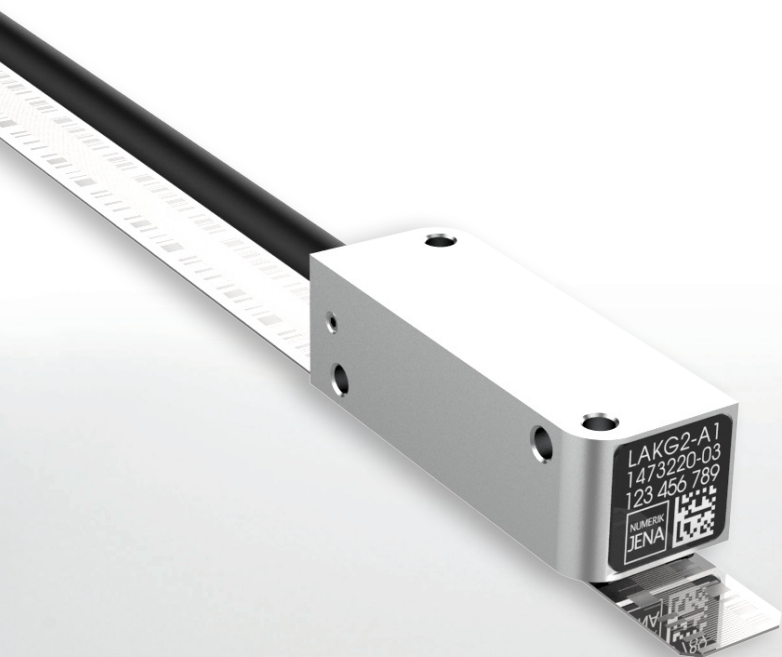




*LAK*go

Mounting Instructions

Table of contents

1	Basic information.....	4
1.1	Applicability of the documentation.....	4
1.2	Target groups of the Mounting Instructions.....	4
1.3	Notes on reading the documentation.....	5
1.4	Symbols and fonts used for marking text.....	6
1.5	Notes in this documentation.....	7
1.6	Units and tolerances.....	7
2	Safety.....	8
2.1	Personnel qualification.....	8
2.2	General safety precautions.....	8
3	Items supplied and accessories.....	10
3.1	Items supplied.....	10
3.1.1	Items supplied with the scale tape.....	10
3.1.2	Items supplied with the scanning head.....	10
3.2	Mounting accessories.....	11
3.2.1	Accessories for mounting the scanning head.....	11
4	Mounting.....	12
4.1	Requirements and notes.....	12
4.2	Mounting the scale tape.....	13
4.2.1	Choosing the mounting variant.....	13
4.2.2	Variant: Mounting the SINGLEFLEX scale tape.....	14
4.2.3	Variant: Mounting the DOUBLEFLEX scale tape.....	16
4.3	Mounting the scanning head.....	19
4.3.1	Choosing the mounting variant.....	19
4.3.2	Variant: Mounting with the holder on the side.....	20
4.3.3	Variant: Mounting with the holder at top.....	22

5	Adjustment and diagnostics.....	25
5.1	Choosing the inspection or testing unit.....	25
5.2	Adjustment and diagnostics with the ABSOFLEX adapter and ABSOFLEX Pro software.....	26
5.2.1	Requirements and notes.....	26
5.2.2	Connecting the encoder to the ABSOFLEX Pro software.....	26
5.2.3	Adjusting the scanning head.....	28
5.3	Diagnostics with a testing device.....	35
5.3.1	Requirements and notes.....	35
5.3.2	Connecting the encoder to the PWT.....	35
5.3.3	Diagnostics for the scanning head.....	39
6	Final steps.....	40
6.1	Connecting the encoder to the downstream electronics.....	40
7	Removal.....	41
7.1	Safety precautions regarding removal.....	41
7.2	Removing the scanning head.....	41
7.3	Removing the scale tape.....	41

1 Basic information

This chapter contains information about the product and the Mounting Instructions.

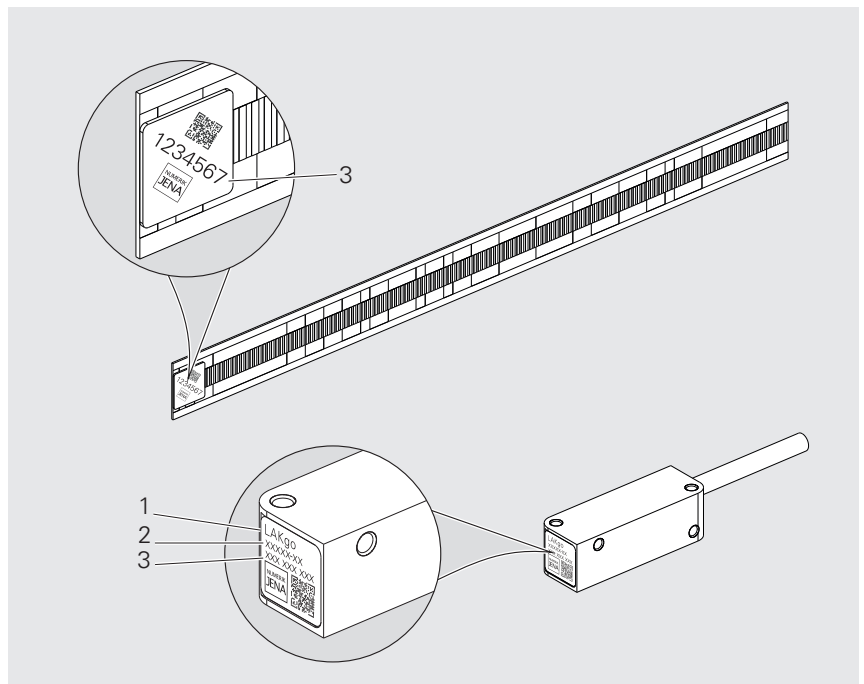
1.1 Applicability of the documentation

These Mounting Instructions apply to the LAKgo.

► Prior to using the documentation, check whether the documentation and product model match

The designation of the product is printed on the ID label.

ID label



ID label with legend

- 1 Product name
- 2 Product ID / Part number (ID)
- 3 Serial number (SN)

1.2 Target groups of the Mounting Instructions

The Mounting Instructions must be read and observed by every person who performs any of the following tasks:

- Design
- Mounting
- Removal

1.3 Notes on reading the documentation

WARNING

Fatal accidents, personal injury or property damage caused by non-compliance with the documentation!

Failure to comply with the documentation may result in fatal accidents, personal injury or property damage.

- ▶ Read the documentation carefully from beginning to end
- ▶ Keep the documentation for future reference



If an Addendum is included in delivery, it supplements or supersedes the relevant contents of the documents listed in the Operating Instructions.

The Operating Instructions are included in delivery and contain all of the information and safety instructions for the proper and intended operation of the product.

Would you like any changes, or have you found any errors?

We are continuously striving to improve our documentation for you. Please help us by sending your suggestions to the following e-mail address:

userdoc@numerikjena.com

1.4 Symbols and fonts used for marking text

In these instructions the following symbols and fonts are used for marking text:

Format	Meaning
▶ ...	Identifies an action and the result of this action
> ...	Example: ▶ Tilt the shipping brace to remove it (c) > The shipping brace has been removed now
■ ...	Identifies an item of a list
■ ...	Example: ■ Solid contaminants: class 3 ■ Max. pressure dew point: class 4

1.5 Notes in this documentation

Safety precautions

Precautionary statements warn of hazards in handling the product and provide information on their prevention. Precautionary statements are classified by hazard severity and divided into the following groups:

DANGER

Danger indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **will result in death or severe injury**.

WARNING

Warning indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in death or serious injury**.

CAUTION

Caution indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in minor or moderate injury**.

NOTICE

Notice indicates danger to material or data. If you do not follow the avoidance instructions, the hazard **could result in things other than personal injury, such as property damage**.

Informational notes

Informational notes ensure reliable and efficient operation of the product. Informational notes are divided into the following groups:



The information symbol indicates a **tip**.
A tip provides important additional or supplementary information.



The book symbol indicates a **cross reference**.
A cross reference leads to external documentation, for example: further documentation from NUMERIK JENA or another supplier.



The globe symbol represents a **cross reference** to a source on the Internet, e.g. www.heidenhain.com

1.6 Units and tolerances

Unless otherwise specified, the dimensions stated in these Mounting Instructions are given in millimeters.

Unless otherwise specified, the tolerances stated in these Mounting Instructions conform to ISO 8015 and ISO 2768 standards.

mm



Tolerancing ISO 8015
ISO 2768:1989-mH
≤ 6 mm: ±0.2 mm

2 Safety

This chapter provides important safety information needed for the proper mounting and installation of the product.

2.1 Personnel qualification

Mounting, initial setup and removal must be conducted by a qualified specialist under compliance with local safety regulations.

2.2 General safety precautions

WARNING

Danger of electric shock due to connection to unsuitable downstream electronics!

If you connect unsuitable downstream electronics to the product, fatal accidents or severe personal injuries can occur.

- ▶ Connect the product only to downstream electronics whose supply voltage comes from PELV systems

WARNING

Risk of injury due to plug connections under voltage!

If you disengage plug connections while the equipment is under power, this may result in fatal accidents or severe personal injury.

- ▶ Do not engage or disengage any connecting elements while the product is under power

WARNING

Risk of injury from damaged or worn components!

Safety functions can fail if damaged or worn components are installed unintentionally. Failed safety functions can result in death or serious injury.

- ▶ Inspect the component for damage
- ▶ Do not use any damaged or worn components
- ▶ In case of replacement, repair the thread
- ▶ Use new screws, spring pins and nuts
- ▶ Secure screws and nuts with suitable material-bonding anti-rotation lock

NOTICE

Property damage due to mechanical stress!

Exposing the product to mechanical stress can cause damage to the product.

- ▶ Do not drop the product or subject it to major vibration
- ▶ Do not expose the product to mechanical stress
- ▶ Do not change the physical structure of the product

NOTICE**Property damage due to electrical stress!**

Improper handling of the connecting element can cause damage to the product.

- ▶ Do not engage or disengage any connecting elements while the product is under power
- ▶ Do not touch the contacts of the plug connections

NOTICE**Property damage due to electrostatic discharge (ESD)!**

This product contains electrostatically sensitive components that can be destroyed by electrostatic discharge (ESD).

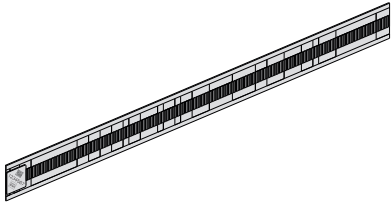
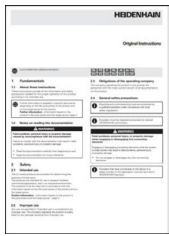
- ▶ It is essential to observe the safety precautions for handling ESD-sensitive components
- ▶ Never touch connector pins without ensuring proper grounding
- ▶ Wear a grounded ESD wristband when handling the connections of the product

3 Items supplied and accessories

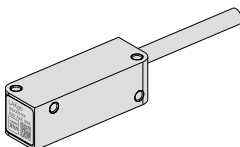
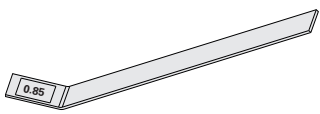
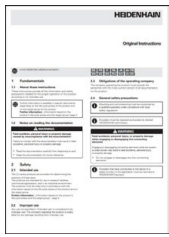
This chapter contains information on the items supplied and the available accessories of the product.

3.1 Items supplied

3.1.1 Items supplied with the scale tape

Component	Figure
Scale tape	
Operating Instructions	

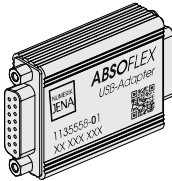
3.1.2 Items supplied with the scanning head

Component	Figure
Scanning head	
Spacing gage	
Operating Instructions	

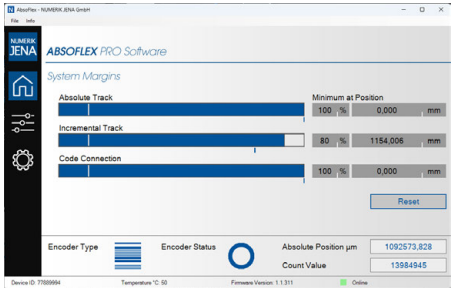
3.2 Mounting accessories

The following accessories can be ordered separately from NUMERIK JENA.

3.2.1 Accessories for mounting the scanning head

Designation	ID	Figure
ABSOFLEX adapter	344220-70	

ABSOFLEX Pro software for adjustment and diagnostics





The **ABSOFLEX Pro software** is available for download free of charge.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Accessories** selection menu
- ▶ Download **ABSOFLEX Pro software**

4 Mounting

This chapter describes the mounting requirements, different mounting variants, and all other tasks necessary when mounting.

