

LINEAR SYSTEM LS HYBRID



INSPIRING PEOPLE **GREAT SOLUTIONS**

ECONOMICAL, PRODUCTIVE & INNOVATIVE. MORE THAN THE SUM OF ITS PARTS.

// Compared with a classic pallet transfer system or cycle chains, the LS Hybrid has unique characteristics that make this system ideally suited for flexible and economical production that is quick and easy to place into operation.

Significant reductions in transport times: Compared to conventional systems on the market, the LS Hybrid is flexible. Faster assembly stations can be served sequentially, while slower stations can be supplied with components in parallel. This flexible and asynchronous transfer system solves the task at hand with a high level of efficiency and reliability, even where space is limited.

Up to 60 cycles/min can be processed within a significantly smaller system footprint. For production environments where there is a distribution of non-uniform processing times between the individual stations, the LS Hybrid compensates for these time differences.

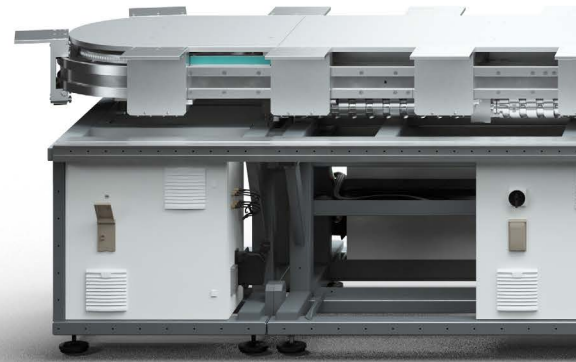
With a load capacity of up to 10 kg and a tooling carriage size of up to 500 mm, the LS Hybrid provides for a wide range of options and processing possibilities. In addition, very high process forces of up to 1000 N can be applied to the tooling carrier without additional support due to the mechanical interlock, critical for operations such as a press-fit process, for example.

There is also a lot to be said for the simple commissioning: With the integrated control system and WEISS Application Software (W.A.S.), the drives can be configured and controlled quickly and easily without the need for specific expertise or experience. Variants and change-over times are also reduced in terms of effort, since the parameters are easily adjusted with W.A.S. The result is that smaller batch sizes can be managed with significantly shorter product throughput times.

WEISS further increases productivity by enabling simultaneous processing of parts without disrupting the overall production flow, thereby reducing downtime. The individual decoupling of stations and modules is significantly increased and allows for a wide range of mechanical vertical integration. [discover more](#)

OUTSTANDING CHARACTERISTICS. **THE FACTS AT A GLANCE.**

Versatile, flexible, efficient: With its modular design principle, the LS Hybrid transfer system sets standards in the adaptation of application requirements. Depending on the process step, the suitable module with the appropriate drive technology can be used for economical production.



Technology

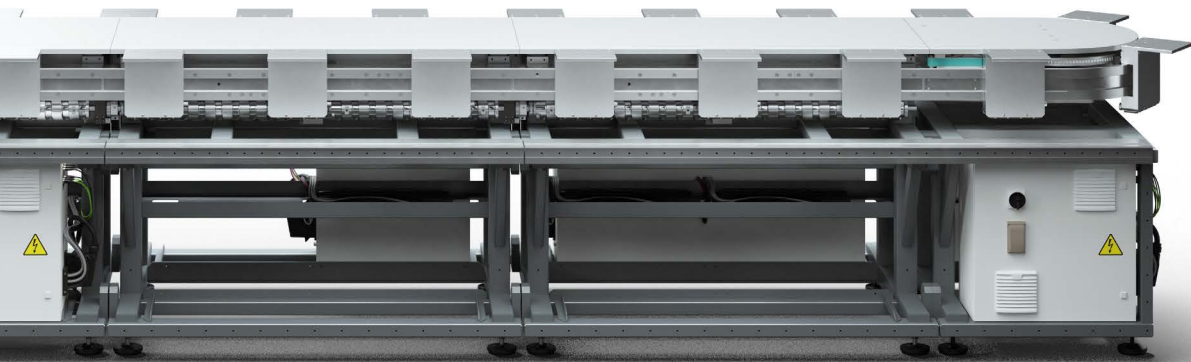
- Superimposed motion profiles of cylinder curve and servo motor
- Approx. 60 cycles per minute, depending on stroke and process time
- Jerk-optimized motion profile
- Absolute locking without additional indexing
- Wide range of parts due to loading up to 10 kg
- Position, acceleration, speed, and direction of movement are freely programmable
- Flexible system configuration
- High precision ($\pm 3/100$ mm in X, Y and Z)
- Almost seamless stringing together of any number of eCam Modules with the same stroke possible

Productive Benefit

- Performance Increase : 20 % higher number of cycles
- Dynamics : 40 % shorter transport times
- Efficiency : more processes in less space
- Process Reliability : fast workpiece transport with the high process capability of the transfer system
- Pure Customer Orientation : demand-oriented investment
- Plug-and-Produce: fast commissioning of the system

Made by Weiss

- Patented innovation with eCam Module
- Flexible system configuration based on a modular design principle
- Hybrid drive concept with eCam, Belt, Linear and Corner Module for a customer-specific requirement
- WEISS Application Software (W.A.S.) makes commissioning quick and easy



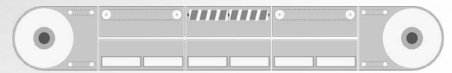
Configuration Example



Precise Positioning LS Hybrid with 2 eCam Modules on each side. For application requirements with consistent indexing at highest precision and dynamics.



Maximum Flexibility & Dynamics LS Hybrid with 3 Linear Motor Modules on each side, for freely definable positioning and process patterns as well as motion sequences with high accuracy requirements and cycle rates.



