

# V2 Reader

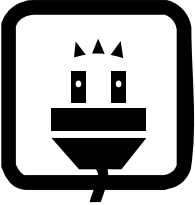
## *Installation Instructions*



For Reader Models:  
R22-1012 with P10-xx10 PlugSert option  
R22-4012 with 80-113-1002 external power supply

**RadarFind™ Corporation**  
**877-RadarFind (723-2734)**  
**[www.radarfind.com](http://www.radarfind.com)**



|   |   |
|---|---|
|  | <p><b>DANGER:</b></p> <ul style="list-style-type: none"> <li>• <b>Risk of electric shock. Disconnect all supplies before working on any circuit.</b></li> <li>• <b>It is important to follow all instructions shipped with this product. Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.</b></li> </ul> |
|---|---|

|  |  |
|--|--|
| <p><b>Cautions:</b></p>  | <ul style="list-style-type: none"> <li>• Risk of malfunction. Use only copper wires of size 12AWG (or larger) suitable for 105°C (221°F).</li> <li>• Installation should conform to national, state, and local electrical codes.</li> <li>• Gauge of electric supply wires should be of appropriate section, function of line current, as per NEC electrical code.</li> <li>• This device must be installed directly into the electrical system.</li> <li>• This device must be installed by a trained and licensed electrician who is thoroughly familiar with the National Electrical Code and follows the NEC Guidelines as well as state and local codes.</li> </ul>   |
| <p><b>Reader Model<br/>R22-1012</b></p> <p><b>Fcc ID:<br/>URGR221012</b></p> | <p>[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, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p> <p>[15.21] Information to user: Changes or modifications not expressly approved by the RadarFind Corporation could void the user's authority to operate the equipment</p> <p>[15.105] NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p> <p>[15.247] This equipment operates under Section 15.247 of the Title 47 FCC Rules.</p> <p>[15.249] This equipment operates under Section 15.249 of the Title 47 FCC Rules.</p> <p>This product protected by one or more of the following U.S. Patents: 7372365, 7525432 &amp; 7528716. Other patents pending</p> |

## General Safety Information

- Wear safety goggles when working under conditions that might be hazardous to your eyes.
- Keep tools where you and others will not fall over them.
- Keep the installation area clear during the installation.
- Do not wear loose clothing that could become caught in the equipment.

## Electrical Safety Information

- Before working on electrical equipment, remove jewelry (necklaces, rings, watches, etc).
- Locate the emergency on/off switch closest to the installation site.
- Before installation, turn OFF the power.
- Refer to the site's safety precautions for details about site-specific hazards.
- Refer to the Reader name plate for information on voltage and current.

## Contents

|   |    |
|---|----|
| General Installation Instructions.....                                  | 4  |
| IMPORTANT INFORMATION .....   | 4  |
| Preparing for Installation .....  | 5  |
| 1 - Installing a RadarFind Plug-in Reader .....                         | 6  |
| 2 - Reversing the PlugSert in a Reader.....                             | 8  |
| 3 - Installing a RadarFind EVN Reader (with external power supply)..... | 11 |
| 4 - Hard wiring a Reader .....  | 13 |
| 4.1 Removing the PlugSert.....  | 13 |
| 4.2 - Hard wired Reader Installation Procedure .....                    | 14 |
| 5 - Reader Mounting Accessories.....                                    | 16 |
| Appendix A – Reader Indicator LED .....                                 | 18 |
| Appendix B – Technical Specifications .....                             | 19 |

## General Installation Instructions

- a- A RadarFind Reader as shipped can only be installed on receptacles with the ground pin up. If it is necessary to install a Reader 180 degrees off-axis from the existing receptacle the orientation of the Reader PlugSert may be reversed (See Section 2)*
- b- If a Reader requires being installed at 90 degrees to the existing receptacle, must be offset, installed over a double gang plate, or installed over a GFCI or single outlet receptacle the services of an electrician is required. (See Section 4)*
- c- In some locations where the only available power is on a plug-strip, head-board unit, or behind a metal cabinet or refrigerator the only option may be to use an EVN Reader, which is powered by an external supply. Due to the vulnerability of the power supply and cord this should be reserved as a last option.*

## **IMPORTANT INFORMATION**

**ALWAYS confirm that the Location ID on the label on top of the Reader matches the Location ID on the map where Reader is installed.**

**If it is necessary to install a Reader in any other location for any reason RadarFind must be notified ASAP in the comment section of the Reader worksheet.**

## Preparing for Installation

**Note:** There are a number of options for installing a RadarFind Reader. Read all instructions before installing or operating this equipment.

