

HR 600 XL

Hybride-Rework-System



Translation of the original operating manual: 3BA00241-01 | Serial
No.:

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Rev. 10
Printing date: 16/01/2024

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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.

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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.





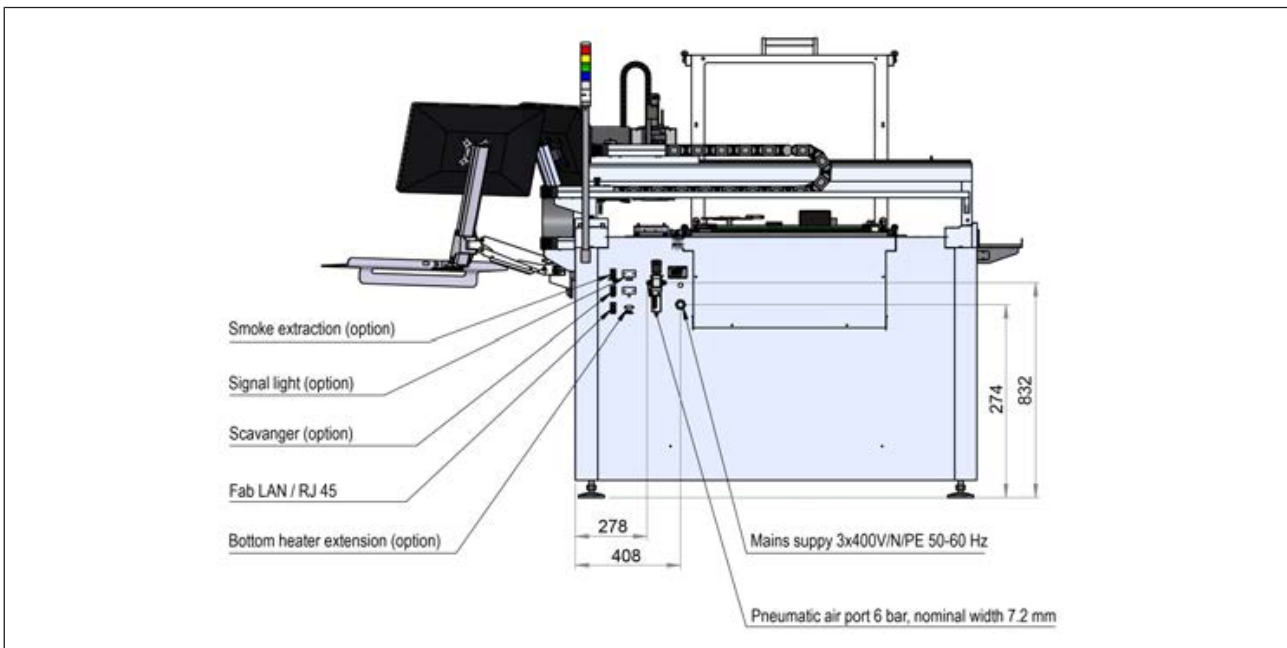
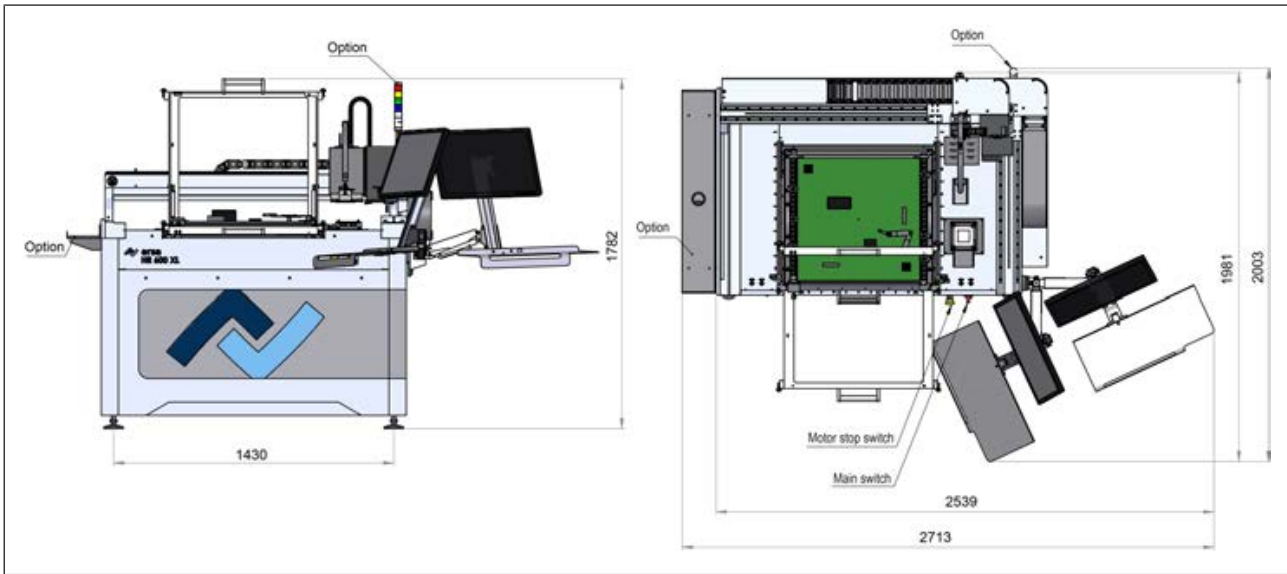
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2.1 General data

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





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 connection (quick coupling)	¼ inch
Pneumatic hose for pneumatic connection to be provided by the customer	6 mm outer diameter
Flow rate at 6 bar (l/min.)	approx. 110

2.4 Heating system

Bottom IR emitter

Description	
Heating type	Infrared IR emitter, long-wave
Dimensions of the IR emitter cassette (width x depth, mm)	625 x 625 (fully heated area)
Number of heating zones	25, individually switchable
Rated power (kW)	15 (25 x 0,6)

Top IR emitter

Description	Heating head 60 x 60 mm, 800 W
Heating type	Hybrid IR emitter, ceramic heating elements, medium-wave, infrared, with convection
Component handling	Built-in pipette, motorised
Dimensions (width x depth, mm)	175 x 105
Number of heating zones	2
Rated power (kW) at 230 V	0,8
Aperture adapter (mm)	40 x 40, 30 x 30, 20 x 20
Description	Heating head 150 x 80 mm, 2000 W
Heating type	Hybrid IR emitter, ceramic heating elements, medium-wave, infrared, with convection
Component handling	Built-in pipette, motorised
Dimensions (width x depth, mm)	150 x 80
Number of heating zones	4



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

Temperature sensors

Description	
Virtual thermocouple	Non-contact infrared sensor (pyrometer)
Inputs for K-type thermocouples*	8

*An AccuTC is included in the scope of delivery.

2.5 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

2.6 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

2.7 Printed circuit boards and components

Designation	
PCB cooling from above	Hybrid blower
PCB cooling from below	Compressed air with blowpipe



Designation	
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

2.8 PC system requirements

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

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

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












2.9 Ambient conditions

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





2.10 Options

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

	Description	Item number
	Heating head 150 x 80 mm, 2000 W	OHR667L
	Heating head 60 x 60 mm, 800 W	OHR667
	RPC camera for XL-rework	OHR610XL
	Signal light	363884
	Tray sheet	335139
	Dip & Print station	OPR100
	Nozzle Ø 1 mm, metallic *	OHR5520-05010
	Nozzle Ø 2 mm, metallic *	OHR5520-10020
	Nozzle Ø 3.3 mm with silicone cup Ø 2 mm **	OHR5520-20033
	Thermocouple holder	OHR640
	AccuTC 2.0 thermocouple	OHR645
	K-type thermocouple wire with plug	OIR4510-02
	PCB holder frame for HR 600 XL, interchangeable	OHR625XL
	Board holder.	OPH100
	Performed rail with pcb clamp for HR 600 XL	OHR628XL
	Handle for pcb clamp HR 600 XL	OHR624XL
	Downholder with pins for HR 600 XL pcb holder	OHR626XL
	Center support for HR 600 XL pcb holder	OHR627XL
	Pin for center support HR 600 XL pcb holder	OHR627XL-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

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

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

The following solder fume extractor is recommended for the HR 600 XL Rework system:

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



2.11 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, F329	520,522	250 V	Fuse F3,15A (ESKA)	26
F325 - F328	520,523	250 V	Fuse F4A (ESKA)	4

If the rework system is equipped with the optional extended 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, the locally applicable accident prevention, safety and environmental protection regulations are to be observed.

3.1.2 Fire protection

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



3.2 Subject-related safety instructions

3.2.1 Dealing with electrical equipment



⚠ DANGER

Dangerous electrical voltage!

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!

3.3 Safety instructions for certain operating phases



⚠ WARNING

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

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



⚠ 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 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.

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 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.



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

Risk of death or severe injury due to the machine tipping over or falling!

- The forklift truck must fulfil the minimum requirements!
- Before lifting the load, identify the [centre of gravity] symbol, which is located either on the bottom of the box or on the machine!
- Always place the hoist in the middle of the centre of gravity!
⇒ If the [Centre of gravity] symbol is not present:
- Attach the hoist 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	OHR600XL OHR600XL-L
1	Thermocouple holder HR 600 XL	OHR640XL
1	Air deflector 20 x 20 mm	OHR620-003
1	Air deflector 30 x 30 mm	OHR620-002
1	Air deflector 40 x 40 mm	OHR620-001
1	AccuTC thermocouple without fixture *	OIR6500-37
1	Thermocouple wire extension 500 mm	OIR5500-51
1	Nozzle \varnothing 5 mm with silicone cup \varnothing 3.5 mm **	OHR5520-35050
1	Nozzle \varnothing 10 mm with silicone cup \varnothing 8 mm **	OHR5520-80100
1	Open-end wrench SW9	316569
1	Open-end wrench SW9	316590
1	Lens cleaning kit	0VSLC100
1	Setup nozzle	OHR5520-0000K
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



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

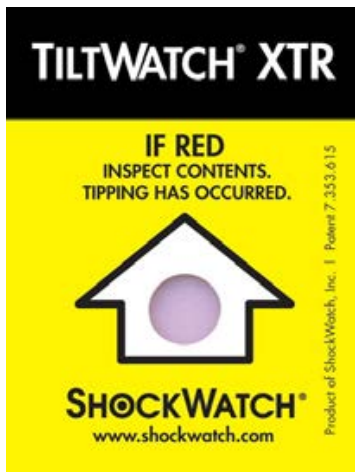


Fig. 3: Indicator not coloured

- ✓ 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!



Fig. 4: Coloured indicator



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

Risk of death or severe injury due to the machine tipping over or falling!



- a) The forklift truck must fulfil the minimum requirements!
- b) Before lifting the load, identify the [centre of gravity] symbol, which is located either on the bottom of the box or on the machine!
- c) Always place the hoist in the middle of the centre of gravity!
⇒ If the [Centre of gravity] symbol is not present:
- d) Attach the hoist 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!

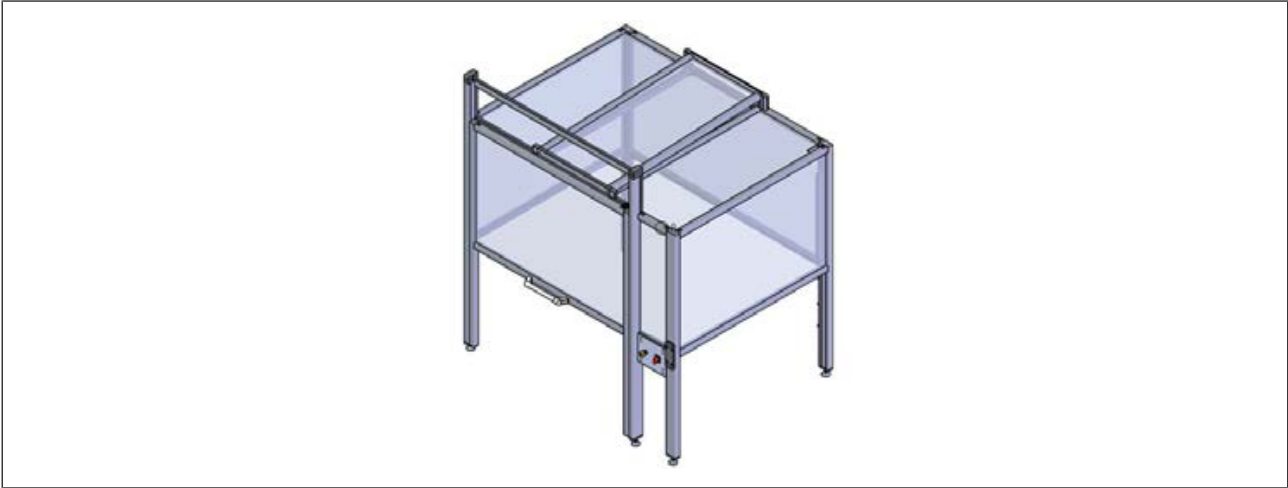


NOTE

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.



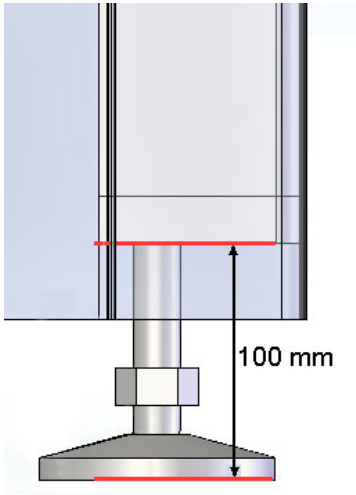
After the installation of the Rework system has been completed, the optional machine housing is pushed over the Rework system and connected to the supply lines.



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.

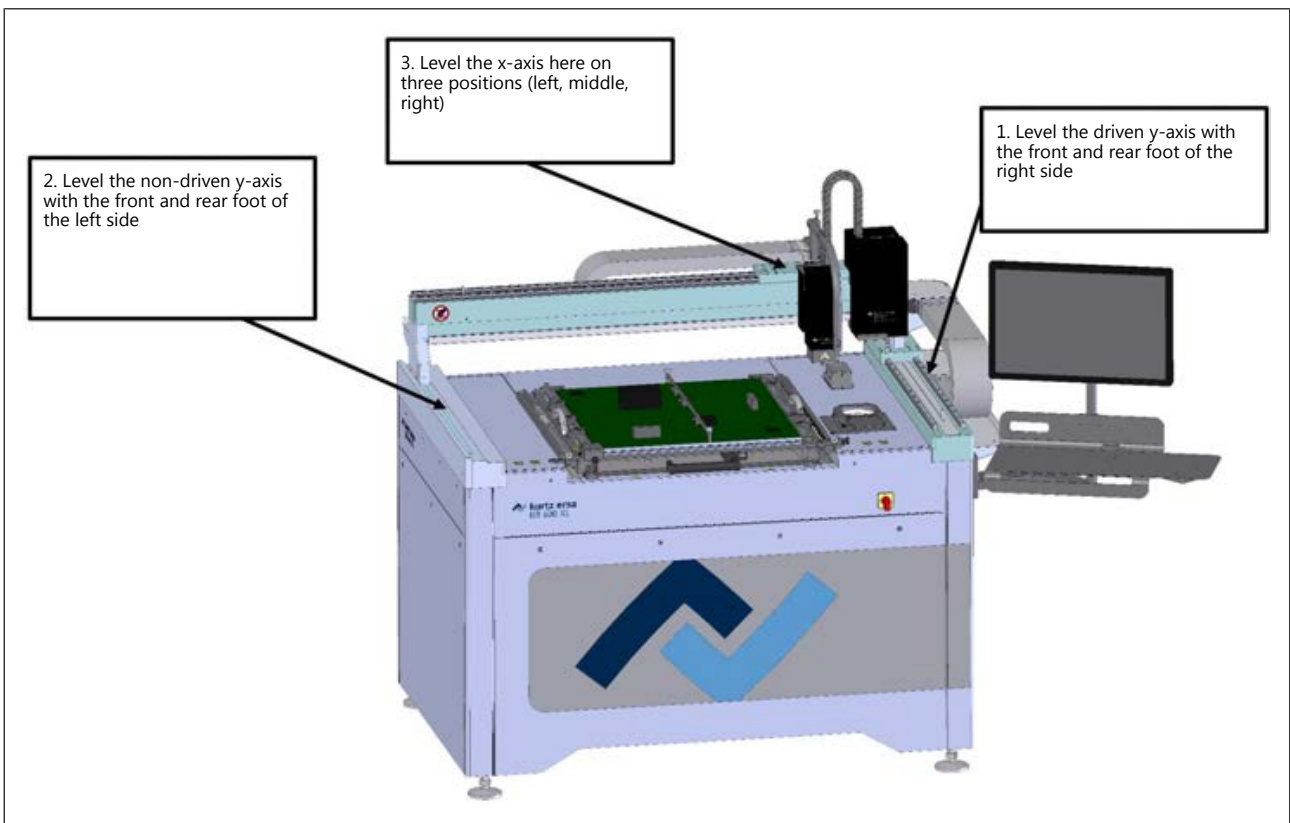


Fig. 7: Aligning the HR 600 XL system

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

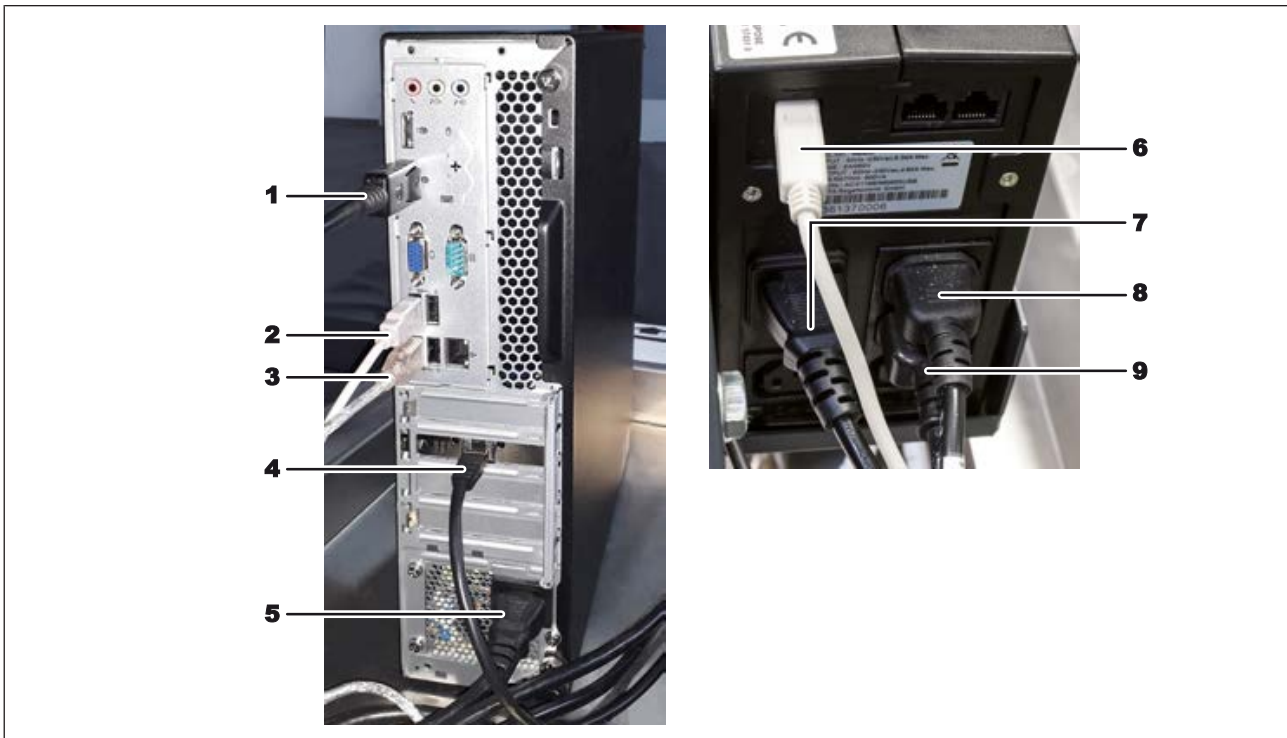


Fig. 8: Overview of computer ports and UPS connections

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.

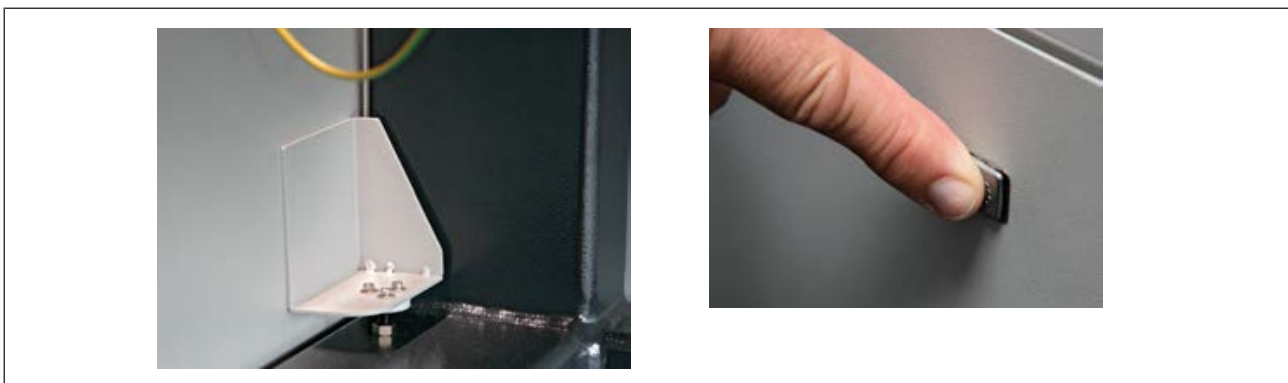


Fig. 13: Fit the bottom side panel and press on the closures on the outside

- 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.

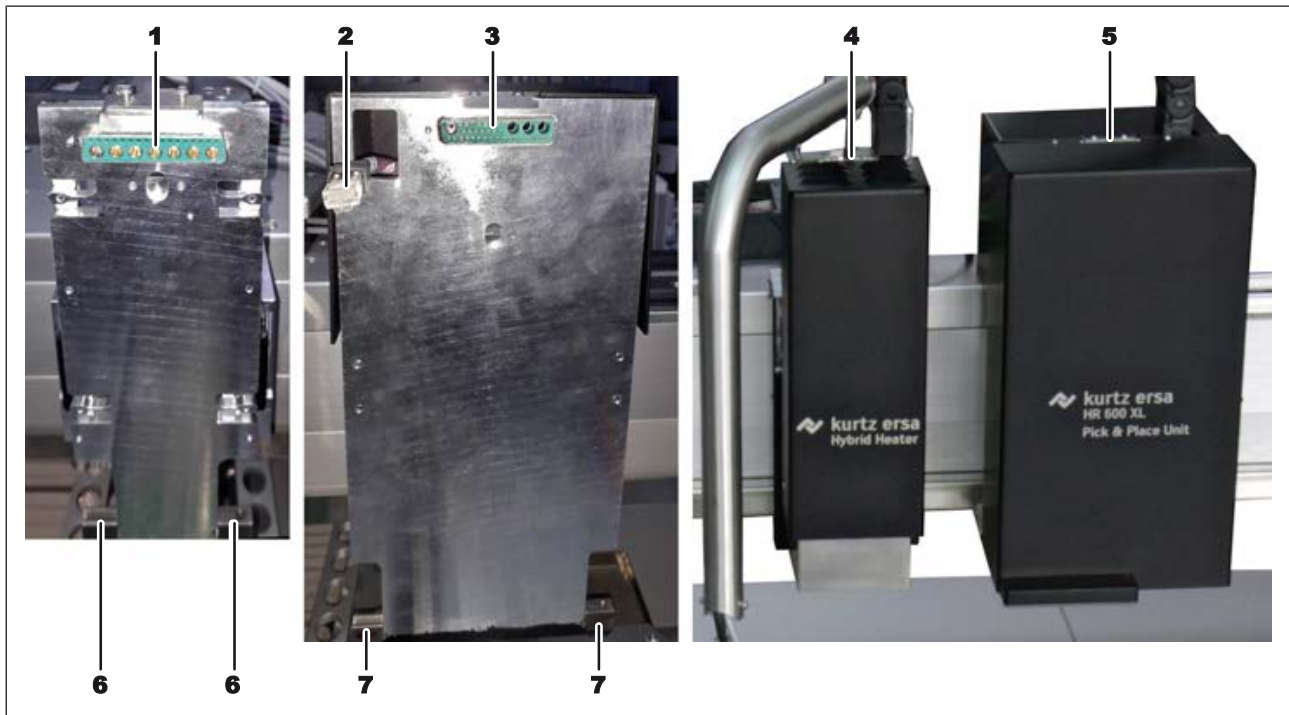
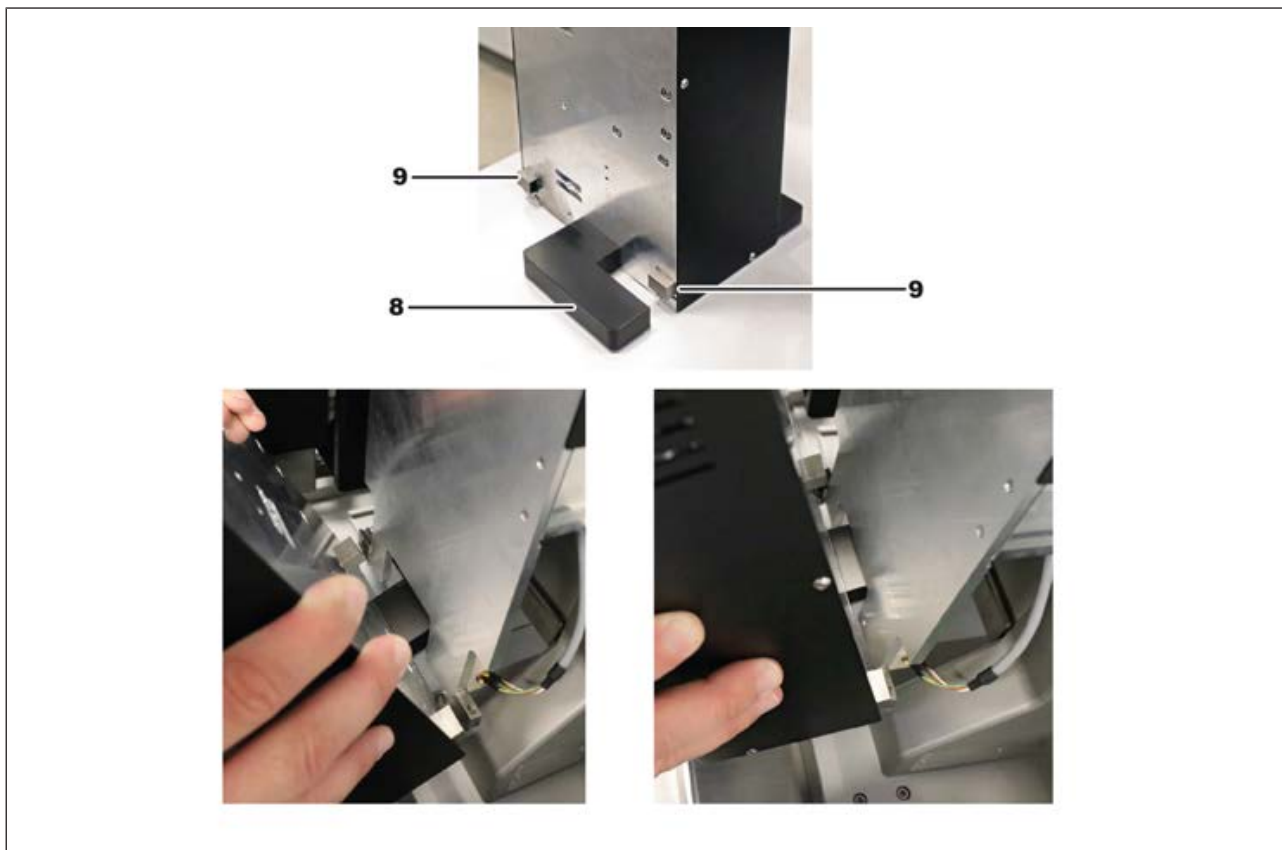


Fig. 14: On the left side of the picture: Heating head holder and placer head holder. On the right side of the picture: Heating and placer heads fitted on the brackets.

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 \[Manual Mode\]](#) [▶ 93].



⚠ 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

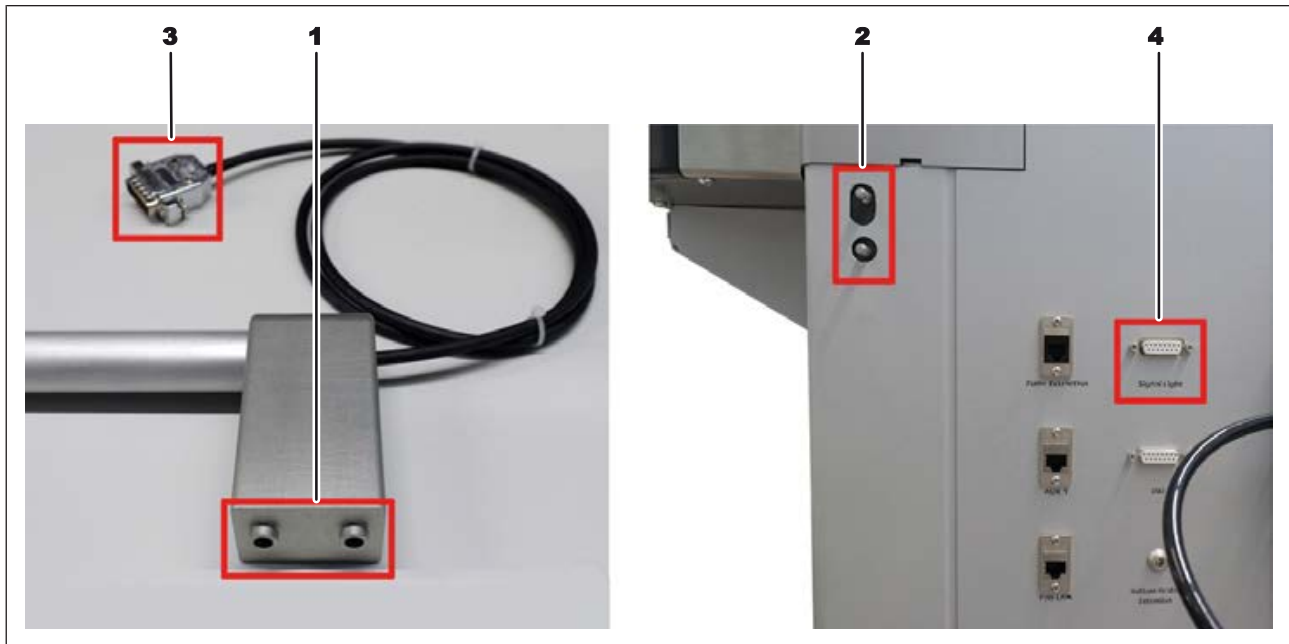


Fig. 17: Fitting of the signal light

- 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.

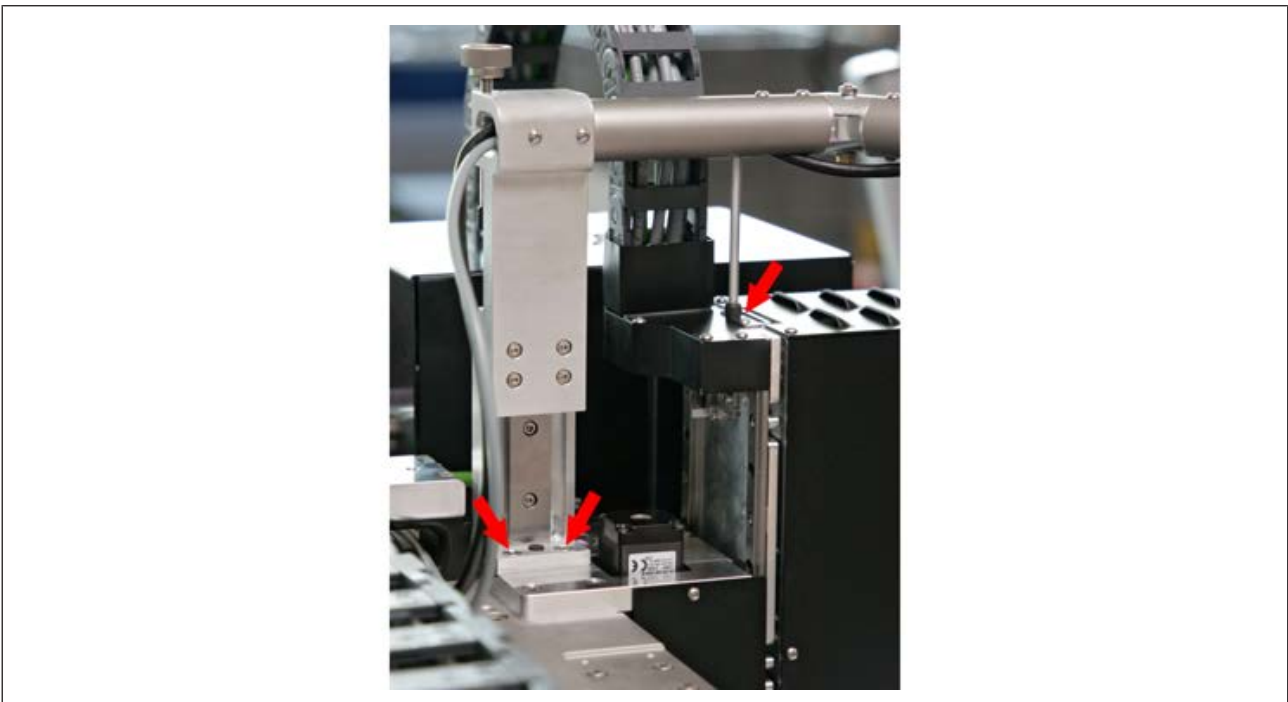


Fig. 23: Screwing on the RPC camera

- 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.

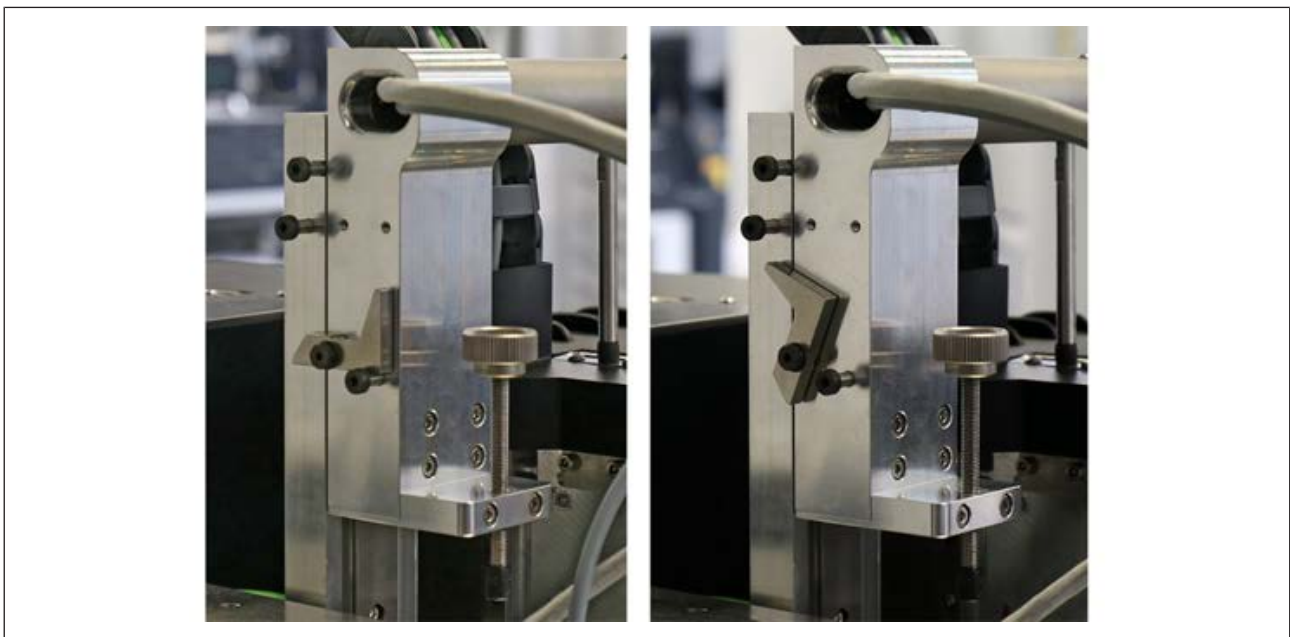


Fig. 26: The photos show the condition with the black housing removed. In the picture on the left, the engaging hook is in the correct position.

- 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.

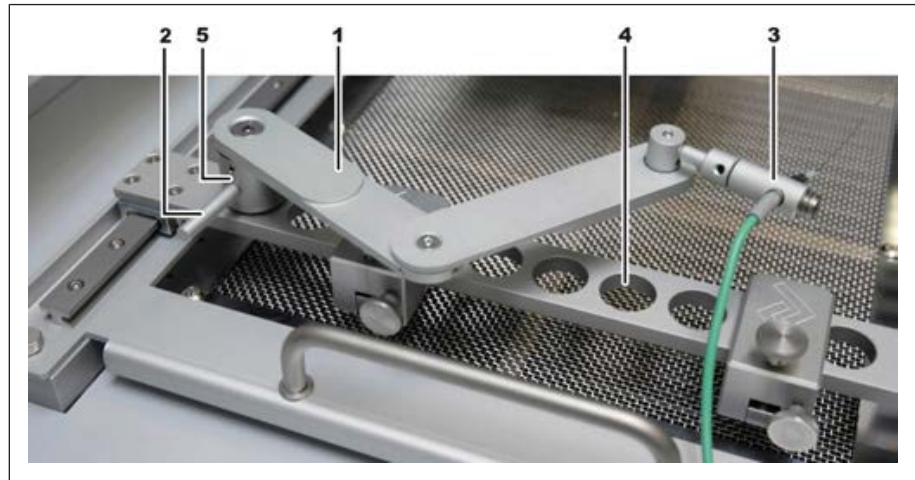


Fig. 27: Assembly of the Accu-TC holder and thermocouple, example picture

- 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.
- Insert the plug of the AccuTC thermocouple without fixture (Article OIR6500-37) into the TC1 socket.
- 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):

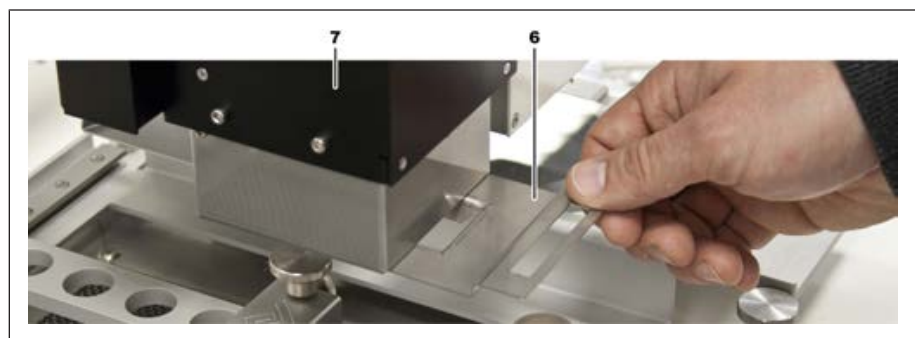


Fig. 28: Sliding in an air baffle, example picture

- 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 \[Start extraneous light compensation\]](#) [▶ 68]
- b) The [Start coordinates transformation] function. With regard to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 121]

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.



