



Selective Soldering System ELS 3.3 INLINE



Nitrogen- Selective Soldering System ELS 3.3

One machine with all possibilities and productions

The Soldering System ELS 3.3 is designed as an Soldering Center for the Inline use with a possible connection to external handling systems.

As the process of parallel nozzles is done simultaneously, the cycle times are dramatically reduced. During the single mode use, the operator can have individual soldering nozzles which will cover all applications accordingly.

For special requests, INERTEC can use a special soldering which is able to operate up to 4 mini wave modules in parallel or combinations in between mini waves and full wave operation, or dip soldering units.

The base machine offers the possibility to operate two mini waves individually.

The use of lead free alloys is anyhow standard at all INERTEC Soldering Systems.

All parts which are in contact with the alloy are ceramic coated.

Based on the robust construction of the soldering unit and the professional X-Y-Z Axis System with servo drive, the unit can handle heavy weight pallets or PCB's. In the gripper INERTEC offers the feature of an integrated down holding device.

By using the axis controlled soldering, the solder quality automatically is increased by using the programmable and dynamic flow.

All modules are designed like plug & play units and easy configurable.

Based on the Inline assembly of the individual components, means the fluxing, preheating and soldering, always 3 PCB's or pallets are in the process and can be handled inside the machine in parallel.

Therefore INERTEC is using a pin-chain conveyor above the fluxer and preheater unit.

After the preheat cycle the gripper is picking up the PCB and after the following soldering process the PCB is placed on the exit conveyor.

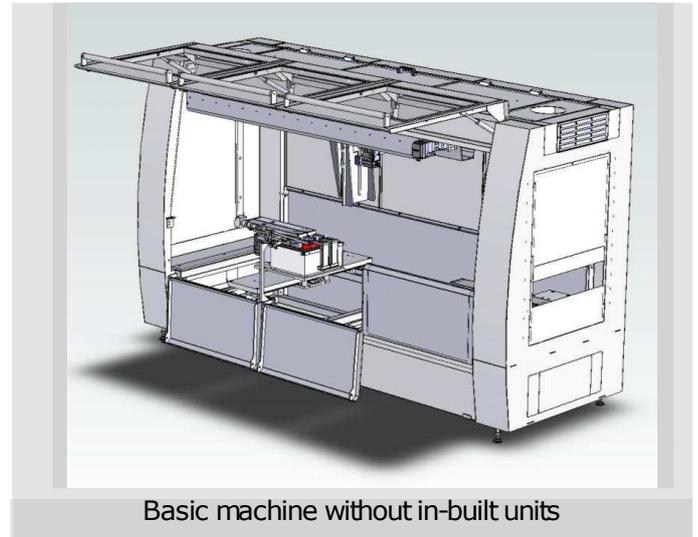
Basic machine

The basic machine is fully functioning in its standard design, and comparable with all rival products.

The equipment comprising servo drives and a flux / pre-heating axis does however render this system superior.

The machine body, weighing around 800 kg, forms the solid basis for the precision axes.

The price-performance ratio is decisive for the worldwide implementation and introduction of the selective soldering technology - also in newly industrialized countries.



Basic machine without in-built units

Professional Handling

The PCB's are guided via the pin chain conveyor to the individual process steps.

The handling can be bare board or based on a carrier or pallet.

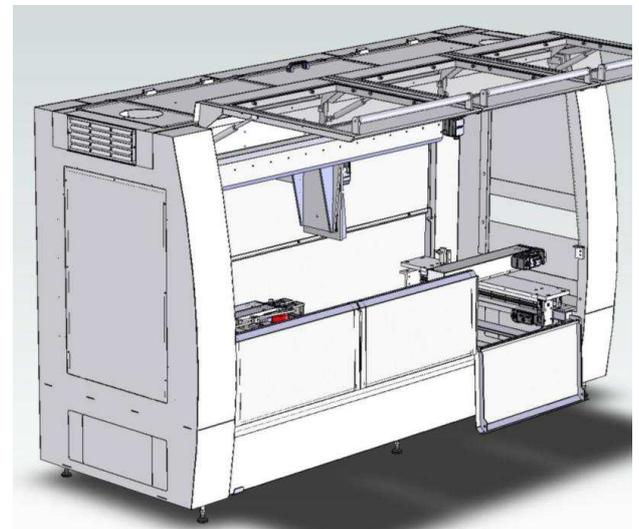
External conveyor systems can be used or the line can be integrated into existing systems.

