

PHOTOMATIQ

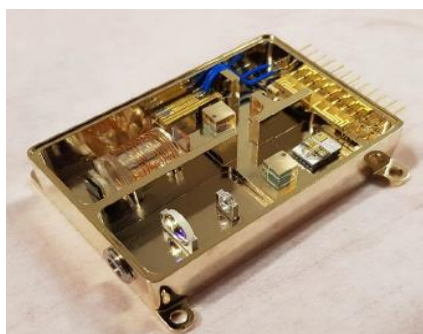
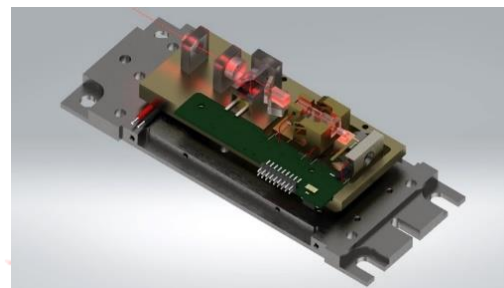
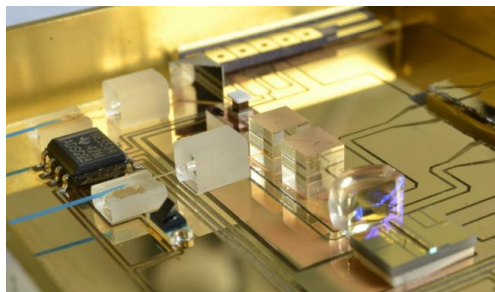
Automated μ -assembly and
packaging equipment for the
photonics industry

PHOTOMATIQ



PHOTOMATIQ is a packaging equipment which has been specifically designed for the photonics industry. It's a standard machine which can be customized according to your requirements.

Field of application



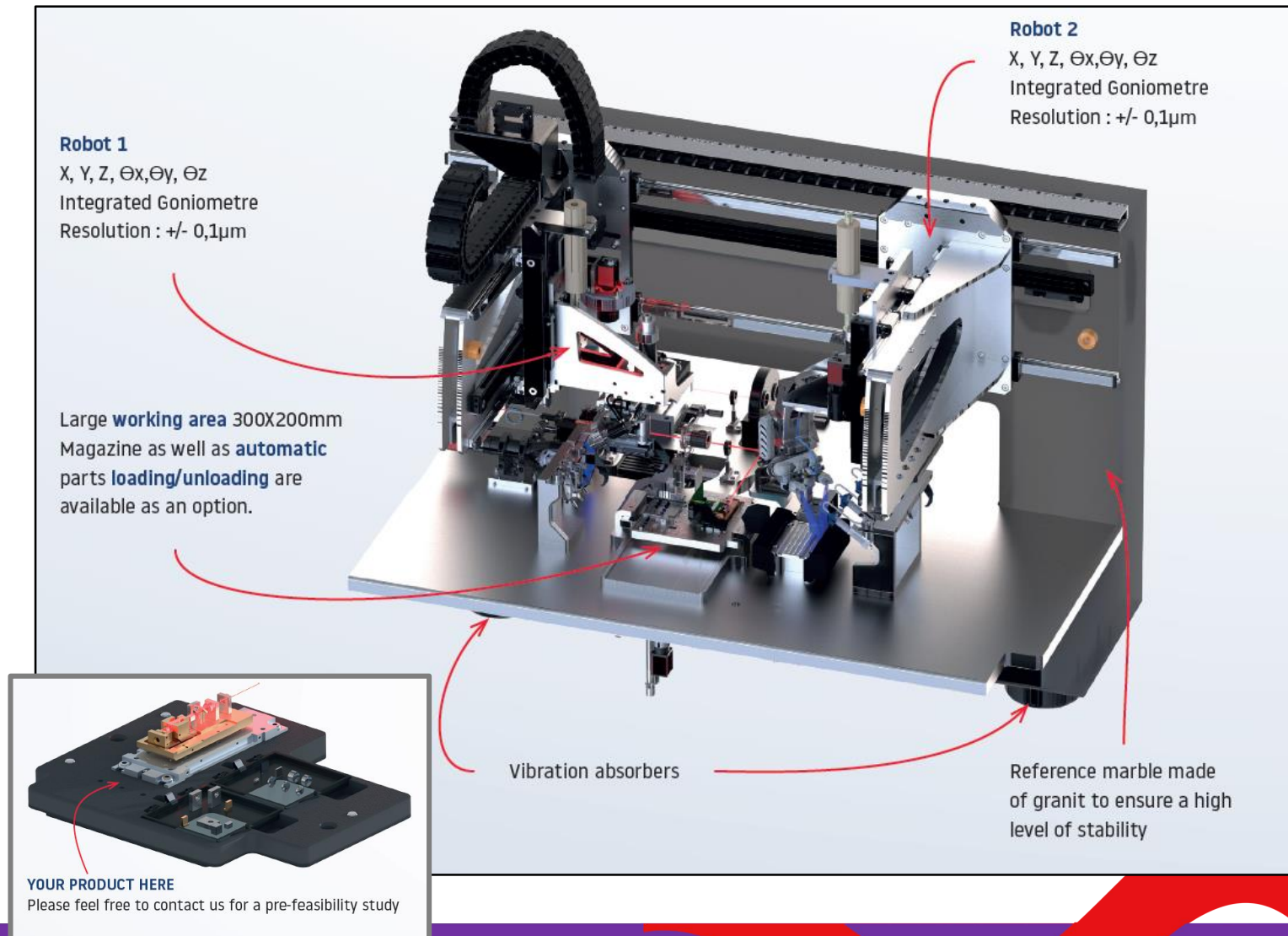
Photonics components to be actively aligned in a package/substrate

