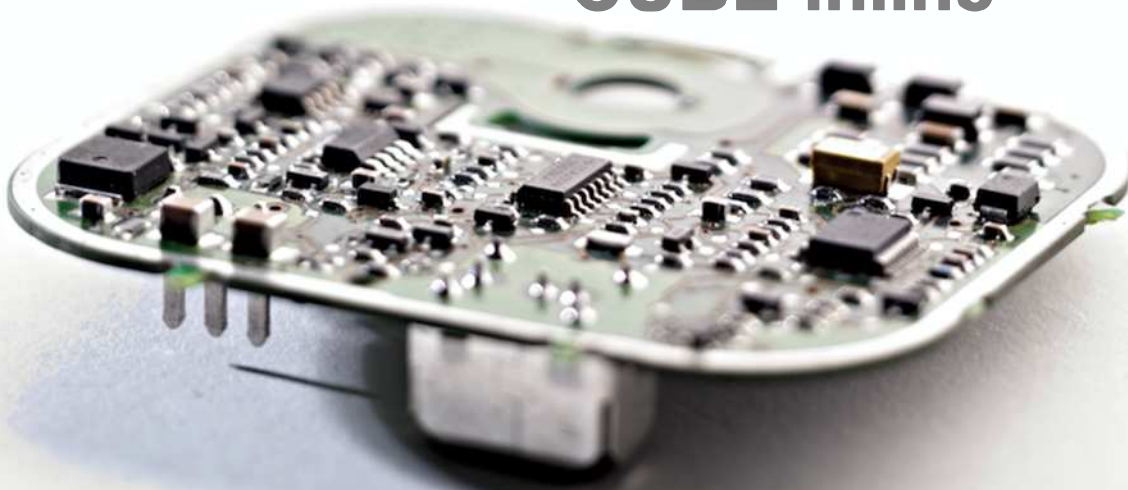


Selective Soldering System

CUBE Inline⁺



CUBE Inline⁺

Based on the market requirements and to realize also shorter delivery times, INERTEC developed the new CUBE Inline

- Modular build up and structure
- Easy to be expanded on customer site
- Fluxing with one or multiple drop jet heads on a fast XY axis
- Preheating via convection or quick reacting quartz heaters
- Soldering with mini wave – ActiveFlow or the combination of both technologies
- Perfect accessibility to all components
- High teach components – servo motors with CAN open bus
- Newest control BECKHOFF TwinCat III
- PCB sizes up to 510 x 460 mm

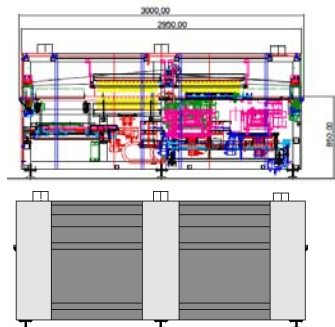
CUBE Inline+ – Modular Structure



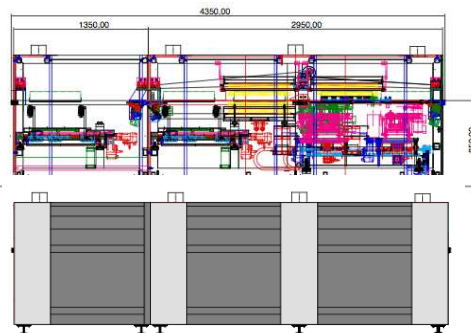
The INERTEC modular construction allows the customer to combine the machine with all available modules:

- Single or Dual flux modul
- One preheat zone – expandable up to 3 preheat zones
- Quick reacting quartz – convection heater or the combination of those
- Several top side heaters
- Solder area
 - Mini wave
 - ActiveFlow

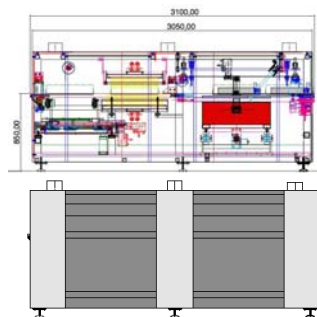
CUBE Inline+ – Modular Structure



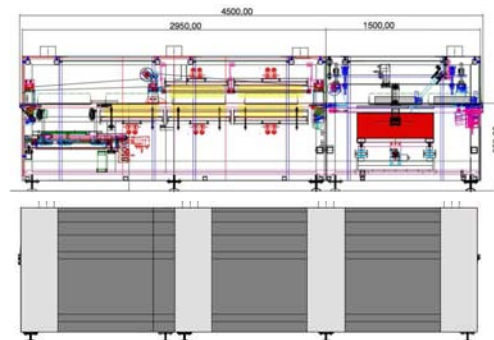
Basic version fluxing – preheating – soldering



Expanded with a fluxer module



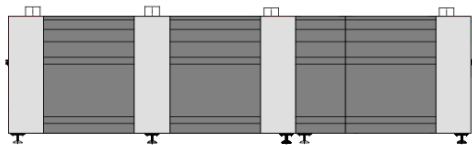
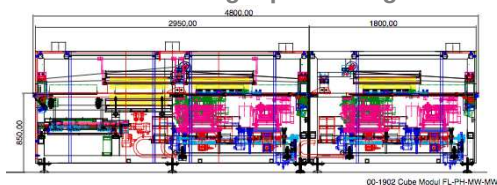
Basic version fluxing – preheating – ActiveFlow



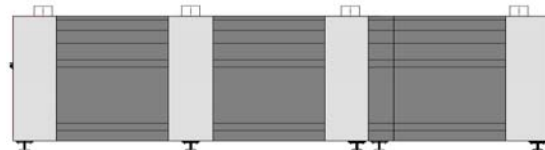
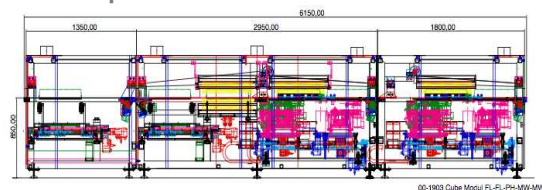
System with 3 preheat stations

CUBE Inline+ – Modular Structure

Basic version fluxing – preheating – soldering – soldering



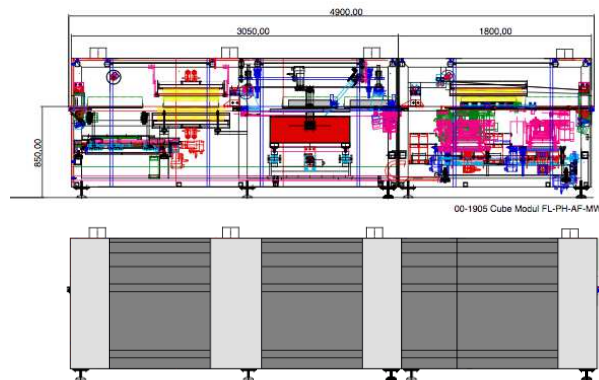
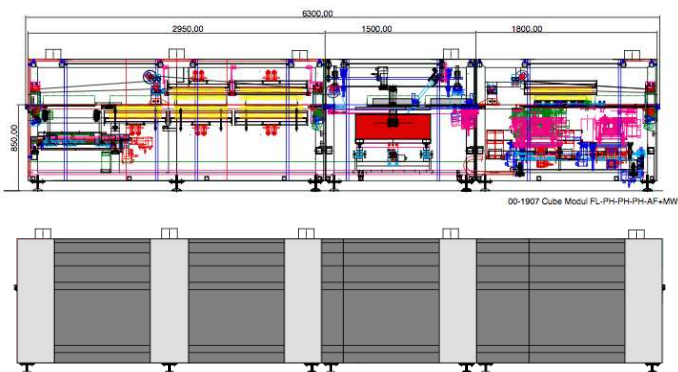
Expanded with a fluxer module



Basic System with two soldering modules



CUBE Inline+ – Modular Structure



Combination Mini Wave
and ActiveFlow



CUBE Inline⁺ – Basic Data

- Inline System
- Robust pin chain conveyor
- Quartz preheater
- PCB sizes up to 510 x 460 mm – Option is the 24" machine
- Soldering unit including one mini wave soldering module
- Machine sizes: 3100 x 1535 x 1250 mm
- XY Fluxer inclusive pressure tank and Micro Drop Fluxer

CUBE Inline+ – Basic Data

The build up of the machine allows a perfect overview...

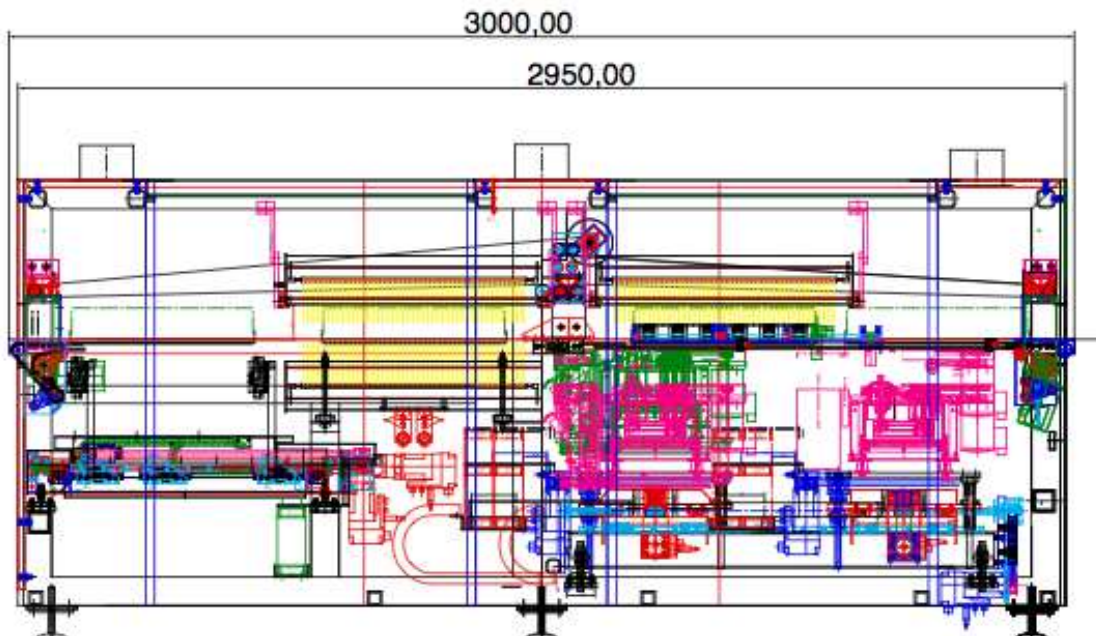


CUBE Inline+ – Basic Data

...and a perfect access within a few minutes to the fluxing, preheating and soldering area



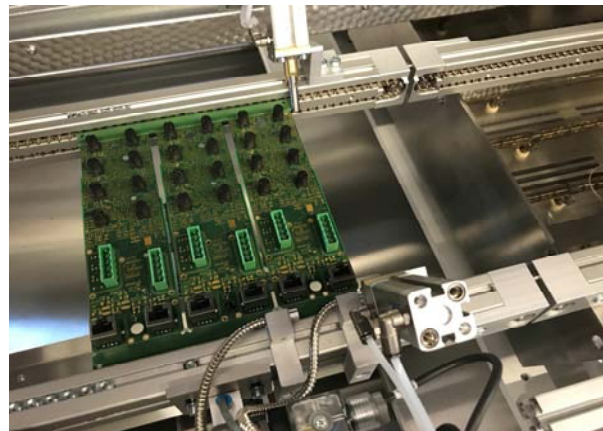
CUBE Inline+ – Basic Data



The base machine shows a compact build up and includes the modules:
Fluxing - Preheating - Soldering.

