TI-120GTS-Series
Group Temperature Screening Thermal Imaging with Face Detection
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Safety Information

Definitions

**! WARNING:** Represents a hazardous situation or behavior that could result in personal injury or death.

**! CAUTION:** Represents conditions or actions that could result in damage to the instrument or permanent loss of data.

**! Note:** Represents useful information for users.

Hardware Installation

Mount the camera to a tripod or other support device. (Tripod not included)

Connect the device to the computer with a USB cable, and plug the USB cable of the Logitech camera into the USB port of the computer.

Connect the external power supply to the camera.

Hold the camera power button until the green light is illuminated.

Connect WLIR to the IR Camera and the DC Camera. Please refer to Section 5.1 for details.

Adjust the focus of the IR Camera and align the IR image with the visible light image. Please refer to Section 5.2 for details.

Set whether to capture photos after alarms and select the photo storage location. Please refer to Section 5.5 for detail.

When screening is in operation, an alarm will be triggered if an individual present abnormal temperature.
Field Setup

1. The installation location should be in an indoor and brightly lit area to avoid backlighting. (It is not recommended to install outdoors. The unstable outdoor environment will affect the temperature measurement accuracy).

2. The distance between the device and the person being inspected is recommended to be within 2.6-10.5 ft (figure 1).

3. Set up the temperature measurement area. It is recommended to set the temperature measurement area around the person being tested with a 1.5 ft distance from the front, back, left and right.

4. The crowd control route is recommended to be L-shaped (figure 2).
Operating Environment

3.1 Operating System
Microsoft Windows 7, 32-bit (User must install .NET Framework 4.0 to allow proper running of the program).

Microsoft Windows 7, 64-bit (User must install .NET Framework 4.0, to allow proper running of the program).

Microsoft Windows 10, 32-bit professional edition
Microsoft Windows 10, 64-bit Professional Edition

3.2 Hardware Configuration
Personal computer with Core i3 7020 equivalent or above.
Memory: at least 4GB or more.
USB 3.0 port.
Available hard disk space: 20GB.
Super VGA (1024 x 768) display (or higher resolution).
Discrete graphics card recommended.
Audio output.
Internet connection capable to perform necessary activation and plug-in upgrade installation.
Keyboard and mouse, or compatible pointing device.
Software Installation

⚠ Caution: Before installing WLIR professional IR image analysis software, please close all programs on the PC.

Software can be found at www.omega.com/p/TI-120GTS-Series

To install WLIR automatic infrared temperature screening software, please follow the steps below:

4.1 Precautions Before Software Installation

Please make sure that the operating system you are using is Windows 7, Windows 8, or Windows 10. The operating system needs to have .NET Framework 4.0 installed and confirm that the operating system you are using is 32-bit or 64-bit (used to confirm the installation of the corresponding USB port driver file).

You must be an administrator or a user with administrator's access to install the program. Find the WLIR.exe file in the installation directory, right-click on it and go to Properties and select the Compatibility tab, check the box for Run this program as an administrator”, apply changes and press Ok.

Default Installation directory:

64-bit operating system C:\ProgramFiles(x86)\IR\WLIR-N\n
32bit operating system C:\ProgramFiles\IR\WLIR-N\n
During the installation process, Microsoft® at times repeatedly warns that the software has not passed the Windows® logo test or trust option. In all cases, select “Continue Anyway” or “Always Trust”. If you are prompted by antivirus software, please choose “Always allow it to run” or choose to trust this software.

A complete installation consists of multiple subprogram installations, some of which come from third-party vendors. Do not abort these subprogram installations, as they are required for a complete installation.

Connecting the product for online use requires the installation of the driver. Windows 8/10 system must be set to "Disable driver signature enforcement" prior to installation. For specific operations, please refer to 5.4. Driver Installation Instructions.
4.2 Install .NET Framework 4.0

Win7 defaults to .NET Framework 3.5. You need to install .NET Framework 4.0 or higher. Find it via any search engine, download and install.