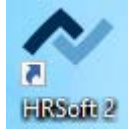
5 Commissioning

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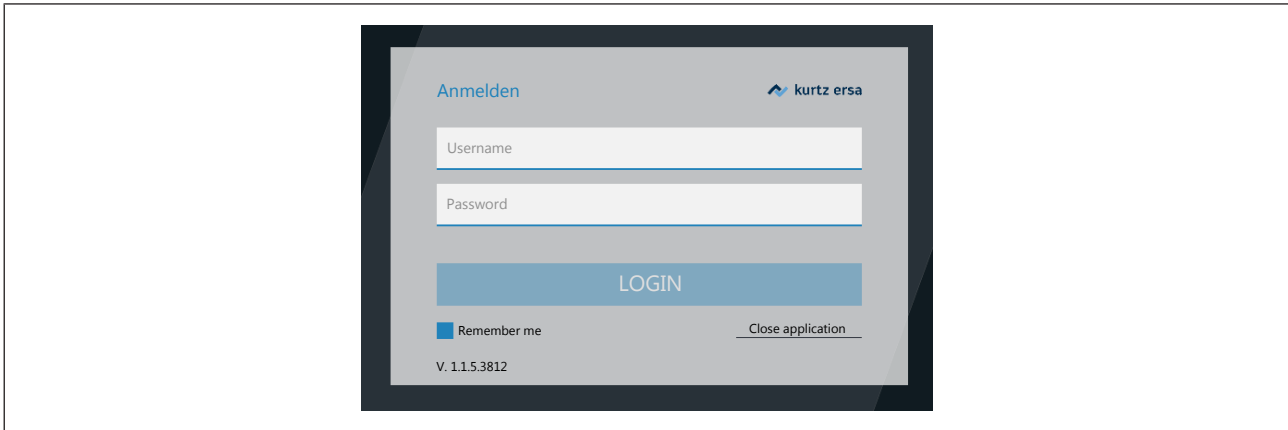


5.1 Switching on the Rework system and starting the HRSoft 2 program

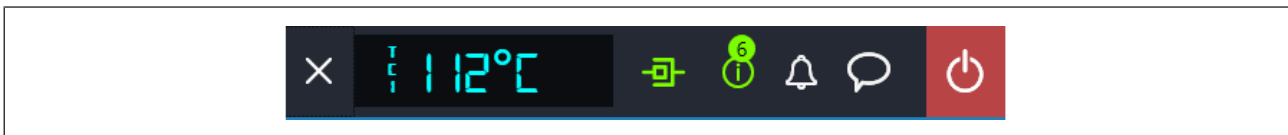
- ✓ To switch on the Rework System proceed as follows:
 - a) Use the main switch on the front of the device to turn on the Rework System.
 - ⇒ The Rework System is switched on and the PC started up.
 - b) If the Windows operating system is password-protected, enter the password.



- 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](#) [▶ 98].



- 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 the [Start light compensation] 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.

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

- a) Click on the [Start light compensation] button on the bottom right.
 - ⇒ 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!

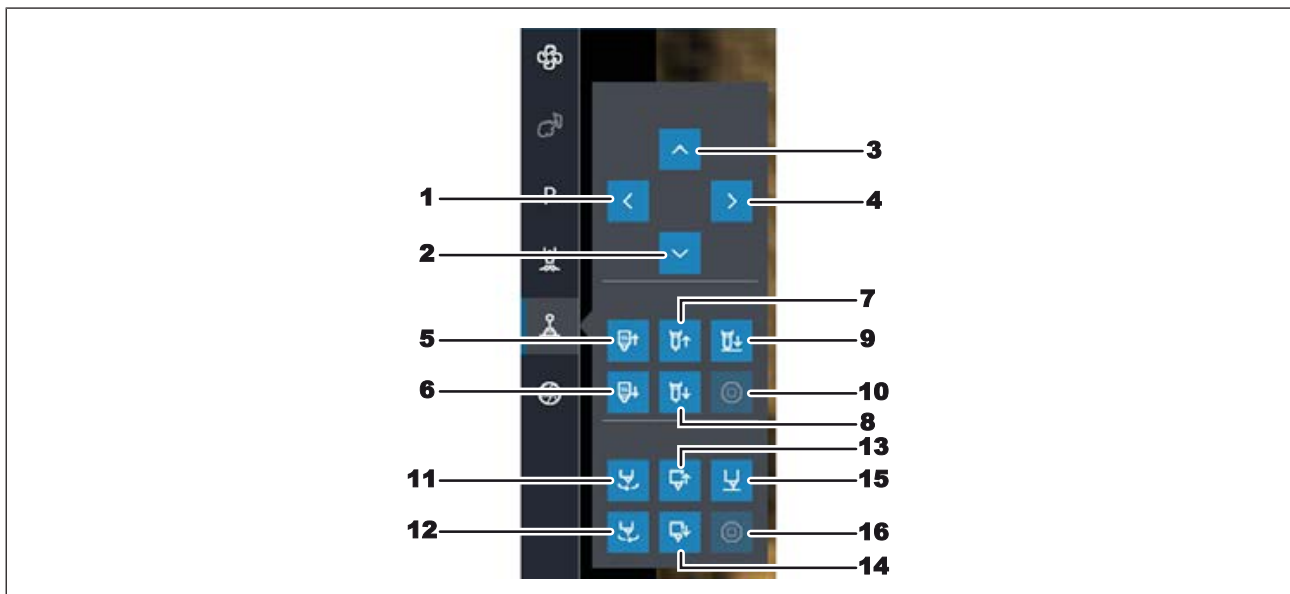
a) Switch to tab [Rework].

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.



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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

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

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



⚠ 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

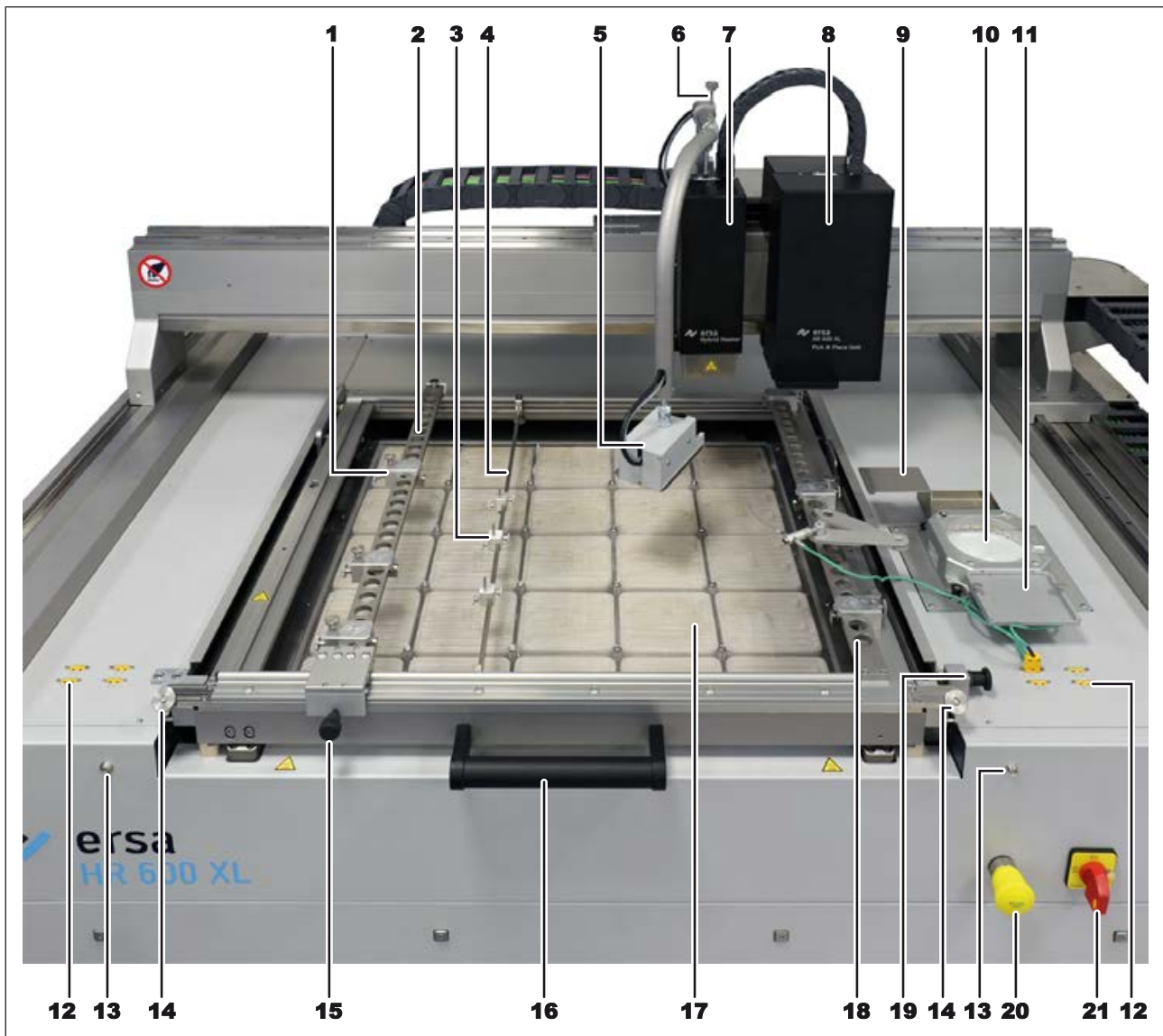


Fig. 29: Overview of the machine parts

1	PCB holder	12	Connector plug for thermocouples 1-4 (right), 5-8 (left)
2	Perforated rail, base for PCB holders, adjustable	13	ESD wrist band connection
3	Pin of the PCB center support	14	Locking screw for PCB frame
4	Rail of the PCB center support	15	Locking screw of the left-hand perforated rail
5	RPC camera (optional)	16	Handle for moving out/sliding in and vertically positioning the PCB holder
6	Heating head height adjusting screw	17	Lower heating, 25 single zones
7	Heating head, adjustable height	18	Right-hand perforated rail, non-adjustable
8	Placer head, non-adjustable height	19	Spigot locking frame in pulled out position.
9	Tray for desoldered components	20	Motor stop pushbutton. Observe the safety instructions!
10	Glass plate illuminated, support for components to be soldered with component identification by camera from below	21	Main switch, lockable
11	Support 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!

⚠ 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.

⚠ 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!



6.3 Stopping the motor with the corresponding pushbutton

DANGER

Dangerous electrical voltage after pressing the motor stop pushbutton!

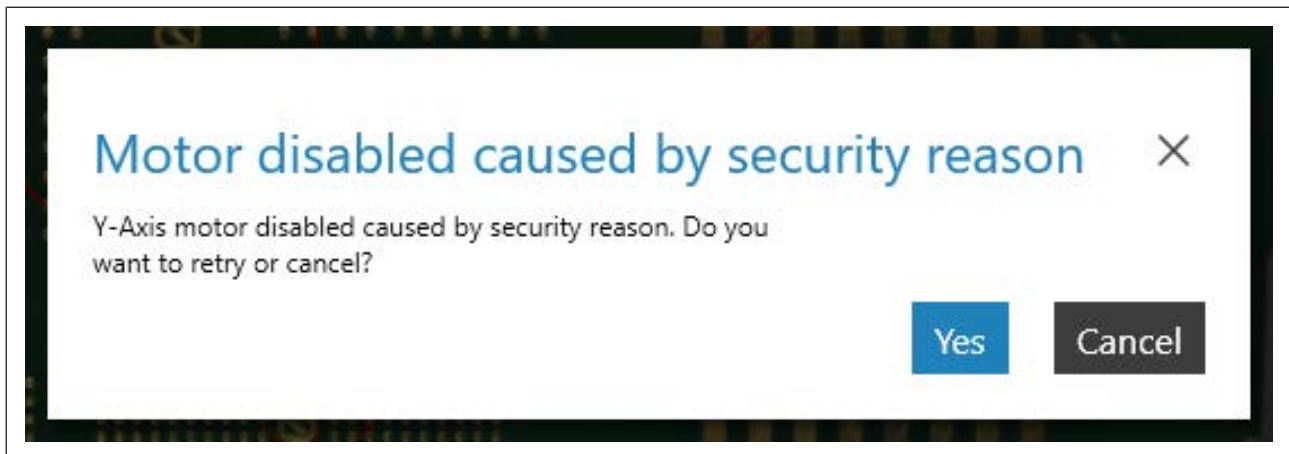
Death or serious injuries due to electric shock!



✓ 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 [▶ 137]



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 safe height prior to an axis travel so as to avoid collision with PCB components or the PCB frame. When the heating head moves into the soldering position, the RPC camera will also be lowered. A tilted RPC camera reduces the distance to components. Depending on the component height, a collision with the RPC camera may occur during an axis travel.

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!

To prevent any collisions:

- Check components for special height!
- Fit the RPC camera horizontally!
- Increase distance to the PCB surface via the [Heating head position] parameter!
- Never leave the Rework System unattended!



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!

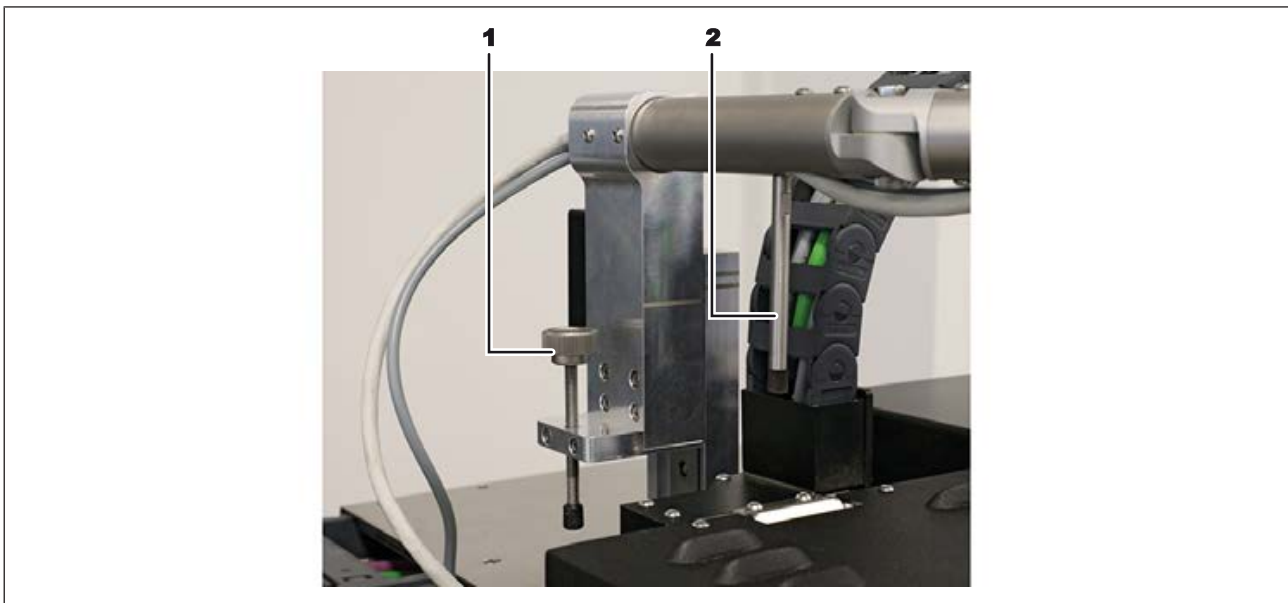


6.5 Manual height adjustment of the RPC camera via the setting screw

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 \[Manual Mode\]](#) [▶ 93].

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 HRSof2 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 Machine control with HRSoft2

6.6.1 The top bar in the HRSoft 2 program

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



- Tab [Rework]: to change all parameters of the soldering profile. Almost identical structure as that of the [0502] tab, but with all rights to manage soldering profiles; creating, copying, deleting and saving is not possible. Profile management Also contains the start button for the rework process. As to this, please read Chapter [Overview of the tab \[Rework\]](#) [▶ 86].
- Tab [User administration]: to show, create, edit, delete and save users with their different user rights. As to this, please read Chapter [The \[user management\] tabulator](#) [▶ 98].
- Tab [Archive]: to show the rework processes performed so far in all details for an analysis. As to this, please read Chapter [The \[Archive\] tabulator](#) [▶ 95].
- Tab [Profile management]: create, change, copy, delete and save soldering profiles. Almost identical structure as Tab [Rework], but with all rights to manage the soldering profiles. If you are logged in as a standard user, the [0502] tab will be missing. Profile management As to this, please read Chapter [Overview of the \[Profile management\] tab](#) [▶ 100].
- Tab [Administration]: to define HRSoft 2 program parameters (e.g. system language, display colours, etc.), program management (e.g. updates), network management, and start-up functions. This tab contains the three [HRSoft 2 options] areas (Chapter [The dialog \[HRSoft 2 settings\]](#) [▶ 114]), [Graph options] (Chapter [The \[Chart settings\] dialog](#) [▶ 116]) and [Device settings] (Chapter [The \[device settings\] dialog](#) [▶ 118]).
- Tab [Manual mode]: The button to show/hide the [Manual mode] button bar, which can only be used in the [Rework] tab, is visible. 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.). As to this, please read Chapter [The \[Manual Mode\]](#) [▶ 93].
- 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](#) [▶ 124].



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

6.6.2.1 The [Information] and [Heating setting] tabs

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

The heating graphs in the middle of the screen can be adjusted for the desired soldering process. As to this, please read Chapter [The chart in the \[Rework\] tabulator](#) [▶ 89]. Also the buttons in line [Process automation] (6) at the bottom can be always changed. As for this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 92]. These buttons enable or disable any process steps.

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

Bottom right you will find button [START/REFERENCE] to start the Rework process. Make sure you have made all settings correctly before starting the rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137] .

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user.

6.6.2.1.1 The two tabs on the right

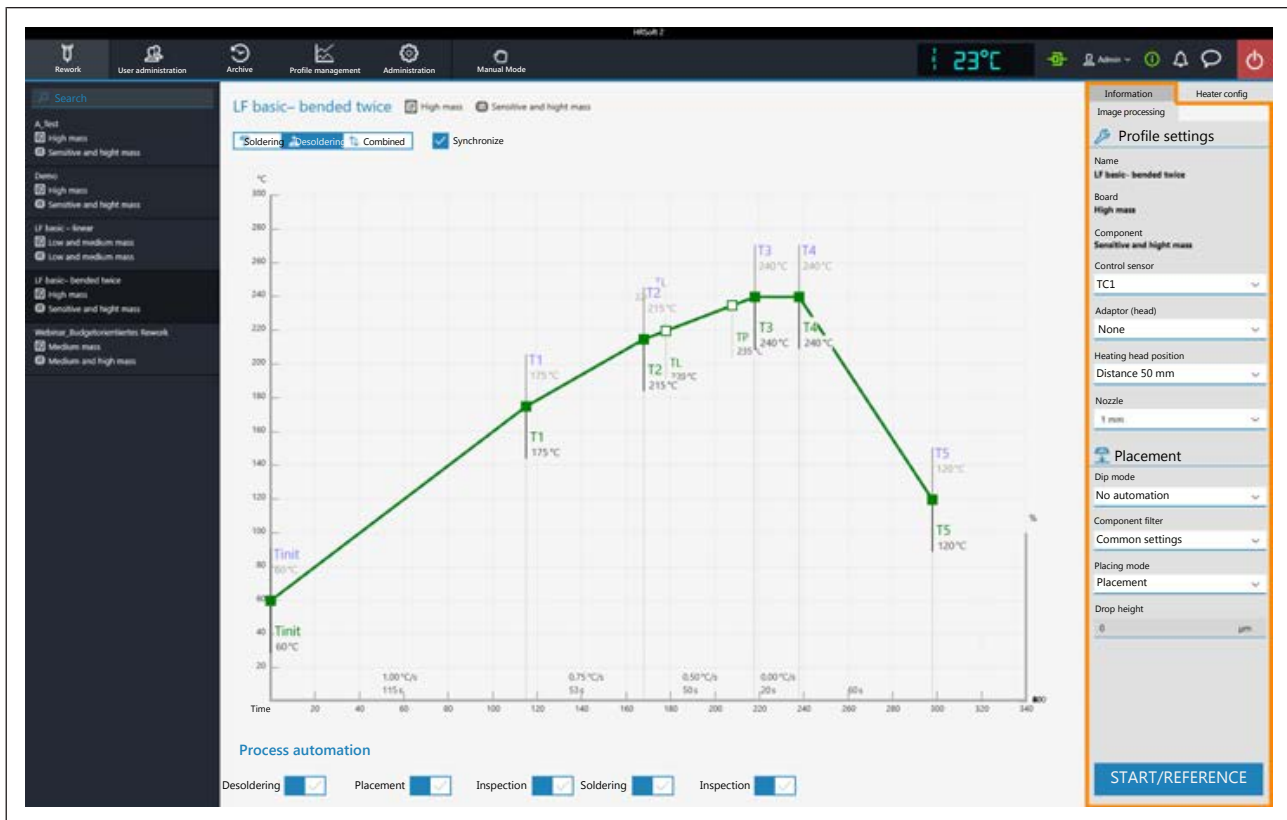
Range (5) on the right contains the two tabs [Information] and [Heater config].

Select tab [Information] to make changes to soldering profile parameters. As to this, please also read Chapter [The \[Information\] tab under the \[Rework\] tab](#) [▶ 82].

Select tab [Heater config] if you want to make changes to the heatings. As to this, please also read Chapter [The \[Heating setting\] tabulator under the \[Rework\] tabulator](#) [▶ 84].



6.6.2.1.2 The [Information] tab under the [Rework] tab



The parameters in tab [Information]

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

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

In range [Profile settings]:

The three bolded parameters [Name], [Board] and [Component] are defined in tab [Profile management].

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

- [Control sensor]: Selection of the temperature sensor that controls the soldering process through the temperature it measures.
[TC1] (thermocouple 1) and up to seven further thermocouples.
[Virtual TC] Can only be used after learning process with the applied thermocouple. As to this, please read Chapter [The virtual thermocouple](#) [▶ 126]. The currently measured temperature of the selected sensor is displayed as a temperature graph.
- [Adaptor (head)]: used adapter (air baffle).
No function, only used to save info.
- [Heating head position]: Define the soldering distance to the PCB from 30 mm to 70 mm. No function, only used to save info. To obtain the heating head distance for tall components on the PCB, the distance can be adjusted with the buttons in the tab [Manual Mode] must be set. As to this, please read Chapter [The \[Manual Mode\]](#) [▶ 93].
- [Nozzle]: Selection of the soldering nozzle used.
No function, only used to save info.
- [Pin 1 orientation]: Position of pin 1 of the component.
No function, only used to save info.

In range [Placement]:



- [Component filter]: The component recognition of the camera is improved for the selected component type. Select the component type before soldering. Possible filters are:
 - [General] = all other component types
 - [BGA] = Ball Grid Array
 - [Small BGA]
 - [Big BGA]
 - Do not use [MFU BGA]!
 - [QFP] = Quad Flat Package
 - [QFN] = Quad Flats No Leads
 - [CBGA] = Ceramic Ball Grid Array, small component [up to 01005 size]
 - [Small component (01005)] = SMD with 0.2 x 0.4 mm
 - [SMD plug]
 - [BGA plug]
- [Dip mode]: You can choose from three soldering methods:
 - [No automation]: Normal soldering without flux material dipping and without using a component that is coated with solder paste. The component is picked up from the component tray, aligned and placed in the soldering position.
 - [Auto. Dip]: The dip stencil prepared with flux material must be placed on the Dip & Print station holder. The component is lifted from the glass plate and immersed into the dip stencil's flux material; then it is aligned and placed in the soldering position.
 - [Auto. Print]: Place the print stencil prepared with the component coated with solder paste on the Dip & Print station holder. The component is picked up from the print stencil, aligned and placed in the soldering position.
- [Placing mode]: during soldering.
 - [Placement]: positioning the component using the contact sensor.
 - [Drop]: dropping the component through the PCB.
- [Drop height]: during soldering. Height above the PCB at which the component is dropped onto the PCB. Only possible if parameter [Drop] is selected.

Starting the Rework process or performing a reference run

Bottom right you will find button [Start/Reference], with which the Rework process can be started. Make sure all settings have been properly made and the desired work steps selected before starting the Rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137].

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

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as "Administrator" user. As to this, please read Chapter --- FEHLENDER LINK ---.

Also see

- 📖 The heating curves in the chart in the [Profile Management] tab [▶ 111]



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

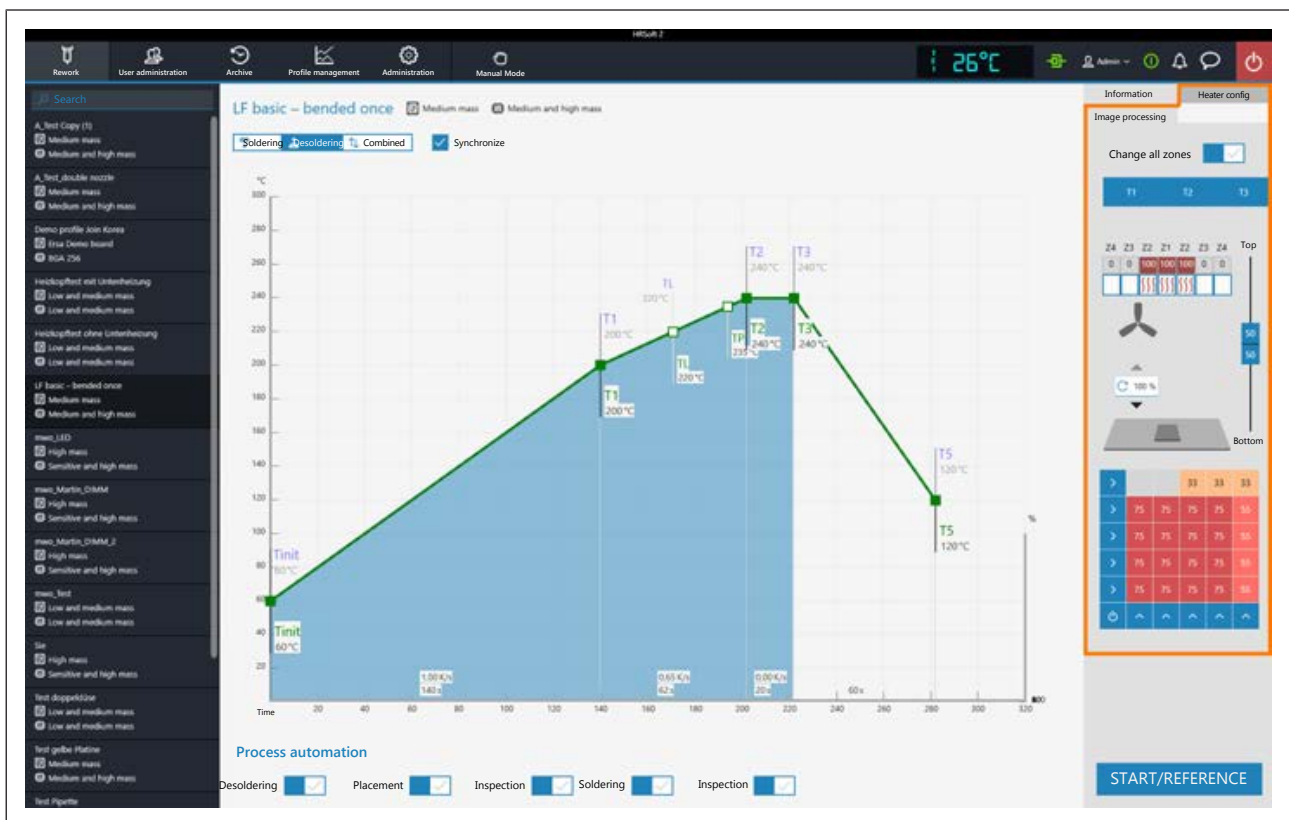
Heater config Extensive settings for the top and bottom lower heating can be made in the [0593] tab.

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

If you want to edit the heating settings specified in the soldering profile, select button [Soldering] or [Desoldering]. Select buttons [Soldering] or [Desoldering] to set a separate heating graph including detailed heating settings for soldering and desoldering. When selecting button [Synchronize], both soldering processes are identical.

The number of heating phases is determined by the selected soldering profile. Depending on how often the heating graph is kinked, there will be 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](#) [▶ 102]. Each heating phase can be entered in the tab [Heater config] in the [0593] tab, the temperature, blower power and top heating proportion, as well as the temperature, proportion and distribution of the lower heating zones can be assigned to each heating phase.

Use button [Synchronize] to edit the desoldering heating graph values to the soldering heating graph ones. The displayed heating settings are valid for the highlighted soldering graph.



The parameters in tab [Heater config]

[Change all zones]: if this button is selected, all heating phases are displayed in blue in the [Heater config] as well in the chart. The parameters in tab [Heater config] will now apply to all heating phases.

If button [Change all zones] is disabled, different heating parameters can be assigned to each heating phases. The number of heating phases is determined by the selected soldering profile.

The following parameters can be edited from top to bottom in the [Heater config]:



- Buttons T1, T2...: 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.
- The shown top heating controller is only visible when XL heating head (Heating head 150 x 80 mm, 2000 W, part number OHR667L) is installed.
Info: The Rework System is equipped with either an 800 watt heating head or a 2000 watt one. The heating head can be replaced with the other optional heating head. As to this, please also read Chapter [Replacing the heating head](#) [▶ 178] and check the Table [Options](#) [▶ 22].
The four heating zones are numbered from the inside to the outside and can be set individually. The division into heating zones is also printed on the heating head.
Enter the desired heating output into the heating zone fields in the top line with values from 0% – 100%. The darker a field is displayed, the higher the set temperature. The bottom line is the on/off switch for the heating zones.
 - To edit the temperature of a heating zone: Highlight the top button of a heating zone by clicking on it and overwrite the value.
 - To switch on/off a heating zone: click on the bottom button.
- Power value for the top heating blower output level. The set value is to be kept constant. The 50% value is suitable for all applications.
- Vertical controller (top - bottom): Top heating/bottom heating percentage power ratio. Adjust the power ratio to the heat requirement of your soldering process.
- Lower heating matrix field: Setting of each the 5 x 5 lower heating zones with 0% – 100% values. The darker a field is displayed, the higher the set temperature.
 - To edit the temperature of a heating zone: Highlight a heating zone by clicking on it and overwrite the value.
 - Methods to highlight several heating zones so as to edit them all to the same value:
Double-click on the single fields to switch them on. The default value upon switch-on is a 75% heating output.
Click on the blue side boundary boxes to switch lines/columns on/off.
Click on the blue box at the bottom left to switch the whole bottom heating on/off.

For large PCBs, to avoid shape distortion, ensure that the entire PCB is heated.

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

Bottom right you will find button [START/REFERENCE] to start the Rework process. Make sure you have made all settings correctly before starting the rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137].

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

Also see

- 📖 The heating curves in the chart in the [Profile Management] tab [▶ 111]



6.6.2.2 Overview of the tab [Rework]

After starting HRSoft 2, the [Rework] tab will be shown. Activate the [871] function in the [Rework]

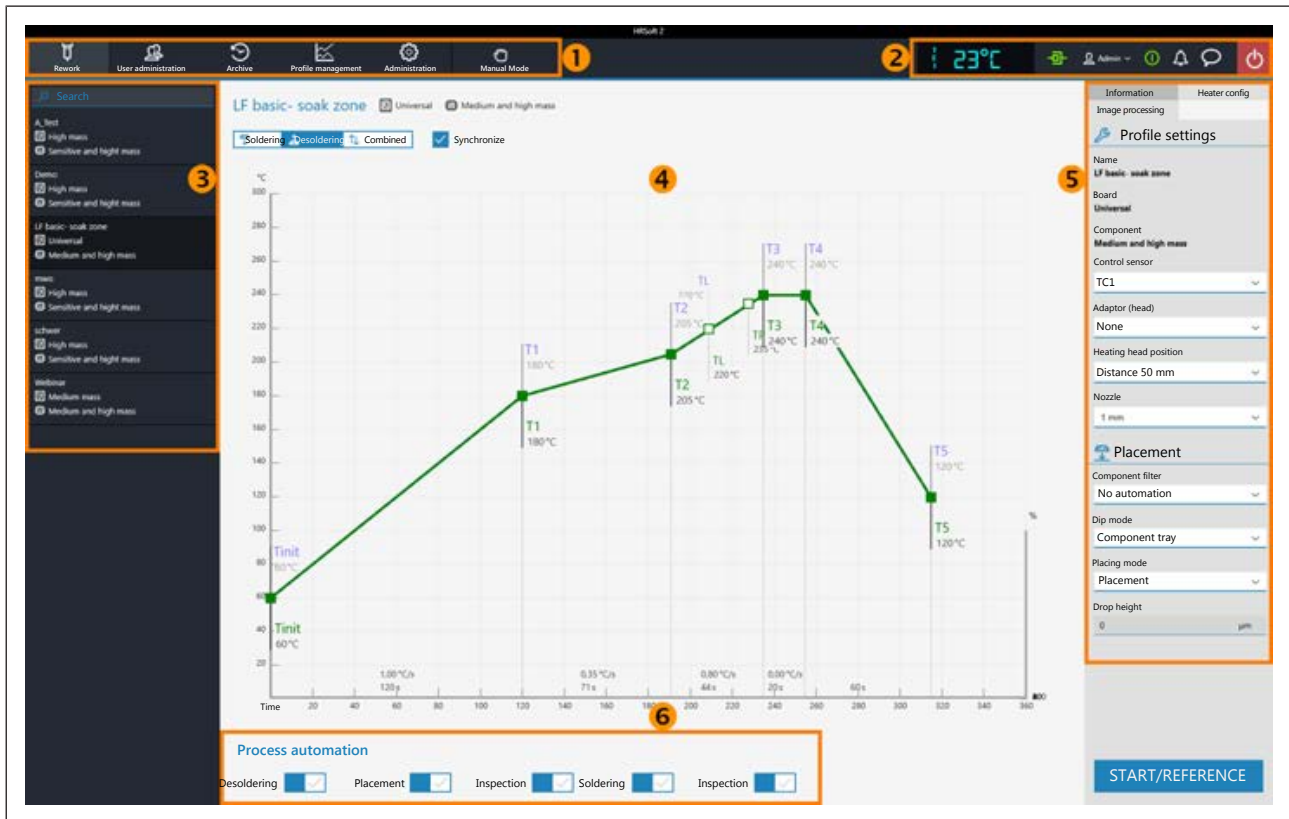


Fig. 30: Soldering processes are started and performed in the [0582] dialog. This dialog is divided into the following fields: Ranges in tab Rework

1	Tab bar: to call up tabs and button bar [Manual mode]	2 Displays (e.g. temperature and network connection) and buttons (e.g. to call up status information and dialogs). As to this, please read Chapter The display and button sequence in the right upper corner.
3	To select a soldering profile and search for profile names. Switch to tab [Profile management] to create and save soldering profiles. As to this, please read Chapter <u>Create, copy, delete and save soldering profiles in the [Profile management] tabulator</u> [▶ 102].	4 Chart with soldering graphs. To display of the soldering process with graphs for soldering and desoldering. Any change that is made here to the soldering process will be accepted but not saved. If you switch from the [Rework] tab to another tab, all changes made to the soldering profile will be lost. As to this, please read Chapter <u>The chart in the [Rework] tabulator</u> [▶ 89].
5	Parameter bar with tabs [Information] and [Heater config]. As to this, please read Chapter <u>The [Information] and [Heating setting] tabs</u> [▶ 81]. The machine initialisation and the Rework process can only be started here with the [0024] button. Start0024] possible.	6 Workflow bar for determining process flow steps (from left to right). Any change that is made here to the process flow will be accepted but not saved. If you switch from the [Rework] tab to another tab, all changes made to the soldering profile will be lost. As to this, please read Chapter <u>[Process automation] and its process steps</u> [▶ 92].



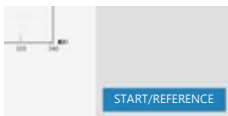
The functions of tab [Rework] largely correspond to those of tab [Profile management]. For a description of tab [Profile management] please read Chapter [Editing the soldering profile in the \[Profile management\] tab and changing it permanently](#) [▶ 100].

Only users logged in as “Administrator” may access all functions. If you are logged in as a “standard user,” you may not save changes, and the [0502] tab is not visible. Profile management] is not visible.

Each of the functions of the [Rework] tab are described in detail in the following chapter.

6.6.2.2.1 The START/REFERENCE MOVE BUTTONS

In the [Rework] tab there is a [] button at the bottom right, which is used to start the Rework process. START/REFERENCE



ReworkAll soldering process parameters may be edited in the [0582] tab before the process is started. Changes may not be saved here.

Make sure you have made all settings correctly before starting the Rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137].

START/REFERENCE The [732] button starts an assistant which will guide you through each step of the whole soldering process. As to this, please read Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137].



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

A soldering profile (3) is a file in which the complete soldering process with all associated parameter settings is saved. Profile management In the [0502] tab, you can create, edit, copy, delete and save new soldering profiles.



You can also edit the soldering profile parameters and other specifications in the [Rework] dialog and then apply them. However, these changes cannot be saved here. To permanently create, edit, copy, delete and save a soldering profile, switch to the [0502] tab. Profile management

Soldering processes are always started in the [0582] tab. Rework

Working with soldering profiles

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

In the [Search] input field, you can search in the solder profile names. The search will automatically start after entering the first sign. Any matches found will be highlighted in colour.