Now we want to introduce the individual modules.

CUBE Inline⁺ – Conveyor



The CUBE Inline is built up with a split conveyor as well as a SMEMA interface

- The conveyor is segmented to work through the three process steps simultaneously
- Stainless steel chain with 3 or 5 mm
- Each station is perfect clocked out by the software
- Conveyor width adjustment via hand wheel and scale
- Automatically width adjustment – optional available
- A dual conveyor for components of 50 – 200 mm can be used
- The PCB is clamped during the soldering process to get a perfect adjustment

CUBE Inline⁺ – Conveyor



The conveyor is built up very robust and it's also very easy to maintain. INERTEC also can offer optional a width adjustment via a servomotor. With this option the width adjustment can be done via the software automatically.

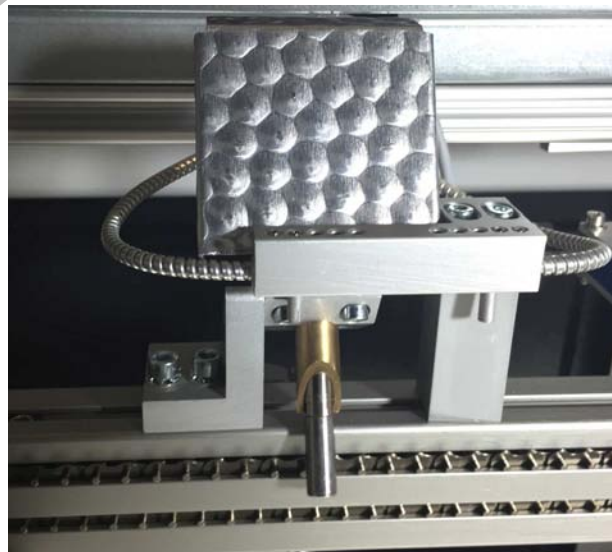


CUBE Inline+ – Conveyor



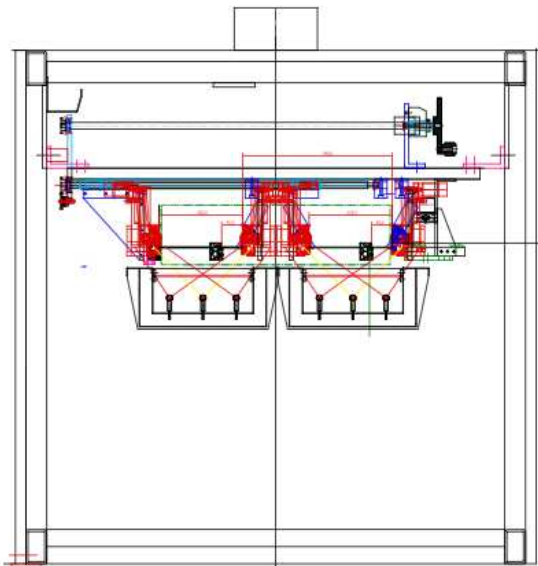
The pre sensor reduces the speed of the motor therefore the component will be stopped smoothly.

The efficient motor push the chain and is controlled via a frequency inverter.



CUBE Inline⁺ – Dual Conveyor

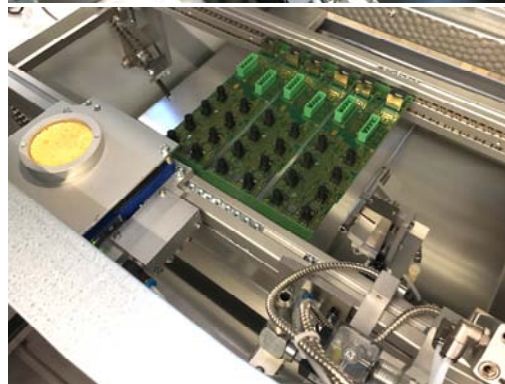
To reach a higher flow of the machine a dual conveyor can be installed. This allows the parallel handling of two components with 50 - 200 mm width.



CUBE Inline+ – Fluxer

The fluxer is equipped with a Micro Dot Fluxer unit and is supplied via a pressure-tight flux tank.

The content of the flux tank will be monitored. If the level is low a signal will be caused.



CUBE Inline+ – Fluxer

One special feature is the optional cleaning unit. By using a special cleaning fluid the contamination will be dissolved and automatically cleaned.



CUBE Inline+ – Fluxer

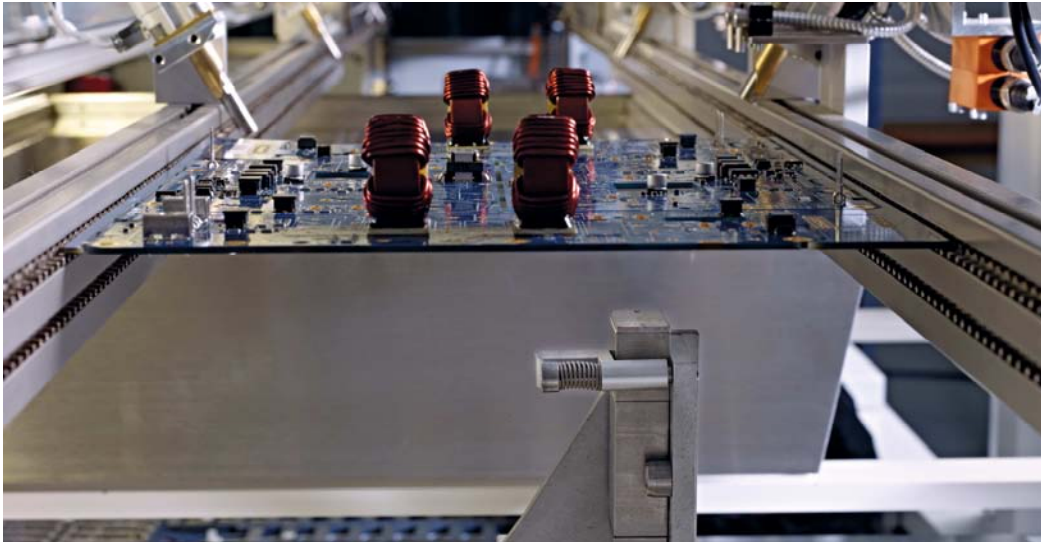
To process fluxes up to a solid content of 5 % the Drop Jet Fluxer are perfect suitable.

To process fluxes with a higher solid content an ultrasonic fluxer can be installed optionally.



CUBE Inline+ – Fluxer

The motors of the Fluxer axis above the servo motors are positioning the Drop Jet very quick and precise with $\pm 0,1$ mm underneath the PCB.

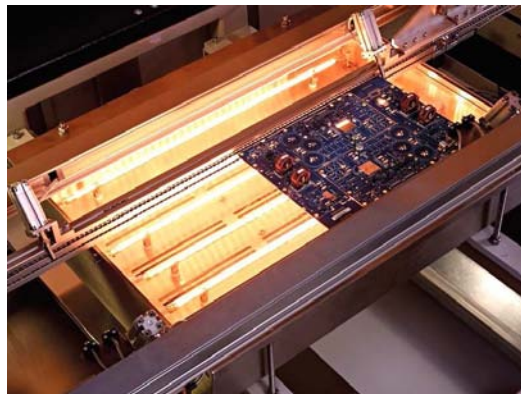


CUBE Inline+ – Preheater

The base machine is equipped with a quick reacting quartz heater. Optionally INERTEC offers also a top heater – also convection – on the standard bottom heater as well as on the soldering area.



CUBE Inline+ – Preheater

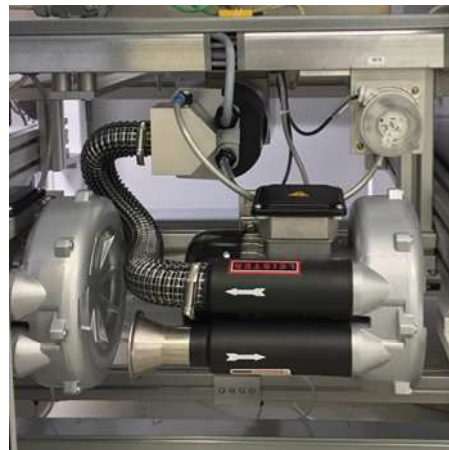


The preheater can be defined
– based on the customer
requirement – variable.

CUBE Inline+ – Preheater



The preheater also can be designed as a convection heater and by using the contour plate, only dedicated areas of the PCB is heated.



CUBE Inline+ – Preheater



Optionally the heater can be controlled closed loop via a pyrometer.

CUBE Inline+ – Solder Module

The soldering unit is placed on the X and Y traverse which also lifts the soldering aggregate in the z-axis.

Also here are the INERTEC Servo motors and very robust axis as well as spindles installed.

The base machine is equipped with a single pot; the solder volume is around 25 Kg



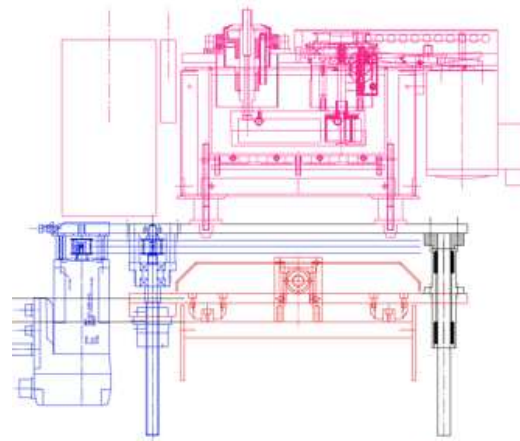
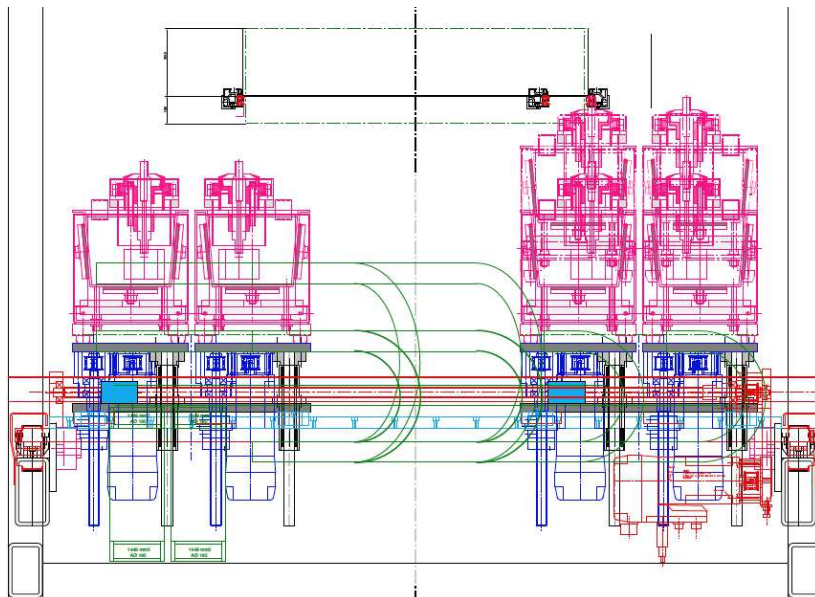
CUBE Inline+ – Solder Module



The option to have two soldering aggregates in the machine offers the possibility to work with two different solders or with different nozzle sizes.

