



Installation Manual V4.1

# SMA 1000 Wireless Repeater



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# SMA 1000 Wireless Repeater

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## Important Safety Instructions

### DANGER



#### SHOCK HAZARD

- Keep the electricity to this device turned OFF until the clock installation is complete.
- Do not expose the clock movement to water, or install the clock in a location where it may be exposed to water.

### NOTICE

- Do not install the device outdoors. Damage to the device if placed outdoors voids the warranty.
- Do not hang objects from the device. The device is not designed to support the weight of other objects.
- The device housing may be cleaned with a damp cloth or disinfectant. Test other cleaning products on a small part of the device housing before attempting to use on the rest of the device. Avoid bleach and chemicals known to dissolve plastics.

### WARNING



#### FIRE HAZARD

- Always follow your national and regional electrical codes or ordinances.
- The AC power circuit for the clock must be attached to a circuit breaker that can be reset by the user.



#### PHYSICAL INJURY HAZARD

- If you are standing on an object while installing your clock, make sure that the object can support your weight, and will not sway or move as you stand on it.
- Take precautions to avoid injury by potential safety hazards near the point of installation including (but not limited to) heavy machinery, sharp objects, hot surfaces, or exposed cables carrying an electric current.
- Follow all mounting instructions exactly as stated in this manual. Failure to do so may result in the device falling off the point of installation.
- Packaging materials and mounting items include plastic bags and small pieces, which pose a suffocation hazard to young children.

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## System Preparations

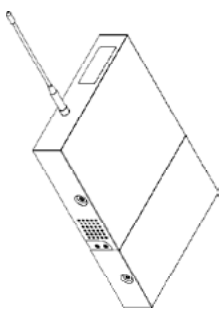
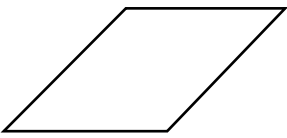

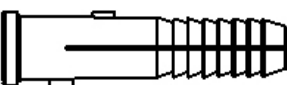
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The location should be accessible to the installer, and should be easily able to access its time base. This means that:

- 1) If the repeater is receiving time data wirelessly, then it needs to be in range of another wireless Sapling device that is either a master clock, or is already synchronized with a master clock.
- 2) If the repeater is receiving time data through Sapling's RS485 protocol, then the repeater should be installed close enough to the master clock that the user can run data wires between both devices. Research your communication protocol and provide an appropriate wire gauge and length to connect the repeater to the master clock.
- 3) The repeater must be placed in a location where the signal is not interfered with or blocked. Be aware of large structures made of stone, concrete, bricks, or sheet metal as these materials will block a wireless signal. The installer should also be aware of other objects that may cause interference to the transmission including, but not limited to, large tanks of salt water, old microwave ovens, and large industrial machines.
- 4) The repeater must be within range of at least one wireless secondary clock. The maximum transmission distance of the repeater in an unobstructed, open space is 3300 feet (1000 meters). Obstructions will reduce this distance, particularly obstructions made of the materials mentioned in the previous paragraph.

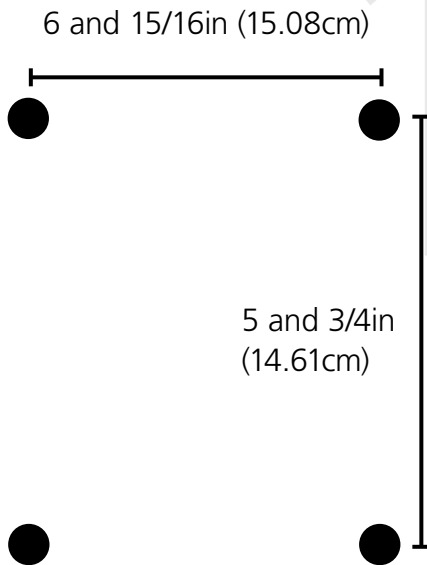
## Wireless Repeater Installation

### Included in Package

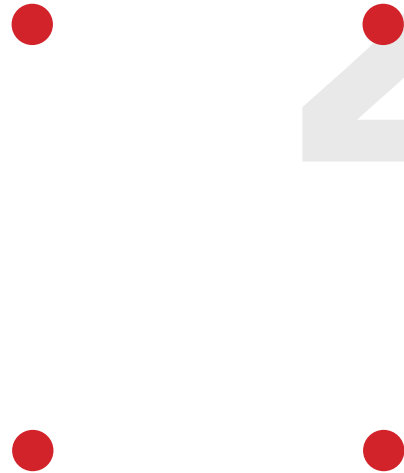
Description	Quantity	Picture
Wireless Repeater	1	
Paper Mounting Template M-SMA1-MTEMP-1	1	
Included in Mounting Kit (M-SURF-MNT-KIT1)		
#10-1.5 Sheet Metal Screw	4	
#10 Wall Anchors	4	

