

**KUKA**



New. Fast. Precise.

**KUKA Small Robots**

# KUKA



## **KUKA - YOUR STRONG PARTNER.**

Quality made German robots built with the utmost commitment to our customer's needs. KUKA has been the basis for decades of exceptional technology helping companies to achieve process optimization. We were the pioneers in the world of robotics, and now are global leader in innovation. Our passion is finding future-oriented solutions to make even complex automation tasks simple. Whatever your application no matter the difficulty you can implement it with KUKA. Thanks to experienced KUKA system partners we are able to provide robotic solutions industry-wide. We strive to turn your ideas into reality. Use our experience to drive your success.

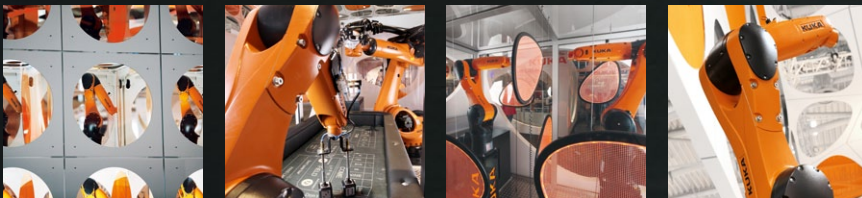
# The new masters of speed.

## KUKA small robots for

## 6 kg and 10 kg payloads.

With the KR AGILUS series, KUKA is presenting a comprehensive small robot family. The performance of the KR AGILUS series is unique in its payload category. It sets standards with five or six axes, very high speeds, short cycle times and an integrated energy supply system. The robots master even unusual tasks, whether installed on the floor or ceiling or, in the case of the 6-axis version, also on the wall. All KR AGILUS models are operated uniformly with the service-proven KR C4, the universal control technology for all KUKA robot models.

Unique in this class is the Safe Robot functionality, which radically simplifies the efficient cooperation of humans and machines. This enables totally new automation concepts. KR AGILUS: Unparalleled functionality and reliability made by KUKA.



To find out more about the KUKA small robot family, scan this QR code with your smartphone.

# The KR AGILUS series.

# The future of small robots.

## Product overview

Robot	KR AGILUS	KR 6 R900 five, KR 6 R900 sixx
Controller		KR C4 compact
Teach pendant		KUKA smartPAD

INTEGRATED ENERGY SUPPLY SYSTEM [+]

EXTREME PRECISION [+]

[+] OPTIMAL WORK ENVELOPE

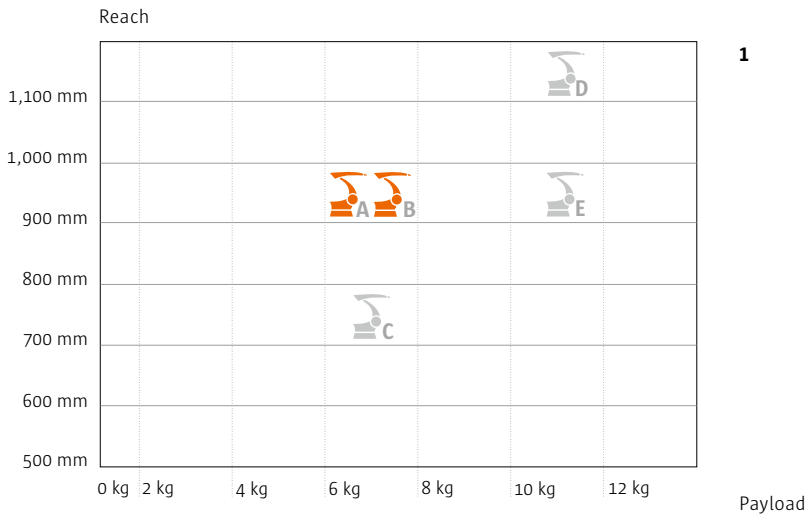
[+] LOW MAINTENANCE

HIGH SPEED [+]

[+] WIDE RANGE OF MOUNTING POSITIONS



SERVICE-PROVEN KUKA CONTROLLER [+]



1



2

**1** KR 6 R900 five (A)  
KR 6 R900 sixx (B).  
In the coming months,  
this will be followed  
by further payload  
variants (C, D, E) in  
the Standard, Food,  
Cleanroom and  
Waterproof variants.

