

# KUKA

OPEN INTERFACES [+]

[+] 5 DOF ARM

FREELY PROGRAMMABLE [+]

[+] REAL-TIME ETHERCAT  
COMMUNICATION



OMNIDIRECTIONAL [+]  
MOBILE PLATFORM

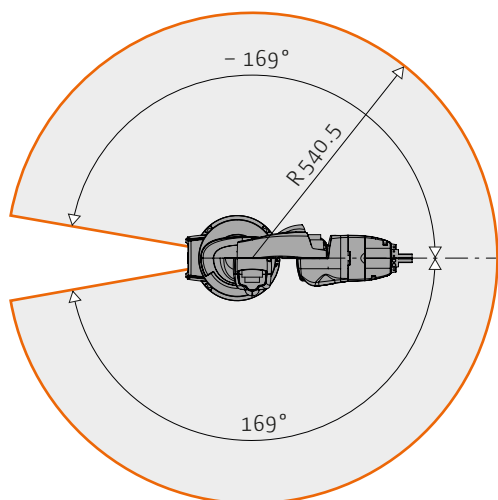
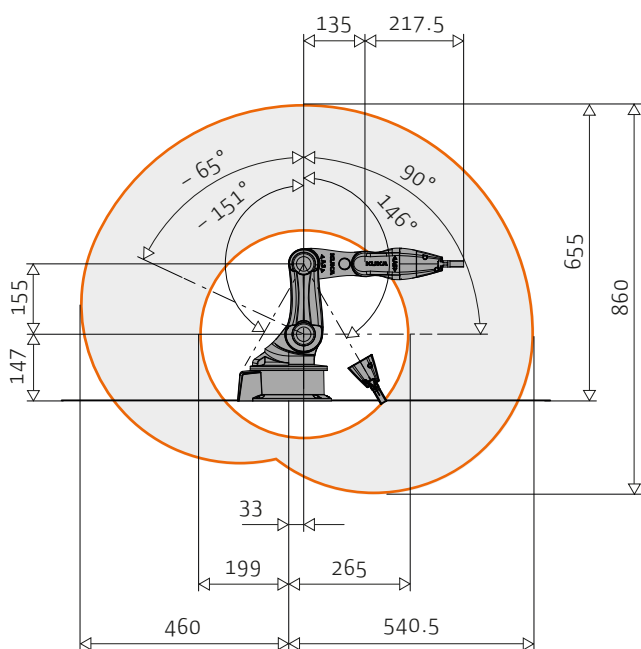
KUKA youBot

Research & Application Development  
in Mobile Robotics

# youBot Arm

## Experience Manipulation

**ENTER INTO THE AREA OF ROBOTIC MANIPULATORS.** With the external, controllable 5-axis kinematics you can practically demonstrate and analyze the basics of robotics kinematics and dynamics. It is possible to perform basic grasping applications and, if extended with sensors, you can realize applications with grasp planning.



## youBot arm

Serial kinematics	5 axes
Height	655 mm
Work envelope	0.513 m <sup>3</sup>
Weight	5.8 kg
Payload	0.5 kg
Structure	Magnesium Cast
Positioning repeatability	0.1 mm
Communication	EtherCAT: 1 ms cycle
Voltage connection	24 V DC
Drive train power limitable to	80 W

Axis data	Range	Speed
Axis 1 (A1)	+/- 169°	90°/s
Axis 2 (A2)	+90°/-65°	90°/s
Axis 3 (A3)	+146°/-151°	90°/s
Axis 4 (A4)	+/-102°	90°/s
Axis 5 (A5)	+/-167°	90°/s

