

Oregon Scientific™ OUTBREAKER Sports Watch (TS1X0 series)

User Manual

TABLE OF CONTENTS

Introduction	2
Key features	3
OUTBREAKER watch	3
Chest belt (TS120/ TS130 only)	3
Bicycle equipment	3
PC Kit	4
LCD display symbols	4
How the OUTBREAKER works	6
How the altimeter, thermometer and barometer work (TS 110 & 130 only)	6
A multi-system facility	6
TOUR Mode	6
PC Kit	6
Getting started	7
Turn on the watch (first-time use only)	7
Batteries	7
Switch between Modes	8
Switch between Mode options	8
Change setting values	8
Use the HI-GLO backlight	8
Key lock	8
Handling the product	8

CLOCK Mode	9
Set clock	9
Set the alarm	9
Stopwatch	9
Timer	10
Temperature display (TS110 / TS130 Only)	10
ALTI Mode (TS110 / TS130 Only)	10
Access altimeter options	11
Set current altitude and resolution	11
Set altitude alert	12
Recall altitude data	12
Switch between view options	13
Additional view options	13
BARO Mode (TS110 / TS130 Only)	13
Set sea-level pressure	13
View sea-level pressure	14
Weather forecast	14
TOUR Mode	14
TOUR memory	14
Activate TOUR Mode	15
Record markers in TOUR Mode	15
Pause TOUR Mode	15
Deactivate TOUR Mode	16
Clear all TOUR memories	16
PULSE (Heart Rate) Mode (TS120 / TS130 only)	16
Wearing the chest belt	17
Training Zones	17
Set Training Zones alarm	18
Track heart rate during training	19

BIKE Mode	20
Set up for BIKE Mode	20
Step 1: Attach the equipment to the bicycle	20
Step 2: Enter wheel circumference	21
Access the BIKE Mode options	22
View speed and cadence information	22
PC Kit	22
PC Mode	23
Set up for PC Mode	23
Use the software	23
PC Mode options	23
Download data	24
Effective use and range	24
Aquatic and outdoor activities	24
Safety and care	25
Safety precautions	25
Care instructions	25
Troubleshooting guide	26
Specifications	27
Warnings	29
Additional resources	29

INTRODUCTION

Thank you for selecting the Oregon Scientific OUTBREAKER Sports Watch as your fitness product of choice. Your new sports watch is designed to give you many years of reliable service and includes the following features:

- Clock, calendar, stopwatch and timer functions
- Barometer with local and sea pressure readings (TS110 / TS130 only)
- Weather forecast and temperature readings for up to 24 hours (TS110 / TS130 only)
- Altimeter readings up to 9,000 meters (29,700 feet) (TS110 / TS130 only)
- Heart rate monitor that gives heart rate readings during exercise (TS120 / TS130 only)
- Bicycle accessory kit to take readings during cycling
- PC docking station and software to download readings onto your computer

The OUTBREAKER TS110 and TS130 sports watches comprise the most advanced and patented Baro-compensation technology, distinguishing between barometric and altitude pressure changes, and giving you more reliable readings (weather forecasts, etc.). It is a precision device designed to augment your daily or weekly exercise program as well as provide you with accurate and easy to use watch functions.

This manual contains important safety and care information, and provides step-by-step instructions for using this product. Read the manual thoroughly, and keep it in a safe place in case you need to later refer to it..

KEY FEATURES

OUTBREAKER WATCH



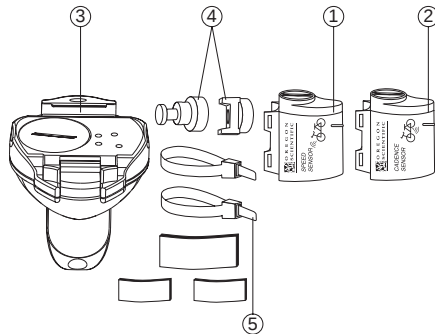
ITEM	NAME	DESCRIPTION
1	SELECT/+	Press to increase value, change Mode display. Press and hold to activate the key lock function.
2	MODE	Press to switch between Modes.
3	MARKER/LIGHT	Press to activate HIGLO backlight. Press to record a marker during TOUR Mode.
4	ST/SP/-	Press to start or stop the Stopwatch/Timer or decrease value.
5	FUN/SET	Press to enter a sub-mode or press and hold to change a value.
6	LYCRA WATCH STRAP	Unfasten the strap and pull to remove.

CHEST BELT



ITEM	NAME
1	CHEST BELT
2	STRAP

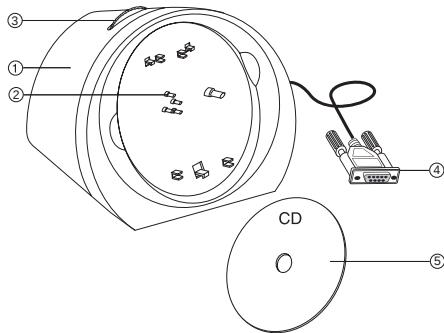
BICYCLE EQUIPMENT



ITEM	NAME
1	WIRELESS SPEED SENSOR
2	CADENCE SENSOR (TS130-WIRELESS; TS110/TS120-WIRE-CONNECTED to Bike Mount)
3	BIKE MOUNT
4	MAGNETS/ SCREWS/ NUTS/PADS
5	FIXING STRAPS

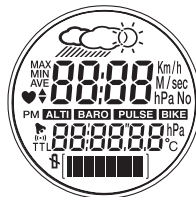
NOTE The OUTBREAKER TS130 comes with two wireless sensors.

PC KIT



ITEM	NAME
1	DOCKING STATION
2	WATCH CONNECTION POINTS
3	MOUNTING CLIPS (rotate to release)
4	RS-232C COMPUTER CONNECTION CABLE
5	SOFTWARE CD-ROM

LCD DISPLAY SYMBOLS



SYMBOL	DESCRIPTION
03:38	The current time.
YR	Year setting.
MTH	Month setting.
DAY	Day setting.
MON (MON..SUN)	Current day of the week.
TRIP	TOUR Mode is running time/date cannot be set
HR	Hour setting.
MIN	Minute setting.
SET	Displayed when in a setting mode.
AL	Shows alarm time, or event alarms (max/min altitude/heart rate etc)
No AL	Shows alarm is deactivated.
▶	Shows if alarm is on.