**2** Completely integrated  
energy supply system  
in the robot arm.

#### KUKA small robots – the strengths of a new generation

**HIGH SPEED.** In handling tasks, especially pick-and-place tasks, KUKA small robots demonstrate one of their greatest strengths: extreme speed. This produces impressive results with minimal cycle times.

**PRECISION.** Where high repeatability and accuracy are required, KUKA small robots are in their element. They enable manufacturing quality at the highest level. Thanks to their robust design, they work with continuous precision throughout the work envelope.

**INTEGRATED ENERGY SUPPLY SYSTEM.** For extremely streamlined contours, KUKA small robots have the energy supply system routed internally, including EtherCAT/EtherNet (bus cable), three 5/2-way valves (compressed air), direct air line, and six inputs and two outputs. Simple gripper integration and fast reaction – for work in confined spaces.

**WIDE RANGE OF MOUNTING POSITIONS.** The KUKA small robots produce impressive results in every position – thanks to the brakes integrated in all axes. KR 6 R 900 five for installation on the floor and ceiling, KR 6 R 900 sixx additionally for installation on the wall.

**LOW MAINTENANCE.** The KUKA small robots require no change of lubricant (lifetime lubrication).

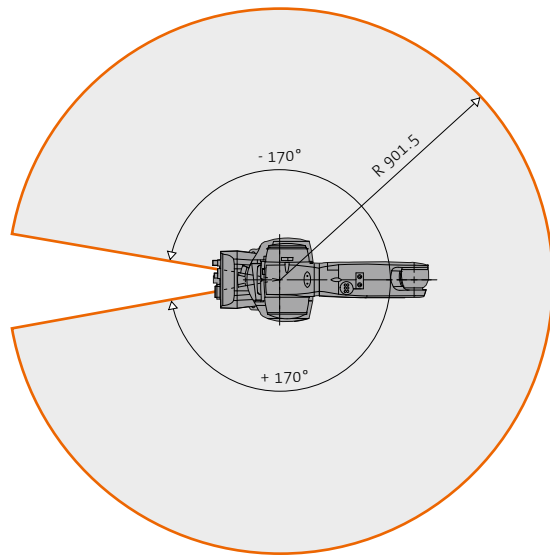
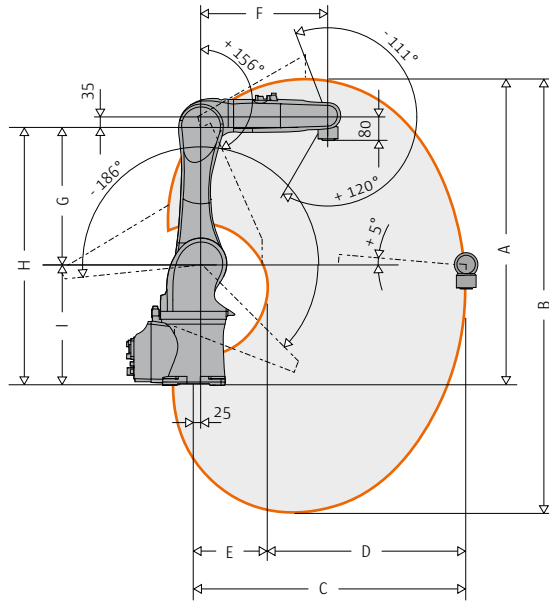
**OPTIMAL WORK ENVELOPE.** With reaches of up to 1,100 mm and the ability to reach points near to the robot base as well as in the overhead area, the KR AGILUS offers an optimal work envelope. Additional equipment can be attached at the mounting points on axis 3 and axis 4 (e.g. valves and I/O modules). This enables cost-effective, space-saving cell concepts.

