

# Application Note

**Topic:**

**Vizia RF+ System Guide**

This Vizia RF+™ Systems Guide is for electrical and home automation installers and contractors in the electrical field. The intent of this systems guide is to educate the reader in Leviton’s Vizia RF+ products when planning and installing your Vizia RF+ network. It is also the intent to provide Best Practices and Technical Tips once the network has been installed.

**Maximum and Optimum Performance**

Throughout this document we make reference to maximum and optimal performances.

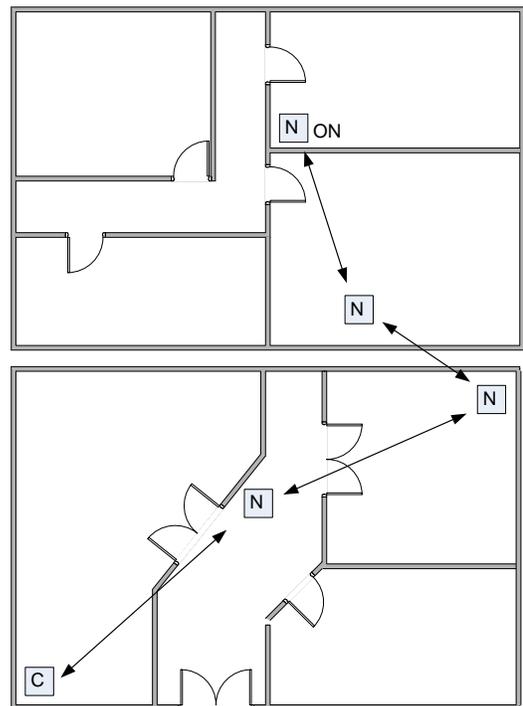
Maximum performance allows the Installer to design Leviton’s Vizia RF+ systems according to maximum specifications: for instance you are able to include up to 128 devices in a Vizia RF+ network.

Optimal performance specifications are simply recommendations an installer may use when specifying Vizia RF+ networks. Optimal performance takes into account the various forms of potential RF interference and obstacles that any given installation can encounter. These recommendations provide the installer a basis to specify and layout any Vizia RF+ network.

**Mesh Networking**

Leviton’s Vizia RF+ network is designed using mesh network technology or topology. Mesh networking is a way to route instructions and information between devices when nodes can’t reach each other directly. It allows for continuous connections and reconfiguration around blocked paths by “hopping” from device to device until a connection can be established. This is very similar to how the Internet is designed, handing off packets of information

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from server to server until it reaches a web browser.

If a device is unable to communicate directly (line of sight) with a controller it uses an alternate route. With routing, devices communicate with the closest neighboring device, (A to B) then subsequent next closest (B to C) until it reaches the target device such as a Vizia RF+ dimmer. Consideration should be taken when laying out your network. This is covered in more detail in the Best Practices section

All Z-Wave® certified products use this technology. Allowing them to communicate and transmit information between each other. However not all devices from all manufacturers communicate on every level.

### ***Interoperability***

#### **Z-Wave® Protocol Level Layer**

- Embedded communication software in Z-Wave® chips (cannot change)
- RF “enabled” control devices can receive and transmit data
- Handles bi-directional trafficking
- Will act as a “platform” for manufacturer’s software applications but does NOT give detailed feedback/notifications
- Interoperability built-in at basic level ONLY
- Manufacturer Application Layer
- Application software developed by manufacturers can be designed to specific criteria by the manufacturer. For example, Leviton’s enhanced two-way control.
- Permits many types of manufacturer specific applications. Examples: lighting, shade control, etc.
- Different grades are available for better system reliability
- Not all manufacturers will understand information sent at every level of your Network.

### ***Leviton’s Vizia RF Interoperability***

Leviton’s Vizia RF+ home automation system is interoperable within an installed network using other manufacturer’s products. This allows contractors and installers to decide which Z-Wave product manufacturers they would like to integrate within a Vizia RF+ system.

#### **Pro Level: Fully Interoperable**

- Fully Leviton licensed to operate efficiently within a Vizia RF+ system AND implement Leviton’s enhanced 2-way technology.
- Pro Level 2 Partners include
  - HAI
  - Wayne-Dalton
  - ControlThink
  - Lagotek
  - Monster (Illuminence)

## ***2-Way Status Updating Operation***

Leviton's scene and zone controllers receive information sent from a device in its network, by displaying its LED reflected by the action performed by the scene or zone controller i.e. Light green when scene or zone is ON. LED is dark when scene or zone is OFF. Leviton's Primary Remote will also give real time information from a single device controlled from the primary remotes device list.

When a controller initiates a command to one or more devices, it ensures the devices have received the command by getting a response back. This is reflected in the form of an LED change to each controller that device is associated to up to 5 if routing to all 5 controllers. On a scene controller this will only happen if buttons have the same devices and scene associated. In order to inform all other controllers on the network, the controller will follow up with an update request to each of the associated controllers.

As mentioned above any one device in your network that is associated to a controller can update up to 5 controllers if routing is required to each controller. If a device is able to talk to a controller in a network without routing, that is, via line of sight, then it is capable of updating as many controllers as it can see through line of sight. 5 controller is a limitation of the dimmer/switch not a controller. A dimmer or switch is designed using the z-wave routing slave library which is only able to store 5 routes to any controller associated to it. This means if a dimmer or switch must report its status to 5 or more controllers, after 5 any additional controllers associated to that dimmer/switch must be in line of sight (direct range) or the dimmer will not be able to transmit the status information to that controller.

However, there is no way of knowing due to Z-Wave™ proprietary protocol whether a controller is communicating with a device via line of sight. Therefore, it is recommended any one device not report its update to more than 5 controllers in a network, if implementing Leviton's 2-way operation.

Leviton's Vizia RF+ lighting uses patent pending enhanced 2-way communication to reliably deliver scene and zone information to Vizia RF+ devices in a network. Enhanced two-way communication with other manufacturer's products is dependent on whether they have implemented Leviton's enhanced two-way protocols.

