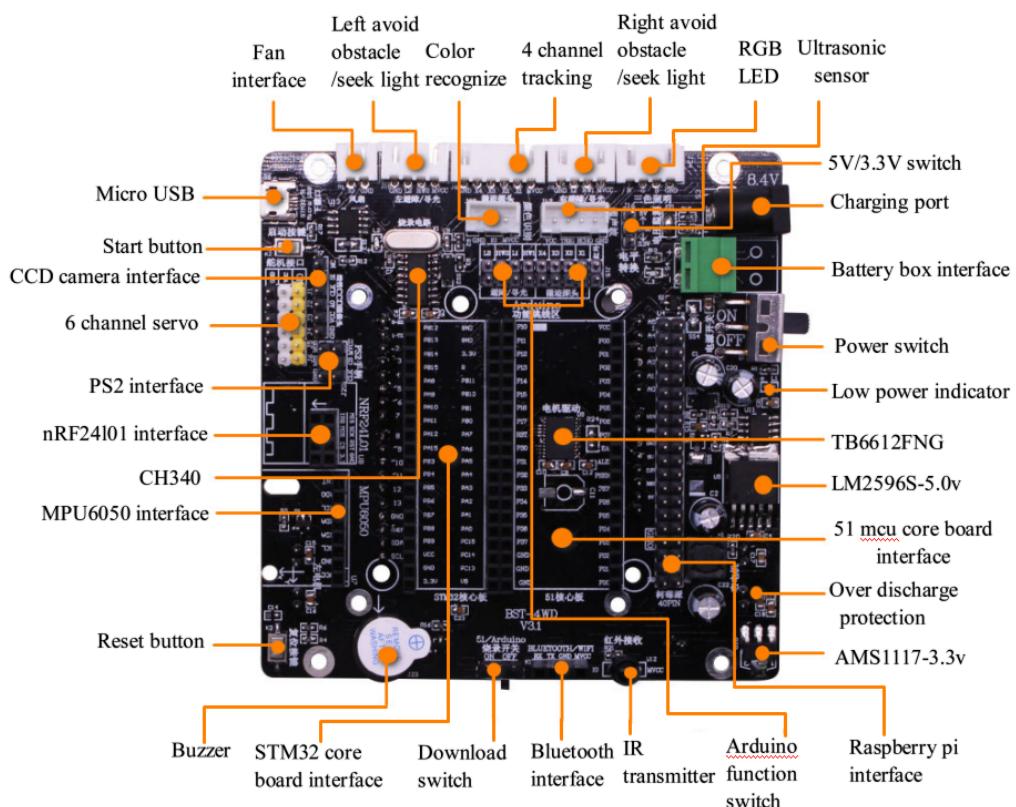
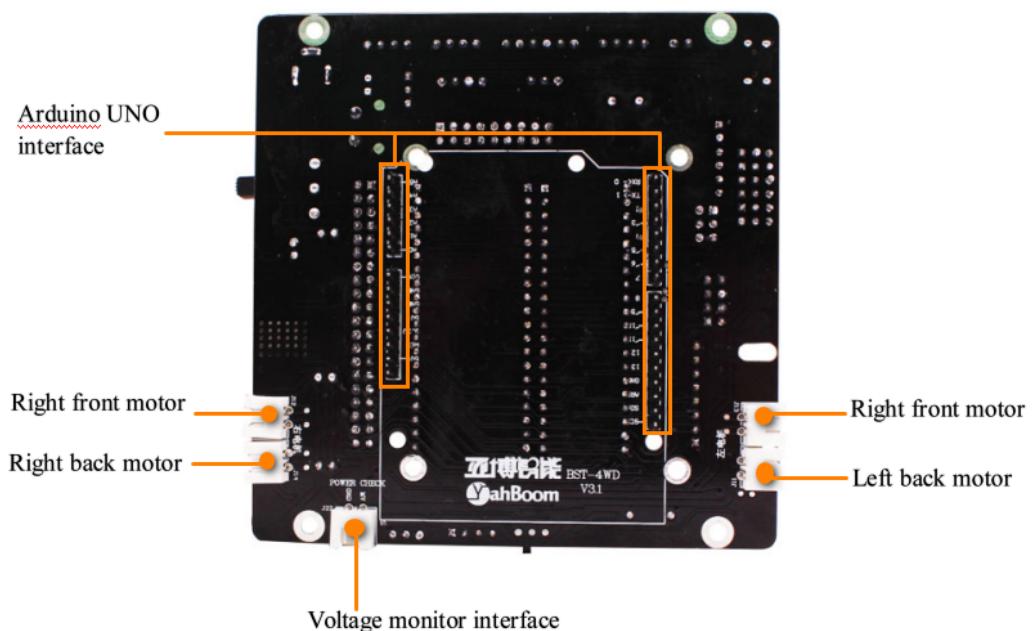


4WD expansion board manual

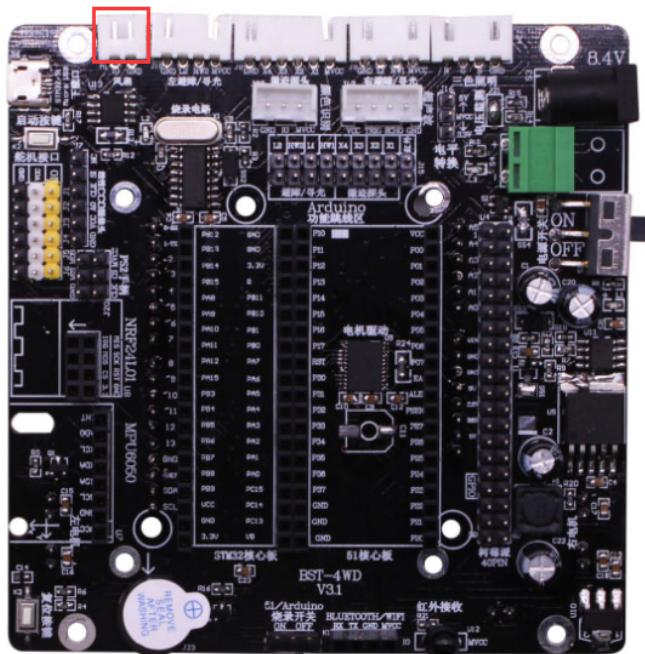
Front:



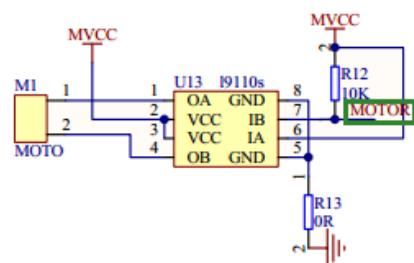
Back:



1. Fan interface:

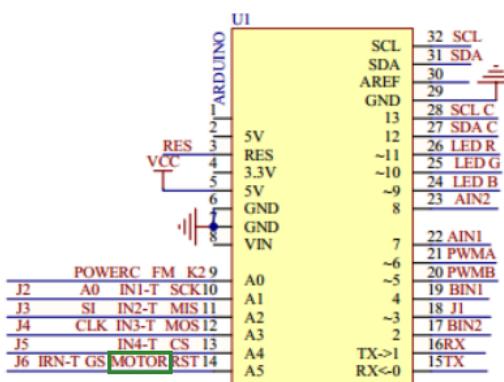


1-1 position



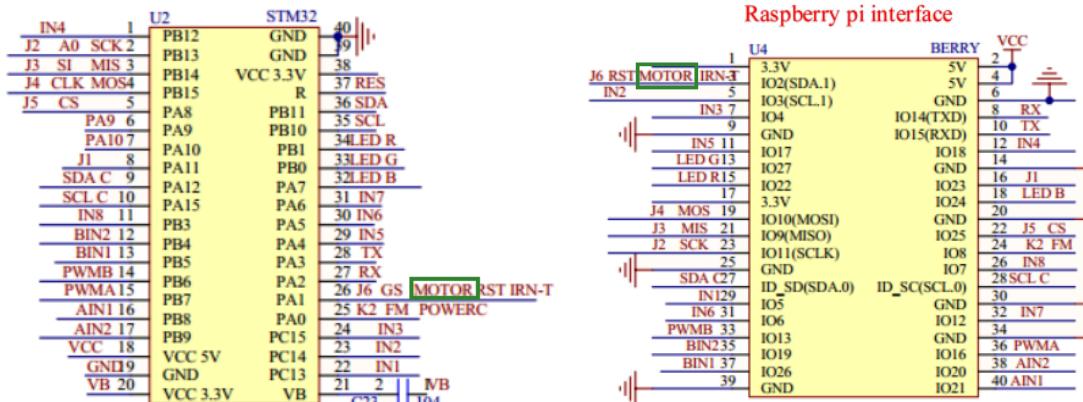
51 mcu core board interface

Arduino UNO interface



IN1	1	U3	STC	40	VCC
IN2	2	P1.0	VCC	39	J6 RST
IN3	3	P1.1	P0.0	38	J5 CS
IN4	4	P1.2	P0.1	37	J4 MOS
IN5	5	P1.3	P0.2	36	J3 MIS
IN6	6	P1.4	P0.3	35	J2 SCK
IN7	7	P1.5	P0.4	34	J1
IN8	8	P1.6	P0.5	33	SDA
		P1.7	P0.6	32	SCL
			P0.7		
51 RES	9				
PA10 TX	10	RST		31	LED R
PA9 RX	11	RXD	EA	30	LED G
IRN	12	TXD	ALE	29	LED B
	13	INT0	PSEN		
	14	INT1			
	15	T0		28	K2 FM
SDA C	16	T1	P2.7	27	
SCL C	17	WR	P2.6	26	PWMB
		RD	P2.5	25	BBN2
	18	XTAL2	P2.4	24	BIN1
	19	XTAL1	P2.3	23	AIN1
	20	GND	P2.2	22	AIN2
			P2.1	21	PWMA
			P2.0		

STM32 core board interface



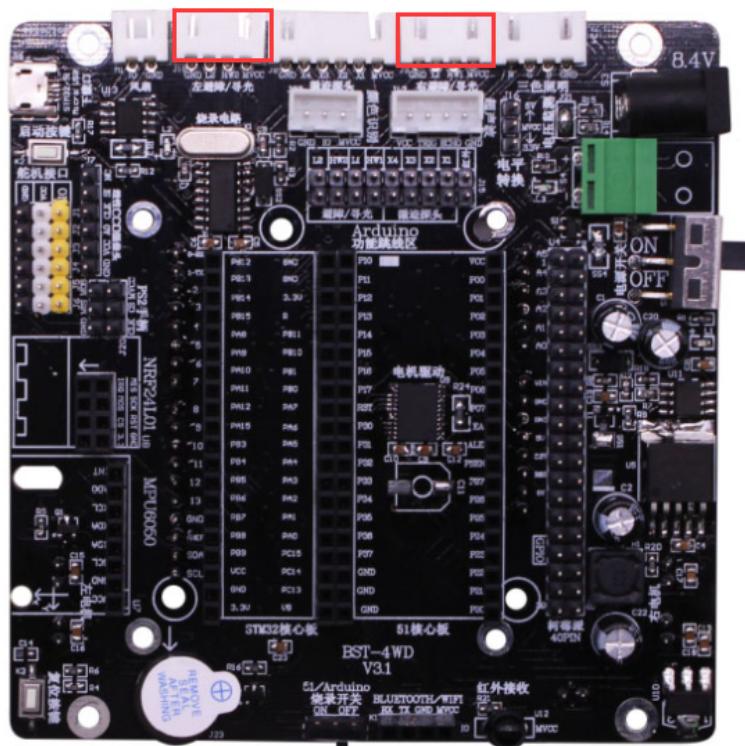
1-2 Schematic diagram

The interface has two pins: GND, IO port. When the IO port gets high level, the fan can rotate.

