wenglor
the innovative family

Operating Instructions
U3HJ301-006-070
Fork Sensor for Label Detection



EN

Translation of the original operating instructions
Subject to change without notice
Available as PDF file only
Version 1.1
www.wenglor.com

Table of Contents

1 General 3

1.1 Information Concerning these Instructions 3

1.2 Explanation of Symbols 3

1.3 Limitation of Liability 4

1.4 Copyrights 4

2 For Your Safety 5

2.1 Use for Intended Purpose 5

2.2 Use for Other than the Intended Purpose 5

2.3 Personnel Qualifications 5

2.4 Modification of Products 6

2.5 General Safety Precautions 6

2.6 Approvals and protection classes 6

3 Technical Data 7

3.1 General Data 7

3.2 Housing Dimensions 8

3.3 Complementary Products 8

4 Installation and Electrical Connection 9

4.1 Installation 9

4.2 Electrical Connection 9

4.3 Diagnosis 10

5 Settings 11

5.1 Settings via Button Press 11

5.1.1 Switching output 11

5.1.2 Output function 12

5.2 External teach-in 12

5.3 wTeach2 Configuration Software 12

5.4 Restoring Factory Settings 12

6 Maintenance Instructions 13

7 Proper Disposal 14

8 Declarations of Conformity 15

1 General

1.1 Information Concerning these Instructions

- These instructions ensure the safe and efficient use of the product.
- These instructions are part of the product and must be retained for its entire service life.
- In addition, local accident prevention regulations and national occupational safety regulations must be observed.
- The product is subject to technical improvements, so the instructions and information in these operating instructions may also be subject to change. You can find the current version at www.wenglor.com in the product's download section.



INFORMATION

The operating instructions must be read carefully before use and kept for future reference.

1.2 Explanation of Symbols

- Safety precautions and warnings are emphasized by means of symbols and signal words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

SIGNAL WORD

Type and source of danger!

Possible consequences in the event that the hazard is disregarded.

→ Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:



⚠ DANGER

This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.



⚠ WARNING

This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.



⚠ CAUTION

This signal word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.



NOTICE

This signal word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

INFORMATION

Information draws attention to useful tips and suggestions, as well as information on efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art technology, as well as applicable standards and guidelines. Subject to change without notice.
- A valid declaration of conformity can be accessed at www.wenglor.com in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
  - Non-compliance with the instructions
  - Use of the product for purposes other than those intended.
  - Use by untrained personnel.
  - Use of unapproved spare parts.
  - Unapproved modification of products.
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

2 For Your Safety

2.1 Use for Intended Purpose

ultrasonic fork sensor

The ultrasonic fork sensor is used for contactless label recognition—especially of transparent labels. The sensor consists of an emitter and receiver unit positioned opposite each other within a fork-shaped housing. By detecting differences in material thickness, the sensor determines whether and when a label is attached to a label material. The sensor detects labels made of paper, plastic (including transparent plastic), and metallic labels on paper, plastic, and metallic label materials.

This Product Can Be Used in the Following Industry Sectors:

- Special-purpose mechanical engineering
- Heavy mechanical engineering
- Logistics
- Automotive industry
- Food industry
- Packaging industry
- Pharmaceuticals industry
- Plastics industry
- Woodworking industry
- Consumer goods industry
- Paper industry
- Electronics industry
- Glass industry
- Steel industry
- Aviation industry
- Chemicals industry
- Alternative energies
- Raw materials extraction

2.2 Use for Other than the Intended Purpose

- Not a safety component in accordance with 2006/42/EC (Machinery Directive).
- The product is not suitable for use in potentially explosive atmospheres.
- The product may be used only with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be found at www.wenglor.com on the product detail page.



⚠ DANGER

Risk of personal injury or property damage in case of use for other than the intended purpose!

Use for other than the intended purpose may lead to hazardous situations.

→ Observe instructions regarding use for intended purpose.

2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel who use the product must have (permanent) access to the operating instructions.

⚠ DANGER

Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!

Personal injury and damage to equipment may occur.

→ Adequate training and qualification of personnel

2.4 Modification of Products

⚠ DANGER

Risk of personal injury or property damage if the product is modified!

Personal injury and damage to equipment may occur. Noncompliance may result in loss of the CE and/or UKCA mark and voiding of the warranty.

