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# ZEROLABOR ROBOTIC SYSTEM

**RANDEK** 

BUILDING THE FUTURE

# REVOLUTIONIZING ROBOTICS

## BRINGING ROBOTICS TO THE OFFSITE CONSTRUCTION INDUSTRY

Randek recognized the lack of industrial robots and inefficiency in the construction industry early on. Back in 2016, we set out to change the industry in this regard. We introduced the first ZeroLabor system in 2017, which used industrial robots at scale in an off-site factory environment. Today our robotic systems cover a wide range of offsite construction applications, but the common features are that they eliminate the physical strain of hard work and significantly reduces manpower costs. Randek's products streamline the construction process while increasing product quality and production output.



## ZEROLABOR ROBOTIC SYSTEM

Cutting-edge, data-driven solutions that automate a range of working processes. Customisable to meet specific requirements and integratable into existing production lines or operate independently.



## THE PRODUCT FAMILY

The ZeroLabor Robotic System Product Family uses advanced technology to transform the offsite construction industry. It has been adapted for seven countries across four continents, with over fifty systems currently in operation.



**ROBOTIC  
ASSEMBLY**



**ROBOTIC  
FRAMING**



**ROBOTIC  
SHEATHING**



**ROBOTIC  
GLUING**



**ROBOTIC  
INSULATION**

# ZEROLABOR ROBOTIC SUB-ASSEMBLY

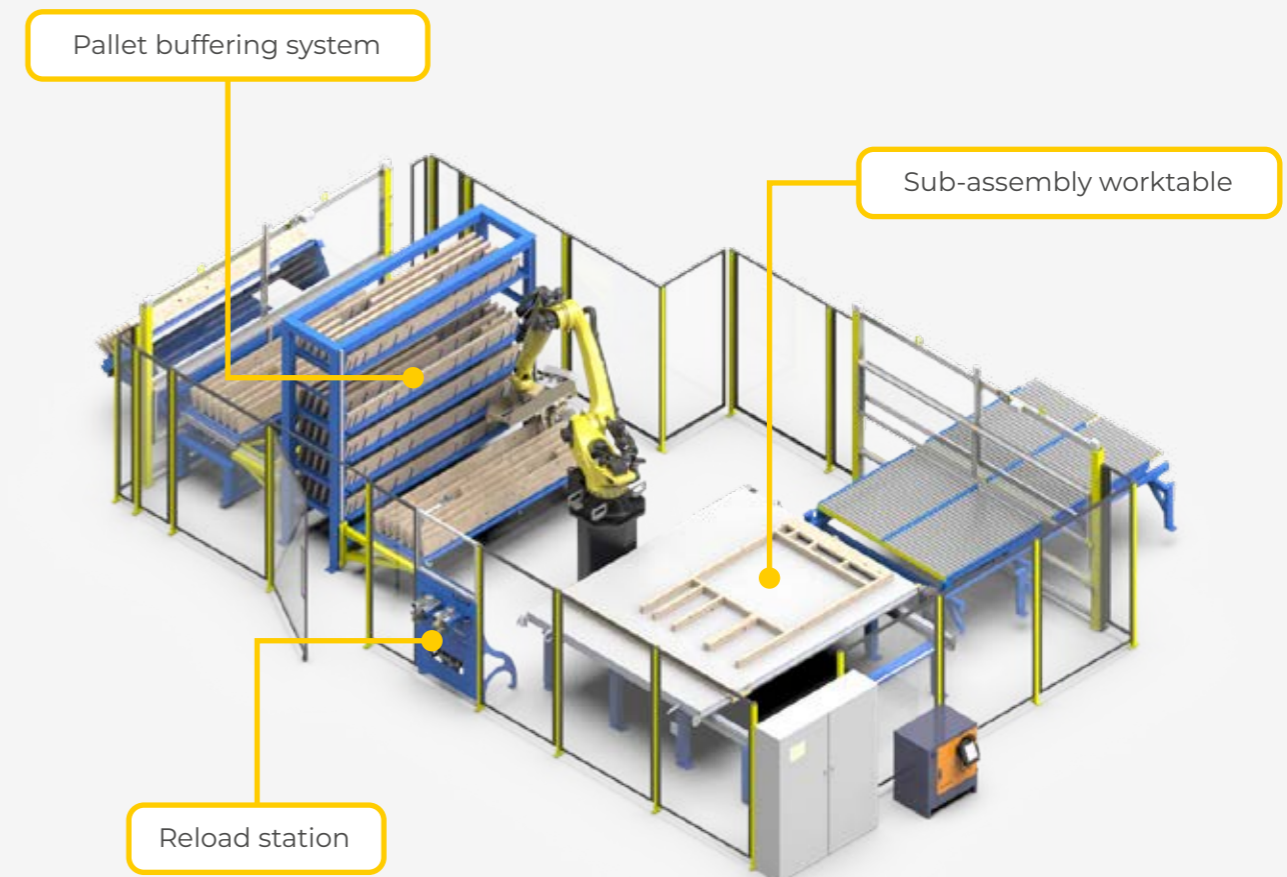
## Automated subcomponent assembly

The system is designed to automatically manufacture and assemble complex subcomponents, such as rough openings for doors, windows, and various multi-studs, in wood wall elements.

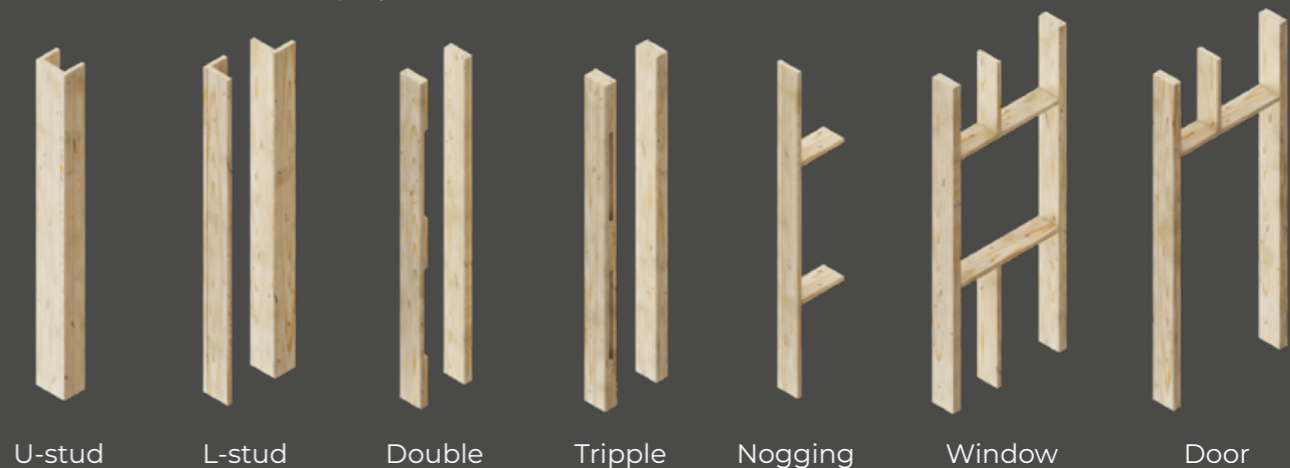
It is a versatile solution that can function as a standalone system or be integrated into larger-scale, high-precision production lines. It boosts productivity and efficiency, maintains consistent quality, and reduces health and safety risks in factory environments.



Whether operating independently or fully integrated into large-scale production lines, the ZeroLabor robotic sub-assembly system's workflow can be planned remotely via the Randek Planner tool. Additionally, **My Randek** enables efficient monitoring, tracking, and analysis of key production statistics.



Our advanced robotic solution leverages a wide range of standardised building techniques, tailored to diverse global construction standards—ensuring adaptability to local requirements for efficient and reliable project execution.



