HR 600/2

Hybride-Rework-System

kurtz ersa

Table of contents

1 Introduction

1.1 Product information

1.1.1 General information about the product

These operating instructions are generally valid for Ersa Hybrid Rework systems of product ranges HR 600 XL Hybrid Rework System (0HR600XL) and HR 600 XL-L Hybrid Rework System (0HR600XL-L).

1.1.2 Intended use

The machine has been built according to state-of-the-art technology and generally accepted technical 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 600/2 Rework System is intended for industrial indoor use. The machine is solely intended for desoldering and soldering electronic components on printed circuit boards. Any other use that is beyond the scope of such use shall be deemed as improper. The manufacturer/supplier shall not be liable for any damage resulting thereof. Intended use also comprises the observance of the operating manual as well as the safety instructions.

1.1.3 Retrofitting, changes

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

1.1.4 Warranty

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

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

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

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

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1.2 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:

	Prohibition, in general!
	Do not touch!
	No fire and naked light!
	Eating and drinking prohibited!
	No smoking!!

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 maintainance by people who are not sufficiently qualified and informed can cause severe damage to the machine or damage to people.

b) Such work may therefore only be performed by properly trained personnel! This personnel must be able to recognize the hazards that can be caused by the system mechanical, electrical or electronic equipment.

c) The people who carry out such work must know and have understood the contents of these instructions.

d) Any person involved in the installation, commissioning, operation and/or maintenance of the machine must have read and understood the contents of the "Safety instructions" chapter, as well as the chapters which are relevant for the specific activity!

1.2.3 Copyright, liability

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

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

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

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

NOTE

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

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

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2 Technical data

2.1 General data

Description	
Width (mm)	850
Depth (mm)	660
Height (mm)	620
Weight (kg)	57
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. 65

2.4 Heating system

Bottom heater

Designation	
Type of heating	Ceramic heating elements, medium wave, infrared, reactive
Dimensions of the heater cartridge (width x depth, mm)	380 x 250
Number of heating zones	3
Rated power (kW) at 230V	2.4 (3 x 0.8)

Top heater

Designation	
Type of heating	Hybrid heater, ceramic heating elements, medium wave, infrared, with convection
Component handling	Integrated, motorized pipette
Dimensions (width x depth, mm)	60 x 60
Number of heating zones	2

Designation	
Rated power (kW) at 230V	0.8 (2 x 0.4)
Aperture (mm)	Up to 20 x 20

Temperature sensors

Designation	
Sensor type	Non-contact infrared sensor (pyrometer), digital
Additional inputs for K-type thermocouples*	2

*An AccuTC is included in delivery.

2.5 Axis system

Description	
Type	Precision guide with stepper motors
Axes	X, Y, Z and rotation
Placement accuracy (µm)	± 25
Pick-and-place nozzles – Ø (mm)	4 and 10, with magnet mounting

2.6 Cameras

Placer-camera, top side

Bezeichnung	
Type	Colour camera
Resolution (Mpixel)	1,3
Interface	USB 2.0
Illumination	LED, dimmable

Component-camera, bottom side

Bezeichnung	
Type	Monochrome camera
Resolution (Mpixel)	1,3
Interface	USB 2.0
Illumination	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 285 (15.3" 11.2")
Extended PCB size (width x depth, mm)*	390 x ca. 500 (15.3" x 19.7")
Max. PCB thickness (mm)	6 (0.24")
Min. component dimensions (mm)	1 x 1 (0.039)
Max. component dimensions (mm)	50 x 50 (2.0" x 2.0")

Description	
Typ. operating distance above (mm)	40 (1.6")
Clearance below (mm)	35 (1.4")
Clearance below (mm) 0HR600/2BHL with lowered bottom emitter	65 (2.6)

*Larger sized PCBs are not fully heated.

2.8   PC system requirements

For the PC configuration required for your Rework System, refer to the PDF document
[3BA00212_PC-Setup-Recommendation_Ersa-IRSoft-HRSoft-ImageDoc.pdf].
This document can be found on the Ersa Rework USB stick (3BA000149).

2.9   Ambient conditions

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

2.10 Options

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

Description	Item number
RPC camera	0HR610P
Dip & Print station	0PR100
Board holder	0PH100
Placement nozzle, Ø 2 mm	3HR600-06-025
Placement nozzle, Ø 1 mm	3HR600-06-023
Micro suction device type 1020	0IR5500-41
Micro suction device type 0510	0IR5500-40
Adaptor for suction device, small	0IR5500-44
Vacuum cup, 8 mm, silicone	0IR4520-01
Vacuum cup, 5 mm, silicone	0IR4520-02
Vacuum cup, 2 mm, silicone	0IR4520-03
Vacuum cup, 8 mm, Viton®	0IR4520-04
Vacuum cup, 5 mm, viton®	0IR4520-05
Additional Board holder (complete assembly)	3HR600-08
PCB frame, XL	0HR635
Interface cable to fume extraction unit, 2 m	3CA10-2005

The following devices can be connected to the HR 600/2 unit. They can be controlled using the HR 600/2 unit.

Description	Item number
Fume extraction Ersa EASY ARM 1 (Through flow volume 110 m^3/h)	0CA10-001
Fume extraction Ersa EASY ARM 2 (Through flow volume 2 x 110 m^3/h)	0CA-10-002

3 For your safety

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!

⚠ DANGER

Health damage due to smoke

    a) In case of smoke formation or unusual odour development, switch off the rework system immediately and ventilate the room sufficiently!

    b) The room may only be re-entered when the air is smoke-free.

    c) To avoid smoke development:

⇨ Follow the operating procedure specified in the operating instructions

⇨ Regularly check the rework system for damage

⇨ Keep the rework system clean

3.4 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 Laser equipment

> ⚠ **DANGER**
>
> **Laser beam! Risk of injury due to retinal burns**
>
> a) Do not stare into the laser beam!
>
> b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
>
> c) Class 2 laser according to DIN EN 60825-1:2008-5, P < 1 mW, λ = 650 nm

3.5.3 Using a solder fume extractor, plug available

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

3.6 Retrofitting and changes

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

> ⚠ **WARNING**
>
> **Personal injury or property damage and environmental damage caused by the machine defective condition!**
>
> ✓ So, please always make sure that retrofitting or modifying the machine does not pose any problem:
>
> a) Prior to making any changes to the machine, or altering its parameters, contact the machine manufacturer!

4 Transport, installation, storage, disposal

4.1 Setting up the rework system

⚠ **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.

✓ Remove the machine from the carton box:

Fig. 1: The lifting points

  a) The machine must be lifted by two people by holding it at the lifting points (1), and removed from its carton box.

  b) Place the machine as far back as possible on the left side of the table.

Fig. 2: Setting up the HR 600/2 unit

✓ To align the machine:

a) To align, use a spirit level. With the levelling feet (2), align the machine horizontally.

b) Observe the following points:

⇨ The device must not be exposed to quick temperature changes! If the device is transported in an environment with wide temperature ranges, before commissioning it must be brought at room temperature over several hours.

⇨ The installation site must be free from draughts of air. Do not install the device close to air ducts or air conditioning devices.

⇨ To position the components smoothly, no extraneous light (e.g. sunlight or ceiling spotlights) must be reflected on the field of vision of the camera.

4.2 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!

4.3 Packaging with TIP n TELL indicator

Fig. 3: Indicator not coloured

✓ 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!

4.4 Unpacking the machine

⚠ CAUTION

Risk of injury!

a) To unpack always use proper tools!

b) Use suitable protective clothing!

NOTE

Disposal

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

NOTE

Find out and ascertain any transport damage

a) Inspect the machine for any transport damage immediately after unpacking it.

b) Immediately notify the forwarder any transport damage.

4.5 Scope of delivery

> **NOTE**
>
> **Is delivery not complete or are there any damaged parts?**
>
> Check the delivery for completeness. If any items are missing or damaged, contact the supplier!

Number	Description	Item number
1	HR 600/2	0HR600/2
1	Thermocouple mount V2	0HR641
1	Air deflector 40 x 40 mm	0HR620-001
1	Air deflector 30 x 30 mm	0HR620-002
1	Air deflector 20 x 20 mm	0HR620-003
1	Board support	238568
1	AccuTC thermocouple without fixture *	0IR6500-37
1	Thermocouple holder	0HR640
1	Placement nozzle, Ø 10 mm	3HR600-06-021
1	Placement nozzle, Ø 4 mm	3HR600-06-022
1	Adaptor for suction device	0IR5500-45
1	Vacuum cup, 5 mm, silicone	0IR4520-02
1	USB 3.0 plug-in card	362553
1	SATA power Y-adapter	362554
1	IDE Y-cable	362556
1	USB flash drive Rework	3BA00149
1	Operating instructions HR 600/2	3BA00207
1	Compressed-air hose, 3 m, 6 mm Ø	98943
1	Lens cleaning kit	0VSLC100
1	USB cable A-B	3ET00241

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

4.6 Unpacking the Rework System

✓ To unpack the machine, two people are required:

a) Transport the machine to the installation site in its carton on a pallet.
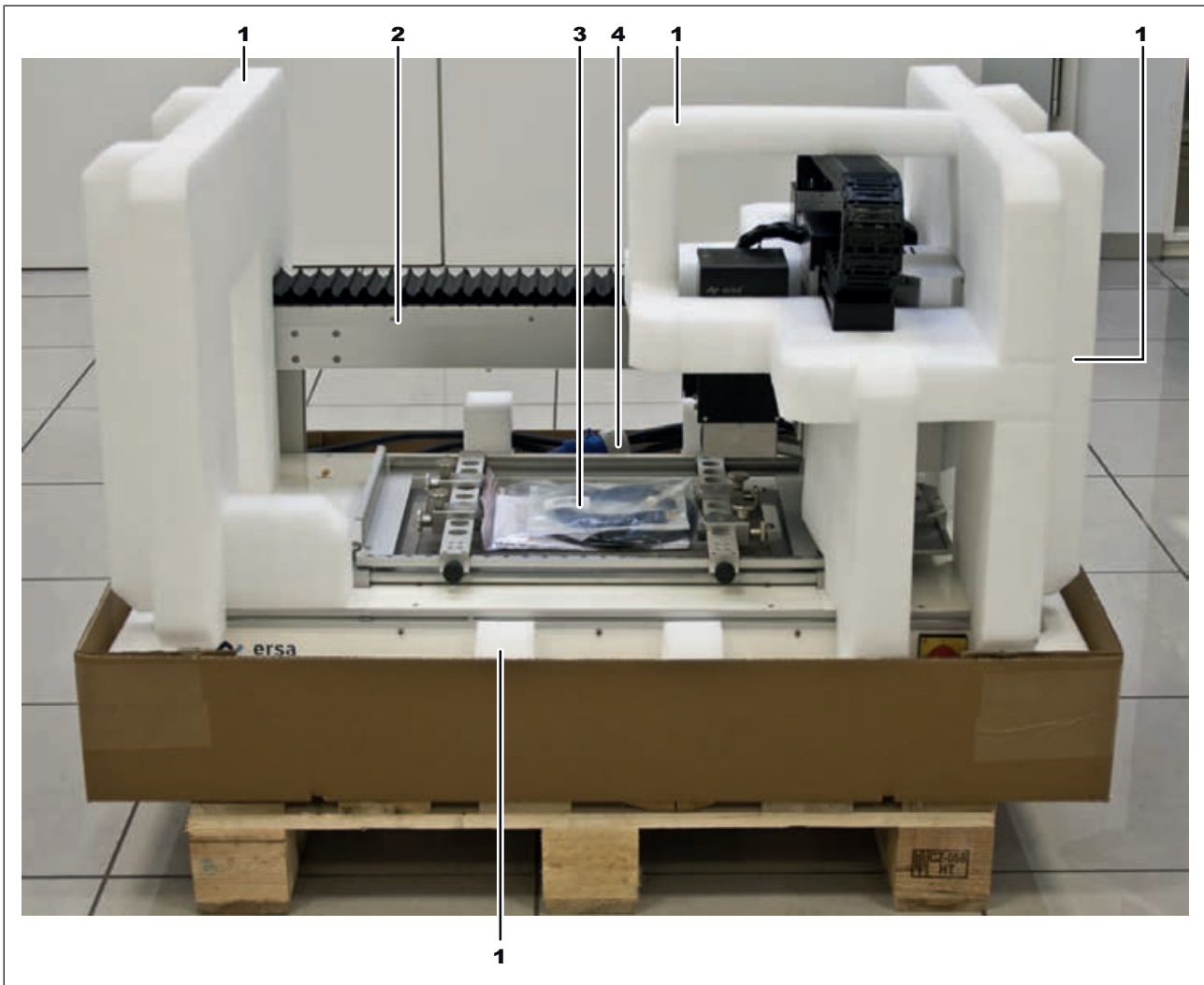
Fig. 4: Opened package

1	Padding material	3	Cables and accessories
2	HR 600/2	4	Power cable

b) Remove the holding straps with scissors.

c) Remove the carton top.

d) Remove the power cable (4) from its fixation and place it on the lower heating.

⇨ The worktable must meet the following requirements:

⇨ The table top must be at least 1500 mm wide and 750 mm deep.

⇨ The table must be stable, level and designed for a load of at least 80 kg. A vibration-free installation of the machine improves working results!

⇨ Install the machine in a place protected from draughts of air!

⇨ If the workstation lighting is too bright, it can interfere with the proper function of the cameras!

e) We recommend keeping the packaging materials for later use.

⇨ Only with this packaging material can the HR 600/2 unit be safely packed, stored and transported!

The possible presence of tempering colours on the heating head is due to manufacturing reasons.

4.7 Setting up the rework system

⚠️ **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.

    ✓ Remove the machine from the carton box:
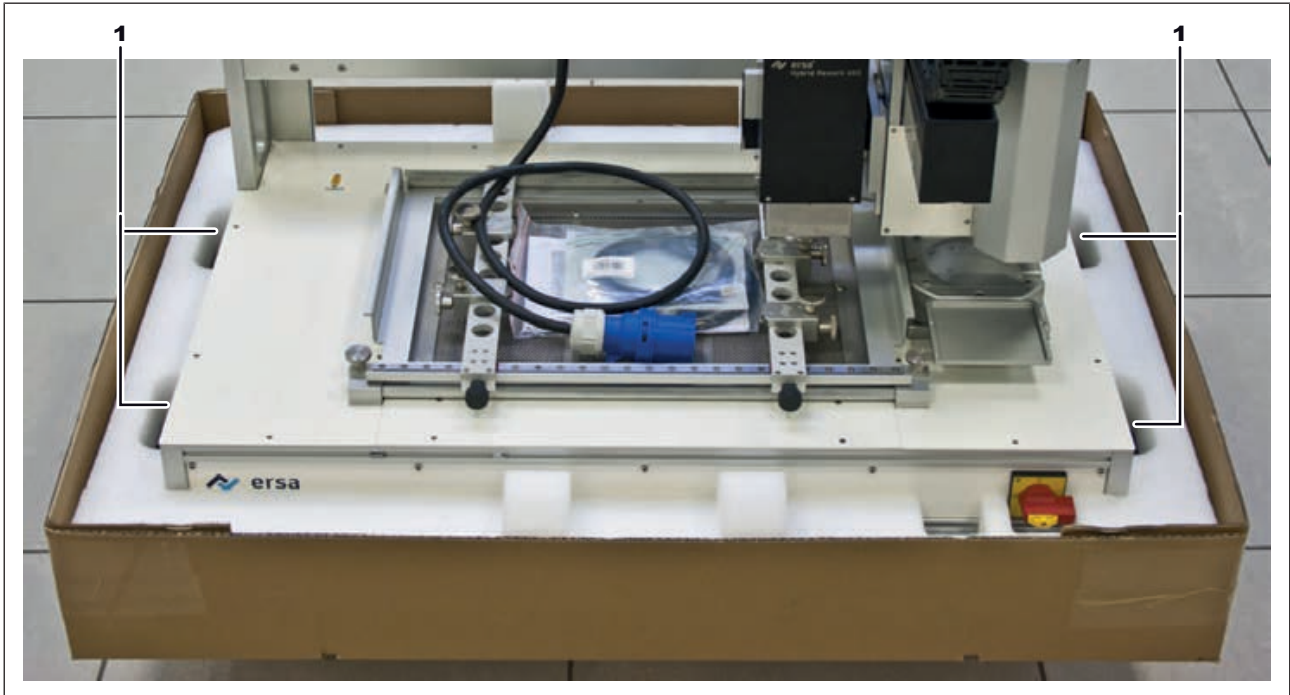
Fig. 5: The lifting points

    a) The machine must be lifted by two people by holding it at the lifting points (1), and removed from its carton box.

    b) Place the machine as far back as possible on the left side of the table.

Fig. 6: Setting up the HR 600/2 unit

✓ To align the machine:

a) To align, use a spirit level. With the levelling feet (2), align the machine horizontally.

b) Observe the following points:

⇨ The device must not be exposed to quick temperature changes! If the device is transported in an environment with wide temperature ranges, before commissioning it must be brought at room temperature over several hours.

⇨ The installation site must be free from draughts of air. Do not install the device close to air ducts or air conditioning devices.

⇨ To position the components smoothly, no extraneous light (e.g. sunlight or ceiling spotlights) must be reflected on the field of vision of the camera.

4.8   Connecting the Rework System

✓ Connecting the machine:

a) Remove all the accessories from the packaging, unwrap them and lay them out.
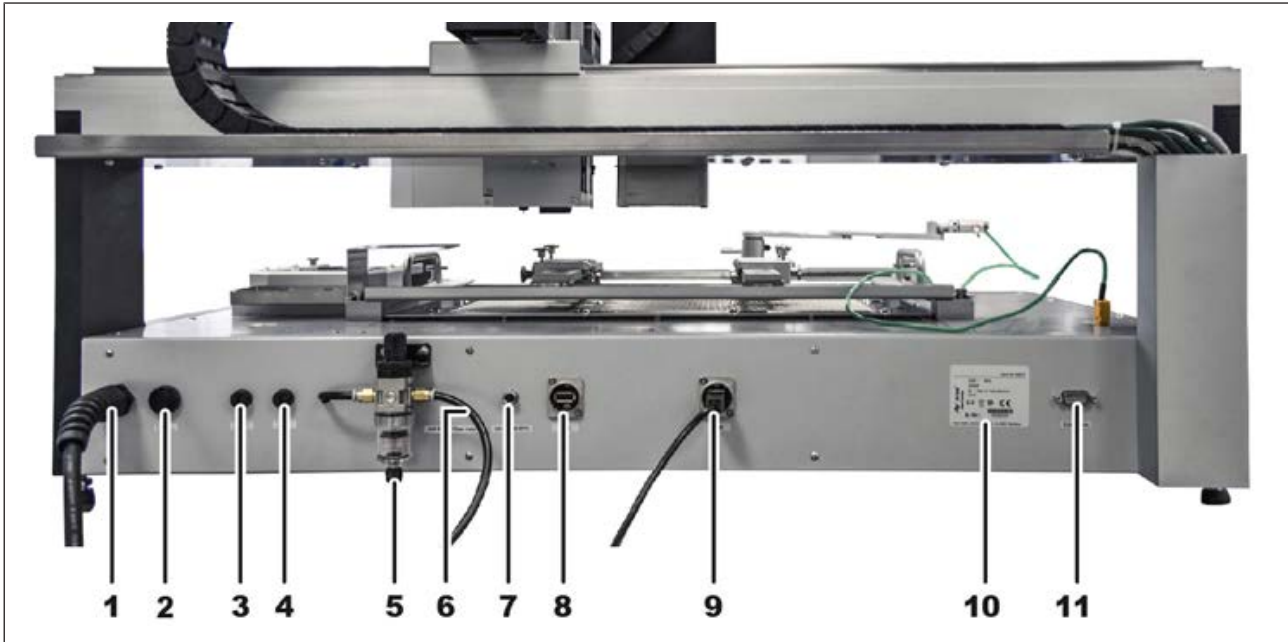
Fig. 7: HR 600/2 back side

1	Power cable	7	Connection for optional RPC camera lighting
2	Main fuse	8	Optional RPC camera connection
3	Zone 1 fuse	9	USB port
4	Zone 2 fuse	10	Nameplate
5	Maintenance unit	11	Connection for the solder fume extractor PLC control system
6	Compressed air hose		

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 [▶ 18].

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 line voltage and the mains frequency with the specifications on the nameplate (10) of the machine.

f) Insert 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.

4.9 Assembling the Accu-TC holder and air deflector

To avoid damage, only insulated thermocouples may be used.

✓ Assembling the Accu-TC holder:
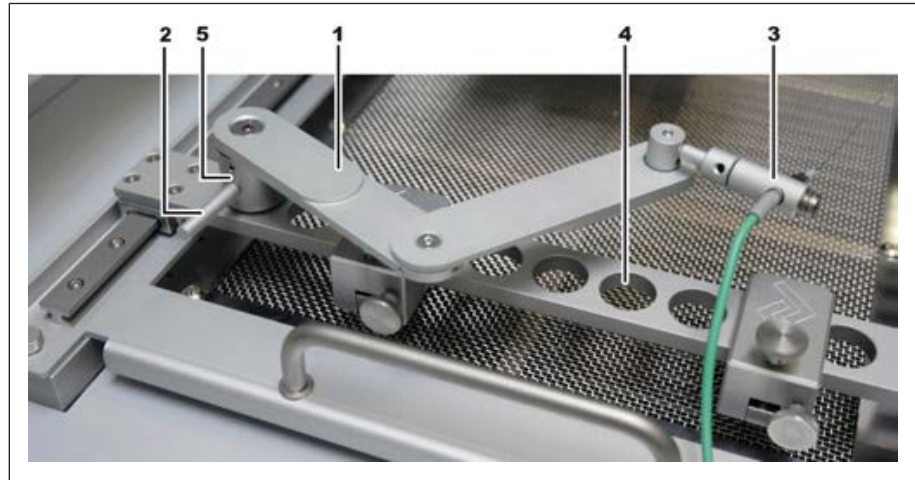
Fig. 8: Assembly of the Accu-TC holder and thermocouple, example picture

a) You can fit the holder into any bore (4) on the product holder. To do this, insert the cylinder (5) into a bore and tighten with the lever (2) counterclockwise.

b) Insert the plug of the AccuTC thermocouple without fixture (Article 0IR6500-37) into the TC1 socket.

c) Mount the thermocouple (3) as shown. To do this, loosen the grub screw at the end of the holder, insert the thermocouple and hand-tighten the grub screw.

✓ If you have to work with air deflectors, fit an air deflector (6):
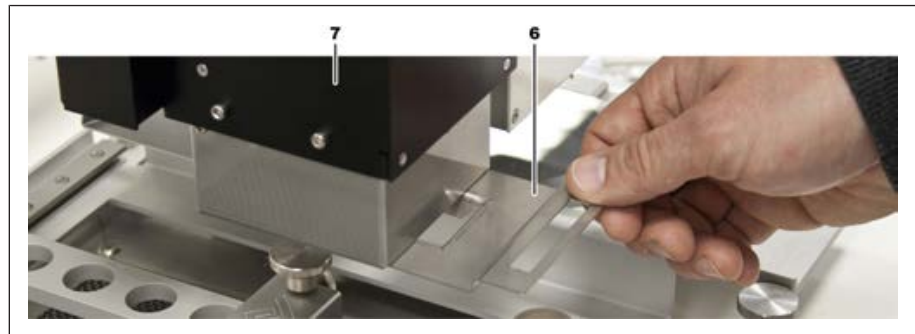
Fig. 9: Inserting an air deflector

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

4.10 Assembling an RPC camera

✓ If you use the optional RPC camera, no. 0HR610P:
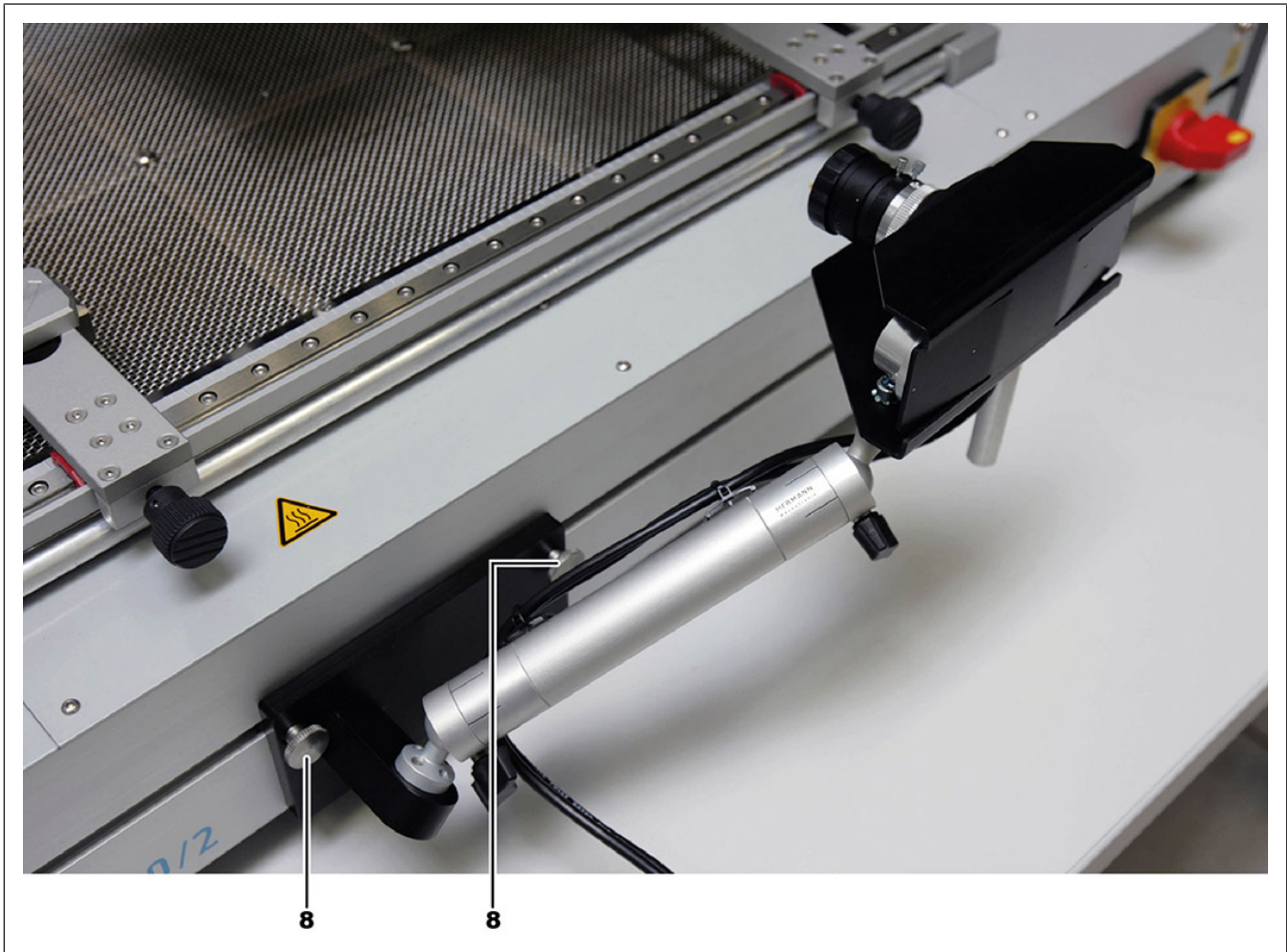
Fig. 10: Assembling an RPC camera, example picture. Run the camera cables under the Re-work System backwards.

  a) Fit the RPC camera to the rail (8) using two knurled screws. With regard to this, please read document [3BA00222 Connecting RPC camera].

  b) Connect USB cable and LED cable to the back of the machine. Run the camera cables under the Rework System backwards. With regard to this, please also read Chapter Connecting the Rework System [▶ 37].

Technical data of the optional RPC camera: 10 MP CMOS USB colour camera, 25 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

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

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

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

5 Commissioning

5.1 Setting up the PC

To set up the PC for the Rework System, sequentially perform all the activities described here.

The PC system requirements can be found in Chapter PC system requirements.

– The PC user must have administrator rights.

– Devices must be assembled and connected as described in the previous chapters.

– Do not connect the HR 600/2 unit and the PC yet.

– Do not use a network cable or wireless LAN yet.

Preparing the PC

a) Switch on the PC and wait for the operating system to start.

Disable the power saving mode:

a) Click on the Windows button on the bottom left of the screen. Now enter: "Power options." [Power options] will be shown in a list. Click on this.

⇨ The [Power options] dialog is displayed.

b) Click on [Change plan settings].

c) Now set: [Put the computer to sleep:] never.

d) Click on [Save settings].

Set in such a way that Windows also displays hidden files:

a) Click on the Windows button on the bottom left of the screen. Now enter: "Hidden." [Hidden files and folders] will be shown in a list. Click on this.

⇨ The [View] tabulator will appear.

b) Scroll to [Hidden files and folders].

c) Select [Show hidden files and folders].

d) Click on [OK].

Installing HRSoft

a) On the PC drive C: create a new folder at the highest directory level into which you will later copy all Rework System data. Name the folder "Ersa data."

b) Enter the data carrier [USB flash drive Rework] (item 3BA00149) into the CD drive.

c) Display the CD contents and copy them all into the newly created folder "Ersa data."

The [USB flash drive Rework] data includes programs, drivers, operating instructions, accessory descriptions and other technical information.

a) Open folder [C: \ Ersa Daten \ Software \ HRSoft \ HRSoft_Setup_vXXX] in the copied data.

b) Start the [setup.exe] installation program by double-clicking.

⇨ The HR 600 control program HRSoft has been installed. Follow the instructions on the screen.

Manually installing the uEye USB camera driver

a) Click on the Windows button on the bottom left of the screen.

b) Now enter: "Devices." [Device manager] will be shown in a list. Click on this.

⇨ The [Device manager] will open.

c) Select the [uEye USV camera] device and right-click to launch [Update driver software].

d) In the next window, click on [Browse my computer for driver software].

e) In the next window, enable the [Include subfolders] checkbox and click on [Browse].

f) Navigate to folder "C: \ Ersa Data \ Software \ Drivers \ uEye USB camera driver."

g) Select the 32-bit driver "yEye-Full-xxxx-32bit-WHQL" only if you are using an older 32-bit based PC. Otherwise select the 64-bit driver.

h) Click on [OK].

i) If a query appears, select : [Drivers only].

⇨ The driver has been installed.

Connecting and switching on the HR 600/2 unit

a) Connect the PC with the supplied USB cable to the HR 600/2 unit. With regard to this, please also read Chapter Connecting the Rework System [▶ 37].

b) Use the main switch to turn on the HR 600/2 unit. With regard to this, please also read Chapter Overview of the machine parts [▶ 54].

⇨ A number of device drivers are automatically installed on the PC. The [HR600-0XXX] removable data carrier appears as a drive in Windows Explorer. Number 0XXX corresponds to the HR 600 serial number.

Disabling the Active Management Technology

a) Click on the Windows button on the bottom left of the screen.

b) Now enter: "Devices." [Device manager] will be shown in a list. Click on this.

⇨ The Device manager will open.

c) Open the [Ports (COM & LPT)] line.

d) Under it, select [Intel(R) Active Management Techlology - SOL] and right-click to launch [deactivate].

Manually installing the FTDI/HR600 USB driver

Under [USB Controller], the [FTDI USB driver] shows an exclamation mark. For this device, install the driver manually.

To install the FTDI USB driver:

a) Select the [FTDI USB driver] and right-click to launch [Update driver software].

b) In the next window, click on [Browse my computer for driver software].

c) In the next window, enable the [Include subfolders] checkbox and click on [Browse].

d) Navigate to folder "C: \ Ersa Data \ Software \ Drivers \ FTDI USB driver Rework Systems."

e) Click on [OK].

⇨ The driver has been installed and the exclamation mark in Device manager disappears.

a) If more exclamation marks are visible in Device manager, also install the drivers for them.

Transferring calibration data

Calibration data must be copied from the HR 600 data carrier to the PC hard disk:

a) Open the [HR600-0XXX] removable data carrier.

b) Holding down the shift key, select the [Calibration Data] folder and the [Specific Control Settings] file.

c) Select the [Copy] command.

d) Open the [C: \ ProgramData \ ERSA GmbH \ HRControl] directory.

e) Copy the files to this directory with the [Paste] command. In case of a query: overwrite the existing files.

⇨ The PC has been set up.

5.2 Starting HRSoft and setting up the database connection manager

It is possible to use an SQL server on a network drive and store the database there. This database can then be used simultaneously by multiple users of the HR 600/2 unit. For any questions about the regular backup of the database, contact your network administrator.

✓ To start HRSoft:

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

⇨ You may need to register as a user, so please read the chapter <u>Creating a</u> <u>user [</u>▶ 91].

b) Enter user name and password.

