



GAI-TRONICS®
A HUBBELL COMPANY

TempSense Models TS200/TS200W

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Confidentiality Notice

This installation and operation manual contains sensitive business and technical information that is confidential and proprietary to GAI-Tronics. GAI-Tronics retains all intellectual property and other rights in or to the information contained herein, and such information may only be used in connection with the operation of your GAI-Tronics product or system. This manual may not be disclosed in any form, in whole or in part, directly or indirectly, to any third party.

General Information

The TempSense Models TS200/TS200W measure and capture EBT (elevated body temperature) or EST (elevated skin temperature) of subjects moving through the TempSense's FOV (field of view). The TempSense module consists of one FLIR® (forward looking infra-red) camera and one standard video camera sharing the same FOV in a wall, pole, tripod, or microphone stand mountable enclosure. The TS200/TS200W captures 608 × 464 resolution images on both cameras and sends them via email to the an email recipient when the highest temperature in the FOV is above the configurable threshold temperature.

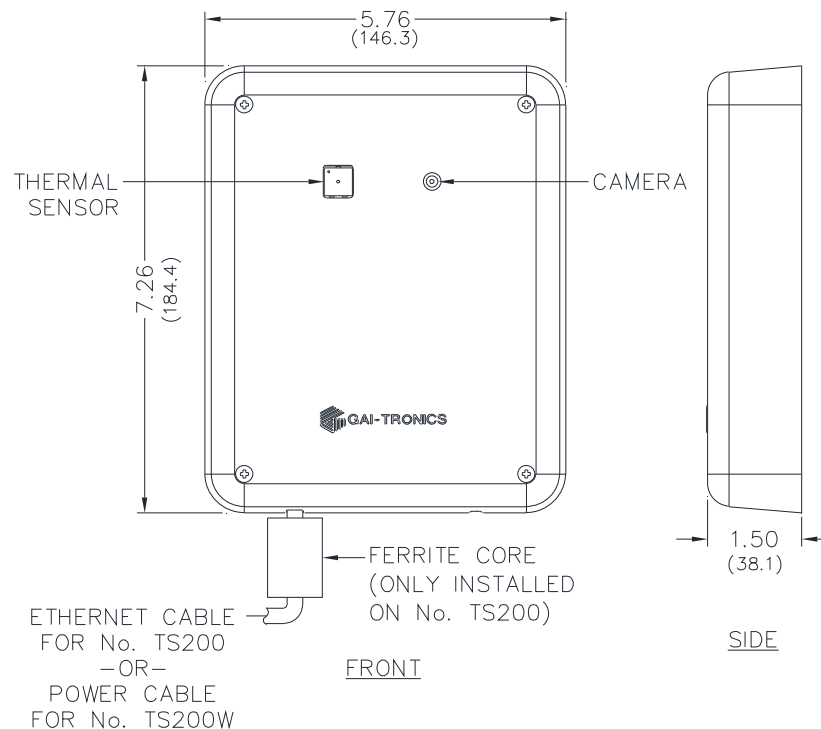


Figure 1. TempSense Models TS200/TS200W

Installation

NOTE: The accuracy of the TempSense TS200/TS200W requires individual subjects pass within two to six feet of the thermal imaging camera lens. Results with different camera positions may vary. Thermal imaging camera accuracy improves as the subject moves closer to the camera.

Camera Location

Locate the TempSense TS200/TS200W so that people in a queue individually pass through the two cameras' shared FOV while facing the cameras. Each subject scanned should come within two to six feet of the cameras. The ideal height for camera installation is 5 feet 5 inches above the floor. Installation at a higher location requires aiming the TS200/TS200W downward so that each subject's forehead passes through the center of the FOV (see [Figure 2](#) and [Figure 3](#)).

