UW-E518-V-V1.0 Face Recognition Attendance Access Control Motherboard

Technical Specification

Document Revision History

	Notes	Date
1	Created	2023-01

1 Product Overview

UW-E518-V-V1.0 is a face recognition attendance motherboard developed based on the EEASYTECH SH518 main chip. This motherboard is equipped with built-in 256MB DDR3L and 8GB eMMC (configurable to 16GB or 32GB), supporting RGB screen display and dual cameras.

The main control IC is based on the RISC architecture, with a clock speed of up to 816MHz, a built-in convolutional neural network accelerator NPU, and 1.0T computing power. After millions of algorithm training iterations, this product integrates functions such as image capture, face detection, face tracking, and face comparison, offering high recognition accuracy and speed. It is widely applicable in scenarios such as residential access control, face recognition attendance, gate channels, and office buildings.

Key Features:

- 32-bit RISC CPU architecture, up to 816MHz clock speed
- Supports RGB screen display with a resolution of up to 1280 × 720
- Dual visible light + infrared 850nm 2MP cameras, built-in high-performance ISP, auto-exposure, and ultra-wide dynamic range
- Rich expansion interfaces including 3 serial ports, fill light, relay, Wiegand IN, Wiegand OUT, etc.

2 Product Specifications

Hardware Specifications:

CPU	EEASYTECH SH518，32-bit RISC CPU
NPU	Built-in convolutional neural network accelerator NPU,1.0T computing power
Memory	Built-in 256MB DDR3L
Storage	EMMC 8GB/16G/32G (default 8GB)
Display Interface	RGB interface, supports up to 1280 × 720 resolution
Network	RJ45 standard interface, 100M Ethernet port, supports Ethernet
	Supports 4G，onboard 4G module (optional, not default)
	Wi-Fi & Bluetooth module, supports Wi-Fi 802.11b/g/n Supports Bluetooth 4.0 protocol
Image Rotation	Supports 0°, 90°, 180°, 270° rotation
RTC	2PIN battery interface
Interfaces	Supports MIPI+DVP dual cameras
	USB OTG function

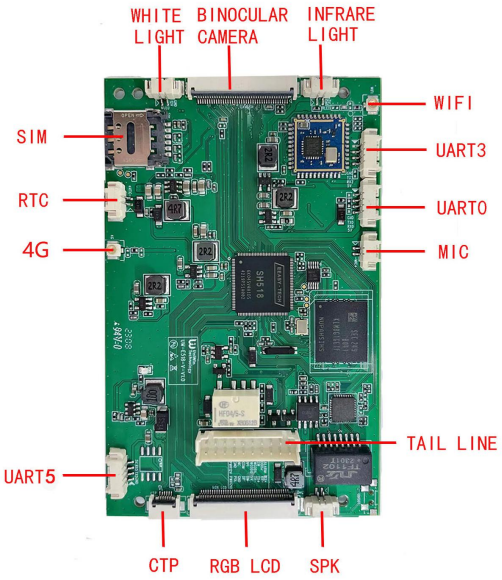
	3 TTL interfaces (can be configured as 1 RS485), 1 Wiegand, onboard relay, and other rich peripheral interfaces
	Built-in amplifier, supports 3W 4Ω speaker
Audio Input	Supports MIC， 1 microphone interface
Touch Screen	Supports capacitive touch screen
Fill Light	Supports white light and infrared fill light

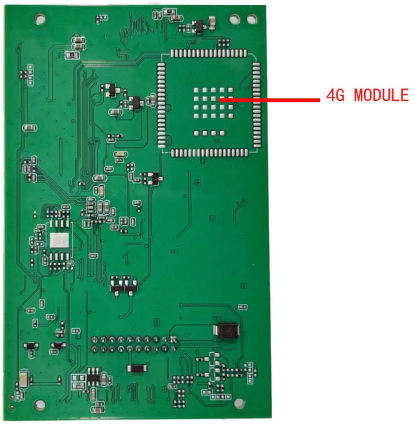
Software Specifications:

OS	Linux system
Face Algorithm	Dynamic face detection and tracking based on video stream, 1:N recognition algorithm; Dynamic dual camera anti-counterfeiting, completely solving the deception of photos and videos on various carriers; Supports 5,000 face database entries and 1 million recognition records; At 5,000 face entries, achieves 0.01% false acceptance rate and 97% pass rate.
Application Software	Supports saving on-site images during face recognition or stranger detection; Management system backend deployed via public cloud; Supports local face registration, database import, network settings, liveness detection switch, and other basic functions.
API Interface	Framework provides C/C++ API; Supports online API(HTTPS);

3 main interfaces

3.1 Interface diagram





3.2 Main Interfaces Introduction

- **TAIL LINE (20PIN/PHD 2.0mm) Tail Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	12V	Power	+12V power input
2	GND	Ground	Ground
3	NC	Control line	Relay normally closed
4	COM	Control line	Relay common terminal
5	NO	Control line	Relay normally open
6	WGOD0	Data line	Wiegand output D0
7	WGOD1	Data line	Wiegand output D1
8	USB_SWITCH	IO	Reserved
9	DOOR	Input	Door open button
10	ALARM	Input	Alarm input
11	GND	Ground	Ground
12	POL	Data line	Force upgrade input
13	GND	Ground	Ground
14	USB DP	Input/Output	D+ signal line
15	USB DM	Input/Output	signal line
16	VCC-PWR	Power Output	+5V power output
17	TX-	Ethernet	Ethernet signal line TX-
18	TX+	Ethernet	Ethernet signal line TX+
19	RX-	Ethernet	Ethernet signal line RX-
20	RX+	Ethernet	Ethernet signal line RX+

