

Easier than ever: click & go multi-axis systems

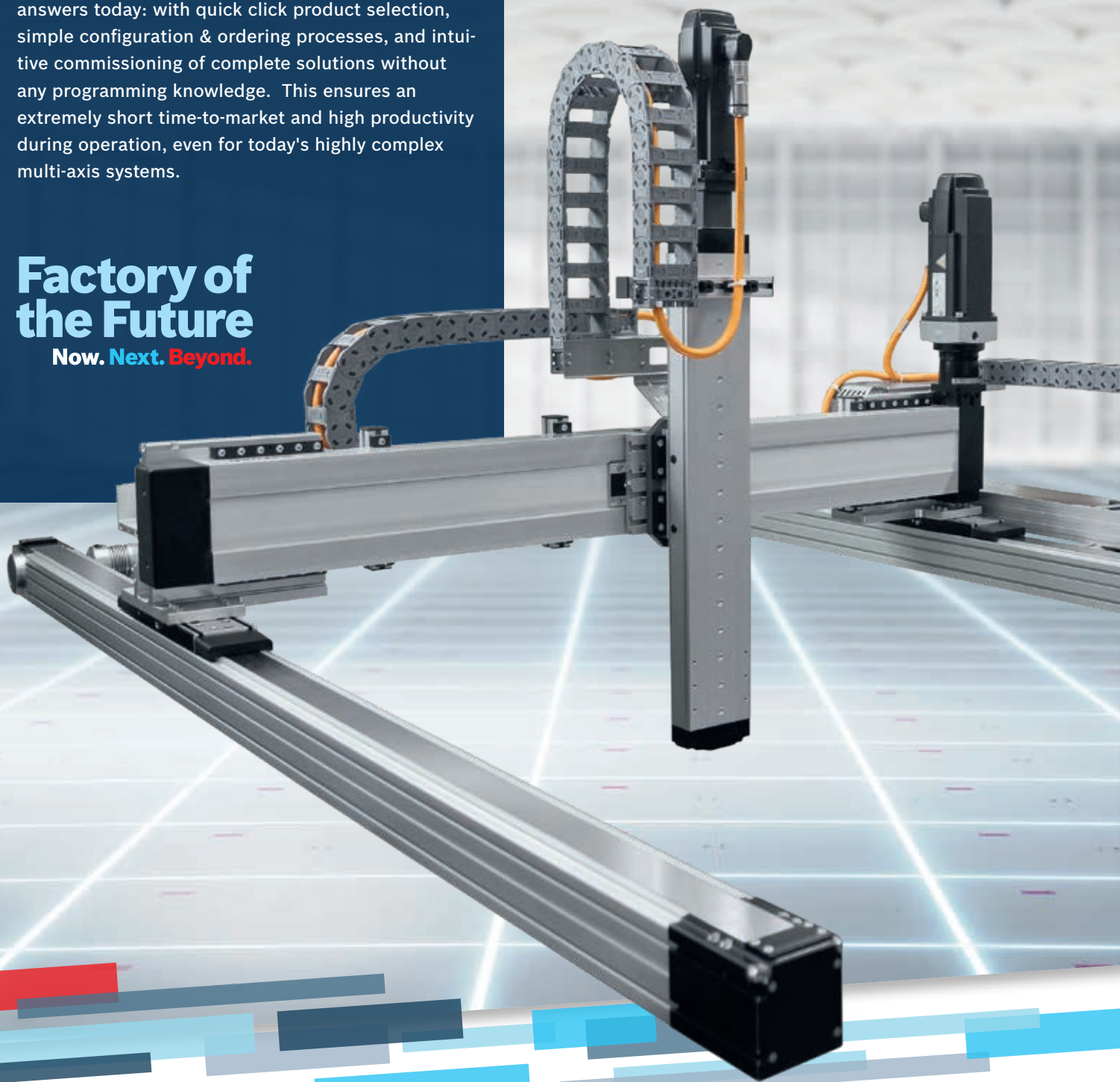


**Now even faster to the ready-to-install sub-system:
plug & produce with smart handling solutions**

**LINEAR MOTION TECHNOLOGY,
A GENERATION AHEAD:
COMPLETE SOLUTION – MINIMAL ENGINEERING**

The Factory of the Future will be more profitable, sustainable and future-proof – despite increasingly individual and flexible production processes. The requirements are therefore defined. As a leading supplier of linear motion technology and mechatronic systems, Bosch Rexroth is already providing the answers today: with quick click product selection, simple configuration & ordering processes, and intuitive commissioning of complete solutions without any programming knowledge. This ensures an extremely short time-to-market and high productivity during operation, even for today's highly complex multi-axis systems.

**Factory of
the Future**
Now. Next. Beyond.



New standard for ready-to-install sub-systems: easier to select and configure, install faster and get started

MULTI-AXIS SYSTEMS MADE EASY. EVERYTHING FROM A SINGLE SOURCE

Bosch Rexroth now makes the path to a ready-to-install sub-system unbeatably simple. 30 years of linear axis expertise have gone into the new multi-axis modular system and the completely revised LinSelect selection tool. There is no easier or faster way to select, configure and commission Cartesian multi-axis systems from standardized best-in-class components. You'll benefit from the latest generation of multi-axis systems from Bosch Rexroth: You'll receive ready-to-install, scalable positioning and handling solutions made of proven and perfectly matched components, including all add-on parts, cable systems, motors and drive controllers – all from a single source, all from one company.

And if your fully assembled, fully integrable sub-system needs to be able to do even more, then take a look at the next step: Smart MechatroniX (from page 16) expands the components to include sensors, electronics and software – with completely new solution approaches and business models. **WE MOVE. YOU WIN.**



A smart solution as a complete kit – including sensors, electronics and software: Smart Function Kit for Handling ► Page 16

A customized multi-axis system with just a few clicks

You can easily check whether the latest generation of the LinSelect selection tool fulfills what is stated in the specifications – “simpler, faster and better than anything you know”: Download LinSelect (see link below) and try the tool for yourself. Or find out about the most important innovations and highlights here in advance.