1. • .NET Framework 4.0 is enabled by default in Windows 10/8. If you need to enable it, please do as follows:

1. Connect your PC to the Internet.

2. Click the "Start" button in the lower left corner of the PC desktop and click "All Applications"->"Windows System"->"Control Panel". Or just click on the search bar and search for "Control Panel".

As shown below:

3. Select "Programs" in "Control Panel" (or click "Uninstall a program" in "Programs"), the following interface will appear:
4. Click “Turn Windows features on or off” to enter the following interface:

5. Click to turn on the “.NET Framework 4.0” feature (or change the version)
4.3 Installation steps for WLIR Automatic Infrared Temperature Screening Software

To install WLIR Automatic Infrared Temperature Screening Software on PC, please follow the steps below:

1. Log into Windows using the administrator account and close any other applications.
2. Double click the installation file of WLIR Automatic Infrared Temperature Screening Software.
3. Do the operations step by step according to the instructions in the Setup Wizard.

4. When installing the software, a window will pop up asking to install Microsoft Visual C++ 2013 and Microsoft Visual C++ 2015/2019. Install these files and then close window and proceed to next step.

5. Install USB Driver once window appears. Click next and follow the steps to successfully install the driver. After successfully installed close window.

6. Click finish on original installation screen.
7. Find the WLIR-IR.exe file under the installation directory (C:\Program Files (x86)\IR\WLIR-IR), then click the right button to select “Properties”, click on “Compatibility” tab in dialogue window, and check the box “Run this program as an administrator” and save.

8. Double click the shortcut icon for the WLIR Automatic Infrared Temperature Screening Software on the PC desktop to start the software, and you’ll see the following interface.

! **Note:** If "EZ-USB" is still displayed under "Other Devices" in Device Manager when camera is connected and powered on, it indicates that the driver is not installed successfully and needs to be reinstalled.

**Software Use**
1. IR camera connection: Connect / disconnect IR imaging device;

2. Visible light camera connection: Connect / disconnect visible light imaging device;

3. Match: Match the IR image and visible light image;

4. Color palette: Change the color of the IR image display;

5. Dual view mode: The interface displays both IR and visible light images;

6. IR image mode: The interface only displays IR image;

7. Visible light mode: The interface only displays visible light image;

8. Data: Searching and exporting data in .csv format.

9. System Settings: System settings for alarm capture, alarm modes, storage path, activation, etc.;

10. About: View the user manual and software version.

11. Alarm temperature: Modify the alarm temperature.

12. Clear: Clear total and abnormal detection counts.
5.1 Device Connection

! Note: Before enabling the device connection, please make sure that the device is connected to the computer via the USB cable and Power on.

1. Click on \( \text{IR ON} \) in the upper left corner, the following prompt will appear:

2. Click on “OK”;

3. Click on \( \text{DC ON} \) to connect to the Logitech camera, the following prompt will appear:
4. Select the camera (generally Logitech HD Webcam C310, Logitech HD Webcam C270 or USB Video Device) and click on “OK”.

! Note: For stable operation, the device needs to preheat for 10 minutes after powering on. Sampling, detection and alarm can be performed after preheating.

5.2 IR and Visible Light Image Match

1. The device must be aligned before its first use, otherwise the visible light image and the infrared image will not correspond, causing a temperature measurement error.

2. Click on the drop-down menu on

3. Select one of the three default options to the distance between the camera and the testing object/individual. The current image matching will be assigned to the selected
distance. Next time the system is launched it will automatically load the last option chosen.

4. Click on "Match" to enter the Match interface.

! Note: Before alignment, please focus the IR image. It is recommended to find a vertex or intersection point for easy identification within the actual measurement distance for alignment.

! Note: If the focus is not clear or the alignment is not precise, it will cause deviation during the temperature measurement, and the measure of the face temperature will be inaccurate.

