Instruction Manual
QuaNix® Keyless

System Description

The dry film thickness gauge **QuaNix® Keyless** is a combination gauge for a large variety of applications. Optionally it can be supplied with memory and statistic functions.
The **QuaNix® Keyless** consists of the basic gauge and a miniature probe that can be taken out of the basic gauge. The gauge has two special features. First no operating keys are required. Neither a calibration nor a zero adjustment has to be performed by the user. The zero adjustment is automatically done while the probe is taken out of the basic gauge. Second, the readings taken by the miniature probe are transmitted wirelessly to the basic gauge. No troublesome and delicate cables impede the measurements. When the basic gauge, inserted in the pouch, is fixed e.g. to an arm, one-hand operation is possible even under difficult conditions, e.g. on scaffolds or masts.
The Fe-probe measures all non-magnetic coatings such as lacquer, plastic, enamel, powder coating, chromium, copper, zinc etc. on steel or iron.
The NFe-probe measures all insulating coatings such as lacquer, plastic, enamel etc. on metallic substrates, e.g. on aluminum, copper, brass or non-magnetic steel.
Via the RS232-interface, which is standard in all gauges, readings can be transferred online to a PC or to our mini-printer **PT 7**.
In the gauge with memory the readings can be stored and divided into blocks. Up to 4000 readings can be stored. For further processing, our **QuaNix®** -software or the mini-printer **PT 7** is optionally available.
The **QuaNix® Keyless** conforms to national (DIN) and international (ISO,BS, ASTM) standards:

DIN 50981, 50984	ISO 2178, 2360, 2808
BS 5411 (3,11), 3900 (C,5)	ASTM B499, D1400

General

This instrument for a large variety of measuring tasks has been designed with the latest electronics. Despite its precision it is handy and rugged. However do not let it drop and protect it from dirt, dust, humidity, chemicals and aggressive vapors. After use please insert it into the pouch supplied with the instrument.
As with all precision instruments large temperature variations can influence the measuring result. Please avoid direct solar irradiation and temperature shocks.

Due to the physical measuring principles the measurements can be influenced by strong electromagnetic fields. Please stay away from e.g. transformers, high voltage lines or discharge sources. Strong emitters in the frequency band used for the data transmission between miniature probe and basic gauge can jam receiving in the basic gauge.
The housing is resistant against most solvents. Just use a soft damp cloth to clean the housing.
Proper results can only be achieved with clean probes. Please regularly check the probe tips and remove any dirt and paint from the rubies
If the gauge is not used for a longer period, please remove the batteries from the basic gauge in order to prevent leakage that can damage the gauge.
In case of a malfunction of the instrument please do not try to repair it on your own. Our customer service will be happy to be of assistance.

Operating and Change of Batteries

The **QuaNix® Keyless** is powered by two 1,5 Volt AA batteries (Alkali). The battery compartment is on the rear side of the gauge. The battery should be exchanged when the "BAT"-sign appears on the right side of the display. However quite a number of readings can still be taken before the gauge shuts off. In gauges with memory stored data will not be deleted when changing the battery.
The miniature probe is powered by an integrated Lithium battery which is automatically charged when the probe is inserted in the basic gauge. When the probe battery is getting weak the sign "Accu" appears in the display. Also in this case several readings can still be taken. The probe battery needs about 3 hours to be recharged.
Empty batteries should be disposed of properly. If possible, please use the special services of your council.

Handling

To switch on the gauge the miniature probe must be taken out of the basic gauge. To do so please turn the probe by 90 degrees and take it out of the fixture. During this procedure both integrated probes are automatically initialized. Then measurements can be started immediately. The Fe-probe with the blue ring is used to measure on steel or iron substrates; the NFe-probe with the red ring is used for non-magnetic substrates such as aluminum, copper etc.
Place the probe evenly on the object to be measured such that the ring around the probe is in full contact with the surface. The display of the reading is accompanied by a beep. Simultaneously the display shows which probe, Fe or NFe, has been used. The sign "Err" (error) indicates incorrect placement of the probe or lift-off before the measurement is finished. The sign "IΠFI" (infinite) indicates readings beyond the measuring range.

