Manual

TOP-CHECK Dual, Ferro, FE, FE-B, FN, FN-B

OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK DUAL

Revision number 326.0 and up

2023-06

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QM-System ISO 9001:2015 zertifiziert

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TOP-CHECK DUAL (2023-06)

1 INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK Dual has a combined probe that measures insulating layers of paint, varnish, plastic, rubber, ceramics and galvanic coatings (except nickel) in a magnet-inductive measuring method. The device is used on iron and steel subsoil. It is also suitable for measuring insulating layers, according to the eddy current method, on non-ferrous metals such as aluminum, brass, copper, bronze and non-magnetic stainless steels, according to ISO 2178 and ISO 2360. It supplements these services by data logger and Bluetooth interface.

To easily manage and send your measurement data with TOP-CHECK Ferro and TOP-CHECK Dual, you can use the free Mobile App for Android and the free transfer TOP-CHECK TRANSFER software for PC.

2 QUICK START GUIDE

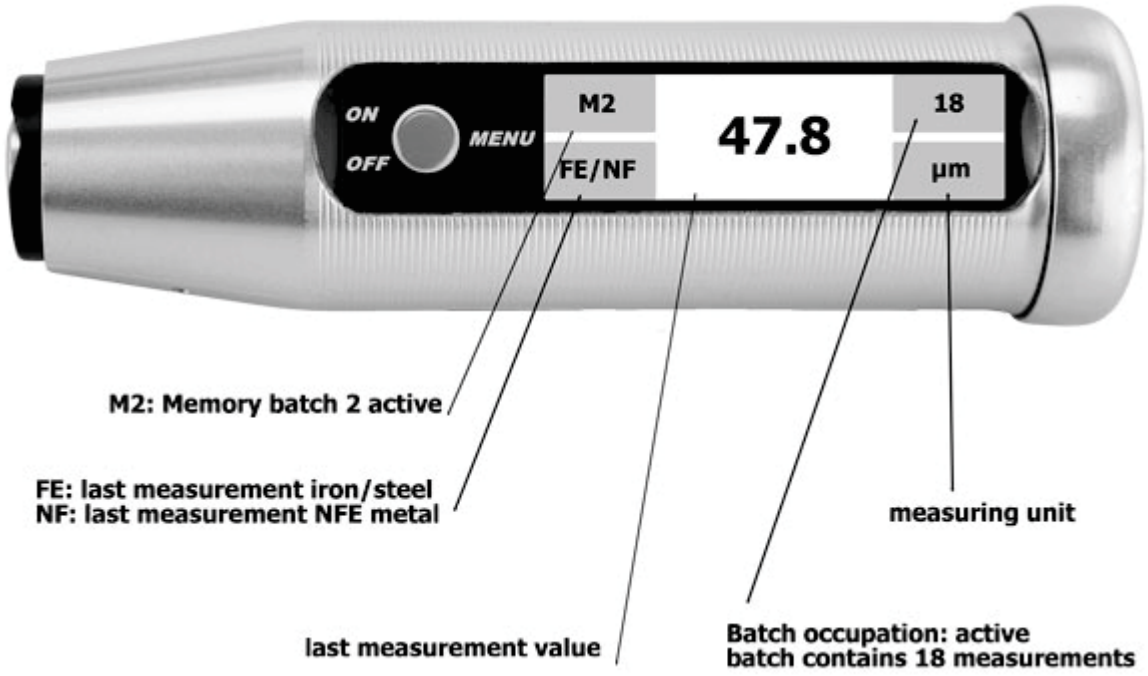
The device is calibrated ex works and can be used immediately on flat steel and aluminum. For special geometries and materials, please perform a calibration.

Switch on: Press the red key for a long time, the display shows **Ready** and then the display of the last measured value

Measurement: Place devices with measuring probe on the object to be measured and wait until a signal tone confirms the measurement. (Measurement on FE metals - 1x signal tone , Measurement on NFE metals - 2x signal tone).

Switch off: Press red key until display goes dark

3 MEASUREMENT DISPLAY



The measurement display shows the last measured value and its measuring unit at a glance. At the bottom left, it indicates whether the measurement was taken on iron/steel (FE = ferromagnetic, FE metal) or on non-ferromagnetic metal (NF = NFE metal).
In addition, the memory used and its current occupancy with measured values are displayed at the top left and top right.

4 OPERATING THE DEVICE WITH THE RED BUTTON

Press the key briefly to scroll through the menu functions, press and hold the key (with signal tone) to activate the desired menu function.
The menu functions can only be called up if the measuring probe is not placed on an object.

At the end of each submenu there is a display **< back** that allows you to exit the submenu and return to the next higher level.

After 10 seconds of inactivity without pressing any key, the device always returns to the measurement display.

In the delivery state, English is preselected as the language.

In the middle of this manual you will find a clear representation of the menu.

5 MENU FUNCTIONS

5.1 SWITCH OFF

Press the key for a long time (long signal tone) to switch off the device manually.

The automatic switch-off time can be changed under the menu item **Settings**.

5.2 CALIBRATION

When measuring on flat material, it is best to calibrate the instrument on the calibration plates in the instrument case. **Calibration must be performed separately on both calibration base plates (FE and NFE).**

If you have to measure on materials **other than flat steel or aluminum**, please perform the calibration according to ISO 2178 on an uncoated original part instead of on the calibration base plate. This applies in particular to curvatures, round material or special alloys.

5.2.1 -0- CALIBRATION

In the off-hook state, select **-0- Calibrate** in the menu, **-0- touch down** appears.

Then place the instrument with the measuring probe in the **center** on the bare FE / NFE calibration base plate and wait until **-0- lift up** is displayed and confirmed by one (FE) or two (NFE) signal tones.

5.2.2 FOIL CALIBRATION

The foil calibration is the second calibration step for the accurate calibration of the instrument (so-called two-point calibration).

Place the calibration foil of approx. 300 µm on the bare FE / NFE calibration base plate.

Select **Foil Calibration** in the lifted state, the display shows **Foil 300 touch down** (or the set foil value), then place the instrument with the measuring probe in the **center** on the measuring foil and wait until **Foil 300 lift up** is displayed and confirmed by one signal tone on FE or two signal tones on NFE.

If possible, the **calibration foil with the higher value (approx. 300 µm)** should always be used for calibration in order to maintain the specified accuracy of the instrument over the **entire measuring range**.

The calibration for **FE measurements is performed on the blue FE** calibration base plate, the calibration for **NFE measurements is performed on the red** NFE calibration base plate, or you use an uncoated original part of the same geometry.

In addition, calibration can be performed with the 1 mm ceramic plate available as an option to achieve even greater accuracy for measurements in the higher measuring range (from 2 mm upwards).

5.2.3 FOIL ADJUST

The calibration foil supplied is approx. 300 µm thick. The exact value is written on the foil. When the device is delivered, the value is set to the supplied foil. If you replace the foil, this value must be adjusted to the new foil in the device.

Entry: Press long to enter the function.

First step: the bar is under **OK**. Now press briefly until the bar is under a field that you want to change.

Second step: the bar is under a number. Now press and hold, the number starts to flash. Now press briefly until the desired value is reached. Then press and hold again to accept the new value. The bar moves under the next field.

With a last long press at **OK** you will leave the foil adjustment.

5.3 MEMORY

The storage of the measured values is switched on when either a new memory batch is created or an existing one is activated.

A maximum of 9 memory batches are possible, which can be filled almost arbitrarily (approx. 4000 measured values). If the total possible memory space is exceeded, a warning message is issued that no more values can be stored.

To indicate that the memory is switched on, the symbol **M** appears at the top left of the measurement display followed by the number of the active memory batch, for example **M2** for memory batch number 2.

Switching the device off and on does not change the setting, the status of whether and which memory batch is active, is retained.

With the **Disable Mem** function, you can switch off the storage again.

Under the word **Memory** the number of currently available memory batches is displayed - here: 2 memory batches are created.

5.3.1 DELETE LAST VALUE

Deleting the last stored measurement value:

Example: You have performed an incorrect measurement and want to remove it from your measurement series immediately.

The function can be repeated and then deletes the second to last value, the third to last value and so on.
Deletion is only possible for values of the current memory batch (here: batch 2).

5.3.2 DISABLE MEMORY

With the **Disable memory** function, you can explicitly switch off the storing of measurement values.

The memory function is then automatically switched on again when either a new memory is created or an existing one is activated.

5.3.3 MEMORY BATCH M1 / M2 / M3 ETC.

The created memory batches are listed one after the other in the menu.

The number of the batch (here: batch number 2) and the number of the values contained in it (here: 15) are displayed in the bottom line in a slightly smaller size.

To view and manage the memory batch in detail, press the red button long.

To jump to the next memory batch, press the red button briefly.

5.3.3.1 Activate

With activation, all measurements are written to this memory batch from now on. All other batches remain unchanged.

This memory batch is active until the storage is generally terminated (disable memory), another batch is activated, or the batch is deleted.

5.3.3.2 Statistics

The display of the statistics shows successively by keystroke these values in the selected batch:

Count	– number of stored measurement values *
Minimum	– smallest stored measurement value
Maximum	– biggest stored measurement value
Mean	– average value
Std.Dev	– standard deviation (corrected sample variance)

* A displayed **Count 15 (13)** means that there are two crossed-out but not yet optimized (and so finally deleted) values in the batch. Only the 13 values that are active are taken into account in the statistics (see chapter: Optimze).

5.3.3.3 Browse

In the browse function, all measurement values of the batch are displayed.
Always 2 values are displayed and by pressing the key it is scrolled by one value. The upper line is marked with a triangle on the left.

This measurement value marked with the triangle can be deleted by a long keystroke. It is then displayed crossed out. A crossed-out / inactive value is no longer included in the statistics and is no longer transferred to the PC or mobile app.

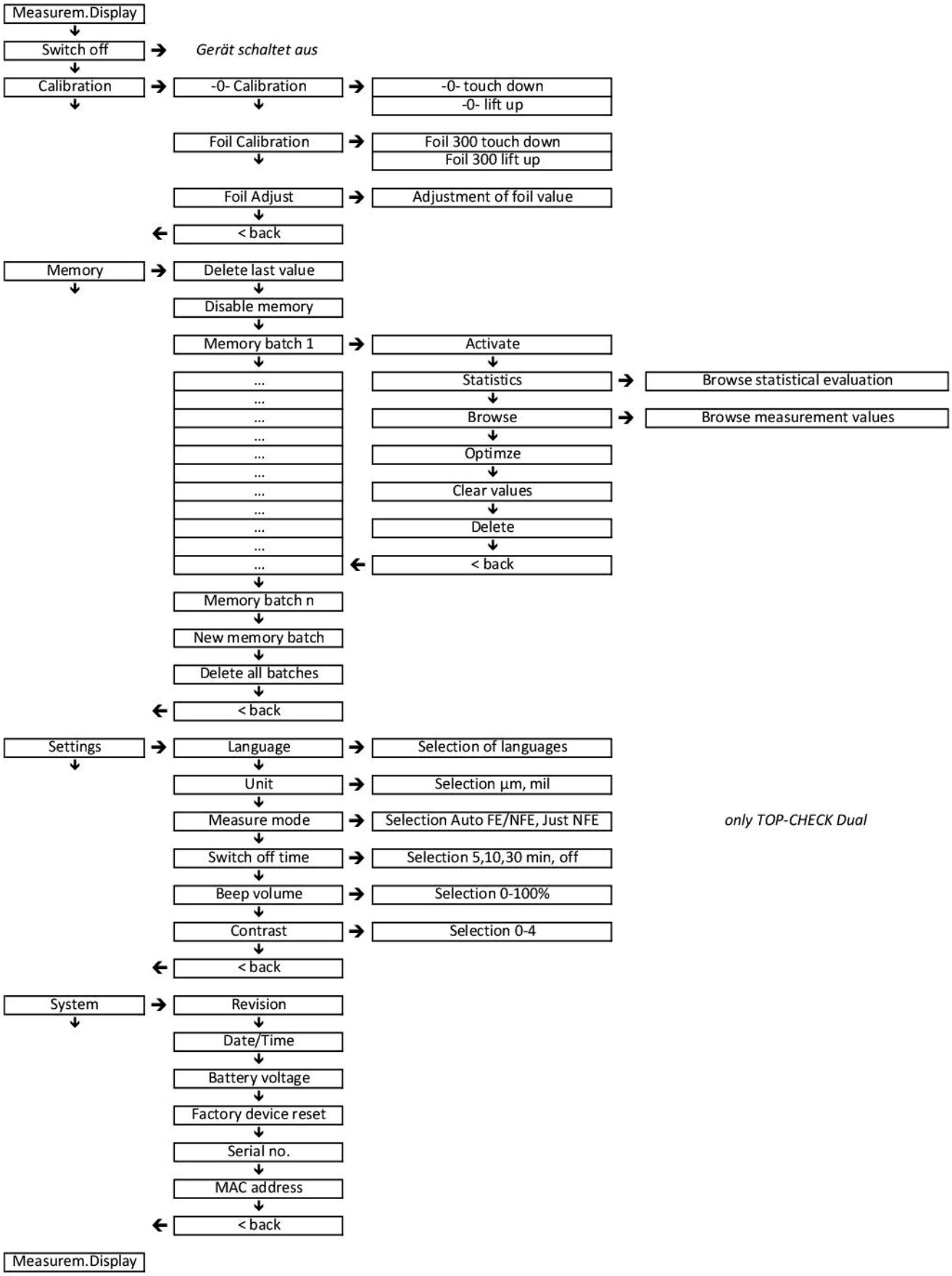
A deleted value can be reactivated by pressing and holding the key again.
The crossed-out value is only finally deleted by **Optimize**.

To exit the function, please wait until the display returns to the menu after a few seconds.

Continuation of memory management after the inner sheet

Menu structure

(Arrow down: red key short, Arrow right: red key long)



Space for your notes

5.3.3.4 Optimize

The memory batch is cleaned up. Deleted measurement values are removed and are no longer visible when scrolling. The numbering of the measurement values is now again ascending without gaps from number 1.

5.3.3.5 Clear values

The memory batch is emptied. All measurement values are removed. However, the memory remains and is not deleted. If the memory was last active, it remains active and is filled again from the next measurement.

5.3.3.6 Delete

The memory batch is deleted. The batch number (here number 2) can be reused later by creating a new memory batch.

5.3.4 NEW MEMORY BATCH

A new memory batch is created.

It is assigned the lowest free number (1-9) and is empty at the beginning.
This new memory batch is activated automatically: the next following measurement is written into this batch.

If the maximum 9 batches have already been created, this menu item is not displayed.

5.3.5 DELETE ALL BATCHES

All memory batches are deleted.
The storage is switched off.

The next memory batch that is newly created is again assigned the number 1.

5.4 SETTINGS

In the settings menu, you can set the language, measuring unit, measuring type, switch-off time, volume and contrast for your device. These settings are retained even after the device is switched off. These settings are deleted during a factory device reset.

5.4.1 LANGUAGE

The language selection depends on which language packs are preinstalled on the device. At least German and English are always installed.
You can install more languages with the Windows application TOP-CHECK SERVICE, which you can find on our homepage www.list-magnetik.com in the category Applications / Service Applications.

5.4.2 UNIT

Change of the measuring unit between µm and mil (1 mil = 25.4 µm).
The active measuring unit is displayed with an asterisk (✱) behind the entry.

5.4.3 MEASURE MODE FE/NFE

The **Automatic measurement FE/NFE** is switched on by default.
The active measurement type is displayed with an asterisk (✱) behind the entry.

With **Auto FE/NFE** the probe recognizes the base material (FE like ferro-magnetic, iron/steel or NFE non-ferromagnetic like aluminum/brass) and automatically switches to the correct measuring method (magnetic inductive / eddy current). For measurements on stainless steel please read the section **Just NFE**.

For measurements on **ferromagnetic steels** (steel, iron), always switch to **Auto FE/NFE** for better accuracy.

Just NFE is a measurement mode for non-ferrous metals such as aluminum, brass and as a special feature also for stainless steel. Here, only the eddy current method is used for measurement.

In these special cases it is necessary to switch the device to **Just NFE**:

- The measurement on slightly magnetic **stainless steels**.

  In this case, the measuring probe is misguided in the automatic mode, it doesn't automatically switch to the eddy current method, and an incorrect value is displayed. Before this, the zero point calibration with the eddy current method must first be carried out on a geometrically identical uncoated stainless steel.

- When you perform a **two-step measurement** of a paint or varnish layer on galvanized sheet steel.

  In **Auto FE/NFE** mode, both layers are measured together here, then with **Just NFE** measurement activated, only the single paint or varnish layer on the galvanizing is measured.

  The thickness of the zinc layer can be determined from the difference between the two measurements. In order to avoid incorrect measurements here, this zinc layer must be greater than 30 µm. Before the measurement, a zero calibration with **Just NFE** mode switched on must be performed on an identical galvanized steel sheet without coating.

5.4.4 SWITCH-OFF TIME

Selection of the automatic switch-off time of the device (5 minutes / 10 minutes /. 30 minutes / off = the device is always switched on). **Off** should only be selected in special cases, as this can greatly increase the power consumption.
The active switch-off time is displayed with an asterisk (✱) behind the entry.

5.4.5 BEEP VOLUME

Selection of the volume of the signal tone (off / 20% / 40% / 60% / 80% / 100%).
The active beep volume is displayed with an asterisk (✱) behind the entry.

5.4.6 CONTRAST

The contrast of the display font can be set on a scale from 0 (low contrast, dark) to 4 (high contrast, bright).
The active contrast is displayed with an asterisk (✱) behind the entry.

5.5 SYSTEM

The system menu displays values that are important for information or diagnostics, but cannot be changed. Resetting the device to factory settings is also possible here. The information provided is:

- Revision number of the firmware version. This information could be requested from you by our technicians when searching for an error
- Date and time. The values cannot be changed in the device itself, but they can be changed via the List-Magnetik apps for Windows, Android and iOS.
- Battery voltage: If the value is below 1 volt, you should change the battery. If the value falls below approx. 1.1 volts, a warning message is also displayed regularly. Below 0.9 volts, the device will no longer work.
- Factory device reset: the measurement parameters set at the time of factory delivery are restored as they may have been destroyed by an error. The measurement batches and settings are completely deleted. The instrument switches off.
- Serial no: The serial number of your TOP-CHECK is written on the cap of the housing. It was also entered here when the device was set up.
- MAC address: The MAC address is a unique identification of the device and its Bluetooth component. When searching for the device in the TOP-CHECK TRANSFER application, this unique identifier is displayed, so you can distinguish several devices within range.

6 IMPORTANT NOTES ON MEASURING

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

6.1.1 RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0.3 mm minimum

Base material non-ferrous metal (NFE): 0.2 mm minimum

7 BATTERY REPLACEMENT

As soon as the battery voltage warning („▲ Voltage 1,15V") appears when the device is switched on, the battery should be replaced.

The device switches off automatically when the battery voltage is less than 1.1 V.

If the display is unclear when the device is switched on, or if an error message **Error-202** is displayed and then the device switches off, the battery is too weak.

Please use only leak-proof batteries.

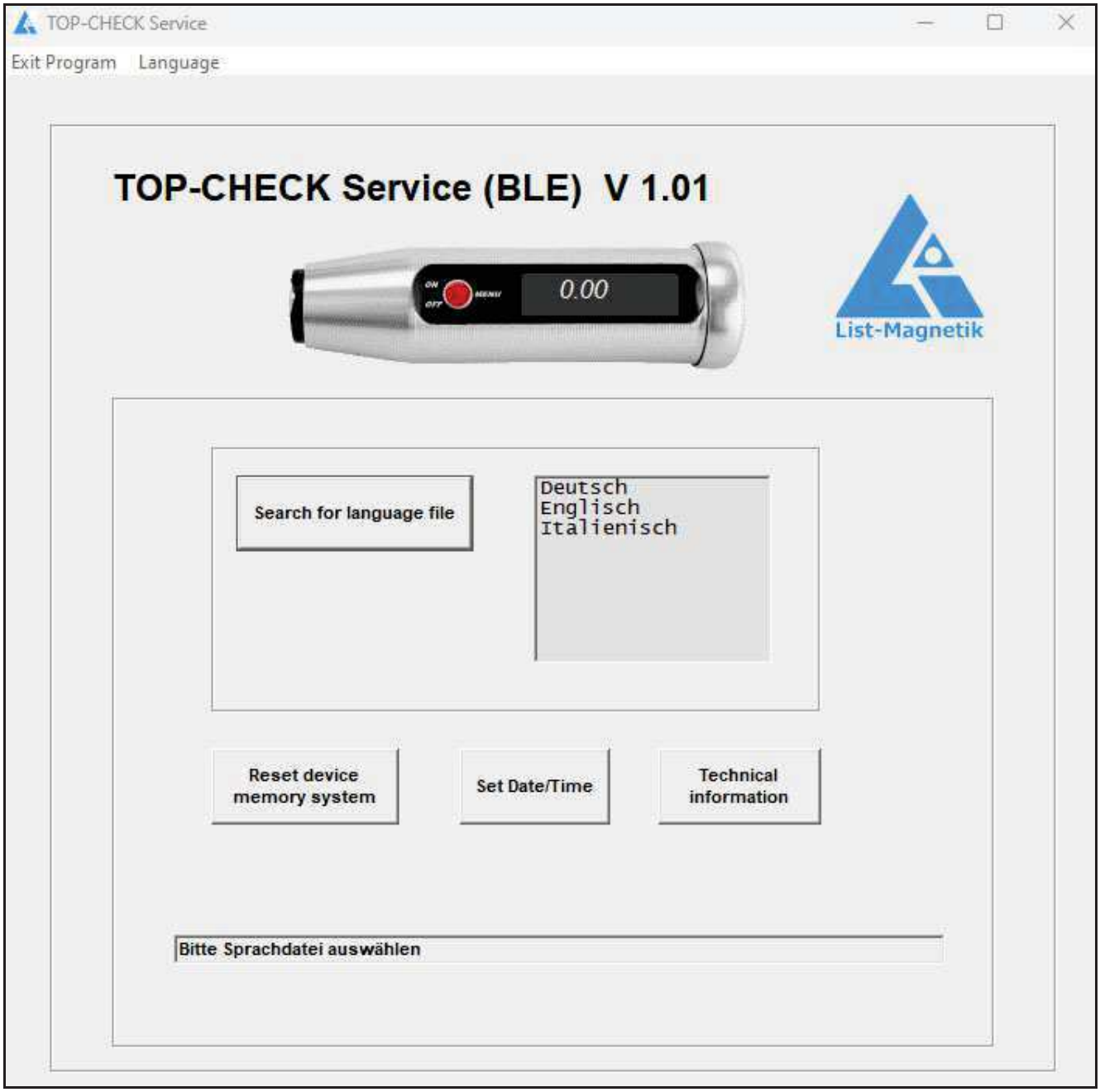
8 TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178) measurement of insulating layers on non-ferrous metals (ISO 2360) automatic detection of base material
Measuring probe:	swivel-mounted 90°
Measuring range:	on steel and iron: 0-5000 µm, on NFE metals: 0-2000 µm
Smallest Area:	ø 8 mm
Smallest curvature radius:	convex: FE 4 mm, NFE 6 mm, concave: 38 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English more languages with the Windows app TOP-CHECK SERVICE, on www.list-magnetik.com in Applications / Service Applications.
Data logger:	max. 4000 measurement values, can be divided into 9 batches
Statistics:	Count / Maximum / Minimum / Average / Standard deviation
Interface:	Bluetooth Low Energy for communication with PC and TOP-CHECK App
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