### ***Site Selection Criteria***

The selection of the mounting location for the reader and the method of connecting it into the existing electrical system must be accomplished under the direction of the facilities engineer and the safety engineer responsible for the proposed building or location.

The installation location must be indoors and protected from all weather and water. All provided mounting fasteners must be used for secure and safe attachment.

### ***Equipment Assessment***

|                 |   |
|-----------------|---|
| <b>Caution:</b> | If the equipment is damaged, do not attempt to install or operate it. |
|-----------------|---|

1. When the equipment arrives, unpack the unit(s).
2. Check for damage that may have occurred in transit.
3. Contact the carrier immediately to file a claim stating the extent of the damage, and contact RadarFind customer service for repair or replacement.
4. Review the following checklist to ensure that all necessary materials are available for installation.

☐ Reader unit

☐ 2—3/4" #6 screws – For mounting Reader to existing electrical box. (Wired Reader only)

☐ 4—hollow wall "Polly" or metal "Ziplt" anchors

☐ 4—3" #6 screws for use with the wall anchors

☐ 4—plastic mounting hole plugs

☐ EVN Readers come with an external power supply attached.



## 1 - Installing a RadarFind Plug-in Reader

### *Plug-in Installation Procedure*

1. Remove existing receptacle cover plate from wall.
2. Plug Reader into existing receptacle
3. Level Reader and mark wall for four corner mounting anchors.
4. Remove Reader.
5. Insert included wall anchors at punch marked locations, tighten until securely compressed into wall, then remove screws from anchors and **discard**.  
(The heads on the anchor screws are too large to be used in the Reader)



*( If the supplies wall anchors are not suitable for the wall material use a suitable replacement)*



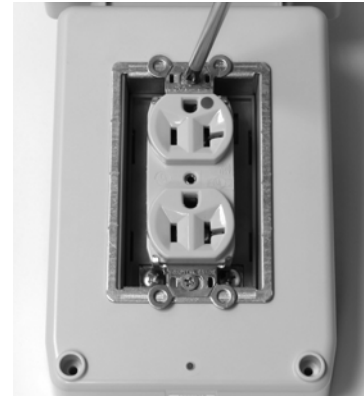
6. Plug Reader into receptacle.
7. Insert and secure 4 corners using the (4) 3" #6 screws, tighten to 12 inch pounds.
8. Tighten Reader receptacle cover plate screw
9. Plug four corner holes with plugs provided.
10. Verify that the Reader has power by observing the blinking LED.

**11. Note on the worksheet the LED blink pattern.**

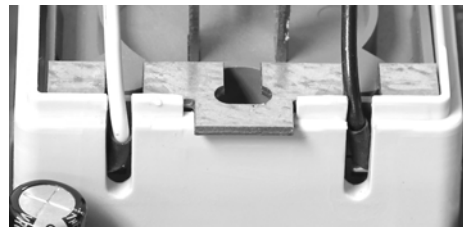
## 2 - Reversing the PlugSert in a Reader

In places where the Reader must be installed on a receptacle in the opposite orientation the PlugSert in the Reader may be reversed. This is required where the ground pin of the wall receptacle is down, or insufficient clearance exists to mount the Reader with the Antenna up.

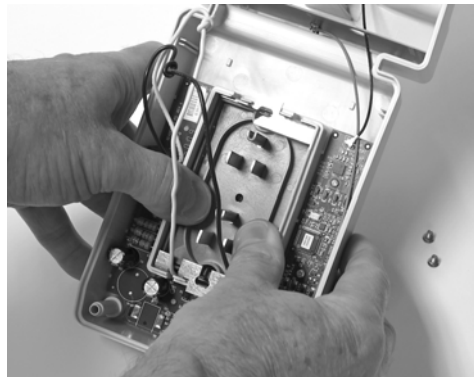
1. Remove the two short receptacle mounting screws.