# ZEROLABOR ROBOTIC FRAMING

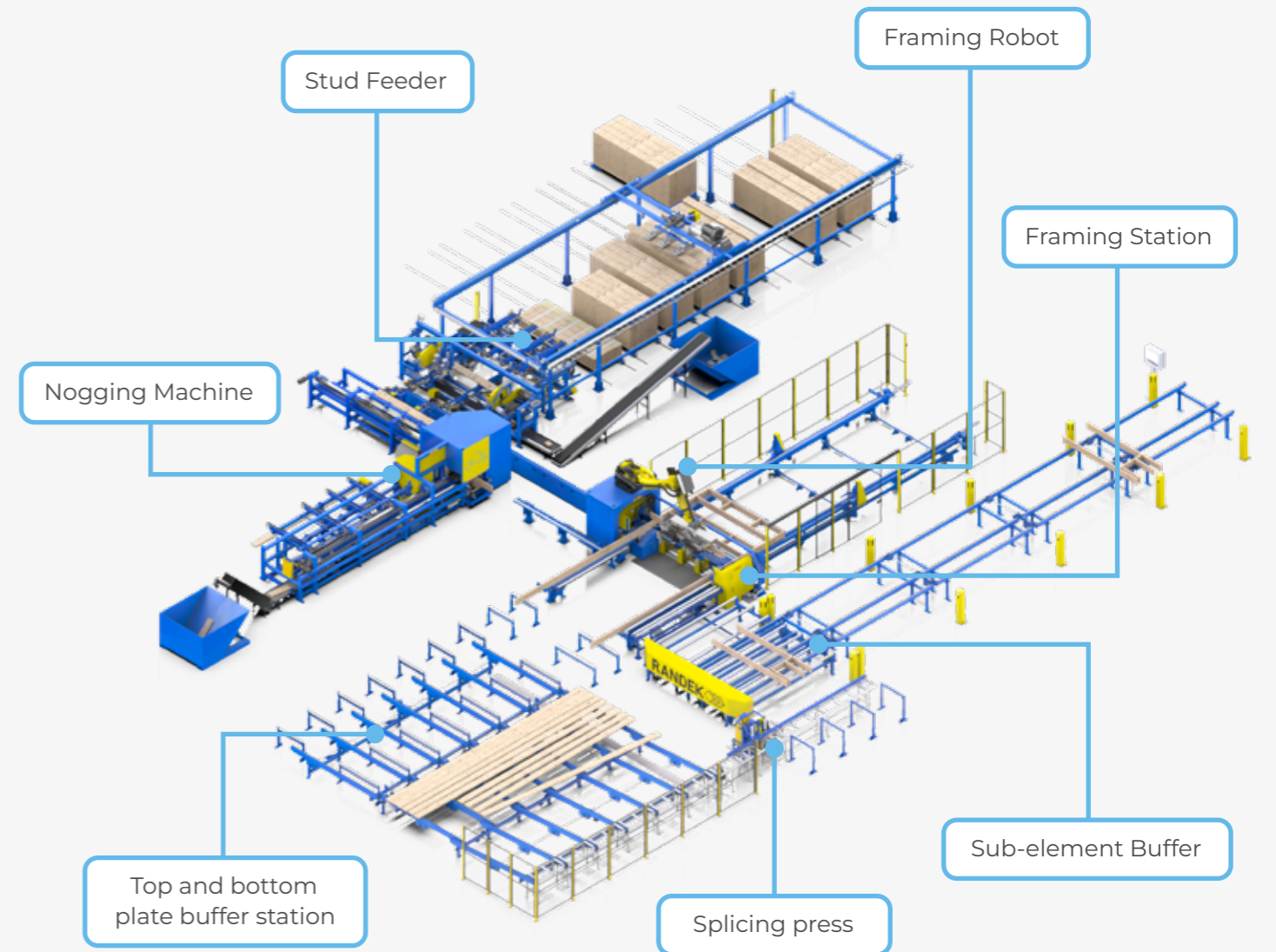
## Ensuring frame accuracy

Randek Robotic Framing provides various robotic solutions for the operator's workspace in the production of framing, facilitating the lifting and placement of different studs.

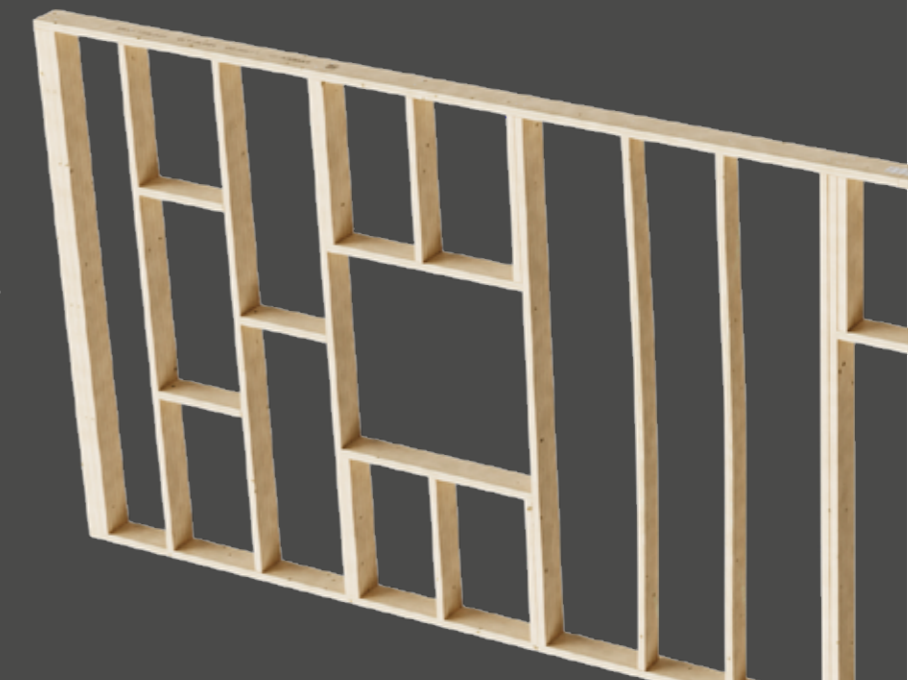
The product is modified and adapted to meet the specific requirements of different markets worldwide.



The stud feeder precisely cuts noggins to the required length and the robot secures them in place, adjusting for stud thickness variations to ensure accurate element dimensions.



Cut and place the noggin, centrally or two pieces evenly spaced.



# ZEROLABOR ROBOTIC SHEATHING

## Automates various tasks with ease

Whether producing walls, floors, or roof elements, the ZeroLabor Robotic Sheathing boasts faster speed and enhanced capabilities

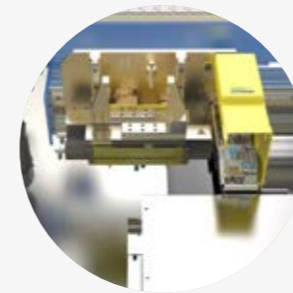
Choose from a configuration of two to five robots.



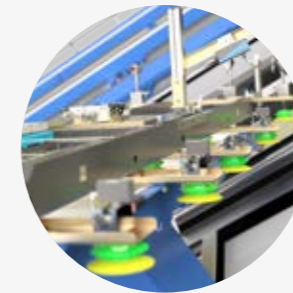
## Handles the following processes

The system can sheet the building element with multiple different layers. Recycle bins with the possibility to separate materials, i.e. OSB and plasterboard in different bins. Next bigger sheet function, robotic saw tool, robotic gluing, separated sheet handling, tool changing for end tools on the router, and advanced tongue and groove capability.

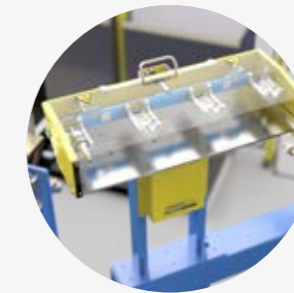
## TOOLS



STUD CORRECTOR



SHEET HANDLING



TOOL CHANGER



SAW TOOL



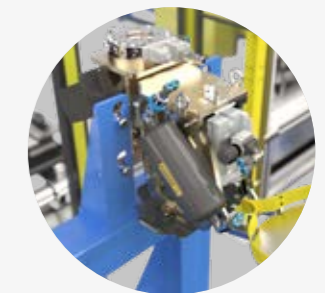
MILLING TOOL



STAPLE GUN



SCREW GUN



NAIL GUN



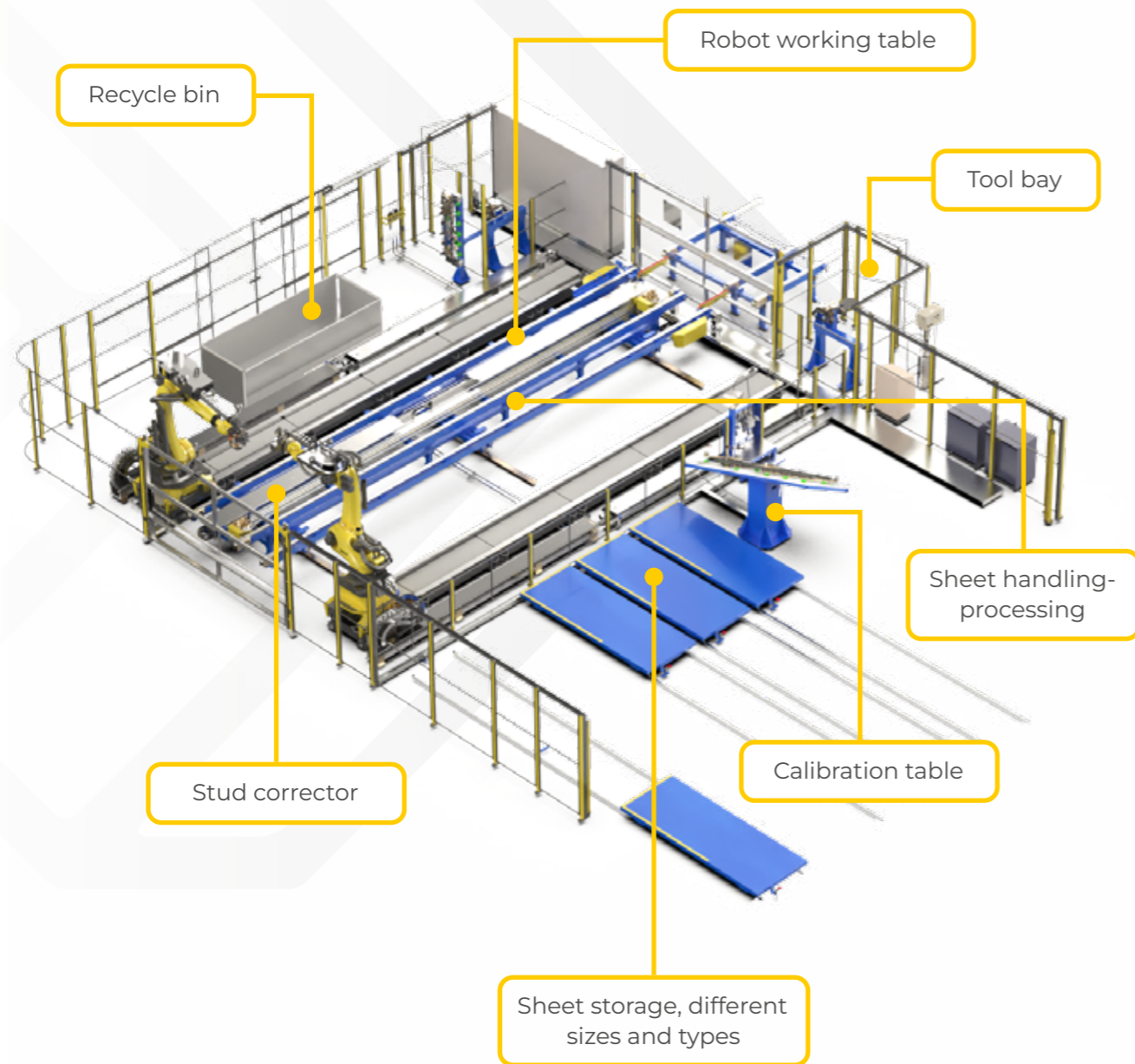
## The standard ZeroLabor Robotic Sheathing is the original workhorse when it comes to off-site factory manufactured elements

With an array of tools and great flexibility, it guarantees to keep the robots busy handling tough tasks such as sheet laying, fastening, and formatting. Once the frame enters the cell, our advanced robot working table squares and corrects the incoming studs for the robots to work effectively.

