



User Manual
Uncooled Infrared
Core module
V2.1

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1. Versions

Version	Date	Note
V1.0	2021-12	Initial version
V1.2	2022-06	Improvement in protocol
V1.3	2023-03	Dimension diagram modification
V2.0	2024-05	Additional product model and corresponding interface description
V2.1	2024-07	Additional description on network version of core module

2. Cautions

To keep you and others away from harm or to keep your product away from damage, please read the following information before using your product. If the product is damaged due to improper use against these precautions, the damaged will not be covered by the warranty.

- 1) When in contact with products, please wear anti-static wristbands, direct contact with bare hands is prohibited;
- 2) To prevent the product from damp or moist, please do not touch the product or cables with wet hands;
- 3) The product should be stored in a cool, dry environment without strong electromagnetic fields;
- 4) The ideal operating temperature for the product is -20 °C to 50 °C;
- 5) Do not touch the detector window with your hands or other objects;
- 6) Do not use diluents to clean the product;
- 7) Please do not unplug the cables without disconnecting the power;
- 8) Before power on, please ensure that the polarity of the power is correct;
- 9) When the product is in use, it has to be powered by the specified voltage to prevent damage;
- 10) Regardless of whether the product is turned on or off, do not aim the product directly at high-intensity radiation sources such as the sun to avoid causing malfunction or even damage;
- 11) Please do not disassemble the product. If there is any malfunction, please contact us for professional repair.

3. Introduction

The uncooled infrared module developed by xxx adopts the VOX uncooled infrared focal plane detector with ceramic encapsulated made domestically. It features small size, light weight, low power consumption, clear image, and high sensitivity. It can be widely used in optoelectronic pods, automobile applications, security monitoring, firefighting and rescue, investigation, border and coastal defense, maritime affairs, electrical engineering, electronic industry, scientific research and other fields. Development of infrared thermal imaging products using this product can be shortened with less difficulty of secondary development.



4.Naming Rule

<u>U62</u>	<u>H</u>	<u>01</u>	<u>P</u>	<u>35</u>	<u>0</u>	<u>S</u>
Specification	Frame rate	Digital video	Analog video	Lens	Serial port	External synchronization
U: uncooled 32:384x288,12um 62:640x512,12um 122:1280x1024,12um 37:384x288,17um 67:640x512,17um	C:25Hz H:30Hz P:50Hz	00:no 01:BT601 02:BT656 03:BT1120 04: reserved 05:Cameralink 06:CML 07:Ethernet 08:LVDS 09:LVC MOS 10:SDI	0:no A:AHD N:NTSC P:PAL	00:no 25:25mm 35:35mm F0:focus FF:focus/zoom	0:TTL 1:RS232 2:RS422 3:RS485	0:no S:yes
Note: "*" mark in the product model indicates that the product is a completely domestic made product.						

Note: The product naming rules is an interpretation of the product model, subject to the information provided by xxx,for specific product selection, please consult sales or technical support.

5. Parameter

Model	Voltage	Typical Voltage	Power consumption(stable)	NETD	MRTD	Weight	Interface	Dimension
U32P00PFF10 U62P00PFF10 U37P00PFF10 U67P00PFF10	DC6-15V	DC12V	≤1.5W	≤40mK	≤400mK	≤50g	Refer to 7.1	Refer to 8.1
U62P05PFF10 U67P05PFF10	DC6-15V	DC12V	≤2.0W	≤40mK	≤400mK	≤55g	Refer to 7.1	Refer to 8.1
U32P01P0000 U62P01P0000 U37P01P0000 U67P01P0000	DC4-7V	DC5V	≤1.2W	≤40mK	≤400mK	≤45g	Refer to 7.2	Refer to 8.2
U62C02PFF00	DC6-15V	DC12V	≤1.2W	≤40mK	≤400mK	≤45g	Refer to 7.3	Refer to 8.2

U62P03PF000	DC4-7V	DC5V	$\leq 1.2W$	$\leq 40mK$	$\leq 400mK$	$\leq 45g$	Refer to 7.4	Refer to 8.2
U62P06P0010	DC4-7V	DC5V	$\leq 1.5W$	$\leq 40mK$	$\leq 400mK$	$\leq 45g$	Refer to 7.5	Refer to 8.2
U62P08P0000	DC4-7V	DC5V	$\leq 1.2W$	$\leq 40mK$	$\leq 400mK$	$\leq 45g$	Refer to 7.6	Refer to 8.2
U62C07PFF00	DC12V	DC12V	$\leq 2.5W$	$\leq 40mK$	$\leq 400mK$	$\leq 100g$	Refer to 7.7	Refer to 8.3
U62C10P0020	DC6-15V	DC12V	$\leq 1.5W$	$\leq 40mK$	$\leq 400mK$	$\leq 50g$	Refer to 7.8	Refer to 8.4
U122H05NFF20 U122H100FF20	DC6-15V	DC12V	$\leq 3.5W$	$\leq 50mK$	$\leq 500mK$	$\leq 150g$	Refer to 7.9	Refer to 8.5
U122P0500020*	DC4-7V	DC5V	$\leq 5.0W$	$\leq 50mK$	$\leq 500mK$	$\leq 160g$	Refer to 7.10	Refer to 8.6
U122C080FF20* U122H100FF20*	DC6-15V	DC12V	$\leq 3.5W$	$\leq 50mK$	$\leq 500mK$	$\leq 150g$	Refer to 7.11	Refer to 8.7

Note:

- 1) The power consumption can be saved by about 0.2W, if the analog video output of the above product is turned off and only digital video is retained;
- 2) The response waveband of the above products is 8-14 μm .
- 3) "*" mark in the product model indicates that the product is a completely domestic made product.

Features

1. brightness adjustment;
2. contrast adjustment;
3. enhancement adjustment;
4. Noise reduction adjustment;
5. digital zoom: 1-4x(step 1);
6. Upgrade with serial port;
7. mirror image: left/right, up/down;
8. contrast adjustment: auto(default)/manual;

9. image correction: auto/manual/background corrections;
10. External synchronization: can be customized;
11. Picture in picture: can be customized;
12. Hotspot tracking: can be customized;
13. Pseudo color: black hot/white hot(default), other pseudo colors can be customized;
14. Reticle: hidden(default), can be customized as shown/moving;

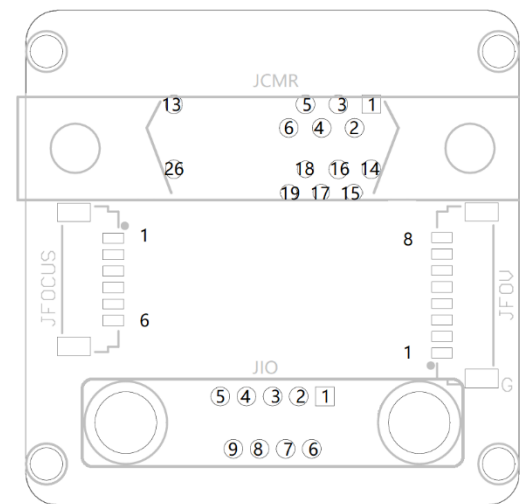
Note: please consult salesman or technical support to find out if customization features are already included.