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

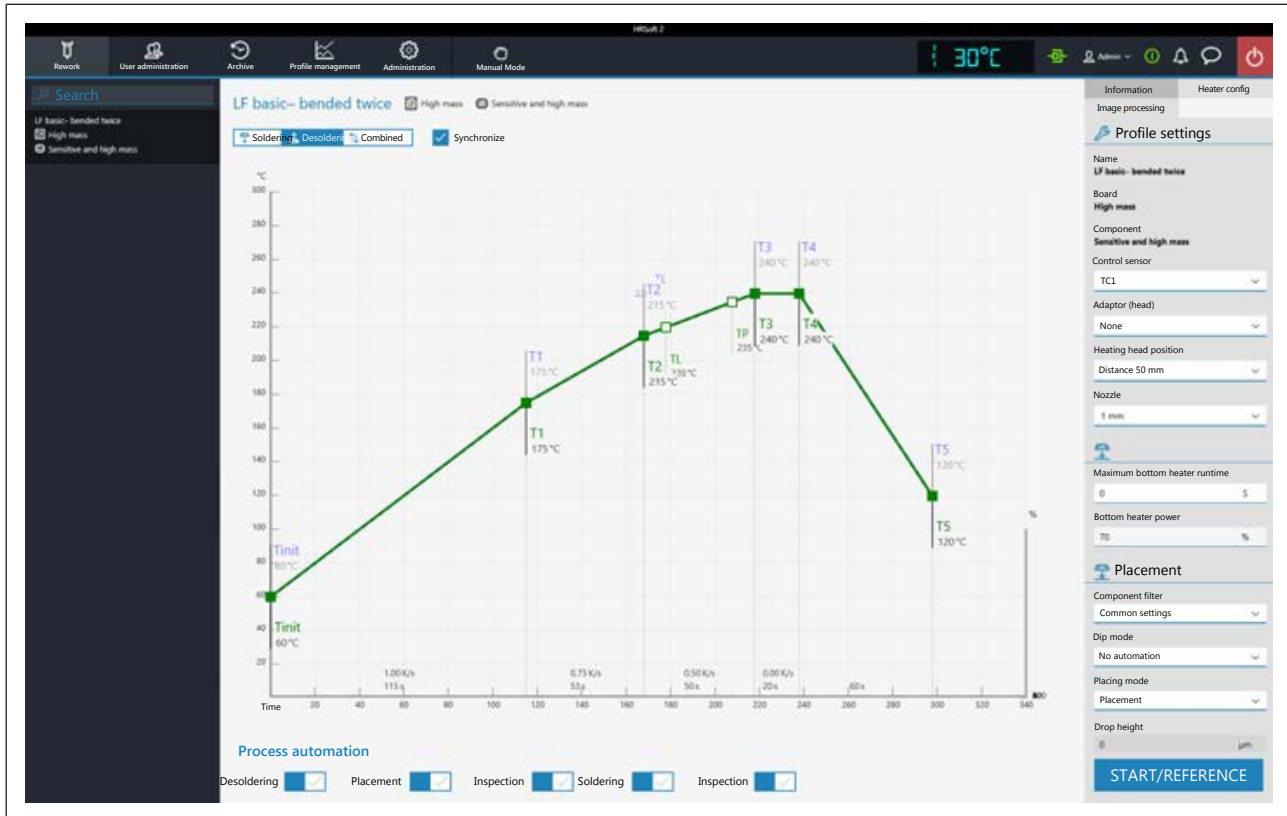
After marking your soldering profile in the soldering profile selection area (3), changes can be made to the time and temperature sequences in Chart fields (4), and to the soldering process steps for this soldering profile in parameter bar (5). With regard to this, please read Chapters from [The chart in the \[Profile management\] tabulator](#) [▶ 111] onwards.



6.6.2.4 The chart in the [Rework] tabulator

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

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



The following buttons are available:

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

For the temperature values of the thermocouples and the IRS, the left Y-scale of the chart with the temperature values shall apply. For correcting variables (e.g. TC infrared coil, Outer IR emitter) the right Y scale in the chart indicating maximum values of 100% applies.



6.6.2.4.1 The heating curves in the [Rework] tab

The heating graph is determined by the selected soldering profile. Depending on how often the heating graph is kinked, there will be 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 graphs in the chart may only be set if the [0074] or [0549] button above the chart has been adjusted. SolderingDesoldering
- 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.
- TinitThe [0207] point is the minimum temperature at which the process is depicted in the chart.
- [TP[0609] (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.

Setting the heating graphs

- To simultaneously edit the temperature and the heating phase duration:
TinitClick on one of the [0207], T1, T2 ... points on the heating graph 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 edit the heat output: click on the value of the heat output (°C/s) to be changed in the heating phase. Enter the new value. The maximum heat output is 2.5 K/s (2.5 °C/s).
You can edit the displayed unit of the heat output in the [Administration] tab 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.
- TPTo edit the [0609] (pipette temperature):
Click on the [0609] temperature value. TP Enter the desired temperature to start lifting the pipette or use the "Up Arrow" and "Down Arrow" keys to edit [0609]. TP



- To edit the TL[0243] (liquidus temperature):

Click on the [0243] temperature value. TL Enter the desired liquidus temperature or use the “Up Arrow” and “Down Arrow” keys to edit the [0243] number. TL

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.

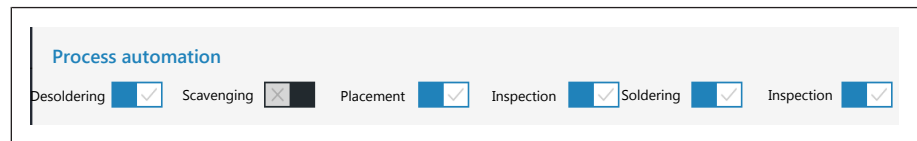
Bottom right you will find button [START/REFERENCE] to start the Rework process. Make sure you have made all settings correctly before starting the Rework process. How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137] .

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. As to this, please read Chapter The heating curves in the [Profile management] tabulator.



6.6.2.5 [Process automation] and its process steps

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



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

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

How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137] .

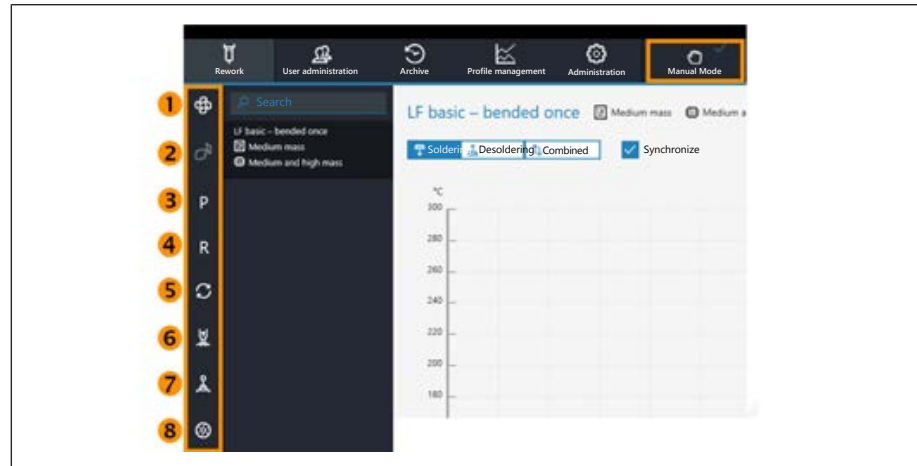
For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from the [Rework] tab to another tab, all changes will be lost.

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



6.6.3 The [Manual Mode]

If the [Rework] tab is enabled, click on the [Manual Mode] top right button. It displays a button column on the far left of the screen where extensive functions to manually operate the Rework System can be performed.



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

CAUTION

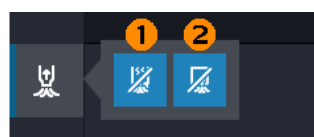
Risk of collision when manually moving the motors!

- ✓ 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: Switching on/off the connected solder fume extractor. If a solder fume extractor is connected, the button will be enabled. The fume extractor switches on automatically at working temperatures above 120° C.
- 3: Moving the heads right back to the park position.
The park position must also be approached to remove the PCB frame. With regard to this, please also read Chapter [Replacing the PCB frame](#) [► 131].
- 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.
Opens a submenu with further buttons:



- 1: Switches the vacuum exhauster of the nozzle on the heating head on/off.
- 2: Switches the vacuum exhauster of the nozzle on the placing head on/off.



- 7: Manually triggering motor movements.
Opens a submenu with further buttons:

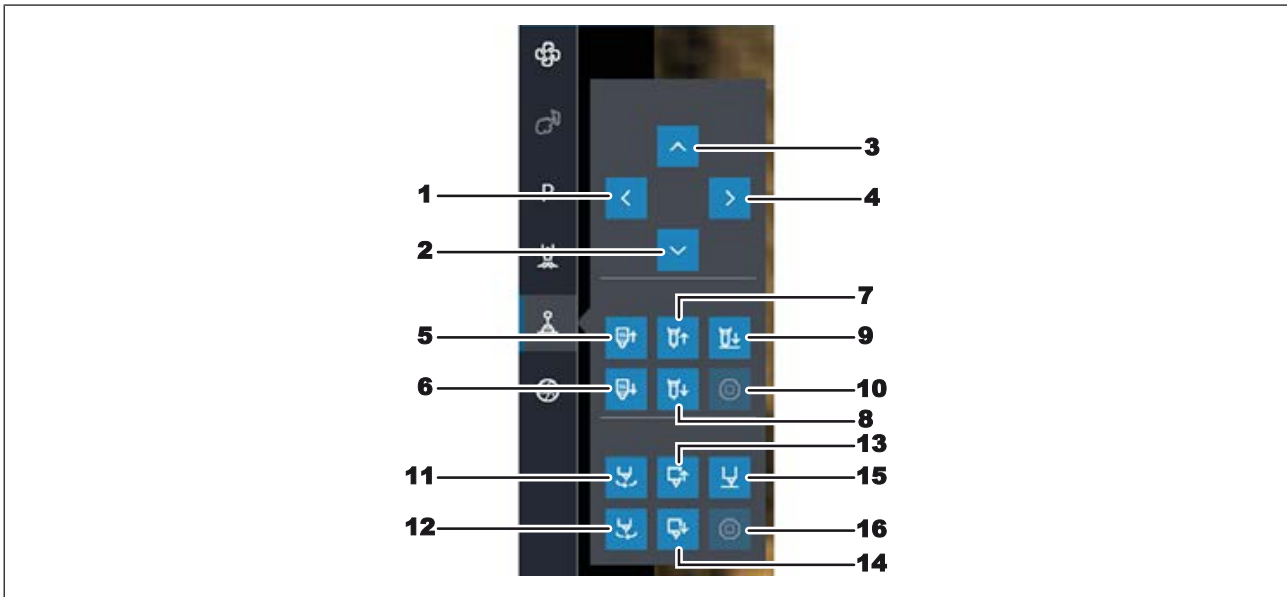


Fig. 31: Manually moving motors

- 1-4: These arrow buttons move the heads forward, backward, left, or right as long as the button is pressed.

The 5-10 buttons control the heating head functions.

- 5: Moves the heating head upwards.
- 6: Moves the heating head downwards.
- 7: Moves the heating head pipette upwards.
- 8: Moves the heating head pipette downwards.
- 9: Moves the heating head pipette downwards until contact is made.
- 10: Stops the pipette or heating head movement.

The 11-16 buttons control the placing head functions.

- 11: Rotates the pick-and-place nozzle counter clockwise.
 - 12: Rotates the pick-and-place nozzle clockwise.
 - 13: Moves the placing head pipette upwards.
 - 14: Moves the placing head pipette downwards.
 - 15: Moves the placing head pipette downwards until contact is made.
 - 16: Stops the movement of the pick-and-place nozzle.
- 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.
When the lower camera aperture is closed, the upper component camera can better recognize small components.

For a description of the machine parts, also read Chapter [Overview of the machine parts being operated](#) [▶ 75].



6.6.4 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.

Tracking ID	Date	User	Profile name	Board	Component
	12/12/2016 3:28:00 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 3:45:37 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 3:46:09 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 12:36:02 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 12:31:12 PM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:43:47 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:35:52 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:34:54 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:29:51 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:15:26 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:12:27 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:10:46 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 11:06:58 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:55:04 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:47:01 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:41:42 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:39:59 AM	Admin	Test 4	Low and medium mass	Low and medium mass
	12/12/2016 10:34:20 AM	Admin	Test 4	Low and medium mass	Low and medium mass

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]: Temperature from which the process record begins.
- [Max Temperature]: Highest measured temperature in the soldering process.
- [TL]: Liquidus temperature entered for the process. No function, freely adjustable in the chart.
- [TP]: Only when desoldering. Pipette temperature at which the pipette moves to the component to lift it.
- [Lens]: 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.



6.6.4.1 The [Show chart] button

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



Fig. 32: 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.

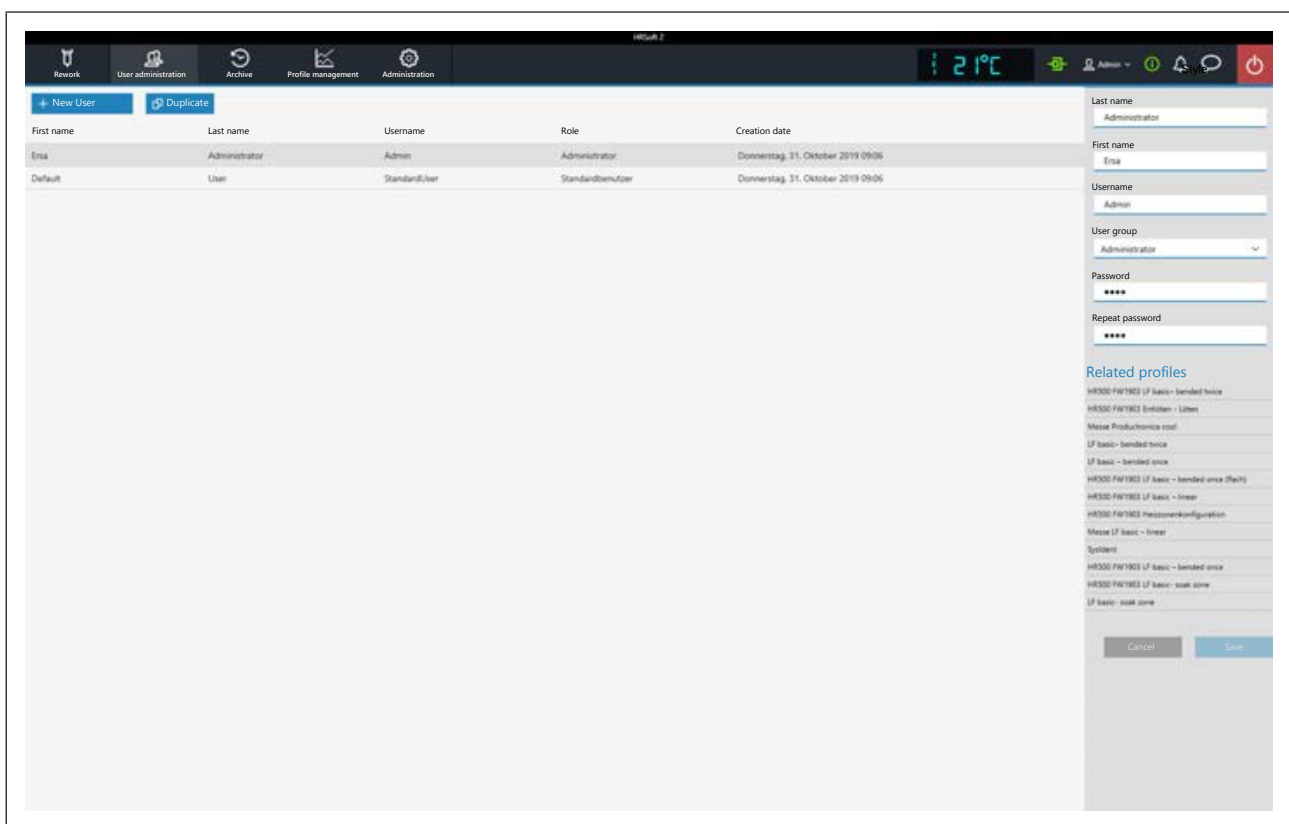


6.6.5 The [user management] tabulator

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

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

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



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

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



- Button [Auto-archiving]: if activated, all soldering processes for this user will be stored in the archive. Started and cancelled processes will be saved in the archive as graphics and in all soldering parameters. With regard to this, please also read Chapter --- FEHLENDER LINK ---.

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

How to delete a user

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



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

6.6.6.1 Overview of the [Profile management] tab

In tab [Profile management], you can create, edit, copy, delete and save soldering profiles as an administrator. If you are logged in as a standard user, this tab will not be available.

Tab [Profile management] largely corresponds to the content of tab [Rework], in which you can also make changes to the soldering profile, but not save them. In tab [Rework] soldering processes are started and controlled. For a description of tab [Rework] please read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 81].

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

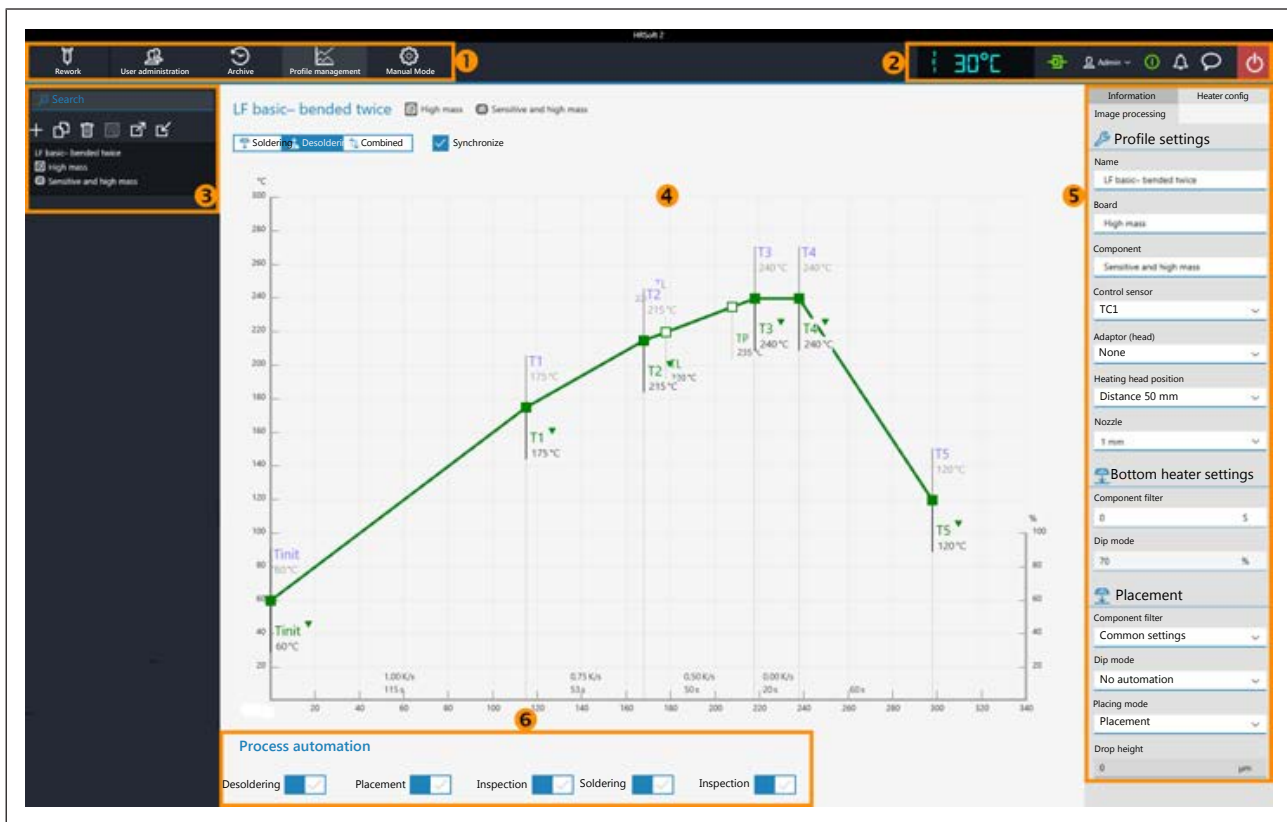


Fig. 33: Ranges in tab Profile management

1	tab bar. Calling up the tabs and button bar [Manual Mode].	2 Displays (e.g. temperature and network connection) and buttons (e.g. to call up status information and dialogs). As to this, please read Chapter The display and switch row top right [▶ 124].
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<p>3 Selection of a soldering profile. Searching for profile names is possible. The buttons in the top range allow you to (from left to right):</p> <ul style="list-style-type: none"> – Create a new soldering profile – Copy the highlighted soldering profile – Delete a soldering profile – Save the highlighted soldering profile <p>As to this, please read Chapter <u>Create, copy, delete and save soldering profiles in the [Profile management] tabulator</u> [▶ 102].</p>	<p>4 Chart / soldering graphs. Display of the soldering process with graphs for soldering and desoldering. Soldering graphs can be changed at the points in the curves.</p> <p>As to this, please read Chapter <u>The chart in the [Profile management] tabulator</u> [▶ 111].</p>
<p>5 Parameter bar for processing parameters in tabs [Information] and [Heater config] as well as the small arrow key [Image processing] to assign users to soldering profiles.</p> <p>With regard to this, please read Chapters <u>The [Information] tab under the [Profile Management] tab</u> [▶ 105], <u>The [Heating setting] tabulator under the [Profile management] tabulator</u> [▶ 107] and <u>Assigning a user to a soldering profile in the "More" arrow key tab under [Profile management]</u> [▶ 109]</p>	<p>6 Workflow bar for determining process flow steps (from left to right). As to this, please read Chapter <u>The [Process automation] buttons under the [Profile management] tabulator</u>.</p>

The functions of tab [Profile management] largely correspond to those of tab [Rework]. For a description of tab [Rework] please read Chapter Overview of the tab [Rework] [▶ 86].

If you want to edit the heating settings specified in the soldering profile, select button [Soldering] or [Desoldering]. Select buttons [Soldering] or [Desoldering] to set a separate heating graph including detailed heating settings for soldering and desoldering. When selecting button [Synchronize], both soldering processes are identical.

The number of heating phases is determined by the selected soldering profile. Depending on how often the heating graph is kinked, there will be 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 [▶ 102]. Each heating phase can be entered in the tab [Heater config] in the [0593] tab, the temperature, blower power and top heating proportion, as well as the temperature, proportion and distribution of the lower heating zones can be assigned to each heating phase.

Use button [Synchronize] to edit the desoldering heating graph values to the soldering heating graph ones. The displayed heating settings are valid for the highlighted soldering graph.

Save changes as described in the following chapter.



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



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

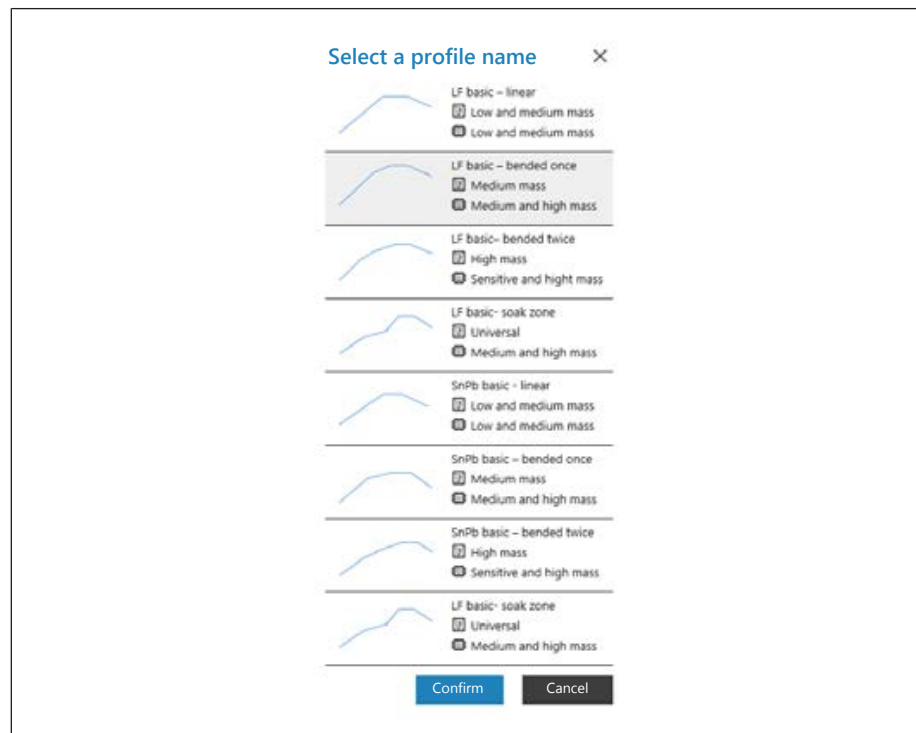
A soldering profile is a file that defines the whole soldering process. Use the four buttons above the soldering profile list to perform the following functions (from left to right):





- Plus sign = Create a new soldering profile
- Duplicate file = duplicate highlighted soldering profile
- Trash = Delete a soldering profile
- Disk = Store the highlighted soldering profile
- Arrow outwards = export soldering profile
- Arrow inwards = import soldering profile
- Search for a soldering profile name in the [Search] input field above. The search will automatically start after entering the first sign. Any matches found will be highlighted in colour.
- The soldering profiles have two lines defining the characteristics of the  PCB and the  component. Properties, such as PCB thickness, high/low component mass and lead-free/lead solder can be entered into these lines.

Creating a new soldering profile

- a) Click on the “plus sign” button above the soldering profile list.
⇒ The [Select a profile name] window will open.



- b) Select the profile stencil that best fits your new soldering profile from the eight available stencils and click on [Confirm]. In practice, the stencil profiles to be selected have been adapted to the applications. They show the temperature pattern as a curve, and the two lines after the soldering profile name define the properties of the  PCB and of the  component. If necessary, sub-



sequently adapt the selected profile stencil to your soldering process. With regard to this, please also read Chapter [The \[Information\] tab under the \[Profile Management\] tab](#) [▶ 105].

⇒ Line 1: Soldering profile names. The profile stencils are always referred to as “basic.”

“LF” stands for lead free.


“SnPB” stands for tin-lead.

“linear” stands for a uniform heating phase. The process has two heating phases.

“bent once” stands for a once kinked heating curve. The process has three heating phases.

“bent twice” stands for a twice kinked heating curve. The process has four heating phases.

“soak zone” stands for heat-reduced heating phase from T1 to T2 to activate the flux material. If the heating curve has been kinked twice, the process has four heating phases.


⇒ Line 2: PCB name  . It is defined by the profile stencil selection. The stencils are called

“low and medium mass” for low to medium PCB mass,

“medium mass” for medium PCB mass,

“high mass” for high PCB mass, and “universal,” suitable for each PCB type.

Assign a different PCB name if desired.

⇒ Line 3: Component name  . It is defined by the profile stencil selection. The stencils are called

“low and medium mass” for low to medium component mass,

“medium and high mass” for medium to high component mass,

“sensitive and high mass” for sensitive and high mass components. Assign

a different component name if desired.

c) Click on the [Confirm] button.

⇒ The new soldering profile will be added at the end of the profile list.

d) Save the soldering profile by clicking on the “Disk” button above the soldering profile bar.

⇒ Change the new soldering profile according to your needs. With regard to this, please also read Chapter [The \[Information\] tab under the \[Profile Management\] tab](#) [▶ 105].

Copying a soldering profile

a) In the soldering profile list, click on the soldering profile you want to copy.

b) Click on the “Duplicate file” button above the soldering profile list.

⇒ The copied soldering profile has now been added at the end of the profile list. Change the soldering profile according to your needs. With regard to this, please also read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator](#) [▶ 102].

Deleting a soldering profile

a) In the soldering profile list, click on the soldering profile you want to delete.

b) Click on the “Trash” button above the soldering profile list.

⇒ The soldering profile has been deleted.

Saving a soldering profile

a) In the soldering profile list, click on the soldering profile you want to save.



- ⇒ Please note: The selected soldering profile will be overwritten! To create an additional soldering profile, first create a new soldering profile and then save it.
- a) Click on the “Disk” button above the soldering profile list.
- ⇒ The soldering profile has been saved.





6.6.6.3 The [Information] tab under the [Profile Management] tab



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

In range [Profile settings]:

- [Name]: is specified by the profile template selection. Assign a different name if desired. As to this, please also read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator](#) [102].
The profile stencils are always referred to as “basic.”
 - “LF” stands for lead free.
 - “SnPB” stands for tin lead.
 - “Linear” stands for a uniform heating phase.
 - “bent once” stands for a heating graph with a single bend.
 - “bent twice” stands for a heating graph with two bends.
 - „soak zone” stands for a heat-reduced heating phase from [T1] to [T2] to activate the flux material. The heating graph has two bends.
- [Board]: It is defined by the profile template selection (). The stencils 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 all PCB types. Assign a different PCB name if desired.
- [Component]: It is defined by the profile template selection (). The templates are called “Low and medium mass” for low to medium component mass, “Medium mass” for medium to high component mass, “Sensitive and high mass” for sensitive and high mass components. Assign a different component name if desired.



- [Control sensor]: Selection of the temperature sensor that controls the soldering process through the temperature it measures. [TC1] (thermocouple 1), [Virtual TC] (infrared sensor), or others. The currently measured temperature of the selected sensor is displayed in range (2). The infrared sensor (IRS) is limitedly suitable for glossy, reflective surfaces or very small boards.
- [Adaptor (head)]: used adapter (air baffle).
No function, only used to save info.
- [Heating head position]: Define the soldering distance to the PCB from 30 mm to 70 mm. No function, only used to save info. To obtain the heating head distance for tall components on the PCB, the distance can be adjusted with the buttons in the tab [Manual Mode] must be set. As to this, please read Chapter [The \[Manual Mode\]](#) [▶ 93].
- [Nozzle]: Selection of the soldering nozzle used.
No function, only used to save info.
- [Pin 1 orientation]: position of pin 1 of the component.
No function, only used to save info.

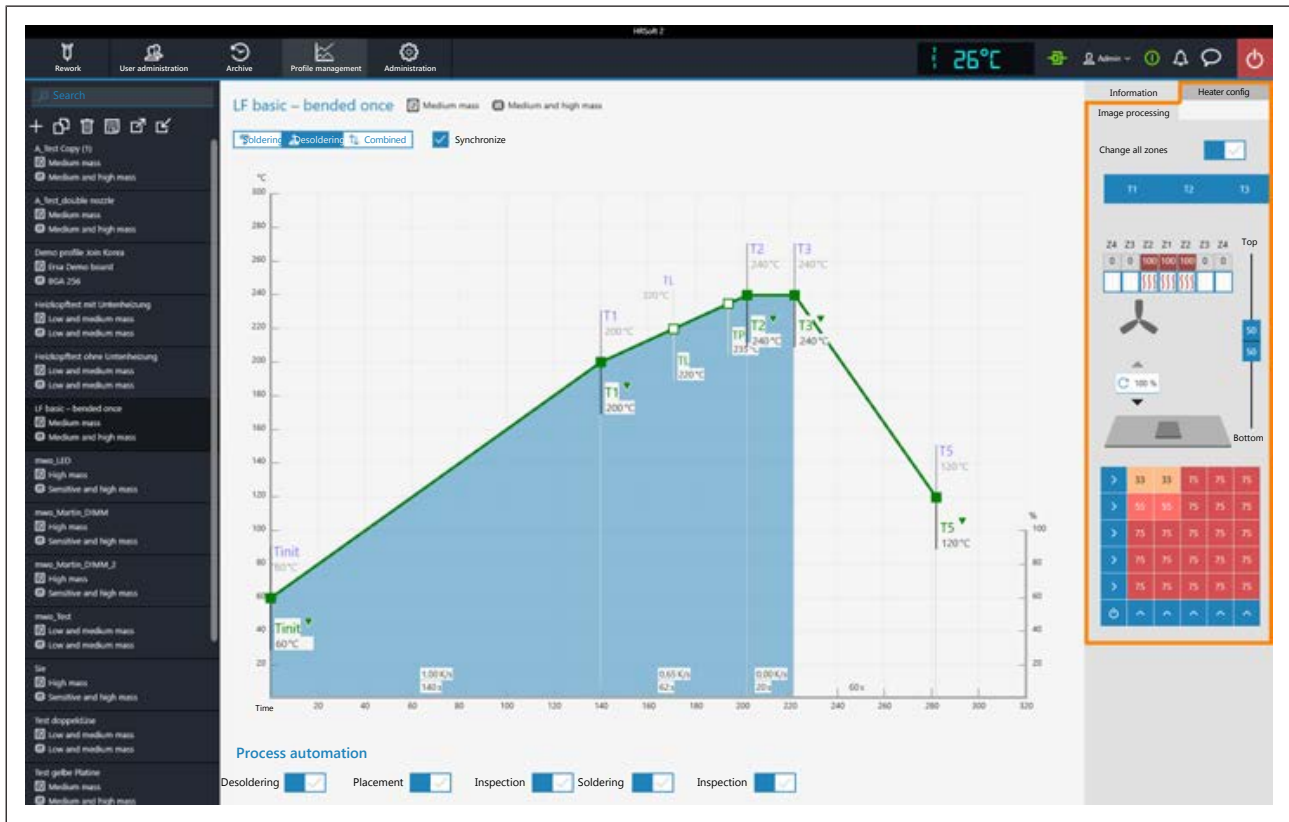
In range [Placement]:

- [Component filter]: The component recognition of the camera is improved for the selected component type. Select the component type before soldering. Possible filters are:
 - [General] = all other component types
 - [BGA] = Ball Grid Array
 - [Small BGA]
 - [Big BGA]
 - Do not use [MFU BGA]!
 - [QFP] = Quad Flat Package
 - [QFN] = Quad Flats No Leads
 - [CBGA] = Ceramic Ball Grid Array, small component [up to 01005 size]
 - [Small component (01005)] = SMD with 0.2 x 0.4 mm
 - [SMD plug]
 - [BGA plug]
- [Dip mode]: You can choose from three soldering methods:
 - [No automation]: Normal soldering without flux material dipping and without using a component that is coated with solder paste. The component is picked up from the component tray, aligned and placed in the soldering position.
 - [Auto. Dip]: Place the dip stencil prepared with flux material on a component tray. The component is lifted from another component tray and immersed in the dip stencil's flux material, aligned and placed in the soldering position.
 - [Auto. Print]: Place the print stencil prepared with the component coated with solder paste on a component tray. The component is picked up from the print stencil, aligned and placed in the soldering position.
- [Placing mode]: during [Placement]: Positioning of the component using the contact sensor, or [Drop]: dropping the component through the PCB.
- [Drop height]: during soldering: Height above the PCB at which the component is dropped onto the PCB. Can only be changed if parameter [Drop] is selected.



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

Heater config Extensive settings for the top and bottom lower heating can be made in the [0593] tab.



The parameters in tab [Heater config]

[Change all zones]: if this button is selected, all heating phases are displayed in blue in the [Heater config] as well in the chart. The parameters in tab [Heater config] will now apply to all heating phases.

If button [Change all zones] is disabled, different heating parameters can be assigned to each heating phases. The number of heating phases is determined by the selected soldering profile.

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

- Buttons T1, T2...: 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.
- The shown top heating controller is only visible when XL heating head (Heating head 150 x 80 mm, 2000 W, part number OHR667L) is installed.
Info: The Rework System is equipped with either an 800 watt heating head or a 2000 watt one. The heating head can be replaced with the other optional heating head. As to this, please also read Chapter [Replacing the heating head](#) [▶ 178] and check the Table [Options](#) [▶ 22].
The four heating zones are numbered from the inside to the outside and can be set individually. The division into heating zones is also printed on the heating head.
Enter the desired heating output into the heating zone fields in the top line with values from 0% – 100%. The darker a field is displayed, the higher the set temperature. The bottom line is the on/off switch for the heating zones.
 - To edit the temperature of a heating zone: Highlight the top button of a heating zone by clicking on it and overwrite the value.



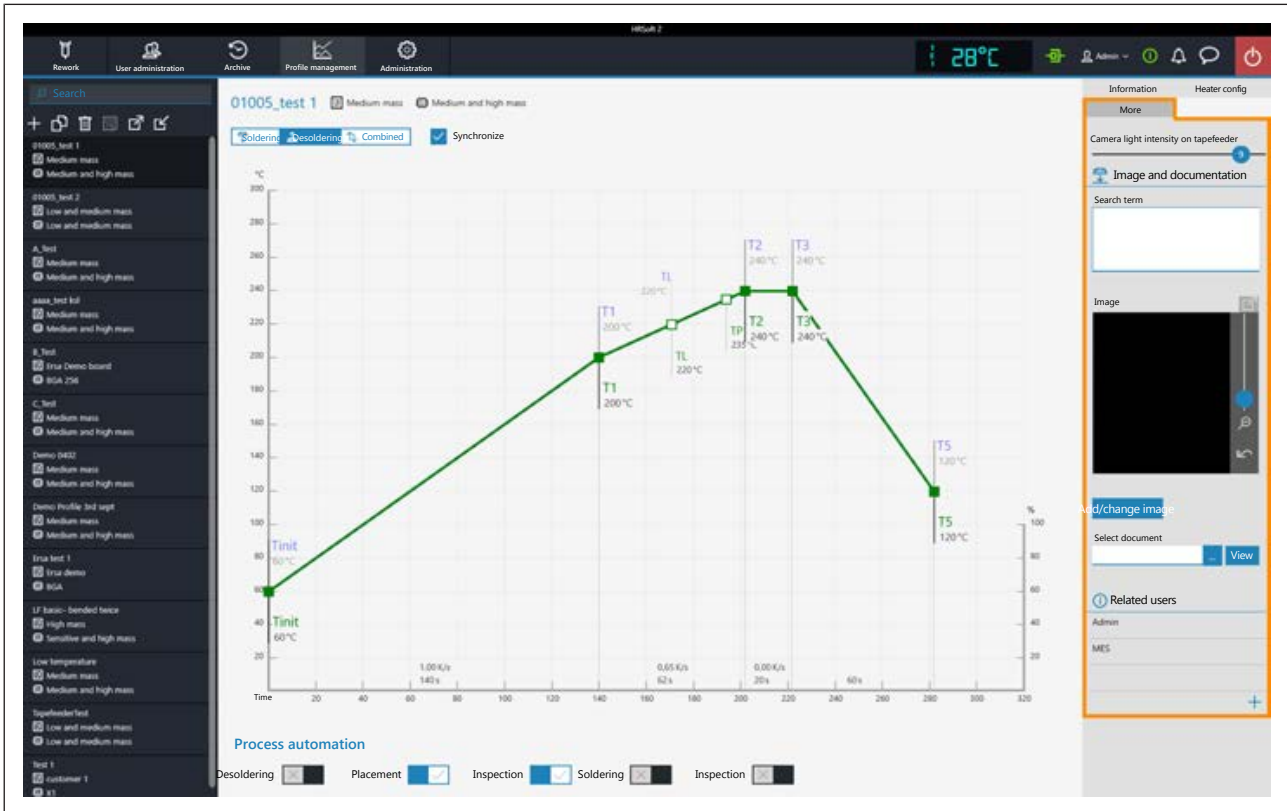
- To switch on/off a heating zone: click on the bottom button.
- Power value for the top heating blower output level. The set value is to be kept constant. The 50% value is suitable for all applications.
- Vertical controller (top - bottom): Top heating/bottom heating percentage power ratio. Adjust the power ratio to the heat requirement of your soldering process.
- Lower heating matrix field: Setting of each the 5 x 5 lower heating zones with 0% – 100% values. The darker a field is displayed, the higher the set temperature.
 - To edit the temperature of a heating zone: Highlight a heating zone by clicking on it and overwrite the value.
 - Methods to highlight several heating zones so as to edit them all to the same value:
 - Double-click on the single fields to switch them on. The default value upon switch-on is a 75% heating output.
 - Click on the blue side boundary boxes to switch lines/columns on/off.
 - Click on the blue box at the bottom left to switch the whole bottom heating on/off.

For large PCBs, to avoid shape distortion, ensure that the entire PCB is heated.

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



6.6.6.5 Assigning a user to a soldering profile in the "More" arrow key tab under [Profile management]



The parameters in tab [Image processing]

Import and display of additional information files for the soldering profile:

[Search term]: Text field for further info to be entered.

[Image]: Display of the added picture.

[Add/change image]: Button to import a picture to the soldering profile.

[Select document]: Blue button with three points to import a PDF file.

[View]: Display of the added PDF file.

