

HR 600/3 P

Rework-System



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1.1 Product information

1.1.1 General information about the product

This operating manual is universally valid for Ersa Hybride-Rework-System of the HR 600/3P series.

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 600/3 P 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

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

1.1.4 Warranty

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

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

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



1.2 Information about this manual

For your safety

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

Nevertheless, residual risks still exist!

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

DANGER

Hazards caused by the improper operation of the machine!

✓ Observe the operating instructions!

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





1.2.1 Pictogram and symbol explanations

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

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



⚠ DANGER

It describes an *immediately* threatening danger

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

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



⚠ WARNING

It indicates a *potentially* threatening danger

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

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



⚠ CAUTION

It indicates a *potentially* threatening danger

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

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



NOTE

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



1.2.1.1 Prevailing term definitions in this instruction manual

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

Safety instructions

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

An example:



NOTE

Machine malfunctions caused by improper maintenance!

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

Operating instructions

the operating instructions contain:

- references to the measures to be adopted

or

- instructions to be followed by all means.

The operating instructions are structured as follows:

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

An example: pressure adjustment

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



1.2.1.2 Warnings

We use the following pictograms for warnings:



⚠ WARNING

Dangerous electrical voltage! Danger of electrocution!



⚠ WARNING

Hot surfaces, hot gases! Burn hazard!



⚠ WARNING

Laser beam! Risk of retinal burns!



⚠ WARNING

Risk of injury! Hand injury risk!



1.2.1.3 Rule notices



NOTE

Read the operating instructions!

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.





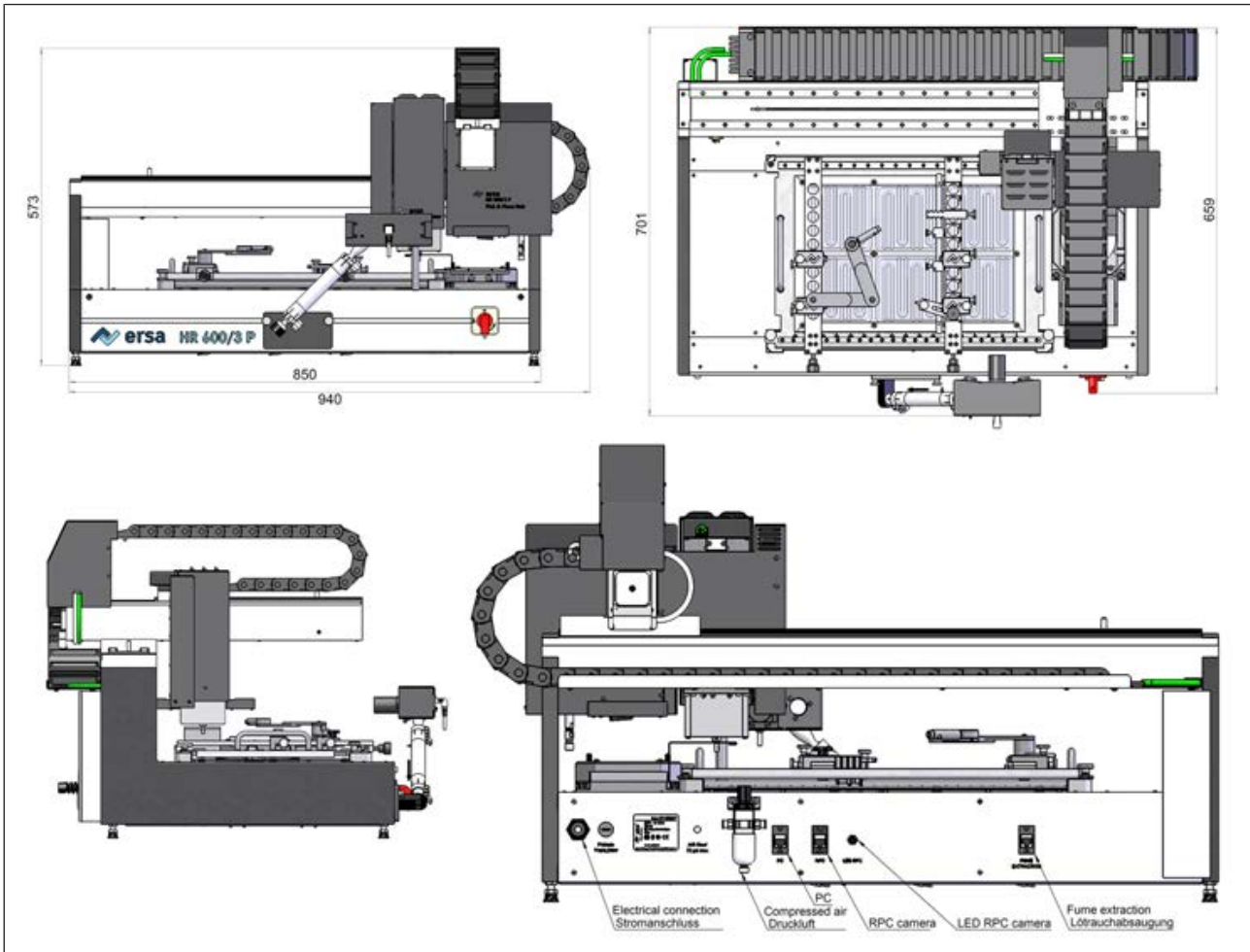
2 Technical data

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2.1 General data

Designation	
Width (mm)	850
Depth (mm)	660
Height (mm)	573
Weight (kg)	Approx. 70
Emission sound pressure level (dB (A))	< 70



2.2 Electrical connection

Description	
Mains voltage 3-wire system N / PE (V)	1 x 230 V
Voltage tolerance (%)	± 10
Mains frequency (Hz)	50 - 60
Pre-fuse (A)	16
Power consumption (kW)	3.2
Connection	EEC plug connection



2.3 Pneumatics

Description	
Inlet pressure (bar, oil-free)	6-10
Required connection (quick coupling)	¼ inch
Outer diameter (mm) of the pneumatic hose for the pneumatic connection to be provided by the customer	8
Flow rate at 6 bar (l/min.)	approx. 105

2.4 Heating system

Bottom radiator

Designation	
Heating type	Medium wave, infrared, reactive ceramic heating elements
Radiator cassette dimensions (width x depth, mm)	380 x 250
Number of heating zones	3
Rated power (kW) at 230 V	2.4 (6 x 0.4)

Top radiator

Designation	
Heating type	Hybrid radiators, ceramic heating elements, medium wave, infrared, with convection
Component handling	Built-in pipette, motorised
Dimensions (width x depth, mm)	60 x 60
Number of heating zones	2
Rated power (kW) at 230 V	0.8 (2 x 0.4)
Aperture adapter (mm)	Up to 20 x 20

Temperature sensors

Designation	
Sensor type	Digital, non-contact infrared sensor (pyrometer)
Additional inputs for K-type thermocouples*	3

*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 (Megapixel)	5
Interface	Ethernet
Lighting	LED, dimmable

Component camera, bottom mount

Designation	
Type	Black and white camera
Resolution (Megapixel)	5
Interface	Ethernet
Lighting	LED, dimmable

2.7 Printed circuit boards and components

Description	
PCB cooling from above	Hybrid blower
PCB cooling from below	Compressed air with blow pipe
Max. PCB size (width x depth, mm)	390 x 300 (15.4" x 11.8")
Larger PCB size thanks to optional PCB frame (width x depth, mm)*	535 x 300 (21" x 11.8")
Max. PCB thickness (mm)	6 (0.24")
Max. PCB mass (kg)	3
Min. component dimensions (mm)	Chip 01005, 0.4 x 0.2 (0.016" x 0.008")**
Max. component dimensions (mm)	60 x 60 (2.4" x 2.4")
Typical operating distance above (mm)	40 (1.6")
Clearance below (mm)	35 (1.4")
Clearance below (mm) OHR600/3BHL and OHR600/3PLBHL with lowered bottom radiator	65 (2.6")

*Larger sized PCBs are not fully heated

**Additional accessories are required

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 Tape feeder option

Designation	
Type	Basic module with exchangeable assembly
Belt widths of the exchangeable assemblies (mm)	4, 8 or 12
Dimensions (L x W x H, mm)	Basic module 213 x 65, 53 Exchangeable assembly 156 x 21 x 26
Total weight (g)	Approx. 500




2.11 Options

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

	Description	Item number
	Reflow process camera for HR600/3P	OHR610/3P
	Dip & Print station	OPR100
	Dip stencil 40 x 40, 0.3 mm	OPR100-D001
	Dip stencil 40 x 40, 0.1 mm	OPR100-D004
	Board holder.	OPH100
	Nozzle Ø 1 mm, metallic *	OHR5520-05010
	Nozzle Ø 2 mm, metallic *	OHR5520-10020
	Nozzle Ø 3.3 mm with silicone cup Ø 2 mm **	OHR5520-20033
	Nozzle Ø 0,3/0,2 mm od/id *	OHR5520-02003
	Nozzle Ø 0.35/0.25 mm od/id *	OHR5520-025035B
	Nozzle Ø 0,6/0,5 mm od/id *	OHR5520-05006
	Nozzle Ø 0,7/0,6 mm od/id *	OHR5520-06007
	Component filter for all nozzles, 10 pieces***	OHR5521/10





	Description	Item number
	Holder for odd shaped PCBs	OHR655

* 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 desoldering processes.

*** Wear part, replacement after 1-10 desoldering processes.

The following solder fume extractor is recommended for the HR 600/3P 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

Tape feeder option

	Tape feeder base assembly	365840
	Exchange assembly, tape width 4 mm	365858
	Exchange assembly, tape width 8 mm	367611
	Exchange assembly tape width 12 mm	365856





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!

Serious injury or death from electric shock!

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

3.2.2 Dealing with process materials and substances



⚠ CAUTION

Irritating substances!

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

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



⚠ DANGER

Hot supplies, hot excipients, liquid metal!

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

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



⚠ DANGER

Substances hazardous to health!

Risk of poisoning by inhalation or ingestion!

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



⚠ CAUTION

toxic fumes!

Risk of poisoning by inhalation!

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



NOTE

Wear safety goggles!

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

3.3 Safety instructions for certain operating phases



⚠ WARNING

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

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

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



⚠ WARNING

The machine malfunctioning is possible!

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

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

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



NOTE

Disposal

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



3.5 Safety instructions for certain machine and system parts

3.5.1 Hot device



CAUTION

Risk of burns from hot surfaces!

- a) Touching the device surfaces may cause burns!

All heated machine parts, 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, plug available



NOTE

Use the soldering fume extraction system!

Solder fumes are hazardous to health. For this reason, a soldering fume extraction system should always be used. As regards the type of soldering fume extraction system, we recommend using the 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!





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4.1 Information concerning machine transport and storage

CAUTION

Material damage is possible!



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

4.2 Information on how to unpack the machine

CAUTION

Risk of injury!



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

NOTE

Disposal



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

NOTE

Find out and ascertain any transport damage



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

4.3 Packaging with TIP n TELL indicator

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



Fig. 1: Indicator not coloured



4.4 Scope of delivery



NOTE

Is delivery not complete or are there any damaged parts?

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

Number	Description	Item number
1	HR600/3P	357249
1	Support rail with two pins	238568E
1	Air deflector 20 x 20 mm	0HR620-003
1	Air deflector 30 x 30 mm	0HR620-002
1	Air deflector 40 x 40 mm	0HR620-001
1	Hexagon screw driver SW9	316569
1	Knurled wrench SW9	316590
1	AccuTC thermocouple without fixture *	0IR6500-37
1	Thermocouple mount V2	0HR641
1	Lens cleaning kit	0VSLC100
1	Nozzle Ø 10 mm with silicone cup Ø 8 mm **	0HR5520-80100
1	Nozzle Ø 5 mm with silicone cup Ø 3.5 mm **	0HR5520-35050
1	Setup nozzle	0HR5520-0000K
1	Set up assembly heating head	364502
1	RJ45 patch cable, 2.0 m	315664
1	Transport lock placing head	363362
1	USB flash drive Rework	3BA00149
1	HR 600/3 P instruction manual	3BA00207

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

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

Available options:

with regard to this, please read Chapter Available options.



4.5 Unpacking and installing the Rework System

- The Rework system must not be exposed to rapid temperature changes. If the Rework System is carried to an environment with a very different temperature, let it adjust to the room temperature for several hours before startup.
- Two people are required to unpack the Rework System:

The work area must meet the following requirements:

- The place of installation must be draught-free! Do not install the unit near ventilation ducts or air conditioning units.
- A bright light pointed at the Rework System may lead to a malfunction of the cameras.
- As regards supply lines and environmental conditions, please see Chapter [Technical data](#) [▶ 17].
- The table must be stable, levelled, vibration-free and designed for a load of at least 80 kg.
- The table top must be at least 1500 mm x 750 mm.

Unpacking the Rework System

Handle the Rework system very carefully. Do not lift the system from sensitive machine parts.

- a) Carry the Rework System in its covering box, on a pallet, to the place of installation.
- b) Pull up the top of the cardboard box.
- c) Remove the internal cardboard boxes and lay them out, see next pictures (1 and 2).
- d) Remove the foam packaging.
- e) Release the power cable from its fastener and place it on the bottom heating.

Setting up the Rework system

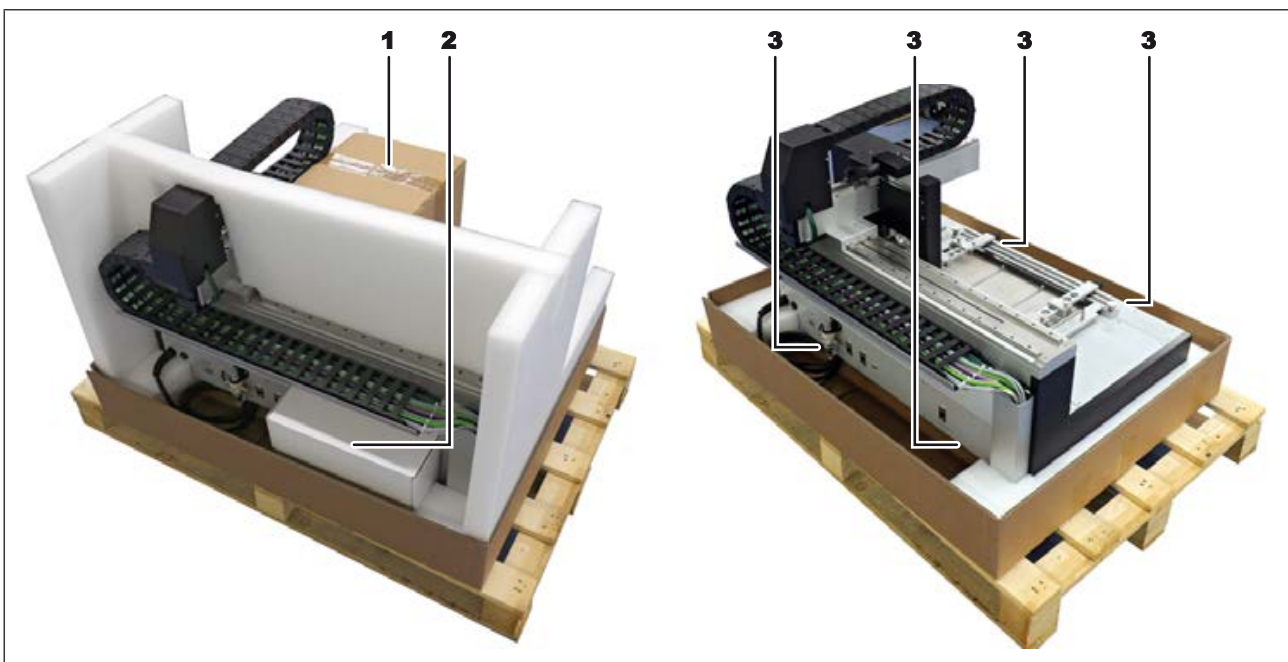


Fig. 2: 1: Box with heating head, 2: Box with accessories. 3: The gripping points when lifting out: only lift the machine from its underside.



- a) The Rework system must be lifted out of the cardboard box by two people. Only lift the machine from its underside, see figure above (3).
- b) Place the Rework System to the left of the table.

⚠ WARNING

Fire hazard, hazard due to heat accumulation!

Personal or material damage is possible!

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

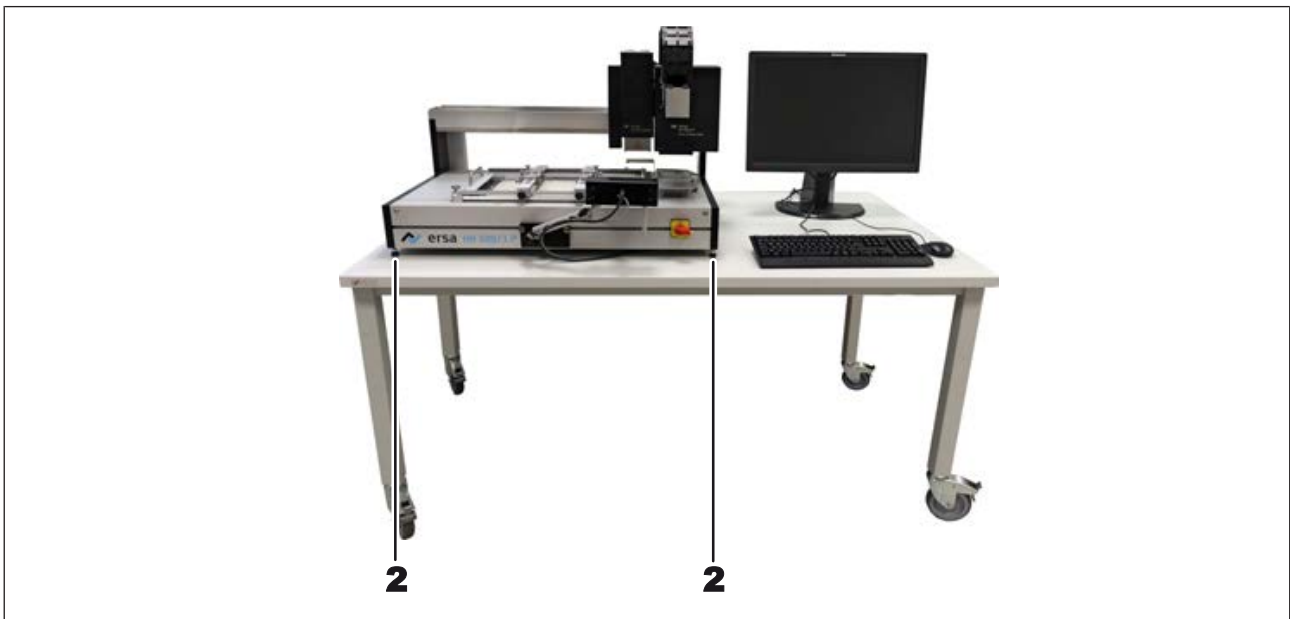


Fig. 3: Positioning the Rework System

- a) For horizontal alignment, use a precision spirit level. Adjust the feet (2) in such a way as to align the Rework System in a perfectly horizontal position.

We recommend storing the packaging material for later use. Only with this packaging material can the Rework System be safely packed, stored and transported.

Any presence of tempering colours on the heating head and on the lower heating is due to manufacturing reasons.

4.6 Remove the transport lock from the placing head

After unpacking the Rework System, remove the transport lock from the pipette holder. The transport lock supports the pipette retention mechanism to prevent damage from external forces. Whenever the machine is shipped, the transport lock must be in place in order to avoid material damages. With regard to this, please also read Chapter Screwing on the transport lock on the placing head before shipment [▶ 97].

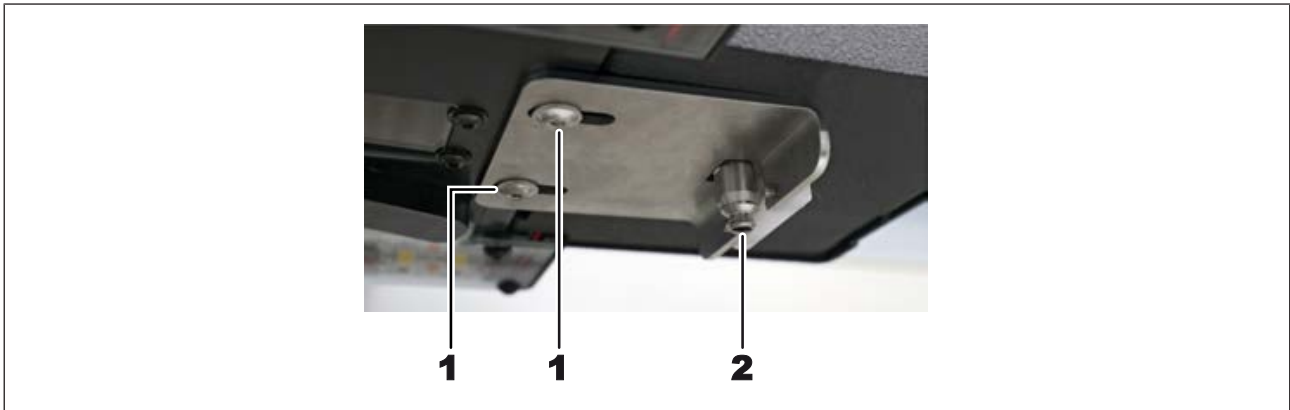


Fig. 4: The transport lock on the placing pipette

The pipette holder (2) must not be subjected to tensile, compressive or rotational forces!

- a) With an Allen key (size 2) loosen the plastic part of the transport lock.
- b) With an Allen key (size 2.5) carefully unscrew the two fastening screws of the transport lock (1) and remove the transport lock by pulling it down vertically.



Fig. 5: Transport lock without fastening screws

- c) Screw the plastic part back onto the transport lock.
- d) Do not attach the fastening screws of the transport lock to the Rework System, as this would affect the camera image.
- e) Keep the transport lock and the fastening screws for later use in case the machine must be transported (e.g. shipped for repair operations).



4.7 Connecting the Rework System

- ✓ To connect the machine:
 - a) Remove all the accessories from the packaging, unwrap them and lay them out.

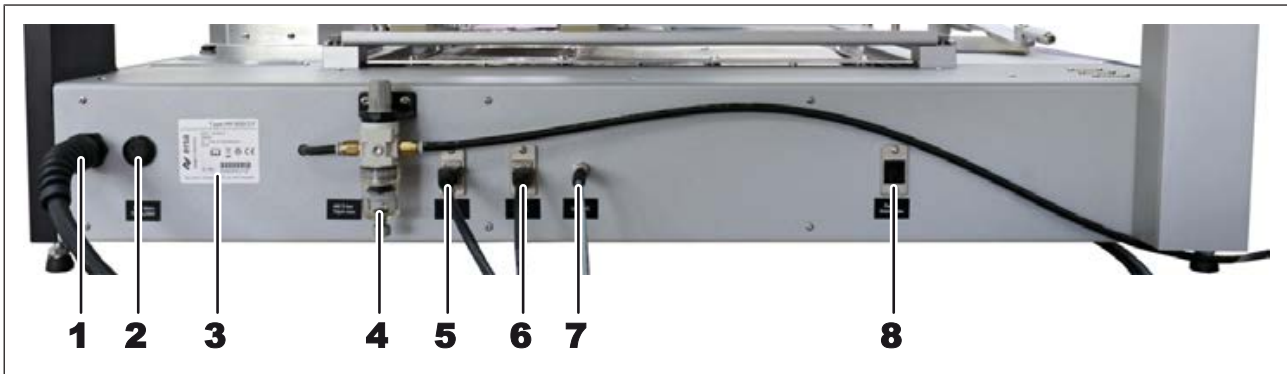


Fig. 6: The back of the HR 600/3P

1	Power cable	5	USB port
2	Main fuse, T16AL	6	Optional RPC camera connection
3	Nameplate	7	Connection for optional RPC camera lighting
4	Maintenance unit, 5 Bar, 72 psi	8	Connection for solder fume extractor control



NOTE

Wear safety goggles!

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

- a) Connect the compressed air hose (6) to the Maintenance unit (5). To do so, insert the compressed air hose all the way into the connector.
- b) Connect the compressed air hose to the on-site compressed air supply lines. with regard to this, please read Chapter Pneumatics.
- c) Connect the USB cable to the USB port (9). Do not make any connection the PC yet now!
- d) Make sure that the main switch on the front of the machine is in the [OFF] position.
- e) Compare the local power supply and the mains frequency with the specifications on the nameplate (10) of the machine.
- f) Plug the mains plug into the socket.



NOTE

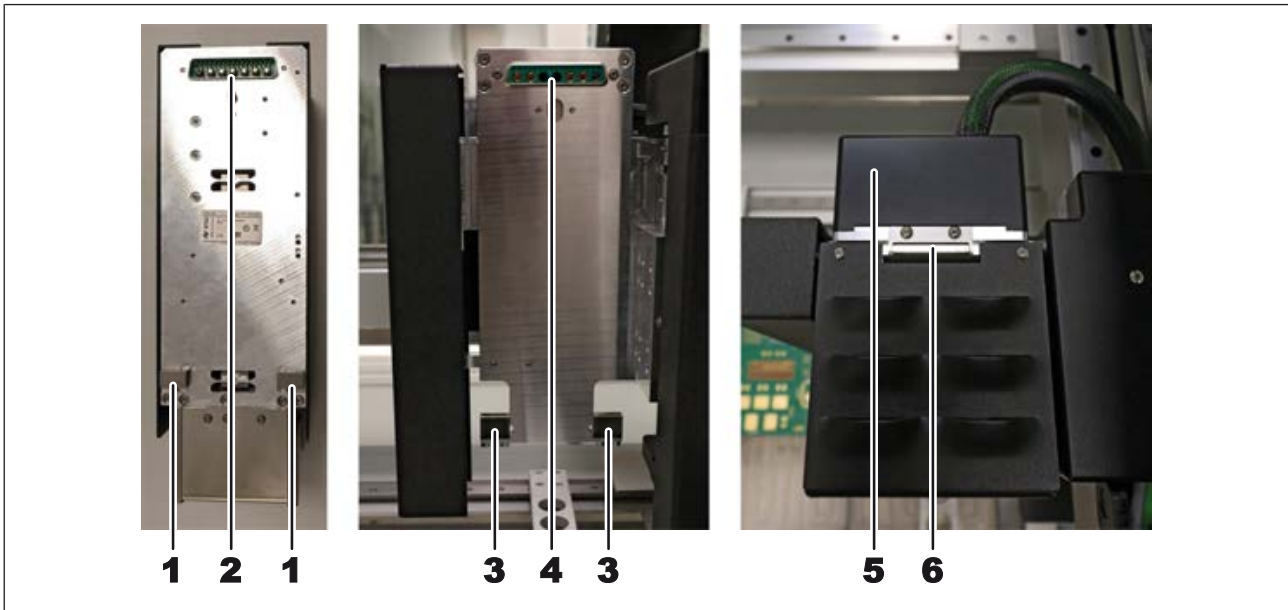
Use the soldering fume extraction system!

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.

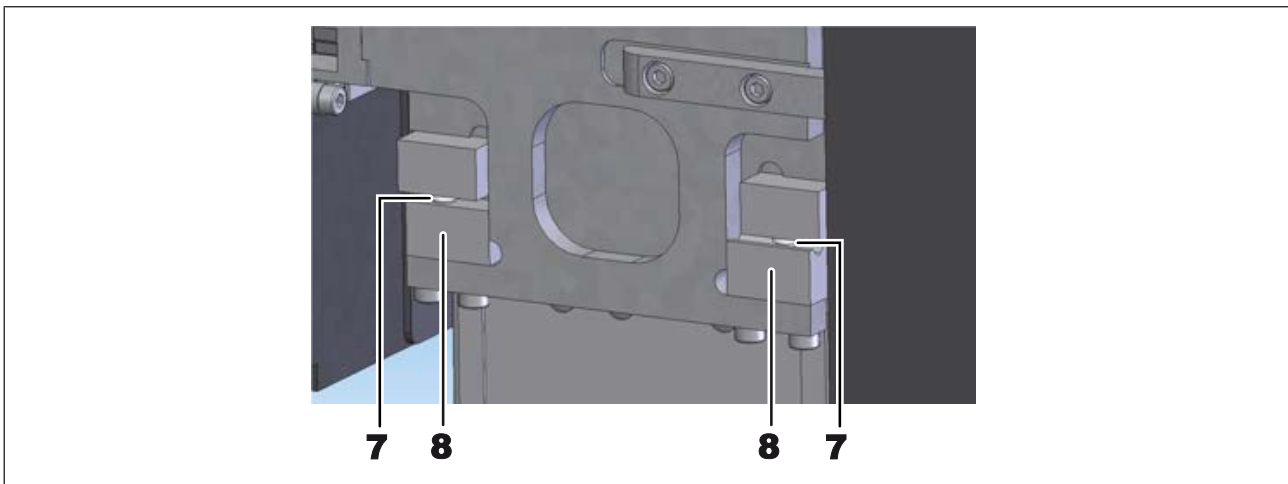


4.8 Fitting the heating head

Handle the heating head very carefully.



- a) Place the heating head frames exactly in the recesses of the bracing supports (3) on the back of the heating head (1). Keep the heating head in this position. Check from the back to make sure that the components are fitting exactly. See the following picture with the spherical support points (7) in the recesses (8).



- b) Once the frames are properly positioned, fit the upper plug above (2) into the connector strip (4). Press the heating head base (5) with your hand against it. From above, there should remain a gap of around 1 mm.
- c) Hold the heating head and screw the retaining plate (6) on the top of the heating head with both screws. In the process, hold the retaining plate in such a way that it cannot fall into the heating head.



4.9 Assembling the Accu-TC holder and air deflector

✓ To assemble the Accu-TC holder:

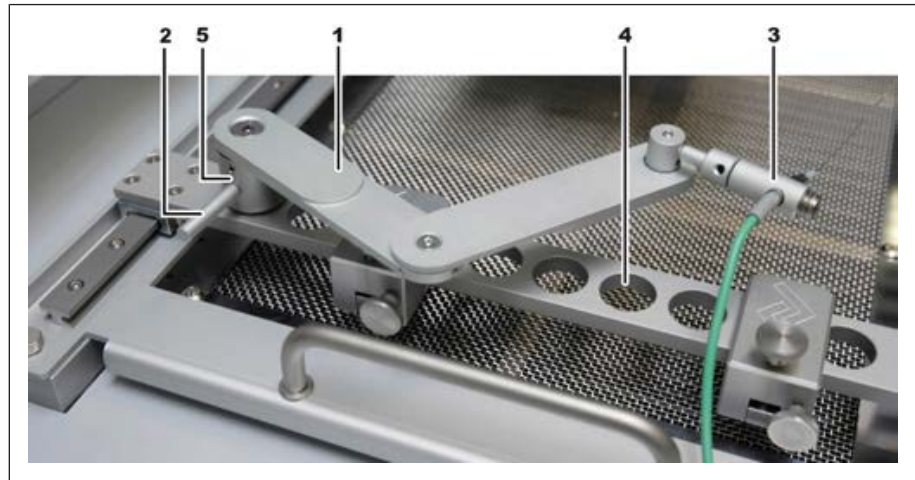


Fig. 7: Assembly of the Accu-TC holder and thermocouple, example picture

- a) You can fit the holder into any bore (4) on the product holder. To do this, insert the cylinder (5) into a bore and and tighten with the lever (2) counterclockwise.
 - b) Insert the plug of the AccuTC thermocouple without fixture (item 01R6500-37) into the TC1 socket.
 - c) Install the thermocouple (3) as shown. To do so, loosen the grub screw at the end of the holder, insert the thermocouple and hand tighten the grub screw.
- ✓ If you work with air deflectors, proceed as follows to install one (6):

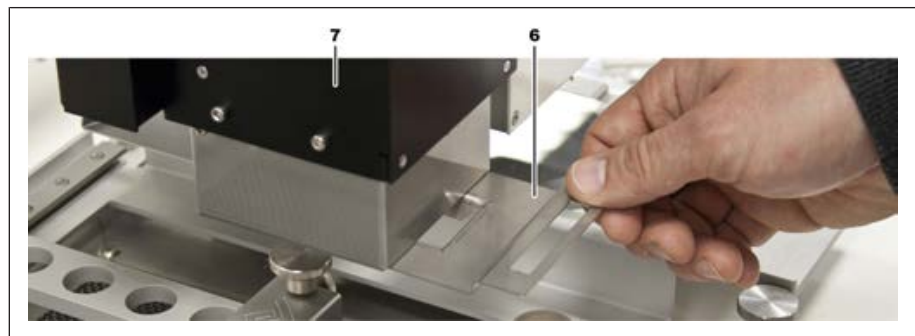


Fig. 8: Inserting an air deflector

- a) Select an air deflector and insert it into the top heater (7) as shown. Air deflectors are used to shield heat-sensitive components.



