Module No. 2030

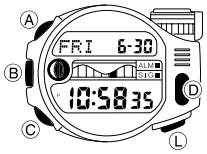
GETTING ACQUAINTED

Congratulations upon your selection of this CASIO watch. To get the most out of your purchase, be sure to read this manual carefully and keep it on hand for later reference when necessary.

Warning!

- The measurement functions built into this watch are not intended for taking measurements that require professional or industrial precision. Values produced by this watch should be considered as reasonable representations only.
- The longitude, lunitidal interval, Moon phase indicator, and tide graph data that appears on the display of this watch is not intended for navigation purposes. Always use proper instruments and resources to obtain data for navigation purposes.
- This watch is not an instrument for calculating low tide and high tide times. The Tide Graph of this watch is intended to provide a reasonable approximation of tidal movements only.
- CASIO COMPUTER CO., LTD. assumes no responsibility for any loss, or any claims by third parties that may arise through the use of this watch.

About This Manual

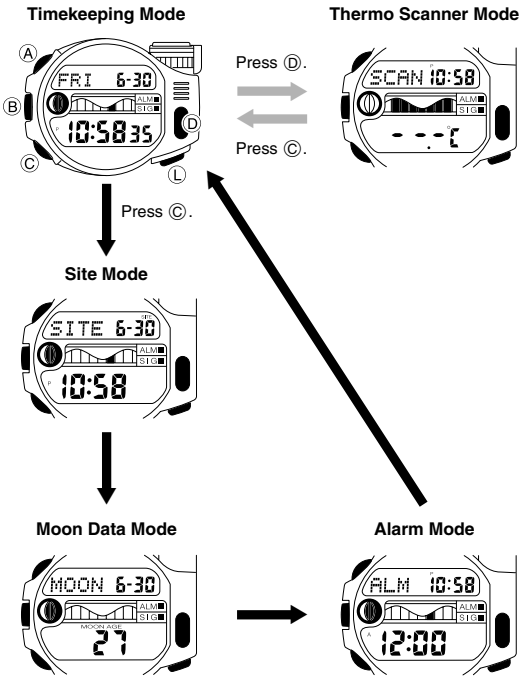


(Light)

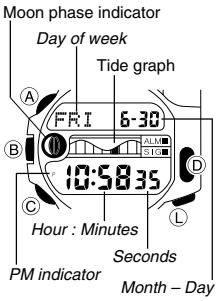
- Button operations are indicated using the letters shown in the illustration.
- Each section of this manual provides you with the information you need to perform operations in each mode. Further details and technical information can be found in the “REFERENCE” section.

GENERAL GUIDE

- Press Ⓒ to change from mode to mode.
- Pressing Ⓓ in the Timekeeping Mode directly enters the Thermo Scanner Mode.
- In any mode, press Ⓛ to illuminate the display.



TIMEKEEPING MODE



In addition to normal timekeeping, use the Timekeeping Mode to set the current time and date.

- The Moon phase indicator shows the current Moon phase for the currently selected time zone, in accordance with the current data as kept in the Timekeeping Mode.
- The tide graph shows tidal movements for the current date in accordance with the current time as kept in the Timekeeping Mode.

Important!

The watch cannot produce correct Moon phase or tide graph data unless the Timekeeping Mode current time and date settings, as well as the GMT differential, longitude, and lunitidal interval settings are all be correct.

Resetting the Seconds Count to Zero

1. In the Timekeeping Mode, hold down Ⓐ until the seconds digits start to flash, which indicates the setting screen.
2. Press Ⓓ to reset the seconds count to 00.

- Pressing Ⓓ while the seconds count is in the range of 30 to 59 resets the seconds to 00 and add 1 to the minutes. In the range of 00 to 29, the minutes count is unchanged.

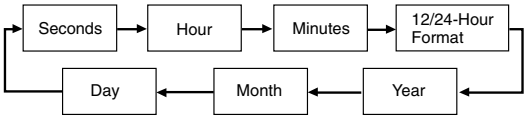
3. Press Ⓐ three times to exit the setting screen.

Setting the Time and Date

1. In the Timekeeping Mode, hold down Ⓐ until the seconds digits start to flash, which indicates the setting screen.

- While the seconds digits are flashing, press Ⓓ to reset the seconds count to 00.

2. Press Ⓒ to move the flashing in the sequence shown below to select other settings.



3. While the hour, minutes, year, month, or day setting is flashing, use Ⓓ (+) and Ⓑ (–) to change it.

- When the 12/24-hour setting is flashing, press Ⓓ to toggle between 12-hour (12H) and 24-hour (24H) timekeeping.