Pin table:

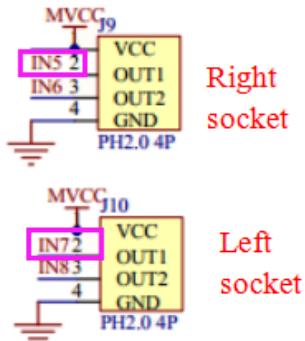
Module interface	Arduino	51controller	STM32	Raspberry Pi
IO port	A5	P0.0	PA1	IO2

2. Left and right infrared obstacle avoidance (light seeking) interface:

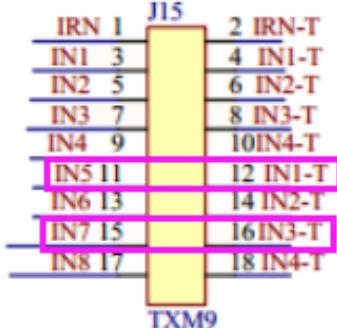


2-1 Position

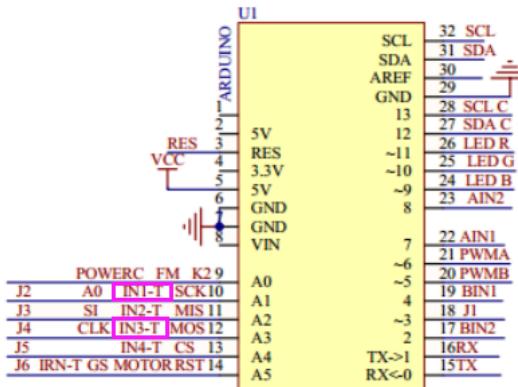
Left IR avoid obstacle/seek light Module interface



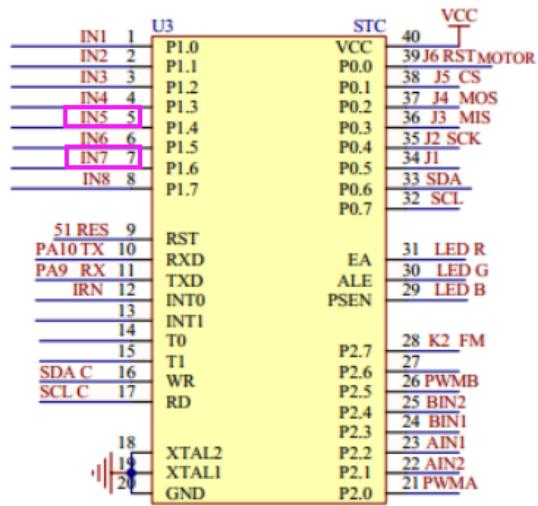
Arduino function switch



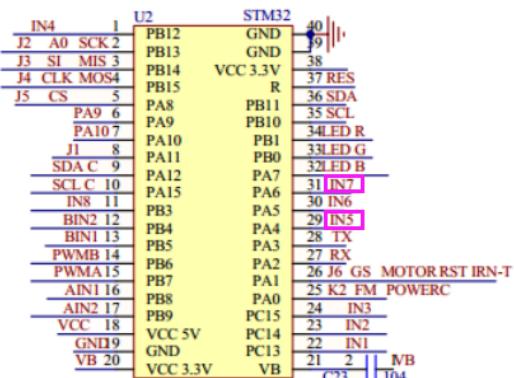
Arduino UNO interface



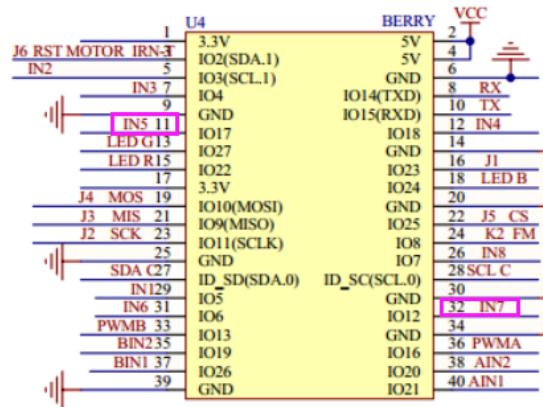
51 mcu core board interface



STM32 core board interface



Raspberry pi interface



2-2 Schematic diagram

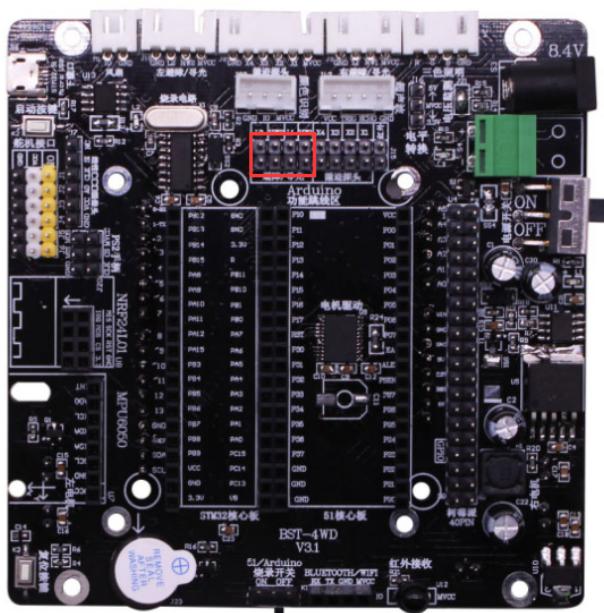
The interface has four pins: VCC, GND, and two OUT ports. Under normal working conditions, VCC is 5V voltage. We can connect the infrared obstacle avoidance sensor module to these two joints, and judge whether the front is an obstacle by detecting the level

of the two OUT1 ports.

Pin table:

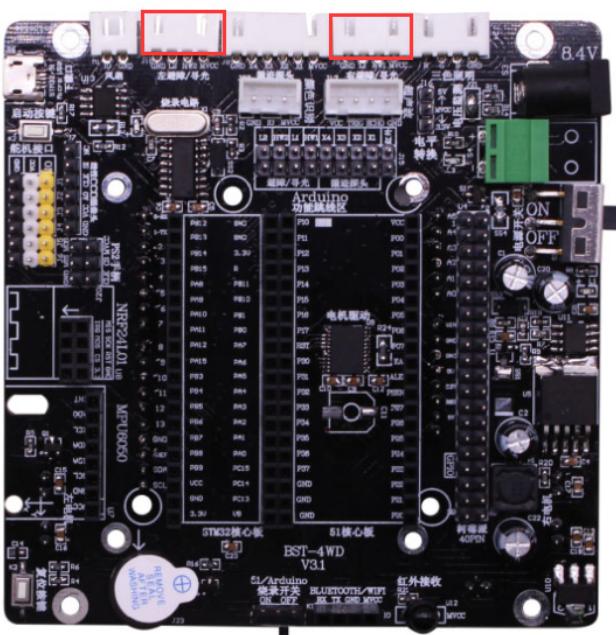
Module interface		Arduino	51 controller	STM32	Raspberry Pi
IN5(OUT1_R)	A1	P1.4	PA4	IO17	
IN7(OUT1_L)	A3	P1.6	PA6	IO12	

Note: When using the Arduino core controller, the corresponding IN5 and in1-t,IN7 and in3-t need to be connected with the jumper cap.



2-3 Position with jumper cap

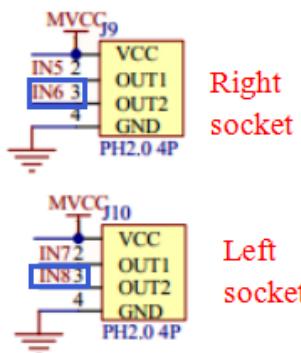
3. Light seeking (Left and right infrared obstacle avoidance) interface: :



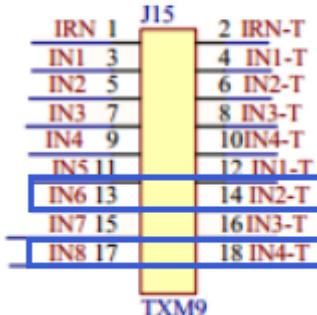
3-1 Position

Left IR avoid obstacle/seek light

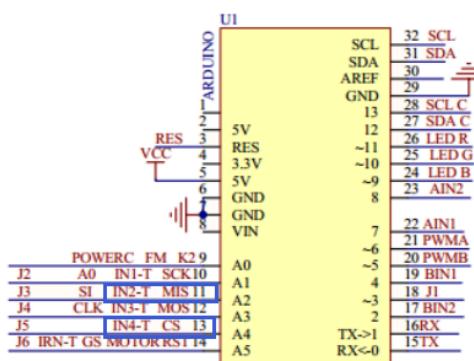
Module interface



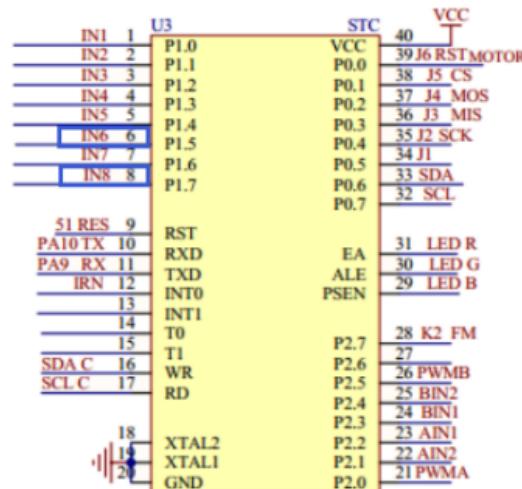
Arduino function switch



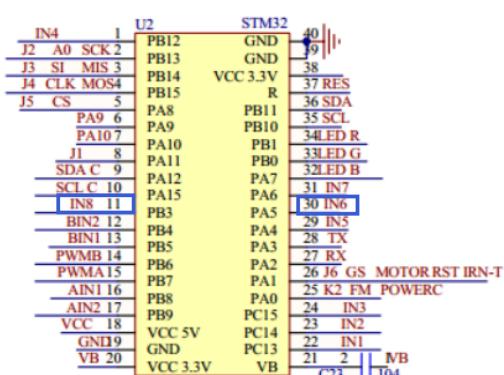
Arduino UNO interface



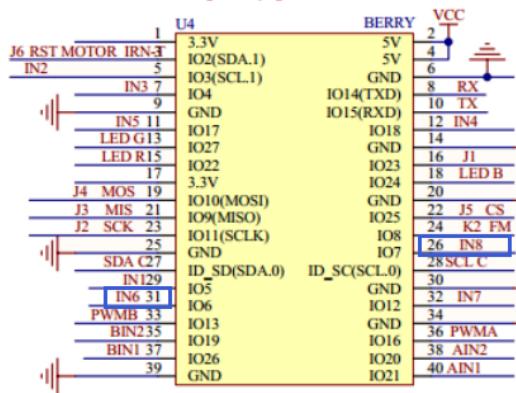
51 mcu core board interface



STM32 core board interface



Raspberry pi interface



3-2 Schematic diagram

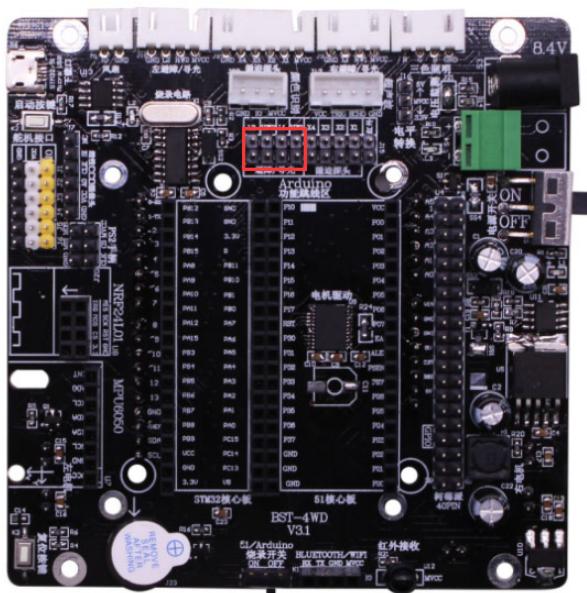
The interface has four pins: VCC, GND, and two OUT ports. Under normal working

conditions, VCC is 5V voltage. We can connect the infrared light-seeking sensor module to these two interfaces, and judge whether there is light by detecting the level of the two OUT2 ports.

