Loepfe

Operation Manual
YarnMaster® EOS

47184003_en

Original Manual

Version 2.0 / 01.2021

Loepfe Brothers Ltd.
Kastellstrasse 10
8623 Wetzikon / Switzerland

Phone +41 43 488 11 11
Fax +41 43 488 11 00
E-mail service@loepfe.com
Internet www.loepfe.com

Document title: Operation Manual

Language version: English

Subject to technical changes.

Table of Contents

1 About this document

This Instruction Manual allows for safe and efficient operation of these devices and the associated software.

Please contact the manufacturer if anything is unclear, or if you are unsure about any aspect of operating the devices and software.

Before operating the devices and software, read this Instruction Manual in its entirety and keep it accessible at all times.

1.1 Scope of application

This document is valid for the YarnMaster EOS device and the associated software.

1.2 Target audience

This document is intended for use by the operator only. The descriptions presented here assume that the reader is a qualified professional trained by the manufacturer. These descriptions do not replace product training.

1.3 Notes

Information symbol

This symbol indicates additional information for the user.

Images in the document

The images of the user interface (screenshots) included in this manual are examples, and do not necessarily contain relevant data.

2 Safety

2.1 Intended use

The sensors are intended solely for purposes of yarn quality control in open-end spinning processes. Any other use, or any use that goes beyond the intended purpose, is considered improper. Loepfe Brothers Ltd. shall not be liable for any damages that result from improper use.

This software is intended exclusively for use as a control, data evaluation and administration tool for sensors that are linked to the Loepfe central units (LZEs) of the spinning machine. Any other use, or any use that goes beyond the intended purpose, is considered improper. Loepfe Brothers Ltd. shall not be liable for any damages that result from improper use.

2.2 Safety Information and Warnings

Safety information and warnings draw attention to hazards and are marked with symbols and signal words to express the danger level.

⚠ DANGER

Indicates an immediate 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 oder moderate injury.

NOTE

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

2.3 Explanation of symbols

Warning symbol

General warning symbol

Electrical voltage warning

2.4 Specialist personnel

The device and software manufacturer defines specialist personnel as follows:

- **«Foreman»**
  - The foreman is able to instruct operators in how to use the system, and may edit device and software settings and configurations.
- **«Electrician»**
  - Electricians are responsible for installing devices and connecting them to a network. Electricians are professionally trained and qualified to work with electrical equipment, and are familiar with the rules and safety regulations for working with electrical equipment.
- **«Service technician»**
  - Service technicians are responsible for repairing and maintaining the devices and software. They are trained and qualified Loepfe employees, or are expressly authorized by Loepfe to perform service operations.
- **«Network administrator»**
  - Network administrators are responsible for connecting the devices and software to a computer network. They are professionally trained and qualified to work with IT networks, and have administrator rights for the installed network.

3 Product and Function

3.1 Product description

Sensors

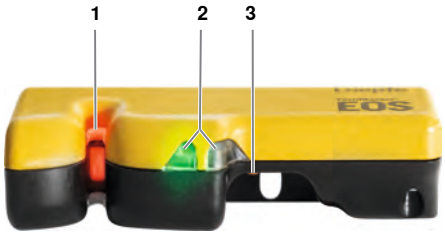
The sensors are used in the open-end spinning process to clear yarn of yarn faults and foreign matter. Simultaneously, the sensors continuously monitor the quality of the yarn throughout the spinning process, e.g. yarn breaks, yarn irregularities, etc.

YarnMaster EOS

1 Optical sensor for yarn fault analysis

2 Sensor status indicators

3 Feeler to remove blocks due to yarn faults



Loepfe Central Unit (LZE)

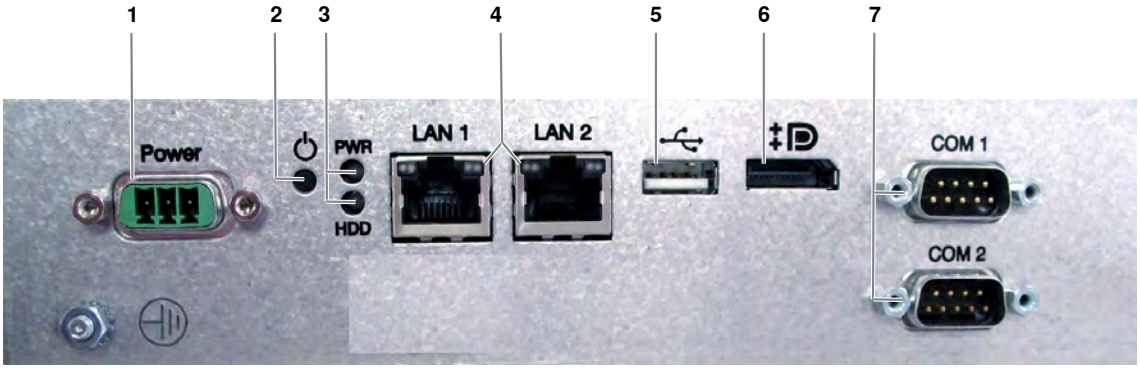
The sensors are connected to the Loepfe central unit (LZE), and are centrally controlled and operated from the LZE. The LZE is used to set the quality criteria for clearing yarn faults, and to collect, analyze and store data from yarn clearing, production and quality control processes.

