

## INDUSTRIAL SOLUTIONS

### Enhancing the productivity of the *Monozukuri* industry and improving quality of life

Our mission in the Industrial Solutions Business Unit is to realize carbon-neutral *Monozukuri* (manufacturing) from the perspective of “green,” and to build a society that expands human potential from the perspective of “peace of mind.” Guided by this mission, we will work to earnestly address the *Monozukuri*-related issues facing our customers, providing them with solution packages that resolve such issues in a manner that best suits their needs. By doing so, we will make significant contributions to industrial and social progress.



**Katsuhisa Shimokawa**  
Head of Industrial Solutions Business Unit

#### Business Strengths

##### Production Assets Thoroughly Refined at Manufacturing Sites and Global 130 Plant

Using our high-quality, highly durable facilities that have been refined on auto part production lines, as well as our core factory automation equipment, such as robots and sensors, we are playing a role in improving productivity throughout the manufacturing industry and society at large while spreading our reach from standalone equipment to processes and modules.

##### *Monozukuri* Know-How That Has Supported DENSO's Products for More Than 70 Years

DENSO solves serious issues directly affecting the manufacturing industry, such as labor shortages, carbon neutrality and DX, with its know-how in flexible and lean manufacturing and lean automation technologies.

##### Safe and Secure Solutions for Society Using QR Codes Developed by DENSO

DENSO creates value for new domains and applications by incorporating outside ideas for using QR codes and QR code reader technologies that have been evolving since 2000 and which have become an international standard (ISO/IEC 18004).

#### Business Strategy for 2022

In addition to lean automation, DENSO is commercializing eco-friendly *Monozukuri*. We strike a balance between business growth in non-automotive fields and the business principles for lean and clean *Monozukuri*.

<b>Growth Strategy</b>	With the aim of spreading lean automation, we are working closely with our customers to come up with ideas for flexible and lean automation, including getting involved in process engineering. We are also utilizing open platforms co-created with partners and scaling up business by leaving behind the idea of being self-sufficient.
<b>R&amp;D</b>	DENSO is concentrating on the development of next-generation technologies to realize clean and lean <i>Monozukuri</i> based on carbon neutrality, digital-twin plants, and collaborative robots to address serious issues faced by the manufacturing industry. The Company is accelerating industry-government-academia activities to further spread DENSO's concept of next-generation plants.
<b><i>Monozukuri</i></b>	Leveraging its strengths in factory automation equipment and facilities provided by the Industrial Solutions Business Unit (i.e., products that are thoroughly proven, improved, and refined with DENSO's Global 130 Plant concept, and then delivered to customers), DENSO is improving productivity while being in touch with customer needs and always providing high-quality production assets.
<b>Hitozukuri</b>	DENSO develops a broad spectrum of human resources adept in digital technologies that are essential for next-generation manufacturing, such as digital-twin and open platforms, as well as human resources that excel in providing solutions (sales engineers) and are able to precisely propose ideas that combine know-how with technologies owned by DENSO to solve issues faced by customers.

### Outcome of Green and Peace of Mind Strategy

Objectives	Results
Spread awareness of lean automation around the world (15 companies)	Inside the plants of 15 customers that took our courses on lean automation, we together achieved several improvements in operations based on the concept and skill sets of lean automation.
Increase partners for co-creation of open platforms (40 companies)	We agreed to co-create an open platform with 47 partner companies that share our concept of lean automation and solutions to rationalize plants.

### Efforts toward Quality

In the Industrial Solutions Business Unit, when DENSO commercializes production assets that have supported its “Quality First” approach to the automotive business, we build in quality in the facilities desired by our customers (shorter preparation times, stable operations soon after launching mass production, ability for anyone to maintain conditions, easy-to-use facilities). DENSO is driving improvements in productivity across the manufacturing industry with its production assets, thoroughly refined via on-site verification and iterative improvements.

### Specific Initiatives to Achieve Strategic Aims Initiatives to Spread Lean Automation

Needs are constantly increasing for rapidly ramping up production and the manufacture of diverse types of products in various volumes in domains where labor plays a large role, such as assembly, inspection and logistics, as a means to reduce CO<sub>2</sub> emitted from plants and to address labor shortages in an aging population.

DENSO has developed and begun selling solutions for rationalizing plants with DX-CELL\* and other products that have been expanded for enabling lean automation. In fiscal 2023, the Company accelerated activities to propose improvements across a broader spectrum of operations, and added to its lineup a newly developed robot called COBOTTA PRO that boosts productivity while working alongside people. We are

also actively engaged in industry-government-academia partnerships to spread DENSO's concept of lean automation.

\* DX-CELL is a robot universal mount platform able to flexibly adapt to variable-volume production of different types of products with modular additions, including by third parties, thereby facilitating the rapid design of precisely automated production lines using DX tools.

**People working alongside COBOTTA PRO**

- This robot looks, thinks, and moves on its own, automating work that could only be done by hand
- Saves space by making safety cages unnecessary, as robot moves slowly when people are nearby

**DX-CELL facilitates variable-volume production of different types of products**

- Able to work with prototypes, small-lot production, mass production, and production wind-downs
- Can be deployed at necessary time to necessary location, only with a software update

### Resolving Social Issues through Our Businesses

Relevant SDGs



### Aiming to Resolve Regional Issues by Collecting Data on QR Code Usage

DENSO has provided QR code solutions that match diverse customer needs in the railway, retail/wholesale, and hotel industries. By using the collected QR code data more universally, we intend to expand services to new domains and applications.

For example, DENSO is cooperating with companies in Tendo City, Yamagata Prefecture (DMC Tendo Onsen Co. and Yamako Bus Corporation) to promote the creation of attractive tourist destinations. Together, we tested the “Gururi” Tendo City bus routes to improve accessibility to tourist spots and enhance transportation convenience. With DENSO's QR code application, DENSO and Tendo City can gather data on tourists' travel history, i.e., when and where they traveled and for what purpose, and use this data to increase the efficiency of tours while satisfying the needs of tourists.

DENSO is helping to revitalize regional activities through the visualization of a broader range of data on people's movements, including restaurants, hotels and shopping, through the use of QR codes.