Pin table:

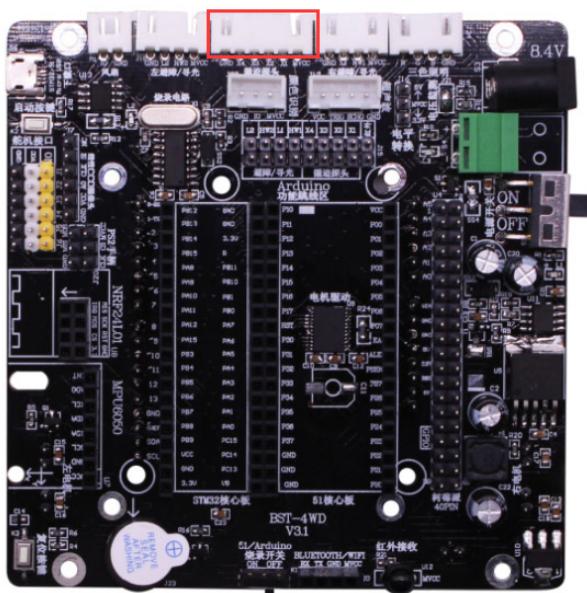
Module interface	Arduino	51controller	STM32	Raspberry Pi
IN6(OUT2_R)	A2	P1.5	PB3	IO6
IN8(OUT2_L)	A4	P1.7	PA5	IO7

Note: When using the Arduino core controller, the corresponding IN6 and in2-t, IN8 and in4-t need to be connected with the jumper cap.



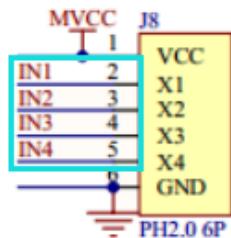
3-3 Position with jumper cap

4. 4-Channel tracking interface

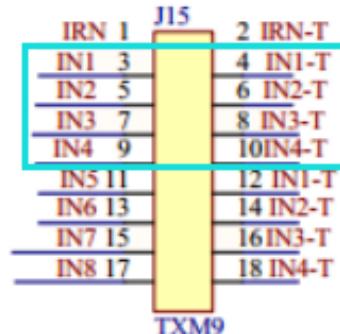


4-1 Position

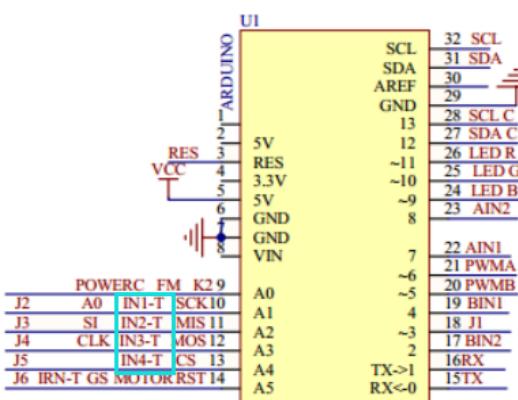
4 channel tracking Module interface



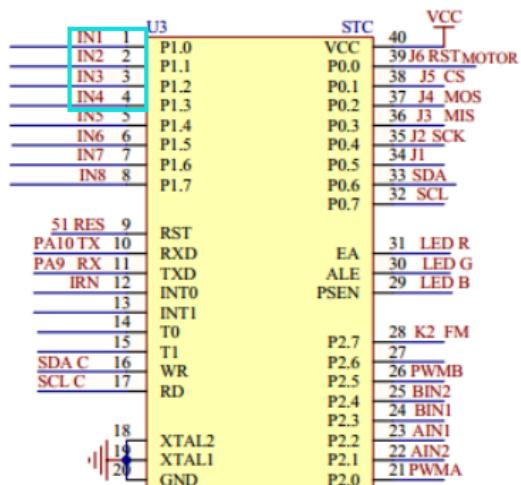
Arduino function switch



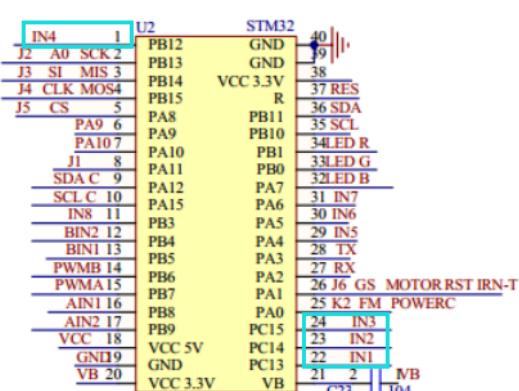
Arduino UNO interface



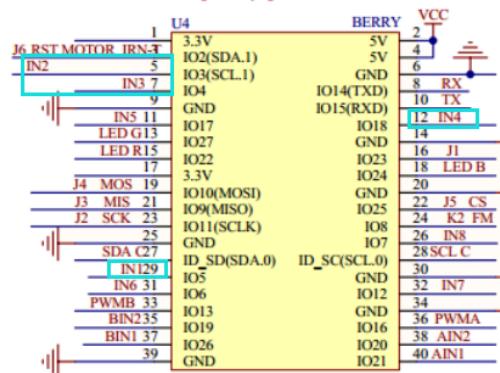
51 mcu core board interface



STM32 core board interface



Raspberry pi interface



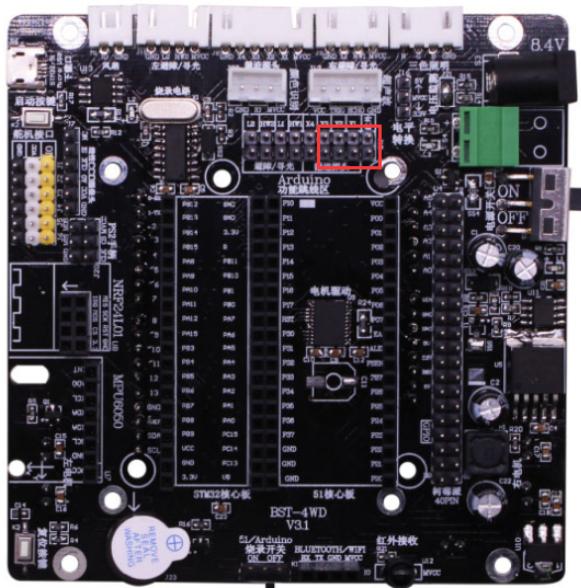
4-2 Schematic diagram

The interface has six pins: VCC, GND, IN1, IN2, IN3, and IN4. VCC is 5V voltage under normal operation. We can connect a four-channel tracking module here, and judge whether it is on the black track by checking the level of IN1, IN2, IN3 and IN4 ports.

Pin table:

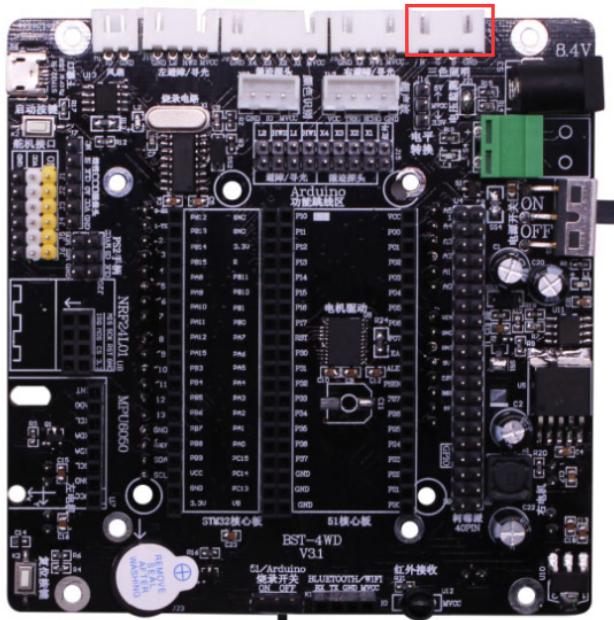
Module interface	Arduino	51controller	STM32	Raspberry
IN1	A1	P1.0	PC13	IO5
IN2	A2	P1.2	PC14	IO3
IN3	A3	P1.3	PC15	IO4
IN4	A4	P1.4	PB12	IO18

Note: When using the Arduino core controller, the corresponding IN1 and in1-t, IN2 and in2-t, IN3 and in3-t, IN4 and in4-t need to be connected with the jumper cap.