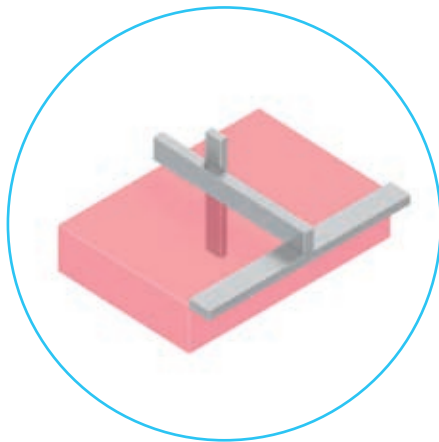


www.boschrexroth.com/linselect

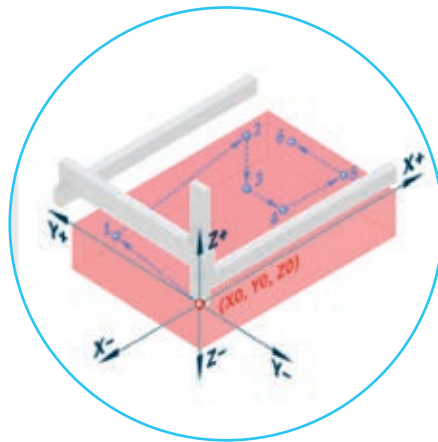
30 YEARS OF LINEAR AXIS KNOW-HOW INSIDE

Experience the concentrated expert knowledge of a leading supplier in linear motion technology – and as part of the Bosch Group also as a leading user – in every selection step of the new LinSelect. You are graphically guided and asked for a few parameters. This allows you to easily and quickly generate the appropriate reference cycle for your application, then receive detailed information and choices on running performance, such as repeatability, for example. You can easily put together your own system from standardized best-in-class components, including electrics, software, drive and motor, with just a few clicks and without any engineering effort.

As a result, you will receive a recommendation in different performance variants and price settings – just as you are used to in a private context from online shops. You can then transfer the system data directly to the configurator and place your order. The CAD models are automatically available at Bosch Rexroth. By the way, commissioning is similarly fast. Could it be any easier?



- ▲ Simple selection via graphical interfaces instead of input fields



- ▲ Simply select a reference cycle instead of creating complex travel profiles



- ▲ Simply use interactive graphics instead of confusing tables





▲ Simply choose from clear recommendations instead of time-consuming comparison and filtering

▲ Easy central access to all project information and links instead of long searches

LINSELECT – SIMPLE SELECTION, MINIMAL ENGINEERING



FEW PARAMETERS, FULL SCOPE – MANY ADVANTAGES



Fast:

- ▶ Select mechanics/motors/drive controllers in a single tool
- ▶ Fast engineering, fast result, shorter time-to-market



Intuitive:

- ▶ Years of application experience implemented in easy-to-use interfaces
- ▶ Visual support through interactive graphics and animations



Intelligent:

- ▶ Input of few parameters – output of prepared complex results with all relevant data
- ▶ Transparent result overview with clear recommendation depending on performance requirements, delivery time or price



Interactive:

- ▶ Continuous tool chain: Automatically transfer result to the online configurator, finish configuration, order and generate CAD data
- ▶ Central project for link management and documentation, bundled access to all project information – no decentralized storage, no long searches

Define the process

The reference process can be adjusted very easily. Simply overwrite the desired parameter and refresh. With 'Individually', individual process steps can be adjusted, deleted or inserted.



Z-Travel	300 [mm]
Y-Travel	600 [mm]
X-Travel	1200 [mm]

Total cycle time	8 [s]
Sub times	3 [s]

→ ext. Gripper open / close

Mass load	5 [kg]
-----------	--------

→ ext. Gripper → ext. attachment parts
→ ext. mass load

Center of gravity

X-Position	0 [mm]
Y-Position	0 [mm]
Z-Position	-100 [mm]

← Back

Individually

Recommendations 1



CMS-3SB-21-2

Technology ⓘ

Price ⓘ

Delivery time ⓘ



CMS-3SA-22-2

Technology ⓘ

Price ⓘ

Delivery time ⓘ



CMS-3SB-22-2

Technology ⓘ

Price ⓘ

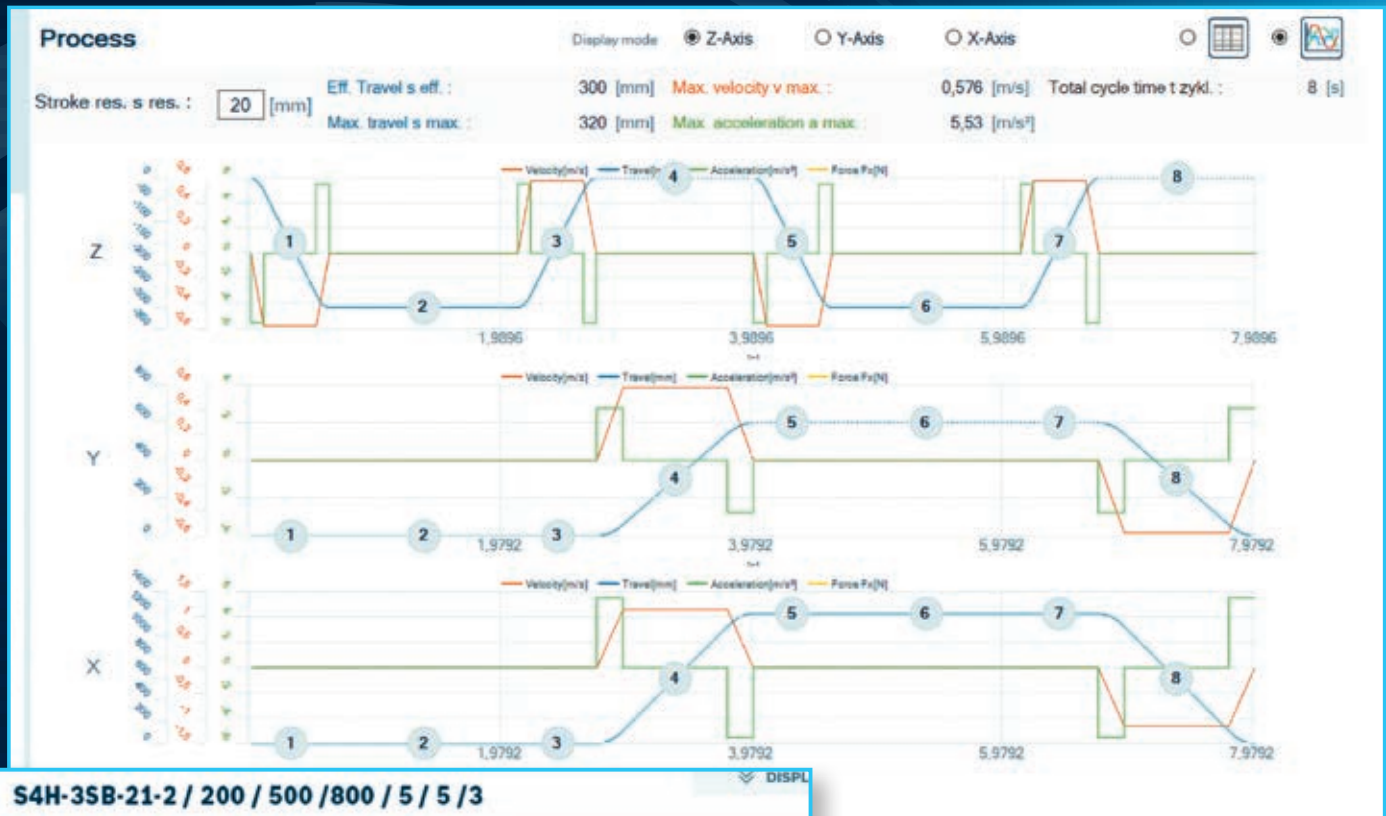
Delivery time ⓘ

◀ SIMPLE INPUT

Choose from 2 to 3 reference cycles – the system shows you the corresponding animation. Then simply define your desired system with 6 to 8 parameters for travel, time and mass – LinSelect does the rest.

