USER'S GUIDE 2471

CASIO

Getting Acquainted

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

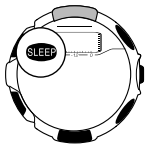
Expose the watch to bright light to charge its battery before using it.
You can use this watch even as its battery is being charged by exposure to bright light.
- **Be sure to read "Battery" of this manual for important information you need to know when exposing the watch to bright light.**

Applications

The built-in sensors of this watch measure direction, altitude, barometric pressure, and temperature. Measured values are then shown on the display. Such features make this watch useful when hiking, mountain climbing, or when engaging in other such outdoor activities.

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.
- When engaging in mountain climbing or other activities in which losing your way can create a dangerous or life-threatening situation, always be sure to use a second compass to confirm direction readings.
- 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.

If the display of the watch is blank...



If the **SLEEP** indicator is on the display (either flashing or steady), it means that the display is blank because the watch's Power Saving function has shut it to conserve power. Power Saving automatically turns off the display and puts the watch into a sleep state whenever your watch is left in an area where it is dark for a certain period.

- The initial factory default setting is Power Saving on.
- The watch recovers from the sleep state if you move it to a well-lit area★, if you press any button, or if you angle the watch towards your face for reading.
  ★*It can take up to five seconds for the display to turn on.*
- **See "Power Saving Function" for more information.**

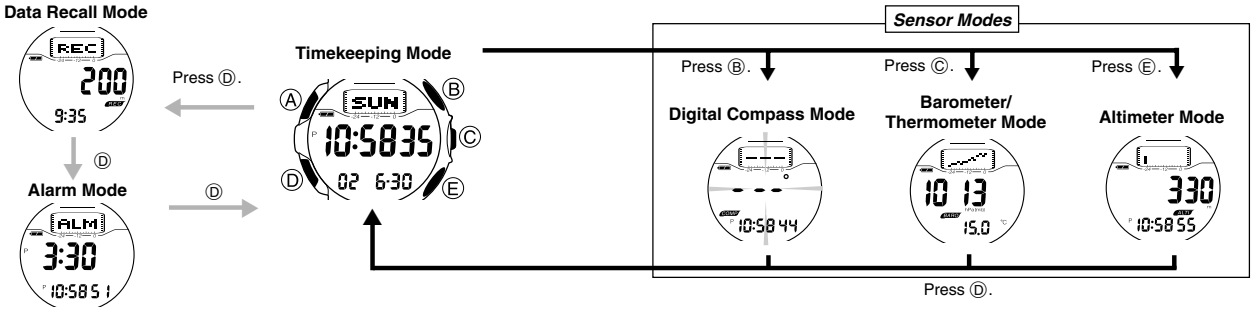
About This Manual

(Light)

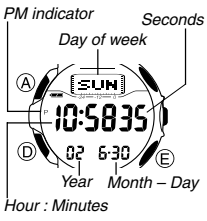
- Button operations are indicated using the letters shown in the illustration.
- Each section of this manual provides you with the information you need to perform operations in each mode. Further details and technical information can be found in the "Reference" section.

General Guide

- The illustration below shows which buttons you need to press to navigate between modes.
- You can use buttons Ⓑ, Ⓒ, and Ⓔ to directly enter a sensor mode from the Timekeeping Mode or from another sensor mode. To get to a sensor mode from the Data Recall or Alarm Mode, you must go to the Timekeeping Mode first.



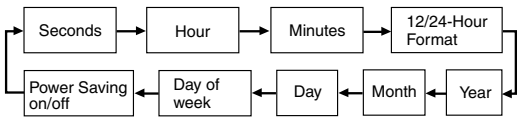
Timekeeping



Use the Timekeeping Mode to set and view the current time and date.

To set the time and date

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



3. When the setting you want to change is flashing, use Ⓔ to change it as described below.

Setting	Screen	Button Operations
Seconds	10:58 35	Press Ⓔ to reset the seconds to 00.
Hour, Minutes		Use Ⓔ (+) to change the setting.
12/24-Hour format	12H	Use Ⓔ to toggle between 12-hour (**12H**) and 24-hour (**24H**) timekeeping.
Year, Month, Day	02 6:30	Use Ⓔ (+) to change the setting.
Day of week	SUN	Use Ⓔ (+) to change the setting.
Power Saving on/off	On	Press Ⓔ to toggle the Power Saving on (**On**) and off (**OFF**).

4. Press Ⓐ to exit the setting screen.

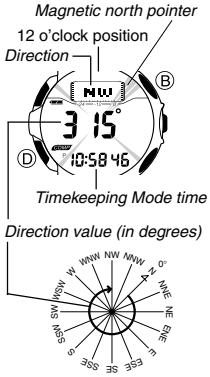
Digital Compass

A built-in bearing sensor detects magnetic north and indicates one of 16 directions on the display. Direction readings are performed in the Digital Compass Mode.
- You can calibrate the bearing sensor if you suspect the direction reading is incorrect.

To enter and exit the Digital Compass Mode

1. While in the Timekeeping, Barometer/Thermometer, or Altimeter Mode, press Ⓑ to enter the Digital Compass Mode.
   - At this time, the watch immediately starts a Digital Compass operation. After about two seconds, letters appear on the display to indicate the direction that the 12 o'clock position of the watch is pointing.
2. Press Ⓓ to return to the Timekeeping Mode.

To take a direction reading



1. Enter the Digital Compass Mode.
2. Place the watch on a flat surface or (if you are wearing the watch), make sure that your wrist is horizontal (in relation to the horizon).
3. Point the 12 o'clock position of the watch in the direction you want to measure.
4. Press Ⓑ to start a Digital Compass measurement operation.
   - After about two seconds, the direction that the 12 o'clock position of the watch is pointing appears on the display.
   - Also, four pointers appear to indicate magnetic north, south, east, and west.
   - After the first reading is obtained, the watch continues to take direction readings automatically each second, for up to 20 seconds.

