

Thermal Imaging System Checklist for Designing and Implementing an Effective Elevated Body Temperature Project

Eagle Eye Networks elevated body temperature (EBT)/thermal imaging system has been proven to accurately measure surface skin temperature without being physically close to the evaluated person. Conversely, most other methods need closer proximity or direct contact to measure temperature (for example, non-contact infrared thermometers or oral thermometers), and should be used with other temperature screening protocols. Thermal imaging is not intended to determine if someone has an illness, but rather to create awareness a person might have a fever/elevated body temperature. A diagnostic test must be performed to determine if someone has an illness, such as COVID-19, SARS, or influenza.

Thermal imaging systems have not been shown to accurately take the temperature of multiple people simultaneously but have shown to provide insight that can be used to further check on individuals or groups when the system cannot isolate a particular person. Accuracy depends on careful setup and operation, training of operators, and proper preparation of the evaluated person.

It is important to note that elevated body temperature (EBT)/thermal imaging systems should be used as an initial screening tool and one that is part of a more holistic, multipoint decision process to determine access into a facility. This checklist is designed to help ensure U.S. Food and Drug Administration (FDA) Guidelines and Manufacturer Guidelines are followed, so your implementation is most effective.

AREAS OF FOCUS

1. Pre-Project Insight
2. Screening Site Design Items
3. Installation, Testing, and Calibration
4. Monitoring and Alerts
5. Training (Technical and Response)
6. Support



Pre-Project Insight

Prior to scoping the project and beginning the implementation process, it's important to set and manage expectations for the role of the system in an overall program to minimize the exposure and potential spread of COVID-19, SARS, or influenza.

- The Eagle Eye Elevated Body Temperature Screening system is part of a comprehensive program designed to slow or impede exposure and/or spread of disease. No thermal imaging system will be successful if it is a standalone component.
- The end user understands the system must be monitored and supported regularly, as changes in the environment, weather, airflow, sunlight, ambient temperature, etc., may require modifications to the system.
- The end user understands thermal imaging is not effective in determining if someone has an illness.
- Systems are used for initial temperature assessment to triage individuals in high throughput areas, but have not been shown to be effective when used to take the temperature of multiple people at the same time.
- The end user understands that someone who is identified through the thermal system as potentially having an elevated body temperature MUST subsequently have their temperature taken orally or with an FDA approved non-contact infrared thermometer (NCIT).
- The end user understands the thermal imaging system is not a substitute for a comprehensive program that follows FDA, Centers for Disease Control and Prevention, and state/local guidelines, including but not limited to, social distancing, wearing facial coverings, and thoroughly washing hands.
- End users and the implementation team follow federal and local protocols and create a system environment where the following are true:
 - The systems are used in the right environment or location.
 - The systems are set up and operated correctly.
 - The person being assessed is prepared according to instructions.
 - The person handling the thermal imaging system is properly trained.

A successful implementation requires that the processes, guidelines, people, and technology come together to achieve the desired outcome. When everyone agrees and understands it is not just about the thermal imaging/ elevated body temperature technology, you are ready to get started.

Screening Site Design Items

- Determine the needed traffic flow.
- Determine type of crowd control, management devices, and signage to be used.
- Determine best location for instruction signage to prepare people, for example, to remove glasses, hats, and head coverings other than masks.
- Ensure detection process notices will be visible.
- Decide which type of throughput scenario is need based on traffic flow;
 - Low: < 100 or fewer scans per hour
 - Medium: 100 to 1,000 scans per hour
 - High: >1,000 scans per hour
- [FDA Guidelines](#) understood by all parties.

System Design

- Type of face/body detection capability.
- Temperature accuracy of the telethermographic system, including the measurement uncertainty, must be less than or equal to $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) over the temperature range of at least $34\text{-}39^{\circ}\text{C}$ ($93.2\text{-}102.2^{\circ}\text{F}$).
- System includes a blackbody temperature reference source (unless specifically not required by the camera manufacturer).
- Both the stability and drift of the system are less than 0.2°C (0.36°F) within a timeframe specified by the manufacturer.
- Minimum thermal detector resolution of 320 X 240.
- Cloud-based video management system (VMS) preferred.
- Ability to render images in high-resolution color and grayscale.
- Ability to display high-resolution image visual display at the screening site.
- Ability to archive images and/or video footage for future reference and image comparison.
- Capable of identifying areas of temperature calculations and locations for reporting.
- Capable of sending alerts/notifications to authorized personnel of identified elevated body temperature.
- Minimum of 256bitAES encryption at rest and in transit.
- User access control is offered.
- Secondary body temperature screening includes non-contact infrared thermometer (NICT).
- System can be used for other needs if/when EBT screening is no longer needed or is secondary use.
- Manufacture guidelines confirmed to meet all system and site requirements and site is supported by the manufacturer's guidelines.

Monitoring and Alerts

- Ability to render images in high-resolution color and grayscale.
- Ability to display high-resolution image visual display at the screening site.
- Ability to archive images and/or video footage for future reference and image comparison.
- On screen alert to potential elevated temperature.
- Email or other immediate alert upon potential of elevated temperature with time and location information.
- Trained person(s) monitoring each area through a centralized display station or at each site.

Training (Technical and Response)

- End user system administrator trained on the complete system.
- Users trained on use of the system for their use case.
- Privacy policy and retention training completed.
- Monitors trained on intervention with person testing positive for a potential elevated body temperature.

Support

- 24X7 remote access and support for system health checks, camera management, and to ensure the system remains operational.
- Available on-site technical support when needed.
- System check and calibration with significant changes in environment, such as weather or seasonal change.
- Remote camera configuration access available for recommended regular optimizations as needed.
- Operational reviews available for consultation of improvements to be made, for example, suggested traffic flow management and crowd control changes to be considered for solution optimization.

Summary

When used correctly, elevated body temperature/thermal imaging systems have been shown to accurately measure surface skin temperature without being physically invasive. This checklist provides direction to help ensure you establish a strong foundation for a successful elevated body temperature screening system and align decision makers, users, and persons being tested on key elements of the system. Each implementation will have unique environmental and physical differences and related challenges. Too often the human behavior aspects of the implementation are overlooked. Please consider over communications and change management practices if you are requiring students, staff, administrators, and campus visitors to behave in new ways. Changes in policy/guidelines from traffic flow to loitering can have an impact on the reliability and efficacy of the system and must be considered as part of the plan and implementation.

Following this checklist will help you create a campus that is more safe, secure, and healthy.

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