Zigbee

Design Guide

DOC.#003-209

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What tools and parts should I have on my truck when deploying an SI Zigbee shading system?

When installing a Zigbee shading system, a best practice is to have a few extra Zigbee parts such as extra Mesh Controller, some extra Edge-Routers, and a few End Point Controller nodes like a Situo 4.

If your Zigbee shading system also contains some RTS nodes, then another extra part to have would be an RTS repeater. An extra PoE injector can also be helpful for Mesh Controllers with PoE as the power source. If you are not sure about what any of these parts are then keep reading as this guide will cover all these parts.

If your system is a hybrid of both Zigbee and RTS or 485 then additional considerations should be exercised such as extra RTS controllers like a Telis remote, or even a Smoove or DecoFlex wall switch which may be needed for the RTS products like a Zen outdoor shade. One note on hybrid systems, they may not typically work together on the same standard type of remote or keypad, so it may also be required that a 3rd party control system also be incorporated so that a single button press can trigger the Zigbee, RTS, or 485 commands to the shades.

As for the necessary tools you will want to have a working computer or other device with a 2.4 GHz frequency scanner. An IOS or Android device for downloading the TaHoma App.

Another best practice is to have an extra router and hotspot in case you need to test the system on a known working networking system. This can also come in hand for any remote trouble shooting or assistance.

Introduction

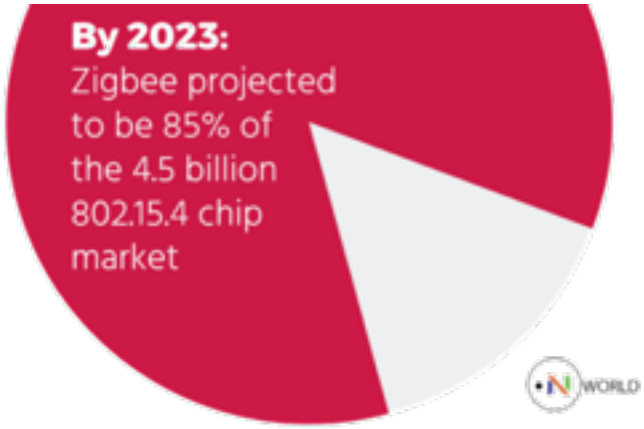
This Zigbee Design Guide was developed for you, our Integration partner, and your clients. We have provided this simple guide to help assist in the design of a Screen Innovation wireless shade system, and to a provide some best practices which can help yield the best possible performance from deployments.

Control – your way, at Screen Innovations we provide complete control of all your shade and screen products via both wireless and wired technologies. This guide is for wireless applications; however, we would like to add a note about wired systems. In a retrofit project you may be forced to use wireless and this guide will help you to maximize your designs for the best possible performance.

If your project is a new construction, and or you can pull wires in a retrofit project we would strongly recommend you consider this and discuss all options with your client.

When a wired system is not possible then a Zigbee system is a great choice and would be considered a wired equivalent protocol or WEP which simply means is can provide the same kind of performance and reliability as a wired system.

Zigbee systems have over a half a billion deployed nodes worldwide which is one of the reasons why we have selected this wireless technology to incorporate into our shading and screen systems. Please review this guide and our product spec sheets so that your wireless projects can benefit from the latest methods and best options to ensure your customers have the best customer experience and get the most out of their investment of an SI shading system.



This guide will cover how to design and deploy a Zigbee shading system by SI.

We also offer the very latest in voice control technology with popular systems like Alexa and the Google Home Assistant to the ultra-sophisticated luxury ai from Josh.

WORKS WITH amazon alexa

Google Home with Google Assistant

We also work with all the popular control systems such as Control4, Elan, Crestron, and Savant.

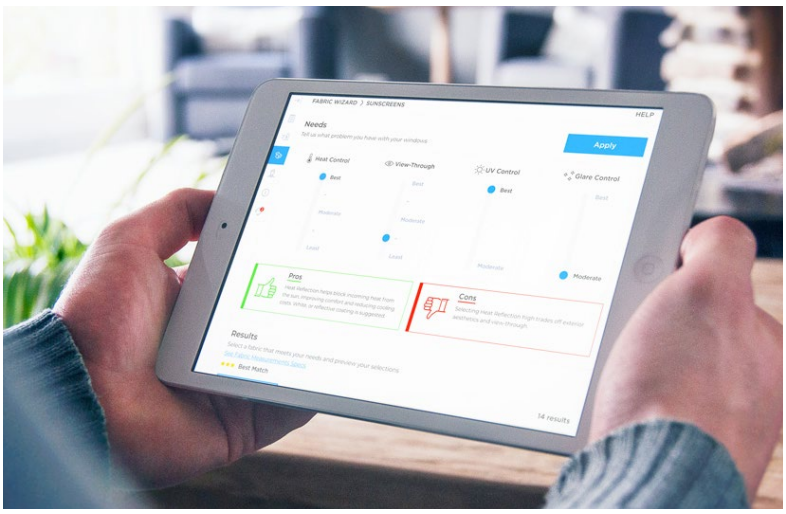
Screen Innovations is not only our name, but it is really at the core of what we do every day. We develop innovative patent pending and state-of-the-art optics, motorization, and control technologies for both residential and commercial applications.

We have also attracted some of the world's finest partners for technology co-development, and co-marketing for industry leading and exclusive product solutions for the CEDIA®, AVIXA®, and Integrated Systems markets all over the world.

At Screen Innovations our goal is to make the experience of using technology Fun, seamless, and as invisible to the user as possible.

Our shading system motors and batteries were co-developed in an exclusive technology and marketing partnership with Somfy the worldwide leader of silent motors.

Our shading system motors and batteries were co-developed in an exclusive technology and partnership with worldwide leader of marketing marketing Somfy the silent motors.
As a Screen Innovations dealer, you have access to the industry's first complete Shade Builder tool called FLOW™.



This innovative and exclusive dealer tool will help ensure your designs have everything needed to quote, sell and complete the job right the first time and every time.

What is Zigbee?

Zigbee is a secure, robust, and reliable wireless technology developed by the Zigbee Alliance and is a worldwide standard with over a half a billion deployed Zigbee nodes.

Is Screen Innovations a part of the Zigbee Alliance?

Yes, Screen Innovations has been in the Zigbee alliance since October 2019

Why has SI partnered with Somfy on Zigbee 3.0?

Somfy is the world-wide leader in robust and reliable motors. Selling over a 170 Million worldwide. SI is the exclusive CEDIA channel partner for the CEDIA market, and this means SI has some exclusive products, co-developed products and access to the latest technology.

Major Global Brand Support with the Connected Home over IP (CHIP)

The Connected Home over IP (CHIP) is a newly formed working group that is developing a connectivity standard to make all Home products compatible regardless of their underlying protocols, with security as a fundamental tenant.

Amazon, Apple, Google and the Zigbee Alliance, together formed an unprecedented industry working group, designed to take the 'best of market' technologies from leading smart home standards, portfolios and ecosystems to influence a super spec that will be open, inclusive and a significant industry shift in the smart home evolution.

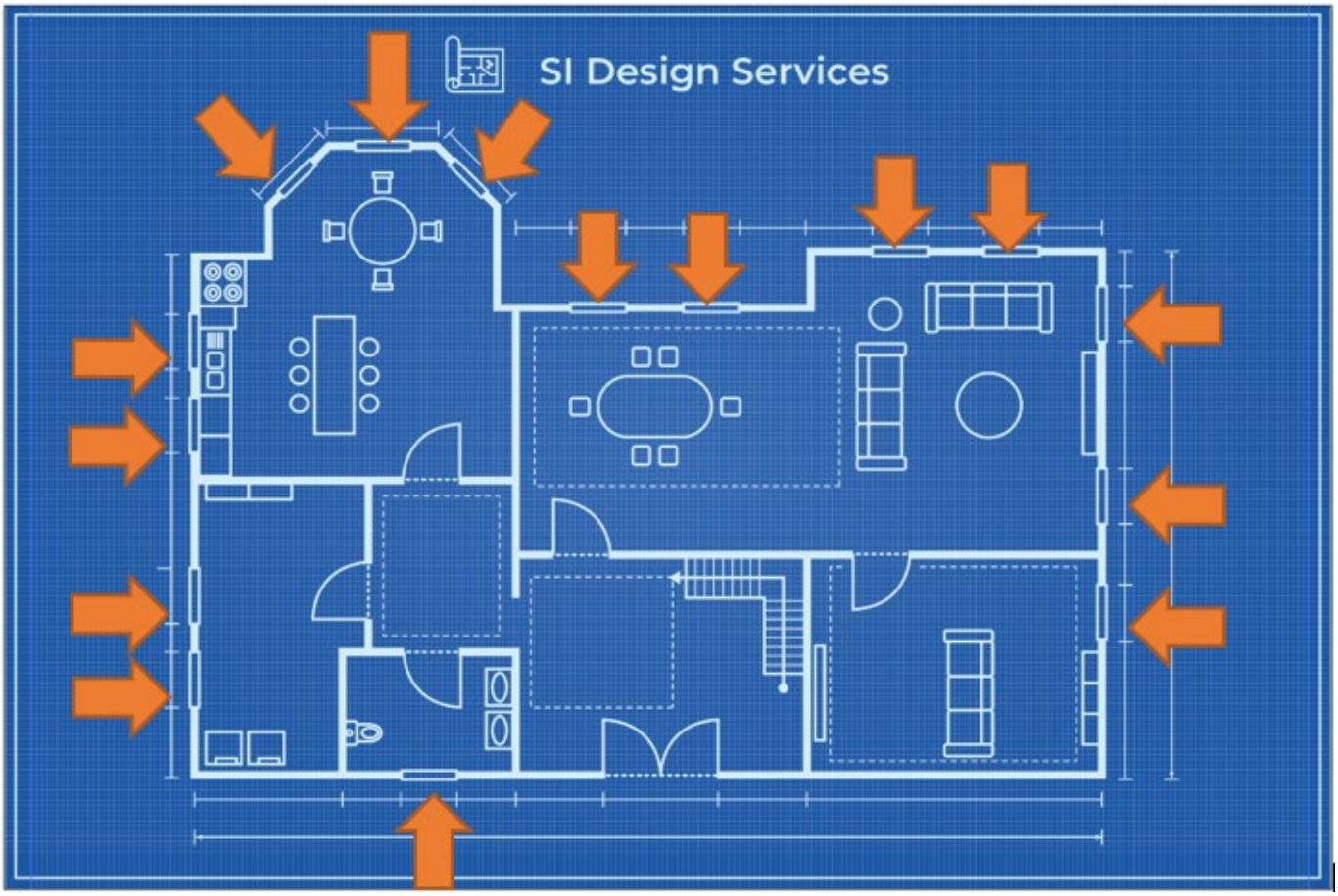
The vision behind this intiative is to blend proven elements of smart technologies - including but not limited to: Amazon Alexa Smart Home, Apple Homekit, Google Weave, Zigbee Alliance's Dotdot. SI is participating in the CHIP working groups.

Current Screen Innovations Zigbee 3.0 products are CHIP ready!

3 easy Steps to get your Zigbee Design project started?

Step 1

Identify all your shade locations, for an existing project this may involve “walking” the project with the end user and determining which windows will be used or use a set of floor plans for new construction.



