Application Note

Topic: Specifying Vizia RF

Application Note ID: HA01170801BH

Version number: 1.0

Date: 1/17/08

Author: BH

Product line: Vizia RF

Product: General

Part numbers affected: Vizia RF

Resolution: Design Considerations for Optimum Performance Opportunity

SYSTEM CONSIDERATIONS:

1. HOUSE SIZE

    1.1.1. Vizia RF is a residential system and it is not recommended for commercial, industrial applications.

    1.1.2. Maximum total square footage: 7500 square feet or less for best performance of the Vizia RF home control system.

2. LAYOUT

    2.1.1. It is important to understand this is a “mesh” network and device location placement is paramount to ensuring maximum system performance

3. NUMBER OF DEVICES

    3.1.1. A typical 7500 square feet house will average 72 devices. This number of devices as tested should deliver optimal performance. As long as devices do not exceed RF range distances beyond the specified limitations below. However, Leviton’s Vizia RF system is capable of 128 devices total in a network.

4. DISTANCE

    4.1.1. 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.)

    4.1.2. 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).

5. RF SIGNAL LOSS

    5.1.1. The presence of typical building construction materials can cause signal loss where a signal may drop out completely before it reaches its intended node. 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.

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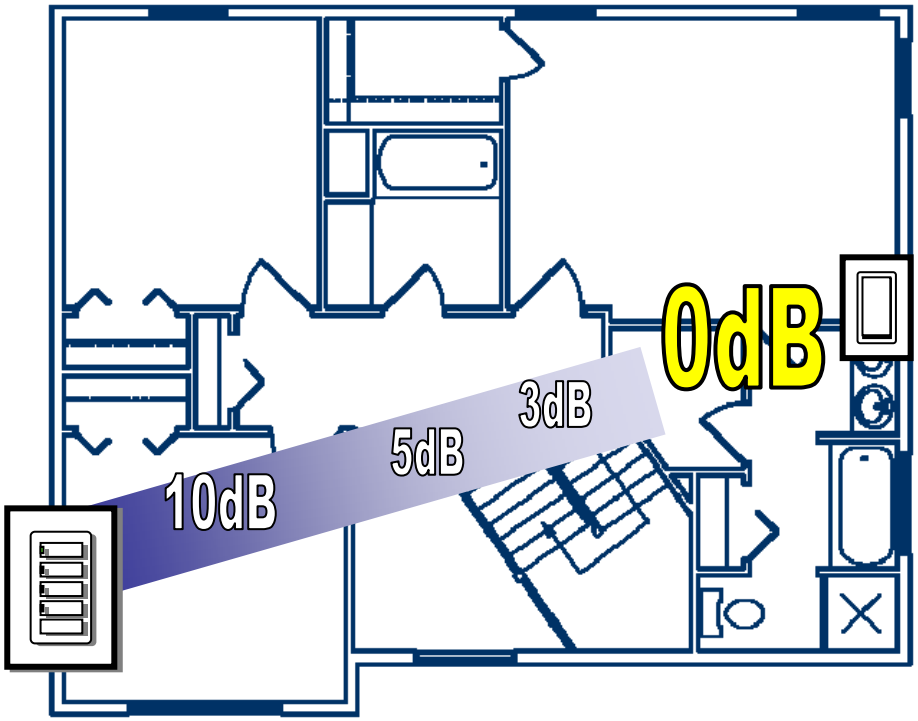
(This picture is for illustration purposes only and does not illustrate actual figures)



5.1.2. 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.

5.1.3. 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.

5.1.4. 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.