Lens, prism, filter, optical fiber, ferrule, FAC, fiber array...

Laser DPSS - Laser diode - Lidar - Laser bar stacking - Fiber optical connector
Fiber to PIC coupling - Fast Axis Collimator ...

High μ -assembly process capabilities

- ✓ Delicate and various parts handling
- ✓ Active and passive alignment
- ✓ Repeatable adhesive dispensing
- ✓ Solder preforms picking from bulk
- ✓ 2 robots working simultaneously

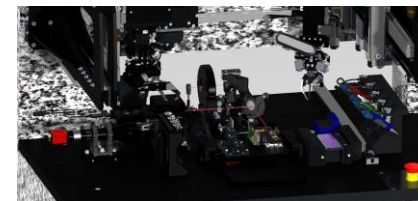
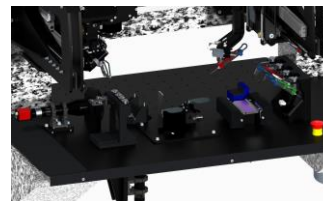
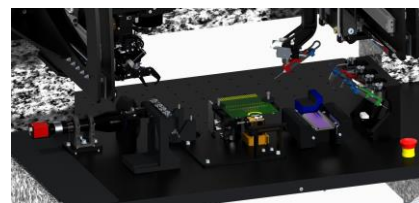
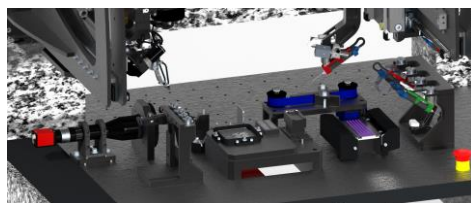


Modular and configurable machine architecture



Frame/Carter
Integrated electrical cabinet
Operative part

Tooling (gripper, workpiece carrier)
Optical bench/analysers
Magazine/loader



Main benefits



- ✓ **Limit the risk** with POC and feasibility testing on the very same machine in our lab
- ✓ **Scale up** your production (better cycle time compare to manual production 3 shifts magazine as an option)
- ✓ Improve the manufacturing **quality/repeatability**
- ✓ Increase your **time to market and protect your know how** by creating your own manufacturing process



