Temperature Measuring Device 2.0 User Guide

This material has been created in order to accommodate a wide range of restaurant operations and your specific business practices and system configuration may differ slightly from what is represented in this material. While ParTech, Inc. ("PAR") takes great care to ensure the accuracy of these materials, all material is provided "as is" without warranty of any kind, either express or implied, including, but not limited to, warranties of merchantability or fitness for a particular purpose. PAR does not make any warranties or representations that the materials will meet your requirements or that the operations of the hardware will be uninterrupted or error free.

Trademark Notices: The PAR logo, Boundless Hospitality by PAR logo, PAR EverServ®, the PAR EverServ logo and PixelPoint® are all trademarks of PAR Technology Corporation, the parent company of ParTech, Inc. or its affiliates. All other product names used throughout this material are trademarks of the respective companies. No such use of any trademark is intended to convey endorsement or other affiliation with these companies.

Reproduction: Copyright © 2014 ParTech, Inc. All rights reserved. This publication, or any part thereof, may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, storage in an information retrieval system, or otherwise, without the prior written permission of ParTech, Inc., PAR Technology Park, 8383 Seneca Turnpike, New Hartford, NY 13413-4991; Phone: (315) 738-0600.

 is a registered trademark of PAR Technology Corporation in the United States of America.

Table of Contents

Change History

Revision	Reason for Change	Changes	Date
1	Initial draft		05/19/2014
2	Review changes		06/25/2014
A	Initial release		07/08/2014

⚠ **WARNING:** TMD 2.0 should only be used with the accessories provided by PAR. Using chargers, power adapters and/or battery packs not specified by PAR could be hazardous.

⚠ **WARNING:** If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

📌 **IMPORTANT:** Always dispose of battery packs according to federal, state, and local regulations. Contact a recycling agency in your area for recycling instructions and locations.

⚠ **WARNING:** Incorrect handling may cause hazardous conditions, resulting in death or severe injury.

Overview

The PAR EverServ® SureCheck® Temperature Measuring Device (TMD 2.0) M8936 is a handheld multifunction temperature probe used for capturing temperatures in three (3) measurement modes. Infrared, RFID and insertion temperature probes are selectable from the front of the unit. (The TMD 2.0 unit can be used as a standalone device.)

LCD Screen

HACCP LED Indicator

Battery Cover

Small diameter tip

Insertion Probe

Micro USB port

Front View   Side View
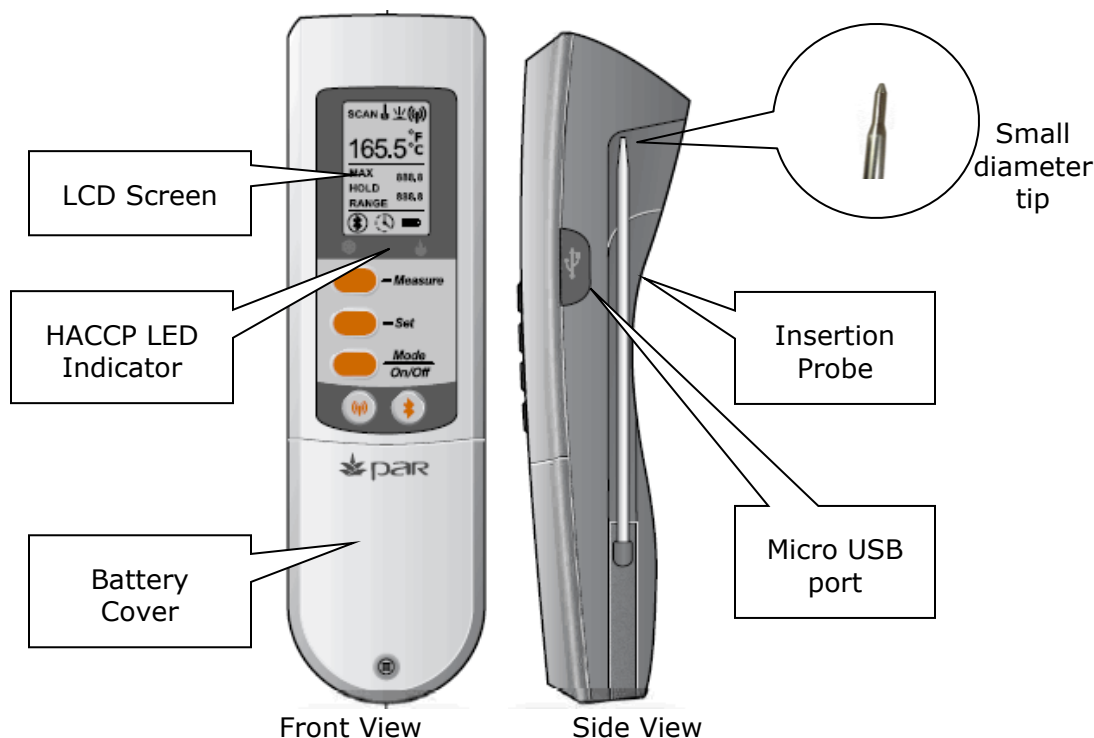
The TMD 2.0 is used in conjunction with a PDA running the EverServ SureCheck PDA software. A SureCheck TMD 2.0 integrates the following into a single handheld device.

- Integrated RFID reader for passive and temperature logging tags (located on the top of the unit)
- Non-contact Infrared temperature probe with targeting beam (located on the top of the unit)
- Insertion probe that folds outward to approximately 180 degrees
- Bluetooth connectivity
- Rechargeable, replaceable Lithium-ion battery. (Calibration parameters are retained during power loss or battery replacement)
- HACCP LED's for process monitoring
- Touch button membrane (aka, Keypad)
- Micro USB port

K8935 provides a charging cradle, AC-DC adapter and USB to right-angle micro USB cable. Reference the Battery Installation section on page 18.

TMD 2.0 LCD Screen

The screen consists of User Interface (UI) elements shown as LCD segments. These segments are lit according to specific conditions (discussed in Operations on page 4).

