

Digital Lumens Lightelligence Mesh Network

Technical Note and FAQ

SiteWorx® intelligent lighting and smart devices communicate with each other via the Digital Lumens Lightelligence® Mesh Network which is built on the IEEE 802.15.4 Technical Standard. IEEE Standard 802.15.4 is a low-power, wireless network standard that does not interfere with 802.11 (WiFi) networks. This internationally recognized Technical Standard is the basis for the Lightelligence Mesh Network, Zigbee®, 6LoWPAN, and Thread specifications, along with other purpose-built implementations of wireless mesh.

Q: What is a Wireless Mesh Network?

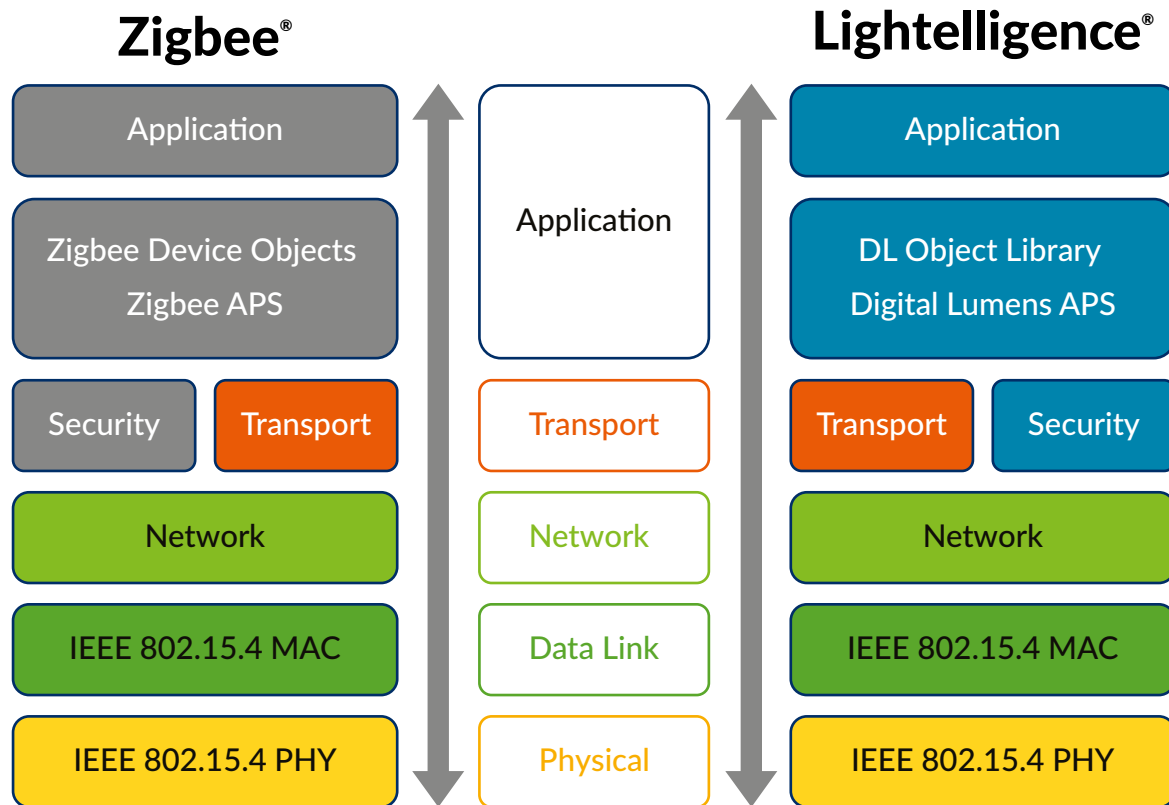
A: A Wireless Mesh Network (WMN) is a communications network made up of radio nodes organized in a mesh topology. In a mesh topology, each node not only captures and disseminates its own data, but also serves as a router for other nodes.

Q: Is Lightelligence Mesh Network the same as Zigbee Mesh Network?

A: Digital Lumens Lightelligence Mesh Network uses the IEEE 802.15.4 Technical Standard and some of the Zigbee Mesh Network specifications, however SiteWorx Smart Devices are not Zigbee certified and not compatible with other Zigbee devices.

Q: How is Lightelligence Mesh Network different from the Zigbee Mesh Network?

A: The Zigbee Mesh Network specification defines the entire communication path and portions of the communications protocol for Zigbee certified devices which connect and communicate using the same language as each other. The Lightelligence Mesh Network is different in that Digital Lumens Lightelligence defines its own secure communications protocol for SiteWorx Smart Devices. SiteWorx Smart Devices leverage portions of the Zigbee specification where applicable but are not eligible for certification by the Zigbee Alliance.