Machine main functions

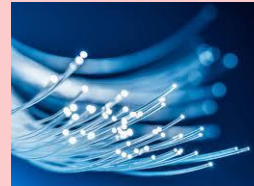
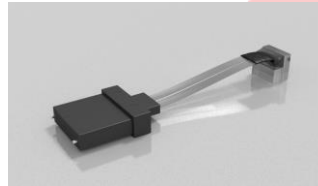
1. Components handling
 - Various parts handling
 - Delicate parts handling
 - Solder preforms picking from bulk
2. Passive and active alignment
3. Repeatable dispensing
4. 2 robots working simultaneously
5. Manufacturing process creation

Various parts handling

Customer need:

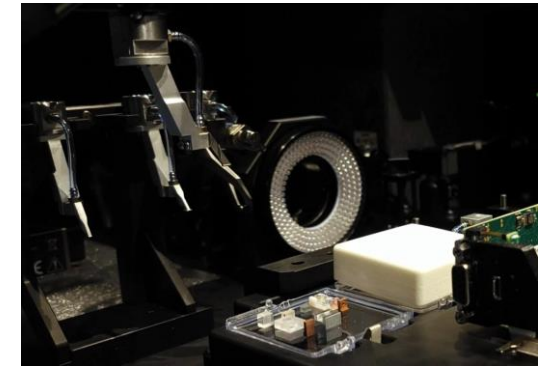
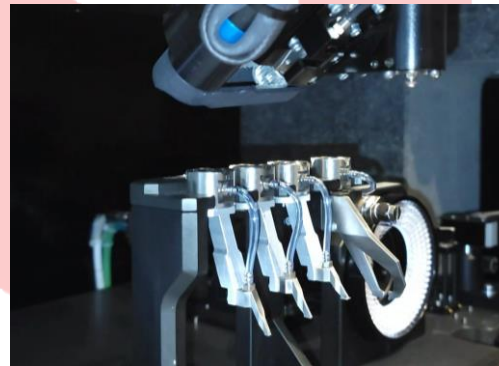
Various components handling in the same automatic cycle (Requires ≠ gripper tools)

Various adhesive dispensing in the same automatic cycle (Requires ≠ syringes)



ISP solution : Automatic tool changer

- ✓ Ongoing patent
- ✓ Space optimized
- ✓ Pressure and vacuum feedthrough
- ✓ Inspired from metrology equipment
- ✓ Repeatable positioning on 3 points



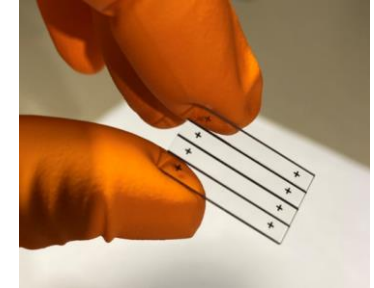
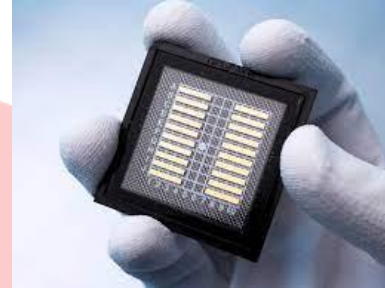
Delicate parts handling

Customer need :

- Fragile components handling
- Forbidden active area (on the side only)
- Ratio length / width difficult to handle

Ex :

