

HR 550

Rework-System



Translation of the original operating manual: 3BA00235 | Serial No.:

Ersa GmbH
Leonhard-Karl-Str. 24
97877 Wertheim
www.ersa.de

Rev. 8
Printing date: 13/12/2021

Phone +49 9342/800-136
Fax +49 9342/800-132
Mobile +49 171 241 846 8
service-ersa@kurtzrsa.de





Table of contents

1	Introduction	7
1.1	Product information.....	8
1.1.1	General information about the product.....	8
1.1.2	Intended use.....	8
1.1.3	Retrofitting, changes	8
1.1.4	Warranty.....	8
1.2	Information about this manual	9
1.2.1	Pictogram and symbol explanations.....	10
1.2.1.1	Prevailing term definitions in this instruction manual.....	11
1.2.1.2	Warnings.....	12
1.2.1.3	Rule notices	13
1.2.1.4	Prohibition notices.....	14
1.2.2	Target readers group	15
1.2.3	Copyright, liability.....	15
2	Technical data	17
2.1	General data.....	18
2.2	Electrical connection.....	18
2.3	Heating system.....	18
2.4	Axis system.....	19
2.5	Cameras	19
2.6	Printed circuit boards and components.....	19
2.7	PC system requirements	19
2.8	Ambient conditions.....	20
2.9	Options.....	21
3	For your safety.....	25
3.1	General safety instructions	26
3.1.1	Nationally valid safety and accident prevention regulations	26
3.1.2	Fire protection	26
3.2	Subject-related safety instructions	26
3.2.1	Dealing with electrical equipment.....	26
3.2.2	Dealing with process materials and substances	26
3.3	Safety instructions for certain operating phases	27
3.4	Safety instructions for maintenance, service, specific work, troubleshooting	27
3.5	Safety instructions for certain machine and system parts.....	28
3.5.1	Hot device.....	28
3.5.2	Laser equipment	28
3.5.3	Using a solder fume extractor, plug available	28
3.6	Retrofitting and changes.....	28
4	Transport, installation, storage, disposal	29
4.1	Information concerning machine transport and storage.....	30
4.2	Information on how to unpack the machine	30
4.3	Packaging with TIP n TELL indicator	30
4.4	Scope of delivery.....	31
4.5	Unpacking, setting up and connecting the Rework System	32
4.5.1	Unpacking	32
4.5.2	Set up.....	33
4.5.2.1	Remove the vision box transport lock.....	34
4.5.3	Connecting the machine.....	35



- 4.5.4 Assembling an RPC camera (optional) 37
- 4.5.5 Assembling an Accu-TC holder and an air baffle 39
- 4.5.6 Insert the heating head 41
- 4.5.7 Screwing on a soldering nozzle and then removing the transport lock..... 42
- 4.5.8 Connect the signal cable of the optional residual solder sucker Scavenger 44
- 4.6 Disposal 48
- 5 Commissioning 49**
- 5.1 Setting up the PC..... 50
- 5.2 Performing functions [Start Setup] and [Pixel Shift adjustment] 52
- 6 Function description 55**
- 6.1 Read this first! 56
 - 6.1.1 Target readers group 56
 - 6.1.2 Supplementary documents 56
 - 6.1.3 ESD-hazardous components 56
- 6.2 Overview of the machine parts 57
- 6.3 Switching on the Rework system and starting HRSoft 2 60
- 6.4 The top bar in the HRSoft 2 program 61
- 6.5 Temporarily editing the soldering profile in the [Rework] tab 62
 - 6.5.1 [Rework] tabulator overview 62
 - 6.5.2 Use of the soldering profile in the [Rework] tabulator 64
 - 6.5.3 The tabulators [Information], [Heating setting] and the arrow key [Image processing] 65
 - 6.5.3.1 The three right tabulators 65
 - 6.5.3.2 The [Information] tabulator under the [Rework] tabulator 65
 - 6.5.3.3 The [Heating setting] tabulator under the [Rework] tabulator 68
 - 6.5.3.4 The tabulator with the small arrow key (Image processing) under the [Rework] tabulator 70
 - 6.5.4 The chart in the [Rework] tabulator 72
 - 6.5.4.1 The heating curves in the [Rework] tab 73
 - 6.5.5 [Process automation] and its process steps 75
- 6.6 The [Archive] tabulator 76
 - 6.6.1 The [Show chart] button 77
- 6.7 The [user management] tabulator 79
- 6.8 Editing the soldering profile in the [Profile management] tab and changing it permanently 81
 - 6.8.1 Overview of the [Profile management] tabulator 81
 - 6.8.2 Create, copy, delete and save soldering profiles in the [Profile management] tabulator 82
 - 6.8.3 The tabulators [Information], [Heating setting] and the arrow key [Image processing] 85
 - 6.8.3.1 The [Information] tabulator under the [User management] tabulator 85
 - 6.8.3.2 The [Heating setting] tabulator under the [Profile management] tabulator 88
 - 6.8.3.3 The tab with the arrow button [More] under the [Profile management] tab 90
- 6.9 The chart in the [Profile management] tabulator 92
- 6.10 The heating curves in the chart in the [Profile Management] tab 92
- 6.11 The [Process automation] buttons under the [Profile management] tabulator 94
- 6.12 The [Management] tabulator with three dialog windows 95
 - 6.12.1 The dialog [HRSoft 2 settings] 95
 - 6.12.2 The [Chart settings] dialog 97
 - 6.12.3 The [device settings] dialog 98
 - 6.12.3.1 The button [Start maintenance mode] 101
 - 6.12.3.2 The [Pixel shift adjustment] button 105
- 6.13 The [Manual Mode] 109
- 6.14 The display and switch row top right 111
- 6.15 Switching off the Rework System 113



7	Tutorial – Soldering or desoldering a component	115
7.1	Insert the PCB	116
7.2	Replacing the soldering nozzle	117
7.3	Position a thermocouple	122
7.4	Shielding heat sensitive components	123
7.5	Activate a soldering profile and prepare the soldering process	124
7.6	Start the process and work with the assistant	125
7.7	Task 1 “Alignment”	127
7.8	Task 2 “Desoldering”	128
7.9	Task 3 “Deposit”	130
7.10	Task 4 “Preparation”	132
7.11	Work step 4 for “Cleaning” with the optional residual solder sucker	134
7.12	Task 5 “Alignment”	138
7.13	Task 6 “Inspection”	140
7.14	Task 7 “Soldering”	142
7.15	Task 8 “Inspection”	144
7.16	Task 9 “Complete”	146
8	Service and maintenance	147
8.1	Check the rework system on a weekly basis for any dirt or damages	148
8.2	Lubricating the worm gear of the pipette hub every six months	149
8.3	Change the heating head	150
8.4	Performing a HRSoft 2 update	151
9	Spare and wear parts	153
9.1	Read this first!	154
9.1.1	Target readers, permitted spare parts	154
9.2	Nameplate and machine number	154
9.3	Spare parts	155
10	Annex	158
10.1	EC Declaration of Conformity	159



1 Introduction

1.1	Product information.....	8
1.1.1	General information about the product.....	8
1.1.2	Intended use.....	8
1.1.3	Retrofitting, changes.....	8
1.1.4	Warranty.....	8
1.2	Information about this manual.....	9
1.2.1	Pictogram and symbol explanations.....	10
1.2.1.1	Prevailing term definitions in this instruction manual.....	11
1.2.1.2	Warnings.....	12
1.2.1.3	Rule notices.....	13
1.2.1.4	Prohibition notices.....	14
1.2.2	Target readers group.....	15
1.2.3	Copyright, liability.....	15



1.1 Product information

1.1.1 General information about the product

This operating manual is universally valid for Ersa Hybrid-Rework-System of the HR 550 series.

1.1.2 Intended use

The machine is a state-of-the-art product that has been designed and manufactured according to recognised safety-related rules. However, the machine may pose residual hazards especially when it is used improperly and operated or serviced by untrained personnel. The HR 550 rework system is design for industrial indoor use. The machine may be used exclusively for soldering and unsoldering electronic components on PCBs. Any other or further use is considered improper. The manufacturer/supplier declines any liability for any damages that may arise as a result of such use. Proper use also includes compliance with the operating instructions as well as safety notices.

1.1.3 Retrofitting, changes

Unauthorized modifications and / or changes that affect the security of the machine are not permitted and exclude any liability of the manufacturer / supplier for any resulting damage. The machine is only intended for commercial use. Private use is generally excluded.

1.1.4 Warranty

The warranty period shall be compliant with ERSA GmbH applicable terms of sale, delivery and payment. ERSA GmbH may only grant a warranty if the unit is returned in its original packaging.

Any inappropriate use and improper operation on the unit shall void all warranty and liability claims of the buyer against the manufacturer.

To the extent permitted by law, liability for direct, consequential and indirect damage resulting from the purchase of this product is ruled out.



1.2 Information about this manual

For your safety

ERSA products are developed, manufactured and tested in compliance with the basic safety requirements.

Nevertheless, residual risks still exist!

For this reason, please read these operating instructions before operating the machine for the first time. The instructions manual helps you master all the functions and use them optimally.

DANGER

Hazards caused by the improper operation of the machine!

✓ Observe the operating instructions!

- a) Any person involved in the installation, commissioning, operation and/or maintenance of the machine must have read and understood the contents of chapter "Safety instructions", as well as the chapters which are relevant for the specific activity!
- b) The operator is advised to have this confirmed in writing!
- c) In addition, for the machine operation, local safety and accident prevention regulations must also be complied with!
- d) Always keep these instructions near the machine, in a place accessible to all users at any time!





1.2.1 Pictogram and symbol explanations

Pictograms are used to identify dangers, both in this instruction manual and on the machine.

Specific information or requirements and prohibitions for the prevention of personal injury or property damage are shown in the manual with a pictogram, and are complemented in the text by **hierarchically graded, signal words in bold print**:



⚠ DANGER

It describes an *immediately* threatening danger

If not avoided, death, serious injury or material damage can result.

- a) Measures are described in the following text to avert the danger.



⚠ WARNING

It indicates a *potentially* threatening danger

If not avoided, death, serious injury or material damage can result.

- a) Measures are described in the following text to avert the danger.



⚠ CAUTION

It indicates a *potentially* threatening danger

If not avoided, death, serious injury or material damage can result.

- a) Measures are described in the following text to avert a danger.



NOTE

The hereinafter highlighted text passages contain explanations, further information or tips.



1.2.1.1 Prevailing term definitions in this instruction manual

In addition to the pictograms described above, we use the following symbols and notations:

Safety instructions

- ✓ This symbol means: **Prerequisite** to avert a danger.
- a) This symbol means: **Measures** to avert a danger.

An example:



NOTE

Machine malfunctions caused by improper maintenance!

- ✓ Shorten service intervals, if necessary!
- a) Service intervals in this manual refer to single shift operation! They are to be shortened accordingly for multi-shift operation!

Operating instructions

the operating instructions contain:

- references to the measures to be adopted

or

- instructions to be followed by all means.

The operating instructions are structured as follows:

- ✓ this symbol means: **prerequisite** for the implementation of a measure **or**
- ✓ **aim** of a measure.
 - a) This symbol means: **description** of a measure.
 - ⇒ This symbol means: **intermediate result**.
 - ⇒ This symbol means: **result**.

An example: pressure adjustment

- ✓ Remove the cover panel.
 - a) Adjust the (A) regulator air pressure to 2.5 bar.
 - ⇒ The symbol on the screen turns green.
 - b) Reinstall the cover panel.
 - ⇒ The air pressure has been properly set.



1.2.1.2 Warnings

We use the following pictograms for warnings:



⚠ WARNING

Dangerous electrical voltage! Danger of electrocution!



⚠ WARNING

Hot surfaces, hot gases! Burn hazard!



⚠ WARNING

Laser beam! Risk of retinal burns!



⚠ WARNING

Risk of injury! Hand injury risk!



1.2.1.3 Rule notices



NOTE

Read the operating instructions!



NOTE

Wear protective goggles!



NOTE

Disconnect power!



NOTE

ESD-hazardous components!



1.2.1.4 Prohibition notices

We use the following pictograms for prohibition notices:





1.2.2 Target readers group

These instructions are intended for people who use, adjust, operate or service the machine.



DANGER

Personal injury or material damage due to inadequate maintenance and improper operation of the machine!

- ✓ Use only qualified personnel!
- a) The machine transport, assembly, connection, commissioning, operation or maintenance by people who are not sufficiently qualified and informed can cause severe damage to the machine or damage to people.
- b) Such work may therefore only be performed by properly trained personnel! This personnel must be able to recognize the hazards that can be caused by the system mechanical, electrical or electronic equipment.
- c) The people who carry out such work must know and have understood the contents of these instructions.
- d) Any person involved in the installation, commissioning, operation and/or maintenance of the machine must have read and understood the contents of the "Safety instructions" chapter, as well as the chapters which are relevant for the specific activity!

1.2.3 Copyright, liability

Ersa has written these operating instructions with great care. However, no guarantee can be given as to the content, completeness and quality of the information provided in this manual. The content is continually updated and adapted to current conditions.

All the data published in these operating instructions, including the information provided about products and procedures, was identified by us to the best of our knowledge and ability, and using the most modern technical aids. These specifications are non-binding and for information only; they do not relieve users from the responsibility to carry out their own checks before operating the equipment. We accept no liability for any infringement of third party rights for applications and procedures without prior express written confirmation. We reserve the right to make technical changes with the intention of improving the product.

To the extent permitted by law, liability for direct, consequential and indirect damage resulting from the purchase of this product is ruled out. All rights reserved.

These operating instructions, or any parts thereof, may not be reproduced, modified, transferred or translated into another language without the written permission of ERSA GmbH!



NOTE

The original operating instructions were drawn up in the [German] language

The original operating instructions in German are contained in the [\\ERSA\product_data\049\] folder on the drive of your machine PC. All other available languages are translations of the original operating instructions. Should any discrepancies occur in the translated text, consult the original operating instructions (German) for clarification or contact the machine manufacturer.





2 Technical data

2.1	General data.....	18
2.2	Electrical connection.....	18
2.3	Heating system.....	18
2.4	Axis system.....	19
2.5	Cameras	19
2.6	Printed circuit boards and components.....	19
2.7	PC system requirements	19
2.8	Ambient conditions.....	20
2.9	Options.....	21



2.1 General data

Description	
Width (mm)	573
Depth (mm)	765
Height (mm)	545 / 747, heating head bottom/top
Weight (kg)	76

2.2 Electrical connection



Fig. 1: Plug CEE 16 A, blue

Designation	
Mains voltage 3-wire system (V)	1 x 230 V
Voltage tolerance (%)	± 10
Mains frequency (Hz)	50 - 60
Fuse (A)	16
Power consumption (kW)	3,68
Connection	CEE 16 A

2.3 Heating system

Bottom radiator

Designation	
Heating type	Ceramic heating elements, medium wave, infrared, reactive
Radiator cassette dimensions (width x depth, mm, mm)	382 x 280
Number of heating zones	3
Rated power (kW) at 230 V	2,4 (3 x 0,8)

Top radiator

Designation	
Heating type	Hybrid radiators, ceramic heating elements, medium wave, infrared, with convection
Component handling	Built-in pipette, motorised
Dimensions (width x depth, mm)	80 x 80
Rated power (kW) at 230 V	0,9 convection and 0,9 infrared
Aperture adapter (mm)	30 x 30, 45 x 45



Temperature sensors

Designation	
Sensor type	Non-contact infrared sensor (pyrometer). digital
Additional inputs for K-type thermocouples*	3

*An AccuTC is included in the scope of delivery

2.4 Axis system

Description	
Type	Precision guide with multiphase motors
Axes	Z heating head, Z pipette
Position accuracy (µm)	± 25
Nozzle diameter (mm)	5 and 10

2.5 Cameras

Visionbox pick-and-place camera

Designation	
Type	Colour camera
Resolution (Mpixel)	5
Interface	GigE
Lighting	LED, dimmable
Laser pointer	Laser Class 2

2.6 Printed circuit boards and components

Description	
PCB cooling from below	Blower
Max. PCB size (width x depth, mm)	400 x 300 (15.7" x 11.8")
Min. PCB size (width x depth, mm)	20 x 20 (0.8" x 0.8")
Max. PCB thickness (mm)	10 (0.4")
Max. PCB mass (kg)	3
Min. component dimensions (mm)	01005
Max. component dimensions (mm)	70 x 70 (2.7" x 2.7")
Type operating distance above (mm)	30 – 60 (1.2" x 2.4") to top heating 35 (1.4") to bottom heating
Clearance below (mm)	35 (1.4")

2.7 PC system requirements

For the PC configuration required for your Rework System, refer to the PDF document

[3BA00212_PC-Setup-Recommendation_Ersa-IRSoft-HRSoft-ImageDoc.pdf].

This document can be found on the Ersa Rework USB stick (3BA000149).



2.8 Ambient conditions

Description	
Ambient temperature (°C)	18...26, constant
Air humidity (% , non-condensing)	40...60



2.9 Options

The following items are available as options (not included in the scope of delivery):

	Description	Item number
	Nozzle Ø 1 mm, metallic *	OHR5520-05010
	Nozzle Ø 2 mm, metallic *	OHR5520-10020
	Nozzle Ø 3.3 mm with silicone cup Ø 2 mm **	OHR5520-20033
	Nozzle Ø 0,3/0,2 mm od/id *	OHR5520-02003
	Nozzle Ø 0.35/0.25 mm od/id *	OHR5520-02503 5B
	Nozzle Ø 0,6/0,5 mm od/id *	OHR5520-05006
	Nozzle Ø 0,7/0,6 mm od/id *	OHR5520-06007
	Component filter for all nozzles, 10 pieces***	OHR5521/10
	RPC camera	OHR510
	Dip & Print station	OPR100





	Description	Item number
	Dip stencil 40 x 40, 0.3 mm	OPR100-D001
	Dip stencil 40 x 40, 0.1 mm	OPR100-D004
	PCB holder frame large	OHR554L
	Board holder	OPH100
	Holder for odd shaped PCBs	OHR655
	AccuTC 2.0 thermocouple	OHR645
	K-type thermocouple wire with plug	OIR4510-02


* Metal, long service life, several months to years. Cleaning with isopropanol. Treat carefully.

** Metal nozzle, long service life. Replace silicone suction cups after 10-30 soldering processes.

The following devices can be connected to the HR 550 unit. They can be controlled via the HR 550 unit:

	Description	Item number
	Fume extraction Ersas EASY ARM 1 (Through flow volume 110 m ³ /h)	OCA10-001
	Fume extraction Ersas EASY ARM 2 (Through flow volume 2 x 110 m ³ /h)	OCA-10-002



	Description	Item number
	Interface cable to fume extraction unit, 2 m	3CA10-2005
	Solder removal module Scavenger	OSC550





3 For your safety

3.1	General safety instructions	26
3.1.1	Nationally valid safety and accident prevention regulations	26
3.1.2	Fire protection	26
3.2	Subject-related safety instructions	26
3.2.1	Dealing with electrical equipment	26
3.2.2	Dealing with process materials and substances	26
3.3	Safety instructions for certain operating phases	27
3.4	Safety instructions for maintenance, service, specific work, troubleshooting	27
3.5	Safety instructions for certain machine and system parts	28
3.5.1	Hot device	28
3.5.2	Laser equipment	28
3.5.3	Using a solder fume extractor, plug available	28
3.6	Retrofitting and changes	28



3.1 General safety instructions

3.1.1 Nationally valid safety and accident prevention regulations

For any work performed on the machine itself or on its electric or pneumatic equipment, the locally applicable accident prevention, safety and environmental protection regulations are to be observed.

3.1.2 Fire protection

- a) The machine is to be assessed for fire protection requirements at the installation site.
- b) Locally applicable fire protection regulations must be observed.

3.2 Subject-related safety instructions

3.2.1 Dealing with electrical equipment



⚠ DANGER

Dangerous electrical voltage!

Serious injury or death from electric shock!

- ✓ Work on the electrical system or the machine electrical devices must be undertaken only by a skilled electrician or by properly trained people under the supervision and guidance of a skilled electrician in accordance with the electro-technical rules.
- a) Before opening any housing parts, remove plug from mains!
 - b) Use only original fuses with the specified current rating.
 - c) Use only insulated tools.
 - d) In case of faults in the power supply, switch off the system immediately.

3.2.2 Dealing with process materials and substances



⚠ CAUTION

Irritating substances!

Personal injury or property damage when dealing with oils, greases, chemicals!

- a) Read the rules applicable to the product safety data sheets before use!



⚠ DANGER

Hot supplies, hot excipients, liquid metal!

Risk of burns when dealing with fuels, additives and liquid metal!

- a) Be aware of the in-house provision for protective clothing!
- b) Work on the hot machine must only be carried out by trained and qualified personnel!



⚠ DANGER

Substances hazardous to health!

Risk of poisoning by inhalation or ingestion!

- a) Flux fumes are produced during soldering. These are harmful to health. Do not eat, drink or smoke in places where soldering is carried out!
- b) Traces of lead from the soldering adhering to a person's hands may access the human organism via food or cigarettes (health hazard). After touching solder, clean your hands thoroughly!



⚠ CAUTION

toxic fumes!

Risk of poisoning by inhalation!

- a) During soldering, gas emissions arise from the module or from the solder paste used. These gas emissions are harmful.
- b) With respect to respiratory protection, the operator must observe the processing instructions specified in the safety data sheets of the solder pastes and fluxes used!

3.3 Safety instructions for certain operating phases



⚠ WARNING

Severe or fatal injuries from flammable substances! Fire and explosion hazard due to overheating!

- a) Do not leave the machine running unattended!
- b) The heating of highly flammable or explosive materials is prohibited!

3.4 Safety instructions for maintenance, service, specific work, troubleshooting



⚠ WARNING

The machine malfunctioning is possible!

Personal injury or property damage due to improper commissioning or incorrect operation of the machine!

✓ Commissioning must be performed by trained and qualified staff only.

- a) Inspect the machine for visible defects!
- b) Check all safety devices for proper operation!
- c) Wear suitable protective clothing for all types of work!
- d) During commissioning, ensure switching on and off processes and monitoring directions are in accordance with the operating instruction manual!



NOTE

Disposal

- a) Provide safe and environmentally friendly disposal of packaging materials!



3.5 Safety instructions for certain machine and system parts

3.5.1 Hot device



CAUTION

Risk of burns from hot surfaces!

- a) Touching the device surfaces may cause burns!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts become strongly heated during the soldering process!

3.5.2 Laser equipment



DANGER

Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!
- b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
- c) Class 2 laser according to DIN EN 60825-1:2008-5, $P < 1 \text{ mW}$, $\lambda = 650 \text{ nm}$

3.5.3 Using a solder fume extractor, plug available



NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersas "Easy Arm" with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.

3.6 Retrofitting and changes

Any unauthorised alterations and/or changes that may affect the machine safety are prohibited and relieve the manufacturer / supplier of any liability for any resulting damages.



WARNING

Personal injury or property damage and environmental damage caused by the machine defective condition!

- ✓ So, please always make sure that retrofitting or modifying the machine does not pose any problem:
- a) Prior to making any changes to the machine, or altering its parameters, contact the machine manufacturer!



4 Transport, installation, storage, disposal

4.1	Information concerning machine transport and storage	30
4.2	Information on how to unpack the machine	30
4.3	Packaging with TIP n TELL indicator	30
4.4	Scope of delivery	31
4.5	Unpacking, setting up and connecting the Rework System	32
4.5.1	Unpacking	32
4.5.2	Set up	33
4.5.2.1	Remove the vision box transport lock	34
4.5.3	Connecting the machine	35
4.5.4	Assembling an RPC camera (optional)	37
4.5.5	Assembling an Accu-TC holder and an air baffle	39
4.5.6	Insert the heating head	41
4.5.7	Screwing on a soldering nozzle and then removing the transport lock.....	42
4.5.8	Connect the signal cable of the optional residual solder sucker Scavenger	44
4.6	Disposal	48



4.1 Information concerning machine transport and storage

CAUTION

Material damage is possible!



- ✓ The machine is supplied in a sturdy carton on a pallet. Damage caused by improper storage or improper transportation is not covered by warranty!
- a) Always transport or store the machine in a box on a pallet!
- b) During the machine transport, avoid any jerky movement, abrupt setting-down or bumping!
- c) During storage, protect the machine from weather conditions (moisture, humidity, sea air, fog)! If required, provide the machine with dehumidifying agent and air tight packaging!

4.2 Information on how to unpack the machine

CAUTION

Risk of injury!



- a) To unpack always use proper tools!
- b) Use suitable protective clothing!

NOTE

Disposal



- a) Provide safe and environmentally friendly disposal of packaging materials!

NOTE

Find out and ascertain any transport damage



- a) Inspect the machine for any transport damage immediately after unpacking it.
- b) Immediately notify the forwarder any transport damage.

4.3 Packaging with TIP n TELL indicator



- ✓ To check a package equipped with TIP n TELL tilt indicator:
 - a) check all the TIP n TELL stickers available.
 - b) If the indicator is not coloured, this means that: the machine was properly transported.
 - c) If the indicator has turned blue, this means that: during transport the machine was excessively tilted.
 - d) If the indicator has turned blue, this must be specified in the consignment note!

Fig. 2: Indicator not coloured



4.4 Scope of delivery



NOTE

Is delivery not complete or are there any damaged parts?

Check the delivery for completeness. If any items are missing or damaged, contact the supplier!

Number	Description	Item number
1	HR 550	0HR550
1	PCB holder HR 500	0HR554
1	Thermocouple mount V2	0HR641
1	AccuTC thermocouple without fixture *	0IR6500-37
1	Hexagon screw driver SW9	316569
1	Knurled wrench SW9	316590
1	RJ45 patch cable, 2.0 m	315664
1	Nozzle \varnothing 10 mm with silicone cup \varnothing 8 mm **	0HR5520-80100
1	Nozzle \varnothing 5 mm with silicone cup \varnothing 3.5 mm **	0HR5520-35050
1	Air deflector 45 x 45	330694
1	Air deflector 30 x 30	330692
1	Basic plate claibration target	320415
1	Calibration target 12 x 0,5 mm, blank	344244
1	Calibration target 12 x 0,3 mm, lasered	320010
1	USB flash drive Rework	3BA00149
1	Operating manual HR 550	3BA00233

* Long service life metallic thermocouple. Cleaning with isopropanol. Do not bend. Months-to-years service life.

** Metal nozzle, long service life. Replace silicone suction cups after 10-30 soldering processes.

Available options:

As to this, please also read Section [Options](#) [▶ 21].



4.5 Unpacking, setting up and connecting the Rework System

4.5.1 Unpacking

✓ Two people are required to lift the rework system:

a) The rework system is shipped to the point of installation in a box on a pallet.



Fig. 3: Open package

1	Cushioning material	4	HR 550
2	Fastening position for the heating head	5	Accessories, packed
3	Heating head, packed		

b) Open the fastening tape of the packaging using scissors.

c) Remove the top of the box.

d) Remove the upper foam packaging material.

e) Remove the boxes with the heating head (3) and the accessories (5).

✓ Should the packaging material be disposed of or stored for future use?

a) We recommend storing the packaging material for future use.

⇒ Only with this packaging material is it possible to pack, store and transport the HR 550 under conditions of safety!



4.5.2 Set up



⚠ WARNING

Fire hazard, hazard due to heat accumulation!

Personal or material damage is possible!

- a) Above, behind and next to the machine there must be no furniture (shelves, cabinets) or flammable products!
- b) The distance to the walls must be at least 10 cm.



Fig. 4: Lifting points

- a) Have two people grab the rework system from the lifting points (1) and remove it from the box. The weight of the device is ca. 75 Kg.
 - b) Place the rework system on the left of the table. In this way, the PC monitor, keyboard, mouse and work area will be on the right. The work table must meet the following requirements:
 - ⇒ The tabletop must be at least 600 mm wide and 900 mm deep. Breadthways it is also necessary to make room for the PC keyboard and screen.
 - ⇒ The table must be stable, level and designed to withstand a weight of at least 80 Kg. A vibration-free location improves the performance level of the rework system.
 - ⇒ Install the rework system in a point in which it is not exposed to draught!
 - ⇒ If the illumination of the work station is too bright, the camera may not work properly.
- ✓ Align the rework system:



- a) Make sure that the surface is horizontal and that the weight is evenly distributed among the machine feet!
- b) Please observe the following points:
 - ⇒ If during transport the device is exposed to strong temperature oscillations, allow it to adjust to room temperature for several hours before commissioning!
 - ⇒ The device must not be exposed to quick temperature changes!
 - ⇒ The point of installation must not be exposed to draught! Do not position the device close to ventilation shafts or air conditioning devices!
 - ⇒ In order to avoid problems while positioning the components, no strong extraneous light (e.g. sun rays or ceiling spotlight) must shine in the camera visual range!

4.5.2.1 Remove the vision box transport lock



- a) Using a #3 Allen wrench, remove the transport locking screw of the vision box on the right side of the housing.
- b) Store the transport locking screw for future use, should the device be transported again in the future.

Insert the screw again in case during transport the rework system is not placed horizontally.



4.5.3 Connecting the machine

✓ Connecting the machine:

a) remove all accessories from packaging, unwrap them and lay them out.



Fig. 5: HR 550 rear side

1	Eight Ethernet ports. For connection ports, see the sticker on the equipment housing	4	Connection for optional RPC camera lighting
2	Nameplate	5	Power cable
3	Connection for the optional solder fume extractor PLC	6	Fuse

- b) Make sure that the main switch on the front of the machine is in the OFF position.
- c) Compare the local line voltage and the mains frequency with the specifications on the nameplate (2) of the machine.
- d) If the RPC camera is already preassembled, plug the lighting cable of the camera into the connector (4). Secure the plug with the coupling nut. Plug the Ethernet cable to connect the camera to the rework system into socket # 2.
- e) If fume extractor “Ersa Easy Arm” is available, plug the modular cable (RJ-12, 2 m, order no. 317096) to the soldering station into socket (3). The fume extractor switches on automatically at working temperatures above 120° C.
- f) To get connected to the PC, plug the Ethernet cable into socket 5.
- g) When connecting the HR 550 to a company network, plug the relevant connecting cable into socket 6.
- h) Plug the mains plug (5) into the outlet.



NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersa “Easy Arm” with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.



4.5.4 Assembling an RPC camera (optional)

✓ If you purchased the optional [RPC camera]:

a) Perform a completeness check on the parts, see the picture below:

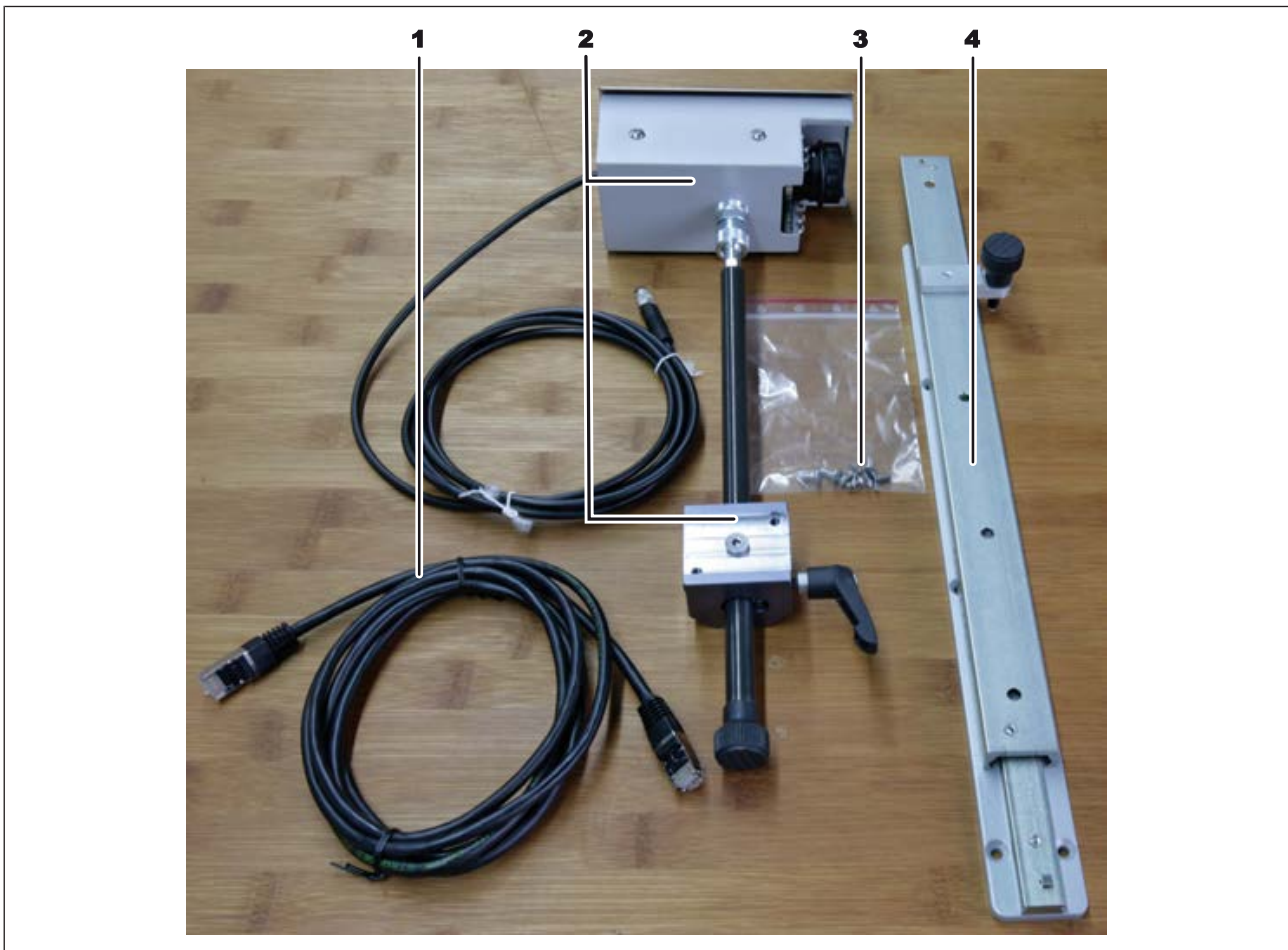


Fig. 6: RPC camera single parts

1	RJ45 patch cable, 2.0 m	3	Counter sunk screw V2A DIN 7991
2	RPC camera with adjustment	4	Telescopic rail with spacer plate

b) Assemble the camera. Fix the screw of the camera mount (6) to the telescopic rail, as shown in the following picture:

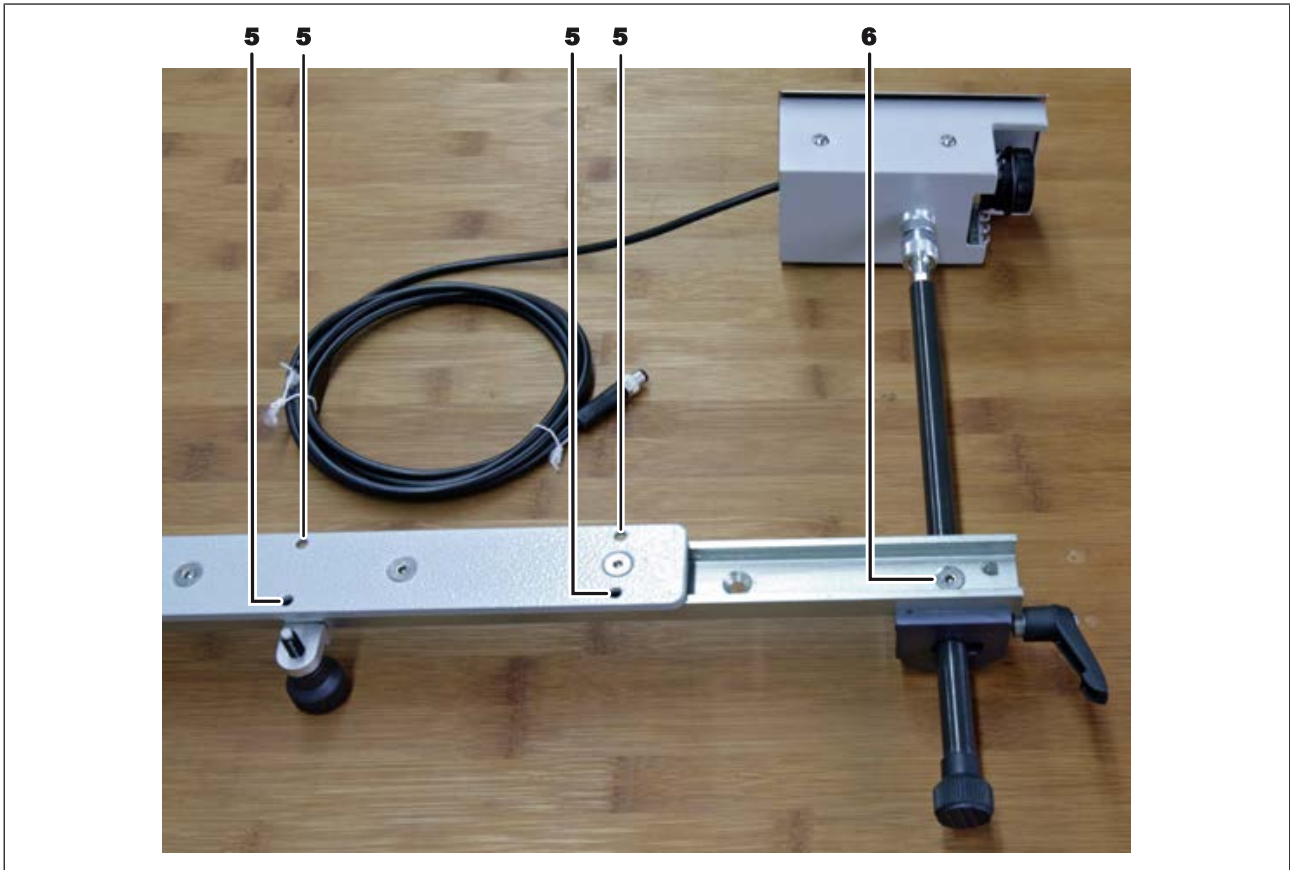


Fig. 7: RPC camera assembled

c) Mount the RPC camera with six screws (3) in the bores (5) at the left side of the Rework System, see the following example picture.



Fig. 8: Mounted RPC camera

d) Connect the Ethernet cable and the LED lighting cable to the Rework System. For this purpose, please read Chapter [Connecting](#) [▶ 35]



4.5.5 Assembling an Accu-TC holder and an air baffle

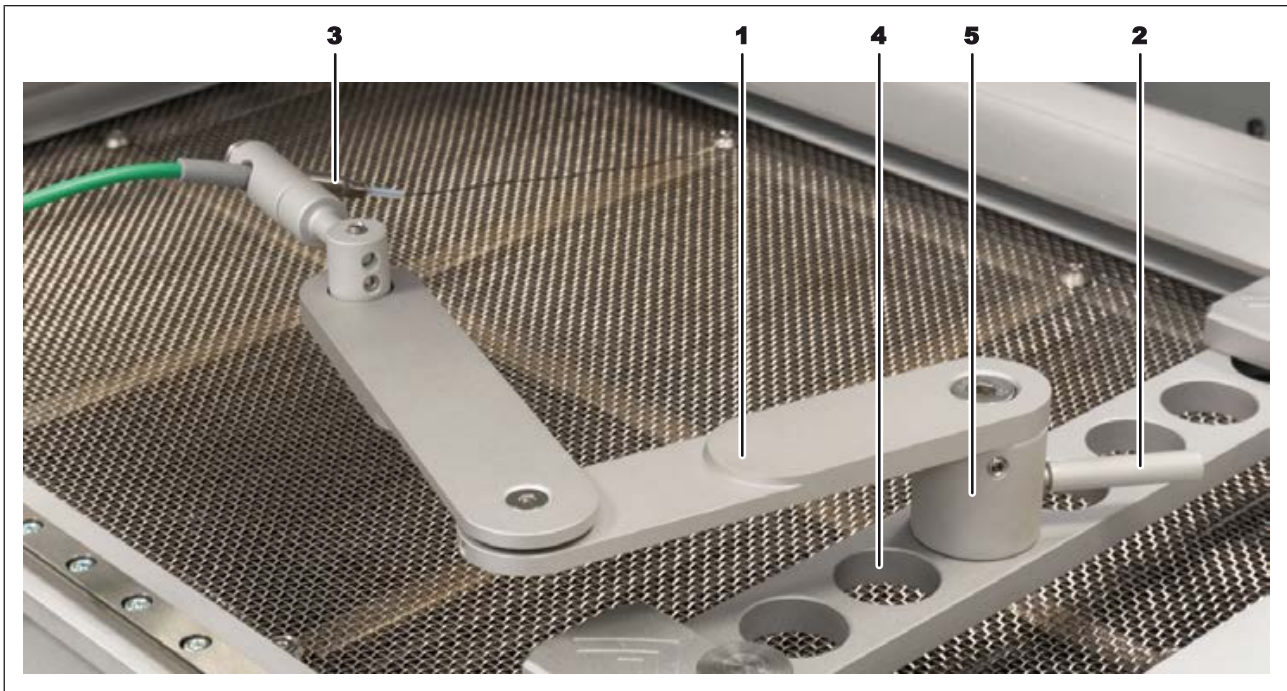


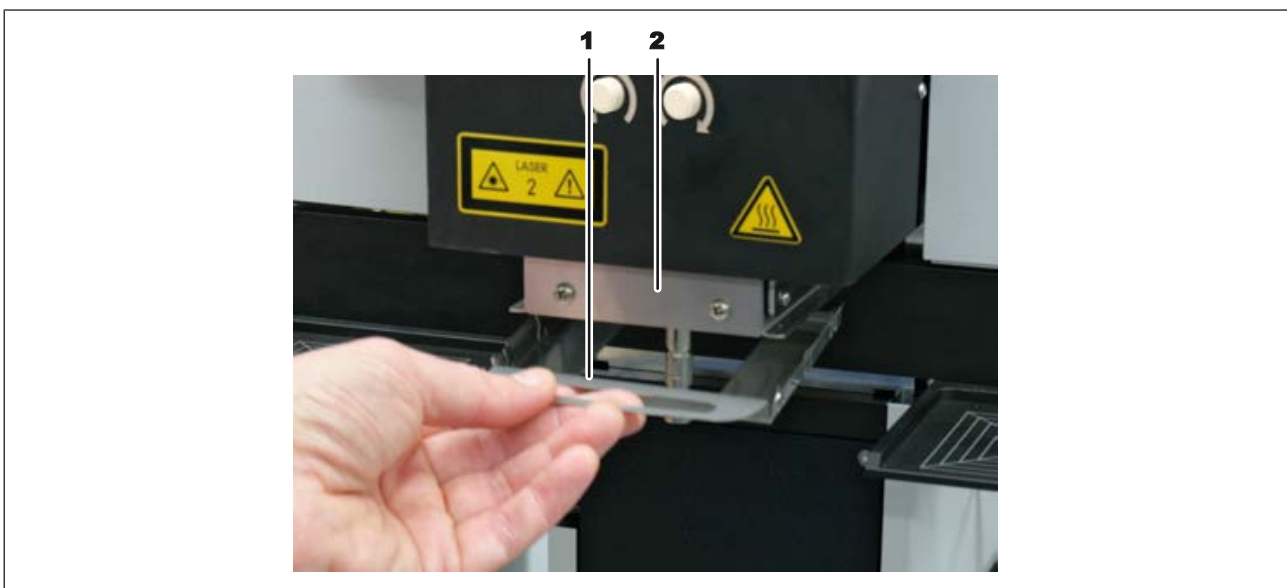
Fig. 9: AccuTC mount

✓ To assemble an Accu-TC holder:

- a) You can fit the holder into any of the four bores (4) in the PCB holder. To do so, insert the cylinder (5) into a bore and tighten with the lever (2).
- b) Connect the AccuTC thermocouple without fixture (item 01R6500-37) (3) to the socket [TC1].
- c) Mount the thermocouple (3) as shown.

