- Gewindefräser — Thread Milling Cutters
- Glockengewindefräser — Shell Type Thread Milling Cutters
- Kombinationswerkzeuge — Combination Tools
- PKD-, CVD-D, PcBN-Werkzeuge — PCD, CVD-D, PcBN Tools
- Hochleistungs-Schneideisen — High Performance Thread Cutting Dies
- Hochleistungs-Gewinderolleisen — High Performance Thread Rolling Dies
- Präzisions-Gewindelehren — Precision Thread Gauges

Nut testing device

Operating instructions

Table of Contents

1. Introduction

The operator of the measuring device is obliged to prepare operating instructions for the operating personnel in order to protect them from health hazards or other safety hazards. In addition, the operator is obliged to instruct the operating personnel on the safe and proper operation, maintenance, servicing and proper operation of the measuring device.

This operating manual may be used as part of an operating instruction, but it is in no case an operating instruction.

The operator must ensure that the operating personnel take note of these operating instructions.

This operating manual is an integral part of the measuring device and an essential aid for successful and safe operation of the measuring device from Johs. Boss GmbH & Co. KG.

The operating manual is intended to help keep the meter at a high level of performance during a long service life and to take the successful accident prevention measures.

After completion of the installation and before putting the measuring instrument into operation, the operator must arrange for a test run to be carried out with the measuring instrument, including testing of all safety devices, in order to satisfy himself of the operational safety of the measuring instrument and of the ability of the personnel to carry out the operation properly and safely..

The measuring device is built according to the state of the art and the recognized safety regulations..

The operator is obliged to adapt the machine to the latest applicable safety regulations.

As the contractor/operator, you are obliged to inform and instruct the operating personnel about existing legal and accident prevention regulations as well as about existing safety devices on the measuring device..

The operating personnel must have understood the instruction and it must be ensured that the instruction is observed.

2. Safety

Although the measuring device has been constructed in accordance with the state of the art and is safe to operate, it may present hazards if it is:

- operated by untrained or insufficiently instructed personnel
- not used in accordance with its intended purpose
- improperly maintained or serviced.

2.1 Intended use

The measuring device is the TDLD5 nut testing device manufactured by Johs. Boss GmbH & Co. KG.

The nut testing device is suitable for the simultaneous measurement of thread length and thread gauge conformity.

Any use beyond this purpose is considered improper use. The operator/user alone shall be liable for any damage resulting from such improper use.

Proper use also includes compliance with the instructions on:

- Safety
- Operation
- Maintenance and servicing

as described in this operating manual.

2.2 Safety instructions

Please read this operating manual carefully and pay particular attention to the safety instructions.
Failure to follow the safety notes and the directions for proper handling provided in this manual may result in personal injury or property damage, for which no liability will be accepted.
In such cases, any warranty or guarantee shall become void.

Personnel

- Keep your workplace clean and tidy. Disorder increases the risk of accidents.
- Use the provided personal protective equipment such as protective gloves, safety glasses, and protective clothing.
- Only carry out tasks for which you are authorized.
- Do not allow unauthorized persons access to the measuring device.
- Before performing any repair work on the measuring device, the power supply must be disconnected and secured against unintentional reconnection.
- For transport of the measuring device, disconnect the cable connection between the measuring device and the control unit. Both units should be transported using suitable transport equipment. Due to the weight of approximately 5 kg, dropping the device may cause impact injuries, especially to the feet. As a general rule, safety shoes should be worn, particularly during transport of the measuring device.

Product

- The product is not a toy. Keep it away from children and pets.
- Protect the product from extreme temperatures, direct sunlight, strong vibrations, high humidity, moisture, flammable gases, vapors, and solvents.
- Never immerse the nut testing device in water, salt water, beverages, or any other liquids.
- Do not expose the product to mechanical stress.
- If safe operation is no longer possible, take the product out of service and protect it from unintentional use. Safe operation can no longer be guaranteed if the product:
  - shows visible damage,
  - no longer functions properly,
  - has been stored for an extended period under unfavorable environmental conditions, or
  - has been subjected to significant mechanical stress during transport.
  - Handle the product with care. Impacts, shocks, or drops from even a low height can cause damage.

- The device and the charging station may only be opened by employees of Johs. Boss GmbH. Opening the device voids all warranty claims.

Miscellaneous

- If you have any doubts regarding the operation, safety, or connection of the product, please contact our technical sales department.
- Maintenance, adjustment, and repair work should only be carried out by a technician from Johs. Boss GmbH.
- The product is manufactured in compliance with RoHS and can therefore be disposed of in accordance with WEEE regulations.

2.2.1 Reduction of accident risk

To reduce the risk of accidents during operation of the measuring device, wear: Close-fitting clothing!

- Risk of entanglement

- No jewelry!
  - Risk of entanglement
- A hairnet to protect long hair
  - Risk of being caught

Use suitable lifting equipment when transporting heavy or bulky parts.

2.3 Symbols

In the hazard areas of the measuring device, safety labels are attached which are self-explanatory through their depicted symbols or short descriptive texts.

Danger!

Particular caution is required in these hazardous areas. These warnings must be strictly observed. Ensure that these signs are not covered and remain clearly visible at all times.

2.4 Symbols on and inside the measuring device

Symbols	Description
	**Caution!** Electrical installation area. Authorized for qualified electricians only.
	**Prohibition!** Access for unauthorized person sist strictly forbidden

2.5 Safety engineering

The interior of the measuring device poses potential hazards; therefore, access is not permitted during operation.

The interior area is secured by:

- Firmly screwed safety covers.

2.5.1 Mechanical installation areas

Access is permitted only for trained and qualified personnel. Access is secured by firmly screwed safety covers.

Caution!

