Total Solutions

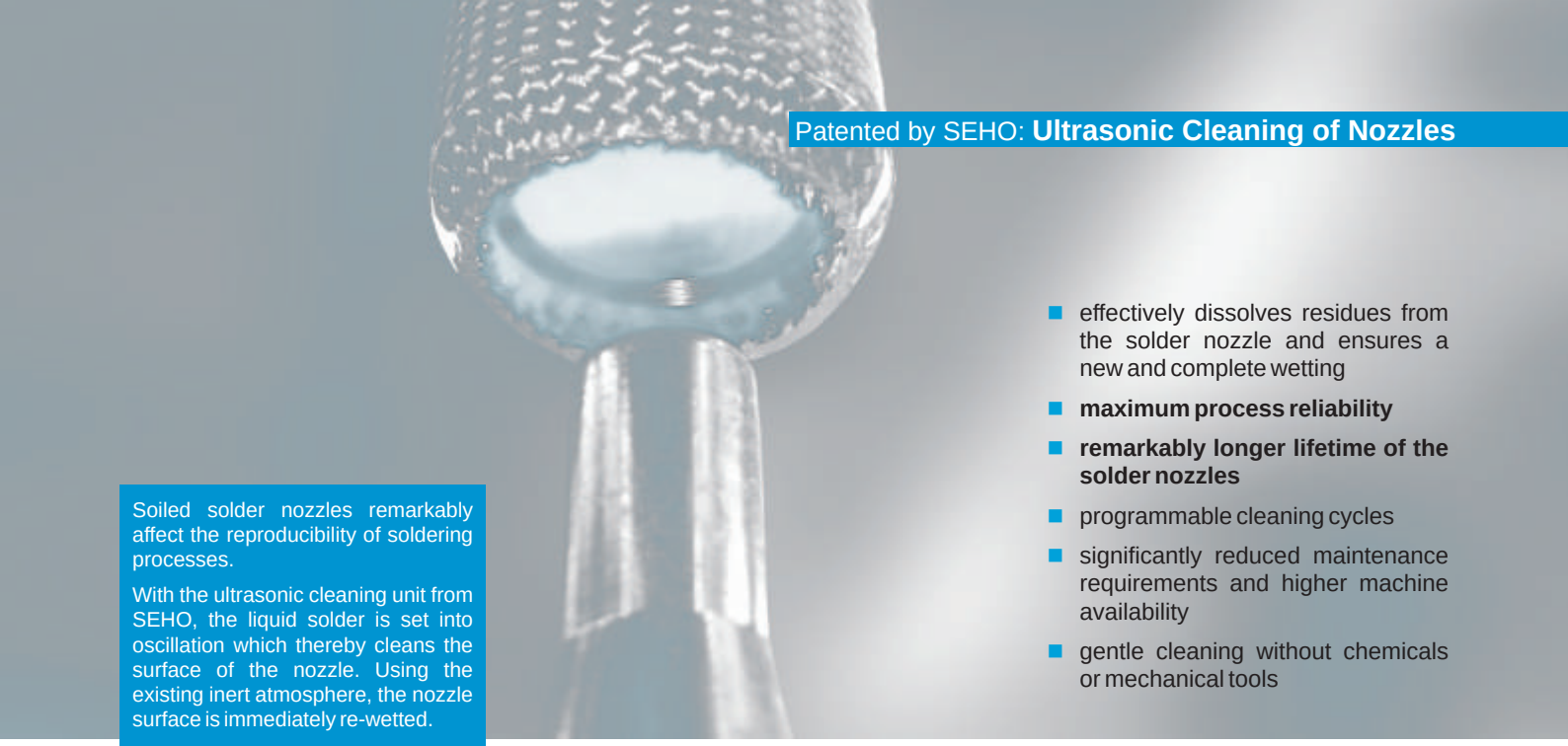
for Soldering Processes and
Automated Production Lines

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**
- programmable cleaning cycles
- significantly reduced maintenance requirements and higher machine availability
- gentle cleaning without chemicals or 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!