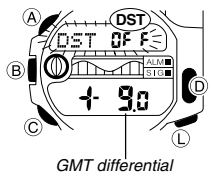
4. Press Ⓐ three times to exit the setting screen and return to the current time screen.

- The day of the week is automatically displayed in accordance with the date (year, month, and day) settings.
- The year can be set in the range of 1995 to 2039.
- The watch’s built-in full automatic calendar automatically makes allowances for different month lengths and leap years. Once you set the date, there should be no reason to change it except after you have the watch’s battery replaced.

Setting the Daylight Saving Time and GMT differential

- Daylight Saving Time (DST) automatically advances the time setting by one hour from Standard Time. Whether you should use Daylight Saving Time depends on the geographic area where you are currently located.
- GMT differential is the difference between the time in the displayed time and Greenwich Mean Time (GMT).

To set the Daylight Saving Time and GMT differential



1. In the Timekeeping Mode, hold down Ⓐ until the seconds digits start to flash, which indicates the setting screen.
2. Press Ⓐ again to move the flashing to the DST On/Off setting.
3. Press Ⓓ to toggle the Daylight Saving Time (On) and standard time (OFF).
4. Press Ⓒ to move the flashing to the GMT differential setting, and then use Ⓓ (+) and Ⓑ (–) to change it.

- Each press of Ⓒ moves the flashing between the DST On/Off setting and the GMT differential setting.
- The “CITY DATA LIST” provides GMT differential information for a number of time zones, cities and longitudes around the world.

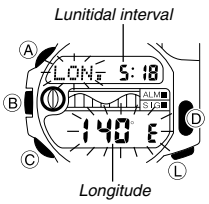
5. Press Ⓐ twice to exit the setting screen and return to the current time screen.

- The **DST** indicator appears on the display to indicate that daylight saving time is turned on.

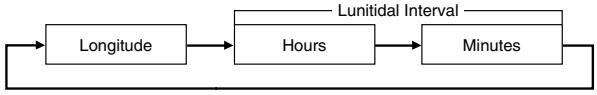
Setting the Longitude and Lunitidal Interval

- The lunitidal interval is the time elapsing between the Moon's transit over the meridian and the next high tide. See "Lunitidal Interval" for more information.
- This watch displays lunitidal intervals in terms of hours and minutes.

To set the longitude and lunitidal interval



1. In the Timekeeping Mode, hold down Ⓐ until the seconds digits start to flash, which indicates the setting screen.
2. Press Ⓐ twice to move the flashing to the Longitude setting.
3. Press Ⓒ to move the flashing in the sequence shown below to select other settings.



4. While the longitude, or lunitidal interval hours or minutes setting is flashing, use Ⓓ (+) and Ⓑ (–) to change it.

- The "CITY DATA LIST" provides GMT differential information for a number of time zones, cities and longitudes around the world.
- Longitude can be specified in the range of 179°W to 180°E, in 1-degree steps.

5. Press Ⓐ to exit the setting screen and return to the current time screen.

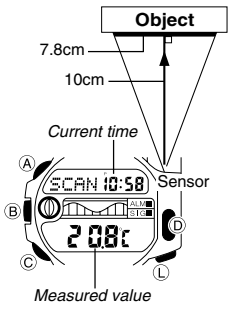
THERMO SCANNER MODE

The Thermo Scanner Mode uses a sensor built into the watch to measure the surface temperature of an object with the touch of a button.

Warning!

- **The Thermo Scanner of this watch is not a precision measurement. Its readings should be regarded as reasonably accurate values only.**
- **Getting too close to a very hot object creates the risk of burn injury, even if you do not actually touch the object. Make sure you do not get too close to hot objects when performing Thermo Scanner measurements.**
- **Do not rely on Thermo Scanner readings to determine whether or not a very hot or very cold object is safe to touch.**
- **Do not use the Thermo Scanner as a clinical thermometer.**
- **The temperature reading produced by the Thermo Scanner indicates only the surface temperature, and not the actual temperature of an object.**

Using the Thermo Scanner



1. As shown in the illustration, point the sensor of the watch at the object whose surface temperature you want to measure.
2. Enter the Thermo Scanner Mode, and then press Ⓓ to start temperature measurement.

- Pressing Ⓓ in the Timekeeping Mode directly enters the Thermo Scanner Mode and immediately starts temperature measurement.

Note

- The area measured by the Thermo Scanner is roughly equivalent to a circle whose diameter can be approximated by the formula: d (diameter) = D × 0.78.
  The value of "D" is the distance in centimeters between the object and the sensor.

- For the example shown in the illustration, the diameter of the area measured is approximately 7.8cm (10 × 0.78).
- You can change the measured temperature value displayed by this watch between Celsius (°C) and Fahrenheit (°F). See "To change the temperature units".

