**Sample application – a “flying saw”**

**Simple synchronisation for transporting and machining workpieces**

**Synchronising two independent processes with relative ease – item shows exactly how this works using the example of a range extender. Simple, lower-cost implementation is made possible by intelligently linking a cobot, linear technology and conveyors with high-resolution signal processing. No higher-level controller or complex programming is needed. The result is a seven-axis system that is ready for use in next to no time, with high tolerance for changes in speed.**

Designing leaner processes and optimising workflows – this lean production goal can be achieved in various ways, including by synchronising processes. The “flying saw” is one example of this. Originally a term used in the wood processing industry, this principle describes the machining of material while it is being transported. The saw moves synchronously with the conveyor belt, cutting logs as they are transported. However, synchronising processes can help with many jobs – not just cutting logs, but a whole host of industrial applications, too. Whether it be pick-and-place tasks, sorting, separating and inspecting materials, or aligning components, synchronisation leads to faster work processes and, therefore, shorter processing times.

**The ideal components for any application**

Synchronised processes optimise the throughput of goods – and can be achieved fairly easily by combining aluminium profiles from the item Building Kit System with linear, conveyor and robot technology. High-resolution signal processing means synchronisation can take place without any need for a complex controller. All the components can be linked together in a simple, straightforward way, thanks to the system groove and matching fasteners. [Conveyor belts](https://de.item24.com/en/theme-world/conveying-technology/conveyor-belt-system/) suitable for a range of speeds and available in a variety of lengths, widths and surface finishes can be adjusted to suit different requirements. The item portfolio also includes a large selection of [Linear Units](https://de.item24.com/en/theme-world/automation/), so customers can pick the one that best suits their application. These units are customisable and capable of moving different robot styles. The linear technology satisfies a range of requirements in relation to speed, payload, precision and stroke length. item also uses other components, including a rotary encoder and a photoelectric sensor, to make the synchronisation of two independent processes a reality.

**Implementing the “flying saw” principle with ease**

For the [range extender sample application](https://www.youtube.com/watch?v=ffimEHgfU6o), item installed a cobot on a Linear Unit that moves in parallel with a six-metre-long conveyor belt. The substructure for the entire system is made out of aluminium profiles from the item Building Kit System. Fully in keeping with the “flying saw” principle, there is a carrier for the workpiece that is machined while it is being transported on the conveyor belt. The cobot picks up components from the belt and rearranges them. At the start of the process, the workpiece passes through an installed photoelectric sensor, which triggers the start of the rest of the process. The trigger signal is transmitted to the controller. As soon as the synchronous position has been achieved, the robot controller receives the command to start work. A rotary encoder constantly transmits the speed of the conveyor belt to the controller, thereby ensuring that the conveyor belt and Linear Unit are always moving synchronously. The rotary encoder is continuously evaluated by the controller, so target and actual values are compared on an ongoing basis. If the speed of the conveyor belt changes, the speed of the Linear Unit also changes to match, balancing out any minor fluctuations. The item drive and control technology means the machining task can be accomplished quickly. The sensor underneath the conveyor belt records the belt’s speed with high precision. It is connected to the controller and programming is easy, thanks to the item MotionSoft® commissioning software. The system is ready for use immediately. “Our controller supports the digital interface. It collects data about the speed of the conveyor belt and transmits it to the Linear Unit,” explains Uwe Schmitz, Head of Product Management at item. “The Linear Unit always moves synchronously with the conveyor belt, so the robot appears to be working in a static position in relation to the workpiece.” The system extends the robot’s working range, resulting in a dynamic working environment with seven axes. When a system of this kind is designed in a conventional way, a multitude of individual components and assemblies need to be coordinated perfectly in order to satisfy the mechanical, electronic and data technology requirements. This requires a huge amount of planning and design work, and the controller is complex.

**Reducing design and implementation work to a minimum**

In contrast to the conventional approach, item, with its modular Building Kit System, offers users the option of developing customised solutions based on preconfigured models. This means users do not need to have a detailed understanding of each individual component. Components are all compatible and can be combined or extended as required. This substantially reduces the design work involved and a variety of applications can be implemented. Combining a robot arm and Linear Unit, but without a conveyor belt, is also an option. In this case, the robot moves from one station to the next, carrying out pre-programmed sequences at each one. What’s more, the [Building Kit System from item](https://de.item24.com/en/theme-world/robotics-applications/) is not linked to any particular robot manufacturer, so it can be used in conjunction with any type of robot. Factory equipment engineers therefore have many different options available to them for creating custom solutions for different tasks in a straightforward way.

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**Caption 1:** For the range extender sample application, item installed a cobot on a Linear Unit that moves in parallel with a six-metre-long conveyor belt.

**Caption 2:** The cobot picks up components from the belt and rearranges them. At the start of the process, the workpiece passes through an installed photoelectric sensor.

**Caption 3:** The conveyor belt and Linear Unit always move synchronously. Minor fluctuations are balanced out immediately.

**Caption 4:** The item drive and control technology means the machining task can be accomplished quickly. The sensor underneath the conveyor belt records the belt’s speed and is directly connected to the controller.

**Caption 5:** Programming is easy, thanks to the item MotionSoft® commissioning software, and the system is ready for use immediately. item, with its modular Building Kit System, offers users the option of developing and implementing customised solutions based on preconfigured models, with relative ease.

**About item**

item Industrietechnik GmbH is the pioneer in building kit systems for industrial applications and a partner of the manufacturing industry across the entire globe. Today, the item product portfolio comprises more than 4000 high-quality components designed for use in machine bases, work benches, automation solutions and lean production applications. The company has received a string of awards for products with ground-breaking industrial design and end-to-end ergonomics.

item is spearheading digital engineering by driving forward the digitalisation of processes with software tools developed in-house. The item Academy offers training at various levels, with on-demand training and online courses available in multiple languages.

Headquartered in Solingen, Germany, item has subsidiaries in various countries. Some 900 employees worldwide harness their know-how and passion to develop innovative solutions and services. Twelve sites make sure the company is always close to customers in Germany, with a global logistics chain ensuring swift delivery times for all components.

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