

# Ersa IR/PL 650

## Semi-Automatic SMD/BGA Rework System



## Operating Instructions

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## 1. Introduction

### 1.1 General product information

The Ersä IR/PL 650 Rework System has been especially developed for extremely large and high-mass printed circuit boards.

The dynamic heating technology of the IR 650, based on Ersä IR technology, offers extensive possibilities, even for repairing complex components and printed circuit boards. Individual profile design, as well as high repetitive precision through automatic process control, extending to component cooling, intelligent measurement technology, and multiple closed loop technology enable ideal process results, even for lead-free applications. The integrated reflow process camera rounds out the process reliability aspects of the IR 650. The IR 650 is ideally supplemented with the PL 650 placement system. With the PL 650 secure placement of even the smallest, multi-position components succeeds in no time. Here as well, state-of-the-art cameras and drive technology support the user and ensure optimal component placement.

Through the flexible, and for the most part automatic operation of the IR/PL 650, cycle times can be significantly reduced in comparison to cycle times achieved with traditional rework systems.

### 1.2 General information about the operating instructions

The operating instructions are designed to provide the owner of the rework system with complete information concerning the product, its set-up and commissioning, basic machine functions, malfunctions and malfunction resolution, maintenance, as well as spare parts and wearing parts.

**Before placing the machine in service, you must carefully read and have understood the section on safety. Our service department is available to respond to any questions and problems you might have with this product.**

#### 1.2.1 Explanation of symbols



This symbol warns of electric shock hazard. Touching voltage-conducting parts can result in serious bodily injuries which can be fatal.



This symbol warns of hazards of any type that can result in bodily injuries that can be fatal.



This symbol indicates a hazard of burn injuries caused by touching hot objects or machine parts.

**ATTENTION!** Attention indicates instructions, which if not complied with, result in damage to the soldering machine or other material damages!

### 1.3 Proper use

The Ersä IR/PL 650 rework system has been built in accordance with the state of the art and standard health and safety regulations. Residual hazards can exist with the system, particularly if it is operated improperly by untrained personnel, or if it is used for purposes for which it is not intended (proper use).

The Ersä Rework System has been designed exclusively for the placement of electronic components and subsequent soft soldering (selective reflow soldering) of electronic assemblies that are suitable for this process. Any other use, or use exceeding this specification, is considered to be improper. The manufacturer/supplier assumes no liability for damages resulting from improper use.

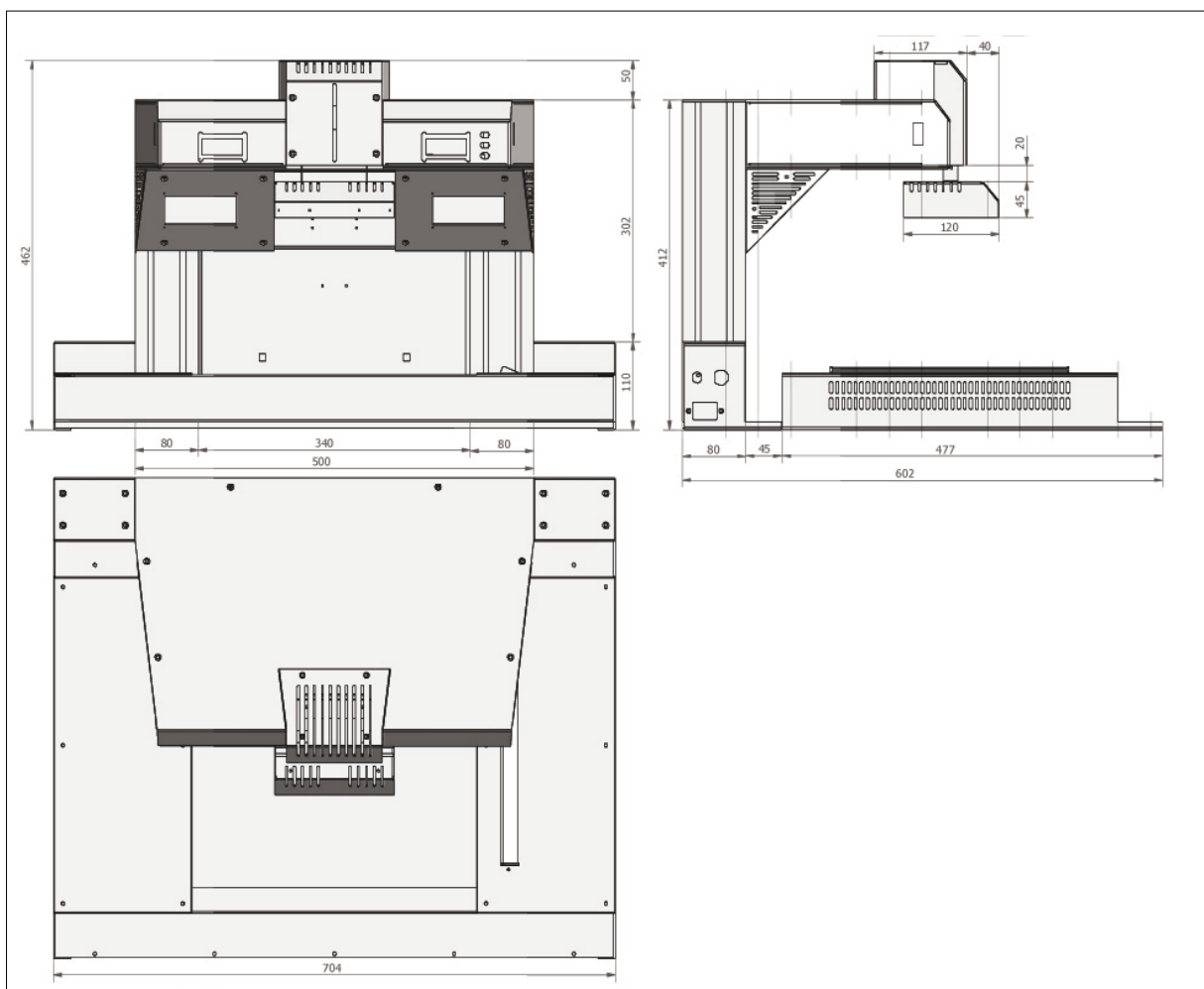
Proper use also includes compliance with the Operating Instructions, including all of the safety instructions.

Unauthorized reconstructions and/or modifications that influence the safety of the Ersä Rework System are prohibited, and the manufacturer/supplier is not liable for any damages resulting from such additions or modifications.

The system is designed exclusively for commercial use. Private use is excluded.

## 2. Technical Data

### 2.1 IR 650 basic unit

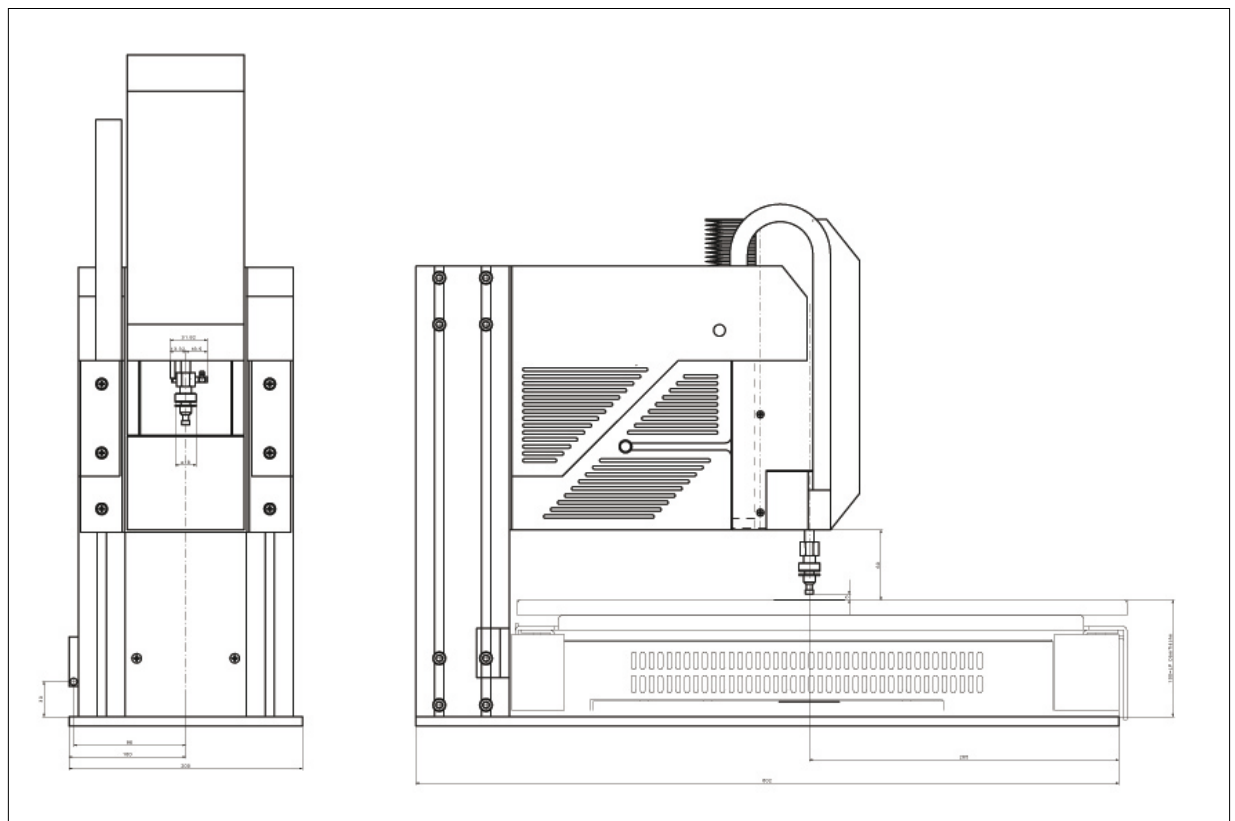


| Designation                                      | Value                    |
|--------------------------------------------------|--------------------------|
| <b>IR 650 basic unit</b>                         |                          |
| Dimensions                                       | L 794 x B 602 x H 462 mm |
| Weight                                           | approx. 75 kg            |
| <b>Electrical data</b>                           |                          |
| Voltage                                          | 1 x 230 V/N/PE           |
| Voltage tolerance                                | +6 bis -10 %             |
| Frequency                                        | 50/60 Hz                 |
| Rated power (without PC)                         | 3600 W                   |
| Protection class                                 | I                        |
| <b>Upper heating element</b>                     |                          |
| Output                                           | 4 x 300 W                |
| Heating zones (separately switched)              | 4 pieces                 |
| Maximum heating element surface                  | 120 x 60 mm              |
| Upper heating element with motorized positioning |                          |
| <b>Lower heating element</b>                     |                          |
| Output                                           | 2 x 800 W + 4 x 400 W    |
| Heating zones (separately switched)              | 5 pieces                 |
| Maximum heating element surface                  | 350 x 470 mm             |
| Wavelength IR heating element                    | 2 bis 5 mm               |