Depending on their opening size, air baffles can reduce the heated surface as well as the thermal load around the soldering area.

To avoid material damage when installing air baffles, make sure that the air baffle does not touch the pipette and the soldering nozzle.



- a) Select an air baffle.



- b) Fit the back lugs of the air baffle (1) into the bottom plate of the heating head (2) from behind. Then press the air baffle upwards on its front side.



4.5.6 Insert the heating head

- a) Push the release lever on the upper side of the heating head on the pin. You can find the release lever in the accessories box.



Fig. 10: Use the release lever

- b) Place the heating head on both lower supports (see the arrow in the figure on the left).

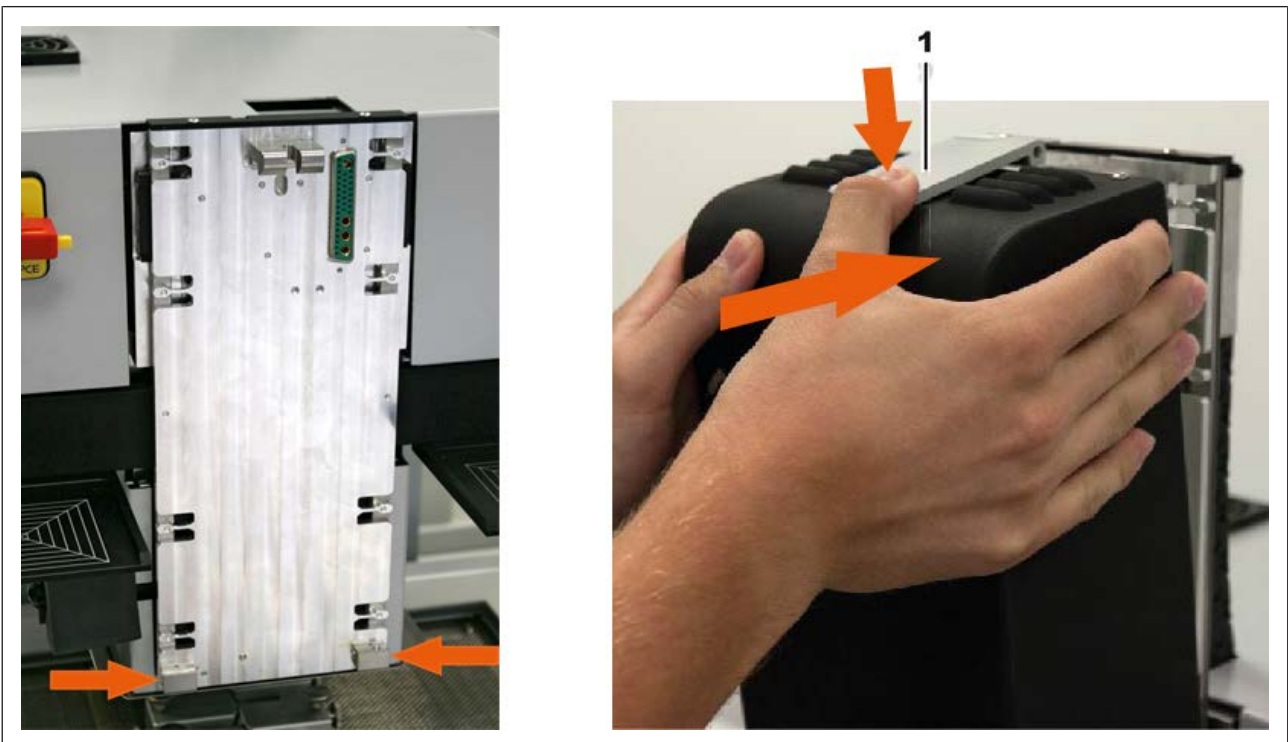


Fig. 11: Use the heating head with its suspension bracket

- c) Hold the heating head tight with both hands and keep the release lever pressed with a finger on the top of the heating head. Press the heating head on the top of the device (see arrow in the figure on the right) until it is locked in place.
- d) No pipette is screwed on the heating head yet. You can find the pipettes in the accessories box.



4.5.7 Screwing on a soldering nozzle and then removing the transport lock

Before start-up, a soldering nozzle must be screwed to the pipette (heating head underside). To do so, use one of the included soldering nozzles. Always select the largest possible soldering nozzle for the component. The soldering nozzle has been fitted to the pipette. With regard to this, please read Chapter [Overview of the machine parts](#) [▶ 57].

After unpacking the Rework system, you will see that a transport lock is fitted under the heating head. It supports the pipette retention mechanism to prevent any damage from external forces. When attaching and removing soldering nozzles, the transport lock must be applied to the pipette to compensate for the resulting strain on the pipette retention mechanism. Otherwise material damage will occur! After attaching or changing a soldering nozzle, unscrew the transport lock again.

The transport lock consists of the following parts:

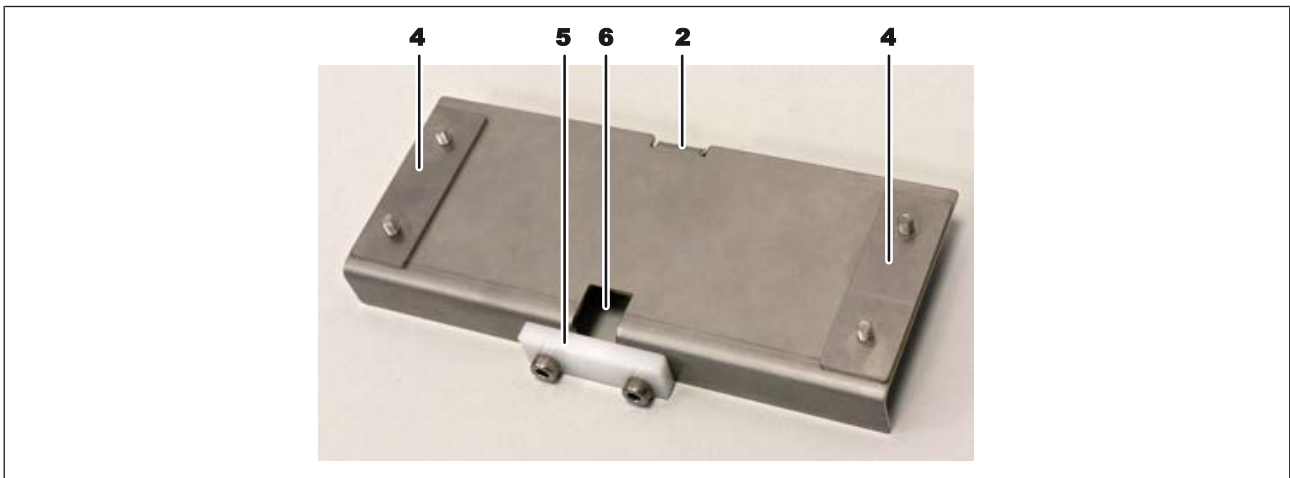


Fig. 12: The transport lock in the removed state

2	Handle of the transport lock.	5	Plastic clamping piece, screwed twice. Not needed for nozzle change. Only used to secure the pipette when shipping the rework system
4	Two fixing strips, each screwed twice	6	Pipette recess

The transport lock when fitted:

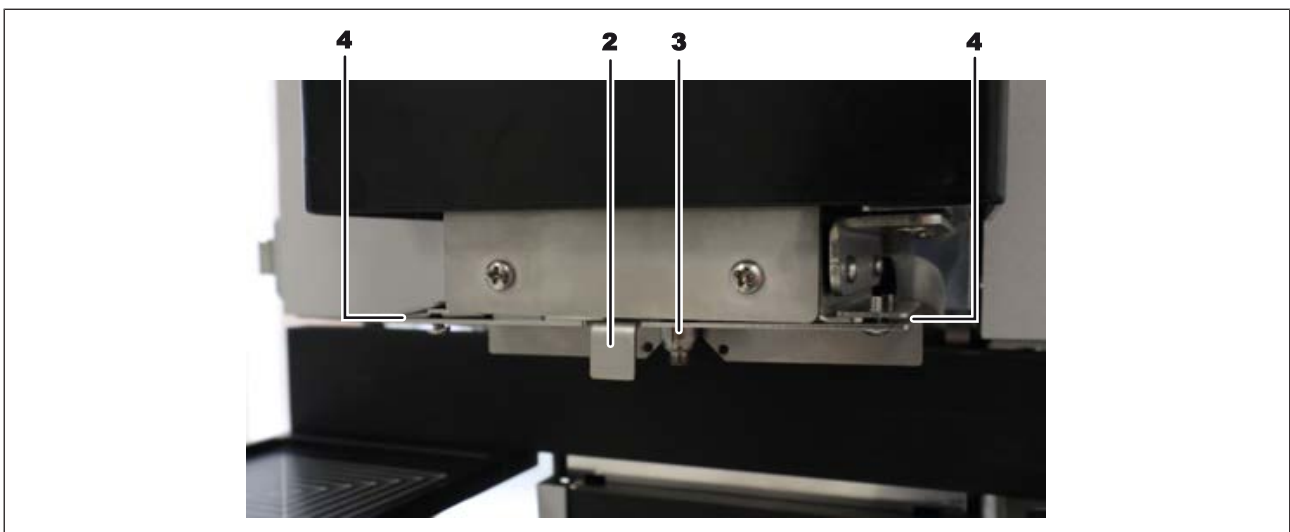


Fig. 13: The transport lock when fitted

- The transport lock is fastened to the heating head with two fixing strips (4)
- (2) Handle of the transport lock



- (3) Pipette (approx. 1 cm from the heating head), still with no soldering nozzle fitted.
 - a) Fit the soldering nozzle to the pipette and tighten it very slightly by hand.
 - b) Unscrew the plastic clamping piece (5) with a size 2 Allen key. When replacing soldering nozzles, you will not need this clamping piece during transport lock application. Store the clamping piece and any associated screws so as to be able to screw it back to the transport lock should the Rework system be subsequently carried or shipped.
 - c) Use the Allen key to loosen the two fixing strips (4), but do not unscrew them.
 - d) Pull the transport lock off the heating head to the front and put it down. Leave the fastening strips (4) screwed on.

Whenever attaching and removing soldering nozzles, the transport lock must be applied to the pipette to compensate for the resulting strain on the pipette retention mechanism. With regard to this, please read Chapter [Replacing the soldering nozzle](#) [▶ 117].

With regard to this, please also read Chapter [Spare parts](#) [▶ 155] where you can find a list of available pipettes.



4.5.8 Connect the signal cable of the optional residual solder sucker Scavenger

If you retrofit the Rework system with the residual solder sucker Scavenger, the Scavenger signal cable must be connected to the distributor board as described here. The work described here is to be carried out after installing the residual solder sucker.

The following tools are needed:

- 2.5 mm Allen keys
- Crimping tool with IDC function for MAS-CON® female multipoint connectors with a 2.54 mm grid dimension



Fig. 14: Crimping tool for pressing in the cables for MAS-CON® female multipoint connectors with a 2.54 mm grid dimension.

- 5 cable ties

The cable is inserted into the opening on the drag chain by the residual solder sucker. The figure shows the cable length needed outside the housing to ensure the swivelling movement of the residual solder sucker.



Fig. 15: Cable routing outside the housing, picture after assembly completion.



⚠ DANGER

Hazard due to electrical voltage when opening the Rework system!

Death or serious injuries due to electric shock!



- a) Work on electrical systems or equipment may only be carried out by a qualified electrician or by people trained in electrical engineering under the direction and supervision of a skilled electrician, in accordance with electrotechnical regulations.
- b) Before any work is performed by a skilled electrician on the electrical cabinet, the Rework system must be disconnected from the mains!

- a) Before starting work, switch off the Rework system and disconnect it from the mains - risk of electric shock!
- b) Use the Allen key on one side of the Rework system to loosen the four screws around the housing - see arrows in the following figure on the left.
- c) Also loosen the four screws on the other side of the housing.

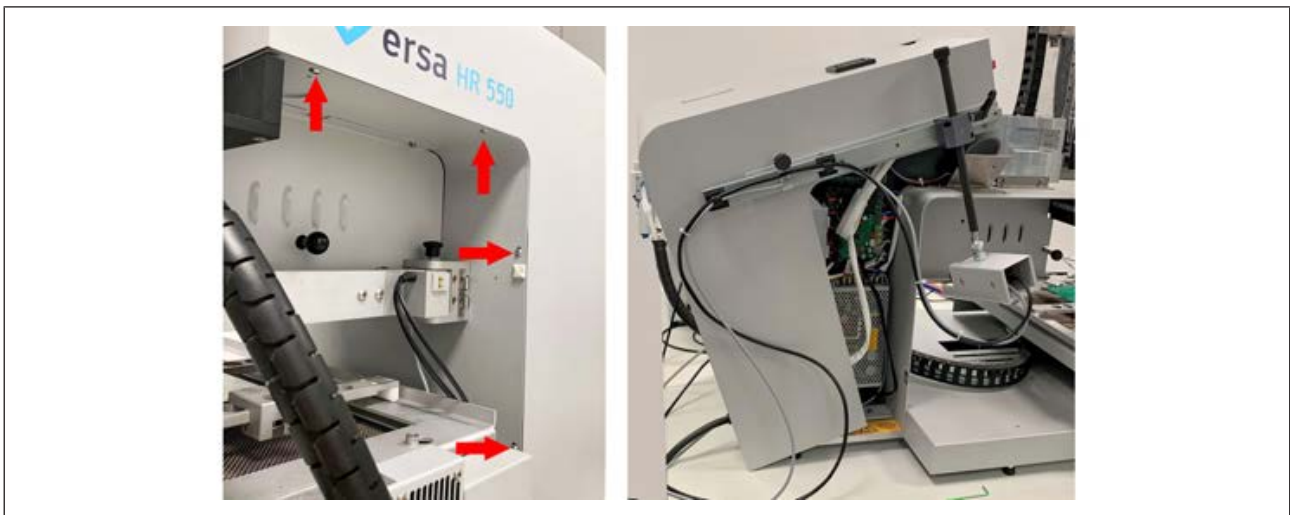


Fig. 16: Loosen four screws on each side and open the housing from the back

- d) Carefully open the housing from the back - see figure on the right.
- e) Keep the housing open by placing an object underneath, in the front area.
- f) Identify the PCB for the connection - see following figure on the left.
- g) Carefully pull the plug-in connector, marked in the middle and on the right in the following figure, from the connection strip by jerking it.
- h) If the existing cables on the PCB prevent access to the plug-in connector, they must be carefully lifted.

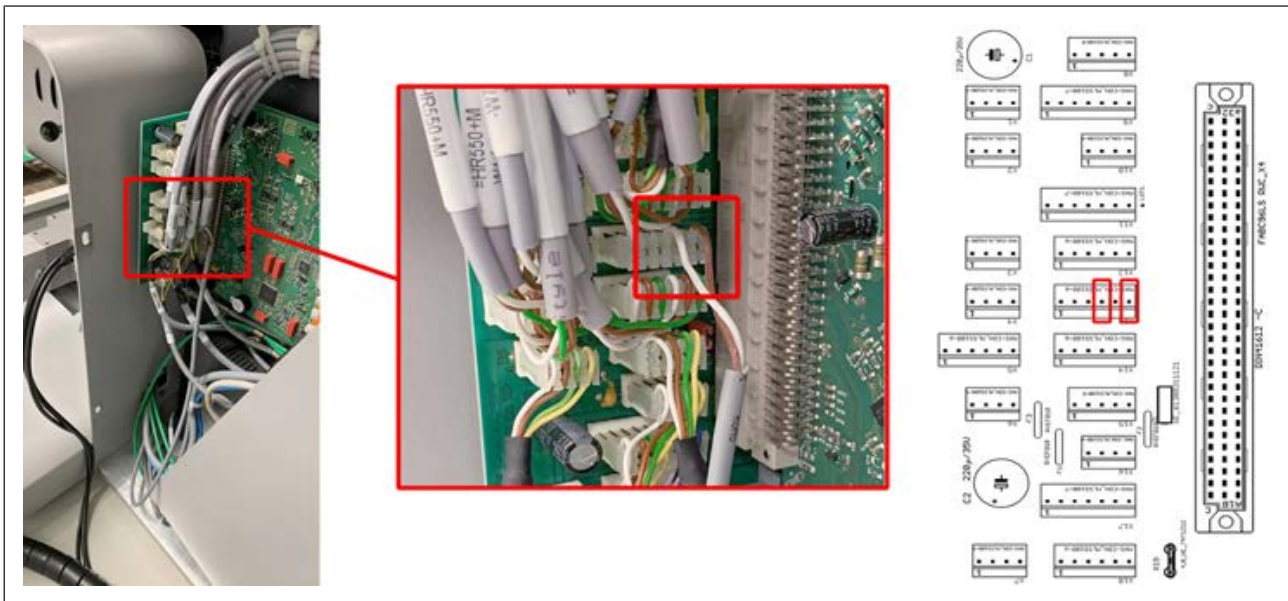


Fig. 17: Left picture: Distribution board, see middle picture: Connector strip with the newly connected cables of the Scavenger, see picture on the right: Pins 4 and 6 are connected

The two cable ends (white and brown) are connected to this plug-in connector. The figure above shows the white connected cables (on pin 4) and the brown ones (on pin 6) in the middle enlarged photo.

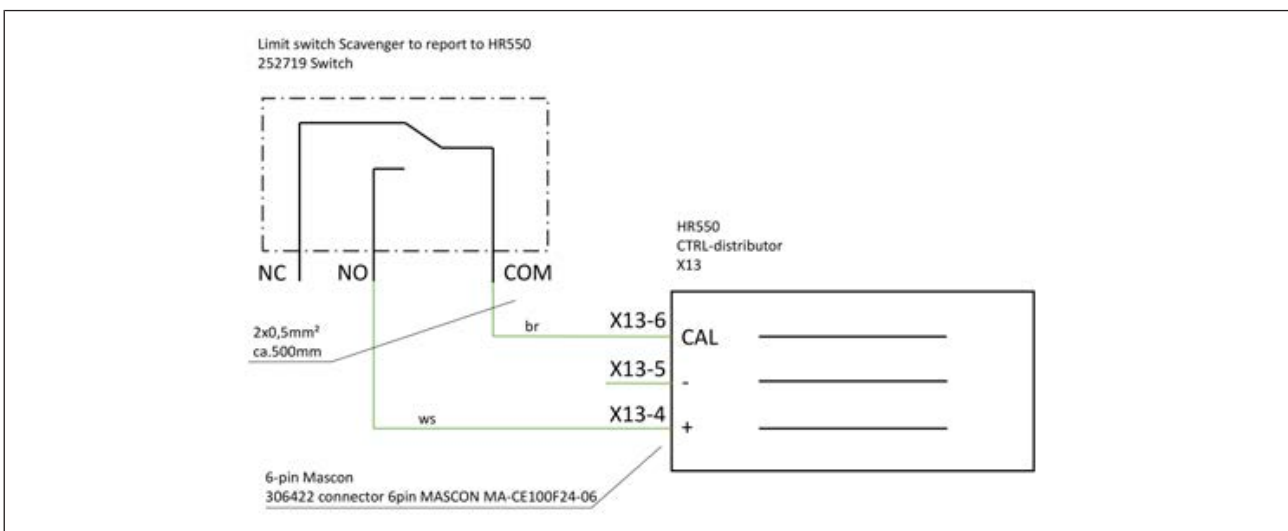


Fig. 18: Wiring diagram

- The two cables must be pressed onto pins 4 (white) and 6 (brown) in the plug-in connector as described below. The cables do not have to be stripped.
- If necessary for better accessibility, the cables already present on the plug-in connector can be carefully pulled out of the strain relief - see the following example figure.

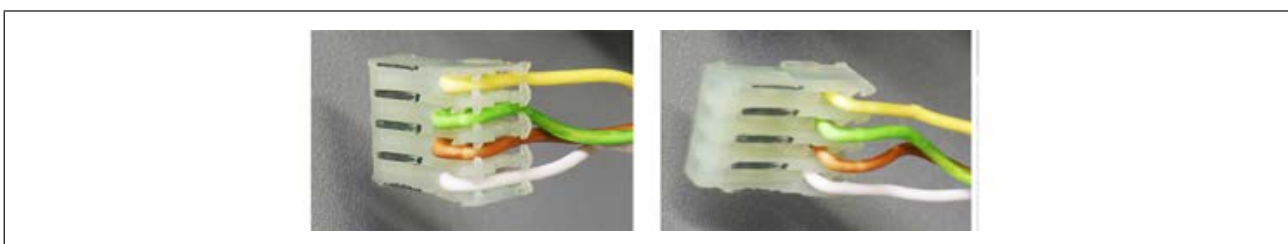


Fig. 19: Example figure. Left: Cable pressed into the strain relief. Right: Cable loose.



- c) Align the black side of the connector pins upwards.
- d) Align the desired pin in the crimping tool, as shown in the example figure on the left.



Fig. 20: Example figure. Left: Insertion of the plug-in connector into the crimping tool. Right: Run the cable into the connector pin from above and press the cable in.

- e) Run the cable in the corresponding colour into the opening of the plug-in connector from above, until it is flush with the plug-in connector at the bottom - example figure on the right.
 - f) Hold the cable in position and press the cable in.
 - g) Check the result.
 - h) Align the connector pin for the second cable in the crimping tool.
 - i) Press the second cable in.
 - j) Check the result.
 - k) Press all cables into the strain relief of the plug-in connector.
 - l) Plug the plug-in connector back into the connector strip.
 - m) Fasten the newly inserted cable to the existing cable harness with cable ties. Make sure there is sufficient cable length outside the housing to ensure the swivelling movement of the residual solder extraction.
 - n) Screw the housing back on with eight screws.
- ⇒ The process has now been completed.



4.6 Disposal



⚠ CAUTION

Disposal

- ✓ Solder waste is hazardous waste and must not be disposed of together with domestic waste.
- a) Provide safe and environmentally friendly disposal of packaging materials!
- b) Make sure that all process materials and replacement parts are disposed of in a safe and environmentally friendly way!

In accordance with Directive 2008/98/EC on waste and Directive 2002/96/EC on waste electrical and electronic equipment, we recommend the following procedure:

- ✓ To prepare the machine for disposal:
 - a) Have the machine disconnected from all utility services by a specialised technician:
 - ⇒ Electrical power supply
 - ⇒ Computer network
 - ⇒ Only when all this work has been performed may the disposal of the machine be started.
- ✓ If professional scrapping is not possible in the user's premises:
 - a) Contact a certified waste management company.

Waste prevention has priority over waste disposal!

Many parts of the machine can be used again. Only when reuse is not possible, should these parts be recycled.

The machine can contain the following substances or devices:

Electronic and electrical equipment	Computer, electronic controls, relays, monitors, cameras, sensors, meters, motors, preheater modules
Plastics	Cables and caterpillars, hoses, heat insulation, sensors
Metals	Steel, copper, aluminum, brass, gold, lead, tin, silver
Glass, ceramics	Preheater modules, screens

NOTE

Disposal of electrical equipment



Waste Disposal in accordance with Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment:

Products marked with the symbol of a crossed out wheeled bin must not be disposed of with unsorted municipal waste. Local authorities have set up special collection points for their disposal. Please check with your city or district council authorities the options available for the separate collection of used equipment. This way, you can make your contribution to the reuse or other forms of use of waste to protect the environment and human health.



5 Commissioning

5.1	Setting up the PC.....	50
5.2	Performing functions [Start Setup] and [Pixel Shift adjustment].....	52



5.1 Setting up the PC

- For the PC configuration required for your Rework System, refer to the PDF document 3BA00212 “PC-Konfigurationsempfehlung_Ersa-IRSOFT-HRSoft-ImageDoc”. This document can be found on the Ersa Rework USB stick (3BA000149).

You will need also:

- A network card must be installed in the PC. Ersa recommends an Intel® network card.
- Network cable for connecting the rework system to the PC and, if required, to the company network.
- USB stick with the Ersa software and the operating instructions for the rework system (item USB flash drive Rework).

Installing drivers

- a) Switch on first the Rework System and then the PC. Wait for the operating system to start.
- b) Have a user with administrator rights get logged in.
- c) Insert the USB stick with the operating instructions and software [USB flash drive Rework] (3BA00149) into a USB port of the PC.
- d) Copy the contents of the USB stick to any folder on drive C:.
- e) There, open folder “Driver,” then folder “ImagingSource.”
- f) Start the installation program by double-clicking:
 - GigEcam_Versions No._setup.exe
- a) Answer any queries with Yes. Do not change any settings.

When requested to do so by Ersa-Service, install the two following programs in the following sequence:

- 1. ic_setup_Versions-Nr..exe
- 2. setup_iccapture_Versions-Nr._Versions-Nr._.exe

Entering the IP address

- a) Click on the Windows start button once and enter “Network.”
- b) Click on the “Network status” line in the Windows start menu.
- c) Click on “Change adapter options” in the “Status” dialog.
 - ⇒ The network adapters will be displayed.

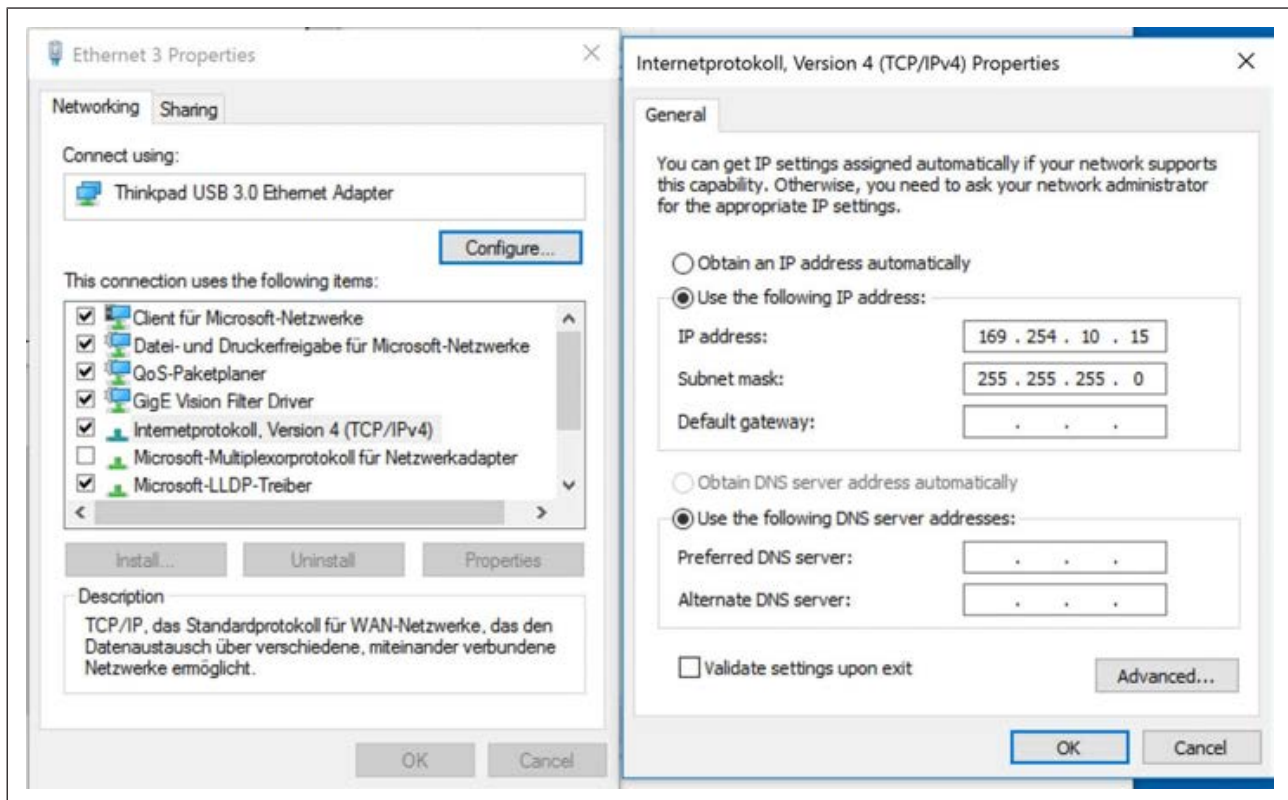


Fig. 21: Entering IP addresses

- d) Right-click on the “Ethernet” network adapter and select “Properties” in the context menu.
- e) Select “Internet protocol version 4 (TCP/IPv4)”.
- f) Click on “Properties.”
- g) Select “Use following IP address.”
- h) In the IP address enter 169.254.10.44
- i) In the “Subnet mask” enter 255.255.255.0
- j) Click on “OK.”
- k) Click on “OK.”

Configuring the network

- a) Right-click on the “Ethernet” network adapter and select “Properties” in the appearing context menu.
- b) Click on “Configure”.
- c) Select the “Advanced” tab.

If you use an Intel[®] Ethernet card, select the menu item named “Jumbo xxx” in the “Settings” menu. The name may differ slightly depending on the manufacturer of the network adapter.

- a) Select the highest value (9014 Byte) in the “Value” menu.
- b) Close all windows by clicking on “OK”.

Install the HRSoft 2 program.

- a) In the HRSoft2_XXX folder search for the installation program “setup.exe” for HRSoft 2. Double click on this file. To do so, follow the instructions and confirm dialogues with OK/Continue.



5.2 Performing functions [Start Setup] and [Pixel Shift adjustment]

The Rework System and Rework processes can be controlled via the HRSoft 2 program. To set up the rework system, now perform functions [Start device setup] and [Adjust pixel shift].

Always perform both functions [Start device setup] and [Adjust pixel shift]:

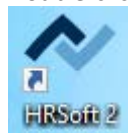
- whenever reinstalling the Rework System
- after reinstalling HRSoft 2
- after replacing the heating head
- after relocating the Rework System.

After starting HRSoft 2 for the first time, you will be logged in as administrator. This is a prerequisite for performing [Start device setup] and [Adjust pixel shift].

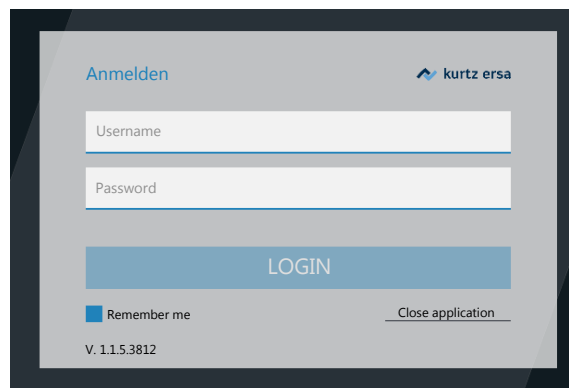
The [Username] and also the [Password] are registered under “Admin,“ please pay attention to capitalization.

If the Administrator changes the [Password] or creates a new [Username], do not forget the passwords entered, or note them down and keep them in a safe place. With regard to this, please also read Chapter [The \[user management\] tabulator \[▶ 79\]](#).

- a) Double-click on the icon of the [HRSoft 2] link on the computer desktop.



- b) Enter the Administrator name and password into the [Login] window.
Info: There are two user classes: “Administrator“ and “Standard user.“ Depending on the user name and password entered, you will be assigned to one of these classes. With regard to this, please also read Chapter [The \[user management\] tabulator \[▶ 79\]](#).



If you highlight checkbox [Remember me], your user name will be already recorded the next time you log in.

- a) Acknowledge your entries by pressing the Enter key or by clicking on the [LOGIN] button.
HRSoft 2 starts in the administrator mode and opens tab [Rework].

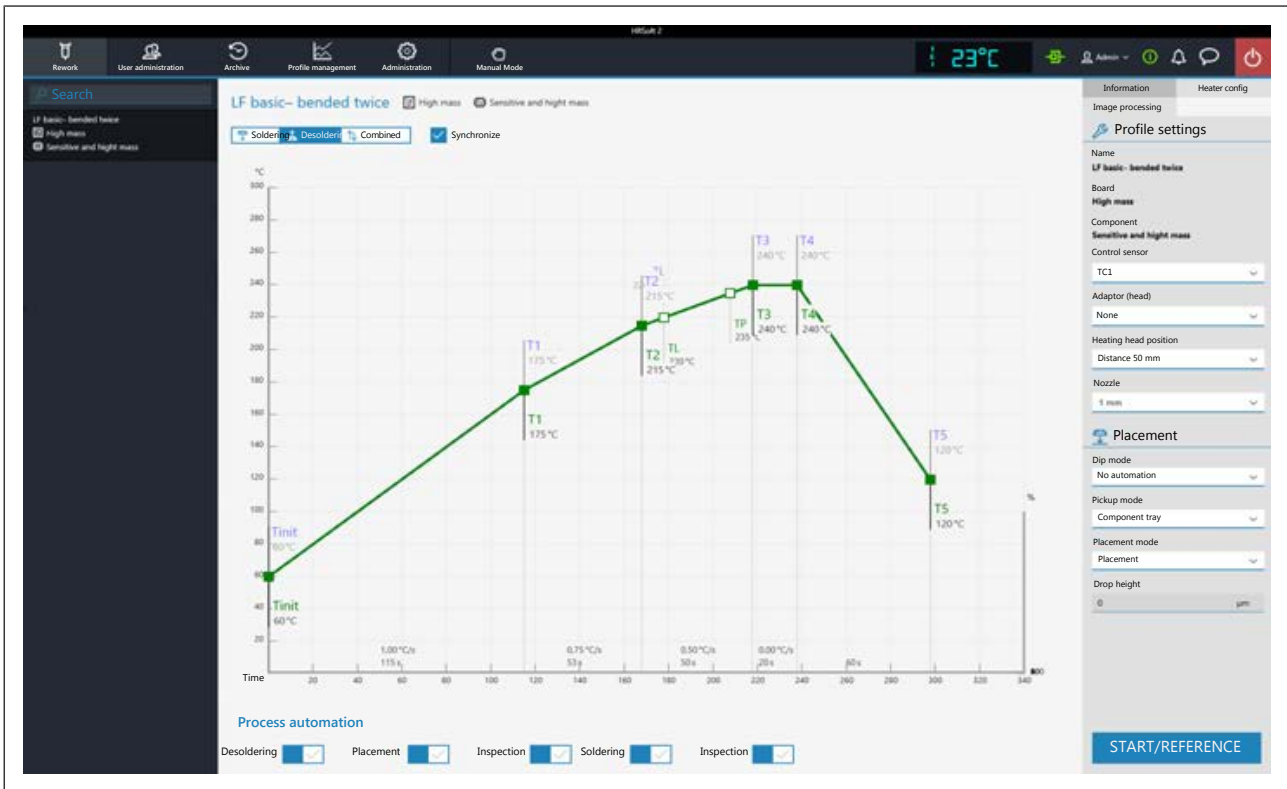


Fig. 22: Tab [Rework] in the administrator view. Example picture.

- b) In the header, select tab [Administration].
- c) In the left menu bar, select menu item [Device settings].

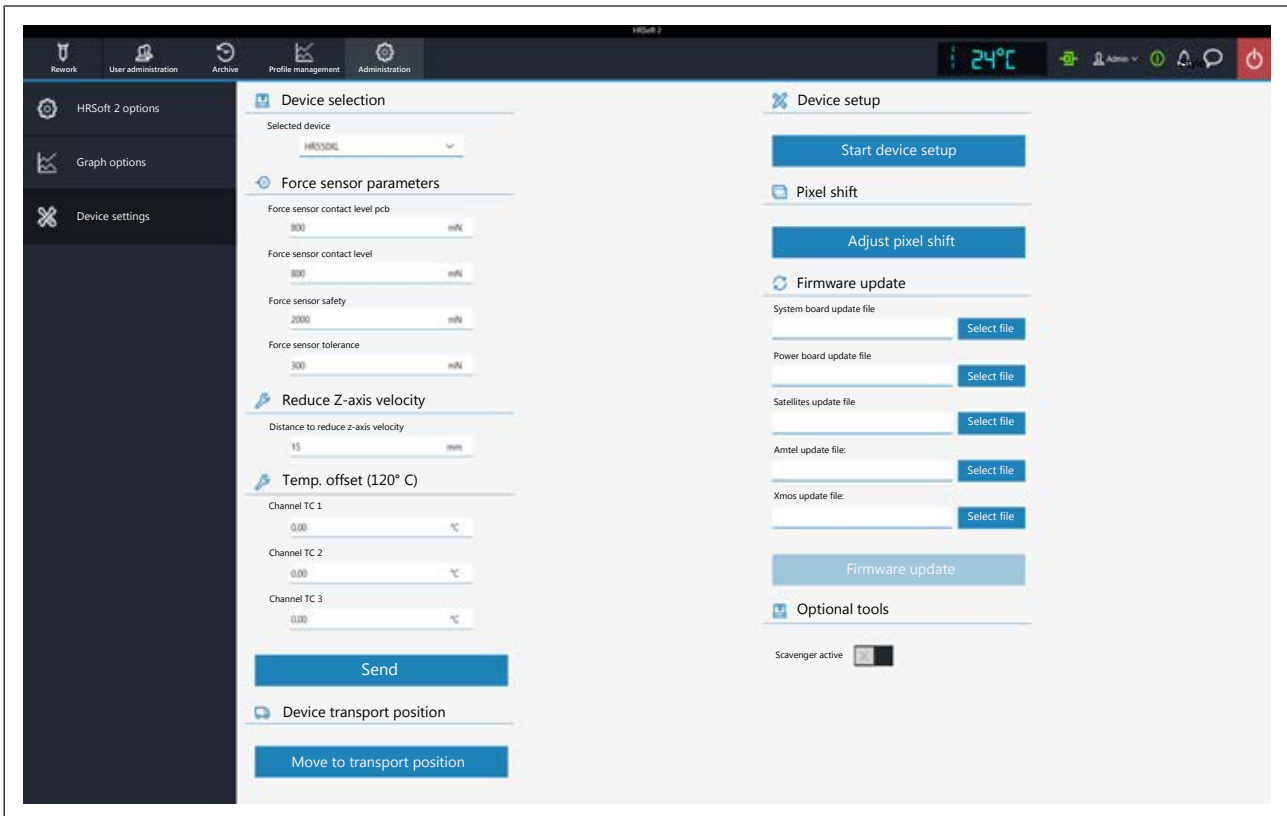


Fig. 23: Device settings



- d) Now perform both functions in the right column. First perform [Start device setup]. With regard to this, please read the description under The button [Start maintenance mode] [▶ 101].
 - e) Then perform function [Adjust pixel shift]. With regard to this, please read the description under The [Pixel shift adjustment] button [▶ 105].
- ⇒ The process has now been completed.