How the Thermo Scanner Measures Temperature

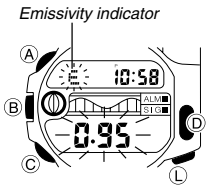
The Thermo Scanner doesn't actually measure temperature directly. Instead, it calculates the temperature of an object after detecting how much infrared radiation is being emitted by the object. All objects emit infrared radiation in accordance with their temperature, their constituent material, and their surface properties. The intensity of radiation that an object emits (due to the material it is made out of and its surface properties) is called its *emissivity*. The Thermo Scanner of this watch calculates temperatures based on the amount of infrared radiation detected and preset emissivity values.

- Setting the correct emissivity value for the object whose temperature you are measuring helps to ensure results that are more accurate.
- The initial factory default emissivity setting is 0.95, because this is the most common emissivity for object we encounter in daily life.
- "Thermo Scanner Mode" provides important precautions and other supplementary information about taking measurements with the Thermo Scanner.

Checking the Current Emissivity Setting

In the Thermo Scanner Mode, hold down Ⓑ to display the current emissivity setting.

Changing the Emissivity Setting

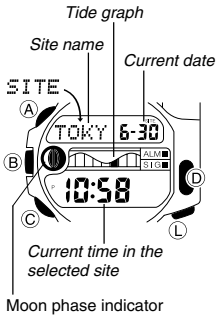


1. In the Thermo Scanner Mode, hold down Ⓐ until the emissivity value starts to flash, which indicates the setting screen.
2. Use Ⓓ (+) and Ⓑ (–) to change the setting.

- You can set a value in the range of 0.10 to 1.20 in steps of 0.05.
- Pressing Ⓑ and Ⓓ at the same time resets the emissivity value to its initial default setting of 0.95.

3. Press Ⓐ to exit the setting screen.

SITE MODE



You can use the Site Mode to view the current time, Moon phase, and tide graph for any one of 10 different sites.

- The watch comes pre-programmed with site data (site name, GMT differential, longitude, and lunitidal interval) for famous fishing sites around the world. You can use this site data as it is or change it to suit your needs.
- See "Moon Phase Indicator" and "Tide Graph" for more information about these display items.
- See "PRE-PROGRAMMED SITE DATA" for more information about the pre-programmed data.
- When you enter the Site Mode, the site that was displayed when you last exited the mode appears first.

Viewing Site Data

In the Site Mode, press Ⓓ to scroll forward through site data and Ⓑ to scroll in reverse.

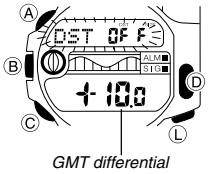
- If the site name is longer than four characters, the display alternates between the first four characters and the remaining characters.
- The site named HOME is your Home Site, which is the one used for your Timekeeping Mode settings.

Changing Site Data

Site data consists of the site name, DST (Daylight Saving Time) setting, GMT differential, longitude, and lunitidal interval of the site. Changing site data causes its time to be set automatically in accordance with the GMT differential.

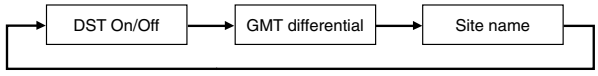
- You cannot change the site data of your HOME site.
- Having the watch battery replaced causes all sites to revert to their initial factory defaults. If you want to use your own site data, you must re-input it each time you have the battery replaced.

To change site data



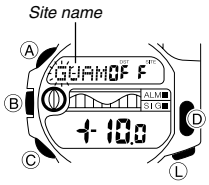
1. In the Site Mode, use Ⓑ and Ⓓ to display the name of the site whose data you want to change.
2. Hold down Ⓐ until the DST On/Off setting starts to flash, which indicates the setting screen.

- Pressing Ⓒ moves the flashing between the settings in the sequence shown below.

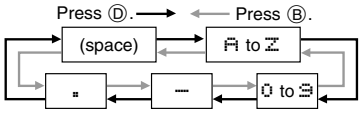


3. Use Ⓒ to move the flashing to the DST On/Off setting.
4. Press Ⓓ to toggle Daylight Saving Time on (On) and off (OFF).
5. Press Ⓒ to move the flashing to the GMT differential setting, and then use Ⓓ (+) and Ⓑ (–) to change it.

- The "CITY DATA LIST" provides GMT differential information for a number of time zones, cities and longitudes around the world.

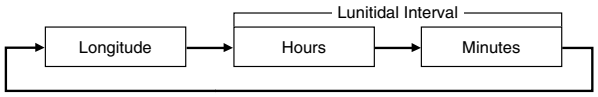


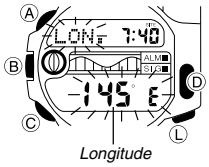
6. Press Ⓒ to move the flashing to the first character of the site name.
7. Input the site name you want.
- Use Ⓓ and Ⓑ to cycle through characters at the current input position in the sequence shown below.