In the example image above, we have identified 15 shade locations

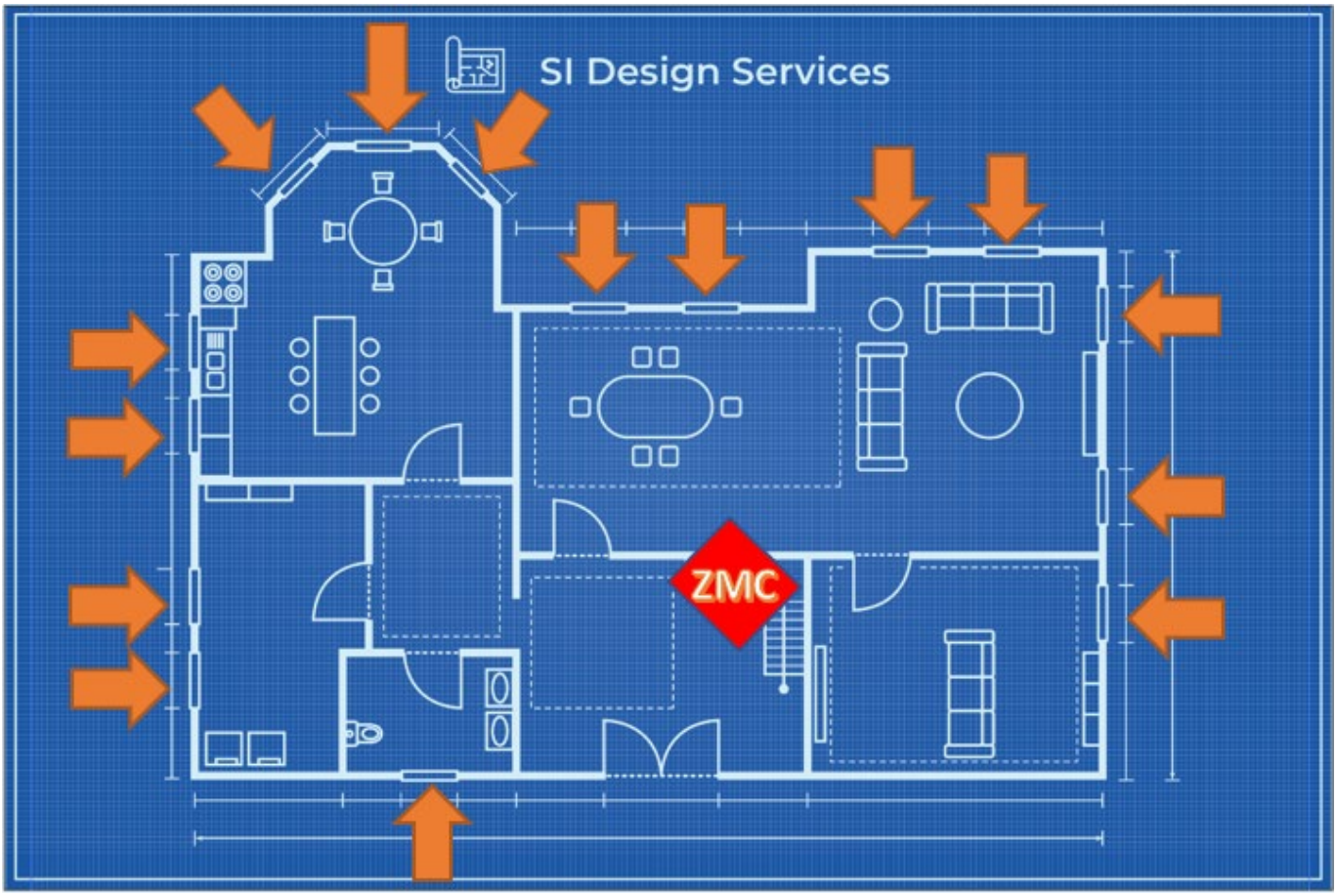
Step 2

Locate your Zigbee Mesh Controller, now that you have identified where all the shades are to be installed, we need to find a location for your Zigbee Mesh Controller (ZMC) sometimes referred to as the gateway or hub. The basic requirements for this location are;
Centrally located from the shades point-of-view. In other words, if all your shades are at one end of your site, then do not locate your gateway on the other end of your site.

Should have access to AC power as some ZME require AC power such as TaHoma.

Should have Network connectivity at this location, and we highly recommend having a PoE wired connection as some ZMC devices require PoE power such as the SI exclusive Link Pro Z.

Should NOT be located or co-located with any WIFI wireless access points as this can cause interference since WIFI and Zigbee share many of the same 2.4GHz frequency ranges.

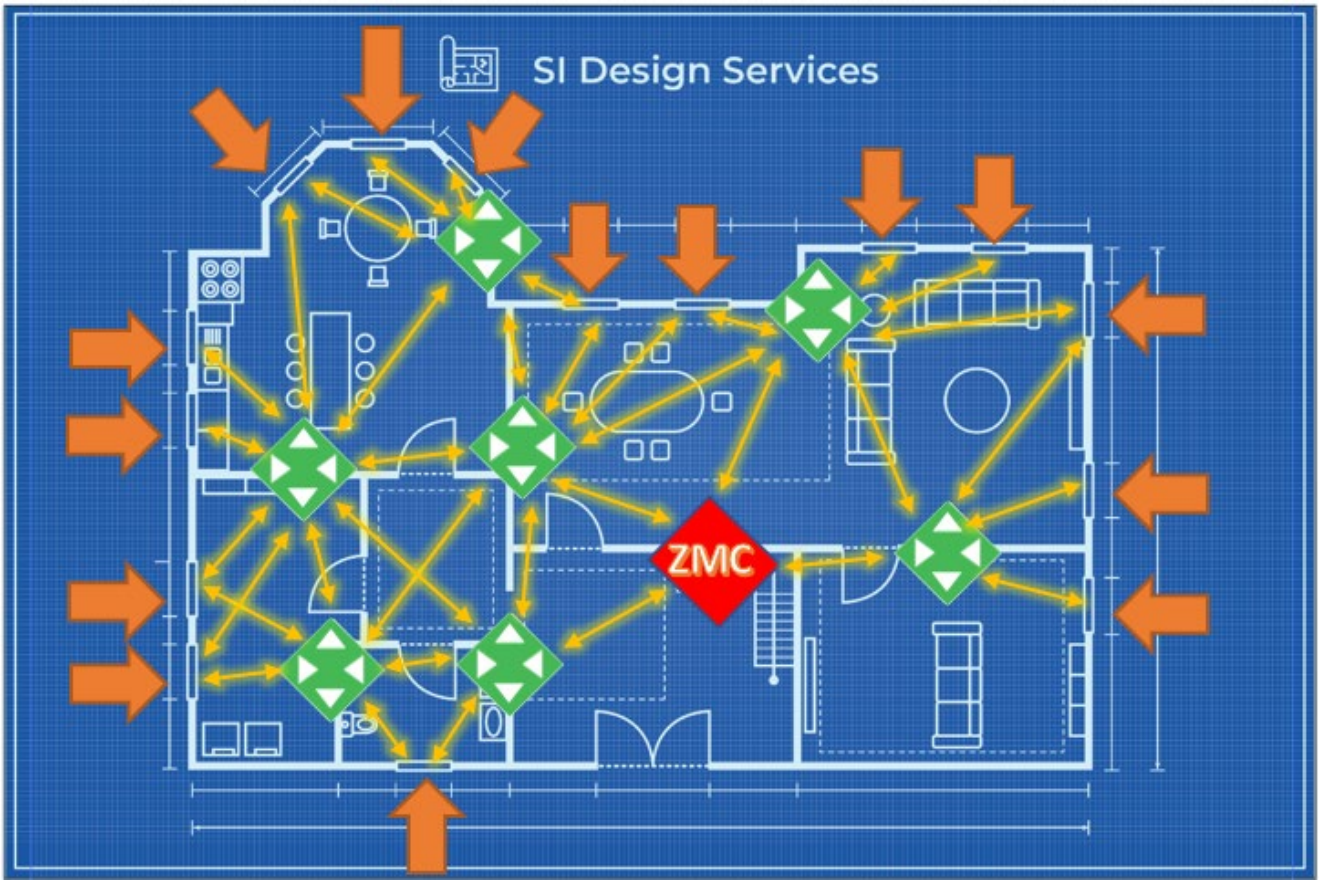


In the example image above, we have chosen the location under the stairs where an equipment location may be present or available using the above-mentioned criteria.

Step 3

Zigbee Edge Routers, now that we have all our Zigbee shades and ZMC locations identified the last step in our design is to build out the Zigbee 3.0 Mesh. We accomplish this by adding Zigbee 3.0 Edge Routers (ZER) sometimes referred to as repeaters. Virtually every type of ZER will require AC power and some soon will also use low voltage power but you will not find battery versions of this device due to its inherent nature of always receiving and transmitting Zigbee RF signals.

A general rule of thumb is to have a ZER located in every room of your project which contain Zigbee 3.0 shades. We also recommend an additional ZER for every 8th shade in a single room.



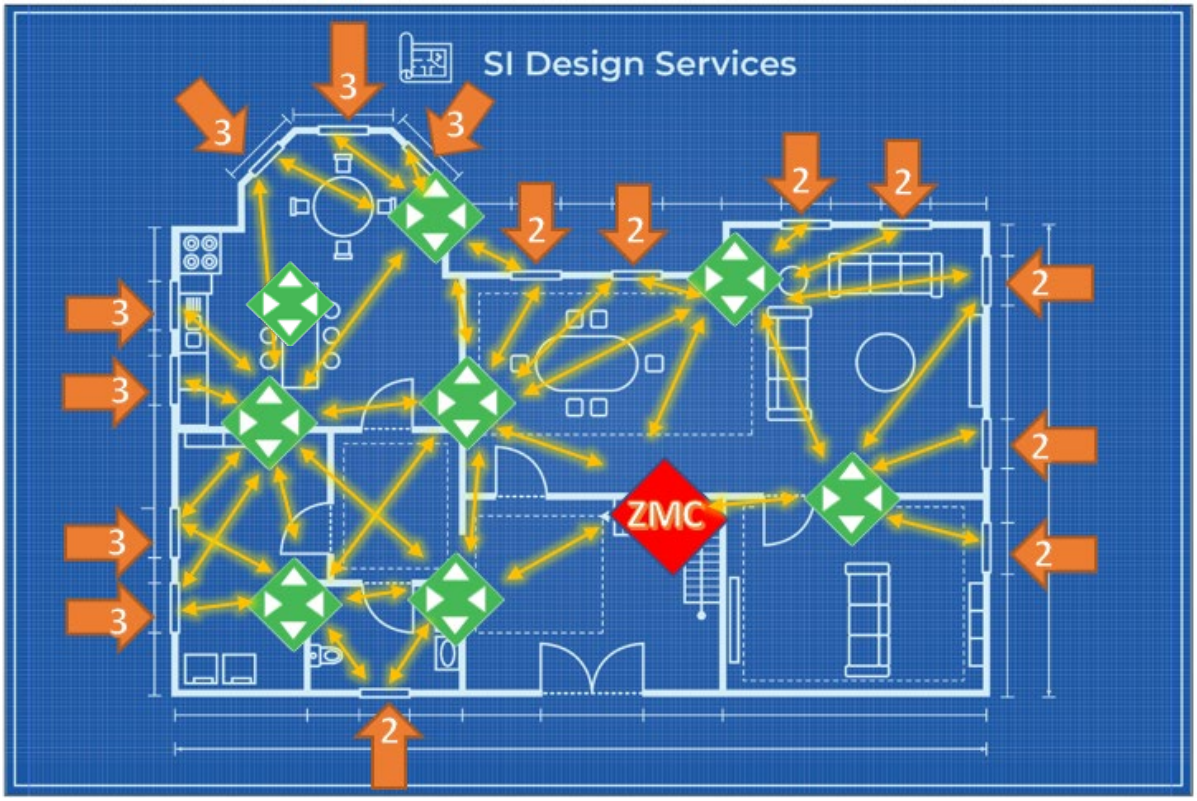
For the example image above, we have seven rooms with shades, and we have found seven locations to place our ZER which allows all Zigbee shades to be within the 7 meter of any ZER, and in some cases multiple ZER to any one Zigbee shade, this is how the Zigbee 3.0 Mesh is created.

Another example would be if you had a single room that had 12 shades, you would have a total of two ZER in that one room, one for the room, and one additional ZER for the number of shades in the room.
ZER devices are plug-and-play, meaning you do not program them, nor do you bind them to any shade or device, they use the advancements in the Zigbee 3.0 protocol to build the communication mesh. Using the proper amount of ZER on your site will improve the latency and battery performance of your shade.