# ZEROLABOR R2 ROBOTIC SHEATHING

Our workhorse, The ZeroLabor R2 - a compact and versatile configuration solution, designed to automate your production processes. Integratable into larger production systems. Featuring tongue and groove assembly and provides ample space for different sizes and types of sheets.

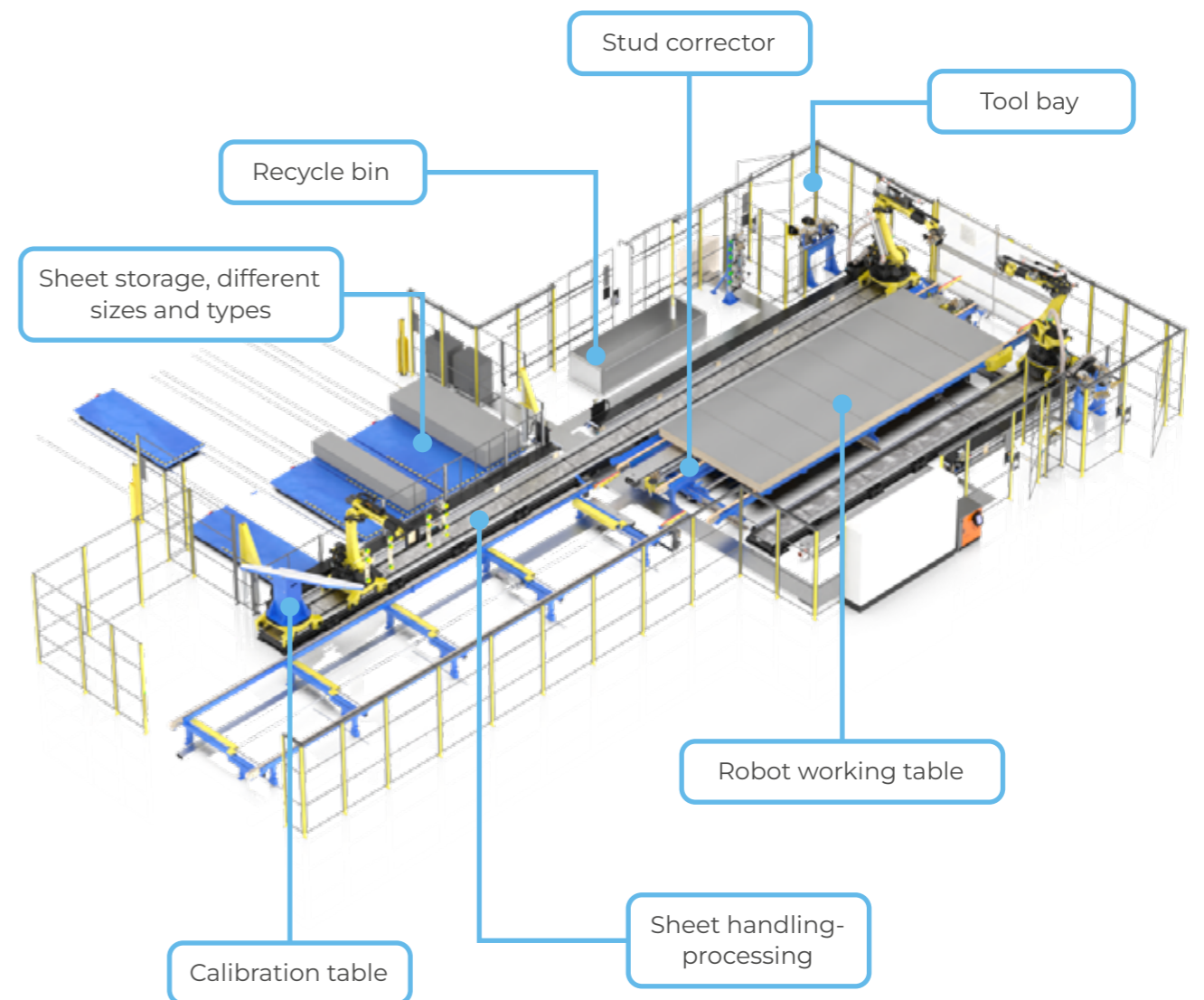
**Tools:**  
Sheathing,  
sawing, milling,  
screwing,  
stapling



# ZEROLABOR R3 ROBOTIC SHEATHING

In the ZeroLabor R3 - one more robot is added offers an even greater capacity with a streamlined tongue and groove capability. With this option sheet storage capacity is also extended.

**Tools:**  
Sheathing,  
sawing, milling,  
screwing,  
stapling



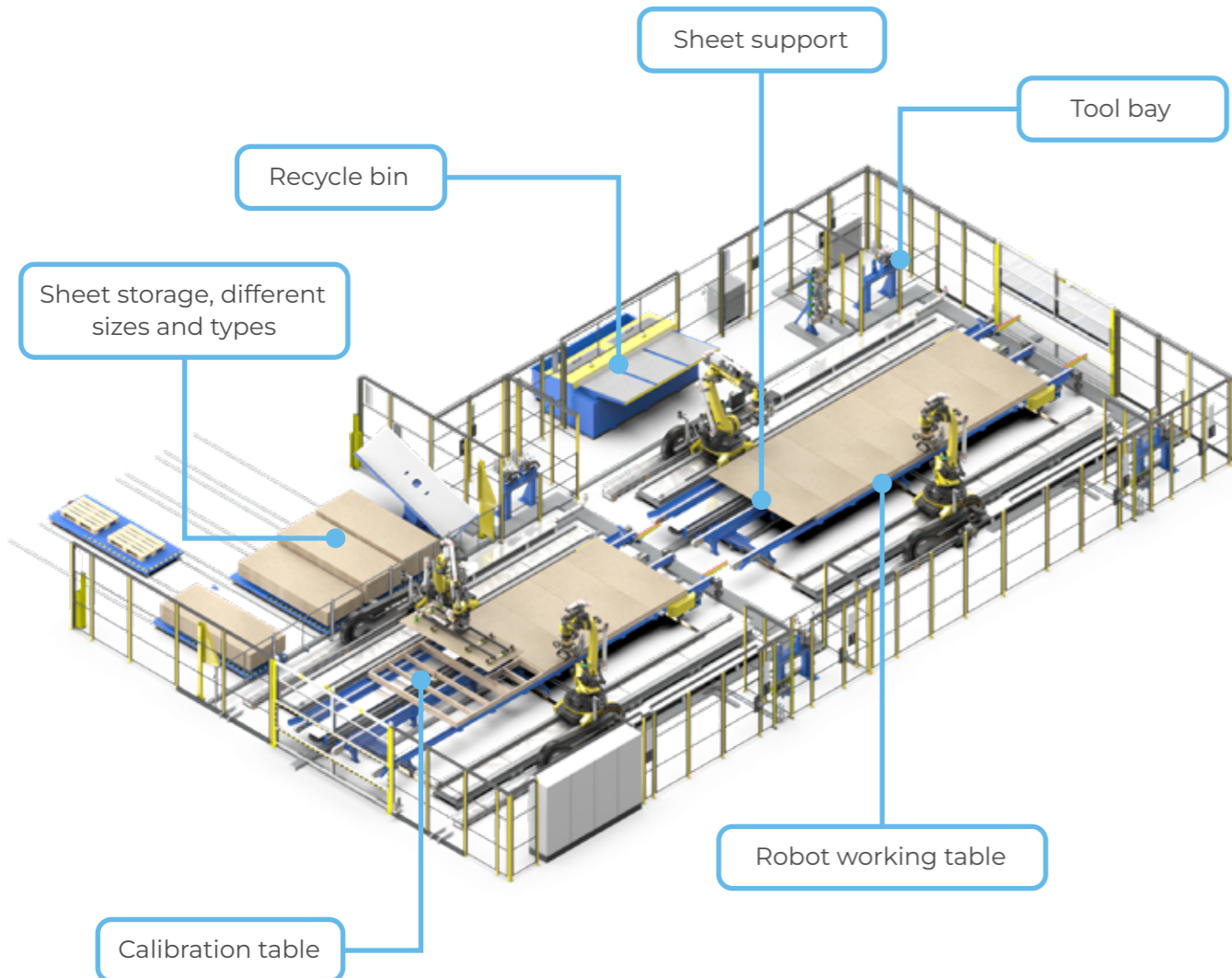
# ZEROLABOR R4 ROBOTIC SHEATHING AND PROCESSING

The ZeroLabor R4 introduces a significant capacity increase for single-layer production while retaining all the features of our versatile ZeroLabor base systems. It is designed to fully automate your production processes, including sheathing, fastening, and CNC removal of recyclable materials.

The system is integratable into larger production setups and features tongue-and-groove assembly. It provides ample space to accommodate various sizes and types of sheets.

In the ZeroLabor R4, two additional robots are added, offering even greater production capacity.