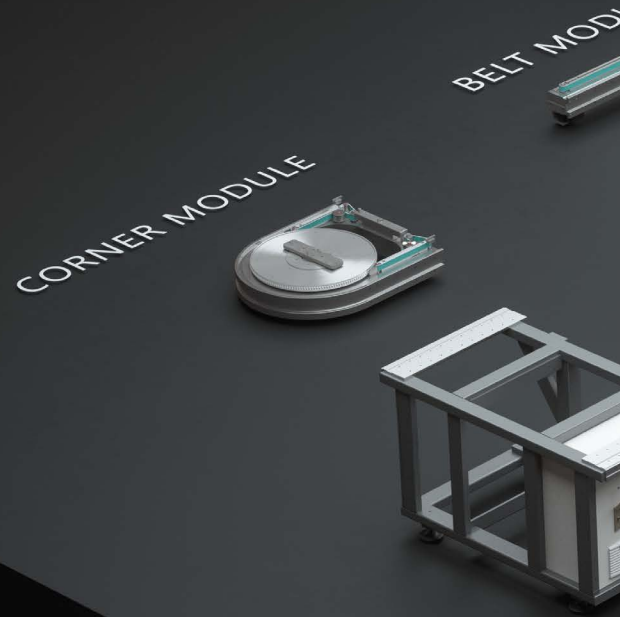
Modular Construction LS Hybrid with 3 Linear Motor Modules on one side and 1 eCam Module on the opposite side, decoupled via 2 Belt Modules for bridging. For application requirements with freely definable motion sequences and fixed interlocked processes in combination.



Fast Return LS Hybrid with 8 eCam Modules on one side for application requirements with consistent indexing at highest precision and dynamics. 8 Belt Modules on the opposite side provide the fast return.

[discover more](#)

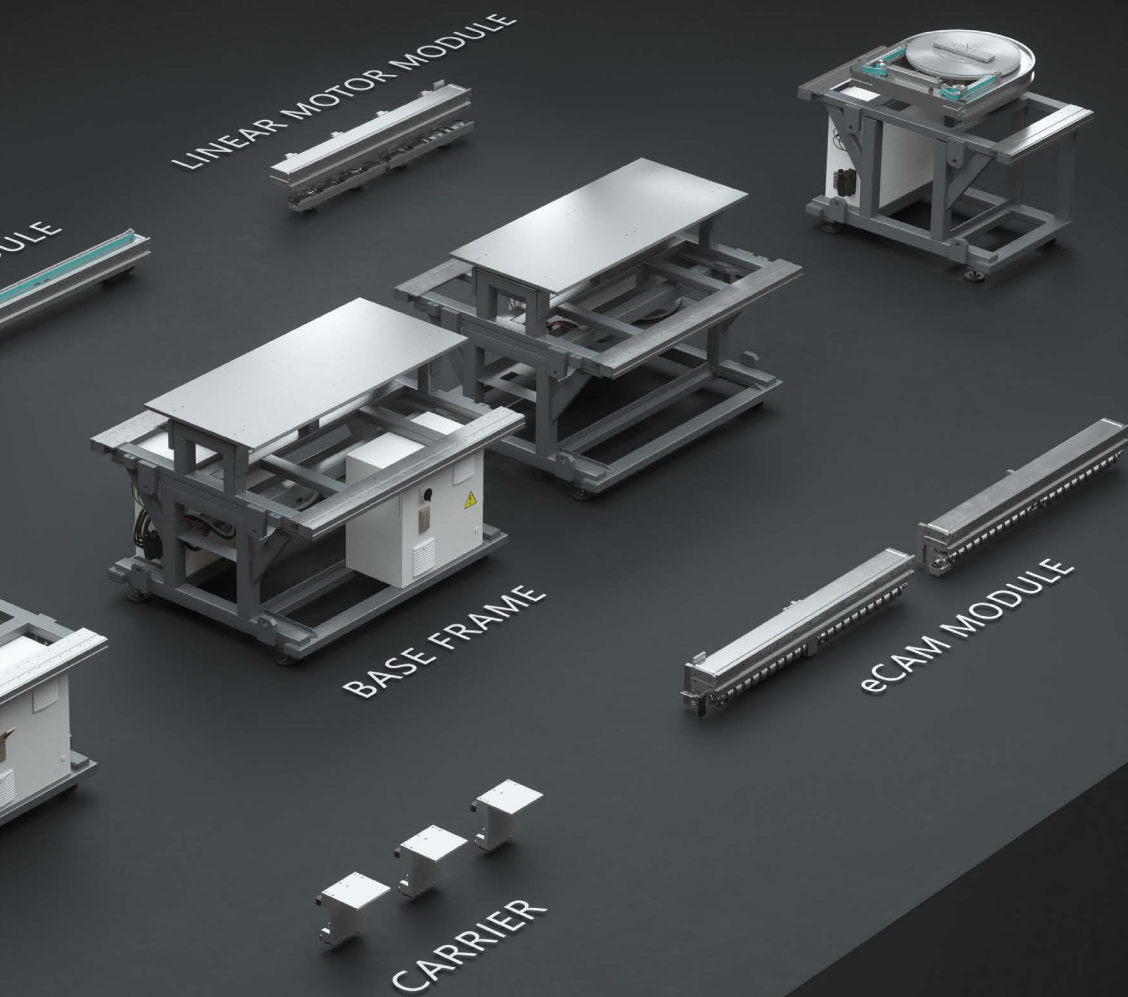
PRODUCTIVITY THROUGH MODULARIZATION. HYBRID DRIVE CONCEPT MADE TO SIZE.



Regardless of whether it is a cam drive, direct drive, corner or conveyor section - the LS Hybrid transfer system can be assigned individual movement profiles in the system, which gives production completely new perspectives. Precise and independently moving shuttles can be moved with intelligent system software in such a way that an increase in productivity with up to 40 % shorter transport times is possible: whether by combining product flows, parallelizing processing stations, or increasing error tolerances. Overall, more processes can be arranged in less space.

The LS Hybrid is the only transfer system on the market with cam, linear and belt drive. Various drive combinations from WEISS are available for selection, offering tremendous flexibility in automation technology with regard to the drive type – all on one platform. For example, from a technology perspective you can design the standard transport as cam-controlled and just as easily equip the processing side with linear drives in a highly flexible and dynamic way.

The system can be aligned with various production philosophies and requirements thanks to its modular design. Oval production lines can be opened, for example, either with machining on both sides or with a linear design (machining and process on one side with efficient and fast return transport on the other side).



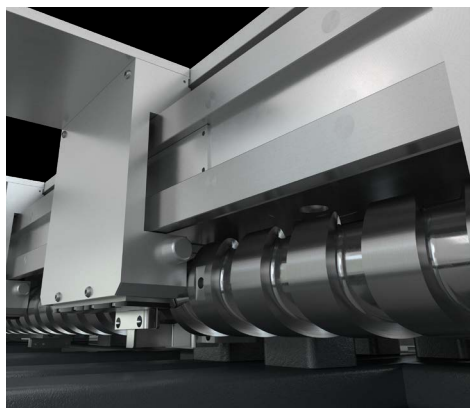
A further advantage is that the Linear Motor Module can also be used as a third axis, performing a dispensing process for example, due to its flexible control.

