D8X3C uncooled thermal imaging module

User manual V1.0

Warning, caution and attention

Definition

! Warning Represents a dangerous situation or behavior that could result in personal injury or death.

! Caution Represents conditions or behavior that could result in damage to the uncooled thermal imaging camera or permanent loss of data.

! Note Represents a message that is useful to the user.

Important information – read before using the instrument

! **Caution – Because the uncooled infrared telescope uses a very sensitive thermal sensor, the lens should not be directed at a strong source (such as the sun, direct laser beam or reflection, etc.) under any circumstances (on or off), otherwise Permanent damage to uncooled infrared telescopes!**

! **Caution - The original shipping box must be used during transportation. Do not shake or collide with the uncooled thermal imaging camera during use and transportation.**

! **Caution – Uncooled thermal imaging cameras are recommended to be stored in the original packaging and placed in a cool, dry, ventilated environment free of strong electromagnetic fields.**

! **Caution - Avoid oil stains and various chemicals contaminating the lens surface and the damaged surface. After use, please close the lens cap.**

! **Caution - To prevent the potential danger of data loss, always copy (backup) the data to your computer.**

! **Caution - Do not open the case or modify it without authorization. Repairs may only be carried out by authorized personnel of the company.**

content

1. Introduction

Thank you for choosing the D8X3C uncooled infrared camera temperature measuring movement component (hereinafter referred to as the component) of Zhejiang Dali Technology Co., Ltd.

Function

The D8X3C includes the following features:

4x digital zoom

12 color labels are available

Polarity switching

Manual / automatic timing correction

Video output - PAL system

Temperature measurement function

8-bit/14-bit interframe digital output (with temperature data)

1.1 Upgrade options

1.2 9mm, 18mm, 25mm, 37mm, 50mm and other lenses can be upgraded to directly change the lens

1.3 main application

1.4 The D8X3C uncooled infrared camera movement assembly uses an uncooled focal plane infrared detector to visually display the infrared thermal spectrum of the object in front of you with high-definition, high-sensitivity black-and-white images, and can display video PAL Format output for later analysis. The product can be used in security areas such as security patrol, security, and border inspection in a variety of harsh environments.

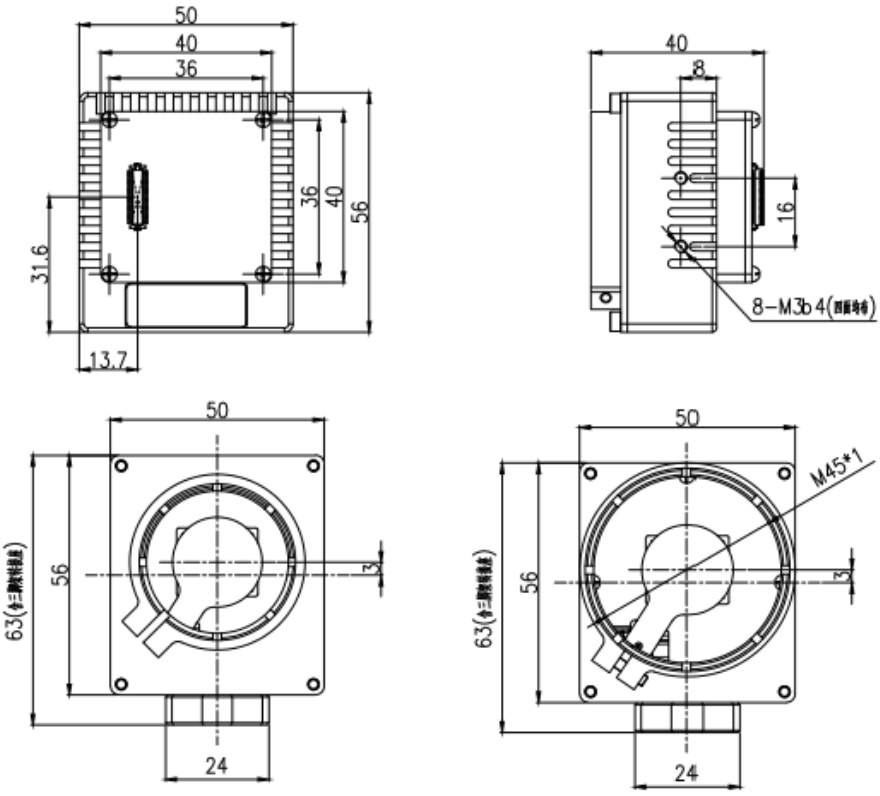
1.5 standard configuration

- Infrared camera
- Accessories cable (2)
- Tripod tray
- carton
- CD (user manual electronic file)

1.6 CD (user manual electronic file)

- 9mm、18mm、25mm、37mm、50mm
- DC12V power adapter
- User Manual (paper)