4.10 Installing the optional RPC camera

✓ If you use the optional RPC camera, no. 0HR610P :

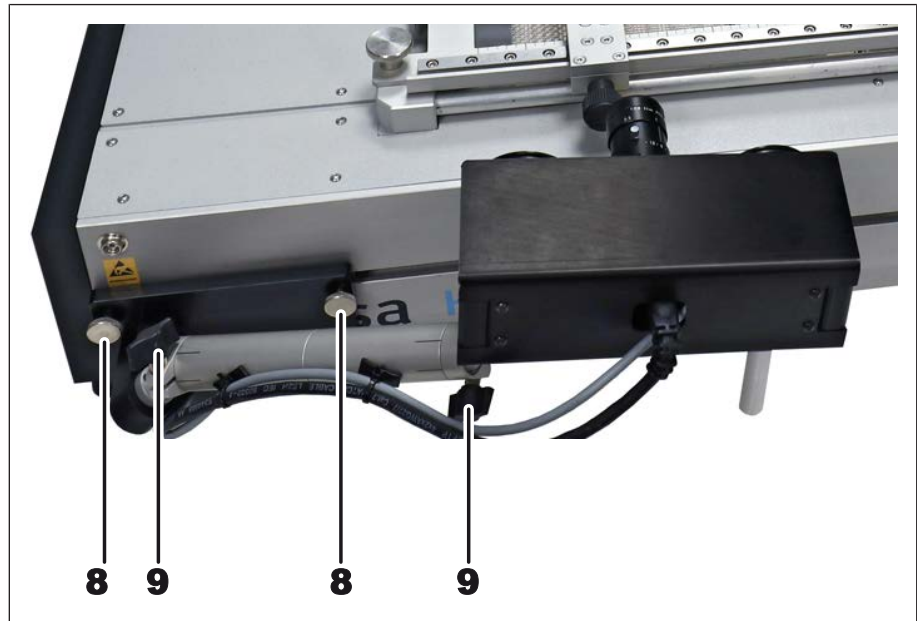


Fig. 9: Assembling an RPC camera, example picture. Run the camera cables under the Rework System backwards.

- a) Mount the RPC camera in the rail with the two knurled screws (8).
- b) Connect the USB cable and the LED cable to the back of the machine. To do so, run the camera cables under the Rework System backwards. With regard to this, please also read Chapter Connecting the machine.

With the wing screws (9) it is possible to achieve an optimal camera position.

Technical data of the optional RPC camera: 10 MP CMOS Ethernet colour camera, 50 mm focal length, lighting 2 x LED point light source, dimmable.



4.11 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

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

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







5 Commissioning

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5.1 Setting up the PC

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

You will need also:

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

Installing drivers

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

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

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

Entering the IP address

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

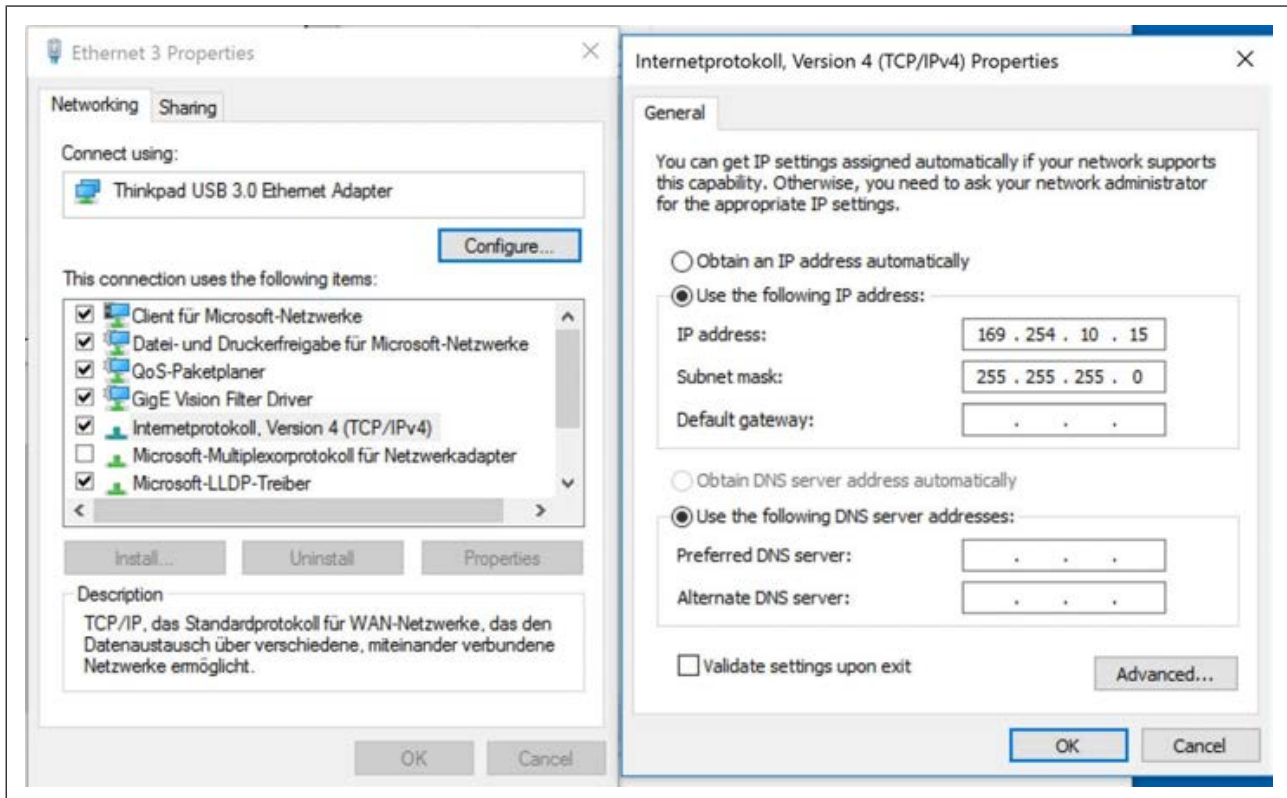


Fig. 10: Entering IP addresses

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

Configuring the network

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

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

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

Install the HRSoft 2 program.

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



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

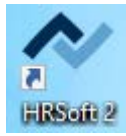


Fig. 11: HRSoft 2 Start-Icon

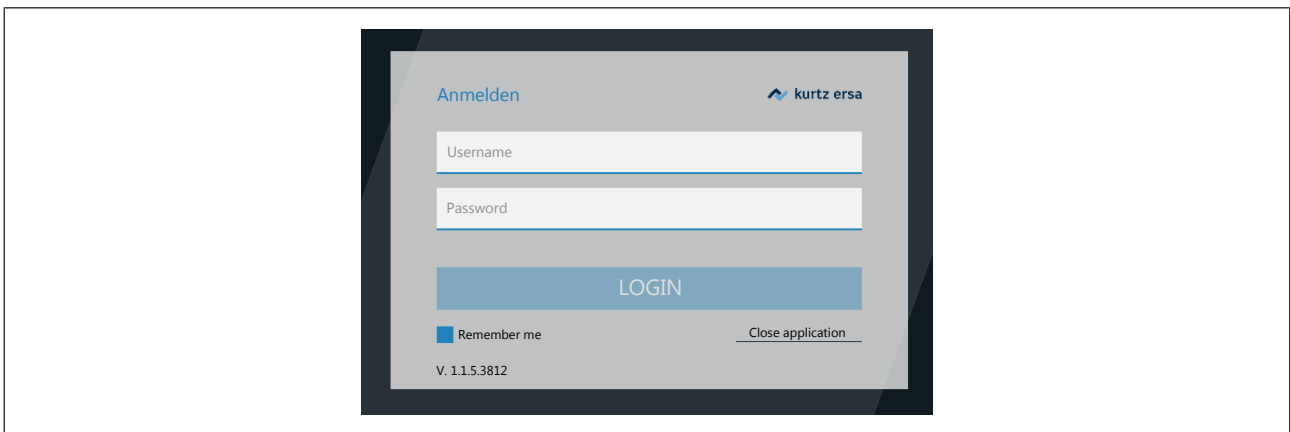
a) Use the main switch on the front of the device to turn on the Rework System.
Switch on the PC and wait for the operating system to start.

a) Double click on the [HRSoft 2] icon on the desktop to start the HRSoft 2 program.

⇒ The Rework System and Rework processes can be controlled via the HRSoft 2 program.

⇒ Rework processes.

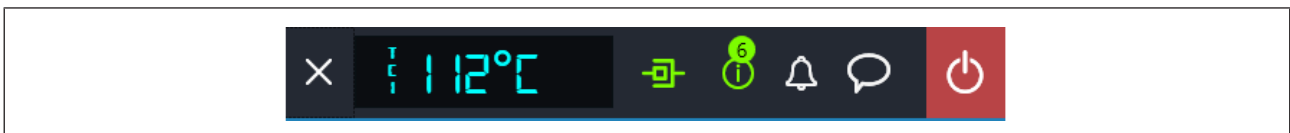
b) In the [Login] window enter Username and Password and press enter. With regard to this, please also read Chapter The [user management] tabulator.



c) 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.

5.3 Button [Start extraneous light compensation]

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

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

a) Click on the [Start light compensation] button in the right column.

⇒ The extraneous light compensation runs automatically.

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

b) Finally, close the dialog box.



5.4 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 placing head 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!

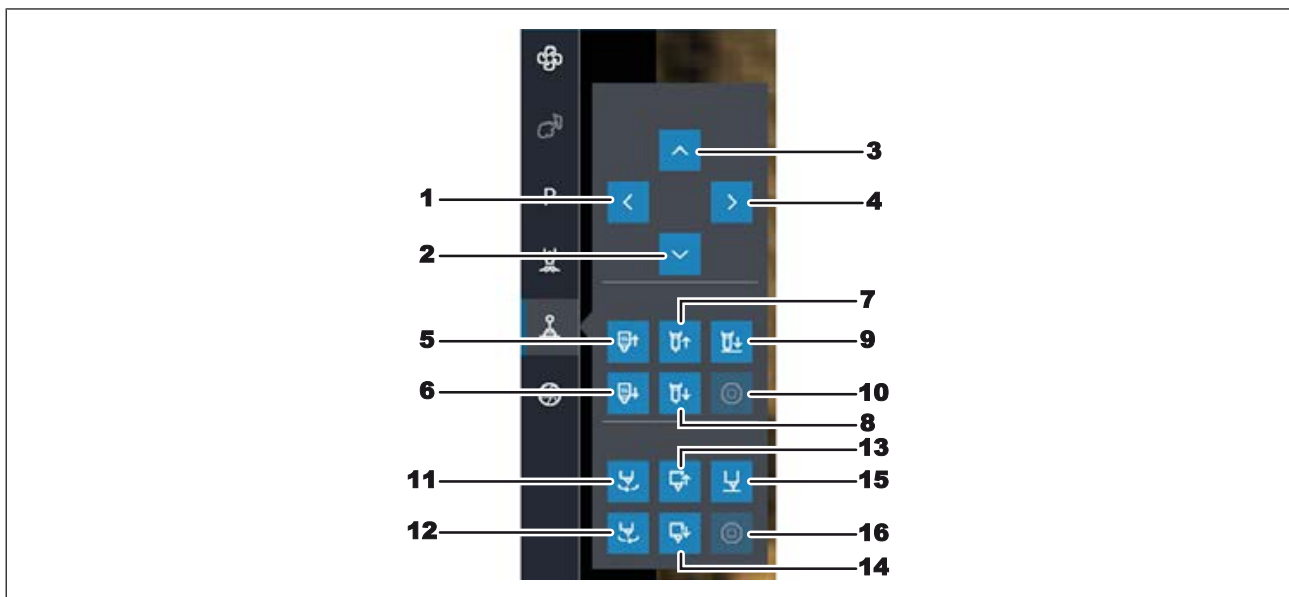


- a) Switch to the [Rework] tab.
- b) Then click on the [Manual Mode] tab to call up the button column for manual operation.

- 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) 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.

With regard 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!

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

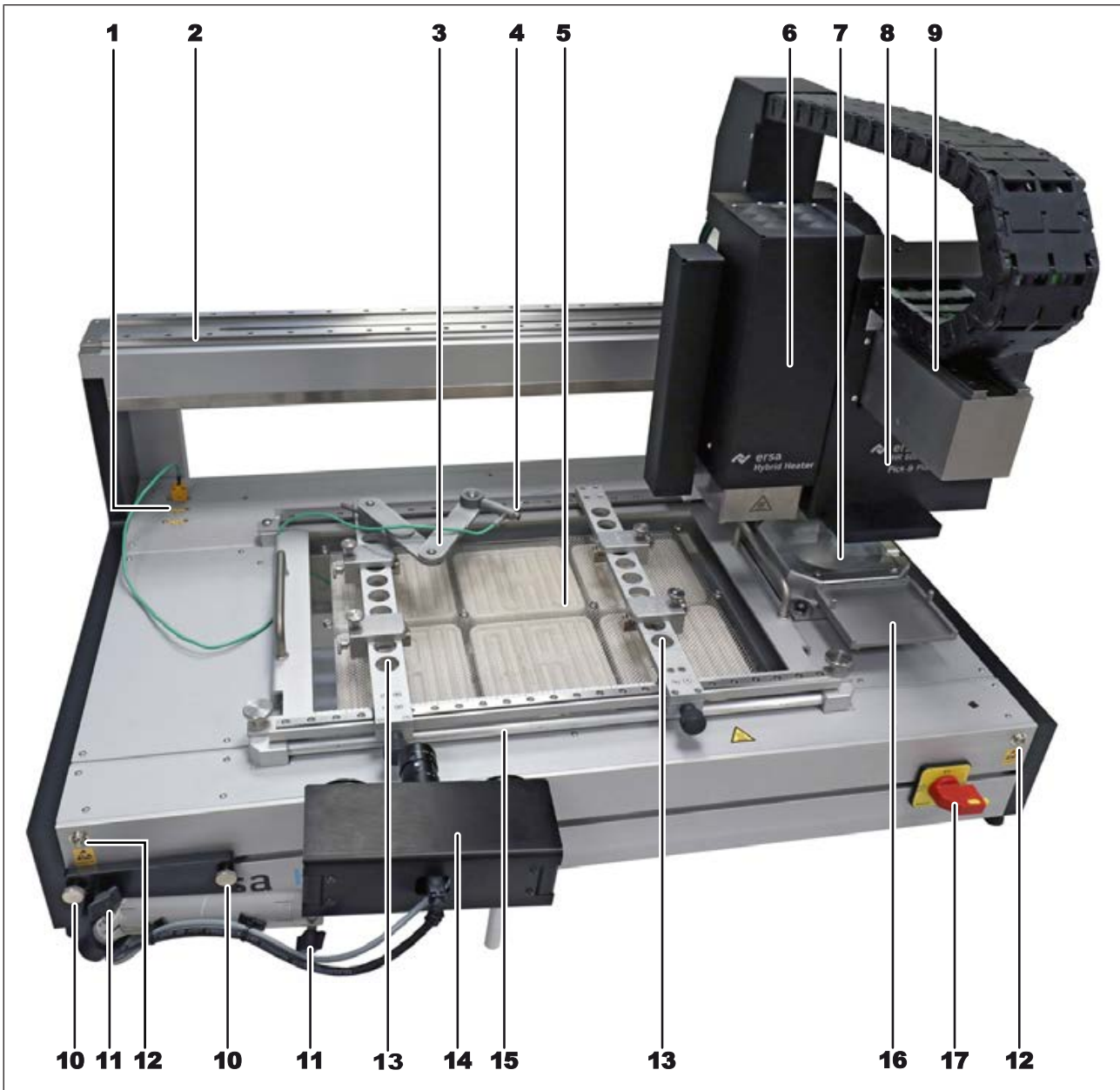


Fig. 12: Overview of the machine parts

⚠ CAUTION

Risk of burning due to heated machine parts and PCB!

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

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



1	Connection sockets for thermocouples (TE1 – TE3)	10	Fastening screws for the optional RPC camera
---	--	----	--



2	X-axis	11	Locating screws for the optional RPC camera position
3	Telescopic holder for thermocouple	12	Connections for ESD wrist band
4	Thermocouple	13	Support rails in the PCB frame
5	Bottom heating, 3 zones	14	Optional RPC camera
6	Heating head, height-adjustable	15	Air duct tube
7	Glass plate, component support and component identification	16	Dip-and-print station holder
8	Pick-and-place unit, left side camera, right side pick-and-place nozzle	17	Main switch, lockable
9	Y-axis		



6.3 The top bar in the HRSoft 2 program

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



- Use the [Rework] tab to change all parameters of the soldering profile. Almost identical structure to that of the [Profile management] tab, but with all rights to manage soldering profiles; creating, copying, deleting and saving is not possible. Also contains the start button for the rework process. With regard to this, please read Chapter [Rework] tabulator overview.
- Use the [User administration] tab to show, create, edit, delete and save users with their different user rights. With regard to this, please read Chapter The [user management] tabulator.
- Use the [Archive] tab to show the rework processes performed so far in all details for an analysis. With regard to this, please read Chapter [The \[Archive\] tabulator](#) [▶ 70].
- Use the [Profile management] tab create, change, copy, delete and save soldering profiles. Almost identical structure to that of the [Rework] tab, but with all rights to manage soldering profiles. If you are logged in as a standard user, the [Profile management] tab will be missing. With regard to this, please read Chapter [Overview of the \[Profile management\] tab](#) [▶ 75].
- Use the [Administration] tab to define HRSoft 2 program parameters (e.g. system language, display colours, etc.), program management (e.g. updates), network management, and start-up functions. This tab contains the following three fields: [HRSoft 2 options] (Chapter [The dialog \[HRSoft 2 settings\]](#)), [Graph options] (Chapter [The \[Chart settings\] dialog](#) [▶ 91]) and [Device settings] (Chapter [The \[device settings\] dialog](#)).
- [Manual mode] tab: button for showing/hiding the button bar [Manual mode], which is visible only in the [Rework] tab. With the Rework buttons, you can move the heating head and the pipette at any time, and switch on/off the Rework System functions that can be manually controlled (e.g. motor movements, cooling, etc.). With regard to this, please read Chapter [The \[Manual Mode\]](#) [▶ 68].
- Display and button row on the right: Temperature display, network display, user name and system status. With regard to this, please read Chapter [The display and button sequence in the right upper corner](#).



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

6.4.1 Overview of the tab [Rework]

After starting HRSoft 2, the [Rework] tab will be shown. Soldering processes are started and performed in the [Rework] dialog. This dialog is divided into the following ranges:

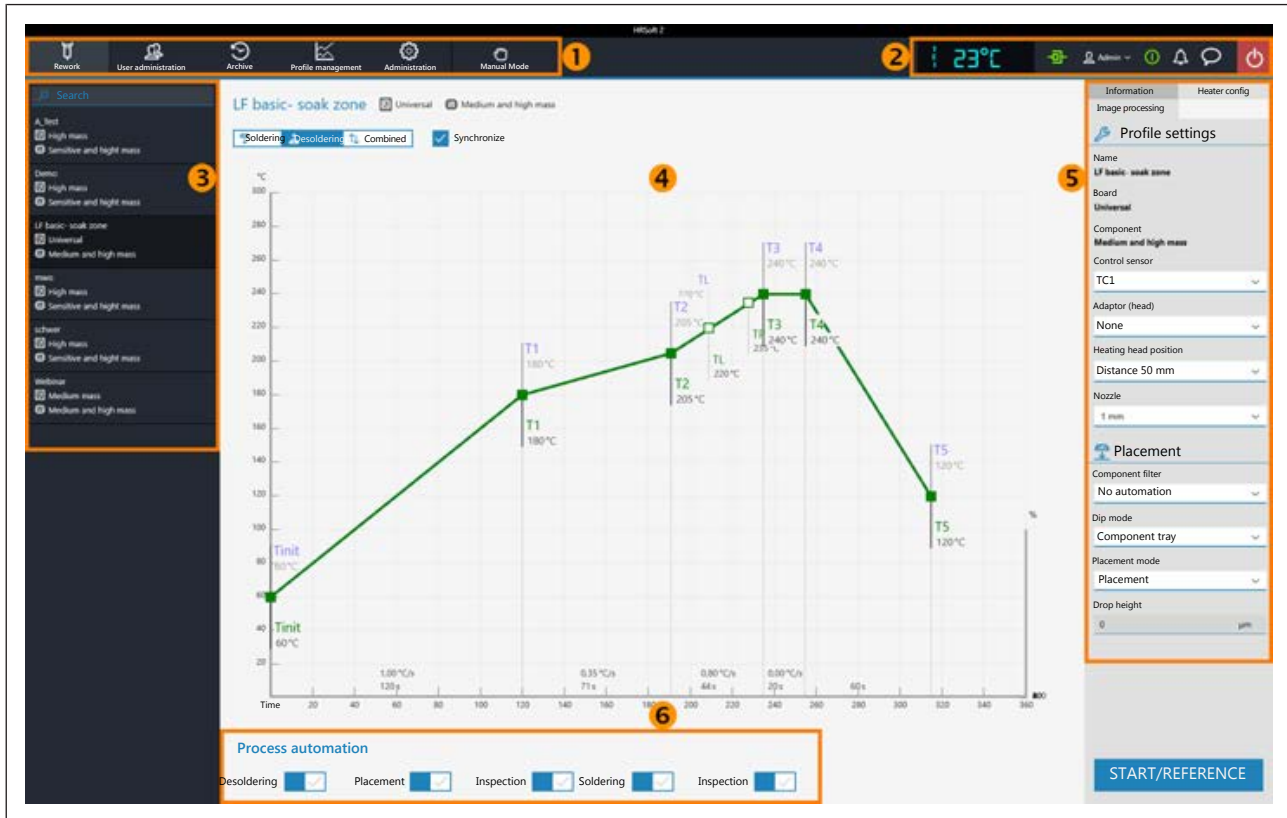


Fig. 13: Ranges in tab Rework

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> [▶ 77].	4 Chart with soldering curves. To display of the soldering process with curves for soldering and desoldering. Any change that is made here to the soldering process will be accepted but not saved. If you switch from tab [Rework] 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> [▶ 64].



5	Parameter bar with tabs [Information] and [Heater config]. As to this, please read Chapter The tabulators [Information], [Heating setting] and the arrow key [Image processing]. The machine initialisation and the Rework process can only be started here with the [Start] button.	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 tab [Rework] to another tab, all changes made to the soldering profile will be lost. As to this, please read Chapter [Process automation] and its process steps [67].
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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 [▶ 75].

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 [Profile management] tab is not visible.

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

6.4.1.1 The START/REFERENCE MOVE BUTTONS

On the bottom right of the [Rework] tab there is the [START/REFERENCE] button, which starts the rework process.



All soldering process parameters may be edited in the [Rework] 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 the soldering process is described by way of example in the Tutorial – Soldering or unsoldering a component.

The [START/REFERENCE] button starts a wizard which will guide you through each step of the whole soldering process. With regard to this, please read Chapter Tutorial – Soldering or unsoldering a component.



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

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



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

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

Working with soldering profiles

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

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

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

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



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

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

The heating curves in the middle of the screen can be adjusted for the desired soldering process. With regard to this, please read Chapter The chart in the [Rework] tabulator. You can also change the buttons in the [Process automation] line (6) at the bottom at any time. With regard to this, please also read Chapter [\[Process automation\] and its process steps](#) [▶ 67]. These buttons enable or disable any process steps.

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

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

The correct soldering profile settings should be specified in the [Profile management] tab beforehand. Only possible as “Administrator” user. With regard to this, please read Chapter The tabulator with the small arrow key (Image processing) under the [Profile management] tabulator.

6.4.3.1 The two tabs on the right

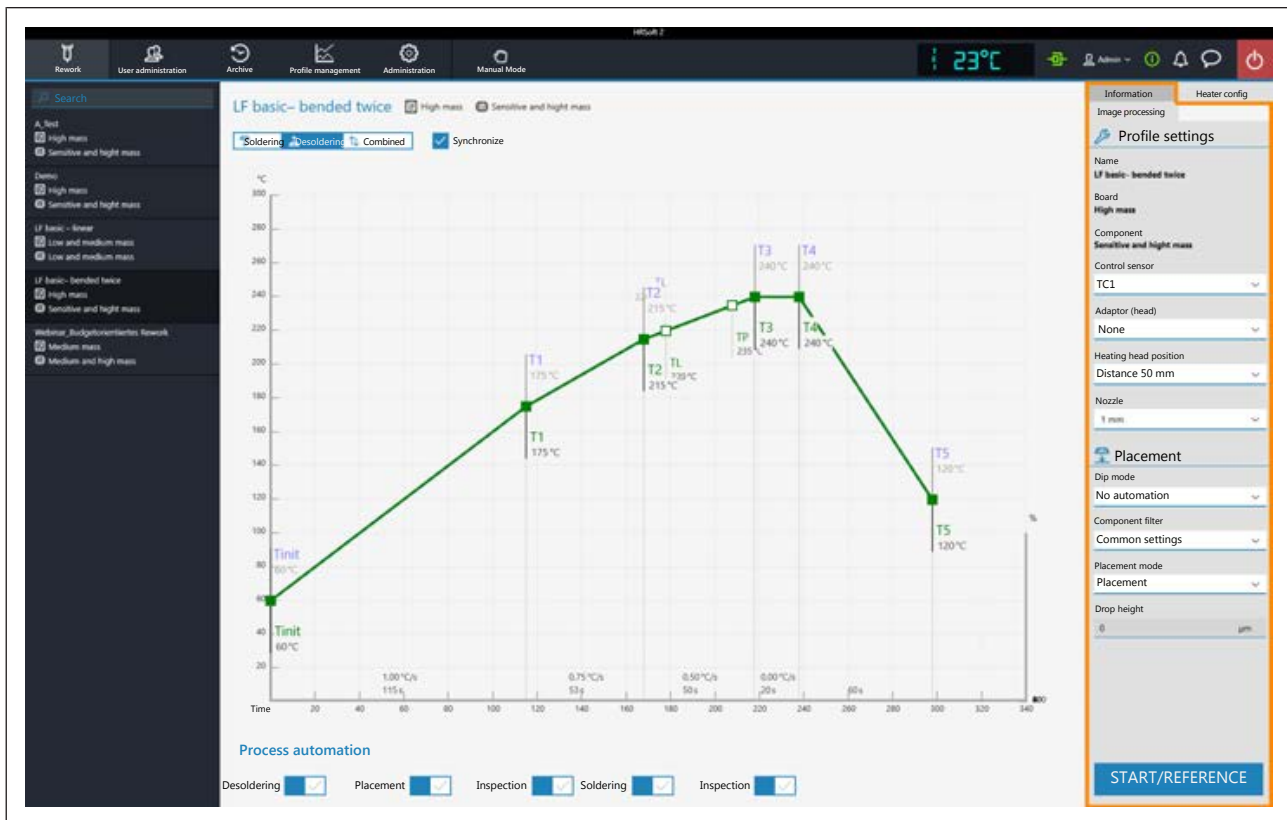
Range (5) on the right contains the two tabs [Information] and [Heater config].

Select tab [Information] to make changes to soldering profile parameters. With regard to this, please also read Chapter The [Information] tabulator under the [Rework] tabulator).

Select tab [Heater config] to make changes to heaters. With regard to this, please also read Chapter The [Heating setting] tabulator under the [Rework] tabulator.



6.4.3.2 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.

You can change the following parameters in tab [Information] here:

In the area [Profile settings]:

The three parameters written in bold [Name], [Board] and [Component] are set in tab [Profile management].

You can change the following parameters in tab [Information] here:

- [Control sensor]: Selection of the temperature sensor controlling the soldering process through temperature measurement. [IRS] (Infrared sensor), [TC1] (Thermocouple 1) and a maximum of eight additional thermocouples. The current temperature measured by the selected sensor is displayed in area (2). The I.R.S. is conditionally suitable for bright and reflective surfaces as well as for very small boards.
- [Adaptor (head)]: adapter used (air baffle). No function, only for data recording.
- [Heating head position]: Set the soldering distance to the PCB, from 30 mm - 70 mm. No function, only for data recording. For high components on the PCB, the heater head distance can be adjusted using the buttons in tab [Manual Mode]. Read more about this in Chapter The [Manual Mode].
- [Nozzle]: Selection of the solder nozzle to be used. No function, only for data recording.
- [Pin 1 orientation]: Position of pin 1 on the component. No function, only for data recording.

In the area [Placement]:



- [Component filter]: The component detection of the camera is improved for the selected part type. Select the component type before soldering. Possible filters are:
 - [General] = all other component types
 - [BGA] = Ball Grid Array
 - [Small BGA]
 - [Large BGA]
 - [MFU BGA] Do not use!
 - [QFP] = Quad Flat Package
 - [QFN] = Quad Flats No Leads
 - [CBGA] = Ceramic Ball Grid Array, small component [up to size 01005]
 - [Small component (01005)] = SMD with 0.2 x 0.4 mm
 - [SMD connector]
 - [BGA connector]
- [Dip mode]: There are three soldering methods available to choose from:
 - [No automation]: Normal soldering without performing a flux dip and without using a component with solder paste coating. The component is picked up from the component tray, aligned and placed in soldering position.
 - [Auto. Dip]: The prepared dip template with flux must be placed in the receptacle for dip & print station. The component is lifted from the glass plate and dipped into the flux of the dip template, after which it is aligned and placed in soldering position.
 - [Auto. Print]: The prepared print template with the solder paste coated component must be placed in the receptacle for dip & print station. The component is taken from the print template, it is then aligned and placed in soldering position.
- [Placement mode]: During soldering.
 - [Placement]: The component is placed with the aid of the contact sensor.
 - [Drop]: The component is discarded via the printed circuit board.
- [Drop height]: During soldering. Height above the PCB from which the component is dropped onto the PCB. Only possible if parameter [Drop] is selected.

Start the rework process or perform a reference run

In the right corner below, with the button [Start/Reference] the rework process is started. Before starting the rework process, make sure that all parameters are set correctly and the required steps are selected. An example of a soldering process is described in chapter Tutorial – Soldering or unsoldering a component .

If you only wish to perform a reference run of the rework system, any work step can be selected. Click [Start/Reference] and cancel the operation after the reference run has been performed.

The correct soldering profile settings should already have been set beforehand in tab [Profile management] where they are saved as a soldering profile. Only possible as an "Administrator" user. Read more about this in Chapter The [Information] tabulator under the [User management] tabulator.

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

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

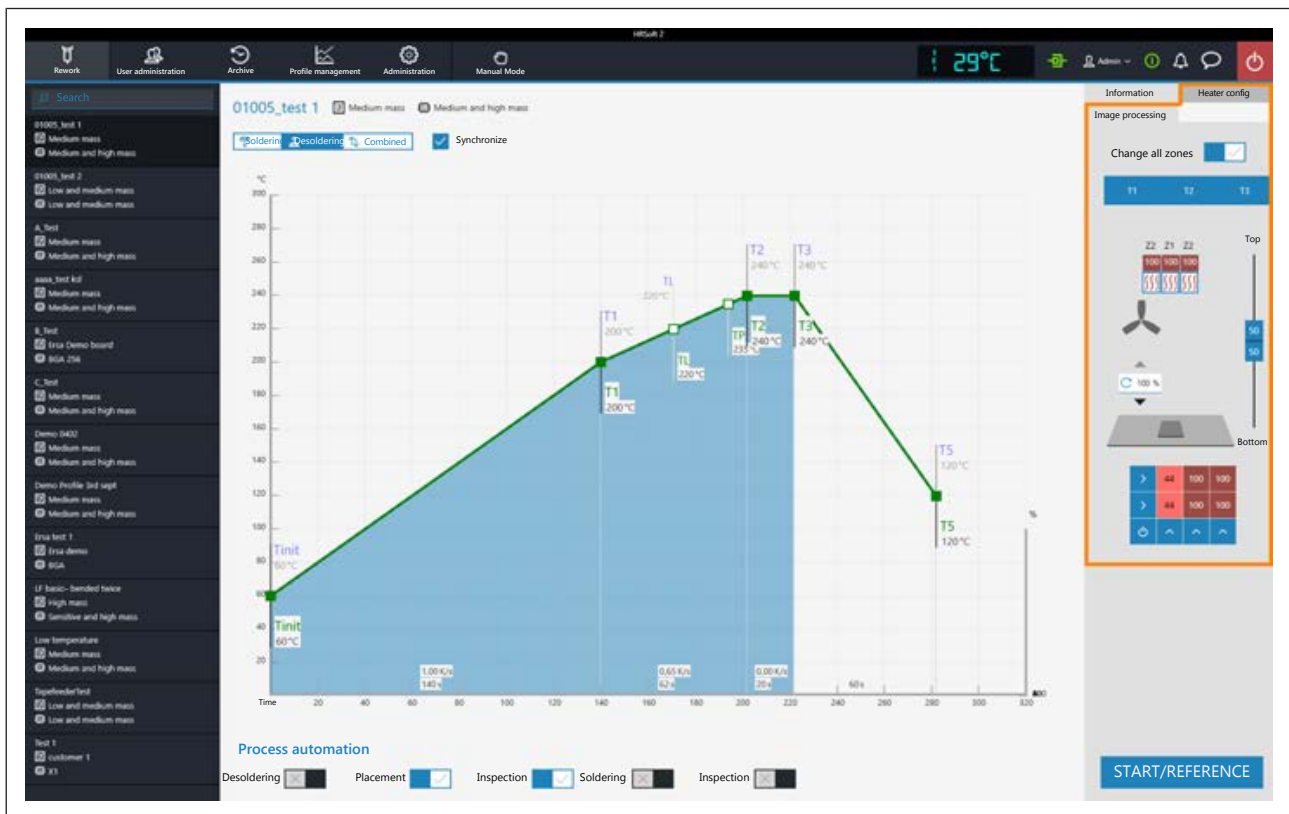


For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from tab [Rework] tab to another tab, all changes will be lost.

