

# **YARNMASTER® 3N1**

**Instruction Manual  
Rieter R60**



Loepfe Brothers Ltd.  
Kastellstrasse 10  
P. O. Box 582  
8623 Wetzikon/Switzerland

Phone +41 43 488 11 11  
Fax +41 43 488 11 00  
E-Mail [service@loepfe.com](mailto:service@loepfe.com)  
Internet [www.loepfe.com](http://www.loepfe.com)

YarnMaster® is a registered trademark of LOEPFE Brothers Ltd. for Switzerland and other countries.

All further company and product names are trading names or registered trademarks of the relative companies.

The content of this Operating Instruction is protected by copyright. All rights reserved. No part of this may be reproduced in whatever form (by printing, photocopying, microfilm or other) without a written grant of LOEPFE Brothers Ltd., nor may it be processed or distributed by any electronic mean.

Copyright© 2012 LOEPFE Brothers Ltd., Switzerland

03.2012 / Version 1.0.0



## Table of Contents

<b>Safety Instructions</b>	<b>7</b>
Norms and Regulations	7
Instruction Manual	7
Liability	7
Operational Notes	8
<b>Yarn Clearing (General)</b>	<b>9</b>
Definition of Yarn Faults	9
Yarn Fault Classification	11
Yarn Clearing	12
Foreign Matter (F)	13
Synthetic Foreign Matter (P)	13
Imperfections	13
Yarn Irregularities	13
Moiré	13
<b>YarnMaster 3N1</b>	<b>14</b>
Functional Range	14
<b>Operating</b>	<b>15</b>
Central Unit SCU	15
User Interface	15
Machine Overview	17
User Password	17
Data Entry	17
<b>Settings Clearer Parameter / Start</b>	<b>18</b>
Yarn Quality (Q)	18
Foreign Matter (F)	18
Polypropylene (P)	18
Lock Functions	19
Production, Lot Change	19
<b>Machine Data</b>	<b>20</b>
Status > Overview	20
Status > Clearer data	21
Q-Pack	23
Hitlist	24
Exceptions	25
Reports	26

## TABLE OF CONTENTS

<b>Base Setup</b>	<b>27</b>
User Interface	27
System	27
Shifts	27
<b>Checks and Maintenance</b>	<b>28</b>
USB	28
Q-Sensor LED	30
Cleaning	31
Index Data Explanation	31
Spare Part Numbers	32
Replacements of Sensor and SE-Board	32
Diagnosis	32
<b>Service</b>	<b>35</b>
Machine Configuration	35
Snapshot	35
<b>Technical Data</b> (Changes reserved)	<b>36</b>
Parameter Settings	37

# Safety Instructions


## Norms and Regulations

The LOEPFE YarnMaster® 3N1 yarn clearing system is a product which has been inspected for technical safety. It complies with the following directives:

2006/42/EC	Machinery Directive
2006/95/EC	Low Voltage Directive
2004/108/EC	Electromagnetic Compatibility

## Instruction Manual

To prevent faults and operating errors, we recommend to carefully read this Instruction Manual and to carefully follow the instructions given.

 **Indicates warnings which, if not properly observed, could harm your health, impair the functioning of the equipment or the security of your data.**

**Note:** *The screen representations in this manual serve as illustration only. They should not be used as setting examples!*

A copy of this Instruction Manual must be kept easily accessible near the machine.

## Liability

The manufacturer assumes no liability for damage caused by:

- Noncompliance with the safety, operating and maintenance instructions contained in this Manual.
- The use of spare parts/non-OEM parts/conversion parts not supplied by us.
- Unauthorized conversion and modification of the yarn clearer.
- Normal wear.

## Operational Notes



This yarn clearing equipment may only be installed, initiated and operated by trained personnel. Improper operation of the equipment could cause hazards.



In accordance with 2006/42/EC, 2006/95/EC, 2004/108/EC. Do not open any covers (cooling, fire protection, contamination, spark interference etc.)



Do not open any sensing head.



**Electronic components and assemblies (printed circuit boards) are endangered by electrostatic charges!** Beware of touching the soldered connectors, pin contacts before they have been discharged statically. Hold the units at the periphery only.



# Yarn Clearing (General)

## Definition of Yarn Faults

The Open End spinning process supplies a relatively uniform yarn. However, differences in yarn diameter cannot be completely avoided. Thus, it is first necessary to distinguish between normal yarn irregularities and actual yarn faults.

**Yarn faults** may be defined as yarn irregularities which can lead to difficulties in subsequent production stages or to faults in the end product. Yarn clearing is defined as the detection and elimination of yarn faults. This task is performed during the spinning process. Yarn clearers are, therefore, part of an Open End spinning machine.

To eliminate a fault it is necessary to interrupt the spinning process. The rotor must be stopped, the defect removed from the package and a new piecing cycle must be initiated. Obviously this interruption results in a loss of production. Yarn clearing is, therefore, always a compromise between quality and production, i.e. between the maximum possible number of yarn faults which could be removed and the least acceptable production loss. This compromise results in a distinction between:

- **Acceptable yarn faults**, namely those which are tolerated for sake of machine efficiency, and
- **Unacceptable yarn faults** (faults that cannot be tolerated)

## Yarn Faults

Based on the average yarn diameter (basic diameter), the following yarn faults can be detected and cleared:

- **Thick and thin places** are defined, depending on whether there is an increase or a decrease in diameter.

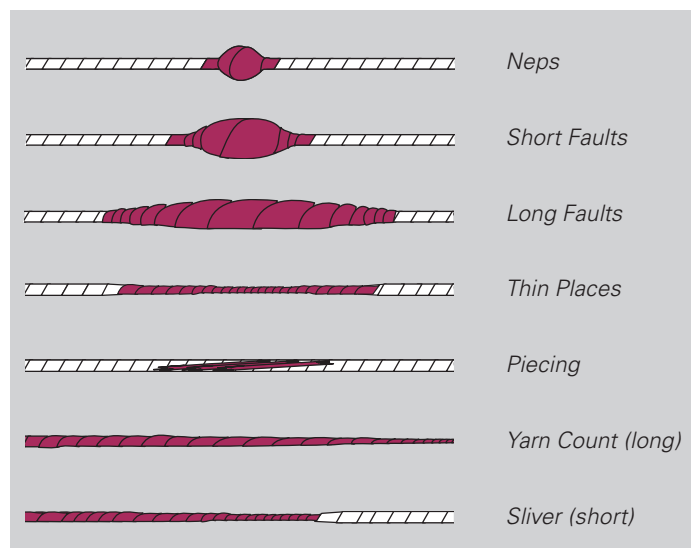
Within the thick places further distinctions are made:

- **Neps**, as extremely short (up to a few mm) and extremely thick faults (several times the base diameter)

- **Faulty piecing**

Within the count deviation further distinctions are made

- **Thin and thick sliver** (short length)
- **Thin and thick count** (long length)



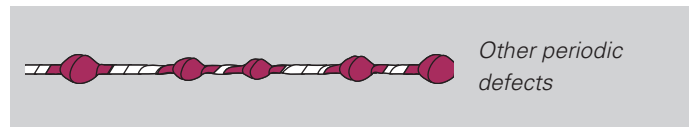
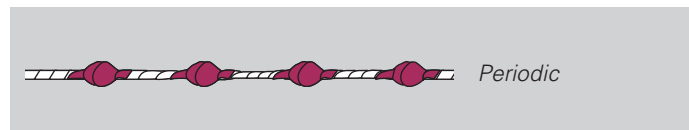
## Accumulations of Faults (Moiré)

- Periodic defects (moiré)

Periodic defect where the period is related to the rotor diameter of the OE rotor. They can be caused by contaminated or used rotor.

- Other periodic defects

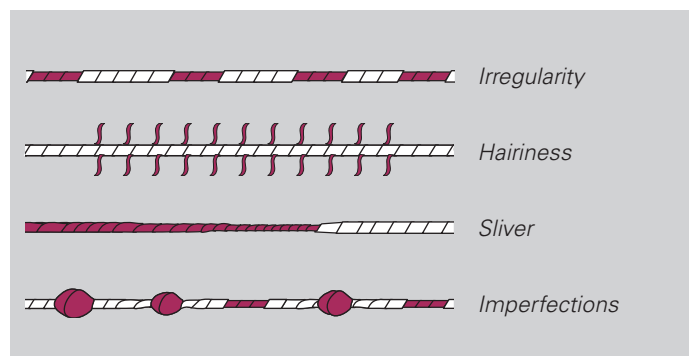
They can be caused by defects or wear from components of the spinbox. These defects are detected by the spectrogram analysis.



## Yarn Irregularities (CV)

Disturbing diameter variations or sporadic irregularities, for example:

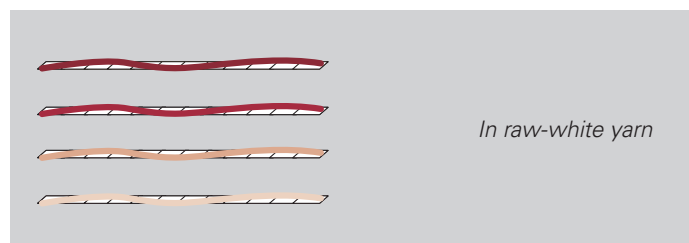
- Variation of yarn (CVy)
- Variation of hairiness (CVh)
- Variation of sliver (CVs)
- Imperfections (IPI)



## Foreign Matter (F)

Foreign matter with a color that is different from the base color of the yarn:

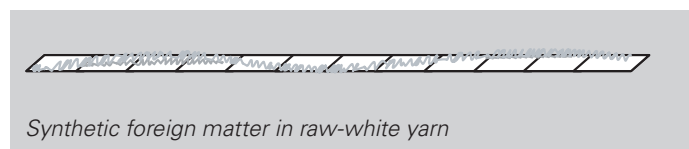
- Dark foreign matter in the raw yarn



## Synthetic Foreign Matter (P)

Synthetic foreign matter (e.g. polypropylene)

- Irrespective of the color of the yarn and the foreign matter, for example, white and transparent polypropylene in raw-white yarn



## Yarn Fault Classification

Yarn faults are defined in terms of a transverse dimension and a longitudinal dimension. The transverse dimension is expressed as a deviation of normal diameter and the longitudinal dimension in millimeters.

The definition of yarn faults in terms of length and thickness suggests the representation of yarn faults in a Cartesian system of coordinates. Thereby the length is plotted in the horizontal direction (X-axis), and the thickness in the vertical direction (Y-axis). Each yarn fault can, thus, be plotted as a point in the plane of the coordinates. Furthermore, the plane of the coordinates can be divided into individual fields (classes) in order to summarize (classify) similar yarn irregularities into groups and to count them. This takes into account another extremely important point of view, namely the frequency of similar faults (see figure 1).