2. Instrument shape



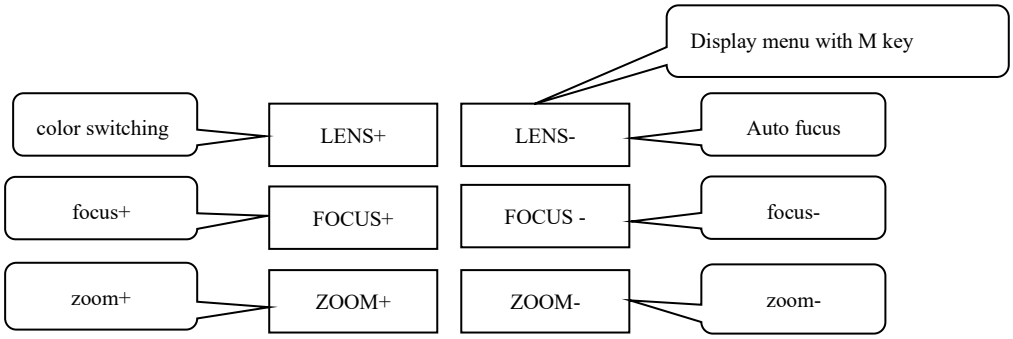
lens ring：M34×0.75　　**lens ring：M45×1**

3. Communication protocol

Built-in Pelco-D、Pelco-P、dali protocol

3.1. Pelco-D protocol introduction

keyboard definition



When the preset number 100 is called, the menu is called up；

When the preset position 101 is called, the camera is manually corrected;

When calling preset position 102, electronically zoom in, press FOCUS+, FOCUS- to modify the parameters;

When the preset number 103 is called, the gain is changed according to FOCUS+ and FOCUS-;

When calling the preset position 104, the brightness, press FOCUS+, FOCUS- modify the parameters;

When calling preset position 105, shutter, press FOCUS+, FOCUS- to modify the parameters;

When calling preset position 106, polarity, press FOCUS+, FOCUS- to modify the parameters;

3.2. Dali protocol introduction

See the separate agreement manual for details.