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 curve 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 curve 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. The temperature, blower power and upper heating proportion, as well as the temperature, proportion and distribution of the lower heating zones can be assigned to each heating phase in [Heater config] tab.

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



The parameters in tab [Heater config]

[Change all zones]: if this button is selected, all 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. Number of heating phases

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.
- Power value of the top heater blower. The 50% value is suitable for all applications. This value is to be always complied with.



- 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 change them all to the same value:
 - Use the mouse to draw a rectangle over the heating zones.
 - Click on the right-hand or bottom blue side fields.
 - Switch off/on the lower heating with the blue field on the bottom left.

Use this function to reciprocally adjust the maximum value of the heating zones and their ratio. For large PCBs, to avoid shape distortion, ensure that the whole PCB is heated. Note that the components should not be heated too quickly as only slow heating will result in uniform temperature distribution. This will increase the safety level of the process.

Bottom right there is 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 unsoldering a component .

The correct soldering profile settings should be specified in 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.



6.4.3.4 The tab with the arrow buttons [Image processing] under the tab [Rework]

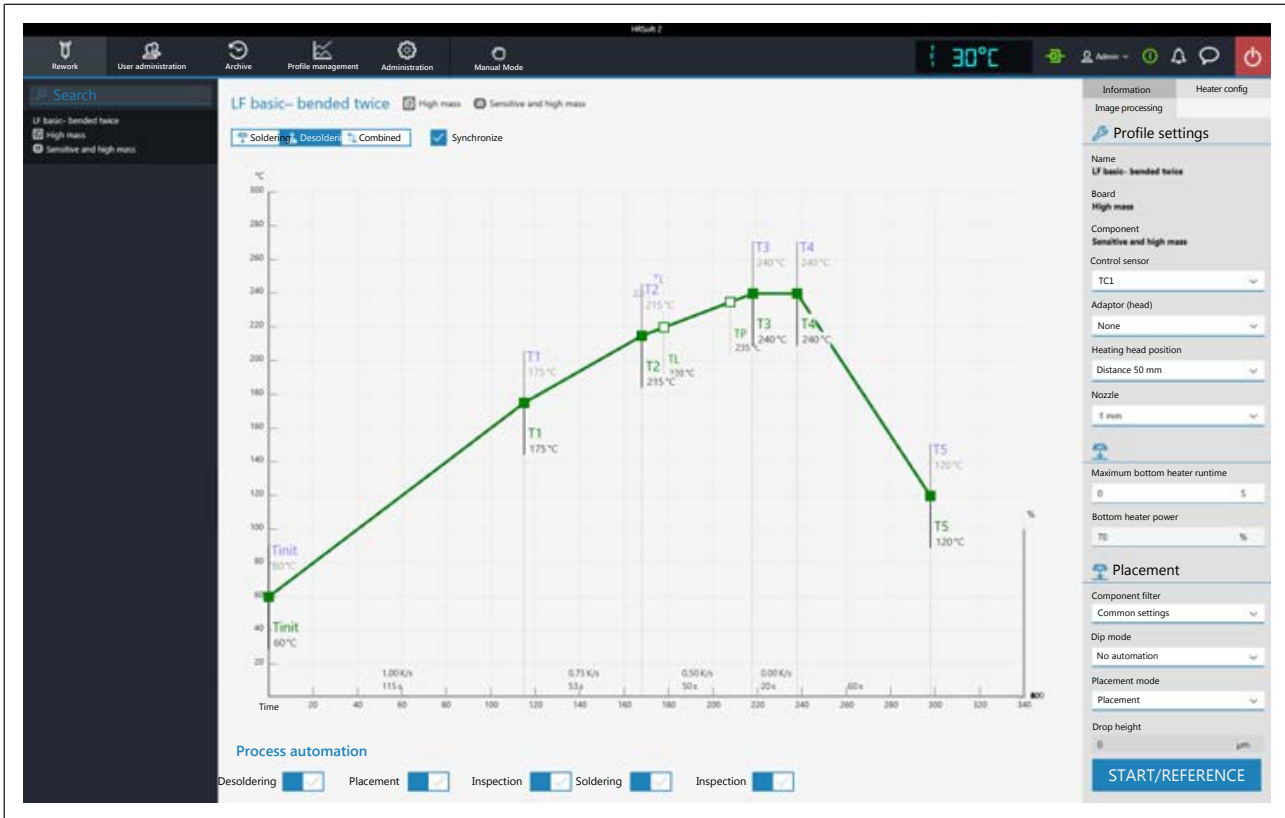
When using the optional tape feeder, the luminance intensity for the image recognition of the tape feeder can be adjusted independently of the soldering process. For best component recognition, set the controller to [8].



6.4.4 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.



6.4.4.1 The heating curves in the [Rework] tab

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

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

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

Setting the heating curves

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



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

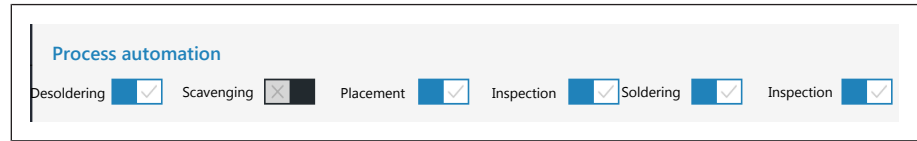
On the bottom right there is the [START/REFERENCE] button, which starts the rework process. Make sure you have made all settings correctly before starting the rework process. How to perform the soldering process is described by way of example in the Tutorial – Soldering or unsoldering a component.

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



6.4.5 [Process automation] and its process steps

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



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

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

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

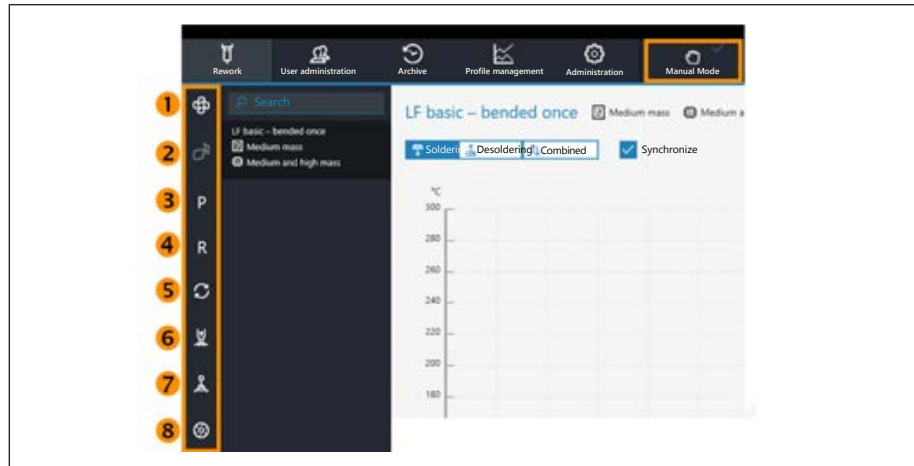
For all changes that are made in tab [Rework], the following applies: changes are accepted but cannot be saved. If you switch from tab [Rework] tab to another tab, all changes will be lost.

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



6.5 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.



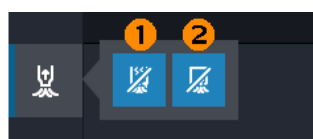
⚠ CAUTION

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.
- 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:

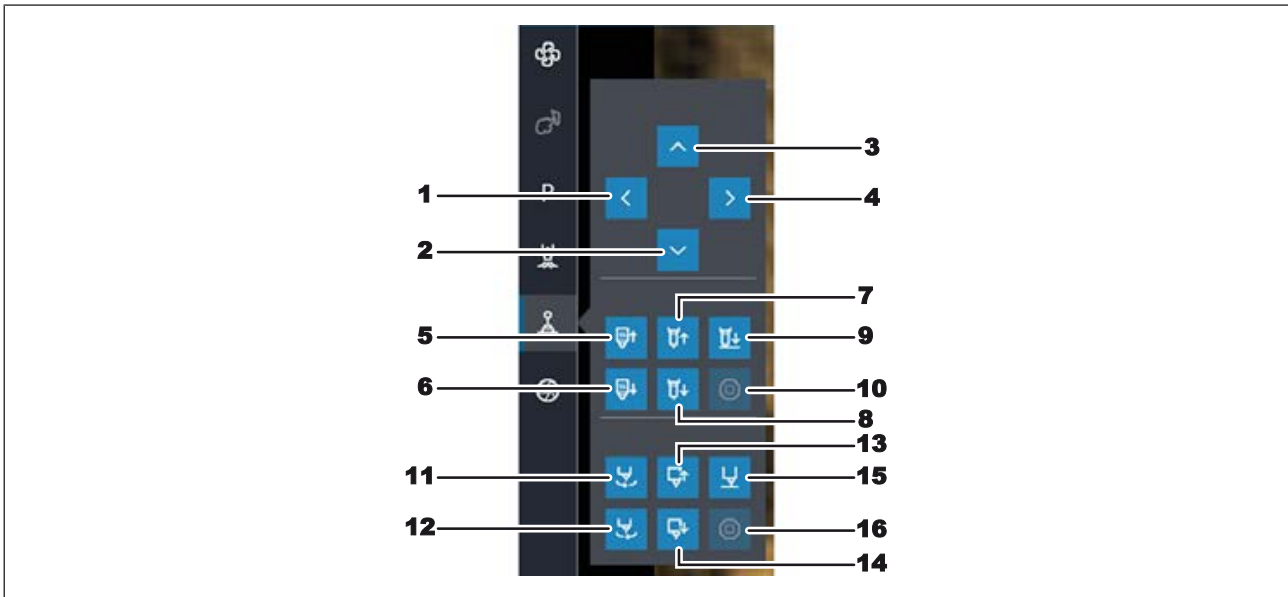


Fig. 14: Manually moving motors

- 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.



6.6 The [Archive] tabulator

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

Process automation

Desoldering Placement Inspection Soldering Inspection

Profil Init Temp
60

Max Temperature
290

TL
217

TP
190

Lens

Nozzle
1 mm

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.



6.6.1 The [Show chart] button

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



Fig. 15: 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.

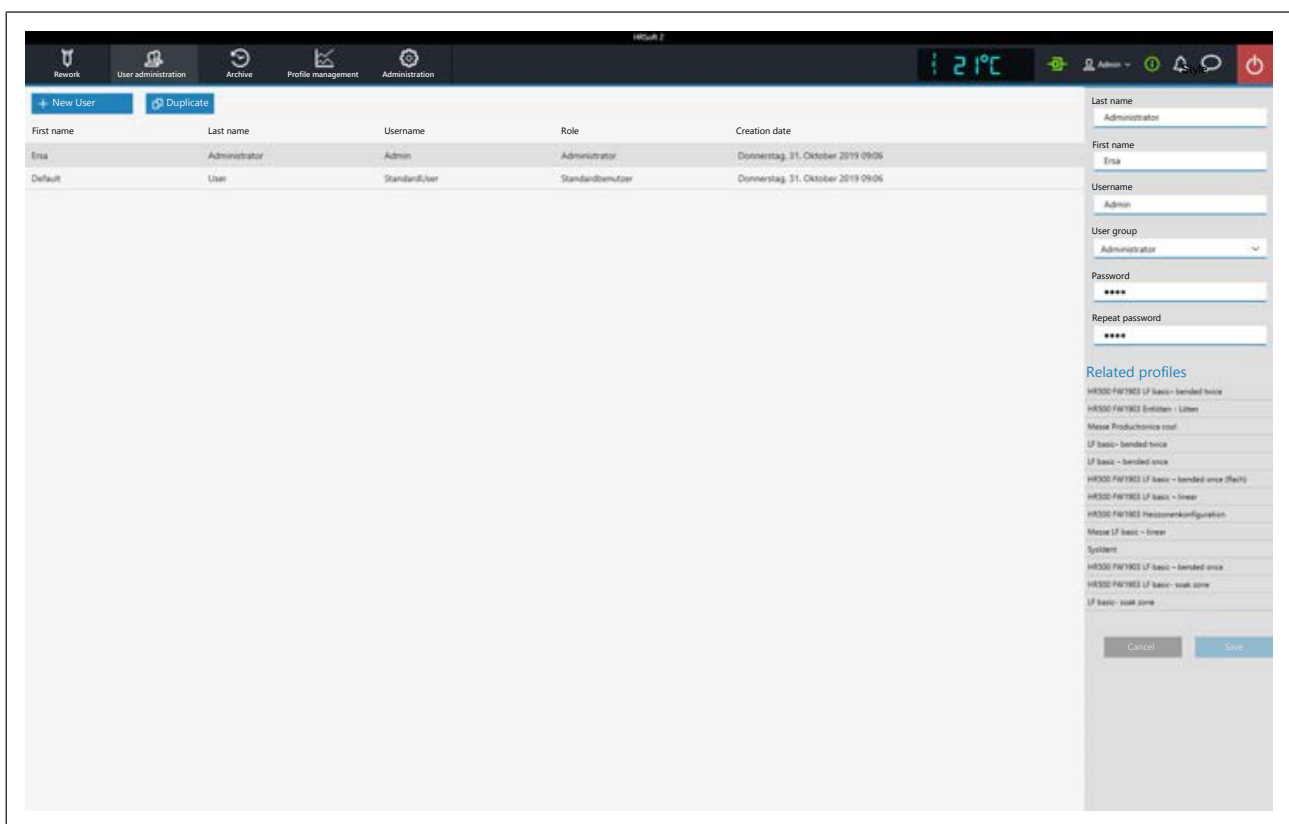


6.7 The [user management] tabulator

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

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

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



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

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



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

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.



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

6.8.1 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. The soldering process is started and controlled in the [Rework] tab. For a description of tab [Rework] please read Chapter [Temporarily editing the soldering profile in the \[Rework\] tab](#) [▶ 55].

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

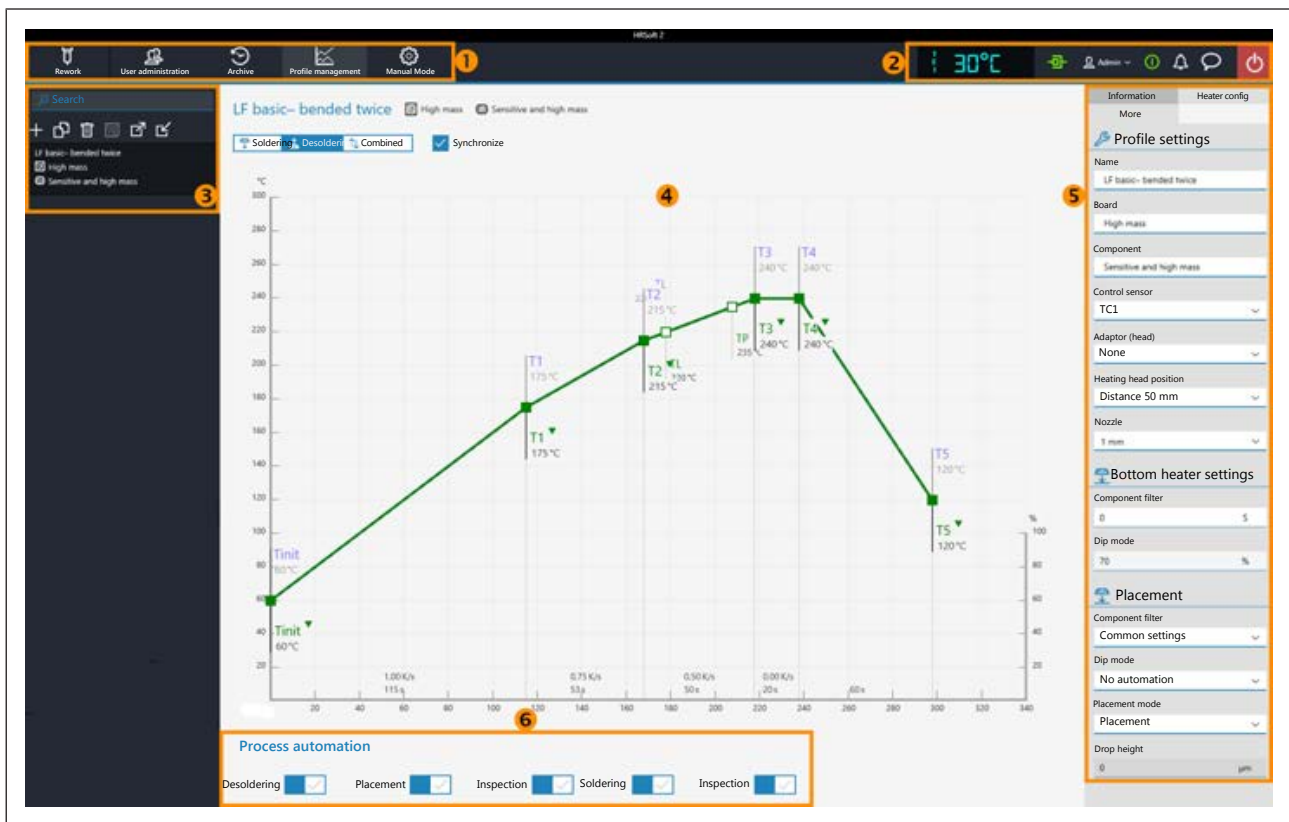


Fig. 16: Ranges in tab Profile management

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 [▶ 95].
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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 Create, copy, delete and save soldering profiles in the [Profile management] tabulator [▶ 77].</p>	<p>4 Chart / soldering curves. Display of the soldering process with curves for soldering and desoldering. Soldering curves can be changed at the points in the curves.</p> <p>As to this, please read Chapter The chart in the [Profile management] tabulator [▶ 86].</p>
<p>5 Parameter bar for processing parameters in tabs [Information] and [Heater config] as well as the small arrow key [More] to assign users to soldering profiles.</p> <p>With regard to this, please read Chapters The [Information] tab under the [Profile Management] tab [▶ 80], The [Heating setting] tabulator under the [Profile management] tabulator and Assigning a user to a soldering profile in the "More" arrow key tab under [Profile management]</p>	<p>6 Workflow bar for determining process flow steps (from left to right). As to this, please read Chapter The [Process automation] buttons under the [Profile management] tabulator.</p>

The functions of tab [Profile management] largely correspond to those of tab [Rework]. For a description of tab [Rework] please read Chapter [Rework] tabulator overview.

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 curve 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 curve 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 \[▶ 77\]](#). The temperature, blower power and upper heating proportion, as well as the temperature, proportion and distribution of the lower heating zones can be assigned to each heating phase in [Heater config] tab.

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

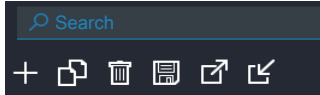
Save changes as described in the following chapter.



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



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

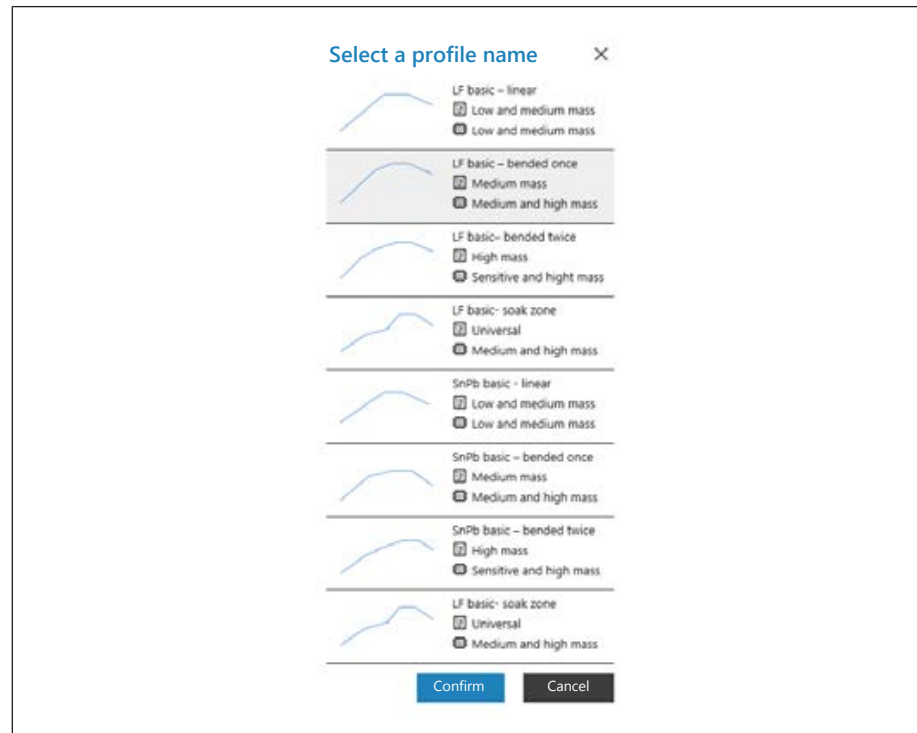
A soldering profile is a file that defines the whole soldering process. Use the four buttons above the soldering profile list to perform the following functions (from left to right):





- 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



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



- 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](#) [▶ 80].

- ⇒ 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](#) [▶ 80].

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](#) [▶ 77].

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.





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



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

In range [Profile settings]:

- [Name]: It is defined by the profile stencil selection. Assign a different name if desired. With regard to this, please also read Chapter [Create, copy, delete and save soldering profiles in the \[Profile management\] tabulator](#) [▶ 77].
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 curve with a single bend.
 - “bent twice” stands for a heating curve with two bends.
 - „soak zone” stands for a heat-reduced heating phase from [T1] to [T2] to activate flux. The heating curve has two bends.
- [Board]: 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” for all PCB types. Assign a different PCB name if desired.
- [Component]: It is defined by the profile stencil selection (). The stencils are called “low and medium mass” for low to medium component mass, “medium mass” for medium to high component mass, “Sensitive and high mass” for sensitive and high mass components. Assign a different component name if desired.



- [Control sensor]: Selection of the temperature sensor that controls the soldering process via its measured temperature. [IRS] (Infrared sensor), [TC1] (thermocouple 1) or others. The currently measured temperature of the selected sensor is displayed in field (2). The infrared sensor (IRS) is not suitable for glossy, reflective surfaces or very small PCBs.
- [Adaptor (head)]: used adapter (air baffle).
No function, only used to store information.
- [Heating head position]: Define the soldering distance to the PCB from 30 mm to 70 mm. No function, only used to store information. For the heating head distance to be kept in case of high components on the PCB, adjust it with the buttons in the [Manual Mode] tab. With regard to this, please read Chapter The [Manual Mode].
- [Nozzle]: Selection of the soldering nozzle used.
No function, only used to store information.
- [Pin 1 orientation]: position of pin 1 of the component.
No function, only used to store information.

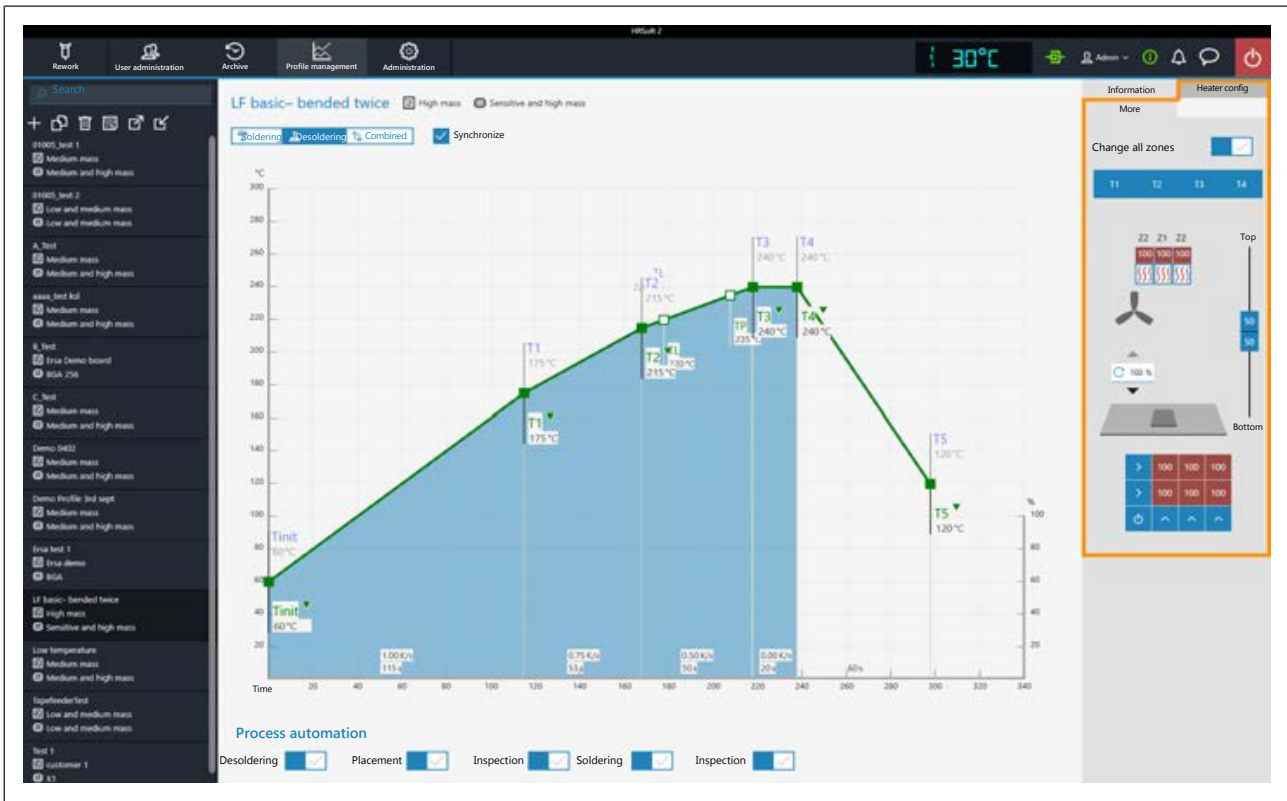
In range [Placement]:

- [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 dipping and without using a component that is coated with solder paste.
The component is picked up from the component tray, aligned and placed on the soldering position.
 - [Auto. Dip]: Place the dip stencil prepared with flux on a component tray. The component is lifted from another component tray and immersed in the dip stencil's flux, aligned and placed in the soldering position.
 - [Auto. Print]: Place the print stencil prepared with the component coated with solder paste on a component tray. The component is picked up from the print stencil, aligned and placed in the soldering position.
- [Placement mode]: during [Placement]: Positioning the component using the contact sensor, or [Drop]: Drop the component onto 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.



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

Extensive settings for the top and bottom lower heating can be made in the [Heater config] 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. Number of heating phases

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.
- Power value of the top heater blower. The 50% value is suitable for all applications. This value is to be always complied with.
- Vertical controller (top - bottom): Upper heating/lower 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 change 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 change them all to the same value:
 - Use the mouse to draw a rectangle over the heating zones.
 - Click on the right-hand or bottom blue side fields.
 - Switch off/on the lower heating with the blue field on the bottom left.

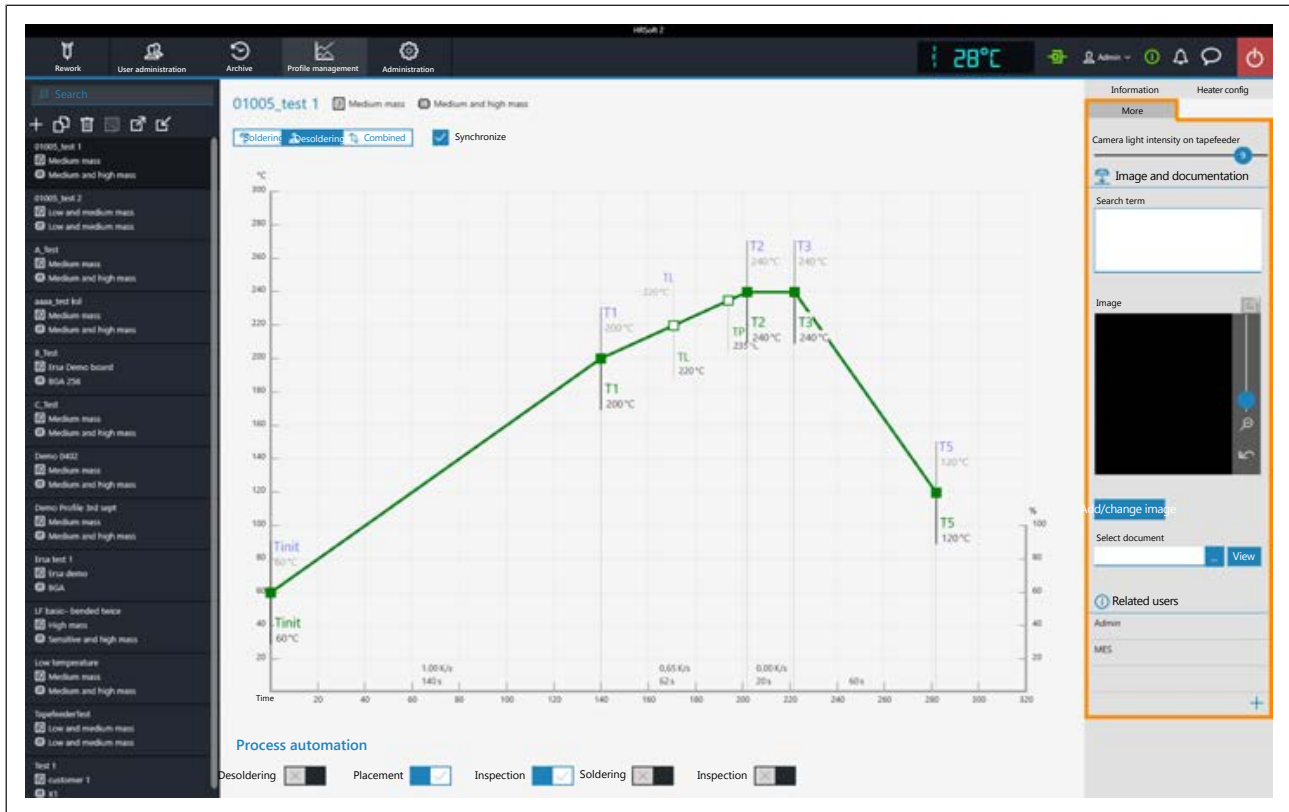



Use this function to reciprocally adjust the maximum value of the heating zones and their ratio. For large PCBs, to avoid shape distortion, ensure that the whole PCB is heated. Note that the components should not be heated too quickly as only slow heating will result in uniform temperature distribution. This will increase the safety level of the process.



6.8.5 The [More] tab under the [Profile Management] tab / Create user

In range [Image and documentation]:



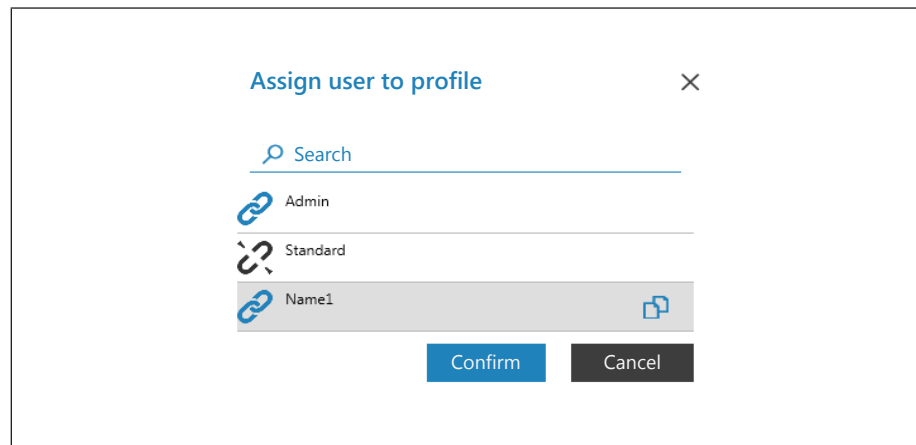
- [Comment]: Field for entering info to be stored for the users of this soldering profile.
- [Image]: Click on button [Add/change image] to add a picture that can serve as useful info for the user of this soldering profile. The camera image can be zoomed with the controller on the right of the camera image or with the mouse wheel. Click on button  to activate the full screen mode.
- [Add/change image]: Add a picture that can serve as useful info for the user of this soldering profile.
- [Select document]: Click the button with the three dots to integrate the soldering profile with a PDF file containing info on the soldering profile.
- [View]: Display of the soldering profile PDF file.

In range [Related users]:

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

Assigning a user to the soldering profile

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



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

Deleting a user from a soldering profile

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



6.9 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.