⇨ A message appears.

c) If you wish to continue in the user language German, confirm the message with [OK].
If you want to change the user language to English, click on [Cancel] and then click on the [Options] button in the [Extras] tab. The [Options] button will only be visible if you are logged in as [Administrator] or as [Power user].
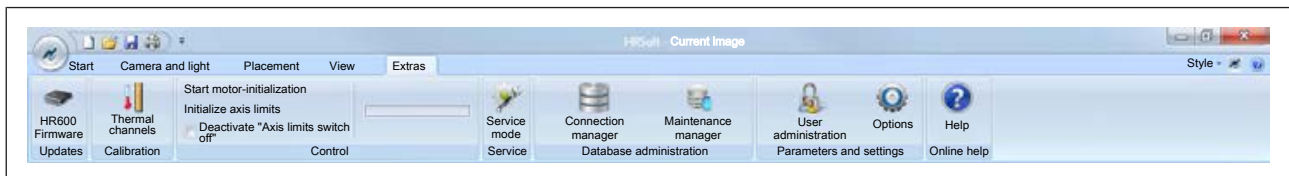
The [HRSoft options] dialog will open. The language can be changed in the [Languages] frame.
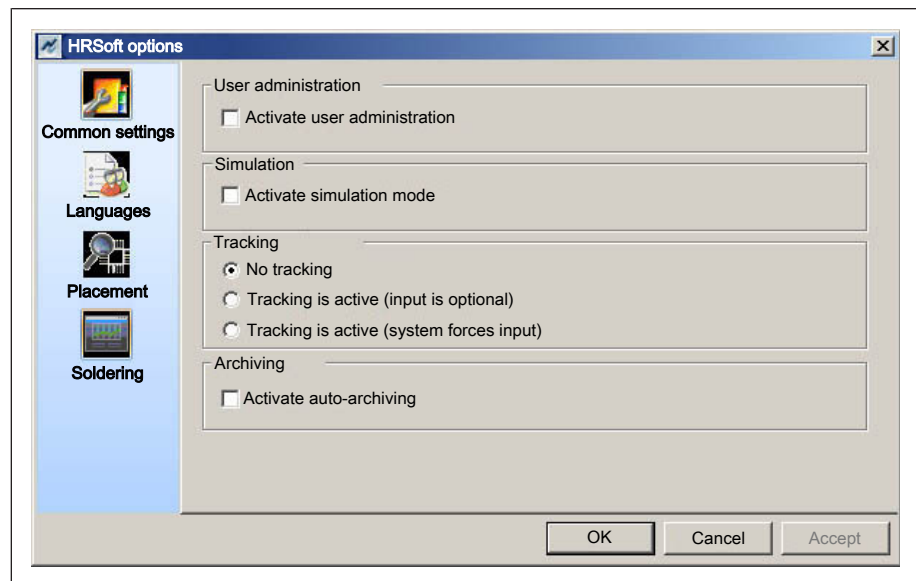
a) Click on [OK].

⇨ A reference run will be performed. Keep the travel paths of the axles clear!

⇨ HRSoft is started.

⇨ The [Database assistant] appears:
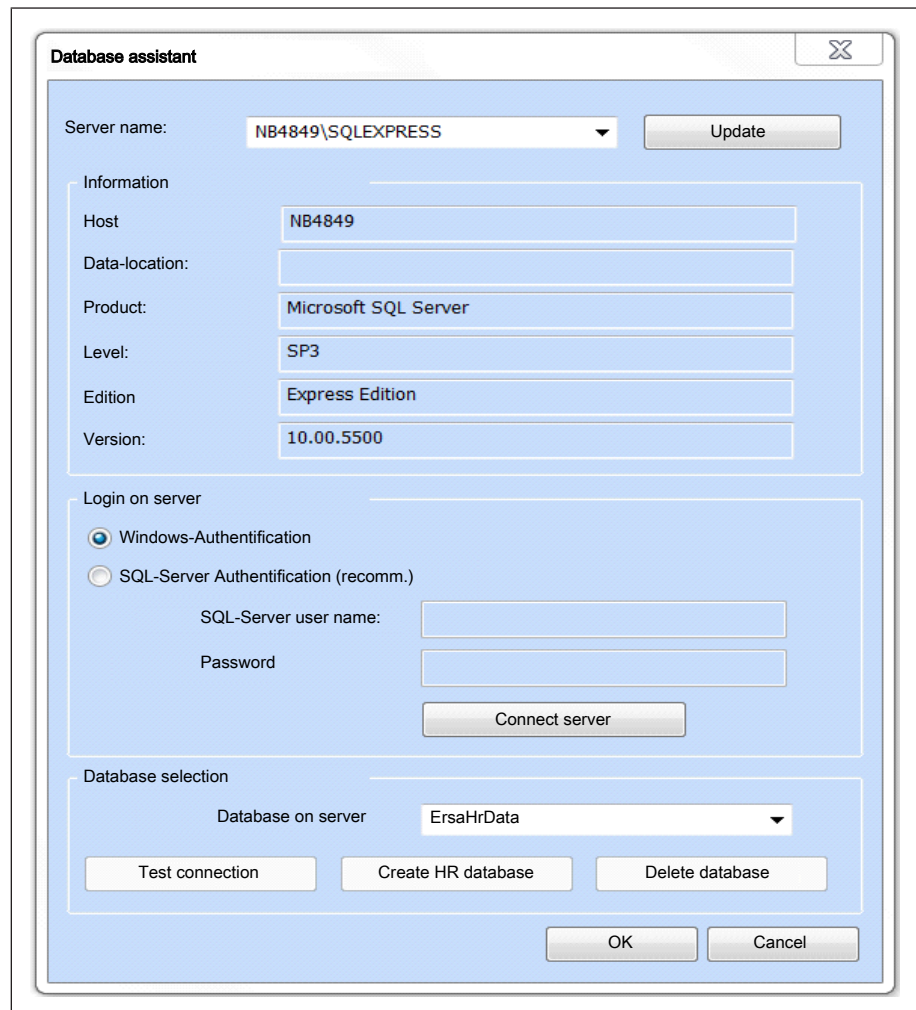
Fig. 11: Database Connection Manager This window appears when you first start HRSoft. With regard to this point, please read the chapter Database assistant [▷ 97] as well.

✓ Make the following settings:

a) Select the item [Eigener PC\SQLEXPRESS] in the drop-down menu [Server name:].

b) Click on the [Database selection] button in the [Create HR database] frame.

c) Select the item [ErsaHrData] in the drop-down menu [Database on server].

d) Click on the [Test connection] button.

⇨ A query dialog is displayed.

e) Confirm with [OK].

f) Close the [Database assistant] by clicking on the [OK] button.

⇨ The message [Cameras and axes will be referenced now] appears.

g) Click on the [OK] button to reference the camera and axles.

⇨ Cameras and axles have been referenced. Keep processing path and pick-up area free!

⇨ Wait until referencing ends. Referencing can take up to 30 seconds.

a) Do not click on the [Cancel] button, otherwise various functions will not be supported.

⇨ HRSoft start screen appears.
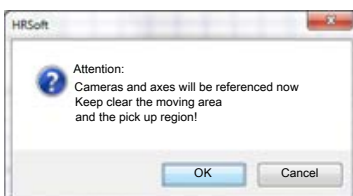
You can change the database settings later. With regard to this point, please read the chapter Database assistant [▷ 97].

For any questions about the regular backup of the database, contact your network administrator. You can also back up the database manually. With regard to this, please read Chapter Database administration and maintenance manager [▶ 100].

5.3 Initialisation of motors and axis limits

> ⚠ **CAUTION**
>
> **Risk of material damage!**
>
> Initialisation was already done during the Rework System set up and does not need to be changed. Axle initialisation may only be carried out by trained, specialised personnel!

✓ To initialise the motor and axis limits, and to disable axis shutdown:

a) The relevant functions [Control], [Start motor-initialization] and [Initialize axis limits] are available in the [Deactivate "Axis limits switch off"] menu range.

⇨ [Start motor-initialization]: Use this button to initialise the motor parameters for the X, Y and Z axes and rotate the latter. Perform this function only when requested by Ersa skilled personnel. The process will take approx. 5 minutes. The initialization progress is indicated by the indicator bar next to the button and by messages in the information window of the work area. A message will then appear. Now switch the rework system off and back on again.

⇨ [Initialize axis limits]: Use this button to initialise the limit switch for the X, Y and Z axes. Perform this function only when requested by Ersa skilled personnel. The process will take a few seconds, as shown by the indicator bar next to the button. A message will then appear. Now switch the rework system off and back on again.

⇨ [Deactivate "Axis limits switch off"]: Disables the axle shutdown. Do not use! Do not stop the motors, risk of damaging the machine!

6 Function description

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 maintainance by people who are not sufficiently qualified and informed can cause severe damage to the machine or damage to people.

b) Such work may therefore only be performed by properly trained personnel! This personnel must be able to recognize the hazards that can be caused by the system mechanical, electrical or electronic equipment.

c) The people who carry out such work must know and have understood the contents of these instructions.

d) Any person involved in the installation, commissioning, operation and/or maintenance of the machine must have read and understood the contents of the "Safety instructions" chapter, as well as the chapters which are relevant for the specific activity!

6.1.2 Supplementary documents

NOTE

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.

6.1.3   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
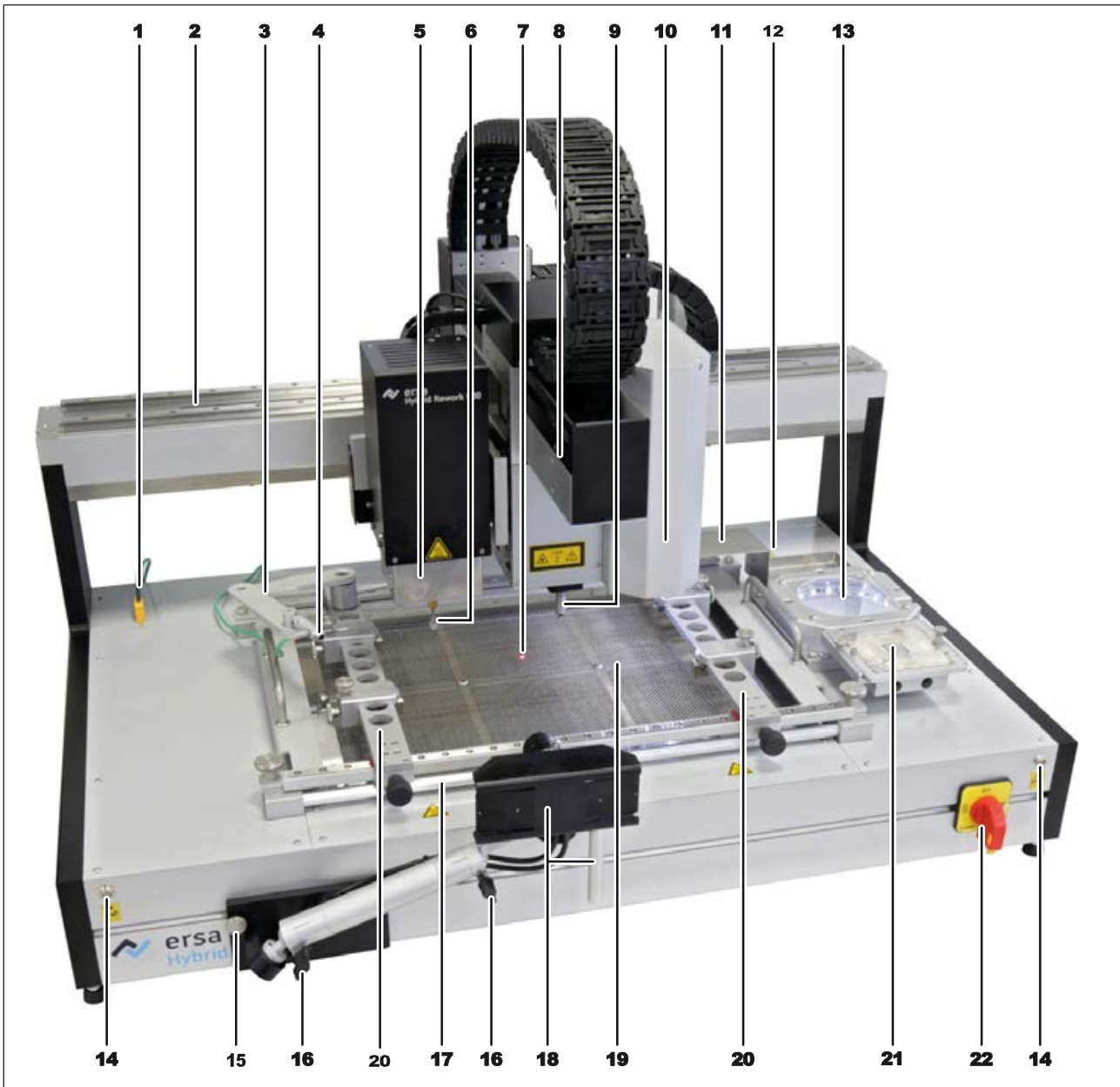
Fig. 12: Overview of the machine parts

1	Connection socket thermocouple 1 (TE1)	12	Connection socket thermocouple 2 (TE2)
2	X axle	13	Glass plate, component support and component identification
3	Telescopic holder for the thermocouple	14	Connection for the ESD strap
4	Thermocouple 1	15	Fastening screw for the optional RPC camera
5	Heating head, height-adjustable	16	Location screw position for the optional RPC camera
6	Pipette	17	Air baffle pipe cooling
7	Laser beam for component positioning	18	Optional RPC camera
8	Y axle	19	Lower heating, 3 zones
9	Pick-and-place nozzle	20	Insertion frame
10	Upper camera	21	Dip & Printstation holder
11	Storage tray for desoldered components	22	Main switch, lockable
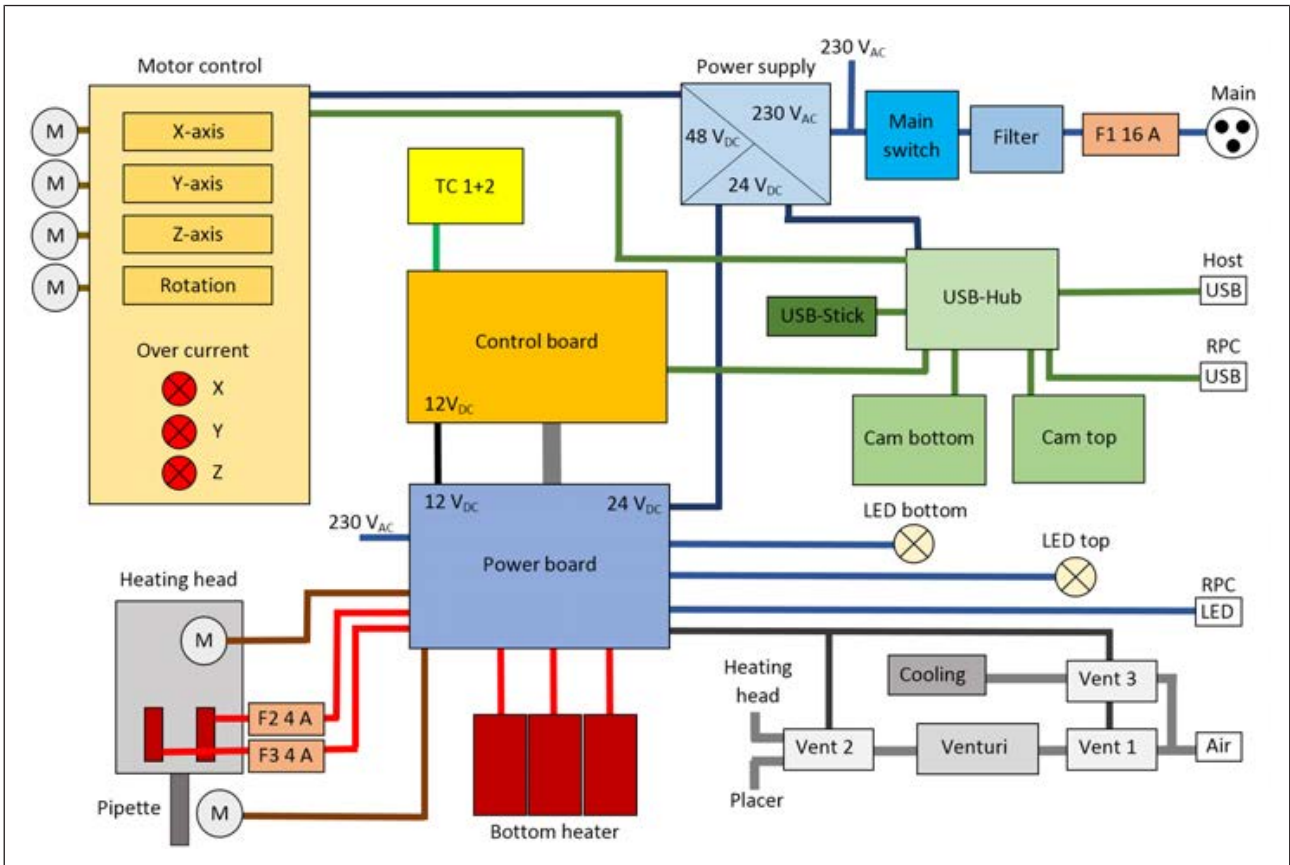
Fig. 13: HR 600 block diagram

6.3   Switching on the Rework System and starting HRSoft

✓ To switch on the Rework System proceed as follows:

a) Switch on the PC

b) Use the main switch [22] to turn on the Rework System

c) Start the HRSoft program on the PC by double-clicking the HRSoft icon on the desktop

⇨ A message appears. Make sure that the travel paths of all axles are clear. Pay special attention to thermocouples or PCBs in the movement area.

d) Click [OK].

e) Wait until the Rework System has performed auto-diagnostics and completed its referencing process.

⇨ Finally, the head remains in the start position and the Rework System is ready for operation.

Info: The chapter Tutorial describes the working steps of the processes Desoldering a component [▶ 124] and Soldering a component [▶ 135] .

6.4 The user interface

After starting HRSoft, the user interface to control the HR 600/2 unit will be displayed. The start dialog is divided into the following areas:

Fig. 14: The start dialog

1	The menu list (see ChapterMenu bar [▶ 58]) with the five tabs Start, see Chapter The [Start] tab [▶ 59], Camera and light, see Chapter The [Camera and light] tab [▶ 61], Placement, see Chapter The [Positioning] tab [▶ 63], View, see Chapter The [View] tab [▶ 65] and Extras, see Chapter The [Extras] tab [▶ 66]	5	The display window
2	The Automation bar See Chapter The automation bar [▶ 68]	6	For the function selection with its four work areas Soldering, please see the following chapters: The work area [Soldering] [▶ 71], Placement; The work area [Placement] [▶ 74], Profile library; The work area [Profile library] [▶ 77] and Archive, The [Archive] work area [▶ 79]

3	The tabs to display windows		7	The parameter windows Actual parameters, Data table, System settings and System info See Chapter The parameter windows [▶ 81]
4	For the work area, also see No. 6 "The four work areas"		8	The status bar Read Chapter The status bar [▶ 86].

6.4.1 Menu bar

The menu bar (1) offers a large number of functions. Depending on the activated tabs and function selection, the menu bar changes its appearance.

There are four buttons in the top-left corner of the screen, in the Quick Access area:

– New: Selects new [Online-HR 600] tab. With regard to this, please also read Chapter The window [Online HR 600] [▶ 87].

– Open: Importing a solder profile (*.HRS file) from any path.

– Save: Saving a solder profile as a *.HRS file from any path.

– Fast printing: Printing the [Online-HR 600] tab with the default printer.

There are three buttons in the top-right corner of the screen:
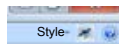
– [Style]: Opens a menu for selecting different colour modes for the HRSoft program.

– Ersa button: Opens the program information window. Also shows the installed program version of HRSoft.

– Question mark button: To invoke the program help tool.

The following menus can be displayed in the menu bar:

6.4.1.1 The [Start] tab

Menu area [Control]:

Manually connection of the HR 600/2 unit to the axle control, and user change.

– [Connect]: This button restores the connection between HR 600/2 and PC in case it was lost.

– [Change user]: Switch to other users with other access rights by entering the password. The button is visible only when the user administration is active. With regard to this, please also read Chapter [The [Options] button].

Menu area [Data accesses]:

You can record the processes occurring when working with the HR 600/2 unit. You can display, save and export this process data. With regard to this, please read Chapter Record, archive and analyse processes [▶ 141].

– [Open]: Opens a saved recording process. The file must be available in [.hrs] format. The [.hrs] file may be loaded on other HR 600 devices or sent to Ersa Service.

– [Save]: Saves the current recording process in the [.hrs] file format.

– [Print]: Prints the current recording process.

– [CSV export]: Exports the current process record in [.csv] format, so that it can be further processed as a file in Microsoft™ Excel.

Menu area [Record processes]:

To represent, record, delete and archive processes.

– [Diagram settings]: To change the graphical representation of the diagram in the [Online-HR 600] window, e.g. colour mode and line thickness. With regard to this, please read the chapter The window [Online HR 600] [▶ 87].

– [Setpoint curve]: To show the temperature pattern specified in the [Online-HR 600] window. The [Setpoint curve] is configured in the profile in the [Profile settings] tab. With regard to this, please read the chapter Adjusting gradients in the [Profile setting] tab [▶ 114].

– [Record]: Manual start or stop of the record of positioning and inspection processes. Soldering and desoldering processes may be recorded automatically. With regard to this, please read the chapter Creating a user [▶ 91].

– [Delete]: Deletion of the current recording process.

– [Archiving]: Manual archive of the recording process.
If in the [Extras] tab, under the [Options] menu area, the [Activate auto-archiving] function is enabled, data will be automatically archived. Manual archiving is not possible in this case, and the [Archiving] button will turn grey. With regard to this, please also read Chapter Setting the language and user control panel.

The button for manually archiving process records will become active at the end of the process if automatic archiving is disabled.

Menu area [Analysis functions]:

To analyse recorded processes. This function is possible during process recording, or after invoking an already archived process. With regard to this, please read Chapter <u>Record, archive and analyse processes [</u>▶ 141].

- – [Cursor]: Enables an analysis cursor in window [Online-HR 600].
- – [Add dot]: Adds an analysis point.
- – [Delete dot]: Deletes the last analysis points one after another.
- – [Delete all dots]: Deletes all analysis points.

6.4.1.2 The [Camera and light] tab
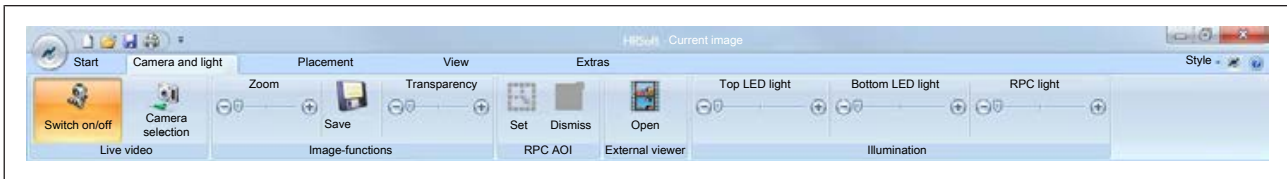
Menu area [Live video]:

– [Switch ON/OFF]: Switches on the camera function. When the camera function is disabled, no camera can be selected. As a result, the buttons under the [Camera selection] drop-down menu are disabled.

– [Camera selection]: In the drop-down menu you can select a camera: [Top camera], [Bottom camera] or [RPC-camera]. The image captured by the selected camera is then displayed in the Camera selection] window.

Do not use the functions [Save corner], [Calibration standpoint/endpoint] and [Capture component limits] in the context menu of the right mouse button.

Menu area [Image-functions]:

– [Zoom]: Move the slider to zoom the camera image.

– [Save]: Saves the current image in format [.bmp] into directory C:\TEMP.

– [Transparency]: If the images are overlaid by the lower and upper cameras (component overlay view), you can move the slider to change transparency. The function buttons of the keyboard are assigned as follows:

<F4> Overlay thicker or overlay white

<F5> Change overlay colours

<F6> Red frame

<F8> Recalculate component position

Menu area [RPC AOI]:

– [Set]: Only with optional RPC camera. After clicking, you can set the RPC camera image section with the mouse.

– [Dismiss]: Deletes a specified image section. Also possible via function call by right-clicking on the image section.

Menu area [External viewer]:

The button opens the external Ersa LiveViewer in which a camera image is displayed in its own window. Especially suitable for the optional high-resolution RPC camera.

Display a high-resolution detail image with the optional RPC camera:

a) Adjust the two clamp screws on the ball joints of the RPC camera in such a way that the camera can be moved while at the same time retaining its position.

b) In the [Illumination] menu area, set the [RPC light] controller to maximum.

c) Focus the camera on its target position and set the lens brightness and focus with both controllers.

d) Right-click to launch the function [Set AOI for the RPC camera]. (AOI = Array of interest). In this way you will set the camera to high-resolution mode.

e) To determine the final zoom, drag a red frame with the left mouse button around the focus area.

⇨ The detail image will be displayed in high definition. In this way you can for example observe the solder melting process.
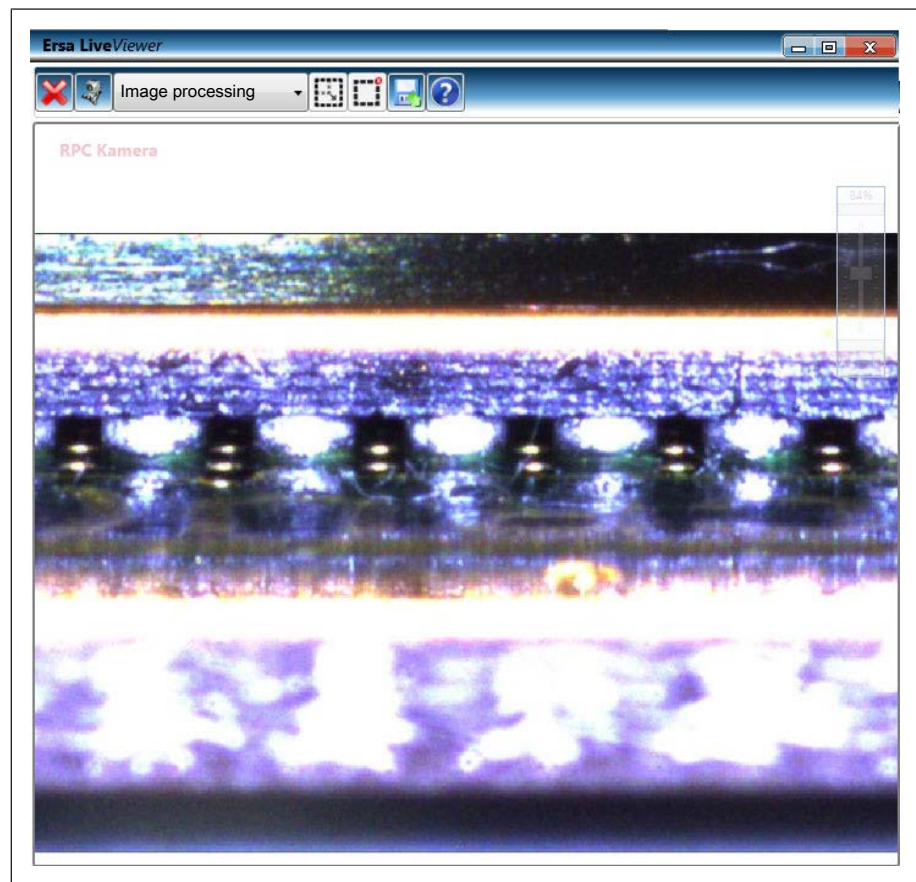
Fig. 15: Ersa LiveViewer

Double-clicking in the LiveViewer top bar enlarges the window to screen size.
You can zoom the camera image via the mouse wheel.
Place the mouse cursor on the line below the LiveViewer top bar to open the additional menu bar with all functions. The functions of the menu bar:

In the menu you can choose the desired camera. On the right of the menu, the two buttons for high-resolution mode (also accessible via right-click). Clicking on the disk symbol saves the current image in the [.bmp] format in the C:\TEMP directory.

Menu area [Illumination]:

In this menu area you can adjust the brightness of the illuminations. Normally, the system regulates illumination automatically.

– [Top LED light].

– [Bottom LED light].

– [RPC light], only with the optional RPC camera connected. The RPC camera lighting can be adjusted via this controller. It can be adjusted on the camera itself via the aperture of the RPC camera lens.

6.4.1.3 The [Positioning] tab
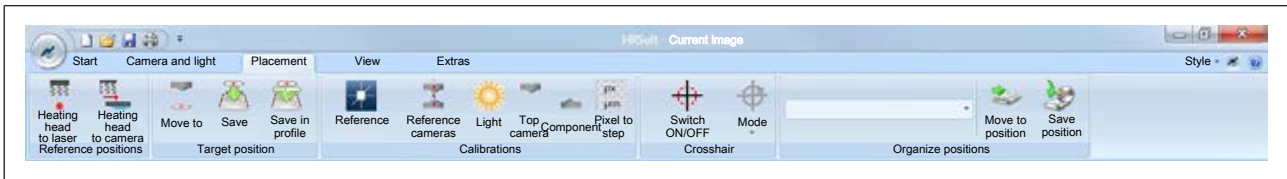
If you are logged in the user administration as [Power user], the [Top camera], [Bottom camera] and [Pixel to step] are not visible.

If you are logged in as [Standard user], also the [Save target position] button is not visible. With regard to this point, please read the chapter [Creating a user [▸ 91]].

Menu area [Reference positions]:

You can bring the heating head exactly to the position of the laser or of the camera. To do so, with the arrow buttons and the key combination [Ctrl] + [Arrow key], move the laser or the camera exactly to the centre of the component. Then, the following functions are available:

> ⚠ **DANGER**
>
> **Laser beam! Risk of injury due to retinal burns**
>
> a) Do not stare into the laser beam!
>
> b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
>
> c) Class 2 laser according to DIN EN 60825-1:2008-5, P < 1 mW, λ = 650 nm

[Heating head to laser]: Moves the heating head to the position of the laser.

Switching on the laser with the button ▣. Keep the travel path of the axles clear!

– [Heating head to camera]: Moves the heating head to the position of the current camera image. Keep the travel path of the axles clear!

Menu area [Target position]:

The last position reached within a process is always saved. The following functions are available:

– [Move to]: The upper camera moves to the target position which was last saved. Keep the travel path of the axles clear!

– [Save]: The current position is saved as global target position.

– [Save in profile]: The current position is saved in the profile in use.

Menu area [Calibrations]:

In this menu you can calibrate axles, cameras and lighting. The following functions are available:

– [Reference run]: Performs a reference movement of the [X/Y/Z] axles. After axle locking and step loss of the conveyor motors, calibration must be performed via a reference run. Keep the travel path of the axles and the pick-up area clear!

– [Reference cameras]: Moves the upper camera to the glass plate and references the upper and lower cameras. Keep the travel path of the axles clear! The fiducial marks (rows of dots on the glass plate) must not be covered. After referencing, the fiducials are to be shown in green in window [Current image]. If this is not the case, it may have the following causes:

– Too bright workplace lighting will adversely affect the camera proper operation.

– The glass plate is very dirty.

– The positions of the cameras are not set up correctly. With regard to this, please read document [HR600 Setup instructions.pdf] on the data carrier [USB flash drive Rework] [3BA00149].

– [Light]: Performs lighting calibration. For correction in the case of changed ambient lighting or after relocating the Rework System.

– [Top camera]: Performs the calibration of the upper camera. Do not use! For service staff only. Necessary for exact positioning.

– [Component]: Performs the calibration of the lower camera. Do not use! For service staff only. Necessary for exact positioning.

– [Pixel to step]: Recalculates the [Pixel to step] factor. Do not use! For service staff only.

Menu area [Crosshair]:

Use the crosshair tool to manually position a component. Stop the movement as soon as the crosshair has reached the centre of the component.

– [Switch ON/OFF]: Switches on the crosshair. It is then displayed in window [Current image].

– [Mode]: Displays the crosshair normally (+) or diagonally (x).

Menu area [Organize positions]:

In the drop-down menu, use the [Change nozzle] bottom function to replace the pick-and-place nozzle.

– [Move to position]: The selected position for replacing the pick-and-place nozzle has been approached.

– [Save position]: The position approached for the pick-and-place nozzle replacement has been saved. This button is not visible to standard users.

After a heating head change, the Rework System must memorise the pipette position again.

– [Heating head to laser]: Use in the process Re-memorising the pipette position [▷ 168].

Do not use all the other functions of this drop-down menu! For service staff only.

6.4.1.4 The [View] tab

In this menu you can set various preferences. With regard to this, please read the chapter Customizing the presentation of charts and windows [▸ 89].

Menu area [View]:

– [Library]: Hide sand shows the [Library] window. With regard to this, please read Chapter The work area [Profile library] [▸ 77].

– [Actual parameters]: This button can hide and show all tabs in the lower section of the parameter window. The drop-down menu commands show or hide single parameter windows under this button.

– [Status bar]: Hides and shows the status bar at the bottom of the screen. The status bar has only a display function if you are logged in as a standard user. With regard to this, please read Chapter The status bar [▸ 86].

Menu area [Window]:

– [Window]: Opens the [Window]dialog in which you can determine which tabs to show.

6.4.1.5 The [Extras] tab

The [Extras] tab is reduced to the [Options] and [Help] buttons if you are not logged in as [Administrator]. All settings contained in the [Extras] tab have already been made when commissioning the HR 600/2 unit. These settings must only be changed by trained, qualified staff!
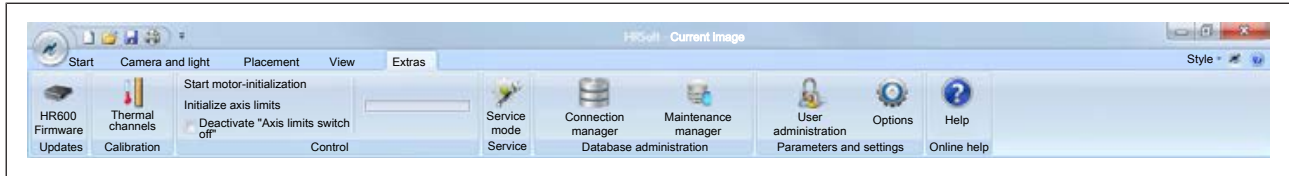
Menu area [Updates]:

– [HR600 Firmware]: Performing a firmware update. With regard to this, please read Chapter Firmware update [▶ 102].

Menu area [Calibration]:

– [Thermal channels]: Performs thermal channels calibration. Do not use! For service purposes only.

Menu area [Control]:

⚠ **CAUTION**

Risk of material damage!

Initialisation was already done during the Rework System set up and does not need to be changed. Axle initialisation may only be carried out by trained, specialised personnel!

– [Start motor-initialization]: Performs a motor initialization. With regard to this, read Chapter [Initialisation of motors and axis limits [▶ 50]].

– [Initialize axis limits]: Initialises the axis limits. With regard to this, read Chapter [Initialisation of motors and axis limits [▶ 50]].

– [Deactivate "Axis limits switch off"]: Disables the axle end stop shutdown. Do not use! The motors do not stop, you risk damaging the machine!

Menu area [Service]:

– [Service mode]: Do not use! Move axles despite lowered heating head or pipette. Risk of damages to the machine!