→ Modification of the product is not permitted

2.5 General Safety Precautions

INFORMATION

These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.

In the event of possible changes, the current version of the operating instructions can be found at www.wenglor.com in the product's separate download area.

Read the operating instructions carefully before using the product.

Protect the sensor against contamination and mechanical influences.

2.6 Approvals and protection classes

3 Technical Data

3.1 General Data

Ultrasonic Data	
Fork Width	6 mm
Smallest Detectable Gap	2 mm
Reproducibility	0.2 mm

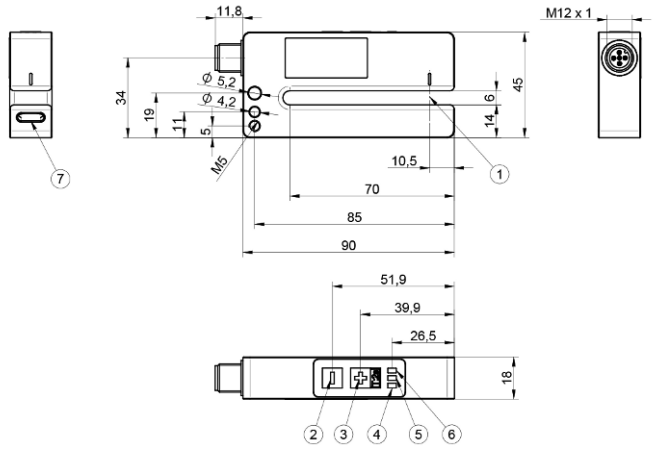
Electrical Data	
Supply Voltage	18...30 V DC
Current Consumption (Ub = 24 V)	< 40 mA
Response Time	0.25 ms
Temperature Range	0...60 °C
Number of Switching Outputs	2
Switching Output/Switching Current	100 mA
Protection Class	III
Time delay before availability	180 ms
Belt speed	≤ 250 m/min

Mechanical Data	
Setting Method	Teach-In
Housing Material	Aluminum
Degree of Protection	IP67
Connection	M12 × 1; 5-pin

General Data	
Scope of delivery	1 × initial start-up instructions 1 × sensor

eCl@ss 5.1.4	27-27-08-04 Ultrasonic distance sensor
eCl@ss 6.x	27-27-08-04 Ultrasonic distance sensor
eCl@ss 7.0	27-27-08-04 Ultrasonic distance sensor
eCl@ss 7.1	27-27-08-04 Ultrasonic distance sensor
eCl@ss 8.x	27-27-08-04 Ultrasonic distance sensor
eCl@ss 10.0.1	27-27-08-04 Ultrasonic distance sensor

3.2 Housing Dimensions



Symbol	Legend
1	Active surface
2	Threshold setting
3	Teach-in key / Threshold value setting
4	error indicator
5	switching status indicator
6	Power LED
7	Exhaust vent

3.3 Complementary Products

wenglor offers you the right connection and mounting technology as well as other accessories for your product. You can find this at www.wenglor.com on the product details page at the bottom.

4 Installation and Electrical Connection

4.1 Installation

- Protect the product from contamination during installation.
- Observe the applicable electrical and mechanical regulations, standards, and safety rules.
- Protect the product from mechanical impact.
- Ensure that the sensor is mechanically secure during installation.
- Torque specifications must be observed (see the section “ Technical Data [▶ 7] ”).
- The active surface of the sensor may not contact any other machine parts.

NOTICE

Risk of property damage in case of improper installation!

The product may be damaged!

→ Comply with installation instructions.

⚠ CAUTION

Risk of personal injury or property damage during installation!

Personal injury and damage to the product may occur.

→ Ensure a safe installation environment.

4.2 Electrical Connection

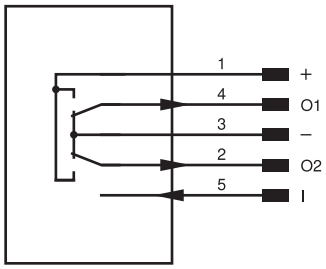
- Wire the sensor according to the connection diagram.
- Switch on the supply voltage (see section Technical Data [▶ 7]).

⚠ DANGER

Risk of personal injury or property damage due to electric current.

Live parts may cause damage to persons and equipment.

→ The electrical device may only be connected by qualified personnel.



