tyco

Smart Elevated Skin Temperature Screening Solution

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Typical Thermal Screening Options

(Non-Clinical Thermometer)

Thermal Hand Held Device

- Pro
  - Typical lower cost
  - Highly portable
  - Easy to use
- Con
  - PPE required to protect screener
  - Less accurate that higher end solutions
  - Suspectable to environmental influence

Thermal Camera Kiosks

- Pro
  - Self Service
  - No PPE required for screening
  - Integration capable
- Con
  - Less accurate without a blackbody device
  - More expensive than most handheld devices
  - Suspectable to environmental influence

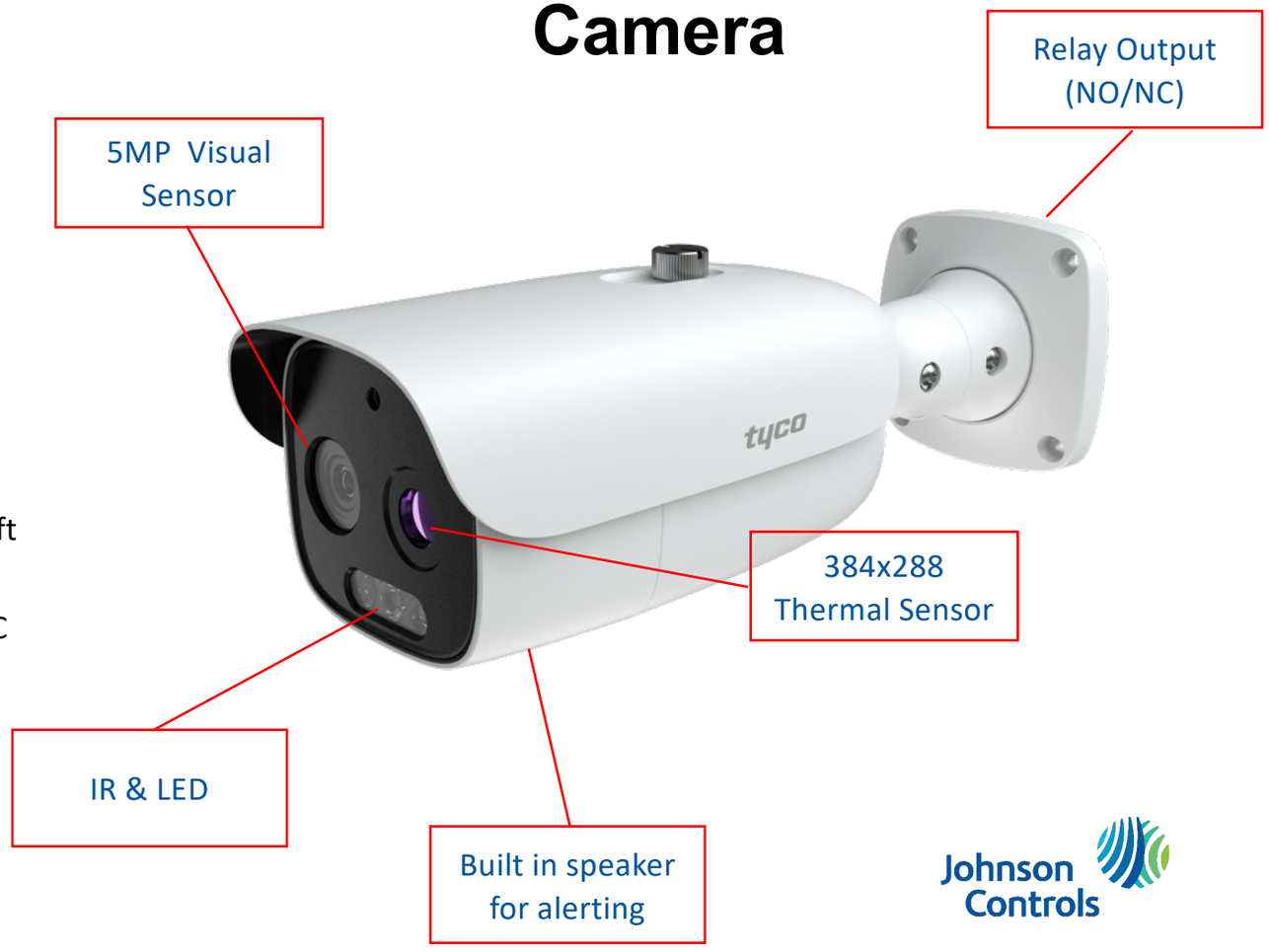
Thermal Camera / Blackbody

- Pro
  - Highest degree of accuracy
  - Video Management System capable
  - Flexible integration options
- Con
  - Tends to be more expensive
  - Suspectable to environmental influence
  - More complex to setup

What you need to know for the most accurate results

- The thermal detector is very sensitive to wind, temperature, heating & cooling sources, lighting, and IR
- The blackbody is a necessary part of the system to ensure the highest levels of accuracy of +/-0.3°C or 0.5°F following calibration and for ongoing usage
- Skin is not core body temperature and can take time to transition due situations such as extreme environmental temperature changes, exercise and near scan removal of articles such as hats, glasses or masks making accuracy of the equipment really important.
- Only 1 person at a time should be scanned in compliance with IEC 80601-2-59:2017 standards and the labeling under FDA guidance outlined in ISO/TR 13154:2017
- Ideally your thermal camera should be between 5 – 10 meters or 16.4 – 32.8 feet away from a main entrance area due to draft and sunlight
- Operating temperatures are ideally range between 10°C – 35°C or 50°F – 95°F for these solutions and should be consistent

Illustra Pro Thermal EST Camera



Blackbody device considerations

- Functions of the Blackbody