| Designation                                       | Value                                                           |
|---------------------------------------------------|-----------------------------------------------------------------|
| <b>IR 650 basic unit</b>                          |                                                                 |
| <b>Control</b>                                    |                                                                 |
| Controlled via a PC (Windows 2000 or XP required) |                                                                 |
| Universal Serial Bus (USB) interface              |                                                                 |
| Display                                           | integrated 4-character LED display                              |
| <b>Additional data</b>                            |                                                                 |
| Temperature measurement                           | 1 x IR sensor, 4 x thermocouple channel(K-type, potential-free) |
| Component size                                    | 1 x 1 mm up to 60 x 60 mm                                       |
| Maximum PCB size                                  | 460 x 560 mm                                                    |
| <b>Environmental specifications</b>               |                                                                 |
| Operating temperature                             | 20 – 40 °C                                                      |
| Relative humidity                                 | 0 – 80 %                                                        |
| <b>Working distance</b>                           |                                                                 |
| From the PCB to the upper heating element         | 60 mm                                                           |
| From the PCB to the work table                    | 140 mm                                                          |
| <b>Volume flow int. cooling fans</b>              |                                                                 |
| Upper                                             | 182 m³/h                                                        |
| Lower                                             | 120 m³/h                                                        |
| <b>Vacuum nozzle switching point</b>              |                                                                 |
| above the upper edge of the PCB                   | up to 15 mm                                                     |

## 2.2

### Ersa PL 650



| Designatio                | Value                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>PL 650</b>             |                                                                                                                      |
| Dimensions                | L 600/700 x B 200 x H 520/690 mm                                                                                     |
| Weight                    | approx. 21,5 kg                                                                                                      |
| <b>Electrical Data</b>    |                                                                                                                      |
| Via external power supply | 1 x 100 – 230 VAC                                                                                                    |
| Supply voltage            | 24/50 VDC/W                                                                                                          |
| Frequency                 | 50/60 Hz                                                                                                             |
| <b>Visionbox</b>          |                                                                                                                      |
| Component size            | 1 x 1 mm up to 60 x 60 mm                                                                                            |
| Splitoptik                | optional for QFP processing                                                                                          |
| Component placement force | app. 2 N for Auto Pick&Place, or position controlled.                                                                |
| Illumination              | LED row light (each side separately adjustable for component and PCB) and LED ring light for RPC camera (adjustable) |
| <b>Camera</b>             |                                                                                                                      |
| CCD color camera          |                                                                                                                      |
| Focus                     | 25 x optical – 12 x digital                                                                                          |
| Swivel area               | 180°                                                                                                                 |
| Interface                 | system bus                                                                                                           |

## 2.3

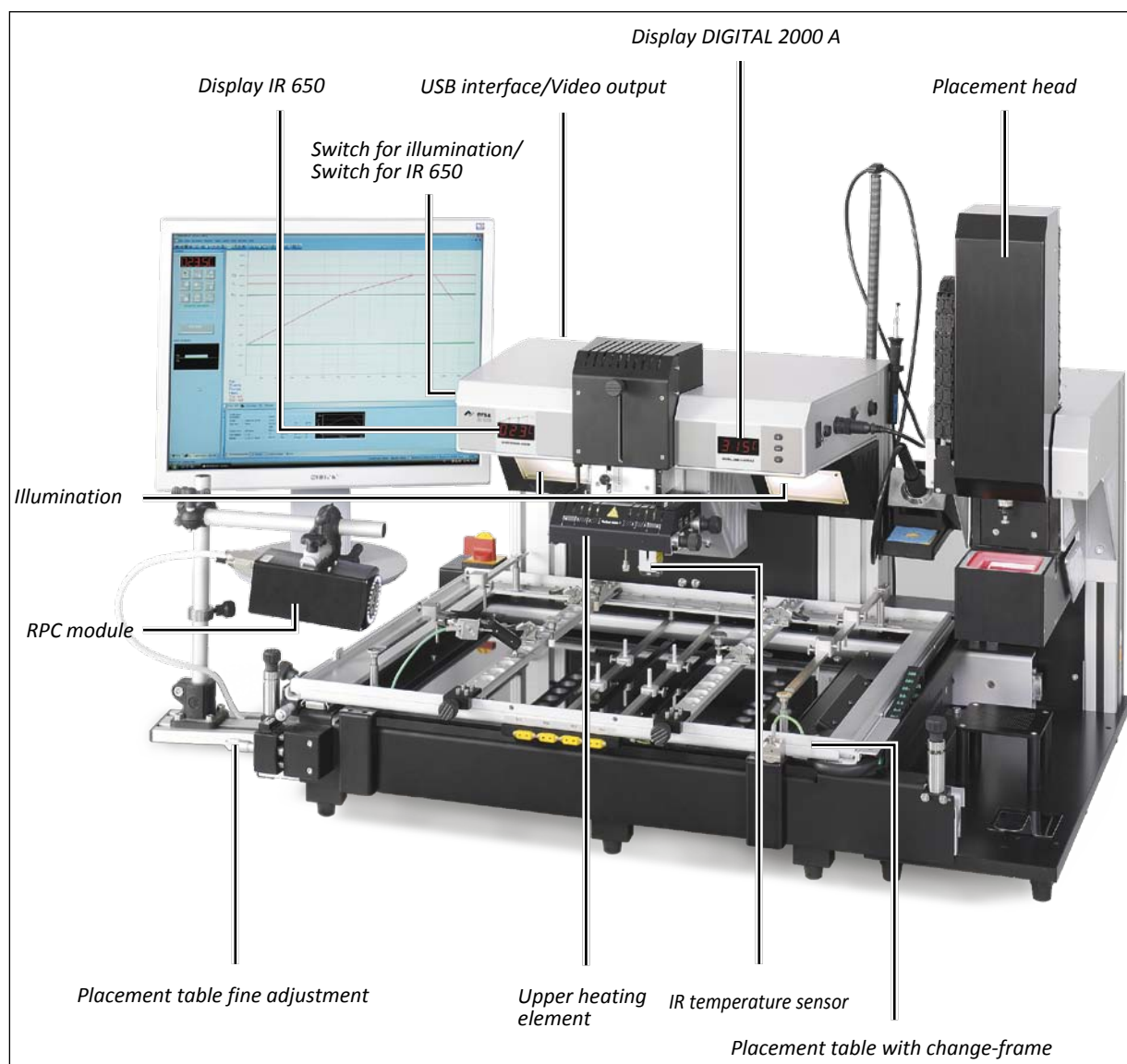
### RPC Camera

| Bezeichnung       | Wert                               |
|-------------------|------------------------------------|
| <b>RPC Camera</b> |                                    |
| Illumination      | LED ring light, white (adjustable) |
| Camera            | CCD colour camera                  |
| Focus             | 25 x optical – 12 x digital        |
| Swivel area       | 180°                               |
| Interfahe         | system bus                         |

### 3. Safety instructions

#### 3.1 3.1 Aggregates and interfaces

The interfaces and aggregates of the IR/PL 650 are shown in the following photo.



\* PC, monitor, mouse, and keyboard are not include in scope of supply

**Display of the integrated DIGITAL 2000 A soldering station**

The display with the three buttons represents a complete DIGITAL 2000 A soldering station. The respective soldering iron is connected to the side connector. Operating and safety instructions for this unit are in the included Ersä DIGITAL 2000 A Operating Instructions.

**Placement head**

The placement head positions the respective component on the PCB in conjunction with IRSoft.

**Attention crushing hazard!**

When placing components do not reach between placement head and PCB.

**Upper heating element**

The required heat from above for soldering/desoldering electronic components is generated via this aggregate. Temperature selection is specified via the IRSoft control software.

**Attention burn hazard!**

Upper heating element and surrounding housing parts reach high temperatures during a soldering process.

**Placement table**

Via the placement table the PCB is aligned so that the placement head places the component precisely on the PCB.

**Lower heating element**

The required heat from below for soldering/desoldering electronic components is generated via this aggregate. Temperature selection is specified via the IRSoft control software.

**Attention burn hazard!**

Lower heating element and surrounding housing parts reach high temperatures during a soldering process.

**Fine adjustment**

Use the fine adjustment to precisely position the placement table.

**IR temperature sensor**

The sensor detects the surface temperature of the component that will be soldered/desoldered, in a contactless process.

**Reflow process camera**

The reflow process camera provides a live image of the soldering process to the monitor. The optionally available IDView or Imagedoc software is necessary for this application.

