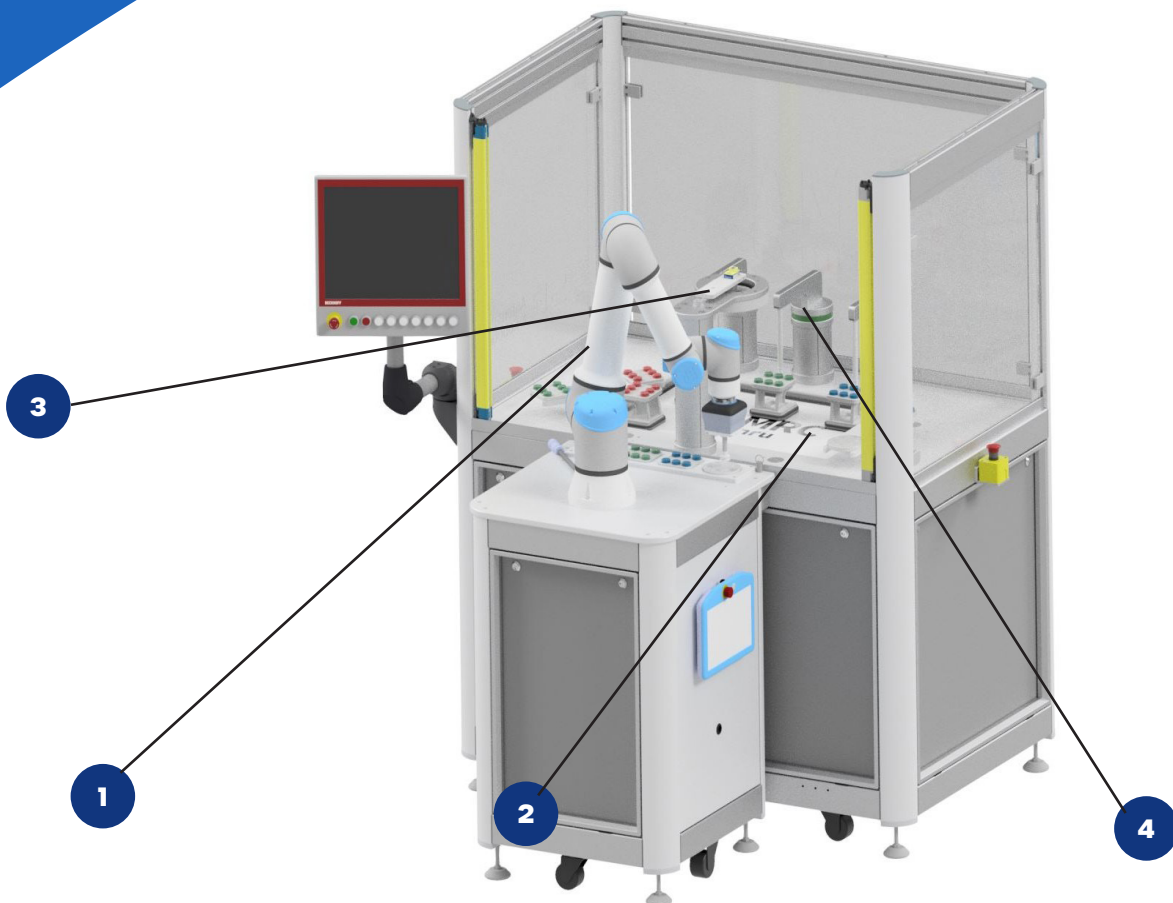


Demo System



- 1 UR Cobot with integrated vacuum pump and end effector. Mounted via docking station to ensure alignment.
- 3 Inspection station, camera captures images of pallets and pass/fail status is indicated on the Beckhoff HMI.

- 2 Beckhoff X-Planar module for product transportation - 6 tiles, 4 movers. Simulates factory logistics environment.
- 4 Loading stations with vacuum end effector, integrated LED lights show real time status.

Demo System

Our customer has helped SMEs and small businesses in Wales to advance digital and sustainable manufacturing. By delivering programmes on energy measurement and working with the country's most innovative companies, they are driving technological adoption, fostering creativity, and accelerating economic growth. They approached SP for a demonstration system after seeing ours at an exhibition.



The Challenge

- X-Planar module: 6 tiles, 4 movers, configured for Stores and Build pallets
- UR16e cobot on dockable trolley with vacuum end-effector (no external air required)
- Manual product loading via light curtains
- Vision system for build inspection
- 10 pre-drilled locations for future stations
- 3 Hold Station assemblies
- Inspection camera for verifying build patterns
- HMI for machine control and dashboards (additional monitors optional)
- System designed for easy transport



The Solution

The system was constructed around a Beckhoff X-Planar platform, serving as a scaled tabletop emulation of a smart factory. Its modular architecture allowed reconfiguration to simulate a wide range of manufacturing scenarios, integrating conventional processes with advanced automation and control systems.

Operators load "Stores" and "Build" pallets, with build pallets pre-populated with coloured discs (red, green, blue). Build patterns are selected via a Beckhoff HMI interface. A collaborative robot (cobot) transports the pallets between loading stations and the X-Planar workspace. The X-Planar movers, functioning as AGVs, navigate predefined trajectories between production cells (Hold Stations), controlled via EtherCAT with sub-millisecond synchronisation for precise positioning. Vacuum fixtures at each cell hold discs until the build pallet aligned correctly.

PLC logic coordinated pallet movement, build sequencing, and inter-device communication, while sensors, including proximity, optical, and torque feedback, ensure safety and accuracy. A machine vision system performed high-resolution inspection, verifying disc placement and pattern fidelity. Completed builds and store pallets were offloaded automatically.



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For more information or to discuss your bespoke solution get in touch.

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