

Operation Guide 3135 3206

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.

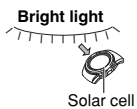
Applications

The built-in sensors of this watch measure direction, barometric pressure, temperature and altitude. 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.
- The Moon phase indicator and tide graph data that appear on the display of this watch are 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.
- 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.
- Note that CASIO COMPUTER CO., LTD. assumes no responsibility for any damage or loss suffered by you or any third party arising through the use of this product or its malfunction.

Keep the watch exposed to bright light



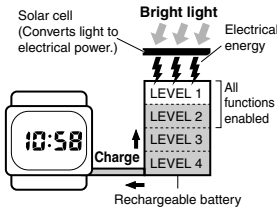
The electricity generated by the solar cell of the watch is stored by a built-in battery. Leaving or using the watch where it is not exposed to light causes the battery to run down. Make sure the watch is exposed to light as much as possible.

- When you are not wearing the watch on your wrist, position the face so it is pointed at a source of bright light.
- You should try to keep the watch outside of your sleeve as much as possible. Charging is reduced significantly if the face is covered only partially.

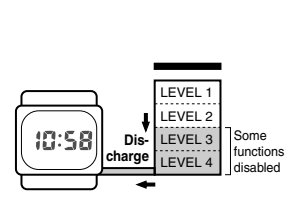


- The watch continues to operate, even when it is not exposed to light. Leaving the watch in the dark can cause the battery to run down, which will result in some watch functions being disabled. If the battery goes dead, you will have to re-configure watch settings after recharging. To ensure normal watch operation, be sure to keep it exposed to light as much as possible.

Battery charges in the light.



Battery discharges in the dark.



- The actual level at which some functions are disabled depends on the watch model.
- Frequent display illumination can run down the battery quickly and require charging. The following guidelines give an idea of the charging time required to recover from a single illumination operation.

Approximately five minutes exposure to bright sunlight coming in through a window

Approximately 50 minutes exposure to indoor fluorescent lighting

- Be sure to read "Power Supply" for important information you need to know when exposing the watch to bright light.

If the display of the watch is blank...

If the display of the watch is blank, it means that the watch's Power Saving function has turned off the display to conserve power.

- See "Power Saving" for more information.

About This Manual



(Light)
Module 3135

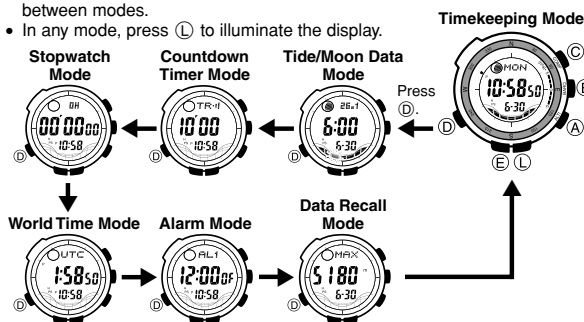


Module 3206

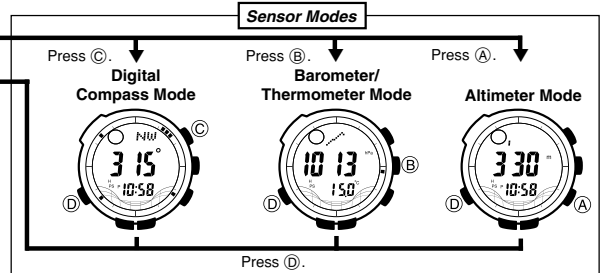
- Depending on the model of your watch, display text appears either as dark figures on a light background (Module 3135), or light figures on a dark background (Module 3206). All sample displays in this manual are shown using dark figures on a light background.
- Button operations are indicated using 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.
- In any mode, press (L) to illuminate the display.



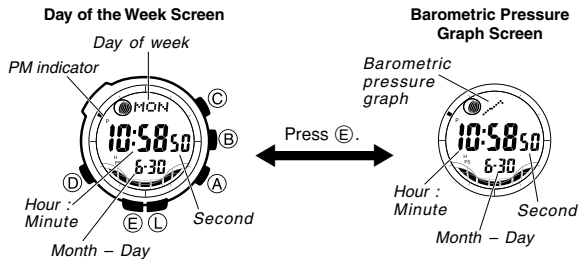
- You can use buttons (A), (B), and (C) to enter a sensor mode directly from the Timekeeping Mode or from another sensor mode. To enter a sensor mode from the Tide/Moon Data, Countdown Timer, Stopwatch, World Time, Alarm, or Data Recall Mode, first enter the Timekeeping Mode and then press the applicable button.



Timekeeping

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

- In the Timekeeping Mode, an indicator moves along the ring around the display as seconds advance.
- The tide graph shows tidal movements for the current date in accordance with the current time as kept in the Timekeeping Mode.
- The Moon phase indicator shows the current Moon phase in accordance with the current date as kept in the Timekeeping Mode.
- In the Timekeeping Mode, you can press (E) to toggle the display contents as shown below.



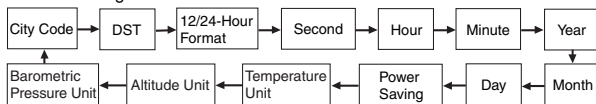
Read This Before You Set the Time and Date!

This watch is preset with a number of city codes, each of which represents the time zone where that city is located. When setting the time, it is important that you first select the correct city code for your Home City (the city where you normally use the watch). If your location is not included in the preset city codes, select the preset city code that is in the same time zone as your location.

- Note that all of the times for the World Time Mode city codes are displayed in accordance with the time and date settings you configure in the Timekeeping Mode.

To set the time and date

- In the Timekeeping Mode, hold down (E) until the city code starts to flash, which indicates the setting screen.
- Use (A) and (C) to select the city code you want.
 - Make sure you select your Home City code before changing any other setting.
 - For full information on city codes, see the "City Code Table".
- Press (D) to move the flashing in the sequence shown below to select the other settings.



- The following steps explain how to configure timekeeping settings only.
- When the timekeeping setting you want to change is flashing, use (A) and/or (C) to change it as described below.

Screen	To do this:	Do this:
TYO	Change the city code	Use (A) (east) and (C) (west).
OFF	Toggle between Daylight Saving Time (ON) and Standard Time (OFF).	Press (A).
24H	Toggle between 12-hour (12H) and 24-hour (24H) timekeeping.	Press (A).
50	Reset the seconds to 00	Press (A).
10:58	Change the hour or minute	Use (A) (+) and (C) (-).
2008	Change the year	
6-30	Change the month or day	

- Press (E) to exit the setting screen.

Note

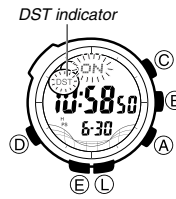
- You also need to enter the Timekeeping Mode in order to configure the following settings.

Power saving on/off ("To turn Power Saving on and off")
 Temperature, barometric pressure, and altitude units ("To select the temperature, barometric pressure, and altitude units")

Daylight Saving Time (DST)

Daylight Saving Time (summer time) advances the time setting by one hour from Standard Time. Remember that not all countries or even local areas use Daylight Saving Time.

To change the Daylight Saving Time (summer time) setting



- In the Timekeeping Mode, hold down (E) until the city code starts to flash, which indicates the setting screen.
- Press (D) and the DST setting screen appears.
- Use (A) to cycle through the DST settings in the sequence shown below.



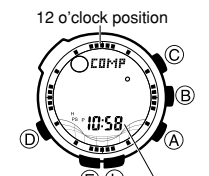
- When the setting you want is selected, press (E) to exit the setting screen.
- The DST indicator appears to indicate that Daylight Saving Time is turned on.

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.
- See "Using the Digital Compass While Mountain Climbing or Hiking" for some real-life examples of how to use this feature.

To enter and exit the Digital Compass Mode

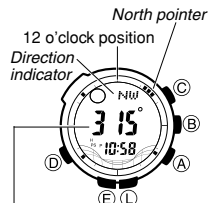


Two seconds ↓ Current time

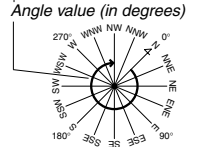


- While in the Timekeeping Mode or in any of the other sensor modes, press (C) to enter the Digital Compass Mode.
 - At this time, the watch will start a Digital Compass operation. After about two seconds, letters appear on the display to indicate the direction that the 12 o'clock position of the watch is pointing.
 - The direction reading on the display is updated each second for up to 20 seconds, after which measurement stops automatically.
- Press (D) to return to the Timekeeping Mode.