The job of a ZER is to setup the communications between Zigbee devices such as shades and your ZMC which is the coordinator and connection to the cloud. To accomplish this, you will want to ensure that every

Zigbee device has a ZER that is located within 7 meters of it.
Next the ZER will need to be located within 7 meters of the ZMC, and if it is not, then you will need to have another ZER that is located within 7 meters of the ZMC and so on.

This brings us to what may be a new term to you called hops. Hops are defined as when a Zigbee communication signal travels from one device to another. To maintain the highest level of wireless performance we recommend that your Zigbee shade is not located more than 7 hops from the ZMC.



In our example image above, you can see that the most hops of any one shade is 3, this system will perform great and have low latency!

That gives your flexibility in your shade design to have Zigbee 3.0 shades up to 49 meters from your ZMC, and if you centrally locate your ZMC, you could have shades that are nearly 100 meters apart from each other. That is a huge shade project.

If you need more distance than 100 meters, then you can always add another ZMC to expand your Zigbee shades system even larger.

SI feels so strongly in this Zigbee 3.0 technology that when you use our free SI Design Services on your project that SI guarantees the Zigbee 3.0 wireless performance to be 100% functional as specified. If the Zigbee 3.0 wireless does not perform as specified, SI will provide the dealer suggested options to solve the issue. If the provided options still don't resolve the performance issue, the dealer may exercise the money back guarantee for the cost of the Zigbee 3.0 wireless equipment.

Additional terms are the dealer must use SI Design Services to specify and complete the Zigbee 3.0 portion of the job "the guarantee only pertains to the wireless performance of the Zigbee 3.0 wireless portion of the job." The term of this guarantee is 90 days from the invoice date.

Contact our SI Design Services team at 512.832.0609.

How is Zigbee different or better than other wireless systems I have used in the past?

Zigbee has several advantages over nearly every other wireless technology. First it is a fully meshed network which allows more reliable and more robust communication, and multiple ways to transmit and receive the commands and relay status back to users. Second since it uses frequencies in ISM bands it can transmit far greater signal strength than most all other wireless systems.

What version of Zigbee does SI use?

SI is using the latest version 3.0 due to its encrypted transmission, self-healing and robust networking topology.

I have seen other shading systems with Zigbee, what is the difference between the SI 3.0 and other Zigbee systems on the market.

The previous versions of Zigbee did not have the same level of security and networking reliability as the 3.0 version has today. If you have seen a Zigbee system in the past, we would highly encourage you to learn more and investigate the very latest Zigbee version. Experts worldwide have tested and agree that the 3.0 version is the first Wired Equivalent Protocol that the Zigbee Alliance has developed.

What is the cost difference between Zigbee wireless and other wireless shading systems?

The cost of a fully deployed Zigbee shading system is equivalent to any two-way wireless system on the market today.

Is a Zigbee shade system hard to program and deploy?

NO, the Zigbee system is a self-organizing system, and does not have any programming. A dealer will configure the shades with a simple and intuitive app called TaHoma which is free to download in the IOS and Google Play app stores.

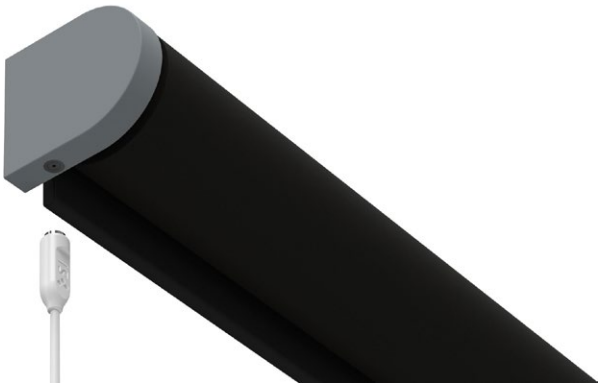
Do I need to know MAC addresses or IP addresses to add a new Zigbee shade to a project?

NO, all the SI Zigbee products have a small QR code printed on them that the TaHoma app can just scan with your phone or tablet. You can then name the shade, adjust the limits and setup any scenes you like all from the same app.

What if my client wants to add an outdoor Zen RTS shade?

No problem, our LinkPro Z, and TaHoma mesh controllers both also provide RTS transmission features so you can mix and match your Zigbee with any RTS shades from the same gateway or you can additional gateways to extend your RTS range. (Refer to the RTS design guide for more info.)

What is a Wireless Shade System?



Screen Innovations has developed a 100% wireless shade solution with state-of-the-art and patented battery powered motors with our exclusive and Patent pending break-away magnetic charging system and digital wireless control options using the robust Zigbee technology.

We offer both indoor shade solutions in our Nano® and Veil lines as well as exterior RTS shade solutions with our Zen™, and Sail lines of motorized system that are all easy to design, deploy, install and use.

How many RTS shades can a Zigbee mesh controller support?

A SI Zigbee Mesh Controller such as the TaHoma, or LinkPro Z can support up to 50 RTS channels or virtually unlimited RTS shades. Each RTS channel can support as many RTS shades as required with the caveat of all shades on a single channel are controlled in unison, i.e. all shades on channel #2 will go to upper or lower positions when the user sends a command from a remote or from the Zigbee Mesh Controller.

Will Zigbee work through walls?

Yes, there is no need to point or aim your remote or controls at the shade because Zigbee is a radio frequency technology using radio waves that travel through the air and can penetrate most standard construction types.

Why not just use WIFI?

WIFI is a server-client or star topology system and not designed to be ultra-low energy efficient like Zigbee 3.0. Battery operated devices like our Lithium powered Nano shades would need to be recharge every week or so with WIFI, but with Zigbee you can go a whole year before you need to recharge.

Star Network Topology (WiFi)

Mesh Network Topology (Zigbee)

Are other Zigbee products compatible with the SI Zigbee system?

SI currently supports only SI and Somfy supported Zigbee 3.0 controllers, edge routers and endpoint nodes. In the near future we will offer some SI sanctioned expansion for selected 3.0 Edge routers and end points, however we will only support SI mesh controllers.

Can I use SI Zigbee shades with other Zigbee 3.0 hubs?

SI can currently only support SI sanctioned Mesh Controllers for Zigbee 3.0 such as TaHoma and Link Pro Z.

Will your Zigbee Shades work directly with a Control4 Zigbee system without your Mesh Controller?

No, Currently you will need an SI Mesh Controller to integrate with a Control4 system. Coming soon SI will release new Edge Routers that will allow SI shades to be directly controlled with a Control4 system.

Does Zigbee interfere with other radio-controlled products or WIFI signals?

Since Zigbee is radio-based technology, you might wonder if your remotes or controls will interfere with other radio-controlled products in your building or neighborhood.

While the Zigbee technology uses many of the same frequencies that WIFI does, they will not interfere with each other, and you configure the Zigbee network to other bands which would ensure that even the small data transmissions used in a Zigbee shading system will have reliable transmissions. In very high density WIFI systems, we would also encourage the WIFI to be configured to run in the 5 GHz band range.

What frequency does Zigbee use? What about RTS?

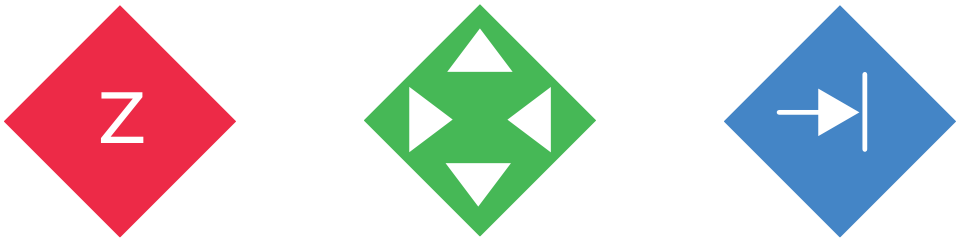
SI uses Zigbee in the 2.4 GHz range, channels 11 - 26 and RTS works in the 433.42 MHz range.

How many Zigbee Shades can I design in a Zigbee shading system?

A Zigbee shading system can be made up from multiple Zigbee meshes. Each Zigbee mesh can support up to 77 Zigbee nodes, and for each mesh you need a single Zigbee mesh controller like the SI LinkPro Z. You can design and build large scale Zigbee deployments using multiple LinkPro Z's up to create very large shading system. Contact SI Design Services to help on designing large Zigbee systems.

What types of nodes make up a Zigbee system?

For Zigbee shading systems you have three types of Zigbee nodes. First you have Mesh Controller nodes like the LinkPro Z. Second you have edge router nodes like the SI Smart Plug, Veil Drapes, and even light bulb like a Phillips Hue bulb. And finally, you have end point nodes like a Lithium powered Nano shade, or a Situo handheld Zigbee remote.



What does a Zigbee mesh controller node do? What kind or mesh controllers does SI offer?

The Zigbee Mesh Controller is the interface from Zigbee to IP, and the Cloud. It is also where all non-Zigbee control systems will communicate with and finally it is the main Zigbee coordinator.
Currently Screen Innovations provides two Zigbee mesh controller products that you can use in your designs. The shelf mounted TaHoma for small to basic systems and systems without PoE, or the professionally mounted and LinkPro Z which requires PoE for connectivity and power.

Screen Innovations exclusive Link-Pro Z Mesh Controller

The SI Zigbee LinkPro Z is a PoE powered and connected device. You would use one device per Zigbee mesh that you would like to design.

This Zigbee mesh controller is designed to be mounted on the ceiling or with an available Flush Mount Kit in or on the ceiling. It should be placed as close to the center of the shades as possible. If you have a two-story house and shades on both floors it should be on the ceiling of the first floor. This device is powered by a PoE link to most any kind of PoE infrastructure and can work with PoE BT/AT or AF versions, and we do include a small PoE injector that you must bring Ethernet to as LinkPro Z communicates with the network over the PoE link. If you really do not have a Ethernet connection it does have a built-in WIFI, but we highly recommend using the PoE Ethernet as WIFI and Zigbee are on the same 2.4 GHz range. Any PoE version switch can also be used for even more powerful administrative and remote support capabilities including PSE self-healing, PD Alive, PD scheduling and more...

LinkPro Z again is designed to be ceiling mounted with the included Magnetic mount or can also be mounted on the wall with the included wall mount, or additionally they can be mounted under nightstands, or in cabinets.

Is LinkPro Z an FCC certified device?

Yes, LinkPro Z is fully FCC certified and contains FCC ID: DWNBEECONPCB.

Is LinkPro Z compatible with the TaHoma App?

Yes, and this is also how you would setup your 3rd party control system to work with your SI shades.

Next the LinkPro Zwas designed to be installed on the ceiling which may benefit from a high location within the home significantly reducing many common houses hold items that can attenuate or interfere with WIFI and sub gig radio transmissions and reception.
LinkPro Z also benefits from being closer, and at a stronger angle of attack to where the shades are located at the top of most windows.
The LinkPro Z's antenna arrays provide a superior horizontal coverage due to the installation orientation and reduction in adjacent interference and lower noise floor.

What does a Zigbee edge router node do? What kind of edge routers does SI offer?

A Zigbee edge router is used to extend and repeat Zigbee traffic and store incoming commands for any bound end point nodes.