**Illumination**

The lighting provides optimal, glare-free illumination of the workstation. It can be switched on or off via the side-mounted switch.

**Switch for illumination**

The switch activates or deactivates the system illumination.

**IR 650 display**

The display shows the current actual temperature of the selected temperature sensor.

**Video output:**

Two cinch sockets are located on the rear of the IR 650. The video signal from the RPC camera and the PL camera are available on these sockets.

This signal is transmitted to the video inputs of the FALCON Frame Grabber card in the PC via two video cables.

**USB interface, system bus:**

The IR /PL 650 is connected to a PC via a USB cable (type A-B). All control functions, and the process parameter documentation, are available via the IRSoft software.

The control signals to the individual system modules are distributed via the system bus. PL 650 and RPC module are connected on the rear of the IR 650 for this.

The video signals of the two motorized zoom cameras are also transmitted internally via these cables.

**Master switch/EMERGENCY-STOP switch:**

The entire IR/PL 650 system is switched on and off via this switch, and in the event of hazard it is all-phase disconnected from the power supply.

**Safety temperature monitoring:**

The upper heating element and the lower heating element of the IR 650 are equipped with thermal safety switches.

In the event of uncontrolled heating they automatically switch off the energy supply to the heating elements, to prevent damage to the device or to objects in the vicinity.

The ring core transformer for the upper heating element is likewise equipped with a safety switch.

**Vacuum supply:**

The IR/PL 650 does not require any external compressed air or vacuum supply. The IR 650 has two integrated vacuum pumps.

One supplies the hand vacuum VacPen grip, the second supplies the vacuum nozzle of the IR 650 and also of the PL 650.

## 4. Transport, storage, assembly and disposal

### 4.1 Scope of supply

Please check the completeness of the packaged contents. The scope of supply consists of:

- R 650 A basic unit with integrated DIGITAL 2000 A soldering station
- PCB frame with anchoring elements
- RPC camera module and pre-mounted camera swivel arm and system cable
- Replacement silicon suction cup Ø 5 mm, replacement silicon suction cup Ø 8 mm (2 x)
- Tech tool soldering iron with rest stand, holder, and cable spring
- VacPen vacuum grip with connecting hose and holder
- Component tray
- External ACCUTC thermocouple K-type (2 x)
- USB cable for connecting to a PC
- FALCON Frame Grabber card to install in a PC
- Video connecting cable (cinch - cinch) (2x)
- Operating Instructions IR/PL 650 on CD-ROM
- Operating Instructions DIGITAL 2000 A (3BA00044)
- Safety instructions
- PL 650 placement system\* with system cable (separate packaging)\*
- Power supply for Placer\*
- Connecting cable for Placer\*
- Vacuum nozzles (2x)\*
- Hex socket wrench\*
- Calibrating plate + needle\*

*\* If placement system was also ordered.*



Please contact your supplier if the listed components are damaged or incomplete.

### 4.2 Transport and storage

IR 650 and PL 650 are each delivered on a pallet in a stable box enclosure.

- Only use the original packaging for transport and interim storage of the systems.
- Strictly avoid jerky movements, jolts, or dropping the systems!
- The systems must be protected from weather influences such as rain, fog, sea air, etc.
- If the units will be stored for a longer period of time under humid conditions, then the system must be packed air-tight with desiccating agents in the enclosure.
- Damages due to improper transport and storage are not covered by the guarantee.

## 4.3 Assembly

### 4.3.1 Setting up the system



- Prepare the site where the system will be set-up:  
Free, solid, level work table, with at least 100 kg bearing capacity, recommended dimensions 2000 x 1000 mm (L x D)

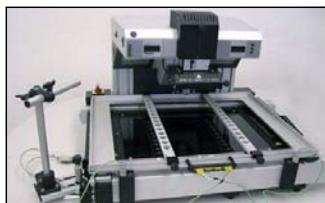


**Note:**

There must be 500 mm free space on both sides of the total system, which is free of objects or obstacles, in order to fully exploit the movement range of the X-Y axes.



- Remove the IR 650 from the packaging. Remove the topside of the enclosure, have two people lift the device under the base plate.



- Place the IR 650 on the work platform. 200 - 300 mm of work platform should remain free in front of the device.



- Now remove the RPC camera module and mount it on the swivel camera arm of the IR 650.

### 4.3.2 Mechanical connections



- Anchor the cable spring for the soldering iron's feeder cable.



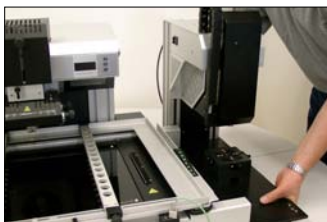
- Anchor the holder of the rest stand on the right bearing column of the IR 650.



- Route the feeder cable of the soldering iron through the cable spring. Place the rest stand on the IR 650.



- Take the PL 650 device out of its packaging



- Position the PL 650 to the right next to the IR 650 on the work platform.



- Connect the IR 650 and the PL 650 to the base plate using the screws (2x M6) provided.

### 4.3.3 Electrical connections

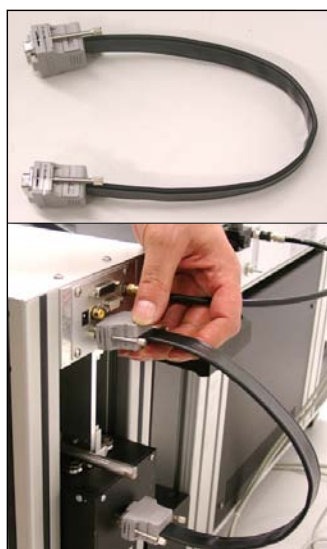


#### Attention:

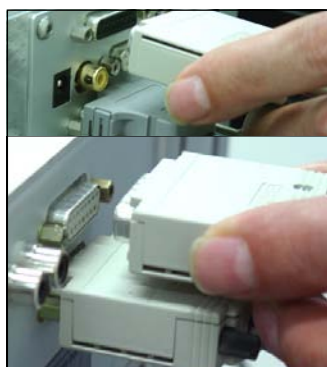
Ensure that the master switch on the IR 650 is switched off, before connecting the electrical systems!



- Connect the vacuum feed line of the PL 650 to the IR 650.



- Connect the VisionBox on the PL 650 to the device control unit (on the upper rear of the device).



- Now connect the PL 650 control unit to the rear of the IR 650 with the system cable.



- Connect the RPC camera module to the IR 650 via the appropriate system cable.



- Now connect the Erska soldering iron to the connector of the digital soldering station (upper right). Place the soldering tool in the rest stand.



- Connect the two video sockets on the rear of the IR 650 to the FALCON Frame Grabber that you have previously installed in your PC.



- Connect the USB cable, type A-B to one of your PC's USB connections.



- Plug the external power supply of the PL 650 into the 230 V connection of the IR 650 (outlet on the rear of the device).



- Connect the feed line of the IR 650 to your power supply connection. The connection must have 230 V AC, 50/60 Hz, 16 A available.



## 4.4 Disposal

After its service life the IR/650 A system must be disposed of in accordance with the applicable regulations of the respective country where the device was used.

Please contact your local provider of disposal services DIGITAL 2000 A in this regard.

## 5. Commissioning

### 5.1 Switching on for the first time



- Switch on the master switch on the IR 650 and on the PL 650. After a brief self-test the devices are ready for operation.

### 5.2 IRSOft installation

Your PC must satisfy certain minimum prerequisites before installing IRSOft. These are specified in the document "PC setup recommendation" on included product-CD.

#### Installation:

- First close all applications.
- - Insert the CD In the CD-ROM drive and run "IRSOftSetup.exe".
- - Setup will now start.
- - Follow the instructions.