▶ DETAILED OUTPUT

LinSelect transforms your inputs into detailed characteristic curves for each axis. You have at least two reference cycles to choose from per portal which allow continued customization as you work through them.



Configuration

Max. travel Z	200	[mm] (Sub-product CKK-090-NN-1)
Max. travel Y	500	[mm] (Sub-product CKR-110-NN -1)
Max. travel X	800	[mm] (2 x Sub-product MKR-065-NN-3)
Mechanical drive Z	5	Ball screw drive / BASA 12x5
Mechanical drive Y	5	Assembly belt drive / gear PG005S-MF i=5
Mechanical drive X	3	Assembly belt drive / gear PG060 i=3
Motor Z	MS2N03-BOBYN	MS2N03-BOBYN
Holding brake Z	Y	With holding brake Single-cable connecting technology Convection cooling
Motor Y	MS2N04-BOBTN	MS2N04-BOBTN
Holding brake Y	Y	With holding brake Single-cable connecting technology Convection cooling
Motor X	MS2N04-COBTN	MS2N04-COBTN
Holding brake X	Y	With holding brake Single-cable connecting technology Convection cooling
Automation & drive package	CtrlX, PR21, WEB HMI	
Function Kit	Handling	

◀ QUICK RESULT

You'll receive an overview of the possible variants along with a recommendation depending on performance requirements, price or delivery time.



You prefer to work differently? We will also show you other ways to select and configure – as individually as you like. ▶
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Best-in-class components for first-class results

PROVEN QUALITY - FROM A SINGLE SOURCE, FROM ONE COMPANY

In the field of linear motion technology, Bosch Rexroth is second to none. For 30 years, we have stood for best-in-class components. They are the proven basis for state-of-the-art, robust, high-precision and yet economical multi-axis systems. And the best thing of all: Bosch Rexroth can also supply you with all the additional components and add-on parts required for your individual axis combination. All components are from a single source, optimally tailored to each other and quickly selected and configured. Could it be any easier?

▲ Handling portal instead of a robot. An economical solution not only in intralogistics

Linear axes

PROVEN BASIS – STANDARD LINEAR AXES FOR MOVEMENTS IN SPACE

COMPACT MODULES



CKK – compact linear axis with two integrated ball rail systems and ball screw assembly

Properties

- ▶ 4 sizes from CKK-090 to CKK-200
- ▶ Precision aluminum profile with two preloaded ball rail systems
- ▶ Drive via precision ball screw assembly
- ▶ Protection of the installation elements by cover plate and cover strips
- ▶ Max. travel 1,800 mm
- ▶ High travel speeds of up to 1.6 m/s
- ▶ Any lengths available in mm steps



CKR – compact linear axis with two integrated ball rail systems and toothed belt drive

Properties

- ▶ 3 sizes from CKR-110 to CKR-200
- ▶ Precision aluminum profile with two preloaded ball rail systems
- ▶ Robust toothed belt drive (allows longer lengths than CKK module)
- ▶ Intelligent toothed belt guide protects internal components
- ▶ Max. travel 3,000 mm
- ▶ High travel speeds of up to 5 m/s
- ▶ Any lengths available in mm steps

LINEAR MODULE



MKR – compact linear module with integrated ball rail system and toothed belt drive

Properties

- ▶ 3 sizes from MKR-065 to MKR-110
- ▶ Extremely compact aluminum profile with preloaded ball rail system
- ▶ High-performance toothed belts for high travel speeds of up to 5 m/s
- ▶ Corrosion resistant steel cover strip
- ▶ Max. travel 3,000 mm
- ▶ Any lengths available in mm steps

Compactness meets modularity: drive controls and motors



ctrlX DRIVE – THE MOST COMPACT DRIVE SYSTEM

In addition to the proven drives such as from the HCS01 series, the world's most compact modular drive system is now available with ctrlX DRIVE. For absolutely future-proof multi-axis solutions. The ctrlX CORE control hardware is optionally integrated in the drive housing – saving you up to 50 percent space in the control cabinet. And even more in combination with the modern MS2N motors, as these offer up to 30 percent higher power density. It couldn't be more compact.

Complete performance package

Particularly in complex multi-axis machine systems, the multi-variant and scalable drive portfolio can demonstrate its strengths. With ctrlX DRIVE, all system components can be freely combined with each other – plus the option of comprehensive extensions of the hardware/software functions.

With a reaction time of around 4 ms, ctrlX SAFETY will offer one of the fastest SafeMotion solutions on the market in the future. Energy management functions ensure energy efficiency, and the patented Smart Energy Mode reduces peak drive loads by up to 70 percent. In addition, ctrlX DRIVE has an extremely robust EMC design.



▲ **ctrlX DRIVE: the new modular drive system, optionally with integrated control ctrlX CORE (left)**

▼ **Control and power in one: the proven IndraDrive Cs (HCS01 in 4 sizes) controls axes perfectly in the power range of multi-axis systems**





▲ **MS2N synchronous servo motors – for more torque and higher rotary speeds. With practical single-cable connection**

POWERFUL SERVOMOTORS

Our servo motors are the perfect team players in the ctrlX DRIVE portfolio. Boasting compact dimensions, they combine optimum dynamics with maximum precision of position, rotary speed, and torque values. Ideal for complex multi-axis systems.

Virtual commissioning

Developers have access to the digital twin of the motor, which is stored in a dimensioning tool and in the ctrlX DRIVE controller. Planning and dimensioning of even complex drive systems can therefore be virtualized quickly and reliably. Every motor is transformed into a data source for intelligent machines or i4.0 applications.