9 AVAILABLE APPLICATIONS

9.1.1 TOP-CHECK SERVICE

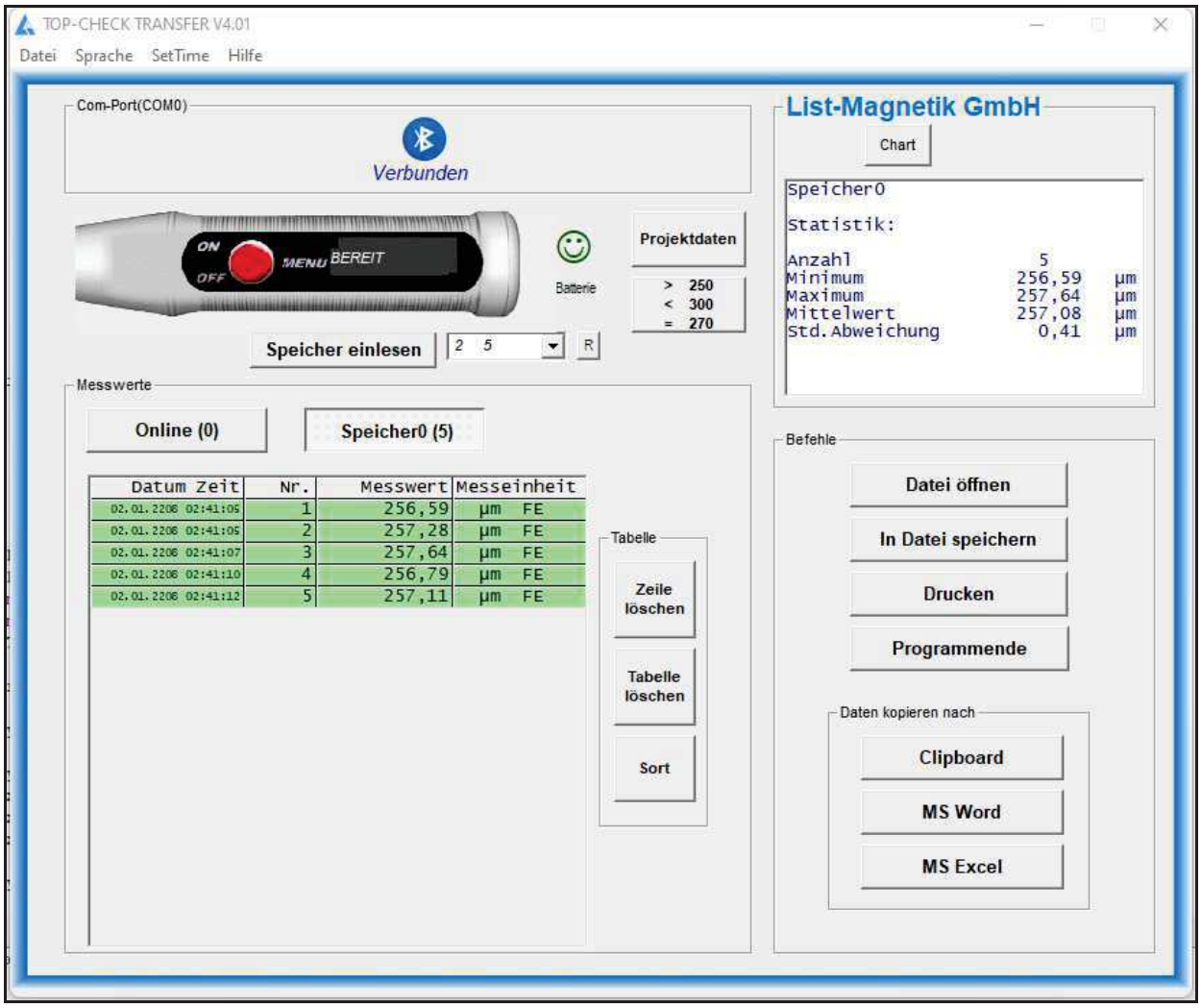
The free Windows app TOP-CHECK SERVICE is available on our homepage www.list-magnetik.com in the Applications section. You can use it to install additional language packages (besides German and English) on your TOP-CHECK Dual or TOP-CHECK Ferro. You can also use it to set the time on your device that will be used during data transfer (Button „Set Date/Time")



9.1.2 TOP-CHECK TRANSFER

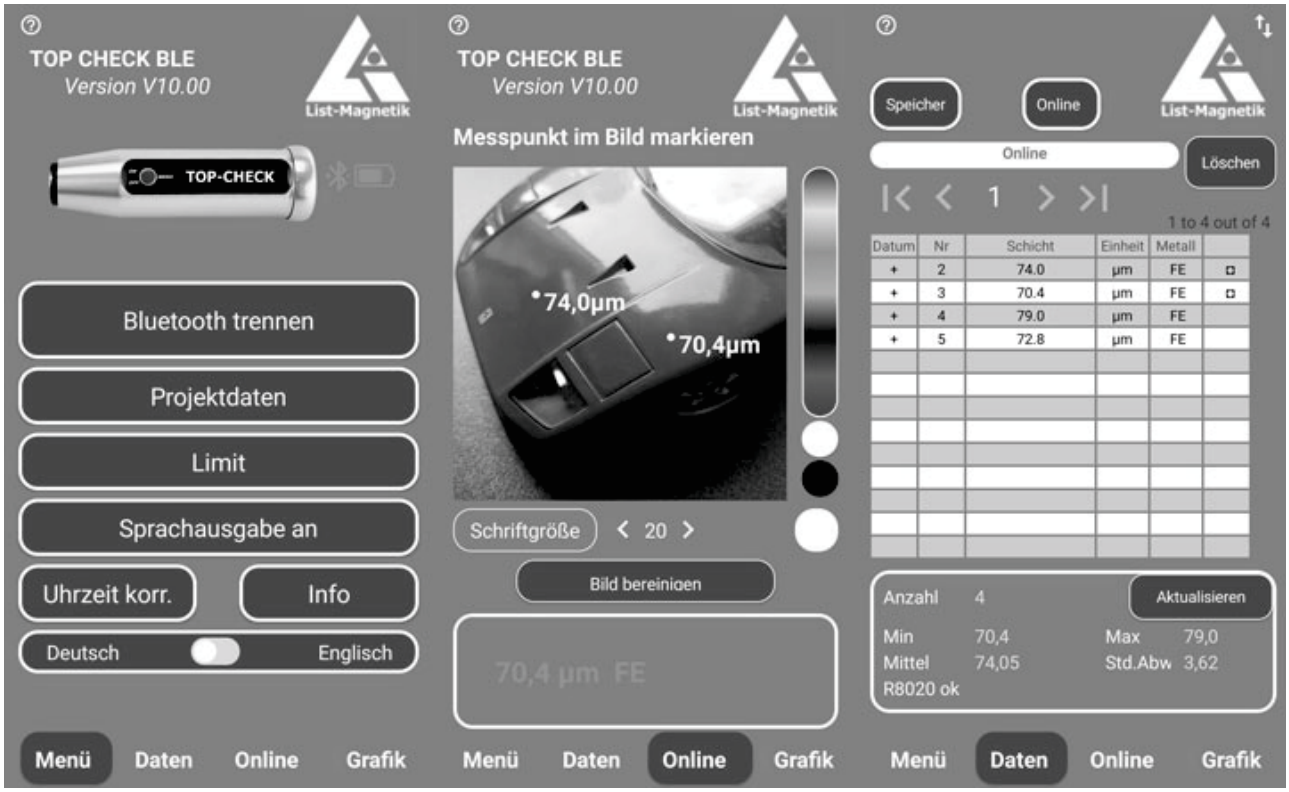
On www.list-magnetik.com, in the category **Applications,** you may obtain the free of charge data transfer application **TOP-CHECK TRANSFER**, to transfer measurement data to your PC.

With TOP-CHECK TRANSFER, you can measure online or read the device's memory, you can evaluate the data statistically or visualize as chart. You can print the results or hand over the data to applications like Microsoft Word and Microsoft Excel.



9.1.3 TOP-CHECK BLE App for Android and iOS

To further process your measurement data, you can pair your TOP-CHECK with mobile Android and iOS devices. This is made possible by Bluetooth Low Energy (BLE) technology. With the TOP-CHECK BLE app you can manage projects and assign the measuring points on a photo. The measurement results can be statistically evaluated and graphically displayed. The app for Android, iOS and Windows is free of charge.



Android	iOS

INSTALLING THE BLUETOOTH USB DONGLE

The installation of this software can be necessary for the communication between TOP-CHECK and a Windows PC.
First of all, please try, if the connection between TOP-CHECK and your PC via Bluetooth works without software installation, by plugging in the Bluetooth receiver.

If this does not work immediately, please install the driver software available on **https://www.list-magnetik.com** in the category **Download**.

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QM-System
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OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK FERRO/FERRO-1000

Revision number 326.0 and up

2023-06

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TOP-CHECK FERRO/FERRO-1000 (2023-06)

1 INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The **List-Magnetik TOP-CHECK Ferro-1000** coating thickness meters use a probe that requires little contact area and low pressure. The compact devices are barely larger than a measuring probe and are particularly suitable for measuring thin layers on uneven or complex ground, for example tinplate cans.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK Ferro is ideal for iron and steel substrates. The device measures insulating layers of lacquer, paint, plastic, rubber, ceramic and galvanic coatings (except nickel) according to ISO 2178. It supplements the performance spectrum by data logger and Bluetooth interface.

To easily manage and send your measurement data with TOP-CHECK Ferro and TOP-CHECK Dual, you can use the free Mobile App for Android and the free transfer TOP-CHECK TRANSFER software for PC.

2 QUICK START GUIDE

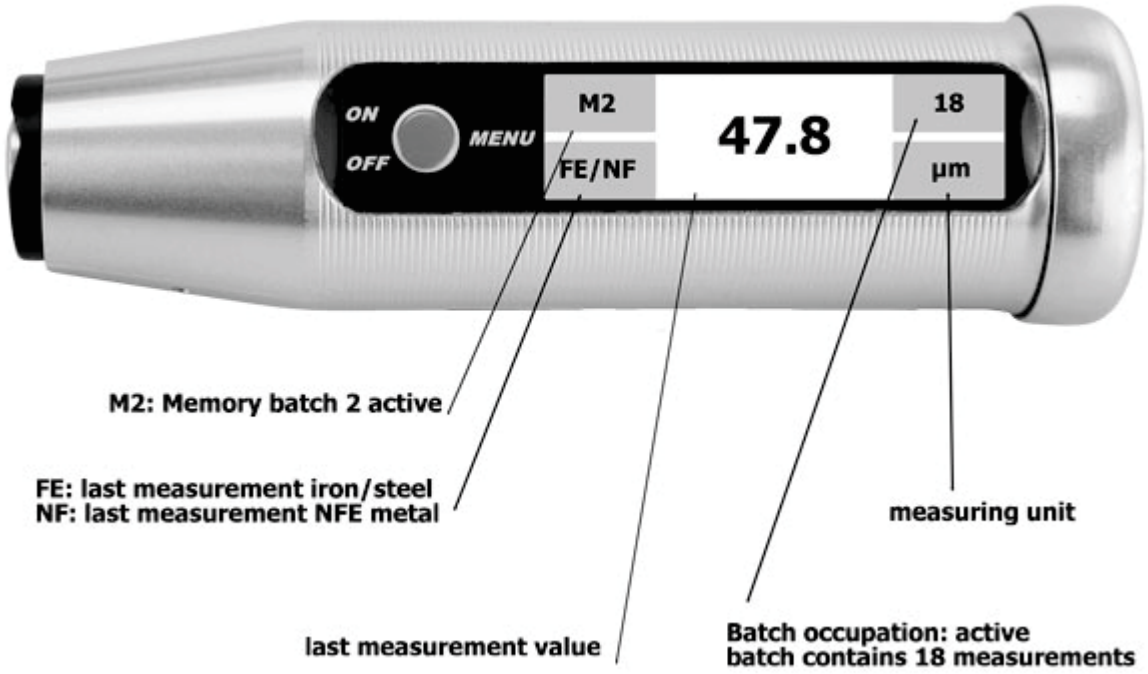
The device is calibrated ex works and can be used immediately on flat steel. For special geometries and materials, please perform a calibration.

Switch on: Press the red key for a long time, the display shows **Ready** and then the display of the last measured value

Measurement: Place devices with measuring probe on the object to be measured and wait until a signal tone confirms the measurement. (Measurement on FE metals - 1x signal tone , Measurement on NFE metals - 2x signal tone).

Switch off: Press red key until display goes dark

3 MEASUREMENT DISPLAY



The measurement display shows the last measured value and its measuring unit at a glance. At the bottom left, it indicates whether the measurement was taken on iron/steel (FE = ferromagnetic, FE metal) or on non-ferromagnetic metal (NF = NFE metal).
In addition, the memory used and its current occupancy with measured values are displayed at the top left and top right.

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Press the key briefly to scroll through the menu functions, press and hold the key (with signal tone) to activate the desired menu function.
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5.2.1 -0- CALIBRATION

In the off-hook state, select **-0- Calibrate** in the menu, **-0- touch down** appears.

Then place the instrument with the measuring probe in the **center** on the bare FE calibration base plate and wait until **-0- lift up** is displayed and confirmed by one signal tone.

5.2.2 FOIL CALIBRATION

The foil calibration is the second calibration step for the accurate calibration of the instrument (so-called two-point calibration).

Place the calibration foil of approx. 300 µm on the bare FE calibration base plate.

Select **Foil Calibration** in the lifted state, the display shows **Foil 300 touch down** (or the set foil value), then place the instrument with the measuring probe in the **center** on the measuring foil and wait until **Foil 300 lift up** is displayed and confirmed by one signal tone.

If possible, the **calibration foil with the higher value (approx. 300 µm)** should always be used for calibration in order to maintain the specified accuracy of the instrument over the **entire measuring range**.

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Mean	– average value
Std.Dev	– standard deviation (corrected sample variance)

* A displayed **Count 15 (13)** means that there are two crossed-out but not yet optimized (and so finally deleted) values in the batch. Only the 13 values that are active are taken into account in the statistics (see chapter: Optimze).

5.3.3.3 Browse

In the browse function, all measurement values of the batch are displayed.
Always 2 values are displayed and by pressing the key it is scrolled by one value. The upper line is marked with a triangle on the left.

This measurement value marked with the triangle can be deleted by a long keystroke. It is then displayed crossed out. A crossed-out / inactive value is no longer included in the statistics and is no longer transferred to the PC or mobile app.

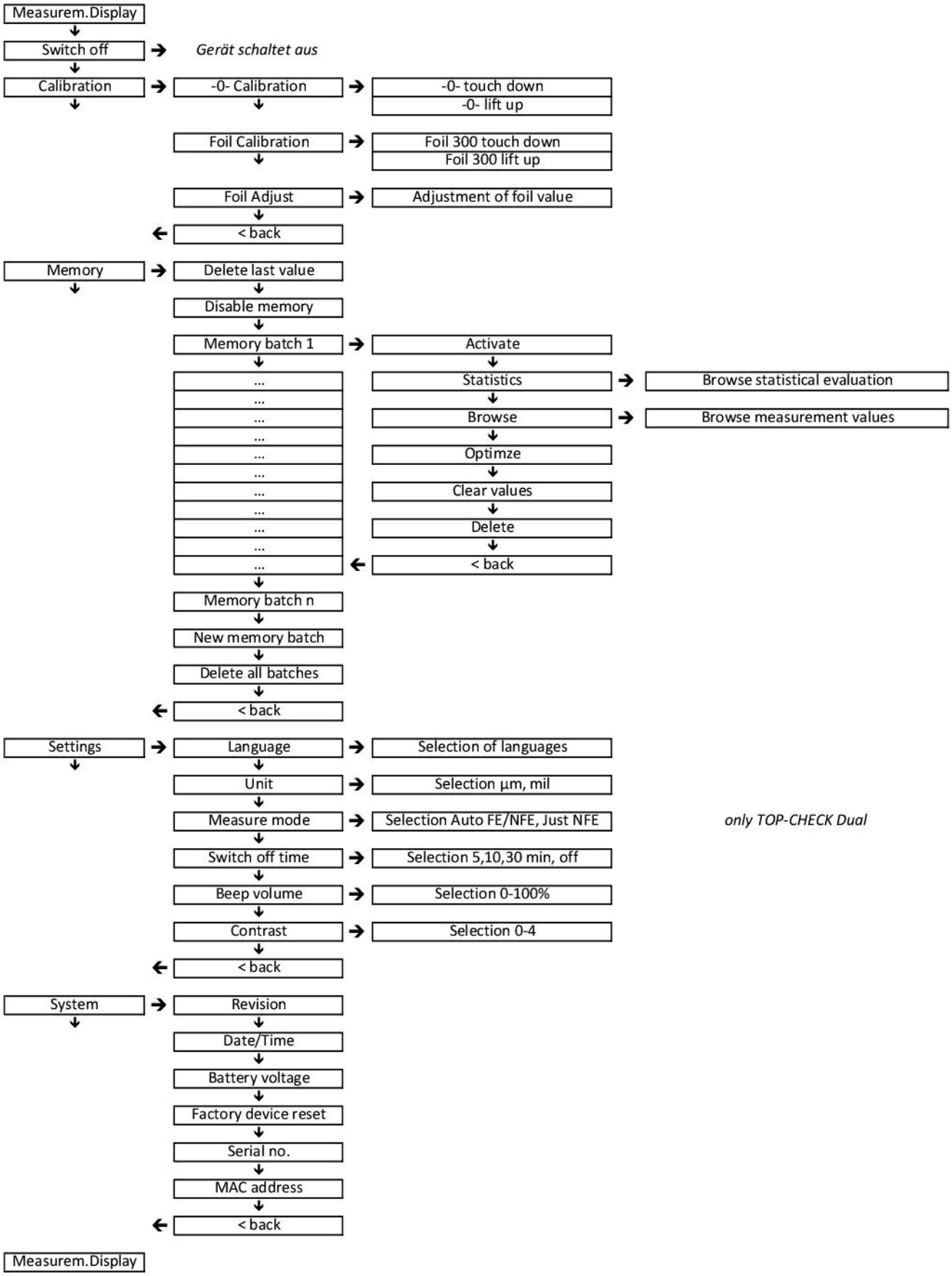
A deleted value can be reactivated by pressing and holding the key again.
The crossed-out value is only finally deleted by **Optimize**.

To exit the function, please wait until the display returns to the menu after a few seconds.

Continuation of memory management after the inner sheet

Menu structure

(Arrow down: red key short, Arrow right: red key long)



Space for your notes

5.3.3.4 Optimize

The memory batch is cleaned up. Deleted measurement values are removed and are no longer visible when scrolling. The numbering of the measurement values is now again ascending without gaps from number 1.

5.3.3.5 Clear values

The memory batch is emptied. All measurement values are removed. However, the memory remains and is not deleted. If the memory was last active, it remains active and is filled again from the next measurement.

5.3.3.6 Delete

The memory batch is deleted. The batch number (here number 2) can be reused later by creating a new memory batch.

5.3.4 NEW MEMORY BATCH

A new memory batch is created.

It is assigned the lowest free number (1-9) and is empty at the beginning.
This new memory batch is activated automatically: the next following measurement is written into this batch.

If the maximum 9 batches have already been created, this menu item is not displayed.

5.3.5 DELETE ALL BATCHES

All memory batches are deleted.
The storage is switched off.

The next memory batch that is newly created is again assigned the number 1.

5.4 SETTINGS

In the settings menu, you can set the language, measuring unit, measuring type, switch-off time, volume and contrast for your device. These settings are retained even after the device is switched off. These settings are deleted during a factory device reset.

5.4.1 LANGUAGE

The language selection depends on which language packs are preinstalled on the device. At least German and English are always installed.
You can install more languages with the Windows application TOP-CHECK SERVICE, which you can find on our homepage www.list-magnetik.com in the category Applications / Service Applications.

5.4.2 UNIT

Change of the measuring unit between µm and mil (1 mil = 25.4 µm).
The active measuring unit is displayed with an asterisk (✱) behind the entry.

5.4.3 SWITCH-OFF TIME

Selection of the automatic switch-off time of the device (5 minutes / 10 minutes /. 30 minutes / off = the device is always switched on). **Off** should only be selected in special cases, as this can greatly increase the power consumption.
The active switch-off time is displayed with an asterisk (✱) behind the entry.

5.4.4 BEEP VOLUME

Selection of the volume of the signal tone (off / 20% / 40% / 60% / 80% / 100%).
The active beep volume is displayed with an asterisk (✱) behind the entry.

5.4.5 CONTRAST

The contrast of the display font can be set on a scale from 0 (low contrast, dark) to 4 (high contrast, bright).
The active contrast is displayed with an asterisk (✱) behind the entry.

5.5 SYSTEM

The system menu displays values that are important for information or diagnostics, but cannot be changed. Resetting the device to factory settings is also possible here. The information provided is:

- Revision number of the firmware version. This information could be requested from you by our technicians when searching for an error
- Date and time. The values cannot be changed in the device itself, but they can be changed via the List-Magnetik apps for Windows, Android and iOS.
- Battery voltage: If the value is below 1 volt, you should change the battery. If the value falls below approx. 1.1 volts, a warning message is also displayed regularly. Below 0.9 volts, the device will no longer work.
- Factory device reset: the measurement parameters set at the time of factory delivery are restored as they may have been destroyed by an error. The measurement batches and settings are completely deleted. The instrument switches off.
- Serial no: The serial number of your TOP-CHECK is written on the cap of the housing. It was also entered here when the device was set up.
- MAC address: The MAC address is a unique identification of the device and its Bluetooth component. When searching for the device in the TOP-CHECK TRANSFER application, this unique identifier is displayed, so you can distinguish several devices within range.

6 IMPORTANT NOTES ON MEASURING

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

6.1.1 RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0.3 mm minimum

7 BATTERY REPLACEMENT

As soon as the battery voltage warning („▲ Voltage 1,15V“) appears when the device is switched on, the battery should be replaced.

The device switches off automatically when the battery voltage is less than 1.1 V.

If the display is unclear when the device is switched on, or if an error message **Error-202** is displayed and then the device switches off, the battery is too weak.

Please use only leak-proof batteries.

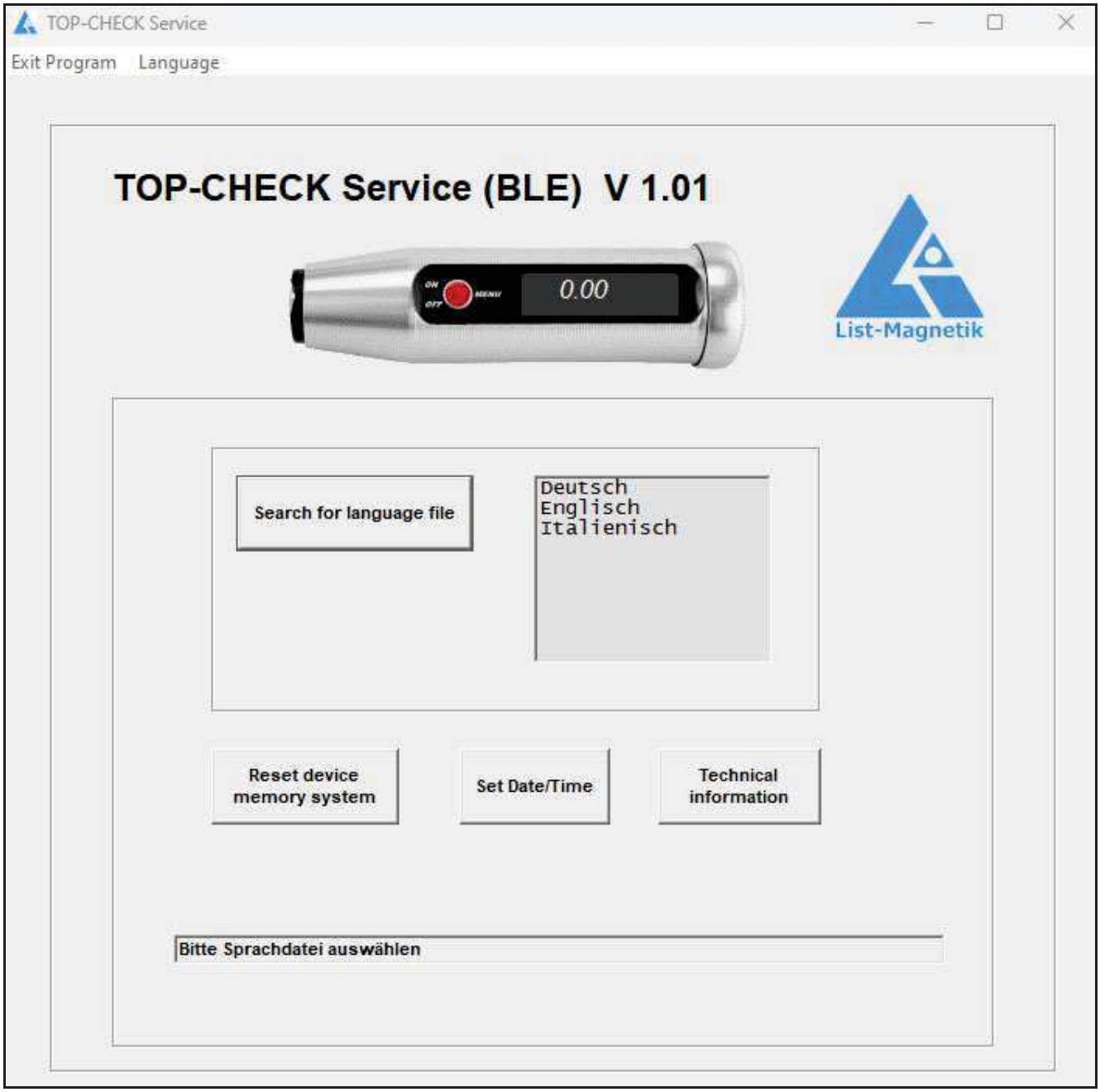
8 TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178)
Measuring probe:	TOP-CHECK Ferro: swivel-mounted 90° TOP-CHECK Ferro-1000: sensing device, springy
Measuring range:	TOP-CHECK Ferro: on steel and iron: 0-5000 µm TOP-CHECK Ferro-1000: on steel and iron: 0-1000 µm
Smallest Area:	TOP-CHECK Ferro: ø 8 mm TOP-CHECK Ferro-1000: ø 2 mm
Smallest curvature radius:	TOP-CHECK Ferro: convex: 4 mm, concave: 38 mm TOP-CHECK Ferro-1000: convex: 1 mm, concave: 6 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English more languages with the Windows app TOP-CHECK SERVICE, on www.list-magnetik.com in Applications / Service Applications.
Data logger:	max. 4000 measurement values, can be divided into 9 batches
Statistics:	Count / Maximum / Minimum / Average / Standard deviation
Interface:	Bluetooth Low Energy for communication with PC and TOP-CHECK App
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