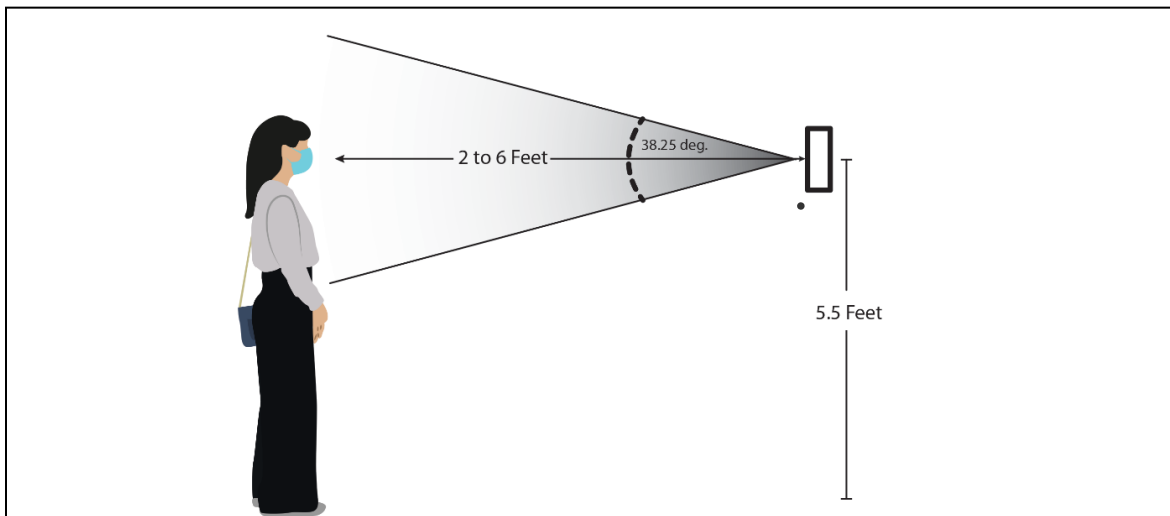


Figure 2. SAMPLE FIGURE Camera Positioning (Side View)

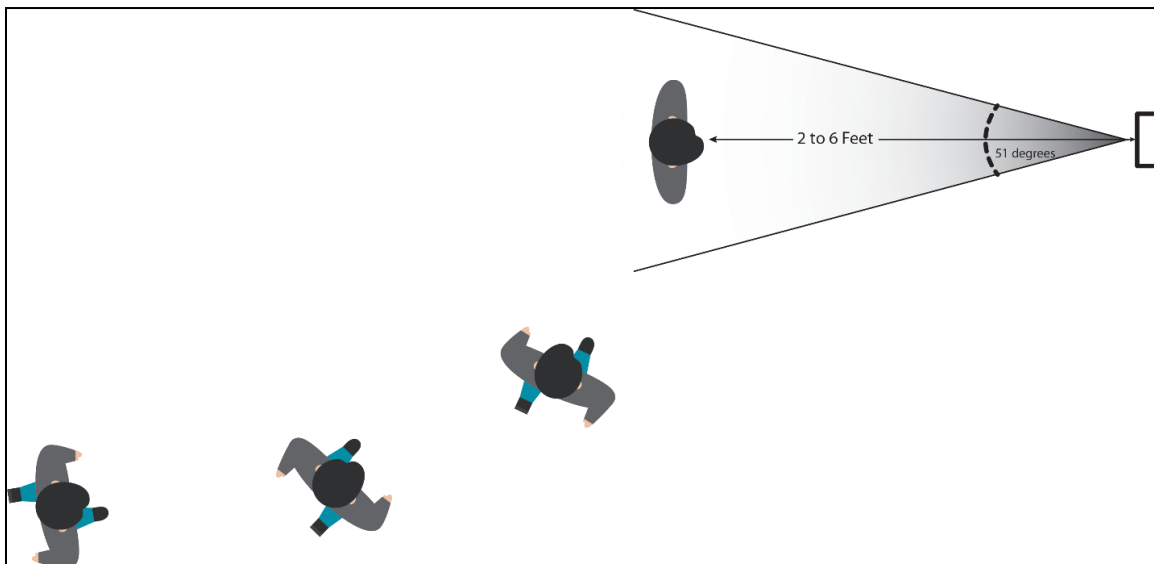


Figure 3. SAMPLE FIGURE Camera Positioning (Top View)

Wall Mount

Mount the TempSense TS200/TS200W to a wall as follows (see Figure 4):

NOTE: GAI-Tronics recommends spacing the TempSense Model TS200 approximately 1/4 inch from any flat surface to allow air flow.

