

Superior Clamping and Gripping



MECHATRONIK³

Alternative – Intelligent – Adaptable





Henrik A. Schunk, Kristina I. Schunk, brand ambassador Jens Lehmann and Heinz-Dieter Schunk

Superior Clamping and Gripping

Jens Lehmann stands for precise gripping, and concentrated safe holding. As a brand ambassador of the SCHUNK team, the No. 1 goalkeeper communicates our global competence leadership for clamping technology and gripping systems.

For more information visit our website:
www.gb.schunk.com/Lehmann

J. Lehmann
 Jens Lehmann



Top Performance in the Team

SCHUNK is the world's No. 1 for clamping technology and gripping systems – from the smallest parallel gripper to the largest chuck jaw program.

As a competence leader, we recognize and develop standards with a large potential for the future, which will drive the rapid progress in many industries.

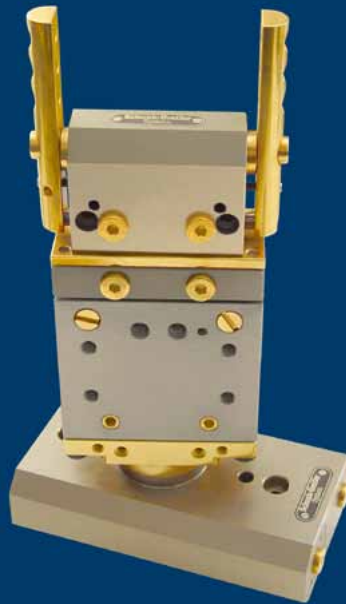
Our customers profit from the expert knowledge, the experience and the team spirit of more than 1800 employees of our innovative family-owned company.

The Schunk family wishes you improved end results with our quality products.

H. Schunk
 Heinz-Dieter Schunk

H. Schunk
 Henrik A. Schunk

K. Schunk
 Kristina I. Schunk



Future needs history

Enthusiasm and experience are the basis of our pioneering spirit. Since our first standardized industrial gripper PPG, top-quality products from SCHUNK have been setting milestones in automated handling.

Today, with the most comprehensive line of products for industrial automation, we offer our customers cost-effective solutions for their everyday processes.

The continuity and quality of our developments motivate us and show what you can expect from SCHUNK in the future.

1983

The first SCHUNK PPG gripper was based on time-tested kinematic clamping technology solutions.



2011

The EGP electric miniature parallel gripper from SCHUNK focuses on what is essential in mechatronics

1983

PPG – first standard gripper

1989

PGN-classic – successor to the PPG

1995

MPG – the benchmark in small parts gripping

2000

PGN-plus – first universal gripper with multi-tooth guideway

2001

PG – first electric standard gripper

2006

SDH – industrial-suited gripping hand

2011

EGP – electric miniature parallel gripper

The fascination of mechatronics

Service robotics and mechatronics fascinate us. SCHUNK is one of the pioneers in both of these areas. That is why we took the initiative early on to expand and develop our competences. In doing so, we were able to set milestones, initiate new developments and implement them successfully. We are proud of that.

Electric PG gripper

First electric universal gripper from SCHUNK.

3-finger gripping hand SDH

Gripping hand with three movable fingers, seven degrees of freedom and tactile sensors for gripping and positioning different objects without changing the setup.

Modular robotics

Flexible robot structures based on a modular system. Through incorporation of the amtec robotics company, SCHUNK assumes a pioneering role.

Care-O-Bot®

Integration of the modular lightweight arm LWA 3 in the development of a mobile robot assistant Care-O-Bot® of Fraunhofer IPA.

EXPERT DAYS SERVICE ROBOTICS

The symposium, with its distinguished speakers and international experts, is considered the leading communication platform for applied service robotics.

Engelberger Award for life work

Heinz-Dieter Schunk was distinguished with the Engelberger Robotics Award for Leadership during the 41st International Symposium of Robotics 2010.