9 AVAILABLE APPLICATIONS

9.1.1 TOP-CHECK SERVICE

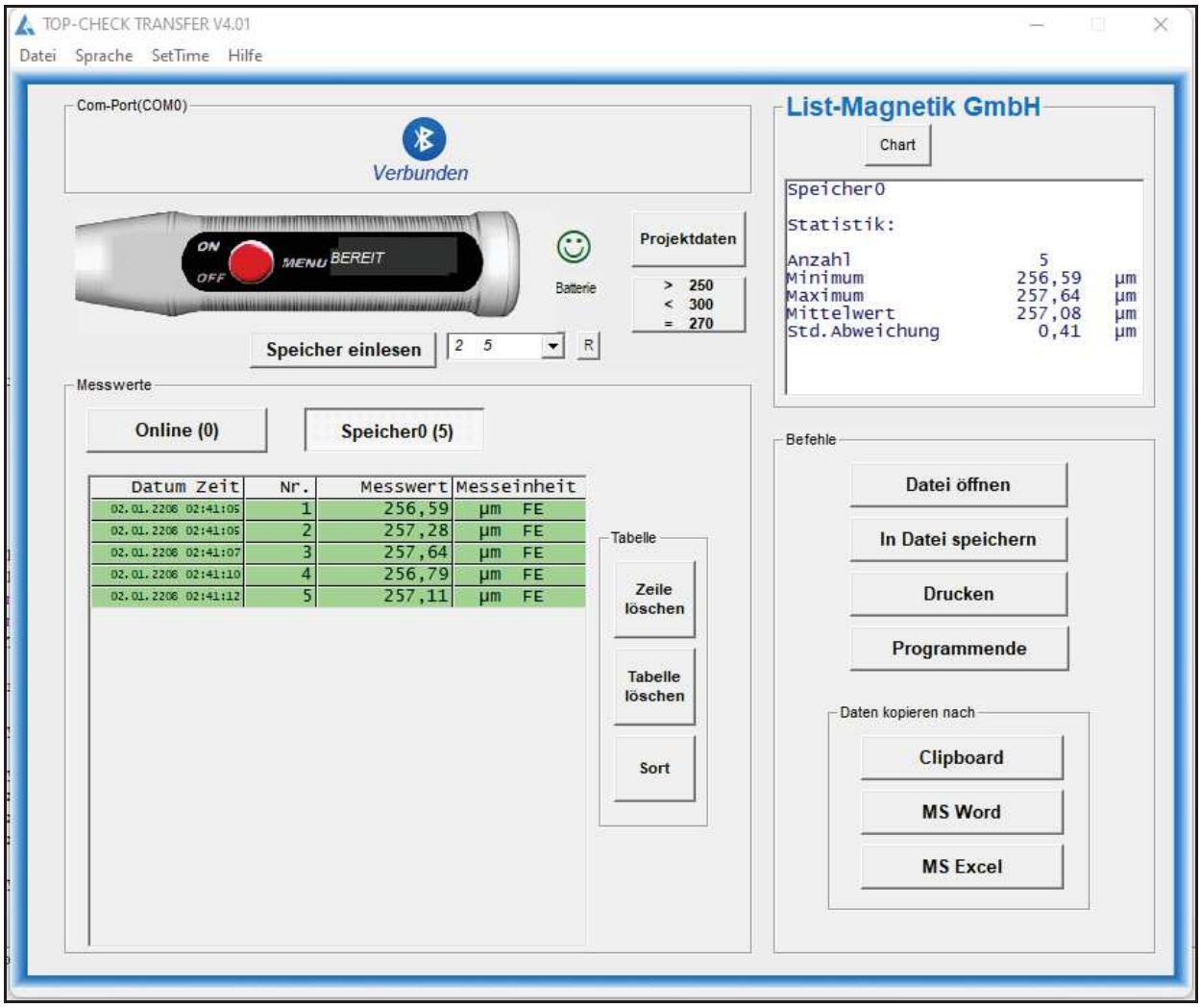
The free Windows app TOP-CHECK SERVICE is available on our homepage www.list-magnetik.com in the Applications section. You can use it to install additional language packages (besides German and English) on your TOP-CHECK Dual or TOP-CHECK Ferro. You can also use it to set the time on your device that will be used during data transfer (Button „Set Date/Time")



9.1.2 TOP-CHECK TRANSFER

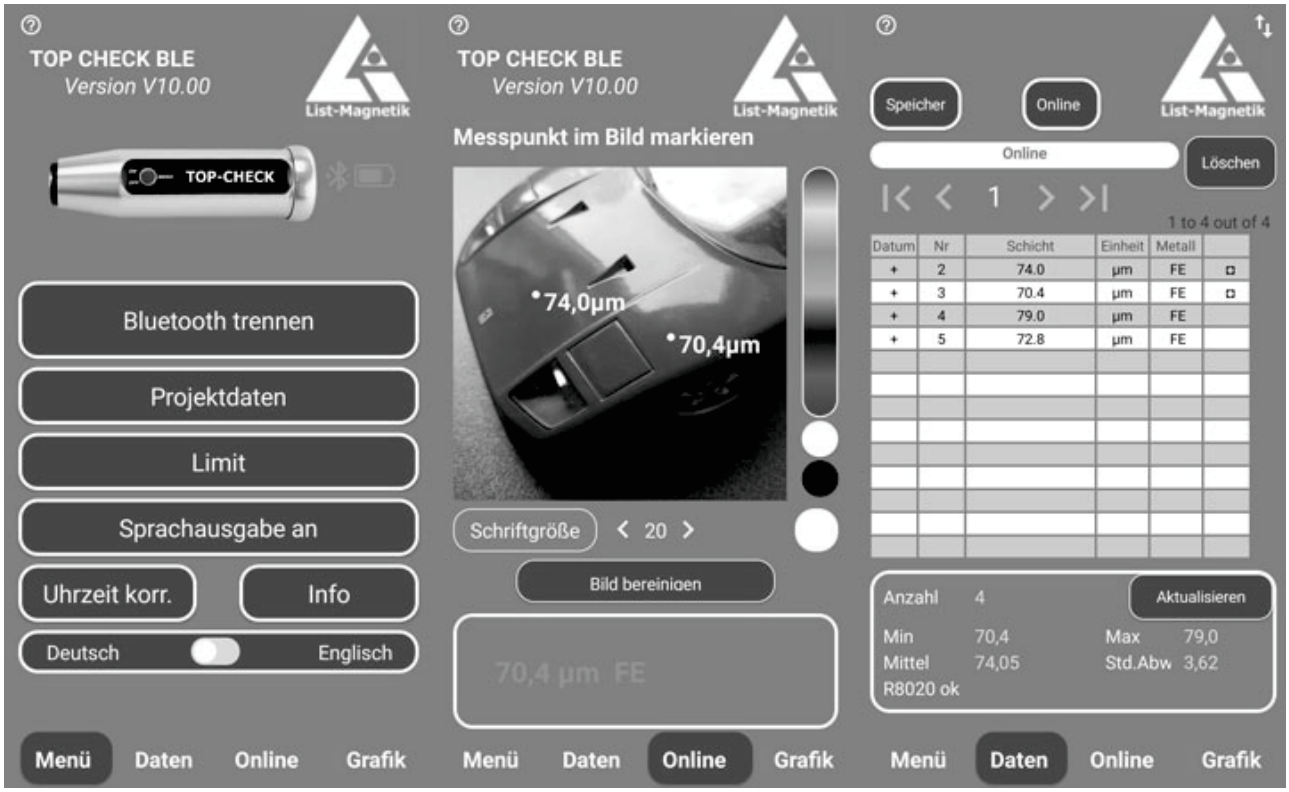
On www.list-magnetik.com, in the category **Applications,** you may obtain the free of charge data transfer application **TOP-CHECK TRANSFER**, to transfer measurement data to your PC.

With TOP-CHECK TRANSFER, you can measure online or read the device's memory, you can evaluate the data statistically or visualize as chart. You can print the results or hand over the data to applications like Microsoft Word and Microsoft Excel.



9.1.3 TOP-CHECK BLE App for Android and iOS

To further process your measurement data, you can pair your TOP-CHECK with mobile Android and iOS devices. This is made possible by Bluetooth Low Energy (BLE) technology. With the TOP-CHECK BLE app you can manage projects and assign the measuring points on a photo. The measurement results can be statistically evaluated and graphically displayed. The app for Android, iOS and Windows is free of charge.



Android	iOS

INSTALLING THE BLUETOOTH USB DONGLE

The installation of this software can be necessary for the communication between TOP-CHECK and a Windows PC.
First of all, please try, if the connection between TOP-CHECK and your PC via Bluetooth works without software installation, by plugging in the Bluetooth receiver.

If this does not work immediately, please install the driver software available on **https://www.list-magnetik.com** in the category **Download**.

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Internet: https://www.list-magnetik.com
E-mail: info@list-magnetik.de

QM-System
ISO 9001:2015 zertifiziert

OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK FN

Firmware Version 10.1 and up

2022-07

List-Magnetik Dipl.-Ing. Heinrich List GmbH
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QM-System ISO 9001:2015 zertifiziert

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TOP-CHECK FN
(2022-07)

Structure of the menu – in the center of this manual

1. INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK FN has a combined probe that measures insulating layers of paint, varnish, plastic, rubber, ceramics and galvanic coatings (except nickel) in a magnet-inductive measuring method. The device is used on iron and steel subsoil. It is also suitable for measuring insulating layers, according to the eddy current method, on non-ferrous metals such as aluminum, brass, copper, bronze and non-magnetic stainless steels, according to ISO 2178 and ISO 2360.

2. QUICK START GUIDE

The device is calibrated ex works and can be used immediately on flat steel and aluminum. For special geometries and materials, please perform a calibration.

Switch On: Press and hold the red button until **READY** is displayed

Measuring: Apply the device with the measuring probe on the coated item and wait for a sound signal which indicates that the measurement and the thickness value will be displayed. (Measurements on FE metals – 1x sound, measurements on NFE metals – 2x sound).

Switch Off: Press and hold the red button, until the display is switched off

3. USING THE MENU VIA THE RED BUTTON

You can scroll through the menu functions with short presses on the button.

The desired menu function is activated by pressing and holding the button (long sound).

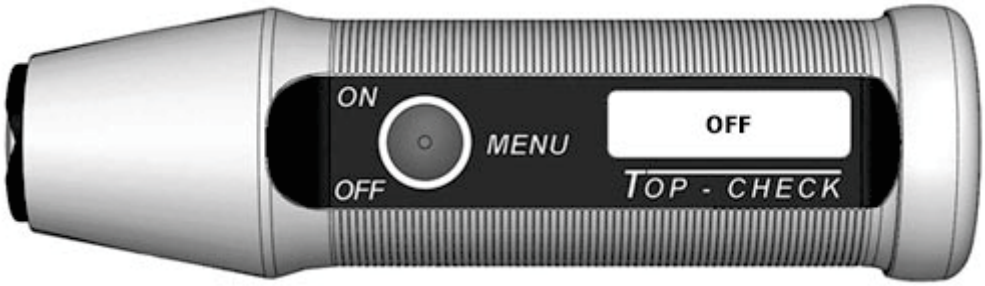
The menu functions can be only called up when the measuring probe is not applied.

At the end of each submenu appears **BACK**, with which you can return to the upper menu level.

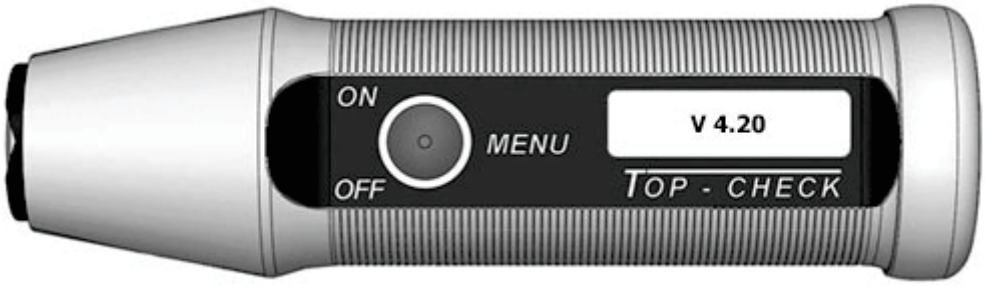
On delivery, **English** is the preselected language. This can be changed to **German** in the menu **SETUP** / **LANGUAGE**.

4. MENU FUNCTIONS

a. OFF



The device is manually switched off by pressing and holding the button (long sound). If the button is kept pressed for more than 3 seconds after switching off, then the program version is displayed before the device switches off.

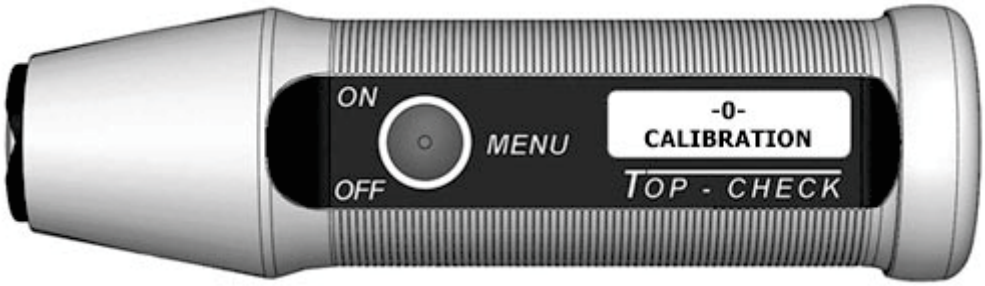


The automatic switch-off time on delivery is 1 minute. This can be changed in the menu **SETUP**.

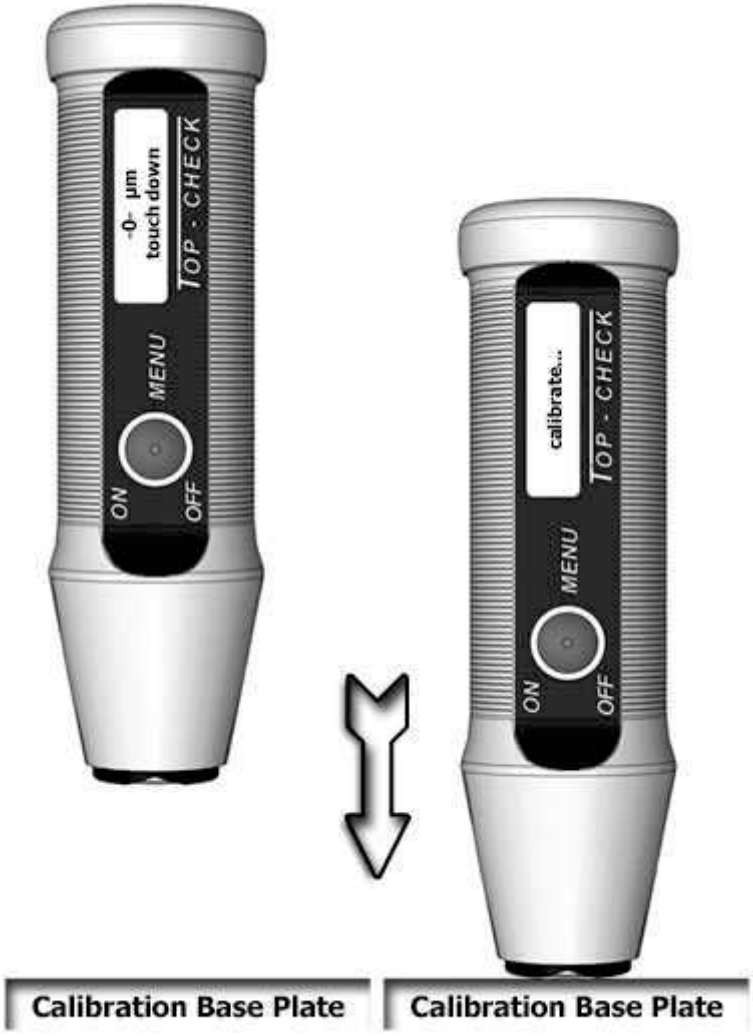
b. CALIBRATE

According to standard specification ISO 2178, it is recommended to recalibrate the instrument, if measurements are taken on small or curved parts, on parts with a higher surface roughness or on different base materials. **The calibration must be performed separately on both calibration base plates (FE and NFE).**

-0- CALIBRATION



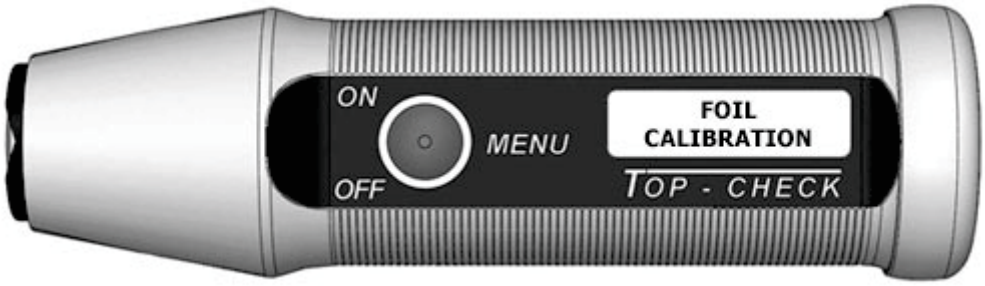
In the raised state activate **-0- CALIBRATION**, then apply the device with the measuring probe to the bare FE / NFE calibration base plate and wait until 0.0 µm is displayed and confirmed by a long sound on FE or two short sounds on NFE.



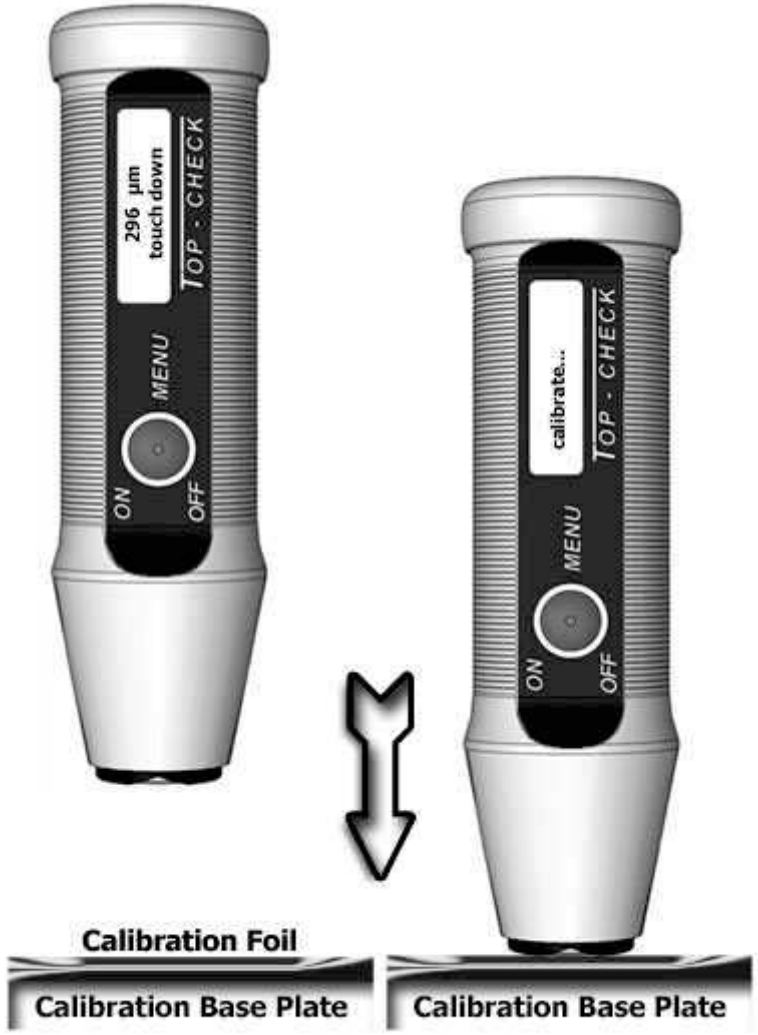
If you have to measure **on materials other than flat steel or aluminum**, please perform the calibration on an uncoated original part instead of on the calibration base plate. This applies in particular to curvatures, round material or special alloys.

FOIL CALIBRATION

The foil calibration assigns a second calibration point for an accurate calibration of the device (two-point calibration).



Place the approx. 300 µm calibration foil on the bare FE / NFE calibration base plate. In the raised state activate **FOIL CALIBRATION**, then apply the device with the measuring probe to the measuring foil and wait until the foil value is displayed and confirmed by a long sound on FE or two short sounds on NFE.



The measuring foil with the higher value (approx. 300 µm) should be always used for an accurate calibration of the whole measuring range.
The calibration for FE measurements is carried out on the blue FE base plate, the calibration for NFE measurements on the red NFE base plate.

The device can also be calibrated with the optionally available 1 mm ceramic plate to achieve even greater accuracy, and particularly in the case of measurements in the higher measuring range (2 mm and up).

FOIL ADJUST

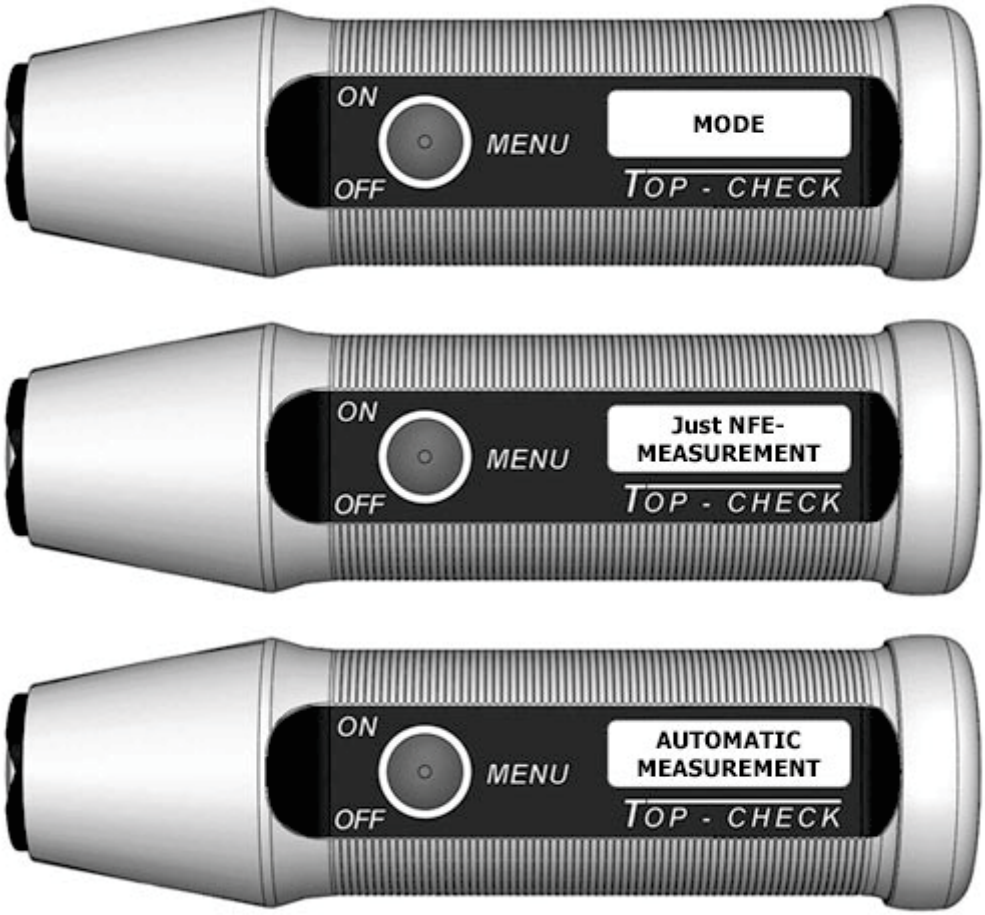
The calibration foils are approximately 300 µm thick. The exact value is written on the foil. When delivered, the foil value is set to the supplied foil. If you replace the foil, this foil value must be adjusted to the new foil.

A short press of the button changes the foil value in 1 µm steps; after releasing the button for at least 1 second, the **<** sign switches to **>** and back in order to increase or decrease the foil value.

To change the foil thickness, the values will be increased or decreased automatically after the tenth step in one direction until the button is pressed again to stop. The accurate value can be adjusted by a single press of the button in both directions.

The foil value is confirmed and saved by pressing and holding the button.

C. MODE / JUST NFE- OR AUTOMATIC MEASUREMENT



AUTOMATIC MEASUREMENT is switched on as standard. The measuring probe recognizes the base material (FE or NFE) and automatically switches to the correct measuring mode (magnetic-inductive on FE or eddy current method on NFE).