The "Hybrid" in LS Hybrid not only stands for a hybrid drive system, but also for "hybrid productivity". It combines fast, precise component transport with the high process capability of the transfer system. Thus, the heavy-duty guides and the drive technology, which can be individually adapted to the application, enable customer processes to be executed virtually in one motion sequence. No other transfer system currently offers this combination and process capability.

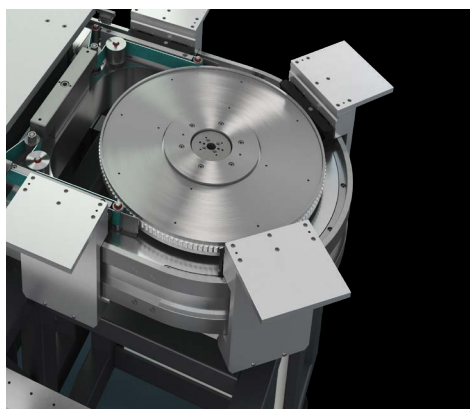
Application orientation through mechanical functional diversity as well as fast Plug-and-Produce through control via WEISS Application Software (W.A.S.) make the LS Hybrid system a mechatronic unit. Commissioning, as well as operation and diagnostics, are optimally supported. Communication between the W.A.S. and the higher-level machine controller can take place via several common communication interfaces (EtherCat, ProfiNet and EthernetIP).

APPLICATION
NEEDS IN FOCUS.
**CUSTOMIZABLE
MOTION PROFILE.**

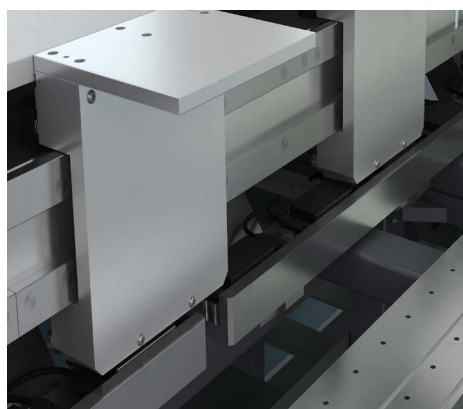




eCam Module The central innovative component of the LS Hybrid system is the patented eCam Module, which combines the classic cylinder cam with a servo motor. The motion sequence of the tooling carriers is no longer determined exclusively by the cam path, but by superimposing the motion profiles of the cam and servo motor. Compared to a pure servo drive, this results in extremely short locking phases, significantly higher dynamics, very precise positioning, and the potential for endless stringing together of curves with the same stroke. This results in significantly shorter transport times. Other features include very high precision ($\pm 3/100$ mm in X, Y, and Z), four stroke variants with 64 mm, 128 mm, 256 mm, and 512 mm (depending on the stroke), and a jerk-optimized motion profile.



Corner Module The LS Hybrid can also be used to position tooling carriers at the corners, for example, loading and unloading. In addition, valuable production space is saved thanks to usable "positions in corners".

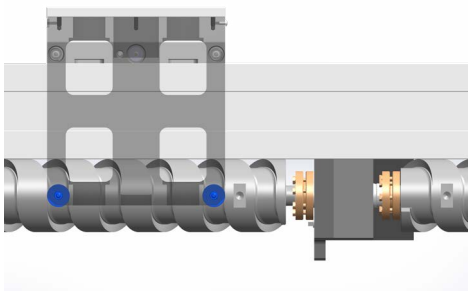


Linear Motor Module Each tooling carrier can be independently and freely programmed with the Linear Motor Module: position, acceleration, speed, and direction of movement. With the Linear Motor Module, all motion sequences become highly flexible. This means that handling can begin while the transfer system is still moving. Certain processes are even possible at full speed. For certain machining operations, the Linear Motor Module replaces an additional process axis. The tooling carrier can be programmed to move forwards and backwards, virtually synchronized with the handling component.



Belt Module Controls the transport between process stations with different lengths, either as a single belt or as a double belt module. The latter can travel at different speeds along the line.

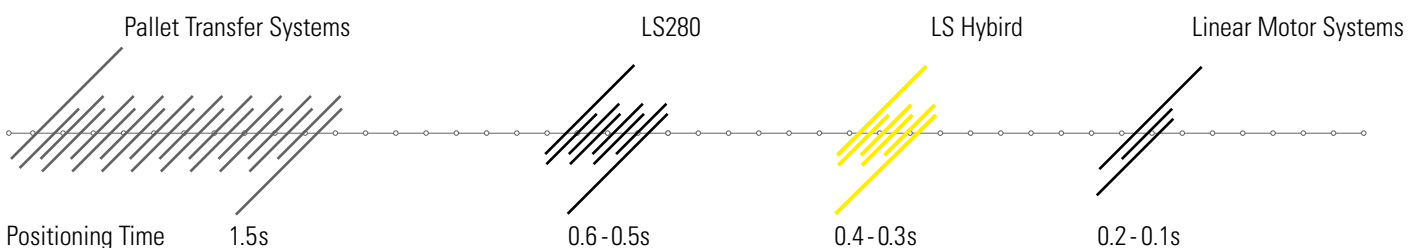
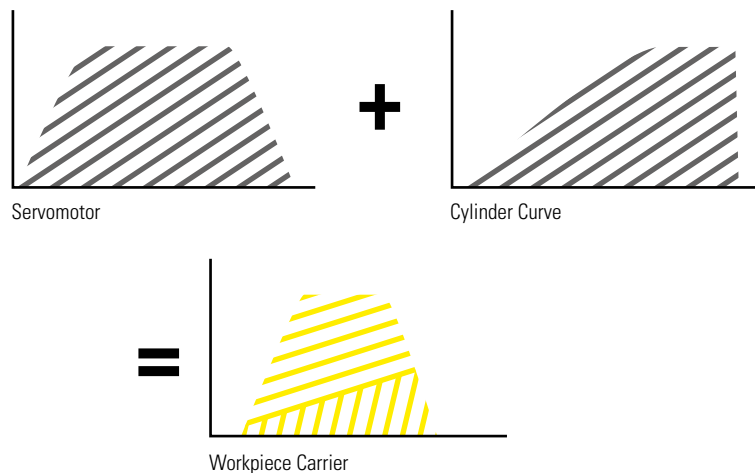
SUPERIMPOSING OF MOTION PROFILES.