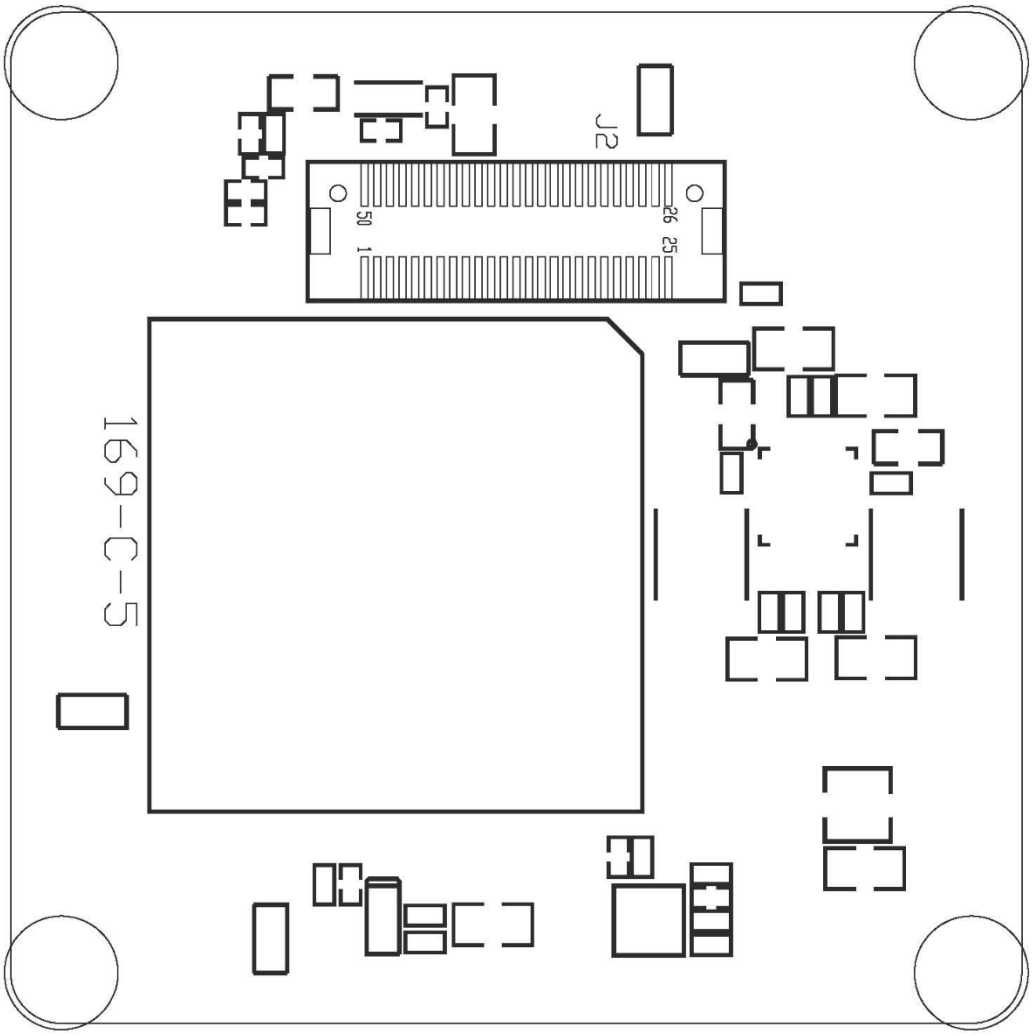
3.3. Interface and timing introduction

3.4. Interface definition

1. Power supply, analog video and digital video interface;
2. The infrared imaging system can simultaneously output analog video and digital video images;
3. The power supply voltage of the infrared imaging system is DC_5V;
4. The digital signal level is 1.8V.

J2 socket:	DF12(5.0)-50DP-0.5V(86)	brand：HRS
Docking socket:	DF12-50DS-0.5V(86)	

Interface definition below and table：



Pin	signal	Name	level	note
1	ACMP	Analog video signal		
2	VGND	Analog video		
3	KEY4	Button M	3.3V	
4	KEY5	Button C	3.3V	
5	KEY1	Button +	3.3V	
6	KEY2	button-	3.3V	
7	KEY3	Button F	3.3V	
8	FPGA_IO2	Reserved 2	1.8V	
9	FPGA_IO1	Reserved 1	1.8V	
10	DGND	Ground		
11	FPGA_CLK	Digital clock	1.8V	
12	FPGA_VSYNC	Field signal	1.8V	
13	FPGA_HSYNC	Line signal	1.8V	
14	FPGA_D13	Digital signal 13	1.8V	
15	FPGA_D12	Digital signal 12	1.8V	
16	FPGA_D11	Digital signal 11	1.8V	
17	FPGA_D10	Digital signal 10	1.8V	
18	FPGA_D9	Digital signal 9	1.8V	
19	FPGA_D8	Digital signal 8	1.8V	
20	POWER_5V	Power supply	+5V	
21	POWER_5V	Power supply	+5V	
22	POWER_5V	Power supply	+5V	
23	NC	NC		
24	NC	NC		
25	NC	NC		
26	NC	NC		
27	NC	NC		
28	NC	NC		
29	SGND	Power ground		
30	SGND	Power ground		
31	SGND	Power ground		
32	NC	NC		
33	NC	NC		
34	FPGA_D0	Digital signal 0	1.8V	
35	FPGA_D1	Digital signal 1	1.8V	
36	FPGA_D2	Digital signal 2	1.8V	
37	FPGA_D3	Digital signal 3	1.8V	
38	FPGA_D4	Digital signal 4	1.8V	
39	FPGA_D5	Digital signal 5	1.8V	

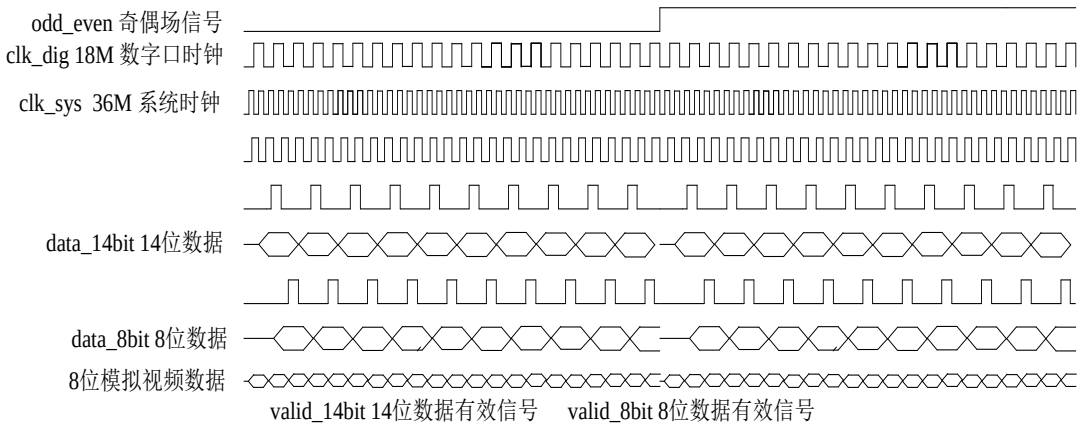
40	FPGA_D6	Digital signal 6	1.8V	
41	FPGA_D7	Digital signal 7	1.8V	
42	FPGA_IO3	Reserve 3	1.8V	
43	DGND	Ground		
44	FPGA_TXD	Serial port transmission	3.3V	
45	FPGA_TXD	Serial port reception	3.3V	
46	FPGA_TCK	JTAG_TCK		
47	FPGA_TDO	JTAG_TDO		
48	V3D3_FPGA	3.3V		3.3V output
49	FPGA_TDI	JTAG_TDI		
50	FPGA_TMS	JTAG_TMS		

