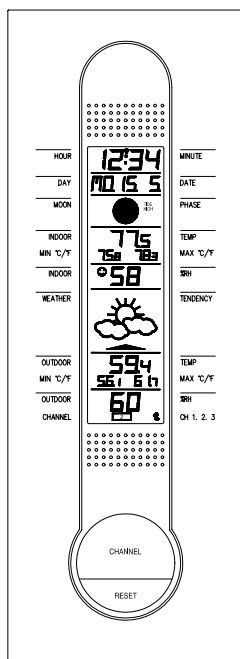# WS-7391U
Wireless 433 MHz
Radio-controlled Weather Station

Instruction Manual

LA CROSSE *tools and technology*
TECHNOLOGY *for home and office*
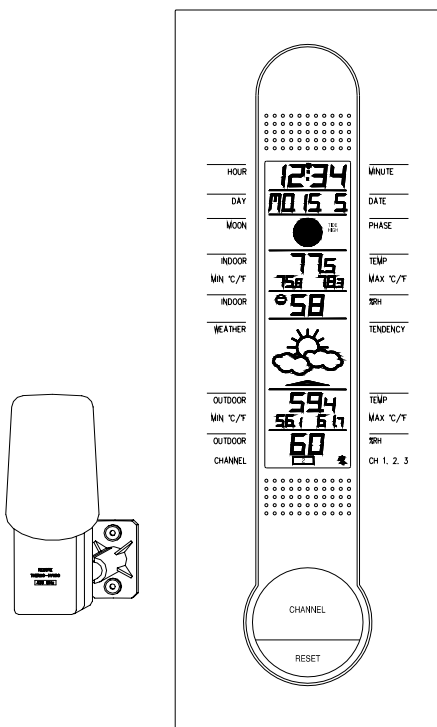
TABLE OF CONTENTS

INVENTORY OF CONTENTS

1. The indoor weather station
2. Remote temperature sensor (model TX4U)
3. Instruction manual and warranty card

ADDITIONAL EQUIPMENT (not included)

1. Four fresh AA 1.5V batteries.
2. Phillips screwdriver (for mounting)

ABOUT WWVB
The NIST (National Institute of Standards and Technology—Time and Frequency Division) radio station, WWVB, is located in Ft. Collins, Colorado and transmits the exact time signal continuously throughout the United States at 60 kHz. The signal can be received up to 2,000 miles away through the internal antenna in the Weather Station. However, due to the nature of the Earth's Ionosphere, reception is very limited during daylight hours. The Weather Station will search for a signal every night when reception is best. The WWVB radio station derives its signal from the NIST Atomic clock in Boulder, Colorado. A team of atomic physicists continually measure every second of every day to an accuracy of ten billionths of a second a day. These physicists have created an international standard, measuring a second as 9,192,631,770 vibrations of a Cesium 133 atom in a vacuum. For more information about WWVB please see the NIST website at http://www.boulder.nist.gov/timefreq/stations/wwvb.htm

QUICK SET-UP GUIDE

Hint: Use good quality Alkaline Batteries and avoid rechargeable batteries.

1. Have the indoor weather station and remote thermo/hygro sensor 3 to 5 apart.
2. Batteries should be out of both units for 10 minutes.
3. Place the batteries into the **remote thermo/hygro sensor** first then into the indoor weather station. (All remote thermo/hygro sensors must be started before the indoor weather station)
4. DO NOT PRESS ANY BUTTONS FOR 10 MINUTES.

In this time the indoor weather station and remote thermo/hygro sensor will start to talk to each other and the indoor weather station will show both the indoor temperature and humidity and the outdoor temperature and humidity. If the indoor weather station does not display all values after the 10 minutes please retry the set up as stated above. After all values are displayed for 10 minutes you can place your remote thermo/hygro sensor outdoors and set your time.

The remote thermo/hygro sensor should be placed in a dry, shaded area. The remote thermo/hygro sensor has a range of 80 feet. Any walls that the signal will have to pass through will reduce distance. An outdoor wall or window will have 20 to 30 feet of resistance and an interior wall will have 10 to 20 feet of resistance. Your distance plus resistance should not exceed 80 ft. in a straight line.

