

HR 600 XL

Hybride-Rework-System



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1.1 Product information

1.1.1 General information about the product

These operating instructions are generally valid for Ersa Hybrid Rework systems of product ranges HR 600 XL Hybrid Rework System (OHR600XL) and HR 600 XL-L Hybrid Rework System (OHR600XL-L).

1.1.2 Intended use

The machine was built according to the current state of the art and the recognised safety rules. However, the machine may pose some residual risks, in particular if it is improperly operated by untrained staff or not used as intended. The HR 600 XL Rework System is intended for industrial indoor use. The machine is intended exclusively for soldering and desoldering electronic components on PCBs. Any other or additional use shall be considered improper. The manufacturer / supplier shall not be liable for any resulting damage. Proper use also includes compliance with the operating instructions including those concerning safety.

1.1.3 Retrofitting, changes

Unauthorised conversions, changes to hardware and software and additional software installations are not permitted and exclude any liability or warranty on the manufacturer's / supplier's part for any resulting damage. The machine is designed exclusively for industrial use only. In principle, no private use is allowed.

1.1.4 Warranty

The warranty period shall comply with the contractual provisions set forth in the currently valid general sales, delivery and payment terms of Ersa GmbH. Ersa GmbH can only provide warranty if the appliance is returned in its original packaging.

Improperly using the appliance and tampering will invalidate any warranty and liability claims from the buyer against the manufacturer.

To the extent permitted by law, liability for direct damage, consequential damage and third-party damage resulting from the purchase of this product is excluded.

The heating elements are subject to wear and are excluded from the warranty.

1.1.5 Minimum operating quality

In the event of electromagnetic interference or voltage drops, operating impairments may occur, which are displayed and recorded. These can be acknowledged or reset by acknowledging the corresponding message to ensure continued safe operation.



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!

Prior to working in areas that are marked with the symbol shown, the corresponding operating instructions must be read!



NOTE

Wear protective goggles!

When working in areas which are marked with the symbol shown, suitable protective goggles must be worn!



NOTE

Use hearing protection!

When working in areas which are marked with the symbol shown, suitable hearing protection must be worn!



NOTE

Disconnect power!

Prior to working in areas that are marked with the symbol shown, switch the system off!



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 instruction manual has been drawn up in the [German] language.

The original instruction manual in German is available in the [Documents] folder on the [3BA00149_USB-Stick_Rework] data carrier which is included in the scope of delivery. All other available languages are translations of the original instruction manual. In case of discrepancies in the translated text, consult the original instruction manual (German) for clarification or contact the machine manufacturer.





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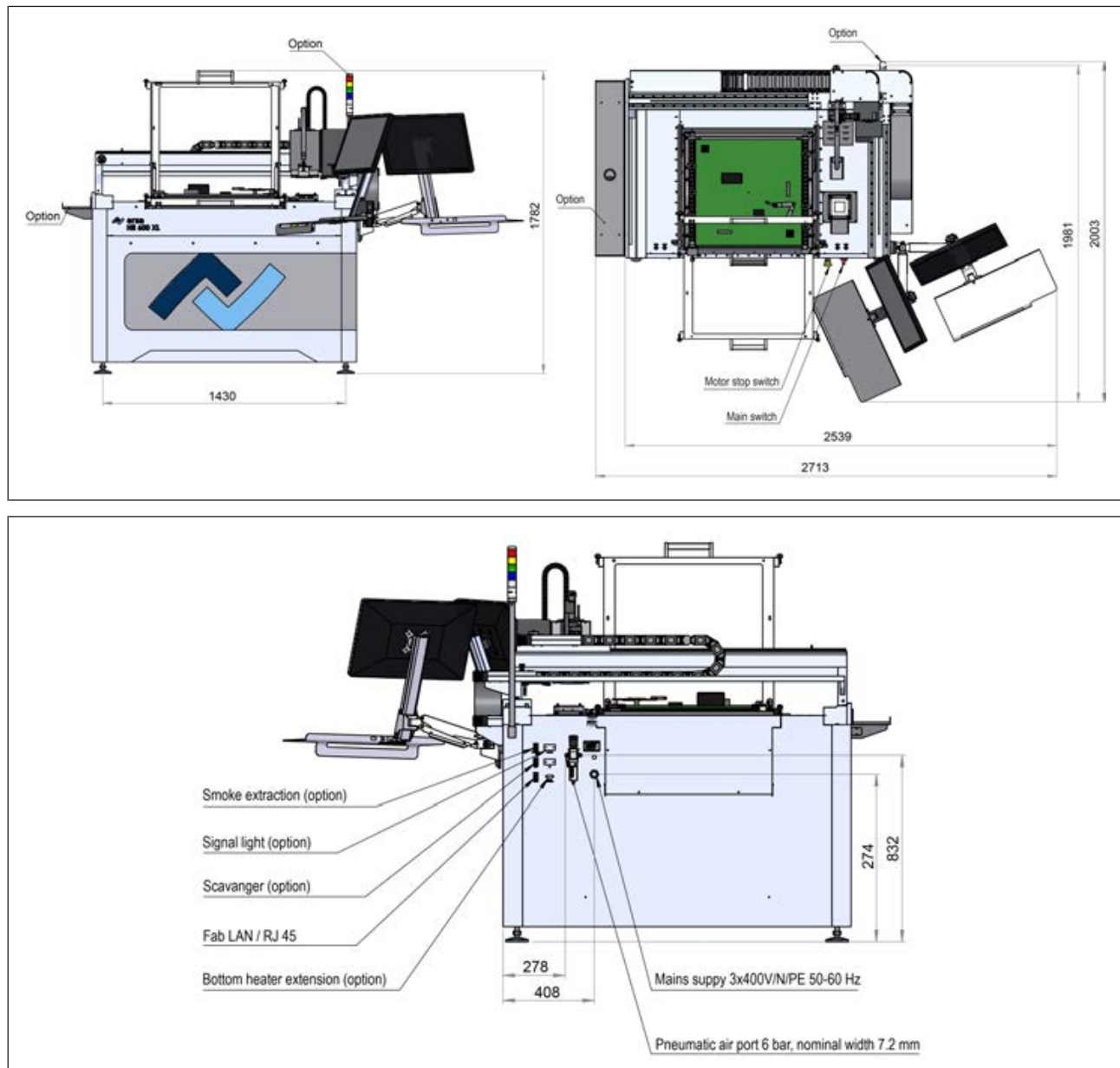
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2.1 General data (base machine)*

Description	
Width (mm), typical with monitor holder	2180
Width (mm), basic unit only	1690
Depth (mm), typical with monitor holder	1929
Depth (mm), basic unit only	1180
Height (mm)	1663
Weight (kg)	312
Weight with packaging (kg)	600
External dimensions of the packaging, Length, width, height (mm)	1870 x 1520 x 1910
Emission sound pressure level (dB (A))	< 70

* These data depend on the particular configuration level. The actual data can be found in the technical drawings provided!





2.2 Electrical connection

Designation	
Mains voltage, 3-wire network N/PE (V)	3 x 400 V
Voltage tolerance (%)	± 10
Mains frequency (Hz)	50 - 60
Insurance (A)	32 To be provided by customer with suitable pipe length
Power consumption (kW)	16
Connection	CEE Form 32A, 5 pin

2.3 Pneumatics

Description	
Inlet pressure (bar, oil-free)	6-10
Required connector (quick coupling)	¼ inch
Pneumatic hose for customer-side pneumatic connection	8 mm external diameter
Flow rate at 6 bar (l/min.)	approx. 110

2.4 Heating system

Bottom emitter

Description	
Heating type	Ceramic infrared emitters, medium wave
Dimensions of the emitter cartridge (width x depth, mm)	625 x 625 (fully heated area)
Number of heating zones	25, individually switchable
Nominal power (kW)	15 (25 x 0.6)

Top emitter

Description	Heating head 60 x 60 mm, 800 W
Heating type	Hybrid emitter, infrared emitter in ceramic housing, medium wave, with hot air
Component handling	Integrated, motorized pipette
Dimensions (width x depth, mm)	175 x 105
Number of heating zones	2
Rated power (kW) at 230 V	0,8
Aperture (mm)	40 x 40, 30 x 30, 20 x 20
Description	Heating head 150 x 80 mm, 2000 W
Heating type	Hybrid emitter, ceramic heating elements, medium wave, infrared, with convection
Component handling	Integrated, motorized pipette
Dimensions (width x depth, mm)	150 x 80



Description	Heating head 60 x 60 mm, 800 W
Number of heating zones	4
Rated power (kW) at 230 V	2
Description	Heating head 150 x 120 mm, 2800 W
Heating type	Hybrid emitter, ceramic heating elements, medium wave, infrared, with convection
Component handling	Integrated, motorized pipette
Dimensions (width x depth, mm)	175 x 150
Number of heating zones	4
Rated power (kW) at 230 V	3,0

2.5 Temperature sensors

Description	
Additional inputs for type-K thermocouples	8

An AccuTC is included in delivery.

2.6 Axis system

Designation	
Type	Precision rail guide with step motors
Axles	X, Y, Z and rotation
Positioning accuracy (µm)	± 25
Pick-and-place nozzles – Ø (mm)	5 and 10, screw connection

2.7 Cameras

Camera, top mount

Designation	
Type	Colour camera
Resolution (Mpixel)	5
Interface	GigE
Lighting	LED, dimmable

Component camera, bottom mount

Designation	
Type	Monochrome
Resolution (Mpixel)	5
Interface	GigE
Lighting	LED, dimmable

2.8 Printed circuit boards and components

Designation	
PCB cooling from above	Hybrid blower



Designation	
PCB cooling from below	Compressed air with blowpipe
Max. PCB size (width x depth, mm)	625 x 625
Min. PCB size (width x depth, mm)	20 x 20
Max. PCB thickness (mm)	10
Max. PCB mass (kg)	10
Min. components	01005
Max. component dimensions (mm)	60 x 60
Typ. working distance top (mm)	40
Clearance below (mm)	80

2.9 PC system requirements

Operate the Rework system with a PC screen resolution of 1920 x 1200.

Please find the required PC configuration for your Rework system in the PDF document

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

This document is available on the Ersa Rework USB stick (3BA000149).

2.10 Ambient conditions

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



2.11 Options

The following items are available as options (not included in delivery).

	Description	Item number
	Heating head 150 x 80 mm, 2000 W	0HR667L
	Heating head 60 x 60 mm, 800 W	0HR667
	RPC camera for XL-rework	0HR610XL
	Signal light	363884
	Tray sheet	335139
	Dip & Print station	0PR100
	Nozzle Ø 1 mm, metallic *	0HR5520-05010
	Nozzle Ø 2 mm, metallic *	0HR5520-10020
	Nozzle Ø 3.3 mm with silicone cup Ø 2 mm **	0HR5520-20033
	Thermocouple holder	0HR640
	AccuTC 2.0 thermocouple	0HR645
	K-type thermocouple wire with plug	0IR4510-02
	PCB holder frame for HR 600 XL, interchangeable	0HR625XL
	Board holder.	0PH100
	Perforated rail with pcb clamp for HR 600 XL	0HR628XL
	Handle for pcb clamp HR 600 XL	0HR624XL
	Downholder with pins for HR 600 XL pcb holder	0HR626XL
	Center support for HR 600 XL pcb holder	0HR627XL
	Pin for center support HR 600 XL pcb holder	0HR627XL-01



	Description	Item number
	Pin for downholder rail HR 600 XL pcb holder	OHR626XL-01
	Dip stencil 40 x 40, 0.3 mm	OPR100-D001
	Dip stencil 40 x 40, 0.1 mm	OPR100-D004
	Automatic residual solder extraction SC 600	OSC600

* Metal, durable, several months to years. Cleaning with isopropanol. Handle with care.

** Metal nozzle, durable. Replace silicone suction cups after 10-30 soldering processes.

The following soldering fume extraction system is recommended for the HR 600 XL Rework system:

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



2.12 Fuse documentation

Type	Part No.	Voltage	Description / Manufacturer	Number
F400	0218004.MXP	250 V	Fuse T4A (Littlefuse)	1
F200, F401, F600	02151.25.MXP	250 V	Fuse T1, 25A (Littlefuse)	3
F300 - F324	S501-3.15-R	250 V	Fuse F3.15A (Eaton)	25
F325 - F329	S501-4-R	250 V	Fuse F4A (Eaton)	5

If the Rework system is equipped with the optional advanced bottom heating, all listed fuses are present a second time.



3 For your safety

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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, locally applicable accident prevention, safety and environmental protection regulations are to be observed.

3.1.2 Fire protection



NOTE

Observe the rules! Risk of fire!

- a) Have the fire protection system assessed at the installation site!
- b) Take the necessary measures provided for by the applicable laws and regulations!

3.1.3 Handling substances that are hazardous to the environment and health



NOTE

Handling substances hazardous to health

Personal injury due to poisoning, irritation or allergic reactions.

- a) When handling flux materials, solder pastes, adhesives or other chemical substances, please adhere to the manufacturer's safety instructions, in particular the permissible temperatures during use.
- b) Read the safety data sheets provided by the product manufacturers. Also adhere to the instructions on wearing protective clothing and respiratory protection!



⚠ CAUTION

Handling substances hazardous to the environment

- a) Do not allow auxiliary substances such as flux material and solder pastes, solders, operating materials, oils and greases to get into the soil or the sewage system!
- b) Dispose of cleaning agents, cleaning cloths, condensates, dust and dirty filters in an environmentally friendly manner!
- c) Comply with the locally applicable waste disposal regulations!
- d) Follow the safety data sheets provided by the product manufacturers!



3.2 Subject-related safety instructions

3.2.1 Dealing with electrical equipment



DANGER

Dangerous electrical voltage!

Death or serious injuries due to electric shock!

- ✓ 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.
- a) When the main switch is off, some electrical parts inside the machine (e.g. mains filter, main switch) are still live. Therefore, disconnect the mains plug before opening housing parts!
- b) Use only original fuses with the specified amperage.
- c) Use only voltage-insulated tools.
- d) In the event of faults in the electrical power supply, switch off the system immediately.



DANGER

Arc flash and electric shock hazard!

Comply with the requirements of US standard NFPA 70E for safe work practices and personal protective equipment!
Non-observance can result in death or injury!

3.2.2 Do not open the electrical cabinet



DANGER

Hazard due to electrical voltage when opening the electrical cabinet!

Death or serious injuries due to electric shock!

- a) The electrical cabinet must not be opened!
- b) In the event of faults in the electrical power supply, switch off the system immediately.
- c) 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 the electrotechnical regulations.
- d) Before any work being performed by a skilled electrician on the electrical cabinet, disconnect the machine from the mains!



3.2.3 Dealing with pneumatic equipment



CAUTION

Highly pressurized machine parts!

Personal or material damage due to pressurized machine parts or unexpected movement of the mechanism!

- ✓ Work on the machine pneumatic and hydraulic devices may only be carried out by professionals with the appropriate skills.
 - a) Read pneumatic and hydraulic plans!
 - b) System sections and pressure pipes to be opened must be depressurized before any repair or maintenance work!



NOTE

Wear safety goggles!

Eye injury hazard! When working on the pneumatic system and pressurised machine components, wear suitable safety goggles!

3.2.4 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!



⚠ CAUTION

Suffocation hazard! Deal with the nitrogen system safely!

- ✓ If there is a leak in the nitrogen system, nitrogen enrichment in the breathing air can displace the oxygen. Nitrogen cannot be sensed by odour!
- a) If the machine is de-energised, the main valve of the nitrogen supply line must be closed!
- b) Workplace regulations applicable at the place of use regarding air exchange must be complied with!

3.3 Safety instructions for certain operating phases



⚠ WARNING

Death or serious injury due to flammable substances! Risk of fire and explosion due to overheating!

- a) Do not leave the machine unattended when switched on!
- b) The heating of highly flammable or explosive substances is prohibited!
- c) The Rework system is not approved for operation in potentially explosive atmospheres.



⚠ DANGER

Risk of injury due to moving machine parts!

After starting automatic processes, machine parts move. No body parts or foreign objects may be present in the working area of these machine parts.

- a) Do not interfere with the movement range of the machine during automatic processes!



⚠ DANGER

Health damage due to smoke

- a) In case of smoke formation or unusual odour development, switch off the rework system immediately and ventilate the room sufficiently!
- b) The room may only be re-entered when the air is smoke-free.
- c) To avoid smoke development:
 - ⇒ Follow the operating procedure specified in the operating instructions
 - ⇒ Regularly check the rework system for damage
 - ⇒ Keep the rework system clean



3.3.1 Normal operation



DANGER

Improperly servicing and operating the machine can result in people being injured and property damaged!

- ✓ Refrain from any working methods that may endanger safety!
 - a) Operate the machine only if in a technically perfect condition!
 - b) Operate the machine only if it is equipped with properly working protective and safety devices!
 - c) The emergency stop device must be available and properly working!

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, the surrounding housing parts and insertion frame, the PCB and the components will become hot even during warm-up to the process temperature [Tinit]!

Parts become strongly heated during the soldering process!

3.5.2 Using a solder fume extractor



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.

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

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4.1 Read this first!

4.1.1 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!

4.1.2 Supplementary documents



NOTE

Supplementary documents

Additional documentation or service instructions are available for the single modules of the machine. These documents are available on data carrier [USB flash drive Re-work], which is included in the scope of delivery. Check there if you cannot find exhaustive information about a specific topic in this instruction manual.



4.1.3 ESD-hazardous components

NOTE

ESD hazardous components!



Electronic components can be damaged by electrostatic discharge. Please observe the warnings on the packaging or contact the manufacturer or supplier. To protect these components, an ESD (ESD = electrostatic discharge) safe workplace will be suitable. The Rework System can be easily integrated into such an environment. Via one of the push buttons on the front, the user can, e.g., connect an ESD wrist band. The housing of this Rework system is connected to the protective conductor of the voltage supply network via the IEC power cable.

All common precautionary measures for ESD-sensitive components must be taken when handling the device.

4.2 Information concerning machine transport and storage

⚠ CAUTION

Material damage possible!



- ✓ The machine is delivered in a wooden box. Damage due to improper transport or storage is not covered by the warranty!
- a) Always transport or store the machine in its original wooden box!
- b) Avoid any jerky movement and impact as well as abruptly setting down the machine during transport!
- c) When storing the machine, protect it from any atmospheric exposure (moisture, humidity, sea air, fog)! If necessary, provide the machine with dehumidifying agent and pack it airtight!



4.3 Unloading and transporting the unit with a forklift

The machine can be supplied in two packaging variants

- screwed onto a pallet (box bottom)
- packed in a box.

The unloading process is identical for both variants.



DANGER

Severe or fatal injury due to the machine overturning or falling!

- The lifting equipment must fulfil the minimum requirements!
- Before lifting the load, identify the [centre of gravity] symbol, which can be found either on the box base or on the machine!
- Always place the lifting equipment in the middle of the centre of gravity!
 - ⇒ If the [Centre of gravity] symbol is not available:
- Fit the lifting equipment to the marked lifting points!

Safely transporting the machine

- Lift the load always in the middle of the centre of gravity.
 - ⇒ The intended lifting points are visibly marked.
- Always lift the machine via the marked lifting points!



Note: Using a non-slip pad for the forklift forks increases safety when transporting the machine. In addition, the paint finish of the machine frame is protected.

Use a forklift with the following properties:

Fork length min. 2000 mm

Fork width 800 mm, adjustable

Loading capacity min. 800 kg



4.4 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.



4.5 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 600 XL Hybrid Rework System with the Heating head 60 x 60 mm, 800 W or HR 600 XL-L Hybrid Rework System with the Heating head 150 x 80 mm, 2000 W	0HR600XL 0HR600XL-L
1	Thermocouple holder HR 600 XL	0HR640XL
1	Air deflector 20 x 20 mm	0HR620-003
1	Air deflector 30 x 30 mm	0HR620-002
1	Air deflector 40 x 40 mm	0HR620-001
1	AccuTC thermocouple without fixture *	0IR6500-37
1	Thermocouple wire extension 500 mm	0IR5500-51
1	Nozzle Ø 5 mm with silicone cup Ø 3.5 mm **	0HR5520-35050
1	Nozzle Ø 10 mm with silicone cup Ø 8 mm **	0HR5520-80100
1	Open-end wrench SW9	316569
1	Open-end wrench SW9	316590
1	Lens cleaning kit	0VSLC100
1	Setup nozzle	0HR5520-0000K
1	Operating manual HR 600 XL	3BA00241
1	Holding frame board stopper	243583

* Durable 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:

Please read Chapter [Options](#) [► 22].



4.6 Unpacking and installing the Rework system

4.6.1 Unpacking the machine



NOTE

The housing, roof and hood of the machine are not accessible and must not be loaded with objects!



⚠ 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.



4.6.2 Packaging with Shock Watch

- ✓ Checking packaging provided with Shock Watch impact indicator:
 - a) Check all available Shock Watch stickers.
 - b) A not coloured indicator means: The machine was transported properly.
 - c) A red coloured indicator means: A shock impact has occurred during the machine transport.
 - d) Make a note of the red coloured indicator in the consignment bill!



Fig. 1: Indicator not coloured



Fig. 2: Red coloured indicator



4.6.3 Packaging with Tilt Watch

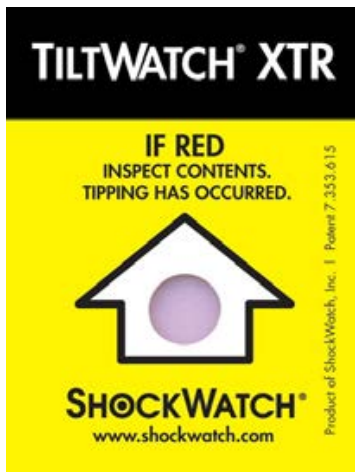


Fig. 3: Indicator not coloured

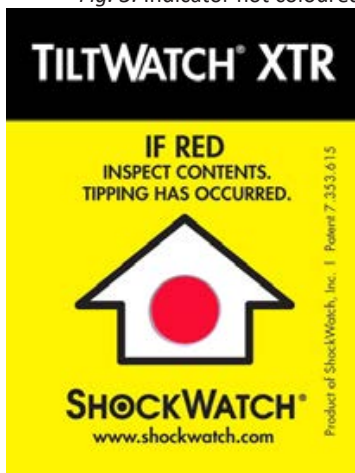


Fig. 4: Coloured indicator

- ✓ Checking packaging provided with Tilt Watch tilt indicator:
 - a) Check all available Tilt Watch stickers.
 - b) A not coloured indicator means: The machine was transported properly.
 - c) A red coloured indicator means: The machine was tilted excessively during transport.
 - d) Make a note of the red coloured indicator in the consignment bill!



4.6.4 Unpacking and positioning the machine

The installation site must have the following properties:

- Have a stable, flat and vibration-free surface.
- Be free from the effects of electromagnetic fields.
- No draught.
- Clearance around the machine on the left, right and at the back of at least 60 cm in each case (maintenance area).
- Too bright workplace lighting can adversely affect the Rework camera proper operation.

For further ambient conditions, please read the [Technical data] Chapter.



DANGER

Severe or fatal injury due to the machine overturning or falling!

- a) The lifting equipment must fulfil the minimum requirements!
- b) Before lifting the load, identify the [centre of gravity] symbol, which can be found either on the box base or on the machine!
- c) Always place the lifting equipment in the middle of the centre of gravity!
⇒ If the [Centre of gravity] symbol is not available:
- d) Fit the lifting equipment to the marked lifting points!

- a) If the machine is coming from a cold environment, wait until the contents of the package have adjusted to room temperature.
- b) Remove the steel bands.
- c) Remove the cover.
- d) Remove the side panels.



Fig. 5: Contents of the box



NOTE

Do not touch the X axle, especially on the non-powered side, and do not apply any tools there! Loss of machine accuracy is possible!

Not to influence positioning accuracy, handle the X axle very carefully during cleaning and lubrication.

- a) Remove the plastic film.



- b) Taking off the two side panels and removing their styrofoam packing
- c) Carefully remove all machine packaging elements.
- d) Take the accessories and boxes out of the side opening.
- e) Apply the adjustable feet.

Lifting the machine off a pallet

- ✓ Lift the load always in the middle of the centre of gravity.
- ✓ The intended lifting points are visibly marked.



Fig. 6: Lifting points for the forklift

- a) To lift the machine out of the box, use a forklift with the following features:
 - Fork length min. 2000 mm
 - Fork width 800 mm, adjustable
 - Loading capacity min. 800 kg
- a) Carry the machine to the place of operation and set it down.

We recommend storing the packaging material for later use. Only with this packaging material may the machine be safely packed, stored and carried!

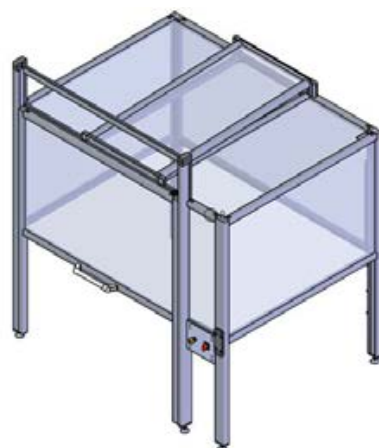


NOTE

Disposal

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

If the optional machine housing was supplied, place the machine housing on the pallet next to the Rework system. The machine housing protects the Rework system from environmental impacts.



After the installation of the Rework system has been completed, the optional machine housing is pushed over the Rework system and connected to the supply lines.



4.6.5 Aligning the machine

It might be necessary to carry out the alignment of the machine several times. After an alignment, check the steps that were carried out before and if necessary adjust the concerned adjustable feet. Continue to align the machine until you have reached an acceptable result.

Required tools: Precision spirit level, steel ruler, open-end spanner.

- a) Screw all adjustable feet to the same height of about 100 mm with an open-end spanner.
- b) Then place the precision spirit level transversely on the flat surfaces according to the following picture. Also, follow the order shown in the picture.
- c) Align the machine with the adjustable feet using the open-end spanner.

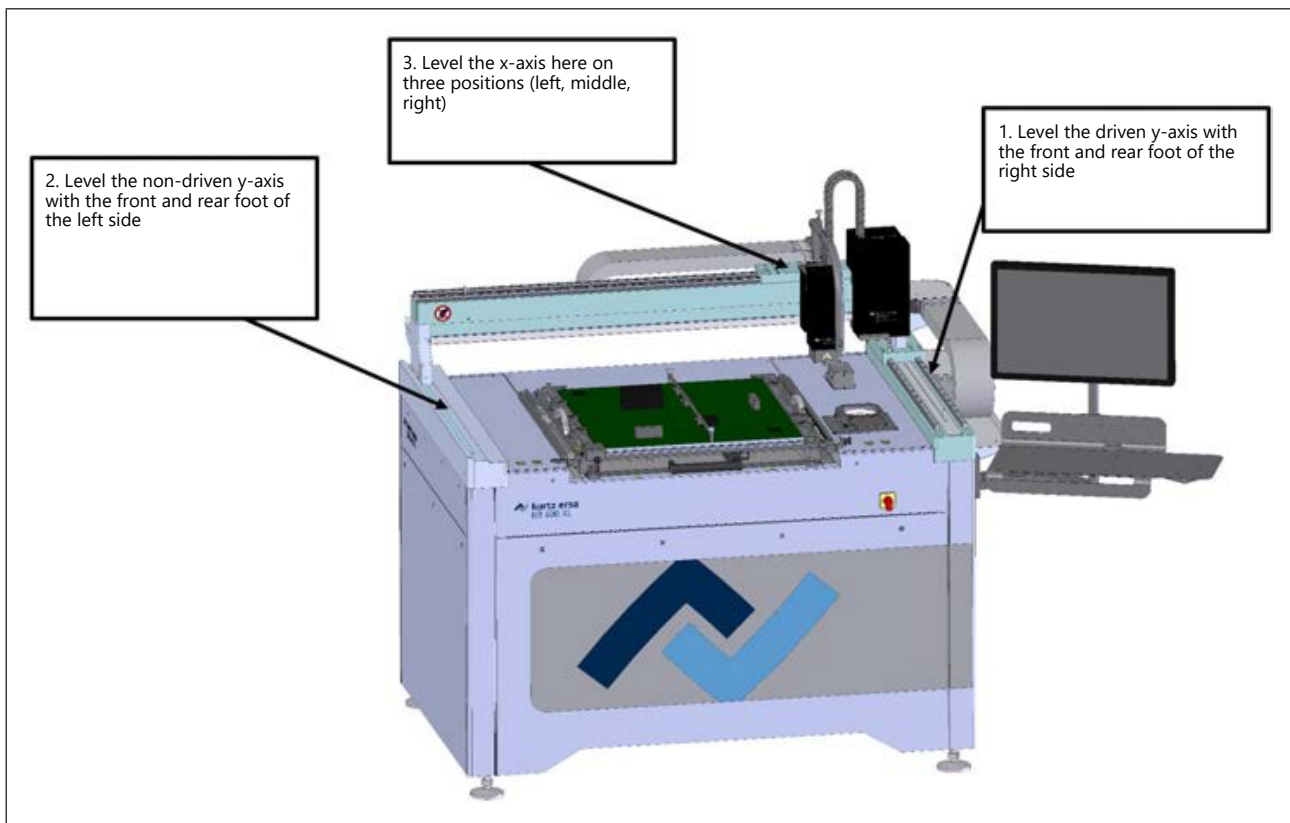
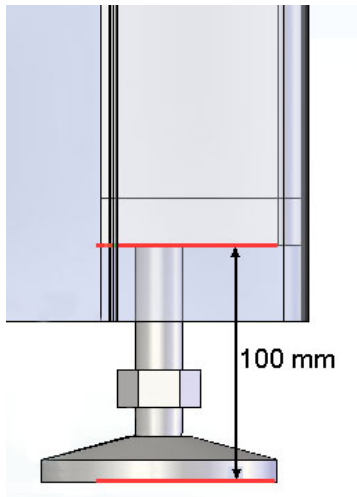


Fig. 7: Aligning the HR 600 XL system

Tighten counter nuts

✓ After aligning:

- a) tighten all counter nuts on the adjustable feet with an open-end wrench.

⇒ The process has now been completed.



4.6.6 Connecting the PC and und UPS

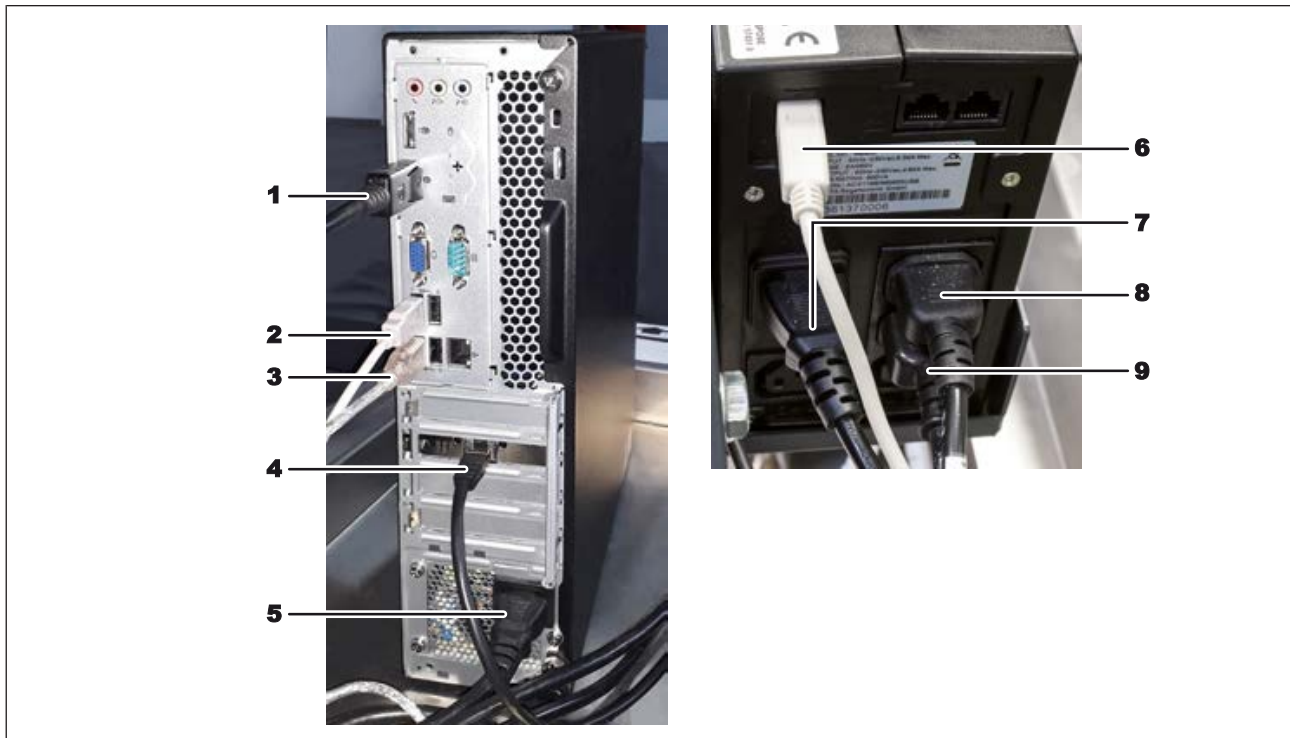


Fig. 8: Overview of computer ports and UPS connections

1	DisplayPort cable to monitor	6	USB cable to PC
2	USB cable to UPS	7	Power connector to three-pin socket
3	USB cable to monitor	8	Power cable to PC or monitor
4	Network cable	9	Power cable to PC or monitor
5	Power cable to UPS		

- a) Unpack the PC and UPS (Uninterruptible Power Supply) and place them next to each other so that their back sides are visible. Via the UPS, the power supply to the PC will be guaranteed.
- b) Read the operating instructions of the UPS, in particular sections "2.6 Installation" and "2.9 Handling accumulators".
- c) Connect the cables to the PC and UPS as shown in the picture above.
⇒ If you are not sure:
- d) have the connection work done by a specialised computer technician.
- e) Connect the UPS power connector (7) to the three-pin socket in the Rework System.
- f) Place the wired PC and UPS on the metal tray available in the Rework System.
Distance between PC and UPS at least 20 cm.



Fig. 9: PC and UPS installed

- g) Run the DisplayPort cable (1), USB cable (3) and power cable to the monitor (8/9) on the right out of the Rework System.
- h) Stow all other cables neatly.
- i) Switch on the UPS.



4.6.7 Mounting and connecting the monitor

- a) Unpack the monitor arm and monitor.
- b) Read the operating instructions for the monitor arms.
- c) Read the operating instructions for the monitor.
- d) Secure the monitor arm to the metal block on the right side of the machine with four screws.
- e) Put the two black covering caps over the screws.



Fig. 10: Screwing on the monitor arm

- f) Insert the monitor into the holder on the monitor arm and secure it with a screw.

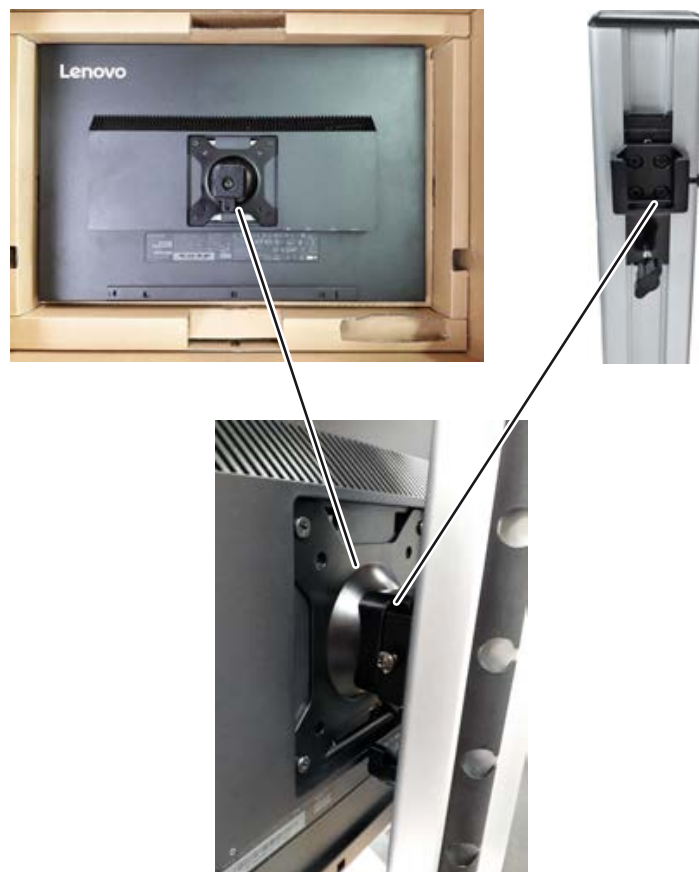


Fig. 11: Fitting the monitor arm



- g) Unpack the keyboard and mouse and place them on the tray of the monitor holder.
- h) Connect the monitor power cable along with the monitor and USB cables to the underside of the monitor.
 - ⇒ If you are not sure:
 - i) have the connection work done by a specialised computer technician.
- j) Connect the keyboard and mouse USB cables to the USB ports on the side of the monitor.
- k) Remove the black protection covers from the cable guides on the back and underside of the monitor holder.
- l) Run the three cables from the monitor through the cable guides and then apply their protection covers.

We recommend storing the packaging material as well as all transport lock parts for later use.



4.6.8 Installing cladding panels

After connecting all cables, fit the side cladding panels. No tools are needed for this.

- a) Connect the earth cable to the frame of the machine.



Fig. 12: Connecting an earth cable

- b) Fit the wired bottom cladding panel (following the photo on the left).
c) Now press the captive closures on the outside with your finger onto the machine until they click into place.
The captive closures can be opened by turning counterclockwise with a screwdriver.

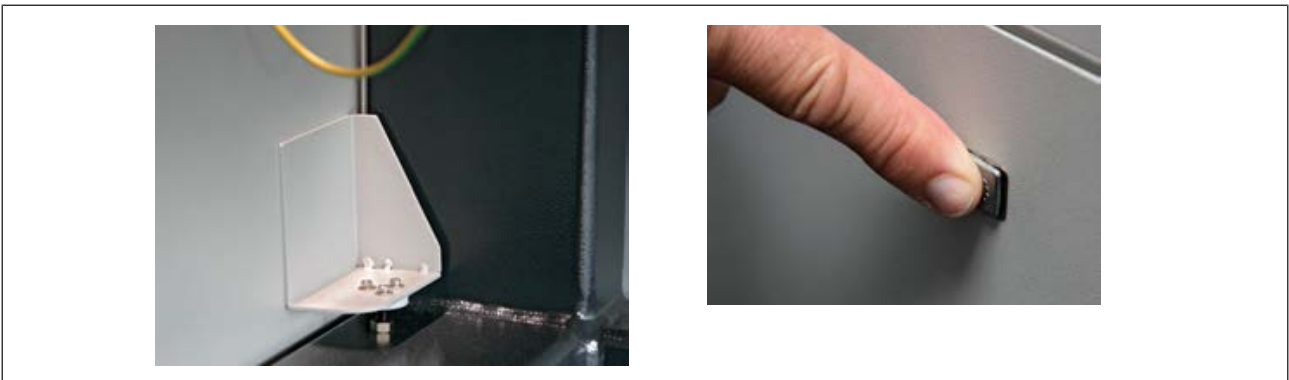


Fig. 13: Fit the bottom side panel and press on the closures on the outside

- d) Repeat with the cladding panel on the opposite side.



4.6.9 Fitting the heating and placer heads

- a) Remove the heating and placer heads from the accessory pack. Handle the heating and placer heads very carefully.

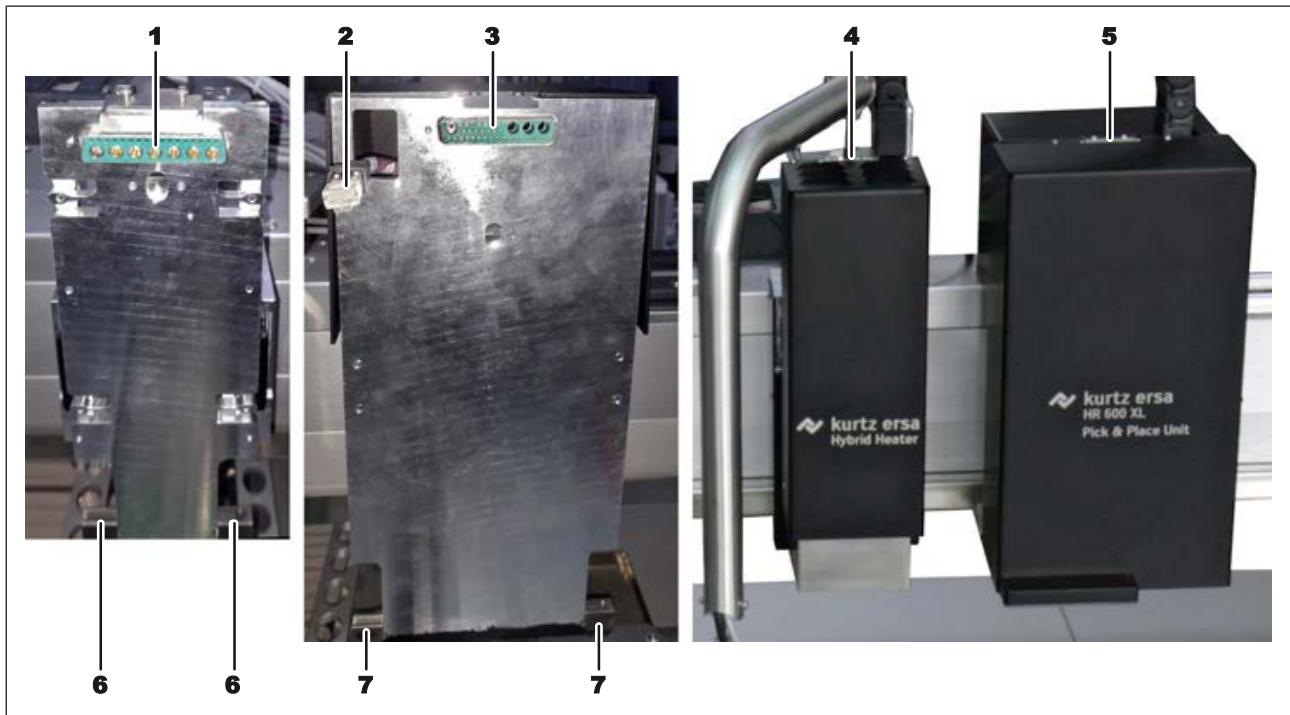
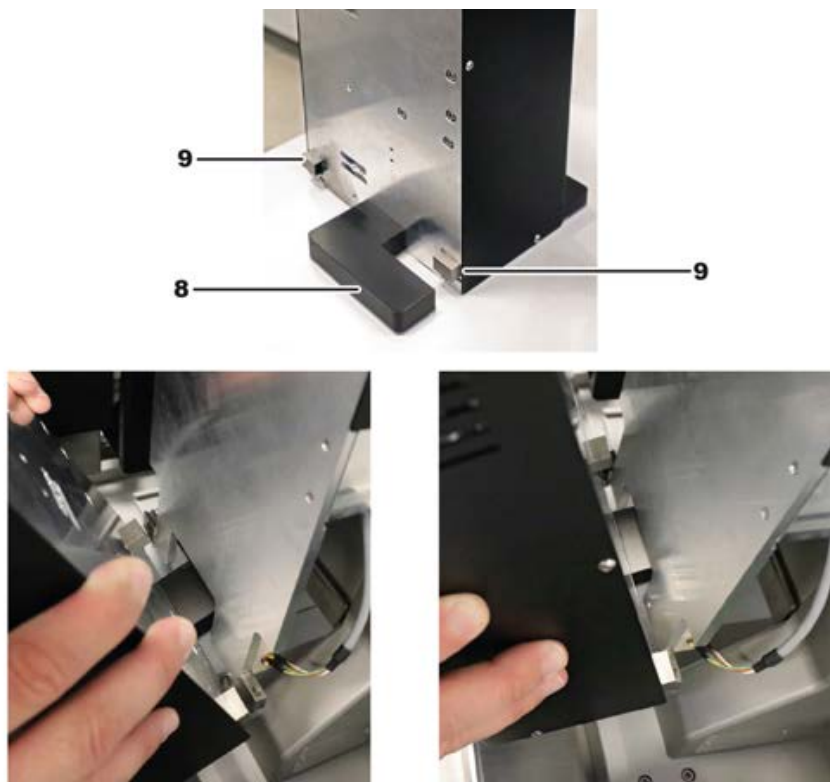


Fig. 14: On the left side of the picture: Heating head holder and placer head holder. On the right side of the picture: Heating and placer heads fitted on the brackets.