- inline operation
- parallel processing of boards
- fluxer and soldering unit(s) in separate modules
- modular concept, individually configurable with fluxer, preheat and soldering modules

SEHO SelectLine

- stand-alone or inline operation
- sequential processing of boards optionally also parallel
- drop jet fluxer and soldering unit(s) installed on one xy axis system, optionally on separate axes

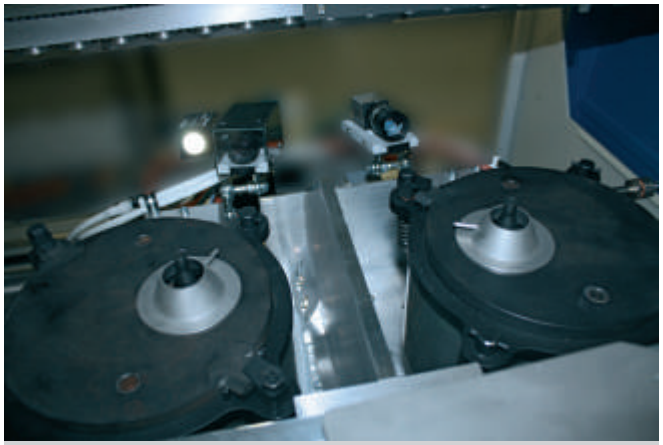
SEHO SelectLine-C

- convection, quartz and infrared emitters in the preheat area
- Twin-Select: dual solder pot system with separate z axes
- Synchro concept guarantees maximum throughput rates
- automatic ultrasonic cleaning of solder nozzles
- brush station integrable
- AOI integrable in the process
- 100 % process control

Innovative Technology for Your Production

SELECTLINE

- **Highest flexibility:**
  Twin-Select soldering unit.
- **Modular expandable any time, also the C-model.**
- **Outstanding soldering quality:**
  electro-magnetic soldering units.
- **Highest throughput rates:**
  patented Sychro 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 with live view control.
- **Fast change-over and maintenance:**
  extremely good accessibility of the soldering area.
- **Ready for Industry 4.0:**
  machine communication software mcServer.



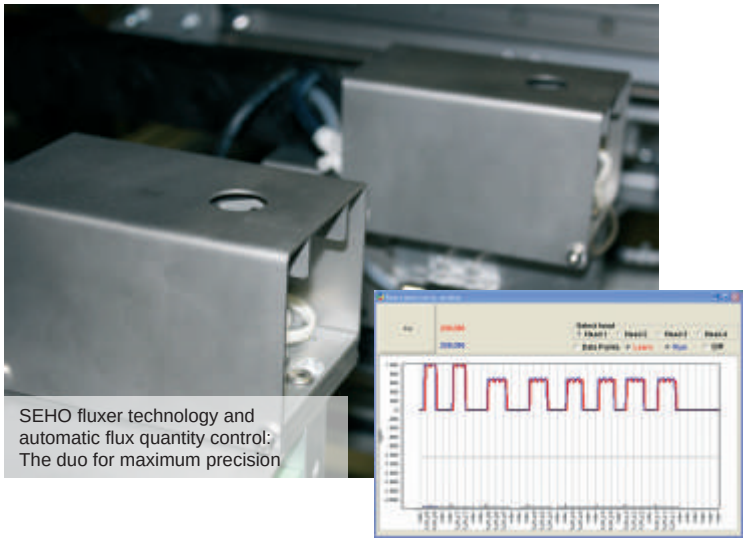
The PLUS of Flexibility and Precision

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. Fluxer module, various preheat modules and several soldering modules, as well as brush station and an AOI system may be equipped individually and, depending on your requirements, they can be configured to a complete manufacturing line. Even SelectLine-C that is designed for stand-alone operation in the basic configuration 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 control, through automatic position correction and z-height correction, to continuous wave height control and the unrivaled opportunity to integrate a system for automated optical inspection directly into the selective soldering process.



SEHO fluxer technology and automatic flux quantity control: 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 three 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 control which actually measures the quantity of each drop that is jetted to the printed circuit board.

