

# FR100 Dynamic Face Recognition Access control device

Model: FR100



DEC 2020, V2.0

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# 1. Reminders and Cautions

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This product aims to detect body temperature and screen the abnormal in a fast way. Please DO read below info carefully before installation.

- The core temperature measurement component is the original thermal imaging sensor of a major manufacturer which measures body temperature by detecting the IR energy radiation from facial part (forehead/canthus) of person. Please DO AVOID from destroying the sensor part by facing directly to the sunlight or other strong light source.
- The product should be operated in environment temperature of 10~40 °C, relative MAX humidity ≤ 85%, or it will cause abnormal temperature detection.
- To ensure temperature accuracy, this product should be installed indoor. Please avoid sunlight, strong wind and heat resource from installing close to door, glasses windows, air-conditioner, etc. Avoid sweating and colorful background during temperature detection. ( Pure white background is suggested here. )
- This device is used for fast body temperature detection, both the device and the person to be detected should be stayed under the same environment for more than 3 minutes, do not take the temperature immediately after drinking and strong sports.
- Do not disassemble the device without professional advice.
- Keep away from below situations:
  - Extreme temperature
  - Harsh impact, drop off
  - Pollution, dust
  - Direct or diffuse scattering sunlight
  - Humidity
- This device is not water-proofed, please do not put it close to liquid or steam.

Reminds: Please do read carefully and follow all above notices and information to avoid any possible dangers and loss.

## 2. Product Features

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As a fast self-service body temperature detection device used in crowd, the device has below advantages:

- Convenient installation and deployment - Takes the advantage of built-in black body, there is no need to do special calibration on black body, no temperature sample needed for contrast, no extra APP needed to install manually. It provides an immediate body temperature detection, accurate and consistent, after installation done.
- Fast and efficient multi-person body temperature detection - It uses high resolution thermal image sensor with built-in black body to achieve multi-person(10 persons) temperature detection within 1 second with no mutual disturbance. (In case there is any outside interfering factor, please keep same body position for constant temperature detection.)
- Support accurate detection with face mask – Implementing with latest AI facial algorithm solution from SenseTime, the device provides accurate facial recognition and temperature detection even with face mask.
- Accurate detection area—— Implementing with latest AI facial algorithm solution from SenseTime, the device can accurately shoot forehead/canthus area to detect body temperature and avoid thermal noise from other areas.
- Multi-language supported – The voice prompt will provide the body temperature and give warnings on abnormal temperature. ( Languages supported: Simplified Chinese, English, Japanese, Korean etc. )
- Support stand-alone operation, use a mouse to connect with device to set parameters just like alarm threshold, temperature unit switch , person import, record export etc.
- Multiple management platform solutions supported for different applications – Support TMS and CRM management system, data can be transferred to cloud platform or local server.
- Data intelligent management – Support real time background data management, Which makes it good for data tracing, all time, person, place, body temperature data can be recorded and pushed via emails, wechat or other social medias.

## 3. FAQs

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### **Q: How to make body surface temperature detection?**

Answer: FDA provides complete suggestion on how to use IR thermal scanner. And here are some suggestions on how to use FR100 .

Better to make detection at the distance of 0.3-2 m

Better to detect the temperature from Canthus part which is the most closest to the core temperature of person.

It is suggested to use professional medical device(e.g medical thermometer) to take second time detection on the abnormal surface temperature detected from FR100 .

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### **Q : Can the FR100 used outdoor?**

Answer : Thermal sensor usually works under temperature environment of 10~37°C. Windy or lower temperature environment will result in the temperature detected lower than real body temperature. Environment with heat source or sunlight will result in higher body temperature or abnormal temperature. For the person comes from outside or any area with environment temperature that differs a lot with the environment that the JC55 locates, it is suggested to stay for at least 2 minutes before taking the detection. It is for sure suggested to use the FR100 in indoor applications.