Mechanical movements may occur behind the safety covers. The safety covers may only be opened by authorized personnel of Johs. Boss GmbH & Co. KG.

2.5.2 Electrical installation areas

Access is permitted only for trained and qualified electrical specialists. Access is secured by firmly screwed safety covers.

Caution!

Behind the safety covers there is access to live components. There is a risk of electric shock. After maintenance work, all safety covers must be securely reattached using the designated screw connections.

2.6 Occupational safety

The measuring device has been manufactured in accordance with the EC Machinery Directive and the relevant occupational safety and accident prevention regulations.

To avoid accidents, the power supply must be disconnected and the system de-energized before any repair work is performed.

Any protective devices that have been removed must be reinstalled before the measuring device is put back into operation.

Any irregularities during operation must be reported immediately by the personnel working with the measuring device to the responsible supervisor.

If a malfunction occurs that compromises the safety of personnel, the device must be shut down immediately. The measuring device may only be put back into operation after the malfunction has been corrected.

2.7 Safety precautions / protective equipment

Despite the safety measures integrated into the design, there remains a residual risk to the operator when using the measuring device. When the thread depth is reached, the built-in servomotor applies additional torque, which signals it to change the direction of rotation. If the preset torque is too high, the motor will not change direction, which may cause the component to be torn from the operator's fingers. This can result in minor cuts to the hand, especially when handling sharp-edged parts.
It is therefore recommended that the operator wear close-fitting, cut-resistant gloves while operating the measuring device. The operator of the measuring device is responsible for providing such protective gloves to the operating personnel.

3. Product description

The nut testing device is designed for the simultaneous measurement of thread gauge conformity and thread depth. The device is equipped with a motor drive that powers a spindle. The desired thread plug gauge is attached to this spindle via a quick-release coupling.
Furthermore, the nut testing device includes a digital depth gauge for measuring depth. The digital gauge communicates with a display unit that shows the measured depth value.
A selector switch on the nut testing device allows the user to choose between two different measuring modes:

„Depth measurement“: In this mode, the actual thread depth is determined. (For blind hole threads)

„Comparative measurement“: In this mode, the actual thread depth is determined. (For blind hole threads)
“Comparative Measurement”: In this mode, a defined minimum dimension is checked. (For both blind hole and through-hole threads)
In both measuring modes, a minimum value (MIN) and a maximum value (MAX) can be defined via the display unit, and the measured depth value can be read. The torque and rotational speed can be adjusted using a program developed by our company and transferred to the motor via a mini-USB interface.
Different thread plug gauges with various diameters can be used via a quick-release coupling. The installed thread plug gauge is protected by a measuring sleeve, which releases it during the measuring process.

Abb. 1: Lieferumfang Mutterprüfgerät TDLD5

1. Control cabinet (Artikel-Nr.: 568264)
2. Nut testing device (Artikel-Nr.: 568264)
3. Cold device cable (Artikel-Nr.: 572157)
4. Mini-USB / micro-USB cable (Artikel-Nr.: 570417)
5. Micro-USB / USB adapter (Artikel-Nr.: 572156)
6. Software dongle eMPG (Artikel-Nr.: 567229)

3.1 Commissioning

Before the initial commissioning of the nut testing device, all designated power and data cables (excluding the data cable for data evaluation) must be connected. The supplied cold device cable serves to supply power to the control cabinet, which in turn provides power to the nut testing device via a connection.

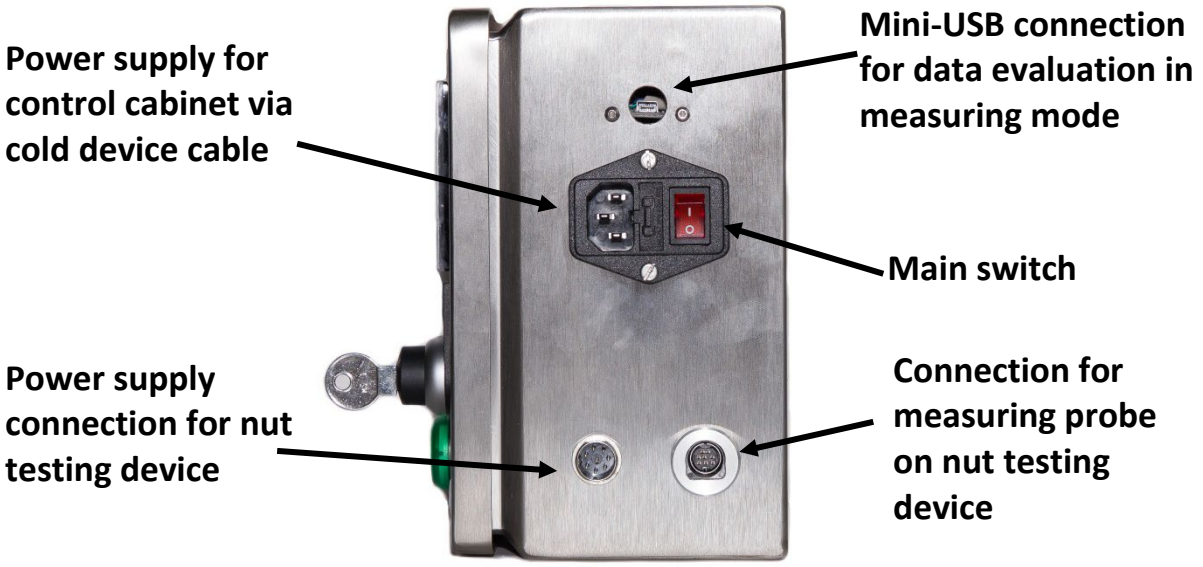


Fig. 2: Power connections and wiring of the nut testing device

3.2 Switching on

First, the main switch must be turned on. By operating rotary switch 1, the motor can be switched on or off. Rotary switch 2 is used to select between the depth measurement mode (Program 1) and the comparative measurement mode (Program 2). Indicator light B, together with a short beep from the signal horn, indicates a rejected part. Indicator light A illuminates when a good part is detected.
The device can be started either by pressing button A or by gently pressing the measuring sleeve.