6 Function description

6.1	Read this first!.....	56
6.1.1	Target readers group.....	56
6.1.2	Supplementary documents.....	56
6.1.3	ESD-hazardous components.....	56
6.2	Overview of the machine parts.....	57
6.3	Switching on the Rework system and starting HRSoft 2.....	60
6.4	The top bar in the HRSoft 2 program.....	61
6.5	Temporarily editing the soldering profile in the [Rework] tab.....	62
6.5.1	[Rework] tabulator overview.....	62
6.5.2	Use of the soldering profile in the [Rework] tabulator.....	64
6.5.3	The tabulators [Information], [Heating setting] and the arrow key [Image processing].....	65
6.5.3.1	The three right tabulators.....	65
6.5.3.2	The [Information] tabulator under the [Rework] tabulator.....	65
6.5.3.3	The [Heating setting] tabulator under the [Rework] tabulator.....	68
6.5.3.4	The tabulator with the small arrow key (Image processing) under the [Rework] tabulator.....	70
6.5.4	The chart in the [Rework] tabulator.....	72
6.5.4.1	The heating curves in the [Rework] tab.....	73
6.5.5	[Process automation] and its process steps.....	75
6.6	The [Archive] tabulator.....	76
6.6.1	The [Show chart] button.....	77
6.7	The [user management] tabulator.....	79
6.8	Editing the soldering profile in the [Profile management] tab and changing it permanently.....	81
6.8.1	Overview of the [Profile management] tabulator.....	81
6.8.2	Create, copy, delete and save soldering profiles in the [Profile management] tabulator.....	82
6.8.3	The tabulators [Information], [Heating setting] and the arrow key [Image processing].....	85
6.8.3.1	The [Information] tabulator under the [User management] tabulator.....	85
6.8.3.2	The [Heating setting] tabulator under the [Profile management] tabulator.....	88
6.8.3.3	The tab with the arrow button [More] under the [Profile management] tab.....	90
6.9	The chart in the [Profile management] tabulator.....	92
6.10	The heating curves in the chart in the [Profile Management] tab.....	92
6.11	The [Process automation] buttons under the [Profile management] tabulator.....	94
6.12	The [Management] tabulator with three dialog windows.....	95
6.12.1	The dialog [HRSoft 2 settings].....	95
6.12.2	The [Chart settings] dialog.....	97
6.12.3	The [device settings] dialog.....	98
6.12.3.1	The button [Start maintenance mode].....	101
6.12.3.2	The [Pixel shift adjustment] button.....	105
6.13	The [Manual Mode].....	109
6.14	The display and switch row top right.....	111
6.15	Switching off the Rework System.....	113



6.1 Read this first!

6.1.1 Target readers group

These instructions are intended for people who use, adjust, operate or service the machine.



DANGER

Personal injury or material damage due to inadequate maintenance and improper operation of the machine!

- ✓ Use only qualified personnel!
- a) The machine transport, assembly, connection, commissioning, operation or maintenance by people who are not sufficiently qualified and informed can cause severe damage to the machine or damage to people.
- b) Such work may therefore only be performed by properly trained personnel! This personnel must be able to recognize the hazards that can be caused by the system mechanical, electrical or electronic equipment.
- c) The people who carry out such work must know and have understood the contents of these instructions.
- d) Any person involved in the installation, commissioning, operation and/or maintenance of the machine must have read and understood the contents of the "Safety instructions" chapter, as well as the chapters which are relevant for the specific activity!

6.1.2 Supplementary documents



NOTE

Additional documents

Additional documentation or service instructions are available for each module of the machine. These documents are contained in the [\\ERSA\product_data\] folder on the drive of your machine PC. If you cannot find exhaustive information on a particular topic in this operating manual, check there.

6.1.3 ESD-hazardous components



NOTE

ESD sensitive components!

Electronic components may be damaged by electrostatic discharges. Please observe the warnings on the packaging or contact the manufacturer or supplier. To protect these components, the system should be placed in an electrostatic protected area (ESD = electrostatic discharge).

The HR 550 can be easily integrated in environments of this kind. Using one of the front buttons, the user can connect for example an ESD wristband. The housing of the HR 550 is connect via power cord to the earth wire of the supply network.

When handling the device, observe all general safety measures normally required for ESD sensitive components.



6.2 Overview of the machine parts

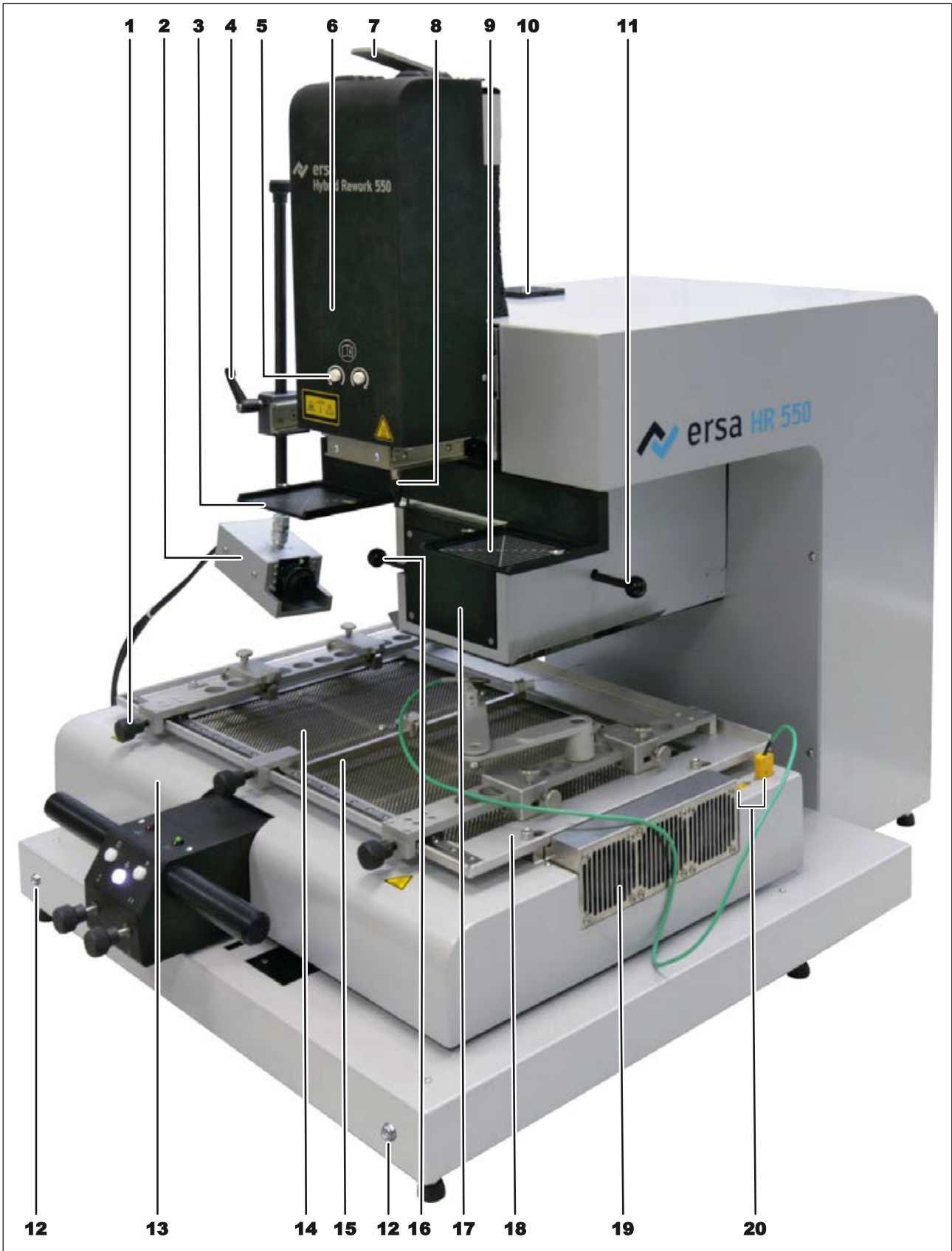


Fig. 24: Overview of the machine parts



⚠ CAUTION



Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

⚠ DANGER



Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!
- b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
- c) Class 2 laser according to DIN EN 60825-1:2008-5, P < 1 mW, λ = 650 nm

1	Locking screw for PCB holder	11	Lever for switching the Vision Box from normal view (lever out) to Zoom / Tele (lever in)
2	RPC camera, optional 5 mpix	12	Connections for ESD wrist band
3	Left component tray, also for Dip & Print stencil	13	Cross table
4	Clamping lever for component camera	14	Lower heating with 3 heating zones
5	Button for rotation of pipette (8), clockwise and counterclockwise. Rotation angle and speed selectable via key functions.	15	PCB support
6	Heating head with motorized height adjustment	16	Lever for moving in / out the Vision Box
7	Sliding lever for heating head removal	17	Vision Box, contains component camera and PCB camera
8	Pipette with motorized height adjustment and touch sensor.	18	PCB holder
9	Right component tray, also for Dip & Print stencil	19	Blower for cooling after the soldering process
10	Fan for machine cooling with inspection chamber for semi-annual lubrication	20	Connection sockets for thermocouples 1 and 2

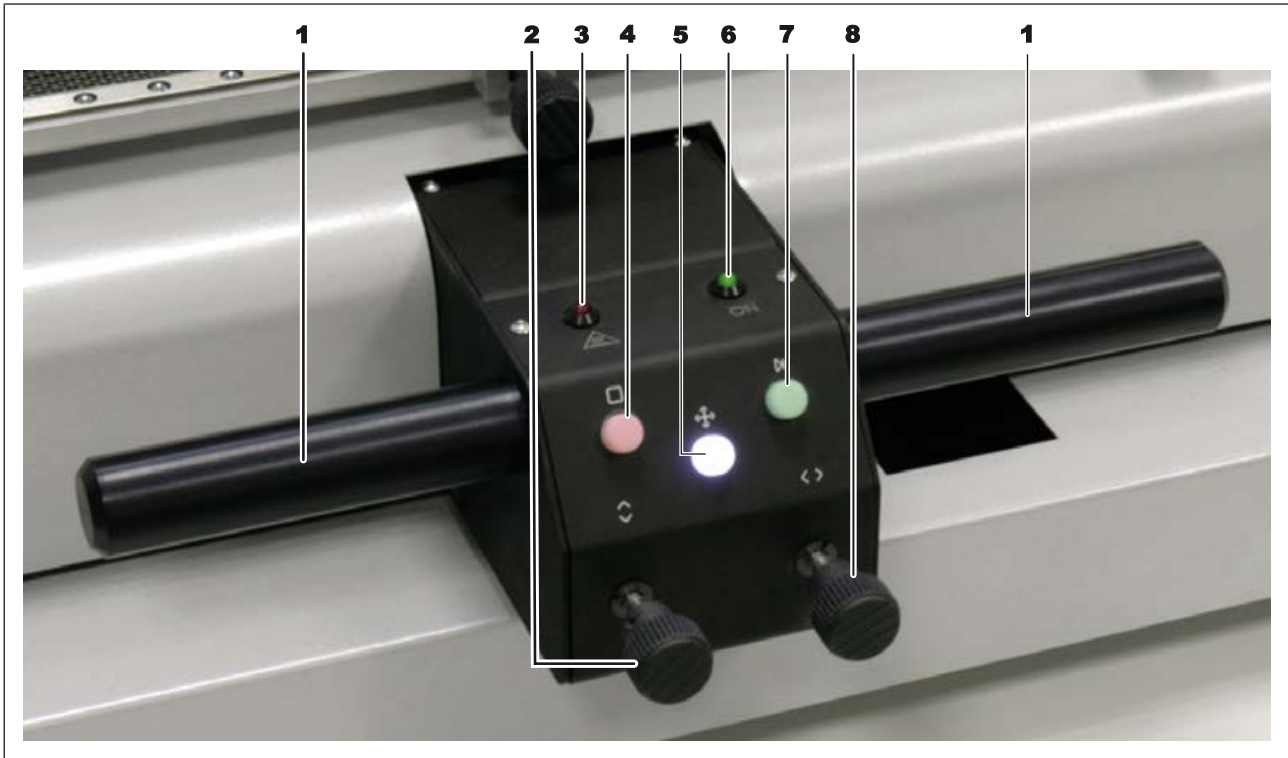


Fig. 25: Control panel

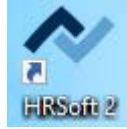
1	Handles for moving the cross table when using the unlock button (no. 5).	5	White illuminated unlock button to release the cross table latch. Press and hold it for fast PCB positioning.
2	Adjusting screw to accurately position the board in the Y direction.	6	Green light signalling powered machine.
3	Red warning light: Caution, hot machine parts! It also lights up when machine is switched off.	7	Green Next button. To switch to the next step.
4	Red exit key to immediately end current work step.	8	Adjusting screw to accurately position the board in the X direction.



6.3 Switching on the Rework system and starting HRSoft 2

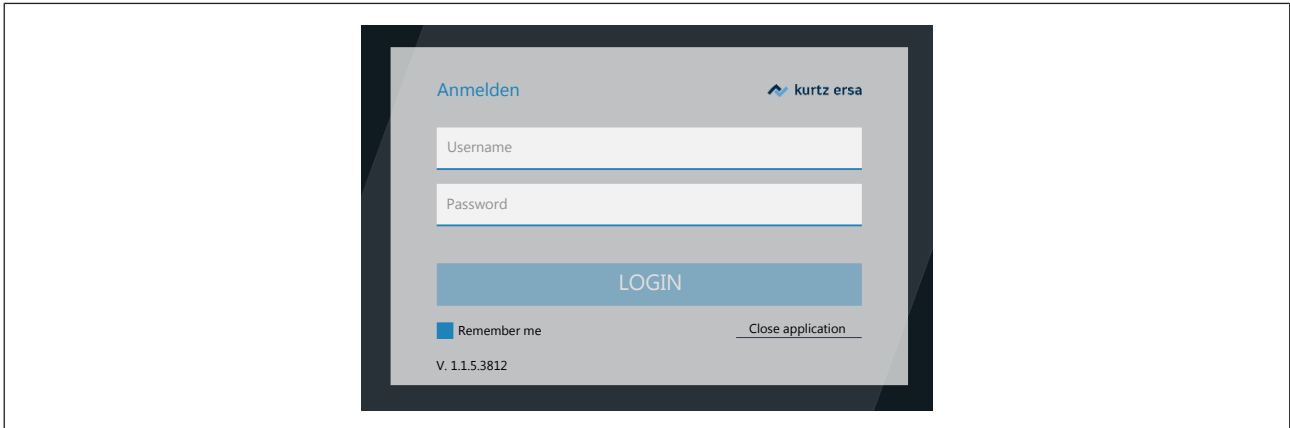
✓ To switch HR 550 on, proceed as follows:

- a) Switch on the PC
- b) Use the main switch to switch on the HR 550 unit
- c) Start programm HRSoft 2 on the PC. To do so, click on link [HRSoft 2] on the



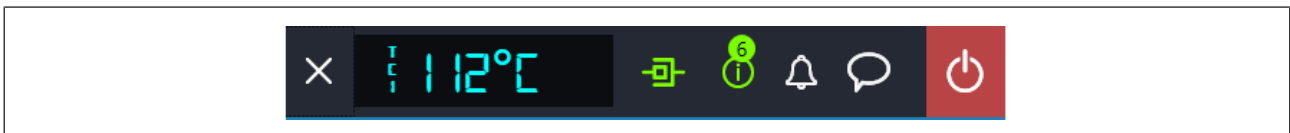
desktop.

- d) Window [Login] will be displayed on the computer monitor.



- e) Enter your Username and Password into the edit fields and press the enter key. If you highlight the [Remember me] button, your Username will be already recorded the next time you log in.

- ⇒ The HRSoft 2 program will open in tab [Rework] and, depending on the password level, in mode [Administrator] or [Standard user].
- ⇒ If the network connection icon next to the temperature display turns green, the connection between the rework system and the PC is established.





6.4 The top bar in the HRSoft 2 program

All the functions of the HRSoft 2 program can be accessed via the top bar. The top bar includes tabs to operate the Rework System on the left, and more buttons and displays on the right.



- Use the [Rework] tab to change all parameters of the soldering profile. Almost identical structure to that of the [Profile management] tab, but with all rights to manage soldering profiles; creating, copying, deleting and saving is not possible. Also contains the start button for the rework process. With regard to this, please read Chapter [Rework] tabulator overview.
- Use the [User administration] tab to show, create, edit, delete and save users with their different user rights. With regard to this, please read Chapter The [user management] tabulator.
- Use the [Archive] tab to show the rework processes performed so far in all details for an analysis. With regard to this, please read Chapter The [Archive] tabulator.
- Use the [Profile management] tab create, change, copy, delete and save soldering profiles. Almost identical structure to that of the [Rework] tab, but with all rights to manage soldering profiles. If you are logged in as a standard user, the [Profile management] tab will be missing. With regard to this, please read Chapter Overview of the [Profile management] tab.
- Use the [Administration] tab to define HRSoft 2 program parameters (e.g. system language, display colours, etc.), program management (e.g. updates), network management, and start-up functions. This tab contains the following three fields: [HRSoft 2 options] (Chapter The dialog [HRSoft 2 settings]), [Graph options] (Chapter The [Chart settings] dialog) and [Device settings] (Chapter The [device settings] dialog).
- [Manual mode] tab: button for showing/hiding the button bar [Manual mode], which is visible only in the [Rework] tab. With the Rework buttons, you can move the heating head and the pipette at any time, and switch on/off the Rework System functions that can be manually controlled (e.g. motor movements, cooling, etc.). With regard to this, please read Chapter The [Manual Mode].
- Display and button row on the right: Temperature display, network display, user name and system status. With regard to this, please read Chapter The display and button sequence in the right upper corner.



6.5 Temporarily editing the soldering profile in the [Rework] tab

6.5.1 [Rework] tabulator overview

After HRSOft 2 is started, the [Rework] tabulator is displayed. In the [Rework] dialog you can start and carry out the soldering processes. This dialog is divided into the following areas:

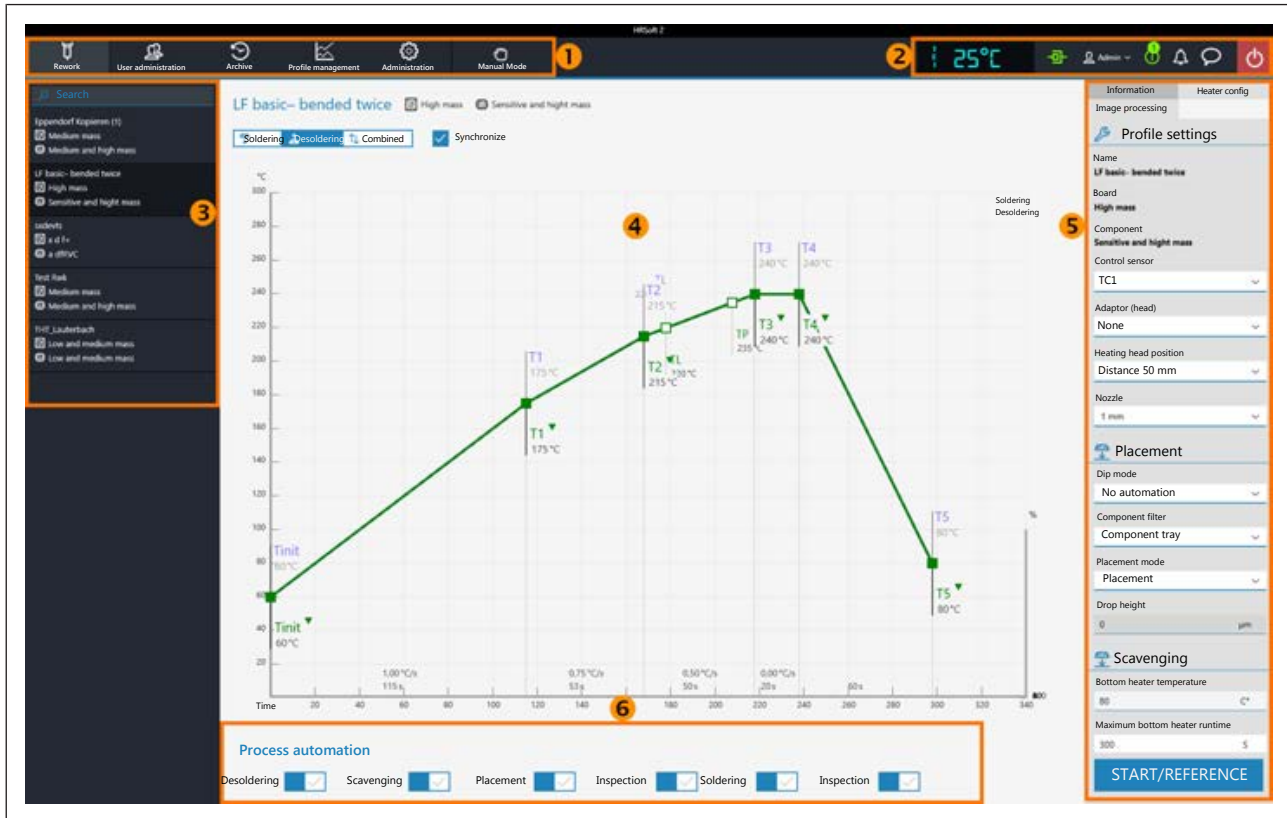


Fig. 26: Areas in the tabulator Rework

1	Tabulator bar. To recall the tabulators and the [Manual mode] button bar	2 Displays and buttons for recalling the dialogs, from the left to the right: <ul style="list-style-type: none"> – Display of the temperature of the relevant temperature sensor – Display icon green = Network connection active; red = No connection – Button “User name” for changing user – Button for recalling the [System state] dialog – Button for closing HRSOft 2. <p>With regard to this, please read the The display and button sequence in the right upper corner-chapter.</p>
---	--	---



3	<p>Selecting a soldering profile. Search by profile name possible.</p> <p>Switch to the [Profile management] tabulator to create and save soldering profiles. With regard to this, please read the Create, copy, delete and save soldering profiles in the [Profile management] tabulator [▶ 82]chapter.</p>	4	<p>Chart with soldering curves. Display of the soldering process with soldering curves for soldering and unsoldering. If any changes are made here to the soldering process, these will be applied but not saved. If you switch from the [Rework] tabulator to another tabulator, all changes to the soldering profile will be lost.</p> <p>With regard to this, please read the The chart in the [Rework] tabulator [▶ 72]chapter.</p>
5	<p>Parameter bar with the tabulators [Information] and [Heater config] and small arrow key to recall the [Image processing] dialog. The rework process may be started only here, with the [Start] button. With regard to this, please read the The tabulators [Information], [Heating setting] and the arrow key [Image processing] [▶ 65]chapter.</p>	6	<p>Workflow bar for determining the process steps (from the left to the right). If any changes are made here to the process, these will be applied but not saved. If you switch from the [Rework] tabulator to another tabulator, all changes to the soldering profile will be lost. With regard to this, please read the [Process automation] and its process steps [▶ 75]chapter.</p>

You can access the tabulators [Archive], [User administration], [Profile management], [Administration] and the button [Manual mode].

The functions of the [Rework] tabulator are in large part the same as those of the tabulator [Profile management]. For a description of the [Profile management] tabulator, please read the [Editing the soldering profile in the \[Profile management\] tab and changing it permanently](#) [▶ 81]chapter.

Only a user logged in as “Administrator” may access all functions. If you are logged in as “standard user”, you cannot save the changes nor view the [Profile management] tabulator.

The [Rework] tabulator includes also the [Start/Reference] button, which starts the rework process. With regard to this, please also read the Tutorial – Soldering or unsoldering a componentchapter.

The functions of the [Rework] tabulator are described in detail in the following chapter.



6.5.2 Use of the soldering profile in the [Rework] tabulator

A soldering profile (3) is a file in which the complete soldering process with all associated parameter settings is saved. In the [Profile management] tab, you can create, edit, copy, delete and save new soldering profiles.



Soldering profile parameters and other specifications may also be edited in this [Rework] dialog and then applied, but these changes may not be saved here. To permanently create, edit, copy, delete and save a soldering profile, switch to the [Profile management] tab.

Soldering processes are always started in the [Rework] tab.

Working with soldering profiles

In the Soldering Profile Selection (3) field, select a soldering profile from the list of saved soldering profiles.

Search for a soldering profile name in the [Search] input field. The search will automatically start after entering the first sign. Any matches found will be highlighted in colour.

The soldering profiles have two lines defining the characteristics of the  PCB and the  component. PCB and component properties, such as PCB thickness, high/low component mass and lead-free/leaded solder, can be entered into these lines.

After marking your soldering profile in the soldering profile selection area (3), changes can be made to the time and temperature sequences in Chart fields (4), and to the soldering process steps for this soldering profile in parameter bar (5). With regard to this, please read the Chapters on [The chart in the \[Profile management\] tabulator](#) [▶ 92].



6.5.3 The tabulators [Information], [Heating setting] and the arrow key [Image processing]

When the [Heater config] tab is called up, the chart (4) with the heating curves is displayed in the middle of the screen, and below the line with the buttons for the [Process automation] (6).

The heating curves in the middle of the screen can be adjusted for the desired soldering process. With regard to this, please read Chapter [The chart in the \[Rework\] tabulator](#) [▶ 72]. You can also change the buttons in the [Process automation] line (6) at the bottom at any time. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 75]. These buttons enable or disable any process steps.

All the changes performed in the [Rework] tab will be accepted but not saved. If you switch from the [Rework] tab to another tab, all changes will be lost.

On the bottom right there is the [START/REFERENCE] button, which starts the rework process. Make sure you have made all settings correctly before starting the rework process. How to perform the soldering process is described by way of example in the Tutorial – Soldering or unsoldering a component.

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. With regard to this, please read Chapter [The tab with the arrow button \[More\] under the \[Profile management\] tab](#) [▶ 90].

6.5.3.1 The three right tabulators

The field (5) on the right contains the two [Information] and [Heater config] tabs as well as a small arrow button to open the [Image processing] tab.

Select the [Information] tab if you want to make changes to the soldering profile parameters. With regard to this, please also read Chapter [The \[Information\] tabulator under the \[Rework\] tabulator](#) [▶ 65]).

Select the [Heater config] tab if you want to make changes to the heaters. With regard to this, please also read Chapter [The \[Heating setting\] tabulator under the \[Rework\] tabulator](#) [▶ 68].

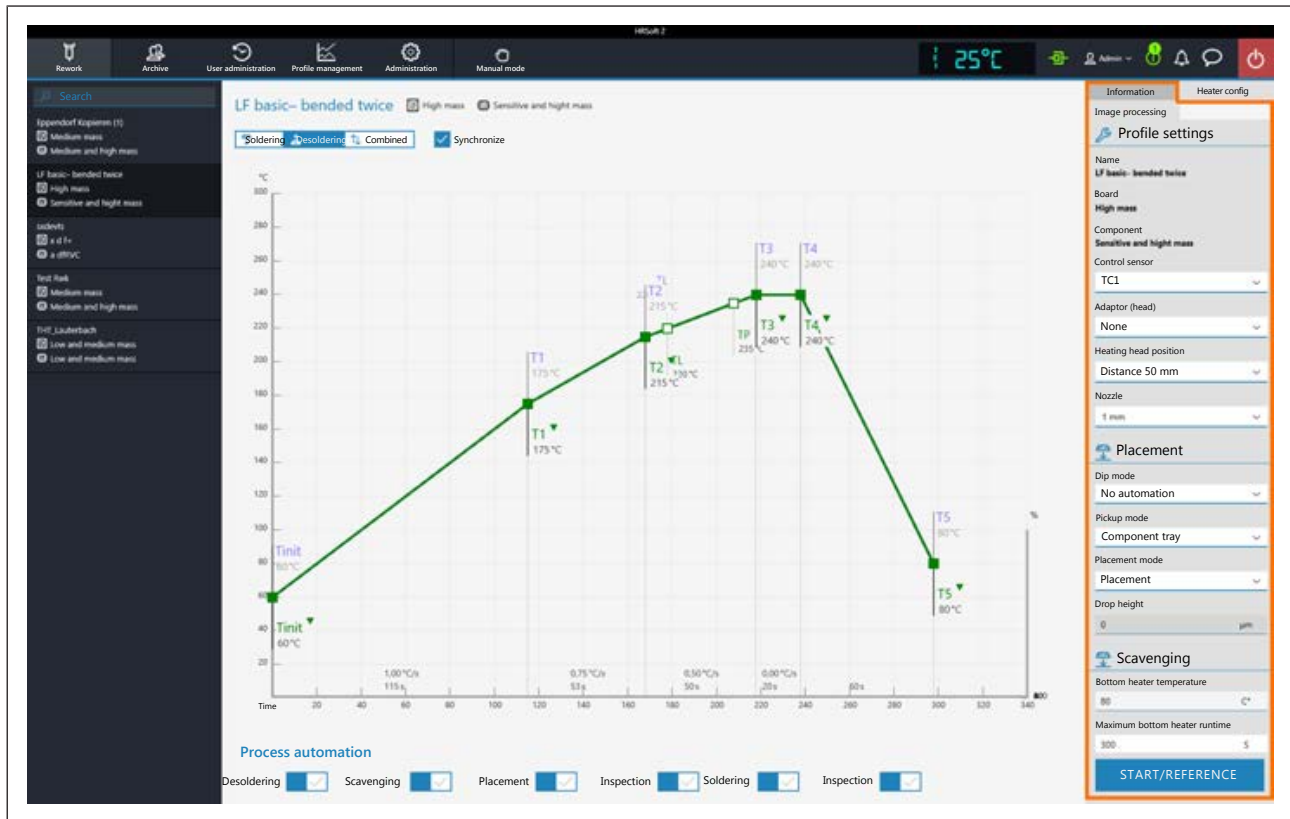
Click on the small arrow button on the right if you want to make image processing changes. With regard to this, please also read Chapter [The tabulator with the small arrow key \(Image processing\) under the \[Rework\] tabulator](#) [▶ 70].

6.5.3.2 The [Information] tabulator under the [Rework] tabulator

The soldering profile is selected in this tab and the rework process is started.

The heating curves in the middle of the screen can be changed. As to this, please also read Chapter [The chart in the \[Rework\] tabulator](#) [▶ 72]. Also the buttons in line [Process automation] (6) can always be changed. As for this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 75]. Use these buttons to enable or disable process steps.

For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from tab [Rework] tab to another tab, all changes will be lost.



The parameters in tab [Information]

In range [Profile settings]

The parameters are defined in tab [Profile management]. The following parameters can be edited here in tab [Information]:

- [Control sensor]: Selection of the temperature sensor that controls the soldering process via its measured temperature. IRS [IRS] (Infrared sensor), [TC1] (thermocouple 1) or [TC2]. The currently measured temperature of the selected sensor is displayed in range (2). The infrared sensor (IRS) is not suitable for glossy, reflective surfaces or very small boards.
- [Adaptor (head)]: used adapter (air baffle). No function, only used to save info.
- [Heating head position]: Define the soldering distance to the PCB from 30 mm to 70 mm.
- [Heating head position]: eating head type [L-head] (big) or [S-head] (small).
- [Lens]: Used lens. No function, only used to save info.
- [pipette]: Used pipette. No function, only used to save info.

In range [Placement]:

- [Dip mode]: You can choose from three soldering methods:
 - [No automation]: Normal soldering without dipping any flux material and without using a component that is coated with solder paste. The component is picked up from the component tray, aligned and placed in the soldering position.
 - [Auto. Dip]: Place the dip stencil prepared with flux material on a component tray. The component is lifted from another component tray and immersed in the dip stencil's flux material, aligned and placed in the soldering position.



- [Auto. Print]: Place the print stencil prepared with the component coated with solder paste on a component tray. The component is picked up from the print stencil, aligned and placed in the soldering position.
- [Placement mode]: during soldering. [Placement]: Positioning of the component using the contact sensor, or [Drop]: dropping the component through the PCB.
- [Drop height]: during soldering. Height above the PCB at which the component is dropped onto the PCB. Can only be changed if parameter [Drop] is selected.

In range [Scavenging]:

parameters for the optional residual solder sucker. As to this, please also read the operating instructions for the residual solder sucker. Only operate the residual solder sucker if all the specifications in the operating instructions are complied with! The optional residual solder sucker must first be integrated into the HRSoft 2 Rework program with the [Scavenger active] function, in the [Device settings] dialog under the [Administration] tab. In so doing, the [Scavenging] work step will be displayed under the chart, for the residual solder sucker to be used after the [Desoldering] work step. As to this, please read Chapter [\[Process automation\] and its process steps](#) [▶ 75].

Click on button [Scavenging] to display the [Scavenging] range.

Like all other parameters, the parameter settings for cleaning can be defined and saved under the [Profile management] tab in the soldering profile. As to this, please read Chapter [The \[Information\] tabulator under the \[User management\] tabulator](#) [▶ 85].

- a) When using the optional Scavenger residual solder sucker, use the button of the [Scavenging] work step to activate the [Scavenging] range.
- [Bottom heater temperature]: temperature that is kept while cleaning the bottom heating.
 - [Placement mode]: maximum heating time for the lower heating during cleaning. For safety reasons, the bottom heating will switch off after this time, even if the swing arm of the residual solder sucker is not swung back into its normal position.

Starting the Rework process or performing a reference run

Bottom right there is button [Start/Reference], with which the Rework process can be started. Make sure all settings have been properly made and the desired work steps selected before starting the Rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or unsoldering a component](#) .

If you only want to perform a reference run of the Rework system, select any work step. Click on [Start/Reference] and cancel the process after performing the reference run.

The correct soldering profile settings should be specified in the [Profile management] tab and saved as a soldering profile. Only possible as “Administrator” user. As to this, please read Chapter [The \[Information\] tabulator under the \[User management\] tabulator](#) [▶ 85].

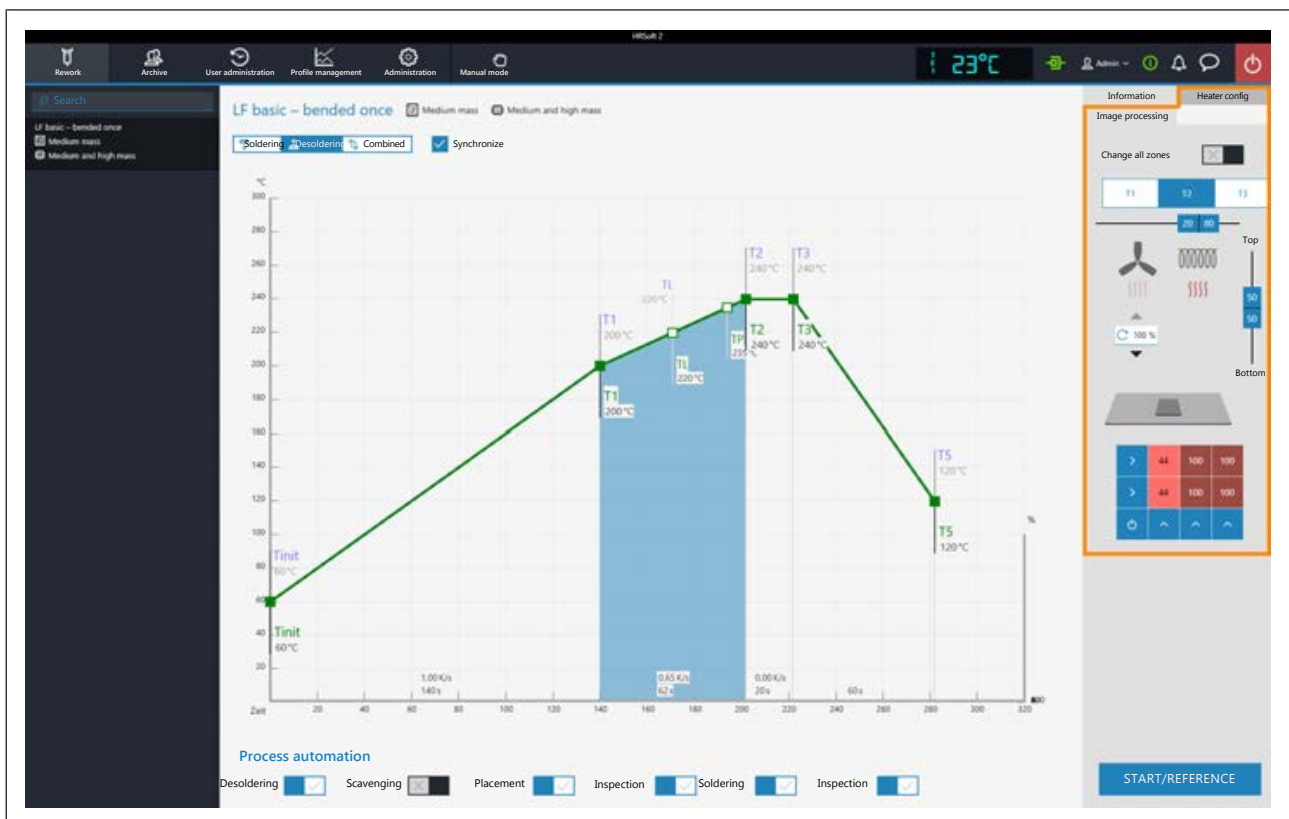


6.5.3.3 The [Heating setting] tabulator under the [Rework] tabulator

When calling up tab [Heater config], chart (4) will be displayed in the middle of the screen with the heating curves and, below, the line with the buttons for the [Process automation] (6).

The heating curves in the middle of the screen can be changed. With regard to this, please read Chapter [The chart in the \[Rework\] tabulator](#) [72]. Also the buttons in line [Process automation] (6) at the bottom can always be changed. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [75]. Use these buttons to enable or disable process steps.

For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from the [Rework] tab to another tab, all changes will be lost.



If you want to change the heating settings specified in the soldering profile, deselect button [Combined] and instead select buttons [Soldering] or [Desoldering]. Buttons [Soldering] or [Desoldering] can each have their own heating curve including detailed heating settings or, by selecting button [Synchronize], the heating curve will be identical for both soldering processes. Button [Synchronize] changes the desoldering heating curve values to the soldering heating curve ones. The displayed heating settings are valid for the highlighted soldering curve.

The parameters in tab [Heater config]

[Change all zones]: if this button is selected, all [Tinit] heating phases up to T4 will be displayed in blue in tab [Heater config] as well in chart (4). The parameters in tab [Heater config] apply only to all heating phases. If button [Change all zones] is disabled, different heating parameters can be assigned to each of the four heating phases.

The following parameters can be edited here in tab [Heater config]:



- Buttons T1 – T4: Selection of the heating phase to define the associated heating parameters. To highlight the corresponding button, you can also click on the heating phase in the chart.
- Horizontal controller: Distribution of top heating in % between hot air heating (fan sign) and infrared heater (heating spiral sign). The infrared heater cannot heat glossy surface components properly.
- Input field with round arrow under the fan logo: Hot air blower speed. Set the blower speed with the small triangle buttons or highlight the blower value and overwrite it. 100 % = maximum blower speed. A high blower value will slightly reduce the hot air energy.
- Vertical controller (top - bottom): Upper heating/lower heating percentage power ratio. Adjust the power ratio to the heat requirement of your soldering process.
- Three lower heating input fields (%): The lower heating is divided into three zones - left, centre and right. Depending on the heat requirement, set the zones with the small triangle buttons above and below the input field, or highlight the heat value and overwrite it. For large PCBs, to avoid shape distortion, ensure that the entire PCB is heated.

Note that the components should not be heated too quickly as only slow heating will result in uniform temperature distribution. This will increase the safety level of the process.

Bottom right there is button [Start], with which the rework process can be started. Make sure you have made all settings correctly before starting the rework process. How to perform a soldering process is exemplified in Chapter Tutorial – Soldering or unsoldering a component .

The correct soldering profile settings should be already specified in tab[Profile management] beforehand. Only possible as “Administrator” user. With regard to this, please read Chapter [The \[Heating setting\] tabulator under the \[Rework\] tabulator \[68\]](#).

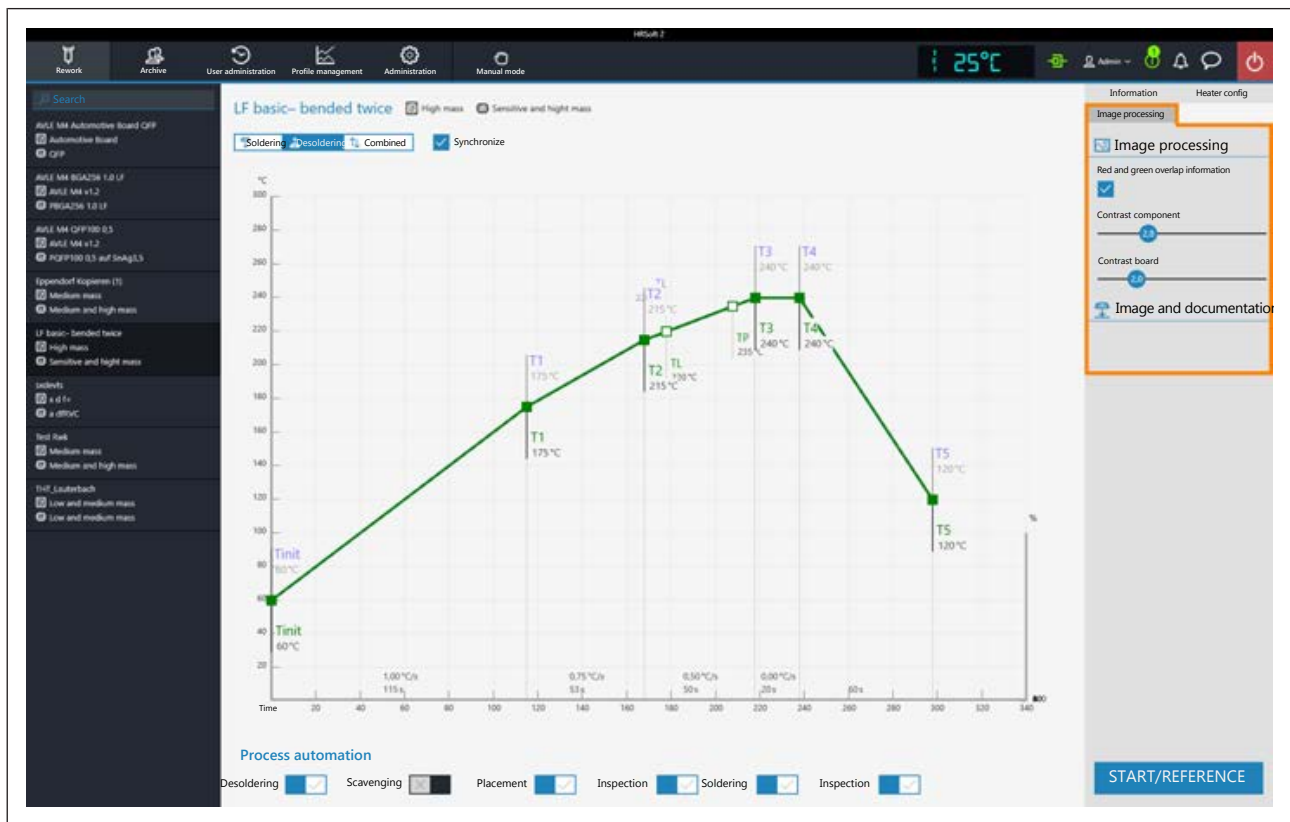


6.5.3.4 The tabulator with the small arrow key (Image processing) under the [Rework] tabulator

If you click on the arrow key, the [Image processing] button will be visible. Click on this button to open the [Image processing] tabulator. At the centre of screen the chart (4) with the heating curves will be displayed, below which the rows and relevant buttons for the [Process automation] (6) will also appear.

