

# FEVER | INSPECT

## FIP-S model: Device Operation/Manual

Device Manufacturer:

Fever Inspect

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For questions or concerns, please contact [support@feverinspect.com](mailto:support@feverinspect.com) or visit <https://www.feverinspect.com> to download the most recent version.

Current Version: V07 Apr 5 2021

Changes: V02 Sept 17 configuration settings  
V03 Oct 20 network settings and image display  
V04 Dec 21 device update  
V05 Jan 28 FCC and Laser compliance  
V06 Feb 25 Corrections enable/disable  
V07 Apr 5 Usability corrections

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## Warning and Precautions for Site Manager - MANDATORY READING

Do not operate this device in the presence of drafts and avoid heat sources in the background of the imaging area. The Fever Inspect's surface temperature mode can be used to identify and avoid heat sources. Minimal drafts are okay, heat sources above 85F can affect the measurement - **test your setup!**

**Do not touch the blackbody surfaces.** If the surfaces are contaminated or disrupted, the calibration can be affected which could cause errors. **If the calibration is affected, the unit must be returned for repair.**

**Do not touch the lens surface recessed into the device or the ambient air temperature sensor** and do not disassemble the device as these could affect the calibration and cause measurement errors.

This medical device is intended to measure human body temperatures from facial areas that have been equilibrated to the ambient air temperature. Do not rely on measurements obtained from other body areas with this device. Do not rely on measurements obtained from facial areas that have been recently exposed to warmer or cooler air (avoid more than 4F differences within last minute) or insulated from air (e.g. with a full face covering). Partial face coverings may be permitted so long as the central half of the face is visible including both eyes.

If recent air temperature exposure is different from the ambient air temperature where this device is being operated, allow at least 1 minute per 5F difference in the present and previous air temperatures. For example, if outside air is 30F and the present air is 70F, you should wait at least 8 minutes before attempting to obtain a scan. We also provide an option to extrapolate based on local weather conditions and typical wait time between entering the controlled environment and taking a scan - however, this has higher variability.

## Sample User Display Printout

Welcome! To help keep us all safe, all employees and visitors are required to answer a few questions and receive a temperature check.

### Questions

1. Have you been exposed to someone who has tested positive or diagnosed with COVID-19 within the last two weeks?
2. Have you traveled outside this area (surrounding counties) within the past 10 days?
3. Do you currently have any of the following symptoms?
  - Fever
  - Shortness of breath
  - Cough
  - Sore throat
  - Loss of Smell
  - Loss of Appetite

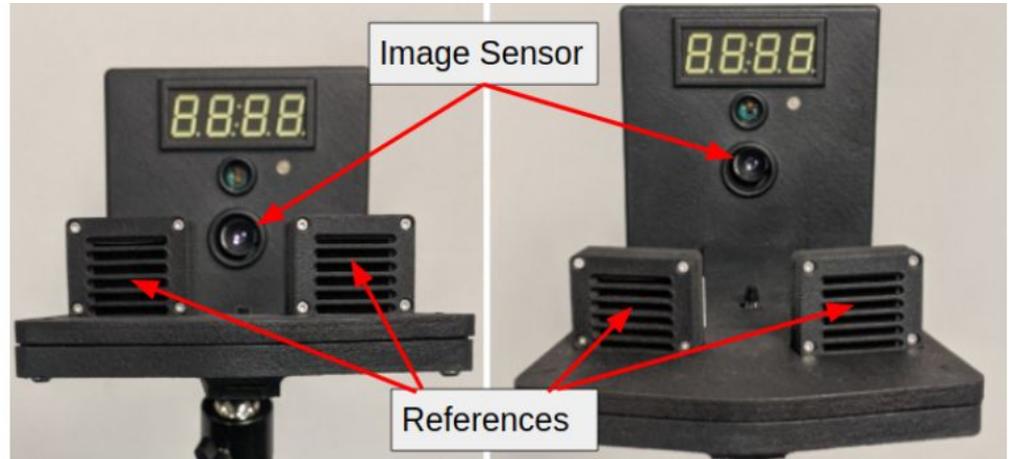
If you answered YES to any of these questions, please inform our staff for further guidance. If not, please proceed to your temperature check.