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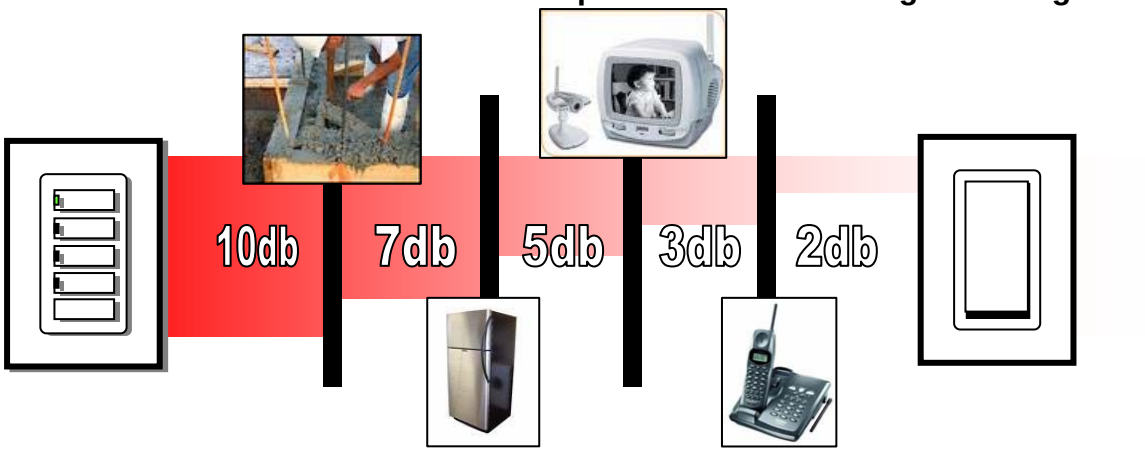
Each source of interference has the potential to reduce signal strength



6. CONSTRUCTION AND OTHER CONSIDERATIONS

6.1.1. Building materials can decrease signal distance and block signals in an RF system. Following are some of the possible materials that can degrade an RF signal:

- Metal foil insulation
- Metallic foil wallpaper
- Reinforced concrete
- Masonry

6.1.2. Other electronic products can cause RF interference, some examples are:

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

6.2. If you have any of the above construction materials or electronic products you may need to add more Vizia RF devices into your installation to improve performance. For electronic product interference, if the addition of Vizia RF devices does not improve performance, you may have to remove the interfering product(s) and use products that communicate on a different frequency such as 2.4 or 5.8MHz.

6.3. Example: See following chart. Coverage shown with overlapping circles

An illustration of poor coverage can be due to any of the above considerations where the mesh network is compromised.

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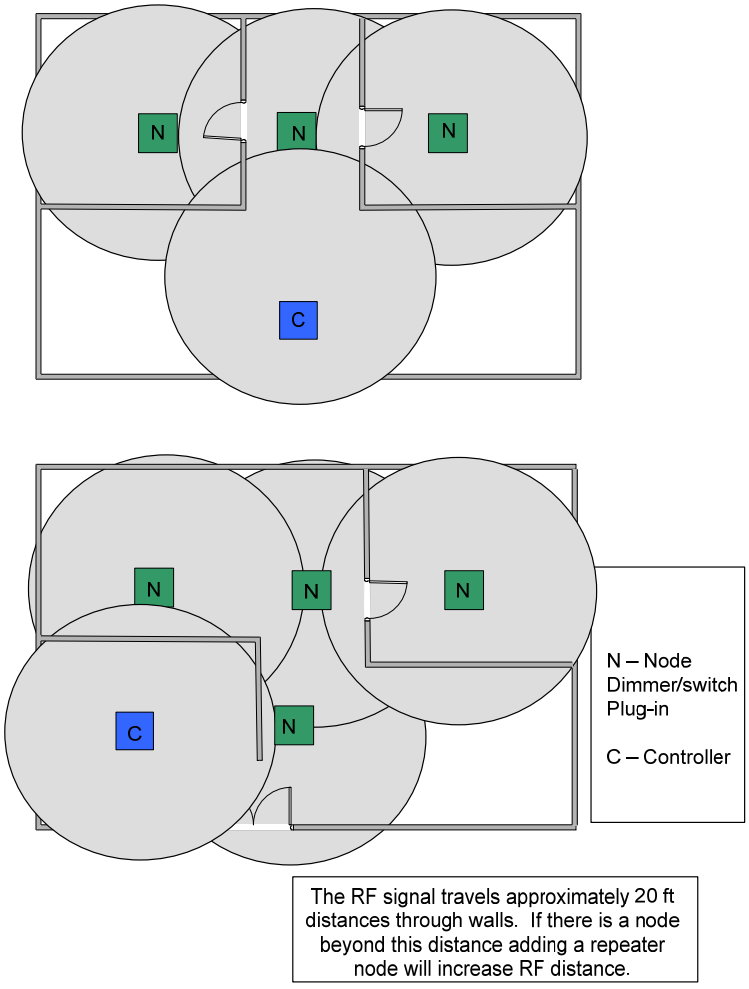
Illustration of Good Coverage