To take a direction reading



Angle value (in degrees)

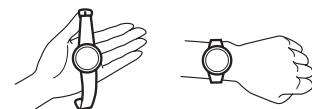


- While the watch is in the Digital Compass Mode, place it on a flat surface, or if you are wearing the watch, make sure that your wrist is horizontal (in relation to the horizon).
- Point the 12 o'clock position of the watch in the direction you want to measure.
- Press (C) to start a Digital Compass 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.

- While the watch is taking compass readings, it displays a direction angle, a direction indicator, and four direction pointers, all of which change dynamically when the watch is moved. The direction angle, direction indicator and direction pointers all disappear from the display after the compass reading operation is complete. Use the direction indicators imprinted on the bezel to record the indicated direction. For details, see "Using the Digital Compass While Mountain Climbing or Hiking".

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 angle value and the direction indicator 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.

- Any ongoing direction measurement operation is paused temporarily while the watch is performing an alert operation (daily alarm, Hourly Time Signal, countdown timer alarm) or while illumination is turned on (by pressing **L**). The measurement operation resumes for its remaining duration after the operation that caused it to pause is finished.
- 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.

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 also should 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 also are 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

You should calibrate the bearing sensor whenever you feel that the direction readings being produced by the watch are off. There are three different calibration methods available: magnetic declination correction, bidirectional calibration, and northerly calibration.

Magnetic Declination Correction

With magnetic declination correction, you input a magnetic declination angle (difference between magnetic north and true north), which allows the watch to indicate true north.

You can perform this procedure when the magnetic declination angle is indicated on the map you are using.

Note that you can input the declination angle in degree units only, so you may need to round off the value specified on the map. If your map indicates the declination angle as 7.4°, you should input 7°. In the case of 7.6° input 8°, for 7.5° you can input 7° or 8°.

Bidirectional Calibration and Northerly Calibration

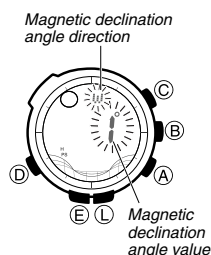
Bidirectional calibration and northerly calibration calibrate the accuracy of the direction sensor in relation to magnetic north.

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 becomes 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).

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 existing 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.

To perform magnetic declination correction



- In the Digital Compass Mode, hold down **E** for about two seconds until the magnetic declination angle and magnetic declination angle direction values start to flash on the display. This is the setting screen.
- Use **A** (+) and **C** (-) to change the magnetic declination angle and magnetic declination angle direction settings.
 - You can select a value within the range of **W 90°** to **E 90°** with these settings.
 - The following explains magnetic declination angle direction settings.
 - OFF**: No magnetic declination correction performed. The magnetic declination angle with this setting is 0°.

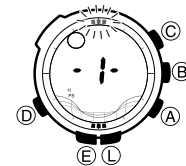
E: When magnetic north is to the east (east declination)
W: When magnetic north is to the west (west declination)

- You can turn off (**OFF**) magnetic declination correction (which effectively makes the magnetic declination angle: 0°) by pressing **A** and **C** at the same time.
 - The illustration above, for example, shows the value you should input and the direction setting you should select when the map shows a magnetic declination of 1° West.
- When the setting is the way you want, press **E** to exit the setting screen.

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.
- Make sure that you do not move the watch while calibration of either 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.

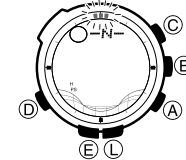
To perform bidirectional calibration



- In the Digital Compass Mode, hold down **E** for about two seconds until the magnetic declination angle and magnetic declination angle direction values start to flash on the display. This is the setting screen.
- Press **D** to display the bidirectional calibration screen.
 - At this time, the north pointer flashes at the 12 o'clock position to indicate that the watch is ready to calibrate the first direction.

- Place the watch on a level surface facing any direction you want, and press **C** to calibrate the first direction.
 - is shown on the display while calibration is being performed. When calibration is successful, the display will show **0°** and **180°**, and the north pointer flashes at the 6 o'clock position. This means that the watch is ready for calibration of the second direction.
- Rotate the watch 180 degrees.
- Press **C** again to calibrate the second direction.
 - is shown on the display while calibration is being performed. When calibration is successful, the display will show **0°** and the Digital Compass Mode (showing the angle value) screen.
 - If --- appears and then changes to **ERR** (error) on the calibration screen, it means that there is something wrong with the sensor. When **ERR** disappears after about one second, try performing the calibration again. If **ERR** keeps appearing, contact your original dealer or nearest authorized CASIO distributor to have the watch checked.

To perform northerly calibration



- In the Digital Compass Mode, hold down **E** for about two seconds until the magnetic declination angle and magnetic declination angle direction values start to flash on the display. This is the setting screen.
- Press **D** twice to display the northerly calibration screen.
 - At this time, **N** (north) appears on the display.

- Place the watch on a level surface, and position it so that its 12 o'clock position points north (as measured with another compass).
- Press **C** to start the calibration operation.
 - is shown on the display while calibration is being performed. When calibration is successful, the display will show **0°** and the Digital Compass Mode (with **0°** shown as the angle value).
 - If ----- appears and then changes to **ERR** (error) on the calibration screen, it means that there is something wrong with the sensor. When **ERR** disappears after about one second, try performing the calibration again. If **ERR** keeps appearing, contact your original dealer or nearest authorized CASIO distributor to have the watch checked.

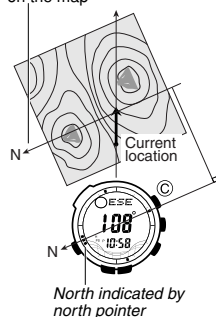
Using the Digital Compass While Mountain Climbing or Hiking

This section describes three real-life situations where you could use the watch's built-in digital compass.

- To set a map and find your current location
 - Having an idea of your current location is important when mountain climbing or hiking. To do this, you need to "set the map", which means to align the map so the directions indicated on it are aligned with the actual directions of your location. Basically what you are doing is aligning north on the map with north as indicated by the watch.
- To find the bearing to an objective
- To determine the direction angle to an objective on a map and head in that direction

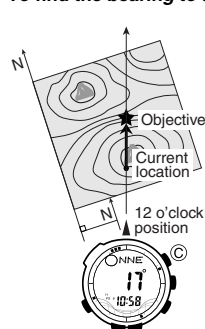
To set a map and find your current location

North indicated on the map



- With the watch on your wrist, position it so the face is horizontal.
- In the Timekeeping, Digital Compass, Barometer/Thermometer, or Altimeter Mode, press **(C)** to take a compass reading.
 - The reading will appear on the display after about two seconds.
- Rotate the map without moving the watch so the northerly direction indicated on the map matches north as indicated by the watch.
 - If the watch is configured to indicate magnetic north, align the map's magnetic north with the watch indication. If the watch has been configured with a declination to correct to true north, align the map's true north with the watch indication.
 - This will position the map in accordance with your current location.
- Determine your location as you check the geographic contours around you.

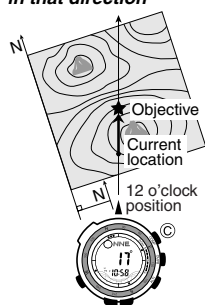
To find the bearing to an objective



- Take a compass reading and then set the map so its northerly indication is aligned with north as indicated by the watch, and determine your current location.
 - See "To set a map and find your current location" for information about how to perform the above step.
- Set the map so the direction you want to travel on the map is pointed straight in front of you.
- With the watch on your wrist, position it so the face is horizontal.
- In the Timekeeping, Digital Compass, Barometer/Thermometer, or Altimeter Mode, press **(C)** to take a compass reading.
 - The reading will appear on the display after about two seconds.
- Still holding the map in front of you, turn your body until north as indicated by the watch and the northerly direction on the map are aligned.

- This will position the map relative to your current location, so the bearing to your objective is straight ahead of you.