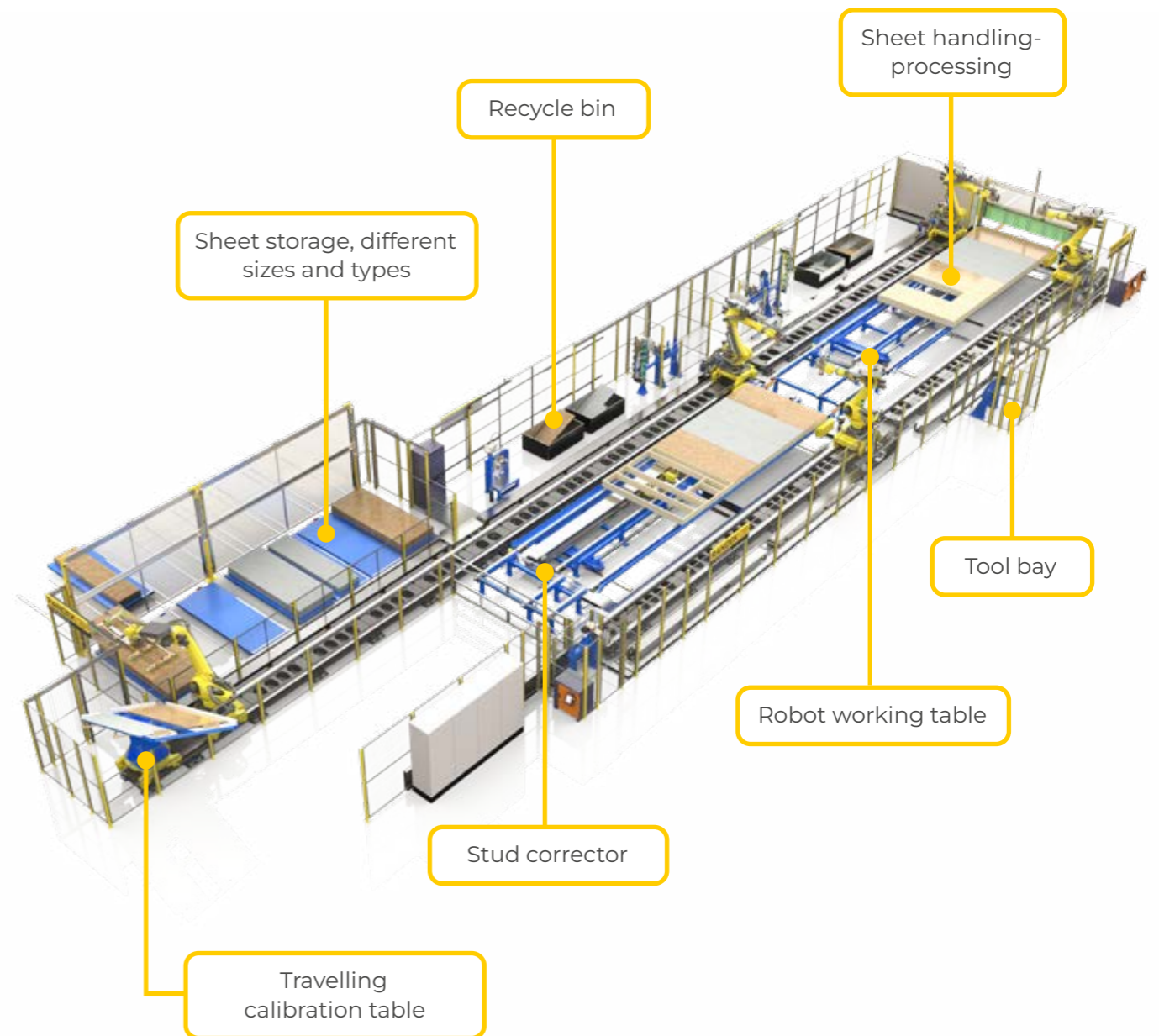
**Tools:**  
Sheathing,  
sawing,  
milling,  
screwing,  
stapling



# ZEROLABOR R5 ROBOTIC SHEATHING

In the ZeroLabor R5 there are five robots. In order to further increase your production, we integrated an extra workstation. The two workstations divide and distribute the work processes, accelerating the pace of work and efficiently sheathing multiple layers.

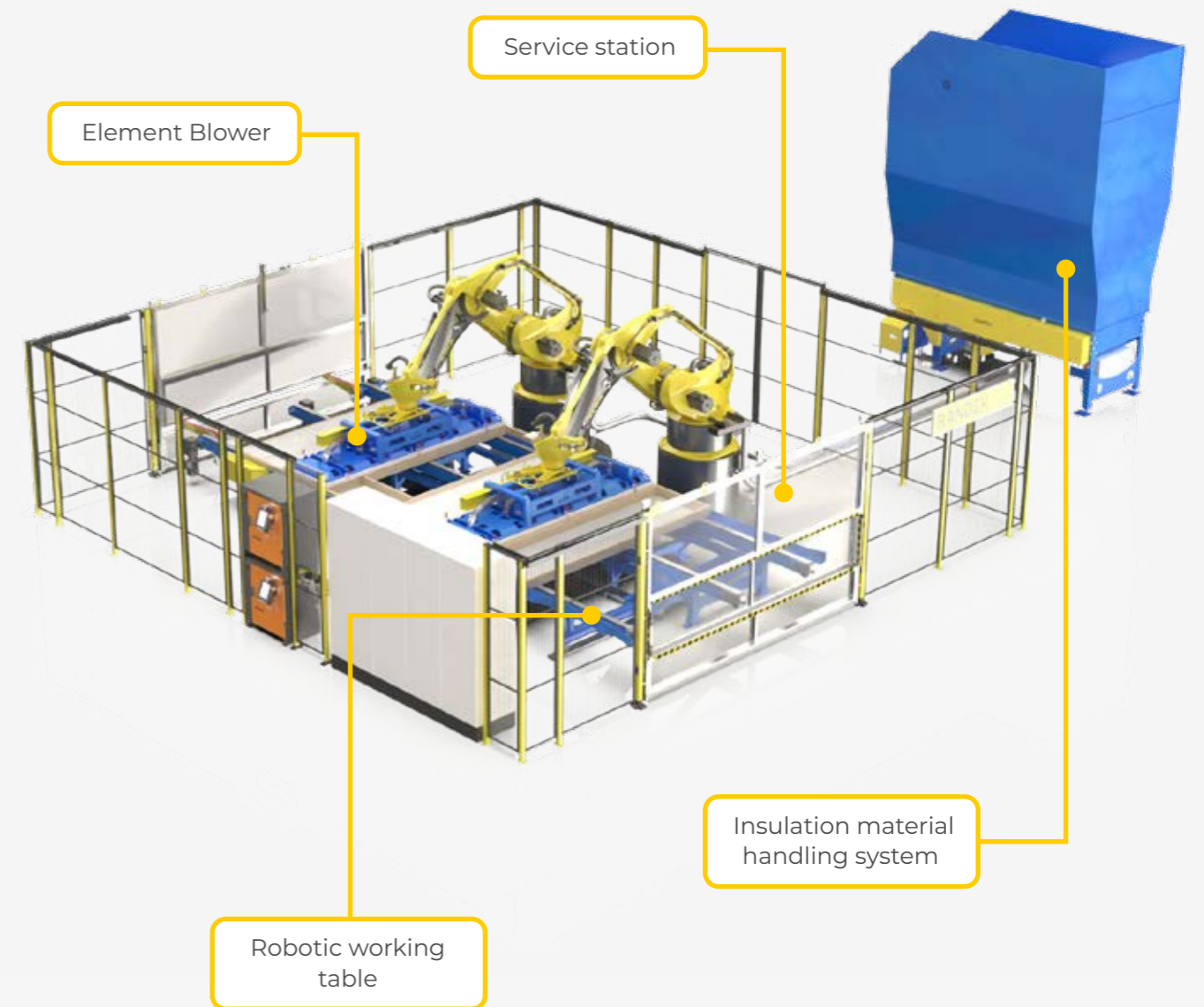
**Tools:**  
Sheathing,  
sawing, milling,  
screwing,  
stapling



# ZEROLABOR ROBOTIC INSULATION

## Application equipment

Our fully automatic ZeroLabor Robotic Insulation of elements allows you too increase the efficiency and quality of your insulating process. This becomes more cost-effective and removes the repetitive and strenuous job of manually fitting the insulation.