- The **COMP** indicator flashes on the display while a measurement is in progress.
- The direction value that appears on the display represents the clockwise angle formed between magnetic north (which is 0 degrees) and the displayed direction.

Note
- Note that taking a measurement while the watch is not horizontal (in relation to the horizon) can result in large measurement error.
- The margin of error for the direction value is ±11 degrees. If the indicated direction is northwest (**NW**) and 315 degrees, for example, the actual direction can be anywhere from 304 to 326 degrees.
- Digital Compass operation is automatically interrupted whenever an alarm (Daily Alarm or Hourly Time Signal) sounds. If this happens, start the Digital Compass operation again from the beginning.
- The following table shows the meanings of each of the direction abbreviations that appear on the display.

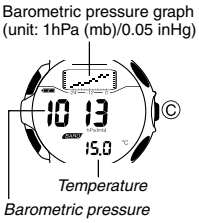
Direction	Meaning	Direction	Meaning	Direction	Meaning	Direction	Meaning
N	North	**NNE**	North-northeast	**NE**	Northeast	**ENE**	East-northeast
E	East	**ESE**	East-southeast	**SE**	Southeast	**SSE**	South-southeast
S	South	**SSW**	South-southwest	**SW**	Southwest	**WSW**	West-southwest
W	West	**WNW**	West-northwest	**NW**	Northwest	**NNW**	North-northwest

- See "Digital Compass Precautions" for other important information about taking direction readings.

Barometer/Thermometer

This watch uses a pressure sensor to measure air pressure (barometric pressure) and a temperature sensor to measure temperature.
- You can calibrate the temperature sensor and the pressure sensor if you suspect that readings are incorrect.

To take Barometric Pressure and Temperature Readings



Pressing Ⓒ in the Timekeeping Mode or in any of the other sensor modes enters the Barometer/Thermometer Mode. The watch automatically starts barometric pressure and temperature measurement, and displays the results.
- Barometric pressure is displayed in units of 1hPa/mb (or 0.05 inHg).
- Temperature is displayed in units of 0.1°C (or 0.2°F).

- The displayed barometric pressure value changes to - - - - hPa/mb (or inHg) if a measured barometric pressure falls outside the range of 260 hPa/mb to 1100 hPa/mb (7.65 inHg to 32.45 inHg). The barometric pressure value will be displayed again as soon as the measured barometric pressure is within the allowable range.
- The displayed temperature value changes to - -. - °C (or °F) if a measured temperature falls outside the range of –10.0°C to 60.0°C (14.0°F to 140.0°F). The temperature value will be displayed again as soon as the measured temperature is within the allowable range.
- Some countries refer to the barometric pressure unit hecto-pascal (hPa) as millibars (mb). It really makes no difference, because 1hPa = 1mb. In this manual, we use hPa/mb or hPa (mb).
- See "About Barometric and Temperature Measurements" for important precautions.

Barometric Pressure Graph
Barometric pressure indicates changes in the atmosphere. By monitoring these changes you can predict the weather with reasonable accuracy. The barometric pressure graph shows the barometric readings for the past 26 hours. The flashing point on the right of the display is the point for the newest measurement. Note that pressure graph readings are relative to the newest measurement point. One dot above the newest point is plus 1hPa(mb)/0.05 inHg, while one dot below is minus 1hPa(mb)/0.05 inHg. The following shows how to interpret the data that appears on the barometric pressure graph.


A rising graph generally means improving weather.


A falling graph generally means deteriorating weather.

Note that if there are sudden changes in weather or temperature, the graph line of past measurements may run off the top or bottom of the display. The entire graph will become visible once barometric conditions stabilize.


Not visible on the display.

The following conditions cause the barometric pressure measurement to be skipped, with the corresponding point on the barometric pressure graph being left blank.
- Barometric reading that is out of range (260 hPa/mb to 1,100 hPa/mb or 7.65 inHg to 32.45 inHg)
- Sensor malfunction
- Dead batteries

About Barometric and Temperature Measurements
- Barometric pressure and temperature measurement operations are performed as soon as you enter the Barometer/Thermometer Mode. After that, barometric pressure and temperature measurements are taken every five seconds for the first three minutes.
- The **BARO** indicator flashes on the display while a measurement is in progress.
- The barometer automatically takes measurements every two hours (starting from midnight), regardless of what mode you are in. The results of these measurements are used for the barometric pressure graph.
- You can also perform a barometric pressure and temperature measurement at any time by pressing Ⓒ in the Barometer/Thermometer Mode.

Barometer and Thermometer Precautions
- The pressure sensor built into this watch measures changes in air pressure, which you can then apply to your own weather predictions. It is not intended for use as a precision instrument in official weather prediction or reporting applications.
- Sudden temperature changes can affect pressure sensor readings.
- Temperature measurements are affected by your body temperature (while you are wearing the watch), direct sunlight, and moisture. To achieve a more accurate temperature measurement, remove the watch from your wrist, place it in a well ventilated location out of direct sunlight, and wipe off all moisture from the case. It takes approximately 20 to 30 minutes for the case of the watch to reach the actual surrounding temperature.
- You can change the measured barometric pressure unit between hecto-pascals/millibars (hPa/mb) and inchesHg (inHg). See "Changing the Barometric Pressure and Temperature Units" for details.
- You can change the measured temperature value displayed by this watch between Celsius (°C) and Fahrenheit (°F). See "Changing the Barometric Pressure and Temperature Units".

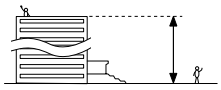
Altimeter

A built-in altimeter uses a pressure sensor to detect the current air pressure, which is then used to estimate the current altitude. The watch is pre-programmed with ISA (International Standard Atmosphere) preset values, which are used to convert air pressure readings to altitude values. If you preset a reference altitude, the watch will also calculate the current relative altitude based on your preset value. Altimeter functions also include data storage memory and an altitude alarm.

