








ThermaCheck™ M1

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1 Description of the ThermaCheck M1 Series camera

The ThermaCheck M1 Series camera uses AI software to identify and screen subjects for elevated body temperature and the presence of a facial mask. Realtime video of the screening subjects and screening results are displayed on a monitor connected to the camera through a standard HDMI interface. The subject's temperature is displayed above a bounding box surrounding the subjects face. The M1 Series camera may be used to screen subjects for wearing a mask, issuing an alert in the case of noncompliance. Recent individual screening results are summarized in a bottom picture bar on the display, along with screening statistics including the total number of individuals screened and counters for elevated temperature and no-mask events.

2 What's in the Box

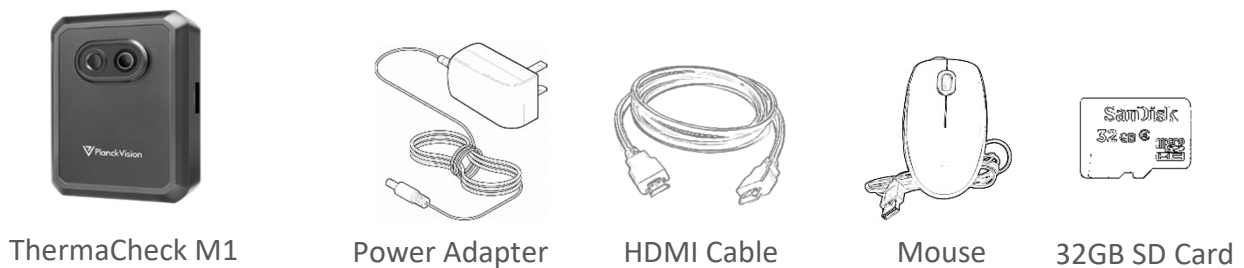


Figure 1: Items provided with the ThermaCheck M1 camera

Note: Please find our Welcome Card that provides a Quick Response code (QR) directing you to registration and product information.



Figure 2: Welcome card with Quick Response code

3 Initial Setup

Steps shown in Figure 3 may be followed for the initial setup of the ThermaCheck M1 camera. The camera head mounts to a 1/4-20" threaded screw (a standard for camera tripods). Typical mounting hardware for the ThermaCheck M1 camera is shown in Section 7.

- Steps:*
- 1) Mount the camera in a suitable screening location. Please see Section 6 for additional screening location requirements.*
 - 2) Connect camera head to power adaptor through the red 12V connector on the camera's rear pig-tail.*
 - 3) Connect power adaptor to the wall outlet.*
 - 4) Connect camera head to a display (not provided) using the HDMI cable provided.*
 - 5) Connect provided mouse to camera head through the USB connector on the camera's rear pig-tail. The mouse need only be connected to the camera while changing settings through the UI. During normal screening operation, the mouse may be disconnected.*