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### **Q : What about the accuracy of FR100 ?**

Answer: The thermal sensor sensitivity is 0.1°C, FR100 reaches accuracy of 0.3°C in suggested environment and working conditions with distance of 0.3-2m. The effective detection distance is 3m, best 0.3-2m. Any bigger or smaller distance will results in possible detection errors. The temperature detected by FR100 is of body surface temperature, which is different from detection at armpit or mouth cavity, but there is already certain algorithm here for calibration.

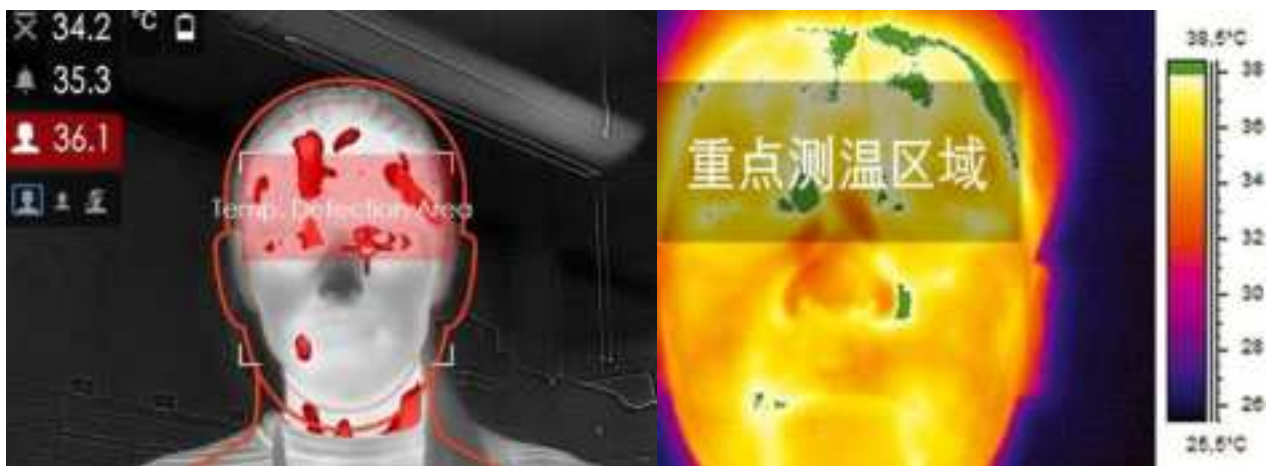
It is noticeable that there are many elements to affect the accuracy of the product like focus, distance, and the emissivity of the target to be detected, obtain speed of the environment temperature.

Emissivity of target means the emissivity that the target is able to release. E.g: China cup, clothes even human body skin has high emissivity rate, and polished metal has low emissivity rate.

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**Q: What is the working principle of FR100 ?**

Answer: The facial recognition algorithm by Sensetime provides exact coordinate point of canthus and forehead, and the key temperature detection zone. The body temperature is reflected by obtaining the value of temperature difference from multi-point thermal image. It is an effective way to avoid the interference from any possible camera background like air-conditioner, wind, light or heat source.



## 4. Device Details

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Notes: Due to the product optimization and updates, if there is any possible difference between the pictures above and the real object, the latter one shall prevail.

## 4.2 Device Parameters

Face recognition+ Temperature detection, thermal sensor sensitivity 0.1°C , Accuracy+- 0.3°C@1m@25°C indoor

Available distance 3 m, best distance 0.3~2m , certain inaccuracy can be caused in bigger or smaller distance. This solution here is to detect temperature of skin surface, which may have some difference from armpit or mouth detection, even though there is already algorithm calibration. We suggest to use the device in indoor application to avoid any possible effect on skin in outdoor environment.