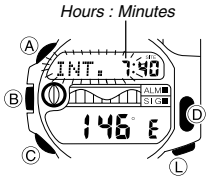
- When the character you want is shown, press Ⓒ to move the flashing to the right and input the next character.
- To delete a character, input a space.
- You can input up to eight characters. Inputting eight characters causes the flashing to return to the DST On/Off setting. If your site name has fewer than eight characters, you must press Ⓒ to skip past all the unused spaces in order to move the flashing to the DST On/Off setting.

8. After the DST On/Off, GMT differential, and site name settings are the way you want, press Ⓐ and the longitude setting starts to flash on the display.
- Pressing Ⓒ moves the flashing between the settings in the sequence shown below.





9. While the longitude setting is flashing, use Ⓓ (+) and Ⓑ (–) to change it.
- Longitude can be specified in the range of 179°W to 180°E, in 1-degree steps.



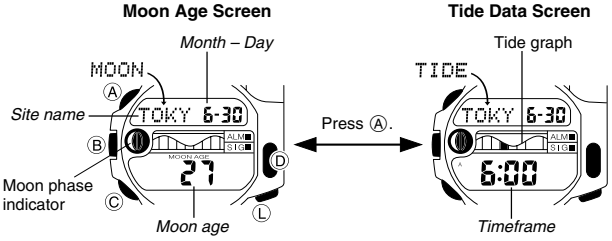
10. Press Ⓒ to move the flashing to the lunitidal interval hours setting, and then use Ⓓ (+) and Ⓑ (–) to change it.
11. Press Ⓒ to move the flashing to the lunitidal interval minutes setting, and then use Ⓓ (+) and Ⓑ (–) to change it.
12. After everything is the way you want, press Ⓐ to exit the setting screen.

MOON DATA MODE

The Moon Data Mode lets you view the Moon age on any date and tide data during a particular timeframe for the site currently selected in the Site Mode.

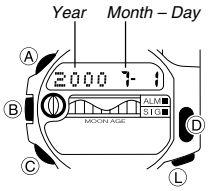
Displaying Moon Data

The Moon Data Mode has two screens: a Moon Age Screen and a Tide Data Screen. Press Ⓐ to toggle between the two screens.



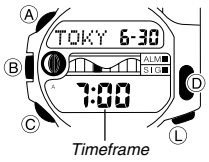
- The data that appears on the screen in the Moon Data Mode is for the site that is currently selected in the Site Mode. This means you have to enter the Site Mode, select the site whose data you want to view, and then enter the Moon Data Mode to view it.
- If the site name is longer than four characters, the display alternates between the first four characters and the remaining characters.

Viewing the Moon Age for a Particular Date



1. In the Moon Data Mode, press Ⓐ to display the Moon Age Screen.
- The initial default date for the Moon Age Screen when you enter the Moon Data Mode is the current date as kept in the Timekeeping Mode.
2. Use Ⓓ (+) and Ⓑ (–) to change the date setting.
- You can select any date from 1995 to 2039.
- The Moon age appears a few seconds after you select a date.

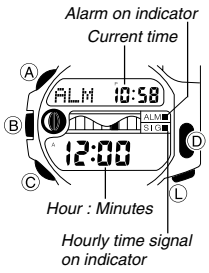
Viewing Tide Data during a Particular Timeframe



1. In the Moon Data Mode, press Ⓐ to display the Moon Age Screen.
2. Set the date whose tide data you want to view.
- The initial default date for the Moon Age Screen when you enter the Moon Data Mode is the current date as kept in the Timekeeping Mode.
- Use Ⓓ (+) and Ⓑ (–) to change the date setting.
- You can select any date from 1995 to 2039.

3. Press Ⓐ to switch to the Tide Data Screen.
4. Set the timeframe for which you want to display tide data.
- Use Ⓓ (+) and Ⓑ (–) to change the time setting in one-hour steps.
- The tide data appears in the tide graph.

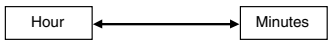
ALARM MODE



You can set a Daily Alarm that sounds at the same time each day, while it is turned on. You can also turn on an Hourly Time Signal that causes the watch to beep twice every hour on the hour.

Setting the Alarm Time

1. In the Alarm Mode, hold down Ⓐ until the hour digits of the alarm time start to flash, which indicates the setting screen.
- This operation automatically turns on the Daily Alarm.
2. Press Ⓒ to move the flashing in the sequence shown below to select other settings.