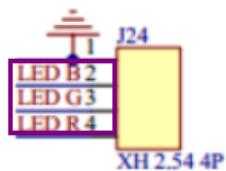
4-3 Position with jumper cap

5.RGB LED module interface

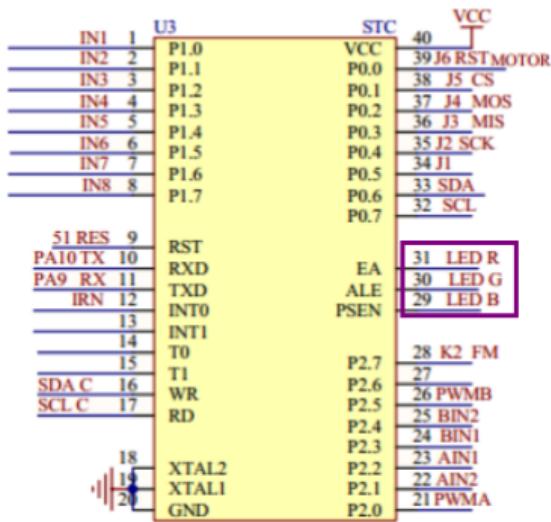


5-1 Position

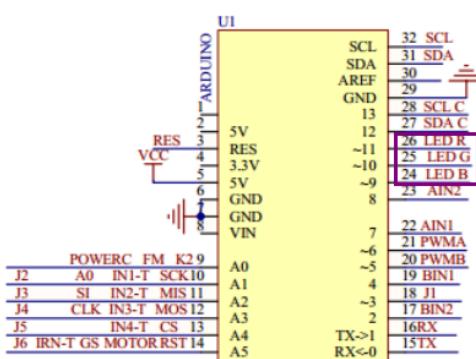
RGB LED Module interface



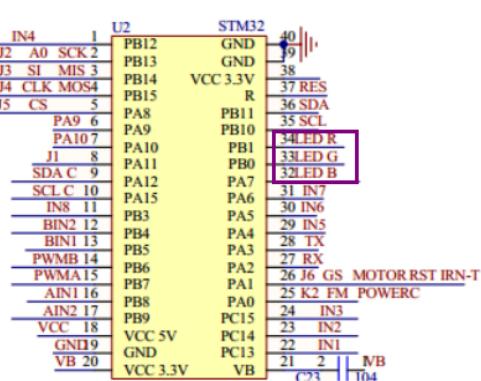
51 mcu core board interface



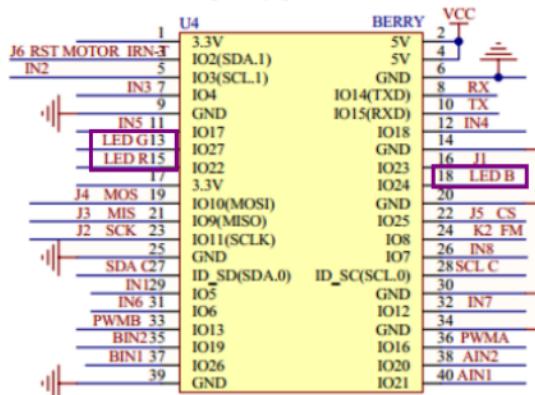
Arduino UNO interface



STM32 core board interface



Raspberry pi interface



5-2 Schematic diagram

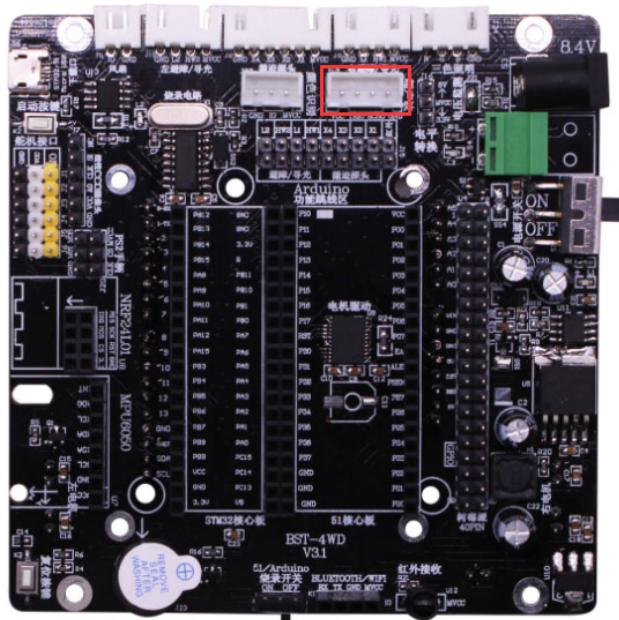
The interface has four pins: GND, LED R, LEDG, LEDB. When the LED R, LED G, and LED B pins are respectively turned on, the corresponding color lights (red, green, and blue) can be lit. When any two of the pins (or three pins) are at a high level, the RGB light will appear in a mixture of two colors (three colors).

Pin table:

Module interface	Arduino	51 controller	STM32	Raspberry Pi
------------------	---------	---------------	-------	--------------

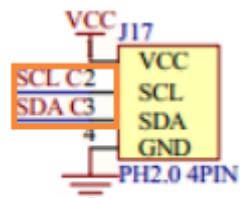
LED R	~11	P4.6 (EA)	PB1	IO22
LED G	~10	P4.5 (ALE)	PB0	IO27
LED B	~9	P4.4 (PSEN)	PA7	IO24

6. Ultrasonic module interface

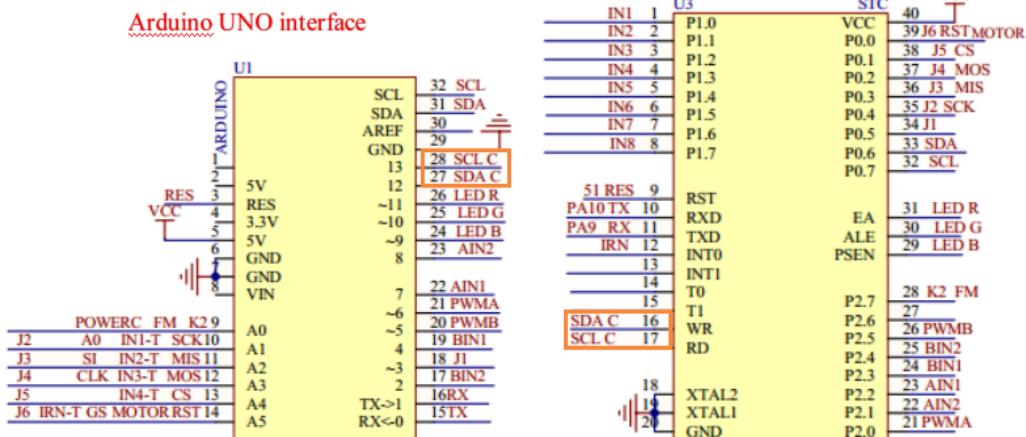


6-1 Position

Ultrasonic sensor Module interface



51 mcu core board interface



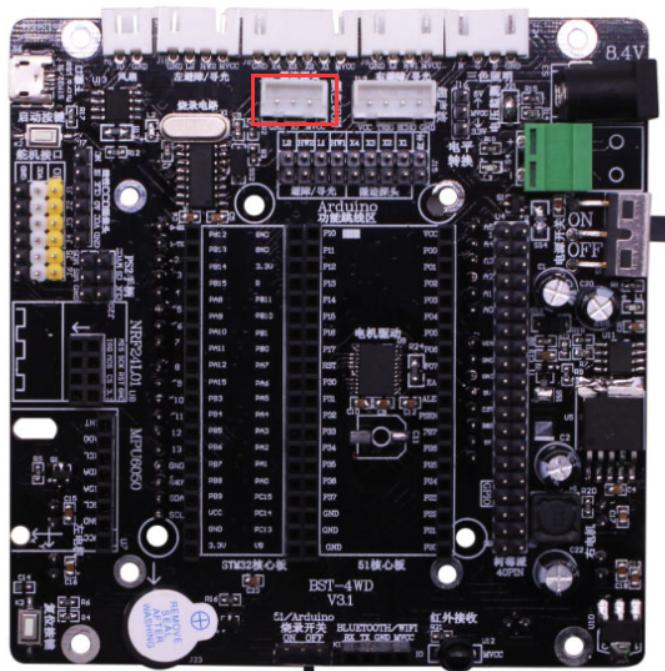
6-2 Schematic diagram

The interface has four pins: VCC, GND, SDA, SCL. Under normal operating conditions, VCC is 5V. When used, the Trig pin of the ultrasonic module is connected to SCL, and the Echo pin is connected to SDA.

Pin table:

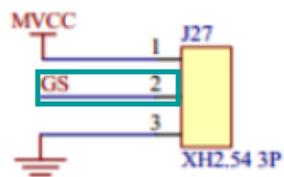
Module interface	Arduino	51controller	STM32	Raspberry Pi
SDA	12	P3.6 (WR)	PA12	ID_SD(SDA.0)
SCL	13	P3.7 (RD)	PA15	ID_SC(SCL.0)

7.Grayscale module (color recognition) interface

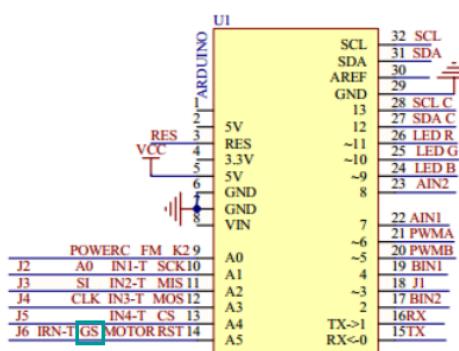


7-1Position

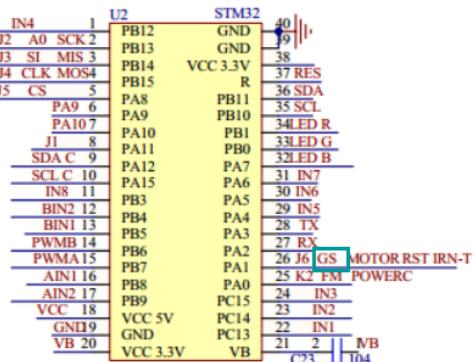
Color recognize Module interface



Arduino UNO interface



STM32 core board interface



7-2 Schematic diagram

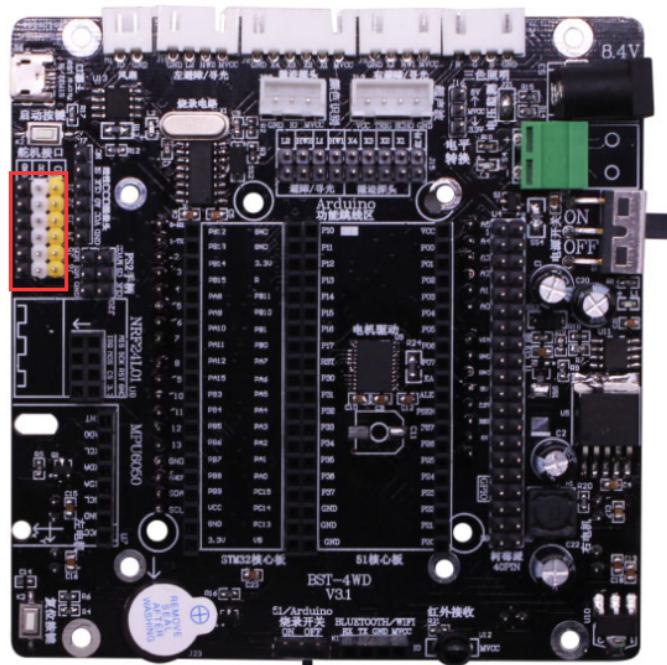
The interface has three pins: VCC, GND, and IO. VCC is 5V under normal operating conditions.

Pin table:

Module interface	Arduino	STM32
GS	A5	PA1

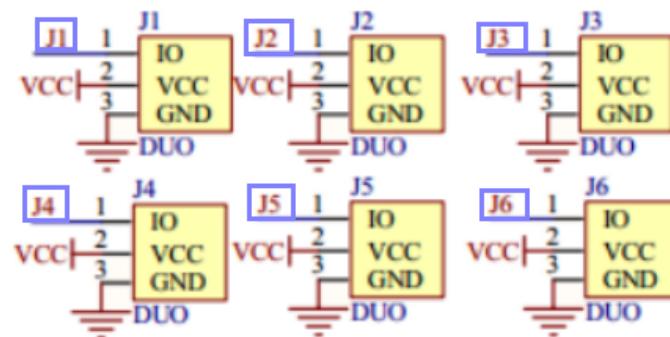
Note: This interface only supports Arduino and STM32 versions. The fan and infrared remote jumper caps need to be removed during use (explained later).

