Enabling Ion™ Networks in Large Applications Instructions

ion™
SYSTEM CONTROL

Wireless Access Point Range Extension

Applications and locations that require a large number of Ion™ systems in a large physical space may benefit from repeaters or Wi-Fi® range extenders to provide or improve wireless coverage across the entire space.

This general guideline is designed to help extend the range of coverage of the Ion wireless network for locations and applications that cover more than 50-80 ft (15-25 m) of lateral distance between the Ion wireless access point (WAP) and any of the wall controls to be connected to that access point. Extended coverage is accomplished using Wi-Fi range extenders, also known as bridges or repeaters.
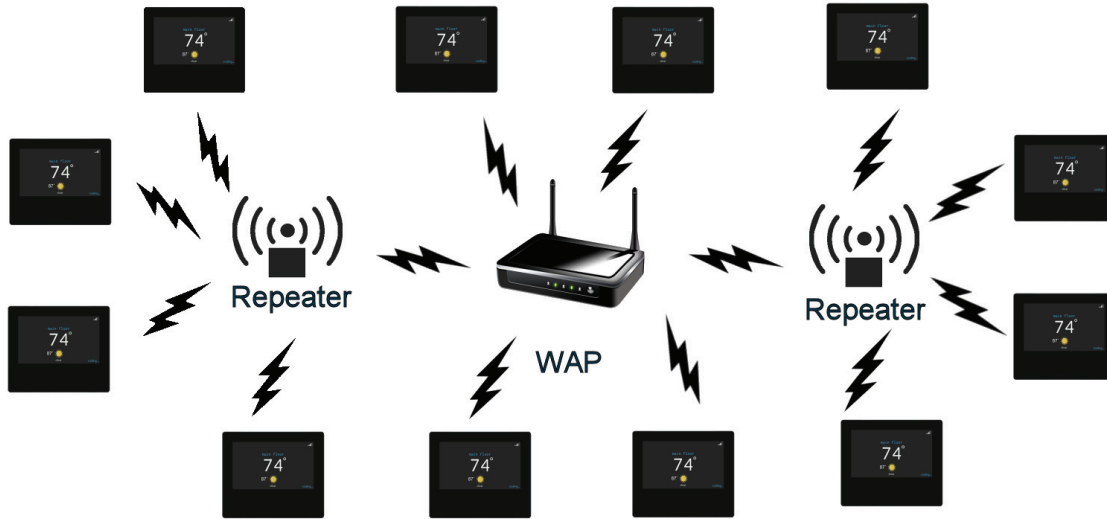
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Fig. 1

This information may be useful if you are having trouble with signal strength due to obstructions between the WAP and a wall control. A repeater may be placed in a way that allows the wireless signal to be directed around an obstruction. See the figure, below.
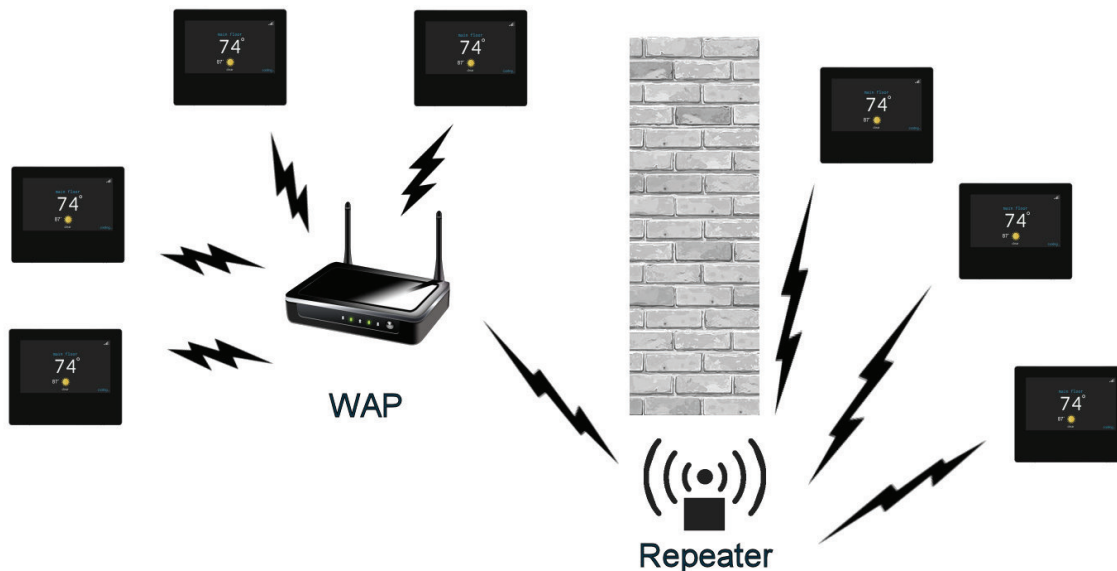
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Fig. 2

Range Extending Options

There are a number of Wi-Fi range extenders on the market. International Comfort Products makes no claims as to the suitability for use of any specific range extender. Manufactures of Range Extenders are continually updating and improving their products so the specification and use of Range Extenders is at the sole risk of the user.