5. Adjust the two red crosses to aim at a same point in both images. It is recommended to find an object that is easy to identify. Repeat the procedure with the green crosses as shown below:
6. Click Match and the following image will appear:

7. Check the Match, click on \( \text{to fine-tune the position. If the alignment is not precise, click \( \text{to re-match. Once successfully matched Save and assign a name to the alignment.} \]

8. If you need to recall the Match information, you can click on the triangle next to the Match button and select from the drop-down menu.
5.3 HawkAI Mode

The HawkAI alarm mode automatically collects 10 forehead temperature samples and calculates the compensation temperature converting forehead surface temperature into human body temperature. As the inspected individuals enter and get sampled continuously, the compensation temperature is calibrated in real time, which is more suitable for locations with constant change of ambient temperature.

1. Click on and select “HawkAI”, as shown below:

![System Settings](image)

2. Close this interface to start AI sampling, as shown below:

![Sampling interface](image)

3. Click on OK. As each inspected individual enters, a headshot and temperature value are captured, as shown below:
4. After sampling 10 times, you will be suggested to enter the HawkAI alarm mode. Click "OK" to enter the HawkAI alarm mode, as shown in the following figure:

5. The default temperature alarm in AI alarm mode is 37.3 degrees Celsius, which is recommended to use. It can be adjusted if necessary, as shown in the following figure:
5.4 Threshold alarm mode

In the threshold alarm mode, it will be measured the real temperature of the surface of the forehead. The temperature and alarm parameters can be manually adjusted.

1. Click on the option under "General", select "Alarm", and then "Threshold" mode, as shown in the following figure:

![System Settings]

2. For the alarm triggering temperature setup it is recommended to measure 5-10 persons, then set the alarm temperature according to the measured temperature, as shown in the diagram below:

![Threshold Temp.]

![Diagram]

---

Note: Accurate temperature measurement requires clear focusing of the screening instrument. The device has a manual focusing ring that can be used to adjust the focus.

Note: Accurate temperature measurement requires a good match between the IR image and the visible image. Poor matching will result in inaccurate sampling and temperature measurement.

Note: The preheating of IR imager should be completed before data collection. No data collection can be made during the preheating process; neither the screening and alarm will be available (More detailed information in the FAQs section).
5.5 Snapshot and Storage Settings

Two types of alarm snapshot can be set. Alarm image only (snapshot is taken once alarm is triggered) and All images (snapshot is taken once human beings are detected).

1. Click on and enter the following interface and check "Alarm image only " to set Alarm snapshot; Check "All images" to set the detection snapshot. Click “Close” after setting.

2. Click and select storage to set the save path for snapshot photos, as shown in the following figure:
3. In order to open the snapshot picture, you can check the head bar at the bottom or the right side of the alarm head bar. Right click in the blank space to open the folder;

4. **Note** When both “Alarm images only” and “All images” are not selected the software does not store any pictures.
5.6 Headcount Statistics

1. The system automatically counts the number of detected people and the number of abnormal detections, as shown in the following figure:

![Headcount Table]

2. Accumulative and abnormal counts can be reset by clicking on

![Reset Button]

3. After the face portrait is captured and the temperature is measured, the captured images will appear at the bottom. If the “All images” function is enabled, those images are stored and can be zoomed in by double-clicking on them; or right-clicking on the images to see a larger view by selecting “Open”.

4. When an alarm sets off, the captured image and temperature will appear on the right side. If the “Alarm image only” is turned on, those images are stored and can be zoomed in by double-clicking on them; or right-clicking on the images to see a larger view by selecting “Open”.

![Alarm Image]

5. Right-click on the face portrait to clear the selected face portrait or right-click on the blank area to clear all face portraits.
5.7 Introduction to More Functionalities

5.7.1 Palette

Click to modify the infrared image palette

![Palette options]

*Note:* This function will only modify the visualization effect, not the temperature measurement itself.

5.7.2 Fonts

Click on **System Settings**, select "Units" to access the following interface to adjust the font and size of temperature prompts.