Fitting the placer head (5)

- a) Carefully insert the lighting (8) into the recess in the placer head holder (picture below). Then place the supporting lugs of the placer head (9) on its rest supports (7).



- b) After that, hold the placer head and insert the RJ plug (2) into the socket on the placer head. The fuse of the plug must engage.
- c) Press the upper part of the heating head onto the bracket. In so doing, the placer head is pressed onto the plug (3).
- d) Hold the placer head firmly and screw the kinked retaining plate with two holes to the top (5) of the placer head using the two screws with a 2 mm Allen key. In the process, hold the retaining plate so that it cannot fall into the placer head

Fitting the heating head (4)

- a) Below, place the heating head on its rest supports (6) and then, above, press onto the connector strip (1).
- b) Hold the heating head and screw the retaining plate of the heating head onto the top (4) with the two screws. To do so, use a 2 mm Allen key. In the process, hold the retaining plate so that it cannot fall into the heating head.

Any tempering colours on the heating head are due to manufacturing reasons.

There are no pipettes attached to the place and heating heads yet. The pipettes are in the accessory box. They are to be attached after the first switch-on, see Chapter [Installing the heating head nozzle and the placing pipette](#) [► 69].

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.



4.6.10 Inserting the PCB frame and becoming familiar with it



Fig. 15: Inserting the PCB frame

The big picture in the middle shows an inserted PCB frame with the base frame pulled out.

- a) Remove the PCB frame from the accessory.
- b) Make sure that all bars and brackets are tightened in the PCB frame.
- c) The frame mechanism of the Rework system poses a risk of crushing injuries. Always ensure safe operation!



CAUTION

Injury hazard! Hand injury hazard!

Crushing hazard due to moving frame parts. Always ensure safe working methods!

- a) Pull the base frame by the front handle until it stops.
 - ⇒ The locking spigot on the right side of the base frame (1) locks the base frame in the outer position.
- b) Place the PCB frame on the base frame and push it all the way back so that the recesses on the back end will engage the mounting pins (2).
 - ⇒ The two knurled screws of the front and left frame screw connections are still open and flipped downwards (3). The PCB frame can thus be taken out.
- c) Flip the two knurled screws (4) upwards and screw them in at a 45-degree angle to lock the PCB frame in place.
- d) Pull out the locking spigot on the right of the base frame (1) and slide in the PCB frame by the front handle until it stops.
 - ⇒ The PCB frame is now in the working position.

Swinging the PCB frame into the vertical position

The PCB frame can be swung into the vertical position so that the underside of the PCB can be reached. This allows positioning, for example, a support rail from below.

To be able to safely swing the PCB frame into the vertical position, first move the heating and placer heads to the park position! As to this, please read Chapter [The \[Manual Mode\]](#) [▶ 104].



WARNING

Crushing hazard! Risk of hand injuries due to squeezing when the PCB frame falls back!



- a) When lifting the PCB frame and swinging it into the vertical position, do not put any body parts under the PCB frame!
- b) Place the PCB frame in a fully vertical position to prevent it from accidentally falling back!
- c) To prevent any injury, do not allow any other person to stand near the Rework System while operating the PCB frame!



Fig. 16: PCB frame swung into the vertical position

- a) Position the swivel arm of the RPC camera in such a way that it cannot collide with the PCB frame.
- b) Pull the PCB frame out by the front handle until it stops.
 - ⇒ The locking spigot on the right side of the base frame (1) locks the base frame in the outer position.
- c) Make sure all strips, holders and terminals are tightly fastened to the PCB frame.
- d) Check whether any cables should be removed from thermocouples before swivelling, if the frame is placed vertically.
- e) Pull the frame upwards by the front handle until it is in the vertical position. Place the frame in a fully vertical position to prevent it from accidentally falling back.
- f) After performing the above operations, slowly and gently swing the PCB frame back down again. In so doing, pay attention to thermocouple cables.
- g) Pull out the locking spigot on the right of the base frame (1) and slide in the PCB frame by the front handle until it stops.



4.6.11 Fitting the optional signal light

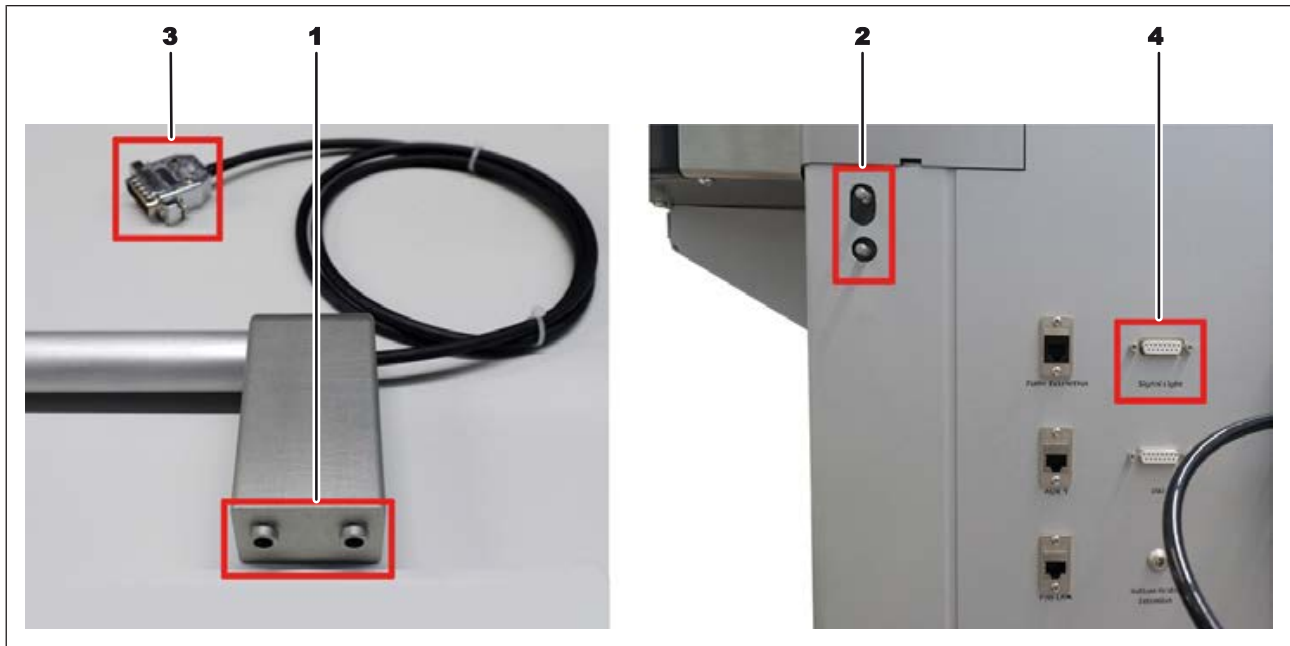


Fig. 17: Fitting of the signal light

- a) Push the openings at the base of the optional signal light (1) onto the connecting pins (2) on the back of the machine.
- b) Use an Allen key to screw the two fixing screws sideways of the signal light (1) base.
- c) Connect the plug (3) of the optional signal light to the [Signal light] plug (4).
- d) If the optional housing is available, the signal light can also be attached to the back right.



Fig. 18: Signal light attached to the housing



4.6.11.1 The signal light displays (option)

The signal light shows the operating state of the machine.



1	Red: critical error
2	Orange: error
3	Blue: User action required.
4	Green: Operation started, no errors.
5	White: No function

4.6.12 Fitting the optional shelf

The optional storage plate on which accessories can be placed is attached to the left side of the machine.



Fig. 19: Loosen the two outer screws

- On the left side of the machine, unscrew the two outer screws of the plate mounting with an Allen key. These screws are no longer required.
- Position the storage plate on the left side so that the screw openings of the two supports of the storage plate match the free screw openings.
- Screw on the two supports with the screws and washers provided.



Fig. 20: Screwing the supports on

The round opening in the storage plate is used to supply the power cable of a soldering station which can be placed on the storage plate.



4.6.13 Making pneumatic and electrical connections

4.6.13.1 Connecting the pneumatic system



CAUTION

Machine parts under high pressure!

Risk of personal injury or property damage due to machine parts under pressure or unexpected movement of mechanisms!

✓ Work on the pneumatic and hydraulic equipment of the machine may only be carried out by a qualified technician who is familiar with the system.

a) Depressurise system sections and pressure lines before starting installation and maintenance work!



NOTE

Wear safety goggles!

Eye injury hazard! When working on the pneumatic system and pressurised machine components, wear suitable safety goggles!



Fig. 21: The maintenance unit

a) Connect the factory-set compressed air hose to the Maintenance unit. The outer diameter of the compressed air hose is 6 mm. To do so, insert the compressed air hose all the way into the connector. With regard to this, please read Chapter [Pneumatic system] in the technical data section.

b) Set the system pressure on the maintenance unit to 5.5 bar.

Please read Chapter [Pneumatics](#) [► 19].



4.6.13.2 Connecting the mains plug

DANGER

Dangerous electrical voltage!

Death or serious injuries due to electric shock!



- ✓ 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.
 - a) When the main switch is off, some electrical parts inside the machine (e.g. mains filter, main switch) are still live. Therefore, disconnect the mains plug before opening housing parts!
 - b) Use only original fuses with the specified amperage.
 - c) Use only voltage-insulated tools.
 - d) In the event of faults in the electrical power supply, switch off the system immediately.
-
- a) Make sure that the main switch on the front of the machine is in the [OFF] position.
 - b) Compare the local line voltage and the mains frequency with the specifications on the nameplate of the machine.
 - c) Insert the mains plug into the socket.



4.6.14 Connecting the optional RPC camera

The optional RPC camera can be retrofitted to the Rework system.

- a) Remove the RPC camera with its support arm from the accessory package.
- b) On the Rework system, unscrew and remove the rounded cover plate behind the placer head.



Fig. 22: Unscrew the cover plate.

- ⇒ The two fastening screws for the RPC camera are already screwed into the rework system in the mounting location. See following picture, two arrows. There is a fixed spigot between the fastening screws for exact placement of the RPC camera.

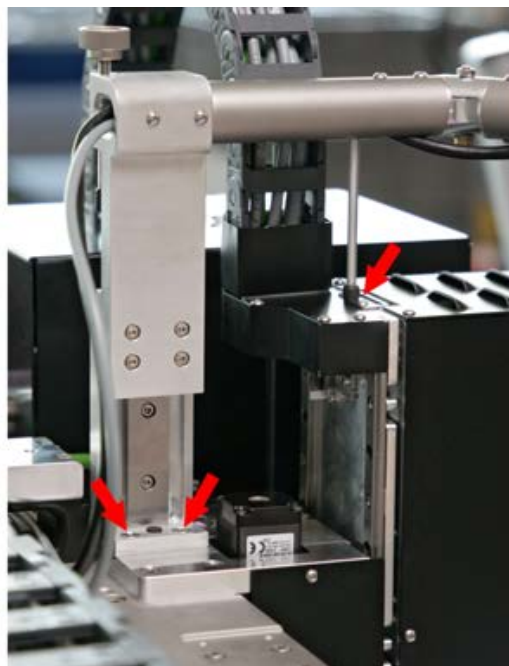


Fig. 23: Screwing on the RPC camera

- c) Unscrew these two screws.



- d) Place the base of the RPC camera onto the spigot and screw it on with the two screws, see picture above, two arrows.
- e) Run the ethernet cable and the RPC camera lighting cable into the unit under the cable cover, as shown in the following photos. Lay the cables so that no tension, overhangs or kinks occur when the axes of the Rework system are moving.

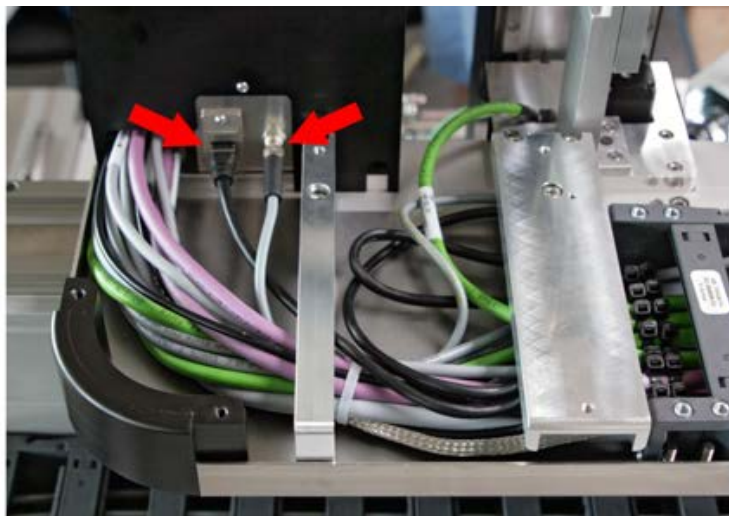


Fig. 24: Lower picture: Plug connected. Arrow on the left: Ethernet cable, arrow on the right: Lighting

- f) Plug in the two cables. Also screw on the lighting cable.
- g) Screw the cover plate over the energy chain back on again.

Checking the mechanical function

For the area under the RPC camera to be more easily reached or to prevent the RPC camera from coming into contact with PCB parts, the camera can be snapped into a raised position. The RPC camera will snap into the raised position when the line on the holding arm is slowly lifted between the two right lines. See the following picture. Then slowly release the holding arm.



Fig. 25: Arrows: Contour lines for engaging mechanism. (1): Black housing of the engaging hook.

If the arm of the RPC camera cannot be lifted up, the engaging hook for the raised position will be tilted into the wrong position. This can only happen immediately after installation. The following illustration shows the engaging hook with the housing removed.

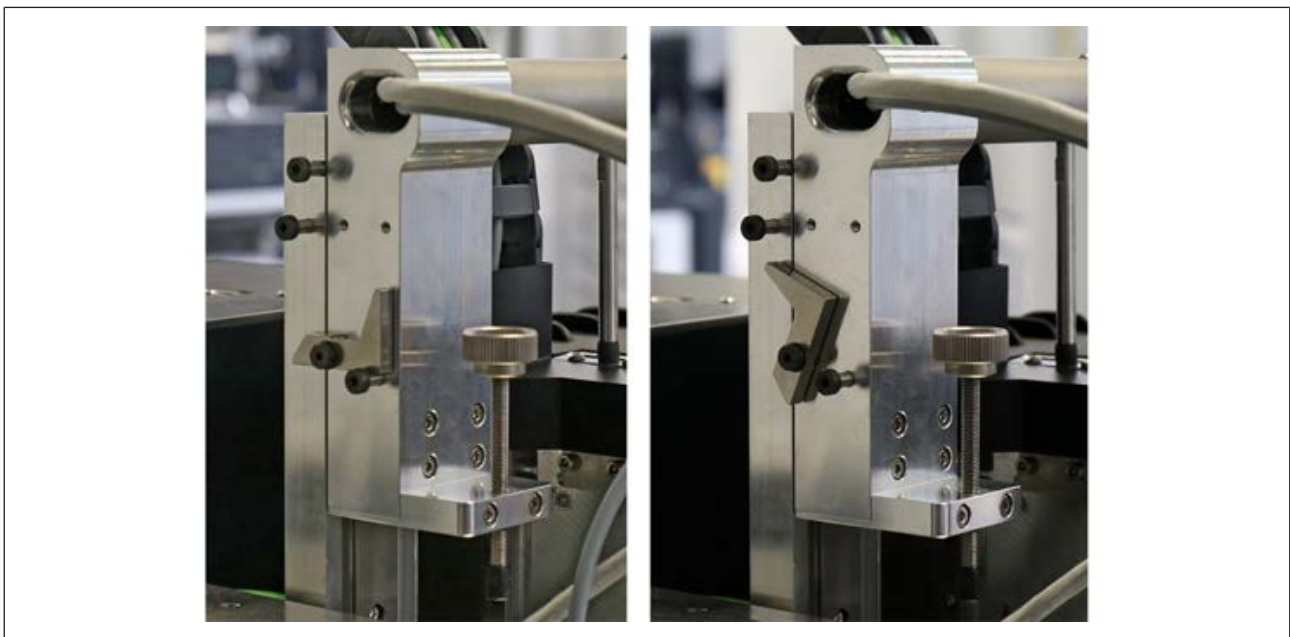


Fig. 26: The photos show the condition with the black housing removed. In the picture on the left, the engaging hook is in the correct position.

- a) To tilt the hook back into the correct position, slide your little finger into the opening under the black housing and tilt the hook.



4.6.15 Assembling an Accu-TC holder

To avoid damage, only insulated thermocouples may be used.

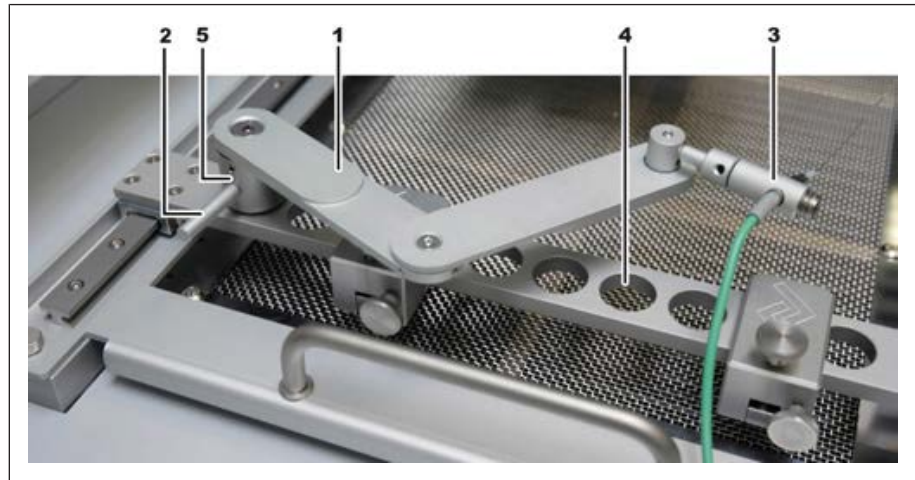


Fig. 27: Assembly of the Accu-TC holder and thermocouple, example picture

- a) You can fit the holder into any bore (4) on the product holder. To do this, insert the cylinder (5) into a bore and tighten with the lever (2) clockwise.
- b) Insert the plug of the AccuTC thermocouple without fixture (Article 0IR6500-37) into the TC1 socket.
- c) Mount the thermocouple (3) as shown. To do this, release the grub screw at the end of the holder, insert the thermocouple and hand-tighten the grub screw.

4.6.16 Mounting an air baffle

Air baffles are used to shield heat-sensitive components from the top heater radiation. By choosing the hole size of the air baffle, you determine the size of the heated surface.

- ✓ To mount an air baffle (6):

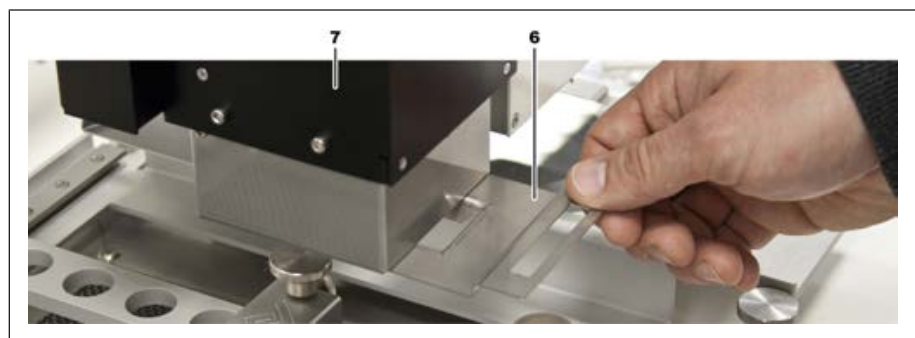


Fig. 28: Sliding in an air baffle, example picture

- a) Select an air baffle and slide it in under the heating head (7) until it stops.

For proper operation, the thermocouple must be inside the heated area.

If necessary, also use protective films to protect temperature-sensitive components from heat radiation.

4.6.17 Transporting the Rework System

Before transporting the Rework System to another place:



- a) In the [Administration] tab, select dialog [Device settings]. Here, click on button [Move to transport position] to move the heating head to a safe position and thus prevent transport damage.
- b) Terminate the HRSoft 2 program by clicking on the red Close button located in the upper right field.
- c) If the HRS file has been changed, the question will appear as to whether the change should be saved.
- d) Do not shut down the PC.
- e) Use the main switch to turn off the Rework System.
- f) The PC will shut down and the Rework System will be switched off.

Das Rework System can be switched on again after three minutes.

After a relocation, perform the following functions:

- a) The [Start light compensation] function. With regard to this, please read Chapter Button [Start extraneous light compensation]
- b) The [Start coordinates transformation] function. With regard to this, please read Chapter The [Start coordinate transformation] button [► 118]

Thereafter, the Rework System is ready for use.



4.7 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
 - ⇒ Pneumatic system
 - ⇒ 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



Notes on waste disposal acc. to the directive 2012/19/EU of the European Parliament and the Committee from 4th of July 2012 for used electric and electronic appliances:

Products marked with a crossed out waste bin must not be disposed of together with unsorted domestic waste. The municipalities established special collecting points for this type of waste. Please consult your council and ask for available possibilities for the separated collection of old appliances. You thereby contribute to the reuse or other forms of use of old appliances, with the aim of protecting the environment and human health.

Follow the operating/safety instructions for the correct disposal of the packaging, which should be kept until the end of their useful life.



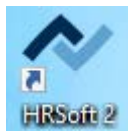
5 Commissioning

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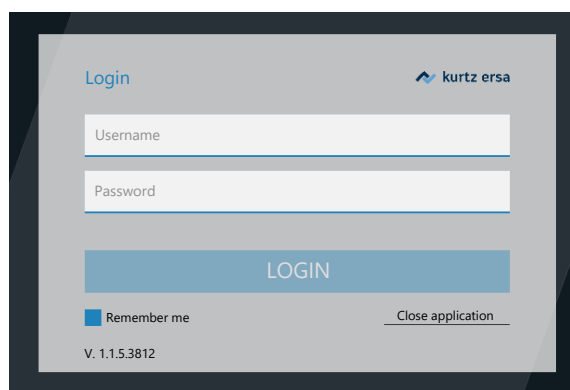


5.1 Switching on the Rework system and starting the HRSoft 2 program

- ✓ To switch on the Rework System proceed as follows:
 - a) Use the main switch on the front of the device to turn on the Rework System.
 - ⇒ The Rework System is switched on and the PC started up.
 - b) If the Windows operating system is password-protected, enter the password.



- c) Start the HRSoft 2 programme on the desktop by double-clicking on the HRSoft 2 icon.
 - ⇒ The Rework System and Rework processes can be controlled via the HRSoft 2 program.
- d) Enter the 0305 and the 0508 into the [Login] window Username Password and press the Enter key. As to this, please also read Chapter [The \[user management\] tabulator](#) [▶ 110].



- e) 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] (see top left) depending on the entered 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.



- ⇒ The Rework System is ready for operation.

5.2 Button [Start extraneous light compensation]

Perform function [Start light compensation] after reinstallation if the ambient lighting of the Rework System has changed, e.g. after a relocation, or if the camera systems have problems with ambient lighting in the Rework System. For problem-free placement of components, no strong external light (such as sunlight or ceiling spotlights) should be allowed to appear in the camera field of vision.

In tab [Administration] open the dialog box [Device settings].

- a) Click on the [Start light compensation] button in the right column.
 - ⇒ The extraneous light compensation runs automatically.



- ⇒ When the [Finish] message appears, the process will be completed.
- b) Finally, close the dialog box.

5.3 Installing the heating head nozzle and the placing pipette

Take the heating head nozzle and the placing head from the accessories cardboard box. For start-up, attach a heating head nozzle and a placing head. Select the largest possible heating head nozzle and placer for the component.



⚠ CAUTION

Risk of burning due to heated machine parts and PCB!

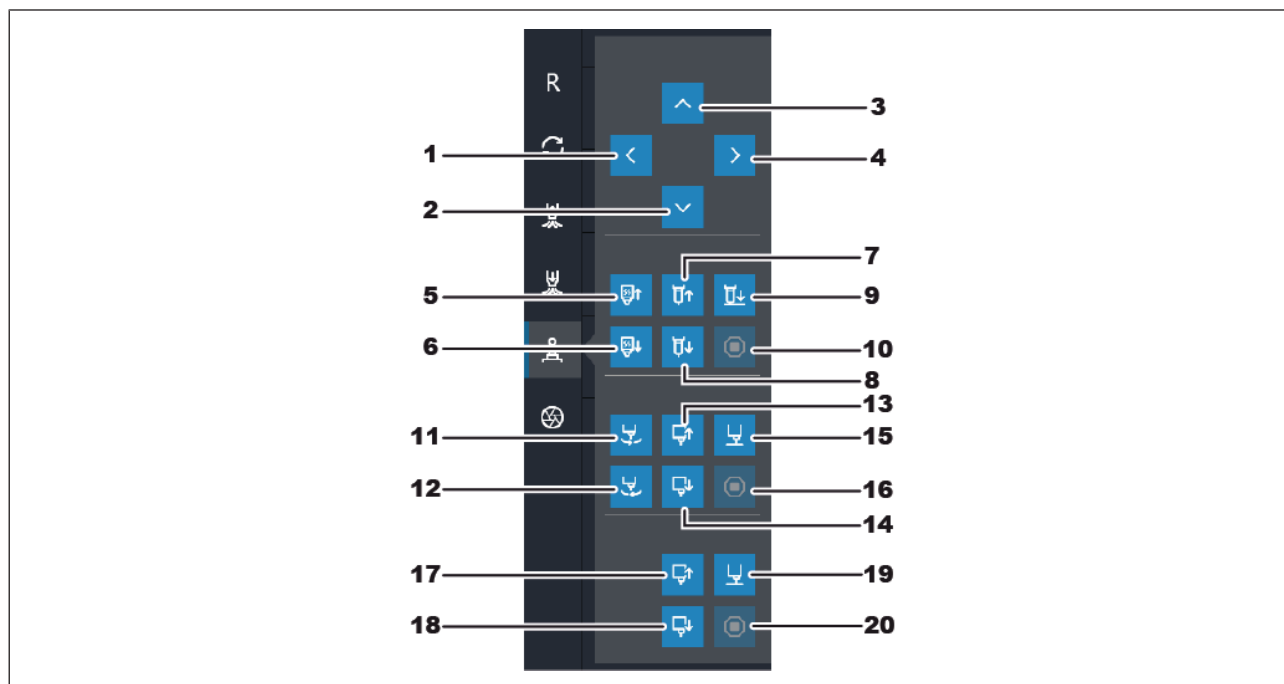
All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

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) Switch to tab [Rework].
- b) Click tab [Manual Mode] to view the button row for manual operation.

- c) Click on the button for the motor movements. 

⇒ The button menu of the manual motor control will open.



- a) Move the heads to a suitable operating position with buttons (1) - (4).
- b) Use the button (7) to move down the heating head nozzle for screwing on.
- c) Use the button (14) to move down the placing head for screwing on.
- d) Wait for the heating head to cool down.
- e) To unscrew, you can use an open-end wrench SW9 and a round knurled wrench SW9 (tools supplied as standard). Do not apply excessive force to the material!



- f) Use an open-end wrench to fix the top holder to the notch, and screw the nozzle or pipette with a knurled wrench. Tighten it very slightly. Later the nozzle and the pipette will be automatically moved upwards.

As to this, please also read Chapter [Options](#) [► 22] where you can find a list of available nozzles and pipettes.



6 Function description

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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 Safety instructions for certain operating phases



WARNING

Death or serious injury due to flammable substances! Risk of fire and explosion due to overheating!

- a) Do not leave the machine unattended when switched on!
- b) The heating of highly flammable or explosive substances is prohibited!
- c) The Rework system is not approved for operation in potentially explosive atmospheres.



DANGER

Risk of injury due to moving machine parts!

After starting automatic processes, machine parts move. No body parts or foreign objects may be present in the working area of these machine parts.

- a) Do not interfere with the movement range of the machine during automatic processes!



DANGER

Health damage due to smoke

- a) In case of smoke formation or unusual odour development, switch off the rework system immediately and ventilate the room sufficiently!
- b) The room may only be re-entered when the air is smoke-free.
- c) To avoid smoke development:
 - ⇒ Follow the operating procedure specified in the operating instructions
 - ⇒ Regularly check the rework system for damage
 - ⇒ Keep the rework system clean

6.1.3 Supplementary documents



NOTE

Supplementary documents

Additional documentation or service instructions are available for the single modules of the machine. These documents are available on data carrier [USB flash drive Rework], which is included in the scope of delivery. Check there if you cannot find exhaustive information about a specific topic in this instruction manual.

6.1.4 ESD-hazardous components



NOTE

ESD hazardous 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 elements, an ESD-proof work place is advisable (ESD = Electrostatic Discharge). The rework system can be smoothly integrated in such an environment. Using one of the buttons on the front, the user can for example connect an ESD strap. The housing of the rework system is connected to the earth wire of the voltage supply network via the kettle plug.

When handling the device, it is necessary to observe the common safety measures that are usually implemented for ESD-hazardous components.



6.2 Overview of the machine parts being operated

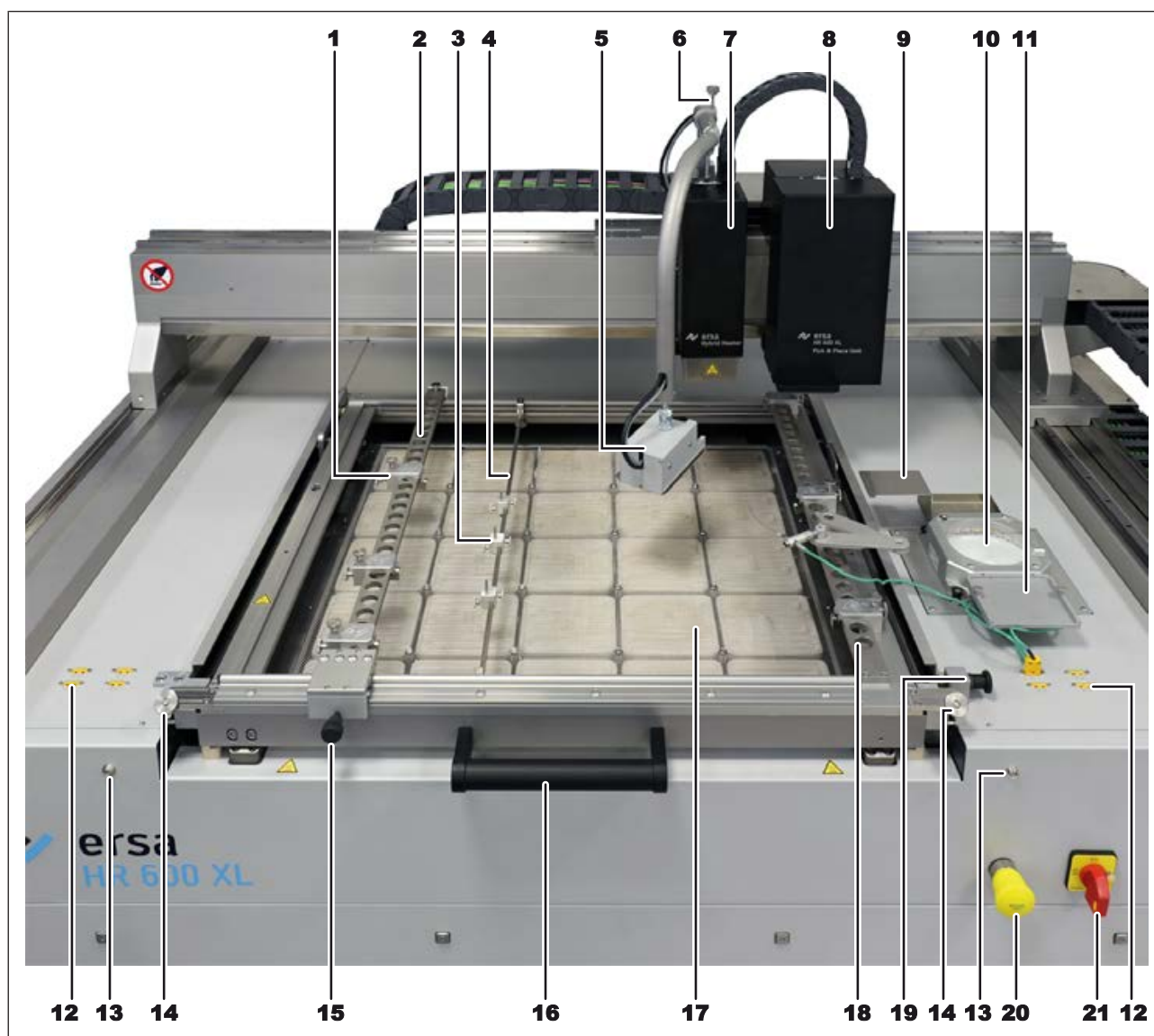


Fig. 29: Overview of the machine parts

1	PCB holder	12	Connection plug for thermocouples 1-4 (right), 5-8 (left)
2	Perforated rail, base for PCB holder, adjustable	13	Connection for the ESD strap
3	PCB center support pin	14	Locking screw for PCB frame
4	PCB center support rail	15	Locking screw of the left perforated rail
5	RPC camera (option)	16	Handle for pulling out/pushing in and vertically positioning the PCB holder
6	Heating head height adjusting screw	17	Lower heating, 25 single zones
7	Heating head, height adjustable	18	Perforated rail on the right, not adjustable
8	Placement head, height not adjustable	19	Locking pin fixes frame in extended position.
9	Storage tray for desoldered components	20	Motor stop push button. Observe the safety instructions!
10	Illuminated glass plate, support for components to be soldered with component identification by camera from below	21	Main switch, lockable
11	Holder for dip or print stencil		



DANGER

Dangerous electrical voltage after pressing the motor stop pushbutton!

Death or serious injuries due to electric shock!

- ✓ The motor stop pushbutton (MOTOR OFF) will not interrupt the power supply to the machine! Single parts of the machine are live even when the motor stop pushbutton is pressed!
- a) Do not use the motor stop pushbutton to disconnect the machine from the mains!
- b) Always switch off the machine via the main switch!
- c) Caution! The machine may still be very hot after pressing the motor stop pushbutton!



DANGER

Hazard due to electrical voltage when opening the electrical cabinet!

Death or serious injuries due to electric shock!

- a) The electrical cabinet must not be opened!
- b) In the event of faults in the electrical power supply, switch off the system immediately.
- c) 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 the electrotechnical regulations.
- d) Before any work being performed by a skilled electrician on the electrical cabinet, disconnect the machine from the mains!



WARNING

Risk of fire or damage to machine parts or the PCB due to components and PCBs being heated!

- a) Do not leave the machine unattended when switched on!



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

Do not touch the X axle, especially on the non-powered side, and do not apply any tools there! Loss of machine accuracy is possible!

Not to influence positioning accuracy, handle the X axle very carefully during cleaning and lubrication.





6.3 Stopping the motor with the corresponding pushbutton

DANGER

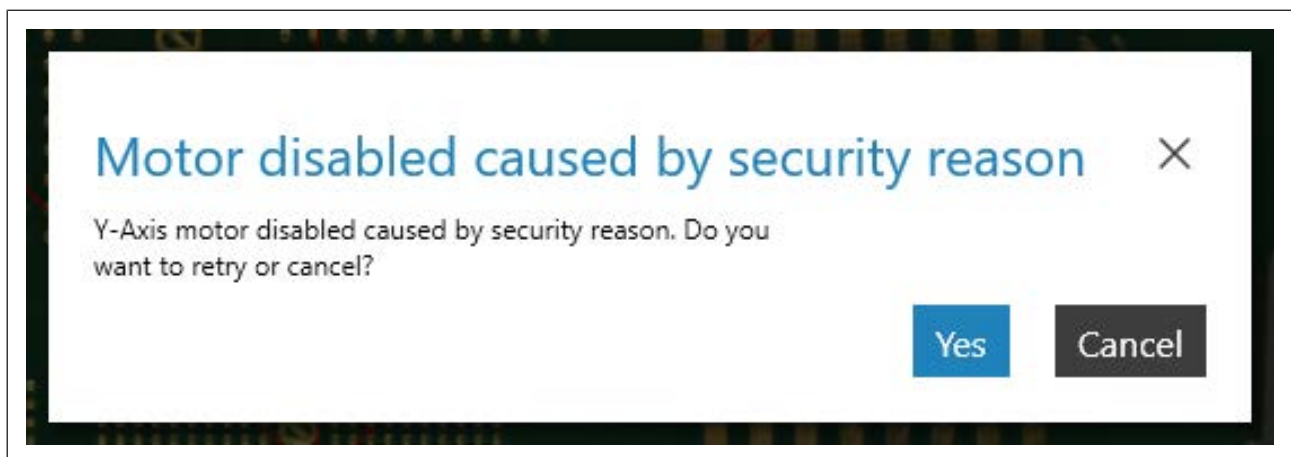
Dangerous electrical voltage after pressing the motor stop pushbutton!

Death or serious injuries due to electric shock!



- ✓ The motor stop pushbutton (MOTOR OFF) will not interrupt the power supply to the machine! Single parts of the machine are live even when the motor stop pushbutton is pressed!
- a) Do not use the motor stop pushbutton to disconnect the machine from the mains!
- b) Always switch off the machine via the main switch!
- c) Caution! The machine may still be very hot after pressing the motor stop pushbutton!

To bring all motors and axes to a standstill immediately, press the yellow motor stop on the front of the machine. The following message appears on the screen:



After eliminating the cause, the push button can be unlocked again by turning it.

- To continue the process at the point where it was interrupted, click on the [Yes] button. Make sure that the travel paths of all axes have been cleared.
- Use the [Cancel] button to end the process.

Also see

-  Tutorial – Soldering or desoldering a component [► 121]

6.4 Avoid collisions with components and PCB holders

CAUTION

Risk of collision of the RPC camera with components on the PCB!



- ✓ If there are tall components on the PCB, there is a risk of collision with the RPC camera! A tilted RPC camera will increase this risk! The height of the RPC camera is also determined by the [Heating head position] parameter in the HRSoft2 program.
- a) Before moving the heating head, always make sure that the RPC camera will not collide!



⚠ WARNING

Risk of fire or damage to machine parts or the PCB due to components and PCBs being heated!

a) Do not leave the machine unattended when switched on!

The heating head, nozzles and RPC camera are moved to a safe height before an axis movement to avoid collision with components of the PCB or PCB frame. When the heating head moves into the soldering position, the RPC camera also moves downwards. A tilted RPC camera reduces the distance to the components. Depending on the component height, a collision with the RPC camera may occur during axis travel.

Before each axis movement, the user must check and ensure that the optional RPC camera does not collide with components on the PCB, thermocouples or cables. A tilted RPC camera increases this danger.

Prevent possible collisions by:

- Checking components for special height!
- Positioning the RPC camera horizontally!
- Increase the distance to the PCB surface with parameter [Heating head position]!
- Never leave the Rework system unattended!

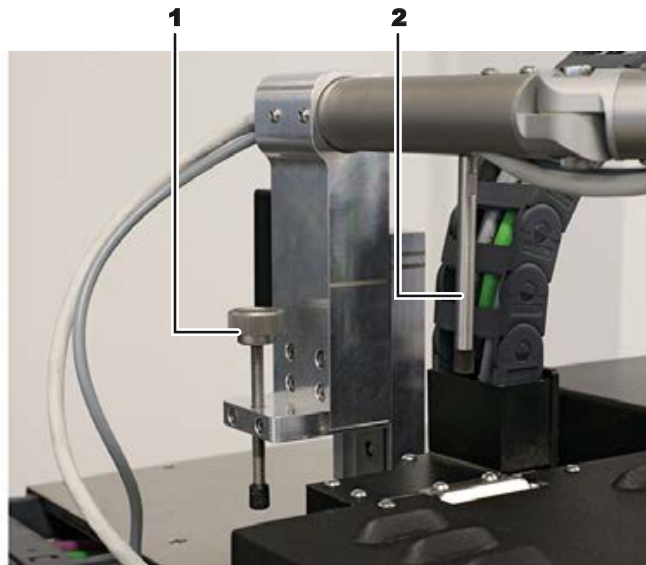


6.5 Manual height adjustment of the RPC camera via the setting screw

If the heating head is lowered, the height of the RPC camera can be changed via the setting screw.

