

WD-C7808

Facial Recognition Thermometer

Whitepaper v 1.5

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1. Product Overview

WD-C7808, is a product with functions of both visual facial recognition and body temperature detection.

1.1 Terminal Description

For WD-C7808, the components and interfaces of the hardware (also called terminal) are showed in the three-view drawing below in Figure 1. For the detailed parameters please refer to Annex A.

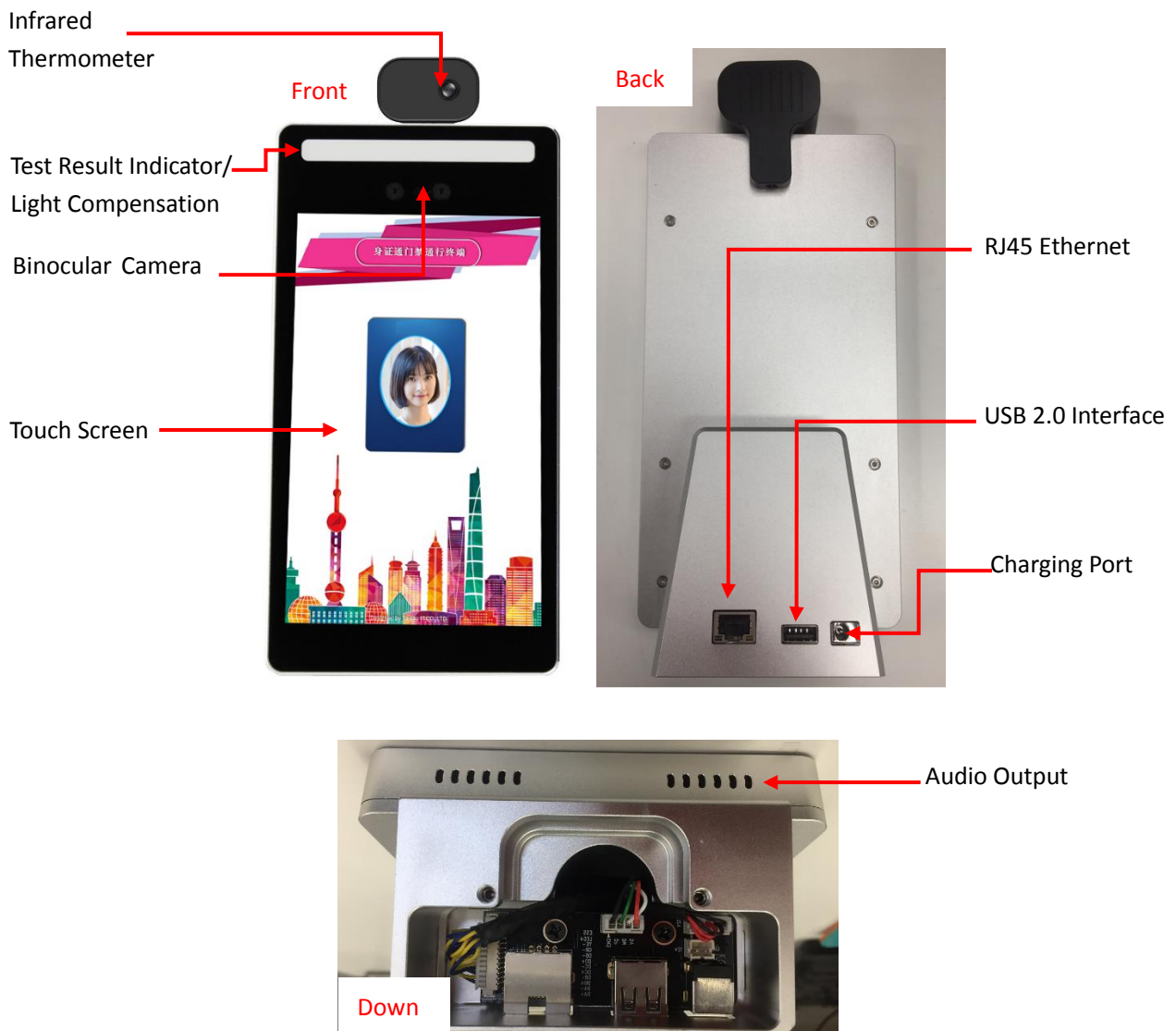


Figure 1. Three-view Drawing of WD-C7808

1.2 Core Functions

WD-C7808 have two core functions: measure body temperature and facial recognition.

1.2.1 Measure Body Temperature

To use WD-C7808 to measure body temperature, the user should stand from the terminal with the distance of 0.4m ~ 0.7m, while facing the *Infrared Thermometer*. The measure process will be finished within 1 second.

How to know the measure result?