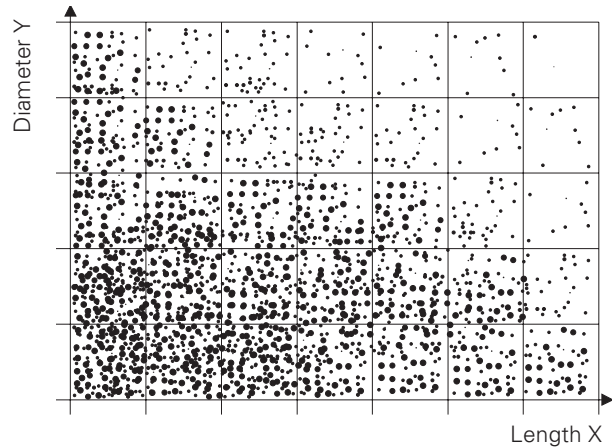


Figure 1

Frequency distribution of yarn faults in the coordinate grid

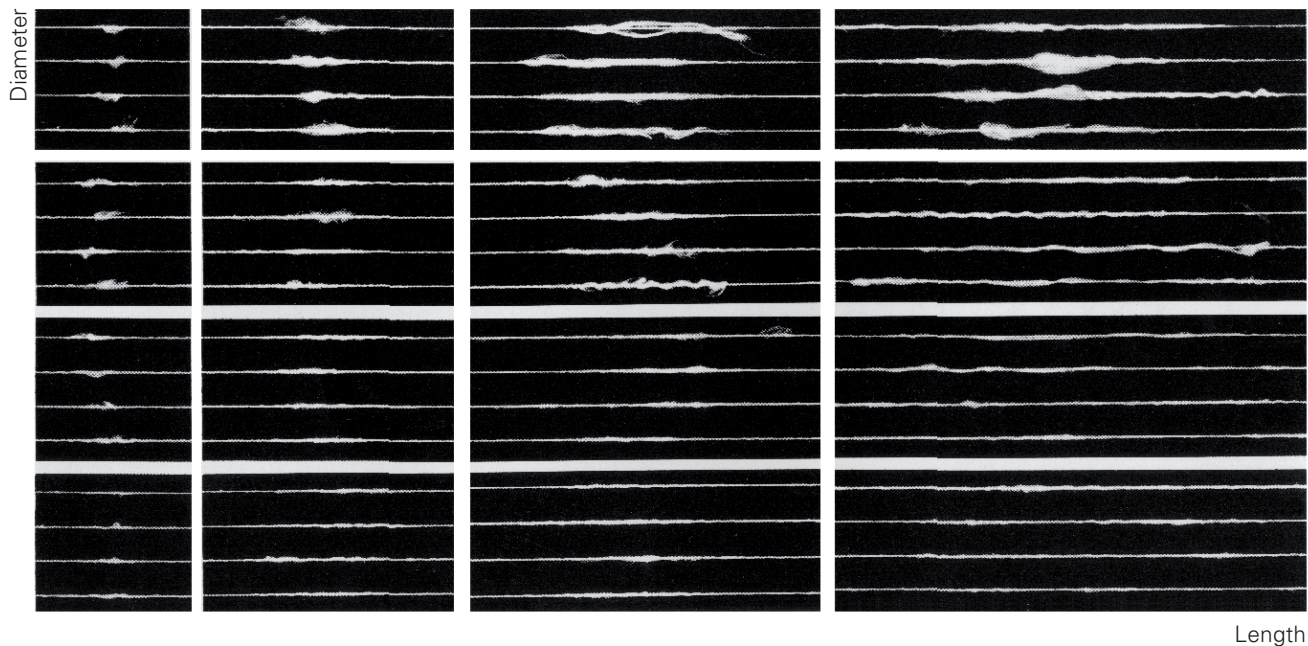


Figure 2

The choice of the class limits is largely random. Diameter faults are most frequently divided into different thickness and length classes (see figure 2).

The YarnMaster System 3N1 uses the following default classification (see figure 3).

4	10	20	40	80	160	320	mm	%
71	72	73	74	75	76	77	+	200
61	62	63	64	65	66	67	+	160
51	52	53	54	55	56	57	+	120
41	42	43	44	45	46	47	+	80
31	32	33	34	35	36	37	+	40
21	22	23	24	25	26	27	+	25
11	12	13	14	15	16	17	-	20
01	02	03	04	05	06	07	-	40

Figure 3

## Yarn Clearing

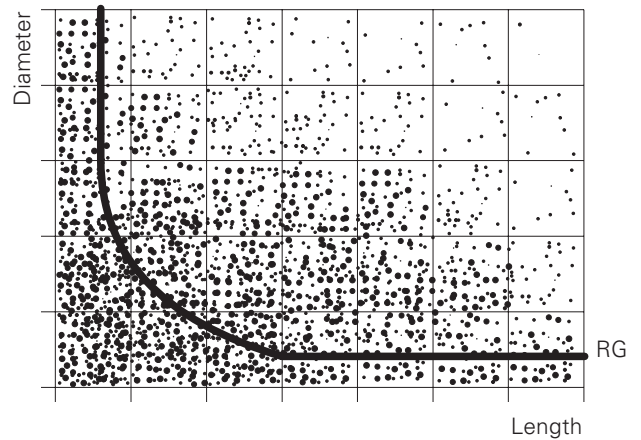
### Base Curve

The distinction between yarn faults which are to be cut out and those which are to be left in the yarn (unacceptable and acceptable yarn faults), which is made in the interest of Open End spinning efficiency, has already been pointed out. This distinction can be represented graphically on the plane of coordinates as a line which separates the acceptable faults (below) from the unacceptable ones (above). This line represents the **theoretically-desirable base curve (RG)**. A concave base curve (see figure 4) normally corresponds to the requirements in practice.

The concave shape arises from the textile evaluation, whereby the greater the deviation in diameter that is tolerated, the smaller the length deviation that appears acceptable. Furthermore, the base curve, thus, passes through fields of similar fault frequencies, which meets the requirement of high efficiency.

A distinction must be made between the theoretically-desirable base curve and the **practically-achievable quality settings**, which depends on the one hand on the clearing characteristic typical of a clearer type, and, on the other hand, on its setting flexibility.

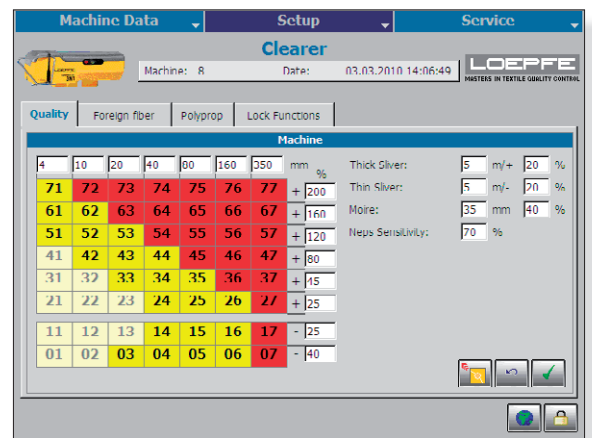
Figure 4



### Clearer Characteristics

#### Matrix Clearing

Each time the detector sees a single diameter measurement that deviates for more than +25% or -20% from the reference mean value (this is the noise region of normal yarn irregularity!), this measurement is considered as the possible beginning of a yarn defect. Subsequent diameter samples are kept in memory until the yarn diameter is again between the noise region around the reference mean. At this time, the average defect diameter deviation and the defect length are calculated. One defect is then added to the count in the appropriate field of the 8x8 matrix, first column is not shown (contains NEPS). This classification matrix divides all defects into 8 diameter classes (2 for thin places; 6 for thick places) and 7 length classes. The class limits can be set freely by the user.



#### Piecing

Clearing according to the settings of the quality matrix allows for the creation of an optional piecing defect detection (depending on type of machine).

## Foreign Matter (F)

The human eye is determining color differences by detecting differences in light absorption. The sensor for foreign matter incorporated in 3N1 is measuring these differences in light absorption to detect Foreign matters in the yarn in a most effective way. Foreign matters are classified in a 7x8 matrix.

10	14	20	24	30	34	40	mm sd
71	72	73	74	75	76	77	45
61	62	63	64	65	66	67	31
51	52	53	54	55	56	57	25
41	42	43	44	45	46	47	21
31	32	33	34	35	36	37	19
21	22	23	24	25	26	27	17
11	12	13	14	15	16	17	16
01	02	03	04	05	06	07	4

## Synthetic Foreign Matter (P)

The detection of synthetic foreign matter as polypropylene, polyamide (nylon) etc. is based on triboelectricity. The different electrical charging of materials (e.g. cotton and polypropylene) caused by travelling of the yarn over a detection element. The settings and classification can be displayed in a 7x8 matrix.

### Triboelectric Effect

The triboelectric effect is an electrical phenomenon where certain materials become electrically charged after coming into contact with another different material. The polarity and strength of the charges produced differ according to material and surface smoothness. That means: The further the materials lie off each other in the series, the more definitely they can be detected.

## Imperfections

Frequent yarn faults are described as Imperfections in the language of the textile industry. It is generally acknowledged that the shorter the fault length, or the smaller the diameter deviation respectively, the more frequent the event.

The source of these faults is found in the raw material or in a non-perfect spinning process. The raw material, card wires, opening rollers, rotor, nozzle have a significant influence on the imperfections.

With a reliable analysis of the Imperfections it is not only possible to optimize the production process but also conclusions can be drawn concerning the quality of the used fibre material.

## Yarn Irregularities

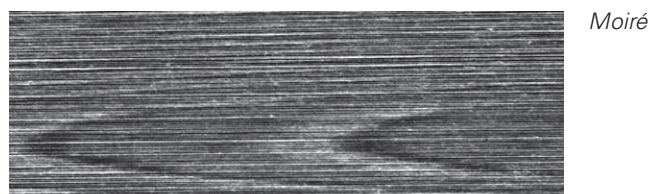
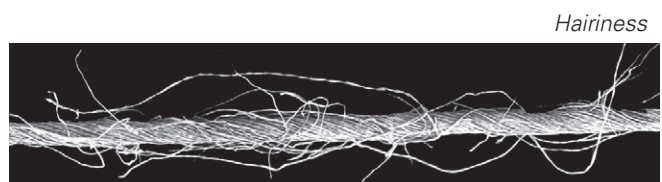
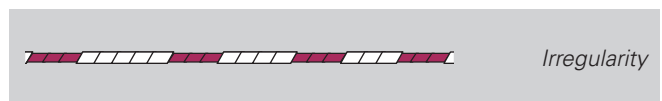
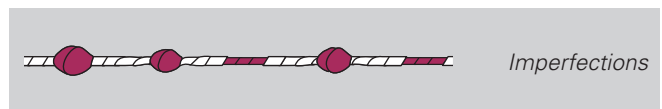
The monitoring and evaluation of the surface structure of a yarn (e.g. hairiness), is a further important criterion for quality assurance. In order to predict yarn behavior during processing in weaving or knitting, it is not sufficient to simply consider individual quality characteristics (e.g. yarn irregularity) to assess a yarn. Only a combination of different quality criteria (e.g. hairiness and irregularity) supports making a definite conclusion.

## Moiré

Moiré is a repetitive yarn defect caused by point contamination of the rotor's internal groove. Such contamination of the rotor produces thick places in the yarn with a distance to each other equal the rotor circumference.