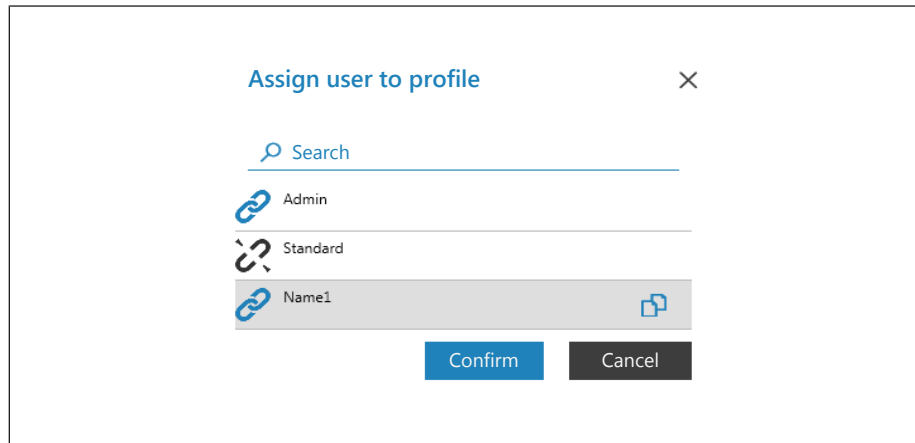
Assignment of allowed users to the soldering profile:

[Related users]: List of users, who can see and use this soldering profile in tab. [Rework]. Only this user can be assigned here.

Assigning a user to a called up soldering profile

a) Click on the "plus" sign.

⇒ Dialog [Assign user to profile] will be displayed.



- b) Click on the user to be assigned. This one has an open pipe character.
- c) Click on the pipe symbol.
 - ⇒ The pipe character is now closed.
- d) Click on button [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.

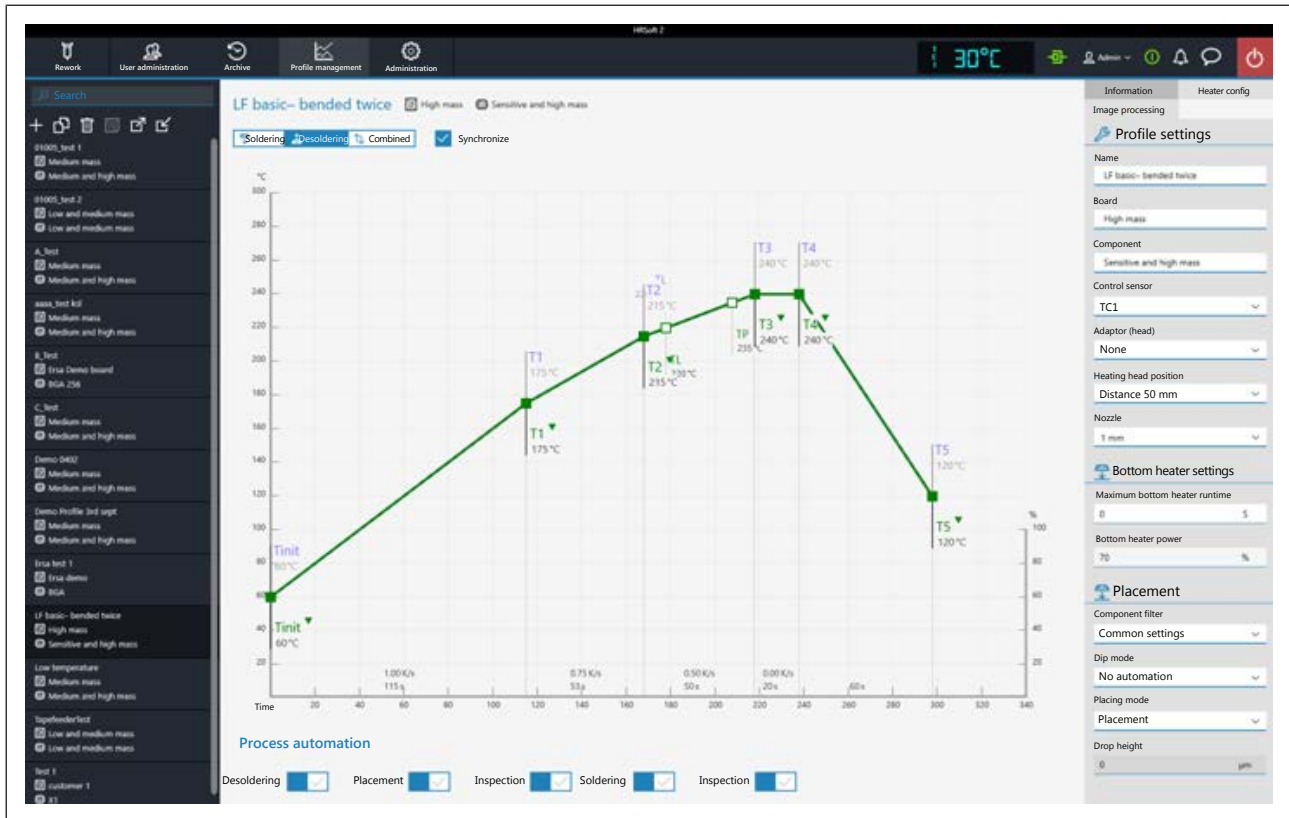
Removing a user from a soldering profile

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



6.6.7 The chart in the [Profile management] tabulator

When tab [Profile settings] is called up, chart (4) will be displayed in the middle of the screen with the heating curves and, below, the [Process automation] (6) line with the buttons for the work phases of the Rework process. The heating curves can be changed here.



The following buttons are available:

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

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

The heating curve is determined by the selected soldering profile. Depending on how often the heating curve is kinked, there will be 2, 3 or 4 heating phases. With regard to this, please read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator](#) [▶ 102]. 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 above the chart 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] (pipette temperature) is the temperature at which the pipette moves to the component to lift it. Only when desoldering.
- TL: (Liquidus temperature) Temperature at which the solder becomes liquid. No function. You can highlight the TL temperature with this.

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

Setting the heating curves

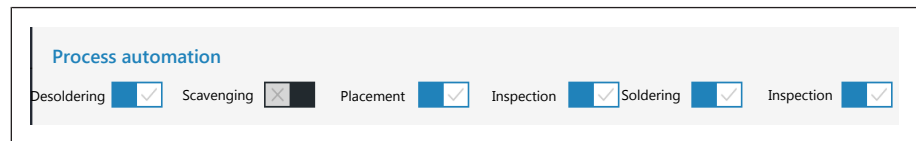
- To simultaneously change the temperature and the heating phase duration: Click on one of the points [Tinit], T1, T2 ... on the heating curve and keep the mouse button pressed until the temperature indicated there is displayed in bold. Now move the point by pressing the mouse button.
- To change temperature: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

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



6.6.8 [Process automation] and its process steps

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



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

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

How to perform a soldering process is exemplified in Chapter [Tutorial – Soldering or desoldering a component](#) [▶ 137].

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

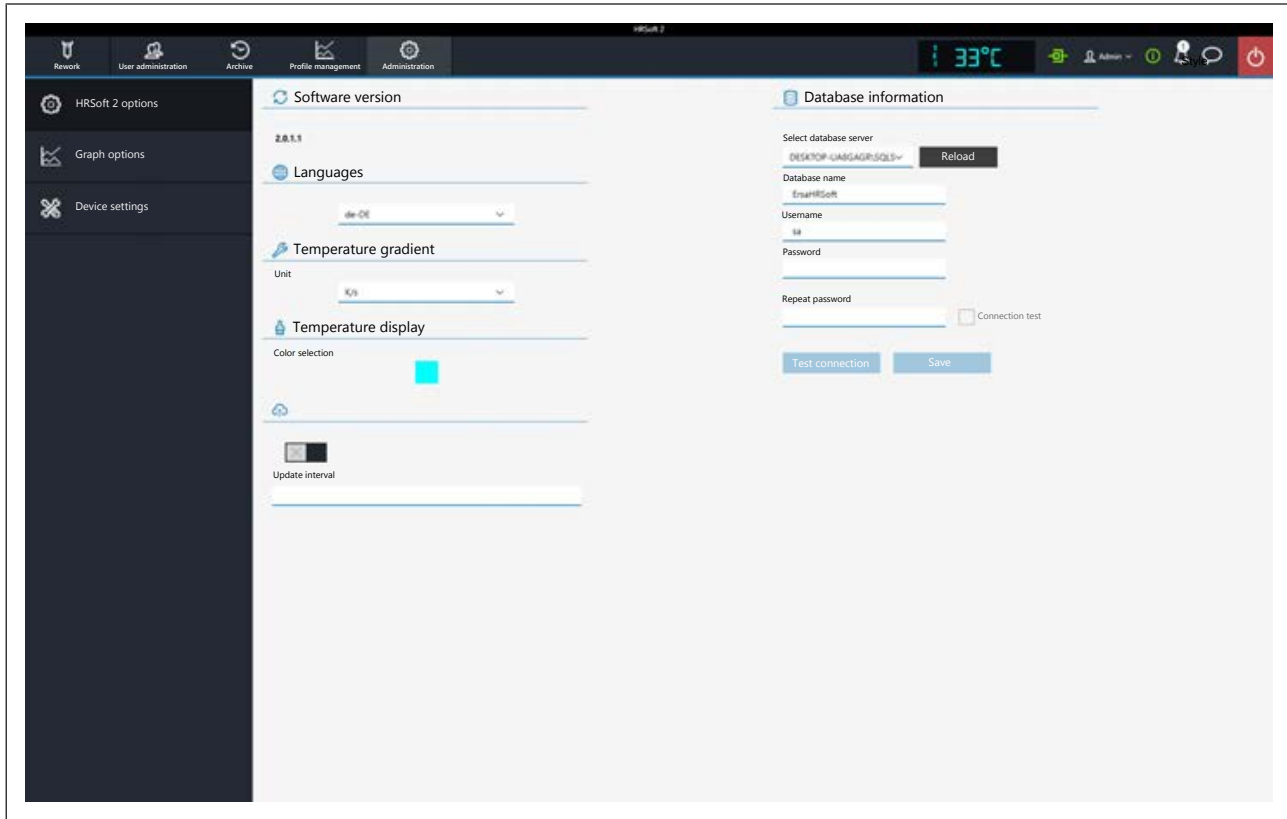
The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. As to this, please read Chapter [The \[Process automation\] buttons under the \[Profile management\] tabulator](#).



6.6.9 The [Management] tabulator with three dialog windows

6.6.9.1 The dialog [HRSoft 2 settings]

Various default settings for the HRSoft 2 program can be accessed in the [HRSoft 2 options] dialog.



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.
- [Update interval]: No function.
- [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.
- [Connection test]: Click on the [Test connection] button. When the connection to the database has been established, a checkmark will appear.



- [Test connection]: click on this button for checking. When the connection to the database has been established, a checkmark will appear in the [Connection test] checkbox.
- [Save]: to save the database settings.



6.6.9.2 The [Chart settings] dialog

In the [0515] dialog, you can set how to display heating graphs and set values in the chart and later in the [0076] tab. Graph optionsArchive

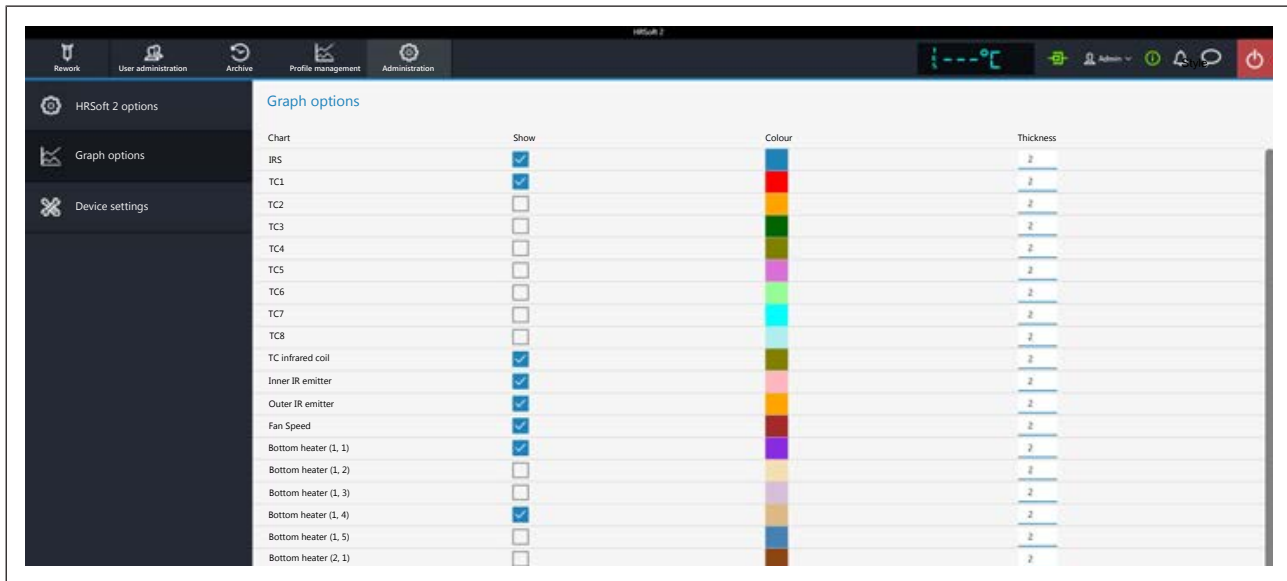


Fig. 34: Example figure. If the heating head and bottom heating are configured differently, the selectable graphic options may differ.

The following parameters can be displayed if available:

Graph optionsThe [0584] table determines which soldering parameters to show in the chart, and in which colour and thickness they are to be displayed during the Rework process.

- Column [Show]: to display/hide the measured graph.
- Column [Colour]: colour of the measured graph. Click on the coloured square to display all available colours.
- Column [Thickness]: line thickness in the chart.

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

- [Virtual TC]: Measured temperature of the virtual thermocouple. The virtual thermocouple can only be used in certain applications. As to this, please read Chapter [The virtual thermocouple](#) [126].
- [TC1], [TC2], etc.: Measured temperature of the external thermocouple. Every connected thermocouple is displayed.
- [TC infrared coil]: measured infrared excitation winding temperature of the thermocouple.
- [Inner IR emitter]: Measured temperature of the inner radiant IR emitter of the top heating.
- [Outer IR emitter]: Measured temperature of the outer radiant IR emitter of the top heating.
- [Fan Speed]: blower output in the top heating.
- [Bottom heater (1, 1)]: Power value of the 1/1 heating element in the bottom heating.
25 heating elements can be selected for the bottom heating. The 1/1 heating element is on the front right. The 1/2 heating element is on the left thereof. Heating element 2/1 left, second row from the front, etc.

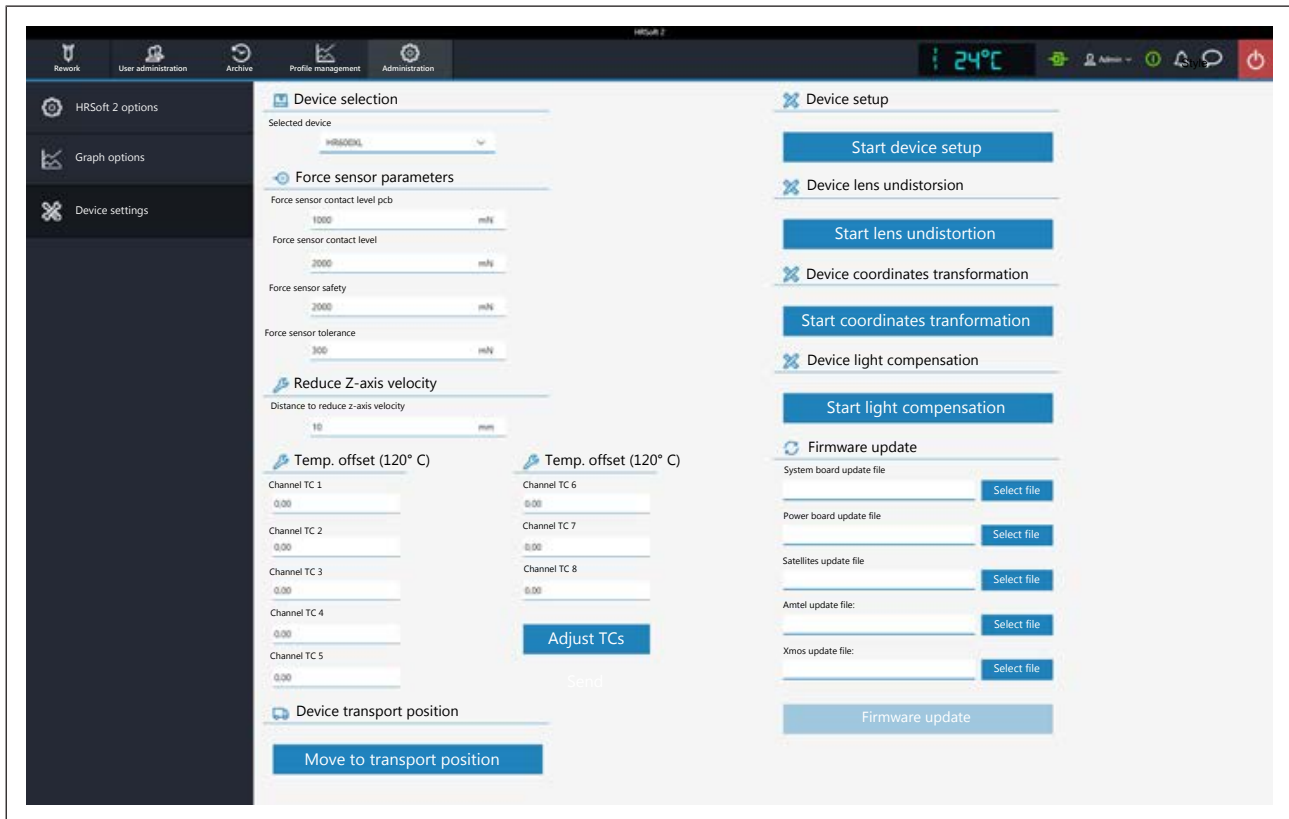
The lines in the chart can be displayed/hidden also during the current soldering process.





6.6.9.3 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 [▶ 134].

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 [▶ 178].
- after replacing the placer head. With regard to this, please read Chapter Replacing the placer head [▶ 180].
- 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] [▶ 68].
 - The [737] function. Start coordinates transformation With regard to this, please read Chapter The [Start coordinate transformation] button [▶ 121].

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 [▶ 195].

Device lens undistorsion

[Start lens undistorsion]: do not carry out this function. For Ersa 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 \[▶ 121\]](#) .

[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 Ers service.
- [Xmos update file:]: only execute if specified by the Ers 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](#).



6.6.9.3.1 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. 35: 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!

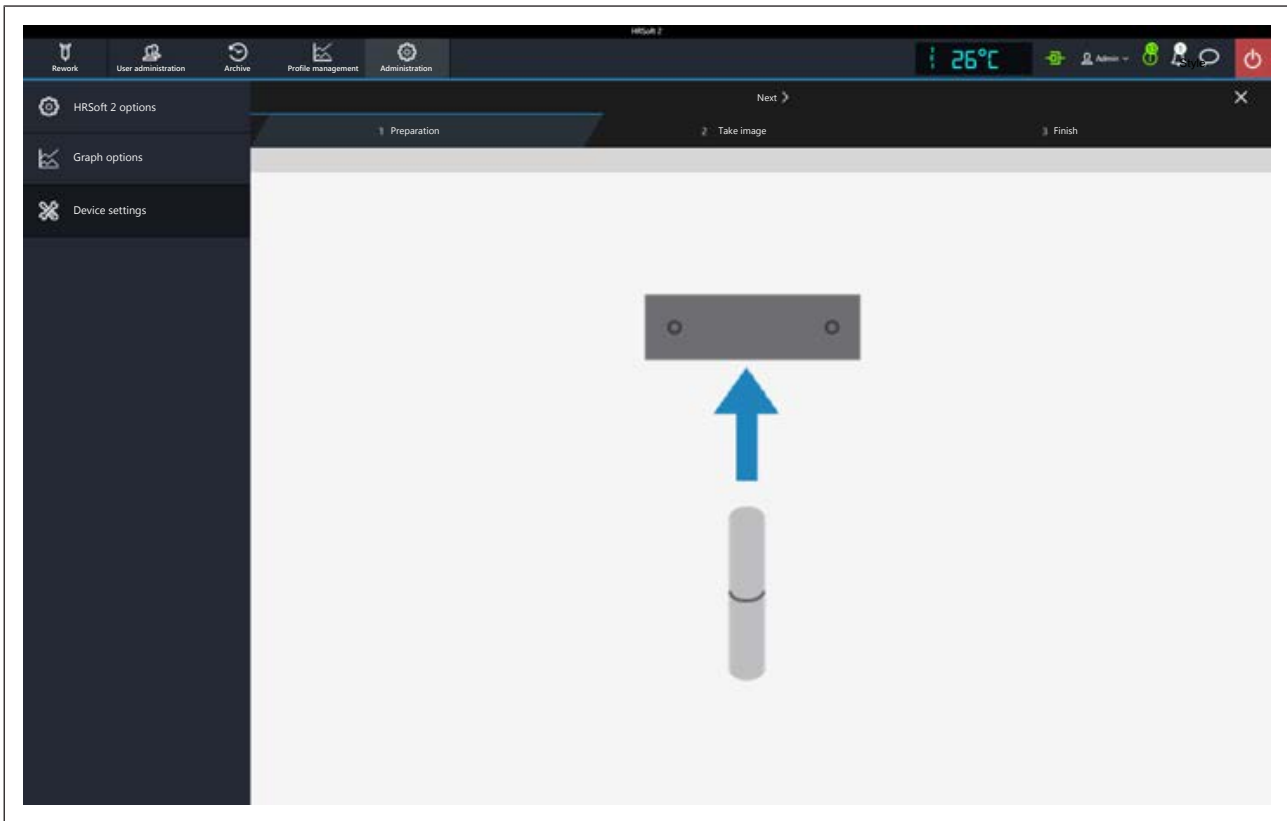


All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

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!

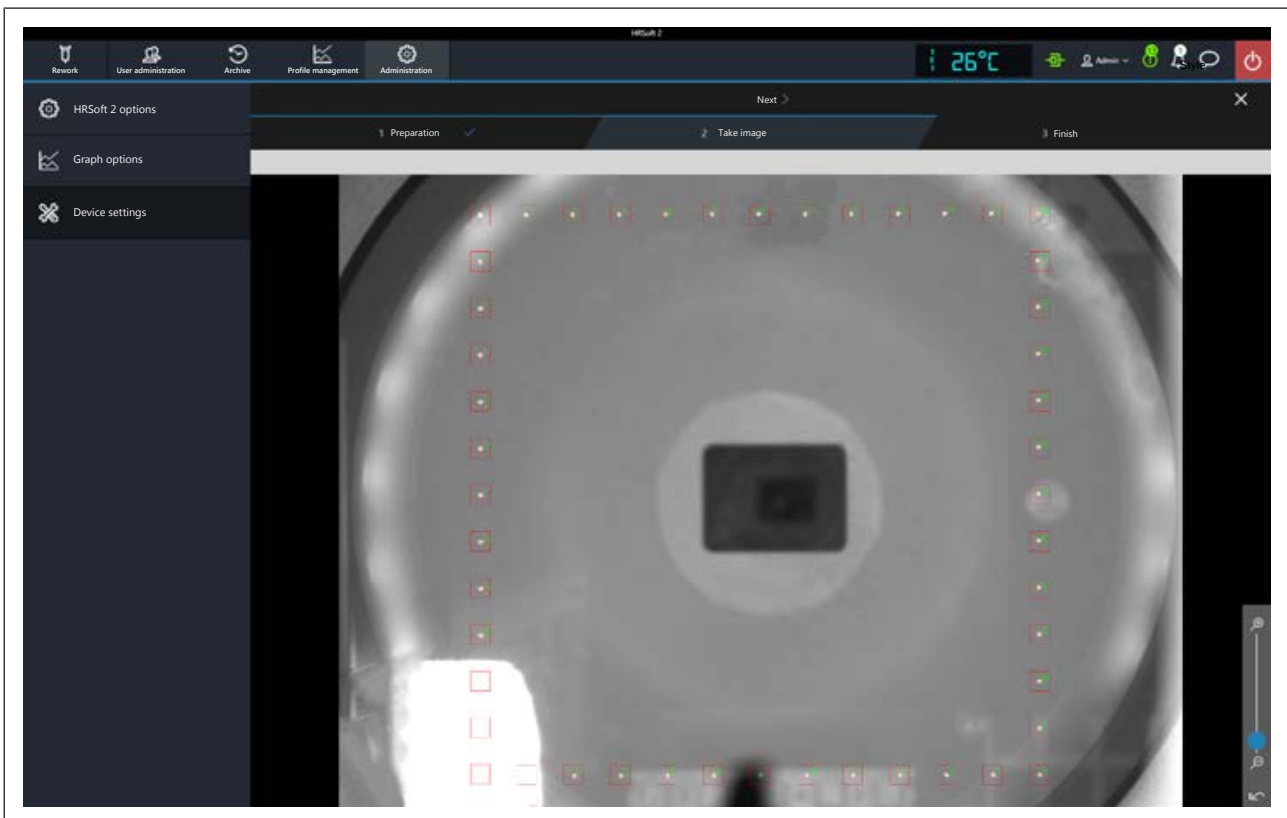
The starting page [Preparation] will be displayed. The information line above the diagram describes the work steps to be performed.

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](#) [▶ 138].

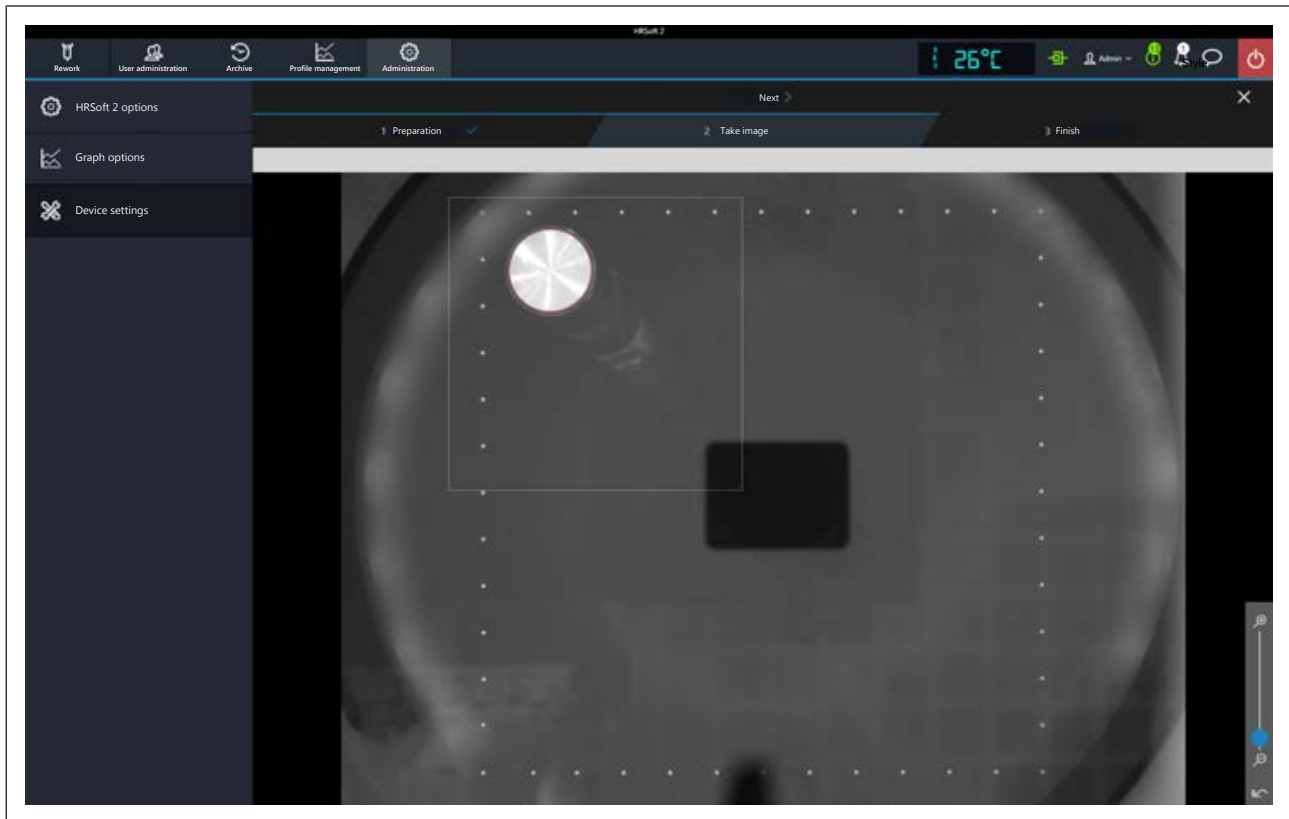
- a) The heating head nozzle and placer were moved down a bit. Screw a calibration nozzle each onto the heating head nozzle and placer.
- b) Click on the [Next] button to switch to the next work step.





⇒ 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.



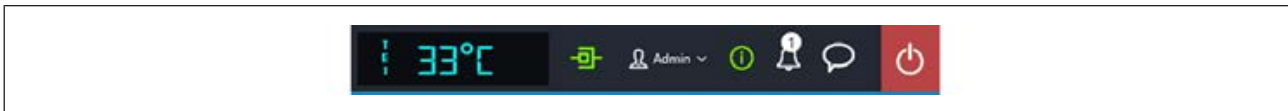
d) The pipettes will be automatically moved and aligned with each other.

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

a) Close the dialog box.



6.6.10 The display and switch row top right



The displays and switches from left to right:

- Far left: Name of the selected temperature sensor and the current temperature measured with it.
- Icon for displaying the network connection between PC and rework system. Green = Network connection established.
- Button “User name”: To call up the edit dialog [Login] for changing user. As to this, please read Chapter [The \[user management\] tabulator \[98\]](#).
- [i] button to call up the [System state] dialog: If there are error messages, the number in the circle will indicate the number of new error messages. Clicking the button opens 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.

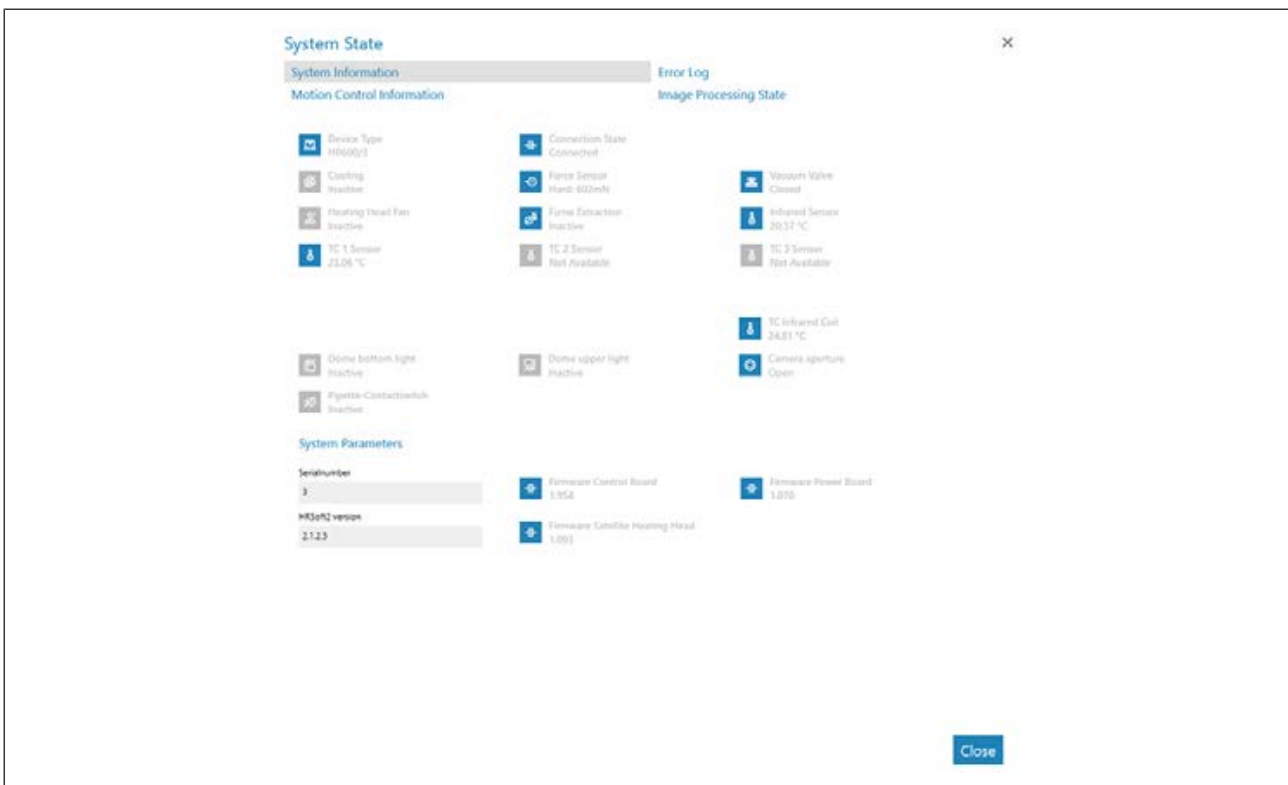


Fig. 36: Starting page of the [System state] range, example in English

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

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



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. In the [Active] column the new errors are marked.

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

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.

The [Image processing state] arrow button

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

The bell icon

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

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

Please read Chapter [The \[device settings\] dialog](#) [▶ 118]. It describes how to load the different variants of firmware updates into the Rework System.

Speech balloon button

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

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

Red button to the far right

- Closes the HRSoft 2 program.



6.7 The virtual thermocouple

Function

The HR 600 XL Rework system is equipped with a virtual thermocouple. The virtual thermocouple measures the process temperature and can control the Rework soldering process like an applied thermocouple. It is located under the heating head and works with an infrared measuring field with constant position and size. HR 600 XL rework systems of older series can be retrofitted with it. Please contact your Ersa sales partner.



Fig. 37: The virtual thermocouple

The virtual thermocouple can be used when several Rework soldering processes with identical component are carried out on identical PCBs - that is, when the same soldering profile can be used in several Rework soldering processes. It can be used for soldering and desoldering.

The first Rework soldering process before using the virtual thermocouple must always be carried out with a thermocouple applied. Any soldering profile can be used as a template. In the process, the soldering profile is taught in, adapted and saved for the application with the virtual thermocouple. The profile name is then marked with the name suffix "- VTC". From the second Rework soldering process with identical component and identical PCB, the thermocouple does not need to be applied. The virtual thermocouple monitors the process when selected as a control sensor.

During the teach-in process with the thermocouple applied, the Rework system checks whether the soldering point and component are suitable for use with the virtual thermocouple.

Teaching in the soldering profile with thermocouple applied

- a) Insert a PCB into the PCB frame as described in Chapter [\[Tutorial – Soldering or desoldering a component \[▶ 137\]\]](#).
 - ⇒ When using the virtual thermocouple for temperature measurement, make sure that the path of the infrared measuring field to the component is not interrupted. The following figure on the left shows the path of the measuring field. The infrared measuring field is not visible.
- b) If necessary, insert the PCB with a different orientation.

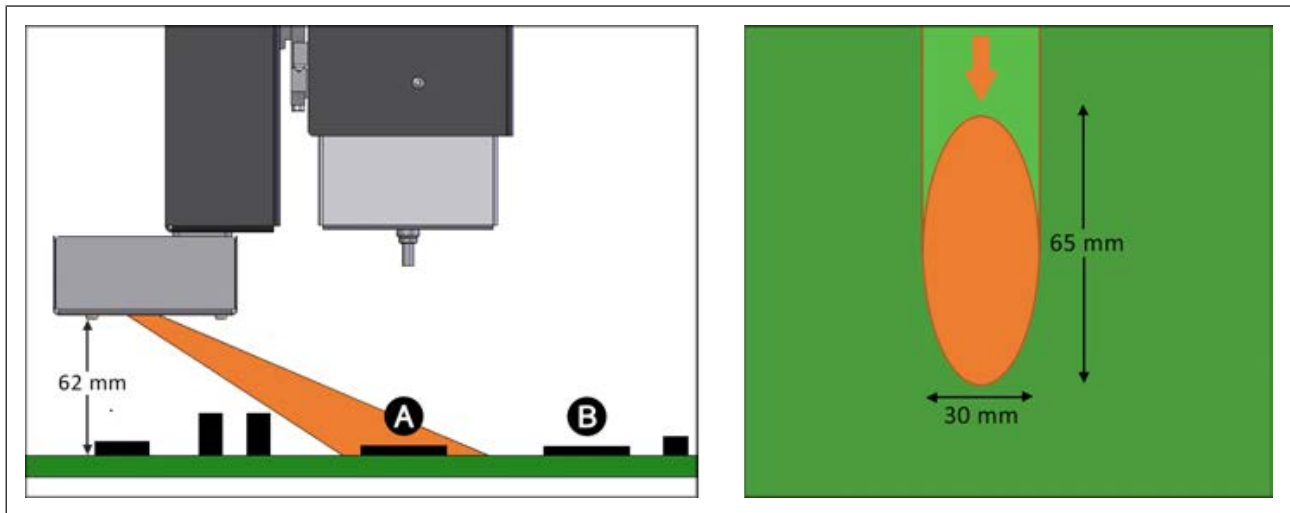
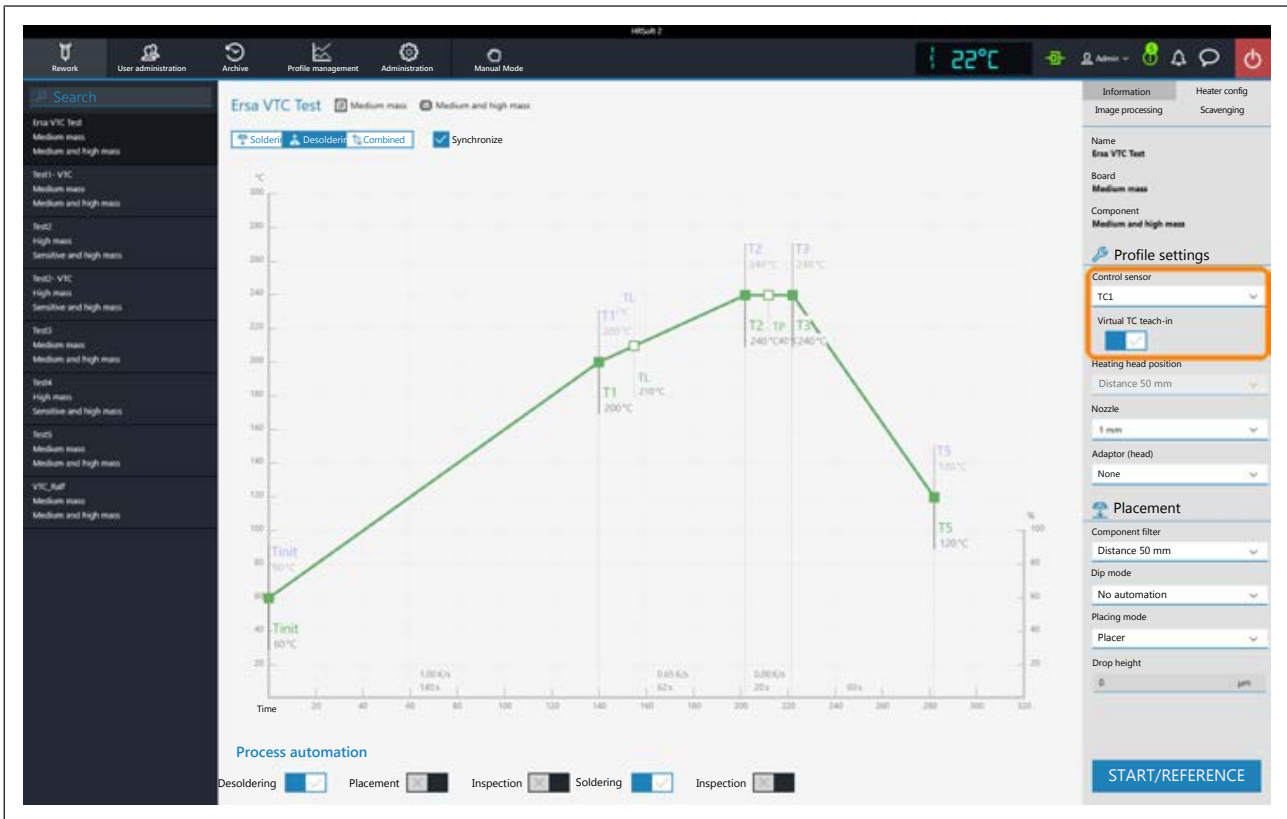


Fig. 38: Left: Beam of the infrared sensor, right: Size and shape of the infrared measurement field on the PCB

- c) Cover as large an area of the component to be processed as possible with the infrared measuring field. The illustration above right shows the shape and size of the measuring field.
- d) Select the [Profile management] tab.
- e) Create a new solder profile for desoldering or soldering.
- f) Set all Rework parameters for the desired Rework soldering process in the [Information], [Heater config] and [Image processing] tabs. As to this, please also read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 81].
 - ⇒ The Rework parameters for [Virtual TC teach-in] can only be edited in the [Profile management] tab.
 - ⇒ Under [Control sensor], thermocouples 1-8 are available for selection.
- g) Use the [Virtual TC teach-in] button to activate the teach-in mode for the virtual thermocouple.