## Wireless Repeater Installation

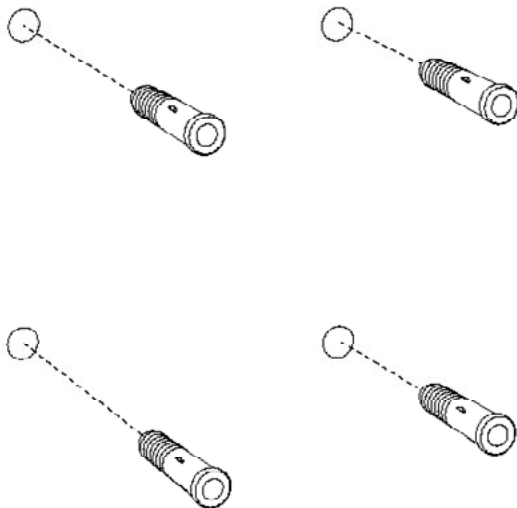
1) Use the provided template and a leveling device to mark four points on the wall.



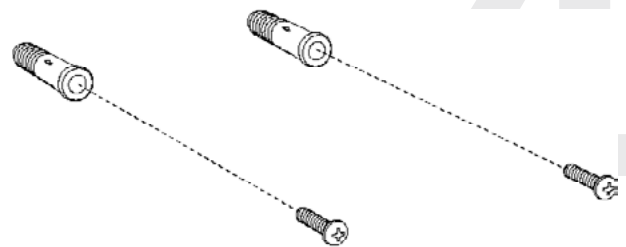
2) Use a drill to drill holes into the wall at the marked locations.



3) Insert the wall anchors into the holes.

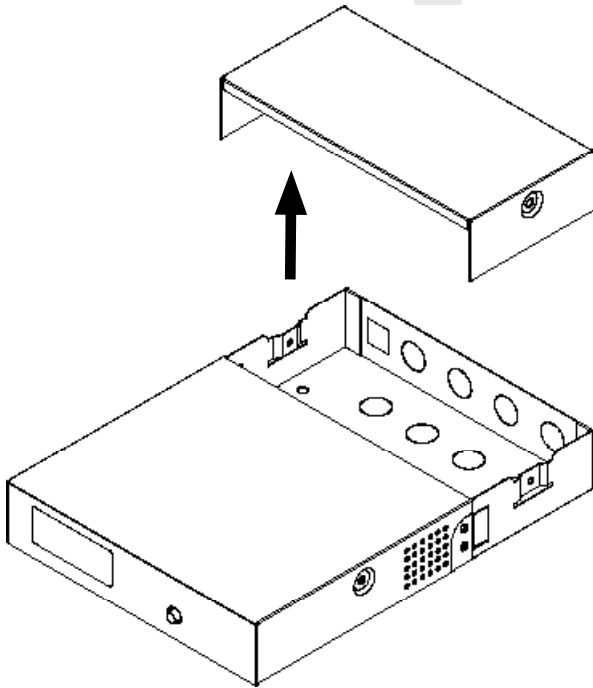


4) Insert the sheet metal screws into the wall anchors.

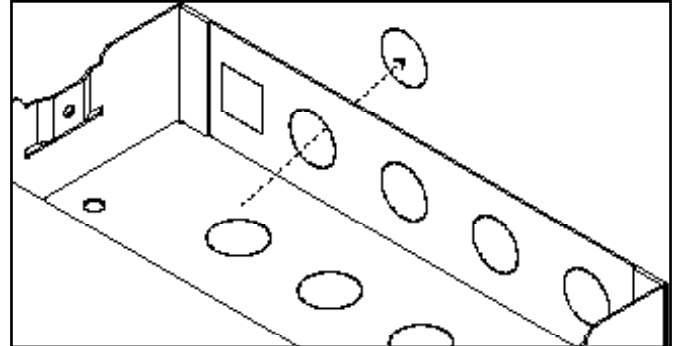


## Wireless Repeater Installation

5) Unscrew the bottom panel from the wireless repeater.

