

**FLEXIBLE ASSEMBLY**

# DESIGN, PROTOTYPING, VALIDATION AND OPTIMISATION OF ASSEMBLY CELL/PRODUCTION LINE CONCEPTS AND ARCHITECTURES IN AN “INDUSTRY 4.0” CONTEXT

Flanders Make offers concept and feasibility studies for flexible manual and (semi-)automated assembly and production systems. We combine new innovative insights with state-of-the-art design technology and with optimisations at both workstation and system level.



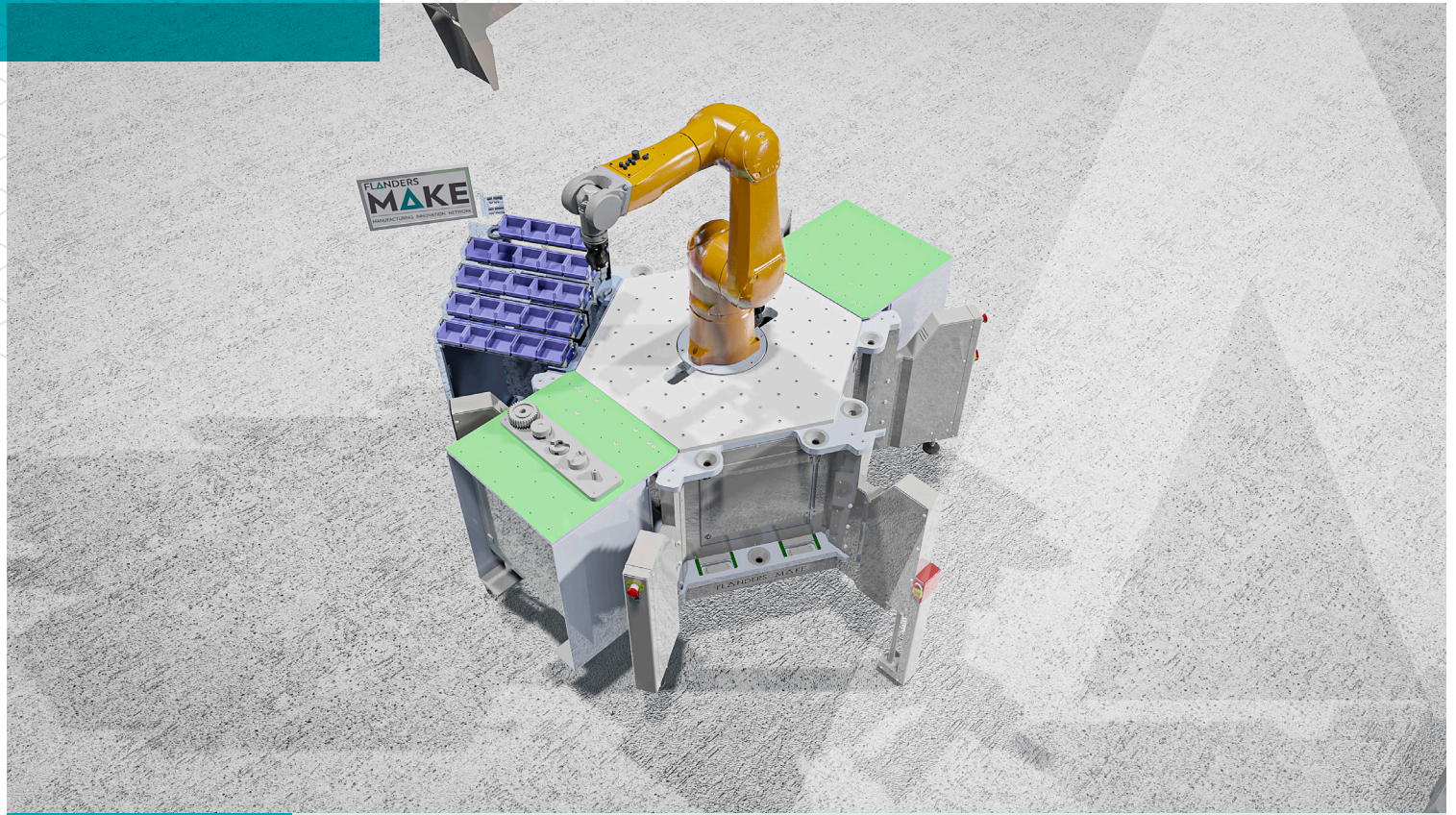
As a supplier-independent solution provider, we support companies with:

- design of flexible assembly/production system architectures (for one-piece flows);
- benchmarking of commercial off-the-shelf assembly technologies;
- development of manufacturing process lay-outs, scheduling strategies, balancing & sequencing, buffer sizes etc.;
- strategies for process monitoring of flows, quality & machine condition;
- virtual commissioning;
- validation in a (near) real-life production environment in our own labs or in virtual reality.

## We use a unique combination of software and hardware tools in this process:

- In-house discrete event simulation and mathematical system models
- Visual components
- FlexSim: Simulation
- Siemens Plant Simulation
- Siemens MCD: Validation of automation concepts and virtual commissioning
- Development of customised VR environments on a Unity platform
- Image-based 3D scans of objects
- AR/VR/MR visualisations and interactions





## SUCCESS STORY

### Open architecture of multiple reconfigurable work cells for flexible assembly

#### PROBLEM

The Flemish manufacturing industry is increasingly confronted with markets demanding highly customised products that must be built to order and assembled quickly and reliably. Obviously, their production systems, which are currently organised to build larger batches of the same products, need a major rethinking and reworking.

#### SOLUTION

Our inflex environment consists of an open architecture of multiple reconfigurable work cells for various assembly tasks, end-effectors and quality controls, allowing to assemble and disassemble multiple customised products in a flexible and reliable way with short reconfiguration times and achieving an optimal single-piece flow. The infrastructure also includes extensive monitoring equipment, which allows to collect valuable production data and evaluate advanced data-driven and model-based assembly process optimisation techniques.

#### CUSTOMER VALUE

Inflex is an infrastructure that allows testing, validating and demonstrating new concepts aimed at enhancing the flexibility and robustness of the assembly process. The infrastructure is easy to reconfigure so that different configurations and architectures can be validated. The main advantage is that customer can make experimental setups and validate different assembly scenarios in a flexible way under industrial conditions while the whole process is continuously being monitored and optimised.