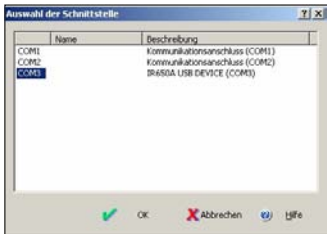
6. Function description

6.1 The IRSOFT user Interface



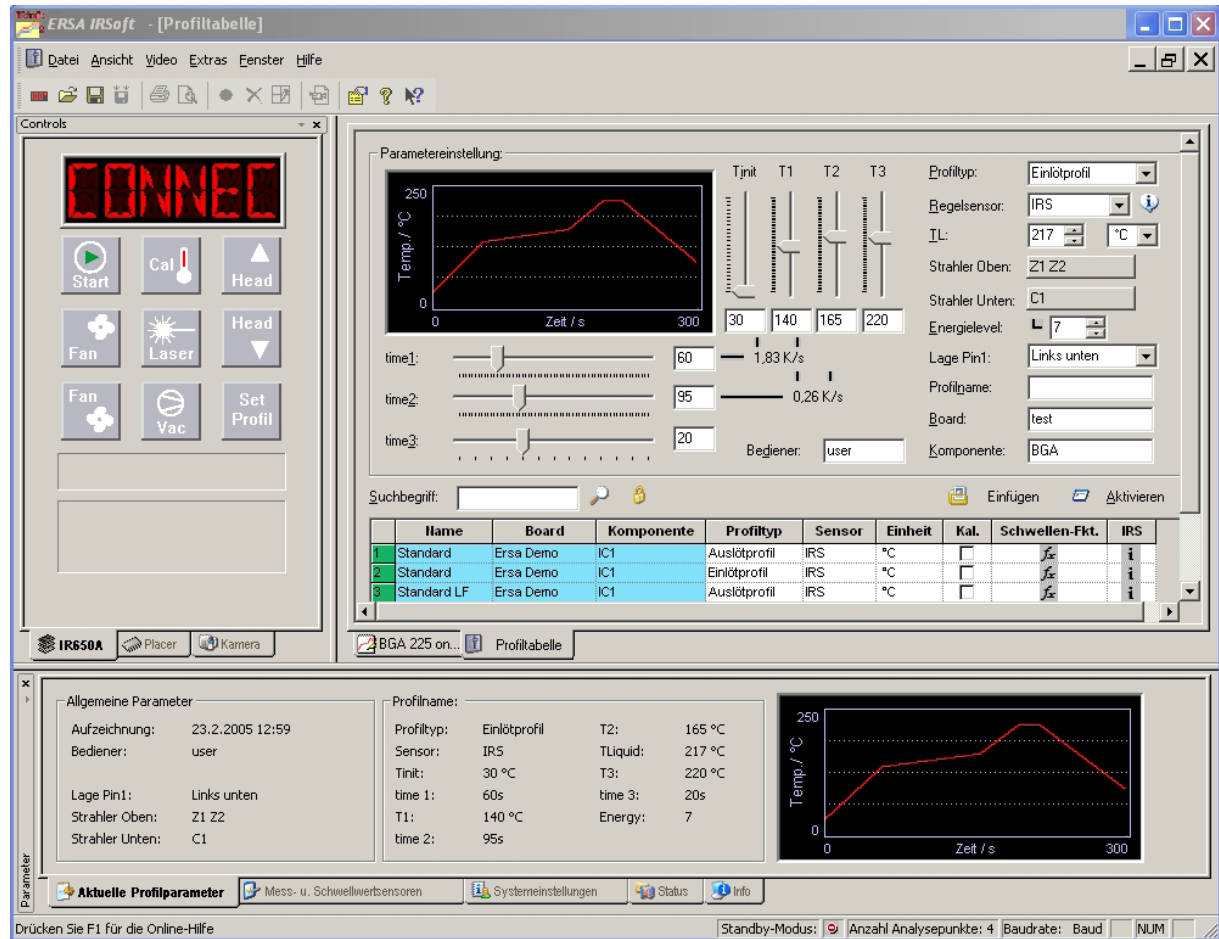
Important note:

This chapter is only an excerpt from IRSOFT’s Online Help. Please see the IRSOFT Online Help for details on functions and settings. You can call the Online Help with the F1 key!



After starting IRSOFT the connection to the connected IR device is established automatically. The prerequisite for this is that only one interface is activated in the interface configuration.  
If multiple interfaces are activated, then the user will first get a interface selection window, in which he can open the desired interface.

After opening the interface, the individual operating and information elements are displayed in the IRSOFT view. The interface is basically divided into three parts. The Operator controls are on the left side, the profile setting view is on the right side, the parameter windows are below.



## 6.2 Device controls

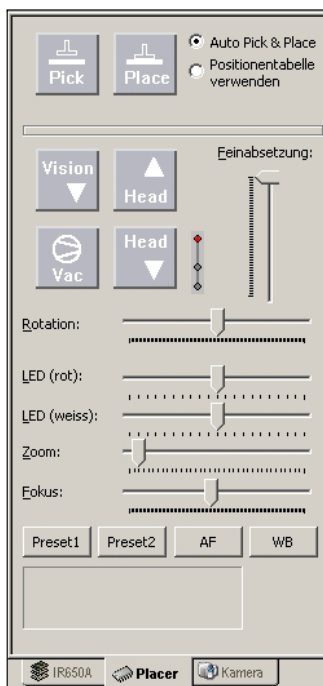
### 6.2.1 IR 650



The currently measured temperature is displayed in the upper section. Underneath there is the keypad for operating the IR 650. Beneath the keypad there are 2 status windows. In the upper status window the current system status is displayed. The field below is used for more extensive messages, such as errors that can occur.

The popup window for this control opens via the right mouse key.

### 6.2.2 PL 650

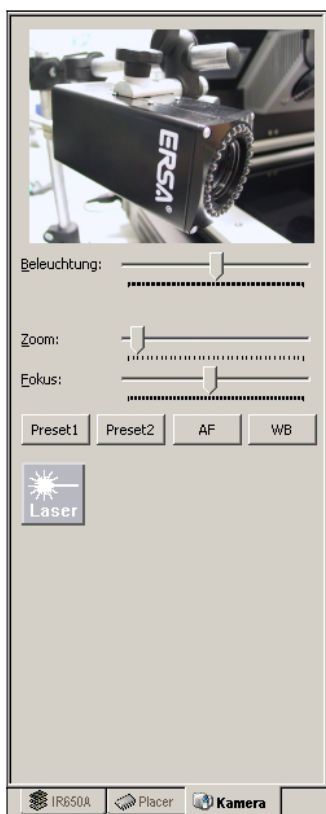


Use the PL 650 operator controller to operate the fundamental functions of the Placer PL 650 (Vision box, Forwards/Back, Head up/down, rotate, Fine drive, up/down. In addition this control includes the operating elements for the camera integrated in the Placer (lighting, lighting red lighter/darker, lighting white lighter/darker, focus, zoom, White Balance key, Auto Focus key, and keys for Preset 1 + 2).

In the lower part of the control there is an output window where the messages relative to the Placer are output in plain text. The head of the Placer has three clearly-defined settings (Top, Middle = place position, Down = pick position). These settings are visualized through the graphic to the left of the "Head down" key.

Pushing the slider triggers the corresponding actuators in the Placer, use the mouse wheel to finely adjust the slider for the input focus.

### 6.2.3 RPC 650 A



The control for the RPC camera is available twice depending on the equipment. It is located on the Placer control, and here it governs the internal camera of the placer, also there is another separate control for an external RPC camera that is connected to the IR 650.

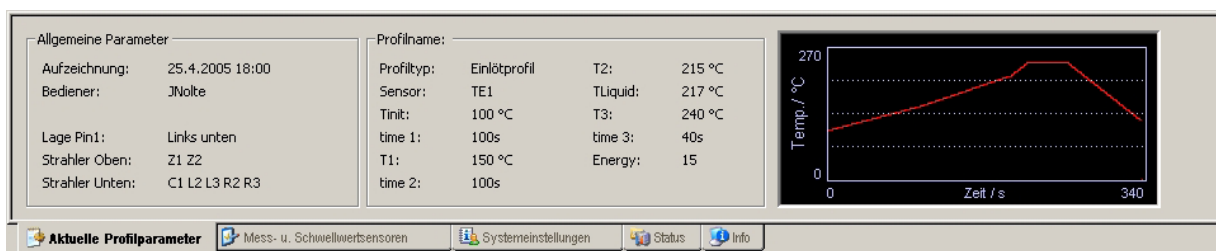
The LED ring light is controlled via the “Lighting” slider. The sliders “Zoom” and “Focus” are for image adjustment. Use the AF button to trigger Auto Focus, use “WB” for white balance. Use the Preset 1 + 2 keys to call previously saved settings (Lighting, Zoom and Focus) at the touch of a button. These functions are quite useful when recurring camera settings, e.g. total adjustment of the arrangement must be called or should be called.

To save the preset – settings all settings are activated manually. Then use the right mouse key to open the following popup menu. By calling the appropriate function all settings are saved and can then be called as desired via Preset 1 (2).

## 6.3 Parameter Window

### 6.3.1 Current profile parameters

In this view the parameters are displayed that are currently active in the connected IR device. Thus the user can check the parameters individually, and he can check them based on the curve of the target profile.



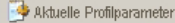
Recording data and time, the name of the user, as well as the other environment variables are saved and displayed on the left side.

With the IR 650 the configuration of the upper and lower heating elements is displayed, with the IR550A, the setting of the apertures is displayed.

### 6.3.2 Measured value and threshold value sensors

In the next view, “Measured value and threshold value sensors”, the user has a table view of all connected temperature sensors. These are the IR sensor for the IR 550, as well as an external thermocouple. For the IR 650 there are four external thermocouples in addition to the IR sensor.

| Profil-Titelzeile: <input type="text"/> |          |             |                    |           |       |            |                                     |        |        |
|-----------------------------------------|----------|-------------|--------------------|-----------|-------|------------|-------------------------------------|--------|--------|
| Sensor                                  | Akt.Temp | Schwelle/°C | Schwellen-Funktion | Meßseite  | Board | Komponente | Darstellen                          | Farbe  | Stärke |
| IRS                                     | 0,000    | 200         | Deaktiviert        | Oberseite | test  | BGA        | <input checked="" type="checkbox"/> | Red    | 2      |
| TC1                                     | 0,000    | 200         | Deaktiviert        | Oberseite | test  | BGA        | <input type="checkbox"/>            | Green  | 2      |
| TC2                                     | 0,000    | 200         | Deaktiviert        | Oberseite | test  | BGA        | <input type="checkbox"/>            | Orange | 2      |
| TC3                                     | 0,000    | 200         | Deaktiviert        | Oberseite | test  | BGA        | <input type="checkbox"/>            | Blue   | 2      |
| TC4                                     | 0,000    | 200         | Deaktiviert        | Oberseite | test  | BGA        | <input type="checkbox"/>            | Purple | 2      |







The designation of the sensor is in the first column, the actual measured temperature is displayed in the second column. In the other columns, in addition to the board and the measured components, the measurement side, as well as the measurement position of the sensor are also documented. In the last 3 columns you specify whether the graph of the corresponding sensor will be displayed in the profile graphs, and you specify the color and line thickness.

### 6.3.3 Specifying threshold value functions

In the “Measurement and threshold value sensors” view different threshold value functions can be linked with the individual sensors. In this process the appropriate sensor is continuously checked for its specified threshold. As soon as this threshold is reached and a threshold value has been stored then this function will be executed.