Menu area [Database administration]:

– [Connection manager]: Opens the [Database assistant] dialog. With regard to this point, please read the chapter Database assistant [▶ 97].

– [Maintenance manager]: Opens the [Database service] dialog. With regard to this, please read Chapter Database administration and maintenance manager [▶ 100].

Menu area [Parameters and settings]:

– [User administration]: Opens the [User administration] dialog. With regard to this, please read the chapter Creating a user [▶ 91].

– [Options]: Opens the [HRSoft options] dialog. With regard to this, please also read Chapter Setting the language and user control panel.

Menu area [Online help]:

- – [Help]: Opens [Online help].

6.4.2 The automation bar

The four left-hand buttons of the automation bar control the process, while the six right-hand buttons control the single process steps.
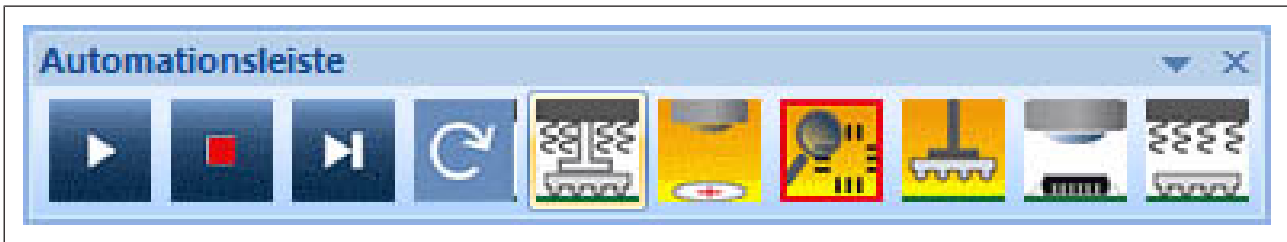

Fig. 16: The automation bar

To use a profile, select it in the profile table and enable it in the [Profile library] work area by clicking on the [Activate] button. With regard to this, please read the chapter The work area [Profile library] [▶ 77]. The process steps included in the profile are marked in yellow in the automation bar. A red frame around a button shows the process step that will be performed next.

Left-click on a button of the process steps to set or delete the yellow marking. This allows you to enable or disable process steps independently of the profile definition.

To set the red frame, right-click on a process step button. This is the process step that will be executed next.
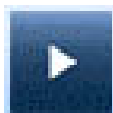
– [Start the process]: Starts the currently activated profile or interrupts a running profile. Between two process steps, the button is shortly displayed as a pause symbol.

– [Pause the process]: By clicking the pause button, you can stop the process, run tests or change settings. Then click on the [Start the process] button to resume the process. The display time of the pause symbol can be adjusted using the [Options] button. With regard to this, please also read Chapter The [Options] button.
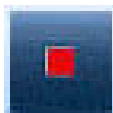
– [Stop the process]: Fully stops the current process, the machine stands still. If the vacuum is active, it is turned off.

Note: Via the [Start or stop soldering process] and [Start or stop desoldering process] buttons in the [Soldering] work area, terminate the soldering or desoldering process so that the component can be stored.

– [Run next process step]: Starts the next process step as a single step. After the process step, the process is held until you click again on this button. In the first status display, the executed process step is displayed. With regard to this, please read Chapter The work area [Placement] [▶ 74].

– [Repeat last procedure step]: Performs the last process step again. It may be used in single step mode between process steps or in automatic mode in the pause times between process steps.
During automatic detection of component connections on the glass plate, clicking on this button several times improves component detection by the camera. If the component is not detected automatically, each further click on this button will reduce the luminance intensity for improved component identification.

– [Start desolder process]: If it is marked in yellow, the desoldering process is carried out.

– [Go to target position]: If it is marked in yellow, the target position on the PCB is approached with the camera.

– [Run pin detection]: If it is marked in yellow, the pins (connections) of the component on the glass plate are detected.
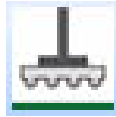
– [Place the component]: If it is marked in yellow, the component is placed on the PCB.

– [Start inspection]: If it is marked in yellow, the target position on the PCB is inspected with the camera.

– [Start soldering porcess]: If it is marked in yellow, the soldering process is carried out.
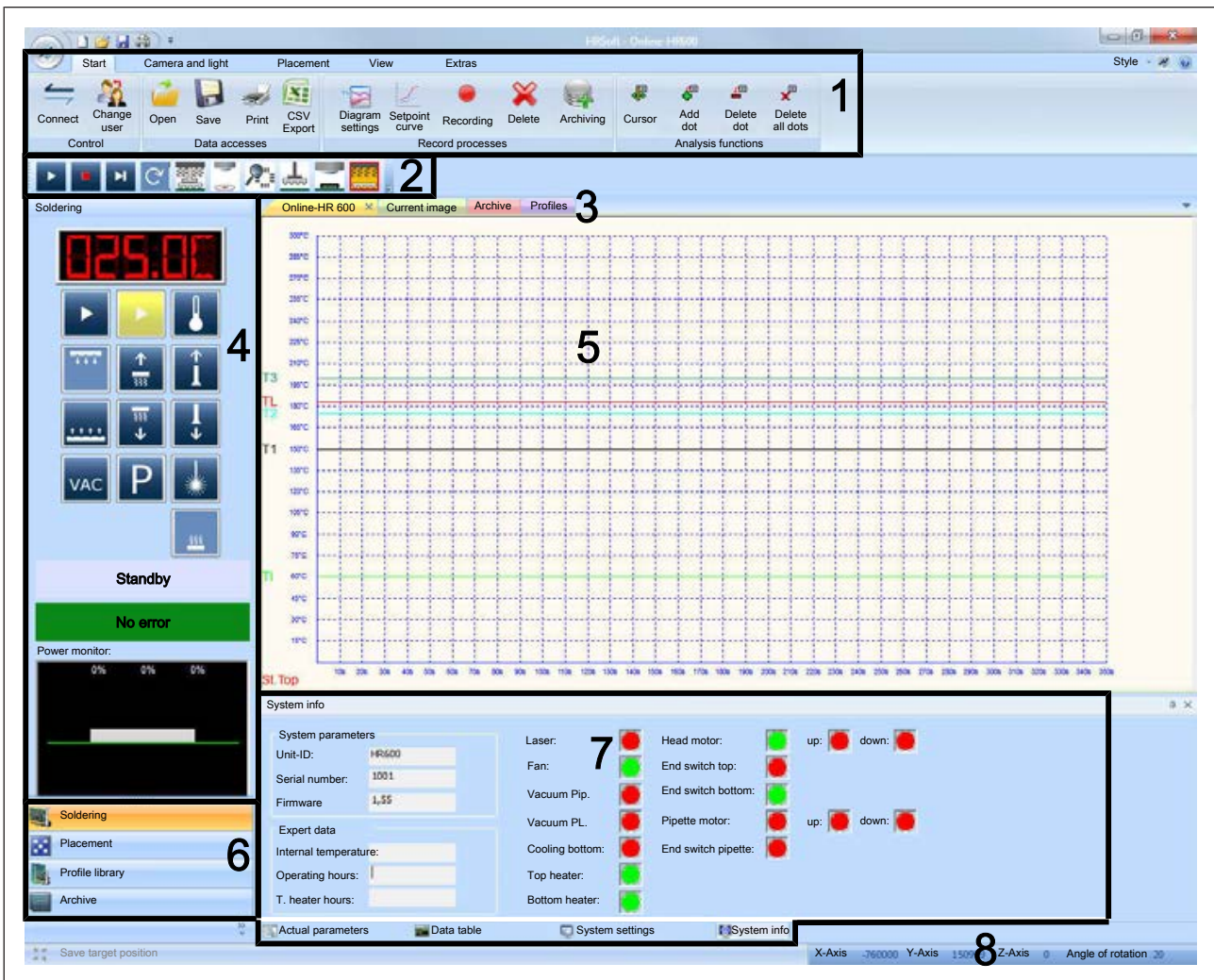
6.4.3 Work areas

Fig. 17: Work area (4) and function selection (6)

Depending on the function selection chosen (6), the work area changes (4) its functions.
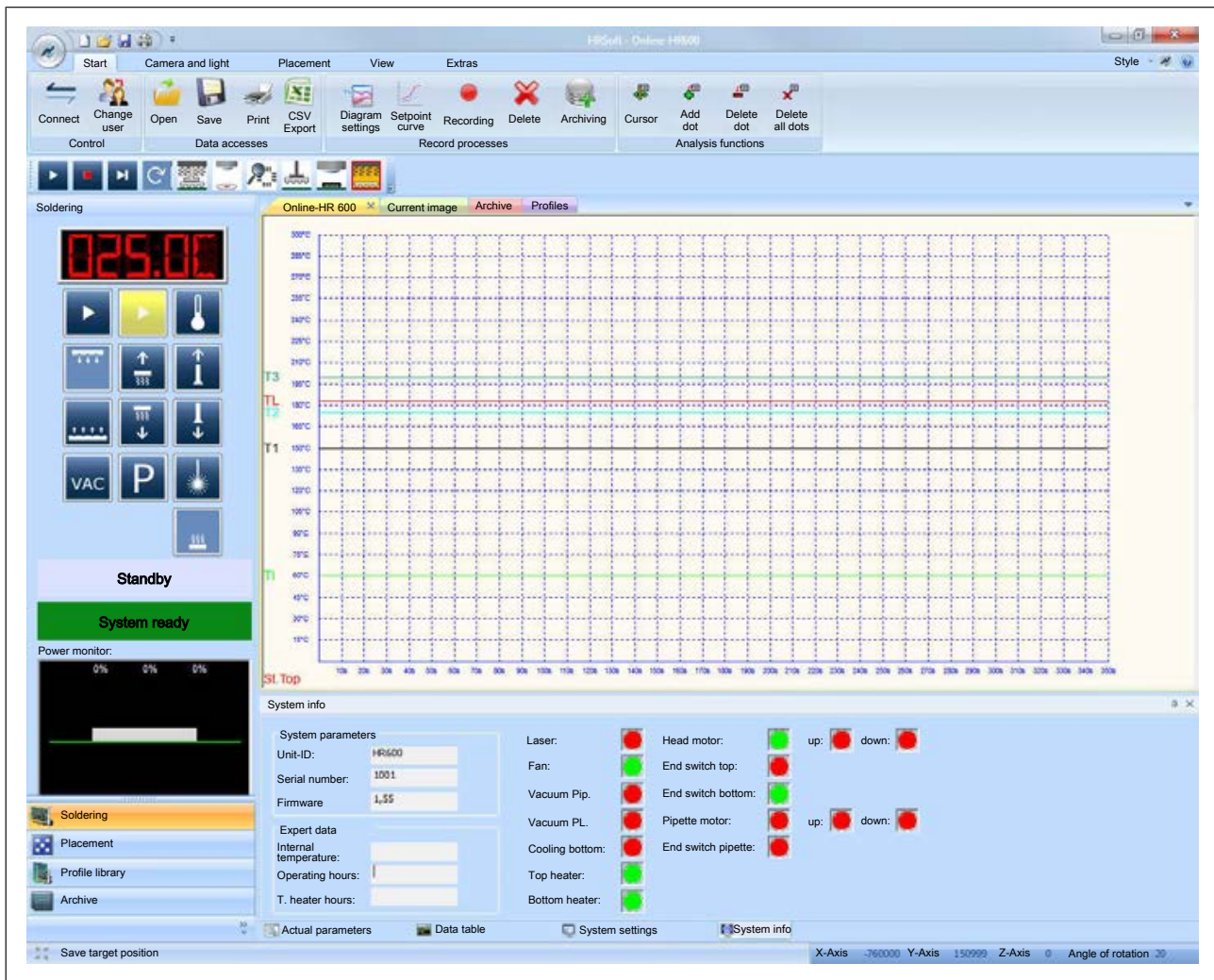
6.4.3.1 The work area [Soldering]

Fig. 18: The work area [soldering]

If [Soldering] is enabled in the functional area, the visual displays and buttons for the soldering process will appear in the work area. In the display window, the [Online-HR 600] window and the [Start] tab will appear automatically.

Shows the current temperature in [°C] of the sensor that regulates the profile temperature. You can select the thermocouples and sensors in the soldering profile (standard = TE1). If the value [0.0 °C] is displayed, there is no thermocouple connected to TC1 or TC2 sockets. With respect to this, please read the chapter Profiles [▶ 104].

– [Start or stop soldering process]: Starts or stops the soldering process immediately, or interrupts a soldering process started in the automation bar. The soldering profile settings of the last profile chosen are used. These profile settings are displayed in the [Actual parameters] parameter window. Keep the travel path of the axles clear!
During the soldering process, the button is displayed as a [Stop soldering process] stop button. It terminates the soldering and desoldering process. The component is stored or the head moves to the parking position. With respect to this, please read the chapter Profiles [▶ 104].
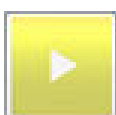
– [Start or stop desoldering process]: Starts or stops the soldering process immediately, or interrupts a desoldering process started in the automation bar. The soldering profile settings of the last profile chosen are used. These profile settings are displayed in the [Actual parameters] parameter window. Keep the

travel path of the axles clear!

During the desoldering process, the button is displayed as a stop button [Stop desoldering process] stop button. It terminates the soldering and desoldering process. The component is stored or the head moves to the parking position. With respect to this, please read the chapter Profiles [▶ 104].

– [Calibrate process at melting temperature]: Calibrates the measurement of the thermocouple or IRS sensor used on the heater head to correct a deviation from the melting point in the real melting point profile. Use the camera image of the optional RPC camera to assess the melting time. Click on the button as soon as the solder melts. Calibration to this melting temperature LT (Liquidus Temperature) has occurred. After calibration, a query dialog appears at the end of the process. If you confirm it with [OK], the calibrated LT value will be stored in the current profile.

[Calibrate process at melting temperature] is disabled if you are logged in as the default user. The melting point temperature saved in the profile may only be used for subsequent soldering processes if the solder, assembly, PCB and thermocouple position parameters are identical.

Note: You can then delete this value and reset the original settings, in case you have reactivate the process at a later point. With regard to this, please read the chapter The work area [Profile library] [▶ 77].

– [Switch top cooling fan on/off]: Switches the upper cooling on or off in manual mode (without soldering profile). The upper cooling is activated after the HR 600/2 is switched on. With respect to this, please read the chapter Profiles [▶ 104].

– [Move heating head up]: Moves the heating head to its upper end position.

– [Move pipette up]: Moves the pipette to its upper end position.

– [Switch bottom cooling on/off]: Switches the lower cooling on or off in manual mode. You can use this function also for cooling down an assembly. After clicking this button, the assembly is cooled down for another 90 seconds.

– [Move heating head down]: By left-clicking, you can move the heating head to a 60 mm working height. Right-click on this button to launch the context menu. Here you can bring the heating head to one of the seven heights available.

– [Move pipette down]: Moves the suction pipette to its lower end position. When the drive comes into contact with a component, the former will automatically stop.

– [Switch pipette vacuum on/off]: Activates or deactivates the vacuum of the suction pipette. When vacuum is active, the button is highlighted.

[Parking position]: Moves the heads to the park position.

Keep the travel path of the axles clear!

> ⚠ **DANGER**
>
> **Laser beam! Risk of injury due to retinal burns**
>
>   a) Do not stare into the laser beam!
>
>   b) Do not point the laser beam at other people! Reflecting surfaces under the laser generate reflections!
>
>   c) Class 2 laser according to DIN EN 60825-1:2008-5, P < 1 mW, λ = 650 nm

[Switch laserpointer on/off]: Turns the laser beam on or off. The laser can be used to manually locate a component.

– [Switch bottom heater on/off]: Switch the bottom heater on/off. When in standby mode, the lower radiator heats at 15% of its power. When the bottom heater is on, the button is highlighted.

Standby

– First status indication: Shows which functions are being currently executed by the system.

System ready

– Second status indication: Shows whether there are errors. If the display panel is green, there are no errors. If the display panel is red, you can read the current error message.
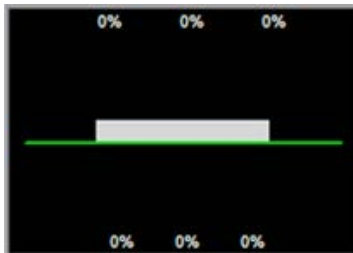
– Display panel [Power monitor:]: Displays the current control level of the top and bottom heaters in [%]. You can adjust the individual heating elements of the top and bottom heaters in the profile. With regard to this point, please read the chapter Adjusting the radiator configuration in the [Configuration] tab [▷ 116].

Also see

▤ The parameter window [System settings] [▷ 84]

6.4.3.2 The work area [Placement]

Fig. 19: The work area [placement]

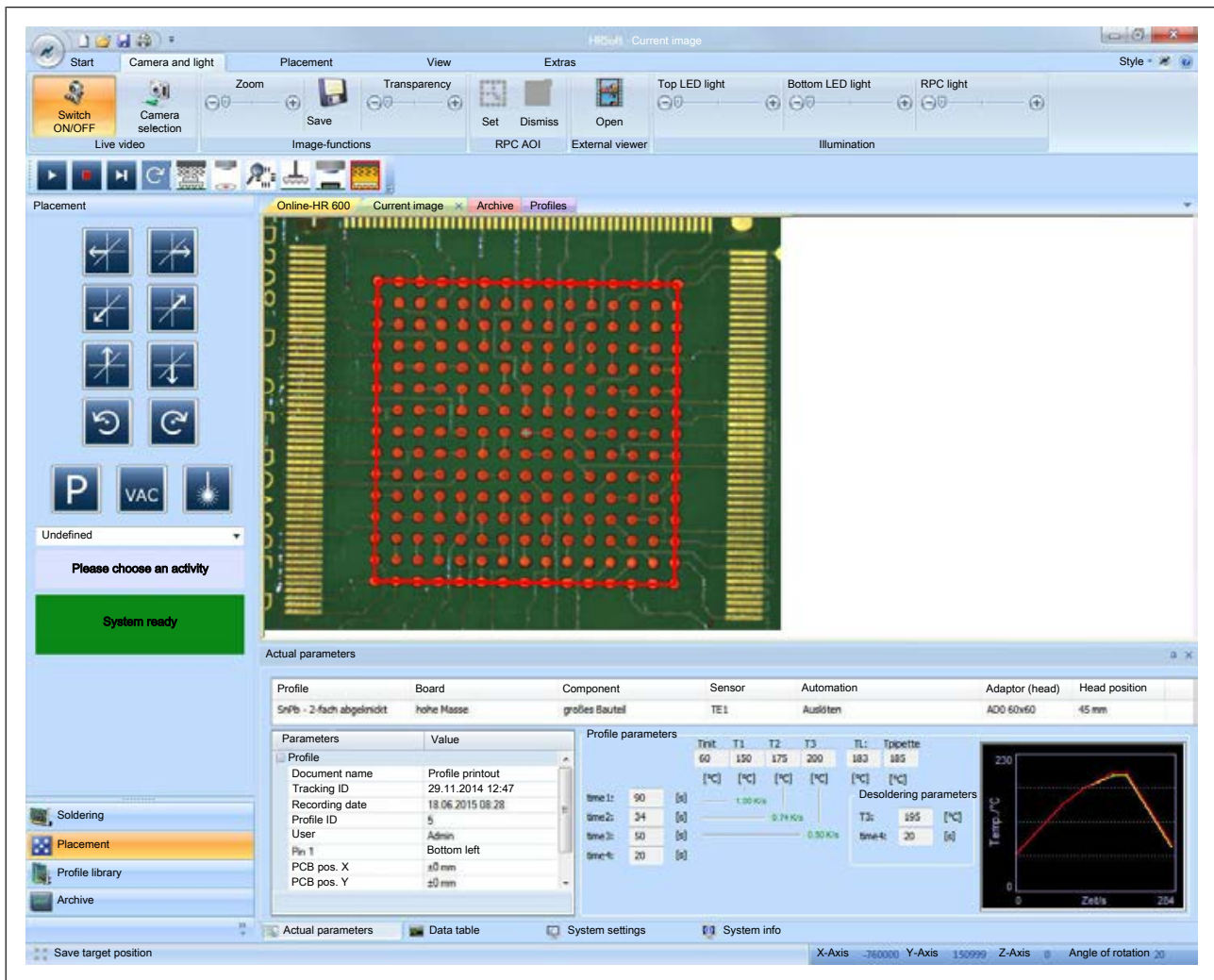If [Placement] is enabled in the functional area, buttons to position heads will appear in the work area. In the display window, the [Current image] window will appear. The current position values can be read from the status bar. With regard to this, please read Chapter The status bar [▶ 86].

– [Move axis left]: Allows moving the heads manually to the left. This is also possible with the key combination [Ctrl] + [Left arrow key].
By pressing the scroll wheel while holding down the mouse button, the movement can be sped up or slowed down. If an overlay is displayed in the display window, you can move this overlay to the left.

– [Move axis right]: Allows moving the heads manually to the right. This is also possible with the key combination [Ctrl] + [Right arrow key].
By pressing the scroll wheel while holding down the mouse button, the movement can be sped up or slowed down. If an overlay is displayed in the display window, you can move this overlay to the right.

– [Move axis foreward]: Allows moving the heads manually forward. This is also possible with the key combination [Ctrl] + [Bottom arrow key].
By pressing the scroll wheel while holding down the mouse button, the movement can be sped up or slowed down. If an overlay is displayed in the display window, you can move this overlay down.

– [Move axis backward]: It allows moving the heads manually backward. This is also possible with the key combination [Ctrl] + [Top arrow key].
By pressing the scroll wheel while holding down the mouse button, the movement can be sped up or slowed down. If an overlay is displayed in the display window, you can move this overlay up.

– [Move axis up]: To manually move the pick-and-place nozzle upwards. For movement, keep the mouse button pressed.

– [Move axis down]: Allows moving the pick-and-place nozzle manually downward. For movement, keep the mouse button pressed.

– [Rotate counter clockwise]: Rotates the pick-and-place nozzle counterclockwise. If an overlay is displayed in the display window, you can rotate this overlay counterclockwise.

– [Rotate clockwise]: Rotates the pick-and-place nozzle clockwise. If an overlay is displayed in the display window, you can rotate this overlay clockwise.

[Parking position]: Moves the heads to the park position.

Keep the travel path of the axles clear!

– [Switch placer vacuum]: Activates or deactivates the vacuum of the pick-and-place nozzle. When vacuum is active, the button is highlighted.
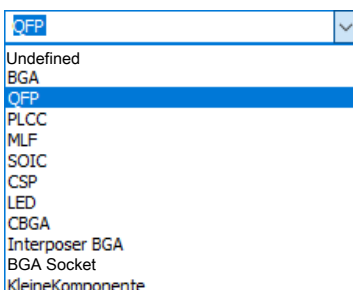

⚠️ **DANGER**

Laser beam! Risk of injury due to retinal burns

a) Do not stare into the laser beam!

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

c) Class 2 laser according to DIN EN 60825-1:2008-5, P < 1 mW, λ = 650 nm

---

[Switch laserpointer on/off]: Turns the laser beam on or off. The laser can be used to manually locate a component.

– Part filter: The camera automatic detection for components on the glass plate is optimised for the type of component selected here. In this drop-down menu, you can select a filter and enable it by clicking on the ⟳ button. A component filter to be called up in the [Placement] tab can also be set in the profile parameters.
[undefined] = all other component types, [BGA] = Ball Grid Array, [QFP] = Quad Flat Package, [PLCC] = Plastic Leaded Chip Carrier, [MLF] = [Micro Lead Package], [SOIC] = Small Outline IC, [CSP] = Chip Scale Package, [LED] = Light-emitting diode, [CBGA] = Ceramic Ball Grid Array, [Interposer BGA] = BGA on wiring layer, [BGA Socket] = Ball Grid Array Socket.

– First status indication: Shows which functions are being currently executed by the system.

System ready

– Second status indication: Shows whether errors have turned up during processing. If the display panel is green, there are no errors. If the display panel is red, you can read the current error message.

Also see

📄 Performing the positioning process [▶ 138]
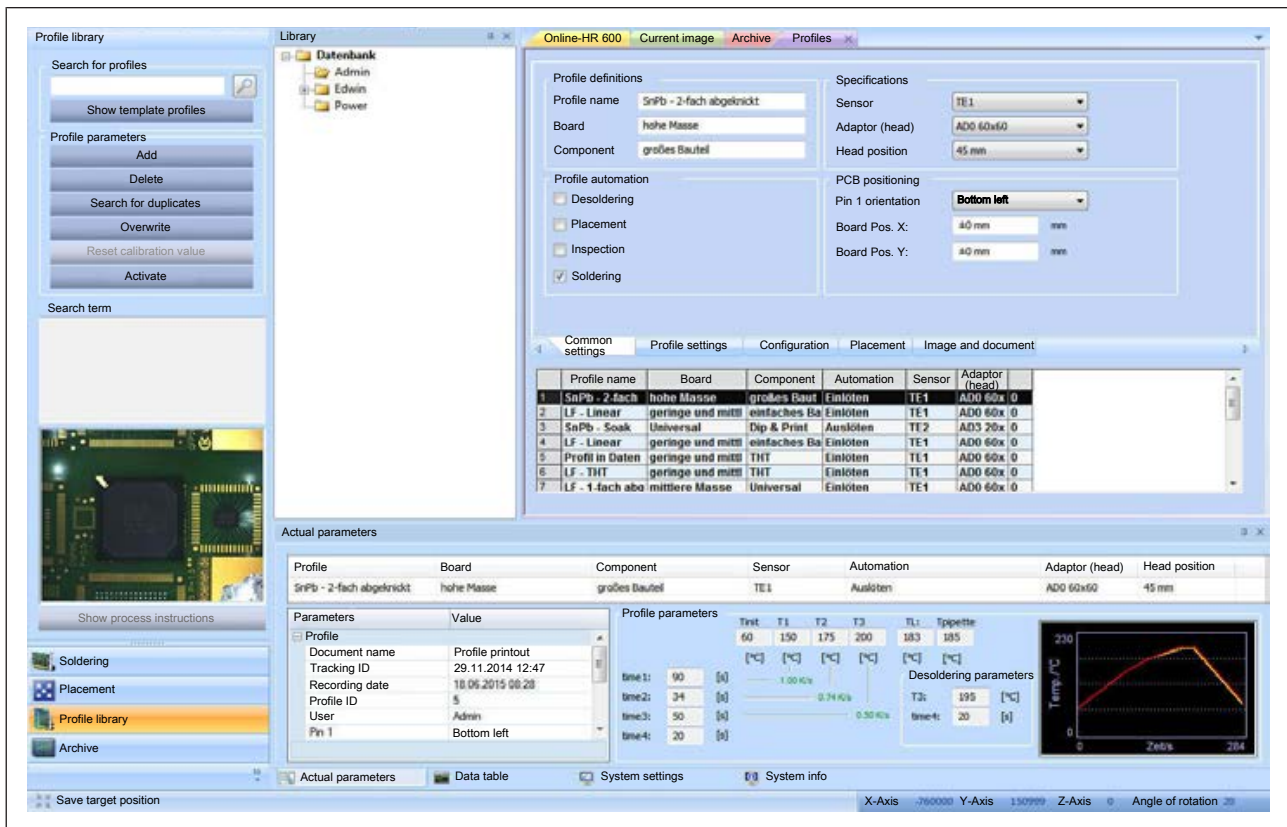
6.4.3.3 The work area [Profile library]

Fig. 20: The [Profile library] work area: On the left the [Library] work area, in the centre the library selection and in the work area, on the right, the [Profile parameters] and the [Profile table].

If the [Profile library] button is enabled in the functional area, the profile library will appear on the left in the work area and in the display window of the [Profiles] tab to edit profiles. Under the [Library] tab, the profile database is displayed in the middle.

[Search for profiles] frame:

Searches for a profile. With respect to this, please read the chapter Searching for a profile [▶ 108].

– [Show template profiles]: Displays the factory-set profile templates provided.

[Profile parameters] frame:

– [Add]: Adds a factory-supplied template to your own profile table. You can then customize the template according to your requirements and save it under a new name. With respect to this, please read Chapter Enabling a profile template [▶ 105].

– [Delete]: Deletes a profile from your own [Profile library]. With respect to this, please read the chapter Deleting a profile [▶ 106].

– [Search for duplicates:] Searches for identical profiles.

– [Overwrite]: Changes to a profile are saved in the profile by clicking on this button.

– [Reset calibration value]: If the [Calibrate process at melting temperature] function has been enabled in the [Soldering] work area, profile calibration will change. The [Reset calibration value] button restores the original calibration value. With regard to this, please read the chapter The work area [Soldering] [▶ 71].

    – [Activate]: Enables the profile you have selected in your profile table. You can then work with this profile.

    – [Search term]: Displays a comment belonging to the profile, if there is one stored.

    – [Image]: Displays a picture belonging to the profile, if there is one stored.

    – [Show process instructions]: Displays a document belonging to the profile, if there is one stored.

With respect to this, please read the chapter Entering information into the [Image and document] tab [▶ 122].

The [Library] window:

If this window is not visible, you can display it. With regard to this, please read the chapter Customizing the presentation of charts and windows [▶ 89].

In the [Library] window, the database is displayed as a directory tree. As [Standard user] you will only see your user directory.

As [Power user] and [Administrator] you have access to all directories and profiles. Via the context menu of the right mouse button, you can file or delete further sub-directories (containers). If a directory is deleted, all profiles of this container will be permanently deleted.
The context menu functions of the right mouse button also allow renaming, cutting and pasting directories. However, the context menu functions are not applicable to user directories automatically created by the system.

[Profiles] window:

In this window you can process profiles. The window contains the [Common set-tings], [Profile settings], [Configuration], [Placement] and [Image and document] tabs. Depending on the enabled tabs, the corresponding windows are opened.
With respect to this, please read the chapter Select a profile and save it under a new name [▶ 109].
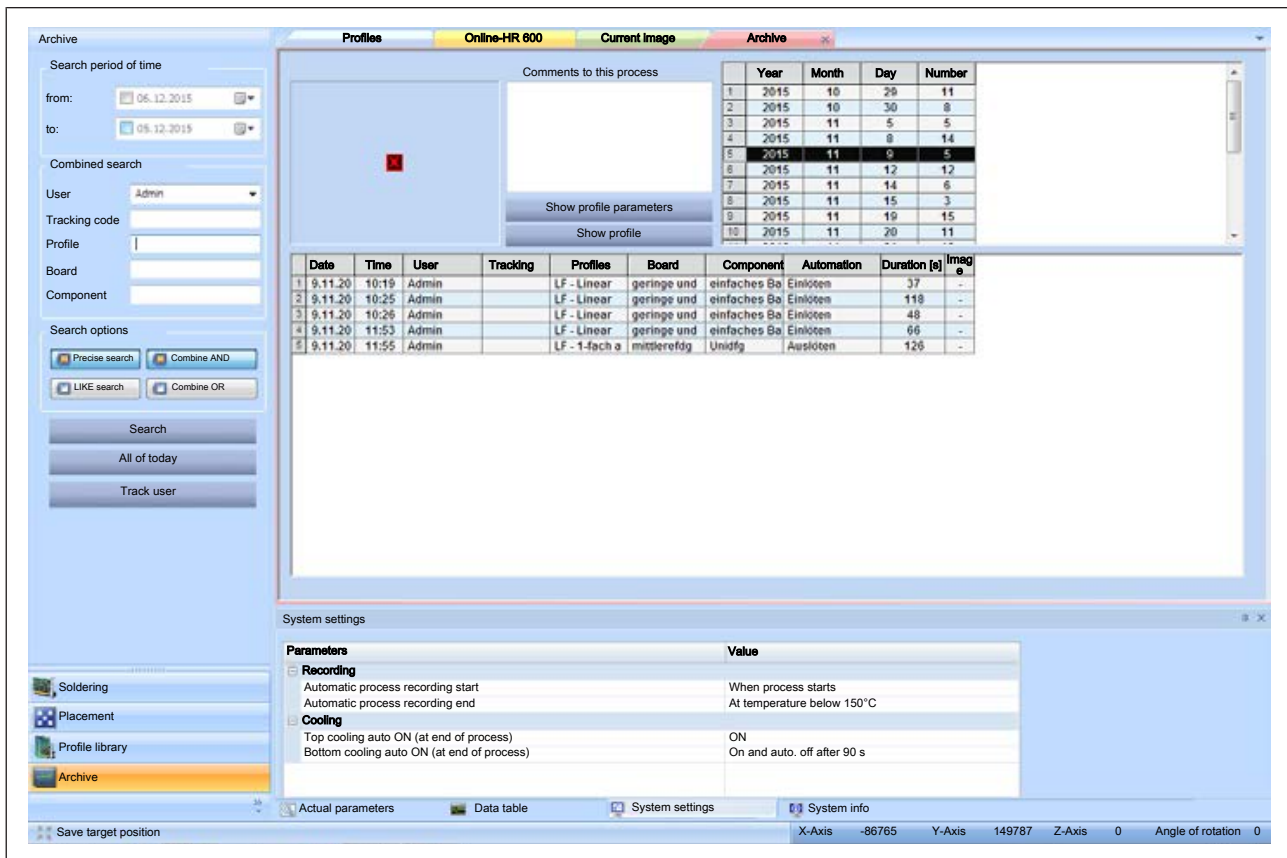
6.4.3.4 The [Archive] work area

Fig. 21: The Window [Archive]

If the button [Archive] is enabled, the displays and buttons to search for recorded processes will appear in the work area and [Archive] will be displayed in the display window.

All recorded processes are saved in the archive. You can have processes recorded automatically. Please read Chapter The [Options] button. You can search for and display process records. In addition, you can display the profiles belonging to the process.

Frame [Search period of time]:

Allows searching for processes within a time period. By clicking the input fields [from:], [to:], you can specify the time period for the search.

Frame [Combined search]:

– Click [User]: Search for process records of a specific user.

– [Tracking code]: Search for files marked with a [Tracking code]. Upper and lower case letters are not distinguished. Please also read Chapter The [Options] button.