CUBE Inline+ – Solder Module

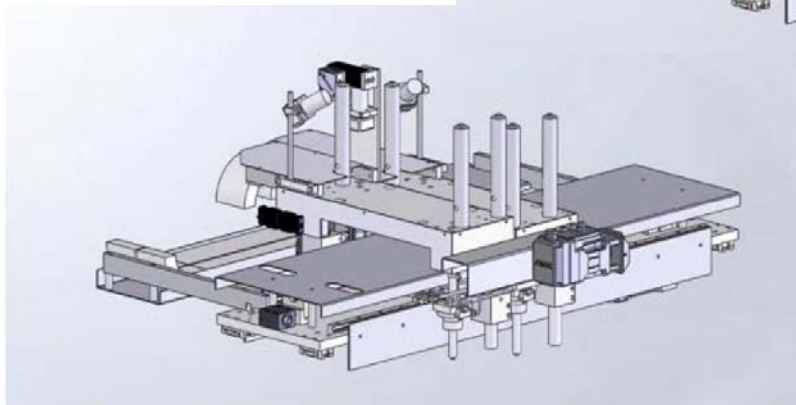
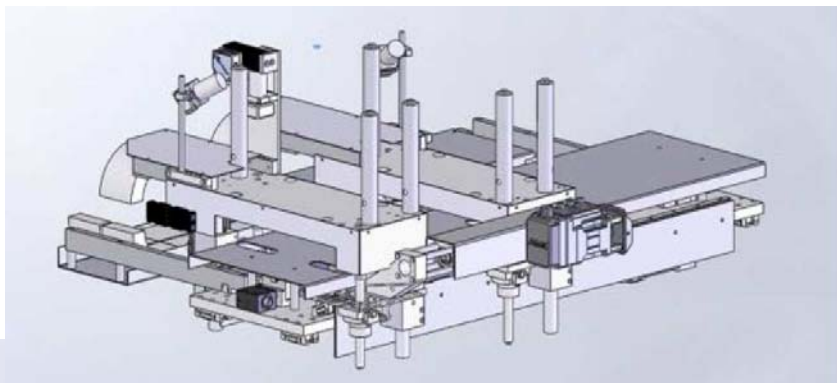
The soldering area is free programmable and both aggregates can reach the full size of the soldering area.



CUBE Inline+ – Solder Module

Optionally the mini wave modules can be adjusted in the width.

The distance is from 145 to 340 mm free adjustable.



CUBE Inline+ – Solder Module



With the help of a trolley it's easy to exchange the solder pot and use different alloys.



CUBE Inline+ – Solder Module



Always before the first board will be soldered – at the beginning as well as in programmed cycles – the wave height will be measured as well as corrected via a titan needle.

CUBE Inline+ – Solder Module



Each solder unit has an individual solder wire feeder.

This way individual alloy will be controlled and the level corrected.

The level sensor in the solder pot measures the filling level and transfers it to the controlling unit.

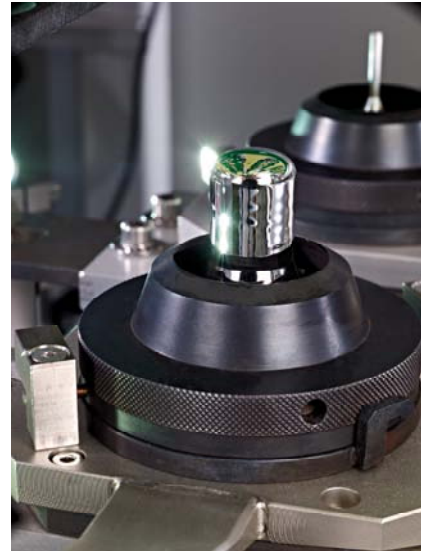
Solder wire feeder:
Full wire, max. 5 kg

CUBE Inline+ – Solder Module

To ensure a perfect soldering quality, the PCB is clamped during the whole soldering process at both sides of the conveyor.



CUBE Inline+ – Solder Module



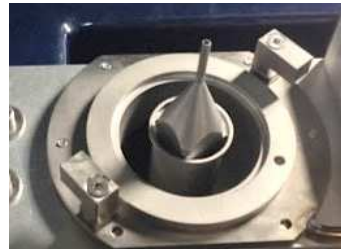
- INERTEC was the first manufacturer on the market who made it possible to work with two different solder nozzles.
- Other soldering systems offers also two solder nozzles but they don't work autonomously – means the don't work with different nozzle diameters

CUBE Inline+ – Perfect Soldering Quality



Therefore the possibility to combine the solder nozzles offers a very flexible soldering process, high flow, small footprint and highest soldering quality at a minor maintenance effort.

CUBE Inline+ – Perfect Soldering Quality



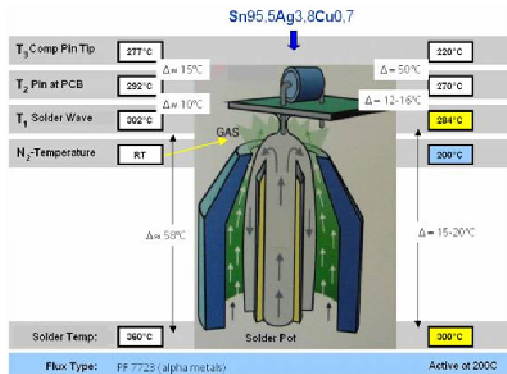
Tin coated (activated) solder nozzle

- Working in 0°
- Trouble-free achievement of tight soldering point (less than 1mm)
- They don't have a preferred direction and are working in X and Y, also an interpolation is possible
- Standard sizes of 4 mm to 20mm



CUBE Inline+ – Perfect Soldering Quality

- The active hot gas technology is the perfect solution for the lead free soldering to prevent delamination and leaching on the PCB
- Therefore the nitrogen is heated up via an 600 watt ceramic heater and actively guided to the soldering area.



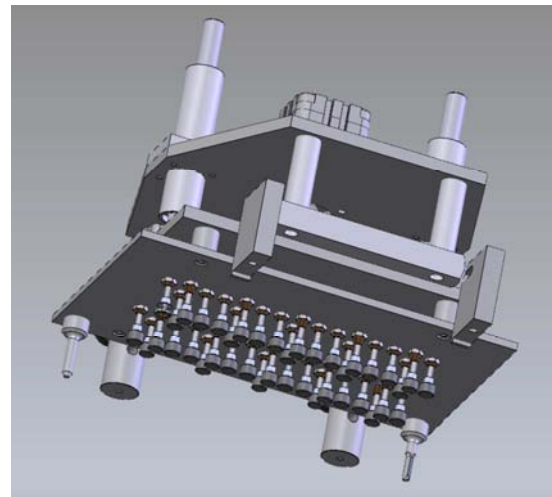
CUBE Inline+ – Perfect Soldering Quality



Active Nozzle Heating

CUBE Inline+ – Solder Module

If the product requires a special fixation – either from the top or the bottom side – INERTEC can install a downholder unit.



CUBE Inline+ – Perfect Soldering Quality

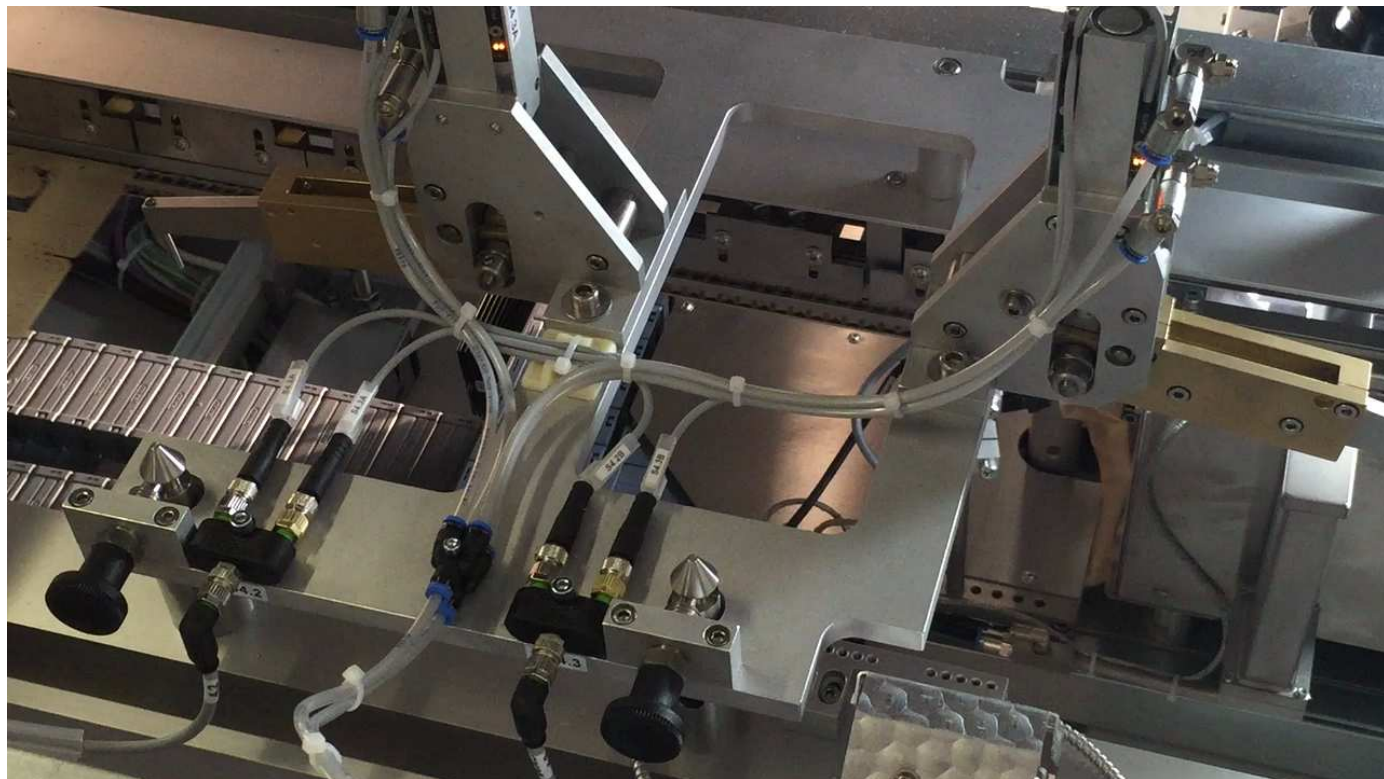


Especially with bare boards, the PCB is always warped.

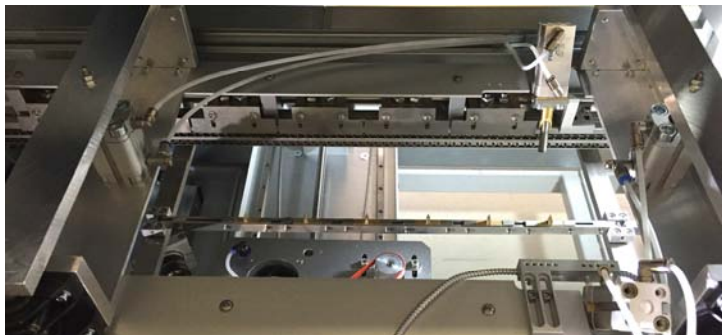
INERTEC developed an automatic unit, which lifts the PCB before the soldering and allows a flat bottom side.