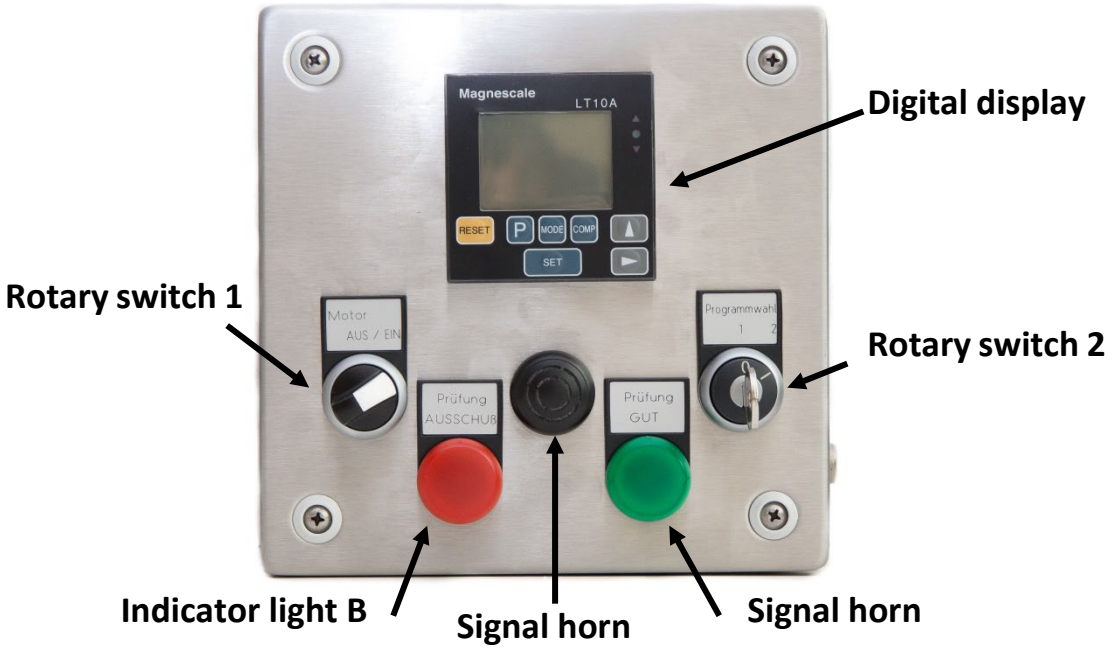


Abb. 3: Control keys control cabinet / Nut testing device

3.3 Switching off

To switch off the measuring device, the main switch must be turned off.

3.4 Procedure for testing the cylindrical internal thread using a thread plug gauge

Use fot he go gauge

The go thread plug gauge checks the fit of the internal thread. It verifies compliance with the minimum size of the pitch diameter, including lead deviation, partial flank deviations, and form deviations that could cause an apparent reduction of the pitch diameter. It also checks compliance with the minimum size of the major diameter and ensures that the straight flank is sufficiently long, meaning that the thread root radius does not extend too far into the thread flank.

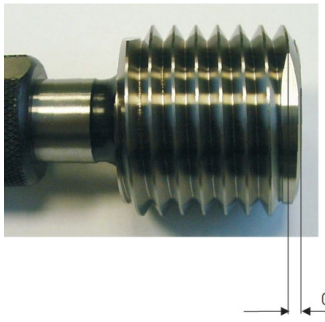
!!!!! A go thread plug gauge does not check the minor diameter of the workpiece.!!!!

Use of the no-go gauge

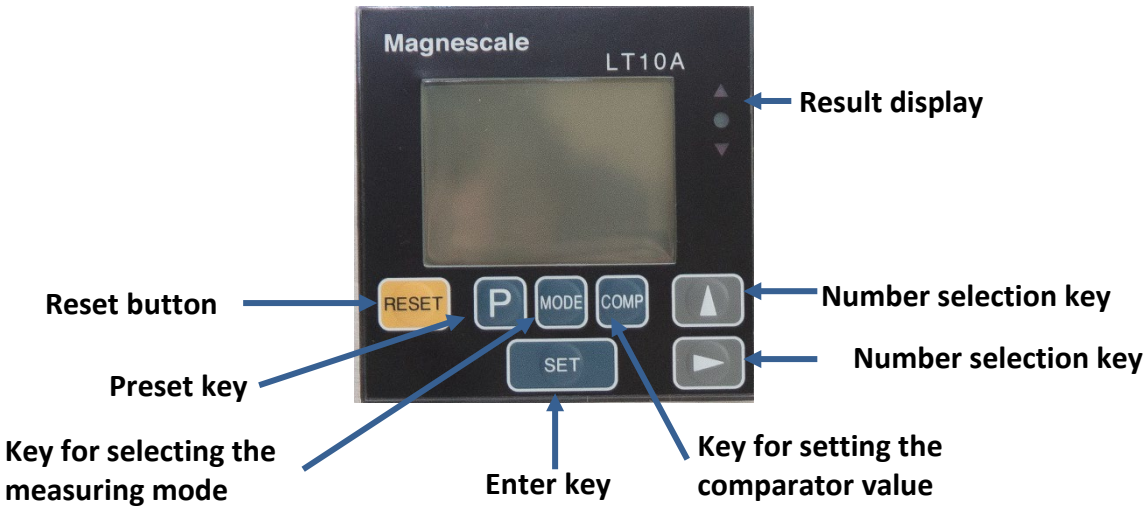
The no-go thread plug gauge checks whether the actual pitch diameter exceeds the specified maximum limit. The no-go gauge must not be screwed into the workpiece more than two turns without applying force.