  - A black body is one that absorbs all the electromagnetic radiation radiation (light...) that strikes it. To stay in thermal equilibrium, it must emit radiation at the same rate as it absorbs it so a black body also radiates well.
- They are not all created equal
  - Calibration Certificate
    - None, 6 Month, 12 Month and 24 Month options
- Blackbody Devices Need Maintenance
  - Every 6 to 12 Months
  - National Institute of Standards and Technology (NIST) traceable
    - NIST traceable calibration is an assurance program that certifies that a laboratory or manufacturer is fully equipped to calibrate equipment to National Institute of Standards and Technology (NIST) standards and that any products offered by that manufacturer will match those NIST-maintained measurement standards

Blackbody Device

Face detection matters, its how temperature detection begins

Resolution = Accuracy

- Cameras can range from 2MP to 5MP for the visual sensor, Illustra Pro Thermal EST is 5MP
- Face detection speed and accuracy drives improved temperature detection
  - Our Face Detection is not generic open standards, it is data scientist driven reference models trained for security purposes accuracy.
- Thermal Sensor factory calibration and compliance to standards is how you know the device is capable of accurate results.
  - Compliance to 80602-2-59:2017 or equivalent is your proof of accuracy

240 x 180 (43,200 Pixels)

To meet IEC 80601-2-59:2017 Standards

Resolution is required for accuracy

- Face & Temperature detection

- Thermal sensor
  - Minimum of 320 x 240 pixels
  - Face minimum of 240 x 180 pixels
  - Recommended target for temperature reading shall be the region medially adjacent to the inner canthus of each eye for best accuracy is true clinically, but can be problematic for today's pandemic environment with masks and glasses
  - Inner canthus is not required IEC 80601-2-59:2017

Tyco Illustra Pro Thermal EST Solution overview

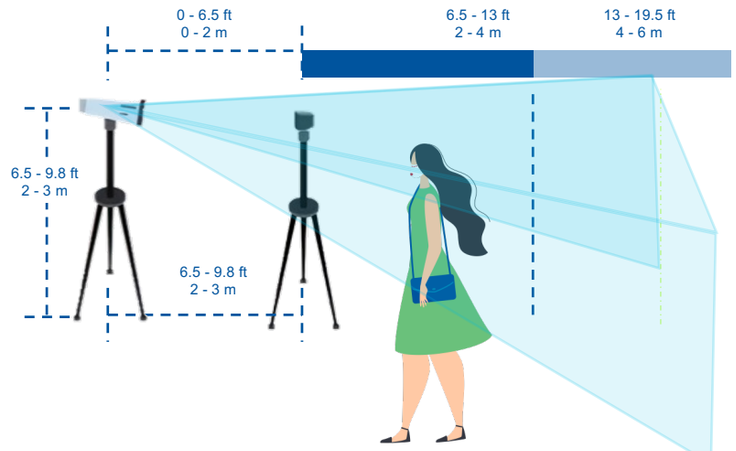
Detects faces within its field of view and accurately measures forehead skin temperatures within ±0.3ºC* at a distance between 2 to 6 meters (6.5 to 19.7 feet).