**KUKA KR C4 CONTROLLER.** The KUKA small robot family is operated just like its big brothers, using the same KUKA control technology.

# KR AGILUS: KR 6 R900 fivve

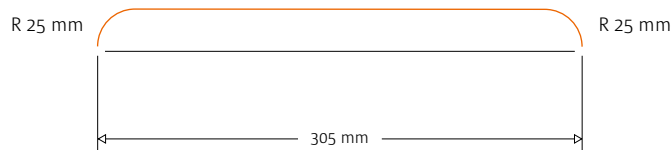
Work envelope<sup>1)</sup>    Dimensions A    Dimensions B    Dimensions C    Dimensions D    Dimensions E    Dimensions F    Dimensions G    Dimensions H    Dimensions I

KR 6 R900 fivve    — 1,015 mm    — 1,437 mm    — 901.5 mm    — 656.5 mm    — 245 mm    — 420 mm    — 455 mm    — 855 mm    — 400 mm



## Cycle time

KR 6 R900 fivve (25/305/25; 1 kg Payload) ————— 155 cycles/min



Details provided about the properties and usability of the products are purely for information purposes and do not constitute a guarantee of these characteristics. The extent of goods delivered and services performed is determined by the subject matter of the specific contract. No liability accepted for errors or omissions.

<sup>1)</sup> Relative to intersection of axes 4/5.

## Features and advantages

**MINIMUM CYCLE TIMES.** With five axes, the KR AGILUS five is consistently rated for particularly high working speeds. At the same time, it offers high precision.

**SPACE-SAVING INTEGRATION.** Low space requirements and the choice between installation on the floor or ceiling make the KR AGILUS five extremely adaptable.

**INTEGRATED ENERGY SUPPLY SYSTEM.** Routed internally in the KUKA small robots, thereby saving space. Includes EtherCAT/EtherNet (bus cable), three 5/2-way valves (compressed air), direct air line and inputs/outputs.

### KR C4 ARCHITECTURE AND FUNCTIONALITIES.

KUKA small robots are every bit as versatile as their larger relatives. They are operated via the KR C4 compact controller, with the same range of functions as the service-proven KR C4 controller.

**KUKA.SAFEOPERATION.** KUKA small robots set standards in safety. Only they offer the KUKA.SafeOperation functionality, which radically simplifies the effective cooperation of humans and machines.



### KR 6 R900 five

Max. reach	901 mm
Max. payload	6 kg
Pose repeatability	±0.03 mm
Number of axes	5
Mounting position	Floor, ceiling
Variant	-
Robot footprint	209 mm × 207 mm
Weight (excluding controller), approx.	51 kg

### Axis data /

Range of motion

Axis 1 (A1)	+/-170°
Axis 2 (A2)	+45°/-186°
Axis 3 (A3)	+156°/+5°
Axis 4 (A4)	-
Axis 5 (A5)	+ 120°/-
Axis 6 (A6)	+/-350°

### Operating conditions

Ambient temperature, robot	+5 °C to +45 °C
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### Protection rating

Protection rating, robot	IP 54
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Controller