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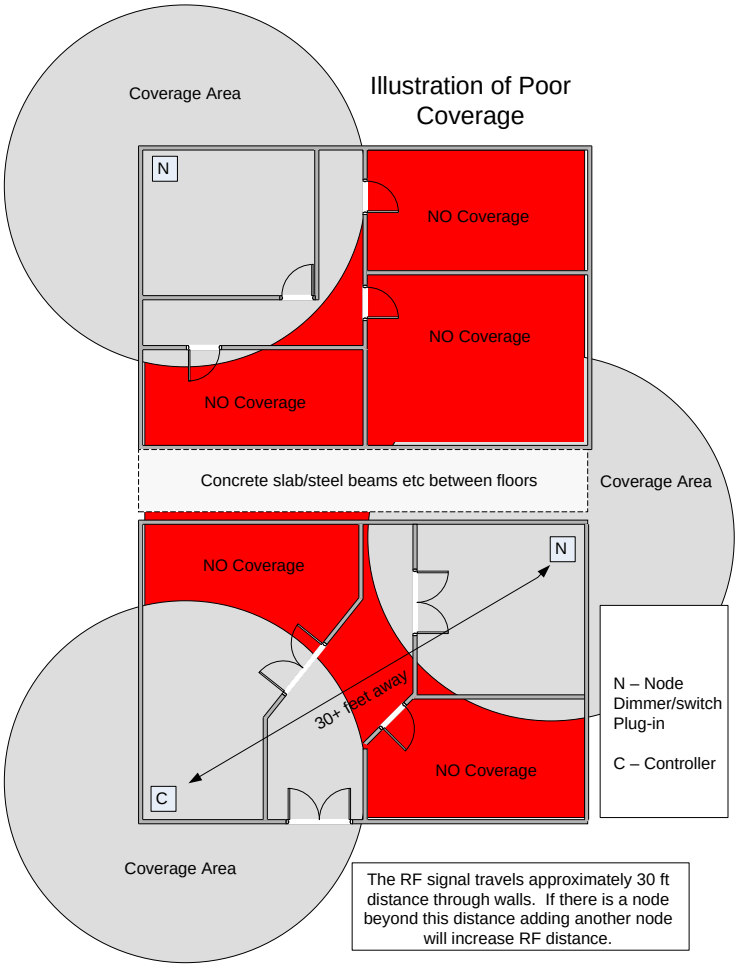

(Note the absence of overlapping coverage can degrade system performance)