The facial part will be marked by a green frame, while the temperature result will be shown both in the frame and by audio.

What happens if the body temperature is high?

The terminal has a pre-set reference temperature of 37.3°C. If the measure result is lower than 37.3°C, the *Test Result Indicator* shows white light. Otherwise, the *Test Result Indicator* shows red light and *Audio Output* makes audio alert.

For functional indicators of measure body temperature, please refer to Annex B.

1.2.2 Facial Recognition

For the facial recognition function, the facial characters should be put in to the terminal first. The internal memory space of terminal is capable of store 20,000 sets of facial characters.

What is facial characters stored in the terminal?

A set of facial characters mainly includes two photos of user (one with mask and one without mask), data characters of these photos, plus name of people in the photos. Other parameters can be added based on function requirements.

Can I use facial recognition function without taking off the mask?

YES, the terminal can perform facial recognitions no matter if user wears a mask.

To use WD-C7808 for facial recognition, the user should stand from the terminal with the distance of 0.3m ~ 0.7m, while facing the *Binocular Camera*. The measure process will be finished within 0.5 second, including comparing with facial characters stored in the terminal.

For functional indicators of facial recognition, please refer to Annex C.

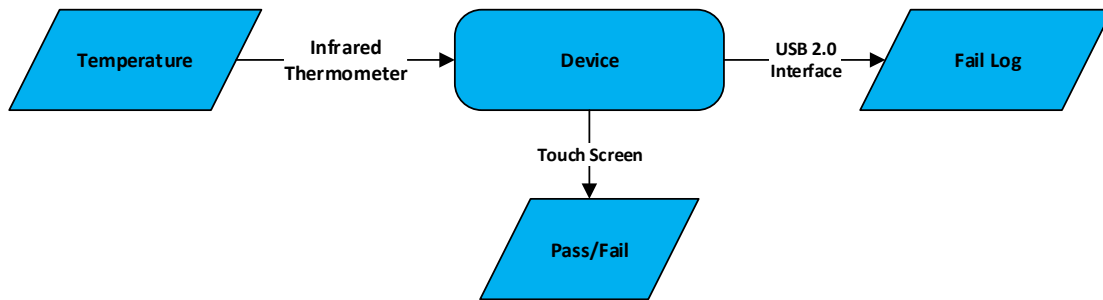
1.2.3 Precautions for Use

- 1) For the accuracy of temperature measurement, the equipment shall be placed in the indoor environment to avoid direct sunlight. Indoor temperature should range from 0°C~30°C.
- 2) The temperature result should only be used as a preliminary screening reference, not as a basis for medical diagnosis.
- 3) In order to achieve the accuracy of facial recognition, the quality of face feature data should be controlled. Please refer to Annex D for photo upload standards.

2. Product Application Mode

2.1 Temperature Measurement Only

WD-C7808 is used for temperature measurement only. If this mode of operation is selected, the device only needs to be connected to the charger and power on. The measure results other than those lower than temperature 37.3°C will be recorded along with corresponding face photos, which can be copied out by USB storage device.



The relationship between input and output in this mode is illustrated in the chart below.

Type	Detail	Temperature	
Input	Temperature result	< 37.3°C	>=37.3°C
Output	<i>Test Result Indicator</i>	Green	Red

2.2 Facial Recognition Only

WD-C7808 is used for facial recognition mode only. In this mode, the device can divide users into four categories: whitelist, visitor, blacklist and stranger.

For users of whitelist, visitor, and blacklist, their names, photos, and other information need to be pre-entered into the terminal. When terminal detects the corresponding individual, it displays the user's name and a pre-recorded photo.

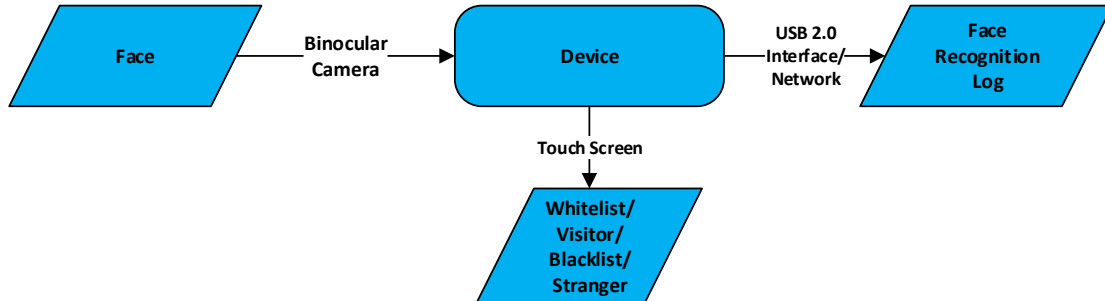
For strangers who do not enter information in advance, terminal shows that no corresponding person has been detected.