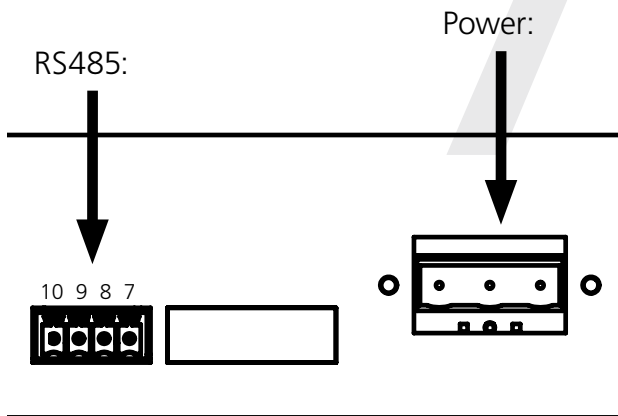


6) Remove at least one metal punch-out from the bottom of the wireless repeater and thread the power/communication cables through the hole.

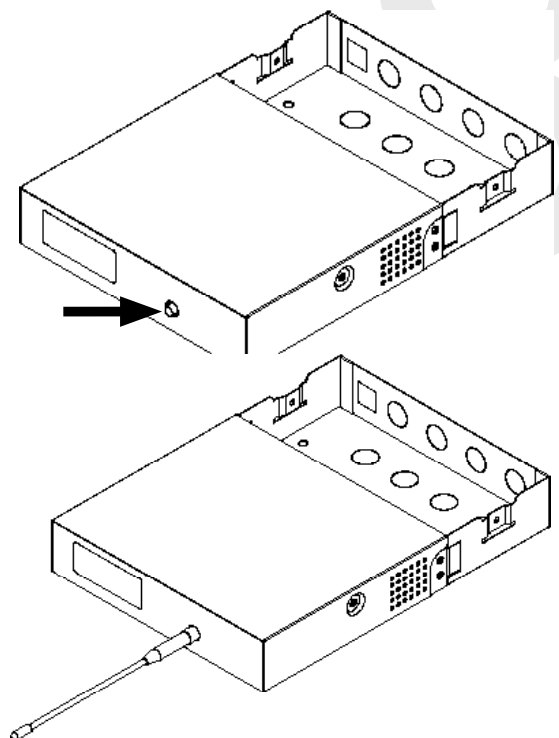


7) Attach the power cables. If you have RS485 data cables, attach them to ports 7-10. Refer to the wiring guide for more information.

Wireless Repeater:

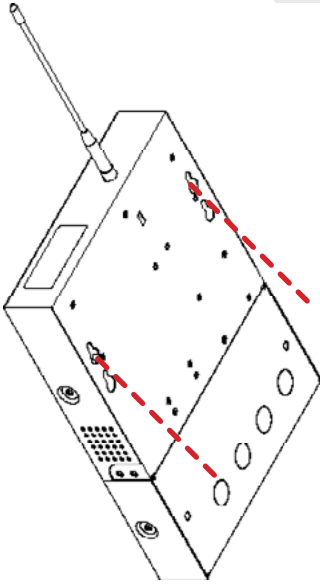


8) Attach the antenna to the output port on top of the device.