All these units can be extended with work places, lift stations or other handling units.

The PCB's are guided very smoothly in the conveyor system.

X-Y-Z Ayis System

High Quality -Servo drive with absolut encoders and brake. The massive axis are proven since years in the INERTEC Soldering Systems.



Maintenance

The system is designed to be easily maintained and the System offers a very good accessibility.

The machine is covered with glasses and all doors are equipped with safety switches.

The maintenance is done very easy and within minutes.



Machine Cover

The machine is equipped with a exhaust port, which need to be connected to the on site exhaust line.

Exhaust Port

the exhaust is controlled via a special flow sensor which is also connectewd to the control unit.

If the exhaust rate is not suficient, the machine cannot be used accordingly.

Option: Nitrogen Supply Module

including a digital flow meter. This high precision unit defines the correct flow of nitrogen and offers the possibility to see the nitorgen use..

based on this the process can be optimised and the nitro- gen consumption can be reduced..

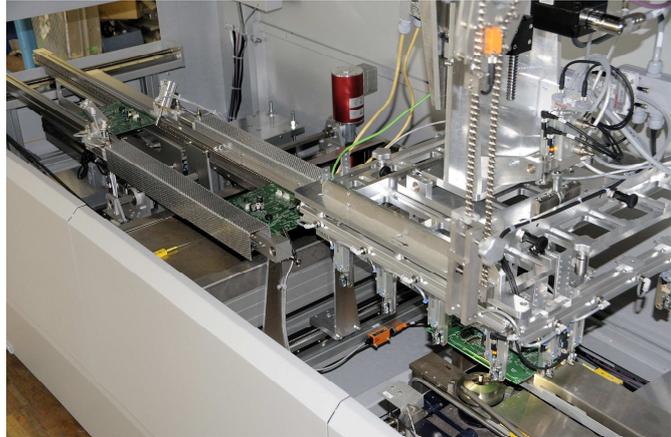


Handling:

The easily changeable and adjustable gripper is the main feature of this machine. It can be set from 80 x 80 mm up to 460 x 460 mm easily without removing it.

The gripper keeps all options possible like top side heating - to keep the PCB temperature stable after the regular preheater - or any other features to keep the board flat for example.

The clamping system is easy, quick and the movement of the gripper is programmable in 0° and 7 ° and interpolation is possible.



Perfect accessibility

This picture shows the side view of the fluxer and preheat area.

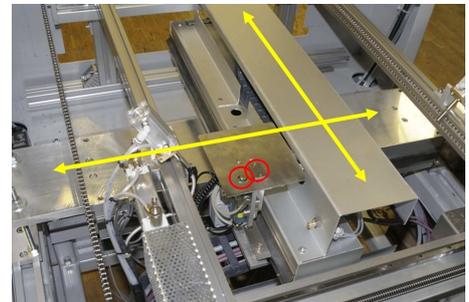
The easy accessibility on the machines is the key for the maintenance and perfectly realized on the ELS 3.3 Inline.



XY fluxer unit

The XY fluxer offers the possibility of having both versions - drop jet and spray fluxer - combined or it can be used to run different flux types without changing over.

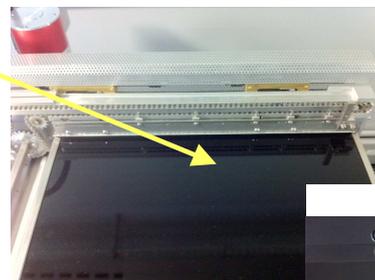
The optional spray control is detecting via an alser unit the correct spray pattern of the drop jet unit.



Lift Stations

The lifting stations offer the possibility to grip the PCB at all 4 sides ! This gives a very stable and flat soldering condition.

Board warpage control and fiducial software is a further software possibility.