Environmental parameter

Working temperature	-40°C to +60°C
Storage temperature	-50°C to +70°C
Humidity	95% Relative humidity, non-condensing
Encapsulation	IP45/IP67 (can be customized)

6. Interfaces

6.1. Cameralink interface board



6.1.1 J30J-9ZKN-J(JIO)

The product adopts J30J-9ZKN-J connector, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can use J30J-9TJL to connect with the core module.

6.1.2 12226-1150-00FR (JCMR)

The Cameralink digital signal adopts the 12226-1150-00FR standard interface, users can use the standard SDR26 data cable to connect to the core module.

6.1.3 SM06B-SURS-TF (JFOCUS)

SM06B-SURS-TF is the interface for focusing, users can use a 0.8mm*6p cable with connector to connect to the core module.

6.1.4 SM08B-SURS-TF (JFOV)

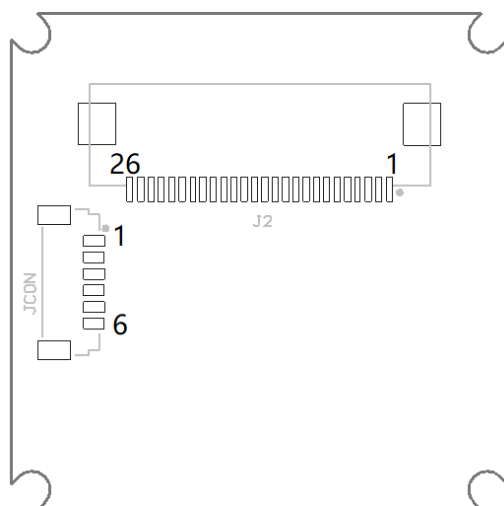
SM08B-SURS-TF is the interface for focusing, users can use a 0.8mm*8p cable with connector to connect to the core module.

6.1.5 Interface definition:

Pin	Definition	Description
JIO		
1	POW+	Power input, DC6V-15V
2	VIDEO	CVBS analog video output, PAL
3	GND	(RS232) serial ground/video ground
4	RS232_RXD	System—> thermal
5	-	NC
6	GND	Power ground
7	-	NC
8	RS232_TXD	Thermal —> system
9	-	NC
JCMR		
1	GND	Power ground
2	CMR_D0-	Data bit: (level 3.3V) D0-
3	CMR_D1-	Data bit: (level 3.3V) D1-
4	CMR_D2-	Data bit: (level 3.3V) D2-
5	CMR_CLK-	Cameralink clock-
6	CMR_D3-	Data bit: (level 3.3V) D3-
7-12	-	NC
13	GND	Power ground
14	GND	Power ground
15	CMR_D0+	Data bit: (level 3.3V) D0+
16	CMR_D1+	Data bit: (level 3.3V) D1+
17	CMR_D2+	Data bit: (level 3.3V) D2+

18	CMR_CLK+	Cameralink clock+
19	CMR_D3+	Data bit: (level 3.3V) D3+
20-25	-	NC
26	GND	Power ground
JFOCUS		
1	VR_BMQ	Connect potentiometer pin 1
2	GND	Connect potentiometer pin 3
3	JFS3	Connect potentiometer pin 2
4	FOS_B	Reserved
5	FOCUS2	focusing motor- (PWM, 100%)
6	FOCUS1	focusing motor+ (PWM, 100%)
JFOV		
1	FOS_LIMIT	Reserved
2	FOV_LIMIT	Reserved
3	VR_BMQ	Connect potentiometer pin 1
4	GND	Connect potentiometer pin 3
5	JFV5	Connect potentiometer pin 2
6	FOV_B	Reserved
7	FOV2	focusing motor- (PWM, 100%)
8	FOV1	focusing motor+ (PWM, 100%)

6.2 BT601 interface board



6.2.1 AFC24-S26FIA-00 (J2)

The product adopts AFC24-S26FIA-00 connector, which includes power supply interface, communication interface, and BT601 digital signal output interface. Users can use a 0.5mm*26PIN FPC cable to connect with the core module.

6.2.2 SM06B-SURS-TF (JCON)

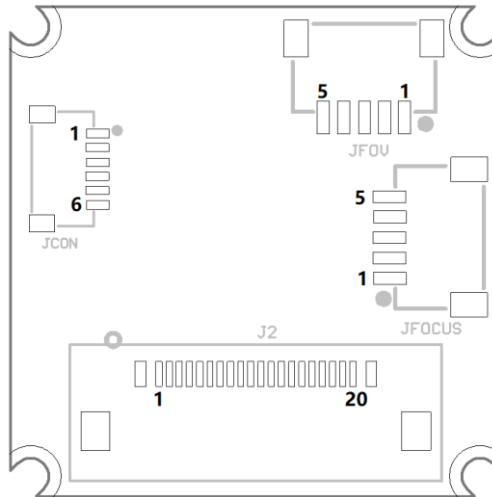
SM06B-SURS-TF is the debug interface, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can use a 0.8mm*6P cable with connector to connect with the core module.

6.2.3 Interface definition:

Pin	Definition	Description
J2		
1	GND	Power ground
2	SN_MCLK	System clock input
3	GND	Power ground
4	SN_PCLK	Clock output of pixels
5	GND	Power ground
6	TTL_TXD	Thermal —> System
7	TTL_RXD	System —> Thermal
8	SN_VD	Field signal
9	SN_HD	Row signal
10-13		NC
14	SN_D0	Data bit: (level 3.3V) D0
15	SN_D1	Data bit: (level 3.3V) D1
16	SN_D2	Data bit: (level 3.3V) D2
17	SN_D3	Data bit: (level 3.3V) D3
18	SN_D4	Data bit: (level 3.3V) D4
19	SN_D5	Data bit: (level 3.3V) D5
20	SN_D6	Data bit: (level 3.3V) D6
21	SN_D7	Data bit: (level 3.3V) D7
22	SN_RST	reserved
23	SN_PWDN	Control to the power of the core enable
24	POW+	Power input, DC4V-7V
25	POW+	Power input, DC4V-7V
26	POW+	Power input, DC4V-7V
JCON		
1	POW+	Power input, DC4V-7V
2	GND	Power ground
3	TTL_RXD	System —> Thermal
4	TTL_TXD	Thermal —> System
5	GND	(TTL) serial ground/video ground

6	VIDEO	CVBS analog video output, PAL
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6.3 BT656 interface board



6.3.1 20455-020E-12 (J2)

The product adopts the 20455-020E-12 connector, which includes the power supply interface, communication interface, and BT656 digital signal output interface. Users can use the 20454-20P cable to connect with the core module.

6.3.2 50408-smt-5p (JFOCUS & JFOV)

50408-smt-5p is the interface for focus and zoom, users can use a 1.0mm*5P cable with connector to connect with the core module.