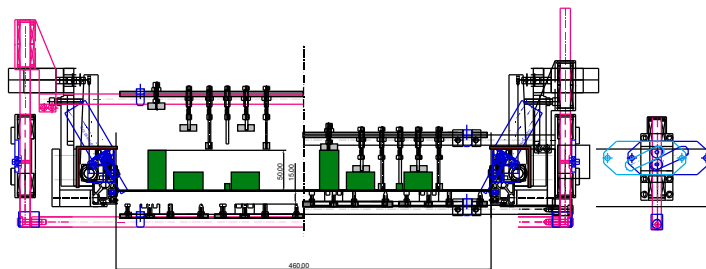
CUBE Inline+ – Perfect Soldering Quality



CUBE Inline+ – Perfect Soldering Quality

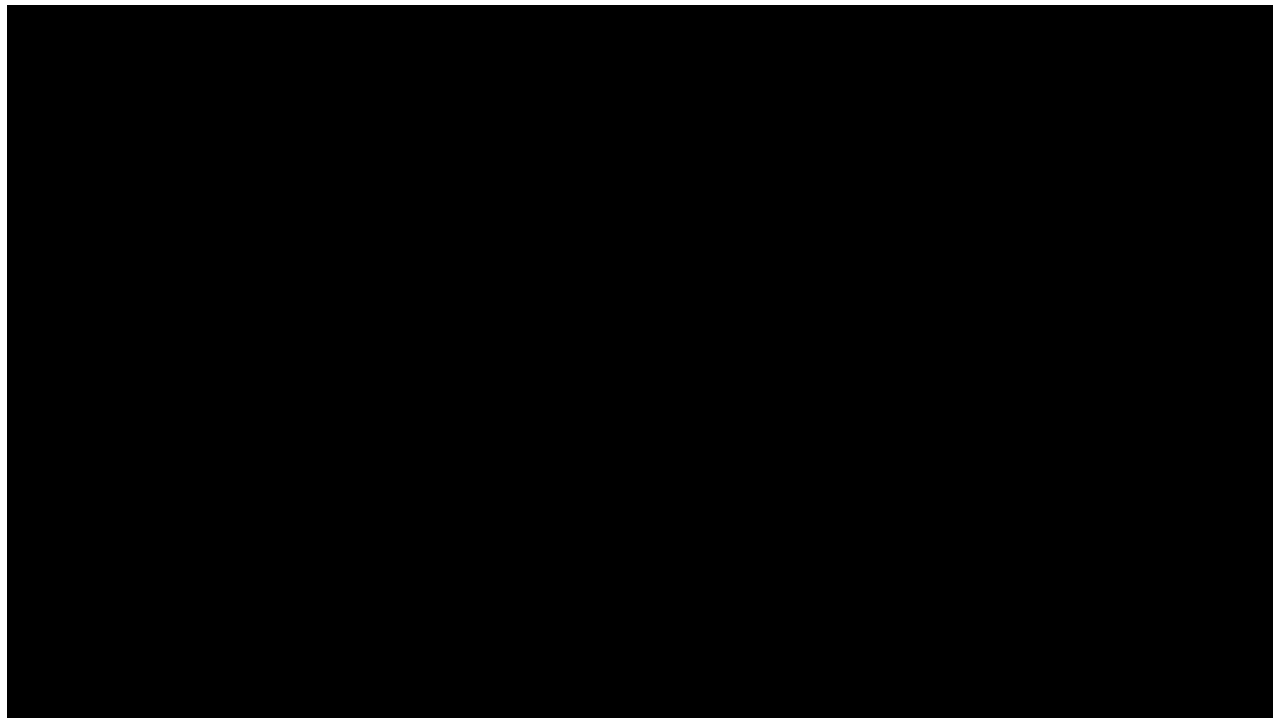


The alternative to pull up the PCB is to lift the PCB also from the bottom side.



CUBE Inline+ – Perfect Soldering Quality

The automatic nozzle cleaning is programmed to clean the nozzle and also to activate it again.



CUBE Inline+ – Perfect Soldering Quality

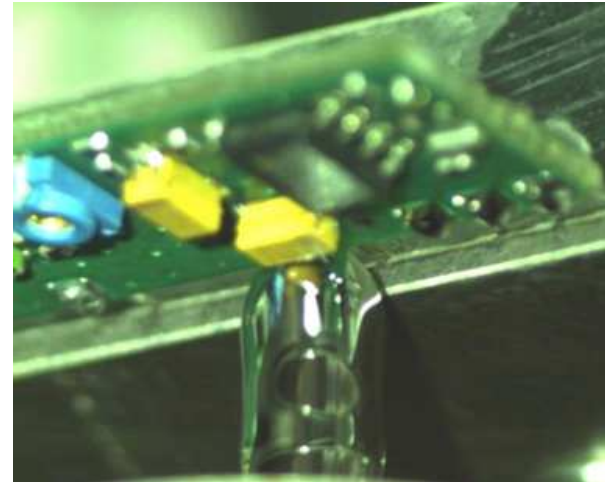
The optional fiducial sensor is correcting the positioning during the solder process.



The optional warpage sensor measures the warping of the PCB after the preheat and corrects the z height automatically.

CUBE Inline+ – Perfect Soldering Quality

The process camera gives a perfect view to the soldering process and is a perfect tool for the process optimization.



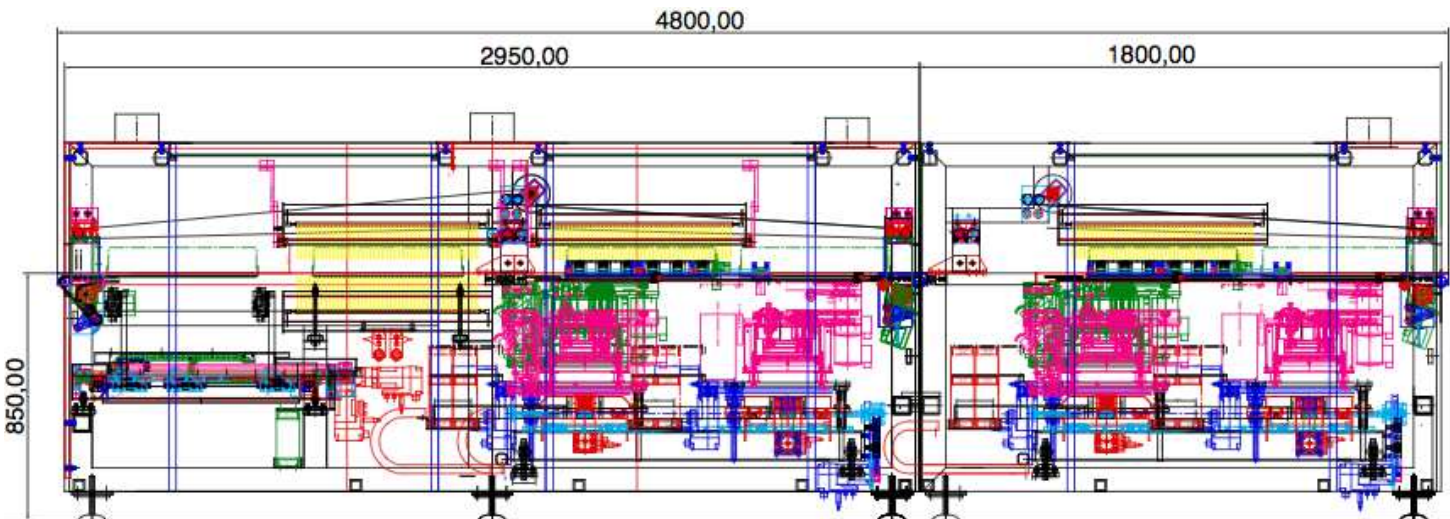
CUBE Inline+ – Soldering

The easy and intelligent nozzle change concept of INERTEC allows the exchange within a few minutes.

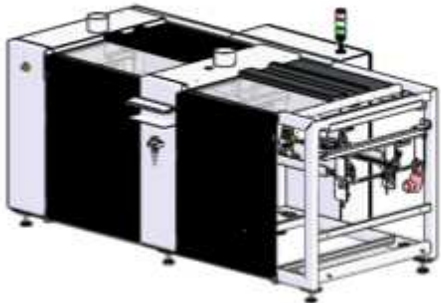


CUBE Inline+ – Dual Soldering

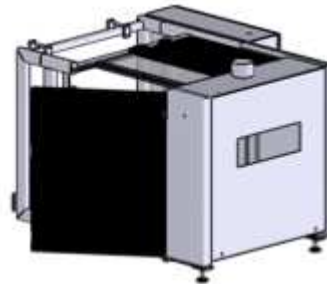
With the request of shorter cycle times, INERTEC can expand the machine with an additional mini wave soldering module.