Important:

Before the gauge is put into operation, the digital display of the nut testing device must either be zeroed or adjusted to the corresponding dimension using the setting piece.

	**The following applies as a general rule:** The zero position of the go thread plug gauge corresponds to 0.5 × P. This means that the end face of the go thread plug gauge protrudes half a pitch beyond the measuring sleeve. The contact surface of the measuring sleeve is factory-set to this position (0.5 × P).

4. Operation via digital display



For a more detailed description and the various functions of the digital display, please refer to the operating manual supplied by the manufacturer of the digital display (Magnescale LT10A).

4.1 Screwing-in process (measuring process)

The operator manually presses the part to be tested against the measuring sleeve. When a microswitch opens, the servomotor starts, causing the gauge plug to rotate and pull the part further in via the thread. The operator must hold the part firmly during the measuring process; otherwise, the part would rotate with the gauge plug around its own axis. During the measuring process, the measured depth can be read on the digital display.

4.1.1 Depth measurement

During the “Depth Measurement” mode, the servomotor continues to rotate until it reaches the thread bottom. Due to the operator’s holding force, a torque value defined by the software is reached, which automatically triggers the motor to reverse its direction. As a result, the part is unscrewed from the thread plug gauge.
If the measured thread depth is within the tolerance range of the set MIN–MAX values, a green light illuminates. If the tolerance is not met, a red warning light turns on and a short beep is emitted.

The following steps describe the procedure for the **“Depth Measurement”** mode:

1. Switch on the device (Main switch)
2. Select the “Depth Measurement” mode (Program 1) using rotary switch 2.
3. Install the gauge holder and measuring sleeve (see Chapter 6).
4. Switch on the motor (set rotary switch 1 to ON).
5. Configure the digital display:
   Set the preset value and comparator values CPH (MAX value) and CPL (MIN value) (see Magnescale LT10A operating manual, sections 5-2-1 and 5-2-3).
6. Test the part to be measured as described in Chapter 4.1 “Screwing-in Process.”

4.1.2 Comperative measurement

In the “Comparative measurement” mode, a desired minimum measuring depth is defined. The component is placed onto the thread plug gauge as previously described. When the defined minimum measuring depth is reached, a green light illuminates. The display unit sends a signal to the motor, which then automatically switches to reverse rotation. If the minimum measuring depth is not reached, the red light illuminates and the signal horn is activated.

The procedure for the “Comparative measurement” mode is described below.

1. Switch on the device (Main switch)
2. Select the “Comparative Measurement” mode (Program 2) using rotary switch 2.

3. Install the gauge holder and measuring sleeve (see Chapter 6).
4. Switch on the motor (set rotary switch 1 to ON).
5. Configure the digital display:
   Set the preset value and comparator values CPH (MAX value) and CPL (MIN value) (see Magnescale LT10A operating manual, sections 5-2-1 and 5-2-3).

   Important: Always set the CPH value 2 mm higher than the specified minimum depth of the component to be tested; otherwise, overlapping measurement values may occur, causing the component to be indicated as rejected.
6. Test the part as described in Chapter 4.1 “Screwing-in Process.”

4.2 Unscrewing process

The unscrewing process occurs automatically once the built-in servomotor reaches the previously defined torque or the minimum depth (in comparative measurement mode).

4.3 Indicator lights

As previously described, the nut testing device has two indicator lights: one green light (Light A) and one red light (Light B). The green light indicates that the measured value lies within the defined tolerance range, whereas the red light indicates that the tolerance has not been met.

4.4 Important notes

- ✓ Contamination of the device may impair the measuring process.
- ✓ Clean a dirty device with a dry cloth. In case of heavy contamination, wipe with a cloth slightly moistened with a neutral solvent. Avoid using volatile solvents, as these may damage plastic components.
- ✓ Regularly applying a thin layer of suitable resin-free oil to the testing gauges helps prevent potential corrosion.
- ✓ Opening the device voids all warranty claims.

4.5 Maintenance measures / calibration

The VDE inspection according to DGUV Regulation 3 must be carried out at regular intervals.
No special maintenance measures are required for the nut testing device.
If you have any questions regarding the calibration of individual components, please contact our technical sales department.