The heating curves in the centre of the screen may be changed. With regard to this, please read the [The chart in the \[Rework\] tabulator](#) [▶ 72]chapter. The buttons in the [Process automation] row (6) may also be edited at any time. With regard to this point, please also read the [\[Process automation\] and its process steps](#) [▶ 75]chapter. With these buttons you can activate or deactivate process steps.

All changes made in the [Rework] tabulator will be applied but not saved. If you switch from the [Rework] tabulator to another tabulator, all changes will be lost.



The parameters in the [Image processing] tabulator

[Red and green overlap information]: If activated, in the camera overlay image the board will be displayed in green and the component in red. The parts of the two overlapping image planes (board and component) will be displayed in blue. If deactivated, the camera image will be displayed in grey.

[Contrast component]: If the [Red and green overlap information] button is activated, you can adjust the contrast value for the component displayed in red.

[Contrast board]: If the [Red and green overlap information] button is activated, you can adjust the contrast value for the board displayed in green.

At the bottom on the right you can find the [Start] button, which allows you to start the rework process. Before starting the rework process, make sure that all settings are correct. For an example of soldering process, please refer to the Tutorial – Soldering or unsoldering a component chapter.



The proper soldering profile settings should be configured in advance in the [Profile management] tabulator. Possible only if the user is logged in as “Administrator”. With regard to this, please read the The tab with the arrow button [More] under the [Profile management] tab [▶ 90]chapter.



6.5.4 The chart in the [Rework] tabulator

When calling up tab [Profile settings], chart (4) with the heating curves will be displayed in the middle of the screen and, below, the button row for the [Process automation] (6). The heating curves and the button for [Process automation] can be changed here.

For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from tab [Rework] to another tab, all changes will be lost.



The following buttons are available:

- [Soldering]: The soldering blue heating curve is highlighted in the chart. The soldering blue heating curve can be changed and tab [Heater config] can be set for soldering.
- [Desoldering]: the desoldering green heating curve will be highlighted in the chart. The desoldering red heating curve can be changed and tab [Heater config] can be set for desoldering.
- [Combined]: The heating curves of the soldering and desoldering temperature are highlighted in the chart. The complete soldering process is displayed. The heating curves cannot be changed and tab [Heater config] is inaccessible. If you want to change the heating settings specified in the soldering profile, deselect button [Combined] and, instead, select buttons [Soldering] or [Desoldering].
- [Synchronize]: changes the desoldering heating curve into the soldering one. Both heating curves will be congruent. In this condition, the changes made to the chart and heater settings will affect both heating curves.



6.5.4.1 The heating curves in the [Rework] tab

The heating curve is determined by the selected soldering profile. Depending on how often the heating curve is kinked, there will be 2, 3 or 4 heating phases. With regard to this, please also read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator](#) [▶ 82]. Temperature, duration and heat output (°C/s) can be assigned to each heating phase.

- The heating curves in the chart may only be set if the [Soldering] or [Desoldering] button above the chart has been adjusted.
- Soldering profiles classified as "linear" have two heating phases, which cannot be set differently.[^]
- Soldering profiles classified as "bent once" (kinked once) always have three heating phases that can be set individually.
- Soldering profiles classified as "bent twice" (kinked twice) and "soak zone" always have three heating phases that can be set individually. The plateau is the soldering process phase with the hottest temperature, which precedes the cooling phase. The plateau is always flat, that is, temperature is always constant.
- The [Tinit] point is the minimum temperature at which the process is depicted in the chart.
- [TP] (pipette temperature) is the temperature at which the pipette moves to the component to lift it. Only when desoldering.
- TL: (Liquidus temperature) Temperature at which the solder becomes liquid. No function. You can highlight the TL temperature with this.

Cooling ventilation will start after the plateau phase and run until the T5 point set temperature is reached. At the end of the plateau phase, the heaters are switched off, while the component is lifted during desoldering.

Setting the heating curves

- To simultaneously change the temperature and the heating phase duration: Click on one of the points [Tinit], T1, T2 ... on the heating curve and keep the mouse button pressed until the temperature indicated there is displayed in bold. Now move the point by pressing the mouse button.
- To change temperature: In the point to be changed, click on the temperature displayed there. Enter the desired temperature or use the "Up Arrow" and "Down Arrow" keys to change the temperature value.
- To change the heat output: click on the value of the heat output (°C/s) to be changed in the heating phase. Enter the new value. The maximum heat output is 2.5 K/s (2.5 °C/s). The displayed heat output can be switched in the [Administration] tab between K/s and °C/s.
- To change the heating phase duration: Click on the time value (s) to be changed in the heating phase. Enter the desired duration (in seconds) or use the "Up Arrow" and "Down Arrow" keys to change the duration value.
- To change [TP] (pipette temperature): Click on the [TP] temperature value. Enter the desired temperature to start lifting the pipette or use the "Up Arrow" and "Down Arrow" keys to change [TP].
- To change [TL] (liquidus temperature): Click on the [TL] temperature value. Enter the desired liquidus temperature or use the "Up Arrow" and "Down Arrow" keys to change the [TL] number.



Please note that the components should not be heated too quickly as only slow heating will result in uniform temperature distribution. This will increase the safety level of the process.

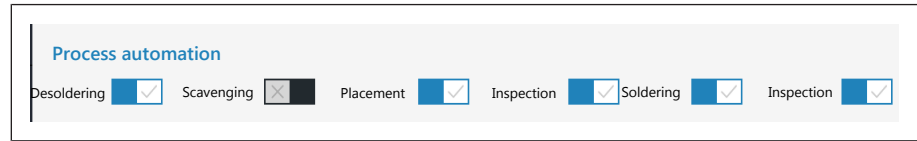
On the bottom right there is the [START/REFERENCE] button, which starts the rework process. Make sure you have made all settings correctly before starting the rework process. How to perform the soldering process is described by way of example in the Tutorial – Soldering or unsoldering a component.

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. With regard to this, please read Chapter [The heating curves in the chart in the \[Profile Management\] tab](#) [▶ 92].



6.5.5 [Process automation] and its process steps

Under the chart there is the [0552] (6) button row. Process automation



These buttons enable or disable process steps. The process flow starts with the first process step on the left and continues by performing the selected process steps on the right one after another.

- [Desoldering]: desoldering a component.
- [Scavenging]: Enable/disable the [Scavenging] work step. Switch on the button after the [Desoldering] only when using the optional Scavenger residual solder sucker. The option can be enabled in the [Device settings] dialog under the [Administration] tab. Use the [Information] tab under the [Rework] tab to set the cleaning parameters. As to this, please also read the operating instructions for the residual solder sucker.
- [Placement]: placing a component in the soldering position. To do so, place the component on the component tray.
- [Inspection]: checking the position of the arranged component with the Rework System optical instruments.
- [Soldering]: soldering a positioned component.
- [Inspection]: Final check of the soldering result with the optical instruments of the Rework System.

How to perform a soldering process is exemplified in Chapter Tutorial – Soldering or unsoldering a component .

For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from tab [Rework] tab to another tab, all changes will be lost.

The correct soldering profile settings should be specified in tab [Profile management] beforehand. Only possible as “Administrator” user. As to this, please read Chapter [The \[Process automation\] buttons under the \[Profile management\] tabulator \[94\]](#).



6.6 The [Archive] tabulator

All started as well as aborted processes are saved in the archive as graphical charts with all set soldering parameters. These processes are listed in tab [Archive].

Tracking ID	Date	User	Profile name	Board	Component
	12/13/2016 9:28:00 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 1:45:37 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 1:40:09 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 12:36:02 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 12:31:12 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:43:47 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:35:52 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:34:54 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:29:51 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:15:26 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:12:27 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:10:46 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:06:58 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:55:04 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:47:01 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:42:52 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:39:59 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:34:29 AM	Admin	Test 4	Low and medium mass	Low and medium mass

Process automation: Desoldering Placement Inspection Soldering Inspection

Right sidebar details:
 Profil Init Temp: 86
 Max Temperature: 260
 TL: 227
 TP: 180
 Lens: Lens25X33
 pipette: pipette1

In table [Archive], click on a process record to display the soldering profile details and the corresponding chart. The graphical elements of the chart can be exported as image files. The following functions are available in the [Archive]:

- [Search]: Search for letter sequences within the whole table contents. The search will automatically start after entering the first character.
- Button [View chart]: The highlighted chart will be displayed. For more information, see below in Chapter [View chart]. Charts that have no temperature record cannot be displayed.
- [from:]/[to:]: filtering processes by date.

The greyed-out column on the right shows further details of the highlighted process:

- [Profil Init Temp]: Temperature from which the process record begins.
- [Max Temperature]: Highest measured temperature in the soldering process.
- [TL]: Liquidus temperature entered for the process. No function, freely adjustable in the chart.
- [TP]: Only when desoldering. Pipette temperature at which the pipette moves to the component to lift it.
- [Lens]: Lens used in the process. Without function, can be freely adjusted in the chart.
- [pipette]: Pipette specified in the process. Without function, can be freely adjusted in the chart.

Range [Process automation] under the table shows the process steps adopted.



6.6.1 The [Show chart] button

The archived chart of the highlighted soldering process can be called up via the [View chart] button.



Fig. 27: Example for a chart

[Soldering] or [Desoldering]: Indicates whether the chart represents the soldering or desoldering process. If both methods were used in the process, these buttons can be used to change the view.

[CSV export]: Exports the recorded soldering profile data in the data format *.zip. This ZIP file contains extensive data in three data formats:

- In *.PDF format. This PDF file is displayed on screen immediately after export.
- In *.CSV format (comma-separated values), e.g. for further processing in Microsoft Excel™.
- In *.HRS2 format.

The storage path is: C:\program data\Ersa GmbH\HRS2\Temp

- i (Information) button on key: Display/hide the key. The chart lines shown may be selected in the [Heater config] tab.
- Plus button on chart key: To display a vertical measuring line to display values of the chart at any time on the time scale (X direction). The values are displayed at the intersection of the lines. Move the line with the mouse. It is possible to add further measuring lines.
The values displayed on the left of the line are temperature values. The left Y scale of the chart with temperature values applies to them. The values to the right of the line are variables. The right Y scale of the chart with up to 100% percentages applies to them.
- Trash button on chart key: Delete the selected measuring line.

Tab [Information]: Display of the soldering process parameters.



Tab [Heater config]: Control of the chart display. If activated during the soldering process, the displayed chart lines can be selected in the [Show] column.

If for the soldering process in the [Change all zones] function has been switched off, the single heating phases T1, T2 can be clicked on and shown.

- [Device info] tab: Display of basic information about the device and software versions.
- Tab [Image processing]: Display of image processing settings.

The X button to close the chart is located on the top right of the chart.

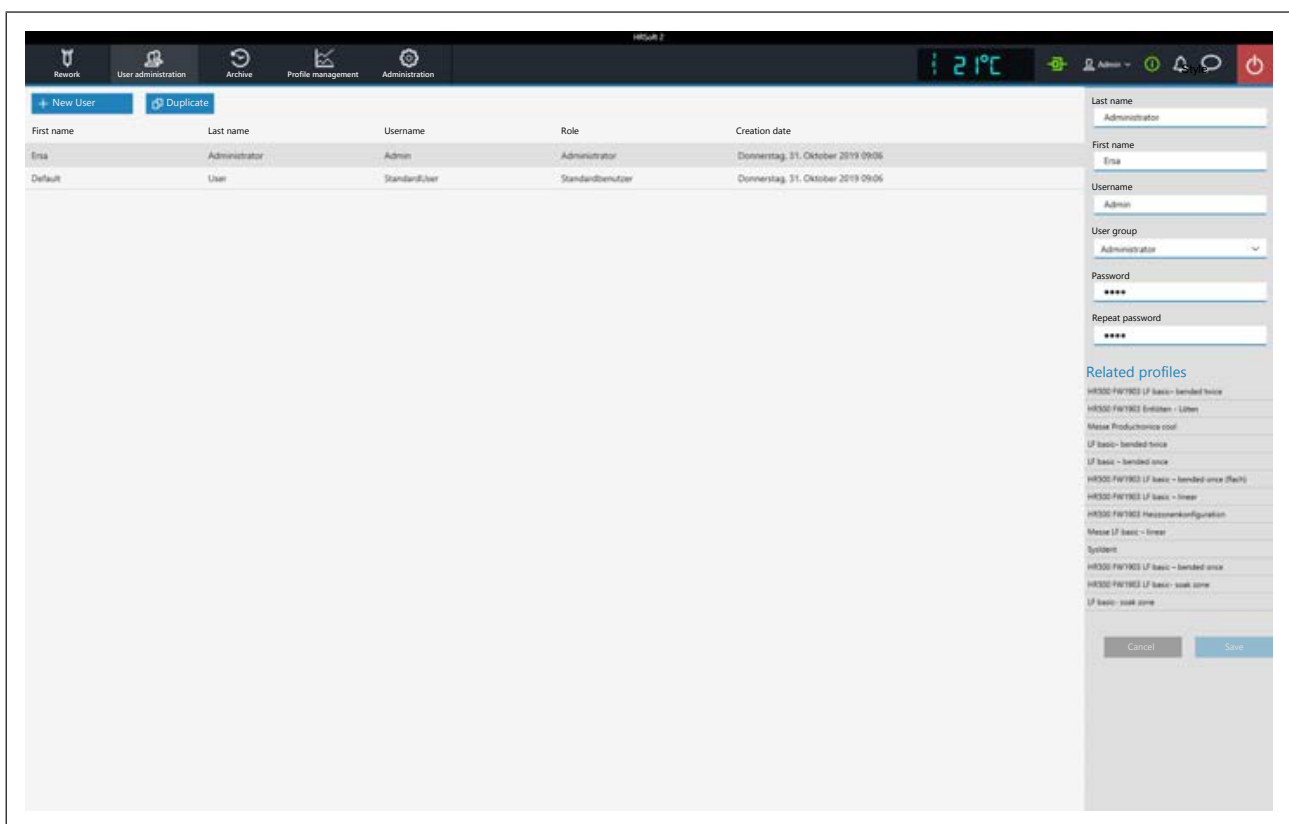


6.7 The [user management] tabulator

Two user classes are available in the HRSoft 2 program: “Administrator“ and “Standard user.“ After starting the HRSoft 2 program, the user class will be determined by the user name and password in dialog [Login]. With administrator rights you may access all functions. As a standard user, you may only use the soldering profiles enabled for this user, and not save any changes made.

Note: To assign a user to a soldering profile as an administrator, switch to tab [Profile management]. This tab is only visible to administrators. Here it is possible to assign users to soldering profiles so that these users can see and use the soldering profile in tab [Rework].

The list of users is only an illustration and cannot be edited directly. Click on a user in the list to display all information for this user in the greyed-out column on the right. All the soldering profiles which this user has been assigned to are displayed on the bottom right.



The following functions are available for the administrator under [User administration]:

- Button [New User]: one more line is created for the new user. Then enter all parameters for the new user into the greyed-out column on the right. A red warning triangle is located close to the input fields yet to be filled in. Also assign a user class to the user with selection field [User group]. The [Username and [Password] must be entered into dialog [Login] when starting the HRSoft 2 program. Do not forget the password, or write it down and keep it in a safe place.
- Button [Duplicate]: Creates a copy of a user. Select a user and click on button [Duplicate] to create a copy of this user. Then enter all parameter fields for the new user into the greyed-out column on the right.



- Button [Auto-archiving]: if activated, all soldering processes for this user will be stored in the archive. Started and cancelled processes will be saved in the archive as graphics and in all soldering parameters. With regard to this, please also read Chapter [The \[Archive\] tabulator](#) [▶ 76].

You can change the user at any time. To do this, click on the button with the current user name in the top right corner and call up function [Logout]. The latter will open dialog [Login] into which you should enter [Name] and [Password] of the new user.

How to delete a user

- a) Highlight the user to be deleted.
 - ⇒ A button will appear in the user line as a red trash icon.
- b) Click on the trash button.
 - ⇒ The user has been deleted.

Also see

- 📄 [The tab with the arrow button \[More\] under the \[Profile management\] tab](#) [▶ 90]



6.8 Editing the soldering profile in the [Profile management] tab and changing it permanently

6.8.1 Overview of the [Profile management] tabulator

Use tab [Profile management] to create, edit, copy, delete and save soldering profiles as an administrator. If you are logged in as a standard user, this tab will not be available. Tab [Profile management] largely corresponds to the content of tab [Rework], where you can also make changes to the soldering profile without saving them. Soldering processes can be started and monitored in the [Rework] tab. For a description of tab [Rework] please read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 62].

Dialog [Profile management] is divided into the following ranges:

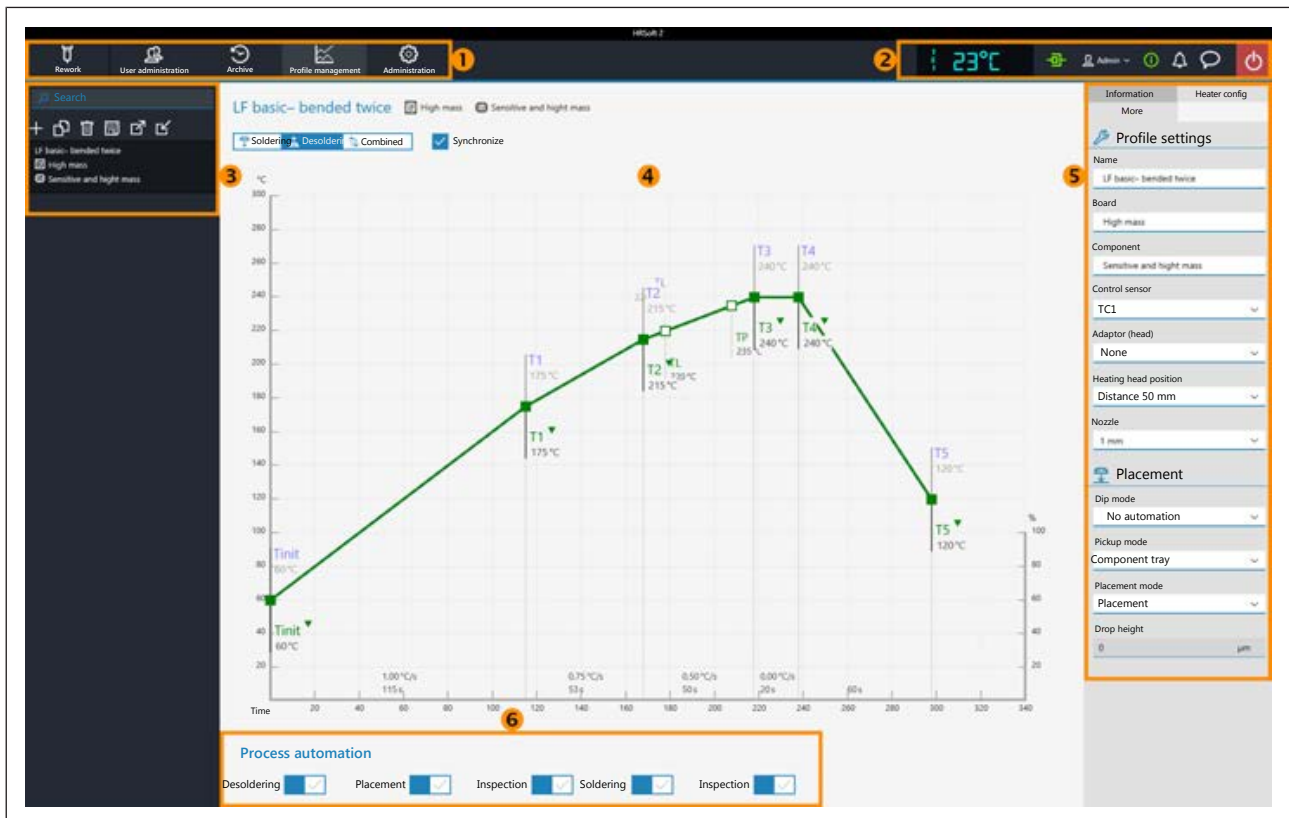


Fig. 28: Ranges in tab Profile management

1	tab bar. Calling up the tabs and button bar [Manual mode]	2	Displays and buttons to call up dialogs, from left to right: <ul style="list-style-type: none"> – Temperature display of the assigned temperature sensor – Green display/icon = network connection established, red = no network connection) – Button “User name” to change user – Button to open dialog [System state] Button to close the HRSoft 2 program As to this, please read Chapter The display and button sequence in the right upper corner.
---	---	---	--



<p>3 Selection of a soldering profile. Searching for profile names is possible. From top left to top right, the buttons allow you to:</p> <ul style="list-style-type: none"> – Create a new soldering profile – Copy the highlighted soldering profile – Delete a soldering profile – Save the highlighted soldering profile <p>As to this, please read Chapter Create, copy, delete and save soldering profiles in the [Profile management] tabulator [▶ 82].</p>	<p>4 Chart / soldering curves. Display of the soldering process with curves for soldering and desoldering. Soldering curves can be changed at the points in the curves.</p> <p>As to this, please read Chapter The chart in the [Profile management] tabulator [▶ 92].</p>
<p>5 Parameter bar with tabs [Information] and [Heater config] as well as a small arrow key to open dialog [Image processing].</p> <p>As to this, please read Chapter Tutorial.</p>	<p>6 Workflow bar for determining process flow steps (from left to right). As to this, please also read Chapter The [Process automation] buttons under the [Profile management] tabulator [▶ 94].</p>

The functions of tab [Profile management] largely correspond to those of tab [Rework]. For a description of tab [Rework] please read Chapter [\[Rework\] tabulator overview](#) [▶ 62].

You also have access to tabs [Archive], [User administration], [Profile management], [Administration] and button [Manual mode].

The functions of tab [Profile management] are described in detail in the following chapter.

6.8.2 Create, copy, delete and save soldering profiles in the [Profile management] tabulator

A soldering profile is a file in which the whole soldering process is defined. With the list of soldering profiles, you may execute the following functions using the four buttons (from the left to the right):





Plus symbol = Create a new soldering profile

Duplicate file = Duplicate a selected soldering profile

Recycle bin = Delete a selected soldering profile

Floppy disk = Save a selected soldering profile

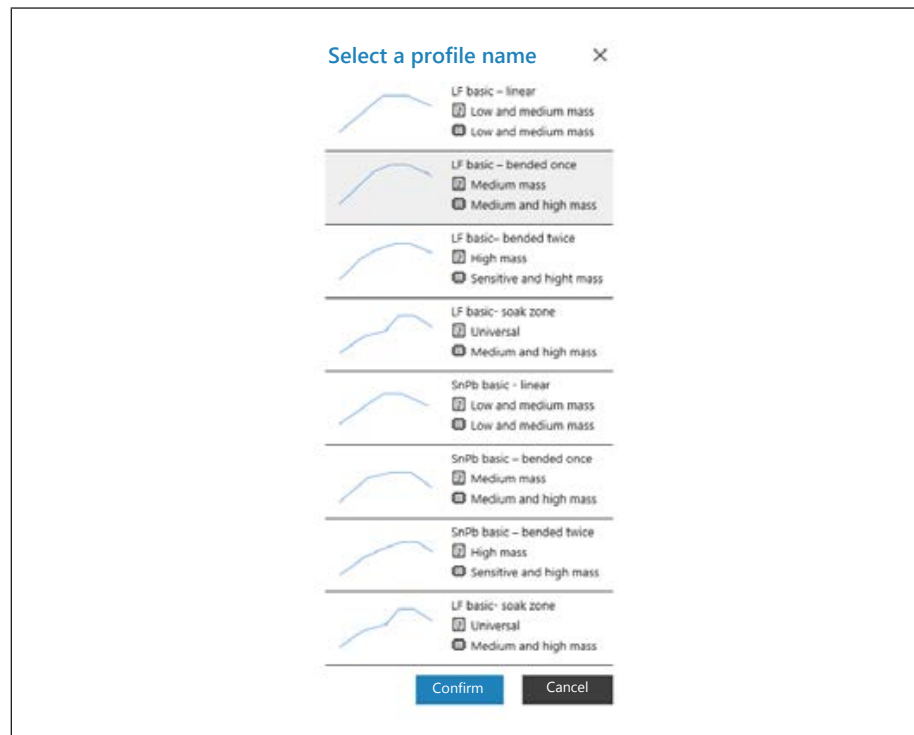
In the [Search] input field you may search the relevant profile names. The search begins automatically as soon as the first characters have been entered. All existing matches are marked in colour.



The soldering profiles have two rows for the definition of the PCB  and of the component . In these rows you may enter the relevant properties, such as board thickness, high/low component mass and unleaded/leaded solder.



Create a new soldering profile

a) Click on the “plus symbol” on the soldering profile list.

⇒ The [Select a profile name] window opens.



b) Among the eight templates available, select the profile template that best matches your new soldering profile and click on [Confirm]. The available templates have been defined based on actual applications. They show the temperature profile as a curve, while the two rows after the soldering profile name define the properties of the PCB  and of the component . If necessary, you may then adjust the selected profile template to your specific soldering process. With regard to this, please also read the [The \[Information\] tabulator under the \[User management\] tabulator \[85\]chapter](#).

- ⇒ Row 1: Soldering profile names. The soldering templates are always identified as “basic”.
 - “LF” means “lead free”.
 - “SnPB” means tin-lead.
 - “linear” indicates a uniform heating-up phase.
 - “bended once” indicates a heating-up curve with one bend.
 - “bended twice” indicates a heating-up curve with two bends.
 - “soak zone” indicates a heating phase with reduced heat from T1 to T2, for the activation of the flux material.
- ⇒ Row 2: PCB name . This is defined by default when selecting the profile template. The templates are named “Low and medium mass” for low to medium PCB mass, “Medium mass” for medium PCB mass and “High mass” for high PCB mass, while “Universal” is suitable for all types of PCB. If you want, you may rename the PCBs.
- ⇒ Row 3: Component name . This is defined by default when selecting the profile template. The templates are named “Low and medium mass” for low to medium component mass, “Medium and high mass” for medium to high component mass and “Sensitive and high mass” in case of high-mass or sensitive components. If you want, you may rename the components.

c) Click on the [Confirm] button.

- ⇒ The new profile is added at the end of the profile list.

d) Save the profile with the “floppy disk” button on the soldering profile list.



⇒ Change the new profile based on your specific needs. With regard to this, please also read the [The \[Information\] tabulator under the \[User management\] tabulator \[▶ 85\]chapter](#).

Copy a soldering profile

- a) In the soldering profile list, click on the soldering profile you wish to copy.
 - b) Click on the “duplicate file” button on the soldering profile list.
- ⇒ The copied profile will now appear at the end of the profile list. Change the profile based on your specific needs. With regard to this, please also read the [The \[Information\] tabulator under the \[User management\] tabulator \[▶ 85\]chapter](#).

Delete a soldering profile

- a) In the soldering profile list, click on the soldering profile you wish to delete.
 - b) Click on the “recycle bin” button on the soldering profile list.
- ⇒ The soldering profile was deleted.

Save a soldering profile

- a) In the soldering profile list, click on the soldering profile you wish to save.
 - b) Click on the “floppy disk” button on the soldering profile list.
- ⇒ The copied profile was saved.



6.8.3 The tabulators [Information], [Heating setting] and the arrow key [Image processing]

When the [Heater config] tab is called up, the chart (4) with the heating curves is displayed in the middle of the screen, and below the line with the buttons for the [Process automation] (6).

The heating curves in the middle of the screen can be adjusted for the desired soldering process. With regard to this, please read Chapter [The chart in the \[Rework\] tabulator](#) [▶ 72]. You can also change the buttons in the [Process automation] line (6) at the bottom at any time. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 75]. These buttons enable or disable any process steps.

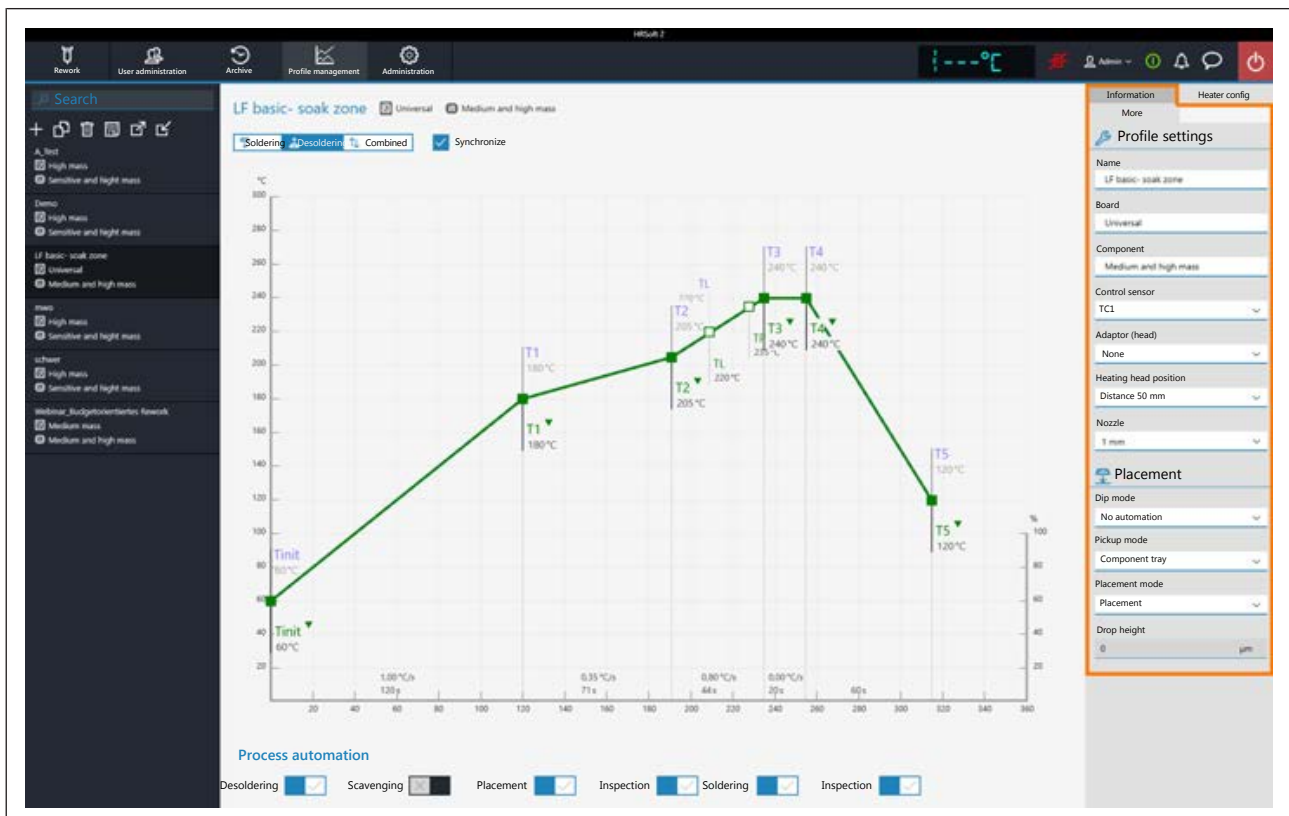
All the changes performed in the [Rework] tab will be accepted but not saved. If you switch from the [Rework] tab to another tab, all changes will be lost.

On the bottom right there is the [START/REFERENCE] button, which starts the rework process. Make sure you have made all settings correctly before starting the rework process. How to perform the soldering process is described by way of example in the Tutorial – Soldering or unsoldering a component.

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. With regard to this, please read Chapter [The tab with the arrow button \[More\] under the \[Profile management\] tab](#) [▶ 90].

6.8.3.1 The [Information] tabulator under the [User management] tabulator

The heating curves in the middle of the screen can be changed. Also the buttons in line [Process automation] (6) can always be changed. Use these buttons to enable or disable process steps.







The parameters in tab [Information]

The following parameters can be edited here in tab [Information]:

In the [0222] range: Profile settings

- [Name]: is specified by the profile template selection. Assign a different name if desired. As to this, please also read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator \[▶ 82\]](#).
The profile templates are always referred to as “basic.”
“LF” stands for lead free.
“SnPB” stands for tin lead.
“Linear” stands for a uniform heating phase.
“Bent once” stands for a heating curve with a single bend.
“Bent twice” stands for a heating curve with two bends.
“Soak zone” stands for heat-reduced heating phase from T1 to T2 to activate the flux material.
- [Board]: It is defined by the profile template selection (). The templates are called “Low and medium mass” for low to medium PCB mass, “Medium mass” for medium PCB mass, “High mass” for high PCB mass, and “Universal,” suitable for each PCB type. Assign a different PCB name if desired.
- [Component]: It is defined by the profile template selection (). The templates are called “Low and medium mass” for low to medium component mass, “Medium mass” for medium to high component mass, “Sensitive and high mass” for sensitive and high mass components. Assign a different component name if desired.
- [Control sensor]: Selection of the temperature sensor that controls the soldering process via its measured temperature. IRS [IRS] (Infrared sensor), [TC1] (thermocouple 1) or [TC2]. The currently measured temperature of the selected sensor is displayed in range (2). The infrared sensor (IRS) is not suitable for glossy, reflective surfaces or very small boards.
- [Adaptor (head)]: used adapter (air baffle). No function, only used to save info.
- [Heating head position]: Define the soldering distance to the PCB from 30 mm to 70 mm.
- [Heating head position]: eating head type [L-head] (big) or [S-head] (small).
- [Lens]: Used lens. No function, only used to save info.
- [pipette]: Used pipette. No function, only used to save info.

In range [Placement]:

- [Dip mode]: You can choose from three soldering methods:
 - [No automation]: Normal soldering without flux material dipping and without using a component that is coated with solder paste. The component is picked up from the component tray, aligned and placed on the soldering position.
 - [Auto. Dip]: Place the dip stencil prepared with flux material on a component tray. The component is lifted from another component tray and immersed in the dip stencil’s flux material, aligned and placed in the soldering position.
 - [Auto. Print]: Place the print stencil prepared with the component coated with solder paste on a component tray. The component is picked up from the print stencil, aligned and placed in the soldering position.
- [Placement mode]: during [Placement]: Positioning of the component using the contact sensor, or [Drop]: Dropping of the component through the PCB.
- [Drop height]: during soldering: Height above the PCB at which the component is dropped onto the PCB. Can only be changed if parameter [Drop] is selected.

**Use range [Scavenging]**

to process parameters for the optional residual solder sucker.

As to this, please also read the operating instructions for the residual solder sucker. Only operate the residual solder sucker if all specifications in the operating instructions have been complied with! The optional residual solder sucker must first be integrated into the Rework program HRSoft 2 using the [871] function in the [0516] dialog under the [0583] tab. Scavenger activeDevice settingsAdministration In so doing, the [851] work step will be displayed Scavenging for the residual solder sucker to be used after the [0231] work step. Desoldering As to this, please read Chapter [\[Process automation\] and its process steps](#) [▶ 75].

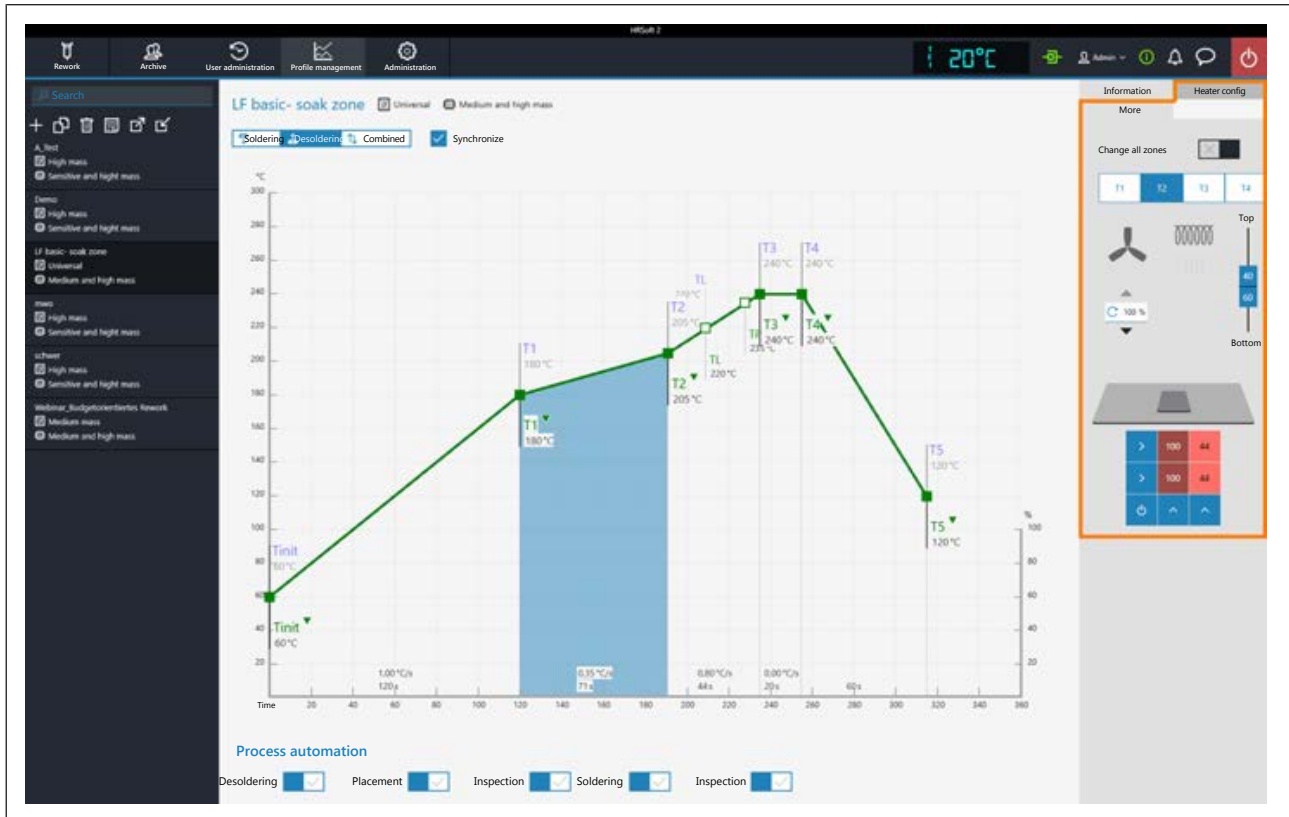
- a) Scavenging When using the optional Scavenger residual solder sucker, use the button of the [851] work step to activate the [851] range. Scavenging
 - [Bottom heater temperature]: temperature that is kept while cleaning the bottom heating.
 - [Placement mode]: Maximum heating time of the bottom heating during cleaning. For safety reasons, the bottom heating will switch off after this time, even if the swing arm of the residual solder sucker is not swung back into its normal position.

To temporarily edit the soldering profile parameters, start the Rework process and perform a reference run, please read Chapter [The \[Information\] tabulator under the \[Rework\] tabulator](#) [▶ 65].



6.8.3.2 The [Heating setting] tabulator under the [Profile management] tabulator

The heating curves in the middle of the screen can be changed. Also the buttons in line [Process automation] (6) can always be changed. Use these buttons to enable or disable process steps.



If you want to edit the heating settings specified in the soldering profile, deselect button [Combined] and, instead, select buttons [Soldering] or [Desoldering]. Buttons [Soldering] or [Desoldering] can have their respective heating curve including detailed heating settings or, by selecting button [Synchronize], the heating curve will be identical for both soldering processes. Click on button [Synchronize] to set the desoldering heating curve to the values of the soldering one. The displayed heating settings are valid for the highlighted soldering curve.

The parameters in tab [Heater config]

[Change all zones]: if this button is selected, all [Tinit] heating phases up to T4 will be displayed in blue in the [Heater config] as well as in chart (4). The parameters in tab [Heater config] will now apply to all heating phases. If button [Change all zones] is disabled, different heating parameters can be assigned to each of the four heating phases.

The following parameters can be edited here in tab [Heater config]:

- Buttons T1 – T4: Selection of the heating phase to define the associated heating parameters. To highlight the corresponding button, you can also click on a heating phase in the chart.
- Horizontal controller: Distribution of top heating in % between hot air heating (fan sign) and infrared heater (heating spiral sign). The infrared heater cannot heat glossy surface components properly.
- Input field with round arrow under the fan logo: Hot-air blower speed. Set the blower speed with the small triangle buttons or highlight the blower value and overwrite it. 100 % = maximum blower speed. A high blower value will slightly reduce the hot-air energy.