Insertion of the Probe:
The red ring of the miniature probe must be on the *left* side with the red mark of the basic gauge.
Wrong insertion of the miniature probe will damage the gauge.

Special Applications:
In most cases the automatic zero adjustment of the two probes insures correct measuring results. In those few applications where an individual zero adjustment is required please proceed as follows: Place the appropriate probe on a piece of uncoated substrate. After a reading is displayed press the probe which is not used for measuring. A control number is displayed and a beep sounds. Lift off the miniature probe at least 5 cm (2"). Another control number is displayed and a beep sounds again. Now the special zero adjustment is done. Note: The special zero adjustment is replaced by the standard zero when the miniature probe is inserted into the basic gauge and taken out again.

Do not take measurements on magnetized parts. Magnetic fields can affect the Fe-measurements. Strong electromagnetic radiation can affect the NFe-measurements

Online-Measurements

All **QuaNix® Keyless** gauges are equipped with an RS232-interface. This allows the transfer of all readings directly to a PC or our mini-printer **PT 7**. For the online display of the data on the PC monitor, the **QuaNix®** -software can be used to immediately provide a comprehensive statistical evaluation, or standard-editing programs such as HyperTerminal found in Windows-software works as well. The instrument must be connected with the PC or the printer via the interface cable, and it must be switched on. The interface socket is on the right side of the basic gauge. Each reading or each statistical value is immediately sent to the PC or is printed by the mini-printer.

Change of Unit µm/mil

The display of the readings by the **QuaNix® Keyless** is factory set to the unit which is common for the user (generally µm). Changing the unit can be performed with our optionally available **QuaNix®**–software or with the mini printer **PT 7**. Regarding the procedure, please see the instruction manual of the **QuaNix®**-software or the printer respectively.

Scope of Supply

The dry film thickness gauge **QuaNix® Keyless** is delivered with a carrying pouch, 2 batteries AA (1.5 V), and an instruction manual. Optionally the **QuaNix® Keyless** can also be supplied with data memory.

Options

- **QuaNix®** - Software for evaluation of the readings in the PC
- Mini-printer **PT 7**
- RS232-interface cable for connecting the **QuaNix® Keyless** to a PC or the mini-printer **PT 7**

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Data Memory (optional)

The **QuaNix**® **Keyless** can optionally be supplied with data memory, offering the following features:

a) Storage of up to 4000 readings
b) Creation of up to 999 blocks
c) Display of statistics per block
d) Deletion of the last reading or the entire memory
e) Processing of the readings using the **QuaNix**® -software

Memory Mode

Each time the gauge is switched on by the removal of the miniature probe, the **QuaNix**® **Keyless** is in the normal measuring mode. No readings are stored in this mode. The memory mode is activated by pushing the slide on the left side upward for about 1 second. Readings taken in the memory mode are indicated by a double beep. Between two measurements the display shows alternating the last reading and the number of this reading in the memory with a leading "N" (e.g. 256 µm alternating with N 0044 means, the last reading is 256 µm and is stored as 44th reading).
If no readings are stored the display shows alternating "b001" and "bloc". This means all readings are automatically stored in block 1.
To switch back to the normal measuring mode push the slide up again for about 1 second. Note: If the slide is pushed up for more than 3 seconds, a new block is created.
Up to 4000 readings can be stored. When no space is left in the memory the display shows "End" for about 6 seconds. Then the last reading and its number are displayed alternatingly.

Block Segmentation in the Memory Mode

The readings can be stored in different blocks (up to 999) to distinguish between different measuring tasks. A new block can be created by pushing up the slide for about 3 seconds. The display shows "bloc", alternating with the number of the new block (e.g. "b002" for block No. 2) – accompanied by a beep. All new blocks are created following this procedure. The size of the blocks can vary as they are determined by the user only. When 999 blocks are created and a new one shall be set up, the display shows "End" for about 6 seconds and a beep sounds repeatedly.