8. Servo interface

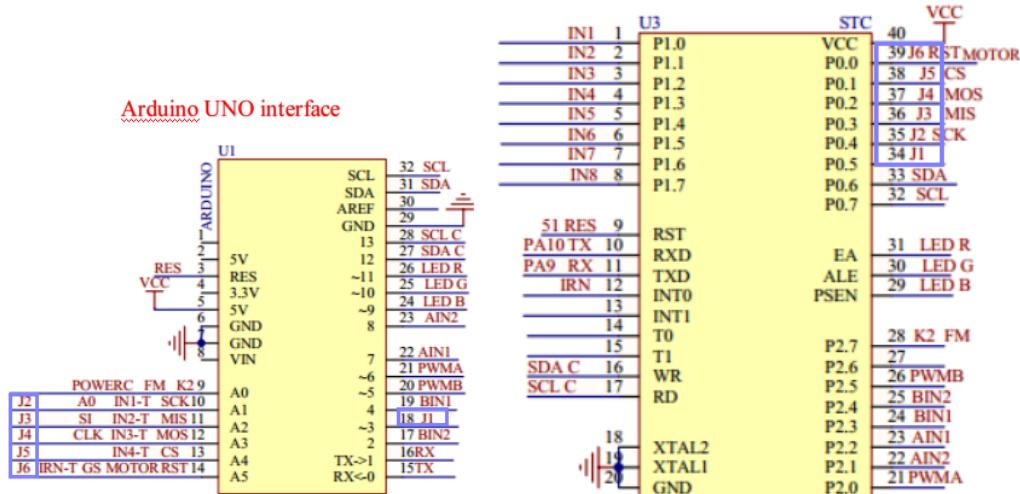


8-1 Position

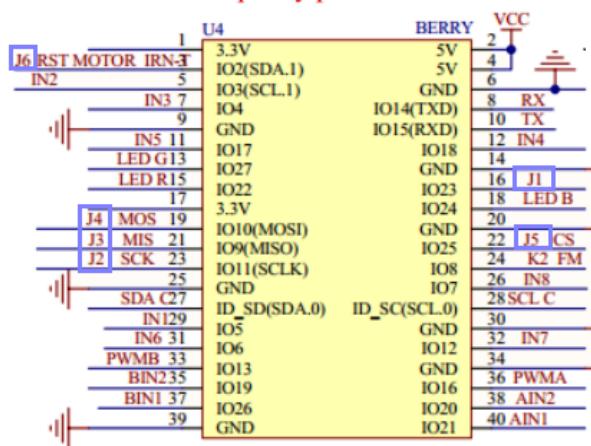
Servo interface



51 mcu core board interface



Raspberry pi interface



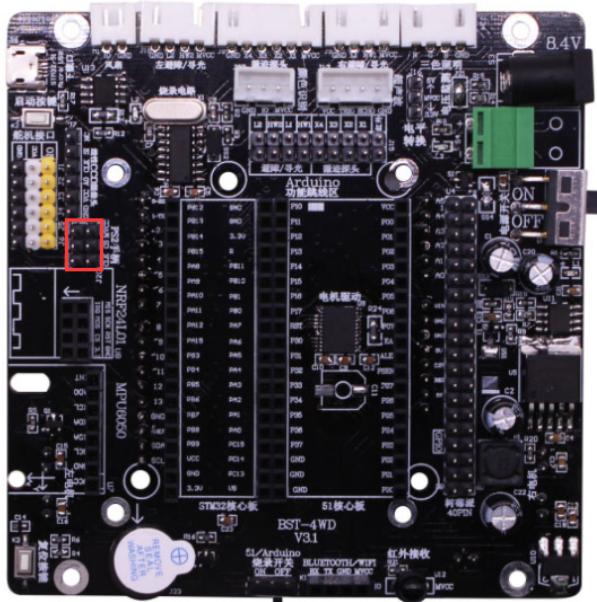
8-2 Schematic diagram

There are 6 servo interfaces, each with three pins: VCC, GND, and IO. VCC is 5V under normal operating conditions. It can simultaneously output 6 PWMs independently to control 6 servos.

Pin table:

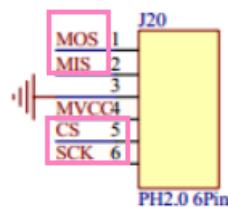
Module interface	Arduino	51 controller	STM32	Raspberry Pi
J1	~3	P0.5	PA11	IO23
J2	A1	P0.4	PB13	IO11
J3	A2	P0.3	PB14	IO9
J4	A3	P0.2	PB15	IO10
J5	A4	P0.1	PA8	IO25
J6	A5	P0.0	PA1	IO2

9. PS2controller receiving module interface



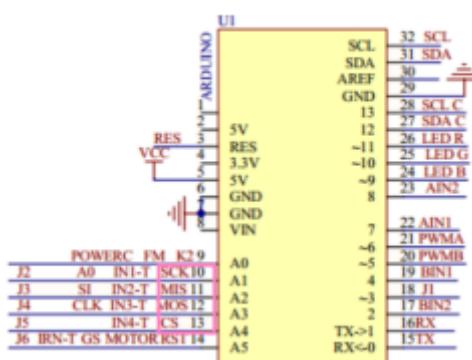
9-1 Position

PS2 receive Module interface

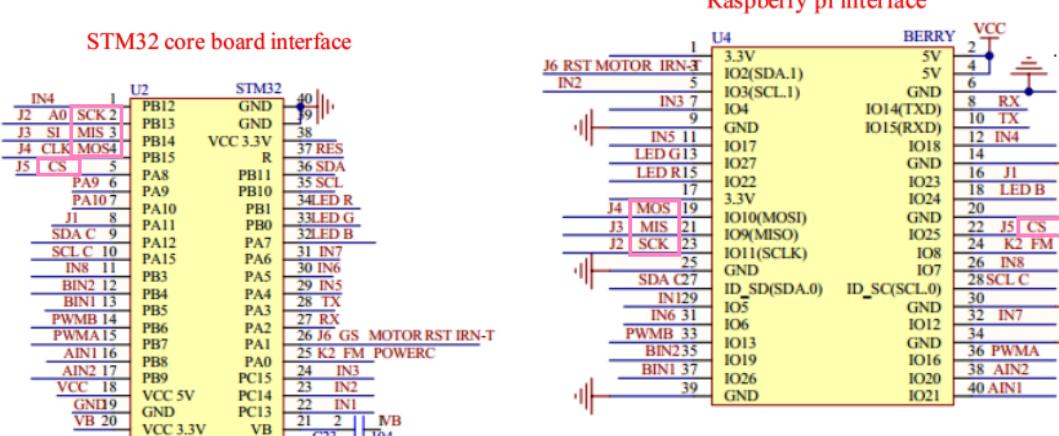


51 mcu core board interface

Arduino UNO interface



IN1	U3	STC	VCC
IN2	P1.0	VCC	39 J6 RSTMOTOR
IN3	P1.1	P0.0	38 J1 CS
IN4	P1.2	P0.1	37 J1 MOS
IN5	P1.3	P0.2	36 J3 MIS
IN6	P1.4	P0.3	35 J2 SCK
IN7	P1.5	P0.4	34 J1
IN8	P1.6	P0.5	33 SDA
	P1.7	P0.6	32 SCL
		P0.7	
51 RES	9		
PA10 TX	10	RST	31 LED R
PA9 RX	11	RXD	30 LED G
IRN 12		TXD	29 LED B
	13	INT0	PSEN
	14	INT1	
	15	T0	28 K2 FM
SDA C	16	T1	27
SCL C	17	WR	26 PWMB
	18	RD	25 BIN2
	19		24 BIN1
	20		23 AIN1
		XTAL2	22 AIN2
		XTAL1	21 PWMA
		GND	P0.0



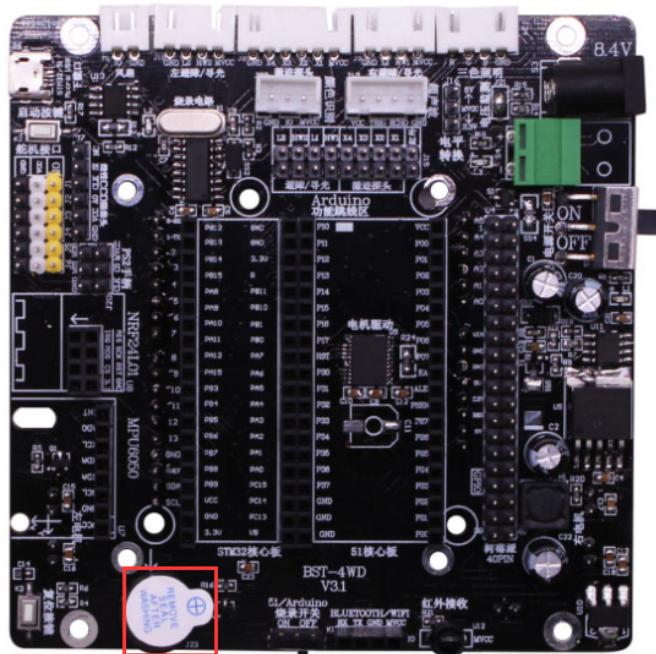
9-2 Schematic diagram

The interface has six pins: VCC, GND, MOS, MIS, CS, SCK. Under normal working conditions, VCC is 5V, and the SPI communication method is adopted between the receiver and the core controller.

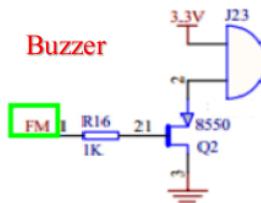
Pin table:

Module interface	Arduino	51controller	STM32	Raspberry Pi
CS	A4	P0.1	PA8	IO25
SCK	A1	P0.4	PB13	IO11
MOS	A3	P0.2	PB15	IO10
MIS	A2	P0.3	PB14	IO9

10.Buzzer

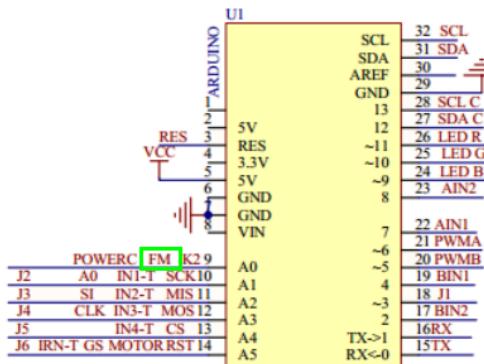


10-1 Position



51 mcu core board interface

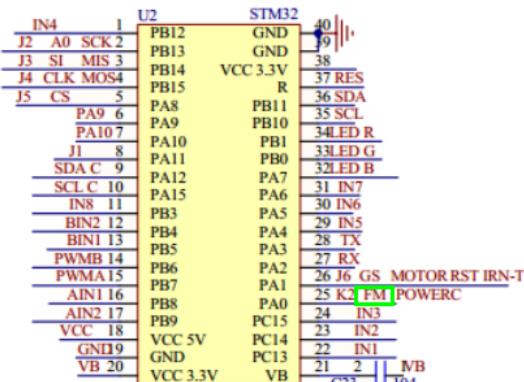
Arduino UNO interface



STM32 core board interface

IN1	1	U3		STC	VCC
IN2	2	P1.0		VCC	40
IN3	3	P1.1		39	J6 RST MOTOR
IN4	4	P1.2		38	J5 CS
IN5	5	P1.3		37	J4 MOS
IN6	6	P1.4		36	J3 MIS
IN7	7	P1.5		35	J2 SCK
IN8	8	P1.6		34	J1
		P1.7		33	SDA
				32	SCL
51 RES 9					
PA10	TX 10	RST		31	LED R
PA9	RX 11	RXD		30	LED G
	IRN 12	TXD		29	LED B
	13	INT0			
	14	INT1			
	15	T0		28	K2 EM
SDA C	16	T1		27	
SCL C	17	WR		26	PWMB
		RD		25	BIN2
	18			24	BIN1
	19	XTAL2		23	AIN1
	20	XTAL1		22	AIN2
		GND		21	PWMA

Raspberry pi interface



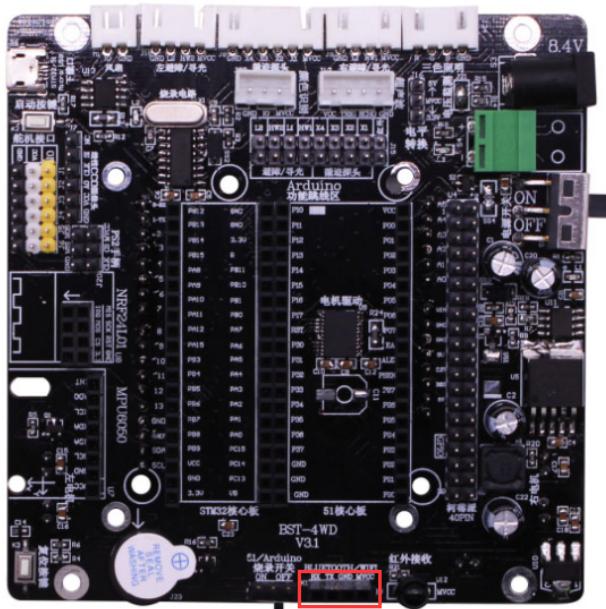
10-2 Schematic diagram

The active buzzer is used here.