NOTE: Fog and mist will not harm your remote thermo/hygro sensor but direct rain must be avoided.

> To complete the set up of your indoor weather station
>   after the 10 minutes have passed please follow the
>   steps in the Detailed Set Up Guide
.

Note: The remote thermo/hygro sensor transmits a signal every 3 minutes; after the batteries have been installed, the indoor weather station will search for the signal for a duration of 5 minutes. If there is no temperature reading in the OUTDOOR LCD after 5 minutes, make sure the units are within range of each other, or repeat the battery installation procedure.

DETAILED SET-UP GUIDE

BATTERY INSTALLATION

A. Remote Thermo/hygro Sensor
1. Pull the cylindrical rain cover off the remote thermo/hygro sensor.
2. Remove the battery cover (located on the backside of the remote thermo/hygro sensor, above the mounting post and bracket).
3. Press the arrow and slide the battery cover off.
4. Observing the correct polarity install 2 AA batteries.
5. Replace battery cover, and place rain cover snugly onto the remote thermo/hygro sensor.

B. Indoor Weather Station
1. Remove the battery cover. To do this, insert a solid object in the space provided at the lower-central position of the battery cover, then push up and pull out on the battery cover.
2. Observe the correct polarity, and install 2 AA batteries.
3. Replace the battery cover.

__Note:__ Immediately after the batteries have been installed, each LCD (Liquid Crystal Display) will flash, and a tone will sound. Within a few seconds the indoor temperature, indoor relative humidity, and the weather icons (sun and clouds) will be displayed. If these items are not displayed remove the batteries for 10 seconds and reinstall. If the outdoor temperature is not displayed within four minutes, remove the batteries from both units, wait 10 seconds, and reinstall. The time will show -:-- and start searching for the signal. If it successfully receives the time signal (reception

is achieved easiest at night), it will display the correct time (factory setting is Eastern time zone).

PROGRAM MODE

Programming Note: If 20 seconds is allowed to pass during programming modes, the unit will confirm/set the last information entered—the display will stop flashing and return to normal time-date readings

TIME AND DATE

There are two methods by which the time and date can be set:

1) Automatically via WWVB reception (only need to set the time zone in section III).

This method requires you to do nothing but wait for the signal to be received, and to select a time zone (default is Eastern Time Zone). Reception usually takes approximately 6-8 minutes during optimal conditions. The best conditions for reception is at night, between midnight and 6:00 am, when there is less atmospheric interference. To keep your time as accurate as possible, the indoor weather station conducts a WWVB search every night between these hours, and overrides any time that has been set manually. The WWVB tower icon (appearing in the TIME LCD) will flash when a search is in progress, will remain steady when the signal has been received, and nothing will be displayed in all other situations. If the WWVB time has not been received after 10 minutes of battery installation, you may manually set the time or leave the time function alone (reception will occur regardless).

2) Manually (performed throughout the programming mode.

When programming, the manual setting of time and date is not necessary and can be skipped. Any time information programmed will be over-written by the reception of the WWVB signal.

FUNCTION KEYS

There are four buttons on the WS-7391U, two on the front and two on the back. The front two buttons are the *"CHANNEL"* button (for selecting different remote temperature sensors if added) and the *"RESET"* button (for resetting the minimum and maximum temperatures). The two back buttons are the *"SET"* button (to enter the programming mode and confirming selections) and the *"+"* button (to select different settings once in the programming mode).

I. 12/24-Hour Time Format

1. Press and hold the *"SET"* button (on the back of the clock) for 2 seconds or until "12h" or "24h" flashes.
2. Press and release the *"+"* button to select 12-hour or 24-hour ("military") time format.
3. Press and release the *"SET"* button to confirm and advance to the time setting (skip step 1 and 2 in section II if continuing).

II. Time Setting

Note: This is only necessary if you do not wish to wait for the WWVB reception. All manual set data will be over-ridden by the reception of the WWVB signal based on the time zone selected.

    1. Press and hold the *"SET"* button (on the back of the clock) for 2 seconds or until "12h" or "24h" flashes.
    2. Press and release the *"SET"* button again, the hour will flash.
    3. Press and release the *"+"* button to advance the hour.