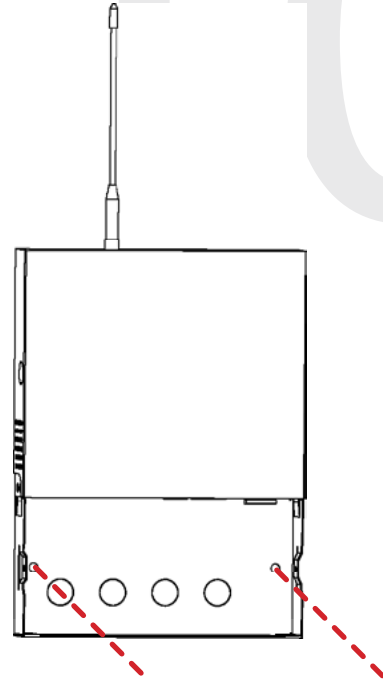


## Wireless Repeater Installation

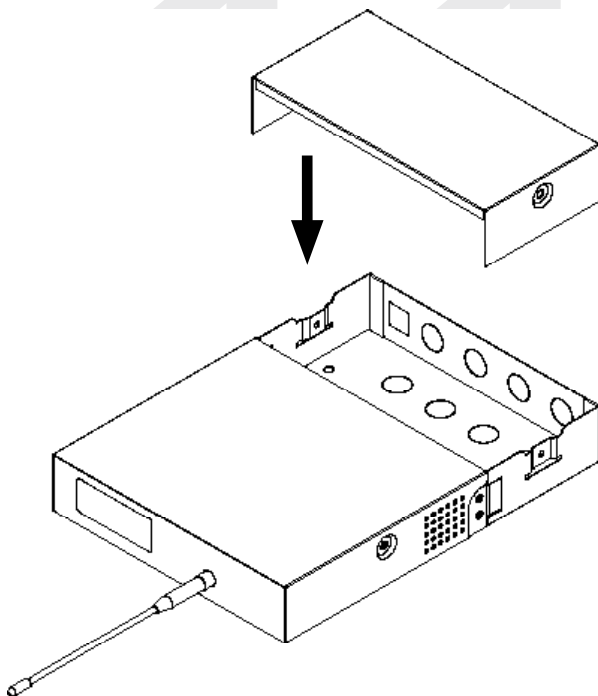
9) Hang the wireless repeater on the wall screws. Do this by lining the screws up with the keyhole slots on the bottom of the box, and slipping the slots on top of the screws.



10) Pass the remaining two screws through the holes in the bottom compartment and into the wall anchors.



11) Reattach the bottom panel.