6.3.3 50408-smt-6p (JCON)

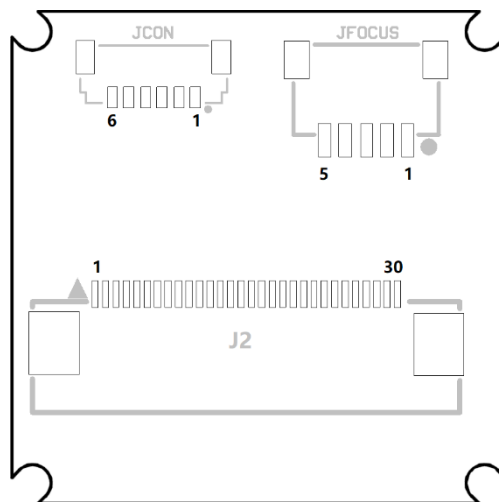
50408-smt-6p is the interface for debug, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can use 1.0mm*6P cable with connector to connect with the core module.

6.3.4 Interface definition:

Pin	Definition	Description
J2		
1	GND	Power ground
2	DV_CLK	System clock

3	GND	Power ground
4	DV0	Data bit: (level 3.3V) D0
5	DV1	Data bit: (level 3.3V) D1
6	DV2	Data bit: (level 3.3V) D2
7	DV3	Data bit: (level 3.3V) D3
8	GND	Power ground
9	DV4	Data bit: (level 3.3V) D4
10	DV5	Data bit: (level 3.3V) D5
11	DV6	Data bit: (level 3.3V) D6
12	DV7	Data bit: (level 3.3V) D7
13	GND	Power ground
14	POW+	Power input, DC6-15V
15	POW+	Power input, DC6-15V
16	GND	Power ground
17	TTL_TXD	Thermal —> System
18	GND	Power ground
19	TTL_RXD	System —> Thermal
20	GND	Power ground
JFOCUS		
1	REF	Standard voltage 1.25V
2	DIST1	Potentiometer check
3	GND	Power ground
4	FOCUS2	Focusing motor- (PWM, 100%)
5	FOCUS1	Focusing motor+ (PWM, 100%)
JFOV		
1	REF	Standard voltage 1.25V
2	DIST2	Potentiometer check
3	GND	Power ground
4	FOV2	Focusing motor- (PWM, 100%)
5	FOV1	Focusing motor+ (PWM, 100%)
JCON		
1	POW+	Power input, DC6-15V
2	GND	Power ground
3	TTL_RXD	System —> Thermal
4	TTL_TXD	Thermal —> System
5	GND	(TTL) serial ground/video ground
6	VIDEO	CVBS analog video output, PAL

6.4 BT1120 interface board



6.4.1 FFC05001-30SBB124W5M (J2)

The product adopts FFC05001-30SBB124W5M connector, which includes power supply interface, communication interface, and BT1120 digital signal output interface. Users can use a 0.5mm*30P FPC cable to connect with the core module.

6.4.2 50408-smt-5p (JFOCUS)

50408-smt-5p is the interface for focus, and users can use a 1.0mm*5P cable with connector to connect with the core module.

6.4.3 SM06B-SURS-TF (JCON)

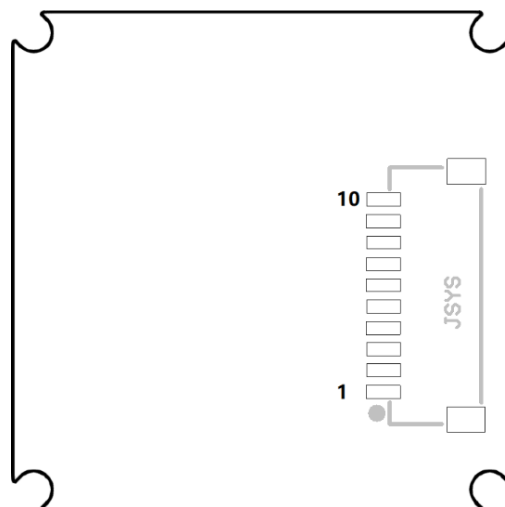
SM06B-SURS-TF is the interface for debug, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can use a 0.8mm*6P cable with connector to connect with the core module.

6.4.4 Interface definition:

Pin	Definition	Description
J2		
1	DV_CLK	System clock
2	DV0	Data bit: (level 3.3V) D0
3	DV1	Data bit: (level 3.3V) D1
4	DV2	Data bit: (level 3.3V) D2
5	DV3	Data bit: (level 3.3V) D3
6	DV4	Data bit: (level 3.3V) D4

7	DV5	Data bit: (level 3.3V) D5
8	DV6	Data bit: (level 3.3V) D6
9	DV7	Data bit: (level 3.3V) D7
10	DV8	Data bit: (level 3.3V) D8
11	DV9	Data bit: (level 3.3V) D9
12	DV10	Data bit: (level 3.3V) D10
13	DV11	Data bit: (level 3.3V) D11
14	DV12	Data bit: (level 3.3V) D12
15	DV13	Data bit: (level 3.3V) D13
16	DV14	Data bit: (level 3.3V) D14
17	DV15	Data bit: (level 3.3V) D15
18	DV_HS	Reserved
19	DV_VS	Reserved
20	DV_DE	Reserved
21	VIDEO	CVBS analog video output, PAL
22	GND	(TTL) serial ground/video ground
23	TTL_RXD	System —> Thermal
24	TTL_TXD	Thermal—> System
25	GND	Power ground
26	GND	Power ground
27	GND	Power ground
28	POW+	Power input, DC4V-7V
29	POW+	Power input, DC4V-7V
30	POW+	Power input, DC4V-7V
JFOCUS		
1	REF3V	Standard voltage 3V
2	DIST1	Potentiometer check
3	GND	Power ground
4	FOCUS2	Focusing motor- (PWM, 100%)
5	FOCUS1	Focusing motor+ (PWM, 100%)
JCON		
1	POW+	Power input, DC4V-7V
2	GND	Power ground
3	TTL_RXD	System —> Thermal
4	TTL_TXD	Thermal—> System
5	GND	(TTL) serial ground/video ground
6	VIDEO	CVBS analog video output, PAL

6.5 CML interface board



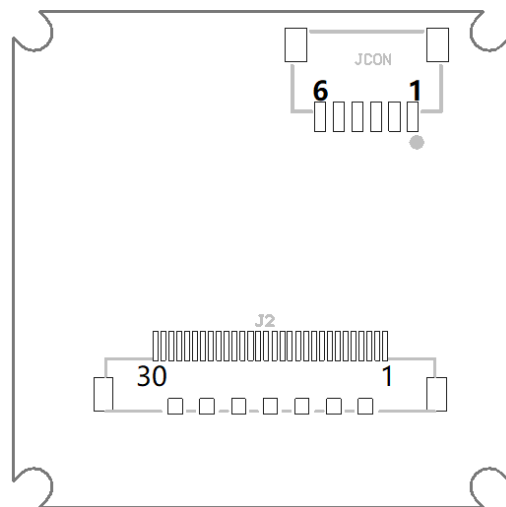
6.5.1.50408-smt-10p (JSYS)

The product adopts 50408-smt-10p connector, which includes power supply interface, communication interface, and CML digital signal output interface. Users can use a 1.0mm*10P cable with connector to connect with the core module.