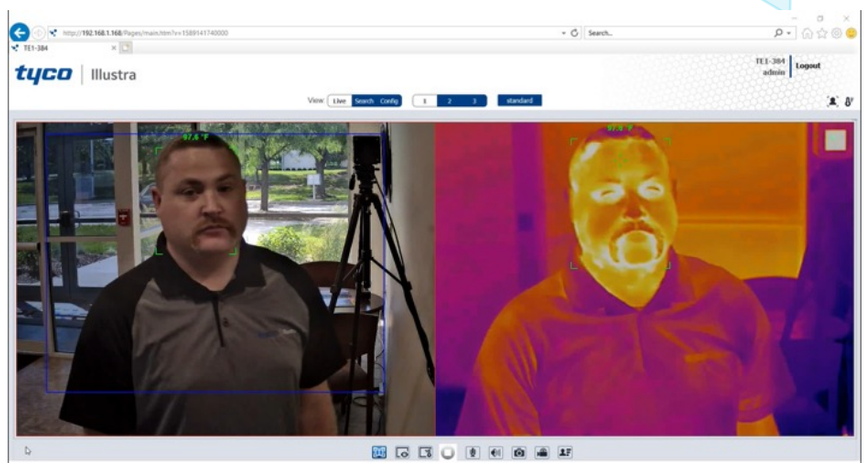
Phase I

- Ideal for contactless temperature measurement at controlled entrances where people enter an area.
- On a single person basis in compliance with IEC standards or up to 30 persons in a field of view by device capability for screening.
- Ability to have a local over-temperature alarm or integrated alarm sent to a Video Management Solution (VMS) or alarm output to an external source such as access control.

Phase II

- Release will add the ability within the VMS to simultaneously record and display the forehead skin temperature in line with regulatory guidance.
- Will suit situations which ordinarily have a high volume of people flow of up to 30 persons per minute maximum in line with IEC standards or up to 300 per minute based on the device capability.
  NOTE: This is not IEC / FDA compliant and reduces the accuracy.