Info: The [851] tab visible in the figuresScavenging is only active if the optionally available residual solder sucker is fitted to the Rework system. Please contact your Ersa sales partner.

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) Carry out the Rework soldering process for the component as usual.

- ⇒ This teach-in process is saved and you can repeat this soldering process with the virtual thermocouple for the taught-in position at any time without having to teach it in again.
- ⇒ After a successful teach-in process, the [Virtual TC taught in successfully and ready to use] message appears. The solder profile now has the name suffix "- VTC". The virtual thermocouple can now be used as a control sensor.
- ⇒ A picture of the taught position is stored in the profile to assist you when repeatedly positioning the heating head and pipette.

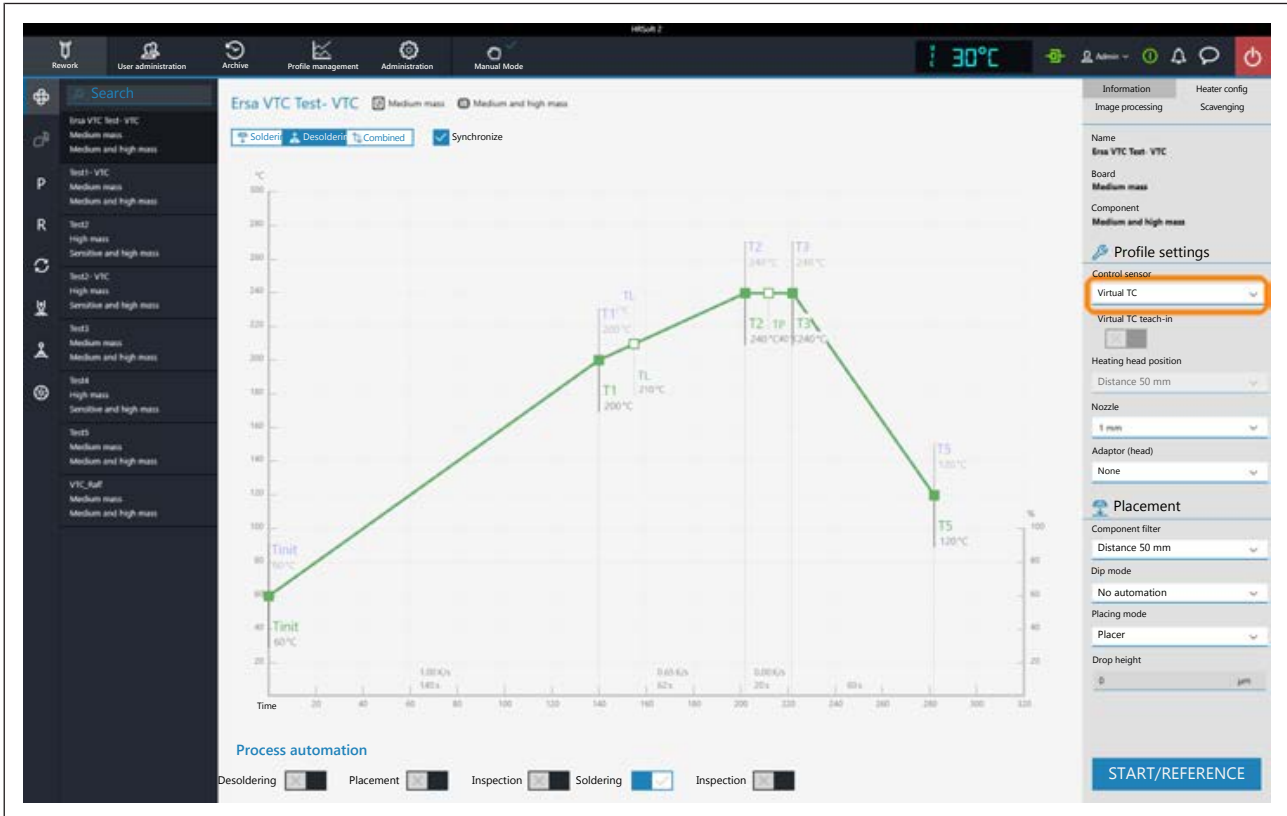
b) After the PCB has cooled down, insert an identical PCB with an identical component.

First Rework soldering process with the virtual thermocouple

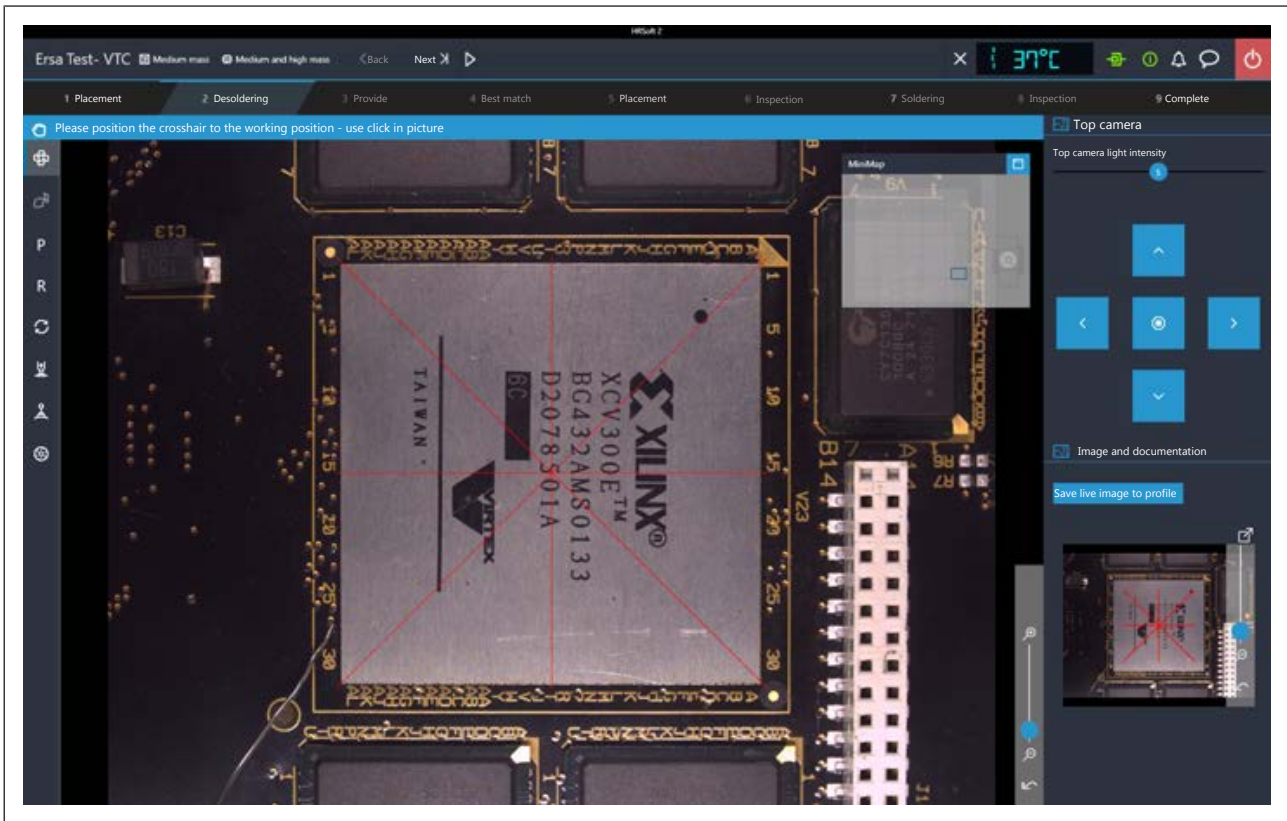
- a) Select the newly created soldering profile with the name suffix "- VTC".
- b) Under [Control sensor] select the [Virtual TC] function.



- ⇒ A thermocouple must be applied.
- ⇒ The [TP] parameter (pipette temperature) is preset by the system when using the virtual thermocouple and cannot be edited.
- ⇒ Fan cooling to the [T5] target temperature cannot be set at the end of the soldering process, but cooling is automatically switched on for a set time.



- c) When all the presettings have been made, press the [Start/Reference] button to start the Rework soldering process with the virtual thermocouple.
- d) Carefully approach the component with the crosshair.



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

⇒ The image with crosshair was saved in the profile.

f) Carry out the steps of the soldering profile.

⇒ After finishing the final cooling process, the Rework process has been completed.



6.8 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.

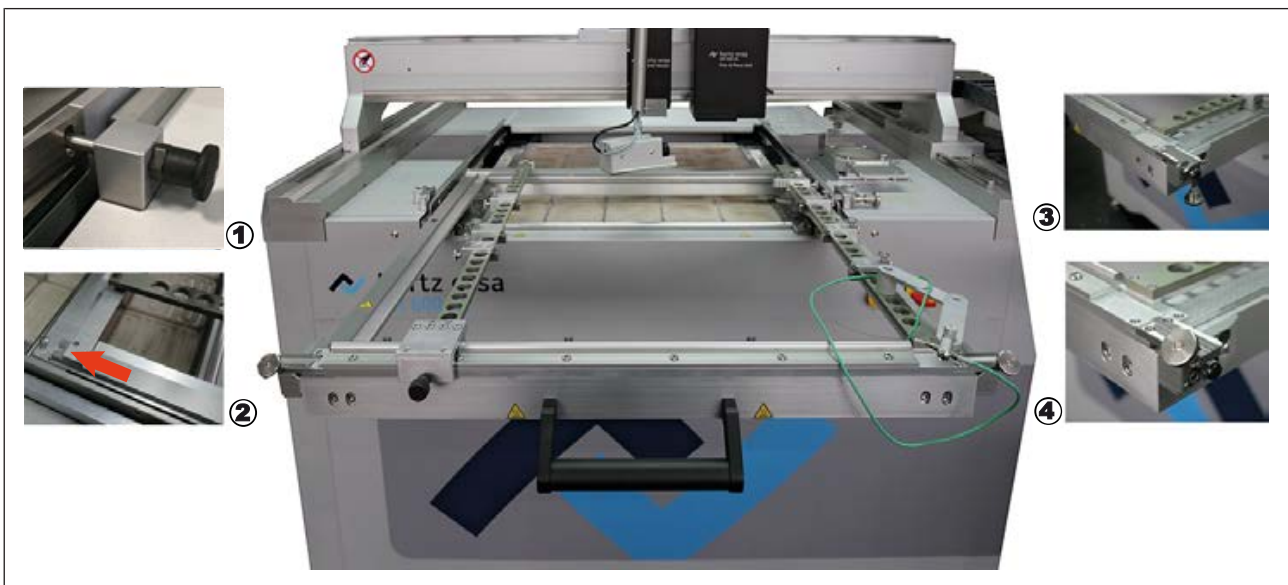
To remove the PCB, the best thing to do is to use two of the optional handles to lift and transport the frame.

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.

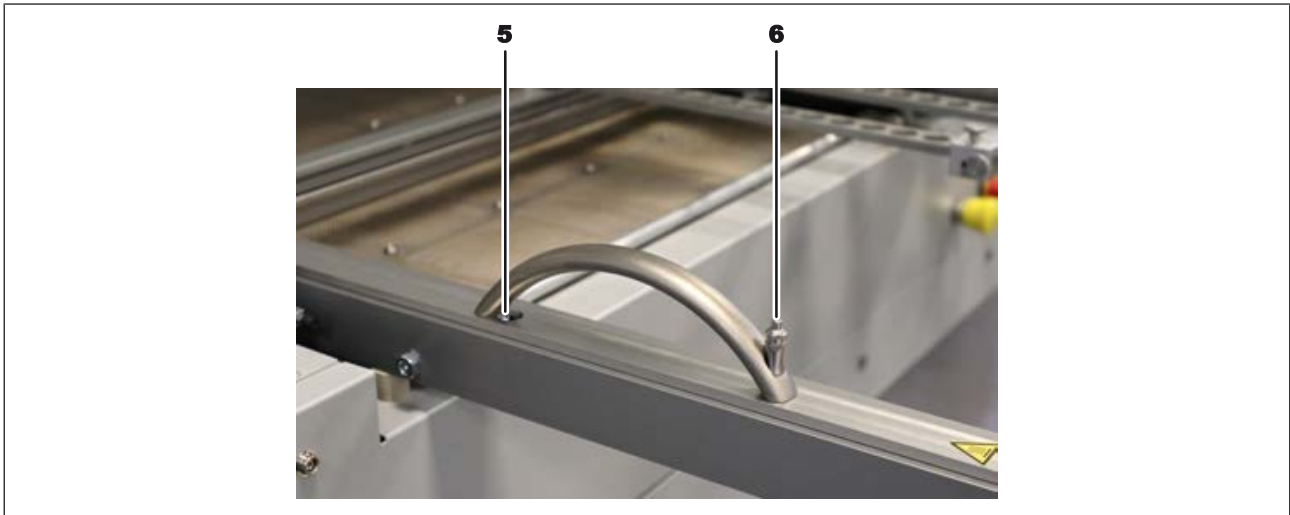


Fig. 39: Optional handles for the PCB frame

- 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.



6.9 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 Ersa sales partner about this.



6.10 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.



6.11 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 \[Start extraneous light compensation\]](#) [▶ 68].
- b) Function [Start coordinates transformation]. As to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 121].

Thereafter, the Rework System is ready for use.





7 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].

7.1 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!

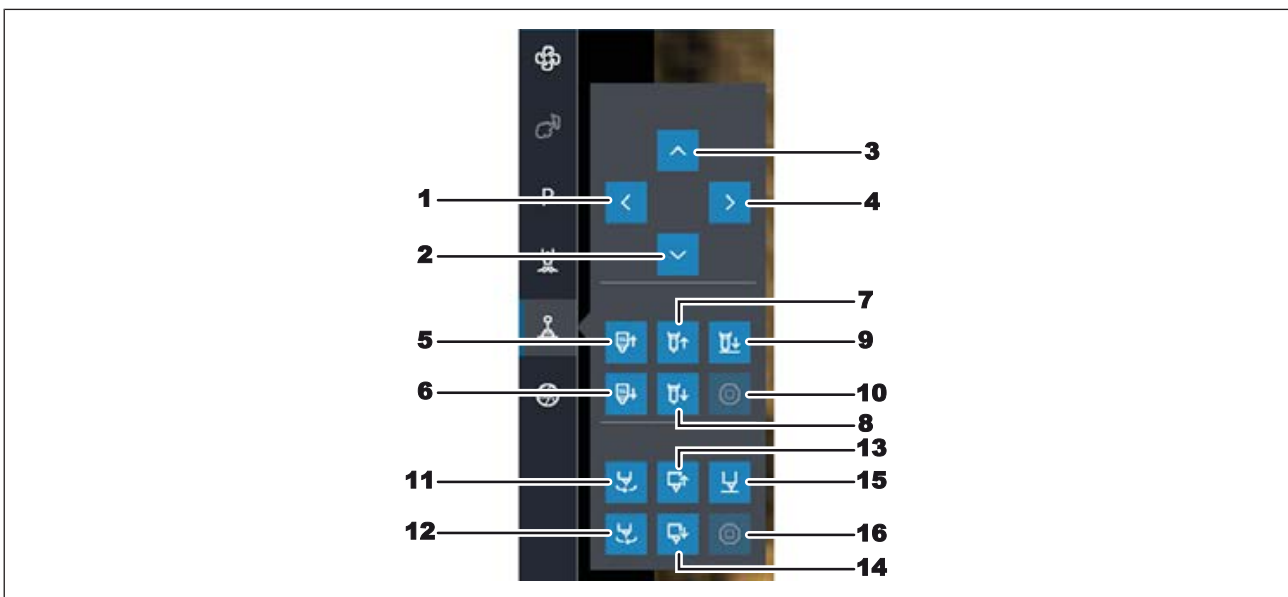
a) Switch to the [Rework] tab.

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](#) [▶ 165] [Spare and wear parts](#) [▶ 163] where you can find a list of available pipettes.

7.2 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 taken out. This allows using several board-mounted frames as a replacement. As to this, please read Chapter [Inserting the PCB frame and becoming familiar with it](#) [▶ 53].

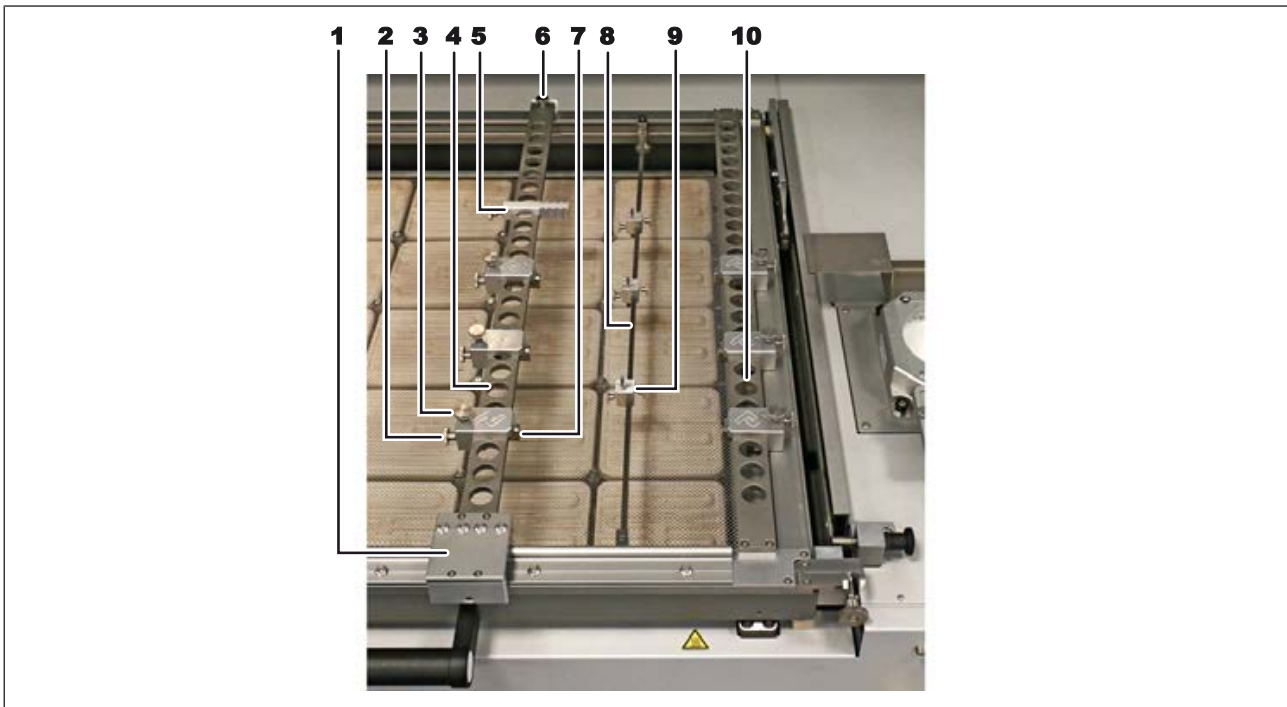


Fig. 40: The restraint system in the PCB frame

1	Base of the perforated strip on the left. Handle for moving the perforated strip.
2	PCB holder locking screw Tighten only slightly.
3	Clamping screw for PCB support (7)
4	Perforated strip on the left, movable
5	Holding frame board stopper . For repeatable positioning of the rear PCB stop. Also base support for clamped PCBs when vertically positioning the PCB frame.
6	Do not use
7	PCB support for laying and vertically clamping the PCB with a screw (3)
8	Bar of the center support. Prevents large PCBs from sagging.
9	Center support pin, spring-mounted.
10	Right perforated strip, fixed

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

- a) Ensure electrostatic discharge protection.
- b) If the virtual thermocouple is to be used for temperature measurement, ensure that the path of the virtual thermocouple's infrared beam onto the component is clear. As to this, please read Chapter [The virtual thermocouple](#) [▶ 126]. If necessary, insert the PCB with a different orientation.
- c) Hold the PCB to the lower right corner of the heating zone to determine the required positions of the left perforated strip, PCB holder and possibly center support.
- d) Release 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.
- e) Slightly tighten the locking screws.
- f) Adjust the position of the left perforated strip. To do so, grasp the base of the perforated strip (1) and move the perforated strip.
- g) Open the clamping screws for the PCB support (3) so widely that the PCB supports (7) can grip the PCB.



h) If necessary, use the center support (8). To do this, on the back, insert the center support into the top bar of the PCB frame, and then, in the front, insert it from the side into the bar of the PCB frame.
Turn the knurled screws at the end of the center support clockwise to rotate the top support by 90 degrees.

i) To position the center support: place the upper knurled screw for clamping in position on the bar.
Open the lower knurled screw to release the spring-loaded pin. Tighten to lock the pin at a certain height.

j) Place the PCBs onto the PCB supports (7).

k) Grasp the left perforated strip on the base (1) and push it up against the PCB.

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

m) Check the PCB for proper fit.

⇒ You can now position the thermocouple.

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

7.2.1 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):

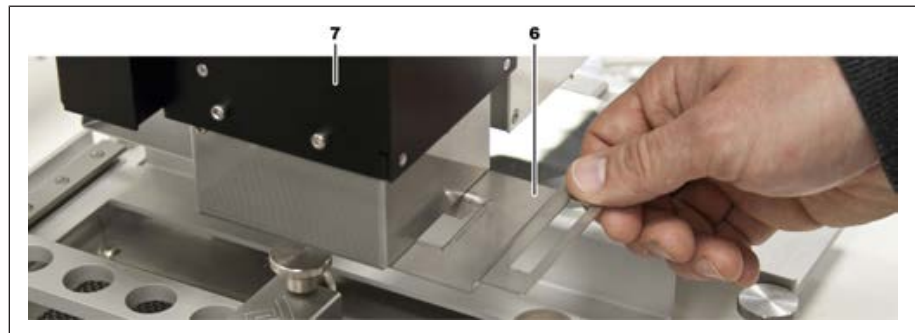


Fig. 41: Sliding in an air baffle, example picture

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.

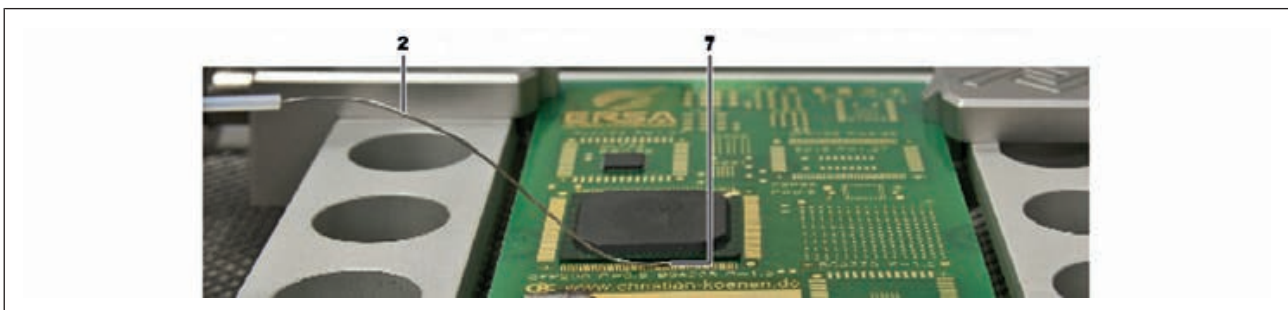
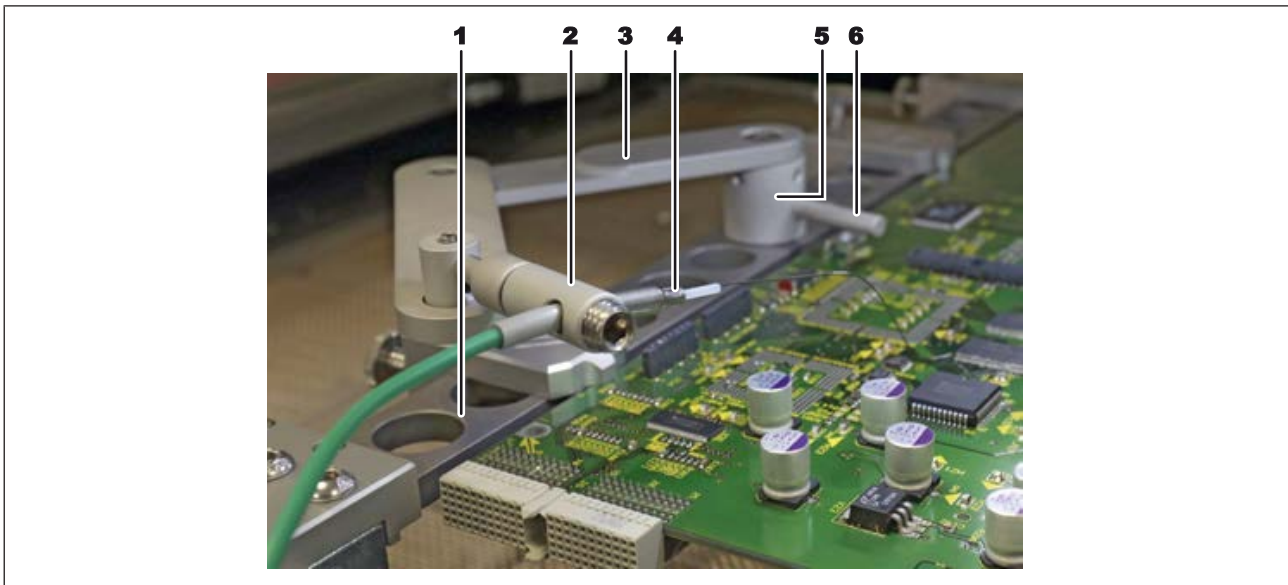
If necessary, also use protective films to protect temperature-sensitive components from heat radiation.



7.3 Position a thermocouple

A correctly positioned thermocouple is important for the self-regulating rework process to work properly. The tip of the thermocouple must be placed in the presumably coolest point, directly next to the component, so that the heating energy on the component to be soldered is sufficient. To avoid damage, only insulated thermocouples may be used.

Even if the virtual thermocouple is to be used for temperature control, a thermocouple must be used for the first Rework process. As to this, please read Chapter [The virtual thermocouple](#) [▶ 126].



- a) 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 to be processed.
- b) Clamp the holder with the lever (6) in a counterclockwise direction.
- c) Fit the thermocouple in the holder (4) as shown. To do so, release the grub screw at the end of the holder with a hexagon wrench no. 5, insert the thermocouple and slightly tighten the grub screw.
- d) Connect the plug of the thermocouple (4) to a [0176] – [718] socket.TC1TC8
- e) Fit the holder (2) in such a way that the end of the thermocouple (7) reaches the point to be measured on the component.
- f) Straighten the end of the thermocouple so that the front 3 millimetres of wire in close proximity to the component lie flat on the PCB.
Place the thermocouple wire in what is likely to be the coolest spot, right next to the component, especially if other components nearby cover the heat radiation.
⇒ You can connect further optional temperature sensors for additional temperature info, e.g. from adjacent components or the PCB underside.



7.4 Activate a soldering profile and prepare the soldering process

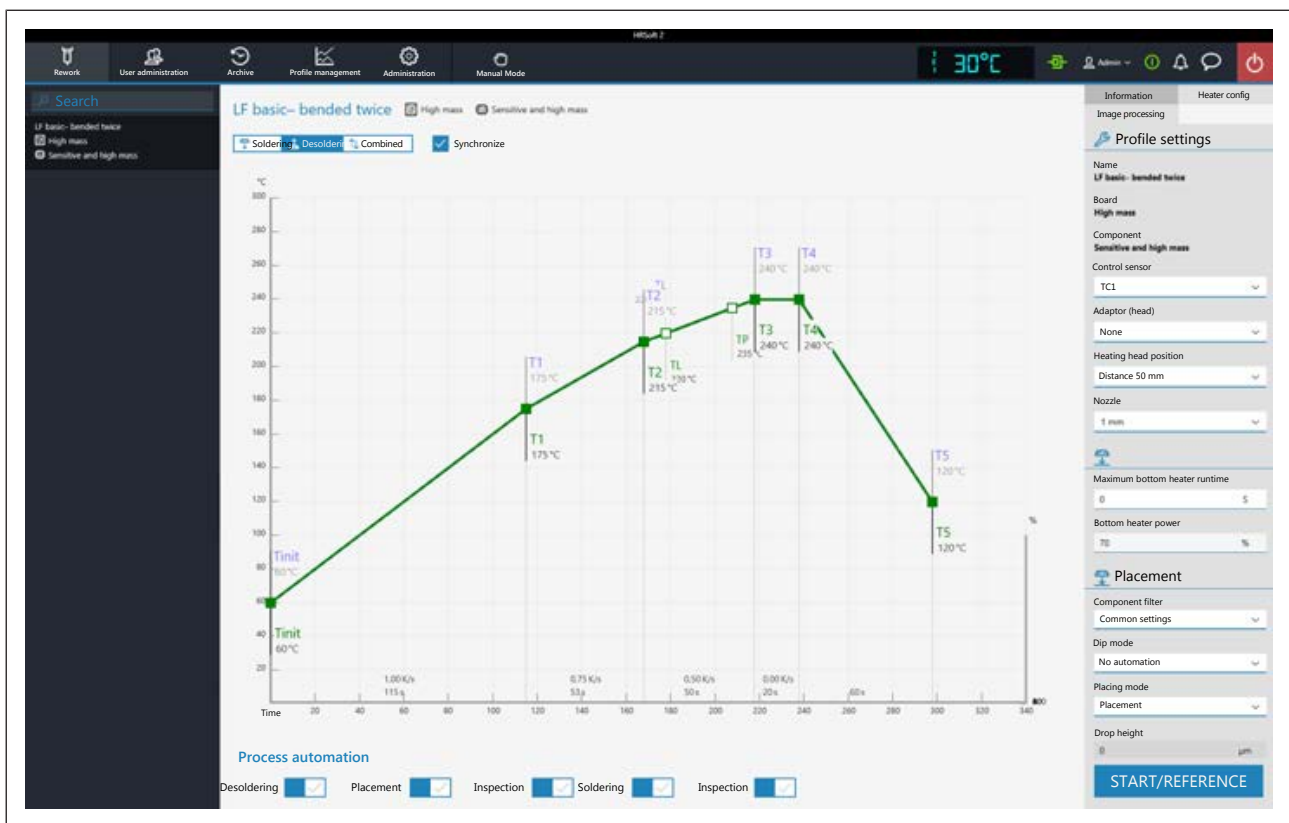
- a) Open tab [Rework]. The available soldering profiles are listed in the left column. With regard to this, please also read Chapter [Use of the soldering profile in the \[Rework\] tabulator](#) [▶ 88].

Notes:

If any changes to the soldering profile are made in the [Rework] tab, they cannot be saved. With regard to this, please also read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 81] and the following ones.

Only the administrator may save soldering profiles. With regard to this, please also read Chapter [Editing the soldering profile in the \[Profile management\] tab and changing it permanently](#) [▶ 100] and the following ones.

Likewise, only the administrator may assign soldering profiles to the standard user, who can then select them in tab [Rework]. With regard 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 and is carried on to the right by performing the various process steps. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 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. With regard to this, please also read Chapter [The \[Manual Mode\]](#) [▶ 93].
- 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.



7.5 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.

They include 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.

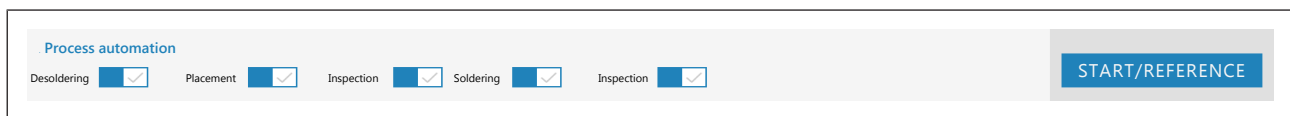


Fig. 42: All five process steps are activated in the [Rework] tab

Check again whether the PCB is properly clamped and the thermocouple properly positioned.

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

⇒ The Wizard will start and guide you through the process phases in numbered working steps. Perform all activities as specified by the wizard.



7.6 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.



7.7 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](#) [▶ 137]



7.8 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.

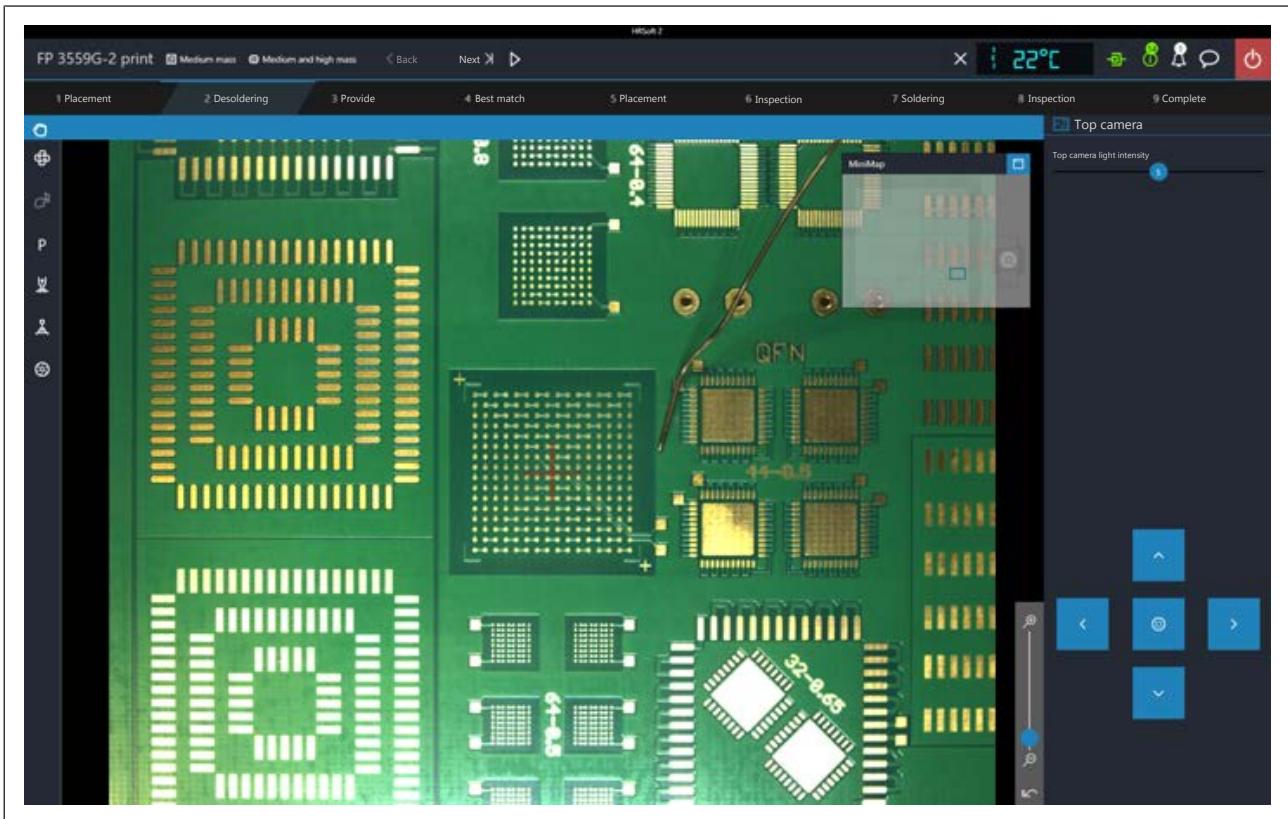


Fig. 43: The red cross is in the middle of the component to be soldered.

- 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] 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](#) [▶ 90].