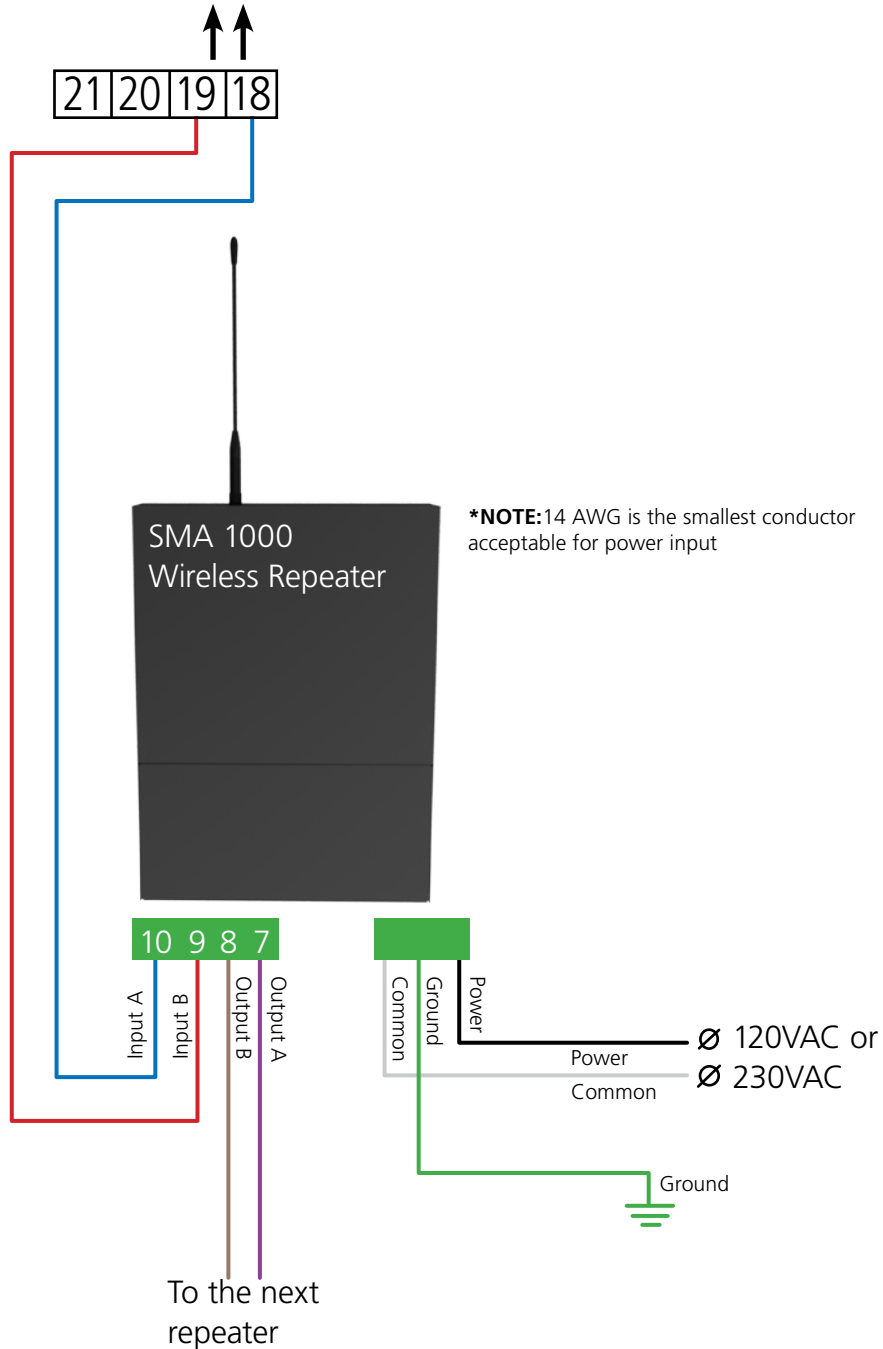


12) The transmitter will begin to transmit as soon as it is powered and is receiving time data.



## Wiring Information

### SMA Series Master Clock

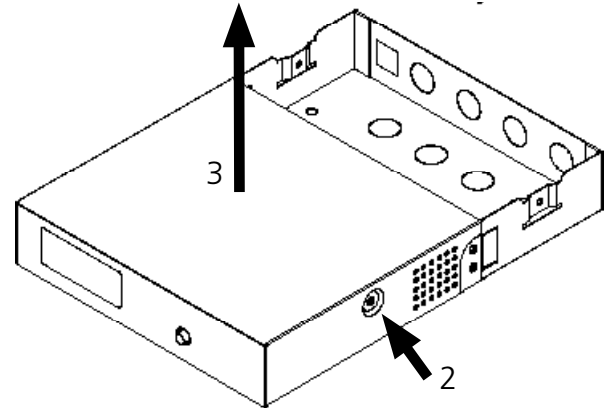


## Transmitter/Repeater Configuration

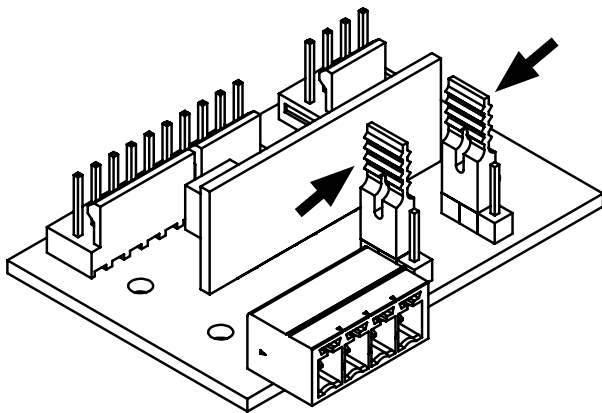
The wireless repeater can be configured to use either incoming wireless signals or RS485 data as a means of receiving the time.

To change the time data source:

- 1) POWER DOWN AND UNPLUG the repeater.
- 2) Use a screwdriver to unlock the top panel.
- 3) Lift the top panel away from the repeater casing.
- 4) Identify the green circuit board with the two red connectors. (Shown below)



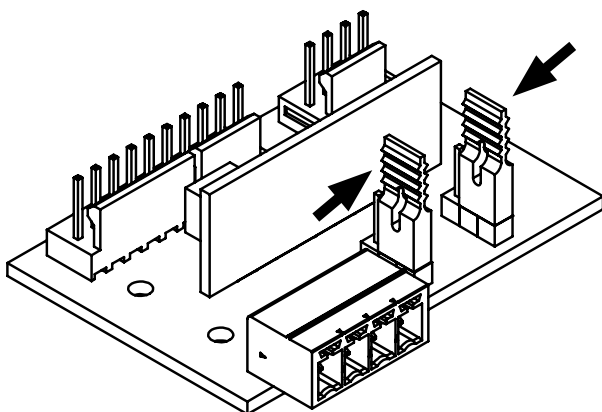
Locate the two black jumpers on the yellow board. Moving the jumpers onto the prongs closest to the red connectors will set the clock to receive time through the RS485 connection. Moving the jumpers onto the prongs furthest from the red connectors will set the clock to receive time data through wireless signals from other Sapling devices.