1 Housing, mounts to machine

2 Monitor, touchscreen

3 USB port

Loepfe Central Unit, rear panel

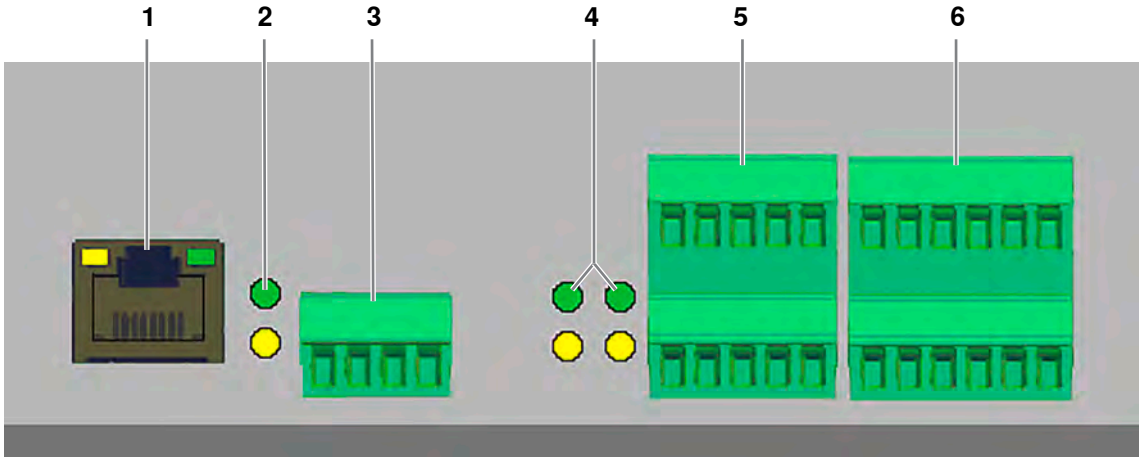


LZE-V rear panel

1	Power connector	5	USB port
2	Microswitch (reset)	6	No function
3	Status indicators (LEDs)	7	No function
4	Network connection (LAN1; LAN2)		

Loepfe Central Unit master module

The master module is integrated into the LZE. The master module connects the central unit (LZE/ Informator) to the bus system and the individual slave bus nodes / evaluation units.



LZE rear panel with master module

1	SE bus	4	Status indicators (LEDs) for items 5 and 6
2	Status indicators (LEDs) for item 3	5	Digital inputs (speed and joint spinning in (JSI))
3	4K port	6	No function

Section electronics

The section electronics board (SE board) is the interface between the sensors and the LZE. The data recorded by the sensor is analyzed and transmitted to the LZE. All the collected data is displayed on the LZE and can be reviewed (analyzed), compared and archived.

3.2 Scope of Delivery

The following components are included with delivery:

- Sensors
- Loepfe central unit with integrated master module and installed software
- Section electronics boards
- Connector cable

The actual scope of delivery differs by product version, since it depends on the machine type.

4 Operation

4.1 Operational design

The user interface is made up of various views and menus:

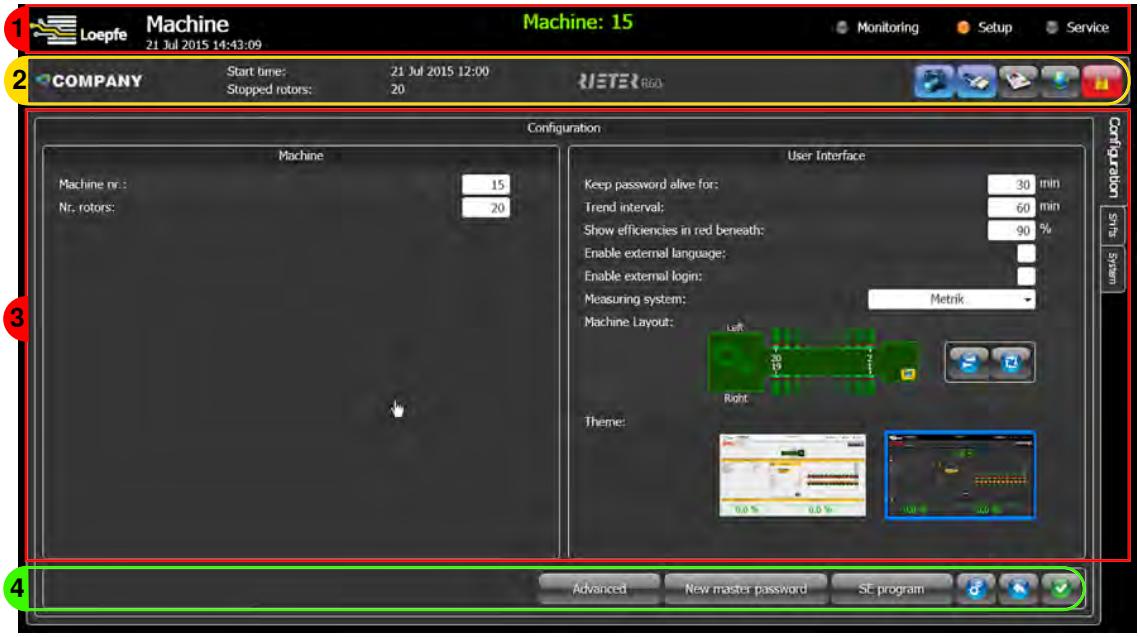
- the data,
- the settings and
- service for technical support.

