K51 Online infrared thermal imaging thermometer

Technical Specifications

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1 Product Description

K 51 online infrared thermal imaging thermometer adopts 1280 × 1024 high-resolution uncooled infrared focal plane detector, high-performance infrared lens and signal processing circuit, and is embedded with advanced image processing algorithm. It has the characteristics of small size, low power consumption, fast startup, excellent imaging quality and accurate temperature measurement.

K 51 online infrared thermal imaging thermometer fully considers the requirements of high and low temperature working performance to ensure that the whole machine has excellent environmental adaptability.

K 51 online infrared thermal imaging thermometer features:

1. It has all-weather passive thermal imaging function and can be used in a wide range of ambient temperature ;

2. High frame rate design allows observation of fast-moving targets ;

3. Adopt self-developed temperature measurement and correction algorithm to achieve accurate temperature measurement;

4. Output full-stream lossless 16-bit temperature data, provide client software and SDK development kit , facilitate customers to carry out secondary development and system integration, and fully carry out personalized temperature analysis of the measured target .

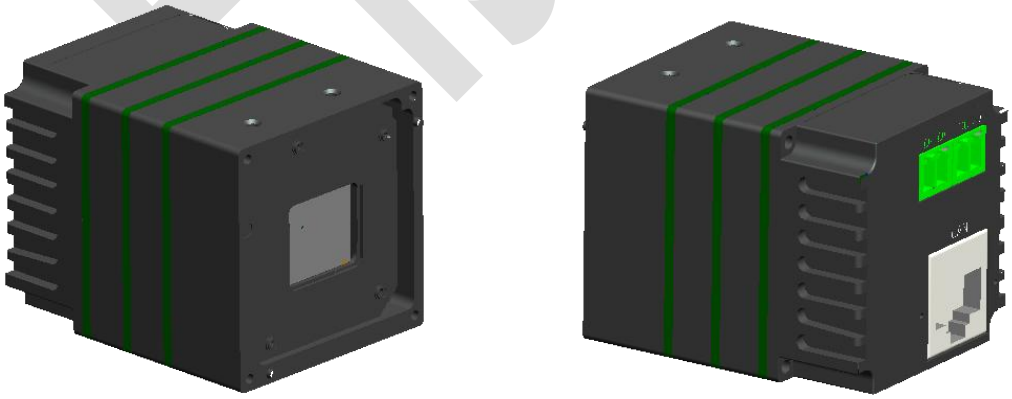


Figure 1 Overall view of online infrared thermal imaging thermometer

2 Product Specifications

detector	
Detector Type	Uncooled focal plane microbolometer
Number of pixels	1280 × 1024
Pixel spacing	1 2 μm
Wavelength range	8～14μm
Thermal sensitivity (NETD)	≤50mk@30℃
Frame rate	≤50Hz (configurable)
Image processing and display	
Color Palette	Multiple color palettes including white hot, black hot, iron red, rainbow, etc.
Contrast, brightness	Automatic/Manual
Data Format	16-bit temperature data (full bit stream)
Temperature measurement analysis	
Temperature measurement accuracy	±2℃ or ±2%
Temperature measurement range	Normal temperature range: -20℃～200℃ (standard) Medium temperature range: 15 0℃～ 80 0℃ (optional) High temperature range: 35 0℃～1600℃ (optional)
Electrical Characteristics	
Data Interface	RJ45
Web Standards	100M/1000M (100M network needs to reduce frame rate)
Protocol support	UDP
Power interface	2EDGKD-3.81mm/2P
Input power voltage	DC12V
Communication interface	UART@ RS 485 (reverse control of PTZ and camera)
Steady-state power consumption	< 3 W
Reverse polarity protection	have
Over-voltage and under-voltage protection	have
Environmental parameters	
Operating temperature	-40 ℃～60 ℃ (-20 ℃ ～60 ℃ to ensure temperature measurement accuracy)
Storage temperature	- 50 ℃～70℃
Temperature shock resistance	5℃/min (-40℃～60℃)
Vibration resistance	4.3g, 2 hours for each of x, y and z axes
Shock resistance	Acceleration 30g, half sine wave, pulse width 6ms, impact 3 times in the installation direction
humidity	≤95%(non-condensing)
Lenses	
focal length	Optional
Focus mode	Manual /Electric
Physical properties	

Dimensions	40 mm × 40 mm × 51.5 mm
weight	< 85 g
Mounting holes	Two M3×4 on each side
Client	
Real-time temperature display	support
Various temperature measurement objects	support
Alarm function	support
Record/Photograph/Playback	support
SDK development package	
Operating Environment	Support win32, x64 , Linux (x86 /ARM)
Data Acquisition	16-bit temperature data (full stream) through callback function

3 Electrical interface

3.1 Interface Diagram

The infrared thermal imager has three external interfaces, namely 2PIN SH interface (RS485), 2PIN SH interface (power supply) and RJ45 interface. The interface diagram is shown in the figure below.

- 2PIN SH connector (power supply) provides DC 12V power interface ;
- 2PIN SH connector (RS485) provides RS485 communication interface;
- RJ45 connector provides a network digital video output .