Dry Human Hands, Skin	<b>Acquires a more positive charge</b>  +
Leather	
Rabbit Fur	
Glass	
Human Hair	
<b>Nylon (Polyamid)</b>	
<b>Wool</b>	
Fur	
Lead	
<b>Silk</b>	
Aluminium	+
Paper	
<b>Cotton</b>	
Steel	-
Wood	
Amber	
Hard Rubber	
Nickel, Copper	
Brass, Silver	
Gold, Platinum	
<b>Polyester</b>	
Saran Wrap	
Polyacrylic	
Polyurethane	<b>Acquires a more negative charge</b>  -
Polyethylene (scotch tape)	
<b>Polypropylene</b>	

Triboelectric Series



# YarnMaster 3N1

## Functional Range

		<p><b>P Clearing</b></p> <ul style="list-style-type: none"> <li>- Clearing of synthetic foreign matters PP PE etc.</li> <li>- Matrix setting and classification</li> <li>- P cluster clearing</li> </ul>
		<p><b>F Clearing</b></p> <ul style="list-style-type: none"> <li>- Clearing of foreign matters</li> <li>- Matrix setting and classification</li> <li>- Foreign matter cluster clearing</li> </ul>
		<p><b>Quality</b></p> <ul style="list-style-type: none"> <li>- Clearing             <ul style="list-style-type: none"> <li>N Neps</li> <li>S Short Faults</li> <li>L Long faults</li> <li>T Thin places</li> </ul> </li> <li>- Yarn count channel             <ul style="list-style-type: none"> <li>Thin and thick count</li> </ul> </li> <li>- Sliver channel             <ul style="list-style-type: none"> <li>Thin and thick sliver</li> </ul> </li> <li>- Moiré</li> <li>- Piecer clearing             <ul style="list-style-type: none"> <li>(depends on machine type)</li> </ul> </li> <li>- Yarn irregularities CV%</li> <li>- Imperfections (IPI)</li> <li>- Classification of faults</li> <li>- Online laboratory Graphics (Q-Pack)             <ul style="list-style-type: none"> <li>Variation of yarn (CVy)</li> <li>Variation of hairiness (CVh)</li> <li>Variation of sliver (CVs)</li> </ul> </li> </ul>
<p><b>YARNMASTER 3N1 BASIC</b></p>	<p><b>YARNMASTER 3N1 FP</b></p>	

# Operating

## Central Unit SCU

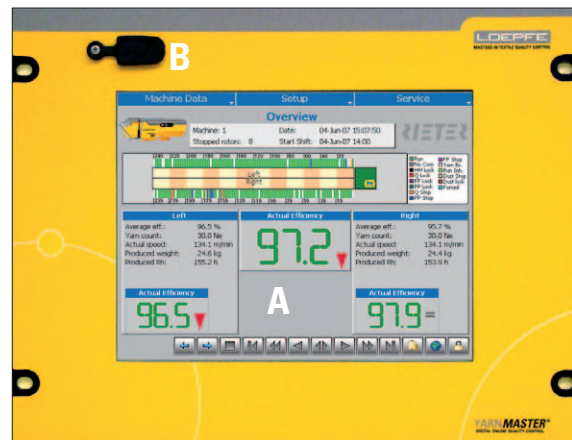
### A Touch Screen

The central unit is operated by direct inputs on the touch screen. Applying light pressure on the screen surface activates the functions shown.

Tap the menu item to be selected with the finger  
Do not use a pointed, metallic object as this could damage the monitor surface!

#### Cleaning:

The monitor surface is made of plastic material. Clean the monitor with a soft cloth. Heavy soiling can be cleaned with a cloth moistened with a water and soap solution.



### B USB Port

USB port to transfer reports and clearer data to a server and printer. The USB port is protected against dust and humidity by a removable cover.

## User Interface

### 1 Menu Bar (Overview Tabs)

Tapping the tabs in the header calls up the respective menus.

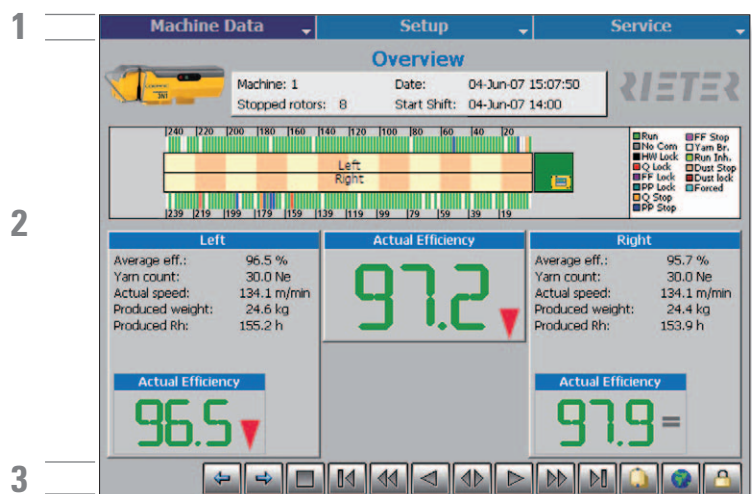
- Machine Data:** Shows all important data
- Setup:** Used for all kind of settings
- Service:** Used partly for one-time base settings and for service applications

### 2 Overview Page

Shows all data on a selected page. Depending on the page displayed, the settings can be entered or an overview of the data is possible.
































### 3 Navigation Bar

Navigation buttons:  
Enter a rotor number to display the rotors' related data.



### 3 Navigation

**Pages can contain following buttons:**

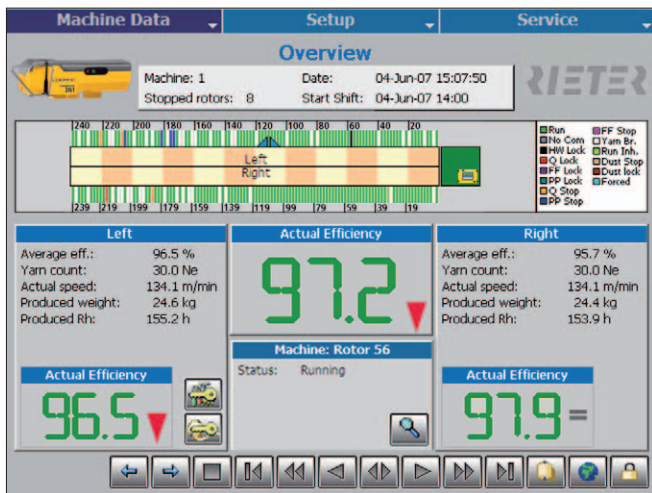
-  /  Next/previous page/list.  
Select next/previous option/value.
-  Enter rotor number.
-  /  First/last rotor of the selected machine side.
-  /  First/last rotor of the selected section.
-  /  Previous/next rotor. Keep touched for fast scrolling.
-  Switch machine side.
-  Deselect rotor.
-  Refresh the shown data.  
To remove this button from or to add it to each page: **Setup > User Interface > General.**
-  Change the user interface language.  
To remove this button from or to add it to each page: **Setup > User Interface > Languages.**
-  /  Lock/unlock data entry with a password.  
To remove this button from or to add it to each page: **Setup > User Interface > Passwords.**
-  Unlock technical alarm
-  Unlock hardware
-  Unlock rotor
-  Warm restart
-  Cold restart / reboot the SCU
-  Touch the cleaning button before cleaning the touch screen.  
To remove this button from or to add it to each page: **Setup > User Interface > General.**
-  /  Sort the list.
-  /  Scroll the list.
-  Replace the settings by the default settings. Touch  to apply the default settings.
-  Undo changes.
-  Cancel the changes.
-  Save the entered data (all changes need to be confirmed).
-  Clear list/report.

Additional buttons are explained per page.

**Important short names for the manual, used in the manual**

- |                     |                           |
|---------------------|---------------------------|
| Q = Quality         | SCU = Sensor control unit |
| F = Foreign matter  | SE = Section electronic   |
| P = Polypropylene   | SH = Sensing head         |
| UI = User interface |                           |





## Machine Overview

The header contains:

- Machine number/name
- Date and time
- Number of stopped rotors
- Shift start date and time

The machine block shows you the state of each particular rotor (see caption below).

Information about the total efficiency and production data on both sides (regarding the machine type). For more information see chapter Machine Data/Status/Overview.

**Note:** Overview shows the data for the entire machine or for one side (left/right; depends on machine type).

Color	Status
<span style="color: limegreen;">■</span>	Running
<span style="color: grey;">■</span>	No communication
<span style="color: black;">■</span>	Hardware locks, forced lock
<span style="color: red;">■</span>	Quality locks
<span style="color: purple;">■</span>	Foreign matter locks
<span style="color: teal;">■</span>	Polyprop locks
<span style="color: orange;">■</span>	Quality stops

Color	Status
<span style="color: fuchsia;">■</span>	Foreign matter stops
<span style="color: blue;">■</span>	Polyprop stops
<span style="color: white;">■</span>	Yarn broken
<span style="color: greenyellow;">■</span>	Run + inhibit
<span style="color: tan;">■</span>	Dust stops
<span style="color: brown;">■</span>	Dust locks
<span style="color: cyan;">■</span>	Forced stop

## Rotor Status Color Codes

The Rotor status color gives the information about the condition of each rotor.



## User Password

Default: 123

Enter the password and confirm.

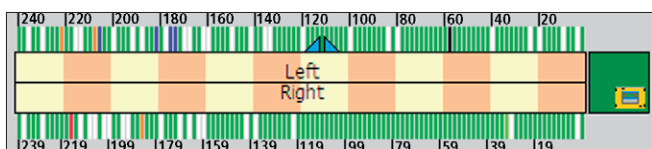
Qualified personnel can touch the lock button and enter the service password.

Change to alternative characters with Cap button.



## Data Entry

Data entry needs to be confirmed twice, once in the data entry window and once in the corresponding main window. The left side shows the selected parameter and the possible limits can be put in.

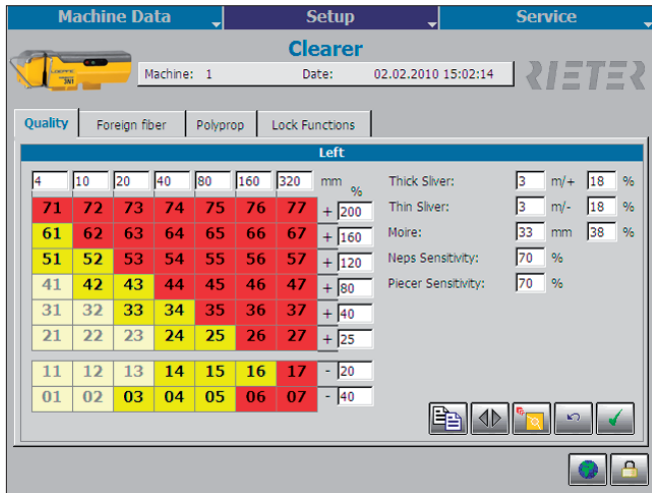


The indicator on the rotor side shows the selected rotor.

# Settings Clearer Parameter/Start

Enter the yarn clearing parameters by putting in the numbers in the length and the % deviation box. (Range for all settings see chapter Technical Data/Parameter Settings).

The matrix clearing can be selected or deselected by pressing the corresponding square. Red is selected for clearing and yellow for possible add on. The light yellow is not possible to be selected (disabled by system).

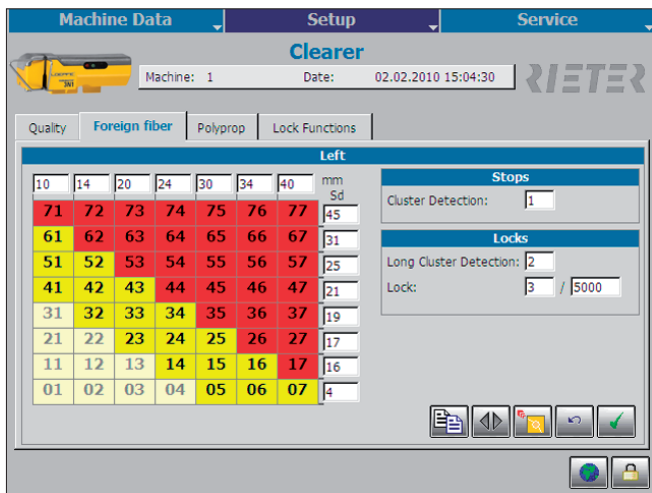


## Yarn Quality (Q)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.

The Y Axis shows the deviation (Sensibility). It is possible to change this parameter.