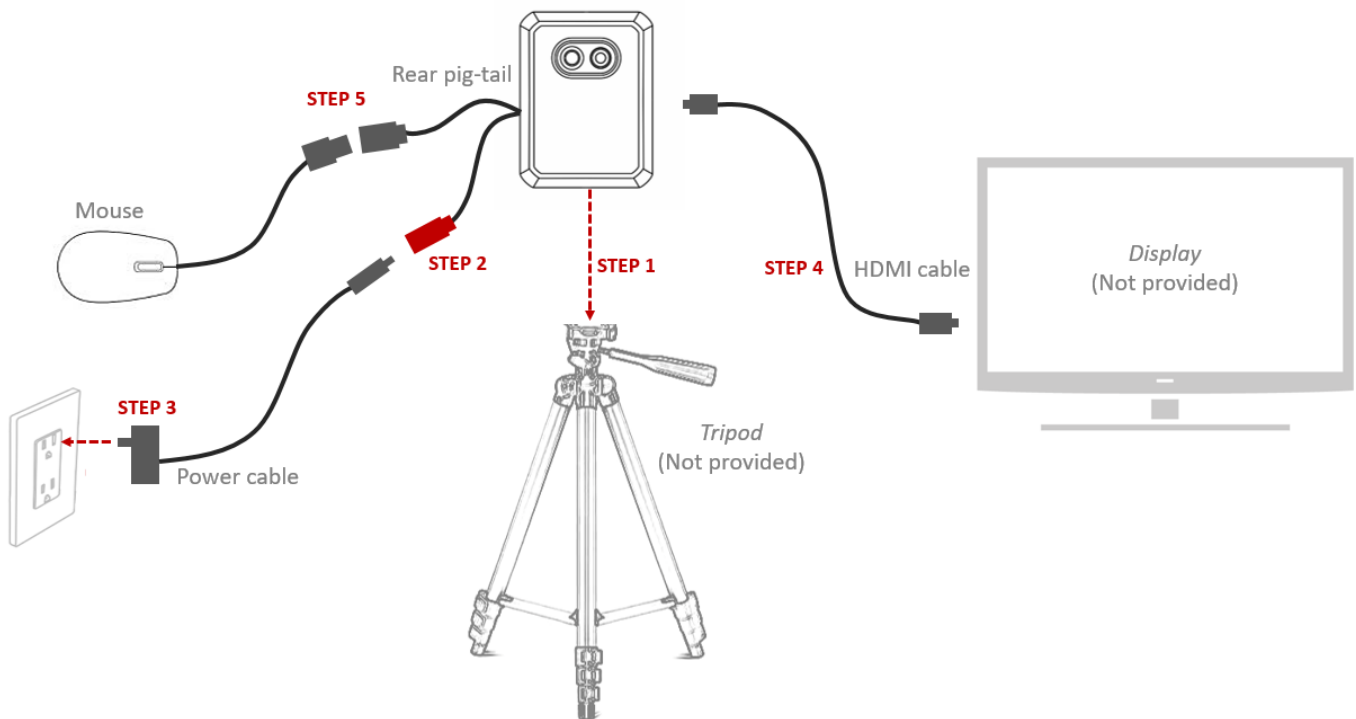


Figure 3: Schematic of the ThermaCheck M1 initial setup.

Notes:

- 1) Camera should be mounted so that screening subjects are 1-4m from the camera.*
- 2) ThermaCheck M1 camera has many real ports to enable integration with access control systems. Please contact info@planckvisionsystems.com for additional information.*

4 Display Features

Realtime video of the screening subjects and screening results are displayed on a monitor (not included) connected to the camera through a standard HDMI interface on the side of the camera head. Principle features of the ThermaCheck M1 display are shown in Figure 4. Features indexed in Figure 4 are described in Table 1.



Figure 4: ThermaCheck M1 main display

Table 1: Main display features

#	UI Feature	Description
1	Cameras	Realtime view of visible and thermal cameras.
2	Screening Bar	Dynamically refreshed recent screening results.
3	Alarm Window	Notification widow for no-pass screening events.
4	Temperature Threshold	Current threshold setting for high temperature alarms.
5	Screening Statistics	Real-time display of the total number of people screened, with counters for high temperature and no-mask events.
6	Date and Time	Current time and date.
7	Menu	Main menu for settings. See Section 5 for camera setting details.

5 User Interface Functions

Screening parameters for the ThermaCheck M1 camera may be set through the user interface when a mouse is connected to the USB port provided in the camera's rear pig-tail. Access to settings are obtained by selecting, with the mouse, the appropriate display icon. The ThermaCheck M1 camera settings are described below.

5.1 System settings and information

System Tab:

- 1) Selection of the date/time field opens a dialog box for setting this field.
- 2) Desired temperature unit is selected with the corresponding radio button.

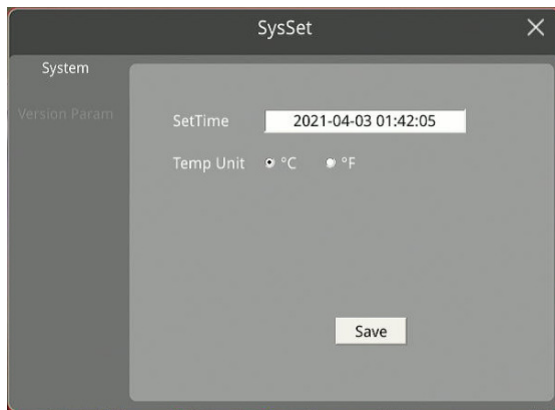


Figure 5: System settings window

Version Parameter Tab:

Opens window providing system information.

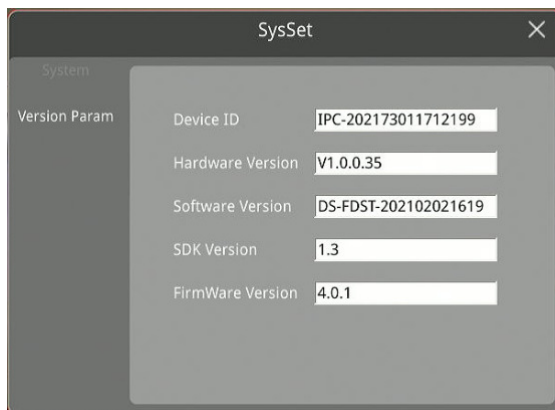


Figure 6: System version window

5.2 Interactive calibration function

Starts an interactive calibration procedure.