LCD segments
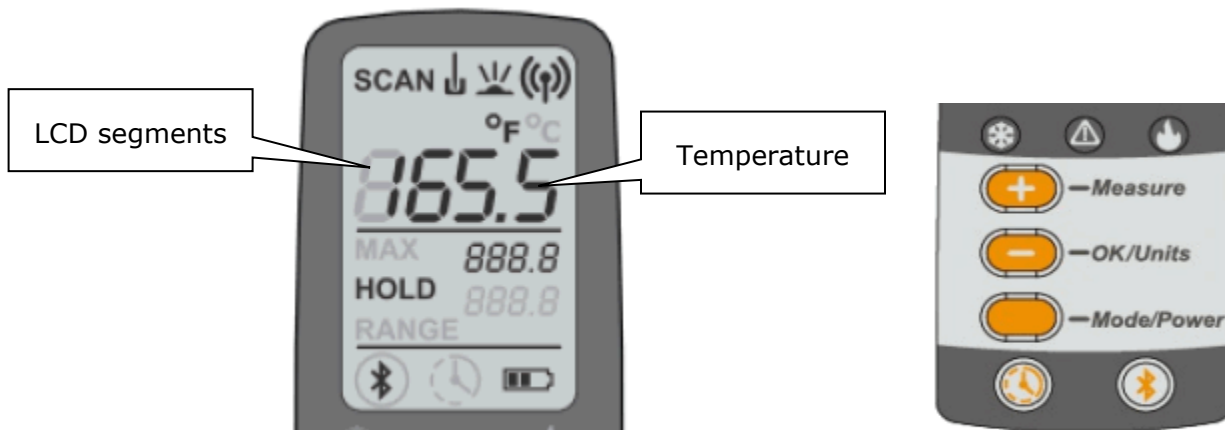
Temperature

The UI provides information on the mode being used and additional information needed. For example, the sample above shows a temperature of 165.5°F.

TMD 2.0 Buttons

The physical buttons on the TMD 2.0 control the operations and interact with a connected PDA (discussed in Operations on page 6).

The built-in Bluetooth connection is discussed later in this document.

TMD 2.0 Labels

A TMD 2.0 has several labels as outlined below.

Serial Number Label

The serial number label is shown below.

Rating Label

The TMD 2.0 rating label (shown below) is located on the back of the unit. It includes the device Bluetooth MAC address.
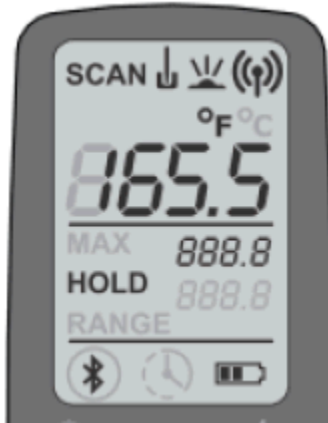
Operations

The following provides operating procedures for your TMD 2.0.

TMD 2.0 LCD Screen

The screen consists of UI elements that are shown using LCD segments.

The segments are lit according to conditions outlined below.

Element	Description
SCAN	Blinks to indicate that a temperature measurement is in progress.
↓ ⌄ (ᵗ)	Indicates the temperature sensing mode. Tap the Mode/Power button to select a sensing mode. Only one mode is shown after it is selected. Left to right the elements are: insertion probe, infrared (IR) or RFID.
165.5°F°C	Indicates the current or final temperature and the unit of measure. Fahrenheit (F) or Celsius (C) can be selected using the OK/Units button.
MAX HOLD RANGE	Labels for the two range values.
888.8 888.8	Indicates the range of values for the measured temperature.
✳	Indicates the status of the Bluetooth connection to the device.
⏱	Indicates that the timer mode is set and running.
▮▮▮	Indicates the charge level of the built-in battery.
❄ ⚠ ♨	HACCP LED Indicators for Cold (green), Alert (red) and Hot (green).

HACCP LEDs

The chart below identifies the temperature guidelines for illuminating the HACCP LEDs. The LEDs appear on the TMD 2.0 below the screen.

LED	Description
❄	Cold indicator. Green LED lights for temperatures < 40ºF (< 4ºC).
⚠	Alert indicator. Red LED lights for temperatures between 40º to 140 º F (4º to 60º C).
🔥	Hot indicator. Green LED lights for temperatures >140ºF (> 60ºC).

Audio Alerts

The TMD 2.0 is capable of producing single-frequency tones of varying duration. Audio feedback is defined as:

- Beep: A short tone of ½ second duration.
- Beeeep: A long tone of 1 second duration.
- Pause: A duration of 1 second with no audio used to separate consecutive sounds.
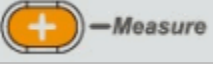
Event	Sound Pattern
Self Check OK	Beep Beep
Self Check- Error	Beep Beeeeep
Low Battery	Beeeep Beeeep
Countdown Timer at "0"	Beep Beep Beep Pause Beep Beep Beep
Start Automatic Temp Scan	Beep
Start Manual Temp Scan	Beep Beep
Aborted or Timed-Out Scan	Beeeep Beep

TMD 2.0 Buttons

The physical buttons on the TMD 2.0 control its operation and interact with a connected PDA.

The buttons are outlined below.

Button	Description
+—Measure	Starts the temperature scan if not in Timer mode. In timer mode it increments the set value for the countdown timer.
—OK/Units	Used to toggle between °F and °C when not in Timer mode. In timer mode it decrements the set value for the countdown timer.
—Mode/Power	This button turns the TMD 2.0 On or Off. It also changes the data collection modes between: Insertion Probe → IR → RFID. Each time you touch the button the mode changes.
⏰	Used to enter Timer mode, plus starts or stops the timer.
✳	Used to turn the Bluetooth radio on or off, or to initiate Bluetooth pairing.

Power Functions

Power On

You can power the TMD 2.0 as follows.

1. Press and hold (Mode / Power) button for approximately two (2) seconds.
2. The LCD Backlight and all LCD segments turn on for two (2) seconds.
3. The TMD 2.0 performs a self-check. If no errors are detected the device emits an audible beep and is ready for use.
4. It displays an error code halting usage of the device if appropriate.
5. The LCD shows the current firmware revision for two (2) seconds, and then clears the display.

Default settings at power on are:

- Insertion probe mode is active/on.
- Bluetooth/IR/RFID all inactive/off.
- Temperature setting is in Fahrenheit (ºF).
- Current battery charge level is shown.

Power On with USB Cable to Charge TMD 2.0

You can power the TMD 2.0 to charge as follows.

1. Connect the smaller end of the USB cable to the Micro USB port on the TMD 2.0.
2. Connect the USB into the device used for charging (Power Adapter, PDA or PC). The TMD 2.0 turns on.
    - The LCD Backlight and all LCD segments turn on for two (2) seconds.
    - The TMD 2.0 performs a self-check. If no errors are detected the device emits an audible beep and is ready for use.