4.1.1 Data view (Overview)

The Overview and other *Data* screens display production data directly from the machine to provide a quick overview of ongoing production.

4.1.2 Settings view (Main Menu)

Articles, production groups and the machine are configured and managed in the *Settings* view.



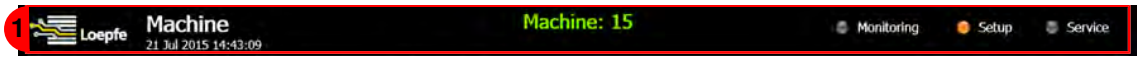
1 Title bar with main menu: Data, Settings, Service

2 Administration bar

3 Tabs: with settings and views

4 Toolbar

Main menu



Data	
Overview	Quick overview of the most important data in graphic and numeric form
Details	Overview in graphic and numeric form
Trends	Production data presented in bar charts and line charts
Reports	Prepare reports
Settings	
Machine	Manage current production
Articles	Add and configure/edit articles
Production groups	Add and edit production groups
Service	
Diagnosis	Overview of the (active) system

Table 1: Main menu

4.1.3 Service view

Information for technical support is managed in the *Service* view.

4.1.4 Function icons

Language selection	Change article name
Logged in	Enter rotor number
Logged out	Copy
Online help	Save/Archive
Confirm	USB storage device active
Cancel/Delete	Show report
Previous step	Print screen
Next step	Previous rotor
Refresh	Next rotor
Add	Calibrate monitor
Remove	Cold start (Restart)
Reset values	Warm start
Restore settings (default)	

4.2 Startup

4.2.1 Starting up the device

✓ The machine's main switch is switched on.

✓ The LZE is plugged into mains power and connected to the machine.

1. Switch on the LZE.
   - ⇨ Microsoft Windows starts.
   - ⇨ The open-end software is loaded.
   - ⇨ The software starts and the user interface opens.
     Note: The user interface always opens to the *Overview* of the machine and the production data.
     See the illustration below.

⇨ The device and software are ready for use.

4.2.2 Configuring the user interface

1. Tap the language symbol in the administration bar.
   ⇨ The **“Select your language”** window opens.
2. Select a language and confirm.
   ⇨ The language changes.
3. Tap the login symbol in the administration bar.
   ⇨ The login window opens.
4. Enter the password and confirm.
   ⇨ The symbol’s background color changes to green.

⇨ The user interface is now configured.

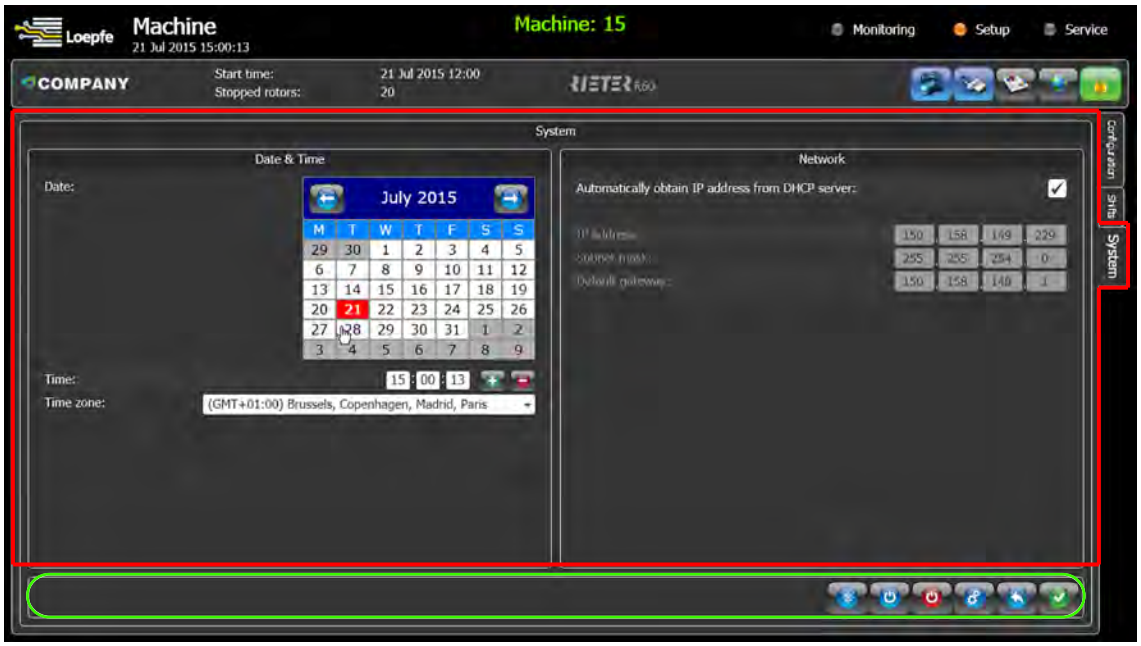
Changing user password

1. Tap the **«New master password»** button in the toolbar.
   ⇨ The window opens.
2. Enter the new password and confirm.
   ⇨ The password changes.
3. Close the window.