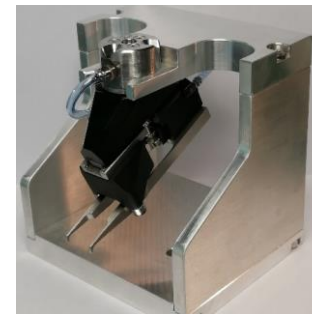
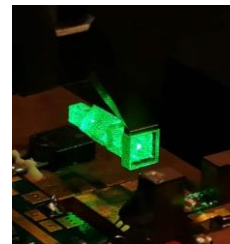
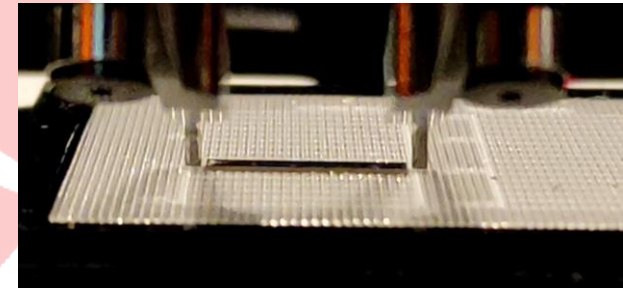
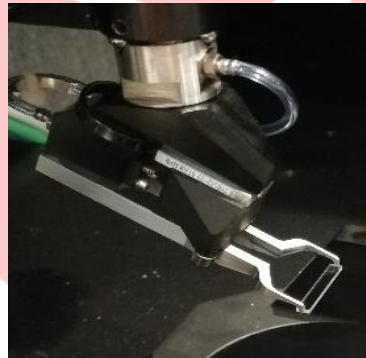
- Laser bar 10mm x 1,5mm (115 μ m thickness)
- Multispectral filters 40mm x 1 mm (1mm thickness)



ISP solution :

Deformable blade gripper

- ✓ Inspired from manual long nose pliers
- ✓ Force regulation
- ✓ Specific gripper clamp for higher accuracy



Solder preforms picking from bulk

Customer need :

Picking and precisely placing solder preforms from bulk
(Mainly used in Eutectic solder process)

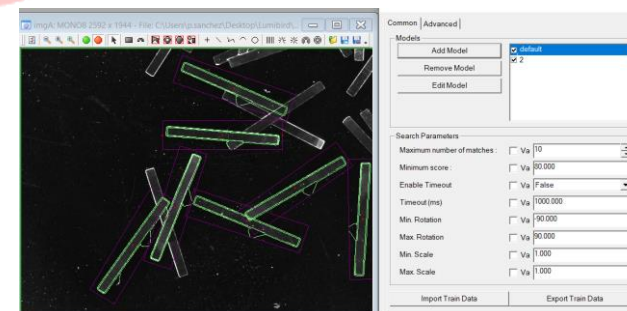
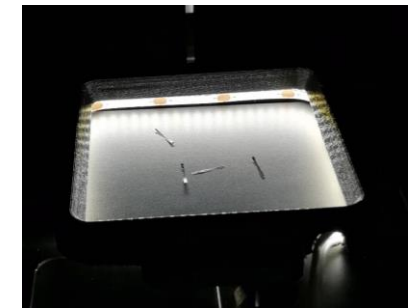
10mm x 1mm (15 μ m thickness)

Which has a rustling / sliding / wrong positioning / disposition and trend



ISP solution :

- ✓ High precision vacuum prehensor
- ✓ 4 direction lighting integrated in the fitting
- ✓ Digital image processing for the automatic recognition of the preforms shape, overlap, and superposition