4.1 Requirements and notes

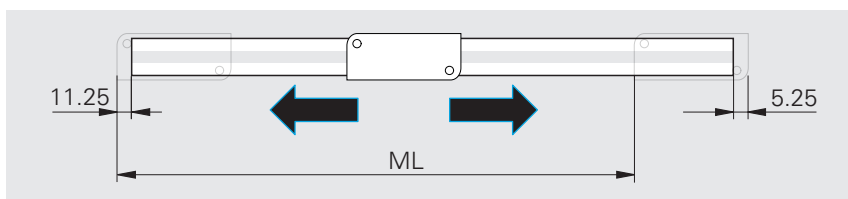
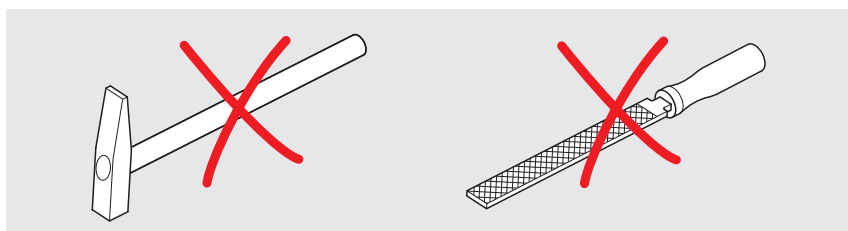
NOTICE

Property damage due to inappropriate tools!

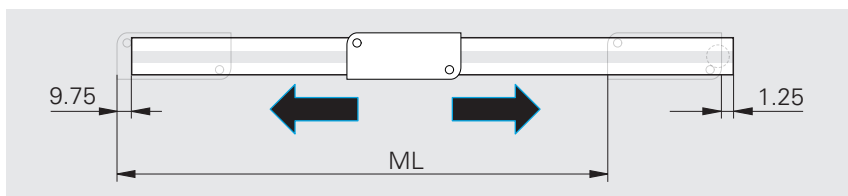
Using inappropriate tools for mounting or removal of the encoder causes damage to the encoder.

- ▶ Do not use hammers
- ▶ Do not use pointed or sharp-edged tools

Choose a mounting position such that the traverse range is within the measuring length (**ML**) of the encoder. Protect the graduation from direct contamination.



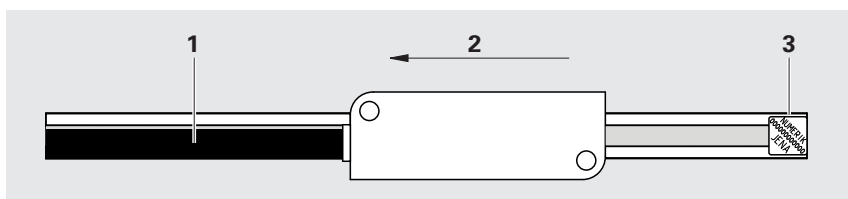
SINGLEFLEX



DOUBLEFLEX

In order to ensure correct operation of the encoder, the scale tape must be positioned correctly relative to the scanning head.

The ID label identifies the side where the minimum measuring position is located. The cable outlet must face away from the ID label.



- 1 Cable
- 2 Positive counting direction
- 3 ID label

In order to avoid signal interferences, observe the minimum clearance from sources of interference (e.g., power lines).



For more information on **electromagnetic compatibility (EMC)**, please refer to the **Product Information** document.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the selection menu for the desired product
- ▶ Download the Product Information document
- ▶ Chapter: Electromagnetic Compatibility (EMC)



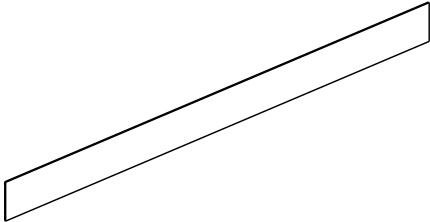
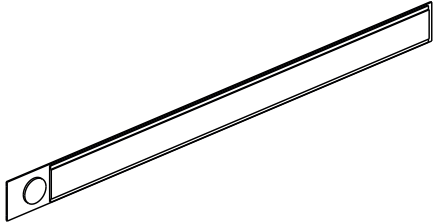
For more information on the **dimensions**, please refer to the **Product Information** document.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the selection menu for the desired product
- ▶ Download the **Product Information** document
- ▶ Chapter: Dimensions and Mounting Conditions

4.2 Mounting the scale tape

4.2.1 Choosing the mounting variant

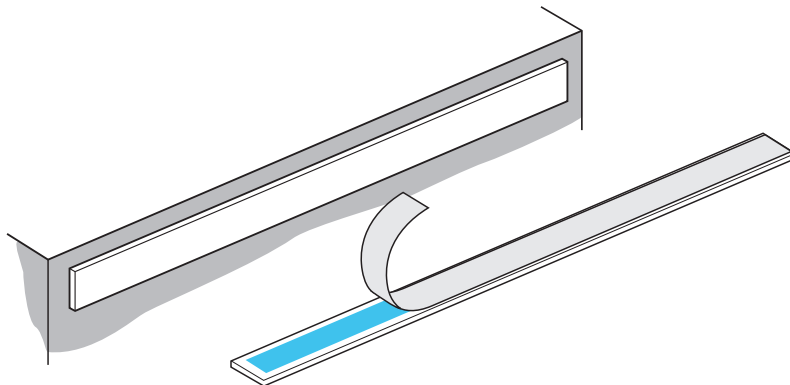
Mounting variants for the scale tape

SINGLEFLEX steel scale tape	DOUBLEFLEX steel scale tape
	
Page 14	Page 16

4.2.2 Variant: Mounting the SINGLEFLEX scale tape

This chapter describes how to mount the SINGLEFLEX scale tape with adhesive tape.

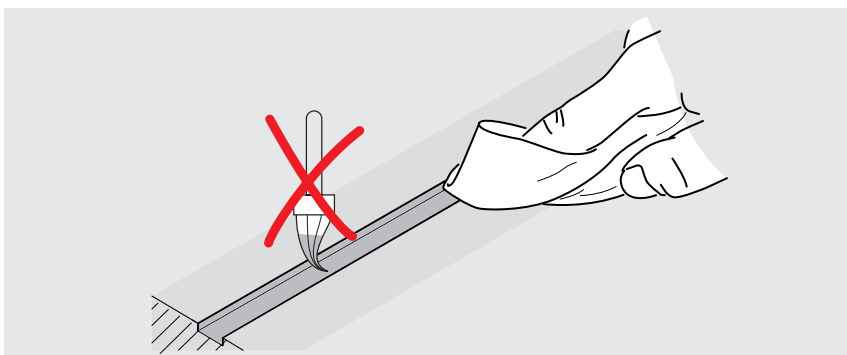
An overview of the mounting variants is provided on Page 13.



Mounting information

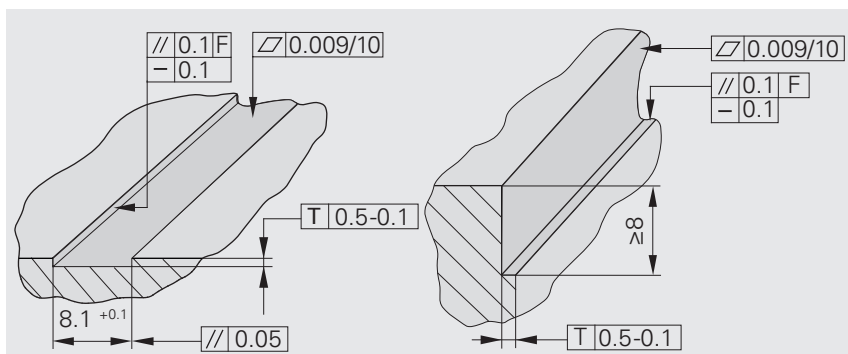
The encoder can be mounted in any position.

Note that the mounting surface, as well as the surface of the scale tape, must be clean and free of paint, dust, or grease.



You can mount the scale tape in a slot, along an edge, or along an aligning rail.

The mounting tolerances refer to the machine guideway (**F**).

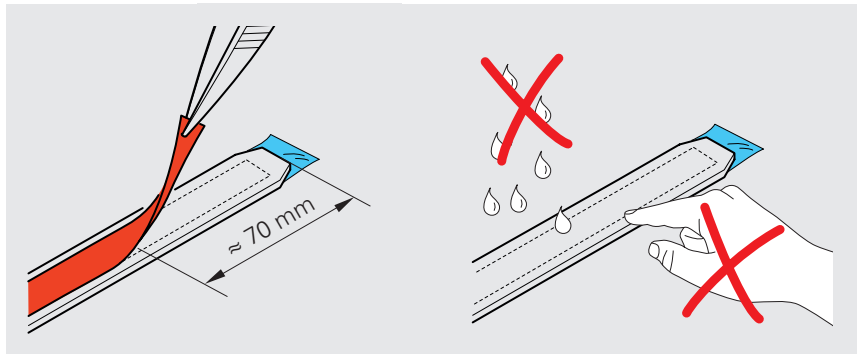


Bonding the scale tape

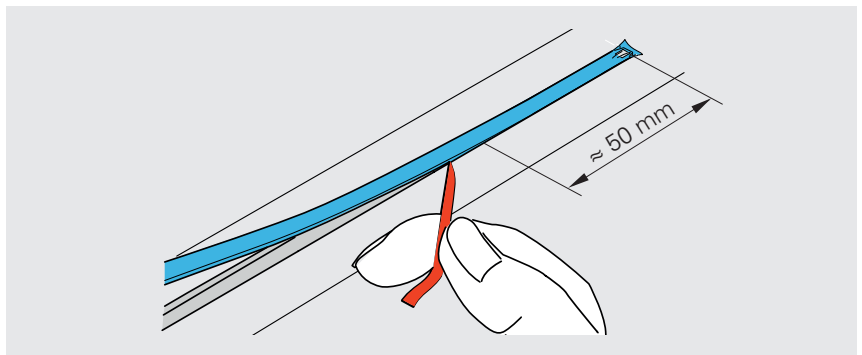
- ▶ Carefully peel off approx. 70 mm of the red protective film on the back of the scale tape



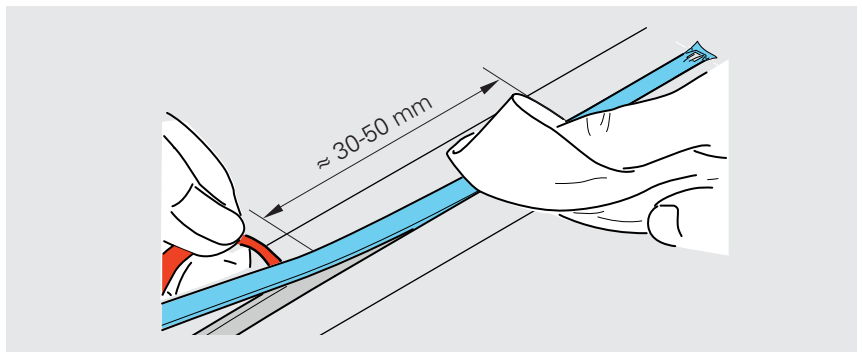
Do not yet remove the blue protective film!



- ▶ Remove the red protective film from the slot
- ▶ Place the scale tape end from which the protective film has been removed against the front end stop (slot) or lateral stop (edge).
- ▶ At the same time, attach the first 50 mm (approx.) of the scale tape



- ▶ Using a soft lint-free cloth, press down the scale tape along its entire length step by step
- ▶ At the same time, carefully pull the red protective film out to the side.
- ▶ Press down at approx. 30 mm to 50 mm behind the point where the protective film is being separated from the adhesive tape



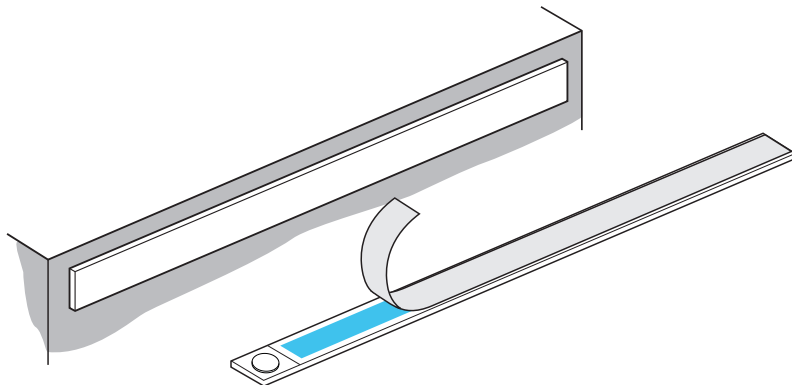
Apply only downward pressure to the scale tape. Do not apply pressure from the side.

Next step: "Mounting the scanning head", Page 19

4.2.3 Variant: Mounting the DOUBLEFLEX scale tape

This chapter describes how to mount the DOUBLEFLEX scale tape with adhesive tape.

An overview of the mounting variants is provided on Page 13.