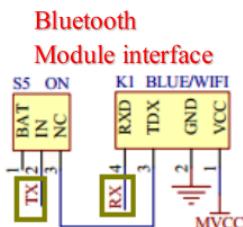
Pin table:

Module interface	Arduino	51controller	STM32	Raspberry Pi
FM	A0	P2.7	PA0	IO8

11.Bluetooth/WIFI module interface



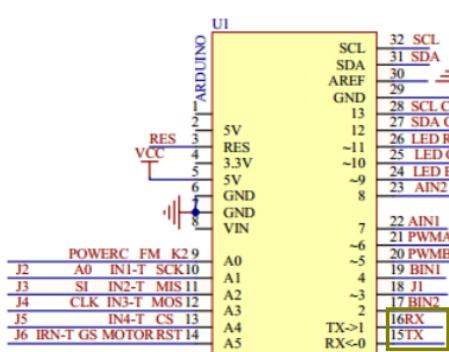
11-1 Position



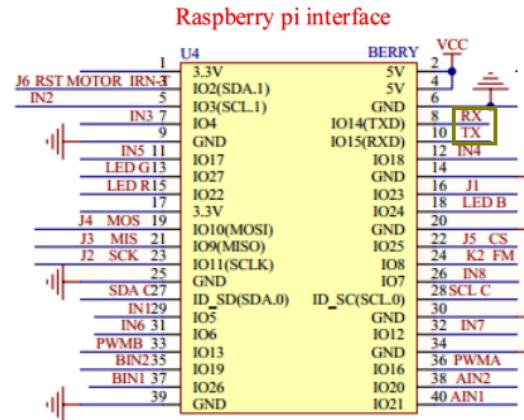
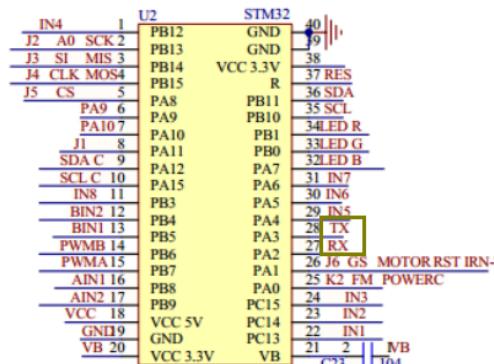
51 mcu core board interface

IN1	U3	STC	VCC
IN2	P1.0	VCC	39 J6 RSTMOTOR
IN3	P0.0	38 J5 CS	
IN4	P1.2	P0.1	37 J4 MOS
IN5	P1.3	P0.2	36 J3 MIS
IN6	P1.4	P0.3	35 J2 SCK
IN7	P1.5	P0.4	34 J1
IN8	P1.6	P0.5	33 SDA
	P1.7	P0.6	32 SCL
		P0.7	
	51 RES	RST	31 LED R
	PA10 TX	RXD	30 LED G
	PA9 RX	TXD	29 LED B
	IRN	INTO	
	12	INT1	
	13	T0	28 K2 FM
	27 SDA C	T1	27
	26 LED R	WR	26 PWMB
	-11		25 BIN2
	-10		24 BIN1
	24 LED G		23 AIN1
	23 AIN2		22 AIN2
	22 AIN1		21 PWMA
	21 PWMA		
	19 BIN1		
	18 J1		
	-3		
	17 BIN2		
	16 RX		
	15 TX		
		XTAL2	P2.2
		XTAL1	P2.1
		GND	P2.0

Arduino UNO interface



STM32 core board interface



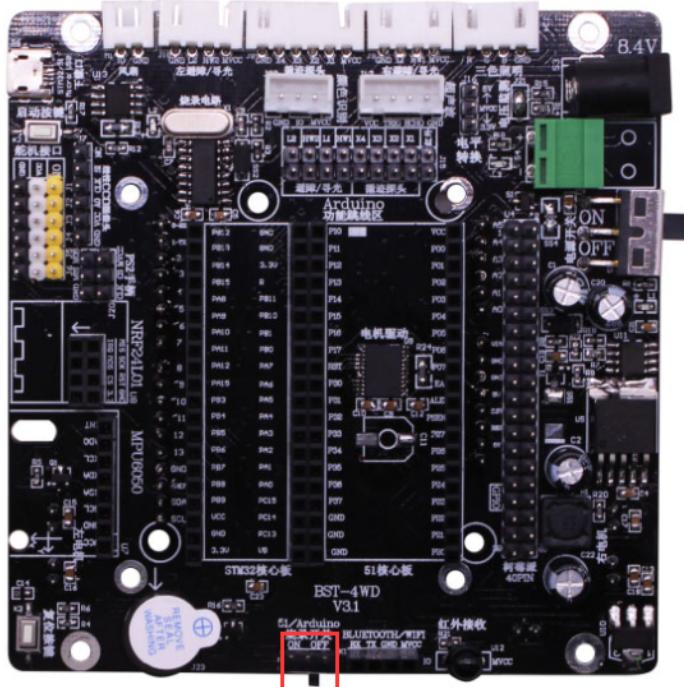
11-2 Schematic diagram

The interface has four pins: VCC, GND, TX, RX. VCC is 5V under normal working conditions, where Bluetooth uses serial communication.

Pin table:

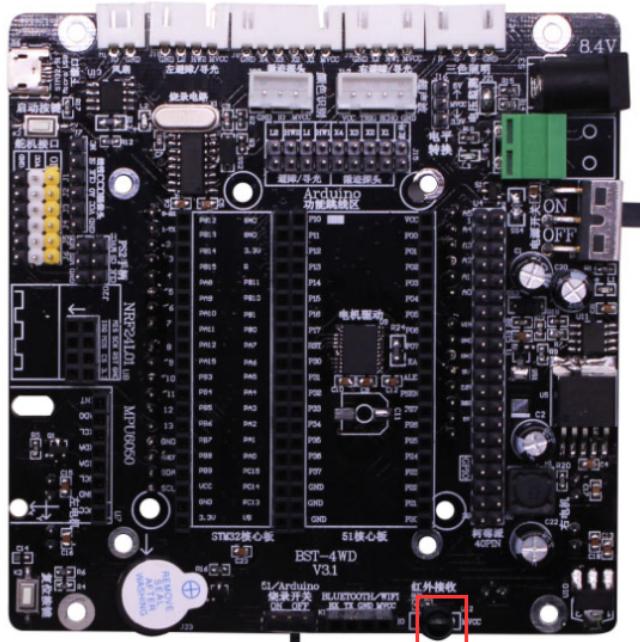
Module interface	Arduino	51controller	STM32	Raspberry Pi
TX	0	P3.0	PA3	IO15
RX	1	P3.1	PA2	IO14

Note: When using the serial port, for example: print data, burn the program through the CH340 serial port, you need to unplug the Bluetooth module. When using the Bluetooth module, you need to turn the programming switch next to the interface to OFF.



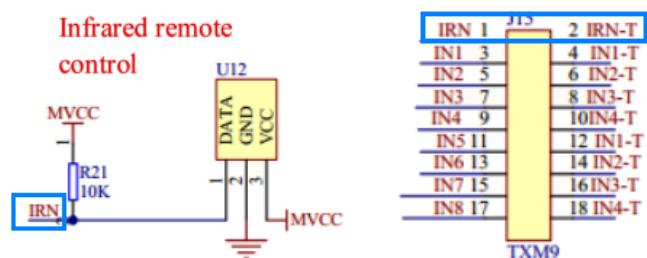
11-3 Switch position for burning

12. Infrared receiver

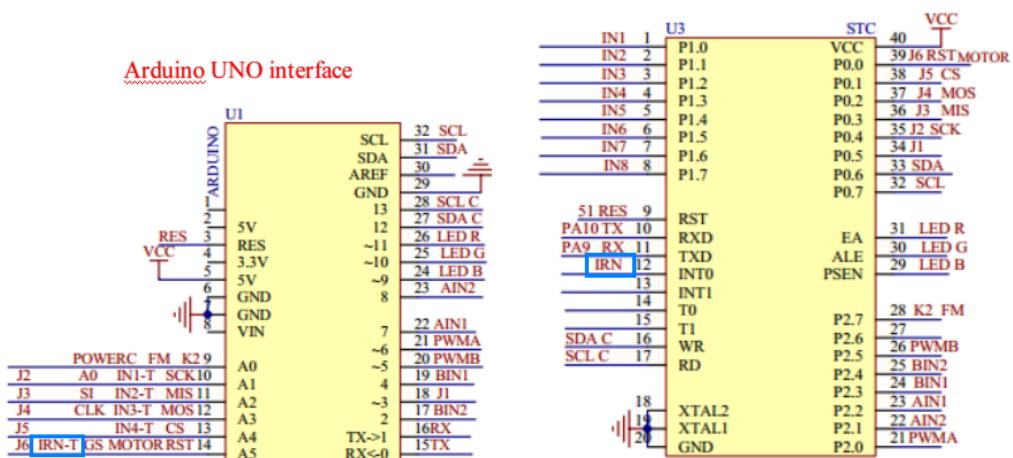


12-1 Position

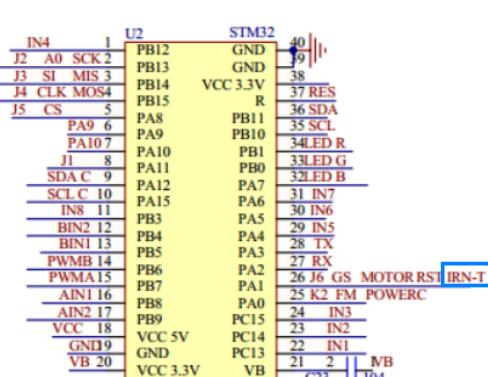
Arduino function switch



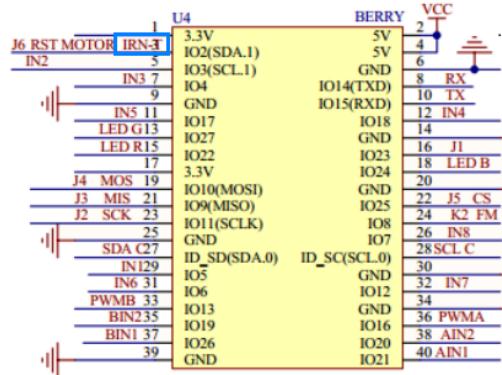
51 mcu core board interface



STM32 core board interface



Raspberry pi interface



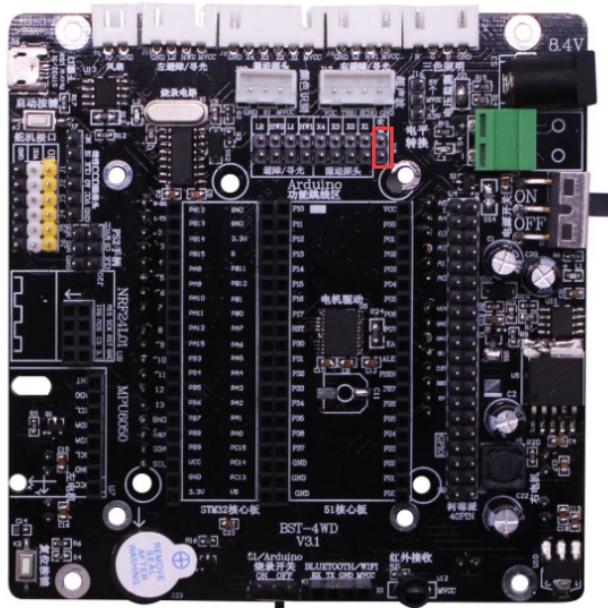
12-2 Schematic diagram

The infrared remote control function needs to use our dedicated remote control to be implemented normally.

