Total Solutions

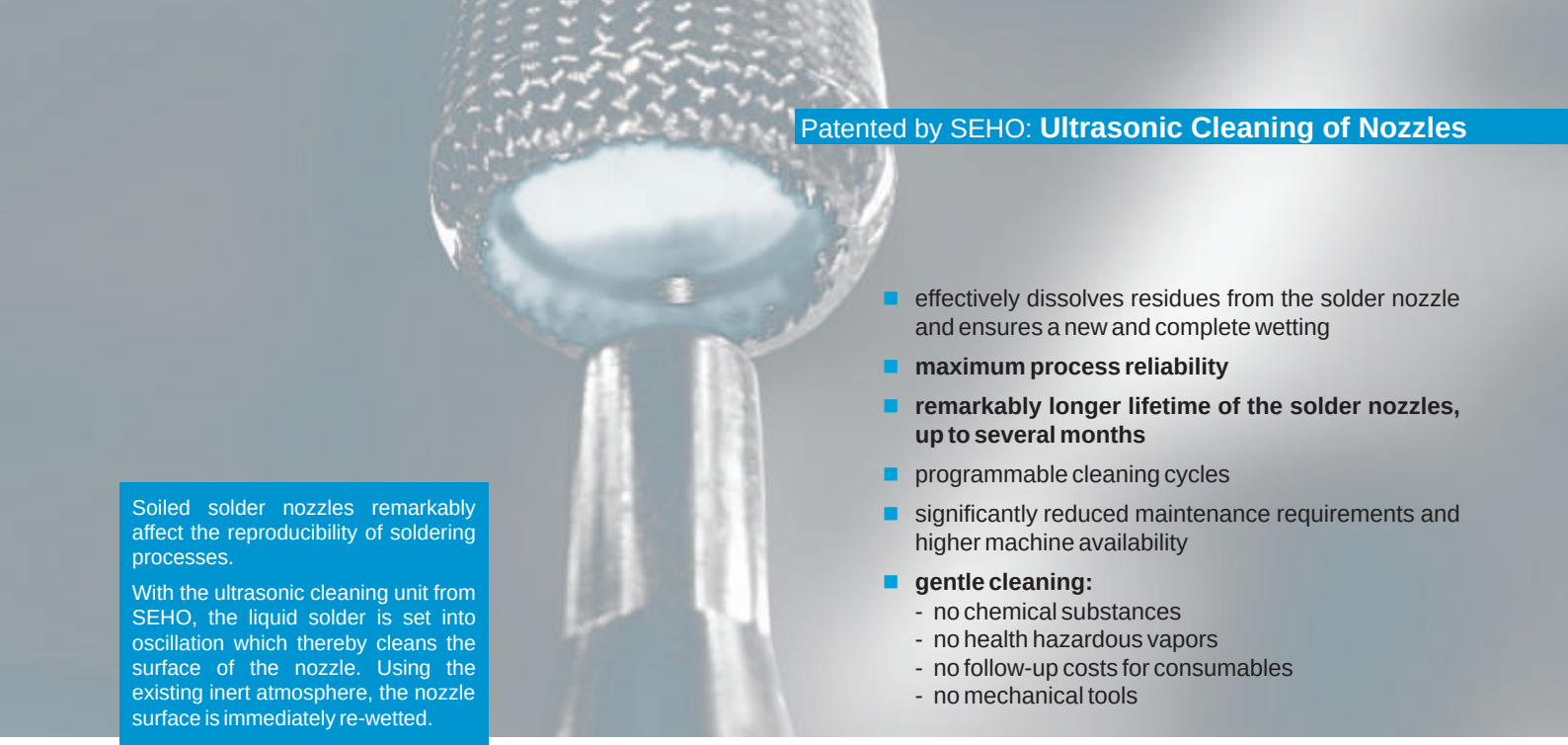
for Soldering Processes and
Automated Production Lines