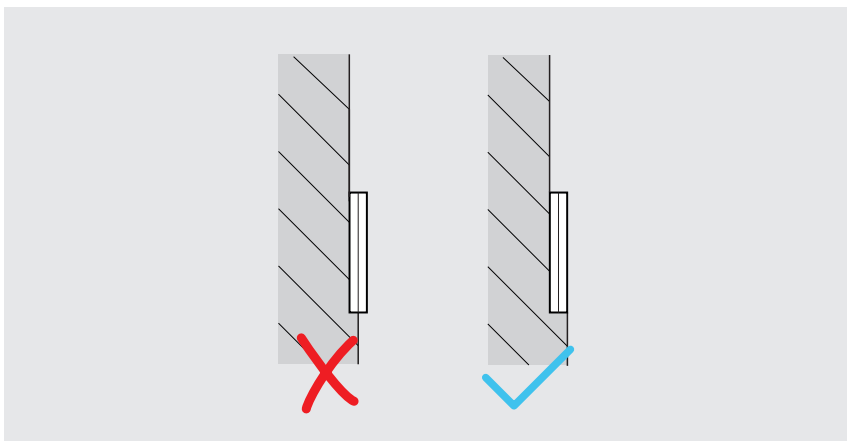


Mounting information

The encoder can be mounted in any position.

Note the following for the horizontal mounting position:

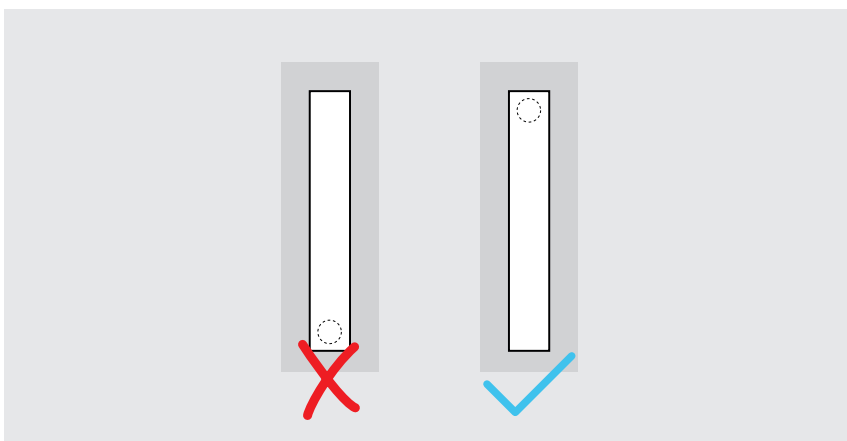
- The scale tape must seat against a supporting edge



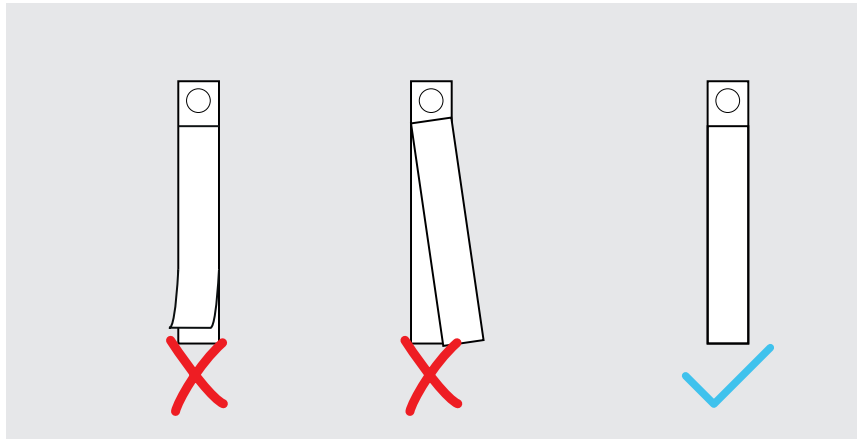
The figure shows the end of the scale tape. The scale tape length extends into the drawing plane and is thus not visible.

Note the following for the vertical mounting position:

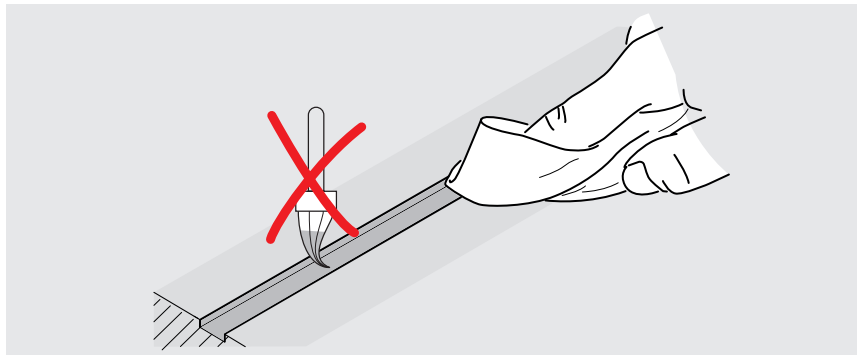
- The fixed point must face upward to prevent the scale tape from separating from the carrier tape



Ensure that the scale tape and the carrier tape are aligned with each other, and do not separate them. This can cause measurement errors and a loss in measuring accuracy.



Note that the mounting surface, as well as the surface of the scale tape, must be clean and free of paint, dust, or grease.

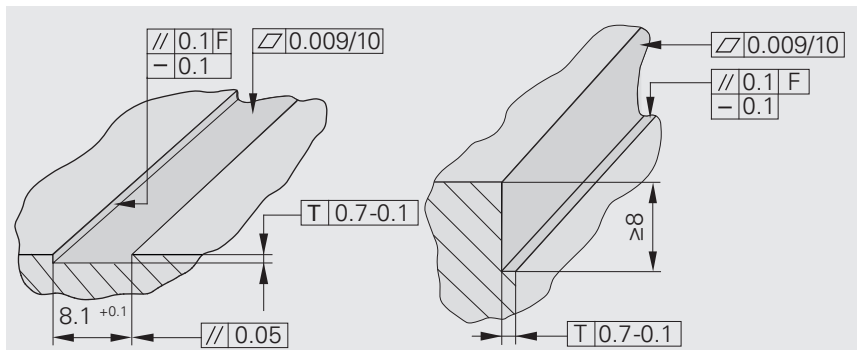


You can mount the scale tape in a slot, along an edge, or along an aligning rail.



The slot, edge, or aligning rail also serves as a stop to prevent misalignment between the scale tape and carrier tape.

The mounting tolerances refer to the machine guideway (**F**).



Bonding the scale tape

- ▶ Apply a drop of adhesive to the center of the fixed point

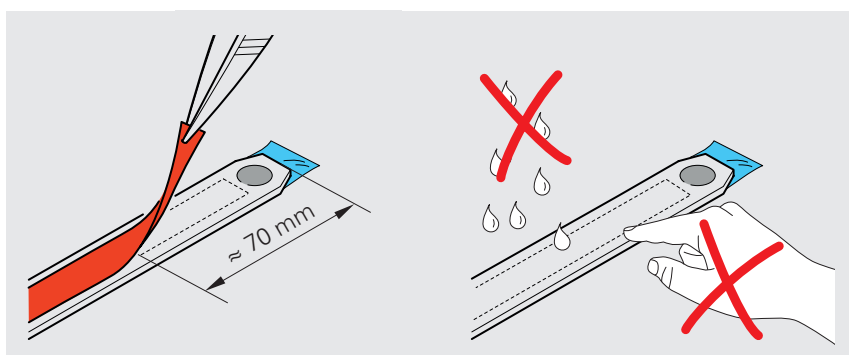
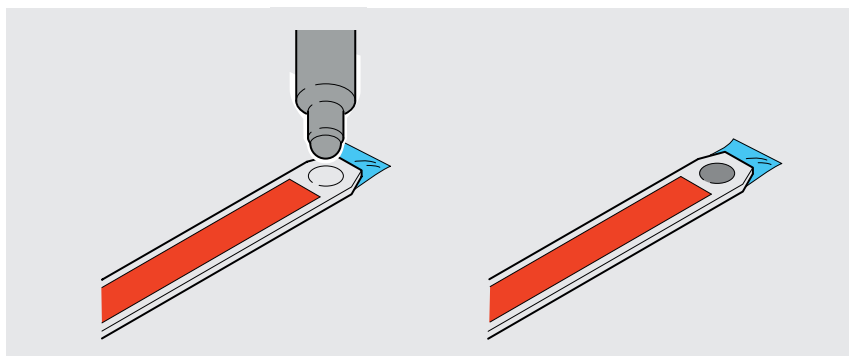
Recommended adhesives:

- Cyanoacrylate adhesive (e.g., Loctite 480 or Loctite 401)
- Epoxy resin

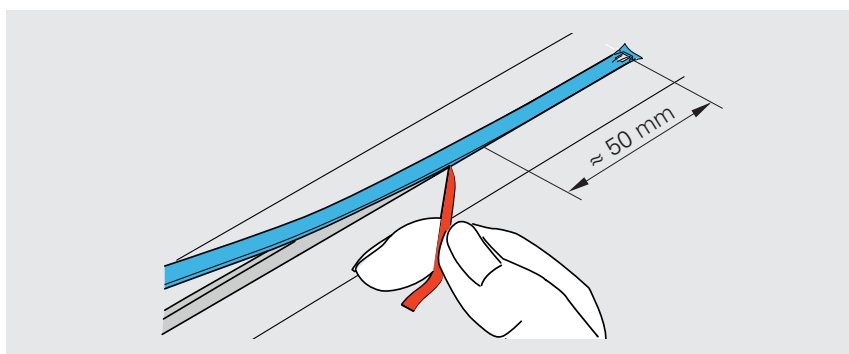
i Pay attention to the work instructions in the applicable documentation.

- ▶ Carefully peel off approx. 70 mm of the red protective film on the back of the scale tape

i Do not yet remove the blue protective film!

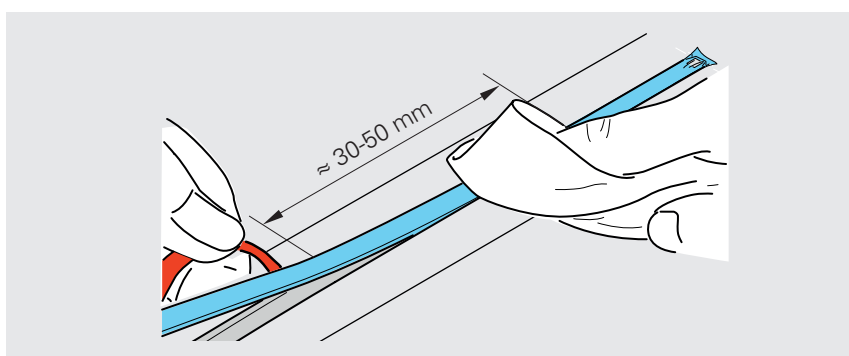


- ▶ Carefully place the scale tape end with the fixed point with the adhesive drop facing down against the front slot edge
- ▶ Remove the red protective film from the slot
- ▶ At the same time, attach the first 50 mm (approx.) of the scale tape



- ▶ Using a soft lint-free cloth, press down the scale tape along its entire length step by step
- ▶ At the same time, carefully pull the red protective film out to the side.
- ▶ Press down at approx. 30 mm to 50 mm behind the point where the protective film is being separated from the adhesive tape

i Apply only downward pressure to the scale tape. Do not apply pressure from the side.



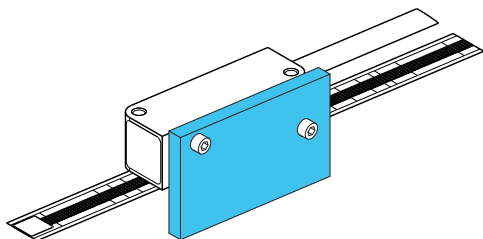
Next step: "Mounting the scanning head", Page 19

4.3 Mounting the scanning head

4.3.1 Choosing the mounting variant

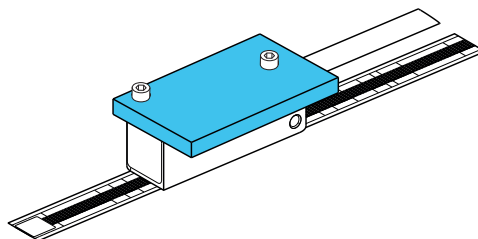
Mounting variants for the scanning head

Holder **on the side**



Page 20

Holder **at the top**

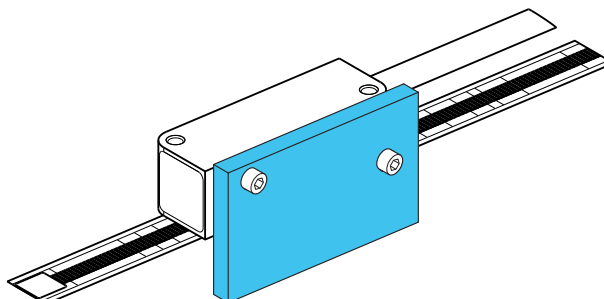


Page 22

4.3.2 Variant: Mounting with the holder on the side

This chapter describes how to mount the scanning head with the holder on the side.

An overview of the mounting variants is provided on Page 19.



Notes on mounting the scanning head with the holder on the side



The tightening torques of the mounting screws are only valid for mounting on steel.

CAUTION

Irritation from isopropyl alcohol!

Contact with isopropyl alcohol or inhaling isopropyl alcohol fumes can cause irritation affecting the skin, eyes, or respiratory system.

