

# WEFTMASTER® FALCON-i

## Optical Yarn Defects Sensor

### Instruction Manual



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# 1 General

## 1.1 About this Manual

### 1.1.1 General

This manual assures a safe and efficient handling of the optical yarn defects sensor FALCON-i.



*For your safety in case of any insecurity, please contact your supplier.*

### 1.1.2 Obligation to Read

The personnel is obligated to read and understand these instructions, specifically the safety instructions, prior to all works.

### 1.1.3 Depository

This manual is an integral part of the optical yarn defects sensor FALCON-i and must be deposited within striking distance to the installation and available to the personal at all times.

In case of a resale of the installation this manual must be included.

## 1.2 Explanation of Symbols

In these instructions, safety information is marked with symbols and signal words which point out the extent of the hazard.

The safety information has to be strictly observed to prevent accidents, personal injuries and damage to property.

### 1.2.1 Symbols



General hazard



Electrical hazard



Flammable



Property damage

### 1.2.2 Signal Words

#### **DANGER**

Indicates an imminently hazardous situation which will result in death or serious injury.

#### **WARNING**

Indicates a potentially hazardous situation which could result in death or serious injury.

#### **CAUTION**

Indicates a potentially hazardous situation which may result in minor or moderate injury.

#### **ATTENTION**

Indicates a potentially hazardous situation which may result in damage to property.

### 1.2.3 Tips and Hints



Useful tips and recommendations

## 1.3 Liability

### 1.3.1 Information within this Manual

Information and safety instructions within this manual have been implemented under consideration of valid standards and guidelines as well as the current state-of-the-art based on our long-standing experience.

### 1.3.2 Delivery

Besides the contractual obligations terms of business and delivery by the supplier apply.

### 1.3.3 Technical Modifications

Loepfe Brothers Ltd. herewith excludes liability for damages and accidents due to following occurrences:

- unauthorized rebuilds or modifications of the optical yarn defects sensor
- usage of unauthorized spare parts / reproductions / modification parts not provided by Loepfe Brothers Ltd.

### 1.3.4 Improper Application or Usage

Loepfe Brothers Ltd. herewith excludes liability for damages and accidents due to following occurrences:

- usage not according to intended purpose of the equipment
- failure to observe the information given within this operation manual

### 1.3.5 Inadequate Maintenance

Loepfe Brothers Ltd. herewith excludes liability for damages and accidents due to following occurrences:

- deferred or inadequate maintenance
- not following the instructions described in chapter "Maintenance"



## 2 Safety

### 2.1 Responsibilities

The customer must rule the responsibilities for installation, operation and maintenance of the optical yarn defects sensor FALCON-i and appoint relevant persons in charge.

### 2.2 Personnel Requisitions

#### 2.2.1 Inadequate Qualifications

**WARNING**

**Inadequate qualifications may cause serious injury and material damage!**

▷ *Installation, operation and maintenance shall only be conducted by qualified technical staff.*

#### 2.2.2 Qualified Personnel

Following qualifications are listed in this manual for the different task areas:

- **Foreman** and **User** are qualified and trained staff for the operation and maintenance of the optical yarn defects sensor.
- **Installation Engineer** and **Service Engineer** are qualified personnel being familiar with all safety checks, installation and service guidelines.
- **Repair Technician** is a qualified and trained employee of Loepfe Brothers Ltd. or a technician specifically appointed therefore by Loepfe Brothers Ltd.

