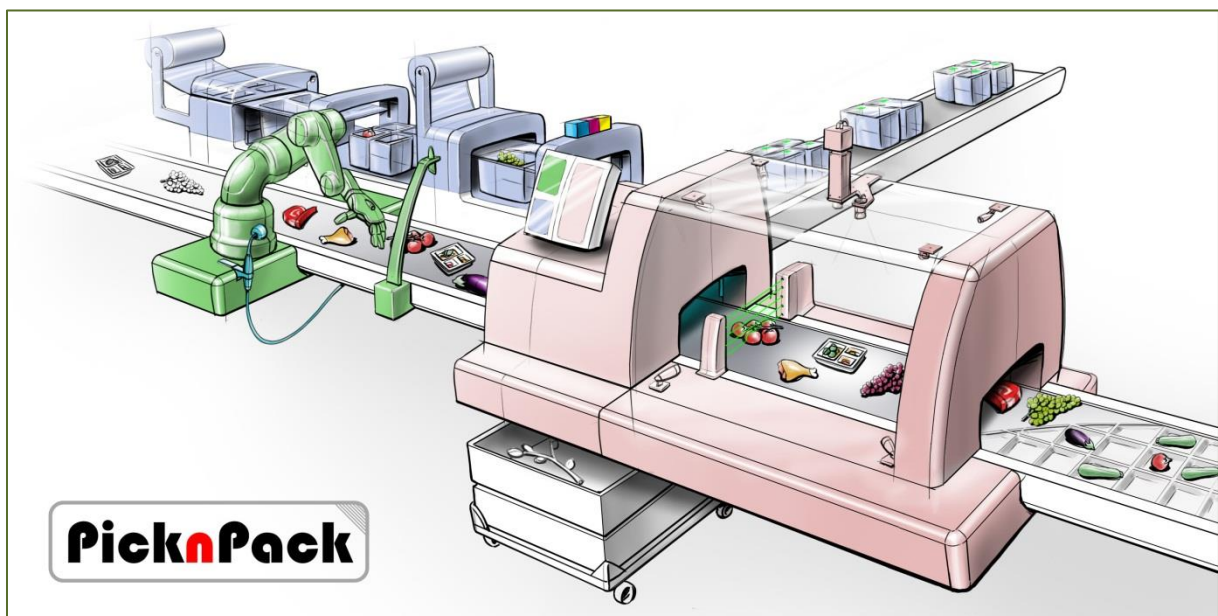


Deliverable 7.4

Prototype with all modules integrated

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Flexible robotic systems for automated adaptive packaging of fresh and processed food products



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Dissemination level

PU	Public	X
PR	Restricted to other programme participants (including the EC Services)	
RE	Restricted to a group specified by the consortium (including the EC Services)	
CO	Confidential, only for members of the consortium (including the EC Services)	

This reports on the deliverable of the Pick&Pack prototype with integrated modules. Not all modules are integrated in a single demo. At this point, there are 3 demo's planned:

- Demo 1:
 - Thermoformer, creates packages flexible with adjustable mold.
 - Marel Robot, picks and places a range of products from a bin.
 - Quality Assessment Module, determines quality parameters of a range of products.
 - Printer, creates and prints a package flexibly, using the quality parameters.
- Demo 2:
 - Laser sealing of printed top foil and cutting of the packages will be demonstrated in a secure room, apart from Demo 1.
- Demo 3:
 - The Cable robot sorts, picks and places separated individual packages into crates. Because the packages are laser cut remotely, the module will be a separate demo. The RFID applicator is integrated with this demo.

Although the Demo's are physically separated, the aim is to integrate them through software. This means that the laser demo will use information from the world model and line controller to perform its tasks. The same holds for the cable robot.

The modules in the demo's are integrated physically and through software. All modules are connected to the World Model and the Line Controller. The World Model saves all information per package. The modules can add information per package. The Line Controller regulates when modules start and stop, including the flow of the packages through the line.

The current prototype does not have all functions needed for the demonstration yet. For example, the Graphical User Interfaces are present, though not yet in final flexible format. Also, some modules are not fully connected to the World Model and Line Controller, though they operate functionally with internal simulators of the software.



Figure 1: A global overview of Demo 1 of the integrated Pick&Pack line. The first module on the left is the thermoformer, though it is occluded in this image by the second module; the Marel pick and place robot. A sectional frame separates the Quality assessment module, including a X-ray scanner. At the end of the line the printer is located. Not that the Laser module (Demo 2) and Cable robot (Demo 3) are missing. These modules will be demonstrated separately, though there is still a reasonable perspective that they can be integrated with Demo 1 in time.