      It displays an error code halting usage of the device if appropriate.
    - The LCD shows the current firmware revision for two (2) seconds, and then clears the display.
    - While device is charging the battery icon will flash and display current charge level.

Default settings on power on:

- Insertion probe mode is active/on.
- Bluetooth/IR/RFID all inactive/off.
- Temperature setting is in Fahrenheit (ºF).

Power Off

You can power off TMD 2.0 as follows.

1. Press and hold the Mode/Power button for approximately five (5) seconds.
   - ✦ The TMD 2.0 turns off.

IMPORTANT: When the TMD 2.0 is powered off, current temperature measurements on the display will be lost but all settings will be retained.

Standby Mode

This mode allows a TMD to conserve energy when not in use. It is a passive mode and is not selectable. The mode works as follows.

1. The TMD 2.0 enters Standby Mode after being inactive for 20 (twenty) seconds.
2. To exit Standby Mode, press any key or provide USB/Bluetooth input.
3. The TMD 2.0 transitions from Standby Mode to Sleep Mode <u>after</u> sixty (60) seconds of inactivity.

Sleep Mode

This mode "pauses" the state of the unit. When restored, the operation continues from a retained state. It is a passive mode and is not selectable. The mode works as follows.

1. The TMD 2.0 enters Sleep Mode after being inactive for sixty (60) seconds in Standby Model.
2. To exit Sleep Mode, press any key or provide USB/Bluetooth input.
3. The TMD 2.0 transitions from Sleep Mode to Power off <u>after</u> ten (10) minutes of inactivity. The TMD 2.0 will beep once fifteen (15) seconds before powering off.

Default Settings in Sleep Mode:

- ⚜ The screen is cleared with the exception of the Bluetooth status indicator, the Timer indicator if running and the battery status indicator.
- ⚜ Last measured value and TMD 2.0 state are retained.

IMPORTANT: When the TMD 2.0 transitions to Sleep Mode, all display data will be lost.

Default settings on Standby:

- ⚜ LCD Backlight turns off.
- ⚜ Last measured value and TMD 2.0 state are retained.

Measuring Temperatures with the Insertion Probe

The following outlines using the insertion probe. It assumes the TMD 2.0 is on and the probe is inserted into the item being measured.

A temperature probe verification and baseline adjustment process is provided in Appendix A (page 28).

⚠ **WARNING:** When a measured object is above 212F (100C), do not leave the temperature probe inserted for more than two (2) minutes. Remove the food from the heat source before attempting to perform a measurement.

Automatic Measurement

This measurement method samples temperatures and automatically holds the value once it is stable.

1. Press the ⬭—Mode/Power button until the ⬇ icon illuminates to indicate the Insertion Probe sensing mode.

2. The upper value display and lower value displays should have no value.

3. Press the ⊕—Measure button to start a measurement session. If any HACCP icons were illuminated from a prior measurement session, they are cleared.

4. A measurement session is started and SCAN flashes.

5. The current measurement value is shown in the top-most display 165.5°F. Refer to the example above.

6. The maximum and minimum values for all measurements thus far in this session are displayed in the range display 888.8 888.8 and the RANGE label is also illuminated.

7. Measurement samples continue until one of the following conditions occurs:

   ✦ _Stable_: 5 consecutive measurements are within 0.4F/0.2C of each other. Once a stable temperature is reached, HOLD is displayed, the alert indicator is lit and 2 short beeps are sounded.

   ✦ _Aborted_: User terminates measurement by pressing ⊕—Measure before a stable temperature is measured. When the measurement is aborted, a long and short beep are sounded and HOLD is displayed flashing.

   ✦ _Timed-Out_: The session times out after 40 seconds of measurements without a stable temperature. When the session is timed-out, a long and short beep are sounded and HOLD is displayed flashing.

⚠ **WARNING:** The temperature probe may be HOT following a measurement. Do not touch the probe until it cools down.

Manual Measurement

This measurement method continuously samples temperatures until the user ends the session.

1. Press the [Mode/Power] button until the ⬇ icon illuminates to indicate the Temperature Probe sensing mode.

2. The upper value display and lower value displays should be clear (no value).

3. Press and hold the [+ –Measure] button for 2 seconds and then release to start a manual measurement session. If any HACCP icons were illuminated from a prior measurement session, they are cleared.

4. A measurement session is started and SCAN illuminates (not flashing).

5. The current measurement value is shown in the top-most display 165.5°F°C.

6. The maximum and minimum values for all measurements thus far in this session are displayed in the range display 888.8 888.8 and the RANGE label is also illuminated.

7. Measurement samples continue until one of the following conditions occurs:

   ⊕ *Ended*: User terminates manual measurement by pressing [+ –Measure] before the session times out. Once terminated, a long and short beep sounds and HOLD is displayed flashing

   ⊕ *Timed-Out*: The session times out after 50 seconds of measurements. When the session is timed-out, a long and short beep are sounded and HOLD is displayed flashing

---

⚠ **WARNING:** The Temperature Probe may be HOT following a measurement. Do not touch the probe until it cools down.

Measuring Temperatures with the IR Sensor

The following outlines using the IR sensor. It assumes the TMD 2.0 is on.

⚠️ **WARNING:** When a measured object is above 150C (302F), keep the TMD 2.0 at least 5cm (2 inches) away from the measured object.

Automatic Measurement

This measurement method samples temperatures and automatically holds the value once it is stable.

1. Press the [⊙ — _Mode/Power_] button until the ☀ icon illuminates to indicate the IR sensing mode. (Refer to the example on the right.)

2. The upper value display and lower value displays should have no value.

3. Press the [➕ — _Measure_] button to start a measurement session. If any HACCP icons were illuminated from a prior measurement session, they are cleared.

4. A measurement session is started and **SCAN** flashes.

5. The IR targeting LED illuminates on the front of the TMD 2.0 to assist in aiming.

6. The current measurement value is shown in the top-most display 165.5°F°C.

   Refer to the example above.

7. The maximum and minimum values for all measurements thus far in this session are displayed in the range display [888.8 / 888.8] and the **RANGE** label is also illuminated.

8. Measurement samples continue until one of the following conditions occurs:

   ✦ _Stable_: 5 consecutive measurements are within 4F/0.2C of each other.

   ✦ _Aborted_: User terminates measurement by pressing [➕ — _Measure_] before a stable temperature is measured.

   ✦ _Timed-Out_: The session times out after 10 seconds of measurements without a stable temperature.

Manual Measurement

This measurement method continuously samples temperatures until the user ends the session.

1. Press the [Mode/Power] button until the ☀ icon illuminates to indicate the IR sensing mode. (Refer to the example on the right.)