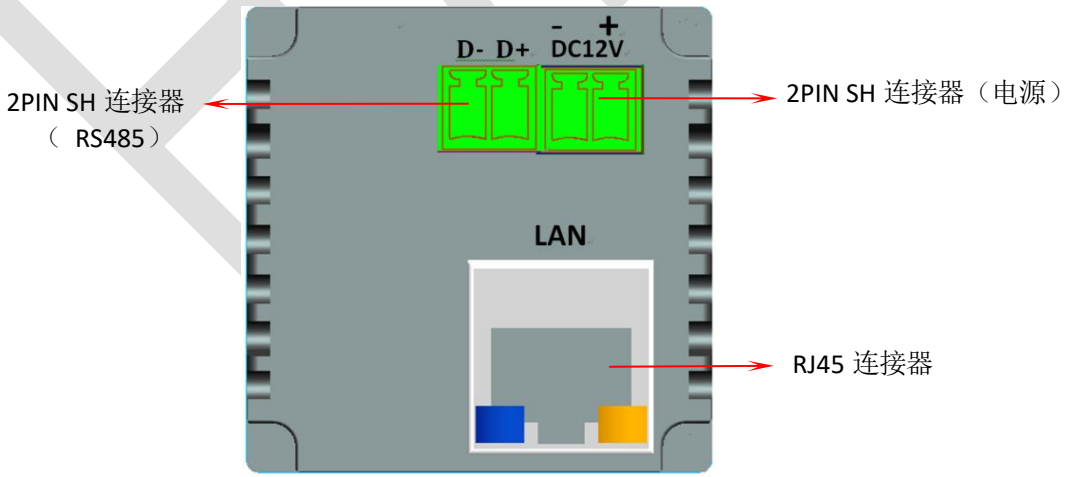


Figure 2 Interface diagram

3.2 Interface Definition

The infrared thermal imager has three external interfaces: two 2-pin SH connectors

and one RJ45 connector . The RJ45 connector is a standard definition, the signal definition of the 2-pin SH connector (power supply) is shown in Table 1, and the signal definition of the 2-pin SH connector (RS485) is shown in Table 2.

Table 1 Signal definition of 2PIN SH connector (power supply)

Pin	Signal Name	Function	Description
1	DC12V+	Power	DC 12V Input
2	DC12V -	Power	Digital Ground

Table 2 Signal definition of 2PIN SH connector (RS485)

Pin	Signal Name	Function	Description
1	D+	Communication	RS485 D+
2	D-	Conference	RS485 D-