HIGHLIGHTS ctrlXDRIVE SYSTEM

More productivity

- ▶ Converters and supply units with high peak power ratings
- ▶ Flexible power supplier concept – space saving, flexible, energy-efficient

Fewer components

- ▶ 50 % less installation space in the control cabinet
- ▶ Perfect for 300 mm control cabinet
- ▶ Integrated ctrlX CORE – saves 100 % control installation space

Less engineering

- ▶ Intelligent functions (multi-Ethernet, multi-encoder, integrated web server etc.)
- ▶ Easy diagnosis
- ▶ Less effort for engineering and wiring
- ▶ Single-cable technology

HIGHLIGHTS MS2N SERVOMOTORS

More productivity

- ▶ High torque density for greater power
- ▶ 5 sizes from MS2N03 to MS2N07
- ▶ Maximum dynamics of the servo axes due to low motor inertia and high overload capability

Fewer components

- ▶ Robust single-cable connection
- ▶ MS2N with integrated SafeMotion encoder – no further safety components required
- ▶ Motor as torque sensor makes external sensors redundant

Less engineering

- ▶ Plug-and-play encoder data memory for faster commissioning
- ▶ Digital twin of the thermal motor model

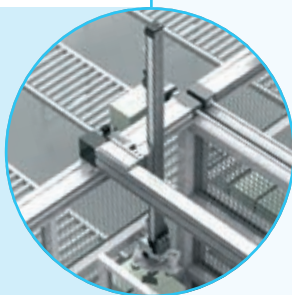
Good to know: all the details of a completely well thought-out system

Practicality does not only become apparent in the tough day-to-day industrial operation, it can already be recognized beforehand by the many clever details, predefined interfaces and add-on parts as well as flexible options. Typical Bosch Rexroth.

GENERAL INFORMATION

Installation position

The multi-axis systems are designed for use in a horizontal installation position on a flat surface.



Ambient conditions

Please note for use:

- ▶ Avoid extreme room temperatures
- ▶ Steer clear of pollution
- ▶ Maintain dry environment
- ▶ Stay away from chemical impact
- ▶ Elude shocks/vibrations



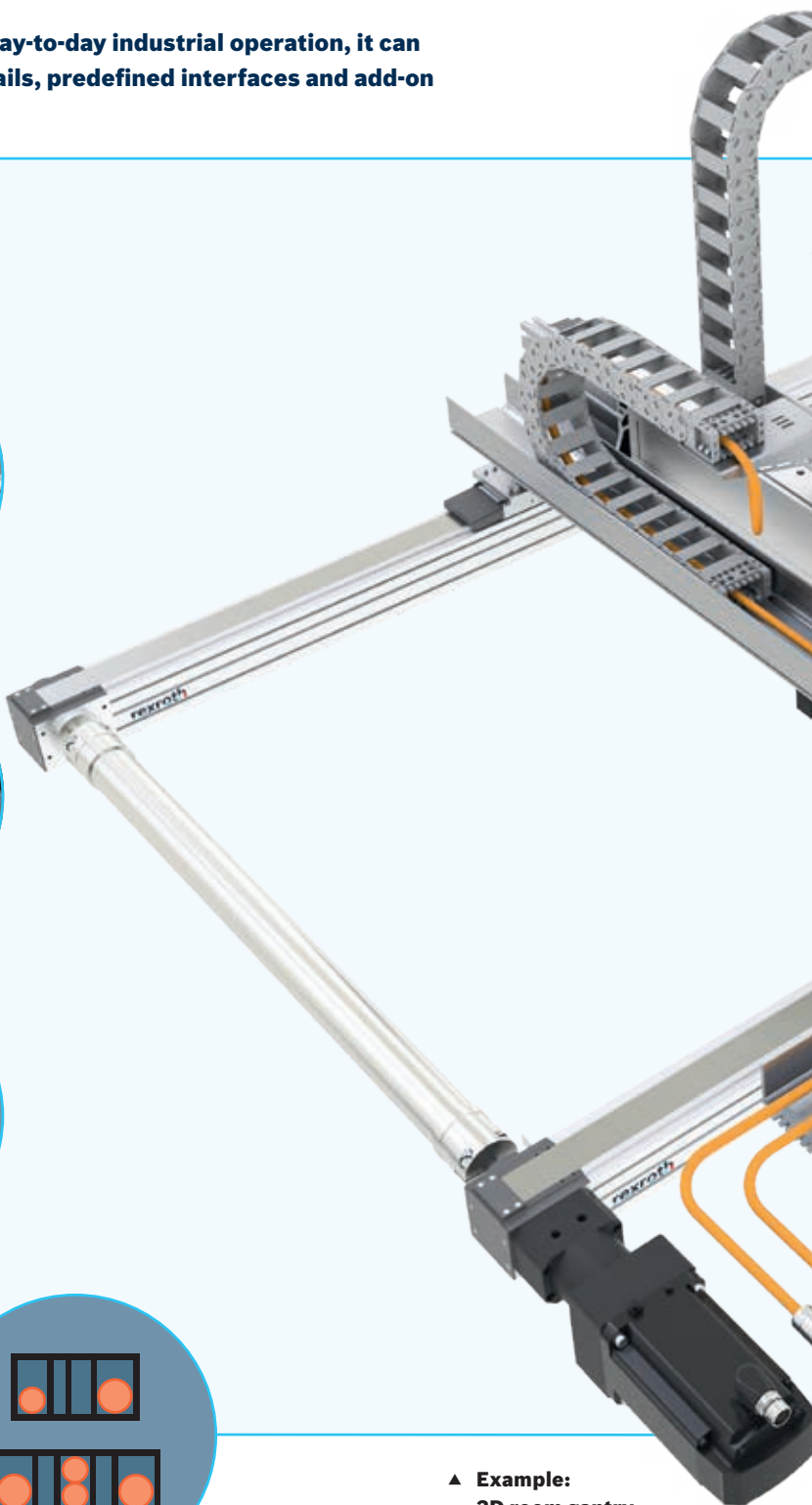
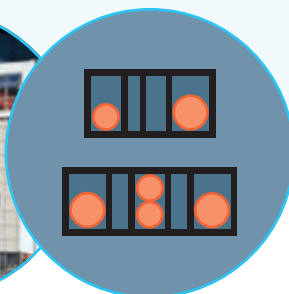
Lubrication/maintenance

Multi-axis systems come with initial greasing and are designed for grease lubrication.