- 1) Procedure supports calibration on a human subject or blackbody, as selected with the radio button shown in Figure 7(a).
- 2) Enter the temperature of the calibration subject in the dialog box shown in Figure 7(a). The calibration subject should be at approximately the same distance from the camera as the screening subjects, as detailed in Figure 8. If using a human subject, measure subject's temperature using a handheld thermometer (FDA approved device is preferred); If using a blackbody subject, set setpoint temperature to 95–97 °F (35–36 °C) and allow the blackbody to reach the setpoint temperature before calibration is started.
- 3) Use the mouse to drag a box over the calibration subject. This is shown for the human subject in Figure 7(b) and blackbody subject in Figure 7(c).
- 4) Press “Start Calibration” to initiate the camera's calibration procedure. Wait until notification of calibration success before closing calibration window, as shown in Figure 7(d).

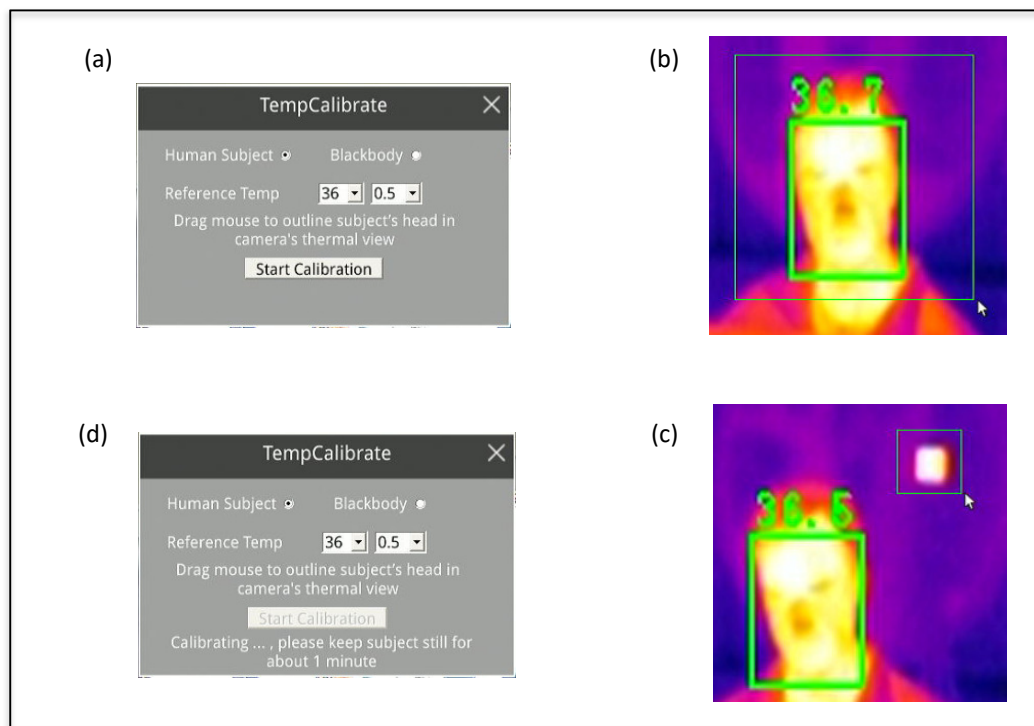


Figure 7: Dialog box for initiating calibration (a). Use of mouse to identify calibration subject when human (b) and blackbody (c). Dialog box during active calibration (d).

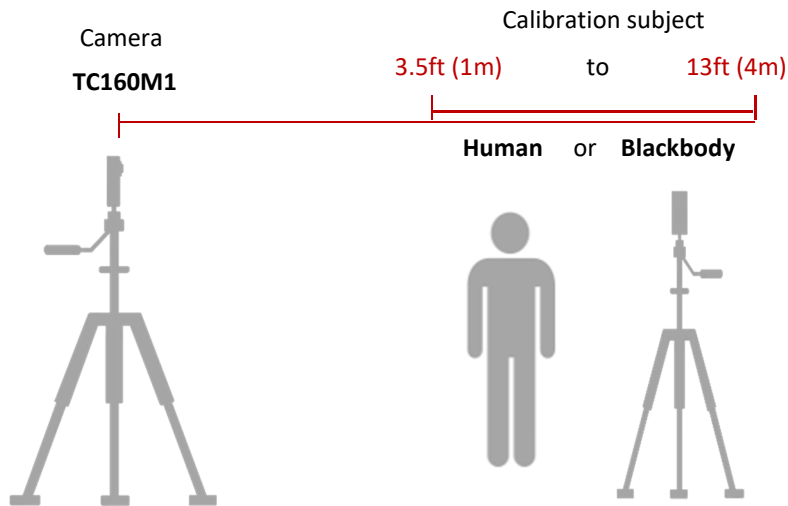




Figure 8: Calibration subject should stand at approximately the same distance from the camera as the screening subjects.