Technical Spec:

Model: FR100	
Thermal imaging resolution	160*120
Temperature measurement range	35°C~42°C
Temperature measurement accuracy	can reach $\pm 0.3^{\circ}\text{C}$ under environment temperature: 15°C ~ 35°C
Temperature calibration	built-in black body, automatic calibration
Microbolometer	vanadium oxide
Field of view	horizontal angle of view 37.2°, vertical angle of view 50°
Measuring time	<1 second
Measuring distance	within 3 meters, the optimal distance is 1~2 meters
Temperature measurement mode	face recognition mode: detects the temperature of the whole face, and can recognize locally registered persons
	non-recognition mode: detects the temperature of the whole face, no need to make recognition
	face Mask mode: Only detect the temperature of the forehead/ the corner of the eyes
	single or multi-person temperature measurement mode
Face recognition distance	within 3 meters
Face recognition angle	front face 30° angle
Face database	standard 50000
CPU	RK3288, quad-core, clocked at 1.8GHz



Algorithm	SenseNebulaSDK_V4.2.0
RAM	DDR3 2GB
ROM	EMMC 8G
Network	1*RJ45
Power supply	12V/2A
Working temperature	10~40°C
Storage temperature	-20~60°C
Working humidity	< 90% ( non-condensing )

Algorithm : Sense time SenseNebulaSDK\_V4.2.0 Face character 3.1.0 Support mask detection and Respirator detection, support colour face recognition.

Integrate with application for real time facial recognition and temperature detection.

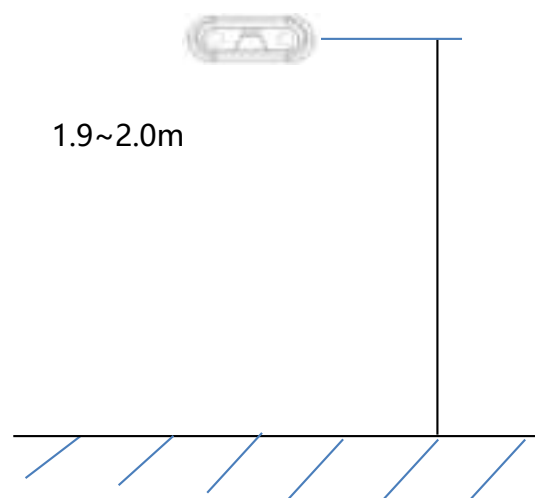
Provide abnormal alarm with voice prompt and interface. The product can be used independently or to communicate with management software.

## 4.3 Device Installation

Remark: it can be hoisting installation mode or support bracket installation mode, you may purchase the necessary accessories based on your actual application.

Installation height: Determine the installation location according to the height of the user. If the height of the user is between 1.5 and 1.8meters, the recommended installation location is about 1.9-2.0 meters from the ground.

Installation location: indoor installation. If there are doors and large areas of glass indoors, avoid the camera directly facing east and west to reduce the interference of sunlight on equipment identification and temperature measurement.



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## 5. Simple Settings

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### 5.1 Application Instruction

This is fit for a simple parameters config just like below conditions:

You are a non-professional construction worker and only want to make simple parameter config (such as temperature unit switch between °C and °F, change company information or logo, temporarily add personnel permission etc.)

You only need to perform temperature measurement when person enter and exit, and only need to perform a quick temperature screening.

Stand-alone temperature measurement and use, no need to network to trace data.

### 5.2 Suggested Detection Temperature

High temperature threshold → recommend 37.3°C.

## 5.3 More Config Instruction

Remarks: Due to the continuous update of software, the interface is probably different with the one you obtained.

**Log in:** Click the button in the upper left corner to log in



Default password : abc123



**Temperature Settings:** Click the temperature unit option to switch between Celsius and Fahrenheit; the warning value is the high temperature threshold.

A screenshot of the 'Temperature Settings' configuration screen. The title 'Temperature Settings' is at the top. Below it, there are several settings with dropdown menus and input fields. The settings are: 'Measure' (dropdown: Open), 'Prompt To Wear Mask' (dropdown: Open), 'Force To Wear Mask' (dropdown: Close), 'Temperature Unit' (dropdown: C), 'Warning value' (input field: 37.3), 'High Temperature Alarm' (dropdown: Close), and 'Open Door For Stranger' (dropdown: Close). Each dropdown menu has a 'Confirm' button below it. Red boxes highlight the 'Force To Wear Mask', 'Temperature Unit', and 'Warning value' fields.

Click "Confirm" to save the configuration.