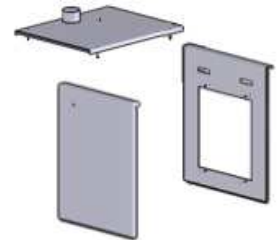
CUBE Inline+ – Modular Structure



Basic System



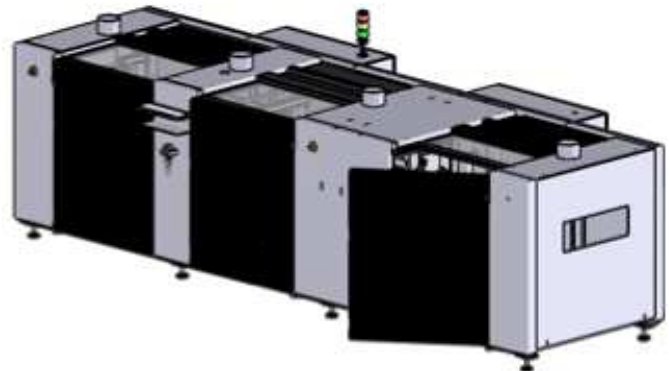
Additional Module



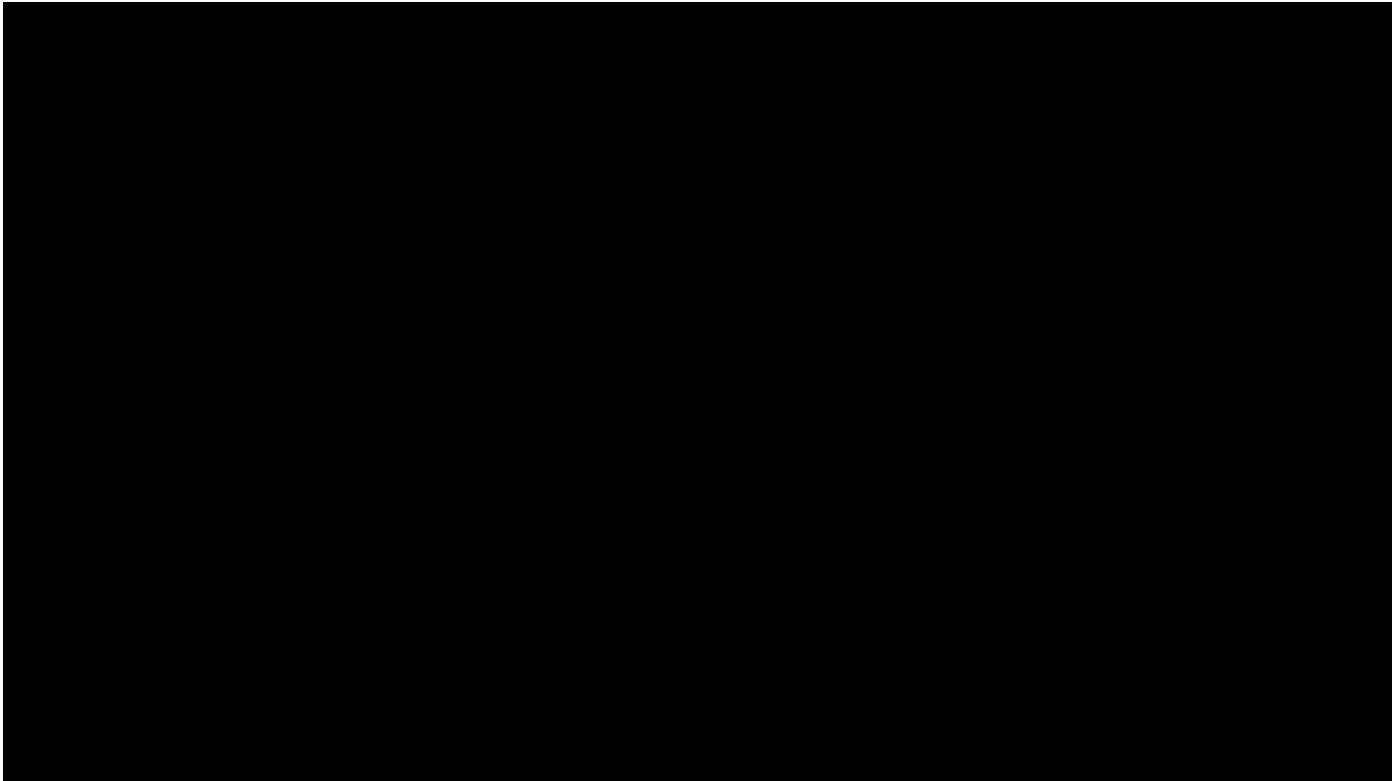
Housing



INERTEC Technician



CUBE Inline+ – Modular Structure



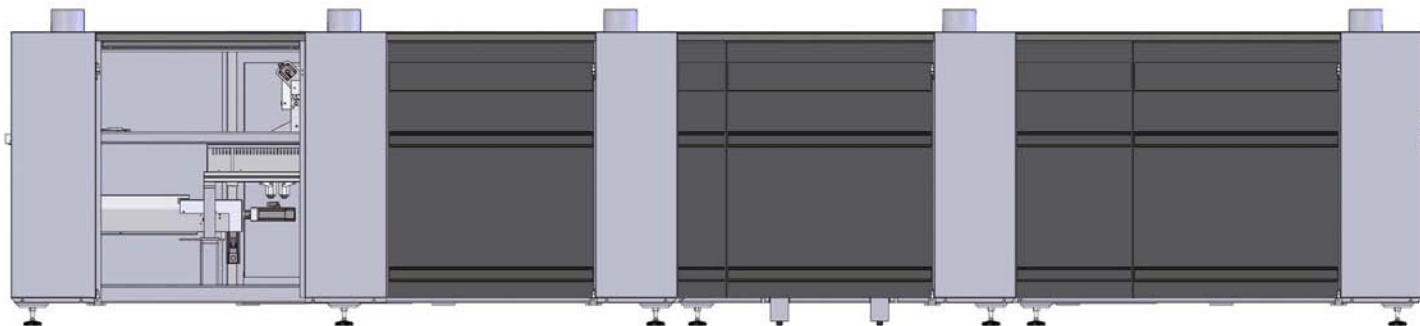
CUBE Inline+ – Modular Structure

Especially with the new – modular software and control concept – the additional module is autonomous – the on site retrofit is simple.



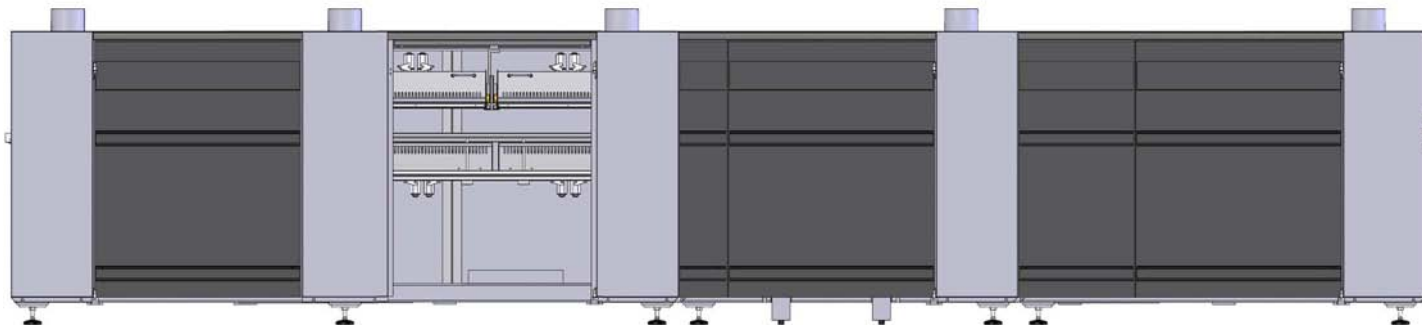
CUBE Inline+ – Modular Structure

Flux Module



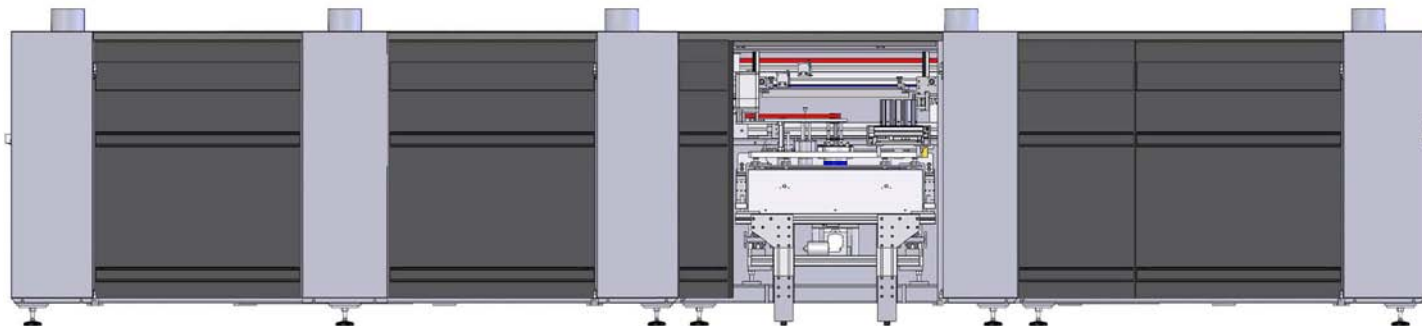
CUBE Inline+ – Modular Structure

Preheat Module



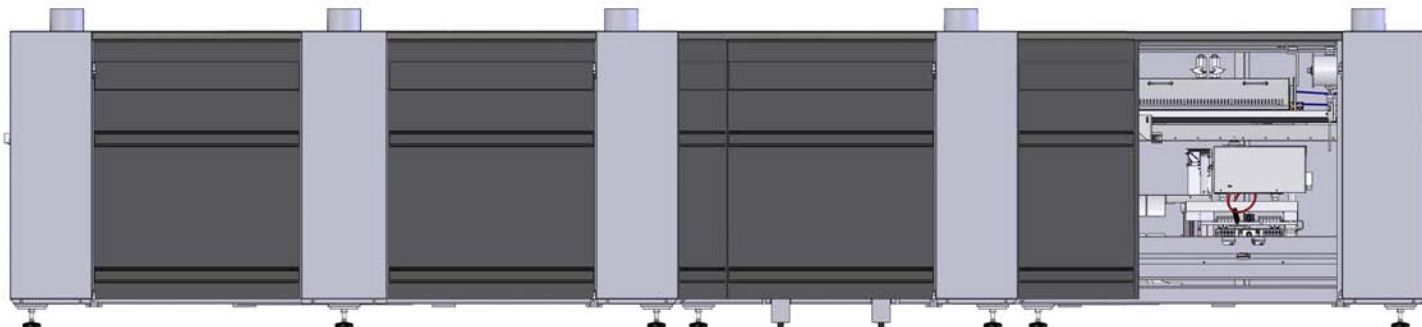
CUBE Inline+ – Modular Structure

ActiveFlow Module



CUBE Inline+ – Modular Structure

Mini Wave Module



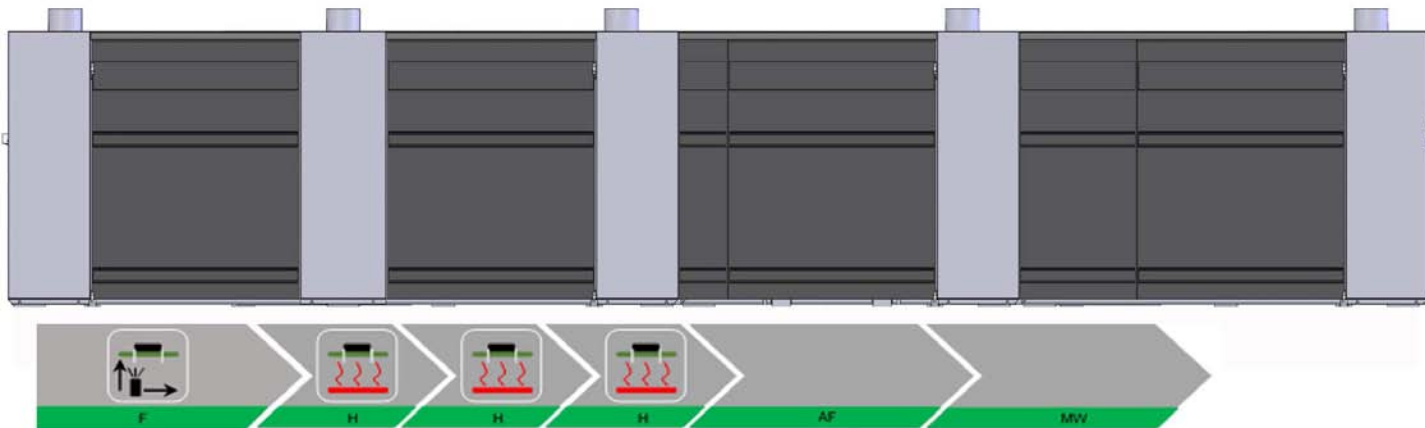
CUBE Inline+ – Modular Structure

Flux Module

Preheat Module

ActiveFlow Module

Mini Wave Module



So the machine size of our CUBE Inline+ is variable from the base machine with 3000 mm machine length up to the maximum configuration of 6300 mm.