6.9.1 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](#) [▶ 77]. 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

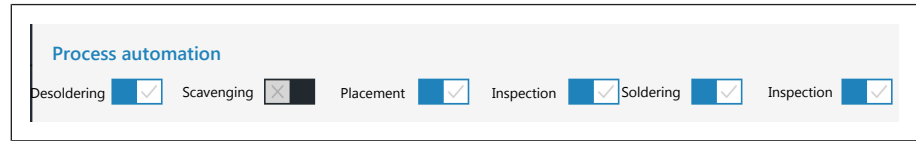
- To simultaneously change the temperature and the heating phase duration: Click on one of the points [Tinit], T1, T2 ... on the heating curve and keep the mouse button pressed until the temperature indicated there is displayed in bold. Now move the point by pressing the mouse button.
- To change temperature: 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.



6.10 [Process automation] and its process steps

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



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

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

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

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

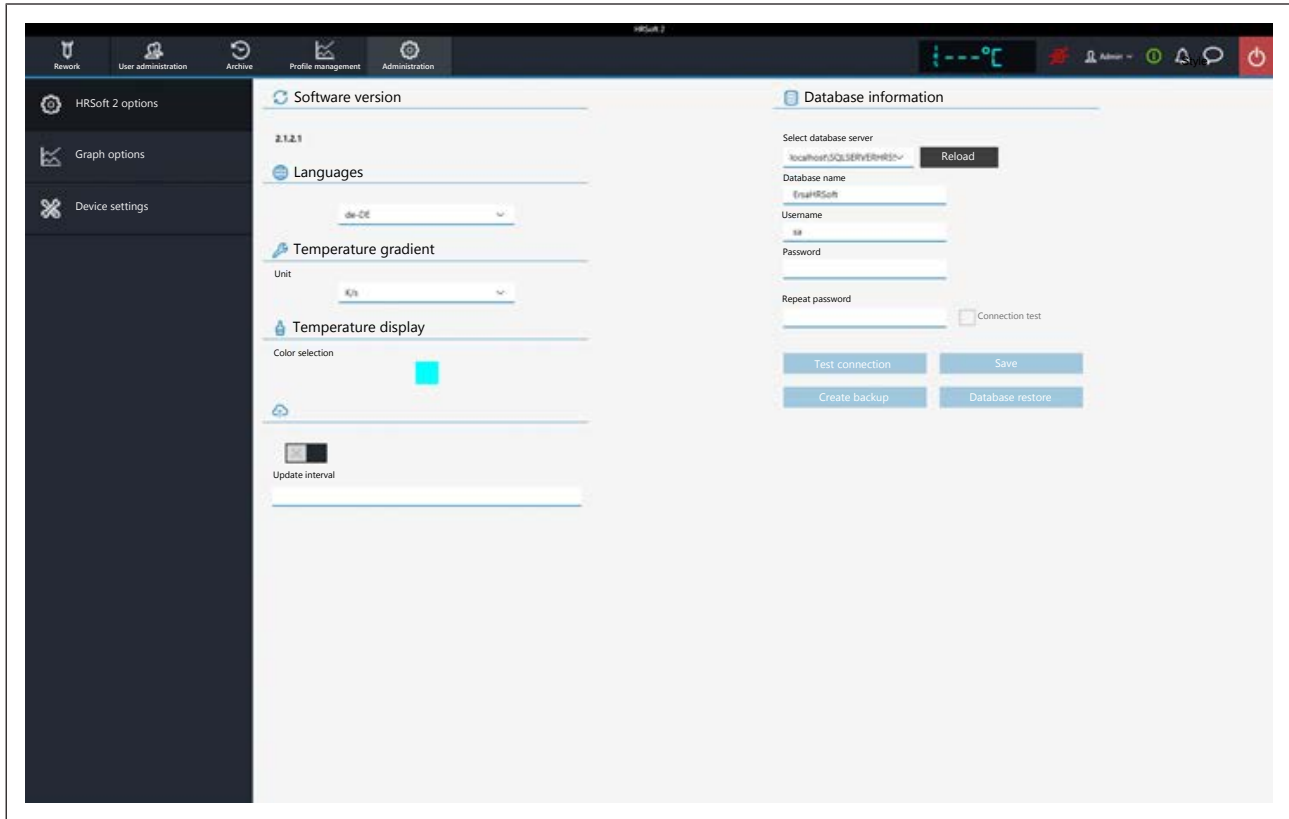
The correct soldering profile settings should be specified in tab [Profile management] beforehand. Only possible as “Administrator” user. As to this, please read Chapter The [Process automation] buttons under the [Profile management] tabulator.



6.11 The [Management] tabulator with three dialog windows

6.11.1 The dialog [HRSoft 2 settings]

In dialog [HRSoft 2 options], various default settings for the HRSoft 2 program can be accessed.



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 button [Test connection]. 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 checkbox [Connection test].
- [Save]: to save the database settings.
- [Create backup]: Create a back-up of the entire database.
- [Database restore]: Load the saved database.



6.1.1.2 The [Chart settings] dialog

Graph options In the [0515] dialog, you can set how to display heating curves and actual values in the chart and later in the [0076] tab. Archive

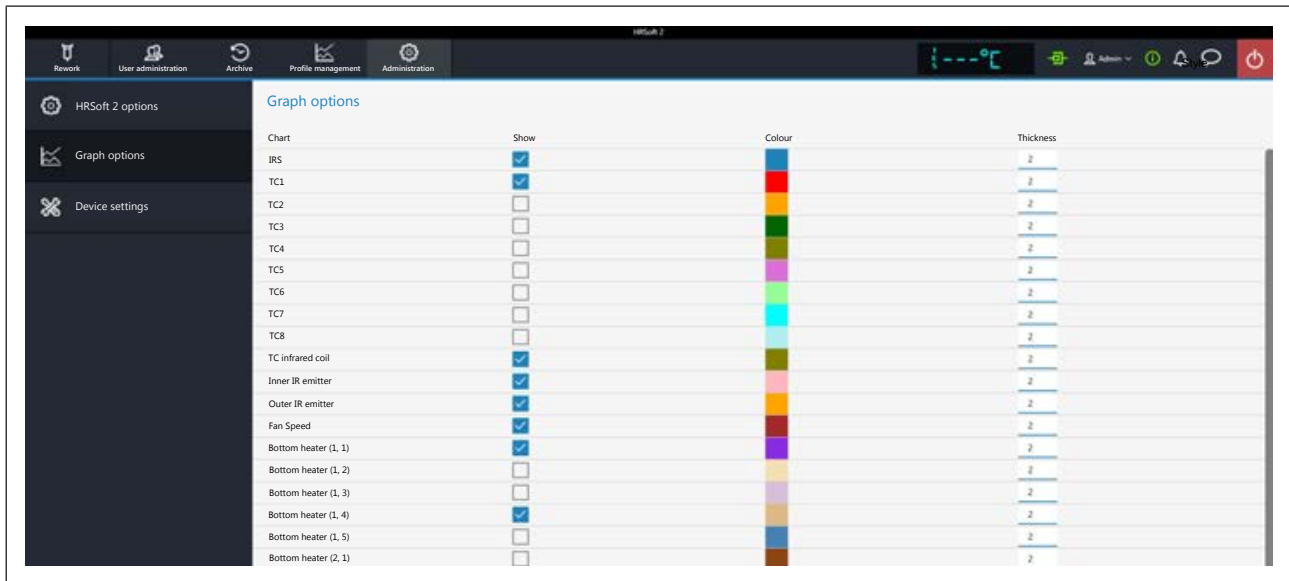


Fig. 17: Example picture. The options available with your Rework System may differ.

The following parameters can be displayed if available:

Graph options The [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 curve.
- Column [Colour]: colour of the measured curve. 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:

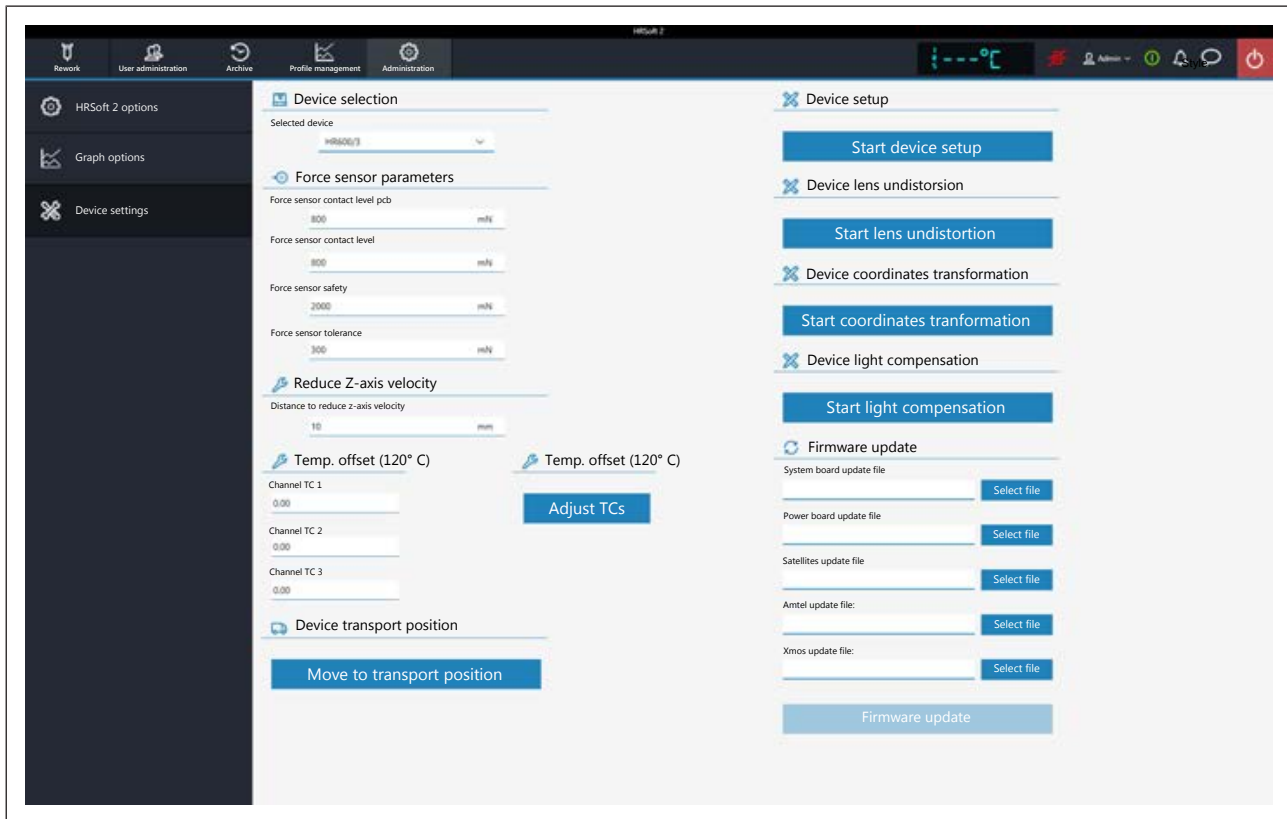
- [IRS]: Measured temperature of the infrared sensor in the heating head. The infrared sensor (IRS) is not suitable for glossy, reflective surfaces or very small PCBs.
- [TC1], [TC2], etc.: Measured temperature of the external thermocouple. Every connected thermocouple is displayed.
- [TC infrared coil]: measured infrared excitation winding temperature of the thermocouple.
- [Inner IR emitter]: measured temperature of the internal radiant heater of the top heating.
- [Outer IR emitter]: measured temperature of the external radiant heater 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.



6.1.1.3 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]: Select “HR 600/3”.

Force sensor parameters

Set the contact sensors of the placing 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 [TC3]: 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 [Move to transport position] to move the axis system to the safe transport position and thus avoid any damage in transit! With regard to this, please also read Chapter Switching off the Rework System.

Device setup

Via the [Start device setup] 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.
- after replacing the placing head. With regard to this, please read Chapter Replacing the placer head.
- after the location of the device has changed, the following functions must be carried out:
 - Function [Start light compensation]. With regard to this, please read Chapter Button [Start extraneous light compensation].
 - Function [Start coordinates transformation]. With regard to this, please read Chapter The [Start coordinate transformation] button.

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.

Device lens undistorsion

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

Device coordinates transformation

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

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

The process is described in Chapter The [Start coordinate transformation] button .



[Device light compensation]

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

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

- a) Finally, close the dialog box.

Firmware update

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

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

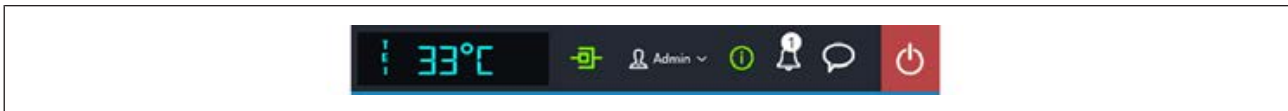
[Firmware update]:

starts updating the firmware selected in the file selection fields.

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



6.12 The display and switch row top right



The displays and switches from left to right:

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

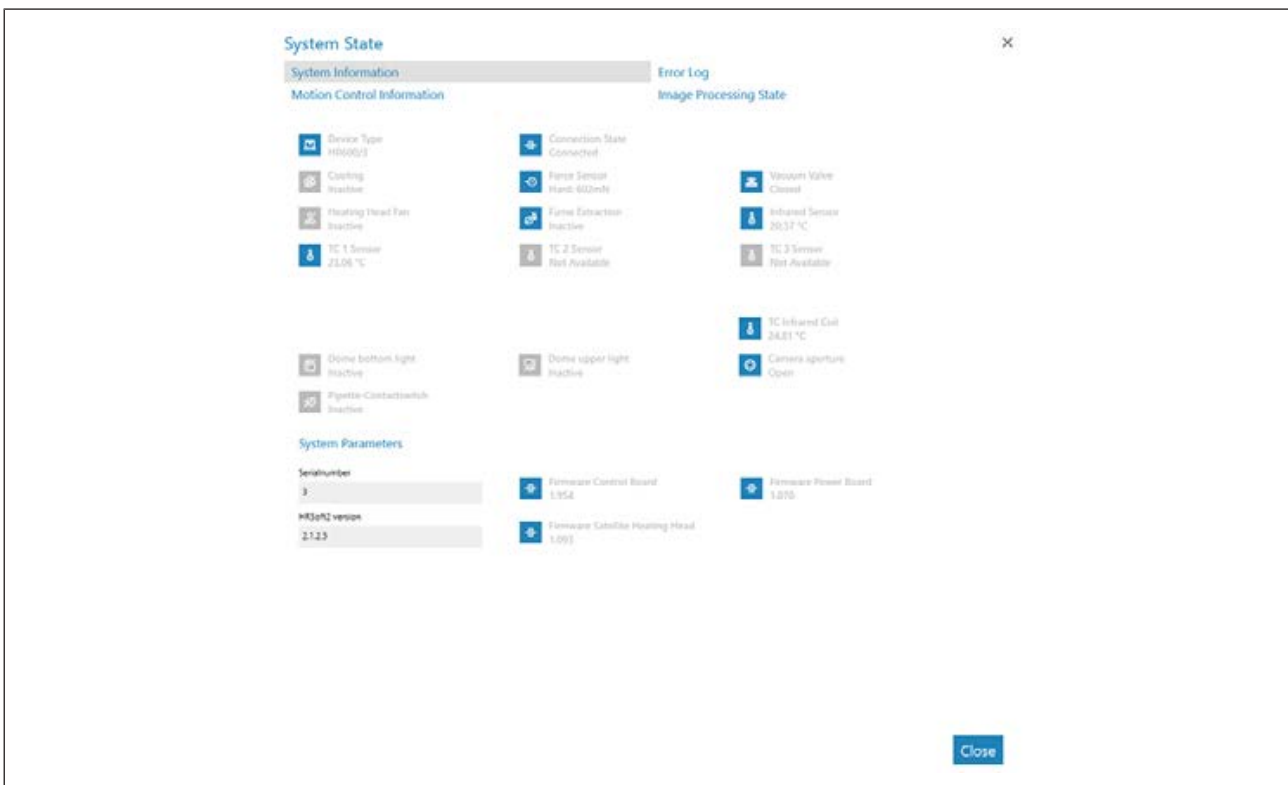


Fig. 18: Starting page of the "System Status" filed, example in English

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

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

Range [System information]

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



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

Range [Error log]

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

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

Range [Motion control information]

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

The [Image processing state] arrow button

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

The bell icon

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

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

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

Speech balloon button

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

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

Red button to the far right

- Closes the HRSoft 2 program.



6.13 Switching off the Rework System

If the Rework System must be moved to another location of the factory, put the heating and placing heads with their nozzles in a safe position before transport:

- a) In tab [Manual mode] click on the [P] button.
⇒ The Rework System reaches its parking position.

Regular switch-off:

- a) Terminate the HRSoft program by clicking on the red Close button located in the upper right field.
⇒ If the process file (*.HRS) has been edited, you will be asked if you want to save the changes.
- b) Wait for the program to finish.
- c) Use the main switch to turn off the Rework System.
- d) Shut down the PC

If the Rework System must be shipped, please read the Chapter [Screwing on the transport lock on the placing head before shipment](#) [▶ 97].

6.14 Screwing on the transport lock on the placing head before shipment

Before shipping the Rework System, the transport lock must be attached to the pipette holder to avoid any material damage. With regard to this, please also read Chapter [Remove the transport lock from the placing head](#) [▶ 35].



Fig. 19: The transport lock; the image does not show the two fastening screws.

Screwing the transport lock

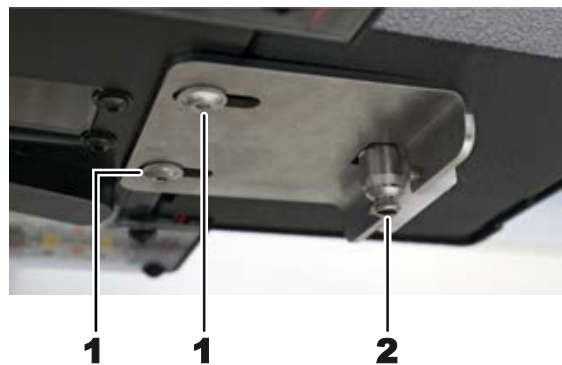
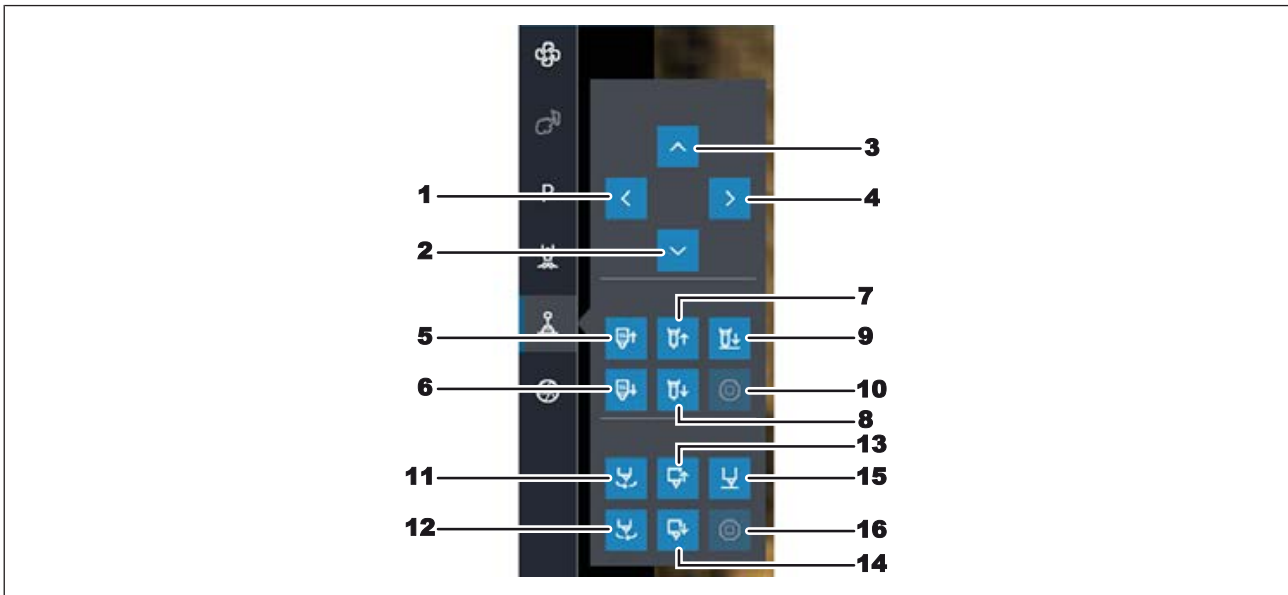


Fig. 20: The transport lock attached to the placing head.

The pipette holder (2) must not be subjected to tensile, compressive or rotational forces! Be extremely careful when handling the pipette holder.



- ✓ The Rework System must be switched on and initialized.
- a) Using the arrow buttons in the [Manual mode] tab, bring the heating head as forward as possible. With regard to this, please read Chapter [The \[Manual Mode\]](#) [▶ 68].



- b) At this point, use the button (14) to move the pipette holder away from the pipette head by around 1 cm.

The pipette holder is not completely round. It has two opposite spanner flats. The plastic part of the transport lock must not touch either of these spanner flats for the pipette holder to be fastened.

- a) Use the buttons (11) and (12) to align the spanner flats of the pipette holder in such a way that they point forward and backward. Inspect the pipette holder closely to check the set angle and the movement performed. Check the direction with your finger.

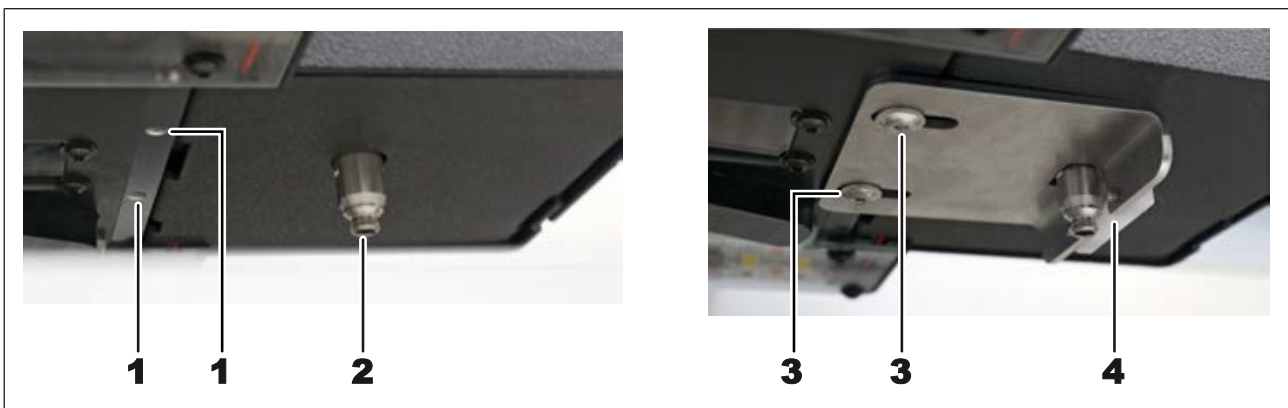


Fig. 21: Left image: Slots (1) for fastening screws and the pipette holder. Right image: Fastening screws (3) and plastic part of the transport lock.

- b) Insert a screw into a long slot of the transport holder and carefully move the transport holder vertically from below over the pipette holder on the pipette head.
- c) Screw the first screw without tightening it.
- d) Make the plastic part of the transport lock touch the pipette holder while keeping a uniform distance from the transport lock and the pipette holder.
- e) In this position tighten the first screw with an Allen key (size 2.5).



- f) Make sure that the plastic part of the transport lock remains in contact with the pipette holder and that the other areas are at a uniform distance. Screw the second screw.
- g) Finally, check that the plastic part of the pipette holder is in contact with the spanner flat and that the other parts of the transport lock are at a uniform distance from the pipette holder.
- h) Click on the [P] button (parking position).
 - ⇒ The Rework System reaches its parking position. Keep the travel path of the axes clear!

At this point the Rework System can be prepared for shipment. Use the original packaging.

With regard to this, please also read Chapter [Switching off the Rework System](#) [▶ 97].





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!](#) [▶ 50].

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!

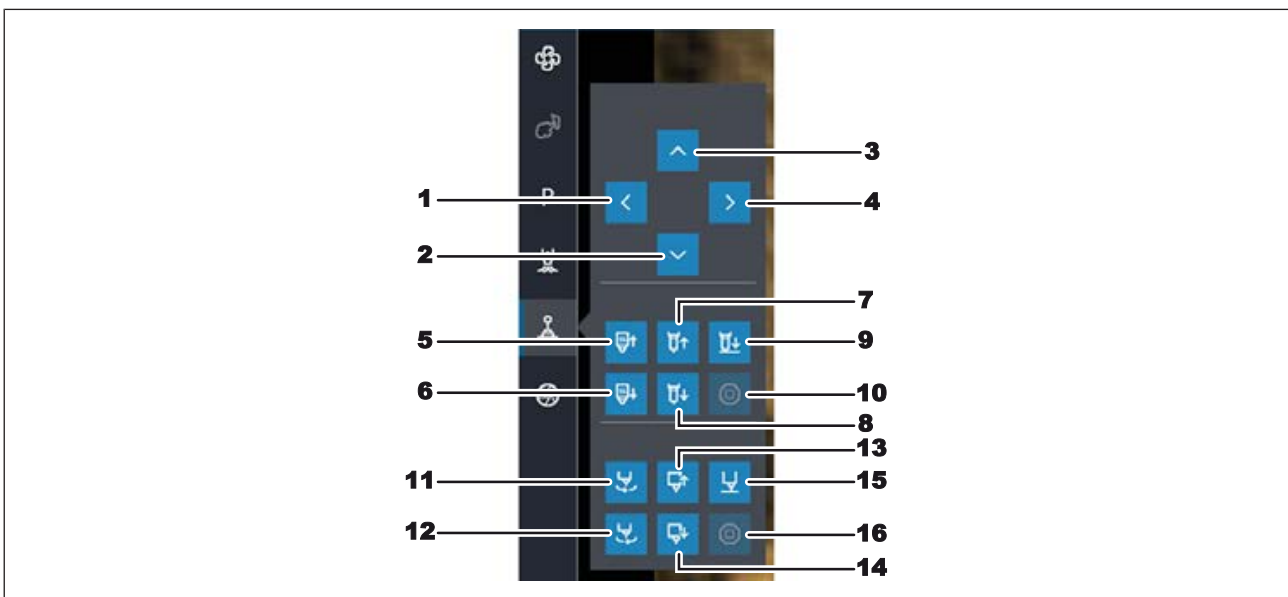
All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!

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 [Spare and wear parts](#) [▶ 165] 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!

Note: The PCB frame can be taken out. This allows using several board-mounted frames as a replacement. With regard to this please read Chapter Inserting the PCB frame and becoming familiar with it.

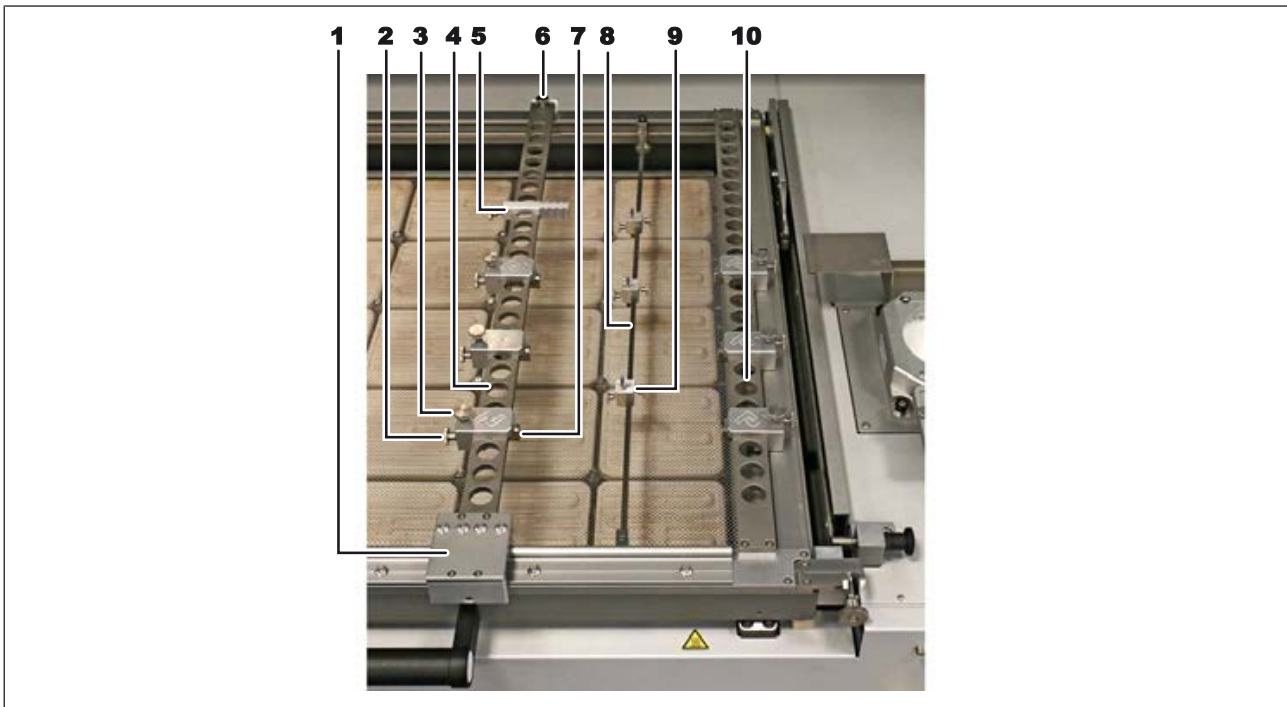


Fig. 22: The restraint system in the PCB frame

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 centre support. Prevents large PCBs from sagging.
9	Centre 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) 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 centre support.
- c) Loosen the locking screws of the PCB holders (2) on the left and right perforated strips and move the PCB holders to the desired holding positions.
- d) Slightly tighten the locking screws.
- e) Adjust the position of the left perforated strip. To do so, grasp the base of the perforated strip (1) and move the perforated strip.
- f) Open the clamping screws for the PCB support (3) so widely that the PCB supports (7) can grip the PCB.



g) If necessary, use the centre support (8). To do this, on the back, insert the centre 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 centre support clockwise to rotate the top support by 90 degrees.

h) To position the centre 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 fix the pin at a certain height.