⇨ The password has been changed.

4.2.3 Configuring the machine (Machine Settings)

1. In the main menu, select **«Settings > Machine»**.
2. Select the “System” tab to make changes.



3. Select the time zone.
4. Enter the current date and time.
5. Enter network data if necessary.
6. Confirm your entries.

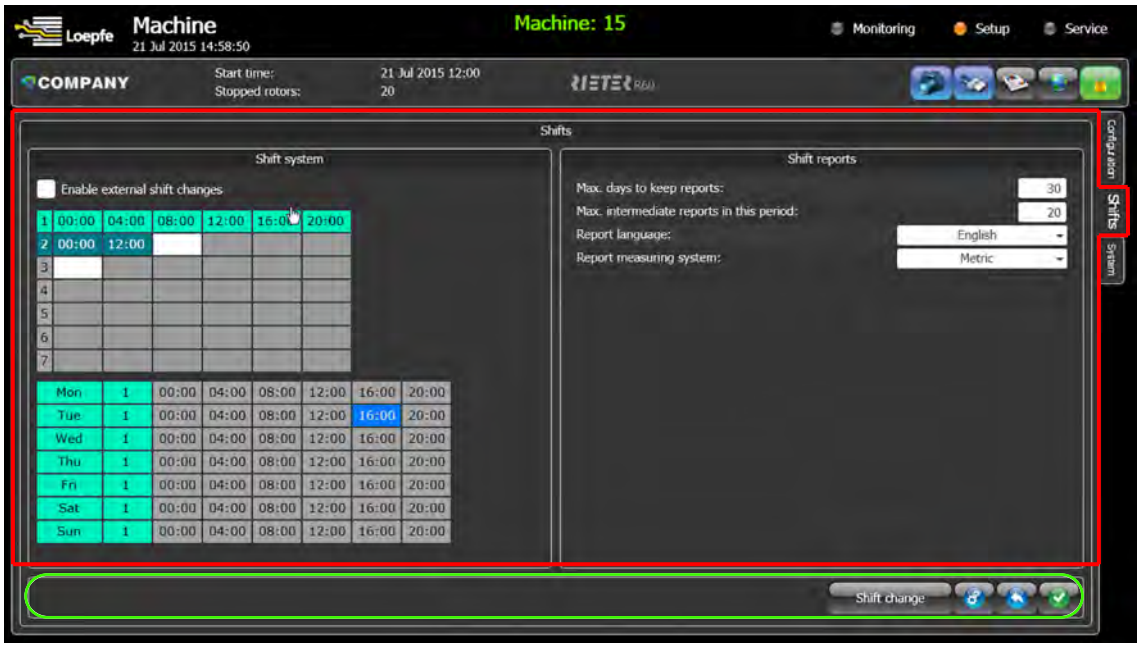
⇨ The changes are saved.

1. Select the “Configuration” tab to make changes.

2. In the Machine section:
   a) Enter the machine number.
   b) Enter the number of rotors.
3. In the User Interface section:
   a) Enter the password lock time in minutes to prevent unauthorized access.
   b) Enter the trend interval in minutes to calculate values for trend analysis.
   c) Enter the efficiency value.
   d) Activate external language.
   e) Activate external logins if an external login is necessary.
   f) Specify the units of measurement.
   g) Adjust the machine configuration to reflect the current situation.
   h) Change the user interface design under Theme.
4. Confirm your entries.

⇨ The changes are saved.

1. Select the “Shifts” tab to make changes.



2. In the Shift System section:
   a) Activate external shift changes, if the machine supports this function.
   b) Select shift cycles; specify up to 7 different shift cycles.
   c) Distribute shift cycles over an entire week; enter at least 1 shift cycle.
3. In the Shift Reports section:
   a) Enter the number of days for which logs should be kept before deletion.
   b) Enter the number of interim reports that should be kept for a given period.
   c) Select the report language if a different language is required.
   d) Specify the units of measurement.
4. Confirm your entries.

⇨ The changes are saved.

4.2.4 Updating software and firmware

This section describes how to update the LZE software and the firmware for the sensors and SE boards.

✓ A new upgrade is available.

✓ The storage device has no other upgrade versions saved on it.

1. Save the new upgrade file to the storage device, e.g. a USB drive.
2. Insert the USB drive in the USB port on the LZE.
   ⇨ The **“USB Actions”** window opens if an update is available on the storage device.
3. If no window opens, tap the USB symbol that has just appeared in the administration bar.

   ⇨ The **“USB Actions”** window opens.
4. Select the **Upgrade to version** radio button.
5. Confirm your selection.
6. Tap the **«Upgrade»** button.

⇨ The software is updated.

7. In the main menu, select **«Service > Diagnosis»** to test the new version from the upgrade.
   ⇨ The version overview opens.

⇨ The software has now been updated.

Updating firmware for section electronics and sensors

> The software versions for the section electronics boards and the sensors must match.

