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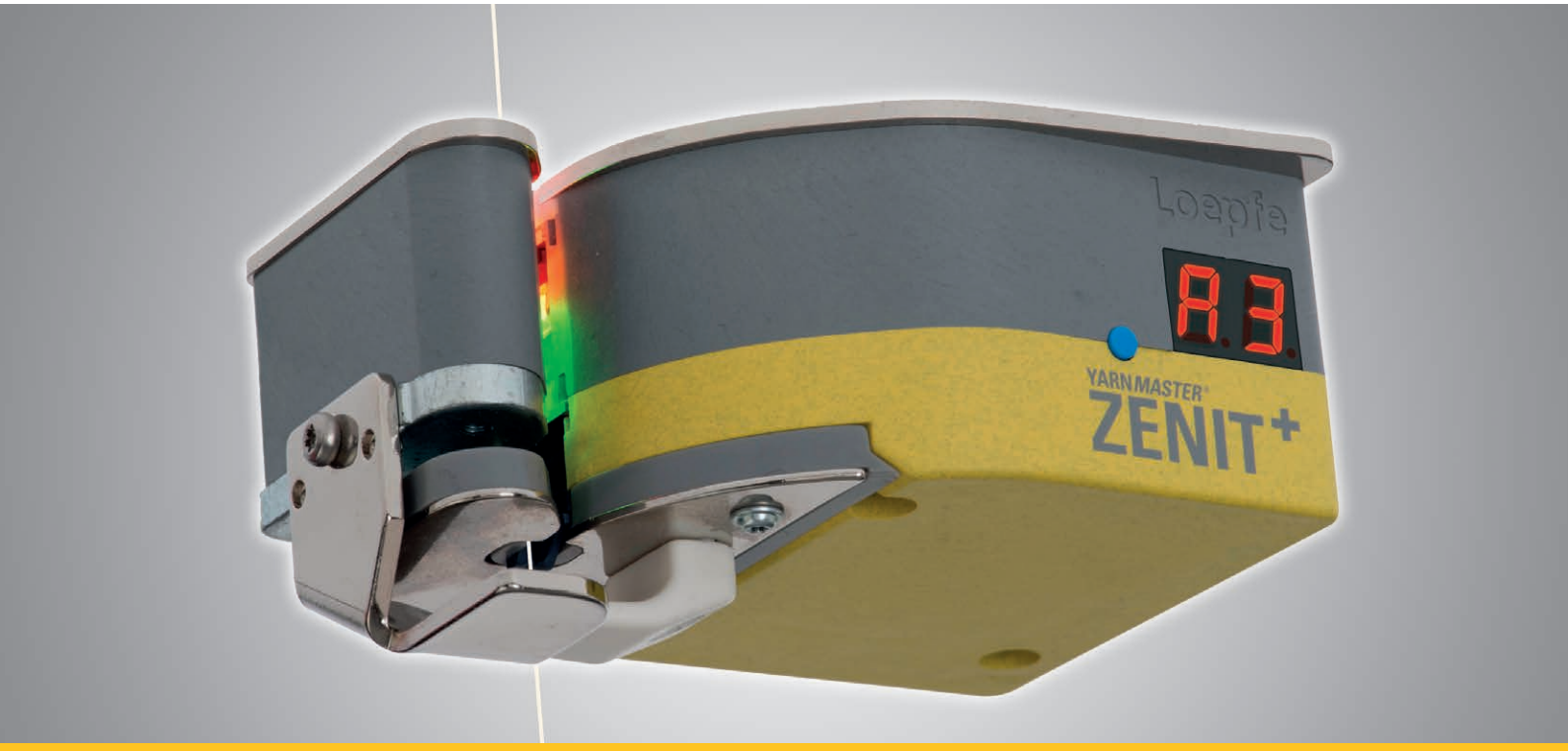

YARN*MASTER*® ZENIT+

Instruction Manual

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1 General

1.1 Information on this Instruction Manual

1.1.1 General

This Instruction Manual allows safe and efficient operation of yarn clearer system YarnMaster Zenit^{+}.

The basic prerequisite for safe working is compliance with all specified safety information and instructions in this Instruction Manual.

Operation as prescribed and thorough maintenance of the yarn clearer system ensure optimum clearer performance, trouble-free operation as well as a high service life of the yarn clearer system.

If anything is not clear, contact the supplier for your own safety.

1.1.2 Duty to Read this Manual

Prior to any work, the personnel must have thoroughly read and understood this Instruction Manual and, in particular, the safety information.

1.1.3 Availability of Instruction Manual

The Instruction Manual is part of yarn clearer system YarnMaster Zenit^{+} and must be kept in direct vicinity of the equipment and accessible for personnel at all times.

When the equipment is sold, this Instruction Manual must be handed over to the buyer.

1.1.4 Loss of Instruction Manual

If you lose the Instruction Manual, ask for immediate replacement.
For contact data, see page 3.

1.2 Explanation of Symbols

In this Instruction Manual, safety information is marked with symbols and signal words which express the extent of the hazard.

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

1.2.1 Symbols


General danger


Voltage


Risk of burns


Highly inflammable


Electrostatically sensitive components and assemblies


Grounding connection


Material 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 may 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 Information


Useful hints and recommendations.

1.3 Liability

1.3.1 Information in this Manual

The information and safety information in this Instruction Manual have been compiled with consideration of the applicable standards, directives and regulations, the state-of-the-art and many years of experience.

> The screenshots in this Instruction Manual serve for illustration. They are not to be used as examples for setting.

1.3.2 Delivery

In addition to the contractually agreed obligations, the manufacturer's General Terms and Delivery Conditions are applicable.

1.3.3 Technical Modifications

Loepfe Brothers Ltd. will not be liable for damage and accidents resulting from the following:

- Unauthorized conversion and modification of the yarn clearer system
- The use of spare parts/non-OEM parts/conversion parts not supplied by us

1.3.4 Improper or False Application

Loepfe Brothers Ltd. will not be liable for damage and accidents resulting from the following:

- Improper user of the machine
- Failure to comply with the information and notices in this Instruction Manual

1.3.5 Inadequate Maintenance

Loepfe Brothers Ltd. will not be liable for damage and accidents resulting from the following:

- Neglected or inadequate maintenance
- Failure to comply with the instructions described in the «Maintenance» chapter

1.3.6 Loss of Data

Loepfe Brothers Ltd. will not be liable for damage resulting from the following:

- Loss of data and operating failures caused by possible malfunctions or defects of the machine and / or software

2 Safety

2.1 Responsibility of Operating Company

2.1.1 Basic Information

The operating company of yarn clearer system YarnMaster Zenit^{+} is subject to the legal requirements for industrial safety.

It is responsible for

- safe and proper operation of the yarn clearer system
- qualification, training and employment of qualified personnel

2.1.2 Responsibilities

The operating company shall define the responsibilities and competences for operation and maintenance of the yarn clearer system and appoint the responsible persons.

2.2 Requirements for Personnel

2.2.1 Inadequate Qualification

WARNING

Risk of injuries and damage through inadequate qualification!
Improper handling can result in severe personal injuries or damage to the yarn clearer system.

▷ *Installation, operation and maintenance must be performed only by qualified specialized personnel.*

2.2.2 Specialized Personnel

The following qualifications for the different areas of activity are specified in this Instruction Manual:

- **User and foreman**
  User and foreman are persons qualified and trained for operation and maintenance of the yarn clearer system.
- **Service technician**
  The service technician is a Loepfe employee qualified and trained for servicing the yarn clearer system or a person expressly named by Loepfe for this task.

2.3 Use

2.3.1 Intended Use

Yarn clearer system YarnMaster Zenit^{+} has been designed and built for online yarn monitoring and clearing of undesired yarn faults on winding machines from various manufacturers.

The yarn clearer system must be installed and operated with observation of the Instruction Manual and the included instructions.

2.3.2 Incorrect Use

Any other or incorrect use of the clearer is considered as incorrect use and can result in dangerous situations.

Claims of any kind resulting from damage because of incorrect use are excluded.

2.4 Special Risks

2.4.1 Electric Current

DANGER

Danger to life due to voltage!
Immediate danger to life when touching live parts.

- ▷ *Work on electrical equipment must be performed by persons with the appropriate qualification.*
- ▷ *Only perform maintenance work on electric components when these are switched off, disconnected from the mains and potential-free.*
- ▷ *The yarn clearer system may be connected to the power supply system only when all front panels, plug-in boards and provided covers, especially on the central unit, are installed.*
- ▷ *The yarn clearer system may be operated only with the standard local line voltage/frequency and with a grounded protective ground contact.*

2.4.2 Unauthorized Modifications

WARNING

Risk of injuries and damage by unauthorized modification of the yarn clearer system!

- ▷ *Conversions or modifications of the yarn clearer system must be agreed with Loepfe.*

The manufacturer will not be liable for damaged caused by unauthorized modification of the yarn clearer system.

2.4.3 Electrostatic Charging

ATTENTION

Electronic components and assemblies (printed circuit boards) are endangered by electrostatic charges!
Possible damage when touching the components!

▷ *Hold assemblies only at the edge.*

▶ *Do NOT touch soldered connectors, pin contacts, printed circuits or electronic components.*

2.5 Safety Devices (Emergency-stop Button)

Yarn clearer system YarnMaster Zenit^{+} is integrated in a winding machine and has no additional safety devices.

For detailed information on the safety devices, e.g. emergency-stop button: See Instruction Manual of the winding machine.

3 Product Description

3.1 General

Yarn clearer system YarnMaster Zenit^{+} serves to clear yarn faults and foreign matter as well as quality monitoring in the winding shop. It is installed in winding machines from various manufacturers.

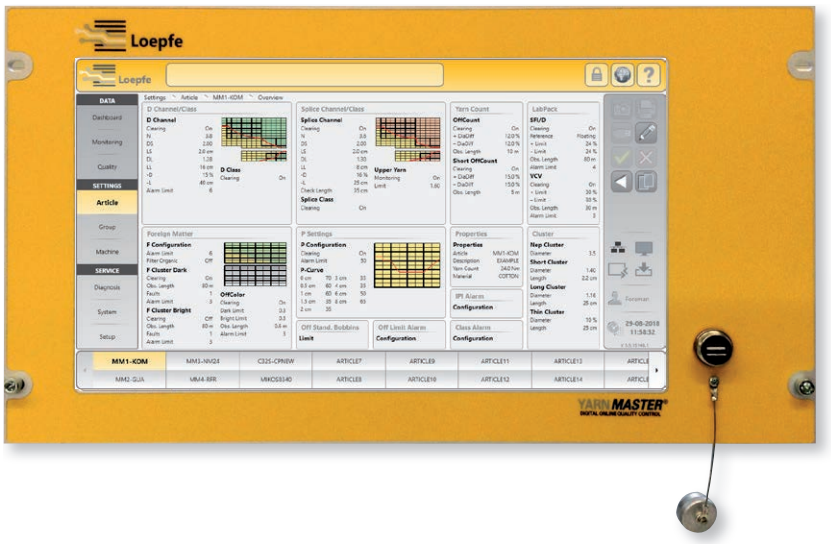
The collection of the yarn faults is based on the optical measuring principle.

3.2 Equipment Configuration

Yarn clearer system YarnMaster Zenit^{+} consists of the following components:

- Central unit LZE-V with control unit or
  Central unit LZE-V Faceless without control unit
- Sensing head TK YM ZENIT^{+} with integrated evaluation electronics (AE)
- Spindle adapter
- Clearer software

3.2.1 Central Unit LZE-V



Central unit LZE-V consists of the following components:

- Computer with or without control unit
- User interface (touchscreen 15.6 inches)
- USB port for data transfer
- Central unit software

Functions:

- Control and monitoring of yarn clearing
- Communication with sensing heads (transfer of clearer settings)
- Processing, logging and saving of operating and quality data

3.2.2 Spindle Adapter (SA)

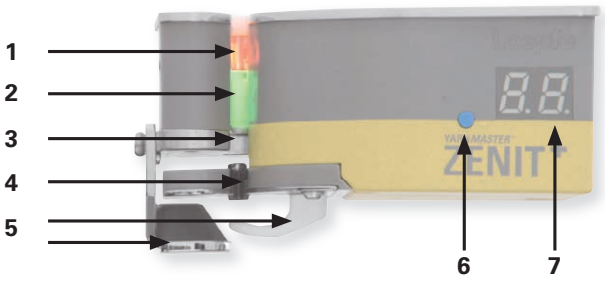
The spindle adapter is the interface between central unit, sensing heads and spindle for provision of the power supply of the sensing head and adaption of the connecting devices.

3.2.3 Sensing Head YM ZENIT+

The complete processing and evaluation of the yarn signal takes place in sensing head YM ZENIT+.

The sensing head consists of the following components:

- Sensors for the collection of yarn diameter and foreign matter
- Integrated evaluation electronics (AE)
- AE software



1 Optical element for scanning the yarn diameter
2 Optical element for scanning foreign matter
3 Cutting device (knife)
4 P sensor
5 Yarn hold-back device
6 Test button / Reset
- Cut –> short actuation
- Reset –> long actuation
- Cancel technical alarm –> long actuation

7 7-Segment display

Sensing Head Variants

TK YM ZENIT+ D	Collection of yarn faults
TK YM ZENIT+ DF	Collection of yarn faults and foreign matter
TK YM ZENIT+ DFP	Collection of yarn faults, foreign matter and synthetic foreign matter (PP, PE, etc.)

Existing DF sensing heads can be retrofitted by mounting the P sensor (Service Station).

Yarn Count Range

TK YM ZENIT+ D	Limit range, coarse:	Nm 4.0 – 10.0 / Nec 2.4 – 5.9
	Limit range, fine:	Nm 430 – 540 / Nec 255 – 320
TK YM ZENIT+ DF / TK YM ZENIT+ DFP		
	Limit range, coarse:	Nm 7.0 – 10.0 / Nec 4.1 – 5.9
	Limit range, fine:	Nm 430 – 540 / Nec 255 – 320

3.2.4 Sensing Head Display (7-Segment Display)

Flashing display indicates ALARM.
The set number of repetitions of the respective clearer channel was reached.

D Cuts (TK Display Mode: Channel)						
n.	S.	L.	t.			**Nep / Short / Long / Thin** with • class cut / without • channel cut
D Class Cuts (TK Display Mode: Class)						
n0.	n 1.	n2.	n3.	n4.		**D Classes N0 – N4** with • class cut / without • channel cut
A0.	A 1.	A2.	A3.	A4.		**D Classes A0 – A4** with • class cut / without • channel cut
b0.	b 1.	b2.	b3.	b4.		**D Classes B0 – B4** with • class cut / without • channel cut
C0.	C 1.	C2.	C3.	C4.	C°.	**D Classes C0 – C4, C00** with • class cut / without • channel cut
C.0	C. 1	C.2				**D Classes -C0 – -C2** Thin place: with • after C channel cut
C.0.	C. 1.	C.2.				**D Classes -C0 – -C2** Thin place: with • • class cut
d0.	d 1.	d2.	d3.	d4.	d°.	**D Classes D0 – D4, D00** with • class cut / without • channel cut
d.0	d. 1	d.2				**D Classes -D0 – -D2** Thin place: with • after d channel cut
d.0.	d. 1.	d.2.				**D Classes -D0 – -D2** Thin place: with • • class cut
E.						**D Classes E** with • class cut / without • channel cut
F.	F°.					**D Classes F, F00** with • class cut / without • channel cut
G.	G°.					**D Classes G, G00** with • class cut / without • channel cut
H0.	H 1.	H2.				**D Classes H0 –H2** with • class cut / without • channel cut
I 0.	I 1.	I 2.				**D Classes I0 –I2** with • class cut / without • channel cut
n -	S -	L -	t -			**Nep / Short / Long / Thin** unclassified cut

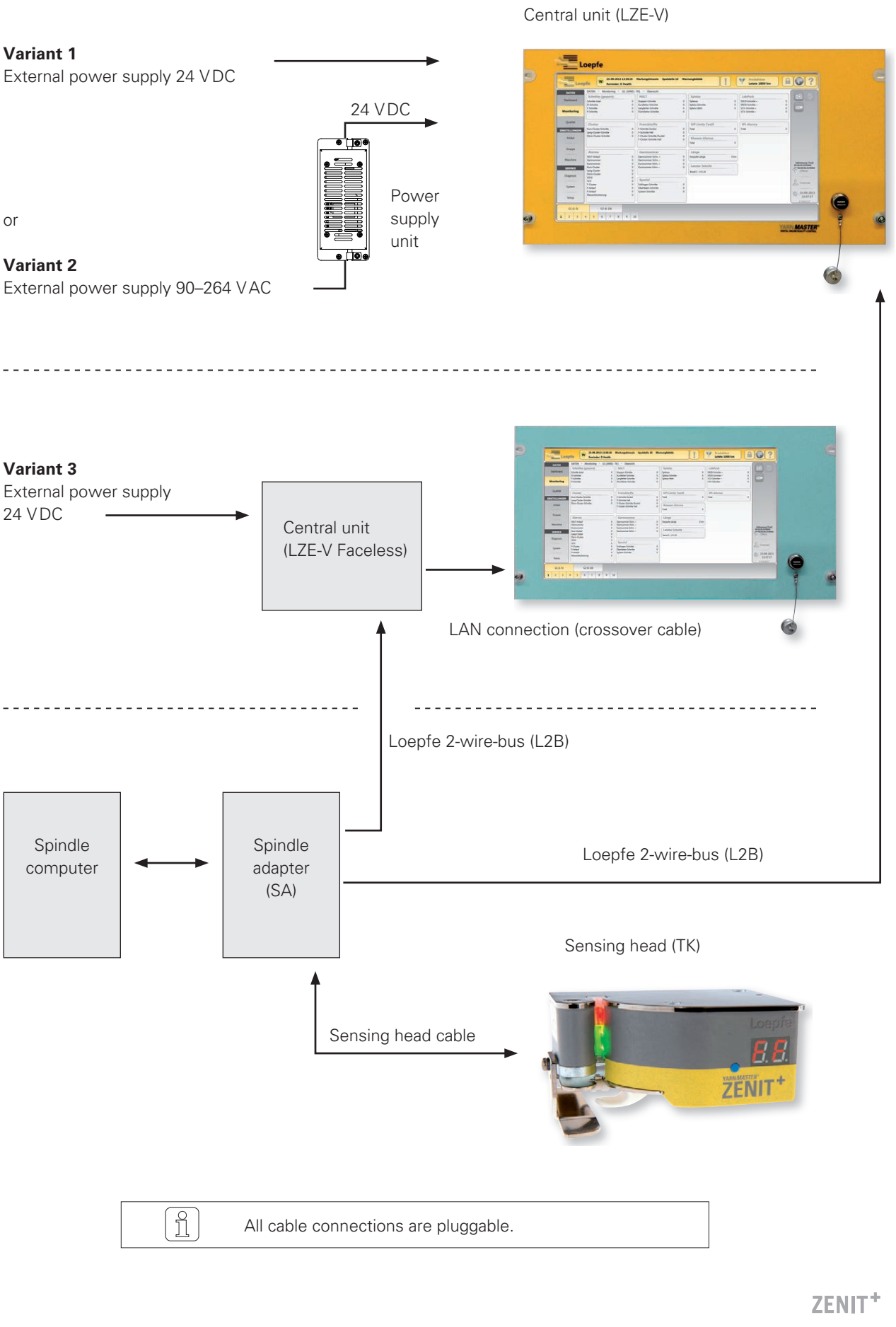
Splice Cuts						
						**Splice: Nep / Short / Long / Thin** with • class cut / without • channel cut
Cluster Cuts						
						**Nep- / Short- / Long- / Thin Cluster**
OffCount Cuts / Short OffCount Cuts						
						**Off Count + / –** with • minus / without • plus
						**Short Off Count + / –** with • minus / without • plus
SFI / D Cuts / VCV Cuts (LabPack)						
						**SFI / D +/ –** with • minus / without • plus
						**VCV +/ –** with • minus / without • plus
P Cuts						
						**Synthetic Foreign Matter**
						**P Classes P1 – P5**
						**P Classes o1 – o5**
						**P Classes L1 – L5**
						**P Classes y1 – y5**
Special Cuts						
						**Bunch**
						**Upper Yarn**
						**Drum Wrap Cut**
						**Drum Wrap Event**

F Cuts (TK Display Mode: Channel)						
FF.						**Foreign Matter** with • bright / without • dark
FC.						**F Cluster** with • bright / without • dark
OF						**OffColor** with • bright / without • dark
F Class Cuts (SIRO) (TK Display Mode: Class)						
S1.	S2.	S3.	S4.			**F Classes S1 – S4** with • bright / without • dark
I1.	I2.	I3.	I4.			**F Classes I1 – I4** with • bright / without • dark
r1.	r2.	r3.	r4.			**F Classes R1 – R4** with • bright / without • dark
O1.	O2.	O3.	O4.			**F Classes O1 – O4** with • bright / without • dark
System-Schnitte						
o0						**Cut by spindle**
o1						**Zeroing failed**
o2						**Cut by user** (Test/Reset button)
o3						**D brightness regulator out of limit**
o4						**F brightness regulator out of limit**
o5						**Adjust cut**
o6						**unklassCut failed** (Cut Monitoring)
o8						**Adjust failed**
o9						**Configuration changed by LZE**
oA						**Spindle power failure**
oC						**Run without clearing**

Yarn Count Difference						
- -	- -	- -				**Diameter difference** ≤ +/-10% > +10% > -10%
Textile Alarms						
CA						**Class Alarm**
OA						**Off Limit Alarm**
IA						**IPI Alarm**
Technical Alarms						
AL	0	alternating				**Technical Alarm**
AL	1	alternating				**Cutter supply or coil failure**
AL	2	alternating				**Internal power supply failure TK**
AL	3	alternating				**No NTP signal**
AL	4	alternating				**Knife blocked**
AL	6	alternating				**Zeroing failed**
AL	7	alternating				**Spindle cycle timeout**
System Info						
Ad						**Adjust active**
do						**Doffing**
PS						**Waiting for spindle communication**
PC						**Waiting for central unit parameters**

PA						**Spindle locked, group not started**
8.8.						**Reset**
. .						**Zeroing** (ECR)
UF						**Update TK Firmware**

3.3 Installation



All cable connections are pluggable.

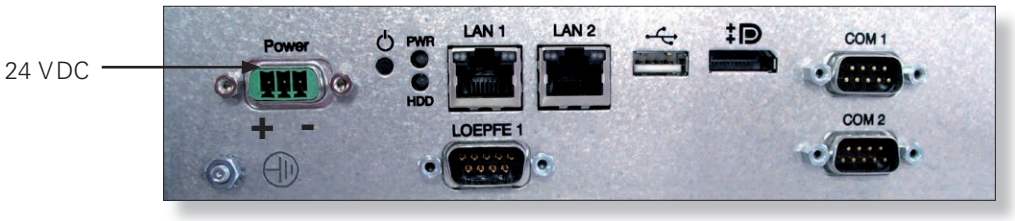
3.4 Connections LZE-V

3.4.1 Front

USB interface (USB port) for import / export of settings and data as well as screenshots.

A removable cap protects the USB interface from dust and humidity.