1. Secure the mounting plate (TS200: see Figure 6, TS200W: see Figure 7) to a flat surface using (customer supplied) hardware.

Use the four VESA mount holes to secure the mounting plate to the wall. No. 8 screws fit through the 0.190-inch threaded VESA mounting holes (see Figure 4).

2. Secure the TS200/TS200W to the mounting plate using the four included #6-32 screws.

Pole Mount

Mount the TempSense TS200/TS200W to a pole (see Figure 5) as follows:

1. Secure the TS200 (see Figure 6) or TS200W (see Figure 7) mounting plate, to a pole using (customer supplied) worm-drive clamps
2. Secure the TS200/TS200W to the mounting plate using the four included #6-32 screws.

VESA Mount

Attach a VESA (video electronics standards association) mount to the mounting plate with the included #10-24 screws and washers (TS200: see Figure 6, TS200W: see Figure 7).

NOTE: The TS200/TS200W includes four #10-24 × 0.38-inch long screws to attach a customer supplied VESA mount. Do **not** use any screws other than the included #10-24 screws to attach the VESA mount to the TS200/TS200W's mounting plate.

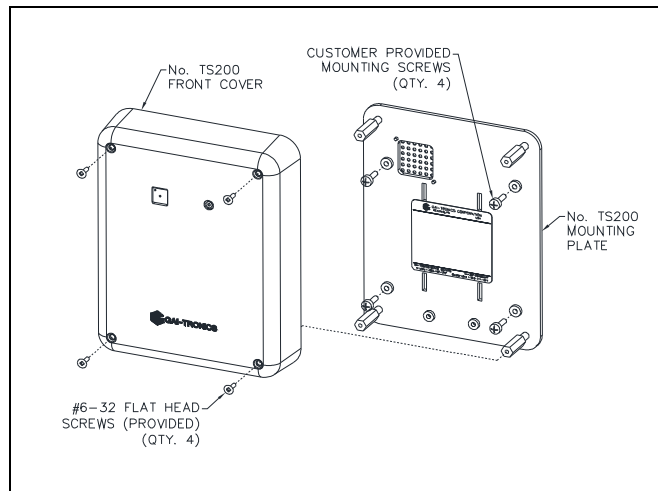


Figure 4. Wall-Mount Detail

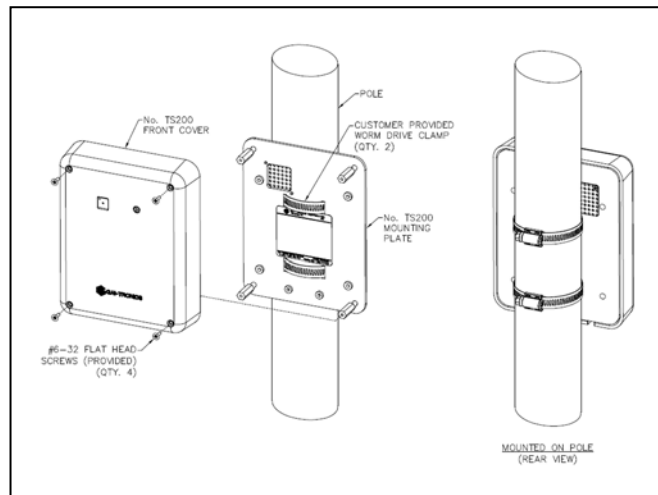


Figure 5. Pole-Mount Detail

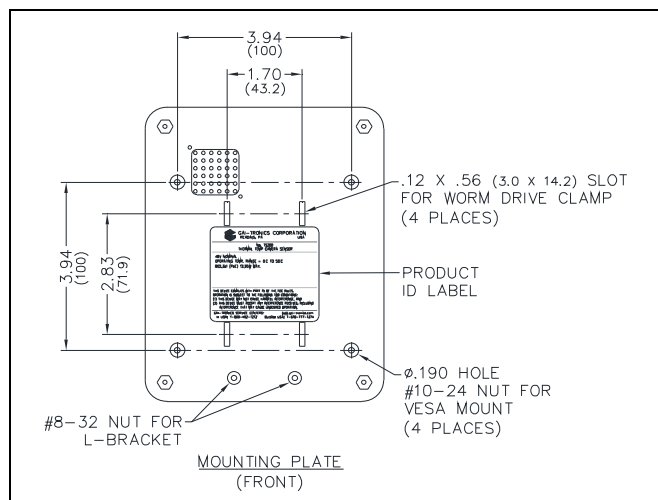


Figure 6. Mounting Plate Detail (Model TS200)