![System Settings interface with Font option highlighted]
5.7.3 Display Settings

Click on [ ] to switch screen display mode; Right click on the IR image or/visible image to display the corresponding full screen. Press Esc or right click to exit the full screen.

5.7.4 Enabling Blackbody Calibration

Click on [ ] to enter the "General" menu to activate the Blackbody temperature calibration. Before enabling this option, it is necessary to preheat and stabilize the Blackbody at the set temperature, then place it on the edge of the IR image picture within the detection distance.

5.7.5 Alarm Sound

Click on [ ] to enter the "General" menu to set up the alarm sound; Vocal: When the alarm is set off, a voice will announce "Caution, abnormal!" Alert: Beeping sound is emitted when the alarm is triggered. If alarm prompt is enabled a custom message will display on the screen. Type in the text box to the right to write custom display message.
5.7.6 Power Saving Mode

Click on to enter the “General” menu to enable power saving mode.

Enabling power saving mode will shutdown the software after 15 minutes of inactivity.
5.8 Privacy Mode

When the Privacy Mode is enabled, only the infrared image will be displayed on the screen and auto snapshot is disabled. Full screen mode can be activated by right-clicking on the infrared image as shown in the figure below:

When the temperature data function is selected the temperature will display on the screen as an individual's temperature is measured. If unchecked the temperature will not show and only the colored box will appear around each individual's face.
5.9 Modbus

1. Modbus functionality is available. Click on , to enter the “General” menu and see Modbus IP in the text box shown in the image:

2. Open debugging software and select “connect” to begin connecting to your device via Modbus. “Modscan32” or any other Modbus TCP/IP data scanning software can be used.

3. The connection type is “Remote TCP/IP Server”, the IP address is “127.0.0.1” and the port is “502” as shown below.
4. Select Modbus point type “Holding Register” to obtain the corresponding data.

<table>
<thead>
<tr>
<th>Description</th>
<th>Holding Register Address</th>
<th>Ex. Data Transmitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative number of people</td>
<td>40002</td>
<td>00563</td>
</tr>
<tr>
<td>Cumulative number of abnormal people</td>
<td>40004</td>
<td>00042</td>
</tr>
<tr>
<td>Number of faces detected in the current screen</td>
<td>40005</td>
<td>00001</td>
</tr>
<tr>
<td>FaceID</td>
<td>40006</td>
<td>00726</td>
</tr>
<tr>
<td>Temperature value *10 of the measured person</td>
<td>40007</td>
<td>00365</td>
</tr>
<tr>
<td>Normal temperature</td>
<td>40008 (00000)</td>
<td>00000</td>
</tr>
<tr>
<td>Abnormal temperature</td>
<td>40008 (00001)</td>
<td></td>
</tr>
</tbody>
</table>
5.10 Language

The software is available in multiple languages. Click on System Settings, to enter the “language” menu to set up the language.

![System Settings](image)

5.11 Help

Click on Help for help and to see the user manual and software version information.

![User Manual](image)

In the “About” section, available online software updates can be detected.
FAQS

1. **Backlighting problem (cannot recognize human face)**

   The recommended installation environment for the device is indoors with good lighting. Try to avoid a backlit environment, which can affect the accuracy of face recognition or even result in detection failure.

   When the device is facing a door or window, the facial recognition failure in the figure below may occur.

   ![Backlighting Problem](image)

   It is recommended to change the orientation of the device or turn on the indoor lights to reduce the effect of backlighting.
2. **Accurate focus**

The device uses manual focus adjustment, and it can only correctly measure temperature if its focus is accurate. If the focus is not accurate, the infrared image can be blurred, and the corresponding measured temperature can also result in a large error.

Blurred focus and inaccurate temperature

![Blurred focus and inaccurate temperature](image1)

Accurate focus and accurate temperature

![Accurate focus and accurate temperature](image2)
3. Matching

To use the device correctly, the visible and infrared images must be matched.

