

TOPICS



Agriculture, robots, and ICT

Squse is working on an automatic tomato-harvesting robot in order to make up for labor shortages, reduce the number of tasks, and boost productivity in the farming, fishing, and forestry industry. It was selected for the Ministry of Agriculture, Forestry and Fisheries' Verification Project for Establishing Advanced-model Agriculture Through Cooperation Between the Agriculture and Economic Worlds in FY2014, by which a prototype was developed. This autonomous, self-propelled robot has eyes, arms, and legs. It selects red tomatoes that are optimum for harvesting and performs the harvesting work. Squse is collaborating with the Nagasaki Southern Producer's Association—which has an established reputation for the stable provision of safe, high-quality tomatoes—on development with the goal of practical implementation. This automatic tomato-harvesting robot was also shown in a video at the EXPO Milano 2015 Japan Pavilion.



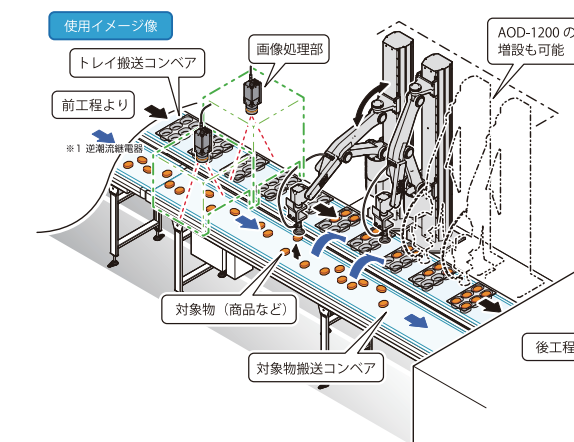
Free robot rentals to educational institutions

Squse rents robots at no cost to industrial high schools and technical junior colleges. Its aim is to make students familiar with industrial robots while they are in school, by which it wants to raise the standard for human resource provision in the robotics industry. Because the development of the robotics industry is essential for Japan to serve as a world leader, in the future Squse intends to further enhance its relations with educational institutions, including cooperation for human resource exchange and incorporating robots into curricula.

FACT SHEET

AOD-1200, an RHP Series five-axis servo robot

A robot that enables automation in small spaces



Technology overview

Robots are ideal for automating tasks that previously had to be performed by human hands—such as packing, transferring, and sorting—at manufacturing sites including for foodstuffs, pharmaceuticals, and automobile parts. For the first time in the world, a Scott Russell linkage mechanism (which converts input from linear motion in the vertical direction into linear motion in the horizontal direction and outputs it) has been adopted in an industrial robot. This robot is unique because it has a small footprint yet the operating range is ensured.

This product has excellent affinity with lines in operation and also allows for expansion. It is ideal for manufacturing sites that handle comparatively small products such as foodstuffs and pharmaceuticals, as well as fields with small workspaces where the installation of all-purpose robots was not possible and automation has been delayed.

This robot is perfect for small to medium enterprises and medium-sized corporations suffering from labor shortages. It helps improve productivity and achieve safe, reliable, and stable manufacturing sites.

Feature 1

This product has a motor output of 80W or less, so there is no need to put a safety barrier between it and people. In addition, it is only mobile in the front, so people can move behind the robot. In these and other ways, this robot offers simple safety measures and easy installation to existing lines.

Feature 2

By adopting an original Scott Russell linkage mechanism, this robot allows extension movement from front to back and left to right. It has a small footprint for compact layouts with multiple units. It can move in a variety of ways including front to back and left to right, left to right rotation, finger tilting, and finger rotation.

Development background

It seems like most plants have already been automated, but in reality there are still many plants that depend on manual labor. At the same time, labor shortages at manufacturing sites are a pressing issue. Squse developed this product due to fervent requests from clients for a way to resolve these challenges. Aiming to create an original robot that enables coexistence and coaction with humans, Squse began developing an automation device that replaces manual labor and an original robot that incorporates this device.

Uniqueness

By adopting a Scott Russell mechanism for the first time in an industrial robot, Squse has achieved a broad range of movement while maintaining a small footprint, making it easy to install this robot on existing lines. In this way, robots can perform simple, repetitive tasks that are labor intensive and depended on manual labor in the past, even in small spaces. For that reason, automation is achieved in which people and robots can work together even at existing manufacturing sites.

The outlook for the future

By creating data about production processes via the automation of manual tasks, both the AOD-1200 stand-alone unit and complex systems including this machine are positioned as components in production innovation through the Internet of Things (IoT). Squse will work so the robots it develops are incorporated into various types of automation devices and adopted by manufacturing industries inside and outside Japan that are struggling with labor shortages. In the future, Squse will develop its own robots that exist nowhere in the world to help support manufacturing.

Company history

- | | | | |
|------|---|------|---|
| 1997 | Opened independently as Squse, an individual business | 2012 | Completed the new Head Office building and plant in Minami-ku, Kyoto-shi |
| 2002 | Incorporated into Squse Limited (capital of five million yen) | | Due to the completion of the company's own plant, began full-scale developments focused on the solution business for manufacturing sites such as developing automated devices and lines that can replace manual labor via joint development with foodstuff and automobile manufacturers |
| 2003 | Reorganized into Squse Co., Ltd., an incorporated public company (capital of 10 million yen) | 2013 | Developed and released the RHP Series Multi Continuous Operation System, a five-axis servo robot multifunction machine that automates manual labor in small spaces |
| 2006 | Obtained a patent (no. 3754666) for an actuator and hand device
Successfully developed a five-fingered robot hand made of metal-less air muscle with the aim of myoelectric prosthesis development (joint research and development with Doshisha University) | 2013 | Obtained a patent related to a Scott Russell mechanism (no. 5438244) |
| 2008 | Was selected as one of the Ministry of Economy, Trade and Industry's 300 Most Energetic Small to Medium Enterprises Supporting Japan's Future | 2014 | Capital increased from 282.28 million to 382.28 million yen (with investment by the Innovation Network Corporation of Japan) |
| 2008 | Obtained a patent for a rotation device (no. 4212644) | 2015 | Developed an automatic tomato-harvesting robot prototype (chosen for the Ministry of Agriculture, Forestry and Fisheries' Verification Project for Establishing Advanced-model Agriculture Through Cooperation Between the Agriculture and Economic Worlds) |
| 2012 | Developed and released a five-axis servo robot (RHP Series: ASD-1100) that works together with people and does not require safety barriers | 2015 | Provided support for the EXPO Milano 2015 Japan Pavilion |

Company Profile - Key information (as of August 2015)

Location: 106 Kisshoin Shinden Ninodan-cho, Minami-ku, Kyoto-shi 601-8317
 URL: <http://www.squse.co.jp/>
 TEL: +81-75-694-0101
 Fax: +81-75-661-5110

Number of employees: 97 (as of April 2015)
 Capital: 382.28 million yen
 Established: 2002 (business started in 1997)
 Representative: President Mikio Shimizu

Business areas

The solution (SL) business for developing automation devices and lines that can replace manual labor and are a hybrid of factory automation (FA) and robots (RB)