Pin	Pin Function	Polarity	Circuit
1	Supply Voltage +		
2	Error output	Push-pull	NO
3	Supply voltage 0 V		
4	Switching output 1	Push-pull	NO

Pin	Pin Function	Polarity	Circuit
5	Input	High-active	

4.3 Diagnosis

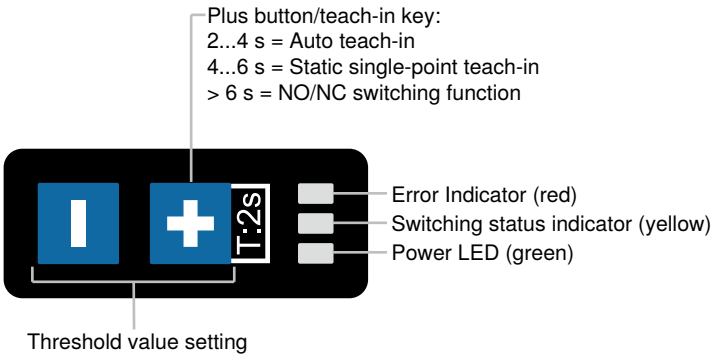
display	Condition	Meaning
Power LED		Sensor ready for operation
	○	No voltage supply available
switching status indicator		Switching output (factory setting: label detected)
error indicator		Stability warning (teach-in not stable/Stability warning during operation)

5 Settings

5.1 Settings via Button Press

This section describes the settings that can be adjusted directly on the sensor using the buttons.

Control panel



5.1.1 Switching output

There are two different teach-in modes available. These can be selected and configured using the Plus button:

Autoteach

1. Insert the label (green LED lights up). The label must rest under tension on the lower arm of the fork sensor.
2. Press the plus button for 2–4 seconds until the yellow LED lights up.
3. Release the Plus button.
4. The autoteach process starts and is indicated by the yellow LED flashing rapidly.
5. Now pass as many labels or label gaps as possible—but at least two—through the ultrasonic beam.
6. As soon as the teach-in process is successfully completed, the yellow LED will light up slowly three times.

If the yellow LED flashes slowly 4 times and the red LED remains lit, the autoteach process was aborted due to an error. The teach-in must be repeated. Additionally, the functional reserve can be increased by pressing the minus button.

Static Single-Point Teach-In

1. Insert the label. The label must rest under tension on the lower arm of the fork sensor.
2. Press the plus button and hold it for 4–6 seconds.
3. Perform static single-point teach-in on the label.

INFORMATION

After the teach-in process is complete, check the teach setting in the label gap or on the label to ensure a sufficient functional reserve. If necessary, the threshold value can be adjusted using the plus and minus buttons.

Threshold Value

The threshold value can be adjusted by briefly pressing the plus and minus buttons.

- Press the plus button to increase the switching threshold (reducing the functional reserve or stability)
- Press the minus button to lower the switching threshold (increasing the functional reserve or stability)

5.1.2 Output function

Use the plus button to switch to the desired switching function.

1. Press and hold the plus button for more than 6 seconds.
2. The NO/NC switching function is changed.

5.2 External teach-in

External Teach-In Input

Teach the O1 output via the teach-in input.

1. Apply 18–30 V to pin 5 for at least 2 seconds (and no more than 4 seconds).
2. As soon as the voltage at the input drops, O1 is programmed.

Lock

If the teach-in input is permanently activated, the buttons are locked and protected against unintentional adjustment.

1. Set pin 5 permanently to 0 V DC.
2. The sensor is protected against adjustment via the Plus button/teach-in key.

5.3 wTeach2 Configuration Software

For information on installing and connecting the wTeach2 software and its structure, as well as information on the general functions, see the wTeach2 operating instructions. They can be found online in the download area at www.wenglor.com under order number DNNF005.

5.4 Restoring Factory Settings

To reset the sensor to its factory settings, press the Plus button and then apply the supply voltage. The yellow LED will flash to confirm.

6 Maintenance Instructions



NOTICE

This wenglor product is maintenance-free.

Cleaning and inspection of the plug connections at regular intervals are advisable.

Do not clean the product with solvents or cleaning agents that could damage the product.

The product must be protected against contamination during initial start-up.

7 Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

8 Declarations of Conformity

Declarations of conformity can be found on our website at www.wenglor.com in the product's separate download area.