## Temperature Check

For the temperature check, please proceed do the following:

- 1) Stand within the marked area on the floor where you can comfortably see the image sensor
- 2) Remove any eyewear (if you receive a scan before you have removed your eyewear, please repeat your scan)
- 3) Look into the image sensor just behind the references
- 4) Wait for the progress bar to fill and a green or red light to turn on

If the scan is green you are cleared. If red, please see our staff for further guidance and for them to clear the device for the next scan.





Side view



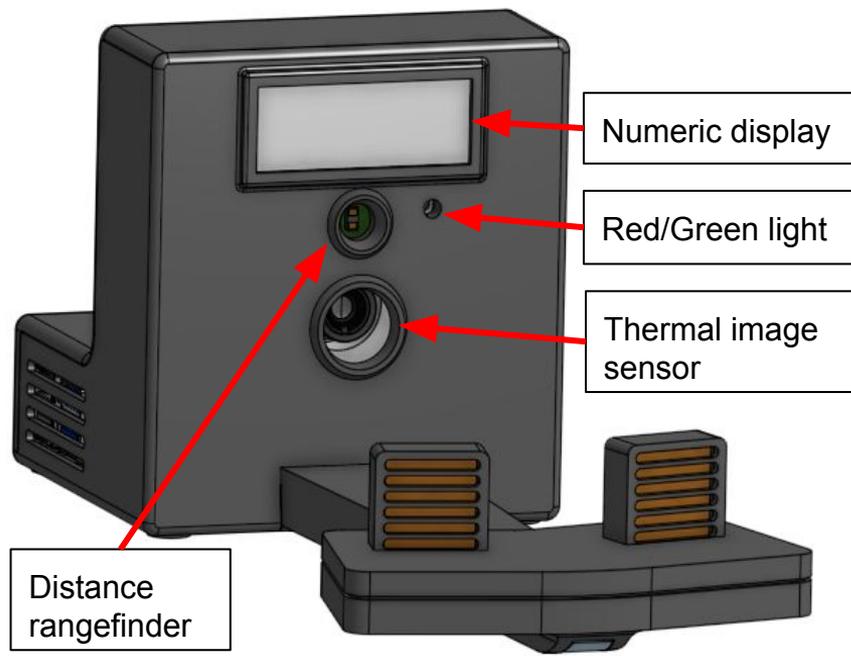
Front view

Numeric temperature display and red/green indicator light display on front and back.