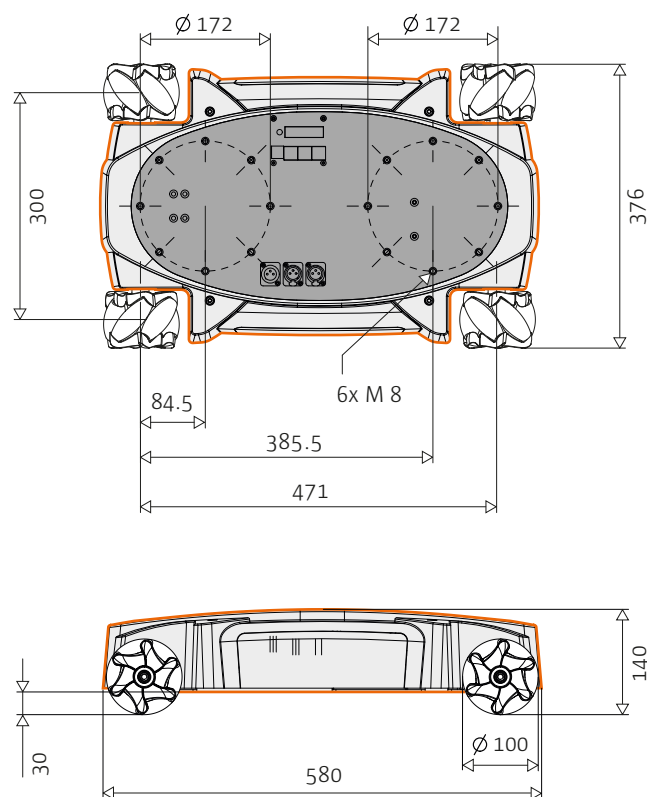
## Gripper Detachable, 2 fingers

Gripper stroke	20 mm
Gripper range	70 mm
Motors	2 independent stepper motors

# youBot Platform

## Experience Mobility

**ENTER INTO THE WORLD OF MOBILE ROBOTICS.** Maximal freedom of movement ( $x, y, \Theta$ ) with the omnidirectional wheel system. The KUKA youBot platform is ideal for research, education and application development especially in the field of logistics and navigation, whether for motion planning, autonomous driving or feasibility studies. With open interfaces – simply extended with sensors or actors – and equipped with an integrated controller PC, it is possible to work on a broad spectrum of topics.



### youBot platform

Omnidirectional kinematics	4 KUKA omniWheels
Length	580 mm
Width	376 mm
Height	140 mm
Clearance	30 mm
Weight	20 kg
Payload	20 kg
Structure	Steel
Speed	0.8 m/s
Communication	EtherCAT: 1 ms cycle
Voltage connection	24 V DC

### General characteristics energy supply

Maintenance-free lead acid rechargeable batteries: 24 V, 5 Ah; Power supply: 200 W

Approximate battery runtime of KUKA youBot mobile manipulator: 90 minutes

### General characteristics mini PC

Mini ITX PC-Board with embedded Intel® Atom Dual-Core CPU, 2 GB RAM, 32 GB SSD, USB

## Modules and Product Variants

In its basic configuration, the KUKA youBot consists of an omnidirectional mobile platform on which a 5-axis robot arm with a gripper is installed. The arm, gripper and mobile platform can also be used individually.



**KUKA youBot** omni-directional mobile platform



**KUKA youBot** 5-degree-of-freedom arm with 2-finger gripper



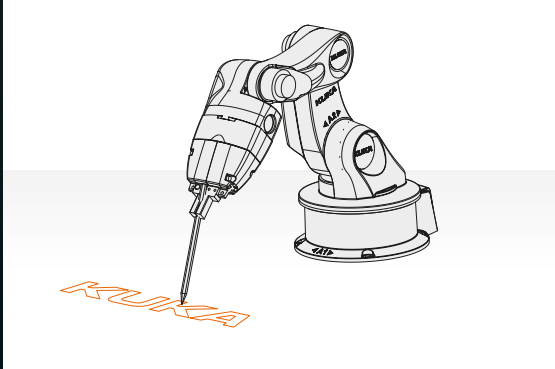
**KUKA youBot** omni-directional mobile platform with 5-degree-of-freedom manipulator with 2-finger gripper