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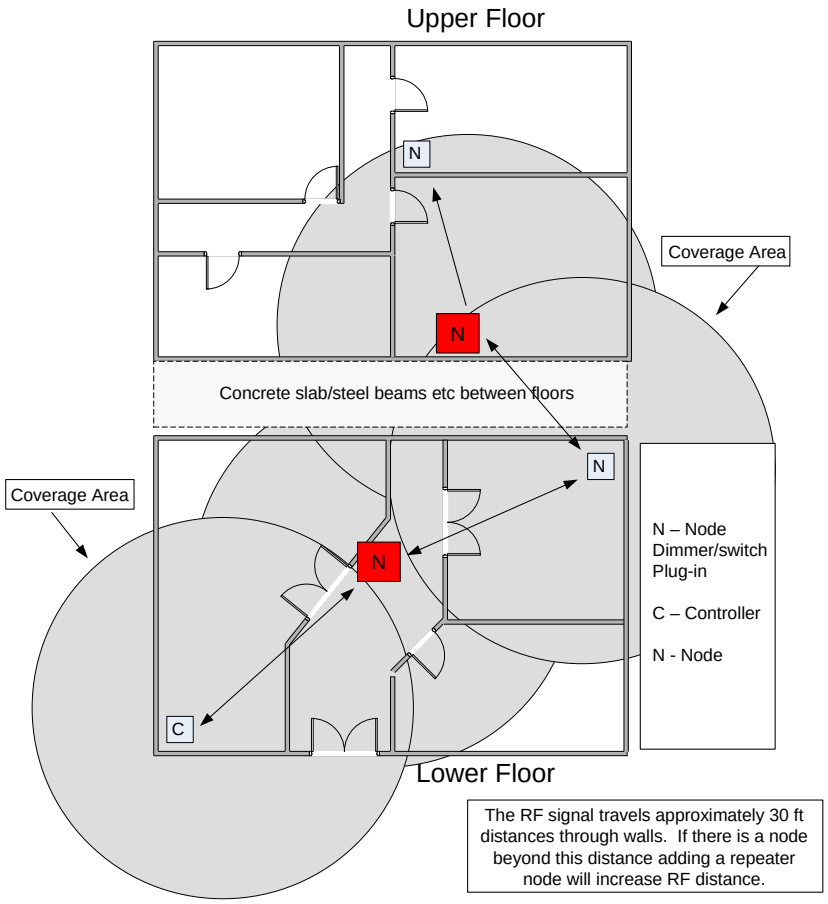
Here is an example of how to correct poor coverage, due to the above considerations, by the use of additional Vizia RF devices:



INSTALLATION TIPS:

1. Not every switch and dimmer in an installation needs to be automated using
2. Vizia RF, for example: closets, bathrooms, laundry rooms
3. Implement Vizia RF where it has the strongest impact on lifestyle and performance. For example, kitchens, hallways, landscape and porch lighting, home theaters, and bedrooms
4. Include standard Vizia products in locations where automation is not needed
5. Use other Leviton products to provide “automated” solutions: IPP15 in closets, laundry rooms and similar locations
6. Room-based applications are easily accomplished with Vizia RF devices. This allows for direct communication with no routing in the system.
7. Whole-house applications must be well displaced throughout the house witha maximum of 30 feet between Vizia RF devices. In some cases, where network performance is slow or sluggish, adding Vizia RF devices into the network will resolve gaps to ensure good communication.
8. Distances are multi-directional and can be on multiple floors
9. Non-recommended applications include devices separated beyond 30 feet and signals have to travel through walls, doors, floors, etc. In some cases 30 feet may exceed the communication distance depending in the interference between devices. Installing devices at separate ends of the house is not recommended for installation

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10. Associating the maximum 32 devices to a single button on a scene or zone. Controller will create slower response when receiving updates to the controller.
11. If you are configuring a single button on a 4 button zone or scene controller as an “ALL OFF,” for you’re lighting, you should separate the zones into partitions. For example, it you have a total of 64 devices in your network, separate the “ALL OFF” into partitions of 16 devices per button, i.e.; upstairs, downstairs, etc.

INTEROPERABILITY

Leviton Vizia RF devices will work with any Z-Wave® certified manufacturer at the basic level. However, in order to get the most out of your Leviton Vizia RF system, the other manufacturers’ devices must implement the same application level features as Leviton. Some of the manufacturers have or are in the process of implemented these application features.

PRO LEVEL 2
Fully licensed to operate efficiently within a Vizia RF system AND implement Leviton’s enhanced 2-way technology, using Vizia RF as the primary remote. These manufacturers offer selected products that meet Vizia RF Pro Level compatibility.

- HAI Home Automation Inc
- Wayne-Dalton
- Lagotek
- Monster
- Electronic Solutions, Inc. (ESI)

Revision History:

Version	Date	Author	Revision
1.0	01/17/08	BH	Original

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