Important!
- This watch estimates altitude based on air pressure. This means that altitude readings for the same location may vary if air pressure changes.
- This watch employs a semiconductor pressure sensor, which is affected by temperature changes. When taking altitude measurements, be sure to do so while ensuring that the watch is not exposed to temperature changes.
- To avoid the effect of sudden temperature changes on measurement, wear the watch so it is in direct contact with your wrist during measurement.
- Do not rely upon this watch for altitude measurements or perform button operations while engaging in sports where there are sudden altitude changes, while sky diving, hang gliding, or paragliding, or while riding a gyrocopter, glider, or any other aircraft.
- Do not use this watch for measuring altitude in applications that demand professional or industrial level precision.
- Remember that the air inside of a commercial aircraft is pressurized. Because of this, the readings produced by this watch will not match the altitude readings announced or indicated the flight crew.

How the Altimeter Works
With the Preset Values (No Reference Altitude)
- The watch measures the air pressure at your current location and uses the built-in ISA values to convert it to the equivalent altitude.

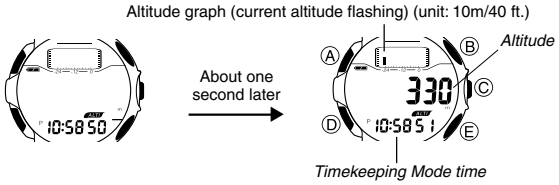
With a Reference Altitude



- If you set a reference altitude, the watch uses that value when calculating altitude based on air pressure.
- To determine the height of a tall building, set the reference altitude to 0 on the ground floor. Note, however, that you may not be able to get a good reading if the building is pressurized or air-conditioned.
- When mountain climbing, you can set the reference value in accordance with a marker along the way or altitude information from a map. After you do this, the altitude readings produced by the watch will be more accurate than they would without a reference altitude.

To take an altitude reading

Pressing Ⓔ in the Timekeeping Mode or in any of the other sensor modes enters the Altimeter Mode. The watch automatically starts altitude measurement, and displays the results.



- See "About Altitude Measurements" for important information.
- Altitude is displayed in units of 5 meters (20 feet).
- The measurement range for altitude is –700 to 10,000 meters (–2,300 to 32,800 feet).
- The measured altitude may be a negative value in cases where there is a reference altitude value set or because of certain atmospheric conditions.
- The displayed altitude value changes to - - - - - meters (or feet) if a measured altitude falls outside the measurement range. The altitude value will be displayed again as soon as the measured altitude is within the allowable range.
- You can change the unit of measurement for the displayed altitude values between meters (m) and feet (ft). See "To change the Altitude Units".

About Altitude Measurements

There are two types of altitude measurements: those for displayed data (Altimeter Mode measurements) and those for memory data (Memory measurements).

Altimeter Mode measurement

You can perform Altimeter Mode measurements in the Altimeter Mode only, and an altimeter measurement operation starts whenever you enter the Altimeter Mode.

During the first three minutes after entering the Altimeter Mode, **ALTI** flashes on the display and measurements are taken every five seconds. After that, the interval between measurements depends on whether you are using the Short Mode (1-minute intervals) or the Long Mode (2-minute intervals).

- Long Mode is the default setting. See "Memory measurement" for information about the Short Mode and Long Mode.
- If you do not perform any operation while in the Altimeter Mode, the watch automatically returns to the Timekeeping Mode after four or five hours in the Short Mode, or after nine or 10 hours in the Long Mode.

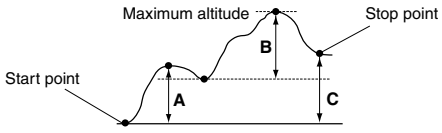
Memory measurement

The memory measurement operation stores the following data in watch memory. Note that each time you perform a memory measurement operation, it creates a new set of records, replacing the set of records currently in memory. Memory measurement continues to be performed (indicated by the **REC** indicator flashing on the display) even if you change to another mode.

Measurement start time, date, and altitude: 1 record
Automatic altitude readings and time, at fixed interval: Up to 39 records
Measurement end time, date, and altitude: 1 record

The watch also calculates the following values using measured data and maintains one record for each in memory.

Relative altitude (altitude difference between start point and current altitude or measurement end altitude)
Measurement time
Maximum altitude (highest measured altitude in memory)
*Total ascent (total of ascents (**A** + **B**))*
Cumulative total ascent (total of all measured altitude values in memory)



- Starting a new measurement automatically clears relative altitude, measurement time, maximum altitude, and total ascent values currently in memory.
- Starting a new measurement does not clear cumulative total ascent. This value continues to increase until it reaches 99,995 meters (327,983 feet). After that, it reverts to 0 and starts again.
- The interval between memory measurements depends on whether the Short Mode or the Long Mode is selected.
  Short Mode: 5-minute interval
  Long Mode: 15-minute interval
- Relative altitude, cumulative total ascent, and maximum altitude data is calculated at regular intervals, depending on the Long Mode/Short Mode setting. In both modes, calculations are performed every five seconds for the first three minutes. After that, calculations are performed every minute in the Short Mode and every two minutes in the Long Mode.

To select the Short Mode or Long Mode

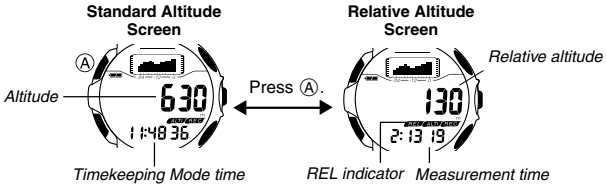
1. In the Altimeter Mode, hold down Ⓐ until the display clears. After four or five seconds, either OFF or the current reference altitude value (if set) starts to flash, which indicates the setting screen.
   - OFF indicates no reference altitude.
   - Note that you will not be able to change the Short/Long Mode setting if a memory measurement operation is in progress.
2. Press Ⓓ twice.
   - This causes either **0:05** (Short Mode) or **0:15** (Long Mode) to appear, which indicates the current mode setting.
3. Each press of Ⓔ toggles between the Short Mode and Long Mode.
4. Press Ⓐ to exit the setting screen.