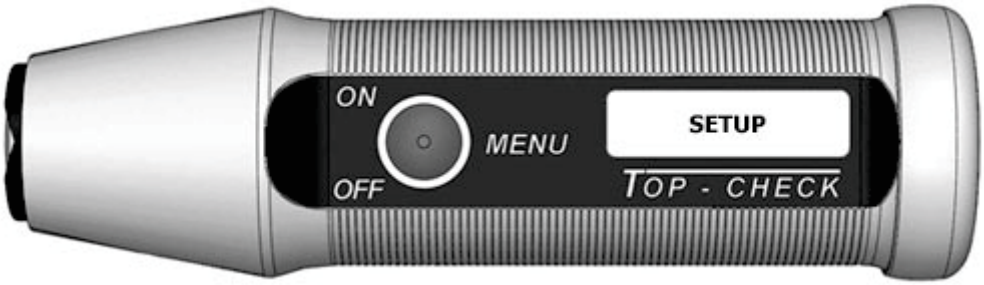
In some special cases, you can switch the device to **Just NFE MEASUREMENT**. Measurements then take place using the eddy current method only:

- Measurement of a paint or varnish coating on galvanized sheet steel. In automatic mode both coatings are measured together here. If **Just NFE MEASUREMENT** is activated, only the individual paint or varnish coat on the zinc plating is measured. Hence, the thickness of the zinc layer can be determined from the difference between the two measuring modes. In order to avoid incorrect measuring the zinc layer must be > 30 µm. Also, the zero calibration should be performed using the eddy current method on an identical steel sheet without coating.

- Measurement on slightly magnetic stainless steel. In **AUTOMATIC MEASUREMENT** mode, the measuring probe cannot switch to the eddy current mode and a false measured value will be displayed. Here again, the zero calibration must be performed using the eddy current method on identical uncoated stainless steel.

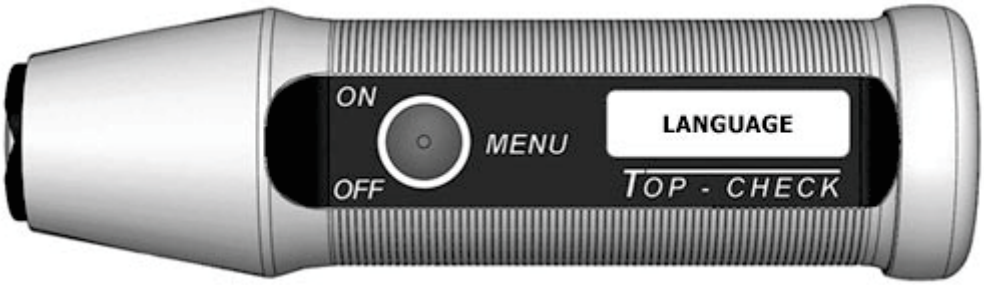
When measuring again on ferromagnetic steels it is essential to switch back to **AUTOMATIC MEASUREMENT**.

d. SETUP



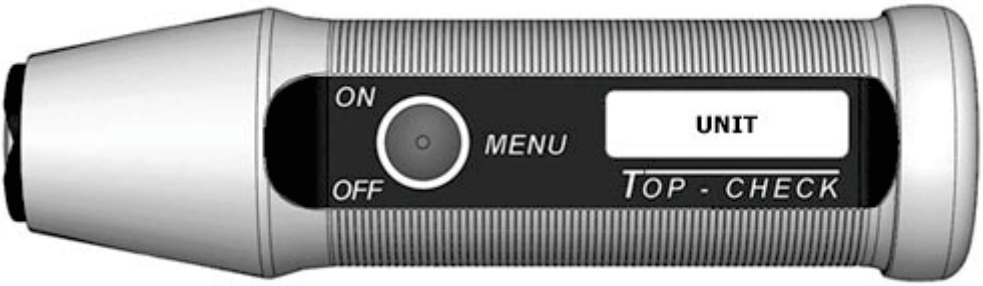
LANGUAGE

Selection of the menu language – ENGLISH or GERMAN.



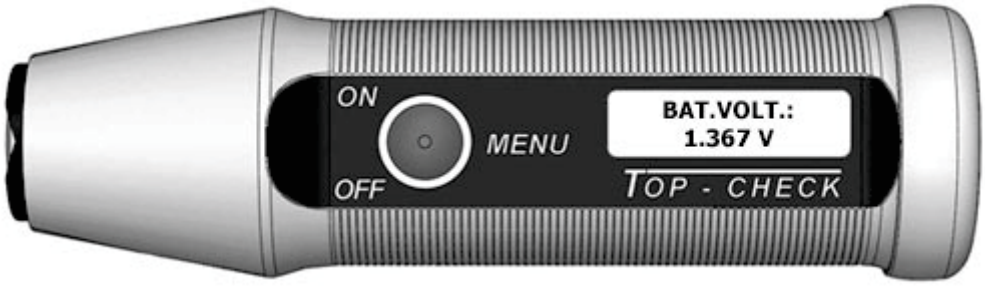
UNIT

Selection of the measuring unit – µm or mils.



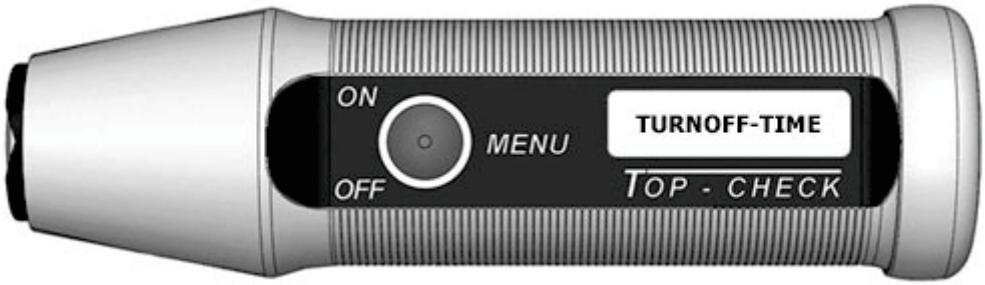
BATTERY

Displays the current battery voltage.

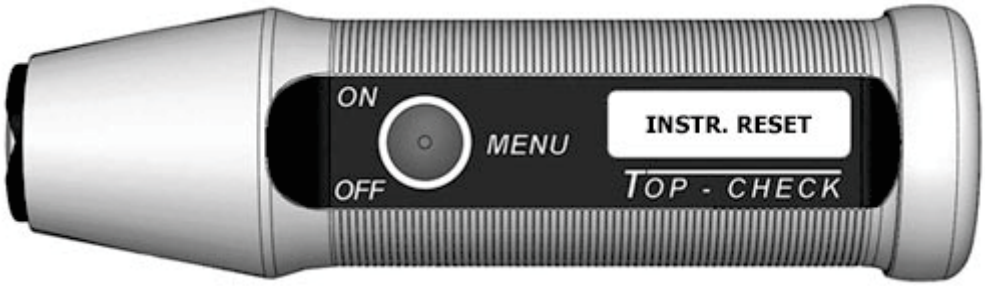


TURNOFF-TIME

Selection of the automatic switch-off time of the device (2 minutes / 15 minutes / off = device is always switched on). Only in special cases, **off** should be selected, since the power consumption can greatly increase as a result.



INSTRUMENT RESET



If the device can no longer be calibrated properly or if other malfunctions occur the works calibration can be restored here by means of an instrument reset. When doing this the device switches off automatically.

5. IMPORTANT NOTES

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

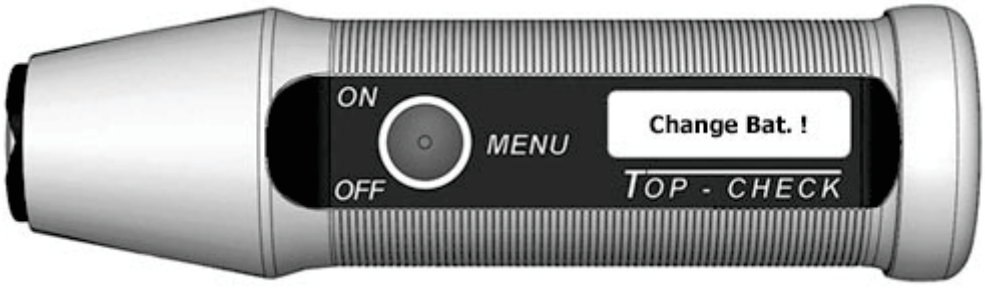
- If the message **Bluetooth Err.** should appear when switching the Bluetooth interface on, and if this message does not disappear after several attempts to switch it on, then the Bluetooth interface is defective, and the device should be sent in for repair.

RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0,3 mm minimum

Base material non-ferrous metal (NFE): 0,2 mm minimum

6. BATTERY REPLACEMENT



The battery must be replaced as soon as the warning **Change Bat.** Appears.

The device switches off automatically if the battery voltage falls below 1.0 V.

Please use only leak-proof batteries

7. TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178), measurement of insulating layers on non-ferrous metals (ISO 2360), automatic detection of base material
Measuring probe:	swivel-mounted 90°
Measuring range:	on steel and iron: 0-5000 µm, on NFE metals: 0-2000 µm
Smallest Area:	ø 8 mm
Smallest curvature radius:	convex: FE 4 mm, NFE 6 mm, concave: 38 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

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OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK FE
TOP-CHECK FE-1000

Firmware Version 10.1 and up

2022-07

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TOP-CHECK FE/FE-1000 (2022-07)

Structure of the menu – in the center of this manual

1. INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The **LIST MAGNETIK TOP-CHECK FE-1000** coating thickness meters use a probe that requires little contact area and low pressure. The compact devices are barely larger than a measuring probe and are particularly suitable for measuring thin layers on uneven or complex ground, for example tinplate cans.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK FE is ideal for iron and steel substrates. The device measures insulating layers of lacquer, paint, plastic, rubber, ceramic and galvanic coatings (except nickel) according to ISO 2178.

2. QUICK START GUIDE

The device is calibrated ex works and can be used immediately on flat steel. For special geometries and materials, please perform a calibration.

Switch On: Press and hold the red button until **READY** is displayed

Measuring: Apply the device with the measuring probe on the coated item and wait for a sound signal which indicates that the measurement and the thickness value will be displayed. (Measurements on FE metals – 1x sound).

Switch Off: Press and hold the red button, until the display is switched off

3. USING THE MENU VIA THE RED BUTTON

You can scroll through the menu functions with short presses on the button.

The desired menu function is activated by pressing and holding the button (long sound).

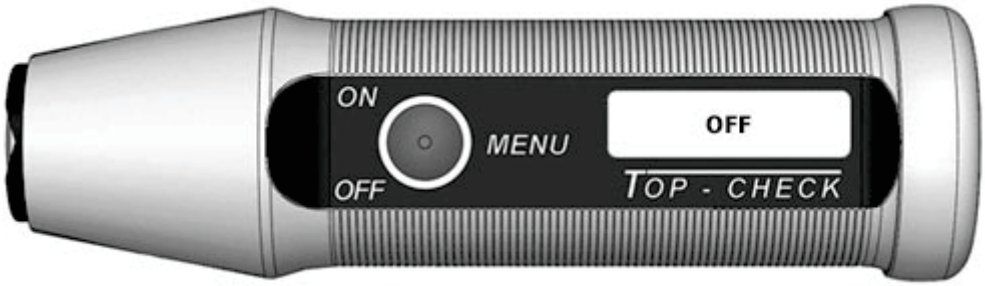
The menu functions can be only called up when the measuring probe is not applied.

At the end of each submenu appears **BACK**, with which you can return to the upper menu level.

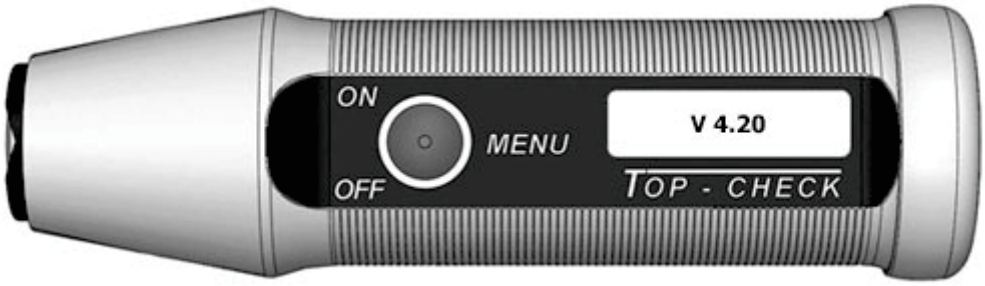
On delivery, **English** is the preselected language. This can be changed to **German** in the menu **SETUP** / **LANGUAGE**.

4. MENU FUNCTIONS

a. OFF



The device is manually switched off by pressing and holding the button (long sound). If the button is kept pressed for more than 3 seconds after switching off, then the program version is displayed before the device switches off.

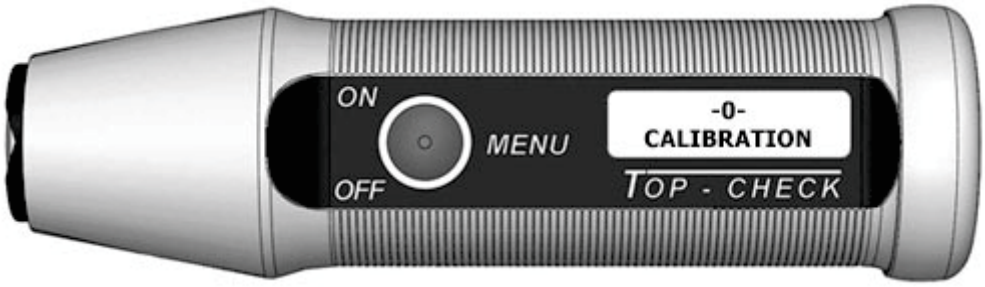


The automatic switch-off time on delivery is 1 minute. This can be changed in the menu **SETUP**.

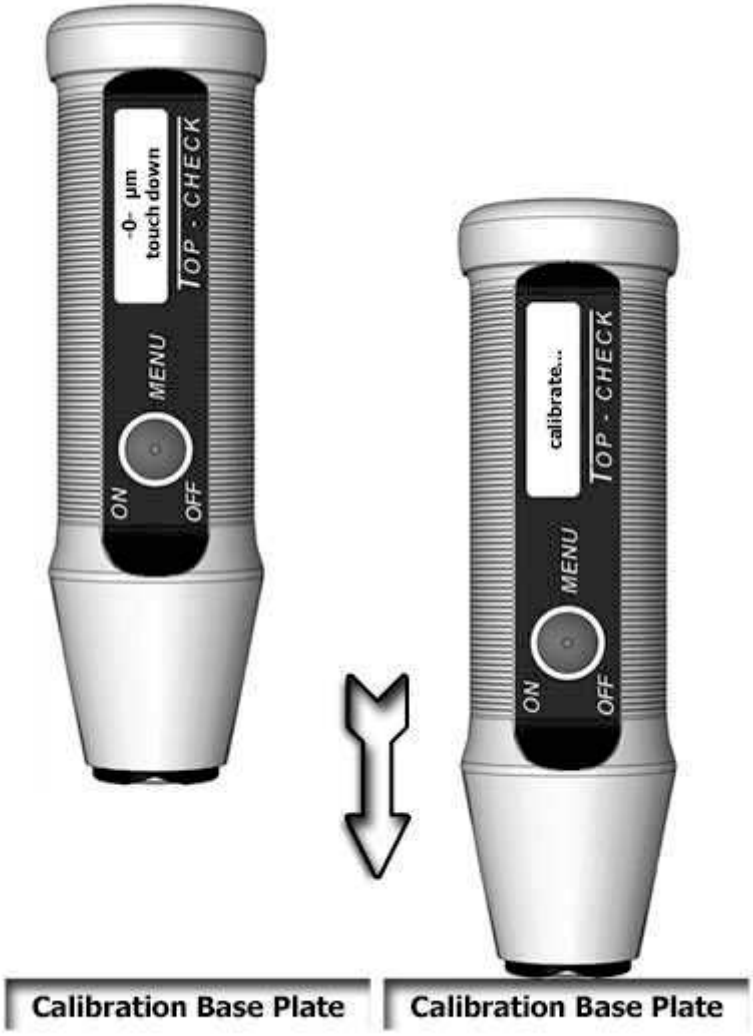
b. CALIBRATE

According to standard specification ISO 2178, it is recommended to recalibrate the instrument, if measurements are taken on small or curved parts, on parts with a higher surface roughness or on different base materials.

-0- CALIBRATION



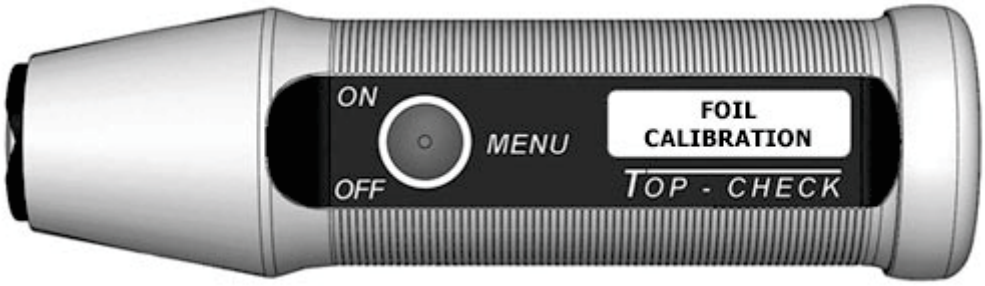
In the raised state activate **-0- CALIBRATION**, then apply the device with the measuring probe to the bare FE calibration base plate and wait until 0.0 µm is displayed and confirmed by a long sound.



If you have to measure **on materials other than flat steel**, please perform the calibration on an uncoated original part instead of on the calibration base plate. This applies in particular to curvatures, round material or special alloys.

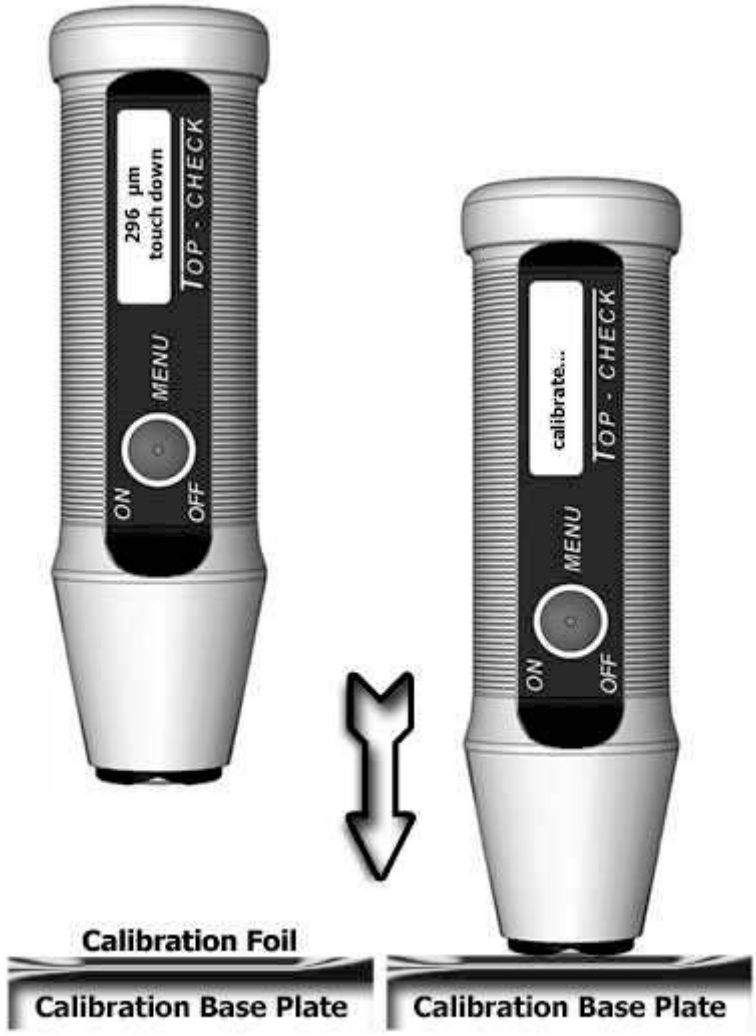
FOIL CALIBRATION

The foil calibration assigns a second calibration point for an accurate calibration of the device (two-point calibration).



Place the approx. 300 µm calibration foil on the bare FE calibration base plate.

In the raised state activate **FOIL CALIBRATION**, then apply the device with the measuring probe to the measuring foil and wait until the foil value is displayed and confirmed by a long sound.



The measuring foil with the higher value (approx. 300 µm) should be always used for an accurate calibration of the whole measuring range.
The calibration for FE measurements is carried out on the blue FE base plate.

The device can also be calibrated with the optionally available 1 mm ceramic plate to achieve even greater accuracy, and particularly in the case of measurements in the higher measuring range (2 mm and up).

FOIL ADJUST

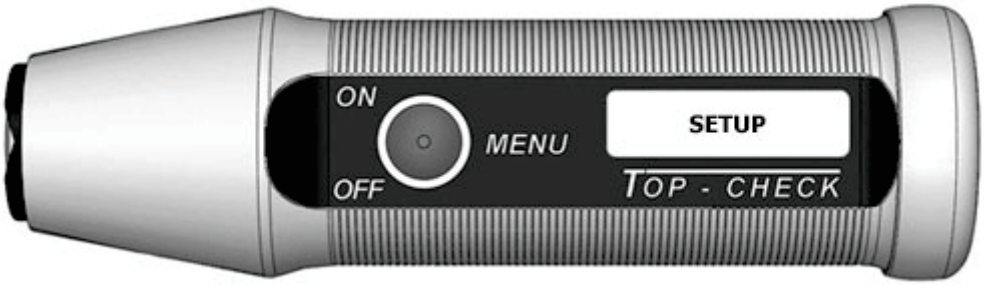
The calibration foils are approximately 300 µm thick. The exact value is written on the foil. When delivered, the foil value is set to the supplied foil. If you replace the foil, this foil value must be adjusted to the new foil.

A short press of the button changes the foil value in 1 µm steps; after releasing the button for at least 1 second, the **<** sign switches to **>** and back in order to increase or decrease the foil value.

To change the foil thickness, the values will be increased or decreased automatically after the tenth step in one direction until the button is pressed again to stop. The accurate value can be adjusted by a single press of the button in both directions.

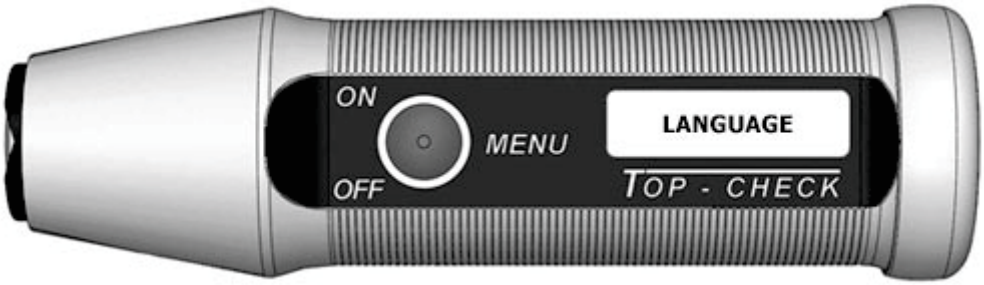
The foil value is confirmed and saved by pressing and holding the button.

C. SETUP



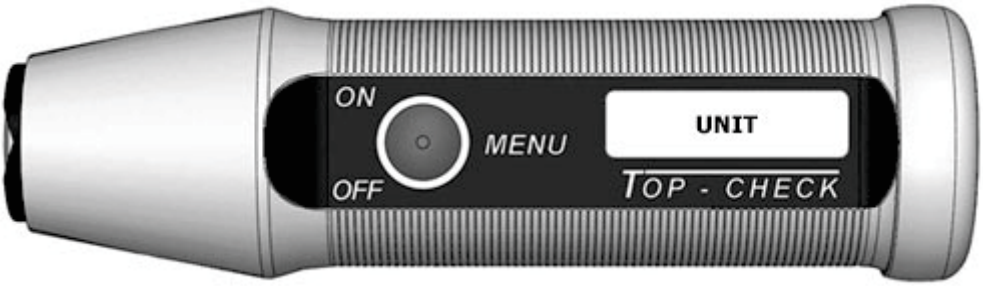
LANGUAGE

Selection of the menu language – ENGLISH or GERMAN.



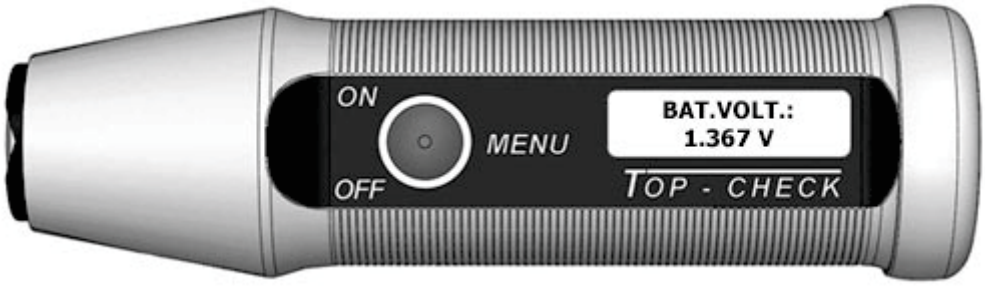
UNIT

Selection of the measuring unit – µm or mils.