2 Digital Port Timing

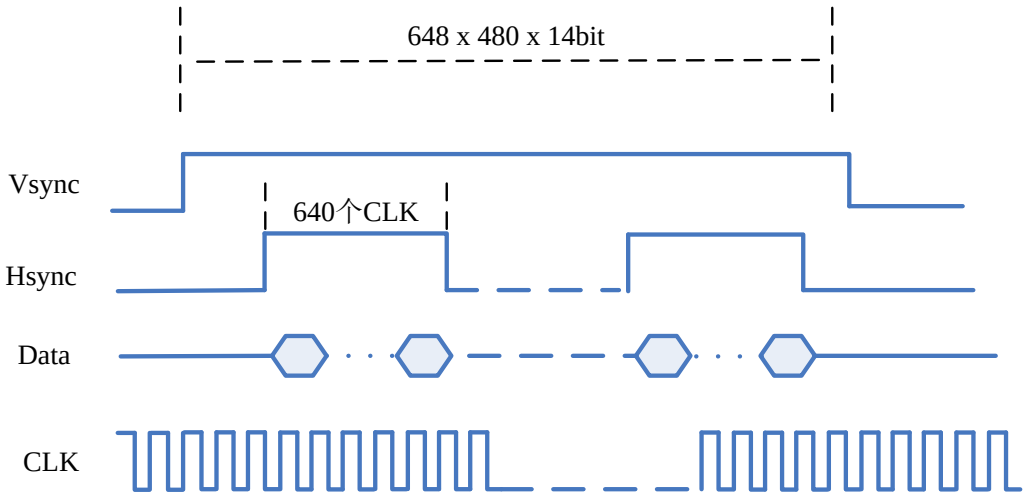
4.2.2 D843C Digital port timing diagram

Digital output: The 8-bit/14-bit interframe output sequence is as follows:：

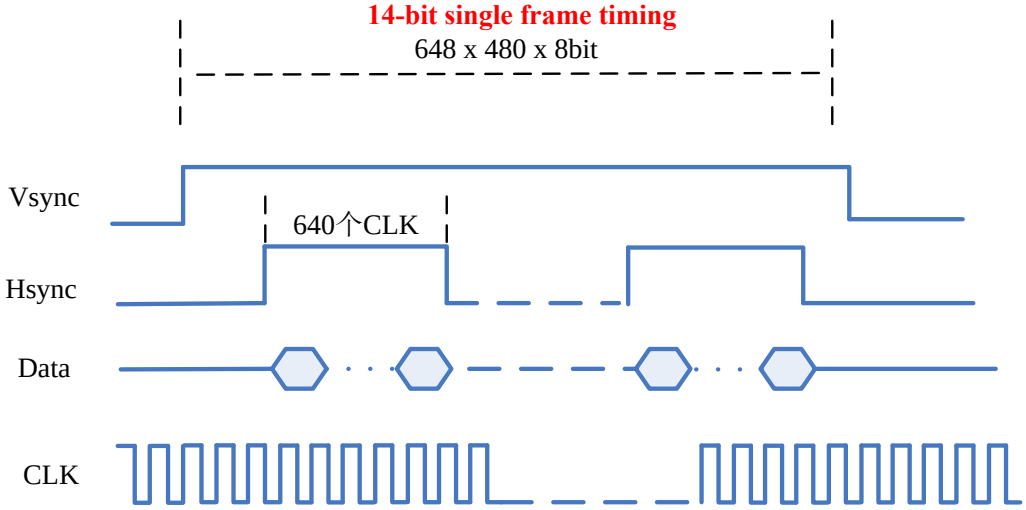
D843C 8-bit / 14-bit frame output timing diagram



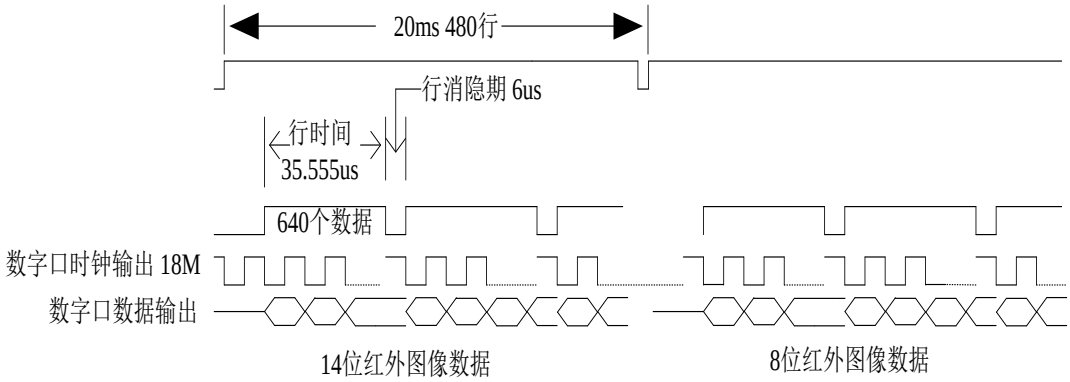
Decompose detailed output timing diagram：