To perform memory measurement

Hold down Ⓔ for about one second until **REC** flashes, which indicates that memory measurement has started.

- Memory measurement stops automatically after there are 41 records accumulated in memory. When you want to stop a memory measurement operation manually, hold down Ⓔ for about one second until **REC** disappears.

- While a memory measurement operation is in progress, press Ⓐ to toggle between the Standard Altitude screen and the Relative Altitude screen.



Note

- **REC** flashes on the display while a memory measurement operation is in progress.
- Starting the memory measurement operation deletes any altimeter data (except for cumulative total ascent data) currently in memory (and its graph) and replaces it with the new data. Note that you cannot delete memory contents manually.
- You can recall data in memory using the Data Recall Mode.

Setting a Reference Altitude

After you set a reference altitude, the watch adjusts its air-pressure-to-altitude conversion calculation accordingly. The altitude measurements produced by this watch are subject to error caused by changes in air pressure. Because of this, we recommend that you update the reference altitude whenever one is available during your climb.

To set a reference altitude

1. In the Altimeter Mode, hold down Ⓐ until the display clears. After four or five seconds, either OFF or the current reference altitude value (if set) starts to flash, which indicates the setting screen.
2. Press Ⓔ (+) or Ⓑ (–) to change the current reference altitude value by 5 meters (or 20 feet).
   - You can set the reference altitude within the range of –10,000 to 10,000 meters (–32,800 to 32,800 feet).

- Pressing Ⓔ and Ⓑ at the same time returns to OFF (no reference altitude), so the watch performs air pressure to altitude conversions based on preset data only.

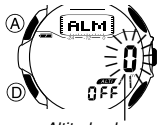
3. Press Ⓐ to exit the setting screen.

About the Altitude Alarm

The altitude alarm sounds for about five seconds when the current altitude matches a preset value during an altitude measurement operation. You can press any button to stop the alarm after it starts to sound.
The altitude alarm sounds only while the Altimeter Mode's Altitude Screen is on the display. It does not sound while the watch is in another mode or while another Altimeter Mode screen is on the display.

Example
If you set the altitude alarm at 130 meters, it sounds when you pass the 130-meter mark on your way up and on your way back down.

To set the altitude alarm



Altitude alarm value

1. In the Altimeter Mode, hold down Ⓐ until the display clears. After four or five seconds, either OFF or the current reference altitude value (if set) starts to flash, which indicates the setting screen.
2. Press Ⓓ once to move the flashing to the altitude alarm setting.
   - Press Ⓓ to move the flashing in the sequence shown below.

Altitude Alarm → Long/Short Mode Setting → Altitude Unit → Reference Altitude

3. Press Ⓔ (+) or Ⓑ (–) to change the current altitude alarm value by 5 meters (or 20 feet).
   - You can set the altitude alarm value within the range of –10,000 to 10,000 meters (–32,800 to 32,800 feet).

- Pressing Ⓔ and Ⓑ at the same time resets the altitude alarm value to 0.

4. Press Ⓐ to exit the setting screen.

To turn the altitude alarm on and off

Altitude alarm on indicator

Current On/Off status

1. In the Altimeter Mode, hold down Ⓐ until the display clears. After four or five seconds, either OFF or the current reference altitude value (if set) starts to flash, which indicates the setting screen.
2. Press Ⓓ once to move the flashing to the altitude alarm setting.
3. Press Ⓒ to toggle the altitude alarm on (ON) and off (OFF).
4. Press Ⓐ to exit the setting screen.

- An altitude alarm on indicator appears on the Altimeter Mode's Altitude Screen while the altitude alarm is turned on. This indicator does not appear on any other screen or in any other mode.

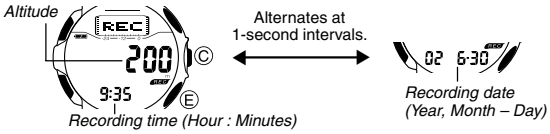
Data Recall

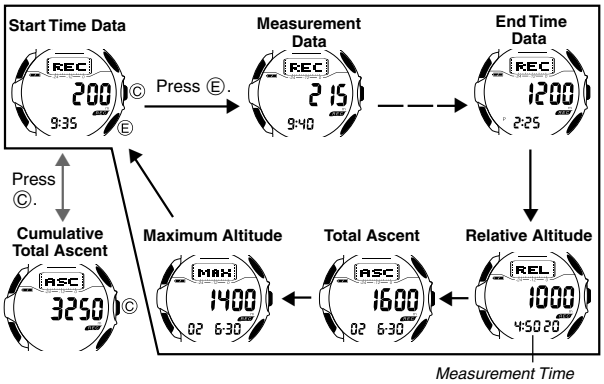
Use the Data Recall Mode to view memory measurement data.

To view memory measurement data

1. Enter the Data Recall Mode.
2. Press Ⓔ to cycle through the various data screens in the sequence shown below.

- To view the cumulative total ascent value, press Ⓒ.
- If an error occurs during memory measurement, the - - - - - is shown for the relative altitude in the Data Recall Mode.





Alarm

Hourly time signal on indicator
Alarm on indicator

Timekeeping Mode time
Alarm time (Hour : Minutes)

After you set (and turn on) the daily alarm, the alarm tone sounds when the alarm time is reached. You can also turn on an Hourly Time Signal that causes the watch to beep for about one second every hour on the hour.

- All of the operations in this section are performed in the Alarm Mode, which you enter by pressing Ⓓ.

To set the alarm time

1. In the Alarm Mode, hold down Ⓐ until the hour setting of the alarm time starts to flash, which indicates the setting screen.
   - This automatically turns on the alarm.
2. Press Ⓓ to move the flashing between the hour and minute settings.
3. While a setting is flashing, use Ⓔ to increase it.
   - When setting the alarm time using the 12-hour format, take care to set the time correctly as a.m. (no indicator) or p.m. (**P** indicator).
4. Press Ⓐ to exit the setting screen.