Note: In 12h mode "PM" will appear to the left of the time during PM hours. If the time is not within the PM hours nothing will be displayed. Be sure to set the time to the correct AM/PM time to ensure automatic reception.

    4. Press and release the *"SET"* button, the digits that represent the minutes will flash.
    5. Press and release the *"+"* button to advance the minutes.
    6. Press and release the *"SET"* button to confirm and advance to the time zone setting (skip step 1 and 2 in section III if continuing).

III. Time Zone Setting

The default (factory set) time zone is EST (Eastern Standard Time)

    1. Press and hold the *"SET"* button for 5 seconds or until "12h" or "24h" flashes.
    2. Press and release the *"SET"* button three more times, "EST" will flash (or other time zone if changed previously).

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3. Press and release the *"+"* button to select your desired time zone.

The TIME LCD displays the 3 letter abbreviations for the time zones found in North America. Observe the chart below, showing corresponding abbreviations, time zones, and codes.

Display	Time Zone	Hours from GMT
GMT	GMT	0
AST	Atlantic	-4
EST;	Eastern	-5
CST;	Central	-6
MST;	Mountain	-7
PST;	Pacific	-8
ALA;	Alaska	-9
HAW;	Hawaii	-10

4. Press and release the *"SET"* button to confirm and advance to the Daylight Saving Time setting (skip step 1 and 2 in section IV if continuing).

IV. Daylight Saving Time (DST) Setting

1. Press and hold the *"SET"* button for 2 seconds or until "12h" or "24h" flashes.
2. Press and release the *"SET"* button 4 times to reach the DST selection mode.
3. DST 1 is the default setting.
4. Press and release the *"+"* button to select DST 1 (recognizes Daylight Saving Time change) or DST 0 (does not change with Daylight Saving Time).

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Note: Some locations (Arizona and parts of Indiana) do not follow Daylight Saving Time.

5. Press and release the *"SET"* button to confirm and advance to the Date setting mode (skip step 1and 2 in section V if continuing).

V. Setting the Day, Date and Year

Note: This is only necessary if you do not wish to wait for the WWVB reception. All manual set data will be over-ridden by the reception of the WWVB signal based on the time zone selected.

1. Press and hold the *"SET"* button for 2 seconds or until "12h" or "24h" flashes.
2. Press the *"SET"* button 5 more times to reach the day of the week setting mode.
3. The two-digit day of the week is flashing (SU is the default or factory setting).
4. Press and release the *"+"* button to advance to the correct day.
5. Press and release the *"SET"* key to confirm the day of the week setting and to shift to month setting.
6. Press and release the *"+"* button to advance to the correct month.
7. Press and release the *"SET"* key to confirm the month and advance to the date setting.
8. Press and release the *"+"* key to advance to the correct date.
9. Press and release the *"SET"* key to confirm the date setting and to advance to the year setting.
10. Press and release the *"+"* key to advance to the correct year.

11. Press and release the *"SET"* button to confirm the year and to advance to °F and °C selection (skip step 1 and 2 in section VI if continuing).

VI. Selecting °F OR °C

1. Press and hold the *"SET"* button for 2 seconds or until "12h" or "24h" flashes.
2. Press and release the *"SET"* button 9 times to reach the °F or °C setting mode.
3. "°F" is the default setting and the temperatures (inside and remote) will be flashing.
4. Press and release the *"+"* button to select °F to °C.
5. Press the *"SET"* button to confirm and to advance to the LCD setting (skip step 1 and 2 of section VII if continuing).

VII. Setting the LCD Contrast

1. Press and hold the *"SET"* button for 2 seconds, or until "12h" flashes.
2. Press and release the *"SET"* key 10 times to reach the LCD contrast setting mode.
3. There are 8 LCD contrast levels to choose from— "Lcd 0" is the lightest, and "Lcd 7" is the darkest. "Lcd 5" is the default setting.
4. Press and release the *"+"* button to toggle through the settings.
5. Press and release the *"SET"* button to confirm and exit the programming mode.