Electric PG Gripper



International EXPERTDAYS
Service Robotics



Engelberger Robotics Award



Care-O-Bot®

More active design of industrial processes

Our claim: Optimal solutions for modern industrial processes – no matter which process strategy you decide for. Pneumatic or mechatronic.

Pneumatic components are especially robust and easy to integrate. Mechatronic modules enable process layouts that are difficult to implement with conventional methods.

With Mechatronik³ we offer the entire spectrum for the mechatronization of handling and assembly processes from a single source. Including decades of experience based on research and development.

In short:

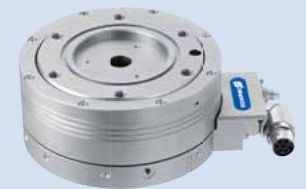
With SCHUNK your processes are designed to be more active and more efficient.



Gripping Hand SDH



Gripping modules



Rotary modules



Linear modules



Robot accessories



Modular assembly automation

MECHATRONIK³

ALTERNATIVE

INTELLIGENT

ADAPTABLE

INDUSTRY EXPERIENCE FROM DECADES

MECHATRONIK³ – One strategy – three pillars

Mechatronik³ is the strategy with which SCHUNK is the first manufacturer to bundle a comprehensive mechatronic product portfolio. The three pillars of this portfolio – Alternative, Intelligent and Adaptable – multiply to create a unique, high-performance modular system. It combines our many years of experience in pneumatics with the pioneer's successes in mechatronics, and offers mature, efficient solutions for almost every requirement.

Alternative

Simple, powerful, fast. Mechatronic modules can be directly used as a pneumatic alternative, in existing systems.

Intelligent

Robust and reliable SCHUNK components with integrated intelligence fully utilize the potentials of mechatronics, such as flexibility and energy-efficiency.

Adaptable

SCHUNK modules with a motor adapter. Simply install a motor of your choice. Integration in the existing control architecture becomes child's play.





MECHATRONIK³

Alternative

Efficient handling – electricity replaces air

High compact performance, attractively priced – mechatronic gripping systems are a highly efficient replacement for existing pneumatic modules in systems. They are compatible with the sensors already in use and are digitally controlled. Additional hoses are superfluous.

In short: The switch from pneumatics to electricity is extremely easy.



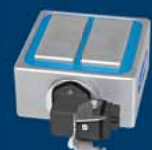
Electric Miniature
Parallel Gripper EGP



Linear Module with
Direct Drive ELM



Electric Gripper MEG



Magnetic Gripper EGM





Kinematics



Gripper jaw interface



Interface

Electric Small Part Gripper EGP

Easy handling, light and flexible – the electrically actuated EGP gripper for small components concentrates on the essential. It scores with a high compact performance for dynamic processes, and for handling of sensitive components, the gripping force can be manually adjusted in four stages. Thereby the EGP is easily controlled via digital inputs, and the conversion of the customer's system from pneumatic to electric gripping modules is done without the loss of gripping force.

The EGP is the electric counterpart to the time-tested pneumatic MPG-plus gripper for small components. Even the sensor system of the MPG-plus can be transferred to the EGP. Its powerful cross roller guide ensures that the EGP achieves a high efficiency, and makes it to a dynamic and energy efficient product for challenging Pick&Place applications.





MCS Controller



Interface

Electric Gripper MEG

The electric gripper MEG is compact and easy to install, extremely flexible with respect to control – and it features all the advantages of mechatronics. The gripper is driven and controlled by a robust and reliable 24-volt stepper motor which is controlled by an external controller. The gripping force can be set by means of a potentiometer on the controller if there should be confined spaces at the gripper, and moves are triggered by digital outputs.

A robust, mechanical wedge hook mechanism and the double guided base jaws, with roller and needle bearings, ensure high reliability and a long life.



