SIMPLY. ALWAYS. FITS.

EXPERIENCE OUR LINEAR ROBOTS FROM THE LRXplus SERIES



KraussMaffei

Pioneering Plastics

FACTS & FIGURES

APPLICATIONS
OF THE LRXplus SERIES



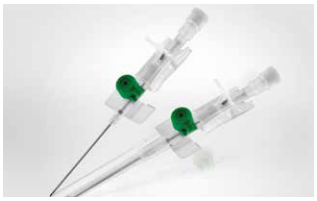
Consumer goods



Packaging



Automotive



Medical/pharmaceutical



Electrical/electronics



White goods

Application areas	Insertion, demolding, packaging
Special features	Speed, precision, durability, cost-efficiency
Device type	Linear robot
Payload of LRXplus	5 – 100 kg
Payload of LRXplus Twin	35 – 100 kg
Axis combinations	Up to 500 different combinations
Standard accessories	Wrist axes, grippers, belt conveyors, safety housings
Control system concept	Integrated or standalone
Clamping force range	500 kN to 60,000 kN
Transfer variants	Non-operator side (standard), operator side, longitudinal discharge

SIMPLY. ALWAYS. FITS.

LRXplus LINEAR ROBOT

The linear robots of the LRXplus series from KraussMaffei impress with maximum efficiency and easy integration into any peripherals – whether with injection molding machines from KraussMaffei, other manufacturers or in a variety of automation tasks.

The new smartControl MC7 control system can be operated intuitively and has freely configurable operating buttons. The traversing axes made of crash-proof aluminum and steel minimize unscheduled downtimes and enable cost-effective maintenance.

This makes the LRXplus linear robot a reliable universal solution for your automated production.

Your benefits at a glance:

- High technical availability thanks to robust axes
- Intuitive smartControl MC7 control system with hard keys
- Quick demolding times
- Custom solutions for complex requirements
- Compatible with injection molding machines from other manufacturers
- Turnkey automation cells
- Flexible gripper solutions

A FASCINATING
TOUR THROUGH THE LRXplus SERIES

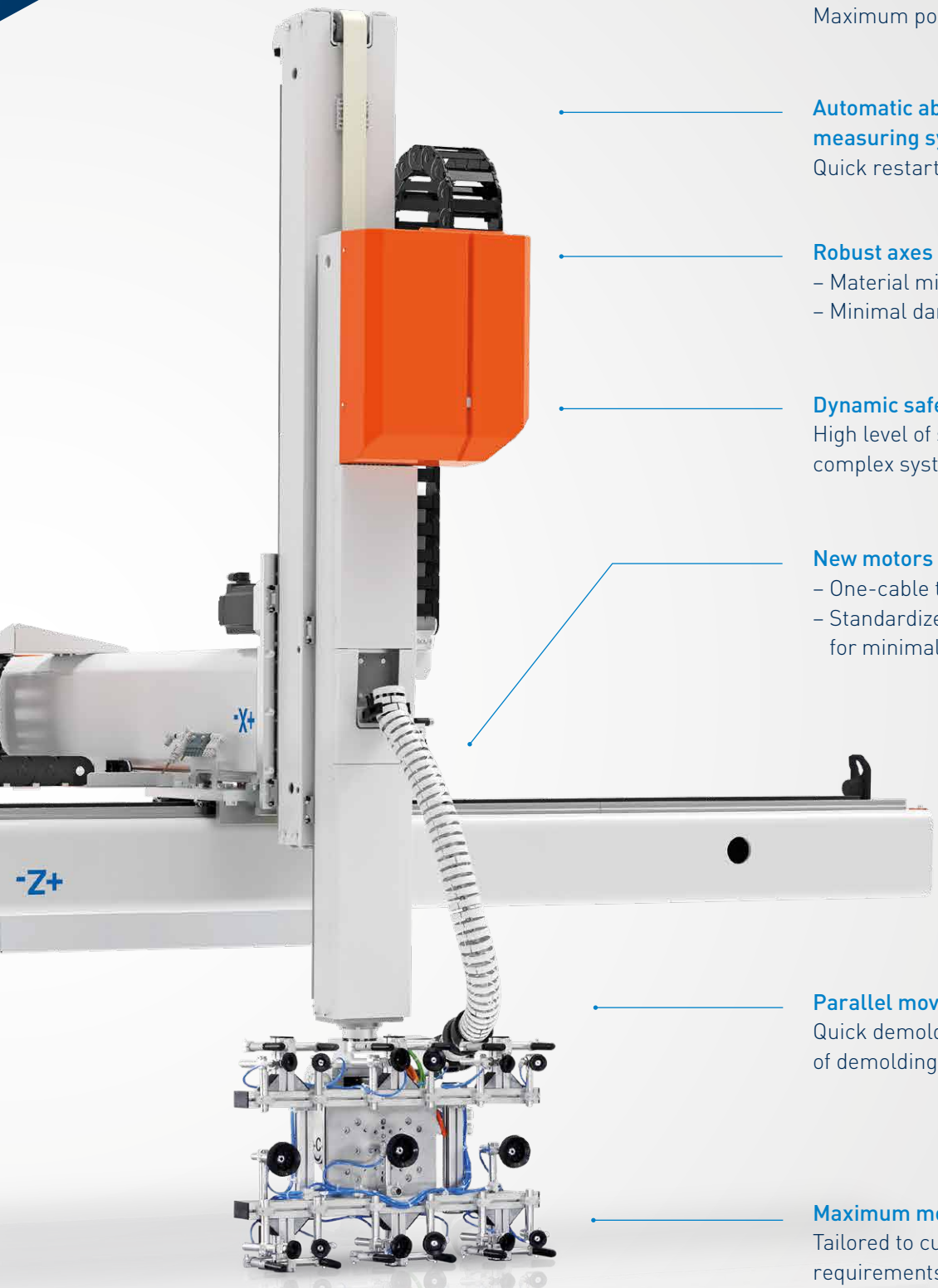
Economical servo-drives
Quick acceleration and
short cycle times