To determine the direction angle to an objective on a map and head in that direction

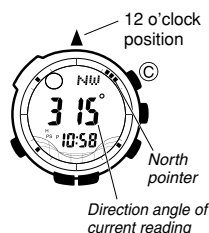


Note

- The following procedure is possible only with a watch that has a rotary bezel.

- Take a compass reading and then set the map so its northerly indication is aligned with north as indicated by the watch, and determine your current location.
 - See "To set a map and find your current location" for information about how to perform the above step.
- As shown in the illustration to the left, change your position so you (and the 12 o'clock position of the watch) are pointed in the direction of objective, while keeping the map aligned with the readings being produced by the watch.

- If you find it difficult to perform the above step while keeping everything aligned, first move into the correct position (12 o'clock position of the watch pointed at the objective) without worrying about the orientation of the map. Next, perform step 1 again to set the map.



- Rotate the bezel so the "N" (North) indicator on the bezel is aligned with the north indicator produced by the reading in step 3.
- To advance to your objective proceed in the direction that 12 o'clock is pointing.

Note

- When mountain climbing or hiking, conditions or geographic contours may make it impossible for you to advance in a straight line. If this happens, return to step 1 and save a new direction to the objective.

Barometer/Thermometer

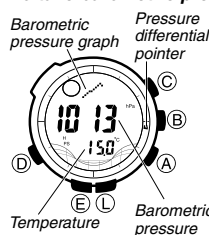
This watch uses a pressure sensor to measure air pressure (barometric pressure) and a temperature sensor to measure temperature.

- You can calibrate the pressure sensor and the temperature sensor if you suspect that readings are incorrect.

To take barometric pressure and temperature readings

Pressing **(B)** in the Timekeeping Mode or in any of other sensor modes enters the Barometer/Thermometer Mode and starts barometric pressure and temperature measurements automatically.

- It can take up to four or five seconds for the barometric pressure reading to appear after you enter the Barometer/Thermometer Mode.
- Barometric pressure is displayed in units of 1hPa (or 0.05 inHg).



- The displayed barometric pressure value changes to --- hPa (or inHg) if a measured barometric pressure falls outside the range of 260 hPa to 1100 hPa (7.65 inHg to 32.45 inHg). The barometric pressure value will reappear as soon as the measured barometric pressure is within the allowable range.
- Temperature is displayed in units of 0.1°C (or 0.2°F).
- 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 reappear as soon as the measured temperature is within the allowable range.
- In some areas, barometric pressure is expressed in millibars (mb) instead of hectopascals (hPa). It really makes no difference, because 1hPa = 1mb.
- You can select either hectopascals (hPa) or inchesHg (inHg) as the display unit for the measured barometric pressure, and Celsius (°C) or Fahrenheit (°F) as the display unit for the measured temperature value. See "To select the temperature, barometric pressure, and altitude units".
- See "Barometer and Thermometer Precautions" 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. This watch takes barometric pressure measurements automatically every two hours (at the top of each even-numbered hour), regardless of its current mode. Measurement results are used to produce barometric pressure graph and barometric pressure differential pointer readings.

The barometric pressure graph shows readings of previous measurements for up to 20 hours. The horizontal axis of the graph represents time, with each dot standing for two hours. The rightmost dot represents the most recent reading. The vertical axis of the graph represents barometric pressure, with each dot standing for the relative difference between its reading and that of the dots next to it. Each dot represents 1hPa.

The following shows how to interpret the data that appears on the barometric pressure graph.

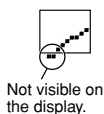


A rising graph generally means improving weather.



A falling graph generally means deteriorating weather.

Note that if there are sudden changes in barometric pressure 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.



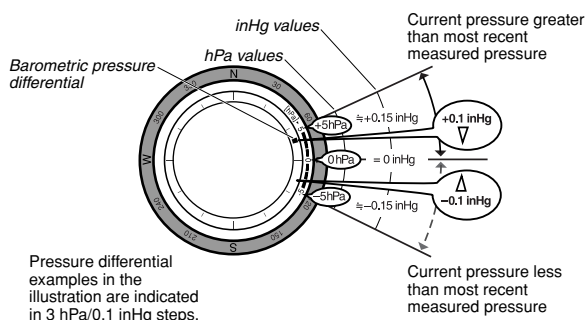
The following conditions cause the barometric pressure measurement to be skipped, with the corresponding point on the barometric pressure graph being left blank.

- 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

Barometric Pressure Differential Pointer

This pointer indicates the relative difference between the most recent barometric pressure reading indicated on the barometric pressure graph, and the current barometric pressure value displayed in the Barometer/Thermometer Mode.

- Pressure differential is indicated in the range of ± 5 hPa, in 1-hPa units.
- The barometric pressure differential pointer is not displayed when the displayed current barometric value is outside of the allowable measurement range (260 to 1,100 hPa).
- Barometric pressure is calculated and displayed using hPa as the standard. The barometric pressure differential also can be read in inHg units as shown in the illustration.



Pressure differential examples in the illustration are indicated in 3 hPa/0.1 inHg steps.

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.
- You also can perform a barometric pressure and temperature measurement at any time by pressing (B) in the Barometer/Thermometer Mode.

Altimeter

The watch's altimeter uses a pressure sensor to detect current air pressure, which is then used to estimate the current altitude based on ISA (International Standard Atmosphere) preset values. You also can specify a reference altitude, which the watch will use to calculate your current altitude based on the value you specify. Altimeter functions also include storage of measurement data in memory.

Important!

- This watch estimates altitude based on air pressure. This means that altitude readings for the same location may vary if air pressure changes.
- The semiconductor pressure sensor used by the watch for altitude measurements also is affected by temperature. When taking altitude measurements, make sure the watch is not subjected to temperature changes.
- To avoid the effect of sudden temperature changes during measurement, keep the watch on your wrist in direct contact with your skin.
- Do not rely upon this watch for altitude measurements or perform button operations while sky diving, hang gliding, or paragliding, while riding a gyrocopter, glider, or any other aircraft, or while engaging in any other activity where there is the chance of sudden altitude changes.
- 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 Measures Altitude

The altimeter can measure altitude based on its own preset values, or a reference altitude specified by you.

When you measure altitude based on preset values

Data produced by the watch's barometric pressure sensor is converted to approximate altitude based on ISA (International Standard Atmosphere) conversion values stored in watch memory.

When you measure altitude using a reference altitude specified by you
After you specify a reference altitude, the watch uses that value to convert the current measured barometric pressure value to altitude.

- When mountain climbing, you can set the reference value in accordance with a marker along the way or altitude information from a map. After that, the altitude readings produced by the watch will be more accurate than they would without a reference altitude.



Displaying Your Current Altitude

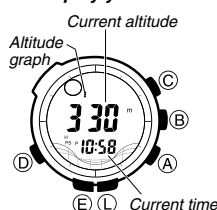
You can use the procedure described in this section to display your current altitude. If you leave the watch in the Altimeter Mode, it will update the displayed altitude value regularly, and indicate reading-to-reading changes in the altitude graph at the top of the display.

Important!

- The procedure in this section simply displays values indicating your current altitude, without storing them in watch memory. For information about recording altitude readings in watch memory, see "Saving Altitude Data".

To display your current altitude

1. Press (A) in the Timekeeping Mode or in any of the other sensor modes to enter the Altimeter Mode.
 - The watch will start altitude measurement automatically, and display the result.
 - It can take up to four or five seconds for the altitude reading to appear after you enter the Altimeter Mode.
2. Leave the watch in the Altimeter Mode if you want the displayed altitude value and the altitude graph contents to be updated at regular intervals.
 - Readings are taken at five-second intervals for the first three minutes after you enter the Altimeter Mode. After that, readings are taken at two-minute intervals.
 - If you want to restart the altitude measurement operation at any point, press (A).
3. To stop the altitude measurement operation, press (D) to exit the Altimeter Mode.



Notes

- Normally, displayed altitude values are based on the watch's preset conversion values. You also can specify a reference altitude, if you want. See "Specifying a Reference Altitude".
- 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 measurement unit for displayed altitude values to either meters (m) or feet (ft). See "To select the temperature, barometric pressure, and altitude units".