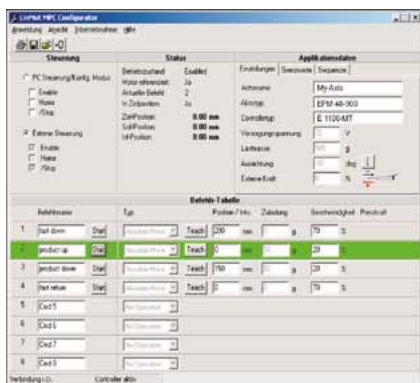
Modularity through a modular design

Linear Module with direct drive ELM

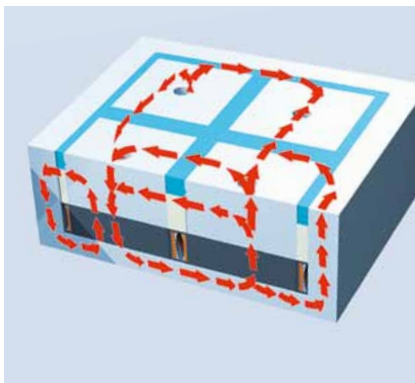
ELM modules are completely ready-to-install linear systems for maximum dynamics and accuracy. They were developed especially for flexible and highly dynamic positioning tasks that cannot be performed with pneumatic drives.

Their high flexibility and unlimited compatibility with the SCHUNK modular system guarantee a solution that is simple and easy to integrate, uncomplicated planning even in case of tasks, which are challenging in terms of drive technology.

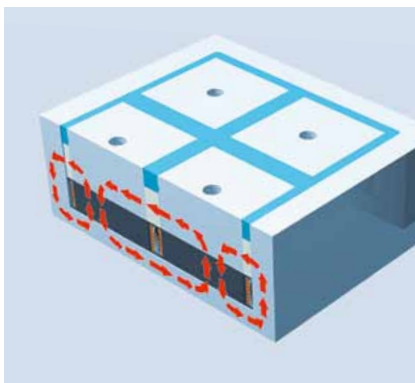
The measuring system for position recognition, control of temperature, and a precision ball guide are integrated. The module does not depend on a specific control unit and could be also controlled via a bus system.