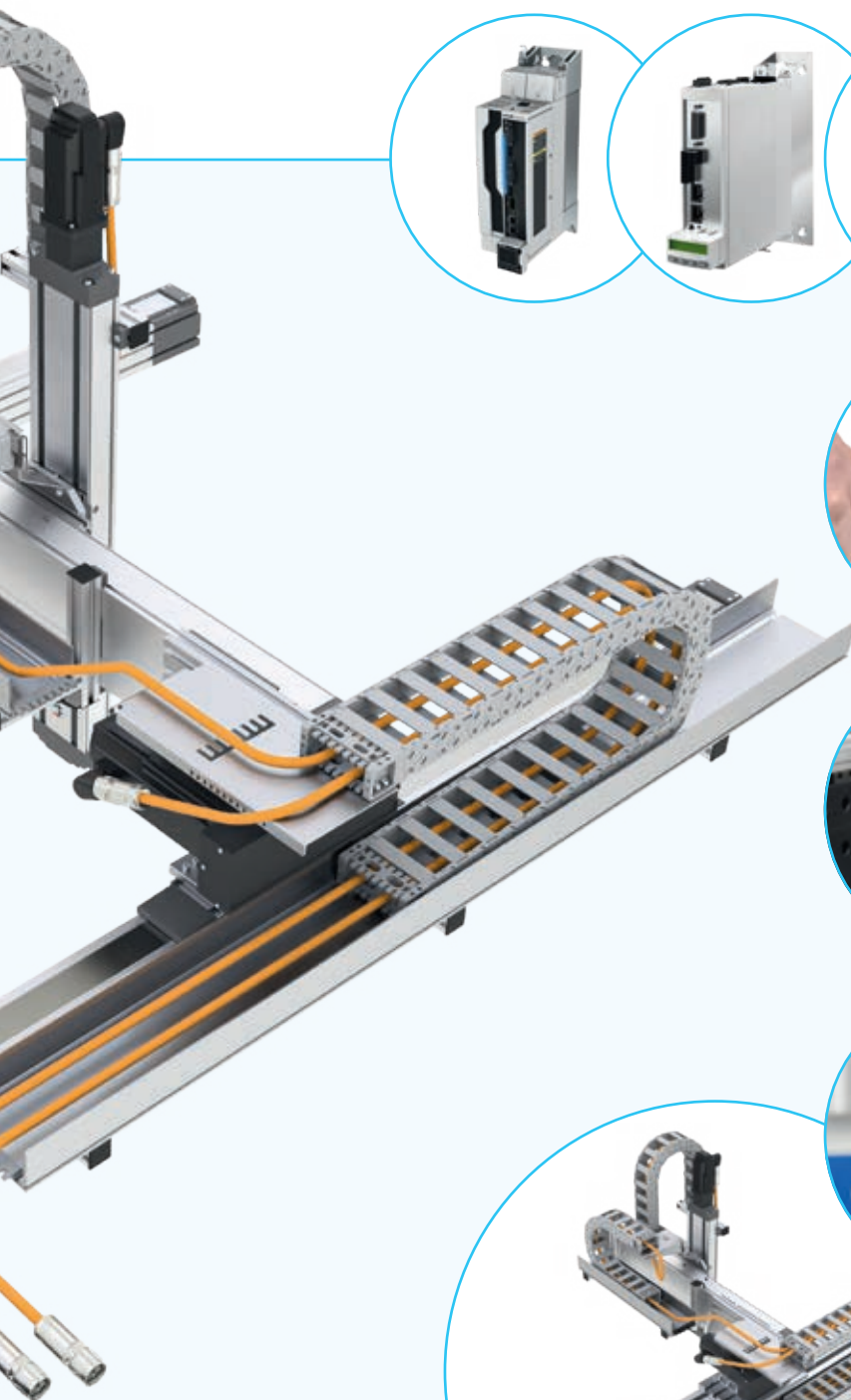


Cable management

Multi-axis systems are optionally available with energy chains and cables (plug connection). With plenty of free cross-sections in the energy chains for your own cable routing.



▲ Example:
3D room gantry



► **Example:**
3D cantilever space



Tailored motor-controller combination

Predefined combinations of motor and controller (electrical drive package) optimally complement the mechanics to form a functional sub-system. The Smart Function Kits with pre-installed operating software offer even more. (Page 16).



Commissioning parameters on encoder memory in motor

Simple commissioning through automated readout of the parameters stored in the motor encoder memory.



Attachment parts, interfaces

Simple mounting of the axis unit on the substructure via clamping fixtures. Wide range of connection options for customer attachments.



Scope of delivery

(depending on equipment)

Completely assembled: The multi-axis system is delivered fully assembled – including the energy chains and cables if cable management is selected as an option. The axis system is aligned on delivery and only needs to be adjusted to the substructure during installation.

Partially assembled: For transport or handling reasons, the multi-axis system is delivered partially assembled. The assembly is carried out by the customer according to instructions.

Flexible in every respect: 5 combinations of axes for precise handling

5 predefined axis combinations in 36 sizes offer you a lot of freedom for all common handling tasks. The travel ranges can be configured in all axial directions in mm increments. This allows you to make optimum use of installation space, obtain maximum flexibility during installation and adapt your sub-system perfectly to your application.

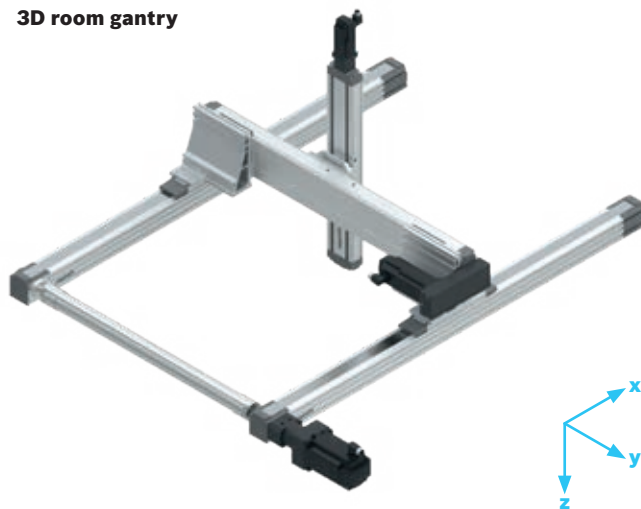
2D area gantry



- 6 sizes
- Max. payload* 25-100 kg
- Travel range [mm]
 - x-axis min. 60, max. 3,000
 - y-axis min. 80, max. 2,869

* Depending on size, travel range and dynamics.

3D room gantry



- 8 sizes
- Max. payload* 10-70 kg
- Travel range [mm]
 - x-axis min. 60, max. 3,000
 - y-axis min. 80, max. 2,753
 - z-axis min. 60, max. 1,590