SEHO SelectLine

Selective Soldering System SEHO SELECTLINE

Soldering is our Passion

Reflow I Selective I Wave I Handling Solutions I AOI I Know How & Training



Patented by SEHO: **Ultrasonic Cleaning of Nozzles**

- effectively dissolves residues from the solder nozzle and ensures a new and complete wetting
- **maximum process reliability**
- **remarkably longer lifetime of the solder nozzles, up to several months**
- programmable cleaning cycles
- significantly reduced maintenance requirements and higher machine availability
- **gentle cleaning:**
  - no chemical substances
  - no health hazardous vapors
  - no follow-up costs for consumables
  - no mechanical tools

Soiled solder nozzles remarkably affect the reproducibility of soldering processes.

With the ultrasonic cleaning unit from SEHO, the liquid solder is set into oscillation which thereby cleans the surface of the nozzle. Using the existing inert atmosphere, the nozzle surface is immediately re-wetted.

The solder nozzle is restored to its original state!

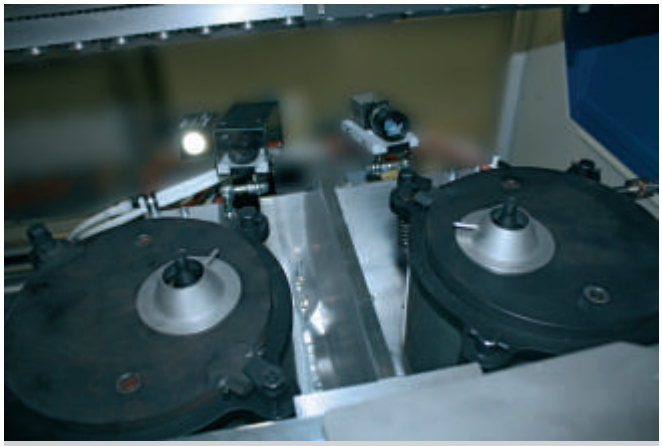
- stand-alone or inline operation
- sequential or parallel processing of PCBs or carriers
- various system modules that can be combined individually
- modular concept: the modules an freely be configurated with fluxer, preheatings, soldering units, cooling, selective brush system and AOI, expandable any time
- **up to 6 soldering units and 11 different workstations in one system**

- convection, quartz and infrared emitters in the preheat area
- Twin-Select:
  dual solder pot system with separate z axes
- **SYNCHRO mode guarantees maximum production volumes**
- automatic ultrasonic cleaning of wetted solder nozzles
- automatic brush station integrable
- AOI integrable in the process
- 100 % process control

Innovative Technology for Your Production

SELECT LINE

- **Highest flexibility: The modular machine concept and numerous configuration possibilities allow adaption to nearly all production requirements.**
- **Outstanding soldering quality: electro-magnetic soldering units for miniwave and multiwave soldering processes.**
- **Highest throughput rates: patented SYNCHRO concept.**
- **Maximum machine availability: patented ultrasonic cleaning for solder nozzles.**
- **100 % process reliability: process control from A like AOI to Z like Z height.**
- **Dynamic precision: exact positioning of the work stations with highly precise axis systems.**
- **Efficient programming: offline teach program.**
- **Fast change-over and maintenance: extremely good accessibility of the soldering area.**
- **Ready for Industry 4.0: machine communication software mcServer.**



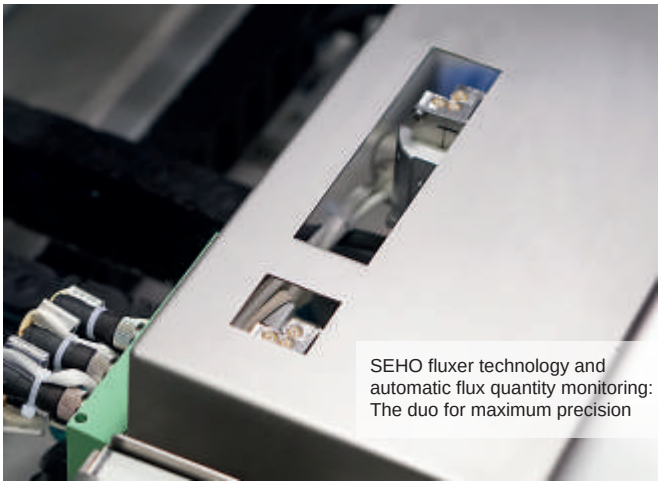
The PLUS of Flexibility and Precision

Time plays a key role in modern electronic production.