Figure 2: A side view from the beginning of the line; the thermoformer and the marel picking robot.



Figure 3: A side view from Demo 1; A sectional frame and the Quality Assessment Module. This sectional frame does not host a module and is intended to give an open view of the filled in packages. Optionally, it can be used for a dispensing unit or manual insertion of other food products.



Figure 4: A side view from Demo 1; the QAS X-Ray device.

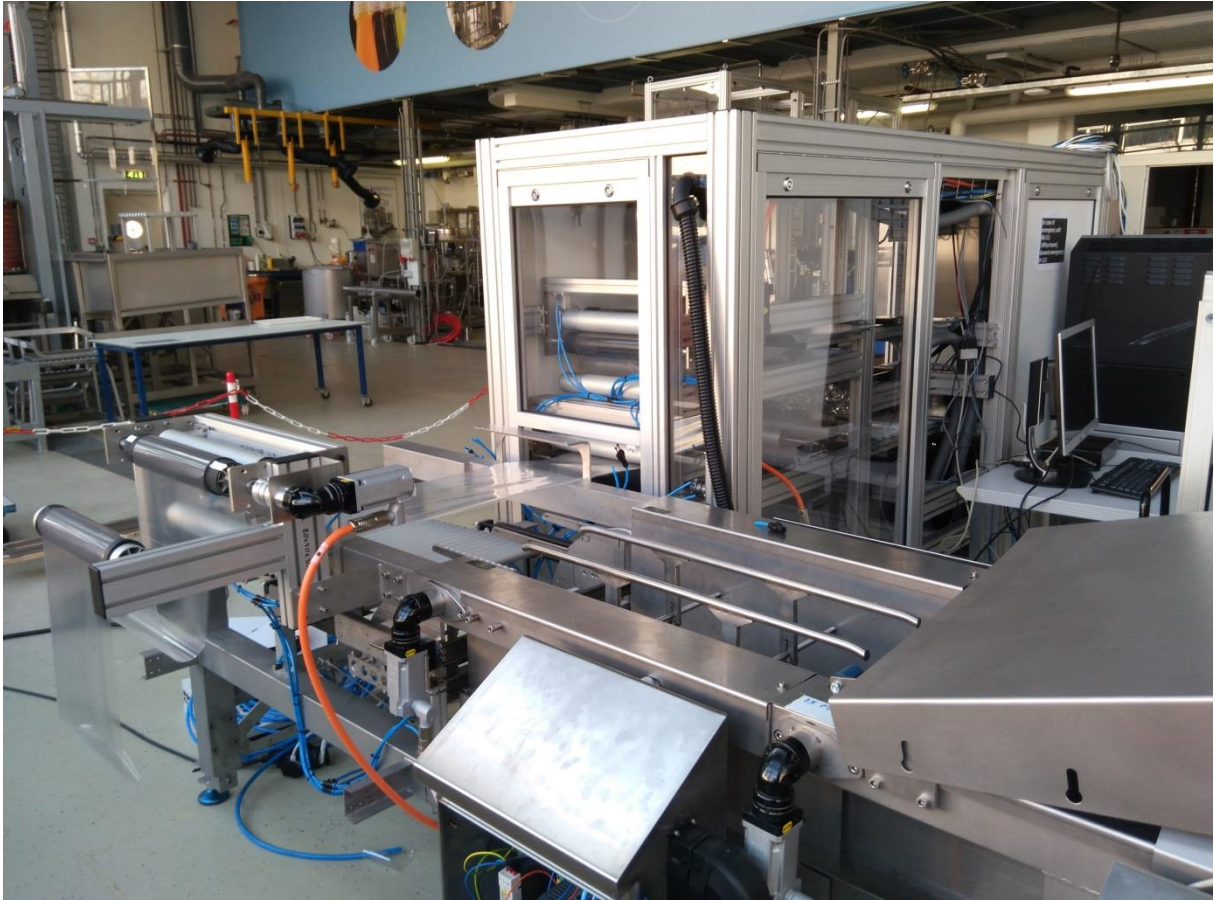


Figure 5: A side view of the Printer module.



Figure 6: A side view of the integrated Demo 1 line. On the left the thermoformer and Marel robot. In the middle the QAS module and X-ray.