

E-Guardian S408

Preliminary Fever Detection Solution

Quick Start Guide



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Disclaimer

The S408 Preliminary Fever Detection Solution is not intended to replace professional medical device. In the event that a potential fever temperature is detected, the subject should be immediately rechecked with an approved medical thermometer.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

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Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

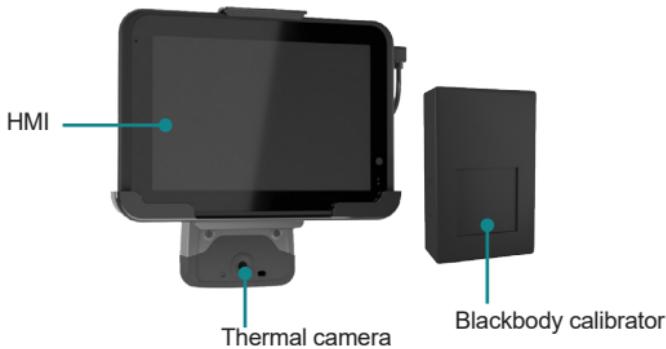
FCC RF Radiation Exposure Statement:

For body worn operation, this phone has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the handset a minimum of 1.5 cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

System Overview

The S408 fever screening detection solution is designed for fast preliminary detection of potential fever symptoms. The S408 comprises of the following main components:

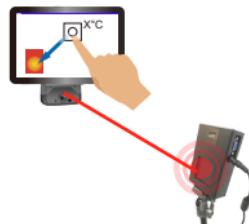
- **Thermal camera:** An infrared thermography camera to detect potential fever. A temperature of $>37.5^{\circ}\text{C}$ is defined as potential fever with S408.
- **HMI:** An interface to display the thermography. It comes with a touch screen to do calibration and audio feature to trigger audio alarm if potential fever is detected.
- **Blackbody calibrator:** To calibrate the thermography camera to enhance the accuracy.



How the S408 Works

Calibration

Using the provided blackbody furnace, with just one touch you can calibrate the thermal camera and the S408 is ready to use.



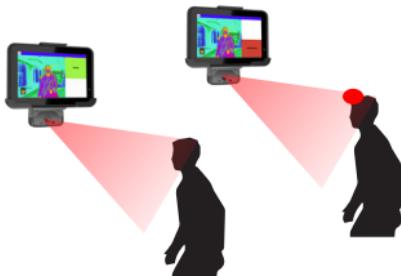
AI-Powered Human Recognition

The S408 is an AI-powered solution so it is able to recognize a human from the thermal image and thus measuring the forehead temperature. An individual wearing a mask can still be detected.



Real-time On-Screen Display

The S408 continuously measures the temperature of people passing through the S408. Detection results are displayed real-time on the screen.



Audio Alert on Potential Fever

When potential fever is detected, the S408 sends an audio alert for further examinations.



Installation Options

Designed for flexible installation, the S408 comes with an all-in-one installation kit to support various installations.

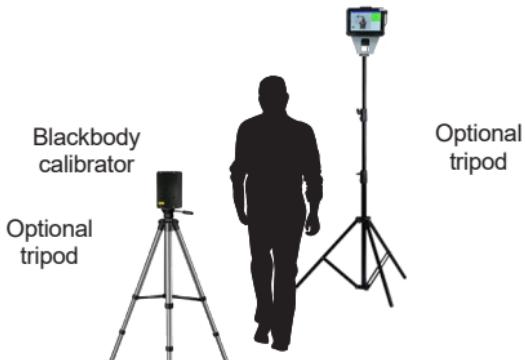
A. Magnetic Mount

The S408 includes 2 magnetic holders so you can securely mount the S408 on any metal surface, e.g, a metal door frame.



