

Industrial Products

1 IoT-compatible Industrial Controller HF-W400E/IoT

The HF-W/IoT series is a next-generation industrial controller that is compatible with Internet of Things (IoT) and is equipped with Windows* and a software programmable logic controller (PLC) to control various EtherCAT*-supported devices such as input/output (I/O) and robot in real time as well as collecting and analyzing data to improve production efficiency and support predictive detection. As a model higher than the existing HF-W100E/IoT, Hitachi is going to launch HF-W400E/IoT, which is thinner and more space-saving, and also suitable for embedded applications and edge computing. The new model features the following product improvements, compared with the existing model:

- (1) Enhanced central processing unit (CPU) performance and larger solid state drive (SSD) capacity
- (2) Windows 10 IoT Enterprise 2019 Long Term Servicing Channel (LTSC) installed

- (3) Three-screen multi-display supported through the simultaneous use of three display output ports

In addition to supporting major industrial networks and providing a real-time data sharing function, HF-W400E/IoT also comes with a data recorder coordination function, which is a newly developed function, to enable the recording of detailed operating conditions when an anomaly occurs, and also enable failure analysis and predictive diagnosis to help improve the productivity and quality.

(Hitachi Industrial Products, Ltd.)

* See "Trademarks" on page 158.

2 Development of a New Vertical-shaft Open Motor

As an industrial three-phase induction motor, the HyMD series was developed for the purpose of downsizing and weight reduction, targeting horizontal-shaft squirrel-cage

Enhanced CPU performance and larger SSD capacity

- Equipped with Intel Core* i3 7101E (3.9 GHz) processor and a large-capacity SSD (512 GB)

Supporting the latest OS and three-screen output

- Windows 10 IoT Enterprise 2019 LTSC (64-bit) installed
- Supporting the simultaneous output of three screens (VGA terminal, DVI-D and DisplayPort*)

Supporting industrial networks and providing middleware

- Supporting the following industrial networks in addition to the existing EtherCAT:
 - (1) PROFINET*, (2) EtherNet/IP*, (3) Modbus* TCP, (4) Modbus RTU, and (5) FL-net*
- Providing a real-time data sharing function and a data recorder coordination function that are middleware supporting the collection of data required for predictive diagnosis and operation monitoring

Inheriting the features of the existing product

- Long stable supply for three years or longer after the start of its sale
- Maintenance service to be provided for a maximum of 10 years
- RAS function provided by default
- Conforming to UL/CSA/CE/KC/CCC/BSMI



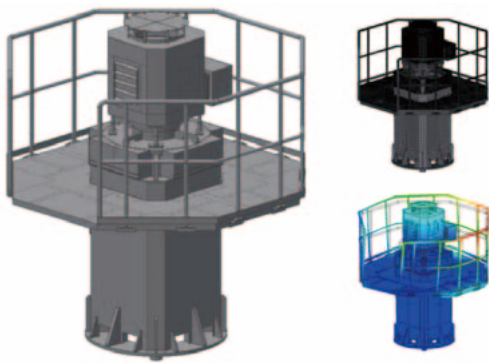
External dimensions: 50 (W) × 285 (H) × 249 (D) mm

VGA: video graphics array DVI: digital visual interface RAS: reliability, availability and serviceability UL: Underwriters Laboratories Inc.

CSA: Canadian Standards Association KC: Korea Certification CCC: China Compulsory Certification BSMI: Bureau of Standards Metrology and Inspection

* See "Trademarks" on page 158.

1 Features of HF-W400E/IoT



3D: three dimensional

2 3D model of the new vertical-shaft open motor

motors. Since it was first launched in the market in 2015, the switchover from the previous series has been conducted.

Recently, Hitachi has developed a new series of vertical-shaft open motors (squirrel-cage/wound-rotor), which can support diversifying needs of small and medium capacity output bands by applying the technologies established based on the horizontal-shaft squirrel-cage motors.

The new model features the following product improvements, compared with the existing model:

- (1) As a larger cooling fan is built in the motor, the cooling performance has improved, and the maximum output of the motor has also improved accordingly.
- (2) The optimal design based on stress and vibration analyses achieves both weight reduction and rigidity improvement. As a result, the natural frequency of the whole motor has improved and the operation speed range has expanded.
- (3) The cooling structure of the interior of the secondary current collector has improved and its application range has expanded.