When the heating head moves into the soldering position, the RPC camera will also be lowered. The height of the heating head and of the RPC camera is determined by the [Heating head position] parameter. A manual change can also be made using buttons in manual mode. With regard to this, please read Chapter [The \[Manual Mode\]](#) [► 104].

If necessary, for example to observe the melting process on BGA components, the RPC camera can be manually screwed further on. Use the setting screw to adjust the height of the RPC camera (1). This is only possible if the heating head is lowered and the support of the RPC camera (2) is not resting on the heating head.



CAUTION

Risk of collision of the RPC camera with components on the PCB!

- ✓ If there are tall components on the PCB, there is a risk of collision with the RPC camera! A tilted RPC camera will increase this risk! The height of the RPC camera is also determined by the [Heating head position] parameter in the HRSoft2 program.

- a) Before moving the heating head, always make sure that the RPC camera will not collide!

If there are tall components on the PCB, check whether the RPC camera collides with components on the PCB or parts of the PCB frame, before lowering the heating head. A tilted RPC camera will increase this danger!

- a) Turn the setting screw to adjust the RPC camera height counterclockwise or clockwise.

⇒ The focus (sharpness) of the RPC camera may need to be corrected. To do so, turn the focusing ring on the lens of the RPC camera.





6.6 Replacing the PCB frame

If an optional second PCB frame is available, the second frame can be already prepared and equipped with a PCB during the current rework process. The PCB frame can be removed from the machine.

Order number for the HR 600 XL PCB frame: 0HR625XL. It consists of a PCB frame with 6 PCB terminals and 2 stops.

To remove the PCB, the best thing to do is to use two of the optional handles to lift and transport the frame.

Order number for a handle: 0HR624XL. As to this, please also read Chapter [Options](#) [► 22].

To prevent any injury, do not allow any other person to stand near the Rework System while operating the PCB frame!

a) Pull the base frame by the front handle until it stops.

⇒ The pin on the right side of the base frame (1) locks the base frame in the outer position.



b) Make sure all strips, holders and terminals are tightly fastened to the PCB frame.

c) Check whether any thermocouple cables should be removed.

d) Release (4) and flip downwards (3) the two knurled screws of the left and right frame screw connections. In doing so, the PCB frame will not be locked anymore.

e) If available, insert the two grab handles (0HR624XL) for the PCB frame.

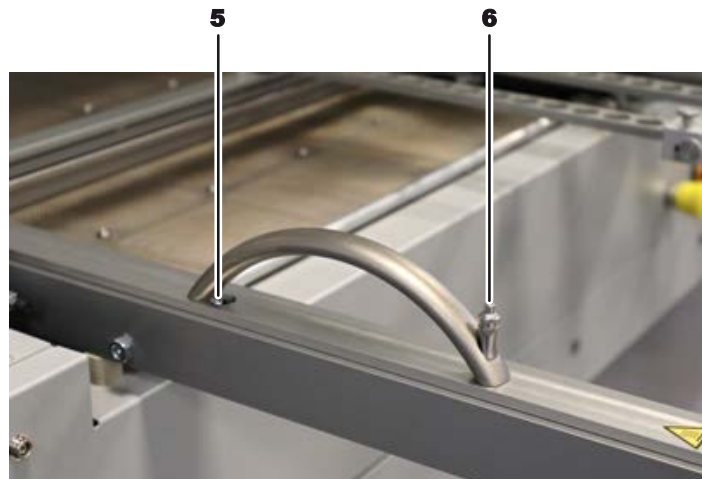


Fig. 30: Optional handles for the PCB frame

- f) In this case, place the rear handle stub (5) into the recess in the frame. Then place the front handle stud on the hole in the frame and insert the fixing pin (6). Press the button (6) to close the mechanism. Repeat the operation with the second handle.
- g) First, pull the PCB frame slightly forward to pull it out of the two mounting pins furthest back (2).
- h) Lift the PCB frame from the machine.
- i) If any, attach the two grab handles to the second frame. To remove a handle, hold the button (6) down while removing the handle.
- j) Place the second PCB frame on the base frame and push it all the way back on it so that the two recesses furthest back engage the two mounting pins (2).
- k) Flip the two knurled screws (4) upwards and screw them in at a 45-degree angle to secure the PCB frame.
- l) If any, remove the two grab handles. To do so, hold the button (6) down while removing the handle. The handles must be removed.
- m) Pull the pin on the right side of the base frame (1) outwards to release the frame.
- n) Slide in the PCB frame by the front handle until it stops.
- o) Now the thermocouples can be positioned.



6.7 Optional extended bottom heating

The HR 600 XL Rework system can be equipped with an extended bottom heating. This requires a second power connection and a second pneumatic connection. The maximum PCB size can thus be increased to 1250 x 625 mm. Ask your Ersas sales partner about this.

6.8 Switching 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 was changed, the question will appear as to whether the change should be saved.
 - ⇒ Do not shut down the PC.
- c) Use the main switch to turn off the Rework System.
 - ⇒ The PC will shut down and the Rework System will be switched off.

Das Rework System can be switched on again after three minutes.

6.9 Transporting the Rework System to another location

- a) In tab [Administration] open dialog [Device settings].
- b) Click on the [Move to transport position] button to move the heating head to a safe position in order to avoid transport damage.
- c) Terminate the HRSoft 2 program by clicking on the red Close button located in the upper right field.
- d) If the HRS file was changed, the question will appear as to whether the change should be saved.
 - ⇒ Do not shut down the PC.
- e) Use the main switch to turn off the Rework System.
- f) The PC will shut down and the Rework System will be switched off.
 - ⇒ Das Rework System can be switched on again after three minutes.

After a relocation, perform the following functions:

- a) Function [Start light compensation]. As to this, please read Chapter Button [Start extraneous light compensation].
- b) Function [Start coordinates transformation]. As to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 118].

Thereafter, the Rework System is ready for use.





7 Operating the Rework system with the HRSoft 2 program

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7.1 Three user classes with different rights

HRSOFT 2 offers three different user classes with tiered access rights: "Administrator", "Power user" and "Standard user". The user class is defined when the program is started by entering the user name and password into the [Login] dialog.

The active user is displayed in the header at the top right. To change the user, the current user must log out, followed by the login of a new user.

User class permissions:

- **Administrator:** Unrestricted access to all program functions.
- **Power users:** Access to all functions with the following restrictions:
No access to the tab [User administration].
Restrictions in tab [Administration], in which most functions are not available.
Three menu items are available in the [Device settings] tab.
- **Standard user:** Access to the assigned soldering profiles. Changes cannot be saved.

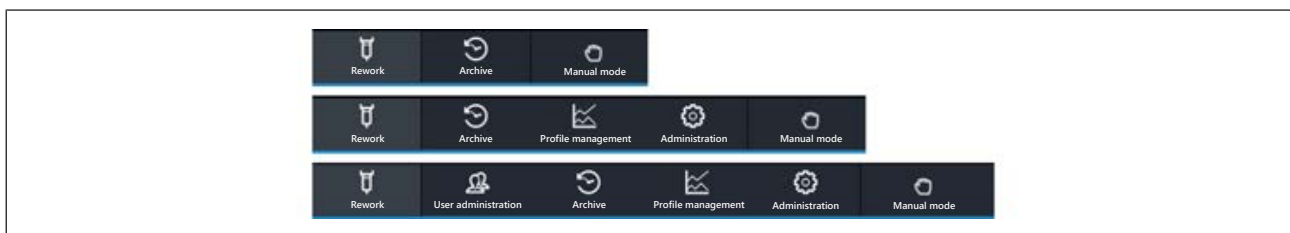
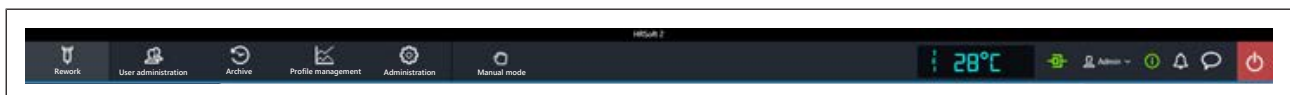


Fig. 31: Menu scopes for the standard user, power user and administrator

As to this, please also read Chapter [The \[user management\] tabulator](#) [► 110].

7.2 The pin header

All the functions of the HRSOFT 2 program can be accessed via the top bar. On the left are the tabs for operating the Rework system, on the right the higher-level buttons and displays.



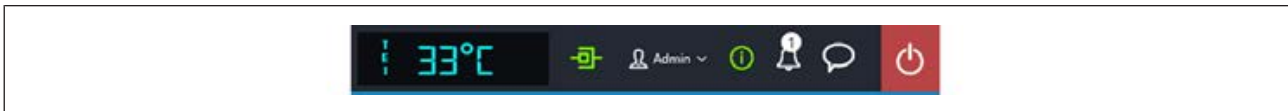
- **Tab [Rework]:**
This is where the Rework processes are carried out. Changes to the specified soldering profiles are possible here, but cannot be saved. Standard users can only use the default soldering profiles but cannot edit them. Almost identical structure as Tab [Profile management]. As to this, please read Chapter [Overview of the \[Rework\] and \[Profile management\] tabs](#) [► 88].
- **Tab [User administration]:**
Create, edit, save or delete users with their user rights. Only visible to users with administrator rights. As to this, please read Chapter [The \[user management\] tabulator](#) [► 110].
- **Tab [Archive]:**
Display the Rework processes carried out for analysis. As to this, please read Chapter [The \[Archive\] tabulator](#) [► 107].
- **Tab [Profile management]:**
Create, change, copy, save and delete soldering profiles. Almost identical structure as Tab [Rework], but with all rights to manage the soldering profiles. Not visible to standard users. As to this, please read Chapter [Overview of the \[Profile management\] tab](#).



- Tab [Administration]:
Defining the program parameters of HRSoft 2 (e.g. system language, database, etc.), chart display (e.g. colour display), program management (e.g. updates), device settings (contact force, temperature offset, device set-up and adjustment) and firmware updates. Not visible to standard users. Power users only have access to some functions in the dialog [Device settings].
- Tab [Manual mode]:
Show the button bar [Manual mode], only visible in tab [Rework]. ReworkWith the 0582 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.). Standard users have a limited range of functions. As to this, please read Chapter [The \[Manual Mode\]](#) [▶ 104].
- Display and button row on the right:
Temperature display, network display, user name and system state. As to this, please read Chapter [The display and switch row top right](#) [▶ 86].



7.3 The display and switch row top right



The displays and switches from left to right:

- Blue digital display, far left: Name of the selected temperature sensor and the current temperature measured with it.
- Display of the network connection between PC and rework system. Green = network connection, red = no network connection.
- Display of the active user and drop-down menu item [Logout] to log in another user. As to this, please read Chapter [The \[user management\] tabulator](#) [110].
- [i] button to call up the [System state] dialog with extensive status information on the single Rework system components. The [System state] dialog can give valuable information on the state of the displayed machine elements at any time.

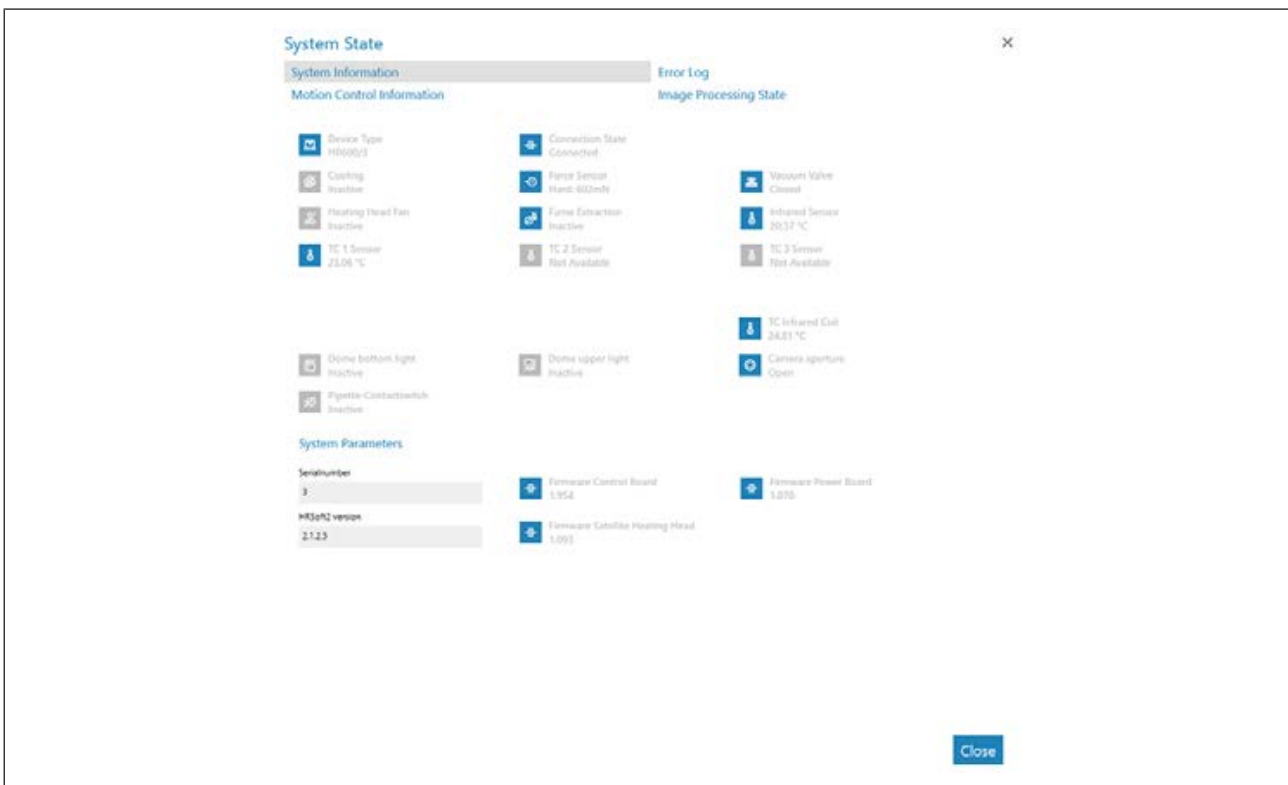


Fig. 32: Example of the start page [System information] in the [System state] range

The [System state] information page shows the four buttons [System information], [Error log], [Motion control information] and [Image processing state].

a) Click on a button to call up the overview of the corresponding area.

⇒ Parameters shown in blue are currently active.

Range [System information]

- At the top: Display of the states 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]: States of the heating head components and firmware versions.
- [Table]: Only in case of Rework Systems of the 600 series. State of the components and firmware versions of the bottom heatings.
- [Placer head]: Only in case of Rework Systems of the 600 series. States of the placing head components and firmware versions.

Range [Image processing state]

- 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 info about the update.
- b) To perform the update, click on the [Update] button.

As to this, please also read Chapter The dialogue [Update].

The speech balloon button

Selection menu for problem reports, suggestions for improvement or general feedback to the manufacturer Erska GmbH.

- Problem menu item: Calls up a dialog to inform Erska of a problem that has occurred with the Rework system.
- Suggestion menu item: Calls up a dialogue to inform Erska of a suggestion for improving the Rework system.
- Feedback menu item: Calls up a dialog to provide Erska with positive or negative feedback on the Rework system.

Red button to the far right

- Closes the HRSoft 2 program.



7.4 The [Rework] and [Profile management] tabs

7.4.1 Overview of the [Rework] and [Profile management] tabs

After starting HRSoft 2, the [Rework] tab will be shown. ReworkThe Rework processes are started and performed in the [0582] dialog. As a standard user, you can only use the predefined soldering profiles under the [Rework Rework] tab. Administrators and power users can make changes to the soldering parameters.

The tabs [Rework] and [Profile management] are almost identical in structure. The tabs are divided into the following ranges:

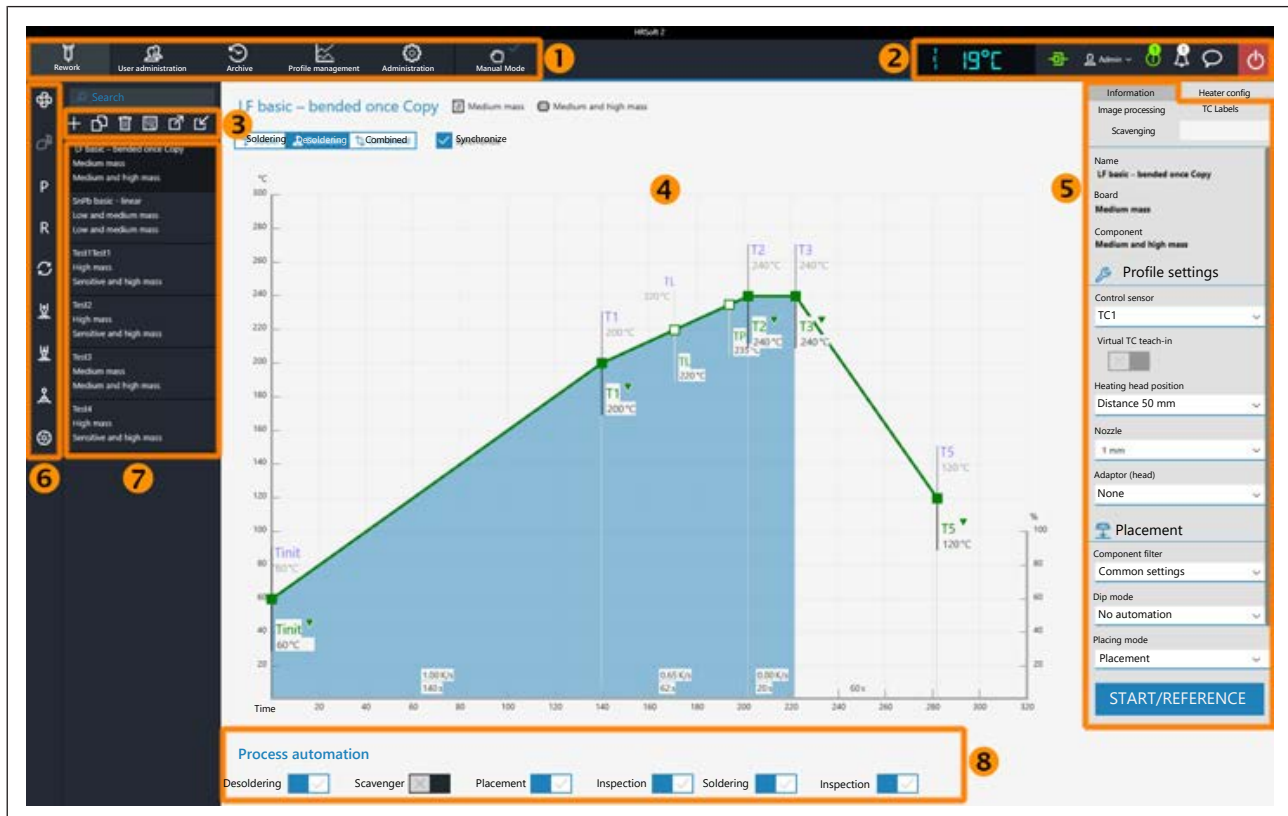


Fig. 33: Example illustration: all ranges that are displayed in the tabs [Rework] and [Profile management] are included

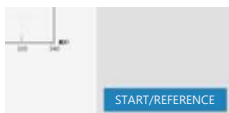
1	Tab bar: The figure shows the maximum number of tabs displayed. It depends on the user rights. In tab [Rework], the soldering profiles (7) can be selected in the [Soldering profiles] menu. If you switch from the [Rework] tab to another tab, any changes made here will be lost. Changes cannot be saved here either.	2	This range contains displays and buttons for higher-level functions. As to this, please read Chapter "The display and button sequence in the right upper corner".
3	Button bar visible only in tab [Profile management]: Add, copy, delete, save, export and import soldering profiles.	4	Chart with soldering curves for soldering and desoldering. As to this, please read Chapter The chart [► 90].
5	Parameter bar with five subordinate tabs. As to this, please read from Chapter The parameter bar on the right-hand side with five tabs [► 93]	6	Can only be called up in tab [Rework] through tab [Manual mode]. You can use this row of buttons to control individual manual functions, e.g. motor movements or lighting. As to this, please read Chapter The [Manual Mode] [► 104].



7	List of applicable soldering profiles and search by profile name. Profiles are created and edited in the tab [Profile management]. As to this, please read Chapter Create, copy, delete and save soldering profiles in the [Profile management] tabulator.	8	Workflow bar [Process automation] to determine the process steps used. Processing from left to right. As to this, please read Chapter The process steps of [process automation] [► 92].
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7.4.2 The START/REFERENCE MOVE BUTTONS

In tab [Rework], the [START/REFERENCE] button at the bottom right first starts the referencing of the Rework system and later the rework process. The Assistant guides you step by step through the Rework process.



In tab [Rework] you have the option of adjusting all parameters before starting the Rework process. Changes may not be saved here.

Make sure that all settings are correct before starting the Rework process, e.g. placement of the thermocouple. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [► 121] .

7.4.3 Working with soldering profiles in the tabulator [Rework]

In the Soldering Profile Selection area (4), select a soldering profile from the list of saved soldering profiles. In the input field [Search] you can search in the soldering profile names. In tab [Profile management] the soldering profiles are created, modified and saved.

Below the chart in the [Process automation] area, the work steps for this soldering profile are displayed. In chart area (5), you can set the time and temperature curve for soldering or desoldering. All parameters of the soldering profile can be changed in the parameter bar (6).

Soldering profiles are created by the administrator in the [Profile management] tab created and permanently changed.



7.4.4 The chart

With the selected tab [Rework] or [Profile management], the chart with the heating curves is displayed in the middle of the screen and, below it, the row with the buttons for the [Process automation]. The heating curves and the button for [Process automation] can be changed here.



The following buttons are available:

- [Soldering]: The blue heating curve for soldering is marked in the chart. Then, the heating curve for soldering can be changed. The functions in tab [Heater config] can be set for soldering.
- [Desoldering]: The green heating curve for desoldering is marked in the chart. Then, the heating curve for desoldering can be changed. The functions in tab [Heater config] can be set for desoldering.
- [Combined]: The heating curves for soldering and desoldering temperatures are marked in the chart. The complete soldering process is displayed. The heating curves cannot be changed and tab [Heater config] is blocked. If you want to change the heating settings defined in the soldering profile, deselect [Combined] and, instead, select buttons [Soldering] or [Desoldering].
- [Synchronize]: Changes the desoldering heating curve to the soldering heating curve. Both heating curves become identical. In this state, changes in the chart and the functions in tab [Heater config] will affect soldering and desoldering.

The left Y-scale of the chart with the temperature values applies to the temperature values of the thermocouples. For control variables (e.g. TC infrared coil, Outer IR emitter), the right Y-scale of the chart applies with a percentage up to 100%.



7.4.4.1 The HRSoft 2 standard heating curves

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

- The heating curves in the chart can only be set if the [Combined] button is deselected and either [Soldering] or [Desoldering] has been set.
- 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 (°C)] (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 heatings switch off; upon desoldering, the component is lifted off.

7.4.4.2 Setting a heating curve

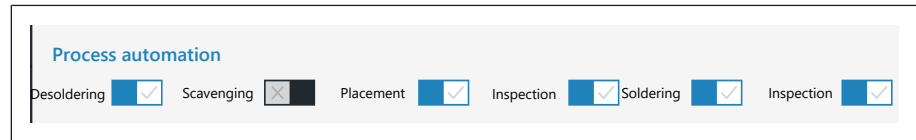
- To simultaneously edit the temperature and the heating phase duration: Click on one of the [Tinit], T1, T2... points on the heating curve and keep the mouse button pressed until the temperature indicated there is displayed in bold. Now move the point by pressing the mouse button.
- To edit the temperature: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

7.4.5 The process steps of [process automation]

Under the chart is the [Process automation] range of buttons.



These buttons activate or deactivate the process steps. The process sequence starts on the left and carries out the selected process steps to the right.

- [Desoldering]: desoldering a component.
- [Scavenging]: Enable/disable the [Scavenging]. Only use this button when using the optional Scavenger SC 600 residual solder sucker. The option can be enabled in the [Device settings] dialog under the [Administration] tab. Use tab [Information] under [Rework] to set the cleaning parameters.
As to this, please also read the operating instructions for the residual solder sucker SC 600 Scavenger.
- [Placement]: placing a component in the soldering position. 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 desoldering a component](#) [▶ 121] .

The correct soldering profile settings are to be determined under [Profile management]. This is only possible as an "administrator" or "power user".



7.4.6 The parameter bar on the right-hand side with five tabs

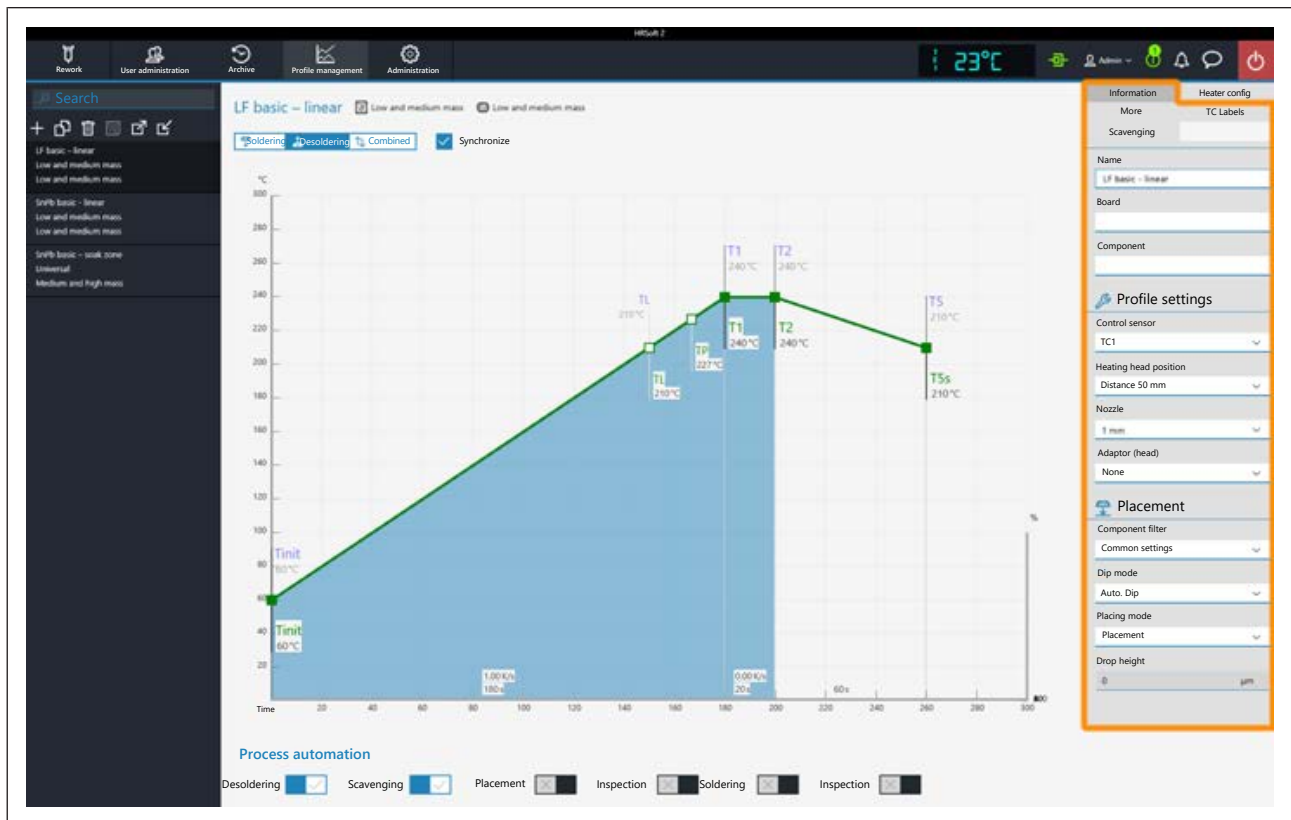
All specific parameters of the Rework process are set in the tabs of the parameter bar on the right-hand side. The functions in tab [Rework] correspond to the five tabs of the parameter bar in tab [Profile management], with the following exceptions:

- Each of the tabs under [Rework] contains button [START/REFERENCE].
Make sure that all settings are correct before starting the Rework process. The implementation of the Rework process is described as an example in Chapter "Tutorial – Soldering or unsoldering a component".
- Use tab [Image processing] to set the [Pindetection camera light intensity].
Use tab [Profile management], this tab bears the [More] designation and offers the opportunity to import additional information, such as an image and text.
Under [More], users can also be assigned to soldering profiles.

Changes in tab [Rework] are accepted, but cannot be saved. If you leave this tab, all changes will be lost. The soldering profiles are determined in tab [Profile management].



7.4.6.1 The [Information] tab under the [Rework] and [Profile management] tabs



The top three soldering profile parameters [Name], [Board] and [Component] are set in tab [Profile management]. In tab [Rework], this information is only displayed.

- [Name]: Is determined by the profile template selection. You can give it a different name. Please also read Chapter Create, copy, delete and save soldering profiles in the [Profile management] tabulator.
The factory profile templates are always labelled “basic.”
 - “LF”: Lead Free.
 - “SnPB”: Tin-lead.
 - “linear”: uniform heating phase.
 - “bended once”: heating curve that is kinked once.
 - “bended twice”: heating curve that is kinked twice.
 - “soak zone”: heat-reduced heating phase of [T1] to [T2] to activate the flux material. Heating curve that is kinked twice.
- [Board]: Is determined 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” for any PCB type. You can assign a different board name.
- [Component]: Is determined by the profile template selection. The templates are called “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” for sensitive components and components with high mass. You can assign a different component name.
- [Control sensor]: Selection of the temperature sensor that controls the soldering process through its measured temperature.
[TC1] (Thermocouples). Switch to another thermocouple if several are connected. The currently measured temperature of the selected sensor is shown in the top right display.



- [Heating head position]: Soldering distance PCB, 30 mm – 70 mm. This selection has no function, it is only used to store information. The heating head distance for high components can be adjusted using the buttons in tab [Manual Mode]. For more information, please read Chapter [The \[Manual Mode\]](#) [▶ 104].
- [Nozzle]: Soldering nozzle used. This selection has no function, it is only used to store information.
- [Adaptor (head)]: Adapter used (air baffle). This selection has no function, it is only used to store information.
- [Component filter]: Component detection from below with a camera on the glass plate is improved for the selected component type. Possible filters are:
 - [General]: all other component types
 - [BGA]: Ball Grid Array
 - [Small BGA]
 - [Large BGA]
 - [MFU BGA]: Do not use!
 - [QFP]: Quad Flat Package
 - [QFN]: Quad Flats No Leads
 - [CBGA]: Ceramic Ball Grid Array, (small component up to 01005)
 - [Small component (01005)]: SMD with 0.2 x 0.4 mm
 - [SMD connector]
 - [BGA connector]
- [Dip mode]: Choose one of the three soldering methods:
 - [No automation]: Normal soldering without flux material dipping and without using a component coated with solder paste.
The component is picked up from the component tray, aligned and placed on the soldering position.
 - [Auto. Dip]: A dip stencil prepared with flux material must be placed in the stencil frame.
The component is lifted from the DIP component tray, dipped into the flux material of the DIP stencil, then aligned and placed on the soldering position.
 - [Auto. Print]: A stencil prepared with a component coated with solder paste must lie on the print stencil.
The component is removed from the print stencil, aligned and placed on the soldering position.

Please also read Chapter [Working step 3 "Initialisation"](#) [▶ 136].

- [Placing mode]: When soldering, you can choose between:
 - [Placement]: Placement of the component using the contact sensor, where the Rework system senses when the component is touched on the PCB surface.
 - [Drop]: Dropping the component over the PCB at a specified distance from the PCB surface.
- [Drop height]: When soldering, determine the height above the PCB at which the component is dropped onto the PCB. Only possible if parameter [Drop] is selected. In tab [Rework], this function is not visible.



7.4.6.2 Tab [Heating setting]

In tab [Heater config], you can set the top and bottom heatings for the soldering profile. All marked heating phases (T1 to T4) in tab [Heater config] and in the chart are displayed in blue. The parameters in tab [Heater config] apply to these marked heating phases.

The number of heating phases is determined by the selected soldering profile. Depending on the number of clicks in the heating curve, there are 2, 3 or 4 heating phases. The heating phases are represented in tab [Heater config] by the "T1", "T2", etc. fields. The heating and fan output can be assigned individually for the top and bottom heating to each heating phase.

Parent settings

Button [Synchronize]: Adjust the desoldering heating curve to the soldering heating curve. The heating settings displayed apply to the selected soldering curve.

Buttons [Soldering] or [Desoldering]: Selection of the heating curve for soldering (blue) or desoldering (green), for each of which individual settings can be made.

- For soldering profiles with 2 heating phases, only the heating curve and the heating parameters of phase 2 can be individually adjusted for soldering and desoldering.
- For soldering profiles with 3 and 4 heating phases, only the heating curve and the heating parameters of phases 3 and 4 can be individually adjusted for soldering and desoldering.

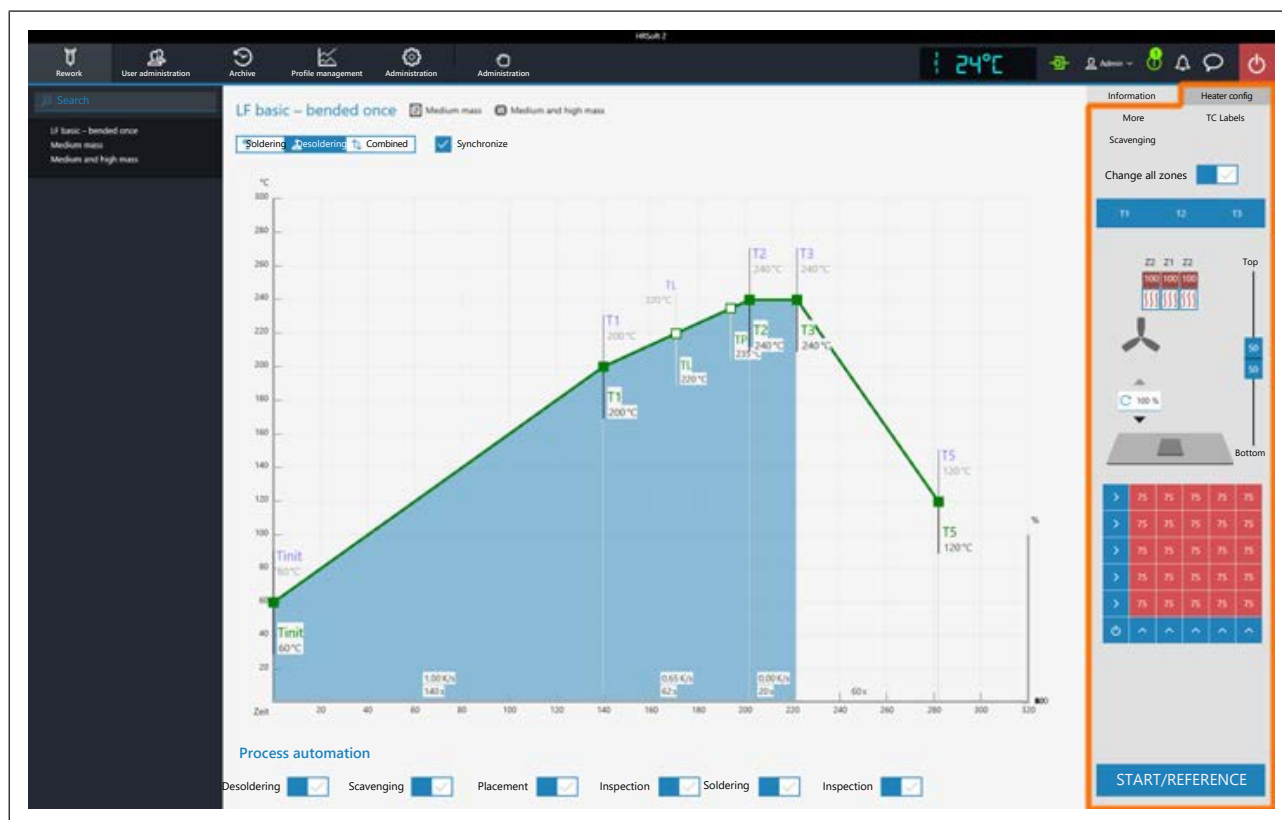


Fig. 34: Example image tab [Heater config] in tab [Rework]

7.4.6.2.1 The parameters in the [Heating settings] tab

For individual parameter settings for soldering and desoldering as well as for the individual heating phases, refer to the buttons [Combined], [Synchronize] and [Change all zones].



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

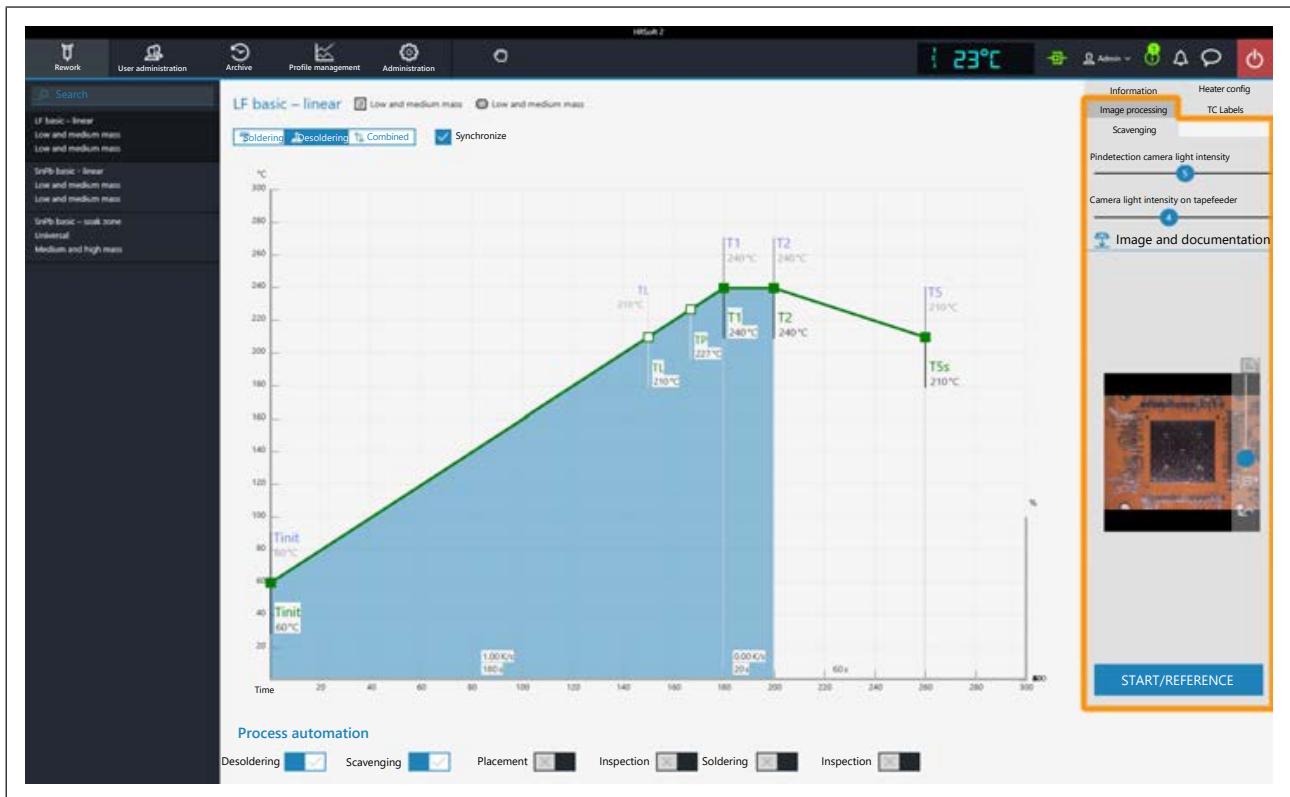
- [Change all zones]: If the button is switched off, you can select individual or multiple heating phases and assign different heating parameters to them. You can also assign different heating parameters to the heating phases for soldering and desoldering. Please also read the introduction in the previous chapter.
- Buttons T1, T2, T3, T4: The number of heating phases is determined by the selected soldering profile. 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.
- Switch heating zones Z1 and Z2 of the top heating on or off: Z1 is the central heating area, Z2 is the left and right outer areas. The heat output can be regulated from 0% - 100%.
- Power value of the top heater blower. The 50% value is suitable for all applications. This value is to be always complied with. Controls the proportion of convection.
- Vertical regulator (top - bottom): Top heating/bottom heating percentage power ratio. Adjust the power ratio to the heat requirement of your soldering process.
- Bottom heater matrix field: Setting of each of the 4 x 6 bottom heating zones with 0% – 100% values. Grouped in 3 heating blocks.
 - To change the temperature of a heating panel: Highlight a heating panel by clicking on it and overwrite the value.Use these functions to control the heating power of the heating panels and the ratio of the heating panels to each other. 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.



7.4.6.3 The tab [Image processing]

This tab is different in tabs [Rework] and [Profile management].

Under [Rework], it has the functionality [Image processing]. Under [Profile management] the functionality [More].



You can set the following parameters in tab [Image processing]:

- [Pindetection camera light intensity]: Light intensity of the glass plate for detecting the component pins from below, for this process before soldering.
- [Camera light intensity]: Do not use.

In range [Image and documentation], an information text, a PDF file and an image of the selected soldering profile are displayed if this has been entered into tab [Profile management]. The image can be enlarged using the corresponding buttons.



7.4.6.4 The tab [More]

This tab is different in tabs [Rework] and [Profile management].

Under [Rework], it has the functionality [Image processing]. Under [Profile management] the functionality [More].



The following parameters can change in tab [More]:

- [Pindetection camera light intensity]: Light intensity of the glass plate for detecting the component pins from below, before soldering.
- [Camera light intensity]: Do not use.
- [Search term]: An information text about the soldering profile can be entered here. The text is saved and displayed in the soldering profile.
- [Image]: An image of the soldering profile can be imported here. The image is saved and displayed in the soldering profile.
- [Select document]: Selecting a PDF file for the soldering profile. Maximum file size 1 MB. The PDF file can only be opened here in tab [More].
- [Related users]: List of users who can see and use this soldering profile in tab [Rework]. Only here can you make this assignment to the soldering profile.