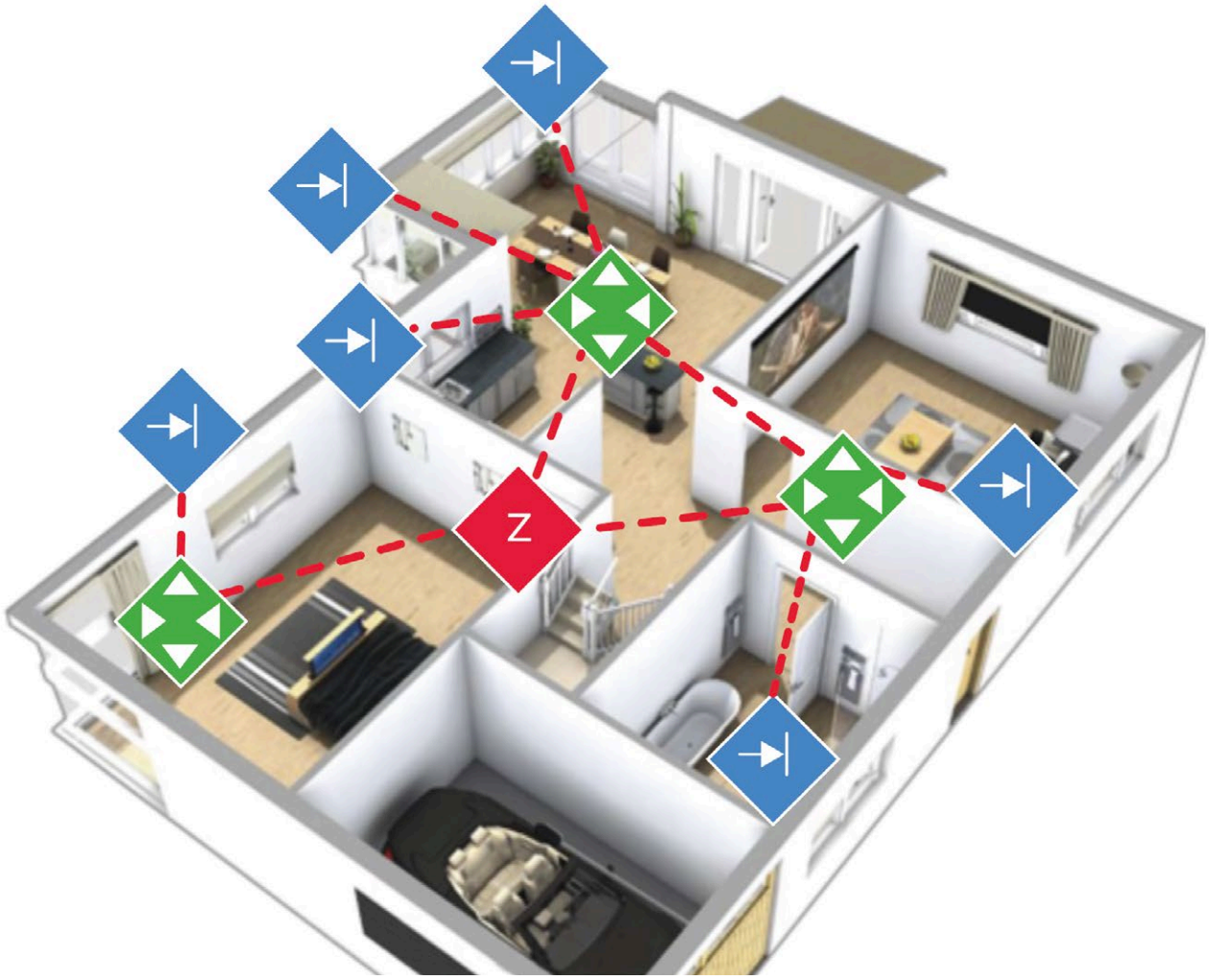
SI currently offers a Smart Plug edge router, ZBDMI (Zigbee to 485 Gateway) and a Veil motor for our drapery options. SI is also working on several other edge router options coming soon.

We will also qualify some 3rd party devices for edge routing such as a Philips Hue Zigbee 3.0 bulb.

How many Edge Routers do I need for my project design?

When designing a Zigbee shading system for best possible performance each node should be within 7 meters of each other and you can add more nodes to extend the range. Each Edge Router you add will make your system more reliable and robust. The signal takes about 5ms to hop from one node to another node. For a low latency system, you should keep the maximum hops from any end point node to the mesh controller to five or less.

Start your design with the mesh controller in the middle of the shades in the project.



Each node should be no more than 7 meters from each other, and for the best performance keep the number of hops to a maximum of five from an end point node to a mesh controller.

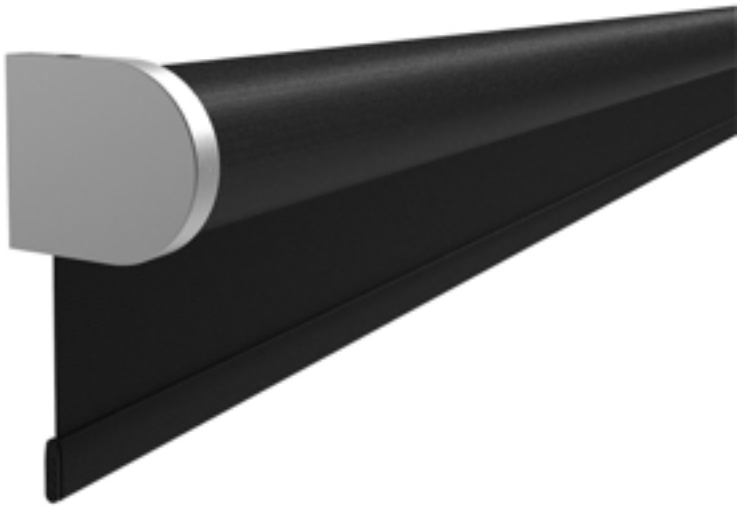
Is it necessary to have all these Zigbee edge routers?

In order to design a robust and reliable Zigbee mesh network a general rule of thumb is to have an edge router located in each room with any Zigbee shades, and or for every 8th Zigbee shades in a single room. Having a properly designed Zigbee mesh network provides low latency and improved battery performance. Having low latency means your commands and groups are executed quickly and in unison. Battery performance can be affected when shades have to wait or re-transmit signals, which means you may have to recharge the shades more often. While the Zigbee protocol has a good RF range in order to maintain the highest possible level of service and to also provide a system that can work in most any residential environment.

What does a Zigbee end point node do? What kind of end point nodes does SI offer?

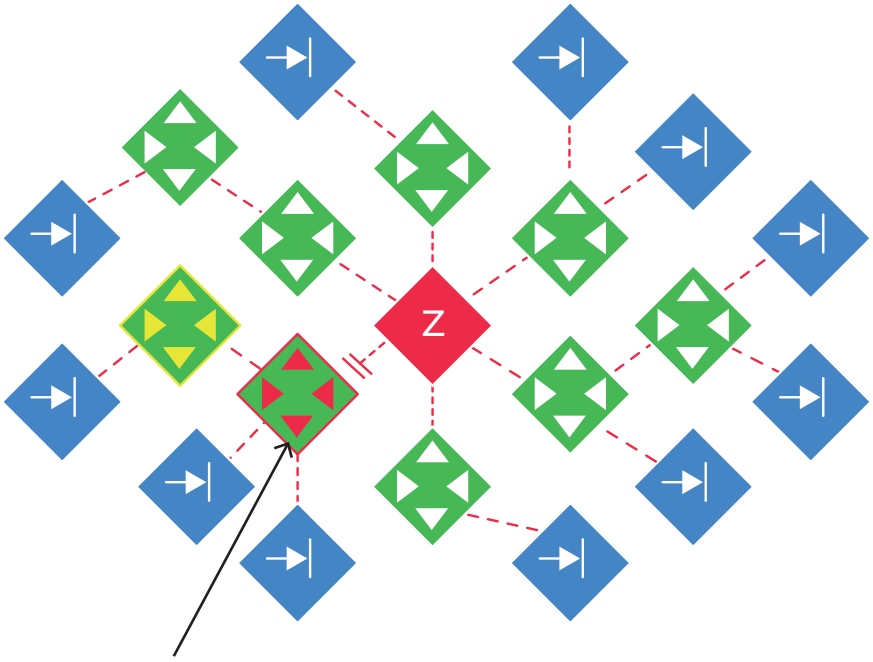
A Zigbee end point node is a fully meshed Zigbee node which can receive and send Zigbee data, however Zigbee end points nodes DO NOT repeat or extend the Zigbee network in any way, and they DO NOT repeat any Zigbee traffic.

SI currently offers our Lithium powered Zigbee Nano shades, and two Zigbee Hand-held remotes.

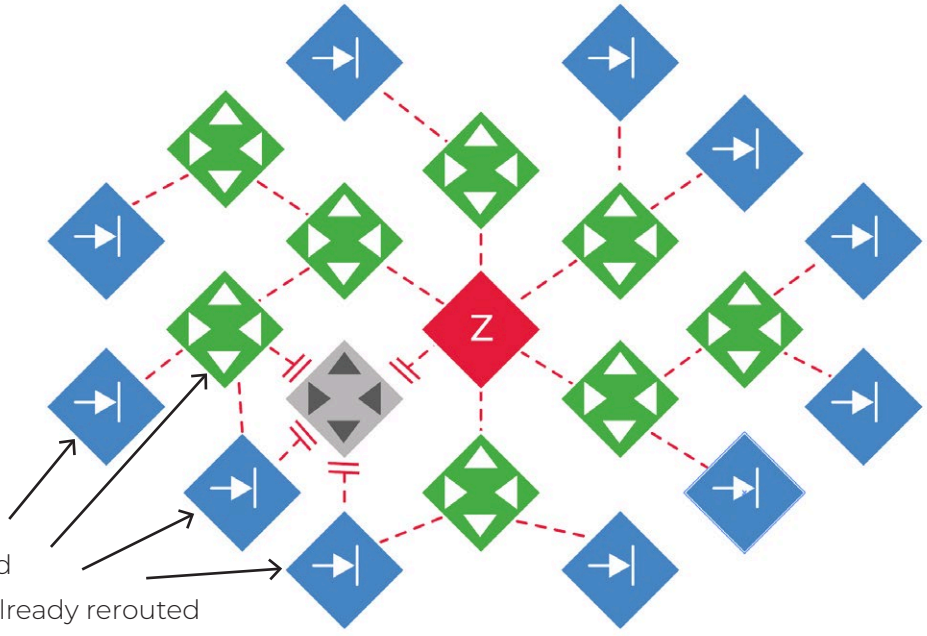


How does self-healing work?

Zigbee self-healing happens automatically and when any router node goes offline, or maybe has local interference which is hampering the ability for it to transmit an end point node or commands from a mesh controller will automatically re-route the signals to adjacent nodes.



An Edge Router is OFFLINE, or has too much interference to transmit, within 20ms the seaf healing already moved data to other routes of the mesh.



Does a Zigbee system cost more than a RTS system?

Generally, a comparable Zigbee and RTS system should be equivalent in pricing usually due to Zigbee's lower cost router nodes and general infrastructure. In the examples we have modeled we have not seen a delta of more than 10% at the very max. The 10% delta is only realized in systems of less than 8 shades or for systems with a single room.

Can I do a sample quote in Flow?

Yes, the Zigbee quote went live for all SI dealers on December 2nd, 2019.

How can I calculate a preliminary budget for a ZigBee Shading system?