The Next Generation Transfer System By means of a cylindrical cam, the tooling carriers can be gripped, transported and mechanically locked with absolutely no play in a single movement process, without additional locking units. The direct transfer of the cam movement to the tooling carrier results in a significantly faster travel path compared to a conventional conveyor belt. Precise coordination between cam, running surface and carriage ensures short transport times and maximum accuracy in all directions during positioning at the process station.

The Transfer System with Unique Motion Profile

By superimposing the motion profiles of the cylindrical cam and servomotor, the motor is permanently maintained at the optimum operating point. On one hand, this results in significantly shorter tooling changeover times and on the other hand (depending on process time, cycle stroke, and loading) a higher production output of approx. 60 cycles/min. This makes the LS Hybrid a leader in the market in terms of flexibility.



COMMISSIONING + PRODUCTIVITY = ECONOMIC EFFICIENCY. THREE CLEAR ADVANTAGES.

Commissioning



Plug & Produce – tested, ready to work and easy to integrate.

Smart Subsystem

Completely wired transport system that can be quickly integrated into a production line as a subsystem.



WEISS Application Software

W.A.S. control for easy & fast commissioning as well as diagnostics without special expertise.

Productivity

60cycles

per minute

= **performance increase**

40%

shorter transport times and approx. 60 cycles/min

= **enormous dynamics**

10kg

payload

= **wide range of components**

Process Capability

The “Hybrid” in LS Hybrid stands for a hybrid drive system, but also for “hybrid productivity”. It combines fast, precise tooling transport with the high process capability of the transfer system. No other transfer system currently offers this combination and process capability.

Profitability

A demand-oriented investment that is specific to an application yet quickly convertible to other applications all in a compact in space. The whole is more than the sum of its parts, because with the LS Hybrid you can produce faster and more efficiently!



Increased production line performance due to higher cycle rates & shortened transport times.



More efficiency through higher process density in less space.



Pure Customer Orientation: Demand-oriented investment specific to the application yet convertible to other applications.



Fewer changeover times and format changes due to Plug-and-Produce.



Short project realization time as well as fast commissioning of the system.

TURNKEY FUNCTIONAL ASSEMBLIES. PLUG & PRODUCE SOLUTION AS A PHILOSOPHY.

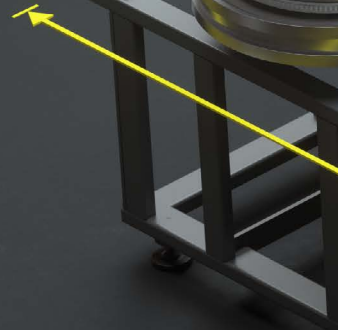


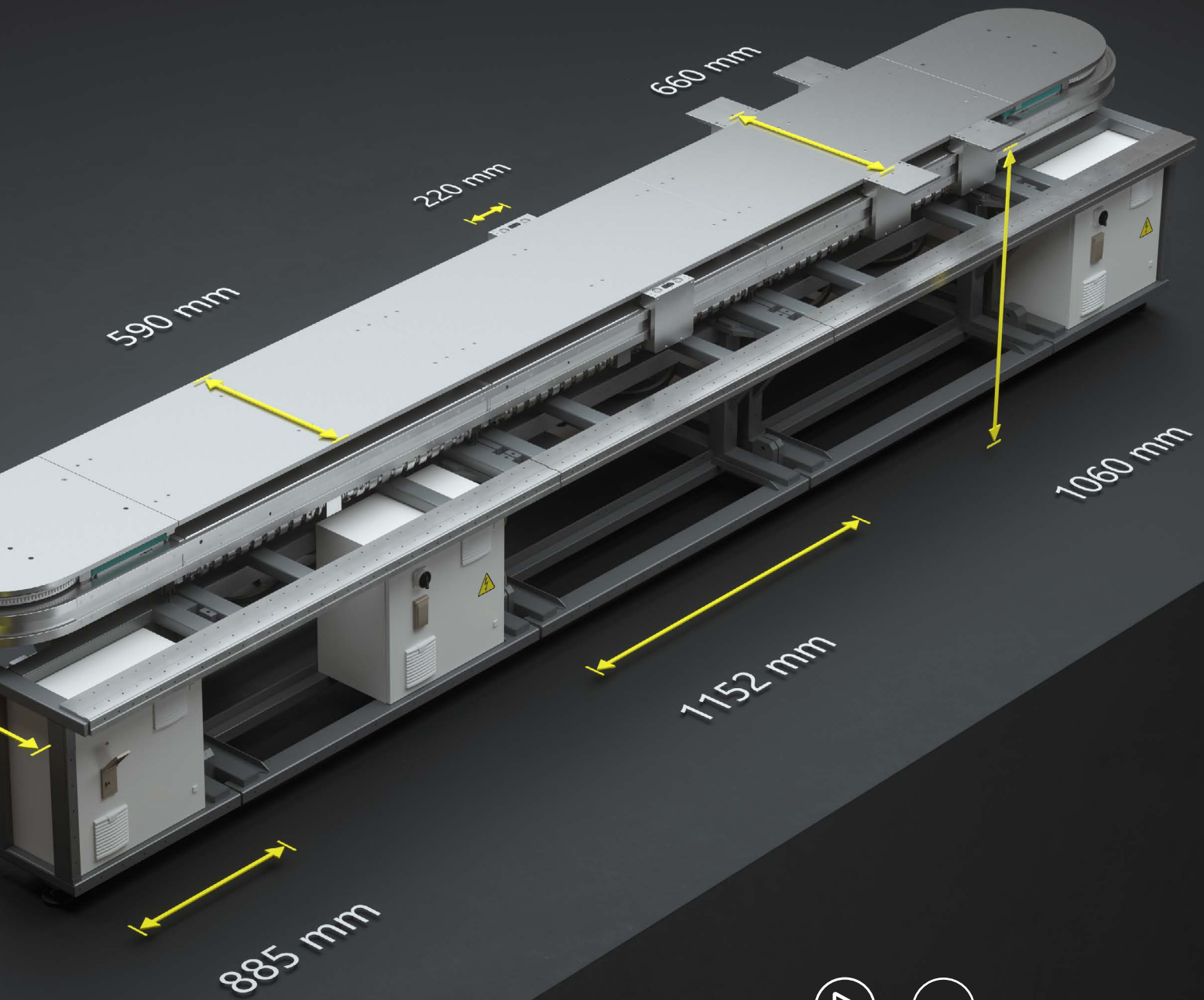
Ready to Plug-and-Produce: The LS Hybrid is the only available subsystem on the market that is a fully wired transport system with process-capable racks ready to integrate into a production line. Perfect for reducing project implementation time, reducing the system footprint and increasing productivity.

