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Kepler FX6 Facial Recognition Device Instruction Manual

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Product Introduction

Overview

Figure 1 FX6

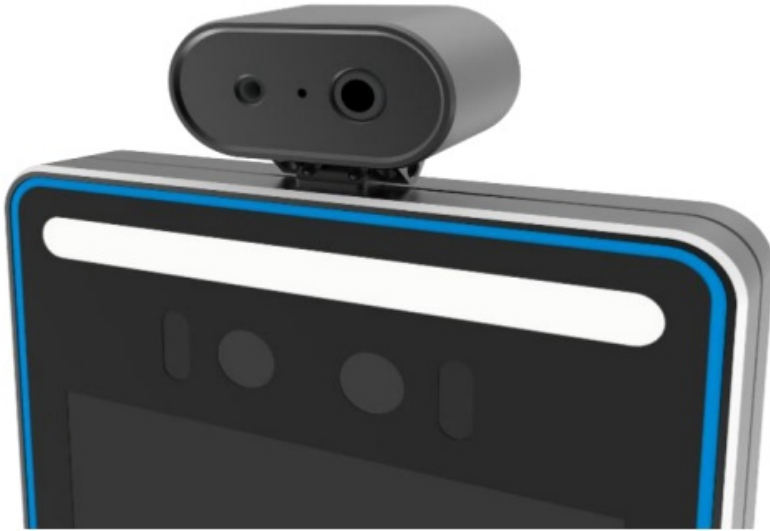**Figure 2 Temperature measuring module of FX6**

Figure 3 FX6 prototype with the card reader on the column support

Facial recognition, a biometric recognition technology based on the facial features of human, is a typical application of artificial intelligence. Facial recognition has been applied to some industries, such as the public security field (border inspections and criminal investigations), the transportation field (airports, train stations, and bus stops), and the education industry (facial attendance, dormitory access control, and kindergarten pick-up). It has great prospect as a portal for connecting people and intelligence.

The infrared non-contact temperature measuring technology is widely used in the field of medical temperature measurement. It can accurately measure the body temperature without direct contact between people, greatly reducing the probability of cross infection of viruses and bacteria.

The Kepler FX6 facial recognition device is equipped with a new built-in infrared non-contact temperature measuring module based on facial recognition. During facial recognition, the device can simultaneously measure the temperature of the person's forehead and facial skin in a non-contact, accurate, reliable, efficient, and unaware manner. For those whose body temperature exceeds a certain threshold, the device will generate an abnormal warning and display their temperature. The unique waterproof and dustproof design of the device meets the IP65 protection requirements, effectively guaranteeing the service life of the device in most environments. Therefore, the device can be widely used in complex indoor and outdoor scenarios.

The Kepler FX6 facial recognition device addresses the high labor costs and low measurement efficiency of traditional body temperature detection devices, and reduces the contact between people and terminals and between people during detection, enabling the rapid screening of crowds.

Features

Effective bioassay with a dual-lens camera

The dual-lens camera can effectively distinguish between living body and pictures, avoiding deception.

Simultaneous detection of body temperature, focusing on personal health

The built-in infrared body temperature detection module achieves a recognition accuracy of ±0.4°C. During facial recognition, it also measures the body temperature of personnel and immediately generates an alarm when the body temperature is abnormal.

Ultrafast and large-capacity deep learning algorithm, accommodating various scenarios

Tens of millions of facial images can be analyzed based on the latest MxNet deep learning framework and aggregate algorithm, achieving world-leading facial recognition. A local facial database containing up to 5000 facial images is provided, achieving high recognition accuracy (> 99.8%).

Service continuity in offline recognition mode

The offline mode of the device ensures continuity of the facial recognition and access control services upon a sudden network disconnection, without being restricted by the network.

Presumable data transfer and offline retransmission, ensuring secure data transmission

Multiple mechanisms such as presumable data transfer and offline retransmission are enabled for device logs, ensuring the integrity and security of data upon network failure.

Application Scenarios

The device provides superb front-end intelligent processing capabilities and is widely applicable to residential estates, communities and streets, governmental organizations, transportation junctions, airports and stations, and schools. In addition to facial recognition, it also measures the body temperature of personnel. The device collaborates with back-end and cloud business platforms to provide customers with solutions such as personnel access permission management, personnel health status detection, visitor management, and attendance management.