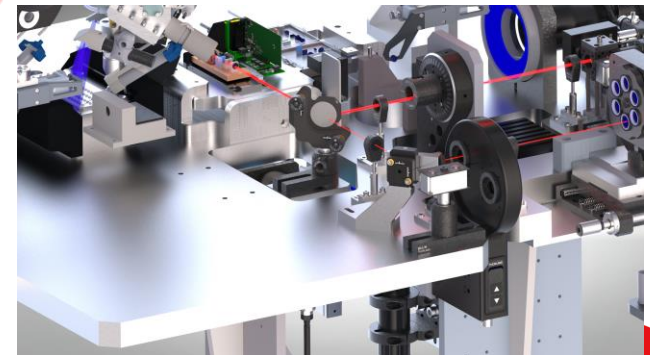
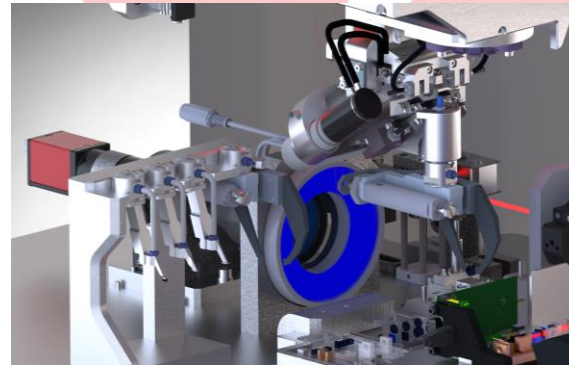
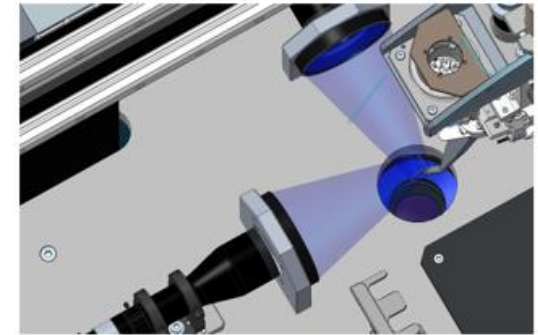
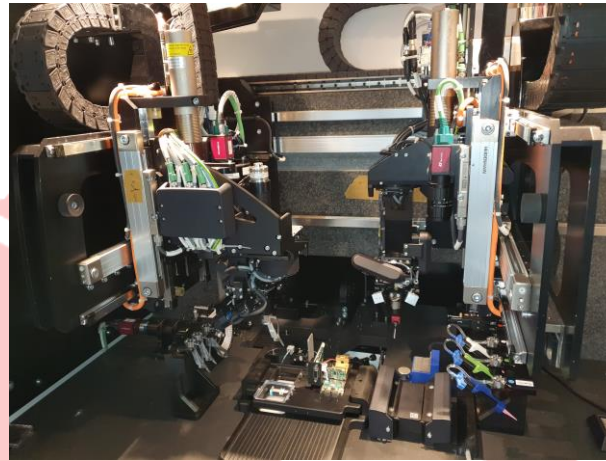
Active and passive alignment

Customer need :

Sub-micrometric alignment based on the optimum lighting coupling

ISP solution :

- ✓ Passive alignment based on the 3D vision station to roughly place the components
- ✓ Fine tune positioning (closed loop adjustment based on the analysers feedback)
- ✓ Integrated optical bench, customizable according to the customer need