APPLICATION EXAMPLES FOR MULTI-AXIS SYSTEMS

Axis combinations for
almost unlimited fields of
application



Pick & place



Positioning



Palletizing



Feeding

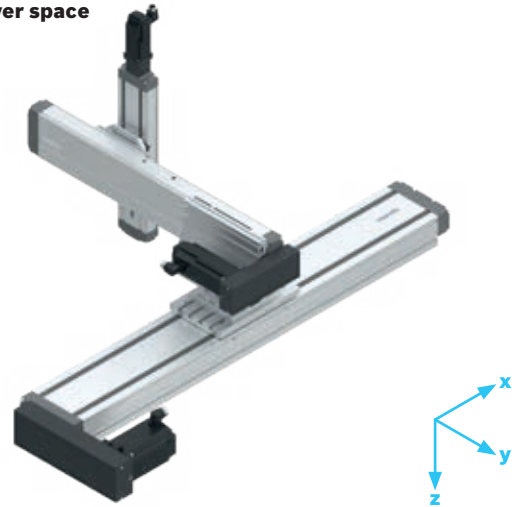
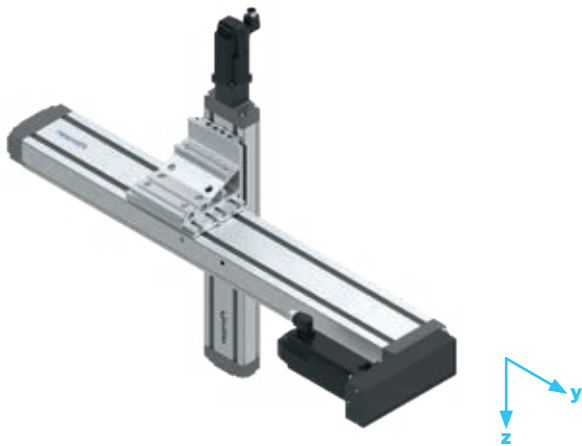


Moving



Equipping

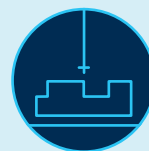
- 6 sizes
- Max. payload* 10-32.5 kg
- Travel range [mm]
 - x-axis min. 150, max. 3,000
 - y-axis min. 350, max. 880
 - z-axis min. 40, max. 1,325

3D cantilever space**2D linear gantry**

- 8 sizes
- Max. payload* 10-61 kg
- Travel range [mm]
 - y-axis min. 210, max. 3,000
 - z-axis min. 40, max. 1,590

2D cantilever surface

- 8 sizes
- Max. payload* 25-82 kg
- Travel range [mm]
 - x-axis min. 150, max. 3,000
 - y-axis min. 200, max. 1,200

**Picking****Stacking****Dispensing****Discharging****Sorting****Checking****Mounting****Screwing**

There is an even smarter way: Smart Function Kit for Handling



THE COMPLETE PACKAGE – INCLUDING SOFTWARE

With the Smart Function Kit for Handling, Bosch Rexroth now offers a ready-to-install mechatronic solution for positioning and handling that is simple and intuitive in selection and configuration, which is the “philosophy” of the Smart Function Kits. This is achieved through predefined kits, intuitive operation and pre-installed software for which no programming knowledge is required while utilizing the responsive Web HMI. Extremely fast due to plug and produce commissioning and auto-parameterization of the controller. This saves you a lot of time compared to conventional systems. You can see how smart the operation is on the following pages.

**STRAIGHTFORWARD PRODUCT SELECTION**

- ▶ Predefined, coordinated hardware components and software
- ▶ Fast selection and dimensioning with LinSelect
- ▶ All components from a single supplier – with proven Rexroth quality

**PLUG & PRODUCE**

- ▶ Delivered in a single package, including pre-installed operating software
- ▶ Only a small number of interfaces thanks to an integrated control system
- ▶ Easy wiring thanks to pre-assembled cables
- ▶ Guided start-up via our wizard
- ▶ Auto parameterization of the overall system
- ▶ Referencing the axes

**ZERO PROGRAMMING**

- ▶ No programming knowledge required
- ▶ Simple and graphical programming of the process
- ▶ Browser-based Web HMI, can be used on various devices
- ▶ Modern and intuitive design

**OPEN INTERFACES**

- ▶ Simple connection to higher-level control system
- ▶ Data access via ReST programming interface
- ▶ IoT connection via OPC-UA
- ▶ Open software platform that can be extended via apps



Best-in-class
components of linear
motion technology
from Bosch Rexroth



Sensors
Electronics
Software



Completely new
solutions and busi-
ness models for the
Factory of the Future

**SMART MECHATRONIX: PLUG & PRODUCE, PERFORM, PROCEED**

With the new Smart MechatroniX solution platform, which combines best-in-class linear motion technology components with sensors, electronics and software, Bosch Rexroth is responding to market trends in factory automation on the way to the Factory of the Future. The resulting solutions are versatile and open up completely new business models. They allow quick commissioning, offer full process transparency and ensure a short time to market and high productivity.



Find out more:

www.boschrexroth.com/smart-mechatronix

INTUITIVE, EASY-TO-USE SOFTWARE – NO PROGRAMMING KNOWLEDGE REQUIRED

Thanks to the modern, intuitive Web HMI, the software is ready for immediate use, with no previous knowledge required. The commissioning wizard guides you through the setting process step by step, programming is done by drag and drop. It couldn't be any simpler or clearer.



The image displays two screenshots of the Rexroth Smart Function Kit software interface. The top screenshot shows the 'INITIAL SETUP WIZARD' with steps: 1. Login, 2. User, 3. System architecture, 4. Parameterization, 5. Orientation, 6. Referencing, and 7. Complete. The 'SYSTEM OVERVIEW' section shows a diagram of the system architecture with HMI, ctrlX, Drive 1, Drive 2, and Drive 3. A message indicates 'System-type 3SB detected' and asks the user to select the correct system type from a list. The bottom screenshot shows the 'PROGRAM' section with a dropdown menu for 'Awesome Program' and a 'LIBRARY' of functions including Motion, In / Out, Loops, Logic, Variables, Functions, and Arrays. A 'on start' block is visible on the right.

Start with ctrlX
The pre-installed app (Web HMI) for the Smart Function Kit for Handling is fully integrated into the ctrlX application

Commissioning:
The commissioning wizard guides through the setting process you step by step

Auto parameterization
The system recognizes all axes independently, the drive controllers are parameterized automatically

Referencing:
Intuitive referencing of the axes including visual feedback



◀ Process configuration

Intuitive graphical programming – without programming knowledge. With expandable command library and validation of program parameters

▲ Web HMI dashboard

Usable on various end devices, everything in view: display of system status and diagnostic messages, of program change and jog mode plus always up-to-date process data such as position, travel speed, acceleration