	Weather forecast for the next 12-24 hours. (Sunny/Slightly Cloudy/Cloudy/Rainy)
STW	Stopwatch can be started/stopped/reset.
TMR	Timer (countdown) can be started/stopped/reset
ALTI	Altitude is displayed (top row).
MEM	Memory record (current trip only).
LOC	Local barometric pressure.
SEA	Sea pressure (barometric).
SPD	Shows vertical speed (historical or current).
	Graphical display of your bicycle speed.
ttl	Shows total time of activity.
	Shows altitude graphically.
	Heart rate (per minute) monitor activated.
	Heart rate signal reception.
Status Bar Blinks	Key lock activated.
Z1 (1-5)	Shows which training shown is currently selected.
	Shows heart beat graphically.
M1 (1..99)	Shows which record you are making, or storing (see TOUR Mode).
WØ (wheel icon)	Wheel circumference setting mode.
CAD	Cadence (pedal) speed (revolutions/min).
88%	% of memory used in TOUR Mode.
END	TOUR is finished.
CLR	Ready to clear all tour memories.

donE	All tour memories have been cleared.
hPa	Pressure shown in Hecto-Pascal's.
inHg	Pressure shown in inches of mercury.
	Low battery level (replace batteries)
REST	TOUR Mode paused (off) or resumed (on)

HOW THE OUTBREAKER WORKS

The top feature of the OUTBREAKER TS series is a Bike Computer that allows you to download information to a PC. Select models also include a Heart Rate Monitor (TS120) or/ and Altimeter and Barometer (TS110). TS110 and TS130 feature temperature and weather forecast (with baro-compensation technology for accuracy). The TS130 has all these features.

HOW THE ALTIMETER, THERMOMETER, AND BAROMETER WORK

The patented baro-compensation technology used in this watch allows it to distinguish between barometric pressure change and altitude pressure change. This means it can detect barometric pressure (localized weather conditions) as distinct from changes in altitude pressure, and gives more accurate readings than most average devices (which frequently rely on manual deactivation before initiating a new forecast).

A MULTI-SYSTEM FACILITY

The product is designed for use during many kinds of activity. It can display and store a range of information of interest to the casual and more serious sports or exercise enthusiast. The watch includes the following Modes:

TS110 — Clock, Altimeter, Barometer, Bike & PC

TS120 — Clock, Pulse, Bike & PC

TS130 — Clock, Altimeter, barometer, Pulse, Bike and PC

It is equipped with a multi-system facility that allows you to

combine information according to your preference, such as sea level pressure and temperature (Except TS120), Heart Rate and Stopwatch (TS120/TS130), or bike speed and cadence for all three models. You may also use the stopwatch or timer (countdown) facility in combination with other functions, and both will continue to run in the background while you use other features of the watch.

The heart-rate monitor and altimeter features of the OUTBREAKER watch include customized settings. For the TS120/TS130 models, maximum and minimum heart rate limits can be set for use during exercise, and for the TS110/TS130, the altimeter can be set to register ascending and descending limits. In both cases a short beep signifies either limit has been exceeded. The watch also has a clock, calendar, and chronometer, all of which need to be set according to the current date and location.

TOUR MODE

The watch features a TOUR Mode in which you can record all data from a single trip, or workout, and then download this information onto your PC for storage and viewing. The watch can recall 99 different single tours, trips or workouts.

NOTE The docking station and CD-ROM are supplied to download information from TOUR Mode.

PC KIT

A docking station is provided with the watch for connecting to a computer, along with a CD-ROM for installing the necessary software onto your computer. You can also use the software to change some of the watch settings.

GETTING STARTED

TURN ON THE WATCH (FIRST-TIME USE ONLY)

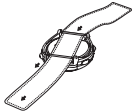
Press **MODE** key for 2 seconds or more to activate the LCD Display

BATTERIES

All batteries are included and already installed. Refer to the Specifications page for battery types (→ 28).

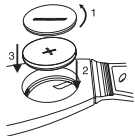
NOTE To avoid the possibility of permanently damaging the watch, we strongly recommend that you take your watch to a local retailer or jeweler to have the watch battery replaced.

To load new batteries in the watch:

Diagram	Instructions
	1. Remove the Lycra strap.
	2. Remove the back cover with a small Phillips screwdriver.
	3. Install the battery by matching the correct polarity. Always use the correct battery type. Warning: Reversing the polarity may damage the product.
	4. Replace the cover, screws, screw pin, and watchband. (Be sure to replace the O ring properly).
	5. Check that replacement batteries are fitted properly by pressing a button. You should hear a beep.

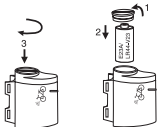
To load new batteries in the chest belt (TS120 and TS130 only) and bike mount:

NOTE The chest belt will stop sending signals if its battery is low. Bad transmission from the chest belt may also be the result of poor contact with the skin, surrounding interference, or placing the receiver watch too far away.

Diagram	Instructions
	1. Insert a coin into the groove. Turn counter-clockwise.
	2. Insert the battery. Match the correct polarity.
	3. Replace the battery compartment. Tighten into place.

To load new batteries in the bicycle sensors and bike mount:

NOTE The sensors will stop sending signals to the watch if their batteries are low.

Diagram	Instructions
	1. Insert a coin into the groove and turn counter-clockwise.
	2. Remove the battery. Remove the battery and insert a new one.
	3. Replace the battery holder and compartment lid. Tighten into place.

NOTE Replace the batteries whenever the HIGLO backlight dims or stops working, or when you see the low battery icon.

Change the battery whenever the sensor does not perform as expected.

NOTE Used batteries can be harmful to the environment, and should not be thrown out with household rubbish. Contact your local waste disposal authority for instructions on how to dispose of used batteries. Protect the environment by taking exhausted batteries to authorized disposal stations.

SWITCH BETWEEN MODES

Press the **MODE** button to switch between the Modes:

TS110 — CLOCK, ALTIMETER, BAROMETER, BIKE, and PC

TS120 — CLOCK, PULSE (Heart Rate), BIKE, and PC

TS130 — CLOCK, ALTIMETER, BAROMETER, PULSE, BIKE, and PC

A status bar the appropriate mode on the LCD display when it is selected.

SWITCH BETWEEN MODE OPTIONS

Press **SELECT/+** to switch between the options within a Mode.

CHANGE SETTING VALUES

Press and hold **FUN/SET** for 2 seconds to enter setting mode. Then, press **ST/SP/-** or **SELECT/+** to change the value. Press **FUN/SET** to switch between options, and to confirm the changes when you are done.

USE THE HI-GLO BACKLIGHT

Press **MARKER/LIGHT** to turn on the HI-GLO backlight on for five seconds. Once the light is on, press any key to keep it on for a further five seconds.

In order to save power the light will not work when the battery is low. If this happens, change the battery as soon as possible.

KEY LOCK

The watch also has a key lock function to stop the buttons from being accidentally pressed during an activity. To activate it simply press and hold **SELECT/+** until the status bar blinks. The function keys are now useless. To reactivate them, press and hold **SELECT/+** again until the status bar stops blinking.