Stand Mount

Mount the TS200/TS200W to a tripod or microphone stand using the included L-bracket (see Figure 8).

1. Secure the mounting plate (TS200: see Figure 6, TS200W: see Figure 7) to the TS200/TS200W using the four included #6-32 screws.
2. Secure the L-bracket to the mounting plate using the two included #8-32 flat head machine screws (see Figure 9).
3. Secure the L-bracket to a microphone stand or tripod (see Figure 8).

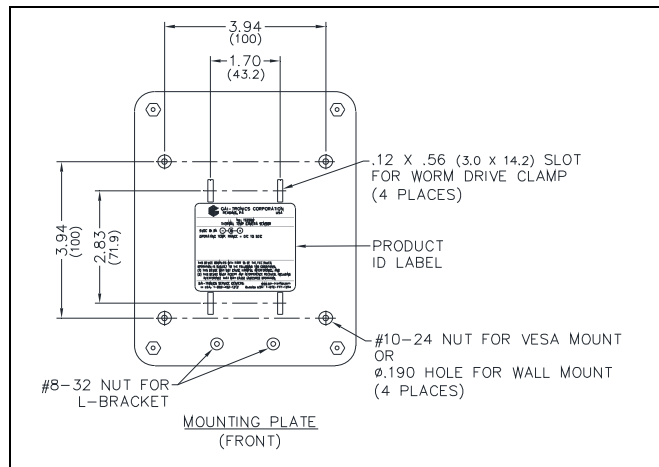


Figure 7. Mounting Plate Detail (Model TS200W)

Connection

Model TS200

Plug a Category 5e or better Ethernet cable with RJ45 plug from a PoE switch port into the TS200's Ethernet jack pigtail. The TS200's IR sensor has a white LED that blinks slowly for 40 seconds, then changes to a fast blink.

NOTE: If the IR sensor LED does not flash, press the sensor into its socket using a soft cloth, then reboot the device.

The Model TS200 boots up and is ready for configuration (see the [Configuration](#) section) or scanning subjects (see the [Operation](#) section) after adjusting to its environment (about 10–30 minutes).

Model TS200W

1. Plug the included power supply into the power cord pigtail on the TS200W.
2. Plug the power supply into a 120 V ac outlet.

The TS200W's IR sensor has a white LED that blinks slowly for 40 seconds, then changes to a fast blink.

NOTE: If the IR sensor LED does not flash, press the sensor into its socket using a soft cloth, then reboot the device.

The Model TS200W boots up and is ready for configuration (see the [Configuration](#) section) or scanning subjects (see the [Operation](#) section) after adjusting to its environment (about 10–30 minutes).