1. Switch off the machine (stop all rotors) before updating the firmware.
2. In the main menu, select **«Settings > Machine»**.
3. Select the “Configuration” tab.
4. Tap the **«SE Program»** button in the toolbar.

⇨ The **“SE Program”** window opens.

5. Tap **«Yes»** to update the firmware.
   ⇨ The firmware is updated on all connected section electronics boards and sensors.
6. Switch on the machine to start all rotors.
7. In the main menu, select **«Service > Diagnosis»** to test the new firmware version.
   ⇨ The version overview opens.

⇨ The firmware has now been updated.

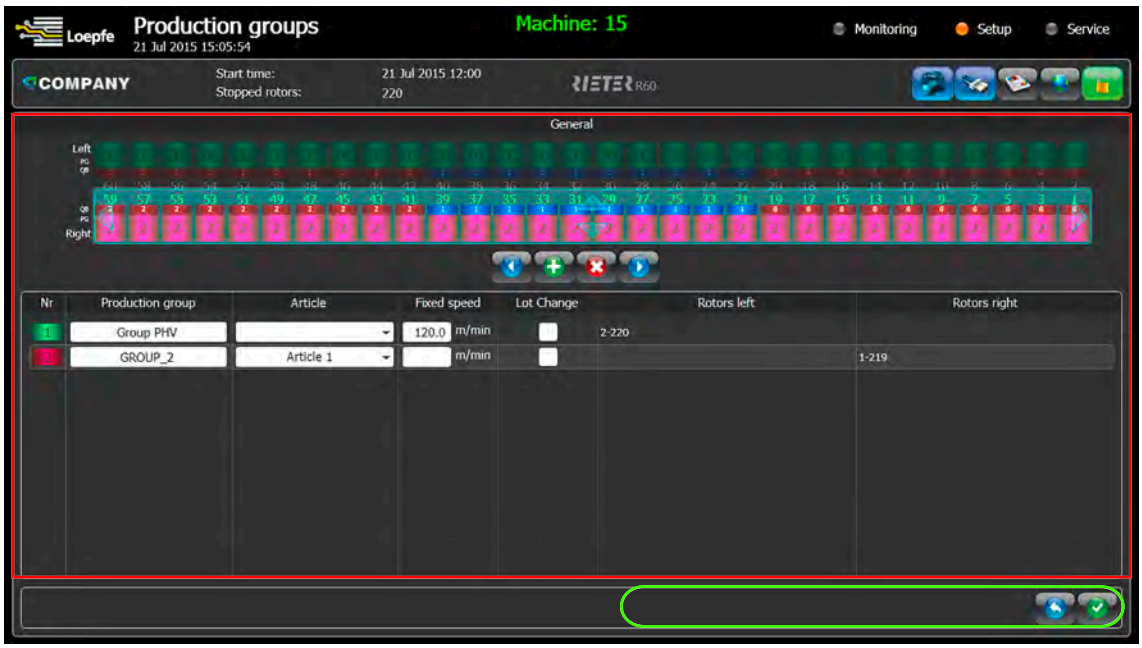
4.3 Operating the software

4.3.1 Configuring production groups (Production group settings)

A production group is made up of the rotors and sensors on a machine. However, a production group can also be divided into two different production groups, a left and a right side, depending on the selected machine type.

> The value for the fixed speed must be entered manually if no video signal (4K port) and proximity sensor signal (square signal) is present for the machine type.

1. In the main menu, select «**Settings > Production Groups**».



2. Check the box for **Use 2 groups** to use 2 production groups on the machine.
   ⇨ The second production group is added.
3. Select articles for each production group. See the chapter on Configuring articles (Article settings).
4. Enter a constant **fixed speed** (winding speed) if no signal is present for the machine type.
5. Confirm your entries.

⇨ The settings are saved.

Lot changes

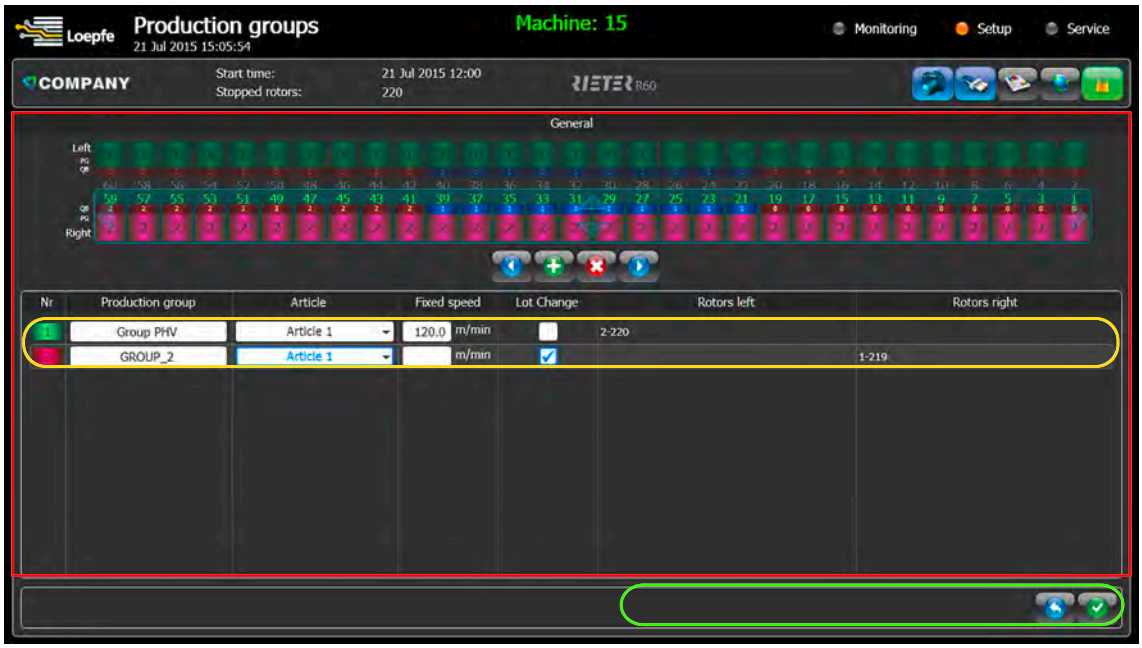
	Before a lot change can be activated, all rotors for the desired production group must be stopped, and the yarn must be removed from the sensors.

