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Laws that can vary from country to country may prohibit camera surveillance. Please ensure that the relevant laws are fully understood for the particular country or region in which you will be operating this equipment. Indigo Vision Ltd. accepts no liability for improper or illegal use of this product.

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1 ABOUT THIS GUIDE

This guide is written for users of the IndigoVision Thermal Temperature Screening Solution. It provides installation and configuration information for the device variants, as well as a description of the hardware and specifications.

Please ensure you read the instructions provided in the guide before using the device.

Safety notices

This guide uses the following formats for safety notices:

⚠️ Warning

*Indicates a hazardous situation which, if not avoided, could result in death or serious injury.*

⚠️ Caution

*Indicates a hazardous situation which, if not avoided, could result in moderate injury, damage the product, or lead to loss of data.*

⚠️ Notice

*Indicates a hazardous situation which, if not avoided, may seriously impair operations.*

✨ Additional information relating to the current section.
2 HARDWARE DESCRIPTION

This chapter details the Thermal Temperature Screening Solution, its connections, and its weights and dimensions.

Overview

The Thermal Temperature Screening Solution is designed to be used with the company’s complete end-to-end IP Video solution. It consists of a Thermal Bullet Camera combined with a Blackbody heat source. The solution is used for obtaining quick contactless temperature readings. Integration into Control Center provides instant alarms for informed actions.

Figure 1: Thermal Temperature Screening Solution - Thermal Camera and Blackbody

Caution

IndigoVision products are not medical devices or intended for medical use and have not been tested or approved by any regulatory authority.
Connections

Thermal camera

The camera is fitted with a preterminated cable bundle for easy installation.

![Thermal camera connections diagram](image)

Table 1: Connections

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Audio OUT</td>
</tr>
<tr>
<td>2</td>
<td>Audio IN</td>
</tr>
<tr>
<td>3</td>
<td>Network Port (LAN)</td>
</tr>
<tr>
<td>4</td>
<td>I/O connections</td>
</tr>
<tr>
<td>5</td>
<td>Power</td>
</tr>
<tr>
<td>6</td>
<td>RS-485 (not supported)</td>
</tr>
<tr>
<td>7</td>
<td>Video OUT (not supported)</td>
</tr>
</tbody>
</table>

Blackbody

![Blackbody connections diagram](image)

Figure 2: Thermal camera connections

Figure 3: Blackbody connections
**Powering up the camera**

The camera can be powered by either an auxiliary power supply or PoE and is compliant with the IEEE 802.3af standard.

The following may be used:

- Power over Ethernet (PoE) switch
- PoE injector/midspan
- Auxiliary power supply
  - 12V DC—Camera has a maximum power usage of 15W

The camera should only be powered from the specified voltage. A suitable power supply can be ordered separately (Part numbers: High PoE Injector 75W 130176, auxiliary 12V DC power supply 110068).

**Powering the Blackbody**

The Blackbody can be powered by 100 - 240VAC

- 100VAC—Blackbody has a maximum power usage of 25W
- 240VAC—Blackbody has a maximum power usage of 32W

The Blackbody should only be powered by the specified voltage using the power cable in the kit contents.

**Camera dimensions and weight**

*Figure 4: Thermal camera dimensions*

- Dimensions and weight: 292.1mm (d) x 103.8mm (w) x 96.7mm (h) and 1.9 kg
Blackbody dimensions and weight

- Dimensions and weight: 184 mm (d) x 125 mm (w) x 125 mm (h) and 2.35 kg

Figure 5: Blackbody dimensions
3 GETTING STARTED

This chapter describes the initial steps required to start using your Thermal Temperature Screening Solution.

Package contents

Before continuing, please check that you have been shipped the items listed for your device.

Thermal Bullet Camera

Camera

• Thermal Bullet Camera

Additional

• 1x Waterproof RJ45 connector kit
• 1x Screw kit (4x screws, 4x rawlplugs)
• 1x Torx Wrench
• 1x Power Cable Adaptor
• 1x Installation template
• 1x Quick Start Guide
Thermal Blackbody

Additional

• 1x Power Cable
• 2x Tripods (1 for camera, 1 for Blackbody)
• 2x Adaptor plates (1 for camera, 1 for Blackbody)
• 2x Fixing kits (1x Allen key, 4x cross-head bolts, 2x washers, 1x Allen bolt)
• 1x Quick Start Guide

Configure the camera

Configure the settings

By default, the camera uses a DHCP server.