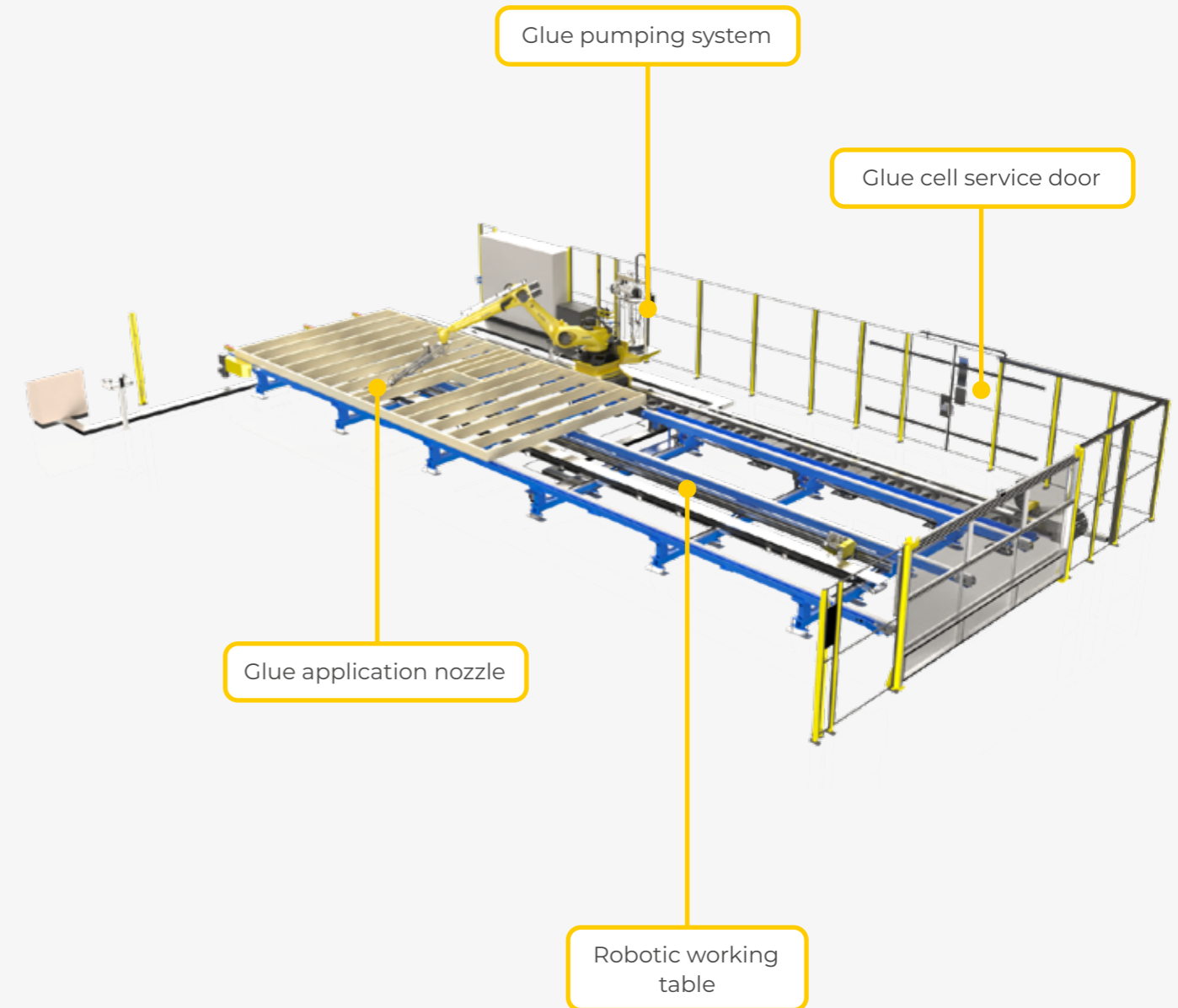
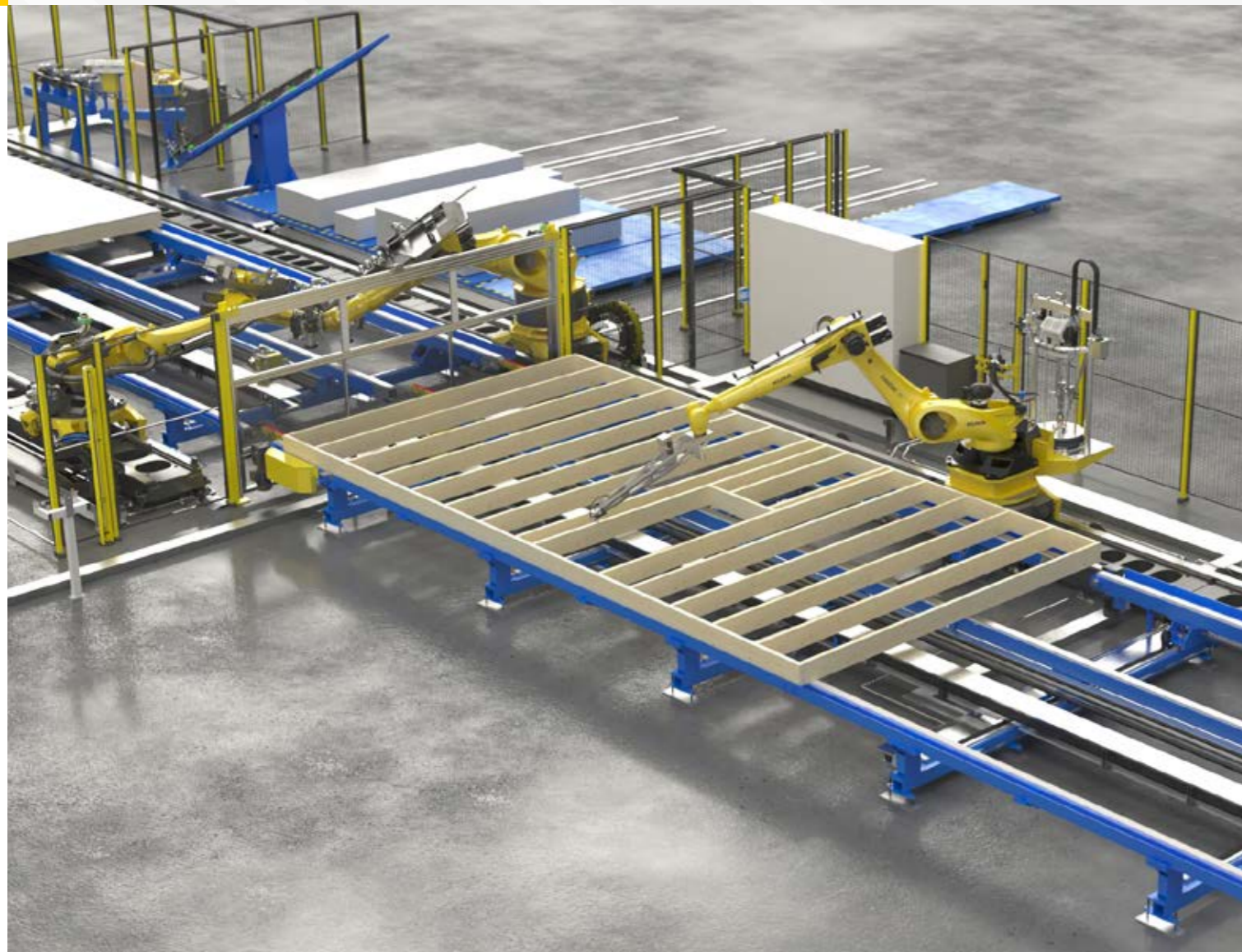


# ZEROLABOR ROBOTIC GLUING

## Application equipment

The ZeroLabor Robot Gluing reads CAD data and applies the selected type of glue smoothly, enabling you too optimize your glue quality and quantity.

It significantly reduces health and safety risks in the workingenvironment. The cell is advantageously positioned in front of a sheathing process, ensuring an optimal workflow.

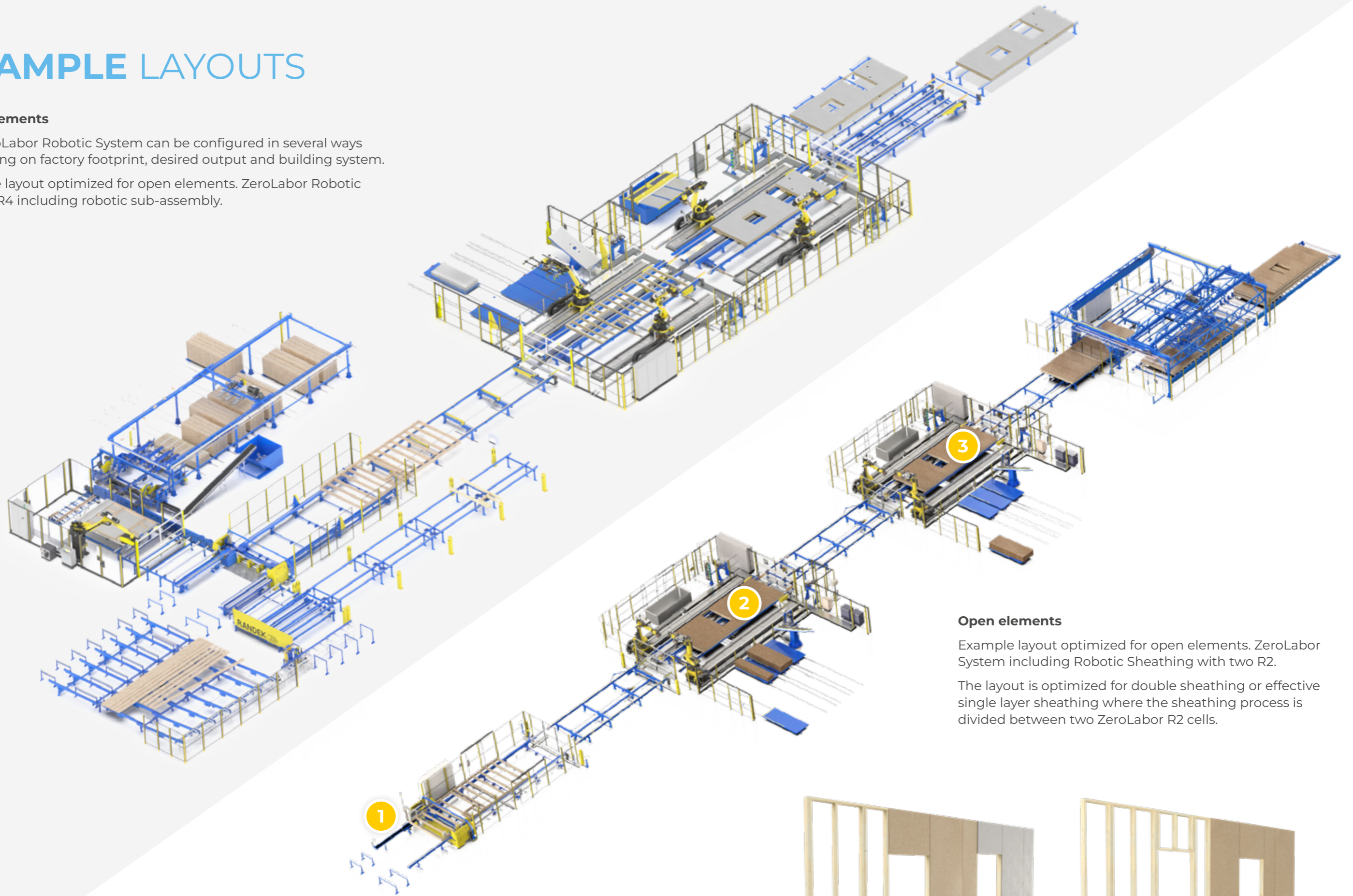


# EXAMPLE LAYOUTS

## Open elements

The ZeroLabor Robotic System can be configured in several ways depending on factory footprint, desired output and building system.

Example layout optimized for open elements. ZeroLabor Robotic System R4 including robotic sub-assembly.



## Open elements

Example layout optimized for open elements. ZeroLabor System including Robotic Sheathing with two R2.

