PDG300 High protection infrared thermal imaging temperature detection and analysis system technical specifications

Wuhan Huajingkang Optoelectronics Technology Co., Ltd.

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PDG300 High protection infrared thermal imaging detection and analysis system technical specifications

1 Overview

In the production process of iron and steel metallurgy, nonferrous smelting, thermal power generation, cement kilns, lime kilns, glass kilns and other industries, it is necessary to conduct real-time temperature monitoring of mechanical equipment, materials and containers to ensure production safety and conduct refined control of production processes.

Infrared thermal imaging thermometer is a device that detects the infrared radiation of the target and converts the target temperature distribution into a visible image and accurate temperature value by means of signal processing, photoelectric conversion, etc. The infrared thermal imaging thermometer accurately quantifies the actual detected heat and images the entire target in real time in the form of a surface, so it can accurately identify the suspected fault area that is heating up. The operator uses the image color displayed on the screen and the hot spot tracking display function to preliminarily judge the heating situation and fault location, and conducts strict analysis, thereby demonstrating high efficiency and high accuracy in confirming the problem.

The infrared thermal imaging thermometer uses advanced non-contact infrared detection technology to quickly, accurately, conveniently and intuitively display the distribution of the surface temperature field of the measured object and measure the surface temperature of the object. It can quickly test the surface temperature reading of the object without direct contact with the surface of the measured object, and can reliably measure the surface temperature of hot, dangerous or difficult-to-reach objects. The infrared thermal imager has a very fast measurement speed and can intuitively and continuously test the temperature changes on the surface of the object.

System Introduction

System Description

The PDG300 high-protection infrared thermal imaging detection and analysis system is an infrared thermal imaging product specially designed for use in harsh environments. The system is mainly composed of an infrared thermal imaging movement, an infrared lens, a metal protective cover, a thermal imager control cabinet, an image algorithm server and client

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software.

The system adopts full-range radiation temperature measurement technology, which can obtain multi-point temperature values at the same time; the temperature measurement range can reach up to 2500 °C; self-developed temperature measurement algorithm, high temperature measurement accuracy; metal protective cover design, IP66 protection level; system software can realize target infrared thermal map display, thermal data collection, storage and analysis, high and low temperature alarm and positioning, temperature tracking and other functions.

This product has been widely used in many industries such as steel metallurgy, nonferrous metals, electricity, cement, glass, etc. Temperature monitoring.

The product application diagram is shown in Figure 1 shown.



picture 1 HIRDA-LT High protection infrared thermal imaging detection and analysis system product application



The system composition is shown in Figure 2 shown.

1.1 System Features

- Wide operating temperature range, can work in -20°C~+60°C ambient temperature;
- High protection level, the highest protection level can reach IP66;

- Full-screen real-time temperature measurement with wide coverage;
- Independent of the system platform, you can directly log in to the web page to access images and configurations, and can directly output reports.

Alarm signal to PLC or alarm;

- Supports onvif protocol and can be connected to mainstream NVR;
- Temperature data can be connected to LED screenandPLC;
- Electric/automatic focus, focus operation can be performed through software at any time;
- The temperature measurement range can be customized, with a maximum support range of -20°C to2500°C;
- Temperature measurement accuracy is better than $\pm 2^{\circ}$ C or $\pm 2\%$;
- Supports modbus protocol and can be connected to DCS system to transmit temperature data.
- **1.2** System Utility Requirements

1.2.1 power supply

Field probe power supply220VAC 50/60HZ Power50W/ set Control room power supply: 220VAC 50/60HZ power300W

2 Application Scenario

Temperature collection and analysis of furnaces, materials and solutions in high temperature industries such as steel smelting, non-ferrous metals, cement and glass.

3 System composition

HIRDA-LT The high-protection infrared thermal imaging detection and analysis system is mainly composed of a high-protection infrared thermal imaging thermometer, a thermal imager control cabinet, an image intelligent server, etc.