## ***Home ID***

The Home ID is programmed into each primary remote at the factory before it ships. There are 4 billion unique home IDs available for programming ensuring an ample supply of network IDs.

The Z-Wave protocol uses a unique home ID to separate each independent network. This unique home ID allows for system design and installation in apartment and MDU applications. Because of the unique home ID in each network condos, apartments, and high rise MDU can install Vizia RF+ systems into any dwelling without interference from another network in the same building.

The first Primary Remote will be the only Remote able to include or exclude devices from a network.

Additional (secondary) Remotes will be assigned that same home ID when included into the network. This is accomplished through a process that leaves the initial controller as the “Primary Remote” and the other remotes as “Secondary Remotes.

All Dimmers/switches and controllers in the network will initially have a home ID that is set to zero. In order to communicate, the Primary Controller needs to assign all devices with its home ID. It is only a Primary Remote or that can assign home ID's to a device.

### ***Node ID:***

Node ID's are used to address individual devices in a network. A node ID is assigned to slave and controller devices by a Primary Remote. A node ID is assigned to each device within a network along with the unique home ID . A sequential progression is used when assigning node IDs to Z-Wave devices. Leviton's VRCPG Remote will start with ID 2, sequentially assigning devices an ID up to 128. Once a device has been included into the network, its node ID can then be named i.e.; Home Theater, Kitchen, Master Bedroom. This allows any installer to easily identify the location of the device and what it is controlling.

Designing a basic Vizia RF+ lighting system is very simple. Advanced applications require further thought and planning to ensure a smooth and reliable installation. When designing a Vizia RF+ system consideration should be given when choosing the best location and layout of your network. Leviton's Vizia RF+ devices communicate at 908MHz radio wave signals within its network.

### ***Best Practices***

Designing and Installing Your Vizia RF+ System for Best Performance

Specifying your Vizia RF+ network:

House Size

Vizia RF+ networks perform best in 7,500 square feet or less for optimum performance. This is based on the distance a signal must travel when hopping between devices before it reaches its intended device. Vizia RF+ devices are able to hop up to 4 times between devices to reach a final device. However it is best to limit the amount of hops to 2 or less for increased performance and decreased latency when transmitting. Limiting the size of installation to 7500 square feet lessens the amount of hopping enabling a more reliable installation.

Poor coverage can be due to an inefficient number of devices installed in your network, where the mesh degrades due to the distance between devices or interference from construction materials such as walls that block the RF signal from reaching its destination. Adding additional devices to increase communication will increase your RF coverage and eliminate RF signal loss due too interference.

Layout

If you are specifying Vizia RF+ as a whole house solution, consider all lighting locations when determining where Vizia RF+ will be installed. Since not every light switch in the home requires home automation benefits, consider using non-RF Vizia+™ devices in areas such as closets, pantries and garage lighting to compliment the Vizia RF+ installation.

If communication is slow or experiencing long lag time (latency) you may find that installing additional plug-in devices and using them as transceivers can increase communication strength,. You may be within 30 ft however you must factor in walls and open air RF loss when laying out your network.

Detached Buildings or landscape lighting:

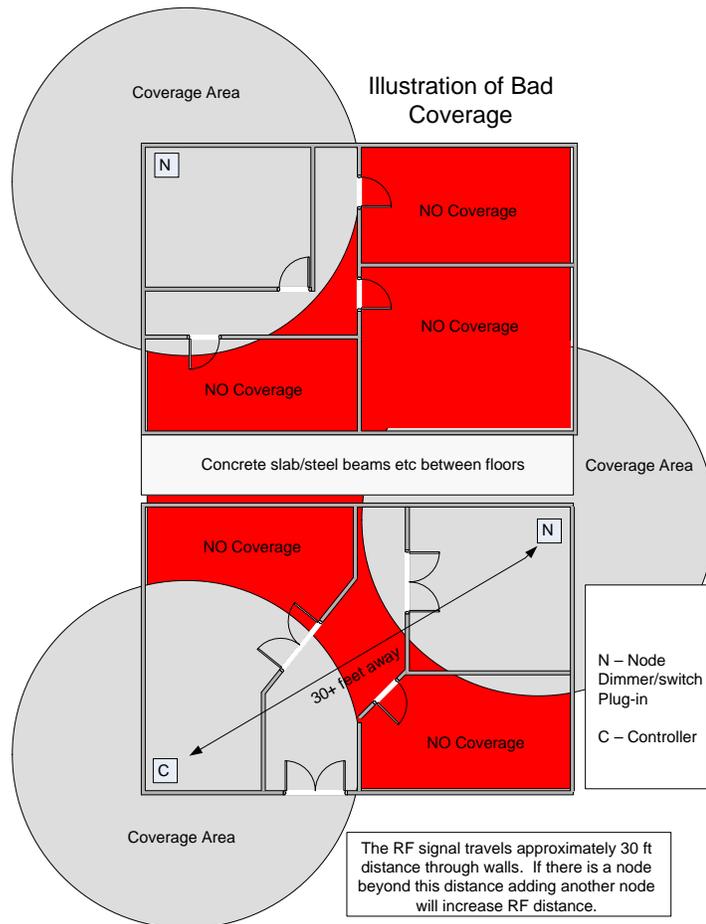
Installing Vizia RF+ in a detached building can be done however depending on the distance between the main house and detached building communication may fail. If you are unable to send or receive communication to a detached building from the main house it is best to program the detached buildings as a separate network from the main house.

Adding additional plug-in devices as transceivers to increase routing between these two buildings can greatly increase communication. If you are experiencing any communication issues install additional plug-in modules at the closest points between the two buildings. Remember when you install these plug-in devices you will need to run a Network Re-discovery to include these modules as possible routing devices between two buildings. Caution: Plug-in devices are not rated for outdoor use.