Can be retrofitted flexibly
– Also compatible with machines from other manufacturers
– Communication via the EUROMAP 67 interface



Improved cooling
Optimized air flow with additional
outlets for the control cabinet
(approved up to 40 °C)

Reliable communication using VARAN bus technology
High control precision in tight tolerances



Rack-and-pinion drive
Maximum positioning accuracy

Automatic absolute position measuring system
Quick restart of the robot without home travel

Robust axes
– Material mix of aluminum and steel
– Minimal damage in the event of a crash

Dynamic safety zones
High level of system safety, even for complex systems

New motors and controllers
– One-cable technology
– Standardized and clearly arranged for minimal maintenance times

Parallel movement of all axes
Quick demolding times and a high level of demolding flexibility

Maximum modularity
Tailored to customer requirements

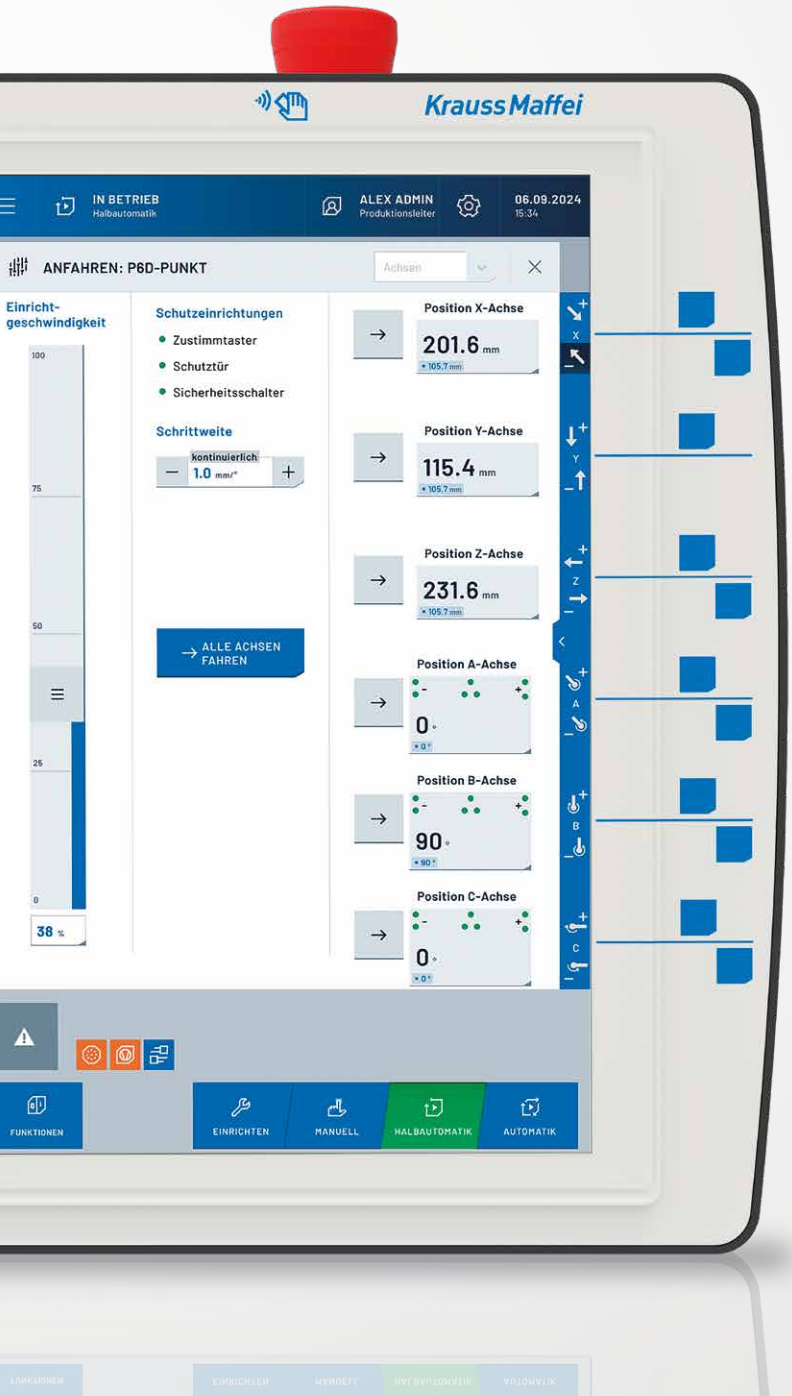
THE HIGHLIGHTS
OF THE NEW SMARTCONTROL MC7 CONTROL SYSTEM





Hard keys
- Simple setup of the linear robot thanks to physical buttons
- Individually configurable hard keys for maximum user-friendliness