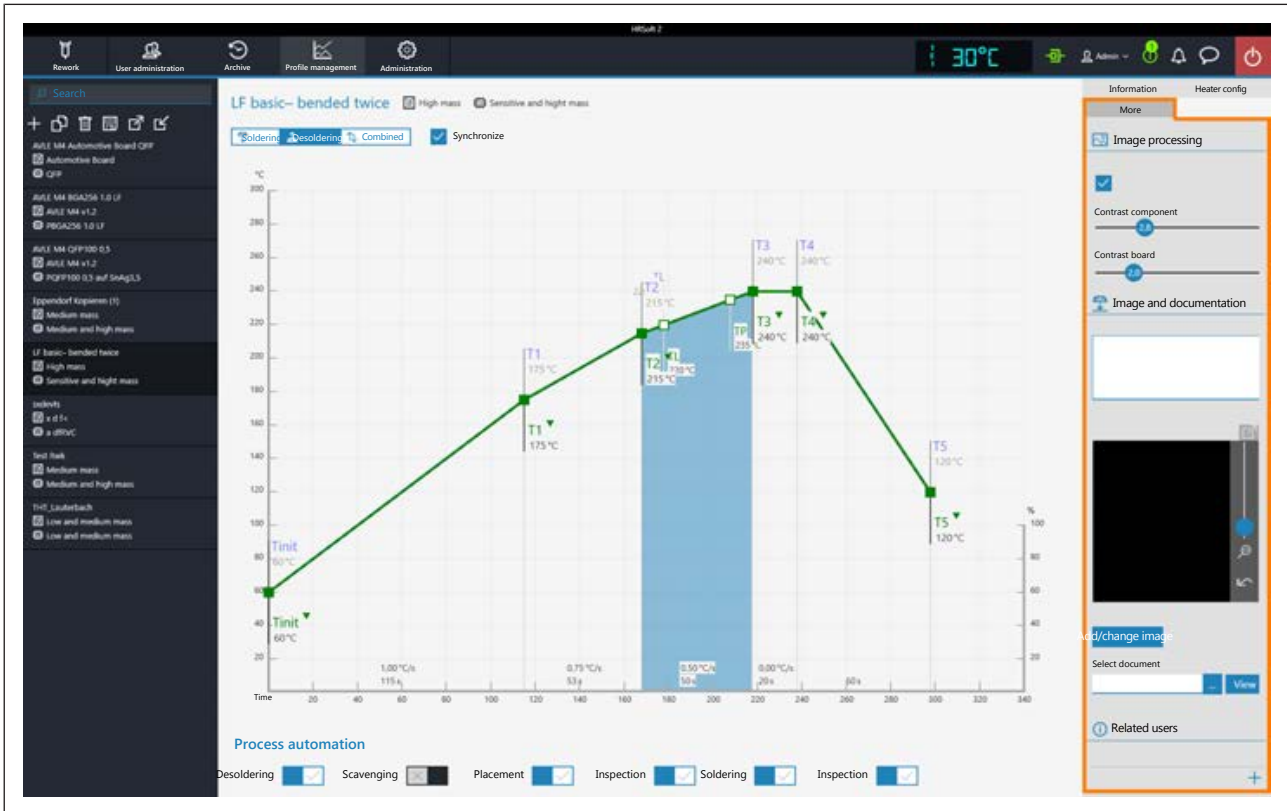
- Vertical controller (top - bottom): Top heating/bottom heating percentage power ratio. Adjust the power ratio to the heat requirement of your soldering process.
- Three lower heating input fields (%): The lower heating is divided into three zones - left, centre and right. Depending on the heat requirement, set the zones over the small triangle buttons above and below the input field, or highlight the heat value and overwrite it. For large PCBs, to avoid shape distortion, ensure that the whole PCB is heated.

Note that the components should not be heated too quickly as only slow heating will result in uniform temperature distribution. This will increase the safety level of the process.

To temporarily edit heating parameters, please read Chapter [The \[Heating setting\] tabulator under the \[Rework\] tabulator](#) [▶ 68].



6.8.3.3 The tab with the arrow button [More] under the [Profile management] tab



In range [Image processing]

[Red and green overlap information]: If enabled, the board is displayed in green and the component in red in the camera overlay image. The overlapping parts of the two image planes, the board and the component, are displayed in blue. If disabled, the camera image will be displayed in grey.

[Contrast component]: If the [Red and green overlap information] button is enabled, adjustment of the contrast value for the component shown in red.

[Contrast board]: If the [Red and green overlap information] button is enabled, adjustment of the contrast value for the board shown in green.

In range [Image and documentation]:

- [Comment.]: Field for entering info to be stored for the users of this soldering profile.
- [Image]: Click on button [Add/change image] to add a picture that can serve as useful info for the user of this soldering profile. The camera image can be zoomed with the controller on the right of the camera image or with the



to activate the full screen mode.

- [Add/change image]: Add a picture that can serve as useful info for the user of this soldering profile.
- [Select document]: Click the button with the three dots to integrate the soldering profile with a PDF file containing info on the soldering profile.
- [View]: Display of the soldering profile PDF file.

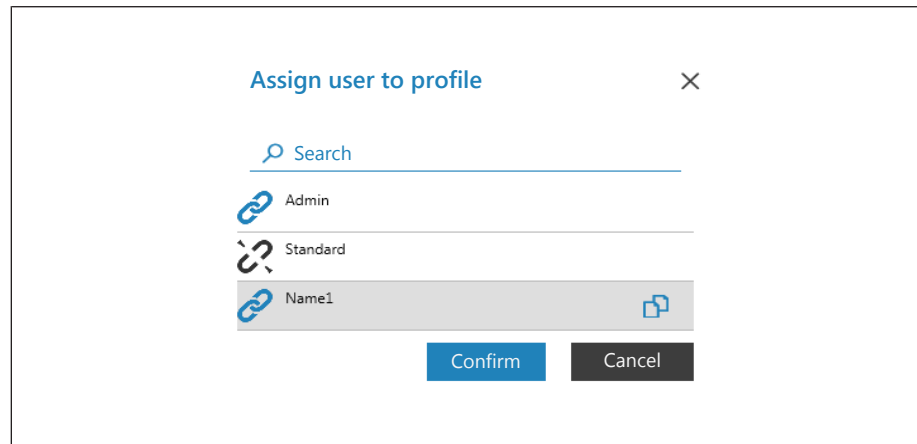


In range [Related users]:

List of users, who can see and use this soldering profile in tab [Rework]. This assignment may only be made here.

Assigning a user to the soldering profile

- a) Click on the “plus” sign.
⇒ Dialog [Assign user to profile] will be displayed.



- b) Click on the user that you would like to assign. This one has an open pipe character.
- c) Click on the pipe character.
⇒ The pipe character is now closed.
- d) Click on [Confirm].
⇒ A user has been assigned to the soldering profile. Also use dialog [Assign user to profile] to assign or remove other users by clicking on the chain icon.

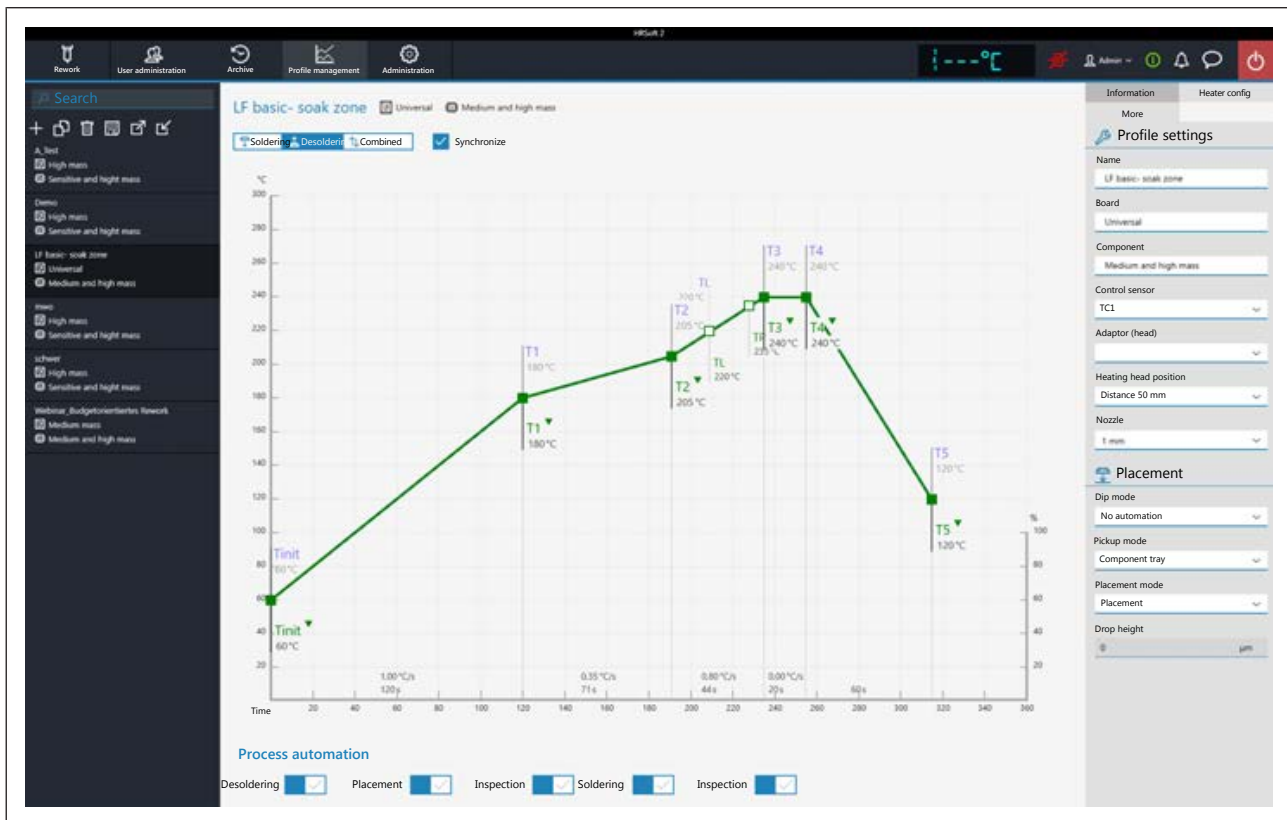
Deleting a user from a soldering profile

- a) Click on the user name you want to delete in the tab with the small arrow button.
- b) Move the mouse over the user name to be deleted.
⇒ A red trash icon will appear behind the user name.
- c) Click on the trash icon.
⇒ A user has been removed from the soldering profile.



6.9 The chart in the [Profile management] tabulator

Under tab [Profile settings], chart (4) with the heating curves will be displayed in the middle of the screen and, below, the button row for the [Process automation] (6). The heating curves can be changed here.



The following buttons are available:

- [Soldering]: The soldering blue heating curve is highlighted in the chart. The soldering blue heating curve can be changed and tab [Heater config] can be set for soldering
- [Desoldering]: The desoldering heating curve is highlighted in green in the chart. The desoldering red heating curve can be changed and tab [Heater config] can be set for desoldering.
- [Combined]: The heating curves of the soldering and desoldering temperature are highlighted in the chart. The complete soldering process is displayed. The heating curves cannot be changed and tab [Heater config] is locked. If you want to change the heating settings specified in the soldering profile, deselect button [Combined] and instead select button [Soldering] or [Desoldering].
- [Synchronize]: changes the desoldering heating curve to the soldering one. Both heating curves will be congruent. In this condition, the changes made to the chart and heater settings will affect both heating curves.

6.10 The heating curves in the chart in the [Profile Management] tab

A heating curve is divided into the five steps “Tinit – T1”, „T1 – T2“ etc. You may assign a specific temperature and time profile to each of these steps.

- [Tinit] = Temperature from which the process is displayed.
- Heating phase [Tinit] – T1, T1 – T2 and T2 – T3: Heating-up phases that allow for different configurations. The heating phases of the soldering and unsoldering process may differ starting from T2 .



- Heating phase T3 – T4: Hottest phase with constant temperature. The two values should always be identical: T3 = T4. At T4, the heatings turn off, and in case of unsoldering the component is picked up.
- Cooling phase T4 – T5: Cooling process after soldering. The cooler ventilation starts at T4 and cools until the selected T5 temperature is reached.
- TL = liquidus temperature, at which the solder becomes liquid. No function; however, you can mark this temperature.
- TP = only in case of unsoldering. Temperature at which the pipette moves to the component to lift it. The component is lifted from T4.

Changing the heating curves

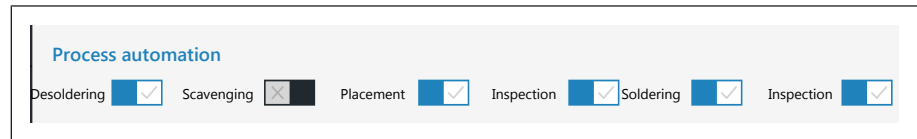
- Change temperature and heat phase duration at the first time: Click on one of the points [Tinit] – T5 on the heating curve and hold the mouse button down until the temperature is displayed in bold. Now move the point while keeping the mouse button pressed.
- Change the temperature: In the point to be changed on the heating curve, click on the relevant temperature. Enter the desired temperature or use the keys “Arrow up” and “Arrow down” in order to change the temperature.
- Change the heating power: In the heating phase below, click on the heating power to be modified and enter the new value. The maximum heating power is 2.5 K/s (2.5 °C/s). In the [Administration] tabulator you may change the heating power unit by toggling between K/s and °C/s.
- Change the heating phase duration: In the heating phase below click on the time to be modified and enter the desired duration (in seconds) or use the keys “Arrow up” and “Arrow down” in order to change the duration.
- [TL] tabulator: Click on the temperature value of [TL] and enter the new liquidus temperature or use the keys “Arrow up” and “Arrow down” in order to change this temperature.
- [TP] tabulator: Click on the temperature value of [TP] and enter the new pipette temperature or use the keys “Arrow up” and “Arrow down” in order to change the temperature.

Please remember that the components should not be heated as quickly as possible: in fact, only a slower heating process can ensure an even temperature distribution. This will ensure a safe process



6.11 The [Process automation] buttons under the [Profile management] tabulator

Under the chart there is the [0552] (6) button row. Process automation Use these buttons to enable or disable process steps. The process flow starts with the first process on the left and continues by performing the selected process steps on the right one after another.



- [Desoldering]: desoldering a component.
- [Scavenging]: Enable/disable the [Scavenging]. Switch on the button after the [Desoldering] only when using the optional Scavenger residual solder sucker. The option can be enabled in the [Device settings] dialog under the [Administration] tab. Use the [Information] tab under the [Rework] tab to set the cleaning parameters. As to this, please also read the operating instructions for the residual solder sucker.
- [Placement]: placing a component in the soldering position. To do so, place the component on the component tray.
- [Inspection]: checking the location of a positioned component with Visionbox.
- [Soldering]: soldering a positioned component.
- [Inspection]: final check of the soldering result with Visionbox.

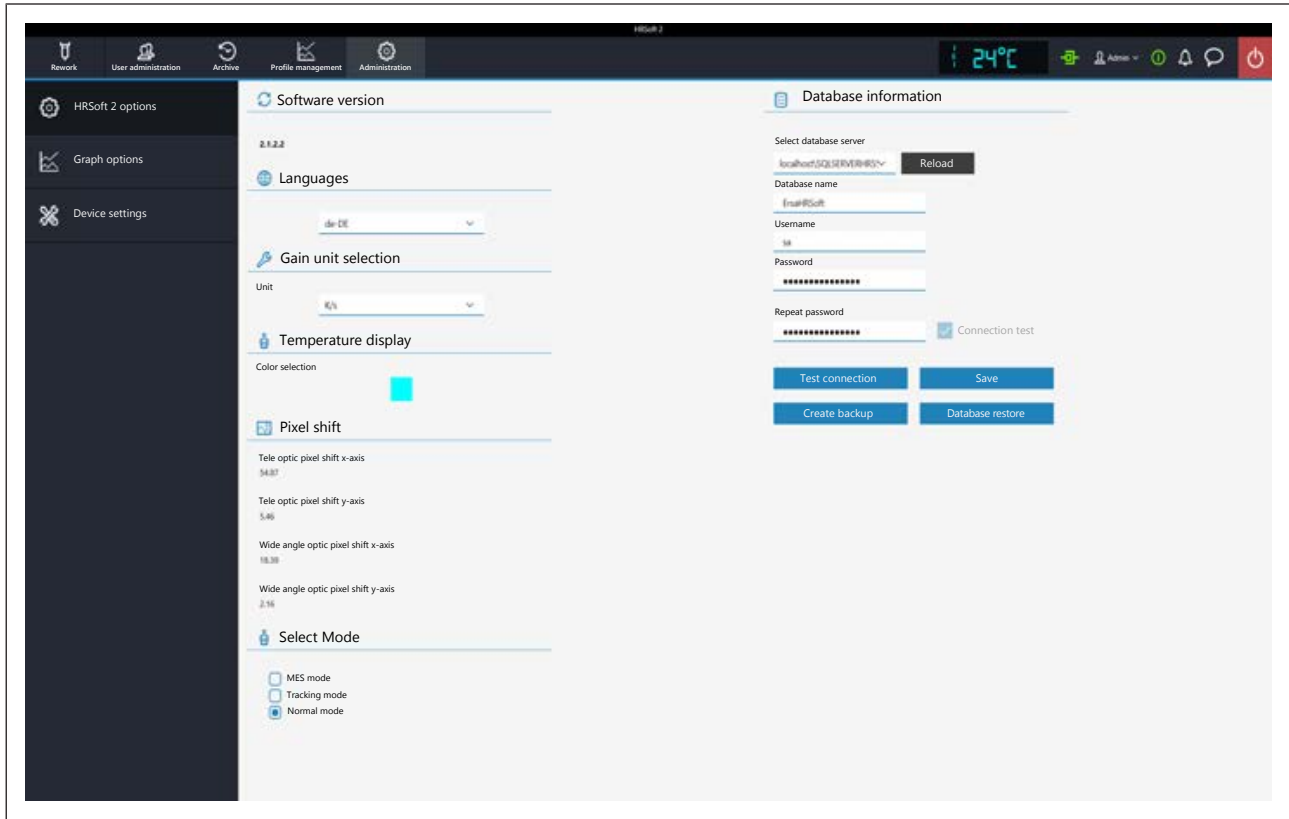
How to perform a soldering process is exemplified in Chapter Tutorial – Soldering or unsoldering a component .



6.12 The [Management] tabulator with three dialog windows

6.12.1 The dialog [HRSoft 2 settings]

Use dialog [HRSoft 2 options] to access various default settings for the HRSoft 2 program.



[Software version]

The software version of HRSoft2.

[Languages]

[System language] - switching the user interface language.

[Gain unit selection]

[Selected gain unit] - Display of the unit in the chart as Kelvin per second or degrees Celsius per second.

[Temperature display]

[Color selection] - Color of the temperature display on the top right. Click on the coloured square to see all available colors.

[Pixel shift]

IMPORTANT: Do not edit these parameters here!

The pixel shift values are determined by performing function [Adjust pixel shift]. Always perform function [Adjust pixel shift]:

- whenever reinstalling the Rework System
- after reinstalling HRSoft 2
- after replacing the heating head



- after relocating the Rework System.

With regard to this, please read Chapter [The \[Pixel shift adjustment\] button \[▶ 105\]](#).

[Select Mode]

Do not use

[Database information]

The database stores user profiles and soldering processes among other things. In range [Database information] (see description of the following functions), correct parameters must be entered to be allowed to access the database.

- [Select database server]: path to database. Click on button [Reload] to set the correct path.
- [Database name]: selected path of the database.
- [Username]: assign any user name.
- [Password]: password for network access protection.
- [Repeat password]: password for network access protection.
- [Connection test]: Click on button [Test connection]. When the connection to the database has been established, a checkmark will appear.
- Button [Test connection]: click on this button for checking. When the connection to the database has been established, a checkmark will appear in checkbox [Connection test].
- Button [Save]: to save the database settings.

Button [Create backup]: The database has been secured. The database includes, for instance, the soldering profiles, the archives and the system settings. A file with *.bak file extension is created. Use this function to transmit the database data to another computer.

Button [Database restore]: to read a protected database (file extension *.bak). For database recovery, e.g. after reinstallation.

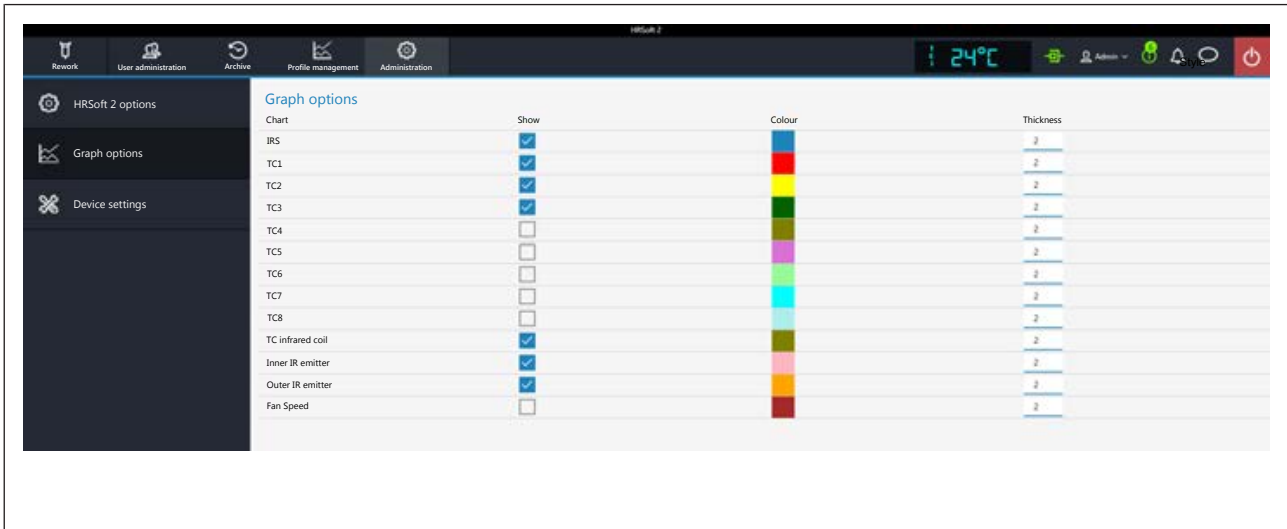
Also see

-  The [device settings] dialog [▶ 98]



6.12.2 The [Chart settings] dialog

In dialog [Graph options], various chart default settings can be accessed.



You may access the following parameters:

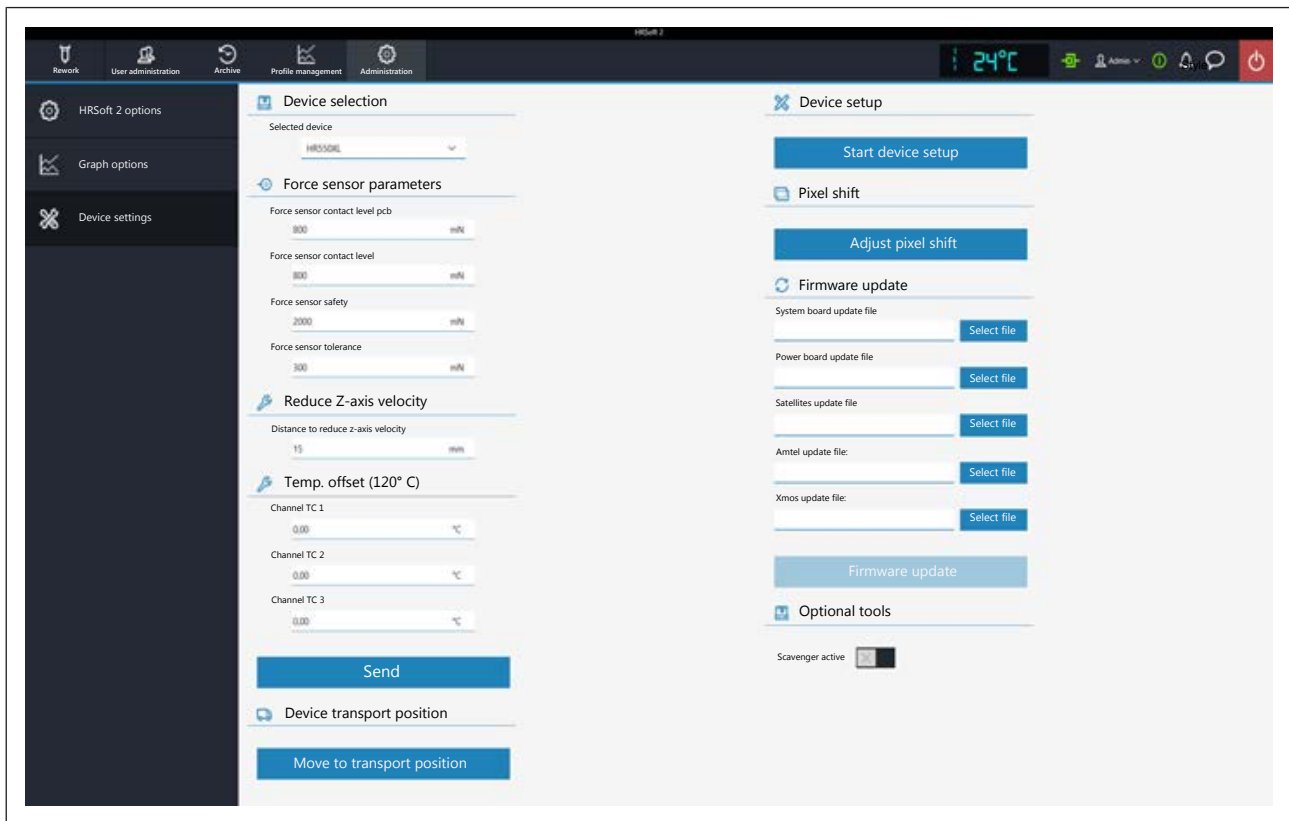
In table [Graph options] determine which colours the measured curves in the chart should have. The measured curves in the chart can be displayed/hidden also during the current soldering process.

- Column [Show]: to display/hide the measured curve.
- Column [Colour]: colour of the measured curve. Click on the coloured square to display all available colours.



6.12.3 The [device settings] dialog

Use dialog [Device settings] to access various pre-settings for the Rework system.



[Device selection]

[Selected device]: to select your Rework system.

[Force sensor parameters]

Set the contact sensors of the placing head pipette. Only change values if the resulting effects are known. Editing these values may cause the pipette to exert too much or too little force.

Info: The contact force of the soldering nozzle is controlled automatically and cannot be changed.

- [Force sensor contact level pcb]: contact force on PCB, component and glass plate where the pipette movement stops.
- [Force sensor contact level]: contact force during dipping at which the dipping movement stops.
- [Force sensor safety]: contact force stopping the movement during the pipette fast drive. Do not change these values!
- [Force sensor tolerance]: Force specification of the hysteresis for pipette drive. Do not change these values!

Reduce Z-axis velocity]

- [Distance to reduce z-axis velocity]: For the last few millimetres before the contact point, the pipette must switch to slowed contact movement. The 0 value corresponds to the PCB surface.
- a) Enter the distance in millimetres at which to switch to slowed contact movement. For tall components, the distance must be higher.



[Temp. offset (120° C)]

- [Channel TC 1] up to [Channel TC 3]: to enter correction values if the temperature readings of the thermocouples differ from the real temperatures.
 - a) Measure the thermocouples with an external calibration tool at 120°C.
 - b) Enter the values of the detected temperature differences (negative minus sign before them) into input fields from [Channel TC 1] up to [Channel TC 3] to offset them.
 - c) Then click on button [Send].
- ⇒ The correction values have been adopted and the Rework System will display the calibrated values of the temperature sensors.

[Device transport position]

Button [Move to transport position]: IMPORTANT: To avoid any transport damage, move the heating head to a safe position using button [Move to transport position] before carrying the Rework System to another location!

[Device setup]

Process [Start device setup] is run being guided by an assistant, similar to the wizard guiding you through the soldering process. The process is described in Chapter [The button \[Start maintenance mode\] \[▶ 101\]](#) . Always perform function [Pixel shift]:

- whenever reinstalling the Rework System
- after updating HRSoft 2
- after replacing the heating head
- after relocating the unit.

Info: To fully set up the Rework system after changing the heating head or relocating the system, also run the function associated with button [Adjust pixel shift] here in this dialog. As to this, please read Chapter [The \[Pixel shift adjustment\] button \[▶ 105\]](#).

[Adjust pixel shift]

Process [Adjust pixel shift] is run being guided by an assistant, similar to the wizard guiding you through the soldering process. The process is described in Chapter [The \[Pixel shift adjustment\] button \[▶ 105\]](#) .

Info: To fully set up the Rework system after changing the heating head or relocating the system, also run the function associated with button [Start device setup] here in this dialog. As to this, please read Chapter [The button \[Start maintenance mode\] \[▶ 101\]](#).

[Firmware update]

- [System board update file]: To refresh the system board firmware, click on button [Open] and select the new system board firmware with file extension *.bin. Then click on button [Firmware update]. The system board firmware has been updated.

Normally, you will realize a firmware update is needed via a bell icon being shown in the display and button bar on the top right. A number of the required firmware updates will appear on the bell icon. Click on the bell icon and start the update, which will be run automatically.
- [Power board update file]: to refresh the Powerboard firmware, click on button [Open] and select the new Powerboard firmware with file extension *.bin. Then click on button [Firmware update]. The PowerBoard firmware has been updated.



Normally, you will realize a firmware update is needed via a bell icon being shown in the display and button bar on the top right. A number of the required firmware updates will appear on the bell icon. Click on the bell icon and start the update, which will be run automatically.

- [Satellites update file]: to refresh the heating head's and lower heating's firmware, click on button [Open] and select the new satellite firmware with file extension *.bin. Then click on button [Firmware update]. The Satellite firmware has been updated.

Normally, you will realize a firmware update is needed via a bell icon being shown in the display and button bar on the top right. A number of the required firmware updates will appear on the bell icon. Click on the bell icon and start the update, which will be run automatically.

- [Amtel update file:]: only execute if specified by the Ersä service.
- [Xmos update file:]: only execute if specified by the Ersä service.
- Button [Firmware update]: to start updating the firmware. The version of the installed firmware is displayed in dialog [Motion control information]. As to this, please read Chapter [The display and switch row top right](#) [▶ 111].

[Optional tools]

- [Scavenger active]: activate only when using the optional Scavenger residual solder sucker. When using Scavenger, activate work step [851]. Scavenging As to this, please read Chapter [The \[Process automation\] buttons under the \[Profile management\] tabulator](#) [▶ 94]. Read the relevant operating instructions before starting up the Scavenger residual solder sucker.



6.12.3.1 The button [Start maintenance mode]

Always perform function [Start device setup] to redefine the heating head positions:

- after reinstalling the Rework system
- after reinstalling HRSoft 2
- after replacing a heating head
- after relocating the Rework System.

You need the black square plate (320415, limiter) and the round calibration target (344244, blank). Process [Start device setup] runs guided by a wizard, similar to the Assistant helping you through the soldering process.

Use a nozzle size 5 or 10 included in the scope of delivery for this process. As to this, please also read Chapter [Replacing the soldering nozzle](#) [▶ 117].

Info: To fully set up the Rework system after changing the heating head or relocating the system, also run the function associated with the [Adjust pixel shift] button in the [Device settings] dialog. As to this, please read Chapter [The \[Pixel shift adjustment\] button](#) [▶ 105].



CAUTION

Risk of burns from hot surfaces!

a) Touching the device surfaces may cause burns!

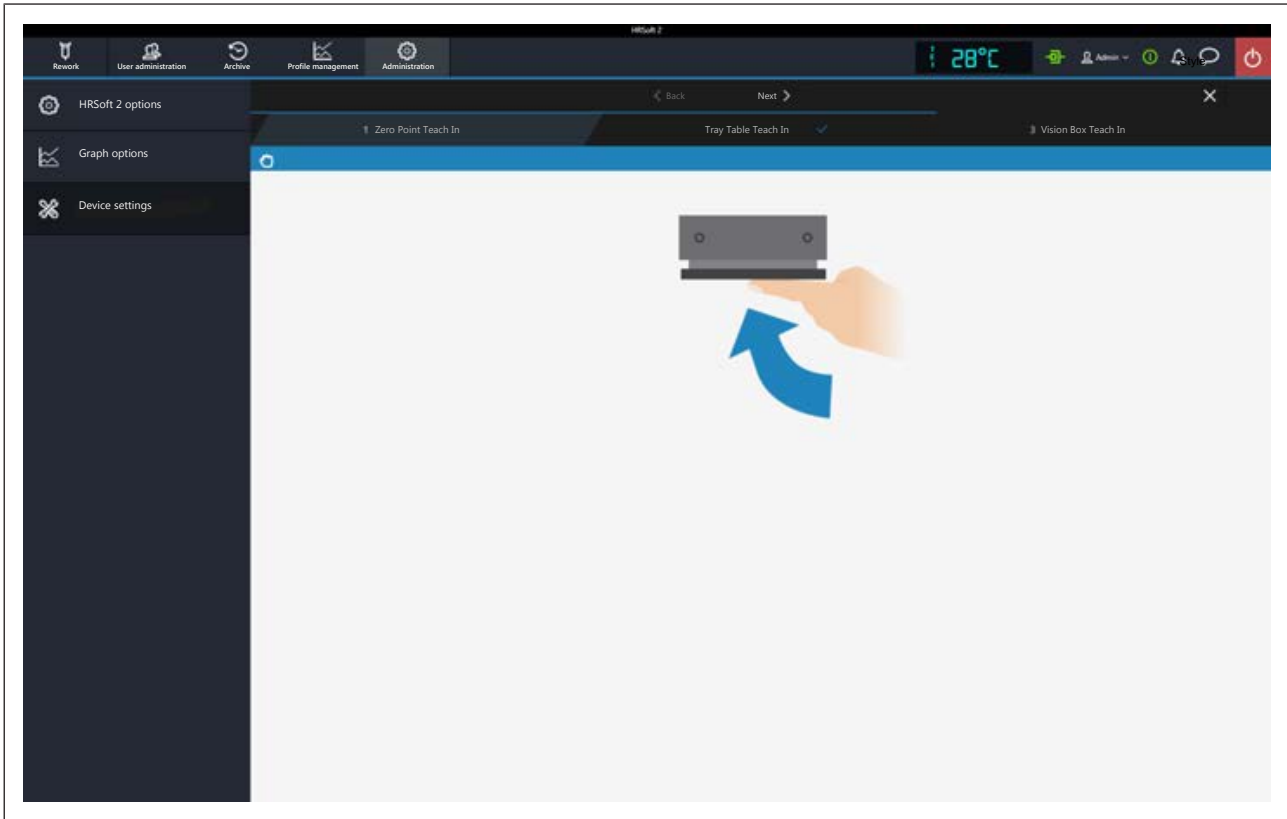
a) Push the lever to switch between normal view and the telephoto lens of the Visionbox through to the tele-position. As to this, please also read Chapter [Overview of the machine parts](#) [▶ 57], no. 11.

b) Click on button [Start device setup].

⇒ The device first carries out a reference run of the pipette and the heating head.

⇒ The Assistant for the soldering head height's maintenance mode is started. The information line above the diagram describes the work steps to be performed.

⇒ You will be asked to hold the square black plate included in the calibration kit under the heating head.



Alternatively, you can use any flat, inflexible object.

- a) Remove any inserted air baffle.
- b) Hold the plate perfectly horizontal and flush with the underside of the heating element.



- c) Keep holding the plate steady and go on to the next work step. This can be done either by pressing the green light button on the control panel, or by clicking on the [Next] button in the upper window range.
⇒ The suction pipette comes into contact with the plate, and the height is learnt.
- a) When the Assistant prompts you, remove the plate.
- b) Go on to the next work step.



- c) Clamp the black square plate to the PCB holder. Lock it with four holders and firmly screw the PCB clamps to bring the plate to a precise height position. Place the plate under the nozzle. If necessary, move the cross table while holding down the white light button on the control panel.
- d) Go on to the next work step.
⇒ The nozzle comes into contact with the black plate and learns the height.
- a) Go on to the next work step.



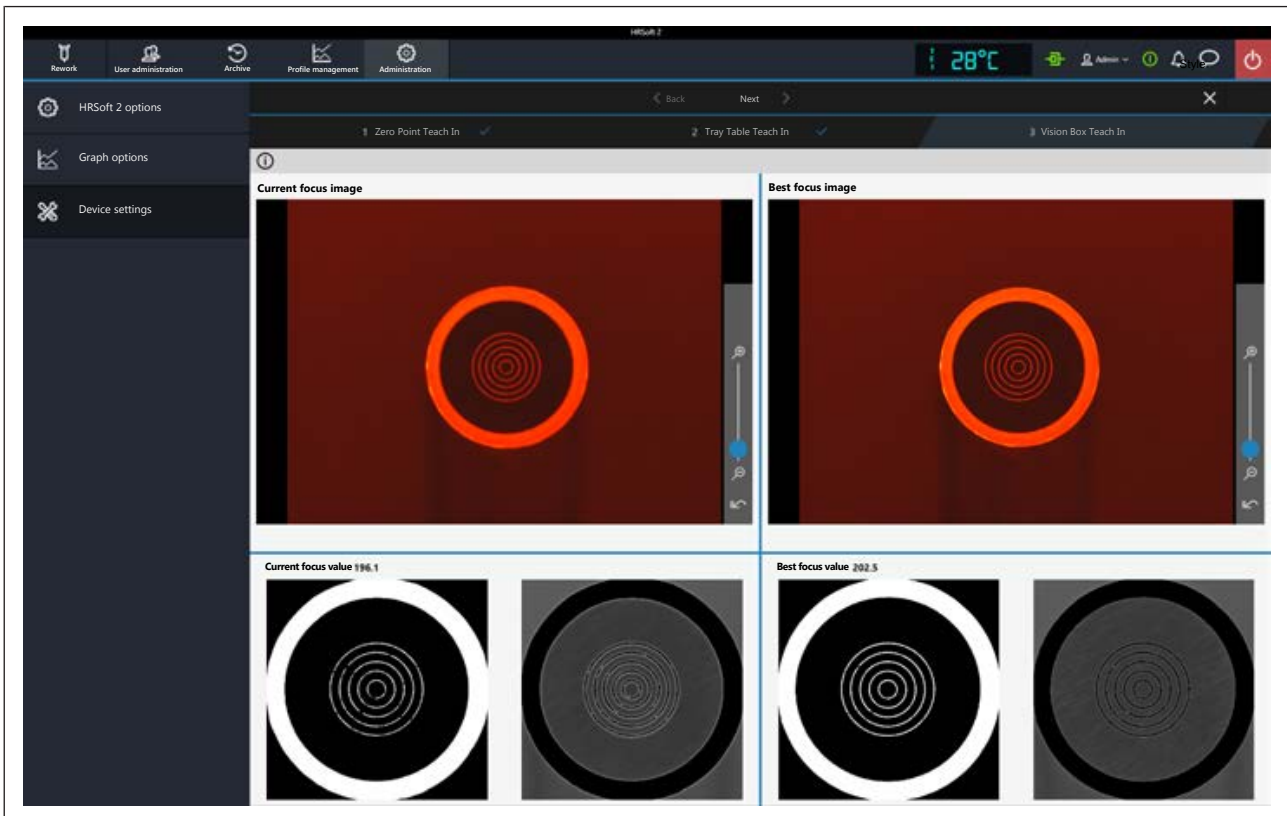
⚠ DANGER

Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!
- b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
- c) Class 2 laser according to DIN EN 60825-1:2008-5, $P < 1 \text{ mW}$, $\lambda = 650 \text{ nm}$

The position laser switches on.

- a) Slide the component tray under the nozzle.
- b) Go on to the next work step.
⇒ The pipette comes into contact the component tray.
- a) Place the calibration target exactly in the middle of the component tray.
- b) Go on to the next work step.
⇒ The pipette picks up the calibration target.
- a) Slide the component tray sideways.
- b) Push the lever in to switch to the Visionbox.
- c) Pull out the Visionbox.
⇒ Autofocus is calculated.





- a) Wait for this window to close.
 - b) Push the Visionbox back in place.
 - c) The focusing small plate is put down.
- ⇒ Maintenance mode has come to an end and the result has been saved.



6.12.3.2 The [Pixel shift adjustment] button

Always perform function [Adjust pixel shift] to redefine optical positions:

- after reinstalling the Rework system
- after reinstalling HRSoft 2
- after replacing a heating head
- after relocating the Rework System.
- You need the black square plate (320415, limiter) and the round calibration target (344244, blank). Process [Start device setup] runs guided by a wizard, similar to the Assistant helping you through the soldering process.

Use a nozzle size 5 or 10 included in the scope of delivery for this process. As to this, please also read Chapter [Replacing the soldering nozzle](#) [▶ 117].

Info: To fully set up the Rework system after changing the heating head or relocating the system, also run the function associated with the [Start device setup] button in the [Device settings] dialog. As to this, please read Chapter [The button \[Start maintenance mode\]](#) [▶ 101].



CAUTION

Risk of burns from hot surfaces!

- a) Touching the device surfaces may cause burns!

a) Push the lever to switch between normal view and the telephoto lens of the Visionbox through to the tele-position. As to this, please also read Chapter [Overview of the machine parts](#) [▶ 57], no. 11.

b) Click on button [Adjust pixel shift].

