

English



Rainbow Robotics
Collaborative Robots

RB Series



www.rainbow-robotics.com

ROBOT FOR COEXISTENCE AND COOPERATION

Rainbow Robotics

Rainbow Robotics is a robot platforms company founded by a group of experienced researchers at the KAIST Humanoid Robot Research Center (HUBO Lab). From the world's best disaster response robots to cooperative robots (cobots) developed in-house and in Korea, Rainbow Robotics invests its energy and resources in commercializing robots by securing its own technology with relentless research and development, and by providing outstanding robots at reasonable prices.

Using humanoid robotics technology, Rainbow Robotics researches and develops a wide variety of robots, including cobots, autonomous mobile robots, medical robots, quadruped walking robots, and astronomical mounts, and the company is always looking for new opportunities to expand into new areas of business.

'We touch the core'

Moving forward, Rainbow Robotics aspires to leverage its superior technological capacities to become a leader in the global robotics field.



Company History

- 2011.02** Established Rainbow Robotics Inc. (Original company name: Rainbow Co.)
- 2011.05** Established an affiliated research institute
- 2011.07** Mount technical service agreement signed with Korea Astronomy and Space Science Institute
- 2011.12** Exported six HUBO II units to the MIT of the United States, with support from the US National Science Foundation
- 2013.09** Exported two HUBO II units to Google Inc., USA
- 2014.01** Acquired the "Venture Company" certification
- 2015.06** Participated in the DRC Finals competition hosted by DARPA as TEAM-KAIST (Final Winner)
- 2015.09** Operated MOUNT, the electronic and optical space object monitoring system of Korea Astronomy and Space Science Institute
- 2015.12** Exported four units of DRC-HUBO+ to the Naval Research Laboratory, USA
- 2016.02** Supplied LIG Nexwon with mount drivers
- 2017.07** Secured KRW 10 billion in investment (venture capital)
- 2018.02** Service contract for the operation of humanoid robot experience service during 2018 Pyeongchang Winter Olympic Games, the Ministry of Trade, Industry, and Energy, South Korea
- 2019.07** Launched the RB series (collaborative robot)
- 2020.04** Acquired the "ISO 9001:2015" Quality
- 2020.07** Signed a service contract to design a satellite monitoring telescope system for the Korea Astronomy and Space Science Institute
- 2020.08** Delivered the LIG Nex1 internal gimbal driving assembly, and 1 other product
- 2021.02** Rainbow Robotics Inc. listed on KOSDAQ (277810)
- 2021.03** Acquired NSF certification for the RB-N series (NSF/ANSI 169)

BUILDING THE FUTURE

Our value lies in building robots that coexist and connect with humanity by enriching people's lives.

Cobot that works with workers

RB Series

Rainbow Robotics' cobot RB series is a next-generation 6-axis robotic arm. RB series features multiple products (RB5-850, RB3-1200, and RB10-1300) to suit the user's work environment, and all products have the CE and KCs certifications approved by the global certification body TUV SUD. (ISO 13849-1, Cat.3, PL d, and ISO 10218-1, ISO/TS 15066)



RB Series Lineup

RB5-850 RB3-1200 RB10-1300 RB3-730 (Scheduled Release) RB16-900 (Scheduled Release)

+ Built-in Pneumatics Option (A1, A2) | + RB-N Series

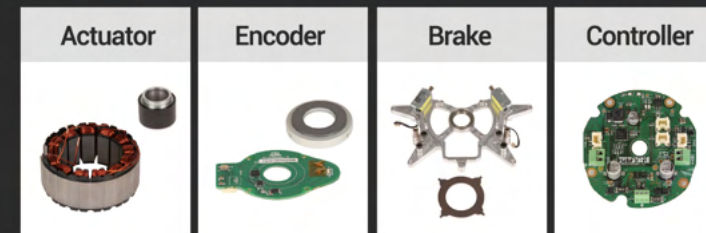
Key Features



Securing high levels of performance and great price competitiveness by internalizing the production of core components

Rainbow Robotics develops and uses core components required in its cobots, such as actuators, encoders, brakes, and controllers, in-house. With these components, the RB series can deliver high driving speeds, precise controls, and braking performance without any play or instability in the braking system. Moreover, the RB series is much more reasonably priced than the competition (30% cheaper) thanks to Rainbow Robotics' extensive use of in-house developed parts.