With the SelectLine SEHO developed a selective soldering system featuring a revolutionary design and which convinces with highest precision and solder joint quality as well as a high degree of flexibility: no change-over is required to dynamically process a variety of assemblies with short cycle times.

The SelectLine machine concept is consistently modular, thus ensuring clear cost benefits. Several modules with different dimensions can individually be configurated with fluxer, preheatings, soldering units, cooling module, selective brush system and AOI system and, depending on your requirements, they may be combined to a complete manufacturing line. Even if the basic configuration should be designed for stand-alone operation it may be expanded with additional modules at any time to be used inline.

Absolutely unique is the 100 % process control that is provided by all selective soldering systems from SEHO: ranging from flux quantity monitoring, through automatic position correction and z-height correction, to continuous wave height control, automatic nozzle measurement and the unrivaled opportunity to integrate an AOI system directly into the selective soldering process.



SEHO fluxer technology and automatic flux quantity monitoring: The duo for maximum precision

Fluxing Process with Maximum Precision

Selective soldering systems from SEHO are equipped with a micro drop jet fluxer that particularly focusses on two points: maximum precision and minimum flux consumption.

Several nozzle heads that ensure a defined flux application in smallest areas can be installed on the high precision xy axis system. Thus, throughput can be increased remarkably when processing symmetric panels.
As an alternative, two different flux types can be used simultaneously, controlled via the software.
Each of the nozzle heads may carry several drop jet nozzles. This allows to flux multi-row connectors with only one passage.

For selective soldering systems from SEHO, 100 % process control already starts with the flux deposition. Both, the filling level in the flux container and the function of the drop jet nozzles are continuously controlled.

Highest process reliability, however, is offered with the flux quantity monitoring which actually monitors the quantity of flux that is jetted to the printed circuit board in production.

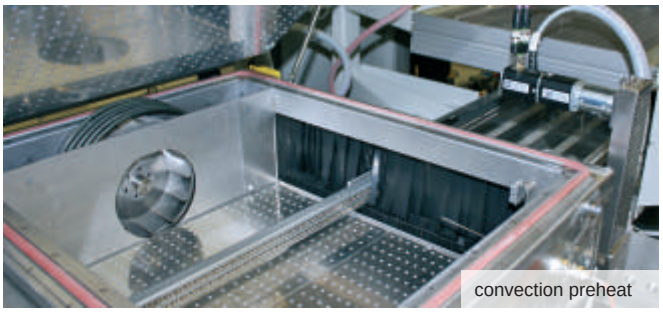
Flexible Preheat Process

A reproducible and effective preheating process is essential to activate the flux and to achieve optimum wetting activity.

The preheat area of the SelectLine can be configured individually in length and type. In particular it scores high because of its energy efficiency.

Quartz heating elements that can be activated individually ensure an effective heat transfer to the PCB bottom side and guarantee very homogeneous heating even in case of different thermal mass. A touchless pyrometer can be installed to allow gradient-controlled heating of the assemblies.

If needed, a top side heating can be installed additionally. Controlled via the software, both preheating systems are perfectly matched to guarantee reproducible temperature profiles.



convection preheat

In case of processing high mass assemblies, the preheat area also may be equipped with a convection heating ensuring a perfect and effective heat transfer with homogeneous temperature distribution within the preheat zone.

To constantly keep assemblies on the same temperature level during long soldering cycles, a top side heating may also be integrated in the soldering area.