Pin table:

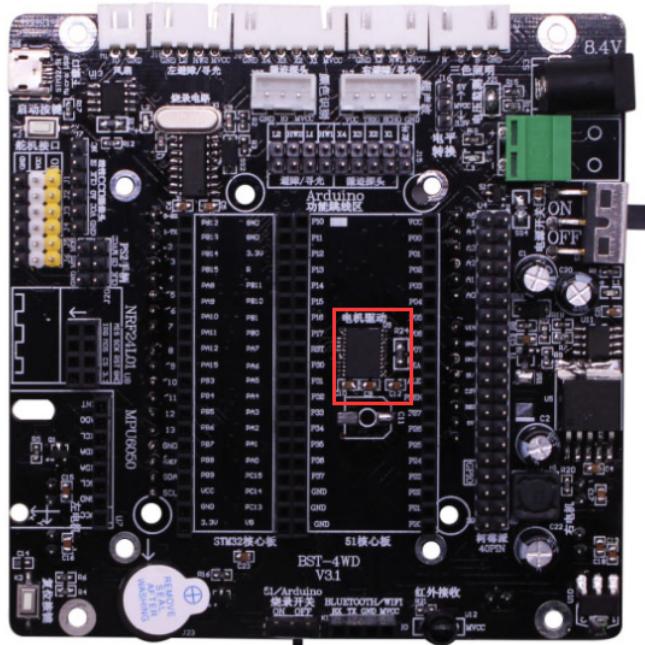
Module interface	Arduino	51controller	STM32	Raspberry Pi
IRN	A5	P3.2(INT0)	PA1	IO2

Note: When using the infrared remote control, you need to connect the infrared jumper cap on the expansion board. And unplug the grayscale (color recognition module) and the small fan.

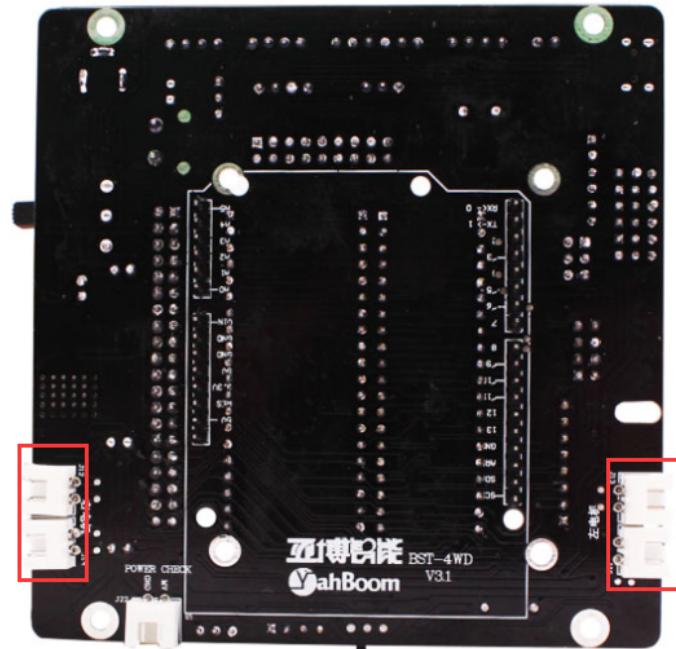


12-3 Position with jumper cap

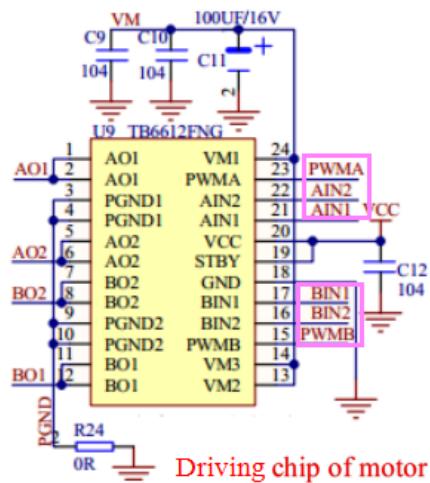
13. Motor driver circuit/interface



13-1 Motor driver chip position

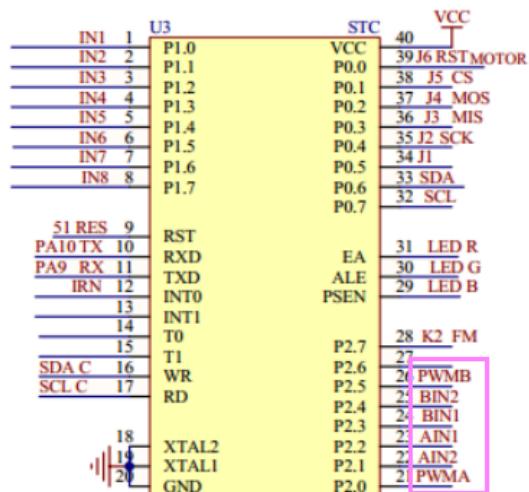
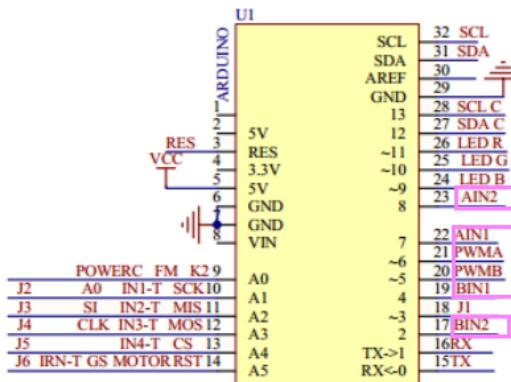


13-1 Motor interface position

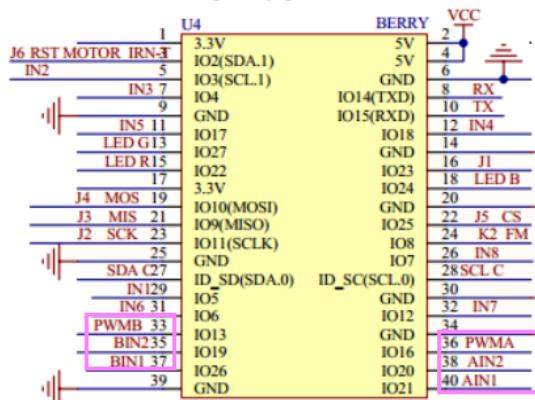
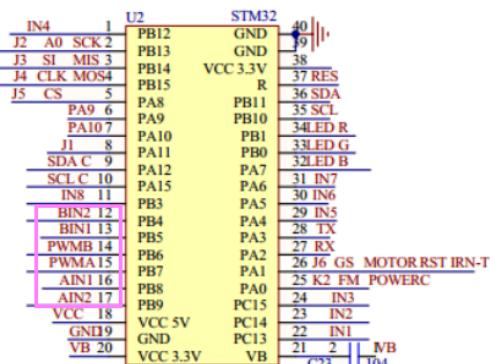


51 mcu core board interface

Arduino UNO interface



STM32 core board interface



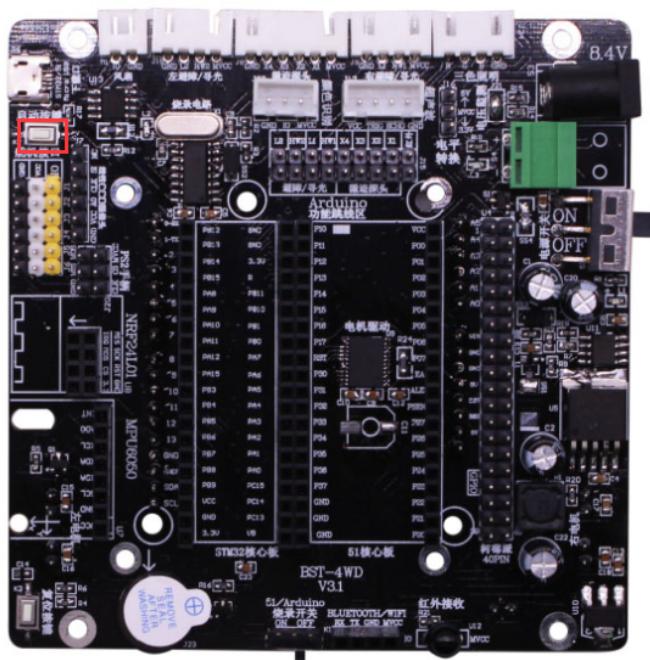
13-3 Schematic diagram

Control two motors with two PWM to adjust the direction and speed of the motor.

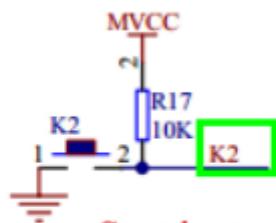
Pin table:

Module interface	Arduino	51controller	STM32	Raspberry Pi
PWMA	~6	P2.0	PB7	IO16
PWMB	~5	P2.5	PB6	IO13
AIN1	7	P2.2	PB8	IO21
AIN2	8	P2.1	PB9	IO20
BIN1	4	P2.3	PB5	IO26
BIN2	2	P2.4	PB4	IO19

14. Start button

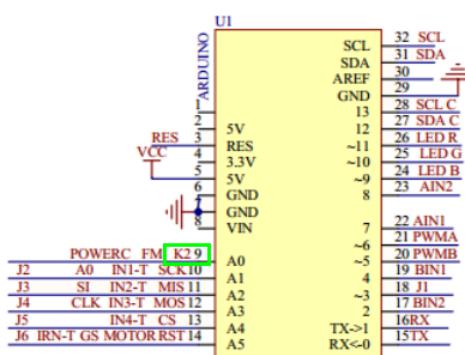


14-1 Position



Start button

Arduino UNO interface

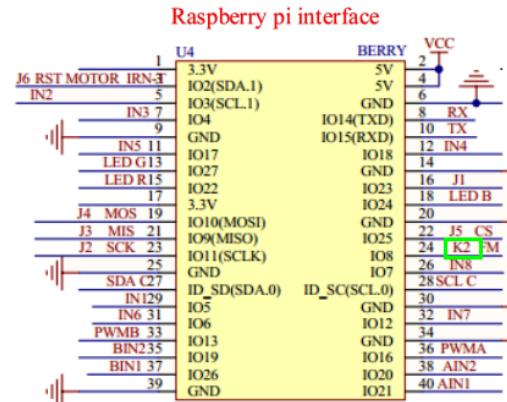


51 mcu core board interface

IN1	1	U3		STC	VCC
IN2	2	P1.0		40	
IN3	3	P1.1		39	J6 RST MOTOR
IN4	4	P1.2		38	J5 CS
IN5	5	P1.3		37	J4 MOS
IN6	6	P1.4		36	J3 MIS
IN7	7	P1.5		35	J2 SCK
IN8	8	P1.6		34	J1
		P1.7		33	SDA
				32	SCL
51 RES	9				
PA10 TX	10	RST		31	LED R
PA9 RX	11	RXD		30	LED G
IRN	12	TXD		29	LED B
	13	INT0			
	14	INT1			
	15	T0		28	K2 FM
SDA C	16	T1		27	
SCL C	17	WR		26	PWMB
	18	RD		25	BIN2
	19	XTAL2		24	BIN1
	20	XTAL1		23	AIN1
		GND		22	AIN2
				21	PWMA