2. The upper value display and lower value displays should have no value.

3. Press and hold the [+ —Measure] button for 2 seconds and then release to start a measurement session. If any HACCP icons were illuminated from a prior measurement session, they are cleared.

4. A measurement session is started and SCAN illuminates (not flashing).

5. The IR targeting LED illuminates on the front of the TMD 2.0 to assist in aiming.

6. The current measurement value is shown in the top-most display 165.5°F°C.

7. The maximum and minimum values for all measurements thus far in this session are displayed in the range display 888.8/888.8 and the RANGE label is also illuminated.

8. Measurement samples continue until one of the following conditions occurs:

   ⊕ *Ended*: User terminates measurement by pressing [+ —Measure] before the session times out.

   ⊕ *Timed-Out*: The session times out after 10 seconds of measurements without a stable temperature.

Measuring Temperatures with the RFID Sensor

The RFID sensor can scan RFID tags which do not return a temperature and ones that do. For non-temperature RFID tags, a unique identifier is returned to the TMD 2.0 and "rFID" is displayed on the screen. A temperature RFID tag returns the temperature to the TMD 2.0 and it is displayed on the screen.

The following outlines using the RFID sensor. It assumes the TMD is on.

1. Press the [Mode/Power] button until the ((•)) icon illuminates to indicate the RFID sensing mode.

2. The upper value display and lower value displays should have no value.

3. Press the [+ —Measure] button to start a scanning session. If any HACCP icons were illuminated from a prior measurement session, they are cleared.

4. A scanning session is started and SCAN flashes.

5. The TMD 2.0 searches for a suitable PAR approved RFID tag that has temperature sensing capability.

    The search continues until one of the following conditions occurs:

    ♦ *Suitable Tag Found*: A temperature-sensing tag has been found. Once a temperature is received by the TMD 2.0 the temperature is displayed, HOLD is displayed and 2 short beeps are sounded.

    A *non-temperature* sensing RFID tag has been found. Once the TMD 2.0 tag is found, "rFID" is displayed and 2 short beeps are sounded.

    ♦ *Aborted*: User terminates scanning for a tag by pressing [+ −Measure] before a suitable tag has been found and before the session times out. SCAN is cleared from the display and a long and short beep are sounded.

    ♦ *Timed-Out*: The session times out after 30 seconds of searching without a suitable tag being found. SCAN is cleared from the display and a long and short beep are sounded.

Bluetooth Usage

The TMD 2.0 features a Bluetooth status icon and button. Each is outlined below.

Bluetooth Status

The status of the TMD 2.0's Bluetooth radio can be viewed using the Bluetooth status icon.

Bluetooth status icon
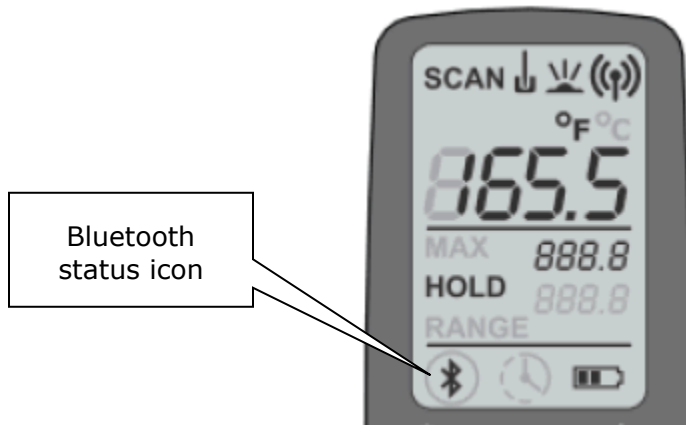
The Bluetooth icon indicates the radio's connectivity and power state as shown in the following table.

Icon	State	Description
(none)	Off	BT radio is off.
✳	On	BT radio is on, but not connected.
✳ (circled)	Connected	BT radio is on and connected, but not actively

			communicating.
✳ (blinking)	Pairing		BT radio is on and not connected and is available for pairing requests.
✳ (blinking ring)	Communicating		BT radio is on, connected and actively communicating.

Bluetooth Button

The Bluetooth radio's state is controlled using the Bluetooth (BT) button.
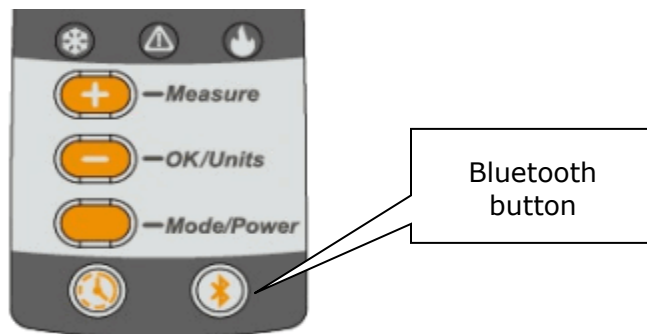
The Bluetooth radio's various states are controlled using the BT button as shown in the following table.

Current State	Action	Final State
Any except Off	Hold for 2 seconds	Off
Off	Hold for 2 seconds	On
Any except Pairing, Communicating	Hold for 5 seconds	Pairing
Pairing	Hold for 5 seconds	Prior state (aborts Pairing)

NOTES:

- If the BT radio is already connected and the user requests the Pairing mode, the current connection is broken in favor of finding a new connection.
- The TMD 2.0 automatically exits Pairing mode if no suitable connection is made within 60 seconds. It then reverts to the prior mode and is available to reconnect to the last-paired device.
- If the TMD 2.0 enters the Off power state, the state of the Bluetooth radio is retained (except for Pairing mode) and resumed once the TMD 2.0 enters any other power state.

Timer Usage

The Timer button supports two functions:

- ⚜ Stopwatch, count up from zero
- ⚜ Countdown Timer, counts down from a defined value.

If a timer (count down or count up) is in-progress, the 🕐 icon blinks. This applies to all timer and measurement modes.

When in the timer mode, the upper (large) display is not used and remains blank. The middle display is used to count minutes from 0-999 and the lower display is used to count seconds from 00 to 59. An example is provides below.

1. The middle display starts at 000 and the lower display starts at 00.

2. The lower display counts from 00 seconds to 59 seconds. Then it resets to 00 and the middle display increments to 1 to represent 1 minute.

3. The current time is read by combining the integer value in minutes from the middle display and the decimal value in seconds from the lower display.