- Thin and thick sliver for detection of misplaced cans or partly decreasing/increasing of the sliver diameter
- Moire: Length of the fault depending on rotor diameter
- Neps sensitivity: length generally 5mm, deviation selectable
- Piecer sensitivity (depends on type of machine) deviation selectable (% of general clearing during piecing)

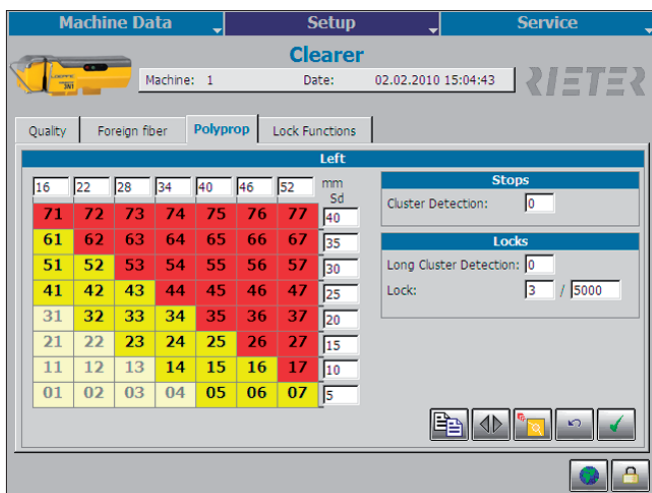


## Foreign Matter (F)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.

The Y Axis shows the intensity It is possible to change this parameter.

- Switch off the F clearing: set Lock to 0
- Cluster: sensitivity for short cluster (possible to remove during piecing)
- Long cluster: sensitivity for long cluster (Locks cannot be removed during piecing. They must be removed manually).
- Lock: stops in F within certain length (Locks cannot be removed during piecing. They must be removed manually).
- The setting 1 is the most sensitive

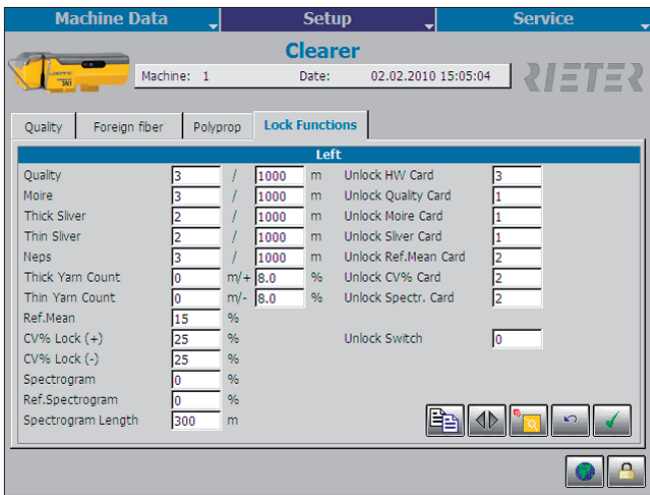


## Polypropylene (P)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.

The Y Axis shows the intensity It is possible to change this parameter.

- Switch off the P clearing: set Lock to 0
- Cluster: sensitivity for short cluster (possible to remove during piecing)
- Long cluster: sensitivity for long cluster (Locks cannot be removed during piecing. They must be removed manually).
- Lock: stops in P within certain length (Locks cannot be removed during piecing. They must be removed manually).
- The setting 1 is the most sensitive



## Lock Functions

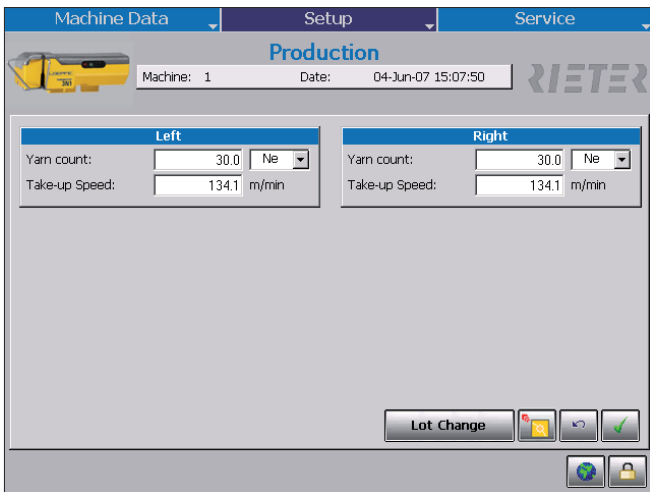
Enter the yarn lock parameters by putting in the numbers. With this function it is possible to lock each rotor with giving parameters. Unlock is possible with the unlock card (corresponding type of card) and at the SCU.

- CV% Lock: relative deviation from the median per side CV%. Lock for particular rotor.
- Unlock switch: Button on sensing head

Unlock 1: unlock all locks with value 1 from the settings above

Unlock 2: unlock all locks with value 1 and 2 from the settings above

Enter 0 to disable a function.



## Production, Lot Change

Enter the product data here.

Put in the yarn count and choose between Ne, Nm, tex, Nc. Take-up speed is set on the machine side.

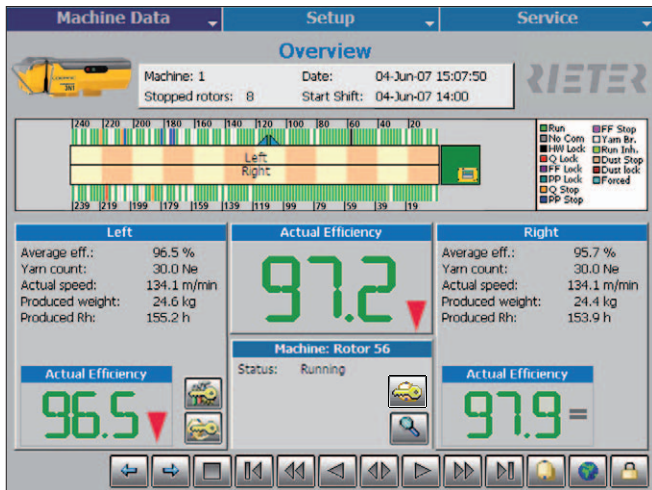
Attention: initiate a lot change:

- After changing yarn count
- After changing Lot
- After each change of spinning parameter on the machine
- After each change of take-up speed
- After interruption for more than 24 hours

- **Production Settings can be saved on, and loaded from a USB stick. (see chapter Checks and Maintenance/USB)**
- **Any Lot change forces a shift change for both machine sides.**

# Machine Data

## Status > Overview



The Overview is the base screen and shows all the important data.

The machine block shows the state of each particular rotor

Information about the total efficiency and production data on both sides (Regarding the machine type) and major information as

Efficiency:

▼ : decreasing

▲ : increasing

▬ : Stable

The value is red, if the efficiency is below the target efficiency. This target efficiency can be set in Setup/User Interface/Overview

Production weight: of the machine (from shift start)

Produced Rh: Rotor hours of the machine (from shift start)



With next or rotor button you can navigate to particular Rotor



With the stop button you just go back to the whole machine



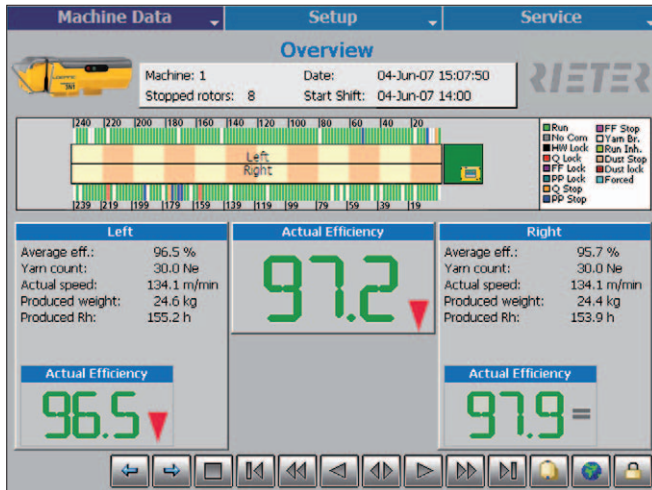
With the lens you can navigate to the production data of the selected rotor (as chapter Machine Data/Status/Clearer Data).

## Status > Clearer data

**Note:** The following production data are possible to see for each side/machine and for each rotor (more information in chapter Checks and Maintenance / Index Data Explanation).

Chart on the left side (for all Clearer Data):

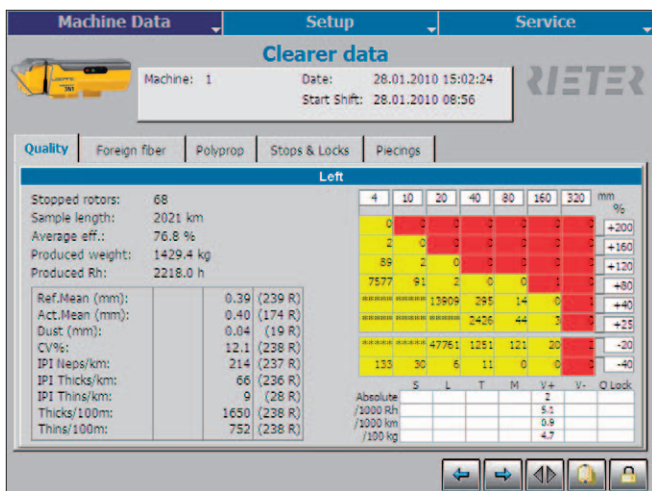
1. Column: Description
2. Chosen rotor
3. Mean value: Machine/Machine side
4. Number of rotors for the corresponding mean calculation



	1	2	3	4
Ref.Mean (mm):			0.39	(239 R)
Act.Mean (mm):			0.40	(174 R)
Dust (mm):			0.04	(19 R)
CV%:			12.1	(238 R)
IP1 Neps/km:			214	(237 R)
IP1 Thicks/km:			66	(236 R)
IP1 Thins/km:			9	(28 R)
Thicks/100m:			1650	(238 R)
Thins/100m:			752	(238 R)

## Quality > Machine/Machine Side

Stopped rotor: total stops  
 Sample length: since shift start  
 Average eff.: of the machine (from shift start)  
 Production weight: of the machine (from shift start)  
 Produced Rh: Rotor hours of the machine (from shift start)



## Quality > Rotor

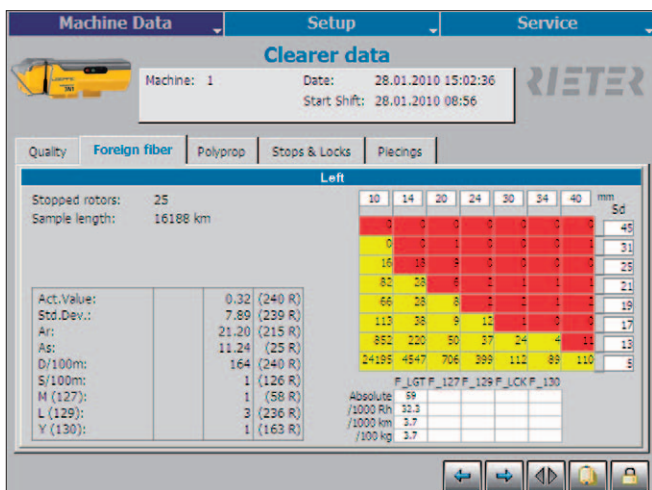
Sample Length: of the rotor  
 Efficiency of the rotor  
 Status: current state of the rotor