Options for the Mini Wave Module:

- Second Miniwave soldering module with servo drive
- 2 lifting cylinders with control valves
- Nozzle heating with interface controller
- Monitoring the height of the solder wave

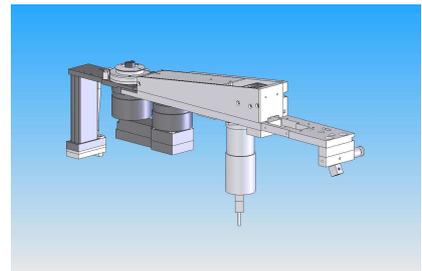


Standard - Soldering Aggregate

This picture shows the standard soldering unit with two soldering modules.

Auxiliary soldering module

The auxiliary soldering module is supplied without a built-in temperature controller. This is integrated in the switch cabinet.



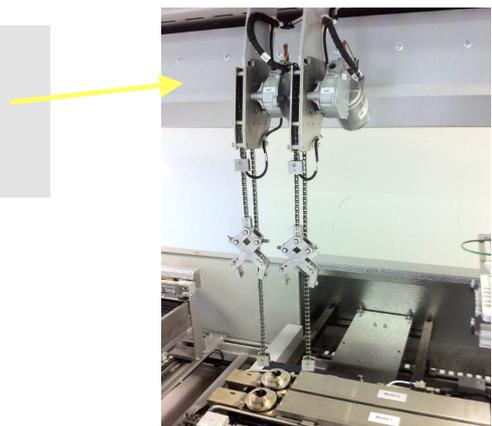
Lifting cylinder for the soldering module

When using two soldering modules it is obligatory to build-in the two lifting cylinders because otherwise this could result in a mechanical collision.



Automatic solder feeder, optional

included with an automatic level detection system.
The unit can handle basically all standard solder bars.
Adaptations to customer solder bars is possible.



Endoscope camera

The endoscope camera is connected directly to the PC.
The customer needs to ensure that a sufficient USB extension is built-in for this purpose.



Nozzle heating with interface controller

The nozzle heating assumes the maximum controller configuration. Interface controllers are used to record via the software.



Infrared heating

The IR heater is build the way to define the width and so the unused area of the heater can be deactivated.

The combination of IR and Convection offers a perfect heat transfer.

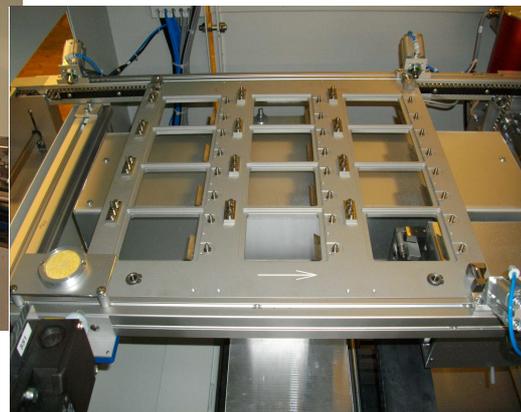


Machine socket for height adaptation

To adapt to different working heights, a connector will be offered which can be bolted on where the adjusting feet are located. Height of the connector 100 mm.

Soldering Frame or Pallets

INERTEC can build up the machine for bare board handling, as well as the operation with pallets. This offers the customer the possibility to reuse for example an existing handling unit or conveyor systems.



Pallet Gripper

For the handling of pallets INERTEC can use a robust gripper system which can handle easily 10 Kg of weight.

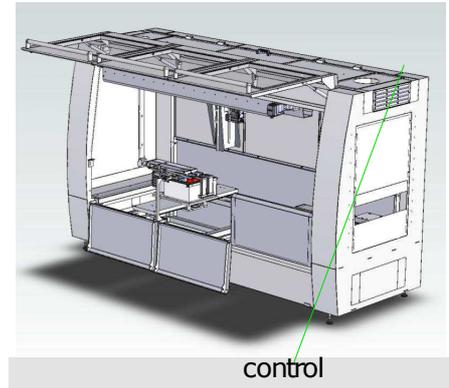
Maximum configuration control

The machine control is an BECKHOFF PLC connected to a PC. If a customer wishes to expand the unit at a later date, the software and control is already prepared to handle all future requirements.