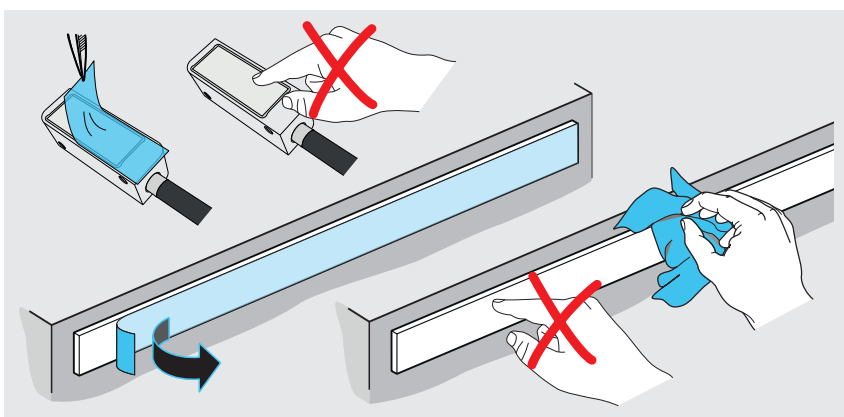
- ▶ Wear protective gloves and safety goggles
- ▶ Wear respiratory protection
- ▶ Keep the workplace well ventilated
- ▶ Comply with the manufacturer's safety data sheets

NOTICE

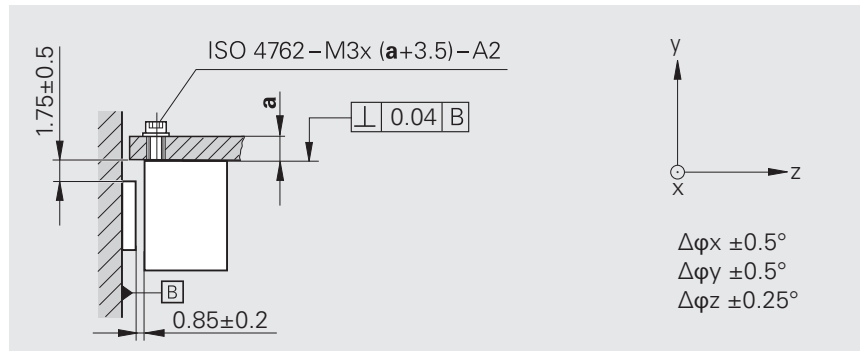
Property damage due to unsuitable cleaning agents!

The use of inappropriate cleaning agents causes damage to the encoder.

- ▶ Use only isopropyl alcohol to clean the encoder
- ▶ Clean the encoder with a lint-free cloth
- ▶ If necessary, clean the graduation and the scanning head with a lint-free cloth and isopropyl alcohol



Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



$\Delta\phi_x$ = Rotation around the X axis

$\Delta\phi_y$ = Rotation around the Y axis

$\Delta\phi_z$ = Rotation around the Z axis

Materials and tools

For this task, the following materials and tools are needed:

Included in delivery

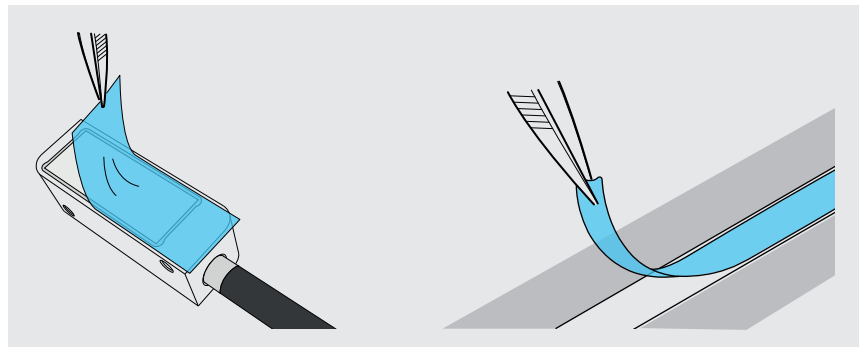
- Spacing gage

To be provided separately

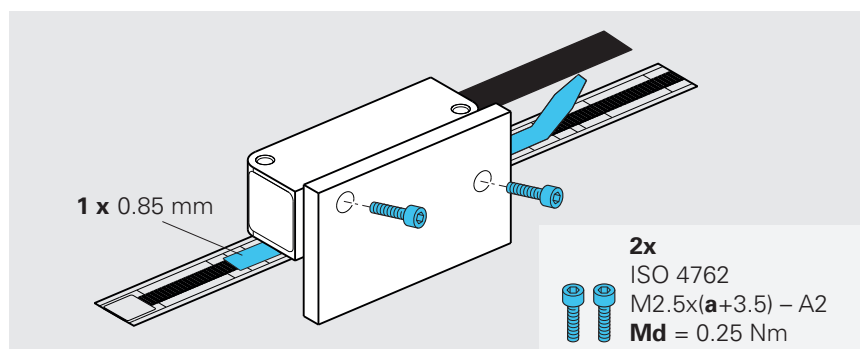
- 2 screws (ISO 4762-M2.5x(a+3.5))
- Torque wrench (hexagon socket for 2 mm)

Mounting the scanning head

- ▶ Remove the protective film from the scanning head
- ▶ Remove the blue protective film from the scale tape, starting from the fixed point for the DOUBLEFLEX scale tape



- ▶ Slide the spacing gage onto the scale tape surface
- ▶ Place the scanning head onto the spacing gage
- ▶ Tighten both mounting screws alternately and evenly with the specified tightening torque until the spacing gage can only just be moved



Verifying that the scanning head is parallel to the scale tape

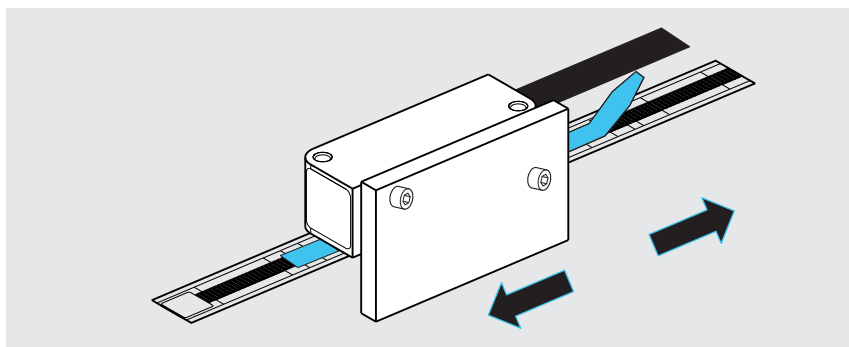
- ▶ Insert approx. 5 mm of the spacing gage alternately from the right and left side, checking whether the play is the same
- ▶ Remove the spacing gage

NOTICE

Damage from jammed spacing gage!

If the spacing gage is jammed or difficult to remove, you can cause damage to the surface of the sensor module.

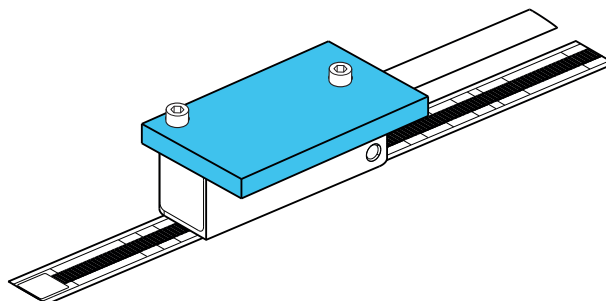
- ▶ Carefully remove the spacing gage
- ▶ If removal is difficult, loosen the scanning head
- ▶ Repeat the mounting procedure



4.3.3 Variant: Mounting with the holder at top

This chapter describes how to mount the scanning head with the holder at top.

An overview of the mounting variants is provided on Page 19.



Notes on mounting the scanning head with the holder at top



The tightening torques of the mounting screws are only valid for mounting on steel.

NOTICE

Property damage due to unsuitable cleaning agents!

The use of inappropriate cleaning agents causes damage to the encoder.

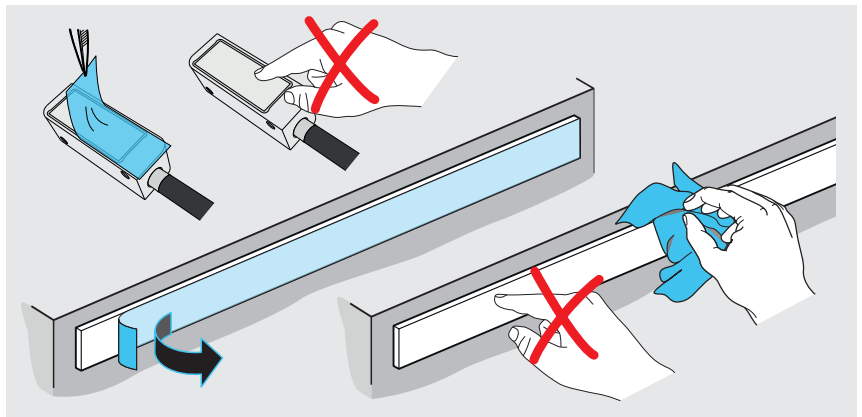
- ▶ Use only isopropyl alcohol to clean the encoder
- ▶ Clean the encoder with a lint-free cloth

⚠ CAUTION**Irritation from isopropyl alcohol!**

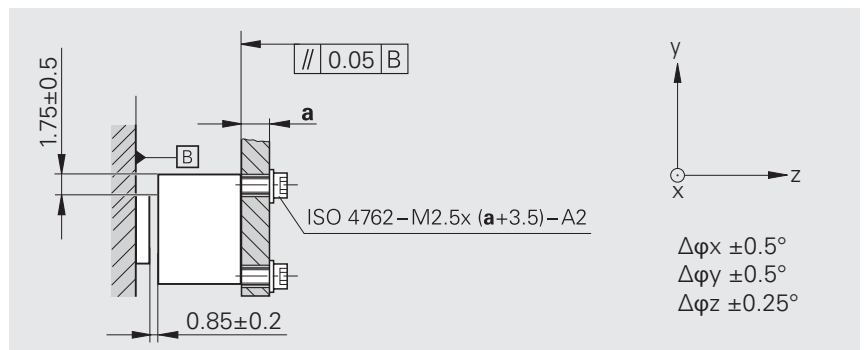
Contact with isopropyl alcohol or inhaling isopropyl alcohol fumes can cause irritation affecting the skin, eyes, or respiratory system.

- ▶ Wear protective gloves and safety goggles
- ▶ Wear respiratory protection
- ▶ Keep the workplace well ventilated
- ▶ Comply with the manufacturer's safety data sheets

- ▶ If necessary, clean the graduation and the scanning head with a lint-free cloth and isopropyl alcohol



Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



$\Delta\phi_x$ = Rotation around the X axis

$\Delta\phi_y$ = Rotation around the Y axis

$\Delta\phi_z$ = Rotation around the Z axis

Materials and tools

For this task, the following materials and tools are needed:

Included in delivery

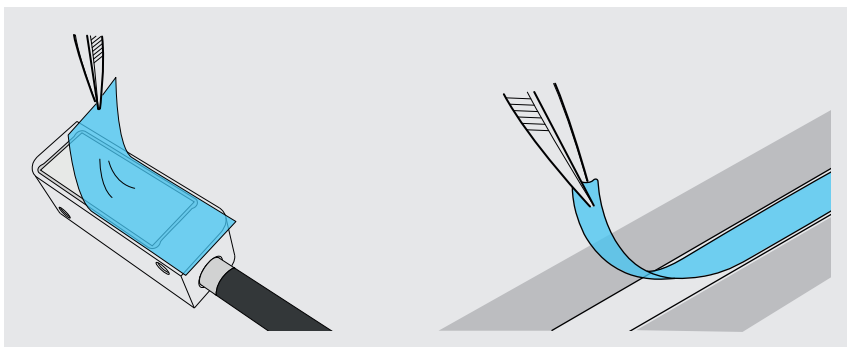
- Spacing gage

To be provided separately

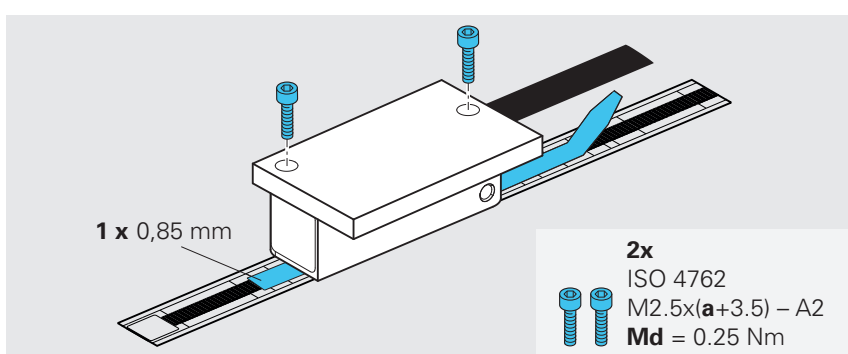
- 2 screws (ISO 4762-M2.5x(a+3.5))
- Torque wrench (hexagon socket for 2 mm)

Mounting the scanning head

- ▶ Remove the protective film from the scanning head
- ▶ Remove the blue protective film from the scale tape, starting from the fixed point for the DOUBLEFLEX scale tape

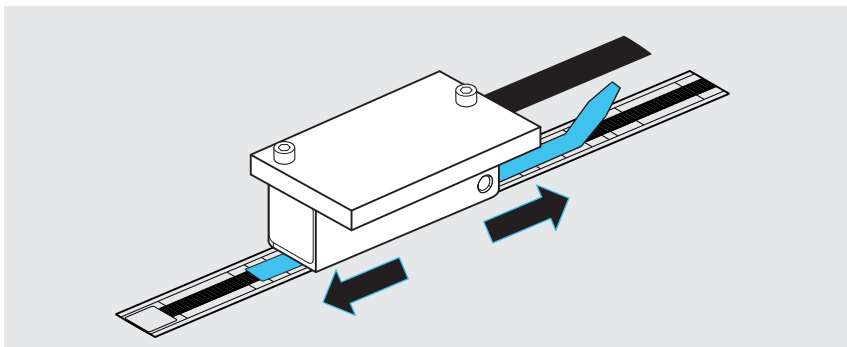


- ▶ Slide the spacing gage onto the scale tape surface
- ▶ Place the scanning head onto the spacing gage
- ▶ Tighten both mounting screws alternately and evenly with the specified tightening torque until the spacing gage can only just be moved



Verifying that the scanning head is parallel to the scale tape

- ▶ Insert approx. 5 mm of the spacing gage alternately from the right and left side, checking whether the play is the same
- ▶ Remove the spacing gage



NOTICE

Damage from jammed spacing gage!