Alarm Operation

The alarm sounds at the preset time for about 10 seconds (in all modes), or until you stop it by pressing any button.

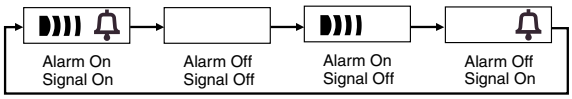
To test the alarm

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

To turn the daily alarm and the Hourly Time Signal on and off

In the Alarm Mode, press Ⓔ to cycle through the settings shown below.

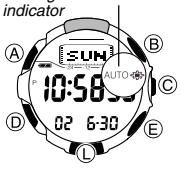
Alarm On Indicator / Hourly Time Signal On Indicator



- The alarm on indicator and the Hourly Time Signal on indicator are shown on the display in all modes while these functions are turned on.

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.

To turn on the backlight manually

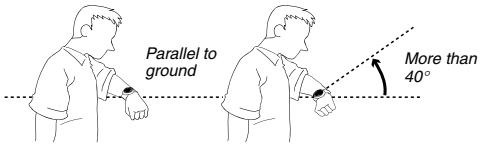
In any mode, press Ⓛ to illuminate the display for about two seconds.

- 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. Note that this watch features a "Full Auto EL Light," so the auto light switch operates only when available light is below a certain level. It does not turn on the backlight under bright light.

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 turn on.



Warning!

- **Always make sure you are in a safe place whenever you are reading the display of the watch using the auto light switch. Be especially careful when running or engaged in any other activity that can result in accident or injury. Also take care that sudden illumination by the auto light switch does not surprise or distract others around you.**
- **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 about one second to toggle the auto light switch on (AUTO displayed) or off (AUTO not displayed).

- Pressing Ⓒ while in the Timekeeping Mode changes to the Barometer/ Thermometer Mode, but keep Ⓒ depressed for about one second to turn the auto light switch on or off. After that, you can return to the Timekeeping Mode by pressing Ⓓ.
- The auto light switch on indicator (AUTO) is on the display in all modes while the auto light switch is turned on.

Questions & Answers

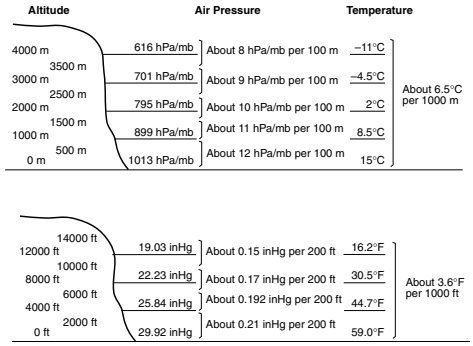
Question: What causes incorrect direction readings?
Answer:

- Incorrect bidirectional calibration. Perform bidirectional calibration.
- Nearby source of strong magnetism, such as a household appliance, a large steel bridge, a steel beam, overhead wires, etc., or an attempt to perform direction measurement on a train, boat, etc. Move away from large metal objects and try again. Note that digital compass operation cannot be performed inside a train, boat, etc.

Question: What causes different direction readings to produce different results at the same location ?
Answer: Magnetism generated by nearby high-tension wires are interfering with detection of terrestrial magnetism. Move away from the high-tension wires and try again.

Question: Why am I having problems taking direction readings indoors ?
Answer: A TV, personal computer, speakers, or some other object is interfering with terrestrial magnetism readings. Move away from the object causing the interference or take the direction reading outdoors. Indoor taking direction readings are particularly difficult inside ferro-concrete structures. Remember that you will not be able to take direction readings inside of trains, airplanes, etc.

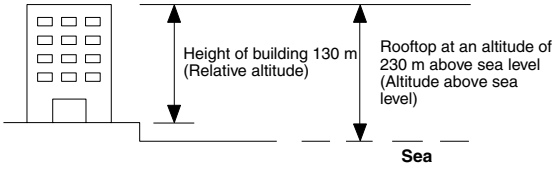
Question: How does the altimeter work?
Answer: Generally, air pressure and temperature decrease as altitude increases. This watch bases its altitude measurements on International Standard Atmosphere (ISA) values stipulated by the International Civil Aviation Organization (ICAO). These values define relationships between altitude, air pressure, and temperature.



Source: International Civil Aviation Organization

- Note that the following conditions will prevent you from obtaining accurate readings:
  When air pressure changes because of changes in the weather
  Extreme temperature changes
  When the watch itself is subjected to strong impact

There are two standard methods of expressing altitude: Absolute altitude and relative altitude. Absolute altitude expresses an absolute height above sea level. Relative altitude expresses the difference between the height of two different places.



Precautions Concerning Simultaneous Measurement of Altitude and Temperature

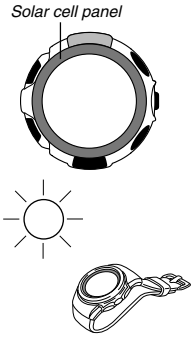
Though you can perform altitude and temperature measurements at the same time, you should remember that each of these measurements require different conditions for best results. With temperature measurement, it is best to remove the watch from your wrist in order to eliminate the effects of body heat. In the case of altitude measurement, on the other hand, it is better to leave the watch on your wrist, because doing so keeps the watch at a constant temperature, which contributes to more accurate altitude measurements.

The following describes what you should do to give priority to either altitude or temperature.

- To give altitude measurement priority, leave the watch on your wrist or in any other location where the temperature of the watch is kept constant.
- To give temperature measurement priority, remove the watch from your wrist and allow it to hand freely from your bag or in another location where it is not exposed to direct sunlight. Note that removing the watch from your wrist can momentarily affect pressure sensor readings.

Question: How does the barometer work?
Answer: Barometric pressure indicates changes in the atmosphere, and by monitoring these changes you can predict the weather with reasonable accuracy. Rising atmospheric pressure indicates good weather, while falling pressure indicates deterioration weather conditions.
The barometric pressures that you see in the newspaper and on the TV weather report are measurements corrected to values measured at 0 m sea level.