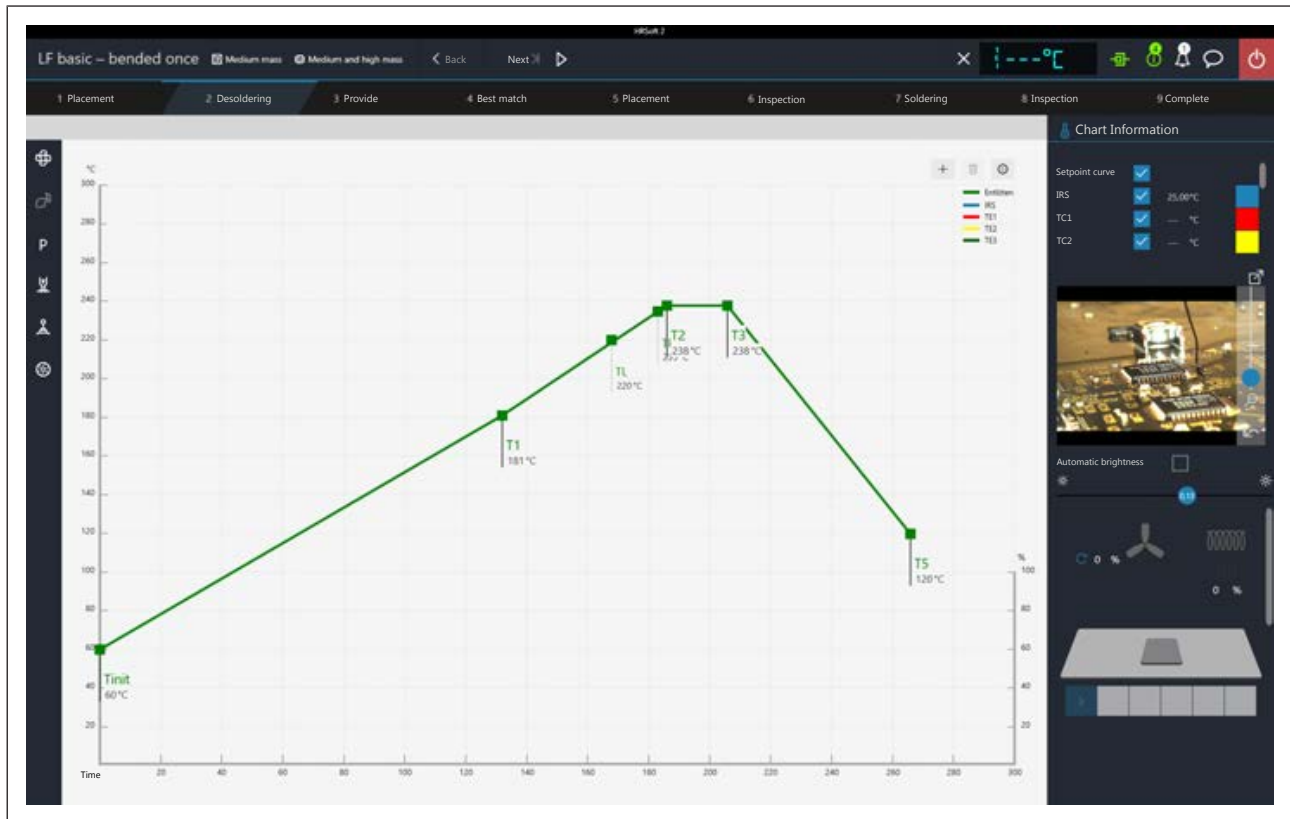


Fig. 44: The chart at the beginning of desoldering

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](#) [▶ 79].

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 Erska 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.



7.9 Working step 3 "Initialisation"

Initialise the procedure to solder the component as follows:

Make the settings for the [Dip mode] of the soldering profile in the default settings under the [Placement] field. With regard to this, please read Chapter [The \[Information\] tab under the \[Rework\] tab \[▶ 82\]](#).

- 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.

- a) 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 [Auto. Dip] flux dipping under [Dip mode], e.g. to process a QFN component:

- ✓ In the preparation phase, flux gel was applied with a squeegee onto the dip stencil in the Dip & Print station. To prepare the dipping procedure, read the separate Erska 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.

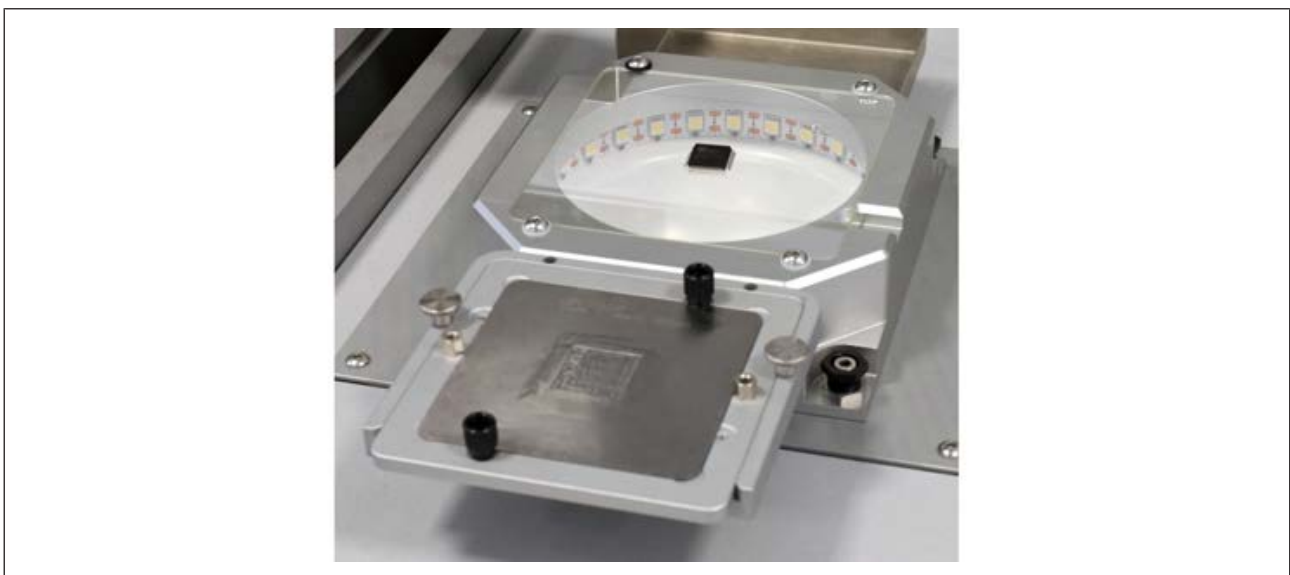


Fig. 45: The dip stencil coated with flux gel is to be inserted into the framed stencil. The component is to be placed on the glass plate of the component holder.



The [Auto. Print] method:

If printing with [Auto. Print] solder paste has been set under [Dip mode]:

- ✓ In the preparation phase, solder paste was applied onto the component underside with a squeegee in the Dip & Print station. To prepare the dipping procedure, read the separate Ersas 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. 46: The solder paste-coated component is inserted into the print stencil and slid into the framed stencil

- a) Click on the [Next] button to switch to the next working 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 from the [Component filter] menu under [Pin detection] on the bottom right.

- b) On the bottom, click on [Use filter].

⇒ All the component pins should now be displayed.

- a) If necessary, adjust the component filter and the light intensity controller and click on [Use filter] again.

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



7.10 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.

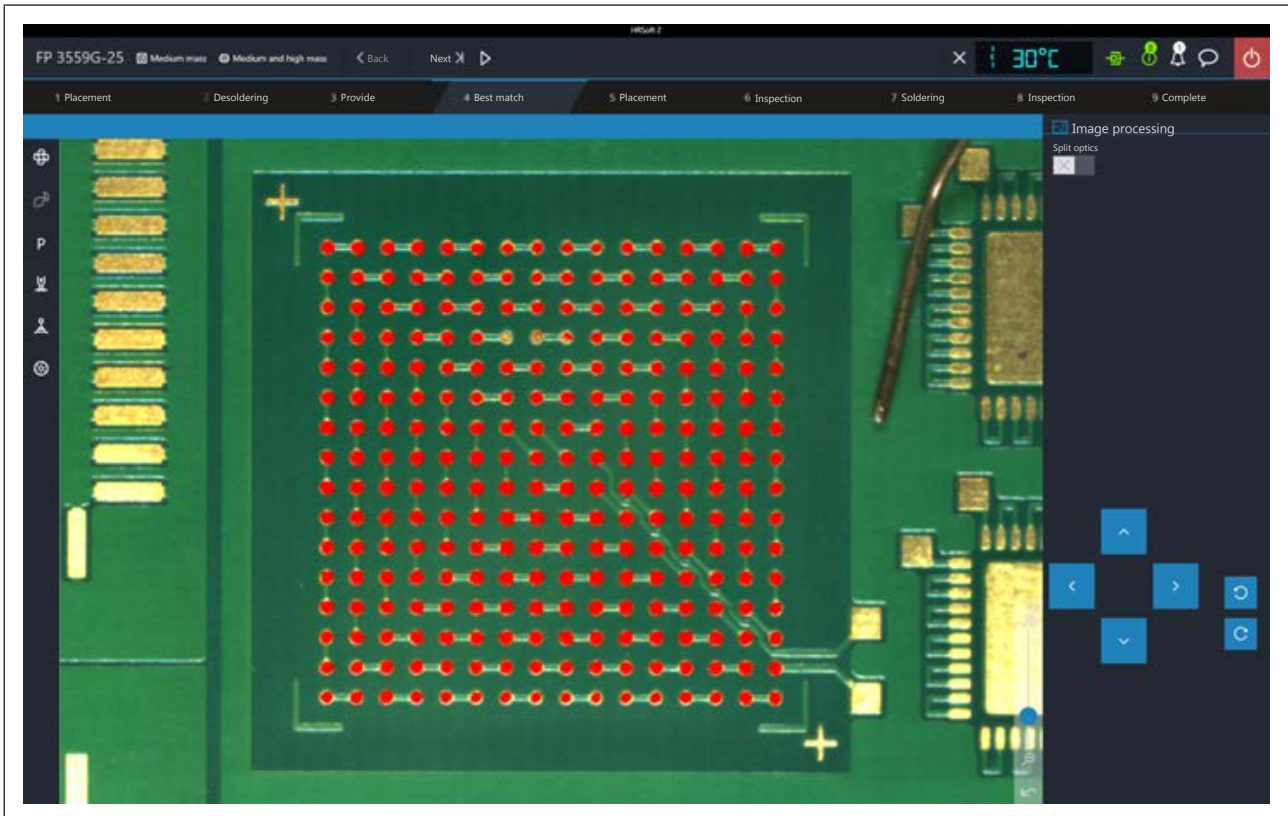


Fig. 47: Overlay increased by zooming

- 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.

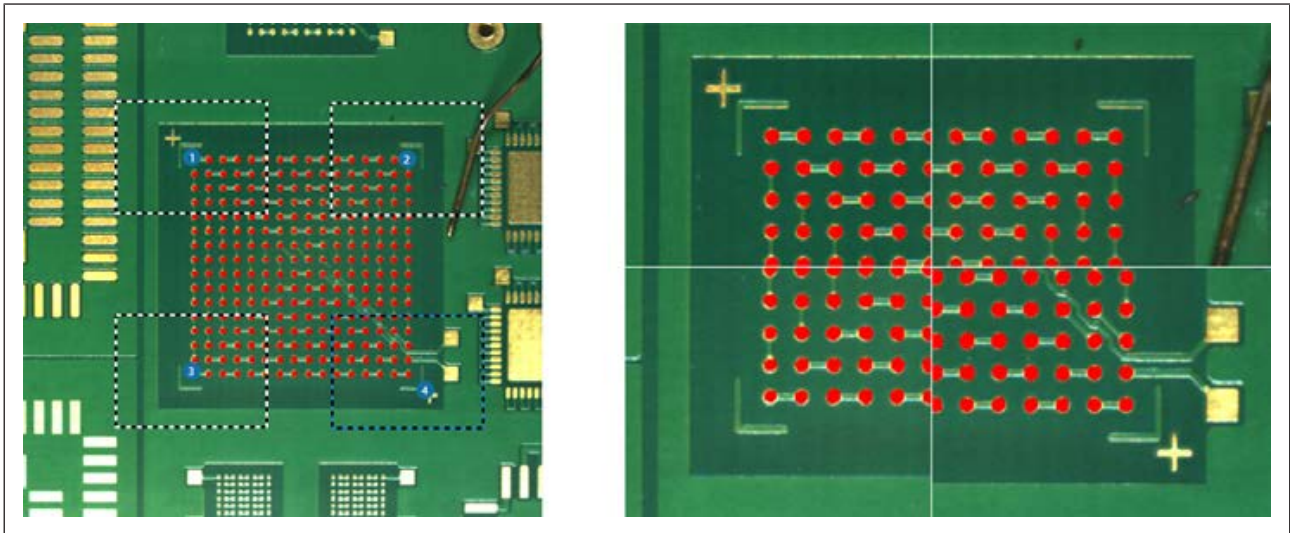


Fig. 48: Setting four image sections for split screen (left), split screen display (right)

- 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.

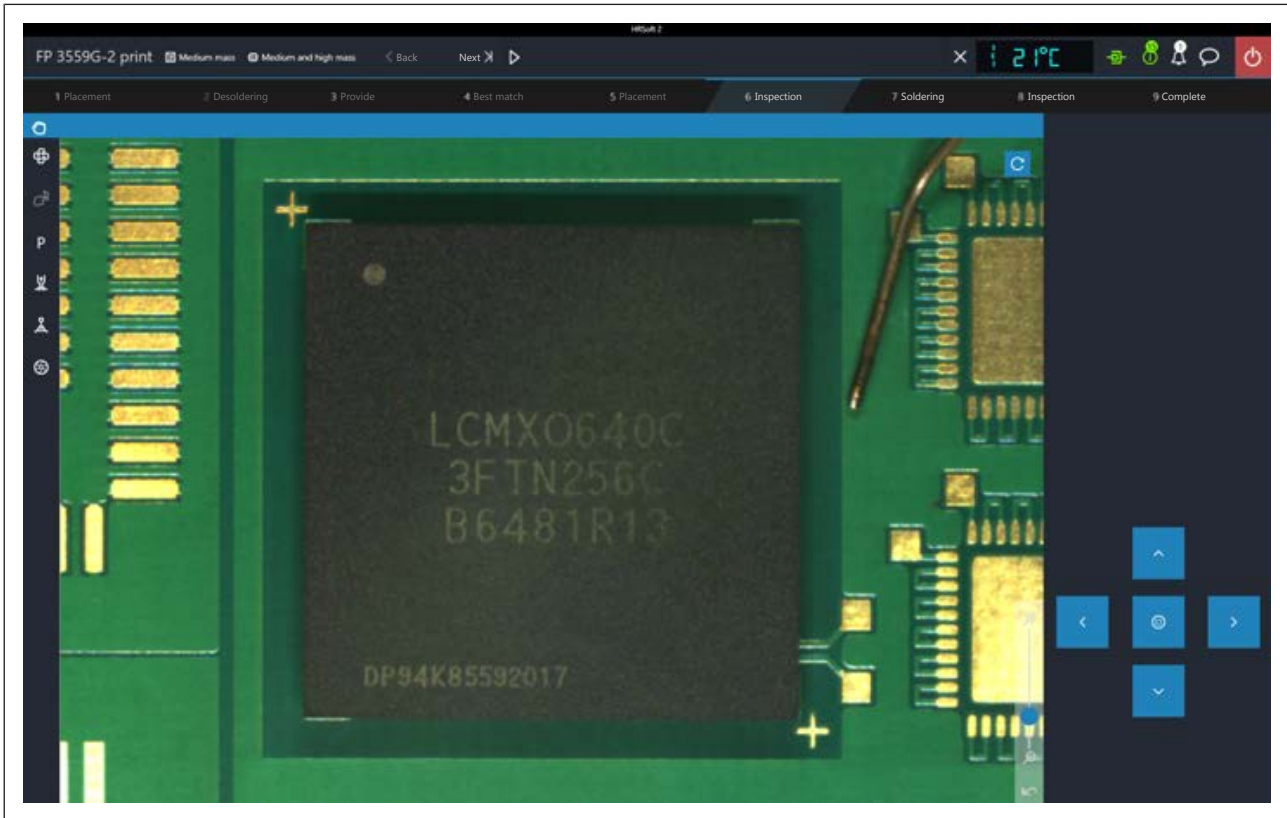


7.11 Working step 5 “Positioning” and working step 6 „Inspection“

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.

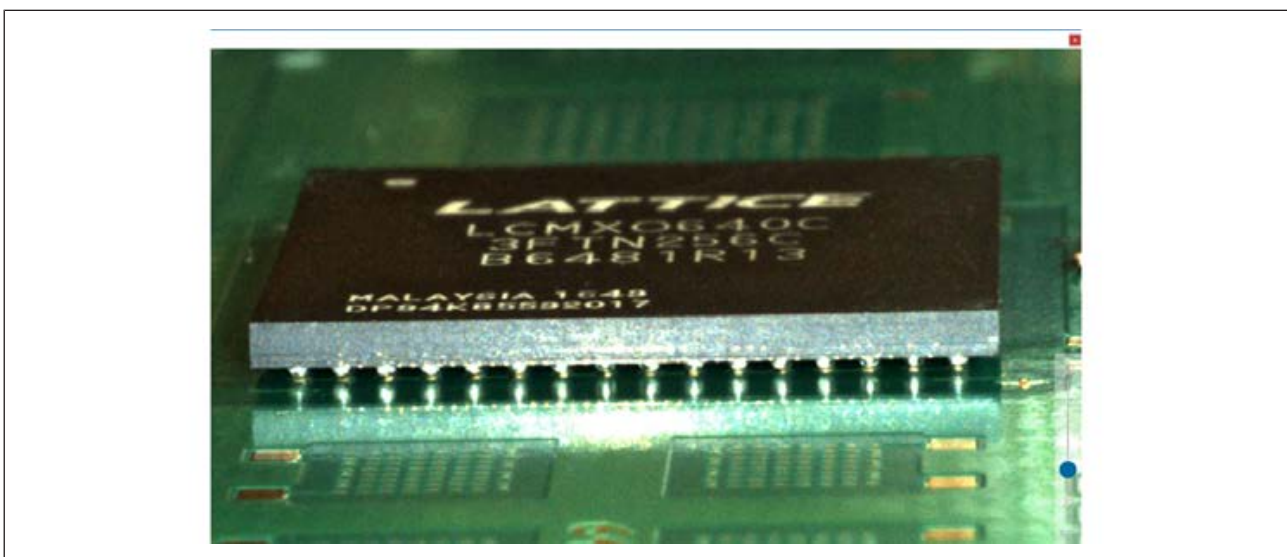


Fig. 49: BGA solder balls, RPC camera display



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](#) [▶ 79].

- 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.



7.12 Working step 6 „Inspection“

The soldered component will be displayed.



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



7.13 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 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) 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](#) [▶ 90].



Fig. 50: 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.



7.14 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.



7.15 Working step 9 "Process completed successfully"

The soldering process has been completed.

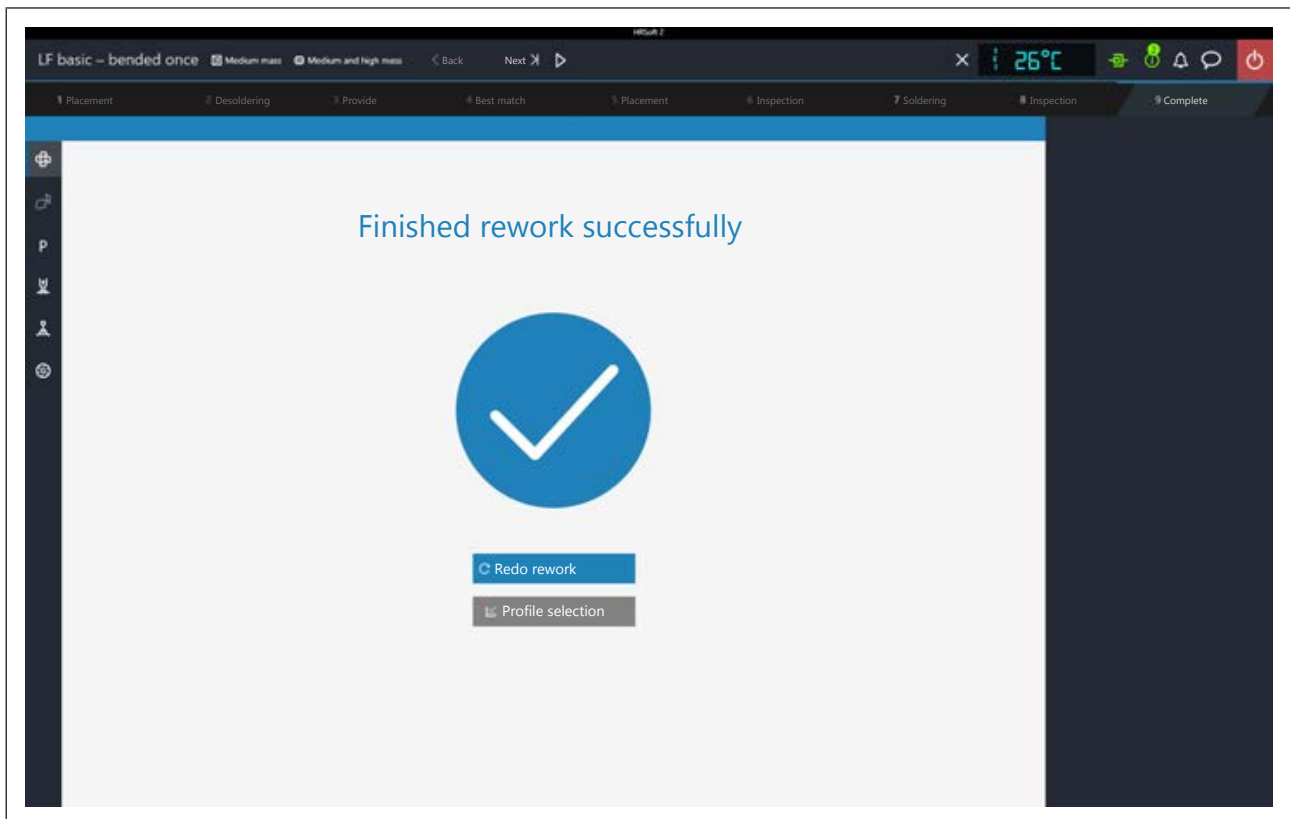


⚠ CAUTION

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.





8 Spare and wear parts

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8.1 Read this first!

8.1.1 Nameplate and serial number



Fig. 51: 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.

8.1.2 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!





8.2 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].



9 Service and maintenance

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9.1 Maintenance table

	Duration	Further information
Weekly	5 Min	9.2 <u>Preparing maintenance work on the residual solder sucker</u>
Weekly	5 Min	9.3.1 <u>Check the Rework System for dirt and damage</u>
Fortnightly	5 Min	9.4.1 <u>Lubricating the Y axle</u>
Quarterly	5 Min	9.5.2 <u>Checking and draining condensate in the maintenance unit</u>
Quarterly	15 Min	9.5.1 <u>Visual inspection and lubrication of the X and Y axes</u>
Quarterly	15 Min	9.6.1 <u>Cleaning and lubricating the X and Y axes threaded spindles</u>
When required	5 Min	9.7.1 <u>Cleaning the glass plate.</u>
When required	5 Min	9.7.2 <u>Cleaning the underside of the optional RPC camera</u>
When required	5 Min	9.7.3 <u>Cleaning the light covers under the placement head</u>
When required	5 Min	9.7.7 <u>Memorising the distance of the heating head nozzle from the placer</u>
When required	5 Min	9.7.8 <u>Memorising the height positions of the heating head nozzle and the placer</u>
When required	5 Min	9.7.9 <u>Memorising the height position of the glass plate</u>
When required	5 Min	9.7.10 <u>Checking and replacing the silicone suction cup in the heating head nozzle</u>
When required	15 Min	9.7.6 <u>Re-memorising the positions of the heating and placer heads</u>
When required	30 Min	9.7.4 <u>Replacing the heating head</u>
When required	30 Min	9.7.5 <u>Replacing the placer head</u>

9.2 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!



9.3 Maintenance work to be performed weekly

9.3.1 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.



9.4 Maintenance work to be performed fortnightly

9.4.1 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. 52: 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.



9.5 Maintenance work to be performed quarterly

9.5.1 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.

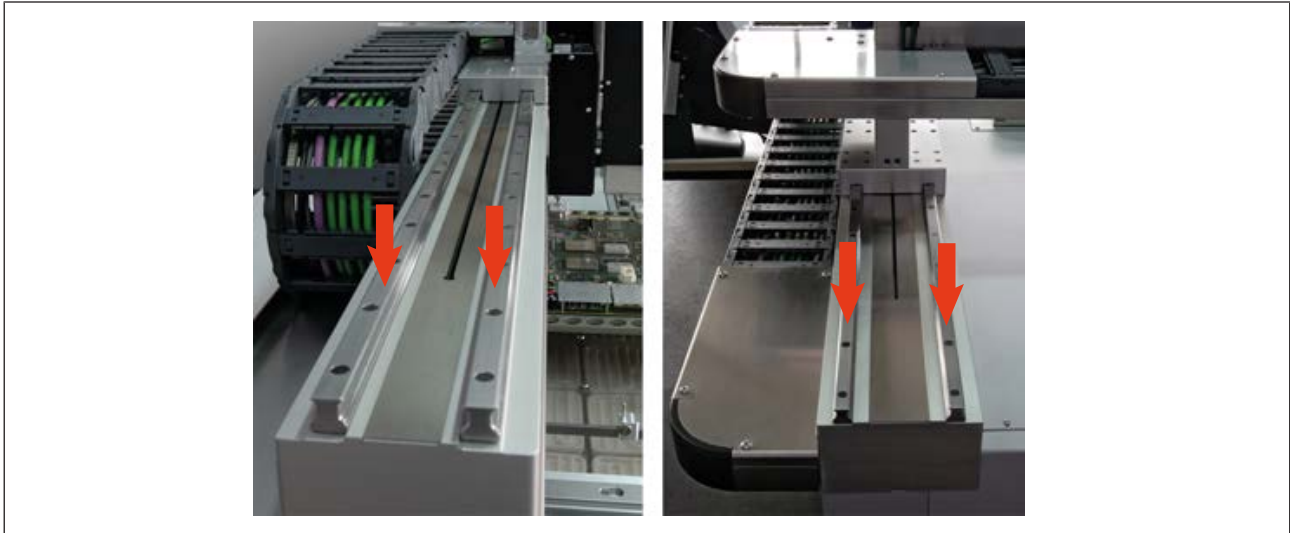


Fig. 53: Lubricating two rails for each X and Y axes



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.



9.5.2 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.





9.6 Service work to be performed annually

9.6.1 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.

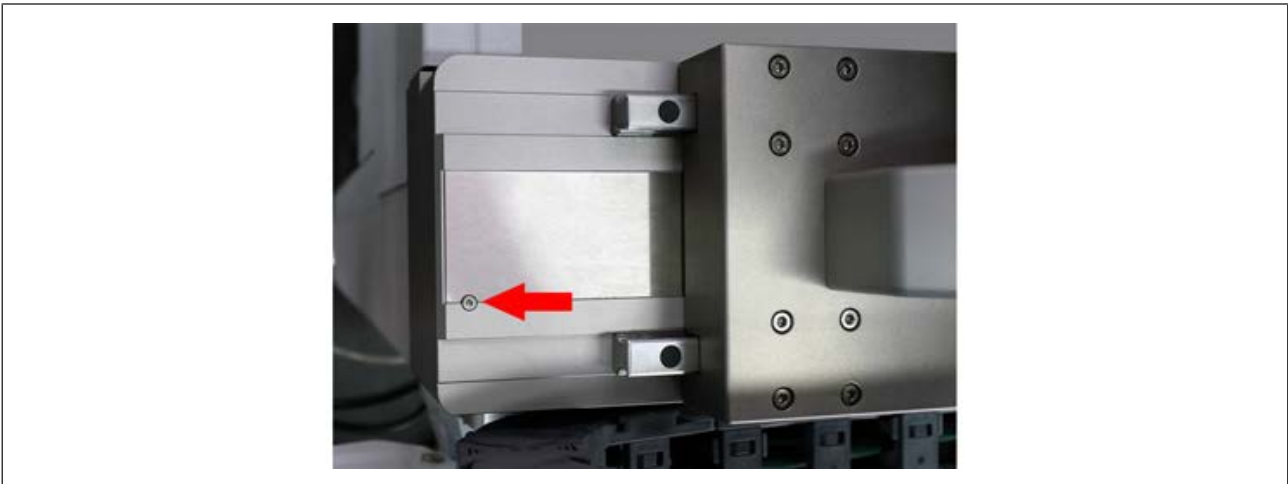


Fig. 54: Removing the safety screw

- 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.



9.7 Service work to be performed when required

9.7.1 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!

9.7.2 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!

9.7.3 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.

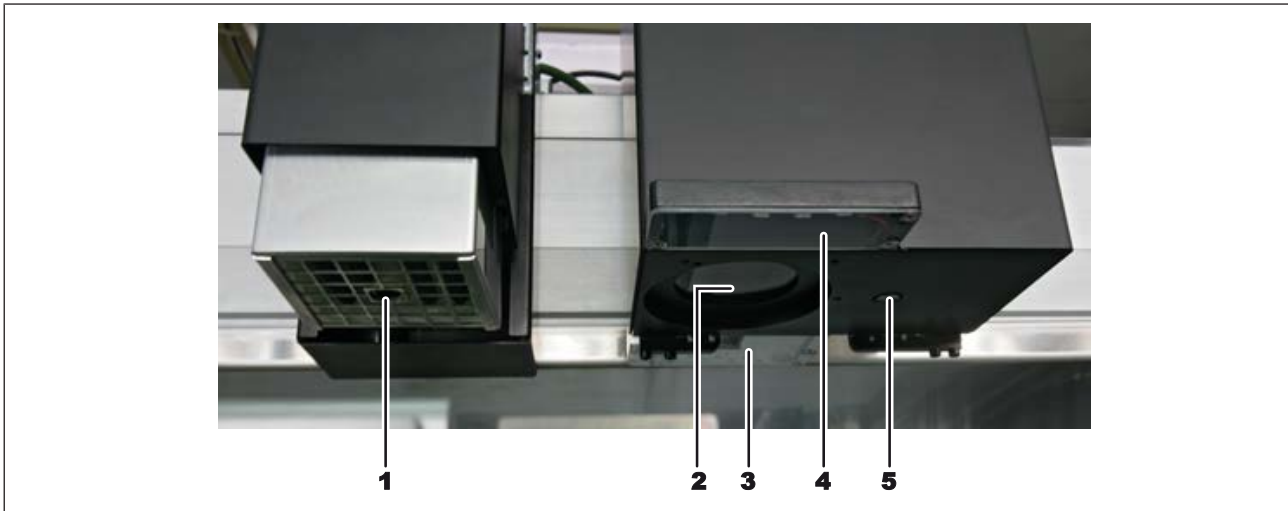


⚠ CAUTION

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!



9.7.4 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 on the [Rework] tab. Click on the [Manual Mode] button.
- b) In the button bar of the manual controller use the arrow buttons to move the heating head forward.



- c) Move the heating head all the way down with the  button.
- 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.

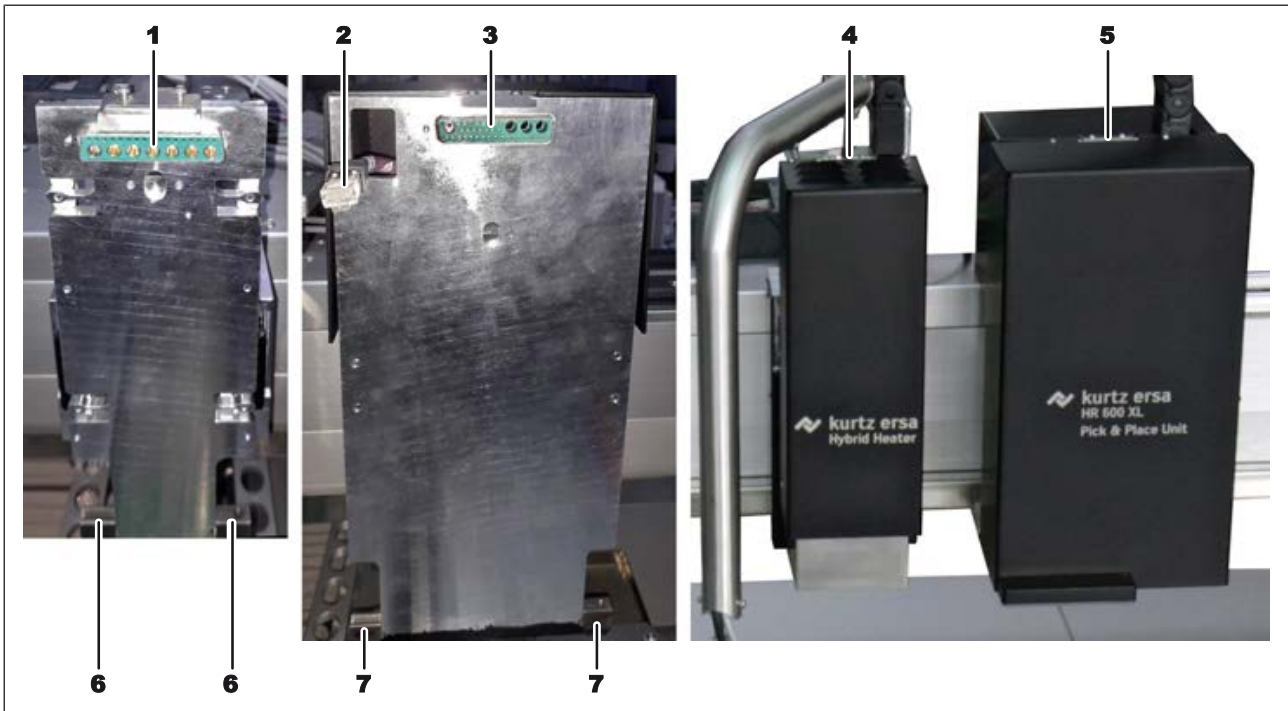


Fig. 55: On the left side of the picture: Heating head holder (on the very left) and placer head holder. On the right side of the picture: Heating and placer heads screwed on.



- 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 rest supports (6).
- c) Remove the heating head.

Fitting the heating head

- 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. 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]. With regard to this, please read Chapter [Re-memorising the positions of the heating and placer heads](#) [▶ 183]
- Perform the [Device coordinates transformation] procedure. With regard to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 121]

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



9.7.5 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 on the [Rework] tab. Click on the [Manual Mode] button.
- 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

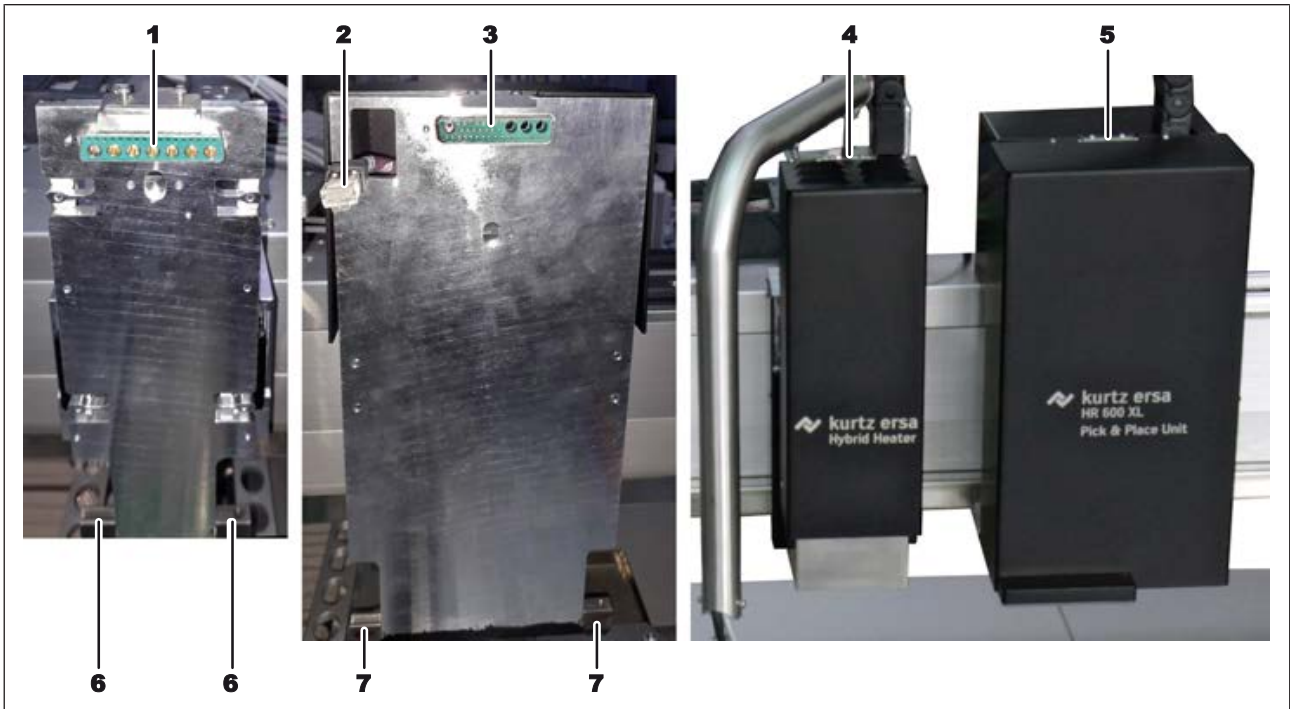


Fig. 56: On the left side of the picture: Heating head holder (left) and placer head holder. On the right side of the picture: Heating and placer heads screwed on.

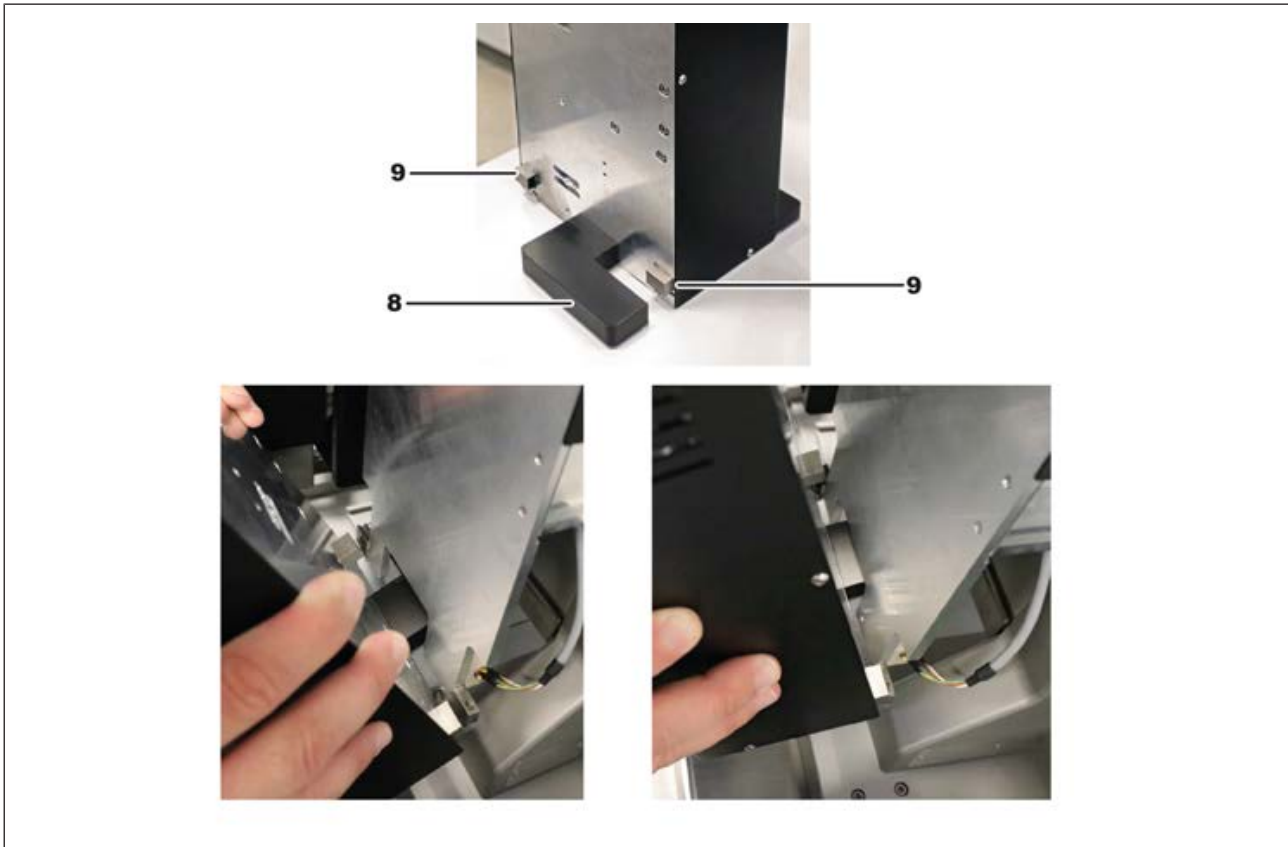
- b) Hold the placer head with two hands and pull the upper part of the placer head forward until the plug (3) is released. The lower part of the heating head will remain on the rest supports (7).