Note: If contemplating this type of installation it is best to contact Leviton technical support. Not all remote structure installations are capable of control from a main house. There are many factors that must be considered when installing your network between two separate structures, such as a Main house and detached garage.

### **Number of Devices**

While specifying a Vizia RF+ system, ensure that you will not exceed 128 devices including controllers.



A typical 7,500 square foot house will average 72 devices. This number of devices as tested will deliver optimal performance. As long as devices do not exceed RF range distances beyond the specified limitations below

### ***Distance***

Vizia RF+ devices will communicate 75 feet in an “open air” environment. (See RF Signal Loss below when figuring actual communication distance between devices in your network.)

In the common home, where RF interference obstacles (gypsum, metal, reinforced concrete, walls, screens, stainless steel, etc.), are frequently encountered, consideration should be given to installing one device per room this will ensure less distance between devices increasing communication within the network. (Typically, 30 feet apart).

### ***RF Signal Loss***

The presence of typical building construction materials, such as mentioned under construction considerations, in the Best Practices section further reduce RF signal strength. RF signal strength drops by 6dB for every incremental doubling of open field distance with no impairments or obstacles. An RF signal can drop inside a typical building with obstacles/impairments by about 25dB for every incremental doubling of distance.

This is a similar effect experienced when driving through a parking garage or a tunnel while talking on a cell phone. When in a parking garage you encounter thick reinforced concrete and steel. This causes you to lose cell service due to the thick concrete blocking the Radio waves. Similarly in an RF system there are losses created as a result of various obstacles and impairments. Another way to look at RF Interference is to consider every obstacle between the transmitter and the receiver as a sponge. Every obstacle absorbs some of the signal. Multiple obstacles absorb much of the RF signal, weakening it to the point where the receiver can no longer see it. Some obstacles will absorb more of the signal, while others will have little effect.

Another type of RF interference obstacle will actually attract and bend an RF signal away from a desired receiving point. This type of interference is often experienced in HDTV over-air broadcasts and can affect all RF signals. Crosstalk, multi-path interference and signal drop-out environments are indicators of this effect.

Common causes of RF interference include:

- Cordless headsets/phones (900 MHz frequency)
- Wireless speaker expanders/extenders (900 MHz frequency)
- IR to RF Remote control extenders (900 MHz frequency)

### ***Construction Materials Considerations***

- Building materials can decrease signal distance and block signal in an RF system. Below are some of the possible considerations:

- Metal foil insulation
- Metal foil wallpaper
- Reinforced concrete
- Masonry
- Tin or metal ceilings
- Metal plumbing and pipes
- Metal screens
- Screening materials for stucco applications
- Steel doors, studs, and metal boxes

If you encounter any of the above construction materials or electronic devices in the installation, you may need to add additional transceivers (plug-in) devices to improve performance. Electronic devices at 900 MHz may need to be removed or relocated. This is due to possible interference they introduce into a Vizia RF+ network. Replace them using devices on a different frequency, for example 2.4 or 5.8 MHz).

### ***Solutions for Common Interference Issues***

Not every switch and dimmer in an installation needs to be automated using Vizia RF+. Implement Vizia RF where it has the strongest impact on lifestyle and performance in areas such as kitchens, hallways, landscape, master bedroom, home theater and porch lighting.

- Include standard Vizia+™ products in non-automated locations.
- Not every dimmer and switch in the home needs to be automated, i.e.; closets, garage, etc.
- Use other Leviton products to provide automated solutions such as the Decora® Manual-On Occupancy Sensor (IPP15) in closets, laundry rooms and similar locations.
- Room-based applications are easily done with Vizia RF+ products. In most cases strong RF communication is achieved when devices have a line of sight communication to and from the scene or zone controller. This allows for extremely fast communication with no latency because there is potentially no routing and or obstacles for the signal to travel through reducing RF range in the system.

### ***Design Considerations***

Extra care should be taken when installing a whole house application. You may have an installation that experiences RF interference or loss due to construction material used in the home, or RF loss from the distance between device and controller. In either case this can cause communication errors resulting in poor user expectations. If this should occur, adding a network transceiver (Leviton Plug-in device either VRP15 or VRP03) between the offending device and controller resolves these errors.

1. Distribute devices throughout the house using existing wall switch locations.
2. Do not install dimmer/switch devices all in one location. i.e.; electrical panel room on the wall. Doing this can result in poor communication. Remember Vizia RF+ is a mesh network and rely on its neighbor devices to communicate messages to controllers. When all devices are located in a cluster communication back to the controller may fail due to long RF distances travelled without the ability to rely on another device to relay the message to the intended controller

Consideration should be taken when designing a system around concrete walls, aluminum siding and metal. These are all materials that can significantly attenuate (reduce) RF signals.

Best practices when installing and programming your network

***Update controllers when adding any new devices/controllers to the network.***

As systems increase in size, expect installation time to also increase. As routing tables grow, sending and receiving traffic will increase. The result can be interpreted as slow performance. However, good system design practices can have a dramatic impact on performance and should be factored in when designing a large Vizia RF+ system.

1. When setting up a network, include all dimmers, switches, and plug-in modules first. Then 4 button or single button controllers. This allows your controller to build a full routing table during its inclusion, giving each controller the most up-to-date information. .
2. Controllers must be updated after all devices are installed or as any changes in the network are implemented by adding/removing devices or changing the locations of any previously installed devices.
3. When removing a device from your system, using the exclusion procedure is critical to a Z-Wave system's reliability and response time. When a device is not excluded, or reset, the routing device may assume it to be part of the network and continue to attempt to communicate with it. If not excluded or reset from you network the result will degrade system performance. It should be noted that Z-Wave technology is designed with "self healing" ability, which after a few failed attempts will re-route the control signal through another device in the network, resuming Communication. However system performance may degrade and appear slow. In extreme circumstances you may even lose RF control to devices.
4. If there is difficulty including a device (dimmer, switch, plug-in) into your network, reset the device to its default setting (see instructions for your device) and then attempt to include it again.
5. If a device fails in the network, Leviton's Primary Remote can be used to run a REMOVE FAILED command from the primary remote. This command scans the devices in a network allowing the user to remove any devices that show failed. This is a very useful programming tool and it can be helpful to locate device which are not communicating properly and allows the user to take the proper steps in troubleshooting the installation.

