

Laser soldering system

LS-LV



- *laser with 40 W / 60 W / 80 W*
- *wave length 980 nm*
- *working distance 76 mm*
- *pilot laser*
- *optionally with solder feeder Mosquito A25*
- *option: integrated ccd camera*

Automated laser soldering

A multitude of applications require joints to be soldered individually: Cables, plugs, special construction components and modules with only a few solder joints.

A further application is the use of special elements, e.g. plugs and pin-through-hole on SMT boards. Often single point soldering is required because of assembly, e.g. if a completely equipped PCB is inserted into a housing

and has to be connected with plugs or other components by soldering.

Automation of these single point soldering processes does not only allow a cost-efficient mass production, it is also demanded to obtain a constant high quality. Modern electronics manufacturing cannot do without automated single point soldering.

Laser soldering allows an accurate focusing and thus the soldering of

smallest solder joints. The special advantages of this procedure are:

- contactless heat transfer
- accurate focusing
- high power density
- high quality soldering joints with high process reliability

Technical Data

Laser		Solder Wire Feeder	
Emitter	diode laser InGaAs	Diameter of solder wire:	0,5-1,4 mm
Optical power	40 / 60 / 80 W cw	Feed	0-24 mm/s
Focus	0,8 – 1,2 mm	Power motor	1,7 W
Focal distance	76 mm	Ration of planetary gear:	1:166
Wave length	980 nm	Stroke pneumatic axis	30 mm
Pilot laser	<1mW / 670 nm	Angle Laser-Feeder	-30° to + 30°
Interfaces:	24V IO / RS-232 / analogue		

Technical description

The source of the laser is a laser diode in the laser tool, where the laser beam is generated and modulated. With the optical system the laser beam is focused accurately on the solder joint. The required temperature at the solder joint is generated by absorption. The application of energy can be controlled precisely. This procedure is suitable both for reflow soldering with soldering paste and soldering with solder wire.

For selective reflow soldering the soldering paste is dispensed first. The solder process occurs in two steps. During the first step the soldering paste is warmed up slowly and the solder joint is preheated. In the second step the soldering paste is melted. A meniscus forms at the solder joint and the contact is completely covered with solder.

For soldering with solder wire the laser is switched on with adjusted power. After the pre-heating time the solder wire is fed for the solder feeding time at a defined speed. Subsequently, the post-heating time begins, so that the solder can flow evenly.

In addition to the heat energy, the solder wire feeding is very important for an accurate soldering process. The solder feed rate is continuously monitored with a miniature rotary encoder. The micro-processor of the control unit evaluates the signals and compensates any disturbance. At the end of the forward solder feeding the rotating direction of the motor is reversed and the solder wire is moved backward for a defined short distance.

This allows an accurately constant melting of the solder wire and thus perfectly identical appearing solder joints.

The laser control unit includes the power supply for the laser tool and makes the communication with the laser tool and the cooling unit possible. The system is generally controlled and monitored by the serial RS-232 interface and the digital IOs. The front panel features additional control elements.



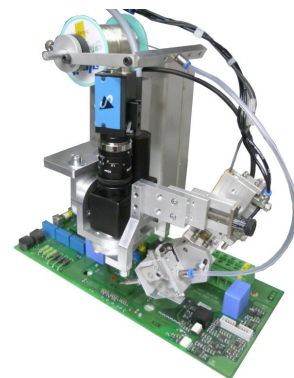
Compact system



controller



laser with wire feeder



laser with wire feeder
and integrated camera