KR C4 compact

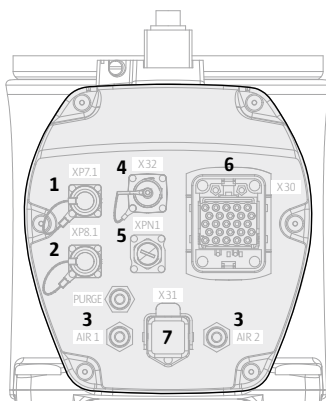


Teach pendant

KUKA smartPAD

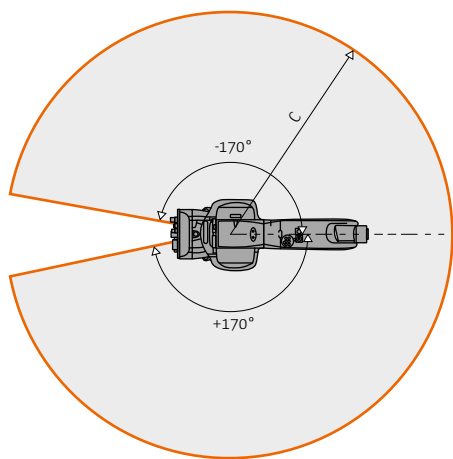
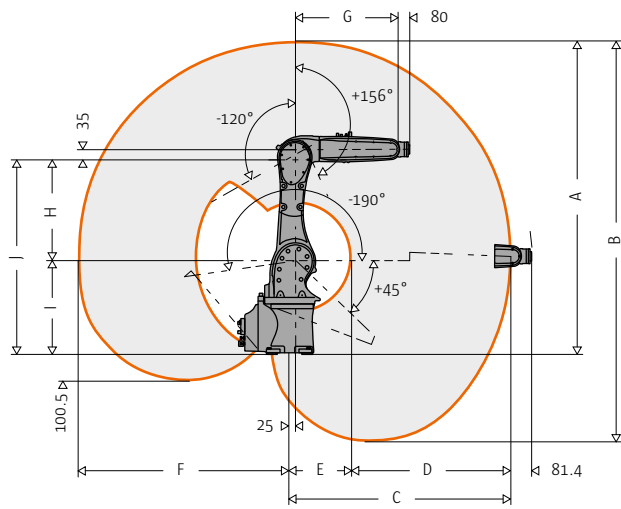
### The KR AGILUS interface plate

- 1 Resolver input for axis 7
- 2 Resolver input for axis 8
- 3 Pneumatic connections (Air 1, Air 2 cleaning air)
- 4 Micro EMD
- 5 Extension Interface (100 MBit)
- 6 Motor connector
- 7 Interface connection



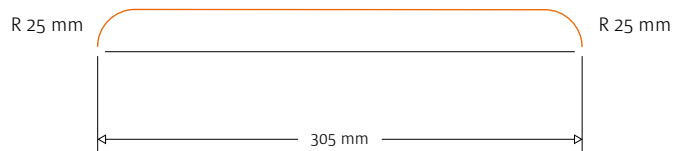
# KR AGILUS: KR 6 R900 sixx

Work envelope <sup>1)</sup>	Dimensions A	Dimensions B	Dimensions C	Dimensions D	Dimensions E	Dimensions F	Dimensions G	Dimensions H	Dimensions I	Dimensions J
KR 6 R900 sixx	1,276 mm	1,620 mm	901.5 mm	656 mm	245.5 mm	851.5 mm	420 mm	455 mm	400 mm	855 mm



### Cycle time

KR 6 R900 sixx (25/305/25; 1 kg Payload)	150 cycles/min
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<sup>1)</sup> Relative to intersection of axes 4/5.



## Features and advantages

**MINIMUM CYCLE TIMES.** The KR AGILUS sixx has six axes and is consistently rated for particularly high working speeds. At the same time, it offers high precision.

**SPACE-SAVING INTEGRATION.** Low space requirements and the choice between installation on the floor, ceiling or wall make the KR AGILUS sixx extremely adaptable.

**INTEGRATED ENERGY SUPPLY SYSTEM.** Routed internally in the KUKA small robots, thereby saving space. Includes EtherCAT/EtherNet (bus cable), three 5/2-way valves (compressed air), direct air line and inputs/outputs.