Configuration



Activated condition

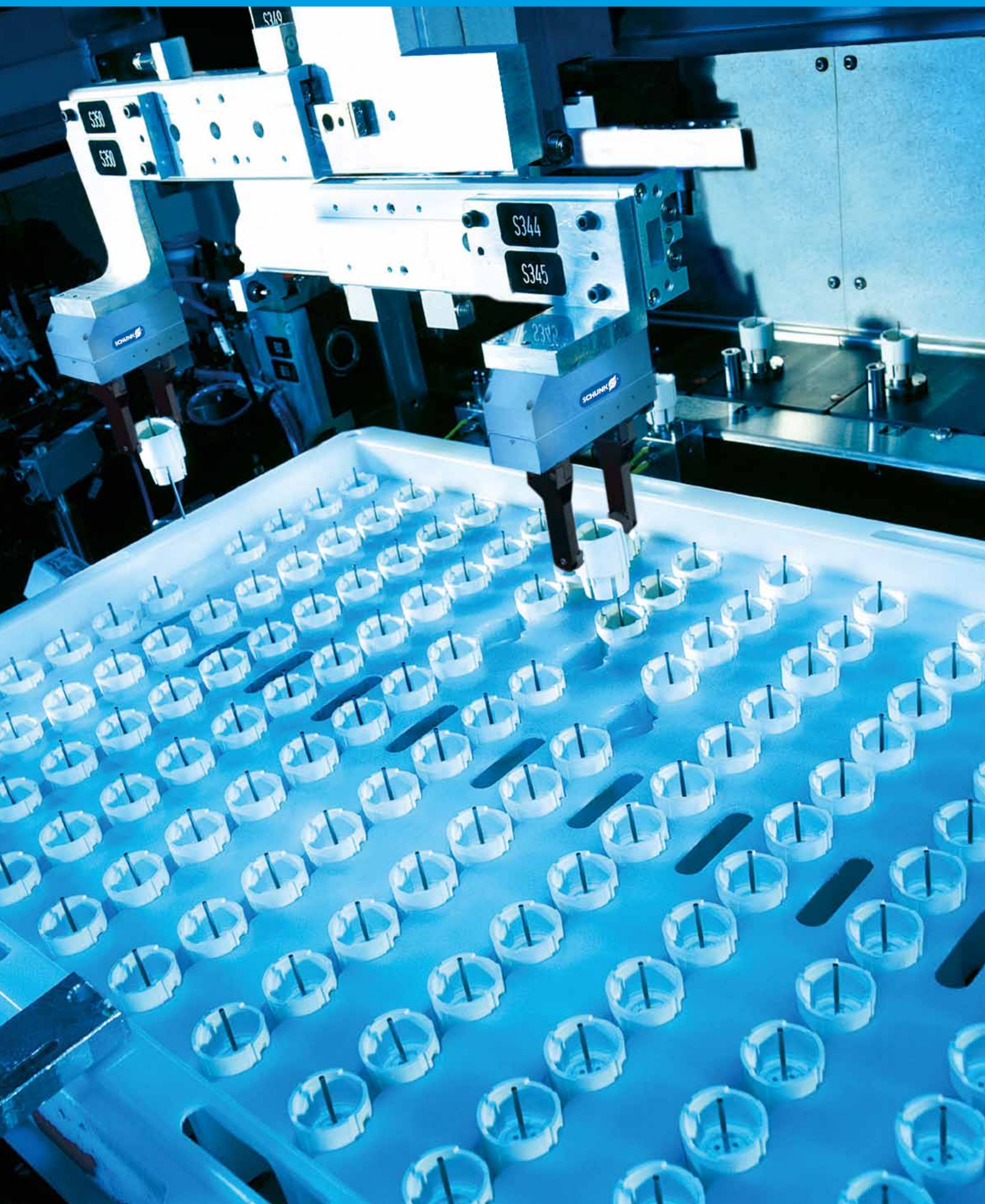


Deactivated condition

Magnetic Gripper EGM

The EGM magnetic gripper is the powerhouse for flexible handling of ferromagnetic workpieces without interfering contours. In contrast to most of the magnetic grippers which are available on the market, the permanent magnets of the EGM are not pneumatically actuated, but with electricity in no time at all. Therefore the EGM is particularly energy-efficient and process reliable. For actuation and deactivation just a short electric pulse is necessary, and the workpiece can be securely held in a emergency stop situations, too.

With minimal set-up and without the interfering contours of gripper fingers, the EGM can handle very difficult workpieces in alternation. Five sides of the workpiece are available for machining. Due to the variable number of magnet pole pairs, and adaption options to every common robot, optimum adaption to the individual applications is ensured.



MECHATRONIK³

Intelligent

More intelligent handling for a more efficient system

SCHUNK modules with integrated intelligence allow for even more efficient processes: measuring, sensing, vision and adaptation – by means of an integrated web server, for example – they enable optimal adaptation to the application. Sensitive components supply systems and machines with the relevant data on processes, products and functions. Increase flexibility, shorten production times and guarantee product quality.

In short: take full advantage of the potential of mechatronics.



2-Finger Parallel Gripper WSG



Powerball ERB



Miniature rotary module ERD



Rotary module PRL



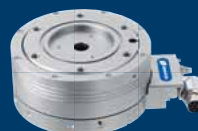
Light-weight arm LWA 3



Rotary module PRH



Powerball LWA 4



Rotary module ERS



ERS with DDF





Flat changing system FWS



Simulation/design

Powerball LWA 4 with ERB and WSG

The SCHUNK Powerball LWA 4 is a compact lightweight arm that utilizes all the advantages of the SCHUNK mechatronic modular system. Three ERB modules can achieve up to six degrees of freedom.

The ERB modules combine the movements of two servo axes per module in a very compact space. The combination of different sizes results in a customized, flexible manipulator for modern handling concepts with a payload of up to 3 kg. The integrated control and regulation electronics and the 24 V DC power supply create optimal conditions for decentralized and mobile use.