Good system design and installation practices will increase Vizia RF system performance and reliability.

Primary Remote Functions and troubleshooting:

Note: Leviton has designed two Primary remotes:

- Basic remote VRCPG-BSG (battery operation only).
- The advanced VRCPG-OSG primary remote. Our VRCPG-OSG advanced remote has all the functions listed below in its menu. The basic remote does not include Events, or a Clock feature.

Features	VRCPG-BSG	VRCPG-OSG
System Setup	■	■
Programmable Scenes and Zones	■	■
Profiles (16 unique)	■	■
Security Settings	■	■
Clock		■
Timed Events		■

***Inclusion/Exclusion within Network***

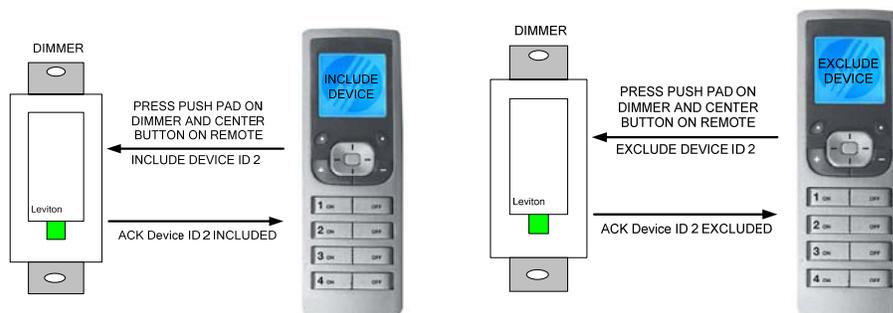
To create a Vizia RF+ network you must first include devices into the network. Your Programmer/Remote assigns the device a unique ID. This is done through the process of Inclusion.

To do this, both the Programmer/Remote and device must activate the include initiator. On any of the Dimmer, Switch or Plug-in devices press the push pad or toggle button to include.

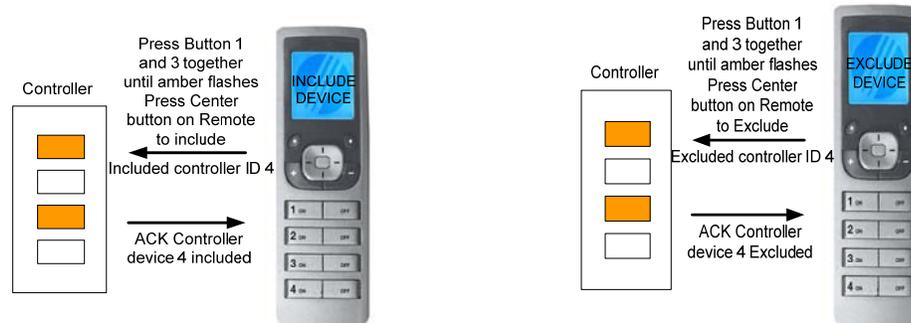
The Programmer/Remote requires selecting the include option under system setup. Both Programmer/Remote and device must be initiated at the same time. Below is an illustration for including/Excluding a device to a network.

Exclusion is used to remove all information from the device setting it to factory defaults. Exclusion can be used to reset a device that is not including properly. If however your device will not include to your network it is best to reset the device (see device instruction sheet to reset)

If your device was moved or part of any other network you will also need to reset the device to clear any previous information in the device. This clears all memory in the device and returns it to factory settings. Inclusion/Exclusion requires close range communication. Ensure your remote is within 3 ft of the device you are including or excluding.



Leviton's SCENE and ZONE controllers include to a network by pressing buttons 1 and 3 until the LED's in the buttons begin to blink amber. See example below



**NOTE:** It is important to update all controllers once you have included all devices and all controllers into your network. This ensures your network is up to date and virtually linked to all devices in your system.

### **Controller Updates**

In order to maintain network integrity in a Vizia RF+ network controller updates are required to reorganize and efficiently build routes. Doing this updates each controller in the network with any changes or additions to the system. A network update should be done at the end of installation to Controllers only. Each controller requires an update. Once all controllers are updated, updates are then only required if additional devices get added to an existing network or to "refresh" to optimize performance.

The update function is located within a sub menu of the system setup network screen in a Leviton primary remote. When you select update controller from the menu and select the controller you wish to update the update will start automatically. It works in low power which is the same as if you were including a device, so you will need to be near the controller you are updating. Once the controller to update is selected by the primary remote, your controller will begin to flash amber on all LED's, which automatically starts the update process. The update process goes quickly depending on the amount of Vizia RF+ devices in your network and the amount of controllers to update.

### **Areas**

Areas are defined as a group of selected devices (within the Primary Remote) who are joined together as a group. This group of devices can be used to quickly associate to a controller. Leviton's Vizia RF+ network is capable of creating 128 areas. These areas can be configured as a single device, all devices in a single room, or as a whole house area up to 32 devices per button on a controller.

Once your areas have been created, you can easily associate a group of devices to a button on a scene or zone controller. Areas are also used when selecting profiles in the primary remote this allows your primary remote to control areas within a profile. Each profile can turn on an area assigned to a button.

Areas can be assigned to a scene or zone controller. When associating your scene or zone controllers select the area option and assign the area you would like to control to that scene or zone. Creating an Area:

```
>>MENU>>[CENTER BUTTON]>>AREA>>[CENTER BUTTON]>>NEW>>[CENTER  
BUTTON]>>ADD DEVICES>>[CENTER BUTTON]>>SELECT DEVICES TO ADD TO AREA USE  
[+] KEY>>[CENTER BUTTON]>>[SAVE]
```

Your Area will now display under the area menu. Select New to create another area.