- Haptic feedback enables operation without looking at the buttons, e.g. when moving the axes manually

Improved visualization and performance
- HTML5-based HMI: Modern design and optimized menu guidance for an intuitive user experience
- Higher performance: Minimal latency for smooth and efficient operation



10" multi-touch display

- Large portrait format display for improved user-friendliness
- Ergonomic handheld pendant for comfortable work
- Control of multiple robots with pluggable handheld pendant

Extended functionality

New program editor:

- More overview and intuitive operation with maximum functionality

MULTIPLE KINEMATICS FOR LINEAR ROBOTS

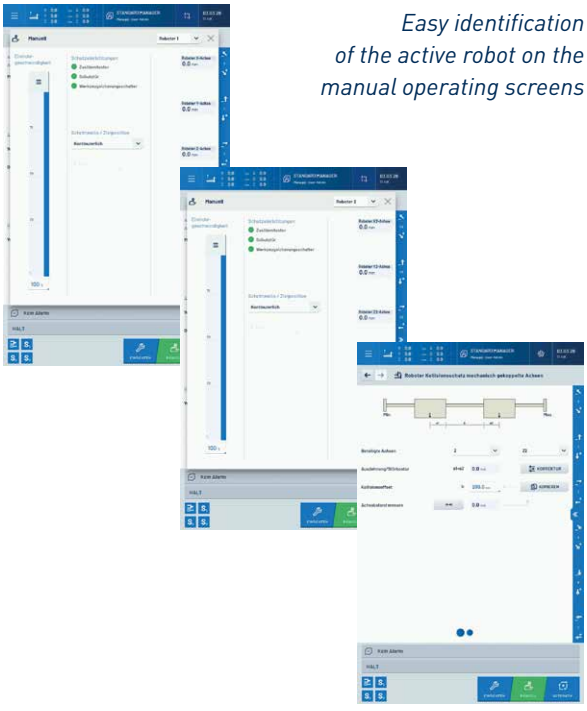
VERSATILE, CONVENIENT AND EASY TO OPERATE

Multiple kinematics on the LRXplus platform offer you a host of benefits in the implementation of complex automation solutions, such as the assignment of an associated production process to several robot axes. The smartControl MC7 control system manages the process and all moving axes are programmed and controlled centrally using a handheld pendant.

What are multiple kinematics at KraussMaffei?