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

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

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

l) 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):

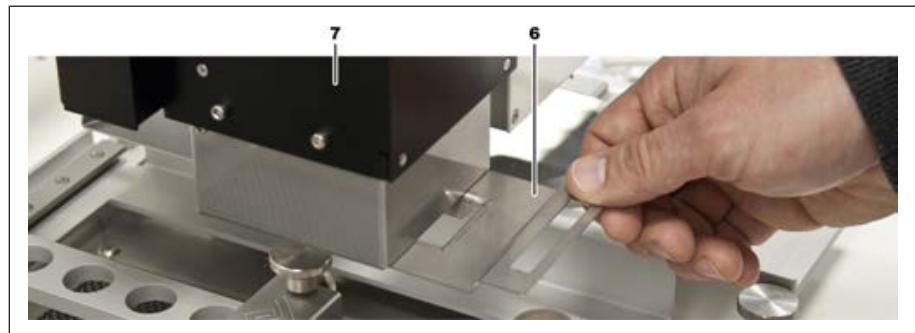


Fig. 23: Sliding in an air baffle, example picture

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

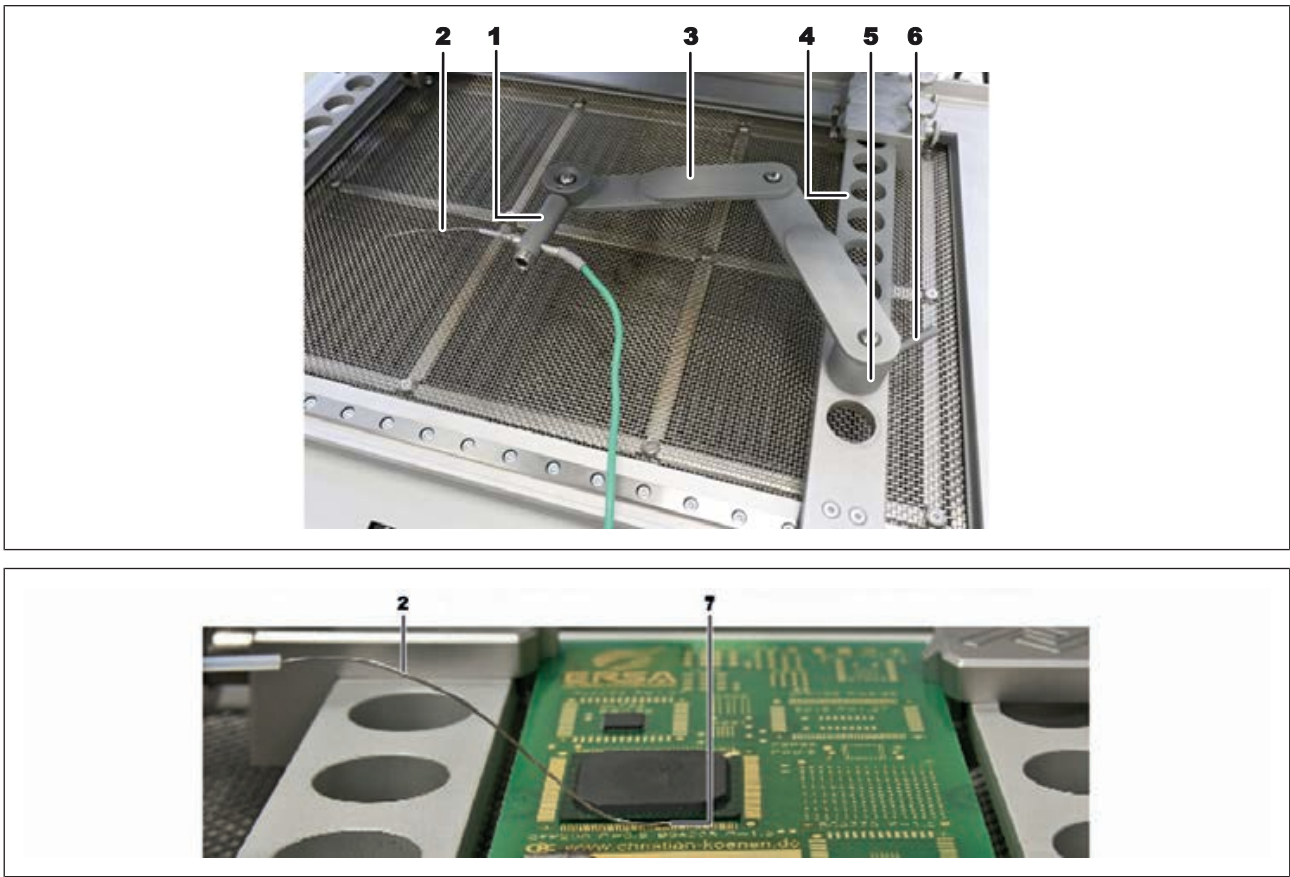


Fig. 24: Example images: Placing the thermocouple holder (top) and the thermocouple (bottom)

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

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

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



7.4 Activate a soldering profile and prepare the soldering process

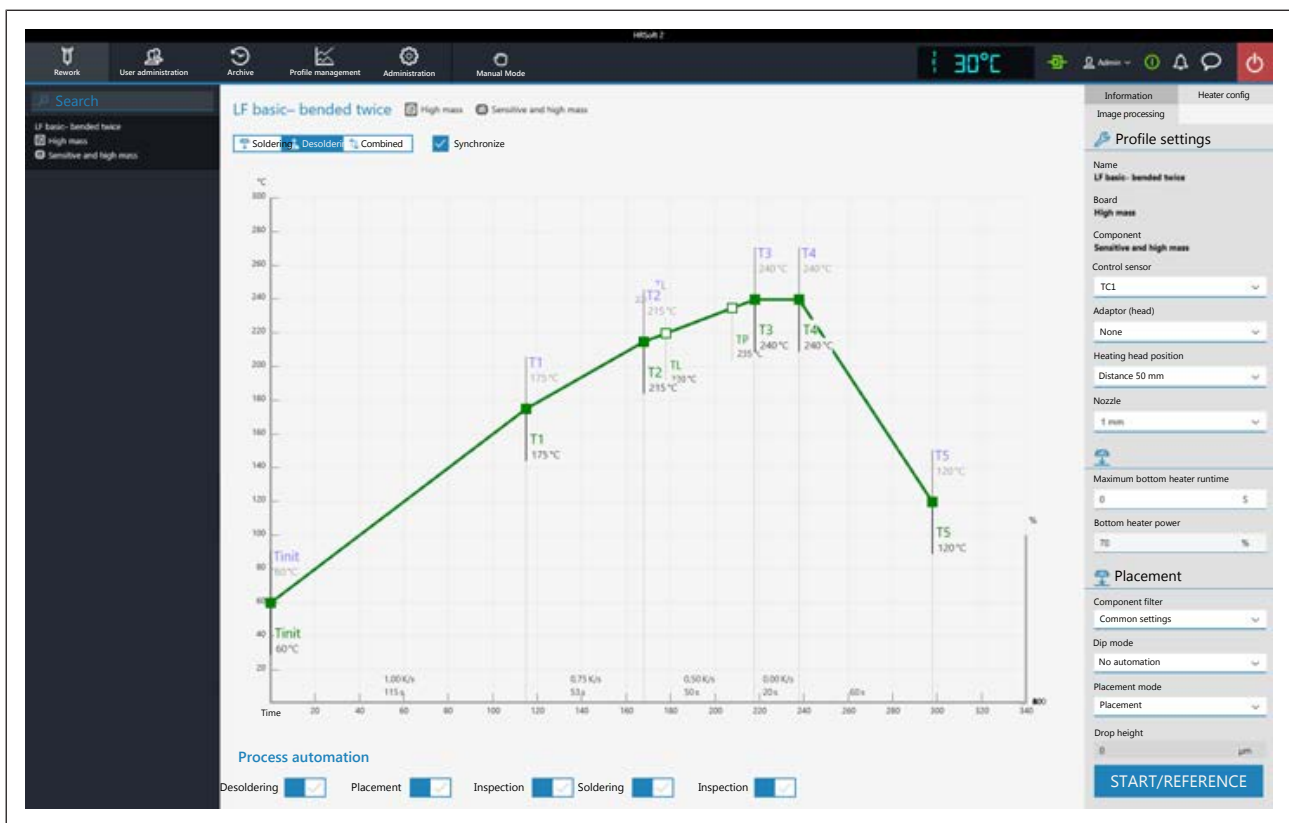
- a) Open tab [Rework]. The available soldering profiles are listed in the left column. With regard to this, please also read Chapter [Use of the soldering profile in the \[Rework\] tabulator](#) [▶ 57].

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](#) [▶ 55] 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](#) [▶ 75] 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](#) [▶ 67].

- 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 \[Manual Mode\]](#) [▶ 68].
- 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.

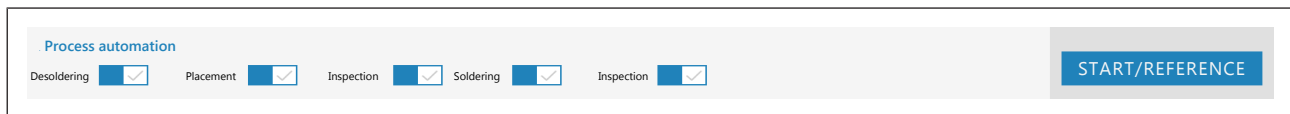


Fig. 25: All five process steps are activated in the [Rework] tab

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!

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 The [Process automation] buttons under the [Profile management] tabulator the descriptions of the process steps that are defined in the soldering profile.



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.

Determining the position of the component to be desoldered

- a) Bring the black cross line exactly to the centre of the component to be desoldered with the mouse and then click.
- ⇒ The red cross line is in the middle of the component to be desoldered. The position of the red cross line determines the position of the placing head during desoldering.
- For long distances, it is also possible to click on the desired target position in the MiniMap on the top right.
- This position may also be reached using the blue arrow buttons.

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

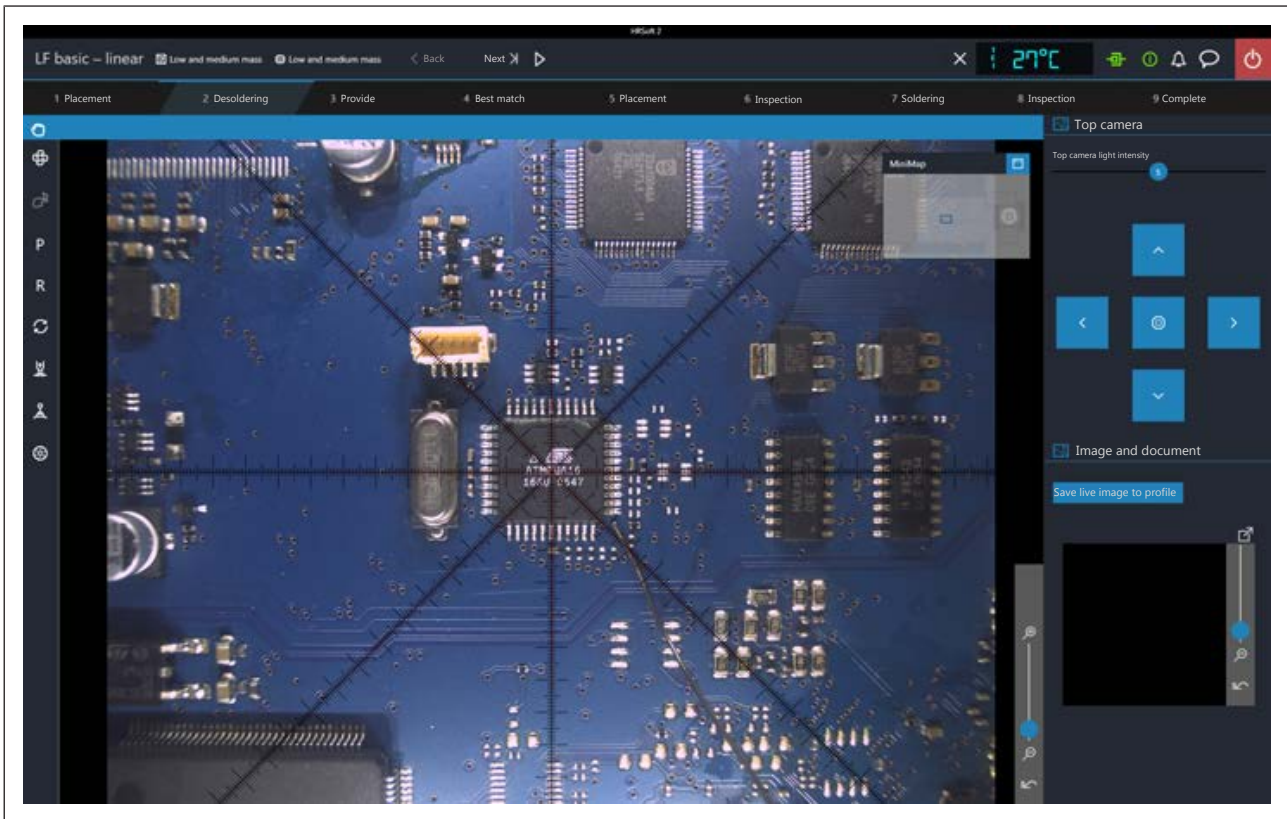



Fig. 26: The red cross is in the middle of the component to be desoldered.

- a) The image brightness may be adjusted with the [Top camera light intensity] controller.
 - b) Enlarge the view with the vertical controller to the right of the camera image. The arrow button below the controller resets the zoom.
 - c) Click on the button  on the camera image to enlarge the view to full screen.
 - d) When the red cross is positioned exactly on the component to be desoldered, click on the [Next] button to move to the next working step.
 - e) The current live image can be saved in the soldering profile under [Image and document] for later use of the soldering profile as a template. Click on the [Save live image to profile] button. The saved image can be zoomed.
- ⇒ 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](#) [▶ 65].

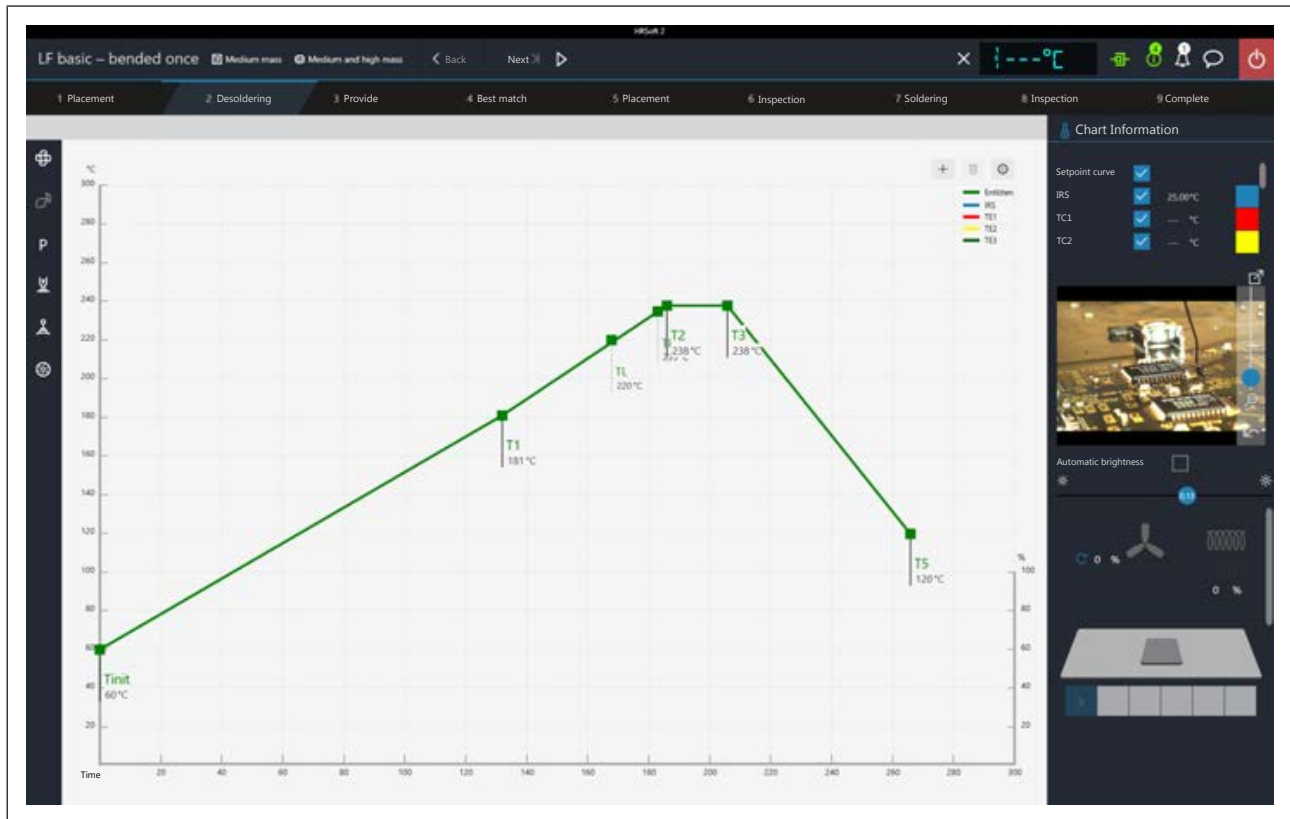


Fig. 27: The chart at the beginning of desoldering

The [Chart Information] in the right column during the soldering process

- Column with blue buttons: To display/hide temperature sensor and power value lines.
- Column with coloured buttons: 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 of the right column shows the current state of the top and bottom heaters:

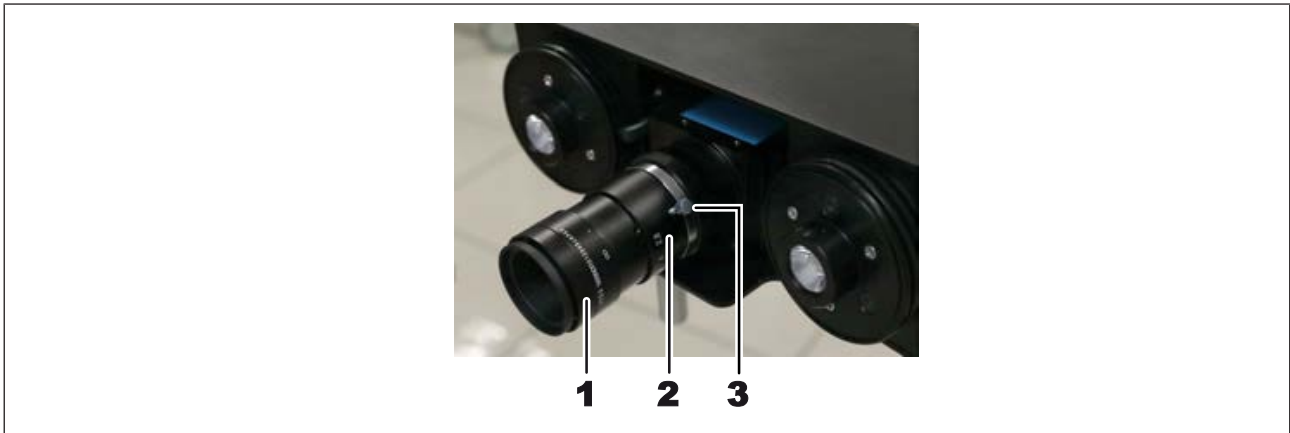
- Percentage on the left: set power value of the top heater blower.
- Percentage on the right: current power value of the top heater.
- Rightmost scrollbar: Scrollbar to display the lower field of the heating information.
- Lower field of heating information: current power values of bottom heating elements.

Using the live image of the RPC camera


The optional RPC camera allows you to closely observe the melting process. With regard to this, please also read Chapter Manual height adjustment of the RPC camera via the setting screw.

During desoldering, the live image of the RPC camera is displayed in the middle of the right column.

- Set the ideal process viewing angle with the RPC camera's swivel arm and movable holder. The position and the angle of the RPC camera must be adjusted in such a way that the heating head cannot hit the camera.



The adjusting ring (1) allows you to adjust the image sharpness. The adjusting ring (2) allows you to adjust the brightness of image. If possible, set the brightness to the middle range. This is a good compromise between brightness and depth of sharpness of the lens. On the adjusting ring (2) it is possible to screw the setscrew (3) in order to prevent changes to the settings.

- [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) 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.
- b)  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.
- c) 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.
- d) Close the full-screen display by clicking on the red X button in the upper right corner.
- e) 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 to the remaining 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 Ersa 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 \[▶ 59\]](#).

- 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.

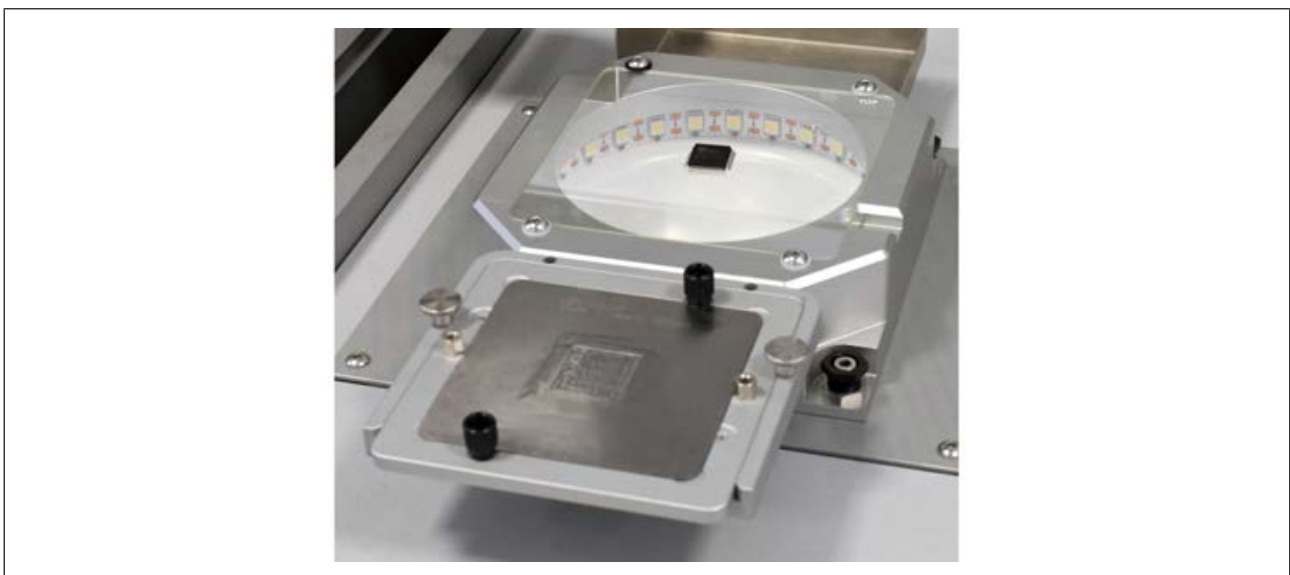


Fig. 28: The dip stencil coated with flux gel is to be inserted into the framed stencil. The component is to be placed on the glass plate of the component holder.



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. 29: 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.

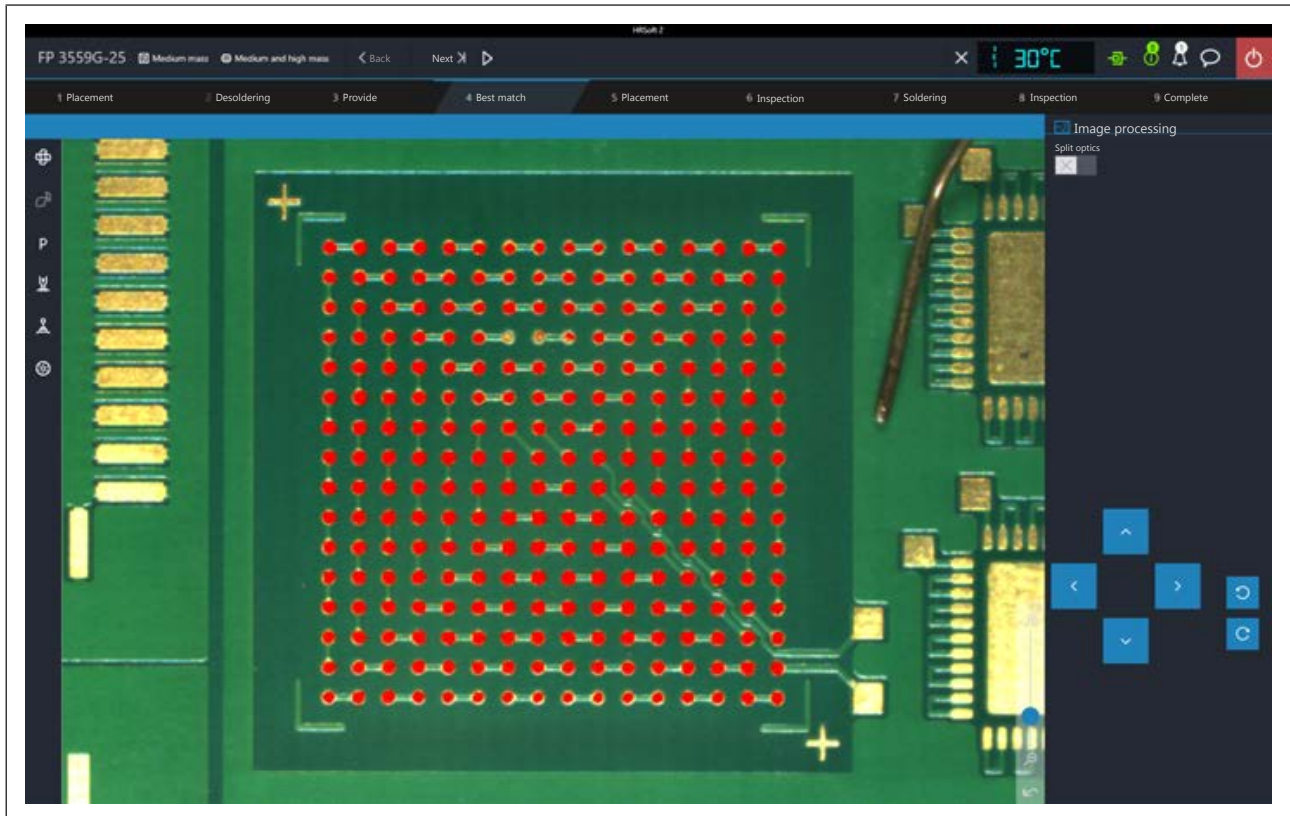


Fig. 30: Overlay increased by zooming

- 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.

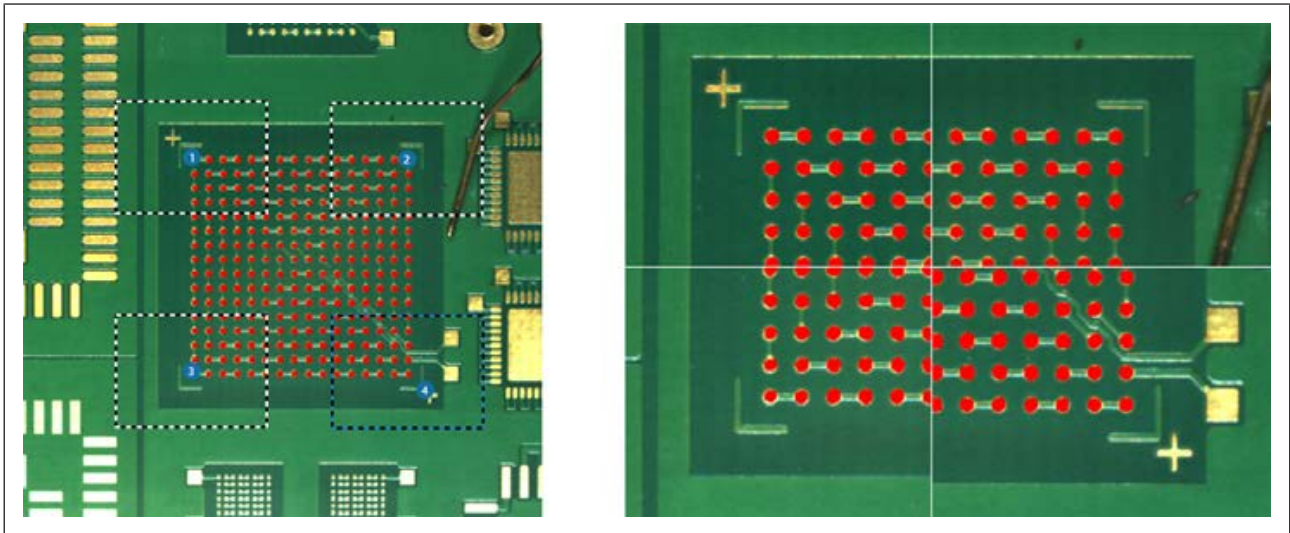


Fig. 31: Setting four image sections for split screen (left), split screen display (right)

- 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.

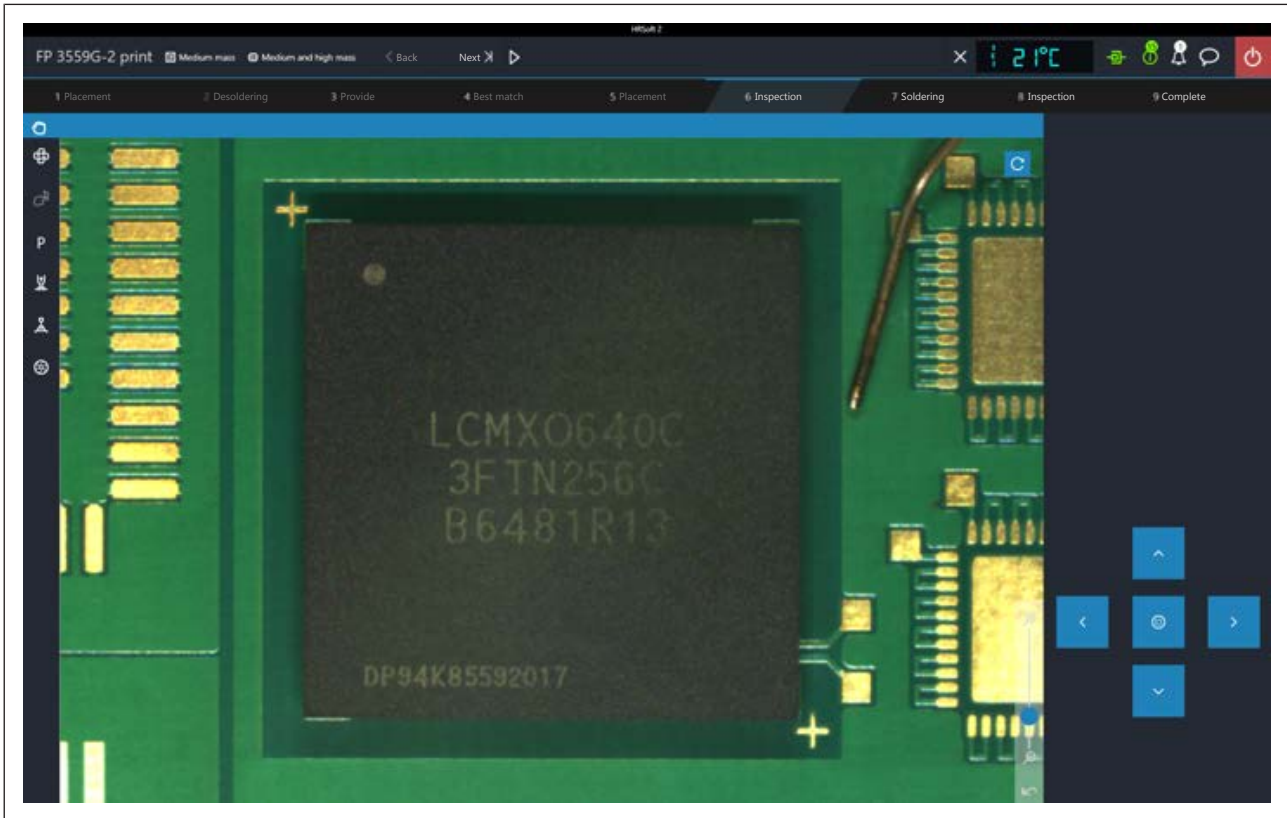


7.11 Working step 5 “Positioning” and working step 6 „Inspection“

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.

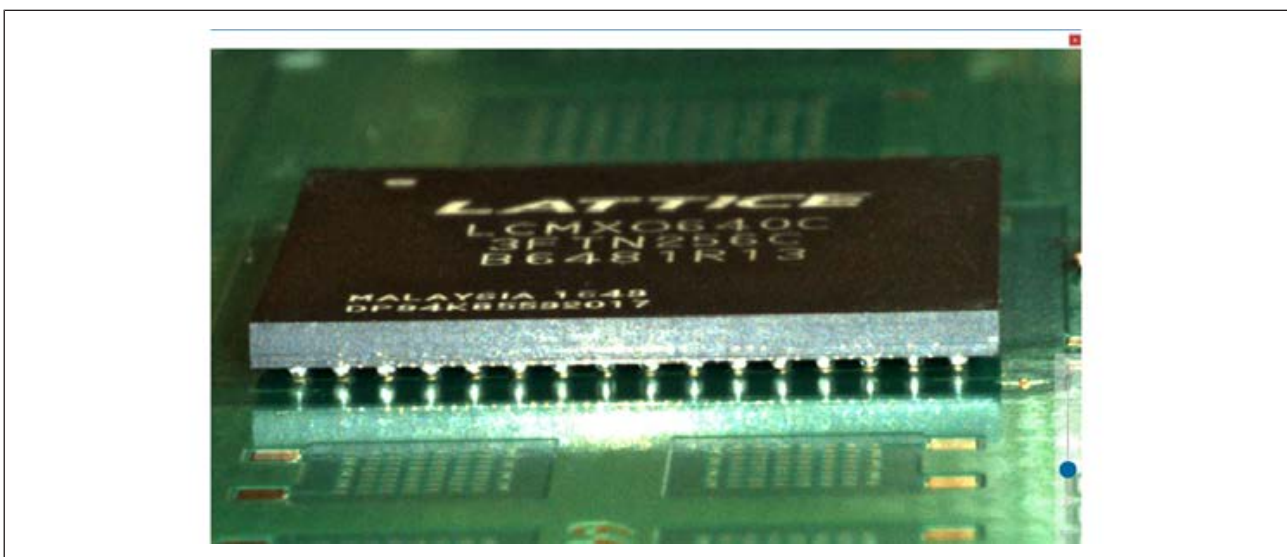


Fig. 32: BGA solder balls, RPC camera display



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.

- 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.



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



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.
 - Afterwards, cooling ventilation will start and run until the temperature set under point [T5] is reached. As to this, please also read Chapter [The heating curves in the \[Rework\] tab](#) [▶ 65].



Fig. 33: 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 work 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.