The next three search filters refer to the profiles that were enabled when a process was recorded. You can search for the characteristics [Profile name], [Board] or [Component]. Please also read Chapter Customizing a profile in the [Common settings] tab. [▶ 111]. Upper and lower case letters are not distinguished.

– [Profiles]: Search for the profile name given to the profile.

– [Board]: Search for [Board] properties that are included in the profile.

– [Component]: Search for [Component] properties that are included in the profile.

Frame [Search options]:

By clicking the buttons [Precise search], [LIKE search], [Combine AND] and [Combine OR] you can refine the search for profiles. If the square inside the button is shown in orange, the respective option is enabled. Upper and lower case letters are not distinguished. You can search for parts of terms.

– [Precise search]: Searches for the exact term.

– [LIKE search]: Searches also for similar terms.

– [Combine AND]: Displays only the data records containing all search terms.

– [Combine OR]: Displays all the data records containing at least one search term.

Buttons:

– [Search]: Starts searching.

– [All of today]: Starts searching. All the processes recorded today will be displayed. The search filters are enabled.

– [Track user]: Starts searching. All recorded processes of the above selected (tracked) [User] are displayed in a separate table. The table contains the columns [Year], [Month], [Day] and [Number]. If you select a line, it highlights with colour. The corresponding records are then displayed in the table below as search results. The search filters are enabled.

Tab [Archive]:

This tab will display the profiles found. The window also contains the buttons to display the process record and profile parameters.

At the bottom of the window, the search result is displayed in table form.

✓ To show a process record:

a) First carry out a search.

b) Select a profile in the search results table.

c) Click the button [Show profile].

⇨ The process record is displayed in a new window.

Info: You can adjust the display in this window. For more information, read Chapter

✓ To show the profile parameters associated with a process record:

a) First carry out a search.

b) Select a profile in the search results table.

c) Click the button [Show profile parameters].

⇨ The window [Profile parameters] opens. You can view all parameters there.
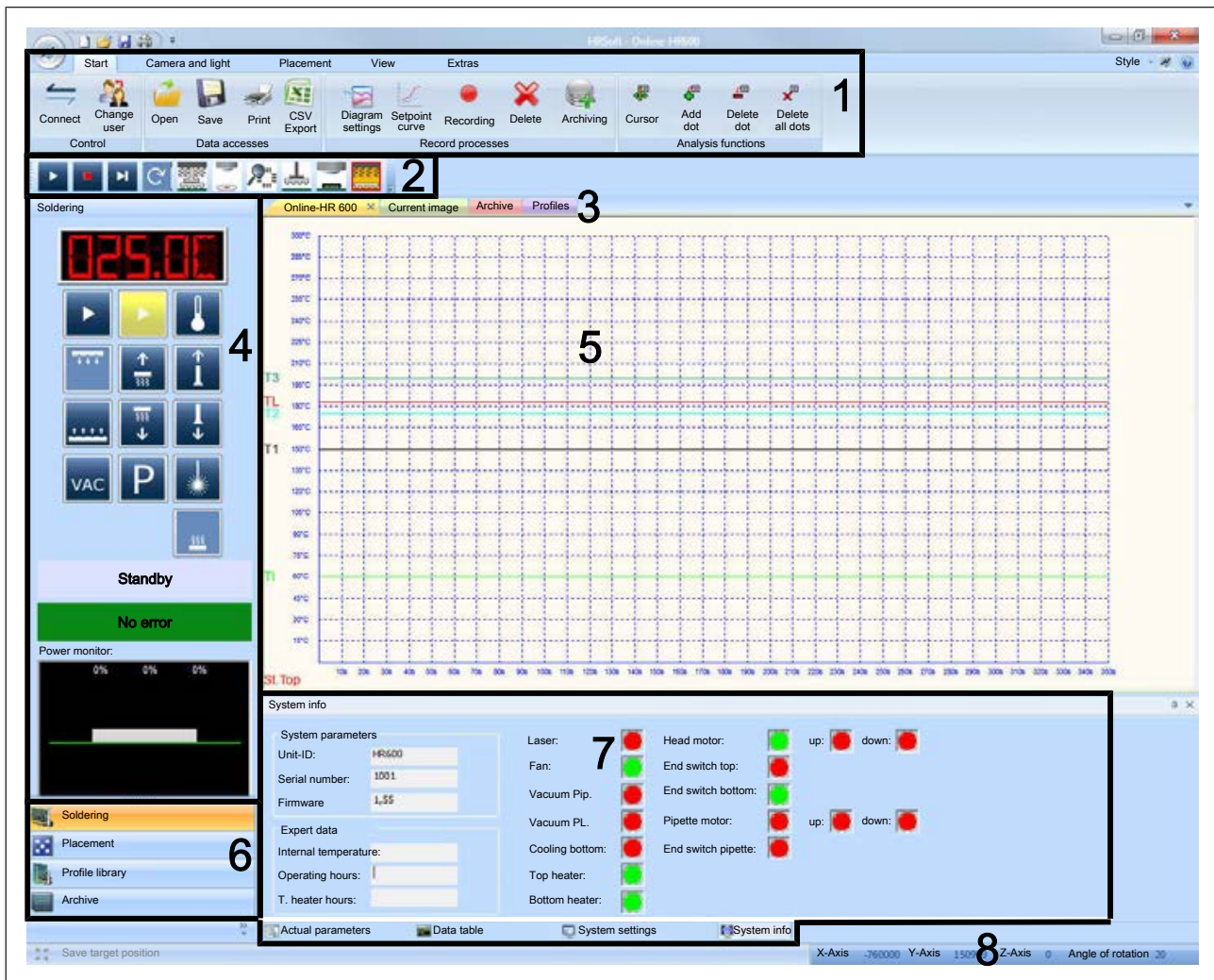
6.4.4 The parameter windows

Fig. 22: The parameter window (7)

Parameter windows are displayed in portion (7)

In the lower section of the parameter window are the tabs for:

– [Actual parameters]

– [Data table]

– [System settings]

– [System info]

Depending on the tabs activated, the parameter window changes its appearance.

You can determine which tabs ought to be displayed. With regard to this, please read the chapter Customizing the presentation of charts and windows [▶ 89].

6.4.4.1 The parameter window [Actual parameters]

The [Profile parameters] of the currently active profile are displayed in this window.

✓ To display the [Actual parameters] parameter window:
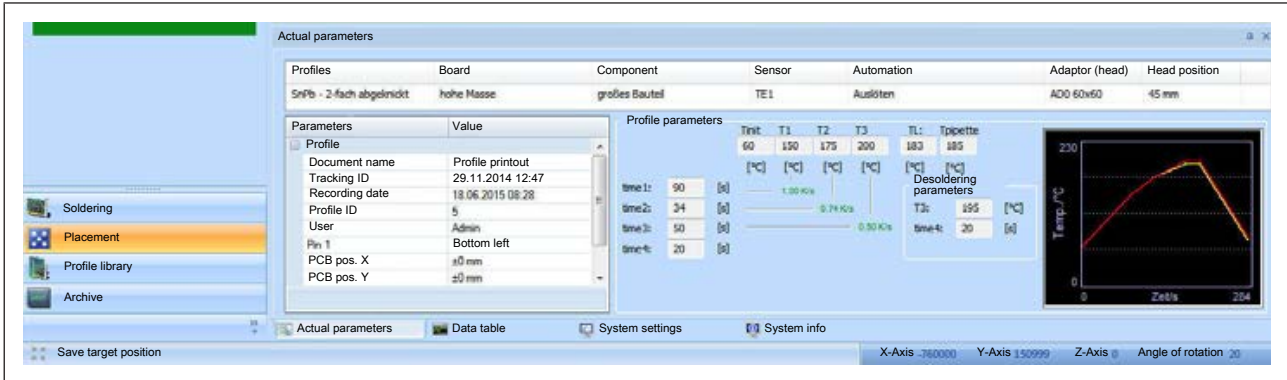
a) Enable the [Actual parameters] tab.

Fig. 23: The [Actual parameters] parameter window

⇨ If you have enabled a [Profile], you can display the selected parameters in the parameter window [Actual parameters]:

– Top table row: Fundamental profile parameters

– Table left Detailed profile parameters

– [Profile parameters] frame on the right: Display of the [Profile settings] tab with the graphic of the gradients. With regard to this, please read the chapter Adjusting gradients in the [Profile setting] tab [▶ 114].

6.4.4.2 The parameter window [Data table]

In the parameter window [Data table] you can specify which values to display in the window [Online-HR 600]. The display of the diagram itself may be adjusted to your requirements in the [Display properties] dialog. With regard to this, please read the chapter <u>The window [Online HR 600] [▶ 87]</u>.

✓ To display the [Data table] parameter window:

a) Enable the [Data table] tab:

Sensor	Temp	Measuring side	Measuring position	Board	Component	Show	Colour	Weight
IRS	---	Top side	Top center			☐		2
TC1	21,5 °C	Top side	Top center			☑		3
TC2	---	Top side	Top center			☐		3
TC TOP	---	Top side	Top center			☐		2
Top center	0%	Top side	Top center			☑		2
Outside top	0%	Top side	Top center			☑		2
Bot left	---	Top side	Top center			☐		2
Center bottom	0%	Top side	Top center			☑		2
Right bottom	0%	Top side	Top center			☑		2
Fan:	100%	Top side	Top center			☑		2

System ready

Soldering
Placement
Profile library
Archive

Save target position

Actual parameters Data table System settings System info

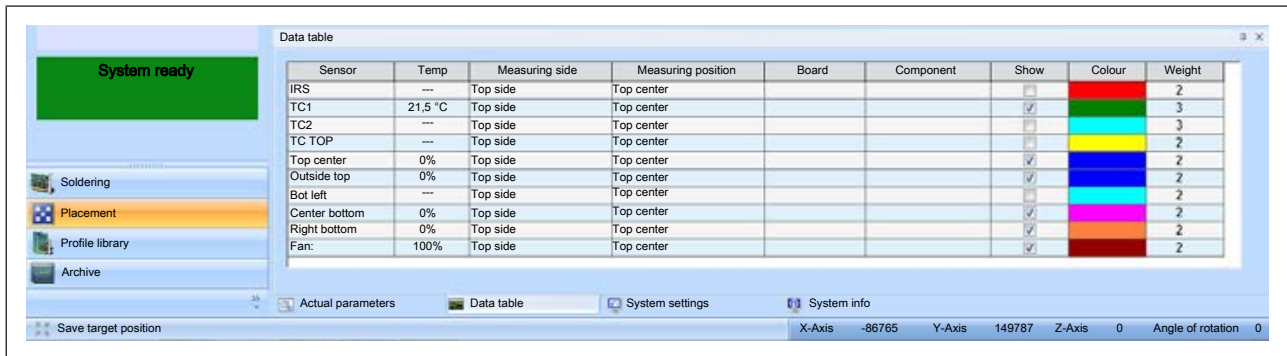X-Axis   -86765   Y-Axis   149787   Z-Axis   0   Angle of rotation   0

Fig. 24: The [Data table] parameter window

To display measured values:

✓ Select which measured values you want to display in the window [Online-HR 600]:

a) In the [Show] column, enable the checkbox of a measured value.

The measured value is displayed in the [Online-HR 600] window. These settings are not linked to a profile.

To customize the graphical representation:

✓ To customize the graphical representation in the [Online-HR 600] window:

a) In the [Colour] column, click on the colour field of a measured value, then select the colour in the [Colour] dedicated window.

b) Click the [Weight] field of a measured value in the [Weight] column, and then choose a thickness value [1], [2] or [3] from the displayed menu.

Description of the sensor types:

[IRS] = Infrared radiator sensor
[TE1] / [TE2] = Thermocouple 1 (TC1) and 2 (TC 2)
[Ostr] = Top radiator sensor is the thermocouple in heating head
[Top centre / Top outside] = sensors of the top radiators: in the middle and outside
[Bot] = Sensors of the bottom radiators: left/centre/right
[Fan] = fan sensor (only above)

6.4.4.3 The parameter window [System settings]

In the [System settings] parameter window, you can set the requirements to automatically record and cool the soldering process at the end of the process. With regard to this, please read the chapter [The window [Online HR 600] [▶ 87]]. The settings made here affect all soldering processes.

✓ To display the [System settings] parameter window:
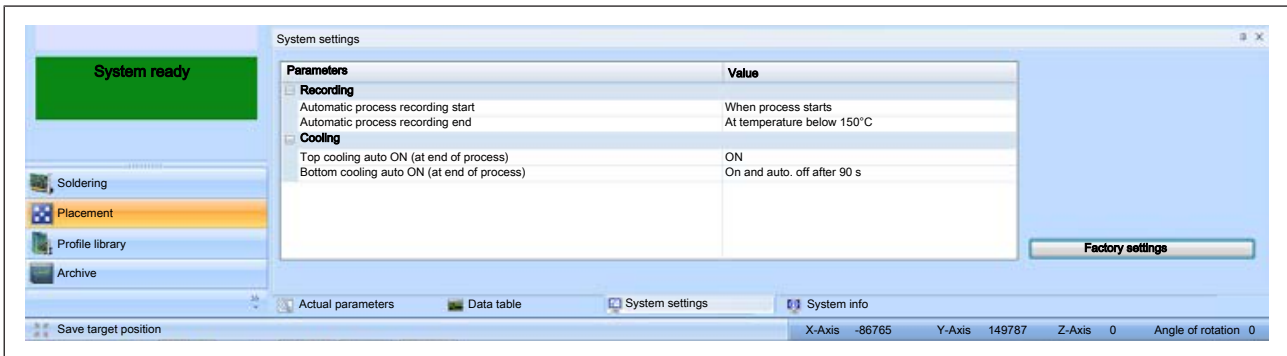
a) Enable the [System settings] tab.

Fig. 25: The [System settings] parameter window

To record start/stop:

✓ To determine when to start and stop the process recording:

a) In the register [Parameters], you can see a list of editable parameters.

b) In the Value] column, click on a line.

c) Select an entry from the drop-down menu.

⇨ The setting has been changed and is immediately active.

Please note: [Tinit] is the temperature above which the profile control starts. It is displayed in the [Online-HR 600] graph window as [TI].

To automate cooling:

In the [Parameters] column, you can see a list of editable parameters.

✓ Define when cooling is to be automatically switched on and off:

a) In the Value] column, click on a line.

b) Select an entry from the drop-down menu.

⇨ The setting has been changed and is immediately active.

To restore factory settings:

✓ To restore the factory settings of the [System settings] tab:

a) Click on the [Factory settings] button.

⇨ The factory settings have been loaded and are immediately active.

6.4.4.4 The parameter window [System info]

In the parameter window [System info], you can display information and the status of the HR 600/2 unit.

✓ To display the [System info] parameter window:
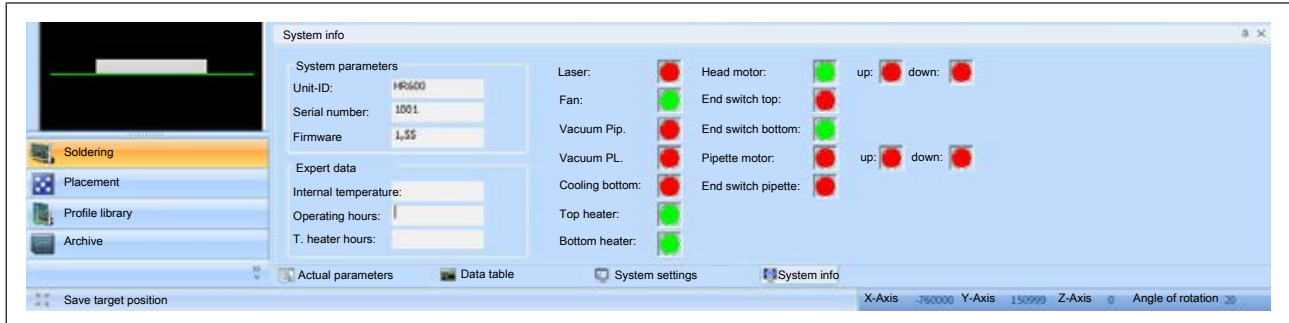
a) Enable the [System info] tab:

Fig. 26: The [System info] parameter window

Information:

– [System parameters]: Shows information on the HR 600/2 unit.

– [Expert data]: Displays information on the operational data.

Note: OSTR = Upper radiator

Status indications:

The status indications are displayed in red or green.

– Green: The function is active.

– Red: The function is not active.

The following status indications are available:

– [Laser:] Laser status

– [Fan:]: Top cooling status.

– [Vacuum Pip.]: Status of the pipette in the heating head.

– [Vacuum PL.]: Status of the positioning nozzle in the placement head.

– [Cooling bottom:]: Bottom cooling status.

– [Top heater:]: Top heating status.

– [Bottom heater:]: Bottom heating status.

– [Head motor:]: Status of the head motor Z axle.

– [End switch top:]: Status of the upper limit switch in the heating head.

– [End switch bottom:]: Status of the lower limit switch in the heating head

– [Pipette motor:] Status of the pipette motor.

– [End switch pipette:] Status of the pipette limit switch.

6.4.5 The status bar

| Save target position | | | X-Axis | -760000 | Y-Axis | 150999 | Z-Axis | 0 | Angle of rotation | 20 |
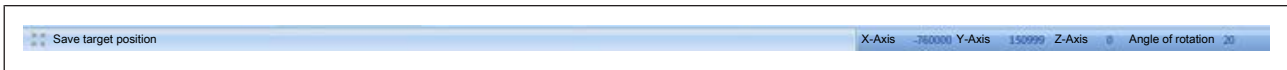
The status bar at the bottom of the screen contains the Save target position button on the left and shows the current position of the X and Y axles on the right, as well as the Z axle and the rotation angle of the pick-and-place nozzle. If you are logged in as an administrator, you can change these parameters from here.

a) To do so, click on the corresponding value in the status bar.

⇨ A window where to enter the position or the angle of rotation will open.
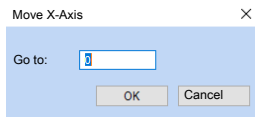
b) Enter the new value and click on [OK].

– To move the X axle to the left, the value must be reduced (negative) (minimum –950,000, maximum 0).

– To move the Y axle forward, the value must be increased (minimum –20,000, maximum 350,000).

– To lower the pick-and-place nozzle, the value must be increased (minimum 0, maximum 77000).

– To turn the pick-and-place nozzle clockwise, the value must be increased (6500 corresponds to approximately a 360-degree rotation).

– You can also easily move the axles with the key combination [Ctrl] + [Arrow key].

The [Save target position] button
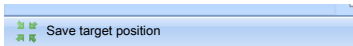
For larger series of a rework task, it is appropriate to save also the coordinates of the [Target position] of a component in the profile. This is especially true if the same components must be always processed in the same [Target position]. When the process starts, the head will always immediately move to the specified [Target position].

The [Save target position] button will become activatable during the process when the target position is reached.

The target position can also be saved in the profile, in the [Placement] tab with the [Target-X] and [Target-Y] input fields. With regard to this, please also read Chapter Customizing the placement process in the [Placement] tab [▶ 119]

6.4.6 The window [Online HR 600]

This window appears when you click on the [Soldering] button in the functional area. The window graphically represents an active soldering process:

Fig. 27: Process record in the [Online-HR 600] window

The diagram parameters for the Y axis are defined by the data in the [Profile settings] tab. With regard to this, please read the chapter [Adjusting gradients in the [Profile setting] tab [▸ 114]].

- [T1] - [T3] = Temperature/time, as defined in the profile.
- [TI] = Tinit, the temperature above that starts the profile control.
- [TL] = Melting point (Temperature Liquidus)
- [St. Top] = Top radiator active
- [St. Bot] = Bottom radiator active
- [Kopf] = Heating head is lowered
- [Pip.] = The pipette has been lowered
- [Fan] = Fan active in the heating head
- [Cooling] = Fan active on the table
- [Vac.] = Pipette vacuum active

Soldering and desoldering processes are recorded automatically. Positioning and inspection processes are recorded if the button [Record] had been clicked. In the [Online-HR 600] window, you can analyse the recording process with analysis points. With regard to this, please read Chapter [Record, archive and analyse processes [▸ 141]].

The graphical representation of the measurements in the diagram can be changed. With respect to this, please read Chapter <u>The parameter window [Data table]</u> [▶ 83].

To edit the process display:

✓ You can adjust the graphic display of the [Online-HR 600] window to your requirements.

a) In the [Start] tab from the [Record processes] menu area, select the [Diagram settings] button.

⇨ The dialog [Display properties] is displayed. It includes the three [Layout], [Status bars] and [Reference lines] areas.

b) In the [Layout] area, you can set the size of the diagram, the temperature axis and the time axis, as well as the thickness and colours of the grid and of the background.

c) In the [Status bars] area, you can set the colour and thickness of the status bars under the diagram and show/hide the bars.

d) In the [Reference lines] area, you can set the colour and thickness of the reference lines and of the target curve and show/hide the lines.

6.5 Working with the Rework system

6.5.1 Presets

6.5.1.1 Customizing the presentation of charts and windows

You can customise the user interface to suit your way of working. You may want to hide some windows permanently, because you do not need them for your work. Also the presentation of charts can be changed.

✓ To open the menu [View]:

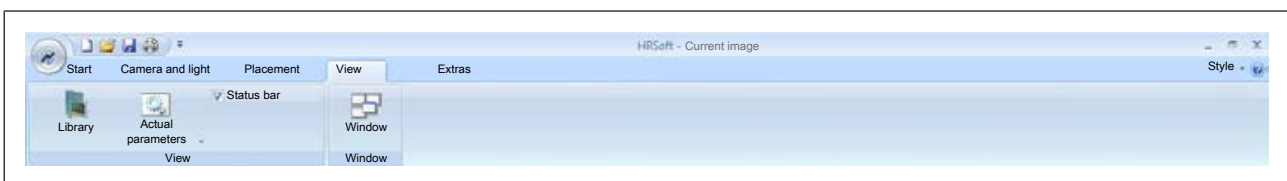a) Activate the tab [View] in the menu bar.

⇨ The [View] menu appears:

Fig. 28: The menu [View]

To show and hide the library:

✓ To show and hide the [Library] window:

a) Click on [View] in the [Library] menu area.

⇨ The [Library] window is shown or hidden:
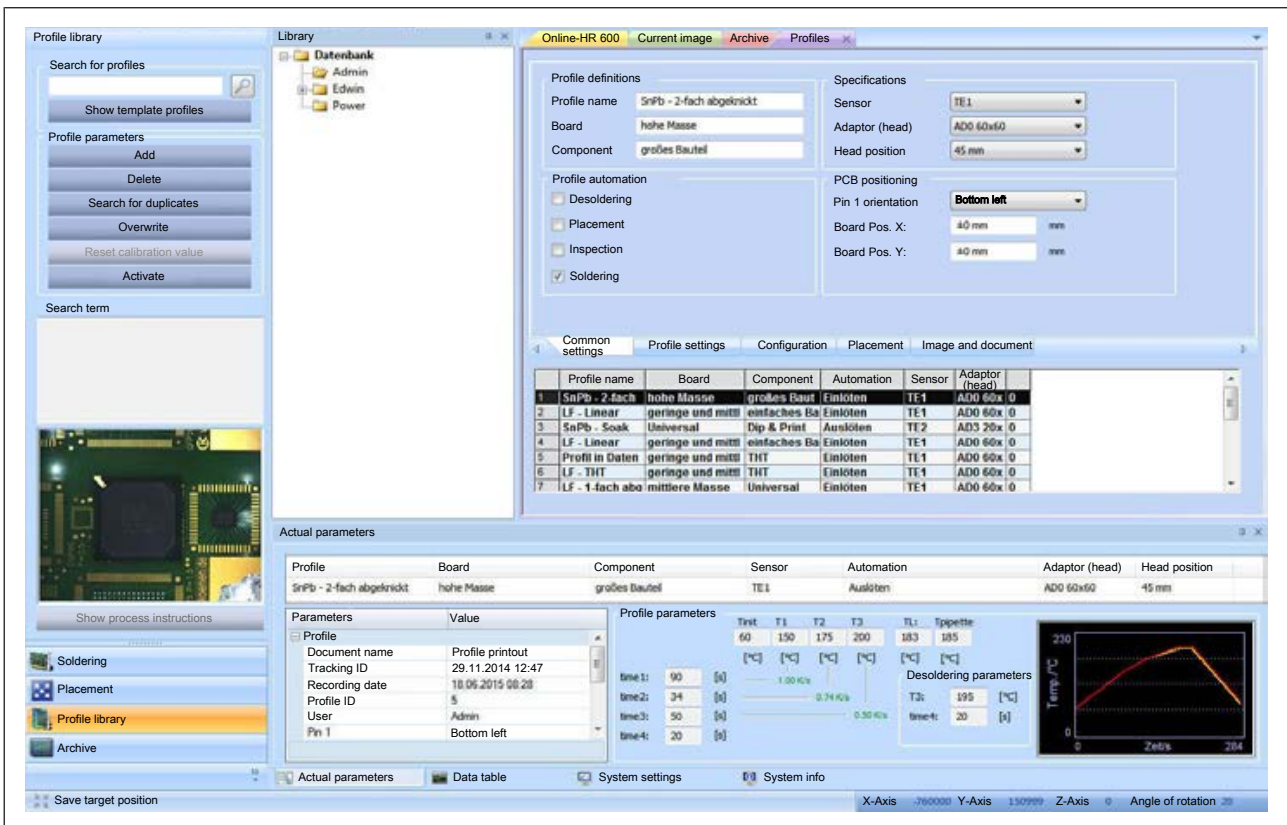
Fig. 29: The window [Library] is shown

To show tabs:

You can show and hide the tabs [Actual parameters], [Data table], [System settings] or [System info] in the lower section of the parameter window.

✓ To show and hide the tabs:

a) In the menu area [View], click the drop-down menu and select an entry [Actual parameters].
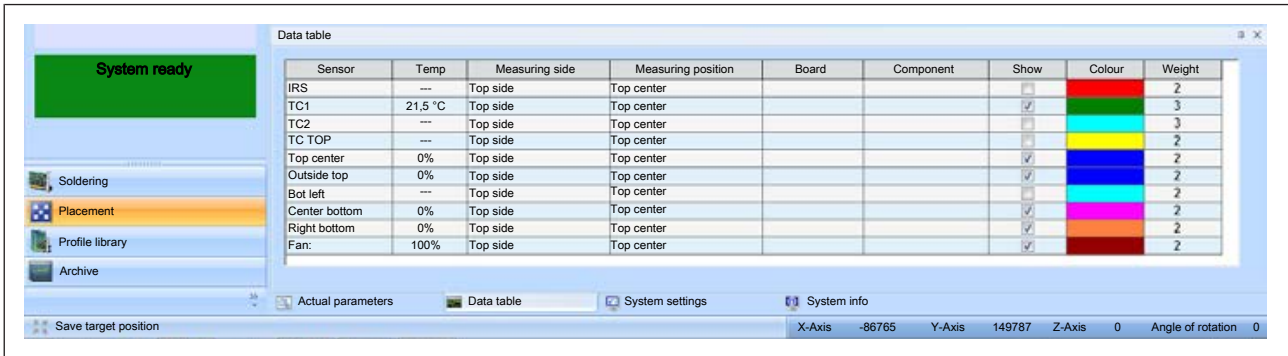
⇨ The tabs are shown and hidden.

Sensor	Temp	Measuring side	Measuring position	Board	Component	Show	Colour	Weight
IRS	---	Top side	Top center					2
TC1	21,5 °C	Top side	Top center			✓		3
TC2	---	Top side	Top center					3
TC TOP	---	Top side	Top center					2
Top center	0%	Top side	Top center			✓		2
Outside top	0%	Top side	Top center			✓		2
Bot left	---	Top side	Top center					2
Center bottom	0%	Top side	Top center			✓		2
Right bottom	0%	Top side	Top center			✓		2
Fan:	100%	Top side	Top center			✓		2

Fig. 30: The parameter window. All tabs are shown.

With regard to this, please read the chapter as well.

6.5.1.2 Creating a user

You can lock or unlock individual sections of the machine control system for a certain group of people. To this purpose, the dialog box [User administration] is used.

There are three levels of user rights:

– [Standard user] with few rights (for instance, it is not possible to change soldering profiles and the [Extras] tab is hidden)

– [Power user] with extended rights (for instance, some buttons in the [Extras] tab) are visible and

– [Administrator] with full rights (for instance, the [Extras] tab is completely visible, and it is possible to calibrate cameras).

To be able to use the user right management, you must log in as [Administrator] and the [User administration] must be enabled. Otherwise, the user administration will not be visible and no log-in window for entering a password will appear when the program starts. With regard to this, please read Chapter Setting the language and user control panel.

✓ To open the [User administration] dialog:

a) Activate the tab [Extras] in the menu bar.

⇨ The menu [Extras] appears:
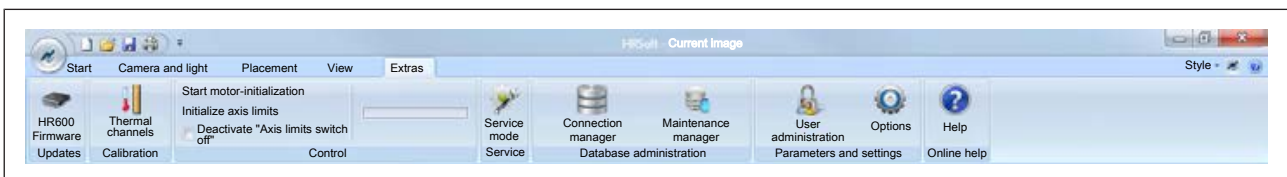
Fig. 31: The menu [Extras] as seen by an administrator

b) Click on [Parameters and settings] in the [User administration] menu area.

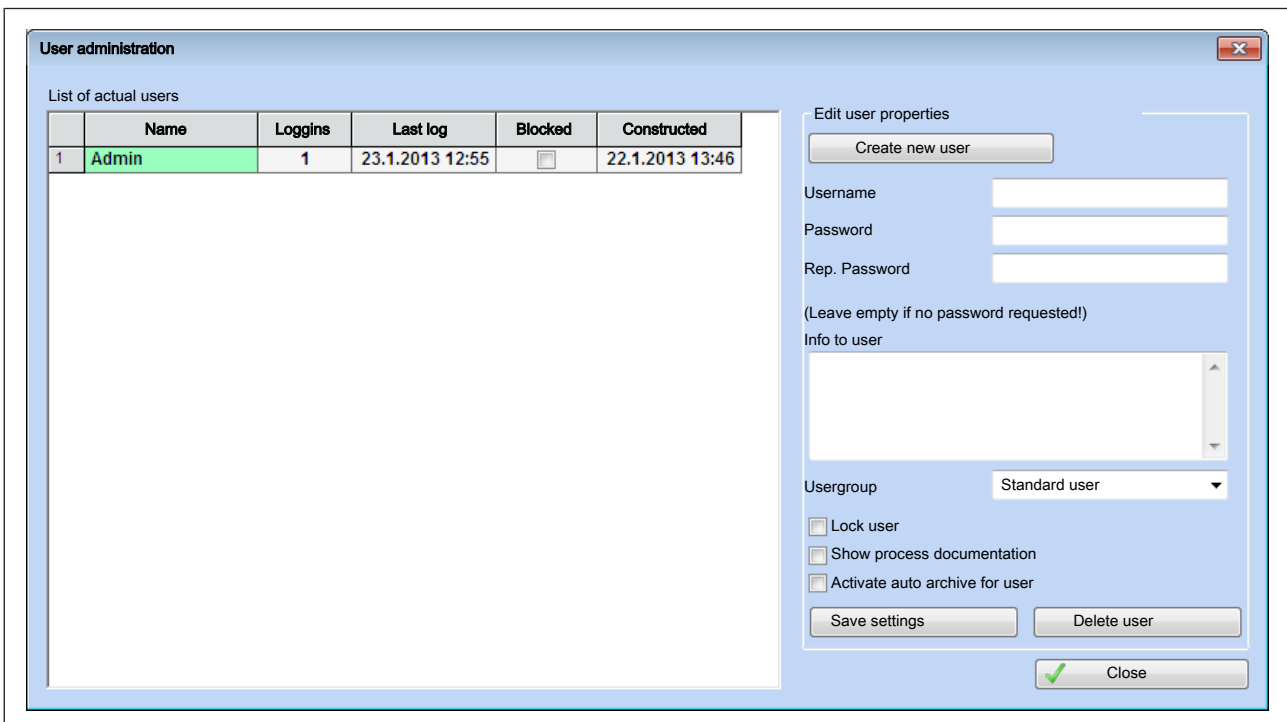⇨ The [User administration] dialog is displayed:

Fig. 32: The dialog box [User control panel]

To add a user:

✓ To add a user:

a) Click on the [Create new user] button.

b) Enter a name into the entry field [Username].

⇨ It is differentiated between capital and small letters.

c) Enter a password to the [Password] input field.

⇨ The password is not shown when it is entered but displayed in a coded way (******).

d) Optional: enter an explanatory text into the [Info to user] input field.

e) Select a group in the drop-down menu [Usergroup]. You can choose among [Standard user], [Power user] and [Administrator].

⇨ This selected group of users will be later integrated and provided with the appropriate rights.

f) Enable the checkbox [Lock user], when the user is to be blocked. Then the user will not be allowed to login any more.

g) The [Show process documentation] checkbox enables the display of the optional information file (e.g. PDF file) that was linked with the profile. With respect to this, please read the chapter [Entering information into the [Image and document] tab [▶ 122]].

h) Enable the checkbox [Activate auto archive for user] when the processes recorded by the user are to be automatically archived.

i) Click on the [Save settings] button.

⇨ The user is created and appears in the [List of actual users] window. After closing the [User administration] window, a directory is created with the user name in the [Library] window. With regard to this, please read the chapter [The work area [Profile library] [▶ 77]].

j) Click on the [Close] button.

⇨ The process has now been completed.

[Usergroup] (authorisation levels):

Log-in as [Administrator]: No limitations.

Log-in as [Power user]: As [Administrator], the [Extras] menu bar is limited to the [Options] and [Open help] buttons. In the [Placement] menu bar, the [Top camera], [Bottom camera] and [Pixel to step] buttons are however not visible.