Multiple kinematics at KraussMaffei are the LRXplus Twin X and Twin Z. They are available in a payload range of 35-100 kg. The Twin X version features mechanically coupled Y-axes on a common X-axis. For the Twin Z, the X-axes are mechanically coupled on a common Z-axis.

The LRXplus Twin is also equipped with the new smartControl MC7 control system. It enables central programming and control of linear robots with up to 24 axes. The software allows the configuration of up to 4 kinematic units (robots), each with 6 axes. Multiple kinematics are the perfect starting point for the development of complex automation solutions used in production.



Easy identification of the active robot on the manual operating screens

In which applications does the LRXplus Twin excel?

It is ideal for parallel movements, such as "flying" transfer of components using a "handshake" transfer. This results in shorter cycle times and higher productivity. It also enables simple process synchronization when processes overlap. Using smartControl M7, all axes can be operated via a common control system.

Extended options

A joint program editor is used to program all the robots. Program commands and parameters can be assigned to individual robots with minimum effort. A joint coordinate system for all axes makes it easier to control specific robots in individual operating modes.

LRXplus Twin integrated and standalone possible

The integrated version offers the added convenience of alternate operation using the panel on the injection molding machine or the handheld pendant on the robot. The standalone version is an autonomous, independent system that incorporates all the usual advantages of the smartControl MC7 control system. The standalone version is typically used with: KraussMaffei injection molding machine models with a control system older than the MC6 or injection molding machines from third-party manufacturers.

YOUR BENEFITS:

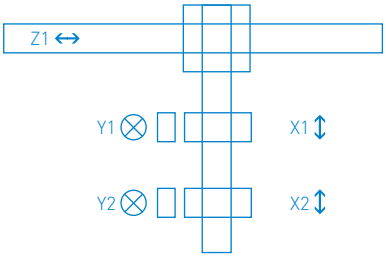
- All benefits of the LRXplus (see p. 3)
- New floor-mounted control cabinet with improved cooling and better accessibility
- Simple process synchronization when processes overlap

CUSTOMIZED APPLICATION
MULTIPLE KINEMATICS IN YOUR PRODUCTION

The possibilities for combining several axes can be extremely varied.
The following case studies show several application options for multiple kinematics.

Configuration Twin X





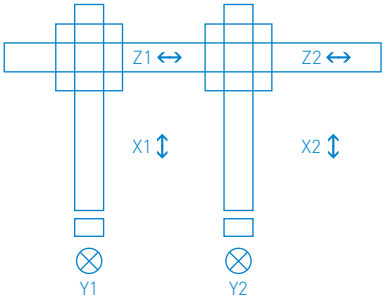
Feature
Mechanically linked Y-axes on a shared X-axis.

Application
Simultaneous demolding or placement process in the mold.

Benefits
- Save time when using a multi-daylight mold or TwinForm machines
- Efficient manufacturing of molds with demolding and insertion on both mold-halves within the same cycle
- High flexibility thanks to expanded options: assembly of demolded parts, flipping over of articles or the like

Configuration Twin Z





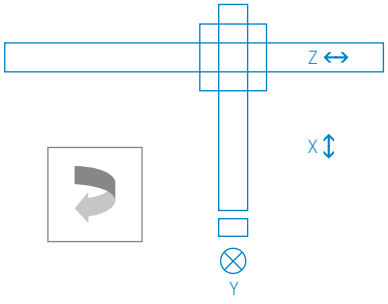
Feature
Mechanically linked X-axes on a shared Z-axis.

Application
Transfer of components (hand-shake) during rapid component demolding, stacking operations.

Benefits
- Save time when using a multi-daylight mold or TwinForm machines
- Space and time saved on automated units with overlapping motion ranges (robot installation in the longitudinal discharge)
- Process linking option: demolding, transfer, installation, stacking, etc.

Configuration of control system of additional peripheral axes





Feature
Additional axes (peripherals) for the standard robot.

Application
Use of rotary and cross tables.

Benefits
- Central control system also used for external axes from easy servo transfer units to completely driven peripheral stations (e.g., feed and separation)

FOR THE MOST VARIED OF TASKS IN THE INJECTION MOLDING PROCESS **CUSTOMIZED AUTOMATION**

Linear robots are equipped with three linear axes and up to three wrist axes, undertaking the most varied of tasks in the injection molding process.