3.4.2 Rear



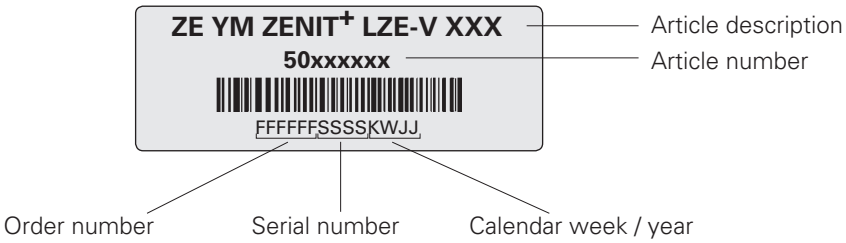
Marking	Type	Description
Power	Sub D PSC	Power supply 24 VDC Contact 1 (+) 24 VDC Contact 2 not connected Contact 3 (–) 0 VDC
		ATTENTION Only 24 VDC may be supplied to this connection!
⏚	Threaded connection	Protective ground
		DANGER This separate grounding point must be connected with the protective ground!
LOEPFE 1	Sub-D, 9-pole connector	Connection of Loepfe 2-wire bus (L2B)
PWR	LED green / red	Power supply OK
HDD	LED red	Compact-flash drive active

Marking	Type	Description		
⏻	Microswitch (Power ON/OFF)	LED green	Tap < 1 second	Switch to standby mode controlled by operating system (LED becomes orange)
		LED green	Press > 1 second	*Only in emergencies!* Forced, uncontrolled switch to standby mode (LED becomes orange)
		ⓘ	Unsaved data are lost!	
		LED orange	Tap < 1 second	Start (LED becomes green)
LAN 1	RJ45	Dedicated connection for LZE-V Faceless IP: 192.168.1.200 (Default)		
LAN 2	RJ45	Connection for network IP: DHCP (Default)		
⇄	USB 2.0	USB port		
‡D	Display port (HDMI)	DP, maximum resolution 1600 x 1200		
COM 1	Sub-D, 9-pole connector	RS 485		
COM 2	Sub-D, 9-pole connector	RS 232		

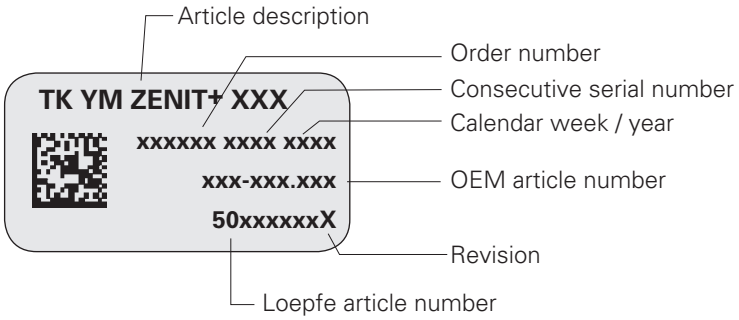
3.5 Identification of Components / Article Description

3.5.1 Type Plates

Central unit

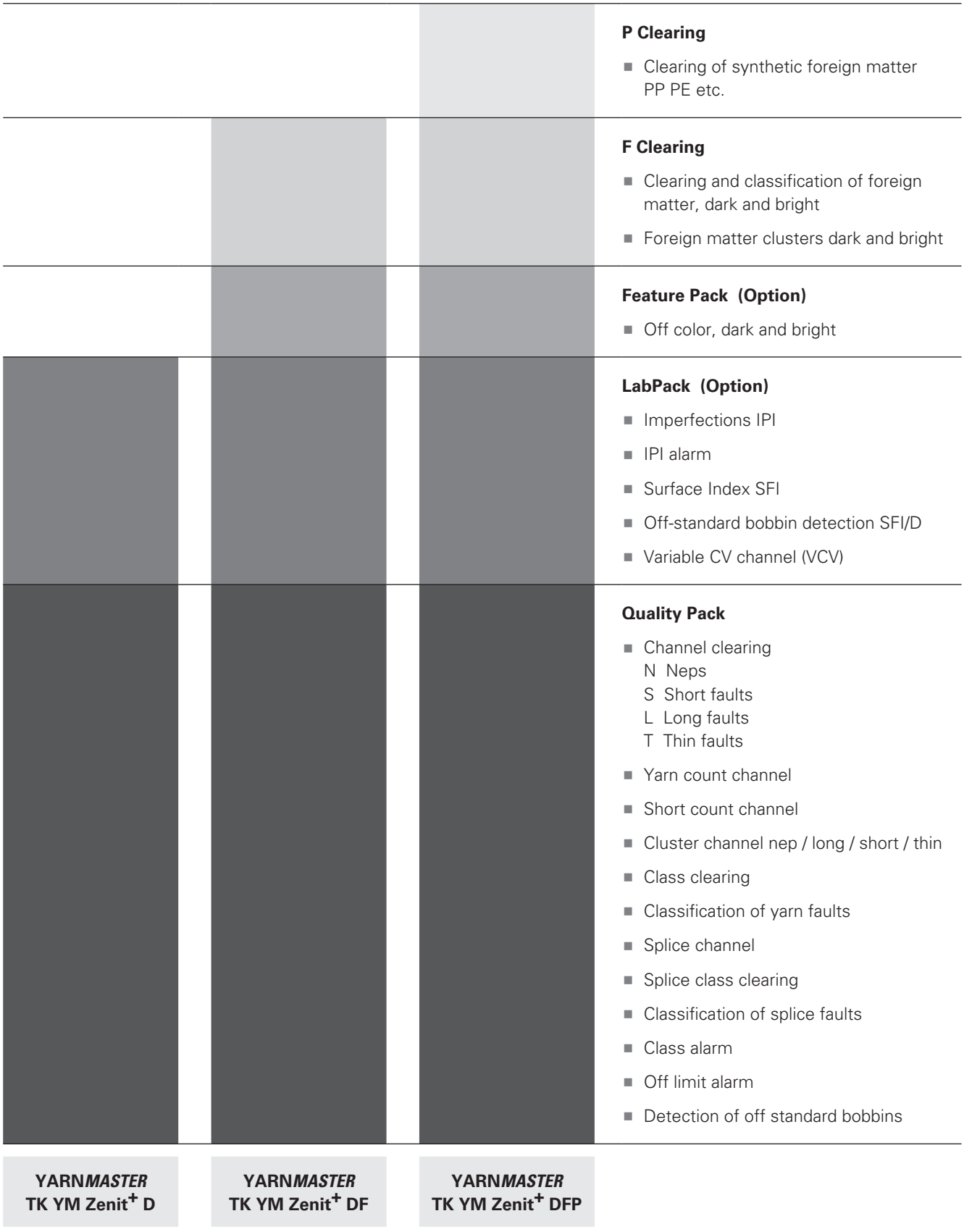


Sensing head



ⓘ State the data on the product type plates when ordering spare parts or when you require technical support.

3.6 Clearer Functions / Clearer Variants



4 Technical Data

System

Concept	Modular, integrated in winding machine / Components individually replaceable / Power supply by winding machine
Central unit	One central unit per machine with serial connection to sensing heads
Operation	Setting of all parameters via touchscreen
Operating temperature	+ 5° up to + 50° C (ambient temperature)
Storage temperature	0° C up to +60° C
Transport temperature	-25° C up to +70° C
Humidity	Up to max. 95% relative humidity, not condensing
Spindle adapter	Per spindle 1 spindle adapter, integrated in electronic box of spindle control
Sensing head	Per spindle 1 sensing head with integrated evaluation electronics
Application	For staple-spun yarns of natural, synthetic or metal fibers

Central Unit (LZE V)

ZE YM ZENIT^{+}	Color display with graphics capability, backlit, touch screen 15.6 inches	
Connection	Variant 2	90–264 VAC 50/60 Hz
	Variant 1 and 3	24 VDC +/- 10%
Max. power consumption	Typically 30 Watt	
Capacity of equipment	Up to 128 yarn clearers can be connected, depending on the machine type	
Articles	94 different article settings can be defined 5 predefined articles which cannot be changed	
Groups	Up to 30 groups can be defined	
Dimensions	Approx. 483 x 266 x 70 mm (W x H x D)	
Weight	Approx. 5.0 kg	
Printing	Printout via USB stick	

Spindle Adapter (SA)

Max. power consumption	5–8 Watt, depending on sensing head type
Winding speed	Up to 2200 m/min

Sensing Head (TK) **Yarn Count Range** (Optical Scanning Principle)

TK Type	**Limit range, coarse:**	**Limit range, fine**
TK YM ZENIT^{+} D	Nm 4.0 – 10.0 / Nec 2.4 – 5.9	Nm 430 – 540 / Nec 255 – 320
TK YM ZENIT^{+} DF	Nm 7.0 – 10.0 / Nec 4.1 – 5.9	Nm 430 – 540 / Nec 255 – 320
TK YM ZENIT^{+} DFP	Nm 7.0 – 10.0 / Nec 4.1 – 5.9	Nm 430 – 540 / Nec 255 – 320

Channel Clearing

Channel / Splice Channel				
N	Diameter limit for neps	1.5	to	7.0
DS	Diameter limit for short faults	1.1	to	4.0
LS	Limit for short fault length	1.0 cm	to	10 cm
DL	Diameter limit for long faults	1.04	to	2.0
LL	Limit for long fault length	6.0 cm	to	200 cm
–D	Limit of diameter decrease	-6%	to	-60%
– L	Limit for thin place length	6.0 cm	to	200 cm
Static Upper Yarn Collection				
UpY	Diameter limit	1.04	to	2.55

Clearing According to Classes

Fine Classification	
Thick places	152 thick place classes
Thin places	36 thin place classes
Splices	188 splice classes for short, long and thin faults
Foreign matter dark/bright	64 foreign matter classes each dark and bright
Coarse Classification	
Thick places	19 thick place classes
Thin places	4 thin place classes
Splices	23 splice classes universal for short, long and thin faults
Foreign matter dark/bright	16 foreign matter classes, each dark and bright
Online Fault Classification	
Per spindle and group with indication of cut and remaining faults of each class	

Clearing of Synthetic Foreign Matter

P Matrix			
Intensity of charge measurement	10	to	90
Signal length of faults	0	to	8.0

OffColor (Option)

Clearing of Dark and Bright Color Deviations			
Limit dark / limit bright	0.1	to	10
Observation length	0.2 m	to	50 m
Alarm limit	0	to	99

Yarn Monitoring

Yarn Count Channel				
Diameter deviation		±3%	to	±44%
Reference length		10 m	to	50 m
Short Count Channel				
Diameter deviation		±3%	to	±44%
Reference length		1 m	to	32 m
Cluster (Fault Accumulations)				
Diameter	Nep cluster	1.5	to	7.00
	Short cluster	1.10	to	4.00
	Long cluster	1.04	to	2.00
	Thin cluster	-6%	to	-60%
Length	Short cluster	1.0 cm	to	10 cm
	Long cluster	6 cm	to	200 cm
	Thin cluster	6 cm	to	200 cm
Observation length		1 m	to	80 m
Maximum fault number relative to the set observation length		1	to	9999
F Cluster (Accumulation of Foreign Matter)				
Detection according to 64 foreign matter classes, each dark and bright				
Observation length		1 m	to	80 m
Maximum fault number relative to the set observation length		1	to	9999
Off Standard Bobbins				
Detection of bobbins with frequent textile faults.				
Off Limit Alarm				
Observation of textile and non-textile events				
5 different alarm settings definable				
Class Alarm				
Observation of yarn fault classes				
Alarm settings definable for all yarn fault classes				
Trend				
Graphic representation of trend curve over a period of 72 hours				
5 different settings definable for group or spindle				

LabPack (Option)

Surface Index Channel (SFI/D)				
Moving or constant reference		5.0	to	25.0
Limits +/- (maximum deviation from reference value)		±5%	to	±40%
Alarm Limit		0	to	9
Check Length		10 / 80 m		
Automatic locking when reaching the alarm limit in the SFI/D channel				

Variable CV Channel (VCV)				
Limits +/- (maximum deviation from mean value)		±5%	to	±100%
Alarm Limit		0	to	9
Check Length		1 m	to	50 m
Automatic locking when reaching the alarm limit in the VCV channel				

Imperfections (IPI)					
Number of frequent yarn faults according to diameter limit per 1000 m					
Neps	Diameter limit		>1.80		
Thick	Diameter limit		>1.30	to	<1.80
Thin	Diameter limit		<0.8		
Number of frequent yarn faults according to diameter limit per m					
Small	Positive deviation:	Diameter limit	1.20	to	1.30
	Negative deviation:	Diameter limit	0.83	to	0.8
Number of frequent yarn faults according to length limit per 1000 m					
4 yarn fault classes in the range			2 cm	to	70 cm
Positive and negative deviation with diameter limits			>1.30	or	<0.80

IPI Alarm
Observation of IPI diameter and IPI length
8 different alarm settings definable for group or spindle

Data Selection Filter

Production	First ... km:	Cut data of the first (100 / 1000 km)
	Last ... km:	Cut data of the last (100 / 1000 km)
	Cone:	Group view: Progress window of selected length Spindle view: When length is reached, data are deleted
Current Shift	Cut data / quality data absolute, per 100 km or per kg	
Previous Shift	Cut data / quality data of previous 5 shifts per 100 km or per kg	

Installation Monitoring

Function alarms	
	Automatic alarm when functions of central unit are incorrect
	Automatic alarm when SA and TK are defective or not functioning correctly

5 Transport, Storage

5.1 Transport

For transport to the "first destination", the equipment parts are packaged according to the expected transport and storage conditions.

For further transport or a possible return, the equipment parts must be packed so that they are protected from mechanical damage and humidity.

The packaging of circuit boards must be such that they are protected from physical damage, electrostatic discharge and absorption of humidity (ESD packaging).

5.2 Incoming Inspection

The consignment must be checked for completeness and transport damage after receipt.

If transport damage is detected during the incoming inspection, proceed as follows:

- Inform the delivery agent (carrier, etc.)
- Create a damage report
- Inform the supplier

Claims for damages must be made within the applicable time limits.

5.3 Storage Conditions

A storage temperature between 0° C und +60° C must be maintained.

The equipment parts must be protected against the influence of humidity.

The equipment parts must be stored indoors, protected against dirt and dust.

Storage outdoors or in a humid environment can cause corrosion or other damage for which we will not be liable.

6 Start-up

6.1 Safety

CAUTION

Danger from improper assembly and putting into operation! Assembly and start-up require trained specialist personnel with adequate experience.

▷ *Assembly and start-up of the yarn clearer system or individual equipment parts as well as upgrades must be performed by an authorized service technician.*

6.2 Assembly and Initial Start-up

Loepfe Brothers Ltd. are responsible for the initial start-up of the yarn clearer system.

The yarn clearer system is handed over to the customer ready for operation.

Assembly and initial start-up are performed by an authorized service technician of the winding machine manufacturer or a service technician of Loepfe Brothers Ltd.

Training and instruction will be provided by a technician from Loepfe Brothers Ltd. after assembly and putting into operation by the winding machine manufacturer.

6.3 Restart after an Upgrade or Software Update

To ensure safe operation of the yarn clearer system, all upgrades and software updates must be performed by an authorized service technician from Loepfe Brothers Ltd.

6.4 Restart after Interruption of Operation

A warm start is performed when operation has been interrupted (e.g. after a power failure).

All settings and shift data except the last cut data which have not yet been sent to the LZE are maintained.

7 Operation of LZE-V

7.1 General

The YM Zenit^{+} yarn clearer system is controlled for all winding machine types via central unit LZE-V.

Machine-specific differences in operation or in the settings are possible and have been stated accordingly in the instructions.

All clearer functions are described in this Instruction Manual.

Individual functions are not available depending on the clearer components installed and the software options.

> The screenshots in this Manual serve for illustration. They are not to be used as examples for setting.

7.2 Safety

7.2.1 General

Prior to any work, the personnel must have thoroughly read and understood this Instruction Manual and, in particular, the "Safety" chapter.

7.2.2 Personnel

This yarn clearing equipment must only be operated by qualified and authorized personnel.

Authorized persons: see chapter "2.2 Requirements for Personnel".

> If anything is not clear, contact the supplier for your own safety.

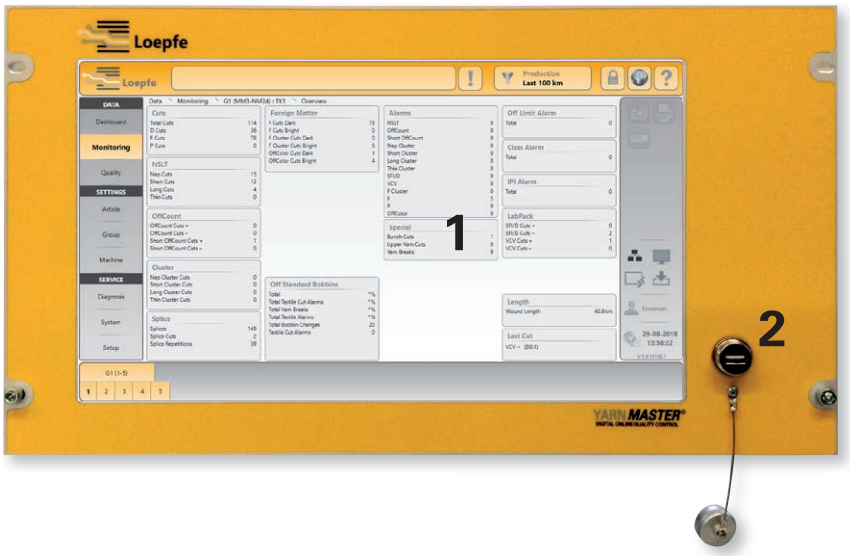
7.2.3 Intended Operation

CAUTION

Risk of injuries and damage if the equipment is not operated as intended!
If the equipment is not operated as intended, this could result in overheating, fire, contamination or electrical noise.

▷ *Only operate the yarn clearer system with the covers installed.*

7.3 Central Unit LZE-V



1 User interface

2 USB interface

7.3.1 Monitor

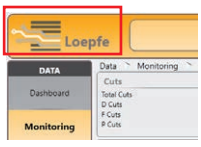
Operation/entry is performed by applying light pressure on the touch-sensitive screen (touch-screen) of the monitor.

> **!** ***ATTENTION!***
> Risk of damage by incorrect handling of surface!
>
> ▷ *Operation by tapping with the finger or a blunt, non-metal object (e.g. tablet pen)*
>
> ▷ *Clean monitor with a soft cloth*
>
> ▷ *Remove severe contamination with a moist cloth.*
>
> ▶ *Do NOT use a pointed, metallic object as this could damage the monitor surface!*
>
> ▶ *Do NOT clean monitor with aggressive cleaners!*

7.3.2 USB Interface

USB interface for import / export of settings and data; and for screenshots. A removable cap protects the USB interface from dust and humidity.

7.3.3 LZE-V without Control Unit (Savio Polar)



1

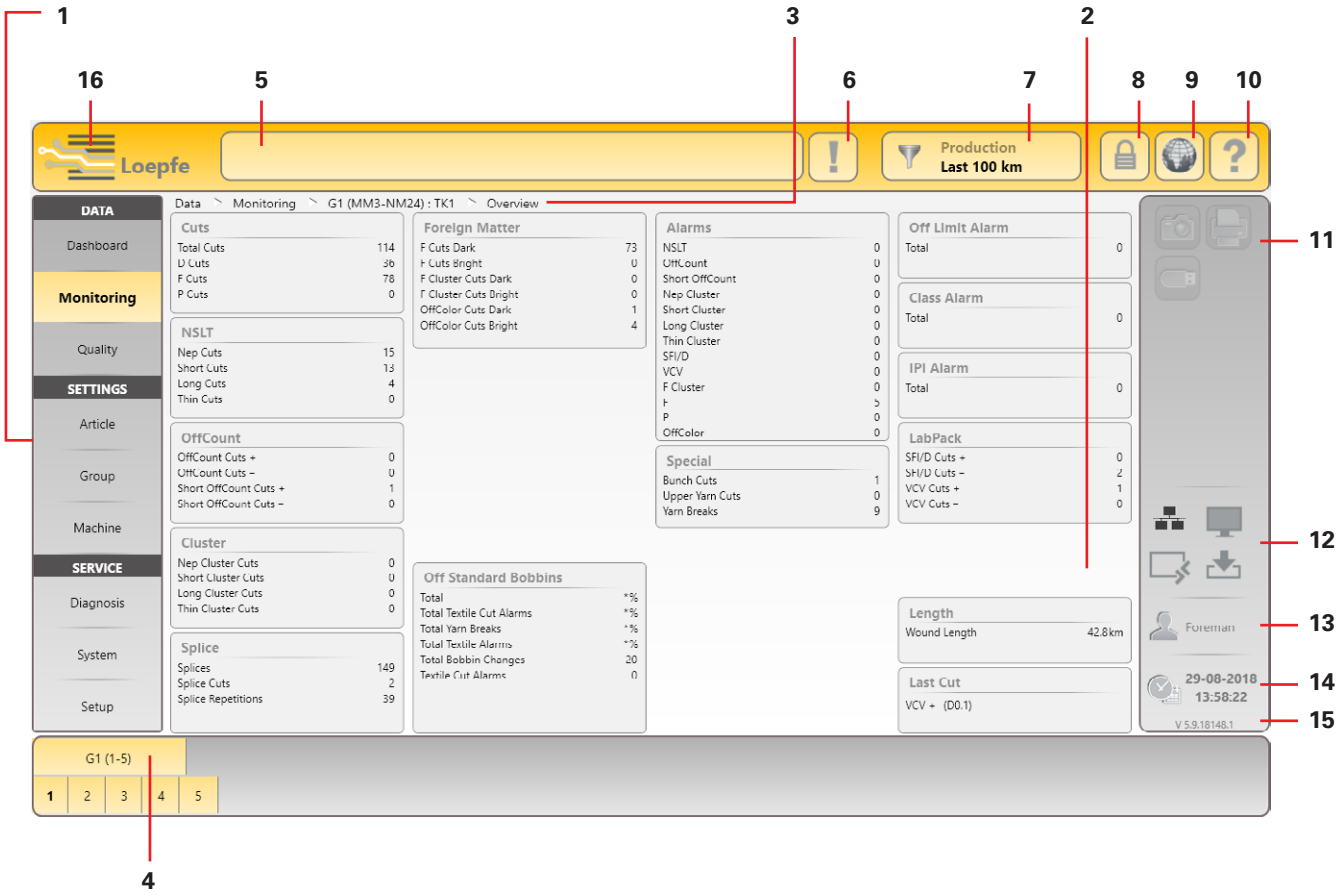
2

The yarn clearer system Zenit^{+} does not have a separate control unit. The clearer is operated via the touch panel of the winding machine.