NOTE The alarm will still go off while the Key Lock is activated. Pressing any key while in Key lock will stop the alarm.

HANDLING THE PRODUCT

The watch is designed to withstand a wide range of sports activities, and comes complete with a strong wristband. When riding, make sure the watch is firmly connected to the bike mount, and connect all bicycle equipment carefully and securely. See the BIKE Mode section (➔ 20) for instructions.

CLOCK MODE

The time, date (including the day of the week) and time alarm can be set while the watch is in CLOCK Mode. Follow the instructions below to set or activate the time, date, alarm time, stopwatch and timer.

SET CLOCK:

1. Press **MODE** to display the CLOCK Mode.
2. Press and hold **FUN/SET** for 2 seconds. "24h" will flash on the display.
3. Press **ST/SP/-** to change from 24 hour to 12 hour time display.
4. Press **FUN/SET** again. The hour will flash. Press **SELECT/+** to move the value up, or **ST/SP/-** to move the value down.

Tip: Continuously press and hold a button to fast-change the value.

5. Repeat Steps 3 – 4 to change the rest of the settings, in this order: hours, minutes, year, month, and day.

NOTE You cannot change these settings while in TOUR Mode. If you attempt to do so, TRIP will show on the display. Refer to the TOUR Mode section (➔ 14).

SET THE ALARM

1. Press **MODE** to display the CLOCK mode.
2. Press **FUN/SET** to display the Alarm screen.
3. To turn the alarm on or off, press **SELECT/+**.
4. To change the alarm settings, press and hold **FUN/SET** for 2 seconds. Then, use the **SELECT/+** or **ST/SP/-** buttons to change the hour. Press **FUN/SET** to switch to minutes, and use **SELECT/+** or **ST/SP/-** to change the values. Press **FUN/SET** again when you are finished.

STOPWATCH

The Stopwatch works in CLOCK, ALTI, PULSE, and BIKE Modes. From any of these Modes, press **SELECT/+** to display the stopwatch. Then,

- Press **ST/SP/-** to start, pause, and stop the stopwatch.
- With the stopwatch stopped, press **ST/SP/-** again to reset.

NOTE You can switch to other Modes while running the stopwatch in the background.



TIMER

The Timer works in CLOCK, ALTI, PULSE, and BIKE Modes. From any of these Modes, press **SELECT/+** to display the stopwatch. Press **ST/SP/-** to reset the Stopwatch, then:



- Press and hold **FUN/SET** for 2 seconds. The display will change to TMR.
- Press **ST/SP/-** or **SELECT/+** to change a value.
- Press **FUN/SET** to switch between values and accept changes.
- Press **ST/SP/-** to start or stop the timer.
- With the timer stopped, press **ST/SP/-** again to reset.

NOTE You can switch to other Modes while running the timer in the background.

NOTE To return to STW Mode, you must reset all the timer values to 0. The timer automatically switches to STW Mode when it reaches 0.

TEMPERATURE DISPLAY (TS110 & TS130 ONLY)

The Temperature can be displayed in CLOCK, ALTI, and BARO Modes. From any of these Modes, press **SELECT/+** to display the Temperature. The Temperature shows in either Celsius or Fahrenheit only, depending on the watch version you purchased.



NOTE Your wrist temperature may affect the reading, particularly during exercise. Take off the watch and leave it for 15 minutes to get the most accurate reading.

ALTI MODE (TS110 / TS130 ONLY)

The OUTBREAKER sports watch includes a barometer that distinguishes between pressure caused by altitude changes and pressure caused by weather conditions. This technology reduces discrepancies in readings and makes the altimeter more accurate than most average devices.



The watch can store and recall the following values:

- Current altitude
- Maximum / minimum altitudes attained during your a trip

- Total accumulated maximum / minimum altitudes attained during your trip
- Maximum / minimum altitude alert (sounds an alarm when exceeded)
- Maximum ascending, maximum descending speeds
- Current vertical speed
- Rate of altitude change

The altitude is shown in two ways, as a numeric value indicating your current altitude, and as a bar chart indicating changes in altitude. Both values will change as you move about.

ACCESSING THE ALTIMETER OPTIONS

Press **MODE** to access the ALTI Mode, then press **SELECT/+** to loop through the options.

SET CURRENT ALTITUDE

When you first use the watch, it is important to set the current altitude and local sea-level pressure so your ascending and descending altitude can be accurately measured. **You can find the current altitude by comparing your position to a topographical map**, and then entering the value in the watch.

NOTE It is necessary to reset the altitude after being in a pressurized chamber (i.e., airplane).

For instructions on setting the sea-level pressure, refer to the next section.

Diagram	Instructions
	1. Press and hold FUN/SET for 2 seconds while in ALTI mode.
	2. Use SELECT/+ or ST/SP/- to change the value.
	3. Press FUN/SET to exit the setting mode.

Tip: You can also set the current altitude and alarm limits with the help of the PC software (see PC section).

SET ALTITUDE ALERT

The watch can be set to remember an altitude limit (either up or down, but not both simultaneously). If the alarm is activated, a series of beeps (at 5 second intervals) will sound, and the whole LCD display will flash, when you breach the limit. To end the alert, press any button.

To activate or deactivate the alert and set its direction:

Diagram	Instructions
	1. Press FUNC/SET 2 times until you reach the Alarm screen. Display reads 'AL' (off) or 'AL' (on) at the bottom)
	2. You may set the arrow at the bottom of the screen to a <i>ascending</i> , or <i>descending</i> limit (but not both). To change direction, press ST/SP/- .
	3. Press SELECT/+ to turn the alarm on or off.

To set the altitude alert value:

Diagram	Instructions
	1. Press and hold FUNC/SET for 2 seconds, then press SELECT/+ or ST/SP/- to change the altitude limit.

RECALLING ALTITUDE DATA

The OUTBREAKER allows you to track the following information as you exercise.

- Max / min altitude attained -- shows the highest or lowest point you have reached so far in relation to your watch's permanent altitude setting.
- Max / min altitude accumulated -- represents the total distance you have ascended or descended; that is, every incline is added together or 'accumulated', and likewise every decline is added and 'accumulated', to give a total.
- Vertical speed -- how fast you are currently climbing
- Max ascending speed -- fastest speed you have climbed
- Max descending speed -- fastest speed you have descended

NOTE Clearing the memory allows you to start over again on a new trip, though all the information from your current trip will be lost.

SWITCH BETWEEN VIEW OPTIONS

While in ALTI Mode, press **SELECT/+** to switch between the view options: Altimeter/Clock, Altimeter/Local pressure, Altimeter/STW and Altimeter/Temperature.