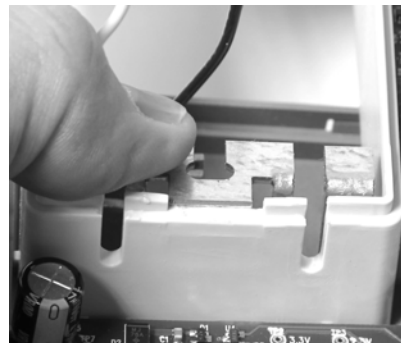
2. Carefully free the PlugSert wires and dress them up and out of the wire slots.



3. Gently push the PlugSert out of the Reader from the back, being careful not to damage the wires attached to the PlugSert.

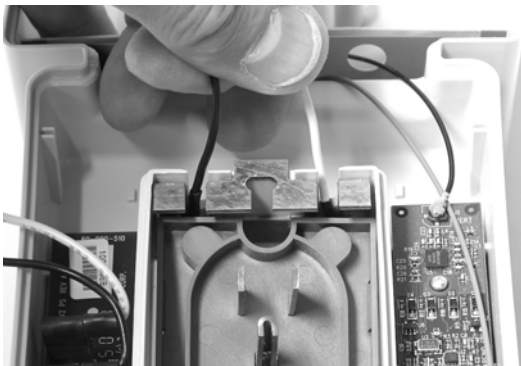


4. Let the PlugSert rest on a table and remove the metal mounting bracket by pressing the locking tabs toward each other and sliding the bracket out of the front of the Reader.



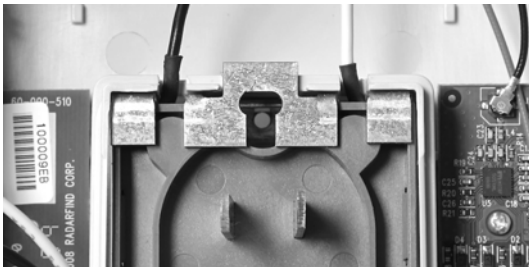


5. Invert the mounting bracket and re-insert into the Reader so the wire slots in the bracket align with the top wire slots in the Reader housing.



6. While holding the wires to keep them aligned in the wire slots gently replace the PlugSert into the Reader.

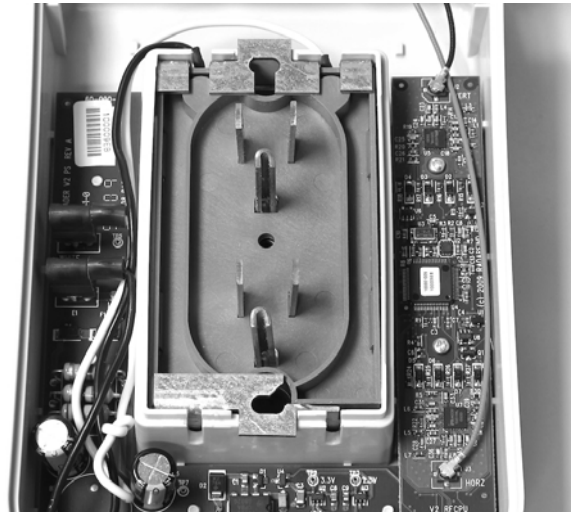
7. Check to make sure the PlugSert wires are not pinched between the bracket and the PlugSert boby. The shrink tubing on the wire ends should protrude equally from both slots.



8. Replace the short receptacle mounting screws.



9. Dress the PlugSert wires back neatly into the Reader housing and replace the Reader back.
10. Proceed with Reader installation as outlined in Section 1.