1 Switch between Loepfe clearer operation and Savio machine operation by tapping the Loepfe logo in the top left corner.

2 Separate Loepfe USB interface on the winding machine.

7.4 User Interface / Navigation



1 Main navigation

2 Menu contents (list, overview, details)

3 Navigation path

4 Selection bar for group/spindle or article

5 Message window

6 Messages requiring intervention

7 Data selection filter (Dashboard, Monitoring and Quality menus)

8 Login / access level

9 Language selection

10 Online help

11 Action buttons / function buttons

12 Connection status (Ethernet / MillMaster TOP / Remote / Data Exist)

13 Active user level / logged on user

14 Date / time

15 Software version

16 Switch-over Loepfe / Savio GUI (only LZE-V Faceless)

7.4.1 Menu Overview

DATA

Dashboard	**Overview** >	**Detailed view**	
	Alarms	✓ Monitoring Overview	
	Cuts	✓ Monitoring Overview	
	Trend	✓ Quality > Trend	
	Off Limits	✓ Monitoring Overview	
Monitoring	**Overview** >	**Detailed view**	
	Cuts NSLT OffCount Cluster Splice Foreign Matter Synth. Foreign Matter Special Off Standard Bobbins Alarms Off Limit Alarm Class Alarm IPI Alarm LabPack Length	✓ Chart	
	Last Cut	✓ > Diagnosis	
Quality	**Overview** >	**Detailed view** >	**Online Help**
	D Class F Class Splice Class P Class	✓ Class Window ✓ Class Window ✓ Class Window ✓ Class Window	Examples for faults of the respective class and information about possible causes
	LabPack IPI LabPack SFI Length Trend	✓ Chart ✓ Chart ✓ Chart ✓ Chart	
	Last Cut	✓ > Diagnosis	

SETTINGS

Article	**List** (Article Administration) >>	**Overview** (Clearer Parameters) >	**Detailed view**
		D Channel / Class	✓
		Splice Channel / Class	✓
		Foreign Matter	✓
		Cluster	✓
		Yarn Count	✓
		Properties	✓
		P Settings	✓
		LabPack	✓
		Off Standard Bobbins	✓
		Off Limit Alarm	✓
		Class Alarm	✓
		IPI Alarm	✓

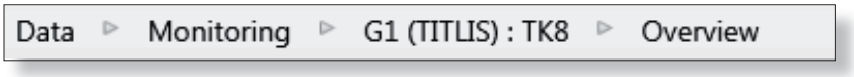
Group	**List** (Group Administration) >>	**Overview** (Group Parameters) Settings Group Settings Optional Data Acquisition Reset Data IPI Correction Factors	
Machine	**Overview** >> Shift Calendar Base Settings Default Group Settings Default Data Acquisition	**Detailed view** ✓ ✓ ✓ ✓	

SERVICE

Diagnosis	**Overview** >	**Details** >	**Chart / Input**
	TK Information	✓	✓ Chart
	TK Parameter	✓	✓ Chart / Service PW
	Last Cut	✓	–
	Event (History)	✓	–
	Test Mode	✓	✓ Input (Foreman password)
	TK Commands	✓	✓ Input (Service password)
	User Activity	List User Activity	–
System	**Overview** >	**Details**	**Input**
	System Information	✓	–
	Log Profile	✓	✓ (Service password)
	Firmware Update	✓	✓ (Foreman password)
	Software Update LZE	(Service password)	✓
	System Backup	(Foreman password)	✓
	System Restore	(Service password)	✓
	Maintenance / Service	✓	✓ (Service password)
Setup	**Overview** >	**Details**	**Input**
	Network	✓	✓ (Service password)
	Software Options	✓	✓ (Foreman password)
	Reports	✓	✓ (Foreman password)
	User Management	✓	✓ (Foreman password)
	Factory Reset	✓	✓ (Service password)
	Restart	(Foreman password)	–
	Date and Time	✓	✓ (Foreman password)
	Alarm Message Settings	✓	✓ (Foreman password)

7.4.2 Navigation Path

Main menu > Menu > Group (Article): Spindle

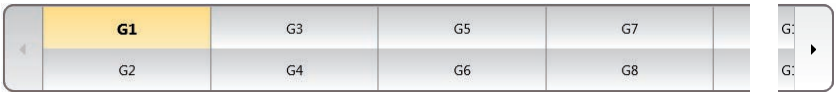


Overview of monitoring data: Group 1 (Article "TITLIS"): Spindle 8

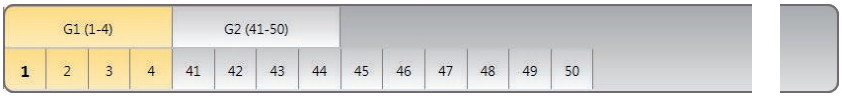
Main menu > Menu > Article

Overview of article settings for article "TITLIS"

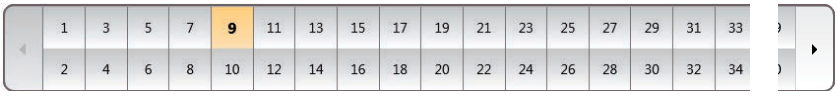
7.4.3 Selection Bar for Group / Spindle or Article



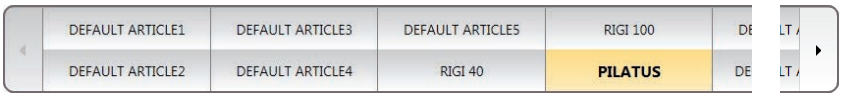
Selected: Group 1 (Settings > Group)



Selected: Group 1 / Spindle 1 (Data)



Selected: Spindle 9 (Service > Diagnosis)



Selected: Article "Pilatus" (Settings > Article)

7.4.4 Data Selection Filter

The cut data are displayed according to the selected option (e.g., Production / Last 100 km).

7.4.5 Function Buttons


Language selection


Login / access level


Online help


List of messages requiring intervention


Create screenshot / save on USB stick


Create reports / save on USB stick


Data export / import


Back


Next


Edit settings


Confirm selection / input


Cancel selection / input


Undo input


Copy article


Start lot / group


Stop lot / group


Adjust
(groups/spindles in production)


Reset monitoring data / quality data


Change password


Logout / user logout


Add user


Delete user


Acknowledge last message


Acknowledge all messages


Firmware Update


Input information

7.4.6 Other Symbols



Connection status
Ethernet On/Off



Connection status
MillMaster TOP On/Off



Connection status
Remote On/Off



Connection status
Data Exist On/Off


Current user level


Date / time

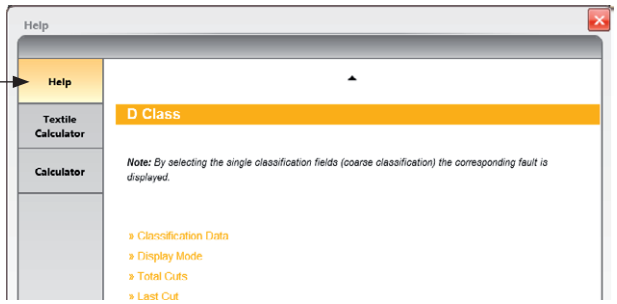
7.5 Language Selection

The desired operator language can be selected.

7.6 Online Help

Help

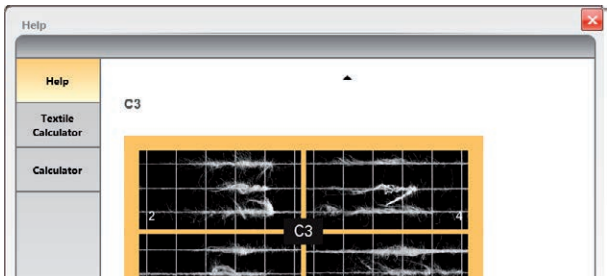
Clicking the Help button displays the Help window with information on the current menu window.



Click the Help button to return to the start of the page.

E.g., menu: Data > Quality > D Class

Tapping a coarse class field displays fault examples with information on the cause of the fault. Fault examples: Combed cotton, 30 Nec.



Textile Calculator

An online calculator is available to help converting the yarn counts.

Calculator

A typical calculator is also available.

7.7 Login / Access Level

7.7.1 Password Level

The access privileges of the users are defined.

The following four password levels exist:

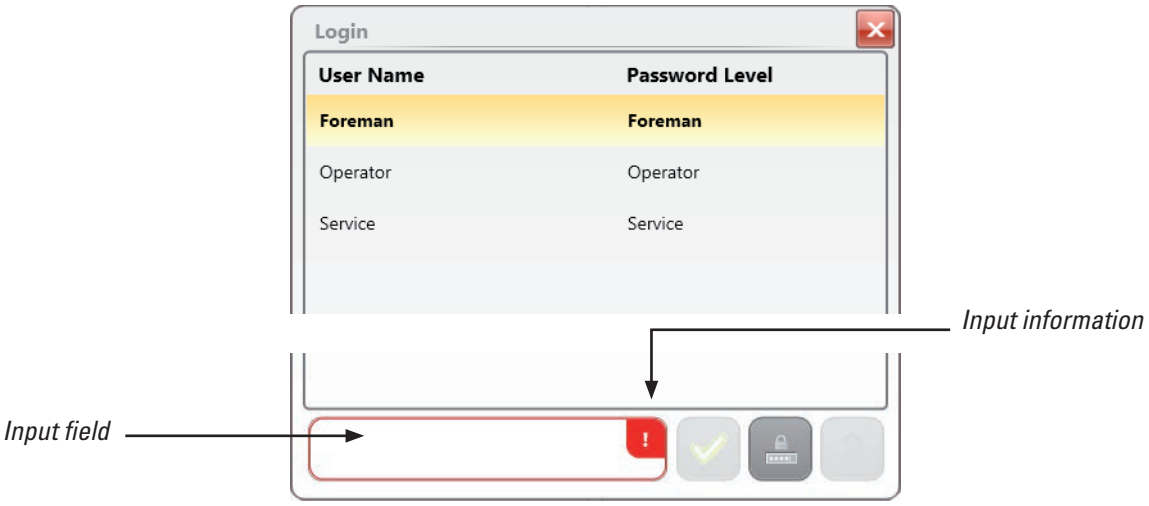
- Operator
- Foreman
- Service (only for Loepfe service personnel)

A password is not required for user "Guest".

7.7.2 User

Users "Foreman", "Operator" and "Service" have been defined by default. Other users (max. 88) can be determined in menu Setup > User Administration.

7.7.3 Login



1. Select user.
2. Tap input field.
3. Enter appropriate password on the keypad and confirm with  .
4. When the Password ******** is correct, confirm with  .

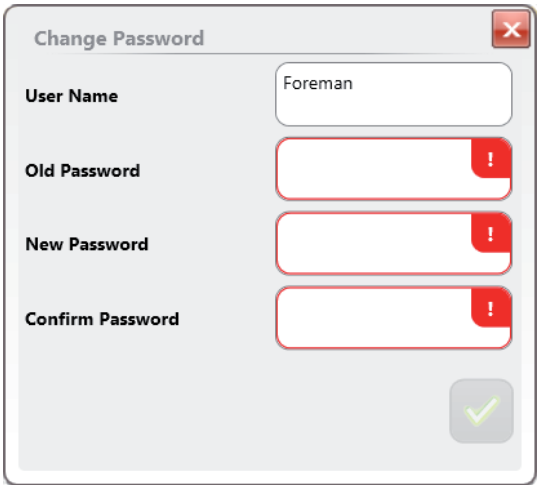
7.7.4 Logout

The access privileges are reset to "Guest".

7.7.5 Change Password

During the startup, the operator password is "**47114711**", the foreman password is "**12911291**".

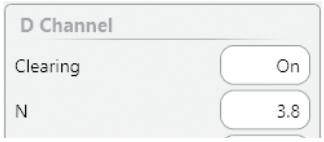
> It is recommended to change these passwords after startup and in regular intervals!



7.8 Edit Settings

To edit settings, the input mode / edit mode must be activated (password level Foreman).

The input fields are now active.



Tap the settings individually and edit them using the keypad or selection lists.

Return to the overview with the Back button to change more settings or to save the changed settings.

Confirm / save changed settings

Discard changed settings

Numeric / Alphanumeric Keypad

Confirm input

Undo input

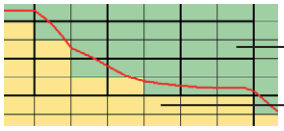
Selection Lists

Function is activated

Function is not activated

Class Matrix

Tapping the class fields (D class, F class, Splice class) activates or deactivates class clearing for these fields.



Clearing is active

Clearing is not active

7.9 Save Data

Screenshots, reports and data can be copied to a USB stick via the USB port.

The respective function buttons become active when the USB stick is inserted.

> **ATTENTION**
>
> *Make sure that the USB stick is free from viruses! LOEPFE assumes no liability for possible damage on the system (loss of data etc.,) which could be caused by viruses!*

7.9.1 Screenshots

A screenshot of selected window is saved as XPS file on the USB stick.

7.9.2 Reports

The following reports can be created and saved as XPS files on a USB stick:

- DATA menus

Depending on the data selection filter:

  - Completed Shift Report
  - Intermediate Shift Report

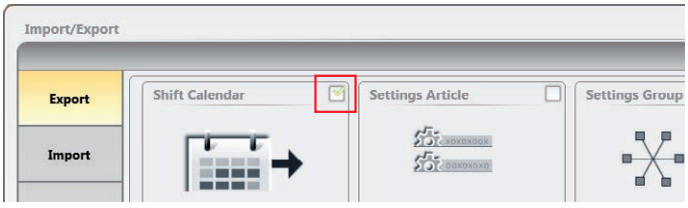
- SERVICE menus
  - Configuration report

7.9.3 Data Export / Import

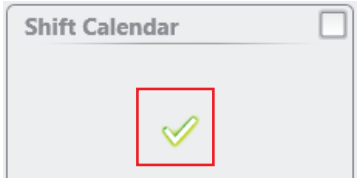
Export

The data selected can be saved / exported on a USB stick.

1. Select the data format (JSON, **XML**, CSV).
2. Select the required data and confirm with  .



3. Wait for acknowledgment.

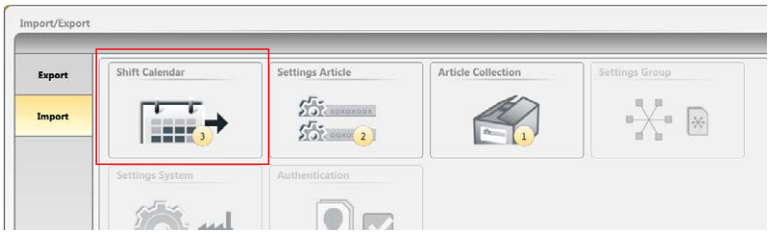


4. Quit Import / Export with  .

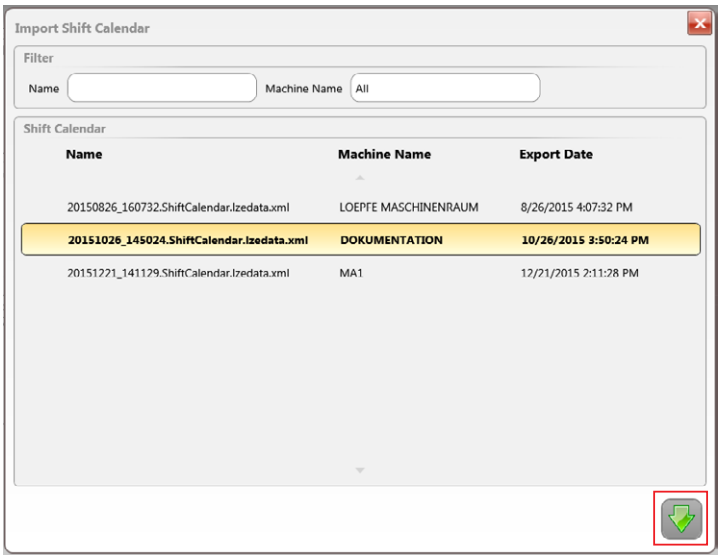
> ***ATTENTION:***
> *Files with the same name on the USB stick are overwritten without any further confirmation prompt!*

Import

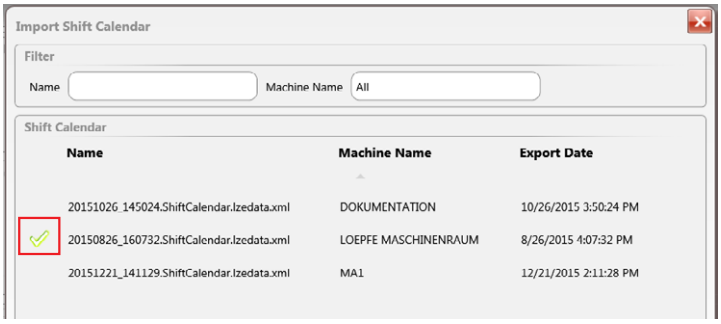
The data selected in the list can be imported from the USB stick to the central unit.



1. Select the required data and import with  .



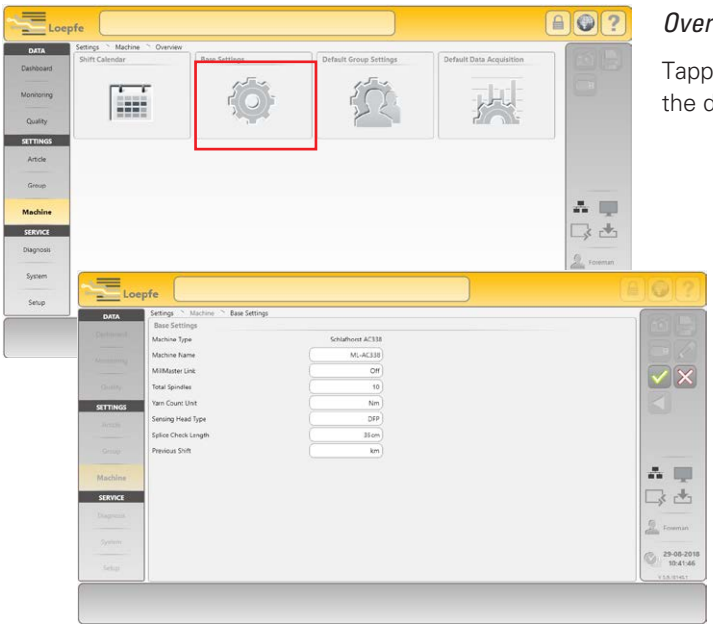
2. Wait for acknowledgment.



3. Quit Import / Export with  .

7.10 Settings > Machine

Machine Menu Level



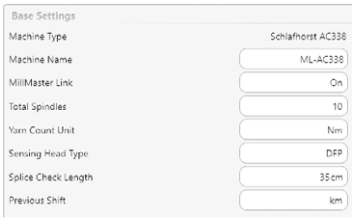
Overview

Tapping a settings block (e.g., Base Settings) opens the detailed view.

Detailed View / Edit Window

The settings can be edited.

7.10.1 Base Settings



The yarn clearer system is configured with these settings.

Machine Type

The machine type is displayed.

Machine Name

A machine name can be entered (max. 20 characters).

MillMaster Link

The MillMaster link can be switched on or off.

Total Spindles

The total number of spindles of the machine can be entered.

Yarn Count Unit

The desired yarn count unit must be selected (Nm, Ne, Tex, Den).

Sensing Head Type

The installed sensing head type must be selected (D, DF, DFP).

Splice Check Length

The desired splice check length can be entered.

Previous Shift

Selection is possible per 100 km or per kg.

7.10.2 Default Group Settings

Base settings for all groups in the "Defined" status.

Drum Pulse Length

The standard value is entered automatically based on the machine type (Base Settings).

Reduction Fine Adjust

Many cuts can be registered after an adjust with very sensitive settings in the yarn count channel or cluster channel. To avoid these cuts, the sensitivity can be reduced as required, i.e., the diameter limit value can be increased by the selected value.

- The reduction is automatically canceled at every spindle after approx. 12 km of wound yarn.
- With setting Off, the yarn count channel as well as the cluster channel are switched off for the first approx. 12 km.
- If a spindle adjust is performed on a spindle, this change of sensitivity is also active for approx. 12 km.

Reduction Cone Change

During a cone change, the limit values for long fault length (LL) and thin place length (–L) are set to 2 m. The diameter limit values for long faults (DL) and diameter reduction (–D) are then less sensitive according to the set reduction. When reduction is switched off (OFF), the long fault channel and the thin place channel are switched off for the first 12 m.

Yarn number channel and foreign matter clearing are not active for the first 10 m after every cone change, independent from the set reduction.

Bunch Monitoring

Bunch monitoring can be switched on or off.

Threshold Static Yarn Signal

Response threshold for static yarn signal.

Threshold Dynamic Yarn Signal

Response threshold for dynamic yarn signal.

Fine Adjust Mode

Fine adjust mode can be selected (individually / continuously).

Suction after Adjust

Suctioning off 25 m after adjustment can be switched on or off.

TK Display Mode

The TK Display Mode can be selected (class / cut type).

Drift Limit Fine Adjust Continuous

Input of allowed min. drift difference during the continuous fine adjust mode can be switched off or activated with the selected value.

Drum Wrap Detection Mode

The drum wrap detection mode can be selected (Off / Event only / Cut).

Dust Compensation Speed

The speed of the dust compensation can be selected (Normal / Medium / High).

Repetitive Splice Removal

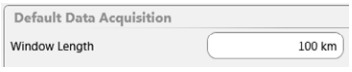
The splice removal repetition can be switched on or off.

F Clearing during Splice

F clearing during the splice check can be switched on or off.

7.10.3 Default Data Acquisition

Window length (100 km / 1000 km) for all groups in the "Defined" status.



The standard settings of the groups and the default window length can be subsequently adapted per group (Group menu).

7.10.4 Shift Calendar

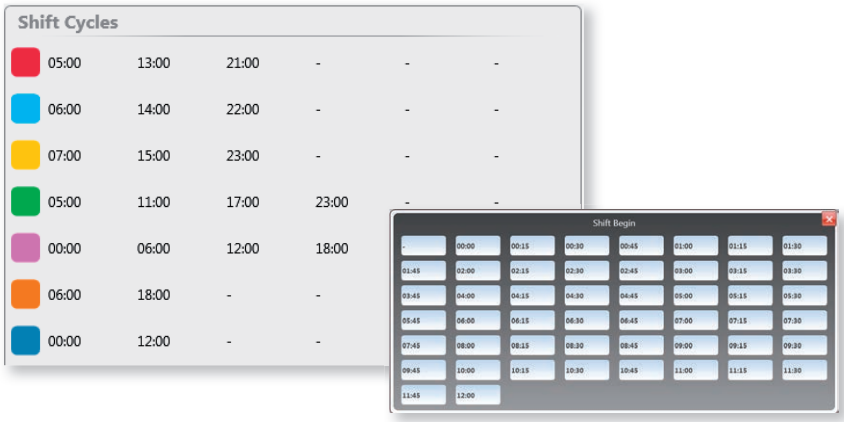
The begin of the individual shifts per weekday (max. 6 shifts per day) is defined in the Shift calendar.

> When a MillMaster System is connected, the shift calendar can be determined only there.

Shift Cycles

A maximum of 7 different shift cycles can be predefined:

- Tap the start date of a shift and replace with the desired date from the selection list.

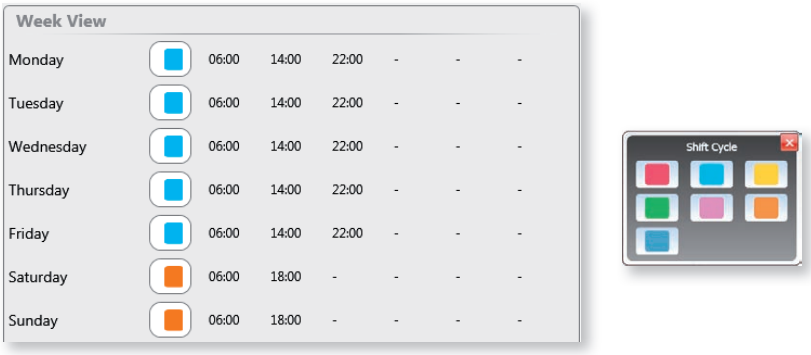


Week View

A predefined shift cycle can be assigned to every weekday:

- Tap the color field of the weekday and replace it with the color field of the desired shift cycle.

> Max. shift cycle 12 hours!



7.11 Article Administration

Settings > Article

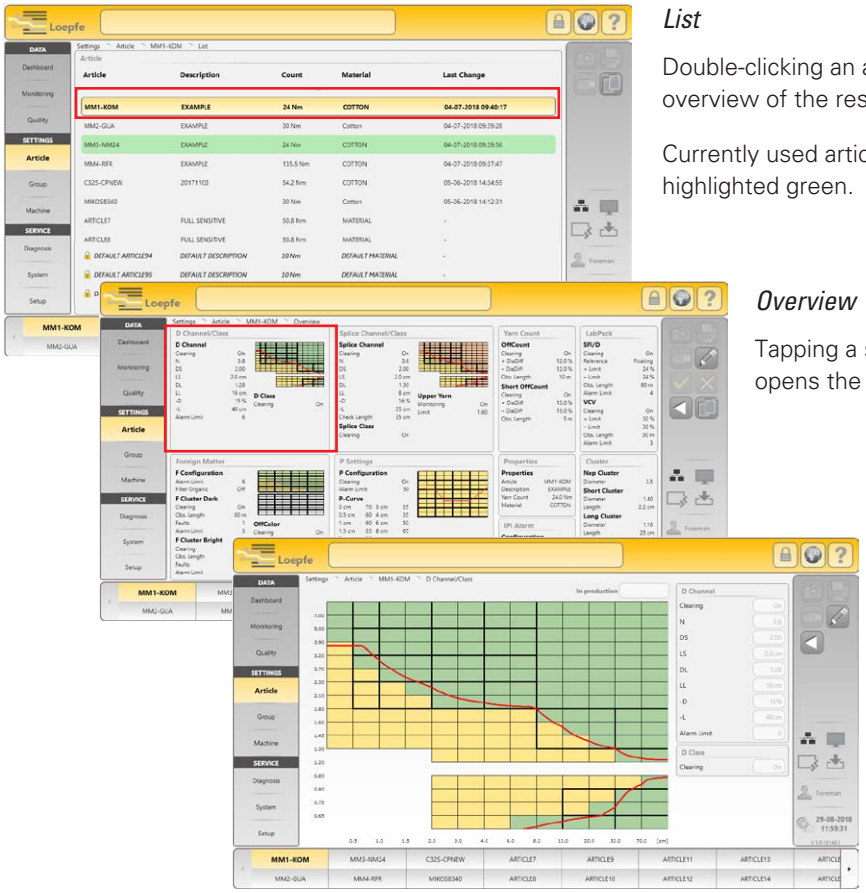
7.11.1 General

An article with assigned clearer and quality parameters determines how the yarn is to be cleared and which quality is to be guaranteed.