**Device Settings:** Click on the Time Zone, you can switch the time zone, click on the Language, you can switch languages.

Device Settings

Time Zone	Asia/Shanghai (UTC+08:00)	Confirm
Language	English	Confirm
TTS Source	TTS	Confirm
QR Code Scan	232-203	Confirm
Record Photos	Save	Confirm
Fan Speed	<input type="range"/>	Confirm

Click "Confirm" to save the configuration.

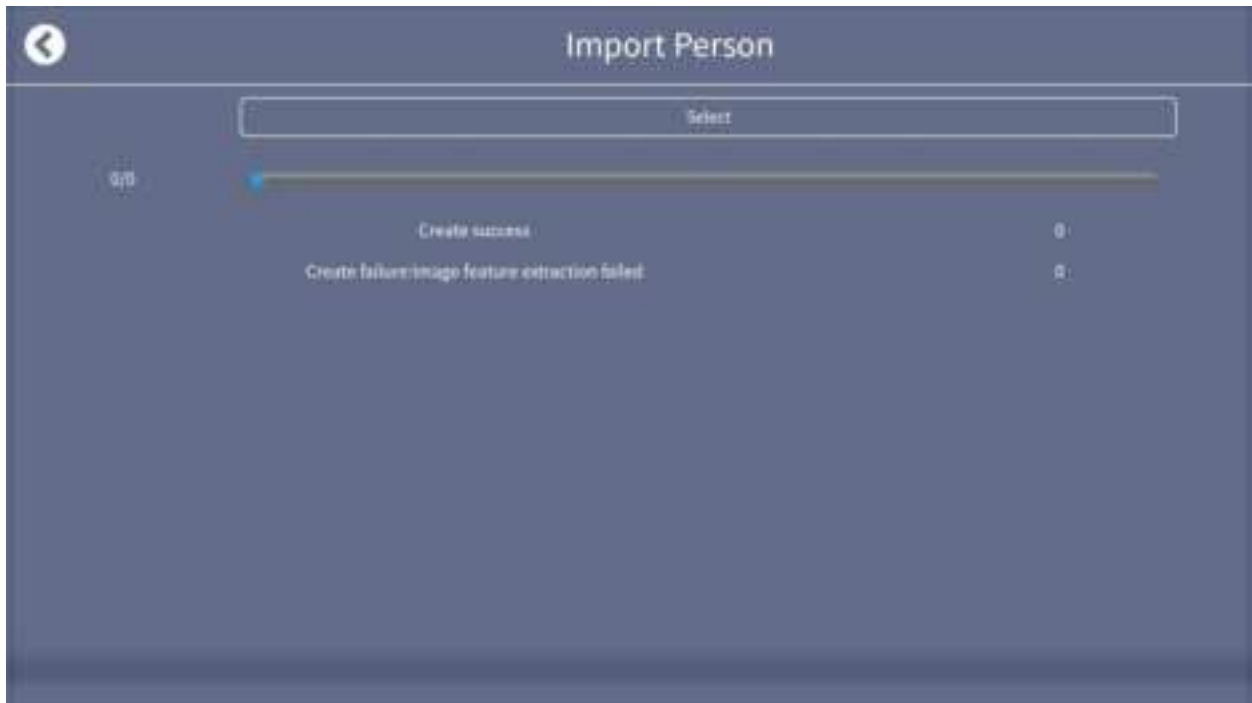
**Recognition Settings:** Set Company Name.

Recognition Settings

Company Name	Please setup company name	Confirm
Scene	Face	Confirm
Mode	Quickest	Confirm
Similarity	90	Confirm
Distance	No Limit	Confirm
Type	Multiple	Confirm
Passtime Ver	1.0	Confirm
Wiegand Output	#34WG{idcardNum}	Confirm
Port Mode	Open Door	Confirm
Custom		Confirm
Display Mode	Name	Confirm
Custom	[name],welcome	Confirm
Voice Mode	No Broadcast	Confirm

