KETRA

WIFI COEXISTENCE AND KETRANET MESH CHANNEL PLANNING

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Introduction

Ketra's wireless control system is extremely flexible and enables easy installation and commissioning. Our extensive experience in deploying wireless lighting control networks has enabled us to gather a collection of best practices and recommendations that have been assembled into this document in order to optimize the performance of your application.

KetraNet Mesh, Ketra's wireless control protocol, is built upon industry standard Institute of Electrical and Electronics Engineers (IEEE) 802.15.4[1] compliant devices including ZigBee®. The IEEE, a non-profit organization, is the world's leading professional association for the advancement of technology. IEEE is a globally respected standards development group whose members are volunteers working in an open and collaborative manner. To be approved as an IEEE 802 standard, IEEE 802 wireless standards must develop a Coexistence Assurance Document and implement a plan as part of the standard that ensures that all 802 wireless standards can operate and coexist in the same space.[2]

Ketra's products are also tested to, and comply with, Federal Communications Commission (FCC) listing requirements thus safeguarding from interference with other IT and communications equipment caused by both conducted and radiated electromagnetic emissions. The FCC has rules to limit the potential for harmful interference being caused to radio communications by computers and other products using digital technology.[3] The existence of these standards and organizations make it possible for KetraNet Mesh to coexist with other wireless protocols within the 2.4 GHz band. We have also optimized our wireless network based on actual, real-world experiences to fine tune our system performance.

In order to provide ultimate flexibility, you are able to select a specific communication channel for each N4 Hub in an installation. All Ketra devices assigned to an N4 Hub are set to the same KNet (KetraNet Mesh network) and will communicate on the selected channel. Channel number selection is done when first creating an installation file in Design Studio and can be changed later if desired.

The remainder of this document provides recommendations and steps that can be taken in order to optimize Ketra's wireless network.

[1] http://standards.ieee.org/about/get/802/802.15.html

[2] https://docs.zigbee.org/zigbee-docs/dcn/07-5219.PDF

[3] http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet62/oet62rev.pdf

Recommendations

- For coexistence with standard US WiFi channels, KetraNet Mesh channels 20 and 25 will have the best performance. Channel 15 is not available on N4 Hubs. The next preferred channels are 11, 14, 16, 19, 21, and 24. Figure 1 illustrates the overlap between KetraNet Mesh (802.15.4) channels and WiFi (802.11) channels.

- Separate two KNets (Ketra networks, one per N4 Hub) that share the same channel by as much distance as possible. For example, if you have a KNet occupying channel 25, the best choice will be to avoid having another nearby KNet on channel 25.

- Spread out KNets that occupy adjacent channels. For example, if you have a KNet occupying channel 20, avoid having nearby KNets using channel 19 or 21.

- In general, if a non-standard WiFi channel is being used, non-overlapping KetraNet Mesh channels will be the best option, followed by channels that are at the fringes of overlapping with the WiFi channel.

- We strongly encourage the use of 5GHz 802.11n and 802.11ac Wi-Fi as it provides higher data rates and avoids the crowded 2.4GHz band.

- Maintain at least 6 feet spacing between any Ketra wireless product and WiFi routers and access points. This recommendation is intended to minimize any impact WiFi may have on Ketra's wireless products. In general, KetraNet Mesh will not interfere with WiFi.
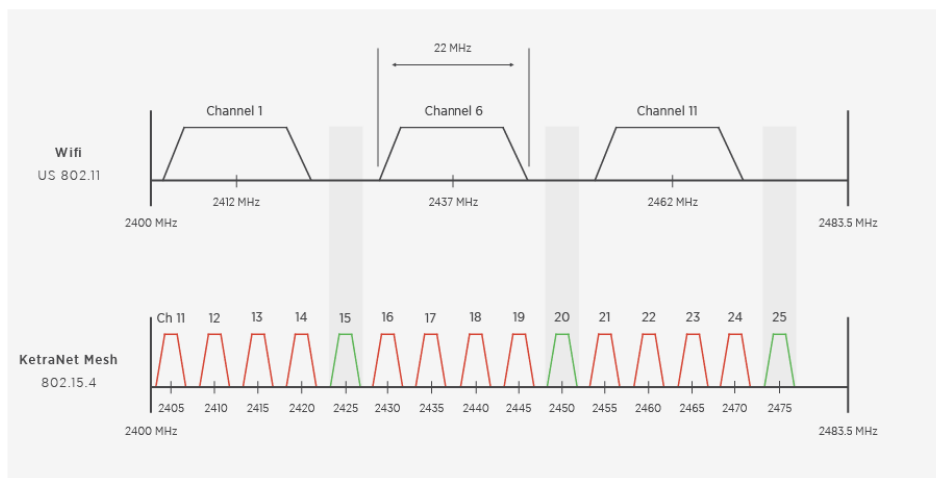

fig. 1

As with any wireless system, various wall thicknesses, materials, presence of large metal surfaces and numerous other factors can impact wireless performance. Ketra's wireless signal can travel 30 feet through construction and 50 feet line of sight.