6.5.2. Interface definition:

Pin	Definition	Description
1	GND	Power ground
2	POW+	Power input, DC4V-7V
3	GND	Video ground
4	VIDEO	CVBS analog video output, PAL
5	GND	Digital signal ground
6	CML+	CML digital signal+
7	CML-	CML digital signal-
8	GND	Serial ground
9	RS232_TXD	Thermal —> System
10	RS232_RXD	System —> Thermal

6.6 LVDS interface board



6.6.1 USL00-30L (J2)

The product adopts the “USL00-30L coaxial,0.4mm*30P horizontal patch” connector, which includes the power supply interface, communication interface, and LVDS digital signal output interface. Users can use the USL20-30SS series cable to connect with the core module.

6.6.2 50408-smt-6p (JCON)

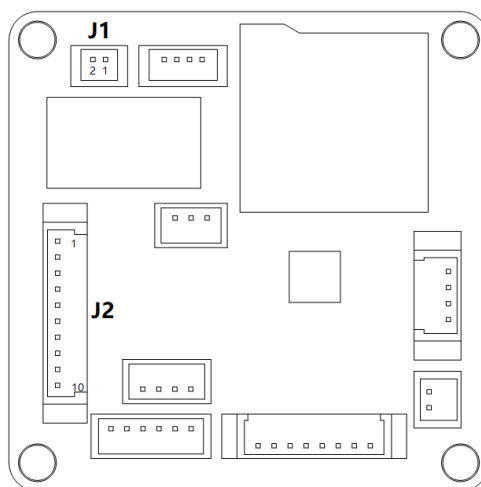
50408-smt-6p is the interface for debug, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can use the 1.0mm*6P cable to connect with the core module.

6.6.3 Interface definition:

Pin	Definition	Description
J2		
1	LVDS_D3+	Data bit: (level 3.3V) D3+
2	LVDS_D3-	Data bit: (level 3.3V) D3-
3	LVDS_CLK+	System clock +
4	LVDS_CLK-	System clock -
5	LVDS_D2+	Data bit: (level 3.3V) D2+
6	LVDS_D2-	Data bit: (level 3.3V) D2-
7	LVDS_D1+	Data bit: (level 3.3V) D1+
8	LVDS_D1-	Data bit: (level 3.3V) D1-
9	LVDS_D0+	Data bit: (level 3.3V) D0+
10	LVDS_D0-	Data bit: (level 3.3V) D0-

11	GND	Power ground
12	TTL_TXD	Thermal —> System
13	TTL_RXD	System —> Thermal
14-18	POW+	Power input, DC4V-7V
19	KEY_IN	reserved
20	GND	Power ground
21	LVDS_D7+	Data bit: (level 3.3V) D7+
22	LVDS_D7-	Data bit: (level 3.3V) D7-
23	LVDS_D6+	Data bit: (level 3.3V) D6+
24	LVDS_D6-	Data bit: (level 3.3V) D6-
25	VIDEO	CVBS analog video output, PAL
26	EXT_SYNC	reserved
27	LVDS_D5+	Data bit: (level 3.3V) D5+
28	LVDS_D5-	Data bit: (level 3.3V) D5-
29	LVDS_D4+	Data bit: (level 3.3V) D4+
30	LVDS_D4-	Data bit: (level 3.3V) D4-
JCON		
1	POW+	Power input, DC4V-7V
2	GND	Power ground
3	TTL_RXD	System —> Thermal
4	TTL_TXD	Thermal —> System
5	GND	(TTL) serial ground/video ground
6	VIDEO	CVBS analog video output, PAL

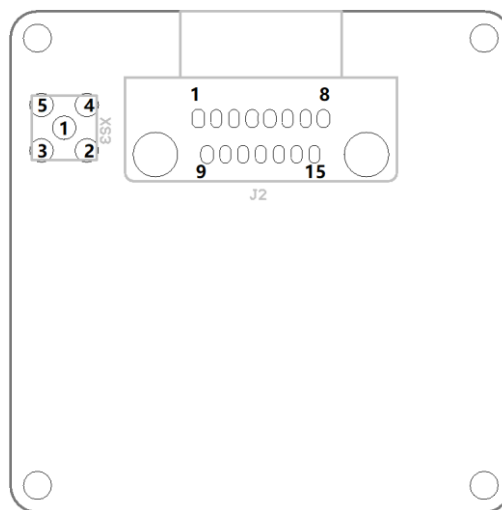
6.7 Network interface board



6.7.1 Interface definition:

Pin	Definition	Description
J1		
1	GND	Power ground
2	POW+	Power input, DC12V
J2		
1、2	NC	/
3	RJ45_1(TX+)	Network signal TX+
4	RJ45_2(TX-)	Network signal TX-
5	RJ45_3(RX+)	Network signal RX+
6、7	NC	/
8	RJ45_3(RX+)	Network signal RX-
9、10	NC	/

6.8 SDI interface board



6.8.1 MDC1-15PW1 (J2)

The product adopts MDC1-15PW1 connector, which includes power supply interface, communication interface, and CVBS analog video output interface. Users can connect the MDC1-15SL5 series cables to connect to the core module.

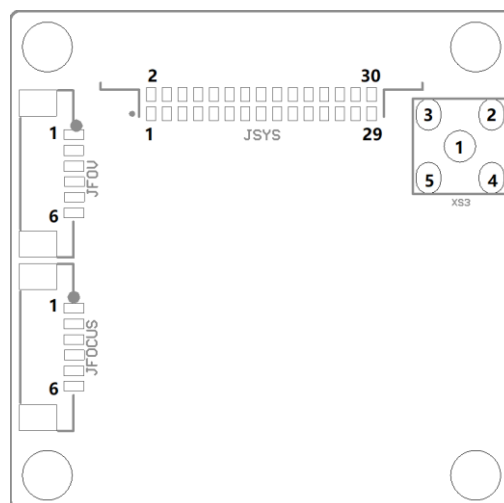
6.8.2 BWMMCX-KWE (XS3)

The product adopts BWMMCX-KWE connector, which includes the SDI signal output interface. Users can use the MMCX-JW series cables to connect with the core module.

6.8.3 Interface definition:

Pin	Definition	Description
J2		
1	POW+	Power input, DC6-15V
2	POW+	Power input, DC6-15V
3	POW+	Power input, DC6-15V
4	RS422_T+	Thermal —> System
5	RS422_T-	Thermal —> System
6	RS422_R+	System —> Thermal
7	RS422_R-	System —> Thermal
8	ESYNC_R+	Reserved
9	GND	Power ground
10	GND	Power ground
11	GND	Power ground
12	VIDEO	CVBS analog video output, PAL
13	GNDV	Analog video ground
14	GND	(RS422) serial ground
15	ESYNC_R-	Reserved
XS3		
1	SDI_VIDEO1	SDI signal
2-5	GND	Power ground

6.9 Cameralink/SDI Interface Board



6.9.1. TFM-115-02-L-DH (JSYS)

The product adopts the TFM-115-02-L-DH connector, which includes power supply interface, communication interface, CVBS analog video, and Cameralink output interface. Users can use the SFSD-15-28-H-10.00-DR-NDX series cables to connect to the core module.