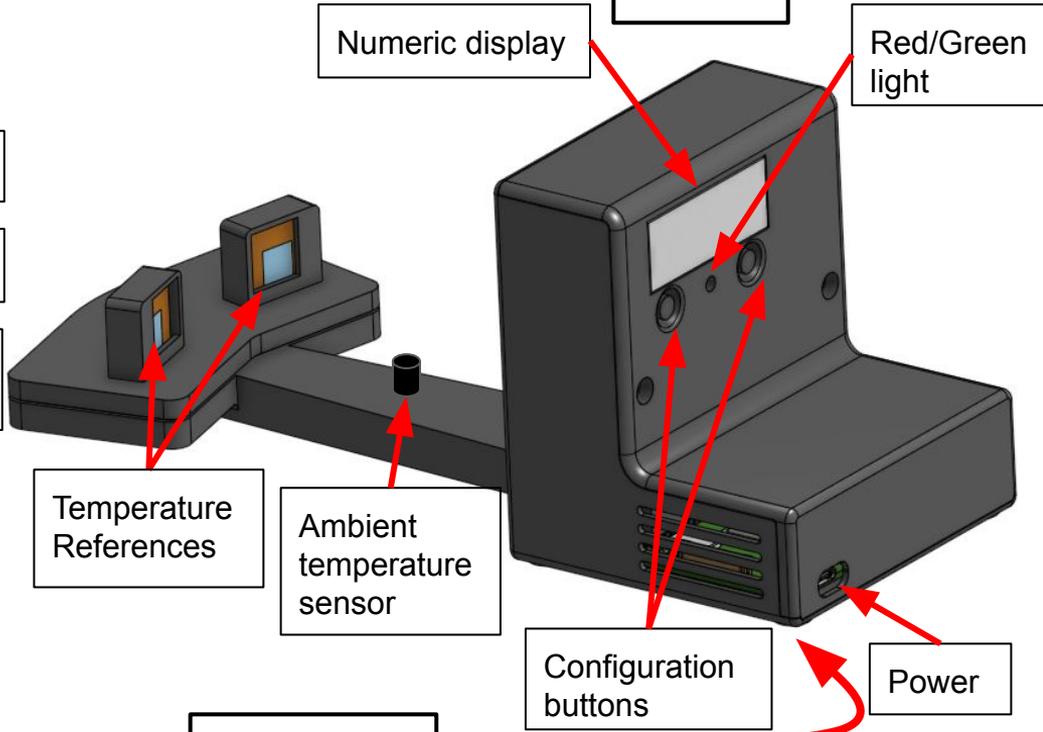
In body scanning mode, if a face temperature is detected at or above the threshold, the light will display red and stay red until either button is briefly pressed, otherwise it will display green and then go out.

The two buttons on the back are used to configure the unit, display statistics and switch between body and surface temperature modes.

**FRONT**



**BACK**



**BOTTOM**

Product label & Standard ¼-inch, 20-thread female mount

Fever Inspect Premium		(01) 195893171675
Mfg By: Fever Inspect		(11) 200726
294 Grove Ln E #200		(17) 210726
Wayzata MN 55391, USA		(10) B004
952-476-8282		(21) FI01000008
<a href="http://www.feverinspect.com">www.feverinspect.com</a>		Produced: 2020-07-26

FIP-S device is standalone (no additional network parts required) or connected via a backend if so configured

**Footprint:** Requires 2x6' foot area

**Power:** Wall-powered by a 5.1V 3A adapter, 4'6" cord

**Mount options:** Flat surface, or mount via 1/4" 20UNC standard tripod nut on base to floor tripod or pedestal, desk mini-tripod, or via hardware to doorway/wall.

**Securing cables:** Secure the system's power cable to mounting options (tripod, table, etc.) to avoid unplugging or jostling