### 2.3 Usage

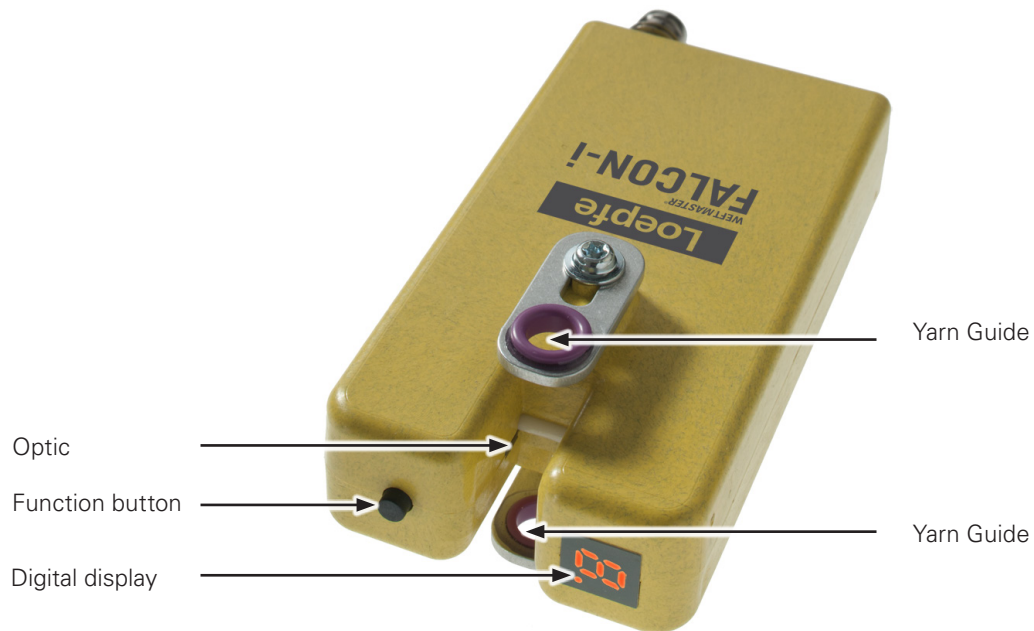
#### 2.3.1 Designated Use

The optical yarn defects sensor FALCON-i is designed and constructed for the detection of yarn defects, knots, loops and impurities in weaving.

The optical yarn defects sensor FALCON-i must be installed and operated in compliance with the provisions listed in installation and operating instructions.



### 3 Product Description



#### 3.1 Application

The optical yarn defects sensor FALCON-i is capable of detecting small yarn imperfections, knots, loops, and lint (dirt) created during the textile manufacturing process in

- Monofilament and multifilament yarns, regardless of yarn color.



The FALCON-i is not capable to detect thin places!

#### 3.2 Components

The optical yarn defects sensor FALCON-i consists of the following components:

- Chemical resistant housing made of a conducting material (ESD protection)
- Optional: especially sealed for use with conducting material such as carbon and similar fibers
- Evaluation electronics
- Optical sensor for measurement of yarn thickness
- Digital display (7 segment-display)
- Function button to adjust sensor sensitivity, to display the fault cause and reset after an error

#### 3.3 Functions

- Constant measuring of yarn thickness for yarn counts between 20 dTex and 3000 dTex
- Fault display and stop signal in case of textile faults / imperfections
- Fault display and stop signal in case of excess lint / dust on the optical sensor

### 3.4 Technical Data

Max power	500 mW
Supply voltage	24 Vdc
PNP output	2.7 mA $\pm$ 8% constant current
NPN output	max. 25 mA
Ambient temperature Operation	0 – 50°C
Ambient temperature Storage	-20°C – 85°C
Humidity	5 – 90% non-condensing
Degree of protection	IP50
Housing	Chemical resistant, made of conducting material
Evaluation electronic	Shielded against electrostatic or magnetic interference
Sensor	Optical measuring principal
Application	Monofilament or multifilament yarns, regardless of yarn color
Yarn speed	Up to 30 m/sec
Yarn count	20 – 3000 dTex
Adjustment range	10 sensitivity levels, manually and automatically adjustable

## 4 Operation

### 4.1 Sensitivity Adjustment

#### 4.1.1 Manual / Automatic

- **Adjusting the sensitivity manually:** The sensitivity of the sensor can be adjusted from level 0 to level 9.
- **Automatic:** The sensor adjusts itself automatically and keeps checking continuously.

#### 4.1.2 Select the Sensitivity Level

1. Push the function button briefly for 1 second.
  - » The actual sensitivity level is now displayed.
2. Push the function button for 3 seconds.
  - » The display starts blinking.
3. Select the Sensitivity level: Push the function button briefly, repeat until the desired sensitivity level (from 0-9) is displayed.
  - » The selected sensitivity level blinks for 4 seconds. Then the setting is saved.
  - » Yarn diameter and degree of pollution are registered.
  - » After 5 more seconds the display goes dark and returns to „Normal“.