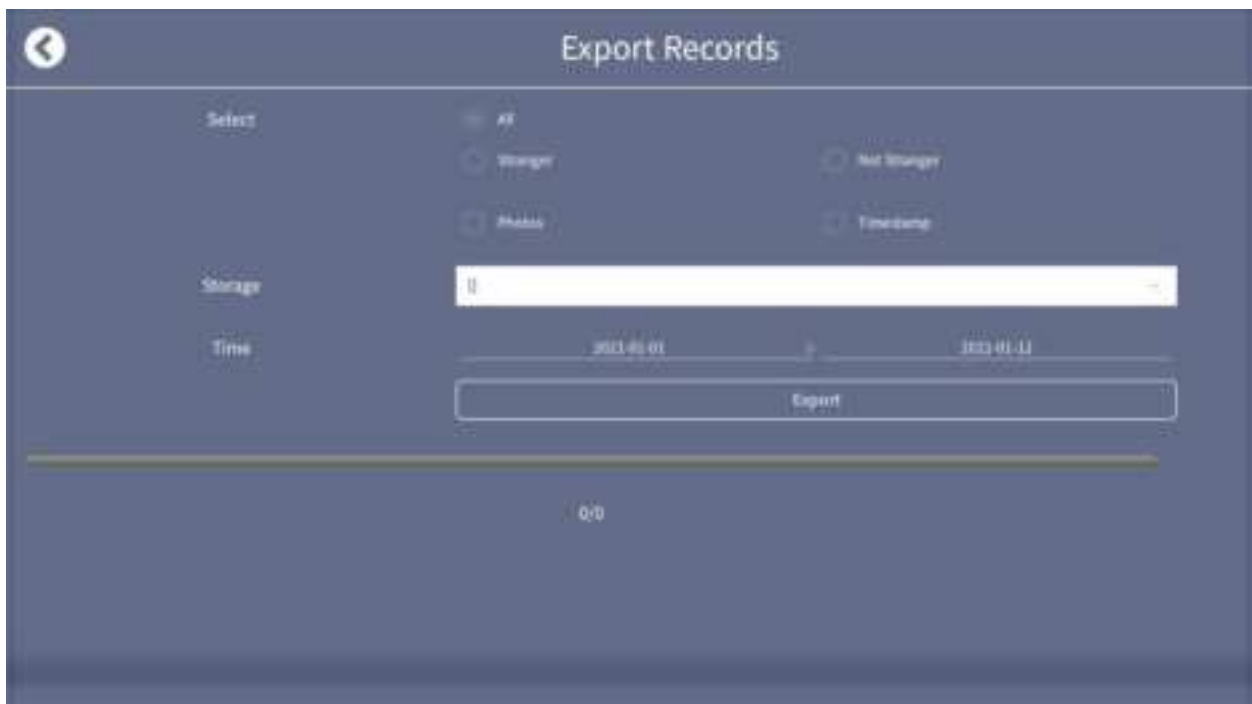
Click "Confirm" to save the configuration.

**Import Person:** Import persons in batches



The screenshot shows the 'Import Person' interface. At the top, there is a title 'Import Person' and a back arrow icon. Below the title, there is a 'Select' button. A progress bar is visible, showing '0/0' on the left and a blue bar on the right. Below the progress bar, there are two status messages: 'Create success' and 'Create failure: image feature extraction failed', each followed by a '0' in a box.

**Export Records:** Connect with USB flash disk, export the recognition records.



The screenshot shows the 'Export Records' interface. At the top, there is a title 'Export Records' and a back arrow icon. Below the title, there are four radio buttons for selection: 'All', 'Stranger', 'Not Stranger', and 'Photo'. Below these, there is a 'Storage' dropdown menu showing 'U'. Below the storage menu, there is a 'Time' range selector with dates '2023-01-01' and '2023-01-11'. Below the time range, there is an 'Export' button. At the bottom, there is a progress bar showing '0/0'.

a. Select→ to filter the person records to be exported

- b. Storage→ connect with USB flash disk,, select the export path
- c. Time→ filter records in the time period
- d. Export→ directly export records

## 5.4 The Ready Setting Screen Display



## FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception,

which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.