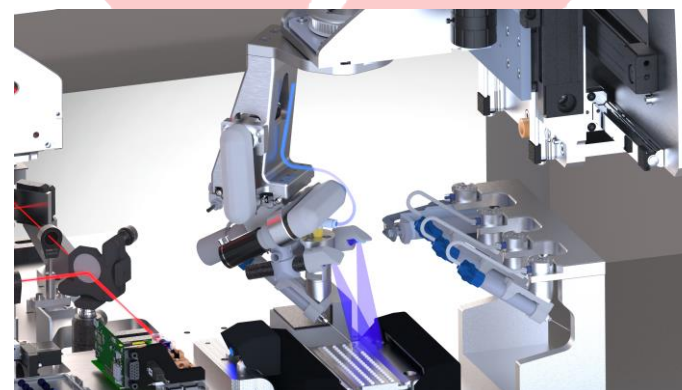
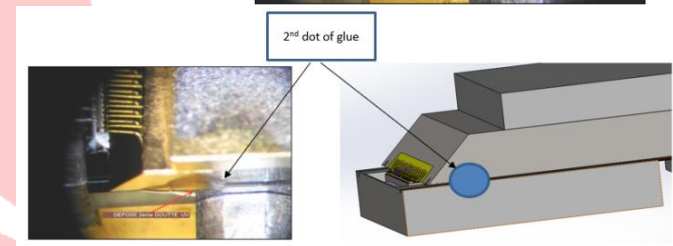
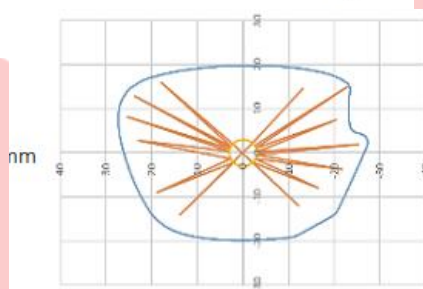
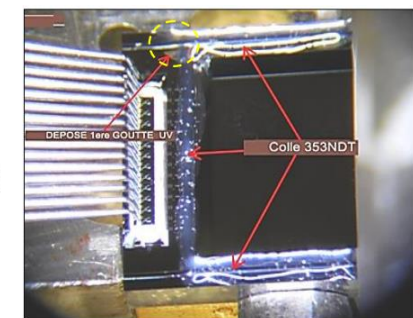
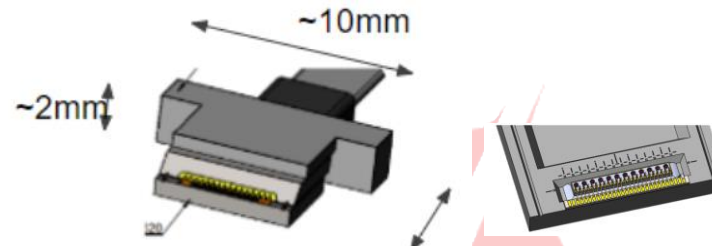
Repeatable dispensing

Customer need :

- ✓ Repeatable dispensing whatever are the temperature, humidity and viscosity conditions
- ✓ Cordon width $\leq 300\mu\text{m}$
- ✓ Star & bespoke patterns
- ✓ Large dispensing area

ISP solution :

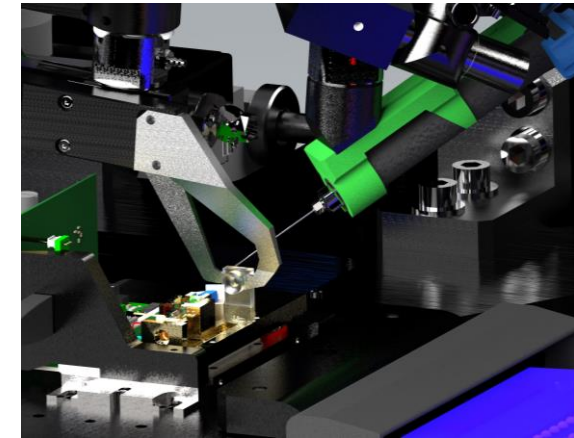
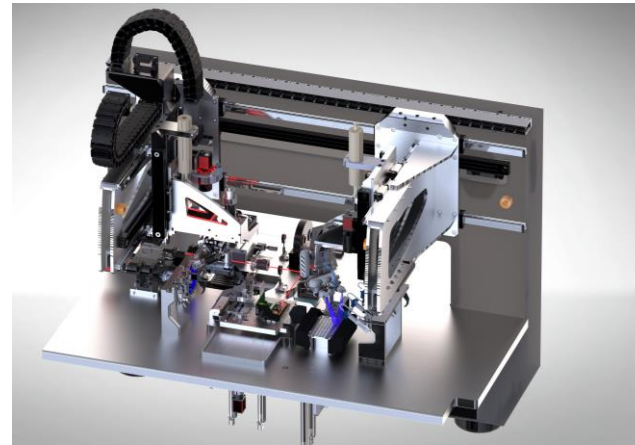
- ✓ Embedded time pressure dispenser
- ✓ Autocalibration
- ✓ Motion control pattern
- ✓ Needle cleaning to avoid the overflow
- ✓ 45° needle orientation to dispense under the components
- ✓ Active adhesive filling