A lot change must be done when the following criteria or values change for a given production group:

- ✓ the yarn count,
- ✓ the lot,
- ✓ the machine's spinning data,
- ✓ the winding speed,
- ✓ or if an interruption of ≥ 24 hours has occurred.

1. Check the **Lot change** box to make a change to the production group.
2. Confirm your entries.

⇨ The settings are saved.



4.3.2

4.3.3 Data

This section shows the production data from the open-end machine in various overviews, as well as individual yarn quality criteria.

Overview

In this menu, production data from the LZE central units is displayed directly (online), providing a quick overview of ongoing production.

Overview

1. In the main menu, select **«Data > Overview»**.
   ⇨ The Overview opens.

The following data is displayed:

Machine with rotors

- The machine and its number of rotors.
- The definition of the two sides that are determined by the machine's location.
- Condition and efficiency of the individual rotors.
- Location of the LZE on the machine.

Production group with article

- Data for the selected production group, such as the average efficiency, yarn count, etc.
  Note: The values for efficiency, weight produced and rotor hours (Rh) are based on the indicated start time.

Scope of application

- A selected set of rotors from the machine. The selection is made by sliding the transparent area.
- The actual production data from a rotor that has been selected within the selected set.
- Double-clicking on the rotor data opens a detailed view for the selected rotor.

Efficiency overview

- The current efficiency of the selected production group with all of the machine's rotors.
  Note: Based on the specified target efficiency, the numbers are shown either in red (if under the target value) or green (over the target). See the chapter on Configuring the machine (Machine Settings) [▷ 18].
- The efficiency trend for the last 2 hours of production.

Details

1. In the main menu, select «**Data > Details**».
   ⇨ The Details menu opens.
2. Select the "Quality" tab, then the "Absolute" tab, to display data.

The following data is displayed:

Production group with article

- Stopped rotors: Total number of stops
- Length produced: *
- Avg. efficiency: of the machine *
- Weight produced: by the production group *
- Rh produced: machine's rotor hours *

Rotor

- Length produced: *
- Efficiency: of the rotors *
- Status: current rotor status

* since start of shift

Stops and Blocks

This tab displays the production data on stops and blocks for the selected production group with article, and for the selected rotor in the same production group.

1. In the main menu, select **«Data > Details»**.
   ⇨ The Details menu opens.
2. Select the “Stops and Blocks” tab, then the “Absolute” tab, to display data.

The following data is displayed:

Production group with article and rotor

- Sum of condition *
- Sum of quality of the individual condition *
- Sum of hardware / contamination block of the individual condition *
  (depending on machine type)

* since start of shift

Piecer

This tab displays the graphical production data on the piecer for the selected production group with article, and on the selected rotor in the same production group.

1. In the main menu, select **«Data > Details»**.
   ⇨ The Details menu opens.
2. Select the “Piecer” tab, then the “Absolute” tab, to display data.

The following data is displayed:

Production group with article and rotor

- Current attempts
- Last piecer

Q Pack

The Q Pack (Quality Pack) tab displays the production data on the selected production group with article, and on the selected rotor in the same production group.

1. In the main menu, select **«Data > Details»**.
   ⇨ The Details menu opens.
2. Select the “Q Pack” tab, then the “Absolute” tab, to display data.

The following data is displayed:

Production group with article

Diameter	Average diameter value
Yarn irregularity CV%	
CVh	Hairiness (L = 2 mm measured)
CVy	Yarn (L = 8 mm measured)
CVs	Sliver (L = 500 mm measured)
Y axis	relative x/100 percent of max amplitude

- Histogram with X/Y axis values
  X axis: ±x/100
  Y axis: x/100 percent of maximum value
- Spectrogram to check the occurrence of periodic variance in the yarn diameter profile.
- CVL curve

Hitlist

This tab shows a summary of the production data with the lowest or highest values for the selected quality criteria. These values help the operator to optimize the spindles.

1. In the main menu, select **«Data > Details»**.
   ⇨ The Details menu opens.
2. Select the “Hitlist” tab, then the “Quality” tab, to display data.