Universal application

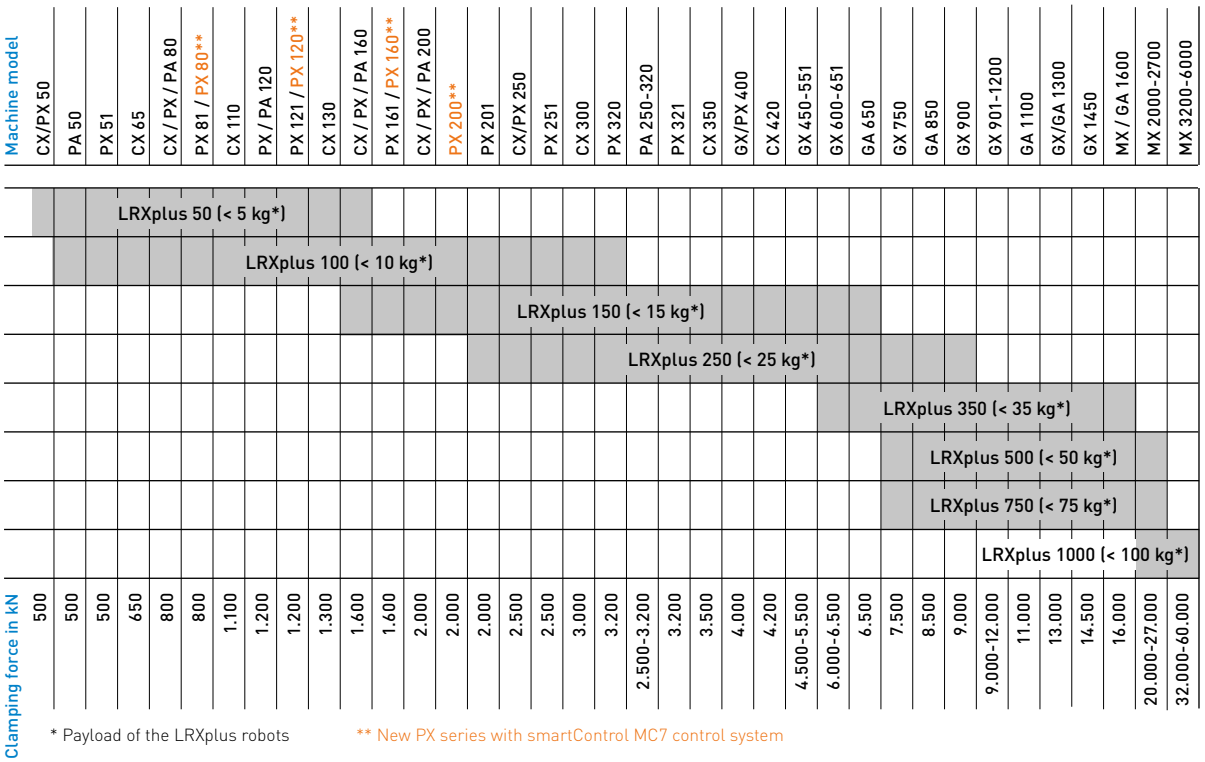
The highlight of the linear robots in the LRXplus series from KraussMaffei is the wide range of variants. They cover all clamping force ranges, from large to small, and can be used universally for all types of injection molding machines – irrespective of brand or manufacturer.

High level of system functionality

The LRXplus series is based on the new smartControl MC7 control system from KraussMaffei. It is easy to operate, program and control. Standardized safety technology and periphery components such as belt conveyors and safety housings are matched with the series, thereby ensuring absolute safety. Robots of the LRXplus series are dynamic, fast and precise: demolding times under a second are possible with repeatability of +/- 0.1 mm.

YOUR BENEFITS:

- High level of productivity
- Wide range of variants
- Precise repeatability



* Payload of the LRXplus robots

** New PX series with smartControl MC7 control system

KraussMaffei linear robots for the implementation of solutions ranging from pick & place to turnkey



EFFICIENT, COMPACT AND CUSTOMIZED
THE RIGHT AUTOMATION SOLUTION FOR EVERY TASK

Whatever your production requirements are: The perfect interplay between the linear robot and injection molding machine makes the LRXplus series a technically and economically outstanding automation solution for your production as well.