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3.1 High protection infrared thermal imaging thermometer

| model | PDG300-NSxxEx (Single infrared) | | | | | |
|--|---|------------|------------|------------|--|--|
| Product images | | | | | | |
| Visible light resolution | - | | | | | |
| Visible light magnification | - | | | | | |
| Infrared resolution | 384×288 | 640×480 | 384×288 | 640×480 | | |
| Infrared lens option | 8,13,25,35 | 8,19,25,35 | 8,13,25,35 | 8,19,25,35 | | |
| Infrared field of view | | °, 10 ° | | | | |
| Infrared wavelength range | $8 \sim 14 \mu m$ | | | | | |
| Thermal sensitivity (NETD) | ≤50mk@30 °C | | | | | |
| Frame rate | | | | | | |
| focusing | focusing Electric / Automatic | | | | | |
| Image Algorithms | Gamma correction, enhancement algorithm | | | | | |
| Temperature measurement accuracy | emperature $\pm 2 \degree C \text{ or } \pm 2\%$ easurement accuracy | | | | | |
| Temperature measurement range-20 °C \sim 1600 °C (need to be divided into sections) , can be expanded to 2 | | | | | | |
| Video compression format | H.264/H.265 | | | | | |
| Data Types | H264, H265, 16Bit Raw temperature data | | | | | |
| Web Standards | Gigabit Ethernet / Adaptive 10M/100M/1000M | | | | | |
| Protocol support | IPv4/IPv6, TCP, UDP, NTP, HTTP, RTSP, RTP, ICMP, WebSocket, ONVIF | | | | | |
| Temperature output | Support analog 420mA, RS485, Modbus TCP/RTU | | | | | |
| External trigger | Support RS485 Level, TTL Level | | | | | |
| Protection level | IP66 | | | | | |
| size | Φ145mm×305mm | | | | | |
| Installation | Equipped with PTZ bracket | | | | | |
| weight | PDG300-NS≤3Kg | | | | | |
| Operating temperature | -20 °C \sim + 60 °C | | | | | |

3.2 Overall size

The overall structure dimensions are shown in the figure below.



PDG190-NSxxEx Structural dimensions

3.3 Thermal imager control cabinet

The thermal imager control cabinet contains an industrial Ethernet switch

(photoelectric conversion), a power adapter, a filter, a lightning protection module, etc.

Its main function is to provide the infrared thermal imager with a reliable and stable

power supply, network exchange (photoelectric conversion), and data conversion.

- Input interface: 100M/1000M Ethernet, RJ45 interface
- Output interface: 1000M electrical port/optical port
- Transmission rate: up to 1000M
 - Standard : IEEE802.3, IEEE802.3u, IEEE802.3x
 - Power supply : AC 220V±10% 50W
- Ambient temperature: -20 °C~60°C
- Ambient humidity : $\leq 90\%$
- Dimensions: $500 (W) \times 600 (H) \times 200 (D) mm$
- Dimensional drawings:



3.4 High temperature resistant cables

As the ambient temperature at the work site is generally high, in order to ensure stable and reliable communication and video transmission, cables are selected that are high temperature resistant, fire resistant, and have shielded mesh.

The main technical parameters are as follows:

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 Rated temperature: -65 °C ~ +250 °C (maximum ambient temperature: 250 °C, minimum ambient temperature:

Temperature : -65 °C)

- ♦ Rated voltage: 600V
- ◆ Implementation standard: GJB773A -2000
- Conductor : Stranded tinned copper wire
 - Color : red, blackDC12V 0.5m²; orange and white, orange, green and white,

green, blue and white, blue, gray and white, gray network cables.

• Insulator: Polytetrafluoroethylene (PTFE)

• Performance : corrosion resistance, strong acid resistance, strong alkali resistance, oxidation resistance; high voltage resistance, non-flammable, non- aging

Test voltage: 7000V No breakdown

3.5 Image Intelligence Server

- Intel[®] CoreTM i7 processor (quad-core, 8MB, 3.60GHz)
- Memory 16GB 1600MHz DDR3 non- ECC
- Hard Drive 256G solid state + 1TB 3.5 -inch SATA (7,200 Rpm) hard drive
- Monitor 23.8 inches
- Windows 10 Professional, 64 -bit operating system
- **3.6** Mounting accessories
 - 1 high temperature resistant cable
 - Adjustable pan/tilt bracket
 - The pre-installation assembly and pre-commissioning are completed at the factory
- 4 System Software
- 4.1 Software interface

IRT The system client software interface is shown in the figure below.