**Network connection (optional):** Use network configurator to connect FIP-S to local WiFi network



## Operational Setup and Procedure:

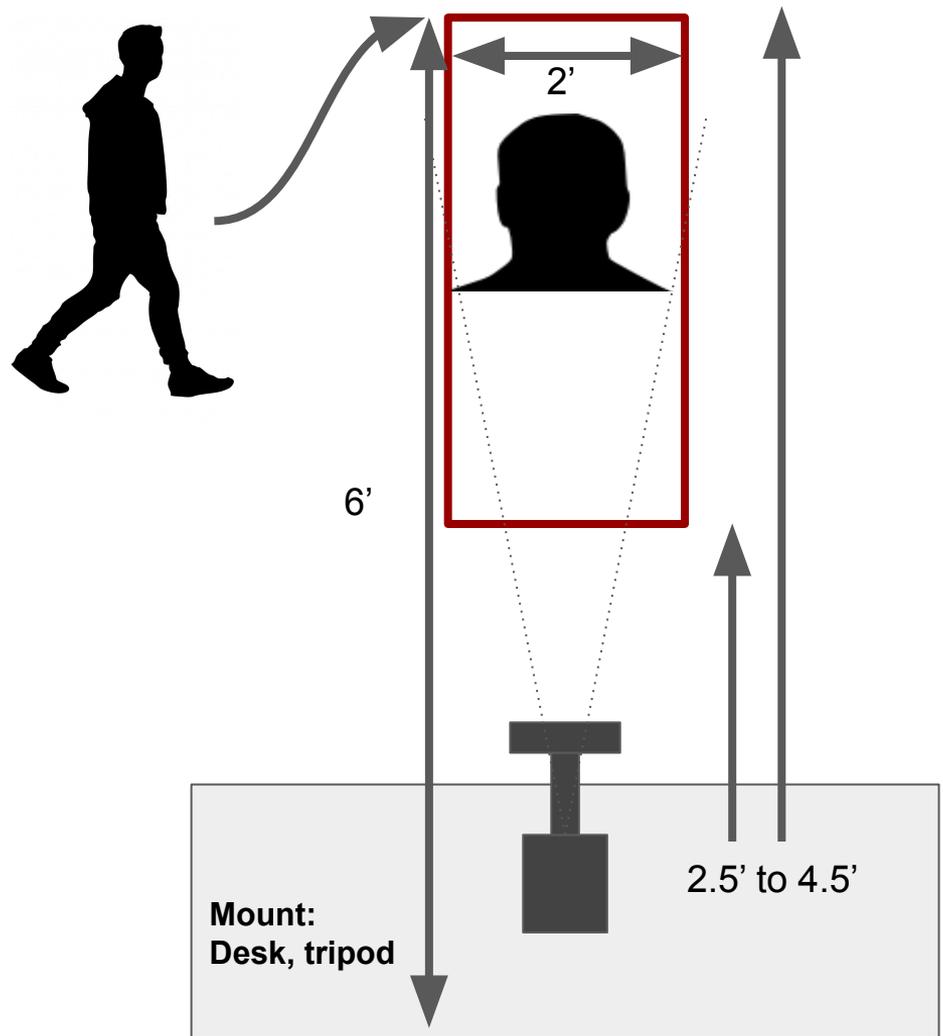
Mark floor area as the operating area (2' wide, 2.5 - 4.5' length from device camera) where people will stand.

- While facing device, a person proceeds to operating footprint furthest from front of device and faces the device.
- The person steps forward into operating footprint and view of the larger circular hole (camera).
- The person pauses position (1-3 sec.) until temperature number appears in LED display.

Device LED automatically displays temperature (and green or red indicator) when finished (typically 1 second).

### HOT BACKGROUND CHECK (MANDATORY)

Prior to operation, check for any hot objects by placing the device into surface temperature mode. Confirm the unit is displaying below 85F.