The switch cabinet is designed as a module and is also taken into consideration by the software. Therefore it is generally adapted to the hardware and software.

The C components are world standard. The servo drives and all the integrated parts are equipped with a CAN OPEN interface. The connection to the PC is realised by an Ethernet connection.

The computer (OEM standard) will be made available by the customer or INERTEC will supply this PC.

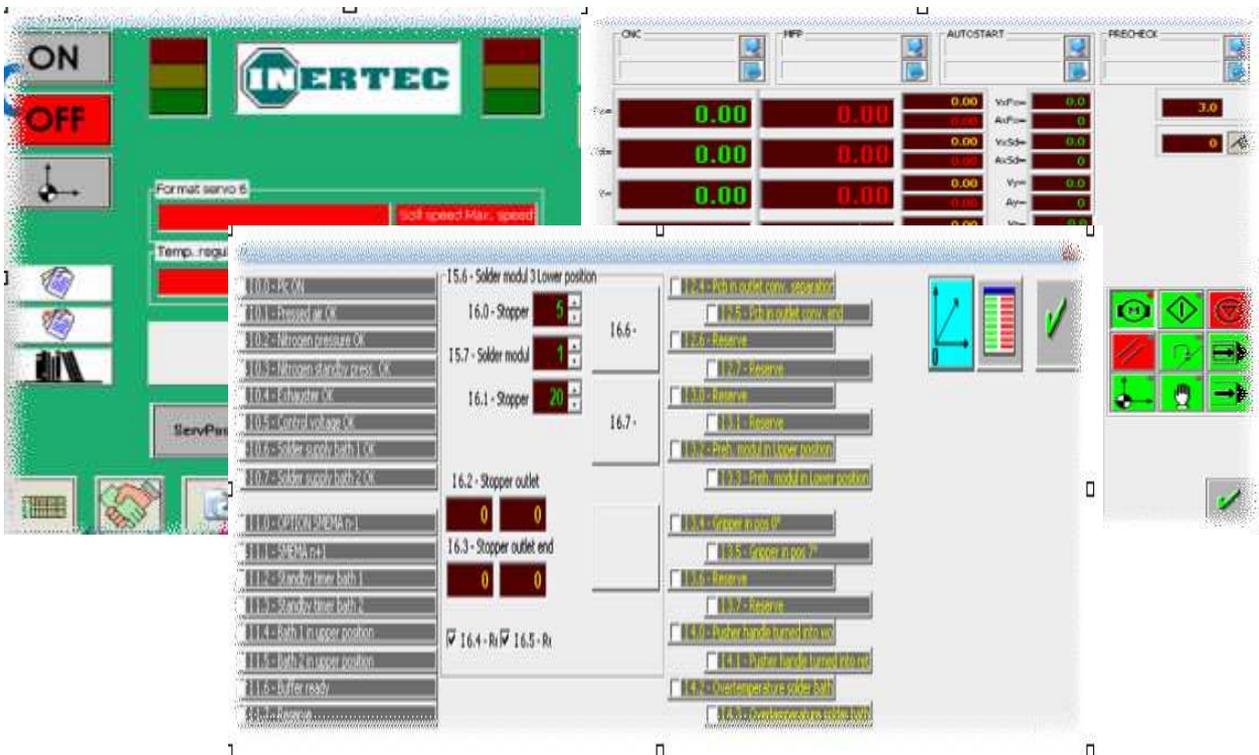


control

PC - Software - Control

The control of the machine is done via the PC in connection to a BECKHOFF PLC which is the INERTEC standard. The software offers all features like SMEMA communication, storage of error messages and production data, etc. etc.

The switch cabinet is integrated at the back side of the machine.



Further Options of the ELS 3.3 Inline



Connection to external Handling Systems

The machine type ELS 3.3 can be extended by lift stations as well as external conveyor modules.

The integration of the machine into a complete production line including working places, buffers, conveyors, etc. can be easily done.