6.9.2. BWMCX-KE (XS3)

The product adopts the BWMCX-KE connector as the SDI signal output interface. Users can use the JBNC/J3/MCX-KWHD series cables to connect to the core module.

6.9.3 MOLEX/53261-0671/1.25mm*6P (JFOCUS and JFOV)

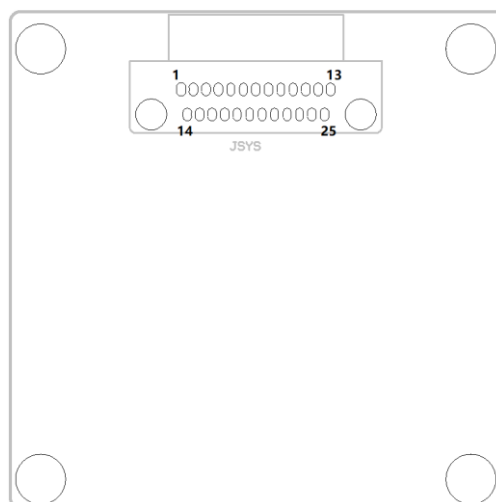
MOLEX/53261-0671/1.25mm*6P is the interface for focusing and zooming, Users can use cable with the 1.25mm 6*p plug to connect to the core module.

6.9.4 Interface definition:

pin	Definition	note
JSYS		
1	GND	Power ground
2	GND	Power ground
3	POW+	Power input, DC6V-15V
4	V3.3O	Power output (3.3V-DC/100mA)
5	GND	Power ground
6	GND	Power ground
7	RS422_TX-	Thermal—>system
8	RS422_TX+	Thermal—>system
9	RS232_RX	Function extension
10	RS422_RX+	Thermal—>system
11	RS232_TX	Function extension
12	RS422_RX-	system—>thermal
13	D0-	Data bit: (Level 3.3V) D0-
14	KEY0	Function extension
15	D0+	Data bit: (Level 3.3V) D0+
16	KEY1	Function extension
17	D2-	Data bit: (Level 3.3V) D2-
18	KEY2	Function extension
19	D2+	Data bit: (Level 3.3V) D2+ -

20	KEY3	Function extension
21	CLK-	Cameralink clock-
22	D1-	Data bit: (Level 3.3V) D1-
23	CLK+	Cameralink clock+
24	D1+	Data bit: (Level 3.3V) D1+
25	EXT_SYNC+	Function extension (external synchronization+)
26	D3-	Data bit: (Level 3.3V) D3-
27	GNDV	analog video ground, the module short circuited to GND
28	D3+	Data bit: (Level 3.3V) D+
29	VIDEO	CVBS analog video out, PAL
30	EXT_SYNC-	Function extension (external synchronization-)
XS3		
1	SDI_VIDEO1	SDI signal
2-5	GND	Power ground
JFOCUS		
1	VR_BMQ	Reference voltage 3V
2	GND	Power ground
3	JFS3	Potentiometer detection
4	FOS_B	NC
5	FOCUS2	Focus motor -
6	FOCUS1	Focus motor +
JFOV		
1	VR_BMQ	Reference voltage 3V
2	GND	Power ground
3	JFV3	Potentiometer detection
4	FOV_B	NC
5	FOV2	Focus motor -
6	FOV1	Focus motor +

6.10 Cameralink Interface Board



6.10.1 MDC1-25PW1 (JSYS)

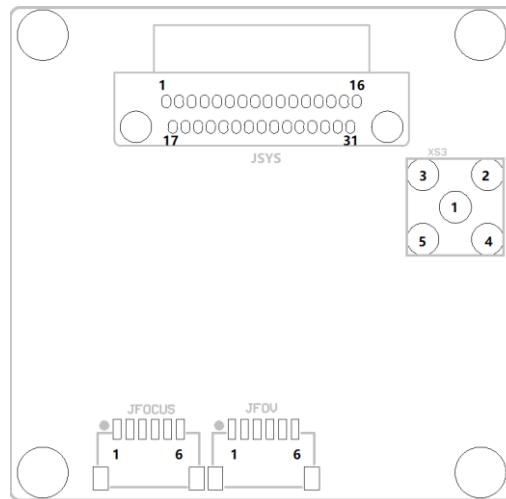
The interface adopts MDC1-25PW1 connector, which includes the power supply interface, communication interface, and LVDS output interface. Users can use the MDC1-25SL5 series cables to connect to the core module.

6.10.2 Interface definition:

Pin	Definition	Note
JSYS		
1	POW+	Power input, DC4V-7V
2	RS422_TX1+	RS422 communication port1: thermal—>system
3	RS422_TX1-	RS422 communication port1: thermal—>system
4	RS422_RX1+	RS422 communication port1: system—>thermal
5	RS422_RX1-	RS422 communication port1: system—>thermal
6	RS422_TX2+	RS422 communication port2: thermal—>system
7	RS422_TX2-	RS422 communication port2: thermal—>system
8	RS422_RX2+	RS422 communication port2: system—>thermal
9	RS422_RX2-	RS422 communication port2: system—>thermal
10	RS422_TX3+	RS422 communication port3: thermal—>system
11	RS422_TX3-	RS422 communication port3: thermal—>system
12	RS422_RX3+	RS422 communication port3: system—>thermal
13	RS422_RX3-	RS422 communication port3: system—>thermal
14	GND	Power ground

15	CMR_D0+	Data bit: (Level 3.3V) D0+
16	CMR_D0-	Data bit: (Level 3.3V) D0-
17	CMR_D1+	Data bit: (Level 3.3V) D1+
18	CMR_D1-	Data bit: (Level 3.3V) D1-
19	CMR_D2+	Data bit: (Level 3.3V) D2+
20	CMR_D2-	Data bit: (Level 3.3V) D2-
21	CMR_D3+	Data bit: (Level 3.3V) D3+
22	CMR_D3-	Data bit: (Level 3.3V) D3-
23	CMR_CLK+	Cameralink clock+
24	CMR_CLK-	Cameralink clock-
25	GND	Power ground

6.11 LVDS/SDI interface board



6.11.1 MDC1-31PW1 (JSYS)

The interface adopts MDC1-31PW1 connector, which includes the power supply interface, communication interface, and LVDS output interface. Users can use the MDC1-31SL5 series cable to connect to the core module.

6.11.2 BWMCX-KE (XS3)

The interface adopts BWMCX-KE connector as the SDI signal output. Users can use the JBNC/J3/MCX-KWHD series cables to connect to the core module.

6.11.3 HC-1.0-6PWT (JFOCUS and JFOV)

HC-1.0-6PWT is the focusing and zooming interface, users can use a cable with 1.0mm*5p plug to connect to the core module.