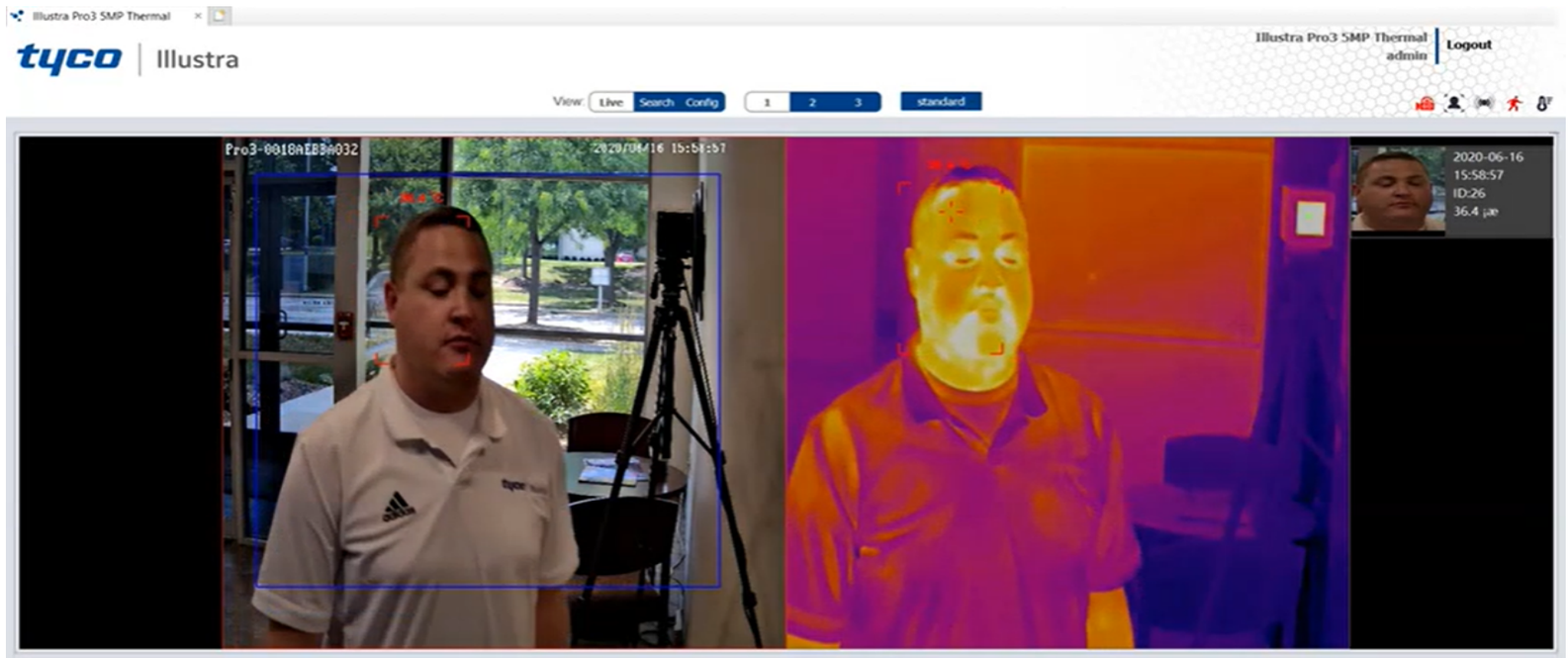




** Accuracy level when used with Blackbody device and configured to recommended specifications*

Tyco Illustra Pro Thermal EST Local Web Monitoring

- View of last 5 temperature alerts viewable on the local web page
  - Date / Time
  - Temperature



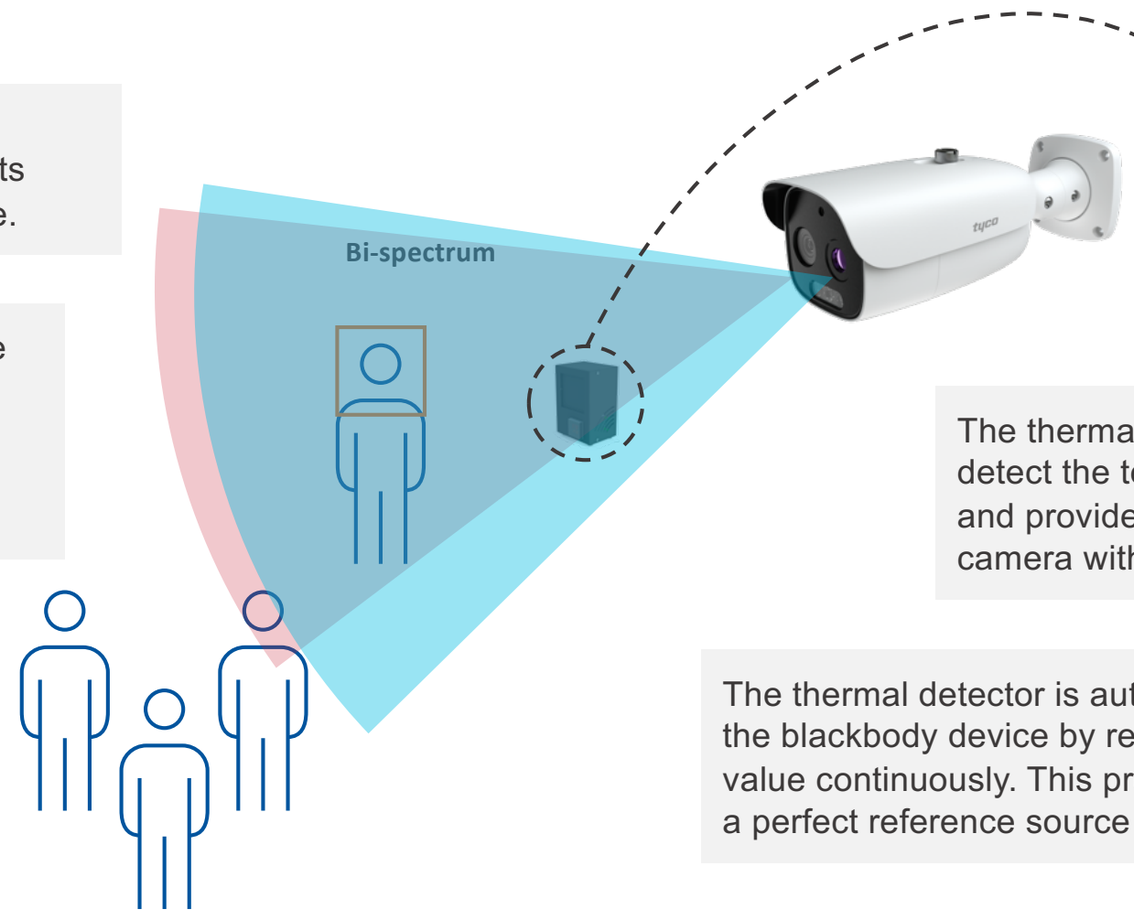
How does the Tyco Illustra Pro Thermal EST solution work?

