

Small robots are the new big change

The Rapoo Case with IRB 120



Lots of little robots add up to one big and revolutionary change at Rapoo's major electronics production facility in China.

On the production line of the Rapoo computer-peripheral plant in Shenzhen, China, 80 of ABB's IRB 120 robots are hard at work. The robots – ABB's smallest – are responsible for assembling wireless mice, keyboards and their sub-components. They've also enabled Rapoo to overcome two major production problems – a shortage of skilled labor and a need for design flexibility.

"ABB's IRB 120 robots have helped us to optimize production, improve product quality and lower operating costs, which, in turn, have greatly increased our profits," says Huang Shuling, Manager of Rapoo Technology's Automation Division. "In fact, they are several times more efficient than the previous manual operations."

That last bit, considerations about labor issues, is a large part of what has driven the change. In addition to reducing repetitive working conditions that can lead to strain for some 300 workers, Zeng Hao, General Manager of Rapoo Technology, says the robots address the increasing issue of labor shortages. More generally, the use of robots & automation has enabled Rapoo to lower their workforce to about 1100 people from 3000 people 2 years ago.

"In recent years, workers' salaries have been growing at an average annual rate of 15 to 20 percent," says Hao. "Under such conditions, corporate profits can be swallowed by growing costs. It has been difficult to manage workers due to high turnover, which has also sometimes impacted production and delivery." Zeng says such shortages are a common challenge faced by the computing, communication and consumer (3C) electronics industry in Guangdong province's Pearl River Delta, where Rapoo is based.

“If we want to develop and improve our competitiveness, we knew we had to find ways to address current conditions,” he says. “Therefore, Rapoo started a large-scale automation program, purchasing a large number of ABB IRB 120 robots. This small robot has features such as high speeds, high accuracy, high reliability, and ease of both installation and use.”

Huang agrees. “This machine is suitable for assembly of mice & keyboards and has a tact time of only three seconds, achieving 60 percent higher productivity than manual assembly,” he says. “It enables simultaneous production of two sets of work pieces, doing the work of 10 workers, or more. As a result, we expect the payback period for this equipment to only be two years.”

Huang first came across the ABB IRB 120 when a bottleneck in the production line led him to research solutions. He discovered the six-axis robot weighed only 25 kilograms and offered the highest speed and levels of precision on the market. With a working radius of 580 mm, it can make any gesture and reach any place, with almost no dead angle. To Huang it was clear that the IRB 120 would solve his problems and be applicable in wide variety of assembly related applications. Those range from using the robot as a tampo print machine, to handling and inserting parts in printed circuit boards, or even assembling critical parts such as an optical tracker into a mouse bezel. As an additional benefit, the adoption of the IRB 120s has led to a 15 percent reduction in the time required to develop automation solutions for the company. It also helped overcome some technical problems and facilitated several applications that had previously been difficult to implement. The ease of implementation of the IRB 120 can be very well illustrated with Rapoo’s automation department’s ability to move from 15 to 31 automation projects managed in a single year.

To get Rapoo’s automated production line operational as quickly as possible, a group of robot engineers from ABB provided full technical support. The engineers assisted Huang’s team to develop and manufacture the automation lines and after programming the equipment, it was put into use immediately. Some of the lines have a pay-off period as short as eight months, while even the longest pay-off period is less than three years. Rapoo now has a strong competitive advantage over companies that haven’t automated.

In the near future it is expected that a greater number of industrial robots will appear on the assembly lines of 3C production plants. These will help enterprises improve their competitiveness, productivity and product quality. Rapoo’s robots and equipment will enable Rapoo to save about RMB 10 million (USD 1.6 Million) each year. Their initial success has convinced Rapoo to introduce ABB robots on a larger scale. With goals that include increased efficiency, higher quality and improved competitiveness, the company plans on purchasing more robots this year alone—which they also say will also lead to more jobs as production is expanded. “We expect the number of ABB robots here at Rapoo to increase constantly as different applications are developed, perhaps growing by 100 to 200 robots or even more,” says Huang. From any perspective that is a lot of robots — even if they’re small.

Facts about Rapoo

Rapoo Technology was founded in 2002 and produces computer peripherals. Its technologies, industrial design and production management have established it as one of the world’s top three wireless peripheral companies. Rapoo is the industry leader in areas including 2.4G wireless connection, intelligent connectors and blue light tracing. Stylish design enables Rapoo Technology to outperform competitors in the wireless mouse market and its Blade series of wireless products won the iF Design Award in Germany.