

News Release

FOR IMMEDIATE RELEASE

Hitachi Launches H4E Series of Compact Finger Vein Authentication Modules for Embedding in Devices Featuring Significantly Improved Authentication Accuracy and Usability with Enhanced Support for Outdoor Use

Designed for doors, safes, attendance management, FA equipment and more across a wide range of industries, with ease of use in various environments and support for the "New Normal" through antibacterial coating



H4E series compact finger vein authentication module exterior (left) and example of the usage (right)

Tokyo, December 14, 2020 – Hitachi, Ltd. (TSE:6501; “Hitachi”) and Hitachi Industry & Control Solutions, Ltd. (“Hitachi Industry & Control”) today announced that they have developed the H4E series⁽¹⁾ of device-embedded-type compact finger vein authentication modules featuring vastly improved authentication accuracy and usability compared with conventional models⁽²⁾ and enhance support for outdoor use. The H4E series will go on sale in Japan, the People's Republic of China and Europe starting today. Hitachi and Hitachi Industry & Control will take advantage of its improved outdoor performance to provide the H4E series to door lock manufacturers and home equipment manufacturers, and expand sales to a range of industries including safe manufacturers, attendance management service providers and FA equipment manufacturers.

In recent years, biometric authentication has become a familiar technology providing high levels of security and convenience for applications such as PC logins, corporate attendance management and access control system, not to mention its inclusion in smartphones. Among these technologies, finger vein authentication is unique in that the device is compact, and makes use of patterns indicating distinct biometric characteristics inside the body that make impersonation or forgery difficult and achieve

high authentication accuracy. In addition, conventionally the control of biometric authentication features embedded in equipment or devices has required combined installation with high-performance control units such as PCs, but since 2008 Hitachi and Hitachi Industry & Control have been providing compact standalone module products that can perform all processes from capturing and verifying finger vein images to issuing authentication results without the need for a separate control unit.

However, with conventional embedded compact finger vein authentication modules, differences can arise between when the information is registered and authentication is performed depending on the way a finger is placed and temperature changes. When this results in authentication rejections or errors, it may be necessary to repeat the authentication process from the beginning, posing issues for operation and management. What's more, despite the strong demand for outdoor installation of such modules, there are limits on the authentication accuracy due to dirt on the sensor and environmental resilience (applicable temperatures, dust and water-proofing). In addition to that, specifications that can stand up to alcohol sterilization to prevent the spread of COVID-19 infections are needed.

In response, Hitachi and Hitachi Industry & Control developed the H4E series, offering vastly improved authentication accuracy and usability combined with improved outdoor performance to address these issues.

The key improvements made to the H4E series are as follows.

(1) Improved authentication accuracy

- Through an enlarged scanning area and improved authentication algorithms, authentication accuracy has been improved by roughly 10 times⁽³⁾ compared with conventional models, offering enhanced security.
- An automatic learning function for biological drift deals with differences in finger vein patterns at the time of registration and authentication due to finger placement and temperature changes, reducing authentication errors.

(2) Enhanced usability

- When an authentication error occurs due to a misaligned scanning position, the continuous authentication function allows continuous authentication through minor adjustments to finger placement in real-time, shortening the time taken for re-authentication.
- A three-colored LED indicator (green: operating guide, red: error, yellow: warning) and beep sound have been added as a status notification function to check that a finger has been correctly placed.
- The shape of the finger guide has also been improved to naturally encourage

correct finger placement.

(3) Enhanced outdoor performance and other specifications enabling embedding in various equipment and devices

- With the addition of an automatic dirt detection function to the sensor, improved IP rating dust and water-proofing ⁽⁴⁾ and an expanded temperature range (-20°C to 50°C), the new specifications are suited to outdoor use. An outside light mode ⁽⁵⁾ can also be selected to facilitate authentication in environments with external light, such as outdoors.
- Thanks to a more compact optical component, the module has been shrunk by around 64% compared with conventional models⁽⁶⁾, enabling it to be embedded in a greater variety of equipment and devices than before.

(4) Support for the "New Normal"

To conform to the new normal, the module features an antibacterial coating⁽⁷⁾ that allows regular sterilization with alcohol.

Going forward, Hitachi and Hitachi Industry & Control will continue to pursue the development of anti-viral coatings and new contactless authentication units that cater to customers' increasingly diverse requirements and the "New Normal" while providing solutions that interface with various systems in the areas of IT, finance and building management to contribute to build a safe, secure and convenient society.

(1) H4E series (model: PCT-KCD0010)

(2) H2E series (model: PCT-KCC5031)

(3) Compared with conventional models, the false acceptance rate (the percentage of times a different person is incorrectly recognized as the authorized person) has been improved from 0.001% (1-in-100,000) to 0.0001% (1-in-1,000,000).

(4) The module is rated for IP54 (performance against dust ingress that would cause malfunction, protection from water spray from any direction), the equivalent of JIS Grade 4 protection (protected against splashing water).

(5) Due to differences in installation environments and individual characteristics, this is not a guarantee that authentication will always succeed.

(6) Comparison of module areas as seen from above. Excludes finger guide and protrusions.