The Powerball LWA 4 in the mechatronic modular system from SCHUNK, in combination with intelligent actuators, such as the WSG, enable new modern handling concepts.



2-Finger Parallel Gripper WSG

Sensitive handling – configured in 2 minutes. The WSG is a sensitive gripper that communicates by means of Profibus DP, CAN or Ethernet TCP/IP. It also features an integrated web server for configuration and diagnosis. This makes programming, commissioning, remote maintenance and updating especially easy. Due to the communication protocols of the integrated control and regulation technology, it ensures maximum flexibility when integrated in higher level systems. The gripper is equipped with an internal MicroSD card for storing programs and documents. Therefore gripper parameters are stored, and can be quickly and easily replicated onto many other modules.



Integrated electronics in the gripper jaws

The electronics integrated in the gripper jaws enable the WSG to measure forces occurring in the gripping process directly by means of sensors. Many different types of sensitive workpieces can therefore be handled securely and reliably with one gripper.



Control via Profibus DP, CAN and Ethernet TCP/IP



Range of motion: 340° per axis

Powerball ERB

The Powerball ERB controls the movements of two axes in a single module with minimum space requirements. The powerful module also supplies high torques. It can be used to implement compact lightweight arms, service robots and other modular handling applications.

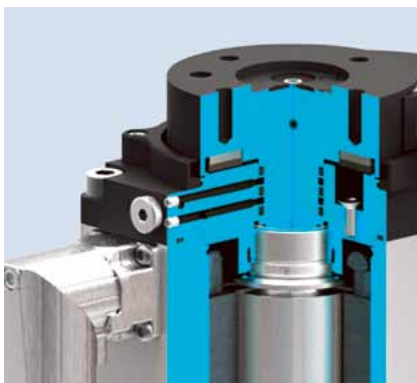
The Powerball ERB fits smoothly to the mechatronic modular system from SCHUNK. Thanks to integrated intelligence, universal CANopen communication interfaces and cable technology for data transfer and power supply, the modules can be very easily integrated in existing control concepts.



Miniature Rotary Module ERD

Compact – strong – highly dynamic. The continuously rotating miniature module is equipped with two integrated air feedings, four electric feed-throughs, and a SIL2-certified absolute encoder measurement system. It allows the design of space saving, high-torque high-speed assembly systems, which come up to highest requirements of the machine guidelines, too.

Its special geometry ensures high dynamic and acceleration. Due to the optimized attached air feed-throughs, pneumatic actuators can be faster actuated. Both factors ensure shorter cycle times and a higher productivity. Since the modules have hardly any wear parts, its lifetime is very long.



Pneumatic and electric feed-through



Absolute encoder



Precision gears

Rotary Module PRL

Freely configurable – low weight. The solutions for flexible robotics solutions with many degrees of freedom. The Rotary Module PRL meet the demands for reconfigurable, modular robot structures since they are consistently implemented. Due to the use of light but also very stable materials, the compact swivel units achieve a weight-payload ratio which is better than 2:1. The modules are equipped with an integrated power supply, control options, and universal communication interfaces. The hollow shaft drive allows a protected installation of cables and hoses inside the arm up to the „wrist“. No cables are visible, and there are no interfering contours. The PowerCube module PRL can be used for applications in the field of industrial automation, but also for service robotics.



Sizes 060, 080, 100, 120

The individual PRL modules can be freely and flexibly assembled to an individual light-weight arm. Due to this combination of this flexible robotics solution, five degrees of freedom are already successfully and reliably integrated.



Light Weight Arm LWA 3

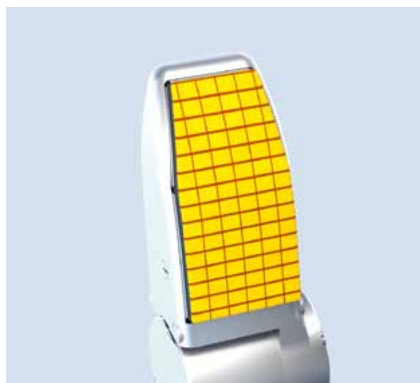
The field of applications of the LWA 3 lightweight arm comprises various fields of robotics: Inspection systems, service robotics, use of mobile platforms, human-machine and human-human interactions are just some examples.