CUBE Inline+ – Options

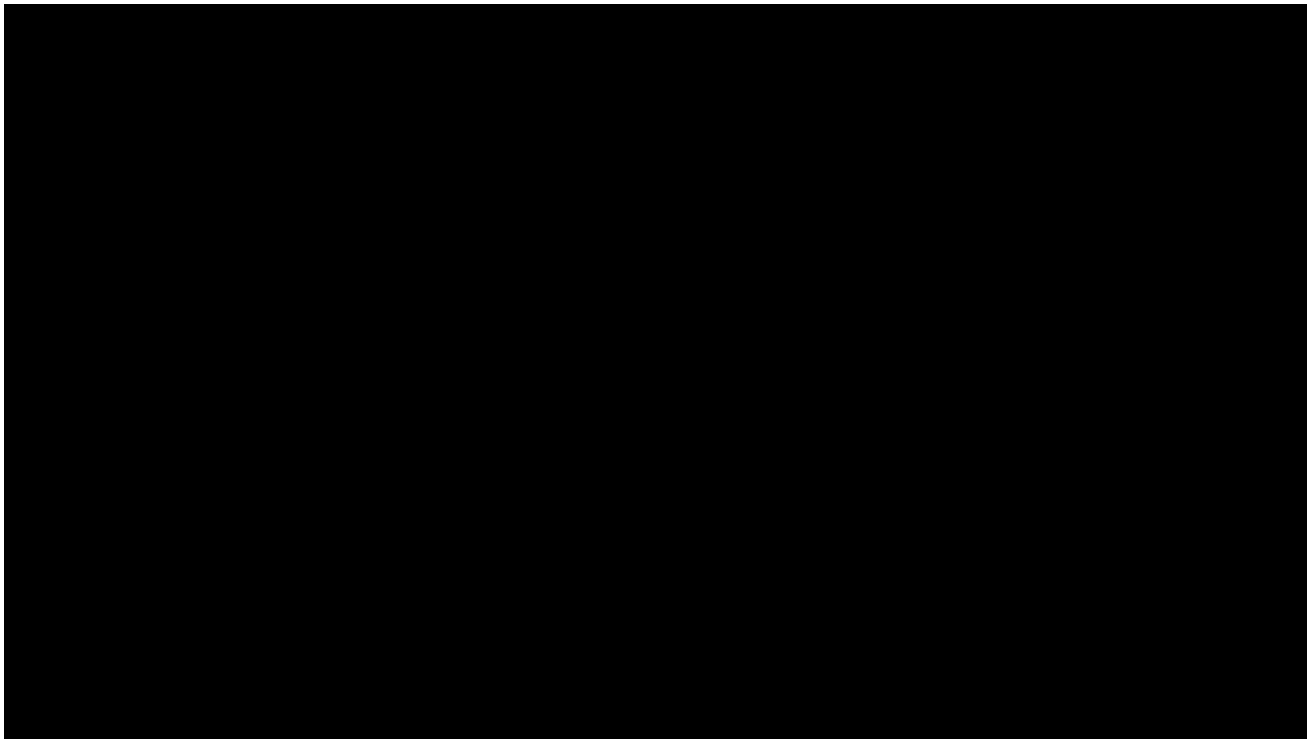
To realize even shorter cycle times, INERTEC can equip the machine with a so called multiport nozzle and a wider soldering aggregate.



CUBE Inline+ – Options



CUBE Inline+ – Options

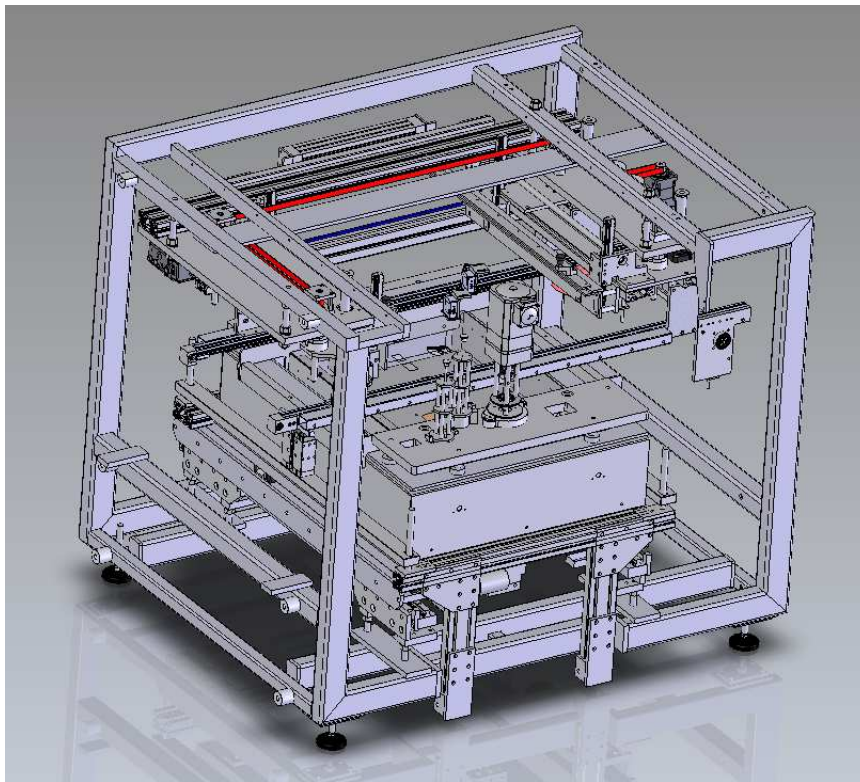


CUBE Inline+ – Options

To realize longer board sizes – up to 1000 mm – INERTEC realized a special version using dual stoppers.



CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow

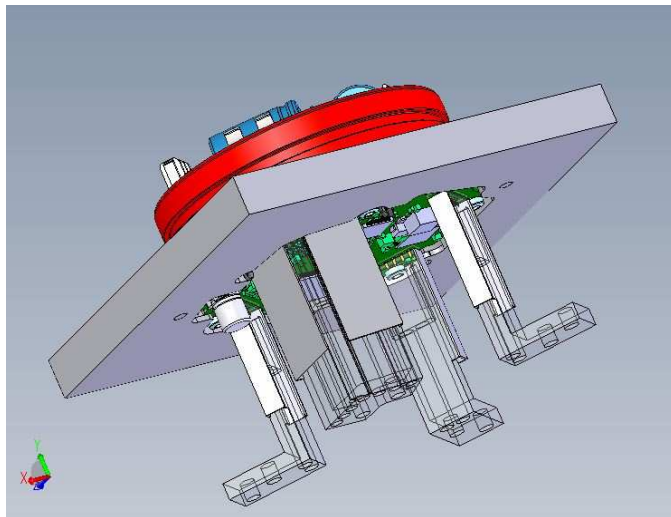


CUBE Inline+ – ActiveFlow

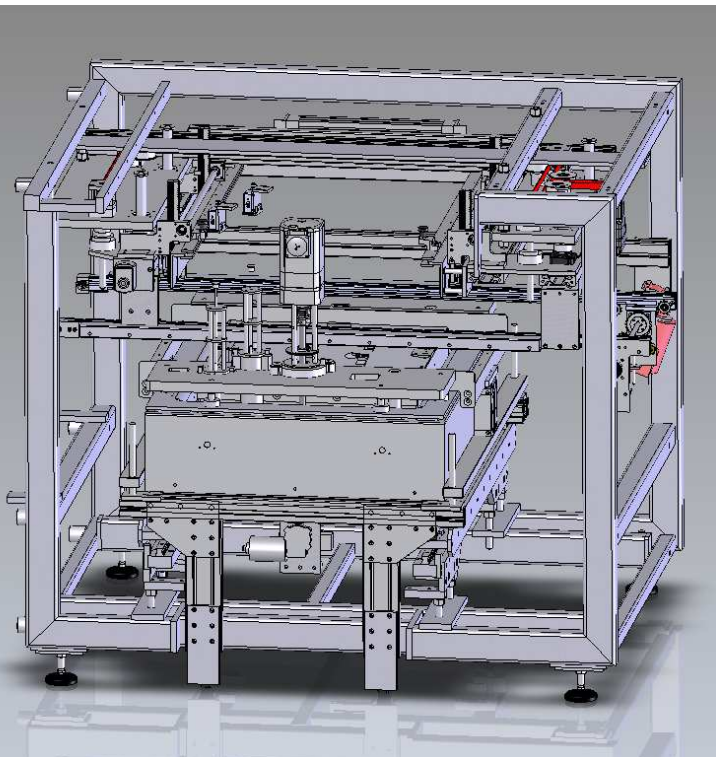
The question of the energy transfer as well as the lifetime of the stamps is always a point of discussion.

That's one reason why INERTEC started the development of the ActiveFlow.

The main difference to other systems in the market is that the solder is circulating inside the stamp.



CUBE Inline+ – ActiveFlow



The solder cycle is:

1. Positioning of the pallet or PCB
2. Clamping of the pallet or PCB
3. Lowering the down holder
4. Lowering the nitrogen hood
5. Lowering the soldering travers with the pallet or PCB to the solder level
6. Solder process – also with peel off on the nozzles
7. Lifting the traverse up again
8. Release of the pallet and transport to the outlet conveyor

CUBE Inline+ – ActiveFlow



The solder aggregate is placed on rails and so the unit can be driven out automatically for a tool change.

The nitrogen cover and tooling is placed and then the solder unit is moved back into the soldering position.

The downholder will be changed inside the machine and is also coded.

The complete soldering unit is driven out via an electro motor and this allows the perfect accessibility for the maintenance and the tool change.

Again the easy maintenance is a key feature of the machine CUBE Inline ActiveFlow.

CUBE Inline+ – ActiveFlow



The lowering of the PCB or pallet is taking place very precise and all parameters such as lowering speed – contact time – peel off, etc. – is freely adjustable.



CUBE Inline+ – ActiveFlow



The solder level in the aggregate as well as the height of the stamp is controlled with a laser sensor.

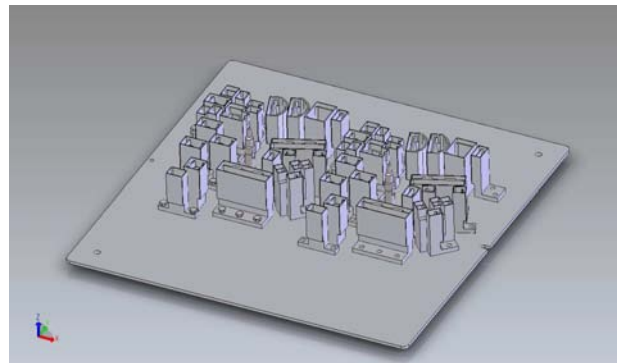
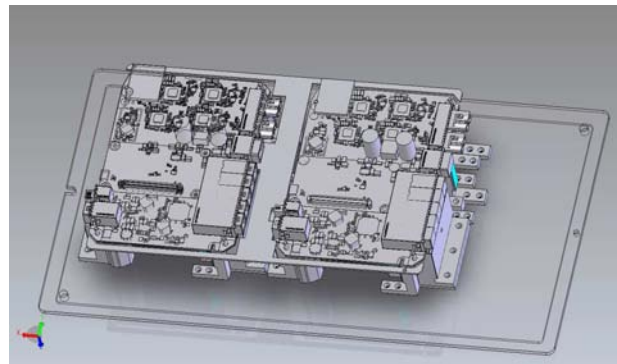
The sensors are integrated in the software and so the level and height can be monitored and programmed.



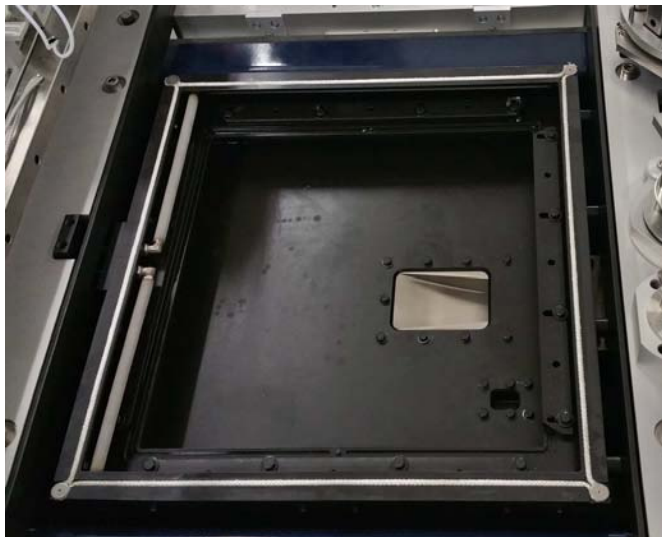
CUBE Inline+ – ActiveFlow



The perfect guiding and clamping in the tool fixation ensures an accurate positioning of the tooling plate.