Due to our highly integrated system solution, the effort required for design, assembly and commissioning is reduced to a minimum. The system undergoes extensive functional and quality testing before delivery and can be quickly and smoothly assembled and commissioned on site. Customer process times can also be simulated in advance, confirming the performance values of the overall system, if desired.

Commissioning is simple and intuitive with WEISS Application Software (W.A.S), resulting in the IBN with the preconfigured software tool being included in the scope of delivery. Without special expertise, the software can be operated via the intuitive user interface. The most important parameters for the drive controllers are predefined, so that only operation commands need to be entered by the user. Application-relevant data is available at the push of a button, as are maintenance and diagnostic functions.

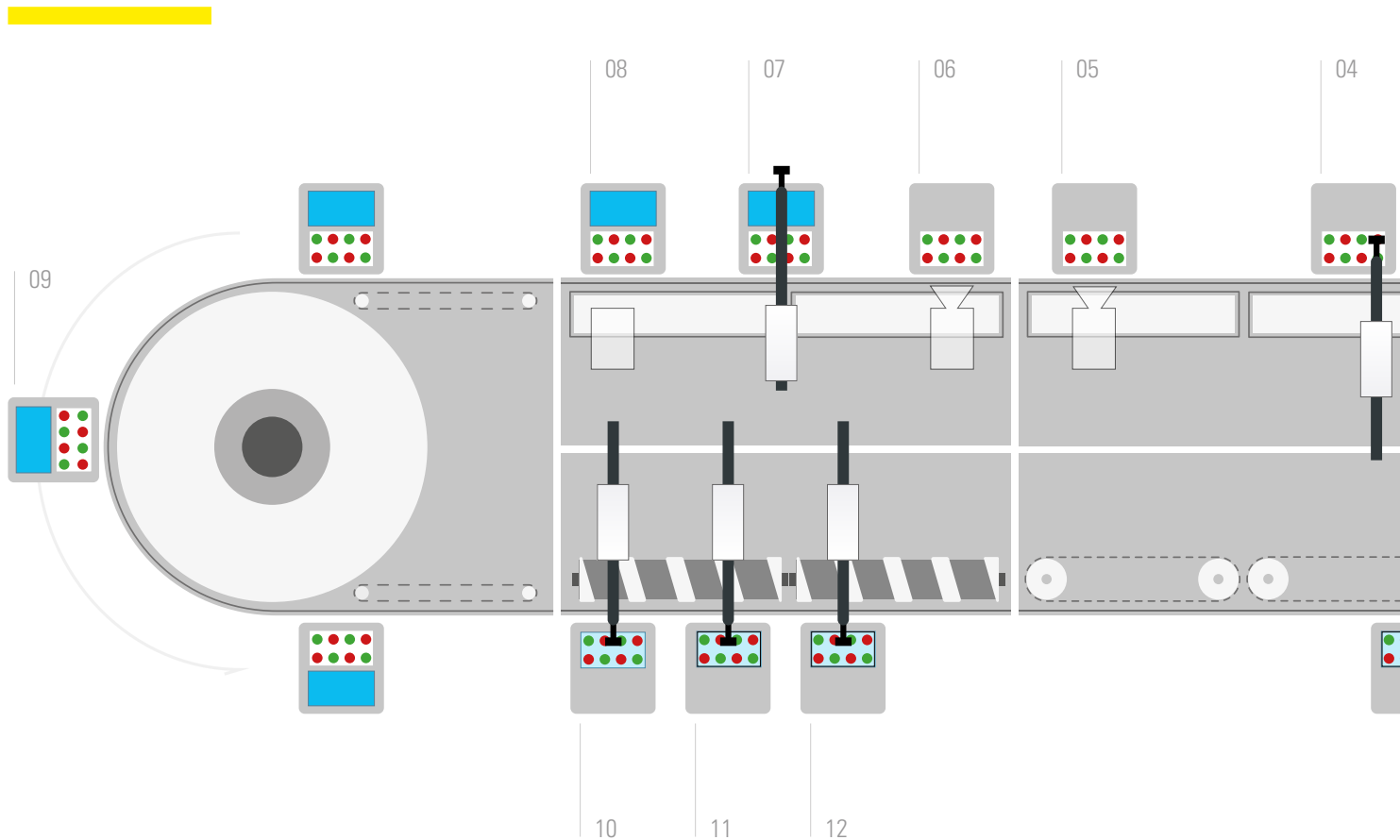
950 mm





The WEISS Application Software (W.A.S.) contains all our knowledge on how to optimally operate WEISS products. It can be used to quickly and easily commission and parameterize all WEISS components connected to the W.A.S. control system.

USE CASE. MORE PROCESSES IN LESS SPACE.



Assembly Process

This six-part assembly is a prime example: It decreases your overall footprint while utilizing each independently controlled carrier. Programming infinite positions and varying speed and acceleration/deceleration values assists in optimization of the process and lowers the overall cost of integration. Important process forces are supported by a guide system and lateral locking of the tooling carriers. The flexibility offered when using the WEISS handling units and process modules allows for smooth communication between components, which will provide, at times, more than double the throughput.