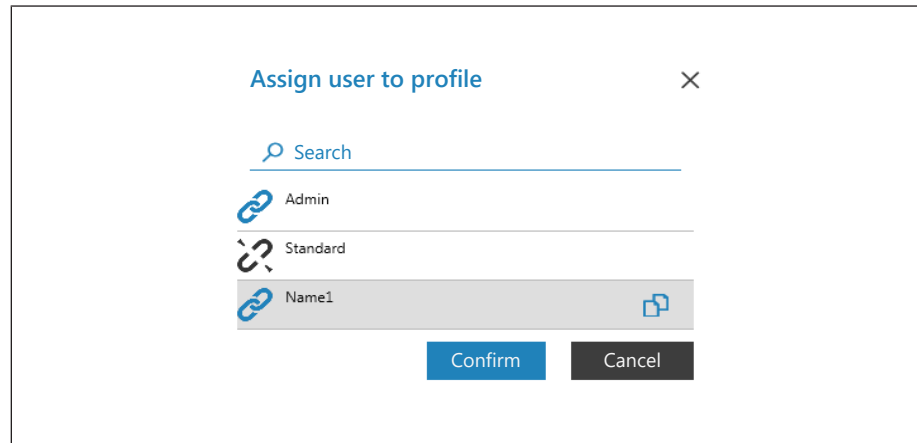
a) Please read the following Chapter.

7.4.6.4.1 Assigning a user to the soldering profile or removing it again

Function [Related users] is located at the bottom of tab [More].

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.

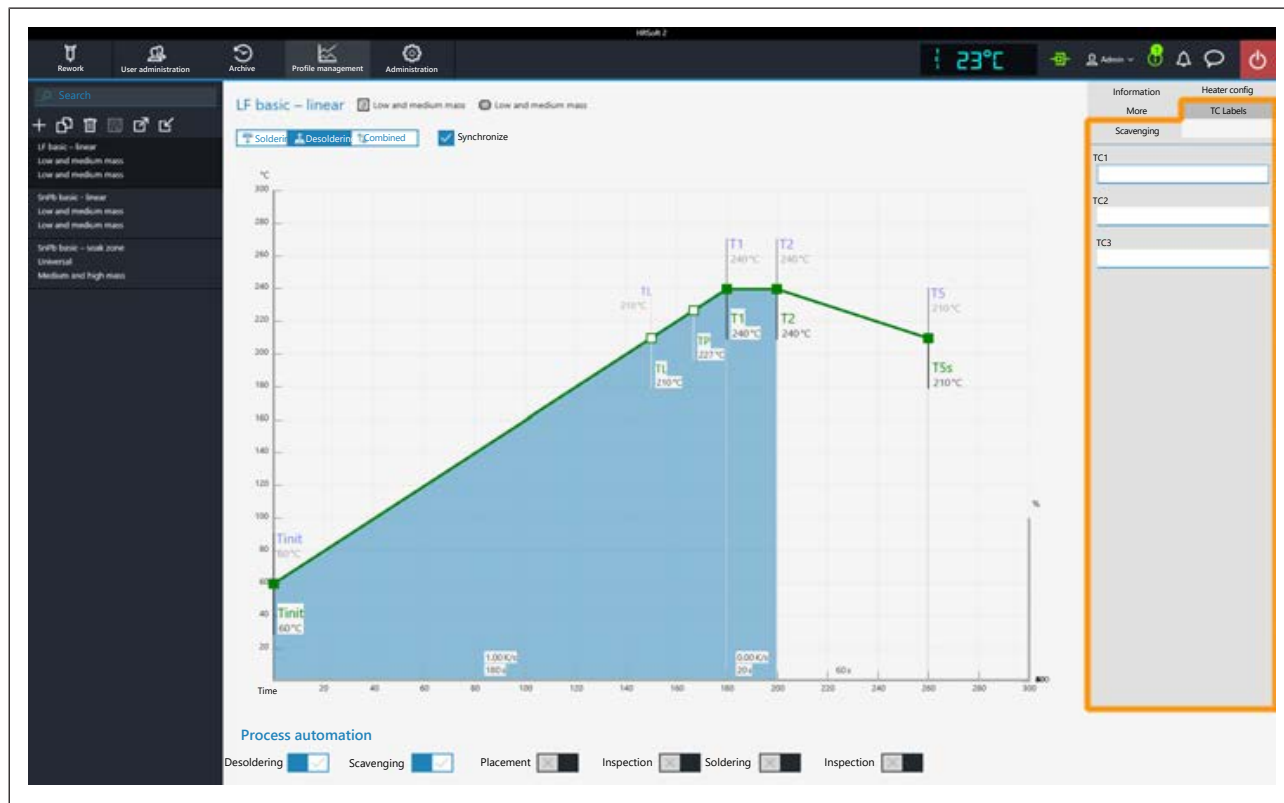
Deleting a user from a soldering profile

- 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 was removed from the soldering profile.



7.4.6.5 The tab [TE Labels]

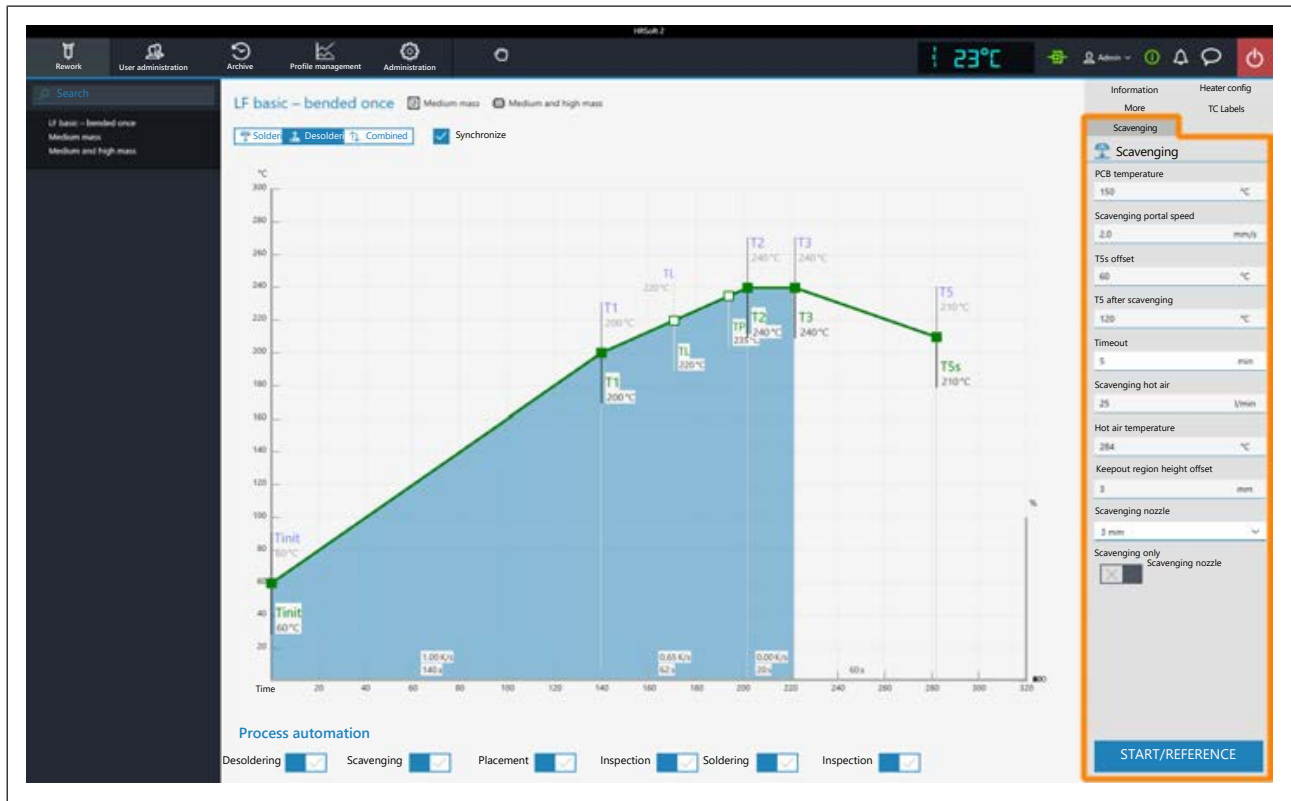
Here you can enter information for each thermocouple that can be saved in the soldering profile.





7.4.6.6 The tab [Cleaning]

Only for the optional residual solder sucker SC 600. As to this, please also read the operating instructions for the residual solder sucker SC 600.



- Set the parameters for the top heating. The top heating settings here refer to unsoldering and not to cleaning. If you only want to clean, the top heating settings are not relevant.
- Define the heating zones and the heating power of the bottom heating. The settings affect both unsoldering and cleaning. Set the heating power between 75% and 100% for the required heating zones.

Setting the parameters for cleaning in the [Scavenging] tab

The function of the residual solder sucker is determined by the interaction of various parameters, such as the hot exhaust gas temperature, the temperature of the bottom heating and the travel speed of the Rework system and, on the other hand, by the characteristics of the surface to be cleaned.

- [Bottom heater temperature]**
Temperature of the bottom heating during cleaning, controlled by the applied thermocouple. The bottom heating is used for residual solder liquefaction.
- [Scavenging portal speed]**
Travel speed of the suction nozzle during cleaning. The thicker the PCB, the slower the speed should be.
- [T5s offset]**
Additional heat energy from the bottom heating to prevent the temperature from falling below the desired level during cleaning. The heat sum of the [Bottom heater temperature] and [T5s offset] parameters gives the value $T5_s$. The value $T5_s$ is also shown in the chart.
- [T5 after scavenging]**
Target cooling temperature after cleaning, heating curve end $T5_s$. The cleaning process will end when the target temperature has been reached.



e) [Timeout]

Prevents uncontrolled overheating during cleaning in maintenance mode.

Waiting time of the Rework system in the program Assistant during cleaning in maintenance mode. If the target temperature is not reached for this long, the Assistant will be stopped, heating switched off and the assistant has to be re-started.

f) [Hot air amount]

Through flow volume of the hot nitrogen on the suction nozzle.

g) [Hot air temperature]

Temperature of the hot nitrogen on the suction nozzle. If the temperature is too low, the suction nozzle may become clogged. If the temperature is too high, the PCB will be damaged.

h) [Keepout region height offset]

Height at which the suction nozzle moves over the defined, non-cleanable restricted surface [1-50 mm].

i) [Scavenging nozzle]

Always select 3 mm.

j) [Scavenging only]

The whole work step [START/REFERENCE] is carried out beforehand, but the pipette is not used to remove an unsoldered component.

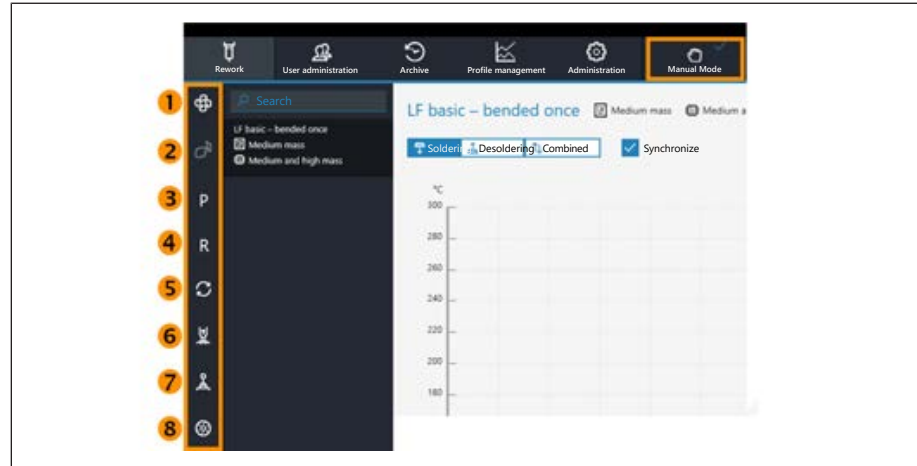
Starting cleaning

- a) Only when all parameters have been set correctly, click on the [START/REFERENCE] button to start setting up the cleaning process.



7.5 The [Manual Mode]

If tab [Rework] is activated, you can click on the [Manual Mode] top right button. This displays a column of buttons on the far left of the screen in which you can perform extensive functions to manually operate the Rework system. Standard users have a limited selection of buttons.



If you move the mouse over one of these buttons, a short text will be displayed as a tooltip.



CAUTION

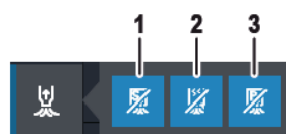
Risk of collision when manually moving the motors!

- ✓ When manually moving the heating head, placer head and nozzles, be aware of collision and contact risks! Collisions may occur even with the RPC camera!
- a) Before moving motors, always make sure that there are no collisions with PCB, components, thermocouples, PCB terminals, or that getting stuck in cables is avoided!

The buttons allow the following functions to be carried out at any time (after a reference move has been performed):

- 1: Switching on/off the bottom cooling blower.
- 2: Switch the connected optional solder fume extractor on/off. If a solder fume extractor is connected, the button will be enabled. The solder fume extractor switches on automatically at working temperatures above 120° C.
- 3: Moving heads to the right back side into the park position.
The park position must also be approached to remove the PCB frame. As to this, please also read Chapter [Replacing the PCB frame](#) [79].
- 4: Perform a reference run of the rework system.
- 5: Move the heads to the front right, into the optimal position for pipette change.
- 6: Switch on/off the pipette vacuum.

To open a submenu with further buttons:



1: Switch the extraction of the optional SC 600 residual solder sucker on/off.

2: Switch the vacuum suction cup of the nozzle on the heating head on/off.



3: Switch the vacuum suction cup of the nozzle on the placer head on/off.

- 7: Trigger motor movements and switches manually.

To open a submenu with further buttons:

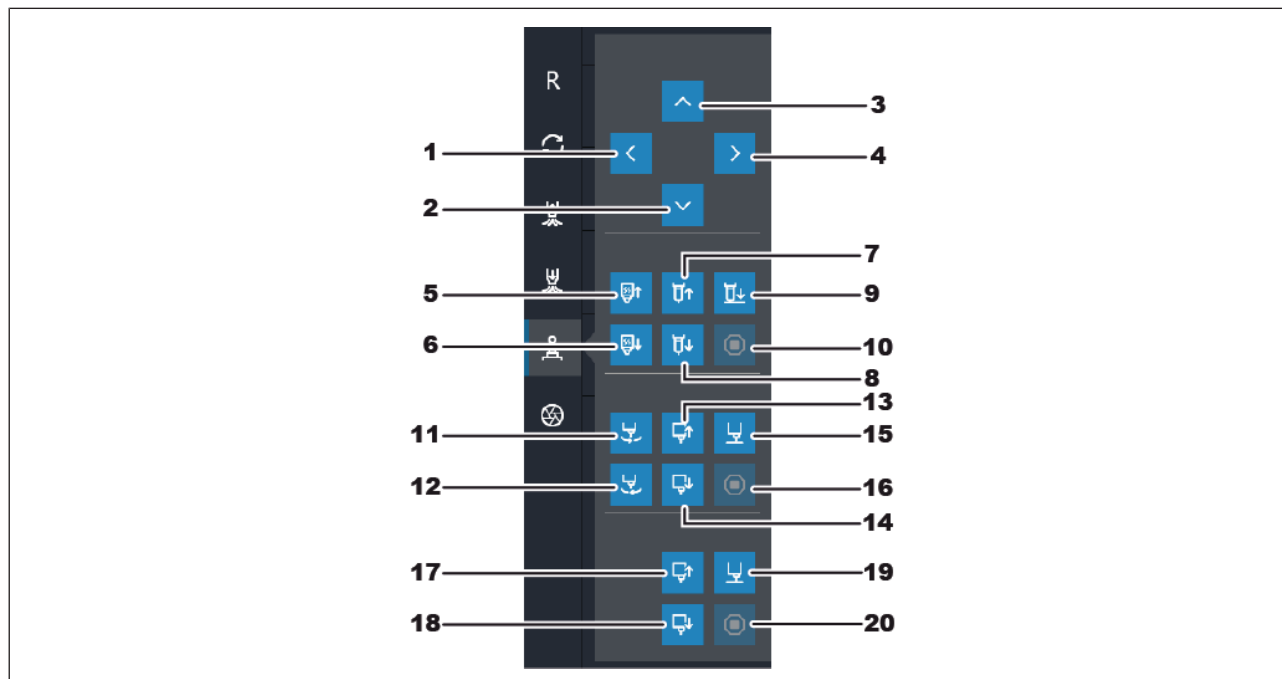


Fig. 35: Manual movement and switching

1-4: Move the heads forwards, backwards, to the left or to the right as long as the button is pressed.

Keep the travel paths of the axes clear!

The 5-10 buttons control the heating head functions.

5: Move the heating head upwards.

6: Move the heating head downwards.

7: Move the heating head pipette upwards.

8: Move the heating head pipette downwards.

9: Move the heating head pipette downwards until contact is made.

10: Stop the pipette or heating head movement.

The 11-16 buttons control the placer head functions.

11: Rotate the pick-and-place nozzle counterclockwise.

12: Rotate the pick-and-place nozzle clockwise.

13: Move the placer head pipette upwards.

14: Move the placer head pipette downwards.

15: Moves the placer head pipette downwards until contact is made.

16: Stop the movement of the pick-and-place nozzle.

Buttons 17-20 control the functions of the optional SC 600 residual solder sucker.

17: Move the suction head upwards.

18: Move the suction head downwards.

19: Move the suction head downwards until it makes contact.

20: Stop the movement of the suction head.



- 8: Closing the lower camera aperture. This function does not need to be used because the camera aperture is automatically controlled by the Rework System.

For descriptions of machine parts, please also read Chapter Overview of the machine parts being operated [► 74].



7.6 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 the [Archive] tab.

Date	User	Profile name	Board	Component	Tracking ID
25.03.2024 11:19:55	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
25.03.2024 11:11:08	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
25.03.2024 11:10:35	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
25.03.2024 11:09:14	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
25.03.2024 10:55:26	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
25.03.2024 10:48:00	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null
21.03.2024 13:59:42	Admin	ARLETest	Low and medium mass	Low and medium mass	Tracking_h_Null
21.03.2024 13:58:57	Admin	ARLETest	Low and medium mass	Low and medium mass	Tracking_h_Null
21.03.2024 12:55:37	Admin	MFU CeTaQ	Medium mass	Medium and high mass	Tracking_h_Null
21.03.2024 12:52:43	Admin	MFU CeTaQ	Medium mass	Medium and high mass	Tracking_h_Null
21.03.2024 12:51:13	Admin	MFU CeTaQ	Medium mass	Medium and high mass	Tracking_h_Null
21.03.2024 11:10:09	Admin	LF basic - bended once- VTC	Medium mass	Medium and high mass	Tracking_h_Null

Process automation

Desoldering ☐ Scavenging ☐ Placement ☐ Inspection ☐ Soldering ☐ Inspection ☐

Click on a process record in the [Archive] table 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 (°C)]: Temperature from which the process record begins.
- [Max Temperature (°C)]: Highest measured temperature in the soldering process.
- [TL (°C)]: Liquidus temperature entered for the process. No function, freely adjustable in the chart.
- [TP (°C)]: Only when desoldering. Pipette temperature at which the pipette moves to the component to lift it.
- [Lens]: No function.
- [Nozzle]: Pipette specified in the process. No function, freely adjustable in the chart.

The [Process automation] field under the table shows the used process steps.



7.6.1 The [Show chart] button

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

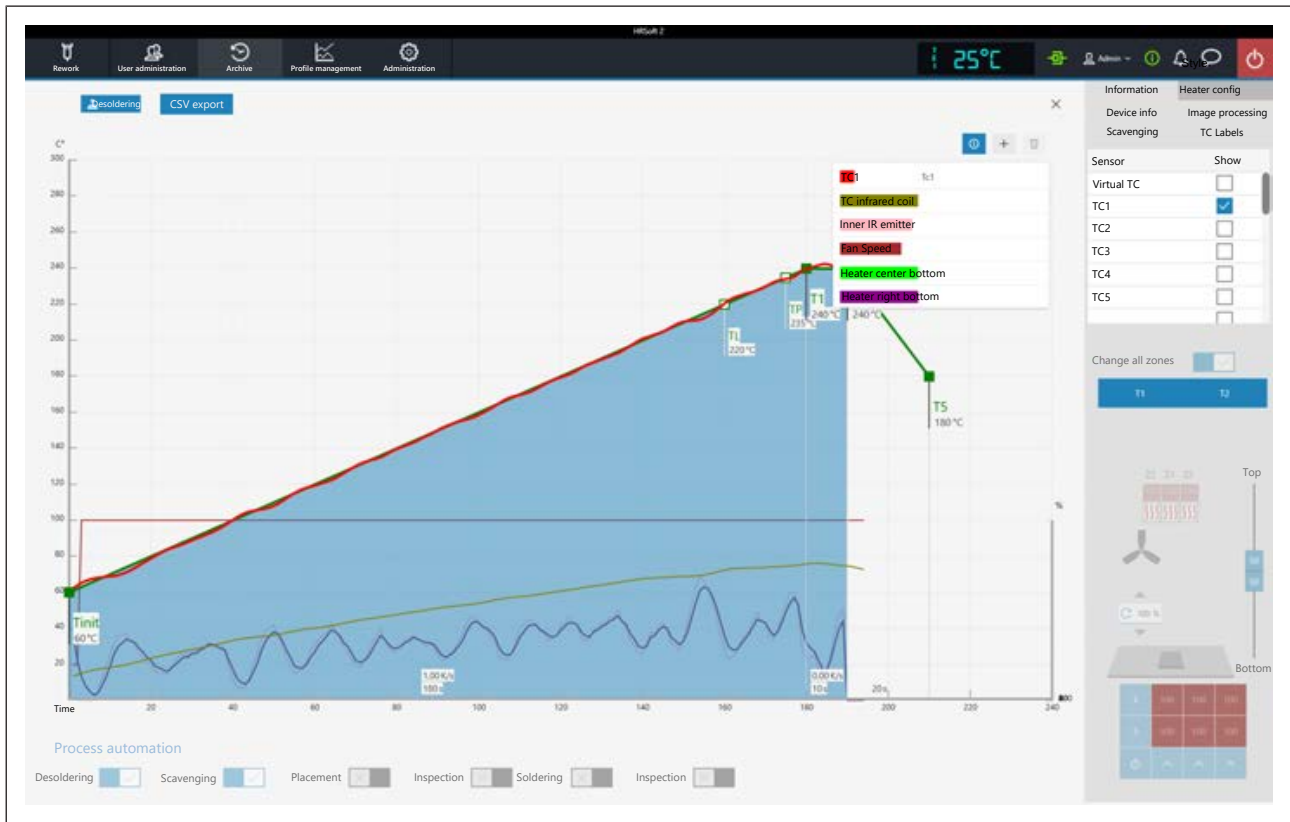


Fig. 36: Example for a chart

[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\HRSoft2\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.



7.7 The [user management] tabulator

HRSoft 2 offers three user classes: **Administrator**, **Power user** and **Standard user**. The respective user class is determined when the program is started by entering the user name and password into dialog [Login].

Permissions:

- **Administrator:** Full access to all functions.
- **Power users:** Access to all functions except tab [User administration] and lack of most functions in tab [Administration]. Three menu items are available in tab [Device settings].
- **Standard user:** Access to the assigned soldering profiles. No option to save changes.

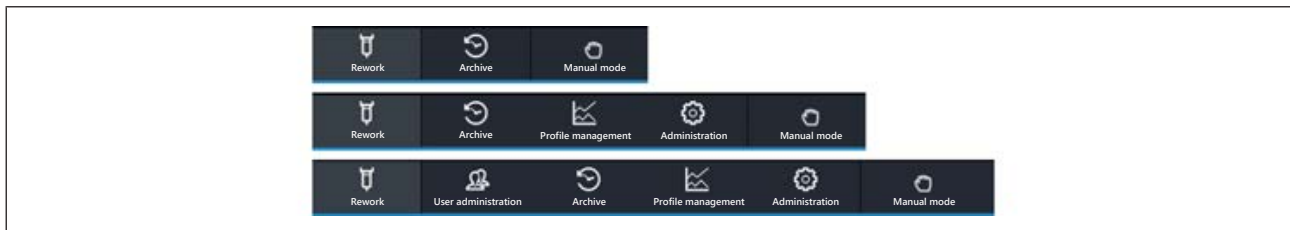


Fig. 37: Menu scopes for the standard user, power user and administrator (in tab [Rework])

User change:

To change the user, click on the logged-in user name in the top right-hand corner and select [Logout]. Then log in with the login details of the new user.

Assign users to the soldering profiles:

Switch to tab [Profile management] and select tab [More]. The assignment of soldering profiles allows users to use them in the [Rework]. As to this, please also read Chapter [The tab \[More\]](#) [► 99].



The functions of [User administration]

The screenshot displays the 'User administration' tab in the HRSoft 2 software. At the top, there is a navigation bar with icons for 'Rework', 'User administration', 'Archive', 'Profile management', and 'Administration'. Below this, there are two buttons: '+ New User' and 'Duplicate'. The main area contains a table with the following columns: First name, Last name, Username, Role, and Creation date. The table lists two users: 'Ersa Administrator' and 'Default User'. To the right of the table is a form for adding or duplicating a user. The form includes fields for Last name, First name, Username, User group (a dropdown menu), Password, and Repeat password. Below the form is a section titled 'Related profiles' which lists various profiles like 'HR500-FW1003 LP basic - bonded twice', 'HR500-FW1003 Einlöten - Löten', etc. At the bottom right of the form are 'Cancel' and 'Save' buttons.

First name	Last name	Username	Role	Creation date
Ersa	Administrator	Admin	Administrator	Donnerstag, 31. Oktober 2019 09:06
Default	User	StandardUser	Standardbenutzer	Donnerstag, 31. Oktober 2019 09:06

- **To add users:** Click on [New User] to acquire a new line for a new user. Enter all the required parameters into the grey column on the right. Red warning triangles indicate missing information. Assign a user class to the user. User name and password must be entered in the login dialog when starting the program. Make a note of the password in a safe place.
- **To copy users:** Select a user and click on [Duplicate] to acquire a copy of this user. Enter the required parameters for the new user in the grey column on the right.
- **To archive soldering processes:** Activate option [Auto-archiving] to automatically save all soldering processes for the selected user in the archive. Started and cancelled processes are saved as a graphic with all soldering parameters in the archive. As to this, please also read Chapter [The \[Archive\] tabulator](#) [► 107].
- **To delete users:** Select the user to be deleted. A red recycle bin button appears in the user line. Click on the button to delete the user.

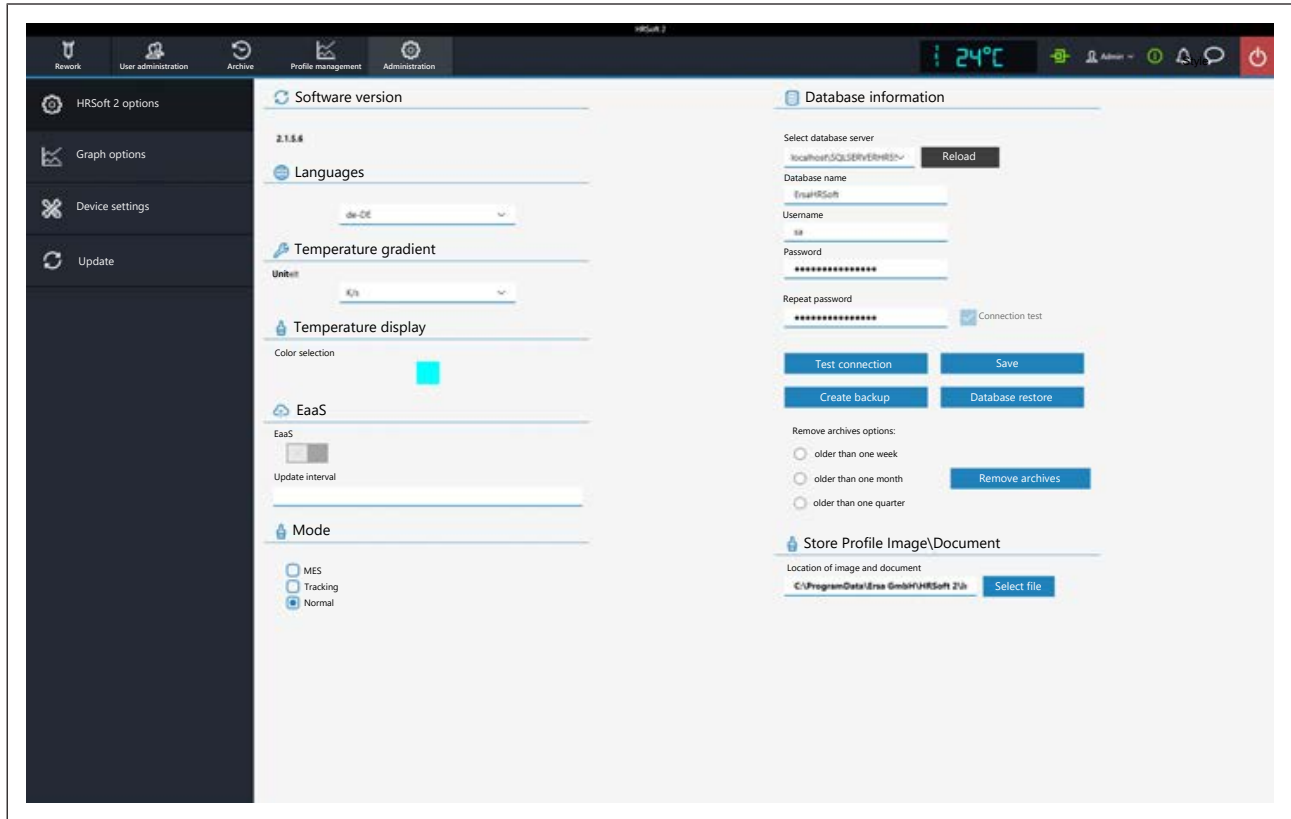
Info: The list of users is for display purposes only and cannot be edited. Click on a user in the list to display the associated information in the grey column on the right. The assigned soldering profiles are displayed at the bottom right.



7.8 The [Administration] tab with four dialogue windows

7.8.1 The dialog [HRSoft 2 settings]

In dialog [HRSoft 2 options], you can have access to various default settings for the HRSoft 2 program.



At the very top of it, the version number of your HRSoft 2 software is displayed.

You may access the following parameters:

- [Languages]: Switching the language of the user interface.
- [Temperature gradient]: Selecting how to display temperature in the chart. Celsius degrees/seconds or Kelvin/second.
- [Temperature display]: Colour of the temperature digital display on the top right of the chart. Click on the coloured square to see all available colours.
- [EaaS]: Do not use.
- [Update interval]: Do not use.
- [Mode]: Do not use.
- [Database information]: The database stores user profiles and soldering processes among other things. To gain access to the database, correct parameters must be entered under [Database information].
- [Select database server]: Click on this box to set the path to the database.
- [Reload]: to refresh the selected path to the database.
- [Database name]: to enter the name of the database
- [Username]: to enter any user name. Overall, only one user name can be assigned.
- [Password]: to enter a password for network access protection.
- [Repeat password]: to repeat the password for network access protection.



- [Test connection]: After entering the database connection above, click this button to check. A dialog will show the result.
- [Save]: to save the database settings.
- [Create backup]: Create a back-up of the entire database.
- [Database restore]: Load the saved database.
- [Remove archives options]: Use the option button to select the desired time period and press [Remove archives].
- [Store Profile Image\Document]: Define the path where the soldering profile images and associated soldering profile documents are saved.



7.8.2 The [Chart settings] dialog

In dialog [Graph options] you can set how heating curves and control values are displayed in the chart and later in tab [Archive].

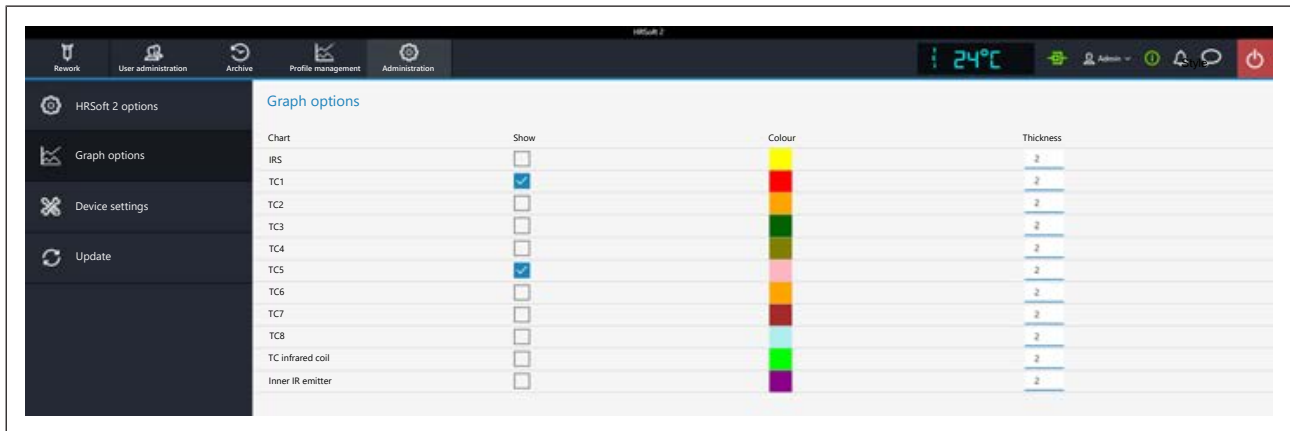


Fig. 38: Example figure: If the heating head and bottom heating are configured differently, the selectable graphic options may differ.

The following parameters can be displayed if present:

In table [Graph options], it is determined which soldering parameters are displayed in the chart and in which colour and thickness they are shown during the Rework process.

- Column [Show]: Show/hide the measurement curve.
- Column [Colour]: Colour of the measurement curve. Click on the coloured square to see all available colours.
- Column [Thickness]: Line thickness in the chart.

The displays that can be viewed in the chart in detail:

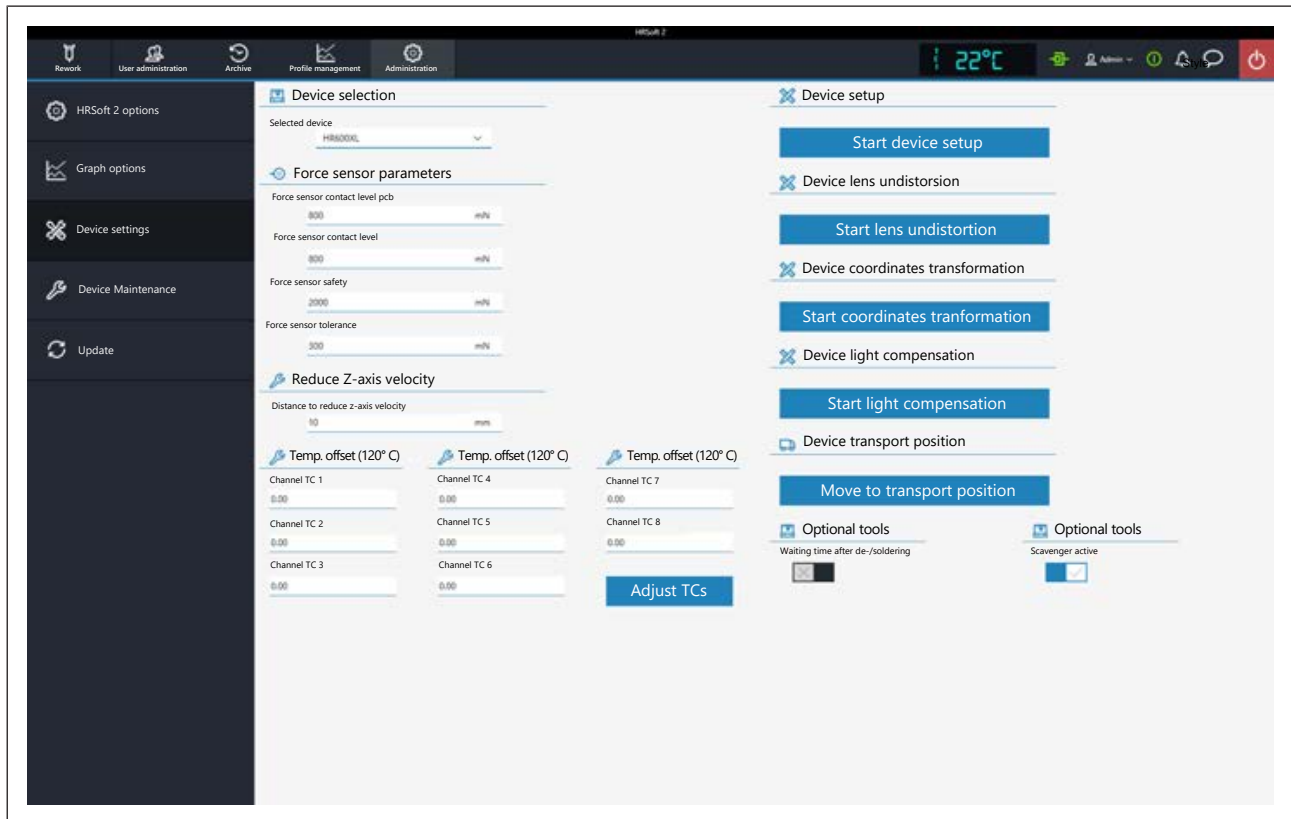
- [TC1], [TC2], etc.: Measured temperature of the external thermocouple. Each connected thermocouple is displayed.
- [TC infrared coil]: Measured temperature of the thermocouple infrared development of the top heating.
- [Inner IR emitter]: Measured temperature of the inner emitter of the top heating.
- [Outer IR emitter]: Measured temperature of the outer emitter of the top heating.
- [Fan Speed]: Fan power in the top heating.
- [Bottom heater (1, 1)]: Adjustment degree of heating element 1/1 in the bottom heating.
25 heating elements selectable for the bottom heating. Heating element 1/1 is front right. Heating element 1/2 to the left of this. Heating element 2/1 left, second row from the front, etc.

The lines in the chart can also be shown/hidden during the soldering process.



7.8.3 The [device settings] dialog

In dialog [Device settings], various pre-settings for the Rework System can be accessed. These functions may only be performed by trained, qualified staff!



Device selection

- [Selected device]: to select “HR 600 XL.”

Force sensor parameters

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

Note: 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)

Apply the changed temperature offsets.

- [Channel TC 1] to [TC8]: 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] to [TC8] to offset them.
 - c) Then click on button [Adjust TCs].
- ⇒ The correction values have been adopted and the Rework System will display the calibrated values of the temperature sensors.

Device transport position

- a) [Move to transport position]: before transporting the Rework System to another location, use button [0541] to move the axis system to the safe transport position and thus avoid any damage in transit! Move to transport position
With regard to this, please also read Chapter Switching off the Rework System [► 81].

Device setup

Start device setup Via the [735] function, basic values can be set for the Rework System if settings have changed or are no longer correct.

These functions may only be performed by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

- when reinstalling the Rework System
- after replacing the heating head. With regard to this, please read Chapter Replacing the heating head [► 162].
- after replacing the placer head. With regard to this, please read Chapter Replacing the placer head [► 164].
- after the location of the device has changed, the following functions must be carried out:
 - The [794] function. Start light compensation With regard to this, please read Chapter Button [Start extraneous light compensation].
 - The [737] function. Start coordinates transformation With regard to this, please read Chapter The [Start coordinate transformation] button [► 118].

It is also possible to redefine a single position if it shows to be inaccurate. With regard to this, please read Chapter Memorising the height positions of the heating head nozzle and the placer [► 179].

Device lens undistorsion

[Start lens undistortion]: do not carry out this function. For Ersä trained service personnel only.

Device coordinates transformation

Perform function [Start coordinates transformation] to define the distance of the heating head nozzle to the placer head pipette:

- when reinstalling the Rework System
- after replacing the heating head
- after replacing the placer head
- after changing the location of the unit.



The process is described in Chapter [The \[Start coordinate transformation\] button](#) [► 118] .

[Device light compensation]

[Start light compensation]: Perform this function if the camera systems have problems with ambient lighting in the Rework System, or if the ambient lighting of the Rework System has changed, e.g. after a relocation.

The extraneous light compensation runs automatically. When the [Finish] message appears, the process will be completed.

- a) Finally, close the dialog box.

Firmware update

If a newer version has been uploaded into the directory of firmware files, a bell icon on the top right of the display and button bar will show a number in a circle indicating the number of firmware updates to be performed.

- [System board update file]: to update the control board firmware, click on button [Select file] and select the new control board firmware with the *.bin file extension. Then click on button [Firmware update]. The control board firmware will be updated.
- [Power board update file]: to update the control Powerboard firmware, click on button [Select file] and select the new Powerboard firmware with the *.bin file extension. Then click on button [Firmware update]. The Powerboard firmware will be updated.
- [Satellites update file]: to update the heating head and lower heating firmware, click on button [Select file] and select the new satellite firmware with the *.bin file extension. Then click on button [Firmware update]. The Satellite firmware will be updated.
- [Amtel update file:]: only execute if specified by the Ersä service.
- [Xmos update file:]: only execute if specified by the Ersä service.

[Firmware update]:

starts updating the firmware selected in the file selection fields.

The version of the installed firmware is displayed in dialog [Motion control information]. With regard to this, please read Chapter [The info icon: The \[System status\] dialog](#).



7.8.3.1 The [Start coordinate transformation] button

Function [Start coordinates transformation] may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed. Use the coordinate transformation to calibrate the distance between the heating head nozzle and the placer head pipette:

- when reinstalling the Rework System
- after replacing the heating head
- after replacing the placing head
- after relocating the unit.



Fig. 39: Calibration nozzles

The process is performed through an Assistant. Two calibration nozzles are needed.

Before any axis movement, the user must check and rule out that the optional RPC camera collides with components on the PCB, or with thermocouples and cables. A tilted RPC camera will increase this danger!