Saving Altitude Data

The watch automatically keeps track of the high altitude achieved to date. You also can save altitude readings with the touch of a button.

- You can recall and view altitude data using the Data Recall Mode. For details, see "Recalling Altitude Data".

Automatic High Altitude Record

Whenever an altitude measurement in the Altimeter Mode is greater than the currently stored high altitude value, the watch will replace the old value with the new measurement automatically, along with the reading date and time. This feature is always enabled and cannot be turned off.

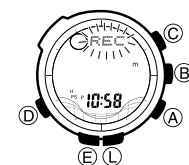
- If the current reading is the same as the existing high altitude value, the older value will be retained.

Saving an Altitude Reading

Perform the following procedure whenever you want to save an altitude reading.

To save an altitude reading

1. Press (A) to enter the Altimeter Mode.
2. Hold down (A) until REC flashes on the display.
 - At this time the watch will beep and the current altitude reading value will be saved along with the reading date (month - day) and time.
3. REC will stop flashing and the watch will return to the Altimeter Mode automatically after data save is complete.

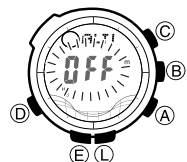


- Memory can store up to 24 altitude records. Storing a new reading while there are already 24 in memory will delete the oldest record currently in memory to make room for the new reading.

Specifying a Reference Altitude

After you specify 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

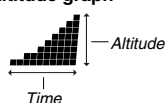


- In the Altimeter Mode, hold down **E** for about two seconds until either **OFF** or the current reference altitude value starts to flash. This is the setting screen.
- Press **A** (+) or **C** (-) to change the current reference altitude value by 5 meters (or 20 feet).
 - You can set the reference altitude within the range of -10,000 to 10,000 meters (-32,800 to 32,800 feet).

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

- Press **E** to exit the setting screen.

Altitude graph



The altitude graph shows Altimeter Mode measurement results.

- The vertical axis of the graph represents altitude, and each dot stands for 10 meters (40 feet).

- The horizontal axis represents time, and the flashing dot in the rightmost column indicates the latest measurement result. For the first three minutes, each dot represents five seconds. After that, each dot represents two minutes.
- An out of range measurement result or a measurement error will cause the column of dots for that measurement to be blank (skipped).

Recalling Altitude Data

In the Data Recall Mode, you can recall and view altitude reading records you stored in the Altimeter Mode, as well as the high altitude record.

- All of the operations in this section are performed in the Data Recall Mode.

Data Screens

The following explains the contents of each of the screens that appear in the Data Recall Mode.

Note

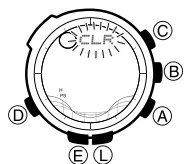
- While the altitude record or high altitude screen is displayed, the bottom part of the display alternates between the measurement date (month and day) and measurement time, at 1-second intervals.



To view altitude reading records and the high altitude record

- Enter the Data Recall Mode.
 - After about one second a record with **MAX** on the top will appear. This is the high altitude record.
- Use **A** (+) and **C** (-) to scroll through the other altitude reading records.

To delete all altitude data currently in memory



- In the Data Recall Mode, hold down **E** until **CLR** flashes on the display and the watch beeps twice.
 - Releasing **E** at any time while **CLR** is flashing on the display will cancel the delete operation.
- Keep **E** depressed for two seconds.
 - The watch will beep to indicate that all of the altitude data stored in watch memory (including readings you stored and the high altitude value) is deleted.

Tide/Moon Data

In the Tide/Moon Data Mode, you can see the current tide and the current date's Moon phase for your Home City. You can specify a date and view tide and Moon data for that date.

- See "Moon Phase Indicator" for information about the Moon phase indicator and "Tide Graph" for information about the tide graph.
- All of the operations in this section are performed in the Tide/Moon Data Mode.

Tide Data

The Tide Graph that appears first when you enter the Tide/Moon Data Mode shows the data at 6:00 a.m. for your currently selected Home City on the current date, according to the Timekeeping Mode. From there you can specify another date or time.

- If the tide data is not correct, check your Timekeeping Mode settings and correct them if necessary.
- If you feel that the information shown by the Tide Graph is different from actual tide conditions, you need to adjust the high tide time. See "Adjusting the High Tide Time" for more information.

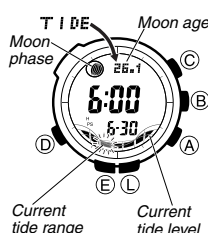
Moon Data

The Moon phase and Moon age information that appears first when you enter the Tide/Moon Data Mode shows the data at noon for your currently selected Home City on the current date, according to the Timekeeping Mode. After that you can specify another date to view data.

- If the Moon data is not correct, check your Timekeeping Mode settings and correct them if necessary.
- If the Moon phase indicator shows a phase that is a mirror image of the actual moon phase in your area, you can use the procedure under "Reversing the Displayed Moon Phase" to change it.

To view Moon Data for a particular date, or Tide Data for a particular date and time

- In the Tide/Moon Data Mode, use **A** (+) and **C** (-) to select the date you want.
 - After you select a date, the watch starts to calculate Moon and tide data for the date you selected. The calculation operation takes about 10 seconds, and is indicated by movement in the Moon Phase indicator and the Tide Graph on the display. You can use **A** and **C** to change to another date while a calculation operation is in progress.
 - After calculation is complete, the Moon information (Moon age and phase) and tide information (current tide level and tide range) will be displayed for the date you selected.



- While the Moon information (Moon age and phase) and tide information (tide level and tide range for the current date) are displayed, you can press **B** (+) to advance the displayed tide range by one hour.
 - You also can use **A** (+) and **C** (-) to change the date.
 - Update of the Moon Phase indicator and the Tide Graph is stopped while any of the following is occurring.
 - During button operation
 - While an alarm is sounding
 - While a countdown beeper is sounding
 - During display illumination
 - During a 2-hour barometric pressure reading operation

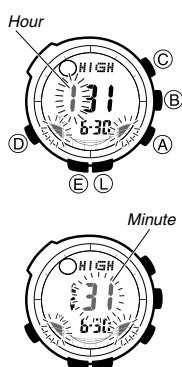
Adjusting the High Tide Time

Use the following procedure to adjust the high tide time within a particular date. You can find out high tide information for your area from a tide table, the Internet, or your local newspaper.

To adjust the high tide time

- In the Tide/Moon Data Mode, use **A** (+) and **C** (-) to select the date you want.
 - After you select a date, the watch starts to calculate Moon and tide data for the date you selected. The calculation operation takes about 10 seconds, and is indicated by movement in the Moon Phase indicator and the Tide Graph on the display. You can use **A** and **C** to change to another date while a calculation operation is in progress.
 - After calculation is complete, the Moon information (Moon age and phase) and tide information (current tide level and tide range) will be displayed for the date you selected.





- While the Moon information (Moon age and phase) and tide information (current tide level and tide range) are displayed, hold down (E) until the hour digits start to flash. This is the high tide time hour adjustment screen.
- Use (A) (+) and (C) (-) to change the hour setting.
- When the hour is the setting you want, press (D).
 - This will cause the minute digits to flash.
- Use (A) (+) and (C) (-) to change the minute setting.
- When the minute setting is the way you want, press (E) to exit the adjustment screen and return to the Tide/Moon Data Mode screen.
 - Pressing (A) and (C) at the same time while the time adjustment screen is displayed (steps 2 through 5 above) will return the high tide time to its initial factory default setting.

- The high tide time setting is not affected by the DST (summer time) setting of the Timekeeping Mode.
- On some days, there are two high tides. With this watch, you can adjust the first high tide time only. The second high tide time for that day is adjusted automatically based on the first high tide time.

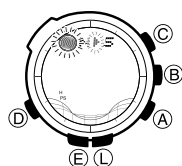
Reversing the Displayed Moon Phase

The left-right (east-west) appearance of the Moon depends on whether the Moon is north of you (northerly view) or south of you (southerly view) as you view it.

You can use the procedure below to reverse the displayed Moon phase so it matches the actual appearance of the Moon where you are located.