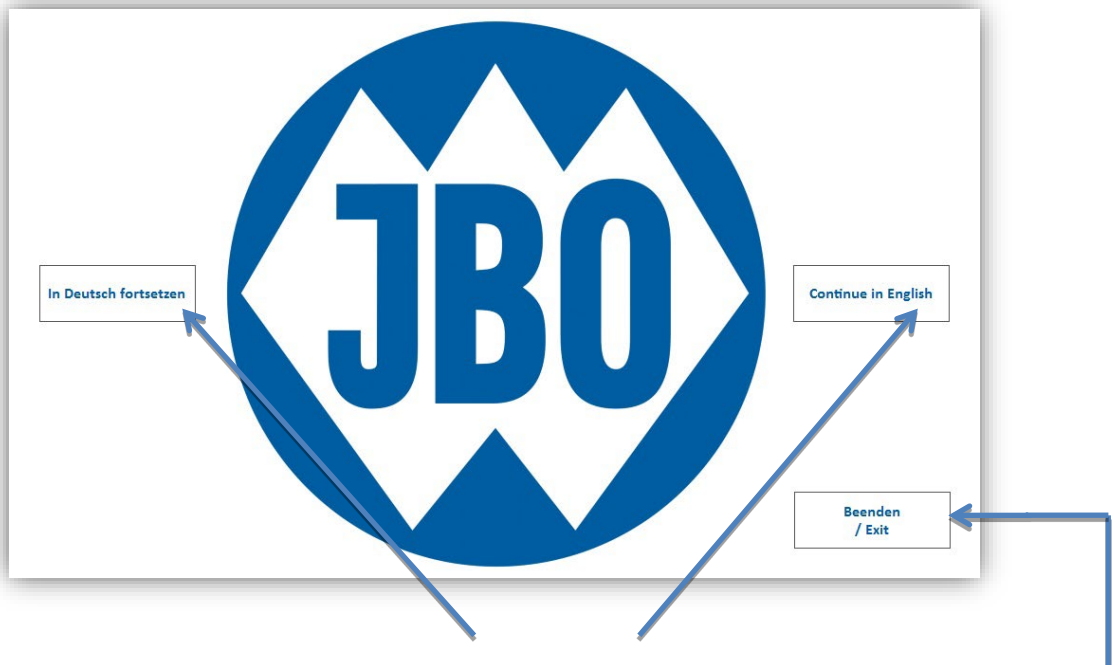
5. Configuration Software „eMPG“

The configuration software “eMPG,” which runs under Microsoft Windows©, allows the nut testing device to be configured quickly and easily. To do this, connect the device’s USB port (Mini USB) to a PC using the supplied USB cable. Then start the software on the PC.

Fig. 4: Software configuration via PC

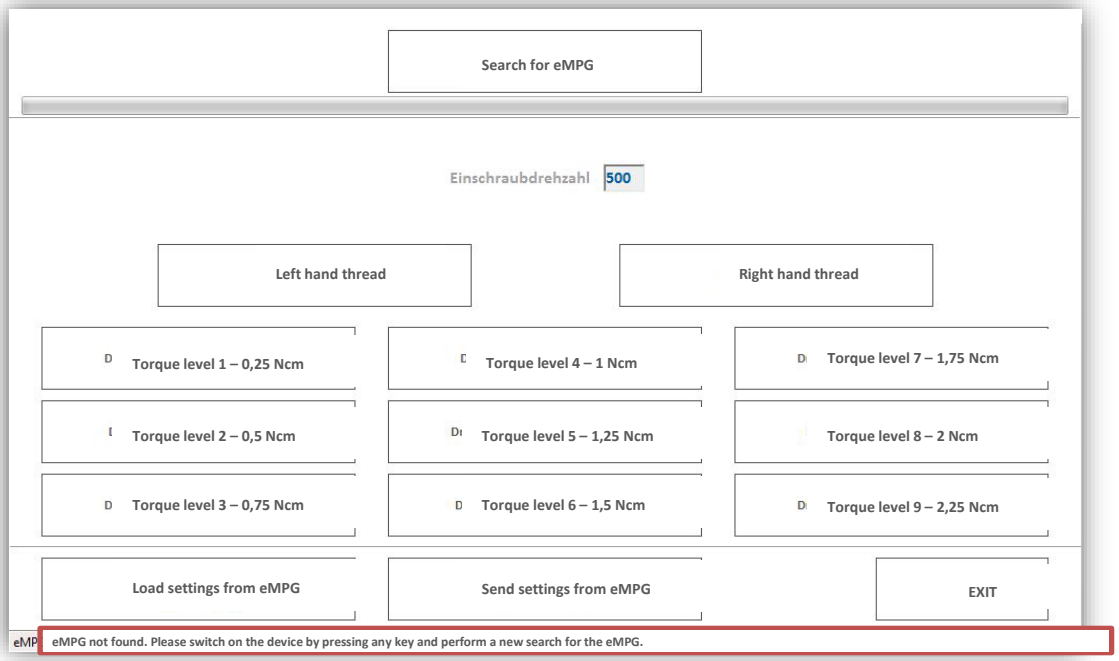
The following settings can be adjusted using the software:

- Direction of rotation (right-hand / left-hand thread)
- Torque according to thread size / material to be tested
- Screw-in speed



On the start screen, the language (German / English) can be selected, or the program can be closed using the “Beenden / Exit” button..

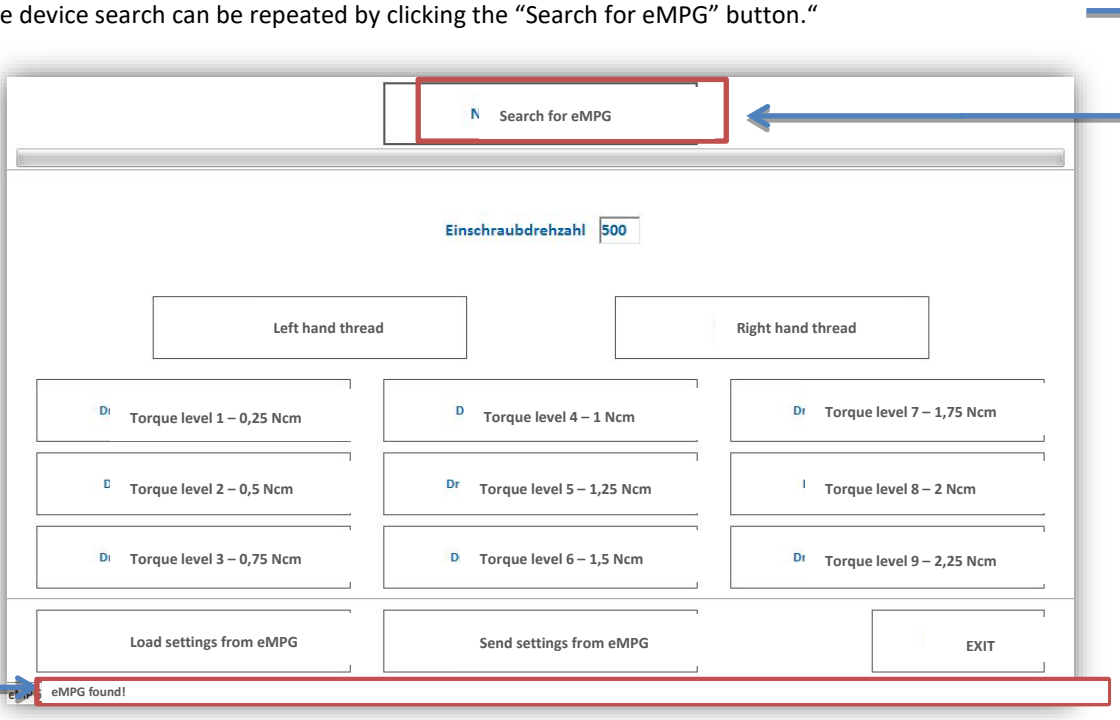
After selecting the language, the operating interface appears automatically.