Log in as [Standard user]: As [Power user], the [Extras] menu bar is however hidden. In the [Placement] menu bar, the [Move to position] button is hidden. Profiles cannot be edited.

To delete users:

✓ Deleting a user means deleting the user name with its rights. You can perform this process only if you have logged in as [Administrator]:

a) Select a user in the window [List of actual users]. The selection highlights with colour.

b) Click on the [Delete user] button.

⇨ The user is deleted.

To change user properties:

✓ Changing the user properties. You can perform this process only if you have logged in as [Administrator]:

a) In the [List of actual users] window, select a user by selecting the number before the user name. The selection highlights with colour.

b) Change user properties in the frame [Edit user properties].

c) Click on the [Save settings] button.

d) Click on the [Close] button.

To cancel a procedure:

✓ To close the [User administration] dialog without the changes made:

a) Click on the [Close] button without first clicking on the [Save settings] button.

⇨ The dialog box is closed and changes are not applied.

6.5.1.3 Click on the button [Options]

Clicking on the [Options] button in the [Extras] will open the [HRSoft options] dialog. The [Options] button will only be visible if you are logged in as [Administrator] or as [Power user].
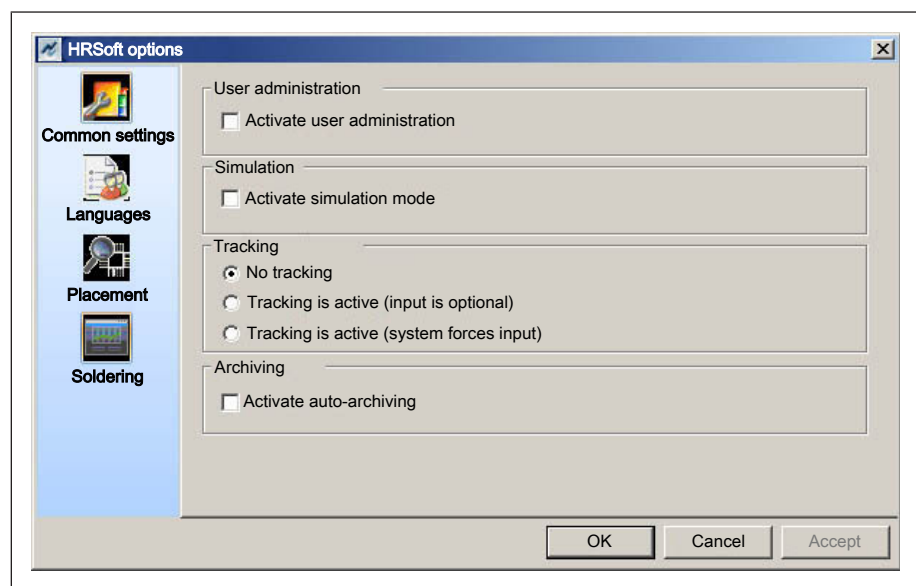

Fig. 33: Der [Extras] tab as seen by an Administrator

The [HRSoft options] dialog includes the three [Common settings], [Languages] and [Placement] frames. Here it is possible to set basic configurations for working with HRSoft.

[Common settings] frame:

Note: If the [Activate user administration] checkbox is not selected, the [Activate auto-archiving] function will be additionally displayed.

– [Activate user administration]: If this check-box is selected, when starting the HRSoft a password will be required. In this way, user rights will be controlled according to their definition in [User administration]. With regard to this point, please read the chapter [Creating a user [▶ 91]]. The user administration allows you to grant or deny certain people access to single areas of the machine control.

– If the [Activate user administration] checkbox is not selected, when starting HRSoft no password entry will be required, and the user will have administrator rights. The [Auto-archiving] will then be turned on or off via the [Activate auto-archiving] function associated with the [Options] button. In the [Library] window, in the profile database, a new directory is created. This is the only visible directory in the [Library] with turned off [User administration].

Note: To enable a change made to the user administration, you must restart HRSoft.

– [Activate simulation mode]: Do not use. For service staff only.

[Tracking]

– [No tracking]: The tracking code is not used.

– [Tracking is active (input is optional)]: The [Tracking code] window will open. It is necessary to enter a tracking code. The [Tracking code] window remains opened.

– [Tracking is active (system forces input)]: The [Tracking code] window will open. It is necessary to enter a tracking code in order to start the process.
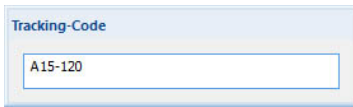
Note: During archiving, the tracking code is written into the profile and may be looked up via the [Archive] function selection.

– [Activate auto-archiving]: If [Activate user administration] has not been selected, the [Activate auto-archiving] function is visible and can be selected.

Note: When [Activate user administration] is selected, the settings of the [User administration] button are valid. For the user, in the [User administration], the [Activate auto archive for user] function can be selected or deselected.

[Languages] frame:
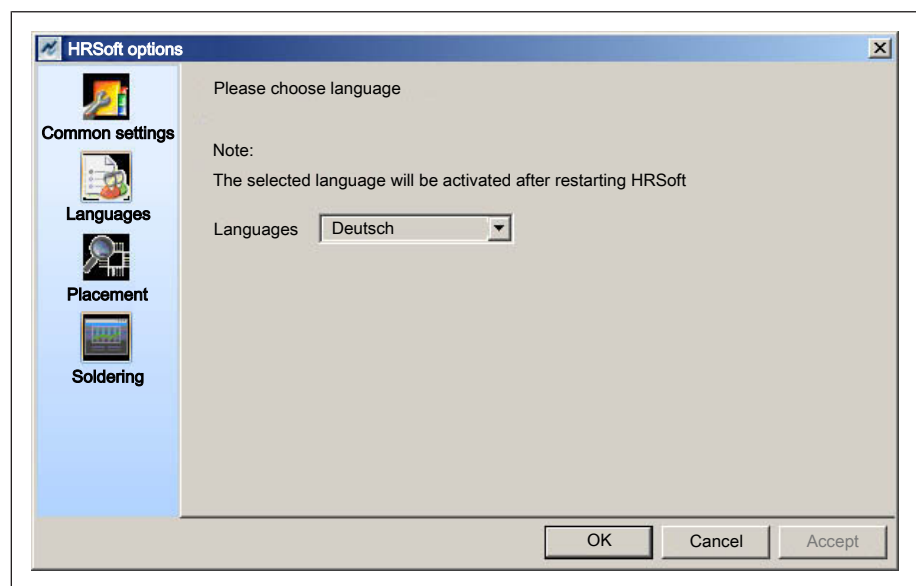
– [Languages]: Selection of the user language with the [Languages] drop-down menu. To enable the selected language change, you must restart HRSoft.

[Placement] frame:
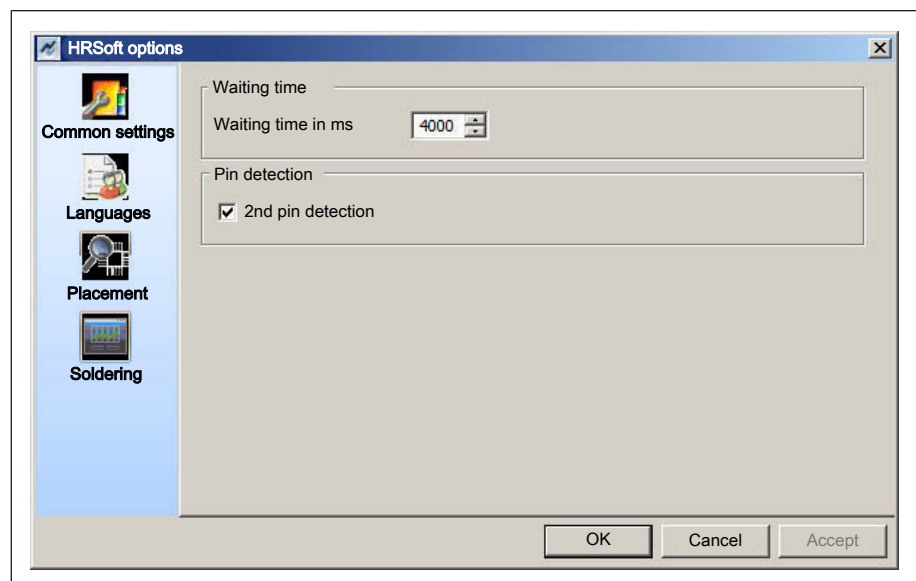
   – [Waiting time in ms]: Setting of the pause time between process steps in auto-
matic mode. With respect to this, please read ChapterThe automation bar
[▷ 68]. During pause times, the [Start the process] button is displayed as a
pause button in the automation bar. By clicking the pause button, you can hold
the process, run tests or change settings. Click once more on the pause button
to resume the process.

   – [2nd pin detection]: If this check-box is activated, when the component is lifted
from the glass plate a second comparison exposure is performed. This in-
creases the accuracy of positioning.

[Soldering] frame:
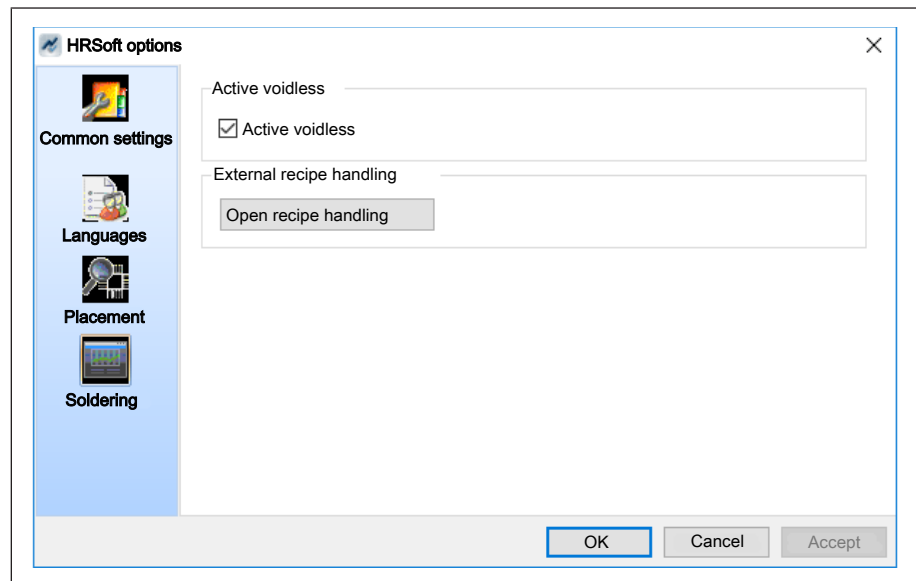
   – [Active voidless]: If this checkbox is enabled, the Rework System will make con-
tact with the optional voidless module. The work area displays the buttons for
using the voidless module.
With the Voidless Rework System, gas entrapments can be reduced in soldered
joints. For this purpose, the PCB is set into sinusoidal vibrations by means of
piezoelectric actuators, and the voids under the components are reduced in li-
quid solder. The HR 600/2 Rework System can be retrofitted with a voidless
module.

   – [Open recipe handling]: Starts the Voidless program with which the desired os-
cillation sequence for the optional voidless module is created, defined and
stored.

6.5.1.4 Database assistant

To work with the HR 600/2 unit, the [ErsaHRData] database is required. This database contains the user data, profiles and process records. The database must be set up on an SQL server. To access the database, you must be logged in as an Administrator.

All server and database settings have already been made when commissioning the HR 600/2 unit; with regard to this, please read the chapter Starting HRSoft and setting up the database connection manager [▷ 47]. Should it be necessary to make changes to these settings, you can use the [Database assistant]. It is recommended to use an SQL server on a network drive and transfer the database there. This database can then be used simultaneously by multiple users of the HR 600/2 unit. For any questions about the regular backup of the database, contact your network administrator. You can also back up the database manually. With regard to this, please read Chapter Database administration and maintenance manager [▷ 100].
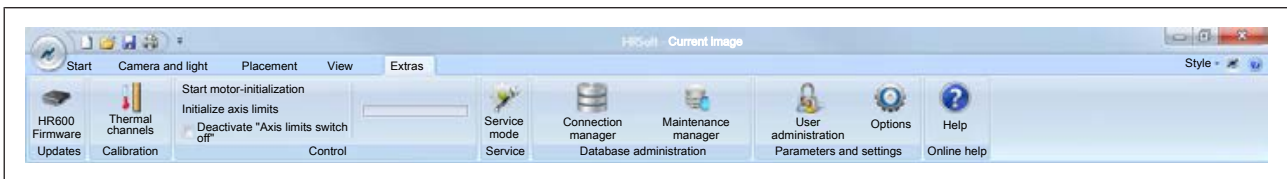
Fig. 34: The menu [Extras] as seen by an administrator.

a) Click on [Database administration] in the [Connection manager] menu area.
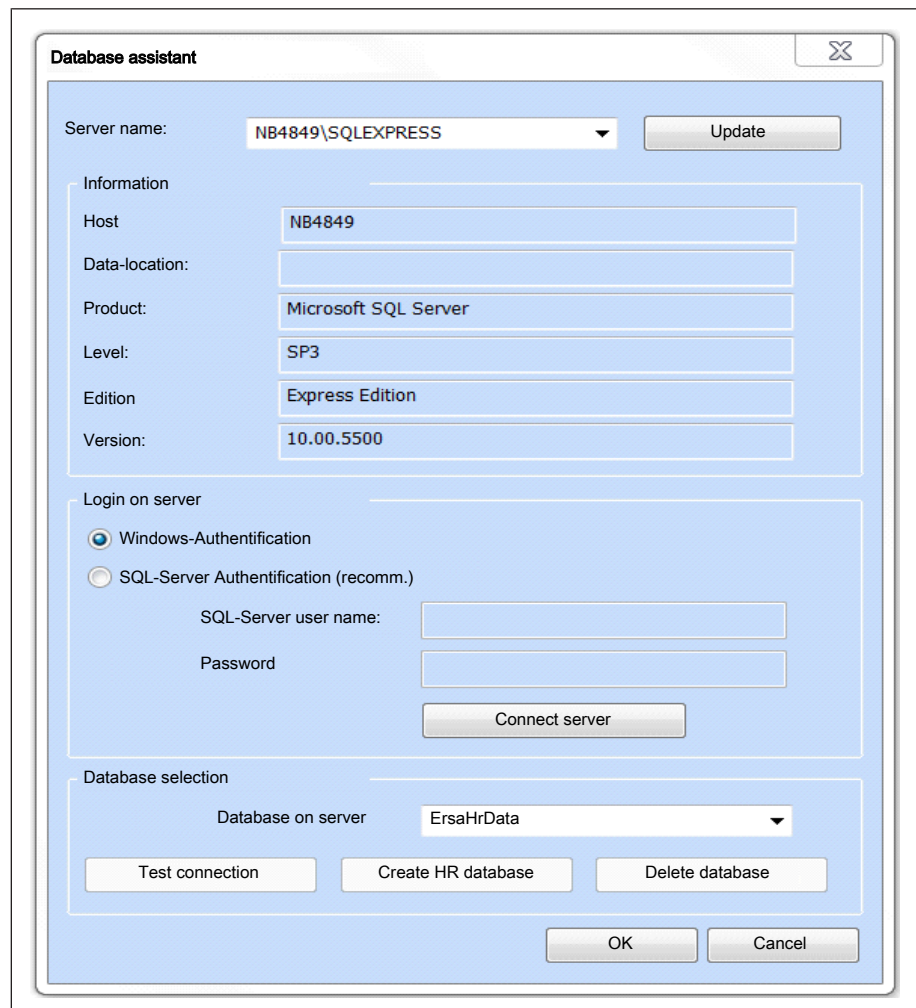
⇨ The [Database assistant] dialog is displayed:

Fig. 35: The dialog box [Database Connection Manager]

Selecting a new server:

✓ To select a new server:

a) [Server name:]: Select a server from the drop-down menu.

b) Click on the [Update] button.

⇨ The data in the [Information] frame is updated.

Authentication:

✓ To perform authentication:

a) Select an authentication method in the [Login on server] frame.

⇨ You may need to enter a username and a password!

b) Click on the [Connect server] button.

⇨ The connection to the server is established.

To select a database:

- ✓ To select a database on the server if it already exists on the server:

a) Select the [ErsaHrData] database from the drop-down menu [Database selection] in the [Database on server] frame.

b) Click on the [Test connection] button.

⇨ A message appears.

c) Confirm with [OK].

⇨ The connection to the database is now established.

To create a new [ErsaHrData] database:

- ✓ If the [ErsaHrData] database is not yet available, create a new database on the server:

a) Click on the [Database selection] button in the [Create HR database] frame.

⇨ A new database named [ErsaHRData] is created.

b) Click on the [Test connection] button.

⇨ A message appears.

c) Confirm with [OK].

⇨ The database has been created.

To delete a database:

⚠ **CAUTION**

Risk of data loss!

If you delete the [ErsaHrData] database, all user data, profiles and process records contained therein will be lost! Delete the database only when you no longer need the data, or if you have previously created a backup!

With regard to this, please also read Chapter <u>Database administration and maintenance manager [</u>▶ 100].

- ✓ To delete a database:

a) Select a database in the [Database on server] drop-down menu.

b) Click on the [Delete database] button.

⇨ A query dialog is displayed.

c) Confirm with [OK].

⇨ The database has been deleted.

6.5.1.5 Database administration and maintenance manager

In these menus you can view the computer/server settings. You can also create a backup of the [ErsaHrData] database, load a backup and optimize the database. You must be logged in as an administrator.
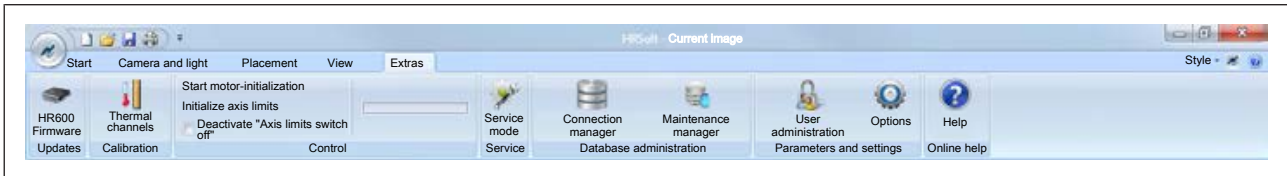

Fig. 36: The menu [Extras] as seen by an administrator.

a) Click on [Database administration] in the [Maintenance manager] menu area.
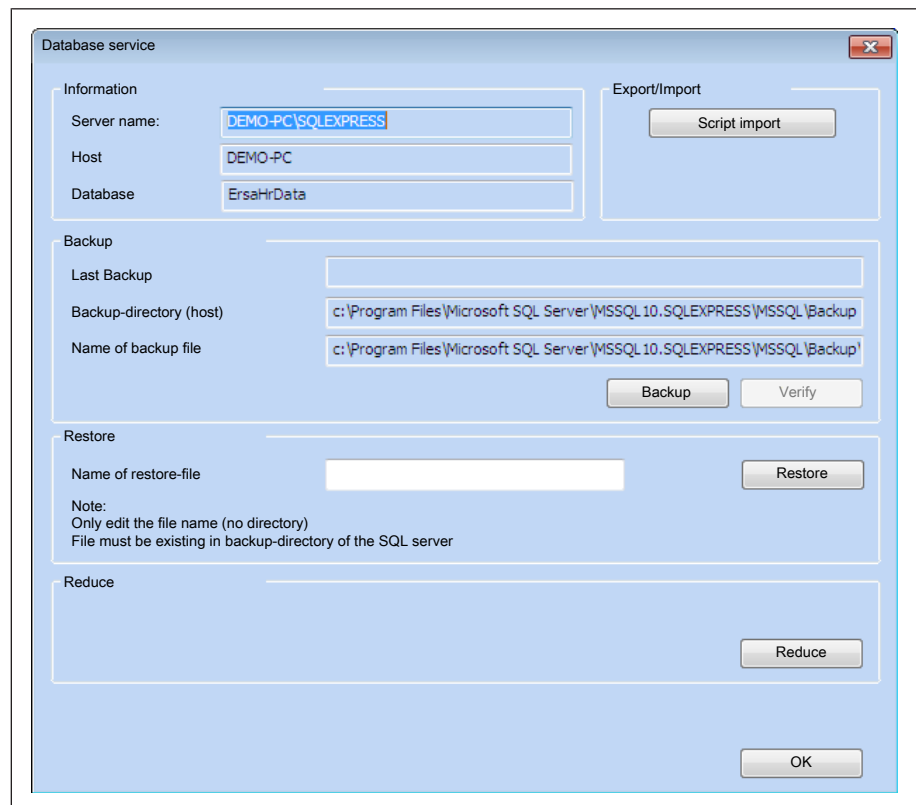
⇨ The [Database service] dialog is displayed:

Fig. 37: The dialog box [Maintenance database]

In the frame [Information]:

In this frame, the information entered into the dialog box [Database assistant] is displayed:

[Server name:], [Host], and [Database]. The ErsaHRData database name is created by the system. With regard to this point, please read the chapter Database assistant [▶ 97] as well.

In the frame [Export/Import]:

Via the [Script import] button you can import another profile template file. The original profile templates will be overwritten. The profile template file must be available in the [.scr] file format.

✓ To import profile templates:

a) Click on the [Script import] button.

  ⇨ A window is opened.

 b) Select a file in [.scr] format.

 c) Confirm with [OK].

⇨ The profile templates have been imported.

In the frame [Backup]:

The [Last Backup] display panel has no functions.

In the [Backup-directory (host)] display panel, you can find the path to the backup process. This path cannot be edited.

In the [Name of backup file] display panel, you can find the path and full file name of the backup process.

 ✓ To create a backup of the [ErsaHrData] database:

 a) Click on the [Backup] button.

  ⇨ The backup is created.

  ⇨ A message appears. The [* .bak] backup file contains the creation date in the file name.

 b) To get to the backup file in Windows Explorer, you can copy the path from the [Backup-directory (host)] line and insert it into the header in the Explorer.

 c) Confirm with [OK].

⇨ The backup has been successfully created.

 ✓ To check a created backup:

 a) Click on the [Verify] button.

  ⇨ The backup is verified.

  ⇨ A message appears.

 b) Confirm with [OK].

In the frame [Restore]:

 ✓ To load a backup of the [ErsaHrData] database:

 a) Enter the full file name of the backup file into the [Name of restore-file] input field.

  ⇨ Note: Navigate using Windows Explorer to the directory [Name of restore-file] and copy the desired file name to the clipboard. Return to HRSoft and copy the name to the [Name of restore-file] input field.

 b) Click on the [Restore] button.

  ⇨ The backup is loaded.

  ⇨ A message appears.

 c) Confirm with [OK].

In the frame [Reduce]:

 ✓ To optimize a database:

 a) Click on the [Reduce] button.

⇨ The database is optimized and restored. Through this operation, the file size decreases.

 a) Click on the [OK] button.

6.5.1.6 Firmware update

The following operations must be performed by trained, qualified staff only. You must be logged in as an administrator. Firmware is the control software of the electronic assemblies in the Rework System.
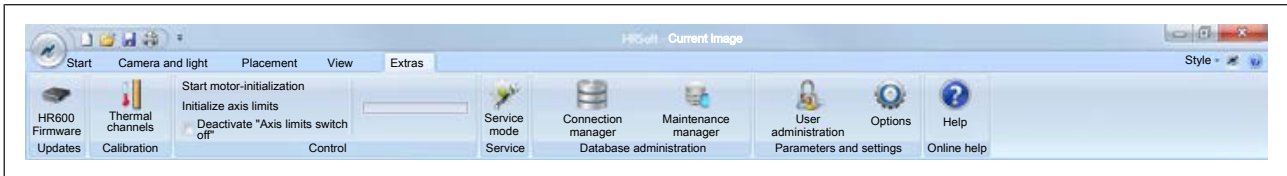

Fig. 38: The menu [Extras] as seen by an administrator

Determining the firmware version

a) Click on [Updates HR600] in the [Firmware] menu area.
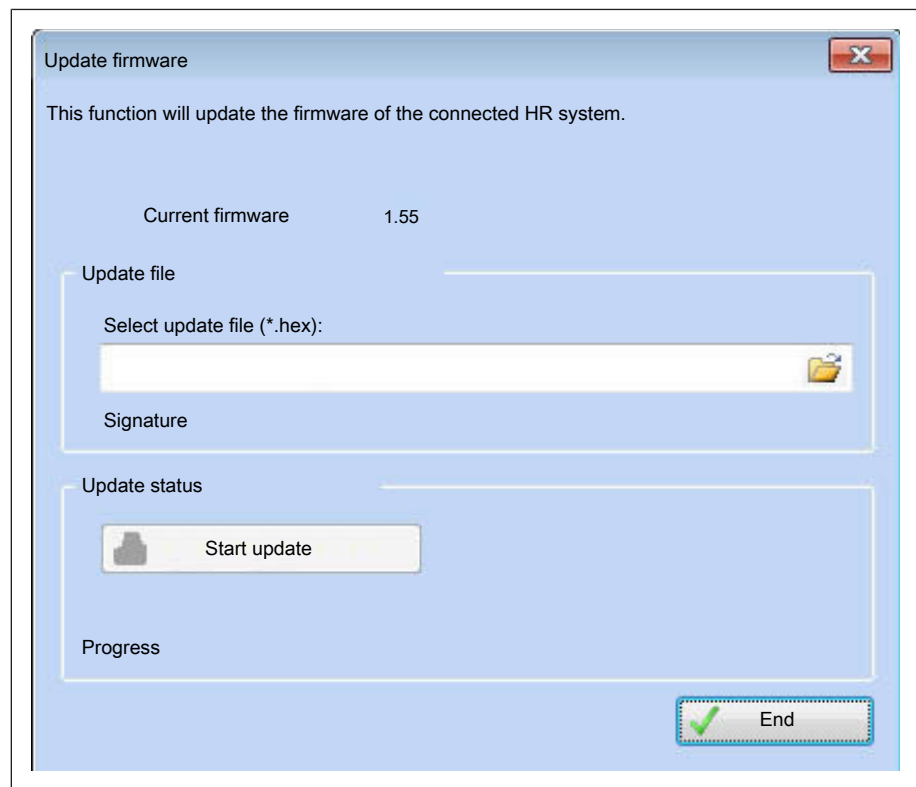
⇨ The [Update firmware] dialog is displayed:

Fig. 39: The dialog box [Performing a firmware update]

The [Current firmware] is displayed in the upper part of the window. The current firmware version is also displayed in the [System info] parameter window. With respect to this, please read Chapter The parameter window [System info] [▶ 85].

Performing a firmware update

✓ To perform a firmware update:

a) In the display field [Select update file (*.hex):], click on the icon of the file folder.

⇨ A window is opened.

b) Search for the update file. The file must be available in the file format [.hex].

c) Click on update file.

d) Click on the [Open] button.

⇨ If the version level of the selected file is equal to or lower than the current firmware version level, an error message is displayed. In this case, you cannot update the firmware with this file.

⇨ If the version level of the selected file is higher than the current firmware version level:

e) Click on the [Start update] button.

⇨ A message appears.

f) Click on the [OK] button.

⇨ The update is carried out.

g) Wait for a message to be displayed.

h) Confirm the message with [OK].

6.5.2 Profiles

What are profiles?

A profile is a file that contains all relevant data and settings for the rework process. You can create profiles, save them and enable them at a later time.

✓ To display profiles:

a) In the function selection field (6) enable the [Profile library] tab.

⇨ The [Profiles] window is displayed in the display window (5):
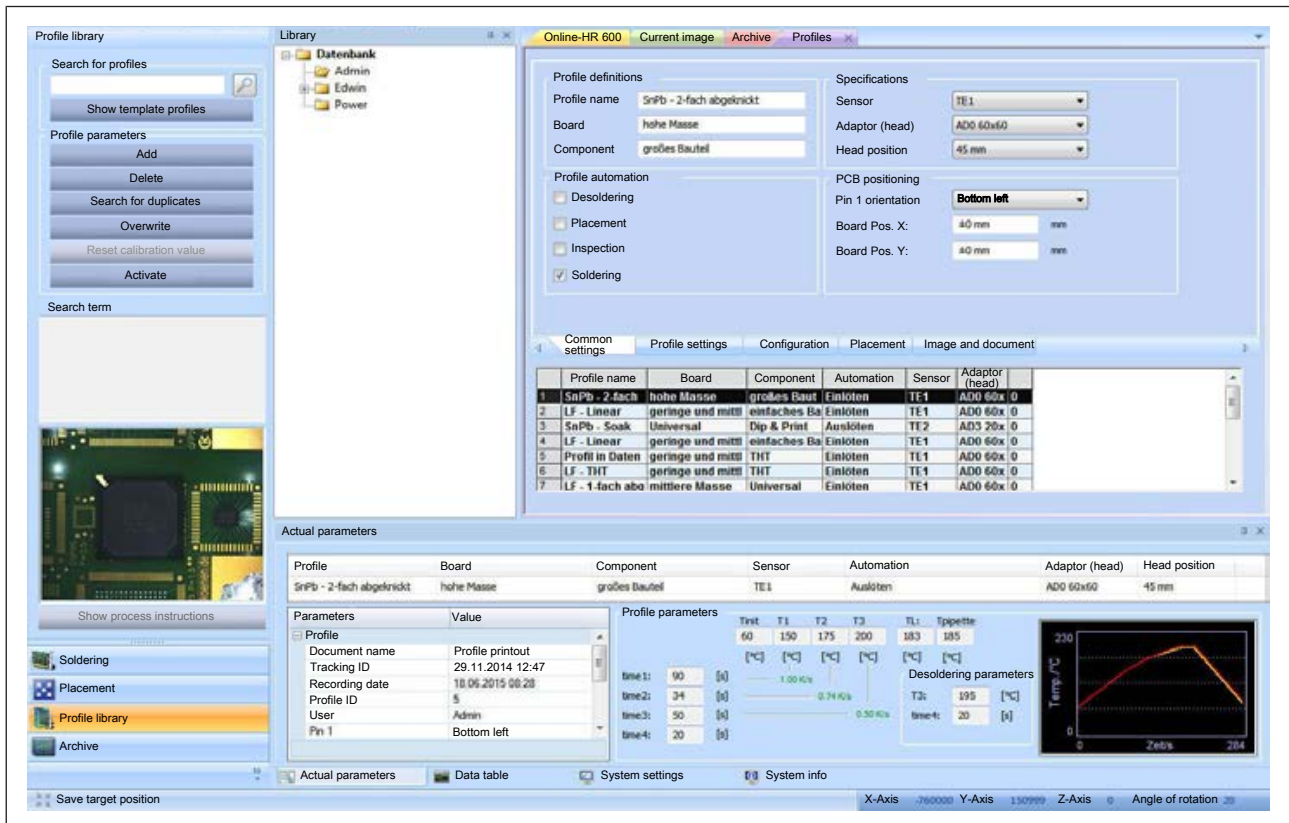
Fig. 40: The window [Profiles]

The profile properties are defined using the [Common settings], [Profile settings], [Configuration], [Placement] and [Image and document] tabs.

The profiles are saved in the [Profile library].

6.5.2.1 Enabling a profile template

Some [Template profiles] are deposited in the factory. These templates already contain useful settings for the most common rework processes. You can choose a template, customize it to your needs, as well as rename and save it. To do this, first select a template and then save it in your own [Profile library].

To learn how to adjust a profile to your own process, please refer to the chapter Customizing a profile [▶ 109] and its subchapters.

The database directory [Library]:

Under the [Library] tab, the profile database is displayed as a directory tree. As a standard user you will only see your user directory. As a power user you will have access to all directories and profiles.

Via the context menu of the right mouse button, you can create further sub-directories (containers) or delete directories. If a directory is deleted, all its profiles are permanently deleted. The context menu also offers the opportunity to rename, cut and paste directories. The functions of the context menu cannot however be applied to user directories that have been created automatically by the system.

As a [Standard user] you cannot edit profiles.

To select a profile template and save it as your own profile:

a) In the function selection field, enable the tab [Profile library].

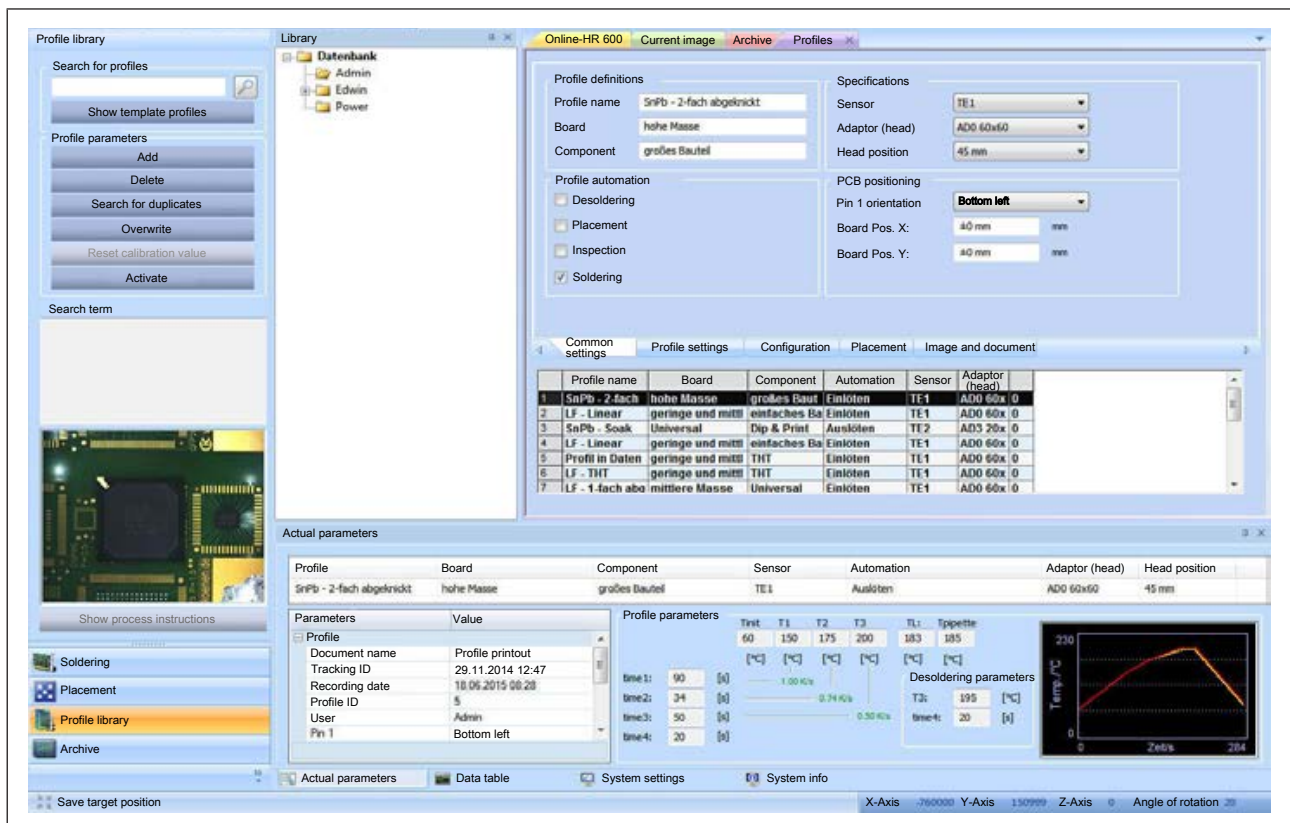⇨ The [Profiles] tab is displayed in the display window:

Fig. 41: Profiles

b) Enable the [Common settings] tab.

c) A tabular [Profile library] will appear. When delivered, the table is empty.

d) Click on the [Search for profiles] button in the [Show template profiles] frame.