### 3 - Installing a RadarFind EVN Reader (with external power supply)



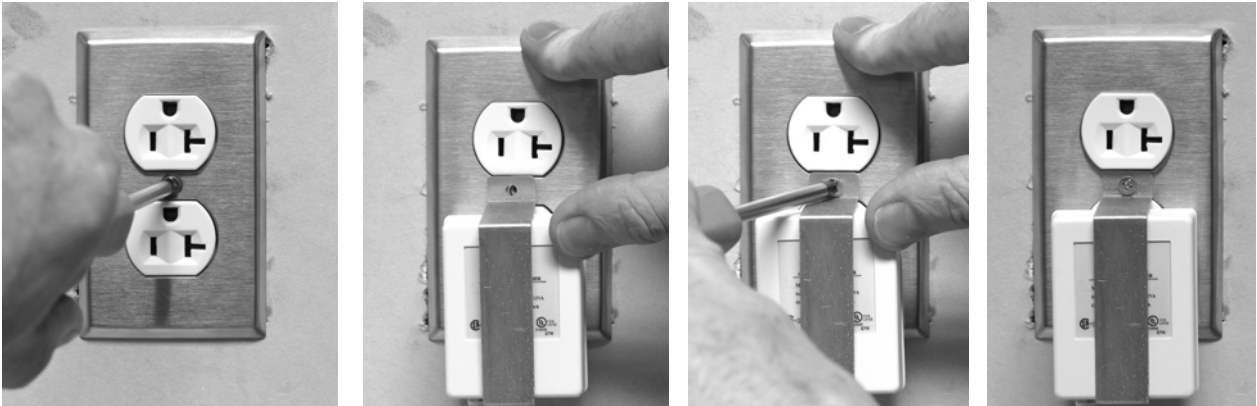
*RadarFind EVN Reader Kit*

***Note: The preferred method of installation is always to permanently mount the Reader on a receptacle, using the methods described in Section 1/2 or Section 4)***

***Occasionally circumstances prevent such installations and require the use of an EVN type Reader which uses an external power supply, e.g where the only power available is on a headboard or plug-strip or the receptacle is hidden behind a large metal cabinet.***

### ***EVN Reader Installation Procedure***

- 1 - Select a good location close to the available power to keep the cord distance to a minimum. If the receptacle is behind a metal cabinet select a spot above or beside the cabinet within reach of the power supply cord.**
- 2 - Mount the Reader to the wall using the included attachment hardware or alternate suitable for the wall material. Plug four corner holes with plugs provided.**
- 3 - Mount the power supply onto the receptacle using the metal bracket if a center screw is available. If no screw is available use adhesive to secure the power supply to the receptacle cover. Be sure to hold metal cover plates in position (Figure 2/3) when attaching power supply and bracket.**



- 4 - Verify that the Reader has power by observing the blinking LED.**
- 5 - Neatly coil and dress the power supply cable so it will not get snagged by surrounding activities.**
- 6 - Note on the worksheet the LED blink pattern**

## 4 - Hard wiring a Reader

*Note: The Reader UL 914C approval - for use as an electrical extension ring - when installed as a direct wired device requires the use of the provided hollow wall "Polly" wall anchors on all four corners. There are available tamper-resistant screws for use with these UL approved wall anchors. Part # 50-100-1020 (See Section 5 – Accessories)*

### 4.1 Removing the PlugSert

**In places where the Reader must be installed off-axis to the receptacle, over a quad box, over a single outlet receptacle, or on a GFCI receptacle the Reader Plug-Sert must be removed and the Reader must be wired directly into the receptacle box.**