Visible Imager

The smart visible camera is used to detect faces automatically with its embedded Facial Detection engine.

When people entering the effective field of view (FoV) the camera will detect the faces and send the position of the calculated forehead area to the thermal detector.

According to the preset temperature range, the temperature anomaly will auto trigger an event from the camera.



A blackbody calibrator should be placed in the FoV of thermal image at all times to ensure the accuracy of temperature detected.

Thermal Imager

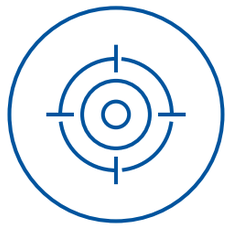
The thermal detector will immediately detect the temperature in the target area and provide the information to the visible camera with a temperature value.

The thermal detector is automatically calibrated with the blackbody device by reading the preset temperature value continuously. This provides an offset for drift from a perfect reference source provided by the blackbody.

Why Tyco Illustra Pro Thermal EST Solution?

Smart

Advanced Face Detection engine to ensure only forehead temperature can be detected. Reduced false readings.



Highly Accurate

High accuracy at ±0.3ºC with a blackbody calibration device following installation instructions.

Fast

Reads multiple faces simultaneously to avoid crowd density increase in the detection area*.

** when used outside of IEC standards for accuracy*

High Image Quality

Up to 5MP resolution on visible imager, TWDR ensures detail in both bright & dark areas.

Flexible

Various mounting options to fit diverse user scenarios.

Interactive

Built-in sound-light alarm and customizable voice alarm.

Closer look at the Tyco Smart Elevated Skin Temperature Screening Solution

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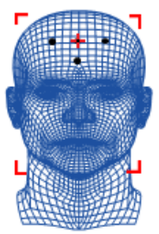
High accuracy

- The thermal detector is very sensitive with the ambient (temperature and heat sources).
- The blackbody is a necessary part of the system to ensure the high accuracy at +/-0.3°C or 0.5°F.
- The camera can calibrate the temperature with the blackbody automatically to minimize the impact of detector drift.