An easy way to do a quick budget would be to add the following control infrastructure to your shade project. Shade materials and sizes can greatly vary from under $500 to over $1,500 each, so multiply this time the number of shades and then add the following;

Zigbee Mesh Controller $600
Zigbee Edge Router $99 per room or per 8th shade in a room
Zigbee End Point Nodes (Hand-held remotes) as end user required $169

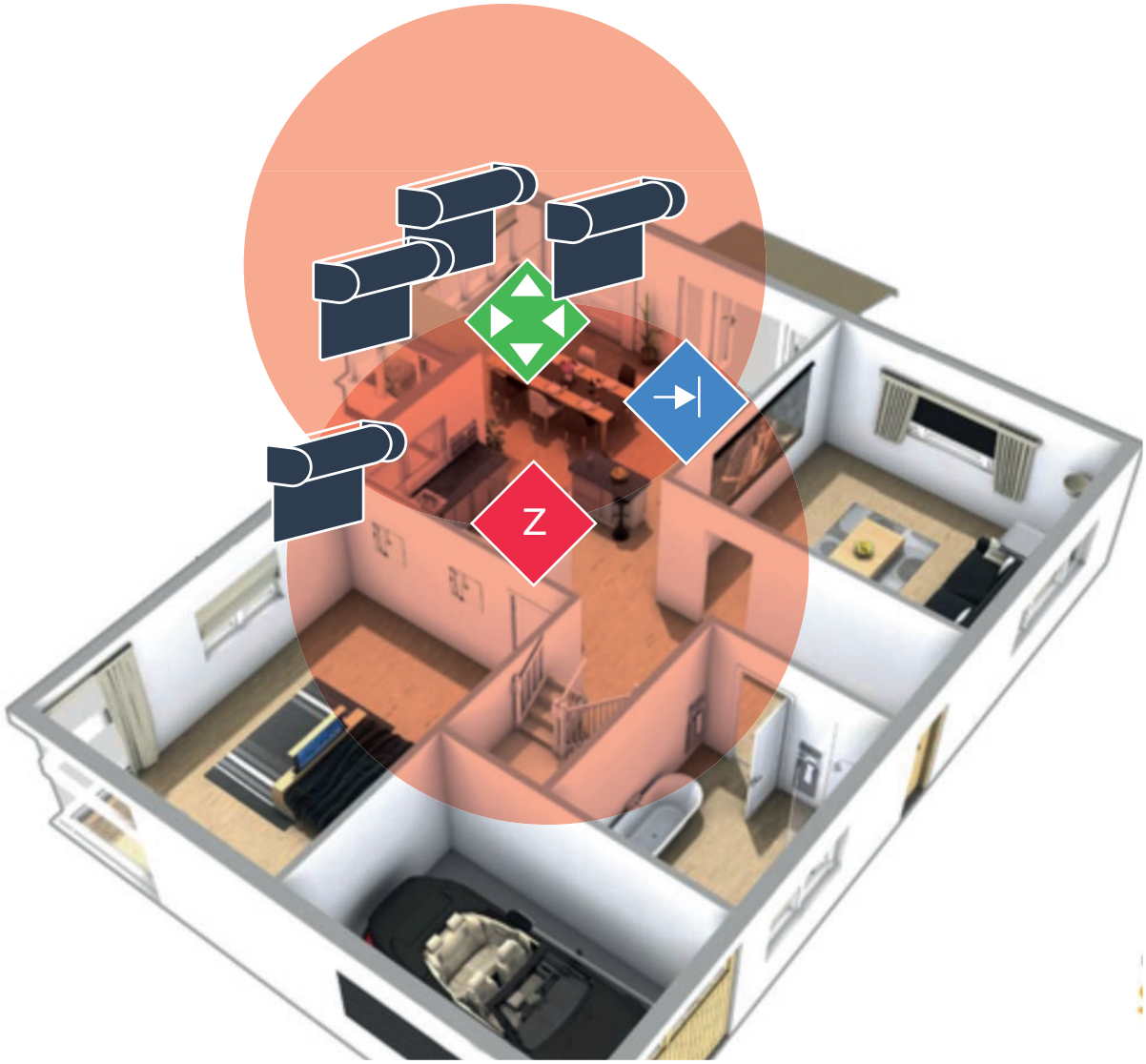
x $600 =

x $99 x Rooms =

x $169 x Remotes =

ZIGBEE EXAMPLE #1:

Less Than 1.5K SF, 1 floor, 1 Room, 4 total shades. This project will require one LinkPro Z. (The customer wants to expand in the future for more Zigbee Shades



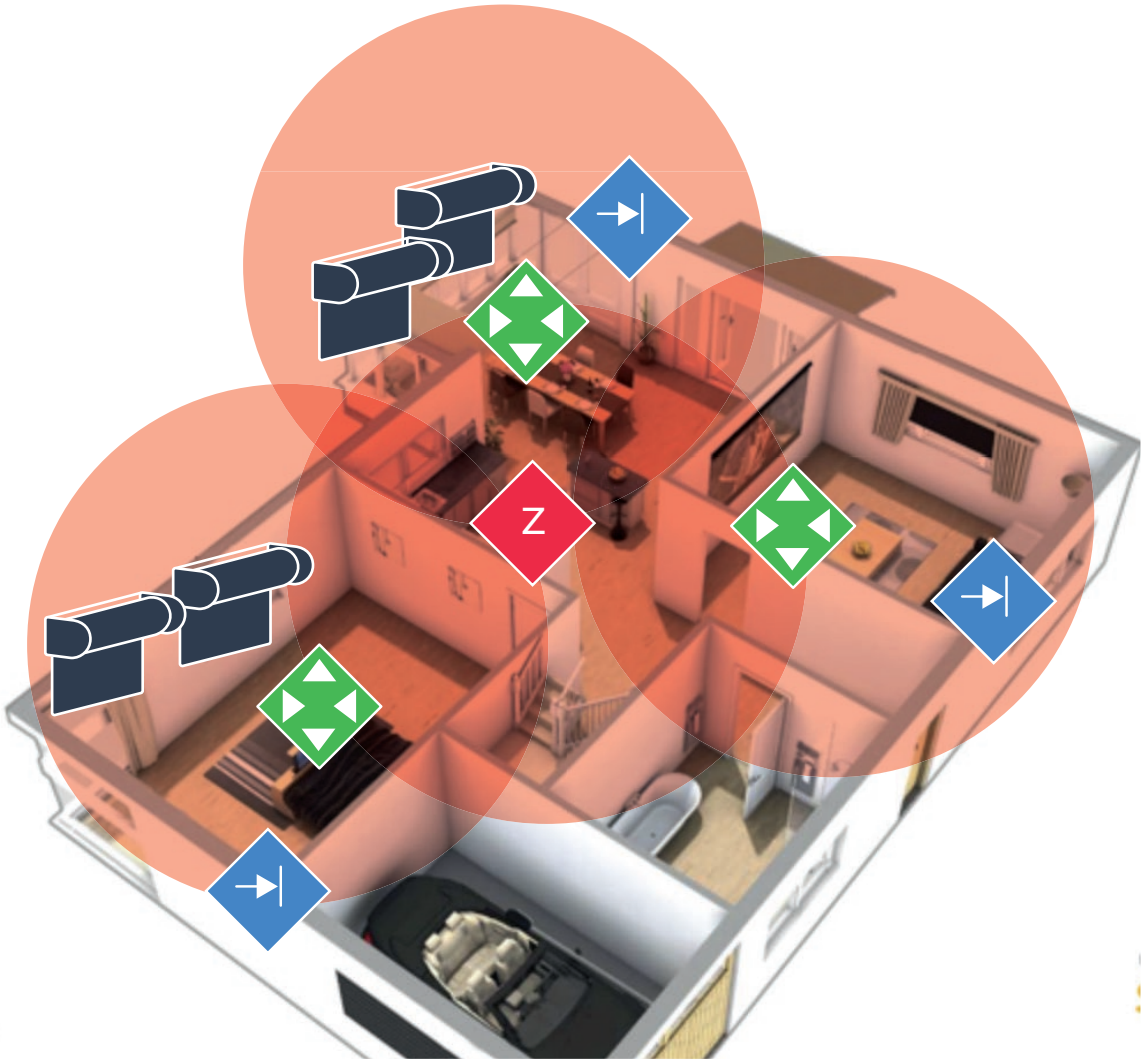
Z x 1 + x 1 + x 5 = $3097

Mesh Controller x 1 + Edge Router(s) x ROOMS + Shades / Controls = MSRP

Value	#	MSRP
PRO Z	1	$599
Smart Plug	1	$99
Shades	4	$550
Controls	1	$199
Totals		$3097

ZIGBEE EXAMPLE #2:

Less Than 1.5K SF, 1Floor, 3 rooms of shades, 6 total shades. This project will require one LinkPro Z and three Edge Routers



Z x 1 + x 3 + x 6 = $4703

Mesh Controller x 1 + Edge Router(s) x ROOMS + Shades / Controls = MSRP

Value	#	MSRP
PRO Z	1	$599
Smart Plug	3	$99
Shades	6	$550
Controls	3	$169
Totals		$4703

ZIGBEE EXAMPLE #3:

2900 SF, and 1 Floor, and 13 shades. This project will require one LinkPro Z, and six edge routers and uses Control4 for controls.

Z x 1 + x 6 + x 13 = $8343

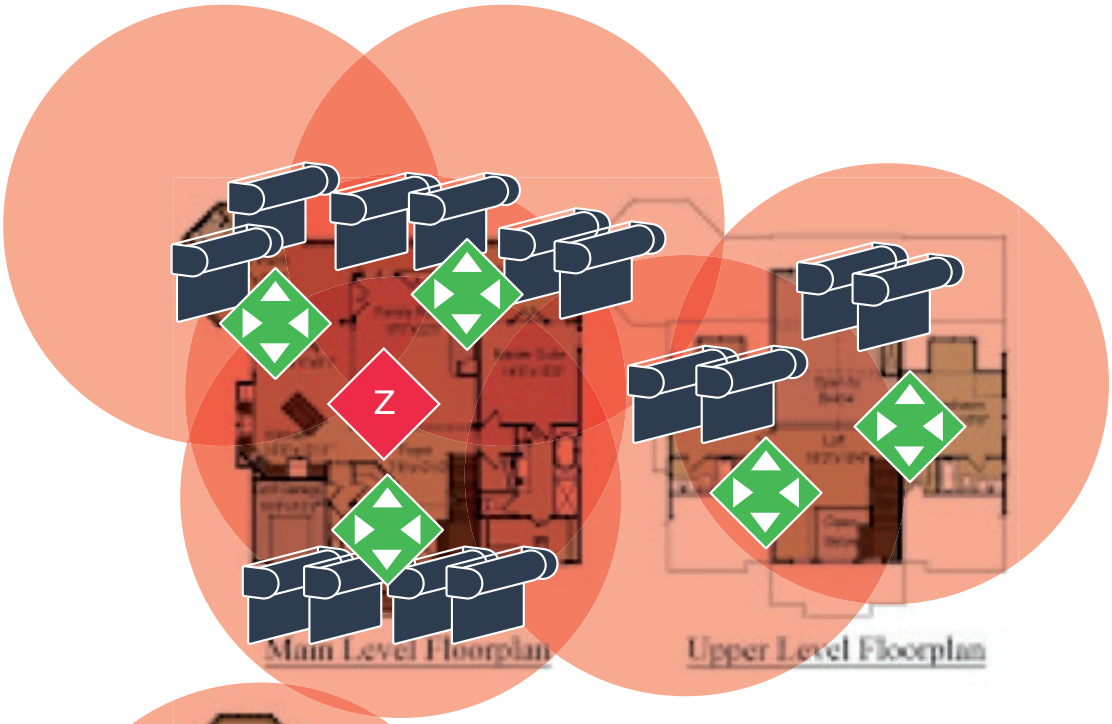
Mesh Controller x 1 + Edge Router(s) x ROOMS + Shades / Controls = MSRP

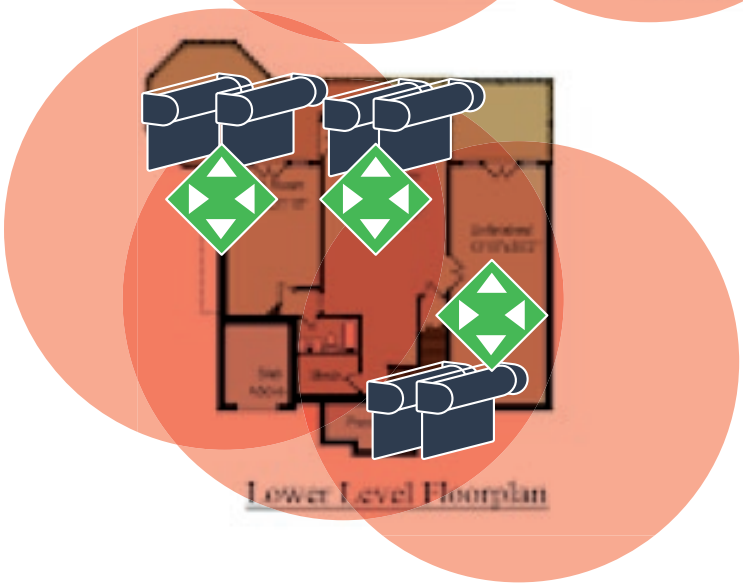
Value	#	MSRP
PRO Z	1	$599
Smart Plug	6	$99
Shades	13	$550
Controls	0	$0
Totals		$8,343

ZIGBEE EXAMPLE #4:

4300 SF, 3 Floors, 10 rooms, 20 shades

This project will require one LinkPro Z and some edge routers and using Alexa





Value	#	MSRP
PRO Z	1	$599
Smart Plug	8	$792
Shades	20	$11000
Controls	0	$0
Totals		$12,391

Mesh Controller x 1 + Edge Router(s) x ROOMS + Shades / Controls = MSRP

These are examples, and your project may need additional coverage depending on all the construction and environmental factors. It is a best practice to carry additional Zigbee Edge Routers on your truck when deploying a Zigbee wireless project

When would I need an RTS repeater?