ADDITIONAL VIEW OPTIONS

While viewing the ALTI/Clock display, press **FUN/SET** to switch between additional view options: max and TOTAL - TTL (accumulated) ascending altitude (press **SELECT/+** to show max and accumulated descending altitude), altitude alarm, current vertical speed and clock (use **SELECT/+** to show current vertical speed and stopwatch), and max vertical speed (press **SELECT/+** for max descending speed).

To clear a value from the memory, press and hold **FUN/SET** for 2 seconds.



BARO MODE (TS110/TS130 ONLY)

A unique feature of the TS110/ TS130 BARO Mode is that it enables you to view sea level pressure history for the past 24 hrs.

SET THE SEA-LEVEL PRESSURE

Sea level pressure can change relative to location. To achieve accurate altitude readings, set the sea-level pressure value before every trip. Check the newspaper, local news station, trail marker, or weather forecast for local readings, and always select the reading nearest to your present location.

Diagram	Instructions
	1. While in BARO Mode, press FUN/SET until the SEA (sea pressure) screen is shown.
	2. Use SELECT/+ or ST/SP/- to change the value. The value will change in increments of 1 hPa or .03 inHg, depending on the watch you purchased.
	3. Press FUN/SET again when finished.

VIEW THE SEA-LEVEL PRESSURE

To view a graphical image of the sea level pressure (for the current 14 hours), press **FUN/SET** with the SEA screen shown in BARO Mode. Press **SELECT/+** to view sea pressure history for -1h (last hour) up to -24h, then press **FUN/SET** again to view the reading.



WEATHER FORECAST

The built-in barometer helps to forecast the weather for the next 12-24 hours. This reading is based on barometric pressure changes and has an effective range of 30 to 50 kilometers (18 – 31 miles). The patented baro-compensation technology in the OUTBREAKER watch allows it to differentiate between pressure changes due to altitude, and those due to weather changes. To avoid inaccurate forecasts, the watch will favor altitude readings when you are *actually* ascending or descending. This means the weather icon will disappear after significant vertical movements. To display an accurate forecast, simply remain at any fixed altitude for roughly 5 minutes.

The forecast will be displayed at the top of the watch as one of these four icons:



NOTE When functioning normally the watch automatically updates the forecast every 15 minutes.

TOUR MODE

There are two ways of using the memory on the OUTBREAKER. First, the watch computer will record information as you train, for display only. This means you can check the information during or after your exercise, but there will be no record once you clear the memory in preparation for your next training event.

To record and store this information (for up to 99 different trips, depending on the size of each record – see below) you must activate the TOUR Mode and view the records through the PC software.

NOTE The information from a TOUR can only be viewed through the PC software.

NOTE You cannot change the date or time during TOUR Mode.

TOUR MEMORY

TOUR Mode allows you to record and store data displayed on the watch, which can then be downloaded onto your PC. Up to 99 TOURs can be recorded and stored to the PC software. Depending on the model you purchase, the information you choose to record (see below), and the time used by TOURs you have already stored on the watch, the available memory length may vary. The average memory storage capacities in real-time, (taking a data sample every 5 seconds), assuming default settings (see Specifications: TOUR Mode) and no TOURs have been saved for each model are as follows:

Recording Interval	Total Memory Recording time (hours)		
	TS130	TS120	TS110
5 sec	11	8	6
20 sec	44	34	23
40 sec	88	68	47
60 sec	132	102	70
120 sec	264	203	140
240 sec	527	406	280

The watch can record and store up to 99 different trips, providing there is enough remaining memory.

Default sampling time for readings in TOUR Mode is every 5 seconds. To increase the gap between samplings, and thus increase the memory capacity, you can adjust this setting through the PC software.

ACTIVATE TOUR MODE:

For best results, perform these steps immediately before you begin your trip.

1. Simultaneously press **FUN/SET** and **MODE**. The TOUR END screen will display.
2. Press and hold **FUN/SET** for 2 seconds. The TOUR number (M1, M2, etc.) will show at the bottom of the display. You are now recording information. The percentage (%) at the top indicates the total used memory.
3. To stop the TOUR, press and hold **FUN/SET** for 2 seconds. END will show at the bottom of the display. The Tour data will be stopped.



4. To begin another TOUR, press and hold **FUN/SET** for 2 seconds. The new TOUR number (M3, etc.) will show at the bottom of the display. You are recording information again.

5. Press **MODE** to return to the CLOCK display.

NOTE Used watch memory is given as a percentage. It is recommended that you download information to your PC and clear all TOUR memories when this figure approaches 100%. When the used memory hits 100% it will no longer record, and any future readings will not be recorded.

RECORD MARKERS IN TOUR MODE

The marker function is used to mark a particular position during a TOUR. To place a marker in TOUR Mode, press and hold **MARKER/LIGHT** until the watch beeps.

NOTE The marker will only be shown in the PC data, once it has been downloaded from the watch.

PAUSE TOUR MODE:

1. If you are not already in TOUR Mode, simultaneously press **FUN/SET** and **MODE**. The TOUR number will display. The percentage (%) at the top indicates the total used memory.
2. Press **FUN/SET**. REST shows at the bottom of the display.
3. Press **SELECT/+** or press and hold **FUN/SET** for 2 seconds to turn the rest on (paused) or off (recording).



DEACTIVATE TOUR MODE:

For best results, perform these steps immediately after you end your trip.

1. Simultaneously press **FUN/SET** and **MODE**. The TOUR number will display. The percentage (%) at the top indicates the total used memory.
2. Press and hold **FUN/SET** for 2 seconds. This **ENDS** the TOUR recording session.
3. Press **MODE** to return to the CLOCK display.



CLEAR ALL TOUR MEMORIES

For best results, perform these steps when you no longer want to keep the data in the watch or want to free up some memory.

Either:

1. Download the information to you PC (the TOUR will be automatically cleared).

Or:

1. Deactivate the TOUR Mode. With the END screen shown, press the **FUN/SET**. CLR shows at the bottom of the display.
2. Press and hold **FUN/SET** until doneE shows at the bottom of the display.
3. Press **FUN/SET** again to display 0% and confirm all data has been cleared.
4. Press **MODE** to return to the CLOCK display.



PULSE (HEART RATE) MODEL (TS 120/TS 130 ONLY)

The OUTBREAKER watch is equipped with a PULSE Mode and heart rate chest belt, which together allow you to measure your heart rate (from 25-240 beats per minute) while exercising. You can view your heart rate with the Stopwatch, Timer and Clock.



Press **SELECT/+** to switch between the HEART RATE/CLOCK (starting) and HEART RATE/STW (stopwatch) screens.