Extreme flexibility thanks to over 500 axis combinations

The LRXplus series provides the right linear robot for every clamping force level. The required axis lengths and wrist axes are preconfigured depending on requirements. A wide range of axis designs, axis extensions and hand-axis combinations in every size enable customized adaptation to your requirements.

YOUR BENEFITS:

- Varied axis combinations
- CE conformity
- Absolute position measuring system
- 5-button operating concept
- Automatic drive to home position



New, ergonomically optimized handheld pendant with touchscreen function for convenient programming and setup of the LRXplus linear robot

Cost-effective standard

The machines in the LRXplus series already provide, as standard, many varied features for article production. In addition to optimized axes for durable, accurate and continuous operation, an absolute position measuring system makes a quick and safe setup mode easier for different applications.

Basic demolding tasks can be started immediately using a program.
Automatic drive to home position makes it possible for the robot to safely travel from the mold or peripherals at the press of a button. For follow-up processes, there is no need for cost-intensive, additional control units because stacking programs for stacking on pallets are already included as standard, and it is also possible to activate external peripherals.

CE conformity for three transfer variants

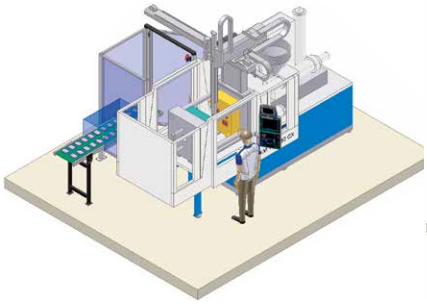
The LRXplus series is granted CE conformity in combination with an injection molding machine. Three different transfer variants are possible:
– Non-operator side (standard)
– Operator side
– Longitudinal discharge

Longitudinal discharge offers an additional advantage. The floor space can be reduced by up to 3 m, which saves valuable production space. For low buildings, KraussMaffei can also provide linear automation in its low-building variant with standard telescopic Y-axis. For injection molding machines produced by other manufacturers, the standalone version from KraussMaffei is used.

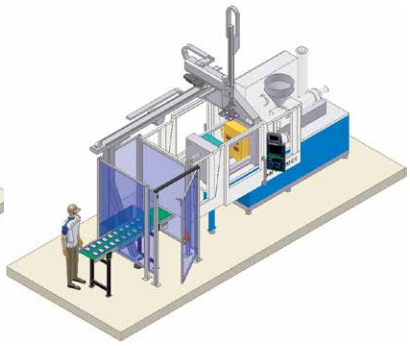
The control system: Intelligent and integrated

The injection molding process and automation form one unit via the integrated control system with VARAN BUS technology. Process data are available in real time. Programming and operation are easy and do not call for any in-depth programming knowledge.

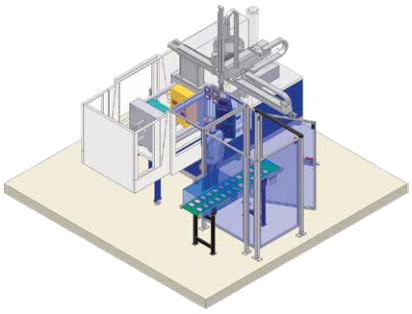
For optimum teaching and ergonomic programming, all LRXplus devices have a handheld pendant with hard keys. The robot can also be fully controlled via the control panel of the KraussMaffei injection molding machine.



Transfer of the LRXplus to the non-operator side



A manufacturing cell with LRXplus longitudinal discharge



The LRXplus extends across the operator side (overhead safety guard)

KEEP ALL YOUR PRODUCTS UNDER CONTROL WITH GRIPPER SOLUTIONS – FOR EVERY TASK AND EVERY SECTOR

Thanks to many years of experience in system and gripper construction, KraussMaffei has automation expertise that goes well beyond purely standard tasks.

Application example

Full automation of a KM 250-t machine for demolding housings for interior lighting. There are three product variants with the same suction position and positioning hole in one 4-cavity mold. The vacuum circuits on the gripper must be monitored. The production parts are deposited in the workpiece rack provided. The workpiece racks must be palletized and are then discharged using a roller conveyor. Furthermore, an integrated belt conveyor for alternative transfer of the molded parts will be required.

The system solution

Demolding of the molded parts with LRX 250 linear robot. When stacked, the molded parts are compacted in the gripper and then deposited in the workpiece racks (trays) provided. The gripper has different versions, each with different dimensions: for handling trays and for handling the components. The trays provided are transported using linear handling and then centered in relation to a shuttle table. There are separate chutes for good components and rejects. They remain quite flexible, and can stack the production components either in trays or pallet cages, or place the components on a belt conveyor. Both options are available to you.