In case of a power failure, the sensor automatically adjusts to the previously selected level.

#### 4.1.3 Change in Yarn Diameter (New Article)

1. Insert new yarn in the sensor.
2. Push the function button for 3 seconds.
  - » The display starts blinking.
  - » The new yarn diameter is registered.
  - » Once the display stops blinking, the new yarn diameter is read and stored.

### 4.2 Display



Lowest Sensitivity level



Highest sensitivity level



Automatic sensitivity level



Mode „Normal“, Yarn is running and the sensor is active



Textile faults

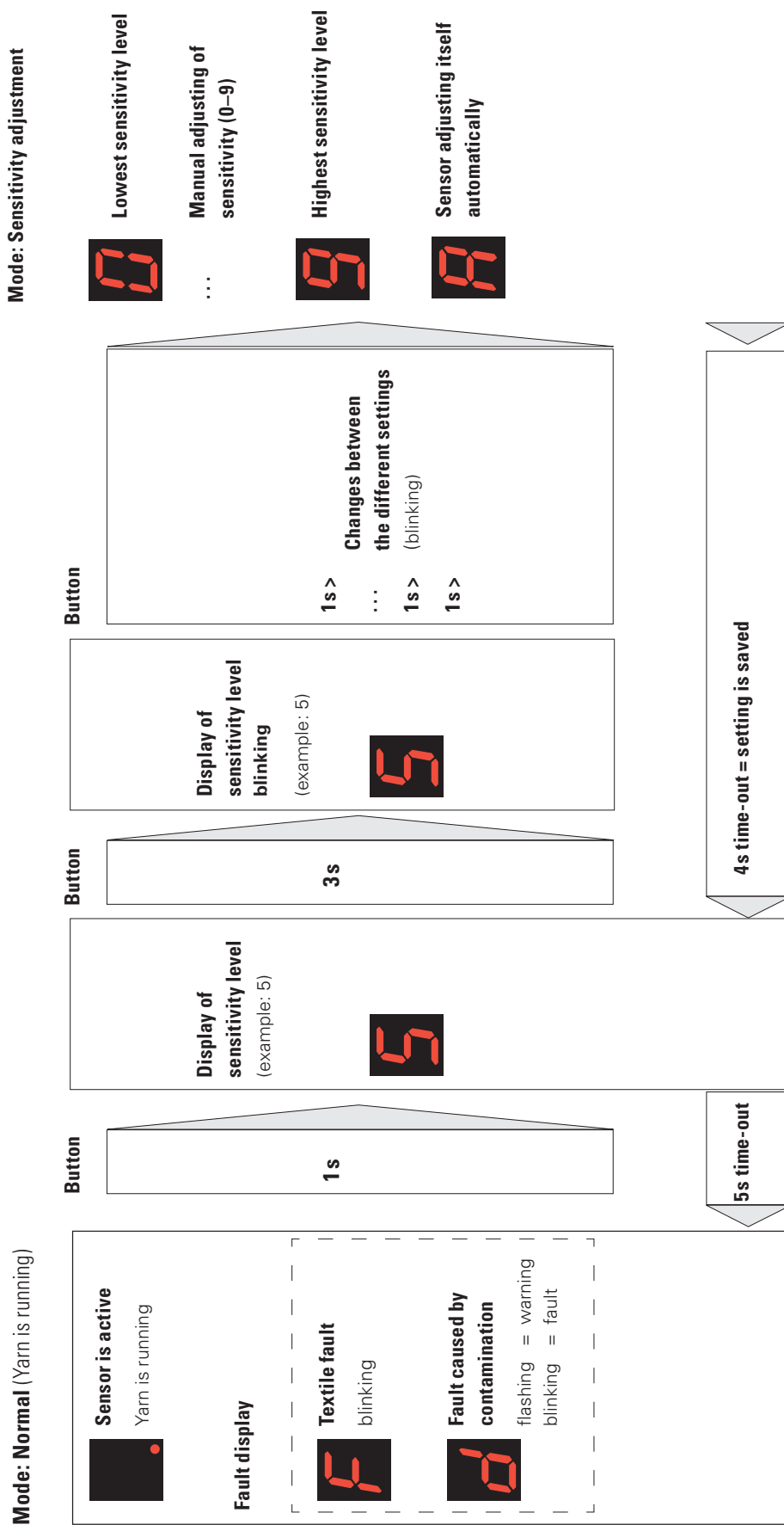
- » Fault display erased after yarn starts running again
- » Fault display can be re-set, by pushing the function button briefly