The following threshold value functions can be activated:

- Message (in this case the user gets a plain text message in IRSoft)
- Profile abort (in this case the profile is aborted immediately)

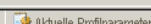
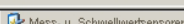
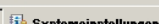
#### Dynamic IR function

- Switch-off the lower heating element
- Reduce lower heating element output
- Increase lower heating element output and reduce top side heating element output

### 6.3.4 System settings

In the “System settings” window, all functions are listed with which the behavior of the system can be specifically changed. All options are immediately active and do not need any special transmission or activation in the device.

|                                                                                                                                                                                                                 |                                                                                                                                                                                      |                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Automatisches Kalibrieren beim Auslötvorgang<br><input checked="" type="checkbox"/> Nach dem Abheben der Pipette direkt im IR Gerät<br><input type="checkbox"/> Ständig nach Überschreitung von TL durch IRSoft | Fan Automatisierung<br><input checked="" type="checkbox"/> Fan Oben am Profilende auto. Einschalten<br><input checked="" type="checkbox"/> Fan Unten am Profilende auto. Einschalten | Buzzer<br>Modus: <input type="text" value="Buzzer eingeschaltet"/>          |
| Auto. Aufzeichnungsstart<br><input type="radio"/> Bei Prozentsart<br><input type="radio"/> Bei Erreichen von Tinit<br><input checked="" type="radio"/> Autostart für die Aufnahme deaktiviert.                  | <input checked="" type="checkbox"/> Aufzeichnung am Prozessende beenden                                                                                                              | Standbymodus<br><input checked="" type="checkbox"/> Standbymodus aktivieren |



6.3.5 The status display

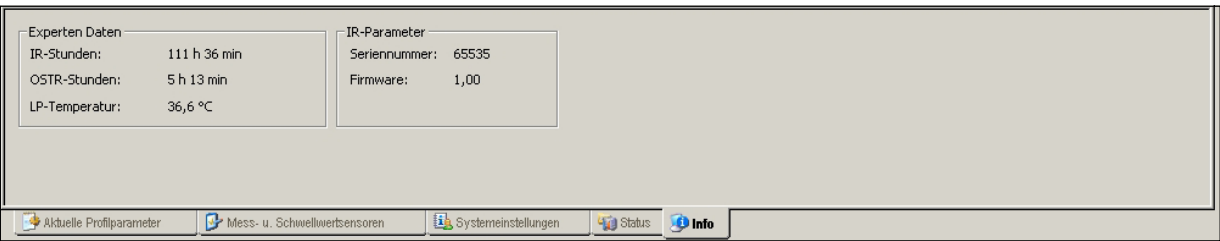
The status display shows (visualizes) the individual states in the system, for the user. If problems occur this information can be quite useful in limiting and resolving them.



6.3.6 Information window

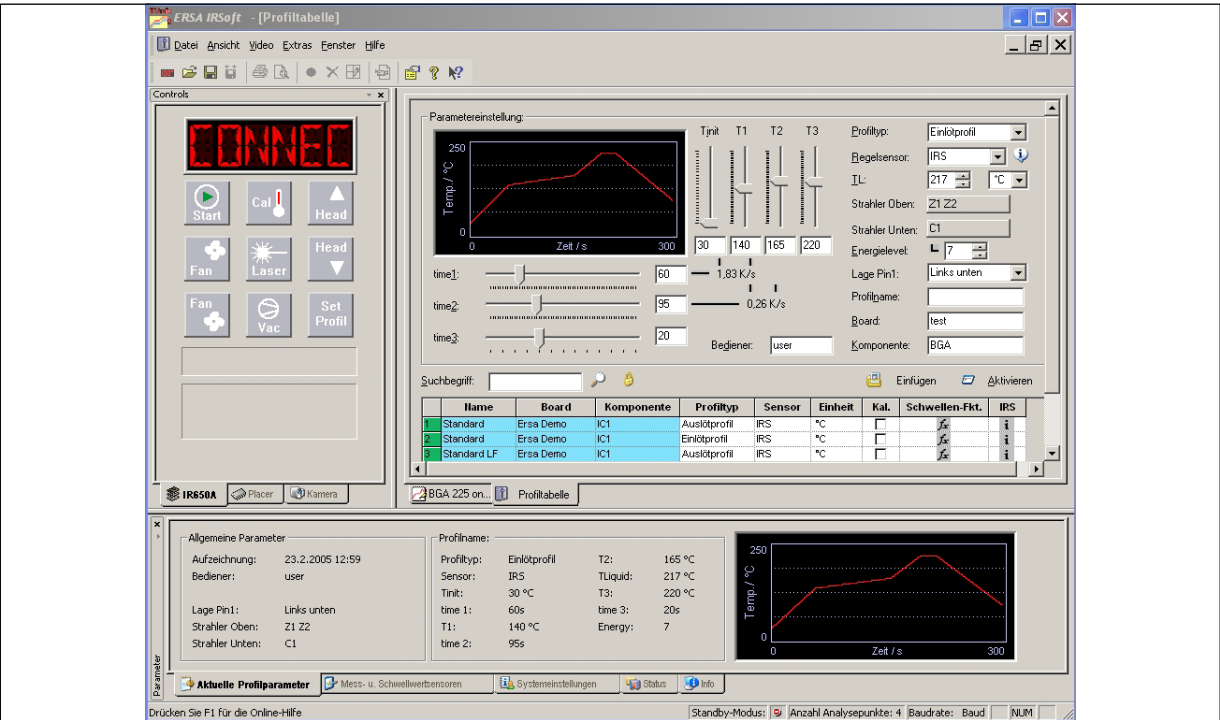
System information of the connected IR device is displayed to the user.

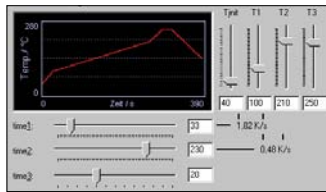
- Serial number
- Firmware version



6.4 Profile settings

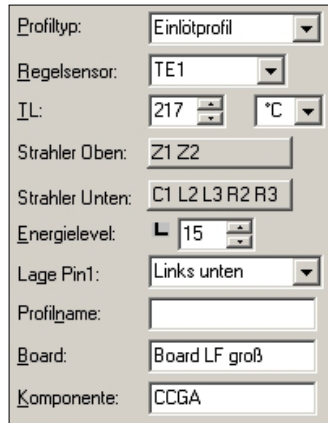
6.4.1 Setting the profile parameters





The individual profile parameters can be conveniently changed via the individual sliders, or they can be changed directly as numeric value in the entry fields. The profile update is transferred when exiting the entry field, and it is updated in the graphic. With the sliders, the graphic is updated “online”.

The system automatically calculates the set gradients in the ranges from Tint to T1 and in the range T1 to T2. These are displayed to the user online.

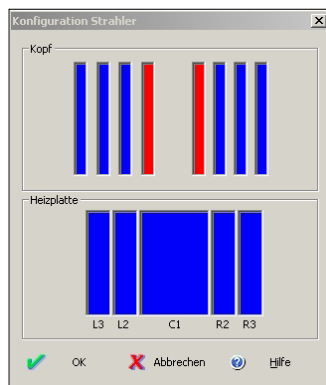


Here the settings for the IR 650 differ from those of the IR 550. With the IR 650 individual zones can be switched on or off in the upper heating element and in the lower heating element. This is not possible in the IR 550. For this the aperture settings must be worked. All available sensors are present in the selection box for the control sensor. This is where you select the sensor on which the device will control the set profile, this means that this sensor is aligned to the component that will be soldered, or it is thermally connected with this sensor and the deviation from the target profile is corrected by its signal.

TL is the melting point of the solder that is used. This temperature serves as the reference value for calibration. The values 0 – 15 are permitted as energy level. 0 means OFF, 15 means maximal output.

The position of Pin1 indicates whether the corresponding board must be tensioned so that the specified position will be reached. Thus the complete solder process can be documented and reproducibility of the soldering results can be increased. In the Board and Component entry fields the user can activate the appropriate entries. These are then transferred accordingly into the sensors table when activating the profile.

## 6.4.2 Setting the heating element configuration



Setting the heating element configuration is only available for the IR 650. Here the individual zones of the upper heating element and the lower heating element are selectively activated or deactivated.

Click on “Upper heating element” or “Lower heating element” for this. The configuration dialog displayed below will open for the heating element.

A simple mouse click on the individual zones activates them (red), or deactivates them (blue). Click on the OK button to transfer the settings to the profile.

The set configurations are displayed as abbreviations in the profile view. For the upper heating element (head) Z1 = center to Z4 = outer zone.

The abbreviations displayed in the dialog apply for the configuration of the lower heating elements.

### 6.4.3 Saving, loading, and managing profiles

Profiles can be permanently saved, called and reused. For this the required settings are activated for the profile. For identification it is strictly necessary that board, component and a name be entered for the profile. In the name field any number of settings can be made, e.g. more detailed specifications, instructions, or similar information items.

Now the profile can be permanently saved via the “Add” button. The entered profiles are stored in the “IRSoftDB.mdb” file in the installation directory. If the user wants to save his profiles then all he has to do is backup this file. If it is lost it can be recopied into the installation directory with no problem. A search function has been implemented in order to find saved profiles. For this the character string sought for must be entered in the “Search term” field, and the search is started by clicking on the search button (magnifying glass).

When searching, a full text search is executed via the columns Name, Board, and Component, and all results found are listed in the table. If no search term has been entered, then all available profiles are displayed. The search results can be sorted by double clicking on the header of the desired column.