B. Tripod Mount

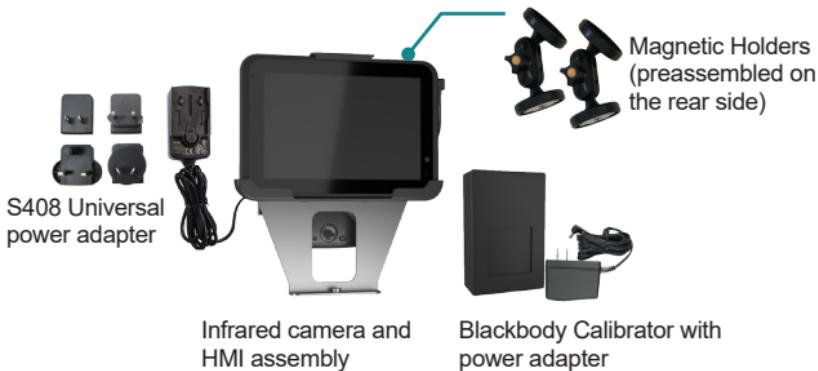
The S408 assembly includes a mount plate with an universal 1/4" threaded tripod socket for installation on a tripod.



Package Contents

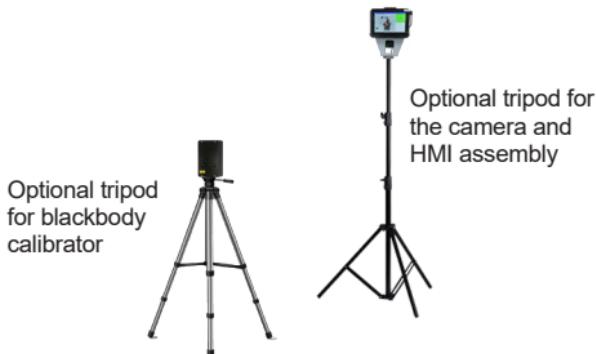
Package Contents

- S408 (including Infrared camera, HMI, mounting plate, Y-power cable and 2 x magnetic holders, all preassembled)
- S408 power adapter
- Blackbody calibrator with power adapter



Optional Accessories

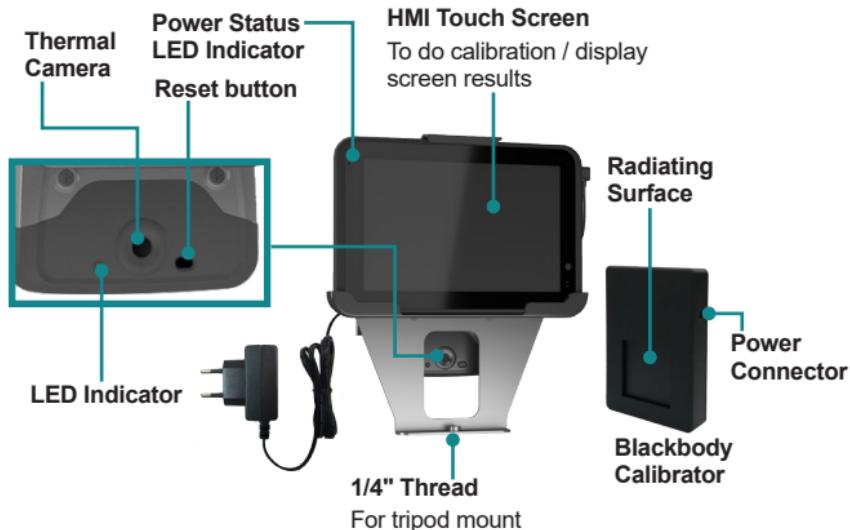
- Tripod for S408 (2.8M, standard 1/4" thread)
- Tripod for the blackbody calibrator (1.5M, standard 1/4" thread)



Getting Started

Before installation, please get yourself familiar with the components of the S408.