14-bit single frame timing



8-bit single frame timing



Combined output image timing

Description: Sample frame period: 40ms

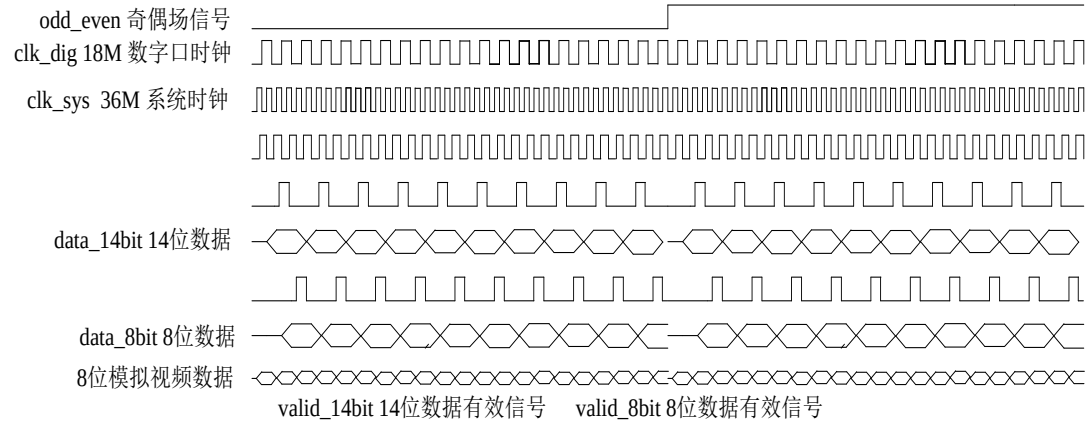
Data: 14 bits

CLK:18MHz

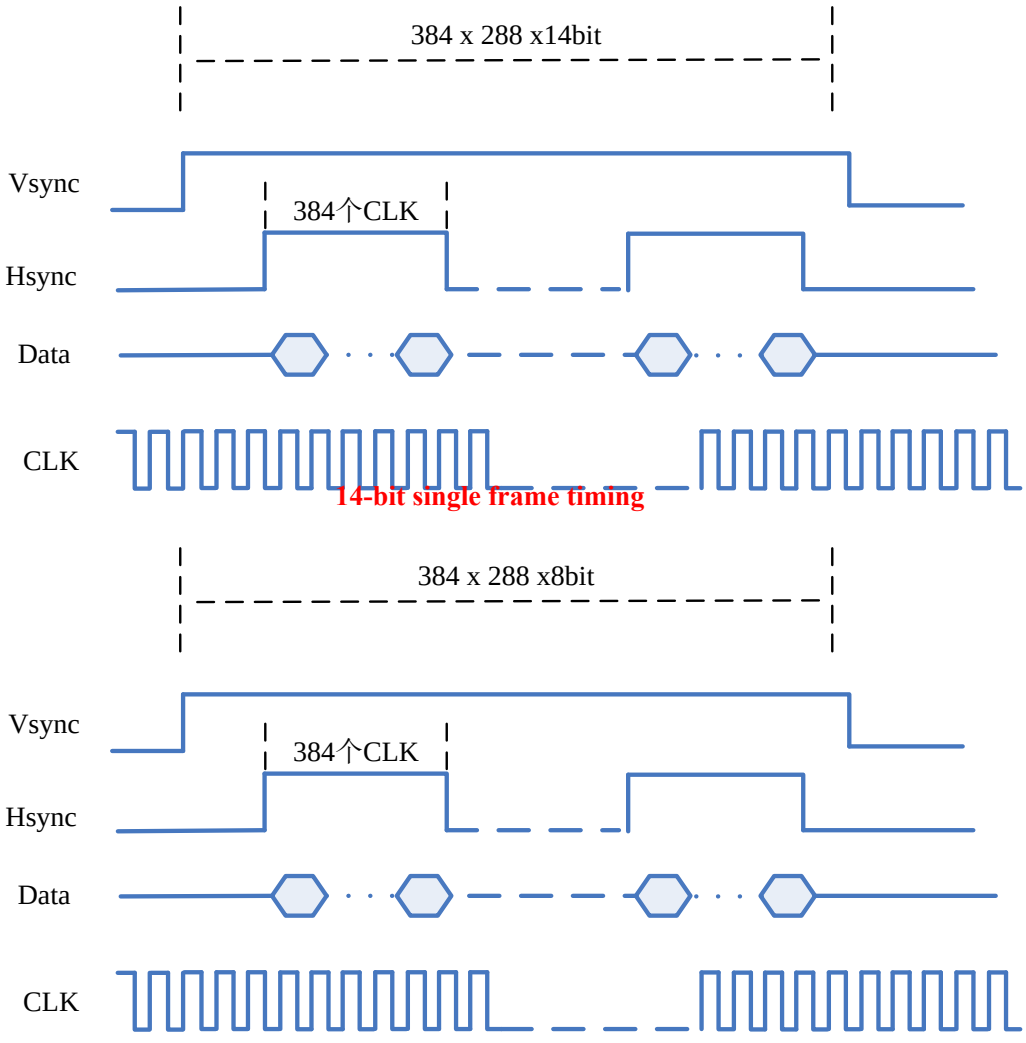
4.2.3 D883C Digital port timing diagram

Digital output: The 8-bit/14-bit interframe output sequence is as follows:

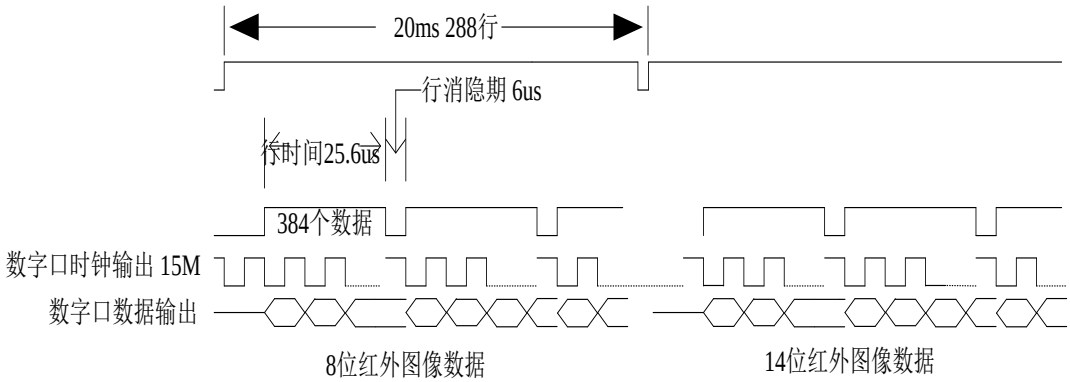
D883C8-bit/14-bitframeoutputtimingdiagram



Decompose detailed output timing diagram：



8-bit single frame timing



Combined output image timing

Description: Sample frame period: 40ms
Image Data: 14 bits (low 8 valid data)
CLK:15MHz

5 basic operations

5.1 Introduction to menu operation when using Pelco-D protocol

5.2 Main Menu Operation

When no menu is executed, the “100 preset position” is called to enter the main menu operation interface, as shown below：

Under the main menu, operate the keyboard “LENS-” to move the cursor position, and operate the keyboard “FOCUS+” or “FOCUS-” to modify the value or option of the cursor. The parameters are automatically saved when you exit the menu.

1. Gain: XXX displays the currently set gain value, range 0~+254, factory default 120;

2. Brightness: XXX displays the currently set brightness value, range 0~+255, factory default 78;

3. Enhancement: XXX displays the currently set enhancement value, the range is 0~+255, and the factory default is 24;

4. Correction: X Display and adjust the status of the currently set auto zero function: Off / Short / Long;

Off: Auto zero is turned off;

Short: Short is 1 minute correction within 30 minutes after power on, 1 minute after 30 minutes to 60 minutes, and 5 minutes after 60 minutes (factory default setting);

Length: short correction for 1 minute within 30 minutes after power on, 1 time for 2 minutes after 30 minutes to 60 minutes, and 1 time for 10 minutes after 60 minutes;

5. Zoom in: XX shows the magnification of the currently set image:

1X/2X/3X/4X, factory default: 1X

6. Color scale: X displays the currently displayed color scale:

Fire, white heat, black heat, iron red, amber, bright rainbow, low contrast rainbow, high contrast rainbow, hot metal, cold metal, dark color, step color

7. Hot-spot threshold: X shows the lower limit of red heat threshold displayed when the red hot color standard is displayed: 0 turns off the red hot color mark; 0~21000 red hot color standard threshold, factory default 0

8. Correction mode: X displays the currently set calibration mode display mode;

Internal: Internal calibration mode (factory default setting) External: External calibration mode

9. Vertical: X displays the vertical mirror of the currently set image:

Y/N, factory default: N

10. Level: X1 displays the vertical image of the currently set image:

Y/N, factory default: N

11. Language: X displays the currently displayed language; English/Chinese/Russian optional, factory default Chinese;

12, auto focus setting: This model is invalid

13. Temperature parameter setting: operate the keyboard “FOCUS+” or “FOCUS-”, pop up the password dialog box, enter the password (FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+) to enter the “temperature measurement parameter setting menu”. After entering, you can set the parameters related to temperature measurement. See “3.3. Auto Focus Setting Menu” for details.

14. Communication setting: Operate the keyboard “FOCUS+” or “FOCUS-”, pop up the password

dialog box, enter the password (FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+), enter the “Communication Settings Menu”, after entering , can set various parameters related to the communication of the camera. See "3.4. Communication Settings Menu" for details.