Battery



This watch is equipped with a solar cell and a rechargeable battery (secondary battery) that is charged by the electrical power produced by the solar cell.

Important!

- Storing the watch for long periods in an area where there is no light or wearing it in such a way that it is blocked from exposure to light can cause rechargeable battery power to run down. Be sure that the watch is normally exposed to bright light whenever possible.

- This watch employs a solar cell that converts light into electricity that charges a built-in rechargeable battery. Normally, the rechargeable battery should not need replacement, but after very long use over a number of years, the rechargeable battery may lose its ability to achieve a full charge. Should you notice problems with getting the rechargeable battery to a full charge, contact your dealer or CASIO distributor about having the rechargeable battery replaced.
- The rechargeable battery should be replaced with a CASIO-specified CTL1616 battery only. Other rechargeable batteries can cause damage to the watch.
- Having the battery replaced will delete all data stored in watch memory.
- Turn on the watch's Power Saving function and keep it in an area normally exposed to bright light when storing it for long periods. This helps to keep the rechargeable battery from going dead.

Battery Power Indicator

The battery power indicator on the display shows you the current status of the rechargeable battery's power.

Battery power indicator

Level	Battery Power Indicator	Function Status
1		All functions enabled.
2		All functions enabled.
3	CHARGE *(Charge Soon Alert)*	Alarm, Hourly Time Signal, backlight, display, sensors, and buttons are disabled.
4		All functions, including timekeeping, are disabled.

- The flashing **CHARGE** indicator at Level 3 tells you that battery power is very low, and that exposure to bright light for charging is required as soon as possible.
- At Level 4, all functions are disabled. Functions are enabled once again after the rechargeable battery is charged, but anything previously stored in memory is lost. Because of this, you need to set the current time and date after the battery is recharged to Level 2 from Level 4. Though the time appears on the display after the battery is charged to Level 3, you will not be able to change the time setting until the battery reaches Level 2.
- Leaving the watch in direct sunlight or some other very strong light source can cause the battery power indicator to temporarily show a reading that is actually higher than the battery level. The correct battery power indicator should appear after a few minutes.
- If you use the backlight or the alarm a number of times during a short period, **RECOVER** appears on the display and the following operations become disabled until battery power recovers.
  Backlight; Alarm and hourly time signal; Sensor operation
  After some time, battery power will recover and **RECOVER** will disappear, indicating that the above functions are enabled again.
- Even if battery power is at Level 1 or Level 2, the Digital Compass Mode, Barometer/Thermometer Mode, or Altimeter Mode sensor may be disabled if there is not enough voltage available to power it sufficiently. This condition is indicated on the display as shown in the table below. Sensor operation should resume when battery voltage returns to the normal levels.

Mode	Display Indication for Low Voltage Upon Entering the Mode	Display Indication for Low Voltage During Measurement
Digital Compass	- - -	Last measured direction
Barometer/ Thermometer	Last measured pressure value	Last measured pressure value
Altitude	Blank	Last measured altitude

Charging Precautions

Certain charging conditions can cause the watch to become very hot. Avoid leaving the watch in the areas described below whenever charging its rechargeable battery.
Also note that allowing the watch to become very hot can cause its liquid crystal display to black out. The appearance of the LCD should become normal again when the watch returns to a lower temperature.

Warning!
Leaving the watch in bright light to charge its rechargeable battery can cause it to become quite hot. Take care when handling the watch to avoid burn injury. The watch can become particularly hot when exposed to the following conditions for long periods.
- On the dashboard of a car parked in direct sunlight
- Too close to an incandescent lamp
- Under direct sunlight

Charging Guide

After a full charge, timekeeping remains enabled for up to about five months, while the watch is used under the conditions described below.

Operating Conditions
- *Watch is not exposed to light*
- *Display on 18 hours per day, sleep state 6 hours per day*
- *1 backlight operation (2 seconds) per day*
- *10 seconds of alarm operation per day*
- *10 digital compass operations per week*
- *1 climb using the pressure sensor per month (10 hours per climb, with the Long Mode)*

Charge Times
Exposing the watch to light for the periods shown below each day restores the power used by the above operating conditions.

Exposure Level (Brightness)	Approximate Exposure Time
Outdoor Sunlight (50,000 lux)	5 minutes
Sunlight Through a Window (10,000 lux)	24 minutes
Daylight Through a Window on a Cloudy Day (5,000 lux)	48 minutes
Indoor Fluorescent Lighting (500 lux)	8 hours

- Stable operation is promoted by frequent charging.

Recovery Times
The table below shows the amount exposure that is required to take the battery from one level to the next.

Exposure Level (Brightness)	Approximate Exposure Time			
	Level 4	Level 3	Level 2	Level 1
Outdoor Sunlight (50,000 lux)	50 minutes		12 hours	2 hours
Sunlight Through a Window (10,000 lux)	2 hours		60 hours	10 hours
Daylight Through a Window on a Cloudy Day (5000 lux)	4 hours		- - - - - - - -	- - - - - - - -
Indoor Fluorescent Lighting (500 lux)	32 hours		- - - - - - - -	- - - - - - - -

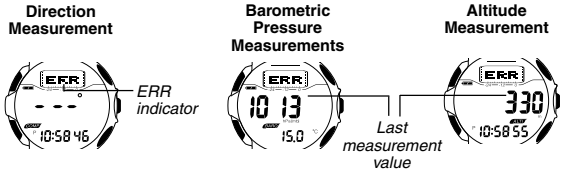
- The above exposure time values are all for reference only. Actual required exposure times depend on lighting conditions.

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.

Sensor Malfunction Indicator

Should the pressure sensor or direction sensor malfunction, the message **ERR** appears on the display for about two seconds, and then sensor operation is disabled.