⇒ The device first carries out a reference run of the pipette and the heating head.

⇒ The Assistant to adjust the Pixel Shift gets started. The information line above the diagram describes the work steps to be performed.



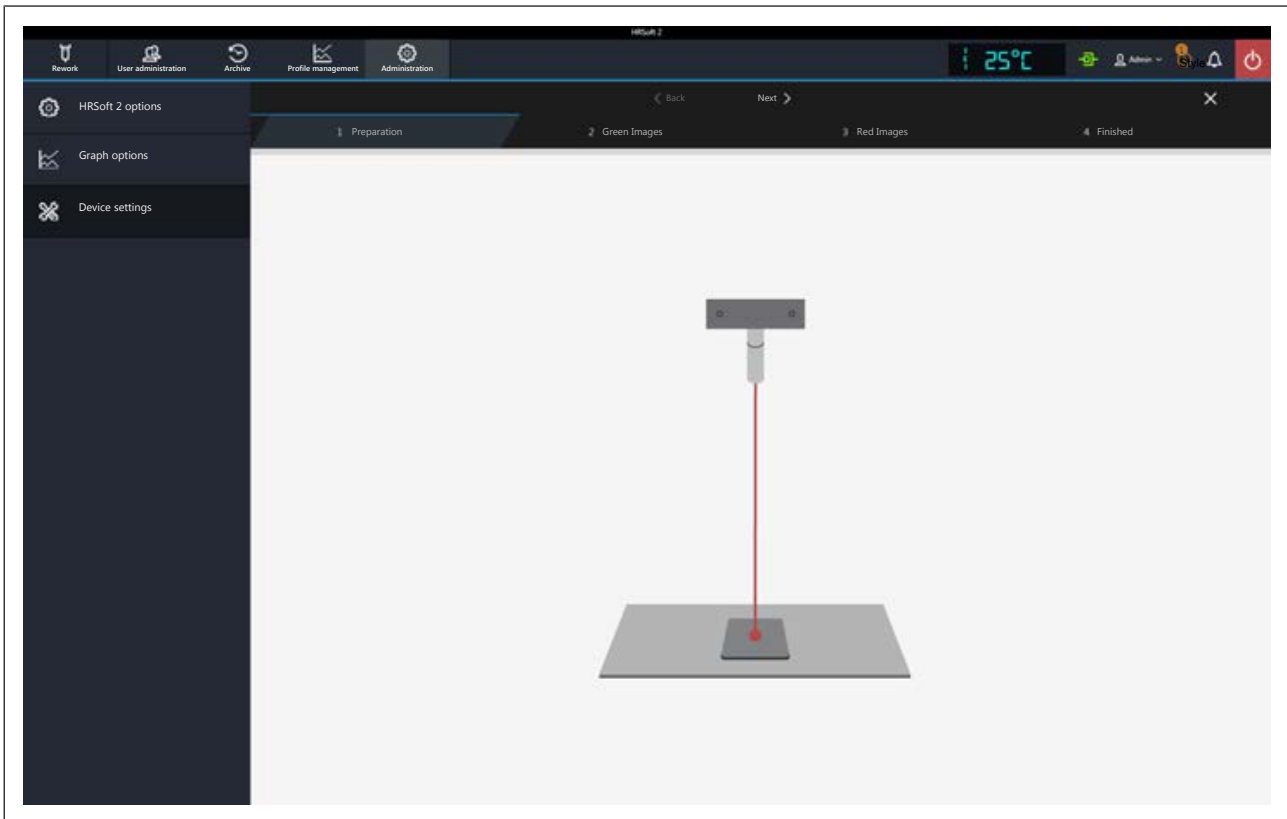
DANGER

Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!

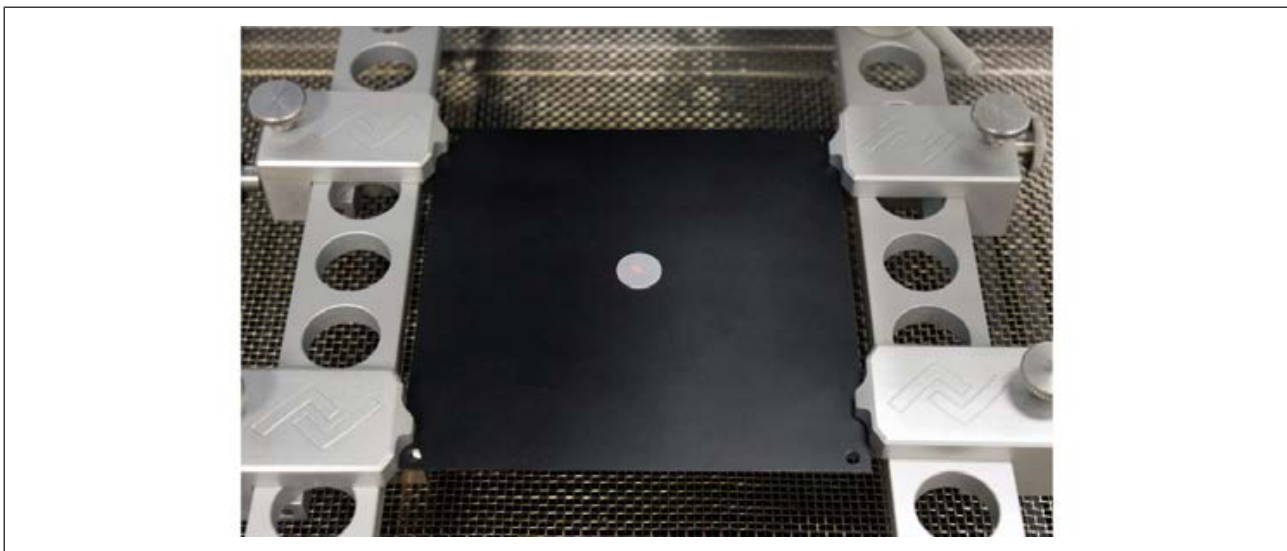
b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!

c) Class 2 laser according to DIN EN 60825-1:2008-5, $P < 1 \text{ mW}$, $\lambda = 650 \text{ nm}$



The position laser is on.

- a) Clamp the black square plate to the PCB holder. Lock it with four holders and firmly screw the PCB clamps to bring the plate to a precise height position. Place the plate under the nozzle. If necessary, move the cross table while holding down the white light button on the control panel.

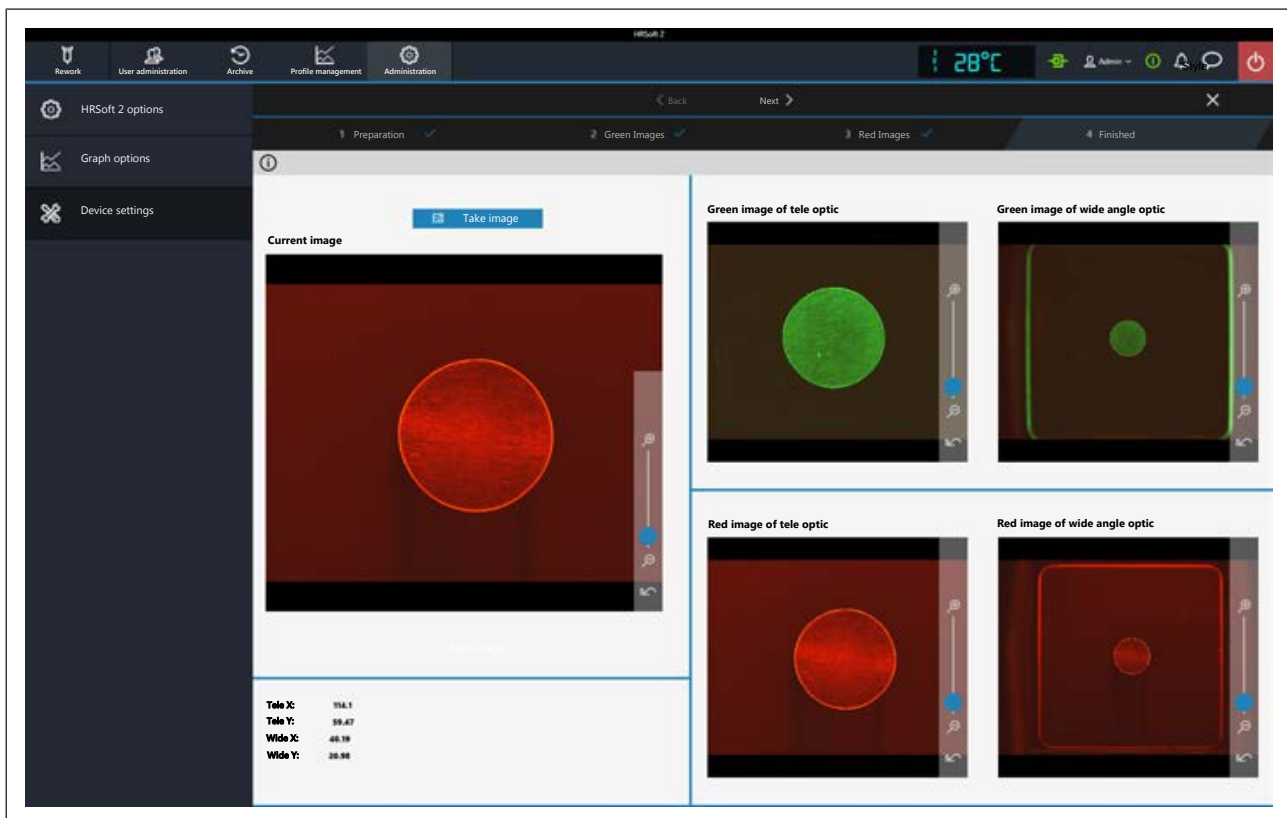


- b) Place the calibration target on the black plate so that the laser is exactly in the middle.
- c) Go on to the next work step. This can be done either by pressing the green light button on the control unit, or by clicking on the [Next] button in the upper window range.
- d) Pull out the Visionbox.
⇒ The dialog for taking four pictures will appear.
- a) Click on button [Take image].



- ⇒ The first picture of the focusing small plate is taken.
 - a) Go on to the next work step.
 - b) Pull out the lever to toggle between wide-angle view and telephoto lens (wide-angle view).
 - c) Go on to the next work step.
 - d) Click on button [Take image].
 - e) Go on to the next work step.
 - f) Slide the Visionbox in.
- ⇒ The pipette picks up the focusing small plate.
 - a) Pull out the Visionbox.
 - b) Click on button [Take image].
 - c) Go on to the next work step.
 - d) Pull out the lever to toggle between wide-angle view and telephoto lens (teleposition).
 - e) Go on to the next work step.
 - f) Click on button [Take image].
 - g) Go on to the next work step.
 - h) Slide the Visionbox in.
- ⇒ The pixel shift is calculated.

The four values determined for wide-angle and telephoto lenses are displayed.



- a) Go on to the next work step.
 - b) Fit a component tray under the heating head.
- ⇒ Place the focusing small plate on it.
- a) Bringing the component trays to the middle position



⇒ The pixel shift has been fully adjusted and the result saved.

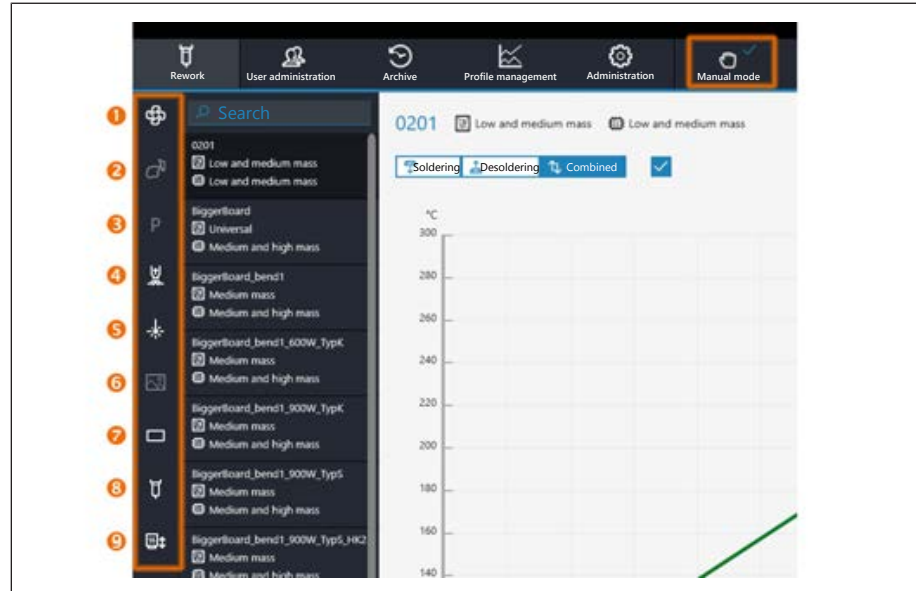
a)



6.13 The [Manual Mode]

Use button [Manual mode] to display and hide, in tab [Rework] button column [Manual mode].

By moving the mouse over one of these buttons, a describing tool tip will be displayed.



The buttons allow the following functions to be switched on and off at any time:

1: Switching on/off the cooling fan.

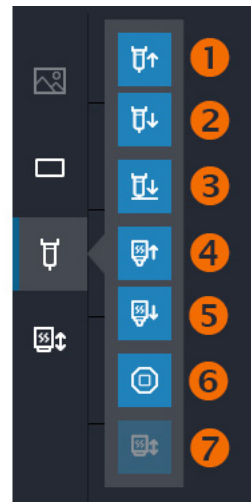


⚠ DANGER

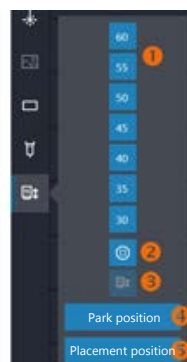
Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!
- b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
- c) Class 2 laser according to DIN EN 60825-1:2008-5, $P < 1 \text{ mW}$, $\lambda = 650 \text{ nm}$

- 2: No function.
- 3: Move the heating head to the park position.
- 4: Switching on/off the pipette vacuum.
- 5: Switching on/off the pick-and-place laser.
- 6: Take a picture. A screenshot in data format *.bmp will be saved in folder C:\Users\Ersa\AppData\Roaming\Ersa\HR550\CapturedImages gespeichert.
- 7: Vision Box lighting. Opens a submenu for selection: above red component camera, below green PCB camera.
- 8: Opens a submenu with further buttons. Free motor run for starting any position of the heating head and of the pipette:



- 1. The pipette will move up as long as the mouse button is pressed.
 - 2. The pipette will move up as long as the mouse button is pressed.
 - 3. The pipette will move down to the contact.
 - 4. The heating head will move up as long as the mouse button is pressed.
 - 5. The heating head will move down as long as the mouse button is pressed.
 - 6. Stops the machine movement.
 - 7. Referencing the Rework system.
- 9. Heating head approaching fixed positions. Opens a submenu with further buttons:

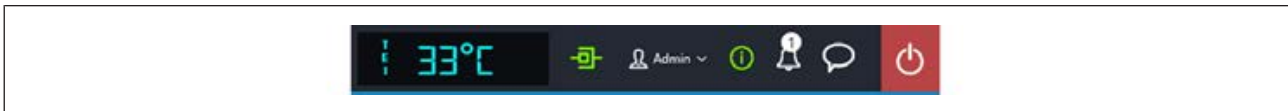


- 1. Buttons 60, 55, 50 ... 30 move the heating head to the selected height, values in millimetres.
- 2. Stops the machine movement.
- 3. Referencing the Rework system.
- 4: Button [Parking position] moves the heating head to the highest position.
- 5. Button [Placement position] moves the heating head to a 60 mm position.

For details about the machine parts, please also read Chapter [Overview of the machine parts](#) [▶ 57].



6.14 The display and switch row top right



The displays and switches from left to right:

- In lower case and to the far left, the name of the selected temperature sensor. Next to it the current temperature measured by it.
- Icon for displaying the network connection between PC and rework system. Green = Network connection established
- Button “User name:” To call up the [Login] input dialog to change the user. With regard to this, please read Chapter The [user management] tabulator.
- i-button to call up the [System state] dialog: If there are error messages, the number in the circle will indicate the number of new error messages. If the button is clicked, the [System state] dialog will open which will show extensive status information about the various Rework System components.

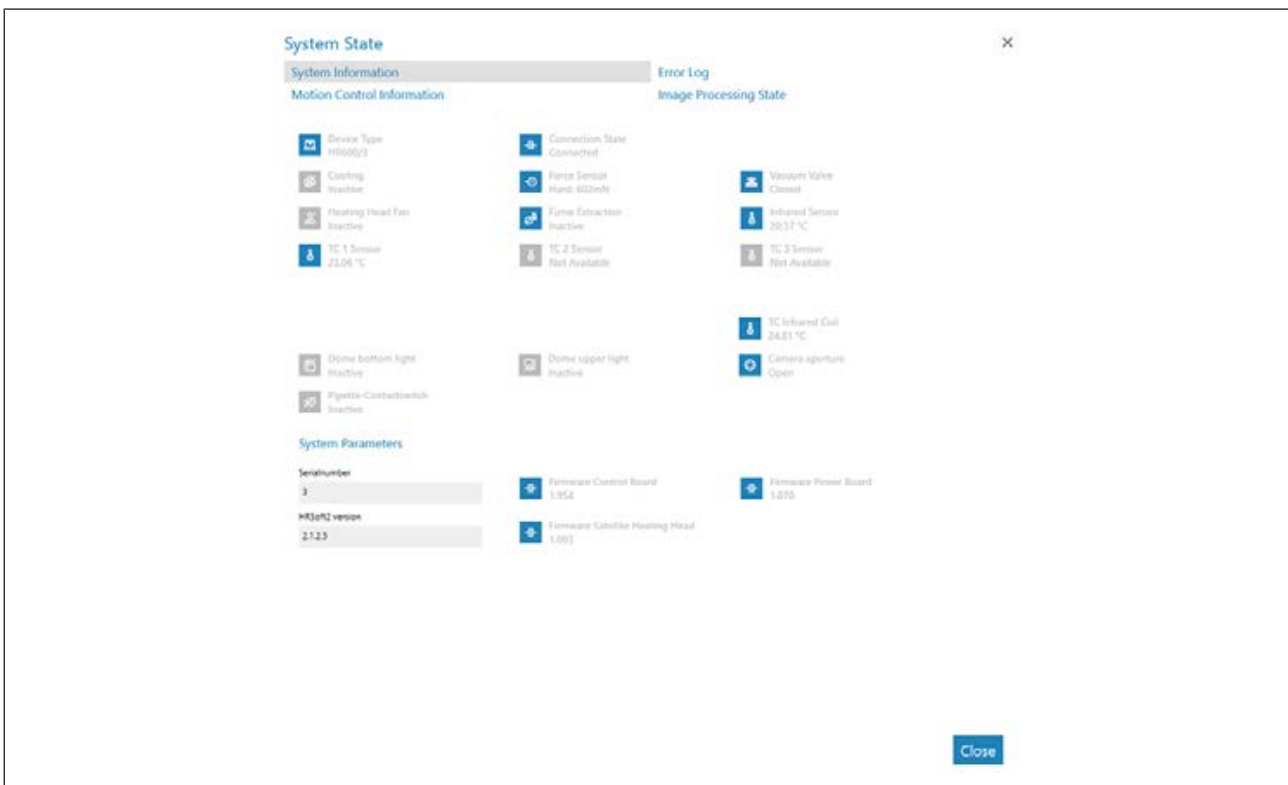


Fig. 29: Starting page of the "System Status" filed, example in English

The starting page of the information page [System state] shows three buttons [System information], [Error log] and [Motion control information], as well as, on the right, the arrow button [Image processing state].

- Click on the buttons and the arrow button in the top field to see the overview of the corresponding area.
- ⇒ The parameters displayed in blue are currently active. Depending on the parameter, additional information will be displayed. The parameters displayed in grey are currently inactive.

Range [System information]

- At the top: Display of the statuses of the basic Rework System components.



- Below [System Parameters]: Current levels of the installed HRSoft 2 version and firmware

Range [Error log]

List of accumulated error messages with date and descriptions. The new errors are highlighted in the [Active] column.

- a) If the causes of the active errors have been cleared, highlight these errors and deactivate them by clicking on the [Confirm] button.
- b) Use the table with the [Severity filter] menu to sort the errors by type.

Range [Motion control information]

- [Top heater]: Statuses of the heating head components and firmware versions.
- [Table]: Only in case of Rework Systems of the 600 series. Statuses of the bottom heating components and firmware versions.
- [Placer head]: Only in case of Rework Systems of the 600 series. Statuses of the placing head components and firmware versions.

The [Image processing state] arrow button

- a) Click on the arrow button and then click on the [Image processing state] button being displayed.
- Left column: State of the top camera components when the camera is active.
 - Right column: State of the optional RPC camera components when the camera is active:

The bell icon

indicates whether there are firmware updates for the Rework System. The number in the circle indicates the number of firmware updates.

- a) When a firmware update is displayed, click on the bell icon.
⇒ A window will appear with information about the update.
- a) To perform the update, click on the [Update] button.

Please read Chapter The [device settings] dialog. It describes how to load the different variants of firmware updates into the Rework System.

Speech balloon button

Selection menu for problem reports, suggestions for improvement or general feedback to the manufacturing company (Ersa).

- Problem menu item: Dialog box to inform the manufacturer (Ersa) about a problem with the Rework System.
- Suggestion menu item: Dialog box to submit the manufacturer (Ersa) a suggestion for improving the Rework System.
- Feedback menu item: Dialog box to give the manufacturer (Ersa) a positive or negative feedback on the Rework System.

Red button to the far right

- Closes the HRSoft 2 program.



6.15 Switching off the Rework System

- ✓ To switch off the Rework System:
 - a) Terminate the HRSofT 2 program by clicking on the red Close button located in the upper right field.
 - b) If the HRS file has been edited, you will be asked if you want to save the changes.
 - c) Use the main switch to turn off the Rework System.
 - d) Shut down the PC.

- ✓ If the Rework system is to be relocated within your company's premises:
 - ✓ Before switching off:
 - a) In tab [Administration] open dialog [Device settings]. Click button [Move to transport position].
 - ⇒ The heating head is moved to the lowest position.

 - ✓ Before shipping the Rework system,
 - a) As to this, please read Chapter Adjust the pipette size to the component.
 - b) Use the original packaging for shipping.

 - ✓ After relocating the Rework system, perform two functions:
 - a) Function [Start device setup]. As to this, please read Chapter [The button \[Start maintenance mode\]](#) [▶ 101].
 - b) Function [Adjust pixel shift]. As to this, please read Chapter [The \[Pixel shift adjustment\] button](#) [▶ 105].

As to this, please also read Chapter Transport, installation, storage, disposal.





7 Tutorial – Soldering or desoldering a component

7.1	Insert the PCB.....	116
7.2	Replacing the soldering nozzle.....	117
7.3	Position a thermocouple.....	122
7.4	Shielding heat sensitive components.....	123
7.5	Activate a soldering profile and prepare the soldering process	124
7.6	Start the process and work with the assistant.....	125
7.7	Task 1 “Alignment”	127
7.8	Task 2 “Desoldering”	128
7.9	Task 3 “Deposit”	130
7.10	Task 4 "Preparation"	132
7.11	Work step 4 for “Cleaning” with the optional residual solder sucker	134
7.12	Task 5 “Alignment”	138
7.13	Task 6 “Inspection”	140
7.14	Task 7 “Soldering”	142
7.15	Task 8 “Inspection”	144
7.16	Task 9 “Complete”	146



In this tutorial you will find an example of how to work through the desoldering and soldering processes as well as step by step through the entire rework process in the software wizard.

With regard to this, please also read the detailed descriptions of the tabs, menus and commands used here and the associated warning notices that are provided from Chapter Read this first!.

7.1 Insert the PCB

NOTE

ESD sensitive components!



Electronic components may be damaged by electrostatic discharges. Please observe the warnings on the packaging or contact the manufacturer or supplier. To protect these components, the system should be placed in an electrostatic protected area (ESD = electrostatic discharge).

The HR 550 can be easily integrated in environments of this kind. Using one of the front buttons, the user can connect for example an ESD wristband. The housing of the HR 550 is connect via power cord to the earth wire of the supply network.

When handling the device, observe all general safety measures normally required for ESD sensitive components.

CAUTION



Material damage caused by overtightening the PCB holder!

Tighten all screws just enough to ensure that the PCB is securely fixed. Excessively high tightening torques can cause damage to threads and circuit boards!

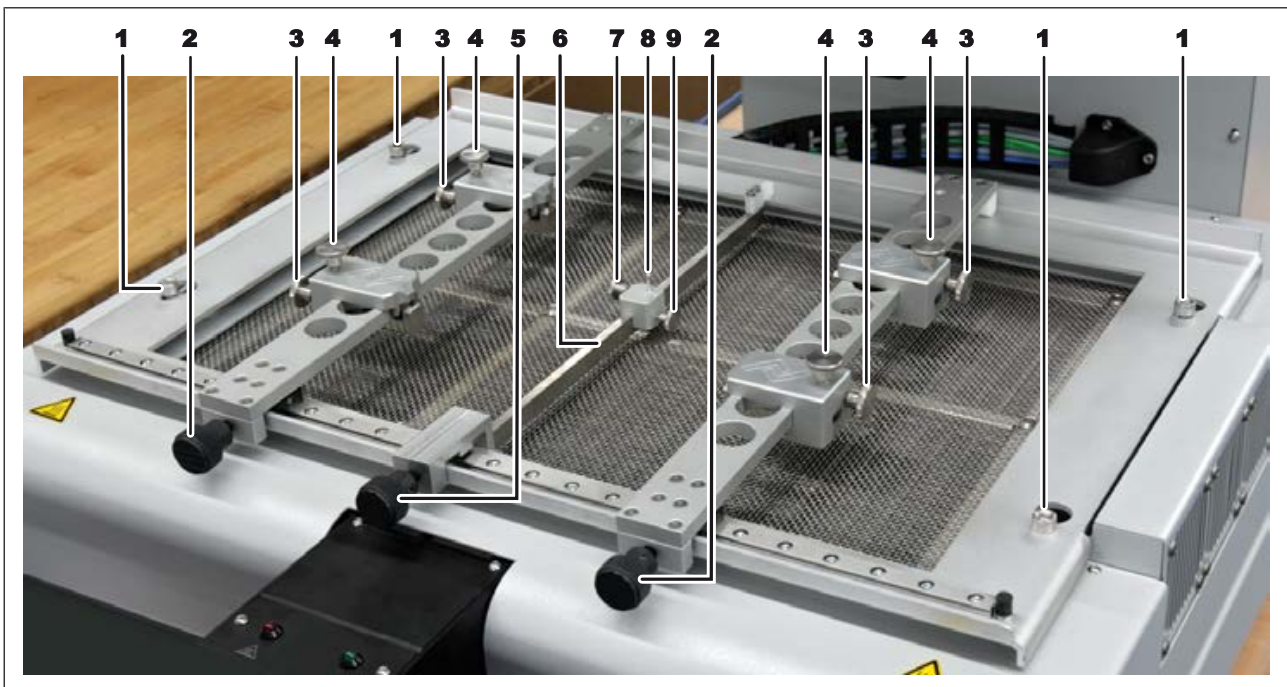


Fig. 30: PCB frame details

Info: The PCB frame can be removed by loosening the four retaining screws (1). This allows using several frames for replacement.

✓ Insert a PCB:

a) Ensure electrostatic discharge protection.



- b) Hold down the white unlock key on the control panel while pulling the cross table forward until the PCB frame can be easily accessed.
 - c) Loosen both knurled thumb screws (2) on the retaining rails.
 - d) Adjust the distance of both rails to approximately the width of the PCB.
 - e) Loosen the knurled thumb screws (3) on all four PCB holders.
 - f) Adjust the PCB holders distance to the PCB size. Also take any components in the way into account.
 - g) Tighten the four knurled screws (3).
 - h) Release the PCB clamp on the knurled screws (4).
 - i) If necessary, use the center support (6). Lock the center support with the knurled screw (5). Use the screw (9) to lock the support pin of the center support in position. The support pin is spring-mounted. Use the screw (7) to lock the spring.
 - j) Insert the PCB.
 - k) Adjust the PCB holders to the PCB width.
 - l) Tighten the PCB clamp with the knurled screws (4).
 - m) Position the PCB to achieve the best possible performance of the bottom heating.
 - n) Tighten both knurled screws (2).
- ⇒ You can now position the thermocouple. As to this, please also read Chapter [Position a thermocouple \[▶ 122\]](#).
- a) Now position the cross table so that the component being processed lies exactly below the pipette.

7.2 Replacing the soldering nozzle

Always select the largest possible soldering nozzle for the component. If necessary, change the soldering nozzle as described below:

The transport lock supports the pipette retention mechanism and prevents damage from external forces. When attaching and removing soldering nozzles, the transport lock must be applied to the pipette to compensate for the resulting strain on the pipette retention mechanism. Otherwise material damage will occur! After attaching or changing a soldering nozzle, unscrew the transport lock again.



CAUTION

Risk of burns from hot surfaces!

- a) Touching the device surfaces may cause burns!

- a) Wait for the heating head to cool down.

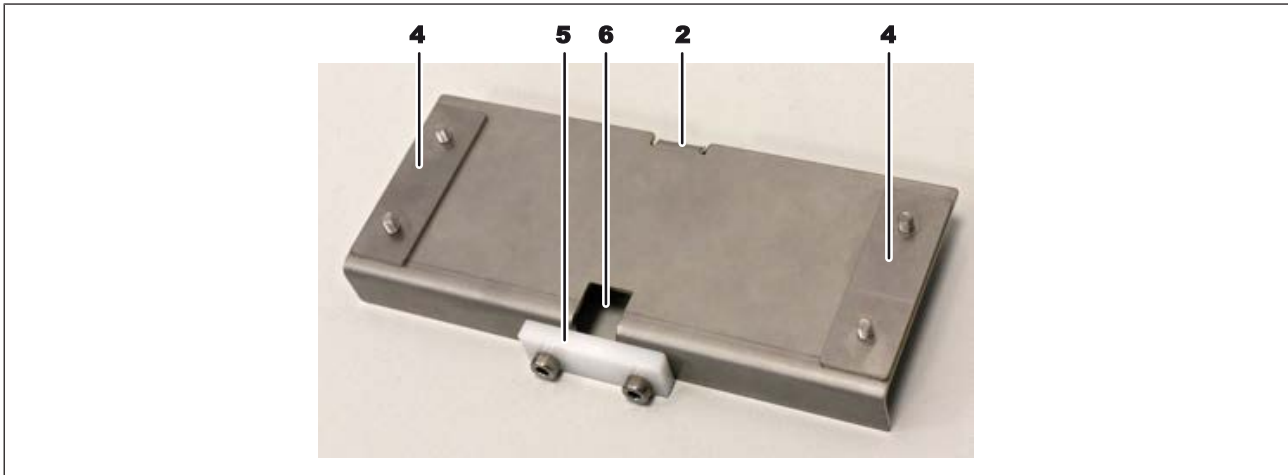


Fig. 31: The transport lock in the removed state. The plastic part (5) is not required.

The transport lock consists of the following parts:

- (2) Handle of the transport lock
- (4) Two fixing strips, each bolted twice
- a) (5) Plastic clamping piece, screwed twice. Not needed for nozzle change. Store the clamping piece and any associated screws so as to be able to screw it back to the transport lock should the Rework system be subsequently carried or shipped.
- (6) Pipette recess
- a) Use button [Manual mode] in tab Rework to call up button column Manual mode .
By moving the mouse over one of these buttons, a describing tool tip will be displayed.

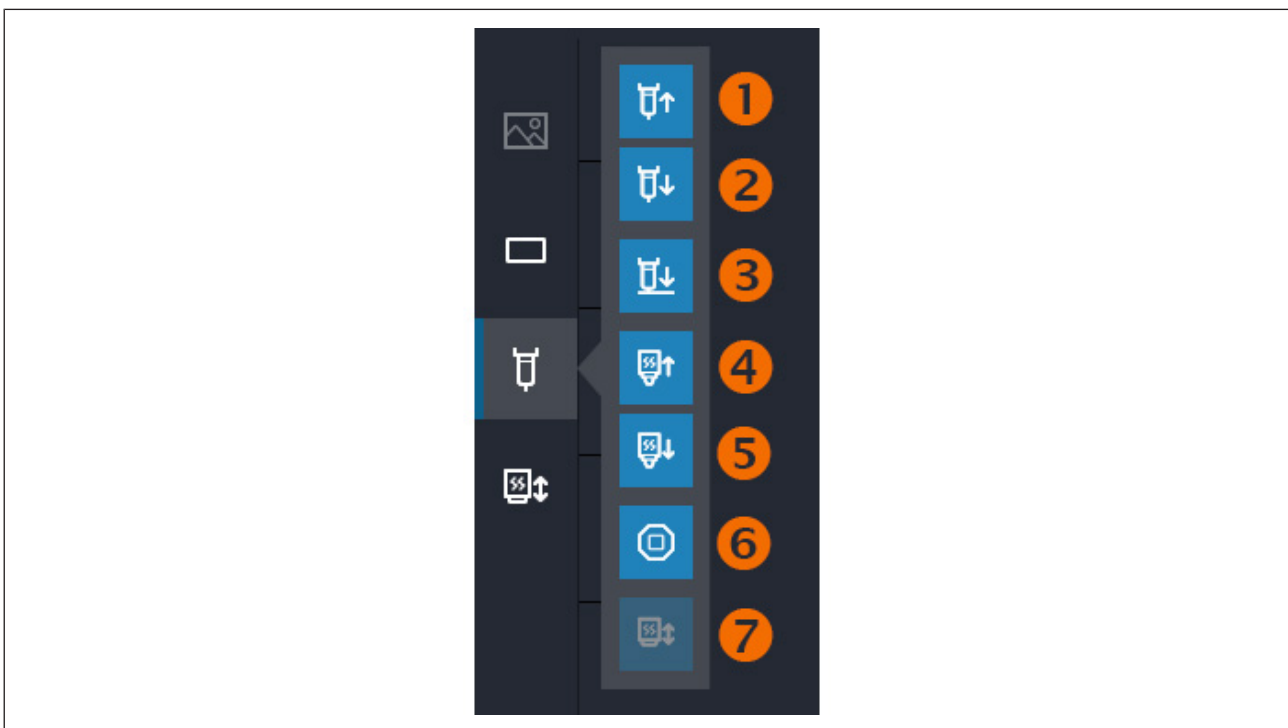


Fig. 32: Manual mode buttons

Button 1: The pipette will move up as long as the mouse button is pressed.



Button 2: The pipette will move down as long as the mouse button is pressed. This button does not work when the heating head is in the lowest position. In this case, use button (4) to move the heating head a little up.

- a) Move the pipette about 1 cm out of the heating head, see the following picture.

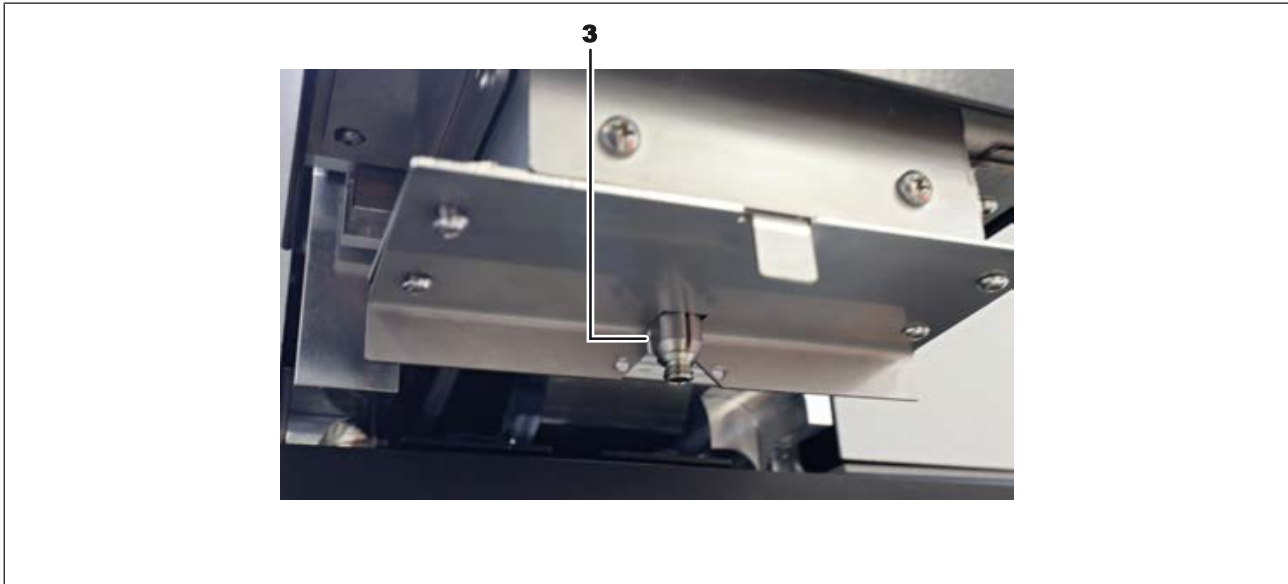


Fig. 33: The extended pipette (3) in the position for changing the nozzle. The picture shows the pipette without the nozzle screwed on. The transport lock is attached.

The pipette is not completely round at its lower end. It has two opposite spanner flats for the transport lock to lock the pipette. To do so, the spanner flats must be aligned exactly at a 90-degree angle, otherwise material damage will occur when the transport lock is applied!

To exactly align the spanner flats of the pipette at a 90-degree angle:

- a) Now use the rotation keys on the heating head to turn the pipette so that the two spanner flats of the pipette are exactly aligned at a 90-degree angle. In doing so, the pipette can be secured in the recess of the transport lock.
- b) Inspect the pipette closely to check the set angle and the movement performed.
 - Method 1: Press and hold a rotation key continuously. The rotation speed will increase slowly. Maximum rotation speed will be reached after approx. 30 s.
 - Method 2: Press a rotation key once. Each time the button is pressed, the pipette will be rotated by a specified degree. The degree of rotation can be set to one of five rotation levels beforehand. The standard angle degree after switching on the Rework system is 0.5° (level 2).
 - Level 1: Rotation by 0.25°
 - Level 2: Rotation by 0.5° (default value)
 - Level 3: Rotation by 0.75°
 - Level 4: Rotation by 1°
 - Level 5: Rotation by 1.25°

To change the rotation by one step, proceed as follows:

- a) First switch to programming mode: press both rotation keys for one second.



- ⇒ After this second, the pipette will rotate a little counterclockwise and then clockwise (wave motion) to indicate that it has entered the programming mode.
- b) Now change the angle degree:
 - press the right-hand key once to switch to the next higher level.
 - To switch to the next lower level, press the left-hand key once.
 - ⇒ The programming mode has now been exited and the angle degree changed by 1 level. It will remain set as default until the Rework system is turned off.
 - ⇒ If necessary, change the angle degree to the next level.
 - ⇒ If the level falls below level 1, or level 5 is exceeded, the pipette will perform a double wave motion to indicate that the lowest/highest level has already been set. The level remains unchanged.
- ✓ When the angle of the pipette spanner flats has been exactly set via the rotation keys, attach the transport lock to the heating head:
 - a) Use an Allen key size 2 to loosen the two fastening strips (4), but do not unscrew them.
 - b) Attach the transport lock to the heating head from the front. In doing so, do not exert any pressure on the pipette!
 - c) Slightly screw on the two fixing strips (4) so that the transport lock will no longer move under stress (see following picture).
If the pipette does not slide into the pipette recess (6, upper picture), the angle of the spanner flats on the pipette has not been correctly set. Rotate the pipette to the exact angle via the rotation keys as described above, otherwise material damage will occur!

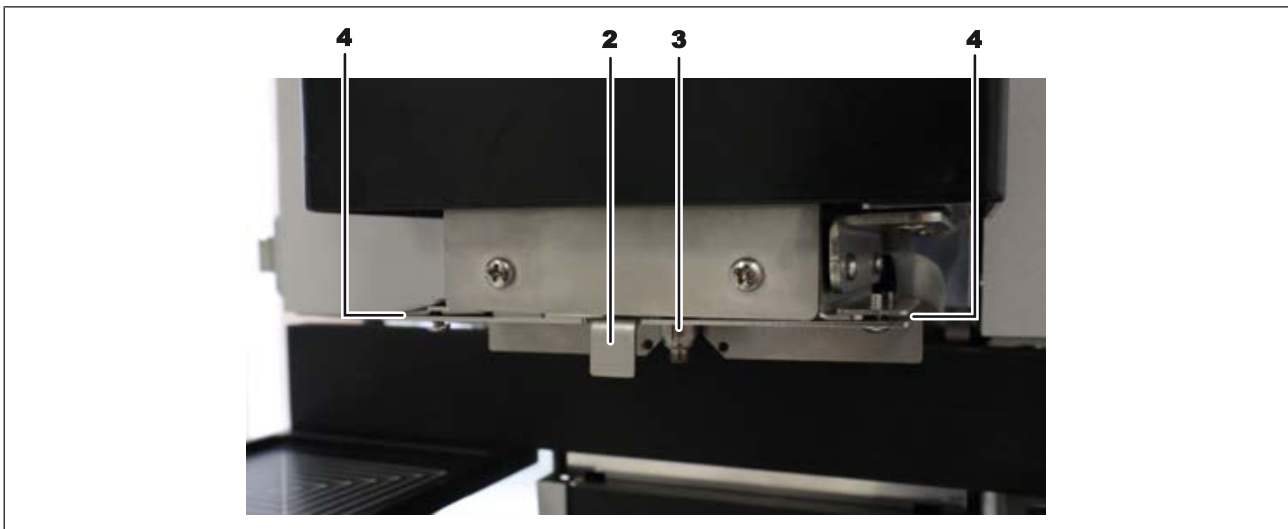


Fig. 34: The transport lock screwed under the heater head

- d) Once the transport lock has been fitted, unscrew the soldering nozzle from the pipette turning it by hand clockwise. If the pipette was manually screwed on too tightly, use the supplied SW9 spanner to unscrew it. Do not allow any lateral forces to act on the pipette axis.
- e) Manually screw the desired soldering nozzle onto the pipette and very slightly tighten it always by hand.
- f) Loosen the two fixing strips of the transport lock, but do not unscrew them.
- g) Pull the transport lock off the heating head to the front and put it down. Leave the fastening strips screwed on.
- h) Set the transport lock aside for later solder nozzle changes.