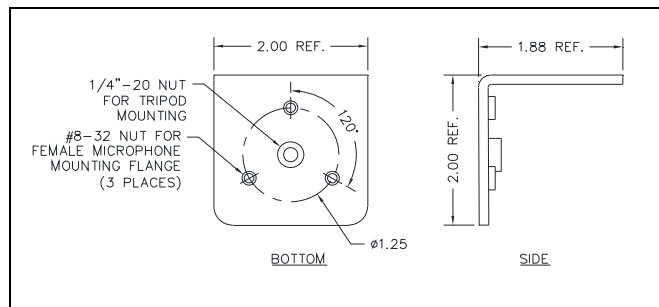


Figure 8. TS200/TS200W L-Bracket Detail

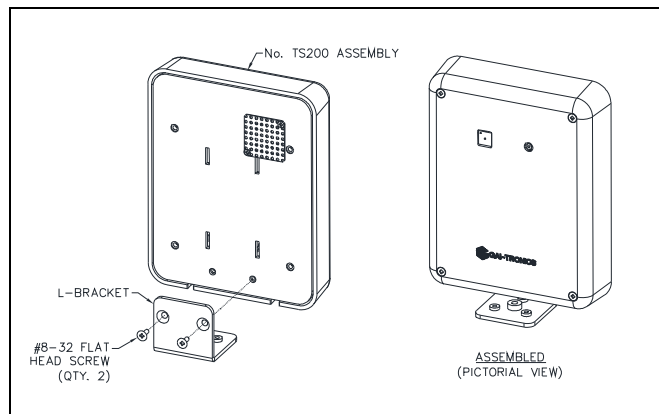


Figure 9. L-Bracket Attachment for Tripod/Microphone Stand Mounting

Configuration

The TempSense TS200 and TS200W have a built in webserver for configuration and calibration of the TempSense device.

TempSense TS200

Configure the TempSense TS200 before calibrating it or using it to scan subjects:

1. Plug a Category 5e or better Ethernet cable with RJ45 plug from a PoE switch port into the TS200's Ethernet jack pigtail.

The TempSense TS200 boots up with a static, class C IP address, set to 192.168.1.55.

2. Wait several minutes for the unit to boot and come up to normal operating temperature.
3. Configure a PC to access the TempSense device on the class C network 192.168.1.x.
4. Open a web browser and enter 192.168.1.55 in the address bar.

The TempSense management webpage contains sections of parameters for defaults (see [Table 1](#)), network (see [Table 2](#)), SMTP (see [Table 3](#)), and time (see [Table 4](#)).

5. Configure all settings and click APPLY CHANGES AND RESTART.

The unit reboots with the configured settings.

NOTE: If the network mode is DHCP but no DHCP server exists, the unit falls back to IP address 192.168.1.55.

TempSense TS200W

Configure the TempSense TS200W before calibrating it or using it to scan subjects as follows:

1. Plug the included power supply into the TS200W's power cord pigtail.
2. Plug the power supply into a 120 V ac outlet.
3. Wait several minutes for unit to boot and come up to normal operating temperature.

The TS200W boots up and creates a wireless network with following properties:

- WiFi frequency: 2.4 GHz
- SSID: ThermalScanner
- IP address: 192.168.4.1
- subnet mask: 255.255.255.0
- password: GAItronics

4. Use a PC to access the ThermalScanner WiFi access point.

Password: **GAItronics**

5. Open a web browser and enter 192.168.4.1 in the address bar to access and authenticate to the TS200W's management webpage.

The TempSense management webpage contains sections of parameters for defaults (see [Table 1](#)), network (see [Table 2](#)), SMTP (see [Table 3](#)), and time (see [Table 4](#))

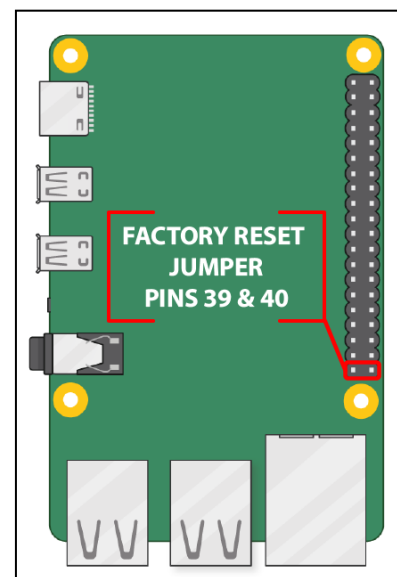


Figure 10. Model TS200W
Factory Reset

6. Configure all settings and click APPLY CHANGES AND RESTART.

The unit reboots and tries to connect to the configured wireless network.

FACTORY RESET: To reset the TS200W, use a jumper cap to short pins 39-40 on the 40-pin header for 5 seconds. The TempSense resets itself to factory original settings, reboots, and re-broadcasts as an access point with the original WiFi properties (see [Figure 10](#)).

NOTE: If the network mode is DHCP but no DHCP server exists, the unit falls back to IP address 192.168.1.55.