3. While the hour or minutes setting is flashing, use Ⓓ (+) and Ⓑ (–) to change it.
- When setting the alarm time using the 12-hour format, take care to set the time correctly as am (**A** indicator) or pm (**P** indicator).
4. Press Ⓐ to exit the setting screen.

Daily Alarm Operation

The alarm sounds at the preset time each day for about 20 seconds, or until you stop it by pressing any button.

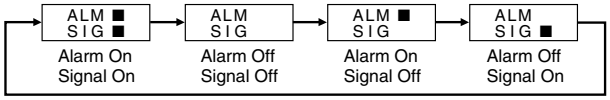
To test the alarm

In the Alarm Mode, hold down Ⓓ to sound the alarm.

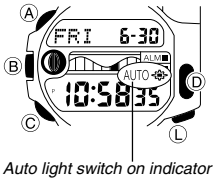
Turning the Daily Alarm and Hourly Time Signal on and off

In the Alarm Mode, press Ⓑ to cycle through the on and off settings as shown below.

[Alarm ON Indicator / Hourly Time Signal ON Indicator]



BACKLIGHT



Auto light switch on indicator

The backlight uses an EL (electro-luminescent) panel that causes the entire display to glow for easy reading in the dark. The watch's auto light switch automatically turns on the backlight when you angle the watch towards your face.

- The auto light switch must be turned on (indicated by the auto light switch on indicator) for it to operate.
- See "Backlight Precautions" for other important information about using the backlight.

Turning on the Backlight Manually

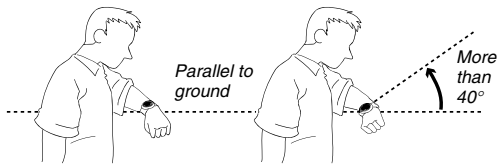
In any mode, press Ⓛ to illuminate the display for about two seconds.

- The above operation turns on the backlight regardless of the current auto light switch setting.

About the Auto Light Switch

Turning on the auto light switch causes the backlight to turn on for about two seconds, whenever you position your wrist as described below in any mode.

Moving the watch to a position that is parallel to the ground and then tilting it towards you more than 40 degrees causes the backlight to light.



Warning!

- **Never try to read your watch when mountain climbing or hiking in areas that are dark or in areas with poor footing. Doing so is dangerous and can result in serious personal injury.**
- **Never try to read your watch when running where there is danger of accidents, especially in locations where there might be vehicular or pedestrian traffic. Doing so is dangerous and can result in serious personal injury.**
- **Never try to read your watch when riding on a bicycle or when operating a motorcycle or any other motor vehicle. Doing so is dangerous and can result in a traffic accident and serious personal injury.**
- **When you are wearing the watch, make sure that its auto light switch is turned off before riding on a bicycle or operating a motorcycle or any other motor vehicle. Sudden and unintended operation of the auto light switch can create a distraction, which can result in a traffic accident and serious personal injury.**

To turn the auto light switch on and off

In the Timekeeping Mode, hold down Ⓑ for two seconds to turn the auto light switch on (AUTO displayed) and off (AUTO not displayed).

- The auto light switch on indicator (AUTO) is on the display in all modes while the auto light switch is turned on.

REFERENCE

This section contains more detailed and technical information about watch operation. It also contains important precautions and notes about the various features and functions of this watch.

Moon Phase Indicator

The Moon phase indicator of this watch indicates the current phase of the Moon as shown below.

Graph								
Moon Age	0, 1, 29	2–5	6–9	10–13	14–16	17–20	21–24	25–28
Moon Phase	New Moon		First Quarter (Waxing)		Full Moon		Last Quarter (Waning)	

- The light part of the Moon phase indicator shows the part of the Moon that is visible in the sky during each particular phase.
- The Moon phase indicator shows the Moon as viewed at noon from a position in the Northern Hemisphere looking south. Note that at times the image shown by the Moon phase indicator may differ from that of the actual Moon in your area.
- The left-right orientation of the Moon phase is reversed when viewing from the Southern Hemisphere or from a point near the equator.
- The Moon phase indicator displayed in the Timekeeping Mode and Alarm Mode is based on Timekeeping Mode (home site) data. The indicator displayed in the Site Mode and Moon Data Mode is based on data for the site that is currently selected in the Site Mode. There is no Moon phase indicator in the Thermo Scanner Mode.

Moon Phases and Moon Age

The Moon goes through a regular 29.53-day cycle during which it appears to wax and wane due to how the Sun illuminates the Moon and the relative positioning of the Earth, Moon, and Sun. The greater the angular distance between the Moon and the Sun,* the more we see illuminated.