Soldering to its Perfection

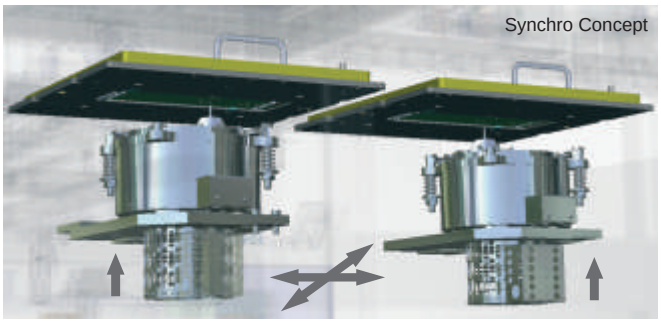
The soldering area - heart of SelectLine - scores highly thanks to its outstanding flexibility and precision.

The electro-magnetic soldering units with innovative solder nozzles for miniwave and multiwave soldering processes ensure an efficient energy transfer and thus guarantee perfect soldering results.

With the dual solder pot concept Twin-Select the process management is pushed to highest flexibility. Each soldering module can be equipped with two electro-magnetic soldering units that are installed on separate z axes and which can be programmed fully independently. This allows to permanently provide two different solder alloys, change-over times are completely eliminated. Alternatively, the Twin-Select concept can reduce cycle times substantially if the soldering units are used with the same alloy, and with solder nozzles having different diameters.

Maximum throughput requirements are met with the Synchro concept - patented by SEHO. Typically, to increase production volume, additional soldering modules need to be added, or the machine has to be equipped with a dual conveyor to allow parallel processing of boards.

These measures, of course, are related to a large investment in equipment. The Synchro concept is an intelligent software feature that coordinates the soldering process for PCBs in such a way that the total throughput is nearly doubled without the need for significant investment. The assemblies can enter the soldering area independently and are not linked to the same cycle. With the Synchro concept, cycle times can be reduced by nearly 50 %.



An automatic ultrasonic cleaning of the solder nozzles definitely represents another highlight in the soldering area. What previously had to be made manually and with aggressive chemicals, now is automatically and environmentally friendly performed through the machine: the solder nozzles get a gentle cleaning and they are completely new wetted.

Besides a remarkably longer lifetime of the solder nozzles up to several months, this unique feature provides an absolute guarantee for your process and significant time saving for you.

100 % Process Control

The ability to reduce production costs while maintaining a consistent high quality is essential for electronic productions. Considering that manual rework soldering processes are not only expensive and time-consuming but also provide poor reproducibility, the target, therefore, is a zero-fault process. A controlled and reliable selective soldering process represents the first and most important step towards a zero-fault production. Selective soldering systems from SEHO support you with this - they provide a comprehensive hardware and software package to control the process sequence 100 %.

Precision starts with the positioning of assemblies. Reproducible soldering results are ensured with the **automatic position correction** using fiducial recognition. This software tool automatically compensates various types of misalignment such as offset or linear shrinkage within the PCB. In addition, loading of the correct soldering program as well as appropriate infeed of PCBs is controlled.

The **automatic z height correction** recognizes warpage of assemblies to be processed, caused by previous thermal or mechanical load and automatically calculates correct z values for all points of the soldering program.

The **flux quantity monitoring system** guarantees flux deposition with utmost precision and exactly dosed, and in the preheat area a touchless **pyrometer control** as well as **monitoring of all heating circuits** ensure reproducible temperature profiles.

Special attention in terms of process control is given to the soldering area. Stable wave heights are ensured using a high precision **measuring needle**. In addition, the **SEHO cross sensor** does not only provide a touchless **wave height control**, it is also used for **automatic tool measurement**: diameter, height and mounting position of the solder nozzle are automatically controlled.
As the **solder level** in the solder pot can affect the stability of the wave it is, of course, controlled as well and solder wire is supplied automatically if needed.