Key components of the collaborative robots developed by Rainbow Robotics



Cobot with built-in humanoid robotics technology

Rainbow Robotics is the company that developed HUBO, a bipedal robot featuring the best robotics technology available in the market today. Using humanoid robotics technology, Rainbow Robotics has developed the RB series (Rainbow Robotics' dedicated line of cobots). Each RB series cobot is equipped with a collision detection system, a gravity compensation device, and a sophisticated motor control system.



Software to boost user's convenience

RB series features a Linux-based, real-time robot operating system developed independently by Rainbow Robotics. The operating system, which uses a supervisory control algorithm, maintains and manages the performance of each cobot, and supports the execution of a given task within a predictable time range. This enables smooth movement (eliminates choppy robot movements), and reduces the time required for each move or action. Furthermore, if a cobot requires any additional functions or upgrades to its system operations, Rainbow Robotics can address the issue with a S/W update.

RB5-850

RB5-850 is the standard model of the RB series, with a max load capacity of 5 kg and a max work radius of 927.7 mm. It can be deployed as an all-purpose unit in manufacturing, such as production, assembly, and components fastening, and in service industries such as food and beverage systems, disinfection/sanitizer systems, and robot studios.

| Specification | |
|---------------------------------|--|
| Payload | 5 kg |
| Reach | 927.7 mm |
| Repeatability | ± 0.05 mm |
| Footprint | Ø 173 mm |
| Materials | Aluminum, plastic, and steel |
| Tool connector type | M10 12-pin connector (12/24V, ~2A) |
| Cable length (Robot arm) | 5 m |
| Weight | 22 kg |
| Operating environment | IP 66 / 0-50 °C |
| Wattage | 200W with the standard program |
| Noise | Less than 65dB(A) |
| Joint range | J1 : ± 360 ° ± 180 °/s J2 : ± 360 ° ± 180 °/s J3 : ± 165 ° ± 180 °/s J4 : ± 360 ° ± 180 °/s J5 : ± 360 ° ± 180 °/s J6 : ± 360 ° ± 180 °/s |

※ Specifications may change to improve performance.



RB10-1300

RB10-1300 has a payload of 10kg and a maximum range of 1300mm, meaning it has the longest reach among all cobots in the RB series. RB10-1300 is perfectly suited for working with heavy objects from a distance (e.g. logistics and assembly automation).

| Specification | |
|---------------------------------|--|
| Payload | 10 kg |
| Reach | 1300 mm |
| Repeatability | ± 0.05 mm |
| Footprint | Ø 196 mm |
| Materials | Aluminum, plastic, and steel |
| Tool connector type | M10 12-pin connector (12/24V, ~2A) |
| Cable length (Robot arm) | 5 m |
| Weight | 37.1 kg |
| Operating environment | IP 66 / 0-50 °C |
| Wattage | 350W with the standard program |
| Noise | Less than 65dB(A) |
| Joint range | J1 : ± 360 ° ± 120 °/s J2 : ± 360 ° ± 120 °/s J3 : ± 165 ° ± 180 °/s J4 : ± 360 ° ± 180 °/s J5 : ± 360 ° ± 180 °/s J6 : ± 360 ° ± 180 °/s |

※ Specifications may change to improve performance.