Deleting an Area:

1. Select Area
2. Scroll to the Area to delete (Area 1...)
3. Select (Delete Area)
4. Confirm delete Area (YES)

If an area is not responding or showing RF fail when trying to toggle it ON or OFF, you may be outside of the range for the remote. The RF remotes must be within close range of the nearest device in the Vizia RF+ system. If a device did not include properly into the network it may cause RF failure also, try and re-include the device after excluding it and program the area again.

### **Association**

To specify the relationships between the dimmers or switches and the controllers, Leviton uses a method called association.

Associations can be created by using a primary controller, or a PC software program which has implemented Vizia RF+ association protocols. Associations can be set, removed, modified or reported back at any time. This creates a much greater level of flexibility and greatly speeds up installation. It is important to associate your network after all devices in your network are installed.

Associating a device/ Area to a scene/zone controller is done through the Primary Remote. Each button on a scene or zone controller is able to associate an Area or device in a network. All information is stored in the scene or zone controllers. If a device/area has been associated to a button, let's say, button number 1, the associated device will react when button 1 is pushed. If you do not want a device or area to react to a button simply do not associate it to any button on your controller. The device or area will not react to the button being pushed if it is not associated. It is best to do your associations after all Vizia RF+ devices are installed into your network and all your areas are created as this allows the scene or zone controllers to build a complete information table to communicate reliably to each device.

Another way to associate devices to a controller button is by associating an Area to the button. If you have built an Area in your network, i.e. bedroom lights, these can be associated to a button.

Note: All devices in that area will automatically be associated to that button and will react when a button is pushed.

Note: If you are having problems associating devices to controllers, ensure that the distance between the controller and device is not exceeded. Also take into account obstacles, walls and wall surfaces when diagnosing RF performance. Each network's signal loss may differ depending on the installed environment. Additionally, sometimes association may fail when doing so with Leviton's two-wire dimmers such as VRI06 and VRI10. This can often be because the load wattage for these dimmers is less than specified in the dimmer instructions. For Leviton's Vizia RF+ two-wire dimmers, minimum wattage requirements must be followed to ensure proper RF communication between the controller and dimmer in its network. Because these dimmers do not have a neutral wire, there must be a constant minimum power supplied to the dimmer in order to maintain its RF communication range and supply power to its components.

### ***Creating an Area ON/OFF or Zone***

- To create a zone, associate any created areas or devices to your controller by selecting those areas or devices in the association list on the Primary Controller. This function is under the association menu from your selected zone controller. When an area or device has been associated with a button, that button will control the area or devices when it is pushed. Once all devices/area have been associated to that button, move to the next button. Each button on the zone controller is able to have 32 devices associated to a button.
- When an Area ON/OFF has been selected by the zone controller, any devices in the association list will respond and turn on to the last level in the dimmer, switch or plug-in.
- NOTE: If a device was not associated to the button being programmed, it will not respond to any button push from the zone controller. All devices required to respond to a zone controller button must be associated with that zone button.
- Creating an Area in Leviton's 1-button scene or zone controllers is configured the same way as a 4-button controller. One-button scene controllers can have a maximum of 32 devices associated to them.
- However, it is important to note that one-button zone controllers will only allow an association of 1 device to its button. Leviton's 1-button scene and zone controllers can also be used as "virtual" matching remotes in a 3-way installation. Vizia RF+ 1-button scene controllers are replaced in a switch remote location, allowing it to be a virtual 3-way to our VRS15-1L. Vizia RF+ 1-button zone controllers can be used as a matching dimmer remote for a 3-way application.

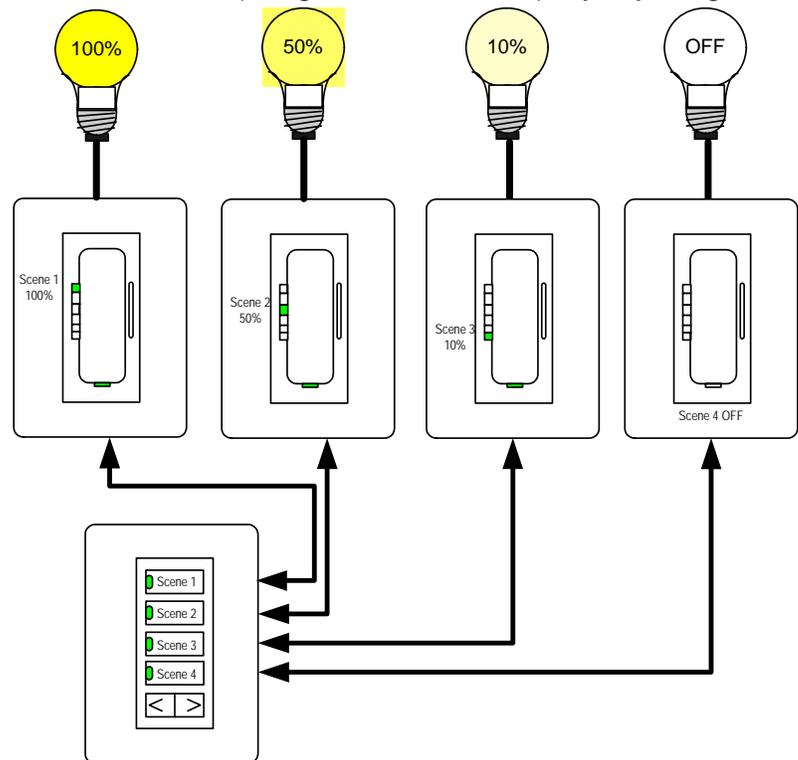
### ***Scenes***

Scenes are arguably one of the most beneficial advances that Vizia RF+ can bring to home control. The ability to conduct a group of lights to automatically change the appearance of a room, using a single stroke of a button, is an amazing experience. Scenes differ from zones/area control in one important manner—invoking a scene adjusts the light intensity states of one or multiple devices, whereby a zone only controls the ON/OFF state.