Table 1. Default Parameters

Parameter	Description	Value:
Description	The TempSense device description.	<i>[MODEL]-[Last Three Octets of MAC ADDRESS]</i>
degreesf	Select <i>Yes</i> to display the temperature in Fahrenheit or <i>No</i> to display the temperature in Celsius.	Yes No
automatic_scan_timeout	The period before scanning restarts after the measured temperature drops below the threshold temperature.	0–100, 5 (seconds)
Offset	The value to add to or subtract from the temperature measured by the TempSense	–10 to +10 °F, 0 °F –6 to +6 °C, 0 °C
Threshold	The measured temperature that triggers the TempSense event.	+60 to +120 °F +16 to +48 °C
Model	The factory configured TempSense model number.	TS200 TS200W

Table 2. Network Parameters

Parameter	Description	Value:
ssid_hidden	Set to <i>Yes</i> if connecting to a wifi network that does not broadcast its SSID. Set to <i>No</i> if connecting to a wifi network that broadcasts its SSID.	Yes No
ip_addr	IP version 4 address of the TempSense	TS200: 192.168.1.55 TS200W: 192.168.4.1 wifi
ssid	The system set identifier for the wireless network	Case sensitive string ThermalScanner
ssid_pass	The password for the SSID the TS200/TS200W will connect to.	GAItronics
nw_mask	IP version 4 network mask	255.255.255.0
nw_gateway	IP version 4 address of the network router	0.0.0.0
dns_addr	IP version 4 address for a DNS server	0.0.0.0
hostname	The common name for this device on the network.	<i>[MODEL]-[Last Three Octets of MAC ADDRESS]</i>
ip_addr_mode	Static or DHCP	static

Table 3. SMTP Parameters

Parameter	Description	Value:
username	The username for the SMTP server mailbox	(string) None
server	the SMTP server's IP Version 4 address	valid IPv4 address or FQDN (Fully Qualified Domain Name) 0.0.0.0
security	SMTP security protocol in use	TLS, SSL, None
password	the SMTP password for the mail account	(string)
recipient	The receiver's email address this TempSense device sends email to.	valid SMTP email address None
port	The I/O memory address of the SMTP service on the host computer	0–65535, 587

Table 4. NTP Parameters

Parameter	Description	Value:
time_server	IP version 4 address for an NTP server	valid IPv4 address or FQDN (string) 0.0.0.0
time_zone	The offset from UTC	Select the offset from UTC using the roll box control.

Calibration

1. Place an object of known temperature in the field of view of the TS200/TS200W at the appropriate height and distance (see the [Camera Location](#) section).
2. Login to the webserver and press the CALIBRATE THRESHOLD AND OFFSET button.
3. While watching the temperature of the object in the IR video feed (left side), slide the OFFSET slider to adjust the on-screen temperature until it displays the known temperature (see [Figure 11](#)).
4. Adjust the TEMP THRESHOLD to the desired temperature for the TS200/TS200W to send an email to the *recipient* to alert them when a subject exceeds this temperature.

The TS200/TS200W captures both an IR and normal picture when the temperature exceeds the TEMP THRESHOLD value. It then waits the *automatic_scan_timeout* period after the temperature drops below the *threshold* temperature before scanning resumes.