Front View



Thermal Camera LED Indicator Status:

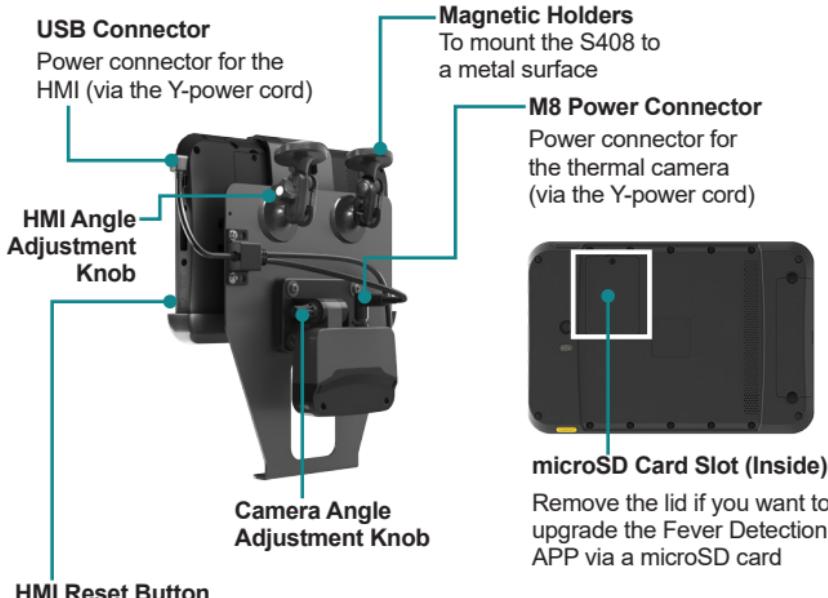
- Red solid: Not paired to HMI
- Blue blinking: Linking to HMI
- Green solid: Link established

HMI Power LED Indicator Status:

- Green: Power is on

Getting Started

Rear View



HMI Reset Button

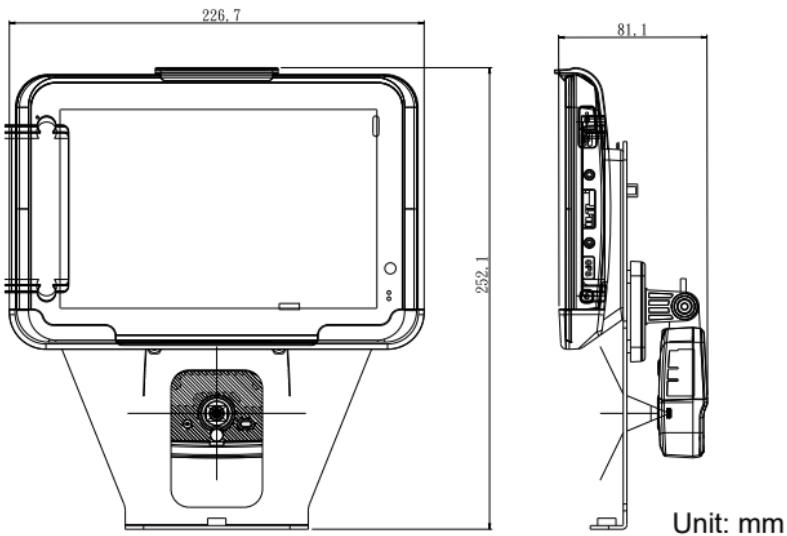
When the S408 is connected to power, press the **Reset** button and a power menu will appear on the screen. But the device will always reset itself when power is applied to the S408.

Top View



Getting Started

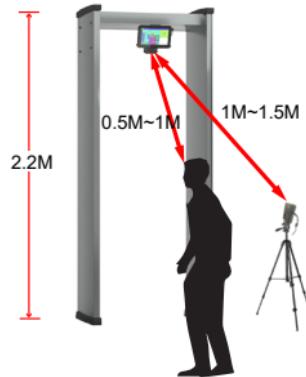
Dimension



Installation Advice

Before proceeding to install the S408, please follow the guidelines below to get the optimal performance of the system:

- Install the S408 indoor with ambient temperature of **15~30°C**.
- For the person to be detected, it's suggested to stand at a distance of **0.5M~1M** to the thermal camera.
- The blackbody calibrator should be positioned at the optimal distance of **1M~1.5M** from the camera.
- To avoid detection interference, prevent other heating source such as fluorescent or lamp from being constantly displayed in the camera's field of view.
- To mount the S408 on a door frame, height of **2.2M** and an angle of **70°** is suggested for optimal performance.
- Avoid any covering on the forehead such as hair or hat to ensure the measurement.
- The S408 is capable of detecting multiple human temperatures. However, avoid overlaps between people to ensure the measurement. For optimal performance, it's suggested that you allow only one person appear in the field of view at a time.



Installations

Mounting the Blackbody Calibrator

The blackbody features an universal 1/4" threaded tripod hole for installation on a tripod:

1. Locate the threaded hole in the bottom of the blackbody calibrator.
2. Mount your tripod head to the blackbody. Tighten the screw-head from the bottom of the tripod head. Then mount it to your tripod.



3. Connect the power connector of the AC power adapter to the power connector on the blackbody calibrator.
4. Connect the power cord to the AC power adapter. Then plug the power cord into a standard AC power outlet.
5. Wait for about 5 minutes for the blackbody furnace to reach the target calibration temperature of 36°C.



Installations

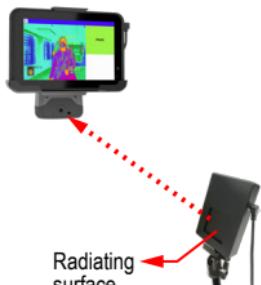
6. Adjust the angle and the height of the tripod. Follow the guidelines below to optimize the installation.



Place the blackbody at a distance of 1M~1.5M to the thermal camera.



Make sure it's in the field of view of the camera.



The radiating surface of the black body must face the camera's irradiation direction.



Ensure that people or other objects don't block the radiation transmission of the blackbody.

Cautions:

- DO NOT use the blackbody in an environment likely to be exposed to direct sunshine, water, oil, dust or corrosive gas.
- DO NOT scratch the radiating area with sharp objects.
- DO NOT touch or wipe the heating area with sharp objects.

Installations

Mounting the S408 – Magnetic Mount

The mounting plate of the S408 allows you to attach 2 magnetic holders to mount the S408 to a metal surface such as a door frame.



If the S408 is preassembled with the magnetic holders, skip to Step 3. If not, follow the steps to proceed.

1. Align the magnetic holder to the central standoff on the assembly's mounting plate as shown in the picture. Then use the screw provided in the magnetic holder kit to fasten the holder. Have the knob face outwards so that you can access it easily later to adjust the angle.



2. Repeat the same steps to attach the other magnetic holder.

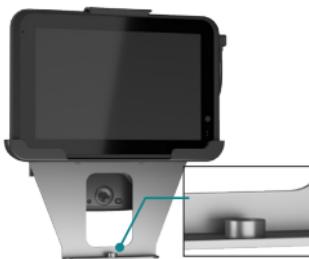


3. Mount the assembly to a metal surface. Please use it on flat metal surface.
4. Adjust the tilt angle of the screen and the camera to ensure the blackbody and person to be detected are in the camera's field of view.

Installations

Mounting the S408 – Tripod Mount

1. Locate the threaded hole in the bottom of the S408 mounting plate.



2. Mount your tripod head to S408 plate. Tighten the screw-head from the bottom of the tripod head to secure the assembly. Then mount it to your tripod.



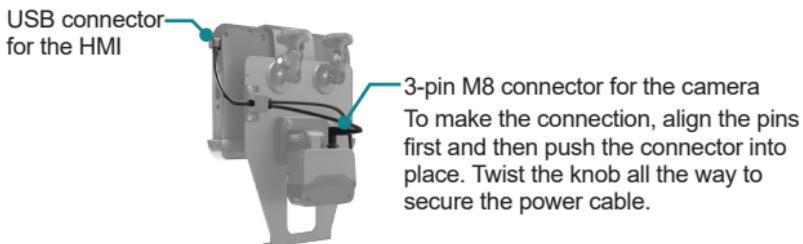
3. Adjust the height of the tripod and the tilt angle of the camera to ensure the blackbody and person to be detected are in the camera's field of view.