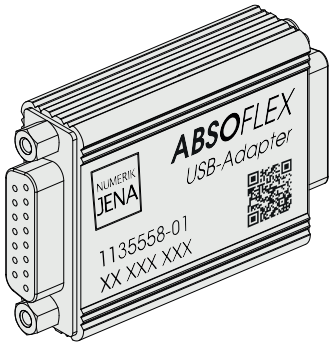
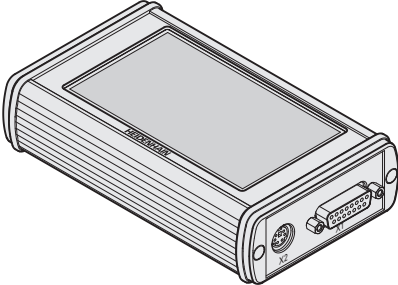
If the spacing gage is jammed or difficult to remove, you can cause damage to the surface of the sensor module.

- ▶ Carefully remove the spacing gage
- ▶ If removal is difficult, loosen the scanning head
- ▶ Repeat the mounting procedure

5 Adjustment and diagnostics

This chapter describes how to perform adjustment and diagnostics by using the ABSOFLEX adapter and the ABSOFLEX Pro software, as well as how to perform diagnostics with a testing device (e.g., PWT 101 or PWT 100).

5.1 Choosing the inspection or testing unit

Adjustment and diagnostics options	
Adjustment and diagnostics with the ABSOFLEX adapter and ABSOFLEX Pro software	Diagnostics with a testing device
 The image shows a rectangular USB adapter with a multi-pin connector on one end. The label on the device includes the text 'NUMERIK JENA', 'ABSOFLEX USB-Adapter', a QR code, and the identification number '1135558-01' followed by 'XX XXX XXX'.	 The image shows a rectangular testing device with a screen on the front and a multi-pin connector on the side. The device is labeled 'PWT 101'.
Page 26	Page 35

5.2 Adjustment and diagnostics with the ABSOFLEX adapter and ABSOFLEX Pro software

5.2.1 Requirements and notes

The following components are needed for the adjustment and diagnostics of NUMERIK JENA encoders:

- ABSOFLEX adapter
- ABSOFLEX Pro software



The **ABSOFFLEX Pro software** is available for download free of charge.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Accessories** selection menu
- ▶ Download **ABSOFFLEX Pro software**



For more information, please refer to the **ABSOFFLEX Adapter Operating Instructions**.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Accessories** selection menu
- ▶ Download the **ABSOFFLEX Adapter Operating Instructions**



Move the axis during signal adjustment without using a drive motor, if possible. If a drive motor is needed, then move the axis under manual control without feedback from the encoder.



During signal adjustment, do not use the encoder signals to control the drive motor. This can trigger faulty pulses, leading to faulty adjustment in the controller and disturbance of the drive system.

5.2.2 Connecting the encoder to the ABSOFLEX Pro software

Connecting the encoder

NOTICE

Damage from multiple supply voltages

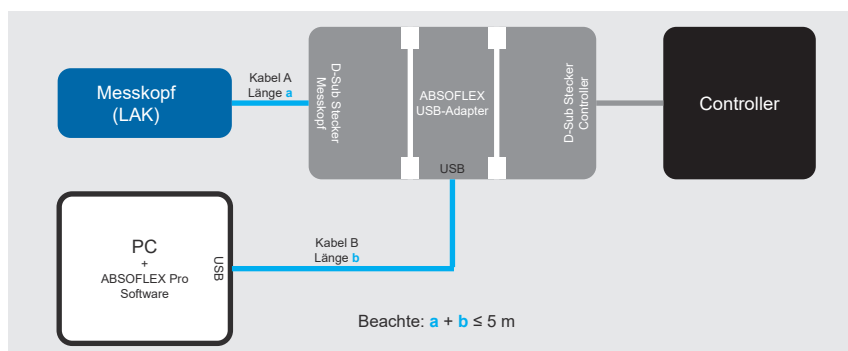
If you simultaneously connect the USB interface and the D-sub interface to live equipment, then this can cause damage to the ABSOFLEX adapter.

- ▶ Switch off all participating devices before connecting
- ▶ Ensure that only one supply voltage is applied
- ▶ Connect or disconnect connections only when they are not under power

- ▶ Connect the encoder to the **ABSOFFLEX adapter**
- ▶ Connect the **ABSOFFLEX adapter** to the PC



Comply with the maximum cable lengths.

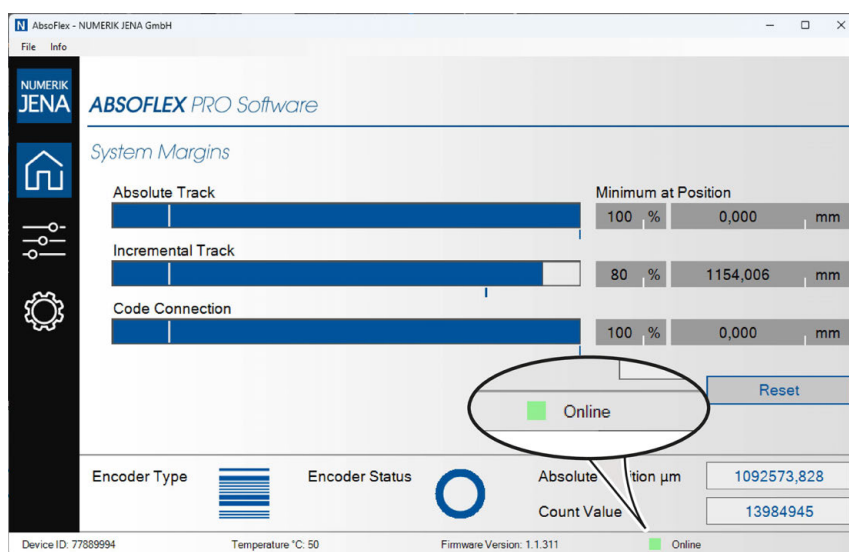


Connecting the encoder to the ABSOFLEX Pro software

- ▶ Open the ABSOFLEX Pro software
- > The home screen opens.
- ▶ Check the connection status
 - Green: The connection has been set up
 - Red: No connection



If there is no connection, make sure all cables and connectors are securely plugged in.

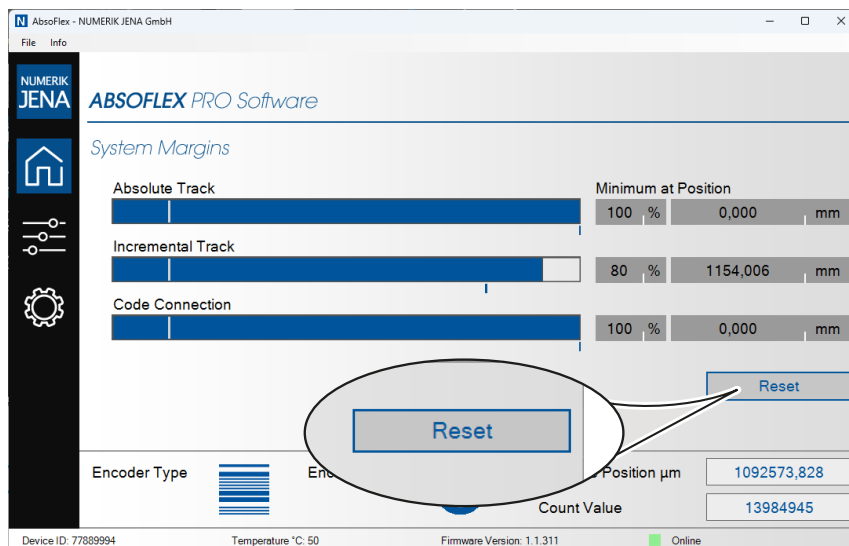


Next step: "Adjusting the scanning head", Page 28

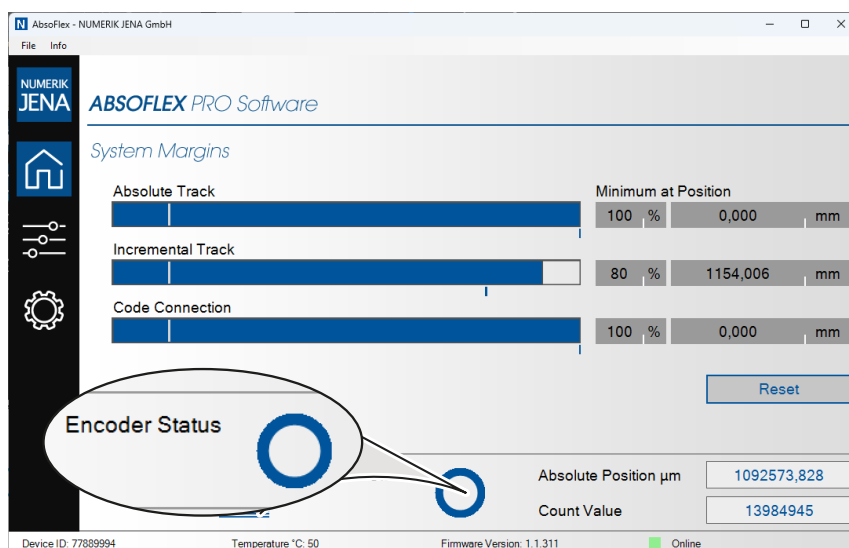
5.2.3 Adjusting the scanning head

Evaluating the signal quality

- ▶ Click **Reset**
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- ▶ Three bars show the current **function reserve status** of the scanning process.
- ▶ **Encoder Status** is displayed.



- ▶ Check the **encoder status**
- The accumulated system status is shown in **Encoder Status**. **Encoder Status** changes from **blue** to **red** if an error occurs.

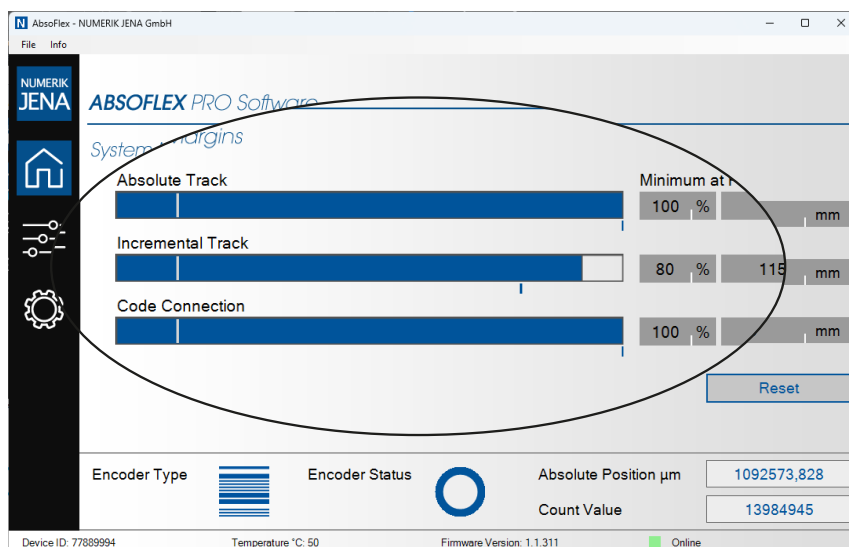


- ▶ Check the **function reserve status**
- Three bars show the current function reserve status of the scanning process:
- **Absolute Track**
 - **Incremental Track**
 - **Code Connection**

Adjustment is recommended in all cases, even if the function reserve status of the scanning process is 100%.



- ▶ Click **Adjustment**
- ▶ The **Adjustment** menu opens.