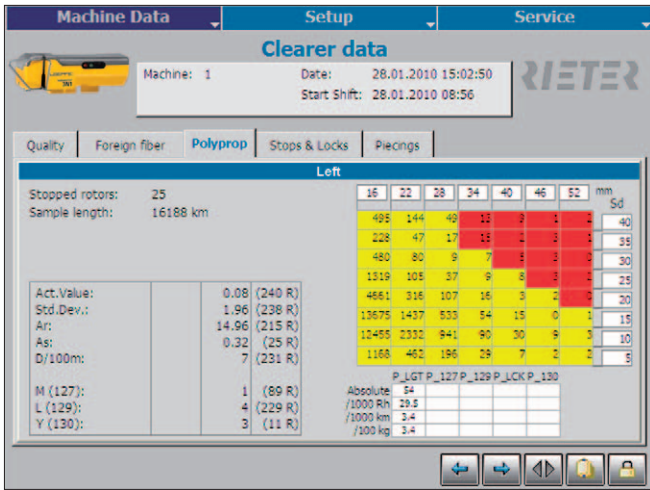
## Foreign Matter > Machine/Machine Side

Stopped rotor: total all stops  
 Sample length: since shift start

## Foreign Matter > Rotor

Sample length: of the rotor  
 Status: current state of the rotor



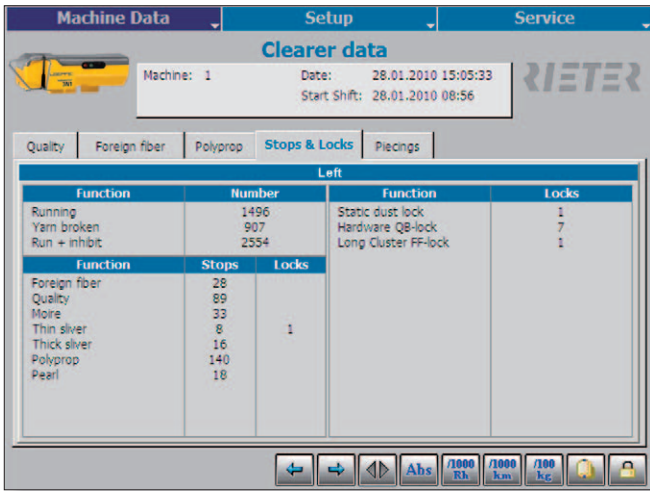


**Polypropylene > Machine/Machine Side**

Stopped rotor: total all stops  
Sample length: since shift start

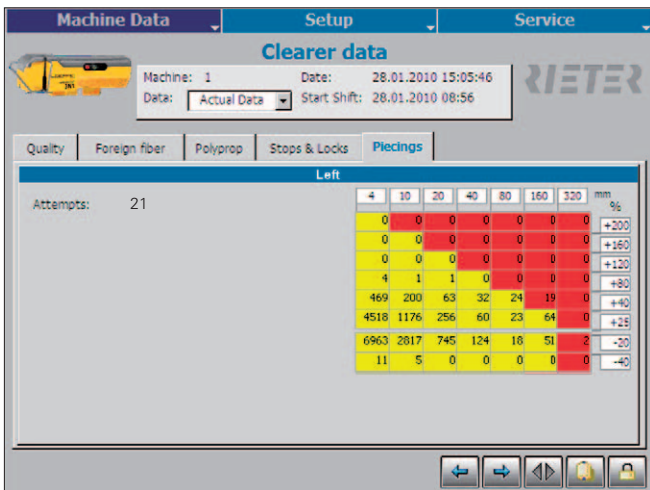
**Polypropylene > Rotor**

Sample length: of the rotor  
Status: current state of the rotor



**Stops and Locks**

1. Amount of the particular state since shift start
2. Quality generally: amount of the particular state since shift start
3. HW/Dust Lock: amount of the particular state since shift start (depends on machine type)



**Piecings**

Reports the classification of all faulty attempts during the piecing phase.

## Q-Pack

Real time Online Laboratory for advanced analysis.

## Spectrogram

Helps to analyze the yarn diameter profile for the presence of periodically occurring deviations.

Sample: needed length for a picture of the spectrogram

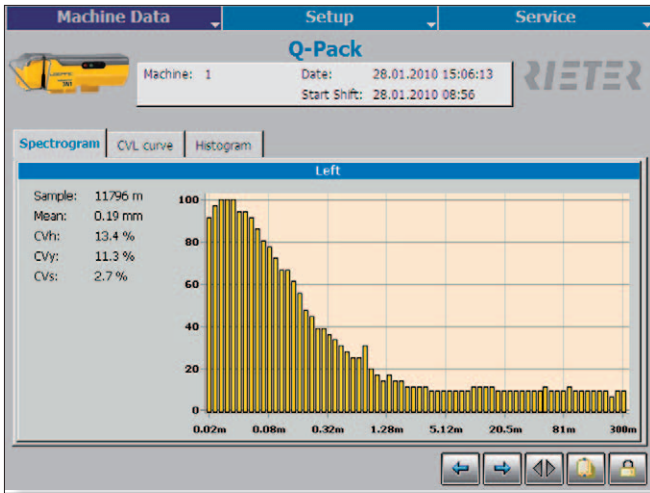
Mean: reference mean

CVh = CV% hairiness (CV% on 2mm)

CVy = CV% yarn (CV% on 8mm)

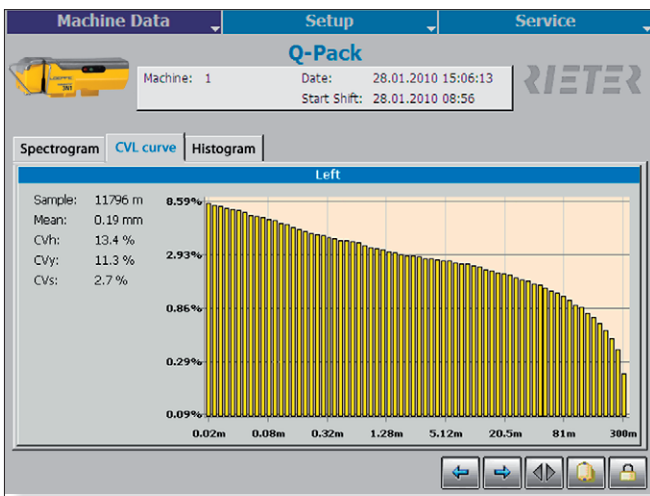
CVs = CV% sliver (CV% on 500mm)

y-axis: relative % to the max. amplitude



## CVL Curve

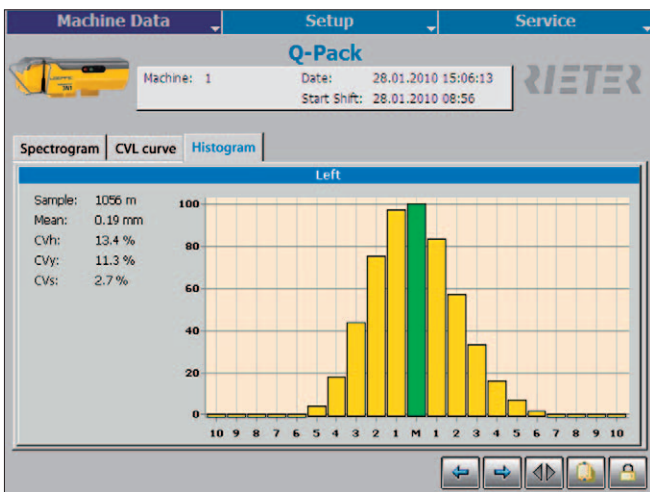
Analyse the CV% of a certain length.



## Histogram

x-axis: +/-x/100 mm

y-axis: rel% to maximum value



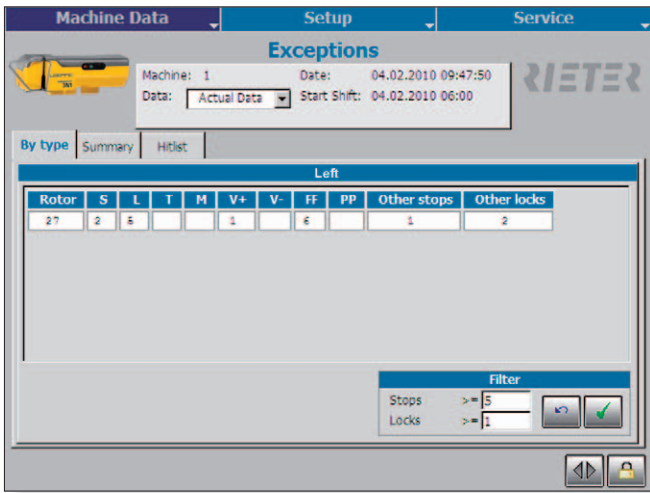




## Exceptions

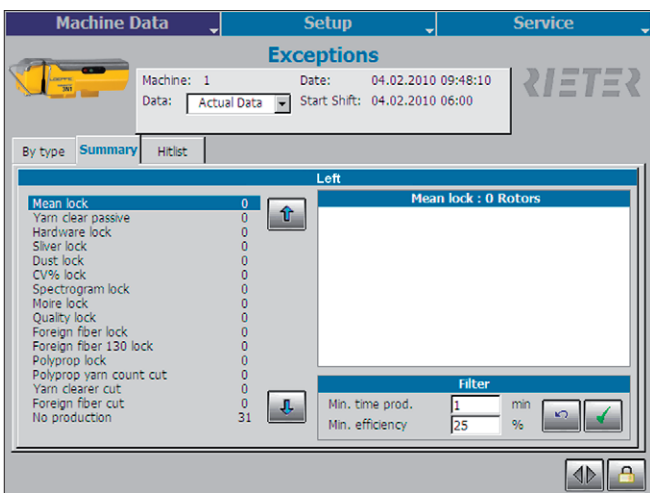
### Exceptions by Type

Shows the corresponding rotor, depends on the limits set. Values of the running shift or past shifts.