#### *Removing the Plug-Sert from Reader*



**1- Remove Reader back plate**

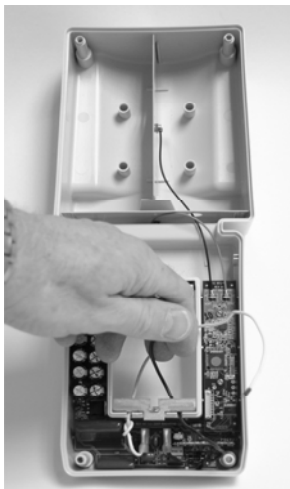
**2- Remove Reader cover plate**

**3-Loosen Plug-Sert wire tap screws from the bottom front of the Reader behind the receptacle**



**4-Pull Reader tap wires out of Plug-Sert from inside the back of the Reader**

**5-Remove receptacle mounting screws**

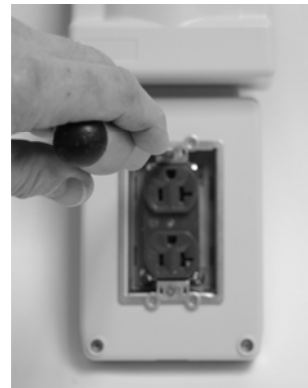


**6-Pull the Plug-Sert out of the front of the Reader**

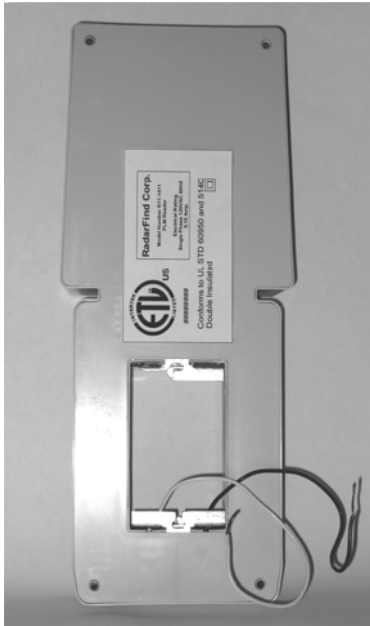
**7-Feed Reader tap wires through slots in Reader cavity.**

**8-Replace Reader back plate.**

**9-Proceed with wired Reader instructions below.**



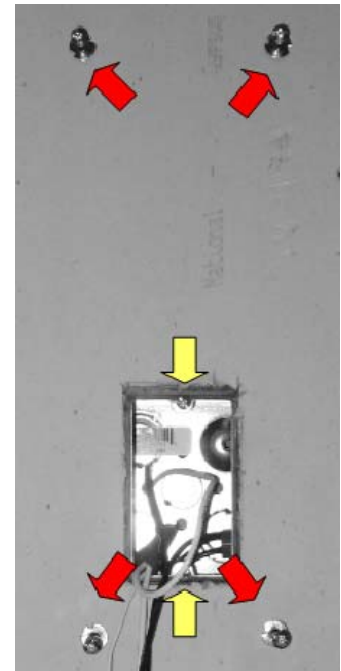
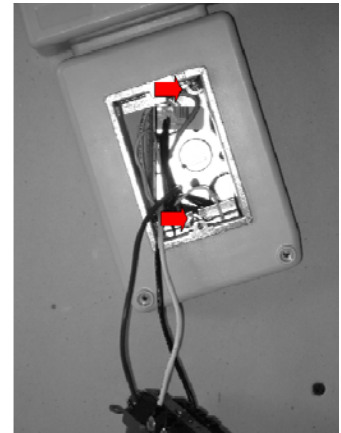
## 4.2 - Hard wired Reader Installation Procedure

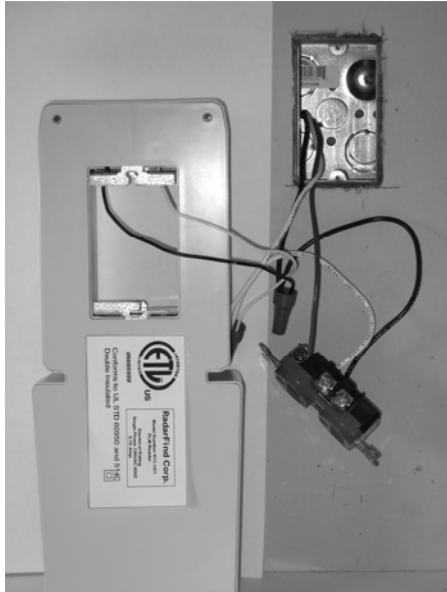


1. Turn off the power to the outlet.
2. Remove the existing receptacle cover plate and mounting screw, set aside screws for use later.
3. Unscrew receptacle, save screws for later use, and pull receptacle out of box.

*NOTE: If Reader orientation is off axis to the existing receptacle or if the existing receptacle is a quad see Reader mounting adapter plate 80-000-1019 adapter plate. (Pg. 10 )*

4. Start bottom receptacle mounting screw from installation kit into the box hole, (YELLOW) leaving approx 1/2" protruding. Cut screw if required to avoid contact with wires in the box.
5. Pull receptacle through Reader from back and place Reader temporarily over box. Slide slot in Reader mounting frame over bottom box screw. Level and mark corner holes with punch.
6. Remove Reader. Insert included wall anchors at punch marked locations, tighten until securely compressed into wall, then remove screws (RED) from anchors and discard. (The heads on the anchor screws are too large to be used in the Reader)
7. Start top receptacle mounting screw into the box hole, (YELLOW) leaving approx 1/2" protruding. Cut screw if required to avoid contact with wires in the box.