- 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 rest support (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 support lugs (9) on the rest supports (7).



- b) 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 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]. With regard to this, please read Chapter [Re-memorising the positions of the heating and placer heads](#) [▶ 183].
- Perform the [Device coordinates transformation] procedure. With regard to this, please read Chapter [The \[Start coordinate transformation\] button](#) [▶ 121].



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



9.7.6 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](#) [▶ 178])
- the placer head has been replaced (with regard to this, please read Chapter [Replacing the placer head](#) [▶ 180])
- 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!

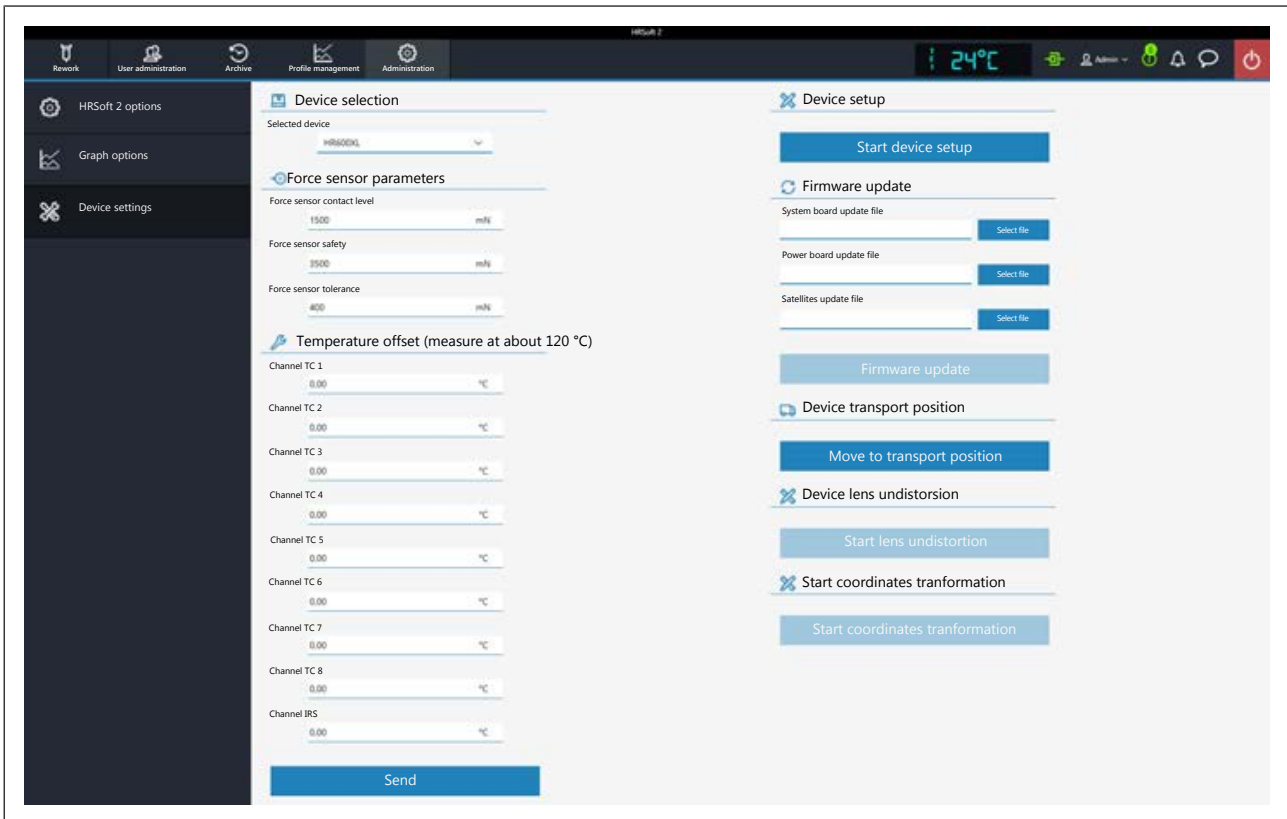


Fig. 57: Calibration nozzles

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

The process is performed via a wizard. You will need

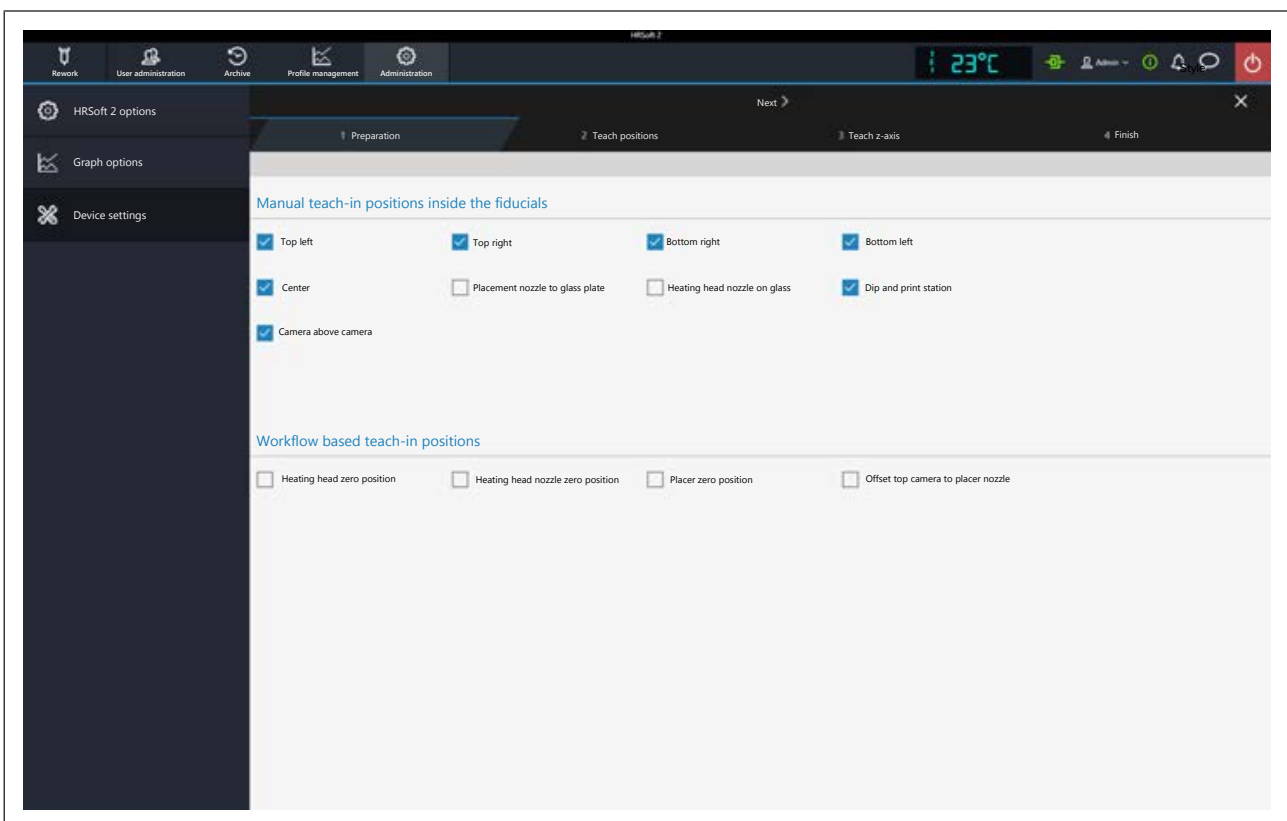
- two calibration nozzles
 - If the position of the Dip & Print station is to be memorised: a dip stencil frame with a dip stencil for the smallest possible component.
- a) In the [Administration] tab, select the [Device settings] dialog box.



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.



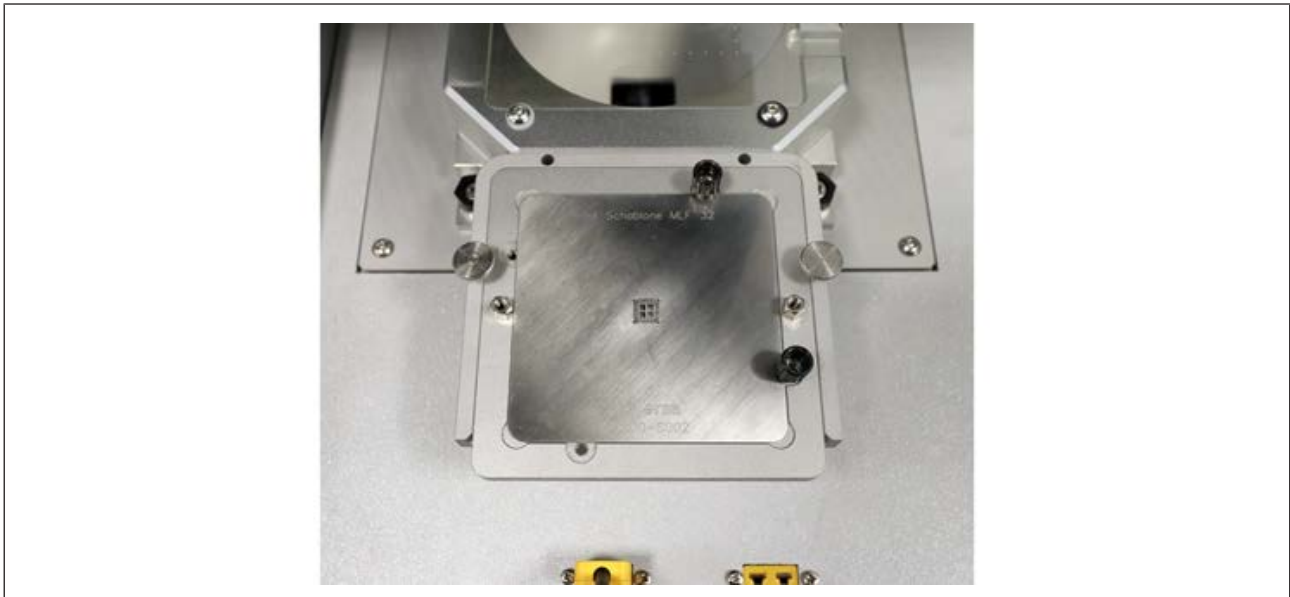


To reassign positions on the glass plate based on fiducials, the following functions can be selected:

- 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.

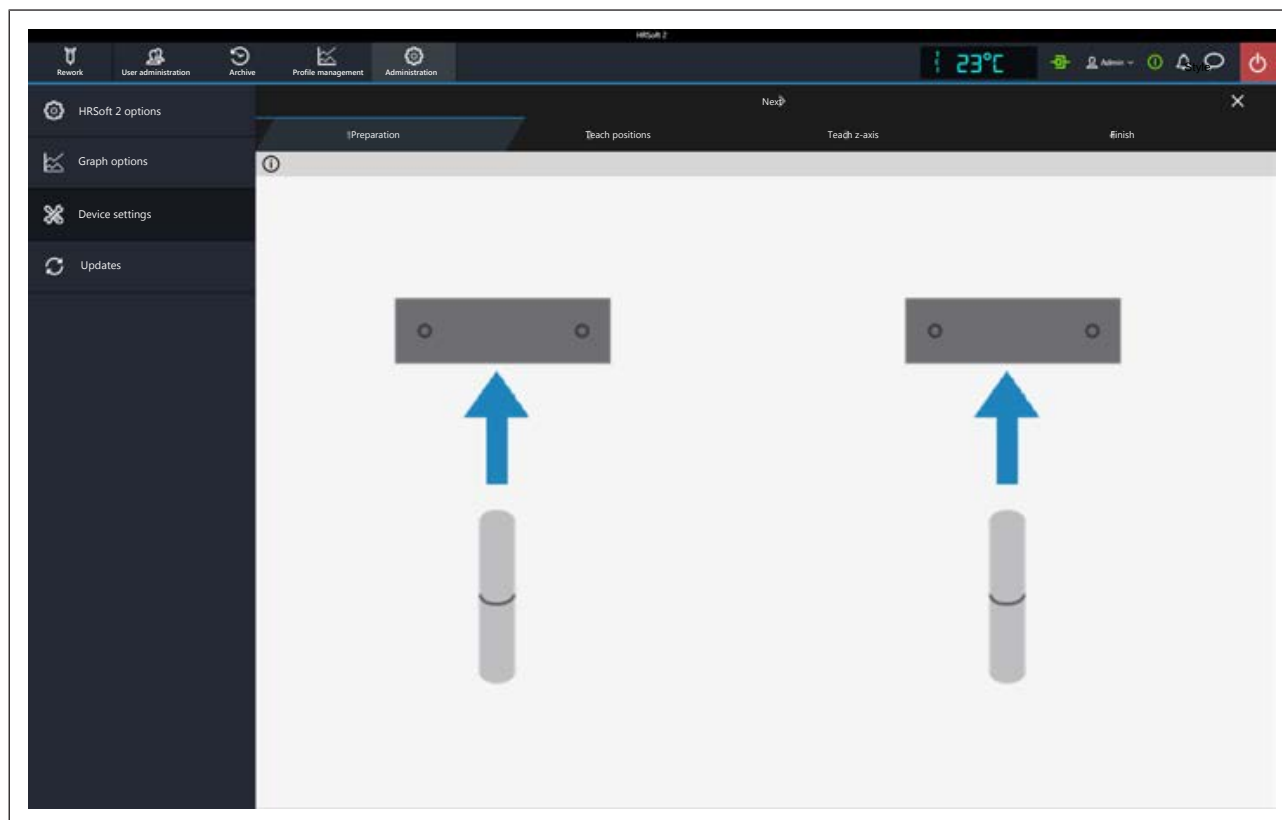
If the [Dip and print station] function is to be performed:

- 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.

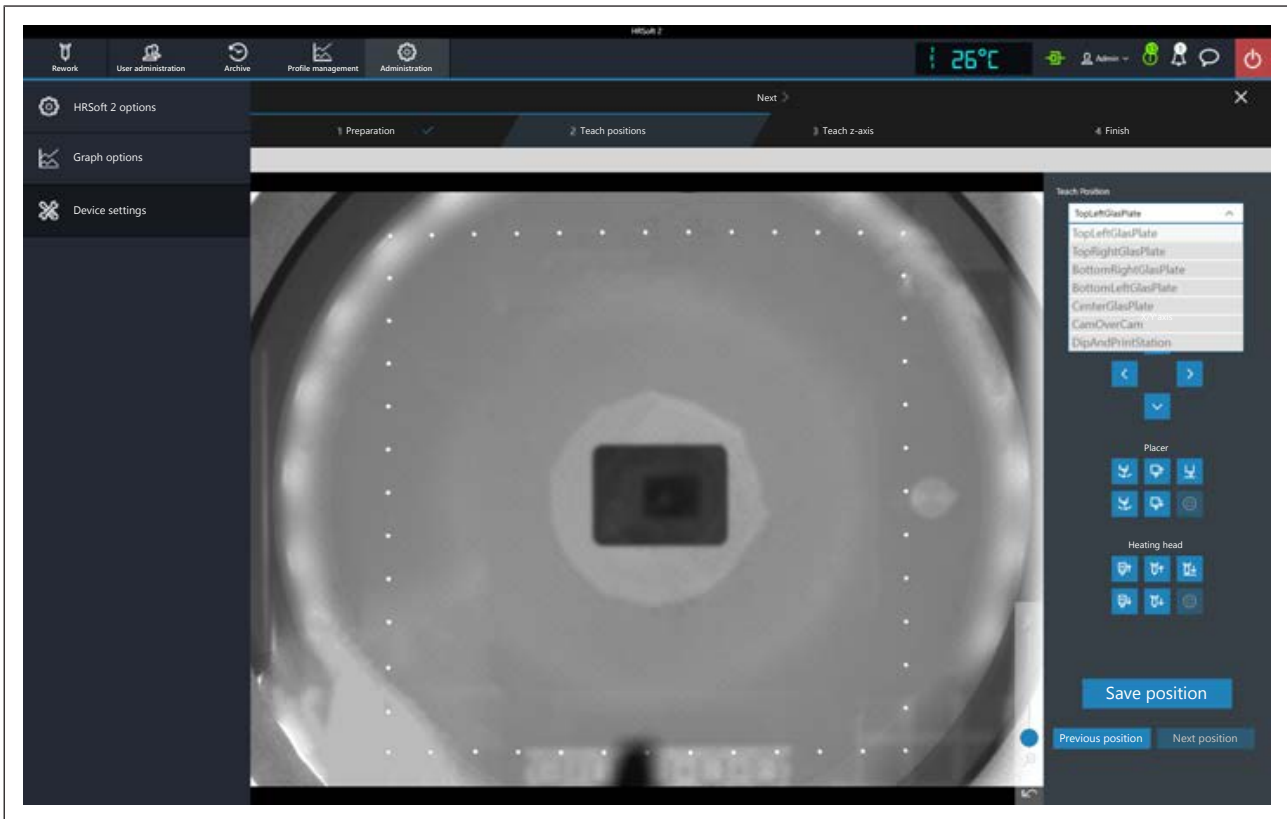
- a) Click on the [Next] button to switch to the next working step.



⇒ 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](#) [▶ 138].

⇒ 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.

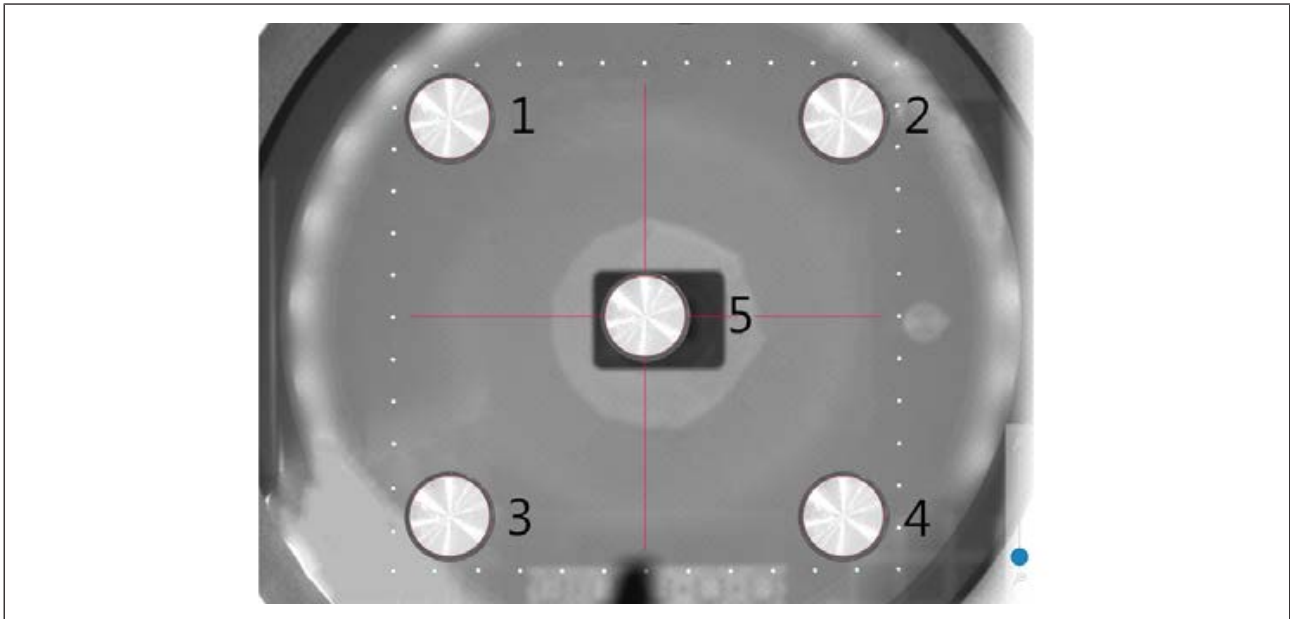
d) Use the arrow buttons to move the placer head over the glass plate.

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).

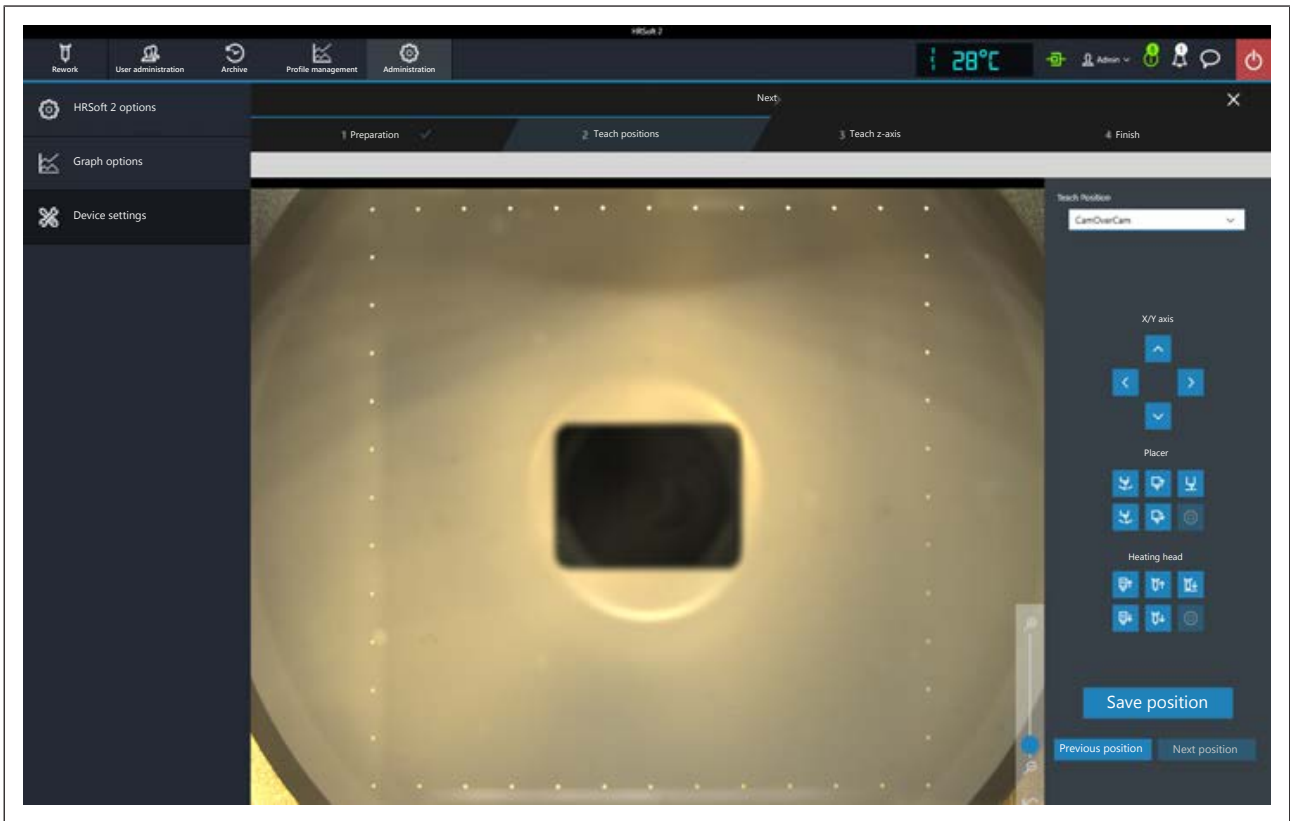


- g) Click on the [Save position] button.
⇒ The pipette position [Top left] (1) has been saved.
- h) Click on the [Next position] button.
⇒ The next menu item [Top right] has now been selected in the [Memorise Position] drop-down menu.
- i) Use the arrow buttons to move the calibration nozzle to the 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.

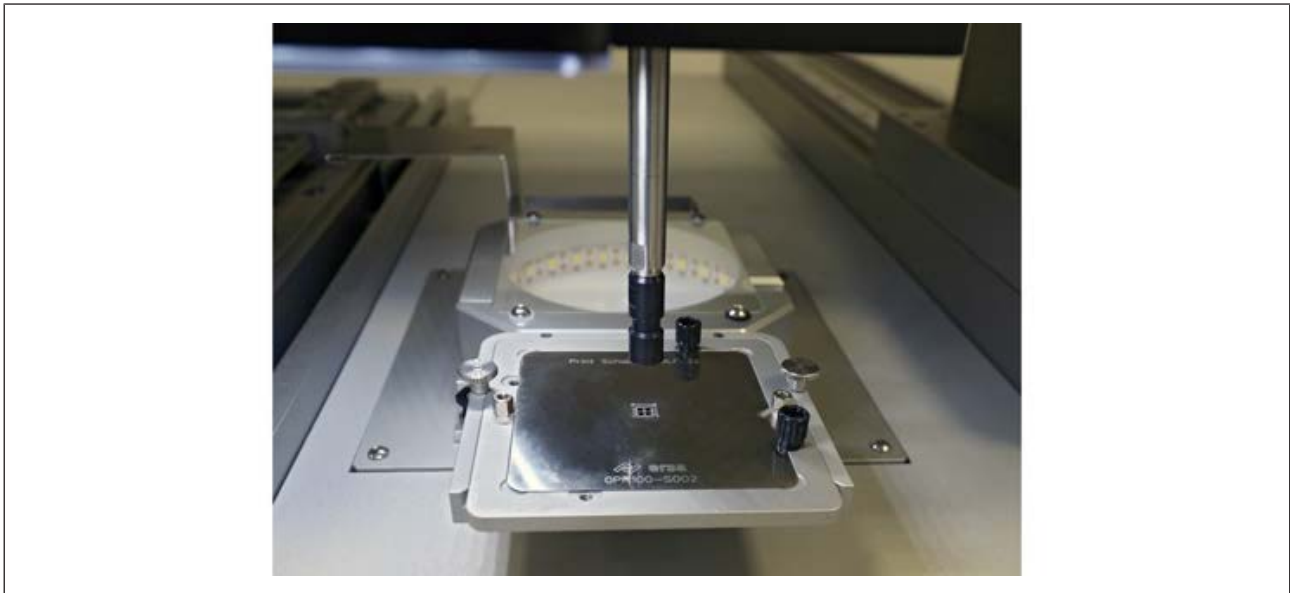
- a) To perform the [Camera above camera] function:



- 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](#) [▶ 121](#).



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

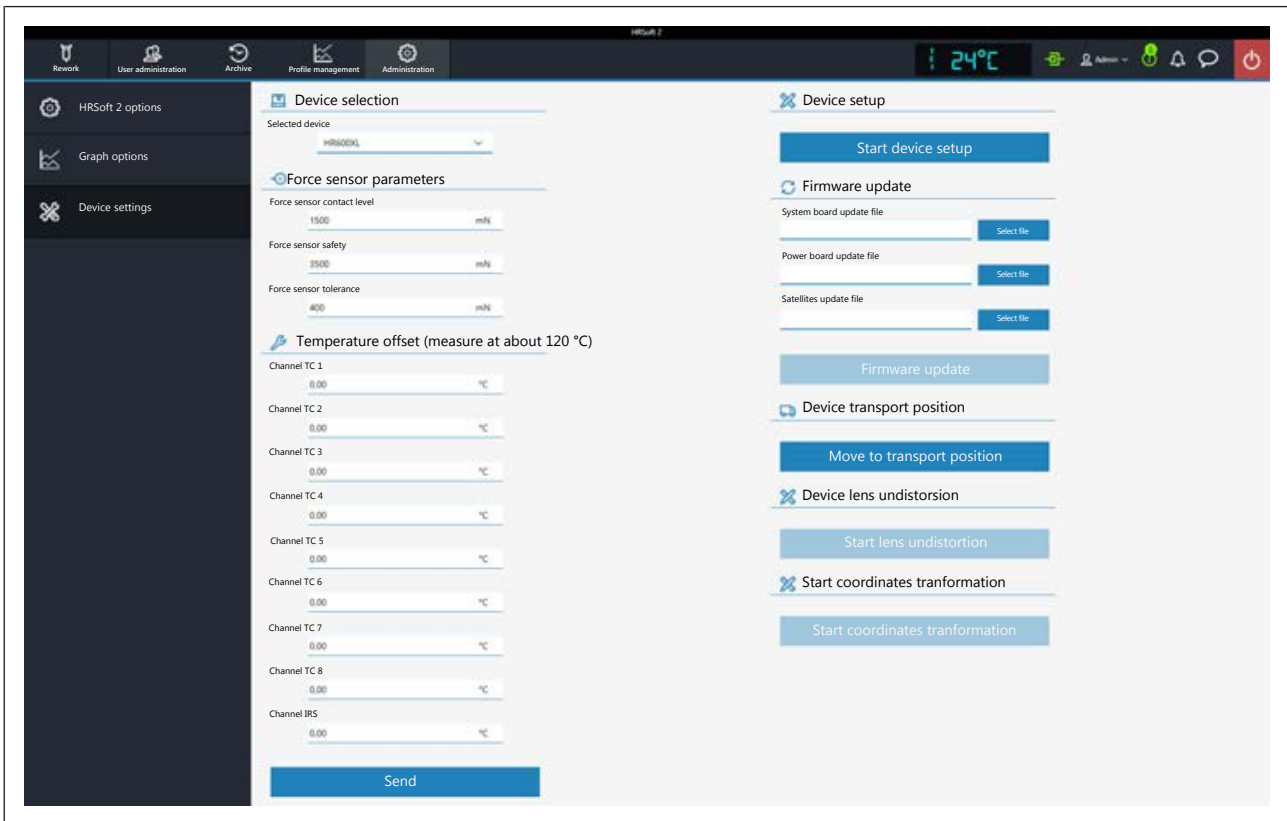
The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

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

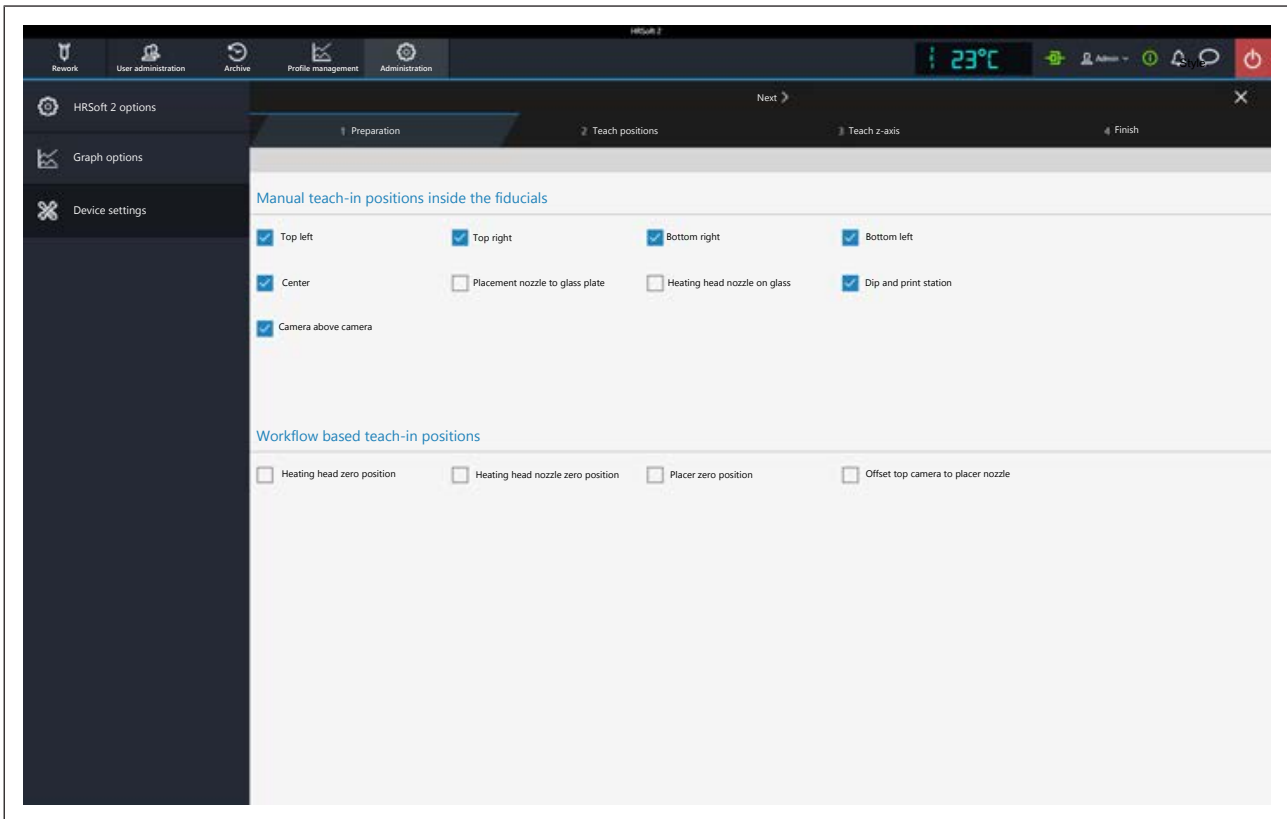
- a) In the [Administration] tab, select the [Device settings] dialog box.



Fig. 58: Calibration nozzles

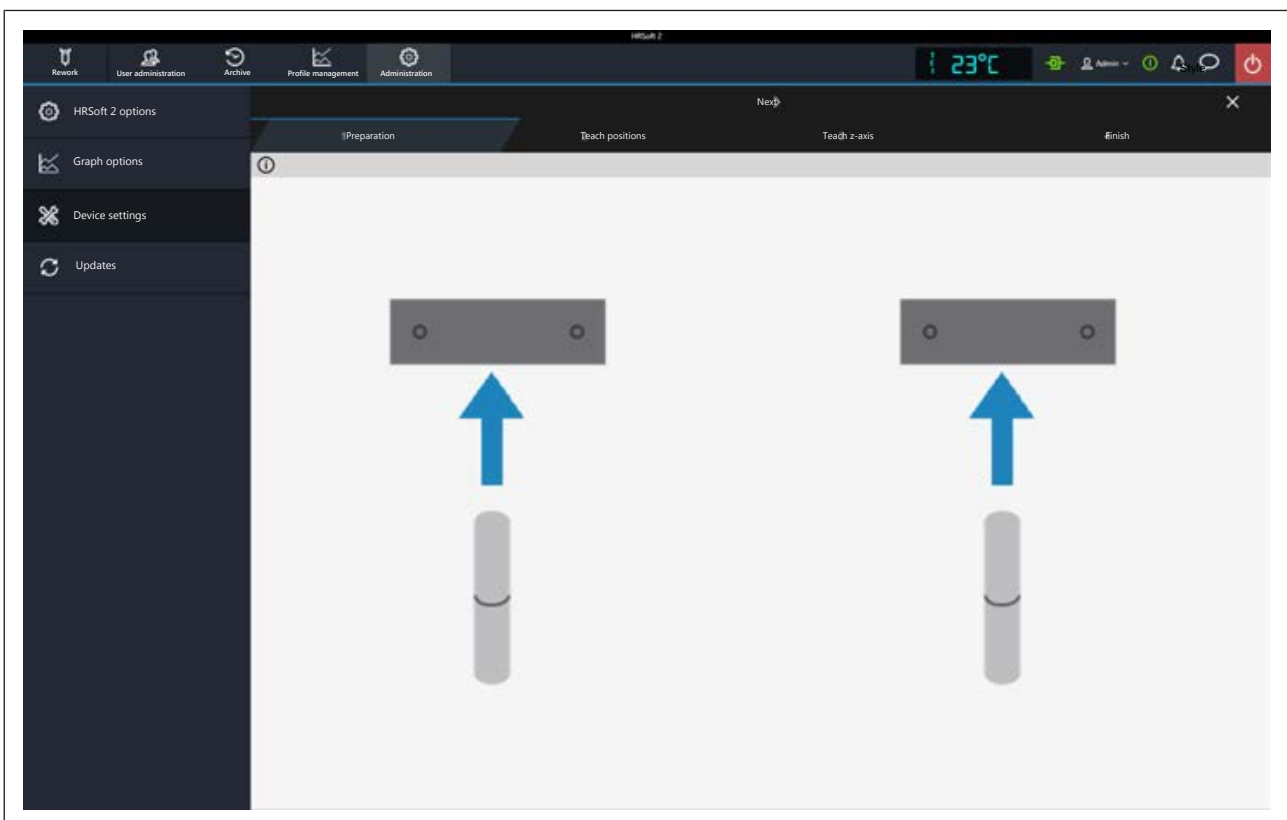


⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.



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

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



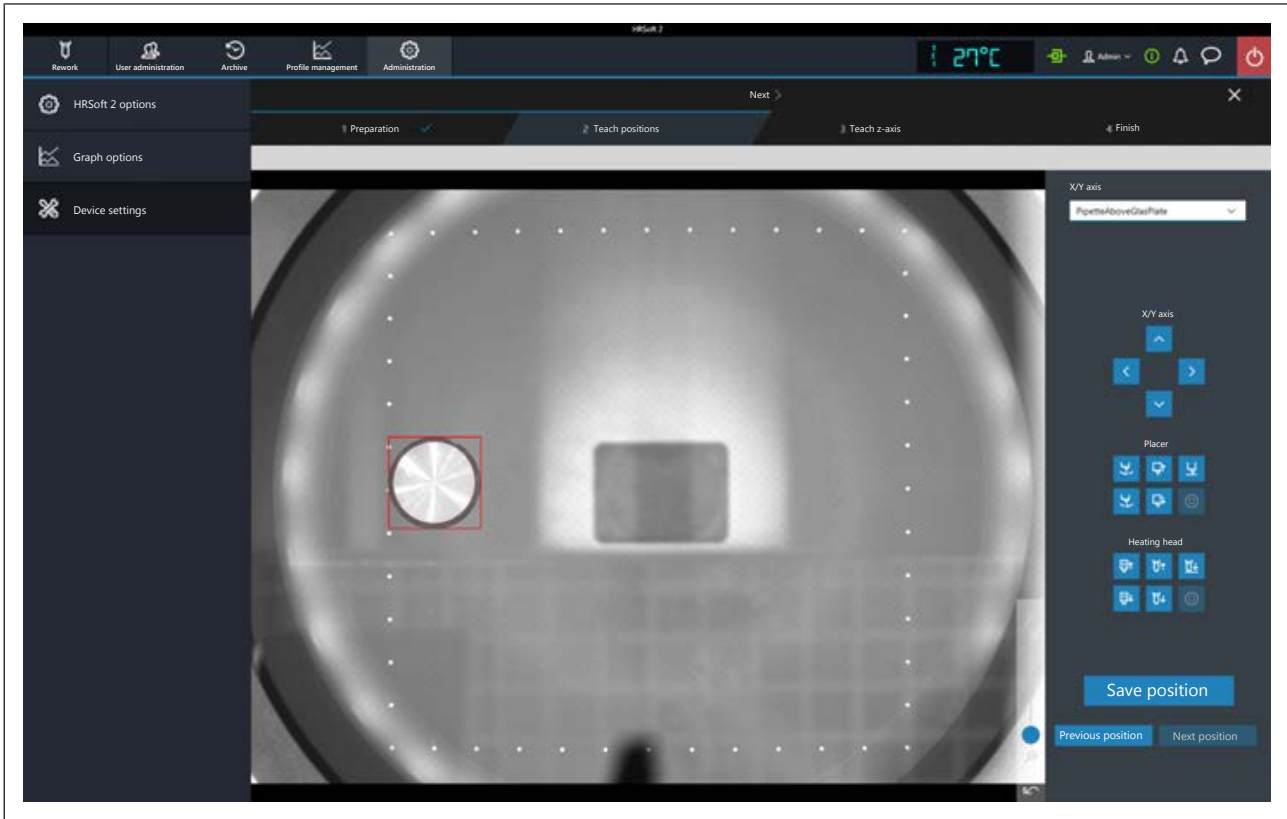


⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles, please also read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [▶ 138].