The following data is displayed:

Tap for the high values.

Tap for the low values.

Quality

- The rotors with the lowest and highest values.

Foreign matter and polypropylene

✓ The **«Data > Details»** main menu is open.

1. Select the “Foreign matter” tab or the “Polypropylene” tab to display data.

- The rotors with the lowest and highest values.

A	Signal variance for the displayed rotors
D	Classified faults
S	Short faults
SC	Short clusters (chain)
SdC	Short clusters (distributed)
LC	Long clusters

Trends

This menu displays production and quality data for the selected production group or the individual rotors. The desired quality criteria (options) are selected separately. Each trend interval is the cumulative number of status changes per rotor since the last trend pass. A trend covers a period of 100 trend intervals; for example, if the trend interval is set to 60 minutes, the trend will cover 100 hours.

> Inactive rotors can be hidden.

1. In the main menu, select **«Settings > Trends»**.
2. Select the “Diameter” and “Production group” tabs.
3. In the Options window, mark checkboxes to activate quality criteria.

✓ The **«Settings > Trends»** main menu is open.

✓ The checkboxes for the desired options are marked.

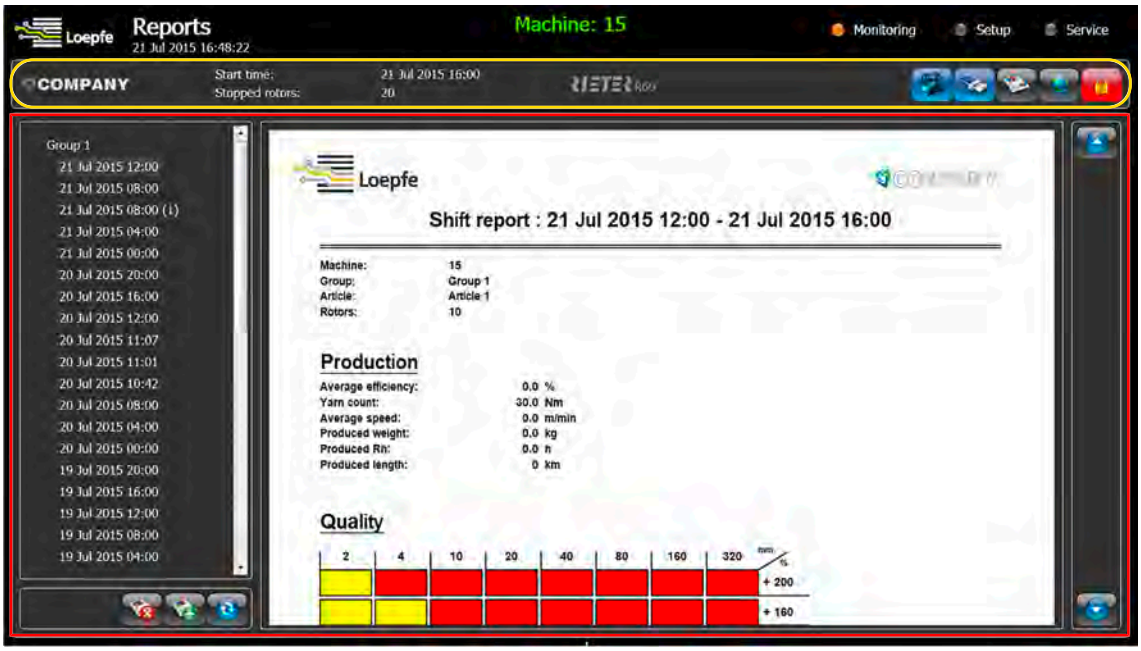
1. Select the “Diameter” and “Production group” tabs.
   ⇨ The quality data for the selected production group is displayed.

2. Select a rotor under the X axis, e.g. number 7.
   ⇨ The bars are shown in the bar chart as indicated in the Options.
   ⇨ The trends for the selected rotor are shown in the line chart.
3. Tap the magnifying glass symbol to delete the selection.

Reports

In this menu, production data for the production groups can be displayed in pre-defined reports. Each production group with its assigned rotors continuously generates production data that is recorded and saved by the system. The reports are saved on the LZE for a maximum of 60 days, during which time they are displayed in the menu as PDFs. When the specified period has been reached, the oldest report is always overwritten next. The reports are closed at each lot and shift change, and started again with a new process. The reports can also be saved to another storage device, such as a USB drive.

1. In the main menu, select **«Data > Reports»**.
   ⇨ The report is generated and opens.



2. Tap the Report symbol to generate an interim report on current production.
3. Use the left column to update, add or delete reports.

Exporting reports

✓ The USB drive has been inserted in the USB port on the LZE.

1. In the administration bar, tap the USB symbol.
   ⇨ The **“USB Actions”** window opens.
2. Select the **Copy reports to USB drive** radio button.
   ⇨ A window opens with the directory and calendar.
3. Select a directory/folder and a date.
4. Confirm your selection.

⇨ The report is copied to the USB drive.

4.4 Recommended settings

4.4.1 For diameter-related faults

This section provides recommended examples from the manufacturer of input values for diameter faults.

