May 2024 Technical Information

Buildings Systems

Connective Industries

#Disaster Prevention and Resilience #Co-creation and Open Innovation #Generative AI #IoT/Data Utilization #Building Systems

1. New Standard Elevator

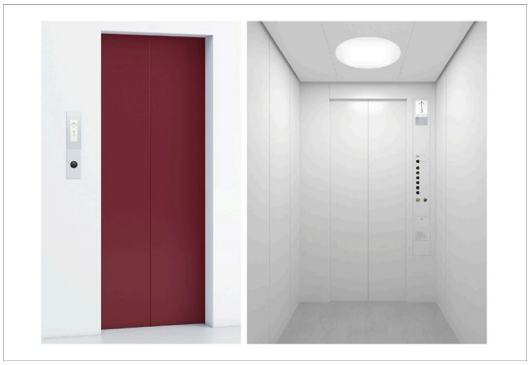
Hitachi has released its new standard elevator series, which features enhanced design and functionality.

The new series of elevators is designed to suit a wide variety of building applications. It features new color variations from Naoto Fukasawa Design Ltd., the studio of world-renowned product designer Naoto Fukasawa, and improved specifications for maximum travel height and carrying capacity.

In response to the demand for better disaster resilience, the risk of flooding during heavy rain has been mitigated by locating the internal elevator shaft control panels and hoists at the top of the elevator shaft. The new elevators also have a hybrid-PCS feature that enables them to operate on power from an electric vehicle during power cuts.

Digital functions for safety, security, and comfort have also been enhanced, including a “double security” function that uses facial recognition for touchless elevator entry and operation and an alert function that displays an icon on the liquid crystal display (LCD) indicator in the elevator car to automatically highlight any items identified as not having passed statutory inspection.

［01］Landing and interior design of new standard elevator Plus



Amid intensifying competition, Hitachi intends to continue paying close attention to market trends and customer preferences to supply the market with products and services that are the first choice for customers.

(Hitachi Building Systems Co., Ltd.)

2. Development of Rapid High-capacity Elevators Supplied to Toranomon Hills Station Tower

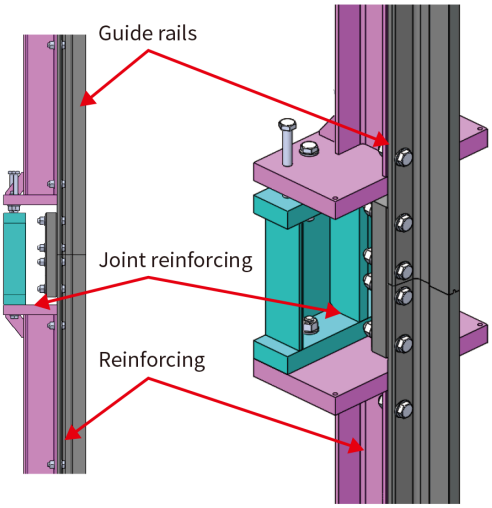
Toranomon Hills Station Tower opened in October 2023 with TOKYO NODE*, a multipurpose center, occupying its top floors (floors 45 to 49). To support the many and varied events held at this facility, Hitachi supplied rapid high-capacity passenger and freight elevators with a capacity of 8 t, speed of 150 m/min, and travel height of 268 m.

Rather than carrying capacity, the travel height of 268 m was a major challenge in the development of the elevators. With this high travel height comes an increase in the weight of items suspended under the elevator cars (including the travelling cables that carry communications and power to each car). When added to the other car components, this brings the total weight up to as much as 31 t. As elevators this heavy have never been installed anywhere else in Japan, a new structural design was also needed for the supporting guide rails. In addition to strengthening the rails with added reinforcing material on their rear side, Hitachi also took steps to ensure the accuracy of rail adjustment and developed a new design that would not compromise ease of installation. A voluntary assessment by a performance testing agency confirmed that the guide rails could cope with weights of up to 31 t, a first for Japan (the previous maximum being 22.7 t).

As the enlargement of component parts required more time to be spent on prototyping and testing, also raising issues with work safety during testing, simulations were used to conduct detailed assessments during the product development process. This included the use of virtual reality (VR) to verify installation and maintenance access.

(Hitachi Building Systems Co., Ltd.)

[02] New guide rail design



* See the list of “Trademarks.”

3. Service Platform for Smart Buildings and New Services

(1) Service platform for smart buildings

The trend toward smart buildings is being driven by a desire for efficient building operation and for improvements in user convenience and comfort. This calls for the provision of a wide range of services, with systems that are linked to building fittings and facilities as well as external systems.

It was in response to this need that Hitachi developed a service platform that operates as a multi-service hub linking these different elements together.