99 articles with the assigned clearer settings can be managed.

The articles marked are articles predefined in the factory. They can not be changed, they can only be used as templates.

Menu Level Article



List

Double-clicking an article in the list opens the overview of the respective clearer parameters.

Currently used articles (group in production) are highlighted green.

Overview

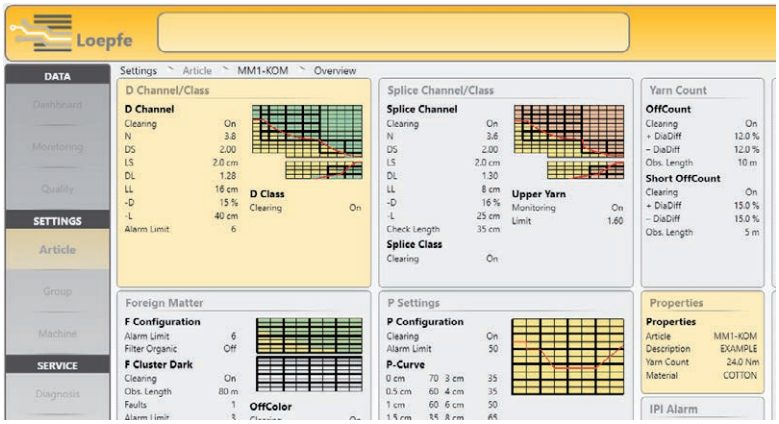
Tapping a settings block (e.g., D Channel/Class) opens the detailed view.

Detailed View / Edit Window

The settings can be edited.

7.11.2 Create / Change Article

1. Select the article.
2. Activate the Edit mode.
3. Change settings and confirm.
4. Return to the overview  .
5. Repeat this action until all setting blocks have been defined.
   - All changed setting blocks are highlighted yellow in the overview.



6. Save changed article  or discard changes  .

7. Select save mode:
   - Overwrite currently selected article.
   - or assign the changed settings to another article (assign new article name, if necessary).
8. Confirm changes.

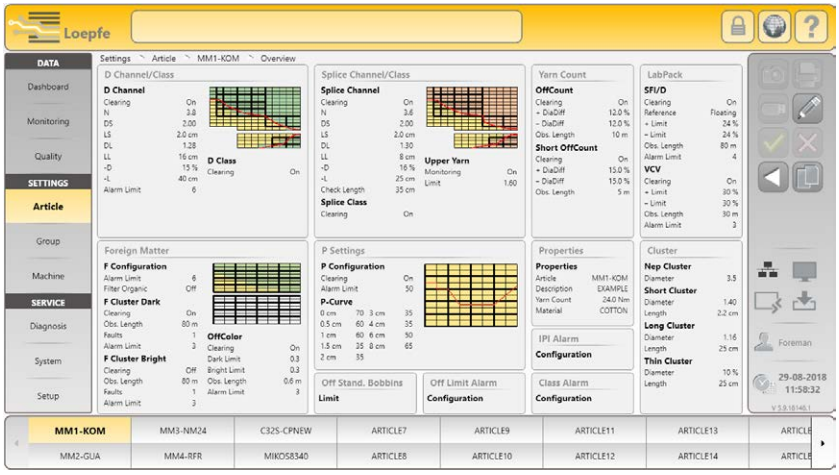
On principle, clearer settings can also be changed for groups in production.
Production continues with the changed settings! Monitoring and quality data are reset.

7.11.3 Copy Article

1. Select an article (e.g., CO NE40 TOP9).
2. Clicking the Copy button opens the Copy window.

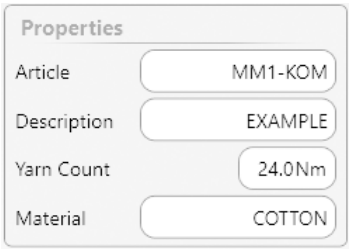
3. Select the target article (existing settings are overwritten during copying).
4. Enter new article name (e.g. DOM) if required.
5. Confirm inputs with  .

7.12 Settings > Article



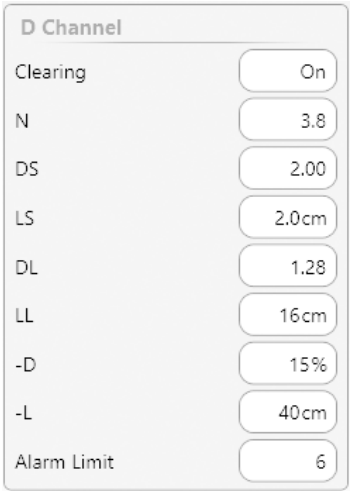
7.12.1 Properties

The article properties are defined with these settings.



Article	Name of article	(max. 20 characters)
Description	Description of article	(max. 20 characters)
Yarn Count	Yarn count of article	
Material	Material of article	(max. 20 characters)

7.12.2 D Channel / Class



D Channel

The limit values for D yarn clearing (clearing curve) are determined by setting the clearer channels.

Clearing

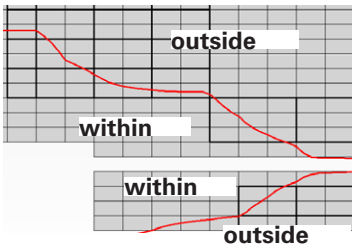
Clearing can be switched on or off.

N	=	Diameter limit value for neps
DS	=	Diameter limit value for short faults
LS	=	Limit value for short fault length
DL	=	Diameter limit values for long faults and double threads
LL	=	Limit value for long fault length
-D	=	Limit value of diameter reduction for thin places
-L	=	Limit value for thin place length

All diameter limit values refer to the normal thread diameter (basis).

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting.
The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.



Clearing Curve

The displayed clearing curve (red) is defined by the setting of the clearer channels. Yarn faults **outside** this curve are cut and yarn irregularities **within** the curve remain in the yarn.

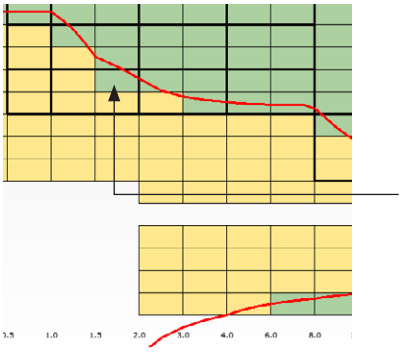
D Class

Clearing

Clearing can be switched on or off.

Clearing according to classes allows for the creation of completely optional clearer characteristics. This is advantageous, especially for fancy yarns or core yarns.

It is recommended to use class clearing in combination with conventional clearing. Better results are achieved thereby when short and long faults occur at the same time.

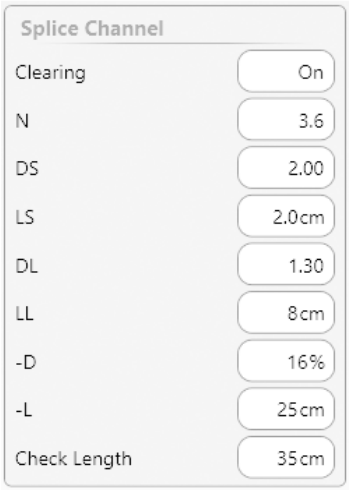


- Green class fields = class clearing active
- Yellow class fields = class clearing not active

For clearing according to classes, specific faults can also be cut **within** the clearer curve.

The class settings (green) are not active during the splice check.

7.12.3 Splice Channel / Class



Splice Channel

The limit values for D yarn clearing (clearing curve) are determined by setting the splice clearer channels for every spindle start according to the set splice control length.

Clearing

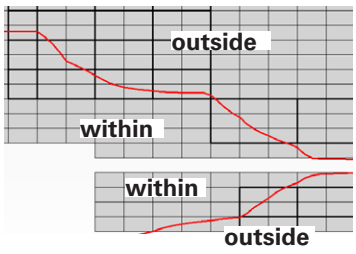
Clearing can be switched on or off.

N	=	Diameter limit value for neps
DS	=	Diameter limit value for short faults
LS	=	Limit value for short fault length
DL	=	Diameter limit values for long faults and double threads
LL	=	Limit value for long fault length
-D	=	Limit value of diameter reduction for thin places
-L	=	Limit value for thin place length

All diameter limit values refer to the normal thread diameter (basis).

Check Length

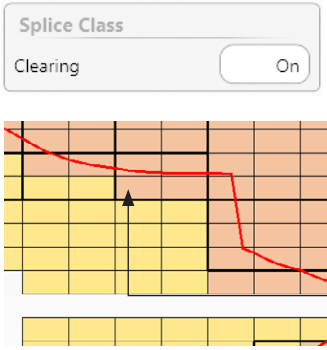
Yarn length with which the splice check is performed after a cut or after a restart. The splice check length is automatically set to 25 cm. It can be changed to 1–120 cm as required.



Splice Clearing Curve

The displayed splice clearing curve (red) is defined by the setting of the clearer channels. Yarn faults **outside** this curve are cut and yarn irregularities **within** the curve remain in the yarn.

Splice Class



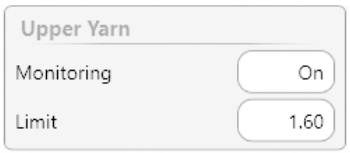
Clearing

Clearing can be switched on or off.

The splice detection settings are active during every spindle start according to the splice control length set.

- Pink class fields = splice class clearing is active
- Yellow class fields = splice class clearing is not active

Splices in the activated class fields **within** the splice curve are also cut.



Upper Yarn

Monitoring

Upper yarn detection can be switched on or off.

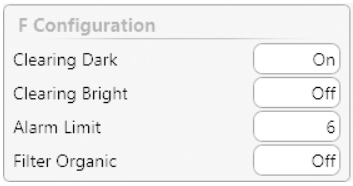
Limit

In order to reliably detect a double-yarn of the cone, the limit value must not be set higher than 1.6. This setting should be checked and perhaps modified when the yarn material is changed.

7.12.4 Foreign Matter

Foreign matter detection requires the use of the sensing head type:
TK YM ZENIT^{+} DF / DFP

Foreign matter can only be cleared according to classes.



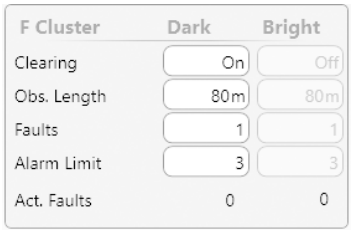
F Configuration

Clearing Dark, Clearing Bright, Organic Filter

These functions can be separately switched on or off.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting.
The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.



F Cluster Dark / F Cluster Bright

With the Foreign Matter Cluster settings, fault clusters can be detected which, as single faults, are usually not considered disturbing. If, however, the faults are repeated multiple times within a short distance, they are disturbing.

The F cluster setting can, e.g., be selected in classes which can be cleared only with increased cut numbers, e.g. oil-soiled bobbins.

Clearing

Clearing can be switched on or off.

Obs. Length / Faults

The observation length and the number of allowed faults can be selected separately for the acquisition of dark and bright foreign matter.

These two settings define the allowed number of faults within the set length.

Alarm Limit

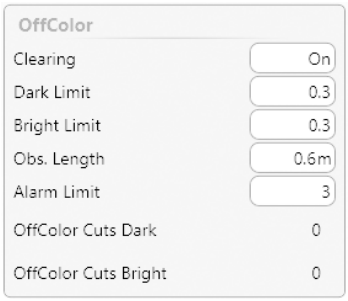
Bobbins with frequent, similar faults can be detected with this setting. The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

> The respective fault length is automatically drawn off the cone after every F cluster cut.

Act. Faults

All events in the selected cluster class fields are continuously displayed via the displayed observation length to support adjustment.

OffColor



Clearing

Clearing can be switched on or off.

Dark Limit / Bright Limit

The limits for dark and bright off colors can be set separately.

Observation Length

The observation length can be selected.

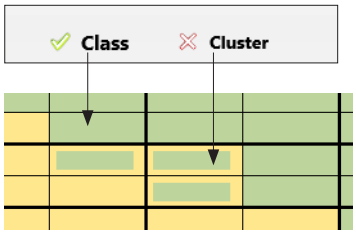
Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting. The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

OffColor Cuts Dark / OffColor Cuts Bright

The number of cuts due to bright and dark off colors of the yarn are listed separately.

Class / Cluster



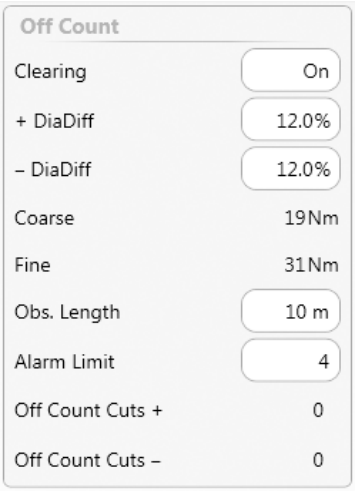
To determine F class clearing, Class must be activated.

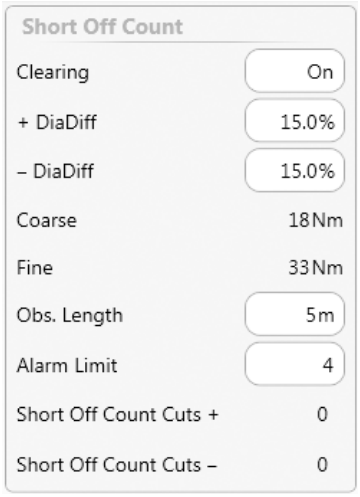
- Green class fields = class clearing is active

To determine F cluster clearing, Cluster must be activated.

- Green-yellow class fields = F cluster clearing is active

7.12.5 Yarn Count





These settings allow the acquisition of false bobbins or yarn with a larger off-count difference.

OffCount / Short OffCount

Clearing

Clearing after "OffCount / Short OffCount" can be separately switched on or off.

+ DiaDiff / – DiaDiff

Depending on the quality or irregularity of the yarn, a diameter difference between ±3% and ±44% (difference to basic value) can be selected. It can be set independently for the positive as well as negative diameter difference.

Coarse / Fine

According to the diameter difference set, the yarn count difference is displayed for Coarse and Fine.

Obs. Length (OffCount)

The length in which the average diameter difference is determined can be adjusted **between 10 and 50 m**. The acquisition of bobbin interchanges and off count variations can thereby be optimized.

Obs. Length (Short OffCount)

As opposed to the off count channel, the short off count channel allows the separate acquisition of yarn with an off count difference **over a length of less than 10 m**. The length for the shorts off count channel can be adjusted between 1 and 32 m.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting.
The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

Murata 21C: In "OffCount" and "Short OffCount", the maximum number of repetitions (9) is automatically set. Cycle repetitions and alarms are processed by the winding machine.

Short OffCount Cuts + / Short OffCount Cuts –

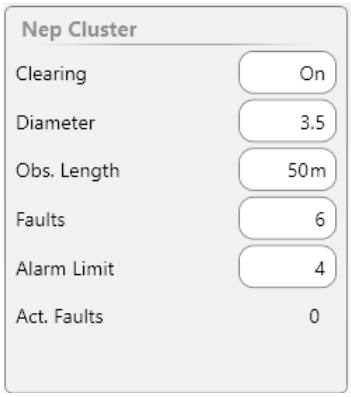
The number of cuts due to a positive or negative deviation of the yarn diameter are listed separately.

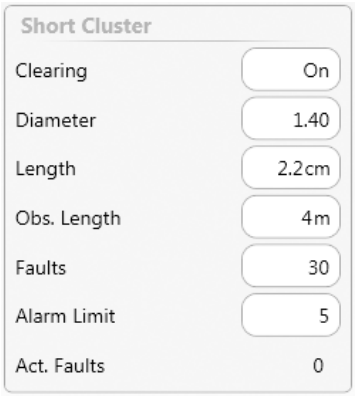
This display allows to optimize the setting.

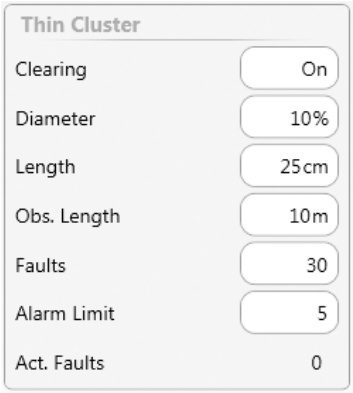
In Production

The actual faults can be displayed for the groups in production with the same article.

7.12.6 Cluster







With the cluster settings, fault clusters can be detected which, as single faults, are usually not considered disturbing. If, however, the faults are repeated multiple times within a short distance, they are disturbing.
To acquire periodic faults, separate cluster curves are defined for the short, long and thin faults. Faults outside these curves are included in the cluster.

Nep / Short / Long / Thin Cluster

Clearing

Clearing after nep cluster / short cluster / long cluster / thin cluster can be separately switched on or off.

Diameter

Yarn diameter setting range:

Nep	1.50 – 7.00
Short	1.10 – 4.00
Long	1.04 – 2.00
Thin	6% – 60%

Length

Reference length setting range:

Short	1.0 cm – 10 cm
Long	6.0 cm – 200 cm
Thin	6.0 cm – 200 cm

Obs. Length / Faults

The observation length and the number of allowed faults can be selected separately for the detection of short, long and thin cluster cuts.

These two settings define the allowed number of faults within the set length.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting.
The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

Act. Faults

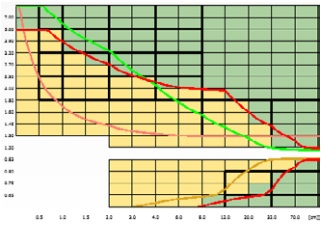
All events in the selected cluster class fields are continuously displayed over the displayed observation length to support adjustment.

In Production

The actual faults can be displayed for the groups in production with the same article.

Curves

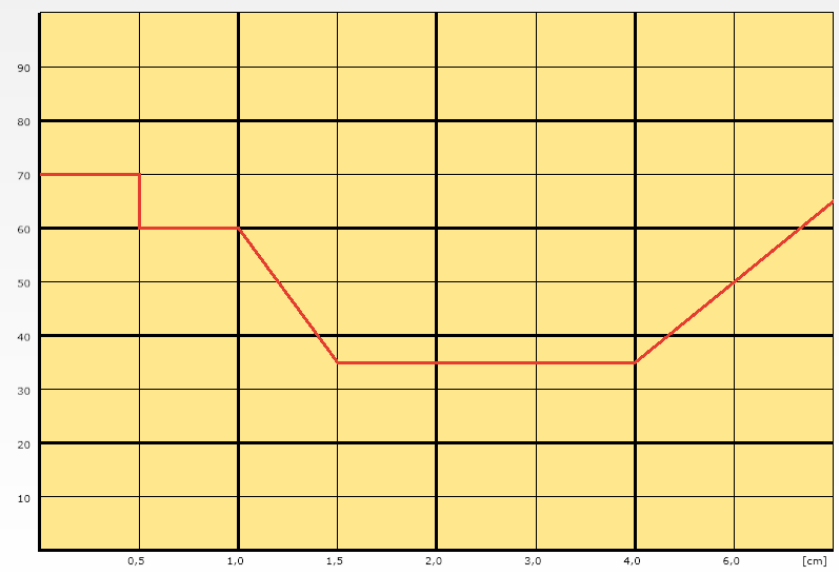
The clearing curves D channel, nep cluster, short cluster, long/thin cluster can be separately shown/hidden.



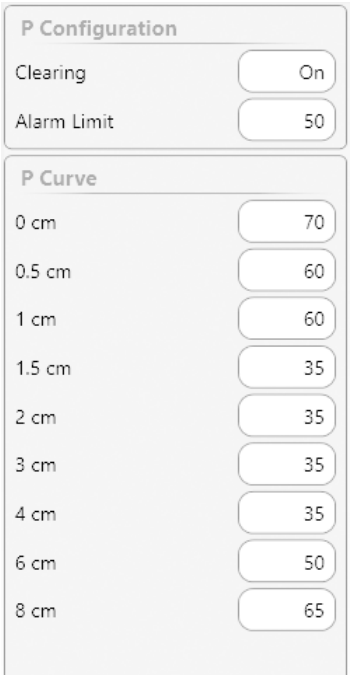
7.12.7 P Settings

The acquisition of synthetic foreign matter, e.g. polypropylene, polyamide (nylon) requires the use of sensing head type: TK YM ZENIT+ DFP

P Matrix



- Vertical axis: Intensity of charge measurement
- Horizontal axis: Signal length of faults (cm)



P Configuration

Clearing

P clearing can be switched on or off.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting. The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

P Curve

These settings define the P curve.

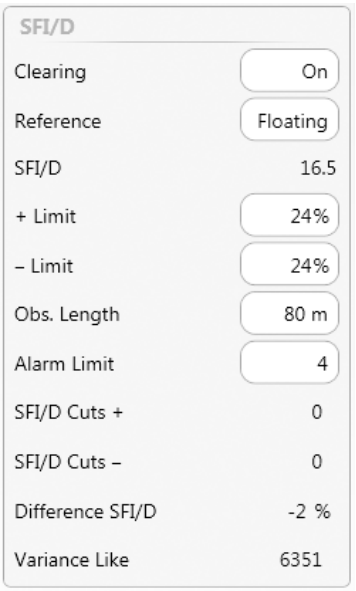
Events above the P curve are registered and cut as P cuts. Yarn irregularities below the curve remain in the yarn.

The P sensor is switched to “insensitive” during the splice check.

In Production

The actual faults can be displayed for the groups in production with the same article.

7.12.8 LabPack



SFI/D

An upper and lower limit value is selected relative to the mean SFI/D value of the yarn (reference). If the current SFI/D value exceeds this limit, the clearer makes a cut and the defective yarn is drawn off the cone.

Clearing

Clearing can be switched on or off.

Reference

With the Floating setting, the SFI/D reference value is adapted to the general surface level of an article.

If the SFI/D value of a yarn is known, a reference value between 5 and 25 can be entered.

> After an adjustment, the floating reference is created anew and is valid only after a length of 4 km! For a constant reference, the first-time display is provided immediately.

+ Limit / – Limit (%)

+ / – Limits (±5% to ±40%) can be set.

Obs. Length

An observation length of 10 m or 80 m can be set.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting.
The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

SFI/D Cuts + / SFI/D Cuts –

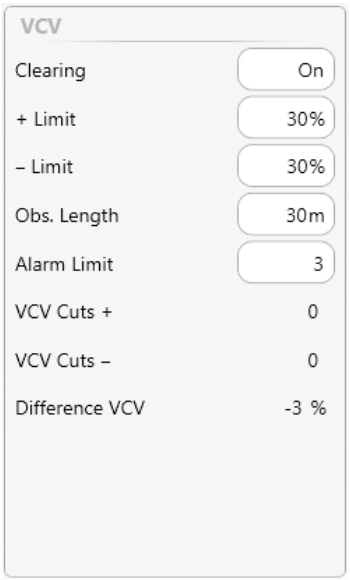
The number of cuts due to a positive or negative deviation are listed separately.This display allows to optimize the setting.

Difference SFI/D (%)

The difference of the value transmitted last in the current group, relative to the reference, is displayed. The limit values for yarn clearing can be optimized based on this difference in percent.

Variance Like

Technical value.



VCV

The clearer calculates continuously the VCV values from the yarn pieces with the set check length and compares these against their sliding average.

Clearing

Clearing can be switched on or off.

+ Limits / – Limit (%)

+ / – Limits (±5% to ±100%) can be set.

Obs. Length

An observation length between 10 m and 80 m can be set.

Alarm Limit

Bobbins with frequent, similar faults can be detected with this setting. The spindle is blocked as soon as the set alarm limits of the respective cut type per bobbin have been reached.

VCV Cuts + / VCV Cuts –

The number of cuts due to a positive or negative deviation are listed separately. This display allows to optimize the setting.

Difference VCV (%)

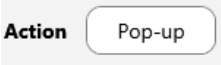
The difference of the value transmitted last in the current group, relative to the reference, is displayed. The limit values for yarn clearing can be optimized based on this difference in percent.