The arm is based on the servo-electric swivel units PRL combined with ERB jointed modules with integrated motor controller units, and a through-hole for cable feed-through. The combination of a high compact performance, and new materials for the connection technology allow the doubling of the payload to nominal 5 kg. The standard design of the LWA 3 is available as a 7-axes system.

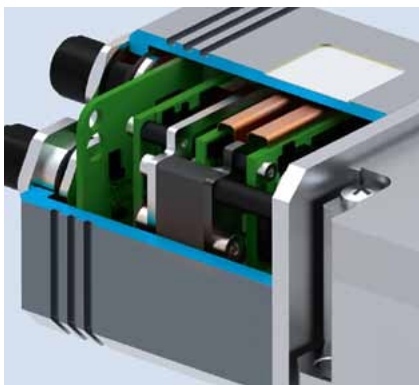
The open software architecture allows for the connection and operation of any type of modules at the servo-electric "wrist" of the arm: Servo-electric 2-finger parallel gripper PG, SDH hand etc.



Gripper hand SDH



Sensors



Integrated electronics

Servo-electric Swivel Unit PRH

Very compact – high torque – high-precision. Due to its compact design and the high positioning accuracy, the swivel modules of the PRH series are suitable for applications in the field of lab automation, for measuring and inspection systems, and for miniaturized assembly machines. The integrated controller with bus connection minimizes the efforts of cabling, and a control cabinet is not required.

For communication purposes, various interfaces such as Profibus-DP and CANbus and USB 2.0 are available.



Rotary Module ERS

The ERS is one of the most compact electric rotary modules on the market. With its dimensions and a center bore for cable feed-through, it offers ideal prerequisites for the design of compact and efficient high-performance systems – whether as a freely programmable rotary table, as a workpiece holder in laser welding machines, or as a rotational axis for grippers in gantries. The endlessly rotating torque motor is the basis, and provides for wear-free and therefore extremely reliably working module. On option, a pneumatic holding brake ensures a safe position conservation even in case of an emergency-stop situation.

In order to ensure highest flexibility of the control strategy, the ERS can be actuated with the SCHUNK Motion Controller MCS12 (48 V DC), a Bosch or Siemens standard controller (560 V DC). A standard encoder interface additionally supports the easy system integration.



Industrial plug connection



ERS interior view



Static and dynamic connections of the feed-through

Rotary Module with pneumatic and electric feed-throughs ERS with DDF

The ERS DDF is the new benchmark for rotary modules. Compact – more flexible – more dynamic – unique! The ERS DDF is the most compact electric rotary module with combined pneumatic and electric feed-through on the market. Due to the combination of electrically driven rotation with pneumatic and electric feed-through, several handling components can be endlessly rotated. No energy lines are disturbing.

It is based on the flat rotary module ERS, which is equipped with a torque motor with hollow shaft. As a result it is very light, compact and wear-free. It is very reliable in use. In order to provide the highest possible flexibility of the control strategy, the module can be equipped with a SCHUNK Motion Controller MCS12 (48 V DC), a Bosch or Siemens standard controller (560 V DC).

The standard DDF is equipped with 8 signal connections and a pneumatic air channel. By using micro valves, the electric feed-throughs can be used for switching the air channels. They can be also used for pneumatic actuation of various actuators.



MECHATRONIK³

Adaptable

On-demand handling – flexible integration of functionality

The challenge: fast adaptation of existing systems and control architectures to changing requirements. The easy solution: Mechatronic modules with adaptable electric drives. Depending on the handling task and the desired functionality, servo motors of various manufacturers can be installed. This enables the control of grippers and robots with an existing control system.

In short: Adaptable modules are always suitable!



