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# Ambient Weather 12100 Series Radio Controlled Analog/Digital Clock User Manual



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## 1 Introduction

Thank you for your purchase of the Ambient Weather Radio Controlled Analog/Digital clock. The following user guide provides step by step instructions for operation and troubleshooting. To download the latest manual and additional troubleshooting tips, please visit:

<http://ambientweather.wikispaces.com/rcc>

## 2 Overview

This product displays the time, date, and the day of the week.

The radio controlled clock (RCC) updates time and date automatically using a radio receiver from the atomic time transmitted from Fort Collins, CO, USA (WWVB).

This signal is shortwave, and travels thousands of miles by bouncing off of the ionosphere. The signal is best received at night when there is no solar interference.

The radio controlled clock never requires setting, and automatically adjusts to daylight savings time (DST). This feature can be overridden for locations that do not observe DST (examples, Arizona and Hawaii).

Features include:

- Noise free second hand (LCD display)
- Weekday and Day of Month hands
- LCD display for seconds
- Automatic daylight savings time update and leap year observation
- 28 time zones settings
- Low battery detection
- IR sensor to correct alignment of the clock hands

The reception attempt for the daily automatic synchronization with the radio time is performed several times a day. Just one successful synchronization per day is sufficient to accurately set the clock to the second.

## 3 Important Notes and Warnings

When used in the directed manner, this unit has been designed and manufactured to ensure your personal safety. Please read all safety and operating instructions carefully before use, and keep these instructions handy for future reference. Take special note of all warnings listed in these instructions.



**Before using this product, please read the following warning and cautions:**

1. Read these instructions – All the safety and operating instructions should be read before the unit is operated.
2. Keep these instructions – The safety and operating instructions should be kept for future reference.
3. Heed all warnings – All warnings on the device and in the operating instructions should be adhered to.

4. Follow all instructions – All operation and use instructions should be followed
5. Operate and store in a dry location. Do not operate outside.
6. The product must be protected against electromagnetic fields, static electrical fields, extreme temperatures, direct sunlight and moisture. Only operate within specified temperature range.
7. Clean only with dry cloth – The device should be cleaned only as recommended by the manufacturer.
8. Do not use near any heat sources such as radiators, heat registers, stoves, or other device (including amplifiers) that produce heat.
9. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as liquid has been spilled or the device has been exposed to rain or moisture, does not operate normally, or has been dropped.
10. This device shall not be exposed to dripping or splashing water and that no object filled with liquids shall be placed on the device.
11. Do not attempt to dismantle, open or repair this product yourself. If a fault occurs, seek advice from Ambient Weather support only.
12. The product must not be exposed to substantial mechanical strain or strong vibrations.
13. Unauthorized conversion and/or modification of the device are inadmissible because of safety and approval reasons (CE, UL and FCC). Any usage other than described in this manual is not permitted and can damage the product and lead to associated risks such as short-circuit, fire, electric shock, etc.
14. Do not leave packaging materials unattended. It may become a dangerous plaything for children.
15. Handle the product with care. It can be damaged by dropping and vibration.

### **Battery Safety Instructions**

1. If the battery electrolyte in the cells should get on your skin, thoroughly wash with soap and water. If in the eyes, rinse thoroughly with cool water. Immediately seek medical attention.
2. Leaking or damaged batteries might cause acid burns when in contact with skin, therefore use suitable protective gloves to handle corrupted batteries.
3. Correct polarity must be observed while inserting the batteries.
4. Batteries should be removed from the device if not used for a long period of time to avoid damage through leaking.
5. Keep batteries out of reach of children. Batteries can be swallowed and represent a choking hazard.
6. Batteries must not be dismantled, short-circuited or thrown into fire.

## **4 Installation**

The clock includes a suspension eye for hanging on a wall.

To ensure proper radio reception, the clock should not be placed near electronic devices or on a metal wall (metal blocks radio signals).


## **5 Battery Installation and Initial Operation**

Open the battery compartment on the back of the housing and insert three AA batteries, observing the correct polarity. The correct polarity is indicated in the battery compartment.

After inserting the batteries and closing the battery compartment, the LCD starts flashing and you can set the time zone (reference Section 6).