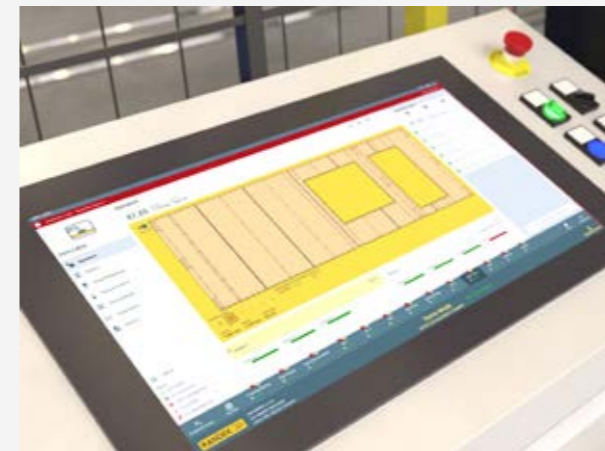
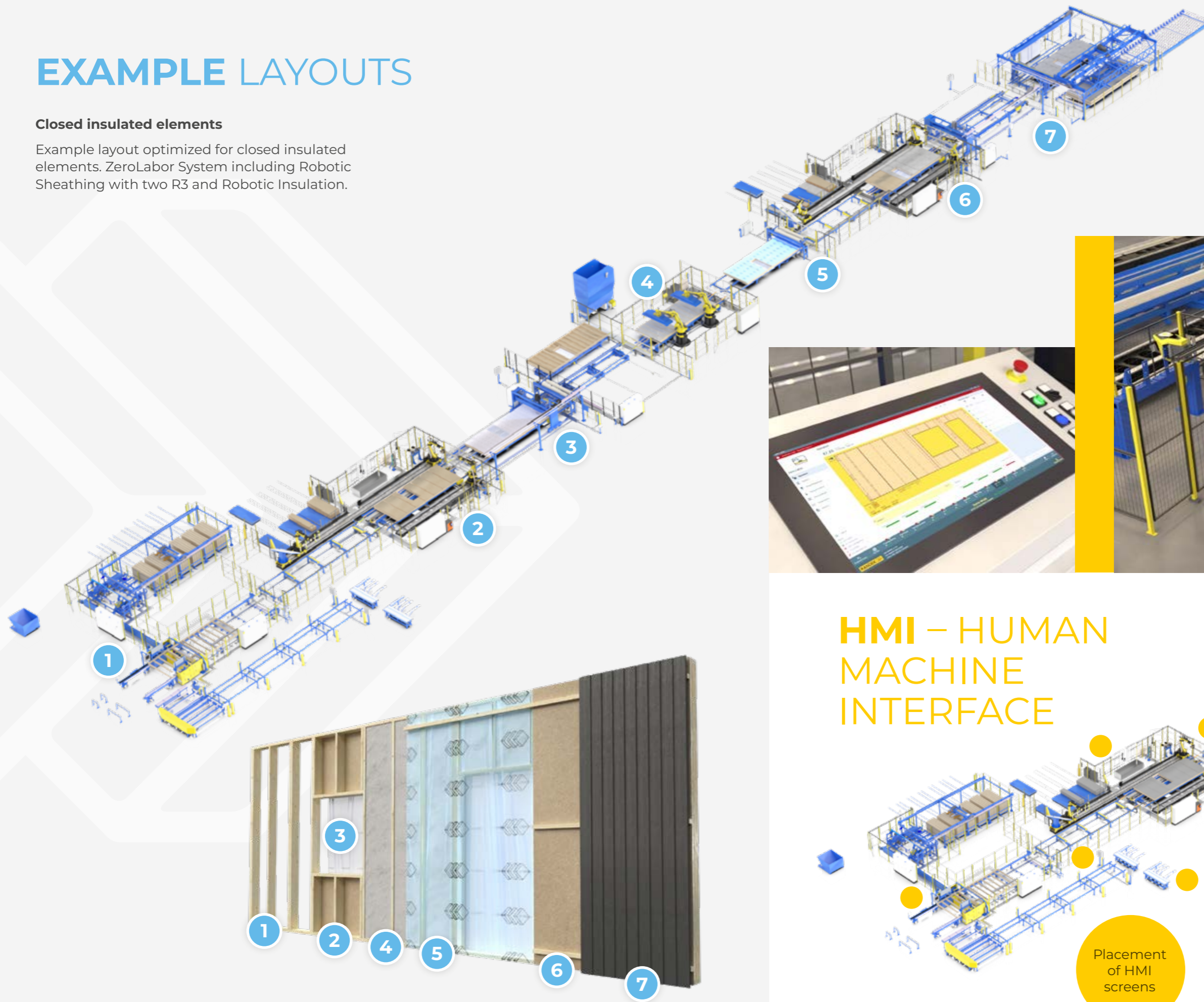
The layout is optimized for double sheathing or effective single layer sheathing where the sheathing process is divided between two ZeroLabor R2 cells.



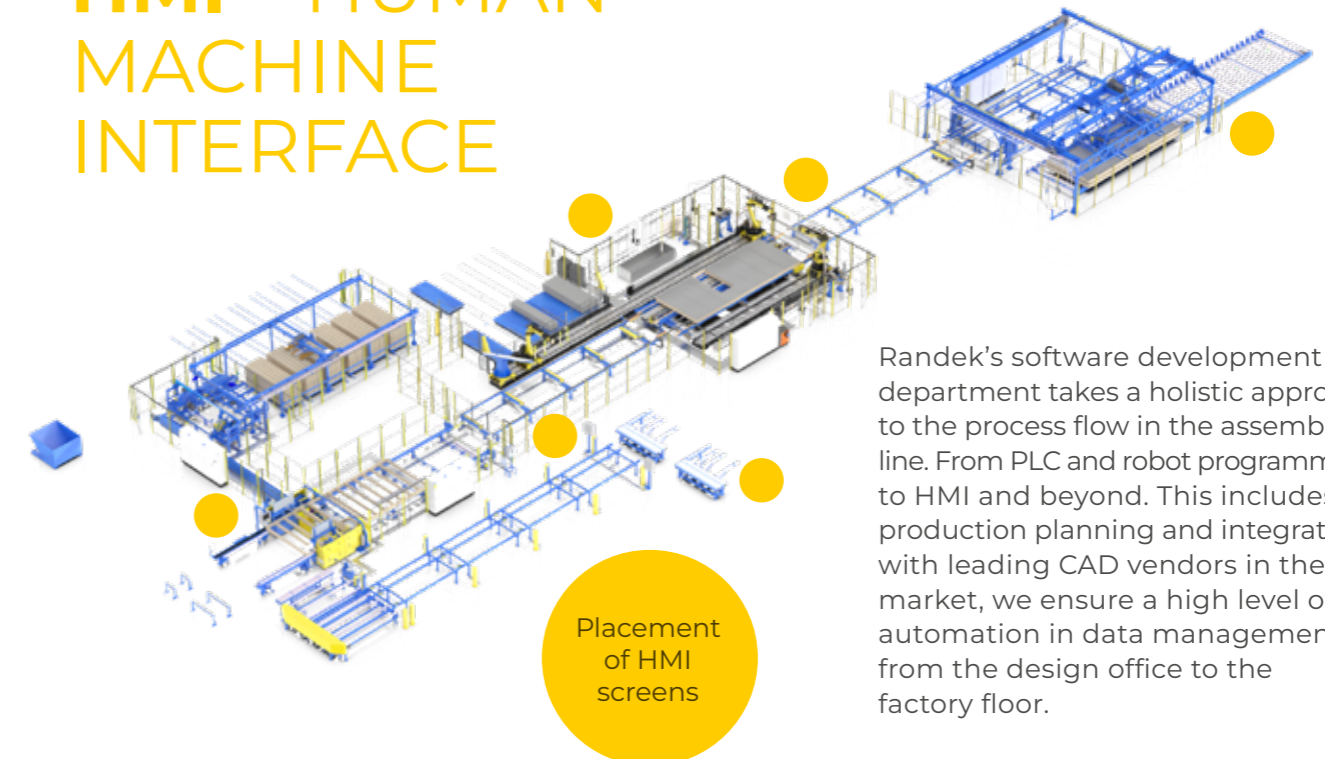
# EXAMPLE LAYOUTS

## Closed insulated elements

Example layout optimized for closed insulated elements. ZeroLabor System including Robotic Sheathing with two R3 and Robotic Insulation.