⇒ The process has now been completed.

With regard to this, please also read Chapter [Spare parts](#) [▶ 155] where you can find a list of available pipettes.



7.3 Position a thermocouple

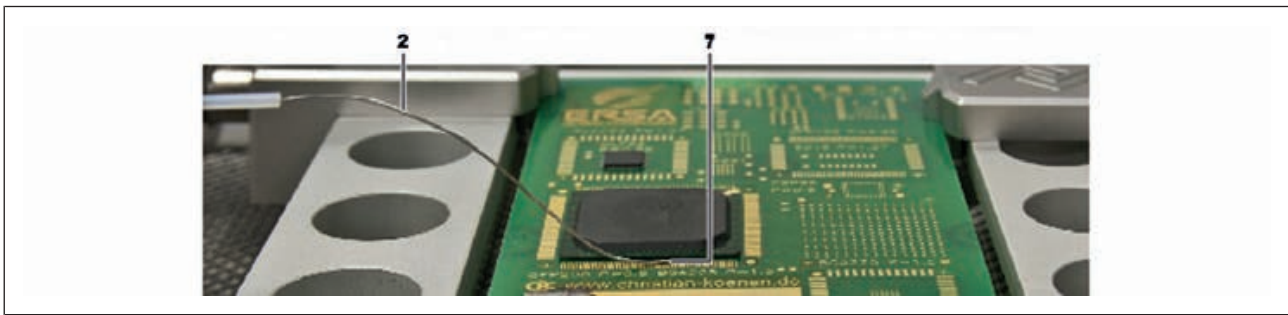
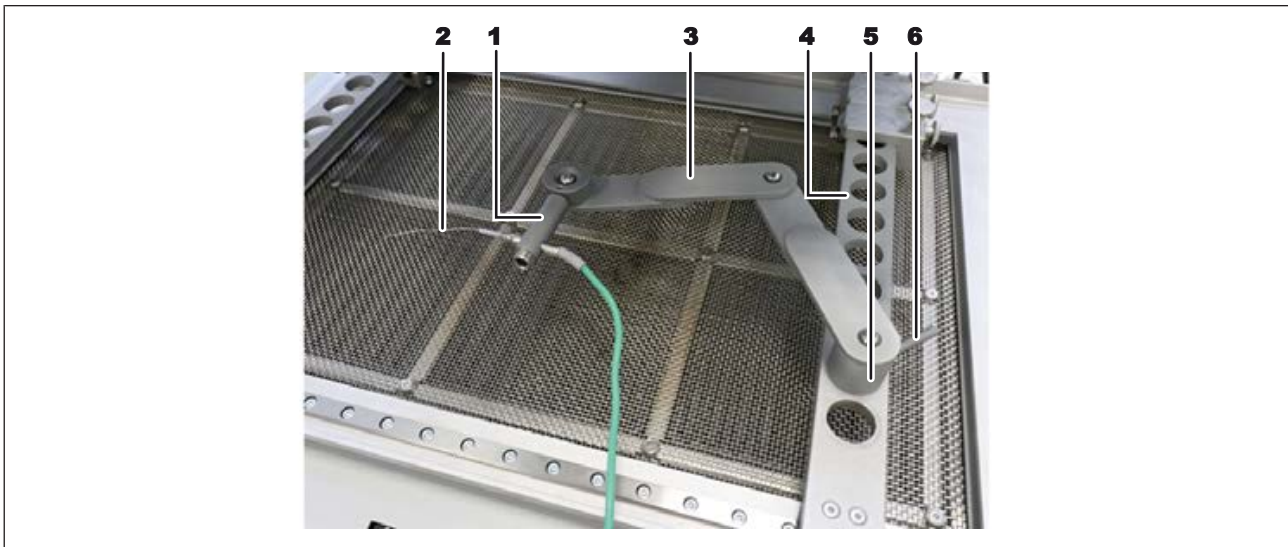


Fig. 35: Example images: Placing the thermocouple holder (top) and the thermocouple (bottom)

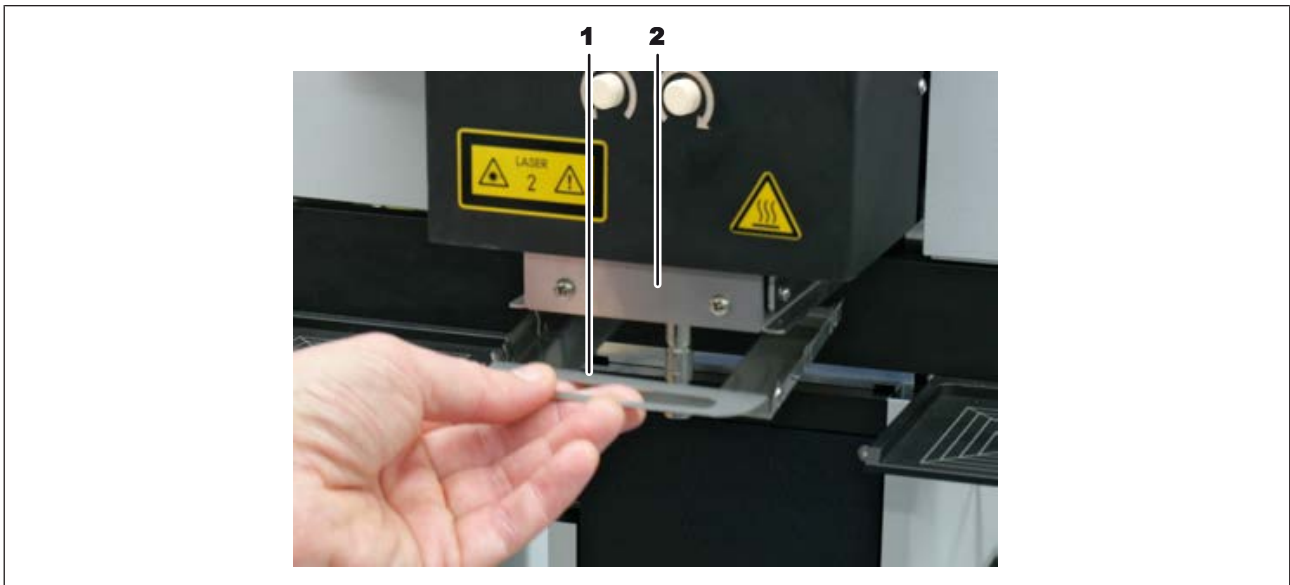
- a) Insert the holder (3) into one of the holes (4).
- b) Fasten the holder with the lever (6).
- c) Insert the plug of the thermocouple (2) the socket [TC1].
- d) Slide the thermocouple into the holder (1).
- e) Fit the holder (1) in such a way that the end of the thermocouple (7) can be placed very close to the component.
- f) Straighten the end of the thermocouple so that the front 3 millimetres of the wire lie in close proximity to the component on the PCB.

For exact values, the thermocouple should be in contact with conductive trace areas, e.g. trace or mass.

Note: The infrared sensor is not suitable for glossy and reflective surfaces.



7.4 Shielding heat sensitive components



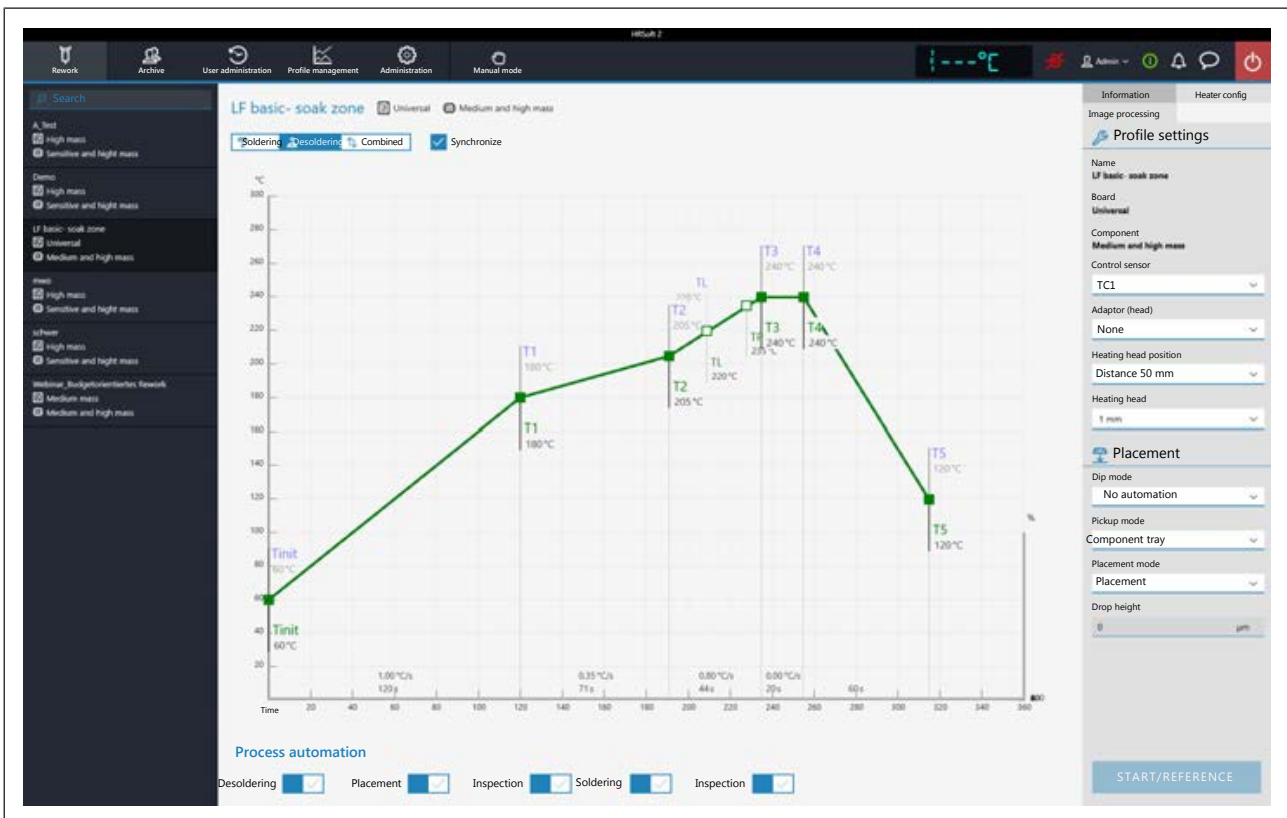
- a) Use reflective strip and/or an adequate air deflector for shielding purposes.
- b) To avoid material damage when installing air baffles, make sure that the air baffle does not touch the pipette and the soldering nozzle.
- c) Fit the back lugs of the air baffle (1) into the bottom plate of the heating head (2) from behind. Then press the air baffle upwards on its front side.



7.5 Activate a soldering profile and prepare the soldering process

Open tab [Rework]. The available soldering profiles are listed in the left column. With regard to this, please also read Chapter [Use of the soldering profile in the \[Rework\] tabulator](#) [▶ 64].

Notes: If any change is made in tab [Rework], they cannot be saved. With regard to this, please also read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 62] and the following ones. Only the administrator may save soldering profiles. With regard to this, please also read Chapter [Editing the soldering profile in the \[Profile management\] tab and changing it permanently](#) [▶ 81] and the following ones. Likewise, only the administrator can assign soldering profiles to the standard user, who can then select them in tab [Rework]. With regard to this, please also read Chapter [The tab with the arrow button \[More\] under the \[Profile management\] tab](#) [▶ 90].



Click on the desired soldering profile to activate it. You can now work with this profile.

Use buttons [Process automation] to enable the desired process steps in the bottom field. The process starts from the left with the first activated process and is carried on to the right by performing the various process steps. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 75].

In the tab line, click on button [Manual mode] to display, in the left window area, the buttons for manually controlling machine functions such as: pick-and-place laser, pipette vacuum, heating head procedure, etc. With regard to this, please also read Chapter [The \[Manual Mode\]](#) [▶ 109].

Check all the soldering profile settings, consisting of the chart, the buttons [Process automation] and the three tabs [Information], [Heater config] and the tab with the small arrow button (Image processing). If necessary, make corrections.



7.6 Start the process and work with the assistant.



CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!



NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersä “Easy Arm” with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.

In what follows, the entire soldering process is described along with all relevant steps. These include unsoldering, Placement the new component, Inspection the position of the new component, Soldering and finally Inspection.

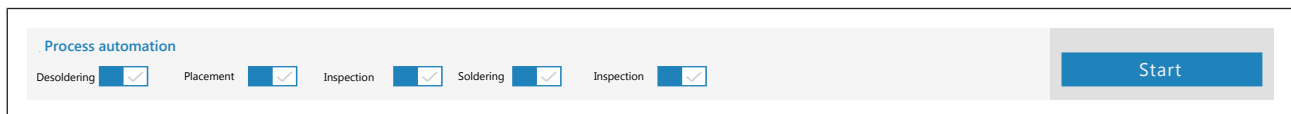
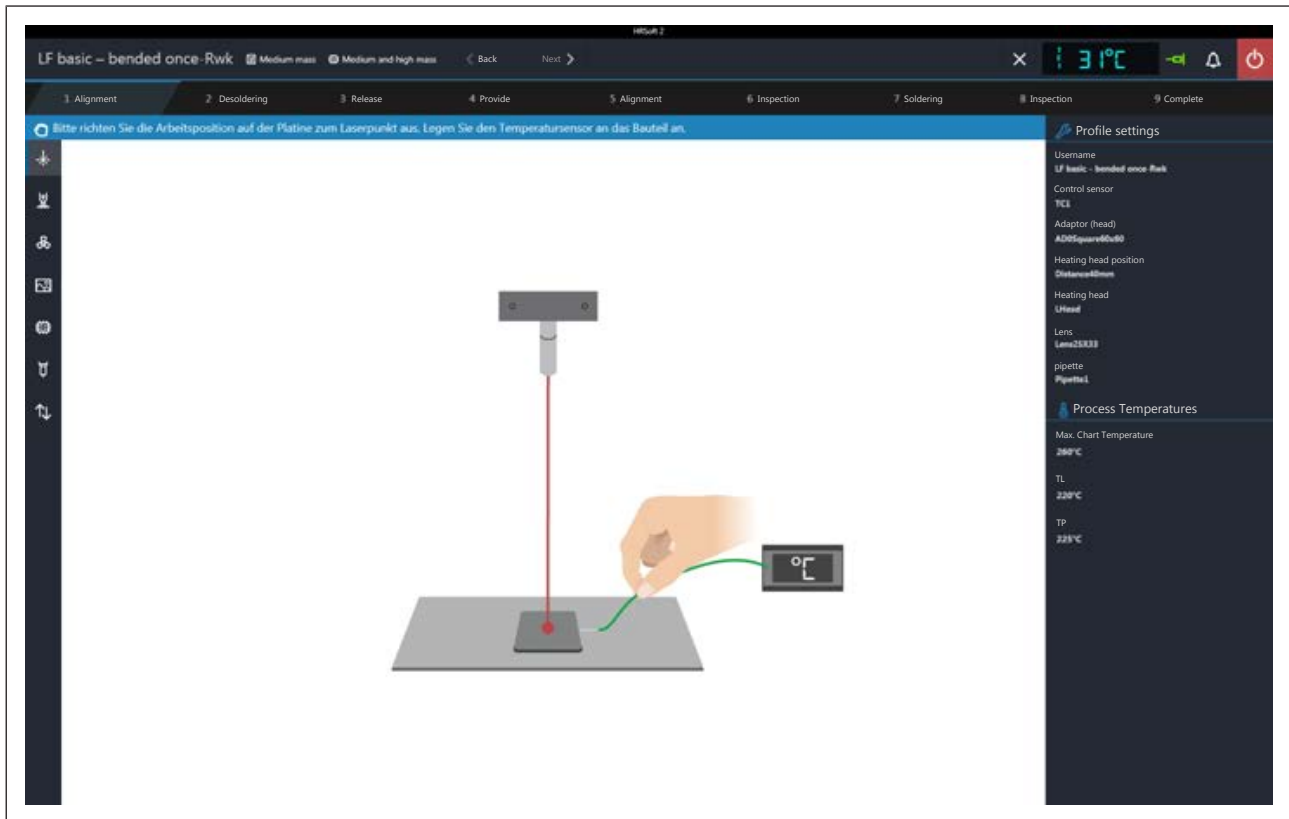


Fig. 36: All five steps are activated

a) Click on the [Start] button.

- ⇒ The Wizard starts and executes the various steps divided into several tasks. Perform all activities as required by the assistant.



In the information row over the graph you will find a description of the required tasks. In the dark area on the right you may view the most important process parameters.



7.7 Task 1 “Alignment”

The device will first start a referencing cycle for the pipette and heating head.



DANGER

Laser beam! Risk of injury due to retinal burns

- a) Do not stare into the laser beam!
- b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
- c) Class 2 laser according to DIN EN 60825-1:2008-5, $P < 1 \text{ mW}$, $\lambda = 650 \text{ nm}$

- ✓ The position laser is switched on. You will be asked to achieve a perfectly centred working position with the aid of the laser.
- a) Move the cross table while holding down the white illuminated unlock button on the control panel, for rough positioning. Then use the two adjusting screws on the control panel for fine positioning. The right screw changes the X direction, while the left adjusting screw changes the Y direction. With regard to this, please also read the [Overview of the machine parts](#) [► 57]chapter.
 - ⇒ Now the temperature sensor must be applied. This step is skipped if in the soldering profile the infrared sensor is selected as the temperature sensor. The infrared sensor is not suitable for shiny or reflecting surfaces.
- b) Set the holder of the temperature sensor in such a way that the end of the thermocouple can be placed very close to the component. Bend the end of the thermal element into shape, so that the front of the wire for the first three millimetres is very close to the component on the PCB. In order to achieve exact values, the thermocouple should be in contact with the trace areas, e.g. to trace or earth. With regard to this, please also read the [Position a thermocouple](#) [► 122]chapter.
 - ⇒ You may connect further optional temperature sensors in order to receive additional temperature information, for instance regarding adjacent components or PCB bottom.
 - ⇒ Once the cross table and the temperature sensor have been exactly positioned, move on to the next task.
- c) You may either press the green button on the control panel or click on the “Next” button in the upper window area.

To cancel the soldering process, you can press at any time the red illuminated button on the control panel or click on the button with the white “X” in the upper window area.

 - ⇒ The selected unsoldering process starts and in the chart you may observe the process. At the end, the pipette lifts the the unsoldered component from the PCB.
- d) Move on to the next task.



7.8 Task 2 “Desoldering”

⚠ CAUTION



Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

NOTE



Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersas “Easy Arm” with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.

The desoldering process is performed.

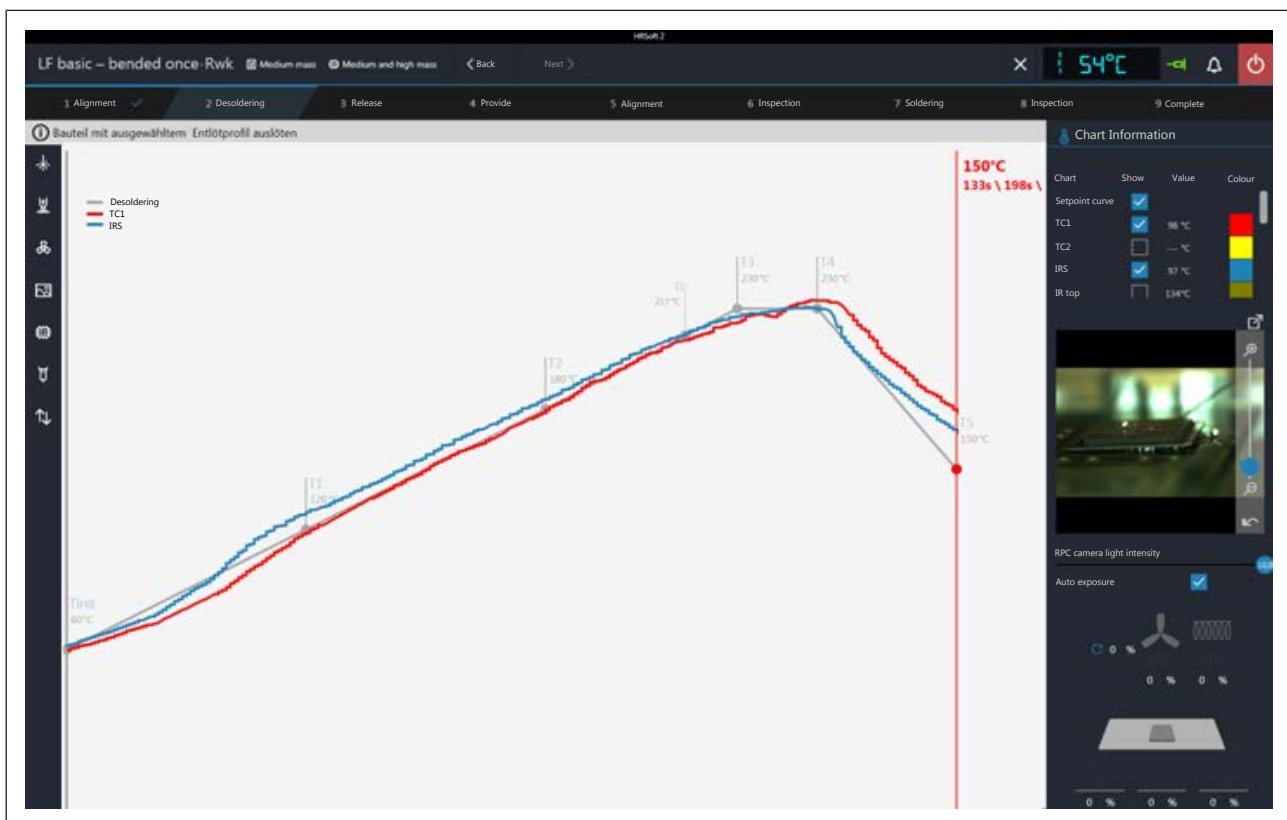


Chart information


- Column [Show]: display/hide the measuring curves.
- Column [Colour]: colour of the measuring curve. Click the coloured square to see all available colours.



RPC Camera Live Image

- a) Adjust the ideal process observation angle through the retainer system of the optional RPC camera. The camera may not be found in the movement area of moving machine parts. The camera lens has a rubber ring in its front part for adjusting the focus. Move the rubber ring carefully with your finger to achieve the ideal focus point. Note: do not change the aperture setting of the camera lens. Should the lens screw loosen, clamp it back with aperture value 8.
- b) The camera image can be zoomed with the controller on the right of the camera image or with the mouse wheel.
 - [RPC camera light intensity]: controls the camera lighting.
 - [Auto exposure]: When activated, the brightness of the image is automatically adjusted after changing the camera lighting or ambient light.



Click the button  to switch the live image to full-screen display. The zoom controller allows further zooming. Use the left mouse button to move the image section. Close the full-screen display by clicking the small red circle button in the upper right corner.

Heating information

The lower field shows the updated status of the heating elements and hot air blower.

- a) When the soldering process ends, go to the next step.



7.9 Task 3 “Deposit”

If you want to solder a new component on the soldering point, clean it of any residual solder.

- a) If the optional Scavenger residual solder sucker is used, refer to the [851] work step, that is included after the [Desoldering] work step. Scavenging As to this, please read the description under Work step 4 for “Cleaning” with the optional residual solder sucker [▶ 134]

CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!



- a) Distribute a small amount of viscous, non-volatile flux material on the residual solder points.
- b) Remove any residual solder with a suitable tool,
 - ⇒ e.g. with the following solder tips: PowerWell 0102WDLF23/SB (small), 0102ADLF40/SB (medium) or 0102ZDLF150/SB (large).
- c) e.g. with the Scavenger residual solder sucker available for your Rework system. The Rework system can be reconditioned with it. As to this, please read the description in Chapter



Fig. 37: Available as optional: Scavenger residual solder sucker



- d) Remove flux residue with Ersa Flux Remover (OFR200).
- e) Dry the solder joints with a clean, lint-free cloth.
- f) Place and properly align the soldered component on the component tray.



7.10 Task 4 "Preparation"

If you selected the dip mode [No automation] (soldering without flux material dip and without component with solder paste in the print template):

- a) With the aid of the laser, position the component to be soldered in the middle and properly align it on a component tray. Then the component is lifted from the component tray. Then the component must be aligned and placed in soldering position.

If you selected the dip mode [Auto. Dip], e.g. for QFN components:

- a) With the aid of the laser, position the component to be soldered in the middle and properly align it on a component tray.
- b) With the doctor blade apply flux material gel in the dip template and place the dip template into the other component tray.

Then the component is taken from the component tray and dipped in the flux material of the dip template. Then the component must be aligned and placed in soldering position.

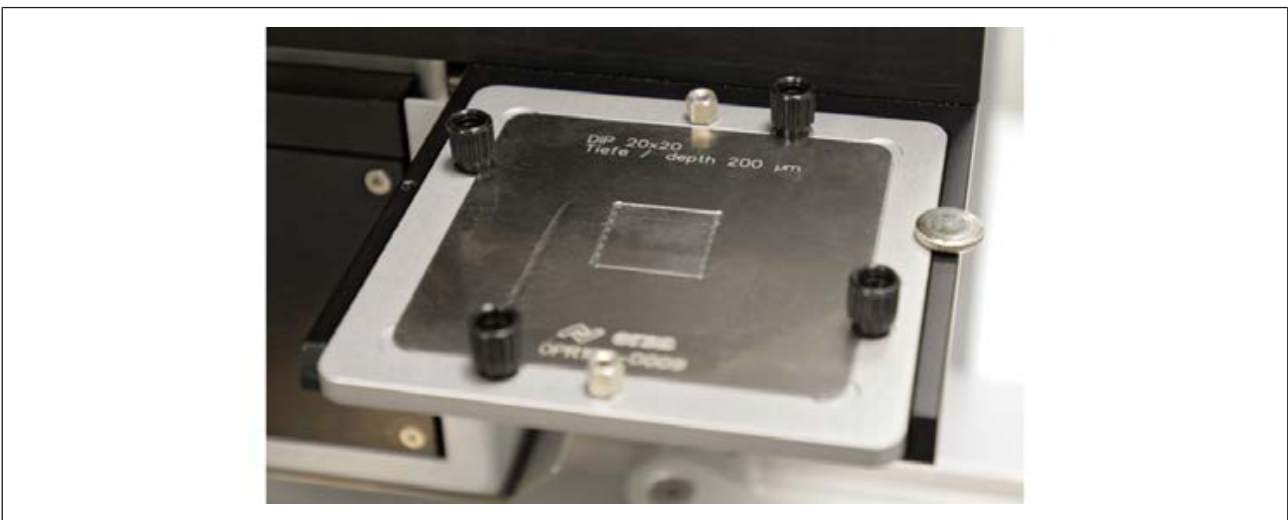


Fig. 38: Dip template covered in flux material on the component tray

- a) After applying flux material gel with the doctor blade in the dip template, place the dip template in the other component tray.

If you selected the print mode [Auto. Print]:

- a) With the doctor blade, apply solder paste on the bottom of the component.
- b) Place the print template in a component tray and make sure it is correctly aligned with the component.

The component is lifted by the print template. Then the component must be aligned and placed in unsoldering position.

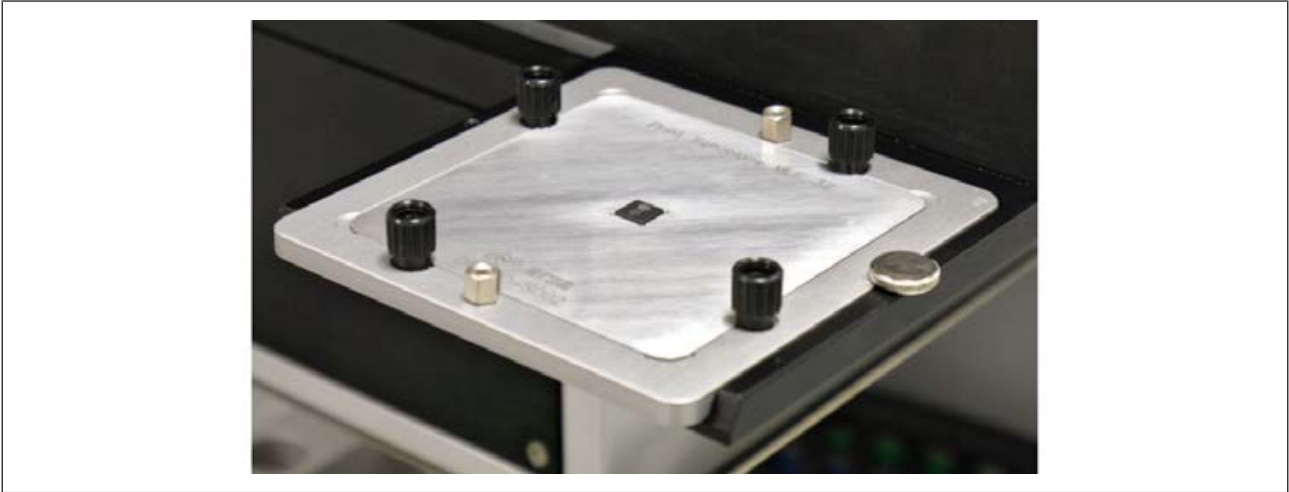


Fig. 39: Component covered in solder paste in the print template on the component tray



7.11 Work step 4 for “Cleaning” with the optional residual solder sucker

Integrating the optional residual solder sucker into the Rework program HRSOft 2

a) Activate the [871] function in the [Device settings] dialog, under the [Administration] tab. Scavenger active As to this, please also read Chapter [The \[device settings\] dialog](#) [▶ 98].

⇒ In [Process automation], [Scavenging] is included as a second work step.

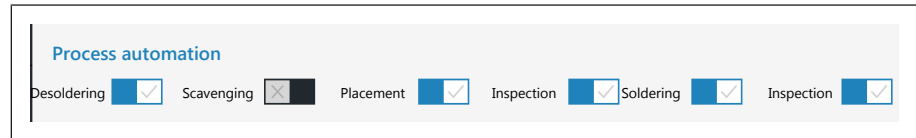
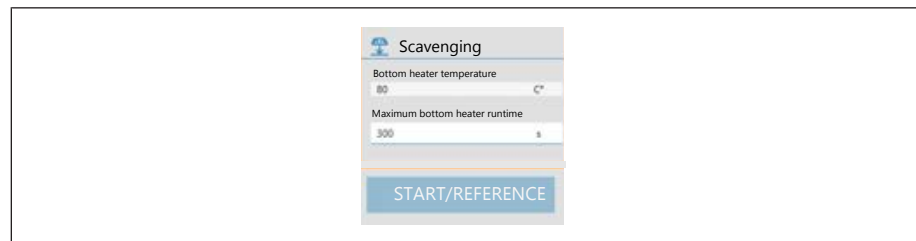


Fig. 40: Work step 2 “Cleaning”

b) Activate the [Scavenging] work step.

⇒ The [851] range is included under the [Profile management] tab, at the bottom of the [Information] tab. Scavenging



- [Bottom heater temperature]: temperature that is kept while cleaning the bottom heating. This is the suitable temperature for cleaning.
- [Placement mode]: Maximum heating time of the bottom heating during cleaning. For safety reasons, the bottom heating will switch off after this time, even if the swing arm of the residual solder sucker has not been swung back into its normal position.

Working with the optional residual solder sucker



⚠ CAUTION

Burn hazard due to the hot suction nozzle and hot air!

The suction nozzle is heated immediately after switch-on with hot air flowing out! Also the parts bearing the suction nozzle can be very hot!



NOTE

Risk of material damage!

Never operate the residual solder sucker without switching on the air blower! The air blower must always be switched on to avoid damaging the heating! An air sucker/blower is particularly required at temperatures above 100 °C.



NOTE

Risk of material damage!

Do not leave the suction head over a PCB for too long to prevent the PCB from delaminating/burning!



NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersa “Easy Arm” with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.



CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

As to this, please also read the operating instructions for the residual solder sucker. Only operate the residual solder sucker if all specifications in the relevant operating instructions have been complied with!

Proceed with cleaning as described in the residual solder sucker operating instructions.

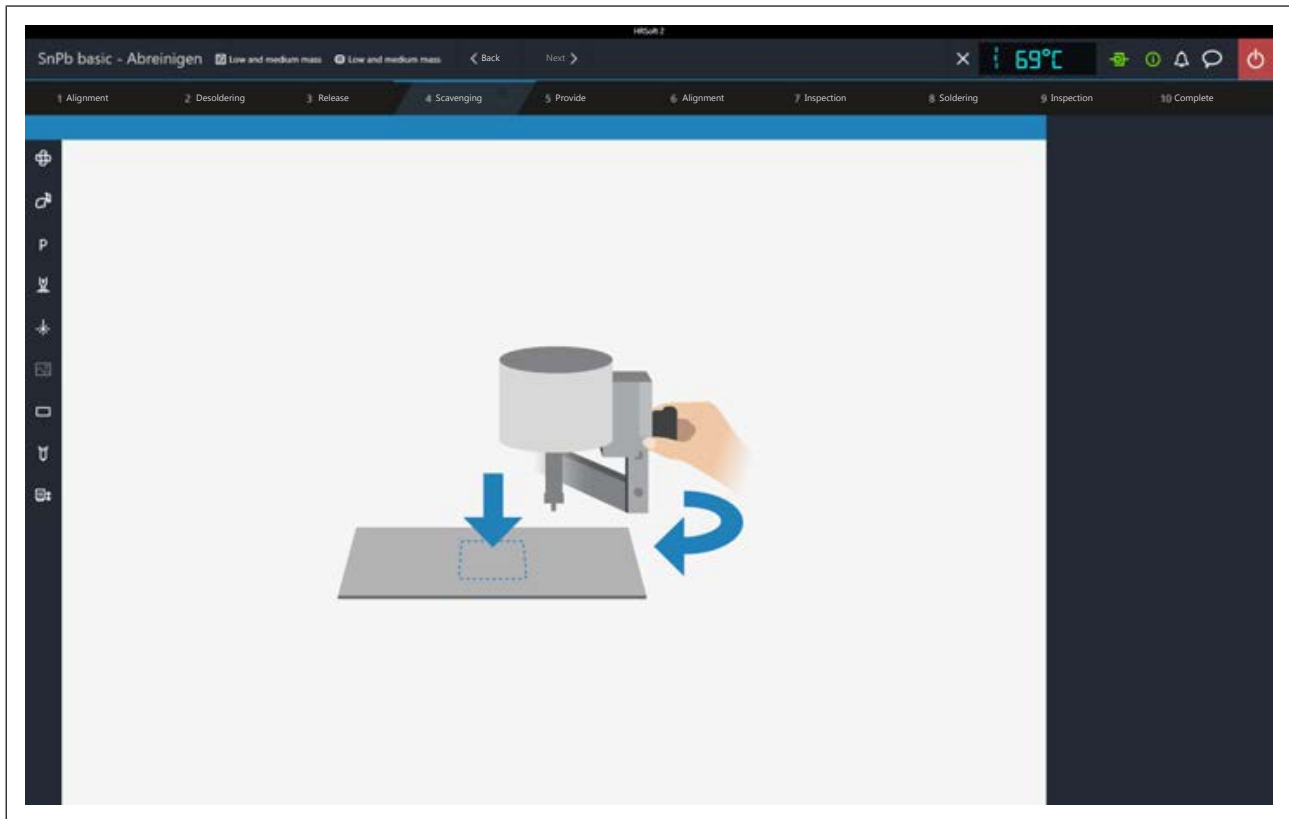


NOTE

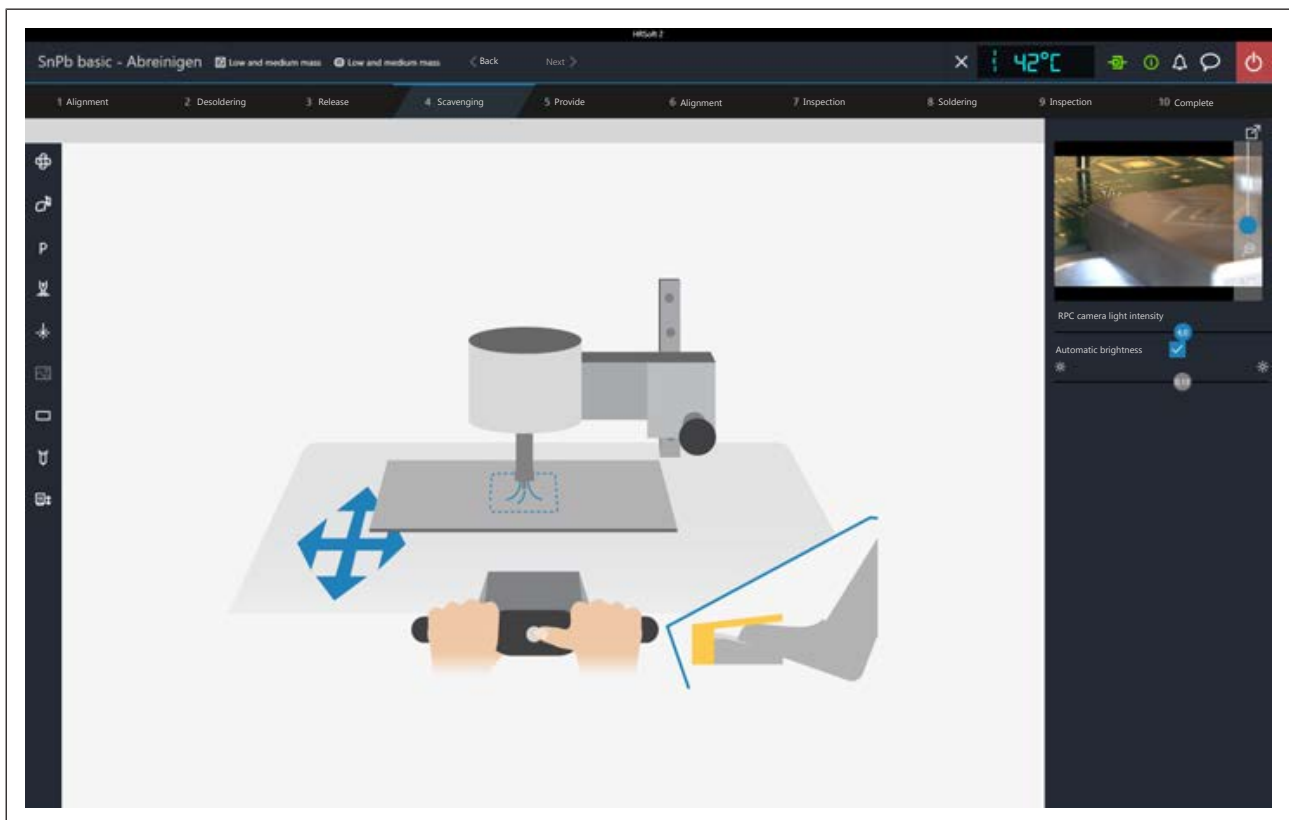
Risk of material damage!

Always snap the nozzle block into the upper position when it is swung under the heating head! In the lower position, the suction nozzle can hit the PCB or other components!

As shown in the first dialog in [Scavenging] work step 4, swing the suction arm towards the suction point.



The second dialog in [Scavenging] work step 4 will now indicate that cleaning can be started.



a) Once all preparations have been made, vacuum the residual solder as described in the residual solder sucker operating instructions.

All other activities are also described in the residual solder sucker operating instructions.



a) When cleaning is over, go to the next step.



7.12 Task 5 “Alignment”

a) Align the component perfectly with the board as indicated in the live image.

