Ψ wireless interface activated
-  continuous measuring mode
-  Buzzer switched off
-  batteries weak, measurements can still be taken
-  batteries empty

12 Scope of Supply

- Gauge with optional probe
- 2 batteries AA 1,5V (alkaline)
- Instruction manual
- Test certificate for optional probe
- Soft pouch with clip
- Case for transport and storage
- Adapter Cable

Optionally available

- Fe-Probe 2 mm (80 mil)
- Fe-Probe 5 mm (200 mil)
- NFe-Probe 2 mm (80 mil)
- Dual-Probe Fe/NFe 2 mm (80 mil)
- Dual-Probe Fe/NFe 5 mm (200 mil)
- Calibration shims, Zero reference plates, also available as set
- **QuaNix**®-Software for transfer to and evaluation of the data in EXCEL and gauge configuration (*)
- Wireless interface for data transfer between gauge and PC (*) incl. Extension cable for dongle

(*) Already included in the scope of supply of the **QuaNix**® 8500 Premium version

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13 Technical Data

Fe-Probe	Measurements on iron and steel substrate			
NFe-Probe	Measurements on non-magnetic metal substrates, such as aluminum, zinc, copper, brass, stainless steel			
Range	see specification of probes			
Resolution	0.1 μm	0 to 99.9 μm	0.01 mil	0 to 9.99 mil
	1 μm	100 to 999 μm	0.1 mil	10 to 100 mil
	0.01 mm	≥ 1.00 mm	1 mil	> 100 mil
Accuracy	(factory calibration on zero reference plates supplied with the gauge)			
	± (1 μm + 2%*)	0 to 2000 μm		
	± (0.04 mil + 2%*)	0 to 80 mil		
	± 3.5%*	> 2000 μm (80 mil)		
	(* of reading)			
	With the one-point or two-point calibration the accuracy can still be improved using the optionally available test shims.			
Minimum Area	Fe-Probe	10 x 10 mm ² (0.4" x 0.4")		
	NFe-Probe	6 x 6 mm ² (0.24" x 0.24")		
Minimum Curvature	convex	5 mm (0.2")		
	concave	30 mm (1.2")		
Minimum Substrate Thickness	Fe-Probe	0.2 mm (8 mil)		
	NFe-Probe	0.05 mm (2 mil)		
Memory Capacity	<u>Basic</u>	<u>Premium</u>		
Readings	100	up to 13,000 (max. 2000 readings per batch)		
Batches	1	999		
Calibrations	1	100		
Interface	wireless 2.4 GHz, range max. 10 m (30ft) in undisturbed environment			
Temperature Range				
Storage	-10°C to 60°C (14°F to 140°F)			
Operation	0°C to 50°C (32°F to 122°F)			
Power Supply	2 x batteries (AA) 1.5V Alkali, or 2 x rechargeable batteries (AA) 1.2V			
Dimensions	124 mm x 67 mm x 33 mm (4.9" x 2.6" x 1.3")			
Weight	ca. 120 g (4.3 oz) gauge with batteries and probe			