   For example, 23 in the middle display and 34 in the lower display equal 23:34 or 23 minutes and 34 seconds.

4. The stopwatch function stops at 16 hours, 39 minutes and 59 seconds. Once the middle display reaches 999 minutes and the lower display reaches 59 seconds, the stopwatch function stops and remains at that value.

NOTES:

- ⚜ Either timer mode can be viewed or initiated when the TMD 2.0 is not actively measuring a temperature; when SCAN is not displayed.

- ⚜ If a timer is in-progress, a temperature measurement may be started and the timer will continue to run in the background. The blinking 🕐 icon indicates that a timer is still running in the background.

- ⚜ An in-progress timer is ended when the TMD 2.0 enters the Off power state, but can continue to run when in all other power states. The TMD 2.0 provides an audio alert before automatically entering the Off power state and thus canceling any active timer.

Stopwatch

The stopwatch function starts at zero and counts elapsed time in minutes and seconds until the user stops the function. The stopwatch is capable of counting elapsed time up to 16 hours, 39 minutes and 59 seconds.

1. Ensure the TMD 2.0 is on and not actively measuring a temperature.

2. Press 🕐. The timer icon 🕐 is displayed and all other display elements are cleared except for the Bluetooth 🛞 and battery status 🔋 icons which remain.

   - ✦ If a timer is currently in-progress (count up or countdown), its current value is shown while the timer icon 🕐 blinks. (Continue with step 3.)

   - ✦ If a timer is not currently in-progress, the display shows their initial values.

3. Press ⏱ to start the stopwatch.

4. The timer icon ⏱ blinks and the displays update. No units are shown.

   ✦ Press ⏱ to stop the timer. The timer icon ⏱ stops blinking. If the timer has been stopped, pressing ⏱ again resumes the timer.

   ✦ Hold ⏱ for 2 seconds to clear the timer, reset the displays and stop the timer icon ⏱ from blinking, if applicable.
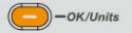
Countdown Timer

The countdown timer function starts at a user-specified value and counts down to zero. When the counter reaches zero (0), the timer stops and the TMD 2.0 beeps. The countdown timer is capable of being set in whole minute increments from 1-999; from 1 minute to 16 hours and 39 minutes.

1. Ensure the TMD 2.0 is on and not actively measuring a temperature.

2. Press ⏱. The timer icon ⏱ is displayed and all other display elements are cleared except for the Bluetooth ⏱ and battery status ▭ icons which remain.

   ✦ If a timer is currently in-progress (count up or countdown), its current value is shown while the timer icon ⏱ blinks. (Continue with step 4.)

   ✦ If a timer is not currently in-progress, the display shows their initial values.

3. Press ➕ or ➖ to set the middle display to the desired countdown start time in minutes from 1 to 999.

   ✦ If either ➕ or ➖ is held for more than 2 seconds, the middle display increments (or decrements) in five (5) minute increments until released.

   ✦ If ⏱ is held for 2 seconds, any set time is cleared.

4. Press ⏱ to start the count down from the set value.

5. The timer icon ⏱ blinks and the displays update. No units are shown.

   ✦ Press ⏱ to stop the current timer. The timer icon ⏱ stops blinking. If the timer has been stopped, pressing ⏱ again resumes the timer.

   ✦ Hold ⏱ for 2 seconds to clear the timer, reset the displays and stop the timer icon ⏱ from blinking, if applicable.

Additional TMD 2.0 Functions

TMD 2.0 Reboot

Pressing the [button] button for 5 seconds causes the TMD 2.0 to reboot.

TMD 2.0 Hardware Reset

Pressing the [button] and [button] buttons simultaneously for 8 seconds causes the TMD 2.0 to perform a hardware reset where certain selected parameters used in measuring temperatures are reset to their default values. When these 2 buttons have been pressed for 8 seconds, the parameters are reset "rSt" is displayed on the screen of the TMD 2.0.

The following is a list of the parameters that are reset and their default values:

Parameter	Default Value
Temperature Unit	Fahrenheit
Probe Scan Stable Temperature Range	0.2C/0.36F
Probe Scan Stable Measurements	5 Measurements
Probe Scan Auto Timeout	40 Seconds
Probe Scan Manual Timeout	50 Seconds
IR Scan Stable Temperature Range	0.2C/0.36F
IR Scan Stable Measurements	10 Seconds
IR Scan Manual Timeout	10 Seconds
IR Emissivity	95

Service and Maintenance

The following provides service and maintenance information. Contact PAR Parts for battery reorder information and the TMD 2.0 service process.

Cleaning the TMD 2.0 and Charging Cradle

The outside surfaces of the TMD 2.0 and its charging cradle unit can be wiped using a household product such as a multi-surface cleaner. The cleaning product CANNOT contain more than 70% isopropyl alcohol.

IMPORTANT: DO NOT submerge the outside surfaces of the TMD 2.0 or the TMD charging cradle in liquid.

MAC Address Location

The MAC address is located on the rating label (back side near lower pivot end).

TMD 2.0 Battery Removal and Installation

Battery removal and replacement is outlined below.

Battery Removal

1. Place the TMD 2.0 unit face up on a suitable surface to ensure you do not damage the unit.

2. Remove the "plug" (shown below).

Remove "plug"

3. Unscrew the cover retaining screw.

4. Remove the battery cover.

5. Carefully remove the battery from the base. You will need to lift the battery gently to remove it from the base.
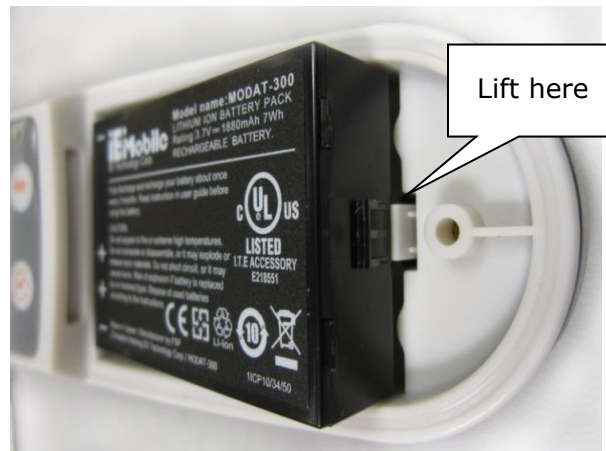
Lift here

IMPORTANT: Always dispose of battery packs according to federal, state, and local regulations. Contact a recycling agency in your area for recycling instructions and locations.

Battery Installation

A new battery requires an initial charging period of approximately 4 hours before being used.