5.3 Mask Detection

Toggles the state of mask detection between: On -  and Off - .

5.4 Screening Capture History

The historical record of screening pictures can be reviewed. After selecting the capture history icon, choose the date and screening record type (Normal/High Temp./No Mask) to perform a search of the screening record, as shown in Figure 9.

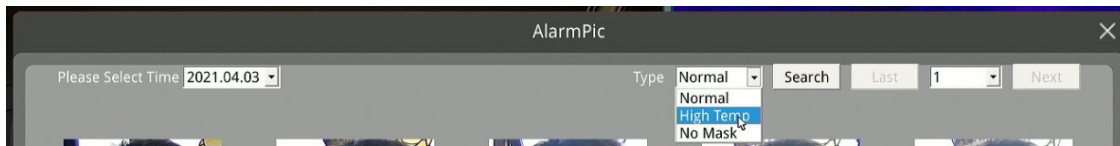


Figure 9: Selecting record type for search of the screening record.

5.5 Temperature Threshold Setting

Opens dialog box for user defined alarm threshold setting, as shown in Figure 10. Users can disable the alarm, change the alarm volume and the audio file for alarm notifications.

Note: The temperature unit can be changed in the System settings, as described in Section 5.1.

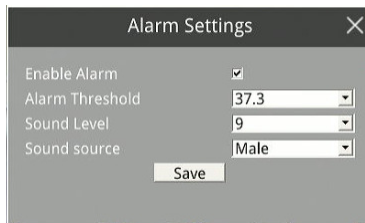


Figure 10: Alarm Settings window.

6 Temperature Screening Location

Preferred environmental conditions for the ThermaCheck M1 operation are 60 - 90°F (16 - 32°C) and less than 85% relative humidity. The best screening location will have a mostly dark indigo color in the background of the thermal image. If the background has a strong heat signature source, consider facing the ThermaCheck M1 camera in another direction. Figure 11 illustrates some adverse environmental conditions that should be avoided in the screening area.

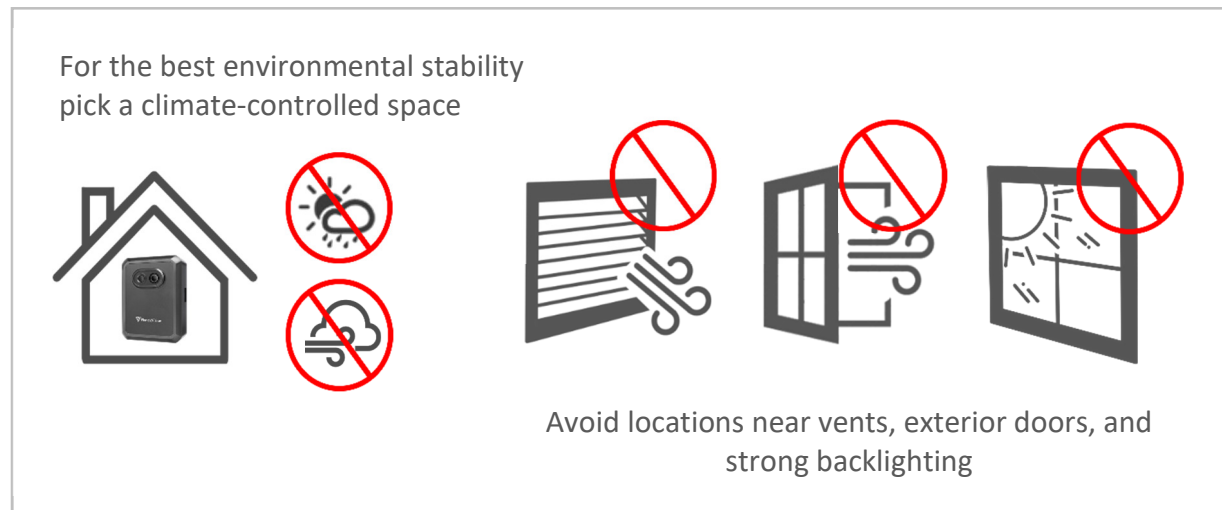
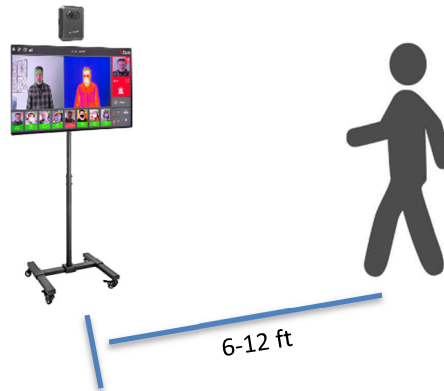