Components



Part A



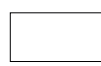
Part B



Part C



Part D

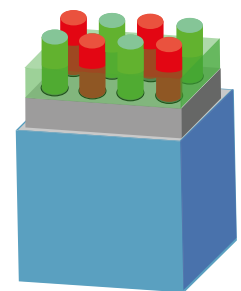


Part E

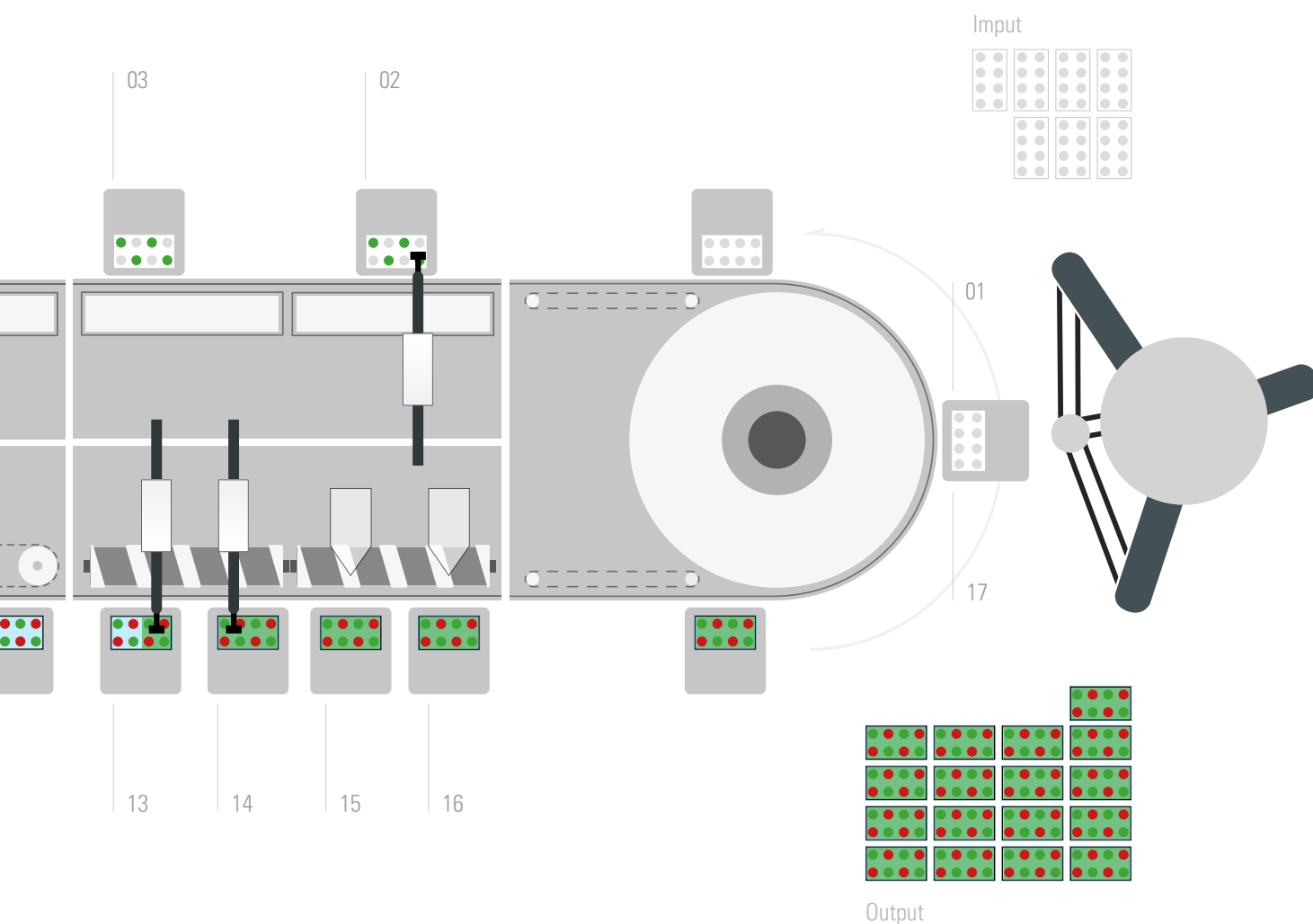


Part F

Final Product



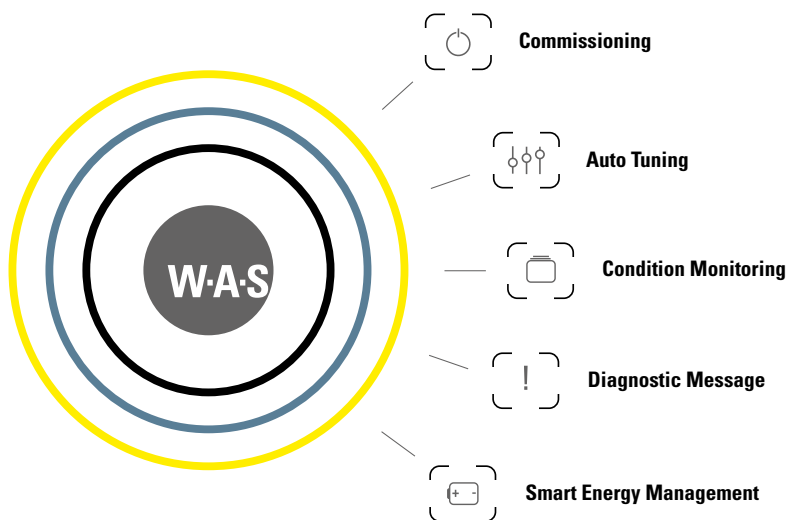
Filigree sleeve container fitted with rods - positioned, labeled, tested and packed.



Positions

- | | | | |
|----------------|---|----------------|---------------------------|
| Pos. 01 | Load part A | Pos. 08 | Laser marking part B |
| Pos. 02 | Assemble part A with part C in position 1+3
Reset
Assemble part A with part C on position 2+4 | Pos. 09 | Turn part B |
| Pos. 03 | Buffer location | Pos. 10 | Match part A + B |
| Pos. 04 | Assemble part A with part D in position 5+7
Reset
Assemble part A with part D on position 6+8 | Pos. 11 | Insert part E into part A |
| Pos. 05 | Check visually in the run | Pos. 12 | Press part E into part A |
| Pos. 06 | Check visually in the run | Pos. 13 | Assemble part F 1 |
| Pos. 07 | Loading part B overhead | Pos. 14 | Assemble part F 2 |
| | | Pos. 15 | Laser spot welding 1 |
| | | Pos. 16 | Laser spot welding 2 |
| | | Pos. 17 | Unload |

SMART FUNCTION UNIT. WEISS APPLICATION SOFTWARE.