1. The "ears" on the battery must be placed in front of the three tabs on each side of the base as shown below.

2. Place the battery in the base at an angle to ensure the label side of battery is facing up; make sure the ears on battery line up with the inside of the base (shown below).

3. Once you slide the battery in it will drop down into base. Press firmly to ensure it is in the base as shown below.

4. Place the battery cover of TMD 2.0 on the base and secure it with screw. Maximum torque of 2.0-2.5 kg-cm.

5. Replace the plug over the screw and push it down.

TMD 2.0 Charging Cradle Overview

There are three charging cradle kits available.

- ❧ K8935: TMD 2.0 Cradle Kit

- ❧ K8935A: TMD 2.0 Charging Cradle and power supply

- ❧ K8935A-01: International TMD 2.0 Charging Cradle and power supply

TMD 2.0 Charging Cradle Wall Mount Installation

The following provides instructions for wall mounting of the charging cradle.

Charging Cradle Bracket Installation

The following provides information to mount the wall bracket.

1. Locate the place where the charging cradle will reside.

F.Y.I. **HINT:** It is recommended you mount the bracket with the cable connections on the bottom.

---

2. Place the supplied template on the wall in the desired location. (A sample template is shown below.)
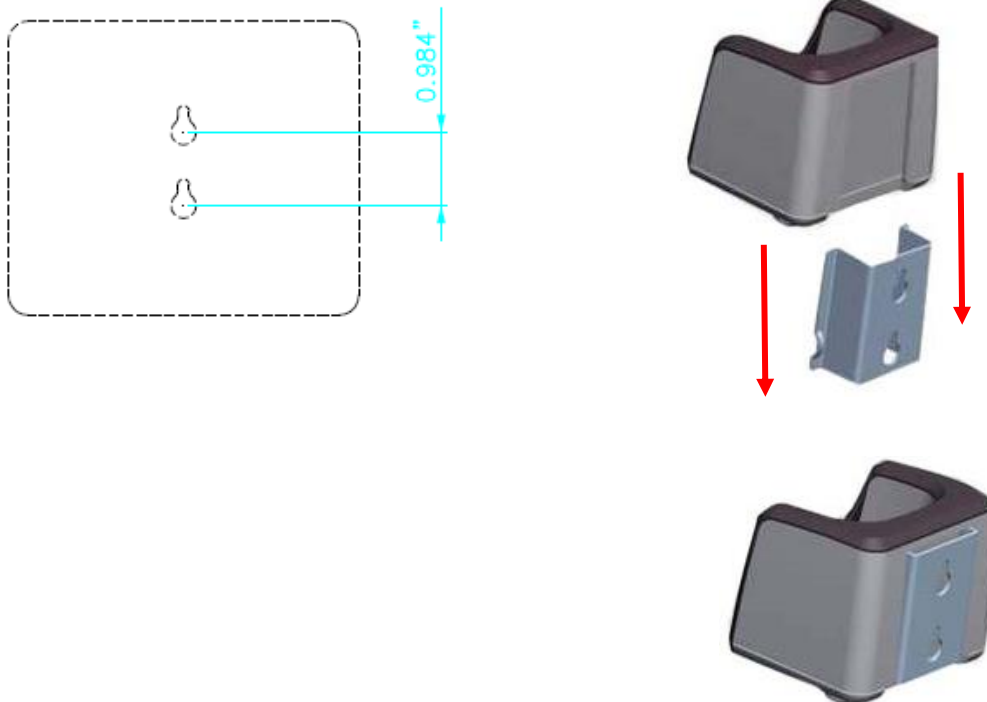
3. Mark the mounting holes at the plus sign (+) as shown above.

4. Drill holes as needed:

- If you are mounting on wood, drill holes for the screws.

- If you are mounting on drywall, drill holes to accept drywall anchors. A 3/16" drill bit is recommended for the plastic anchors.
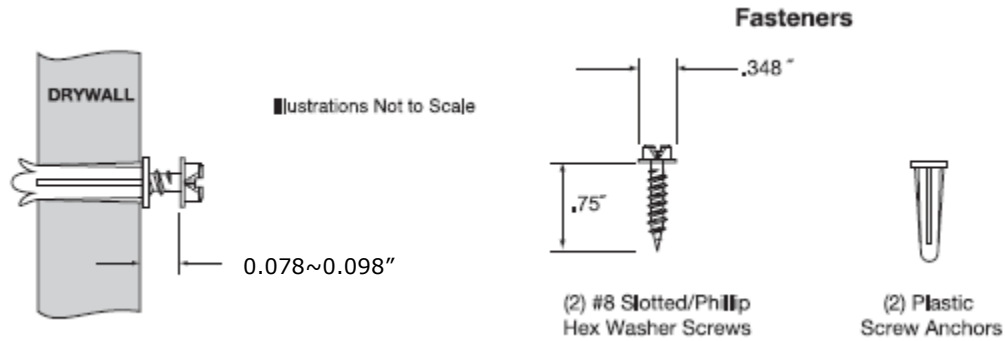
5. Use a Phillips screwdriver to insert screws into the wall. Make sure to that screws extend 0.2 inches from the wall.

6. Locate the charging cradle bracket over the screw heads, and then gently push down to lock the bracket onto the screws.

Charging Cradle Installation

The following assumes the charging cradle bracket is attached to wall.

1. Attach the micro USB end of cable to the charging cradle and bend wire down to allow for attachment to the bracket (as shown below).

2. Slide the cradle onto the wall mount bracket over the top of wire (as shown below).

3. Plug the AC/DC adapter into the USB type A cable as shown below. Two AC/DC adapters are provided and shown below.

4. Plug the AC/DC adapter into an outlet to verify the charging cradle is functioning. The charging cradle LEDs show as:

    ◈ Green indicates Standby
    ◈ Red indicates Charging

Replacement Parts

The table below shows replacement parts.

Replacement Part	PAR Part Number
TMD 2.0	M8936
TMD 2.0 Battery	980017901
TMD 2.0 Cradle Kit	K8935
TMD 2.0 charger & power supply	K8935A
TMD 2.0 International charger & power supply	K8935A-01

Troubleshooting with Cradle

- Not powering up
    - Verify that the battery is fully charged (takes at least 4 hours)
- Battery runs out of power in a short time (<2 Hours)
    - Verify that the battery is fully charged (takes at least 4 hours).
- No battery icon
    - Clean the battery terminals with a soft cloth
- Slow Charger
    - Clean the battery terminals with a soft cloth

TMD 2.0 Specifications

- Operating Temperature: 0ºC to 50ºC (32°F to 122°F)
- Storage Temperature: -40ºC to 60ºC (-40°F to 140°F)
- Input Voltage: 5V
- Input Current: 0.5A max.