Figure 3 System software interface

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;
- Can draw up to 32 Temperature measurement objects, such as points, lines, circles, rectangles, and polygons;
- 3D Temperature field and isotherm display, temperature distribution is more intuitive;
- Upto12 Medium color palette, suitable for more application scenarios;
- Maximum temperature, minimum temperature, average temperature and multi-point temperature tracking;
- Maximum support 32 Devices are online at the same time; automatically reconnect when offline;
- Adaptive display resolution, supports vertical screen display.
- 2) Smart 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.

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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.

5 Configuration List

| Serial number | name | model | unit | quantit y | Remark |
|------------------|-----------------------------------|----------------------------------|----------|--------------|--|
| 1 | High temperature infrared | PDG300/PDG190- NSxxEx PSG350- | tower | | |
| | thermal | NSxxEx | | | |
| | imaging | | | | |
| | thermometer | | | | |
| 2 | Thermal imager control cabinet | KZG- 600×500×200 | indivual | | |
| 3 | Image algorithm server | HIRDA- IDS | set | | Including hardware and software, monitor |
| 4 | High temperature resistant cables | / | set | | |
| 5 | Mounting accessories | HIRDA- FJ | set | | Including mounting bracket, Cloud stage |
| 6 | 4-20mA conversion module | HIRDA- DA | indivual | | Optional |

6 On-site installation diagram



7 Division of labor between the two parties

Supplier:

1) Provide manufacturing, transportation, installation guidance and commissioning services for HIRDA-LT high protection infrared thermal imaging temperature detection and analysis system to ensure the normal operation of the system, ensure the integrity of the system and meet the requirements of on-site use.

2) Responsible selection of HIRDA-LT The equipment installation location of the high-protection infrared thermal imaging temperature detection and analysis system shall include an equipment installation location diagram before construction.

3) HIRDA-LT on the demand side personnel The training on commissioning, use, maintenance and overhaul of high-protection infrared thermal imaging temperature detection and analysis systems enables the purchaser's personnel to master the operating skills independently.

4) Provide product certificates, inspection reports, operating and

maintenance instructions and other relevant technical information .

1) HIRDA-LT available Required for installation and commissioning of high protection infrared thermal imaging temperature detection and analysis system equipment

Relevant on-site information and design drawings.

2) Undertake HIRDA-LT Power supply, piping, wiring and fiber fusion of optical

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fibers and cables required for high protection infrared thermal imaging temperature detection and analysis system equipment.

3) Make sure the site has the installation conditions required by the supplier, and notify the supplier's technical staff in advance to participate in guiding the installation and commissioning.

4) The purchaser shall assist in providing working conditions for the supplier's onsite service personnel.

8 Acceptance Criteria

1) Can be used in HIRDA-LT The high-protection infrared thermal imaging temperature detection and analysis system software interface displays the infrared thermal image of the measured target. Under the conditions that meet the use requirements, the equipment maintains good working effect;

- 2) Can display the current equipment usage status and record temperature data;
- 3) Display the abnormal temperature area of the measured target and prompt an alarm;
- 4) The supplier shall provide professional training to the personnel designated by the purchaser.
- 9 After-sales commitment
 - 1) HIRDA-LT The warranty period of the high protection infrared thermal imaging temperature detection and analysis system is the date of acceptance

From12 Months or 18 days after equipment arrival Months (for outsourced products and servers, including internal hardware warranty period from equipment to

Cargo day calculation 12 months).

- 2) If the thermal imager is damaged due to improper use, the purchaser shall order spare parts in a timely manner and the supplier shall provide maintenance services.
- 3) HIRDA-LT The high-protection infrared thermal imaging temperature

detection and analysis system software is used for a long time, and free software

upgrade services are provided .

4) When receiving a call from the buyer, the supplier is responsible for guiding the buyer to handle the fault; if the buyer cannot solve the problem, the supplier

The company promised to arrive at the scene to deal with it within 48 hours. The company's service phone number is: 400-080-4288.