RB3-1200

RB3-1200 has a payload of 3kg, and a range of up to 1,200mm. It is the model that boasts the largest working radius among all existing small-load cobots currently on the market. It can perform complex tasks, including welding, grinding, and CNC machine tending, and it can be used in combination with an autonomous mobile robot (AMR).

| Specification | |
|---------------------------------|--|
| Payload | 3 kg |
| Reach | 1200 mm |
| Repeatability | ± 0.05 mm |
| Footprint | Ø 173 mm |
| Materials | Aluminum, plastic, and steel |
| Tool connector type | M10 12-pin connector (12/24V, ~2A) |
| Cable length (Robot arm) | 5 m |
| Weight | 22.4 kg |
| Operating environment | IP 66 / 0-50 °C |
| Wattage | 200W with the standard program |
| Noise | Less than 65dB(A) |
| Joint range | J1 : ± 360 ° ± 180 °/s J2 : ± 360 ° ± 180 °/s J3 : ± 165 ° ± 180 °/s J4 : ± 360 ° ± 180 °/s J5 : ± 360 ° ± 180 °/s J6 : ± 360 ° ± 180 °/s |

※ Specifications may change to improve performance.



Built-in Pneumatics Option (A1, A2)

Rainbow Robotics also offers a built-in pneumatic line, which makes its cobots much easier to use (eliminates the need to arrange and organize cables). The built-in pneumatic option is compatible with all RB series products. Users can select either A1 or A2 according to their pneumatic and signal lines.



| Model Name | Pneumatics line | Signal line |
|-------------|-----------------|---------------|
| RB5-850A1 | 4 EA(4Ø tube) | N |
| RB5-850A2 | 4 EA(4Ø tube) | 12 Pin(AWG28) |
| RB3-1200A1 | 4 EA(4Ø tube) | N |
| RB3-1200A2 | 4 EA(4Ø tube) | 12 Pin(AWG28) |
| RB10-1300A1 | 1 EA(8Ø tube) | N |
| RB10-1300A2 | 1 EA(8Ø tube) | 12 Pin(AWG28) |

※ Specifications may change to improve performance.
 ※ In addition, when applying the option, it is necessary to check the driving range and operating environment.

Scheduled Release

RB3-730

RB3-730 is a compact, high-precision model with a payload of 3kg and a maximum range of 729.1mm. With joints arranged using S-pipes, RB3-730 is efficient when executing contour motions often used in welding and bonding, and can be used for IT, electronics, and bio services applications.

| Specification | |
|--------------------------|--|
| Payload | 3 kg |
| Reach | 729.1 mm |
| Repeatability | ± 0.05 mm |
| Footprint | Ø 128 mm |
| Materials | Aluminum, plastic, and steel |
| Tool connector type | M10 12-pin connector (12/24V, ~2A) |
| Cable length (Robot arm) | 5 m |
| Weight | 11 kg |
| Operating environment | IP 66 / 0-50 °C |
| Wattage | 100W with the standard program |
| Noise | Less than 60dB(A) |
| Joint range | J1 : ± 360 ° ± 180 °/s J2 : ± 360 ° ± 180 °/s J3 : ± 150 ° ± 180 °/s J4 : ± 360 ° ± 180 °/s J5 : ± 360 ° ± 180 °/s J6 : ± 360 ° ± 180 °/s |

※ Specifications may change to improve performance.



Robot Control Box

Robot control box is a device that controls the movement of the robot arm according to the program written by the user. Equipped with digital and analog input/output ports. Various equipments and devices can be connected and used.

Standard Control Box



| Specification | |
|---------------|---|
| I/O ports | Digital input 16 (PNP) |
| | Digital output 16 (PNP) |
| | Analog input 4 (0~10V) |
| | Analog output 4 (0~10V) |
| | RS-232/422/485 |
| | Ethernet (TCP/IP, MODBUS TCP, Control Script) Siemens S7, OMRON Fins, Mitsubishi MC, etc |
| | ※ I/O expansion modules available |
| Power source | 100-240V AC, 50-60 Hz |
| Size | 454 x 240 x 416.2 mm |
| Weight | RB3-1200/ RB5-850 20.3 kg RB10-1300 22.2 kg |
| Materials | EGI (electric galvanized steel sheet) |