// From rotary indexing tables to handling units and transfer systems, including complete sub- and multi-axis systems, WEISS Application Software (W.A.S.) makes the transition to application easy. As a link between man and machine, W.A.S. creates the smart connection between the mechanics and the mechatronic function. W.A.S. enables a simple and efficient do-it-yourself commissioning and monitoring without the need for expert knowledge. With W.A.S. it is easy to design, plan & program the entire system, as well as, commission & diagnose any issues.

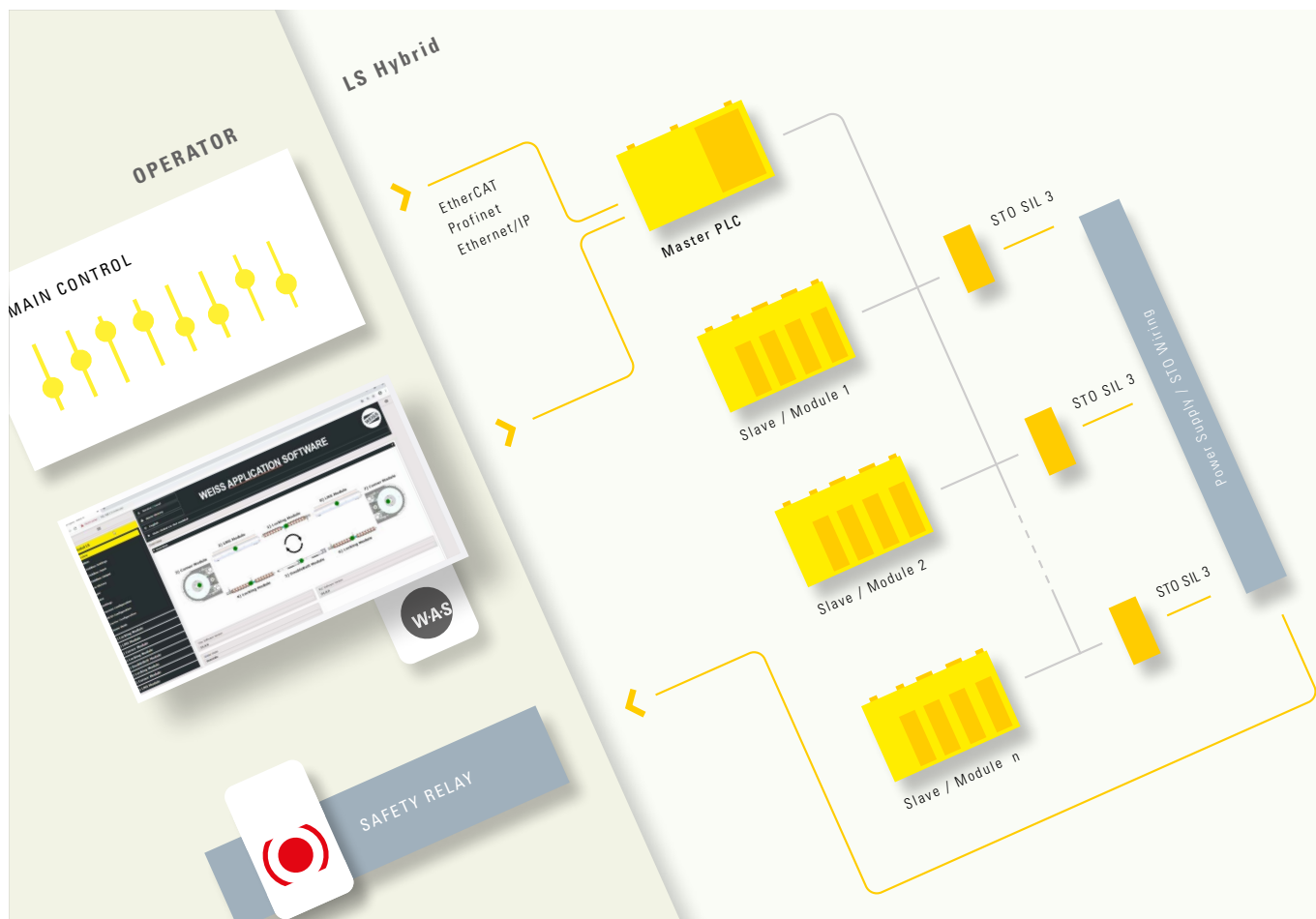
Quickly understandable HMI: The interface to a higher-level master control can be parameterized easily and intuitively

via a web browser, requiring no “in-depth control knowledge” for commissioning. The system is perfectly preconfigured, all application-specific parameters are already integrated, and nothing stands in the way of getting your system up and running. In addition, you benefit from considerable time savings.

Plug & Produce as Benefit

- Simplest parameterization: Simply enter the application data such as pitch, travel and load, speed and acceleration are controlled - and that's it.
- For the fastest processes: Simple sequence programming of time-critical processes directly in the drive controller.

- Control down to the last bit: For quick and easy commissioning and monitoring of the fieldbus interface.
- Optimal motion profiles: Live Scope with the optimization and diagnosis tool.
- Up to 20 % more output: All modules communicate directly with each other, which saves valuable process time and increases the cycle rate of your system - in high-speed applications, output increases by up to 20 %.
- Versatile interlinking and networking enable an increase in process capability in addition to maximum repeatability.



The LS Hybrid and W.A.S. make the perfect combination: simple programming, fast processes, optimal motion profiles and auto-tuning included.

Smart Services

- Auto Tuning: Quickly and automatically identify optimization opportunities at the touch of a button.
- Condition Monitoring: Anticipate errors before they happen with PCM (Permanent Current Monitoring) and avoid unexpected production interruptions through constant analysis.
- Diagnostic Message: Understandable information and error messages, as well as, an easy-to-use error log of the drive commands, providing a quick response capability.
- Smart Power Management: Power recovery with active power supply is possible with W.A.S. 2 SCALABLE.