For projects combining RTS and Zigbee, an RTS repeater can be used in specific scenarios an RTS repeater can be used in specific scenarios to help the RF coverage in a home, especially when the RTS shades are located far from the LinkPro Z.

We only recommend using a single RTS repeater in a Zigbee Shade system.

Do not use more than one RTS repeater in any system.

Can I use WIFI with my LinkPro Z in my Zigbee system?

Yes, you can use WIFI for connection with a LinkPro Z in a Zigbee shade system.

We HIGHLY recommend using a PoE Ethernet connection to provide the most reliable communication and to avoid two 2.4 GHz transmissions from the Mesh Controller, one from ZigBee and one from WIFI.

The WIFI will work when no PoE is present, but we recommend using a wired Ethernet connection with or without PoE. Our included PoE injector has a data input for your Ethernet connection.

With this data, the FLOW tool will make a recommendation of Zigbee Mesh Controllers to cover the project. When you go to install the project Screen Innovations will guarantee the performance of the coverage of the system.

Somfy RTS Repeater 1810791

Can I select which Zigbee channel on my Mesh Controller?

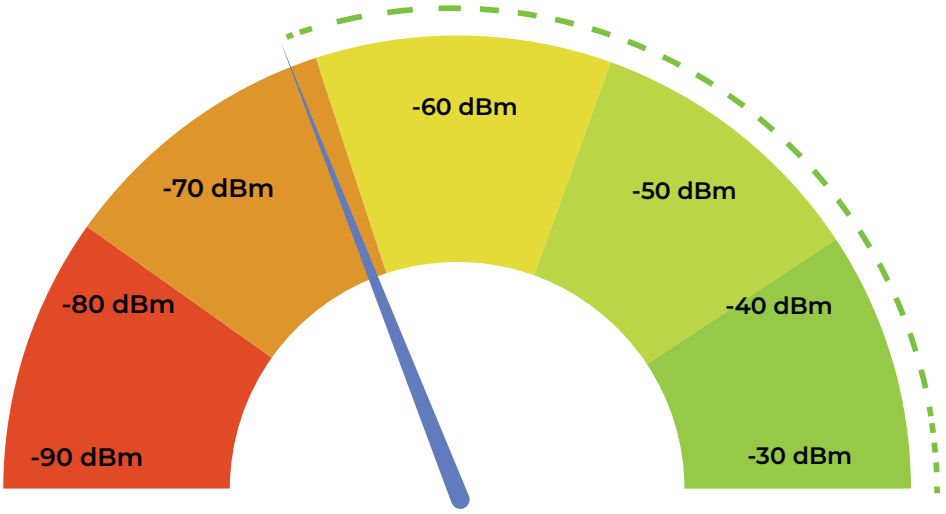
Yes, when you place an order in the Flow, you can select any valid Zigbee channel. Currently, once you make the selection you will not be able to change it, SI working is on a software update which will enable the channel to be changed in the future.

How do I measure the WIFI signal?

WIFI signal strengths are measured in decibel milliwatts or dBm and are expressed as a negative integer and the lower the value the better the signal strength. You can use a WIFI scanner app on your phone or PC and you will look for the Received Signal Strength Indicator or RSSI value.

If you are on a MAC with OS X just press and hold the **Alt** key while clicking on the WIFI icon in the status menu.

In order to have a reliable and robust Zigbee shade system each Zigbee Mesh Controller will need a signal strength of at least **-65dBm**. If the WiFi signal strength remains at a weaker signal than this, the device may fall off the network, or in some networks may be pruned from the network.



What steps can I take to ensure a robust and reliable WIFI?

- Perform a site survey and recommend adding WIFI coverage in areas that cannot maintain over a -65dBm signal strength, and or move the WAP or Zigbee Mesh Controller to achieve this signal strength.
- The Zigbee Mesh Controller should be installed in locations free of obstructions like furniture, glass, and other RF interfering materials. Use the ceiling if possible.
- For best performance WiFi channels should be located on channel 1, 6, or 11 when using 2.4GHz.
- For best performance set your WAP broadcast strength manually.
- Place the Zigbee Mesh Controller within 15 meters to a single WAP, and that a strong signal is present at that location of at least -65dBm.
- DO NOT place the Zigbee Mesh Controller in-between one or more WAP with the same SSID and same signal strength. Move until one of the WAP is stronger than any others.

At the end of this Zigbee Design Guide we have listed several free & paid versions of WIFI scanning software including the download links, screen shots & more.

What WIFI networks are fully qualified with our Zigbee shading systems?

What WIFI networks are not currently fully qualified for use with our Zigbee shading systems?

For help with any of the brands, models or firmware you see here or other brands that have not yet been fully qualified, please contact SI technical support for further assistance.

FOOTNOTES FROM ABOVE

*We are working directly with Access Networks to fully qualify the equipment.

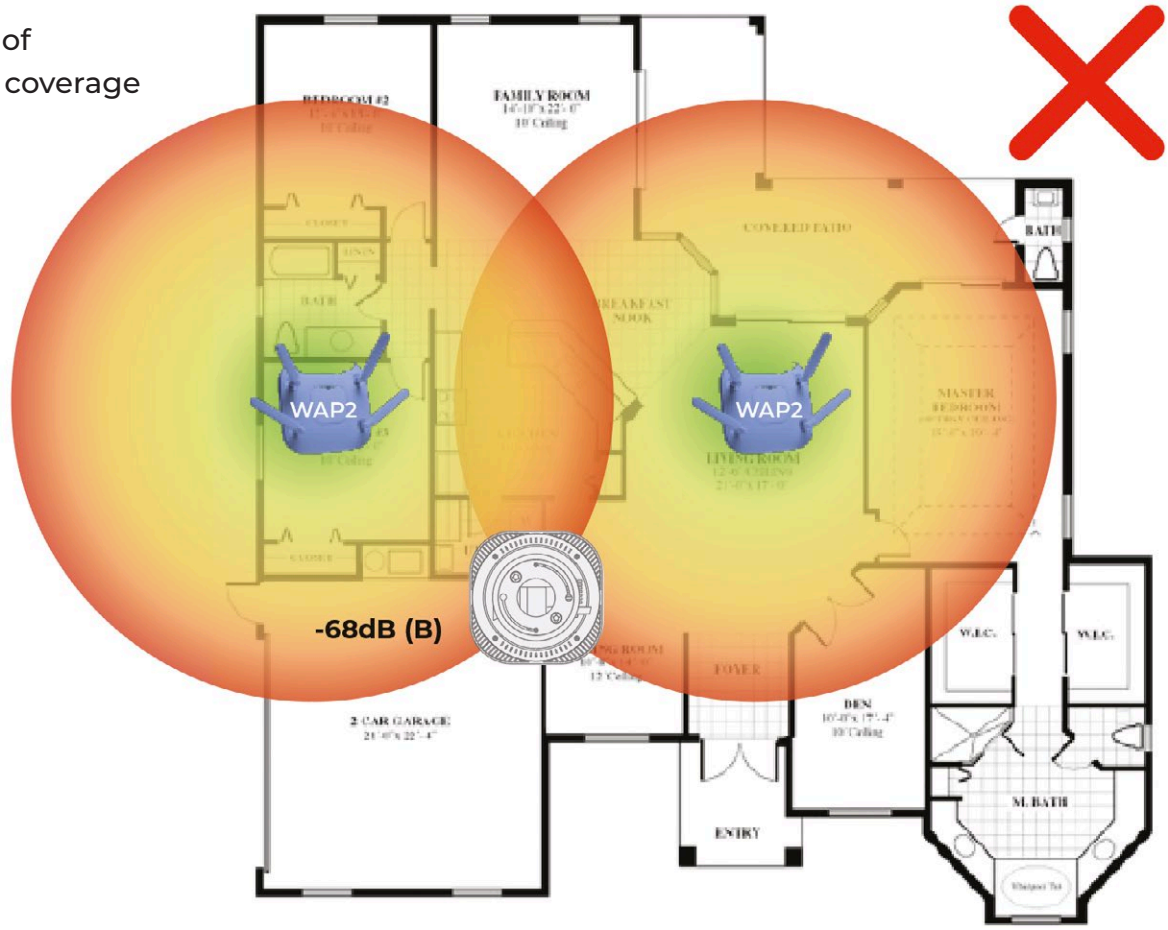
***We are working directly with Pakedge to solve a WAN issue. Most deployments are LAN based.

How should I design the Zigbee and WIFI networks?

Make sure that the Zigbee Mesh Controller is located close to one of the WiFi access points, and not in the middle of two access points. We would like the Zigbee Mesh Controller to have greater than -65dBm signal (Yellow in graph) to the access point. (lower number is stronger signal)

We describe how to generate a WIFI heatmap later in this guide and a link to a trial version of software that you can use.

Example of
bad WiFi coverage



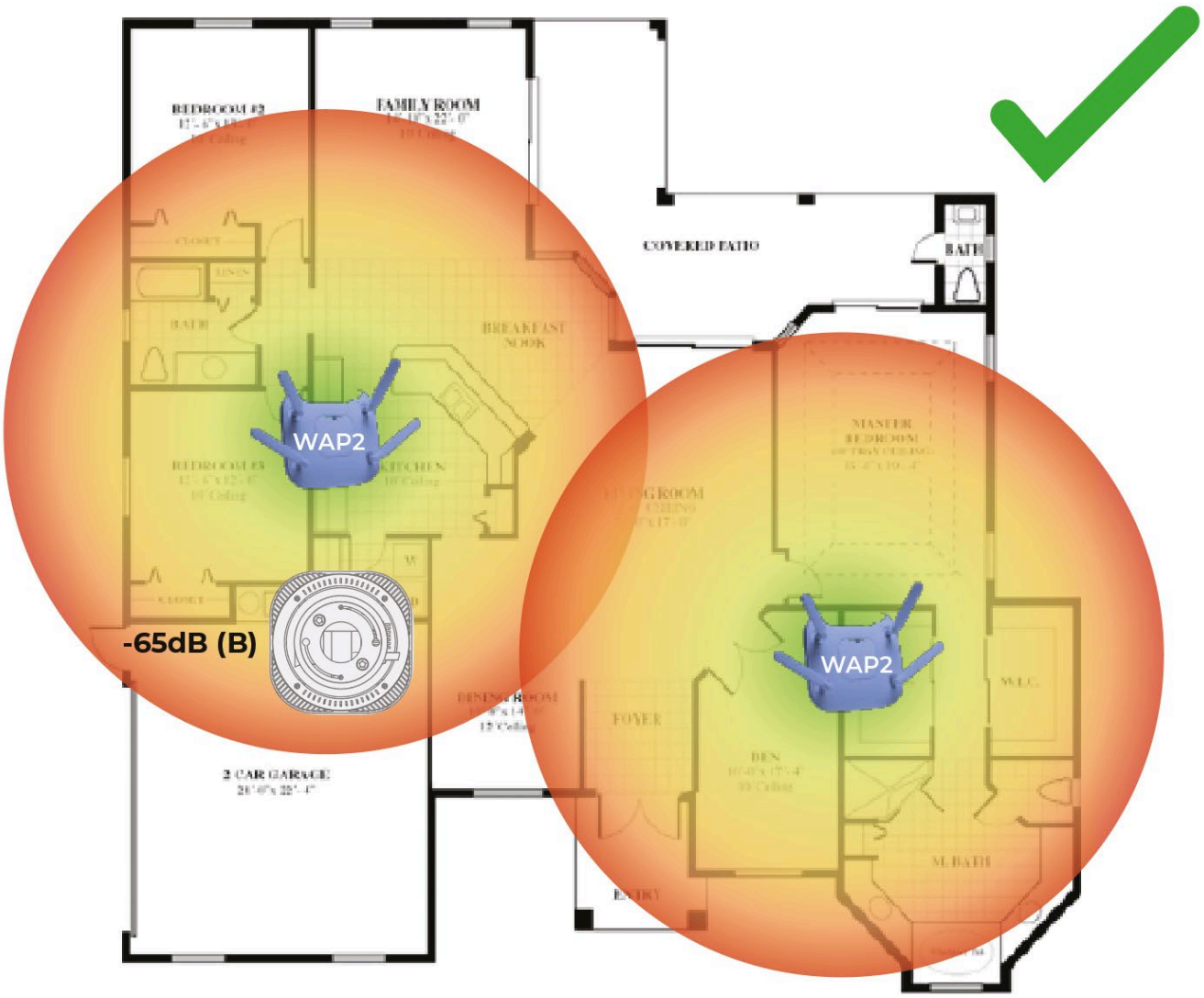
What is wrong with this design?