A brush station for **automatic cleaning** of particular board areas can be implemented after the soldering process.

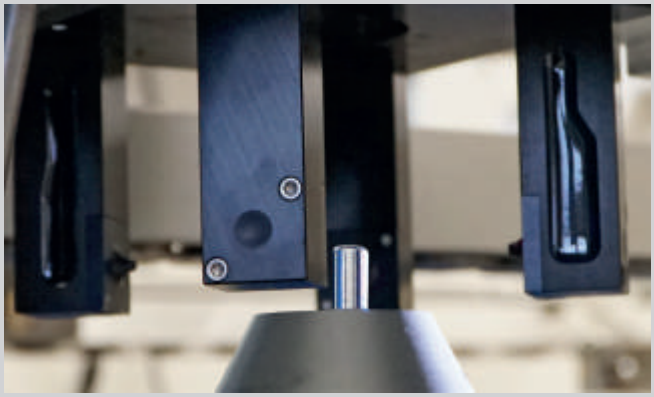
The zero-fault production turns into reality with the integration of an **AOI system**. Here, inspection of the solder joints is made immediately after the soldering process. Assemblies that have been detected with a fault automatically can be removed from the inline production and directly can be passed on to an automatic rework process.
Besides clear cost benefits particularly in terms of floor space requirements and board handling, evaluation of trend and series defect information enables early process optimization to reduce the error rate notably.

Transparent Processes: With SEHO mcServer Ready for Industry 4.0

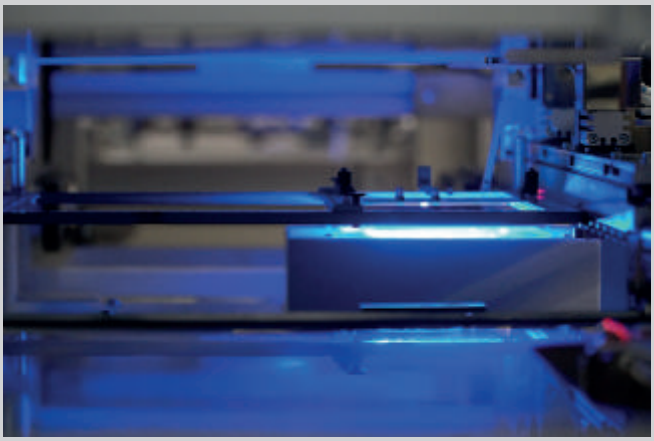
With the machine communication software mcServer selective soldering processes can be traced completely and are ready for the requirements of Industry 4.0.
This software feature allows comprehensive control of the soldering process. Additionally, direct linking to cameras which are integrated in a machine is possible.

The mcServer machine communication software collects, analyzes and archives all information about the machine and production processes using a comfortable user interface. With its specific serial number, the entire process for a single printed circuit board can be traced, for example.

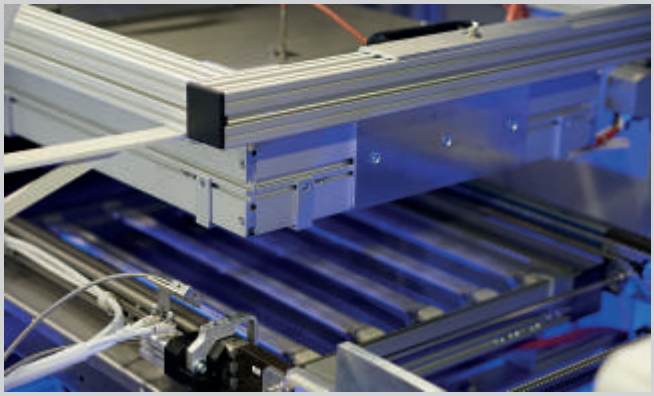
Using appropriate interfaces, every machine can be integrated into nearly each specific MES/ERP system for superordinate control of the process.