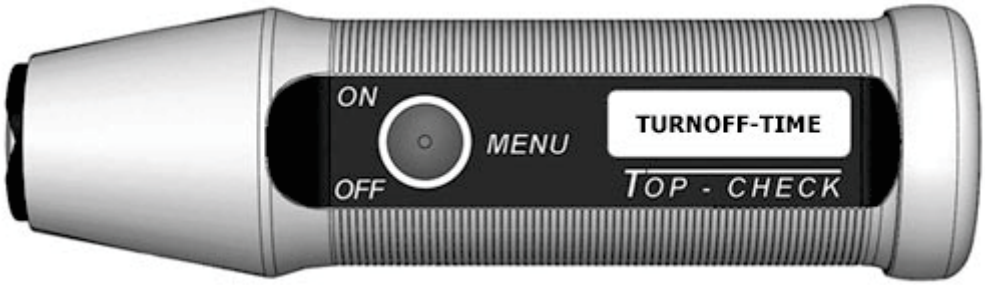
BATTERY

Displays the current battery voltage.

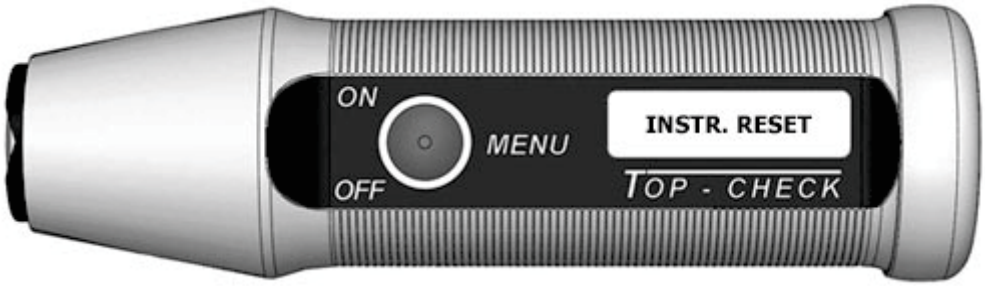


TURNOFF-TIME

Selection of the automatic switch-off time of the device (2 minutes / 15 minutes / off = device is always switched on). Only in special cases, **off** should be selected, since the power consumption can greatly increase as a result.



INSTRUMENT RESET



If the device can no longer be calibrated properly or if other malfunctions occur the works calibration can be restored here by means of an instrument reset. When doing this the device switches off automatically.

5. IMPORTANT NOTES

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

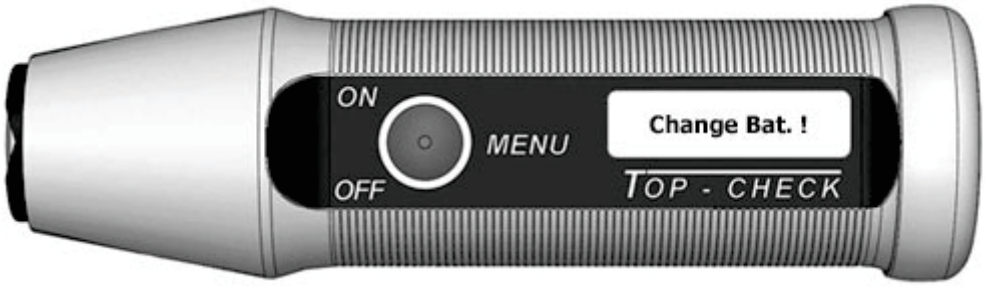
- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

- If the message **Bluetooth Err.** should appear when switching the Bluetooth interface on, and if this message does not disappear after several attempts to switch it on, then the Bluetooth interface is defective, and the device should be sent in for repair.

RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0,3 mm minimum

6. BATTERY REPLACEMENT



The battery must be replaced as soon as the warning **Change Bat.** Appears.

The device switches off automatically if the battery voltage falls below 1.0 V.

Please use only leak-proof batteries

7. TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178)
Measuring probe:	TOP-CHECK FE: swivel-mounted 90° TOP-CHECK FE-1000: sensing device, springy
Measuring range:	TOP-CHECK FE: on steel and iron: 0-5000 µm TOP-CHECK FE-1000: on steel and iron: 0-1000 µm
Smallest Area:	TOP-CHECK FE: ø 8 mm TOP-CHECK FE-1000: ø 2 mm
Smallest curvature radius:	TOP-CHECK FE: convex: 4 mm, concave: 38 mm TOP-CHECK FE-1000: convex: 1 mm, concave: 6 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

We supply:

- Coating Thickness Meters
- Magnetic Field Meters
- Magnetic Permeability Meters
- Magnetizing and Demagnetizing Equipment

We advise and provide tailor-made solutions for your specialized requirements in magnetizing, demagnetizing and measuring

Fast calibration and repair service

List-Magnetik Dipl.-Ing. Heinrich List GmbH
D-70771 Leinfelden-Echterdingen Max-Lang-Str. 56/2
Fon: + 49 (711) 903631-0 Fax: + 49 (711) 903631-10
Internet: https://www.list-magnetik.com
E-mail: info@list-magnetik.de

QM-System
ISO 9001:2015 zertifiziert

OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK FN-B

Firmware Version 10.1 and up

2022-09

List-Magnetik Dipl.-Ing. Heinrich List GmbH
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QM-System
ISO
9001:2015
zertifiziert

TABLE OF CONTENTS

TOP-CHECK FN-B (2022-09)

1. INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK FN has a combined probe that measures insulating layers of paint, varnish, plastic, rubber, ceramics and galvanic coatings (except nickel) in a magnet-inductive measuring method. The device is used on iron and steel subsoil. It is also suitable for measuring insulating layers, according to the eddy current method, on non-ferrous metals such as aluminum, brass, copper, bronze and non-magnetic stainless steels, according to ISO 2178 and ISO 2360. **TOP-CHECK FN-B** supplements these services by data logger and Bluetooth interface.

To easily manage and send your measurement data with TOP-CHECK FE-B and TOP-CHECK FN-B, you can use the free Mobile App for Android and the free transfer TOP-CHECK TRANSFER software for PC.

2. QUICK START GUIDE

The device is calibrated ex works and can be used immediately on flat steel and aluminum. For special geometries and materials, please perform a calibration.

Switch On: Press and hold the red button until **READY** is displayed

Measuring: Apply the device with the measuring probe on the coated item and wait for a sound signal which indicates that the measurement and the thickness value will be displayed. (Measurements on FE metals – 1x sound, measurements on NFE metals – 2x sound).

Switch Off: Press and hold the red button, until the display is switched off

3. USING THE MENU VIA THE RED BUTTON

You can scroll through the menu functions with short presses on the button.

The desired menu function is activated by pressing and holding the button (long sound).

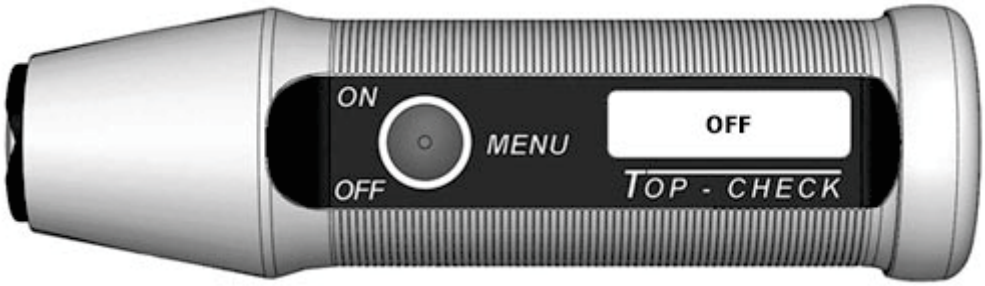
The menu functions can be only called up when the measuring probe is not applied.

At the end of each submenu appears **BACK**, with which you can return to the upper menu level.

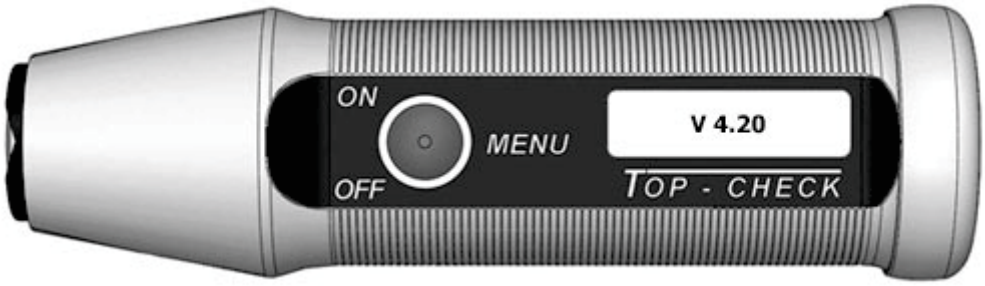
On delivery, **English** is the preselected language. This can be changed to **German** in the menu **SETUP** / **LANGUAGE**.

4. MENU FUNCTIONS

a. OFF



The device is manually switched off by pressing and holding the button (long sound). If the button is kept pressed for more than 3 seconds after switching off, then the program version is displayed before the device switches off.

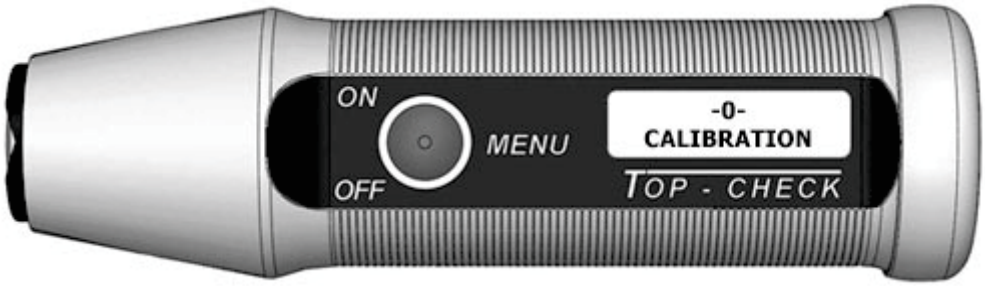


The automatic switch-off time on delivery is 1 minute. This can be changed in the menu **SETUP**.

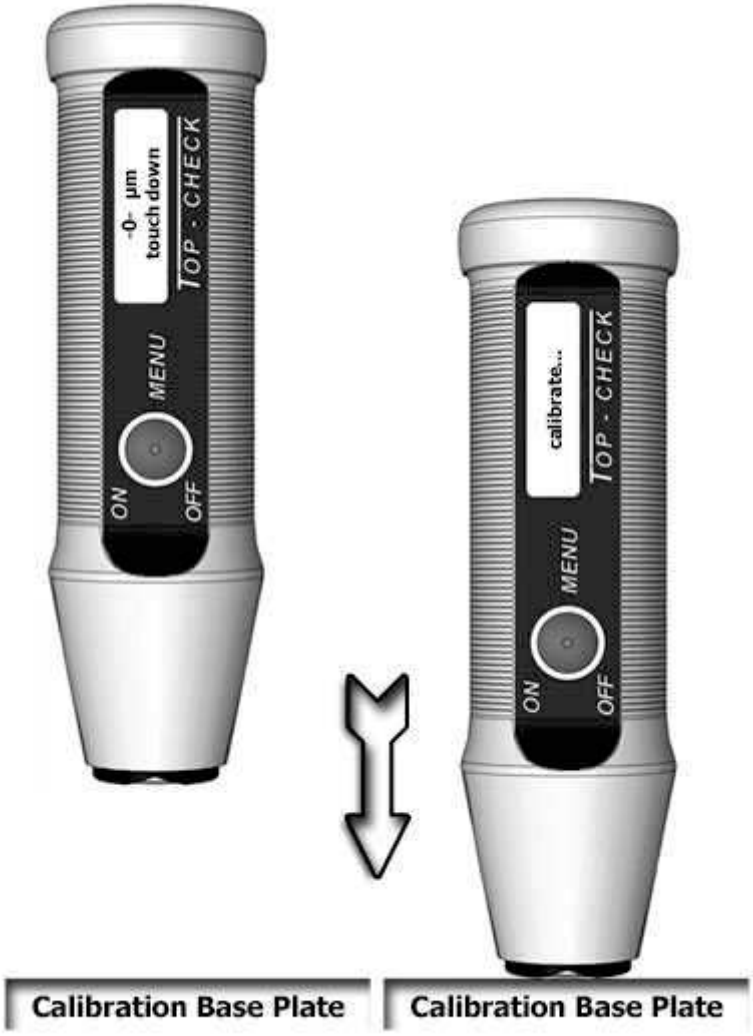
b. CALIBRATE

According to standard specification ISO 2178, it is recommended to recalibrate the instrument, if measurements are taken on small or curved parts, on parts with a higher surface roughness or on different base materials. **The calibration must be performed separately on both calibration base plates (FE and NFE).**

-0- CALIBRATION



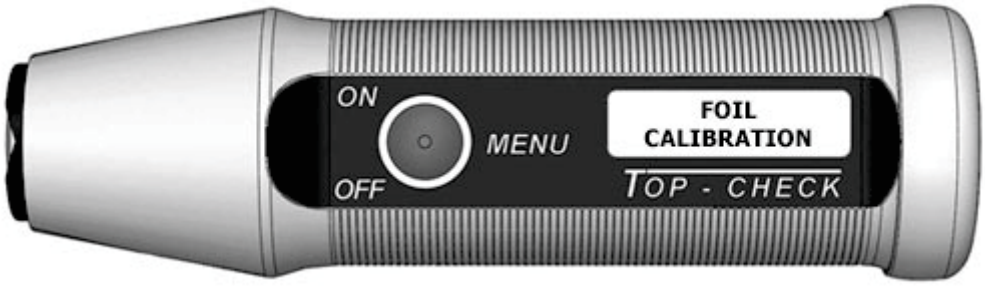
In the raised state activate **-0- CALIBRATION**, then apply the device with the measuring probe to the bare FE / NFE calibration base plate and wait until 0.0 µm is displayed and confirmed by a long sound on FE or two short sounds on NFE.



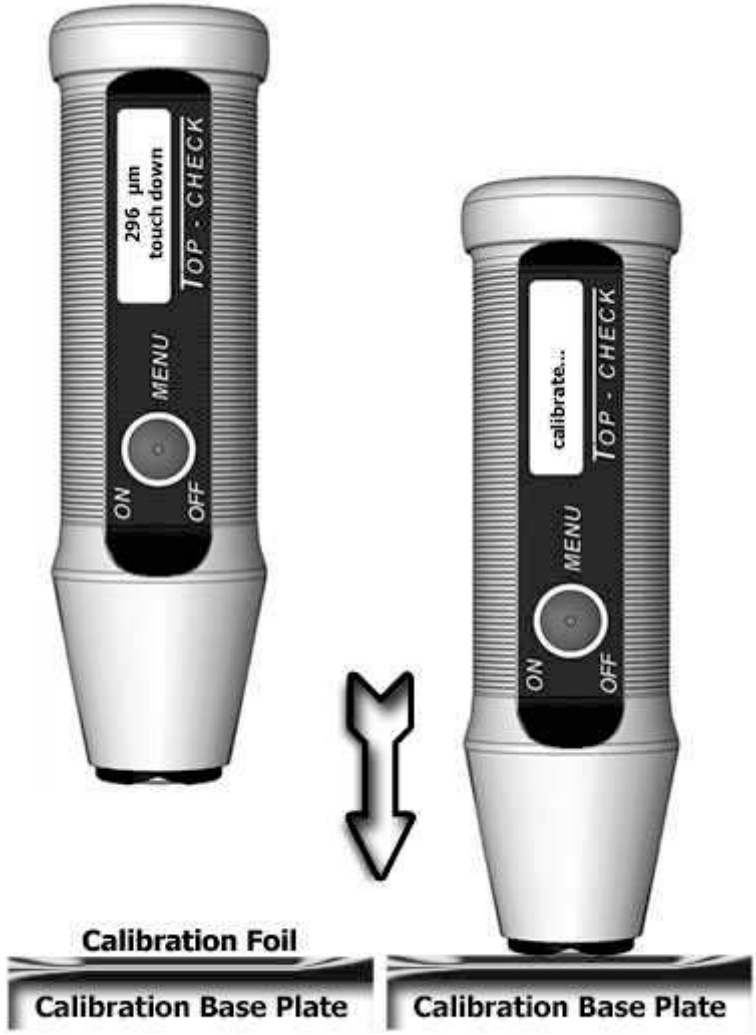
If you have to measure **on materials other than flat steel or aluminum**, please perform the calibration on an uncoated original part instead of on the calibration base plate. This applies in particular to curvatures, round material or special alloys.

FOIL CALIBRATION

The foil calibration assigns a second calibration point for an accurate calibration of the device (two-point calibration).



Place the approx. 300 µm calibration foil on the bare FE / NFE calibration base plate. In the raised state activate **FOIL CALIBRATION**, then apply the device with the measuring probe to the measuring foil and wait until the foil value is displayed and confirmed by a long sound on FE or two short sounds on NFE.



The measuring foil with the higher value (approx. 300 µm) should always be used for an accurate calibration **of the whole measuring range**.
The calibration for **FE measurements** is carried out **on the blue FE** base plate, the calibration for **NFE measurements on the red NFE** base plate.

The device can also be calibrated with the optionally available 1 mm ceramic plate to achieve even greater accuracy, and particularly in the case of measurements in the higher measuring range (2 mm and up).

FOIL ADJUST

The calibration foils are approximately 300 µm thick. The exact value is written on the foil. When delivered, the foil value is set to the supplied foil. If you replace the foil, this foil value must be adjusted to the new foil.

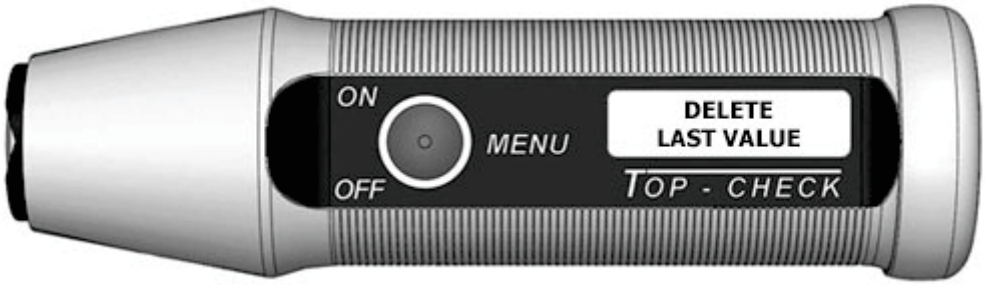
A short press of the button changes the foil value in 1 µm steps; after releasing the button for at least 1 second, the **<** sign switches to **>** and back in order to increase or decrease the foil value.

To change the foil thickness, the values will be increased or decreased automatically after the tenth step in one direction until the button is pressed again to stop. The accurate value can be adjusted by a single press of the button in both directions.

The foil value is confirmed and saved by pressing and holding the button.

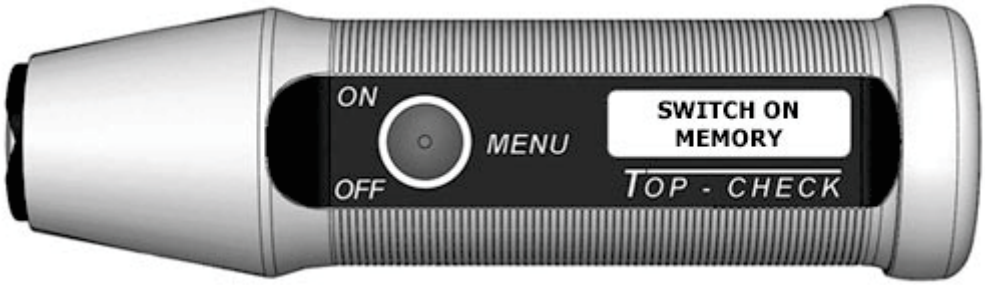
C. MEMORY

DELETE LAST VALUE



Deletes the last-saved measured value.

SWITCH ON / OFF MEMORY

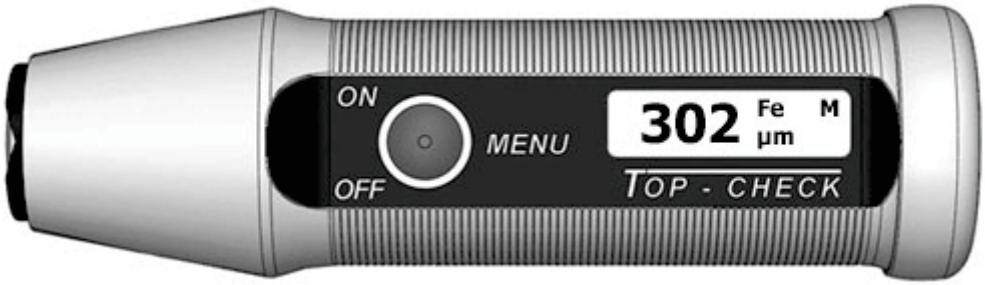


Switches the memory / data logger on or off.

After switching on the memory, the device automatically saves all FE measured values in the FE memory and all NFE measured values in the NFE memory (a maximum of 500 measured values in each case).

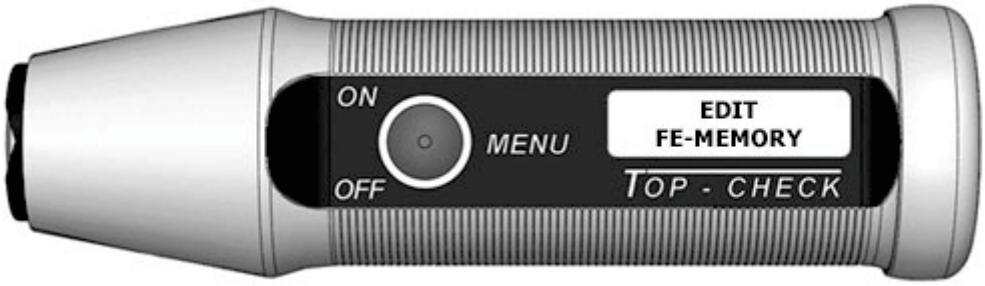
If the memory capacity is exceeded (more than 500 measured values) a warning message appears on the display and no further measured values are saved.

The symbol **M** appears on the display at the top right to indicate that the memory is switched on.



When switching the device on again the message **MEMORY ON** is briefly displayed, that is, if the memory has been used previously.

EDIT FE-MEMORY/ NFE-MEMORY

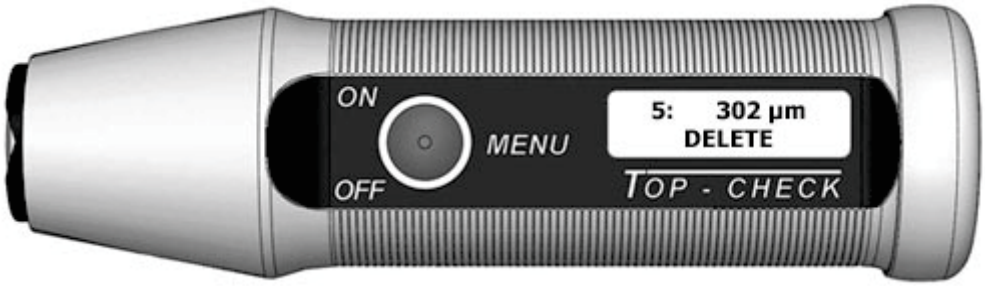


The measured values entered in the memory are statistically evaluated:

No.:	–	number of measured values saved
Min:	–	smallest measured value saved
Max:	–	largest measured value saved
Mean:	–	average value
Std.Dev:	–	standard deviation

The statistical values are displayed first with each press of the button, and after that, the numbered individual measured values are displayed.

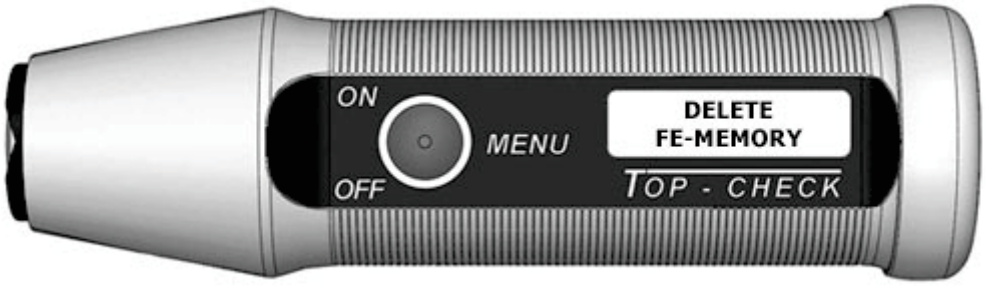
By pressing and holding the button when displaying an individual measured value, it is possible to delete it from the measurement series:



You can confirm the deletion of the measured value by pressing and holding the button, or return to the display of the individual measured values without deleting it by a short press of the button.

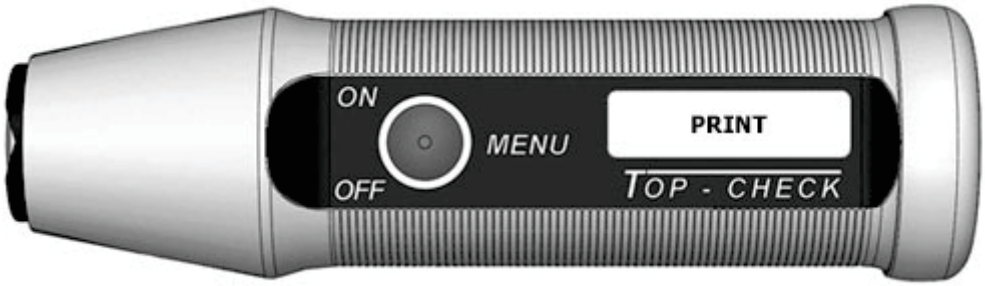
To exit from the sub-menu, wait until **READY** appears on the display.