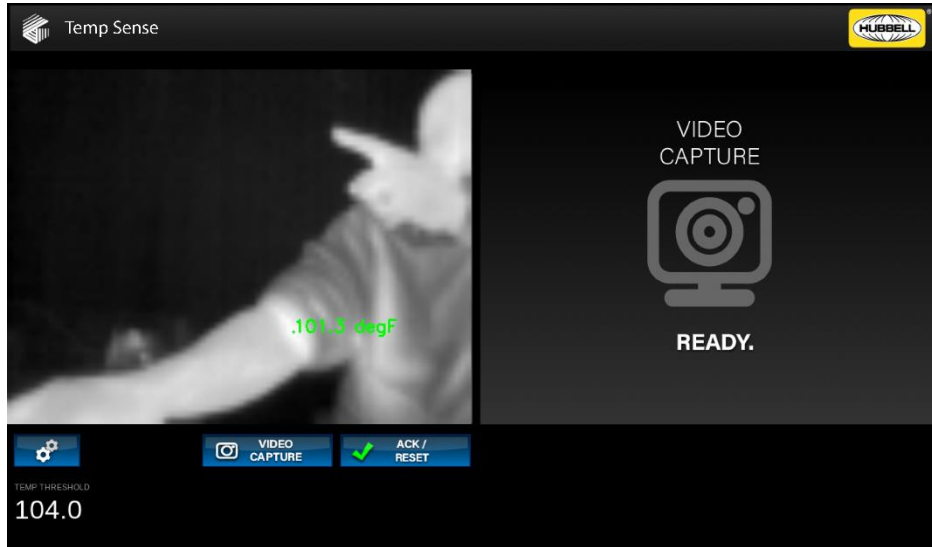


Figure 11. Temperature Superposition and Calibration

Operation

Environment

Environmental considerations for the Models TS200/TS200W NCIT (non-contact infra-red thermometer) performance:

- Use the temperature scanning feature of the TS200/TS200W in a draft-free space that is out of direct sunlight and away from radiant heat sources.
- The optimal environment for the TS200/TS200W temperature sensor is between 60.8–104 °F (16–40 °C) with the relative humidity below 85 percent.
- Allow the TS200/TS200W to operate in the testing environment for 10–30 minutes to adjust to its environment before scanning personnel.

Subject Preparation

To obtain accurate skin temperatures, ensure that the subject has not:

- been wearing a hat, scarf, heavy clothing, etc.
- underwent recent physical exertion
- just entered from a much lower temperature environment
- recently used facial cleaning products
- engaged in any other act that may affect their skin temperature.

Scanning Subjects

When a subject with a temperature exceeding the configured *threshold* enters the IR camera's FOV:

- The TempSense TS200/TS200W sends an email to the SMTP *recipient* containing still images of the IR and standard camera's FOV.
- The TS200/TS200W image includes the *temperature ±Offset* superimposed in the IR picture.

Specifications

Electrical

Power:

TS200	PoE
TS200W power supply	90–264 V ac
	5.0 V dc, 15 W, 3.0 A (maximum)

Mechanical

Dimensions 7.26 H × 5.76 W × 1.5 D in (184.4 × 146.3 × 38.1 mm)

Weight..... 2.0 lb (0.9 kg)

FLIR Camera

Horizontal FOV 51°

Vertical FOV..... 38.25°

Approvals

Compliance to standard.....FCC 47 CFR Part 15B Class A

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Depending upon the wiring and features used on this device, additional precautions may be necessary not to cause harmful interference. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warranty

Equipment. GAI-Tronics warrants for a period of one (1) year from the date of shipment, that any GAI-Tronics equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed-upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to GAI-Tronics' nearest depot repair facility, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy. The warranty period on any repaired or replacement equipment shall be the greater of the ninety (90) day repair warranty or one (1) year from the date the original equipment was shipped. In no event shall GAI-Tronics warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder. Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by GAI-Tronics hereunder. The applicability of any such third-party warranty will be determined by GAI-Tronics.

Services. Any services GAI-Tronics provides hereunder, whether directly or through subcontractors, shall be performed in accordance with the standard of care with which such services are normally provided in the industry. If the services fail to meet the applicable industry standard, GAI-Tronics will re-perform such services at no cost to buyer to correct said deficiency to Company's satisfaction provided any and all issues are identified prior to the demobilization of the Contractor's personnel from the work site. Re-performance of services shall be Buyer's sole and exclusive remedy, and in no event shall GAI-Tronics warranty obligations with respect to services exceed 100% of the total cost of the services provided hereunder.

Warranty Periods. Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

Limitations / Exclusions. The warranties herein shall not apply to, and GAI-Tronics shall not be responsible for, any damage to the goods or failure of the services supplied hereunder, to the extent caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by GAI-Tronics to maintain or service the equipment. **THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

Return Policy

If the equipment requires service, contact your Regional Service Center for a return authorization number (RA#). Equipment should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist our technicians in their troubleshooting efforts.

Call 800-492-1212 (inside the USA) or 610-777-1374 (outside the USA) for help identifying the Regional Service Center closest to you.