⇨ The [Profile-templates] window is displayed:

e) Select a template and confirm your selection with [OK].

⇨ The template will be copied and displayed in the [Profiles] tab.

f) In the directory tree under [Library], click on the directory in which the profile should be saved.

g) Subsequently, click on the [Add] button in the [Profile parameters] frame.

⇨ The copied profile template is ready to process the [Profile parameters].

To enable a profile:

a) In the function selection field, enable the tab [Profile library].

⇨ The window [Profiles] is displayed in the display window: If you are logged in as a default user, the buttons in the [Profile library] tab are reduced and no changes can be made in the [Profiles] window.

b) Enable the [Common settings] tab.

Fig. 42: Profile, enabled [General] tab

c) In the [Library] click on the directory that contains the profile.

d) Select a profile in the profile table.

e) Click on the [Profile parameters] button in the [Activate] frame.

⇨ The profile has been selected.

a) Click on the [Activate] button.

⇨ The profile is active. You can now work with the profile.

6.5.2.2 Deleting a profile

A profile which is no longer needed can be deleted. This function is not available if you are logged in as a standard user.

a) Select a profile in the profile table-

b) Click on the [Profile parameters] button in the [Delete] frame.

    ⇨ A query dialog is displayed.

c) Confirm with [OK].

⇨ The profile has been deleted.

6.5.2.3 Searching for a profile

If many profiles are already available in your [Profile library], you can use the [Search for profiles] to search for an existing profile.

a) Enable the [Profiles] tab in the [Common settings] window.

⇨ The [Profile library] is displayed.

b) In the [Search for profiles] frame, click on the entry field.

c) Enter a profile name, or part of the profile name.

d) Click on the magnifying glass next to the entry field.

⇨ The search results are displayed.

To display all profiles:

✓ After a single profile search, show all profiles again:

a) In the [Search for profiles] frame, click on the entry field.

b) Delete the previously entered search term.

c) Click on the magnifying glass next to the entry field.

⇨ All profiles are displayed.

6.5.2.4 Customizing a profile

6.5.2.4.1 Select a profile and save it under a new name

In most cases, it makes sense to adapt an existing profile to your own require-ments. To do so, use the [Template profiles] which were delivered together with the HR 600/2 unit. You can also customise a profile from your own [Profile library]. As a standard user you cannot edit profiles.

✓ To select a profile:

a) If in your own [Profile library] no profile exists yet, get a profile template. With respect to this, please read Chapter Enabling a profile template [▶ 105].

b) In the function selection field, enable the tab [Profile library].

c) Selecting the [Common settings] tab

d) A profile table will appear.

Fig. 43: Profile table

e) Select a profile in the table.

f) Click the entry field [Profile name] and enter a new name. Assign unambigu-ous, descriptive profile names because you can also search by profile name.

g) In the directory tree under [Library], click on the directory in which the profile should be saved.

h) Click on the [Profile parameters] button in the [Add] frame.

⇨ The profile appears as a new profile in the [Profile library]. Now you can adjust the profile to the process. Enable the following tabs one after the other: [Com-mon settings], [Profile settings], [Configuration], [Placement] and [Image and document]. In each tab, you can now edit the profile.

Save:

✓ To save the profile:

a) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ Changes are saved in the profile.

Also see

▤ The [Archive] work area [▶ 79]

6.5.2.4.2 Customizing a profile in the [Common settings] tab.

In this and in the following chapters you will find a description of the tabs in which the profile parameters are defined. Open the tabs one after another and adjust the profile.

✓ To customise general settings:

a) In the directory tree under [Library], click on the directory in which the profile is located.

b) Enable the [Common settings] tab in the [Profile] tab.

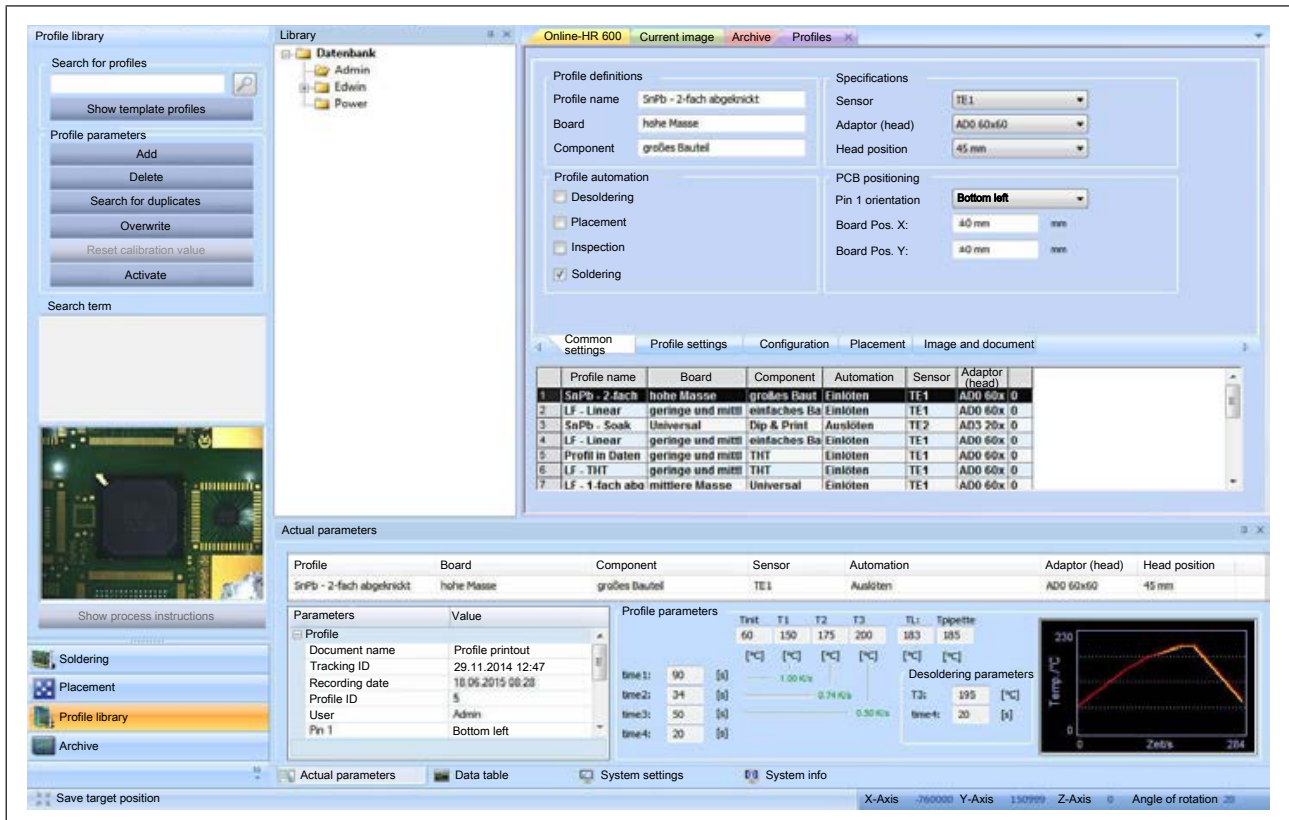⇨ A profile table will be displayed:

Fig. 44: Enabled tab [General] with profile table.

c) Select a profile in the table.

d) Click the entry field [Profile name] and enter a new name.

e) Click on the entry field [Board] and describe the property of the circuit board in a more detailed way.

f) Click on the entry field [Component] and describe the property of the component in a more detailed way.

g) In the [Profile automation] frame, click on one or more tasks that should be executed by the profile.

⇨ After activating the profile, these buttons are marked with colours in the automation bar and executed one after another. With respect to this, please read Chapter The automation bar [▶ 68].

h) Click on the drop-down menu [Sensor] in the [Specifications] area and specify the sensor used for temperature control:

⇨ [TC1], [TC2] or [IRS]. If the [Soldering] tab is selected in the function selection area, the red digital display will show the temperature of the sensor currently controlling the process temperature

⇨ Thermocouples TE1 and TE2 measure the temperature at the tip of the thermocouple. With respect to this, please read the chapter Positioning a thermocouple [▶ 128]. The infrared sensor (IRS) measures the surface temperature and, depending on the PCB and components, this value may differ from that measured with the thermocouple. All currently measured temperature values can be displayed in the [Data table] parameter window.

i) Click on the drop-down menu [Adaptor (head)] and specify the air deflector used on the heating head. This does not lead to a functional change but serves only as a marker. The correct air deflector must be fitted by the user on the heating head. Air deflectors are used to shield heat-sensitive components. With regard to this, please also read Chapter Shielding heat sensitive components [▶ 129].
AD0 60 x 60 = without air deflector
AD0 20 x 20 = Fit an air deflector 20 mm
AD0 30 x 30 = Fit an air deflector 30 mm
AD0 40 x 40 = Fit an air deflector 40 mm
Do not select AD4 Ø.

j) Click on the drop-down menu [Head position] and specify the [Head position] to be used.

⇨ This heating head height position is automatically approached during soldering and desoldering.
Note: For head positions of less than 40 mm, the [IRS] sensor cannot be used. A message appears on the screen in this case.

k) Click on the drop-down menu [Pin 1 orientation] and select the position of pin 1 on the component:

⇨ [Bottom left], [Top left], [Bottom right] or [Top right].
For comparison, check whether the component on the glass plate is properly aligned (polarity). This will not result in a parameter change.

l) {[Board Pos. X:, Board Pos. Y:]: Click on the entry fields and specify the coordinates of the PCB position.

⇨ These X/Y coordinates are used to store and reuse the PCB position in the insertion frame during serial operations.
[Board Pos. X:] = Front scale, reading on the right product support bar
[Board Pos. Y:] = Right-hand scale, reading on front PCB edge.
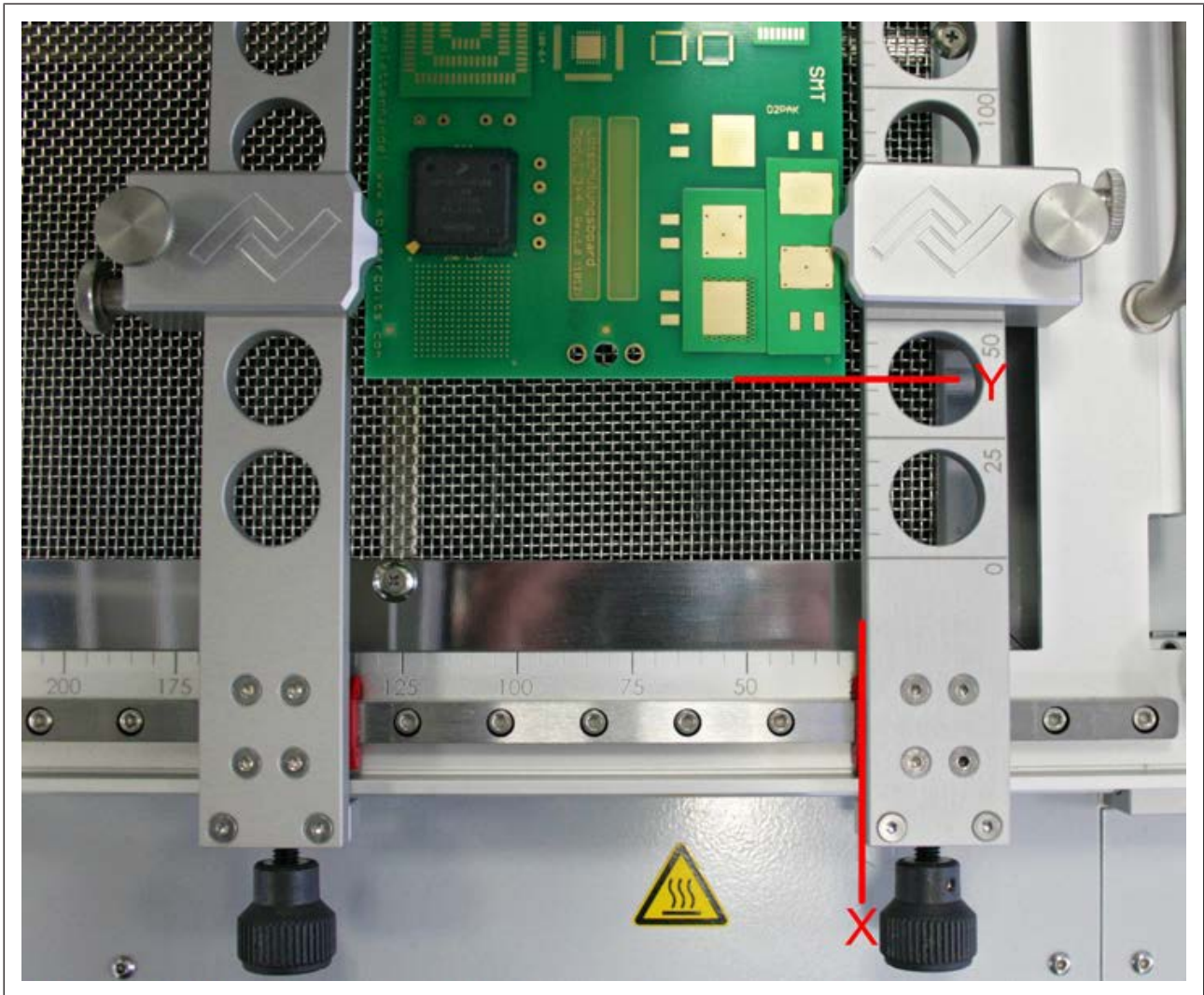The following example picture shows the values X = 25 mm, Y = 38 mm. Two scale strokes are 5 mm apart.

Fig. 45: Read PCB placement on the scales

To save changes in the profile:

a) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ Changes are saved in the profile.

6.5.2.4.3 Adjusting gradients in the [Profile setting] tab

Now adjust gradients to your requirements. The temperature gradients stored in the [Template profiles] have been identified in test series and fit the most common rework processes.

✓ To adjust gradients:

a) Enable the [Profiles] tab in the [Profile settings] window.

⇨ The [Profile settings] window is displayed.

Fig. 46: The [Profile setting] window

b) With the horizontally arranged sliders you can change the times from [time 1] to [time 4]. With vertically arranged sliders you can change temperatures from [Tinit] and [T1] to [T3] to the [time 1] times to [time 4].

⇨ [Tinit] = Temperature from which the process is automatically started.
In the display panels next to and below the sliders you can read the values set, or directly enter your own values. During setting, observe how the gradient changes.
The green Kelvin values are displayed in red when the HR 600/2 is unable to reach the requested temperatures in the requested time.
Please note that the components should not be heated as quickly as possible; in fact, a uniform temperature distribution requires a slower heating process. This increases the safety level of the process

c) In the [TL] field, set the temperature in [°C] at which the solder used becomes liquid (Liquidus Temperature). The optional RPC camera can help you determine the [TL].

d) In the [Tpipette] field, set the temperature in [°C], at which during the desoldering process the pipette moves down, picks the component and reaches its park position.

e) In the [Differing solder parameters] frame, in case of profiles including both soldering and desoldering, the desoldering process can be set individually. The gradient of the desoldering process is displayed in yellow in the graph display.

f) [T3]: Set a [T3] temperature for the desoldering process differing from that of the soldering process.

g) [time 4]: Set a [time 4] time for the desoldering process differing from that of the soldering process.

h) [Synchronize with soldering process]: Resetting the desoldering gradient to the soldering gradient.

To save changes in the profile:

a) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ Changes are saved in the profile.

6.5.2.4.4 Adjusting the radiator configuration in the [Configuration] tab

Now adjust the radiator configuration to your requirements. For [time 1], [time 2], [time 3] and [time 4] you can determine each time a radiator configuration.
If in the [Common settings] tab several temperatures have the same values, their [time] indications will be summed up.

✓ To customize the [Configuration]:

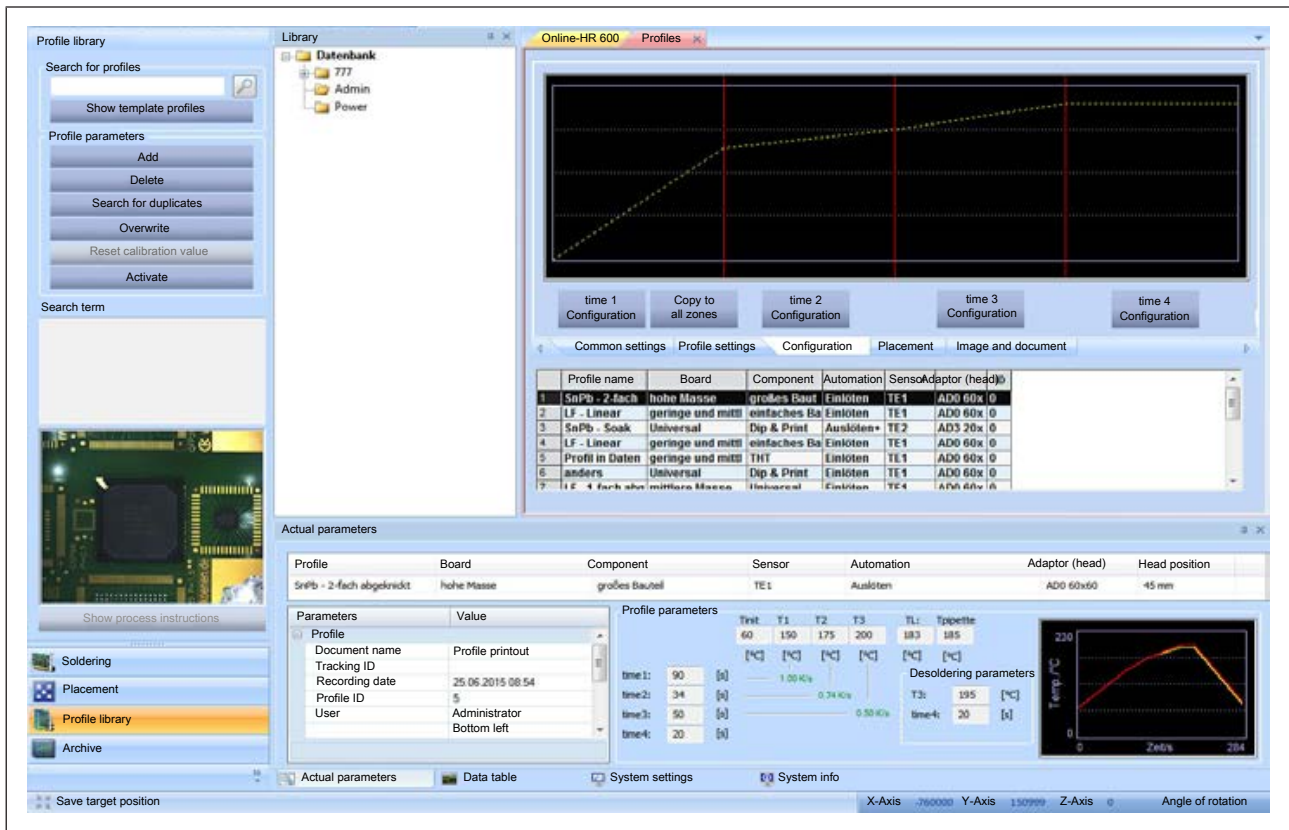a) Enable the [Profiles] tab in the [Configuration] window.

⇨ The [Configuration] window is displayed.

Fig. 47: The [Radiator configuration] window

⇨ The top graph window is divided into four areas [time 1] to [time 4], separated by vertical red lines. The buttons for radiator configuration are located here.

b) Click on [time 1] [Configuration].
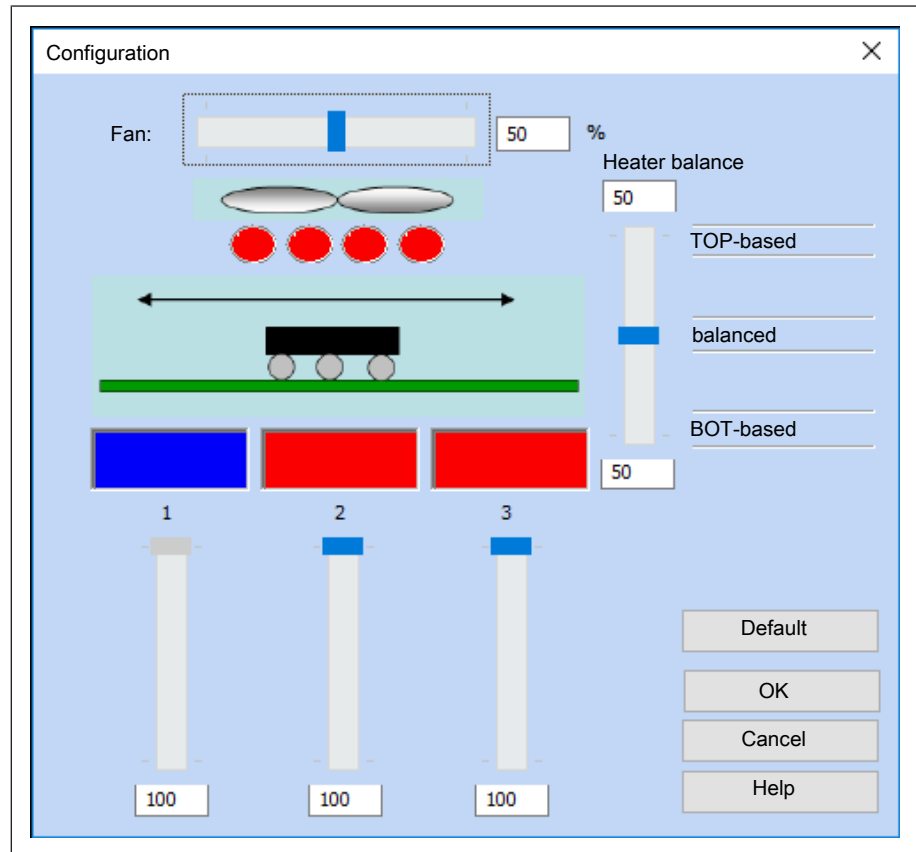
⇨ The configuration window is displayed:

Fig. 48: Configuration window

To adjust the output of a convection fan to an area:

a) Move the slider [Fan:] to the left or right.

⇨ In the display panel, on the right next to the slider, you can read the output of the fan in [%] or enter a value.

To enable the upper and lower radiators:

The upper radiator group consists of four single radiators. You can either enable all or only the two inner radiators, matching the component size.

✓ To enable the upper radiator group:

a) Click the oval icons of the radiator with the mouse. The colour changes to either blue or red.

⇨ Red: The radiator is enabled. Blue: The radiator is disabled.

The lower radiator group consists of three individual radiators. You can enable each radiator separately. Only enabled radiators are used for the process.

✓ To enable the lower radiator group:

a) Click on the rectangular icon of a radiator with the mouse. The colour changes to either blue or red.

⇨ Red: The radiator is enabled. Blue: The radiator is disabled.

To customize the maximum output of the lower radiators:

You can limit the output of each radiator to a maximum value.

a) Move the slider up or down under the rectangular symbol of a radiator.

⇨ In the display panel below the slider, you can read the radiator output or enter a value.

To customize the control ratio between upper radiator/lower radiator:

You can change the power ratio:

- – [TOP-based] (100%, heat only the upper radiator)
- – [balanced] (50%, heat upper and lower radiators equally)
- – [BOT-based] (0%, heat only the lower radiator)

In between, control conditions can be set with 1%-increments.

✓ To customize the control ratio:

a) Move the slider [Heater balance] up or down.

⇨ In the display panel below the slider, you can read the value set, or enter a value.

✓ Saving changes:

a) Click on the [OK] button.

⇨ Settings have been applied, the window is closed.

✓ Cancelling the operation:

a) Click on the [Cancel] button.

⇨ The window is closed. No changes have been applied.

✓ To restore the factory settings:

a) Click on the [Default] button.

⇨ The factory setting is restored:

- – Fan power: 50%
- – All the radiators are active
- – Lower radiator power: 100%
- – Control ratio 50 [balanced]

Displaying the help function:

a) Click on [Help], or press the [F1] key on the keyboard.

⇨ The online help is displayed.

To transfer the [time 1] configuration to other areas:

✓ Copy the [Configuration] of [time 1] to the [time 2], [time 3] and [time 4] areas:

a) Click on [Configuration] in the [Copy to all zones] window.

⇨ The settings of the [time 1] area are copied to all areas.

To save changes in the profile:

a) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ Changes are saved in the profile.

6.5.2.4.5 Customizing the placement process in the [Placement] tab

The placement process involves picking up the component from the glass plate or dip module and putting it down onto the PCB.

You can now adjust the placement process to your requirements. You can make settings affecting [Automation] and [Placing mode] and define target coordinates for component placement.

✓ To adjust the placement process:

a) Enable the [Profiles] tab in the [Placement] window.

⇨ The [Placement] window is displayed.
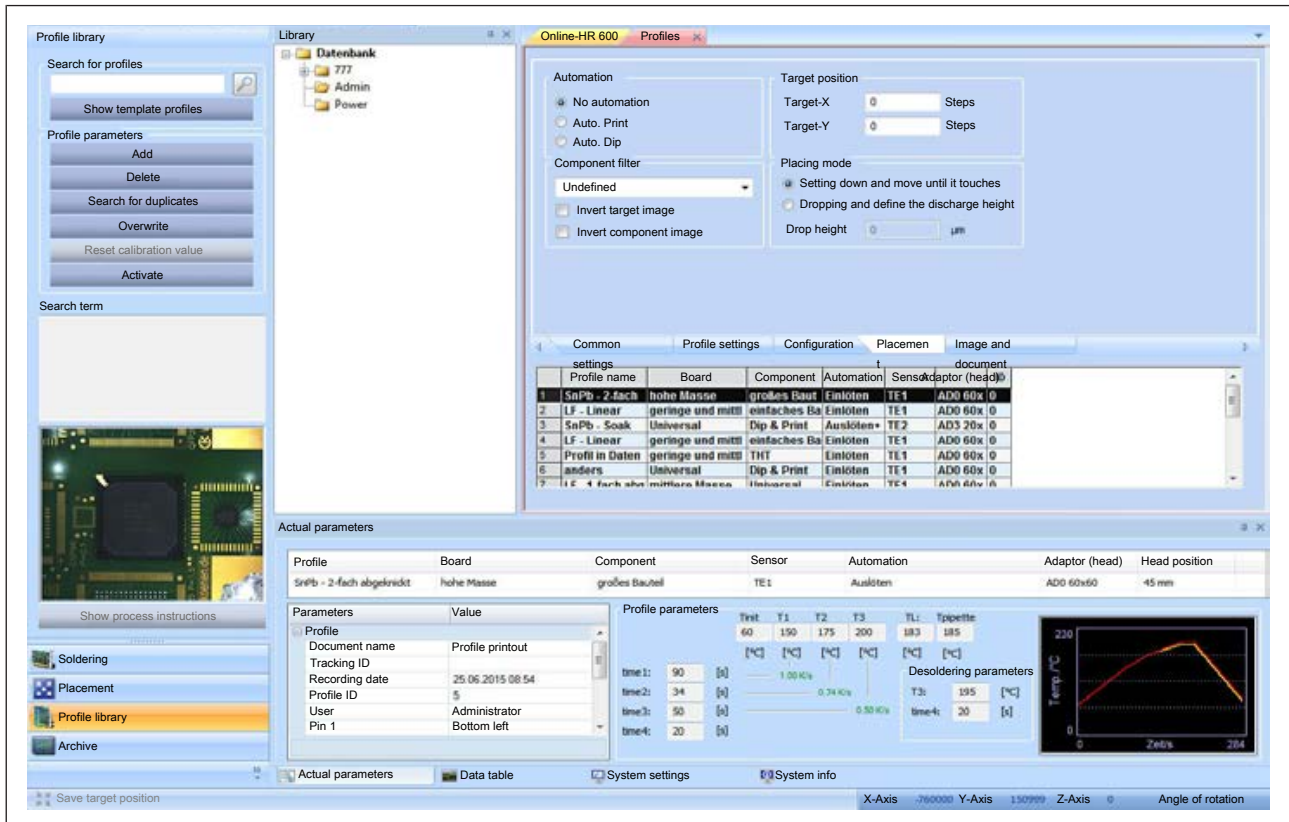
Fig. 49: The window [Placement]: The status bar at the bottom of the screen shows the current position coordinates.

Automation

The use of the DIP & Print station is described in document [3BA00199]. The DIP & Print Template picture shows No. 21 in the Overview of the machine parts [▶ 54]. When using a DIP & Print Station, the following functions are available to automate the placement process :

[No automation]: in this case, the component must lie on the glass plate. The following steps are performed automatically:

- The head moves to the landing surface.
- The pick-and-place nozzle collects the component on the glass plate and aligns it.
- The pick-and-place nozzle places the component onto the landing surface.

[Auto. Print]: in this case, the print template must be incorporated and the component lie on the print template. The following steps are performed automatically:

- The head moves to the landing surface.
- The pick-and-place nozzle collects the component on the print template and moves to the glass plate. Here, the component is aligned.

– The pick-and-place nozzle places the component onto the landing surface.

[Auto. Dip]: in this case, the Dip station must be incorporated and the component lie on the glass plate. The following steps are performed automatically:

– The head moves to the landing surface.

– The pick-and-place nozzle collects the component on the glass plate and aligns it.

– The pick-and-place nozzle moves to the dip position and dips the component into the flux.

– The pick-and-place nozzle moves to the glass plate. There, the component is re-aligned.

– The pick-and-place nozzle places the component onto the landing surface.

✓ To select an automation process:

a) In the [Automation] frame, enable a [No automation], [Auto. Print] or [Auto. Dip] radio button.

⇨ The automation process is saved as described above in the profile.

Component filter

a) In this drop-down menu, you can select a component filter.

⇨ Possible filters are: [undefined] = all other component types, [BGA] = Ball Grid Array, [QFP] = Quad Flat Package, [PLCC] = Plastic Leaded Chip Carrier, [MLF] = [Micro Lead Package], [SOIC] = Small Outline IC, [CSP] = Chip Scale Package, [LED] = Light-emitting diode, [CBGA] = Ceramic Ball Grid Array, [Interposer BGA] = BGA on wiring layer, [BGA Socket] = Ball Grid Array Socket.

⇨ The component detection system of the camera is enhanced for the selected component type.

b) [Invert target image]: Negative representation of the landing surface image

c) [Invert component image]: Negative representation of the component image

d) Save the change.

Target position

[Target-X]: Input field of the target position in the X direction.

[Target-Y]: Input field for the target position in the Y direction.
The status bar at the bottom of the screen shows the current position coordinates. If the [Save target position] button is active in the status bar, click on it to save the current position as a target position in the profile. With regard to this, please read Chapter The status bar [▶ 86].

For larger series of a rework task, it is appropriate to save also the coordinates of the [Target position] of a component in the profile. This is especially true if the same components must be always processed in the same [Target position]. When the process starts, the head will always immediately move to the specified [Target position].

✓ To save the [Target position]:

a) Move the head to the landing surface.

⇨ The coordinates of the landing surface are displayed in the status line, [X-Axis], [Y-Axis]. With respect to this, please read the chapter The user interface [▶ 57] as well.

b) In the frame [Target position], enter the coordinates into the entry fields [Target-X] and [Target-Y].

c) Save the change.

Placing mode

✓ To position a component:

a) Enable the [Setting down and move until it touches] radio button in the [Placing mode] frame.

⇨ The component is placed onto the landing position, until it comes into contact with the circuit board.

✓ To discard a component:

a) Enable the [Dropping and define the discharge height] radio button in the [Placing mode] frame.

⇨ The entry field [Drop height] can now be edited.

b) Enter a value in [µm] into the entry field.

⇨ The component is driven to the landing position and lowered, until the [Drop height] is reached. The component is then discarded.

a) Save the change.

To save changes in the profile:

a) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ Changes are saved in the profile.

6.5.2.4.6 Entering information into the [Image and document] tab

You can store further information for your profile such as working instructions, documents or pictures. All information can be saved in the profile.

✓ To enter information:

a) Enable the [Profiles] tab in the [Image and document] window.

