



AUTOMATION Dr. NIX
GmbH & Co. KG

Instruction Manual

Coating Thickness Gauge

Q NIX[®] 1500
QUALITY BY EXCELLENCE

Optionally with Memory

Introduction

The **QNix® 1500** is a part of the product line of non-destructive coating thickness measurement gauges manufactured by **Automation Dr. Nix GmbH & Co. KG** in Köln, Germany.

Designed for the future, this gauge is characterized by its many applications and wide measuring range of up to 5 mm. It is also characterized by its robust construction as well as by other advantages already known from our other gauges. An ON/OFF switch is not necessary, no time-consuming calibration routines are required, and exchange of probes is not necessary.

The special design of this gauge facilitates measurements in hard-to-reach corners, even more so because of the duplex display and the memory for the last measured value.

Please read these instructions carefully before operating the gauge for the first time. It will help you to make use of all the advantages and conveniences this gauge offers.

Would you like information on the other gauges in our coating thickness measurement line or do you have any questions concerning coating thickness measurement? Please do not hesitate to contact us. Our specialists with their long-standing experience will be happy to assist you.

System Description

The **QNix® 1500** is a combination coating thickness gauge, optionally available with memory and interface RS 232. Two non-wearing probes, Fe-probe and NFe-probe have been integrated in the housing.

The Fe-probe measures all non-magnetic coatings such as lacquer, plastic, enamel, chromium, copper, zinc, etc. on steel or iron. The NFe-probe measures all insulating coatings such as lacquer, plastic, enamel, etc. on non-magnetic, metallic substrates, i.e. aluminum, copper, brass or stainless steel. This compact design without cables and plugs allows for easy and comfortable one-hand operation thus increasing the working safety under rough conditions.

The **QNix® 1500** with memory can store the measurements taken and even subdivide them into blocks. All in all, up to

3900 values can be stored and statistically evaluated. Optionally, a special software for statistical evaluation can be supplied.

The **Qnix® 1500** complies with national (DIN) and international (ISO, BS, ASTM) standards and regulations: DIN 50981, 50984; ISO 2178, 2360, 2808; BS 5411(3, 11), 3900 (c, 5); ASTM B499, D1400, D7091

Maintenance and Handling

This gauge incorporates the latest electronic technology in order to fulfill different measuring tasks. This high precision instrument covers a wide range of applications, yet it is robust and easy-to use in every-day practice. If operated and treated with care, it will serve you many years.

Do not let it drop and protect it from dirt, dust and other substances. After use, the gauge should be stored in its protective carrying case.

Substantial changes in temperature can influence the readings, as it is the case with all precision gauges. Do not expose the gauge to strong, direct sunlight or to other sources of energy causing temperature shocks.

Protect the gauge from moisture, chemically aggressive substances and/or gases.

The casing is resistant against most solvents. However, a resistancy against all chemical substances cannot be guaranteed. Use only a damp, soft cloth to clean the casing.

Accurate readings can only be obtained, if the measuring probes are clean. Check the probes regularly and remove existing residues such as lacquer etc. from the ruby probe tip.

If the gauge will not be used for a long period, remove the battery in order to prevent leakage and therefore destruction of the gauge.

In case of a malfunction, please do not try to repair the gauge yourself. Our repair service will be glad to help at any time.

Measuring Range

0 – 5000 µm or 0 – 200 mil in one measuring range

Gauges without memory can be switched from µm to mil by operating the two switches on the sides of the instrument.

While there is a value visible on the display, push both slides simultaneously forward and hold for more than one second. The reading will change to the other dimension.

Gauges with memory can be switched from μm to mil using the optionally available software.

Resolution

0.1 μm in the range of 0.0 – 99.9 μm
1 μm in the range of 100 – 999 μm
0.01 mm in the range of 1.00 – 5.00 mm

Or

0.01 mil in the range of 0.00 – 9.99 mil
0.1 mil in the range of 10.0 – 99.9 mil
1 mil in the range of 100 – 200 mil

Temperature Range

0 °C - 50 °C or 32 °F - 122 °F

Operating and Changing of Battery

The gauge is powered by a 9V alkaline battery. The battery is located at the wide end of the gauge. If the blinking sign "BAT" appears on the display, it is advisable to change the battery, but it is still possible to measure for some time. Memorized data will remain stored, even while changing batteries.

Empty batteries should be disposed separately. If possible, use the special services provided by your council.

Adjustment and User Information

A new zero-adjustment is required when using the gauge for the first time, working with different materials, after inserting a new battery, or from time to time.