DELETE FE-MEMORY / NFE-MEMORY



This deletes the entire contents of the memory.

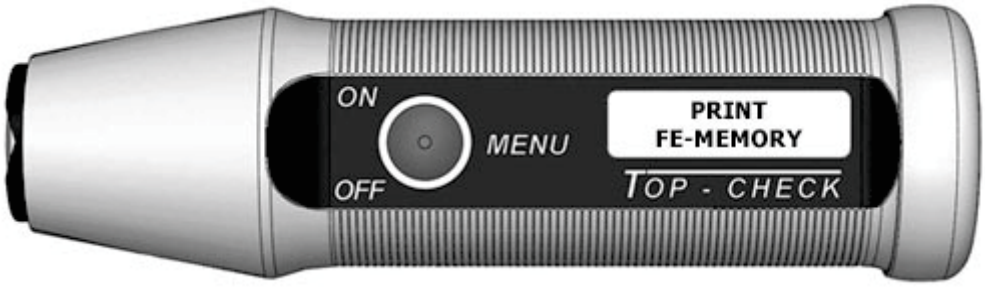
d. PRINT



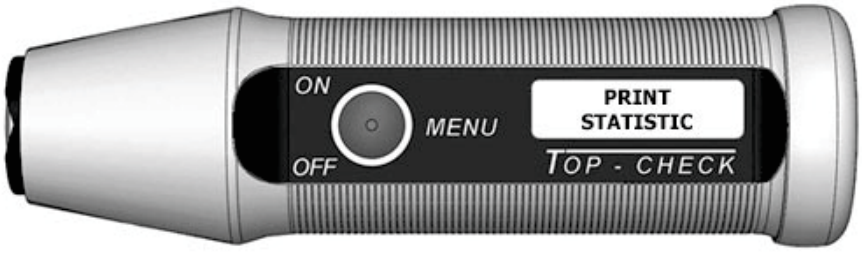
With this function, you can transfer data to the printer **TOP-PRINT4.**
When selecting a printer function (Print Memory, Online printing) first, after switching on the device, the connection is done automatically and can take up to 20 seconds. First switch on the printer, then start the process on the TOP-CHECK (displays **Printer connecting...**). **Please hold the device tight to the printer for this connection process.**

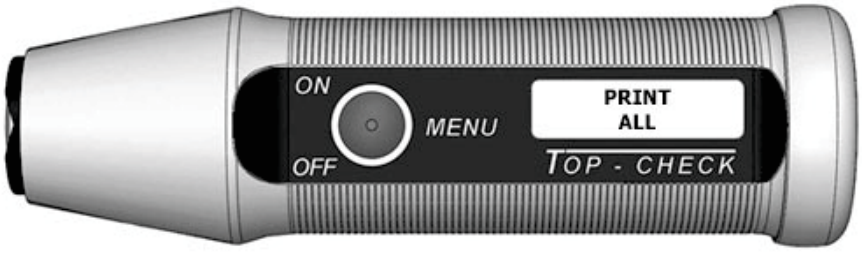
After switching off the device, to print again you need to reconnect to the printer.

PRINT FE-MEMORY / NFE-MEMORY



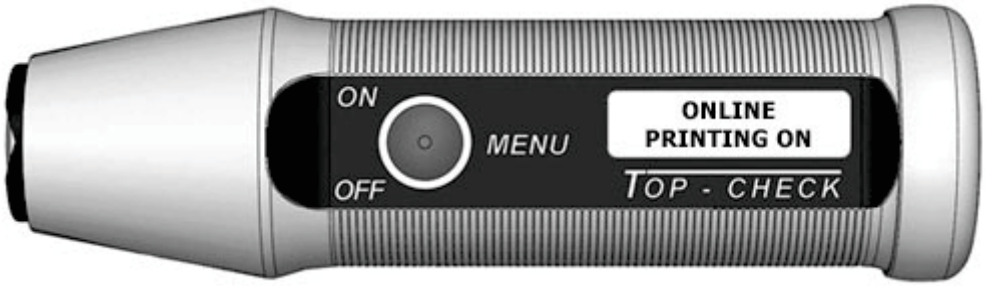
Here you can select, whether only the statistical values (saves paper if there are a large number of measured values) or both statistic and all measured values should be printed.



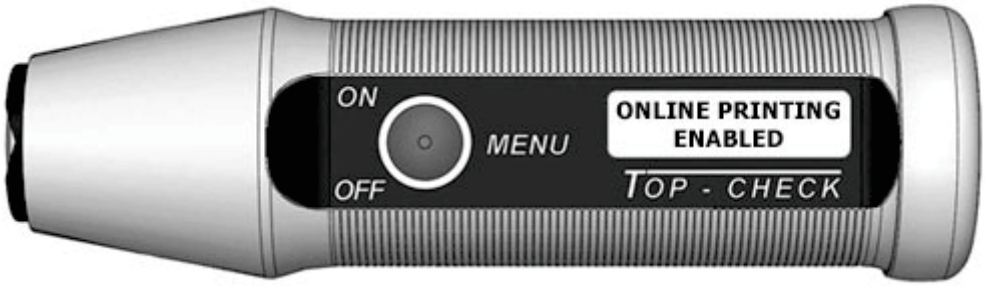


The parallel use of **Online printing** and **Print memory** is not possible. When **Online printing** is enabled, and you plan to print a memory, please first disable **Online printing**.

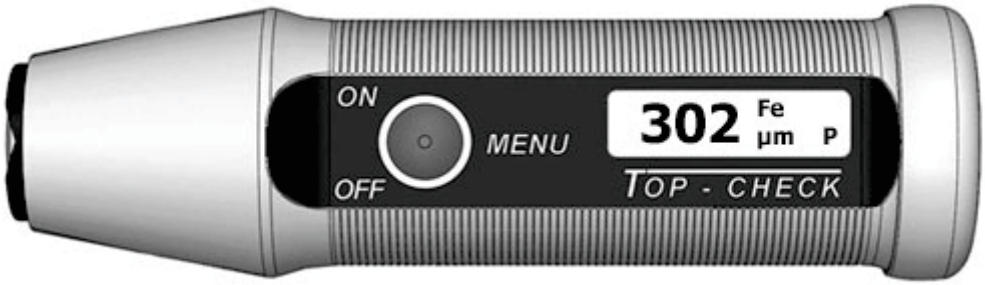
ONLINE PRINTING ON / OFF



With a long press on the red button, you can change the printing mode to either **printing on**, or **printing off**.



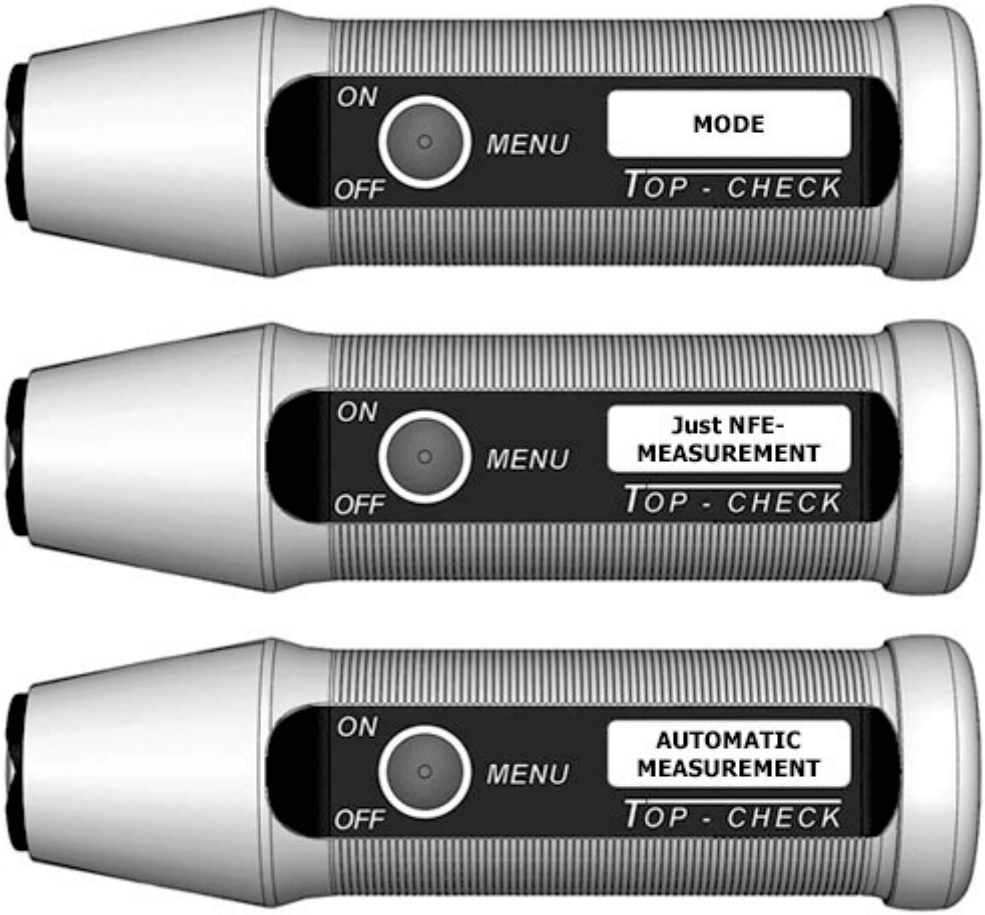
To notify about an active online printer connection, **P** is displayed on the down right side.



The parallel use of **Online printing** and **Print memory** is not possible. When **Online printing** is enabled, and you plan to print a memory, please first disable **Online printing**.

The parallel use of **Online printing** and **Online measuring** is not possible - if **Online measuring** is switched on, it will be automatically switched off here.
To return to **Online measuring** from **Online printing**, you are requested to switch off and on again the device.

e. MODE / JUST NFE- OR AUTOMATIC MEASUREMENT



AUTOMATIC MEASUREMENT is switched on as standard. The measuring probe recognizes the base material (FE or NFE) and automatically switches to the correct measuring mode (magnetic-inductive on FE or eddy current method on NFE).

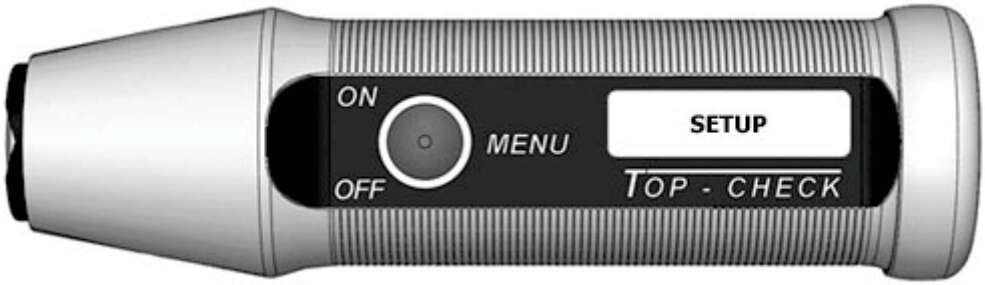
In some special cases, you can switch the device to **Just NFE MEASUREMENT**. Measurements then take place using the eddy current method only:

- Measurement of a paint or varnish coating on galvanized sheet steel. In automatic mode both coatings are measured together here. If **Just NFE MEASUREMENT** is activated, only the individual paint or varnish coat on the zinc plating is measured. Hence, the thickness of the zinc layer can be determined from the difference between the two measuring modes. In order to avoid incorrect measuring the zinc layer must be > 30 µm. Also, the zero calibration should be performed using the eddy current method on an identical steel sheet without coating.

- Measurement on slightly magnetic stainless steel. In **AUTOMATIC MEASUREMENT** mode, the measuring probe cannot switch to the eddy current mode and a false measured value will be displayed. Here again, the zero calibration must be performed using the eddy current method on identical uncoated stainless steel.

When measuring again on ferromagnetic steels it is essential to switch back to **AUTOMATIC MEASUREMENT**.

f. SETUP



BLUETOOTH

For transferring data to a Windows PC, we deliver a Bluetooth dongle. Plug it into an unused USB port. The Windows driver is then automatically activated and the associated virtual serial interface is generated.

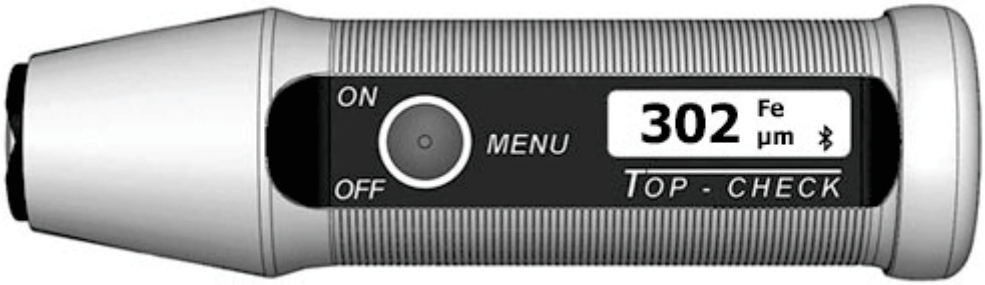
Should you face problems with the automatic installation, please refer to **https://www.list-magnetik.com** in the category **download** for a driver for various Windows releases.

In order to transfer the measured values to a PC or mobile device, TOP-CHECK and PC / mobile device must be paired via Bluetooth. For this, the Bluetooth interface must be switched on in the meter (**SETUP / BLUETOOTH / ON**), and a device scan must be performed on the PC / mobile device in the Bluetooth menu. Then, the identified measuring device must be selected and paired to the PC / mobile device.

TOP-CHECK identifies with its MAC address. This unique device number (a row of numbers and letters) can be displayed in the **SETUP / BLUETOOTH / MAC ADDRESS** menu.

After pairing, the **TOP-CHECK APP** has to be connected via the menu item **Connect Bluetooth**. With the PC software TOP-CHECK TRANSFER the selection of an interface (COM port) is required. The used COM port can be obtained via Windows / system / device manager / Bluetooth.

To indicate that a Bluetooth connection is active, the Bluetooth symbol ᛒ appears at the bottom-right of the display.



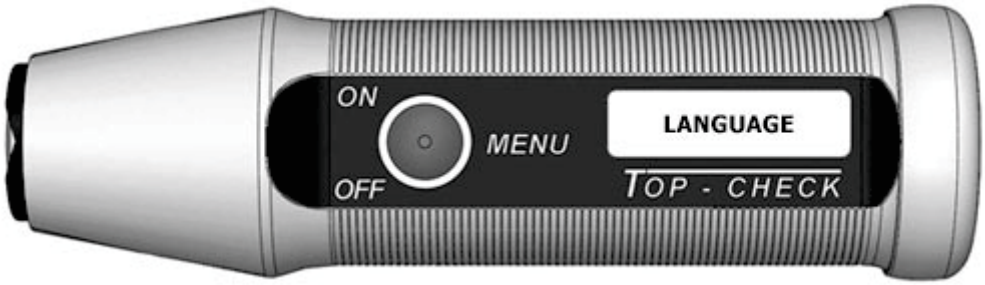
As soon as the Bluetooth interface is switched on, TOP-CHECK App and TOP-CHECK TRANSFER can communicate with the TOP-CHECK device, for example transfer the memory, or receive online measurements.

The Bluetooth interface can be switched off and on again, without repeating the pairing process. When the Bluetooth interface is switched off, the power consumption of the device is lower.

SETUP / BLUETOOTH / BLUETOOTH OFF
or
SETUP / BLUETOOTH / BLUETOOTH ON

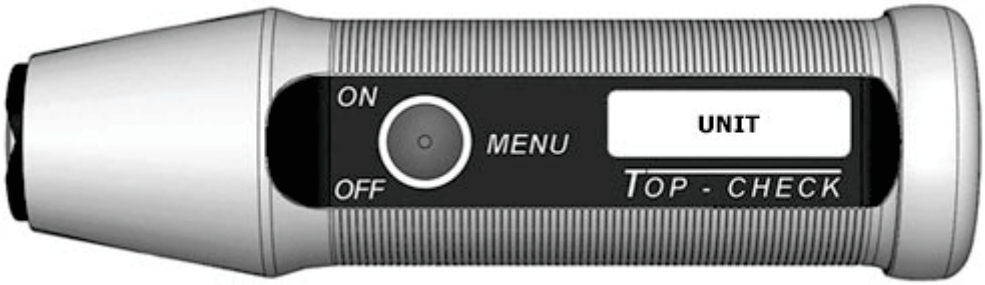
LANGUAGE

Selection of the menu language – ENGLISH or GERMAN.



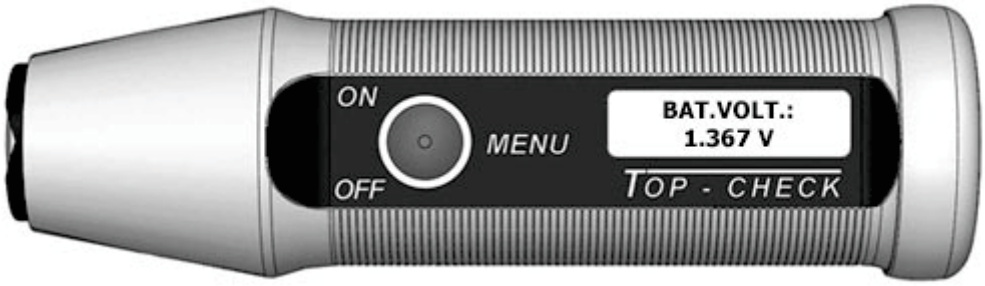
UNIT

Selection of the measuring unit – µm or mils.



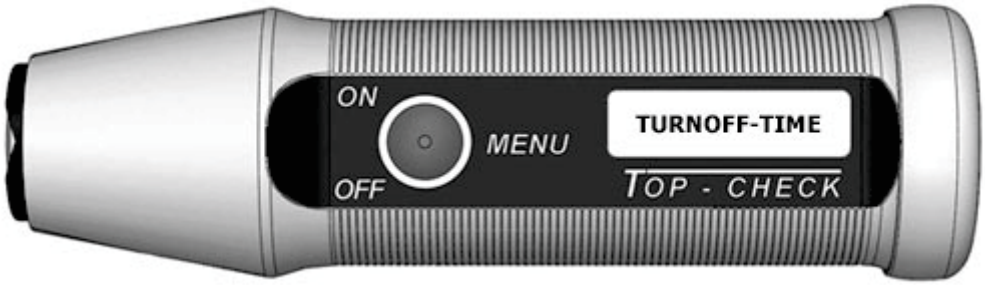
BATTERY

Displays the current battery voltage.

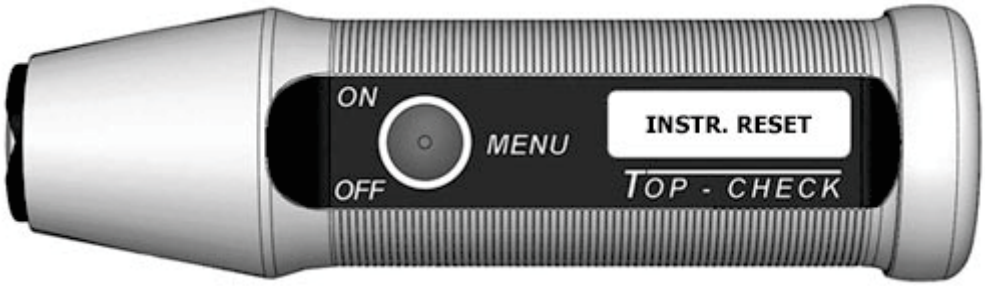


TURNOFF-TIME

Selection of the automatic switch-off time of the device (2 minutes / 15 minutes / off = device is always switched on). Only in special cases, **off** should be selected, since the power consumption can greatly increase as a result.



INSTRUMENT RESET



If the device can no longer be calibrated properly or if other malfunctions occur the works calibration can be restored here by means of an instrument reset. When doing this the **FE and NFE memory is also cleared** and the device switches off automatically.

5. IMPORTANT NOTES

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

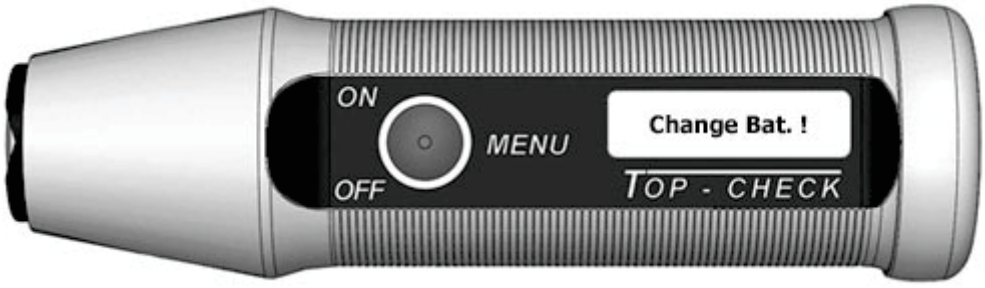
- If the message **Bluetooth Err.** should appear when switching the Bluetooth interface on, and if this message does not disappear after several attempts to switch it on, then the Bluetooth interface is defective, and the device should be sent in for repair.

RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0,3 mm minimum

Base material non-ferrous metal (NFE): 0,2 mm minimum

6. BATTERY REPLACEMENT



The battery must be replaced as soon as the warning **Change Bat.** Appears.

The device switches off automatically if the battery voltage falls below 1.0 V.

Please use only leak-proof batteries

7. TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178) measurement of insulating layers on non-ferrous metals (ISO 2360) automatic detection of base material
Measuring probe:	swivel-mounted 90°
Measuring range:	on steel and iron: 0-5000 µm, on NFE metals: 0-2000 µm
Smallest Area:	ø 8 mm
Smallest curvature radius:	convex: FE 4 mm, NFE 6 mm, concave: 38 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English
Data logger:	2 x 500 measurements
Statistics:	Count / Maximum / Minimum / Average / Standard deviation
Interface:	Bluetooth 4.0 interface class 2 for communication with PC and TOP-CHECK App
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

8. AVAILABLE APPLICATIONS

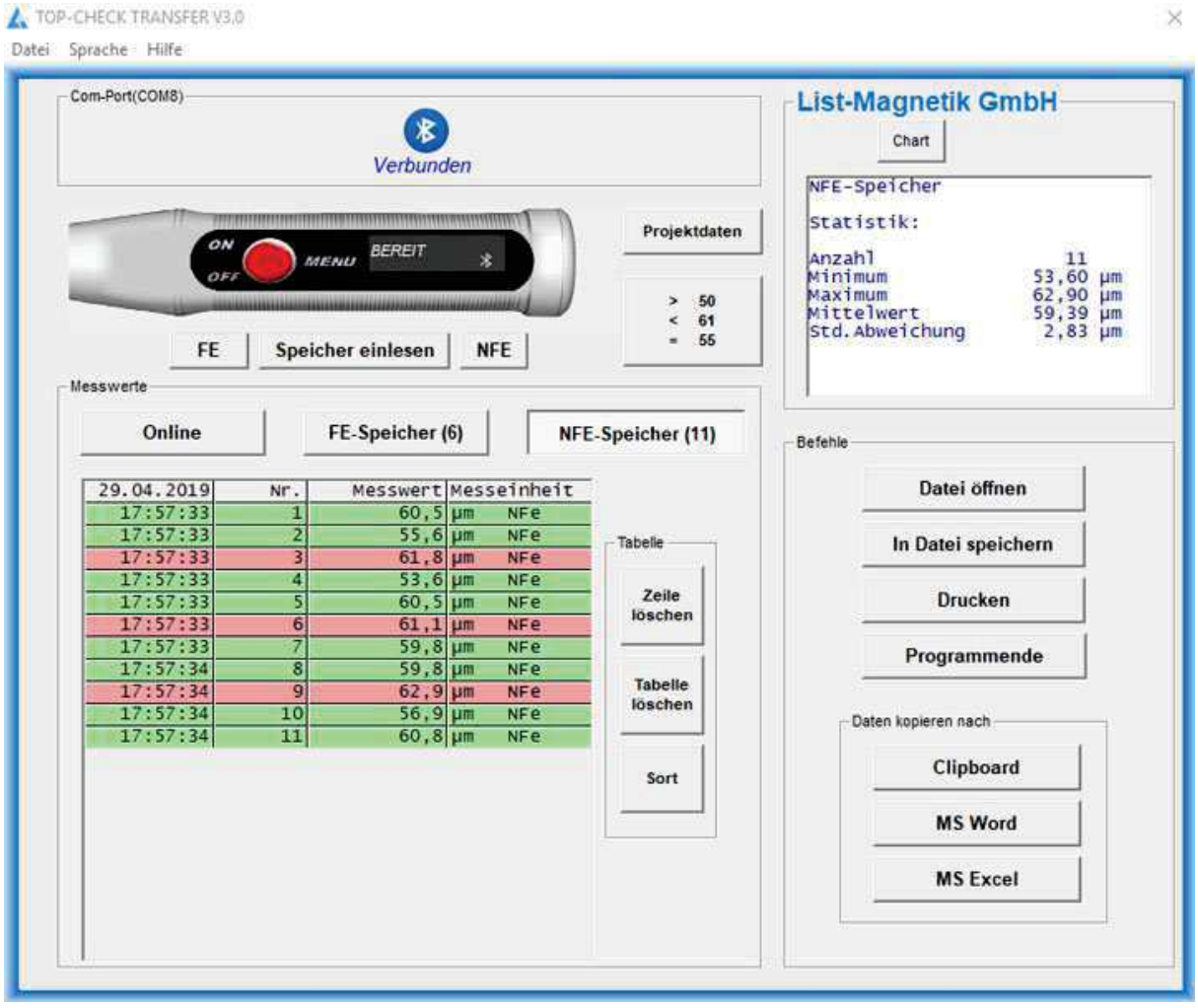
TOP-CHECK APP

For transfer of measurement readings to android smart phone or tablet, available free at Google Play Store.