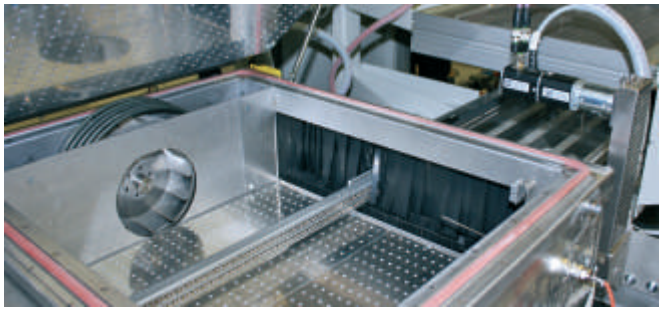
Flexible Preheat Process

A reproducible and effective preheating process is absolutely 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 printed circuit board bottom side and guarantee very homogeneous heating even in case of different thermal mass.

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.



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.
Of course, all heating circuits can be monitored and for precise control of the preheat temperature profile a touchless pyrometer can be installed which allows gradient-controlled heating of the assemblies.

Soldering to its Perfection

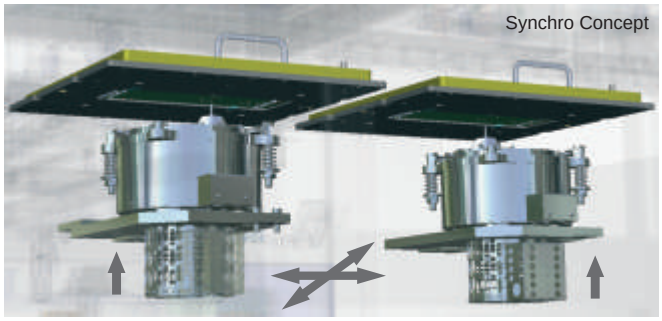
The soldering area - heart of SelectLine - also scores highly thanks to its outstanding flexibility and precision.

The electro-magnetic soldering unit with exceptionally stable and precise wave height as well as innovative solder nozzles 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. The electro-magnetic soldering units - two per soldering module - are installed on separate z axis and 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. Connectors, for example, then can be soldered in one passage using a larger solder nozzle, while fine structures on the same assembly are soldered with a small solder nozzle.

Maximum throughput requirements are met with the Sychro concept - an intelligent software feature - patented by SEHO. Here, the same soldering program is loaded for both soldering units in parallel, working in an infinite loop. The assemblies can enter the system independently.

While one PCB is processed on the first soldering unit, a second PCB can enter the system at any time and will be positioned on top of the second soldering unit. The soldering process for the second assembly starts at the point which the first assembly has currently reached. As soon as the first assembly is finished it will be transported out of the machine and the second assembly will be moved forward to the first soldering unit in order to clear space for following PCBs. The soldering program automatically continues the process at the next soldering position. By means of this intelligent linking into the running program, cycle times can be reduced by nearly 50 %, without the need for investment in additional modules or a dual conveyor system.


Synchro Concept

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 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 repair 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 control 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. 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.

Cameras for visual process control provide additional safety and even can be integrated into the offline teach program for fast parameter optimization.

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

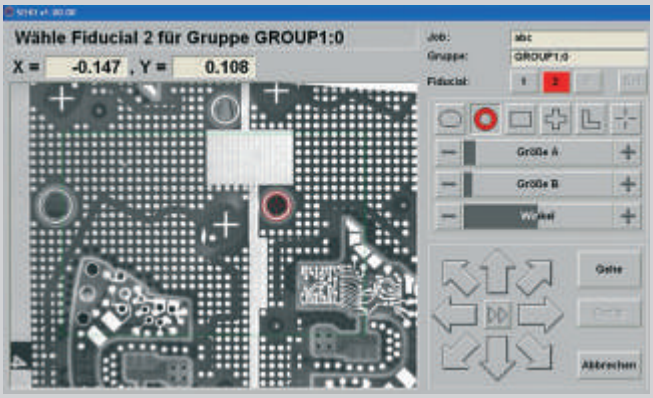
The zero-fault production turns into reality with the integration of an AOI system. Here, inspection of the solder joints is made immediately after the soldering process. Assemblies that have been detected with a fault automatically can be removed from the inline production and directly can be passed 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 with real-time access to all connected machines that are installed in different production sites worldwide. Additionally, direct linking to cameras which are integrated in a machine is possible.