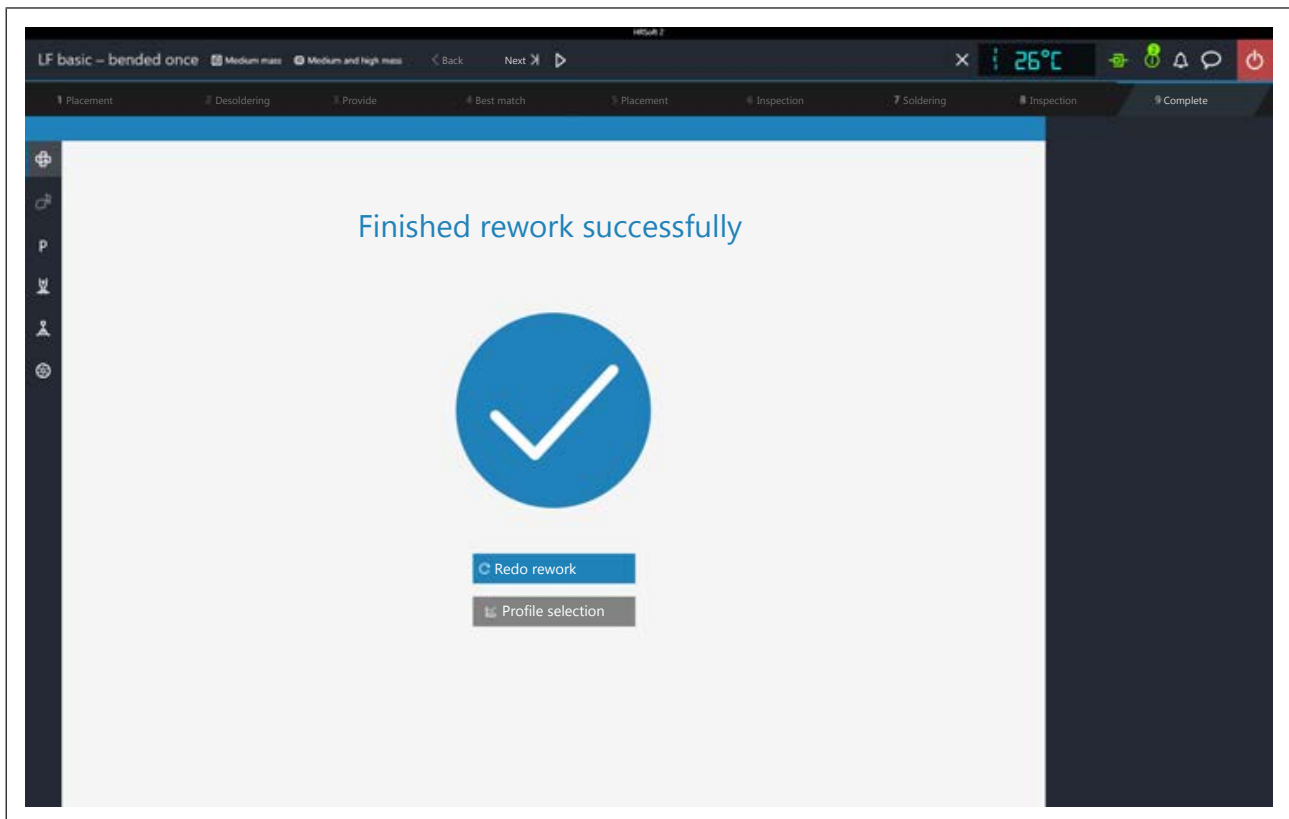


⚠ CAUTION

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 Treatment of messages and malfunctions

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8.1 Contours are not correctly recognized

If image contours cannot be properly detected, optimising the workstation lighting can be a remedy. If the workstation lighting is too bright, it can interfere with the proper function of the cameras! Also avoid direct illumination of the glass plate with bright light. Clean the glass plate if dirty. For more information, please refer to Chapter [Cleaning the glass plate.](#) [▶ 138].

8.2 Wrong position of the heating head nozzle

If the position of the heating head nozzle is no longer correct, it must be adjusted with reference to the camera.

For the adjustment you need a 1-mm heating head nozzle, the white plastic plate provided in the accessory package and a pad. Proceed as follows:

- a) Click on the [Administration] tab in the HRSoft2 program.
- b) Select dialog [Device settings].
- c) Click on button [Start device setup].
- d) Function [Heating head pipette to print position].
- e) Click on the [Next] button to switch to the next work step.
- f) In the [Preparation] work step, screw the 1-mm nozzle to the heating head.
- g) Click on the [Next] button to switch to the next work step.
- h) Remove all thermocouple holders and any other items from the path of the heating head.
- i) Fit the [Mounting plate calibration] in the middle of the bottom heating.
- j) Colour the contact area of the heating head nozzle using the pad.
- k) With the arrow buttons move the heating head nozzle over the centre of the plastic plate.
For descriptions of the buttons, please also read the Chapter [The \[Manual Mode\]](#).

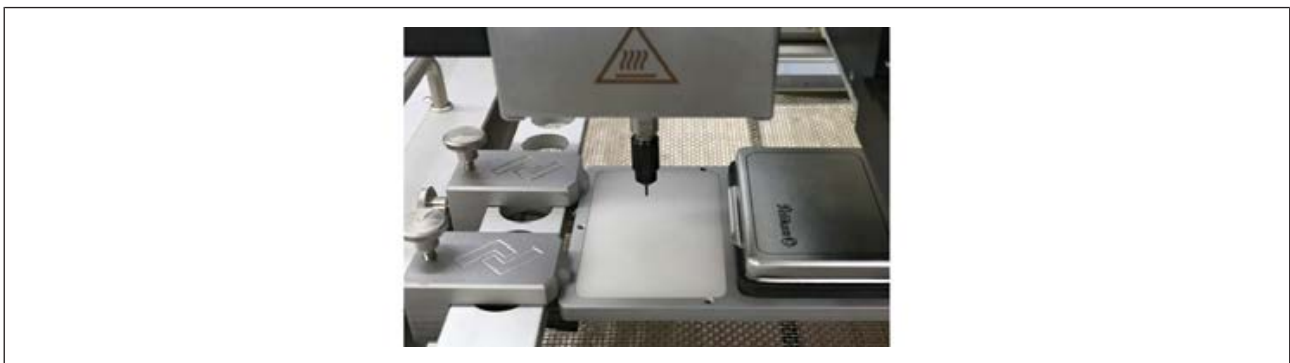


Fig. 34: Marking the plastic plate

- l) Using the button, bring the heating head to the centre to a distance of 40 mm from the plastic plate.
- m) With the right button make the heating head nozzle approach the plastic plate.
⇒ The pipette will leave a mark on the plastic plate. This marking will be acquired by the upper camera and used by the system for the adjustment process.
- a) Click on button [Save position].
- b) Click on the [Next] button to switch to the next work step.
⇒ The camera will move to the marked point and the position will be adjusted.
- a) When the process is over, close the Assistant.



b) Clean the plastic plate and the nozzle with alcohol.





9 Service and maintenance

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9.1 Service table

	Duration	Further information
Monthly	5 Min	<u>9.2.1</u> <u>Checking the vacuum filter of the pipette air supply and replacing it</u>
Quarterly	15 Min	<u>9.3.1</u> <u>Visual inspection and lubrication of the X axis</u>
Quarterly	15 Min	<u>9.4.1</u> <u>Cleaning and lubrication of the X axis threaded spindle</u>
When required	5 Min	<u>9.5.1</u> <u>Cleaning the glass plate.</u>



9.2 Maintenance work to be performed monthly

9.2.1 Checking the vacuum filter of the pipette air supply and replacing it

Every month, the vacuum filter of the pipette air supply must be checked for dirt or clogging. The vacuum filter is located below the cover of the heating head.

- a) Switch off the Rework System.
- b) Loosen both screws on the heating head lid (1) and remove it.



- ✓ Check:
 - a) If discolouration is visible on the filter (2) or the suction power of the pipette is reduced, replace the Heating head vacuum filter, No. 244532 .
- ✓ To replace:
 - ✓ Push back the fastening ring of the vacuum filter using for instance tweezers and remove the vacuum filter from the hose connector. Do not damage the lines!
 - ✓ Remove the vacuum filter from the hose.
 - a) Insert the new vacuum filter and lay the lines flat.
 - b) Screw the heating head lid back on.



9.3 Maintenance work to be performed quarterly

9.3.1 Visual inspection and lubrication of the X axis

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

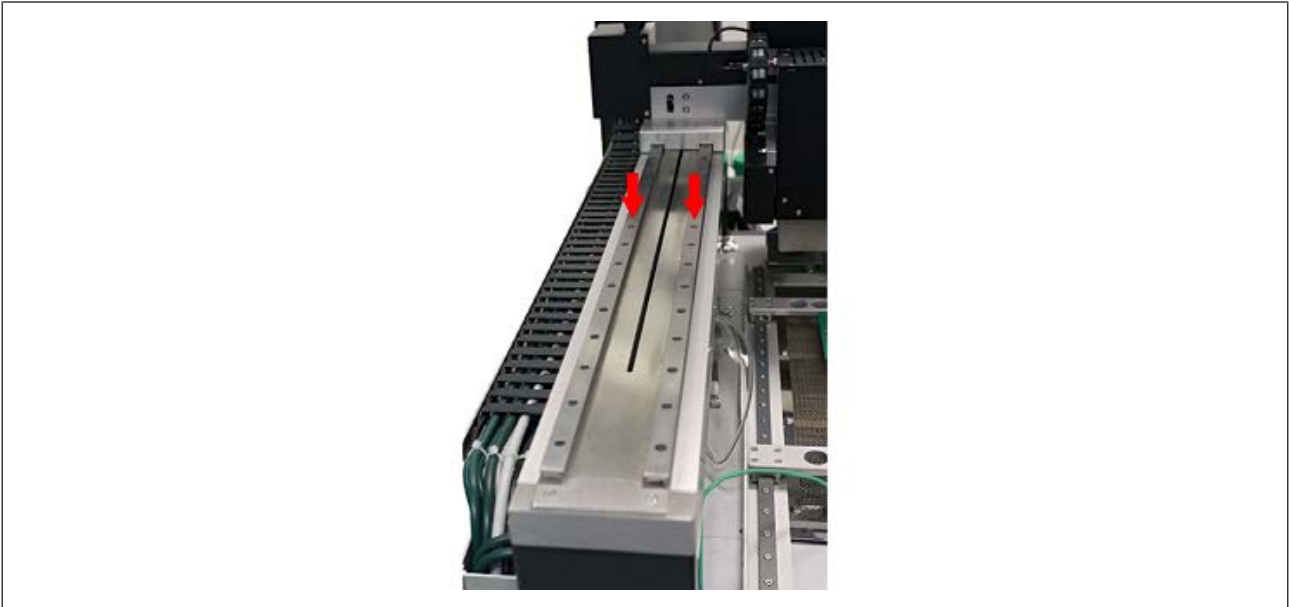


Fig. 35: Lubricating both guide rails of the X axis



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 controller, move the X axis to the far right.
- b) Visual inspection of the X axis. Clean dirty axes with a lint-free cloth.
- c) Put a thin layer of suitable grease (such as Klüber NBU 12/300 KP or a similar product) on a lint-free cloth.
- d) Lubricate the two guide rails of the X axis with it.



9.4 Service work to be performed annually

9.4.1 Cleaning and lubrication of the X axis threaded spindle

Lubricate the X axis threaded spindle 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 KP), brush to 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) Use the HRSoft 2 controller to move the X-axis to the far left.



Fig. 36: Removing side end pieces

b) Switch off the Rework System. To do so:

c) a) Terminate the HRSoft 2 program by clicking on the corresponding button located in the upper right area.

⇒ If the process file (*.HRS) has been edited, you will be asked if you want to save the changes.

a) b) Wait 10 seconds for the program to finish.

b) c) Use the main switch to turn off the Rework System.

⇒ The PC must not be switched off.

c) Using a 2 mm Allen key: remove the two screws (see picture) on the left and right ends of the X axis and remove the end pieces.

d) Slide the X-axis cover plate as far as possible to the left so that the internal threaded spindle is exposed.

e) 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 the spindle cover back to the normal position.
 - c) Make sure the spindle cover has been correctly placed in the normal position.
 - d) Start HRSoft 2. To do so:
 - e) Use the main switch to turn on the Rework System.
 - ⇒ Cameras and axes have been now referenced.
 - f) Keep the travel path of the axes and the pick-up area clear!
 - ⇒ Message Cameras and axes will be referenced now will be displayed.
 - g) d) Click on button [OK].
 - ⇒ Cameras and axes have been referenced. Keep the travel path of the axis clear!
 - h) e) Wait for referencing to be over.
 - i) Use the controller in HRSoft 2 to move the X axis to the far right.
 - j) Switch off the Rework System. To do so:
 - k) a) End the HRSoft 2 program.
 - l) c) Use the main switch to turn off the Rework System.
 - m) Push the X 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 suitable plain bearing grease (e.g. Klüber NBU 12/300 KP or a similar product) to the spindle nut across its 12 cm length, as close as possible to the threaded spindle.
 - c) Push the spindle cover back to the normal position.
 - d) Make sure the spindle cover has been correctly placed in the normal position.



- e) Screw back on both end pieces.
- f) Use the main switch to turn on the Rework System.
- g) d) Click on button [OK].
- h) With the HRSoft 2 controller move the X axis twice to the left and right to bring grease to the spindle nut.



9.5 Service work to be performed when required

9.5.1 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!



9.6 Performing a HRSoft 2 update

Download the software

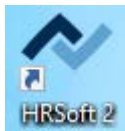
- a) On the Ersa website www.ersa.de click on "Login".
- b) Log in with your e-mail address and password.
⇒ The Members Area will appear.
- c) Go to the area 6.2.3 (Software / Rework) HRSoft 2.
- d) Compare the version number offered with the installed version. The number of the installed version is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

Uninstalling the outdated HRSoft 2

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

Install the new HRSoft 2 version.

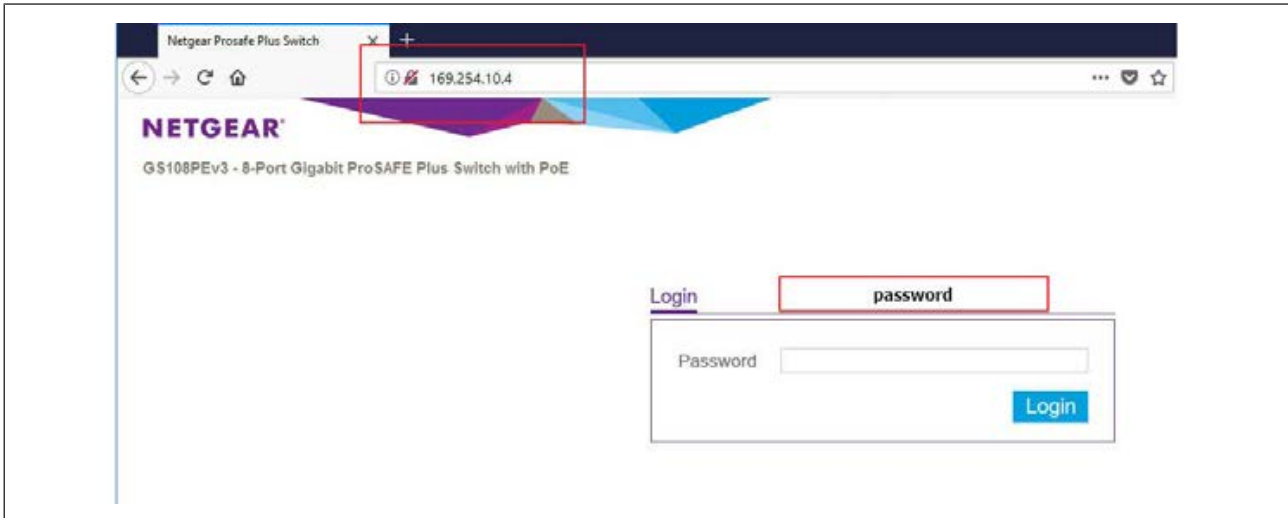
- a) In the C:\ProgramData\ErsaGmbH\HRSoft 2\Firmware directory launch the "setup.exe" file. Follow the instructions and confirm dialogues with OK/Continue.
- b) Once installation is completed, the HRSoft2 program will be started by double-clicking the program icon on the desktop.
- c) Switch on the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



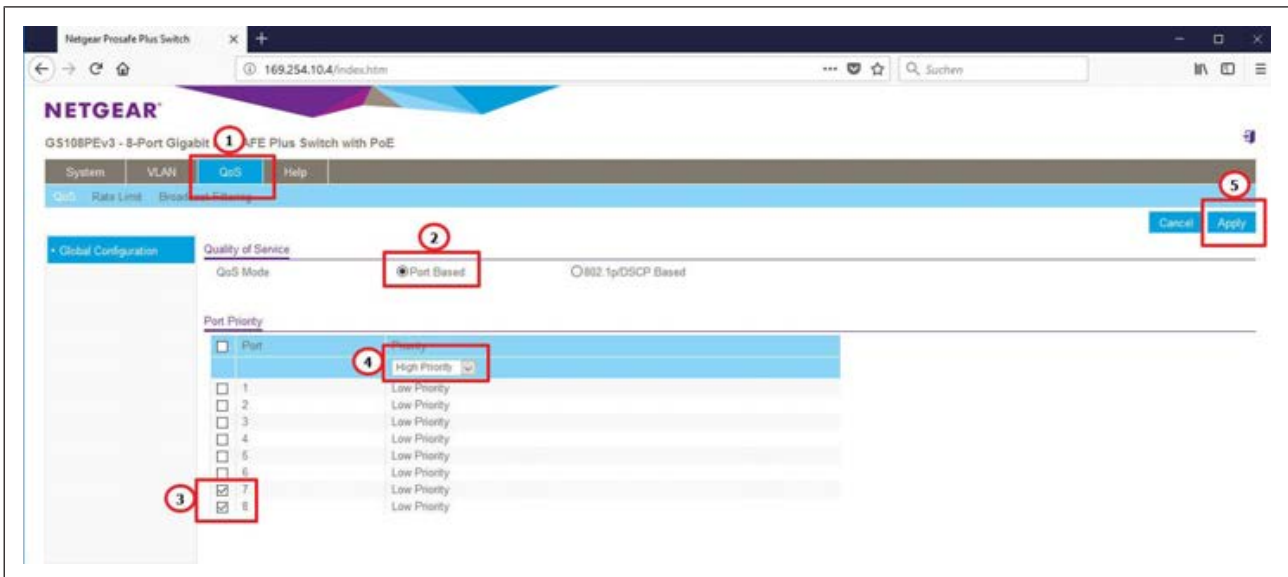
Checking the Netgear switches configuration

Switch on the Rework System and the PC.

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



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



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



10 The optional tape feeder

10.1 Attaching the basic module of the optional tape feeder to the Rework system



Fig. 37: Basic module with component tray attached

The optional tape feeder consists of a basic module (7), which is attached to the Rework system, and an exchangeable assembly (2) – (9), see next figure. The exchangeable assembly is available in different sizes for different belt formats. As to this, please also read Chapter [Tape feeder option](#) [▶ 21]. The component tray (1) is part of the basic module and is replaced when the tape feeder is attached. The basic module and the exchangeable assembly(ies) are packed in two different packages.

You will need an Allen wrench set, size 2.5.

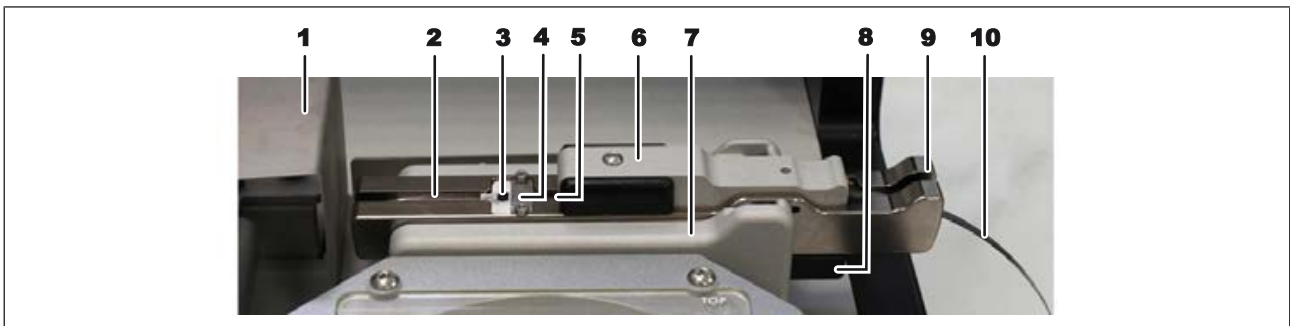


Fig. 38: Component tray (1), basic module (7) and exchangeable assembly (2-9)

- a) Remove all parts from their packaging.
- b) Access to the installation position on the rework system behind the glass plate on the back right must be free. If necessary, move the heating and placement heads to the left. Keep the travel way clear!

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!



Unscrewing the component tray on the Rework system

- a) Use an Allen key to undo the two raised countersunk screws fastening the component tray behind the glass plate.

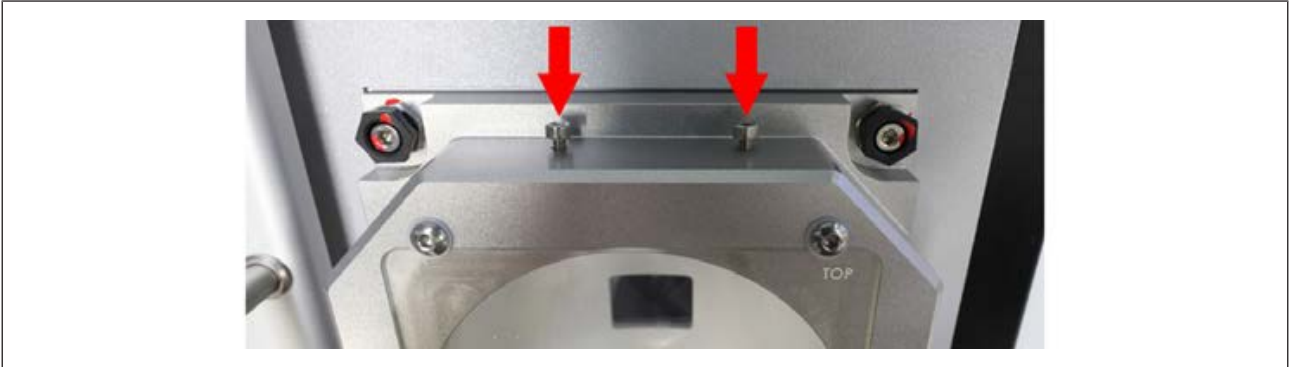
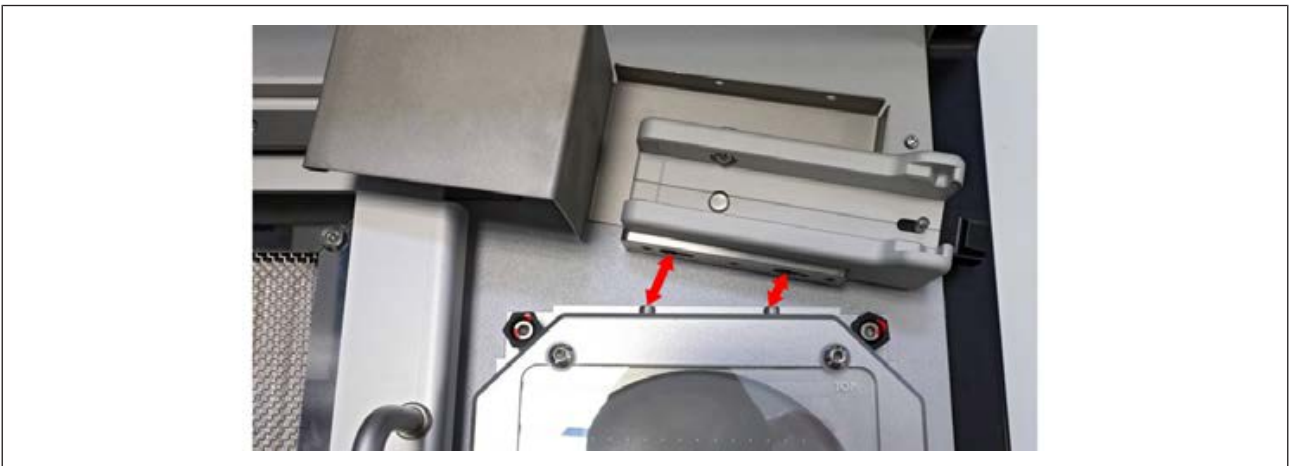
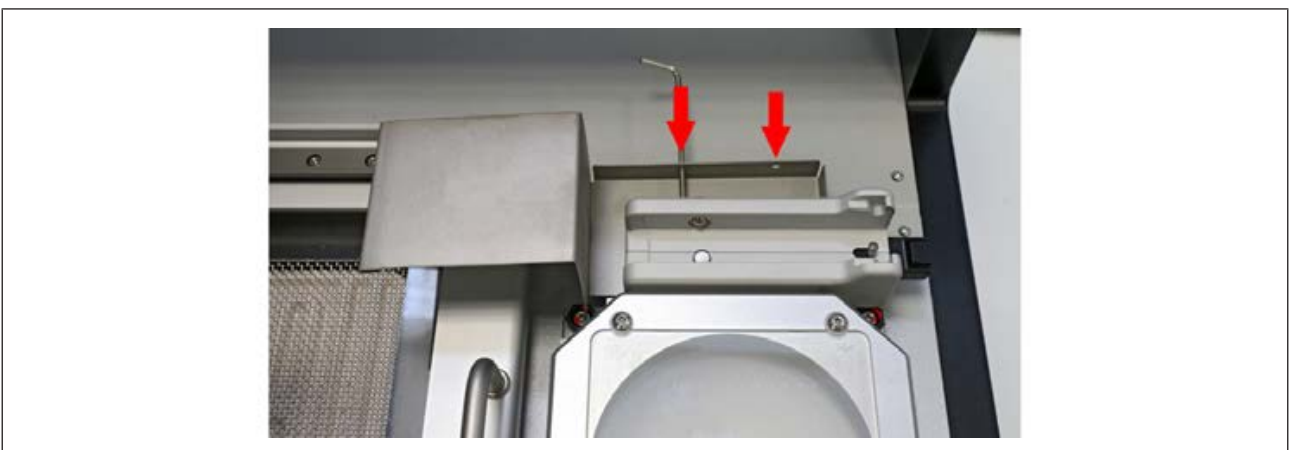


Fig. 39: Example picture: screws for fastening the component tray and the tap feeder's basic module.

- b) Remove the component tray. The component tray and the two raised counter-sunk screws are no longer required.
- c) Remove the two screws from the packaging of the basic module. Screw them all the way into the back of the glass plate so that the elongated hole of the basic module can be hooked in. See the picture above and the following one.



- d) Hook the basic module into the screws.
- e) Insert the Allen key through the holes in the component tray and tighten the two screws.



Now the exchangeable assembly can be placed onto the basic module. As to this, please read Chapter [Operating the optional tape feeder](#) [▶ 145].



Fig. 40: Tape feeder with the exchangeable assembly for a specific component size, on the basic module



10.2 Step 3 "Deploying" the optional tape feeder

10.2.1 Defining the optional tape feeder in the HRSoft 2 Rework program

The optional tape feeder can be attached to the HR 600/3 Rework system to process small components such as 0201 and 01005 directly from a belt section. For the tape feeder to be used in the HRSoft 2 soldering program, the following parameters must be selected in the soldering profile. Two methods are available:

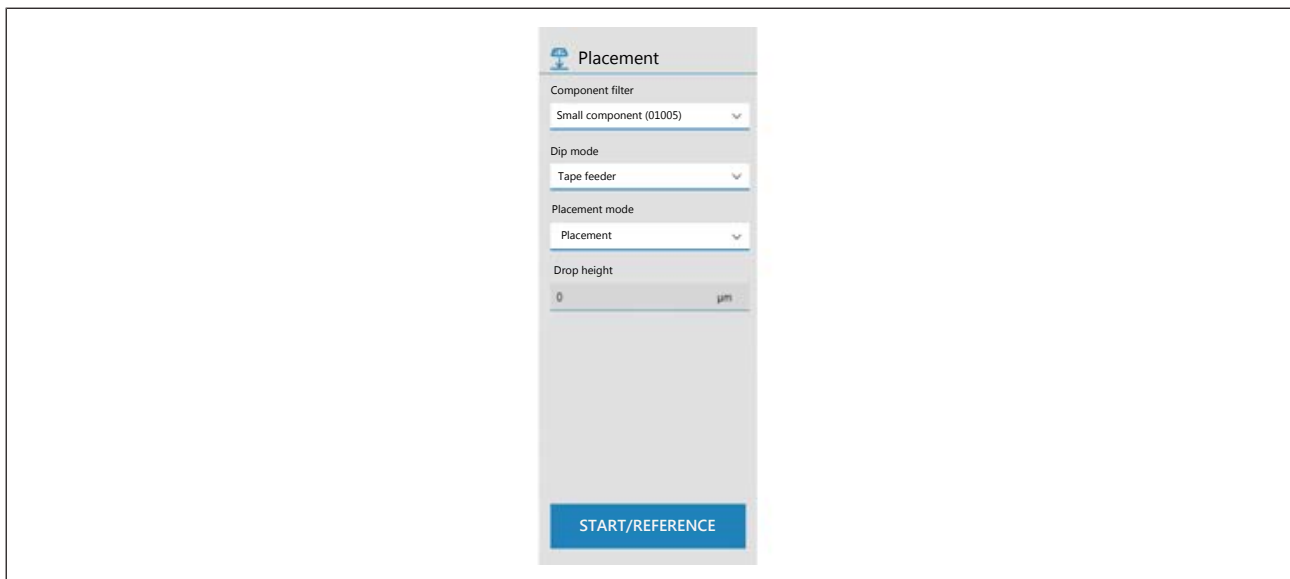
- Using residual solder to solder components from the belt
- Dipping components from the belt into solder paste

As to this, please also read the Chapters under [Step 3 "Deploying" the optional tape feeder](#) [▶ 144].

Using residual solder to solder components from the belt

Use this method if, after the old component has been desoldered, there is enough residual solder for re-soldering on the desoldering point.

- Switch to the [0592] tab under the [0502] tab. Profile management Information
 - Select [730] under the [0026] function. Placement Small component (01005)
- ⇒ The camera system is optimised for component detection in the tape feeder.

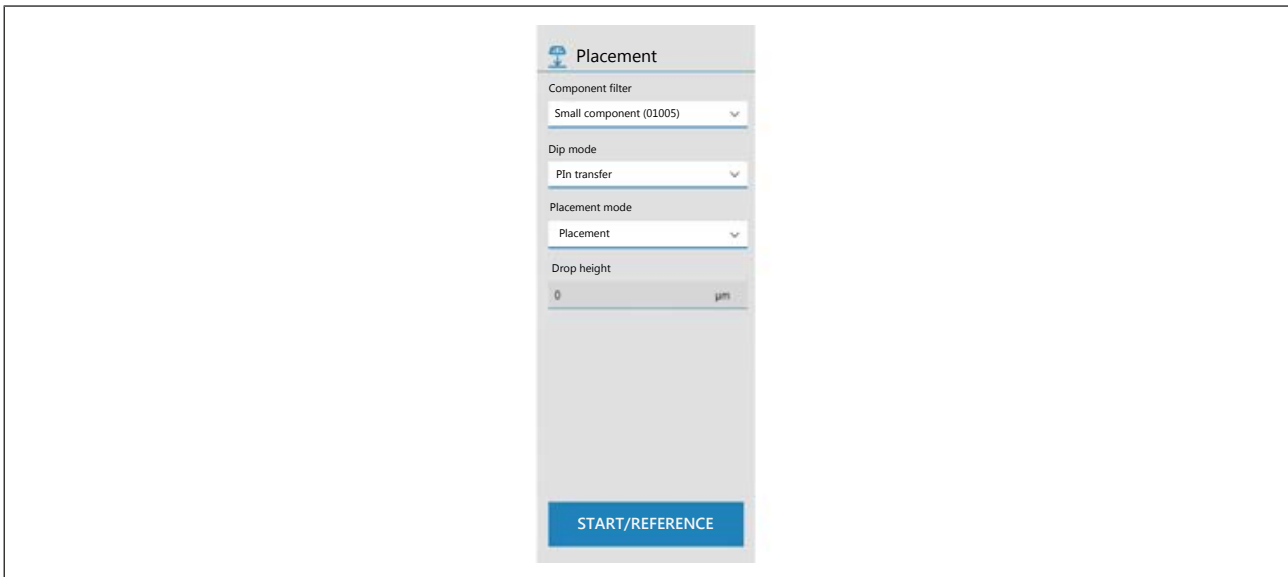


- Select [874] under the [0560] function. Dip mode Tape feeder
- ⇒ The [0635] Provide changes its function when the component is removed from the tape feeder and residual solder is used for soldering.
- Set all other parameters as when working without the tape feeder.
 - Save the changes in the soldering profile.

Dipping components from the belt into solder paste and soldering them

Use this method when the soldering point has been cleaned of any residual solder and solder paste is provided on the rework system. As to this, please read Chapter [Working step 3 "Initialisation"](#) [▶ 116], the [0254] method. Auto. Dip The solder paste depth must be adapted to the component size and type.

- Switch to the [0592] tab under the [0502] tab. Profile management Information
 - Select [730] under the [0026] function. Placement Small component (01005)
- ⇒ The camera system is optimised for component detection in the tape feeder.



a) Under the function [Dip mode] the [Pin transfer] Select [874] under the [0560] function.

⇒ The [0635] Provide changes its function when the component is removed from the tape feeder and soldered into the residual solder.

b) Set all other parameters as when working without the tape feeder.

c) Save the changes in the soldering profile.

As to this, please read Chapters under Step 3 “Deploying” the optional tape feeder [▶ 144].

10.2.2 Operating the optional tape feeder

The optional tape feeder can be attached to the HR 600/3 Rework system to process small components such as 0201 and 01005 directly from a belt section. It is used to ensure that components are fed to the Rework system. This way the correct component can be picked up and conveyed in the proper position.