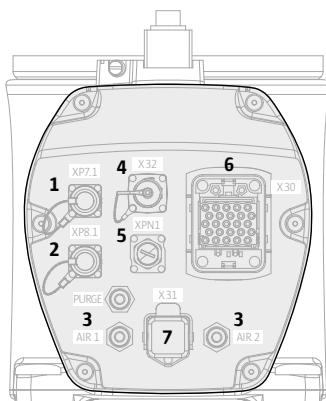
### KR C4 ARCHITECTURE AND FUNCTIONALITIES.

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- 3 Pneumatic connections (Air 1, Air 2 cleaning air)
- 4 Micro EMD
- 5 Extension Interface (100 MBit)
- 6 Motor connector
- 7 Interface connection



### KR 6 R900 sixx

Max. reach	901 mm
Max. payload	6 kg
Pose repeatability	±0.03 mm
Number of axes	6
Mounting position	Floor, ceiling, wall
Variant	-
Robot footprint	209 mm × 207 mm
Weight (excluding controller), approx.	52 kg

### Axis data /

#### Range of motion

Axis 1 (A1)	+/-170°
Axis 2 (A2)	+45°/-190°
Axis 3 (A3)	+156°/-120°
Axis 4 (A4)	+/-185°
Axis 5 (A5)	+/-120°
Axis 6 (A6)	+/-350°

### Operating conditions

Ambient temperature, robot	+5 °C to +45 °C
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### Protection rating

Protection rating, robot	IP 54
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Controller

KR C4 compact



Teach pendant

KUKA smartPAD

# An unbeatable team.

## Product overview

[+] FASTER AS A TEAM



Small robots

**EXTREMELY FAST, STREAMLINED AND ROBUST: THE KR AGILUS SMALL ROBOT FAMILY.** Solve automation tasks more flexibly. Minimize cycle times. Open up totally new areas of application. The extensive KUKA small robot series is 100 percent KUKA: reliable quality and durability, combined with maximum functional diversity and flexibility. Fastest small robots and the KUKA.SafeOperation function – this combination is what gives the KR AGILUS series its major competitive advantage.

[+] SAFER AS A TEAM



System controller: KR C4 compact

**THE SMALL ROBOT CONTROL SYSTEM OF THE FUTURE.** With its compact dimensions and the powerful technology of the service-proven KR C4, the KR C4 compact offers maximum performance in minimum space. The revolutionary concept provides a firm foundation for the automation of tomorrow. Only KUKA offers integrated safety functions as a standard, together with open interfaces enables truly simple integration into the overall system. This significantly reduces the costs in automation for integration, maintenance and servicing. At the same time, the long-term efficiency and flexibility of the systems are increased. Benefit from the openness you need to meet tomorrow's requirements.

# 99.99%

**AVAILABILITY.** ROBUST AND LOW ON MAINTENANCE, THIS UNBEATABLE TEAM WORKS NON-STOP ON YOUR SUCCESS.

[+] SIMPLER AS A TEAM

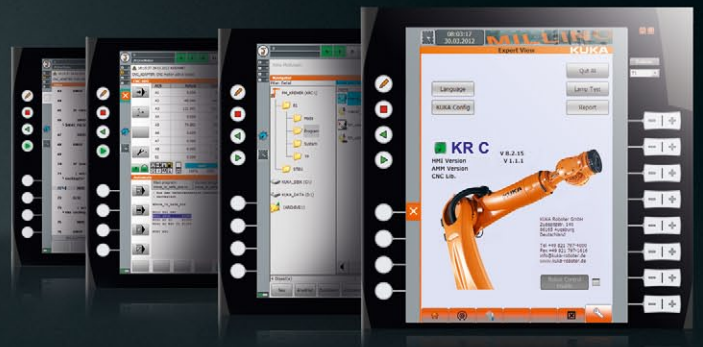


Teach pendant: KUKA smartPAD

#### THE SIMPLEST WAY OF OPERATING ROBOTS.

Touch screen. Graphics support. Flexible interaction. With its large touch screen, the KUKA smartPAD allows operation of both the robots and entire systems, all visually represented on the screen. The display adapts to show the user only those operator control elements that are needed at any given moment. Attention is always focused on what is important, allowing users to work more intuitively, quickly, easily and efficiently.