Figure 11: Adverse environmental conditions for the ThermaCheck M1 camera

Notes:

- 1) *Temperature measurements of subjects entering the screening area from the outside could be affected if there is a significant temperature difference between these two environments.*
- 2) *When the environmental temperature in which the ThermaCheck M1 camera is operating changes by more than ± 10 °F (± 6 °C), the camera should be recalibrated for the new conditions. If the user needs to operate the ThermaCheck M1 camera without a stable environmental temperature, it is recommended to use a blackbody in the scene of the camera to provide dynamic calibration.*

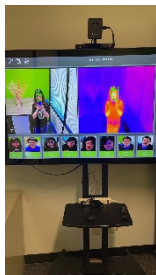
6.1 Typical Setups



Notes: The ThermaCheck M1 camera has great flexibility of installation options shown in Section 7.

7 Mounting Options

The ThermaCheck M1 camera connects to a standard ¼"-20 thread, used by traditional cameras and mounting systems as shown in Figure 12.



Rolling Monitor Stand



Wall Mount



Vesa Mounts

Figure 12: Several mounting options for the ThermaCheck M1 Camera

8 Why doesn't ThermaCheck M1 need a blackbody?

A blackbody is a stable temperature source used in the factory calibration of thermal cameras to make their temperature measurements as accurate as possible. Some infrared cameras used for human temperature screening require a blackbody source in the background scene to ensure their measurement accuracy. This increases both the cost and complexity of the screening solution with minimal added benefit to the user.

ThermaCheck M1 uses a US manufactured infrared sensor core and advanced factory calibration procedures that optimize it for the measurement of human body temperatures. It automatically performs periodic compensation

routines that give ThermaCheck M1 superior temperature stability and measurement accuracy. We recommend that our cameras be calibrated on the human face, using a medical grade thermometer.

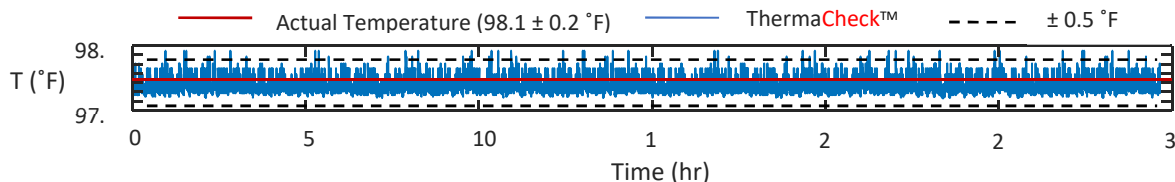


Figure 13: Stability of ThermaCheck M1 camera shown over a 30hr period.

Note: When the environmental temperature in which the ThermaCheck M1 camera is operating changes by more than $\pm 10^{\circ}\text{F}$ ($\pm 6^{\circ}\text{C}$), the camera should be recalibrated for the new conditions. If the user needs to operate the ThermaCheck M1 camera without a stable environmental temperature, it is recommended to use a blackbody in the scene of the camera to provide dynamic calibration.

9 Can ThermaCheck M1 be used to diagnose illness?

No. The ThermaCheck M1 camera is designed for preliminary temperature screening only. Although the available scientific literature supports the use of infrared cameras for this purpose [1], they cannot be used for medical diagnostics since the skin temperature is influenced by environmental conditions. Individuals with abnormal skin temperature readings should be further evaluated with a medical grade thermometer.

Planck Vision Systems is not advertising our cameras as medical equipment. Our products can only identify individuals with elevated skin temperature. There is no way to thermally detect an infected individual who does not have an elevated body or skin temperature and only a licensed medical professional can determine if such an individual is experiencing an abnormal medical condition.

[1] Ring, Francis J., and E. Y. K. Ng. "Infrared thermal imaging standards for human fever detection." *Medical Infrared Imaging: Principles and Practices*. CRC press, 2007.

10 Thank you

Thank you for purchasing a ThermaCheck M1 camera. We develop our products to deliver reliable, long lasting performance, and want to make sure you are satisfied with your purchase. For more product information visit www.planckvisionsystems.com, and feel free to get in touch with us at info@planckvisionsystems.com with questions, problems, and comments.