Fault caused by excessive contamination on the optical sensor

- » Fault display can be re-set, by pushing the function button briefly

### Schema (7 Segment Display)



## 5 Checks and Maintenance

### 5.1 General

Regular inspections of the optical yarn defects sensor FALCON-i ensures a reliable and trouble-free operation.

### 5.2 Safety

Maintenance work may only be performed by authorized and trained personnel.

All maintenance NOT described in chapter 5.3 "Inspection and Maintenance Work" has to be done by service engineer.



**WARNUNG**

**Risk of injuries!**

Maintenance on the running machine may lead to serious personal injury.

▷ *Before performing maintenance, stop the machine and wait until the machine has come to complete standstill.*

### 5.3 Inspections and Maintenance Work

#### 5.3.1 Yarn Flow

- Check the yarn flow.
  - » In order to ensure proper function, the yarn flow has to smooth and should be positioned in the center of the yarn guide.
- If necessary, the mounting position of the sensor / yarn guides has to be checked and corrected.

#### 5.3.2 Sensors

- Check the sensors for contamination.
  - » Excessive lint and contamination in the sensor area could cause false stops of the optical sensor. The sensor may not work reliably.
  - » A contaminated optic is indicated with „d“ on the display.



### Cleaning of contaminated sensors

- Gently blowing off with air pressure
- Remove contamination with a vacuum cleaner



In case of heavy contamination, all the sensors have to be cleaned after every machine stop.

- Clean the area on the left and right side of the white ceramic of the yarn guide carefully with cotton swab or cloth and 1–2 drops of detergent.



#### ATTENTION

#### Risk of damage to the sensors!

The sensors could become damaged by improper cleaning!

- ▷ Clean the sensors with utmost care.
- ▶ Do NOT immerse the sensing head in cleaning agent!
- ▶ Do NOT spray cleaning agent directly in the optical system!
- ▶ Do NOT use any hard/sharp objects!



#### ATTENTION

#### The substances listed below must be avoided by all means, as their use will destroy the optical system!

- ▶ Aromatic hydrocarbons, e.g. benzene, benzol, toluol
- ▶ All kinds of alcohol, e.g. methanol, ethanol
- ▶ Spirit, Acetone
- ▶ Automobile and aviation gasoline

Loepfe will not be liable for damage claims resulting from the use of unsuitable substances!

#### Suitable cleaning agents:

- Light contamination:
  - » Cleaning agent TK-Clean from LOEPFE
- Heavy contamination
  - » "Zippo Premium Lighter Fluid"
  - » "Ronsonol Lighter Fluid"
  - » Medical grade benzine
  - » n-Heptane (C<sub>7</sub>H<sub>16</sub>)
  - » Cypar 7, Cycloaliphath (C<sub>7</sub>) (a SHELL product)



#### DANGER

#### Gasoline is highly inflammable!

- ▷ Observe warning notices on container!

## 6 Troubleshooting

Fault	Possible Cause	Solution
Fault display, but current yarn has no fault	The knot was inserted one insertion earlier.	It is necessary to use the pick finding device once more.
The point in the display is illuminated („Normal“ mode) but the yarn is not running	Faulty electrical ground connection.	It could be necessary to insulate the sensor, install rubber dampers.
Several false stops	The sensitivity level is set too high.	Set the sensitivity level lower.
	Yarn is not flowing smoothly (uncontrolled)	Adjust the yarn guides to create a smooth yarn flow or install an additional brake before the optical sensor.
Machine does not stop after an imperfection		<p>Increase Sensitivity level until the machine stops all the time, then lower the sensitivity by 2 levels.</p> <p>Example: Machine stops at level 7 all the time, then set the sensitivity to level 5.</p>





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