



## BUILDING A ZIGBEE NETWORK BEST PRACTICES

### IMPORTANT

*Read and understand all instructions before installing. Always wear personal protection equipment including safety glasses and gloves. Use a ladder per its manufacturer's instructions. Work safely!*

**When starting a project, the successful installation of a shade system requires a site survey and plan. Please follow all points below.**

#### Point 1

Where will the Qube, or network gateway, be located relative to the shades.

#### Point 2

Consider the router brand as well. QMotion has tested Luxul routers, which, like many other brands, will work well with QMotion shades. If your project does not yet have a selected router, we recommend using the Luxul products.

#### Point 3

ZigBee is a radio frequency communication protocol. Range of the radio signals will vary. Typical expectations can be 30 feet of transmission, but there are environments where significantly lower range appear. There could be issues with other radio devices, wall composition and appliances that could interfere. This means that proper planning and preparation are required.

#### Point 4

Survey the site for how the signals can travel. The best path might be in a closet, behind a wall or furniture. QMotion offers Repeater / Range Extenders which are designed to bridge the gaps between devices. Repeater / Range Extenders can also be used to build a larger network, and will talk to each other, finding the best path for the data to travel.

#### Point 5

When commissioning the ZigBee network, **be sure to stay on the same wifi network where the Qube is attached.** Please note: Phone software like "wifi-assist" can switch a phone off wifi, causing the commissioning to fail. Also, make sure that if you are using a dual-band router, stay on the correct network, which is often the 2.4GHz version. If your commissioning app does not show the "add devices" button in the Dashboard, being off the wifi network is typically the cause.

#### Point 6

Note that shades, remotes and Repeater / Range Extenders all must be in range of the network. That means, they need to be within the range of the Qube or a Repeater / Range Extender.

### Commissioning Steps

The steps to start commissioning the QMotion ZigBee network are:

A: Locate the Qube, plug it in to power and into the router.

B: Create your account on the Qube, and write the account details down in a safe place. Consider using a system like: Create an email address at a free email host, using the client and job number. An example could be: smith2764@gmail.com. The password should also be something with a pattern, like qube with the job number: qube2764. Using a pattern like this will help you remember it in the future, if required.

C: Bring your Repeater / Range Extenders around the job site, placing them, not plugged in yet, where you expect to locate them. Identify the power source for each.

D: Discuss the location of them with your client, informing them that **these cannot be unplugged or the shades will not operate.** Ensure that no wired devices (the Qube or the Repeater / Range Extenders) are on outlets that will be disconnected or turned-off. A switched outlet, a timer, or a client using the outlet or usb cable for a different use will disconnect the network, and this can cause the shades to not function properly and fail to react to system commands.

E: Locate the shades at their windows, and install the shade brackets. Leave the shades packaged at this time.

F: Begin learning the Repeater / Range Extenders to the Qube, starting with the device closest to the Qube. During this time you may find a Repeater / Range Extender might need to be added to build the network connection to another.

G: Once the Mesh network is complete, you must follow the official instructions included in the shade packaging to begin programming any remote controls to the network.

H: Next, install the shades per the official QMotion instructions, program them to the network and learn them to any desired remote controls. If a remote or a shade has difficulties, or is not consistently on the network, you may need to add an additional Repeater / Range Extender. Consider different angles, the other side of a room, or the like.

I: Once complete, with the network functional, make a site sketch, or listing. This should describe locations of each Repeater / Range Extender, as well as the Remotes. List out the channels for each remote and which shades it should control.

## Shade is unresponsive or works intermittently

**What it is:** When a shade is controlled by a ZigBee network, if the network becomes unstable and the shade loses communication for a period of 15 minutes or more, the shade will stop functioning. When users try to control the shade through a system, remote or app control, it will be unresponsive. If the shade is tugged manually, it may be controlled.

**How do shades get back on the network from this mode:** Typically shades will simply return to normal function when the network recovers and be controllable as normal. They will not move at that time, unless they receive a signal or a tug. The user may need to wait a couple of minutes when using the remote control to give the shade time to reconnect to the network. Sometimes a shade may need to be tugged to rediscover the network. A simple manual tug of shades can cause them to recover very quickly, as long as the Mesh network is back running prior to the manual tug.

**Why can it happen:** Mesh networks need all nodes to be on and functional at all times. If a device like a Repeater / Range Extender turns off, or is disconnected, that can cause a network disruption. If the shade is unresponsive at some times and not others, there may be additional devices causing network issues such as a timed outlet.

**How can unresponsive shades be prevented:** Ensure all network mesh nodes are powered at all times. Verify that the network is strong and stable. Major components, like Automation systems, Qubes or even Repeater / Range Extenders may benefit from commonly available UPS (battery backup systems) which can keep them powered at all times. Consider adding additional Repeater / Range Extenders in spaces where the shades are unresponsive.

**Which setup do I use:** We have created three different interactive online training modules that can be used on your desktop or mobile device. Training modules are available for Qadvanced with ZigBee HA1.2 and Qadvanced Intelligence System (QIS). Each is complete with an introduction to the product, its controls and specific programming instructions. To view this content go to: <http://qmotionshades.com/support-center/online-tools> and choose the setup you desire.

## Other Specifications

The QMotion R&D group has determined a comfort level of 95 nodes on a ZigBee network using a Qube. This comfort level is to be maintained in order to sustain a functional ZigBee Mesh Network. Each device equals one node.

### Example Network Configurations:

Network set-up A:

1 Qube  
9 Range extenders  
25 Shades  
15 Remotes

Total - 50 nodes

Network set-up B:

1 Qube  
20 Range extenders  
45 Shades  
25 Remotes

Total - 91 nodes

Please note that these network examples as designed MUST follow installation best practices for ZigBee.



For more information visit us at [qmotionshades.com](http://qmotionshades.com) or call 877.849.6070

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