Installations

Power Connection

1. The S408 is preconnected with a Y-power cord to connect the HMI and the thermal camera to the power source. In case any of the cables is loosen, reconnect the cables.

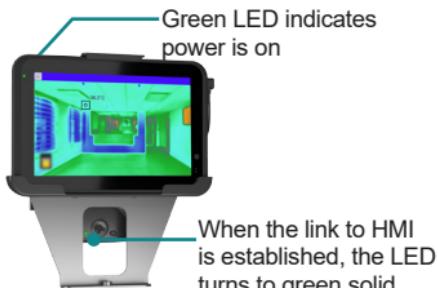


2. Attach the correct plug according to your location to the power adapter. Then plug the power adapter into a standard AC power outlet.



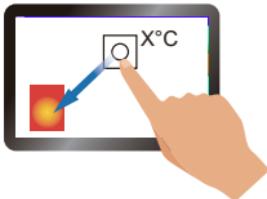
3. When power is applied, the S408, including the HMI and the thermal camera will power on automatically.

The HMI has been paired with the camera before shipping and will automatically connect to the camera and launch the Fever Detection APP upon startup.



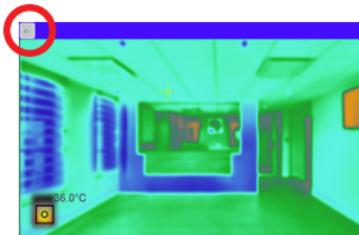
Calibration & Offset Setup

1. On the HMI touch screen, touch and move the indicator  to the blackbody image. The pointer will then snap to the highest temperature area of the blackbody.



To further ensure the accuracy, use a forehead thermometer to measure one's temperature and see if S408's gets the same measurement. If not, proceed to take the steps below to adjust the temperature offset.

2. Tap the arrow icon in the upper left corner of the screen.



3. Tap and drag the offset slider to adjust the offset values as needed.

For example, if the thermometer reading is 36°C and the S408 reading is 36.5°C, then adjust the offset to be -0.5°C.



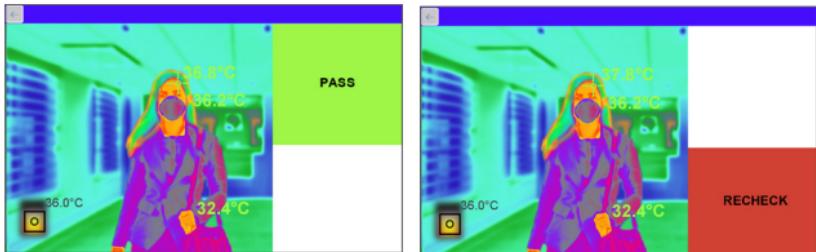
4. Then the S408 is ready to use.



If the system is reset, you will need to perform the calibration and offset adjustment again before using the S408.

Using the S408

When a person's temperature is detected under 37.5°C, "PASS" will be displayed; otherwise "RECHECK" will be displayed and a sound alert will be sent.

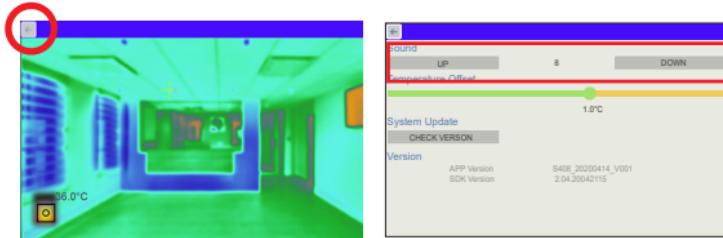


If you need to adjust the volume of the audio:

- Use the volume control on the top of the HMI.