⇨ The [Image and document] window is displayed.
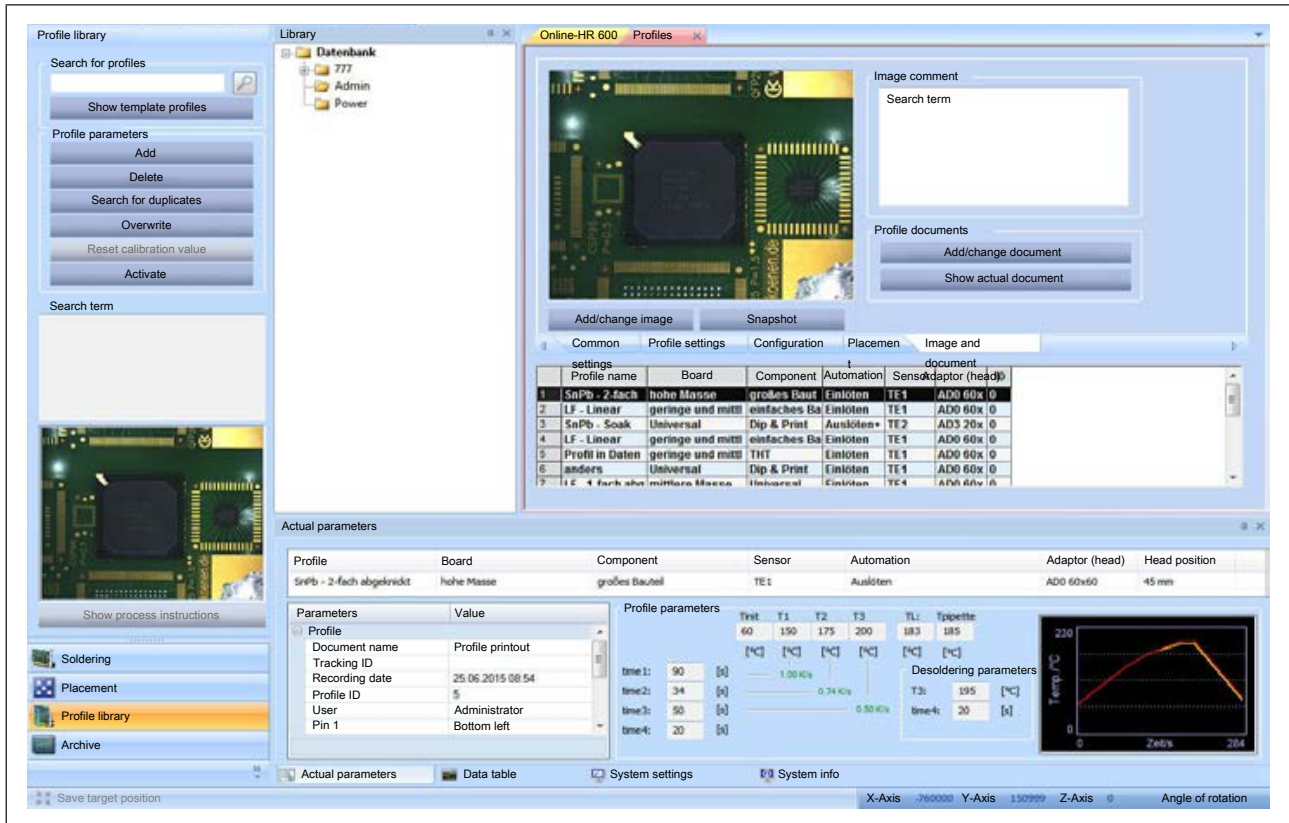
Fig. 50: The [Image and document] window

To insert a picture from your file system:

a) Click on the [Add/change image] button.

⇨ A window is opened.

b) Select a picture from your file system. Supported formats are [.jpg] and [.bmp].

c) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ The picture will be shown in the [Profile library] window as soon as you select the profile.

To take and insert a picture:

a) Activate the tab [Camera and light] in the menu bar.

b) Select a camera in the menu area [Live video].

c) Move the camera to the position from which you want to capture the image. Now go back to the profile and enable the [Image and document] tab.

d) Click on the [Snapshot] button.

e) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ The picture is now stored in the profile.

To paste a Search term:

a) Enter any text into the [Image comment] frame.

b) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ The comment will be shown in the window in the [Image and document] tab as soon as you select the profile.

To add a document:

a) Click on the [Profile documents] button in the [Add/change document] frame.

b) A window is opened.

c) Select a document from your file system. The supported formats are [.JPG], [.PDF], [.XLS/XLSX], [.DOC/DOCX] or [.PPT/PPTX

d) Click on the [Profile parameters] button in the [Overwrite] frame.

⇨ The document is now stored in the profile.

To display a pasted document:

a) Click on the [Show actual document] button.

⇨ The currently stored document is opened. To do this, the software required for display must be installed on your computer.

6.5.3 Formatting example - Selecting a profile and saving it under a new name

In most cases, it makes sense to adapt an existing profile to your own requirements. To do this, use the [Template profiles] which were delivered together with the HR 600/2 unit. You can also customise a profile from your own [Profile library]. As a standard user you cannot edit profiles.

✓ Select a profile and save it under a new name:

a) If in your own [Profile library] no profile exists yet, copy a template first. With respect to this, please read the chapter Enabling a profile template [▶ 105].

b) Enable the [Common settings] tab.
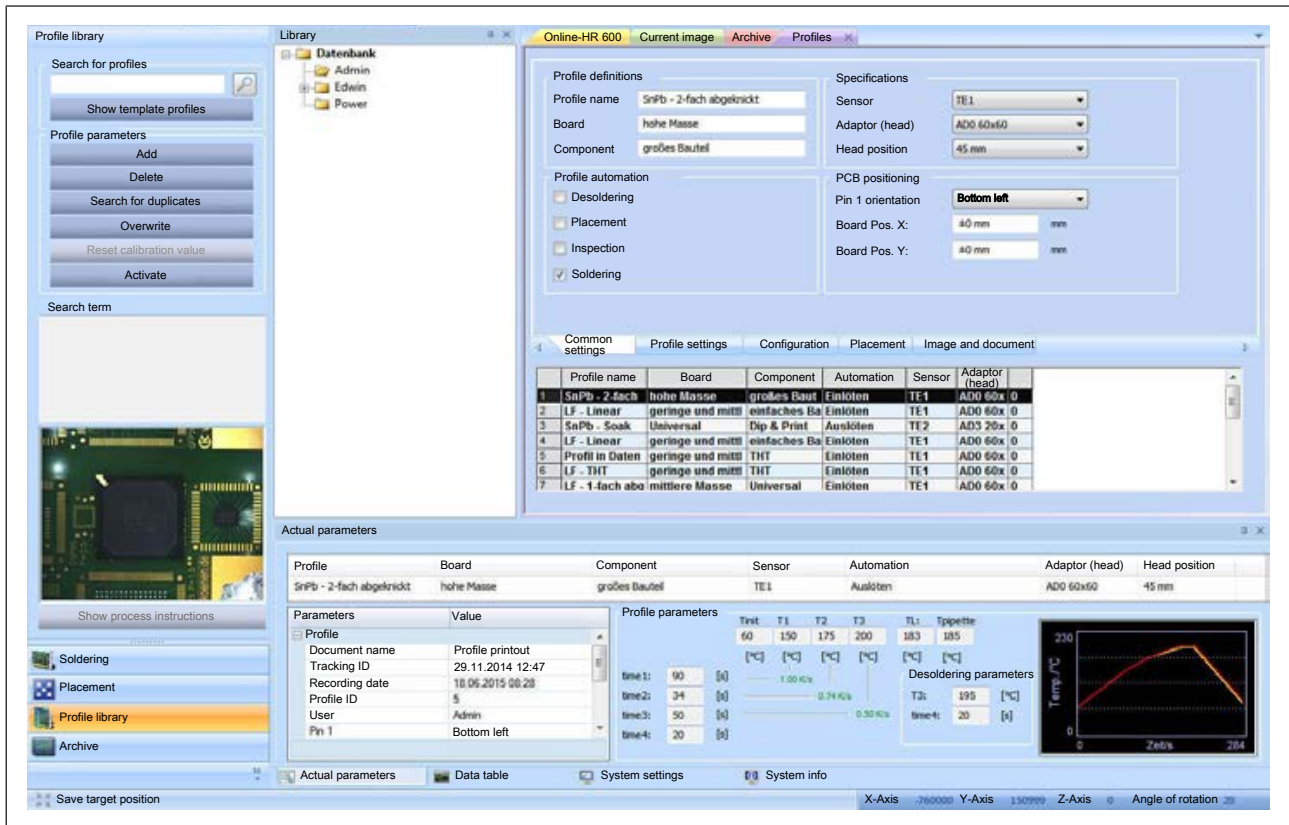
⇨ The [Common settings] window is displayed:

Fig. 51: Profile table

c) In the table, select a profile; the profile highlights with colour.

d) Click on the input field [Profile name] and enter a new name. Assign unambiguous, descriptive profile names because you can also search by profile name. You can use the search function in the frame [Search for profiles] or the advanced search in the work area [Archive]. For more information, please also read the chapter The [Archive] work area [▶ 79].

e) In the directory tree under [Library], click the directory in which the profile ought to be saved.

f) Click on the button [Add] in the frame [Profile parameters].

⇨ The profile appears as a new profile in the [Profile library]. Now you can adjust the profile to the process. To do so, adjust consecutively the tabs [Common settings], [Profile settings], [Configuration], [Placement] and [Image and document]. In each tab, you can now edit the profile.

6.5.4 Soldering instruction manual

6.5.4.1 Desoldering a component

The step-by-step sequence of the soldering process is described below.

6.5.4.1.1 Inserting a PCB

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.

⚠ 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

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.
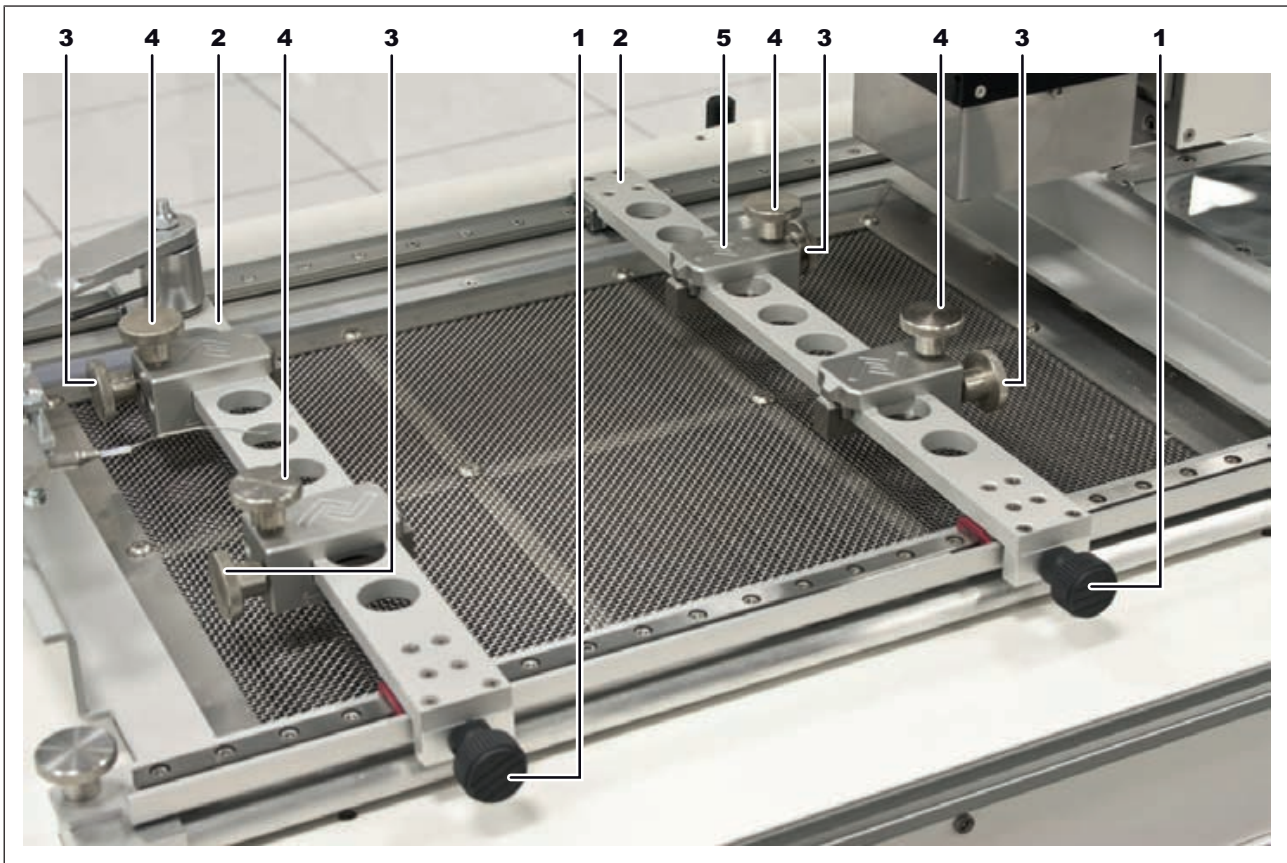
Fig. 52: Inserting the circuit board

✓ To insert the circuit board:

a) Activate the tab [Start] in the menu bar.

b) In the work area, click on the **P** button.

⇨ The heads will move to the park position. Keep the travel path of the axles clear!

c) Loosen all six knurled screws (1) and (3).

d) Adjust the position of the PCB terminals (5) to the PCB size and tighten the four knurled screws (3).

e) Open the PCB terminals with the knurled screws (4).

f) Insert the PCB and use the rails (2) to grip it.

g) Clamp the PCB with the knurled screws (4).

h) Slide the fixed PCB to the middle of the insert frame:

i) Retighten the two knurled screws (1).

To adjust the pipette size to the component:

Select the largest possible pipette for the component.

✓ If necessary, replace the pipette:

a) Wait until the soldering head has cooled down.

b) In the function selection field, enable the tab [Placement].

⇨ The [Placement] work area is displayed:

c) Use the arrow buttons with the key combination [Ctrl] + [Arrow key] to move the pipette into a suitable maintenance position.

d) Click on the [Move pipette down] button.

⇨ The pipette is lowered completely.

e) In case of larger pipettes: Pull the clear silicone nozzle downwards.

f) Attaching a new silicone nozzle

g) In case of smaller pipettes: Remove the pipette. The pipette is held magnetically.

h) Attach another pipette.

⇨ Click on the [Move pipette up] button.

To save the PCB position in the insertion frame:

To restore the PCB position in the insertion frame, it is possible to save the scale values in the profile parameters. With respect to this, please read Chapter <u>Customizing a profile in the [Common settings] tab.</u> [▸ 111].
[Board Pos. X:] = Front scale, reading on the right product holder.
[Board Pos. Y:] = Scale on the right, reading on the PCB front edge.

6.5.4.1.2 Positioning a thermocouple

To avoid damage, only insulated thermocouples may be used.
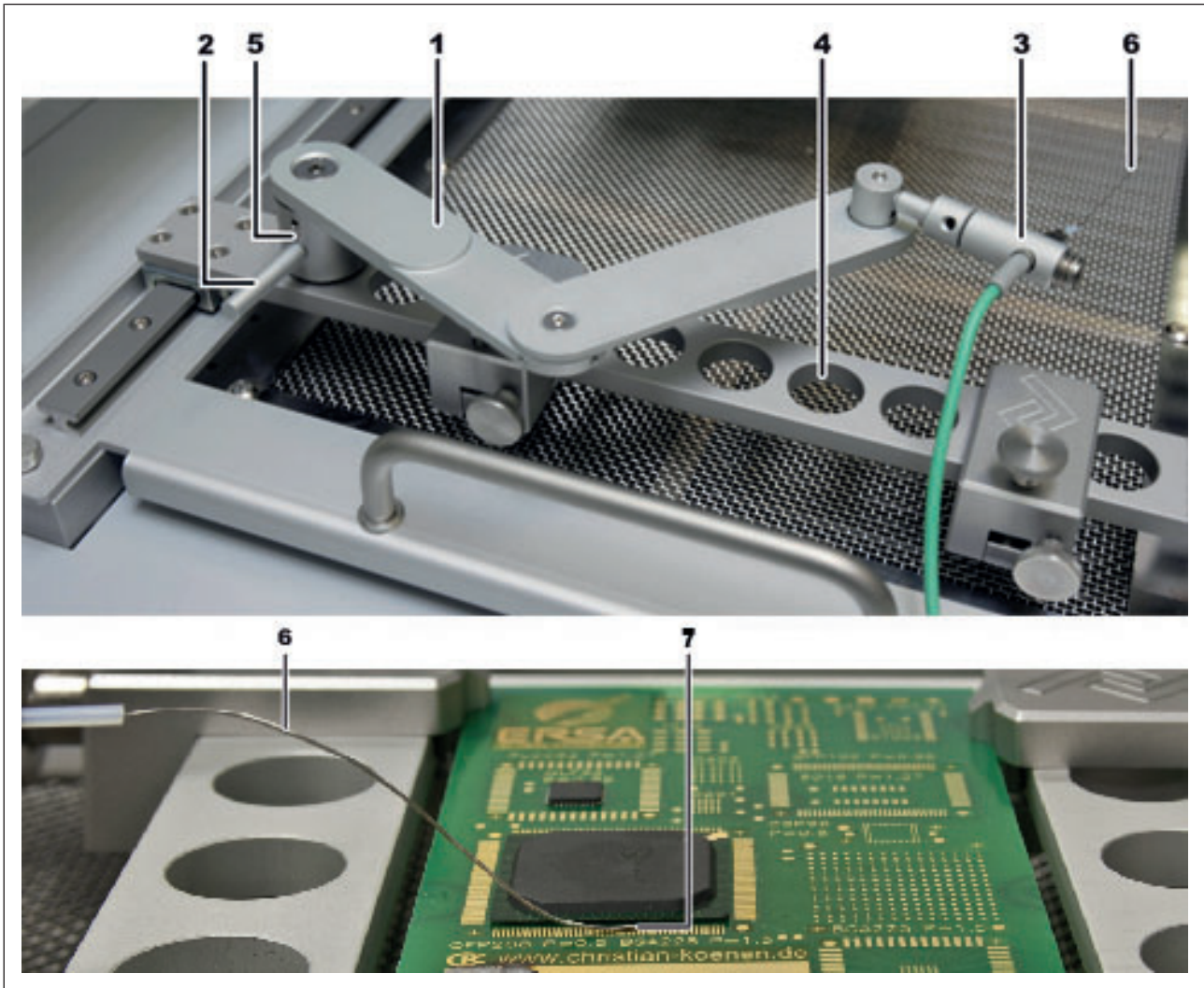
Fig. 53: Positioning the thermocouple

a) Insert the holder (5) into one of the bores (4).

b) Clamp the holder with the lever (2) in a clockwise direction.

c) Insert the plug of the thermocouple (6) into the [TC1] socket.

d) Slide the thermocouple into the holder (3).

e) Fit the holder (3) 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 mm of the wire are 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. Properly positioning the thermocouple is very important for the soldering process. The best heat transfer of the thermocouple can be obtained through: close proximity to the solder joint, flat support, preload in the wire and contact flux.
The infrared sensor is not suitable for glossy and reflective surfaces.

6.5.4.1.3 Shielding heat sensitive components
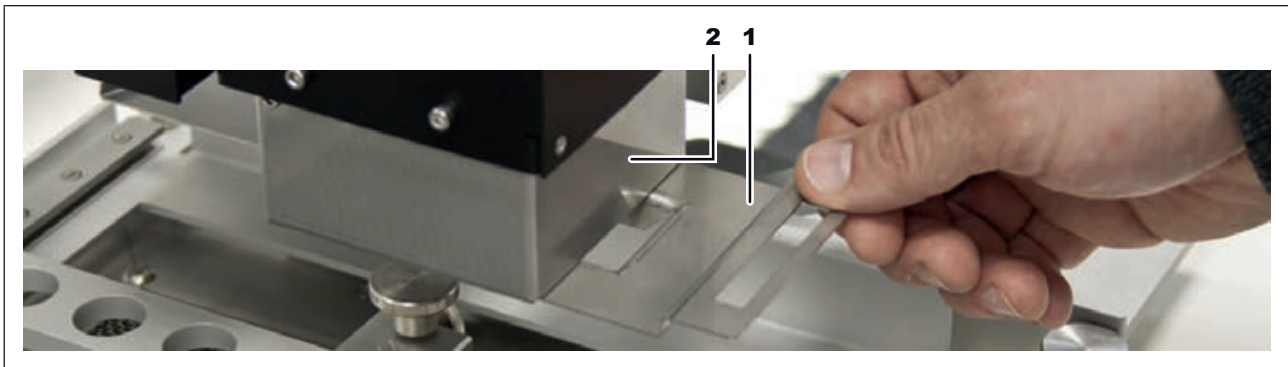
Fig. 54: Shielding heat sensitive components

a) Use reflector tape and/or a suitable air deflector for shielding.

b) To do this, slide the air deflector (1) along the rail under the heating head (2).

If you want to desolder a component, in the next step select a profile of the [Desoldering] type and enable it.

6.5.4.1.4 Enabling a profile template

Some [Template profiles] are deposited in the factory. These templates already contain useful settings for the most common rework processes. You can choose a template, customize it to your needs, as well as rename and save it. To do this, first select a template and then save it in your own [Profile library].

To learn how to adjust a profile to your own process, please refer to the chapter Customizing a profile [▶ 109] and its subchapters.

The database directory [Library]:

Under the [Library] tab, the profile database is displayed as a directory tree. As a standard user you will only see your user directory. As a power user you will have access to all directories and profiles.

Via the context menu of the right mouse button, you can create further sub-directories (containers) or delete directories. If a directory is deleted, all its profiles are permanently deleted. The context menu also offers the opportunity to rename, cut and paste directories. The functions of the context menu cannot however be applied to user directories that have been created automatically by the system.

As a [Standard user] you cannot edit profiles.

To select a profile template and save it as your own profile:

a) In the function selection field, enable the tab [Profile library].

⇨ The [Profiles] tab is displayed in the display window:

Fig. 55: Profiles

b) Enable the [Common settings] tab.

c) A tabular [Profile library] will appear. When delivered, the table is empty.

d) Click on the [Search for profiles] button in the [Show template profiles] frame.

⇨ The [Profile-templates] window is displayed:

e) Select a template and confirm your selection with [OK].

⇨ The template will be copied and displayed in the [Profiles] tab.

f) In the directory tree under [Library], click on the directory in which the profile should be saved.

g) Subsequently, click on the [Add] button in the [Profile parameters] frame.

⇨ The copied profile template is ready to process the [Profile parameters].

To enable a profile:

a) In the function selection field, enable the tab [Profile library].

⇨ The window [Profiles] is displayed in the display window: If you are logged in as a default user, the buttons in the [Profile library] tab are reduced and no changes can be made in the [Profiles] window.

b) Enable the [Common settings] tab.

Fig. 56: Profile, enabled [General] tab

c) In the [Library] click on the directory that contains the profile.

d) Select a profile in the profile table.

e) Click on the [Profile parameters] button in the [Activate] frame.

⇨ The profile has been selected.

a) Click on the [Activate] button.

⇨ The profile is active. You can now work with the profile.

6.5.4.1.5 Place the head above the component

With regard to this, please read the chapter The work area [Placement] [▶ 74].

Version 1:

✓ Position the head using the laser:

a) In the functional area, enable the [Placement] button.

⇨ In the work area, the buttons and the visual displays for the placement process appear.

b) Click on the ⬛ button.

⇨ The laser is turned on.

c) Move the head by clicking on the buttons ⬛ ⬛, ⬛ or ⬛ until the laser beam can be seen on the centre of the component.

d) Activate the tab [Placement] in the menu bar.

e) Click on [Reference positions] in the [Heating head to laser] menu area.

⇨ The heating head moves now to the position of the laser beam. Keep the travel path of the axles clear!

Version 2:

✓ Position the head with the help of the upper camera:

a) Activate the tab [Camera and light] in the menu bar.

b) In the [Live video] menu area, select the upper camera by clicking on the [Camera selection] button.

c) Activate the tab [Placement] in the menu bar.

d) In the menu area, [Crosshair], click on [Switch ON/OFF].

⇨ The crosshair is displayed.

e) Move the head by clicking on the buttons ⬛ ⬛, ⬛ or ⬛ until the crosshair can be seen in the centre of the component.

f) In the menu bar, click on [Heating head to camera].

⇨ The heating head now moves to the position of the crosshair. Keep the travel path of the axles clear!

6.5.4.1.6 Desoldering a 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!
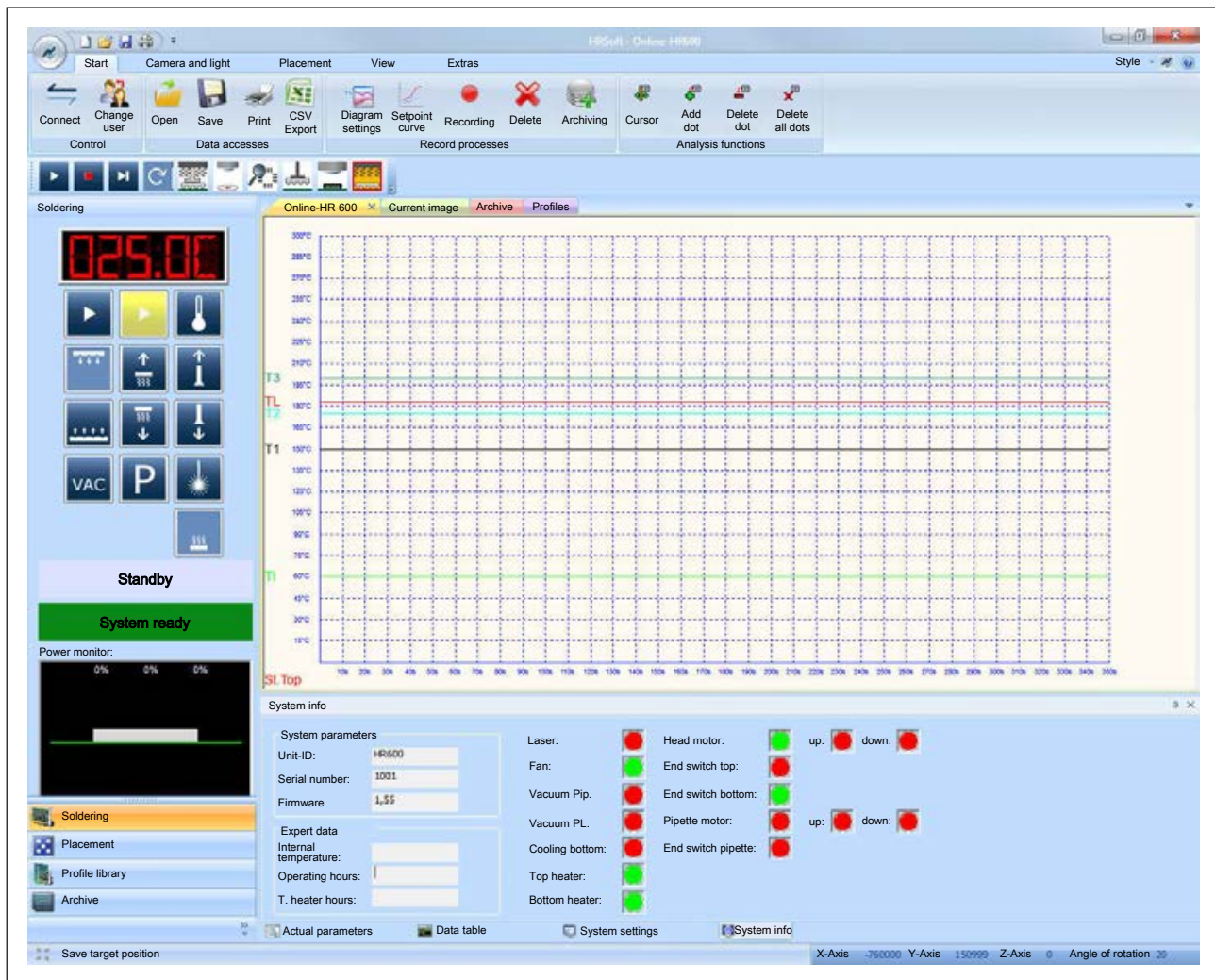
---

a) In the menu bar, enable the [Start] tab:

Fig. 57: The work area [Soldering] appears when the [Start] tab is enabled in the menu bar.

b) In the [Automation bar], click on the ▶ button.

⇨ The process is started. The External Ersa LiveViewer opens. The image of the camera selected under [Camera selection] will be shown. With respect to this, please read the chapter The [Camera and light] tab [▶ 61].

⇨ According to the settings of the profile and the [System settings], the component is desoldered and placed on the component storage tray.

⇨ You can view the process in the [Online-HR 600] window.

6.5.4.1.7 Removing any residual solder from the PCB

For good soldering results, any residual solder and flux must be removed.

a) Apply some flux to the solder joints.

b) Remove any residual solder with a suitable tool,

⇨ e.g. with the following wedge-shaped solder tips:
PowerWell 0102WDLF23/SB (small),
0102ADLF40/SB (medium) or
0102ZDLF150/SB (large)

c) Remove flux residue with Ersa Flux Remover (0FR200) and a lint-free cloth or paper wipe.

d) Dry the solder joints with a clean, lint-free cloth.

⇨ The process has now been completed. The component is unsoldered and the solder joint is ready to receive the new device. If you want to solder a component in the next step, you must first search for a profile of the [Soldering] type and enable it.

6.5.4.2 Soldering a component

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 step-by-step sequence of the soldering process is described below.

6.5.4.2.1 Preparing the soldering operation

✓ Adjust the Rework System and the PCB as described in Chapter <u>Desoldering a component [▶ 124]</u> :

a) Insert the PCB into the support frame as described in Chapter Inserting the PCB .

b) In necessary adjust the pipette size to the component, as described in Chapter Inserting the PCB .

c) For soldering operations on the same product series, save the PCB position in the support frame as described in Chapter Inserting the PCB .

d) Position the thermocouples as described in Chapter <u>Positioning a thermocouple [▶ 128]</u> .

e) Shield components ad described in Chapter <u>Shielding heat sensitive components [▶ 129]</u> .

6.5.4.2.2 Enabling a profile template

Some [Template profiles] are deposited in the factory. These templates already contain useful settings for the most common rework processes. You can choose a template, customize it to your needs, as well as rename and save it. To do this, first select a template and then save it in your own [Profile library].

To learn how to adjust a profile to your own process, please refer to the chapter Customizing a profile [▶ 109] and its subchapters.

The database directory [Library]:

Under the [Library] tab, the profile database is displayed as a directory tree. As a standard user you will only see your user directory. As a power user you will have access to all directories and profiles.

Via the context menu of the right mouse button, you can create further sub-directories (containers) or delete directories. If a directory is deleted, all its profiles are permanently deleted. The context menu also offers the opportunity to rename, cut and paste directories. The functions of the context menu cannot however be applied to user directories that have been created automatically by the system.

As a [Standard user] you cannot edit profiles.

To select a profile template and save it as your own profile:

a) In the function selection field, enable the tab [Profile library].

⇨ The [Profiles] tab is displayed in the display window:

Fig. 58: Profiles

b) Enable the [Common settings] tab.

c) A tabular [Profile library] will appear. When delivered, the table is empty.

d) Click on the [Search for profiles] button in the [Show template profiles] frame.

⇨ The [Profile-templates] window is displayed:

e) Select a template and confirm your selection with [OK].

⇨ The template will be copied and displayed in the [Profiles] tab.

f) In the directory tree under [Library], click on the directory in which the profile should be saved.

g) Subsequently, click on the [Add] button in the [Profile parameters] frame.

⇨ The copied profile template is ready to process the [Profile parameters].

To enable a profile:

a) In the function selection field, enable the tab [Profile library].

⇨ The window [Profiles] is displayed in the display window: If you are logged in as a default user, the buttons in the [Profile library] tab are reduced and no changes can be made in the [Profiles] window.

b) Enable the [Common settings] tab.

Fig. 59: Profile, enabled [General] tab

c) In the [Library] click on the directory that contains the profile.

d) Select a profile in the profile table.

e) Click on the [Profile parameters] button in the [Activate] frame.

⇨ The profile has been selected.

a) Click on the [Activate] button.

⇨ The profile is active. You can now work with the profile.

6.5.4.2.3   Select the type of component and set it ready

a) Position the component in the middle of the glass plate after properly aligning it.

⇨ Proper polarity means: If Pin 1 is for example located top left in the soldering position, also PIN 1 of the prepared component must be arranged on the top left.

b) In the function selection field, enable the tab [Placement].

⇨ In the work area, a drop-down menu appears.

c) Select the appropriate component type from the drop-down menu.

⇨ [undefined] = all other component types, [BGA] = Ball Grid Array, [QFP] = Quad Flat Package, [PLCC] = Plastic Leaded Chip Carrier, [MLF] = [Micro Lead Package], [SOIC] = Small Outline IC, [CSP] = Chip Scale Package, [LED] = Light-emitting diode, [CBGA] = Ceramic Ball Grid Array, [Interposer BGA] = BGA on wiring layer, [BGA Socket] = Ball Grid Array Socket.

⇨ The component detection system of the camera is enhanced for the selected component type.

d) In the automation bar, click on the ⟳ button. If the component connectors are not properly detected, click this button several times to improve detection.

⇨ The component filter is applied. The camera will then re-detect the connection of the component.

### 6.5.4.2.4 Performing the positioning process

Version 1: Single-step mode:

In this mode, the process is always stopped when an input is expected from the user.

✓ To start the placement process in the single-step mode:

a) In the function selection field, enable the tab [Placement].

b) In the automation bar, click on the ▶ button.

⇨ The single-step mode is started.

⇨ The camera head is moved to the target position that was last approached.

⇨ The crosshair is activated.

⇨ When the crosshair is not in the centre of the target position:

c) Move the head by clicking on the buttons ◤ ◥, ◣ or ◢ until the crosshair can be seen in the centre of the target position.

⇨ The process is stopped.

d) Click on the ▶ button to proceed to the next step.

⇨ The picture of the target position is saved.

⇨ The head moves to the glass plate.