Long-stroke Gripper EGA



Rotary module ERM



Compact spindle
cantilever axis ELS





Base jaws



Guidance



Gear can rotate 90°

Long-stroke Gripper EGA

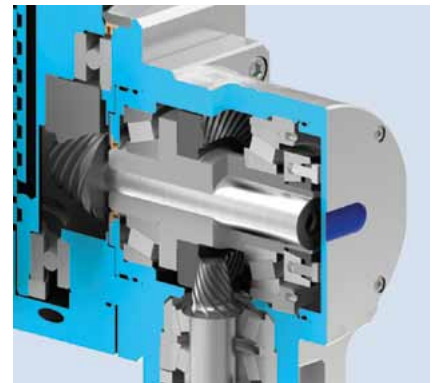
The robust EGA is an adaptable long-stroke gripper for the high demands of continuous operation. Due to integration in the system controller all characteristics with respect to programming, safety and field buses can be employed using the existing control system. All standard industrial servo motors are suitable as drives. The motor can be flange mounted parallel to the direction of motion, which is favorable for robot applications in which the height of the gripper needs to be reduced. Or it can be mounted at a right angle to the direction of motion, to minimize the width of the gripper for gantry applications, for example. The EGA has an extremely flat and compact design and minimal interfering contours.

Due to the anti-friction guideway, it is very precise and long-lasting. The weight-optimized design of the gripper and the dynamics and energy efficiency further enhance the system.



Rotary Module ERM

The electrically driven rotary module is extremely flexible, and is designed for precise positioning of high payloads. Seamlessly implemented, the ERM can be equipped with all common industrial servo motors, and offers maximum flexibility for the control strategy. Equipped with the right motor, the features of a system control unit in terms of programming, safety and fieldbus can be directly transferred onto the module.



Swivelling gear



Motor is adaptable

Compact Spindle Cantilever Axis ELS

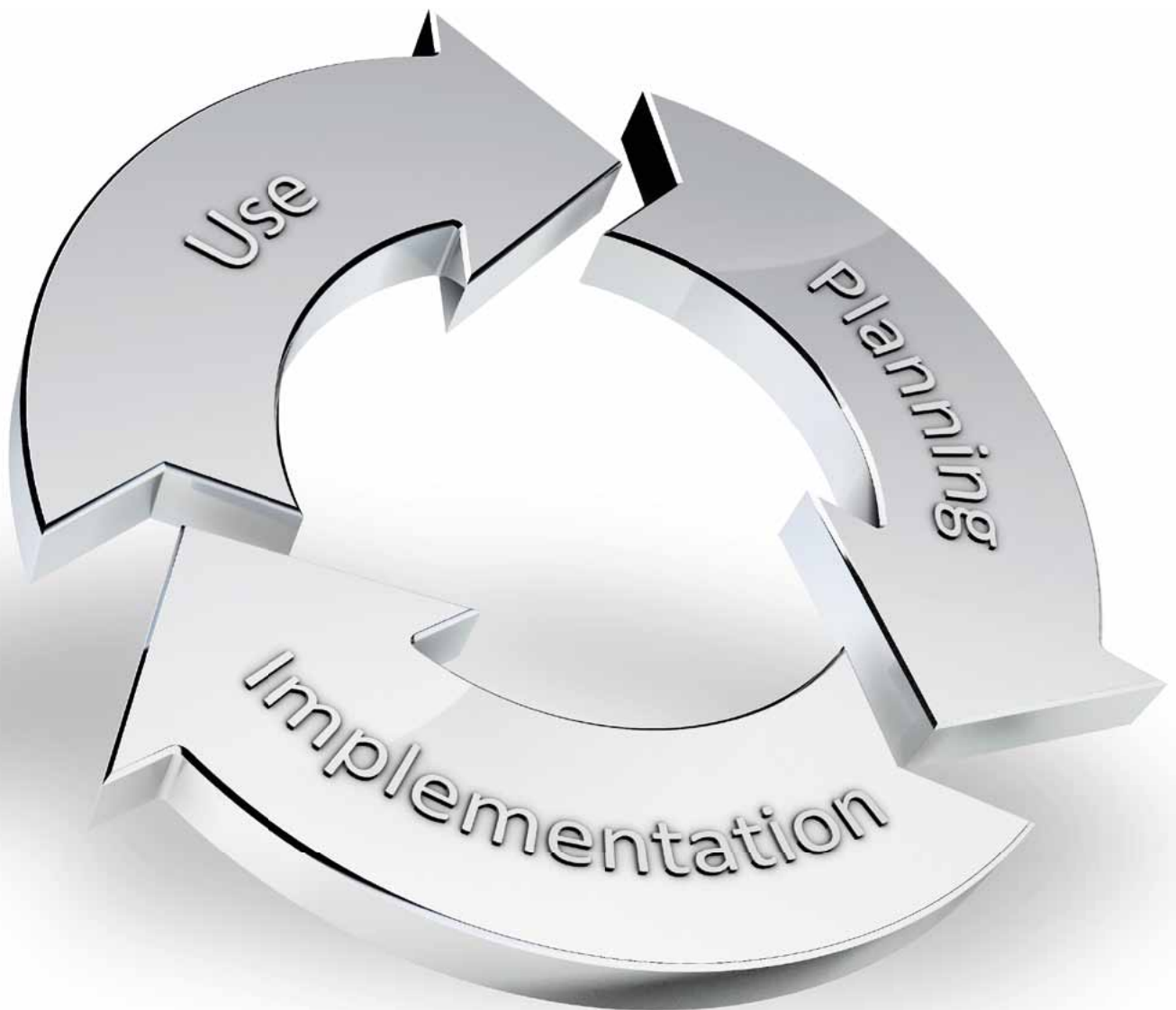
The compact, energy-efficient cantilever axis ELS with spindle drive and profiled rail guide is perfectly integrated in the SCHUNK modular system. As opposed to conventional spindle axes, the ELS axis has a stationary motor. Only the slide moves and is extended telescopically. This minimizes the space needed for the axis and reduces the moving mass, to enable the use of smaller and more economical drives. The ELS axis is ideal for applications in which the module needs to move back out of the work area, and also as a Z-axis for short strokes.