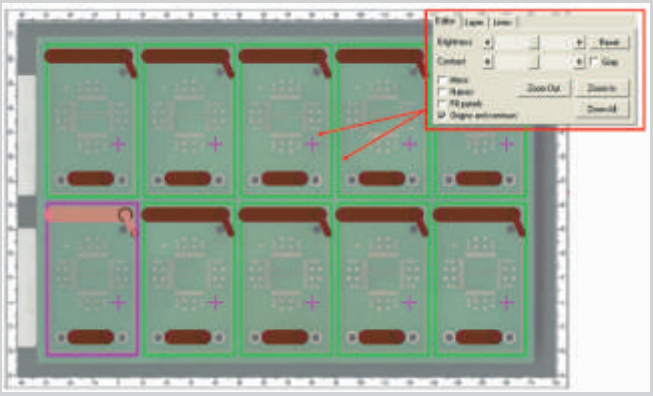
The mcServer machine communication software collects, analyzes and archives all information about the machine and production processes using a comfortable user interface. With its specific serial number, the entire process for a single printed circuit board can be traced, for example. Production statistics, user statistics or AOI statistics can be as easy generated as comprehensive reports for documentation.

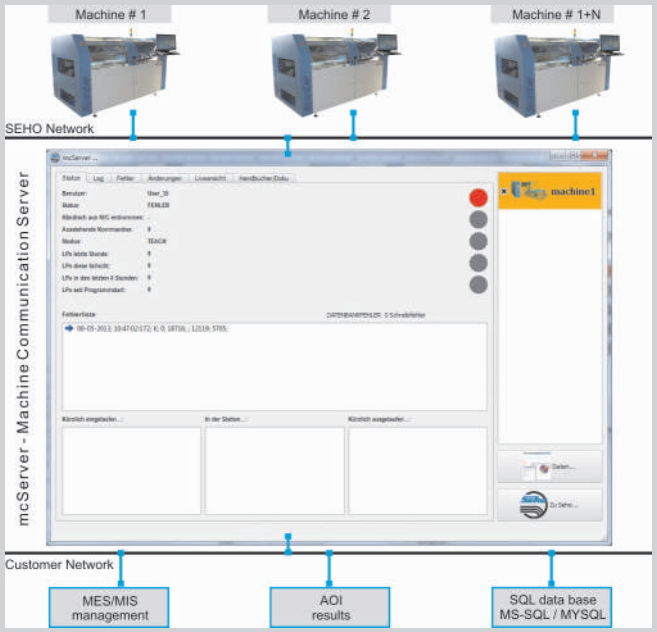
Using appropriate interfaces, every machine can be integrated into nearly each specific MES/ERP system for superordinate control of the process.



Automatic position correction in the soldering program using fiducial recognition


Automated optical inspection


Offline Teach Program



SELECTLINE

Technical Data and Options	SelectLine-C	SelectLine
processing of boards (standard)	sequential (parallel opt.)	parallel
dimensions of boards/carriers, max.	500 x 500 mm [20"x20"]	500 x 500 mm [20"x20"]
modular expandable	yes	yes
Fluxer Area		
separate module	optionally	yes
micro drop jet fluxer	●	●
flux type	alcohol or water based	
solids content	up to 5 % (standard), optionally higher	
exhaust hood in the fluxer area	●	●
automatic level control	●	●
spray jet control	●	●
flux quantity control	●	●
Preheat Area		
separate module	optionally	yes and/or integrated
bottom side quartz heating	●	●
top side infrared heating	●	●
convection	●	●
pyrometer control	●	●
heating circuit control	●	●
Soldering Area		
electro-magnetic soldering unit	yes	yes
Twin-Select (two soldering units)	●	●
Synchro concept	●	●
ultrasonic cleaning for solder nozzles	●	●
solder pot volume	approx. 10 kg	approx. 10 kg
solder pot temperature	max. 320°C	max. 320°C
nitrogen operation	●	●
infrared heating on top of soldering area	●	●
Automatic Process Control in the Soldering Area		
wave height control	●	●
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		
PLC with integrated CNC control	●	●
industry PC with SSD hard disk	●	●
touch display 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	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	l x w = 2525 x 1852 mm [99.4" x 72.9"]	
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"]	
SelectLine (combi module)	l x w = 2322 x 1852 mm [91.4" x 72.9"]	

Further options upon request. ● Standard ● Option

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