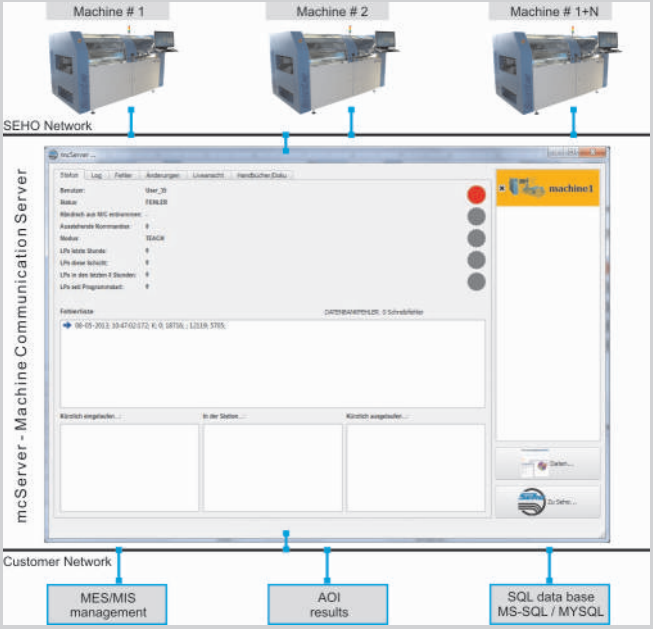
SEHO cross sensor: automatic wave height control and tool measurement



Automated optical inspection



top-side heating and bottom-side heating in the preheat area



SELECTLINE

Technical Data and Options

processing of boards (standard)	sequential, parallel or SYNCHRO
dimensions of boards / carriers	max. 508 x 508 mm [20" x 20"]
modular expandable	yes
Fluxer Area	
separate module	yes and/or integrated
micro drop jet fluxer	●
flux type	alcohol or water based
solids content	up to 5 % (standard), optionally higher
several nozzle heads possible	○
automatic level control	●
spray jet control	○
flux quantity monitoring	○
Preheat Area	
separate module	yes and/or integrated
bottom side quartz heating	○
top side infrared heating	○
convection	○
pyrometer control for quartz heaters	○
heating circuit monitoring	○
Soldering Area	
electro-magnetic soldering unit	yes
miniwave process or multiwave soldering process	yes
Twin-Select (two soldering units)	○
Synchro concept	○
ultrasonic cleaning for wetted solder nozzles	○
solder pot volume	10 kg - 15 kg
solder pot temperature	max. 320°C
nitrogen operation	●
infrared top side heating in the soldering area	○
Automatic Process Control in the Soldering Area	
wave height control and nozzle measurement	○
solder level control and wire supply	○
position correction with fiducial recognition	○
automatic z height correction	○
camera for process visualization	○
automatic brush station	○
automated optical inspection (AOI)	○
automatic rework process	○
mcServer - machine communication	○
Control Unit and Software	
automation PC with SSD hard disk	●
several network interfaces	●
monitor 21.5"	●
online teach camera	○
offline teach program	○
Utility Supplies	
nitrogen supply and connection	to be supplied locally, R 1/4"
nitrogen pressure / quality	min. 4 bar / 5.0 recommended
nitrogen consumption per soldering unit	approx. 1.5 - 2.0 m³/h
exhaust stack / volume (depending on equipment)	1 pce. / 500 m²/h
available voltages	230/400 V - 50 Hz - 3 phase + N + PE 3 x 208 V - 60 Hz - 4 phase
Dimensions	
SelectLine-C Basic Module 1 + 2	l x w = 2525 x 1831 mm [99.4" x 72.1"]
SelectLine-C Basic Module 3	l x w = 1600 x 1831 mm [63.0" x 72.1"]
fluxer module	l x w = 1113 x 1342 mm [43.8" x 52.8"]
preheat module	l x w = 910 x 1342 mm [35.8" x 52.8"]

Further options upon request. ● Standard ○ Option

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