All devices/areas must be associated to each button on your scene controller. Each button on the scene controller can support a total of 32 Vizia-RF+ devices associated to it. NOTE: If a device was not associated to the button being programmed, it will not respond to any scene activations from the scene controller. All devices required to respond to a scene controller button, must be associated with that scene button.

Programming a scene is done in a few simple steps. First you must put the scene controller into scene programming mode. Press and hold one of the scene buttons until it blinks green. This enables scene level programming, indicated by a blinking green LED in the button. (Each button requires its own scene programming). Next, walk through the house and set the lighting levels for each device in the area that is associated to that button (assigned to that scene). By adjusting the various intensities of each lighting load, you can create scenes for reading, entertaining, cleaning and even all off. After all light levels have been set (and each device has been associated to the appropriate button) Press the scene button a final time on the scene controller to learn the scene into a button on the controller.

Leviton scene controllers can be set to 5 default scenes allowing for quick scene programming. Scenes 1-5 can be assigned to any scene controller button as default scenes. (I.e. scene one is defaulted to 100%, any devices associated to this scene will go to 100 %.) Scene two is set to 50%, scene three 10%, scene four OFF.



4 button scene controller, default scenes:

NOTE: If a device was not associated to the scene button being programmed, it will not respond to any scene activations from the scene controller. All devices required to respond to a scene must be associated with the scene button desired.

Vizia RF+ 4-button scene and zone controllers also feature an IR port for control via IR remote controls. Both Scene and zone controllers come default with the IR port disabled. To enable simply remove button 5 (DIM/BRIGHT) the last button, and replace with clear plastic button to allow IR receiver to get signals. The 4 button controllers can receive a simple remote IR code to turn ON/OFF Bright/Dim or activate a scene or zone. When using IR features in the scene or zone controllers do not install two 4-button controllers that are using IR coding next to each other. This can cause both controllers to receive the IR remotes signals causing false scene or zone triggers. (See Vizia RF+ IR codes document)

### **Scene and Zone control....what is the difference?**

What is the difference if I use a scene or zone controller? Scene and Zone operation are quite different. What makes scene and zone control different? First let's see how zone control operates.

### ***Zone Control***

When devices are associated to a zone controller they are simply added to a list. The controller remembers these devices and knows which ones to call should its button be pressed. When zone control is selected or GROUP ON/OFF in your association menu for a given controller, any time that button is pressed your devices (dimmer/switch and/or plug-ins) at the receiving end turn ON. These devices will turn ON to the last level the devices were previously at regardless if the device was changed locally at the device, or at the controller.

A zone controllers LED's will change depending on the action programmed and condition of the device it is controlling. If a group of 3 devices are told to turn ON by the zone button and all devices acknowledge back that they are ON to the controller, the LED will light green (IN ZONE). Additionally any other controllers that have any of these same devices associated to them will also light green (or ON). If all 3 devices are turned OFF either from each device or controller then the LED will reflect OFF (LED will go dark) any other controllers with these same 3 devices will also reflect OFF. If any of the other controllers have additional devices associated to these same buttons as the 3 devices, the LED will remain ON until those additional devices have been turned OFF. If only one device in that group gets turned off the LED will stay lit, this is because the programmed group of devices for that zone have not turned off.

The Zone controller also allows ability to toggle an area ON or OFF by the LEFT/RIGHT toggle button. Zone controllers receive true acknowledgement of a single associated device or group of associated devices ON or OFF position.

### ***Scene Control***

When devices are associated to a scene controller they also are added to a list. The controller remembers these devices and knows which ones to call should its button be pressed, just as the zone controller. When a scene is selected as the action in your association menu for a given scene controller, and that button is pressed your devices (dimmer/switch and/or plug-ins) at the receiving end turn to the pre programmed scene levels. Each device is set to turn ON each time to the level your scene controller learned. When you press the scene controller button until it begins to blink green it is set to scene programming mode. You must then set each device associated to that button to a level. (On a dimmer 1-100% or on a switch ON or OFF). Once you have set all devices to there level you must again press the scene button to learn that scene.

A scene controllers LED's will turn ON whether the scene was programmed to turn ON or OFF. This is because when the scene is actuated it sets each associated device to the pre programmed level set by the user. If any one device in that scene changes its level the LED on the scene controller will go out (dark) indicating that the scene is OFF, or no longer true. If that same device is turned ON locally again to the same level the scene LED does not change. The LED will only turn back ON after the scene button is pressed on the controller and sets all devices to its pre programmed levels. Note: If any device associated to either a scene or zone controller is removed or loses power, pressing a zone or scene button on that controller will still turn on the LED green. However when the button is pressed the indication that it is experiencing communication errors is indicated by a green blinking LED followed by the LED flashing red once.

The communication errors would be a result of removing or loss of power to the associated device.

### **Creating Events (Timed Event)** (VRCPG-OSG Remote ONLY)

Our primary remote allows for the programming of up to 64 events. Each one of the events can be programmed to set a device/area/scene, to an On/Off level at a programmed time. A recurrence can also be specified. The recurrence selects what days of the week or month the time clock will run.

ON or OFF times can specify a particular time of day, or a value relative to the calculated sunrise or sunset times dusk or dawn. In order for this feature to work you must enter longitude, latitude and time zone settings into the location tab in the settings menu. Ensure event settings are enabled under the event setup tab. A time randomizer provides for some daily variations so that it does not appear to an outsider that the lights are controlled by a mechanical system. The default programmed state of the timers is that they are ENABLED. Completion of the Wizard will enable preferred events to be activated.

