KetraNet Mesh Channel Planning and WiFi Coexistence

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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.

Introduction

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

In order to provide ultimate flexibility, you are able to select a specific communication channel used by KetraNet Mesh for each installation. Channel number selection is made when first creating a project in Design Studio and can be changed at a later date if desired. A brief series of steps are outlined in the next section of this document. Below are the recommendations you should follow when selecting a KetraNet Mesh channel and installing our products.

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Introduction

[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

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Recommendations

- For coexistence with standard US WiFi channels, the following KetraNet Mesh channels will have the best performance: 15, 20, and 25. The next preferred channels should be 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 installations that share the same channel by as much distance as possible. For example in figure 1, if you have an installation occupying channel 15, the best choice will be to avoid having another nearby installation on channel 15.

- Spread out installations that occupy adjacent channels. For example in figure 1, if you have an installation occupying channel 15, avoid having nearby installations using channel 14 or 16.

- 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 802.11a/c 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.
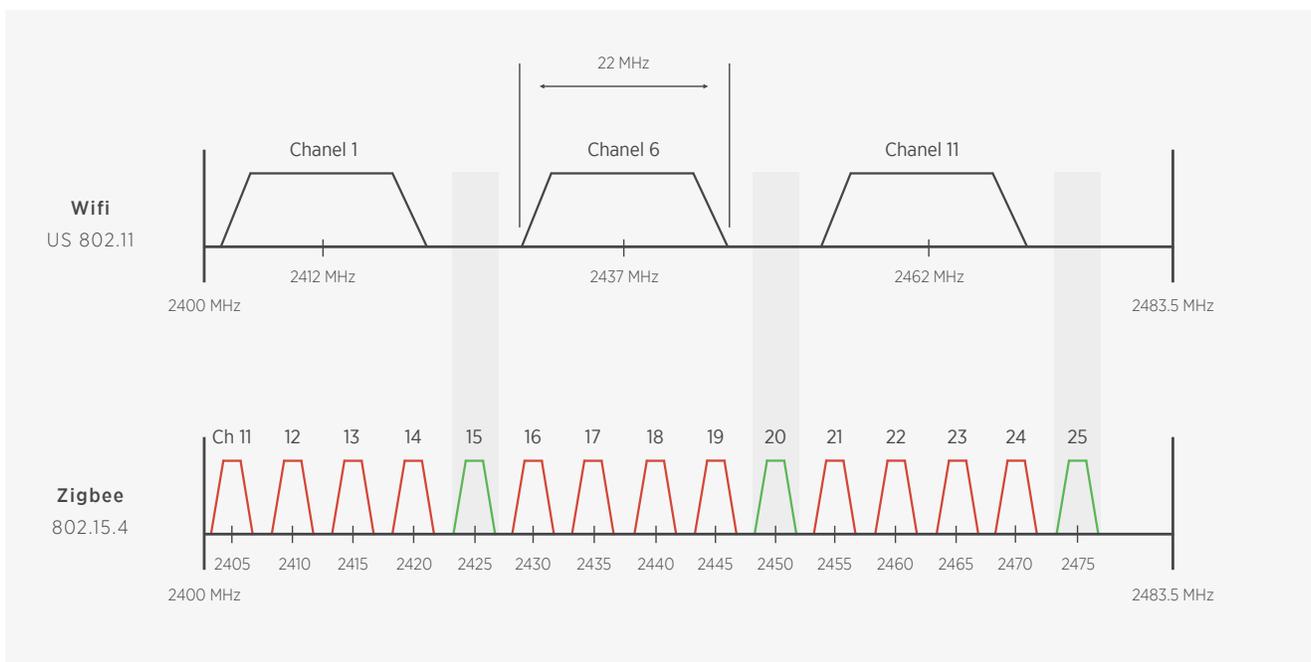

Figure 1.

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As with any wireless system various wall thicknesses, materials, presence of large metal surfaces and numerous other factors can impact wireless performance. However, when best practices are taken into account typically these issues can be reduced to negligible levels.