DC Control Box



| Specification | |
|---------------|---|
| I/O ports | Digital input 16 (PNP) |
| | Digital output 16 (PNP) |
| | Analog input 4 (0~10V) |
| | Analog output 4 (0~10V) |
| | RS-232/422/485 |
| | Ethernet (TCP/IP, MODBUS TCP, Control Script) Siemens S7, OMRON Fins, Mitsubishi MC, etc |
| | ※ I/O expansion modules available |
| Power source | 19~72V DC |
| Size | 380 x 182 x 270 mm |
| Weight | 11.5 kg |
| Materials | SUS 304 |
| Remarks | ※ Four fixing brackets provided |

※ Specifications may change to improve performance.

Scheduled Release

RB16-900

RB16-900 has a payload of 16kg and a maximum range of 900mm, meaning it can handle the heaviest load among all cobots in the RB series. RB16-900 is effective when working with heavy loads (e.g. packaging, courier transportation, palletizing, and assembly automation).

| Specification | |
|--------------------------|--|
| Payload | 16 kg |
| Reach | 900 mm |
| Repeatability | ± 0.05 mm |
| Footprint | Ø 196 mm |
| Materials | Aluminum, plastic, and steel |
| Tool connector type | M10 12-pin connector (12/24V, ~2A) |
| Cable length (Robot arm) | 5 m |
| Weight | 32 kg |
| Operating environment | IP 66 / 0-50 °C |
| Wattage | 350 W with the standard program |
| Noise | Less than 65dB(A) |
| Joint range | J1 : ± 360 ° ± 180 °/s J2 : ± 360 ° ± 180 °/s J3 : ± 165 ° ± 180 °/s J4 : ± 360 ° ± 180 °/s J5 : ± 360 ° ± 180 °/s J6 : ± 360 ° ± 180 °/s |

※ Specifications may change to improve performance.



I/O expansion module

RB series has a total of 40 I/O ports (default configuration). If more I/O ports are required, users can add ports without using additional equipment, such as a PLC, using the I/O expansion module.



| Specification | |
|---------------|------------------------------------|
| I/O ports | Digital input 16 (PNP) |
| | Digital output 16 (PNP) |
| | Analog input 4 (0~10V) |
| | Analog output 4 (0~10V) |
| Power source | 100-240V AC single phase, 50-60 Hz |
| Size | 403 x 313 x 110 mm |
| Weight | 500 g |
| Materials | Aluminum |

※ Specifications may change to improve performance.

Teaching Pendant

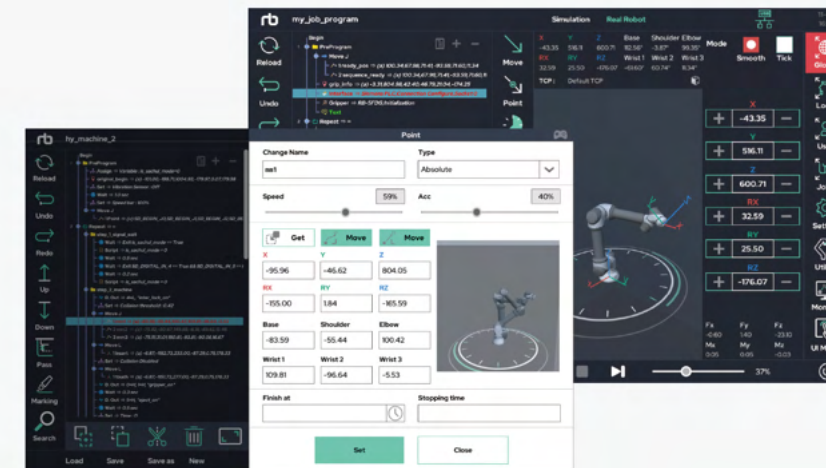
Rainbow Robotics' cobots are easy to program using the Rainbow Robotics Teaching Pendant. Moreover, the icon-based GUI allows users to configure the interface to suit their required conditions. The user-friendly GUI also makes maintenance easier, improves security, and enables intuitive programming. Teaching Pendant is compatible with Android OS-based smartphones, tablet PCs, and Windows OS-based devices.