Currently, Hitachi is delivering the new model to customers gradually to meet their diversifying needs. (Hitachi Industrial Products, Ltd.)

3 Remote Commissioning Supervising Service for Centrifugal Compressors

Hitachi Industrial Products Co., Ltd. provided remote commissioning supervising service for two centrifugal compressors that were delivered to a methyl tertiary butyl ether production facility in the petrochemical complex of Indonesia's largest petrochemical company, PT Chandra



3 Information sharing for remote supervising services

Asri Petrochemical Tbk through Toyo Engineering Corporation.

This service is provided as a new form of supervising service that replaces the dispatch of supervisors to the site in situations where it is difficult to dispatch Hitachi's supervisors during the prevalent novel coronavirus (COVID-19) infection in the world. The customer shares all necessary information by using wearable cameras and PCs in a compressor control panel and distributed control system (DCS) in real time, and Hitachi provides smooth remote supervising services by dedicating an experienced and skillful supervisor to take appropriate action and complete the work successfully.

In the future, Hitachi will further refine the content and methods of instruction and promote the provision of its own remote instruction service utilizing digital technology.

(Hitachi Industrial Products Co., Ltd.)

4 Expansion of the IoT-compatible Industrial Controller HX Series

Hitachi's IoT-compatible industrial controller HX series offers a hybrid model, which can execute both the



4 HX-CPU hybrid model II

arithmetic processing of sequence control and information processing application to contribute to the digitization of manufacturing workplaces. This model is popular, as it can coordinate with an information processing system in the single-device configuration, while ensuring the real-time performance of the sequence control.

The new hybrid model II has a package management system and build tools, which are used to develop applications in the Linux^{*} environment, embedded into its virtual controller, which processes information, to provide a system that can support ever-advancing information processing applications in a flexible manner. Its features are as follows:

- (1) Equipped with a multicore micro processor unit (MPU) to improve the speed-enhancing performance through the parallel processing of sequence control and information processing application
- (2) Interrupt input module provided by default to improve the sequence control functionality
- (3) Virtual controller function that connects the server message block (SMB) and the secure shell (SSH) to improve the flexibility in the development and execution of information processing applications
- (4) Built-in embedded multi media card (eMMC) and optional SSD used to increase the storage capacity to improve the availability of development languages, external libraries and more
- (5) Sub-CPU module that can be mounted on the base unit to improve the complete separation and portability of information processing applications

Hitachi implements live data processing at manufacturing sites, artificial intelligence (AI) analysis and edge computing, which executes protocol conversion and other information processing onsite, to further contribute to the digitization and IoT transformation of automation systems.

(Hitachi Industrial Equipment Systems Co., Ltd.)

* See "Trademarks" on page 158.

5 Expansion of the Industrial Wireless Router Series

As IoT is evolving, the need to send the data obtained from various devices wirelessly is increasing. To deploy such devices globally, it is desirable to enable the use of the same communication terminal worldwide. Considering these aspects, Hitachi Industrial Equipment Systems Co., Ltd. has expanded the industrial wireless router series, which has already been deployed for long.



5 New industrial wireless router

In general, it is necessary to obtain certification according to the related laws of each country to be able to perform wireless communications. For this reason, the use of the previous industrial wireless router series was limited to Japan. Therefore, the company decided to add the new industrial wireless router, which can be used in about 50 countries, including North America, Europe and Asia in addition to Japan, and also to continue to expand its coverage gradually in 2021 and beyond. This router can also be used in a flexible manner by customizing the software according to the device to be connected. Hitachi is also planning to deploy the device management service that will support the use of the industrial wireless router series both in Japan and overseas and provide various functions, including condition monitoring and remote firmware updates of the routers.

(Hitachi Industrial Equipment Systems Co., Ltd.)