Ready-for-IoT-Peripherals

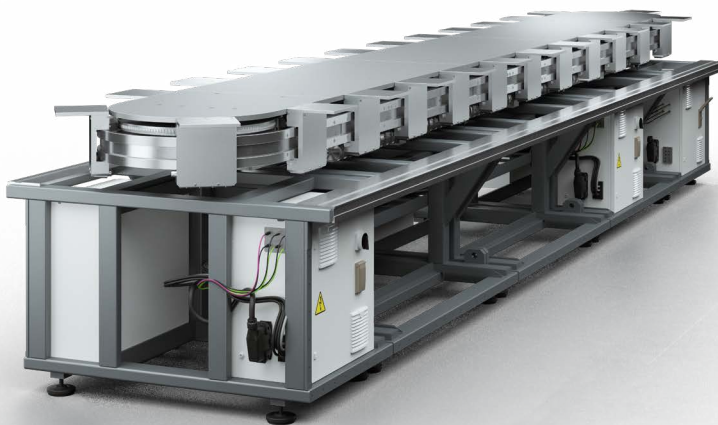
- Control Independent: Independent of a higher-level PLC, the parameterization works without special expertise.
- Affinity for Digitalization: W.A.S. is based upon decentralized intelligence and provides the basis and language for digitalization, allowing for new scenarios in the context of Industry 4.0.
- Universal Networking: Open for fieldbus interfaces, OPC-UA and cloud solutions.

One small step with W.A.S., one giant leap in terms of digitalization. WEISS is a component manufacturer, system partner and enabler for intelligent automation concepts. By bundling hardware and software expertise, highly networked mechatronic systems are created that are conducive to digital transformation and smart production. Application-oriented thinking, forward-looking system partnership and reduced complexity are added values that pave the way to a digital future.

[discover more](#)

ASSEMBLY TECHNOLOGY TO SIZE.

01 PLUG & PRODUCE TRANSPORT PLATFORM

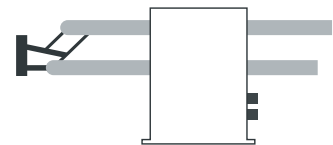


Transfer System LS Hybrid Individual motion sequences can be assigned due to the free combination of cam drive, direct drive, freely programmable deflection or belt path in the system.

02 PLUG & PRODUCE HANDLING



Linear Motor Axes State-of-the-art drive technology highly integrated and ready for installation. Ideal for dynamic, high-precision positioning tasks.

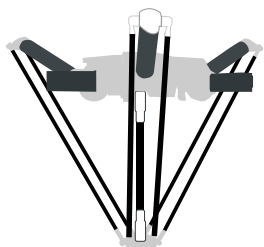


Pick-and-Place-Units Equipped with two linear motor axes. Rapid dynamics, freely programmable and highest accuracy.

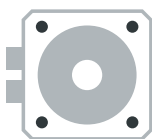
The LS Hybrid Linear Transfer System enhances production lines and elevates manufacturing to a new level of flexibility and efficiency. As an integral component, the LS Hybrid introduces a new dimension of creative versatility by accelerating pallet transfers and significantly boosting cost-effectiveness. The big reasons for choosing it are plug-and-produce, hybrid drive technology, and smart inline assembly. The overall result is to intelligently orchestrate production, taking it to greater heights of profitability and productivity.

Following this philosophy, WEISS is able to offer highly integrated system solutions from transport to handling to system control, allowing system engineering, commissioning, efficiency and productivity to be seamlessly managed.

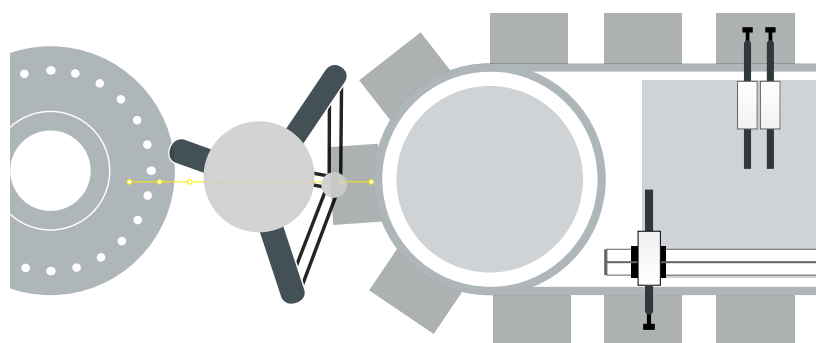
03 PLUG & PRODUCE ADVANCED PLATFORMS



Delta Robot With two to five axes, designed for assembly and handling in the high-speed range for maximum precision.



High-Torque-Rotation Combine Units. When precise and highly dynamic rotation, swiveling and gripper movements are required.



Customized Special Solutions The combination of intelligent WEISS components and superstructures turn the LS Hybrid platform into a highly productive functional unit consisting of mechanics, electronics, and software. Ready for assembly, designed and manufactured with uncompromising WEISS quality.

LS TRANSFER SYSTEMS. PRODUCT RANGE.



LS 280 This LS system transfers the drive principle of the rotary indexing table to the straight section - including unlimited number of stop positions.



LS Hybrid Whether cam drive, direct drive, freely programmable deflection or conveyor section - the hybrid drive system allows adaptation to individual application requirements.



LS One Even shorter processes and faster transport times with approx. 70 cycles/min are guaranteed with the LS One - as with all LS systems with the Plug-and-Produce design.

Specifications

Cycle Rate	approx. 40 cycles per minute	approx. 60 cycles per minute	approx. 70 cycles per minute
Max. Load	4kg	10kg	2kg
Process Forces (Without Support)	approx. 300N	approx. 1000N	approx. 300N
Locking Station / eCam-Module Positioning Accuracy	± 0.03 mm (x- & y-axis) ± 0.06 mm (z-axis)	± 0.03 mm	–
Locking Station / eCam-Module Strokes (Exchange Time)	70 mm (approx. 0.4s) 140 mm (approx. 0.5s) 280 mm (approx. 0.6s) 560 mm (approx. 1.2s)	64 mm (approx. 0.25s) 128 mm (approx. 0.30s) 256 mm (approx. 0.40s) 512 mm (approx. 0.90s)	–
Linear Motor Module Positioning Accuracy	–	± 0.02 mm (x-axis) ± 0.03 mm (y- & z-axis)	± 0.05 mm (x-axis) ± 0.03 mm (y- & z-axis)
Fieldbus Interface	EtherCAT PROFINET EtherNet/IP Profibus	EtherCAT PROFINET EtherNet/IP –	EtherCAT PROFINET EtherNet/IP –
W.A.S. (WEISS Application Software)	included	included	included



INSPIRING PEOPLE **GREAT SOLUTIONS**

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