1. Connect the camera to a PC using an Ethernet cable.
2. Navigate to the camera's default IP address using a web browser and set a secure password.
   If the default password is required, enter 1234.
   If you cannot connect to a DHCP server, enter the default network settings.

<table>
<thead>
<tr>
<th>Default Username</th>
<th>Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default IP Address</td>
<td>10.5.1.10</td>
</tr>
<tr>
<td>Default Subnet Mask</td>
<td>255.0.0.0</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>10.0.0.1</td>
</tr>
</tbody>
</table>

3. Enter the NTP server and port on the Setting > System > General > Date&Time menu.
4. Enter a new IP address and subnet mask on the Setting > Network > TCIP/IP menu.
5. Select the video standard for your region using the Video Standard option on the Setting > System > General > General menu.
Choose **PAL** for countries with 50Hz power frequency and **NTSC** for countries with 60Hz power frequency.

**Further configuration**

After the IP address has been configured, you can also access the camera’s configuration pages through IndigoVision Control Center.

1. In **Setup** view, select the camera you want to configure.
2. Select the **Configure** tab, and enter a valid user name and password if required.
This section details how to install the Thermal Temperature Screening Solution.

**Equipment setup**

Ensure all the devices are powered off before setting up the equipment.

---

**Notice**

The Blackbody comes pre-configured at 35°C and does not need to be adjusted. It is not possible to set this temperature to Fahrenheit.

The Blackbody is only a heat source. If the thermal camera is set for Fahrenheit measurements, then the camera detects the Blackbody as 95°F.

---

Set up the devices and tripods using the following configuration:

- Position the camera 2m from the ground.
- Position the Blackbody 1.8m from the ground.
- Position the Blackbody in the field of view of the camera and 3m apart.

---

**Figure 6:** Equipment setup measurements
Turning on the devices

1. Connect power lead to the Blackbody.
2. Turn on the Blackbody using ON/OFF switch.
3. Leave the Blackbody for a short period of time until it reaches a stable 35°C, shown on the display.
4. When the Blackbody is at a stable temperature, power on the camera.
   The camera should be powered on for 60 minutes to allow it to stabilize before readings can be taken. During this time you can configure the camera settings.

Notice

*Do not power on the camera until the Blackbody has been turned on and reached a stable temperature.*

*The OUT1 LED is continuously on as the Blackbody stabilizes at the set temperature. The OUT1 LED starts to flash when the temperature has been reached.*

Using the equipment

To ensure temperature screening is reliable and accurate, follow these recommendations:

- People waiting to be screened **must be acclimatized** to the ambient temperature of the screening area.
- People should **not be screened** if they have come directly from a colder or warmer environment than that of the screening area ambient temperature.

Figure 7: Equipment setup and use
• The environmental conditions around the screening area should be stable and controlled.
  • No heat sources near the screening area, for example, radiators.
  • Limit cold air movement around the screening area, for example, air-conditioning systems.
  • No reflective surfaces behind the person being screened, for example, windows.
• The equipment is for indoor use only.
• The screening area must not be located near a door, particularly if the door opens to outside areas.
• Only one person should be in the frame for screening at a time (2).
• The person should stand for 5 seconds within the region of interest.
• The person should stand next to the Blackbody. IndigoVision recommends having floor markings to make it clear where the person should stand for screening.
• For improved accuracy, the upper part of the face of the person being screened, must not be covered.
  • Glasses, hats, or any face coverings should be removed.
  • Long hair should be removed from the forehead.
• People waiting to be screened should stand to the side of the person being screened (1).
• All people being screened should queue safely according to local guidelines and advice.
This section explains the various configuration options provided by the Web Configuration pages.

**Camera configuration**

The Blackbody does not require any configuration or adjustments. The Blackbody is supplied pre-configured and set to the right temperature settings.

However, the camera requires configuration using the camera web configuration pages. This includes identification of the location of the Blackbody in the camera's line of sight.

After the camera has been connected and if DHCP is not available, the default static IP address will be used, 10.5.1.10.

Follow these steps to configure the camera:

1. Open Internet Explorer 11 and enter the IP address of the camera.
2. Type and confirm an Admin password using the **Device Initialization** screen.