## Product Specifications

Functions

Table 2- 1 Functions

Category	Item	Description
Facial recognition algorithm	Recognition rate	≥ 99.8%
	Bioassay	Bioassay can prevent attacks from non-living body such as photos/videos on mobile phones, photos/videos on computers, and printed black and white/color photos.
	Recognition distance	0.5 m
	Recognition angle	0°–90°
	Recognition speed	≤ 1s
Personnel management	Facial database	Local facial database with 20,000 images
	Personnel management	Add, delete, modify, and query
	Multiple recognition patterns	Facial recognition, person-certificate comparison, and body temperature detection
Body temperature detection	Measuring angle/FOV	±5°
	Measuring accuracy	±0.4°C
	Fever alarm	The device generates an alarm when detecting a fever.
Network	Wi-Fi	Wi-Fi access is supported.
	Wired network port	RJ45 wired network access is supported.
Functions	Facial recognition	The captured facial images can be compared with the local built-in database in real time, and the comparison results are logged.
	Access control	Access control is enabled based on the facial recognition results, to manage the personnel in the controlled area.
	Time-based control	Time-based control is enabled for the personnel, allowing them to pass only in the specified period of time.
	Regional control	Regional control is enabled for personnel, to prohibit personnel in specific regions from passing.

Hardware Specifications

Table 2- 2 Basic hardware specifications

Hardware specifications of Kepler FX6		
Module	**Parameter**	**Specifications**
Main unit	Dimensions	243.0 mm (L) × 138.0 mm (W) × 30.0 mm (H)
	OS	Android 5.1
	Protection class	IP65
Processor	CPU	RK3288, 4-core A17 high-performance facial recognition chip
	Clock speed	1.8 GHz
Storage	Memory	2 GB
	Storage device	8 GB
Display	Screen	8.0 inches
	Resolution	800×1280
	Display ratio	10:16 in portrait mode
Camera	HD built-in cameras	2M HD camera + 2M infrared night-vision HD camera
	Lens	6 mm
Temperature measuring module	Infrared temperature measuring module	High-precision infrared temperature measuring module
Communication	LAN	Built-in Wi-Fi
	Bluetooth	Yes
Audio effect	Loudspeaker	8 ohms/ 2 W
Fill light	LED	Built-in fill LED
Power supply	Power adapter	12 V/2 A
Operating environment	Operating temperature	−20°C to +60°C
	Operating humidity	85%
Power consumption	System power consumption	15 W

Device Connectors

DC IN 12V/2A

USB female connector

RJ45

Wiegand output

Wiegand input

Relay output/alarm input
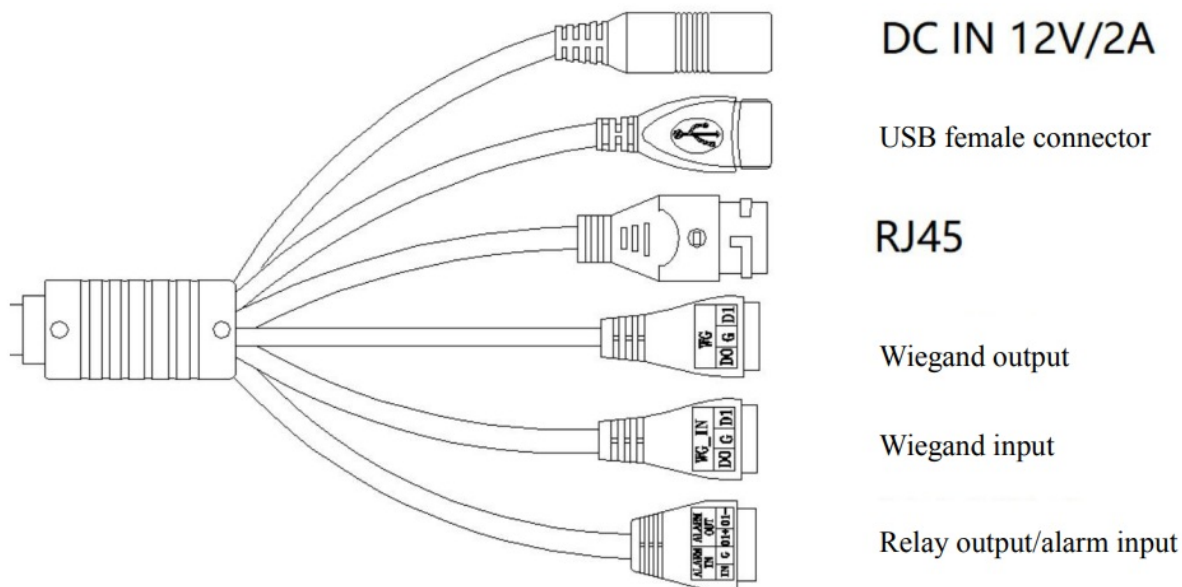
Function	ID	Description
12 V DC input		Standard 12 V/2 A
RJ45		Used for 10/100 Mbps Ethernet transmission
WG output	WG_O D0/D1	Used to output recognition results and connect other WG in put devices
WG input	WG_I D0/D1	Used to receive Wiegand signals, such as the IC card number
		Relay output: used to output gate opening
Relay output/alarm input	O1+/O1−	signals. Alarm input: used to receive signals to enable
		linkage.
USB connector	USB	Type-A USB connector