In Production

The SFI/D and VCV cuts can be displayed for the groups in production with the same article.

7.12.9 Off Limit Alarm

Allows monitoring of textile/non-textile cutting types and provides different visualization and/or intervention options for selection, depending on the individually selected action.



Action

Block

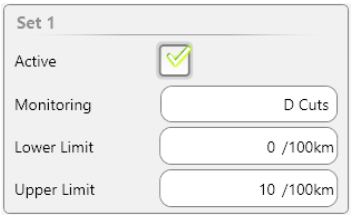
When the set limit value is exceeded, the spindle/group triggers an alarm.

Message

When the set limit value is exceeded, this is displayed in the message window.

Pop-up

When the set limit value is exceeded, this is visualized by the pop-up.



Set 1–5

Active

Off limit monitoring can be activated or deactivated.

Monitoring

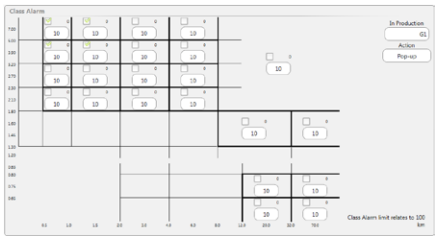
Selection of the monitoring off limit criterion / cut type.

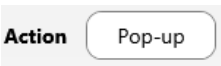
Lower Limit / Upper Limit

Input of the limit values for off limits relative to the respective events per 100 km.

7.12.10 Class Alarm

Allows monitoring of up to 8 coarse classes and provides different visualization and/or intervention options for selection, depending on the individually selected action.





Action

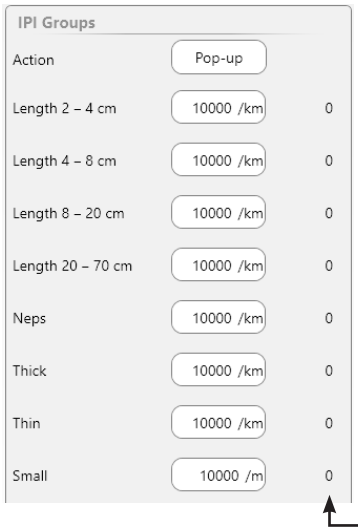
See off limit alarm.

In Production

Classification events can be displayed for the groups in production with the same article.

7.12.11 IPI Alarm

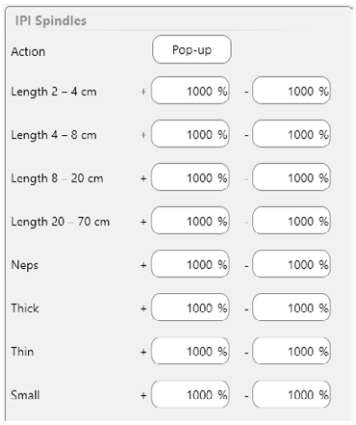
Allows monitoring of IPI diameter / length and provides different visualization and/or intervention options for selection, depending on the individually selected action.



Effective events (to support adjustment)

IPI Groups

Input of absolute IPI limit values relative to the group. To support adjustment, the events occurring for the current group are displayed.



IPI Spindles

Input of relative IPI limit values relative to the spindle.

Action

Block

When the set limit value is exceeded, the spindle/group triggers an alarm.

Message

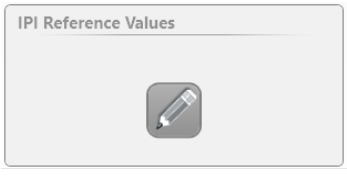
When the set limit value is exceeded, this is displayed in the message window.

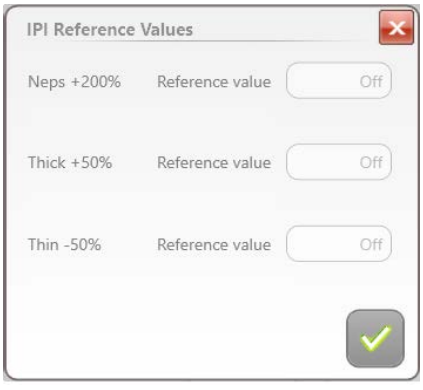
Pop-up

When the set limit value is exceeded, this is visualized by the pop-up.

IPI Reference Values

The IPI reference values according to the laboratory test can be entered.

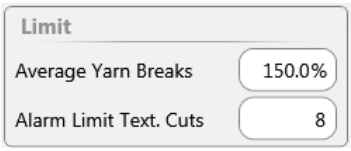




In Production

IPI events can be displayed for the groups which are in production with the same article.

7.12.12 Off Standard Bobbins



Limit

Average Yarn Breaks

Allows to detect bobbins with an increased number of yarn breaks.

Alarm Limit Text. Cuts

Bobbins with frequent, textile faults can be detected with this setting. The spindle is blocked as soon as the set alarm limits per bobbin have been reached.

7.13 Group Administration

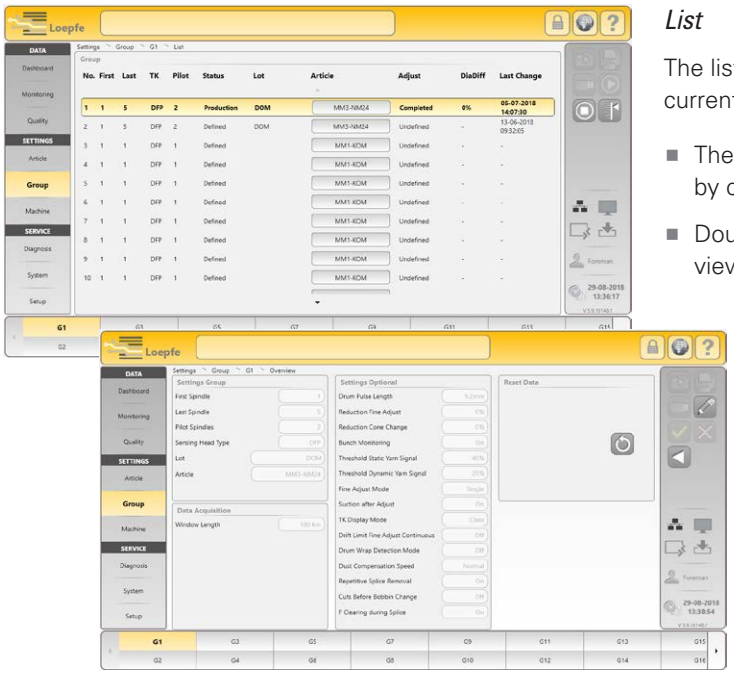
Settings > Group

7.13.1 General

The complete lot control is performed via the Group menu:

- Prepare the group
- Start / stop group (lot)
- Perform adjustment / fine adjustment

Menu Level Group



List

The list provides an overview of the groups and their current status. 30 groups (lots) can be managed.

- The article assigned to the group can be opened by clicking the article (button).
- Double-clicking a group in the list opens the overview of the respective group settings.

Overview

The settings can be edited.

7.13.2 Prepare Group

The group is defined with these settings:

- Settings Group
  - Spindle range (first/last spindle of group)
  - Number of pilot spindles (standard setting = 10% of spindles of this group)
  - Installed Sensing head type (D, DF, DFP)
  - Lot name
  - Article
- Settings Optional / Data Acquisition
  - These settings are equivalent to the standard settings (Machine menu) and can be individually adapted per group.
- Reset Data
  - The production data (monitoring and quality data) of the group are reset.

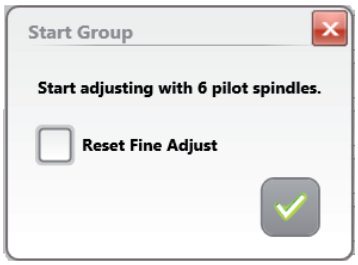
7.13.3 Start Group

> A group cannot be started when the spindle range overlaps another group in production.

An adjustment is performed (the current yarn count or yarn structure is read in and the basic value determined) at every group start.

If necessary, the fine adjust values can be reset for all sensing heads of this group.

7.13.4 Adjust



> The adjustment must be performed very thoroughly because it influences clearing quality!

1. All spindles of the group are at a standstill.
2. Confirm pop-up "Start Group" with  .
   - Spindle adjustment is started.
   - "Production" is displayed in column "Status" and "Active" in column "Adjust"

No.	First	Last	TK	Pilot	Status	Lot	Article	Adjust	DiaDiff
1	1	60	DFP	6	Production	LOT 2	30COMB	Active	-

   -  (Adjust) is displayed for all sensing heads.

3. Start and monitor the respective number of pilot spindles individually.
   - The "Ad" display goes out for each pilot spindle when adjustment is terminated.

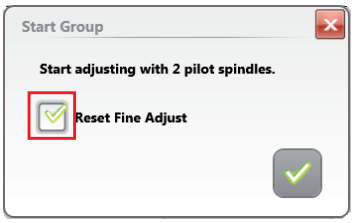
   After successful adjustment of all pilot spindles:

   - "Completed" is displayed in column "Adjust".
   - The "Ad" display also goes out for all non-pilot spindles.

4. For the initial start-up or after a software update, an adjustment must also be performed afterwards for each non-pilot spindle.
   - The "Ad" display goes out for each non-pilot spindle when adjustment is terminated.

> If "Completed [x]" is displayed after adjustment, it was not possible to complete adjustment with all pilot spindles (in this case it is recommended to repeat adjustment with other pilot spindles!)
>
> The other spindles may be started only when adjustment status "Completed" is displayed!

7.13.5 Adjustment with Fine Adjust Reset



If large deviations (> ± 10%) are determined for the diameter basis value between the individual spindles in the chart ("Diagnosis > TK Parameter" menu), it is advisable to reset the fine adjust values.

The adjustment must be performed very thoroughly because it influences clearing quality!

1. All spindles of the group are at a standstill.
2. Confirm pop-up "Start Group" with .
   - Spindle adjustment is started.
   - "Production" is displayed in column "Status" and "Active" in column "Adjust"

No.	First	Last	TK	Pilot	Status	Lot	Article	Adjust	DiaDiff
1	1	60	DFP	6	Production	LOT 2	30COMB	Active	-

   - (Adjust) is displayed for all sensing heads.
3. Start and monitor the respective number of pilot spindles individually.
   - The "Ad" display goes out for each pilot spindle when adjustment is terminated.

   After successful adjustment of all pilot spindles:
   - "Completed" is displayed in column "Adjust".

No.	First	Last	TK	Pilot	Status	Lot	Article	Adjust	DiaDiff
1	1	60	DFP	6	Production	LOT 2	30COMB	Completed	-

4. Afterwards, an adjustment must also be performed for each non-pilot spindle.
   - The "Ad" display goes out for each non-pilot spindle when adjustment is terminated.

If "Completed [x]" is displayed after adjustment, it was not possible to complete adjustment with all pilot spindles (in this case it is recommended to repeat adjustment with other pilot spindles!)

The other spindles may be started only when adjustment status "Completed" is displayed!

7.13.6 Adjust for Group In Production

> All spindles of the group should be stopped before an adjustment can be performed for a group in production.

The following can be required for a group in production:

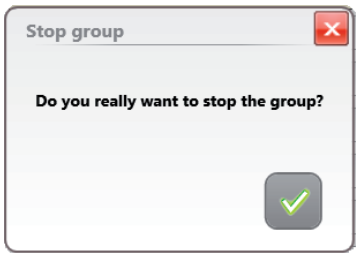
- to perform an adjustment again.
- to reset the fine adjust values for all sensing heads of this group.

Spindle Adjustment

A single spindle adjustment should be performed when a sensing head of a current group is replaced or a large diameter deviation (> ± 10%) was determined for a spindle.

Spindle adjustment is started in the "Diagnosis > TK Parameter" menu.

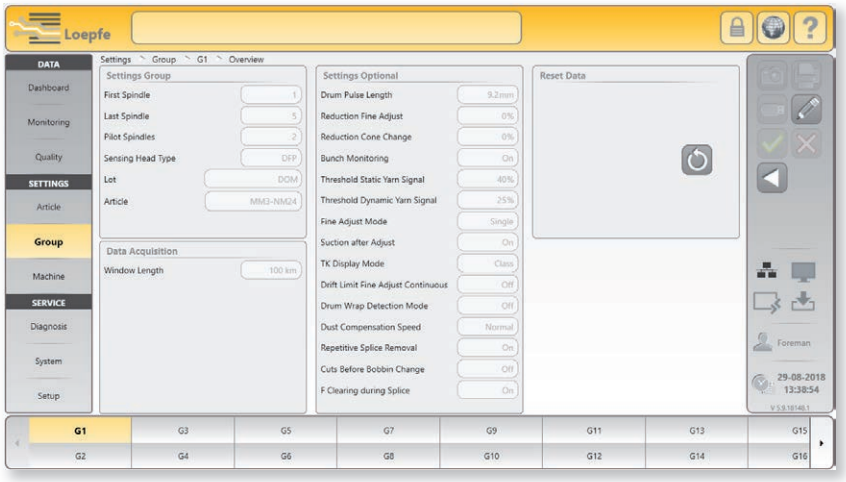
7.13.7 Stop Group



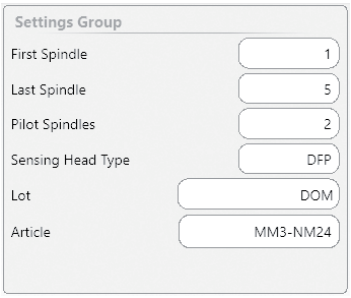
The status changes to "Stopped".

No.	First	Last	TK	Pilot	Status	Lot	Article	Adjust	DiaDiff
1	1	60	DFP	6	Stopped	LOT 2	30COMB	Undefined	-

7.14 Settings > Group



7.14.1 Settings Group



First / Last Spindle

Spindle range (first/last spindle of group).

Pilot Spindles

Number of pilot spindles (standard setting = 10% of spindles of this group).

Sensing Head Type

Installed Sensing head type (D, DF, DFP).

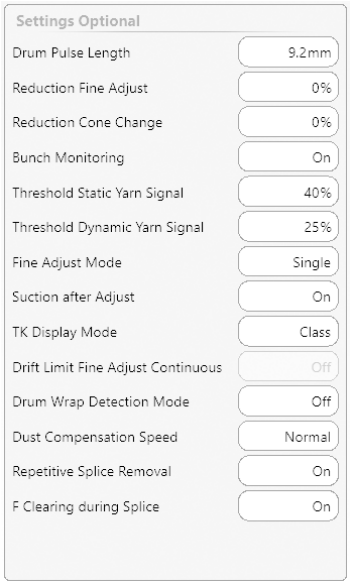
Lot

Optionally selectable lot name (max. 20 characters).

Article

An article can be assigned via a selection list.

7.14.2 Settings Optional



These settings are equivalent to the standard settings (Machine menu) and can be individually adapted per group as required.

Drum Pulse Length

The standard value is entered automatically based on the machine type (base settings). This value (mm) can be changed depending on the configuration.

Reduction Fine Adjust

Many cuts can be registered after an adjust with very sensitive settings in the yarn count channel or cluster channel. To avoid these cuts, the sensitivity can be reduced as required, i.e., the diameter limit value can be increased by the selected value.

- The reduction is automatically canceled at every spindle after approx. 12 km of wound yarn.
- With setting Off, the yarn count channel as well as the cluster channel are switched off for the first approx. 12 km.
- If a spindle adjust is performed on a spindle, this change of sensitivity is also active for approx. 12 km.

Reduction Cone Change

During a cone change, the limit values for long fault length (LL) and thin place length (–L) are set to 2 m. The diameter limit values for long faults (DL) and diameter reduction (–D) are less sensitive according to the set reduction. When reduction is switched off (OFF), the long fault channel and the thin place channel are switched off for the first 12 m.

Yarn number channel and foreign matter clearing are not active for the first 10 m after every cone change, independent from the set reduction.

Bunch Monitoring

Bunch monitoring can be switched on or off.

Threshold Static Yarn Signal

Response threshold for static yarn signal.

Threshold Dynamic Yarn Signal

Response threshold for dynamic yarn signal.

Fine Adjust Mode

Fine adjust mode can be selected (individually / continuously).

Suction after Adjust

Suctioning off 25 m after adjustment can be switched on or off.

TK Display Mode

The TK Display Mode can be selected (class / cut type).

Drift Limit Fine Adjust Continuous

Input of allowed min. drift difference during the continuous fine adjust mode can be switched off or activated with the selected value.

Drum Wrap Detection Mode

The drum wrap detection mode can be selected (Off / Event only / Cut).

Dust Compensation Speed

The speed of the dust compensation can be selected (Normal / Medium / High).

Repetitive Splice Removal

The splice removal repetition can be switched on or off.

F Clearing during Splice

F clearing during the splice check can be switched on or off.

7.14.3 Data Acquisition

These settings are equivalent to the standard settings (Machine menu) and can be adapted individually per group.

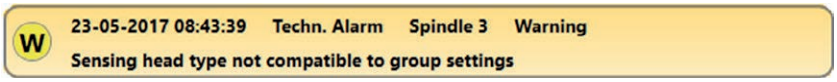
Window length (100 km / 1000 km) can be selected.

7.14.4 Reset Data

The production data (monitoring and quality data) of the group are reset. The shift data are maintained.

7.15 Messages / Alarms

7.15.1 Last Messages



The last message is displayed.

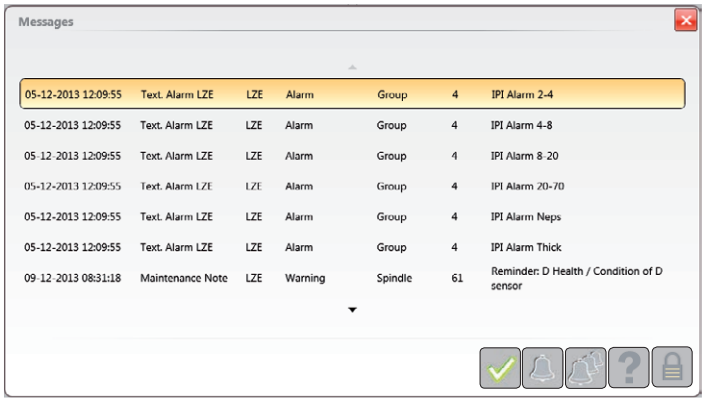
Tapping displays a list with the 20 last messages.

Alarm Levels

W	**Warning**	Message not requiring intervention
E	**Error**	Message requiring intervention
A	**Alarm**	Messages requiring intervention
F	**Fatal**	Message which prevents further use of the LZE and cannot be acknowledged

7.15.2 Messages Requiring Intervention

Tapping opens the following window. A message requiring intervention must be acknowledged. Troubleshooting see list chapter “8.4 Messages”.




Acknowledge and delete all messages.


Acknowledge last message.


Acknowledge all messages.


Help


Login (Acknowledging the messages requires at least the Foreman password level).

7.16 Data > Data Selection Filter

7.16.1 Production

The cut/quality data are displayed according to the selected option (e.g., the last 100 km).

- **First:** With the "First" setting, the acquisition of monitoring and classification data of the current production is stopped at e.g. 100 km (window length). For a group of 50 spindles this would mean that the first 2 km of every spindle are displayed together. With 1000 m/min. spindle speed, 100 km are reached in 2 min.
- **Last:** With the "Last" setting, the current data of a group or spindle are indicated for the last 100 km (window length), for example.
- **Cone:** With the "Cone" setting, the data of each individual cone will be shown in the Monitoring and Quality menus and automatically deleted after changing the cone. The current data of the group are displayed for the last e.g. 100 km (window length).

7.16.2 Current Shift

Cut data/quality data of the current shift.

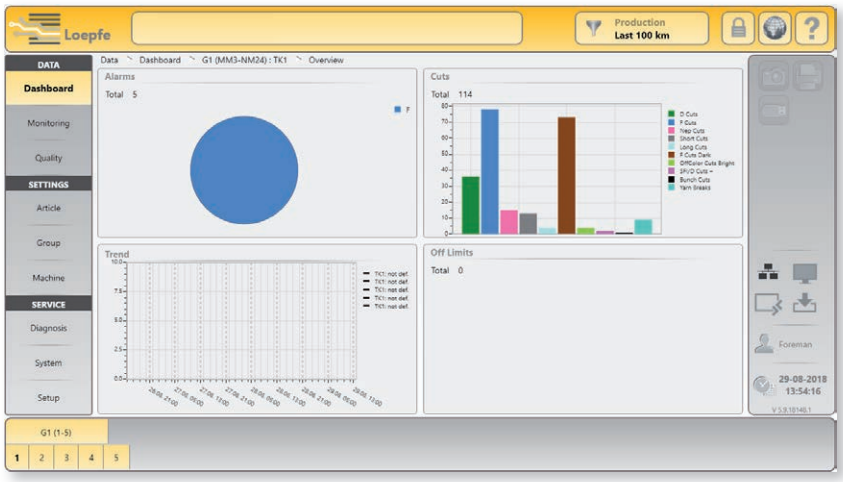
- **Absolute:** Absolute cut data
- **/100 km:** Cut data per 100 km
- **/kg:** Cut data per kg

7.16.3 Previous Shift 100km or /kg

Cut data/quality data of the previous 5 shifts, per 100 km or per kg. (according to the setting of Machine > Base settings > Previous Shift).

7.17 Data > Dashboard

The dashboard allows a quick overview of important system variables. In this context, preconfigured alarm and cut evaluations, on the one hand, and user-configurable trend and offline evaluations, on the other hand, are shown.



Alarms

Display of all current alarms of the selected group / spindle.

Cuts

Display of the 10 cutting types with the currently highest number of cuts of the selected group / spindle.

Trend

Display of trends of a group or spindle based on the maximum 5 configurable trend settings over a period of 72 hours.

Tapping the trend curve opens the detailed view and the Edit window for the trend settings.

Off Limits

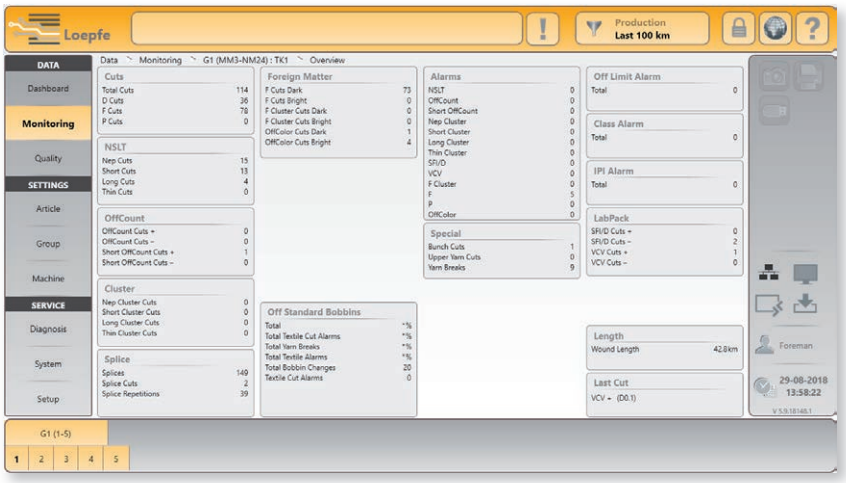
Display of the off limit alarms of a group or spindle based on the maximum 5 configurable off limit settings.

The off limit alarms are defined in the article.

7.18 Data > Monitoring

Shows the sum of all events with respect to the wound length (km), relative to the selected data selection filter.

This data can be optionally viewed per spindle or group.



7.18.1 Cuts

Total Cuts

Total of textile cuts (D / F / P cuts)

D Cuts, F Cuts, P Cuts

Yarn fault cuts, Foreign matter cuts, Synthetic foreign matter cuts

7.18.2 NSLT

Nep Cuts

Nep cuts (N)

Short Cuts

Short cuts (S)

Long Cuts

Long cuts (L)

Thin Cuts

Thin cuts (T)

7.18.3 OffCount

OffCount Cuts +

Off count cuts (+)

OffCount Cuts –

Off count cuts (–)

Short OffCount Cuts +

Short off count cuts in the short count range (+)

Short OffCount Cuts –

Short off count cuts in the short count range (–)

7.18.4 Cluster

Nep Cluster Cuts

Nep cluster cuts

Short Cluster Cuts

Short cluster cuts

Long Cluster Cuts

Long cluster cuts

Thin Cluster Cuts

Thin cluster cuts

7.18.5 Splice

Splice

Sum of all wound splices

Splice Cuts

Splice cuts

Splice Repetitions

Splice repetitions caused by splices that did not occur (e.g., no upper/lower yarn, yarn breaks, splicer malfunction).