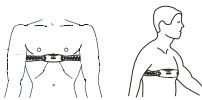


NOTE The maximum and minimum values for the various sub-modes (i.e., max heart rate, or max altitude, etc) will remain after all data has been cleared.

WEARING THE CHEST BELT

You must wear the chest belt to measure your heart rate.

NOTE This OUTBREAKER watch is specially designed to work with the coded chest belt with which it was sold. It is not recommended you use any other chest belt with this watch, as the transmission may not work.

Diagram	Instructions
	1. Wet the conductive pads on the underside of the chest belt with few drops of water or a conductive gel to ensure a better, solid contact. 2. Put on the belt, wrapping it around the upper chest so the heart rate monitor is in the middle of the chest, tucked snugly under the pectoral muscles. 3. Adjust the belt for comfort and best contact with the skin.

Tips: The transmission from the belt is dependent on good contact with the skin and proximity to the receiver watch. Make sure the transmitting section of the belt is against the skin, not blocked by chest hair, and close enough to the receiver watch (approximately 76 cm/30 inches) to send a clear signal. Sweat or gel can help to improve the signal, and remember it is not instantaneous. If no signal is received immediately, wait for a few seconds for the signal to get through.

NOTE An old battery may weaken the transmission and reception power. Replace the battery if the performance is progressively worse.

Once you have good contact with the chest belt, ♥ will begin to flash. This means the signal is being sent and your heart rate will soon appear in place of the large 0. Your heart rate will be displayed as the larger font in every screen of this Mode. If you remove the chest belt, or the watch is moved too far away from it, the signal will be broken.

NOTE The PULSE Mode will stop functioning after no signal is received for 5 or more minutes.

NOTE When you are measuring your heart rate, keep the watch away from signal generating sources, such as TVs, PCs, and car engines, as these may impair the reading.

TRAINING ZONES (TS 120 / TS130 ONLY)

The OUTBREAKER watch is equipped with a special Training Zone feature that allows you to pre-select the optimal heart rate range (25-240 beats per minute) for your activity. For example, the amount of exertion required for a stroll in the park is different from the amount of exertion required for weight lifting to build muscle mass. With the Training Zone feature, you can set and then monitor the upper and lower heart rate limits (Training Zone) that best support your training activity and goals.



The calculation for determining your upper and lower heart rate limits is as follows.

Sex	Maximum Heart Range (MHR)	Lower limit	Upper limit
Men	$220 - \text{age} = \text{MHR}$	$\text{MHR} \times (\text{lower training zone } \%)$	$\text{MHR} \times (\text{upper training zone } \%)$
Women	$230 - \text{age} = \text{MHR}$		

Once you know your maximum heart range, you can set the 5 Training Zones (described below) with the PC software (refer to the online help). With the OUTBREAKER watch, you can directly set your upper and lower limits for Training Zone 5, and can set an alarm to sound whenever you exceed the limits for the selected Training Zone.

Warning: The heart rate limits for Training Zones 1 – 4 are based on the profile for a 20-year-old young man. If you do not meet this profile, we **HIGHLY RECOMMEND** that you either set the limits for Training Zones 1 – 4 using the PC software, or follow the steps below to set the limits for Training Zone 5.

The recommended Training Zones are as follows:

Zone	MHR range (min – max %)	Description
1	50 – 60%	Moderate Activity – This low-intensity zone is good for warm-ups, cool downs, and activities such as brisk walking. It is also good for beginners and those who want to strengthen their cardiovascular systems.
2	60 – 70%	Weight Management – Up to 85% of calories burned in this zone are from fat cells. Moderate exercises such as light jogging or swimming are good for this zone.
3	70 – 80%	Aerobic Zone – Increases strength and endurance. It works within the body's oxygen intake capability, burns more calories, and can be maintained for a long period of time.

4	80 – 90%	Anaerobic Zone – Generates speed and power. It works at or above the body's oxygen intake capability, builds muscle, and cannot be maintained for a long period of time.
5	90 – 100%	Red Line Zone – This high-intensity zone can only be maintained in short bursts or intervals, as it pushes your muscles and cardiovascular system beyond their capacity.

NOTE High-altitude activities may elevate your maximum heart rate.

NOTE You can override the zone preference by adjusting the value through the PC (all zones), or by manually adjusting Zone 5.

SET TRAINING ZONE ALARM

1. Press **MODE** to access the PULSE (heart rate) Mode.
2. Press **SELECT/+** to show the clock sub-mode.
3. Press and hold **FUN/SET** for two seconds. The zone number will flash at the bottom of the screen. The upper limit is shown above the line in larger font, and the lower limit is below. (You may adjust the value for upper and lower rate limits in Zones 1-4 by using the PC software. Otherwise pressing **ST/SP/-** will simply activate or deactivate the preset alarm).
4. Press **SELECT/+** or **ST/SP/-** to switch to Zone 5.
5. Press **FUN/SET** again to display the SET screen. The upper HR will flash.



6. Press **SELECT/+** or **ST/SP/-** to change the upper heart rate limit.
7. Repeat Steps 5 – 6 to set the lower heart rate limit.
8. Press **FUN/SET**.
9. Press **SELECT/+** or **ST/SP/-** to turn the alarm off or on.
10. Press **FUN/SET** again to exit the setting mode.

NOTE You can set the Heart Range between (upper 26-240 bpm) and (lower 25-239 bpm).

TRACK HEART RATE DURING TRAINING

To set up the OUTBREAKER watch so that it can track your heart rate activity during training, first do the following:

1. Put on the chest belt (refer to the “Wearing the Chest belt” section).
2. Press **MODE** to access the PULSE Mode and check to make sure the watch is receiving your heart rate signals.
3. Select the Training Zone that is most appropriate for your activity (refer to previous section).
4. Activate the Stopwatch or Timer in PULSE Mode (refer to the Stopwatch / Timer section).
5. Set up the TOUR Mode if you want to store a long-term record of your heart rate history that spans several training sessions or activities (refer to the TOUR Mode section).



Once you complete these steps, you are ready to begin exercising. After you finish, reset the Stopwatch or Timer to zero, then press **FUN/SET** to have the following metrics displayed in 5-second intervals:

- Time and date in M1 or M2....M99 (all current data will be stored under M1, while previous data is stored under M2 and so on until M99).
- Average heart rate during exercise and Total exercise time
- Upper Training Zone limit and time spent above limit
- Lower Training Zone limit and time spent below limit
- Total time spent exercising within the heart rate limits

NOTE If you have more than one set (M1-M99) of training records, press **SELECT/+** or **ST/SP/-** to loop through the records.