Procedure

When you first create an installation in Design Studio, you will be prompted by the following screen. At the bottom there is a drop down box next to a wireless icon.
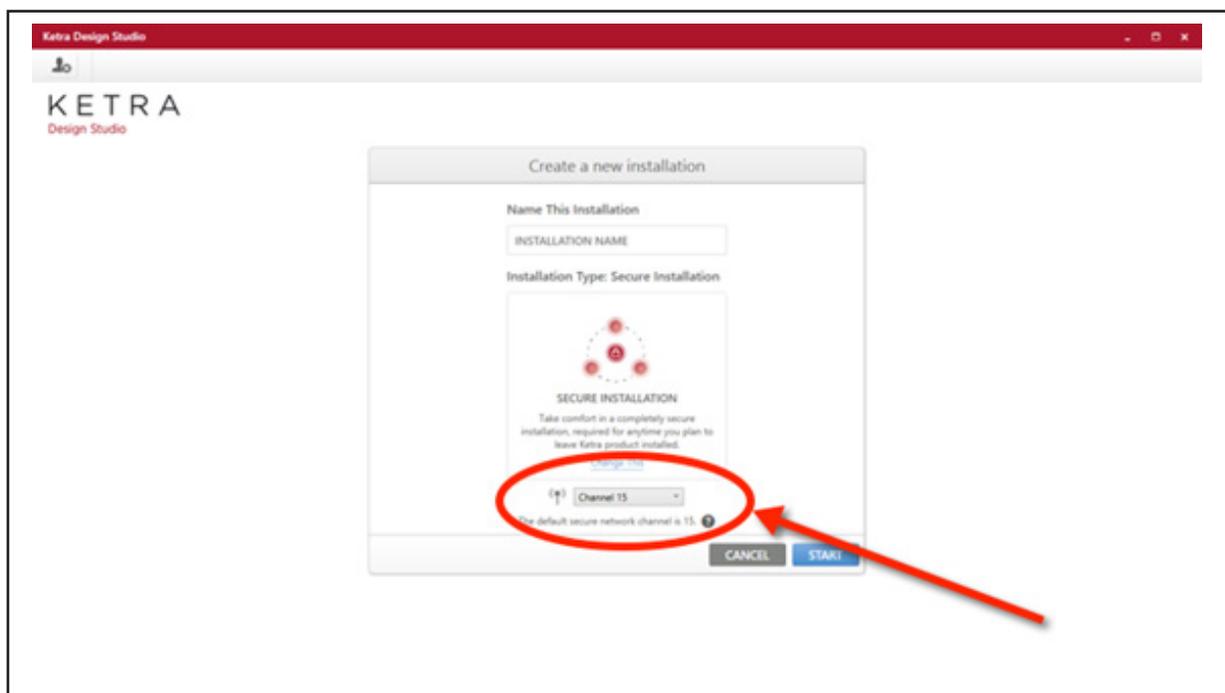
Select the drop down box and you will be presented with a list of channel numbers to choose from. Select the channel number that is best for your application based on the guidelines presented earlier in this document.

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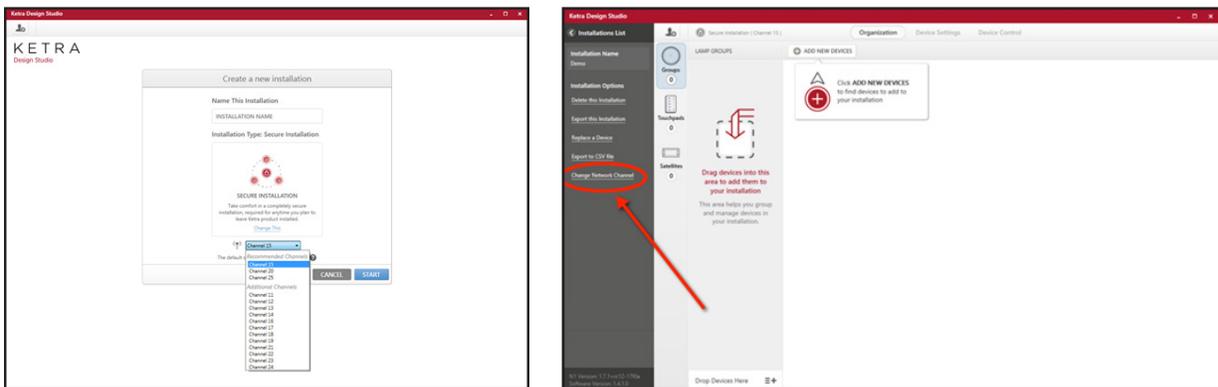
If you have any questions or concerns, please don't hesitate to contact us. We're here to help!

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