[+] MORE VERSATILE AS A TEAM



Function and technology packages

#### AN OPTIMALLY PREPARED, EFFICIENT SOFTWARE SOLUTION FOR EVERY TASK.

KUKA function and technology packages breathe life into the KUKA robots. They enable them to carry out particular industry-specific functions within an automation solution. Handling, machining, measuring, or function packages for conveyor synchronization or vision-controlled part detection. KUKA function and technology packages make automation easy.

# KR C4 compact

The small robot control system of the future

**MORE POWERFUL, SAFER, MORE FLEXIBLE, AND MORE INTELLIGENT.** The KR C4 compact offers the high performance and reliability of the KR C4 technology in a compact design. Its flexible configuration and expansion capability make it a real all-rounder. The number of hardware components, cables and connectors has been significantly reduced and replaced by software-based solutions. The robust, high-quality controller is designed for low maintenance; the temperature-controlled fan technology only switches on briefly when needed, and is barely audible.

SPACE-SAVING [+]

[+] UNIVERSAL APPLICATION

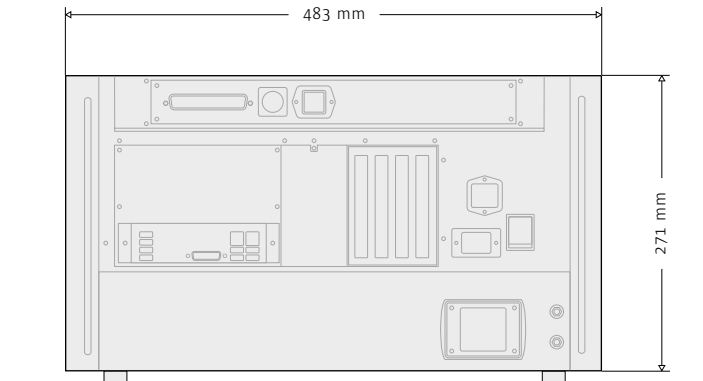
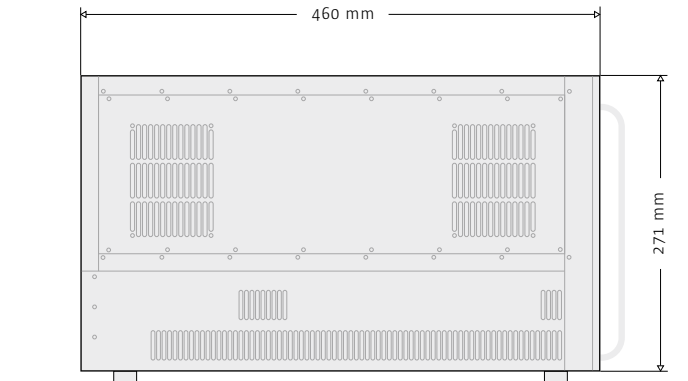


ROBUSTNESS [+]

[+] ENERGY-EFFICIENT

COMMUNICATION TALENT [+]

[+] ALL-ROUNDER



### Features and advantages

**SPACE-SAVING.** The compact dimensions of the housing enable space-saving installation in 19" enclosures or in small protective housings. Despite its compact size, the KR C4 compact offers the entire range of functions of the KR C4 controller.

**ALL-ROUNDER.** Safety, Robot, Logic, Motion and ProcessControl – the KR C4 combines everything in a single controller. And allows effortless control of the entire system.

**UNIVERSAL APPLICATION.** The open architecture of the KR C4 compact can control not only KUKA robots but also external axes – for maximum flexibility, scalability, performance and openness, in minimum space.

**COMMUNICATION TALENT.** In addition to its own robot language KRL, the KR C4 also understands the language of the CNC machining world (G-code) and the language of PLCs, enabling it to communicate directly with your Siemens® or Rockwell® controller, for example.