- After battery power drops to Level 4, the watch performs a memory check when power is restored from Level 3 to Level 2. The message **ERR** appears on the display if any memory abnormality is discovered. If this happens, take the watch to an authorized CASIO distributor or maintenance service provider.
- Even if battery power is at Level 1 or Level 2, the Digital Compass Mode, Barometer/Thermometer Mode, or Altimeter Mode sensor may be disabled if there is not enough voltage available to power it sufficiently. In this case, the **ERR** message appears on the display when you switch to the Timekeeping Mode. This does not indicate malfunction, and sensor operation should resume once battery voltage returns to its normal level.
- Even if battery power is at Level 1 or Level 2, the **ERR** message will appear on the Timekeeping Mode screen if there is not enough voltage available to power the pressure sensor sufficiently during a barometric pressure measurement or memory measurement (altitude) operation. This does not indicate malfunction, and sensor operation should resume once battery voltage returns to its normal level.

Whenever you have a sensor malfunction, be sure to take the watch to an authorized CASIO distributor or service provider as soon as possible.

Auto Return Features

- The watch automatically returns to the Timekeeping Mode if you do not perform any button operation for two or three minutes in the Digital Compass Mode or Barometer/Thermometer Mode.
- If you do not perform any button operation while in the Altimeter Mode, the watch automatically returns to the Timekeeping Mode after four or five hours in the Short Mode, or after nine or 10 hours in the Long Mode.
- If you leave a screen with flashing digits 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.

Power Saving Function

When turned on, the Power Saving function automatically puts the watch into a sleep state whenever it is left in an area where it is dark for a certain period. The table below shows how watch functions are affected by the Power Saving function.

Elapsed Time in Dark	Display	Operation
30 to 40 minutes	Blank, with **SLEEP** flashing	All functions enabled, except for the display
6 or 7 days	Blank, with **SLEEP** not flashing	Daily alarm, Hourly Time Signal, sensor measurements disabled

- Wearing watch inside the sleeve of clothing can cause it to enter the sleep state.

To recover from the sleep state

Perform any one of the following operations.

- Move the watch to a well-lit area. It can take up to five seconds for the display to turn on.
- Press any button.
- Angle the watch towards your face for reading.

To turn Power Saving on and off

1. In the Timekeeping Mode, hold down Ⓐ until the seconds start to flash, which indicates the setting screen.
2. Press Ⓓ eight times until the Power Saving on/off screen appears.
3. Press Ⓔ to toggle Power Saving on (ON) and off (OFF).
4. Press Ⓐ to exit the setting screen.

Data and Setting Scrolling

The Ⓔ and Ⓑ buttons are used in various modes and setting 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.

Timekeeping

- Resetting the seconds to 00 while the current count is in the range of 30 to 59 causes the minutes to be increased by 1. In the range of 00 to 29, the seconds are reset to 00 without changing the minutes.
- The year can be set in the range of 2000 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 when battery power drops to Level 4.

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 on the display for times in the range of noon to 11:59 p.m. and no indicator appears for times in the range of midnight to 11:59 a.m.
- With the 24-hour format, times are displayed in the range of 0:00 to 23:59, without any indicator.

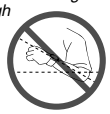
Backlight Precautions

- The electro-luminescent panel that provides illumination loses power after very long use.
- The illumination provided by the backlight may be hard to see when viewed under direct sunlight.
- The backlight automatically turns off whenever an alarm sounds.
- The watch may emit an audible sound whenever the display is illuminated. This is due to vibration of the EL panel used for illumination, and does not indicate malfunction.
- Frequent use of the backlight runs down the battery.

Auto light switch precautions

- Wearing the watch on the inside of your wrist and movement or vibration of your arm can cause the auto light switch to activate and illuminate the display. To avoid running down the battery, turn off the auto light switch whenever engaging in activities that might cause frequent illumination of the display.

More than 15 degrees too high



- 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.

Digital Compass Precautions

This watch features a built-in magnetic bearing sensor that detects terrestrial magnetism. This means that north indicated by this watch is magnetic north, which is somewhat different from true polar north. The magnetic north pole is located in northern Canada, while the magnetic south pole is in southern Australia. Note that the difference between magnetic north and true north as measured with all magnetic compasses tends to be greater as one gets closer to either of the magnetic poles. You should also remember that some maps indicate true north (instead of magnetic north), and so you should make allowances when using such maps with this watch.

Location

- Taking a direction reading when you are near a source of strong magnetism can cause large errors in readings. Because of this, you should avoid taking direction readings while in the vicinity of the following types of objects: permanent magnets (magnetic necklaces, etc.), concentrations of metal (metal doors, lockers, etc.), high tension wires, aerial wires, household appliances (TVs, personal computers, washing machines, freezers, etc.)
- Accurate direction readings are impossible while in a train, boat, air plane, etc.
- Accurate readings are also impossible indoors, especially inside ferro-concrete structures. This is because the metal framework of such structures picks up magnetism from appliances, etc.

Storage

- The precision of the bearing sensor may deteriorate if the watch becomes magnetized. Because of this, you should be sure to store the watch away from magnets or any other sources of strong magnetism, including: permanent magnets (magnetic necklaces, etc.) and household appliances (TVs, personal computers, washing machines, freezers, etc.)
- Whenever you suspect that the watch may have become magnetized, perform one of the calibration procedures under "Calibrating the Bearing Sensor".

Calibrating the Bearing Sensor

Whenever you suspect that direction readings produced by the watch are wrong, you should calibrate it. You can use either one of two calibration procedures: *bidirectional calibration* or *northerly calibration*.

Use bidirectional calibration when you want to take readings within an area exposed to magnetic force. This type of calibration should be used if the watch become magnetized for any reason.

With northerly calibration, you "teach" the watch which way is north (which you have to determine with another compass or some other means). You could use this calibration procedure, for example, to set the watch to indicate true north instead of magnetic north.

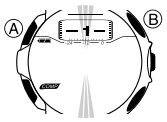
Important!