15. Analysis setting: Operate the keyboard “FOCUS+” or “FOCUS-”, pop up the password dialog box, enter the password (FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+), enter the “analysis setup menu”, after entering , can set various parameters related to the communication of the camera. See “3.5. Analysis Settings Menu” for details.

16. Temperature alarm parameter: operate the keyboard “FOCUS+” or “FOCUS-”, pop up the password dialog box, enter the password (FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+), enter the “temperature alarm parameter”, enter After that, you can set various parameters related to the grayscale alarm. See “3.6. Temperature Alarm Parameter Menu” for details.

17, system menu: manufacturers adjust internal parameters;

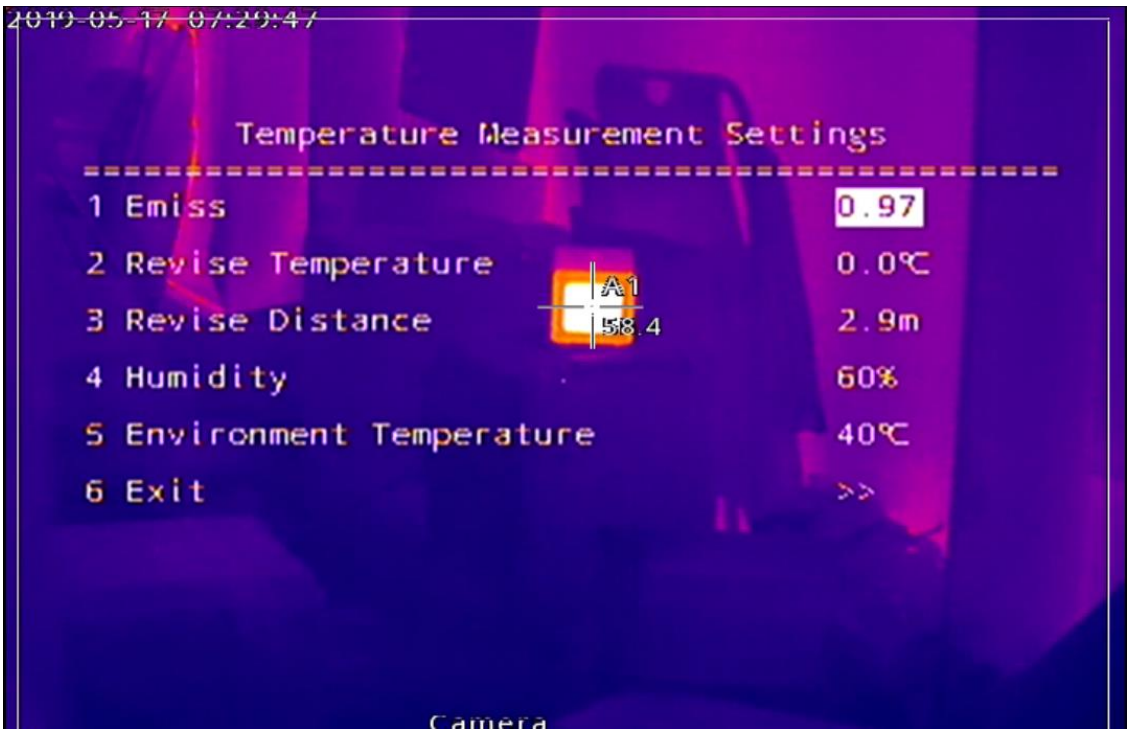
18. Main menu: The manufacturer adjusts the internal parameters;

19, restore the factory value: restore the factory parameters of the instrument;

20, Exit: >> Operate the keyboard “FOCUS+” or “FOCUS-” to exit the current menu;

5.3 Temperature measurement parameter setting menu

The first step: execute the “100 preset position”, enter the main menu operation interface, operate the keyboard “LENS-” to move the cursor position to the “temperature measurement parameter setting” option, and operate the keyboard “FOCUS+” or “FOCUS-” to enter the password. Dialog box, enter the password: "FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-", enter the temperature measurement parameter setting menu；



Step 2: After entering the temperature measurement parameter setting menu, operate the keyboard “LENS-” key to move the cursor, and operate the keyboard “FOCUS+” or “FOCUS-” to modify the value or option of the cursor position. The parameters are automatically saved when you exit the menu.

1. Specific emissivity: XX shows the currently set specific emissivity: 0~1, default 1
2. Correct temperature: XX shows the currently set correction temperature: -10 ° C ~ 10 ° C, default 0
3. Correction distance: XX shows the currently set correction distance: 0~50m, default 0
4. Humidity: XX shows the currently set humidity: 0~100%, default 0
5, ambient temperature: XX display the current set ambient temperature: -20 ° C ~ 600 ° C, the default 25 ° C
6. Exit: >> Operate the keyboard "FOCUS+" or "FOCUS-" to exit the current menu.

