



13-14 YDAS

Newsletter 9

Overcoming the challenge of scanner-robot integration in automated repair



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

Connecting 3d scanning and robotics for automated remanufacturing

One of the key challenges addressed within the R3-Mydas project is the integration of 3D scanning systems with robotic repair cells, a crucial step towards achieving truly automated and flexible remanufacturing processes.

While both technologies are well established individually, their seamless integration remains a significant technical challenge. R3-Mydas tackles this complexity by developing methods that allow inspection data to be directly transformed into executable robotic repair actions.

Why scanner-robot integration matters

In traditional repair processes, the transition from inspection to repair is often manual, time-consuming and highly dependent on expert knowledge. This creates bottlenecks that limit scalability and repeatability.

By connecting the scanner directly with the robotic system, R3-Mydas enables:

- Automatic transfer of geometric data from the scanned component
- Digital identification of geometry
- Generation of repair paths directly from inspection results

This integration is essential to close the digital loop between inspection, decision-making and repair execution, which is a cornerstone of advanced remanufacturing.

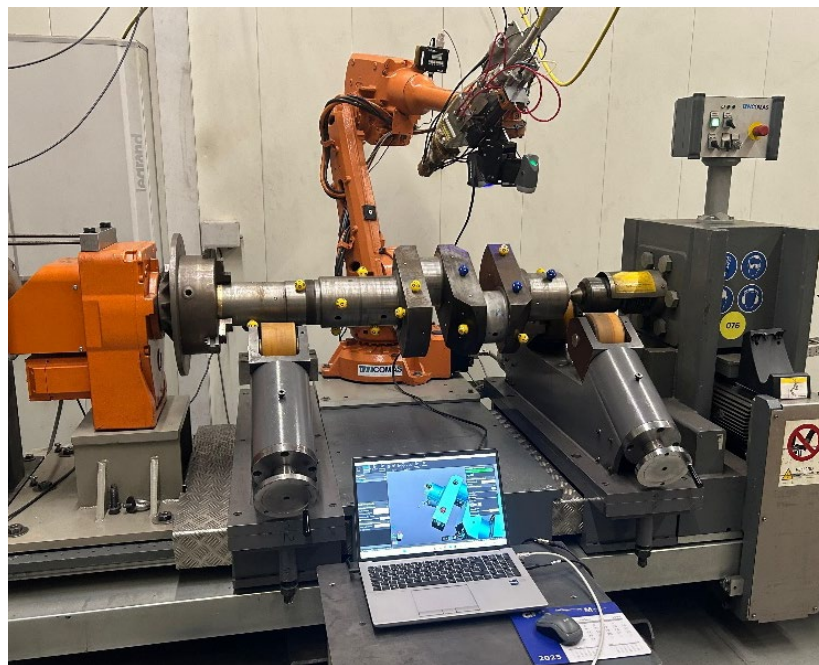


Figure 1: TMCOMAS cell during the automated scanning process

Technical challenges behind the integration

One of the most critical and complex aspects addressed in R3-Mydas is the direct integration between the 3D scanning system and the robotic repair cell. In this context, the project relies on the combination of Creaform 3D scanning technologies and ABB industrial robots, connected through an EtherNet/IP communication interface.

Although both scanning systems and industrial robots are mature technologies, their direct connection presents several technical challenges.

In R3-Mydas, the scanner–robot connection via EtherNet/IP enables a structured and deterministic exchange of information between inspection and execution stages. Dedicated software developed by ZIKNES processes the scanned data and transforms it into parametric repair paths, which are validated in a virtual environment before robot execution.

Within R3-Mydas, significant effort has been devoted to:

- Synchronising scanner data with the robot reference frame
- Translating scanned geometries into parametric repair paths
- Validating trajectories in a virtual environment before execution
- Ensuring robustness and repeatability in industrial conditions

Addressing these challenges is essential to move from isolated automation steps to a fully integrated and autonomous repair workflow.

Impact on automation and industrial processes

The successful integration of Creaform scanning systems with ABB robotic platforms represents a key enabler for end-to-end automation within the R3-Mydas repair workflow. By establishing a direct digital link between inspection and repair, the project moves beyond isolated automation steps towards a closed-loop, scanner-driven repair process.

This approach significantly reduces manual intervention, shortens setup and programming time, and improves repeatability and traceability. Ultimately, it strengthens the industrial applicability of MYDAS solutions and their potential deployment in real remanufacturing environments.

For industrial applications, this means:

- Reduced programming and setup time
- Improved consistency and repair quality
- Better control and repeatability throughout the automated repair process

These advancements support R3-Mydas' objective of making remanufacturing more efficient, sustainable and economically viable.