YOUR BENEFITS:

- Flexible overall concept
- Very compact production cell for restricted floor space
- Multi-dimensional gripper
- High level of workplace safety thanks to safety light grid with muting system
- Very short cycle time due to many parallel processes
- High level of positioning accuracy when stacking
- Components aligned for any further processing that may be required



Custom demolding and gripper concepts:
A multi-dimensional gripper is being used in this illustration.

VERSATILE PERIPHERALS
FOR COMPLEX AUTOMATION SOLUTIONS

Wide variety of grippers
Whether simple grippers with standard components such as vacuum exhausters, parallel grippers, sprue gate grippers or complex inserting and demolding grippers, we have the perfect solution for you. Benefit from cost-effective solutions for your special requirements.

Precise sorting and feeding units
Sorting and material feeding units are necessary for insertion technology or subsequent processes. For such processes, the robot requires the components to be in a repeatable, aligned position. A further plus: the peripherals can be included directly in the robot control system so that only one control unit is required.

Different drawer systems
They are used for providing parts, for discharging QA components and for buffer storage. In addition to single and double drawers, a combination of drawers and chutes is a further equipment variant. Each drawer system is equipped with a request and acknowledge button, as well as a protection guard.

Quick SCARA robots
These are quick, compact, 4-axis relocating robots, which move payloads of 5-10 kg to the required position at high speed for a reach of 350-850 mm.

Custom delivery systems
We can provide you with standard delivery systems such as belt conveyors, conveyors for different product types, roller conveyors and chain conveyors which are driven by motors or gravity. Depending on what your application is, we can create an optimum concept for you. Pallet cages, pallets, cardboard boxes and small load carriers with different designs (e.g., multi-track) can be conveyed to or from the processing line.

Depending on the application: the right camera systems and testing systems
We have the right solution to suit your requirements: Simple camera systems are used when it comes to measuring, testing and counting components with straightforward shapes. Configurable image processing systems check safety-relevant components and complex geometries, undertake checks that need to be documented and carry out highly accurate measurements at high checking speeds. A great number of the tests run simultaneously and require a great deal of lighting. Other testing systems, e.g., for pressure testing and short-circuit testing, are available on request and can be integrated into the production cell.

YOUR BENEFITS:

- System solutions from a single source
- Individual modular peripheral concepts
- Integrated complex peripherals
- Fast product changeover



Complex automation solutions:
Integrating different kinematics and peripherals


KraussMaffei LRXplus
KraussMaffei
MADAG
PRINTING SYSTEMS



CUSTOMIZED AUTOMATION SOLUTIONS FOR MAXIMUM EFFICIENCY

Our automation expertise includes customized solutions from demolding to post-processing in highly productive manufacturing processes.

- ***Gripper expertise:*** *Development and production of end-of-arm tools, including innovative 3D printing grippers.*
- ***Versatile automation solutions:*** *Testing, inserting, marking and mounting – precise and reliable.*
- ***Multirobot systems:*** *Seamless combination of linear and industrial robots for maximum flexibility.*
- ***Traceability applications:*** *Seamless traceability for maximum quality and safety.*

ALMOST AUTOMATIC: OUR PROJECT MANAGEMENT THROUGH PARTNERSHIP

WORKING TOGETHER TOWARDS SUCCESS IN JUST SEVEN STEPS

Step 1 Project meeting → **Step 2** Solutions → **Step 3** Layout design → **Step 4** Cycle time diagram → **Step 5** Simulations → **Step 6** Initial acceptance → **Step 7** Service

1. Detailed project meeting

We work together with you to appraise the current state of your production, discuss the pros and cons of existing production lines and concepts, and work out any potential improvements that could be made. In addition to this exchange of experience, we work with you to draw up an initial outline schedule for your planned project.

2. Drawing up different approaches to solutions

During the concept phase, we will outline various solutions for you and they will serve as the basis for any further meetings and discussions. We will illustrate different scenarios for you and visualize complex technical designs.

3. Layout design

All components are laid out in 2D or 3D. The layout is the basis for finding the best possible arrangement of the peripherals in the production cell, and helps with optimizing cycle time and floor space in order to integrate the system layout into your existing building layout in the best way possible.