### JUMPERS IN TRANSMITTER POSITION

When the jumpers are on the upper pair of prongs, the repeater will read time data from RS485 ports 9 and 10. It will then transmit time data as both a wireless signal and as RS485 data through ports 7 and 8.

The repeater will ignore incoming wireless time data in this mode.



### JUMPERS IN REPEATER POSITION

When the jumpers are on the lower pair of prongs, the repeater will read time data from wireless signals sent by other Sapling devices. It will then repeat the time data as a wireless signal.

The repeater will ignore the RS485 input in this mode, and it will not produce RS485 data as an output.

**Each Jumper must sit on two prongs. If the jumper is only sitting on one prong, the device may not work.**

**Both jumpers MUST be set to the same position to configure the repeater data source. Having one jumper on the upper prongs and another on the lower prongs may damage the repeater.**

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## Frequently Asked Questions

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### **Where is the best place to mount a Repeater?**

Usually, the hallway is the best location because it is mostly open space in typical applications. Refer to the section "System Preparations" for more options and a detailed explanation.

### **How far can the Repeater transmit the wireless signal?**

The maximum transmission distance in an unobstructed, open space is 3300 feet (1000 meters).

### **Will cordless or cellular phones interfere with the repeater signal?**

No. The repeater uses frequency hopping technology to avoid interference from other devices. The repeater switches frequencies automatically when the receiver and transmitter is open, thus interference is avoided.

### **Can analog wireless clocks be combined with digital wireless clocks?**

Absolutely. The analog and digital wireless clocks are designed to work together, whether the clocks are running on battery (analog wireless clock only), 24 volts or 110 volts.

### **My power source is 220 volts. Can the Repeater be powered on that voltage?**

Yes, the Repeater can work on 110 volts/50-60 Hz or 220 volts/50-60 Hz.

### **Can I connect this device to my WiFi network?**

No. This repeater does not receive or transmit data over a WiFi network.

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## Troubleshooting

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### **The clocks aren't receiving the signal. What should I do?**

Make sure that the Repeater is in a place where the signal can be transmitted in open space.

### **What should I do if the Repeater is not powering up?**

Measure the voltage between pins L1 & L2. The voltmeter should read 85 - 135 VAC between the hot and the neutral.

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## FCC Wants You to Know

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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 commercial 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:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

### **FCC WARNING**

*Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.*

**Note:** For precautionary measures, FCC recommends a distance of 10cm from the clock to constant human physical exposure.

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## Warranty

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### **Sapling Limited Warranty and Disclaimer**

The Sapling Company, Inc. warrants only that at the time of delivery and for a period of 24 calendar months after delivery or the period stated in this invoice, if different, the Goods shall be free of defects in workmanship and materials, PROVIDED that this warranty shall not apply:

To damage caused by Buyer's or any third party's act, default or misuse of the Goods or by failure to follow any instructions supplied with the Goods.

Where the Goods have been used in connection with or incorporated into equipment or materials the specification of which has not been approved in writing by The Sapling Company, Inc.;

To Goods which are altered, modified or repaired in any place other than a Sapling Company, Inc. factory or by persons not expressly authorized or approved in writing by The Sapling Company, Inc.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WITH RESPECT TO GOODS DELIVERED UNDER THIS CONTRACT, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The foregoing warranty runs only to Buyer. There are no oral or written promises, representations or warranties collateral to or affecting this contract. Representatives of The Sapling Company, Inc. may have made oral statements about products described in this contract. Such statements do not constitute warranties, shall not be relied on by Buyer and are not part of the contract.

**Note:** An extended 5 year (60 month) warranty is also available at the time of the system purchase with a surcharge.