Search key:







Add



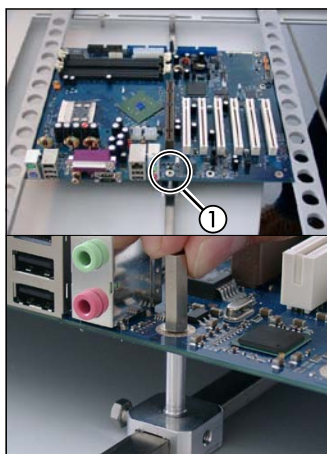
Activate

|   | Name            | Board         | Component | Profile type  | Sensor | Unit | Cal.                     | Limit function                                                                        | IRS | Activ. free                         |  |
|---|-----------------|---------------|-----------|---------------|--------|------|--------------------------|---------------------------------------------------------------------------------------|-----|-------------------------------------|--|
| 1 | Profile 1 SnPb  | Large, low ma | BGA 1     | Desoldering p | IRS    | °C   | <input type="checkbox"/> |    | i   | <input checked="" type="checkbox"/> |  |
| 2 | Profile 2 SnPb  | Large, heavy  | BGA 1     | Desoldering p | IRS    | °C   | <input type="checkbox"/> |    | i   | <input checked="" type="checkbox"/> |  |
| 3 | Profile 4 SnPb  | Large, heavy  | BGA 1     | Soldering pro | IRS    | °C   | <input type="checkbox"/> |   | i   | <input checked="" type="checkbox"/> |  |
| 4 | Profile 3 SnPb  | Large, low ma | BGA 1     | Soldering pro | IRS    | °C   | <input type="checkbox"/> |  | i   | <input checked="" type="checkbox"/> |  |
| 5 | Profile 6 LF (S | Large, heavy  | BGA 1     | Desoldering p | IRS    | °C   | <input type="checkbox"/> |  | i   | <input checked="" type="checkbox"/> |  |
| 6 | Profile 8 LF (S | Large, heavy  | BGA 1     | Soldering pro | IRS    | °C   | <input type="checkbox"/> |  | i   | <input checked="" type="checkbox"/> |  |
| 7 | Profile 5 LF (S | Large, low ma | BGA 1     | Desoldering p | IRS    | °C   | <input type="checkbox"/> |  | i   | <input checked="" type="checkbox"/> |  |

In order to view the desired profile so that it can then be transferred into the IR device, you must click on the first (green) column. The stored parameters are loaded and displayed in the parameter settings view. As soon as a profile has been selected additional buttons will be displayed.

These provide the user with the possibilities of deleting the profile, or changing the profile and overwriting the profile. The profile can now be transferred into the connected IR device at anytime via the “Activate” button.

## 6.5 Desoldering a component



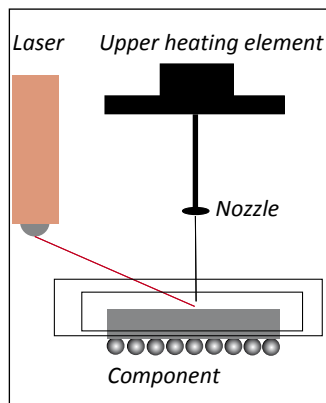
- Place the PCB in the frame of the IR 650 and fix it in place. In many cases it is necessary to use the PCB support ① to prevent bending the PCB.



- Insert the frame with the PCB in the IR 650.



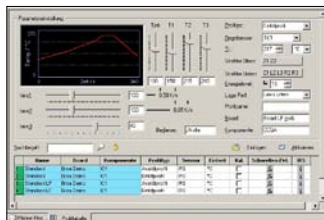
- Cover the surrounding heat-sensitive components and plug connectors with reflecting tape.  in IRSofT.


**Note:**

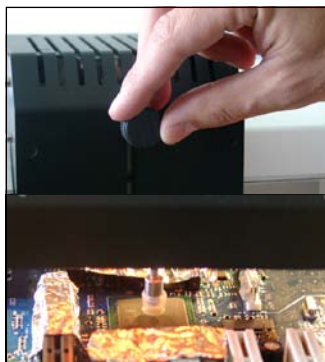
For higher positioned components it is necessary to adjust the laser pointer.

Because the laser beam (as shown in the illustration) hits the component from the side, the discharge point of the laser changes for components of different height.

You will find detailed instructions on the CD-ROM included with the shipment.



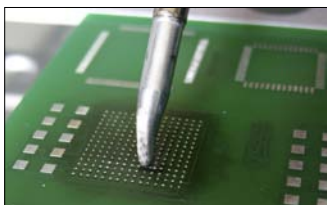
- In this dialog select a suitable “desoldering profile” for the assembly and activate this profile. Then push the start button  in the operating controls for the IR 650. The IR 650 now begins to work through the soldering profile.



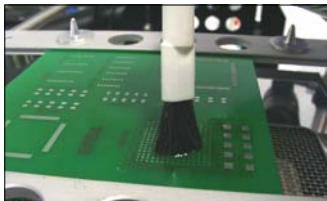
- A short time before reaching the melting point the vacuum pump in the IR 650 starts automatically. When you detect the melt via the RPC camera, place the nozzle on the component as shown in the photo.



- The extraction head automatically lifts the component from the PCB. The cooling fans start automatically and cool the PCB according to the soldering process.

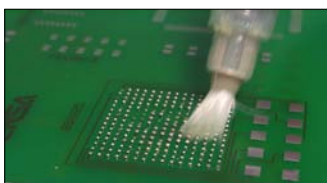


- Remove the residual solder from the PCB. Use the optional Ersä TechWell solder tip for this.

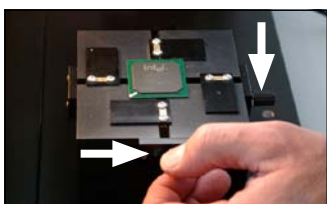


- Loosen the flux residues with flux remover. Remove residues with a fleece cloth.

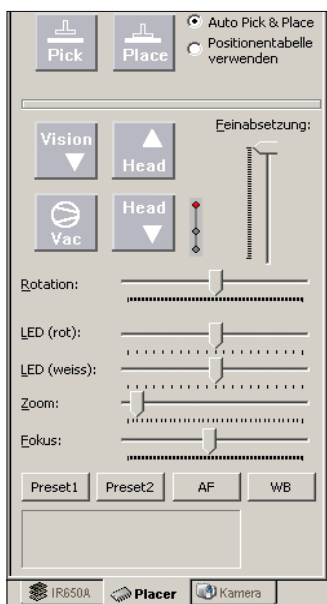
## 6.6 Placing the component and soldering



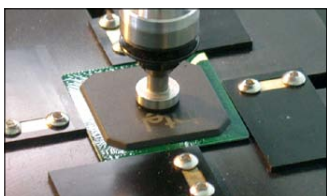
- Apply the flux on the solder joints of the PCB.



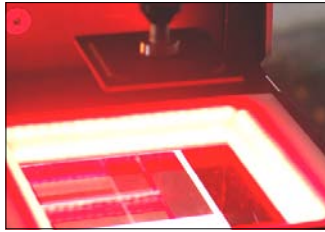
- Place the component in the Placer's receptacle. Then adjust the guide plates in such a manner that the component is precisely in the middle.  
\* The photo shows the optional centering station of the PL 650



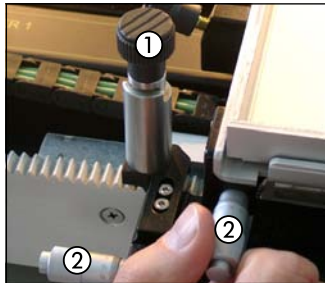
- Push the button in the operating controls  for the PL 650 two times. Mark the entry "Pick and place with contact detection" in the right dialog. Push the button  in the right dialog.



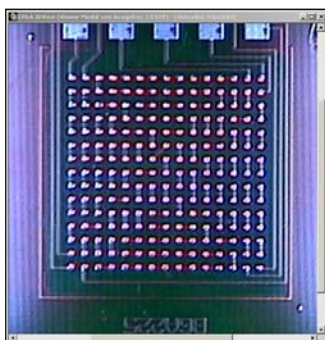
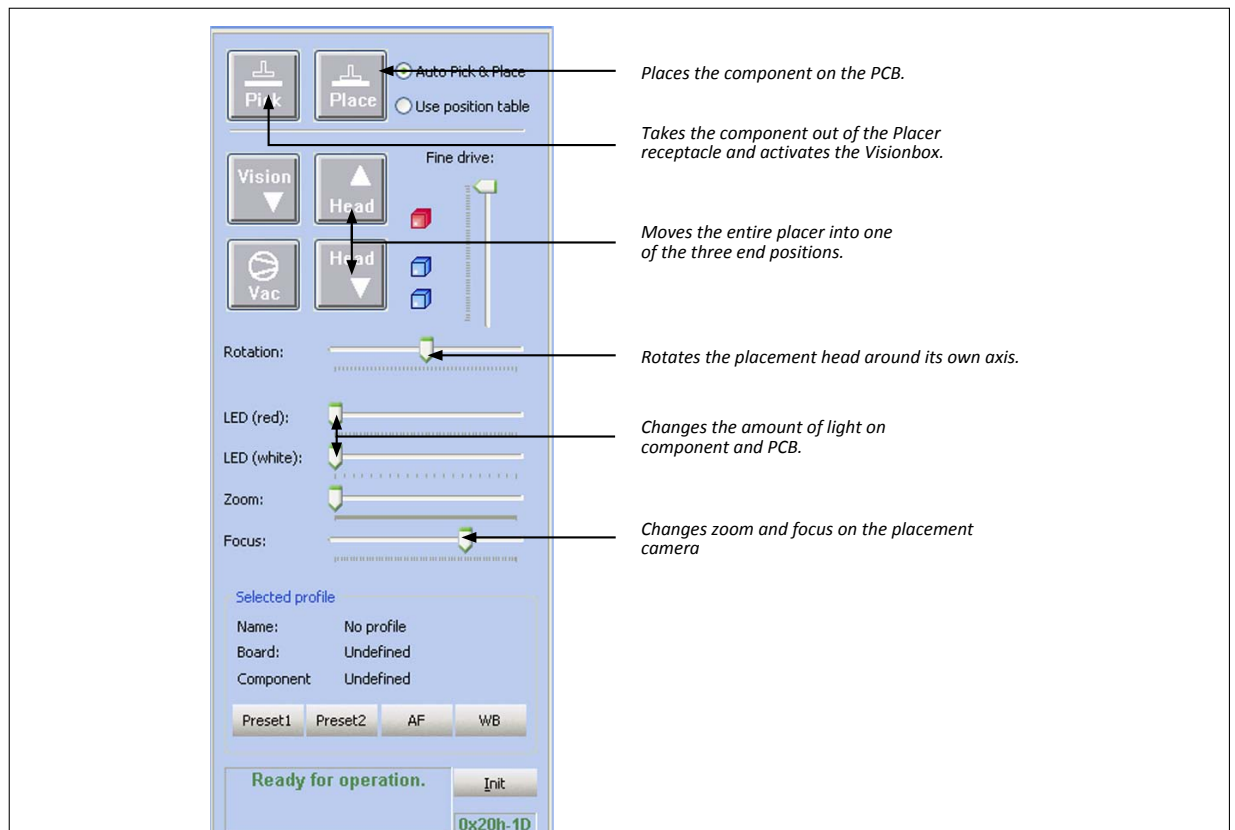
- The placement head picks up the component automatically and moves up.  
\* The photo shows the optional centering station of the PL 650.