To input personnel information and to export facial recognition record, both USB storage device and network can be used.

STEP 1: Preparation



SPT2: For use



The relationship between input and output in this mode is illustrated in the chart below.

Type	Detail	Identity			
Input	Face	Whitelist	Visitor	Blacklist	Stranger
Output	<i>Test Result Indicator</i>	Green	Green	Red	White

2.3 Combination Mode

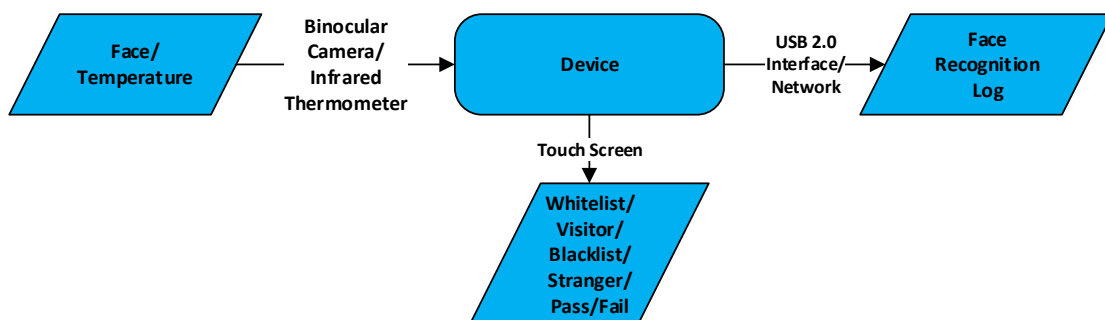
For the combination mode, the terminal verifies the user's identity and measures the user's temperature.

In this mode, to input personnel information and to export facial recognition and temperature measurement record, both USB storage device and network can be used.

STEP 1: Preparation



STEP 2: For use



The relationship between input and output in this mode is illustrated in the chart below.

		Identity			
		Whitelist	Visitor	Blacklist	Stranger
Temperature	< 37.3°C	Green	Green	Red	White
	>=37.3°C	Red	Red	Red	Red

3. System Software Solution

3.1 Stand-alone Solution (Recommended)

For stand-alone solution, information of whitelist, visitor and blacklist should be loaded into terminal in advance. Data between the management software on PC and terminal is transmitted by specific USB storage device.

3.2 Online Solution

Online solution requires the terminal connected to network by wifi or cable.

When online, the terminal can not only export the log of facial recognition, but also upload the stranger recognition record to the server in real time. Online solution requires a separate private deployment of the management platform developed by Watchdata.

4. Terminal Mounting Methods

Terminal of WD-C7808 has three ways of placing, providing a great convenience for customer of variety scenarios.



Figure 2. Desktop, On the Wall and On the Gate

4.1 Desktop

With additional base in the package, terminal of WD-C7808 can be placed on table, desk and similar positions. The additional base is suitable to place a contactless reader inside.

4.2 On the Wall

Weighted 1.45kg totally, terminal of WD-C7808 can be easily mounted on the wall of any entrances or buildings.

4.3 On the Gate

The bottom side of WD-C7808 terminal is designed to support sticking to a stick, which makes it to be placed on the gates.

5.Application Scenario

As the result of temperature measurement and facial recognition can be output, which can be used as the basis for subsequent access control and recording of attendance, WD-C7808 is applied to libraries, shops, restaurants, schools, units, buildings, and other indoor environments.

6.Comparison and Advantages of Similar Products

6.1 Products Comparison

	Remote Infrared with Black Body	Remote Infrared	WD-C7808	Forehead Thermometer
Market Price (USD)	11K~14K	5K	-	0.06K
Passage Quantity (Person/Minute)	≥ 200	100	50	10
Individuals Tested Simultaneously	Multiple	Multiple	Single	Single
Measure Distance (Meters)	2~10	2~5	0.3~0.7	0.05
Automated Operation	Yes	Yes	Yes	No

6.2 Product Advantages

Based on the chart above, it is a clear conclusion that for customers who is looking for a solution of either non-contact body temperature measurement, or facial recognition, or the combination of both, WD-C7808 is an effective, convenient and cost-saving choice.