CAUTION

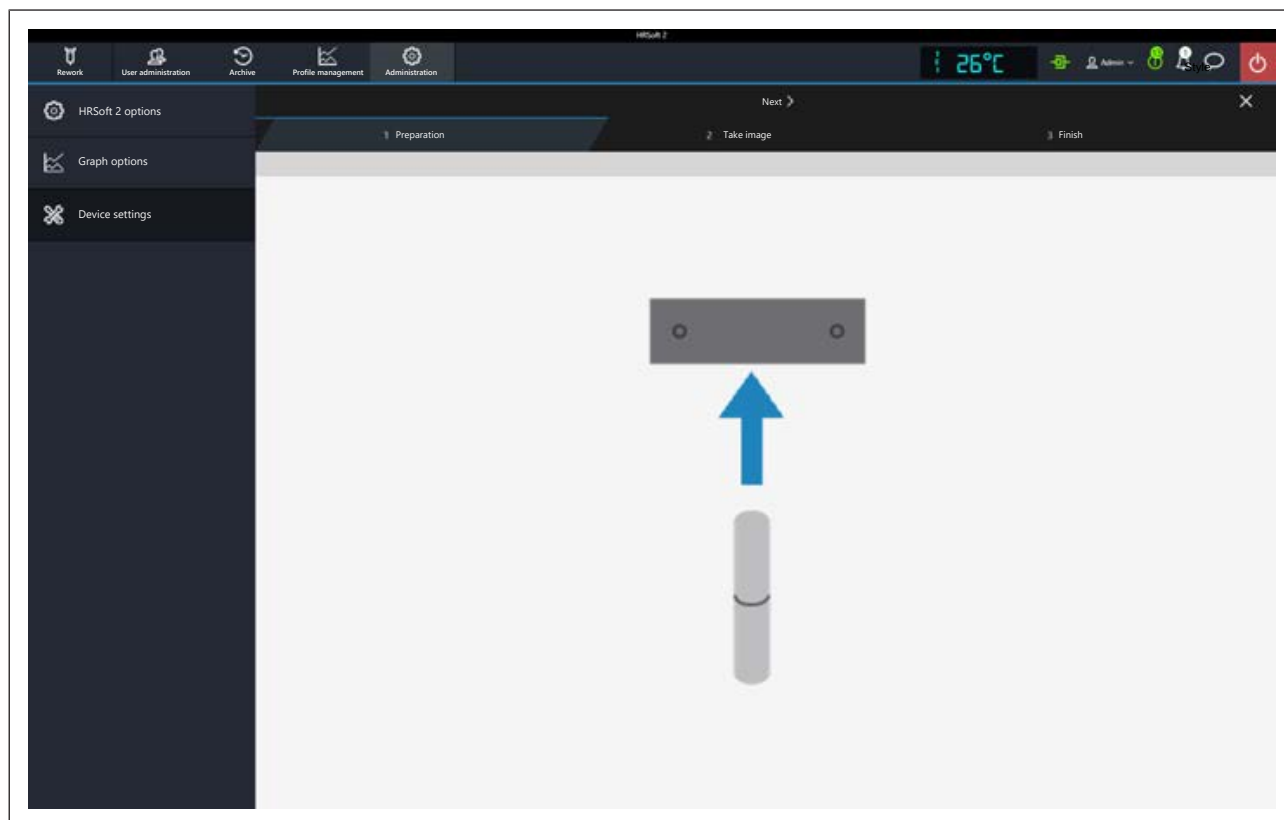
Risk of burning due to heated machine parts and PCB!

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!

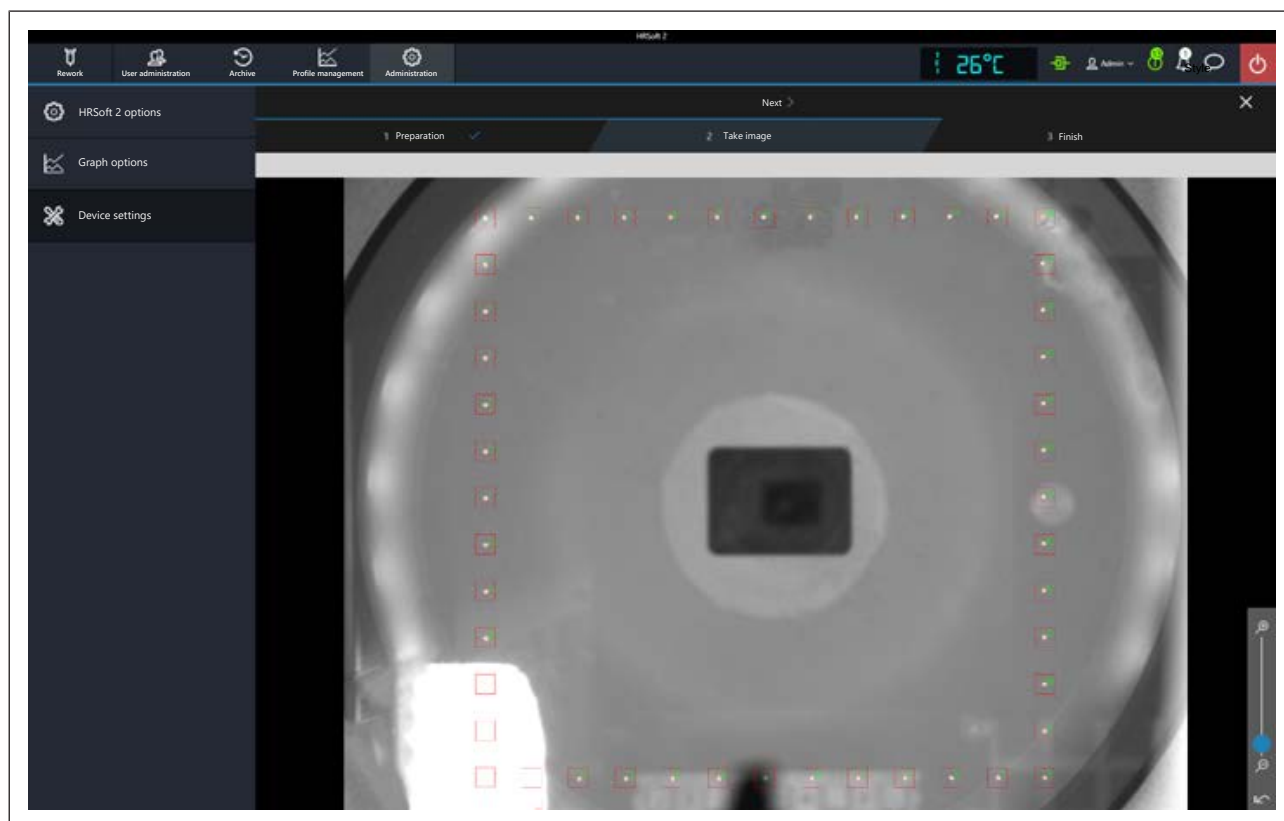
The starting page [Preparation] will be displayed. The information line above the diagram describes the work steps to be performed.

The unit will first perform a reference move, if not already done.



The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To change the nozzles, please also read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [► 122].

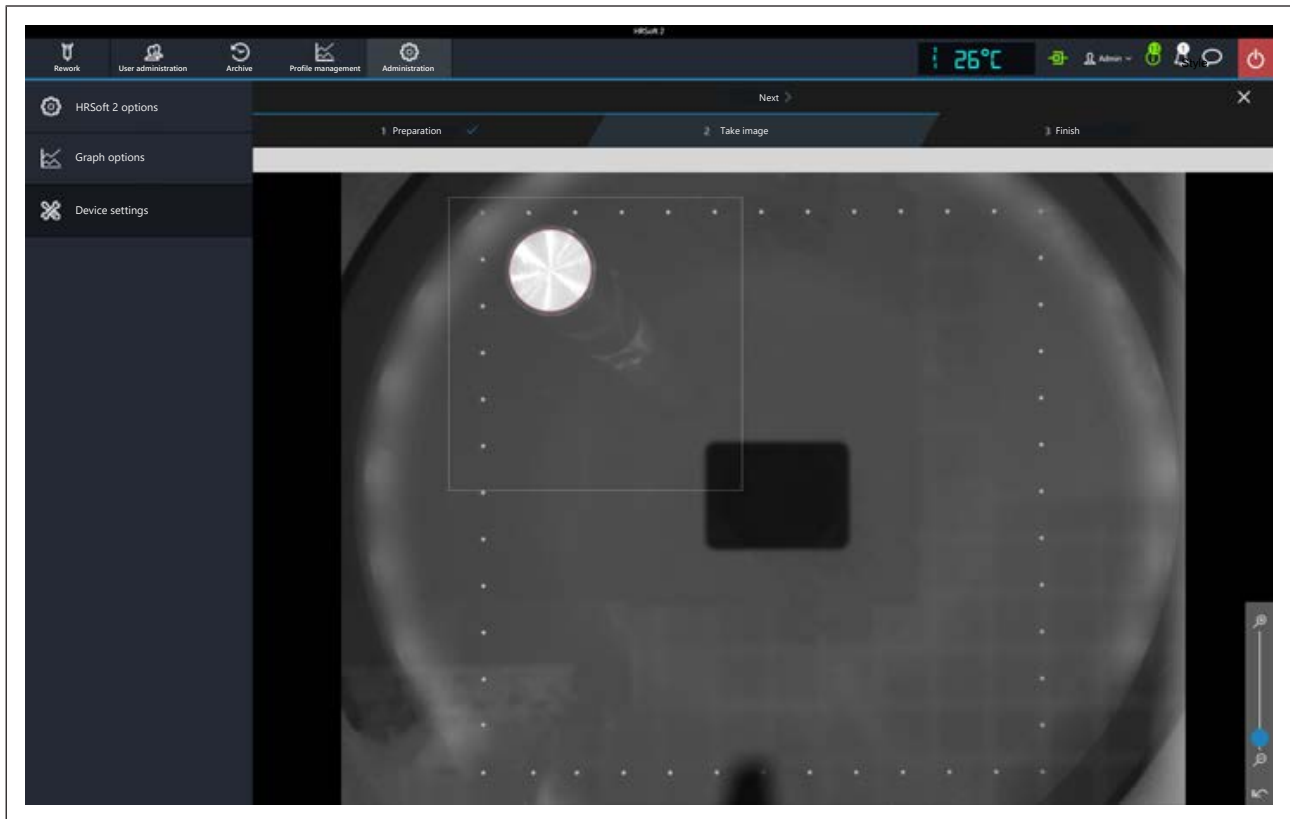
- a) The heating head nozzle and placer were moved down a bit. Screw a calibration nozzle each onto the heating head nozzle and placer.
- b) Click on the [Next] button to switch to the next work step.





⇒ The glass plate camera image will be shown. The rectangularly arranged fiducial points will be detected by the system and framed in red.

c) Click on the [Next] button to switch to the next work step.



d) The pipettes will be automatically moved and aligned with each other.

⇒ When the [Finish] message appears, the process will be completed.

a) Close the dialog box.



8 Tutorial – Soldering or desoldering a component

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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!](#) [► 72].

8.1 Adjusting the sizes of the heating head nozzle and placer to components

The heating head nozzle and placing pipette are interchangeable.

Select the largest possible heating head nozzle and placing head for the component. If necessary, change the heating head nozzle and or placing pipette as described below.



⚠ 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]!

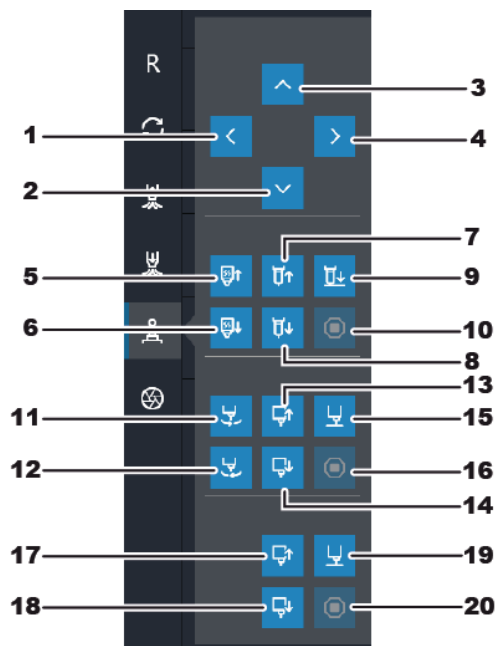
Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

a) Switch to the [Rework] tab.

b) Then click on the [Manual Mode] tab to call up the button column for manual operation.

c) Click on the button for the motor movements.

⇒ The button menu of the manual motor control will open.



a) Move the heads to a suitable working position with buttons (1) - (4).

b) Using buttons (7) and (8), move the heating head nozzle up or down to change it.

c) Using buttons (13) and (14), move the placing pipette up or down to change it.



- d) Wait for the heating head to cool down.
- e) To change nozzles, you can use an open-end wrench SW9 and a round knurled wrench SW9 (tools supplied as standard). Do not apply excessive force to the material!



- f) Use an open-end wrench to fix the top holder to the notch, and turn the nozzle with a knurled wrench.
- g) Screw on the new nozzle or pipette in the same way. Tighten it very slightly. Later the nozzle will be automatically moved upwards.

With regard to this, please also read Chapter [Spare parts](#) [► 149] [Spare and wear parts](#) [► 147] where you can find a list of available pipettes.

8.2 Inserting a PCB into the PCB frame

NOTE

ESD hazardous components!



Electronic components can be damaged by electrostatic discharge. Please observe the warnings on the packaging or contact the manufacturer or supplier. To protect these components, an ESD (ESD = electrostatic discharge) safe workplace will be suitable. The Rework System can be easily integrated into such an environment. Via one of the push buttons on the front, the user can, e.g., connect an ESD wrist band. The housing of this Rework system is connected to the protective conductor of the voltage supply network via the IEC power cable.

All common precautionary measures for ESD-sensitive components must be taken when handling the device.

⚠ 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!

Info: The PCB frame can be removed. This allows using multiple frames with PCBs interchangeably. For more information, please read Chapter [Inserting the PCB frame and becoming familiar with it](#) [► 53].

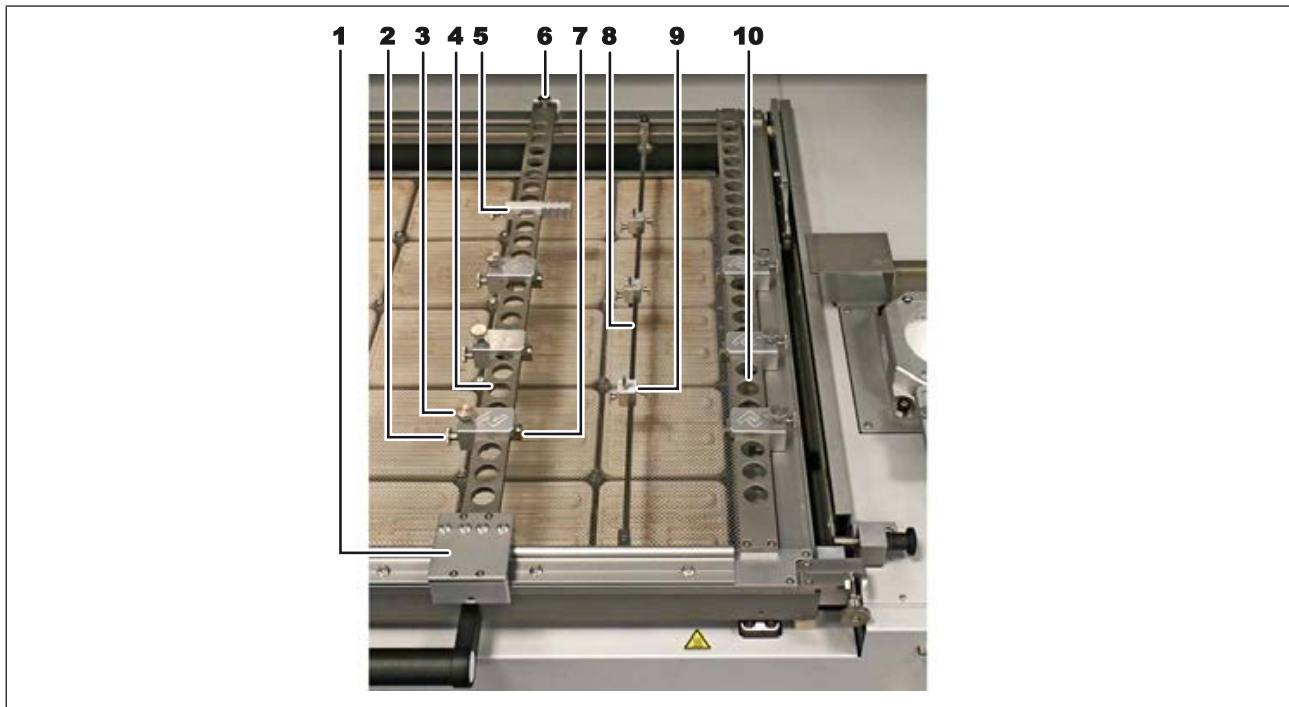


Fig. 40: The holding system in the PCB frame

1	Base of the perforated strip on the left. Handle for moving the perforated strip.
2	Locking screw for the PCB holder. Just tighten it slightly.
3	Clamping screw for PCB support (7)
4	Perforated strip left, movable
5	Holding frame board stopper . For reproducible position of the rear PCB stopper. Also base support for clamped PCBs when positioning the PCB frame vertically.
6	Do not use
7	PCB support, for placing and vertically clamping the PCB by screw (3)
8	Center support bar. Prevents large PCBs from sagging.
9	Center support pin, spring loaded.
10	Perforated strip right, fixed

The PCB is fitted in the lower right corner of the PCB frame.

- a) Provide ESD protection.
- b) Hold the PCB to the lower right corner of the heating zone to determine the required position of the left perforated strip, the PCB holders and, if applicable, the center support.
- c) Loosen the locking screws of the PCB holders (2) on the left and right perforated strips and move the PCB holders to the desired holding positions.
- d) Tighten the locking screws slightly.
- e) Adjust the position of the left perforated strip. To do this, grasp the base of the perforated strip (1) and move the perforated strip.
- f) Open the clamping screws for the PCB support (3) far enough so that the PCB supports (7) can grip the PCB.



g) If necessary, insert the center support (8). To do this, insert the center support into the top strip of the PCB frame at the back and then slide it at the front into the strip of the PCB frame from the side.
Turn the thumbscrews at the end of the center support clockwise to rotate the top support by 90°.

h) To adjust the center support: Upper knurled screw for clamping in position on the strip.

Open the lower knurled screw to release the spring-loaded pin. Tighten to fix pin at a specific height.

i) Place the PCB on the PCB supports (7).

j) Grasp the left perforated strip at the base (1) and push it towards the PCB.

k) Slightly tighten the clamping screws for the PCB supports (3).

l) Check that the PCB is correctly seated.

⇒ You can now place the thermocouple.

Only open the screw at the rear end of the left perforated strip (6) to replace the PCB holder or the entire perforated strip.

8.2.1 Mounting an air baffle

Air baffles are used to shield heat-sensitive components from the top heater radiation. By choosing the hole size of the air baffle, you determine the size of the heated surface.

✓ To mount an air baffle (6):

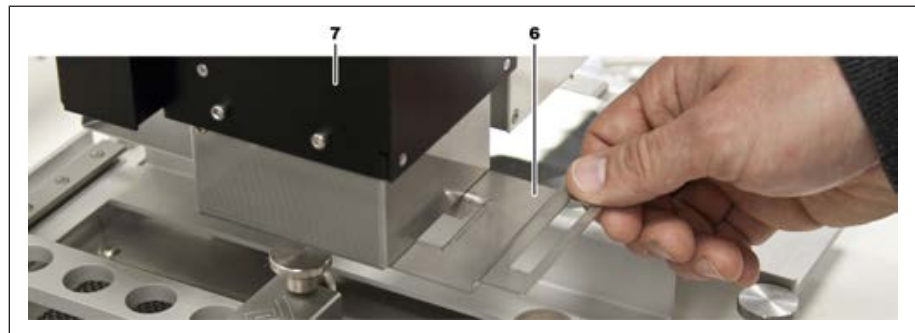


Fig. 41: Sliding in an air baffle, example picture

a) Select an air baffle and slide it in under the heating head (7) until it stops.

For proper operation, the thermocouple must be inside the heated area.

If necessary, also use protective films to protect temperature-sensitive components from heat radiation.



8.3 Position a thermocouple

The correct positioning of the thermocouple is crucial for precise temperature monitoring of the soldering process. To avoid damage, only insulated thermocouples may be used. For accurate measurements, the thermocouple should be in contact with conductive areas such as PCB conductive pathways or ground planes. When using a non-insulated thermocouple, it is important to ensure that the uninsulated parts do not come into contact with the PCB support system or conductive parts of the PCB, as this may distort the temperature measurement.

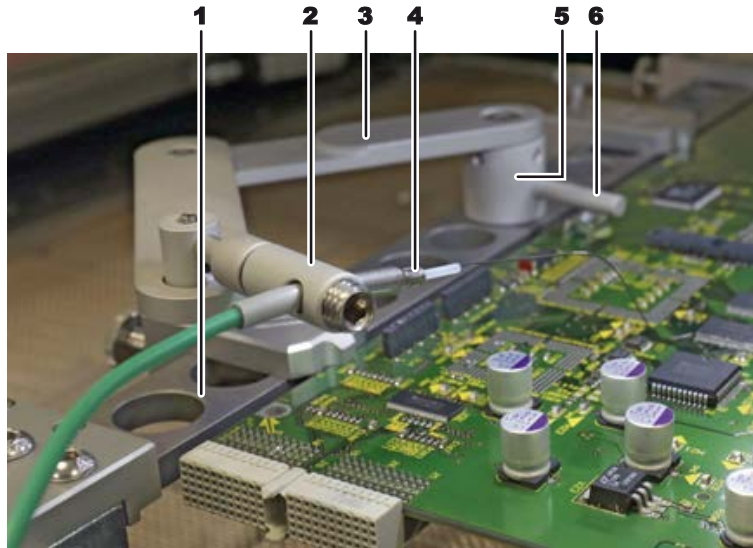


Fig. 42: Example figure: Components of the thermocouple holder

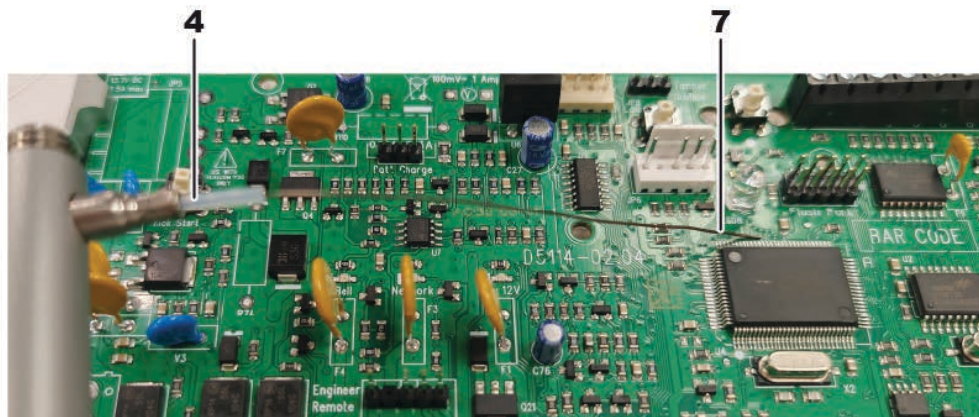
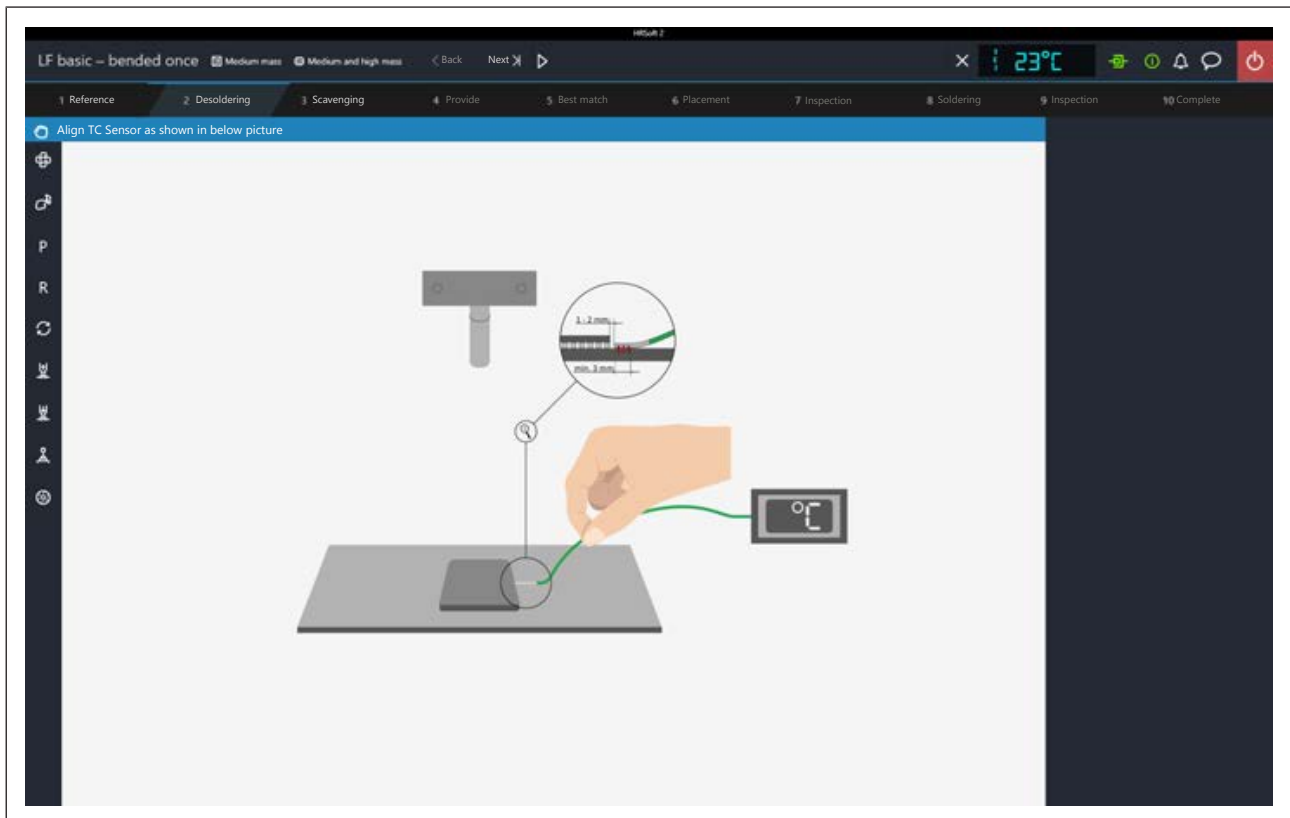


Fig. 43: Example image: applying a thermocouple

- a) Bend the tip of the thermocouple wire precisely so that only the front three millimeters (120 mils) of the wire can lie flat on the PCB.
- b) Slide the thermocouple (4) into the holder (2) and secure it with a 5 mm Allen key.
- c) Insert the holder (3) into one of the holes in the perforated strip (1) so that the wire of the thermocouple can be placed on the component.
- d) Clamp the holder with the lever (6) counterclockwise.
- e) Mount the holder so that the end of the thermocouple (7) can be placed very close to the component.
- f) Connect the thermocouple plug to a socket [TC1] – [TC8].



- g) Observe the exact placement specifications for the thermocouple in the illustration of the corresponding work step.



- 3 mm (120 mils) of the thermocouple tip must be resting
 - Distance 1.5 mm (60 mils) to the solder point of the component.
- a) The currently measured temperature of the selected thermocouple is displayed in the top right corner of HRSoft 2.
- ⇒ You can connect additional optional temperature sensors to obtain additional temperature information.



8.4 Activate a soldering profile and prepare the soldering process

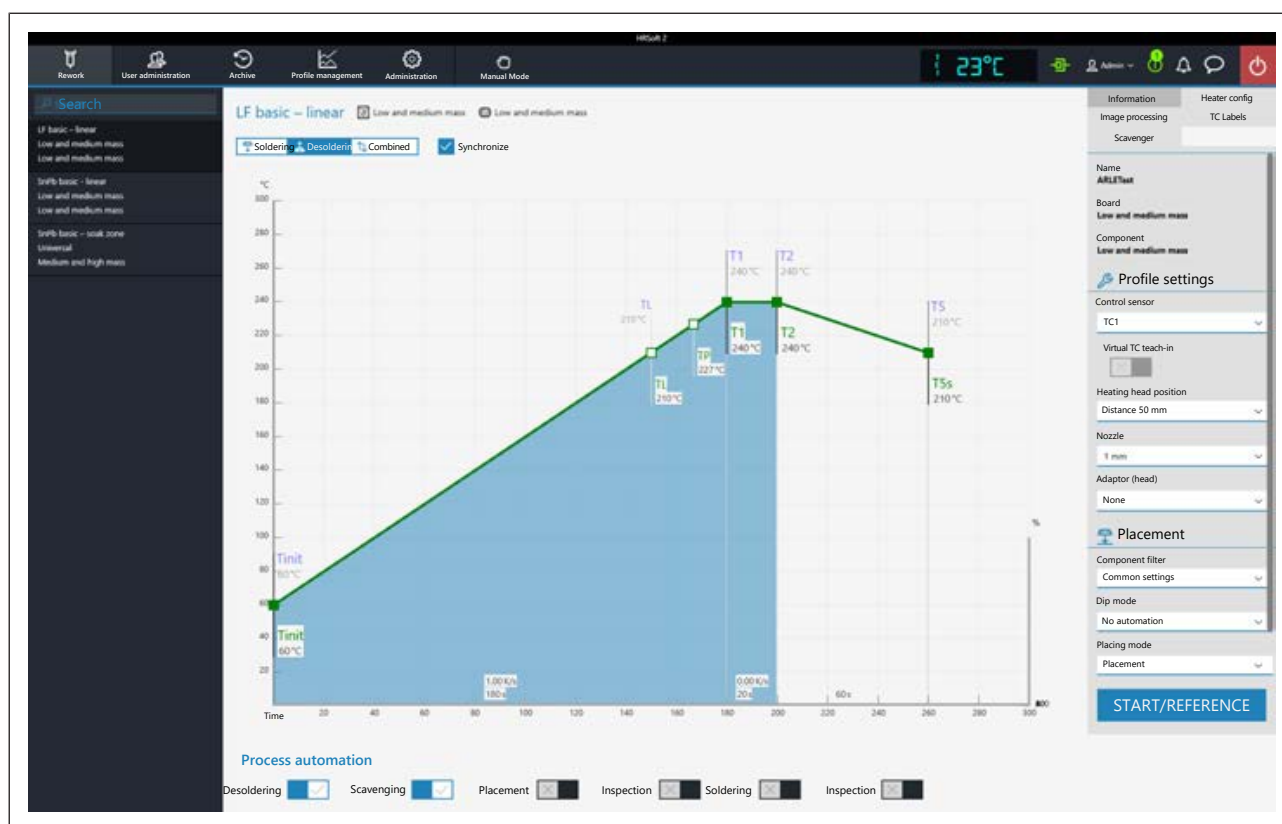
- a) Open tab [Rework]. The available soldering profiles are listed in the left column. As to this, please also read Chapter Use of the soldering profile in the [Rework] tabulator.

Notes:

If changes to the soldering profile are made in tab [Rework], they cannot be saved. As to this, please also read Chapter Temporary changes to the soldering profile in the [Rework] tabulator and the following ones.

Only the administrator may save soldering profiles. As to this, please also read Chapter Permanently changing the soldering profile in the [Profile management] tabulator and the following ones.

Likewise, only the administrator may assign soldering profiles to the standard user, who can then select them in tab [Rework]. As to this, please also read Chapter The tabulator with the small arrow key (Image processing) under the [Profile management] tabulator.



- a) 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 step and is carried on to the right by performing the various process steps. As to this, please also read Chapter [The process steps of \[process automation\]](#) [92].

- a) 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: moving the heating head, pipette vacuum, fan, etc. As to this, please also read Chapter [The \[Manual Mode\]](#) [104].
- b) Check all soldering profile settings, consisting of the chart, the buttons [Process automation] and both tabs [Information] and [Heater config].
- c) If necessary, make corrections to the soldering profile.



d) If you are using the optional SC 600 residual solder sucker, please read the separate operating instructions.

8.5 Starting the rework process and performing it wizard-driven



⚠ 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 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.

The following chapters describe the complete soldering process with all process steps.

This includes 1. desoldering, 2. the Placement of the new component, 3. the Inspection of the new component position, 4. the Soldering and 5. the final Inspection.

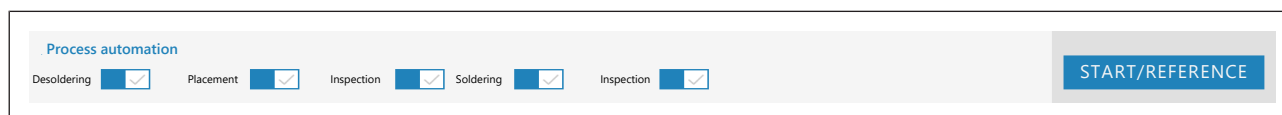


Fig. 44: All five process steps are in the tab [Rework] tab, has been activated

Double check that the PCB is clamped correctly and that the thermocouple is perfectly positioned.

a) Click on the button [START/REFERENCE].

⇒ The Wizard starts and guides you through the process steps in numbered steps. Perform all tasks as instructed by the assistant.

b) Ensure that the Windows screen display scaling is set to 100%.





8.6 Interrupting the soldering process

To interrupt the soldering process, click on the button with a white "X" in the upper window area on the right.

You now have the following options:

- [Redo rework]: the performed soldering process is completely repeated again.
- [Profile selection]: selecting another soldering profile.



8.7 Working step 1 "START / REFERENCE MOVE"

If it is the first Rework process after switching on, the Rework system will perform a reference run of the heating and placer head after clicking on the [START/REFERENCE] button.

If the Rework System has already been referenced, the Assistant will start with the first step determined in [Process automation].

- a) Make sure that the travel paths of all axes have been cleared. Pay special attention to the optional RPC camera, the thermocouples or the PCBs lying in the movement area.



CAUTION

Risk of collision of the RPC camera with components on the PCB!

- ✓ If there are tall components on the PCB, there is a risk of collision with the RPC camera! A tilted RPC camera will increase this risk! The height of the RPC camera is also determined by the [Heating head position] parameter in the HRSoft2 program.
- a) Before moving the heating head, always make sure that the RPC camera will not collide!



DANGER

Dangerous electrical voltage after pressing the motor stop pushbutton!

Death or serious injuries due to electric shock!

- ✓ The motor stop pushbutton (MOTOR OFF) will not interrupt the power supply to the machine! Single parts of the machine are live even when the motor stop pushbutton is pressed!
- a) Do not use the motor stop pushbutton to disconnect the machine from the mains!
- b) Always switch off the machine via the main switch!
- c) Caution! The machine may still be very hot after pressing the motor stop pushbutton!

After referencing, the Assistant will continue the work process with the step determined in [Process automation].

Please read the descriptions of the numbered steps specified in the soldering profile in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 121]



8.8 Working step 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 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.

- a) Move the red cross in the camera image of the placer head to the centre of the component to be desoldered.
- For long distances, click on the desired target position in the MiniMap on the top right.
- For medium distances, click on the target position with the mouse on the screen.
- Finally, to cover small, precise paths, click on the blue arrow keys.

The button in the middle of the blue arrow keys immediately stops the travel of the placer head.

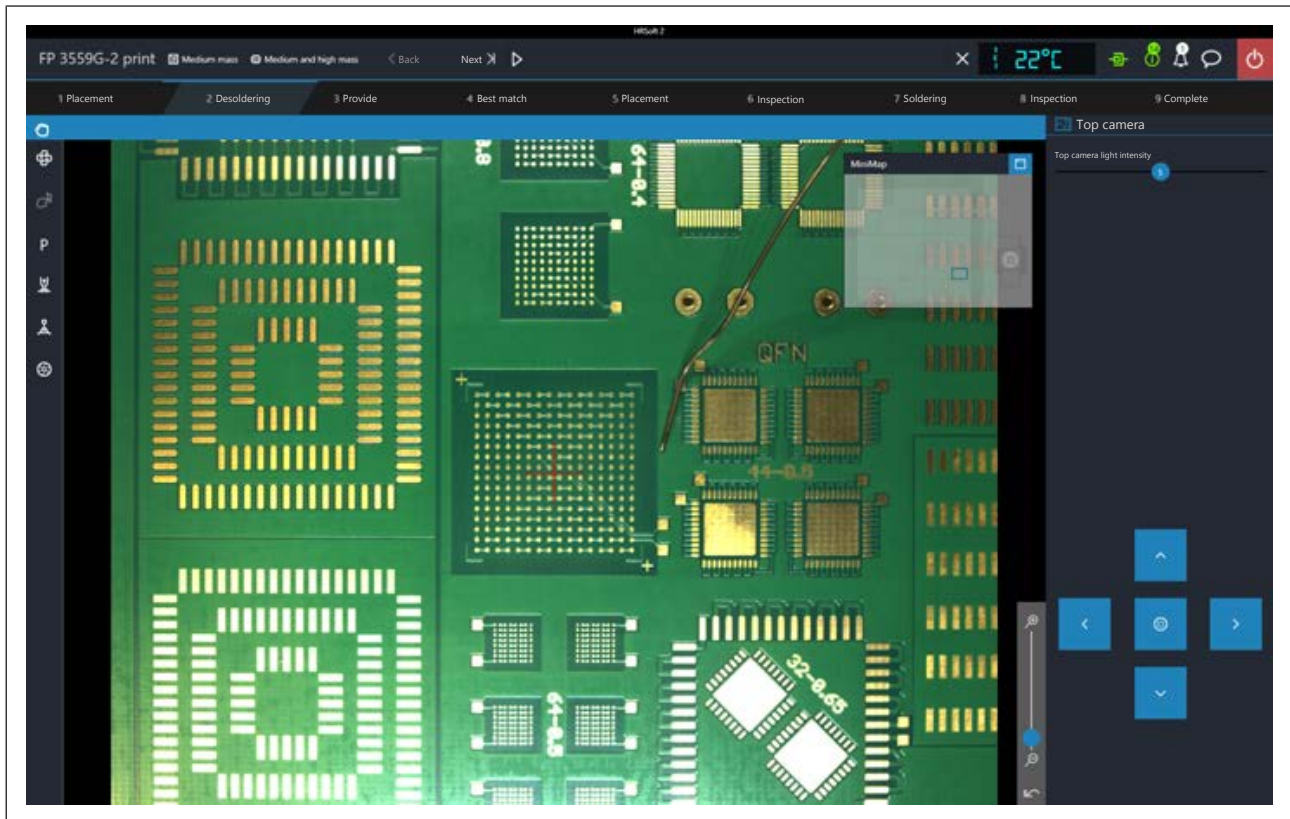


Fig. 45: The red cross is in the middle of the component to be soldered.

- a) When the red cross is positioned exactly on the component to be soldered, click on the [Next] button to move to the next working step.
⇒ The desoldering process will begin.

The desoldering process

- a) Observe the soldering process.
 - If the [TP (°C)] point (temperature pipette) is reached in the chart, the heating head pipette will move onto the component.
 - If the [T3] point is reached, the pipette will pick up the component and place it on the component tray.
 - Cooling ventilation will start and run until the temperature set under point [T5] is reached. With regard to this, please also read Chapter The heating curves in the [Rework] tab.

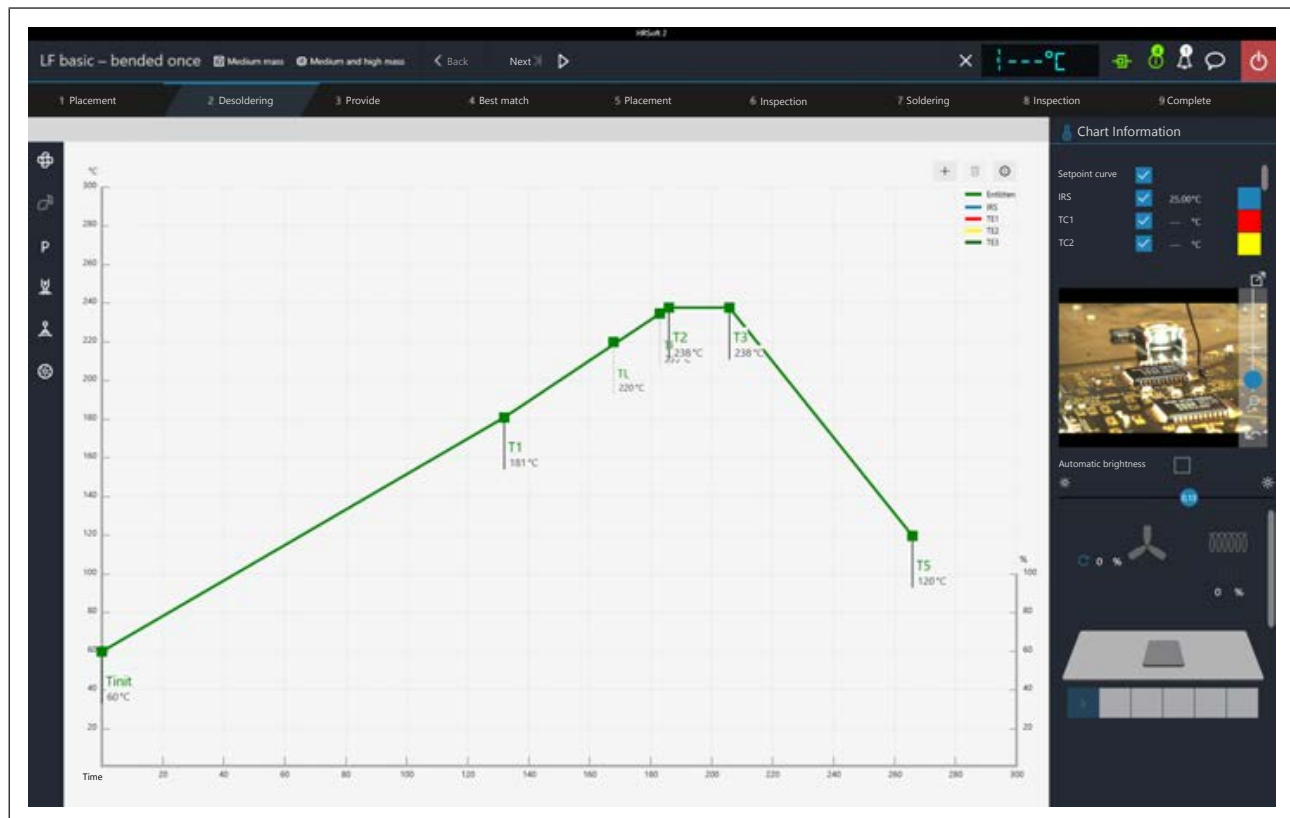


Fig. 46: The chart at the beginning of desoldering

Chart information during the soldering process

- Blue button column: To display/hide temperature sensor and power value lines.
- Coloured button column: To change the colour of temperature and power value lines. Click on a coloured area to change the colour.
- Column in between: values currently measured by sensors.

Heating information during the soldering process

The lower area shows the current state of the top and bottom heaters:

- Percentage on the left: set power value of the top heater blower.
- Percentage on the right: current power value of the top heater.
- Rightmost scroll bar: Scroll to display the lower field of the heating information.
- Lower field of heating information: current power values of bottom heating elements.