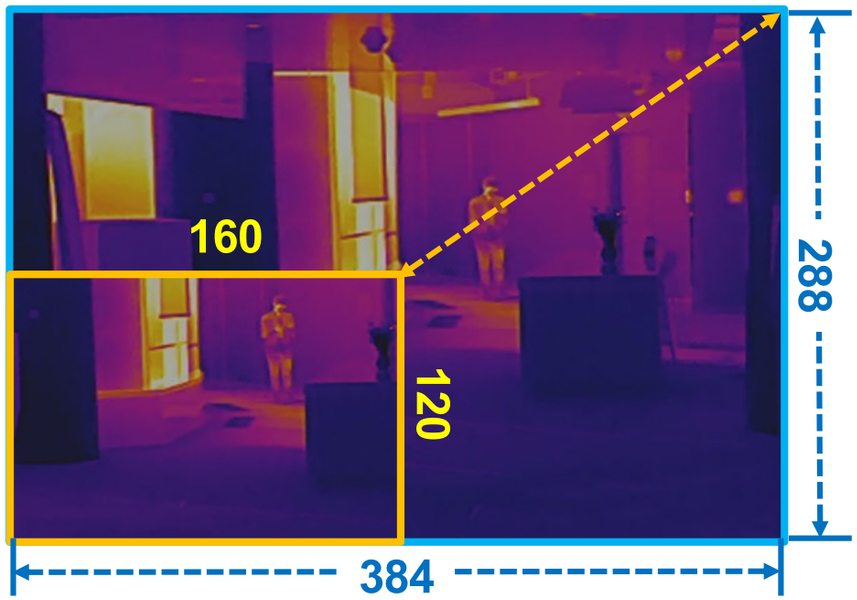


- Multi-point temperature measurement to ensure a better accuracy than single point measurement.