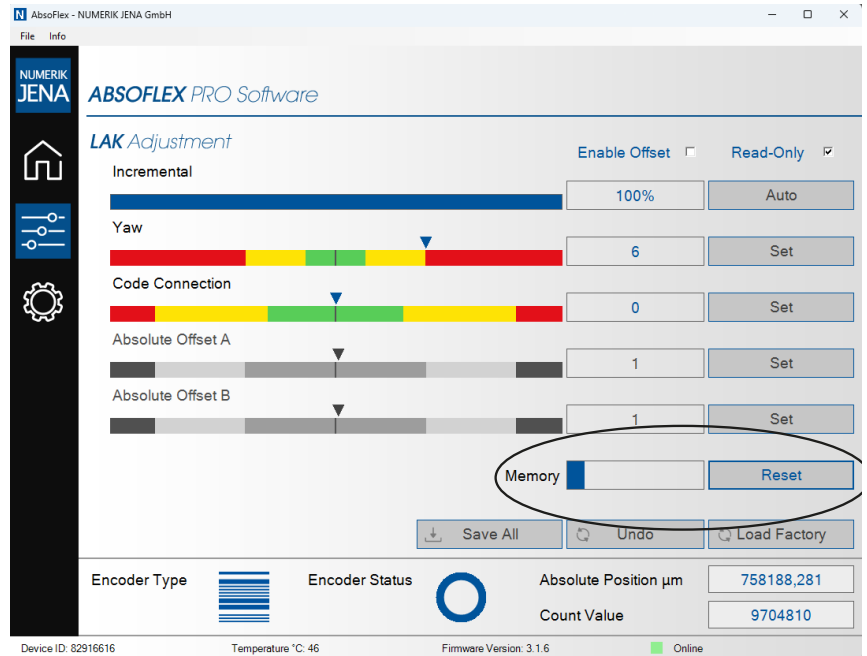


Next step: "Automatic signal adjustment", Page 29

Automatic signal adjustment

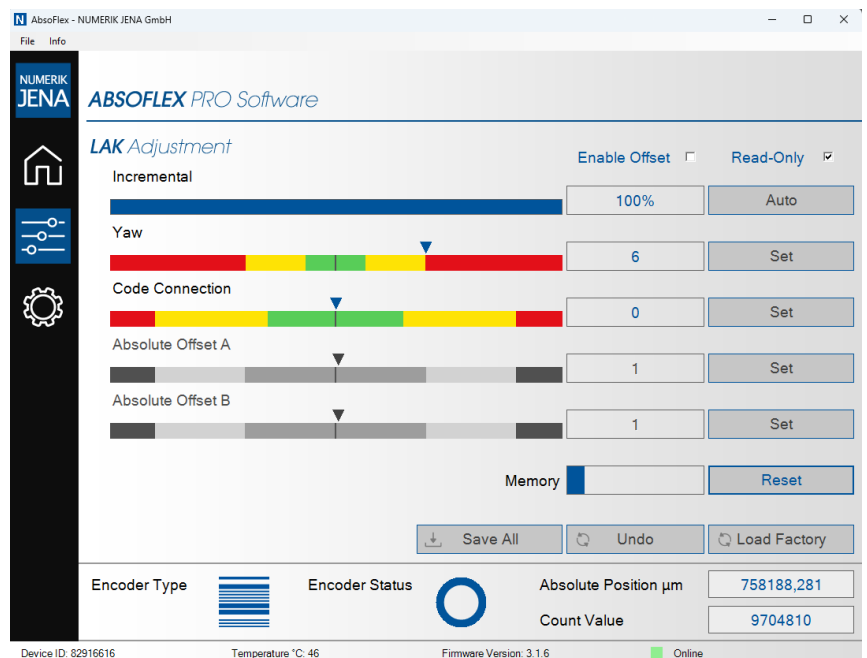
Clearing the memory

- Click **Reset**
- > The memory is cleared.



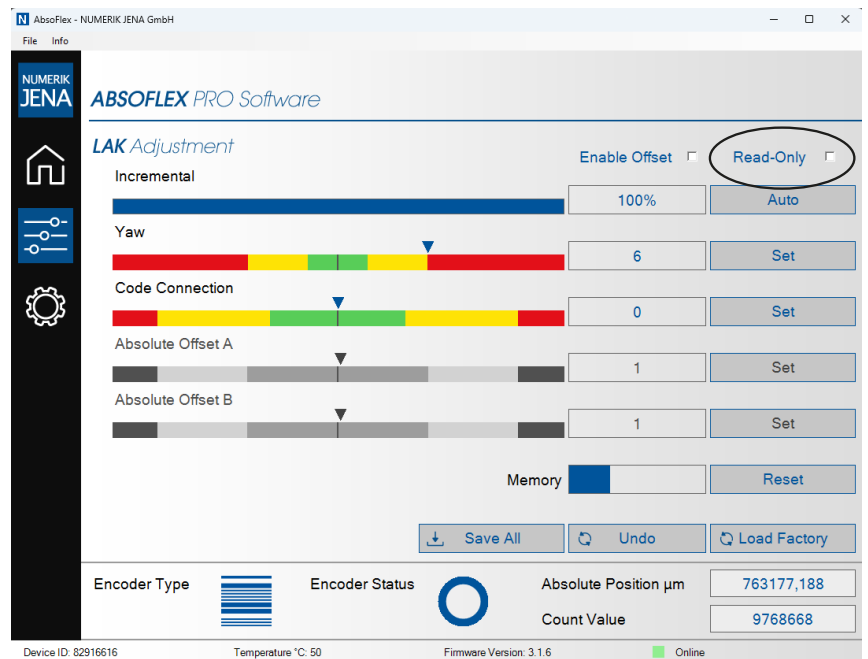
Checking the mechanical mounting conditions

- Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- > The bar graph shows the function reserve of the incremental track (**Incremental** bar) at the current position, the yaw angle (**Yaw** bar), the code connection (**Code Connection** bar), and the offset of the absolute tracks A and B (**Absolute Offset A** and **Absolute Offset B** bars).



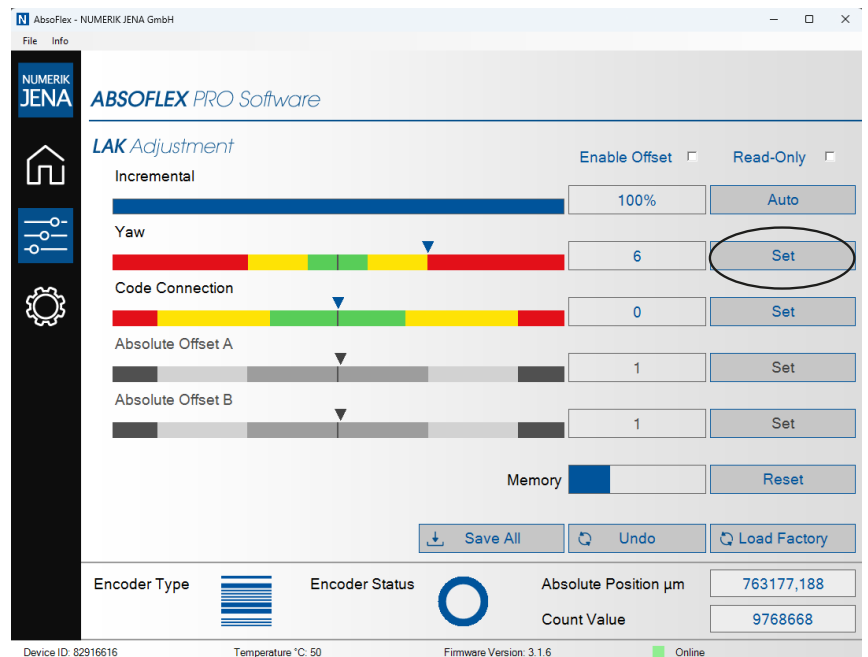
Adjusting the incremental track (Incremental bar)

- ▶ Deselect **Read-Only** mode
- ▶ Signal adjustment is now enabled and can be selected.
- ▶ Click **Auto**
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s until the bar is shown in blue
- ▶ The incremental track is automatically adjusted.
- ▶ The incremental track value is $\geq 80\%$. Adjustment is complete.
- ▶ Continue with **yaw angle** adjustment
- ▶ The incremental track value is less than 80%.
- ▶ Repeat the incremental track adjustment
- ▶ The incremental track value is still less than 80%.
- ▶ Check the mounting conditions and repeat the incremental track adjustment

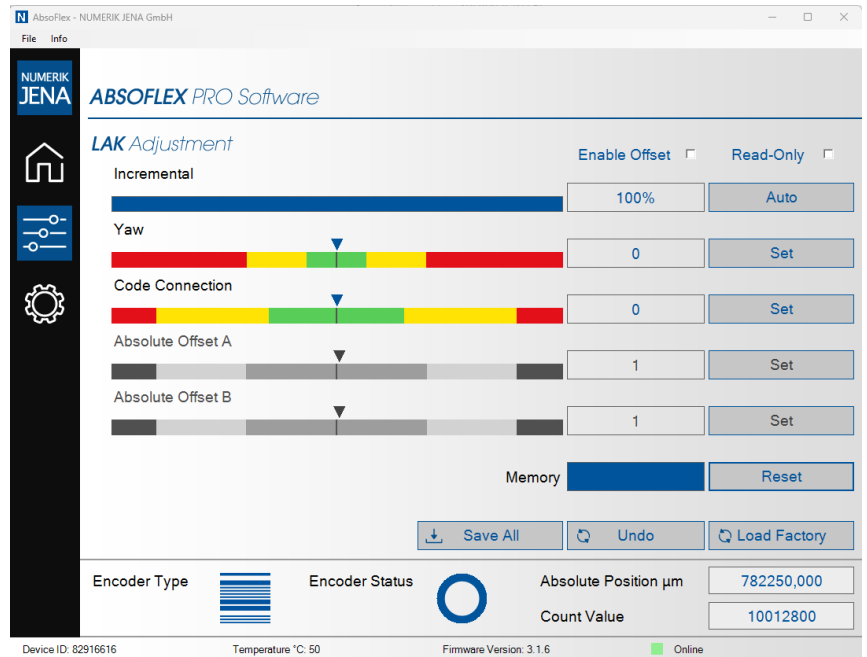


Adjusting the yaw angle (Yaw bar)

- ▶ Click **Set**
- ▶ The yaw angle error is automatically adjusted.

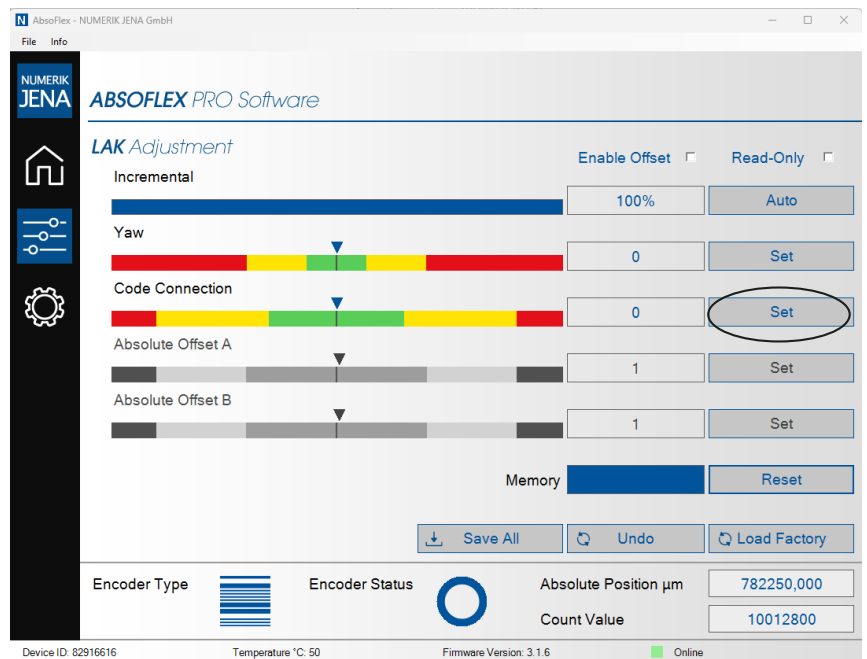


- ▶ Click **Reset**
- > The memory is cleared.
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- > The value is within the green range (optimum). Adjustment is complete.
- ▶ Continue with **code connection** adjustment
- > The value is outside the green range.
- ▶ Repeat the **yaw angle** adjustment
- > The value is still outside the green range.
- ▶ Check the mounting conditions and repeat the **yaw angle** adjustment

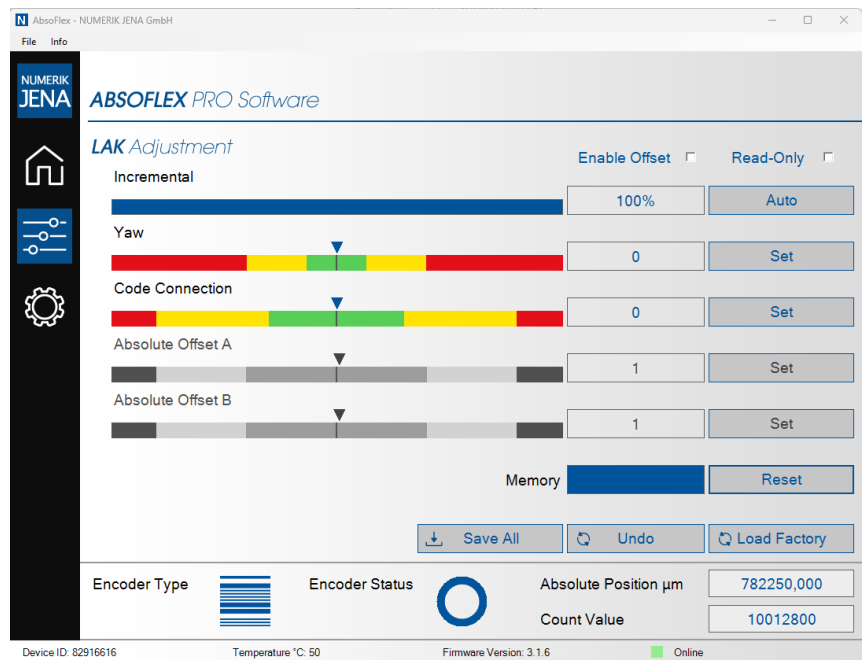


Adjusting the code connection (Code Connection bar)

- ▶ Click **Set**
- > The code connection error is automatically adjusted.