UI

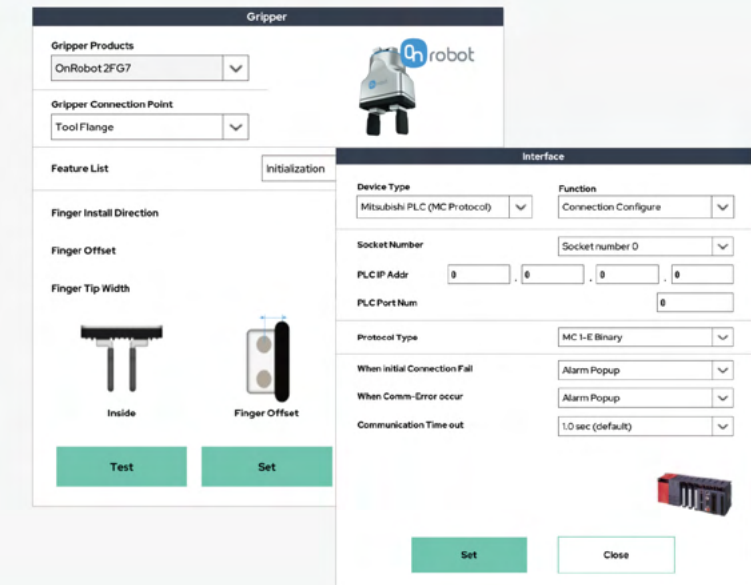
Easy to Handle

The operation and movement of the robot is easy with its simple and intuitive UI. Using a touch screen and/or joystick, operate the robot intuitively and quickly.



Various Accessories


Our robots support various gripper and sensors such as Robotiq/OnRobot (simply plug-and-play). The feature and various accessories can be used without having to install a separate program.




Connectivity

Our robots can communicate with various PLC / Sensor / Welder / HMI using its built-in communication function. They can exchange data with various devices without any additional programming.


Main Features




User's convenience
Rainbow Robotics' Teaching Pendant is a lightweight, highly responsive product, and it can be connected via wired or wireless options. Also, a single Teaching Pendant can control multiple robots.




Program configuration
Users can confirm and load previously created programs through the SubProgram and Template functions. The loaded program is automatically grouped so that the user can check the full overview.




Jog-based interface
When writing a program, a robot often has to be repositioned or relocated. RB series cobots have a jog dial next to the programming window. Users can use the jog dial to move the robot and add the desired commands.



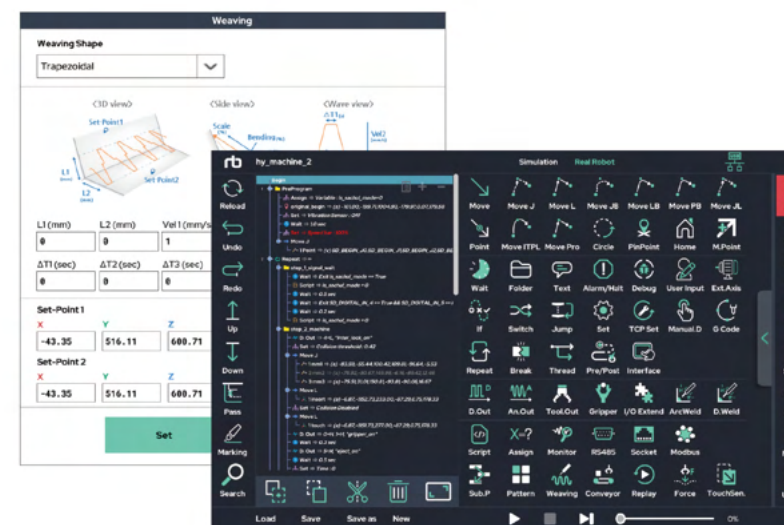
Digital output
Users can control the entire port by selecting either ON or OFF. Furthermore, various options such as a bit combination output and pulse output are available for digital output.