7.18.6 Foreign Matter

F Cuts Dark

Foreign matter cuts (in raw-white yarn)

F Cuts Bright

Foreign matter cuts (in dyed or dark yarn)

F Cluster Cuts Dark

Foreign matter cluster cuts (in raw-white yarn)

F Cluster Cuts Bright

Foreign matter cluster cuts (in dyed or dark yarn)

OffColor Cuts Dark

Dark off color cuts

OffColor Cuts Bright

Bright off color cuts

7.18.7 Special

Bunch Cuts

Cuts caused by yarn breakage resulting from bunches or similar running errors

Upper Yarn Cuts

Cut caused by upper double thread

Yarn Breaks

Yarn breaks without textile cause

7.18.8 Off Standard Bobbins

Total

All off standard bobbins relative to the total number of bobbin changes

Total Textile Cut Alarms

Off standard bobbins caused by textile cut alarms relative to the total number of bobbin changes

Total Yarn Breaks

Off standard bobbins caused by an increased number of yarn breaks relative to the total number of bobbin changes

Total Textile Alarms

Off standard bobbins caused by textile alarms relative to the total number of bobbin changes

Total Bobbin Changes

Number of bobbin changes

Textile Cut Alarms

Number of textile cut alarms

7.18.9 LabPack

SFI/D Cuts +

Surface index cuts (+)

SFI/D Cuts –

Surface index cuts (–)

VCV Cuts +

Variable CV cuts (+)

VCV Cuts –

Variable CV cuts (–)

7.18.10 Alarms

Number of alarms when the set alarm limits are reached

7.18.11 Off Limit Alarm

Number of off limit alarms

7.18.12 Class Alarm

Number of class alarms

7.18.13 IPI Alarm

Number of IPI alarms

7.18.14 Length

Wound Length

- Data Selection Filter "Current / Previous Shift":
  The effectively wound length is displayed.
- Data Selection Filter "Production":
  The wound length up to reaching the set window length (e.g., 1000 km) is displayed.

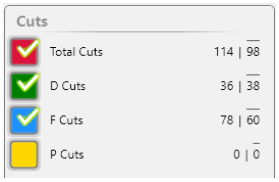
Detailed View of Monitoring Data

Overview

Tapping a data block (e.g., Cuts) opens the detailed view.

Detailed View

Data Window

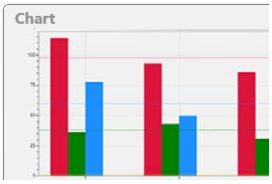


The total as well as the average value of the selected data are displayed and shown graphically in the chart.

114 Total value

98 Average value

Chart



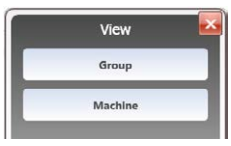
Graphic representation of the selected data as a bar chart.

Range

The following ranges can be selected:

Full	Scale from zero to the highest value of the displayed group.
Optimized	Scale from the lowest to the highest value of the displayed group. This representation is used to show the deflection more clearly.
Relative	Relative, negative and positive deviation of the values of the spindles from the mean value.
Percentage	Relative, negative and positive deviations of the spindles from the mean value.

View



The following views can be selected:

Group	Group view
Machine	Machine view

7.18.15 Last Cut

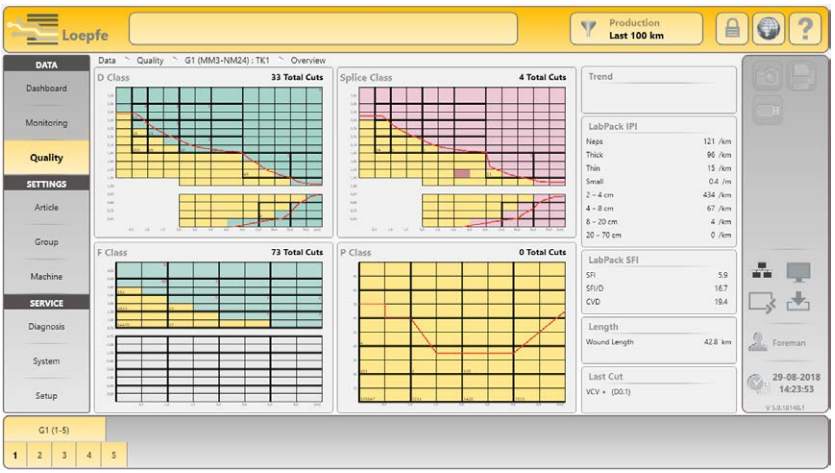
Display of last cut event (cut type, fault classification and possible alarms).

Tapping displays the last 5 cut events (Diagnosis).

Display	Cause
N/S/L/T Channel	Channel cut (Nep, Short, Long, Thin)
N/S/L/T Class	Class cut (Nep, Short, Long, Thin)
N/S/L/T Splice Channel	Splice Channel cut (Nep, Short, Long, Thin)
N/S/L/T Splice Class	Splice Class cut (Nep, Short, Long, Thin)
N/S/L/T Cluster	Cluster cut (Nep, Short, Long, Thin)
OffCount – / OffCount +	Negative or positive yarn count difference
Short OffCount – / Short OffCount +	Negative or positive short off count difference
SFI/D – / SFI/D +	Negative or positive surface index difference
VCV – / VCV +	Negative or positive VCV difference
F Dark / F Bright	Foreign matter cut dark or bright
F Cluster Dark / F Cluster Bright	Foreign matter cluster cut dark or bright
OffColor Dunkel / OffColor Hell	OffColor cut dark or bright
P	P cut
Bunch	Bunch cut
Upper Yarn	Upper Yarn cut
Adjust	Adjust cut
Adjust failed	Adjustment incorrect
Runout	Runout or yarn break
LZE	Configuration changed by LZE
User	Cut by user (Test / Reset button)
Knife blocked	Cut by knife locking
Drum Wrap	Drum wrap cut
Cut Retries	Cut retries
Zeroing failed	Zeroing failed
Spindle	Cut by spindle
Spindle Supply	Spindle power failure
TK Supply	Internal power supply failure of sensing head
D Regulator Limit	D brightness regulator out of limit
F Regulator Limit	F brightness regulator out of limit
Undefined	Cut cause not defined

7.19 Data > Quality

An optimum setting of the clearer parameters can be performed very quickly and efficiently using the detailed information concerning the number as well as the length and thickness of the yarn faults.



7.19.1 D Class

YarnMaster Zenit^{+} classifies all yarn faults of every group and spindle.

Yarn faults in the yarn to be cleared are entered in the respective fault classes based on length and diameter.

7.19.2 F Class

YarnMaster Zenit^{+} classifies all foreign matter of every group and spindle.

Foreign matter faults in the yarn to be cleared are entered in the respective F fault classes based on length and contrast.

7.19.3 Splice Class

YarnMaster Zenit^{+} classifies all splice faults of every group and spindle.

Splice faults in the yarn to be cleared are entered in the respective fault classes based on length and diameter.

The actual splice control length (0–120 cm) can be changed or switched off, as required, in menu Settings > Article > Splice Channel.

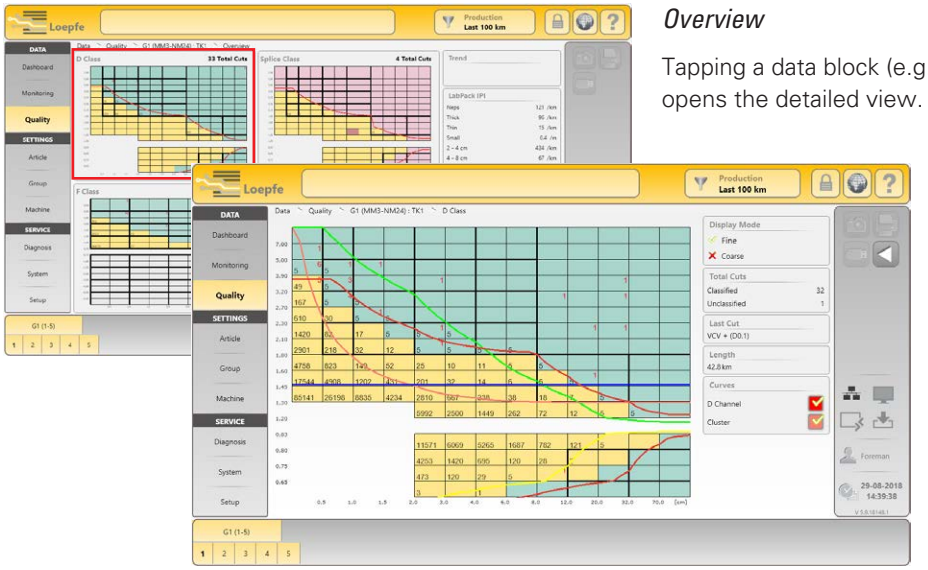
7.19.4 P Class

YarnMaster Zenit^{+} classifies all P faults of each group and spindle.

P faults are entered in the corresponding classes based on length and triboelectric voltage difference.

The P clearer settings can be changed or switched off in the Settings > Articles > P Settings menu.

Detailed View Classification Data



Overview

Tapping a data block (e.g., D Class) opens the detailed view.

Detailed View

Classification Data

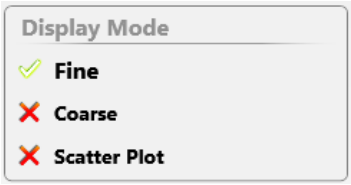
The numbers in the individual class fields indicate the cut and fault sums which remained in the yarn for the corresponding classes relative to the wound length which is displayed on the screen.

- Red = number of cut faults
- Black = number of "faults" remaining in the yarn

This data can be viewed per spindle or group.

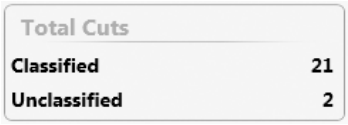
During classification per spindle, the last cut fault in the respective class is marked.

Display Mode



- **Coarse** = classification data of the 23 main classes
- **Fine** = classification data of all 188 classes
- **Scatter Plot** = graphic representation of fault clusters (D Class, groups in Production)

Total Cuts

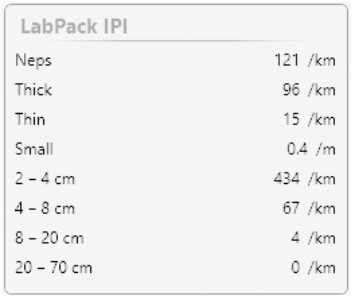


The total of the classified and unclassified faults of all class fields is shown here.

Curves

The channel and cluster curves can be shown / hidden for D Class. These are defined by the article settings.

7.19.5 LabPack IPI



Imperfections IPI

The classical yarn clearing in the winding process is designed for the recording of thick/thin places in the yarn which are defined according to the respective fault classes.

In yarn fault classification, "rare" and "frequent" yarn faults are distinguished. The general rule is that the shorter the fault length or the smaller the diameter variation, the more frequent the events. In textile usage, frequent yarn faults are referred to as "imperfections".

The raw material, card wires, eccentric top rollers/bottom rollers, defective aprons, rings and ring travelers etc. have a significant influence on the imperfections.

The recording of the imperfections must be considered as detailed online quality control in the winding process.

IPI Diameter

Diameter-related imperfections: In addition to the frequent yarn faults (neps, thicks, thins), YarnMaster Zenit^{+} also classifies the so-called very frequent events, the "small" imperfections. These small imperfections are used to evaluate the evenness of the checked yarn.

IPI Length

Length-related imperfections: In addition to the diameter-related imperfections, length-related imperfections (from 2–4 cm, 4–8 cm, 8–20 cm and 20–70 cm) are also classified.

7.19.6 LabPack SFI

Surface Index SFI

The Surface Index SFI is a universally usable quality parameter and allows conclusions as to the neppiness, hairiness and irregularity.

The evenness of the yarn material (yarn fineness) and, to a special degree, the yarn hairiness, are basic characteristics of spun yarns. In most cases, the unevenness of the yarn fineness has a close relationship to the warpage in spinning or problems of the warpage elements.

SFI

Quality variable SFI is the sum signal of the fibers protruding from a yarn within a measured length of 1 cm yarn.

SFI / D (LabPack)

The SFI/D is the sum signal of the fibres protruding from the core diameter of the yarn. The core diameter of the yarn is fixed at 100%.The SFI/D numbers therefore refer to 100.

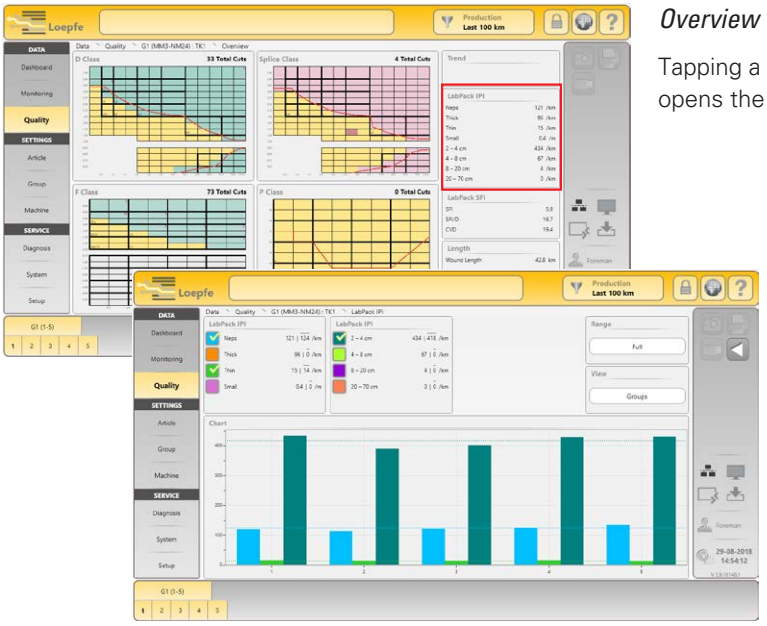
Surface index SFI/D allows to detect off-standard bobbins (e.g., sporadic thin or thick places which normally do not disturb, but have a negative effect on the fabric appearance when too many occur) and, if necessary, remove the yarn with faults during the winding process.

Variable CV

CVD (LabPack)

The clearer calculates continuously the VCV values from the yarn pieces with the set check length and compares these against their sliding average.

Detailed View LabPack

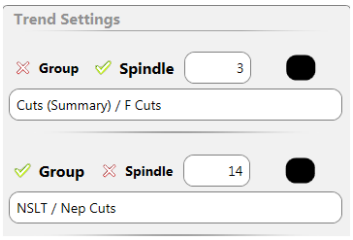


Overview

Tapping a data block (e.g., LabPack IPI) opens the detailed view.

Detailed View

7.19.7 Trend



Trend Settings

A total of 5 trend settings can be defined.

The desired criterion can be determined using a selection list.

Each shift group can be assigned a color.

The trend settings can be defined for a group and also for an individual spindle.

Trend (Curve)

The defined criteria are shown in a trend curve.

7.19.8 Length

Wound Length

- Data Selection Filter "Current / Previous Shift":
  The effectively wound length is displayed.
- Data Selection Filter "Production":
  The wound length up to reaching the set window length (e.g., 1000 km) is displayed.

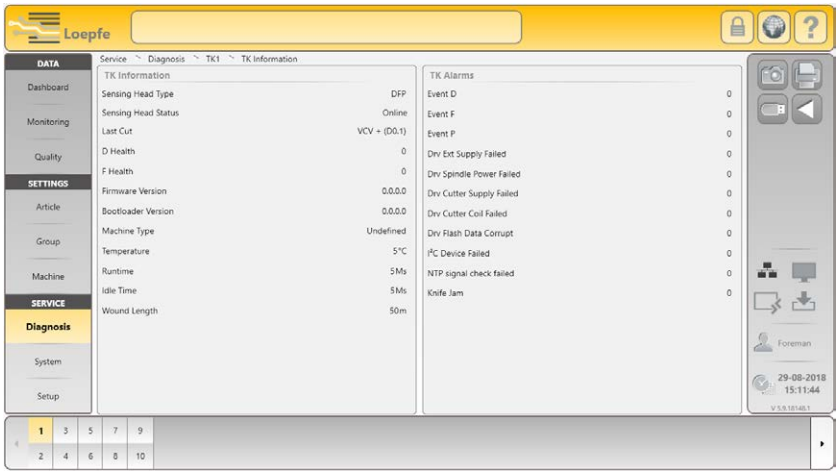
7.19.9 Last Cut

Display of the last cut event (cut type, fault classification and possible alarms).

Tapping displays the last 5 cut events (Diagnosis).

7.20 Service > Diagnosis

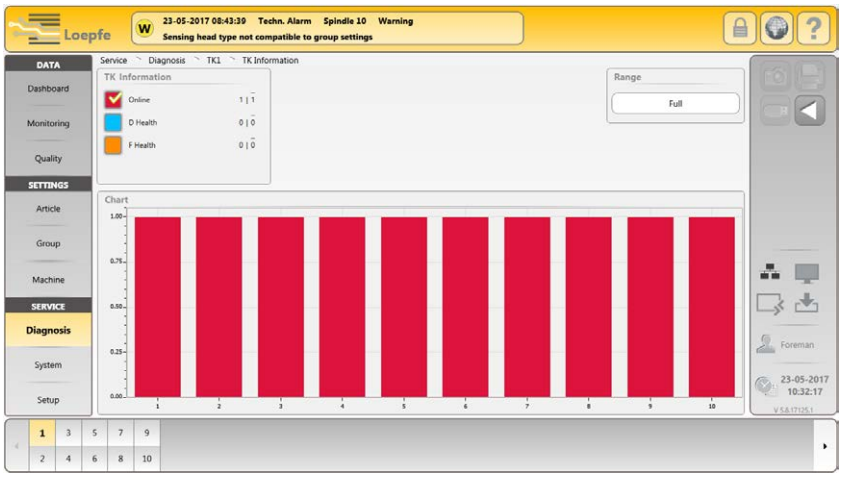
7.20.1 TK Information



TK Information

Information concerning the installed sensing heads.

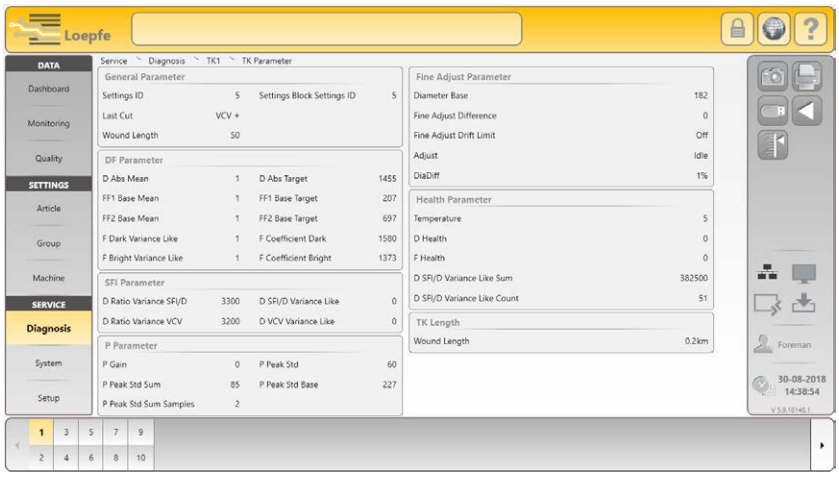
Clicking TK Information opens the Diagram view. The status of the individual spindles can be checked in the diagram.



TK Alarms

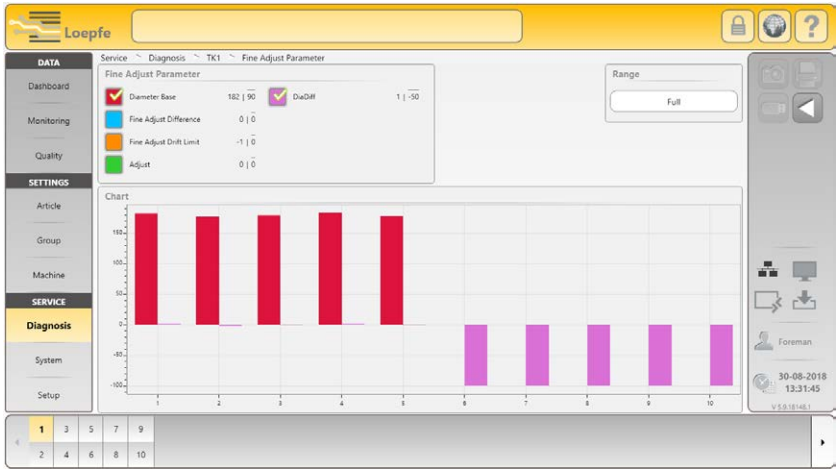
Overview of registered events.

7.20.2 TK Parameter



Detailed information for authorized personnel (exception: Fine Adjust Parameter).

Fine Adjust Parameter



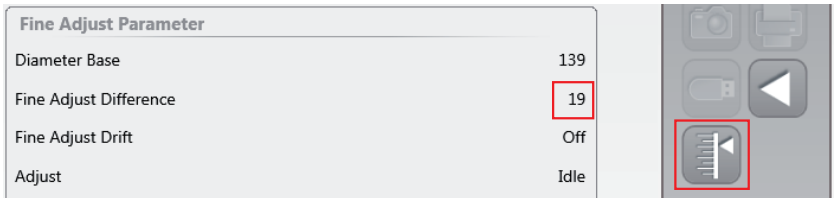
Clicking Fine Adjust Parameter opens the Diagram view. The values of the individual spindles can be checked in the diagram.

182 Value of selected spindle

$\overline{90}$ Average value of all spindles

If large deviations (> ±10%) are determined for the diameter basis value between the individual spindles in the chart, it is advisable to reset the fine adjust values.

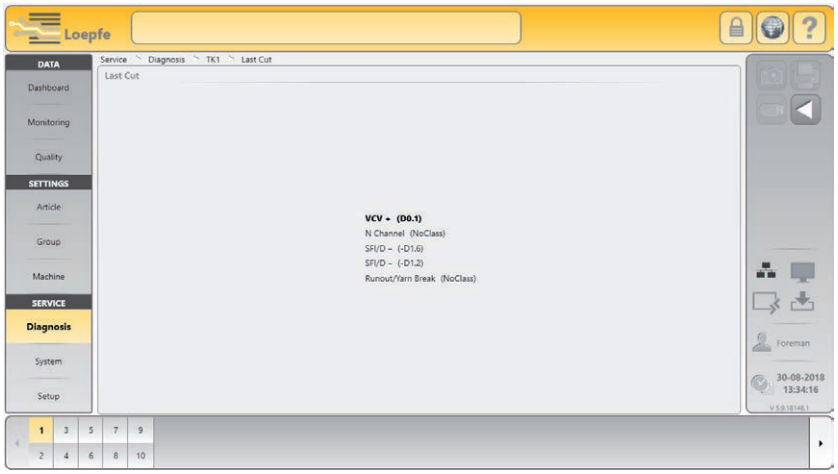
Spindle Adjustment



A single spindle adjustment should be performed when a sensing head of a current group is replaced or a large diameter deviation (> ±10%) was determined for a spindle.