⇨ The contours of the component are identified and displayed as a red area.
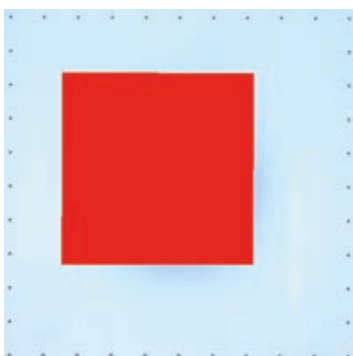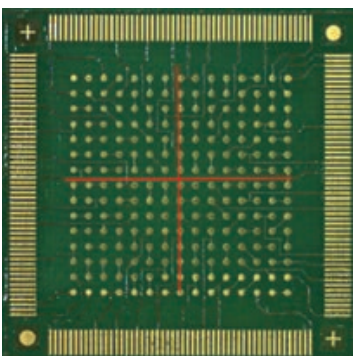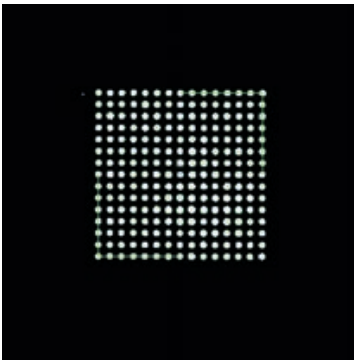
⇨ The lower camera detects the connections of the component with different brightness degrees. The connections of the component are shown with a coloured border.

⇨ The process is stopped. If not all connections are recognized:

e) Select a suitable component from the component filter and apply it once more with the button ⟳. If the component connectors are not properly detected, click this button several times to improve detection.

f) Click on the ⏭ button to proceed to the next step.
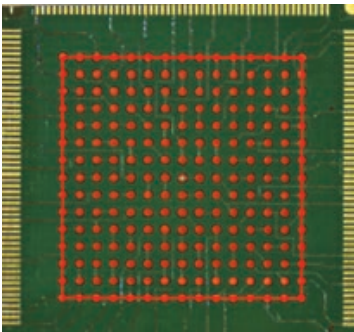
⇨ The component is lifted and if necessary aligned. The connections will then be detected again. The overlay is displayed. The overlay shown indicates the correct position of the component on the PCB.

⇨ The process is stopped. You can now select one of three overlay modes by repeatedly pressing the <F4> key, and change the overlay colour via the <F5> key. To do this, check if the overlay is correctly placed.

Notes:

– To change transparency, you can also move the slider.

The function keys of the keyboard are assigned as follows:

– <F4> To call up three different component display modes in the overlay.
– <F5> To change overlay colours
– <F6> To show a red frame
– <F8> To recalculate component position

If the overlay is not correct:

a) Move the camera head by clicking on the ⬑, ⬏, ⬐ or ⬎ buttons until the overlay is correct.

b) Click on the ⏭ button to proceed to the next step.

⇨ The pick-and-place nozzle places the component in the target position.

⇨ The process is stopped. The upper camera is switched on.

⇨ If you want to check the positioning result:

c) Move the camera by clicking on the buttons ⬑, ⬏, ⬐ or ⬎ until the positioned component is displayed.

d) Check in the camera the results of the placement process.

e) Click on the ⏭ button to proceed to the next step.

Version 2: Automatic mode:

In this mode, the entire placement process is carried out automatically. To do so, you must select and enable a profile with a saved [Target position]. In any event, in the short process pause time between single steps you have the opportunity to stop the process and intervene.

✓ To start the placement process in automatic mode:

a) In the function selection field, enable the tab [Placement].

b) In the automation bar, click on the ▶ button.

⇨ The automatic mode is started.

⇨ The camera head is moved to the target position saved in the profile.

⇨ The picture of the target position is saved.

⇨ The head moves to the glass plate.

⇨ The contours of the component are identified and displayed as a red area.

⇨ The lower camera detects the connections of the component with different brightness degrees. The connections of the component are shown with a coloured border.

⇨ The component is lifted and if necessary aligned. The connections will then be detected again.

⇨ The pick-and-place nozzle places the component in the target position.

6.5.4.2.5 Performing the soldering process

> ⚠ **CAUTION**
>
> **Risk of burning due to heated machine parts and PCB!**
>
> All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!
> Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

✓ To start the soldering process:

a) Click on the 🔳 button.

⇨ The soldering process is started.

⇨ You can view the process in the [Online-HR 600] window. With regard to this, please read Chapter <u>Record, archive and analyse processes</u> [▸ 141].

⇨ At the end of the process, the head moves to the park position.

⇨ Cooling is started.

b) Wait until PCB and device have cooled down to safe temperatures.

c) Remove the PCB.

6.5.4.3 Record, archive and analyse processes

To record and analyse a process:

✓ Soldering and desoldering processes can be recorded automatically by pressing the [Record] button. With respect to this, please read the chapter The parameter window [System settings] [▶ 84]:

✓ To record a process and observe its progress when automatic process recording is enabled:

a) Select and enable a profile.

b) Start the process.

⇨ The recording is started automatically and displayed in a new window. With regard to this, please read the chapter The window [Online HR 600] [▶ 87].

c) In the menu bar, enable the [Start] tab:

d) Click on [Analysis functions] in the [Cursor] menu area.

⇨ The analysing cursor appears.

e) Move the cursor with the mouse to any desired point in the process.

⇨ Next to the pointer, the numerical values of the process are displayed:

Fig. 60: Graphical display of the process with an analysis cursor.

Automatically archiving a process

When the process is finished, the recording process can be automatically archived. The soldering and desoldering processes have been archived.

✓ To enable automatic archiving:

a) In the [Extras] tab from the [Parameters and settings] menu area, click on the [Options] button.

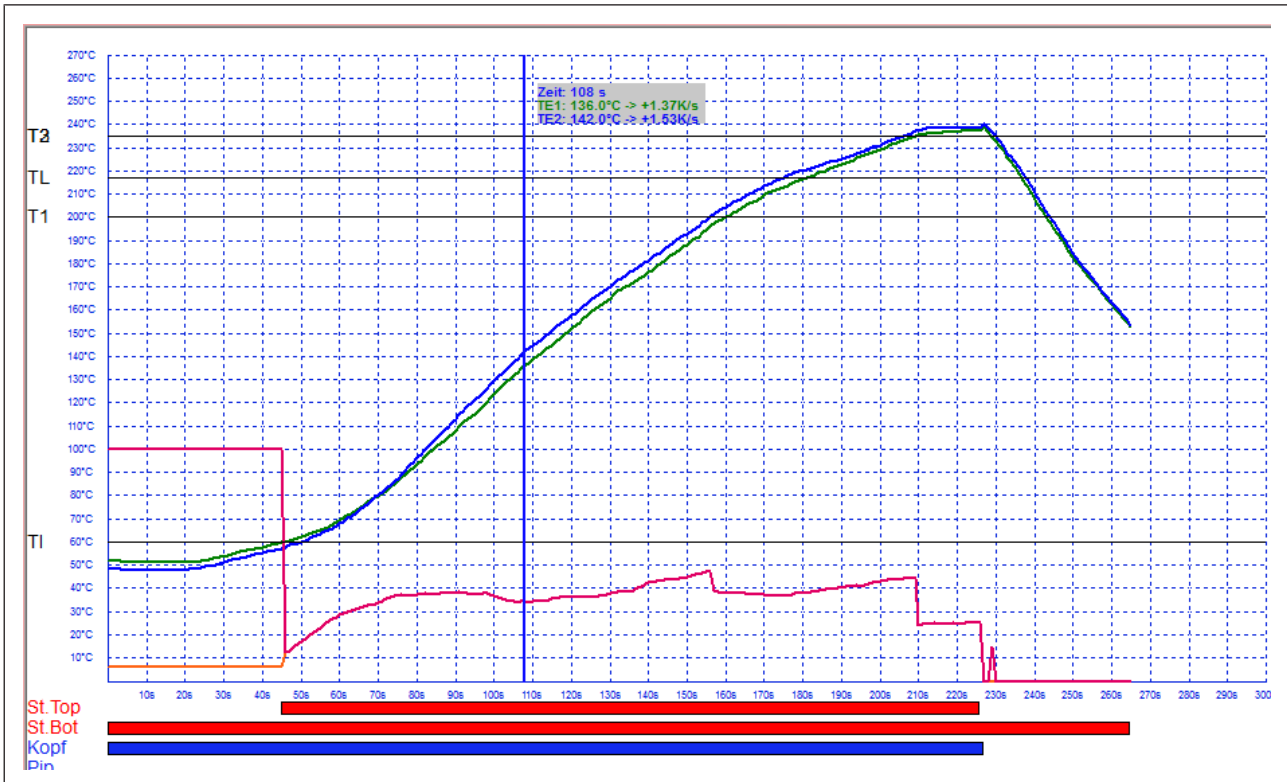b) If [Activate user administration] has not been selected, the [Auto-archiving] function is visible and can be selected. Click on it.

⇨ When [Use user administration] is selected, the settings of the [User administration] dialog are valid. For each user, in the [User administration], the [Activate auto archive for user] function can be selected or deselected.

Archiving manually:

a) When automatic archiving is disabled, you can start archiving at the end of the process by clicking on the [Archiving] button in the [Record processes] menu area.

To analyse an archived process:

a) In the function selection field, enable the tab [Archive]. With regard to this, please also read the chapter The [Archive] work area [▶ 79].

b) Search for an archived process and highlight it.

c) Click on the [Show profile] button.

⇨ The process is displayed in a new window.

d) In the menu bar of the menu area [Analysis functions], click on [Cursor].

⇨ The analysing cursor appears.

e) Move the mouse pointer over the process and click on the desired analysis point.

f) Click on [Analysis functions] in the [Add dot] menu area.

g) The analysis point is added. You can add up to 5 analysis points. Analysis points allow comparing soldering parameters at fixed times.

To manually archive an edited process:

a) Enable the [Start] tab and click on the [Save] button in the [Data accesses] menu area.

⇨ The dialog [Save as] appears.

b) Save the process into the desired directory. The analysis points are stored here along with the process.

To display an edited, archived process again:

a) In the menu bar of the menu area [Data accesses], click on [Open].

⇨ The dialog [Open] is displayed.

b) Select the archived process recording. The file must be available in the file format [.hrs].

⇨ The process recording is displayed in a new window.

To edit the process display:

✓ You can adjust the graphic display of the [Online-HR 600] window to your requirements.

a) In the [Start] tab from the [Record processes] menu area, select the [Diagram settings] button.

b) The dialog [Display properties] is displayed. It includes the three [Layout], [Status bars] and [Reference lines] areas.

c) In the [Layout] area, you can set the size of the diagram, the temperature axis and the time axis, as well as the thickness and colours of the grid and of the background.

d) In the [Status bars] area, you can set the colour and thickness of the status bars under the diagram and display or hide the bars.

e) In the [Reference lines] area, you can set the colour and thickness of the reference lines and of the target curve, and display or hide the lines.

The diagram display can be changed. With regard to this, please read the chapter The window [Online HR 600] [▶ 87].

6.6 Switching off the Rework System

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.

6.7 Updating the HRSoft program

The number of the installed HRSoft version can be found in the program information window.

   a) Call it up via the Ersa icon button in the top right corner.

   b) Make sure that the same Windows user is used as the one the previous version was installed with. You must be logged in as an administrator.

   c) Uninstall the HRSoft program.

   d) Install the new HRSoft version.

If, after the update, no connection to the database is possible, set up the database access as described in Chapter Database assistant [▶ 97].

With respect to this, please also read Chapter Firmware update [▶ 102].

7 Spare and wear parts

7.1 Read this first!

7.1.1 Nameplate and serial number

Fig. 61: 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.

7.1.2 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!

7.2   Spare parts

Name	Item number
Controller for stepper motor	3ET00339
Motherboard MMC-01	259581
Control board	0HR605
USB cable A-B	3ET00241
USB cable A - B mini 5 pin	3ET00347
USB stick	0HR630
Operating instructions HR 600/2	3BA00207
USB Hub, 7-fold	3ET00369
Power supply	3ET00370
USB flash drive Rework	3BA00149
Stepper Motor NEMA 17	3ET00333
Distribution board	242369
Coupling	223030
Pushbutton	223031
Sensor	271658
Micro suction device type 0510	0IR5500-40
Vacuum cup, 1 mm, silicone	0IR4520-07
Adaptor for suction device	0IR5500-45
AccuTC 2.0 thermocouple	0HR645
K-type thermocouple wire with plug	0IR4510-02
Stepper Motor NEMA 11	3ET00334
Lens for placer camera, top	3ET00335
Placer camera, top, colour	3ET00336
Placement nozzle, Ø 10 mm	3HR600-06-021
Placement nozzle, Ø 4 mm	3HR600-06-022
Bottom heater	0IR6500XL-02
Light dome, Glass plate 50 x 50 mm	3HR600-09-003
Lens for device camera, bottom	3ET00337
Device camera, bottom, monochrome	3ET00338
Heating head	271693
PCB frame, standard	0HR625
PCB frame, XL	0HR635
Vacuum generator	168120
One-way restrictor	6BO548
Maintenance unit	3PT00046
2 way magnet valve on /off	3PT00049
Fuse F4A	361792
Fuse F3, 15A	361793

With regard to this, please read Chapter Available options.

8 Treatment of messages and malfunctions

8.1 Stiff control of the pick-and-place nozzle

If this error occurs, the control of the pick-and-place nozzle needs to be cleaned. With regard to this, please read section Cleaning the control of the pick-and-place nozzle [161].

8.2 Pin pad overlay incorrect

If the pad and pin displays are not the same size in the overlay, the overlay cannot be matched. With regard to this, please read Chapter Performing the positioning process [138].

8.3 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. [167].

8.4 Positions are approached improperly

✓ If the heating head does not move to the specified position, reference the axles and cameras through:

a) End HRSoft. Use the main switch to turn off the HR 600/2 unit.

b) Wait 10 seconds. Use the main switch to turn on the HR 600/2 unit.

c) Start HRSoft.

 ⇨ The message [Cameras and axes will be referenced now] appears.

d) Click on the [OK] button.

 ⇨ Cameras and axles have been referenced. Keep the travel way of the axes free.

e) Wait until referencing is over. Referencing can take up to 30 seconds.
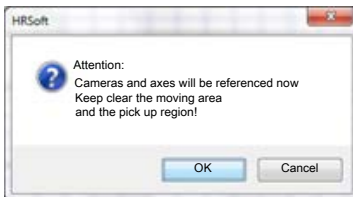
9 Service and maintenance

9.1 Service table

	Duration	Further information	
Daily	15 Min	9.2.1	Checking the pipette for smooth running and cleaning it
Weekly	5 Min	9.3.1	Cleaning the control of the pick-and-place nozzle
Monthly	5 Min	9.4.1	Checking the vacuum filter of the pipette air supply and replacing it
Quarterly	15 Min	9.5.1	Visual inspection and lubrication of the X axis
Quarterly	15 Min	9.6.1	Cleaning and lubrication of the X axis threaded spindle
When required	5 Min	9.7.1	Cleaning the glass plate.
When required	30 Min	9.7.2	Re-memorising the pipette position

9.2 Maintenance work to be performed daily

9.2.1 Checking the pipette for smooth running and cleaning it

Check the pipette for smooth running every day after switch-on.

The pipette in the heating head is exposed to flux smoke. Depending on the intensity of smoke exposure, the pipette requires regular cleaning. Use a smoke evacuator to reduce smoke build-up.

> ⚠ **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!

Checking for smooth running

a) Switch to the [Placement] work area.

b) Move the heating head to the extreme left front position using the axle movement buttons.

c) Click on the [Move heating head down] button.

⇨ The pipette is fully lowered.

d) Press the pipette upwards with your finger several times. The pipette must run smoothly, otherwise clean it.

Cleaning the pipette

a) Unscrew the pipette tip.

b) Clean the pipette. Use a flux remover or rubbing alcohol recommended by the flux manufacturer. Apply a lint-free cloth or cleansing paper to a brush and clean.

c) Wipe dry with a dry, lint-free cloth.

d) Check the pipette for smooth running again.

e) If the pipette still does not run smoothly, continue with the step [Removing the pipette and cleaning it completely].

f) Otherwise, screw on the pipette tip again.

g) Use the main switch to turn on the Rework System.

h) Start the HRSoft program.

⇨ The pipette is automatically moved upwards.

Removing the pipette and cleaning it completely

You need the following tools: Phillips screwdriver and 8 mm Allen key

a) Switch to the [Placement] work area.

b) Move the heating head to the extreme left front position using the axle movement buttons.

c) Switch to the [Soldering] work area.

d) Click on the [Move heating head down] button.

⇨ The pipette is fully lowered.

e) Terminate the HRSoft program by clicking on the top-right corresponding button.

f) Use the main switch to turn off the Rework Station.

g) Unscrew the steel sheet of the heating head cover. To do so, loosen the four screws.

h) Leave the protective conductor cable attached to the heating head cover.

In a different series of HR 600 rework systems, the cover of the pipette should not be opened with an Allen key, but with an open-end wrench. You will see this looking inside through the grid above the heating head. In this case, carry out the activities described below under "Removing the heating head and cleaning the pipette."

a) Using an 8 mm Allen key, unscrew the cover of the pipette.
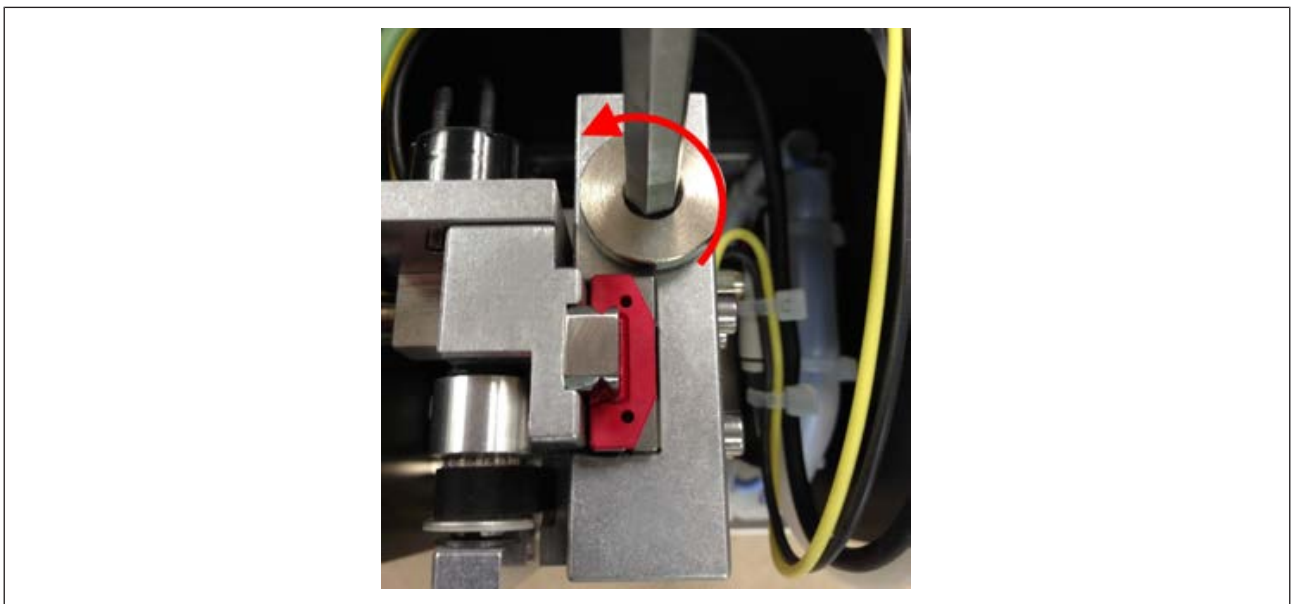
b) Unscrew the pipette tip; see the picture on the left.
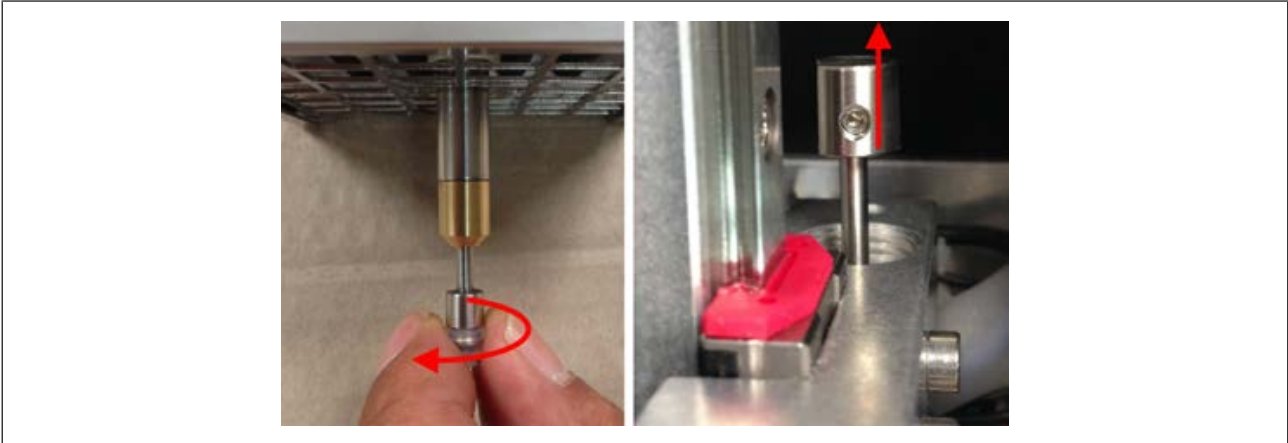
c) Push the pipette upwards and pull it out of the heating head from above; see the picture on the right. If necessary, use a gripping tool, e.g. tweezers.

d) Clean the whole pipette. Use a flux remover or rubbing alcohol recommended by the flux manufacturer. Apply a lint-free cloth or cleansing paper to a brush and clean.

e) When the pipette is dry again, put it back into its holder. Align the pipette in the holder in such a way that the opening of the thickened pipette top snaps into place.

f) Check the pipette for smooth running. If the pipette still does not run smoothly, repeat the cleaning process.

g) Remove the heating head in reverse order.

h) Screw on the pipette tip.

i) Use the main switch to turn on the Rework System.

j) Start the HRSoft program.

⇨ The pipette is automatically moved upwards.

Removing the heating head and cleaning the pipette thoroughly

You need the following tools: Phillips screwdriver, 7 mm and 17 mm open-end wrenches

✓ Unscrew the heating head and clean the pipette as follows:

a) Disconnect the pneumatic hose from the rear of the heating head; see the picture on the left. To do so, push back the ring on the hose attachment directly on the housing while pulling off the hose.

b) Check whether the vacuum filter of the air supply of the pipette is discoloured or clogged. If this is the case, replace the vacuum filter. For more information, please refer to the following Chapter <u>Checking the vacuum filter of the pipette air supply and replacing it [▶ 162]</u>.

c) Unscrew the heating head. To do this, loosen the two screws with a 7 mm open-end wrench; see the picture on the left. Put down the heating head.

d) Unscrew the steel sheet of the heating head cover. To do so, loosen the four screws; see the picture on the right.

e) Leave the cable with which the cover plate is connected to a heating head.

f) Using a 17 mm open-end wrench: unscrew the cover of the pipette.

g) Unscrew the pipette tip; see the picture on the left.
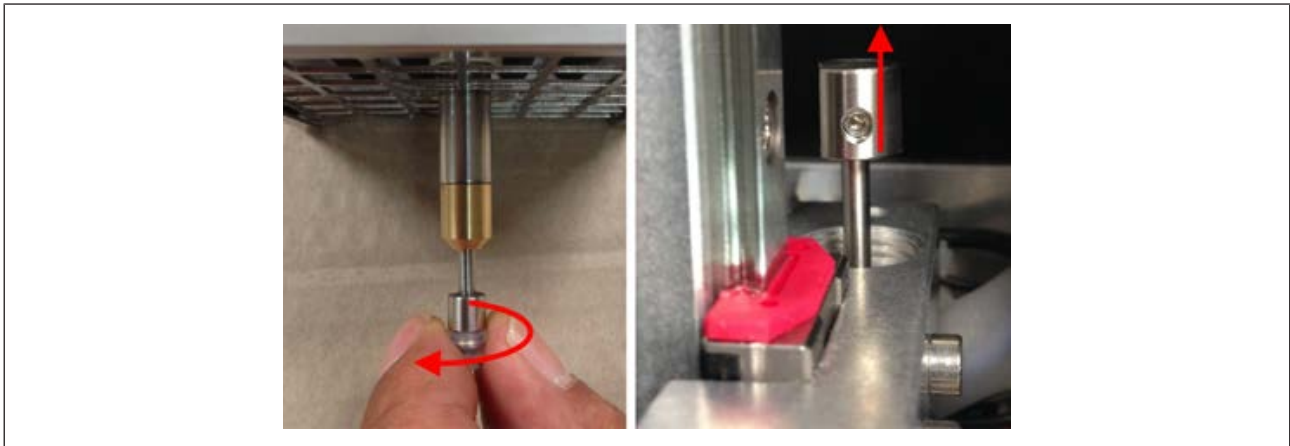
h) Remove the pipette from the heating head; see the picture on the right. If necessary, use a gripping tool, e.g. tweezers.

i) Clean the whole pipette. Use a flux remover or rubbing alcohol recommended by the flux manufacturer. Apply a lint-free cloth or cleansing paper to a brush and clean.

j) Wipe dry with a dry, lint-free cloth.

k) When the pipette is dry again, put it back into its holder. Align the pipette in the holder in such a way that the opening of the thickened pipette top snaps into place.

l) Reposition the heating head in the reverse order of removal, and screw it back on to the Rework System. As soon as possible, check whether the pipette runs smoothly.

m) If the pipette still does not run smoothly, repeat the cleaning process.

n) Reconnect the pneumatic hose.

o) Screw on the pipette tip again.

p) Use the main switch to turn on the Rework System.

q) Start the HRSoft program.

⇨ The pipette is automatically moved upwards.

9.3 Maintenance work to be performed weekly

9.3.1 Cleaning the control of the pick-and-place nozzle

The control of the pick-and-place nozzle needs to be cleaned at least once a week. With intensive use of the HR 600/2 unit, daily.

The pick-and-place nozzle is exposed to flux smoke. Depending on the intensity of smoke exposure, the pick-and-place nozzle requires regular cleaning. Use a smoke evacuator to reduce smoke build-up.

⚠ CAUTION

Risk of burning due to heated machine parts and PCB!

All heated machine parts as well as the surrounding housing parts and product support frame, the circuit board and the components become hot even during warm-up to the process temperature [Tinit]!
Parts are particularly hot during the soldering process! After the soldering process, wait until the device and the PCB have cooled down and reached non-hazardous temperatures!

✓ To clean the control:

a) Activate the tab [Placement] in the menu bar.

⇨ The [Placement] menu appears:
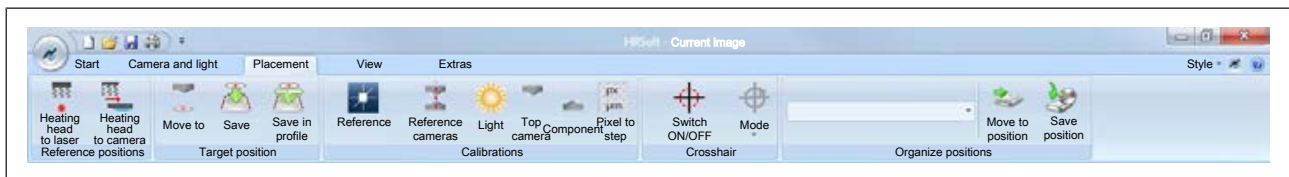
Fig. 62: The [Placement] menu

b) In the [Organize positions] drop-down menu, select the [Change nozzle] entry.

c) Click on the [Move to position] button.

⇨ The pick-and-place nozzle moves to the maintenance position.

d) Let the machine cool down to a safe temperature.

e) Carefully pull the pick-and-place nozzle down.

⇨ The pick-and-place nozzle is fixed by a magnet.

f) Clean the pick-and-place nozzle with a dry, lint-free cloth.
When contaminated with flux or solder paste, clean with a detergent recommended by the flux or solder paste manufacturer and a lint-free cloth.

g) Reinsert the pick-and-place nozzle. Carry out this operation carefully!

h) Release the pick-and-place nozzle. The nozzle must glide smoothly to the lower limit.

⇨ If this is not the case:

i) Repeat the cleaning process. In this case, also clean the control in the placement head with a lint-free cloth.

9.4 Maintenance work to be performed monthly

9.4.1 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.

9.5 Maintenance work to be performed quarterly

9.5.1 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 thee months.
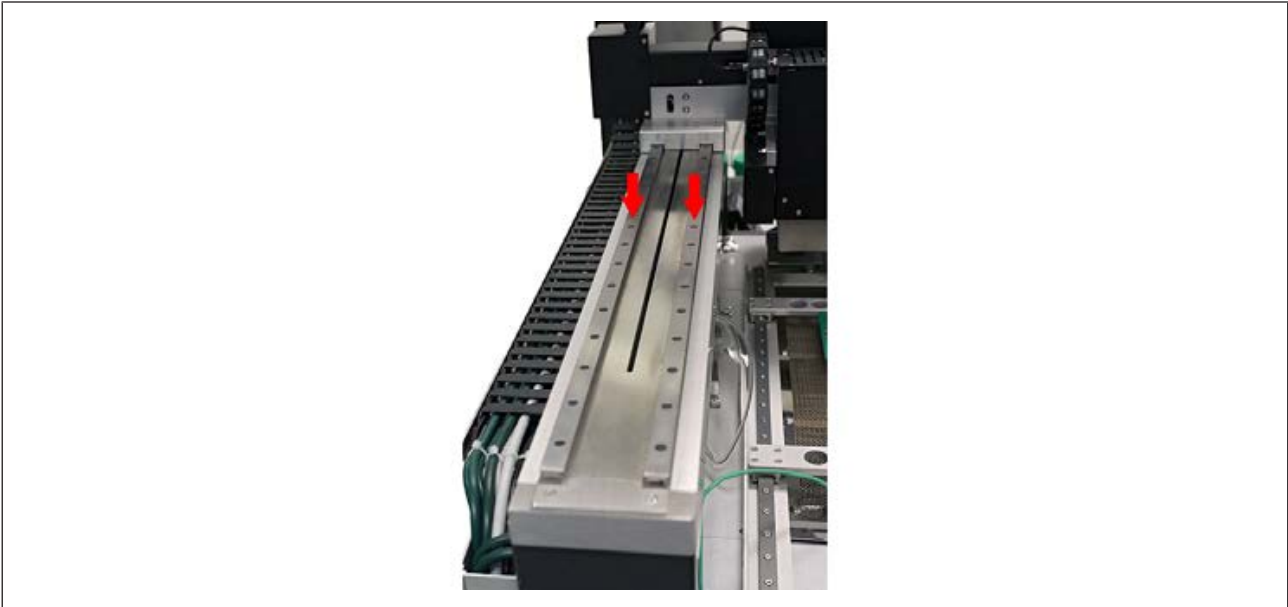
Fig. 63: Lubricating both guide rails of the X axis

> **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.

9.6 Service work to be performed annually

9.6.1 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. 64: 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.

9.7 Service work to be performed when required

9.7.1 Cleaning the glass plate.

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

✓ Clean the glass plate:

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

b) Clean the glass plate using the optical cleaning set included in the accessories (Order No. 0VSLC100).

⇨ If heavily soiled with flux or solder paste:

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

9.7.2   Re-memorising the pipette position

After a heating head change, the Rework System must memorise the pipette position again. You need a pen to mark a PCB.
Perform the following steps:

Use the smallest pick-and-place nozzle for this procedure. If the nozzle has a sucker, remove it.

If necessary, replace the pipette

a) To do so, in the [Organize positions] drop-down menu, select the [Change nozzle] entry.

b) Click on the [Move to position] button.

   ⇨ The pick-and-place nozzle moves to the maintenance position.

c) Let the machine cool down to a safe temperature.

d) Carefully pull the pick-and-place nozzle down.

   ⇨ The pick-and-place nozzle is fixed by a magnet.

e) Use the smallest pick-and-place nozzle.

Defining the pipette position

a) Clamp a PCB to be marked on a vacant spot with the pen.

b) In the [Placement] tab, under [Organize positions] in the drop-down menu, select the [Heating head to laser] function.

c) Click on the [Move to position] button.

   ⇨ The heating head moves to the selected position.

d) Switch to the [Soldering] work area.

e) Move the mouse arrow over the [Move heating head down] button without clicking and select "45 mm" from the context menu of the right mouse key.

f) Click on the [Move heating head down] button.

   ⇨ The heating head moves to a 45 mm height.

g) Click on the [Move pipette down] button.

   ⇨ The pipette moves to the PCB.

h) Use a pen to mark the exact position of the pipette on the PCB. You may need to move the pipette upwards again to reach a component-free location with the [Move pipette up] button.

i) After marking, click on the [Move pipette up] button.

j) Click on the [Move heating head up] button.

Defining and saving the camera position

a) In the [Placement] tab, under [Organize positions] in the drop-down menu, select the [Top camera] function.

b) Click on the [Move to position] button.

   ⇨ The pick-and-place nozzle moves to the selected position.

c) Call up the [Current image] window with the camera image.

d) In the [Placement] tab, under [Crosshair], turn on the crosshair.

e) Use the buttons to move the axles, or with the key combination [Ctrl] + [Arrow key], approach the marked position on the PCB.

f) Under [Organize positions], click on the [Save position] button.

⇨ The pipette position has been memorised.

10 Annex

10.1 EC Declaration of Conformity

Also see

📄 CE Declaration of Conformity HR 600 [▶ 175]

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 600/2**

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

Richtlinie/Norm	Titel	Ausgabe
DIN EN 82079-1	Preparation of instructions – Structuring, content and presentation	2013-06
DIN EN 12100	Safety of machinery - Basic concepts, risk assessment and risk reduction	2011-03
DIN EN ISO 13732-1	Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces	2008
DIN EN 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	2016-06
DIN EN 61000-6-4	Industrial equipment - Electromagnetic disturbance characteristics	2007+A1:2011
DIN EN 55011	Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	2018-05
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	2007-06
DIN EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)	2014
DIN EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A	2013
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards: Immunity for industrial environments	2005

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

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

Wertheim, 2018-10-24

Technical responsibility

Wolfram Sinn, *Development Manager*

Legally binding signature

Ralph Knecht, *General Manager*