Flexible automation for separating and feeding nuts to projection welding machine

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Metalworking company Malmar goes for flexible automation in its high-mix-low-volume production. The project does not only envision introducing reconfigurable mobile robotic production assistants to support the operators, other interventions are also required to ensure smooth operation within the production cell, including a new system for the separation and feeding of nuts to a nut projection welding machine.

As a metalworking company, Malmar manufactures a wide range of products. Consequently, the company has a diverse set of processes at its disposal, such as laser cutting, bending, milling, welding, painting and assembly work. Malmar wants to produce customer-specific products with ultra-short lead-times and to reach its goal it envisions to implement automation in its production process. Dedicated automation or a fixed cobot at each machine is not feasible given the many different production processes and the job-shop environment with its typical high-mix-low-volume production orders.

Flexible automation

In this context, Malmar and Sirris are working together within the Trinity project on a solution to automate repetitive and manual tasks. This will allow the technical operators to concentrate on improving quality and making their working environment more people-oriented. Malmar wants to make reconfigurable mobile robotised production assistants (CPAs) available to its operators: the 'Reconfigurable Cobotic PRODuction Assistant: RECOPRODAS'. Supported by Sirris, the company is developing a prototype of such a CPA for a specific product range and a series of manufacturing processes belonging to a single operator cell: bending, tapping and projection welding.

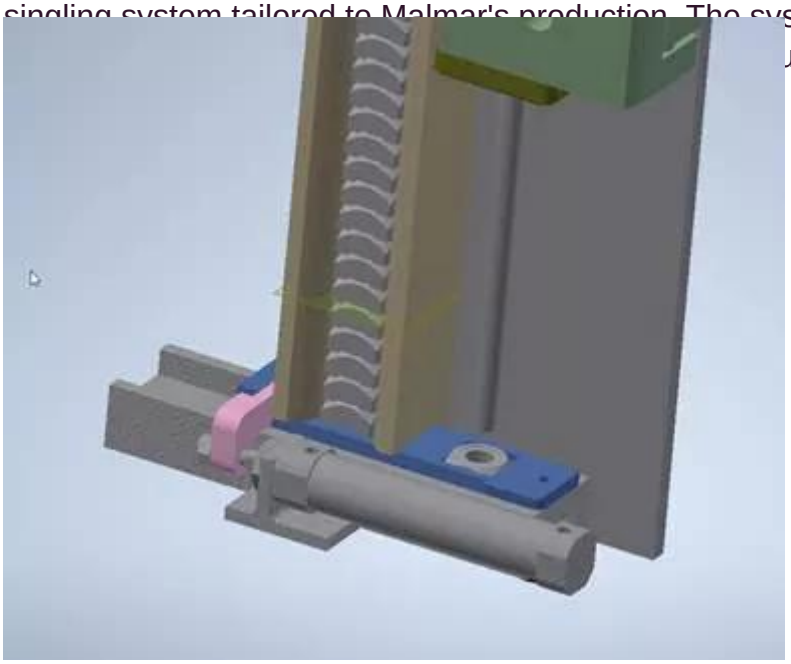
The aim of the project is flexible automation in production, making automation solutions suitable for several processes. However, this not only places specific demands on the robot installation, such as plug & produce, high ease of use, etc., but also requires certain process-specific issues to be resolved, such as the separation and feeding of nuts to a nut welding machine.

Customised system

Automation of nut projection welding on sheet metal requires not only a robot that handles sheets, but also automatic feeding and positioning of the nuts. A nut separation and feeding system that allows an easy change between different nut types was not available on the market. The systems on the market allow nut separation and feeding for just one type of nut. However, these systems are only useful when large series have to be welded for the same nut, which is not the case at

Malmar.

Modifying an existing system was not an option either, because it is too complex. So, together with Sirris, a flexible solution was explored through a side project. On the basis of various existing separation systems for different objects and applications, a cartridge-based concept was developed with a guide and piston. This concept was further developed using CAD into a new nut singling system tailored to Malmar's production. The system was developed in such a way that it



use of tools, by exchanging just three plastic



With the development of an automatic feeding and separation system for the nut projection welding machine, the physical realisation of the RECOPRODAS project is another step closer. We will present the results of the project at a final event. More info is will available in our agenda.

The reconfigurable Cobotic PRODuction Assistant: RECOPRODAS is one of many demonstrators made possible thanks to the support of the Trinity initiative. The Trinity project focuses on digital technologies and advanced robotics for agile production in future European manufacturing ecosystems.

Do you want to know more? Watch the video on the project (see blog) or contact us directly!

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