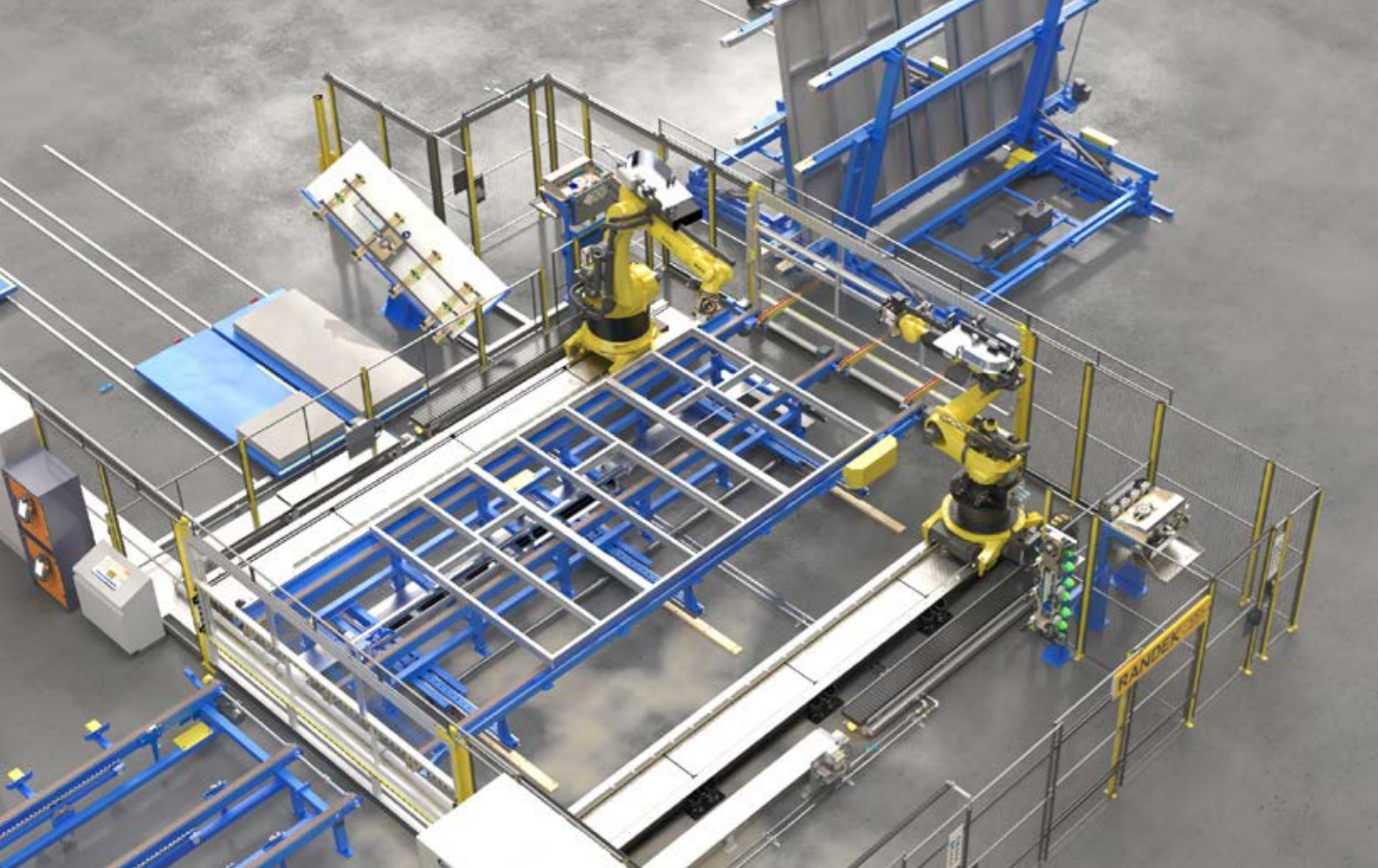


## HMI – HUMAN MACHINE INTERFACE



Placement of HMI screens

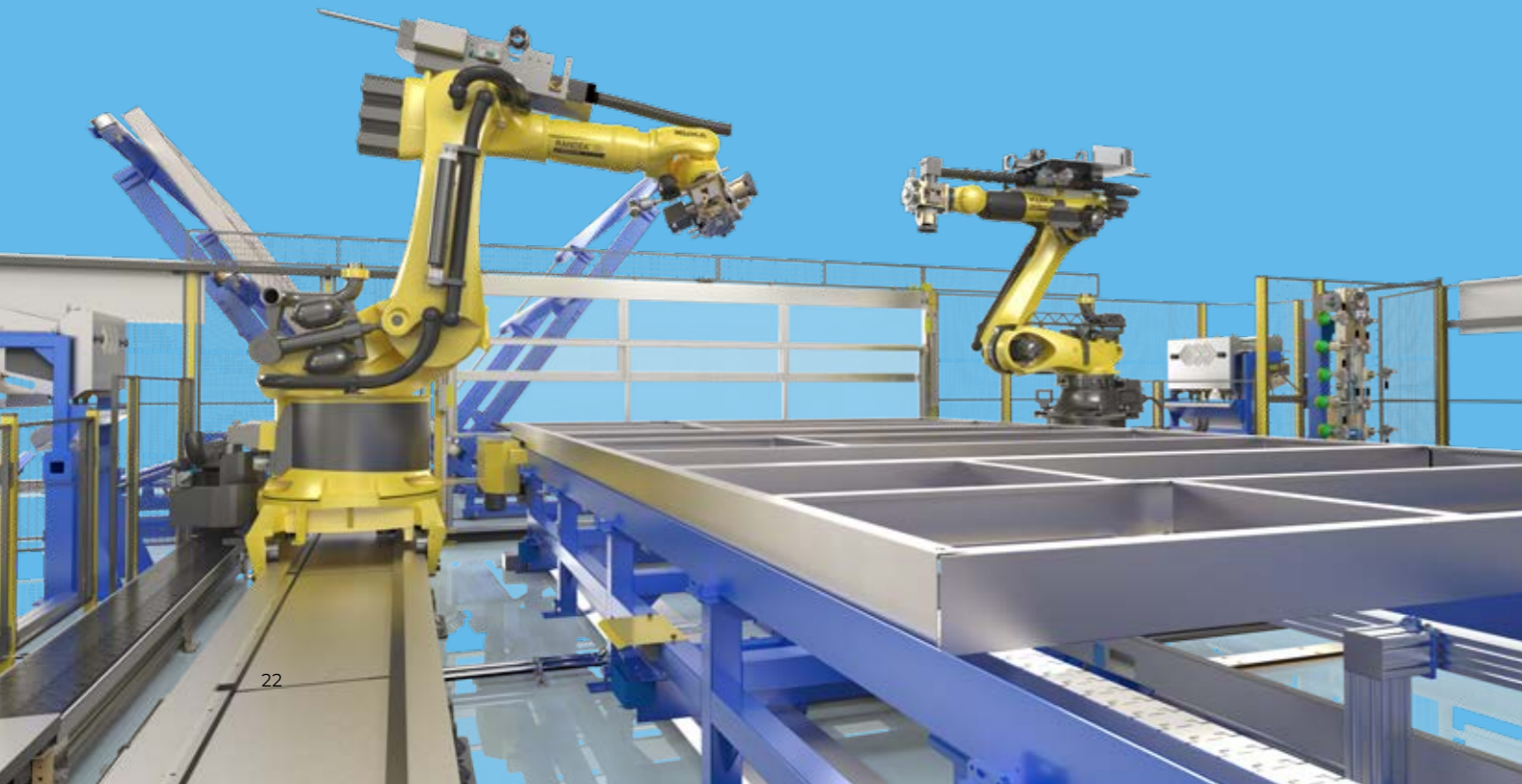
Randek's software development department takes a holistic approach to the process flow in the assembly line. From PLC and robot programming to HMI and beyond. This includes production planning and integration with leading CAD vendors in the market, we ensure a high level of automation in data management, from the design office to the factory floor.



# ZEROLABOR LIGHT GAUGE STEEL

## LGS wall frame sheathing

The ZeroLabor System is able to accommodate sheathing of Light Gauge Steel frames. With this system, you can choose the highest level of automation, for LGS frames. It provides the same benefits of quality, precision, high output, and flexibility.



## BRITISH OFFSITE

ZEROLABOR ROBOTIC SHEATHING OF LGS FRAMES. R3X2 AND ROBOTIC INSULATION. CLOSED ELEMENTS.



British Offsite, one of the UK's leading specialists in offsite light gauge steel (LGS) hybrid construction.

Their pre-programmed (via CDT files) robots produce UNisystem panels to the customer's exact specifications — time after time. Whether it's 100 panels or 1,000, each one is identical, ensuring precise and consistent quality. The result is perfectly fitting units that can be quickly lifted and bolted into place. One UNisystem SFS (non-loadbearing) panel can be installed every 15 minutes.

*"Together with Randek, we've created one of the most automated light gauge steel panel assembly lines in Europe — and one of the largest single production lines in the UK. Automation and productivity solutions are complemented by skilled operatives, and working together, they have quadrupled our production capacity to 10,000 linear meters — the equivalent of 6,000 homes per year"*

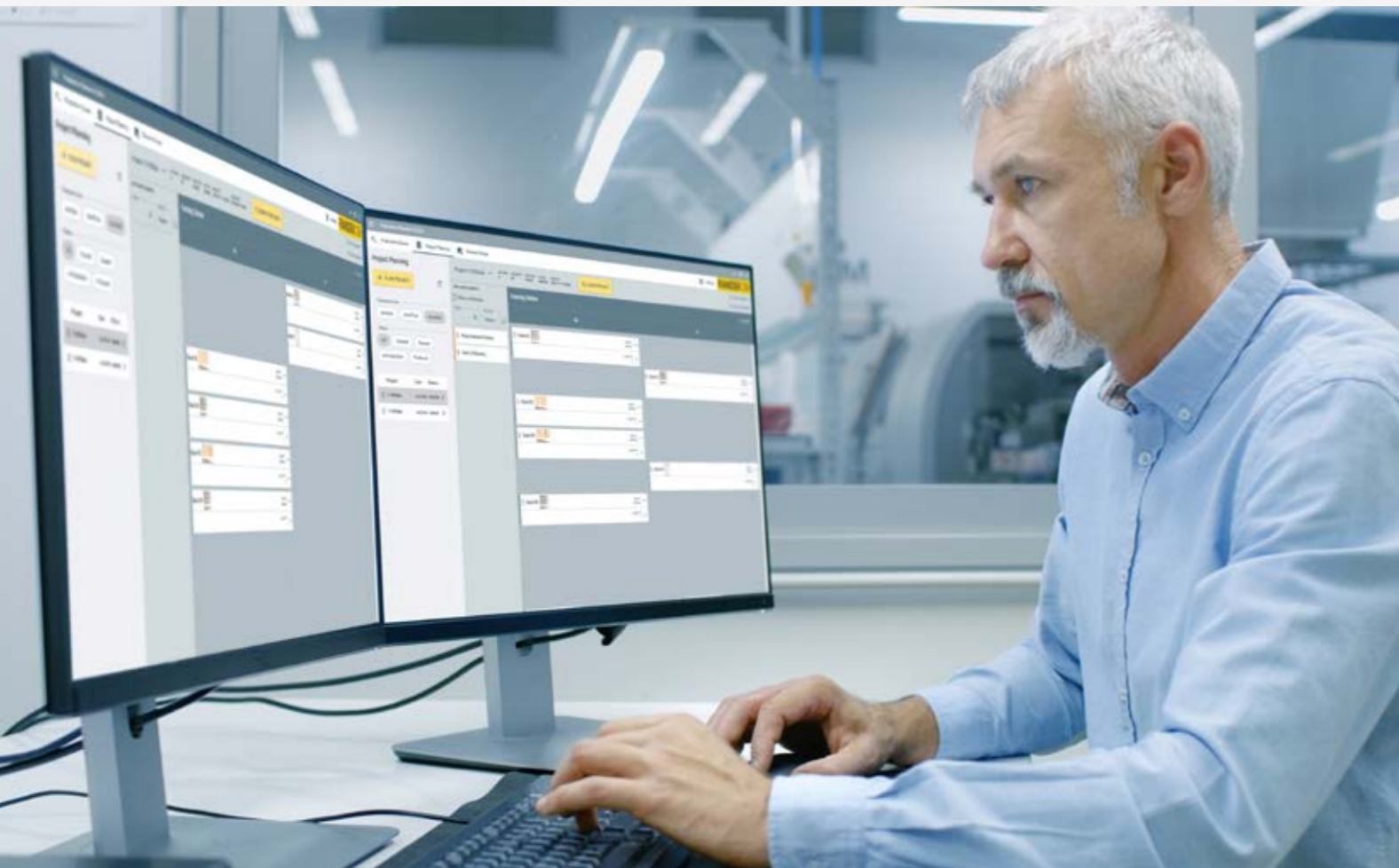
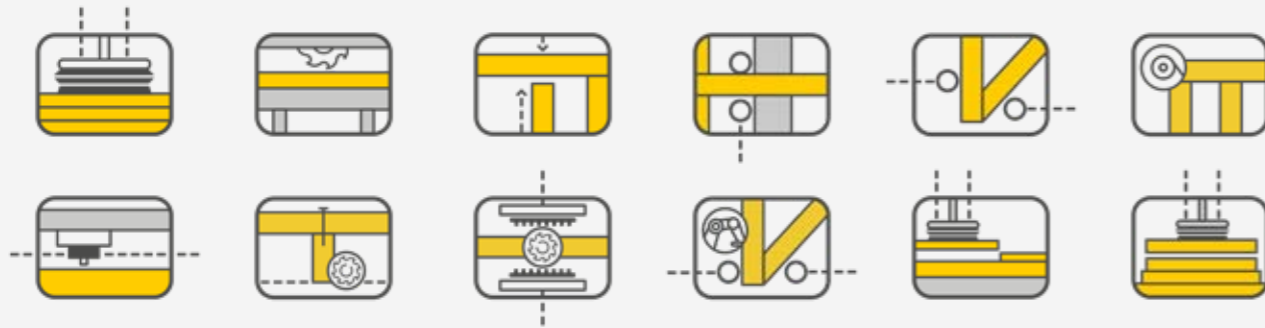
**Shaun Weston**  
Managing Director British Offsite