* *The angle to the Moon in relation to the direction at which the Sun is visible from the Earth.*

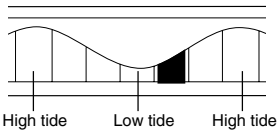
The Moon age indicates the number of days from the New Moon to any particular phase. It is normally calculated using either noon or midnight as a reference point. This watch calculates the Moon age based on the angular distance of the Moon at noon, which can result in an error of ±1 day. Because of this, the appearance of the Moon phase indicator may be different from that of the actual Moon.

The watch uses the following formula to calculate Moon age.

Moon Age (days) = 29.53 × (Moon angular distance / 360°)

Tide Graph

The black bar on the watch's tide graph indicates the current tide.



- The tide graph displayed in the Timekeeping Mode and Alarm Mode is based on Timekeeping Mode (home site) data. The graph displayed in the Site Mode and Moon Data Mode is based on data for the site that is currently selected in the Site Mode. There is no tide graph in the Thermo Scanner Mode.

Tidal Movements

Tides are the periodic rise and fall of the water of oceans, seas, bays, and other bodies of water caused mainly by the gravitational interactions between the Earth, Moon and Sun. Tides rise and fall about every six hours. The tide graph of this watch indicates tidal movement based on the Moon's transit over the meridian and the lunitidal interval. The lunitidal interval differs according to your current location, so you must specify a lunitidal interval in order to obtain the correct tide graph readings.

Lunitidal Interval

Theoretically, high tide is at the Moon's transit over the meridian and low tide is about six hours later. Actual high tide occurs somewhat later, due to factors such as viscosity, friction, and underwater topography. Both the time differential between the Moon's transit over the meridian until high tide and the time differential between the Moon's transit over the meridian until low tide are known as the "lunitidal interval." When setting the lunitidal interval for this watch, use the time differential between the Moon's transit over the meridian until *high* tide.

Auto Return Features

- If you leave a screen with flashing digits or a cursor on the display for two or three minutes without performing any operation, the watch automatically saves anything you have input up to that point and exits the setting screen.
- If you leave the watch in any mode for about three minutes without performing any operation, it automatically changes to the Timekeeping Mode.

Data and Setting Scrolling

The Ⓑ and Ⓓ buttons are used in various modes and screens to scroll through data on the display. In most cases, holding down these buttons during a scroll operation scrolls through the data at high speed.

12-hour/24-hour Timekeeping Formats

The 12-hour/24-hour timekeeping format you select in the Timekeeping Mode is also applied in all modes.

- With the 12-hour format, the **P** (PM) indicator appears to the left of the hour digits for times in the range of noon to 11:59 p.m. and the **A** (AM) indicator appears to the left of the hour digits for times in the range of midnight to 11:59 a.m.
- With the 24-hour format, times are indicated in the range of 0:00 to 23:59, without any indicator.

Site Mode

- The current time in all Site Mode sites is calculated in accordance with the Greenwich Mean Time (GMT) differential for each site, based on the current time setting in the Timekeeping Mode.
- GMT differential is calculated by this watch based on Universal Time Coordinated (UTC) data.

Backlight Precautions

- The electro-luminescent panel loses illuminating power after very long use.
- The illumination provided by the backlight may be hard to see when viewed under direct sunlight.
- The watch will emit an audible sound whenever the display is illuminated. It does not indicate malfunction of the watch.
- The backlight automatically turns off whenever an alarm sounds.

Auto light switch precautions

- Avoid wearing the watch on the inside of your wrist. Doing so causes the auto light switch to operate when it is not needed, which shortens battery life. If you want to wear the watch on the inside of your wrist, turn off the auto light switch feature.

More than 15 degrees too above

- The backlight may not light if the face of the watch is more than 15 degrees above or below parallel. Make sure that the back of your hand is parallel to the ground.
- The backlight turns off in about two seconds, even if you keep the watch pointed towards your face.

- Static electricity or magnetic force can interfere with proper operation of the auto light switch. If the backlight does not light, try moving the watch back to the starting position (parallel with the ground) and then tilt it back toward you again. If this does not work, drop your arm all the way down so it hangs at your side, and then bring it back up again.
- Under certain conditions the backlight may not light until about one second after you turn the face of the watch towards you. This does not necessarily indicate malfunction of the backlight.
- In order to protect against running down the battery, the auto light switch is automatically turned off approximately six hours after you turn it on.

