

Dexterous and articulate

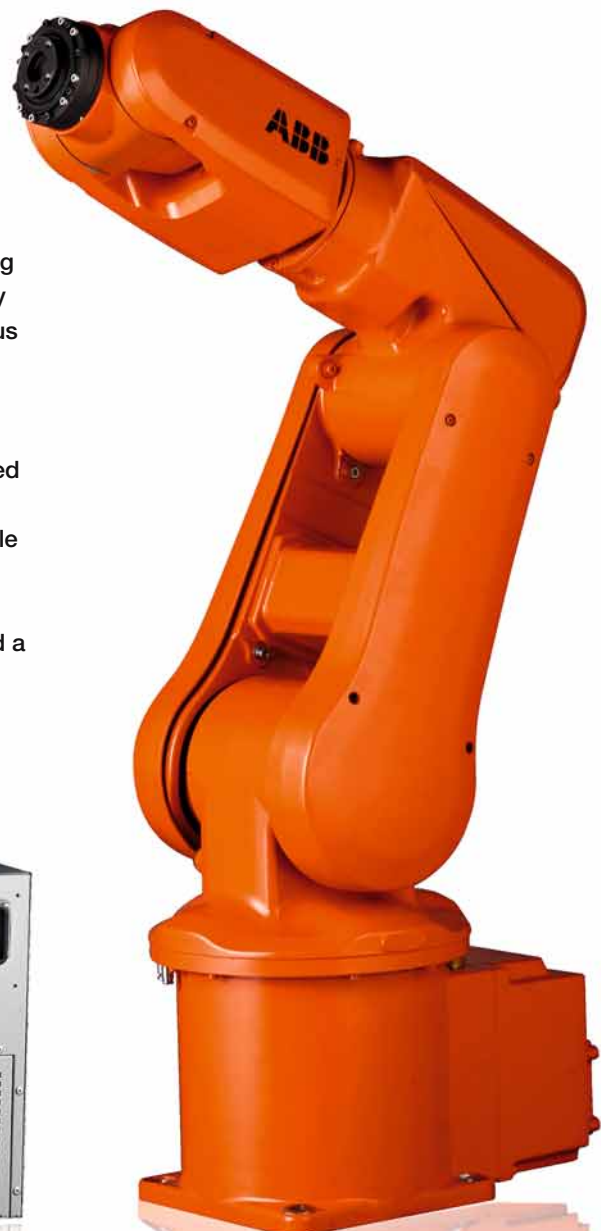
ABB's new IRB 120 robot and IRC5 Compact controller

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Many industries rely on robots to improve productivity, reliability and safety. They are primarily used for assembly, material handling and for the movement of products around the factory. Their ability to carry out highly repetitive tasks tirelessly and often in hazardous environments ensures greater product uniformity and helps to reduce employees' exposure to danger.

The brand new IRB 120 is the latest ABB robot and is ideally suited to a wide range of tasks, including the handling and assembly of small, delicate components. It is a compact desktop robot capable of manipulating payloads up to 3kg.

ABB is a leading manufacturer of industrial robots and has played a significant role in promoting their use in manufacturing.



Innovation in production

In many industries, including pharmaceutical, medical, solar, electronics (particularly the 3C: computer, communication and consumer) industries, food and beverage industries and research sectors, the assembly and handling of products are labor intensive and the production pace is often high. Tedious or repetitive production tasks can result in fatigue, which may lead to production bottlenecks, repetitive strain injuries or other employee health issues. Furthermore, in countries like Japan, with falling populations, the size of the available workforce is also expected to fall, which may lead to inflated labor costs and possibly reduced manufacturing capacity.

After discussing the market requirements with over 50 system integrators, partners and end customers across the globe, ABB concluded that a cost-effective, compact, agile and lightweight robot was required to satisfy these industries' needs. ABB followed up by developing the IRB 120 to automate lightweight multicomponent manufacturing processes. The robot's accuracy and versatility ensures that product quality and uniformity are retained, while reducing production costs and providing greater flexibility, so that production capacity can be adjusted rapidly to meet changes in demand.

The IRB 120's multiple mounting options provide greater flexibility for the design of automated production lines, helping reduce the footprint required for production processes.

ABB's IRB 120 robot

The IRB 120 is ABB's smallest robot, offering all the functionality of the ABB range in a much smaller package. It has a single articulated arm with a reach of 580 mm, a distance

1 The IRB 120 can be mounted in a wide range of positions. Here, it is mounted from the ceiling (left) and a wall (right).



designed to mimic the reach of a human arm. Like all of ABB's single-arm robots, the IRB 120 is dexterous with six axes of movement **Factbox 1**. This feature, together with its compact turning radius (due to its symmetry when vertically extended), allows the robot to be mounted close to other equipment. The robot's multiple mounting options provide greater flexibility for the design of automated production lines and help to reduce the footprint required for production

2 The IRB 120 weighs in at 25 kg



processes **1**. Once installed, these robots can reach components 112 mm below their base and can operate in tight locations, thanks to their slim wrist, smooth and easy-to-clean surfaces, and internally routed cables. These features also make it ideally suited to applications in dust-free environments.