If the nut testing device is not detected, this will be indicated in the lower status bar.
Possible reasons why the nut testing device is not recognized include:

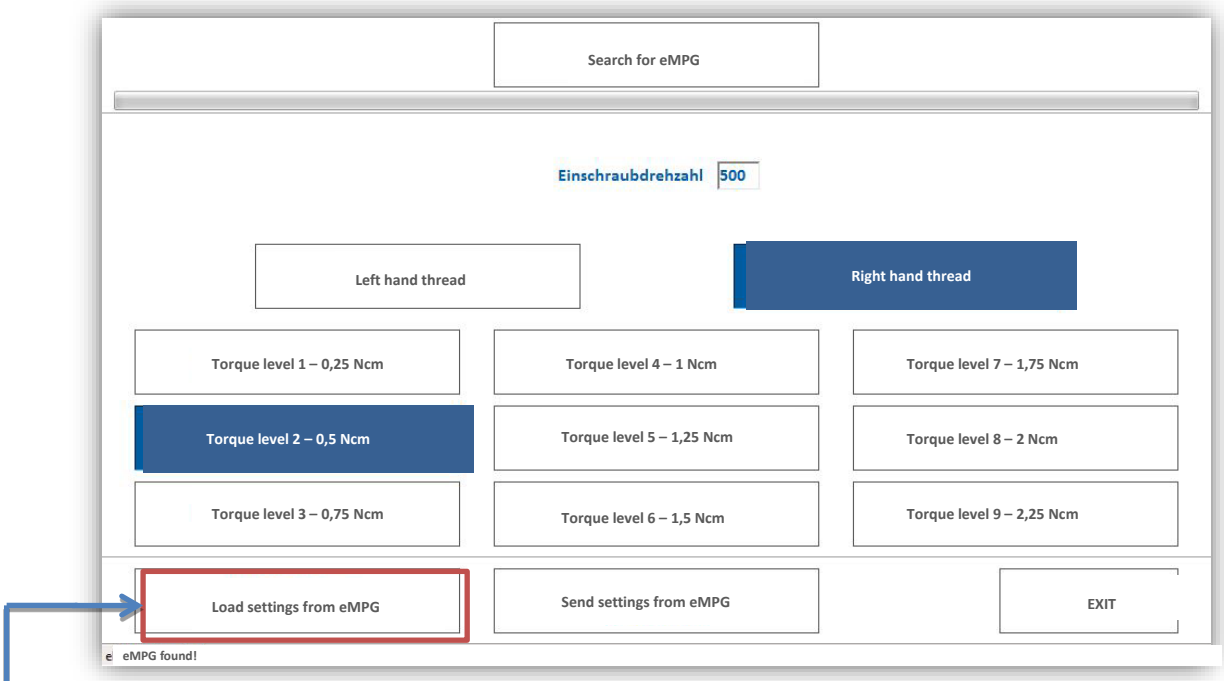
- The USB cable is not properly connected.
- The USB driver has not yet been fully installed (this occurs automatically when the device is connected to the PC for the first time).
- The nut testing device is in standby mode and must be activated by pressing a button (see Section 3.2 “Switching On”).

The device search can be repeated by clicking the “Search for eMPG” button.“



Once the nut testing device has been detected, this will also be indicated in the lower status bar.