Option: 4-up Mini Wave Module

To increase the throughput in the Selective System, INERTEC is able to install a larger soldering aggregate which can handle up to 4 mini waves.

These units can be operated parallel or individual by using the stroke cylinders.

Exchangeable Soldering Aggregate

To offer the possibility to operate the machine like a Selective Soldering Unit as well as the traditional Wave Soldering Machine, INERTEC developed an exchangeable Soldering Module. This module can be heated up during the Selective Process and while having the Mini Wave in a park position, the Full Wave Module can be used.



Standard configuration

Lead free ready, exchangeable 50 kg solder pot. (If using lead free solder, weight is 45 kg)
Solder pump/motor lead free ready
Mini-wave nozzle (various sizes) lead free ready with nitrogen inertion
Spray fluxer
IR preheater
X and Y axis flux drive system
Float sensor to maintain constant level of solder in pot
Temperature control probe for constant temperature monitoring
Exhaust port for exhaust monitoring

Options available

- PC/Monitor/Keyboard/Mouse
- Additional complete mini-wave soldering nozzle to make "Dual Nozzle" system. Each nozzle can function individually without change-over
- Nitrogen pre-heat at the nozzle and board, adjustable to 250°
- Additional, lead free ready exchangeable solder pot for use with multiple alloys
- Trolley system for changing pot
- Control unit for pre-heating or using additional solder pot on bench
- Top and bottom pre-heat (CUSTOM: must be detailed at time of order)
- Additional offline software programming key
- Additional mini-wave nozzle inserts (various sizes and shapes available)
- Micro-dot drop jet fluxer with intelligent frequency control system
- Additional flux pot for use with different fluxes
- Endoscope camera for "real time" direct bottom side view of soldering process
- Offline/Online programming software
- Special fixtures, holders, carriers, available upon request

Delivery time

Upon agreement

Application

The INERTEC 3.3 Soldering System is a Inline Soldering Unit, designed to solder through-hole components on PCB's.

Boards are hand loaded like a bare board or into a pallet, then onto the carrier.

The process consists of fluxing, pre-heating (If necessary), soldering, and unloading by movement of the board in the "X" and "Z" axis, movement of the soldering pot in the "Y" axis.