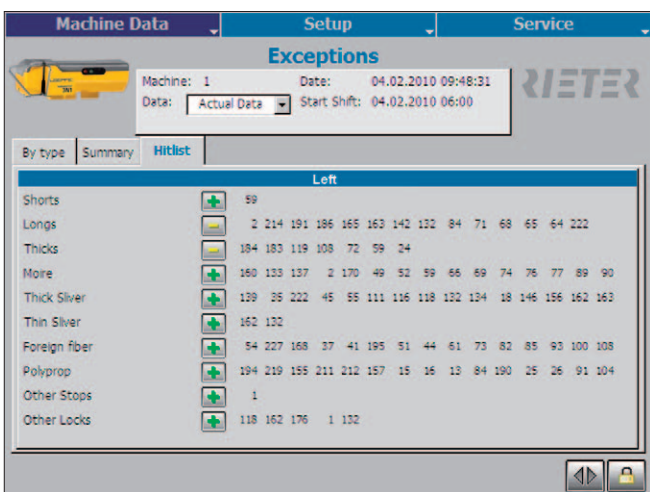
### Exceptions Summary

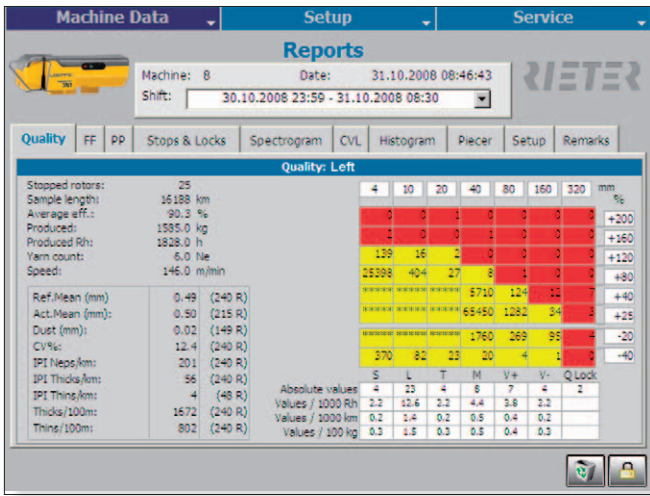
Shows the summary of a certain state. The summary depends on the limits set. Values of the running shift or past shifts. In the blue field all the rotors are seen in the chosen state.



### Exceptions Hitlist

The hitlist shows the rotors with the most or lowest stops.





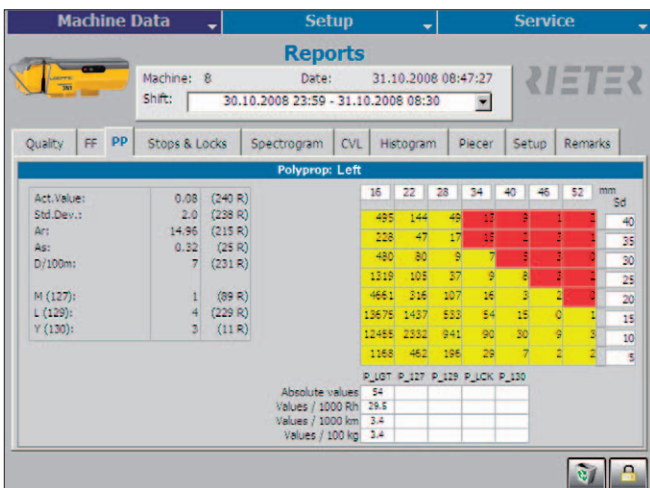
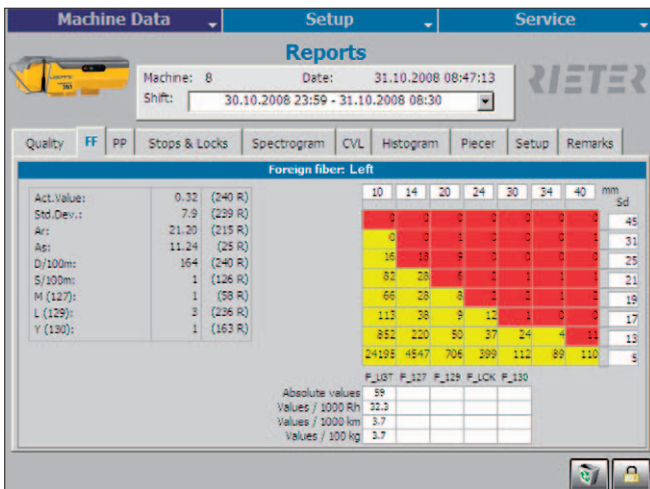
## Reports

All important data can be displayed as a report. Such as machine data and setup.

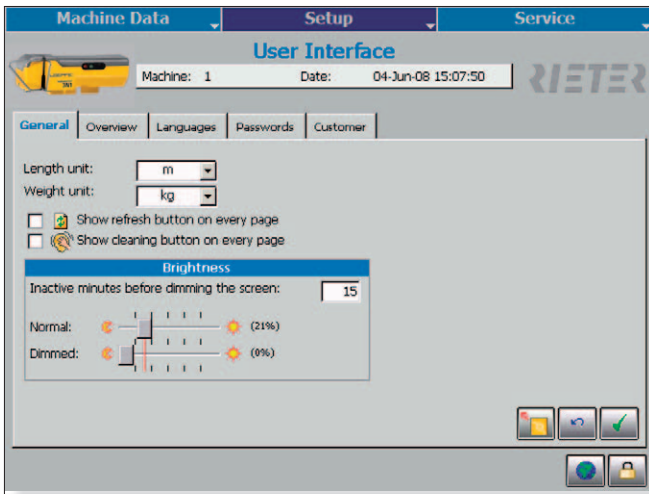
A shift/lot needs to be ended for a report

It is possible to change the shift to the past 100 (see chapter Base Setup / Shifts)

**Note: Reports can be stored via USB**  
 (See chapter Checks and Maintenance/USB)



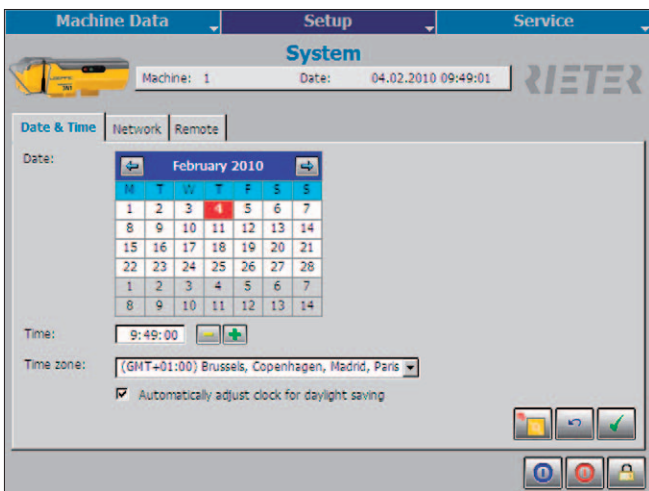
## Base Setup User Interface



Use the units of measurement system  
 Customize the Overview  
 Choose the user language  
 Change the Password if necessary  
 Customize the display logo

**Note: UI Settings can be saved on USB**  
 (See chapter Checks and Maintenance/USB)

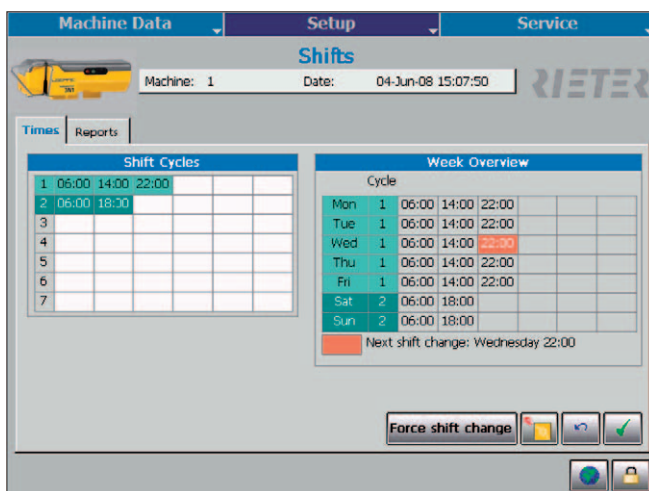
## System



Configure the system

Change options:  
 Region: choose the local Date/Time Zone  
 Network for external browser (Change IP will force an auto warm start)  
 Remote: license key

## Shifts



Times:  
 Define up to seven different shift cycles. For a non-working day, do not enter time.

Select a shift cycle for each day of the week.

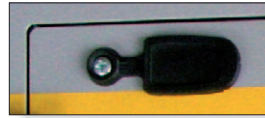
Reports:  
 Number of reports to be kept in memory. Once this number of report is reached, the oldest report is substituted by the new report.  
 The report language can also be a different language than the user interface language.

# Checks and Maintenance

## USB

### USB Stick

On the front of the SCU, a USB port is available to save shift reports, to transfer settings from and to another machine and to upgrade the software by using a USB stick.



#### Procedure:

1. Open the cover of the USB port.
2. Plug in the USB stick.
3. Wait until one or two USB buttons are added to the button bar in the lower part of the display. This may take 10 seconds. If no buttons appear, the USB stick cannot be used in this page.

#### Function:



Save data to the USB stick.



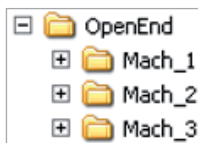
Read data from the USB stick. This button only appears when the USB stick contains data that correspond with the current page.




**Attention: Do not remove the USB stick while data transfer is busy. Wait for the confirmation message. After removing the USB stick, close the cover.**


### Folder Structure

All files are stored in the OpenEnd folder. This folder contains a subfolder for each machine, called "Mach" followed by the machine name.



### Shift Reports

To save shift reports on the USB stick, first open the Report page. Then touch  to save the data. This will save all tabbed pages of the shift report.

- First, check the file formats to be saved (XML, HTML).
- To save shift reports of shifts that have ended between two dates, select the first and last date and confirm with .
- To save all shift reports, touch All.





A confirmation message will be displayed upon terminating the action. Confirm.

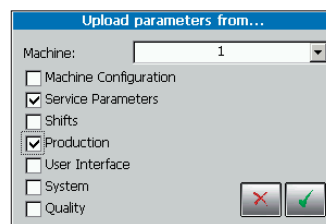
The file ShiftReports\_<yymmdd>\_<yymmdd>.zip is saved and contains:

- One or more files Shift\_<yymmdd>\_<hhmm>\_<yymmdd>\_<hhmm>.htm or Shift\_<yymmdd>\_<hhmm>\_<yymmdd>\_<hhmm>.xml (the filename includes the shift start/end date/time)

## Settings

Settings can be transferred from one machine to another. By touching  in a settings page, all settings are downloaded to the USB stick: file Parameters\_<machine number>.xml. A progress bar will be displayed while the settings are downloaded.

By touching  in a settings page, settings can be uploaded from the USB stick. Select the machine and which settings have to be copied to the SCU and confirm. A progress bar will be displayed while the settings are uploaded.














































## Read Stored Shift Reports

Take a copy of the newly generated shift report. Place it in a separate empty folder.

Unzip (extract) it in the empty folder. Thus you receive 2 new folders (ShiftReports\_<xxxxxx>\_<xxxxxx>\_HTML.zip and Shift-Reports\_Common.zip). Unzip (extract) these 2 new folders together in the same folder. It should create the reports (html format).

## Q-Sensor LED

During normal operation, the red LED is off and the green LED blinks shortly. If there is a quality or other problem, the way the LEDs light up or flash indicates the kind of lock, stop or problem. Check the Machine overview page for details.