- If you want to perform both bidirectional and northerly calibration, be sure to perform bidirectional calibration first, and then perform northerly calibration. This is necessary because bidirectional calibration cancels any previously set northerly calibration setting.
- The more correctly you perform bidirectional calibration, the better the accuracy of the bearing sensor readouts. You should perform bidirectional calibration whenever you change environments where you use the bearing sensor, and whenever you feel that the bearing sensor is producing incorrect readings.

Precautions about bidirectional calibration

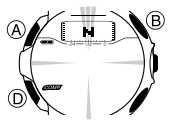
- You can use any two opposing directions for bidirectional calibration. You must, however, make sure that they are 180 degrees opposite each other. Remember that if you perform the procedure incorrectly, you will get wrong bearing sensor readings.
- Do not move the watch during the one or two seconds (from the point you press Ⓑ up to the point that **OK** appears in the upper display area) that the calibration of each direction is in progress.
- You should perform bidirectional calibration in an environment that is the same as that where you plan to be taking direction readings. If you plan to take direction readings in an open field, for example, calibrate in an open field.

To perform bidirectional calibration



1. Press Ⓑ to enter the Digital Compass Mode.
2. Hold down Ⓐ for about one second until the upper display area changes to show **---1---**, which indicates the setting screen.
   - At this time, the magnetic north pointer flashes at the 12 o'clock position to indicate that the watch is ready to calibrate the first direction.
3. Place the watch on a level surface facing any direction you want, and press Ⓑ to calibrate the first direction.
   - When the calibration procedure is complete, the message **OK** appears in the upper display area. This soon changes to **---2---** and the magnetic north pointer flashes at the 6 o'clock position to indicate that the watch is ready for the second direction.
4. Rotate the watch 180 degrees.
5. Press Ⓑ again to calibrate the second direction.
   - The message **OK** appears and the watch automatically returns to the Digital Compass Mode screen.

To perform northerly calibration



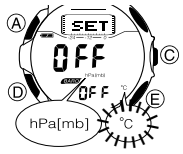
1. While in the Digital Compass Mode, hold down Ⓐ for about one second until the upper display area changes to show **---1---**, which indicates the setting screen.
2. Press Ⓓ to start the northerly calibration procedure.
   - At this time, the indicator (direction **N**) appears in the upper display area.
3. Place the watch on a level surface, and position it so that its 12 o'clock position points north (as measured with another compass).
4. Press Ⓑ to start the calibration operation.

- The message **OK** appears and the watch automatically returns to the Digital Compass Mode screen.

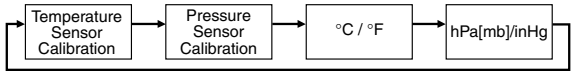
Changing the Barometric Pressure and Temperature Units

Changing the barometric pressure units automatically restarts the barometric pressure graph.

To change the Barometric Pressure and Temperature Units



1. Press Ⓒ to enter the Barometer/ Thermometer Mode.
2. Hold down Ⓐ until either OFF or a temperature value (if set) starts to flash, which indicates the setting screen.
3. Press Ⓓ to move the flashing in the sequence shown below.



4. Press Ⓓ to move the flashing to the unit setting you want to change (**°C/°F** or **hPa[mb]/inHg**).
5. Use Ⓔ to select the unit you want.
6. Press Ⓐ to return to the Barometer/Thermometer Mode screen.

Calibrating the Temperature Sensor

The temperature sensor of this watch is calibrated at the factory before shipment and further adjustment is normally not required. If you notice serious errors in the temperature readings produced by the watch, you can calibrate the sensor to correct the errors.

Important!

Incorrectly calibrating the temperature sensor can result in incorrect readings. Carefully read the following before doing anything.

- Compare the readings produced by the watch with those of another reliable and accurate thermometer.
- If adjustment is required, remove the watch from your wrist and wait for 20 or 30 minutes to give the temperature of the watch time to stabilize.

To calibrate the temperature sensor

1. Press Ⓒ to enter the Barometer/ Thermometer Mode.
2. Hold down Ⓐ until either OFF or a temperature value (if set) starts to flash, which indicates the setting screen.
3. Press Ⓔ (+) or Ⓑ (–) to change the displayed temperature by 0.1°C (or 0.2°F).
   - Pressing Ⓑ and Ⓔ at the same time returns to the factory calibration (OFF).
4. Press Ⓐ to return to the Barometer/ Thermometer Mode screen.

Calibrating the Barometric Pressure Sensor

The pressure sensor of this watch is calibrated at the factory before shipment and further adjustment is normally not required. If you notice serious errors in the barometric pressure readings produced by the watch, you can calibrate the sensor to correct the errors.

Important!

Incorrectly calibrating the barometric pressure sensor can result in incorrect readings. Before performing the calibration procedure, compare the readings produced by the watch with those of another reliable and accurate barometer.

To calibrate the pressure sensor

1. Press Ⓒ to enter the Barometer/ Thermometer Mode.
2. Hold down Ⓐ until either OFF or a temperature value (if set) starts to flash, which indicates the setting screen.
3. Press Ⓓ to move the flashing to the pressure sensor calibration setting.
   - At this time, OFF or the barometric pressure value should be flashing on the display.
4. Press Ⓔ (+) or Ⓑ (–) to change the displayed barometric pressure by 1 hPa/mb (0.05 inHg).
   - Pressing Ⓑ and Ⓔ at the same time returns to the factory calibration (OFF).
5. Press Ⓐ to return to the Barometer/ Thermometer Mode screen.

To change the Altitude Units

1. Press Ⓔ to enter the Altimeter Mode.
2. Hold down Ⓐ until the display clears. After four or five seconds, either OFF or the current reference altitude (if set) starts to flash, which indicates the setting screen.
3. Press Ⓓ three times to move the flashing to the altitude unit setting.
4. Use Ⓔ to select the unit you want (**m** or **ft**).
5. Press Ⓐ to return to the Altimeter Mode screen.

- Changing the altitude units automatically turns the altitude alarm off.
- Changing the altitude units automatically restarts the altitude graph.
- Performing the above procedure causes altitude values stored in memory also to be converted to the unit you select.