The IRB 120's light, yet robust aluminum structure and its powerful compact motors weigh in at just 25 kg **2**. This ensures that the robot is capable of rapid and accurate acceleration. In fact, the IRB 120 has all the fine features common to the ABB

robot tradition, including the best path accuracy and motion control on the market. With these features, manufacturers can be assured of high and consistent quality in production.

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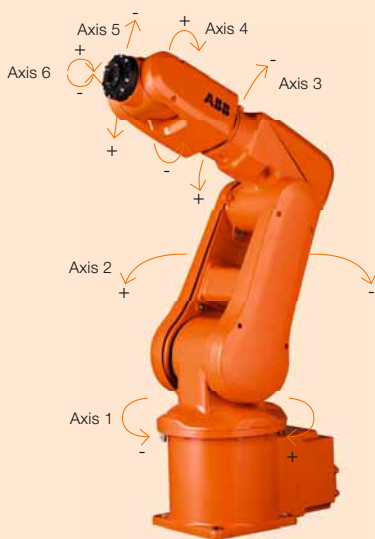
The IRC5 Compact controller

The IRB 120's high speed, smooth movements and accuracy are achieved using ABB's new lightweight (27.5 kg) IRC5 Compact controller, the latest addition to ABB's comprehensive IRC5 family of robot controllers **3**. This device delivers superior motion control and uses ABB's RAPID robot programming language. The program can be viewed and executed using either the Windows style FlexPendant™ HMI (human machine interface) **Factbox 2**, which was developed as an integral part of the IRC5 Compact controller, or using a PC. The controller supports structured programs, shop-floor language and many advanced process applications. Using advanced dynamic modeling, the controller can optimize the performance of the robot for the shortest possible cycle time and precise path accuracy, automatically delivering consistently high performance with no additional tuning required by

the programmer. Such features will be familiar to users of existing IRC5 controllers, requiring no additional training to operate the new compact version. In addition all benefits to users of the IRC5 controller are extended to the IRC5 Compact controller, such as

Factbox 1 Six axes of movement

The robot can rotate from left to right by 330 degrees through axis 1, close to the base plate. Immediately above this rotation point is axis 2, which allows the arm to pivot so that the upper arm can extend horizontally forward or backward. Axis 3 extends the robot's vertical reach so that the upper part of the arm can be raised and lowered. Axis 4 provides what is known as the wrist roll. It rotates the upper arm in a circular motion moving the end effector between the horizontal and vertical orientations. Axis 5 is responsible for the pitch, giving up and down motion, and the yaw, giving left and right motion. Finally axis 6 provides a twisting motion, giving the effector more than 360 degrees of rotation in either a clockwise or counterclockwise direction.



3 The IRC5 Compact controller



worldwide dedicated support and the global availability of quality spare parts.

ABB's new lightweight IRC5 Compact controller provides high speed, smooth movements and accuracy to the IRB 120 robot.

The combined weight of the IRB 120, its IRC5 Compact controller, floor cables and FlexPendant is less than 60kg, providing a truly compact, lightweight robotic system.

In addition the new IRC5 Compact controller enables easy commissioning through one-phase power input, external connectors for all signals and a built-in expandable 16 in, 16 out I/O system. Sensor interface functionality, remote disk access and socket messaging are examples of the many powerful networking features available to operators. Remote monitoring of the robot is also available through standard communication networks such as GSM¹⁾ or Ethernet. Advanced diagnostic methods allow fast investigation of failure as well as the monitoring of the robot's condition throughout its life cycle. Service packages are also available, including new

Factbox 2 The FlexPendant

When using the FlexPendant, the operator can take advantage of several design features that make robot control easy. Firstly, it is a complete computer in itself and is therefore unaffected by controller load. It can be used easily by both right- and left-handed operators. It is characterized by its clean, color graphical touch-screen design and 3-D joystick for intuitive interaction. Powerful customized application support enables loading of tailor-made applications, for example customized operator screens, which eliminate the need for any separate additional operator HMI. It features enhanced language support, including Asian characters, so that operators around the world can work in their own languages.

services such as program backup management, reporting, and proactive maintenance activities.

Although initially released for the new IRB 120, the IRC5 Compact controller is also scheduled to be released throughout 2010 for the operation of other small ABB robots.

Offline programming is also available for the IRB 120 through ABB's RobotStudioTM, which enables manufacturers to simulate a production cell to find the optimal position for the robot, and provide offline programming to prevent costly downtime and delays to production.

The combined weight of the IRB120, its IRC5 Compact controller, floor cables and FlexPendant is less than 60 kg, providing a truly compact, lightweight robotic system.

ABB has many years of experience in the automation business and is particularly well equipped to automate production processes. Improved cycle times, consistent high quality and increased flexibility have contributed to the success of many industries. With this in mind, ABB launches its new compact IRB 120 robot and IRC5 Compact controller. Together they will extend ABB's automation solutions to industries concerned with the assembly and handling of small, complex components and devices.

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