◆ **SPK(2PIN/1.25mm) Speaker Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	OUTN	Output	Audio-signal (connect to speaker -)
2	OUTP	Output	Audio+signal (connect to speaker +)

◆ **MIC(2PIN/1.25) Microphone Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	MIC-	Audio Input	Audio input negative
2	MIC+	Audio Input	Audio input positive

◆ **INFRARE LIGHT(2PIN/1.25mm) Infrared Fill Light Power Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	3.3V	Power	Infrared LED power supply

◆ **WHITE LIGHT POWER(2PIN/1.25mm) White Light Power Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	12V	Power	White LED power supply
2	GND	Ground	Ground

◆ **UART3(4PIN/1.25mm) TTL Serial Port 3, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX3	Signal Output	TTL serial port
3	RX3	Signal Input	TTL serial port
4	5V	Power	Power supply

◆ **UART5(4PIN/1.25mm) TTL Serial Port 5 (Configurable as RS485), as shown by the arrow in the diagram**

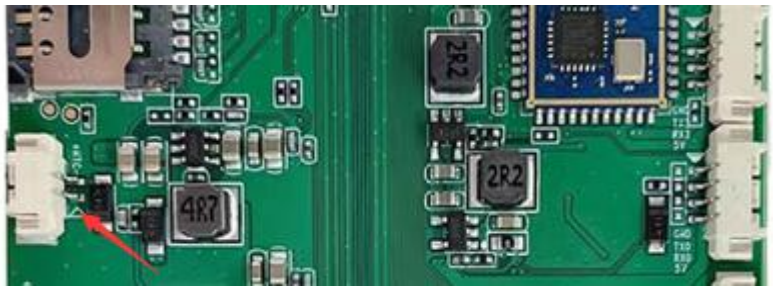
S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX5	Signal Output	UART1 data output or 485 A
3	RX5	Signal Input	UART5 data input or 485 B

4	5V	Power	Power supply

- **UART0(4PIN/1.25mm) TTL Serial Port 0 (Debug Port), as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	RX0	Signal Input	Debug receive
3	TX0	Signal Output	Debug send
4	NC	NC	NC

- **RTC BAT(2PIN/1.25mm) RTC Power Interface, as shown by the arrow in the diagram**



S/N	Definition	Attribute	Description
1	3V Battery Negative	Power	3V battery negative
2	3V Battery Positive	Power	3V battery positive

- **CTP(6PIN/0.5mm) CTP Capacitive Touch Screen Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	SDA	Input/Output	I2C data
2	SCK	Output	Clock signal
3	REST	Output	Reset
4	INT	Input	Interrupt
5	GND	Ground	Ground
6	3.3V	Output	3.3V Output

◆ **BINOCULAR CAMERA(40PIN/0.5mm) Dual Camera Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	CSI-SCK	Output	I2C CLK
2	CSI-SDA	Input/Output	I2C DAT
3、5、23、26、29、32、36	GND	Ground	Ground
4	DVP-PCLK	Input	DVP PCLK
6	DVP-MCLK	Output	DVP MCLK
7	DVP-PWDN	Output	DVP PWDN
8	DVP-RESET	Output	DVP RESET
9	DVP-HSYNC	Output	DVP HSYNC
10	DVP-VSYNC	Output	DVP VSYNC
11	DVP-D11	Input	DVP DATA

12	DVP-D10	Input	DVP DATA
13	DVP-D9	Input	DVP DATA
14	DVP-D8	Input	DVP DATA
15	DVP-D7	Input	DVP DATA
16	DVP-D6	Input	DVP DATA
17	DVP-D5	Input	DVP DATA
18	DVP-D4	Input	DVP DATA
19	DVP-D3	Input	DVP DATA
20	DVP-D2	Input	DVP DATA
21	DVP-D1	Input	DVP DATA
22	DVP-D0	Input	DVP DATA
24	MCSI-CKN	Output	MIPI CLK-
25	MCSI-CKP	Output	MIPI CLK+
27	MCSI-D1N	Input	MIPI D1-
28	MCSI-D1P	Input	MIPI D1+
30	MCSI-D0N	Input	MIPI D0-
31	MCSI-D0P	Input	MIPI D0+
33	MCSI-RESET	Output	MIPI RESET
34	MCSI-PWDN	Output	MIPI PWDN
35	MCSI-MCLK	Output	MIPI MCLK
37、38	3V3	Power	3.3V Power supply
39、40	NC	NC	NC

◆ **RGB LCD(40PIN/0.5mm)，RGB Screen Interface, as shown by the arrow in the diagram**

S/N	Definition	Attribute	Description
1	LED-	Power	Backlight negative
2	LED+	Power	Backlight positive
3、29、36	GND	Ground	Ground
4	VDD	Power	3.3V power supply

5-12	Red Data	Output	Red Data
13-20	Green Data	Output	RGB Green Data
21-28	Blue Data	Output	RGB Blue Data
30	LCD-CLK	Output	RGB LCD-CLK
32	LCD-HSYNC	Output	LCD HSYNC
33	LCD-VSYNC	Output	LCD VSYNC
34	LCD-DE	Input	RGB LCD-DE
37	LCD-RST	Output	Reset
38	SDI	Output	SPI MOSI
39	SCL	Output	SPI CLK
40	CS	Output	SPI CS

4 Dimensions

4.1 Board Dimensions

PCB Length：95.4mm　PCB Width：61mm　Overall board height is approximately 10mm.

For detailed drawings, contact sales for help.