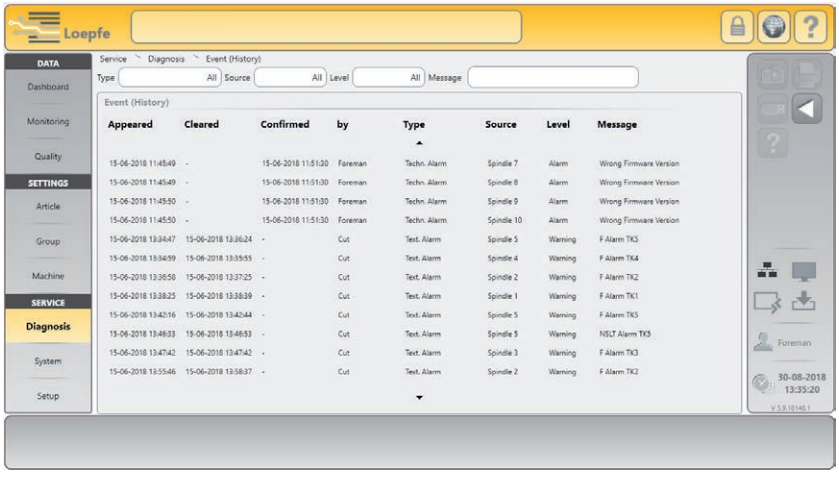
1. Select the affected spindle.
2. Start spindle adjustment with  .
3.  (adjustment) is displayed on the sensing head.
4. The "Ad" display goes out after the performed adjustment.

7.20.3 Last Cut



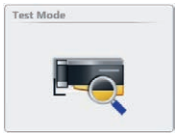
Display of the last 5 cut events of the selected spindle (cut type, fault classification and possible alarms).

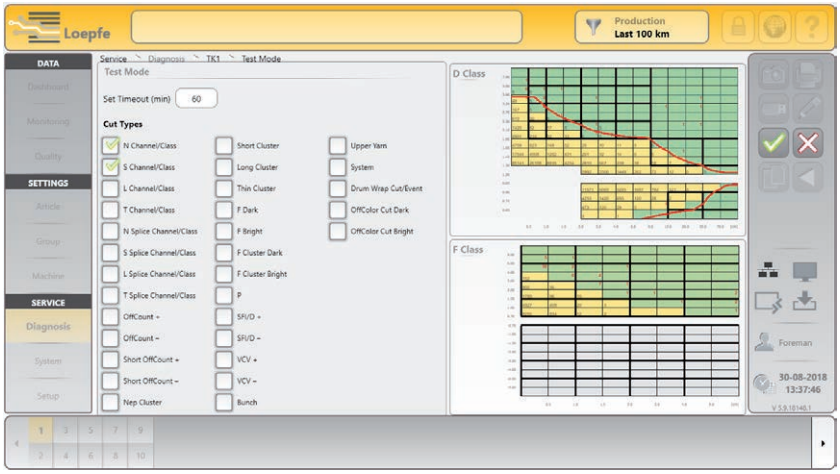
7.20.4 Event (History)



Display of the list of all events with additional information.
The messages can be filtered according to type, source, level, message.

7.20.5 Test Mode

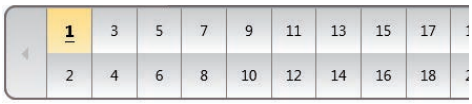


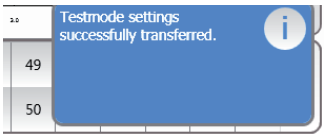


The Test mode is available for all cutting types. Several class fields (per D and F class) can be activated at the same time.

Activate the Test mode

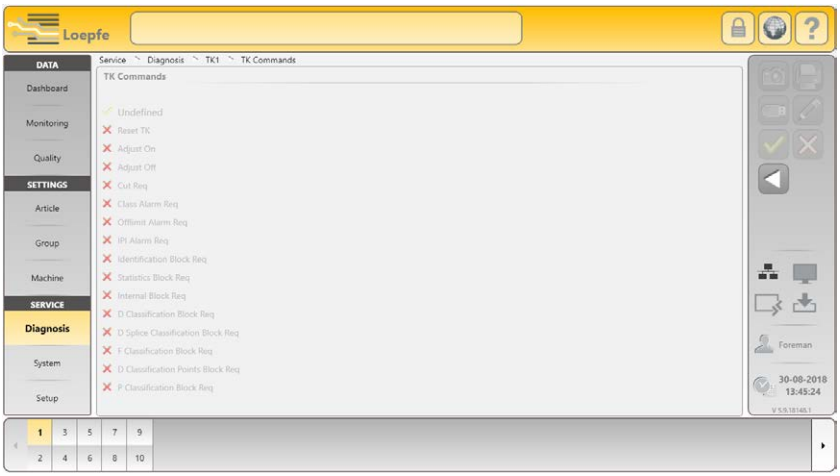
1. Activate the Edit mode with  .
2. Determine the time-out (Off, 30, 60, 90 or 120 min.)
3. Select the cut types or respective class fields and confirm with  .
4. Select the spindle range and confirm with  .
   – The selected spindles are underlined in the spindle selection list.





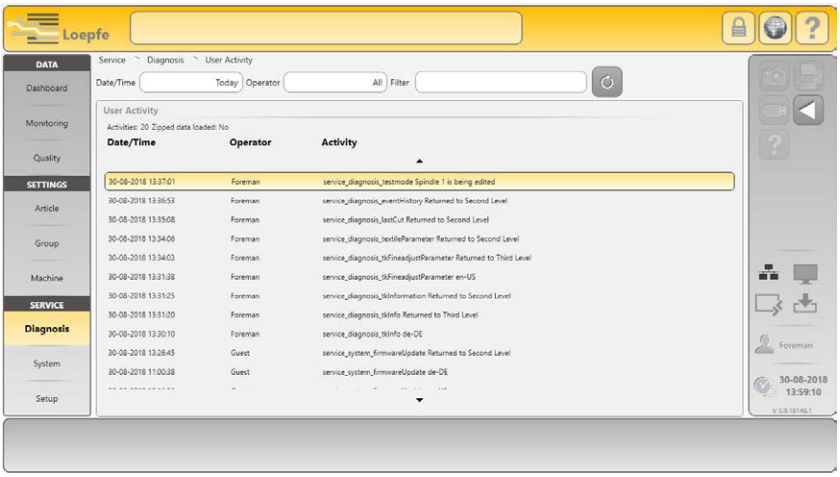
   – As soon as a respective fault is cut, the spindle is blocked. The fault can be analyzed.
   – The Test mode is automatically disabled after the set time-out time has elapsed.
   – The Test mode can be terminated prematurely by time-out «Off» as required.
5.  The settings of the selected spindle can be copied to further spindles.

7.20.6 TK Commands



Only for authorized personnel (Service password).

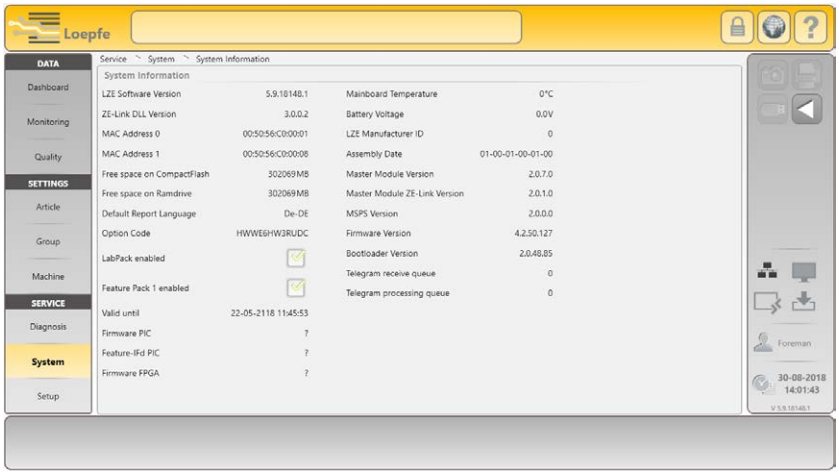
7.20.7 User Activity



The list of user activities can be filtered according to date / time, user and activity.

7.21 Service > System

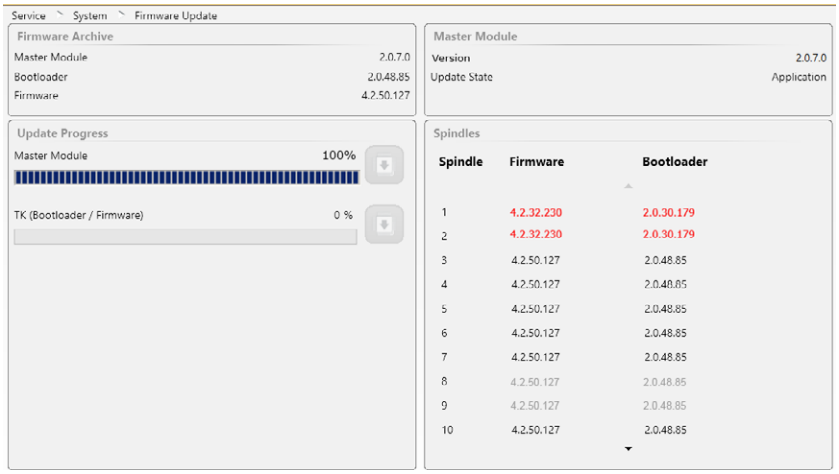
7.21.1 System Information



7.21.2 Log Profile

Only for authorized personnel (Service password).

7.21.3 Firmware Update



Master Module, Bootloader and Firmware Versions

The versions shown in the "Master Module" field and in the "Spindles" field must match the versions shown in the "Firmware Archive" field.

- Red version number: versions do not match
- Grey version number: TK is offline

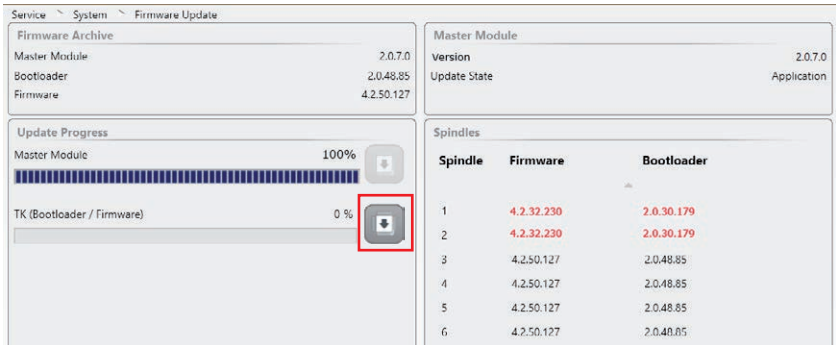
Perform the firmware update

If the versions do not match (e.g., after a master module or a sensing head exchange), the corresponding firmware update must be performed:

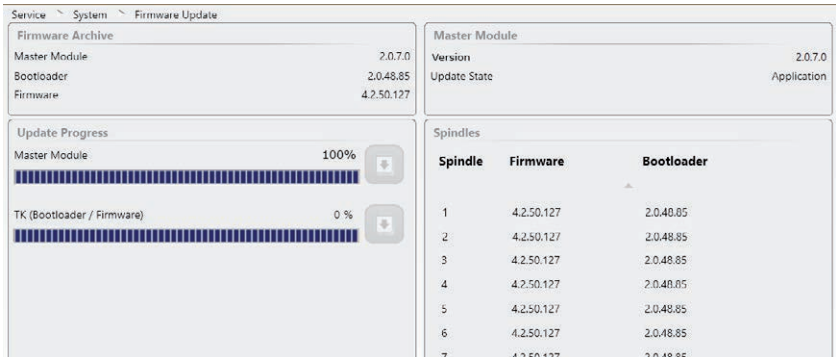
1. Activate the edit mode with  .
2. Start the Master Module update with  .
   – The status of the update is displayed in the progress bar.

> It can take some time (30 s) until the update is terminated and the respective next update button becomes active!

3. Start the TK (Bootloader / Firmware) update with  .
   – The status of the update is displayed in the progress bar.
   –  (Update Firmware) is displayed for all sensing heads which do not match.
   –  is displayed after a successful update.



4. After a successful firmware update, all progress bars show 100%.

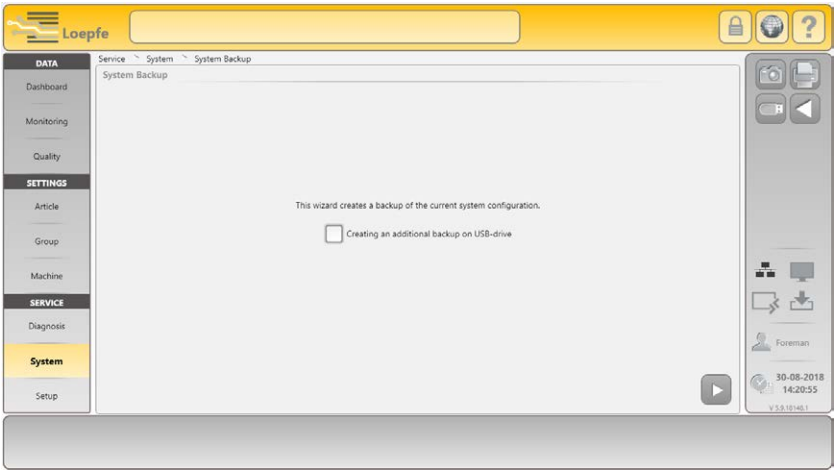


5. Terminate edit mode with  .

7.21.4 Software Update LZE

Only for authorized personnel (Service password).

7.21.5 System Backup



Assistant for creation of a backup copy of the current system configuration (e.g., before a reset to factory settings).

7.21.6 System Restore

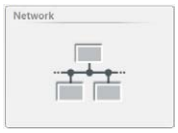
Only for authorized personnel (Service password).

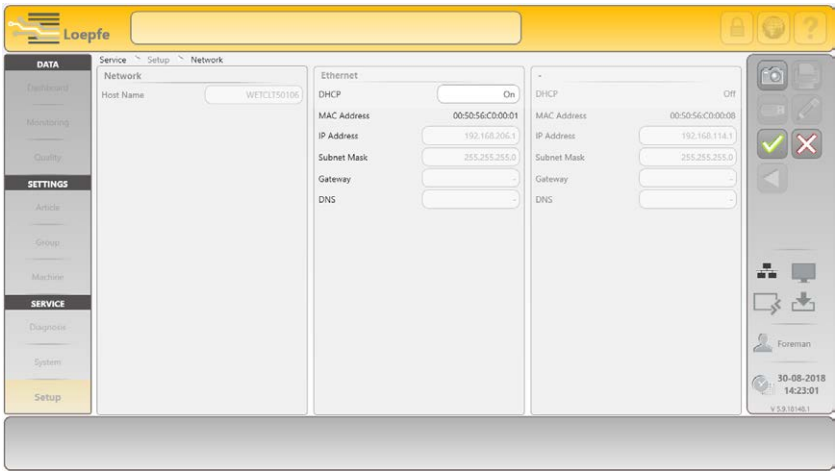
7.21.7 Maintenance / Service

Only for authorized personnel (Service password).

7.22 Service > Setup

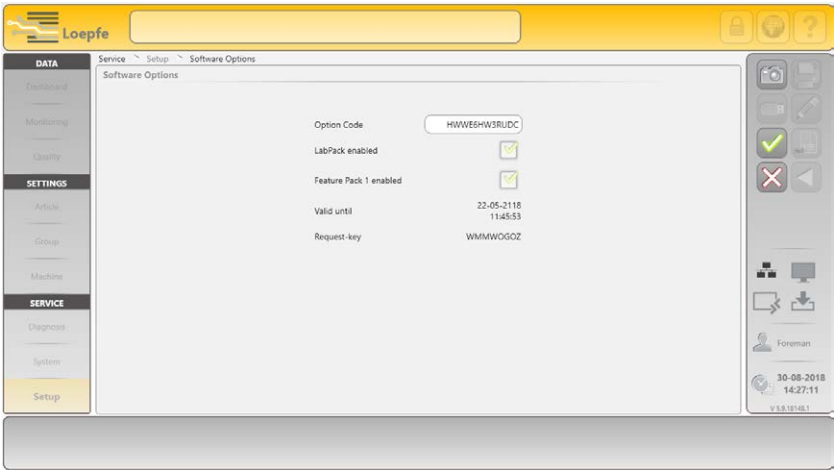
7.22.1 Network





Network information (can be edited with Service password).

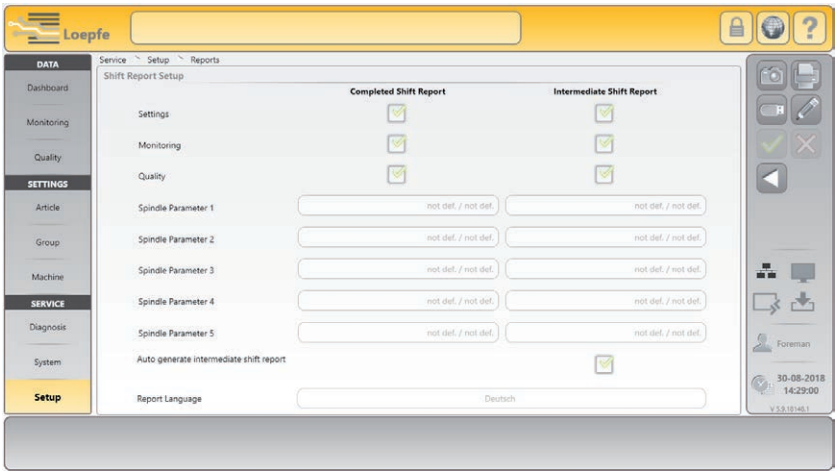
7.22.2 Software Options



The associated option code is required to activate the software options; this code must be requested from Loepfe. For this purpose, Loepfe requires the request key shown in the Software Options menu.

It is recommended to keep a print-out of the option code!

7.22.3 Reports



Configuration of Shift reports:

- Completed Shift report (completed shifts)
- Intermediate report (current shift)

  – The setting, monitoring or quality data can be printed individually or combined per Shift report.

  – In addition, 5 spindle parameters each can be selected.

  – An intermediate report (☑ default) can be created automatically when a group stop occurs.

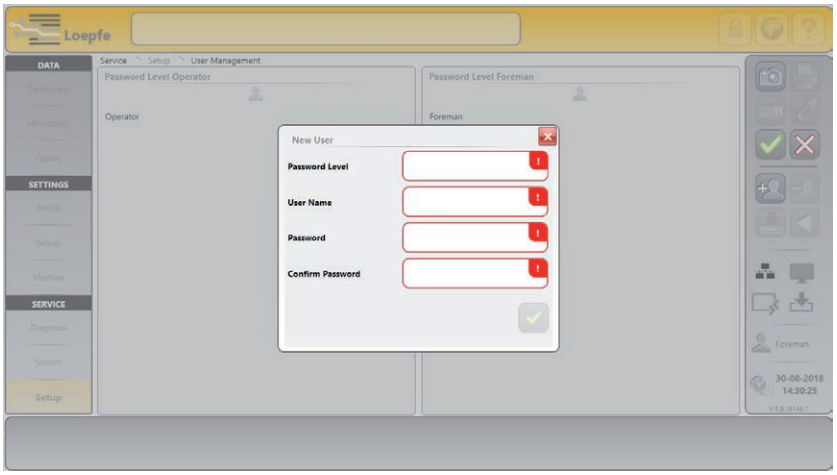
  – Any available language can be selected for the Shift reports.

7.22.4 User Management


Add user


Delete user


Change password



One user each per password level (operator, foreman) exists when the system is put into operation.

Additional users can be set up for both password levels.

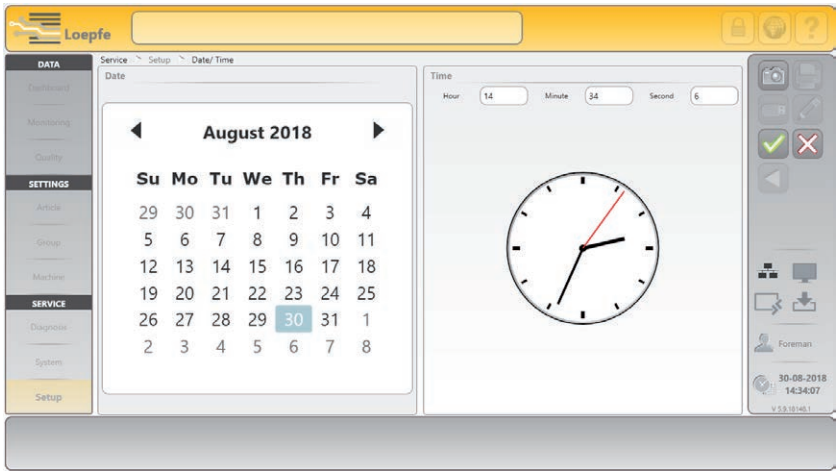
7.22.5 Factory Reset

The factory reset requires password: “MAKERESET” or the Service password.

7.22.6 Restart

The central unit is restarted.

7.22.7 Date and Time



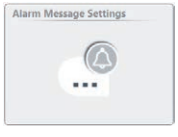
Setting:

1. Enter date/day/hour/minutes.
2. Save date and time with ✓.
3. Confirm pop-up “Save date and time settings” with ✓.

> Later changes can cause a loss of data!

7.22.8 Alarm Message Settings

Alarm message settings can be activated or deactivated.



8 Inspection and Maintenance

8.1 General

Yarn clearer system YarnMaster Zenit^{+} requires hardly any maintenance. However, regular inspections of the yarn clearer system are important and ensure troublefree and reliable operation.

YarnMaster Zenit^{+} monitors clearer components and processes, and points out required maintenance tasks or faults.

The information included in this chapter serves for analysis and possible clearance of occurred malfunctions.

If the described actions do not contribute to fault clearance, we recommend to contact the Loepfe Service Station.

8.2 Safety

Only authorized and trained persons are allowed to perform the work described in this chapter.

The safety instructions in chapter "2 Safety" must be known.

8.2.1 General Danger

WARNING

General risk of injuries!
Risk of injuries when touching spindles in production.

▷ *Switch off the respective and adjacent spindles and secure them against switching on again before working on the sensing head.*

8.2.2 Electric Current

DANGER

Danger to life due to voltage!
Immediate danger to life when touching live parts.

▷ *Work on electrical equipment must be performed by persons with the appropriate qualification.*

▷ *Only perform maintenance work on electric components when these are switched off, disconnected from the mains and potential-free.*

▷ *The yarn clearer system may be connected to the power supply system only when all front panels, plug-in boards and provided covers, especially on the central unit, are installed.*

▷ *The yarn clearer system may be operated only with the standard local line voltage/frequency and with a grounded protective ground contact.*

8.3 Fault Display

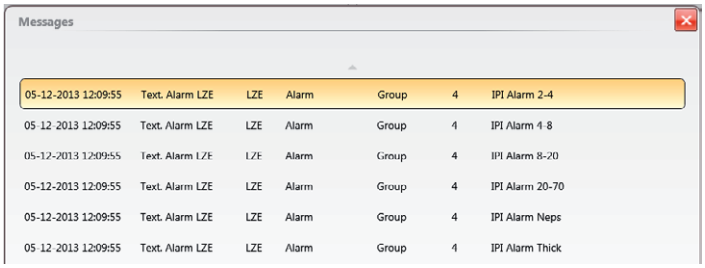
Messages and alarms are displayed as follows:

Message Window

The respective last message is displayed in the Message window.Tapping the Message window displays the last 20 messages.

Messages Requiring Intervention

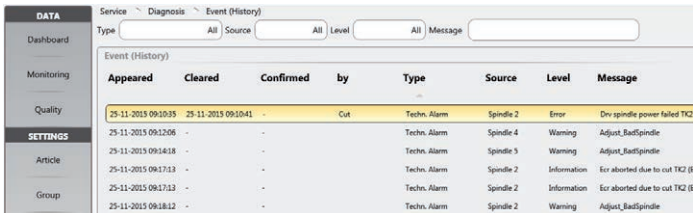
Messages requiring intervention are displayed in a popup window. These messages must be acknowledged.



Event (History)

SERVICE > Diagnosis > Event (History)

A list of all messages can be called up in the Diagnosis menu.



7-Segment Display

The 2-digit 7-segment display on the sensing head blinks and shows the respective alarm type when an alarm occurs.

Alarm Display on Spindle

Machine-specific alarms with spindle blockage are indicated by a warning light at the respective spindle. For detailed information concerning alarm monitoring, see the operating instructions of the spindle.

8.4 Messages

Procedure for messages requiring intervention:

1. Perform suggested measures for fault clearance.
2. Acknowledge the respective alarm message in the popup window with  .
3. If the fault cannot be corrected, contact the Service Station.

Send defective systems parts in suitable packaging and with the relevant fault information for repair to the local Service Station (see "5 Transport, Storage").