Program tree viewing & processing
Users can access the program summary through the program tree, and functions such as zoom/scroll can help view the content with greater accuracy.



Real-time monitoring
Teaching Pendant has debugging and monitoring functions to check the value of each selected variable. While the program is running, users can check the selected variable via a pop-up, and check variables in real-time using the monitoring function.



Various Functions

The Rainbow Robotics program offers a variety of built-in functions. Users can quickly access available functions by inputting a few setting values.

Accessory

RB series cobots support "Plug&Play" so that users can easily use various grippers, sensors, PLCs, welding machines, and HMI. RB series accelerates development, and it works under a wide variety of working conditions.

| | | | |
|-------------------|---|--------------------|--|
| | | | |
| Robotiq Hand-E | JRT JEGB 485/4140 | HIWIN SEG-24-TM | MITSUBISHI PLC Series |
| | | | |
| Robotiq 2F-85/140 | DH-AG-95 | HIWIN SEG-04-TM | LS ELECTRIC PLC Series |
| | | | |
| Robotiq E-Pick | Schunk Co-act | Robotiq F/T Sensor | Welding Equipments ESAB / Kemppi / Kolarc |
| | | | |
| Robotis RHP12RN | Schunk EGP | Robotis F/T Sensor | HMI |
| | | | |
| OnRobot 2FG7 | OMRON PLC | Pickit 3D | Siemens PLC |
| | | | |
| OnRobot RG2/RG | Analog Welding Equipments OTC Deihen, Megmeet, etc | Setech NutRunner | SCHMALZ |



World's first NSF-certified cobot RB-N Series

RB-N series has been certified by the National Sanitation Foundation (NSF) for safe and hygienic use in the food and beverages market, and is designed to be used as stand-alone units without the need to add any jackets or additional devices to the robot.

RB-N series features three models, RB5-850N, RB3-1200N, and RB10-1300N, that can be applied in various food and beverage applications, such as fryers using high-temperature oil and espresso machines using high-pressure steam.

※ The specifications of RB-N series robots are the same as the RB series robots.

NSF Certificate and scope of application



Various F&B industry applications

- Unmanned cafe platforms (coffee, ade, milk tea, cocktail, etc)
- Soft ice cream robots
- Waffle-making robots
- Chicken-cooking robots
- Kitchen utensils-washing robots, etc

✓ NSF Mark

- Safety certification for special purpose food processing equipment and related components (NSF/ANSI 169)
- Approved as a production facility/equipment by the NSF

✓ Innocuous cooking robot (safe for the human body)

- Uses special paint that does not emit any harmful substances
- Guarantees a level of safety that allows food to be cooked again even if it comes into direct contact with the robot
- Approved with a crash test (harmlessness of foreign substances such as paint chips generated as a result of a collision proven)

✓ Use of highly durable fasteners /connections

- Uses special SUS fasteners/connections that do not rust
- Uses coupling rings proven for use at high temperatures and offers high strength, high stiffness, low moisture absorption, fatigue resistance, creep resistance, and great hygiene performance

✓ Superior user's convenience

- Features a waterproof and dustproof 6-axis robot arm with an IP66 rating
- Works as a stand-alone robot unit that can eliminate the hassle of changing jackets and reduce costs

Cases of RB series applications

1 CNC machine tending

CNC machine tending is a process that repeats the task of inserting raw materials into a machining tool, then taking out the processed product. RB series not only performs simple and repetitive tasks on behalf of human workers, but also prevents the risk of industrial accidents. Furthermore, it supports IP66-rated (dust and water-resistant), meaning RB series can continue to work without any issues even if it comes in contact with cutting oil and coolant during the machining process.



STS PRECISION CO., LTD

"We have managed to boost productivity by 40~50% by introducing RB series cobots to the manual CNC process. Also, we are now able to respond more actively to the demands of our customers, which have increased two to three times since the recent boom in semiconductors."