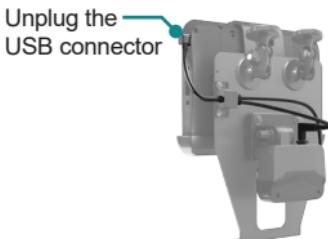
- Or, tap the arrow icon in the upper left corner of the screen and then use the on-screen volume control.



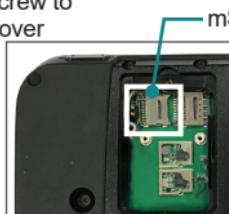
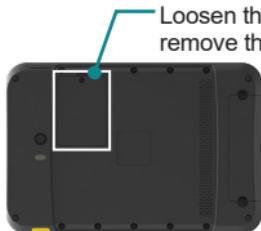
APP Upgrade

In case you need to upgrade the Fever Detection APP, follow the steps below.

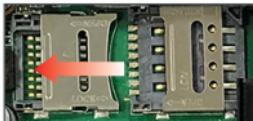
1. Get the latest Fever Detection APP and save it to a microSD card.
2. Disconnect the power connection of the S408 and then unplug the USB connector from the HMI .
3. Remove the HMI from the bracket.



4. On the rear side of the HMI, loosen the screw to remove the expansion slot cover. Then you can see the microSD card slot.

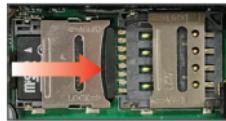


5. Follow the direction of the arrow to open the lid of the microSD slot.



To open the lid

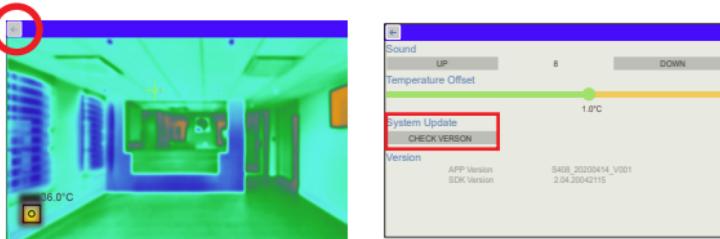
6. Insert the mSD card into the slot. Close the lid and follow the arrow direction to lock it.



To lock the lid

App Upgrade

7. Reattach the slot cover and fasten the screw to secure it.
8. Mount the HMI to the bracket and reconnect the USB connector.
9. Connect the S408 to power source.
10. After powering on the S408, tap the arrow in the upper left corner of the screen to enter the Setup page. Tap **CHECK VERSION** and then the system will automatically upgrade the App.



11. When the upgrade is complete, the system will automatically reset and launch the Fever Detection APP upon startup.



After system reset, you will need to perform the calibration and offset adjustment again before using the S408.

Specifications

Specifications Highlight

Measuring Distance	0.5M ~1M
Accuracy	$\pm 0.5^\circ\text{C}$ (@25 °C)
Offset Adjustment	On-screen adjustment, $\pm 5^\circ\text{C}$
System Power	5V/2A
Touch Screen	8" Capacitive touch screen
Control	Reset, Volume control
O.S	Android 7.0
Thermal Imaging	Lepton 2.5, on board
Array Format	80 x 60
Field of View	51° x 63.5° (H x D)
Calibration	Blackbody, $\pm 0.3^\circ\text{C}$
Blackbody Power	DC5V/2.5A, 3M
Dimension	S408: 226.7 x 252.1 x 81.1 mm (W x H x D) Blackbody: 90 x 130 x 25 mm (W x H x D)(TBC)
Weight (TBC)	S408 w/o magnetic holders: 1.49kg S408 w/ magnetic holders: 0.33 kg Blackbody: 0.81 kg
Working Temp.	15~30 °C
Storage Temp.	-10~50 °C