# RANDEK PRODUCTION PLANNER

**Production planning is an important function for all manufacturers, but it varies amongst companies.**

Randek offers easy to use planning software solutions to businesses who want to manage their production planning process more

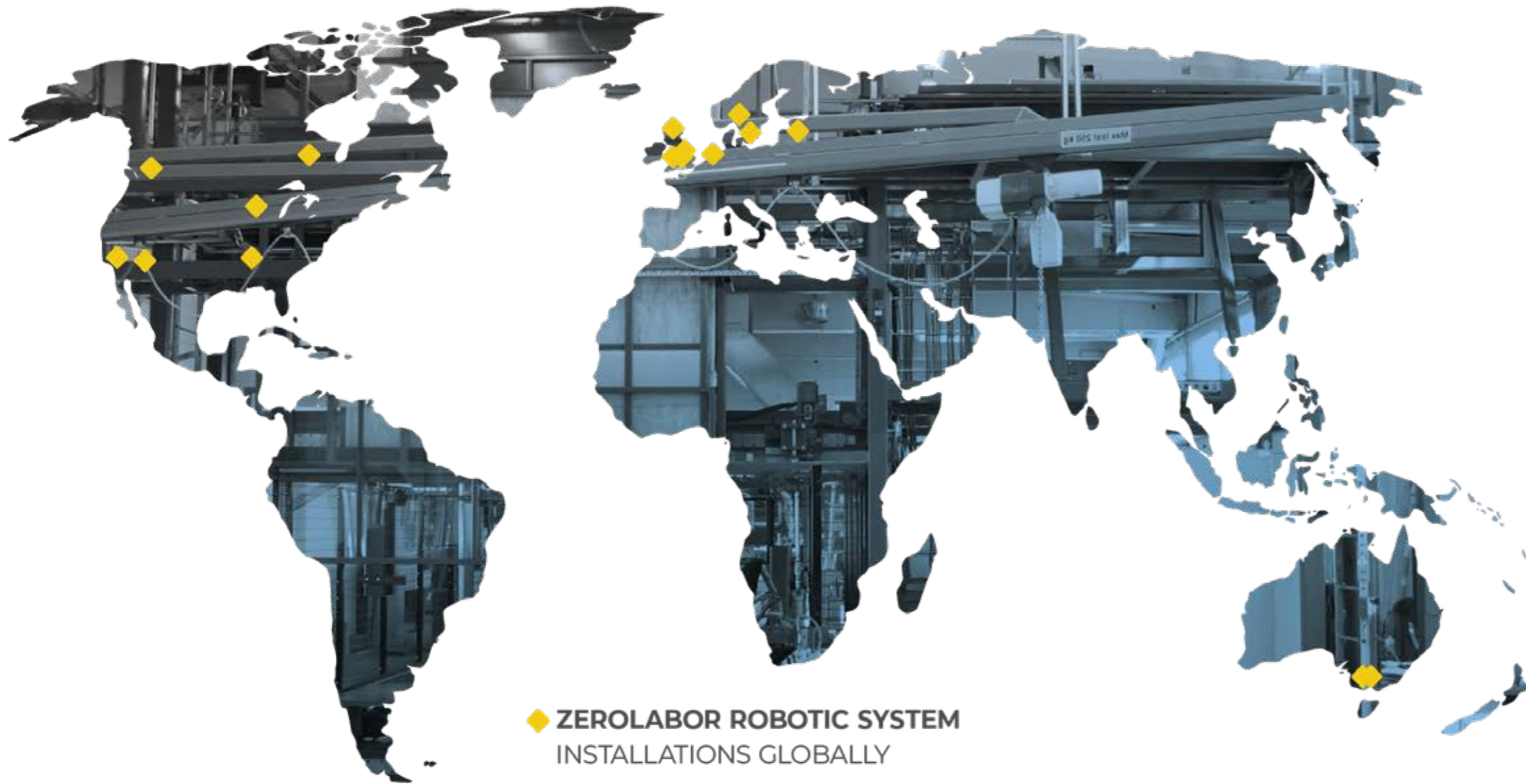
effectively, bridging the gap between leading CAD vendors and the production line. Furthermore, we provide completely automated APIs that allow ERP or SCADA systems to control the planning process via API calls.



## MY RANDEK ADVANCED IIOT PLATFORM

MY RANDEK is a comprehensive Industrial IoT (IIOT) platform designed for real-time monitoring and KPI tracking. It enables users to continuously analyze production processes, optimize workflows, and identify bottlenecks. By assessing potential upgrades and automation opportunities, **MY RANDEK** enhances efficiency and maximizes productivity.

# CUSTOMER COMMENTS



## Kodumaja, ZeroLabor Robotic Sheathing R2 Closed elements

Kodumaja mainly builds multi-story apartment buildings. They specialize in the construction of high-quality timber frame housing. They use an effective and future-oriented construction method that ensures and conforms to their strategic markets construction requirements and standards.

“Before we needed to have many quality checks in production, to eliminate human errors. The ZeroLabor Robotic System is highly automated, we can remove manual operations and quality checks which will increase our productivity dramatically. In general, it is difficult to find workers in the labor market, we need to hire people outside Estonia which is demanding. To have workers not speaking the same language is also challenging. We also struggled with the cost of introduction and training which is a significant cost to consider. We also like the fact that the system is future-proof as tools and functions can be added in the future if needed. The system is flexible if we would change the building system”

*Marti Mets, CEO Kodumaja Element OÜ*



## Arcabo, ZeroLabor Robotic Sheathing with two R2 and Robotic Gluing Closed elements

Arcabo, Europe's largest specialist in chalet construction for over twenty years and has been using Randek equipment for years and

years and invested in a ZeroLabor Robotic Cell R2. The ZeroLabor Robotic System is integrated into a wall production line and several new functions were developed during the project. The robots will handle sheets, perform cutouts, remove and sort waste, handle nailing, screwing, stapling and gluing. All automated operations are based on CAD-drawing.

“The ZeroLabor Robotic System is the most automated robotic system on the market for the production of wall elements, the system will be a great asset for us in order to increase our growth and profit!”

*Rijk Houthuijzen, CEO Arcabo*



## BoKlok, ZeroLabor Robotic Sheathing R3 plus R5 Closed elements

BoKlok, jointly owned by IKEA and Skanska chose Randek as a supplier to their modular factory. Randek delivered a highly automated

robotic wall production line consisting of in total R3 plus R5. The ZeroLabor concept was further developed to increase the overall capacity and smartness of the system.

“One of the reasons we chose Randek as a supplier of the wall production line was that they managed to present a solution that could meet our requirements regarding space efficiency, automation level, capacity and data integration (Industry 4.0). All this could be achieved by a close cooperation where further development of the ZeroLabor Robotic System was required.”

*Andreas Knutsson, Project Director BoKlok*

# SWEDISH QUALITY LASTS

Randek are pioneers in creating innovative automation solutions for customers within the prefabricated house manufacturing industry since the 1940s. Today, Randek is one of the world's leading suppliers of high-performance machines, robotic solutions and complete systems with production lines holding several world records in production capacity.

## PRODUCTS/SYSTEM



### CUT SAWS

Sturdy reliable cut saws delivered to house and roof truss manufacturers all over the world. From manual to fully automated



### WALL, FLOOR AND ROOF PRODUCTION LINES

A comprehensive product range with tailor-made systems for prefab manufacturing of walls, floors and ceilings. From manual to fully automated.



### ROBOTIC SYSTEM

Randek Robotics develop advanced systems in robotic automation. Delivering efficiency to customers in Europe, China, North and South America since the 1990s.



### ROOF TRUSS SYSTEM

Equipment for traditional and effective manufacturing of roof trusses and a revolutionising automated roof truss production system.



### BUTTERFLY TABLES

Innovative wall-turning tables. From moderate manual wall-turning tables to advanced with a range of options.

## RANDEK SERVICES



### PRESTUDY



### MAINTENANCE



### GLOBAL SUPPORT



### IIOT

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