Creating events based on dawn and dusk give a user the ability to turn ON or OFF scenes or zones according to each day's dawn and dusk time. In order for these settings to work properly you must input your location settings. At the end of this guide starting on page 25 there are Longitude and latitude settings for all major cities and locations in the USA. Change your latitude and longitude to match your location. You also need to locate your time zone and enable daylight savings mode. These settings must be input correctly in order for dawn dusk settings to trigger. (See Application Note: Setting Up an Event)

Deleting an Event:

1. Select Event
2. Scroll to your Event to delete (press center button)
3. Scroll to option 2 and use the left or right arrow to select Delete.
4. Select Save
5. Confirm (Delete Event) by selecting YES.

### **Profiles**

Profiles are a unique feature within the Leviton Primary Remote. Profiles can be created to control different rooms of the house all with one remote. When creating profiles each device in the network may be controlled also by assigning an Area to the four buttons of a profile. An area can be created by a primary remote and then assigned as a profile in your remote.

Creating a profile is done after all devices have been included into your network and area has been created. Once the basic network is setup then select the Profile option in the primary remote associate one of the created areas to your profile and assign it a button (1-4) to control. Repeat to add up to 16 customizable profiles.

Pressing the button you have programmed will bring all the devices in that scene to the scene level you had just created. (See Application note: Setting up a Profile)

Delete a profile:

1. Select Profile

2. Scroll to your Profile to delete (press center button)
3. Scroll down to button
4. Press Left arrow until delete is selected
5. Your programmer will confirm DELETE PROFILE (YES)
6. This will remove your profile completely from your primary remote.

### ***Controlling Devices and Profiles***

Leviton's Primary remotes can also work as a stand alone controller to turn ON/OFF/dim/ brighten lights. There are two ways this is done in the remote. One way is to individually control a light through the device menu.

The Device menu allows you to select an included node in your network and control it ON/OFF, dim/bright. When the node is selected you also receive confirmation that the device turned ON or OFF.

Profiles allow you to control a group of lights at one time. Another way is setting up profiles in the primary to control your preset Areas. After creating an Area you can assign any area to each of the four buttons on the primary for up to 16 profiles. Each profile can control 4 areas. Simply scroll through each profile and assign it to a button on your primary remote. Once finished use left and right arrows to select the Profile you would like to control.

Profiles can be very convenient when using a primary remote for whole house control. You can configure a profile for each room, selecting each room profile when in that room.

### ***Join as Secondary***

To add secondary remotes to your network, you must join your new remote to the primary remotes network. This is done by invoking the join network function (under network settings) on your new (secondary) remote and invoking the inclusion function on your primary. Once you have told your primary to include the new remote, and set your secondary to join its network you will see progress icons on the remotes while the transfer takes place.

Your secondary remote is limited in its abilities, one being unable to include or exclude devices from your network. Any modifications to your network require the Primary controller to include/exclude devices.

Once your remote has joined the network it will receive a home ID from your primary remote and the next available node ID. You will know if your secondary remote has joined your network by an X2 in the upper middle of the LCD screen on the remote. This is only available with Leviton VRCPG remotes.

### ***Network Re-Discovery***

Network Re-Discovery allows you to rebuild your networks routing table based on the power level specified. The default power level for network Re-Discovery is -3dB. This level can change from -9 to 0dB. Rediscovering at different power levels can change the performance of your system. If your network Vizia RF+ devices through out your installation are close together you may be able to

rediscover at the lowest power level -9dB which it turn can reduce latency. If you are having communication errors and your devices are fairly spread out average 15+ feet through out the house rediscover your network starting at a few decibels above -3dB at -2 or -1dB. If it does not work at these settings then move up until you have reached the max 0dB. Note: increasing your power level will allow devices in your network to see other devices further away. This can be good and bad. If it sees these devices further away and can communicate with them reliably great, although sometimes a device may only see a far off neighbor sometimes which can result in intermittent performance. So it is always best to try and rediscover your network at a lower decibel than the default, or just leave it at -3dB.

Network Re-Discovery can greatly increase your routed communications throughout your installation. Once you have done a rediscovery you must update all controllers in your network with the new routing information. Finally you will have to set routes to each node back to the controller. This process will start as soon as all your controllers have been updated in your network. As it sets routes you should see on your Primary remote each device setting its route back to the controller. This process can take a while depending on the size of your network.

### ***Reset Controller***

Resetting your Primary Remote sets it into a factory default state. This will clear out all devices in you remotes information table as well as any areas, event, or profiles created. Resetting your Primary remote will result in loss of control from your remote to any devices in your network. (Any scene controllers or zone controller in your network will still function as configured in the system.) If you lose your primary remote or it breaks your network will still function as mentioned above. If you decide to add additional devices you will need to purchase a new primary remote and reset your network

To rebuild your network see Primary remote instruction sheet on configuring these settings. However this information can be transferred from a primary controller into a secondary controller after the installation has been completed for a backup. The secondary remote will not have certain functions i.e. inclusion, exclusion ability.

### ***Resetting devices to factory default***

Dimmers, switches and 1 button controller: (i.e. VRI06, VRS15, and VRCS1)

Resetting your device will require pulling the push pad up until a (click) is heard engaging the air gap on the top. In the same motion push the paddle back into the frame and hold until the device Locator LED turns to RED.

4-Button Scene and Zone controllers: (i.e. VRCS4)

Press and hold buttons one and three until the four LED's on the 4 button controllers turn red. You can verify that your device has reset its home ID and device ID by pressing one of the buttons on the controller. If the button illuminates RED when pushed it has been reset.

### ***Plug-in Devices***

Unplug the device, plug it back in- Press and hold the LED indicator button until the LED turns red.

### ***Advanced Features***

RS232 serial interface module:

Leviton's RS232 module will interface to control equipment to communicate as a bridge between your Z-wave devices and RS232. Leviton and HAI have teamed to provide control of your Vizia RF lighting control system via an HAI interface using Leviton's Vizia RF serial module (VRC0P). The VRC0P is included into your Vizia RF network as a controller. Once all devices are included, your RS232 module is setup accessing the HAI setup menu in your Leviton Primary remote listing your RS232 serial interface in your network. Select the interface module using the center button and associate any installed devices to the module. Once your devices have been associated you will need to program the HAI system to operate your RF devices. See HAI instructions for programming. also see Vizia RF serial Interface Protocol document found at our Leviton website for further setup and configuration of your RS232 module.