⇒ 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.



9.7.8 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.

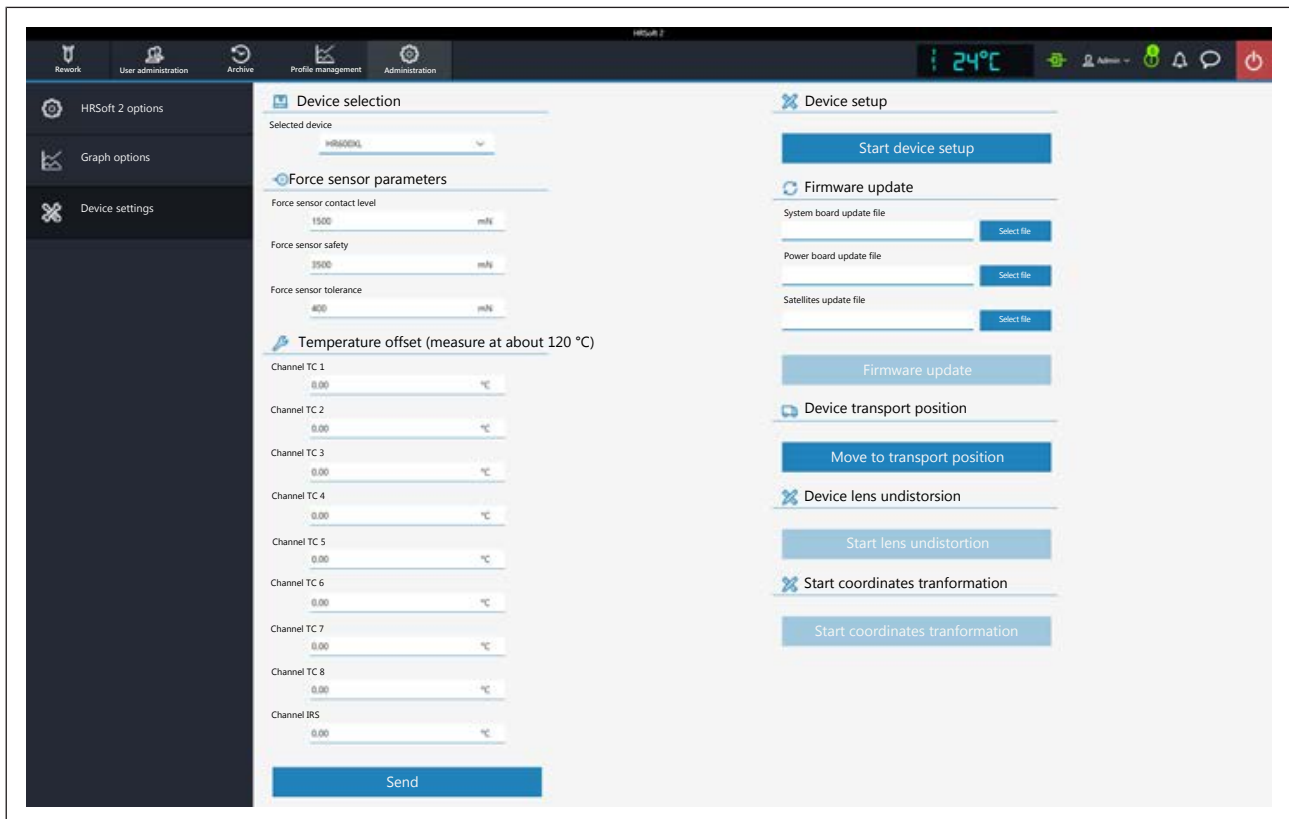
The process is performed via a wizard. You will need

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

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

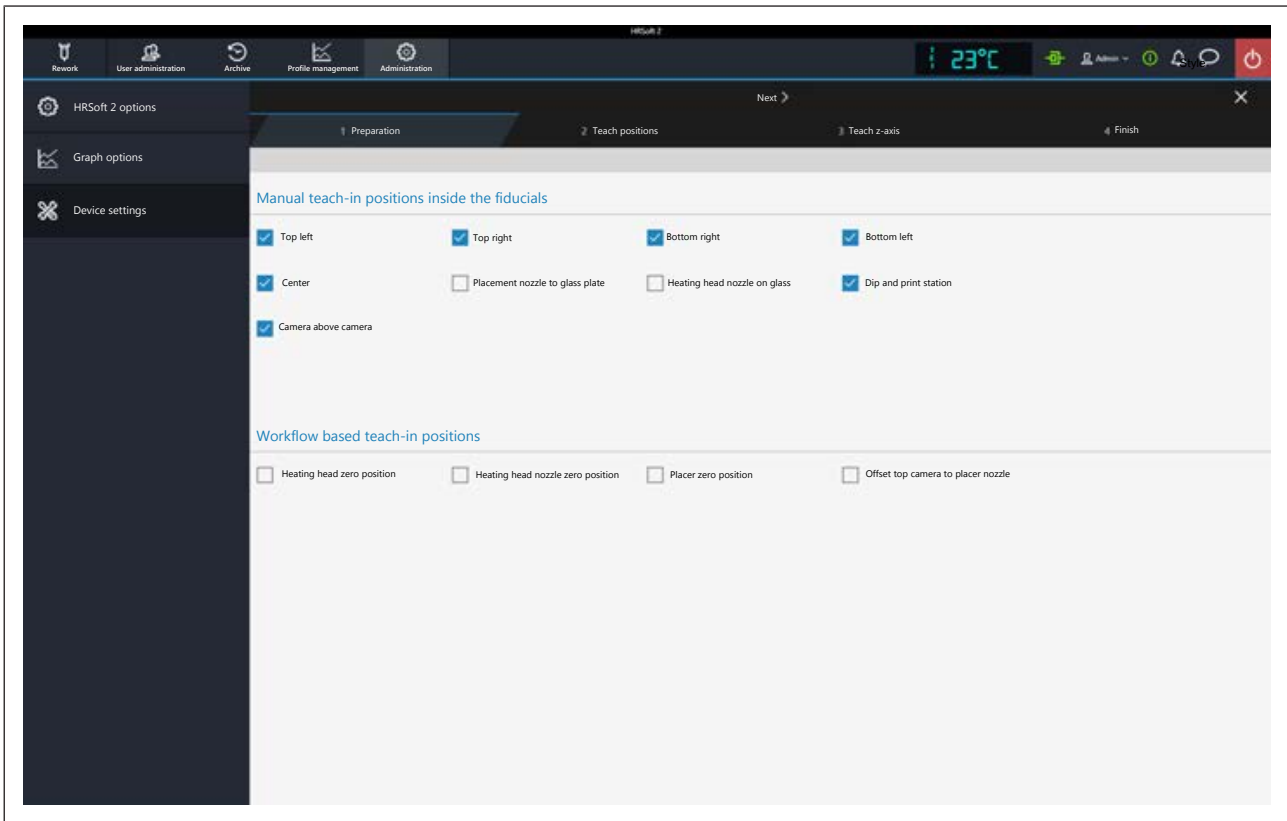


Fig. 59: Calibration nozzles



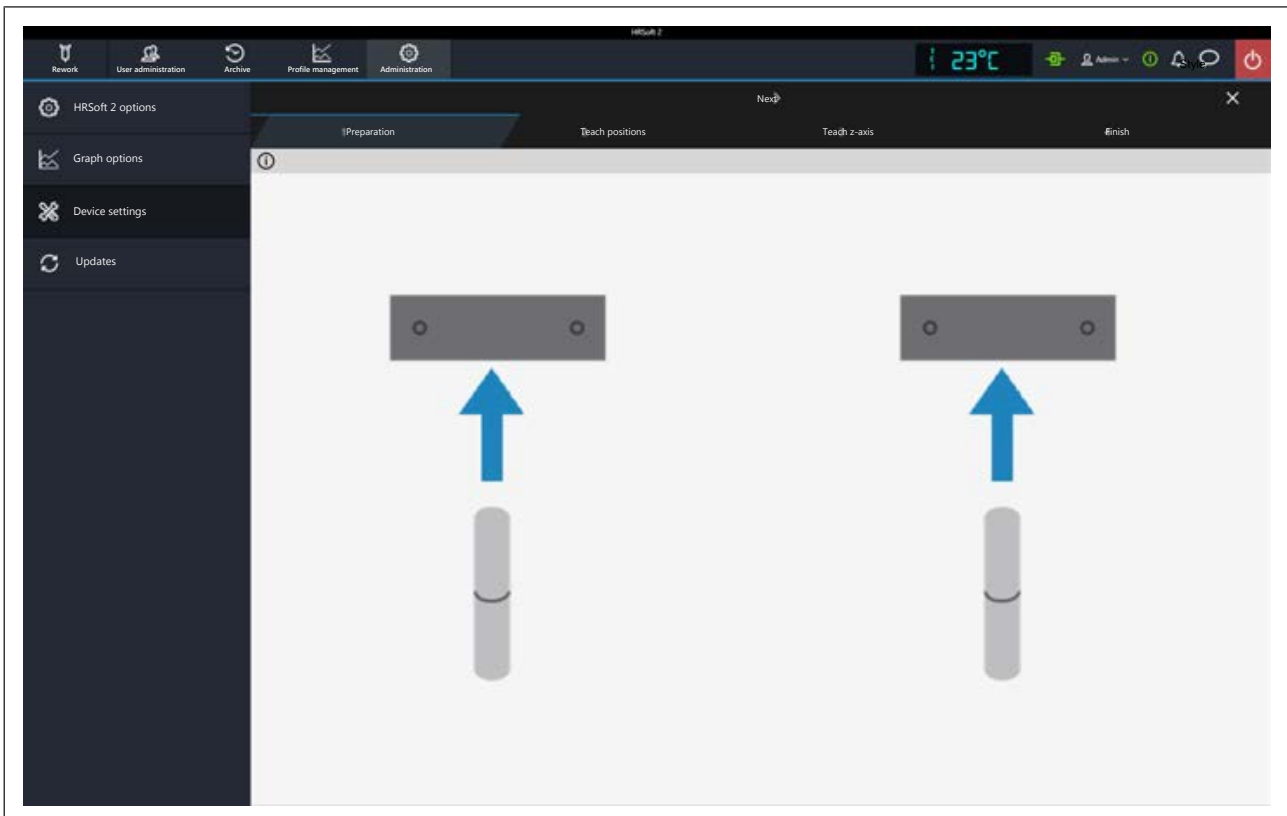
b) Click on the [Start device setup] button.

⇒ 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.



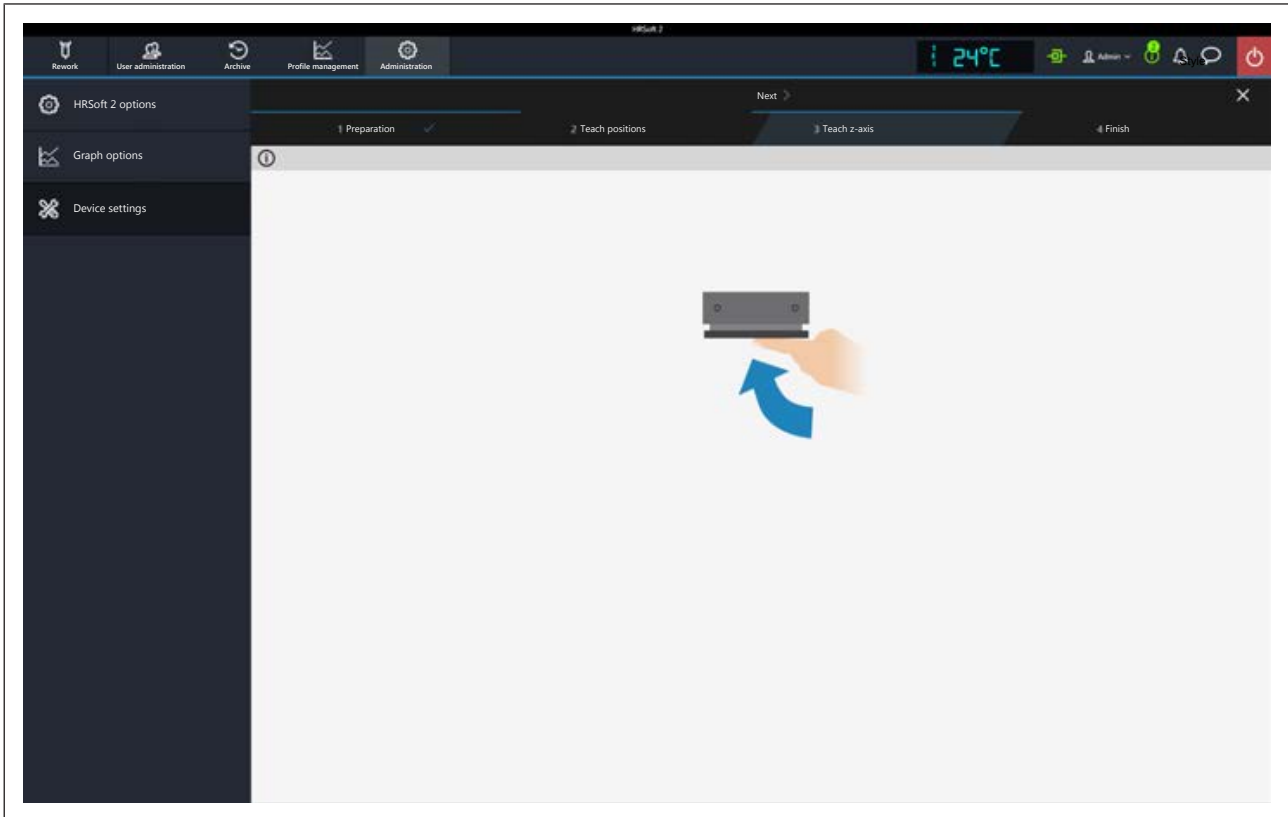


⇒ The diagram shows that calibration nozzles must now be screwed onto the heating and placer heads. To replace nozzles, please also read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [▶ 138].

⇒ 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.



9.7.9 Memorising the height position of the glass plate

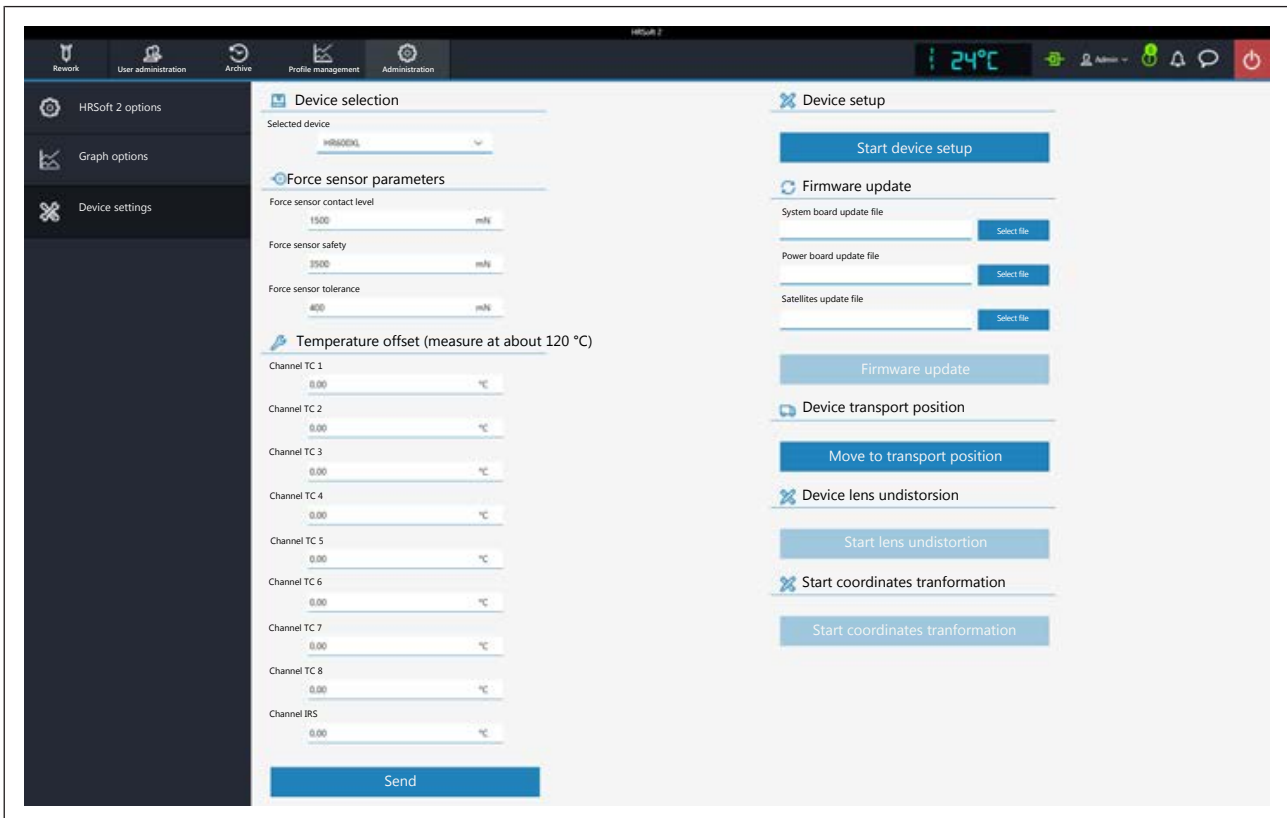
The functions that are called up via the [Start device setup] button may only be carried out by trained, qualified staff! The Rework System can be significantly altered if these functions are not properly performed.

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



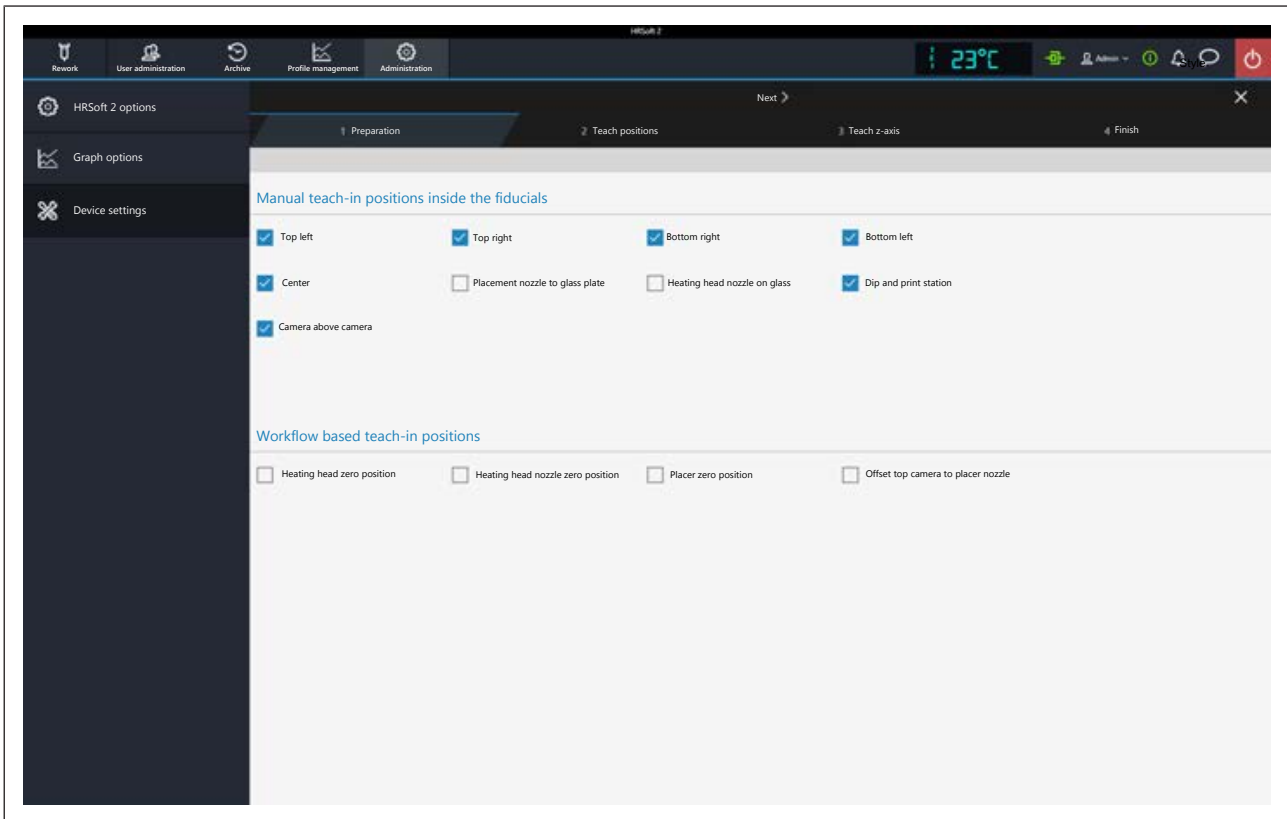
Fig. 60: Calibration nozzles

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



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

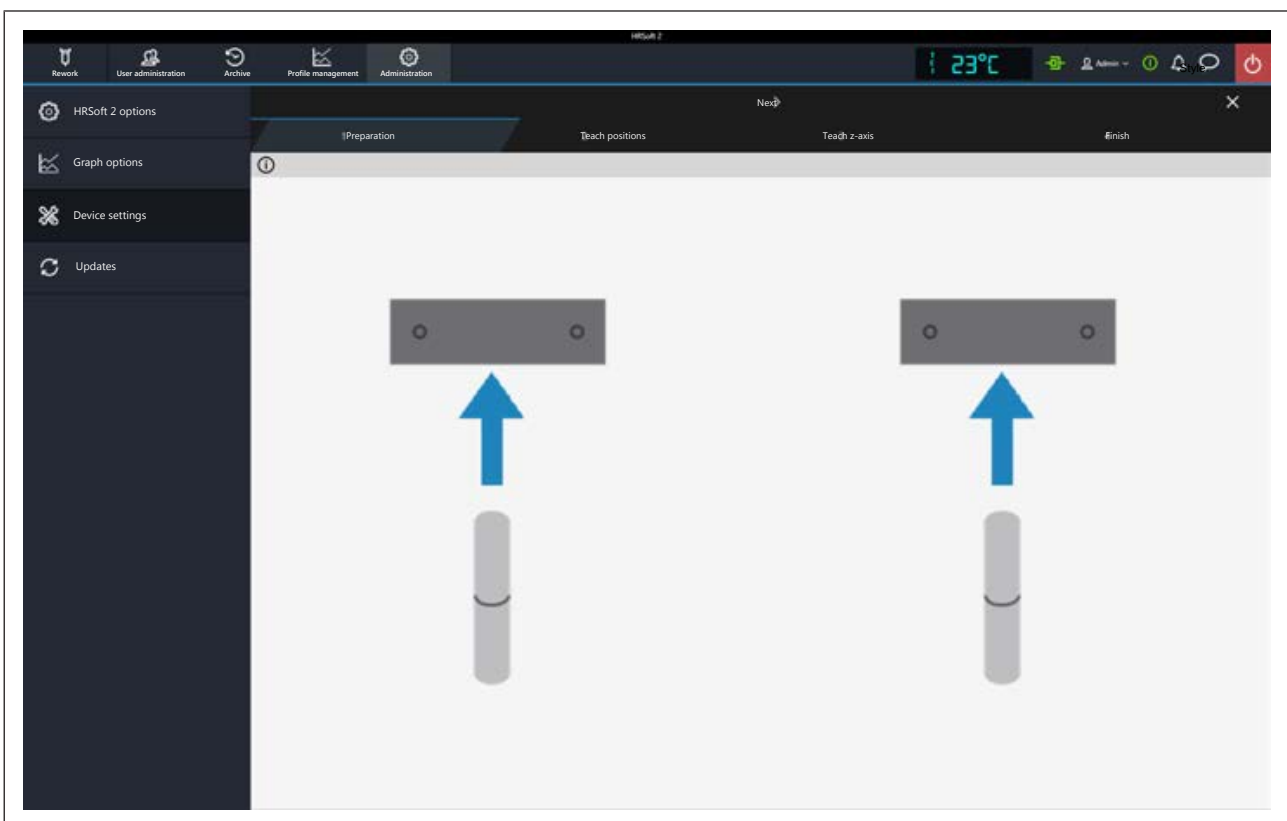
⇒ The [Preparation] working step will appear. The information line above the diagram describes the working steps to be performed.



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

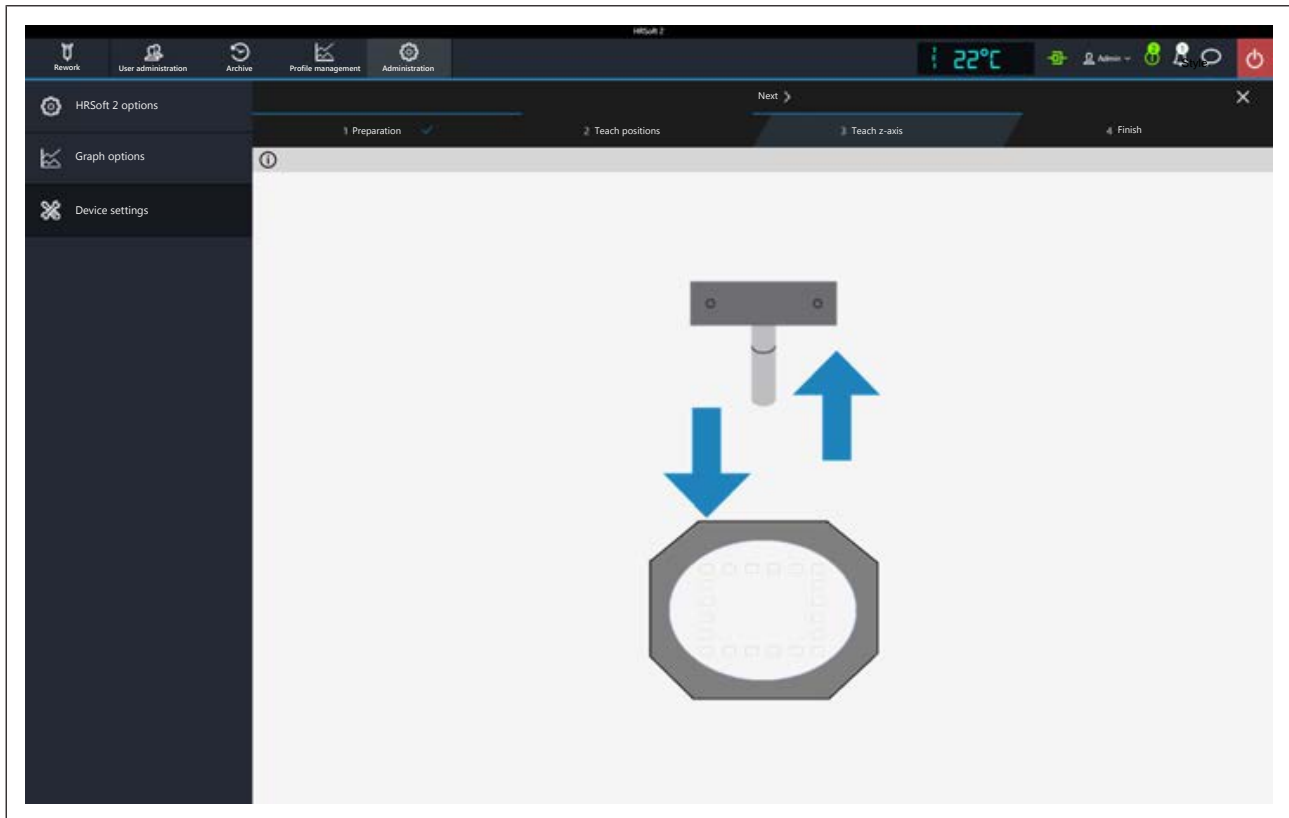
d) Click on the [Next] button to switch to the next working step.

⇒ 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](#) [▶ 138].
- ⇒ 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.



9.7.10 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].

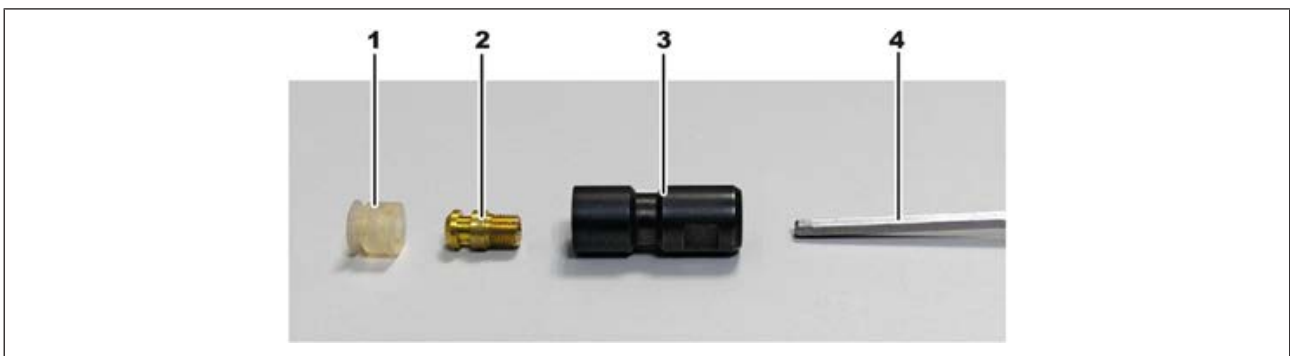
For a description of how to unscrew the heating head nozzle, read Chapter [Adjusting the sizes of the heating head nozzle and placer to components](#) [▶ 138].

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



Fig. 61: Example: Heating head nozzle 5 mm left, heating head nozzle 10 mm right

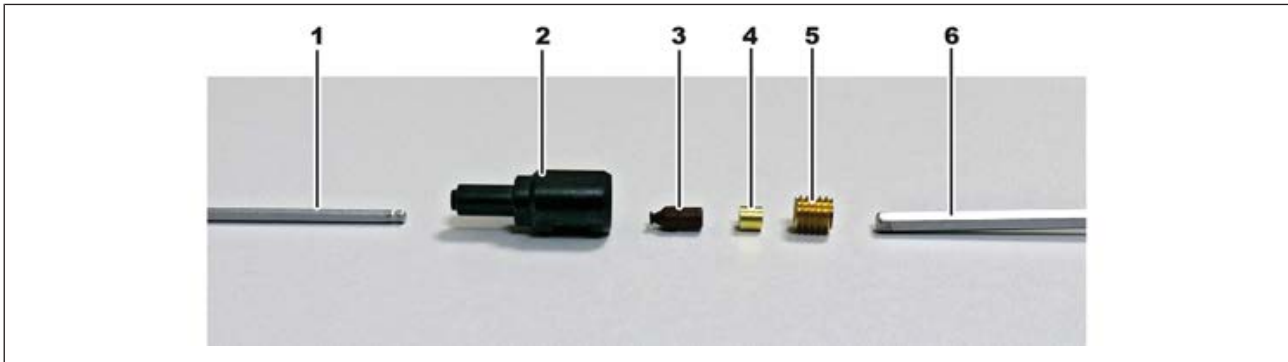
Replacing a large silicone suction cup e.g. in a 10 mm heating head nozzle
Unscrew the heating head nozzle (3).



- 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.



9.8 Performing a HRSoft 2 update

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

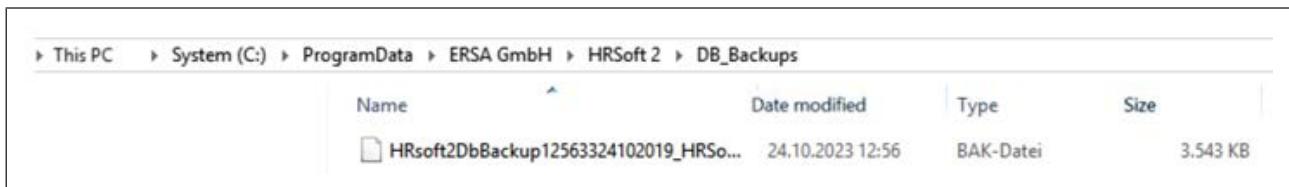
- a) The number of the installed version is shown by the Rework system in the [HRSoft 2 options] dialog under the [Administration] tab.

Download the update package

- a) from Ersa website www.ersa.de 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 the area 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 "Hidden elements" function is activated in Windows 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.

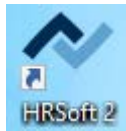


Uninstalling the outdated HRSoft 2 version

- a) Switching 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) Launch the "setup.exe" file in the C:\ProgramData\ErsaGmbH\HRSoft 2\FirmwareXXXXXXXXXX directory.
- 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.

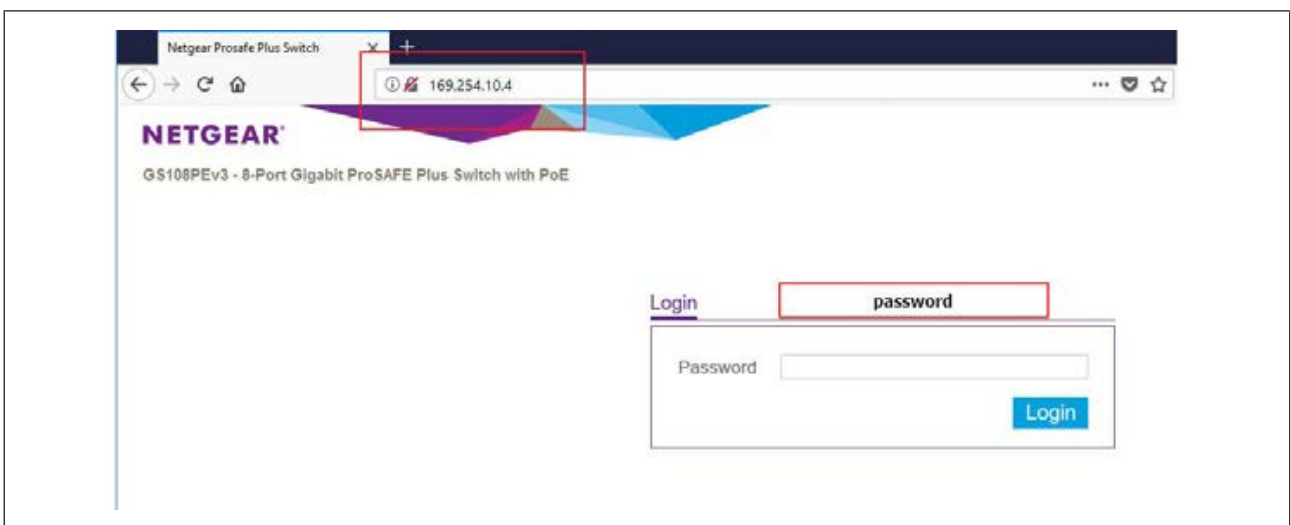


- d) Switch on the Rework system.
- e) Switch on the PC and start HRSoft 2.
- f) Check if there is a connection between the Rework system and the PC. The "Connection" icon on the right of the temperature display must be green.
- g) If further firmware updates of single Rework system modules are required, carry them out in the [Device settings] dialog under the [Administration]. With regard to this, please read Chapter The [device settings] dialog.

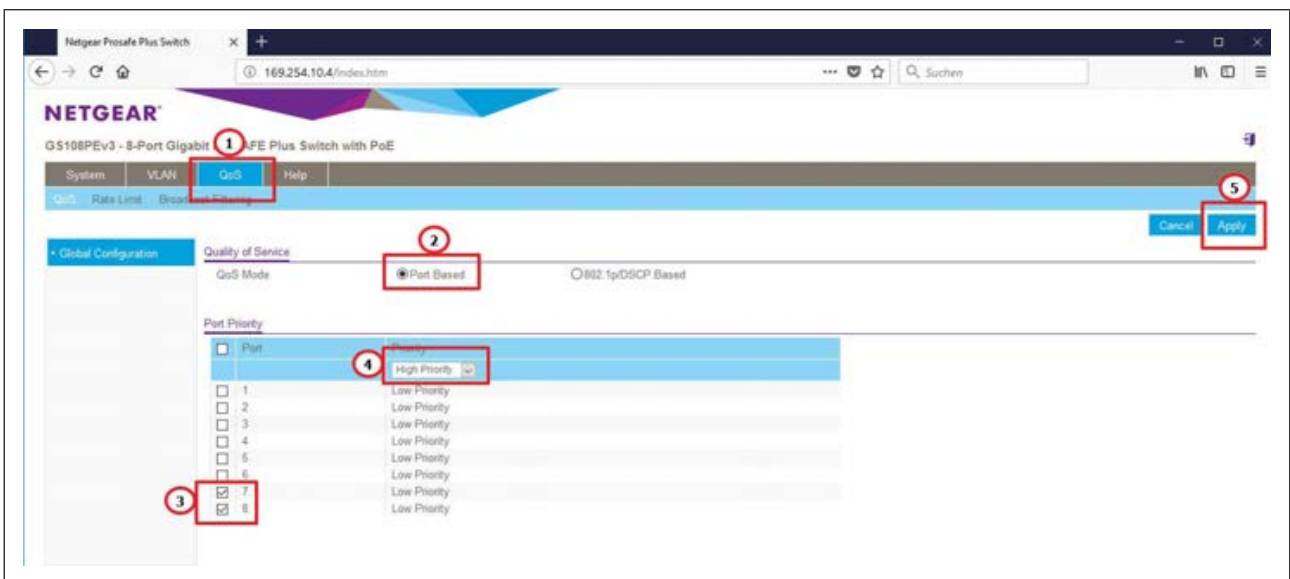
Checking the Netgear switches configuration

Switch on the Rework system and the PC.

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



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



- c) The settings must match the illustration in the figure, otherwise make the following settings:
- d) Select controller "QoS".
- e) Select the optional field "Port based" under "Quality of Service".



- f) Highlight ports 7 and 8 under “Port Priority”.
 - g) Select menu item “High priority” for both ports in the drop-down menu.
 - h) Click on the “Apply” button to confirm all entries.
 - i) Power cycle the Rework system.
- ⇒ The process has now been completed.







10 Annex

10.1 EC Declaration of Conformity [HR600XL]

Network setup

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 \leq 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 \leq 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 Knécht, General Manager

Technical responsibility



Wolfram Sinn, Development Manager