Smart Function Kit for Handling: System overview

DRIVE AND CONTROL

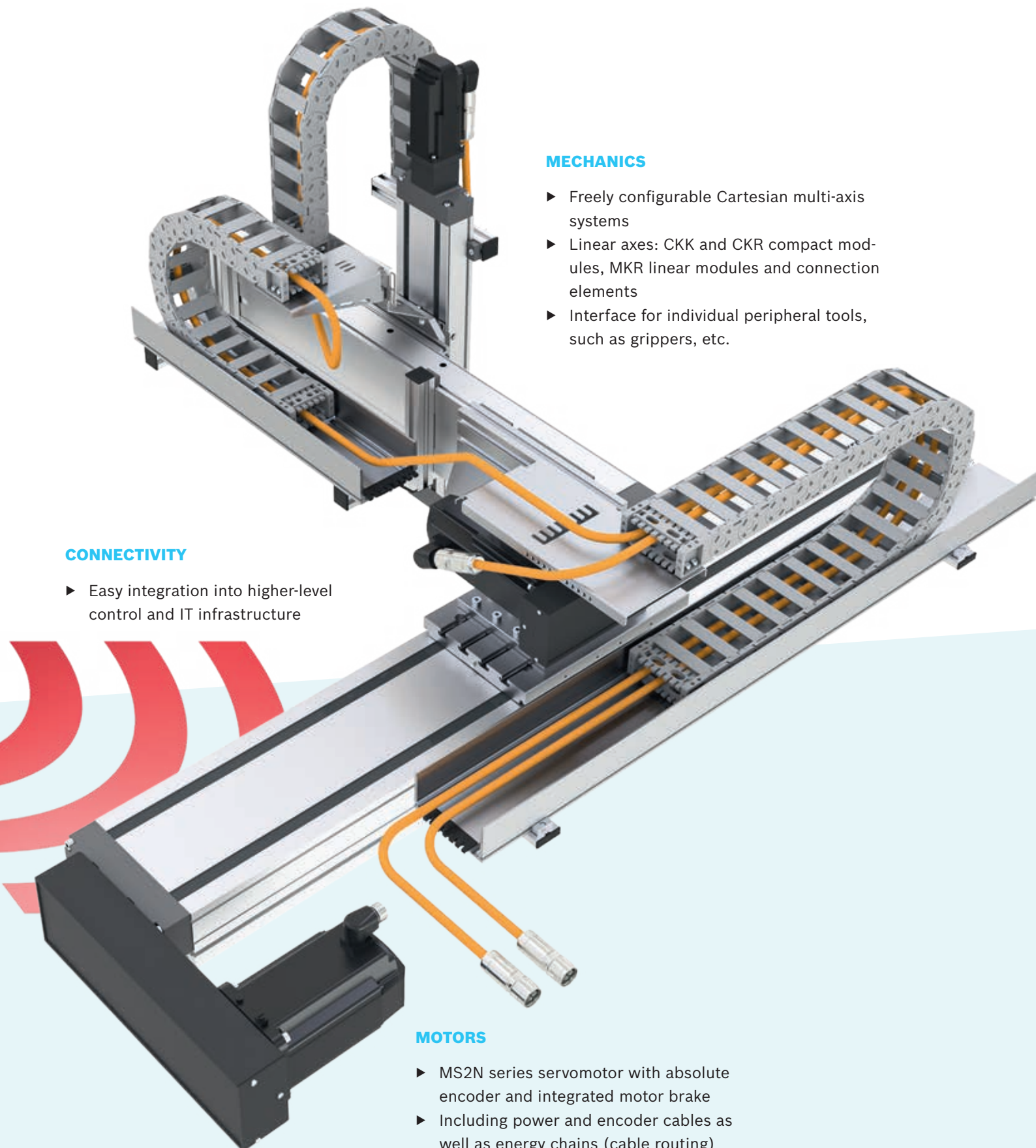
- ▶ ctrlX DRIVE controller of the latest generation
- ▶ ctrlX CORE control integrated
- ▶ Open interface for i4.0 via OPC-UA
- ▶ Building blocks for connection to higher-level control system
- ▶ ReST programming interface
- ▶ Pre-installed engineering and runtime apps – easy to extend individually
(■ scope of delivery, ■ optional)



BROWSER-BASED WEB HMI

- ▶ Pre-installed, intuitive software
- ▶ No programming knowledge required – graphical programming via drag & drop
- ▶ Runs on various end devices starting at 10 inches