VRCPG Utilities Send/Get Data is an enhanced feature of the VRCPG primary remote used to transfer setup programming information from a Leviton primary remote to a Leviton secondary remote. You must join your secondary remote into the network before you can use the Send/Get data utility. See Join as Secondary in this document.

The VRCPG Utilities feature allows you to transfer system setup (i.e. node ID names etc.) events, areas, and profiles to your secondary remote with out manually configuring these steps. How is this done? Selecting Send data in the primary remote and selecting Get Data in the secondary remote. In the secondary remote Get Data screen you can choose what information to send system setup, areas, events, profiles. Select the center button and follow the on screen instructions.

Leviton's Vizia RF+ system has two options if a device has failed or has been removed from a network.

Remove Failed and Replace Failed allow a user to select a device that has appeared in its remove or replace list by scanning through existing nodes to verify network connections. At the end of it scan all nodes that could not be contacted will appear in the list.

Select the node you wish to remove/replace and press center button. If remove failed, was selected after the process an updated list will appear. This list should be blank after all devices in the list have been removed. If replace failed option was used you will be prompted to prepare replacing device follow the steps prompted by primary remote.

Replace Failed function will reassign your new device with the failed devices ID and update its routing tables.

Sometimes RF performance in an installation may have communication errors. If this should happen Leviton has designed some advanced features into its system to increase performance and communication reliability. If an RF signal does not reach a device directly, it will try and route through another device, this is the beauty of a mesh network. However the device used to route may not always be the best or most direct node to communicate to the intended device. To help with routing Leviton has built some network optimization features into the Vizia RF+ system. These features are:

- Set Routes
- Set Hail

- Update Routes

Set Routes provides the installer with the ability to define which device the controller will talk to when routing to the final device in the message. The Z-wave protocol will build a table automatically when you setup your network assigning a device the routing node to another. But sometimes the assigned node is not always the best choice.

Z-Wave protocol does not tell you what device has been chosen to route through. If a device is sluggish or sometimes struggles to communicate assigning a Set Route may be desired by the installer. This Feature allows you to specifically assign the route device that will communicate to the intended end device having communication issues. From the Advanced menu:

- Select RTS Devices
- Select Set Routes
- Select the Device (i.e.; Dimmer/Switch/Plug-in)
- Select the Controller (i.e.; 4 button single button)

Your primary remote will process the selected action and assign the manually Set Route to your device. Once you have selected the controller you are finished. Doing this may improve the communication to the intended device to control.

Leviton's Vizia RF+ system can give levels from its dimmers switches and plug-ins for up to 5 routed controllers.

Set Hail is a function designed into the Vizia RF+ system to optimize and arrange where a device acknowledges a controller. This rearrangement can assist with traffic congestion in a system. There may be a device geographically located far from its associated controller. In this instance it could make sense to change the controller its currently hailing by re-assigning the device to a new controller to hail. If a device is trying to hail beyond the recommended distance away, reassigning that controller to hail a closer controller can decrease traffic and improve performance on a network.

Another case would be to offload the controller being hailed because one controller in the system might end up with a lot of dimmers/switches trying to hail the same controller again creating increased traffic.

Update Routes is the final selection in the network optimization menu. Each device installed into the network is listed in the route update list. If you have a device that seems to respond intermittently or may take a long time to turn ON updating its route may optimize its performance. Updating routes does not hurt the network in any way. Update routes simply refreshes the association table already set into the device ensuring there are not association issues.

Within the utilities menu of the Primary Remote there is an option called Re-discovery PL (Power Level). This setting is default -3dB. An installer has the ability to change this if needed. Why would you change Power level? When a Z-Wave network builds its routing tables it discovers devices within range based on the power level used. In other words it learns who its neighbors are based on its power level.

The default setting is not always the ideal discovery of the network devices. In some cases you may want your devices to route through a device further away or closer to the device that is receiving the

command. Adjusting the power level in the negative direction causes a lower power level in turn using the closet devices to the controller to route through. Adjusting the power level positive to a max of 0dB increases the power level allowing the network to possibly choose a device better suited to route through the desired device.

In any situation if you are unsure of what effects adjusting the power level will have on your system contact Leviton technical support to determine if this setting should be used.

### ***Technical Tips:***

All dimmer/switch and controller devices are not part of another network. Exclude and or reset any devices that were part of another network.

If all devices are reporting NO ID and the network does not work, on any dimmer/switch devices exclude the node using the exclude function in the primary remote. (Leviton 4 or single button controllers can not be excluded by a primary remote with a different home ID. The Primary controller must be reset. Finally (If exclusion does not work for the dimmer/switch) reset the devices following the reset steps in the devices instruction sheet.

### ***After Installation:***

Do a Rediscovery of the network to ensure all devices are still present in your system. Update all controllers. Manually operate each device from the primary controller to ensure that all devices are in the mesh network and hence can be addressed from the controller

### ***How do I do a Rediscovery of my devices?***

If a device is moved in your network to a different location, it must be “rediscovered” in your network to rebuild communication between devices. Rediscovery an option in your primary remote will rebuild routes in your network to include the moved device. It can also be used to recover from failing links due to changes in the RF environment

### ***How do I Replace a Failed Node?***

If a device fails, it is possible to replace it with a brand new device and assign it the same Node ID. This is done using the Replace Failed option on the primary controller. After searching for the failed device it will replace the node.

If I forgot to exclude my device and my controller has been reset, how can I reset my devices?  
For all Leviton devices you may do a hard reset of the device. See instructions for device to reset.

### ***Why should I update my Controllers?***

This will ensure that both controllers and routing slaves are always updated with newest routing information.

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**Revision History:**

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