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Procedure

SETTING HUB CHANNEL

When creating an installation in Design Studio, you will be prompted to add N4 Hubs. Design Studio shows all the hubs on the local area network (LAN) and enables you to change each hub's channel prior to adding.
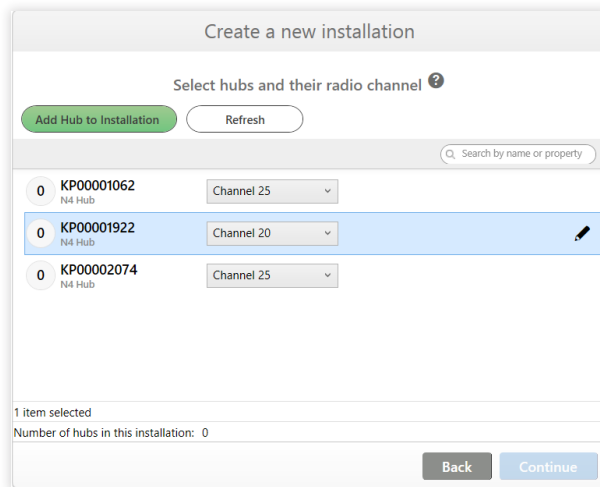

fig. 2

Select the best channel for the selected N4 according to the guidelines in this document. Note that highlighting an N4 in the list causes the unit to flash its indicator lights, enabling you to identify its location in the space as needed.

Hubs can be added later using the installation's **Organization** tab, as in fig. 3.
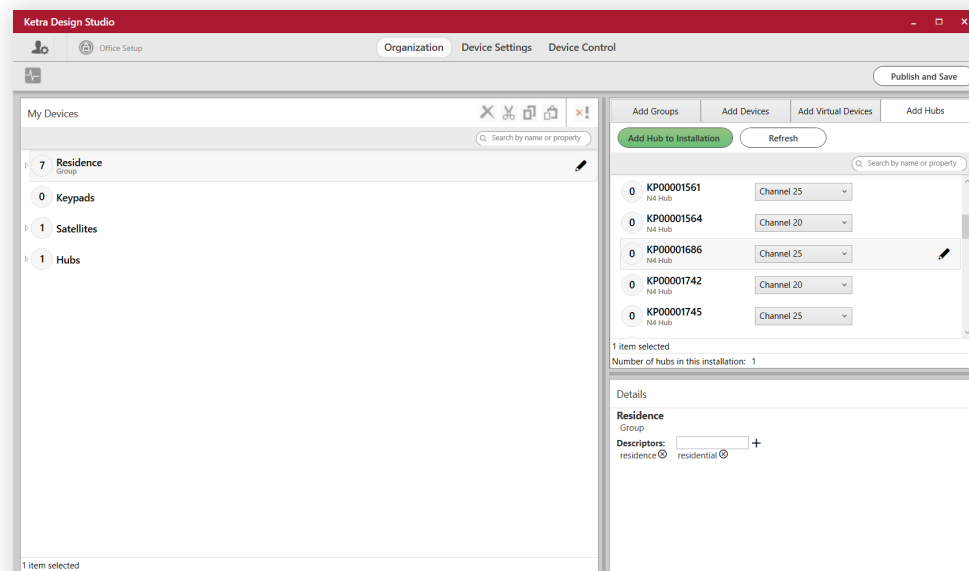

fig. 3

continued on next page

CHANGING HUB CHANNEL

You can change a hub's channel using Design Studio's **Change Network Channel** feature, located in the installation sidebar.

Before changing an N4 Hub's KetraNet Mesh channel, make sure that all of the wireless devices on its KNet respond to wireless control. If Design Studio cannot communicate with a device while changing the hub channel, that device will be left behind on the old channel and will require troubleshooting.

Support

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