4 Structural dimensions

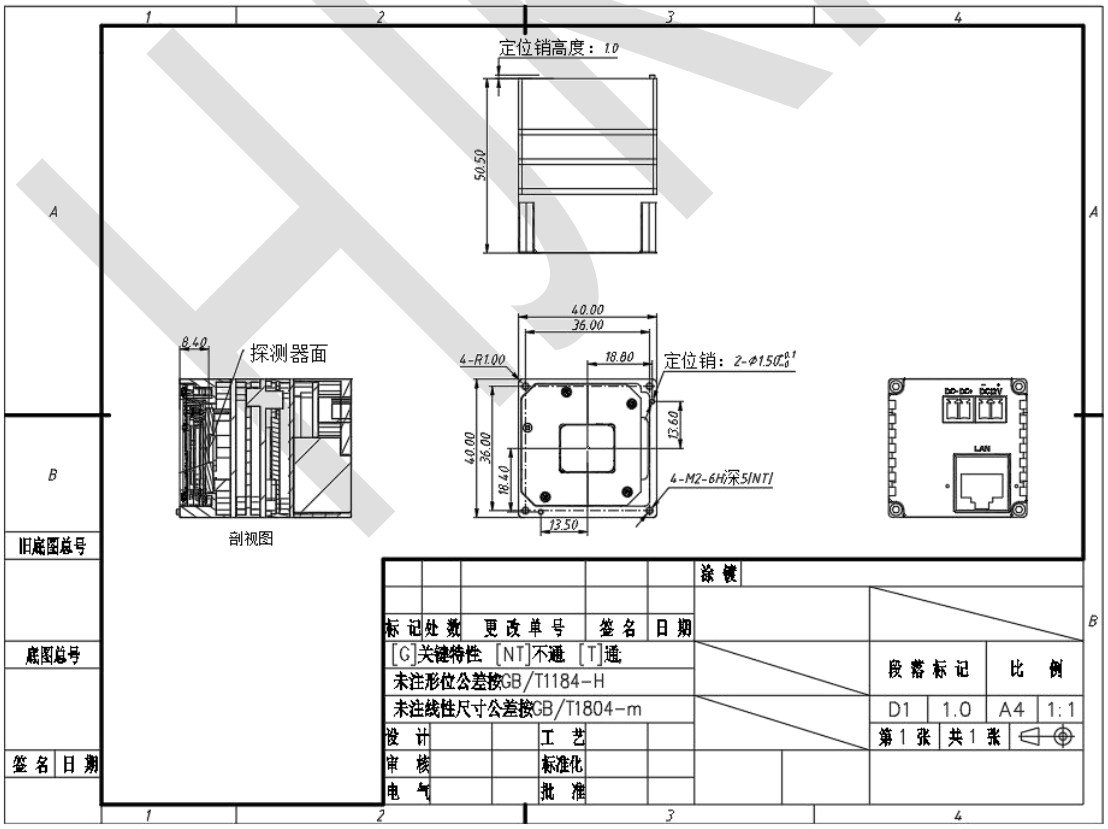
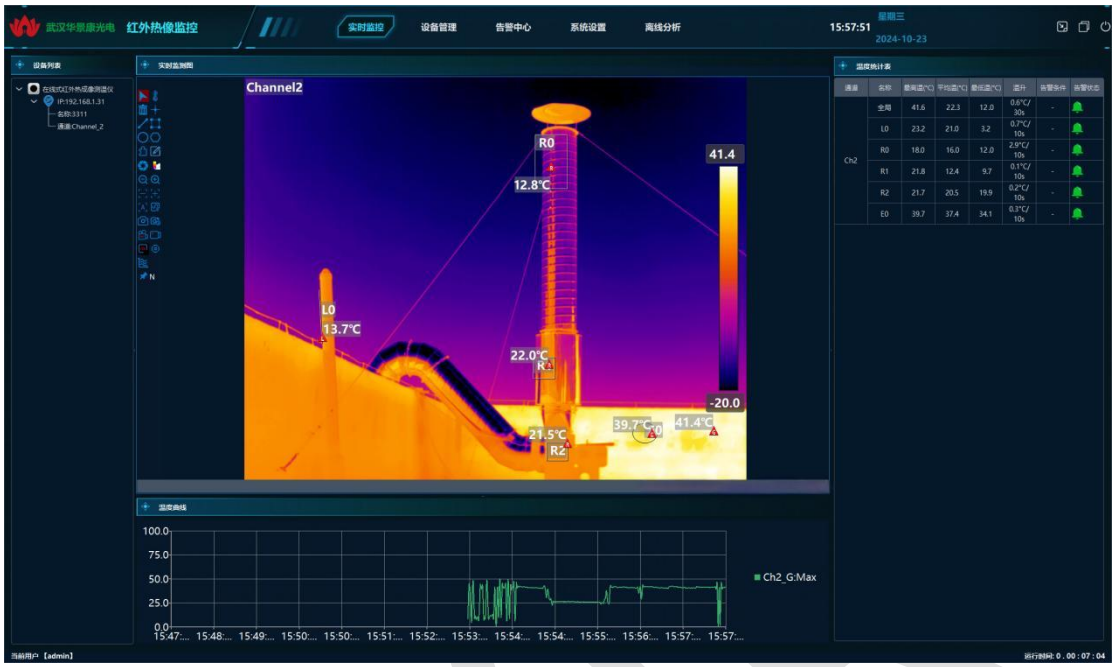


Figure 3 Movement structure dimensions

5 Software Features



The basic functions of the software are as follows:

1) Real-time video display

- Real-time display of full radiation thermal images and high-definition visible light video ;
- A maximum of 32 temperature measurement objects can be drawn, such as points, lines, circles, rectangles, and polygons;
- 3D temperature field and isotherm display, temperature distribution is more intuitive;
- Up to 12 color palettes, suitable for more application scenarios;
- Maximum temperature, minimum temperature, average temperature and multi-point temperature tracking ;
- Supports up to 32 devices online at the same time; automatically reconnects when disconnected;
- Adaptive display resolution, supports vertical screen display.

2) Intelligent analysis

- Real-time display of temperature curve, custom display time period and temperature range, temperature data can be stored in real time;
- Record in multiple video formats and take photos at regular intervals;

- Offline analysis of videos and pictures with temperature data;
- Temperature correction can be performed by adjusting emissivity, reflected temperature, distance, secondary calibration, etc.
- Target contour extraction and size calculation.

3) Alarm Center

- High temperature, low temperature, interval temperature, temperature rise, temperature difference and other types and levels of alarm;
- When an alarm is triggered, short videos, photos, temperature information and other logs are stored for easy query afterwards;
- IO, RS485, Modbus and other alarm output forms;
- Customizable alarm thresholds and levels: Assist staff in assessing the urgency and development trend of potential hazards.

4) User Management

- Support multi-user login ;
- User permissions can be set in different levels.

6 Optional lenses and detailed parameters

Focal length (mm)	Dimensions (mm)	F#	Detector resolution			Field of view (°)		Spatial resolution (mrad)
			level	vertical	Pixel size (um)	level	vertical	
14mm	Φ45×45	1.0	1280	1024	12	57	47	0.857
17mm	Φ41×44	1.0	1280	1024	12	48	39	0.7
23mm	Φ45×45	1.0	1280	1024	12	37	30	0.522

25mm	Φ41×39	1.0	1280	1024	12	33	27	0.48
35mm	Φ57.4×50	1.0	1280	1024	12	24	19	0.34
65mm	Φ62×65.5	1.2	1280	1024	12	13	10	0.18
100mm	Φ92×99	1.2	1280	1024	12	8	7	0.12