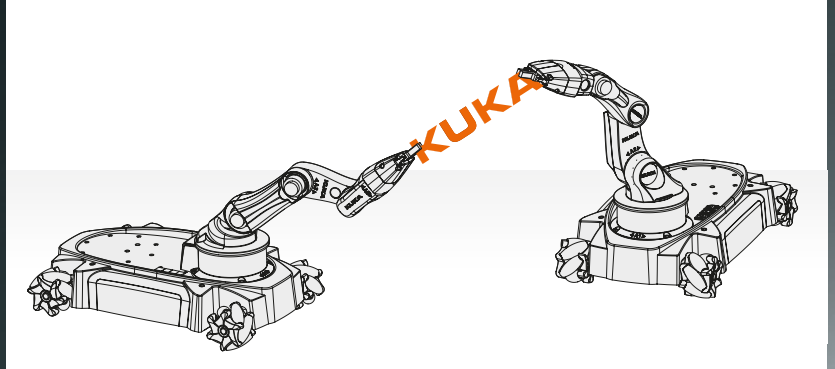
**KUKA youBot** omni-directional mobile platform with two 5-degree-of-freedom manipulators with two 2-finger grippers

# youBot Application Development

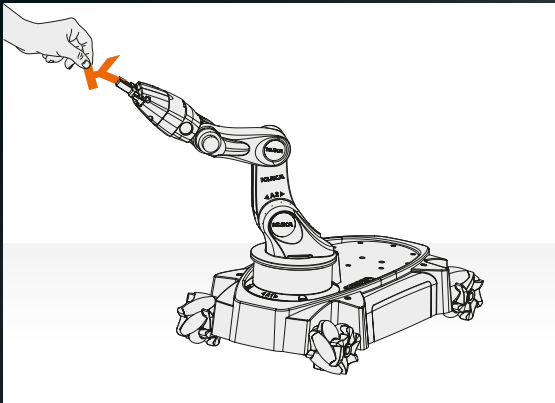
## Possible Application Domains



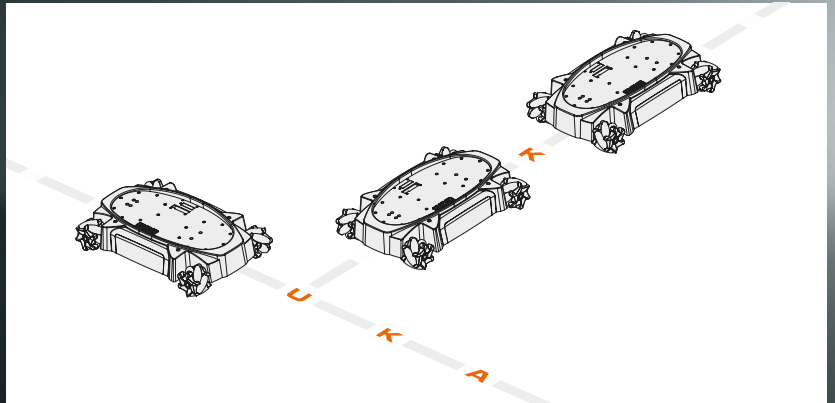
high accuracy applications



cooperating robots



human-robot interaction



logistics and swarm applications

## Available Software

- Linux-based, open-source robot control API with open interfaces (position, velocity and current control) and sample applications
- models for simulation software tools
- application development by common control systems and functional packages (e.g. ROS, Orocos, LabView)
- infinite variety of compatible sensors (e.g. laser scanners, infrared distance sensors, cameras)



KUKA youBot product page  
[www.kuka-youbot.com](http://www.kuka-youbot.com)



Further examples of applications  
[www.youtube.com/kukalaboratories](http://www.youtube.com/kukalaboratories)

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