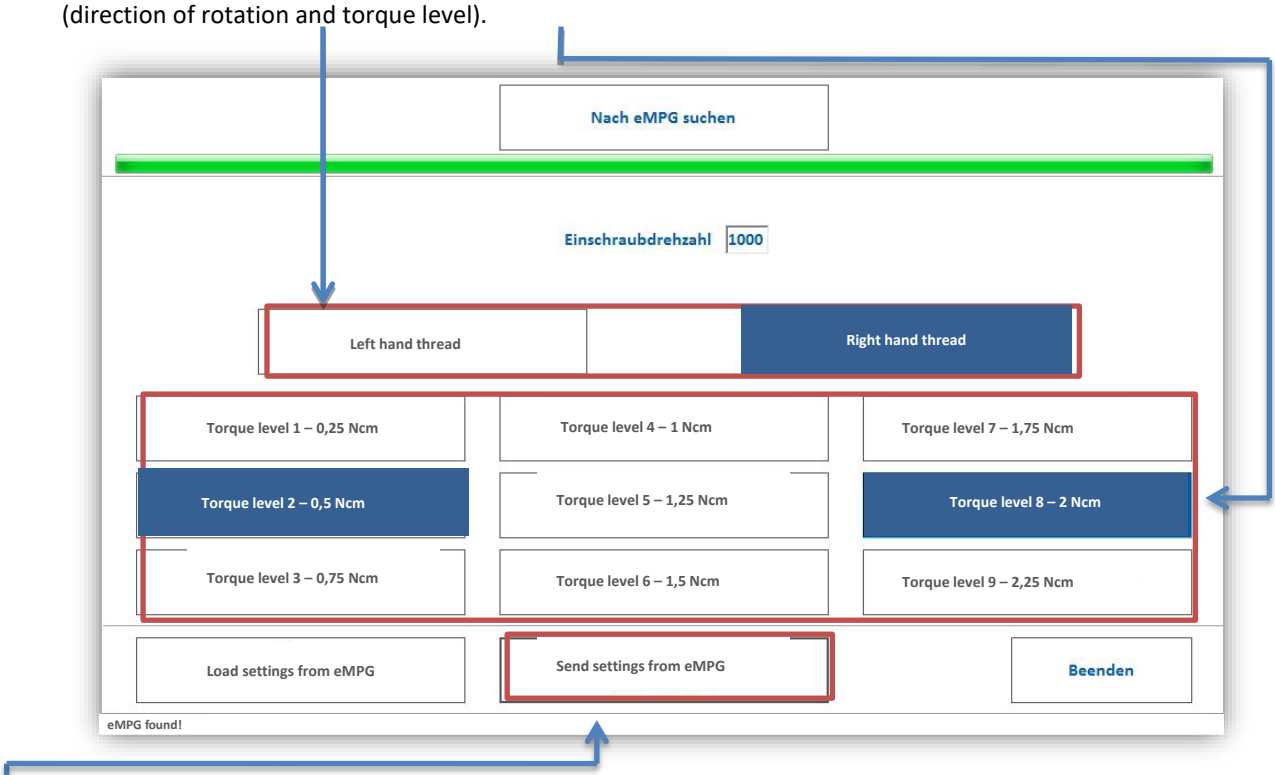
5.1 Loading the current configuration



By pressing the “Load settings from eMPG” button, the current configuration is loaded from the nut testing device and displayed by color highlighting of the corresponding buttons.

5.2 Saving a new configuration

If the current configuration of the device is to be changed, this is done by activating the respective buttons (direction of rotation and torque level).



The new configuration is transferred by pressing the “Send settings to eMPG” button.

6. Installation of the thread plug gauge / attaching the measuring sleeve

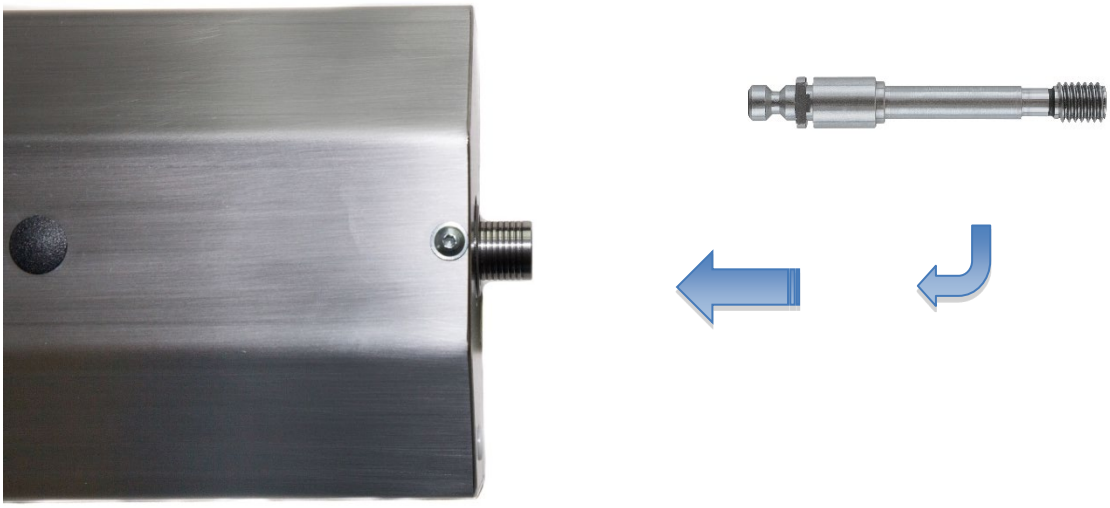


Fig. 5: Installation of the thread plug gauge

The go thread plug gauge is mounted in a specially pre-set holder. First, pull back the sleeve on the base unit, then insert the gauge into the sleeve using the quick-release coupling (it must lock into place with the two flat surfaces). Releasing the sleeve secures the gauge in position.