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Display of Statistics

In the last active block the following statistical values can be displayed: average, maximum, minimum and standard deviation.
The gauge must be switched on and set to the memory mode. The statistical values can be called by pulling down the slide repeatedly.
When pulling down the slide for about 1 second "Ae" (= average), the average value of all readings in the block and the unit (µm, mm or mil) are displayed, alternating with "N" and the number of readings stored in the block (Example: Ae 265 µm alternating with N 0033 means, the average is 265 µm and was calculated from 33 readings).
Each time the slide is pulled again maximum (sign ∩), minimum (sign ∪) and the standard deviation (sign d) is displayed subsequently.
The statistic mode can be left anytime by taking a new reading with the miniature probe.

Deleting Stored Readings or Blocks

Data stored in the **QuaNix**® **Keyless** can be deleted individually or as a whole. The gauge must be in the memory mode. The slide must be pulled down for about 3 seconds. This allows to delete the last value directly, e.g. because it was taken in error and it would falsify the statistics.
When all readings in a block are deleted, the next deleting process will delete the empty block, followed by the display of the last reading of the previous block.
The entire memory content can be deleted by holding the slide pulled down for another 3 seconds after the last reading was deleted. The display shows alternating "dEL" and "ALL", accompanied by a beep. If the slide is not released within the 3 seconds, the entire memory is deleted.
The entire memory can also be deleted using the optionally available **QuaNix**®–software or our mini-printer **PT 7**.

Processing of Stored Readings

For further processing of the readings in a PC we can supply the **QuaNix**® -software. Fast and direct evaluation can also be performed with our mini-printer **PT 7**.
For further information regarding data evaluation please refer to the instruction manuals of the software or the mini-printer respectively.

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Technical Data

Substrate		
Steel and iron		Fe-probe
Non-magnetic metals, e.g. aluminum, copper, brass		NFe-probe
Measuring Range	standard	0 – 2000 µm (0 – 80 mil)
	optional	0 – 5000 µm (0 – 200 mil)
Display of Readings		from 0 – 999 in µm from 1.00 in mm
	resp.	0.00 – 80 (200) in mil
Accuracy	standard	± (1.5µm+2%*) for 0–2000 µm
	optional	± (1.5µm+2%*) for 0–999 µm ± 3.5%* for 1.00 – 5.00 mm (* of reading)
Minimum Object Size		10 x 10 mm (0.4" x 0.4")
Minimum Curvature		5 mm (0.2") convex 25 mm (1") concave
Minimum Substrate Thickness		Fe: 0,2 mm (0.04") NFe: 0,05 mm (0.002")
Temperature Range	Storage	-10°C to 60°C (14°F to 140°F)
	Operation	0°C to 60°C (32°F to 140°F)
Display		Digital (LCD)
Interface		RS232
Probes		One-point, integrated
Power Supply Basic Gauge		2 x 1.5 V Battery AA (alkaline)
Power Supply Miniature Probe		Li-Akku, recharged by basic gauge
Capacity of Miniature Probe		ca. 4000 measurements
Frequency Band		868 MHz (USA/Japan 315 MHz)
Transmission Range		max. 20 m (60 ft)
Dimensions		110 x 64 x 23 mm (4.3" x 2.5" x 0.9")
Weight		ca. 130 g (4.6 oz) incl. batteries
Memory Capacity (optional)		4000 readings
Blocks (optional)		up to 999
Statistics (optional)		average, maximum, minimum, standard deviation

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Display Messages

1.	Fe	=	for measurements on steel and iron substrates
2.	NFe	=	for measurements on non-Fe substrates
3.	Err	=	incorrect handling
4.	IIIFI	=	wrong substrate or reading beyond measuring range
5.	BAT	=	batteries in basic gauge getting weak, please exchange
6.	Accu	=	battery in the miniature probe getting weak, please insert in basic gauge for recharging
7.	bloc	=	displayed alternating with the number of the new block
8.	End	=	memory or block capacity out of space
9.	Ae	=	average value of the readings in the active block
10.	a) N	=	total number of readings in the memory
	b) (Ae)N	=	number of readings in the active block
11.	no	=	no readings in the active block, average can not be calculated
12.	∩	=	maximum reading in active block
13.	∪	=	minimum reading in active block
14.	d	=	standard deviation of average value in active block

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