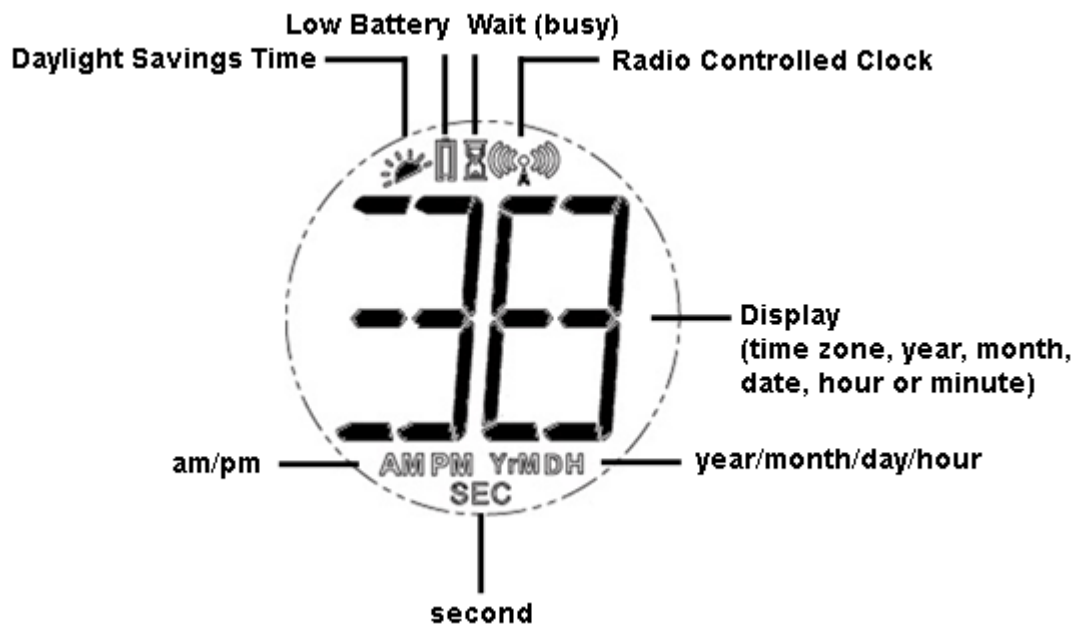
After 10 seconds, or subsequent to pressing the **ZONE** button on the back of the housing, the RCC clock will attempt receive the WWVB signal.

If the text on the LCD is invalid, press the **RESET** button on the back of the housing to resume normal operation.

**NOTE:** Replace the batteries when the low battery warning symbol  appears on the LCD. The use of rechargeable batteries is acceptable. However, the lower operating voltage and lower capacity will reduce the operating time.

## 6 Initial Set Up








The LCD displays status icons, as shown in Figure 1.



**Figure 1**

The following table provides the sequence of events during initial set up. When initializing the clock operation, move away from any electronic sources such as televisions, computers and other wireless devices. The sequence may take several hours, based on the time of day (reception is better at night) and distance from the radio controlled clock.

The IR sensor(s) on the clock face must not be exposed to direct sunlight during initial startup. Thus, perform the start up in a shady location. If the RF sensor fails, the LCD will display “KE”.

Step	Display	Description
Insert Battery Set Time Zone		ET (WWVB Eastern Time Zone for USA) flashes on LCD.  Press [-] to adjust down, [+] to adjust up (reference Table 4) on the back of the housing. Press <b>ZONE</b> button to confirm.  If no buttons are pressed for 60 seconds, the clock will proceed to the initialization step.
Set Daylight Savings Time		Press [+] to toggle between AU (automatic), OF (always off, example Arizona and Hawaii) and ON (always on).  If no buttons are pressed for 60 seconds, the clock will proceed to the initialization step.
Hour:minute Clock hand initialization		HM (hour:minute) and the WAIT symbol (⌚) flashes and the clock hands move to the reception search position (08:05).  Please wait...
Month clock hand initialization		MO (month) and the WAIT symbol (⌚) flashes and the clock hands move to the reception search position (December), if this hand is available with your clock.  Please wait...
Day clock hand initialization		DA (day) and the WAIT symbol (⌚) flashes and the clock hands move to the reception search position (31), if this hand is available with your clock.  Please wait...
Day of week clock hand initialization		WK (day of week) and the WAIT symbol (⌚) flashes and the clock hands move to the reception search position (Sunday), if this hand is available with your clock.  Please wait...
Radio controlled clock synchronization		The radio controlled clock icon (📡) will flash and seconds will be displayed. Do not touch any buttons during synchronization.  Refer to Section 7 for more details on radio reception mode and issues related to lack of reception and incorrect clock setting.

**Table 1**

## 7 Radio Signal Search Mode

To perform a manual search for the radio controlled clock signal, press and hold the + button for two seconds to begin.