## Positioning device height and angle:

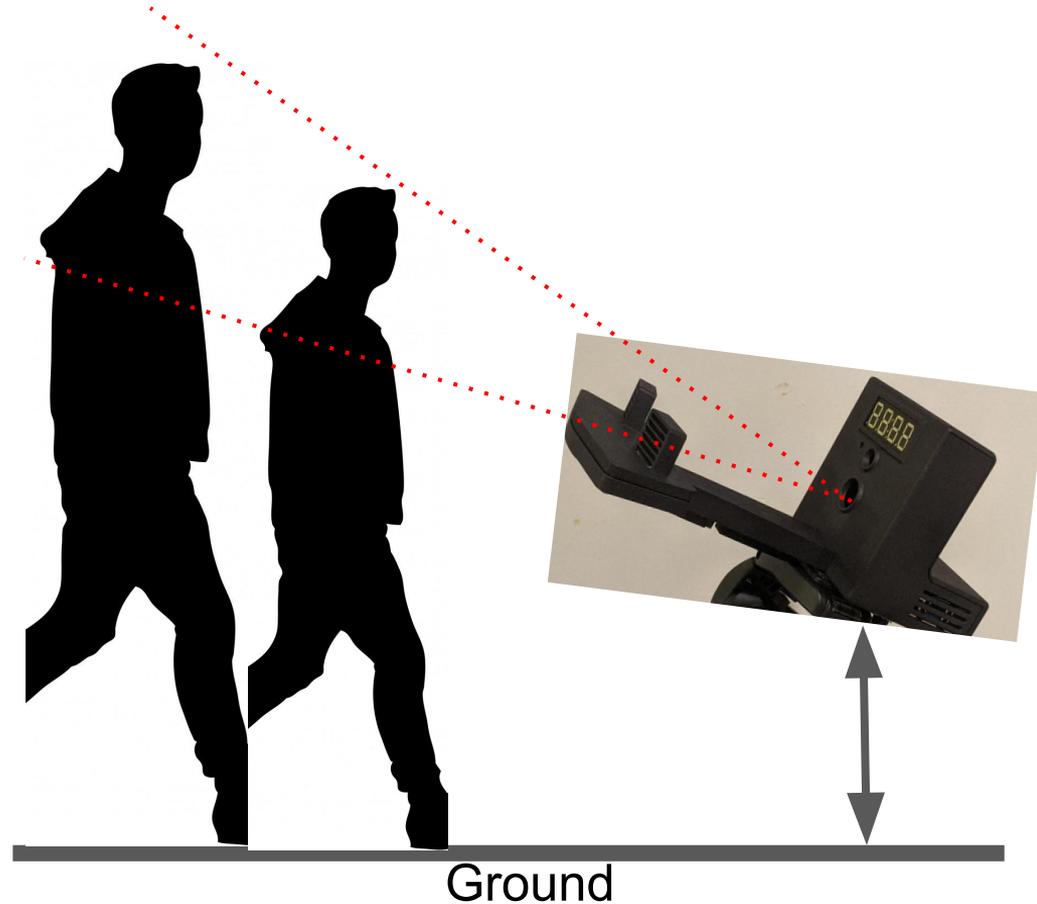
- **Mounting height:** The height of the device's mounting partially defines the face heights the device will measure.
- **Device angle:** Once mounted, the device may also be angled up or down (see 2. below) to measure a wider range of face heights.

1. To measure people in a group when individual heights are within one-foot of the group's average height:

- Mount the unit flat, at 12" below the average height.

2. To measure people in a group where individual heights are beyond one foot of the group's average height:

- **To look down at device:** Mount the unit at a height that is lower the shortest person in the group. Angle device up.
- **To look up at device:** Mount the unit at a height higher than the tallest person in the group. Angle device down.
- Group members then move forwards into the scan area until they can see the thermal sensor aligned between the references.



### Temperature Thresholds:

The unit has a default fever threshold of 100.4F. For reference purposes, 97.5-99.5F is considered normal. Temperatures lower than 97.5 may indicate a person is wearing glasses or was recently exposed to cold air.



### What you may see:

Green Light and Number:

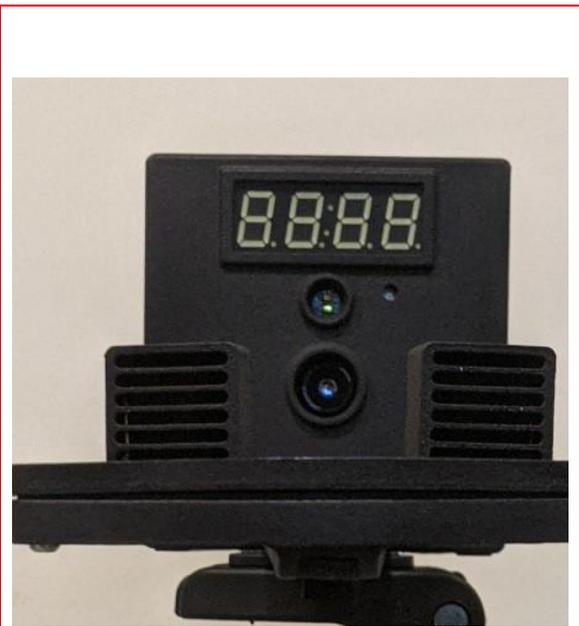
- Temperature is at, or below, threshold
- Green Light and Number will clear