Sensing Head LEDs	Status and Color	Descriptions	Unlock Method	
			Button	Card
 Green running light  Red off (normal operation)	Run  Lime green	Yarn running	—	—
	Yarn br.  White	Yarn broken		
	Run inh.  Green yellow	Piecing in progress (run inhibit)		
	Q stop  Orange	Q stop		
	F stop  Fuchsia	Stop: F_LNG, F_127, F_129		
	P stop  Blue	Stop: P_LNG, P_127, P_129		
 Green slow blink  Red fast blink	Q stop  Orange	Piecer quality stop	This status disappears on run inhibit.	
 Green on  Red off	Q lock  Red	Ref. mean lock	 (rotor)	Ref. Mean
 Green slow blink  Red off	Q lock  Red	Thin/thick yarn count lock	 (rotor)	Ref. Mean
 Green fast blink  Red off	Q lock  Red	Thin/thick sliver lock	 (yarn)	Sliver
 Green off  Red on	Q lock  Red	Quality lock & Pearl lock	 (yarn)	Quality
	F lock  Purple	F cluster lock long: F_130, F_LCK	 (yarn)	F
 Green off  Red fast blink	Q lock  Red	Moiré lock	 (yarn)	Moiré
 Green on  Red slow blink	F lock  Purple	F lock	 (yarn)	F
	P lock  Teal	P lock	 (yarn)	P
 Green on  Red fast blink	Q lock  Red	CV% lock	 (rotor)	CV%
	Q lock  Red	IPI neps/thin/thick lock	 (yarn)	CV%
 Green fast blink  Red on	Q lock  Red	Spectrogram alarm lock & Remote spectrogram lock	 (rotor)	Spectr.
 Green on  Red on	Dust lock  Brown	Dynamic/static dust lock	Clean sensing head	
 Green fast blink  Red fast blink	Forced  Cyan	Forced stop	This status disappears on run inhibit.	
	HW lock  Black	Can't stop lock, Forced locks & Hardware lock	 (hardware)	HW
 Green off  Red off	No comm.  Gray	No communication, unlock, new mean	Consult technician.	

## Cleaning

**When?** Clean the measuring slot of the Q-sensor regularly, for example at lot change. This will reduce dust locks. Always clean when a rotor is stopped for dust lock (both sensor LEDs on).

**With?** Use a cleaning swab from LOEPFE or equivalent. Use it either dry or dampened with optical lens cleaner. The swab may not be soaked to avoid damage to the sensor. **Do not use any other liquids!**

**How?** Drag the soft tip of the cleaning stick a few times through the measuring slot. When the LEDs go out automatically after removing the cleaning stick, the sensor is cleaned well.

## Index Data Explanation

### Q

Ref.Mean (mm): Reference mean value from adjust at the lot start or from a forced mean by the user. Measurement absolute in mm.

Act. Mean (mm): current mean in real time

Dust (mm): contamination of the Sensor (according to the empty and clean optic)

CV%: statistic calculation

IPI Neps/km: 2-4mm, +50% diameter deviation

IPI Thicks/km: 20-40mm, +30% diameter deviation

IPI Thins/km: 20-40mm, -30% diameter deviation

Thicks/100m: generally classified

Thins/100m: generally classified

S: stops short fault up to 80mm

L: stops long starts from 80mm

T: stops thin

M: stops Moiré

V+: stops thick sliver

V-: stops thin sliver

Q-Lock: Quality lock

### F

Act. Value: Reference mean value from adjust at the lot start or from a forced mean by the user.

Std.Dev.: Standard deviation

A: variance of the actual value

Ar: variance running

As: variance stopped

D/100m: classified defects (matrix)

S/100m: short (up to 80mm)

M F127: short cluster accumulating (chain)

L F129: short cluster accumulating (distributed)

Y F130: long cluster accumulating

F\_LGT: F matrix stop

F\_127: chain of short F Cluster stop

F\_129: distributed short F cluster stop

F\_LCK: F Lock

F\_130: long F Cluster stop

### P

Act. Value: Reference mean value from adjust at the lot start or from a forced mean by the user.

Std.Dev.: Standard deviation

A: variance of the actual value

Ar: variance running

As: variance stopped

D/100m: classified defects (matrix)

M F127: short cluster accumulating (chain)

L F129: short cluster accumulating (distributed)

Y F130: long cluster accumulating

P\_LGT: P matrix stop

P\_127 chain of short P Cluster stop

P\_129: distributed short P cluster stop

P\_LCK: P Lock

P\_130: long P cluster stop

## Replacements of Sensor and SE-Board

Replacement of the SH and its cables is possible while the machine is running. Just unplug the cables. For any case of defective parts or malfunction please contact customer support.

**Note: for all other changes you need to unplug the power for the according part.**

**After changing the SE board, please check the software version on menu *Service/Version*.**

**There should be one line with SE (1-n). Please force an SE program on page *Service/Machine Configuration* if there are divided sections or any other incompatibilities (software variations).**

## Spare Part Numbers

Loepfe	Description
A016964900	Cleaning Tips
A280066800	SCU basic
A280066710	SCU full
A505668230	SE board basic
A701000000	extension print for SE (Full Version)
905263110	Sensor basic

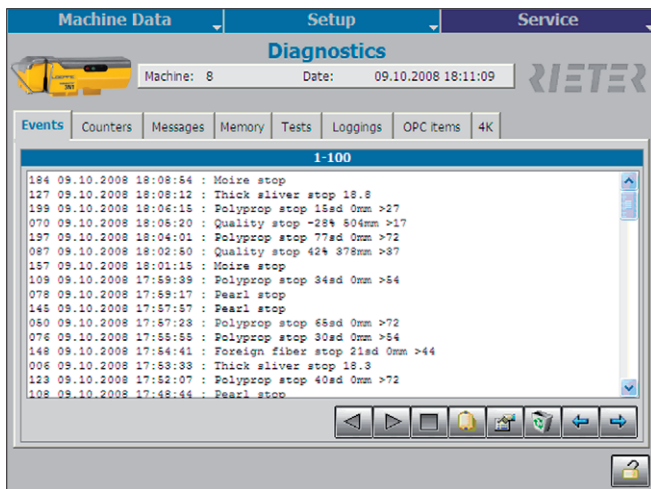
Loepfe	Description
905263000	Sensor full
V314103	Fuse for SCU
A080992900	Fuse for SE
P222004	Battery for SCU
A016957900	Battery for SE
045757000	USB Stick Loepfe

## Diagnosis

### Events

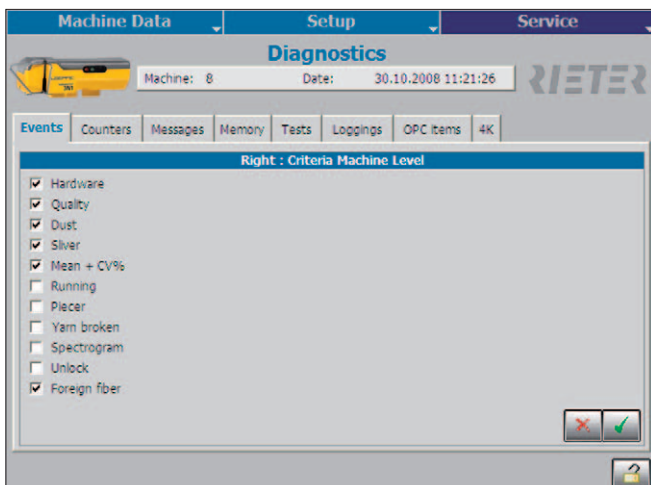


Use the filter for particular events



Event data:

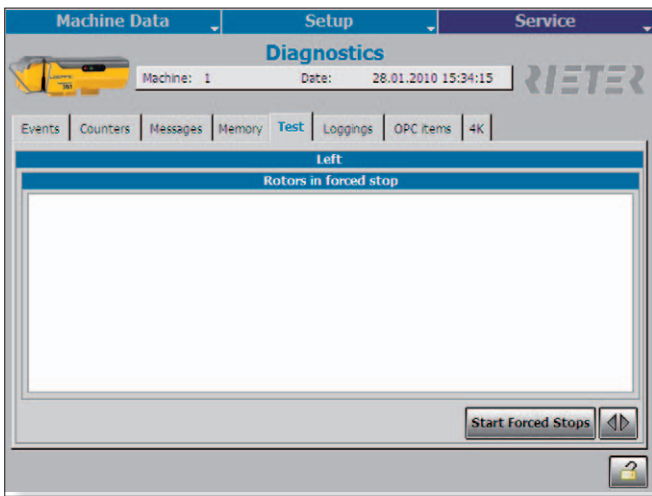
- Rotor
- Date
- Time
- Stop reason (state)



Filter Function as:

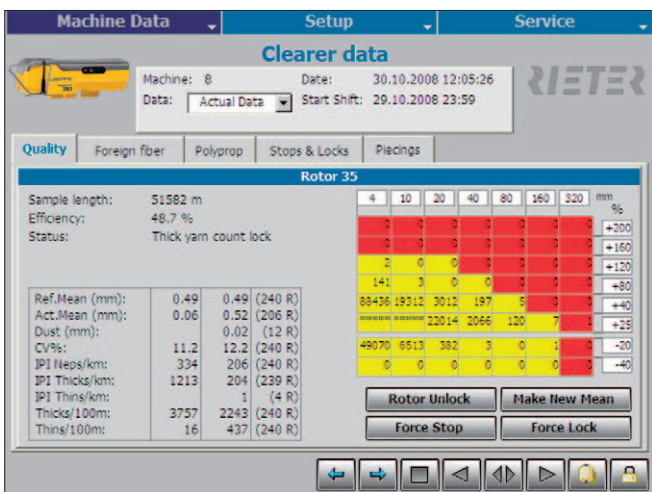
- Hardware
- Quality
- Dust
- Sliver
- Mean + CV%
- Running
- Piecer
- Yarn broken
- Spectrogram
- Unlock
- Foreign matter (incl. P)





### Tests

Check by testing, if each particular sensor is working. Check by following the flashing of the LED on each sensor.

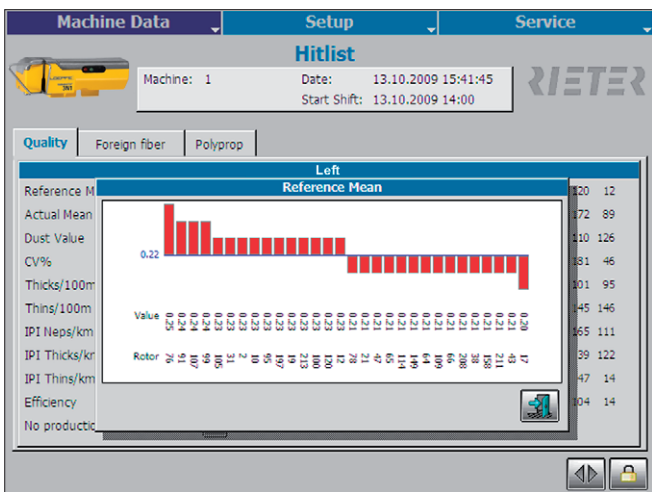


### Trouble shooting

In case of troubles with one rotor position e.g. too many cuts, use the rotor clearer data for the following action:

- Make new mean: New adjusting of the current yarn
- Force Stop: Check for communication
- Force Lock: for service purpose
- Rotor Unlock: at overview screen

A locked rotor must be inspected by qualified personnel. A fault or a malfunction needs to be corrected. After elimination, unlock the rotor.



Use statistic for further analysis. Figure cut bad running sensors for Q, F and P are shown in this graph.

LOEPFE 3N1 has a built-in diagnostic function. Technical problems are indicated by means of hardware locks.

Hardware locks can be cancelled by means of the unlock card and from the SCU. Since hardware failures of this kind can have a severe influence on yarn quality, they should be corrected and reset by qualified personnel only. Hardware locks should therefore be assigned to unlock card 3, which should be accessible to qualified personnel only.