BIKE MODE

The OUTBREAKER sports watch comes complete with a bicycle computer (and accessories), which records and displays the following information:

- Speed: 0 – 255 km/hour or 0 – 158 mile/hour
- Average speed (Max:255km/hr or 158 mile/hr)
- Maximum speed (Max:255km/hr or 158 mile/hr)
- Cadence: 0 – 255 rpm (pedal revolutions per minute)
- Distance traveled (Max:999.9 km/999.9 mile)
- Total distance travelled (Max:99,999.9 km/99,999.9 miles)
- Total time spent cycling

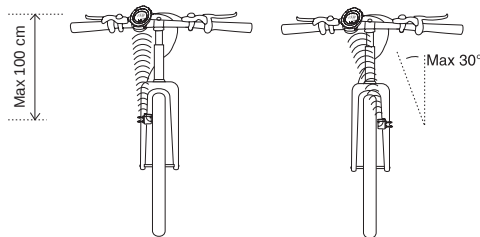
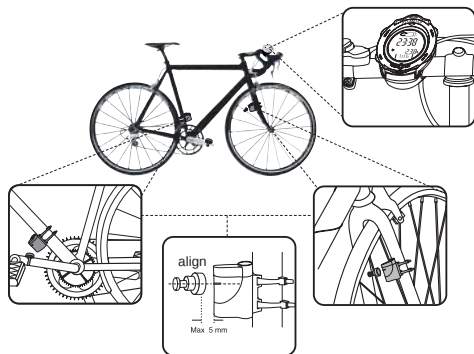
The BIKE Mode for the TS130 model comprises pioneering technology that uses two wireless sensors instead of one (other models use one wireless and one wired sensor). The formatted signals of the sensors eliminate possible interference between the cadence and speed sensors, ensuring you accurate performance measurements.

SET UP FOR BIKE MODE

To set up the BIKE Mode you must first do two things:

1. Attach the measuring equipment to your bicycle: speed sensor (front wheel), cadence sensor (pedal), two magnets (front wheel and pedal), and bike mount (handle bar). Refer to the next section for instructions.
2. Specify your wheel circumference. See below for instructions.

STEP 1: ATTACH THE EQUIPMENT TO THE BICYCLE



To attach the equipment:

1. Attach the bike mount to the right or left handlebar using the nut and bolt provided. Tighten until the bike mount is fixed into place.
2. Attach the cadence sensor to a stationary point just behind the pedal, using the rubber grip for a firmer contact. There should be maximum 100cm (39 inches) between the sensor and the bike mount, and less than 30 degrees vertical angle.
3. Attach the cadence magnet to a pedal so that it is directly aligned with the sensor with less than 5mm (0.2 inches) between.
4. Attach the speed sensor to either leg of the front forks, using the rubber grip for a firmer contact. There should be maximum 100cm (39 inches) between the sensor and the bike mount, and less than 30 degrees vertical angle.
5. Attach the speed magnet on a spoke of the front wheel so that it is less than 5mm (0.2 inches) from the sensor.
6. Check and adjust as necessary, then snip the ends off the clips so that no excess remains.
7. Remove the Lycra strap. Fit the watch into the bike mount.
8. Press **MODE** on the watch to switch to BIKE Mode.
9. Press **FUN/SET** twice, then press **SELECT/+** to view the cadence sub-mode.
10. Ride the bike a short distance to make sure signals are being sent to the watch successfully.
11. You are now ready to begin your trip.

NOTE The watch can work with one or both sensors.

NOTE When the display shows a low battery icon  or does not perform to expectation (see 'Battery' section) replace the battery.

STEP 2: ENTER WHEEL CIRCUMFERENCE

You must set the bike's wheel circumference on the watch so it can accurately calculate your speed and distance. If you do not know the bike's wheel circumference, you can check the manufacturer's specifications or measure it by marking the wheel where it touches the ground, and then rotating the wheel once fully along the ground. Measure the difference between the two marks.



NOTE Most wheels have their specifications written on them.

To specify this information on the watch:

1. Press **MODE** to switch to the BIKE Mode.
2. Press **SELECT/+**.
3. Press and hold **FUN/SET** for 2 seconds. The wheel circumference data will appear.
4. Press **SELECT/+** or **ST/SP/-** to increase or decrease the value.
5. Press **FUN/SET** to save your changes.

NOTE You can also use the PC software for this operation (see PC section).

ACCESSING BIKE MODE OPTIONS

Press **MODE** to access the BIKE Mode, then press **SELECT/+** to loop through the options: Bike speed/STW, Bike speed/TTL (see TOUR Mode section), and Bike speed/Clock.

For instructions on how to use the Stopwatch or Timer in BIKE Mode, refer to pp. 9 – 10.



VIEWING SPEED AND CADENCE INFORMATION

1. Press **FUN/SET** while in BIKE Mode to view Average speed/Tour time. To view Maximum speed, TOUR distance, and Total distance, press **SELECT/+** repeatedly.
2. Press **FUN/SET** again to view Cadence/STW. To view Cadence/Clock, press **SELECT/+**.
3. Press **FUN/SET** a third time to view Average Cadence/TOUR time. Press **SELECT/+** to view Max Cadence/Tour time.

To clear a value from a specific memory, press and hold **FUN/SET** for 2 seconds.

When finished press **FUN/SET** or wait 30 seconds to return to the Speed/STW view.

PC KIT

The Oregon Scientific OUTBREAKER sports watch is equipped with a PC Kit that includes a PC Docking Station and CD-ROM for downloading information to a personal computer. Full instructions for using the software are provided in the online help and can be viewed once you have installed the CD-ROM.

The PC Kit enables you to store and recall most of the information that is collected by the OUTBREAKER watch. This allows you to free up the watch memory for recording more information, while preserving the training records that are most important to you. For example, with the PC Kit you can specify which information you want to record in TOUR Mode: By limiting what is recorded, you can keep longer records. This can be useful if you wish to monitor your performance during an extended period such as a two-day hike, where only heart rate and altitude are of concern, or a day of cycling, where only speed and distance are important to you. Full details of the watch's memory capacity are given in the USING THE TOUR MODE section.

You can also use the PC Hook-up Kit to set values on the watch through the PC. A full list of options is given at the end of this section.

NOTE The hardware/software requirements for the PC Kit are listed at the back of this manual.

PC MODE

SET UP FOR PC MODE

To use the features of the PC Mode, you will need the PC Kit (includes PC docking station, connector cable, and the installation software CD-ROM), and a PC or laptop computer.