4. Realistic cycle time diagram

The whole production process is visualized in order to simplify complex processes if necessary. The individual process steps are analyzed to optimize the main process steps and reduce the cycle time. This will provide you with a realistic estimate of the cycle time that is to be achieved.

5. Simulating the production process

The whole production process can be illustrated using 3D simulation. This will make it easy to spot critical procedures quickly, and the whole process can be improved even further if necessary.

6. Initial acceptance

Initial acceptance can take place in the TechCenter in Munich where you will once again have the opportunity to assess with us how the injection molding machine and automation system work together, and carry out a comparison with the technical specifications (cycle time – process – quality). Changes can be made before delivery so that you will not need to carry out any rework on-site at your premises. Furthermore, you can tour the entire machine outfit, with its varied applications and different robot types, in the TechCenter.

7. Comprehensive service

Of course, we are there for you even after the automation system has been delivered to you. We can provide you with various services for your machine or system. From commissioning your machine to individually agreed maintenance contracts and remote diagnostics. We are your single-source provider for servicing your injection molding system and automation.

YOUR BENEFITS:

- **Cooperation-based project support, documentation and specification**
- **Presentation of different concepts**
- **Layout design**
- **Overview of the planned production process**
- **Evaluation of the whole process**
- **On-site commissioning**
- **Technical changes at the supplier's site**
- **Global spare parts logistics**

SIMPLY. ALWAYS. FITS.
THE NEW LINEAR ROBOT FROM THE LRXplus SERIES



COMPATIBLE

- For injection molding machines from KraussMaffei
- For injection molding machines from other manufacturers
- For any other automation task

SIMPLE

- Intuitive operation
- New smartControl MC7 control system
- New teaching function

ALWAYS

- For every application
- For any load (5-100 kg)
- For every budget





OUR WORLDWIDE EXPERTISE IS YOUR ADVANTAGE
DIGITAL & SERVICE SOLUTIONS

With your KraussMaffei machine, you have chosen a product that delivers the highest levels of productivity and reliability. In addition to our range of machinery, KraussMaffei focuses on comprehensive and future-oriented solutions, innovative business models and an innovative portfolio of digital products.

Customer service at the touch of a button

The process of digital transformation is becoming faster and easier than ever for the customer. Our Digital & Service Solutions unit makes your production chain even more flexible and efficient with future-oriented solutions. KraussMaffei thus globally provides an all-inclusive customer service package and networks machines and processes with each other. Our global support offers a sound basis for your local long-term success.

Individual challenges in mechanical engineering call for intelligent solutions

With our services portfolio, we support you throughout your machine's lifecycle with a strong focus on your specific needs. In order to satisfy your wishes, we offer you a wide range of solutions in order to ensure maximum availability and optimum productivity of your machines.

Technology³ as a unique selling proposition

KraussMaffei is the only supplier in the world with a product range comprising the most important machine technologies for plastic and rubber processing: injection molding machinery, automation, reaction process machinery and extrusion technology. KraussMaffei is represented worldwide with more than 30 subsidiaries and over 10 production plants as well as about 570 commercial and service partners. Working together with our customers and partners, we are thus in a position to offer vast and unique expertise in the industry.

You can find further information at:
www.kraussmaffei.com



KRAUSSMAFFEI – PIONEERING PLASTICS

Extensive expertise from a single supplier

KraussMaffei is one of the world's leading manufacturers of machinery and systems for producing and processing plastics and rubber. Our brand has been synonymous with cutting-edge technology for over 180 years. Our product range includes all technologies in injection molding, extrusion and reaction process machinery. KraussMaffei has a unique selling proposition in the industry as a result. By drawing on our proven innovative capacity, we can guarantee our customers sustained additional value over their entire value-adding chain through our standardized and individual product, process, digital and service solutions. The range of our products and services allows us to serve customers in many sectors including the automotive, packaging, medical and construction industries. We also supply manufacturers of electrical and electronic products and household appliances.

At your service all over the world

KraussMaffei is represented all over the world. Subsidiaries provide you with support in the countries shown in light blue. Our sales and service partners take care of you in the regions shown in white.

You can find all contact information at www.kraussmaffei.com

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SIMPLY. ALWAYS. FITS.

EXPERIENCE OUR LINEAR ROBOTS FROM THE LRXplus SERIES



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