Description	Default value	Input value	Deactivate
	mm	**mm**	**mm**
Class thresholds – Clearer matrix	 4 10 20 40 80 160 320	Note: Input values must not use the same value twice. 2 – 8 6 – 18 12 – 38 22 – 78 42 – 158 82 – 318 162 – 840	—
	%	**%**	**%**
Class thresholds – Clearer matrix - Diameter	-40 -20 25 40 80 120 160 200	-26 – (-50) -20 – (-34) 25 – 34 31 – 74 46 – 114 86 – 154 126 – 194 166 – 350	—
Classification – Piecer sensitivity	70	50 – 100	0
	Classes	**Classes**	
Active classes – Clearer matrix	71 62 53 44 35 26 17 7	Note: The following classes cannot be activated. 1, 2, 11, 12, 13, 21, 22, 23, 31, 32, 41	active/deactivated
Moiré	**mm**	**mm**	**mm**
Rotor diameter	33	20 – 70	
	%	**%**	**%**
Yarn diameter variance	38	20 – 99	0

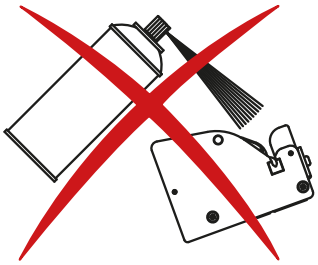
Description	Default value	Input value	Deactivate
Sliver stops	**m**	**m**	**m**
Thin and thick segments	3	1 – 9	0
	%	**%**	
Diameter variance – Thin and thick segments	 -18 18	 -30 – (-2) 2 – 30	
Yarn count block	**m**	**m**	**m**
	Not activated	10 – 1000	0
	%	**%**	
Diameter variance	—	0.3 – 20	
Neps	**%**	**%**	**%**
Average diameter value	70 (50 EN)	50 – 100 (5-170 EN)	0
Blocking function	**Stops/m**	**Stops/m**	**Stops/m**
Quality (block)	3/1000	1 – 9/16000	0
Moiré (block)	3/1000		0
Sliver (block)	2/1000		0
Neps (block)	3/5000		0
	%	**%**	**%**
Average diameter value (block)	15	4 – 30	0
CV block	-25	-50 – (-4)	0
	25	4 – 50	0
	Feeler	**Feeler**	
Level unblocking	0	0 1 2	0

5 Maintenance

5.1 Cleaning

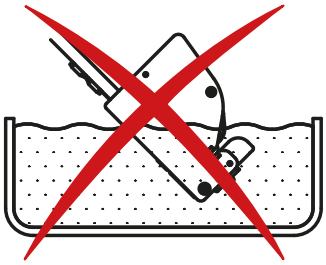
5.1.1 Cleaning the sensors

The sensors' measurement channel must be cleaned regularly, e.g. to prevent a production group or individual rotors and sensors from being blocked due to contamination.



Do not apply cleaning agents directly to the sensors!

Do not use hard or sharp objects for cleaning!



Do not submerge sensors in cleaning agents!

Prerequisites

✓ Loepfe cotton swabs (item no. 16964900) are available.

✓ Loepfe sensing head cleaner (item no. 14359900) is available.

1. Use cotton swabs dry, or moistened with sensing head cleaner.
2. Insert the cotton portion of the cotton swab into the measurement channel.
3. Pass the cotton swab through the measurement channel a few times.

⇨ The measurement channel is clean when the LEDs no longer remain lit after the cotton swab is removed from the measurement channel.

6 Technical Data

6.1 Specifications

Installation	
Concept	■ modular integrated yarn clearer system in third party OpenEnd spinning machine ■ power supplied by OpenEnd machine
Section boards	One board per section control up to 24 individual EOS yarn sensors
Central unit LZE	One central unit LZE per machine
Operation	over central unit LZE and touch-screen
Application for	staple-spun yarns of natural and synthetic fibers
Ambient conditions	
Operating temperature	5 – 50 °C
Humidity (relative)	max. 95 % rH, non-condensing
Storage temperature	0 – 60 °C
Transport temperature	-25 – 70 °C

Sensors	
YarnMaster EOS	1 optical sensor
YarnMaster 3N1	2 optical sensors 1 triboelectric sensor
Range of application	Yarn count: Nm 5—170
Voltage	< 12 V DC
Yarn speed	max. 250 m/min
Mounting	with machine specific bracket, max. torque of attaching screw 2.5 Nm

Section electronic (SE)	
Voltage	24 V DC ±10 % /max. 400 mA with 24 sensors
Rotor count varies with machine type	max. 24 rotors
SE-Bus repeater (required with > 20 SE)	
Voltage	24 V DC ±10 % /250 mA
Mounting	individually in section electronic compartment

Central unit LZE	
Display	Touch-screen with LCD color display
User interface	multilingual
Voltage	24 V DC ±10 % /1100 mA or via AC/DC pwr converter with 90–264 V AC /50-60 Hz input
Dimensions WxHxD	483x266x70 mm
Weight	5.0 kg
Mounting	individually into Headstock

7 Annex

Loepfe Brothers Ltd.
8623 Wetzikon/Switzerland
Phone +41 43 488 11 11
Fax +41 43 488 11 00
service@loepfe.com
www.loepfe.com

47184003_en