FEATURES OF THE WS-7391U

I. Weather Forecast

The weather forecasting feature is estimated to be 75% accurate. By adjusting the sensitivity setting, you can achieve a better accuracy of forecast. The weather forecast is based solely upon the change of air pressure over time. In areas where the weather is not affected by the change of air pressure, this feature will be less accurate.
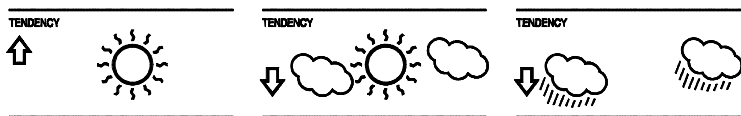
1. Weather Icons

There are 3 possible weather icons that will be displayed in the TENDENCY LCD:

Sunny—indicates that the weather is expected to improve (not that the weather will be sunny).
Sun with Clouds—indicates that the weather is expected to be fair (not that the weather will be sunny with clouds).
Clouds with Rain—indicates that the weather is expected to get worse (not that the weather will be rainy).

The weather icons change when the unit detects a change in air pressure. The icons change in order, from "sunny" to "partly sunny" to "cloudy". It will not change from "sunny" directly to "rainy", although it is possible for the change to occur quickly. If the symbols do not change

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then the weather has not changed or the change has been slow and gradual. If this happens on a regular basis, it may be necessary to adjust the weather forecast sensitivity.

2. Weather Tendency Arrows

Other possible displays in the TENDENCY LCD are 2 weather tendency arrows, one that points up and one that points down. These arrows reflect current changes in the air pressure: an arrow pointing up indicates that the air pressure is increasing and the weather is expected to improve or remain good, an arrow pointing down indicates that the air pressure is decreasing and the weather is expected to become worse or remain poor. No arrow means the pressure is stable.

A storm can be expected if there is a drop of 4 hPa or more in less than 6 hours, the rain icon is displayed, and the downward pointing arrow is flashing. The flashing will stop when the air pressure stabilizes or begins to rise.

II. Indoor Temperature, Humidity, and Comfort Level Indicator

The current indoor temperature (viewed on the left) and relative humidity (viewed on the right) are displayed in the INDOOR LCD. The comfort level indicator is located at the center of the INDOOR LCD. The comfort level indicator will display a happy face icon when the temperature is between 68°F and 79°F (20°C and 25.9°C), and the humidity is between 45% and 64%. A sad face icon will be displayed when the temperature and humidity are outside the mentioned ranges.

III. Outdoor Temperature and Humidity

The outdoor temperature and humidity is viewed in the OUTDOOR LCD. When there is more than one remote sensor unit in operation a "boxed" number will appear to the right of the temperature. This indicates which remote sensor unit (1, 2, or 3) is currently displaying its data in the OUTDOOR LCD. (This feature is explained in further detail in the following section—*Adding Remote Sensors*).

IV. Minimum and Maximum Temperature Records (Indoor, Outdoor and Resetting)

The WS-7391U keeps a record of the minimum and maximum temperatures for both the indoor and outdoor sections. These temperatures can be viewed directly underneath the current indoor and outdoor temperatures. The minimum recorded temperature is on the left and the maximum-recorded temperature is on the right.

Resetting the Minimum and Maximum Records

To reset both the indoor and outdoor temperature records press and hold the reset button for 5 seconds.

<u>Note:</u> This will reset both the indoor and outdoor records, it is not possible to only reset one or the other.

V. Adding Additional Remote Sensors (Optional)

The WS-7391U is able to receive signals from 3 different remote sensors. These extra remote sensors can be purchased through the same dealer as this unit. A TX4U will monitor the temperature and humidity, a TX3U will monitor temperature and display the temperature on its LCD and the TX3UP will monitor the temperature via a probe for measuring soil or water temperatures.

Note: When setting up multiple units it is important to insert batteries first into all the remote sensors, and in numeric sequence. Second install batteries into the indoor weather station. Transmission problems will arise if this is not done correctly and if the total time for set-up exceeds 6 minutes.

VI. Set-up of Multiple Units

1. It is necessary to remove the batteries from all units currently in operation.
2. Remove the battery covers to all remote sensors.
3. Place all remote sensors in a numeric sequential order.
4. In sequential order, install batteries following the same battery installation procedures seen in Detailed Set-Up Guide section of this manual.
5. Install batteries into the indoor weather station.
6. Follow the Detailed Set-Up Guide for programming and operating instructions.