Automatic calibration

Clearer, Wider View

Larger, Wider, More Objective, More Accurate

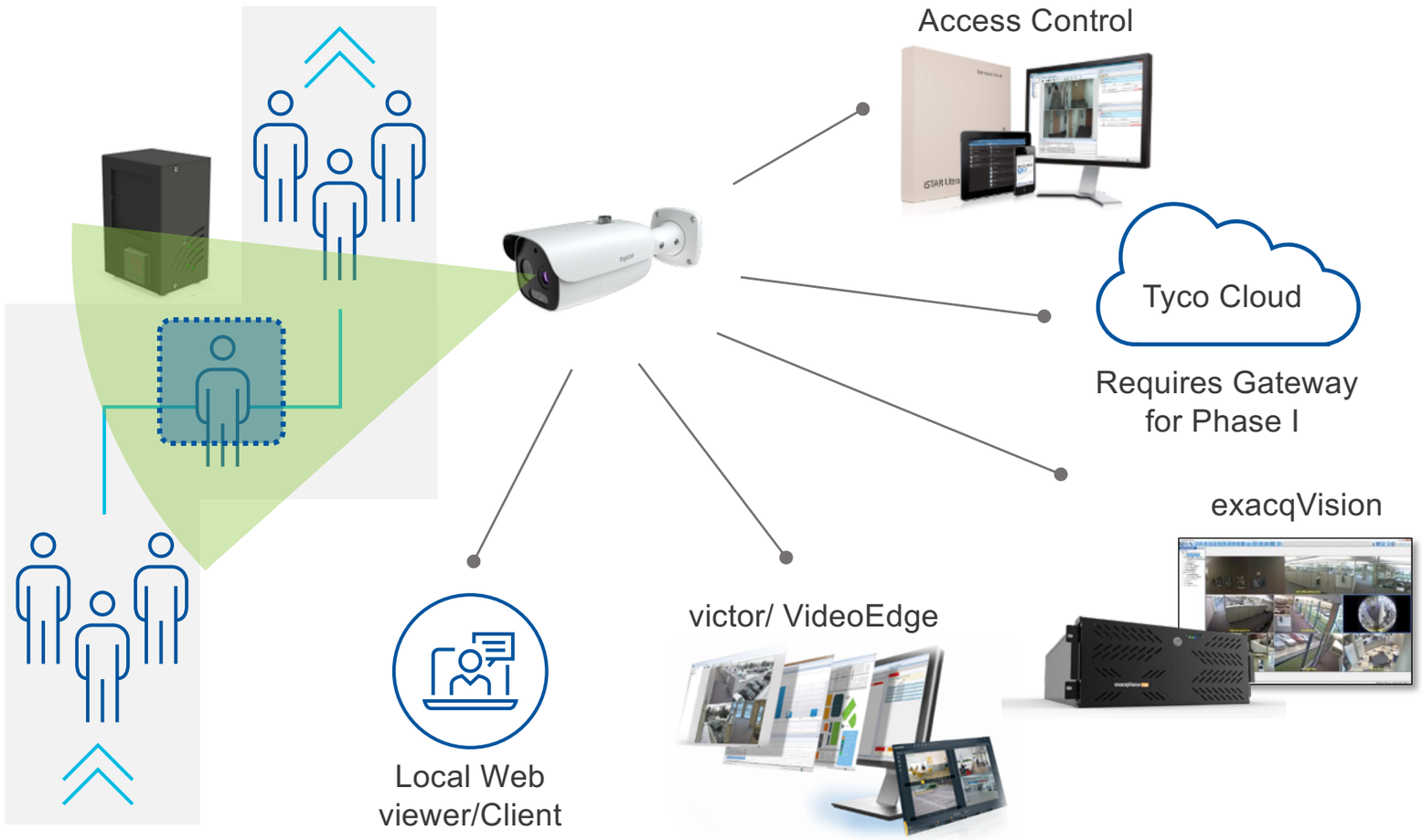


Larger size thermal detector brings larger detection area more accurate temperature reading

Clearer, Better Fit, More Adaptable

Up to 5MP (2592 x 1944) resolution on visible imager provides more details, TWDR ensures detail in both bright & dark areas required to support views of an indoor [dark] or outdoor [bright] scene (e.g. reception)

One product, multiple solutions



Usage Options Phase I

- Standalone with local webpage monitoring
- ONVIF/ iAPI3 VMS Integration Capability with VMS
  - victor/VideoEdge
  - exacqVision
  - Third-party VMS
- Output to access control/intrusion input for alarm trigger

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Use cases

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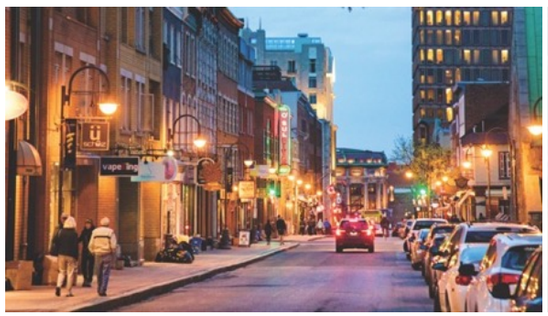
User scenarios




Commercial buildings
Entrance of office buildings

Sports & Entertainment
Entrance of events

Healthcare
Entrance of hospitals

Transportation hub
- Airport
- Railway station
- Metro station

Industrial
Manufacturing plants

Education
Entrance of schools

Retail
Entrance of shops, restaurants

Use case no video management system

Building Site

- Pop-up Tent for entry to the site.
- Security guard monitors the system locally.
- Persons enter the tent and walk through the camera's field of view.
- When an over temperature is detected an alarm is sounded (link from camera output and/or local speaker).
- Guard looks at the browser screen on the PC and identifies who has created the alarm.
- Persons temperature checked with a medically approved core body temperature device.

Use case with Tyco access control

Airport for staff screening

- Staff arriving for work approach the turnstile/gate/airlock.
- Over temperature is detected and the camera switches its output.
- Output is monitored in the Access Control system and an event is created.
- The event disables the reader so the staff member cannot gain entrance.
- Relevant staff are alerted to mitigate the situation.
- Once mitigation by predetermined procedure, alarm is cleared, and reader is re-enabled by the access control system.

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Compliance

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NDAA compliant

Tyco Illustra Pro Thermal EST is NDAA Compliant!

Medical standard compliance

FDA 510 (k)

- Application expected in 2020
- Releasing under the COVID-19-Thermography Devices Guidance provide by the FDA April 2020.