Place the respective probe of the **QNix® 1500** on one of the zero plates enclosed in the case. For measurements on ferrous substrates use the steel zero plate, for non-ferrous applications the aluminum plate or a respective uncoated substrate.

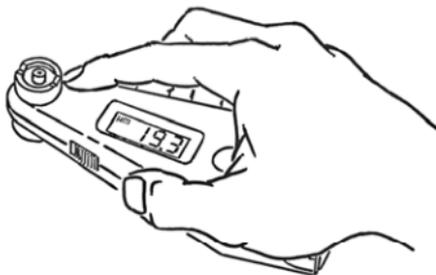
Hold the gauge according to the drawing and slightly press the probe onto the surface so that the ring around the probe is evenly placed. If the value indicated on the zero plate or on your uncoated substrate is not within the basic tolerance, the gauge should be adjusted (gauges with a memory must not be in the Memory Mode). Push one of the slides at the sides of the gauge while the probe is placed firmly on the substrate, i.e. the zero plate. You will hear a "Beep" and a control number will appear on the display. Lift the gauge at least 25 mm or one inch from the zero plate. The gauge will "beep" again and another number will be displayed. The **QNix® 1500** is adjusted now.

When repeating measurements on the same spot, the measured value may not always be 0.00, due to surface roughness, dirt, scratches etc.

The gauge is delivered with two protective rings around the probe for better positioning and protection. These rings can easily be removed by slightly turning and pulling. On concave surfaces remove the protective rings in order to achieve accurate measurements.

Measurement

Place the **QNix® 1500** with its ring around the probe plane on the object to be measured (see drawing). For measurements on steel or iron, the Fe-sticker should face you. For measurements on



non-magnetic metallic substrates such as aluminum you should be able to see the NFe-sticker.

Do not place your finger on the upper probe, otherwise the readings will not be correct. Take care that the circular probe ring is placed evenly on the surface. On even objects, the two rear supporting points will help to position the gauge. The

measured value is immediately indicated on the display accompanied by a "Beep".

The display shows "ERR" (error) if the **QNix® 1500** is placed incorrectly and "INFI" (infinite) if the measurement is out of range. The same will be displayed, if measurements on non-metallic substrates are taken. The gauge turns on automatically and shuts off after approx. 10 sec., if it is not used.

When measuring on rod materials remove the red ring and align the "V"-groove in the ring of the probe with the rod.

Do not take measurements on magnets. Magnetic fields are likely to influence the readings with the Fe-probe. Strong electromagnetic fields may influence all measurements.

Memorizing Measured Values

Optionally, the **QNix® 1500** can be delivered with a built-in memory and an interface RS 232C, offering the following features:

- a) Memory for up to 3900 values
- b) Block segmentation up to 999 blocks
 - Block No. 1 Indication b001
 - Block No. 2 Indication b002 as up to
 - Block No. 999 Indication b999
- c) Display of the calculatory average value in each block
- d) Display of the maximum value in each block
- e) Display of the minimum value in each block
- f) Deleting the last measured value and the entire memory
- g) Processing the measured values using interface and software

Memory Mode (optional)

To work in the Memory Mode, the gauge has to be switched on (take any measurement). Push both slides on the sides of the gauge simultaneously and hold them for approx. 1 second. Let the slides go. The display will show "bloc" alternating with "b001". The gauge is now in the **Memory Mode** and all following measurements will be stored in Block 1. Measurements in the **Memory Mode** will be accompanied by

a double "Beep" and the value will be displayed. After approx. 1 second, the display changes and gives you the number of the measurements just taken. Both readings will be displayed alternately, e.g. the display will show N 14 (number of measurement) and 124 μm (last measured value).

To leave the **Memory Mode**, push both slides simultaneously and very shortly.

Do not hold.

The built-in memory can store up to 3900 measurements. In case the memory capacity is limited, the display will show "END" for approx. 6 seconds. After this, you will see the last measured value alternating with the number of this measurement.

If no measurements are taken within 30 seconds, the gauge will switch off. The gauge will automatically return to **Normal Mode** when started again.

Block Segmentation within the Memory Mode

It is possible to store the measuring values in different blocks, in order to distinguish the different tasks. To set up a new block, e.g. Block 2, push both slides simultaneously forward and hold them until you see the display changing. Let the slides go. Accompanied by a "Beep", the display will show "bloc" alternating with b002. Now you have created a new block and all following measurements will be stored in Block 2. Other blocks can be created using the same procedure.

The sizes of the blocks may vary as they are determined by the user only. Within the total capacity of the memory up to 999 blocks can be built. If the memory runs out of space, the information "End" will be shown.