6 New 22 and 37 kW Air-cooled Oil-free Rotary Screw Air Compressor

Following the DSP NEXT II series, Hitachi released a 22 and 37 kW air-cooled two-stage compressor in the DSP G series, which is a new oil-free rotary screw compressor model with a newly designed air end and drive system, to achieve higher efficiency. Its main features are as follows:

- (1) The 37 kW discharge air rate is higher than that of the previous model by up to about 7%, based on dedicated air end, the reduction of intake pressure loss and the improved efficiency of the permanent magnet motor. The energy efficiency has also improved by up to 6% for the variable-speed type, or by up to 5% for the fixed-speed type.
- (2) Equipped with unit control function that can control a maximum of six units only with the wiring connection between compressors without external controller.



6 New oil-free rotary screw air compressor (37 kW air-cooled model)

(3) Equipped with a heat safety mode function that can provide a stable supply of compressed air without stopping the compressor by automatically reducing the discharge air rate up to an ambient temperature 50°C in the warning range where the ambient temperature of the compressor always remains at 45°C or higher.

(4) Common design for Hitachi compressors has been proposed to strengthen their branding power.

Hitachi is going to deploy the G series to other models. (Hitachi Industrial Equipment Systems Co., Ltd.)

UX2 Series Industrial Ink Jet Printers

Industrial ink jet printers are used worldwide by manufacturers to print quality control information onto finished industrial products and packaging. This includes the manufacturing date, expiry date, and lot number to aid traceability.



As a successor of the UX series that were released in 2015, Hitachi has developed a new model series called UX2, which features a safe-clean station. Two model variants are due to start production in November 2020 and have the following features:

(1) Standard model

(a) An intuitive touch panel operator interface with wide screen display that employs animated guidance instructions.

(b) New ink charge control improves the printing quality baseline. Additionally, the quality at high speed has been enhanced through the development of a special printhead. This provides class-leading print quality for the most-commonly used 1- or 2-line codes.

(c) Other new features that improve the maintainability of the printer include a quick change terminal interface to make it easier to disconnect the printer from the production line and a unique ink guard electrode in the printhead that prevents ink build-up on printhead components and reduces the need for frequent cleaning.

(d) The domestic model is equipped with a mobile network module that enables status monitoring from a cloud service.

(2) The enhanced model is equipped with a safe-clean station.

(a) This model is based on the UX2 standard model and has all of the features listed above but includes an additional feature to improve the printhead cleaning process.

(b) In all inkjet printers, the tip of the printhead head cover is most likely to become contaminated with ink and to ensure optimum performance it should be cleaned regularly. Instead of manual cleaning,



7 UX2 standard model with improved printing quality and usability (left) and UX2 model equipped with safe-clean station, which further reduces the risk of solvent exposure to the operator, while optimizing the printhead cleaning process. (right)

the UX2 model variant can simplify the process of cleaning.

After removing the printhead cover, the printhead is slotted into the safe-clean station, which automatically and efficiently washes the printhead with solvent. Any solvent vapor produced during the automatic washing process is safely drawn back into the main unit reducing the level of solvent that the operator is exposed to. It also reduces the amount of solvent used in the cleaning process.

(Hitachi Industrial Equipment Systems Co., Ltd.)

8 High-accuracy Positioning: Expansion of the Position Detection System Series

As the labor shortage is growing as the birthrate is declining and the population is aging, the needs for automation of industrial vehicles and their remote monitoring are increasing. To meet such needs, Hitachi Industrial Equipment Systems provides the position detection system series as a sensor that provides high-accuracy position information. In FY2020, the company developed a communication device for the position detection system, which is a communication terminal for a global navigation satellite system (GNSS) with an additional wireless router function, to further expand the product lineup.