STM32 core board interface

	IN4	U2	STM32
J2	A0	SCK 2	PB12 GND
J3	SI	MIS 3	PB13 GND
J4	CLK	MOS4	PB14 VCC 3.3V
J5	CS		PB15 R 37 RES
PA9	6		PA8 PB11 36 SDA
PA10	7		PA9 PB10 35 SCL
J1	8		PA10 PB1 34 LED R
SDA C	9		PA11 PB0 33 LED G
SCL C	10		PA12 PA7 32 LED B
IN8	11		PA15 PA6 31 IN7
BIN2	12		PB3 PA5 30 IN6
BIN1	13		PB4 PA4 29 IN5
PWMB	14		PB5 PA3 28 TX
PWMA	15		PB6 PA2 27 RX
AIN1	16		PB7 PA1 26 J6 GS_MOTOR RST IRN-T
AIN2	17		PB8 PA0 23 K2 M_POWERC
VCC	18		PB9 PC15 22 IN1
GND	19		VB PC14 21 2 NB
VB	20		VCC 3.3V PC13 GND 39



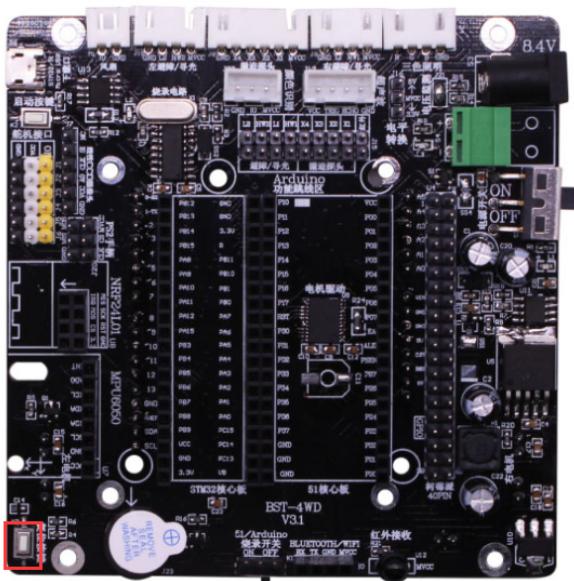
14-2 Schematic diagram

This is a start button that can be defined to turn on a feature.

Pin table:

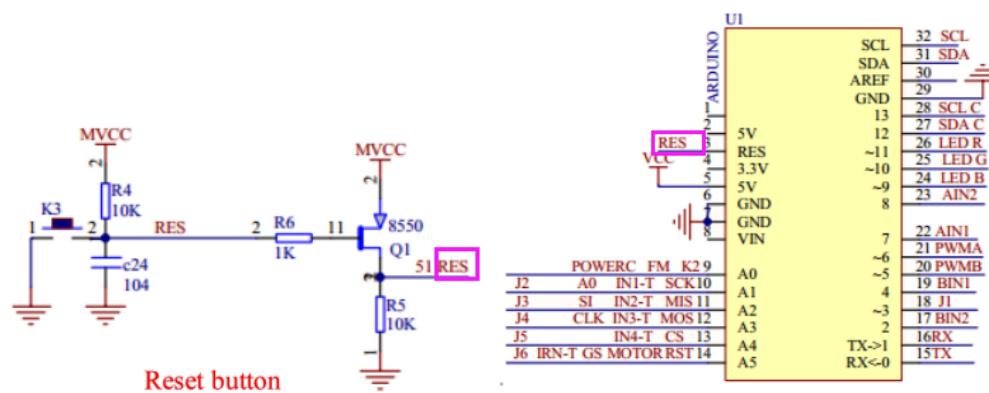
Module interface	Arduino	51controller	STM32	Raspberry Pi
K2	A0	P2.7	PA0	IO8

15. Reset button



15-1 Position

Arduino UNO interface



51 mcu core board interface

IN1	1	U3	STC	40 VCC
IN2	2	P1.0	VCC	39 J6 RST MOTOR
IN3	3	P1.1	P0.0	38 J5 CS
IN4	4	P1.2	P0.1	37 J4 MOS
IN5	5	P1.3	P0.2	36 J3 MIIS
IN6	6	P1.4	P0.3	35 J2 SCK
IN7	7	P1.5	P0.4	34 J1
IN8	8	P1.6	P0.5	33 SDA
		P1.7	P0.6	
			P0.7	32 SCL
51 RES	9	RST		
PA10 TX	10	RXD	EA	31 LED R
PA9 RX	11	TXD	ALE	30 LED G
IRN	12	INT0	PSEN	29 LED B
	13	INT1		
	14	T0		
SDA C	16	T1	P2.7	28 K2 FM
SCL C	17	WR	P2.6	26 PWM_B
	18	RD	P2.5	25 BIN2
		XTAL2	P2.4	24 BIN1
		XTAL1	P2.3	23 AIN1
		GND	P2.2	22 AIN2
			P2.1	21 PWM_A
			P2.0	

STM32 core board interface

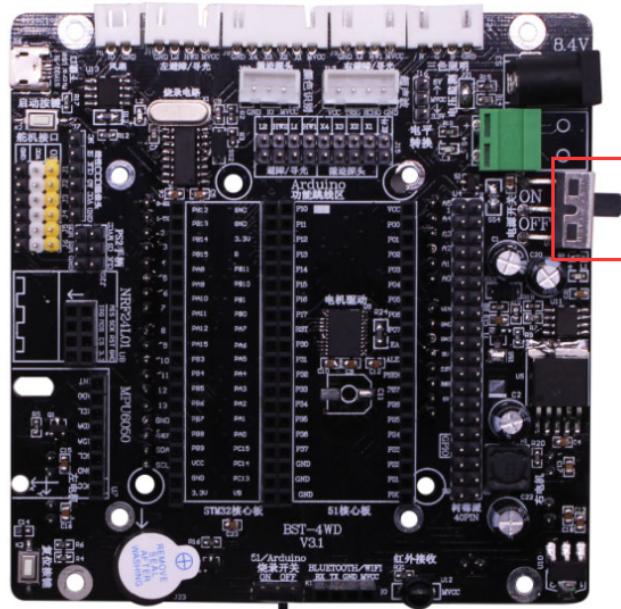
IN4	1	U2	STM32	40 VCC
J2	A0	SCK 2	PB12	GND
J3	SI	MIS 3	PB13	GND
J4	CLK	MOS4	PB14	VCC 3.3V
J5	CS	5	PB15	R
			PA9	37 RES
			PA8	36 SDA
			PA9	35 SCL
			PA10	34 LED R
			PA11	33 LED G
			PA12	32 LED B
			PA13	31 IN7
			PA14	30 IN6
			PA15	29 IN5
			PA16	28 TX
			PA17	27 RX
			PA18	26 J6 GS MOTOR RST IRN-T
			PA19	25 K2 FM POWERC
			PA20	24 IN3
			PC15	23 IN2
			PC14	22 IN1
			PC13	21 2 NB
			VB	C23 T04
			VB	

15-2 Schematic diagram

This is a reset button that re-energizes the expansion board, which is equivalent to restarting the expansion board and the core controller.

Note: The Raspberry Pi core controller does not need to connect to this button.

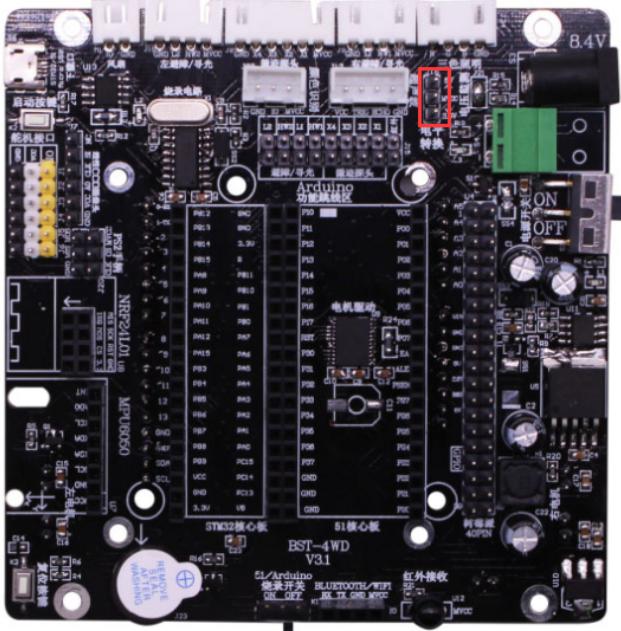
16. Power button



16-1 Position

It is used to control the power switch of the expansion board.

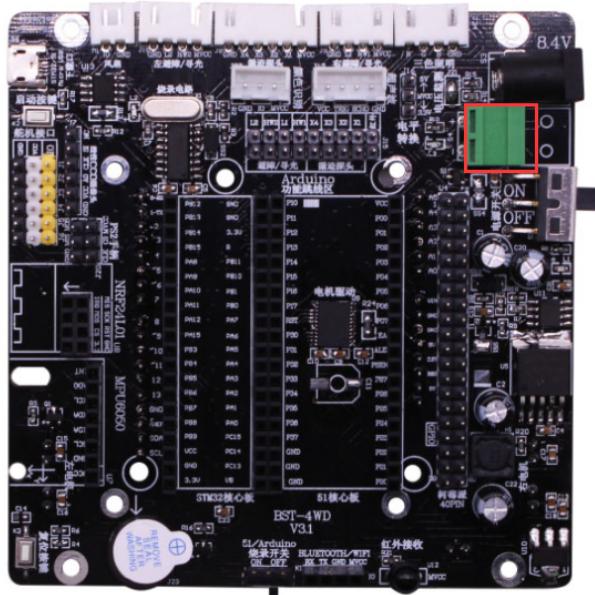
17. 5V/3.3V power switch



17-1 Position

If the top two pin headers are connected by a jumper cap, it is a 5V power supply; if the lower two pin headers are connected, it is a 3.3V power supply.

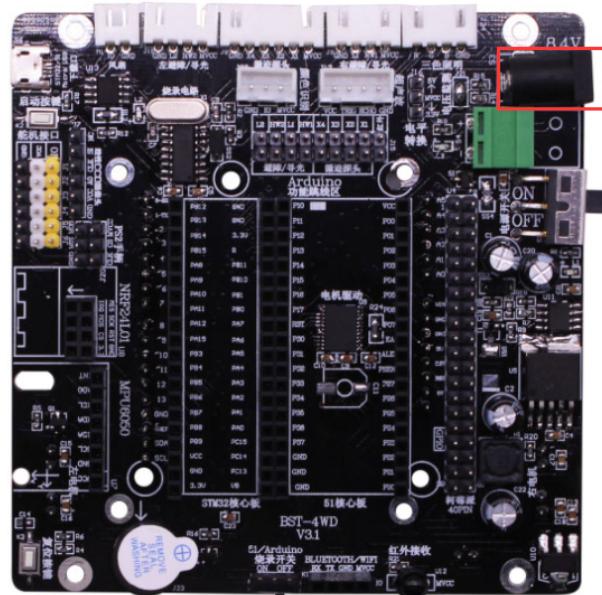
18. Battery box interface



18-1 Position

Plug the special battery box here to supply power to the expansion board. The power supply voltage of the expansion board cannot exceed 12.6v.

19. Charging socket



19-1 Position

Here you can charge the battery with a 12.6V in-line charger.