(7) Antibacterial coating has been verified to resist peeling for seven years under certain conditions. For the finger vein access control system terminal (model: FVA-100FL/SL), support has been provided for antiseptic coating and simple contactless operation (September 2020). Support for antiseptic coating in finger vein authentication modules (models: PCT-KCAX010, PCT-KCUA011) is planned for January 2021 onwards.

About Pricing and Release

Product Name	Price	Release
H4E series compact finger vein authentication module for device embedding	Open	December 14, 2020

Additional Note

When exporting this product, please follow the necessary procedures after confirming the regulations of the Foreign Exchange and Foreign Trade Act, and other export-related laws and regulations of the United States and other countries.

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About Hitachi Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is focused on its Social Innovation Business that combines information technology (IT), operational technology (OT) and products. The company's consolidated revenues for fiscal year 2019 (ended March 31, 2020) totaled 8,767.2 billion yen (\$80.4 billion), and it employed approximately 301,000 people worldwide. Hitachi drives digital innovation across five sectors – Mobility, Smart Life, Industry, Energy and IT – through Lumada, Hitachi's advanced digital solutions, services, and technologies for turning data into insights to drive digital innovation. Its purpose is to deliver solutions that increase social, environmental and economic value for its customers. For more information on Hitachi, please visit the company's website at <https://www.hitachi.com>.

About Hitachi Industry & Control Solutions

Hitachi Industry & Control Solutions is a key company supporting the Industry & Distribution Business of the Hitachi Group. Hitachi Industry & Control provides various solutions for industry, social infrastructure, embedded devices and video applications that support the businesses of manufacturers and other customers in the industrial and social infrastructure fields. Through consulting services based on IT and control expertise honed over many years, Hitachi Industry & Control works with customers to identify their issues and addresses them with solutions that combine products and technologies.

To learn more, please visit the website of Hitachi Industry & Control Solutions at <https://www.hitachi-ics.co.jp/> (Japanese)
<https://info.hitachi-ics.co.jp/eng/> (English)

Appendix

Specifications

		Specification	Remarks
Model name		PCT-KCD0010	
Product structure		Sensor-integrated authentication device	
Size		39(W)×40(D)×34(H) mm	Without detachable finger guide. Except for the protruding parts.
Weight		Approx. 32g	
Power supply voltage		DC5.0V-1.0V to 5.0V+1.4V(4.0~6.4V)	Applicable to dry batteries
Current consumption	Stand-by	0.7μA typ.	Touch sensor OFF
	Enrollment/verification	130mA typ. 600mA max.	Varies depending on individual finger and environment
Connection interface		Asynchronous serial communication 3.3V CMOS 12pin connector	
User interface		Indicator LED (Green, red and yellow) Buzzer	
Data storage location of finger vein data		In the device	
Maximum number of enrollments		1,000 fingers	Save in flash ROM
Authentication method		1:1 and 1:N	
Accuracy	False Rejection Rate (FRR)	0.01% (1/10,000)	
	False Acceptance Rate (FAR)	0.0001% (1/1,000,000)	
Capture mode		Normal mode Outside light mode	Default: Normal mode
IP rating Dust resistance/Waterproof		Conforms to IEC IP54 (Exposed part)	The host equipment needs waterproof in the built-in part.
Environmental conditions	Ambient temperature	-20 °C to 50 °C Operation -20 °C to 60 °C Storage	
	Ambient humidity	20 to 80%Rh Operation 10 to 90%Rh Storage	No condensation
Operating environment conditions		No direct sunlight at scanning area	
Firmware update command		Available	

Improved items compared to the conventional device

	Specification	Conventional product H2E series (PCT-KCC5031)	New product H4E series (PCT-KCD0010)	Advantage
1	Accuracy	False Rejection Rate (FRR) 0.01% (1/10,000) False Acceptance Rate (FAR) 0.001% (1/100,000)	False Rejection Rate (FRR) 0.01% (1/10,000) False Acceptance Rate (FAR) 0.0001% (1/1,000,000)	Increased accuracy 10 times(FAR)
2	Maximum number of enrollments	360 fingers	1,000 fingers	Increased about 3 times
3	Size	44 x 56 x 23.5 mm(Except for the protruding parts)	39 x 40 x 34 mm (Except for the protruding parts)	Area ratio 64% (Area ratio seen from the top. Except for finger guide and protruding parts)
4	Dust resistance and Waterproof	IPX3	IP54	Improved IP rating for dust resistance and waterproof
5	Ambient temperature (Operation)	0 °C to 40 °C	-20 °C to 50 °C	Expanded operating temperature range
6	Power supply voltage	DC 4.75V to 5.25V	DC 4.0V to 6.4V	Support for dry batteries
7	Stand-by current	75µA typ.	0.7µA Typ. (Touch sensor can be turned off)	Stand-by current is 1/100 (Touch sensor OFF)
8	Firmware update command	N/A	Available	Can be updated remotely
9	Target design product life (Assumed operating conditions)	5 years (12,000 hours) (8Hr/day,25days/month)	7years (61,320 hours) (24Hr/day,365days/year)	Extended 5 times by using long-life parts

External Views and External Dimensions