CUBE Inline+ – ActiveFlow

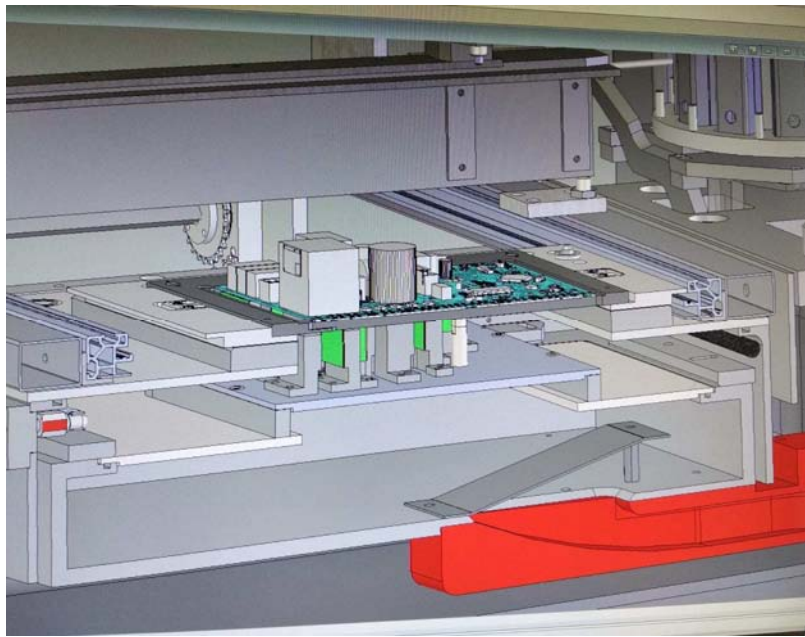
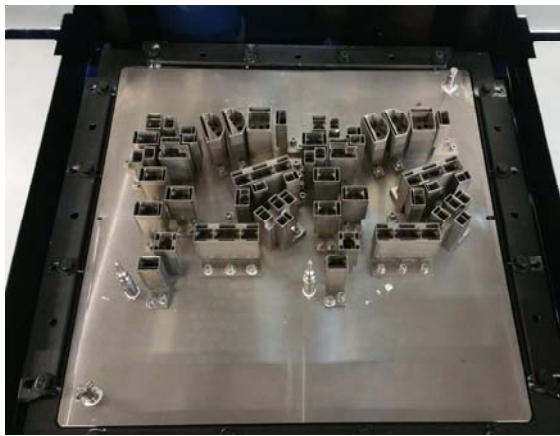


Sinter metal tubes ensure a perfect N2 insertion and the fixation of the tooling plate guarantees a fast and reproducible exchange of the tooling plate.

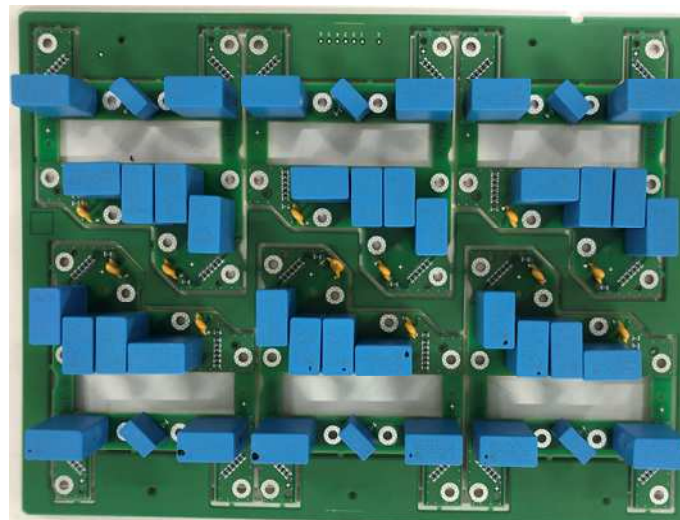
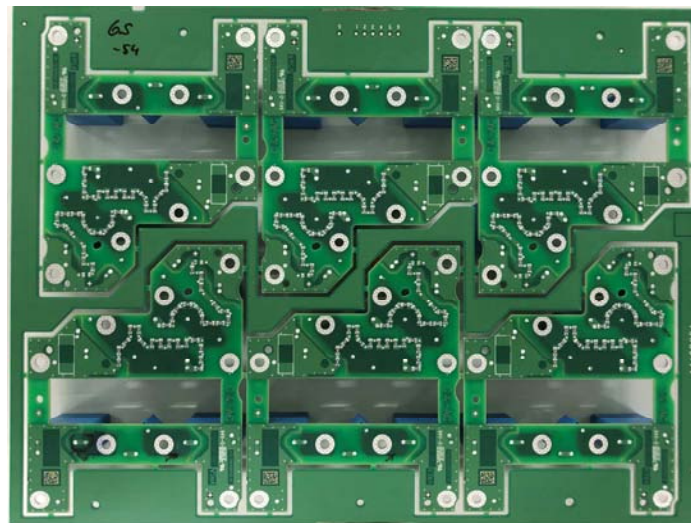
The solder bar feeder – in combination to the level sensor – guarantees a constant soldering volume in the system.



CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow



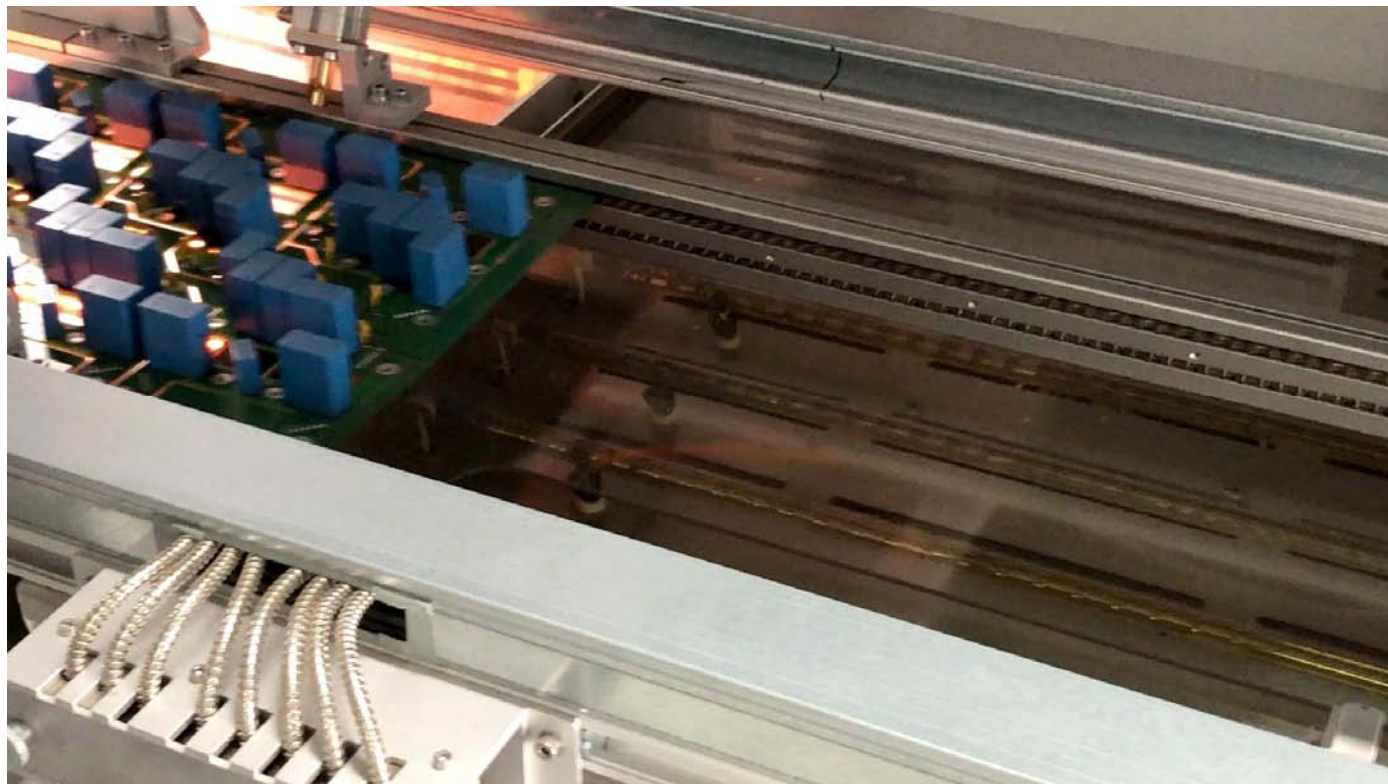
CUBE Inline+ – ActiveFlow



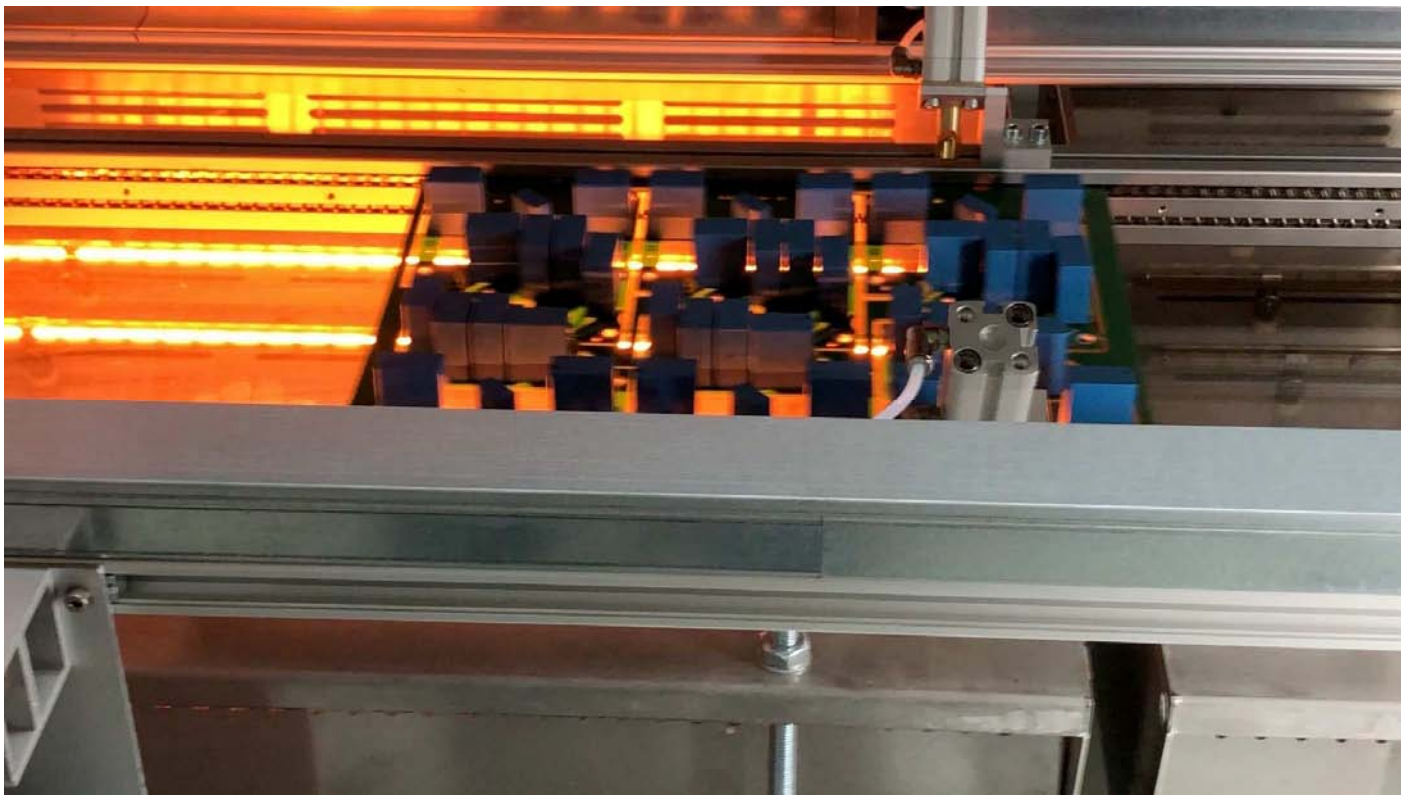
CUBE Inline+ – ActiveFlow



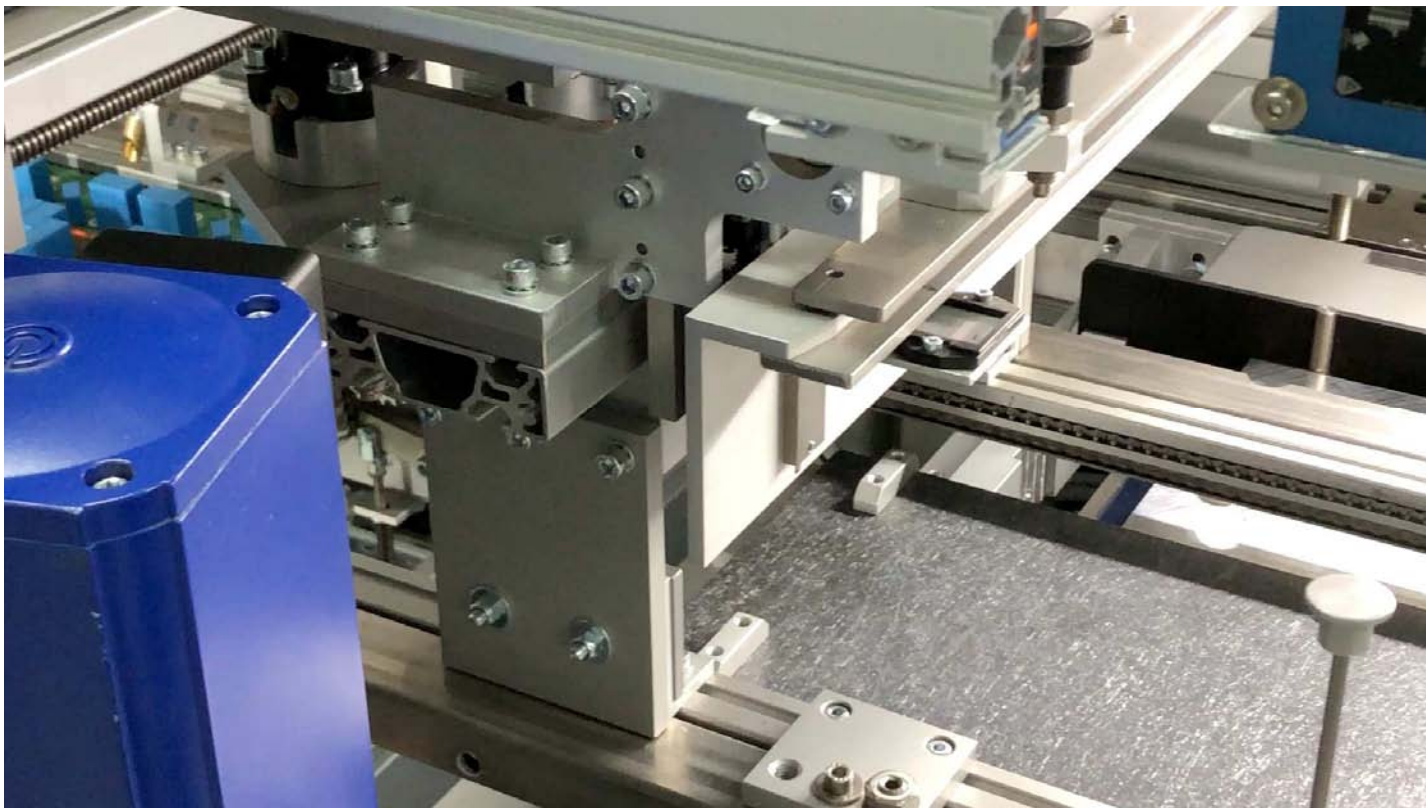
CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow



CUBE Inline+ – ActiveFlow

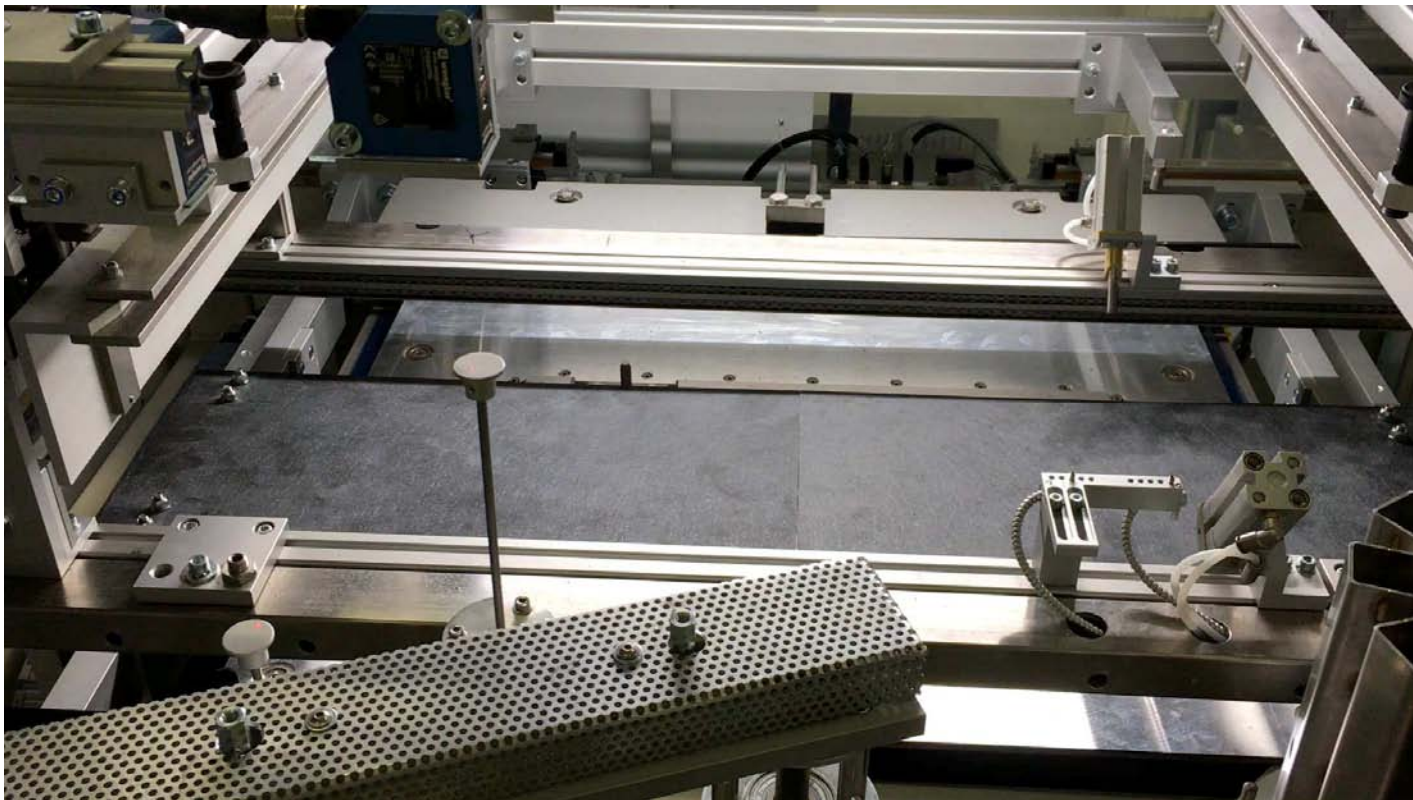


CUBE Inline+ – ActiveFlow

CUBE Inline+



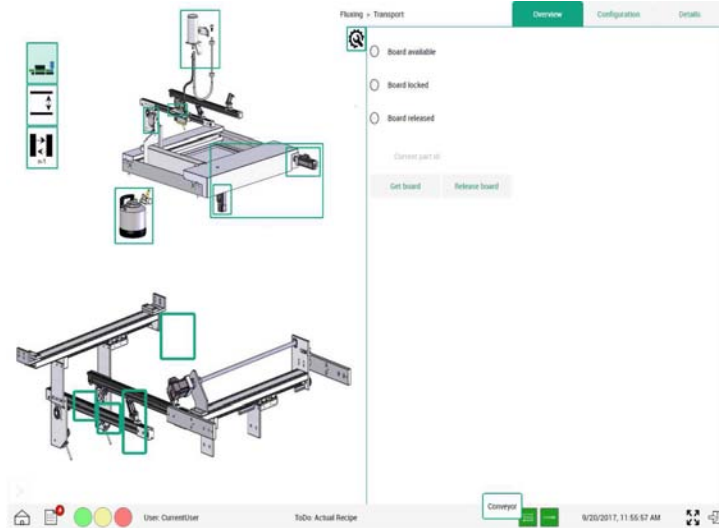
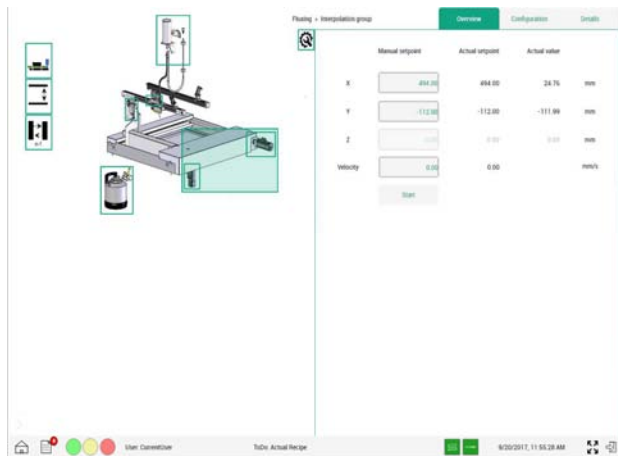
CUBE Inline+ – ActiveFlow



CUBE Inline+ – Software

The BECKHOFF TwinCat III – 64 Bit – control is „State of the Art“ and offers with the new E Bus System all features.

In addition is the PC software defined very user friendly and intuitive.



CUBE Inline⁺

You still have any questions to our selective soldering system?

Please contact us, we look forward explaining the machine to you!

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...more than just soldering!