**ROBUSTNESS.** The consistent choice of durable components and the well-designed cabinet ensure long-term, reliable operation, even under extreme conditions.

**ENERGY-EFFICIENT.** The new energy management system allows the energy consumption of the controller to be reduced by up to 95 % in standby mode. The improved cooling concept, combined with a temperature-controlled fan, further reduces the power dissipation of the controller, while making operation considerably quieter.



### KR C4 compact controller

Type	KR C4 compact
Processor	Multi-core technology
Hard drive	HDD, SSD optional
Interface	USB, EtherNet, DVI-I
Field buses	PROFINET, EtherNet/IP, PROFIBUS, DeviceNet, EtherCAT
Max. number of axes	6 + 6 (with additional axis box)
Protection rating	IP 20
Dimensions (D x W x H)	460 mm x 483 mm x 271 mm
Weight	33 kg

### Power supply connection

Rated supply voltage	1 x 208 to 230 V AC
Permissible tolerance of rated voltage	-10 to +10 %
Mains frequency	49 to 61 Hz
Mains-side fusing	1 x 16 A slow-blowing

### Operating conditions

Ambient temperature	+5 °C to +45 °C
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# KUKA smartPAD

KUKA smartPAD – Making robot operation really easy

**TOUCH SCREEN. GRAPHICS SUPPORT. FLEXIBLE INTERACTION.** The more diverse the robots' abilities become, the greater the importance of intuitive user interfaces for their operation. The new KUKA smartPAD brilliantly demonstrates, on a large antireflection touch screen, just how simple it can be. Intelligent, interactive dialogs provide the user with those operator control elements that are currently required. This makes work easier, faster, more efficient and simply smarter all-round.

[+] INTEGRATED USB CONNECTION

[+] UNIVERSAL APPLICATION

ANTIREFLECTION TOUCH DISPLAY [+]

ERGONOMICALLY OPTIMIZED [+]



[+] HOT-PLUGGABLE

[+] HAPTIC JOG KEYS



1

2

1 Simple, intuitive operator control via touch screen

2 Ergonomic 6D mouse

#### Features and advantages

**UNIVERSAL APPLICATION.** Operate all KUKA robots and KR C4 controllers with the KUKA smartPAD.

**ANTIREFLECTION TOUCH DISPLAY.** Simple operation via the well-lit 8.4" screen with intuitive user interface.

**ERGONOMICALLY OPTIMIZED.** Designed to be user-friendly. High mobility and lightweight with an overall weight of just 1,100 grams.

**HOT-PLUGGABLE.** If the KUKA smartPAD is not being used, it can be simply unplugged during ongoing operation and used for any other KR C4 controller.

**INTEGRATED USB CONNECTION.** Direct saving and loading of configurations via USB port on the KUKA smartPAD itself.

**HAPTIC JOG KEYS.** The combination of haptic jog keys and a haptically controlled mouse enables intuitive maneuvering with constant visual contact with the robot.



#### KUKA smartPAD teach pendant

Type	KUKA smartPAD
Display	scratch-resistant industrial touch display
Display size	8.4"
Dimensions (D x W x H)	80 mm x 330 mm x 260 mm
Weight	1,100 g

# KUKA function and technology packages

## Function and technology packages for the KR C4 compact

KUKA function and technology packages help you to solve specific automation tasks efficiently, with a minimum of programming. That's because the portfolio of KUKA software solutions cover nearly all the common areas of application. On the basis of these packages, our KUKA system partners implement tailored solutions to meet every customer requirement.