Two main issues with this WiFi deployment;

First of all the Mesh Controller is beyond the -65dBm RSSI signal level that you will want to have. REMEDY – Move the Mesh Controller closer to one of the WAP and maintain -65dBm or better signal strength.

Second, the Mesh Controller is equally split between two WAP which may cause swicthing back and forth between the strongest signal. REMEDY – Move one of the WAP's or move the Mesh Controller so that they are at different RSSI signal strengths.

Example of good WiFi coverage

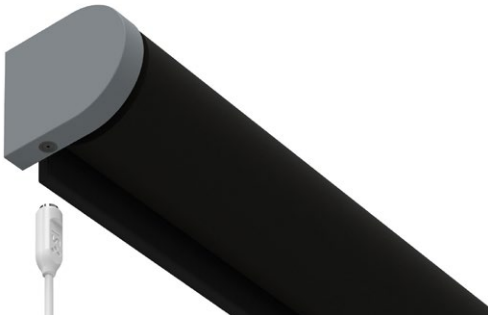


Can I mount LinkPro Z Upside down?

Yes, however LinkPro Z was designed to be ceiling mounted, so mounting it upside down may result in a lower RF performance, keep orientation the same.

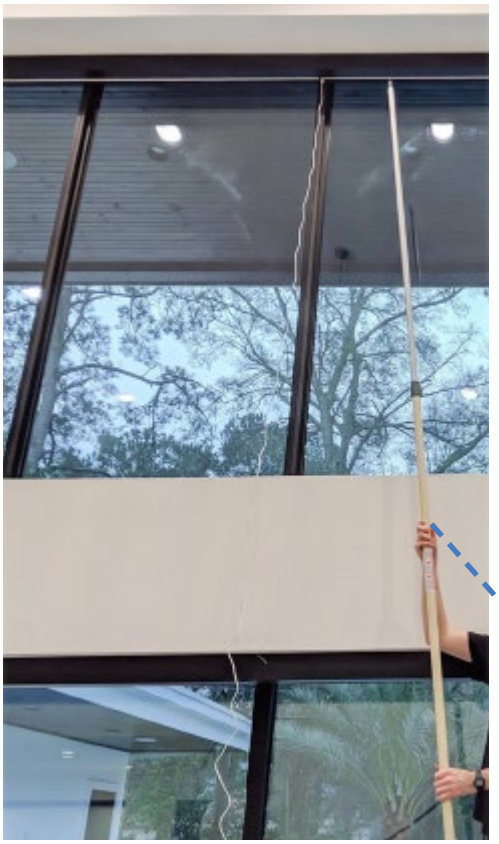
How long does the battery last in an Zigbee shade?

The Screen Innovations Zigbee shades are designed to maximize energy and customers should expect to need a recharge about every 10-16 months. This estimate is based on a normal everyday use of opening and closing each day and the deployment of a properly Zigbee Mesh network.



How often does the batteries need to be replaced?

The Screen Innovations Zigbee shades will not need the batteries replaced and charging them could not be any simpler with our patented break-away magnetic connector.



How long does it take to recharge the batteries?

4 to 6 hours to a full recharge

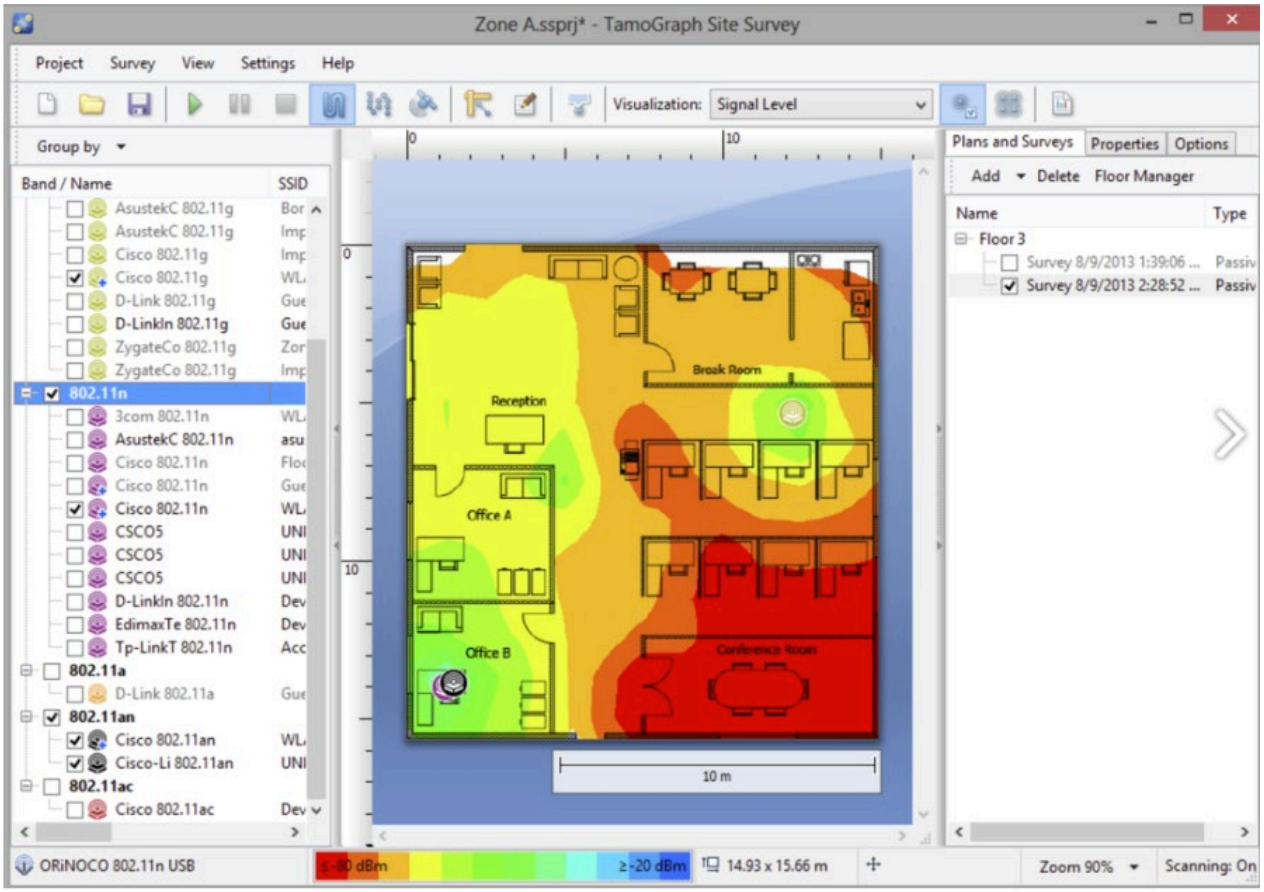
Do I need a ladder to recharge shades installed on a second level?

We provide a tip that will thread onto most any standard "painters poles" which are commonly found at local hardware stores and since our shade charging connection is magnetic, just get it close and it will pull the charging cable to the right spot for you.

My SI Zigbee proposal was accepted by my client, what best practice should I do BEFORE the shade installation day?

Before you deploy a shade project, we highly recommend conducting a RF site survey. Several companies make software and tools that can help you with this.

One such tool is called TamoGraph Site Survey from Tamosoft.



Using this tool, you will be able to generate a report and visual graphics that can identify problematic locations where the client would like you to install shades.
Using tools such as this BEFORE your deployment day can identify many problems, such as weak WIFI, or gaps in your WIFI coverage, or even which WIFI channels to use to avoid high noise floor areas of the job site.

This can allow you to make WIFI recommendations and upgrades and ensure a robust and reliable WireFree environment. The software is easy to conduct, just by walking through your client's site with the software running on your PC you can generate this report in less than 30 minutes.

Visit **https://www.tamos.com/products/wifi-site-survey/** to learn more.

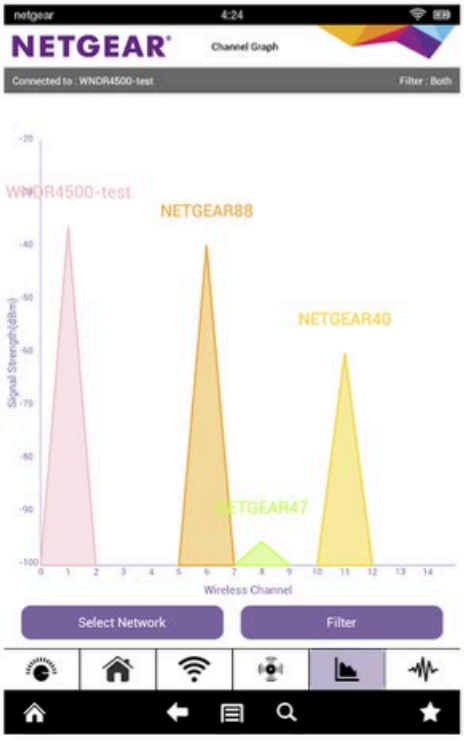
What other software would be helpful to deploy a reliable WIFI system?