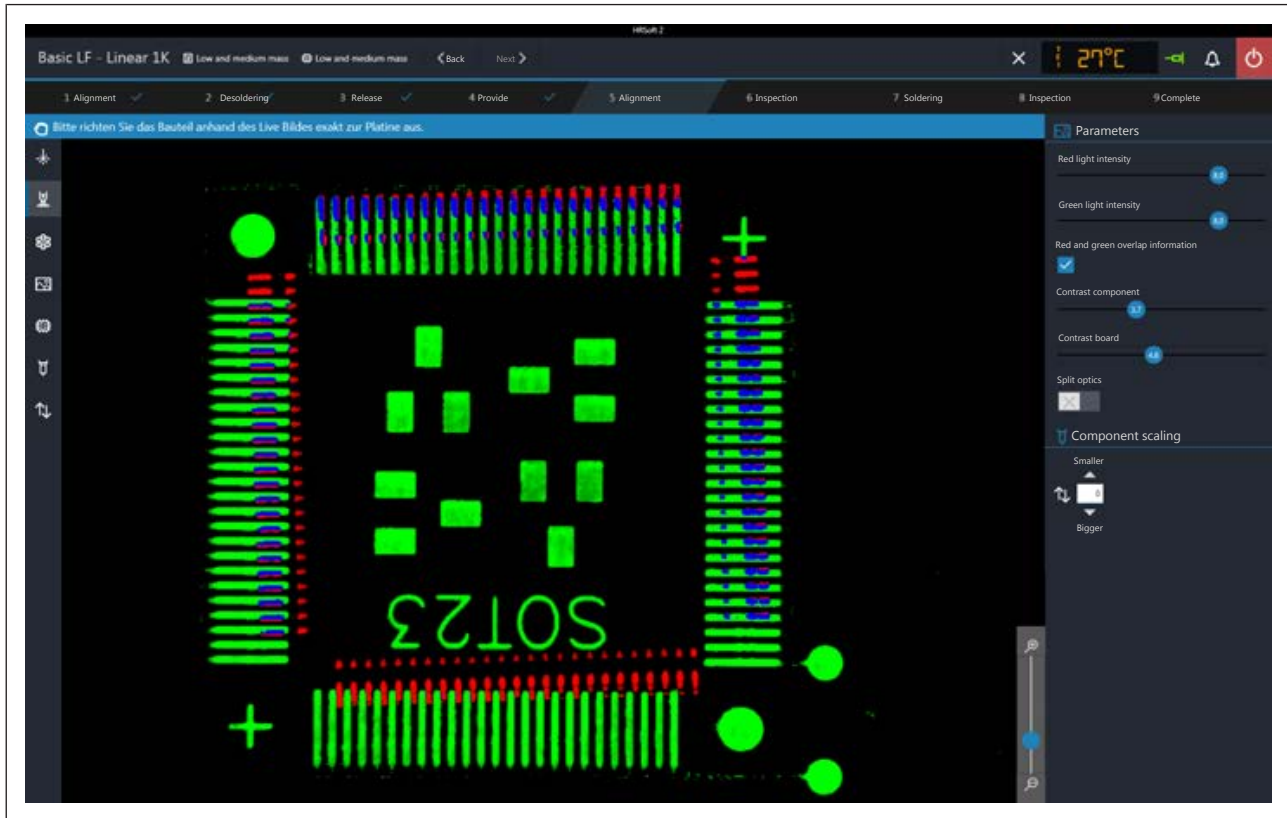


Fig. 41: Component before correcting its position

- b) You may use the normal view/telephoto toggling lever of the vision box. With regard to this, please also read the [Overview of the machine parts \[► 57\]chapter , No. 11.](#)
- c) Activate the [Show red and green overlay] button to view the overlapping parts of the green board image and of the red component image.
- d) Use the four intensity and contrast controllers to optimise the image quality.
- e) With the controller at the bottom on the right, you may adjust the vision box zoom.
 - First, correct the component rotation using the relevant rotary button. With regard to this, please also read the [Overview of the machine parts \[► 57\]chapter , No. 5.](#)
 - Then correct the display of the component size with the small arrow key and with the [Component scaling] button. Arrow up/smaller = reduce red component image. After making the correction, wait for the pipette motor to implement the change.
 - Correct the PCB position with the two adjusting screws on the control panel. The right screw changes the X direction, while the left adjusting screw changes the Y direction. With regard to this, please also read the [Overview of the machine parts \[► 57\]chapter , No. 2 and Nr. 8](#) on the control panel.
- a) For instance, in case of large components, in order to enlarge the comparison display of widely separated image areas click on the [Split optics] button. Now click four times with the small blue rectangle on the four points that you wish to enlarge.

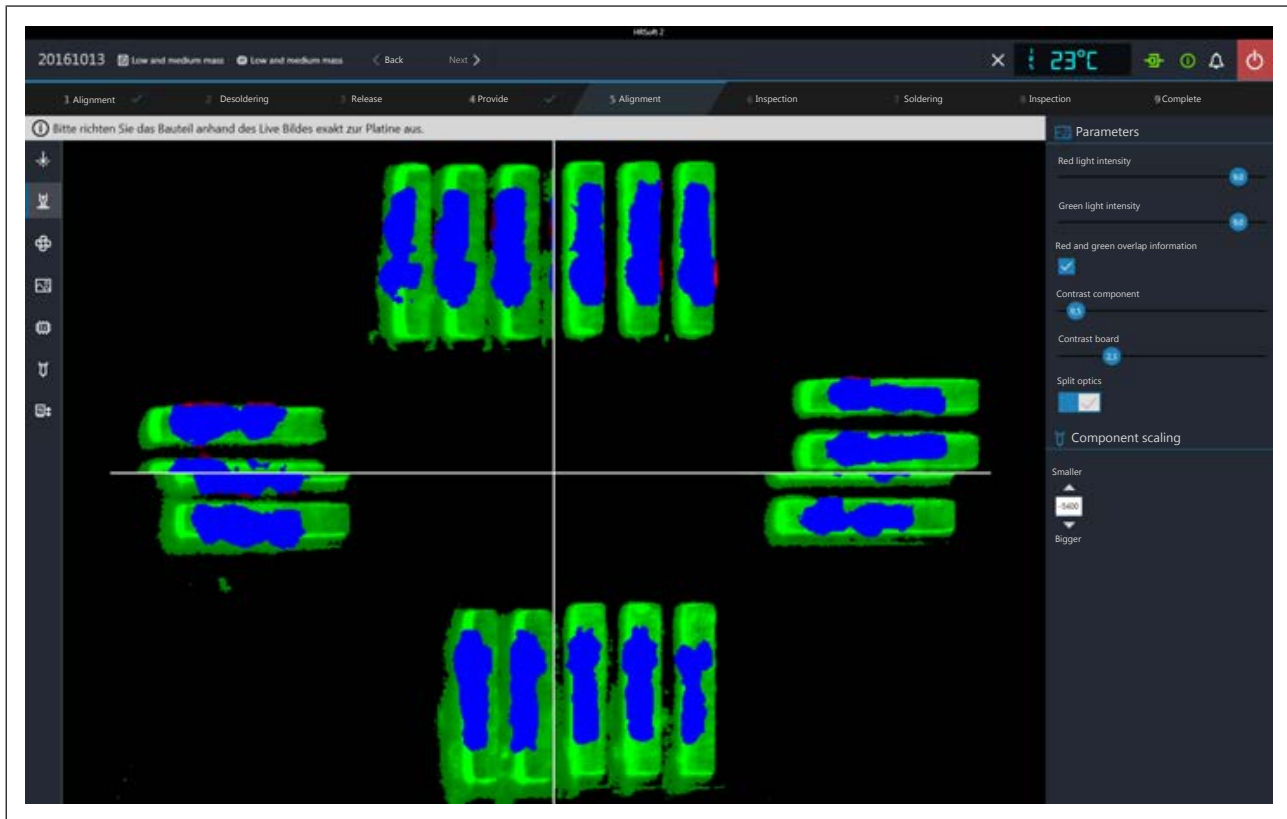


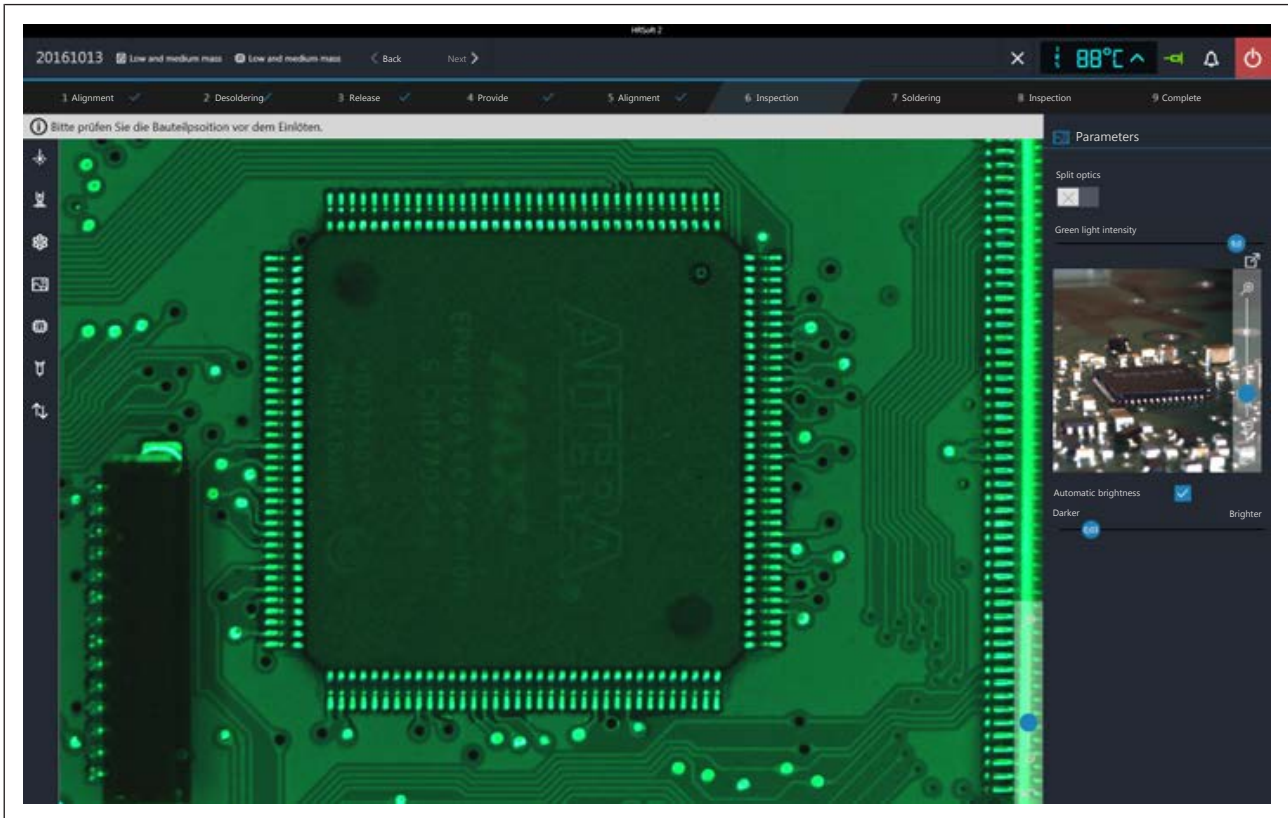
Fig. 42: Split screen view with simultaneous display of the four corners of a large component

- b) If necessary, even in this case adjust the angle compensation before correcting the position.
 - c) If the component is coextensive with the soldering point, push back the vision box and move on to the next task.
- ⇒ The component is deposited on the board.



7.13 Task 6 “Inspection”

a) Check the position of the component based on the displayed live image.



b) You can use the lever to switch between normal view and the telephoto lens of the Vision box. With regard to this, please also read Chapter [Overview of the machine parts](#) [► 57], no. 11.

c) For example, in case of large components, in order to see an enlarged comparison of widely spaced image areas, click on button [Split optics]. Now click four times with the small blue rectangle on the four points that you want to see enlarged.

⇒ A split screen view will be displayed.

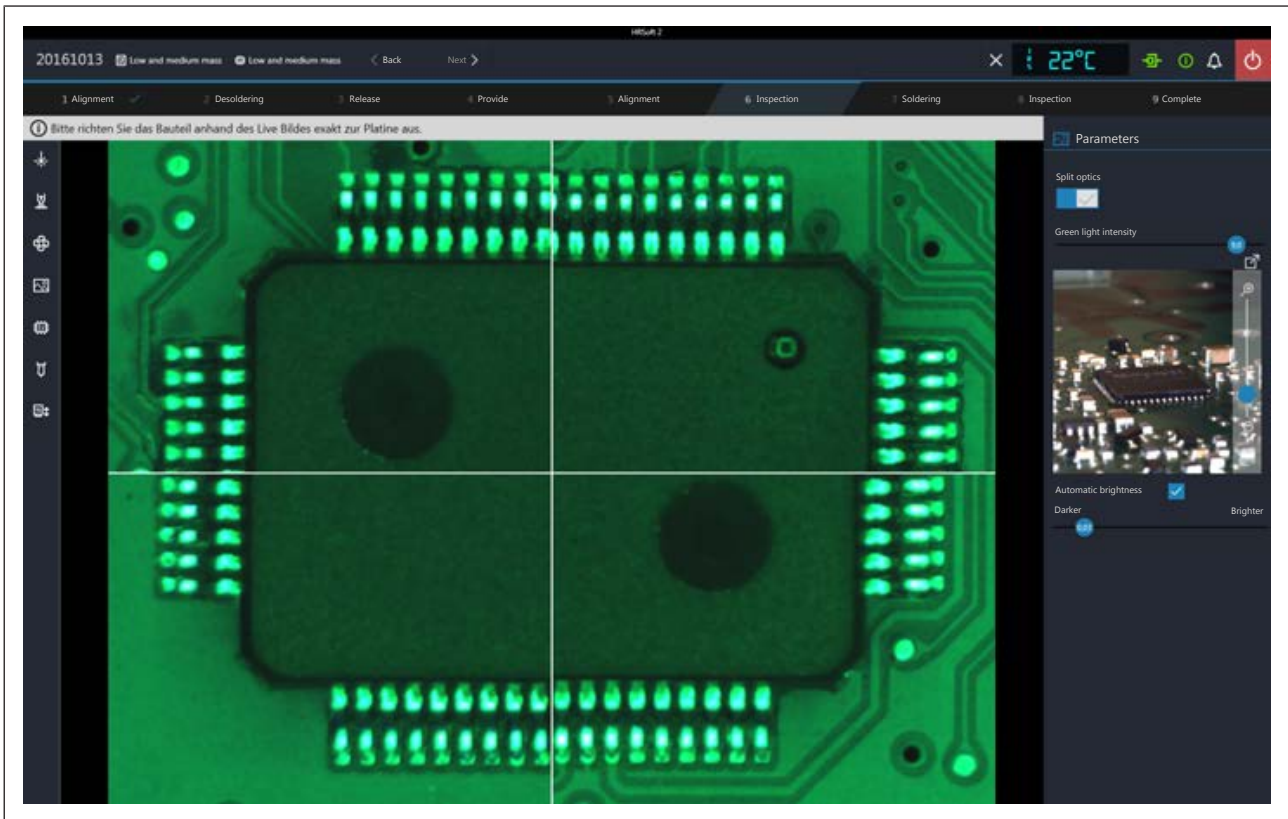



Fig. 43: Split screen view with simultaneous display of the four corners of a large component

- a) You can zoom the Vision box image using the controller on the bottom right of the camera image.
 - Green light intensity: Checks the brightness of the green PCB lighting.
 - Automatic brightness: When activated, the RPC camera image is automatically adjusted after changing the camera lighting brightness or ambient light.
 - Darker/Brighter: Checks the RPC camera lighting
- a) Click on the button  to switch to the live image of the RPC camera in full-screen display. The zoom controller allows further zooming. Use the left mouse button to move the image section. Close the full-screen display by clicking on the blue circle button in the upper right corner.
- b) When the component is correctly positioned, slide the Vision box backward and follow the instructions in the following steps.



7.14 Task 7 “Soldering”



⚠ CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

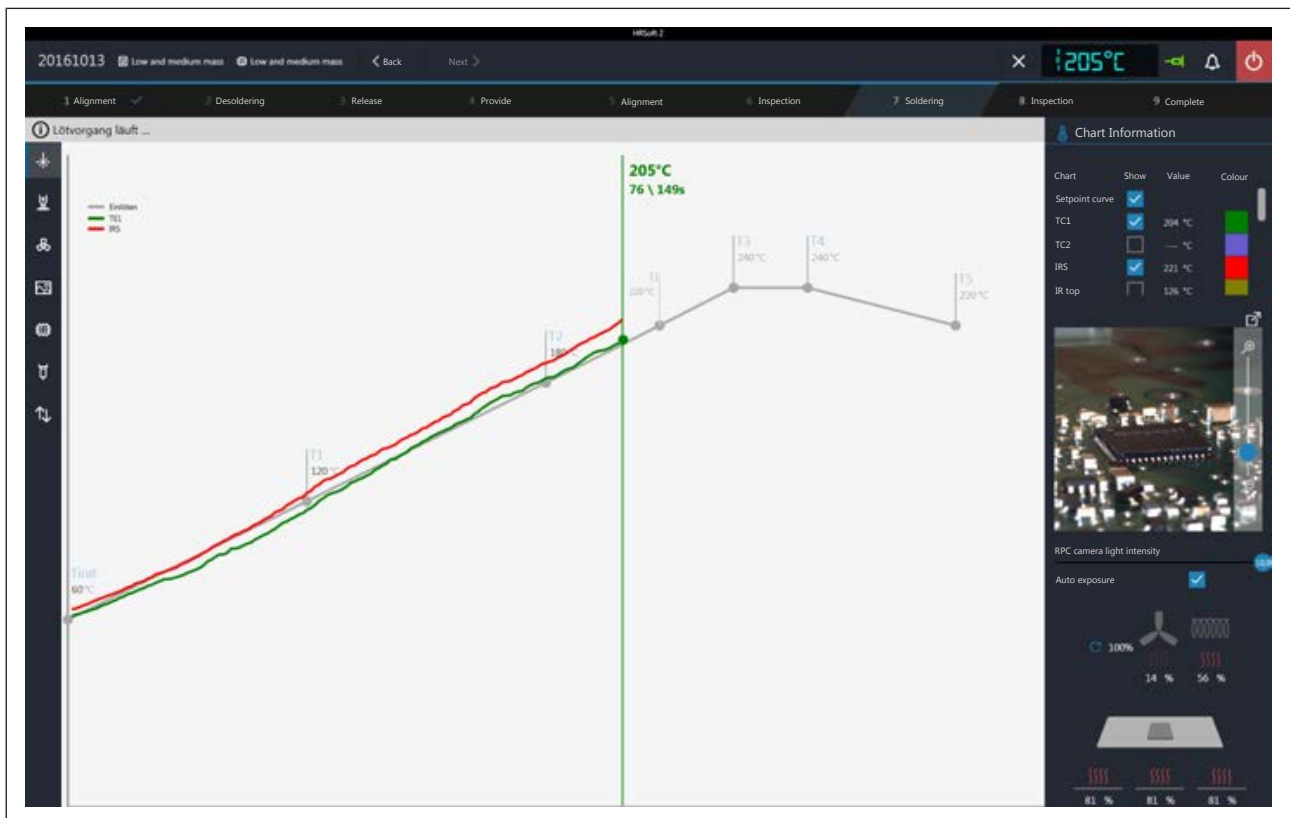


NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the Ersas “Easy Arm” with prefilter, HEPA, particle filter and activated carbon filter. The device is equipped with a suitable connection for the soldering fume extraction system. The soldering fume extraction system prevents the device from accumulating dirt quickly.

The soldering process is carried out.




Information chart

- Column [Show]: Show/hide the measurement curves.
- Column [Colour]: Colour of the measurement curve. Click on the coloured square to view all available colours.



RPC camera live

- a) On the support system of the RPC camera, set the ideal angle for monitoring the process. The camera must not be located within the operating range of the component trays. On the front of the camera objective, you will find a rubber ring to set the focus. Move the rubber ring carefully with a finger to focus the camera as accurately as possible. Note: do not change the setting of the objective aperture. If the locating screw of the aperture has opened, close it with aperture value of 8.
- b) With the right controller, you may adjust the camera zoom.
 - [RPC camera light intensity]: Camera illumination controller.
 - [Auto exposure]: If activated, the brightness of the image is automatically adjusted as the camera illumination is changed.

Click on the button  to view the live image in full-screen mode. You may zoom in even more using the zoom controller. With the left mouse button you can relocate the image detail. Close the full-screen view by clicking on the red button in the right upper corner.

Heating information

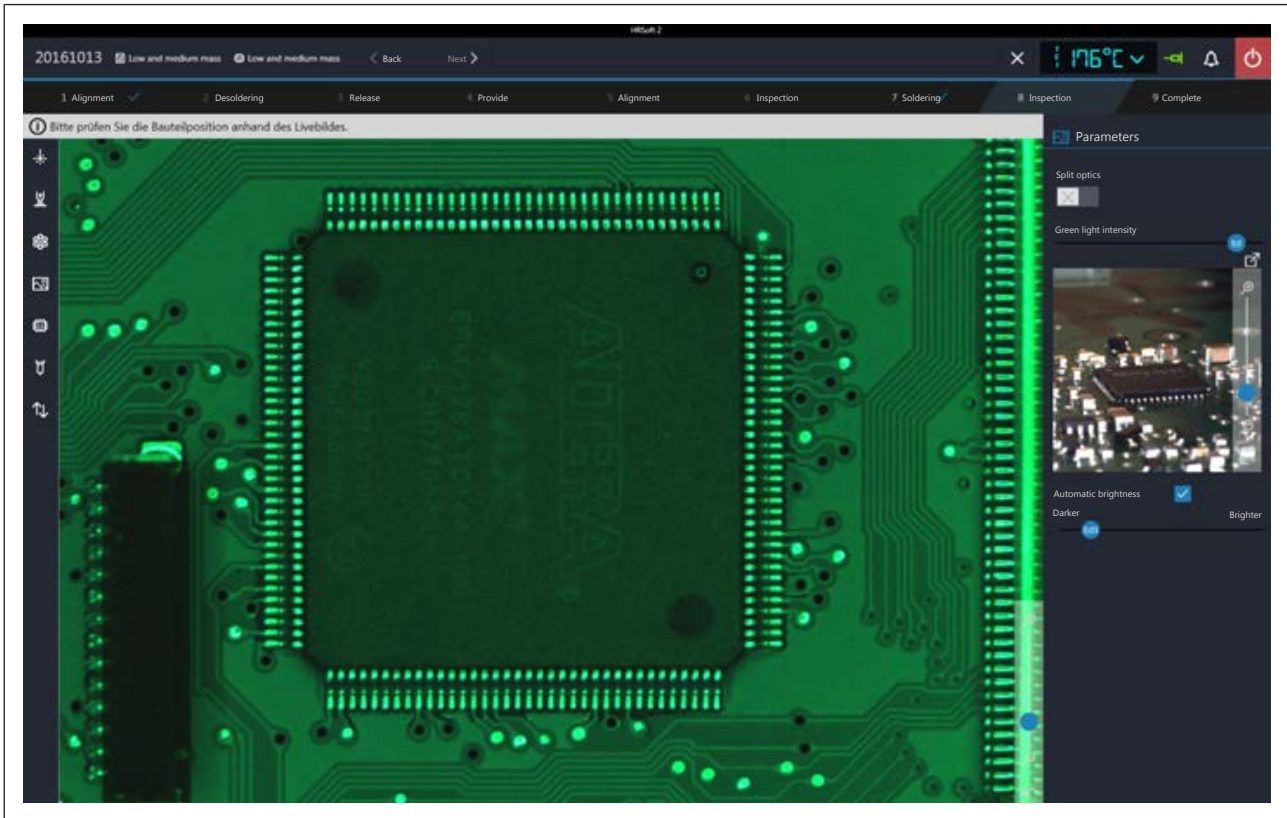
In the lower area, the current status of the thermocouples and blower elements is displayed.

- a) When the soldering process is over, move on to the next task.



7.15 Task 8 “Inspection”

a) Check the position of the component based on the live image.



- b) You may use the normal view/telephoto toggling lever of the vision box. With regard to this, please also read the [Overview of the machine parts](#) [► 57]chapter , No. 11.
- c) For instance, in case of large components, in order to view the comparison display of widely separated image areas click on the [Split optics] button. Now click four times with the small blue rectangle on the four points that you wish to enlarge.
- ⇒ The split screen view appears.

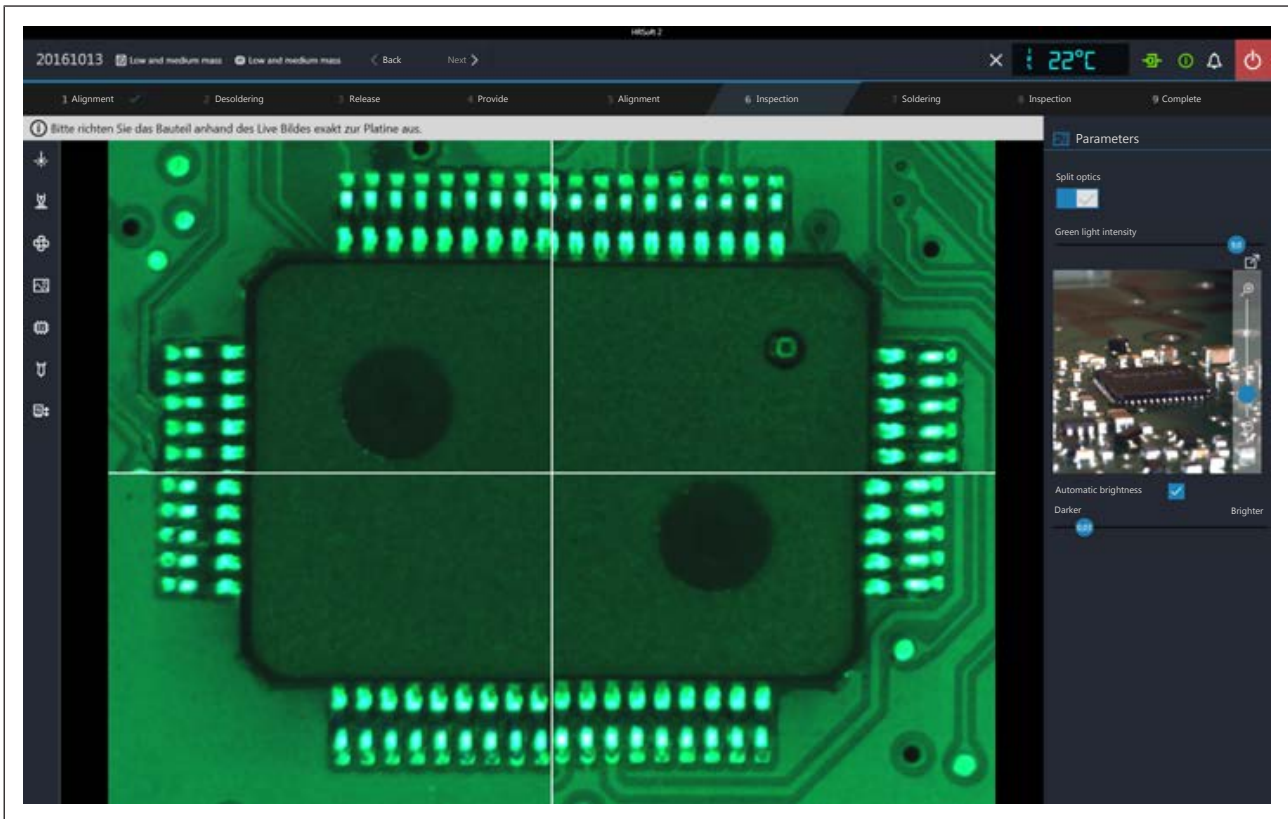



Fig. 44: Split screen view with simultaneous display of the four corners of a large component

- a) With the controller at the bottom on the right, you may adjust the vision box zoom.
 - Green light intensity: To adjust the intensity of the green PCB illumination.
 - Automatic brightness: If activated, the image of the RPC camera is automatically adjusted as the camera illumination intensity or ambient light is changed.
 - Darker/Brighter: To adjust the illumination of the RPC camera
- a) Click on the button  to view the live image of the RPC camera in full-screen mode. You may zoom in even more using the zoom controller. With the left mouse button you can relocate the image detail. Close the full-screen view by clicking on the small red button in the right upper corner.
- b) Once the component is properly positioned, slide the vision box back in.



7.16 Task 9 “Complete”

The soldering process is completed. You have the following options:

- Repeat the process: The whole soldering process is repeated once
- Select profile: With this option you may cancel the soldering process and switch to another soldering profile.



8 Service and maintenance

8.1	Check the rework system on a weekly basis for any dirt or damages.	148
8.2	Lubricating the worm gear of the pipette hub every six months.....	149
8.3	Change the heating head	150
8.4	Performing a HRSoft 2 update	151



8.1 Check the rework system on a weekly basis for any dirt or damages.

Check the following machine parts on a weekly basis for any dirt or damages. If you spot any dirt, remove it as indicated. During cleaning never scrub the machine and never work with hard or sharp-edged objects!

Before performing any cleaning or maintenance operation, turn off the rework system from the main switch!



⚠ CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

- ✓ Upper and lower glasses of the vision box:
 - a) Remove the vision box.
 - b) Clean the glass plates with a lint-free cloth and a commercially available glass cleaner.
- ✓ Component trays:
 - a) Clean the component trays with a lint-free cloth.
 - ⇒ In case of heavy dirt with flux material or solder paste: Use a cleaning agent recommended by the flux material or solder paste manufacturer.
- ✓ Mirror plates under the RPC camera and under the vision box:
 - a) Bring the RPC camera and the cross table to a suitable position.
 - b) Clean the mirror plates with a lint-free cloth and a commercially available glass cleaner.
 - ⇒ In case of heavy dirt with flux material or solder paste: Use a cleaning agent recommended by the flux material or solder paste manufacturer.
- ✓ Housing parts:
 - a) Clean all housing parts with a soft, lint-free cloth and a household detergent.
- ✓ PCB holder plane parallelism check:
 - a) If bent, straighten or replace it.
- ✓ Heating head ceramic check:
 - a) Check the ceramic at the bottom of the heating head for any flaws or deformations; further, check the heating coils in the ceramic for any flaws. Replace in case of damages.
- ✓ Filter mat of the housing blower:



- a) Clean it if dirty. If in doubt replace it.



Fig. 45: 1 housing blower

8.2 Lubricating the worm gear of the pipette hub every six months

Every 6 months lubricate the worm gear of the pipette hub. Switch off the Rework System via the main switch before any cleaning and maintenance work!

Required material:

- 2 Allen keys
- Lubricating grease Klüber Micolube GL 261

- a) Switch off the Rework System.
b) Remove one screw from the inspection opening with the Allen key and loosen the other screw.



Fig. 46: 1 inspection flap



NOTE

For lubrication, a thin film of grease is enough!

If the drive components are excessively lubricated, they get dirty very quickly. Clean dirty drive components before lubrication!

- a) Use a grease brush to sparingly apply grease to the worm gear.
b) Screw the maintenance flap back on.



8.3 Change the heating head

CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!



If you have several heating heads, you may change them:

- a) Close HRSoft 2.
- b) Turn off the rework system.
- c) Allow the heating head to cool down.
- d) If the release lever is not available on the top of the heating head, use the suspension bracket (see figure, No. 1).
- e) Hold the heating head tight with both hands and keep the release lever pressed with a finger on the top of the heating head. In the upper area, pull the heating head forward (see the arrows in the figure) until it disengages.

Position the other heating head:

- a) Place the heating head on both lower supports (see the arrows in the figure).



Fig. 47: Unlock and remove the heating head.



Fig. 48: Heating head suspension bracket, the arrows indicate the supports

- b) Press the upper part of the heating head to the device until the upper lock is engaged.
 - c) Turn on the rework system.
 - d) Start HRSoft 2.
 - e) Always execute the function [Start device setup]. With regard to this, please read the [The button \[Start maintenance mode\] \[▶ 101\]](#)chapter.
 - f) Always execute the function [Adjust pixel shift]. With regard to this, please read the [The \[Pixel shift adjustment\] button \[▶ 105\]](#)chapter.
- ⇒ The rework system is ready for operation.



8.4 Performing a HRSoft 2 update

Download the software

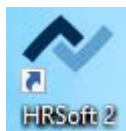
- a) On the Ersa website www.ersa.de click on "Login".
- b) Log in with your e-mail address and password.
⇒ The Members Area will appear.
- c) Go to the area 6.2.3 (Software / Rework) HRSoft 2.
- d) Compare the version number offered with the installed version. The number of the installed version is shown by the Rework System in the [HRSoft 2 options] dialog under the [Administration] tab.
- e) If you wish to update the system, download the software package and save it on the Rework System PC under:
C:\ProgramData\ErsaGmbH\HRSoft 2\Firmware.
- f) Extract the file in this directory.
- g) Open and read the "HRSoft2_Liesmich" file.

Uninstalling the outdated HRSoft 2

- a) Switch off the Rework System.
- b) Click on the Windows start button once and enter "Programs" in the input field.
- c) In the Windows Start menu, click on the "Adding or Removing Programs" line.
- d) Uninstall the HRSoft 2 program in the "Apps & Features" program list.

Install the new HRSoft 2 version.

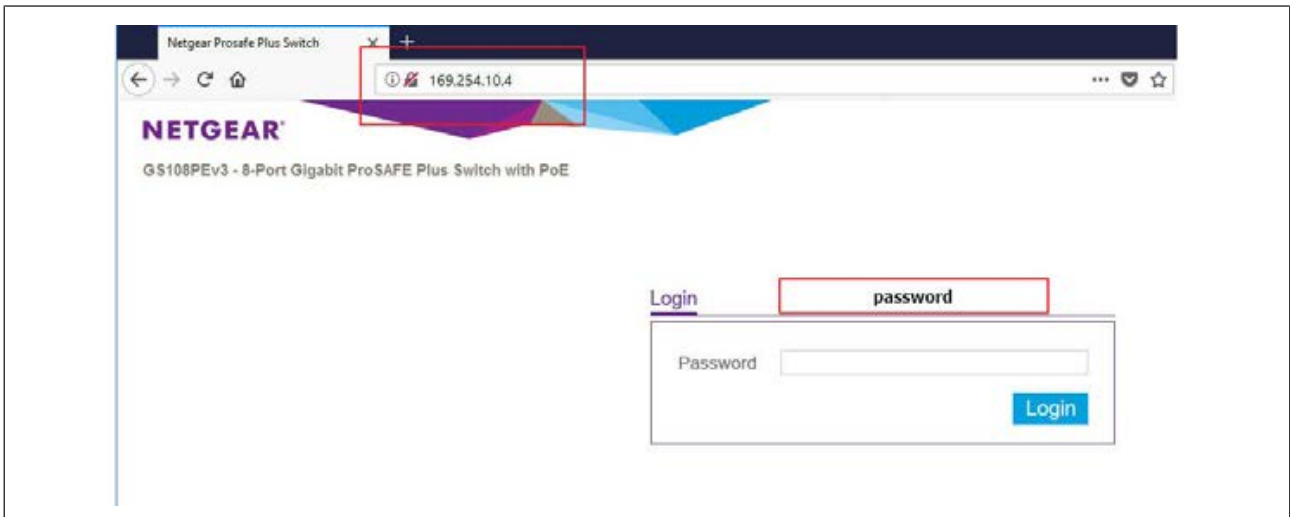
- a) In the C:\ProgramData\ErsaGmbH\HRSoft 2\Firmware directory launch the "setup.exe" file. Follow the instructions and confirm dialogues with OK/Continue.
- b) Once installation is completed, the HRSoft2 program will be started by double-clicking the program icon on the desktop.
- c) Switch on the Rework System.
- d) Switch on the PC and start HRSoft 2.
- e) Check if there is a connection between the Rework system and the PC. The "Connection" icon on the right of the temperature display must be green.
- f) If further firmware updates of specific modules of the Rework System are required, these must be executed in the [Device settings] dialog under the [Administration] tab. With regard to this, please read Chapter The [device settings] dialog.



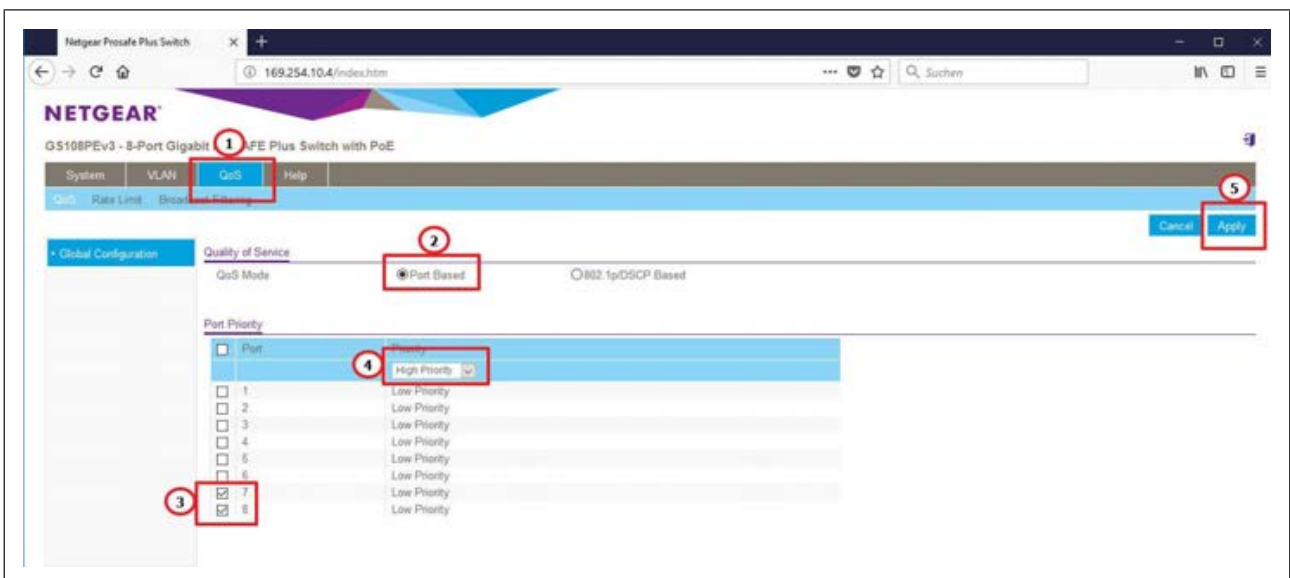
Checking the Netgear switches configuration

Switch on the Rework System and the PC.

- a) Open a web browser and enter the following IP address: 169.254.10.4. Press Enter.
⇒ The Netgear user interface will be displayed.



- b) Enter the word “password” into the "Login" window and click on “Login”.
- ⇒ The following dialog will appear:



- c) The settings must match the illustration in the figure, otherwise make the following settings:
- d) Select controller “QoS”.
- e) Select the optional field “Port based” under “Quality of Service”.
- f) Highlight ports 7 and 8 under “Port Priority”.
- g) Select menu item “High priority” for both ports in the drop-down menu.
- h) Click on the “Apply” button to confirm all entries.
- i) Power cycle the Rework System.
- ⇒ The process has now been completed.



9 Spare and wear parts

9.1	Read this first!.....	154
9.1.1	Target readers, permitted spare parts	154
9.2	Nameplate and machine number	154
9.3	Spare parts	155



9.1 Read this first!

9.1.1 Target readers, permitted spare parts

WARNING

Machine malfunctioning is possible!

Personal injury or material damage due to the machine inadequate maintenance and improper operation!

- ✓ Maintenance work must be performed by trained and qualified staff only.
 - ✓ Carry out the maintenance and inspection activities recommended in this instruction manual.
- a) First, read the section "Safety instructions"!
 - b) Comply with the specified maintenance intervals!
 - c) Wear suitable protective clothing for all types of work! Also, check personal protective equipment for cleanliness and functional efficiency! Do not use damaged protective equipment, replace it with new items!
 - d) Use spare parts, replacement parts and wear parts exclusively authorized by the machine manufacturer!
 - e) Thoroughly clean the machine before starting work!
 - f) Re-tighten loosened screws after completion of maintenance! Install safety devices and check for their proper operation!
 - g) Dispose of operating and auxiliary materials, cleaning agents, and replacement parts properly and in an environmentally-friendly manner!



9.2 Nameplate and machine number



NOTE

Important note

When ordering spare parts always specify the machine number. This number is printed on the nameplate (see illustration above). The nameplate contains other important information about the machine such as machine type, electric power rating, conformity marking and disposal data.








9.3 Spare parts

	Name	Item number
	Silicone nipple 2.0 for 3.3 mm nozzle *	0HR5520-20
	Silicone nipple 3.5 for 5.0 mm nozzle *	0HR5520-35
	Silicone nipple 8.5 for 10 mm nozzle *	0HR5520-80
	Basic plate claibration target	320415
	Switch PoE	295847
	Power supply	3ET00370
	Membrane pump	3VAPU011
	3/2 directional valve	119765
	Fan bottom heating	313959



	Name	Item number
	Rework powerboard	297445
	Rework controllerboard	285856
	Stepper motor controller	297444

* Elastic silicone. Average service life 10-30 soldering processes.
As to this, please also read Chapter [Options](#) [▶ 21].



10 Annex

10.1 EC Declaration of Conformity 159

EU Declaration of Conformity

Ersa GmbH, Leonhard-Karl-Str. 24, D-97877 Wertheim

EU Declaration of Conformity as defined by:

- EU Machinery directive 2006/42/EC (version 2006)
- EU EMC Directive 2014/30/EC (version 2014)

We herewith declare that the product

Designation: **Reworksystem**

Type: **HR 550**

in the delivered model satisfies the above-named EU directives and DIN EN standards listed below:

Richtlinie/Norm	Titel	Ausgabe
DIN EN 62079	Preparation of instructions – Structuring, content and presentation	2013-6
DIN EN 12100	Safety of machinery - Basic concepts, risk assessment and risk reduction	2011-3
DIN EN ISO 13732-1	Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces	2008
DIN EN 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	2016-6
DIN EN 61000-6-4	Industrial equipment - Electromagnetic disturbance characteristics	2007+A1:2011
DIN EN 55011	Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	2009 A1: 2010
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	2006 A1: 2009
DIN EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	2014
DIN EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A	2013
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards: Immunity for industrial environments	2005

Authorized for machine documentation: Ersa GmbH, Manager Mechanical Design Tools.

This declaration is rendered invalid if the machine is modified without our prior approval.

2018-03-29 Ersa GmbH



Dipl.-Ing. Rainer Kurtz
General Manager