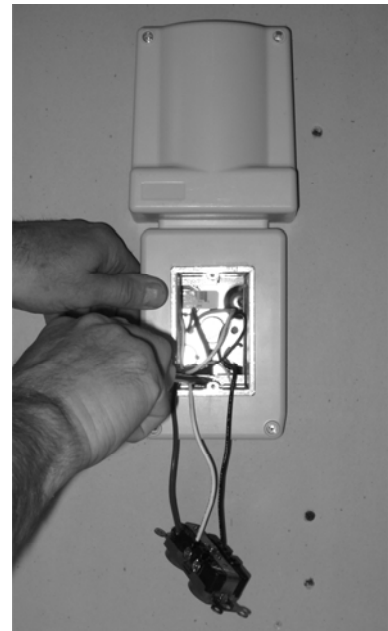
8. Wire Reader into circuit with Reader leads protruding from rear of Reader.
9. Pass receptacle through reader cavity and tip Reader onto the protruding box screws (RED) by sliding slotted end of metal mounting frame onto bottom screw, tipping the Reader to left and turning clock-wise onto top screw.

**IMPORTANT ! Use caution to assure that no wires are caught under metal Reader frame.**

10. Tilt the Reader straight, level, and tighten box screws loosely.

11. Insert and secure 4 corners using the (4) 3" #6 screws. Tighten to 12 inch pounds.

12. Tighten box screws (RED) and reinstall receptacle onto Reader mounting bracket using the original receptacle screws. Tighten to 12 inch pounds.



13. Replace outlet plate and cover four mounting holes with plastic plugs (provided) .
14. Restore power to the outlet.
15. **Note on the worksheet the LED blink pattern**

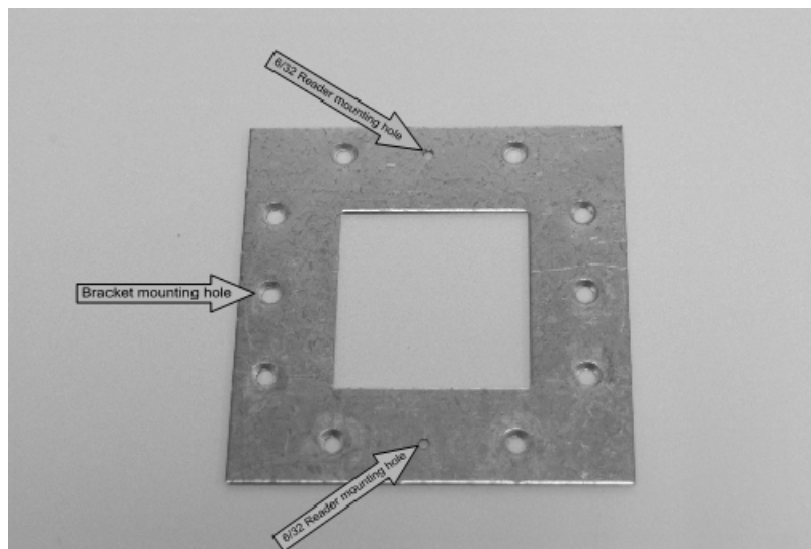
See Appendix A for details

*Note : See Reader mounting adapter plate (Pg. 16 ) for mounting at 90 Degrees to single gang receptacles or on quad-box receptacles.*

## 5 - Reader Mounting Accessories

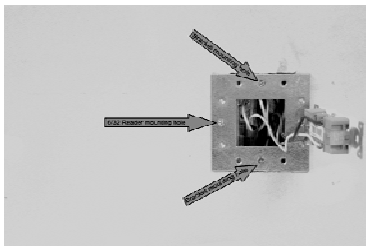
### Reader mounting adapter plate – 80-000-1019

In some cases other objects near a receptacle, such as railings or cabinets, will prevent the Reader from being installed in its default position or orientation. RadarFind Readers may be hard wired at a 90 degree angle over single gang wall receptacles or in any orientation over quad receptacles with the accessory adapter plate.