Annex A Terminal Parameters

Highlight features of WD-C7808

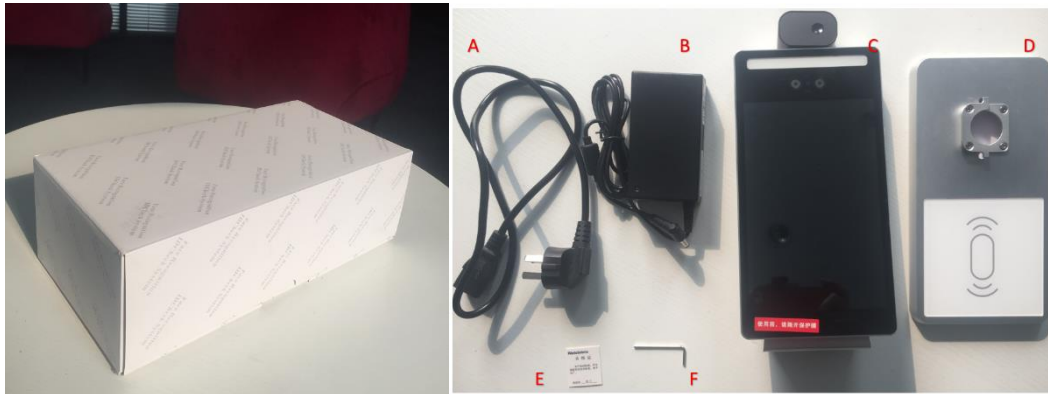
- *Automatic light compensation*
- *Support local library of 20K identity, function for both offline and online*
- *Support un-identified user detection and snapshot;*
- *Waterproof, high temperature proof, anti-backlight, adapt to a variety of outdoor scenes*
- *Audio alarm once body temperature detected equals or exceeds 37.3 °C*

Hardware Parameters		
Dimension	Terminal 240*123*19.5 mm (Height * Width * Thickness)	
Mounting Method	Desktop, On the Wall, On the Gate	
Resolution	1280 * 800 px	
Touch Screen	8 inches,	
Mainboard	CPU	4 Core, up to 1.8 GHZ
	Internal Storage	2 G
	Storage Space	8 G
Camera	Binocular Camera, 2 Million px, RGB Infrared, Wide Dynamic Supported, Vertical Angle 67°, Horizontal Angle 37°	
OS	Android 5.1	
Audio	Internal	
Video	Internal	
USB Interface	One USB 2.0 Interface	
Cable	RJ45 Ethernet	
Temperature Measurement Module	TS-N95 Temperature Measurement Module Supported	
Compensation Light	IR Compensation Light, with Green, White and Red Indicator	
Software Parameters		
Face Detection	One Individual Tested and Tracked Simultaneously	
1:N Facial Recognition	99.7% recognition accuracy under the condition of 0.03% false recognition rate	
Infrared Image	Measurement Range	25 ~ 45°C
	Heat Image Accuracy	0.1°C
	Body Temperature Error Range	≤±0.4°C
	Environment Temperature to Measure Body Temperature	0 ~ 30°C
	Measure Distance	40 to 70 cm

	Resolution	32 * 32 px
Remote Update	Support	
<i>Other Parameters</i>		
Protection Level	IP54	
Power	DC 12V IN	
Working Temperature	-20 ~ 70°C (Infrared excluded)	
Working Humidity	10% ~ 90%	
Power Consumption	18 W Max	
Language	English, Mandarin Simple	
Weight	About 1450g	

Annex B Packaging Detail

The package of WD-C7808 is as the picture showed below.



Attribute	Unit	Amount
Size	cm ³	33.0 * 16.7 * 10.7
Weight	kg	2.5

With six accessories contained in the package, it is extremely easy to assemble and put to use.

Accessory	Unit	Description
A	1	Power line
B	1	Transformer
C	1	Terminal host
D	1	Foundation of terminal
E	1	Certificate of qualification
F	1	Screw key

Annex C Functional Indicators of Measure

Body Temperature

- 1) Measurement speed < 1 second
- 2) Measurement distance 0.4 ~ 0.7 m
- 3) Measurement range of environment temperature: 0 ~ 30°C
- 4) Measure accuracy $\leq \pm 0.4^\circ\text{C}$
- 5) Automatic warning of measure result equal and above 37.3°C

Annex D Functional Indicators of Facial Recognition

- 1) 20,000 face matching library
- 2) Recognition speed < 0.5 second
- 3) Living accuracy > 98%
- 4) Support mask recognition
- 5) Recognition rate > 99.7%
- 6) Mask wearing tips

Annex E Photo Upload Standards

For all photos, including both with mask and without mask, the following standards apply.

- 1) The face in the photo should be positive, upright, with appropriate light, and with light-colored simple background (against white wall, for example).
- 2) Both forehead and facial outline should be in the photo. If wears a pair of glasses, the glasses cannot reflect light.
- 3) After photo selection, adjust the size and direction of the phot to make the whole head in the frame, while with an appropriate distance.
- 4) The photo uploaded should not be beautified.
- 5) Always upload a new photo after the original one rejected.

For photos with mask, the following two standard apply.

- 1) The color of the mask should not be BLACK.
- 2) The mask wearing should not be too high.