8.4.1 Maintenance Information

Message	Cause	Action
Cut repetitions: Check the knife	– The knife was not able to cut the yarn – After a cut, there is still yarn in the optical system	– Clean the cutting device (paraffin) – Check the knife and replace, if necessary – Check the cutting magnet and replace, if necessary – Check the connection wire for interruption – Replace the sensing head – Replace the spindle board
D reference value outside tolerance: Check the D sensor	Light sensor for scanning the yarn diameter outside tolerance	– Clean the optics. – Perform a single spindle adjust – Perform a sensing head reset – Pull out sensing head / insert again after 10 s – Replace the sensing head
Condition of D optics outside tolerance: Check the D sensor	D health value too low (optimal 100).	– Clean the optics. – Replace the sensing head
Condition of F optics outside tolerance: Check the F sensor	F health value too low (optimal 100)	– Clean the optics. – Replace the sensing head
F bright coefficient outside tolerance: Check the F sensor	Light sensor for foreign matter detection outside tolerance	– Clean the optics. – Perform a single spindle adjust – Replace the sensing head
F dark coefficient outside tolerance: Check the F sensor		
FF1 reference value outside tolerance: Check the F sensor		– Clean the optics. – Perform a single spindle adjust – Replace the sensing head and perform a reset
FF2 reference value outside tolerance: Check the F sensor		– Clean the optics. – Perform a single spindle adjust – Replace the sensing head
Fine adjust drift outside tolerance (only valid for "Continuous" mode)	The deviation of one or several sensing heads to the 2nd fine adjust correction value of the last adjustment is too high.	
Deviation of wound length: Check spindle	The wound length of this spindle is half the group average value.	Check the respective spindle: – Mechanical yarn running problems – Problem on splice – Spindle alarm – Sensing head problem
Splice fault: Check the splicer	Spindle with factor 2 more splice faults than group average value.	Check the functions and setting of the splicer of this spindle.

8.4.2 Textile Alarms

- The respective cause of the alarm is shown on the sensing head.
- The respective spindle is blocked.
- The yarn with faults is automatically removed from the cone (max. 80 m).
- The respective bobbin is ejected (machine-specific setting).

Message	TK Display	Cause	Action
NSLT Alarm	The last N, S, L or T cut is displayed blinking.	N, S, L or T yarn fault alarm The tolerated number of repetitions of the yarn fault cuts in the N, S, L or T channel was exceeded.	Check settings Check respective spindle.
Off Count Alarm	The last yarn count cut (Oc) is displayed blinking.	Yarn count difference. Tolerated number of repetitions of the yarn fault cuts in the yarn count channel was exceeded.	Alarm on all spindles of this group: – Check yarn count setting – Repeat adjustment. Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
Short Off Count Alarm	The last short count cut (Sc) is displayed blinking.	Short count difference. Tolerated number of repetitions of the yarn fault cuts in the short count channel was exceeded.	Alarm on all spindles of this group: – Check yarn count setting – Repeat adjustment. Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
Short Cluster Alarm	The last short cluster cut (Sc) is displayed blinking.	Excessive fault accumulations in the SC channel (cluster alarm). Tolerated number of repetitions of the yarn fault cuts in the short cluster channel was exceeded.	Alarm on all spindles of this group: – Check short cluster setting Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
Nep Cluster Alarm	The last nep cluster cut (nC) is displayed blinking.	Excessive fault accumulations in the nC channel (cluster alarm). Tolerated number of repetitions of the yarn fault cuts in the nep cluster channel was exceeded.	Alarm on all spindles of this group: – Check nep cluster setting Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
Long Cluster Alarm	The last long cluster cut (LC) is displayed blinking.	Excessive fault accumulations in the LC channel (cluster alarm). Tolerated number of repetitions of the yarn fault cuts in the long cluster channel was exceeded.	Alarm on all spindles of this group: – Check long cluster setting Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem

Thin Cluster Alarm	The last thin cluster cut (tC) is displayed blinking.	Excessive fault accumulations in the tC channel (cluster alarm). Tolerated number of repetitions of the yarn fault cuts in the thin cluster channel was exceeded.	Alarm on all spindles of this group: – Check thin cluster setting Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
SFI/D Alarm	The last SFI/D cut (SF) is displayed blinking.	Deviation from the determined SFI/D value. Tolerated number of repetitions of the yarn fault cuts in the SFI/D channel was exceeded.	– Alarm on all spindles of this group: – Check SFI/D setting – Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
VCV Alarm	The last VCV cut (c) is displayed blinking.	Deviation from the determined VCV value. Tolerated number of repetitions of the yarn fault cuts in the VCV channel was exceeded.	– Alarm on all spindles of this group: – Check VCV setting – Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
F Alarm	The last foreign matter cut (FF) is displayed blinking.	F yarn fault alarm. Tolerated number of repetitions of the yarn fault cuts in the F channel was exceeded.	– Alarm on all spindles of this group: – Check F setting – Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
P Alarm	The last foreign matter cut (PP) is displayed blinking.	P yarn fault alarm. Tolerated number of repetitions of the yarn fault cuts in the P channel was exceeded.	– Alarm on all spindles of this group: – Check P setting – Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
F Cluster Alarm	The last foreign matter cluster cut (FC) is displayed blinking.	Excessive fault accumulations in the FC channel (F cluster alarm). Tolerated number of repetitions of the yarn fault cuts in the FC channel was exceeded.	– Alarm on all spindles of this group: – Check F cluster setting – Alarm always on one spindle of this group only: – Yarn quality (when occurred once) – Mechanical yarn running problems – Sensing head problem
Class Alarm	The class alarm (CA) is displayed blinking.	The set limit values for monitoring the cuts in the selected classes were exceeded.	– Check class alarm setting – Yarn quality – Mechanical yarn running problems – Sensing head problem
Off Limit Alarm	The off limit alarm (OA) is displayed blinking.	The set limit values for monitoring the selected cutting types were exceeded.	– Check the off limit alarm setting – Yarn quality – Mechanical yarn running problems – Sensing head problem
IPI Alarm	The IPI alarm (IA) is displayed blinking.	The set limit values for monitoring the imperfections were exceeded.	– Check IPI alarm setting – Yarn quality – Mechanical yarn running problems – Sensing head problem

8.5 Maintenance Work

8.5.1 Clean the Optics

Contamination in the sensor area affects clearer functions and could cause increased cutting numbers and fault classifications.

Clean the optics in shorter intervals when marking paint, paraffin and antistatic oils are used.

Clean the Sensor Area

ATTENTION

Sensor damage caused by improper cleaning!
The sensors could become damaged by improper cleaning!

▷ *Clean the sensors with utmost care.*

▷ *Clean the sensors with cotton swabs.*

▶ *Do NOT immerse the sensing head in cleaning agent!*

▶ *Do NOT spray the cleaning agent directly in the optical system!*

▶ *Do NOT use any hard/sharp objects!*

1. Press cotton swab together slightly.
2. Lightly moisten cotton with cleaning agent.
3. Pull cotton swab several times through the complete sensor area.

Forbidden Cleaning Substances

ATTENTION

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

▶ *Aromatic hydrocarbons, e.g. benzene, benzole, toluene*

▶ *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 Substances

- Light contamination:
  - Cleaning agent TK-Clean from LOEPFE
- Heavy contamination:
  - "Zippo Premium Lighter Fluid"
  - "Ronsonol Lighter Fluid"
  - Medical grade benzine
  - n-Heptane (C_7H_{16})
  - Cypar 7, Cycloaliphat (C_7) (a SHELL product)

DANGER

Gasoline is highly inflammable!

▷ *Observe warning notices on container!*

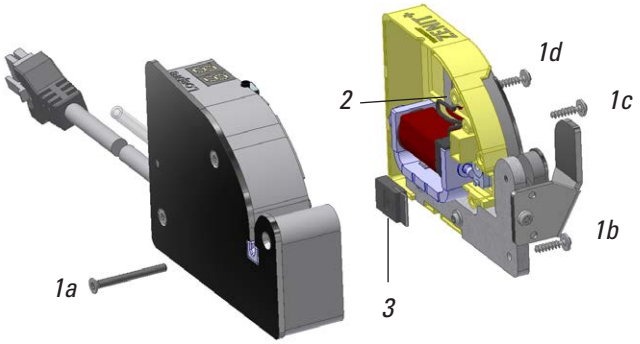
8.5.2 Clean the Knife Guide

Contamination (e.g., caused by dust and / or paraffin residues) can reduce cutting performance or cause the knife to block.

1. Pull out the sensing head cable.
2. Disassemble the sensing head.
3. Remove the cover: Unscrew screws *1a, 1b, 1c, 1d* (Torx no. 8.)
4. Open the cover with cutting magnet / pull off the plug *(2)*.
5. Blow out the cover.
6. Remove paraffin residues with a soft, dry cloth or cotton swabs.

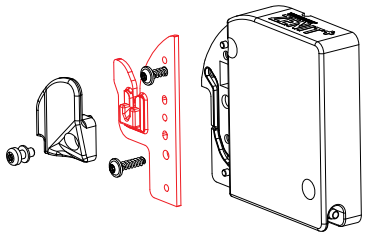
8.5.3 Replace the Knife

1. Pull out the sensing head cable.
2. Disassemble the sensing head.
3. Remove the cover: Unscrew screws *1a, 1b, 1c, 1d* (Torx no. 8.)
4. Open the cover with cutting magnet / pull off the plug *(2)*.
5. Replace knife *(3)* (If necessary, blow out cover).
6. Reassemble the sensing head.
7. Cut check.



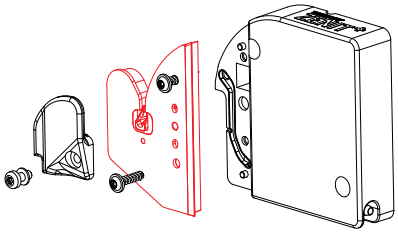
8.5.4 Replace Yarn Guides

Fissures and notches in the yarn guide affect the running of the yarn and could be the cause of higher cutting numbers and classification faults.



TK YM ZENIT+ D / DF

1. Pull out the sensing head cable.
2. Check yarn hold-back device and yarn guide plate with glued in ceramics (Torx screwdriver No. 8).
3. Replace yarn guide plate with glued in yarn guide.
4. Reinstall yarn hold-back device.



TK YM ZENIT+ DFP

1. Pull out the sensing head cable.
2. Remove yarn hold-back device and P sensor with glued in ceramics (Torx screwdriver No. 8).
3. Replace P sensor.
4. Reinstall yarn hold-back device.

8.5.5 Replace the Sensing Head

1. Stop affected and adjacent spindles.
2. Switch off the voltage supply of the spindle.
3. Remove required covers on the spindle.
4. Pull the sensing head cable off the spindle adapter.
5. Remove the defective sensing head.
6. Install the new sensing head and insert sensing head cable.
7. Re-install removed covers.
8. Switch on the voltage supply of the spindle.
9. A TK reset is automatically performed on the new sensing head.
10. When PC is displayed after a sensing head change, a firmware update must be performed for this spindle (Service > System > Firmware Update).
11. Perform an adjustment of the affected spindle (menu Diagnosis > TK Parameter).
12. Start the spindles.

If "Suction after Adjust" is not activated, the wound yarn (25 m) can still have faults because clearing is not active during adjustment.

8.5.6 Replace the Spindle Adapter (Machine-specific)

ATTENTION

Electronic components and assemblies (printed circuit boards) are endangered by electrostatic charges!
Possible damage when touching the components!

▷ *Hold assemblies only at the edge.*

▶ *Do NOT touch soldered connectors, pin contacts, printed circuits or electronic components.*

1. Stop affected and adjacent spindles.
2. Switch the voltage supply of the spindle off.
3. Remove required covers on the spindle.
4. Pull all cables off the spindle adapter.
5. Replace the defective spindle adapter, insert all cables.
6. Re-install removed covers.
7. Switch the voltage supply of the spindle on.

8.5.7 Monitor Calibration

The monitor is calibrated before delivery and should be recalibrated only when input on the touchscreen is no longer possible without faults.

Calibration is performed directly after the start of the central unit.

1. Touch the first calibration point (top left) with a fine, non-scratching object until the next calibration point is displayed (the display changes from TOUCH to HOLD to RELEASE).
2. Repeat this process for the eight further calibration points.

9 Dismantling and Disposal

9.1 Dismantling

DANGER

Danger to life due to voltage!
Immediate danger to life when touching live parts.

- ▷ *Work on electrical equipment must be performed only by persons with the appropriate qualification.*
- ▷ *Only perform maintenance work on electric components when these are switched off, disconnected from the mains and potential-free.*
- ▷ *Make sure the equipment parts are completely disconnected from the power supply.*

All connection cables between the equipment parts and the winding machine must be unplugged before dismantling equipment parts.

For packaging, transport and storage of dismantled equipment parts: See chapter “5 Transport, Storage”.

9.2 Disposal

Equipment parts of the yarn clearer system which cannot be reused must be disposed of properly and according to all standard national environmental protection regulations.

CAUTION

Possible environmental damage and property damage by improper disposal of electric and electronic components/assemblies.

- ▷ *Electric and electronic components and assemblies as well as batteries and capacitors must be properly disposed of or recycled.*

10 Spare Parts / Accessories

10.1 Safety

ATTENTION

Safety risk with non-original spare parts or non-approved accessories!
Non-original spare parts or non-approved accessories could affect safety and cause damage, malfunctions or total failure of the yarn clearer system.

▷ *Only use original spare parts or accessories approved by Loepfe.*

The manufacturer assumes no liability for damage caused by the use of spare parts / non-OEM parts / conversion parts not supplied by us.

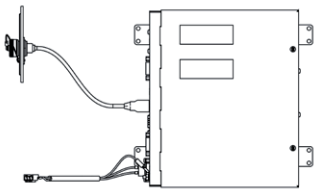
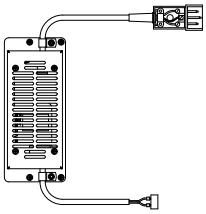
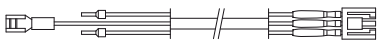
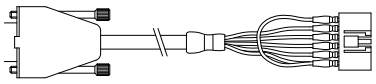
10.2 Ordering Information

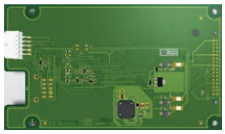
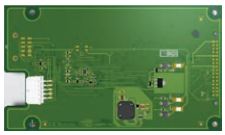
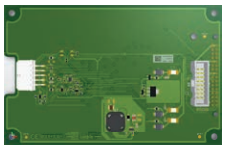
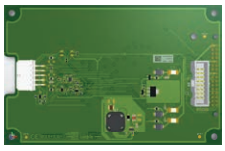
All listed spare parts and accessories can be ordered through our local representation or service point.

To avoid errors in delivery please state these particulars when ordering:

- Company name / Complete company address
- Spare part description
- Spare part number
- Quantity
- Machine type involved / Serial number, if applicable

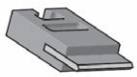
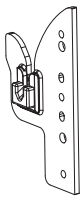
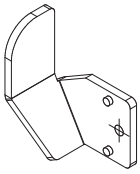
10.3 Spare Parts

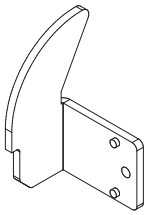
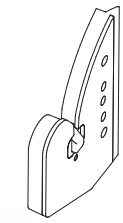
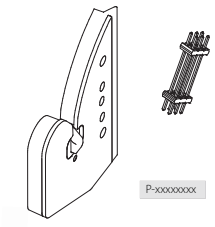
Central Unit LZE-V YM ZENIT+		
	**Central unit complete** LZE-V YM Zenit+ 21C / QPRO LZE-V YM Zenit+ 21C / QPRO Labpack LZE-V YM Zenit+ SOP LZE-V YM Zenit+ SOP Labpack LZE-V YM Zenit+ AC LZE-V YM Zenit+ AC Labpack LLZE-V YM Zenit+ SMARO/ISPERO/FARO/VCRO LZE-V YM Zenit+ SMARO/ISPERO/FARO/VCRO Labpack LZE-V YM Zenit+ TAITAN	 50304000 50322000 50303000 50321000 50305000 50323000 50409000 50410000 50494000
	**Central unit "Faceless" complete** LZE-V ZENIT+ Faceless Savio LZE-V ZENIT+ Faceless Savio Labpack	 50340000 50341000
	Master module LZE-V YM Zenit+	50271000
	Power supply kit Murata 21C / QPRO	16836900
	Power cable LZE-III / LZE-V 24V SOP / SMARO Power cable LZE-III / LZE-V 115/230V SMARO/ISPERO Power cable LZE-V 24V AC Power cable Netzkabel LZE-V 24V (TAITAN)	46385000 46390000 50307000 46416000
	BUS adapter cable LZE-III / LZE-V SOP	44959000

Spindle Adapter		
	Spindle adapter YM Zenit+ QPRO	50328000
	Spindle adapter YM Zenit+ 21C	50330000
	Spindle adapter YM Zenit+ SOP	50155100
	Spindle adapter YM Zenit+ AC	50274000
	Spindle adapter YM Zenit+ AC338	50276000
	Spindle adapter YM Zenit+ SMARO/ISPERO	50233000

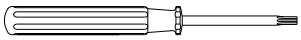
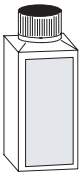
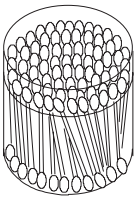
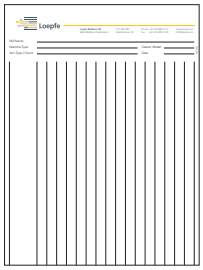
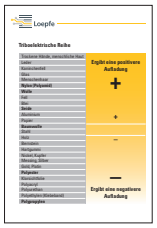
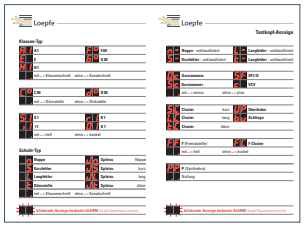
Sensing Head TK YM ZENIT+

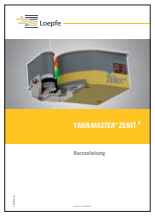
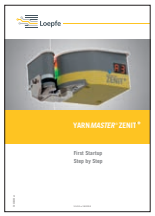
Murata	
TK YM Zenit+ D QPRO	50314020
TK YM Zenit+ DF QPRO	50315020
TK YM Zenit+ DFP QPRO	50316020
TK YM Zenit+ D N QPRO	50317000
TK YM Zenit+ DF N QPRO	50318000
TK YM Zenit+ DFP N QPRO	50319000
TK YM Zenit+ D 21C	50234020
TK YM Zenit+ DF 21C	50235020
TK YM Zenit+ DFP 21C	50236020
TK YM Zenit+ D N 21C	50281000
TK YM Zenit+ DF N 21C	50282000
TK YM Zenit+ DFP N 21C	50283000
Savio	
TK YM Zenit+ D SP	50342000
TK YM Zenit+ DF SP	50343000
TK YM Zenit+ DFP SP	50344000
TK YM Zenit+ D N SP	59345000
TK YM Zenit+ DF N SP	50346000
TK YM Zenit+ DFP N SP	50347000
TK YM Zenit+ D SOP	50237020
TK YM Zenit+ DF SOP	50238020
TK YM Zenit+ DFP SOP	50239020
TK YM Zenit+ D N SOP	50284000
TK YM Zenit+ DF N SOP	50285000
TK YM Zenit+ DFP N SOP	5028600
Schlafhorst	
TK YM Zenit+ D AC5 / ACX5	50240020
TK YM Zenit+ DF AC5 / ACX5	50241020
TK YM Zenit+ DFP AC5 / ACX5	50242020
TK YM Zenit+ D N AC5 / ACX5	50287000
TK YM Zenit+ DF N AC5 / ACX5	50288000
TK YM Zenit+ DFP N AC5 / ACX5	50289000
TK YM Zenit+ D AC6	50348000
TK YM Zenit+ DF AC6	50349000
TK YM Zenit+ DFP AC6	50350000
TK YM Zenit+ D N AC6	50351000
TK YM Zenit+ DF N AC6	50352000
TK YM Zenit+ DFP N AC6	50353000

	Schlafhorst	
	TK YM Zenit^{+} D AC338	50471000
	TK YM Zenit^{+} DF AC338	50472000
	TK YM Zenit^{+} DFP AC338	50473000
	TK YM Zenit^{+} D N AC338	50474000
	TK YM Zenit^{+} DF N AC338	50475000
	TK YM Zenit^{+} DFP N AC338	50476000
	QDHD	
	TK YM Zenit^{+} D SMARO	50411000
	TK YM Zenit^{+} DF SMARO	50412000
	TK YM Zenit^{+} DFP SMARO	50462000
	TK YM Zenit^{+} D N SMARO	50413000
	TK YM Zenit^{+} DF N SMARO	50414000
	TK YM Zenit^{+}D VCRO (12 pin)	50464000
	TK YM Zenit^{+}DF VCRO (12 pin)	50465000
	TK YM Zenit^{+}DFP VCRO (12 pin)	50466000
	TK YM Zenit^{+}D VCRO (14 pin)	50464010
	TK YM Zenit^{+}DF VCRO (14 pin)	50465010
	TK YM Zenit^{+}DFP VCRO (14 pin)	50466010
	QTM	
	TK YM Zenit^{+} D ISPERO	50442000
	TK YM Zenit^{+} DF ISPERO	50443000
	TK YM Zenit^{+} DFP ISPERO	50444000
	TK YM Zenit^{+}D FARO	50467000
	TK YM Zenit^{+}DF FARO	50468000
	TK YM Zenit^{+}DFP FARO	50469000
	Knife TK YM Zenit^{+}	50033020
	Yarn guide plate TK YM Zenit^{+}	50302000
	2 x SR HRD TORX8 WN5451 K25 x 10	17045900
	Side limiter TK YM Zenit^{+}	50246000
	1 x SR LZYL TORX8 M 2.5 x 6	16666900
	1 x Schnorr lock washer Z/M 2.6	10667900

	Side limiter TK YM Zenit^{+} AC	50254000
	1 x SR LZYL TORX8 M 2.5 x 6	16666900
	1 x Schnorr lock washer Z/M 2.6	10667900
	Retaining mechanism TK YM Zenit^{+}	50299000
	1 x SR LZYL TORX8 M 2.5 x 6	16666900
	1 x U SB 2.5 x 5.0 x 0.5 Polyamid	16516900
	Retaining mechanism TK YM Zenit^{+} 21C / QPRO, AC	50298000
	1 x SR LZYL TORX8 M 2.5 x 6	16666900
	1 x U SB 2.5 x 5.0 x 0.5 Polyamid	16516900
	P sensor TK YM Zenit^{+} DFP	50025030
	2 x SR HRD TORX8 WN5451 K25 x 10	17045900
	P upgrade set TK YM Zenit^{+} DF QPRO	50381000
	P upgrade set TK YM Zenit^{+} DF 21C	50382000
	P upgrade set TK YM Zenit^{+} DF SOP	50383000
	P upgrade set TK YM Zenit^{+} DF AC	50384000
	P upgrade set TK YM Zenit^{+} DF AC6	50415000
	P upgrade set TK YM Zenit^{+} DF SP	50416000
	2 x SR HRD TORX8 WN5451 K25 x 10	17045900

10.4 Accessories

	Screwdriver Torx T8	16748900
	LOEPFE TK Clean	14359900
	Cotton buds	14655900
	Fault chart	42874000
	Card “Triboelectric” YM Zenit^{+} deutsch français english español italiano português türkçe 中文	 50354001 50354002 50354703 50354004 50354005 50354006 50354007 50354010
	Card “7 Segment Display” YM Zenit^{+} deutsch français english español italiano português türkçe 中文	 50320001 50320002 50320003 50320004 50320005 50320006 50320007 50320010

	Quick Guide YM Zenit+	
	deutsch	50418001
	français	50418002
	english	50418003
	español	50418004
	italiano	50418005
	português	50418006
	türkçe	50418007
	中文	50418010
	Startup manual YM Zenit+	
	deutsch	50338001
	français	50338002
	english	50338003
	español	50338004
	italiano	50338005
	português	50338006
	türkçe	50338007
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	english	50521003
	türkçe	50521007

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