3. Log in to the camera configuration web pages.
4. Click **Allow** to accept and install the **WebActiveX Module**.

After the web plugin has been installed you should see the video stream and display in the **Live view**.
5. Select the **Setting** tab.
6. From the menu, select **System > General**, then select the **Date & Time** tab.
7. Select the **NTP** option and enter the correct NTP server IP address.
   
   If there is no NTP server available, click **Sync PC** to sync to the local PC time.
   
   For regions that use daylight savings time should select **DST** and provide the start and end times for the DST.

8. From the menu, select **Smart Thermal > Smart plan**.
9. Select the thermometer icon to enable this feature.
10. Click **Save**.
11. From the menu, select `Smart Thermal > Thermal Temperature Monitoring`, then select the `Thermal Temperature Monitoring` tab.

12. Configure the camera `Thermal Temperature Monitoring` web page.

   a. On the camera view area, change the size of the ROI (Region Of Interest) by dragging in the corners of the selection area.

   This is the area where the person being screened can be viewed.

   Ensure the ROI covers the head and shoulders of the person being screened.

   b. Select the `Enable` option.

   c. Select the `High Temperature Warning` option.

   This is pre-configured to 37.3°C (99.1°F). However this can be adjusted as required.

   d. Select the `Audio Linkage` option.

   This sounds an audible alarm when the temperature threshold is met and an alarm is triggered.
The audible alarm can be heard from the camera speaker and, if attached, through the Audio Out connector to an external speaker.

e. Select the **White Light** option.

This turns on the white light in the camera when the temperature threshold is met and an alarm is triggered.

Both the **Audio Linkage** and **White Light** can be disabled if discrete over-temperature event notifications are required.

13. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**, then select the **Blackbody parameter** tab.

The Blackbody must be switched on and at a stable temperature before selecting this region.

The Blackbody, camera, and tripods must not be moved after configuring the ROIs. If they are moved then the temperature readings will be inaccurate.

The Blackbody must be square to the camera with no white areas being shown.

a. On the camera view area, change the size of the ROI (Region Of Interest) by dragging the corners of the selection area to be around the inner edges of the Blackbody.

![Figure 15: Blackbody region of interest](image)

b. Select the **Enable** option.

c. If required, configure an alarm to detect any changes to the position of the Blackbody during screening. To configure an alarm for the Blackbody, select **Setting > Event > Blackbody abnormal alarm > Blackbody error**.

The Blackbody comes pre-configured at 35°C and does not need to be adjusted.

14. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**, then select the **Compensation Settings** tab.

Leave this page with the default settings.

If you see an unexpected trend in your screening temperature readings or not matching another external temperature source, then a compensation factor can be applied.

- A negative value decreases the temperature readings by the entered value.
- A positive value increases the temperature readings by the entered value.
15. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**, then select the **Smart Channel** tab. Leave this page with the default settings.

16. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**, then select the **Others** tab.

a. Use an external thermometer and measure the ambient temperature around the screening area.

b. Type the measured value at **Ambient Temp Setting**.

c. Click **Save**.

d. The camera can detect ambient temperature. When there is significant variation in the camera temperature readings, IndigoVision recommends you use an external thermometer to measure the ambient temperature and enter this value.
IR

IR is turned off by default. If you require IR to be on follow these steps:

1. From the menu, navigate to *Peripheral > Illuminator*.
2. Change *Mode* from *Manual* to *Auto*.
3. Click *Save*.

FFC

The FFC is a camera refresh which ensures the camera is accurately reading the Blackbody temperature.

This setting should be left as default.

If required, the *FFC Period* can be reduced to enable a camera refresh more often.

⚠️ There is a short pause in the video stream while the *FFC period* is adjusted and camera refreshes.

1. From the menu, select *Camera > Conditions*.
2. Select the *Conditions* tab.
3. Select *Channel 2*.
4. In the *Advanced* area, expand the *FFC Settings* option.

![FFC settings options](image)

**Figure 19:** FFC settings options

Celsius to Fahrenheit

The default setting for the temperature readings are in Celsius. This can be changed to Fahrenheit. To change the settings, follow these steps:

1. In the menu, select *Temperature > Global Setup*.
2. Select the required *Temperature Unit* (°C or °F).
It is not possible to change the Blackbody display to show readings in Fahrenheit. The Blackbody always reports temperature in Celsius. The Blackbody is only a heat source. If the camera is set to read in Fahrenheit, then the camera identifies the Blackbody as 95°F even though the Blackbody displays 35°C.