Positioning the Wireless Access Point and Range Extenders

Network delays can be caused if messages on the network must "hop" from one device to another before ever reaching the Internet. It is best to limit the number of hops that a message from the Ion wall control must make before getting to the Internet.

For best results:
- Connect the Ion Wireless Access Point (WAP) directly to a LAN port of the home network router, and not through a network switch. This eliminates one or more hops. It is acceptable if the WAP is located away from the home network router, but still directly connected to the home network router via an Ethernet cable.
- Position the WAP close to the center of the Wi-Fi network so that range extenders can link directly to the WAP, and not to each other. This eliminates one or more hops. See the first system illustration, above.
- If it becomes necessary for a range extender to link to the WAP through another range extender, keep the number of hops to a minimum.
- If possible, connect the range extenders to the WAP using Ethernet cable, instead of wirelessly. This will help to avoid delays and corrupted messages caused by radio noise that interferes with Wi-Fi signals. It will also allow each range extender to find an open channel/frequency to operate within, to avoid interference with other networks. See the Wired versus Wireless Bridging/Extending section, below.
- Keep all WAPs and range extenders away from microwave ovens, wireless baby monitors, wireless video or audio equipment, and wireless telephone equipment. These devices can all emit radio interference in the same 2.4 GHz band that is used by Wi-Fi radios.

Wireless Bridging Network Channel Configuration

NOTE: When the Wireless Access Point (WAP) and range extending devices are configured for WIRELESS bridging/extending, they all share the same wireless channel. Due to this, it is best to use the minimum number of range extenders (REs) possible to help avoid the devices interfering with each other.

If it is desired to set up the WAP/router and REs with different wireless channels, you will need to connect the range extenders to the WAP/router with Ethernet cable, instead of wirelessly. See the Wired versus Wireless Bridging/Extending section, below.

Select and Assign Devices

Choose the Wireless Access Point (WAP) and range extending devices that you plan to use for a location. Follow the instructions provided with the range extender (RE) to set up that device, and link/associate it with the Ion wireless access point (WAP) or home Wi-Fi network.
TIP: We recommend that the SSID name of the RE be the same as the WAP, plus the extension "_ext"; each RE should have its own SSID. The password for the RE(s) should be set to the password of WAP.
For example:
- If the WAP SSID is myHVAC, set the RE SSID(s) to myHVAC_ext; or myHVAC_ext1, myHVAC_ext2, etc. This allows easy recognition of the appropriate/closest Wi-Fi network for the Ion system, as well as differentiates among the different access points (WAP or RE) to choose the one closest to each wall control.
- If the WAP Wi-Fi password is 12345678, for example, set the RE password(s) to 12345678. This allows remembering only one password for the different SSIDs of the entire Ion wireless network.

Wired versus Wireless Bridging/Extending (aka "access point mode")

The advantage of wireless bridging is, of course, no wires between the WAP and range extenders (REs). The WAP and range extenders can be placed anywhere convenient and anywhere which provides good signal strength and coverage. However, all of the Wi-Fi devices must share the same Wi-Fi channel, which can lead to channel/radio interference problems, and slow overall network performance.

If wired Ethernet connections are available between the WAP and range extenders, wired bridging can provide a few key advantages, leading to faster message transfer rates, and ease of configuration and installation:
- Radio interference can be greatly reduced among the wireless access points (WAP and REs) by assigning different devices to different Wi-Fi channels, allowing faster message transfer between the devices, and reduced Wi-Fi traffic to interfere with other messages in other networks.
- Range extenders can be placed closer to clusters of wall controls, thus avoiding a compromise position half-way between the WAP and the wall controls.
- The Ion WAP does not necessarily need to be placed physically between the range extenders, allowing easier connection to the home router.

If you wish to wire the bridges/extenders to the Ion WAP, follow the instructions provided by the range extender manufacturer. The label on the back of the Ion WAP may be removed from covering the LAN ports for this purpose. Note that not all range extenders support the wired bridging mode.

In addition to dedicated range extenders, many newer routers support router wired access point and wireless repeater/bridge modes. The wired bridge mode is often referred to as "access point" mode. See the instructions for the particular device for details and how to configure the device for the different operating modes. Instructions for most of these devices can be found online, and may be reviewed before purchasing the device.

NOTICE:The ability to remotely access and adjust the settings of the ICP Ion Control with the "My Ion" mobile applications is dependent on the compatibility of the user's computer/network or mobile device, the ICP Ion Control, and/or the "My Ion" web server with, and the availability of, the user's internet service provider or mobile device carrier service. ICP makes no representations or warranties, express or implied, including, to the extent permitted by applicable law, any implied warranty of merchantability or fitness for a particular purpose or use, about the compatibility of the user's computer/network, or mobile device, with the ICP Ion Control, and/or the "My Ion" web server, with, and the availability of, the user's internet service provider or mobile device carrier service, or that the ability to remotely access and adjust the settings of the ICP Ion Control will not be negatively affected by the network-related modifications, upgrades, or similar activity of the user's internet service provider or mobile device carrier service.