FDA 510(k)

Heath Canada application expected in 2020

Health Canada

Global Certification Standards

- ISO/TR 13154:2017
- IEC 80601-2-59:2017

ISO International Organization for Standardization

IEC INTERNATIONAL ELECTROTECHNICAL COMMISSION

US FDA - Enforcement Policy for Telethermographic Systems During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency (April 2020)

- The enforcement policy in this guidance applies to telethermographic systems that are intended for adjunctive diagnostic screening during the COVID-19 pandemic. (Product Code LHQ)
- The FDA is taking a risk-based approach and clarifying the policies that FDA intends to apply to telethermographic systems during the COVID-19 pandemic
- These systems are indented to help prevent the spread of disease and as such are defined by the FDA as a medical device.
- FDA believes devices included in this enforcement policy will not create such an undue risk where:
  - The performance and labeling elements in Section IV.D are met, and
  - An elevated body temperature measurement is confirmed in the context of use with secondary evaluation methods (e.g., non-contact infrared thermometer (NCIT) or clinical grade contact thermometer)
- Performance and Labeling requirements
  - Testing consistent with IEC 80601-2-59:2017 and labeling to ISO/TR 14971 or
  - Testing using alternative performance specification and includes safety & usability

FDA 510(k) Approved LHQ devices today

(out of 80,802 devices)

APPLICANT	DEVICENAME	DECISIONDATE
InTouch Technologies, Inc., d.b.a. InTouch Health	**InTouch Thermal Camera**	**3/25/2019**
Med-Hot Thermal Imaging Inc.	**Med-Hot Thermal Imaging Systems**	**12/8/2017**
First Sense Medical, LLC	Sentinel BreastScan II System	1/9/2017
First Sense Medical, LLC	FirstSense Breast Exam	6/1/2016
ALFA THERMODIAGNOSTICS, INC.	AlfaSight 9000 Thermographic System	4/10/2015
UE LIFESCIENCES, INC.	NOTOUCH BREASTSCAN	2/10/2012
AG DIGITAL TECHNOLOGY CORP.	AG THERMOGRAPHIC CAMERA, MODEL ATIR-M301	6/16/2011
TEXAS INFRARED	**ICI P AND S SERIES IR CAMERAS**	**7/11/2008**
MEDHOT THERMAL IMAGING, INC.	**MEDHOT MTI 2000 THERMAL IMAGING SYSTEM**	**10/19/2006**
EM DIAGNOSTICS, INC.	EMD THERMOGRAPHY SYSTEM	3/16/2006
FLIR SYSTEMS	**TELETHERMOGRAPHIC CAMERA, SERIES A, E, S AND P**	**3/9/2004**
INFRARED SCIENCES CORP.	INFRARED SCIENCES BREASTSCAN IR SYSTEM	2/20/2004
TITRONICS RESEARCH & DEVELOPMENT CO.	TYTRON C-500IR CLINICAL INFRARED IMAGING SYSTEM	10/10/2003
THERMATREK	THERMATREK IRIS-IV INFRARED IMAGING SYSTEM	4/16/2003
MICRO HEALTH SYSTEMS INC.	MHS 7000	3/26/2003
IX-DR, INC.	MARK I THERMAL IMAGER	2/11/2003
DOREX, INC.	DOREX SPECTRUM 9000MB THERMOGRAPHY SYSTEM	11/14/2002
TELESIS TECHNOLOGIES INC.	TELESIS DIGITAL INFRARED THERMAL IMAGE SYSTEM, SPECTRUM 9000MB	6/7/2002
MICRO HEALTH SYSTEMS INC.	MHS 5000	9/5/2001
MEDITHERM, INC.	MEDITHERM MED2000	2/21/2001
SIE-MED, INC.	REGUTHERM 952 THERMOGRAPHIC SYSTEM	2/16/2001
OMNICORDER TECHNOLOGIES, INC.	OMNICORDER BIOSCAN SYSTEM	12/23/1999
THERMATREK, INC.	THERMATREK IRIS-3 INFRARED IMAGING SYSTEM	8/20/1998
INFRAMETRICS, INC.	INFRAMETRICS INFRACAM-MED	8/18/1998
WERNER EIDAM MEDIZIN-TECHNOLOGIE GMBH	CRT2000 THERMOGRAPHIC SYSTEM	8/22/1997

Cybersecurity

Johnson Controls Cyber Solutions

- Disciplined Governance
- Expert-driven Design
- Security-infused Development
- Knowledge-driven Deployment
- Lifecycle Management
- Rapid Response
- Commitment to Partnership