### Color Bar

To enable the color bar, follow these steps:

1. From the menu, select **Temperature > Global Setup**.
2. Expand the **Advanced** area.
3. Set **Color Code** to **On**.

### Configuration of the face detection region

The following are guidelines and information for configuring the face detection region.

- The default settings can be adjusted to give more accurate readings.
- The thermal camera only reads temperature in the top half of the face marking box so it is important to have the positioning of this correct.
- The crosshair (or + symbol) shows the hottest point in the measured rectangular area.
• It is important to make sure the camera is reading the temperature on the forehead and not the eye canthus. This ensures the temperature readings are close to temperature readings from a non-contact IR thermometer.

• Below is shown the correct and incorrect face marking box areas:
  - Image 1 - the face marking box in the correct place measuring the forehead only.
  - Image 2 - too low and reading the hotter eye canthus rather than the forehead.

![Figure 22: Image 1](image1.png)
![Figure 23: Image 2](image2.png)

The face marking box is higher up so the eye canthus is not in the top half of the facial marking box.

The face marking box is lower down so the eye canthus is in the top half of the facial marking box. This results in readings which may not be as precise when compared to readings measured from a non-contact IR gun pointed at the forehead.

Positioning the face marking box

There are two methods for adjusting the position of the face marking box.

Method 1

1. From the menu, select **Camera > Conditions**.
2. Select the **Conditions** tab.
3. Select **Channel 2**.
4. Use the arrows next to **Hybrid Calibration Adjustment**.
Figure 24: Hybrid Calibration Adjustment method

Method 2

1. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**.
2. Select the **Thermal Temperature Monitoring** tab.
3. From the **Face Marking Box** section, use the arrows next to **Location**.

Figure 25: Location adjustment

**Face marking box size**

The face marking box size can be adjusted to give more accurate readings.
1. From the menu, select **Smart Thermal > Thermal Temperature Monitoring**.
2. Select the **Thermal Temperature Monitoring** tab.
3. In the **Face marking Box** area, adjust the **Horizontal Zoom** and **Vertical Zoom** sliders.

IndigoVision recommends setting the face marking box horizontal and vertical zoom values to 40.

![Face marking box size adjustment](image)

Figure 26: Face marking box size adjustment

After the face marking box size has been changed, ensure that the box is in the correct location for the forehead. If not then move the box using the adjustments methods described above.

**Blackbody**

**Blackbody abnormality warning**

A Blackbody abnormal error warning is enabled by default.

This sounds an audible alarm if the Blackbody is not switched on or moved out of position.

You can disable the audible alarm if it is not required.

1. From the menu, select **Event > Blackbody Abnormal Alarm**.
2. Disable **Audio Linkage**.
3. Click **Save**.
To ensure the accuracy of Blackbody temperature measurement, IndigoVision recommends calibrating the Blackbody once every 12 months.

IndigoVision provides Blackbody calibration as a paid service. Contact us for further information.

Blackbody maintenance

Ensure that the Blackbody is not covered during use. Do not prevent any heat dissipation and resulting reduced temperature reading accuracy.

When not in use the Blackbody should be put into the packing box or covered with a clean cloth. Ensure that the storage environment, temperature and humidity are appropriate.

For more information, see "Environment" on page 32

If required, IndigoVision recommends using a neutral detergent to clean the Blackbody shell only. A soft brush can be used to clean any dust on the radiation surface of Blackbody.
6 HARDWARE SPECIFICATION

This chapter details the hardware specifications for the Thermal Temperature Screening Solution.

Thermal camera

Environment

• Temperature:
  • Operating: 10°C to +30°C (50°F to 86°F)
  • Cold start: +10°C (50°F)
  • Storage: -20°C to +60°C (-4°F to 140°F)
• Maximum humidity: 95%

Regulatory

• EN 61000-3-2
• EN 61000-3-3
• FCC Part 15 Subpart B
• EN 50130-4
• EN 55032
• EN 55035
• UL60950-1
• RoHS directive 2002/95/EC
Blackbody

Environment

- Temperature:
  - Operating: 0°C to +40°C (32°F to 104°F)
  - Cold start: +10°C (50°F)
  - Storage: -10°C to +50°C (14°F to 122°F)
- Maximum humidity: 80%

Regulatory

- EN 61000-3-2
- EN 61000-3-3
- FCC Part 15 Subpart B
- EN 50130-4
- EN 55032
- EN 55035
- RoHS directive 2002/95/EC