The communication device for the position detection system is equipped with a high-accuracy positioning

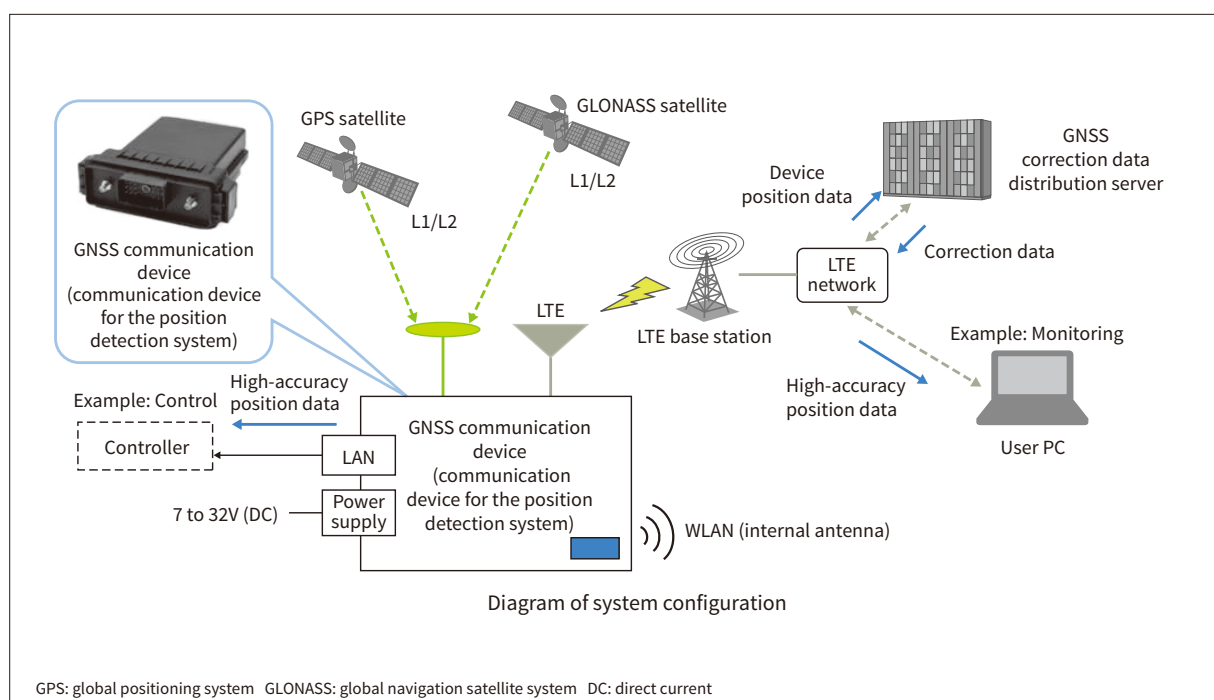
function using GNSS. It is also equipped with communication functions such as Long Term Evolution (LTE), wireless local area network (WLAN) and wired local area network (LAN) to enable remote monitoring of vehicle position information and information about various devices mounted on the vehicle. The communication device for the position detection system can use GNSS and LTE communications to obtain correction information with the networked transport of RTCM via Internet protocol (NTRIP), calculate high-accuracy position information and apply it to vehicle control or other operations.

Hitachi is going to further expand the position detection system series, including a product that combines the communication device for the position detection system with the laser scanner-driven position detection system, which is a high-accuracy positioning system based on a laser scanner.

(Hitachi Industrial Equipment Systems Co., Ltd.)

9 AK Series Low-voltage Air Circuit Breakers (ACBs)

Up until now, large-size molded case circuit breakers (MCCBs) have often been used for large-capacity low-voltage electric equipment in buildings and plants. In recent years, however, the use of low-voltage air circuit breakers (ACBs), which achieve more advanced circuit



8 Communication device for position detection system and its system configuration

protection and easier remote control, is increasing due to the improved supply reliability and increasing needs for more intelligent equipment. In response to these market changes, Hitachi has released the AK series, which is a new low-voltage air circuit breaker that helps make large-capacity electric equipment more compact and more intelligent.

Its main features are as follows:

- (1) The lineup of three series according to the equipment capacity supports a wide range of applications from renewable energy to spot network.
- (2) Four frame sizes cover 630 to 6,300 AF to standardize their depths. Their heights are also integrated into two sizes to help standardize their designs.
- (3) In addition of the basic overcurrent protection, the AK series also supports various protection functions, including ground fault protection and generator protection, as well as measurement and communication functions using Modbus.

(Hitachi Industrial Equipment Systems Co., Ltd.)



9 AK series Low-voltage air circuit breakers (ACBs)