CONNECTIVITY

- Easy integration into higher-level control and IT infrastructure

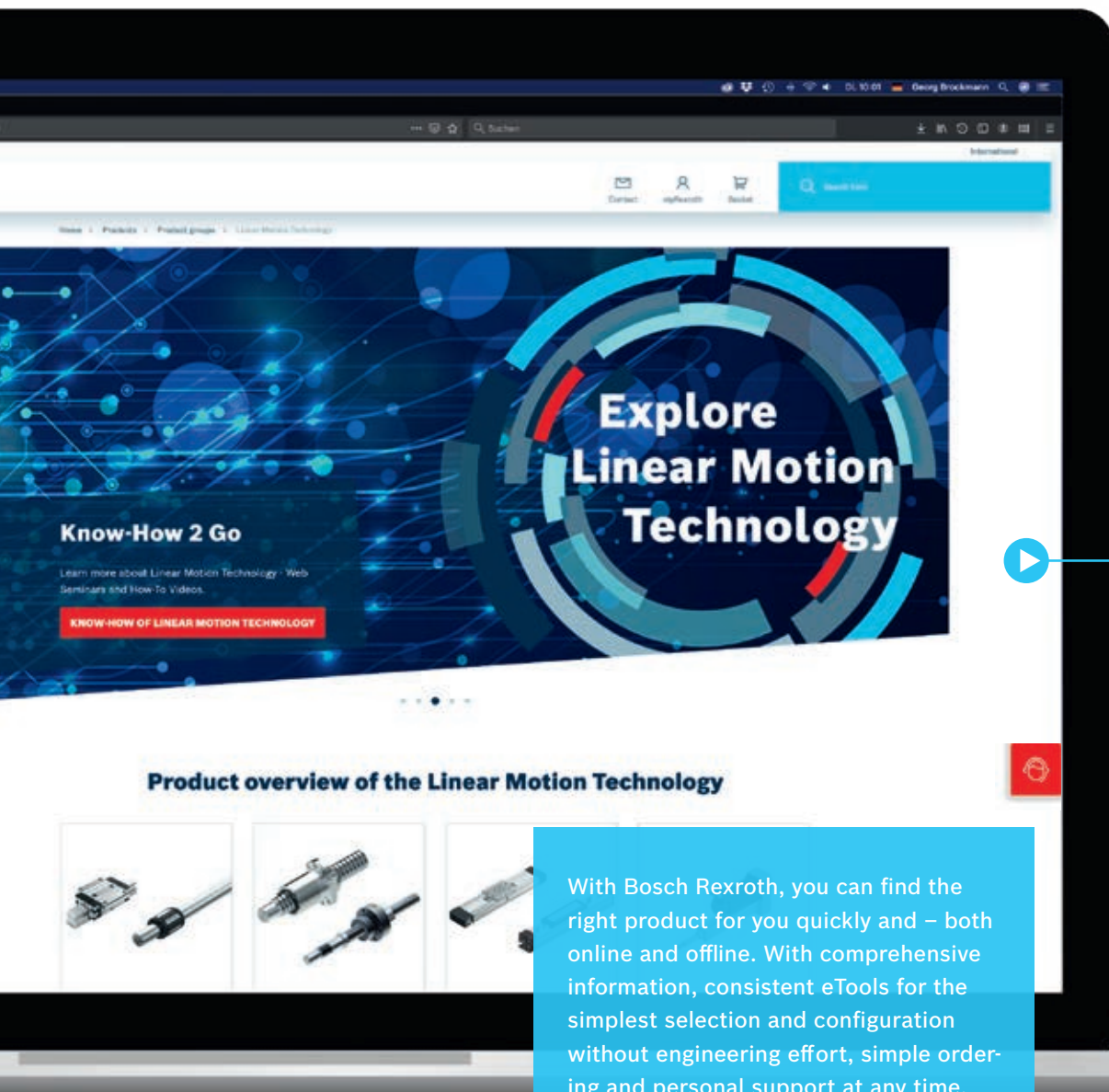
MECHANICS

- Freely configurable Cartesian multi-axis systems
- Linear axes: CKK and CKR compact modules, MKR linear modules and connection elements
- Interface for individual peripheral tools, such as grippers, etc.

MOTORS

- MS2N series servomotor with absolute encoder and integrated motor brake
- Including power and encoder cables as well as energy chains (cable routing)

Perfect fit: Choose the best way to your product



With Bosch Rexroth, you can find the right product for you quickly and – both online and offline. With comprehensive information, consistent eTools for the simplest selection and configuration without engineering effort, simple ordering and personal support at any time. The perfect basis for building best-in-class multi-axis systems. Fast and economical.

ONLINE

All selection aids are immediately available via the Bosch Rexroth website

DIRECT CONTACT

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- E-mail address
info@boschrexroth.de
- Contact form
- Chat



**www.boschrexroth.com/
linear-motion-technology**



Linear motion technology servicing: maximum machine availability and productivity



Rexroth servicing for linear motion technology means partnership over the entire life cycle of your systems. We are there to help you in 80 countries around the world. From emergency repairs to field service, with original spare parts, modernization and predictive maintenance services. And beyond that with an extensive training portfolio. Working together, we increase your productivity and ensure maximum availability.



REPAIRS

- ▶ Analysis
- ▶ Expert overhauls
- ▶ Cost control



SPARE PARTS

- ▶ Inexpensive
- ▶ Time-saving
- ▶ Spare parts from the original manufacturer
- ▶ Low storage costs



FIELD SERVICE

- ▶ Repairs on location
- ▶ Reduced downtimes
- ▶ Customer-specific service packages



TRAINING

- ▶ Professional assembly
- ▶ Replacing wear parts
- ▶ Damage analysis
- ▶ Rexroth Academy
- ▶ How-to videos



LINEAR MOTION TECHNOLOGY SERVICING GERMANY

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- ▶ Direct hotline +49 9721 9378617
(workdays from 08:00 until 17:00)
- ▶ service.lt@boschrexroth.de



WE MOVE. YOU WIN.

SUCCESS STORY

If a standardized multi-axis system cannot optimally meet your requirements, Bosch Rexroth will tailor your individual solution. Here's an example:

Electrochemical machining with ready-to-install six-axis handling system

Compact, robust and highly precise

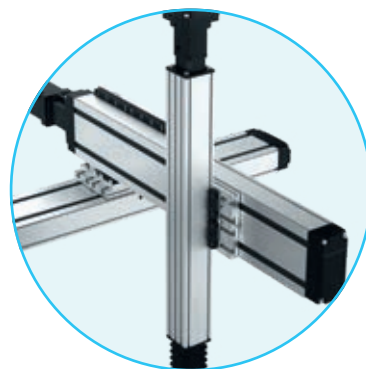
THE CHALLENGE

Today's machines for electrochemical machining (ECM) should have short cycle times and work with micrometer precision even over long travel distances. At the same time, use in corrosive salt spray places huge demands on the material. With the help of Rexroth components, the medium-sized EMAG Group developed a new modular and economical machine concept for use in such environments. It should be particularly compact and cover all process steps – from pre-cleaning and electrochemical machining to post-cleaning and testing.

THE REXROTH SOLUTION

The modular, corrosion-resistant six-axis system with an integrated high-precision IMS-I measuring system includes a complete sensor system and evaluation electronics in the runner blocks. The fully pre-assembled system is based on adapted standard modules from Rexroth's linear motion technology toolbox. The positive-locking connection technology allows quick final assembly with no need for time-consuming adjustment. An automated central lubrication system guarantees minimum maintenance and maximum service life.

THE COMPONENTS



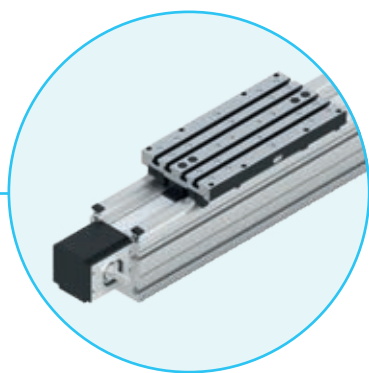
Two three-axis systems



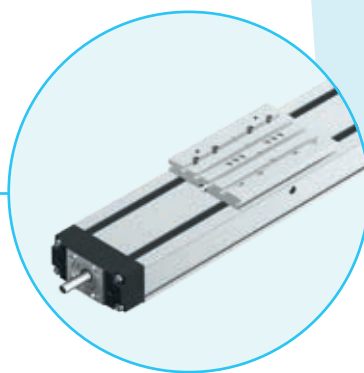
THE RESULT

“Rexroth achieved our goals as regards compactness, costs and flexibility.”

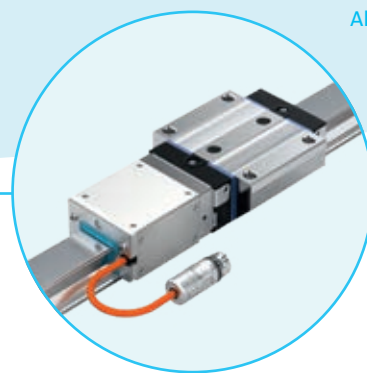
Alexander Noller,
EMAG



Linear modules MKR



Compact modules CKK



Integrated measuring system IMS-I

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www.boschrexroth.com/linear-motion-technology

www.morrell-group.com/smart-function-kit-for-handling

**Your personal contact**

At your service. You can find your local Rexroth contact online at www.boschrexroth.com/contact

**Linear Motion Technology online**

Videos and tools and our online catalog as well as configurators and selection guides are available for downloading here:

www.boschrexroth.com/linear-motion-technology

**Dimensioning and selection tool LinSelect**

The direct way to download:

www.boschrexroth.com/linselect

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Evolution in Controls

**LINEAR MOTION TECHNOLOGY
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