Red Light and Number

- Temperature is above threshold
- Red Light and Number will stay lit until cleared

Blue light and either Number or dashes

- The unit has entered surface temperature mode and is reporting the surface temperature once per second
- Dashes indicate the surface temperature is either colder (dashes to the left side) or hotter (dashes to the right side) than calibration region
- Press both buttons at same time until the blue light goes out to re-enter body scanning mode



**Too Low:**

This perspective is too low. The device will only see one eye, move higher



**Correct:**

These perspectives show correct positionings. If the device appears like this to the person being scanned from between 2.5 and 4.5 feet away they should receive a reliable reading in ~1-2 seconds.



### **Left button 3 second press (Config):**

1. Fahrenheit/Celsius
2. Alarm Threshold (100.4F/38C)
3. Require user to clear alarm conditions
4. Front/Back/Both/Off colored alarm light
5. Display Enable/Disable
6. Hold time to display last temperature and red/green light (default 2.5 seconds)
7. Config delay period
8. Reporting period (1 wk - 10 wks)
9. Hotspot Mode (Access point/reconnect)
10. (A) Save Data Off/On
11. (b) Luminance Correction On/Off
12. (C) Averaging On/Off
13. (d) Distance Correction On/Off

### **Right button 3 second press (Stats):**

- 1) # of scans today
- 2) # above threshold today
- 3) Average room temperature today
- 3) # of scans during report period
- 4) # above threshold during report period

### **Both buttons 3 second press:**

Switches the unit between surface temperature and body scanning modes

## **Modes of operation: Warmup, Body, Surface, Configuration, Statistics, Error**

**Warmup:** When the device is first started or if a large ambient temperature change is detected, the device will display an estimated countdown to when it will be stable and ready for scanning. The countdown may increase if a large temperature change is detected.

**Body scanning:** After the warming up is complete, the device will enter body scanning mode. The Fever Inspect will watch for a face remaining still within the field of view and distance range for at least 1 second and will then report the estimated core body temperature on the numeric display. The colored light will display a green light if the temperature is below the fever threshold or red light otherwise. When the red light is activated, it will not deactivate until the user presses either button briefly to indicate they have been made aware of a potential fever. The threshold, display and hold time can be configured.

**Surface scanning (blue):** This mode is entered and exited by simultaneously pressing and holding both buttons for 3 seconds. When entering the mode, the front and back colored light will turn **blue** and the device will report the hottest temperature within the center field of view. Warning, this mode is only accurate between 90 and 100F and approximate outside this range.

## Modes of operation (continued)

**Configuration (white):** Pressing the left button for 3 seconds puts the device into configuration mode and the light will display **white**. The display will show a number for the setting. Pressing the left button briefly will cycle thru configuration options for the Fever Inspect's body mode (temperature units configures both body and surface mode). Pressing the right button will select a configuration option and "enter" its setting. Pressing both buttons briefly will return to the cycle of configuration options. Pressing a button for 3 seconds or waiting ten seconds will return to body scanning mode. The options are 1) temperature units (Fahrenheit or Celsius), 2) fever alarm threshold in units of 0.1C/0.18F (99.5 to 104.5, default 100.4F/37C), 3) alarm light display sides (front/back/both), 4) numeric display on/off, 5) wait time to display a result, 6) automatic clear alarm (warning), and 7) data collection.

**Statistics (yellow):** Pressing the right button for 3 seconds puts the device into statistics display mode and the light will display **yellow**. EEOC- and HIPAA-compliant information is collected for purposes of reporting to local health authorities, including the number of face scans performed and number of over-threshold temperatures detected per day and over the reporting period. You may be asked to provide this data to local health bodies for public health purposes. Waiting for five seconds returns the device to body scanning mode.