To set up for PC Mode:

Diagram	Instructions
	1. Connect the PC Docking Station to your computer. For best results, turn the computer off before you connect.
	2. Install the software using the CD-ROM (first-time use only). The process is automatic, and requires you to respond to self-explanatory prompts. Once the software is installed, an Oregon Scientific icon will be placed on your desktop.
	3. Remove the Lycra watch strap. Mount the watch on the docking station, making sure the contact points on the station and the watch are aligned. Press the MODE button to switch to PC Mode. NOTE The cadence, speed and heart rate functions will be temporarily disabled when you use the watch in PC Mode.

USING THE SOFTWARE

Double-click on the Oregon Scientific icon. Once the software opens, click on **Help** for information about the function you require.



PC MODE OPTIONS

You can perform the following tasks by using the CD-ROM software supplied.

Access/recall information/ on the PC	Change watch settings on the PC
- All information recorded in TOUR Mode, including temperature, altitude, local pressure, heart rate, wheel speed, cadence, trip distance, etc, [Provided this data has been selected in "Data should be stored" in the "Configuration menu" (see software help menu)]. - Back up/import and export data - Define user data - Display graphical chart and print table - Give data overview with a specified duration	- Date and time (set to PC time, or a manual setting) - Time, and event alarm (3 event alarms, 1 daily alarm, and select alarm duration) - Current sea-level pressure - Altitude limits - Weather icon - Upper and lower heart rate limits for Training Zones 1 – 5. - Wheel circumference/diameter - TOUR Mode data recording and download options - Choose a serial port (Com 1 to Com 4) - Sampling rate (1 second and up)

NOTE To send all selected settings and preferences to the watch select “Transfer configuration” in the “communication” sub-menu (PC software).

DOWNLOAD DATA

Follow these procedures to download data

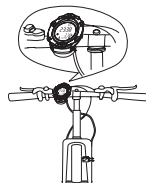
1. After installing the CD-ROM click the OUTBREAKER icon on your PC.
2. In the main menu, select “Communication”.
3. Connect the docking station to your PC.
4. Press “Mode” until you reach PC Mode.
5. Fit the OUTBREAKER watch in the docking station, making sure the pins are matched and secured.
6. Select “Connect” in the “Communication” sub-menu.
7. You will see an arrow mark on the watch, and “download in progress” on your PC.
8. Select “Read Trip Data” in the “Communication” sub-menu, then follow the on screen instructions.
9. Select “Format” to process the data arrangement.
10. Download is now complete. Select desired graphical report.

EFFECTIVE USE AND RANGE

The heart rate and chest belt have a maximum transmission range of about 76 centimeters (30 inches). If the signal is weak take the following steps:

- Shorten the distance between the heart rate chest belt and watch
- Re-adjust the position of the heart rate chest belt
- Check the batteries. If they are low or exhausted, change the battery immediately

You can wear the receiver watch on your wrist or strap it to a bike or exercise machine as shown below:



AQUATIC AND OUTDOOR ACTIVITIES

The watch is water-resistant up to 30 meters. The chest belt and other accessories (bike mount/speed and cadence sensors) are splash-proof, but should not be worn for underwater activities, as the heart rate transmission cannot work properly under water. Refer to the table below for guidelines.

	 RAIN SPLASHES, ETC	 SHOWERING (WARM / COOL WATER ONLY)	 LIGHT SWIMMING / SHALLOW WATER	 SHALLOW DIVING / SURFING / WATER SPORT	 SNORKELING / DEEP WATER DIVING
30m / 100ft	OK	OK	NO	NO	NO
50m / 165ft	OK	OK	OK	NO	NO
100m / 325ft	OK	OK	OK	OK	NO

When using the watch for outdoor sports activities, observe the following guidelines:

- Do not press the buttons underwater or with wet fingers.
- Rinse with water and mild soap after use.
- Do not use the watch in hot water.

Tips for keeping your watch fit: Keep your watch water resistant! Avoid chemicals (gasoline, chlorine, perfumes, alcohol, hair sprays, etc.). Rinse after use. Reduce exposure to heat. Have your watch serviced by an approved service center once yearly.

SAFETY AND CARE INSTRUCTIONS

SAFETY PRECAUTIONS

Please observe these safety precautions when using this product.

- Do not consult the watch while moving or engaging in active sports. Doing so may result in a collision that causes personal injury.
- Do not subject the product to excessive force, shock, dust or temperatures.
- Do not tamper with the product's internal components.
- Do not mix fresh and old batteries, or batteries of different specifications.
- Do not use this watch as a substitute for professional measuring devices used in skydiving, hang gliding, paragliding, gyrocopter piloting and flying small aircraft.
- Do not use this watch as a substitute for industrial precision instruments.
- Follow the water-resistance guidelines carefully before use in water (see Effective Use and Range section).
- Keep the product away from heat sources such as radiators, stoves, heaters, and other heat-generating products.

CARE INSTRUCTIONS

To ensure you receive the maximum benefit from using this product, please observe the following guidelines.

- **Cleaning** – Clean with a damp cloth. Do not use liquid cleaning agents, benzene, thinner, or aerosols.
- **Repair** – Do not attempt to repair the product or modify the circuitry by yourself. Contact the retailer or a qualified repairman if the product requires servicing. Only use replacement parts that are recommended by the manufacturer.
- Do not scratch hard objects against the LCD display as this may cause damage.

TROUBLESHOOTING GUIDE

This section includes a list of frequently asked questions for problems you may encounter with the OUTBREAKER sports watch. If your watch is not operating as you think it should, check here before arranging for servicing.

Problem	Symptom	Check this	Remedy
No power	Power will not turn on.	Batteries are exhausted.	Replace with new batteries.
		Batteries are inserted incorrectly.	Insert the batteries correctly (→ 7).
	Keys do not respond	Key lock in operation. (Key icon shown)	Press SELECT/+ for 2 seconds (blinking icon will disappear).
Date / time is wrong	Date display is wrong	Date not set	Set date correctly (→ 9) Cannot be changed when TOUR Mode is operating.