The picture below shows an unmatched photo. The visible light recognition frame (right) is positioned to the face, while the infrared recognition frame (left) does not match the face position. The temperature test result obtained is incorrect, as it has not read a human face temperature.

After matching, the face recognition frame of the infrared photo and the visible light photo are in the same position, so the measured result is accurate.
4. Threshold mode

The threshold mode directly displays the human body surface (face) temperature. The body surface temperature is greatly affected by the environment.

In threshold mode, the temperature compensation can be performed manually, and the compensation temperature value is ≤10 °C.

5. Recommended Screening Mode

The working principle of the HawkAI mode is that the device first collects the human body surface (face) temperature, and then automatically calculates the compensation temperature through the AI algorithm to convert the human body surface temperature into the real body temperature. HawkAI mode can adjust the compensation temperature value in real time according to the flow of people continuously passing the temperature measurement point, to adapt to the change of ambient temperature.

Please note: The AI mode is designed with caution. The goal is to screen out people with a high body temperature in the crowd, and then perform a second temperature measurement. Body temperature varies from person to person; the biggest difference can be as high as 1-2 °C. With careful consideration, please have the screened person stabilize their temperature for 5-10 minutes, and then perform a second temperature measurement. If their temperature is still high, it is recommended to use a medical thermometer to repeat the measurement.

6. Recommended Screening mode data sampling

When using AI mode, the software will prompt: “You have to resample temperature for 10 sets”. We recommend sampling the temperature of 10 different people with variations, so that the temperature compensation value of the AI algorithm can fit most people.

7. No alarm above 40 °C

When the measured temperature of the human face exceeds 40 °C, the software will not emit an alarm. The software’s upper limit of the alarm temperature is 40 °C. If the temperature of the human body exceeds 40 °C, the person would feel unmistakably ill and should go to the hospital for treatment immediately. An individual can use many methods to attempt to reduce his or her face temperature and prevent being detected by infrared thermal imaging devices.
8. The effect of distance on temperature measurement

First, we recommend that the location of the temperature measurement point be fixed and the distance from the device to the measurement point also be fixed. Then the device is focused and matched under this premise. Therefore, when the person to be inspected reaches the temperature measurement point, the focal length is appropriate, and the measured temperature is accurate.

If the person being inspected continues to walk towards the IR imaging camera, he/she will be closer to the infrared camera, the focal length of the infrared image changes, and the measured temperature may increase.

Therefore, when the equipment is installed, we recommend that the temperature measurement route to be arranged in an "L" shape. After reaching the determined temperature measurement point, the channel turns left or right by 90°.

9. Cannot display visible light image

There may be several reasons when the software prompts that the visible light (DC) image connection fails: 1. The USB cable connection of the visible light camera is faulty. Please reconnect or try again with a different USB port on the computer; 2. The computer may not have a camera driver installed. Please go online (Logitech official website: https://www.logitech.com), download and install the relevant driver. 3. Please check if the network is disabled. Disabling the network may cause the visible light image to fail.

10. Cannot display infrared thermal image

First, please make sure that the device is power on, and the status light is green. Second, make sure that the device driver is installed correctly. Third, make sure the USB connection between the device and the computer is stable.
11. The Windows 8 / 10 version of the driver cannot be successfully installed

Please check whether the driver signature enforcement is disabled (Disable driver signature enforcement). If this step is not performed, the prompt below will appear. The second possibility is that a 32-bit driver (x86) or a 64-bit driver (x64) is installed on a 64-bit or 32-bit system, respectively.

12. Shutdown

To manually shut down, press and hold the power button for about 6 seconds. If the device is disconnected from the software (software has been closed or the computer is in sleep), the device will automatically shut down after 5 minutes.

13. Unable to recognize faces

The face recognition rate of the software cannot always be completely accurate. It is necessary to pay attention to these situations in which faces may not be successfully recognized: people with black masks; people with long hair covering their foreheads; people with hats; people with less hair; people walking too fast, etc. Additionally, misidentification may occur where other objects are mistakenly considered as human faces for temperature measurement.
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