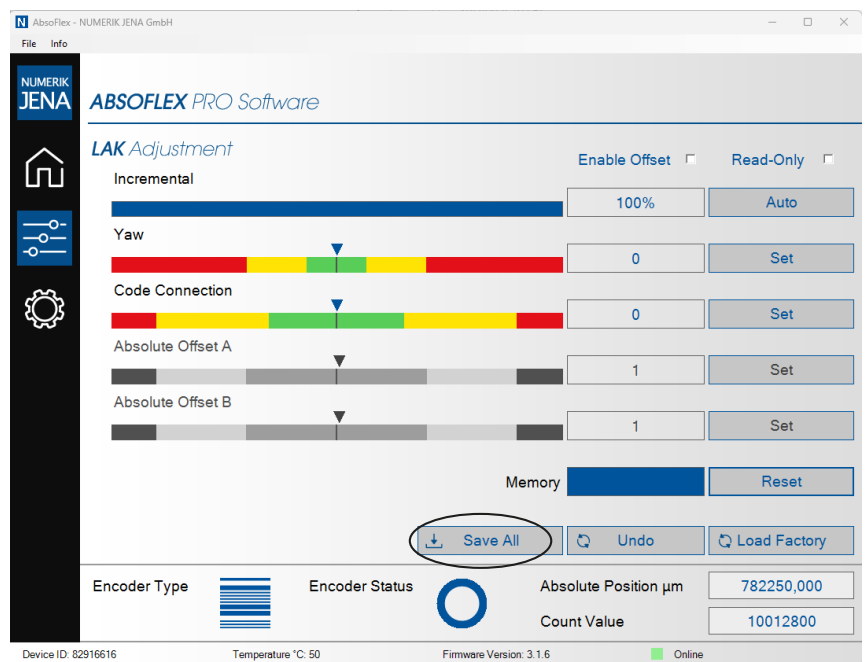


- ▶ Click **Reset**
- ▶ The memory is cleared.
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- ▶ The value is within the green range (optimum). Adjustment is complete.
- ▶ The value is outside the green range.
- ▶ Repeat the **code connection** adjustment
- ▶ The value is still outside the green range.
- ▶ Check the mounting conditions and repeat the **code connection** adjustment



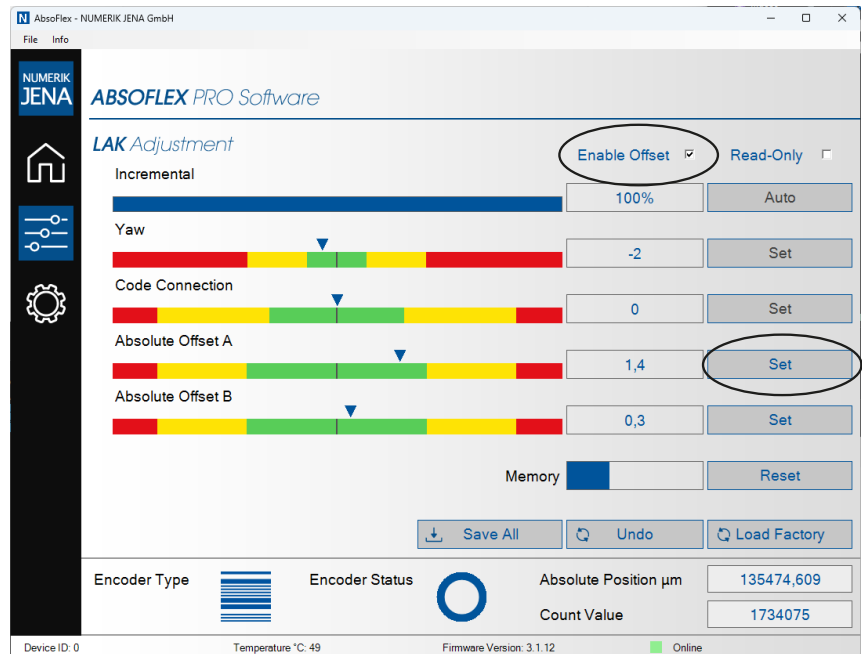
Saving the setting parameters

- ▶ Click **Save All**
- ▶ The setting parameters are saved.
- ▶ Continue with the adjustment of the **offsets of the absolute tracks A and B**



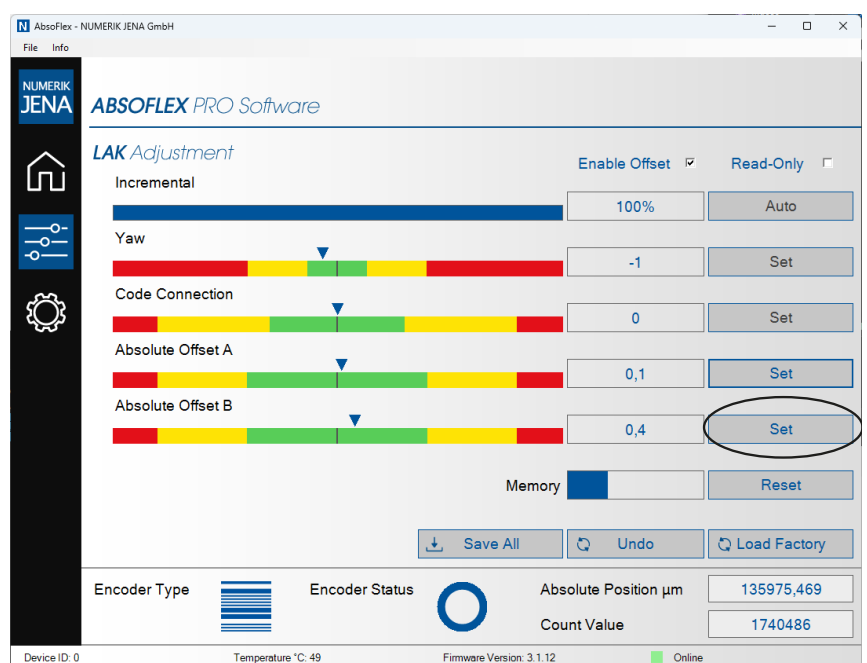
Adjusting the offset of the absolute track A (Absolute Offset A bar)

- ▶ Select **Enable Offset**
- Signal adjustment of the offset limits is now enabled and can be selected.
- ▶ Click **Set**
- The **offset of the absolute track A** is automatically adjusted.
- ▶ Click **Reset**
- The memory is cleared.
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- The value is within the green range (optimum). Adjustment is complete.
- ▶ Continue with the adjustment of the **offset of the absolute track B**
- The value is outside the green range.
- ▶ Repeat the adjustment of the **offset of the absolute track A**
- The value is still outside the green range.
- ▶ Check the mounting conditions and repeat the adjustment of the **offset of the absolute track A**



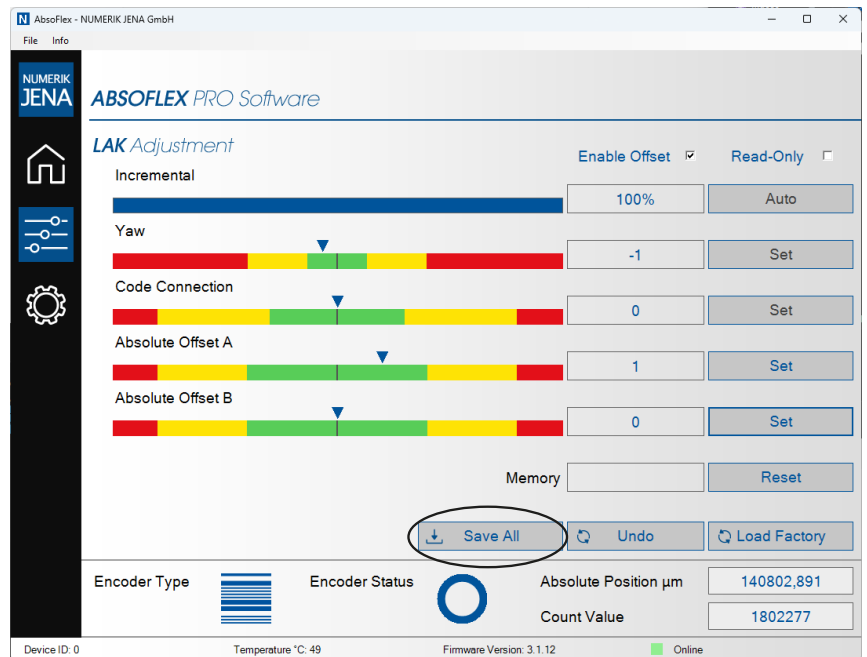
Adjusting the offset of the absolute track B (Absolute Offset B bar)

- ▶ Click **Set**
- The **offset of the absolute track B** is automatically adjusted.
- ▶ Click **Reset**
- The memory is cleared.
- ▶ Traverse the scanning head multiple times over the entire length of the scale tape at a speed of 10 mm/s to 100 mm/s
- The value is within the green range (optimum). Adjustment is complete.
- The value is outside the green range.
- ▶ Repeat the adjustment of the **offset of the absolute track B**
- The value is still outside the green range.
- ▶ Check the mounting conditions and repeat the adjustment of the **offset of the absolute track B**



Saving the setting parameters

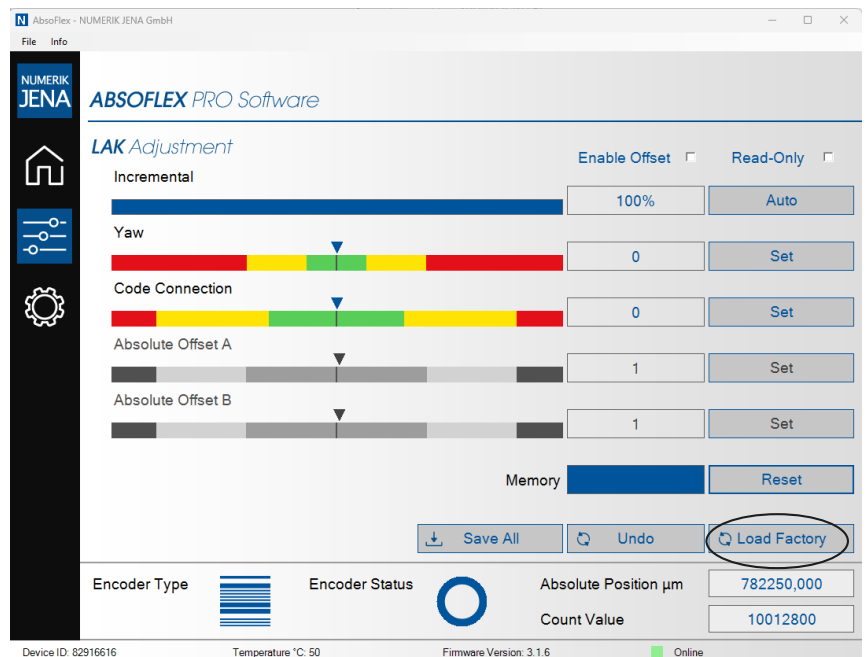
- Click **Save All**
- > The setting parameters are saved.
- > The encoder has been adjusted successfully.



Problems during adjustment

If problems occur during signal adjustment or the adjustment cannot be performed, the sensor parameters may need to be reset to the factory default settings.

- Click **Load Factory**
- > The sensor parameters are reset to the factory default settings.
- > Repeat the adjustment



5.3 Diagnostics with a testing device

5.3.1 Requirements and notes

A testing device (e.g., PWT 101 or PWT 100) and the NUMERIK JENA software module are needed for diagnostics.



The **NJ PWT software module** is available for download free of charge.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Accessories** selection menu
- ▶ Download the **NJ PWT software module**



For more information, refer to the **PWT 100/PWT 101 Operating Instructions**.