VII. Viewing and Operating with Multiple Remote Sensors

1. To view the temperature of a different remote sensor press and release the *"CHANNEL"* button. A shift from one "boxed" number to the next should be observed in the OUTDOOR LCD.
2. The minimum and maximum temperature of the additional remote sensor will be displayed below the current temperature of the remote sensor in the OUTDOOR LCD.
3. To reset the minimum and maximum temperature readings it is necessary to select which remote sensor you wish to reset. Press and hold the *"RESET"* button for 5 seconds and the records for the selected remote sensor will be reset.

VIII. Mounting

<u>Note:</u> *Before permanently mounting ensure that the indoor weather station is able to receive WWVB signals from the desired location. Also, extreme and sudden changes in temperature will decrease the accuracy of the indoor weather station. Changes in elevation will result with inaccurate weather forecasting for the next 12 to 24 hours. These changes will require a 12 to 24 hour wait before obtaining reliable data. To achieve a true temperature reading, avoid mounting where direct sunlight can reach the remote thermo/hygro sensor. We recommend that you mount the remote thermo/hygro sensor on a North-facing wall. The transmitting range of the remote thermo/hygro sensor is 80ft. Obstacles such as walls, concrete, and large metal objects can reduce the range. Place both units in their desired location and wait approximately 10 minutes before permanently mounting to ensure that there is proper reception. The indoor weather station should display a temperature in the OUTDOOR LCD within 4 minutes of setting up.*

1. Remote Thermo/hygro Sensor

A. Mounting With Screws

1. Remove the mounting bracket/receptor from the packaging.
2. Place the mounting bracket over the desired mounting surface.
3. Through the 2 screw holes of the bracket mark the mounting surface with a pencil.
4. Where marked, start the screw holes using the provided screws.

5. Remove screws from the mounting surface.
6. Align the mounting bracket with the started screw holes.
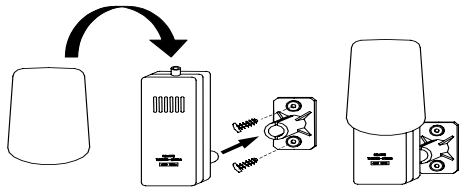
7. Screw mounting bracket onto the mounting surface. The screws should be flush with the bracket.
8. Fit the mounting post (on the back of the remote thermo/hygro sensor) into the receptor of the mounting bracket.

B. Mounting With Adhesive Tape

1. With a nonabrasive solution, clean and dry the back of the mounting bracket and the mounting surface to ensure a secure hold. The mounting surface should be smooth and flat.
2. Remove the protective strip from one side of the tape. Press firmly onto the designated area on the back of the mounting bracket.
3. Remove the protective strip from the other side of the tape, and situate the mounting bracket. Firmly press the mounting bracket onto the mounting surface.
4. Fit the mounting post into the receptor of the mounting bracket.

2. The Indoor Weather Station

1. The WS-7391U is a wall mount only indoor weather station. To mount the display on your wall:
2. Fix a screw (not included) into the desired wall, leaving approximately 3/16 of an inch (5mm) extended from the wall.
3. Place the indoor weather station onto the screw using the hanging hole on the backside.
4. Gently pull the indoor weather station down to lock the screw into place.

Troubleshooting

Problem:	No reception of WWVB time signal
Solution:	1) Wait overnight for signal.
	2) Be sure indoor weather station is at least 6 feet from any electrical devices, such as televisions, computers, or other radio-controlled clocks.
	3) Remove batteries for five minutes, reinsert and leave alone without pressing buttons overnight.
	4) If there are still problems, contact La Crosse Technology
Problem:	Hour is incorrect (minute and date are correct)
Solution:	Be sure correct time zone and daylight saving time are selected.
Problem:	The LCD is faint
Solution:	1) Set the LCD contrast to a higher number
	2) Replace batteries
Problem:	No remote temperature is displayed
Solution:	1) Remove all batteries, reinsert into remote sensor(s) first, then indoor weather station.
	2) Place remote sensor(s) closer to indoor weather station.
	3) Be sure all batteries are fresh.
Problem:	Remote humidity displays "- -"
Solution:	1) A temperature only sensor is being used and displayed
	2) The humidity is outside the range of 19-95%

NOTE: For problems not solved, please contact La Crosse Technology.