Display of Mean, Maximum and Minimum Values

Additionally, the gauge can display the mean, maximum and minimum value of the measurements taken in the presently used block, if the gauge is switched on and working in the **Memory Mode**. Push one of the slides for approx. 1 second

and let it go. Immediately, you will see the letters "AE" for "Average" and a number giving you the number of all measurements in the respective block. This information is followed by the display of "µm" or "mil" and the value itself, representing the average or mean value of all measurements taken in the present block. For example, "AE 22" alternating with "139 µm" means, that in the active block 22 measurements have been taken and stored and that the average value is 139 µm.

In order to see the maximum value of the active block, again push one of the slides forward. The display will show \sqcap and the maximum value. Pushing one of the slides forward again you will receive the minimum value \sqcup of the active block. In order to leave this mode push one of the slides forward again or take a measurement.

In case no measurements have been taken in the active block, it is not possible to get any statistical value. The display will then read "AE". Then the gauge automatically returns to the memory mode.

Deleting Measured Values

While operating in the **Memory Mode**, the **QNix® 1500** offers the possibility to delete the last reading on the display and in the memory as well as the entire memory. To achieve this, push one of the slides for longer than 3seconds. The last reading will be deleted. If the slide is held further on the display shows "dEL" and "ALL" (alternating) for 3 seconds and a "Beep" sounds. If the slide is not released within these 3 seconds the entire memory will be deleted.

In case all values in a block are already deleted, the next deleting process will eliminate the block itself, and the last measurement in the previous block will be displayed.

The entire memory can also be deleted by use of our optionally available software.

Processing of Memorized Values

The built-in interface RS 232 allows transfer of the data to a PC to process the measured data statistically. The respective plug is mounted on one side of the gauge. A software for

statistical evaluation on your PC is optionally available.
For further information concerning "Data Processing" please refer to the software.

Possible Display Information

1. Fe = Measurement on steel or iron substrates
2. NFe = Measurement on non-ferrous metallic substrates
3. ERR = Incorrect handling
4. INFI = Incorrect substrate, e.g. measuring beyond the measuring range or measuring on wood
5. BAT = Battery is getting weak, please exchange.
Information: the measured values will remain stored.
6. bloc = Displayed alternating with the block number
7. End = Memory or block capacity out of space
8. N = a) alternating with Fe or NFe
= number of measurements
b) alternating with Ae
= number of measurements of the active block
9. Ae = Average value measured in the active block
- 10.∩ = Maximum value measured in the active block
- 11.∪ = Minimum value measured in the active block

Accessories

The electronic coating thickness gauge **QNix® 1500** is delivered with a carrying case containing Fe and NFe zero plates, a 9 V alkaline battery, two probe protection rings and Instruction Manual.

Technical Data

Substrate	Fe: steel or iron NFe: non-ferrous metallic substrates as aluminum, zinc, copper, brass, stainless steel
Measuring Range	0.0 – 5000 μm or 0.00 – 200 mil convertible by slide or by software
Display of Values	from 0.0 – 999 in μm from 1.00 – 5.00 in mm or from 0.00 – 200 in mil
Resolution	0.1 μm in the range of 0.0 – 99.9 μm 1 μm in the range of 100 – 999 μm 0.01 mm in the range of 1.00 – 5.00 mm or 0.01 mil in the range of 0.00 – 9.99 mil 0.1 mil in the range of 10.0 – 99.9 mil 1 mil in the range of 100 – 200 mil
Repetitive accuracy	$\pm (1 \mu\text{m} + 2\%$ of reading) in the range of 0 – 999 μm $+ 3.5\%$ of reading in the range of 1000 – 5000 μm
Minimum object size	10 x 10 mm ² or 0.4" x 0.4"
Minimum curvature	5 mm convex or 0.2" 25 mm concave or 1.0"
Minimum substrate thickness	Fe: 0.2 mm or 8 mil NFe: 0.05 mm or 2 mil
Temperature range	storage $-10^{\circ}\text{C} - 60^{\circ}\text{C}$ ($14^{\circ}\text{F} - 140^{\circ}\text{F}$) operating $0^{\circ}\text{C} - 50^{\circ}\text{C}$ ($32^{\circ}\text{F} - 132^{\circ}\text{F}$)
Display	Digital (LCD)
Probes	One-point, integrated
Power supply	9 Volt E block alkaline
Dimensions	166 mm x 64 mm x 34 mm incl. probes (6.5" x 2.5" x 1.3")
Weight	130 g (4.6 oz) incl. battery
Optional:	Memory capacity up to 3900 values Blocks up to 999 Interface RS 232



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03/09