SCHUNK Service Gripping Systems

Reliability and efficiency for the entire product life cycle

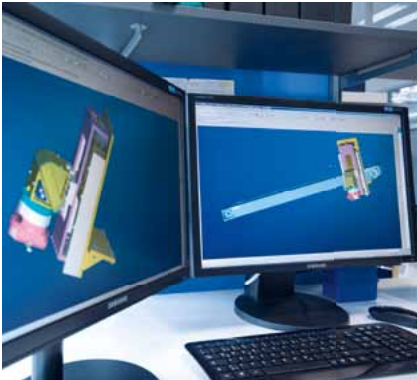
Service means that we ensure the optimum availability of all our products. This is the reason why we concentrate on the essentials for SCHUNK Gripping Systems: On the competent support from the project planning, delivery, commissioning, and maintenance over the entire product life cycle.

This service philosophy ensures you safety in the fields of **planning, implementation** and **use**.



SCHUNK Service Gripping Systems

Your benefits at a glance



Planning

Greater individuality due to customized solutions. Greater planning certainty in quality, time, and costs.

- Cost-free CAD data
- Configuration software
- Trial order
- Gripping system hotline
- Feasibility study
- Customizing
- Order-related development service

Implementation

Faster start of production due to a more effective implementation. More cost-efficiency right from the start.

- Preliminary start-up
- Implementation assistance on-site
- Customer-specific documentation
- Express assembly*
- Rapid prototyping

* On request

Use

Targeted support for the entire product life cycle. More economic efficiency and reliability in the production process.

- Service hotline
- Spare part service
- Repair service
- Maintenance service
- Customer training
- Product optimization
- SCHUNK longlife warranty

Exceptional Precision from the Competence Leader for Clamping Technology and Gripping Systems.

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J. Lehmann

Jens Lehmann,
SCHUNK brand ambassador since 2012