Maintenance and Care Instructions

- Extreme temperatures, vibration, and shock should be avoided to prevent damage to the units.
- Clean displays and units with a soft, damp cloth. Do not use solvents or scouring agents; they may mark the displays and casings.
- Do not submerge in water.
- Immediately remove all low powered batteries to avoid leakage and damage.
- Opening the casings invalidates the warranty. Do not try to repair the unit. Contact La Crosse Technology for repairs.

Specifications

Temperature measuring range:	
Indoor	32°F to 139.8°F with 0.2°F resolution. (0°C to 59.9°C with 0.1°C resolution) "OFL" displayed if outside this range
Outdoor	-21.8°F to 157.2°F with 0.2°F resolution. (-29.9°C to 69.9°C resolution) "OFL" displayed if outside this range
Relative humidity measuring range	19% to 95% with 1% resolution ("- -" displayed if outside this range
Indoor temperature checking interval	Every 10 seconds
Indoor humidity checking interval	Every 1 minute
Outdoor temperature and humidity checking interval (Remote thermo/hygro sensor)	Every 1 minute
Outdoor temperature and humidity	Every 3 minutes

reception (indoor weather station)	
Transmission Range	80 feet (in open space)
Power Supply	
Indoor weather station	2 x AA
Remote thermo/hygro sensor	2 x AA
Battery life cycle	Approximately 12 months
Recommended battery type	Alkaline
Dimensions (L x W x H)	
Indoor weather station	6.5 x17.75 x 1.25 inches
	(171 x 450 x 31mm)
Remote thermo/hygro sensor	1.56 x 0.78 x 4.29 inches
	(40 x 20 x 110 mm)

WARRANTY INFORMATION

La Crosse Technology, Ltd provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and used in North America and only to the original purchaser of this product. To receive warranty service, the purchaser must contact La Crosse Technology, Ltd for problem determination and service procedures. Warranty service can only be performed by a La Crosse Technology, Ltd authorized service center. The original dated bill of sale must be presented upon request as proof of purchase to La Crosse Technology, Ltd or La Crosse Technology, Ltd's authorized service center.

La Crosse Technology, Ltd will repair or replace this product, at our option and at no charge as stipulated herein, with new or reconditioned parts or products if found to be defective during the limited warranty period specified above. All replaced parts and products become the property of La Crosse Technology, Ltd and must be returned to La Crosse Technology, Ltd. Replacement parts and products assume the remaining original warranty, or

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ninety (90) days, whichever is longer. La Crosse Technology, Ltd will pay all expenses for labor and materials for all repairs covered by this warranty. If necessary repairs are not covered by this warranty, or if a product is examined which is not in need or repair, you will be charged for the repairs or examination. The owner must pay any shipping charges incurred in getting your La Crosse Technology, Ltd product to a La Crosse Technology, Ltd authorized service center. La Crosse Technology, Ltd will pay ground return shipping charges to the owner of the product to a USA address only.

Your La Crosse Technology, Ltd warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (including the lack of reasonable and necessary maintenance); (2) damage occurring during shipment (claims must be presented to the carrier); (3) damage to, or deterioration of, any accessory or decorative surface; (4) damage resulting from failure to follow instructions contained in your owner's manual; (5) damage resulting from the performance of repairs or alterations by someone other than an authorized La Crosse Technology, Ltd authorized service center; (6) units used for other than home use (7) applications and uses that this product was not intended or (8) the products inability to receive a signal due to any source of interference.. This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

LA CROSSE TECHNOLOGY, LTD WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT. THIS PRODUCT IS NOT TO BE USED FOR MEDICAL PURPOSES OR FOR PUBLIC INFORMATION. THIS PRODUCT IS NOT A TOY. KEEP OUT OF CHILDREN'S REACH.

This warranty gives you specific legal rights. You may also have other rights specific to your State. Some States do no allow the exclusion of consequential or incidental damages therefore the above exclusion of limitation may not apply to you.

For warranty work, technical support, or information contact:

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