2 High precision robots working simultaneously

Customer need :

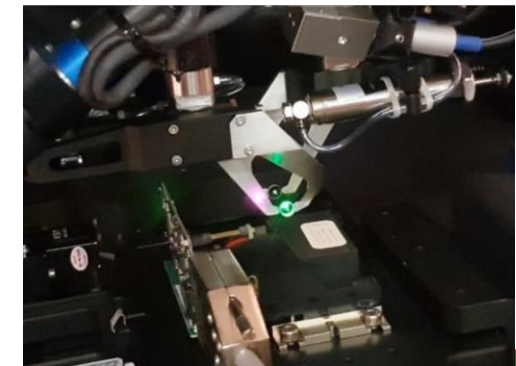
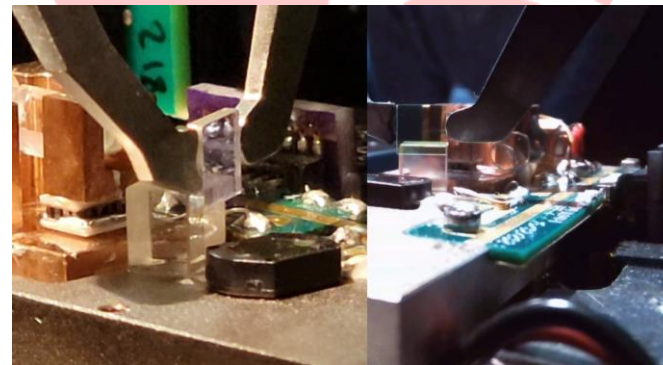
- ✓ Keep aligning while curing the glue in order to limit the shrinkage effect
- ✓ Holding the components in place while dispensing the glue
- ✓ Actively align 2 components simultaneously



ISP Solution :

12 Axis operative part

- ✓ Interlinked robots in the same working area
- ✓ Secure through current detection (at low speed)



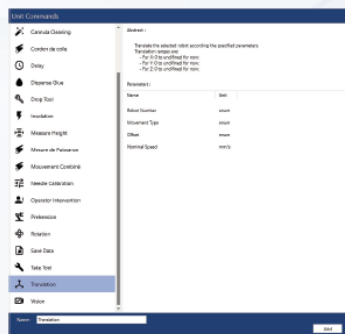
Create your own manufacturing process



PhotonSmart

by ISP SYSTEM

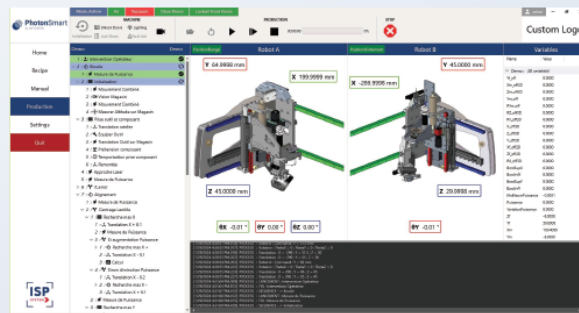
The **open control** PhotonSmart software allows non-automation experts to operate the machine, edit new recipes, and supervise the production.



Just **pick and drop** the pre-developed function blocks into an assembly sequence to **create your own** manufacturing process

➤ Fine tune your process through the **development mode**

➤ **Supervise** your production and manage the **traceability**



Customer need :

- ✓ Being able to create and modify assembly sequences self-sufficiently without any knowledge in coding or programming (NO CODE)

ISP solution :

PhotonSmart will allow you to

- ✓ Secure your know how
- ✓ Continuously improve your manufacturing process
- ✓ Quickly introduce new product's variant on the market