2 Welding solutions

As standard, RB series is equipped with the necessary functions for weaving and arc welding, which makes it capable of various welding applications, including specimen, argon, weaving, pulse, arc, and corner welding.



J.system

"Welding requires great precision and attention to detail. Naturally, you need to input a lot of robot motions and points. Unlike industrial robots, cobots come with a direct teaching function, making motions and points much easier to input."



JCT

"Welding systems using cobots have the advantage of being easy to install and being capable of small-lot productions compared to conventional industrial robots. Also, cobots are more economical in terms of the space and cost they require since they do not require any additional devices or facilities such as fences. If you are finding it difficult to recruit an experienced and skilled welder, try using a robot welder that is easy to control, even for novice robot operators."



3 Mold handling

Mold handling is used when loading-unloading injection molded parts. A robot can perform dangerous tasks such as operators putting their hand into the injection molding machine to take out a newly produced component.

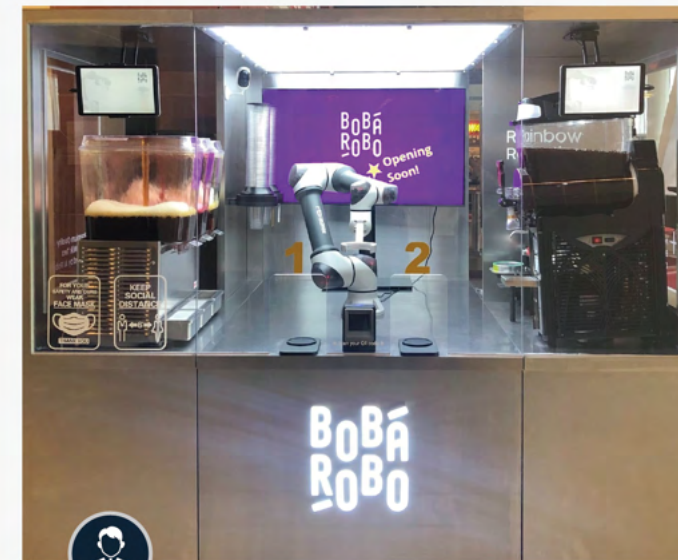


TP Solution

"Since a robot is always consistent in performing its task, it reduces the defect rate and boosts productivity quite substantially. Also, cobots can help workers learn new skills. For example, they can learn how to control the overall process, rather than performing simple and repetitive tasks."

4 Milk tea barista robot

Milk tea barista robot is a beverage platform developed together by Rainbow Robotics and BOBA ROBO. The platform is equipped with AI robotics technology, so when a customer orders a drink using an unmanned kiosk, the platform can deliver the order within 95 seconds. Meanwhile, supervisors can check the order and waiting status using a dedicated monitor.



BOBA ROBO Inc.

"The world's first milk tea barista robot is available at the University of Nevada, Las Vegas in the United States. Milk tea barista robot is particularly popular among MZ generation consumers. It satisfies customers with more than just simple robot movements - it produces milk tea in a similar way a human barista would do to deliver delicious cups of milk tea. In Korea, the first BOBAROBO platform is available at the Oksan Service Station in Chungcheongbuk-do."

5 Ice cream Robot

Ice cream robot using RB series is operated in collaboration with employees in the store. It provides high-quality ice cream regardless of employee proficiency.



GS Global

"We introduced an ice cream robot as a unique marketing initiative at our Cafe on the Road establishment at the Cardoc Gas Station in Ilsan. Ice cream robot is very popular with children and customers. Plus, our staff is extremely happy since the robot has helped take a simple and repetitive task off their hands. In particular, we were looking for a platform that was easy to use once it was installed. We made an inquiry to Rainbow Robotics, and we were able to get the technical support we needed."



Main Office and Factory
10-19, Expo-ro 339beon-gil,
Yuseong-gu, Daejeon, Korea

Phone +82.42.719.8070
FAX +82.42.719.8071

Contact email rainbow@rainbow-robotics.com
Sales inquiries sales@rainbow-robotics.com
Homepage www.rainbow-robotics.com