The radio controlled clock icon (📡) will flash and seconds will be displayed. Do not touch any buttons during synchronization.

If no signal is received after 10 minutes, the incomplete radio controlled clock icon will be displayed (▲).

There may be interference present from solar radiation, proximity to electronic devices, or the signal may be blocked by aluminum siding, thick concrete walls, basements, or window treatments. Allow 24 to 48 hours for the time to set. If the problem persists, move the clock near a window location.

If the correct time is received, the complete radio controlled icon will be displayed (📶) and the correct time is displayed.

If the hour hand is incorrect but the minute hand is correct, additional programming of the time zone and daylight savings time may be required.

All other programming features are locked out until the 10 minute search mode is complete.

## 8 Setting the Time Manually

If reception is not available, the clock date and time can be set manually.

To set manually, press and hold the **ZONE** button for two seconds to begin and follow Table 2. Press and hold the + or – buttons to change rapidly.

Command	Mode	Settings
<b>Press and hold ZONE button for 2 seconds</b>	Enter manual time mode Set year	Press [+] to increase, [-] to decrease.
<b>Press ZONE button</b>	Set month	Press [+] to increase, [-] to decrease.
<b>Press ZONE button</b>	Set day	Press [+] to increase, [-] to decrease.
<b>Press ZONE button</b>	Set hour	Press [+] to increase, [-] to decrease (observing the AM and PM icon)
<b>Press ZONE button</b>	Set minute	Press [+] to increase, [-] to decrease.
<b>Press ZONE button</b>	Exit manual time mode	

Table 2

## 9 Display Date and Time

To view the date and time on the LCD, press the [+] button to display the year. Press the [+] button again to display the month, day, minutes and seconds.

## 10 Setting the Time Zone

To set the time zone, press the **ZONE** button (do not hold) and follow Table 3.

Command	Mode	Settings
Press <b>ZONE</b> button	Display current time zone setting	
Press and hold <b>ZONE</b> button for 2 seconds	Set time zone	Press [+] to increase, [-] to decrease. Reference Table 4.
Press <b>ZONE</b> button	Set daylight savings time (DST)	Press [+] to change between AU (automatic), OF (off) and ON (on).
Press <b>ZONE</b> button	Exist Set Time Zone mode	

**Table 3**

The automatic (AU) daylight savings time setting is recommended. If you live in Arizona or Hawaii, off (OF) is recommended, since daylight savings time is not observed.

#	Cities	Display	Time Zone	Daylight Savings Time (DST)
1	Hawaii Time	HA	-10	OF (pre-set) and ON
2	Alaska Time	AL	-9	AU (pre-set), OF and ON
3	Vancouver	VA	-8	AU (pre-set), OF and ON
4	Pacific Time	PT	-8	AU (pre-set), OF and ON
5	Mountain Time	MT	-7	AU (pre-set), OF and ON
6	Central Time	CT	-6	AU (pre-set), OF and ON
7	Mexico	MX	-6	AU (pre-set), OF and ON
<b>8</b>	<b>Eastern Time</b>	<b>ET</b>	<b>-5</b>	<b>AU (pre-set), OF and ON</b>
9	Atlantic Time	AT	-4	AU (pre-set), OF and ON
10	Newfoundland	NF	-3.5	OF (pre-set) and ON
11	Rio de Janeiro	RI	-3	OF (pre-set) and ON
12	London	LO	+0	AU
13	Frankfurt	FF	+1	AU
14	Paris	PA	+1	AU
15	Madrid	MA	+1	AU
16	Rome	RO	+1	AU
17	Zurich	ZU	+1	AU
18	Cairo	CA	+2	AU
19	Baghdad	BA	+3	OF (pre-set) and ON
20	Moscow	MO	+4	OF (pre-set) and ON
21	India	IN	+6.5	OF (pre-set) and ON
22	Bangkok	BK	+7	OF (pre-set) and ON
23	Hong Kong	HK	+8	OF (pre-set) and ON
24	Beijing	BJ	+8	OF (pre-set) and ON
25	Tokyo	TY	+9	N/A
26	Adelaide	AD	+9.5	AU (pre-set), OF and ON
27	Sydney	SY	+10	AU (pre-set), OF and ON
28	Auckland	AK	+12	AU (pre-set), OF and ON

OF = daylight savings time always OFF (example, Arizona or Hawaii)  
 AU = automatically sets based on daylight savings time.  
 ON = daylight savings time always ON.

**Table 4**

## 11 Temperature and Humidity Display (RC-12118)

The RC-12118 include an LCD display for temperature and humidity.