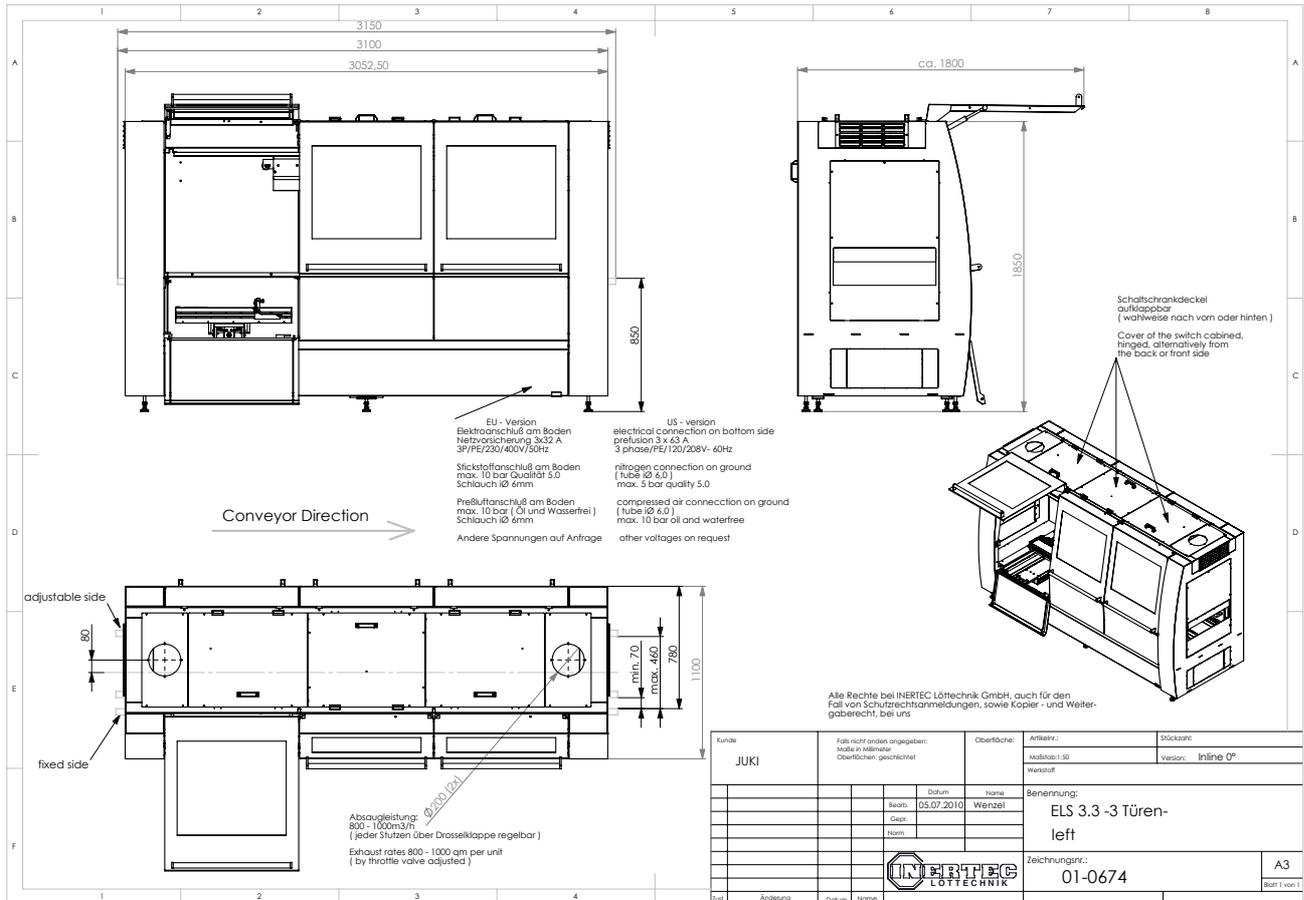
All systems are capable of both Pb, and Pb free soldering.

All standard fluxes are useable in the system through both the spray fluxer and Microdot fluxer.

**It is recommended to use No Clean type fluxes that are non-corrosive.
When other fluxes are used the machine must be thoroughly cleaned daily.

**Microdot fluxer: Fluxer used for precisely applying flux on the PCB.

**Spray fluxer: Fluxer used for applying wide area of flux. Generally used when using a full traditional wave.



Miscellaneous Notes

Solder and Flux

Customer must be responsible for supplying all products unless otherwise organized at time of sale

System size/weight - Standard Machine

Length of the system 3150 mm

Width of the system 1100 mm

Height of the system 1800 mm (Frame)

Weight of the system approx. 1000 Kg without solder

Motors

XYZ, and solder pump	Servo (Maintenance free)
Positioning Accuracy	0,1 mm
CPK	> 1,67
Speed of the Z Axis - Spindle Axis	max. 335 mm/sec controlled by the motor ramp
Speed of the Main Axis	max. 625 mm/sec controlled by the motor ramp

Air Supply (into machine)

Air supply min.	5 bar
Air supply max.	6 bar

Air Exhaust

Extraction rating	1000 CMH per port
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Nitrogen

Nitrogen supply pressure min.	5 bar
Nitrogen supply pressure max.	6 bar
Nitrogen quality recommendation	5.0 (99.999) 10PPM
Nitrogen usage Miniwave	25 – 30 Liter/minute per mini wave

Workspace

Carrier	Adjustable size (Manual)
Carrier Angle	0° or 7° tiltable
Max. Board Size (WxD)	from 80 x 80 to 460 x 460 mm
Pallet operation	up to 10 Kg weight

Power Supply

Connection Type	50 Ampere
Voltage	3X400 VAC Ground and Neutral or US Voltage
Frequency	50 Hz. or 60 Hz
Power Consumption with IR Pre-Heat	9 KW
Power Consumption Nozzle Heating	600 Watt
Power Consumption Top Side Heater	1500 Watt
Power Consumption Solder Pot	
Mini Wave	1800 Watt
Power Consumption Solder Pot	
Full Wave	9000 Watt