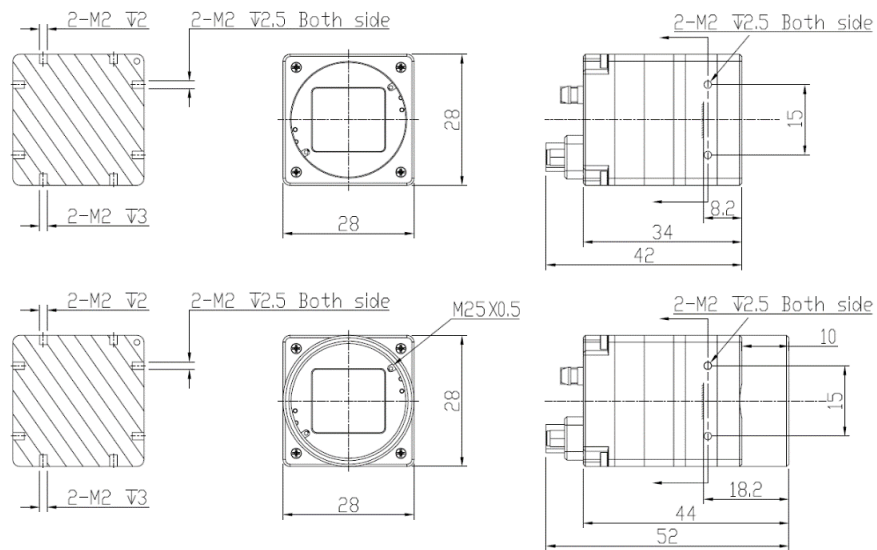
6.11.4 Interface definition:

Pin	Definition	Note
JSYS		
1-3	POW+	Power input, DC6V-15V
4	GND	Power ground
5	RS232_TX	Function extension
6	RS232_RX	Function extension
7	RS422_TX+	thermal—>system
8	RS422_TX-	thermal—>system
9	SYNC_TX+	Function extension (external synchronous sending+)
10	SYNC_TX-	Function extension (external synchronous sending-)
11	LVDS_D0+	Data bit: (Level 3.3V) D0+
12	LVDS_D0-	Data bit: (Level 3.3V) D0-
13	LVDS_D2+	Data bit: (Level 3.3V) D2+
14	LVDS_D2-	Data bit: (Level 3.3V) D2-
15	LVDS_CLK+	LVDS clock+
16	LVDS_CLK-	LVDS clock-
17-19	GND	Power ground
20-21	NC	NC
22	GND	Power ground
23	RS422_RX+	system—> thermal
24	RS422_RX-	system—> thermal
25	SYNC_RX+	Function extension (external synchronous receiving+)
26	SYNC_RX-	Function extension (external synchronous receiving-)
27	GND	Power ground
28	LVDS_D1+	Data bit: (Level 3.3V) D1+
29	LVDS_D1-	Data bit: (Level 3.3V) D1-
30	LVDS_D3+	Data bit: (Level 3.3V) D3+
31	LVDS_D3-	Data bit: (Level 3.3V) D3-
XS3		
1	SDI_VIDEO1	SDI signal
2-5	GND	Power ground

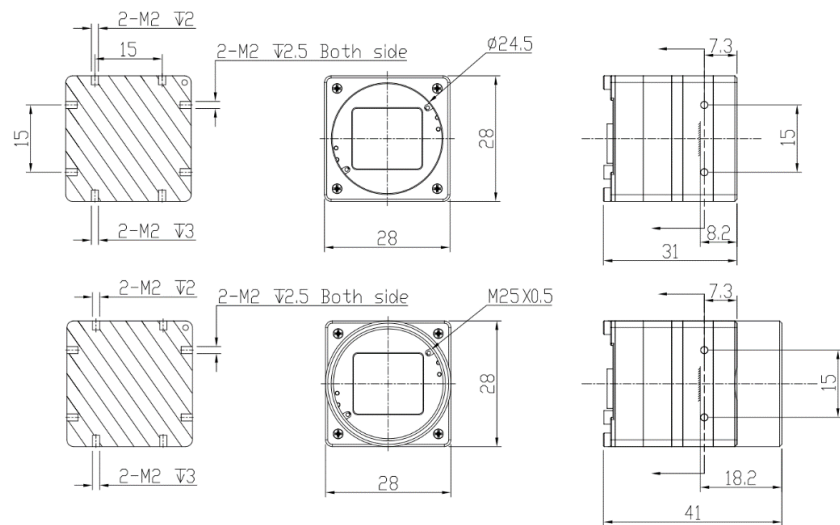
JFOCUS		
1	VR_BMQ	Reference voltage 2.48V
2	GND	Power ground
3	DIST1	Potentiometer detection
4	NC	NC
5	FOCUS2	focusing motor-
6	FOCUS1	focusing motor+
JFOV		
1	VR_BMQ	Reference voltage 2.48V
2	GND	Power ground
3	DIST2	Potentiometer detection
4	NC	NC
5	FOV2	focusing motor-
6	FOV1	focusing motor+

7. Size

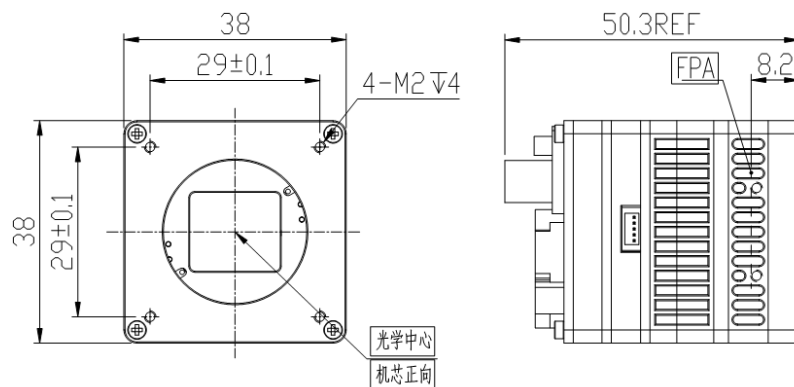
7.1 Uncooled 384/640 core module: analog/ Cameralink series:



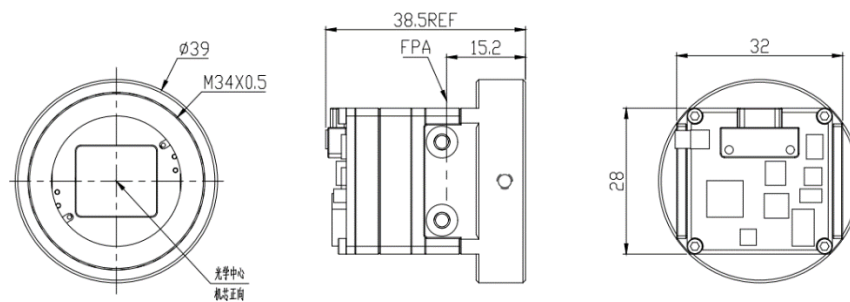
7.2 Uncooled 384/640 core module : analog/ BT601/BT656/BT1120/CML/LVDS series:



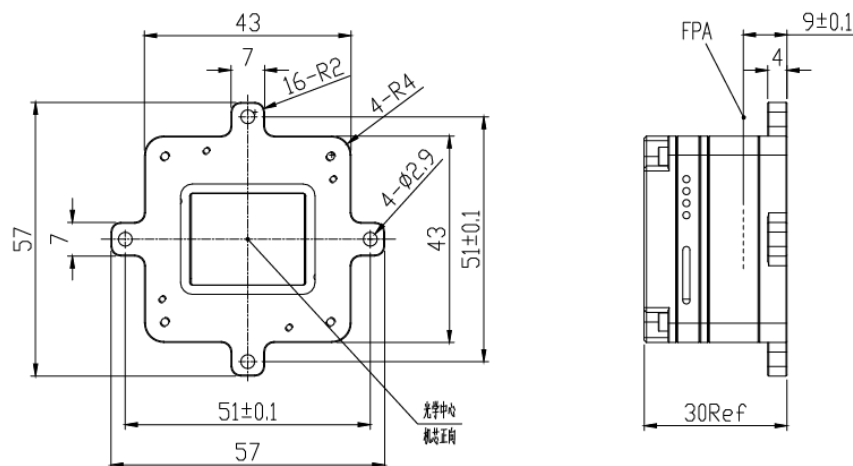
7.3. Uncooled 384/640 core module: network version series:



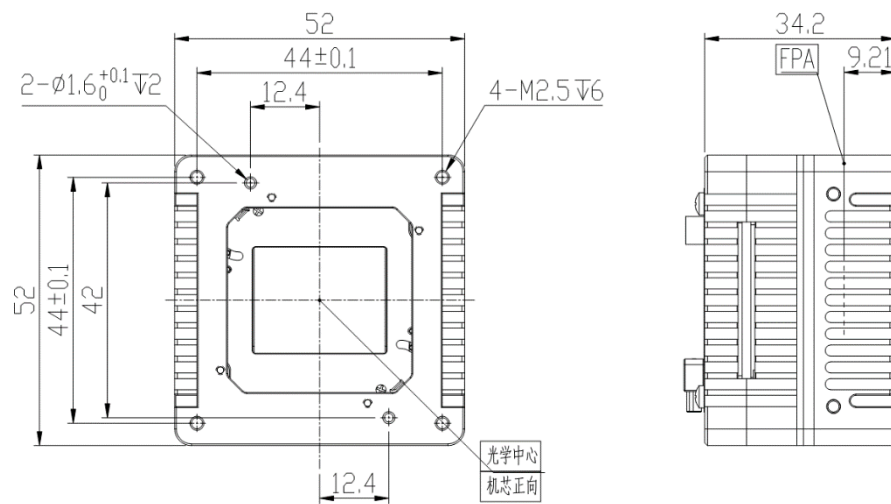
7.4. Uncooled 384/640 core module: analog/SDI series:



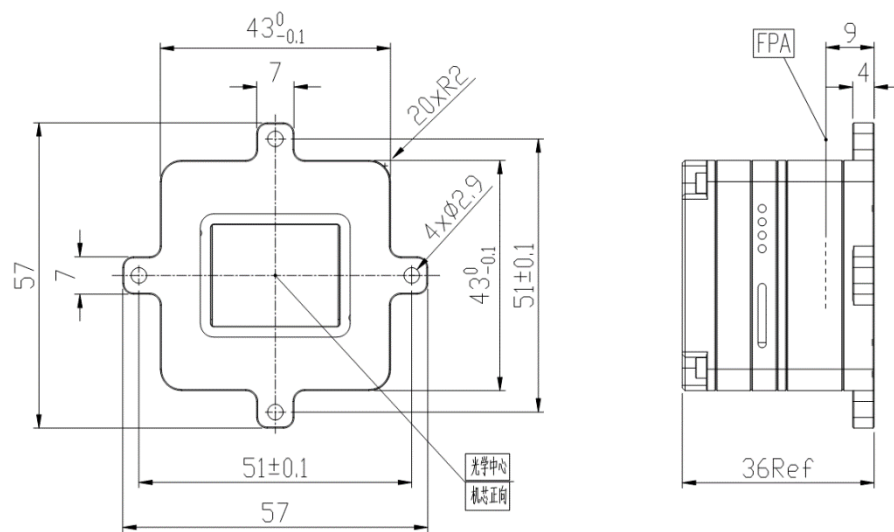
7.5 Uncooled 1280 core module (non-domestic-made) Analog/Cameralink/SDI series:



7.6 Uncooled 1280 core module (domestic-made): Cameralink series:



7.7 Uncooled 1280 core module (domestic-made): SDI/LVDS series:



8. Protocol description

8.1 Control software: Upper computer IRCore_Control.

8.2 Descriptions:

8.2.1 Select the number and the baud rate (default is 115200) of the corresponding port, click "turn on Serial Port", and then click "Parameter Synchronization" to synchronize the parameters of the product to the upper computer.



The gray button indicates that the relevant function cannot be used before it is turned on

8.2.2 Data package description

Command format from system to thermal

[STX+ Address + Command Number+ Data + Checksum + ETX]

8.2.2.1 Definition of Command

Command	Definition	Value
STX	Command starts	02H
ETX	Command ends	03H

8.2.2.2 Command address

Address: 18H is the communication address between the product and the operation panel

Format: 02H 18H Command Data Check 03H

8.2.2.3 Checksum

Checksum=Byte wise XOR of address, command code, and data, except for STX and ETX.

8.2.2.4 Function Command Table

Function	Command	Data	Upper computer button	note
Parameter synchronization	0x00	0xCD	Parameter synchronization	
Brightness value	0x01	Range :0xE0-0xFF 0x00-0x20	Brightness +	Value +
			Brightness -	Value -
Contrast value	0x02	Range :0x01-0x3F	Contrast+	Value +
			Contrast-	Value -
Image polarity	0x03	0x00	White hot	
		0x01	Black hot	
Image enhancement	0x04	Range :0x00-0x03	Enhancement+	Value +
			Enhancement-	Value -
Digital zoom	0x05	0x00	Zoom in 1X	
		0x01	Zoom in 2X	
		0x02	Zoom in 3X	
		0x03	Zoom in 4X	
Image mode adjustment	0x06	Range :0x00-0x03	Mode +	Value +
			Mode -	Value -
Save parameters	0x07	0x00	Save	
Cross reticle	0x08	0x00	reticle off	
		0x01	reticle on	
	0x09	Range :0x80-0xFF 0x00-0x7F	reticle X +	Value +
			reticle X -	Value -
	0x0A	Range :0x80-0xFF 0x00-0x7F	Reticle Y +	Value +
			reticle Y -	Value -
Bad pixel replacement	0x1B	0x00	Replacement off	
		0x01	Replacement on	
	0x1B	0x06	Calibrate/ cancel	
	0x1C	0x01	Save bad pixel	
	0x2D	0x00	Move to left	
		0x01	Move to right	
	0x2E	0x00	Move down	
		0x01	Move up	
Image flipping	0x21	0x00	X-axis forward	
		0x01	X-axis backward	
	0x22	0x00	Y-axis forward	
		0x01	Y-axis backward	