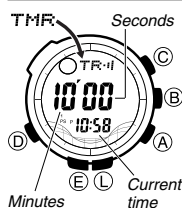
- To determine the viewing direction of the Moon, use a compass to take a direction reading of the Moon at its meridian passage.
- For information about the Moon phase indicator, see "Moon Phase Indicator".

To reverse the displayed Moon phase



- In the Tide/Moon Data Mode, hold down (E) until the hour digits start to flash.
- Press (D) twice.
 - This will cause the Moon phase indicator to flash. This is the indicator switching screen.
- Press (A) to toggle the Moon phase indicator between the southerly view (indicated by $N\neq S$) and northerly view (indicated by $N\neq S$).
 - Northerly view: Moon is north of you.
 - Southerly view: Moon is south of you.
- When the Moon phase indicator setting is the way you want, press (E) to exit the switching screen and return to the Tide/Moon Data Mode screen.

Countdown Timer



The countdown timer can be set within a range of one minute to 60 minutes. An alarm sounds when the timer reaches zero. The press of a button will start the countdown timer from the currently set start time, and a progress beeper sounds to keep you informed of the current status of the countdown. These features make it possible to use the watch for yacht racing.

- All of the operations in this section are performed in the Countdown Timer Mode, which you enter by pressing (D).

Configuring Countdown Timer Settings

The following are the settings you should configure before actually using the countdown timer.

Countdown start time and reset time
Progress beeper (on/off)

- See "To configure countdown timer settings" for information about setting up the timer.
- For details about the progress beeper, see "Progress Beeper".

Reset Time

You can set a "reset time", which is a kind of alternate countdown start time you can recall with the press of a button any time a countdown operation is in progress.

Countdown Timer Beeper Operations

The watch beeps at various times during a countdown so you can keep informed about the countdown status without looking at the display. The following describes the types of beeper operations the watch performs during a countdown.

Countdown End Beeper

The watch beeps each second of the final 10 seconds before a countdown reaches zero, and at zero. The first five beeps (seconds 10 through 6) are higher pitched than the final five beeps (seconds 5 through 1). The watch emits a longer beep to signal when the countdown reaches zero.

Progress Beeper

The progress beeper actually includes two beepers: a reset time beeper and a reset period beeper.

- Note that the reset time beeper and reset period beeper operate only while the progress beeper is turned on. For more information, see "To turn the progress beeper on and off".

Reset Time Beeper

The reset time beeper is similar to the countdown end beeper. The watch beeps each second of the final 10 seconds before the countdown reaches the reset time.

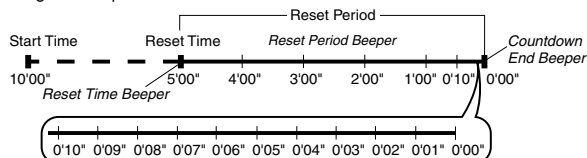
Reset Period Beeper

The reset period is in the portion of the countdown between the reset time and zero. While timing is the reset period, the watch will beep four times at the top of each minute and 10 seconds before the end of the countdown.

Countdown Timer Examples

Countdown start time: 10 minutes; Reset time: 5 minutes

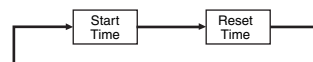
Progress beeper: On



To configure countdown timer settings



- While the countdown start time is on the display in the Countdown Timer Mode, hold down (E) until the countdown start time setting starts to flash, which indicates the setting screen.
 - If the countdown start time is not displayed, use the procedure under "To use the countdown timer" to display it.
- Press (D) to move the flashing in the sequence shown below to select other settings.



- When the setting you want to change is flashing, use (A) and (C) to change it as described below.

Setting	Screen	Button Operations
Start Time	TMR 10:00	Use (A) (+) and (C) (-) to change the setting. • You can set a start time in the range of 1 to 60 minutes in 1-minute increments.
Reset Time	RST 05:58	Use (A) (+) and (C) (-) to change the setting. • You can set a reset time in the range of 1 to 5 minutes in 1-minute increments.

- Press (E) to exit the setting screen.
- The reset time setting must be less than the countdown start time setting.

To turn the progress beeper on and off

Pressing (B) while the countdown start time is on the display or while a countdown timer operation is in progress in the Countdown Timer Mode toggles progress beeper operation on ($TR-II$ displayed) and off (TR displayed).

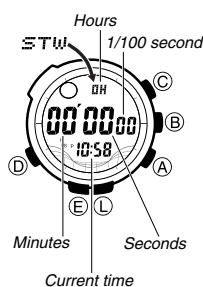
To use the countdown timer



- In the Countdown Timer Mode, press (A) to start the countdown timer.
- The countdown timer measurement operation continues even if you exit the Countdown Timer Mode.
 - The table below describes button operations you can perform to control countdown operations.

To do this:	Do this:
Stop the countdown operation	Press (A).
Resume a stopped countdown operation	Press (A) again.
Display the countdown start time	While the countdown is stopped, press (C).
Stop the countdown operation and display the reset time	Press (C).
Start the countdown from the displayed reset time	Press (A).

Stopwatch

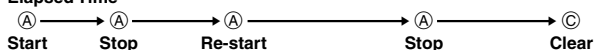


The stopwatch lets you measure elapsed time, split times, and two finishes.

- The display range of the stopwatch is 23 hours, 59 minutes, 59.99 seconds.
- The stopwatch continues to run, restarting from zero after it reaches its limit, until you stop it.
- The stopwatch measurement operation continues even if you exit the Stopwatch Mode.
- Exiting the Stopwatch Mode while a split time is frozen on the display clears the split time and returns to elapsed time measurement.
- All of the operations in this section are performed in the Stopwatch Mode, which you enter by pressing **(D)**.

To measure times with the stopwatch

Elapsed Time



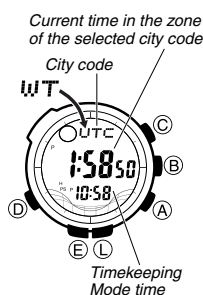
Split Time



Two Finishes



World Time



World Time displays the current time in 33 cities (29 time zones) around the world.

- If the current time shown for a city is wrong, check your Home City time settings and make the necessary changes.
- All of the operations in this section are performed in the World Time Mode, which you enter by pressing **(D)**.

To view the time in another city

In the World Time Mode, use **(A)** (east) and **(C)** (west) to scroll through city codes (time zones).
 • For full information on city codes, see the "City Code Table".

To toggle a city code time between Standard Time and Daylight Saving Time

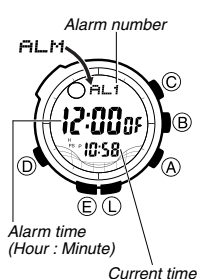
DST indicator



1. In the World Time Mode, use **(A)** (east) and **(C)** (west) to display the city code (time zone) whose Standard Time/Daylight Saving Time setting you want to change.
 2. Hold down **(E)** to toggle between Daylight Saving Time (**DST** indicator displayed) and Standard Time (**DST** indicator not displayed).
- The **DST** indicator appears on the display whenever you display a city code for which Daylight Saving Time is turned on.

- You cannot toggle between Daylight Saving Time and Standard Time if the displayed city code is **UTC**.
- Note that the DST/Standard Time setting affects only the currently displayed city code. Other city codes are not affected.

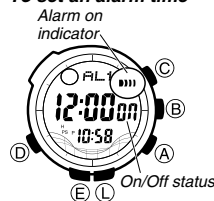
Alarms



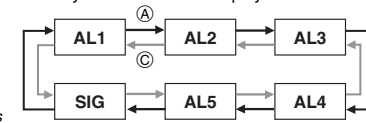
You can set five independent daily alarms. When an alarm is turned on, the alarm tone sounds when the alarm time is reached. You also can turn on an Hourly Time Signal, which will cause the watch to beep twice every hour on the hour.

- The alarm number (**AL1** through **AL5**) indicates an alarm screen. **SIG** is shown when the Hourly Time Signal screen is on the display.
- When you enter the Alarm Mode, the data you were viewing when you last exited the mode appears first.
- All of the operations in this section are performed in the Alarm Mode, which you enter by pressing **(D)**.

To set an alarm time



1. In the Alarm Mode, use **(A)** and **(C)** to scroll through the alarm screens until the one whose time you want to set is displayed.