Temperature Measuring Device (TMD 2.0) Dimensions

- Height: 182.5 mm (7.19 inches)
- Width: 51.0 mm (2.01 inches)
- Depth: 47.5 mm (1.87 inches)
- Weight: 196 grams (6.9 oz. without battery)

Thermo Couple Type T Based Insertion Probe

- Temperature range: -40°C to 300°C (-40°F to 572°F)
- Accuracy: -40°C to 300°C (-40°F to 572°F) = Measured Temp ± 0.5°C or 0.4%
- Probe: approximate 4" usable insertion depth. Folds back into hand grip for storage when not in use

Infrared Temperature Probe

- Temperature range: -40°C to 300°C (-40°F to 572°F)
- Accuracy:
    - 0°C to 65°C (32°F - 150°F) = Measured Temp ±1 °C (± 2 °F)
    - < 0°C (32°F) = Measured Temp ± 1°C (± 2°F) + 0.1 degree per degree
    - Formula:[=Measured Temp ± |(1°C or 2°F) +(Measured Temp * 0.1)|]
    - >65°C (150 °F) = Measured Temp ± (Measured Temp *1.5%)
- Optimal scanning distance: 2 inches or less
- IR sensor: detects surface temperatures and target beam visible on surfaces within approximately five (5) inches

RFID

- 13.56 MHz operating frequency
- 10 mm typical range for passive tags, 30 mm for self-energized tags
- Compliant to NFCIP-1 (ISP 18092) and NFCIP-2

Bluetooth Connectivity

- Ability to interface with outside devices via Bluetooth
- Supports Bluetooth low energy 4.0 capability

Micro USB Port

- Used for charging the battery pack. Micro USB charging cable required, PAR P/N 980017903

Power Options

- Lithium Ion Battery, requires initial charging of approximately 4 hours
- Rechargeable battery pack, PN980017903

LCD Screen

- Backlight: White LED

Platform and Driver Support

- Windows CE6
- Windows Mobile 6.1 and 6.5
- Windows Vista
- Windows 7

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

FCC Statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

1. This device may not cause harmful interferences, and

2. This device must accept any interference received, including interference that may cause undesired operation.

APPENDIX A: PROBE VERIFICATION & BASELINE ADJUSTMENT

Introduction

The TMD 2.0 probe is calibrated at the factory. Periodically, you may need to adjust the reported temperature with an offset from this factory setting.

In order to verify and adjust the offset of the probe we must use temperature reference points. These points are:

- ⚜ Freezing (32°F or 0°C) — freezing can be simulated by an ice bath method (ice point)
- ⚜ Boiling at sea level, (212°F or 100°C) — altitude affects the "boiling point" as shown in the table below. At sea level, water boils at 212°F, but at 5,000 feet above sea level it boils at only 202.4°F

Table A: Approximate Boiling Point of Water at Altitude

Feet	°F	°C	Feet	°F	°C
0	212.0	100.0	3000	206.2	96.8
250	211.5	99.7	3250	205.7	96.5
500	211.0	99.5	3500	205.3	96.3
750	210.5	99.2	3750	204.8	96.0
1000	210.1	98.9	4000	204.3	95.7
1250	209.6	98.6	4250	203.8	95.5
1500	209.1	98.4	4500	203.4	95.2
1750	208.6	98.1	4750	202.9	94.9
2000	208.1	97.8	5000	202.4	94.7
2250	207.6	97.6	10000	193.2	89.6
2500	207.2	97.3	15000	184.4	84.7
2750	206.7	97.1	20000	175.9	79.9

Offset Ranges

If the probe is outside the ranges below, you will not be able to adjust the baseline.

- ⚜ Freezing (Ice Bath)
    - ✦ Fahrenheit — 32°F is the expected temperature. ± 10 of the expected temperature is the allowed adjusted temperature range, which is (22°F to 42°F)
    - ✦ Celsius — 0°C is the expected temperature. ± 5.5 of the expected temperature is the allowed adjusted temperature range, which is (-5.5°C to 5.5°C)

- Boiling (the boiling point range covers from sea level to 20000 feet above sea level)
  - Fahrenheit — 212°F is the expected temperature. The allowed range is defined by taking +10 of the expected temperature and -10 of the boiling point at 20000 feet above sea level, which is 175.9°F. The allowed adjusted temperature range is (165.9°F - 222 °F)
  - Celsius — 100° C is the expected temperature. The allowed range is defined by taking +5.5 of the expected temperature and -5.5 of the boiling point at 20000 feet above sea level, which is 79.9°C. The allowed adjusted temperature range is (74.4°C – 105.5°C)

Verification & Offset Procedures

You must perform temperature preparation and temperature verification procedures prior to adjusting the baseline.

If the TMD does not pass a temperature verification you may have to:

- Send the TMD 2.0 in for repair or service, it may be damaged or needs to be reset to factory calibration
- Check the temperature reference point being used: ice water bath or boiling water (see page 28)

Verification Preparation

The following outlines basic temperature point preparation. You should use distilled water for both verifications.

Ice Point (Water Bath)

1. Fill an insulated container with crushed or chipped ice. The container should be at least 4 inches deep and 4 inches wide.
2. Add cold water slowly until it overflows and then add more ice until it is packed tightly, allowing excess to overflow. The water should be 1 inch below the top of the ice in the container.
3. Allow time for the mixture to come to 32°F or 0°C (about 3-5 minutes).
4. Insert the probe into the center of the container so that the sensing area is completely submerged. At least 2 inches of the probe should be submerged.
5. Make sure the probe is not on the bottom and sides of the container.

Boiling Point (Boiling Water Bath)

1. Fill a deep pan with water and bring to a boil. Boiling water at sea level is 212°F or 100°C. See Table A on page 28 different altitudes.
2. Insert the probe into the pan of boiling water so that the sensing area is completely submerged. At least 2 inches of the probe should be submerged.
3. Make sure the probe is not on the bottom and sides of the pan.

Temperature Verification

The following outlines temperature verification. You can use a separately calibrated "reference" thermometer immersed in the identical temperature reference point to verify your reading as needed.

It is recommended that you:

- Perform both verifications for the probe
- Use distilled water for both verifications

Ice Point Verification

You must have your "ice point" preparation ready (see page 29).