Internal/external calibration	0x2B	0x00	Internal calibration	
		0x01	External calibration	
Auto calibration	0x30	0x00	Auto calibration off	
		0x01	Auto calibration on	
Focus step setting	0x37	Range :0~255	Focusing step setting	
Focusing control	0x38	0x00	focus stop	
		0x01	Focus +	
		0x02	Focus -	
		0x03	Single Step Focusing +	
		0x04	Single Step Focusing -	
		0x05	Auto focus	
Zooming control	0x43	0x00	Zoom stop	
		0x01	FOV -	
		0x02	FOV +	
		0x03	Single step FOV -	
		0x04	Single step FOV +	
Zooming step setting	0x44	Range :0~255	Zooming step setting	
Delay setting	0x45	Range :-32~32	Delay setting	
Language selection	0xFC	0x01	Chinese/English	

8.2.2.5 Command Reference

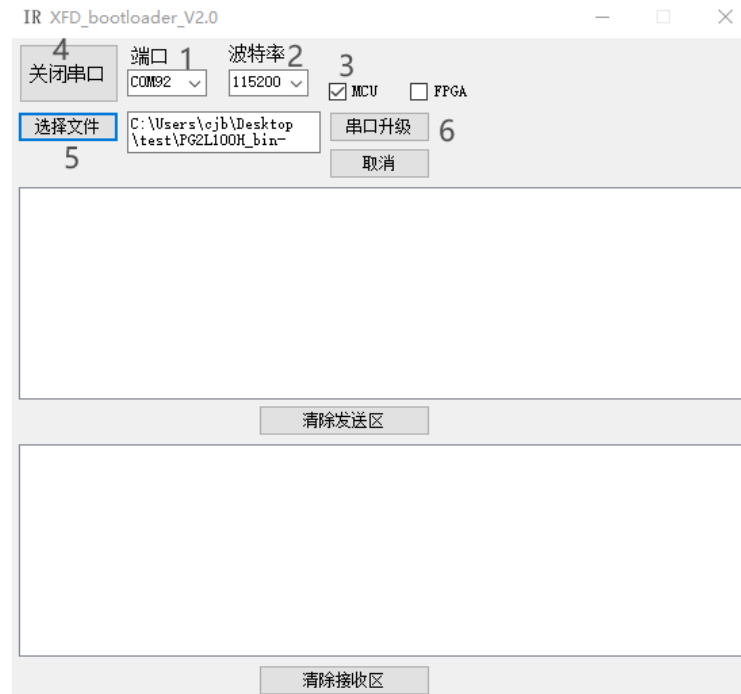
Function	Instruction(hex)	Note
Parameter synchronization	02 18 00 CD D5 03	Synchronize IR parameters to the upper computer
Brightness	02 18 01 XX YY 03	Brightness value: XX ($E0 \leq XX \leq FF$; $00 \leq XX \leq 20$; $YY = 18 \oplus 01 \oplus XX$) Range of XX: -31~32
Contrast	02 18 02 XX YY 03	Contrast value: XX ($01 \leq XX \leq 3F$; $YY = 18 \oplus 02 \oplus XX$)
Image polarity	02 18 03 00 1B 03	White hot
	02 18 03 01 1A 03	Black hot
Image enhancement	02 18 04 XX YY 03	DDE value: XX ($01 \leq XX \leq 03$; $YY = 18 \wedge 04 \wedge XX$)

Digital zoom	02 18 05 00 1D 03	Digital zoom 1X
	02 18 05 01 1C 03	Digital zoom 2X
	02 18 05 02 1F 03	Digital zoom 3X
	02 18 05 03 1E 03	Digital zoom 4X
Image mode adjustment	02 18 06 00 1E 03	mode0: histogram off; auto gain off
	02 18 06 01 1F 03	mode1: histogram off; auto gain on
	02 18 06 02 1C 03	mode2: histogram on; auto gain off
	02 18 06 03 1D 03	mode3: histogram on; auto gain on
Save parameters	02 18 07 00 1F 03	Save
Cross reticle	02 18 08 00 10 03	Off
	02 18 08 01 11 03	on
	02 18 09 XX YY 03	reticle moves along the X axis direction ($80 \leq XX \leq FF$; $00 \leq YY \leq 7F$ $YY = 18 \oplus 09 \oplus XX$)
	02 18 0A XX YY 03	reticle moves along the Y axis direction ($80 \leq XX \leq FF$; $00 \leq YY \leq 7F$ $YY = 18 \oplus 09 \oplus XX$)
Bad replacement pixel	02 18 1B 00 03 03	Turn off replacement
	02 18 1B 01 02 03	Turn on replacement
	02 18 1B 06 05 03	Calibrate/ cancel
	02 18 1C 01 05 03	Save bad pixel
	02 18 2D 00 35 03	calibration reticle moves to the left along X axis
	02 18 2D 01 34 03	calibration reticle moves to the right along X axis
	02 18 2E 00 36 03	calibration reticle moves down along Y axis
	02 18 2E 01 37 03	calibration reticle moves up along Y axis
Image flipping	02 18 21 00 39 03	X axis forward
	02 18 21 01 38 03	X axis backward
	02 18 22 00 3A 03	Y axis forward
	02 18 22 01 3B 03	Y axis backward
Internal/external calibration	02 18 2B 00 33 03	Internal calibration
	02 18 2B 01 32 03	External calibration
Auto calibration	02 18 30 00 28 03	Turn off auto calibration
	02 18 30 01 29 03	Turn on auto calibration

Focus step setting	02 18 37 XX YY 03	time of focusing step is the "XX corresponding to the decimal number" X0.5ms ($00 \leq XX \leq FF$; $YY = 18 \oplus 37 \oplus XX$)
Focusing control	02 18 38 00 20 03	Focusing stop
	02 18 38 01 21 03	Focus +
	02 18 38 02 22 03	Focus -
	02 18 38 03 23 03	Single step focus+
	02 18 38 04 24 03	Single step focus-
	02 18 38 05 25 03	Auto focus
Zooming control	02 18 43 00 5B 03	Zooming stop
	02 18 43 01 5A 03	FOV -
	02 18 43 02 59 03	FOV +
	02 18 43 03 58 03	Single FOV-
	02 18 43 04 5F 03	Single FOV+
Zooming step setting	02 18 44 XX YY 03	time of zooming step is the "XX corresponding to the decimal number" X0.5ms ($00 \leq XX \leq FF$; $YY = 18 \oplus 44 \oplus XX$)
Delay setting	02 18 45 XX YY 03	Delay setting value is the "XX corresponding to the decimal number" ($E0 \leq XX \leq FF$ 或 $00 \leq XX \leq 20$; $YY = 18 \oplus 45 \oplus XX$)
Language selection	02 18 FC 01 E5 03	Chinese/English switch
Note: XX and YY in the above are both hexadecimal numbers; "⊕" represents XOR.		

9. Upgrade online

9.1. Connect the system, run the software shown below, and select the corresponding port.



9.2. Select the corresponding baud rate (default 115200).

9.3. Select **【MUC】** ; Note: FPGA (for internal use) cannot be selected.

9.4. Click on **【Turn on Serial Port】** .

9.5. Click on [Select File] and select the corresponding program file.

9.6. After the system powered on, click on [Serial Port Upgrade], and restart the system after the program is successfully upgraded.

10. Technical Support

10.1 Customization design is available according to the different application needs of users;

10.2 Systematic training can be provided to the technical and operational personnel of users.