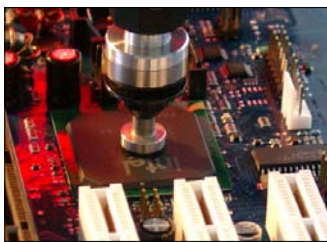
- The VisionBox extends automatically and via IRSofT enables a view of the landing area of the component and of the PCB.



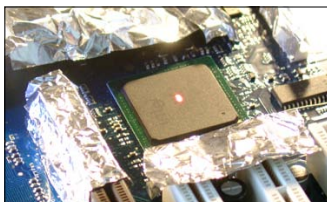
- Adjust the movement table so that the landing area of the component matches the solder contacts on the PCB.
- Fix the movement table in place with the lock lever ①.
- Then make the fine adjustment with the fine adjustment screws ②.
- To rotate the component you must use the IRSofT operating controls. The functions in this dialog are explained here.



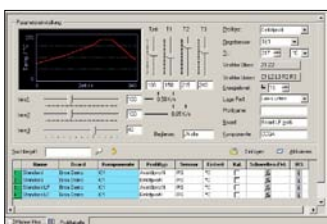
- If the footprint the component precisely match the pads on the PCB, press the Place button .



- The component will then be placed automatically on the PCB.



- Unlock the placement table.
- 
- Activate the laser on the IR 650.
- Position the PCB so that the laser points to the middle of the component.



- In this dialog select a suitable "soldering profile" for the assembly and activate this profile. Then push the start button  in the operating controls for the IR 650. The IR now begins to work through the soldering profile.

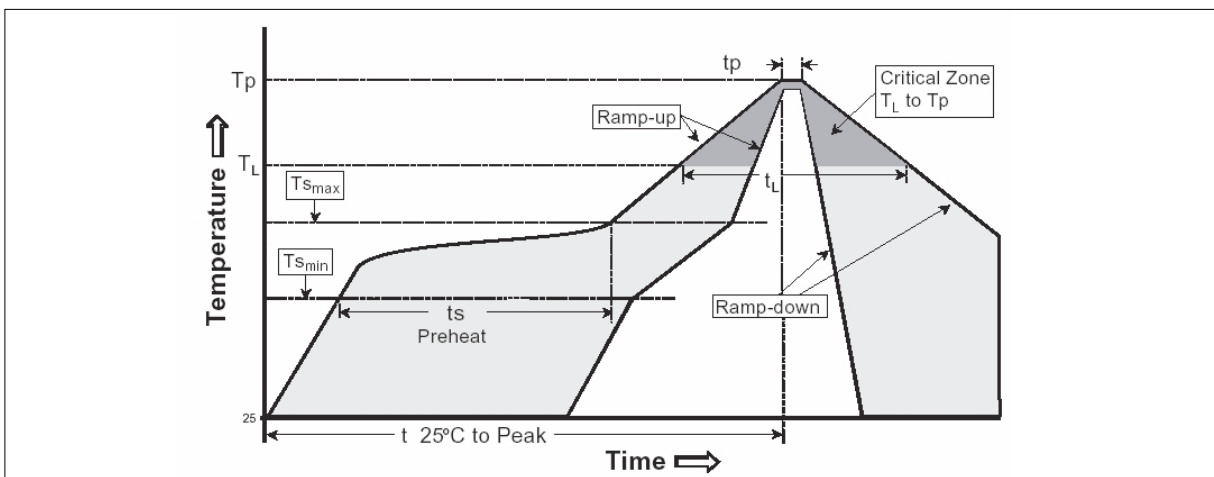
## 6.7 The optimal profile

In order to achieve optimal results with the IR 650 Rework System, the following instructions must be complied with.

### Solder profile in "Closed Loop Adjustment"

The selected adjustment sensor will generate the selected temperature profile for each assembly, with due consideration of the threshold value sensors. In this process the thermal capacity of the assembly must be taken into account. Basically for rework processes profile data should be set according to "IPC/JEDEC J-STD-020C".

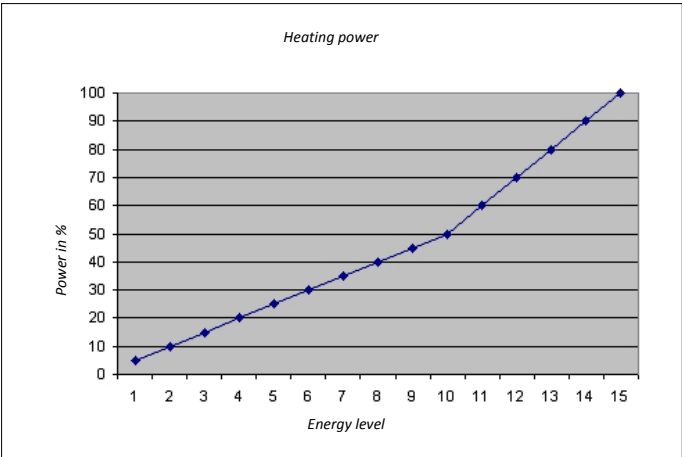
In addition recommendations made by the component manufacturer, and the producers of the solder paste and flux must also be complied with.



Basically the thermal requirement for the solder process increases with the increase in the following parameters.

- Size of the component to be soldered
- Size of the PCB
- Thickness of the PCB (multi-layer)
- Solder melt temperature

Heating zones, energy level, final temperature and peak hold time must be adapted to the respective application..



| Energy level bottom heater | Power in % |
|----------------------------|------------|
| 1                          | 5          |
| 2                          | 10         |
| 3                          | 15         |
| 4                          | 20         |
| 5                          | 25         |
| 6                          | 30         |
| 7                          | 35         |
| 8                          | 40         |
| 9                          | 45         |
| 10                         | 50         |
| 11                         | 60         |
| 12                         | 70         |
| 13                         | 80         |
| 14                         | 90         |
| 15                         | 100        |



**Note:**

For further Information please also take a look at the document "Profile Recommendations" on the product-CD.

## 7. Troubleshooting

| Problem                                                  | Possible cause                                                                                                                                                                              | Solution                                                                                                                                                                                                                                                |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The IR system is not functioning                         | Power cable is not plugged in.<br>Device fuse defective.<br>EMERGENCY-STOP active.                                                                                                          | Connect the power cable to a power outlet.<br>Check/replace the device fuse.<br>Switch EMERGENCY-STOP to I.                                                                                                                                             |
| The IR 650 display shows <STOP>                          | USB cable not plugged in correctly<br>The device is not switched on.<br>The device is not detected by the PC.<br><br>The driver has not been installed.<br><br>Incorrect interface setting. | Connect the USB cable to the device and PC.<br>Switch on the device.<br>Check whether the device appears in the system control.<br>Install the driver as described in the Online Help.<br>Make the interface settings as described in the Online Help.. |
| The IR 650 display shows <Inf0>                          | The device is too hot.                                                                                                                                                                      | Ensure adequate device ventilation. Reduce the energy level if possible.                                                                                                                                                                                |
| The IR 650 display shows <Inf6>                          | The regulating sensor does not register any change in temperature although the system is heating.                                                                                           | Ensure that the thermocouples are intact and that they are aligned to the measurement object.                                                                                                                                                           |
| The IR 650 display shows <Err1>                          | IR head end switch does not supply a signal<br>IR head is mechanically blocked.<br>Motor is defective.                                                                                      | Remove the obstacle in the movement range of the IR head<br><br>Replace motor                                                                                                                                                                           |
| The IR 650 display shows <Err7>                          | Error external thermocouple 1.                                                                                                                                                              | Ensure that an intact thermocouple is connected                                                                                                                                                                                                         |
| The IR 650 display shows <Err8>                          | Error external thermocouple 2.                                                                                                                                                              | Ensure that an intact thermocouple is connected                                                                                                                                                                                                         |
| The IR 650 display shows <Err9>                          | Parameter in the EEPROM is damaged.                                                                                                                                                         | Push the Stop button. This resets the error message. If it appears again then the control card must be replaced.                                                                                                                                        |
| An aggregate (compressor, fan, etc.) does not switch on. | A defect of the respective aggregate                                                                                                                                                        | Open the IRSOFT status display. Check whether the software activates the aggregate. If yes then the respective aggregate must be replaced.                                                                                                              |

## 8. Maintenance

**Note:**

Use only genuine Ersä consumable items and spare parts to maintain reliable function and the warranty.