2. Hold down **(E)** until the hour setting of the alarm time start to flash, which indicates the setting screen.
 - This automatically turns on the alarm.
3. Press **(D)** to move the flashing between the hour and minute settings.
4. While a setting is flashing, use **(A)** (+) and **(C)** (-) to change 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).
5. Press **(E)** to exit the setting screen.

Alarm Operation

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

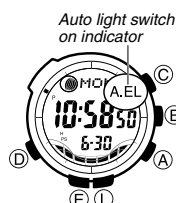
To test the alarm

In the Alarm Mode, hold down **(A)** to sound the alarm.

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

1. In the Alarm Mode, use **(A)** and **(C)** to select an alarm or the Hourly Time Signal.
 2. When the alarm or the Hourly Time Signal you want is selected, press **(B)** to turn it on (**AL**) and off (**BF**).
 - **AL** Indicates alarm is ON.
 - **AL** Indicates Hourly Time Signal is ON.
- The alarm on indicator (**AL**) and the Hourly Time Signal on indicator (**AL**) are shown on the display in all modes while these functions are turned on.
 - If any alarm is on, the alarm on indicator is shown on the display in all modes.

Illumination



The display of the watch is illuminated using an EL (electro-luminescent) panel for easy reading in the dark. The watch's auto light switch turns on illumination automatically 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 "Illumination Precautions" for other important information about using illumination.

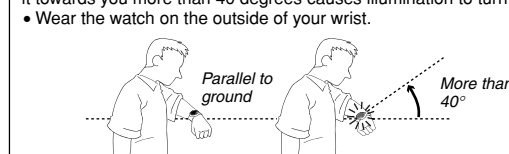
To turn on illumination manually

- Press **(L)** in any mode to illuminate the display for about one second.
- The above operation turns on illumination regardless of the current auto light switch setting.
 - Illumination is disabled while configuring sensor measurement mode settings, and during bearing sensor calibration.

About the Auto Light Switch

- Turning on the auto light switch causes illumination to turn on, 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 illuminate the display under bright light.
- The auto light switch is always disabled, regardless of its on/off setting, when any one of the following conditions exists.
 - While an alarm is sounding
 - During sensor measurement
 - While a bearing sensor calibration operation is being performed in the Digital Compass Mode
 - During tide data calculation

Moving the watch to a position that is parallel to the ground and then tilting it towards you more than 40 degrees causes illumination 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 startle 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 three seconds to toggle the auto light switch on (A.EL displayed) and off (A.EL not displayed).

- The auto light switch on indicator (A.EL) is on the display in all modes while the auto light switch is turned on.
- The auto light switch turns off automatically whenever battery power drops to Level 4.
- Illumination may not turn on right away if you raise the watch to your face while a barometric pressure or altitude measurement operation is in progress.

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 is 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 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 can the barometer be used to predict weather?

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 deteriorating 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.

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.

Altitude	Air Pressure	Temperature
4000 m	616 hPa	About 8 hPa per 100 m
3500 m	701 hPa	About 9 hPa per 100 m
3000 m		
2500 m	795 hPa	About 10 hPa per 100 m
2000 m	899 hPa	About 11 hPa per 100 m
1500 m		
1000 m	1013 hPa	About 12 hPa per 100 m
500 m		
0 m		

About 6.5°C per 1000 m

Altitude	Air Pressure	Temperature
14000 ft	19.03 inHg	About 0.15 inHg per 200 ft
12000 ft	22.23 inHg	About 0.17 inHg per 200 ft
10000 ft		
8000 ft	25.84 inHg	About 0.192 inHg per 200 ft
6000 ft	29.92 inHg	About 0.21 inHg per 200 ft
4000 ft		
2000 ft		
0 ft		

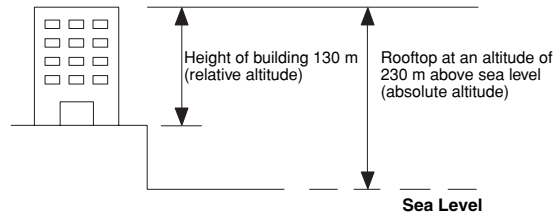
About 3.6°F per 1000 ft

Source: International Civil Aviation Organization

- Note that the following conditions will prevent you from obtaining accurate altitude 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 requires 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.

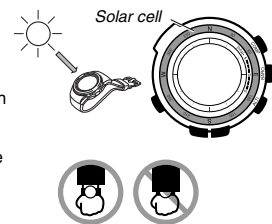
- To give altitude measurement priority, leave the watch on your wrist or in any other location where the temperature of the watch is kept constant.
- To give temperature measurement priority, remove the watch from your wrist and allow it to hang freely from your bag or in another location where it is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

Power Supply

This watch is equipped with a solar cell and a special rechargeable battery (secondary battery) that is charged by the electrical power produced by the solar cell. The illustration shown below shows how you should position the watch for charging.

Example: Orient the watch so its face is pointing at a light source.

- The illustration shows how to position a watch with a resin band.
- Note that charging efficiency drops when any part of the solar cell is blocked by clothing, etc.
- You should try to keep the watch outside of your sleeve as much as possible. Charging is reduced significantly if the face is covered only partially.



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 exposed to bright light whenever possible.
- This watch uses a special rechargeable battery to store power produced by the solar cell, so regular battery replacement is not required. However, after very long use, the rechargeable battery may lose its ability to achieve a full charge. If you experience problems getting the special rechargeable battery to charge fully, contact your dealer or CASIO distributor about having it replaced.
- Never try to remove or replace the watch's special battery yourself. Use of the wrong type of battery can damage the watch.
- All data stored in memory is deleted, and the current time and all other settings return to their initial factory defaults whenever battery power drops to Level 5 and when you have the battery replaced.
- The Home City setting reverts to the initial default of T^Y□ (Tokyo) whenever the battery power level drops to Level 5 or when you have the rechargeable battery replaced. If this happens, change the Home City to the setting you want.
- 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 Indicators

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	H	All functions enabled.
2	M	All functions enabled.
3	LOW L	Illumination, beeper, and sensor operation disabled.
4	C (Charge Soon Alert)	Except for timekeeping and the C (charge) indicator, all functions and display indicators disabled.
5		All functions disabled.

- The flashing L 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 5, all functions are disabled and settings return to their initial factory defaults. Once the battery reaches Level 2 (indicated by M indicator) after falling to Level 5, reconfigure the current time, date, and other settings.
- Display indicators reappear as soon as the battery is charged from Level 5 to Level 2.
- Leaving the watch exposed to direct sunlight or some other very strong light source can cause the battery power indicator to show a reading temporarily that is higher than the actual battery level. The correct battery level should be indicated after a few minutes.



- Performing multiple sensor, illumination, or beeper operations during a short period may cause all of the battery indicators (L, M, H) to flash on the display. Illumination, alarm, countdown timer alarm, hourly time signal, and sensor operations will be disabled until battery power recovers. After some time, battery power will recover and battery indicators (L, M, H) 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 is indicated by battery indicators (L, M, H) on the display.
- If battery indicators (L, M, H) appears frequently, it probably means that remaining battery power is low. Leave the watch in bright light to allow it to charge.

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.

- The following table shows the amount of time the watch needs to be exposed to light each day in order to generate enough power for normal daily operations.

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

- For details about the battery operating time and daily operating conditions, see the "Power Supply" section of the Specifications.
- Stable operation is promoted by frequent exposure to light.

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 5	Level 4	Level 3	Level 2	Level 1
Outdoor Sunlight (50,000 lux)		1 hour		14 hours	4 hours
Sunlight Through a Window (10,000 lux)		4 hours		68 hours	19 hours
Daylight Through a Window on a Cloudy Day (5,000 lux)		6 hours		137 hours	38 hours
Indoor Fluorescent Lighting (500 lux)		61 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.

Moon Phases and Moon Age

The Moon goes through a regular 29.53-day cycle. During each cycle, the Moon appears to wax and wane as the relative positioning of the Earth, Moon, and Sun changes. 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.

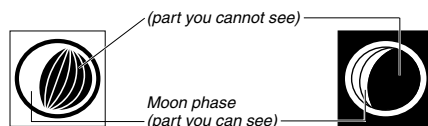
This watch performs a rough calculation of the current Moon age starting from day 0 of the moon age cycle. Since this watch performs calculations using integer values only (no fractions), the margin for error of the displayed Moon age is ± 1 day.

