

**Project Acronym:** CONVERGING  
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**Project Full Title:** Social-industrial collaborative environments integrating AI, Big Data and Robotics for smart manufacturing



**CONVERGING**



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## DELIVERABLE

### CONVERGING AI-based tools - Standalone demonstration

<b>Dissemination level:</b>	SEN
<b>Type of Document</b>	DEM
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<b>Deliverable Leader</b>	COMAU
<b>WP / Task responsible</b>	WP3 - T3.1, T3.2, T3.3, T3.4
<b>Keywords:</b>	planning, orchestration, autonomy, mechatronics

## Executive Summary

The report details the progress made in CONVERGING's WP3 over the past twelve months, highlighting the progression of software and hardware components aimed at implementing adaptable, scalable, and AI-powered production systems across different levels, with a focus on robotics.

WP3 has seen the creation of eight (8) cutting-edge software and hardware modules, as an outcome of 4 distinct tasks (T3.1-T3.4). The **Dynamic Work Reorganization** module (DWR) incorporates considerations of human factors, safety, and environmental sustainability into the allocation of tasks and actions for cell resources. Meanwhile, the **AI Station Controller** module (AISC) undertakes the flawless execution of robotic application decisions via real-time coordination. The **Collaborative Robot Control** module (CRC) improves robots' path planning and real-time task modification abilities, leveraging human feedback and self-learning for superior performance. Furthermore, the **Perception and Autonomy Module** (PAM) boosts robot independence by providing advanced perception capabilities for effective human-robot collaboration, including anticipatory adjustments and 3D environmental mapping. The **Humanoid Collaborative Robot** (HCR) consists of a humanoid robot undertaking precise assembly tasks. The **Remote Inspection Robot** (RIR) is used for remote inspection and maintenance tasks in confined spaces, consisting of a robot-on-robot configuration. The **Medium Payload Collaborative Manipulator** (MPCM) comprises of a medium payload industrial robot enhanced for collaborative applications. Lastly, the **Polishing Robot** (PR) is used to perform automated polishing tasks.

In conclusion, CONVERGING D3.2 presents the final version of two of the modules (DWR and AISC) as well as highlights the updates and new features of the other six. In particular, for CRC, PAM, HCR, RIR, MPCM and PR modules, their final version is expected to be delivered on month 36.