Using the live image of the RPC camera

The optional RPC camera allows you to closely observe the melting process. With regard to this also read Chapter [Manual height adjustment of the RPC camera via the setting screw](#) [► 78].

The live image of the RPC camera is displayed on the right.

- Set the ideal process viewing angle with the RPC camera's swivel arm and movable holder. The position and angle of the RPC camera must be set in such a way that the camera does not collide with parts of the PCB holder when the heating head moves.



- [Auto exposure]: When activated, the brightness of the RPC camera image is automatically adjusted after changing the camera lighting or ambient light.
- Horizontal controller: controls the camera lighting.
- a) At the front of the camera lens there is a black rubber ring for adjusting the focus. If necessary, gently turn the ring with a finger to adjust the focus point.
- b) Zoom in with the vertical controller on the right side of the camera image to better observe the melting process. The arrow button below the controller resets the zoom.
- c) Click on the  button on the camera image to enlarge the image of the RPC camera to full-screen display. This allows the melting process to be displayed enlarged.
- d) Further zooming is possible via the zoom controller or by turning the mouse wheel. Move the image section by clicking and holding the left mouse button.
- e) Close the full-screen display by clicking on the blue circle button in the upper right corner.

- a) Click on the [Next] button to switch to the next working step.

Cleaning the desoldering point

If you want to solder a new component in the desoldering point, then remove any residual solder from the desoldering point:



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!

The temperature of the soldering point should be below the melting point.

- a) Apply some flux material to the residual solder points.
- b) Remove any residual solder with suitable soldering tools,
 - ⇒ e.g. with the following solder tips: PowerWell 0102WDLF23/SB (small), 0102ADLF40/SB (medium) or 0102ZDLF150/SB (large)
- c) Remove flux residue with Ersä Flux Remover (OFR200) and a cleaning cloth.
- d) Dry the soldering point with a clean, lint-free cloth.
- e) Click on the [Next] button to switch to the next working step.



8.9 Working step 3 "Initialisation"

Initialise the procedure to solder the component as follows:

The settings for the [Dip mode] of the soldering profile are to be set in the default settings under the [Placement] range. As to this, please read Chapter The [Information] tab under the [Rework] tab.

- a) Perform one of the following three methods.

The [No automation] method:

If you have set the [No automation] selection under [Dip mode], soldering will be performed without flux dipping and solder paste printing.

Place the component to be soldered centrally and correctly aligned on the glass plate of the component tray. The placer will later pick up the component from the component tray. Then follow the following working steps: Align component and Place component in the soldering position.

The [Auto. Dip] method:

If you have set the [Auto. Dip] flux material dipping under [Dip mode], e.g. to edit a QFN component:

- ✓ In the arming phase, flux material gel was applied with a squeegee onto the dip stencil in the Dip & Print station. To arm the dipping procedure, read the separate Ersas instructions "Selective printing and dipping of components."
- a) Insert the dip stencil into the framed stencil (see picture below) and slightly screw it on the stencil with two silver retaining screws.
- b) Place the component to be soldered centrally and correctly aligned on the glass plate of the component tray.

The placer will later pick up the component from the component tray and dip it into the flux material in the dip stencil.

Then follow the following working steps: Align component and Place component in the soldering position.

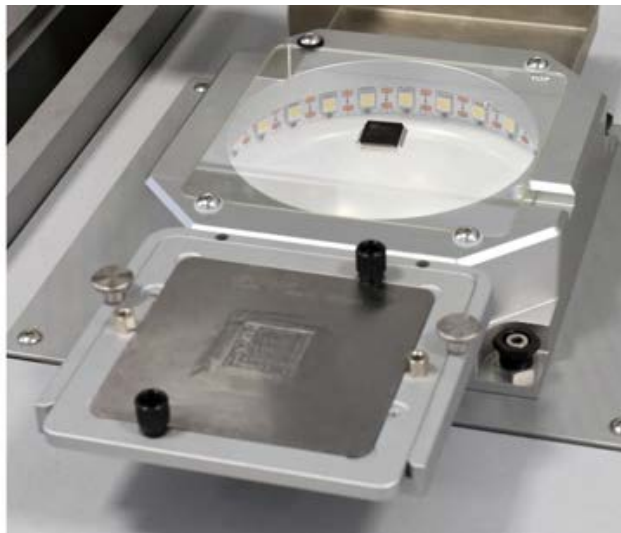


Fig. 47: Example picture: The dip stencil coated with flux material gel is to be inserted into the framed stencil. The component is to be placed on the glass plate of the component holder.

The [Auto. Print] method:

If you have set the [Auto. Print] printing with soldering paste under [Dip mode]:



- ✓ In the arming phase, solder paste was applied onto the component underside with a squeegee in the Dip & Print station. To arm the dipping procedure, read the separate Ersä instructions "Selective printing and dipping of components."
- a) Insert the print stencil with the component into the framed stencil (see picture below) and screw it on the stencil slightly with two silver retaining screws.

The placer will later pick up the component from the print stencil.

Then follow the following working steps: Align component and Place component in the soldering position.



Fig. 48: Example picture: The solder paste-coated component is inserted into the print stencil and slid into the framed stencil

- a) Use button [Next] button to switch to the next work step.
- ⇒ The component is picked up and, depending on the selected method, immediately moved to the glass plate, or dipped into the dip stencil.
- ⇒ The bottom camera in the glass plate will perform pin detection.

Pin detection

- a) Select the appropriate component type on the right, under [Pin detection], in the [Component filter] menu.
- b) Click on [Use filter] below.
- ⇒ All component pins should now be displayed.
- a) If necessary, adjust the component filter and the light intensity regulator and click on [Use filter] again.
- b) Use button [Next] button to switch to the next work step.



8.10 Working step 4 "Best Match"

The system will calculate the best possible overlay and move the component to the solder point.

The system will now display the pins.

Adjusting the overlay

- Use the zoom controller or the mouse wheel to enlarge the image.
- Use the blue arrow keys to adjust the overlay to the superposable position and rotation.

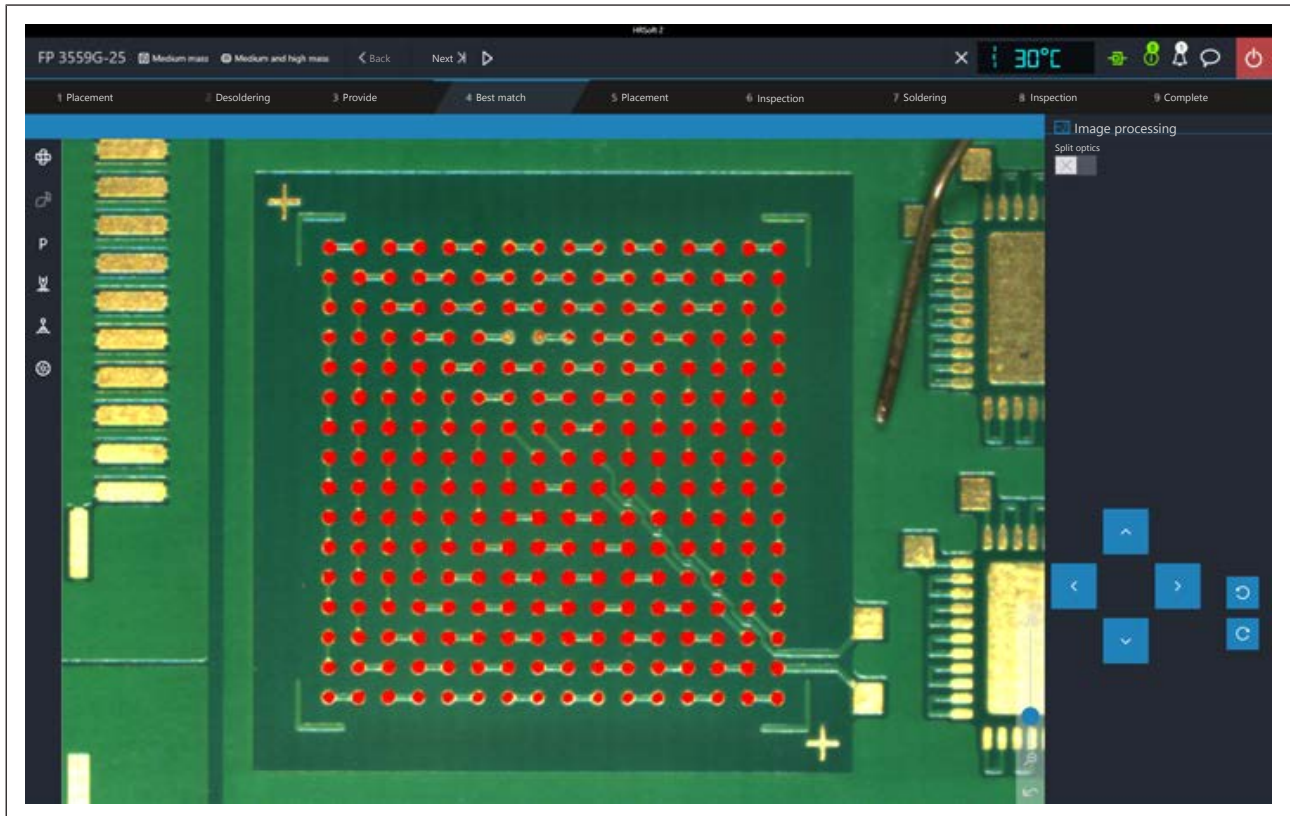


Fig. 49: Overlay increased by zooming

- The four corners of the component can be moved to a further enlarged view
- For example, in case of large components, click on the [Split optics] button to see an enlarged comparison of widely spaced image areas. Now click four times with the displayed rectangle on the four points that you want to see enlarged in one image.

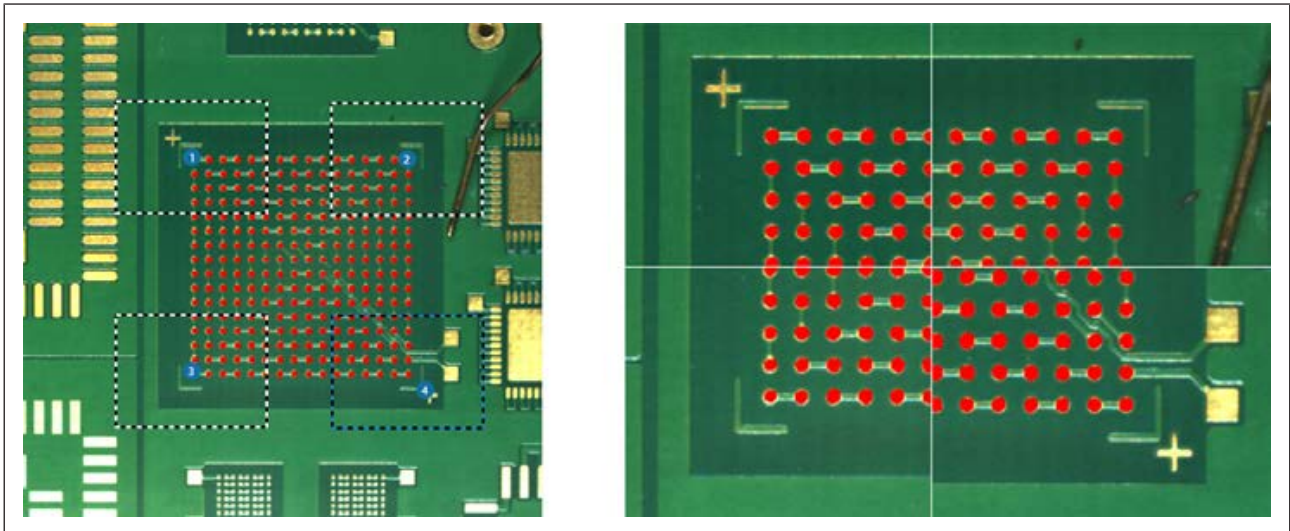


Fig. 50: Setting four image sections for split screen (left), split screen display (right)

- e) Use the blue arrow keys to adjust the overlay in the split screen image to the superposable position and rotation.
- f) Click on the [Next] button to switch to the next working step.



8.11 Working step 5 “Positioning” and working step 6 „Inspection“

In working step 5, the component is positioned.

The process will then switch to working step 6 „Inspection“.

The positioned component will be displayed.



- a) Evaluate the positioned component.
- b) To enlarge the image, use the zoom controller or the mouse wheel.
- c) To display the optional RPC camera, click on the blue circle arrow button in the diagram on the top right.

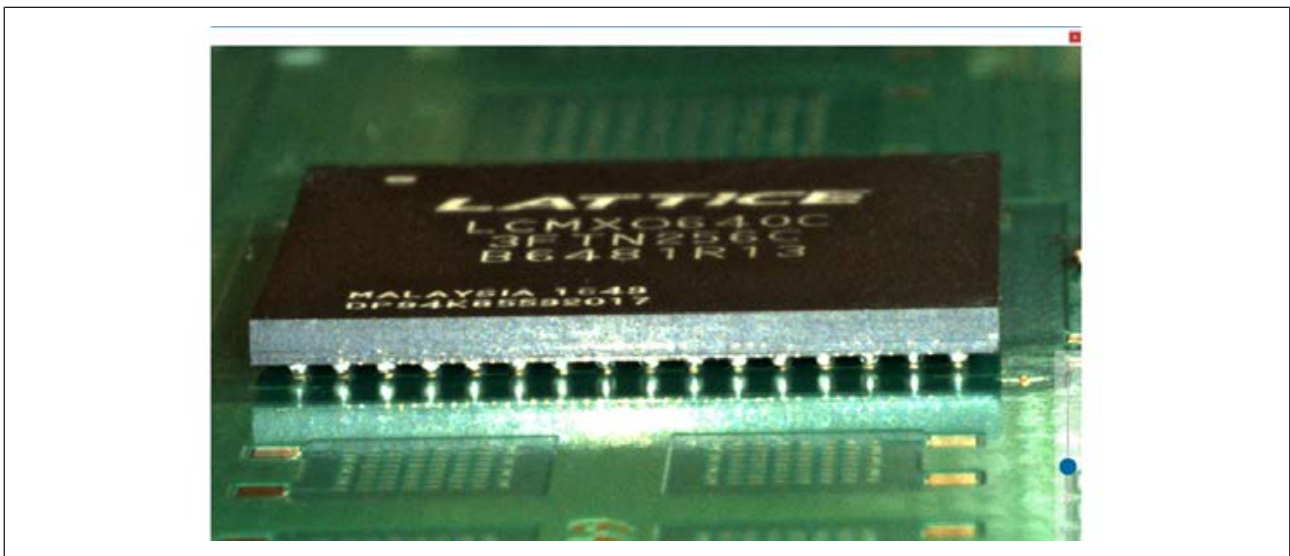


Fig. 51: BGA solder balls, RPC camera display



Using the live image of the RPC camera

The optional RPC camera allows you to closely observe the melting process. With regard to this also read Chapter [Manual height adjustment of the RPC camera via the setting screw](#) [► 78].

- a) Set the ideal process viewing angle with the RPC camera's swivel arm and movable holder. The position and angle of the RPC camera must be set in such a way that the camera does not collide with parts of the PCB holder when the heating head moves.
- b) At the front of the camera lens there is a black rubber ring for adjusting the focus. If necessary, gently turn the ring with a finger to adjust the focus point.
- c) Zoom in with the vertical controller on the right side of the camera image to better observe the melting process. Further zooming is also possible by turning the mouse wheel. The arrow button below the controller resets the zoom.
- d) Move the image section by clicking and holding the left mouse button.
- e) Close the full-screen display by clicking on the red square in the upper right corner.
- f) When the component is properly positioned, click on the [Next] button to move to the next working step.



8.12 Working step 6 „Inspection“

The soldered component will be displayed.



- a) Evaluate the positioned component.
- b) To enlarge the image, use the zoom controller or the mouse wheel.
- c) To display the optional RPC camera, click on the blue circle arrow button in the diagram on the top right.
- d) Click on the [Next] button to switch to the next working step.



8.13 Working step 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 Erska "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.



- a) Use the live image of the RPC camera to better observe the melting process.
 - The soldering process will run up to the [T3] point.
 - Cooling ventilation will start and run until the temperature set under point [T5] is reached. With regard to this, please also read Chapter The heating curves in the [Rework] tab.



Fig. 52: The chart during cooling after soldering



Chart information during the soldering process

- Blue button column: To display/hide temperature sensor and power value lines.
- Coloured button column: To change the colour of temperature and power value lines. Click on a coloured area to change the colour.
- Column in between: values currently measured by sensors.

Heating information during the soldering process

The lower area shows the current state of the top and bottom heaters:

- Percentage on the left: set power value of the top heater blower.
- Percentage on the right: current power value of the top heater.
- Rightmost scroll bar: Scroll to display the lower field of the heating information.
- Lower field of heating information: current power values of bottom heating elements.

a) Click on the [Next] button to switch to the next working step.



8.14 Working step 8 "Inspection"

The soldered component will be displayed.



- a) Evaluate the soldered component.
- b) To enlarge the image, use the zoom controller or the mouse wheel.
- c) To display the optional RPC camera, click on the blue circle arrow button in the diagram on the top right.
- d) Click on the [Next] button to switch to the next working step.



8.15 Working step 9 "Process completed successfully"

The soldering process has been completed.

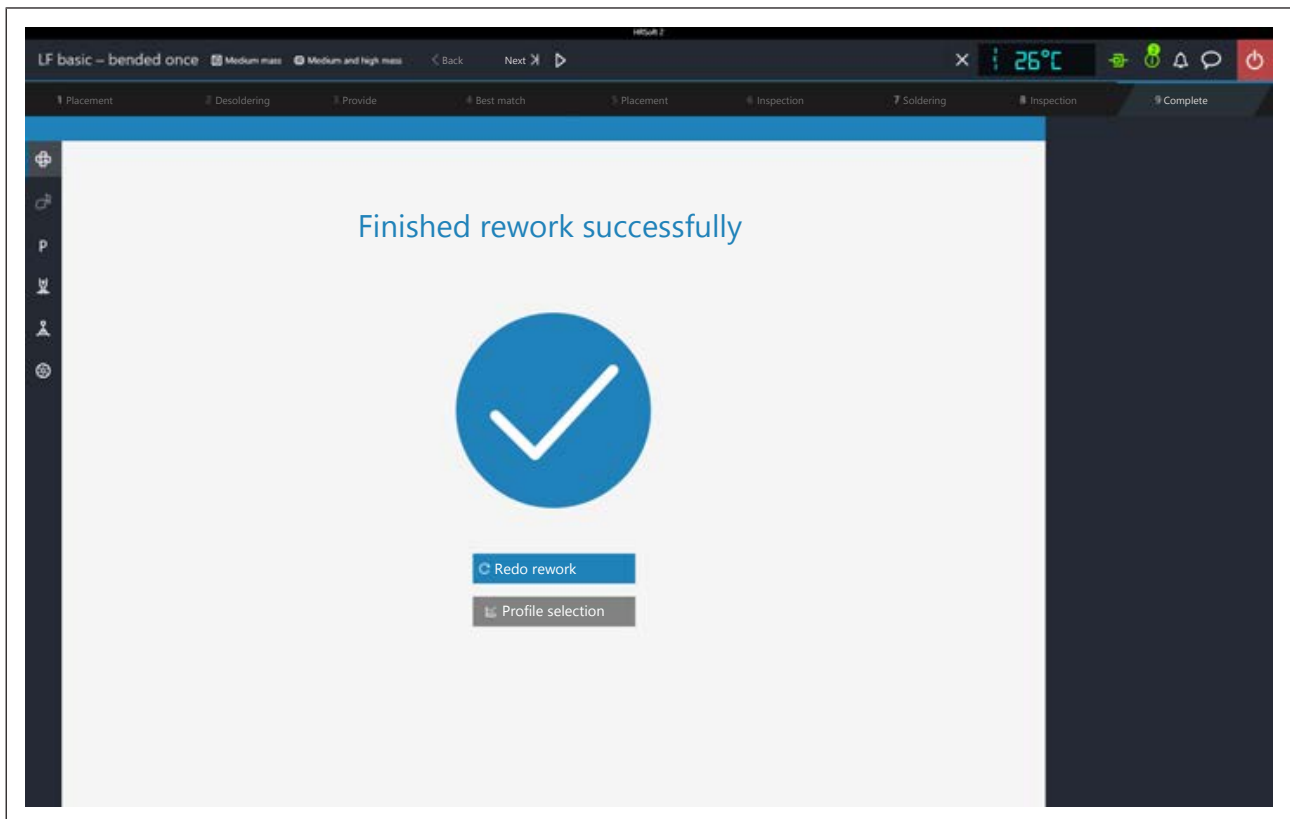


CAUTION

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!



You now have the following options:

- [Redo rework]: the performed soldering process is completely repeated again.
- [Profile selection]: selecting another soldering profile.



9 Spare and wear parts

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9.2 Spare parts 149



9.1 Read this first!

9.1.1 Nameplate and serial number



Fig. 53: Example of the nameplate of a machine. The details are not identical to those specified on the nameplate of your machine!



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.

9.1.2 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 Spare parts

	Name	Item number
	K-type thermocouple wire with plug	0IR4510-02
	Light dome, glass plate 60 x 60	324367
	Filter in electric cabinet	3N401
	Heating head vacuum filter	244532
	Vacuum generator	168120
	RW current measurement	363175
	Transportation lock HR 600 XL	346886U
	Heating cassette HR 600 XL	339265
	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



	Name	Item number
	Setup nozzle	0HR5520-0000K
	Heating head 60 x 60 mm, 800 W	0HR667
	Heating head 150 x 80 mm, 2000 W	0HR667L
	USB flash drive Rework	3BA00149
	Operating manual HR 600 XL	3BA00241

* Elastic silicone. Average service life 10-30 soldering processes.

As to this, please also read Chapter [Options](#) [► 22].



10 Service and maintenance

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10.1 Maintenance table

	Duration	Further information
Weekly	5 Min	10.2 Preparing maintenance work on the residual solder sucker
Weekly	5 Min	10.3.1 Check the Rework System for dirt and damage
Fortnightly	5 Min	10.4.1 Lubricating the Y axle
Quarterly	5 Min	10.5.2 Checking and draining condensate in the maintenance unit
Quarterly	15 Min	10.5.1 Visual inspection and lubrication of the X and Y axes
Annually	15 Min	10.6.1 Cleaning and lubricating the X and Y axes threaded spindles
When required	5 Min	10.7.1 Cleaning the glass plate.
When required	5 Min	10.7.2 Cleaning the underside of the optional RPC camera
When required	5 Min	10.7.3 Cleaning the light covers under the placement head
When required	5 Min	10.7.7 Memorising the distance of the heating head nozzle from the placer
When required	5 Min	10.7.8 Memorising the height positions of the heating head nozzle and the placer
When required	5 Min	10.7.9 Memorising the height position of the glass plate
When required	5 Min	10.7.10 Checking and replacing the silicone suction cup in the heating head nozzle
When required	15 Min	10.7.6 Re-memorising the positions of the heating and placer heads
When required	30 Min	10.7.4 Replacing the heating head
When required	30 Min	10.7.5 Replacing the placer head

10.2 Preparing maintenance work on the residual solder sucker



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) Close the HRSoft 2 program and switch off the Rework System via the main switch before any cleaning and maintenance work!



10.3 Maintenance work to be performed weekly

10.3.1 Check the Rework System for dirt and damage

Check the following machine parts for dirt and damage on a weekly basis. If dirt is visible, clean these parts as suggested here. Clean without scrubbing and never work with hard or sharp objects!



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) Close the HRSoft 2 program and switch off the Rework System via the main switch before any cleaning and maintenance work!
- ✓ Housing parts:
 - a) Clean all housing parts with a soft, lint-free cloth and household detergent.
 - b) Underside of the optional RPC camera:
 - c) Clean the shiny steel sheet under the RPC camera with a soft, lint-free cloth and household detergent.
- ✓ Check PCBs for plane parallelism:
 - a) If bent, correct or replace.
- ✓ Check ceramic parts in the heating head:
 - a) Check the ceramic parts on the underside of the heating head for defects and deformation, and the heating coils in the ceramic parts for defects. Replace if damaged.



10.4 Maintenance work to be performed fortnightly

10.4.1 Lubricating the Y axle

If soiled, or at least every 14 days, oil the sliding surface of the non-powered Y axis (left side).



Fig. 54: Oiling sliding surfaces

- a) Apply lubricant with corrosion protection (Klüber Contrakor Fluid H1 Spray or comparable product) using a lint-free cloth.
- b) Clean and oil the entire sliding surface with it.



10.5 Maintenance work to be performed quarterly

10.5.1 Visual inspection and lubrication of the X and Y axes

If dirty, or at least every three months, lubricate the two guide rails of the X and Y axes.

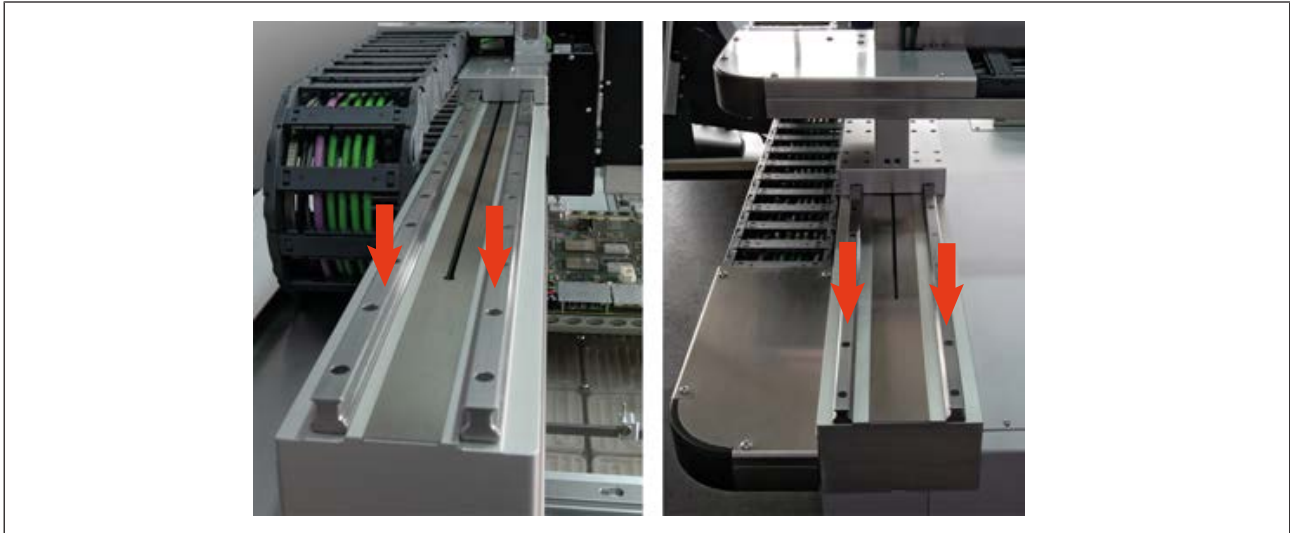


Fig. 55: Lubricating two rails for each X and Y axes



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) With the Rework System manual controller, move the X axis to the right and the Y axis all the way forward.
- b) Visual inspection of the X and Y axes Clean dirty axes with a lint-free cloth.
- c) Put little lubricating grease GL 261 or equivalent on a lint-free cloth.
- d) Lubricate the two guide rails of each axis with it.

10.5.2 Checking and draining condensate in the maintenance unit

Condensate may accumulate in the pneumatic maintenance unit. The maintenance unit is located on the back of the machine.

- a) Check whether condensate has accumulated on the lower inspection glass of the maintenance unit.



⇒ If there is condensate:

- b) Place a suitable container under the maintenance unit and drain the condensate by turning the lower screw.
- c) Tighten the drain screw again.

If a lot of condensate builds up, shorten the maintenance intervals.



10.6 Service work to be performed annually

10.6.1 Cleaning and lubricating the X and Y axes threaded spindles

Lubricate the spindles of the X axis and Y axis once a year.

To do so, you need the following tools:

2 mm Allen key, degreasing agent (e.g. brake cleaner or flux remover spray), plain bearing grease (e.g. Klüber Staburags NBU 12/300 or an identical plain bearing grease), brush to apply grease, lint-free cloth.



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) With the manual controller, move the heating head to the rear left.
- b) Press the motor stop pushbutton.

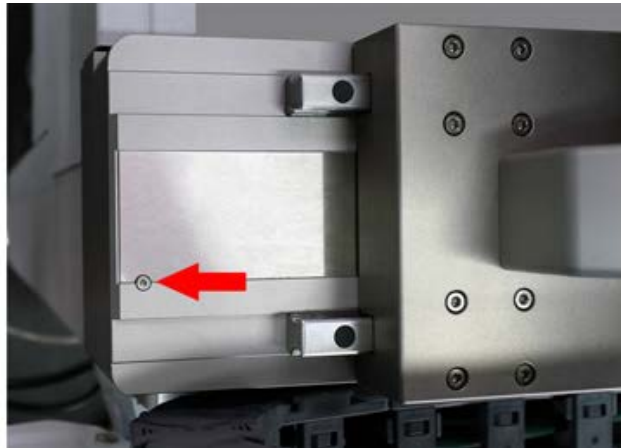


Fig. 56: Removing the safety screw

- c) With a 2 mm Allen key: remove the safety screw at the front end of the Y axis (see picture).
- d) Also remove the safety screw at the right end of the X axis.
- e) Slide the X-axis cover plate as far as possible to the left so that the internal threaded spindle is exposed.
- f) Push the X axis cover plate as far as possible to the right.
- g) If you have to take appropriate safety precautions for the degreasing agent:



DANGER

Fire hazard due to flammable vapours!

Possible personal and material damage!

- a) Comply with fire regulations!



NOTE

Handling substances hazardous to health

Personal damages in form of poisoning, irritation or allergic reactions.

- a) When working with solder paste, glues or other chemical substances, observe the safety instructions of the manufacturers.
- b) The relevant instructions can be found in the safety data sheets of the manufacturers. This also applies to the use of safety clothing and respiratory protections.

- a) Put some degreasing agent on the lint-free cloth or apply some degreasing spray onto the spindle and onto the cloth. No degreasing agent may drip down from the spindle! Abide by the degreasing agent product instructions!



⚠ WARNING

Entanglement hazard!

- a) Danger of bruising body parts or having clothes and hair entangled!
During the maintenance process, no axis may be moved without authorization!
- a) With a soaked cloth: remove any grease from the exposed area of the threaded spindle.
- b) Push both spindle covers back into the normal position.
- c) Make sure the spindle covers have been correctly placed in the normal position.
- d) Unlock the motor stop pushbutton.
- e) In tab [Rework] click on button [Profile selection].
⇒ The rework system is referenced. Keep the travel paths of the axes clear!
⇒ The X axis is at the front. The heating and placer head is on the right.
- a) Press the motor stop pushbutton again.
- b) Slide the X axis cover plate as far as possible forward so that the internal threaded spindle is exposed.
- c) Push the Y axis cover plate as far as possible to the right.



⚠ WARNING

Entanglement hazard!

- a) Danger of bruising body parts or having clothes and hair entangled!
During the maintenance process, no axis may be moved without authorization!
- a) Proceed in the same way to remove any grease from the threaded spindle.
- b) Use a brush to sparingly apply Klüber Staburags NBU 12/300 plain bearing grease or an identical product over a 12 cm length, as close as possible to the spindle nut, on the threaded spindle.
- c) Push both spindle covers back into the normal position.
- d) Make sure the spindle covers have been correctly placed in the normal position.
- e) Screw the two safety screws of the covers back on.
- f) Make sure once again that the spindle covers have been correctly placed in the normal position.
- g) Unlock the motor stop pushbutton.
- h) In tab [Rework] click on button [START/REFERENCE].



- ⇒ The rework system is referenced. Keep the travel paths of the axes clear!
- a) With the controller in HRSoft 2, move the X axis twice all the way to the left and right to distribute grease onto the spindle nut.
 - b) Likewise, move the Y axis fully backwards and forwards twice.



10.7 Service work to be performed when required

10.7.1 Cleaning the glass plate.

If the glass plate is dirty, components and pins will not be detected.

- ✓ Clean the glass plate:
 - a) allow the machine to cool down to safe temperature.
 - b) Clean the glass plate using the optical cleaning set included in the accessories (Order No. 0VSLC100).
 - ⇒ If heavily soiled with flux or solder paste:
 - c) Use a cleaning agent recommended by the flux or solder paste manufacturer.
Never work with hard or sharp objects!

10.7.2 Cleaning the underside of the optional RPC camera

If the high-gloss underside of the optional glass plate is dirty, heat will be no longer reflected.

- ✓ To clean the metal plate of the RPC camera:
 - a) allow the machine to cool down to safe temperature.
 - b) Clean the metal plate with a lint-free cloth and a commercial glass cleaner.
 - ⇒ If heavily soiled with flux or solder paste:
 - c) Use a cleaning agent recommended by the flux or solder paste manufacturer.
Never work with hard or sharp objects!

10.7.3 Cleaning the light covers under the placement head

For the placer head to be sufficiently lit, clean the light covers under the placer head if dirty.

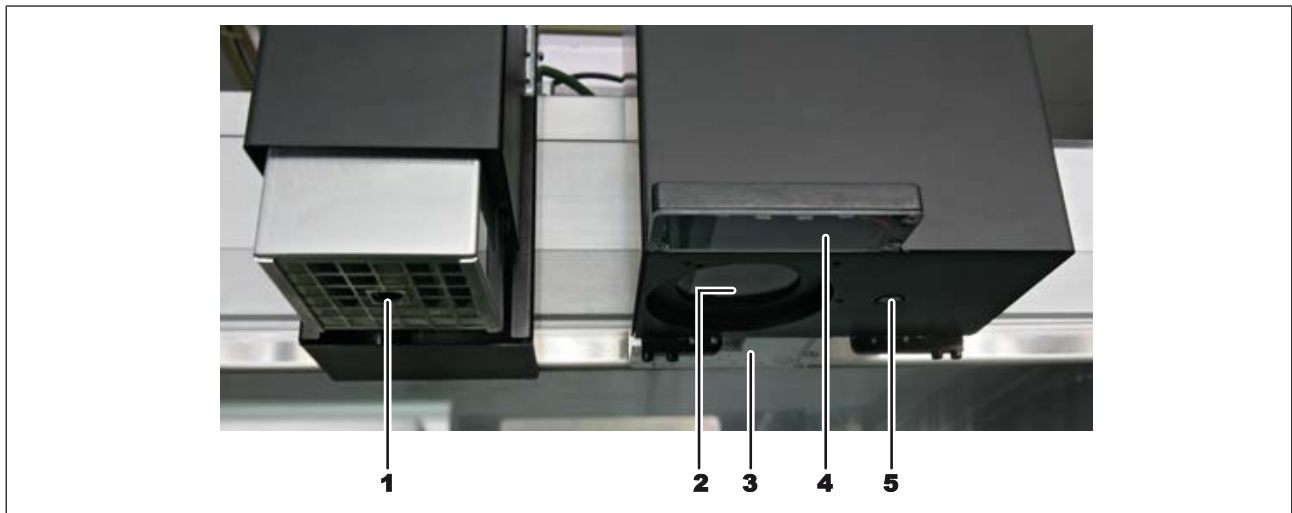


CAUTION

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!



1	Pipette	4	Front light cover
2	Camera cover	5	Pick-and-place nozzle
3	Back light cover		

✓ To clean light covers:

a) allow the machine to cool down to safe temperature.

b) Clean the three covers (2-4) with a lint-free cloth and a commercial glass cleaner.

⇒ In case of heavily soiled flux material or solder paste:

c) Use a cleaning agent recommended by the flux material or solder paste manufacturer. Never work with hard or sharp objects!



10.7.4 Replacing 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!

To remove or change the heating head, proceed as follows:

- a) Click tab [Rework]. Click button [Manual Mode].
- b) In the manual control button bar, use the button  "Move to maintenance position" to move the heating head forwards.
- c) Use the button to move the heating head all the way down. 
- d) Closing the HRSoft 2 program
- e) Switch off the Rework System.
- f) Allow the Rework System to cool down to safe temperature.

Removing the heating head

Handle the heating head very carefully.

- a) Unscrew the retaining plate of the heating head on the upper side (4) by loosening the two screws. To do so, use a 2 mm Allen key. In the process, hold the retaining plate in such a way that it cannot fall into the heating head.

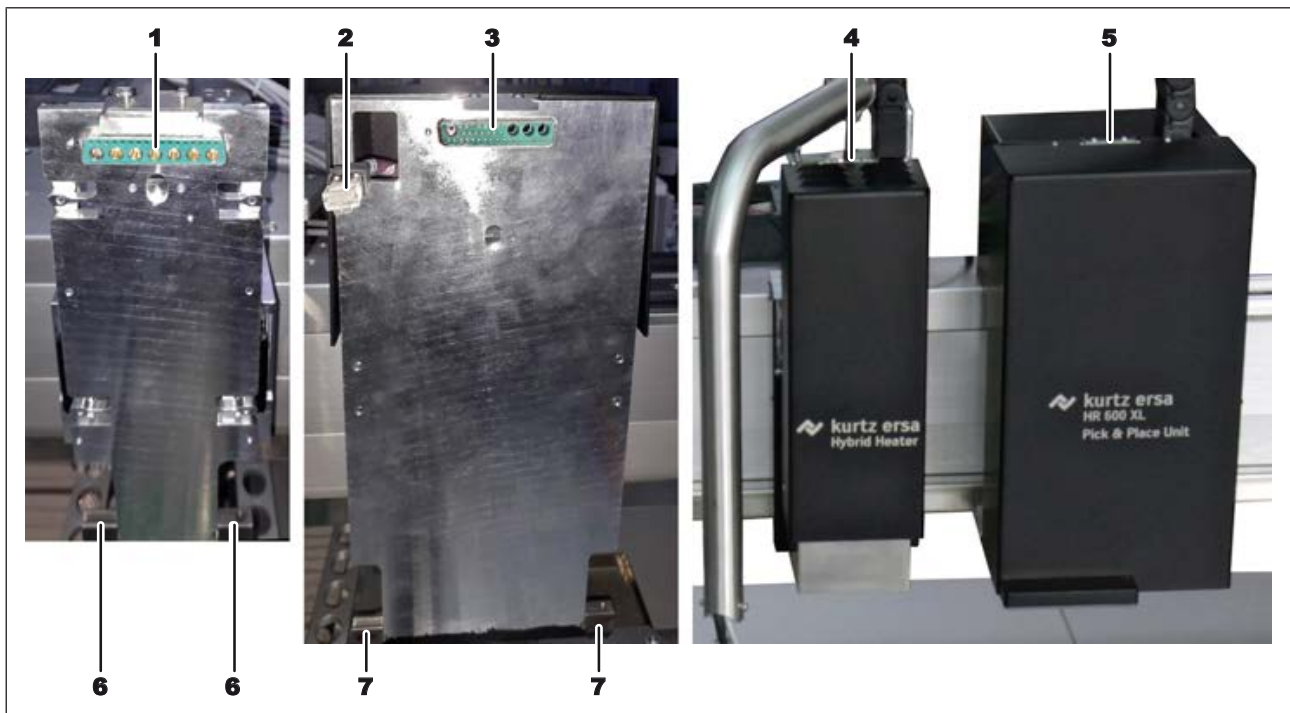


Fig. 57: Example images: Heating head holder (on the very left) and placer head holder. Right: Heating and placer heads screwed on.



- b) Hold the heating head with two hands and pull the upper part of the heating head forward until the plug (1) is released. The lower part of the heating head will remain on the bracing supports (6).
- c) Remove the heating head.

Fitting the heating head

- a) Below, place the heating head on its bracing supports (6) and then, above, press onto the connector strip (1).
- b) Hold the heating head and screw the retaining plate of the heating head onto the top (4) with the two screws. In the process, hold the retaining plate in such a way that it cannot fall into the heating head.
- c) Switch on the Rework system.
- d) Start the HRSoft 2 program.

Re-memorising the positions of the heating head and performing coordinate transformation

- Perform the procedure [Re-memorising the positions of the heating and placer heads]. As to this, please read Chapter [Re-memorising the positions of the heating and placer heads](#) [▶ 167].
- Perform the [Device coordinates transformation] operation. As to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 118].

Thereafter, the Rework System will be ready for use again.



10.7.5 Replacing the placer 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!



To remove or change the placer head, proceed as follows:

- a) Click tab [Rework]. Click button [Manual Mode].
- b) In the button bar of the manual controller, use the arrow buttons to move the placer head forward.
- c) Closing the HRSoft 2 program
- d) Switch off the Rework System.
- e) Allow the Rework System to cool down to safe temperature.

Removing the placer head

Handle the placer head very carefully.

- a) Unscrew the retaining plate of the placer head on the upper side (5) by loosening the two screws. To do so, use a 2 mm Allen key. In the process, hold the retaining plate in such a way that it cannot fall into the placer head

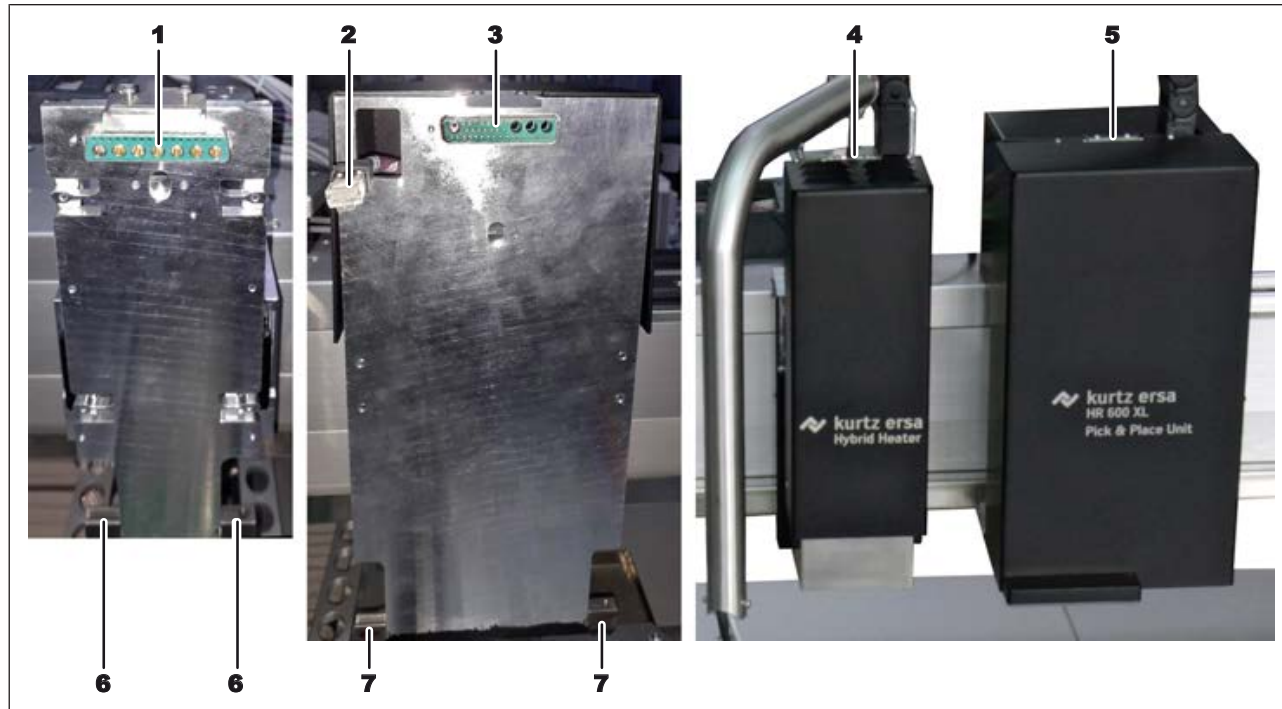


Fig. 58: Example images: Heating head holder (left) and placer head holder. Right: Heating and placer heads screwed on.