Moon Phase Indicator

Moon Phase indicator



The Moon phase indicator of this watch indicates the current phase of the Moon as shown below. It is based on the view of the left side of the moon at meridian transit from the northern hemisphere of the Earth. If the appearance of the Moon phase indicator is reversed from the actual Moon as viewed from your location, you can use the procedure under "To reverse the displayed Moon phase" to change the indicator.



Module 3135

Module 3206

Moon Phase Indicator	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206
	Moon Age	28.7-29.5 0.0-0.9	1.0-2.7	2.8-4.6	4.7-6.4	6.5-8.3	8.4-10.1	10.2-12.0	12.1-13.8	
Moon Phase	New Moon				First Quarter (Waxing)					

Moon Phase Indicator	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206	Module 3135	Module 3206
	Moon Age	13.9-15.7	15.8-17.5	17.6-19.4	19.5-21.2	21.3-23.1	23.2-24.9	25.0-26.8	26.9-28.6	
Moon Phase	Full Moon				Last Quarter (Waning)					

Tidal Movements

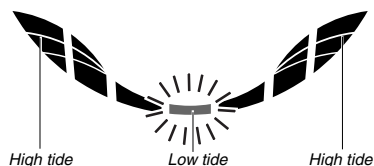
Tides are the periodic rise and fall of the water of oceans, seas, bays, and other bodies of water caused mainly by the gravitational interactions between the Earth, Moon and Sun. Tides rise and fall about every six hours. The Tide Graph of this watch indicates tidal movement based on the Moon's transit over a meridian and the lunital interval. The Tide Graph calculates and graphically represents current tide conditions in your Home City or a port city in the vicinity of the Home City based on longitudes, lunar day length, and lunital interval preset in watch memory, and on high tide times specified by you.

Tide Graph

The Tide Graph graphically represents the current tide condition using one of three patterns that represent spring tide, intermediate tide, and neap tide, as shown below.

Tide Name	Graph	Description
Spring Tide		Large difference between high tide and low tide. Occurs a few days before and after a New Moon and Full Moon.
Intermediate Tide		Medium difference between high tide and low tide.
Neap Tide		Small difference between high tide and low tide. Occurs a few days before and after the first quarter and last quarter of a half moon.

- The Tide Graph flashes as shown below to indicate the tide range.



- The segments on either end of the Tide Graph flash during high tide.

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".

Auto Return Features

- The watch returns to the Timekeeping Mode automatically if you do not perform any button operation for two or three minutes in the Tide/Moon Data, Alarm, Data Recall, Digital Compass, or Barometer/Thermometer Mode.
- If you do not perform any button operation while in the Altimeter Mode, the watch returns to the Timekeeping Mode automatically after nine or 10 hours.
- If you leave a screen with flashing digits on the display for two or three minutes without performing any operation, the watch exits the setting screen automatically.

Initial Screens

When you enter the World Time or Alarm Mode, the data you were viewing when you last exited the mode appears first.

Scrolling

The (A) and (C) buttons are used on the setting screen 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.

Sensor Malfunction Indicator

Subjecting the watch to strong impact can cause sensor malfunction or improper contact of internal circuitry. When this happens, E.F.F. (error) will appear on the display and sensor operations will be disabled.

- If E.F.F. appears while a measurement operation is being performed in a sensor mode, restart the measurement. If E.F.F. appears on the display again, it can mean there is something wrong with the sensor.
- 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, E.F.F. will appear on the display. This does not indicate malfunction, and sensor operation should resume once battery voltage returns to its normal level.
- If E.F.F. keeps appearing during measurement, it could mean there is a problem with the applicable sensor.

Whenever you have a sensor malfunction, be sure to take the watch to your original dealer or nearest authorized CASIO distributor as soon as possible.

Button Operation Tone

Mute indicator



The button operation tone sounds any time you press one of the watch's buttons. You can turn the button operation tone on or off as desired.

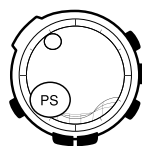
- Even if you turn off the button operation tone, the alarm, Hourly Time Signal, and Countdown Timer Mode alarm all operate normally.

To turn the button operation tone on and off

In any mode (except when a setting screen is on the display), hold down (D) to toggle the button operation tone on (X not displayed) and off (X displayed).

- Since the (D) button also is the mode change button, holding it down to turn the button operation on or off also causes the watch's current mode to change.
- The X indicator is displayed in all modes when the button operation tone is turned off.

Power Saving



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

- There actually are two sleep state levels: "display sleep" and "function sleep".

Elapsed Time in Dark	Display	Operation
60 to 70 minutes (Display Sleep)	Blank, with PS flashing	Display is off, but all functions are enabled.
6 or 7 days (Function Sleep)	Blank, with PS not flashing	All functions are disabled, but timekeeping is maintained.

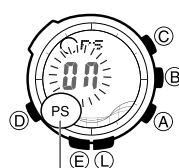
- Wearing the watch inside the sleeve of clothing can cause it to enter the sleep state.
- The watch will not enter the sleep state while the digital time is between 6:00 AM and 9:59 PM. If the watch is already in the sleep state when the digital time reaches 6:00 AM, however, it will remain in the sleep state.
- The watch will not enter the sleep state while it is in the Digital Compass, Barometer/Thermometer, Altimeter, Countdown Timer, or Stopwatch Mode. When the watch is left in any mode besides the Countdown Timer and Stopwatch Mode, it will return to the Timekeeping Mode automatically after a specific amount of time. Then if left in the dark for the elapsed time indicated in the table above, the watch will 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 two 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



Power Saving on indicator

- In the Timekeeping Mode, hold down (E) until the city code starts to flash, which indicates the setting screen.
 - Press (D) nine times until the Power Saving on/off screen appears.
 - Press (A) to toggle Power Saving on (PS) and off (PSF).
 - Press (E) to exit the setting screen.
- The Power Saving on indicator (PS) is on the display in all modes while Power Saving is turned on.

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.
- 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.
- The 12-hour/24-hour timekeeping format you select in the Timekeeping Mode is applied in all modes.
- The watch's built-in full automatic calendar 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 5.
- The times for the Timekeeping Mode and all the city codes of the World Time Mode are calculated in accordance with each city's UTC offset.
- The UTC offset is a value that indicates the time difference between a reference point in Greenwich, England and the time zone where a city is located.

- The letters "UTC" is the abbreviation for "Universal Time Coordinated", which is the world-wide scientific standard of timekeeping. It is based upon carefully maintained atomic (cesium) clocks that keep time accurately to within microseconds. Leap seconds are added or subtracted as necessary to keep UTC in sync with the Earth's rotation.

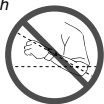
Illumination Precautions

- The electro-luminescent panel that provides illumination loses power after very long use.
- Illumination may be hard to see when viewed under direct sunlight.
- Illumination turns off automatically 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 illumination runs down the battery.

Auto light switch precautions

- The auto light switch is turned off automatically whenever battery power is at Level 4.
- Wearing the watch on the inside of your wrist, movement of your arm, or vibration of your arm can cause frequent activation of the auto light switch and illumination of 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.
- Note that wearing the watch under your sleeve while the auto light switch is turned on can cause frequent illumination of the display and can run down the battery.

More than 15 degrees too high



- Illumination may not turn on 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.
- Illumination turns off in about one second, 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 illumination does not turn on, try moving the watch back to the starting position (parallel with the ground) and then tilt it back towards your face 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, illumination does not turn on until about one second after you turn the face of the watch towards you. This does not necessarily indicate malfunction.
- You may notice a very faint clicking sound coming from the watch when it is shaken back and forth. This sound is caused by mechanical operation of the auto light switch, and does not indicate a problem with the watch.

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 all moisture from the case. It takes approximately 20 to 30 minutes for the case of the watch to reach the actual surrounding temperature.