**Attention:**

Device housing parts can still be very hot after the device is switched off. Only perform cleaning work on the device when it is turned off and it has cooled down. Do not use any solvent-containing cleaning agents.

### 8.1 Cleaning

#### 8.1.1 IR 650

A dry or slightly damp cloth is recommended for cleaning the device.

The component tray and the glass plate over the lower heating element can be cleaned of residual solder and flux splashes with dull hard object and a cloth.

#### 8.1.2 PL 650

Make sure that the optical components of the camera module are free of dirt and grease.

Depending on the degree of soiling, perform the following maintenance operations:

- Using a moist cloth and mild household cleaner, remove solder paste and flux residue as well as dust from the system.
- Clean the camera lens and the beam splitter of the Visionbox using the Optical System Cleaning Kit (OVSLC100).
- Clean the guide rods of the placement head and the guide rails of the PCB holder with a lightly oiled cloth.
- Regularly check the mobility of the rack and pinion drive at the placement head and if necessary re-grease the rack and pinion.
- Replace the vacuum filter of the pump unit if it visibly soiled or if the vacuum is too weak.

### 8.2 Replacing a silicon suction cup on the IR 650

To replace a worn silicon suction cup, switch the device off and wait until the vacuum nozzle and the upper heating element have cooled down. Pull the silicon suction cup down and off of the vacuum pipette and replace it with a new unit. Suction cups with a diameter of 2 mm and 3.5 mm can be mounted directly on the vacuum tube without adapter!

## 9. Spare parts and wearing parts

Although Ersä IR Rework Systems are manufactured with the utmost care, malfunctions or failures of individual components can occur. This list is provided as an aid for quick identification and replacement of defective parts. Important accessories and wearing parts are also listed..

### 9.1 Ersä IR 650

| Spare Parts                                        | Order Number |
|----------------------------------------------------|--------------|
| <b>Spare Parts for IR 650</b>                      |              |
| Controller board for IR 650                        | OIR6500-02   |
| Display board for IR 650                           | OIR6500-03   |
| Power distribution board                           | OIR6500-05   |
| IR Top radiator 1400 W/48 V AC                     | OIR6500-09   |
| IR Bottom radiator 400 W/230 V                     | OIR6500-10   |
| IR Bottom radiator 800 W/230 V                     | OIR6500-11   |
| ROBAX glas plate                                   | OIR6500-04   |
| Geared motor for IR 650                            | OIR6500-06   |
| Vacuum pump                                        | OIR5500-10   |
| IRS Module complete with Laser                     | OIR6500-07   |
| Laser diode                                        | OIR5500-22   |
| IRS Sensor module with micro plug                  | OIR6500-24   |
| Gear wheel for motor IR 650                        | OIR6500-08   |
| Nozzle complete                                    | OIR6500-12   |
| Shutter blade set complete for IR 650              | OIR6500-13   |
| Fine adjustment Y complete for IR 650              | OIR6500-14   |
| Fine adjustment X complete for IR 650              | OIR6500-15   |
| PCB frame with anchoring elements OIR6500-16       | OIR6500-16   |
| PCB-holder                                         | OIR6500-17   |
| Component tray                                     | OIR6500-18   |
| Rework Process Camera RPC650A                      | OVSRPC650A   |
| ACCUTC sheath thermocouple (class 1 "recommended") | OIR6500-01   |
| Cable USB A-B                                      | 3ET00241     |
| Frame Grabber IS-FALCON                            | 3VSFG100-02  |
| Cinch video cable                                  | 3ET00250     |
| Vacuum nozzle with tube                            | OVP020       |
| Suction cups for nozzle (3pcs.) set with 4, 7, 9mm | OSVP13A      |
| Connection current limiter                         | OIR6500-19   |
| Control transformer for IR 650                     | 3ETRAF0048   |
| Power transformer for IR 650                       | 3ETRAF0049   |
| Solid state relay                                  | OIR6500-20   |
| 3/2 direction control valve + alu block            | OIR6500-21   |
| Replacement fuse set                               | OIR6500-22   |

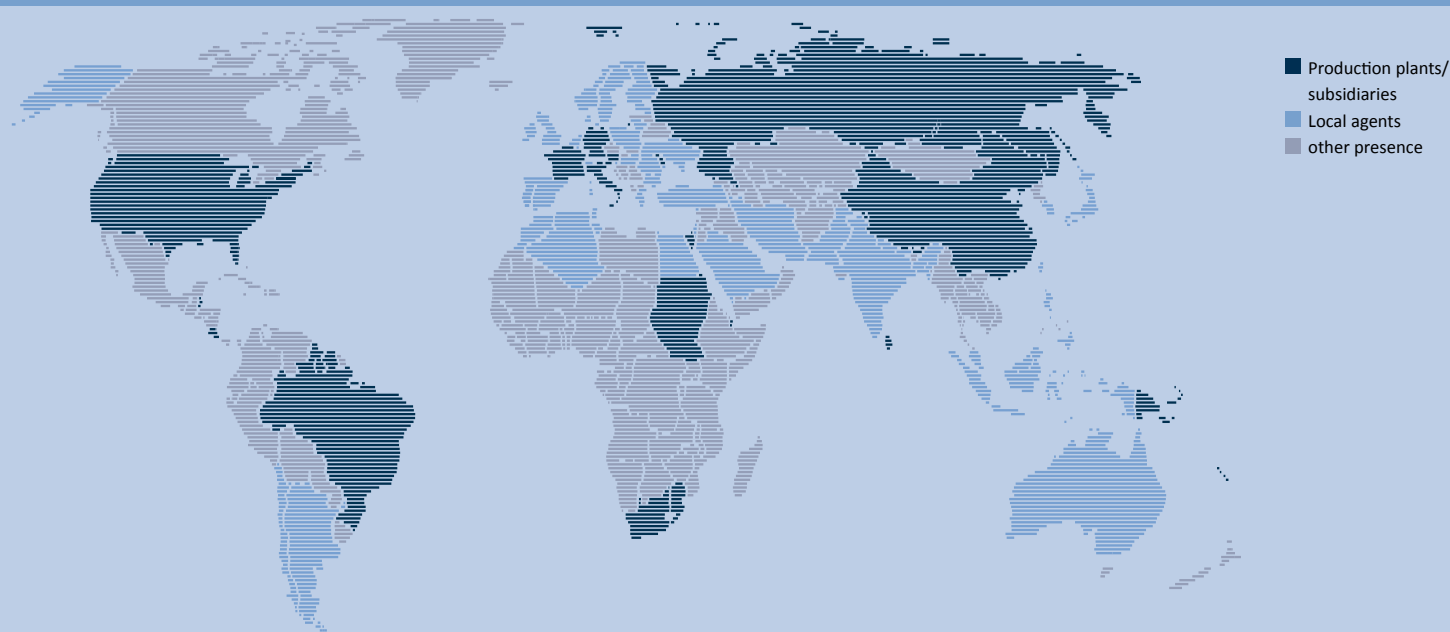
| Accessories and consumable items IR 650                          |             |
|------------------------------------------------------------------|-------------|
| Filter unit complete                                             | 0IR4500-23  |
| Reflective tape (yard ware)                                      | 0IR4500-39  |
| Reflective tape 25mm x 1000mm                                    | 0IR4500-40  |
| Capton tape                                                      | 0IR4500-07  |
| THERMO COUPLE WIRE K-TYPE WITH PLUG                              | 0IR4510-02  |
| Thermocouple wire for DIG 2000A                                  | 0DIG207     |
| Operating manual IR 650A plus CD-version                         | 3BA00144    |
| Operating manual IR 650 DE/EN                                    | 3BA00143    |
| OPERATING INSTRUCTION DIG 20 A                                   | 3BA00044-00 |
| Packaging IR 650A                                                | 3VP00666    |
| Silicon suction cups 8mm                                         | 0IR4520-01  |
| Silicon suction cups 5mm                                         | 0IR4520-02  |
| Silicon suction cups 2mm                                         | 0IR4520-03  |
| Viton® suction cups 8mm                                          | 0IR4520-04  |
| Viton® suction cups 5mm                                          | 0IR4520-05  |
| Viton® suction cups 2mm                                          | 0IR4520-06  |
| <i>Viton® is a registered trademark of DuPont Dow Elastomers</i> |             |

## 9.2

### Ersa PL 650

| Spareparts                              | Order Number |
|-----------------------------------------|--------------|
| Control card for PL 650                 | 0PL6500-02   |
| LED vaccum display for PL 650           | 0PL6500-03   |
| Vacuum valve for PL 650                 | 0PL6500-04   |
| Rotation motor for PL 650               | 0PL6500-05   |
| Z-Motor fine adjusted gear for PL 650   | 0PL6500-06   |
| Z-Motor insertion head for PL 650       | 0PL6500-07   |
| Vision box complete for PL 650          | 0PL6500-08   |
| Motor vision box complete for PL 650    | 0PL6500-09   |
| Sensor for vision box for PL 650        | 0PL6500-10   |
| Accessories and consumable items PL 650 |              |
| Split optic for PL 650                  | 0PL6500-11   |
| Centering station for PL 650            | 0PL6500-12   |
| Nozzle Ø 0.8 mm                         | 0PL6500-13   |
| Nozzle Ø 1,2 mm                         | 0PL6500-14   |
| Nozzle Ø 3 mm                           | 0PL6500-15   |
| Nozzle Ø 4 mm                           | 0PL6500-16   |
| Nozzle Ø 10 mm                          | 0PL6500-17   |

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