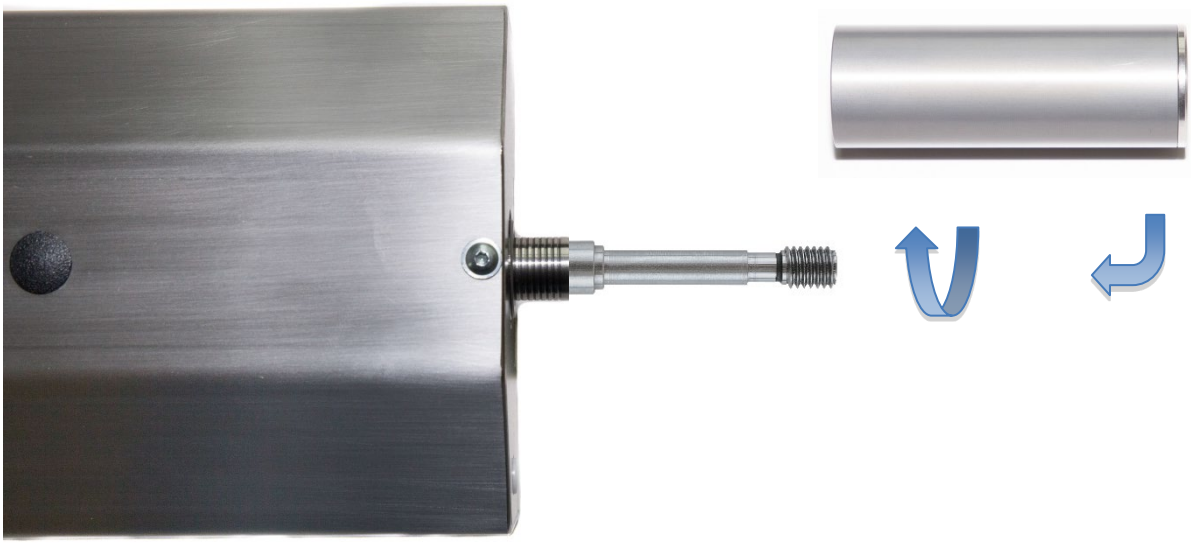


Fig. 6: Attaching the measuring sleeve

Next, guide the measuring sleeve over the gauge and screw it in by hand until it reaches the stop.
After this, the nut testing device is ready for operation.

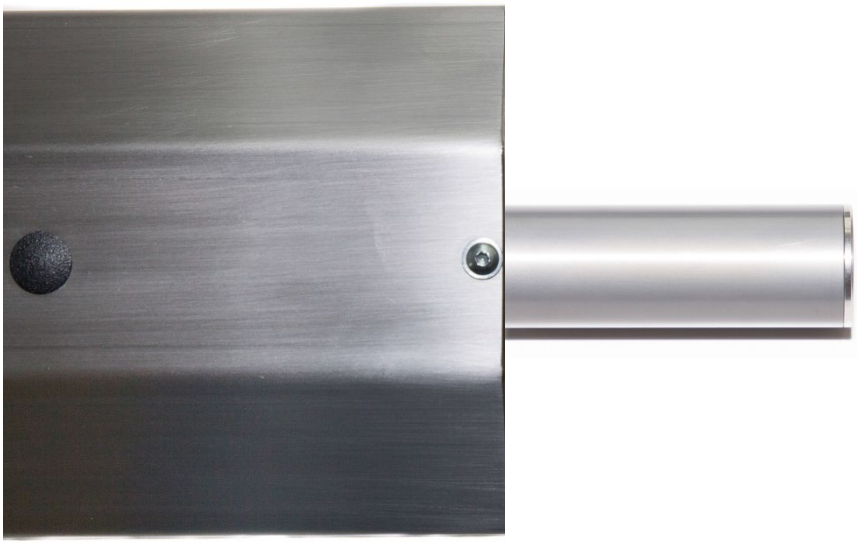


Fig.7: Nut testing device with gauge holder and measuring sleeve

7. Trouble shooting

Malfunction	Possible causes	Remedy
Control cabinet or nut testing device does not switch on	Power cable defective	Replace power cable
	Cable not properly connected	Insert cable correctly
	Main switch not turned on	Turn on main switch
	Rotary switch 1 set to “Motor OFF”	Rotary switch 1 set to “Motor ON”
	Switch defective	Send device in for service
Beeping at 0.5-second intervals	Digital display defective	Send device in for service
Digital display does not respond to key press	Key lock activated	See Magnescale LT10A operating manual, section 5-2-4
Test part cannot be removed from gauge holder	Test part likely jammed	Set rotary switch 1 to “Motor OFF,” loosen cover 1, and insert a sturdy round tool (max. Ø4.0 mm) through the opening into the device. Gently turn the gauge holder by hand until the inserted tool noticeably engages. The shaft is now locked, and the test part can be unscrewed.
Comparative measurement does not function	Rotary switch 2 set to Program 1	Set rotary switch 2 to Program 2

If the above-mentioned or any other malfunctions occur and cannot be rectified, please contact our technical sales department.

8. Technical Data

Dimensions of nut testing device (L x W x H)	253 x 124 x 92 mm
Dimensions of control cabinet (L x W x H)	200 x 200 x 120 mm
Weight of nut testing device	4,0 kg
Weight of control cabinet	3,5 kg
Measuring range	12 mm
Accuracy [A]	0,01 mm
Operating temperature	0 bis 50°C
Storage temperature	-10 bis 60°C

[A] The specified measurement accuracy refers to an operating temperature of 20°C.

Unser Kunden-Service
Our client services

- Technische Beratung durch unsere Anwendungstechniker, telefonisch oder vor Ort
  Technical advice from our application engineers, by telephone or on site
- Projektierung kundenspezifischer Sonderwerkzeuge und Sondergewindelehren
  Development of customized special tools and special gauges
- Technische Unterstützung an der Maschine beim ersten Einsatz der Gewindefrästechnologie
  Technical on-site support with introduction to thread milling technology
- JBOtronic für die selbständige Erstellung von CNC-Programmen für Ihren Produktionsprozess
  JBOtronic for the independent creation of CNC programmes for your production process
- Schulungen und Fachvorträge für Industrie und Handel
  Training courses and technical lectures for industry and commerce
- Versuche mit Kunden-Materialien/-Werkstücken
  Trials on customers materials or workpieces
- Datenblätter mit Schnittparametern und Richtwerten
  für Ihre Zerspanungsaufgabe
  Data sheets with cutting parameters and approximate values
  for your stock removal tasks
- JBO-Kalibrierservice akkreditiert für Gewindelehren
  JBO calibration service accreditated for thread gauges
- Nachschleifservice oder Nachschleifanleitung
  Regrinding service or instruction

Was können wir für Sie tun?
What can we do for you?

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