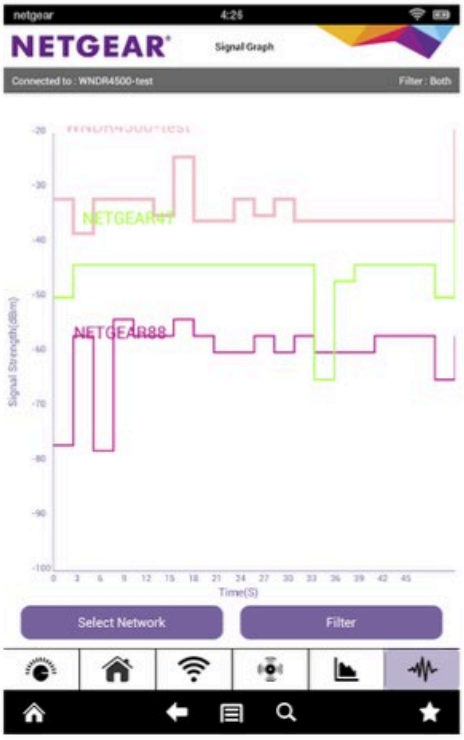
We have also used a product called the Wi-Spy DBx, and a software called Chanalyzer by Metageek.
This software can help you to identify and document the WIFI environment and all the 2.4GHz traffic and radiators.

https://www.metageek.com/products/wi-spy/

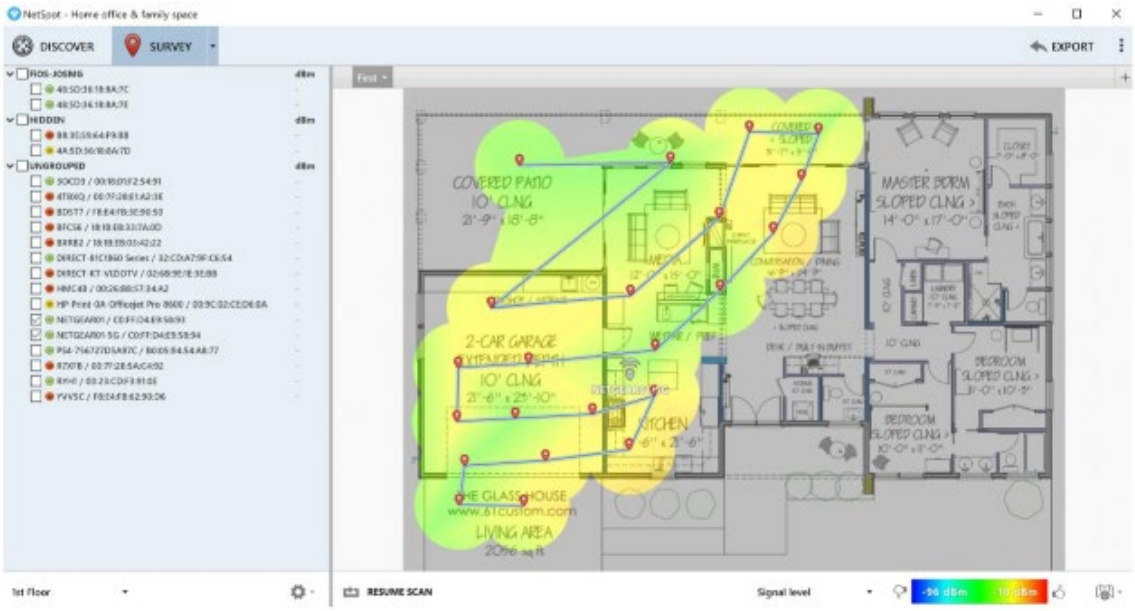
What free tools can I use to help conduct a site survey?

Install the NETGEAR WiFi Analytics for Android phones for no-cost quick survey. Find this app in the Google Play store





NetSpot – Free and paid versions https://www.netspotapp.com



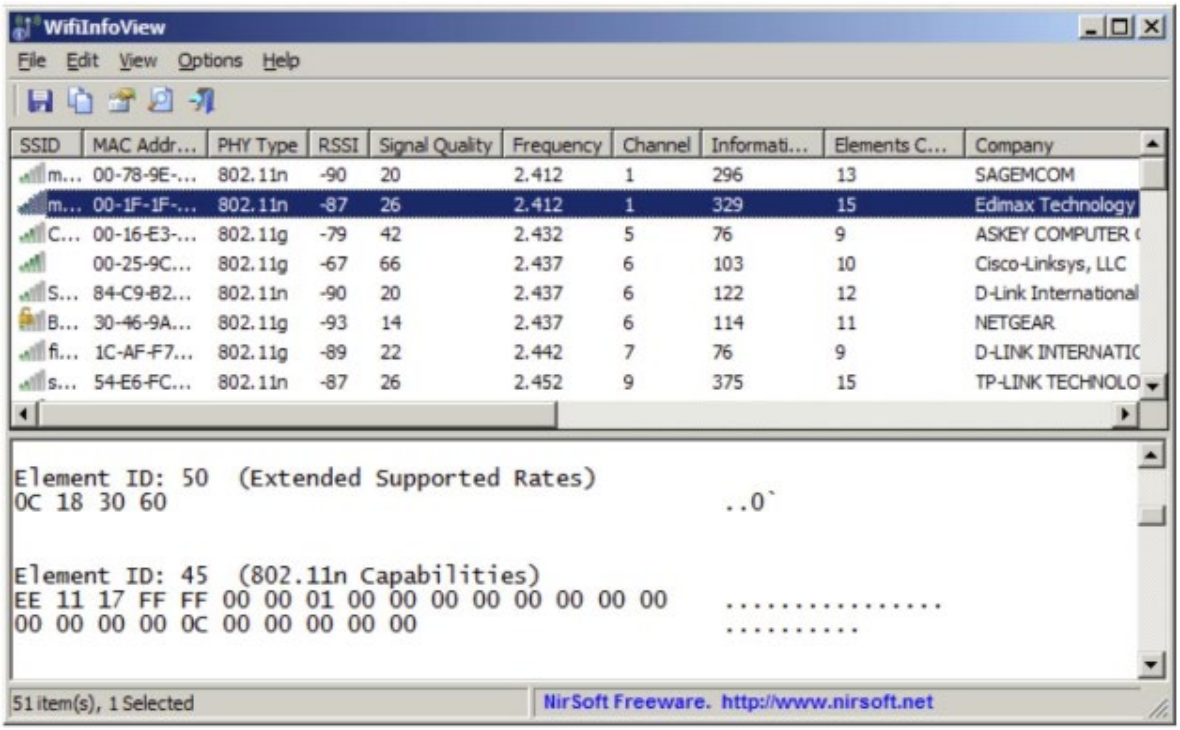
inSSIDer – Free and paid https://www.metageek.com/products/inssider/

Xirrus Wi-Fi Inspector– Free and paid versions

https://www.riverbed.com/products/xirrus/inspector.html

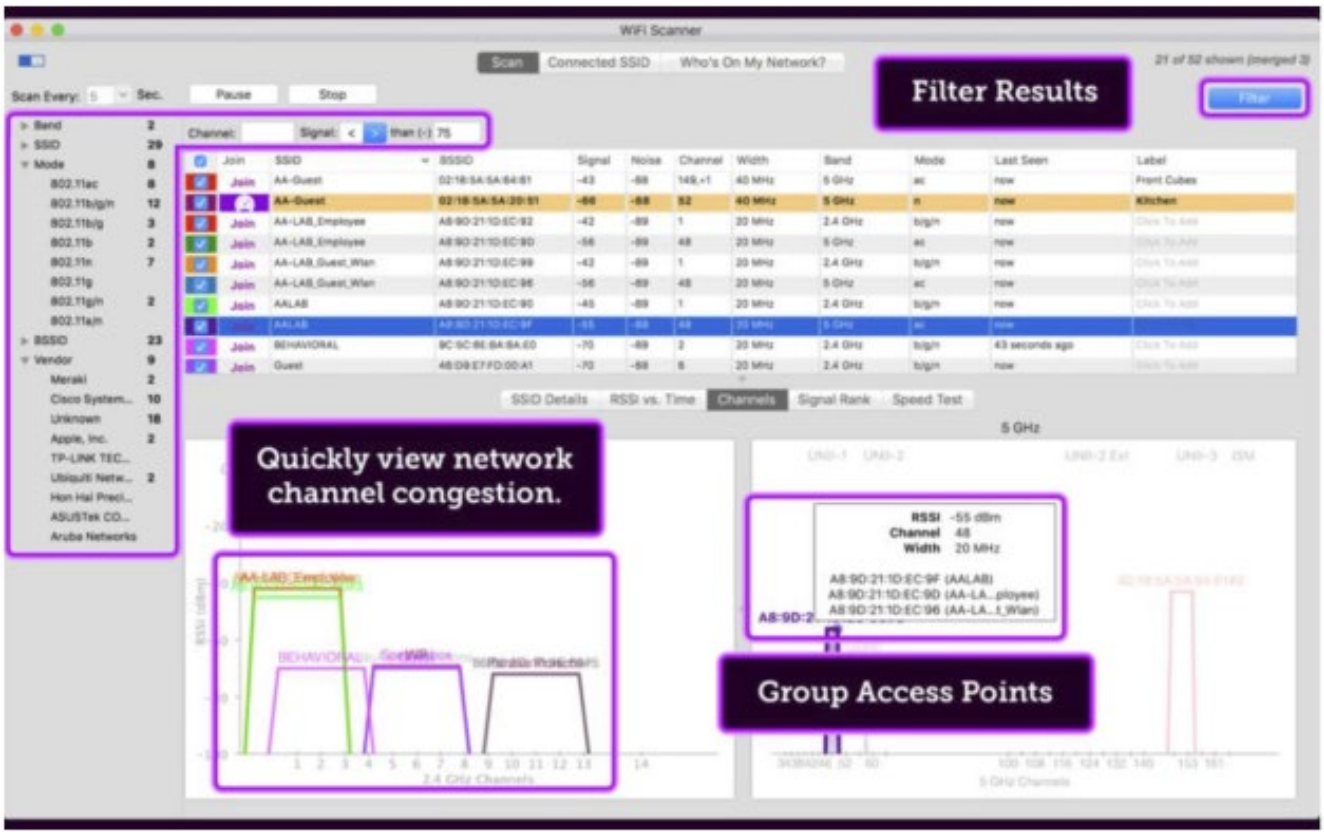
WifiInfoView– Free versions

http://www.nirsoft.net/utils/wifi_information_view.html

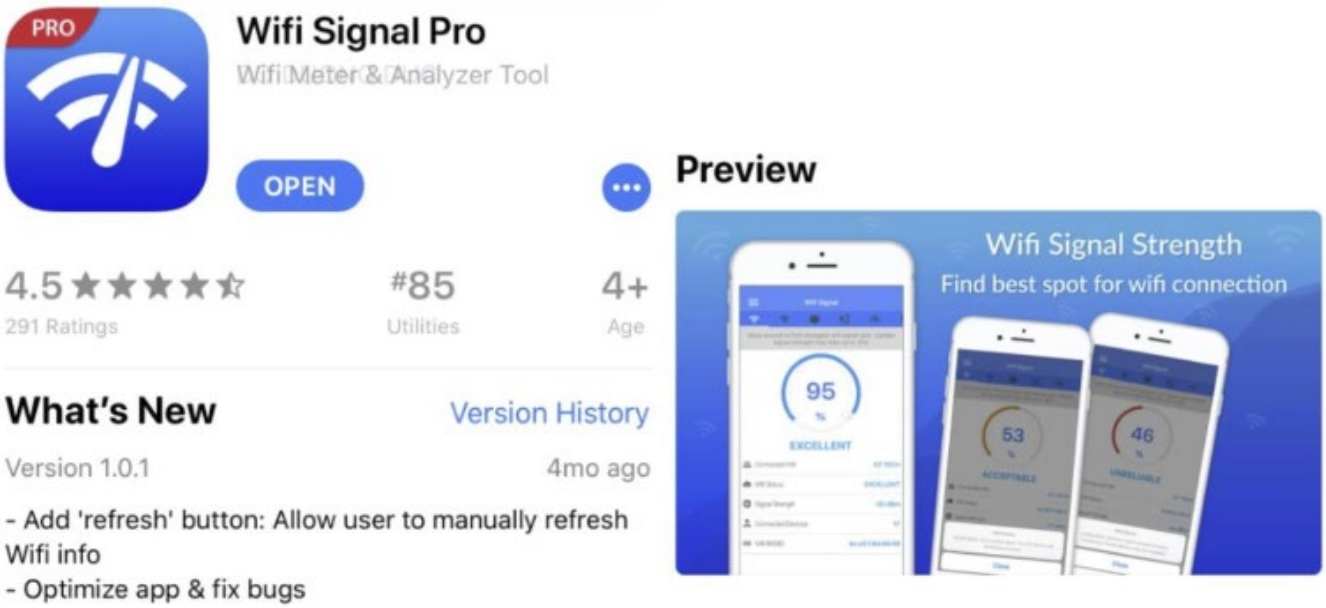


WiFi Scanner– Free and paid versions

http://wifiscanner.com/wifiscanner-windows.html



Wifi Signal Pro fpr iPhone and iPad



For more information and design help please call us or contact us at www.screeninnovations.com

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