Pressure Sensor and Temperature Sensor Calibration

The pressure sensor and temperature sensor built into the watch are calibrated at the factory and normally require no further adjustment. If you notice serious errors in the pressure readings and temperature 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.
- 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 pressure sensor and the temperature sensor



- Press (B) to enter the Barometer/Thermometer Mode.
- In the Barometer/Thermometer Mode, hold down (E) for about two seconds until either **OFF** or the reference temperature value starts to flash. This is the setting screen.
 - If you want to calibrate the barometric pressure sensor, press (D) to move the flashing to the middle display area. This is the pressure sensor calibration screen.
 - At this time, **OFF** or the barometric pressure value should be flashing on the display.
- Use (A) (+) and (C) (-) to set the calibration value in the units shown below.

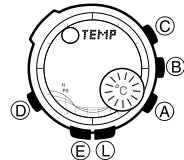
Temperature	0.1°C (0.2°F)
Barometric Pressure	1 hPa (0.05 inHg)

 - "OFF" is displayed while the reference temperature value and barometric pressure value are zero (0).

- Pressing (A) and (C) at the same time returns to the factory calibration (**OFF**).

- Press (E) to return to the Barometer/Thermometer Mode screen.

To select the temperature, barometric pressure, and altitude units



- Enter the Timekeeping Mode.
- Hold down (E) until the city code starts to flash, which indicates the setting screen.
- Use (D) to select the setting screen for the unit you want to change.
 - See step 3 under "To set the time and date" for information about how to scroll through setting screens.

- Press (A) to change the unit setting.
 - Each press of (A) changes the selected unit setting as shown below.

Temperature	°C and °F
Altitude	m and ft
Barometric Pressure	hPa and inHg
- After the settings are the way you want, press (E) to exit the setting screen.

Specifications

Accuracy at normal temperature: ±20 seconds a month

Timekeeping: Hour, minute, second, p.m. (P), month, day, day of the week

Time format: 12-hour and 24-hour

Calendar system: Full Auto-calendar pre-programmed from the year 2000 to 2099

Other: 2 display formats (Day of the Week, Barometric Pressure Graph); Home City code (can be assigned one of 33 city codes); Standard Time / Daylight Saving Time (summer time)

Digital Compass: 20 seconds continuous measurement; 16 directions; Angle value 0° to 359°; Four direction pointers; Calibration (bidirectional, northerly); Magnetic declination correction

Barometer:

Measurement and display range: 260 to 1,100 hPa (or 7.65 to 32.45 inHg)

Display unit: 1 hPa (or 0.05 inHg)

Measurement timing: Daily from midnight, at two hour intervals (12 times per day); Every five seconds in the Barometer/Thermometer Mode

Other: Calibration; Manual measurement (button operation); Barometric pressure graph

Thermometer:

Measurement and display range: -10.0 to 60.0°C (or 14.0 to 140.0°F)

Display unit: 0.1°C (or 0.2°F)

Measurement timing: Every five seconds in the Barometer/Thermometer Mode

Other: Calibration; Manual measurement (button operation)

Altimeter:

Measurement range: -700 to 10,000 m (or -2,300 to 32,800 ft.) without reference altitude

Display range: -10,000 to 10,000 m (or -32,800 to 32,800 ft.)

Negative values can be caused by readings produced based on a reference altitude or due to atmospheric conditions.

Display unit: 5 m (or 20 ft.)

Current Altitude Data: 5-second interval for first 3 minutes followed by 2-minute interval for next 9 or 10 hours

Altitude Memory Data: 24 altitude records and one high altitude record
Altitude records: Pressing a button records the current altitude value, along with the date (month-day) of the reading.

High altitude record: Automatically records the highest altitude value measured in the Altimeter Mode to date, along with the date (month-day) of the reading.

Other: Reference altitude setting; Altitude graph

Bearing Sensor Precision:

Direction: Within $\pm 10^\circ$

Values are guaranteed for a temperature range of -10°C to 40°C (14°F to 104°F).

North pointer: Within ± 2 digital segments

Pressure Sensor Precision:

	Conditions (Altitude)	Altimeter	Barometer
Fixed temperature	0 to 6000 m 0 to 19680 ft.	\pm (altitude differential $\times 3\%$ + 30 m) m \pm (altitude differential $\times 3\%$ + 100 ft.) ft.	\pm (pressure differential $\times 3\%$ + 3 hPa) hPa \pm (pressure differential $\times 3\%$ + 0.0885 inHg) inHg
	6000 to 10000 m 19680 to 32800 ft.	\pm (altitude differential $\times 3\%$ + 45 m) m \pm (altitude differential $\times 3\%$ + 150 ft.) ft.	
Effect of variable temperature	0 to 6000 m 0 to 19680 ft.	± 80 m every 10°C ± 264 ft. every 50°F	± 6 hPa every 10°C ± 0.177 inHg every 50°F
	6000 to 10000 m 19680 to 32800 ft.	± 120 m every 10°C ± 396 ft. every 50°F	

- Values are guaranteed for a temperature range of -10°C to 40°C (14°F to 104°F).
- Precision is lessened by strong impact to either the watch or the sensor, and by temperature extremes.

Temperature Sensor Precision:

$\pm 2^\circ\text{C}$ ($\pm 3.6^\circ\text{F}$) in range of -10°C to 60°C (14.0°F to 140.0°F)

Tide/Moon Data:

Moon phase indicator for specific date; Tide level for specific date and time

Other: High tide time adjustment; Moon phase reversal

Countdown Timer:

Measuring unit: 1 second

Countdown range: 60 minutes

Setting ranges: Countdown start time (1 to 60 minutes, 1-minute increments);

Reset time (1 to 5 minutes, 1-minute increments)

Other: Progress beeper

Stopwatch:

Measuring unit: 1/100 second

Measuring capacity: 23:59' 59.99"

Measuring modes: Elapsed time, split time, two finishes

Alarms: 5 Daily alarms; Hourly time signal

World Time: 33 cities (29 time zones)

Other: Daylight Saving Time/Standard Time

Illumination: EL Backlight (electro-luminescent panel); Auto Light Switch (Full Auto EL Light operates only in the dark)

Other: Battery power indicator; Power Saving; Low-temperature resistance ($-10^\circ\text{C}/14^\circ\text{F}$); Button operation tone on/off

Power Supply: Solar cell and one rechargeable battery

Approximate battery operating time: 5 months (from full charge to

Level 4) under the following conditions:

- Watch not exposed to light
- Internal timekeeping
- Display on 18 hours per day, sleep state 6 hours per day
- 1 illumination operation (1.5 seconds) per day
- 10 seconds of alarm operation per day
- 10 digital compass operations per week
- 10 hours of altimeter measurement at 2-minute interval, once per month
- 2 hours of barometric pressure measurement per day

Frequent use of illumination runs down the battery. Particular care is required when using the auto light switch.

20 months when the watch is left in the sleep state (display off) after a full charge.

City Code Table

City Code	City	UTC Offset/ GMT Differential
PPG	Pago Pago	-11
HNL	Honolulu	-10
ANC	Anchorage	-9
LAX	Los Angeles	-8
DEN	Denver	-7
CHI	Chicago	-6
NYC	New York	-5
CCS*	Caracas	-4
RIO	Rio De Janeiro	-3
FEN	Fernando de Noronha	-2
RAI	Praia	-1
UTC		-
LON	London	0
PAR	Paris	0
BER	Berlin	+1
ATH	Athens	
CAI	Cairo	+2
JRS	Jerusalem	

City Code	City	UTC Offset/ GMT Differential
JED	Jeddah	+3
THR	Tehran	+3.5
DXB	Dubai	+4
KBL	Kabul	+4.5
KHI	Karachi	+5
DEL	Delhi	+5.5
DAC	Dhaka	+6
RGN	Yangon	+6.5
BKK	Bangkok	+7
HKG	Hong Kong	+8
SEL	Seoul	+9
TYO	Tokyo	
ADL	Adelaide	+9.5
SYD	Sydney	+10
NOU	Neumea	+11
WLG	Wellington	+12

- Based on data as of December 2008.
- The rules governing global times (GMT differential and UTC offset) and summer time are determined by each individual country.
- * In December 2007, Venezuela changed its offset from -4.0 to -4.5 . Note however, that this watch displays an offset of -4.0 (the old offset) for the CCS (Caracas, Venezuela) city code.