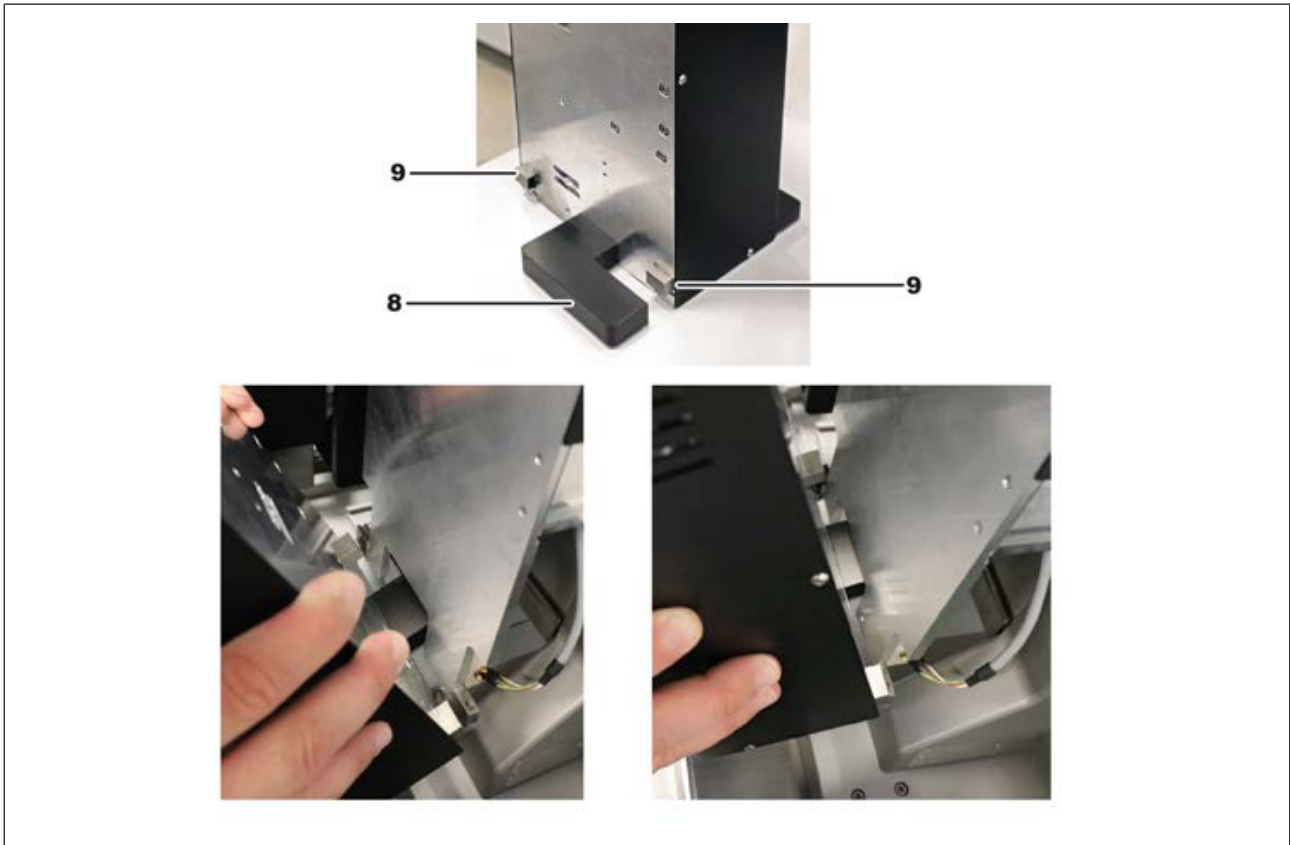
- b) Hold the placer head with two hands and pull the upper part of the placer head forward until the plug (3) is released. The lower part of the heating head will remain on the bracing supports (7).



- c) Continue to hold the heating head and disconnect the RJ plug (2). To do so, push down the safety lever of the plug.
- d) Lift the placer head slightly from the bracing supports (7) and inspect the placer head from the uppermost side to see how to finally remove the heating head from its holder. Also see the following picture.
- e) Carefully pull out the lighting (8) and remove the placer head.

Fitting the placer head

- a) Carefully run the lighting (8) into the recess of the placer head holder (bottom left image) and then place the supporting lugs (9) on the bracing supports (7).



- b) Hold the placer head and insert the RJ plug (2) into the socket on the placer head. The plug lock must click into place.
- c) Press the upper part of the heating head to the appliance. In so doing, the placer head is pressed onto the plug (3).
- d) Hold the placer head and screw the retaining plate of the placer head onto the top (5) with two screws. In the process, hold the retaining plate in such a way that it cannot fall into the placer head
- e) Switch on the Rework system.
- f) Start the HRSoft 2 program.

Re-memorising the positions of the placer head and performing coordinate transformation

- Perform the procedure [Re-memorising the positions of the heating and placer heads]. As to this, please read Chapter Re-memorising the positions of the heating and placer heads [▶ 167].
- Perform the [Device coordinates transformation] operation. As to this, please read Chapter The [Start coordinate transformation] button [▶ 118].



Thereafter, the Rework System will be ready for use again.



10.7.6 Re-memorising the positions of the heating and placer heads

The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

The functions described here may only be carried out if new positions are to be assigned to the placer system of the Rework System because:

- the heating head has been replaced (with regard to this, please read Chapter [Replacing the heating head](#) [► 162])
- the placer head has been replaced (with regard to this, please read Chapter [Replacing the placer head](#) [► 164])
- If positions within the Rework System cannot be approached exactly,
- the Rework System has been relocated.

Before any axis movement, the user must check and rule out that the optional RPC camera collides with components on the PCB, or with thermocouples and cables. A tilted RPC camera will increase this danger!



⚠ 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!

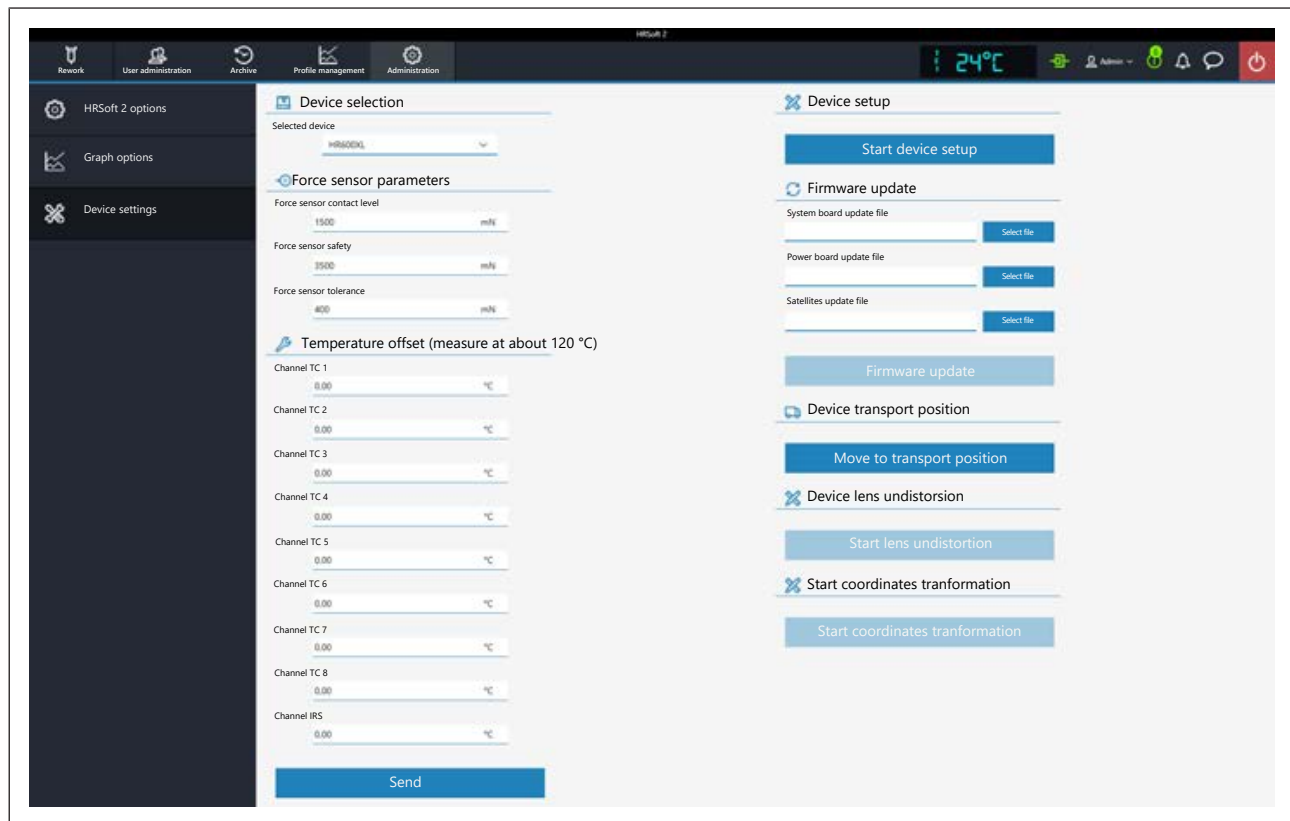


Fig. 59: Calibration nozzles

Memorising the positions of the heating and placer heads on the Rework System

The process is performed via a wizard. You will need

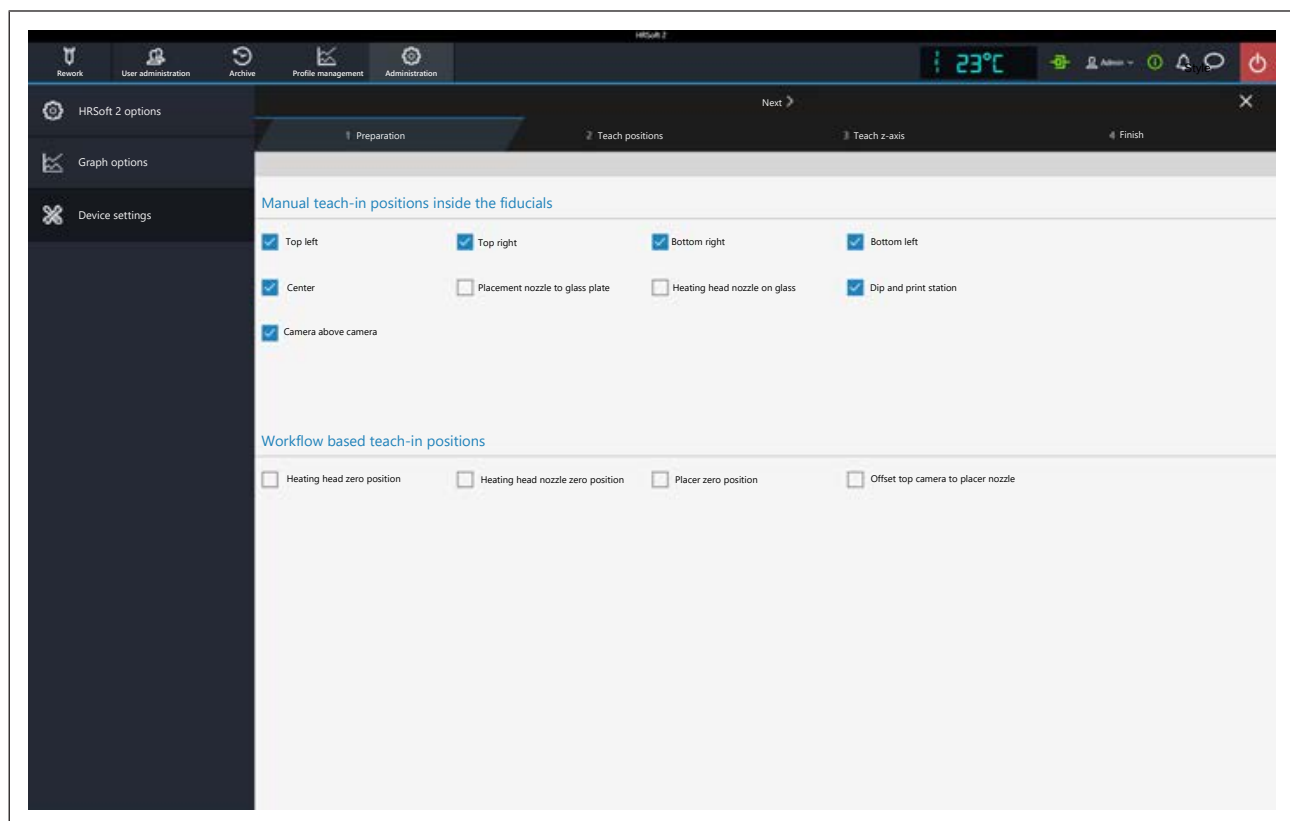
- two calibration nozzles
 - If the position of the Dip & Print station is to be memorised: a dip stencil frame with a dip stencil for the smallest possible component.
- a) In the [Administration] tab, select the [Device settings] dialog box.



b) Click on the [Start device setup] button.

⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.

⇒ The unit will first perform a reference move.



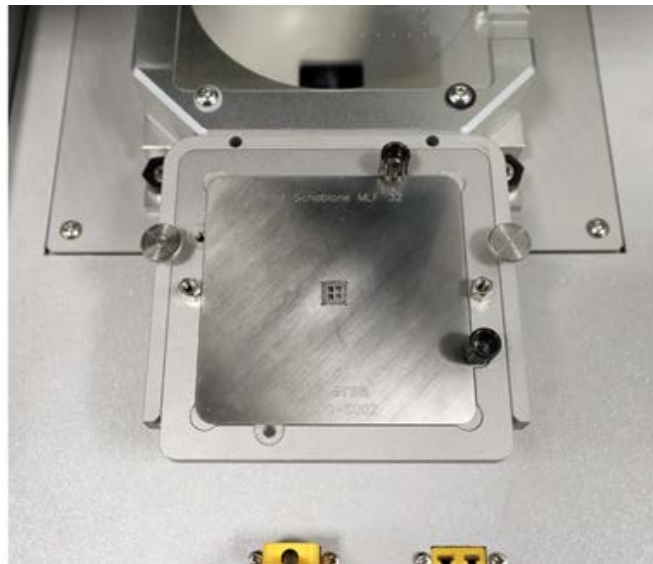


To reassign positions on the glass plate based on fiducials, the following functions can be selected:

- Select the five functions [Top left] to [Center] to re-memorise the positions of the heads on the glass plate.
 - Select the [Camera above camera] function to memorise the position of the placer camera over the glass plate.
 - The [Placement nozzle to glass plate] and [Heating head nozzle on glass] functions will both memorise the height position of the glass plate for the nozzles.
 - Select the [Dip and print station] function to re-memorise the position of the pick-and-place nozzle on the Dip & Print station.
- a) Select the functions you want to perform.

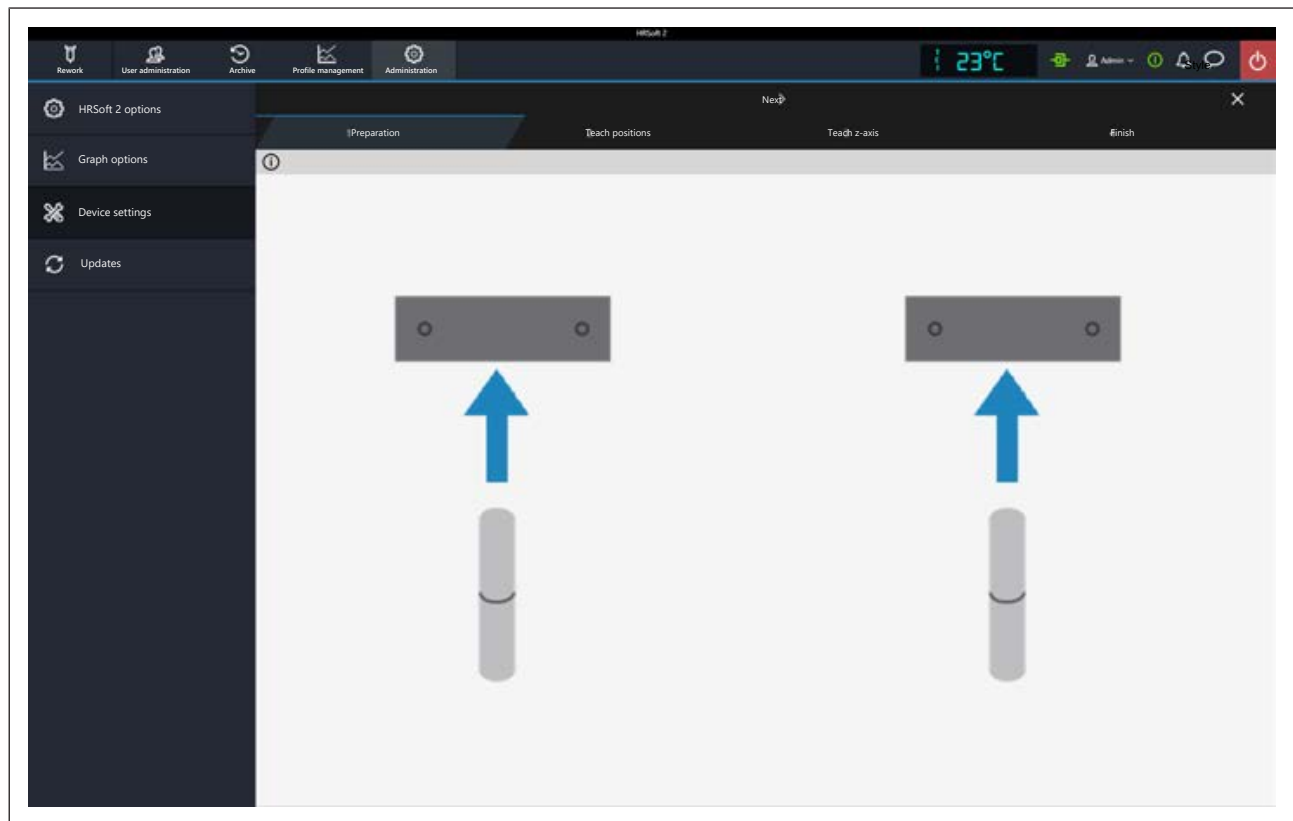
If the [Dip and print station] function is to be performed:

- a) use a dip stencil for the smallest possible component in the template frame.
- b) Fix the template frame by slightly tightening the black knurled screws.
- c) Insert the dip stencil into the framed stencil (see picture below) and slightly screw it on the stencil with two silver retaining screws.

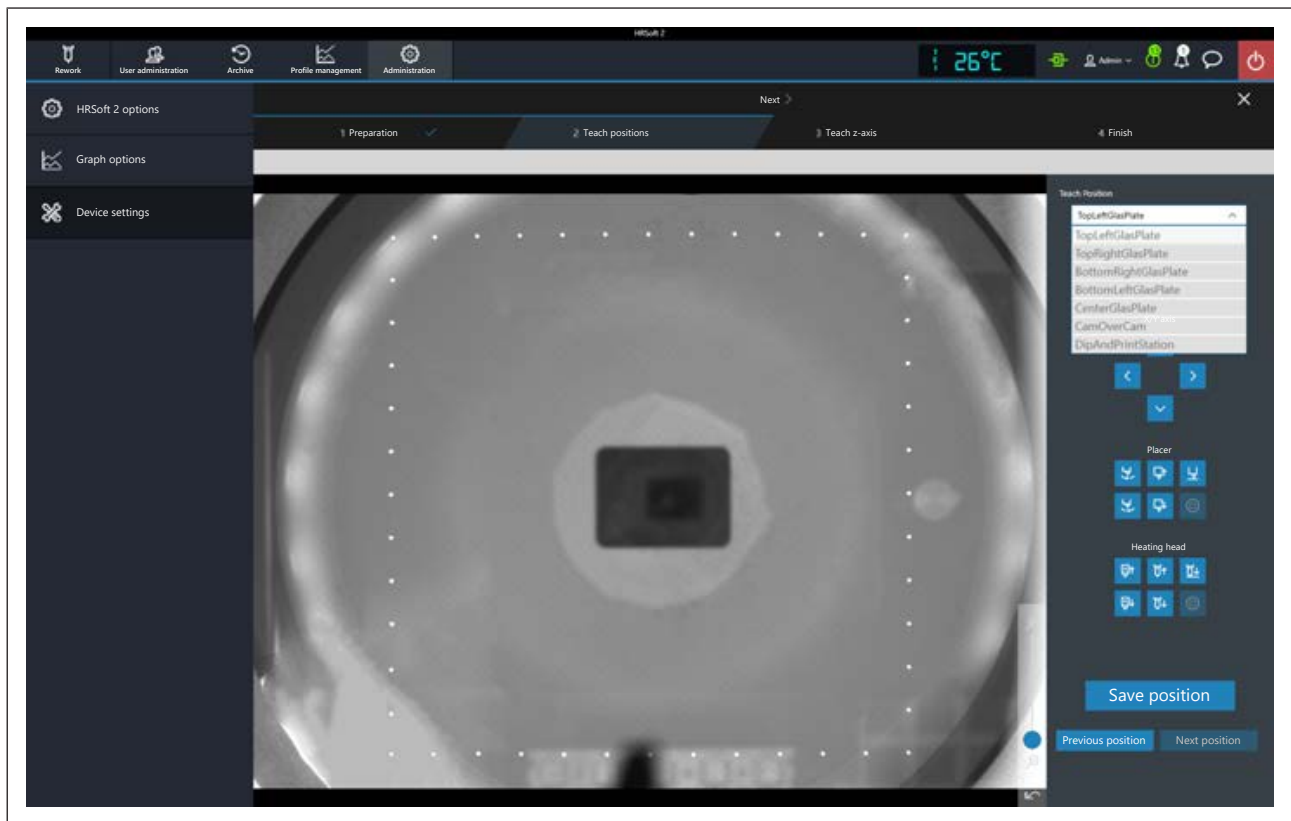


⇒ The dip stencil has been prepared for position determination.

- a) Click on the [Next] button to switch to the next working step.



- ⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles please also read Chapter Adjusting the sizes of the heating head nozzle and placer to components [► 122].
- ⇒ The heating head nozzle and placer were moved down a bit.
- b) Screw a calibration nozzle onto both the heating head nozzle and the placer.
- c) Click on the [Next] button to switch to the next working step.



- ⇒ The glass plate camera image will be shown. On the right there is the [Memorise Position] drop-down menu and the buttons to control motors.
- ⇒ The first function to be performed is indicated in the [Memorise Position] drop-down menu. In the example, [Top left] (top left glass plate) has been selected. This top left position on the glass plate should now be approached and saved by you via the placer with the screwed calibration nozzle (see next picture).
You will be guided through the selected functions in succession by the program wizard.

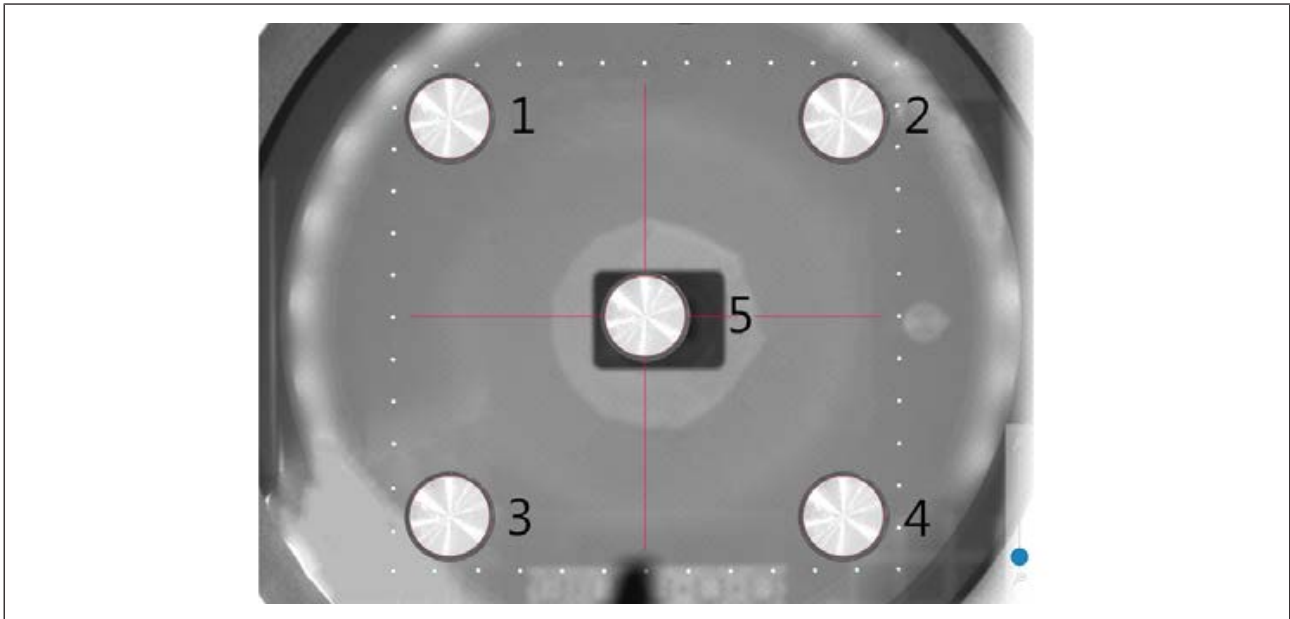
d) Use the arrow buttons to move the placer head over the glass plate.

e) To detect the position of the calibration nozzle above the glass plate on the

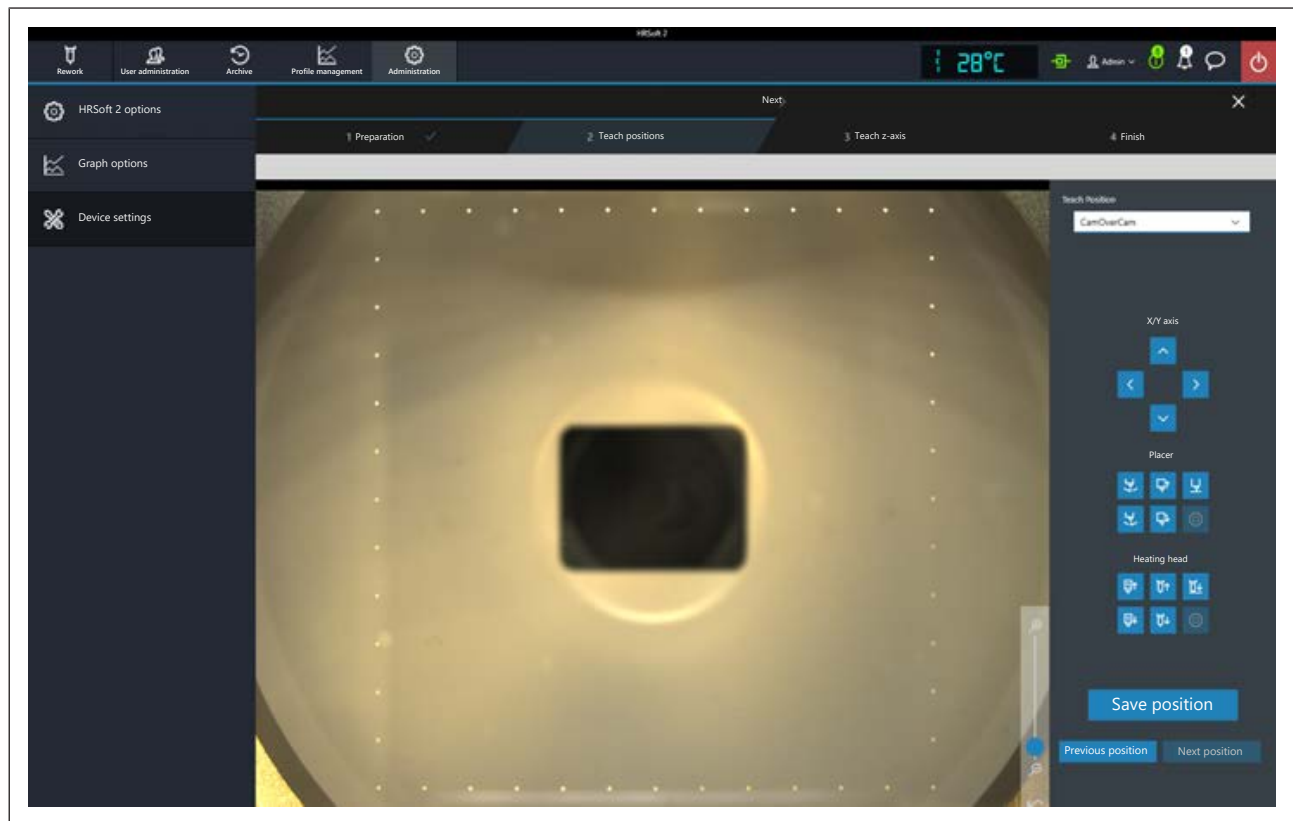


camera image, lower the placer onto the glass plate. To do so, use the button.

f) When the calibration nozzle comes into contact with the glass plate: use the arrow buttons to move the calibration nozzle to the upper left corner of the square forming the white fiducial points. Trace the position and distance to the fiducial points as in the following figure on position no. (1).



- g) Click on the [Save position] button.
 - ⇒ The pipette position [Top left] (1) has been saved.
- h) Click on the [Next position] button.
 - ⇒ The next menu item [Top right] has now been selected in the [Memorise Position] drop-down menu.
- i) Use the arrow buttons to move the calibration nozzle to the upper right corner of the fiducial square - see position (2) in the picture.
- j) Click on the [Save position] button.
 - ⇒ The pipette position (2) has been saved.
- k) Proceed to set the other pipette positions [Bottom right] (glass plate bottom right) (3), [Bottom left] (glass plate lower left) (4) and [Center] (glass plate centre) (5) as well. For the centre (5) do not use the black rectangle for orientation, but rather the middle points of the fiducial square - see crosshair in the picture above.
- l) Move the placer all the way up. To do so, use the  button.
 - ⇒ The position of the heads on the glass plate has been memorised.
- a) To perform the [Camera above camera] function:



- b) Use the arrow buttons to move the camera image exactly to the middle of the window, so that the square forming the white fiducial points will cover all directions in the centre of the image - see picture. If the image is too bright to detect the fiducial points, cover the LED lighting on the placer head with your hand.
- c) Click on the [Save position] button.
- d) Position [Camera above camera] (1) has been saved.
- e) Click on the [Next position] button.
⇒ The position of the placer camera on the glass plate has been memorised.

To perform the [Dip and print station] function:

- a) Use the arrow buttons to move the placer head over the Dip & Print stencil.
- b) Move the placer all the way down. To do so, use the  button.



- c) Use the arrow buttons to move the pipette over the dip stencil and as exactly as possible to the centre thereof - see picture. To do so, check the pipette several times from the front and from the side to correct its position.
 - d) Click on the [Save position] button.
 - e) Move the placer all the way up. To do so, use the  button.
 - f) Click on the [Next] button to end the [Start device setup] function.
 - g) Click on the [Next] button to exit the program wizard.
- ⇒ The Dip & Print station position has been memorised.

At the end of the setup process:

- a) unscrew the calibration nozzles again.

If positioning problems continue to show up after this set-up, perform the [Start coordinates transformation] function. With regard to this, please read Chapter [The \[Start coordinate transformation\] button](#) [► 118].



10.7.7 Memorising the distance of the heating head nozzle from the placer

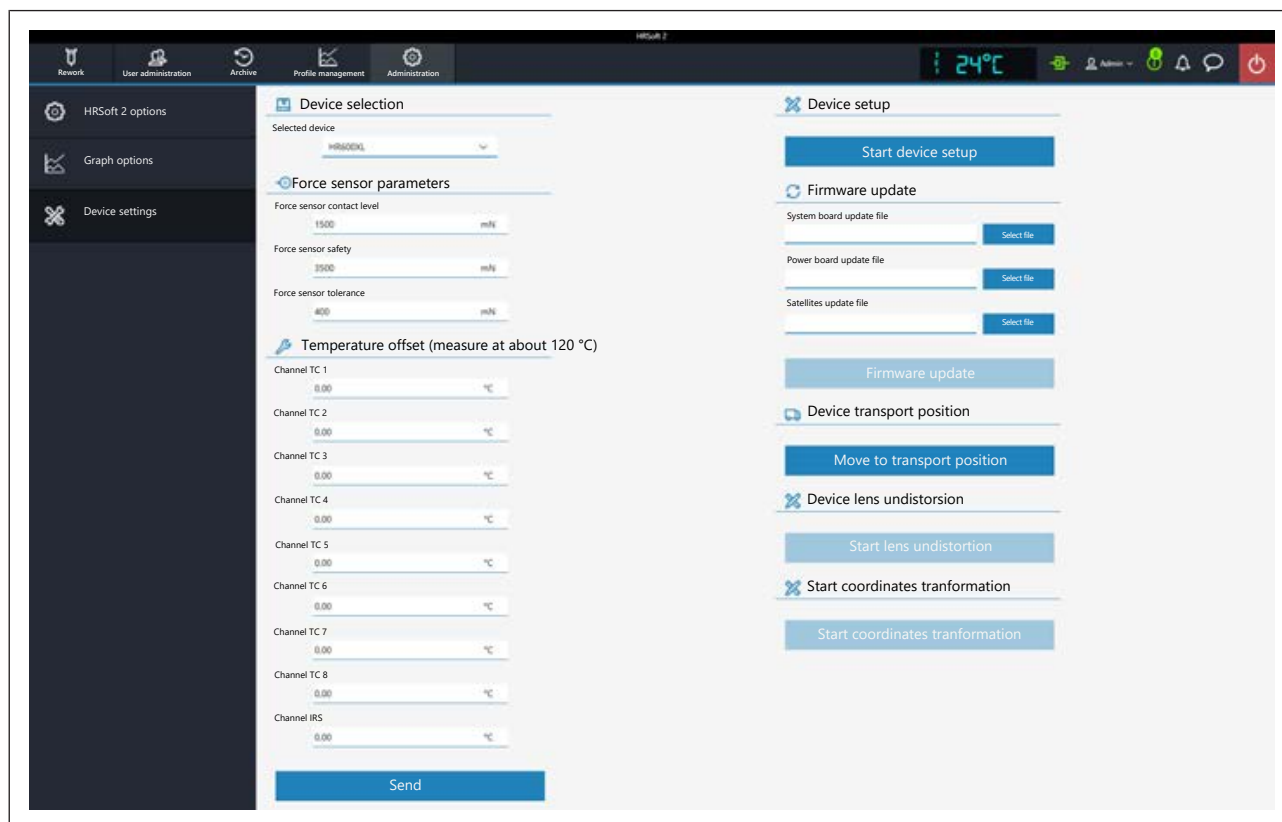
The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

The process is performed via a wizard. Two calibration nozzles are needed.

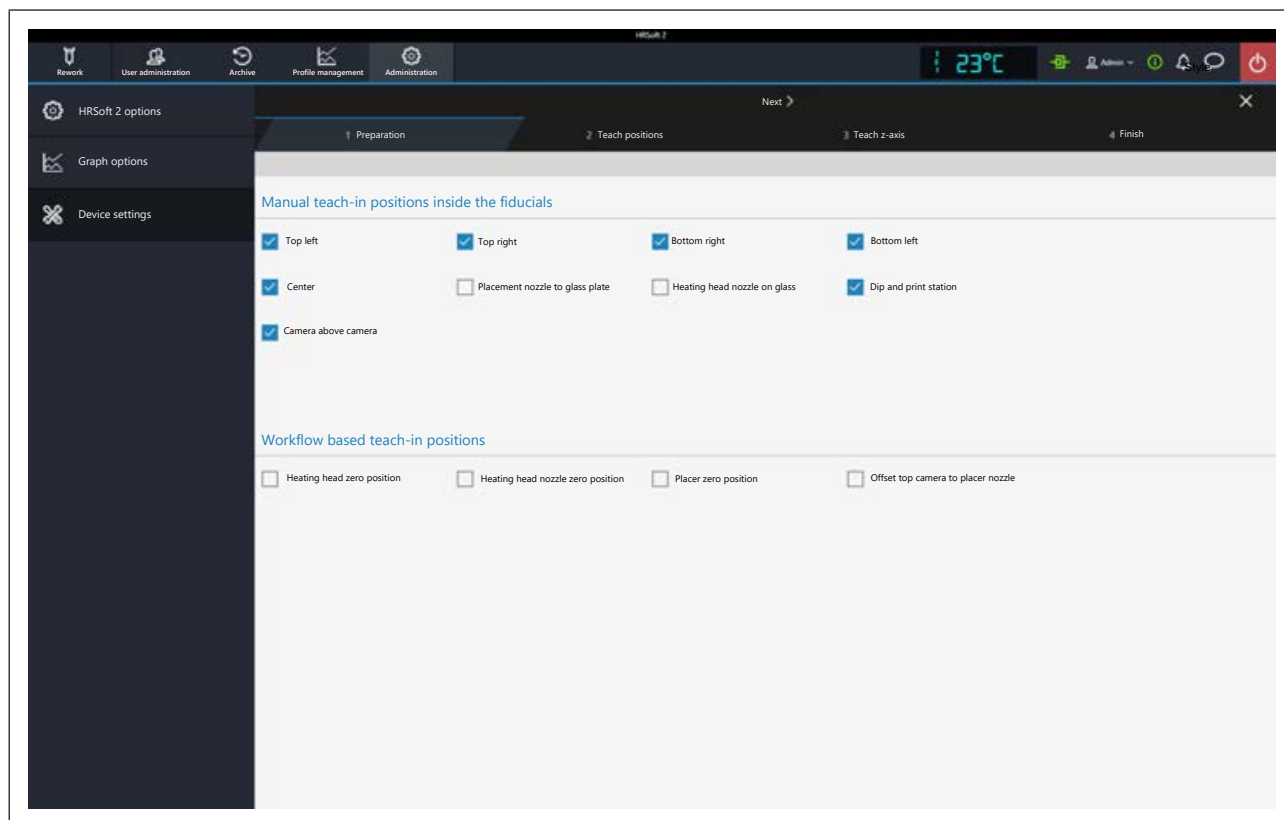
- a) In the [Administration] tab, select the [Device settings] dialog box.



Fig. 60: Calibration nozzles

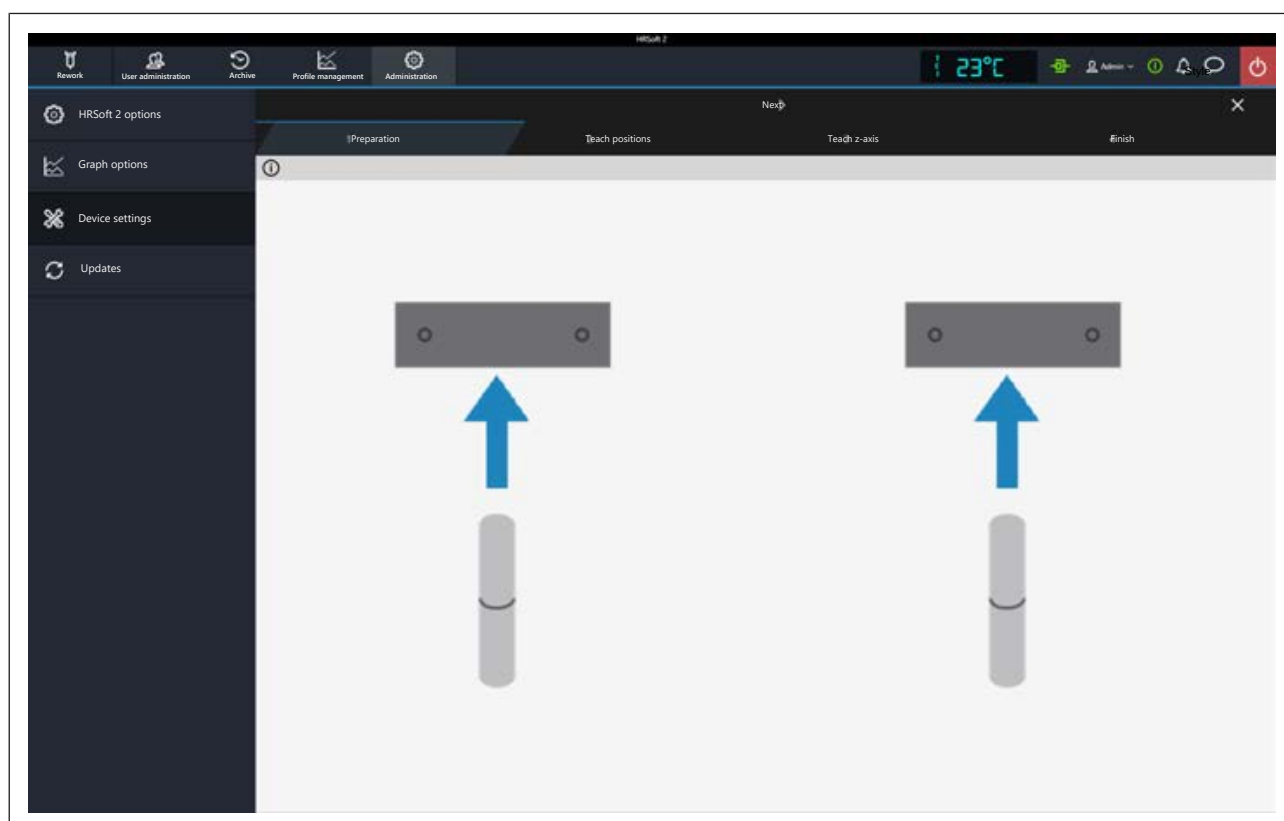


- ⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.