## Modes of operation (continued)

**Error:** If the Fever Inspect device detects a fault condition, the numeric display will read “Err<number>”, where the number is any of 0-9. Error code 0 (display “E 0”) indicates the Fever Inspect is operating outside its specified operating temperature range.

For error code 0, if the ambient temperature is within the operating range and there are no heat or cold sources and no detectable drafts, please contact Fever Inspect asap.

Otherwise, if the device is operating outside its range, please adjust the ambient conditions to maintain the operating temperature and wait for the device to recover. If the device detects it has returned to its operating range and the error clears, there is no need to report the error. For error code 1, the internal FPA temperature is out of spec, and usually this is only present when starting in a cold environment, as it will typically warm to within spec within a few minutes. Error code 1 clears itself once the device has warmed up (less than 10 minutes).

Error code 0 is the only error code you may need to physically react to (by moving the device to a less extreme temperature). All other error codes (2-9) indicate internal diagnostics and should be reported immediately to Thermal Diagnostics LLC at [error@feverinspect.com](mailto:error@feverinspect.com), briefly describing the circumstances, the physical condition of the Fever Inspect device and the error code(s).

## CONFIGURATION

**C.1: Units (C or F).** This option sets the output display temperature to either Fahrenheit (default) or Celsius (F or C).

**C.2: Threshold (0.1C/0.18F increments between 99.5 to 104.9).** This option sets the threshold value for declaring an alarm condition.

**C.3: Compliance mode (CE or CD).** This option puts the device in a self-compliance mode (CE, default) or disables that mode (CD). CE mode causes the device to stop responding when an alarm condition has been set, unless an operator presses either button briefly to “clear” the alarm.

**C.4: Alarm Light Configuration (F, B, FB or none).** This option sets the output green/red light to display only on Front (F), Back (B), both (FB) or none (blank).

**C.5: Numeric Display (DE or DD).** This option turns on (Display Enable, DE) the numeric temperature display on both sides or disables (Display Disable, DD) the numeric temperature display.

**C.6: Display Hold Time (0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4).** This option sets the time limit for the device to maintain the last display output on both numeric display and the threshold light, default of 2.5 seconds.

## CONFIGURATION

**C.7: Config Hold Time (5, 10, 15, 20, 30, 60).** This option sets the wait time for configuration and statistics modes to return automatically to body scanning mode.

**C.8: Reporting Period (2, 3, 4, 5, 6, 7, 8, 12, 16, 20, 24, 28, 32).** This option sets the additional time reporting period (in weeks) to report statistics from. Default is 10 weeks.

**C.9: Network Status/Reset.** Press and hold both buttons to disconnect from a local wireless connection and restart the device into hotspot mode.

**C.A: Save Data.** Default off, if set, this will store face data to the encrypted filesystem. NOTE: this is intended only for research modes and furthermore this will have no function unless a device key has been generated.

**C.b: Luminance Correction.** Enable (“ CE” means “luminance correction enabled”) or disable (“ CO” means “correction off”) correction for local pixel radiant intensity artifact. Default is Enabled.

**C.C: Averaging Adjustment.** Enable (“A CE” means “averaging adjustment enabled”) or disable (“A CO”) averaging. Note, if enabled, this will reduce false positives but will also reduce device sensitivity. Default is disabled.

**C.d: Distance Correction.** Enable (“d CE” means “distance correction enabled”) or disable (“d CO”) correction for distance-to-target. Default is Enabled.

## STATISTICS REPORTING

**S.0:** Alternating between “FI” and the 4-digit unique device ID.

**S.1: N Today.** This index reports the total number scanned today.

**S.2: Alarms Today.** Reports the total number above threshold today.

**S.3: Environment.** Reports the average environment temperature today (in C).

**S.4: N This Week.** Similar to S.1, reports over past week.

**S.5: Alarms This Week.** Similar to S.2, reports over past week.

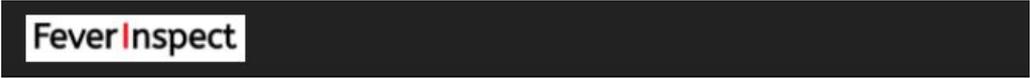
**S.6: N During Reporting Period.** Similar to S.1, reports over full period.