Connector Description

Power Connector

 of the tail wire at the rear of the device is the power input connector. The details are as follows:

Table 2- 3 Power connector

Signal	Direction	Function
12 V	Inward positive	12 V±20% DC input
GND	Outward negative	Power ground

Reverse polarity protection and surge protection are provided for the device's internal power input.

Relay Output

The alarm output is a passive relay Boolean output. The contact voltage capacity is 220 V DC, 250 V AC. The contact current capacity is 1 A. The power capacity is 30 W.

WG Output

This connector is used to output recognition results and connect other WG input devices such as access control boards.

Ethernet Connector

The RJ45/LAN connector of the tail wire at the rear of the device is the camera's Ethernet connector, used to transmit camera control commands and captured images.

USB

The USB connector is used to connect a USB device such as an ID card reader.

Module and Code

Code	Name	Description
-S	ID card reader	-S indicates that an ID card reader is configured.
None	None	If no code is carried, no ID card reader is configured.

Installation Mode and Code

Code	Installation Mode	Picture	Remarks

B	Wall-mounting by using the backplane		The device is mounted to the wall by using the backplane.
Z	Column support		The column support is used to fasten the device to a gate machine.
L	Long column support		The long column support is about 1.4-m high and is directly placed on the ground.

FAQs

1. How to measure the temperature accurately? The ambient temperature should not change drastically, the head should be within the portrait frame, and the face should not move violently.
2. Why is the temperature measurement inaccurate after the device is brought indoors from outdoors? After being

brought indoors, the device needs to wait for the thermal balance calibration (which takes 20 minutes after power-on as expected) before it can output the normal body temperature.

3. How to measure the temperature efficiently? The device needs to be aligned with the best area of the face.
4. Can the device be installed against the light? The device can be installed against the light, but it is not recommended. Be sure to avoid direct sunlight on the temperature sensor.

Release History

Version	Date	Description
V1.0	July 23, 2019	Released the first official version.
V1.1	September 5, 2019	Modified the device pictures.
V1.2	February 3, 2020	Modified the device appearance based on hardware iterations and modified the document style.
V1.3	February 7, 2020	Updated the device appearance pictures and hardware dimensions.
V1.4	February 10, 2020	Optimized the typesetting and added the model classification and FAQs.

Appendix

Table 3- 1 Common models

Model	Product Code	Package and Accessory	Packing
FX6-B	FX6-B	Device, 12 V power supply, packing cotton, user manual, and installation backplane	1 piece/box
FX6-Z	FX6-Z	Device, 12 V power supply, packing cotton, user manual, and common column support	1 piece/box
FX6-L	FX6-L	Device, 12 V power supply, packing cotton, user manual, and 1.4-m column support	1 piece/box
FX6-S-B	FX6-S-B	Device (with the ID card reader), 12 V power supply, packing cotton, user manual, and installation backplane	1 piece/box
FX6-S-Z	FX6-S-Z	Device (with the ID card reader), 12 V power supply, packing cotton, user manual, and common column support	1 piece/box
FX6-S-L	FX6-S-L	Device (with the ID card reader), 12 V power supply, packing cotton, user manual, and 1.4-m column support	1 piece/box

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications to this unit 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

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

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and the receiver.
3. 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.

The device has been evaluated to meet general RF exposure requirement. This
device should be installed and operated with a minimum distance of 20cm between the device and your body.

Company Information

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Scan the QR code to add our WeChat customer service:

Documents / Resources

Kepler FX6 Facial Recognition Device [pdf] Instruction Manual
FX6, 2AWLJ-FX6, 2AWLJFX6, FX6 Facial Recognition Device, Facial Recognition Device, Recognition Device