As well as facilitating efficient service development by providing common functions for things like user management and system interconnectivity, the multi-service hub is also designed to treat service functions like containers, thereby making services easy to add or modify. Doing it this way facilitates the packaging of services to suit specific applications, such as combining different service containers to create services specifically for residential or office buildings. This allows for more seamless service delivery and the flexibility to meet diverse customer requirements. One example is the ability to use a smartphone to check video images as part of door open/close control that was implemented by combining security and cloud-based recording functions.

(2) New services using multi-service hub

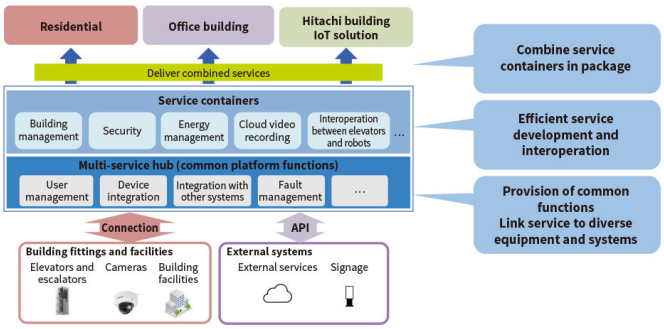
Two new services were developed using the multi-service hub as a platform: a cloud-based video recording service and a service for interoperation between elevators and robots.

The cloud-based video recording service provides recording and playback of the video feed from cameras installed in a building. This provides for remote monitoring of video from a PC or smartphone. The service supports remote building management, enabling tasks such as following up on reports from building users or checking up on heavy rainfall events without having to be on site.

The service for interoperation between elevators and robots supports vertical movement inside the building and is provided in anticipation of workforce shortages leading to greater use of robots for tasks such as delivery, cleaning, and surveillance. By linking elevators to the management systems of robot vendors from the cloud, the service allows robots to travel up and down on elevators without difficulty.

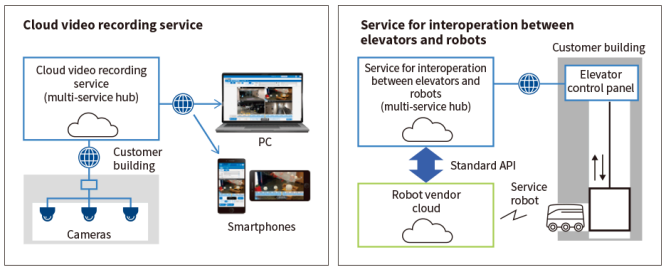
In the future, Hitachi intends to contribute to making buildings smarter by expanding new services and by responding speedily to customer needs.

［03-1］Block diagram of multi-service hub



IoT: Internet of Things
API: application programming interface

［03-2］Examples of new services using multi-service hub



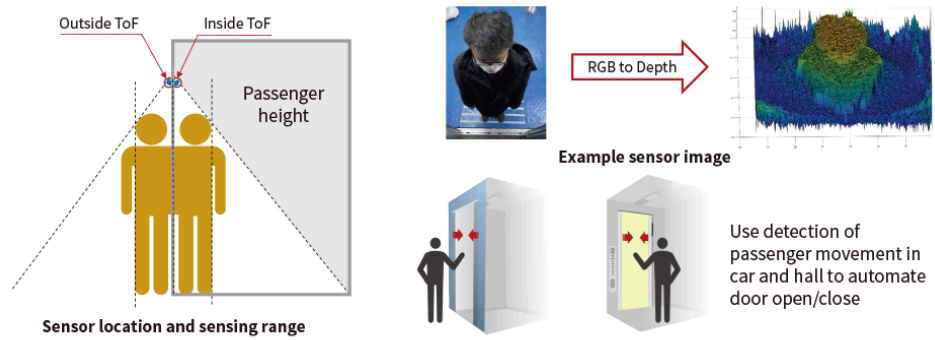
4. Smart Elevator Car System Using ToF Sensors

Hitachi has developed a smart elevator car system that uses time-of-flight (ToF) sensors and artificial intelligence (AI) to enhance passenger convenience, safety, and user experience.

ToF sensors detect the distance to an object from the phase difference between emitted and reflected infra-red light. When combined with AI, this can determine the movements of people in an elevator car or hall and be used to improve operational efficiency by automatically opening or closing the elevator door based on when people are entering or exiting. The system can also provide a better service for passengers by ensuring safety and comfort, with capabilities that include identifying dangerous behaviors such as unaccompanied children or people leaning on the door. Other capabilities include detecting when items have been left in the elevator car. More efficient dispatching of elevator cars is also possible through integration with supervisory control, using the system to determine the number of people in an elevator car and how much of its floor space is taken.

[Hitachi Building Technology (Guangzhou) Co., Ltd.]

［04］Smart elevator car system using ToF sensor



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