Requirements:

- The basic module must be attached to the Rework system. As to this, please read Chapter Attaching the basic module of the optional tape feeder to the Rework system [▶ 141].
- Access to the basic module must be free. If necessary, move the heating and placement heads to the left. Keep the travel way clear!



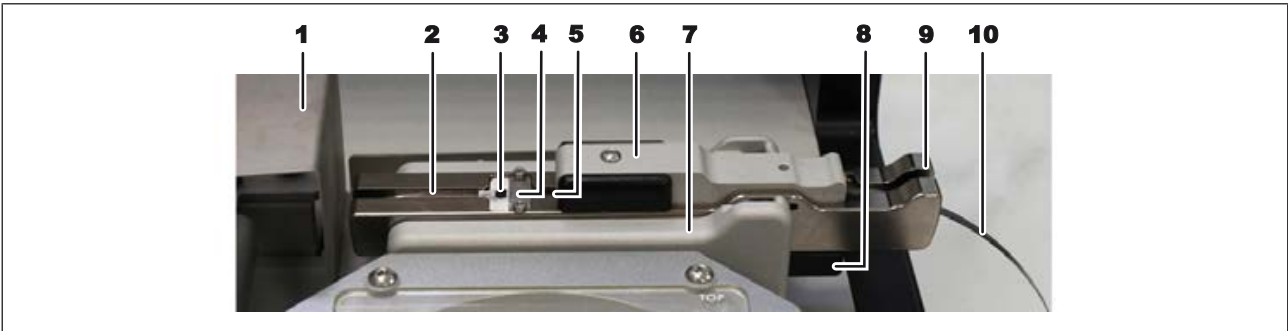
CAUTION

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!



Fig. 41: Tape feeder with exchangeable assembly for a specific component size



1	The component tray is replaced by the tape feeder	6	Belt shifter for component manual conveying
2	Belt outfeed	7	Basic module for fitting the exchangeable assembly. Firmly fixed to the Rework system
3	Component removal opening	8	Lever for releasing the exchangeable assembly from the basic module
4	Mounting plates of the removal opening	9	Pressure point for the lever arm to unlock the belt for conveying components
5	Exit point of the belt cover sheeting	10	Belt infeed

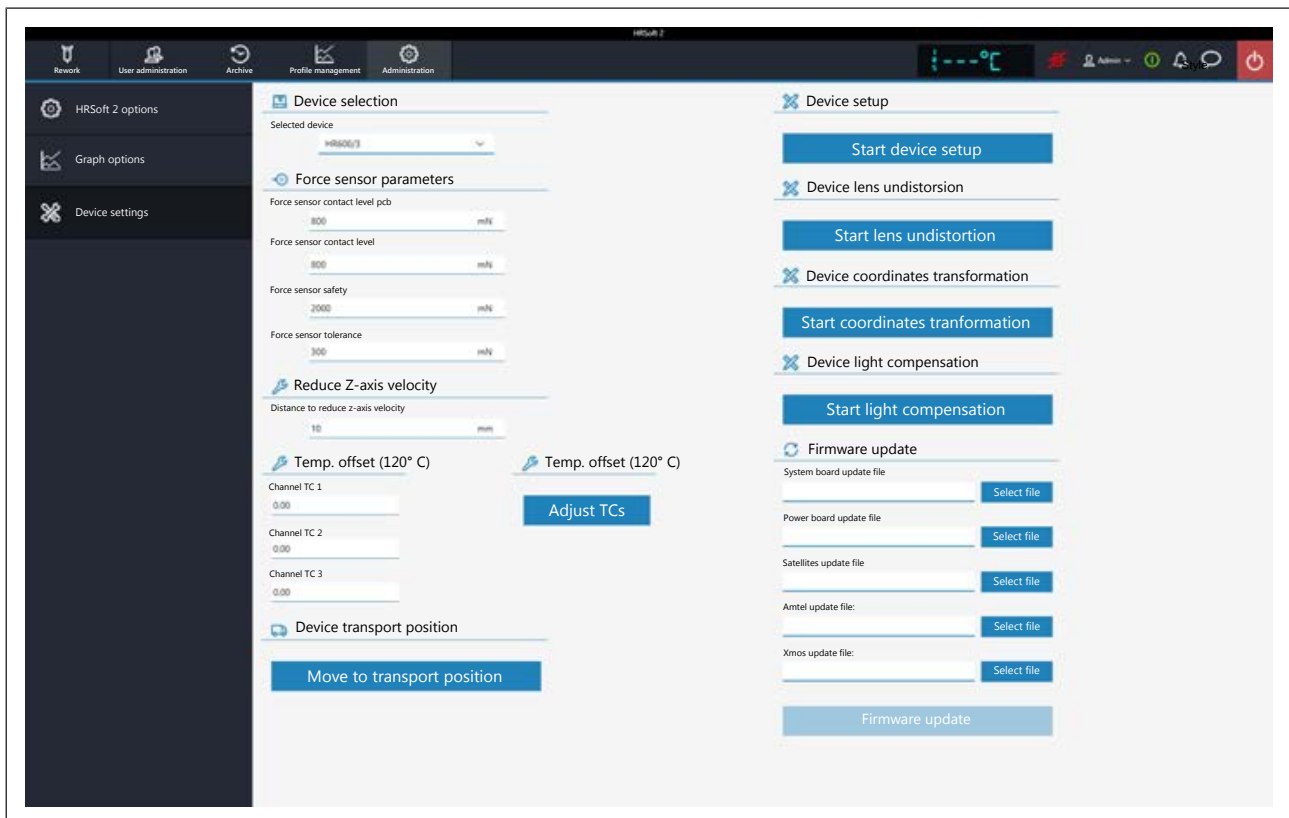


10.2.2.1 Learning a component’s position in the optional tape feeder

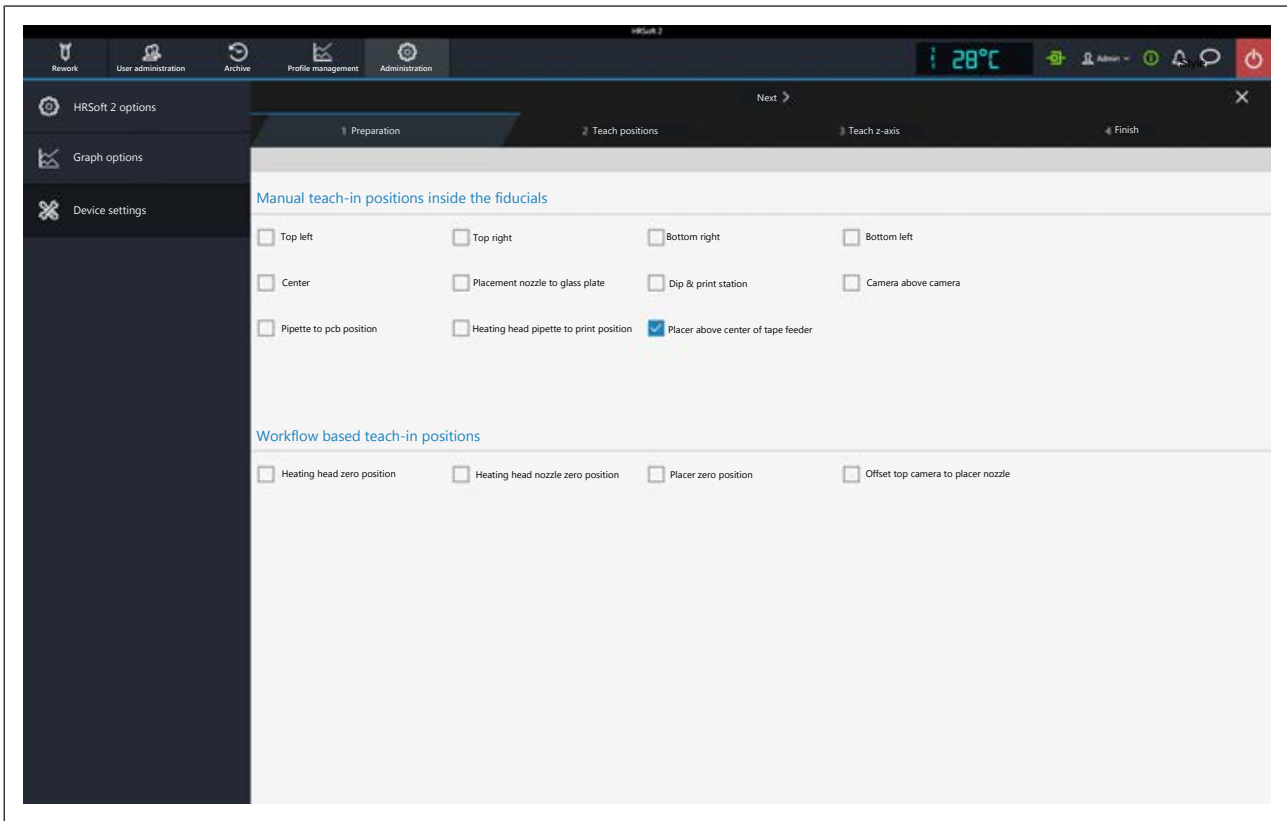
Before using the optional tape feeder, the component’s position in the tape feeder must be learnt.

If the optional tape feeder is to be used, the following requirements should also be met:

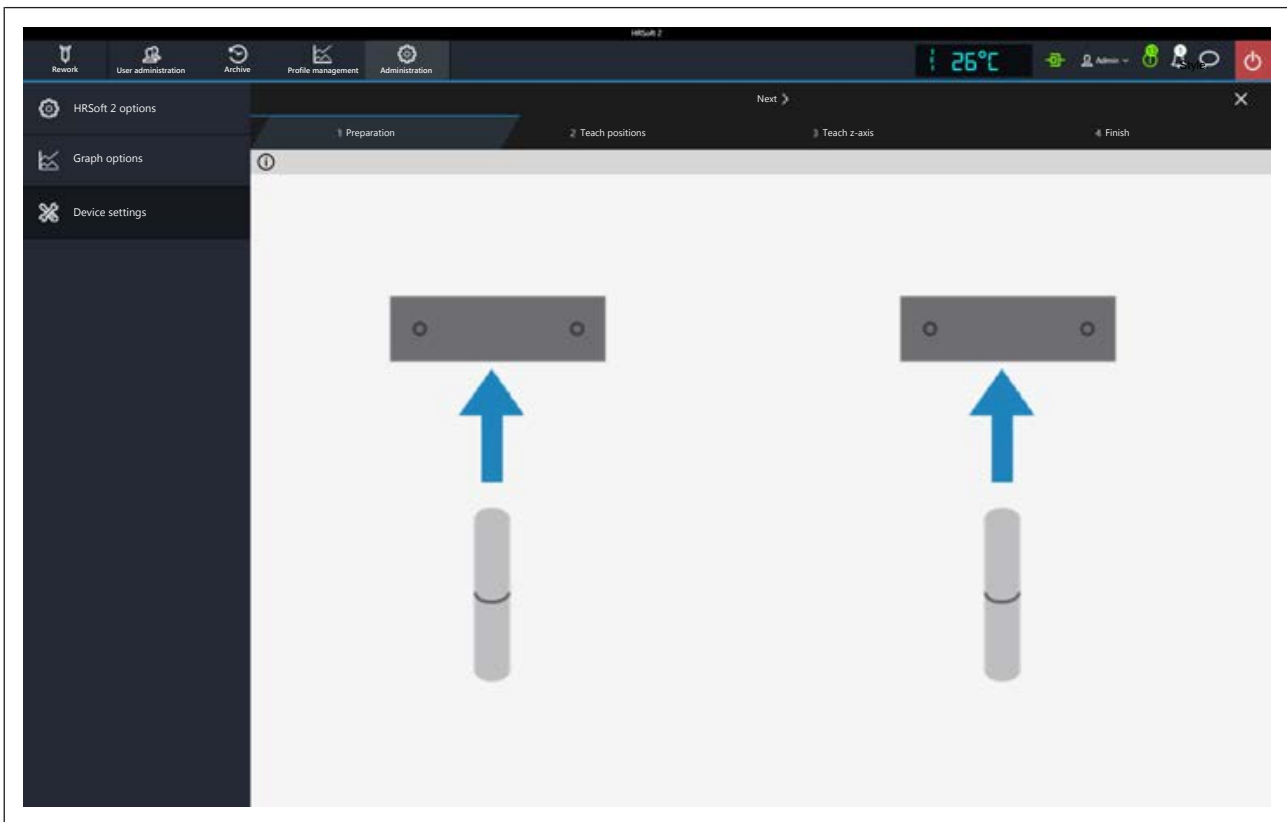
- The basic module of the optional tape feeder must be built into the Rework system. As to this, please read Chapter [Attaching the basic module of the optional tape feeder to the Rework system](#) [▶ 141].
 - The component belt must be inserted into the exchangeable assembly of the tape feeder, and the component to be soldered lie in the tape feeder at the removal point. As to this, please read Chapter [Operating the optional tape feeder](#) [▶ 145].
 - The tape feeder must be enabled in the HRSoft 2 Rework program. As to this, please read Chapter [Defining the optional tape feeder in the HRSoft 2 Rework program](#) [▶ 144].
- a) Have a suitably sized placement pipette ready for the component.
b) In tab [Administration] open the dialog box [Device settings].



- c) Click on button [Start device setup].
- ⇒ The Rework system performs a reference run.
 - ⇒ In work step [Preparation] will be displayed.
- d) Select the function [Placer above center of tape feeder].



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



- ⇒ The heating and placement heads move forward for easier access to the nozzles.
- ⇒ The heating head nozzle and the placement pipette are moved down a bit.



⇒ The diagram shows that the calibration nozzles must now be screwed onto the heating and placement heads. To change the nozzles, please also read Chapter Adjusting the sizes of the heating head nozzle and placer to components [▶ 102].

f) Screw a suitable pick-and-place nozzle onto the placement pipette.

⚠ CAUTION

Danger of material damage



The pipettes are lowered. This poses a risk of collision when moving the heating and placement heads.

- a) Keep the travel path clear when moving the heating and placement heads!
- b) You may use the buttons to move the pipettes up and then lower them again after the procedure!

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

⇒ In work step [Teach positions], the camera image of the placement head is displayed with a red crosshair.

b) Use the arrow buttons in the right dialog frame to move the placement head exactly over the removal position of the component in the tape feeder. The crosshair of the intersecting red lines must lie on the component to be removed.

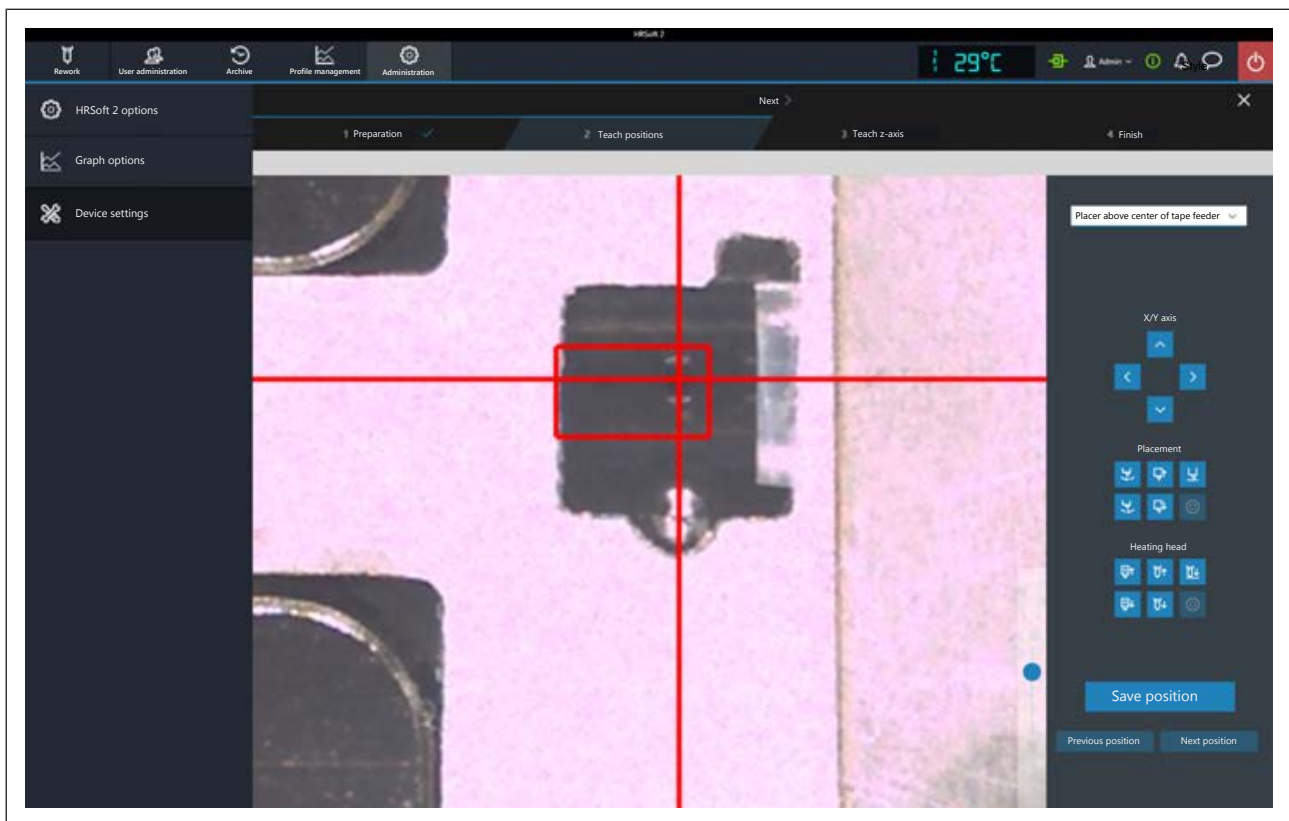


Fig. 42: Exact control of the component in the crosshair. The picture shows a size 01005 component.

The red rectangle is the area where the Rework system's camera detects and assesses components. If the components are so small that two of them can be fitted into the removal opening and covered by the rectangle, please do so. They will then be both detected and subsequently removed from the tape feeder in two distinct soldering processes. The system establishes in which order components should be removed. If components are too close to the edge of the component re-



removal opening, they must not be picked up because the nozzle will otherwise hit the edge of the opening.

If no more component is under the red rectangle, the belt must be moved one conveying step forward. As to this, please read Chapter [Carrying a component to the removal point with a belt shifter](#) [▶ 155]. The Rework system detects when no component is ready in the removal opening or has been shifted in the right position (e.g. it is in a twisted position).

- a) Use the vertical controller on the bottom right of the camera image to enlarge the view and thus better control the position. The camera image can also be zoomed by turning the mouse wheel.
- b) When the crosshair is positioned exactly, press the [Save target position].
⇒ The component's position in the optional tape feeder has been learnt.
- c) Click on the [Next] button to switch to the next work step.
- d) The process is finished. Close the Assistant.

10.2.2.2 Inserting the belt into the exchangeable assembly



Fig. 43: The exchangeable assembly with the belt inserted

The function of the two conveying needles under the belt shifter and the lower positioning needle

Before the insertion into the basic module, the movable lower positioning needle (next figure, left and middle pictures) must engage in the belt catch from below. Before this, the two fixed conveying needles of the belt shifter (next figure, picture on the right) must engage in the belt catch from above. If the lower positioning needle or the upper conveying needles of the belt shifter stick with a little pressure next to the belt catch, the belt will be damaged and can no longer be transported due to deformation. This damaged part of the belt must then be removed.

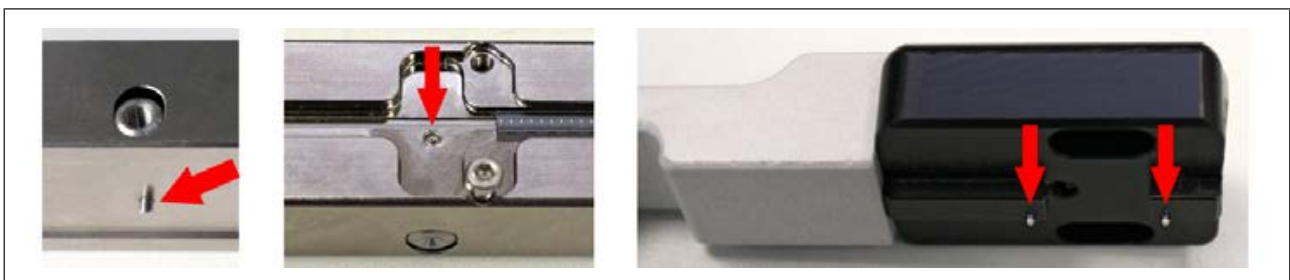


Figure left: The movable lower positioning needle underneath the exchangeable assembly in the lowered position. The shaft in the elongated hole on the side of the exchangeable assembly shows the lower position of the needle. If the exchangeable assembly is placed e.g. on the tabletop or in the component, this positioning needle will be pressed upwards.

NOTE! Risk of damaging the belt! No pressure may be exerted on the lower positioning needle from below if it cannot be guaranteed that the needle engages in the belt catch!



Middle figure: the movable lower positioning needle in the component receiving area of the exchangeable assembly. When it is inserted into the basic module, the needle moves up and must then engage in the belt catch, otherwise the belt will be damaged.

Right picture: The two fixed conveying needles underneath the belt shifter must engage in the belt catch to advance the belt, otherwise the belt will be damaged and can no longer be moved in the tape feeder. This is only guaranteed if the movable lower positioning needle engages in the catch and thus ensures a defined position of the belt. These needles are visible from the side when the belt shifter is raised.

NOTE! Risk of damaging the belt! No pressure may be exerted from above onto the belt shifter if it cannot be guaranteed that the needles engage in the belt catch!

Inserting the belt

- a) Before inserting the belt, pull off the cover sheeting by approx. 15 mm. To pull off the sheeting at the correct end, position the belt so that the sheeting is at the top and the belt perforation is inclined towards you. Pulling off the sheeting on the left side

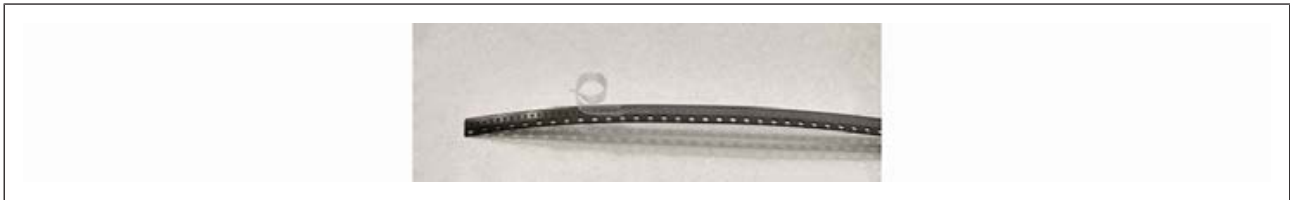


Fig. 44: Example picture with 01005 component belt: Pull off the cover sheeting by 15 mm.

- b) Remove the exposed components from the belt to prevent malfunctions in the conveyor mechanism.
- c) Remove the exchangeable assembly from the basic module.
- d) Use an Allen key size 1.5 to undo the two screws fastening the mounting plates to the removal opening.



Fig. 45: Example images with the belt already inserted.

- e) Pull out the two mounting plates.





- f) Lift the exchangeable assembly in such a way that the positioning needle, which is to reach into the belt perforation from below, moves down. This can be identified in the next figure, underneath the exchangeable assembly and on the underlying shaft which is connected to the needle.



⇒ The lower positioning needle, and with it the shaft on the elongated hole, will fall in the lower position when the exchangeable assembly is raised. The shaft can also be used to pull the positioning needle down, if it does not drop as desired. To avoid damaging the belt, do not use the shaft to push up the positioning needle.

- g) Continue lifting the exchangeable assembly and align it for insertion into the basic module.
- h) To insert the belt, keep the tilting mechanism of the belt shifter pressed - see the arrow in the next figure on the left. Control the pressure in such a way that the belt shifter is only half pressed down, so as to prevent the belt from being clamped due to complete tilting.



⇒ Now insert the belt from the left, with the sheeting side facing up. The belt must be run in under the bridge plate, which is located under the belt shifter, figure on the right. After the belt has been pushed in, no pressure must be exerted on the belt shifter to avoid any damage to the belt by the conveying needles.

- i) Insert the belt so far that the beginning of the removed sheeting lies between the screw threads.



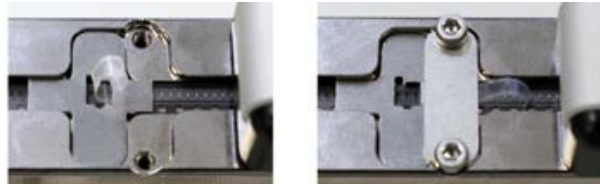
- j) Place the exchangeable assembly on the edge of the table so that the lower positioning needle is not on the tabletop; see also the following instructions.

The exchangeable assembly should be only laid down if it is ensured that the lower positioning needle engages in the belt catch. Otherwise, to avoid damaging the belt, place the exchangeable assembly on the edge of the table so that the positioning needle is not pressed upwards.



Fig. 46: The exchangeable assembly has been laid down, the positioning needle is not on the tabletop and is not pressed upwards.

Put on the cross-shaped cover plate and run the removed sheeting through the opening, left picture.



- a) Hold the removed sheeting to the right and place the cover plate with the holes on it. The sheeting must lie flat.
 - ⇒ After a conveyor step of the component belt to the left, it must be possible to further remove the sheeting in the opposite direction, to enable component removal.
- b) Screw on the cover plate. Tighten the screws only with moderate force, figure on the right.
 - ⇒ From now on, to avoid damaging the belt, no pressure must be applied to the lower positioning needle from below! If it is ensured that the positioning needle engages in the belt grid, the exchangeable assembly can also be placed on the tabletop.

Place the conveying needles of the belt shifter in the belt grid and test the belt feed

- a) Lift the exchangeable assembly and align it for insertion into the basic module.
- b) Make sure the lower positioning needle has moved down. This can be seen from the lower position of the shaft on the side elongated hole.



Fig. 47: The lower positioning needle has moved down

- c) Hold the exchangeable assembly with your left hand. With your right hand, hold the belt shifter very carefully down, and move it back and forth a little for the conveying needles to engage in the belt catch. Stop the movement when the conveying needles tangibly engage in the belt grid.
- d) From now on, to keep the position of the conveying needles, do not lift the belt shifter any longer. Carefully move the belt shifter back and forth in the maximum possible distance from one stop to another, to check whether the belt is being carried by the belt shifter trouble-free. In doing so, observe the removal opening to detect any obstacles to movement due e.g. to the removed sheeting.



When handling the exchangeable assembly, hold the belt shifter in place. If the belt shifter is pressed against its front or rear stop, the lower positioning needle will engage in the belt catch without damaging the belt when it is pressed upwards. If the exchangeable assembly has to be placed down, it can also be placed, for example, on the edge of the table, so that the lower positioning needle will not rest on the tabletop and is pressed upwards.

- e) If the belt movement is ensured by the belt shifter, go to the Rework system to insert the tape feeder.

10.2.2.3 Inserting the exchangeable assembly into the basic module

Access to the basic module must be free. If necessary, move the heating and placement heads to the left. In doing so, keep the travel way clear!

If the exchangeable assembly has to be put down, place it on the edge of the table so that the lower positioning needle will not lie on the tabletop and is not pushed up. If it is ensured that the positioning needle engages in the belt grid, the exchangeable assembly can also be placed on the tabletop.



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!

Inserting the exchangeable assembly

After checking the belt in the exchangeable assembly for smooth running (Chapter [Inserting the belt into the exchangeable assembly](#) [▶ 150]), the exchangeable assembly can be inserted into the basic module.

During insertion into the basic module, it must be ensured that the lower positioning needle engages in the belt catch when it is pressed upwards. This can be guaranteed by pushing the sliding belt shifter against its front or rear stop.

- a) Lift the exchangeable assembly and align it for insertion into the basic module.
- b) Use your left hand to press the conveyor slide to the right against its stop (1).



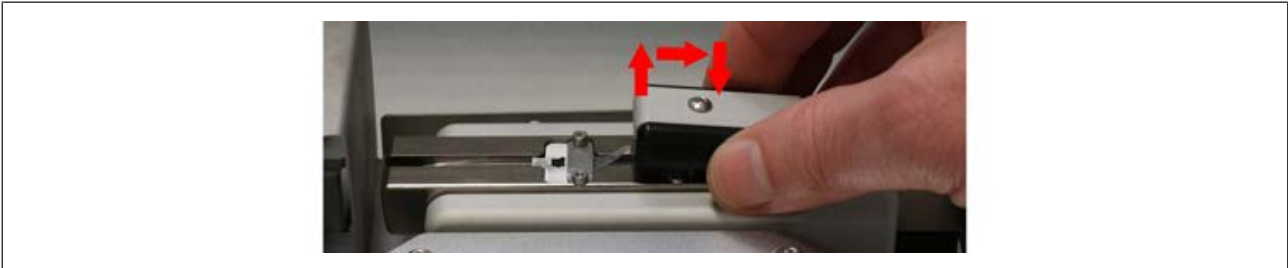
- c) Use your right hand to keep the lever on the basic module pressed in order to release the lock (2).
- d) Insert the exchangeable assembly into the recess for the lateral pins (3) while maintaining the pressure on the conveyor slider (1).
- e) When the side pins are locked in, let go the lever to release the lock.
- f) Continue pressing conveyor slider against its stop and finally insert the exchangeable assembly horizontally into the basic module.



10.2.2.4 Carrying a component to the removal point with a belt shifter

If a component is in the tape feeder for soldering, the next component will be conveyed into the removal opening as follows.

- a) Raise the belt shifter vertically as far as possible and reset it to the right as far as it will go. Keep pressing on the right and then lower it. The belt shifter has conveying needles on its underside which must reach into the belt catch.



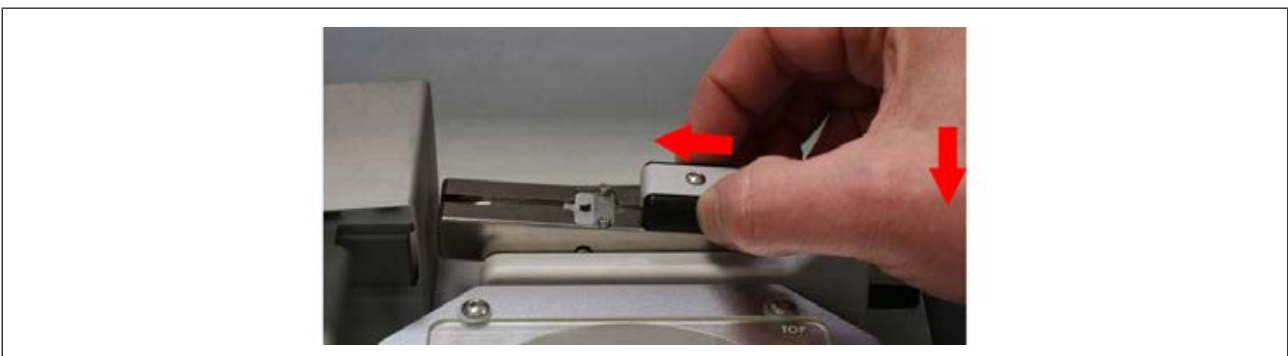
- ⇒ Use the edge of your hand to press the outside of the lever arm in order to tilt the exchangeable assembly. As a result, the lower positioning needle, which engages in the belt catch from below, falls down, thus releasing the belt.



- b) Keep pressing with the edge of your hand while pushing the belt shifter downwards and sliding it all the way to the left.

⇒ The belt is moved to the left and the next component conveyed into the removal opening.

Only when the belt shifter has completely reached the stop can it be ensured that the lower positioning needle will engage exactly in the belt catch when the exchangeable assembly is lowered.



- c) Keeping the belt shifter in its stop position
- d) Stop pressing with the edge of your hand to lower the exchangeable assembly completely.
- e) The lower positioning needle engages in the belt lock.



- f) Carefully pull the cover sheeting off the belt to the right, so that the component is exposed in the removal opening.



To ensure that the belt can run smoothly, the cover sheeting must be continuously checked, and its length and position adjusted if necessary.

The component in the tape feeder can now be picked up by the Rework system.

10.2.2.5 Removing the exchangeable assembly from the basic module.

- a) Keep pressing the lever on the basic module to release the lock (1) and lift out the exchangeable assembly.

Do not put the exchangeable assembly back into the basic module if the belt shifter is not pressed against one of its stops; risk of damage to the belt due to improper positioning of the lower positioning needle.



- b) When handling the exchangeable assembly, hold the belt shifter in place.

10.2.2.6 Taking the belt out of the exchangeable assembly

- a) Remove the exchangeable assembly from the basic module.
- b) Use an Allen key size 1.5 to undo the two screws fastening the mounting plates of the removal opening.