1. Set the mode on the TMD to "Probe."
2. Immerse the probe into the ice water bath.
3. Press "Measure" and wait for a stabilized temperature.
4. Verify that the temperature as expected:
    - Fahrenheit — 32°F is the expected temperature. ± 10 of the expected temperature is the allowed adjusted temperature range, which is (22°F to 42°F)
    - Celsius — 0°C is the expected temperature. ± 5.5 of the expected temperature is the allowed adjusted temperature range, which is (-5.5°C to 5.5°C)
5. If the probe is outside the offset ranges), you will not be able to adjust the baseline. See "outside of ranges information" below.

Boiling Point Verification

You must have your "boiling point" preparation ready (see page 29).

1. Set the mode on the TMD to "Probe."
2. Immerse the probe into the boiling water.
3. Press "Measure" and wait for a stabilized temperature.
4. Verify that the temperature is the "altitude adjusted" temperature (the boiling point range covers from sea level to 20000 feet above sea level) as expected:
    - Fahrenheit — 212°F is the expected temperature. The allowed range is defined by taking +10 of the expected temperature and -10 of the boiling point at 20000 feet above sea level, which is 175.9°F. The allowed adjusted temperature range is (165.9°F - 222 °F)
    - Celsius — 100° C is the expected temperature. The allowed range is defined by taking +5.5 of the expected temperature and -5.5 of the boiling point at 20000 feet above sea level, which is 79.9°C. The allowed adjusted temperature range is (74.4°C – 105.5°C)
5. If the probe is outside the offset ranges, you will not be able to adjust the baseline. See "outside of ranges information" below.

Outside of Ranges Information

If the probe is outside the offset ranges, you should consider if:

- ⚜ Using a separately calibrated "reference" thermometer immersed in the identical temperature reference point to verify your reading

- ⚜ If there is visible damage to the device or the device has been dropped. The TMD would need to be sent in for repair and/or factory calibration reset

- ⚜ If the TMD is consistently out of range from the cold and hot temperature ranges. The device will need to be sent back for factory calibration reset

- ⚜ If the TMD is ± 10 for Fahrenheit or ±5 for Celsius for the temperature reference points. The device needs to be sent back for factory calibration reset

Temperature Offset Adjustment

You can use the adjustments outlined below as needed.

Expected Freezing Temperature Acceptance

You must have your "ice point" preparation ready (see page 29). The following shows a Fahrenheit adjustment example, but could be done in Celsius.

1. Set the mode on the TMD to "Probe."

2. Immerse the probe into the ice water bath.

3. Press "Measure" and wait for a stabilized temperature. For example, the display shows 34°F.

   NOTE: If two out of three measurements are in range of +/- 2°F or 1.1°C, no adjustment is needed. If two or more measurements are not in range an adjustment is needed.

4. Remove the probe from the ice water bath.

5. Simultaneously press and hold the "+/Measure" and "-/OK/Units" buttons for 4 seconds to enter "Adjustment" mode.

   - ✛ The TMD validates that the measured temperature is within the acceptable range to allow adjustments. In our example, the measured temperature of 34°F is between the acceptable adjustment range of 22°F – 42°F

6. The TMD blinks the expected temperature in the main display (32°F), and then emits two short beeps (1 second each) to signify the start of adjustment mode.

7. In our example, you can press and hold the "−" button until 32°F shows. The adjusted temperature decrements by 1 with <u>every second</u> you hold the button. Note that if you press and hold the "+" button you increment the temperature.

   - ✛ You could also tap the "+" button, which increments the temperature by 0.1 with each tap

   - ✛ If needed you could use the "−" button, decrements the temperature by 0.1 with each tap

8. Press the "Mode" button, <u>within</u> 30 seconds. The TMD stores the displayed temperature. It displays "good" on the main display, "LO" on the top lower display, "set" on the lower most display and emits one short beep (1 second).

9. You need to wait two 2 seconds for the TMD to return to "Ready" state.

Expected Boiling Temperature Acceptance/Adjustment

Prior to performing the following, you'll need to use Table A (page 28) to find your approximate water boiling point. In our example we are at 500 feet, so boiling is at 211°F.

You must have your "boiling point" preparation ready (see page 29). The following shows a Fahrenheit adjustment example, but could be done in Celsius.

1. Set the mode on the TMD to "Probe."

2. Immerse the probe into the boiling water.

3. Press "Measure" and wait for a stabilized temperature. For example, the display shows 210°F.

   NOTE: If two out of three measurements are in range of +/- 2°F or 1.1°C, no adjustment is needed. If two or more measurements are not in range an adjustment is needed.

4. Remove the probe from the boiling water.

5. Simultaneously press and hold the "+/Measure" and "-/OK/Units" buttons for 4 seconds to enter "Adjustment" mode.

   ✛ The TMD validates that the measured temperature is within the acceptable range to allow adjustments. In our example, the measured temperature of 210°F is between the acceptable adjustment range of 165.9°F – 222°F

6. The TMD blinks the expected temperature in the main display (212°F) and emits two short beeps (1 second each) to signify the start of adjustment mode.

7. In our example, you can press and hold the "+" button until 211°F shows because at 500 feet above sea level the boiling point is 211°F. The adjusted temperature increments by 1 with <u>every second</u> you hold the button. Note that if you press and hold the "−" button you decrement the temperature.

   ✛ You could also tap the "+" button, which increments the temperature by 0.1 with each tap

   ✛ If needed you could use the "−" button, decrements the temperature by 0.1 with each tap

8. Press the "Mode" button, <u>within</u> 30 seconds. The TMD stores the displayed temperature. It now display "good" on the main display, "high" on the top lower display, "set" on the lower most display and emit one short beep (1 second)

9. You need to wait two 2 seconds for the TMD to return to "Ready" state.

TMD Display Messages

You may see the following messages on a TMD: good high set, good LO set, bAd high set or bAd LO set. Their meaning and placement of the messages are:

✤ good or bAd — shows on the main display. A "Good" is for a successful stored adjustment. A "bAd" is where a bad state is reached

✤ high or LO — shows on top lower display. A "high" shows that the good or bad adjustment was for the high temperature range (boiling/hot). A "LO" shows that the good or adjustment was for the low temperature range (freezing/cold)

PAR Phone Numbers

For Service
      USA: 800.382.6200
      Canada: 905.264.4700

For Parts
      USA: 800.PAR.PART
      Canada: 905.264.4700

For Sales
      Continental USA except New York: 800.448.6505
      Outside Continental USA: 315.738.0600