To change the temperature display units of measure between degC and degF, press the button behind the temperature LCD, with the following specifications:

Measurement	Range	Accuracy
Temperature	14 to 158 °F	± 1 °F
Humidity	20 to 95%	± 5 %

## 12 Maintenance

The device is maintenance-free, but should be cleaned occasionally. Only use a slightly dampened and soft cloth to clean the housing. Do not use abrasives or solvents.

## 13 Specifications

Operating Voltage	4.5 Vdc
Battery	3 x AA
Battery Life	About 2 years (high quality batteries)
Radio controlled time protocol	WWVB (USA)
Dimensions	RC-12112: Diameter 30.5 cm (12") RC-12116: Diameter 40.0 cm (15.6") RC-12118: Diameter 44.0 cm (17.4")

## 14 Glossary of Terms


Term	Definition
DST	Daylight saving time (DST) or summer time is the practice of advancing clocks during the lighter months so that evenings have more daylight and mornings have less. Typically clocks are adjusted forward one hour near the start of spring and are adjusted backward in the autumn.
LCD	A liquid-crystal display (LCD) is a flat panel display that uses the light modulating properties of liquid crystals.
RCC	A radio-controlled clock is a clock that is synchronized by a time code bit stream transmitted by a radio transmitter connected to a time standard such as an atomic clock.
WWVB	WWVB is a NIST time signal radio station near Fort Collins, Colorado. WWVB is the station that radio-controlled clocks in most of North America use to synchronize themselves. The 70 kW ERP signal transmitted from WWVB is a continuous 60 kHz carrier wave, the frequency of which is derived from a set of atomic clocks located at the transmitter site, yielding a frequency uncertainty of less than 1 part in one trillion.



## 15 Troubleshooting Guide

If your question is not answered here, you can contact us as follows:

1. Email Support: [support@ambientweather.com](mailto:support@ambientweather.com)
2. Technical Support: 480-346-3380 (M-F 8am to 4pm Arizona Time)

Problem	Solution
The low battery warning symbol  appears on the LCD.	Replace the 3 x AA batteries.
“KE” is displayed on the LCD.	The IR sensor(s) on the clock face must not be exposed to direct sunlight during initial startup. Thus, perform the start up in a shady location. If the RF sensor fails, the LCD will display “KE”.
The incomplete radio controlled clock icon is displayed (▲) and the clock has not set properly.	There may be interference present from solar radiation, proximity to electronic devices, or the signal may be blocked by aluminum siding, thick concrete walls, basements, or window treatments. Allow 24 to 48 hours for the time to set. If the problem persists, move the clock near a window location.
The hour hand is incorrect but the minute hand is correct.	Additional programming of the time zone and daylight savings time may be required.

## 16 Liability Disclaimer

Reading the “User manual” is highly recommended. The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.

This product is not to be used for medical purposes or public information.

The specifications of this product may change without prior notice.

This product is not a toy. Keep out of the reach of children.

No part of this manual may be reproduced without written authorization of the manufacturer.

Ambient, LLC WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT.

This product complies with the applicable national and USA and European regulations. All rights reserved and patent pending.

## 17 FCC Statement

### Statement according to FCC part 15.19:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

- 
2. This device must accept any interference received, including interference that may cause undesired operation.

**Statement according to FCC part 15.21:**

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

**Statement according to FCC part 15.105:**

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 or an experienced radio/TV technician for help.

## 18 Warranty Information

Ambient, LLC provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original purchase date, and is valid only on products purchased and used in the United States, only to the original purchaser of this product, and only from an authorized dealer. To receive warranty service, the purchaser must contact Ambient, LLC for troubleshooting and service.

Warranty service can only be performed by an Ambient, LLC authorized service representative. The original receipt must be provided upon request as proof of purchase to Ambient, LLC.

Ambient, LLC will replace this product with new or reconditioned parts or products, if found to be defective during the limited warranty period specified above.

Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer.

The owner must pay any shipping charges incurred in getting your Ambient, LLC product to a Ambient, LLC for replacement or repair. Ambient, LLC will pay reasonable return shipping charges to the owner of the product.

Your Ambient, LLC 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 resulting from failure to follow instructions contained in your owner's manual; (3) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (4) units used for other than in the manner described in this manual.

## 19 Disposal

Please help in the preservation of the environment and return used batteries to an authorized depot. The electrical and electronic wastes contain hazardous substances. Disposal of electronic waste in wild country and/or in unauthorized grounds strongly damages the environment.