TOP-CHECK TRANSFER

On www.list-magnetik.com, in the category **Applications,** you may obtain the free of charge data transfer application **TOP-CHECK TRANSFER**, to transfer measurement data to your PC.

With TOP-CHECK TRANSFER, you can measure online or read the device's memory, you can evaluate the data statistically or visualize as chart. You can print the results or hand over the data to applications like Microsoft Word and Microsoft Excel.



9. THERMAL PRINTER TOP-PRINT4

Small, battery powered printer for measurement values and statistics.

Technical data

Printing method:	Thermal printer
Characters/line:	32
Transfer speed:	38400 baud
Interface:	Bluetooth class 2 and Serial
Paper:	Thermal paper 57 mm wide – max. 10 m long
Power supply:	Li-Io rechargeable battery (approx. 60 hours of operation)
Dimensions:	100 x 75 x 45 mm
Weight	210 g

Operating instructions

1. Insert paper roll
2. Switch on printer (is it already charged? See below)
3. Switch on the device

Charging the built-in Li-Io rechargeable battery

When delivered new, the Li-Io rechargeable battery in the TOP-PRINT4 must be charged up before first-time use. The rechargeable battery is charged up with the mains charger supplied. The cable from the mains charger is plugged into the connection socket on the right-hand side. **The charging time should be at least 4 hours.** The blue LED blinks during the charging process; it lights steadily when the battery is fully charged. The charger then switches automatically to maintenance charging mode. The capacity of the rechargeable battery is sufficient for approx. 60 hours of operation.

Notes on operation

1. The paper is manually transported using the **Feed** key. After completion of the printout the paper strip is transported out of the housing by pressing this key and can then be cut off cleanly.
2. Faulty printout: The **TOP-PRINT4** must be charged up again if individual lines of the printout are not printed correctly.
3. Inserting a new paper roll: Open the cover, Insert the paper roll, pull out the end of the paper, Close the cover

INSTALLING THE BLUETOOTH USB DONGLE

The installation of this software can be necessary for the communication between TOP-CHECK and a Windows PC.
First of all, please try, if the connection between TOP-CHECK and your PC via Bluetooth works without software installation, by plugging in the Bluetooth receiver.

If this does not work immediately, please install the BRLink software available on **https://www.list-magnetik.com** in the category **Download** as BRLink_V_1.1.0.34.zip.

TOP-CHECK APP FOR ANDROID

TOP-CHECK App runs on Android devices and enables you to transfer your measurements to a mobile device or tablet PC, where you may administrate or forward your series of measurements.

Scanning this QR code you will directly be connected to Google Play Store for the installation of TOP-CHECK App.

We supply:

- Coating Thickness Meters
- Magnetic Field Meters
- Magnetic Permeability Meters
- Magnetizing and Demagnetizing Equipment

We advise and provide tailor-made solutions for your specialized requirements in magnetizing, demagnetizing and measuring

Fast calibration and repair service

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Internet: https://www.list-magnetik.com
E-mail: info@list-magnetik.de

QM-System
ISO 9001:2015 zertifiziert

OPERATION MANUAL

COATING THICKNESS METER

TOP-CHECK FE-B/FE-1000-B

Firmware Version 10.1 and up

2022-09

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E-mail: info@list-magnetik.de

QM-System
ISO
9001:2015
zertifiziert

TABLE OF CONTENTS

TOP-CHECK FE-B/FE-1000-B (2022-09)

1. INTRODUCTION

With the integrated, world-wide unique 90° swivel-mounted probe of the **List-Magnetik TOP-CHECK** coating thickness meters, you always carry out precise measurements. The compact, lightweight devices are barely larger than a probe and are therefore ideal for on-site applications in areas that are difficult to access. For interference-free measurements in harsh environments, the handy metal housing is splash-proof, in accordance with IP 64. Optionally, we also offer equipment with flow-water protection. The measuring probe has a wear-resistant ruby probe pole for a long service life with frequent measurement on rough surfaces.

The **LIST MAGNETIK TOP-CHECK FE-1000-B** coating thickness meters use a probe that requires little contact area and low pressure. The compact devices are barely larger than a measuring probe and are particularly suitable for measuring thin layers on uneven or complex ground, for example tinplate cans.

The devices are very easy to use, with the press of a button, and the self-explanatory multilingual menu.

TOP-CHECK FE is ideal for iron and steel substrates. The device measures insulating layers of lacquer, paint, plastic, rubber, ceramic and galvanic coatings (except nickel) according to ISO 2178. **TOP-CHECK FE-B** supplements the performance spectrum by data logger and Bluetooth interface.

To easily manage and send your measurement data with TOP-CHECK FE-B and TOP-CHECK FN-B, you can use the free Mobile App for Android and the free transfer TOP-CHECK TRANSFER software for PC.

2. QUICK START GUIDE

The device is calibrated ex works and can be used immediately on flat steel. For special geometries and materials, please perform a calibration.

Switch On: Press and hold the red button until **READY** is displayed

Measuring: Apply the device with the measuring probe on the coated item and wait for a sound signal which indicates that the measurement and the thickness value will be displayed. (Measurements on FE metals – 1x sound).

Switch Off: Press and hold the red button, until the display is switched off

3. USING THE MENU VIA THE RED BUTTON

You can scroll through the menu functions with short presses on the button.

The desired menu function is activated by pressing and holding the button (long sound).

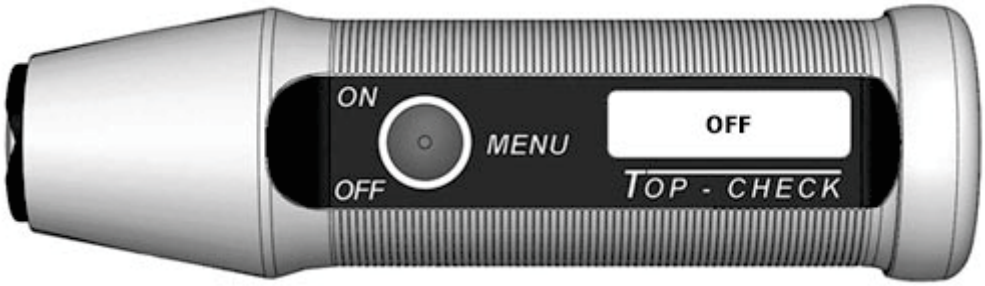
The menu functions can be only called up when the measuring probe is not applied.

At the end of each submenu appears **BACK**, with which you can return to the upper menu level.

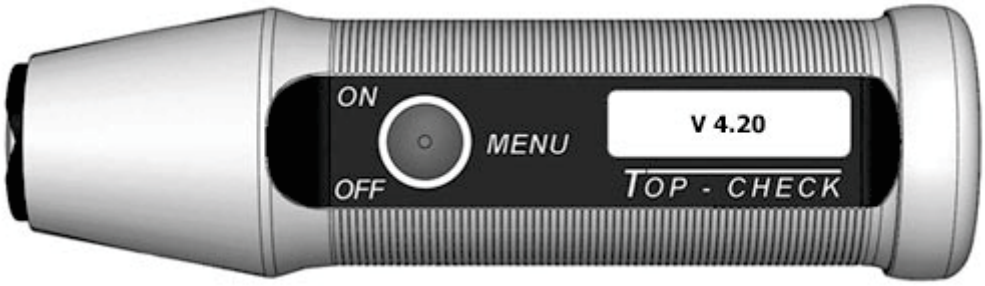
On delivery, **English** is the preselected language. This can be changed to **German** in the menu **SETUP** / **LANGUAGE**.

4. MENU FUNCTIONS

a. OFF



The device is manually switched off by pressing and holding the button (long sound). If the button is kept pressed for more than 3 seconds after switching off, then the program version is displayed before the device switches off.

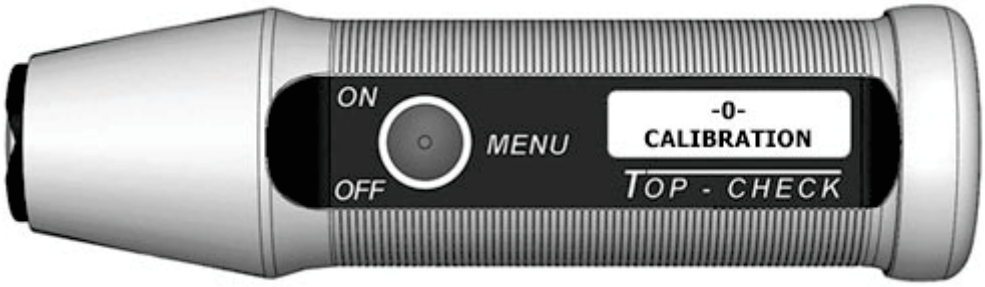


The automatic switch-off time on delivery is 1 minute. This can be changed in the menu **SETUP**.

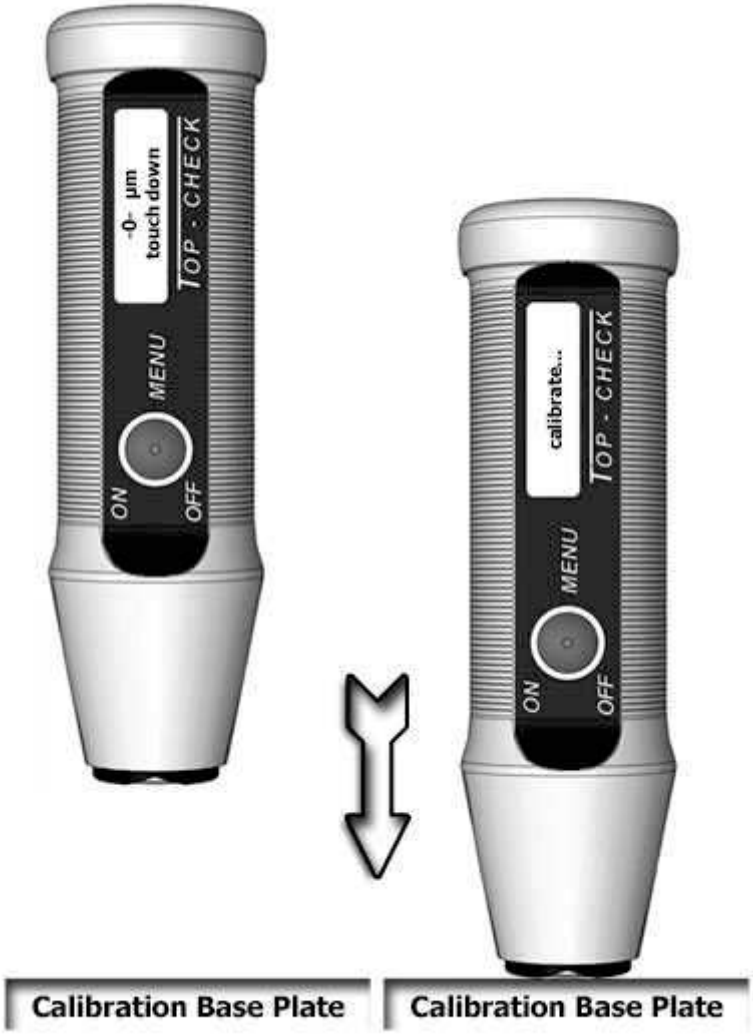
b. CALIBRATE

According to standard specification ISO 2178, it is recommended to recalibrate the instrument, if measurements are taken on small or curved parts, on parts with a higher surface roughness or on different base materials.

-0- CALIBRATION



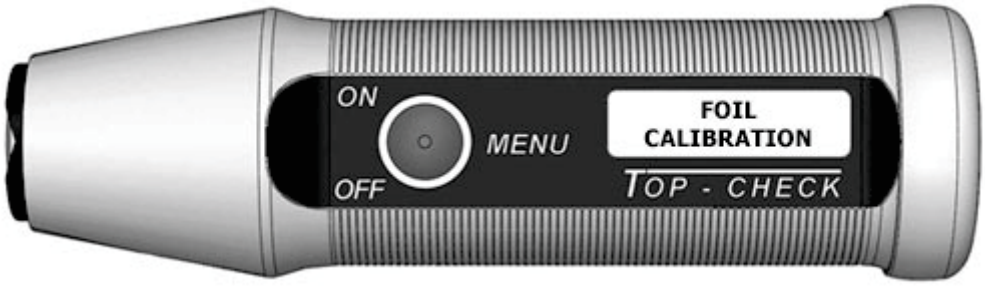
In the raised state activate **-0- CALIBRATION**, then apply the device with the measuring probe to the bare FE calibration base plate and wait until 0.0 µm is displayed and confirmed by a long sound.



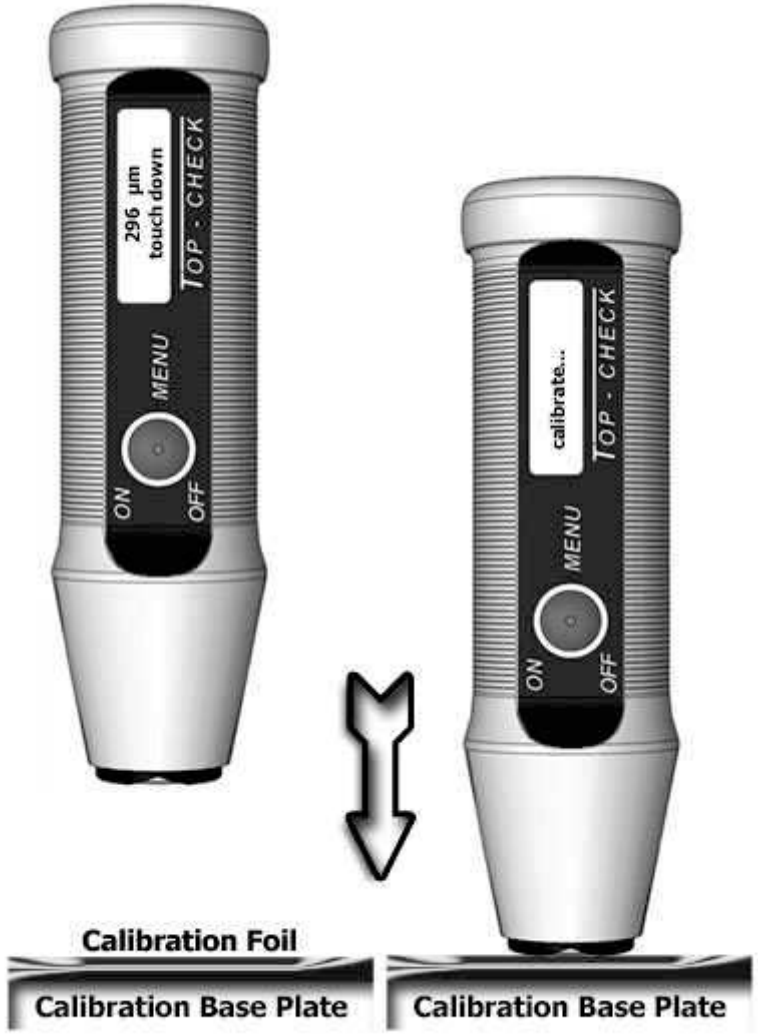
If you have to measure **on materials other than flat steel**, please perform the calibration on an uncoated original part instead of on the calibration base plate. This applies in particular to curvatures, round material or special alloys.

FOIL CALIBRATION

The foil calibration assigns a second calibration point for an accurate calibration of the device (two-point calibration).



Place the approx. 300 µm calibration foil on the bare FE calibration base plate.
In the raised state activate **FOIL CALIBRATION**, then apply the device with the measuring probe to the measuring foil and wait until the foil value is displayed and confirmed by a long sound.



The measuring foil with the higher value (approx. 300 µm) should always be used for an accurate calibration **of the whole measuring range**.
The device can also be calibrated with the optionally available 1 mm ceramic plate to achieve even greater accuracy, and particularly in the case of measurements in the higher measuring range (2 mm and up).

FOIL ADJUST

The calibration foils are approximately 300 µm thick. The exact value is written on the foil. When delivered, the foil value is set to the supplied foil. If you replace the foil, this foil value must be adjusted to the new foil.

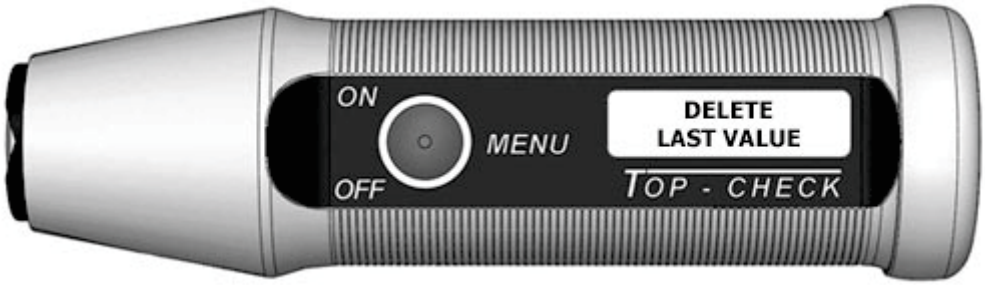
A short press of the button changes the foil value in 1 µm steps; after releasing the button for at least 1 second, the **<** sign switches to **>** and back in order to increase or decrease the foil value.

To change the foil thickness, the values will be increased or decreased automatically after the tenth step in one direction until the button is pressed again to stop. The accurate value can be adjusted by a single press of the button in both directions.

The foil value is confirmed and saved by pressing and holding the button.

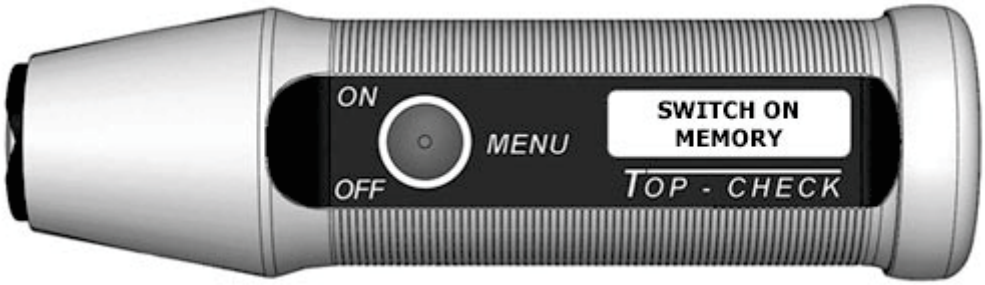
C. MEMORY

DELETE LAST VALUE



Deletes the last-saved measured value.

SWITCH ON / OFF MEMORY

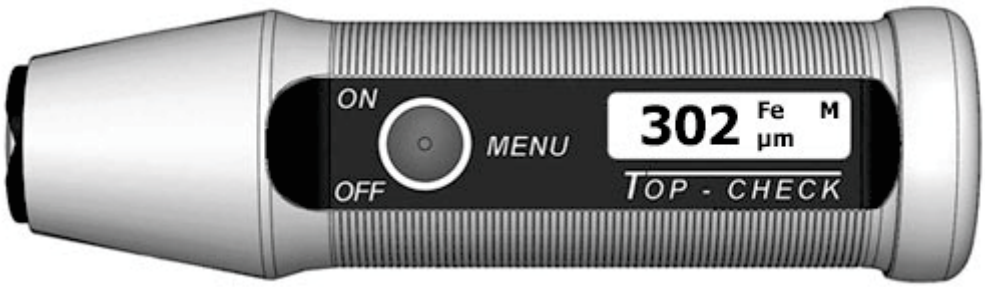


Switches the memory / data logger on or off.

TOP-CHECK FE-B has two separate FE memories (FE-MEMORY1 or FE-MEMORY2) which can be alternatively used. After switching on one memory, the device automatically saves all FE measured values in the memory (max. 500 measured values / memory).

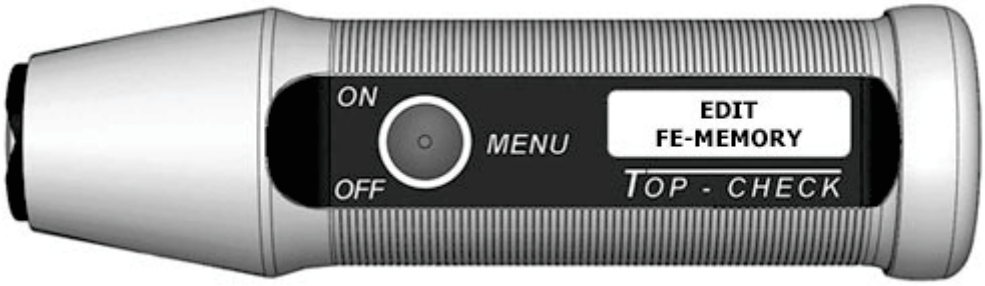
If the memory capacity is exceeded (more than 500 measured values) a warning message appears on the display and no further measured values are saved.

The symbol **M** appears on the display at the top right to indicate that the memory is switched on.



When switching the device on again the message **MEMORY ON** is briefly displayed, that is, if the memory has been used previously.

EDIT FE-MEMORY 1 / 2

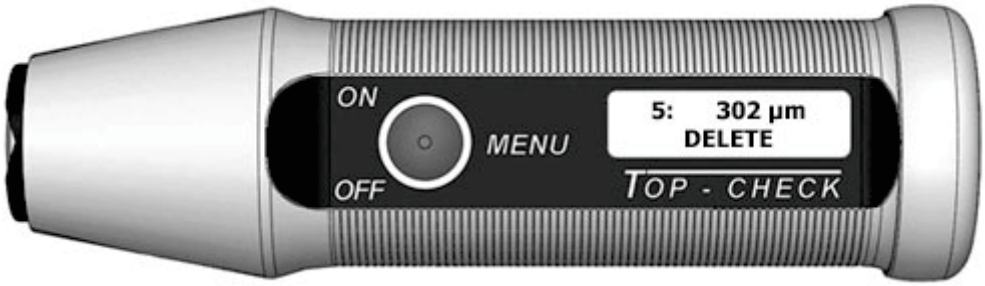


The measured values entered in the memory are statistically evaluated:

No.:	–	number of measured values saved
Min:	–	smallest measured value saved
Max:	–	largest measured value saved
Mean:	–	average value
Std.Dev:	–	standard deviation

The statistical values are displayed first with each press of the button, and after that, the numbered individual measured values are displayed.

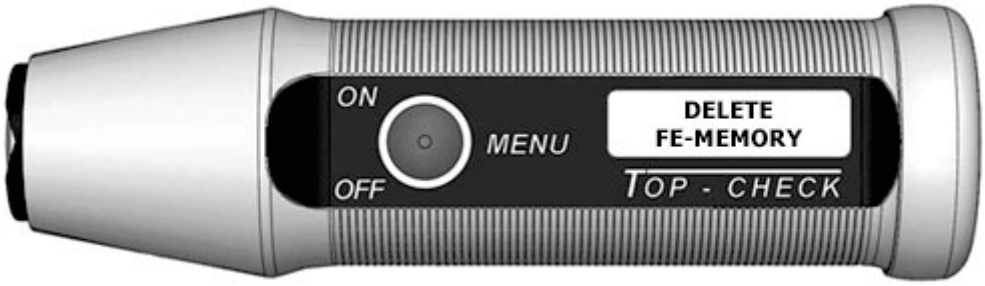
By pressing and holding the button when displaying an individual measured value, it is possible to delete it from the measurement series:



You can confirm the deletion of the measured value by pressing and holding the button, or return to the display of the individual measured values without deleting it by a short press of the button.

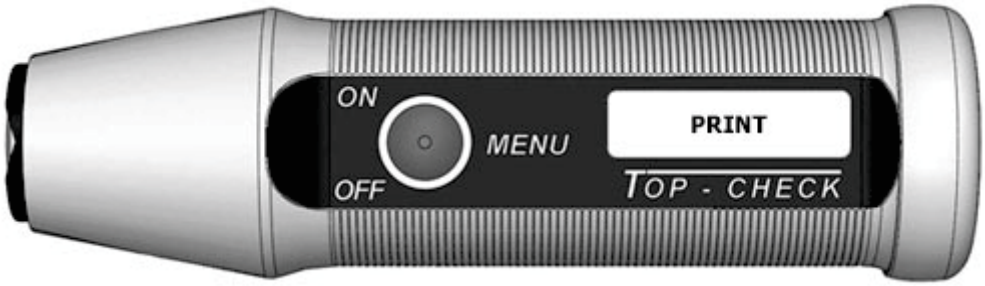
To exit from the sub-menu, wait until **READY** appears on the display.