### KUKA function and technology packages

<b>KUKA.WorkVisual</b>	Engineering environment for all KUKA robots for system configuration, programming, data backup, diagnosis, and more.
<b>KUKA.Load</b>	Supports the evaluation of the load on a KUKA robot or the selection of a suitable robot for a given load.
<b>KUKA.UserTech</b>	Fast programming of motion and program sequences using freely definable buttons, input masks and parameter lists.
<b>KUKA.ExpertTech</b>	Faster, simpler programming even for non-experts in KRL code via menu-guided command selection.
<b>KUKA.HMI Zenon</b>	Creation of customized, application-specific user interfaces for visualization and operator control without programming knowledge. Display and operation using the touch panel and keys of the KUKA smartPAD.
<b>KUKA.RemoteView</b>	Allows remote access to the robot via a secure Internet connection, thereby offering the possibility of remote diagnosis or start-up support.
<b>KUKA.VirtualRemotePendant</b>	Allows the use of EtherNet communication to run the user interface of the KUKA smartPAD on an external PC and to operate the robot.
<b>KUKA.RobotSensorInterface</b>	Supports simple and flexible interfacing with sensors in the KR C4. It is also possible to integrate a number of channels with hard real-time requirements.
<b>KUKA.VisionTech</b>	"onBoard" vision system including image processing, camera and sensors. Extensive configuration options enable the flexible use of the robot in an unstructured environment.
<b>KUKA.ConveyorTech</b>	Organizes the cooperation of robots and conveyors. Allows efficient, dynamic handling of parts, even for complex applications.
<b>KUKA.ForceTorqueControl</b>	Takes account of process forces and torques exerted on the workpiece during machining, and controls and adjusts these as specified in the program sequence. In applications such as grinding, polishing, bending or even assembly, this technology package is an indispensable help.
<b>KUKA.SafeOperation</b>	Flexible programming of safe cooperation between humans and machines. Definition of safe workspaces, velocities, envelopes around robot tools, and cooperation with the operator.
<b>KUKA.SafeRangeMonitoring</b>	Beginners' tool for limiting and monitoring the safety and work areas of the robot. The monitoring and limitation of statically defined axis ranges creates an adequate degree of work safety for many applications.

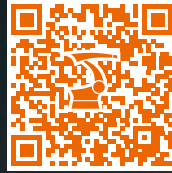




#### KUKA function and technology packages

- KUKA.Gripper & SpotTech** — Programming of grippers and weld guns via easy-to-use inline forms for many industrial applications.
- KUKA.RoboTeam** — Coordinates and enables the high-precision interaction of a team of robots for handling a shared load or for working together on a moving workpiece.
- KUKA.EtherNet KRL** — Makes it possible to exchange data with external computers via the EtherNet interface. The robot can function here both as a client and as a server.
- KUKA.OPC-Server** — Basic technology for standardized data exchange between robots and external controllers for non-real-time information streams. Ideal for interfacing with external visualization and MES systems.
- KUKA.PLC Multiprog** — Programming environment for an extremely fast Soft PLC conforming to the IEC61131 standard. Expands the functionality of the KR C4 and offers virtually unlimited openness in the programming of automation cells and applications.
- KUKA.PLC ProConOS** — Runtime system of the KUKA.PLC Multiprog Soft PLC. PLC programs created with KUKA.Multiprog are run directly on the KR C4, with full access to the entire I/O system of the robot. Reading and processing of variables such as axis positions and velocity via function blocks.
- KUKA.PLC mxA** — Allows direct commanding and positioning of the robot by external controllers (Siemens®, Rockwell®, etc.). The user thus requires no knowledge of robot programming in the KUKA-specific robot language KRL.
- KUKA.CNC** — Complete software-based CNC implementation for execution of machine tool code (G-code) directly on the robot controller. This turns the robot, with its accuracy and stiffness, into a machining center for path-supported processes.
- KUKA.Sim** — The simulation programs of KUKA.Sim allow robotic cells to be planned with true-to-life accuracy.

Contact KUKA at:



[www.contact.kuka-robotics.com](http://www.contact.kuka-robotics.com)



[www.facebook.com/KUKA.Robotics](https://www.facebook.com/KUKA.Robotics)



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