**S.7: Alarms During Reporting Period.** Similar to S.2, reports over full period.

## Network Configuration

**Access Point (AP) Mode:** The device will present an access point with SSID “FI-01-XXXX”, where XXXX is the device’s unique device ID code. This mode can also be accessed manually by entering the configuration menu C.9 and pressing and holding both buttons.

The code to connect to the device is “*fithermal*”.



Once connected, navigate to 10.0.0.5:8081.

***You should see a screen like this ->***

Select your SSID from the list and enter your network’s WiFi password if you wish to connect your Fever Inspect. If you do not see your SSID in the drop-down list, you can also enter it manually, but you do not need to do this if you see your SSID in the list.

Once you press “Connect” the Fever Inspect will drop your device from its connection while it attempts to re-connect to your WiFi. Re-connect to your building’s WiFi and navigate to “feverinspect-01-XXXXXX.local:8080” and you should see the next page.

### FeverInspect Live Image Stream

Please choose your WiFi Network from the list.

WiFi Networks  ▼

WiFi Password

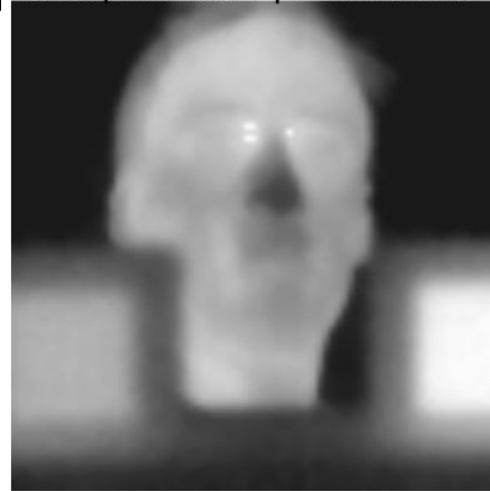
## Live Image Stream:

Navigate to <http://10.0.0.5:8081> when connected in AP mode or to <http://feverinspect-01-00XXXX.local:8081> (replace XXXX with your device's ID) if connected to local WiFi. feverinspect-01-000018 | IP=192.168.1.193

***You should see a screen like this ->***

The hottest pixels in the face will be set to white (typically the inner canthus).

While the web page is active, the device will transition to surface temperature mode until this page is closed (to minimize accidental disclosure of protected health information). This live streaming mode can also be deactivated at the device by pressing and holding both buttons until the blue light disappears. This will stop both the live stream and put the device back into body scanning mode.



Surface: 92.7F, Distance: 28in, Air: 68.1F

Up 0 days 00:46:17, Scans/Alarms: 0/0

CPU temp: 63C, BB Stability: 0.002/0.002 C

**Please note, during live-viewing, human temperature scanning is disabled until this window is closed**

**Device will only report surface temperatures to prevent disclosure of PHI**

**Live-viewing can also be halted by long-pressing both buttons on back of unit**

## Compliance

The Fever Inspect device contains a VL53L1X time-of-flight module having an eye-safe Class 1 laser (<https://www.st.com/en/imaging-and-photonics-solutions/vl53l1x.html>). The VL53L1X contains a laser emitter and corresponding drive circuitry. The laser output is designed to remain within Class 1 laser safety limits under all reasonably foreseeable conditions including single faults in compliance with IEC 60825-1:2014 (third edition).

The Fever Inspect device also contains an intentional RF emitter (WiFi module) configured for 2.4GHz transmit/receive and pre-certified with modular FCC ID: 2ABCB-RPI4B.