A hardware alarm is indicated on the Q-sensor: Both LEDs are flashing. The type of alarm can be viewed on the SCU screen.



Fault	Description	Possible cause	Recommended action
Hardware SE lock 0	Unspecified diagnostic lock after restart of SE	A lock was present before Power Down of the SE and is restored by the SCU	Correct lock situations before Power Down of SE Reset lock and check again
Hardware SE lock 1 (*)	The SH detects no Yarn signal although the rotor is in RUN state	Yarn not/not correctly in the SH measuring slit SH lower ceramic missing SH defective	Check Yarn position and guiding Replace SH
Hardware SE lock 2	Measured Yarn signal is too low	Yarn position wrong SH lower ceramic missing SH defective	Check Yarn position and guiding Replace SH
Hardware SE lock 3	Measured Yarn signal is too high	Measuring slit obstructed by dust or lint SH defective	Remove dust or lint Replace SH
Hardware SE lock 4	Too much Run/Stop transitions in the measured Yarn signal	Maximum piecing attempts reached (default 20 per shift) Yarn position wrong SH defective	Check piecing robot and spinbox components Check and correct Replace SH
Hardware SE lock 5	No communication with YM 3N1 SH	Cable unplugged or defective SH defective SE has a defective input	Connect or replace cable Replace SH Replace SE
Hardware SE lock 6	Minimum intensity signal. (F channel)	SH has no F-function SH defective	Install correct SH Replace SH
Hardware SE lock 7	Maximum intensity signal. (F channel)	Machine is producing blended yarn SH defective	Disable F-channel of YM 3N1 Replace SH
Hardware SE lock 8	Minimum intensity signal. (P channel)	SH has no P-function SH defective	Install correct SH Replace SH
Hardware SE lock 9	Maximum intensity signal. (P channel)	Machine is producing synthetic yarn SH defective	Disable P-channel of YM 3N1 Replace SH

Notes:

(\*) = Function not present on stand-alone installations

SH = Sensing Head

SE = Section Electronics

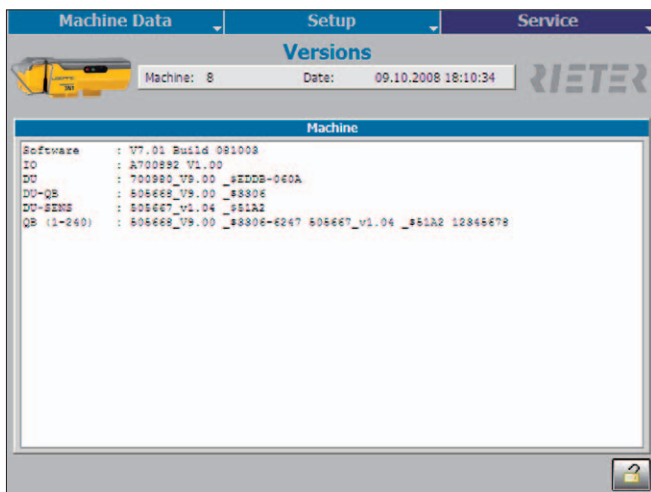
SCU = Sensors Central Unit

YM 3N1 = YarnMaster 3N1

## Service Machine Configuration

### Versions

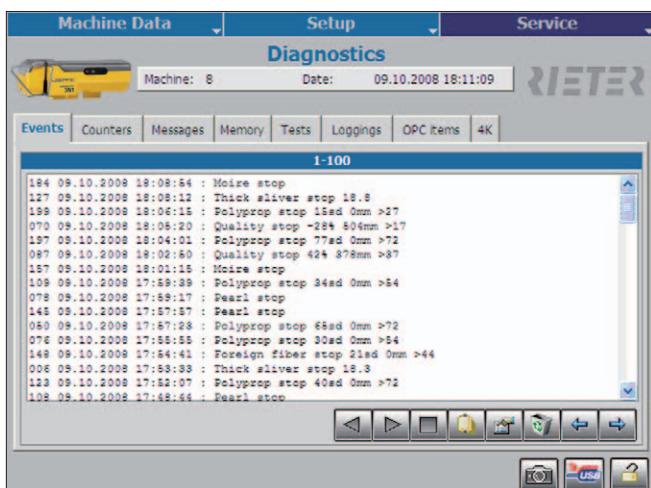
The version is important for any support communication.



### Snapshot

For any correspondence, please take a snapshot (takes about 20 minutes) and send it to Loepfe.

1. Plug in the USB-stick.
2. Wait until the camera button is added.
3. Push the camera button to start the snapshot.



## Technical Data (Changes reserved)

### System

Concept	Modular, integrated in spinning System / Components individually replaceable / Power supply depends on machine type
SCU	One control station per machine / Date and time indication / Data memory in case of power failure / Bus connection to section electronic / Data connection to machine control station LAN connection to local network
Operating	Setting of the conventional clearing parameters via touch screen
Operating temperature	+0° up to +50° C
Humidity	Up to max. 95% relative humidity not condensing
Section electronic	1 Board per Section (20 Rotors)
Sensing head	1 Sensor per rotor
Range of application	For staple-spun yarn of natural, synthetic or blends

### Central Unit (SCU)

SCU	Graphics-capable display backlit and, touch screen Keyboard and mouse connection via USB possible Microsoft® Windows CE®
Connection	All type of machine: 24V DC SELV, +25%/-15% Max. Current: 4A / Fuse: 2xT3.15AL
Capacity of OE Spinning machine	Rieter R60: Up to 540 clearers can be connected
Settings/side	Rieter R60: 2 different settings (1 for each side)
Dimension	Approx. 483 x 266 x 83mm (W x H x D)
Max. power consumption	- no lamp tree is connected: 30 Watt - lamp tree with lamps of 3W is connected: 45 Watt - lamp tree with lamps of 5W is connected: 53 Watt
Weight	Approx. 5.25kg
Printing	Printout via USB stick

### Evaluation Unit (Section Electronic)

SE-Board Rieter	20 rotors
Spinning speed	Up to 400 m/min (Loepfe side)
Max. power supply and consumption (incl. SH)	Basic: max. 675 mA at 24V DC SELV, +25%/-15% Full: max. 750 mA at 24V DC SELV, +25%/-15% Max current: 1.1A/fuse: 1xT2AL.

### Sensing Head

Basic	1 Sensor for diameter measurement integrated
Full	3 Sensor for Q/F/P measurement integrated

### Yarn Count Range (Optical scanning principle)

TK Type	Limit Range Coarse	Limit Range Fine
Sensor basic/full	Nm 5	Nm 100

## Parameter Settings

### Settings for thick and thin places

Default values	Valid values	To desable, set to
Matrix lengths in mm		
4, 10, 20, 40, 80, 160, 320	2 to 8, 6 to 18, 12 to 38, 22 to 78, 42 to 158, 82 to 318, 162 to 840 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix diameter deviations in %		
-40, -20, 25, 40, 80, 120, 160, 200	-26 to -50, -20 to -34, 25 to 34, 31 to 74, 46 to 114, 86 to 154, 126 to 194, 166 to 350	—
Activated matrix squares for quality stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17, 07	All matrix fields can be activated, except 01, 02, 11, 12, 13, 21, 22, 23, 31, 32 and 41.	Deselect/select matrix square
Piecer classification		
Sensitivity: 70 %	50 to 150 %	0 %
Moiré		
Rotor diameter: 33 mm	20 to 70 mm	
Yarn diameter deviation: +38 %	20 to 99 %	0 %
Sliver stops		
Thin place. Length: 3m. Diameter deviation: -18 %.	1 to 9m 2 to 30 %	0m
Thick place. Length: 3m. Diameter deviation: +18 %.	1 to 9m 2 to 30 %	0m
Yarn count lock		
Disabled	Length: 10 to 1000m Deviation: 0.3 to 20 %	0m
Neps or pearl channel		
Neps with respect to the reference mean: +50 %	+5 to +170 %	0 %
Spectrogram analysis		
Maximum statistically secured wavelength: 300m	37 to 300m	0m
Spectrogram lock: 0 %	10 to 255 %	0 %
Reference spectrogram lock: 0 %	10 to 255 %	0 %
Lock functions		
Quality lock: 3 stops per 1000m	1 to 9 stops per 1000 to 16000m	0 stops
Moiré lock: 3 stops per 1000m	1 to 9 stops per 1000 to 16000m	0 stops
Sliver lock: 2 stops per 1000m (thick, thin)	1 to 9 stops per 1000 to 16000m	0 stops
Neps lock: 3 stops per 5000m	1 to 9 stops per 1000 to 16000m	0 stops
Reference mean value lock: 15 %	4 to 30 %	0 %
CV% lock: 25 % (+ and -)	4 to 50 %	0 %
Unlock priorities and groups		
Quality, moiré and sliver belong to group 1 (unlock with card 1).	Card 1 to 3	—
CV%, spectrogram locks, yarn count and reference mean locks belong to group 2 (unlock with card 2).	Card 1 to 3	—
Technical locks, such as hardware locks belong to group 3 (unlock with card 3).	Card 1 to 3	—
Unlock switch: 0 (switched off)	0,1,2	0

## Settings for colored fiber detection

Default values	Valid values	To desable, set to
Matrix lengths in mm		
10, 14, 20, 24, 30, 34, 40	2 to 12, 12 to 18, 16 to 22, 22 to 28, 26 to 32, 32 to 38, 36 to 198 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix intensity values		
4, 16, 17, 19, 21, 25, 31, 45	4 to 15, 5 to 16, 17 to 18, 18 to 20, 20 to 24, 22 to 30, 26 to 44, 32 to 99	—
Activated matrix squares for foreign matter stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17	All matrix fields can be activated, except 01, 02, 03, 04, 11, 12, 13, 21, 22, 31	Deselect/select matrix square
Stops		
Cluster detection: 1	1 to 9 (1= highest sensitivity)	0
Locks		
Long cluster detection: 2	1 to 9 (1= highest sensitivity)	0
Lock: 5 stops per 5000m	1 to 9 stops per 1000 to 16000m	0m (10.4)
Unlock priorities and groups		0m
Foreign matter belongs to group 1 = unlock with card 1	Card 1 to 3	—

## Settings for polypropylene detection

Default values	Valid values	To desable, set to
Matrix lengths in mm		
16, 22, 28, 34, 40, 46, 52	2 to 20, 18 to 26, 24 to 32, 30 to 38, 36 to 44, 42 to 50, 48 to 200 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix intensity values		
5, 10, 15, 20, 25, 30, 35, 40	5 to 9, 6 to 14, 11 to 19, 16 to 24, 21 to 29, 26 to 34, 31 to 39, 36 to 99	—
Activated matrix squares for polypropylene stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17	All matrix fields can be activated, except 01, 02, 03, 04, 11, 12, 13, 21, 22, 31	Deselect/select matrix square
Stops		
Cluster detection: 1	1 to 9 (1= highest sensitivity)	0
Locks		
Long cluster detection: 0	1 to 9 (1= highest sensitivity)	0
Lock: 5 stops per 5000m	1 to 9 stops per 1000 to 16000m	0 m
Unlock priorities and groups		0 m
Polypropylene belongs to group 1 = unlock with card 1.	Card 1 to 3	—





Loepfe Brothers Ltd.  
8623 Wetzikon / Switzerland  
Phone +41 43 488 11 11  
Fax +41 43 488 11 00  
[info@loepfe.com](mailto:info@loepfe.com)  
[www.loepfe.com](http://www.loepfe.com)