Daifuku built state-of-the-art logistics systems by fusing robotics technologies. These systems attained 99.99999%, or “seven nines” accuracy, the highest in the industry.

As a systems integrator, Daifuku offers logistics systems that meet customers’ real needs in virtually all fields. At the large-scale distribution center “TBC Saitama” (provisional name) of Toho Pharmaceutical Co., Ltd., a pharmaceutical wholesaler, major themes in systems design were not only efficiently handling shipments of a large number of items in small lots, but also introducing robots that would reduce labor inputs, as labor becomes increasingly scarce in the years ahead. Daifuku worked with its customer to develop and deliver state-of-the-art logistics systems that make use of robots. Case picking by robots, with some exceptions, is 100% automated from delivery to the distribution center to shipments. In addition, Daifuku went beyond this accomplishment to use robots for piece picking from a large number of items, a step which was previously thought to be too difficult.

Moreover, Daifuku expanded the scope of automation by integrating computer systems with its various automated storage and retrieval systems (AS/RSs). As a result, the number of personnel was reduced by half compared to distribution centers of the same size, and productivity was doubled, while accuracy of shipments attained the highest level of 99.99999%, described as “seven nines.”

Accurate Management of Pharmaceutical Products
Pharmaceuticals received from manufacturers are automatically inventoried and managed by lot based on bar-code information or data from automatic word recognition equipment. These systems enable both the reduction of labor inputs and increased traceability of about 30,000 pharmaceutical items.

Automated Through to Shipments
Products to be shipped are matched and loaded into collapsible totes, and then placed on a conveyor. Next, they are temporarily stored on the Shuttle Rack mini load AS/RS for shipments. They are then retrieved in the delivery vehicle in the reverse order that they will be delivered in, to increase the efficiency of removing cases at the point of delivery. The totes for shipment are loaded automatically on roll box pallets. (Photo 2) Meanwhile, cases of various shapes and sizes are transported by an automatic palletizing robot, which then palletizes them in an optimal manner quickly onto roll box pallets. (Photo 3)
Evolving Daifuku’s Solutions

More than 20 Years of Experience in Wireless Power Supply Systems

Daifuku’s transport and storage systems that use HID* noncontact power supply technology are safe and dustless and are suited to cleanroom environments. Daifuku has delivered more than 10,000 such systems for production lines in the semiconductor sector where they are operating non-stop for 24 hours a day and 365 days a year, as well as in automobile production lines.

* HID: High-efficiency inductive power distribution

Expansion into Wireless Charging Technology

In addition to its conventional plant business, Daifuku has launched a device business that makes use of noncontact power supply technology. In February 2016, with the cooperation of Komatsu Forklift Japan Ltd., Daifuku commercialized a wireless battery charging system for electric forklifts using its new technology called the D-PAD (the first system of its kind in the world according to Daifuku’s own research and is patent-pending). The system realizes a high level of transmission efficiency and reduces damage and accidents due to contact failure of electric plugs. (Photos 1 and 2)

Going forward, Daifuku will focus on developing technology for detecting foreign objects and workers as well as work to develop systems with improved and longer transmission capabilities to enhance the quality and functionality of its D-PAD technology, improve their cost performance, and expand applications in a wide range of industries. Efforts are also being focused on identifying new markets that will make the smart mobility society a reality.

The Daifuku Group has a strong record for installing systems for automobile production lines around the world, principally to Japanese and U.S. automakers. These systems include not only conveyor systems for transporting car bodies from one work process to another but also automated guided vehicles. For example, Magna T.E.A.M. Systems Inc., which manufactures SVUs on a subcontracting basis, makes use of the SmartCart automatic guided cart, one of the main products of U.S. Daifuku Group company, Jenis B. Webb Company. (Photo 1)

Applying the Internet of Things (IoT) in Manufacturing Fields

In the field of automobile production line systems, one of the key factors in determining equipment utilization rates is maintenance. As a new mode of human machine interface (HMI), Daifuku has developed a mobile system that uses a tablet terminal (see below right). Through the use of wireless LANs, this new system provides information on the status of utilization in real time, reports abnormal displays, and monitors input/output status. Moreover, it can maintain systems through remote operations and provide information on when to replace parts with limited lifetimes and other preventive maintenance-related information. In addition, the tablet terminal can read the QR codes located at each operating point and become a multipurpose tool that operates those points, thus making it possible to design operation control boxes located on the production line substantially smaller and simpler. Also, another strength of this tablet terminal system is that it can play a role in explosion-proof and other environments where it is not possible to install control panels.

The system provides necessary information, such as machine design drawings, anytime, anywhere, and in portable form, thus making it possible for work in collaboration with the workplace through a computer terminal. These system capabilities enhance conditions in the workplaces of Daifuku’s customers and are expected to increase the convenience of operations.

# Industry  Smart Mobility

## Solution  Wireless Charging System

| 1 | 2 |

Go to see Daifuku products and case studies

Corporate Site: Solutions

www.daifuku.com/solution/cleanroom

www.daifuku.com/solution/wirelesspower

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# Industry  Automobiles

## Solution  Introducing New Approaches for Both Equipment and Maintenance

| 1 | 2 |

Go to see Daifuku products and case studies

Corporate Site: Solutions

www.daifuku.com/solution/automotive
The Daihuku Group has provided a new product to avoid workplace accidents at airports, realizing the integration of humans and machines with its ergonomics approach.

**TSA's Challenge**
The Transportation Security Administration (TSA), an agency of the U.S. Department of Homeland Security with authority over the security of the traveling public, deploys security officers for more than 450 commercial airports and provides 100% screening of all checked baggage for explosives. For over a decade, the TSA has experienced growing ergonomic issues from workers lifting heavy bags from and to the conveyor systems within the Checked Baggage Resolution Areas (CBRAs). This was connected to the ergonomic approach.

**Evolving Daihuku’s Solutions**

### New Concept of Mobile Inspection Technology Improves Ergonomics

The MIT is highly sought after because of the increased ergonomics, elimination of lifting injuries by TSA employees, flexibility, quick installation time, and direct tracking as well as adheres 100% to the latest Planning Guidelines and Design Standards for Checked Baggage Inspection Systems standards. The integration of the technology with Jervis B. Webb’s baggage handling control system, WebbView, and the Syrml software and controls package of BCS Group Limited, developed its CONPROSYS device cloud and monitoring packages for photovoltaic facilities and social infrastructure.

During fiscal 2015, Contec developed 26 products in the CONPROSYS series and plans to develop 24 more products in fiscal 2016, with the aim to achieve 50 products in total. CONPROSYS draws on Contec’s strengths developed for more than 30 years as a leader in the PC-based electronic measuring and FA control markets, as it has offered remote monitoring packages for photovoltaic facilities and social infrastructure.

The Daihuku Group is pursuing the development of simple, convenient, and easy-to-use products and services for the M2M/IoT market, which is expanding in terms of applications and industries, and is actively working to increase the value added of its product and service offerings.

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*MIT: Mobile Inspection Table, I.B.S.: Incline touch brushing system
* M2M: Machine to Machine, IoT: Internet of Things