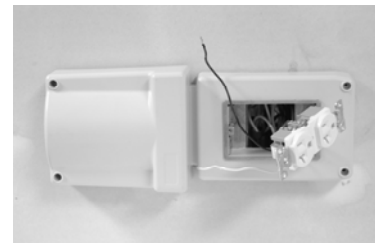
1 – Remove PlugSert module from Reader.

2 - Remove cover plate and receptacle mounting screws, tip receptacle up from wall.



3 – Install adapter plate with tapped 6/32 Reader mounting holes for desired Reader orientation.

4 – Install Reader onto adapter plate according to the Hard wired Reader Installation Procedure.





## **Reader mounting accessories**

**Note:** RadarFind Readers are packaged with standard 6/32 combination head screws for the center plate retention screw and the four corner anchor screws. Tamper resistant screws and matching drivers are available as accessories.

*Note: The Reader UL 914C approval - for use as an electrical extension ring - when installed as a direct wired device requires the use of the provided wall anchors on all four corners. The 50-100-1020 tamper-resistant screws are custom manufactured for use with these UL approved wall anchors.*




### **RadarFind Reader Accessories**

| <b><u>Part Number</u></b> | <b><u>Description</u></b>   |
|---------------------------|---|
| <b>80-100-1019</b>        | <b>Adapter mounting plate for R11-1411 Reader</b>                             |
| <b>50-100-1019</b>        | <b>(1) 6/32 2" tamper-resistant center plate screw for R11-1411 Reader</b>    |
| <b>50-100-1020</b>        | <b>(4) 6 /32 3" tamper-resistant wall mounting screws for R11-1411 Reader</b> |
| <b>50-100-1021</b>        | <b>Tamper-resistant screw driver for 50-100-1019</b>                          |
| <b>50-100-1022</b>        | <b>Tamper-resistant screw driver for 50-100-1020 for R11-1411 Reader</b>      |
| <b>80-113-1002</b>        | <b>Replacement external power supply for EVN style Reader # R22-4012</b>      |

## Appendix A – Reader Indicator LED

|                                       |  |
|---------------------------------------|--|
| <b>10 Seconds ON   10 Seconds OFF</b> | <b>Reader is functioning correctly in Tap-Ops mode</b>       |
| <b>1 Second ON   4 Seconds OFF</b>    | <b>Application is running but no TimeSync</b>                |
| <b>Blink ON   4 Seconds OFF</b>       | <b>Application is running, waiting for top of Epoch</b>      |
| <b>Blink Blink   8 seconds OFF</b>    | <b>In BootLoader – No Network</b>                            |
| <b>Blink 10 Times   OFF</b>           | <b>BootLoader 5 minute survey before sync</b>                |
| <b>1 Second ON   Blink Blink</b>      | <b>BootLoader Synced, waiting for command from Collector</b> |

## Appendix B – Technical Specifications

| Technical Specifications:<br>Part # - R22-1012   |  |
|--|--|
| AC supply:   | 108-130 VAC RMS, single phase 60HZ   |
| Power:   | 1.2 VA   |
|  | Double Insulated  |
| Communications:  | FHSS FCC Subpart 15.249 and 15.247   |
| RF frequency range:  | FSK channel between 902 and 928 MHz  |
| Transmit power:  | +8dBm maximum  |
| Antenna:   | 6 dB gain cardioid   |
| Operating:   | 0 to 40° C, 5% to 90% RH, non condensing   |
| Dimensions:  | 5" W x 12.3" L x 2.25" D<br>(4 mounting holes for wall anchors)                                      |
| <div><div><p>Recognized Component</p><p>RadarFind Corp.<br/>Part Number 90-100-101<br/>Single Gang Extension Ring<br/>for Reader</p><p>Conforms to UL STD 514C</p></div><div><p>RadarFind<br/>FCC ID:URGR221012</p><p>This device complies with Part 15 of the FCC Rules.<br/>Operation is subject to the following two conditions:<br/>(1) this device may not cause harmful interference,<br/>and (2) this device must accept any interference<br/>received, including interference that may cause<br/>undesired operation.</p></div></div> |  |