5.4 Communication Settings Menu

Step 1: Execute the call "Preset No. 100", enter the main menu operation interface, operate the keyboard "LENS-" to move the cursor position to the "Communication Settings" option, and operate the keyboard "FOCUS+" or "FOCUS-" to enter the password dialog box. , enter the password: "FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-â, enter the communication ® menu；

Step 2: After entering the communication setting menu, operate the keyboard “LENS-” to move the cursor, and operate the keyboard “FOCUS+” or “FOCUS-” to modify the value or option of the cursor position. The parameters are automatically saved when you exit the menu.

1. Baud rate: XXX Display the currently set communication address: 0~254, default 2

2. Address: XXXX Shows the currently set communication rate: 2400/4800/9600, etc., default 2400

3. Protocol: XXX Display the currently set communication protocol: PELCO-D/P, etc., default PELCO-D

4. Exit: X operation keyboard “FOCUS+” or “FOCUS-” exits the current menu

Factory default (recommended): Address: 1 Baud rate: 2400 Protocol: PELCO-D

5.5 Analysis Settings Menu

Step 1: Execute the call "Preset No. 100", enter the main menu operation interface, operate the keyboard "LENS-" to move the cursor position to the "Analyze Settings" option, and operate the keyboard "FOCUS+" or "FOCUS-" to enter the password dialog box. Enter the password:

“FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-” to enter the analysis setup menu；

6 Technical specifications

Temperature measurement component specifications (D8X3C project)

items		parameter	
		D883C	**D843C**
detector	Detector type	Uncooled focal plane micro-heat type	
	Pixel	384×288	640×480
	Pixel spacing	25um	17μm
	Noise equivalent temperature difference	≤80mK@F1，300K，50Hz	
	Field frequency	50Hz	
	Wavelength range	8～14um	
lens	Non-heating focus-free lens	9mm、13mm、18mm、25mm、37mm、50mm	
	Electric focus lens	75mm、100mm、150mm（But this component does not match the lens motor drive circuit）	
image	Preheat time	(at normal temperature 25 ° C) (image stable output) 10S	
	display resolution	PAL: 768 × 576; NTSC: 720 × 480	
	Frame rate	50Hz (PAL) or 60Hz (NTSC)	
	Brightness/gain adjustment	Manual Brightness/Gain; Auto Brightness/Manual Gain; Auto Brightness/Gain.	
	Polarity transformation	Color mark reverse color	
	Electronic zoom	1X/2X/3X/4X	
	Image enhancement	Have	
	Correction function	Manual calibration, automatic calibration at startup, timing correction after normal operation (timed with short time, long time and off optional).	
	Raw heat map data output	25 frames / sec	
	Image display	A variety of pseudo-color labels (fire color, iron red, red hot, amber, white heat, black heat, etc.)	
	Auto focus	Have	
	Language	Chinese English	
temperature	Temperature range	First gear: -20°C - 180°C; second gear: 100-600°C	
	Temperature measurement accuracy	±2°C or ±2% (reading range), maximum	
	Temperature measurement mode	Supports the highest temperature/lowest temperature/average temperature automatic tracking alarm function in multiple areas, supports	

		1 center point temperature, and the temperature is displayed in the upper right corner of the screen.
	Emissivity correction	0.01 to 1.0 radiance adjustable
alarm	Alarm Output	When the dali protocol is used, the serial port can output the alarm temperature data at this time.
power	External power supply	DC 5V
	Power consumption	≤4W (normal work at normal temperature, no zero adjustment, no focus adjustment, etc.)
interface	Power interface	Have
	Data output interface	8-bit and 14-bit frame output or 8-bit BT656 output
	Serial port	3.3VTTL frequency signal with Pelco-D/P general protocol and dali protocol
	Analog video interface	Have
structure	Installation interface	2xM3 screw hole (four sides), standard 1 1/4″-20-UNC standard tripod screw hole adapter.
	Shell shape	The housing without the lens assembly is square, and the front end is the lens interface (M45*1 thread or M34*0.75).
environment	Operating temperature	-20℃~ +50℃
	storage temperature	-40℃~ +70℃
physical	Weight (g)	145g
	dimension (mm)	40×50×56mm(length × width × height) (component without lens)

If the specifications change, no further notify

7 Common troubleshooting

If you have problems with your thermal imaging camera, use the following table for troubleshooting. If it cannot be solved, please disconnect the power supply and

contact our maintenance department (400-887-1897).

symptom	**the reason**	**Solution**
The camera does not start	The power supply is not installed accurately.	● Reinstall the power supply.
	The infrared camera is turned off.	● Wait 5 seconds and then turn it back on.
Infrared camera automatically shuts down	The power connection is not reliable	● Connect the power supply
No thermal image	The lens cover is not open.	● Open the lens cover.
	Power conversion between external power supply and battery.	● Restart the instrument image to display.