Thermo Scanner Mode

Measurement Precautions

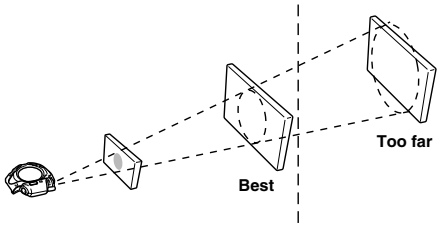
- The temperature reading produced by the Thermo Scanner indicates only the surface temperature and not the actual temperature of the object. Measuring the temperature of your hand, for example, displays the temperature of your skin surface, not your body temperature. Note that surface temperature is affected by surrounding temperature and other factors.
- Accurate measurements are not possible for the following types of objects.

Type of Object	Description
Metal objects, objects coated with shiny paint (gold, silver, etc.) and other objects with low emissivity	• Such objects reflect surrounding infrared radiation. • Measurements are possible for dull painted metal and dark metal with no visible shininess.
Flame	• Temperatures are too high • Some infrared radiation may also be picked up from background objects.
Air or gas	• The Thermo Scanner can pick up infrared radiation from solids and liquids only.

- Take care to keep the sensor lens free of dirt, dust, chemicals, and other foreign matter. A dirty or damaged lens makes accurate measurement impossible.
- Leaving the watch in a closed automobile under direct sunlight or otherwise subjecting it to high temperatures can cause the sensor to overheat, which makes accurate measurement impossible.
- Fluctuation of the temperature of the watch itself (due to taking the watch outdoors on a cold day, etc.) can cause unstable sensor temperature, making accurate measurement impossible.
- Avoid keeping the watch too close for long periods to objects that continuously generate high heat (like a hot plate), which can cause overheating of the watch.
- Any of the following causes the measurement operation to be cancelled: changing to another mode, sounding of an alarm or hourly time signal, turning on the backlight, display of the emissivity value, changing the emissivity value setting, measurement error.

Measurement Range

The area measured by the Thermo Scanner increases the further you are from the object. Make sure you are close enough to the object so the area measured remains within the surface area of the object.
Also, remember that the temperature value displayed by the watch is the average temperature for the entire area measured.



Diameter of the area measured can be approximated by the formula:
d (diameter) = Distance × 0.78 (cm)

Distance	Diameter of Area Measured	Distance	Diameter of Area Measured
10	7.8	50	39.0
20	15.6	80	62.4
30	23.4	100	78.0

Measurement Range: –20 to 200°C / –4 to 392°F
Measurement Units: 0.1°C (10.1 to 39.9°C) / 0.2°F (50.2 to 103.8°F)
1°C (–20 to 10°C and 40 to 200°C)
1°F (–4 to 50°F and 104 to 392°F)
Measurement Time: Approximately 3 seconds

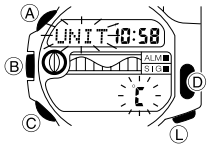
Emissivity

The intensity of infrared radiation that an object emits (due to the material it is made out of and its surface properties) is called its *emissivity*. Fixed emissivity values have been established for a number of objects. Emissivity is expressed as a value that represents the ratio of the radiation intensity of a real body to the radiation intensity of a blackbody*, which is 1.
* blackbody: A total absorber that absorbs all the energy that falls upon it.
Generally speaking, the emissivity of human skin, wood, and paper is high, while that of aluminum, and other metals is low. Metals whose surfaces are oxidized (non-lustrous finish) tend to have high emissivity, while polished (lustrous) surfaces tend to have low emissivity.

Note

- Low emissivity objects (especially those with a lustrous, metallic finish) tend to reflect infrared radiation emitted by surrounding objects, and so accurate temperature readings are impossible.
- For more accurate Thermo Scanner readings from a particular type of object, measure the temperature of the object using another measurement device you know to be accurate, and then use the Thermo Scanner to take a reading of the object. Next, adjust the emissivity value until the reading produced by the Thermo Scanner is the same as the other instrument.
- The "EMISSIVITY VALUES" provides emissivity values for a number of different objects. Note that these values are for reference purposes only. Other factors can also affect emissivity.

To change the temperature units



1. In the Thermo Scanner Mode, hold down Ⓐ until the emissivity value start to flash, which indicates the setting screen.
2. Press Ⓒ to move the flashing to the unit setting (°C or °F).
3. Press Ⓓ toggle between the two settings.
4. Press Ⓐ to exit the setting screen.

Troubleshooting

ERR. Messages

The following shows the error messages that can appear and what you need to do to correct the situation.