To redefine the distance of the heating head nozzle from the placer, three functions are selected:

- Select the [Heating head nozzle on glass], [Placement nozzle to glass plate] and [Offset top camera to placer nozzle].
- Click on the [Next] button to switch to the next working step.
⇒ The unit will first perform a reference move.



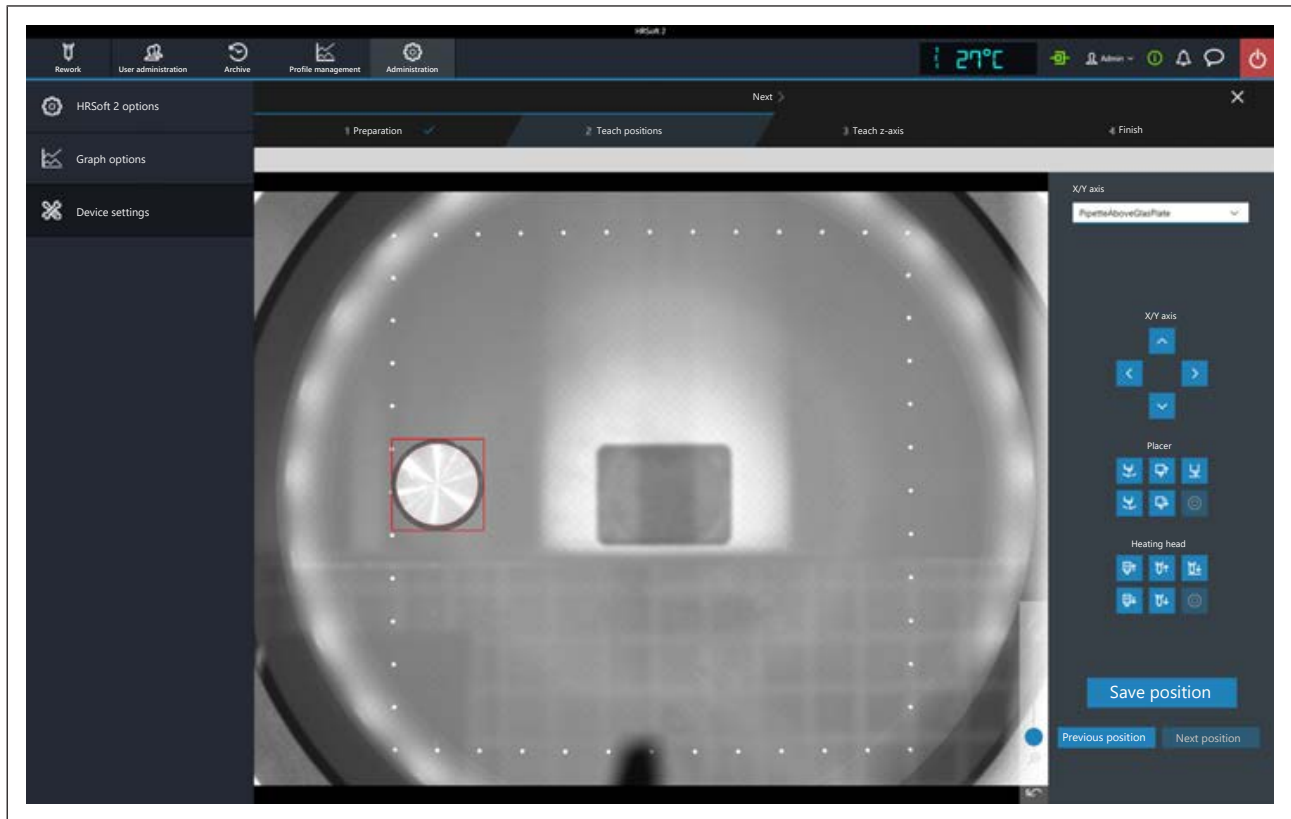


⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles, please also read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [▶ 122].

⇒ The heating head nozzle and placer were moved down a bit.

c) Screw a calibration nozzle onto both the heating head nozzle and the placer.

d) Click on the [Next] button to switch to the next working step.



⇒ The glass plate camera image with a red square inside will be shown. On the right there is the [Memorise Position] drop-down menu and the buttons to control motors.

⇒ The first function to be performed is indicated in the [Memorise Position] drop-down menu. [Heating head nozzle on glass]. The position in the red square on the glass plate should now be approached and saved by you via the placer with the screwed calibration nozzle.

e) Use the arrow buttons to move the placer head over the glass plate.

f) To detect the position of the placer above the glass plate on the camera image,



lower the placer onto the glass plate. To do so, use the button.

g) When the calibration nozzle comes into contact with the glass plate: use the arrow buttons to move the calibration nozzle into the red square - see picture above.

h) Click on the [Save position] button.

⇒ The [Heating head nozzle on glass] pipette position has been saved.

i) Click on the [Next position] button.

⇒ The next menu item [Placement nozzle to glass plate] has now been selected in the [Memorise Position] drop-down menu.

j) Use the arrow buttons to move the heating head over the glass plate.



- k) Swivel the optional RPC camera to the side so that no collision will occur with parts of the Rework System if the heating head is lowered.
- l) Move the heating head all the way down so that the calibration nozzle can approach the glass plate. To do so, use the  button.
- m) To detect the position of the calibration nozzle above the glass plate on the camera image, lower the heating head nozzle onto the glass plate. To do so, use the  button.
- n) When the heating head nozzle comes into contact with the glass plate: use the arrow buttons to move the heating head nozzle into the red square - see picture above.
- o) Click on the [Save position] button.
 - ⇒ The [Placement nozzle to glass plate] pipette position has been saved.
- p) Move the heating head nozzle all the way up. To do so, use the  button.
- q) Click on the [Next position] button.
 - ⇒ The next menu item [Offset top camera to placer nozzle] has now been selected in the [Memorise Position] drop-down menu.
- r) Use the arrow buttons to move the placer head over the glass plate.
- s) Lower the placer onto the glass plate. To do so, use the  button.
- t) If the calibration nozzle has come into contact with the glass plate, click on the [Save position] button.
 - ⇒ The [Offset top camera to placer nozzle] pipette height has been saved.
- u) Click on the [Next] button to exit the program wizard.
 - ⇒ The distance of the heating head nozzle from the placer has been memorised.
- a) Then unscrew the calibration nozzles again.



10.7.8 Memorising the height positions of the heating head nozzle and the placer

The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

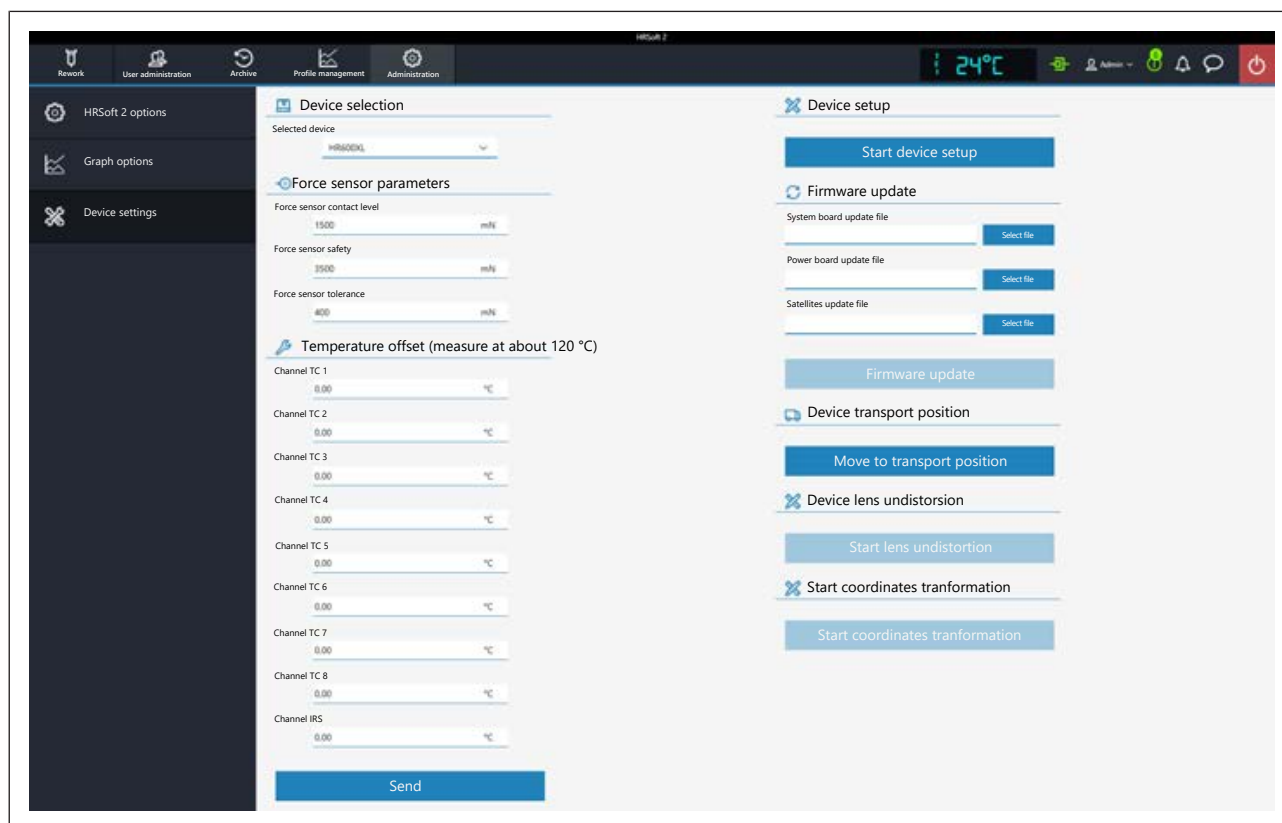
The process is performed via a wizard. You will need

- two calibration nozzles
- a stable, flat plate to be held under the heads.

a) In the [Administration] tab, select the [Device settings] dialog box.

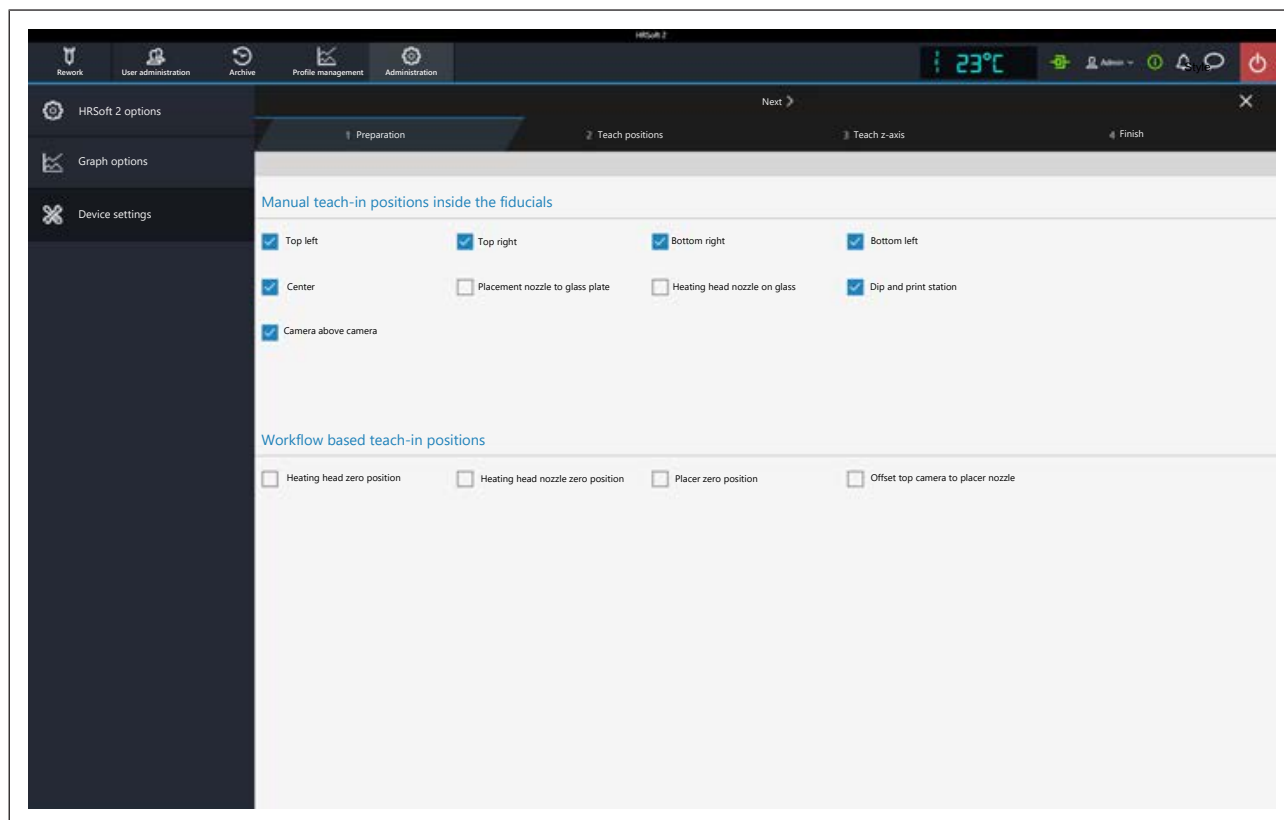


Fig. 61: Calibration nozzles



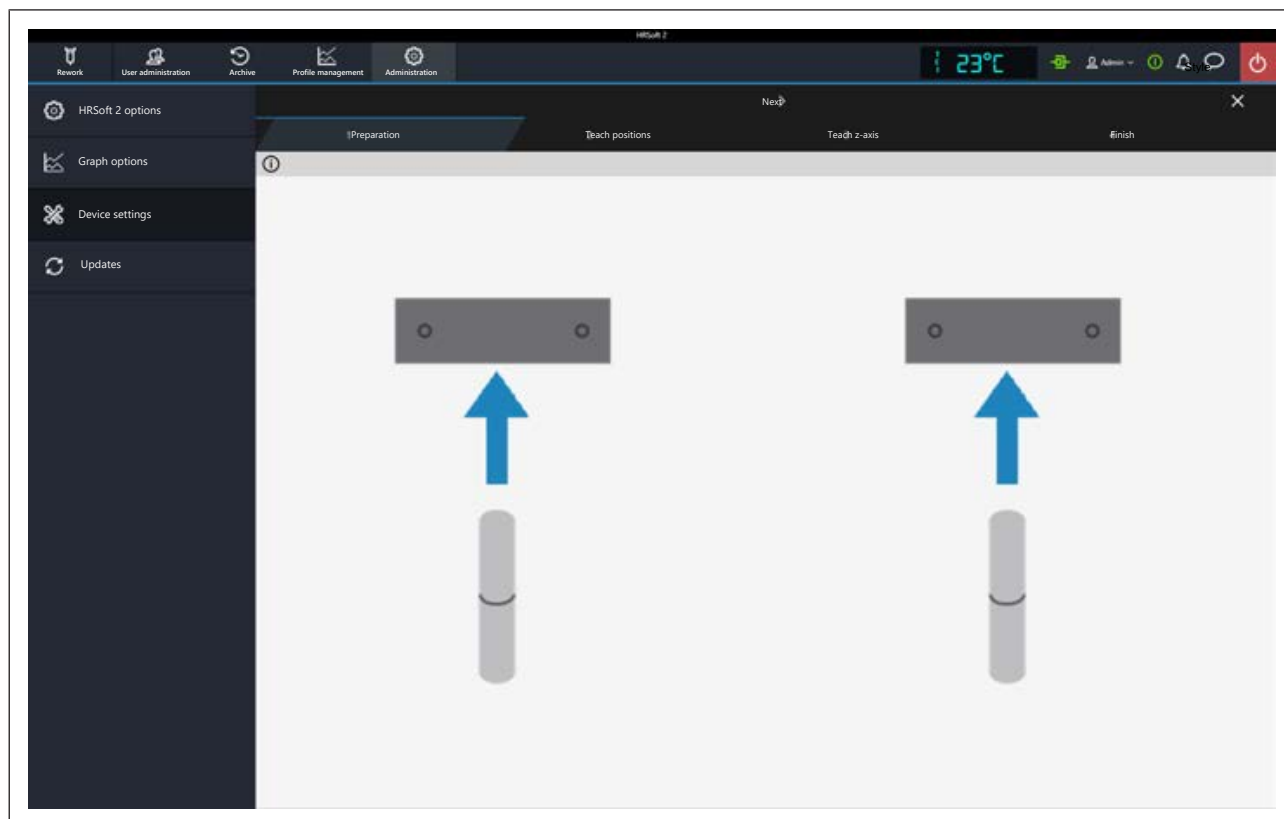
b) Click on the [Start device setup] button.

⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.



To redefine the heating head nozzle and the placer, two functions are selected:

- a) Select the two [Heating head zero position] and [Heating head nozzle zero position] functions.
 - b) Click on the [Next] button to switch to the next working step.
- ⇒ The unit will first perform a reference move.



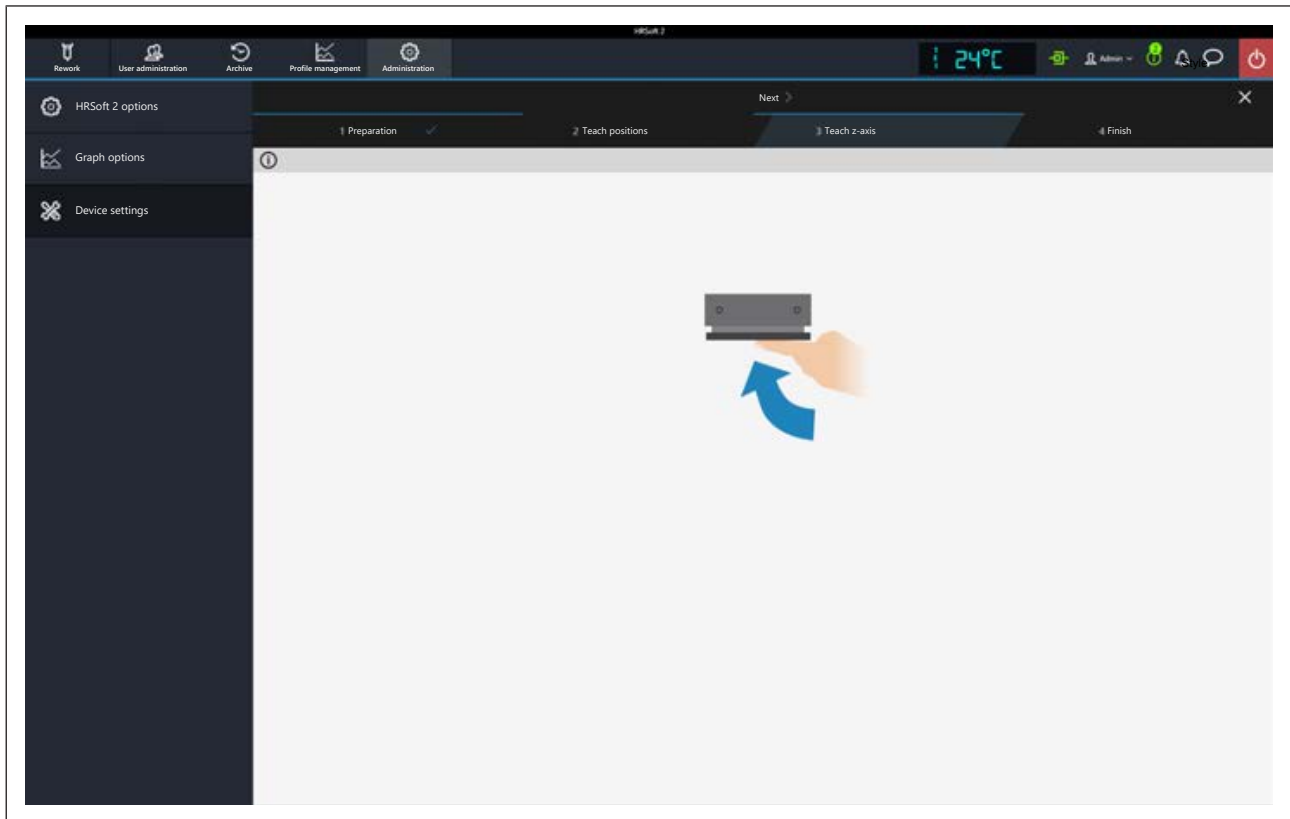


⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles, please also read Chapter Adjusting the sizes of the heating head nozzle and placer to components [▶ 122].

⇒ The heating head nozzle and placer were moved down a bit.

c) Screw a calibration nozzle onto both the heating head nozzle and the placer.

d) Click on the [Next] button to switch to the next working step.



e) Hold a stable, flat plate under the heating head. Hold the plate exactly horizontal and flush with the underside of the heating element.

f) Continue to hold the plate and in doing so click on the [Next] button to switch to the next working step.

⇒ The calibration nozzle comes into contact with the plate and memorises the nozzle height.

g) Remove the plate and switch to the next working step.

h) Hold the plate under the placer head. Hold the plate exactly horizontal and flush with the placer underside.

i) Continue to hold the plate and in doing so click on the [Next] button to switch to the next working step.

⇒ The calibration nozzle comes into contact with the plate and memorises the pipette height.

j) Remove the plate and switch to the next working step.

k) Click on the [Next] button to exit the program wizard.

⇒ The height positions of the heating head nozzle and the placer have been memorised.

a) Then unscrew the calibration nozzles again.



10.7.9 Memorising the height position of the glass plate

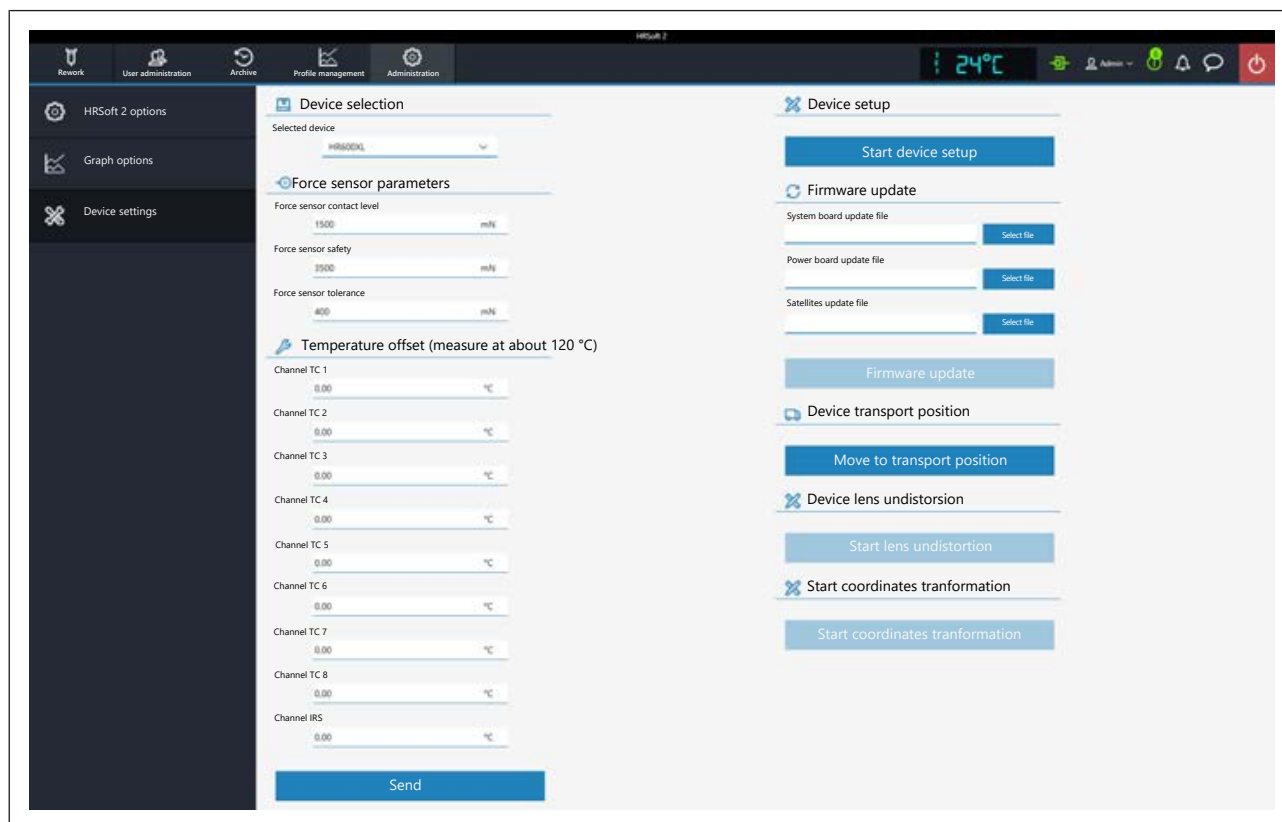
The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

The process is performed via a wizard. Two calibration nozzles are needed.

- a) In the [Administration] tab, select the [Device settings] dialog box.

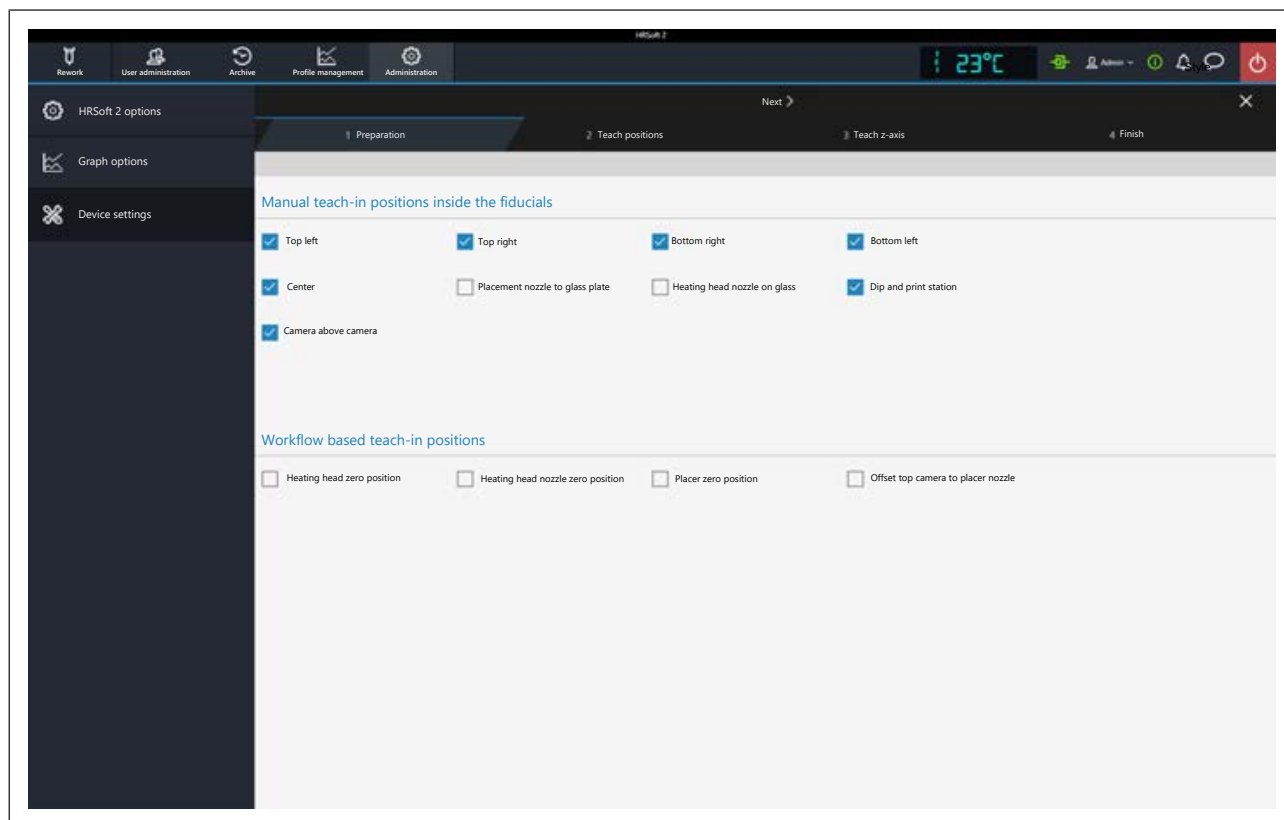


Fig. 62: Calibration nozzles



- b) Click on the [Start device setup] button.

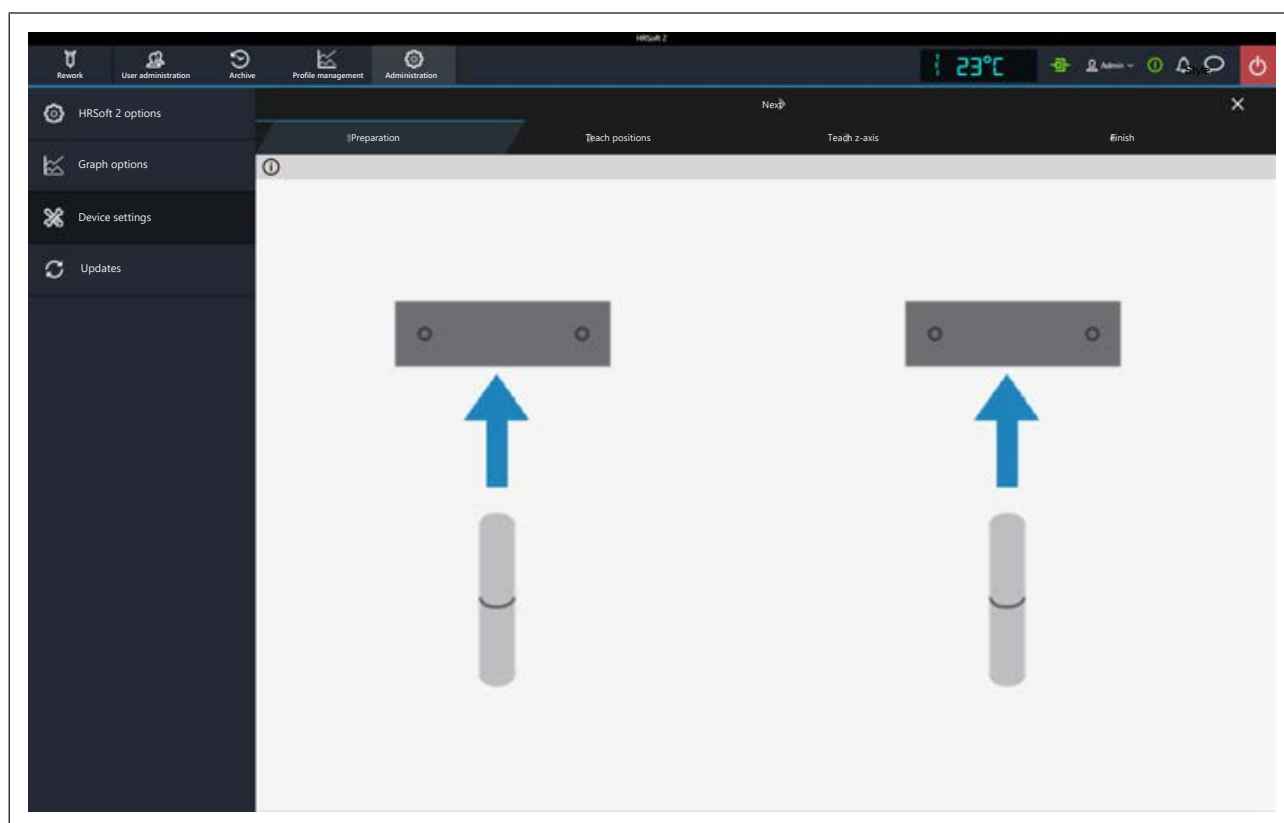
⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.



c) Select the [Offset top camera to placer nozzle] [Placer Head To Camera] function.

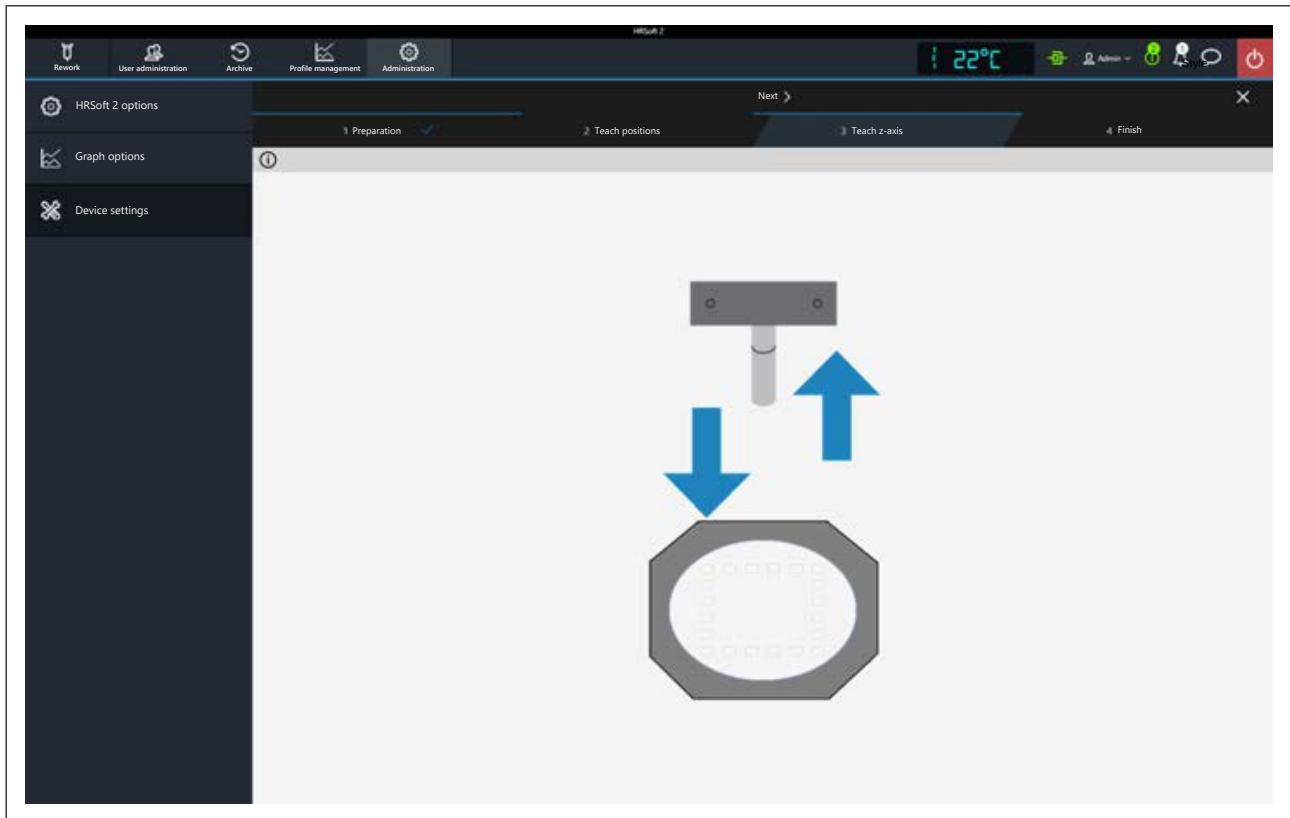
d) Click on the [Next] button to switch to the next working step.

⇒ The unit will first perform a reference move.





- ⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles, please also read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [▶ 122].
- ⇒ The heating head nozzle and placer were moved down a bit.
- e) Screw a calibration nozzle onto both the heating head nozzle and the placer.
- f) Click on the [Next] button to switch to the next working step.
 - ⇒ The placer head moves over the glass plate.
- g) Click on the [Next] button to switch to the next working step.



- ⇒ The placer will come into contact with the glass plate.
- h) Click on the [Next] button to exit the program wizard.
- ⇒ The glass plate height position has been memorised.
- a) Then unscrew the calibration nozzles again.



10.7.10 Checking and replacing the silicone suction cup in the heating head nozzle

The silicone suction cup on the heating head nozzle ensures components to be securely accommodated. For this purpose, the silicone suction cup must be clean, flat, wear-resistant and non-porous.

- ✓ If the suction cup is dragged:
 - a) allow the machine to cool down to safe temperature.
 - b) Clean with a soft, lint-free cloth and a mild detergent.
 - ⇒ In case of heavily soiled flux material or solder paste:
 - c) do not use any solvent-based cleaner or flux material remover. Instead, replace the silicone suction cup. See description below.
- ✓ Is the silicone suction cup is not flat or is worn or porous:
 - a) replace the silicone suction cup.

Replacing the silicone suction cup

Silicone suction cups are available as options and included in the corresponding list of options, see [Options](#) [► 22].

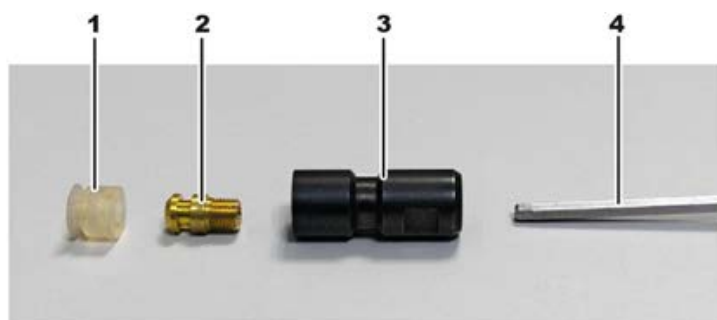
For a description of how to unscrew the heating head nozzle, read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [► 122].

- a) allow the machine to cool down to safe temperature.



Fig. 63: Example: Heating head nozzle 5 mm left, heating head nozzle 10 mm right

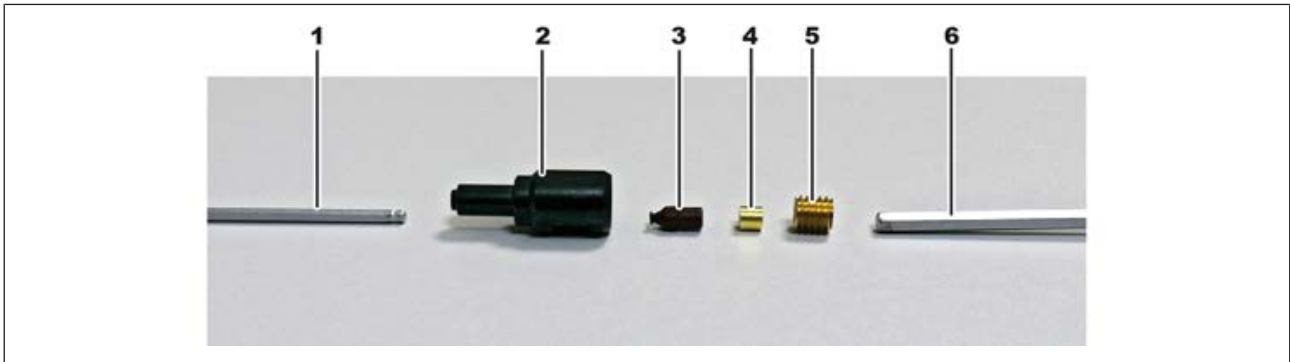
Replacing a large silicone suction cup e.g. in a 10 mm heating head nozzle
Unscrew the heating head nozzle (3).



- a) Unscrew the brass screw (2) with an Allen key no. 2.5 (4).
- b) Remove the old silicone suction cup (1) from the brass screw.
- c) Place the new silicone suction cup on the brass screw.
- d) Screw the brass screw back into the heating head nozzle.
- e) Screw the heating head nozzle back to the heating head.



Replacing a small silicone suction cup e.g. in a 5 mm heating head nozzle
Unscrew the heating head nozzle (2).



- a) Unscrew the brass screw (5) with an Allen key no. 3 (6).
- b) Gently pry out the spacer (4), it can easily be lost.
- c) Using an Allen key no. 2 (1), press the silicone suction cup (3) out from the front through the heater head nozzle.
- d) Drop the new silicone suction cup into the heating head nozzle from the rear and align it to the front.
- e) Drop the spacer into the heating head nozzle and centrally align it.
- f) Screw on the brass screw first by hand and then with an Allen key.
- g) Screw the heating head nozzle back to the heating head.



10.8 Performing a HRSoft 2 update

This chapter describes how to update an installed HRSoft 2 version to a newer version.

- a) The installed version number is shown by the Rework System in the [HRSoft 2 options] dialog under the [Administration] tab.

Download the update package

- a) from Ersas website www.ersa.com Select the "Login" function from the drop-down menu at the top left.
- b) Log in with your e-mail address and password for the members area.
- c) Go to 6.2.3 (Software / Rework) HRSoft 2.
- d) Compare the HRSoft 2 version number offered with the installed version.
- e) Download the software package and save it on the Rework system PC under: C:\ProgramData\ErsaGmbH\HRSoft 2\Firmware.
⇒ The "ProgramData" directory is only visible if the "Indicators/Hidden Items" function is activated in File Explorer.
- f) Extract the ZIP file in this directory.
- g) Open and read the "HRSoft2_Liesmich" file.

Backing up the HRSoft 2 database

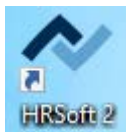
- a) Go to the downloaded file "databaseBackup.bat" in the directory \HRSoft2_Setup_v2-1-5-2\Tools\Bat.
- b) Start "databaseBackup.bat".
⇒ A backup copy of the existing HRSoft 2 database is created.
- c) Make sure that the backed up database is located in directory C:\ProgramData\Ersa GmbH\HRSoft 2\DB_Backups.

Uninstalling the outdated HRSoft 2 version

- a) Switch off the Rework System.
- b) Click the Windows Start button once and enter "Programs" in the input field.
- c) Click on "Add or remove programs" in the Windows Start menu.
- d) Select and uninstall the "HRSoft 2" program in the "Apps & Features" window.

Installing the new HRSoft 2 version

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





11 Annex

11.1 EC Declaration of Conformity [HR600XL]

0HR600XL-EN

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 600 XL

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

Richtlinie/Norm	Titel	Ausgabe
DIN EN 82079-1	Preparation of instructions – Structuring, content and presentation	2013-06
DIN EN 12100	Safety of machinery - Basic concepts, risk assessment and risk reduction	2011-03
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	2016-06
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	2018-05
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	2007-06
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.

Wertheim, 2019-02-11

Legally binding signature



Ralph Knecht, General Manager

Technical responsibility



Wolfram Sinn, Development Manager