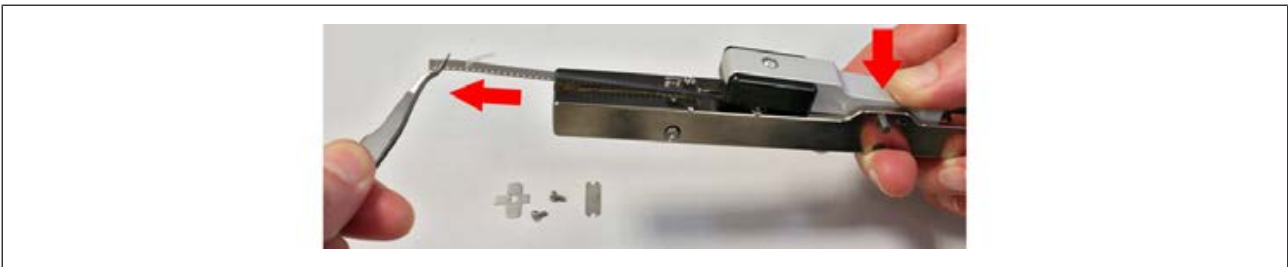


- c) Lift the exchangeable assembly in such a way that the shifter needle, which should engage in the belt perforation from below, moves downwards.

⇒ The shaft at the elongated hole is in the lower position.



d) To remove the belt, keep the tilting mechanism of the belt shifter pressed - see the arrow on the right in the next figure. Control the pressure in such a way that the belt shifter is only 2/3 pressed down, so as to prevent the belt from being clamped due to complete tilting.



e) Now pull out the belt to the left.

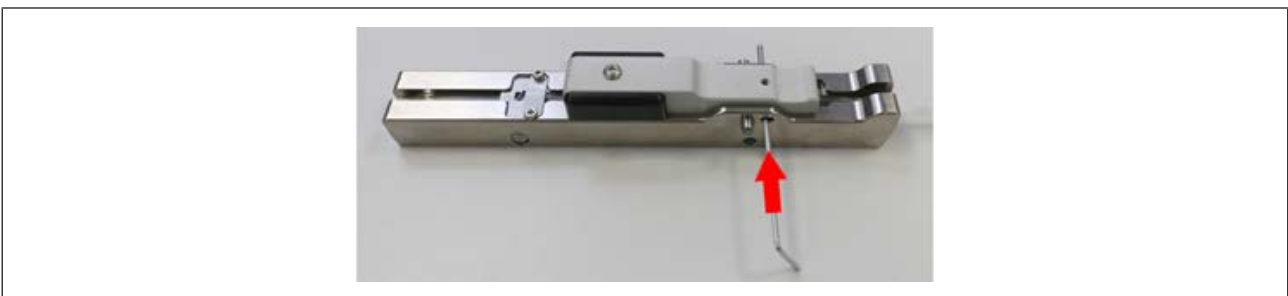
10.2.2.7 Screwing on the exchangeable assembly for maintenance

To clean the inside of the exchangeable assembly of foreign bodies and dirt, it can be screwed on.

a) Unscrew the grub screw on the belt shifter with an Allen key size 1.5.



b) Push out the metal pin from the side.



c) Remove the belt shifter.



d) Reassemble in reverse order.



10.2.3 Step 3 “Deploying” the optional tape feeder

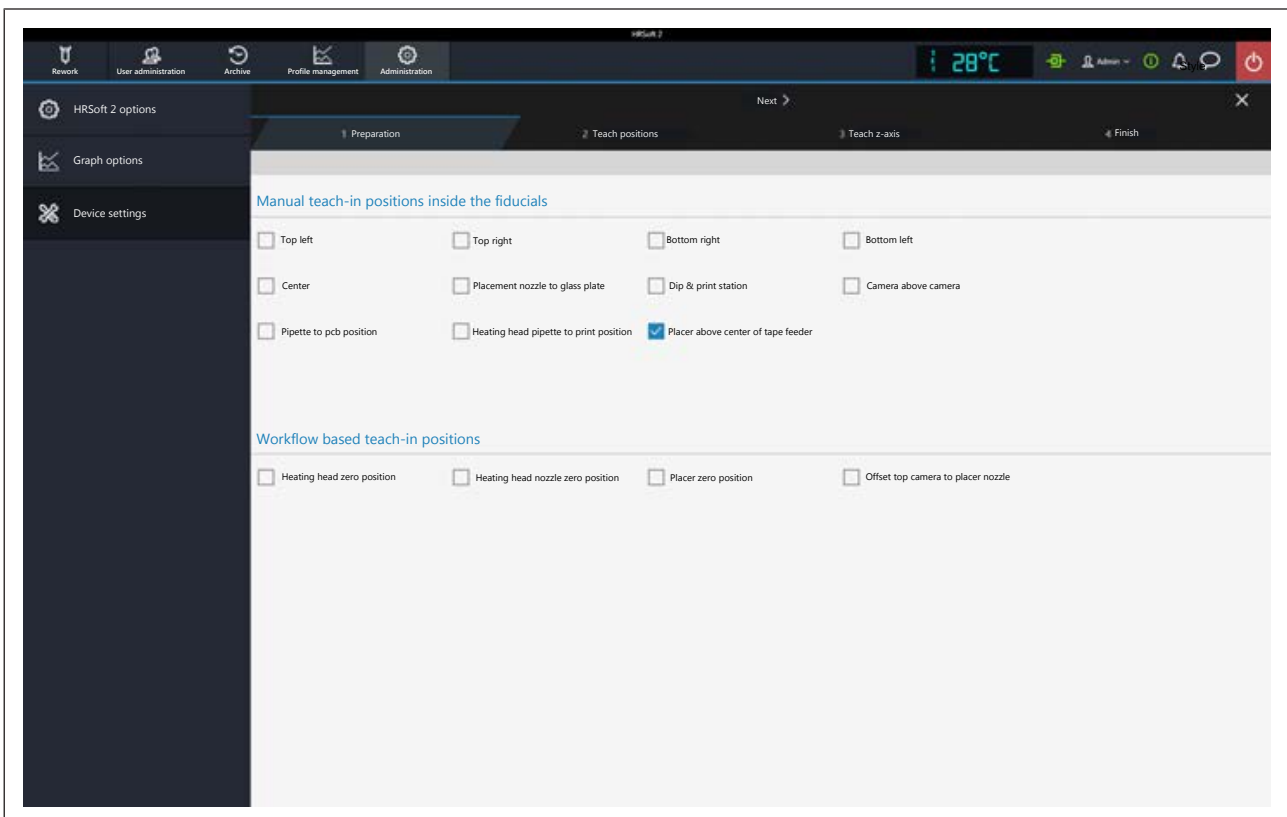
If components from the optional tape feeder are to be used for soldering, the following requirements must be met:

- The basic module of the optional tape feeder must be attached the Rework system. As to this, please read Chapter [Attaching the basic module of the optional tape feeder to the Rework system](#) [▶ 141].
- The component belt must be inserted into the exchangeable assembly of the tape feeder, and the component to be soldered lie in the tape feeder at the removal opening. As to this, please read Chapter [Operating the optional tape feeder](#) [▶ 145].
- The tape feeder must be enabled in the HRSoft 2 Rework program. There are two variants: “using residual solder to solder a component” and “dipping a component in solder paste and soldering it”. As to this, please read Chapter [Defining the optional tape feeder in the HRSoft 2 Rework program](#) [▶ 144].
- The position of the removal point of the component in the tape feeder was learnt. As to this, please read Chapter [Learning a component’s position in the optional tape feeder](#) [▶ 147].

If in the [Dip mode] menu the [PIn transfer] function has been selected, the component from the tape feeder will be dipped in solder paste in the dip stencil before soldering. For this to be done, make sure that the dip stencil is attached and the component prepared for it. The [874] function Tape feedersolders components from the tape feeder without dipping.

The component is picked up from the tape feeder in the [Provide] work step 3, before the soldering work step, as follows:

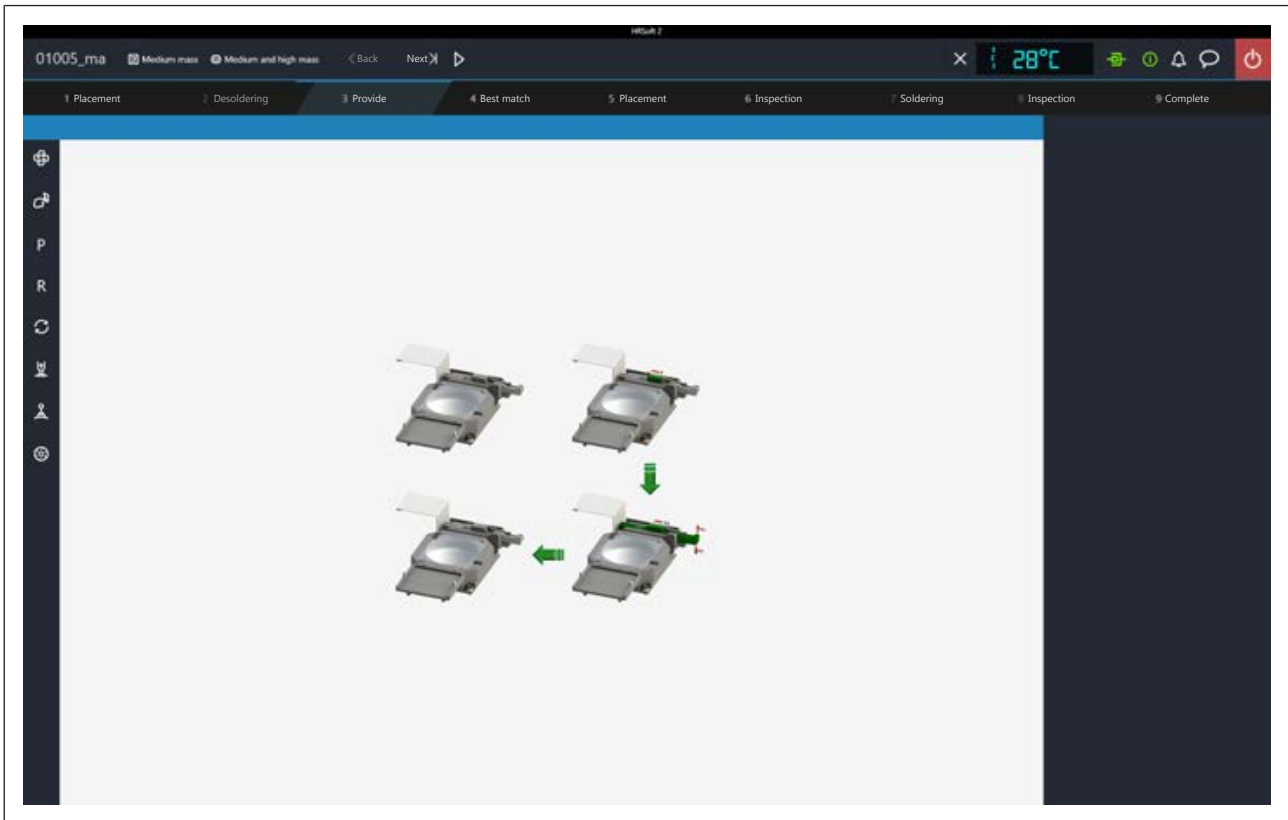
- ✓ The assistant for placing the component opens.



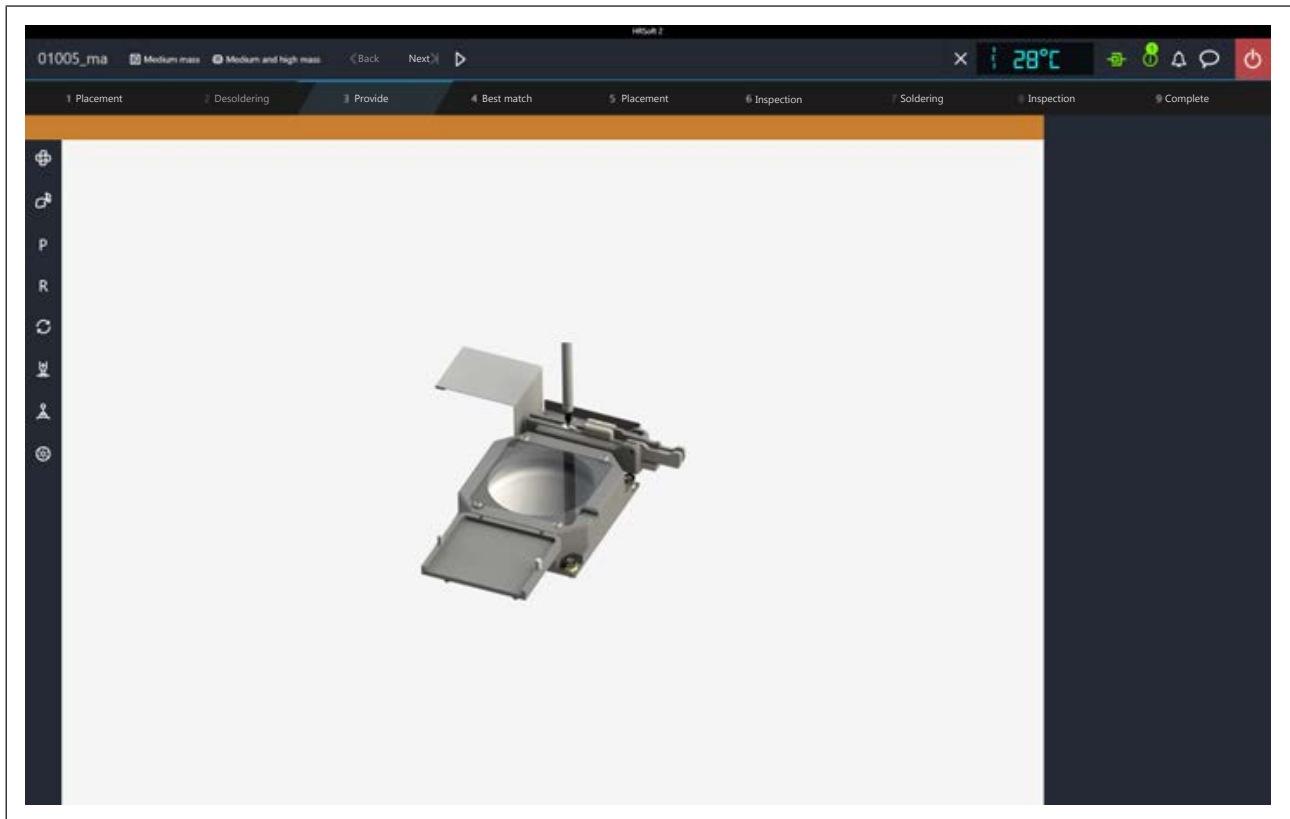
- Select the [873] function.Placer above center of tape feeder
- Click on the [Next] button to switch to the next work step.



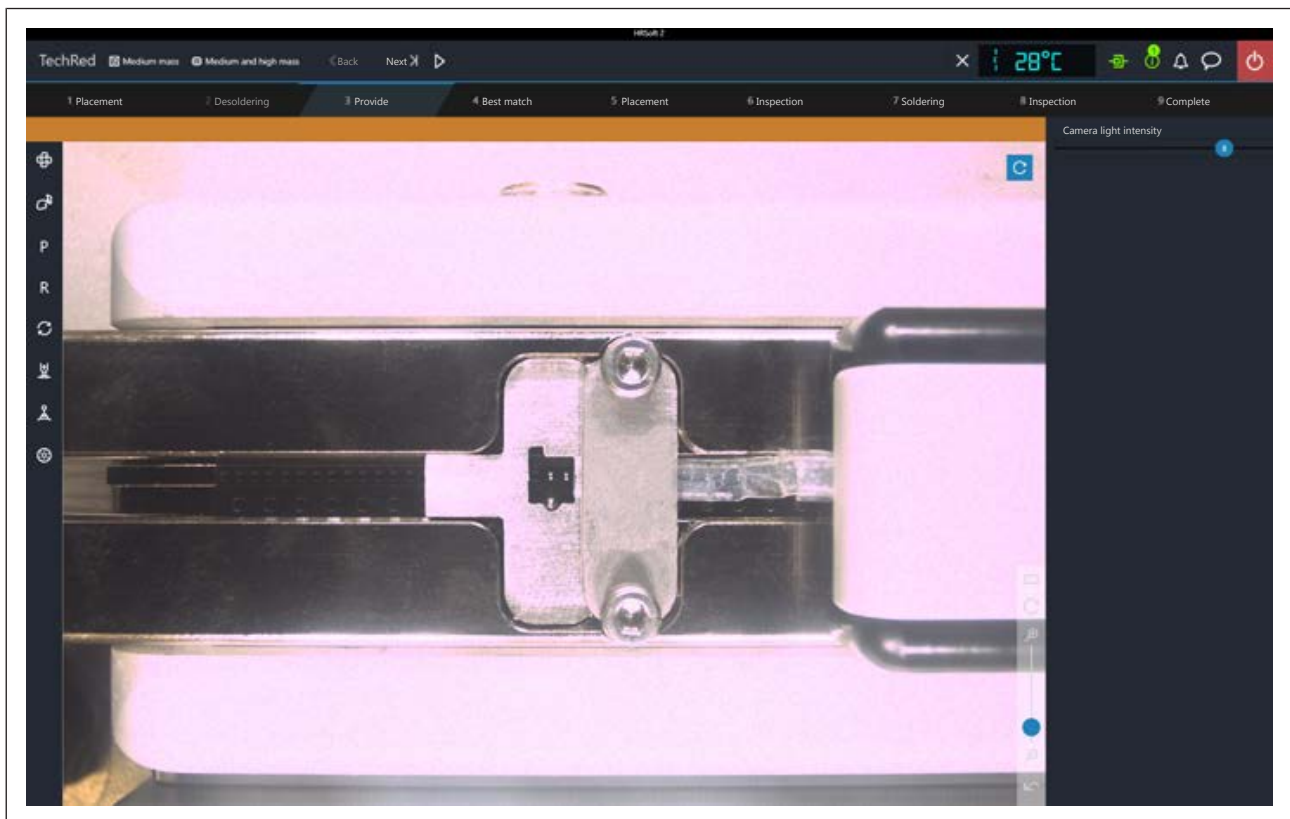
- ⇒ The heating and placement heads move sideways to grant access to the tape feeder.
- ⇒ The window for the work step Positioning the component in the tape feeder opens.



- c) If necessary, use the belt shifter to convey the next component in the tape feeder to the removal position. Carefully follow the instructions in Chapter [Carrying a component to the removal point with a belt shifter](#) [▶ 155].
- d) Click on the [Next] button to switch to the next work step.
 - ⇒ The window for the work step Picking up the component opens.



- e) Click on the [Next] button to lift the component out of the tape feeder.
⇒ The camera view opens.



- f) Set the [Camera light intensity] controller to level 8 to enable component detection.
⇒ The upper camera will now detect components in the removal opening.



- g) The view can be enlarged with the vertical controller on the bottom right of the camera image. The camera image can also be zoomed by turning the mouse wheel.
 - ⇒ The correct component position in the removal opening and the position of the sheeting are shown.
- h) If the components are properly located in the receiving opening, click on the [Next] button to switch to the next working step.
 - ⇒ The component selected by the camera system is removed and placed on the glass plate for inspection.

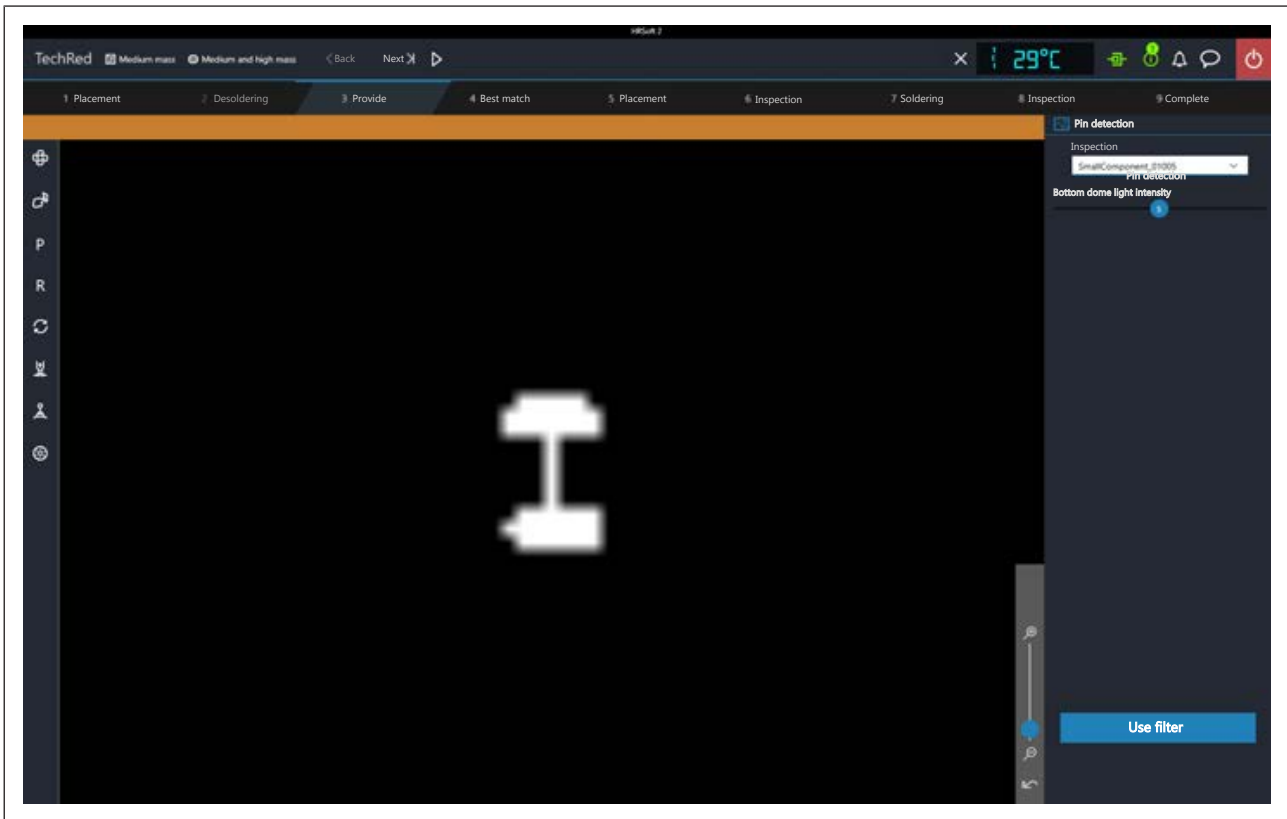


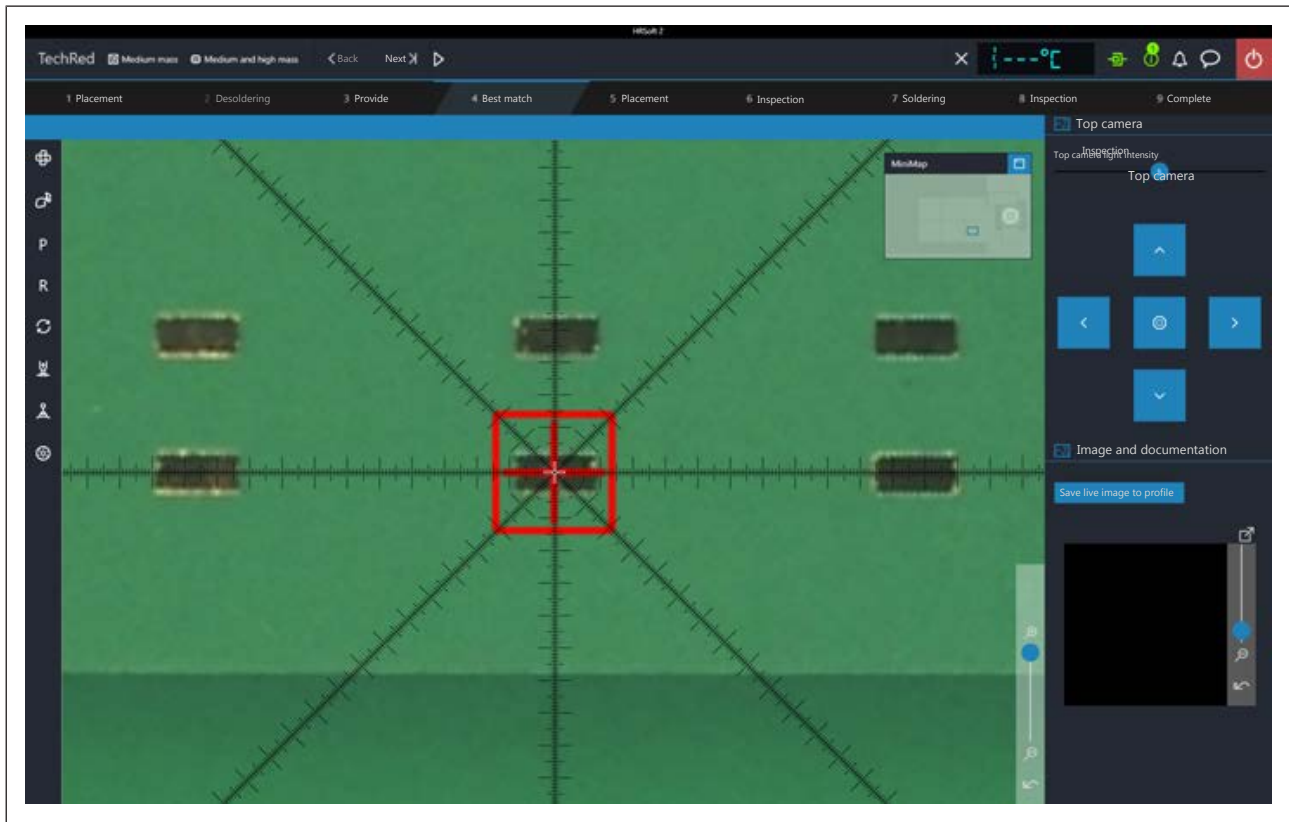
Fig. 48: The pins are assessed. Example picture with 01005 component

- ⇒ The lower camera assesses the position of the pins.
- i) Select the appropriate component in the [Component filter] menu.
- j) Set the [786] controller to level 5. Bottom dome light intensity If the image is not satisfactorily displayed, try a different value. The view must show maximum details.
- k) Click on the [Use filter] button.
- l) Click on the [Next] button to switch to the next work step.
 - ⇒ If the [Dip mode] function has been selected in the [Pin transfer] menu, the component will now be dipped into the dip stencil.

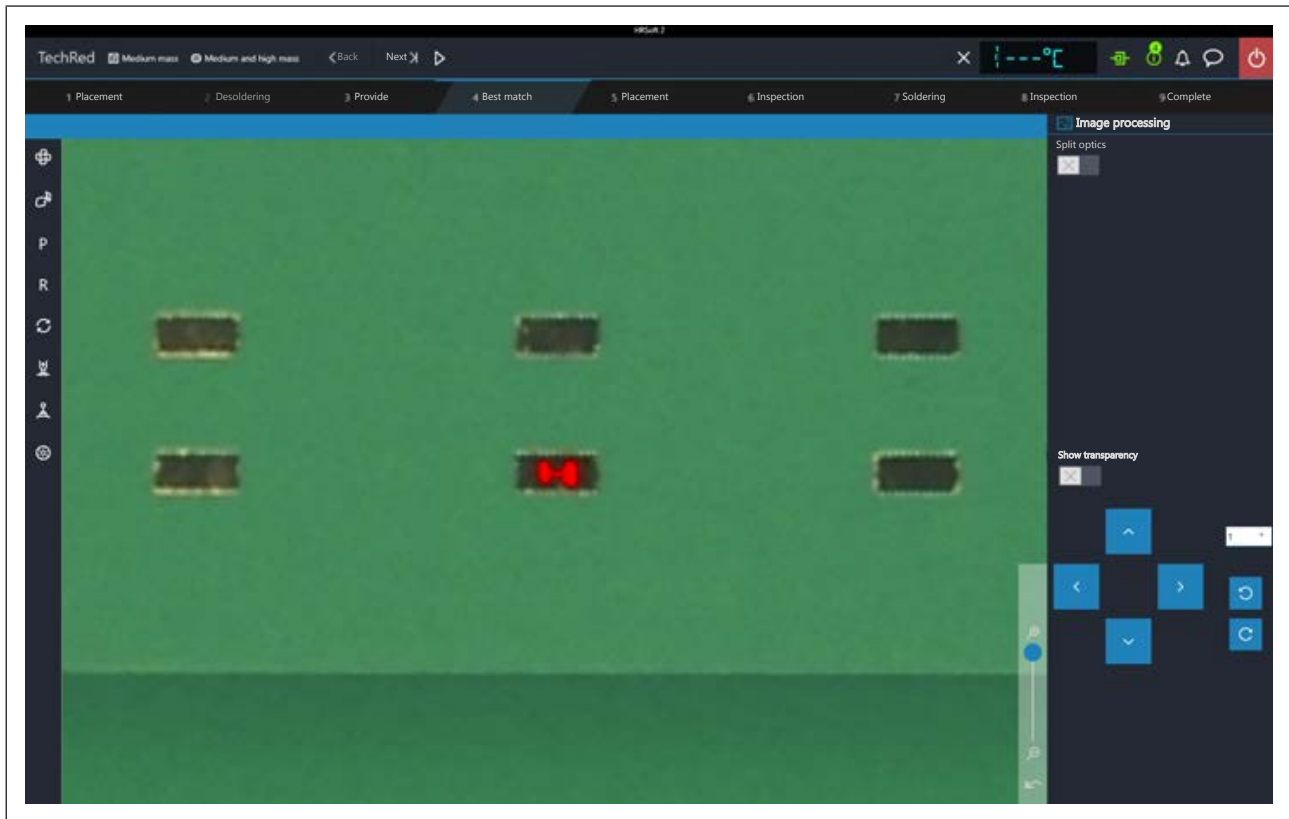


10.3 Work step 4 "Best Match" with the optional tape feeder

- ✓ The component is moved over the soldering point and the upper camera shows the soldering point.



- If the Rework system could not learn a placement position from the previous desoldering process, use the blue arrow buttons or click in the MiniMap to move to the soldering point. For accurate positioning, the centre of the black star-shaped ruler can also be clicked to control the soldering point. The centre of the red square must lie exactly on the soldering point.
The view can be enlarged with the vertical controller on the bottom right of the camera image. The camera image can also be zoomed by turning the mouse wheel.
- For later documentation, you can use the [868] button to save Save live image to profile a screenshot of the camera image in the soldering profile used.
- If the soldering position has been defined exactly, click on the [Next] button to switch to the next work step.
 - ⇒ The overlay of the component detected by the lower camera is shown in red.



- d) If the rotation of the component overlay needs to be adjusted, enter a value for the number of rotation degrees into the white field. Perform this rotation by clicking on a blue rotation button.
- e) If the position of the component overlay needs to be adjusted, use the blue arrow buttons to position the component overlay exactly in the middle of the soldering position.
- f) Click on the [Next] button to switch to the next work step.





11 Spare and wear parts

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11.1 Read this first!

11.1.1 Nameplate and serial number



Fig. 49: 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.

11.1.2 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!





11.2 Spare parts

	Name	Item number
	Silicone nipple 3.5 for 5.0 mm nozzle *	0HR5520-35
	Silicone nipple 8.5 for 10 mm nozzle *	0HR5520-80
	Silicone nipple 2.0 for 3.3 mm nozzle *	0HR5520-20
	Component filter for all nozzles, 10 pieces **	0HR5521/10
	AccuTC thermocouple without fixture	0IR6500-37
	AccuTC 2.0 thermocouple	0HR645
	K-type thermocouple wire with plug	0IR4510-02
	Thermocouple mount V2	0HR641
	Stepper motor controller 1 with filter	343647
	Stepper motor controller 2 with filter	353201
	Stepper motor controller 3 with filter	353203
	Control board	0HR605



	USB stick	0HR630
	Switch PoE	295847
	Power supply	3ET00370
	USB flash drive Rework	3BA00149
	Stepper Motor NEMA 17	3ET00333
	Driver board	287461
	Stepper Motor NEMA 11	3ET00334
	Camera placing unit	353176
	Light dome, glass plate 60 x 60	324367
	Monochrome camera DMM 25GP031-ML	324349
	Heating head 150 x 80 mm, 2000 W	0HR667L
	PCB holder, assembly, PCBs up to 390 x 300 mm (15.4" x 11.8")	353700
	PCB holder 300 x 535 mm, PCBs up to 535 x 300 mm (21" x 11.8")	363325
	Vacuum generator	168120



	Maintenance unit	3PT00046
	Heating head vacuum filter	244532
	Transport lock placing head	363362
	Filter in electric cabinet	3N401
	RW pyro sensor	352816
	Setup nozzle	OHR5520-0000K
	Mounting plate claibration	364500
	Stamp plate calibration	364498
	Inkpad black	364249

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

** Wear part, replacement after 1-10 desoldering processes.

As to this, please read Chapter Available options.



12 Annex

12.1 EC Declaration of Conformity

CE Declaration of Conformity HR 600/3 P

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 600/3P

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

Directive/Standard	Title	Edition
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	2016+A1:2017A
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	2007-06
DIN EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	2014
DIN EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A	2013
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards: Immunity for industrial environments	2019

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, 2020-03-02

Legally binding signature



Ralph Kniecht, General Manager

Technical responsibility



Wolfram Sinn, Development Manager