Error Message	Meaning	Cause	What to do
ERR. NO. 1	Overheat error	Watch temperature is outside the range of –20°C to 60°C (–4°F to 140°F).	Keep watch out or direct sunlight and other areas where it is exposed to temperature extremes.
ERR. NO. 2	Out of range error	Measured temperature is outside the range of –20°C to 200°C (–4°F to 392°F).	Perform measurements only on objects whose temperatures are within the allowable range.
ERR. NO. 3	Abnormal temperature error	Sudden rise or fall of watch temperature.	Wait for about 10 minutes to allow watch temperature to stabilize.
ERR. NO. 4	Sensitivity error	Sensor sensitivity could not be calibrated correctly.	Cancel the measurement (press Ⓒ to return to the Timekeeping Mode) and try again.
ERR. NO. 5	Battery error	Battery power is low	Contact your CASIO Service Center to have the battery replaced.
		Watch temperature is too cold	The error should clear when the watch returns to normal temperature. Try measuring again after the watch returns to normal temperature.

Thermo Scanner Measured Value Problems

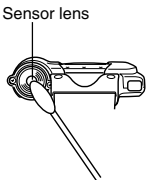
Problem	Possible Cause	What to do
Measured value is considerably higher or lower than the actual temperature of the object.	Wrong emissivity value setting	Set the emissivity value that matches the object.
	Dirty sensor lens	Rinse the lens with cold or warm water and then wipe off all remaining moisture with a cotton swab.
	Scratched sensor lens	Contact your CASIO Service Center.
	Damaged sensor	
Large differences between temperatures or the same temperature value for various objects	Sensor malfunction	Contact your CASIO Service Center.

Flashing E (Emissivity) Indicator during a Thermo Sensor Measurement

Check the current setting and change it if necessary. If the setting is correct, you can perform measurements even though E is flashing on the display.

Cleaning the Sensor Lens

A clean sensor lens helps to ensure more accurate temperature readings.



To clean the lens

Rinse the lens with cold or warm water and then wipe off all remaining moisture with a cotton swab, taking care not to scratch the lens.

The lens may be dirty, even though you cannot see any dirt or dust on it. Because of this, you should make it a habit to clean the lens periodically.

Important!

- Acids (including fruit juices, etc.) can permanently damage the lens and make accurate measurements impossible. Should any acidic matter get onto the lens, rinse it off immediately.
- Accurate measurements are impossible whenever there is condensation, water droplets, snow, or any other moisture on the lens. Before measurements, wipe off all moisture with a cotton swab, taking care not to scratch the lens.
- Avoid scratches by keeping scissors, needles, and other pointed objects away from the lens.

PRE-PROGRAMMED SITE DATA

Site Name	Location	Longitude	GMT Differential	Lunitidal Interval
TOKYO	Tokyo	140°E	+9.0	5:20
PALAU	Palau	134°E	+9.0	7:30
GUAM	Guam	145°E	+10.0	7:40
GBR	Great Barrier Reef, Cairns	146°E	+10.0	9:40
CHRISTMS	Christmas Island	157°W	+14.0	4:00
HAWAII	Kona, Hawaii	156°W	–10.0	4:00
BAJA CA	Baja, California	110°W	–7.0	8:40
BAHAMAS	Bahamas	77°W	–5.0	7:30
MAURITIS	Mauritius	57°E	+4.0	0:50
MALDIVES	Maldives	74°E	+5.0	0:10

Based on data as of August 1999.

CITY DATA LIST

City	GMT Differential	Longitude	Lunitidal Interval
ANCHORAGE	–9.0	150°W	5:40
BANGKOK	+7.0	100°E	4:40
BOSTON	–5.0	71°W	11:20
BUENOS AIRES	–3.0	58°W	6:00
CASABLANCA	+0.0	8°W	1:30
DAKAR	+0.0	17°W	7:40
HAMBURG	+1.0	10°E	4:50
HONG KONG	+8.0	114E	9:10
HONOLULU	–10.0	158°W	3:40
JAKARTA	+7.0	107°E	0:00
JEDDAH	+3.0	39°E	6:30
KARACHI	+5.0	67°E	10:10
LIMA	–5.0	77°W	5:20
LISBON	+0.0	9°W	2:00
LONDON	+0.0	0°E	1:10
LOS ANGELES	–8.0	118°W	9:20
MANILA	+8.0	121°E	10:30
MELBOURNE	+10.0	145°E	2:10
MIAMI	–5.0	80°W	7:30
NOUMEA	+11.0	166°E	8:30
PAGO PAGO	–11.0	171°W	6:40
PANAMA CITY	–5.0	80°W	3:00
PAPEETE	–10.0	150°W	0:10
RIO DE JANEIRO	–3.0	43°W	3:10
SEATTLE	–8.0	122°W	4:20
SHANGHAI	+8.0	121°E	1:20
SINGAPORE	+8.0	104°E	10:20
SYDNEY	+10.0	151°E	8:40
VANCOUVER	–8.0	123°W	5:10
WELLINGTON	+12.0	175°E	4:50

• Based on data as of January 2000.

EMISSIVITY VALUES