Problem	Symptom	Check this	Remedy
	Time display is wrong	Time zone set incorrectly	Reset time zone Cannot be changed when TOUR Mode is operating. (TRIP shows on display)
Altitude reading is strange	Reading is less than 0 (-20, etc.)	Current altitude is below ground (watch sea level setting)	Adjust altitude, or accept reading
	Different height reading at same point after trip	Barometric changes	Minor pressure changes may produce minimal deviations in altitude readings
No altitude alarm	Alarm does not sound	Levels not set	Set levels (→ 12)
Temperature reading is strange	Too high	Watch is too close to body	Take off watch, wait 15 minutes, then try again
No alarm	Expected alarm does not sound	Levels not set	Set levels (→ see relevant MODE section)
		Alarm not activated	Activate alarm (→ see relevant MODE section)
Pressure reading is strange	Too high or low	Is change due to wind, pressurized chamber, or pressurized environment (airplane)?	Reset after you have changed locations
Heart icon not working	Blank display	Time out after 5 minutes of inactivity	Press MODE to return to PULSE Mode
		Chest belt is too far from watch or poor skin contact	Move chest belt closer or adjust contact with skin

Problem	Symptom	Check this	Remedy
No heart rate alert	Expected alarm does not sound	Training Zone/Alert limits not set	Set limits (→ 19)
No heart rate memory	No heart rate data	Chest belt is too far from watch or poor skin contact	Move chest belt closer or adjust contact with skin
	No data	Sensor not ready	Check distance between sensor and magnet
	No display	Watch not fitted well on Bike Mount	Adjust the watch
	No TOUR data stored	Disabled feature through PC	Re-select check box in PC software
		Memory is full	Download TOUR memory to PC or clear memory
	Strange distance, cadence or speed reading	Wrong wheel size set	Measure and set wheel circumference again (→ 21)
		Sensors fitted incorrectly	Check sensor fittings
		Magnet not aligned	Realign magnet
		Interference	Find source and move or switch off
No sensor power	Weak reception or poor transmission	Battery low or empty	Replace battery
No memory	Memory % does not changed	TOUR Mode not set	Set TOUR Mode
	100% of memory used	Memory full	Clear all memories manually, or download to the PC. Data manually erased cannot be recalled or recovered

SPECIFICATIONS

NOTE Unit of measurement (Imperial/metric, Celsius/Fahrenheit, etc.) depends on the store model purchased.

Calendar Clock

Hour format	12/24 hr
Date format	DD:MM:YY (MM:DD:YY)
Auto calendar	2001-2099
Alarms	1 daily (hr:min) 3 event (hr:min DD.MM.YY)
(Must be set with PC)	
Chronometer/Timer	99:59:59 (hr:min:sec)

Heart Rate Monitor (TS 120 / TS 130 only)

Heart rate range	25...240 beats per minute (bpm)
Resolution	1 bpm
Accuracy	+/- 1 bpm
Training zones	5
HR alert range	26...240 bpm (upper) 25...239 bpm (lower)
Alert memory	2 heart rate alarms
TOUR memory	99 max

Thermometer (TS 110 / TS 130 only)

Range	-10.0° C....60.0° C (14.0° F....140.0° F)
Resolution	0.1° C (0.1° F)
Accuracy	+/- 1° C (+/- 2° F)

Altimeter (TS 110 / TS 130 only)

Range	-400...9,000 meters (-1,312....29,700 feet)
Resolution	1 m (3 ft)

Accuracy	+/- 10 m (+/- 30 ft)
Vertical speed (ascending or descending)	0...125 m/sec (0...415 ft/sec)
Vertical speed resolution	1 m/sec (3 ft/sec)
Max altitude change	+/- 32,787 m (+/- 99,999 ft)
Total altitude change	+/- 32,787 m (+/- 99,999 ft)
Alerts	1 alarm

Barometer (TS 110 / TS 130 only)

Local pressure range	300...1100 hPa (8.86...32.48 inHg)
Sea level pressure range	900...1100 hPa (26.58...32.48 inHg)
Resolution	1 hPa (0.03 inHg)
Accuracy	+/- 3 hPa (+/- 0.1 inHg)
Bar graph x-resolution	1 hour
Bar graph y-resolution	1 hPa (0.03 inHg)

TOUR Mode

OUTBREAKER TS 110

Record time:	350 min
5 second samplings:	Altitude / Pressure / Temperature / Speed / Cadence / Distance

OUTBREAKER TS 120

Record time:	508 min
5 second samplings:	Heart Rate / Distance / Speed / Cadence

OUTBREAKER TS 130

Record time:	659 min
5 second samplings:	Distance / Cadence / Speed / Heart Rate/ Altitude / Pressure / Temperature

BIKE Computer

Wheel speed range	0...255 km/hr (158 mile/hr)
Wheel speed resolution	1 km/hr (1 mile/hr)
Cadence range	0...255 revolutions per minute (rpm)
Cadence resolution	1 rpm
Max trip distance	999.9 km (999 miles)
Max total trip distance	99,999.9 km (99,999.9 miles)
Wheel circumference	1,000...3,000 mm (39 in...118 in)
Circumference resolution	1 mm (0.04 in)

Environment

Operation	-10° C...60° C (14° F...140° F)
Storage	-20° C...70° C (-4° F...158° F)
Relative Humidity	10%...95%

Water Resistance

Watch	not actuating keys to 30 m (100 ft)
Other accessories	splash proof

Power

Watch	1 x CR2032 3V lithium battery
Chest belt	1 x CR2032 3V lithium battery
Bike mount	1 x CR2032 3V lithium battery
Speed sensor	1 x 23A 12V alkaline battery
Cadence sensor (TS 130 only)	1 x 23A 12V alkaline battery

PC Requirements

- Pentium I or above with 128 KB RAM or above
- Windows 98 or above
- 50 MB free memory (hard disk)
- Printer and mouse recommended

WARNINGS

To ensure you use your product correctly and safely, read these Warnings and the entire user manual before using the product. The warnings given here provide important safety information and should be observed at all times.

- Do not attempt to repair the product yourself. Contact the retailer or our customer service department if it requires servicing.
- Take precautions when handling all battery types. They can cause injuries, burns, or property damage as a result of contact with conducting materials, heat, corrosive materials or explosives. Remove the batteries before storing the product for long periods of time.
- The product is a precision instrument. Never attempt to take this device apart. There is a serious danger of powerful electric shocks.
- Do not, under any circumstances, touch the exposed electronic circuitry of the device as there is a danger of electric shock should it become exposed.
- Take special care when handling a damaged LCD display, as the liquid crystals can be harmful to your health.
- Do not use or store the device, including the remote sensor, in locations that may adversely affect the product such as, snow, desert, and magnetic fields.
- Do not use this device in aircrafts or hospitals. The use of radio frequency products can cause malfunctions in the control devices of other equipment.

- Do not subject the product to impact or shock.
- Check all major functions when the device is unused for a long period of time. This is to ensure its full operation. Maintain a regular internal testing and cleaning of your device.
- When disposing of this product, do so in accordance with your local waste disposal regulations.

ADDITIONAL RESOURCES

Visit our website (www.oregonscientific.com) to learn more about your OUTBREAKER sports watch and other Oregon Scientific™ products such as digital cameras, hand-held organizers, alarm clocks, and weather stations. The website also includes contact information for our customer service department, in case you need to reach us.

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Outbreaker

TS110/TS120/TS130



Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

FCC ID: NMT – TS1X0A

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

NOTE This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is

encouraged to try to correct the interference by one or more of the following measures:

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

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE 0359 !