- ▶ www.heidenhain.com/documentation
- ▶ Enter the document ID **1162581**

5.3.2 Connecting the encoder to the PWT

Connecting the encoder

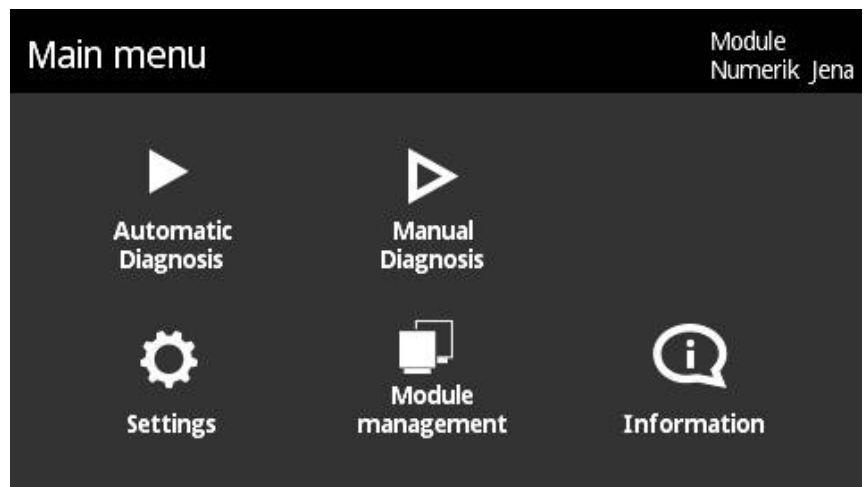
- ▶ Connect the encoder to the PWT
- ▶ Connect the PWT to the power supply

Selecting the connection

Connection options	
Connecting the encoder automatically	Connecting the encoder manually
Recommended option with automatic determination of the measuring parameters. Page 36	Alternative option if the encoder cannot be connected automatically. Page 37

Connecting the encoder automatically

- ▶ On the **Main menu** screen, tap **Automatic Diagnosis**
- > **Automatic Diagnosis** is performed.
- > The **Online diagnostics** screen opens.



Main menu

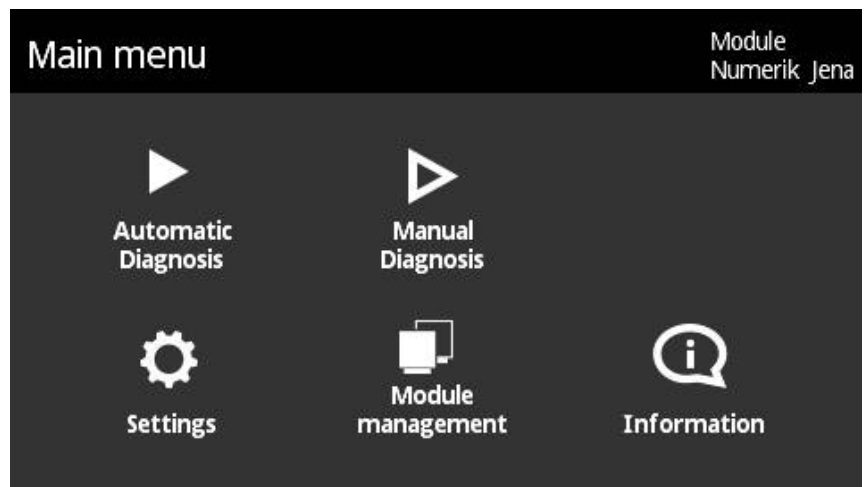


If you cannot connect the encoder automatically, proceed as described in the **Connecting the encoder manually** chapter.

Next step: "Diagnostics for the scanning head", Page 39

Connecting the encoder manually

- ▶ On the **Main menu** screen, tap **Manual Diagnosis**
- > The **Supply voltage of encoder** screen opens



Main menu

NOTICE

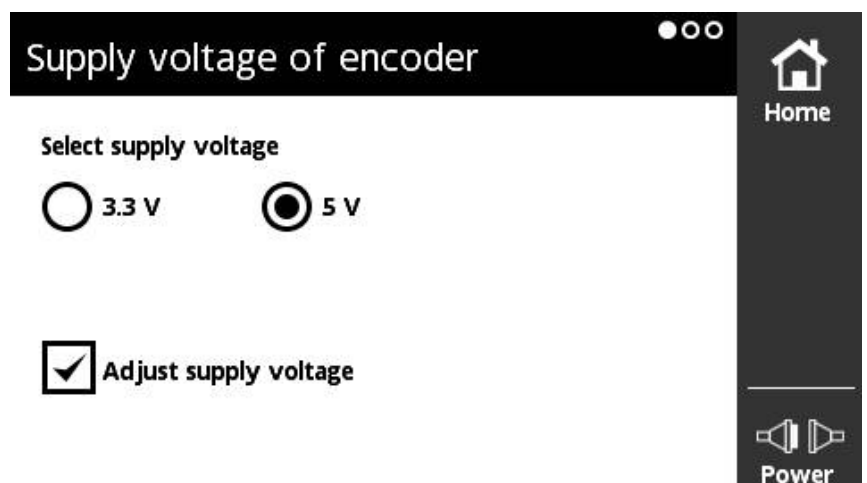
Property damage due to incorrect encoder data settings!

Incorrect encoder data settings can cause damage to the encoder, the interface card, or the PC.

- ▶ Before connecting the encoder, check the encoder data

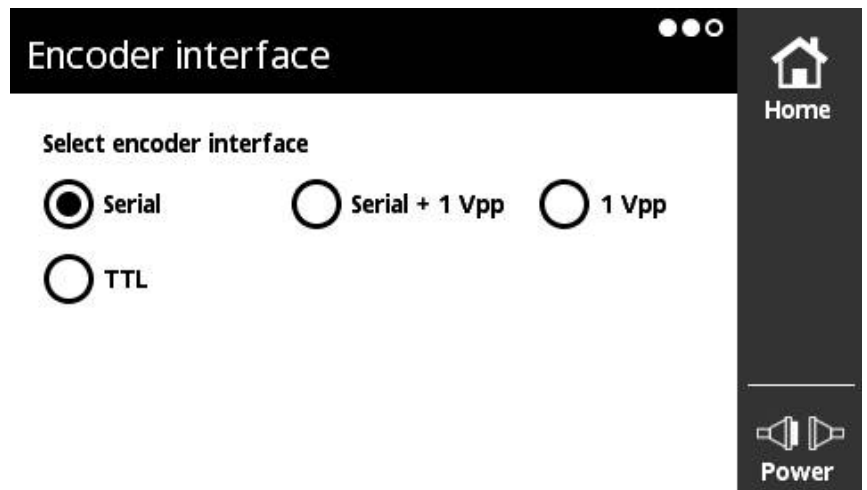
Encoder interface:	EnDat 2.2, TTL, 1 V _{PP}
Supply voltage [V]:	5.0
Voltage adjustment:	Yes

- ▶ Select the supply voltage
- ▶ To activate voltage adjustment by the PWT, select the **Adjust supply voltage** checkbox
- ▶ Swipe right to left
- > The **Encoder interface** screen opens.



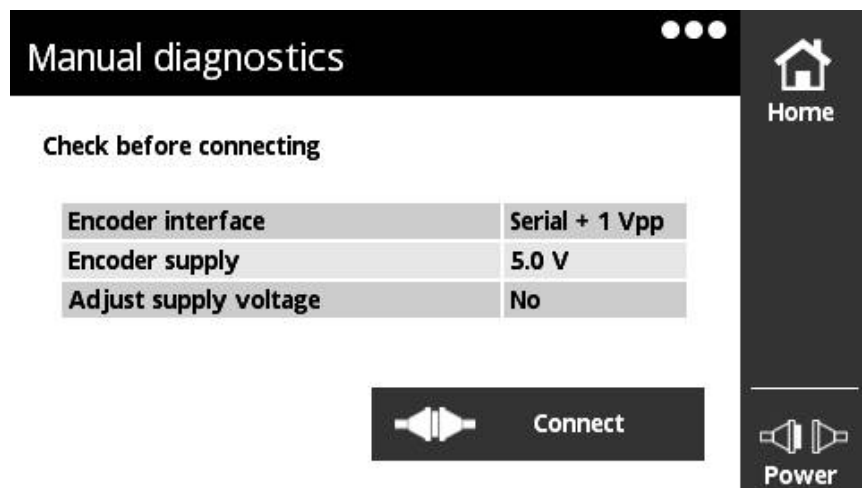
Supply voltage of encoder

- ▶ Select the appropriate encoder interface
- ▶ Swipe right to left
- > The **Manual diagnostics** screen opens.



Encoder interface

- ▶ Check the encoder data
- ▶ Tap **Connect**
- > The connection to the encoder is set up.
- > The **Online diagnostics** screen opens.



Manual diagnostics

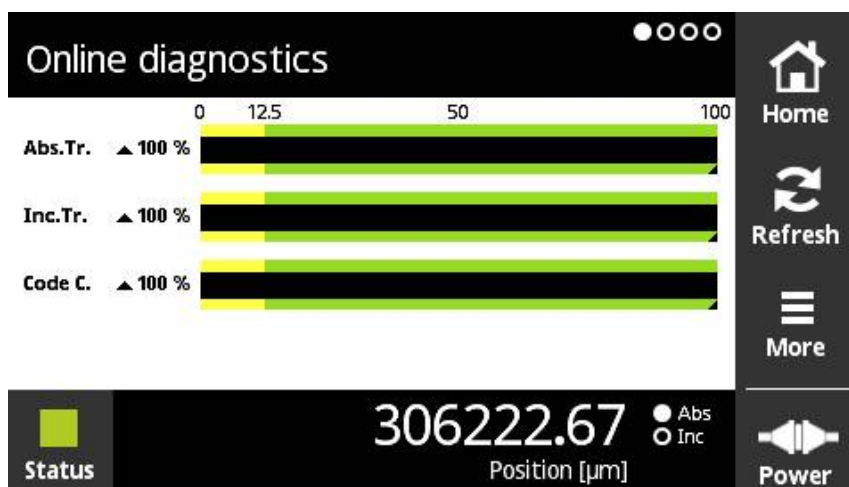
Next step: "Diagnostics for the scanning head", Page 39

5.3.3 Diagnostics for the scanning head

- ▶ Traverse the scanning head over the entire measuring length
- ▶ Ensure that the minimum markers remain within the green ranges



If the green ranges are not reached or if strong signal jitter occurs over the entire measuring length, check the mounting tolerances and inspect for contamination.



Next step: "Final steps", Page 40

6 Final steps

This chapter describes the necessary final steps.

6.1 Connecting the encoder to the downstream electronics

WARNING

Danger of electric shock due to plug connections under power!

Connecting and disconnecting live cables and connecting elements in the equipment can result in death or serious injury.

- ▶ Do not connect or disconnect any cable or connecting element when they are under power
- ▶ Disconnect the downstream electronics from power before connecting the product
- ▶ For cables without connectors, pay attention to the pin layout

- ▶ Connect the encoder to the downstream electronics

NOTICE

Property damage resulting from incorrect routing of the connecting cable!

Connecting cables may become damaged as a result of incorrect routing.

- ▶ Observe the maximum permissible bend radii
- ▶ Do not cross connecting cables in drag chains
- ▶ Route connecting cables professionally



For more information on the **cable characteristics and cable routing**, please refer to the **Product Information** document.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the selection menu for the desired product
- ▶ Download the **Product Information** document
- ▶ Chapter: Specifications



For more information on the interfaces, please refer to the **Interfaces of NUMERIK JENA Encoders** brochure.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Interfaces** selection menu
- ▶ Download the **Interfaces of NUMERIK JENA Encoders** brochure

7 Removal

This chapter describes the disassembly of the product.

7.1 Safety precautions regarding removal

WARNING

Risk of injury due to plug connections under voltage!

If you disengage plug connections while the equipment is under power, this may result in fatal accidents or severe personal injury.

- ▶ Do not engage or disengage any connecting elements while the product is under power

WARNING

Risk of injury due to moving machine parts!

Depending on the installation location and the application, there is a high risk of injury due to moving machine parts.

- ▶ Observe all of the machine manufacturer's notes on working on the machine (e.g., always disconnect the machine from the power supply)

CAUTION

Risk of injury from splinters and sharp edges of the carrier material!

If you remove fragile carrier material incorrectly, this can result in material breakage with splinters and sharp edges.

- ▶ Wear protective gloves and safety goggles
- ▶ Do not bend or deform the carrier material excessively

7.2 Removing the scanning head

- ▶ Disconnect the encoder from the downstream electronics
- ▶ Remove the scanning head in the reversed sequence of mounting

Further information: "Mounting the scanning head", Page 19

7.3 Removing the scale tape



Further information can be found in the **Disassembly Instructions**.

- ▶ www.numerikjena.com/downloads-en/documents-software/
- ▶ Open the **Linear Encoders / Incremental** selection menu
- ▶ Open the **Measuring standards** selection menu
- ▶ Download the **Disassembly Instructions**



Original document
1508668 · Ver00 · 02

NUMERIK JENA GmbH
Im Semmicht 4
07751 Jena, Germany

info@numerikjena.com
www.numerikjena.com



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