DELETE FE-MEMORY 1 / 2



This deletes the entire contents of the memory.

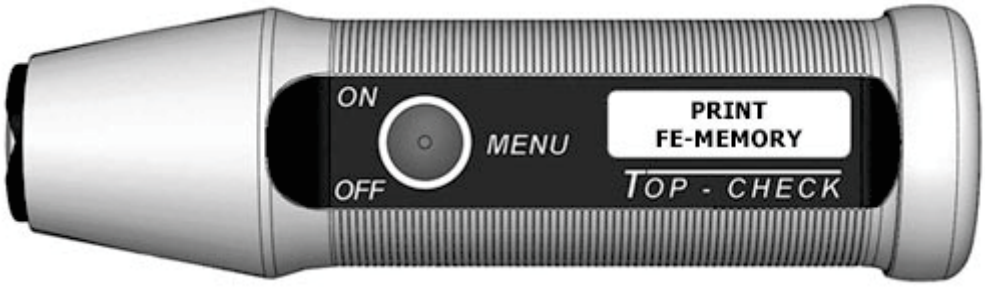
d. PRINT



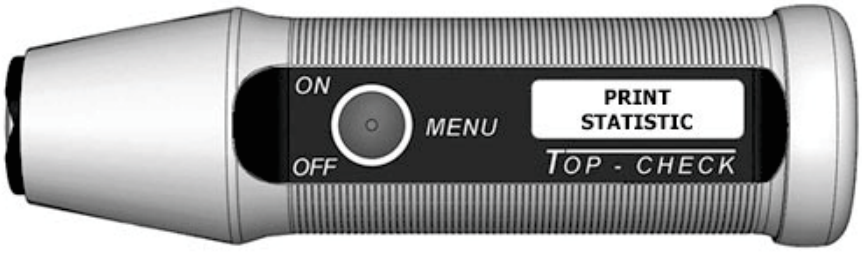
With this function, you can transfer data to the printer **TOP-PRINT4.**
When selecting a printer function (Print Memory, Online printing) first, after switching on the device, the connection is done automatically and can take up to 20 seconds. First switch on the printer, then start the process on the TOP-CHECK (displays **Printer connecting...**). **Please hold the device tight to the printer for this connection process.**

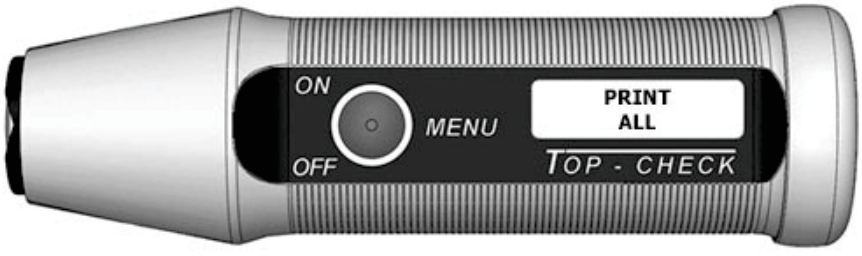
After switching off the device, to print again you need to reconnect to the printer.

PRINT FE-MEMORY 1 / 2



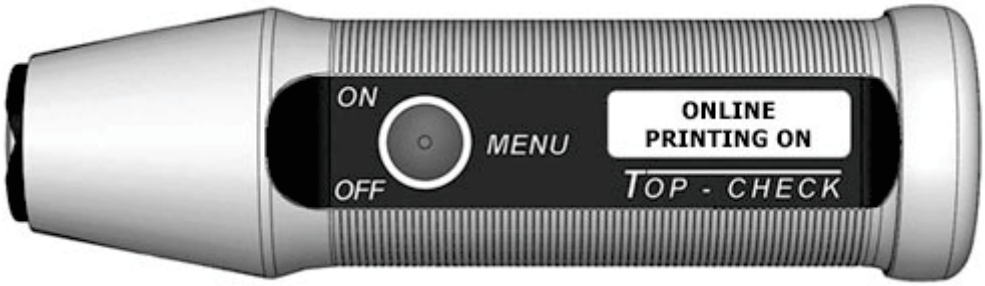
Here you can select, whether only the statistical values (saves paper if there are a large number of measured values) or both statistic and all measured values should be printed.





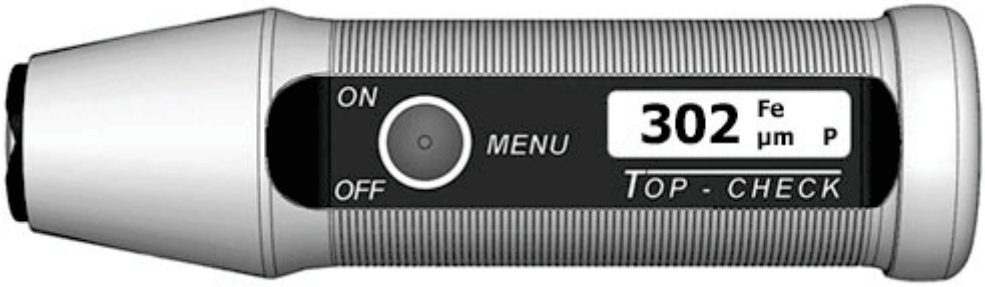
The parallel use of **Online printing** and **Print memory** is not possible. When **Online printing** is enabled, and you plan to print a memory, please first disable **Online printing**.

ONLINE PRINTING ON / OFF



With a long press on the red button, you can change the printing mode to either **printing on**, or **printing off**.

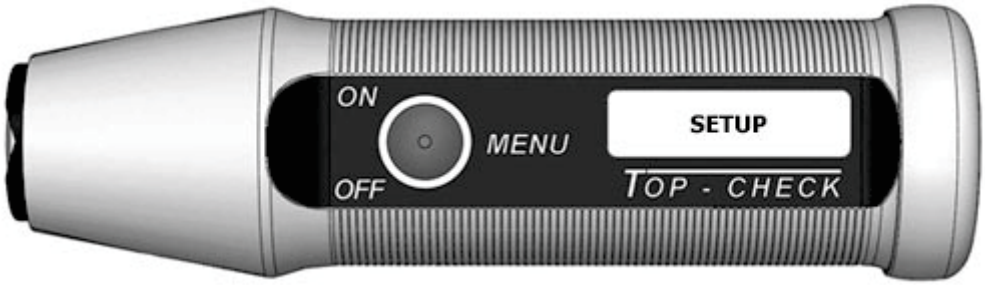
To notify about an active online printer connection, **P** is displayed on the down right side.



The parallel use of **Online printing** and **Print memory** is not possible. When **Online printing** is enabled, and you plan to print a memory, please first disable **Online printing**.

The parallel use of **Online printing** and **Online measuring** is not possible - if **Online measuring** is switched on, it will be automatically switched off here.
To return to **Online measuring** from **Online printing**, you are requested to switch off and on again the device.

e. SETUP



BLUETOOTH

For transferring data to a Windows PC, we deliver a Bluetooth dongle. Plug it into an unused USB port. The Windows driver is then automatically activated and the associated virtual serial interface is generated.

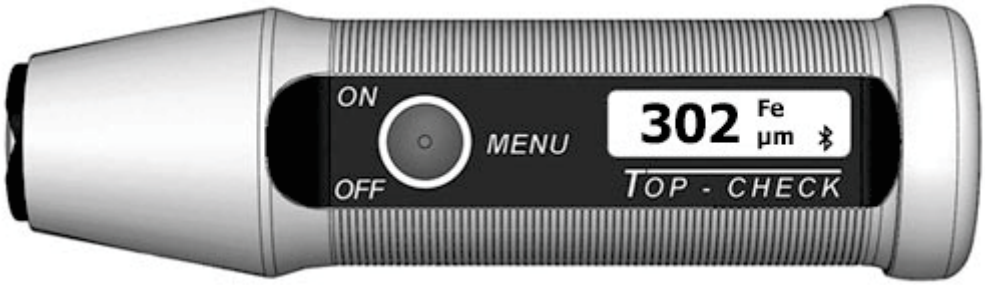
Should you face problems with the automatic installation, please refer to **https://www.list-magnetik.com** in the category **download** for a driver for various Windows releases.

In order to transfer the measured values to a PC or mobile device, TOP-CHECK and PC / mobile device must be paired via Bluetooth. For this, the Bluetooth interface must be switched on in the meter (**SETUP / BLUETOOTH / ON**), and a device scan must be performed on the PC / mobile device in the Bluetooth menu. Then, the identified measuring device must be selected and paired to the PC / mobile device.

TOP-CHECK identifies with its MAC address. This unique device number (a row of numbers and letters) can be displayed in the **SETUP / BLUETOOTH / MAC ADDRESS** menu.

After pairing, the **TOP-CHECK APP** has to be connected via the menu item **Connect Bluetooth**. With the PC software TOP-CHECK TRANSFER the selection of an interface (COM port) is required. The used COM port can be obtained via Windows / system / device manager / Bluetooth.

To indicate that a Bluetooth connection is active, the Bluetooth symbol ᛒ appears at the bottom-right of the display.



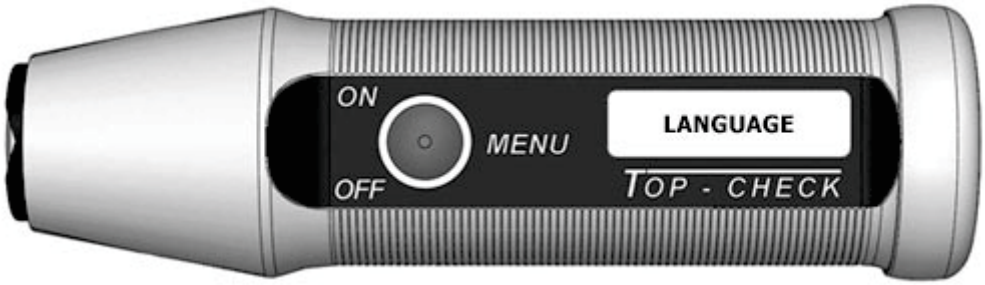
As soon as the Bluetooth interface is switched on, TOP-CHECK App and TOP-CHECK TRANSFER can communicate with the TOP-CHECK device, for example transfer the memory, or receive online measurements.

The Bluetooth interface can be switched off and on again, without repeating the pairing process. When the Bluetooth interface is switched off, the power consumption of the device is lower.

SETUP / BLUETOOTH / BLUETOOTH OFF
or
SETUP / BLUETOOTH / BLUETOOTH ON

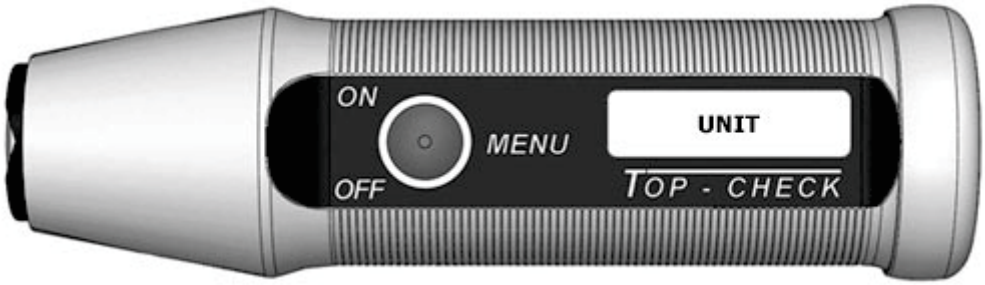
LANGUAGE

Selection of the menu language – ENGLISH or GERMAN.



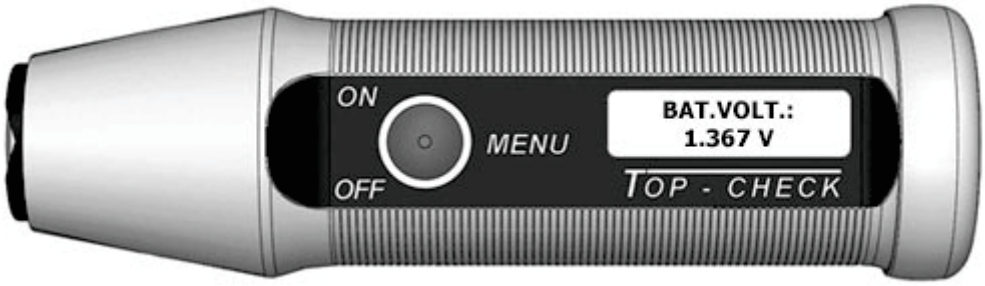
UNIT

Selection of the measuring unit – µm or mils.



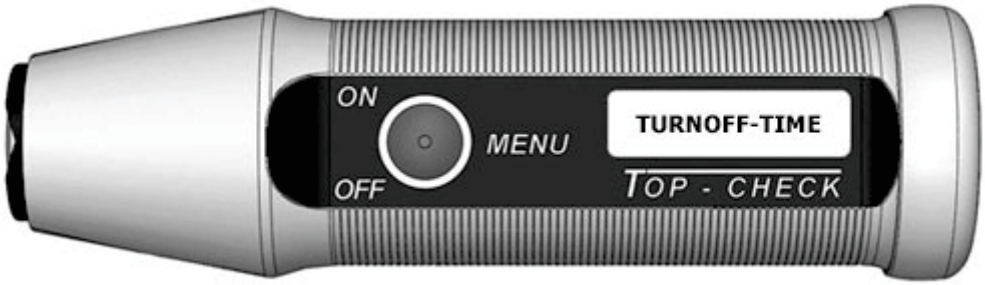
BATTERY

Displays the current battery voltage.

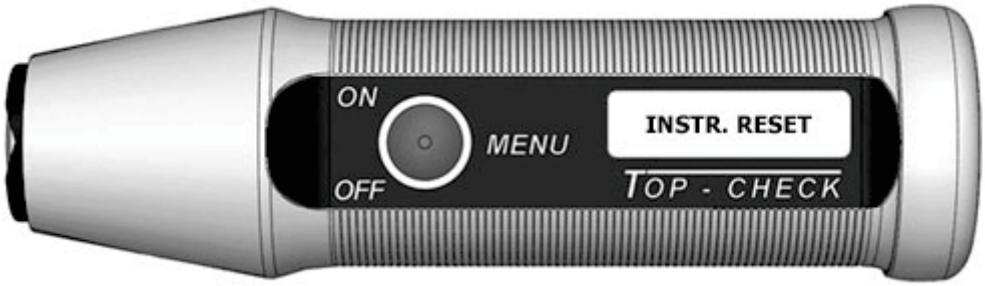


TURNOFF-TIME

Selection of the automatic switch-off time of the device (2 minutes / 15 minutes / off = device is always switched on). Only in special cases, **off** should be selected, since the power consumption can greatly increase as a result.



INSTRUMENT RESET



If the device can no longer be calibrated properly or if other malfunctions occur the works calibration can be restored here by means of an instrument reset. When doing this the **memory is also cleared** and the device switches off automatically.

5. IMPORTANT NOTES

- Do not drag the measuring probe over the measuring object – always measure point-by-point. Hold the device up for about one second after each measurement, and by doing so, the stored calibration is automatically checked and if necessary, corrected.

- Make sure that the measuring head and the calibration plate are clean and free from swarf and dust.

- When taking measurements on small or curved parts or on different, in particular alloyed materials, it is advisable to carry out the calibration on a bare part with the same geometry or the same material as the measuring object (according to ISO 2178) instead of on the base plate provided.

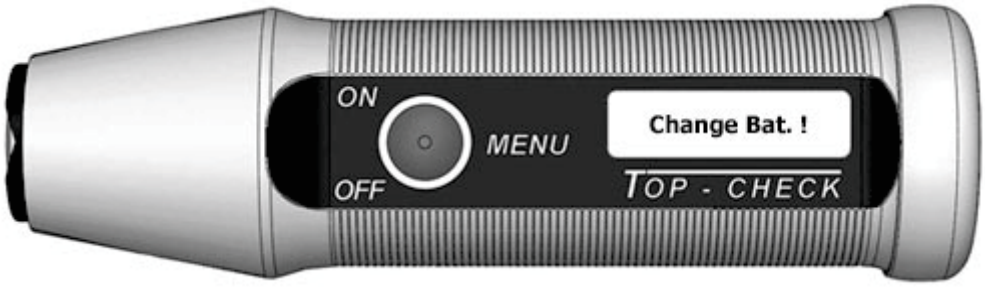
- When taking measurements in the upper measuring range (more than 2 mm), better accuracy will be obtained if the device is calibrated using the optionally available 1 mm calibration plate.

- If the message **Bluetooth Err.** should appear when switching the Bluetooth interface on, and if this message does not disappear after several attempts to switch it on, then the Bluetooth interface is defective, and the device should be sent in for repair.

RECOMMENDED THICKNESS OF THE BASE MATERIAL

Base material iron/steel (FE): 0,3 mm minimum

6. BATTERY REPLACEMENT



The battery must be replaced as soon as the warning **Change Bat.** Appears.

The device switches off automatically if the battery voltage falls below 1.0 V.

Please use only leak-proof batteries

7. TECHNICAL DATA

Applications:	Measurement of paint, varnish, plastic and galvanic coatings on steel (ISO 2178)
Measuring probe:	TOP-CHECK FE-B: swivel-mounted 90° TOP-CHECK FE-1000-B: sensing device, springy
Measuring range:	TOP-CHECK FE-B: on steel and iron: 0-5000 µm TOP-CHECK FE-1000-B: on steel and iron: 0-1000 µm
Smallest Area:	TOP-CHECK FE-B: ø 8 mm TOP-CHECK FE-1000-B: ø 2 mm
Smallest curvature radius:	TOP-CHECK FE-B: convex: 4 mm, concave: 38 mm TOP-CHECK FE-1000-B: convex: 1 mm, concave: 6 mm
Calibration value:	300 µm
Accuracy:	less than 100 µm: ± 1 µm, 100-1000 µm: ± 1%, 1000-2000 µm: ± 3%, > 2000 µm: ± 5%
Resolution:	1-100 µm: 0.1 µm, 100-1000 µm: 1 µm, > 1000 µm: 10 µm
Measuring units:	µm and mils
Environment temperature:	0 - 50° C
Display:	illuminated high contrast graphic OLED display
Multi-lingual menu:	German, English
Data logger:	2 x 500 measurements
Statistics:	Count / Maximum / Minimum / Average / Standard deviation
Interface:	Bluetooth 4.0 interface class 2 for communication with PC and TOP-CHECK App
Power supply:	1x 1.5 V AA Mignon
Operating time:	approx. 30 hours
Dimensions:	Ø 28 x 98 mm
Weight:	72 g (with battery)
Warranty:	24 months on the device, 3 months on the probe

8. AVAILABLE APPLICATIONS

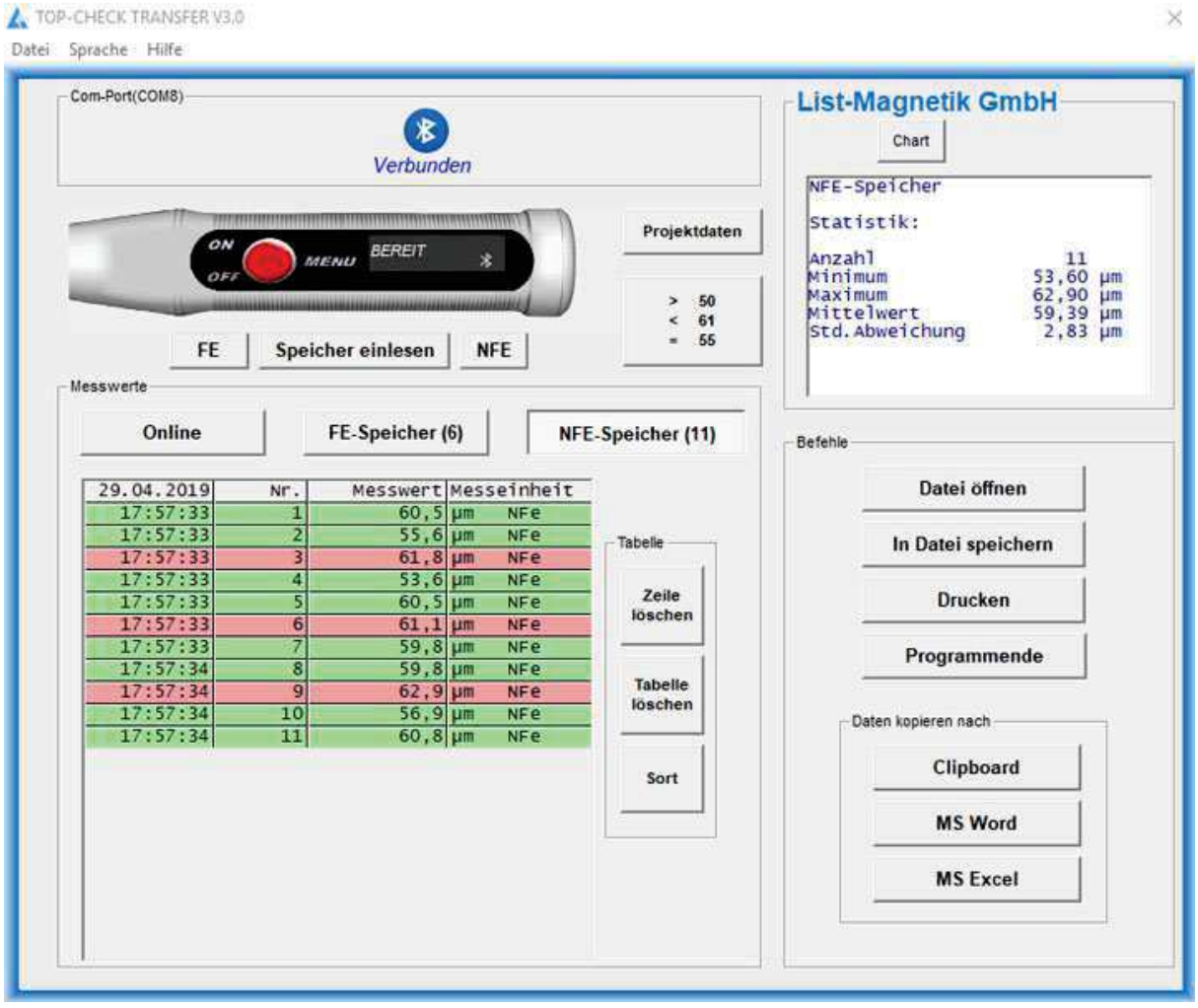
TOP-CHECK APP

For transfer of measurement readings to android smart phone or tablet, available free at Google Play Store.

TOP-CHECK TRANSFER

On www.list-magnetik.com, in the category **Applications,** you may obtain the free of charge data transfer application **TOP-CHECK TRANSFER**, to transfer measurement data to your PC.

With TOP-CHECK TRANSFER, you can measure online or read the device's memory, you can evaluate the data statistically or visualize as chart. You can print the results or hand over the data to applications like Microsoft Word and Microsoft Excel.



9. THERMAL PRINTER TOP-PRINT4

Small, battery powered printer for measurement values and statistics.

Technical data

Printing method:	Thermal printer
Characters/line:	32
Transfer speed:	38400 baud
Interface:	Bluetooth class 2 and Serial
Paper:	Thermal paper 57 mm wide – max. 10 m long
Power supply:	Li-Io rechargeable battery (approx. 60 hours of operation)
Dimensions:	100 x 75 x 45 mm
Weight	210 g

Operating instructions

1. Insert paper roll
2. Switch on printer (is it already charged? See below)
3. Switch on the device

Charging the built-in Li-Io rechargeable battery

When delivered new, the Li-Io rechargeable battery in the TOP-PRINT4 must be charged up before first-time use. The rechargeable battery is charged up with the mains charger supplied. The cable from the mains charger is plugged into the connection socket on the right-hand side. **The charging time should be at least 4 hours.** The blue LED blinks during the charging process; it lights steadily when the battery is fully charged. The charger then switches automatically to maintenance charging mode. The capacity of the rechargeable battery is sufficient for approx. 60 hours of operation.

Notes on operation

1. The paper is manually transported using the **Feed** key. After completion of the printout the paper strip is transported out of the housing by pressing this key and can then be cut off cleanly.
2. Faulty printout: The **TOP-PRINT4** must be charged up again if individual lines of the printout are not printed correctly.
3. Inserting a new paper roll: Open the cover, Insert the paper roll, pull out the end of the paper, Close the cover

INSTALLING THE BLUETOOTH USB DONGLE

The installation of this software can be necessary for the communication between TOP-CHECK and a Windows PC.
First of all, please try, if the connection between TOP-CHECK and your PC via Bluetooth works without software installation, by plugging in the Bluetooth receiver.

If this does not work immediately, please install the BRLink software available on **https://www.list-magnetik.com** in the category **Download** as BRLink_V_1.1.0.34.zip.

TOP-CHECK APP FOR ANDROID

TOP-CHECK App runs on Android devices and enables you to transfer your measurements to a mobile device or tablet PC, where you may administrate or forward your series of measurements.

Scanning this QR code you will directly be connected to Google Play Store for the installation of TOP-CHECK App.

We supply:

- Coating Thickness Meters
- Magnetic Field Meters
- Magnetic Permeability Meters
- Magnetizing and Demagnetizing Equipment

We advise and provide tailor-made solutions for your specialized requirements in magnetizing, demagnetizing and measuring

Fast calibration and repair service

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