Automatisierungstechnik
Niemeier GmbH

Automatic soldering for the J-Box of solar panels

- *high process reliability achieved by induction soldering (patented)*
- *flexible, for different connection geometry*
- *with active and passive transfer*
- *design can be adapted to customer-specific J-Box*

System description

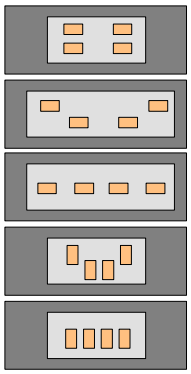
One of the manufacturing processes for solar modules that greatly affect the quality of the product is soldering of the junction box (J-Box). This is conventionally done manually, but with specially designed J-boxes mounting and soldering can be done automatically.

A suitable, fast and safe process is induction soldering. Soldering the connection tabs of the J-box is achieved with a ceramic hold-down that incorporates the induction coil. Mating parts are pressed against each other and heated inductively until the solder joint has been created.

Depending in the type of solar module there are different connection geometry (footprints).

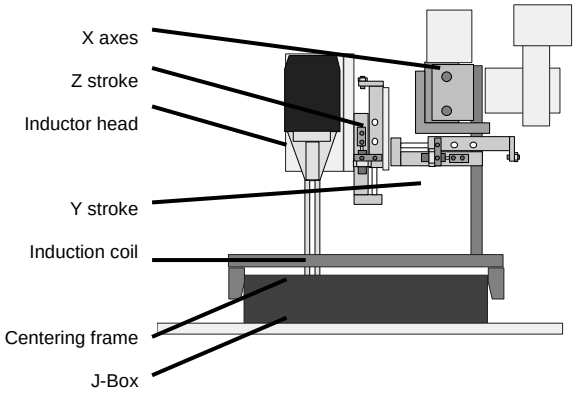
For processing, the module is loaded into the system and aligned. The operator then positions the soldering head above the J-Box with the system's controls. When the soldering head is being lowered it automatically is centered and aligned onto the J-Box.

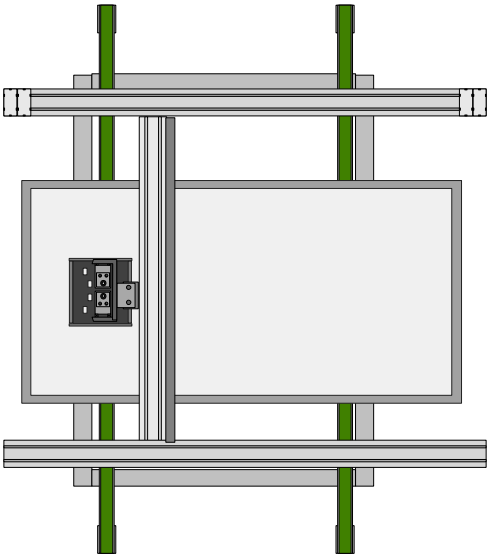
Two vacuum grippers secure the robotic tool head to the solar module, then the four solder joints are automatically created consecutively by positioning the soldering head along the tool's three robotic axes (XYZ).



Footprints of different J-Boxes

Soldering system





Technical data

Soldering heads per system	1 or 2
Power HF generator	3,5 kW
Water cooling (closed loop)	C15S 1 head C25S 2 heads
Module dimensions	max. 1.000x1.800 mm
System dimensions (WLH)	2.400x2.400x1.800 mm
Controller	Mini-PLC
Power supply	240V, 50/60Hz

HF generator

Controller

Water cooling system

Options:

Flux dispensing system

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