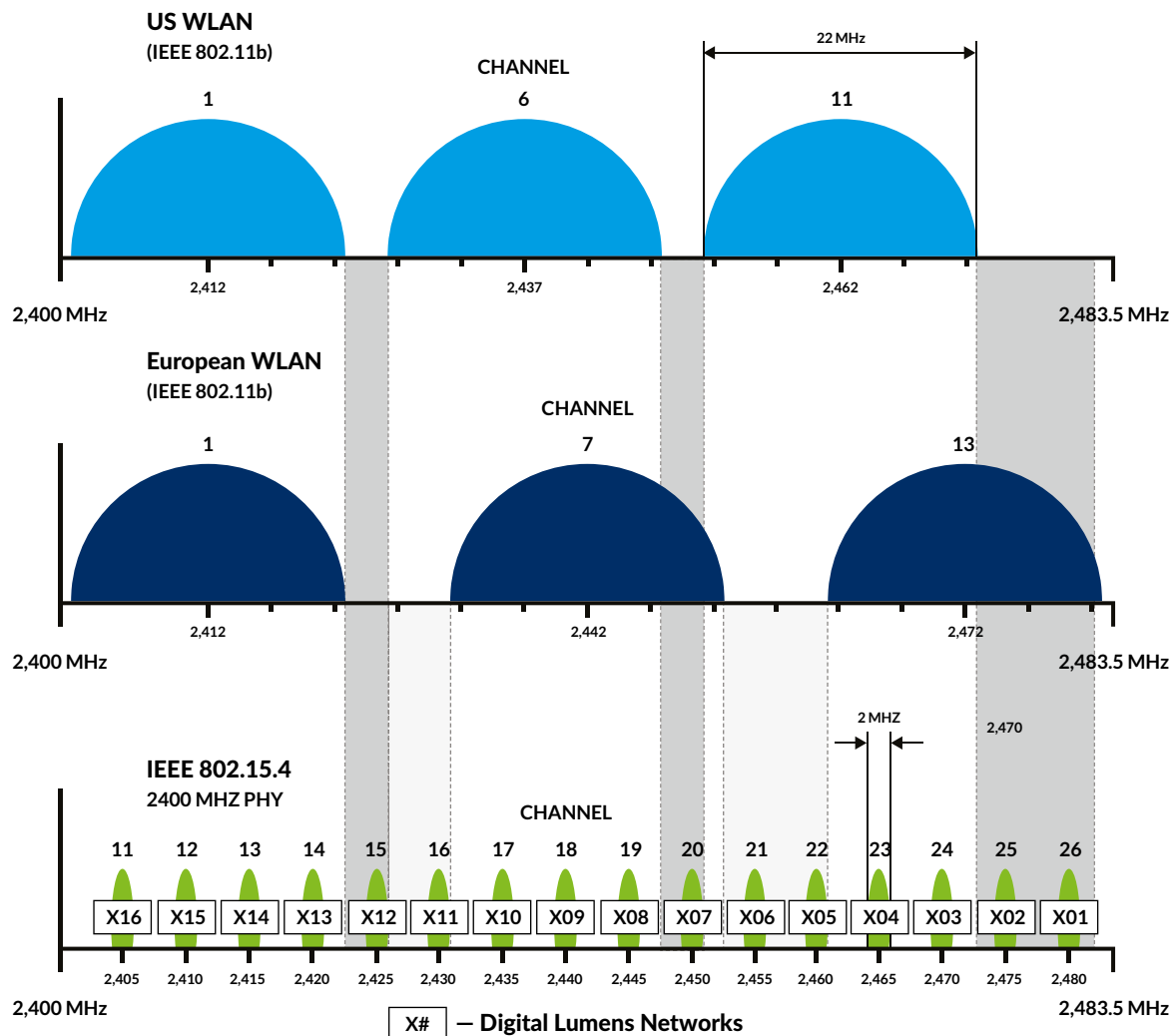


Q: Is the Lightelligence Mesh communication encrypted?

A: SiteWorx data and device communication is secured and protected using 128-bit AES (Advanced Encryption Standard) encryption. SiteWorx Wireless Network Gateway (DLGW3) features a hardware-based cryptographic chip and TLS encryption for communication with the cloud environment.

Q: Will the Lightelligence Mesh Network interact with other IEEE 802.15.4 based or WiFi 802.11b/g networks at a facility?

A: Digital Lumens SiteWorx Smart Devices output 1/100th to 1/200th of the power output by WiFi, on a far smaller frequency band, for a much shorter period of time. The image below identifies the relevant channel and frequency information for wireless deployments and identifies the Digital Lumens Lightelligence Mesh Network channel frequency details.



Q: How do SiteWorx devices mitigate the risk of interference with other devices that operate within the 2.4GHz band?

A: SiteWorx Smart Devices perform clear channel assessments (i.e. listen before they talk) before transmitting data to reduce the risk of interference when additional devices are operating within the 2.4 GHz band.

Q: On what channel or channels within the 2.4 GHz band do SiteWorx gateways communicate?

A: SiteWorx Wireless Network Gateways (DLGW3) are each assigned one channel and one Gateway manages up to 50 SiteWorx network nodes in a single mesh network.

Q: What is the power output of the SiteWorx Smart Devices, in milliwatts?

A: Power output for SiteWorx Smart Devices is 0 dBm, or 1 mW.

Q: Can the assigned channel be changed using software, or are channels hard-coded at the factory?

A: Yes, the channel can be changed through wireless configuration. This process can be performed in the field or remotely.

Network Reference Table

DL Network Number*	802.15.4 Channel	802.15.4 Channel Mask	Frequency
X1	26	4000000	2.405 GHz
X2	25	2000000	2.410 GHz
X3	24	1000000	2.415 GHz
X4	23	800000	2.420 GHz
X5	22	400000	2.425 GHz
X6	21	200000	2.430 GHz
X7	20	100000	2.435 GHz
X8	19	80000	2.440 GHz
X9	18	40000	2.445 GHz
X10	17	20000	2.450 GHz
X11	16	10000	2.455 GHz
X12	15	8000	2.460 GHz
X13	14	4000	2.465 GHz
X14	13	2000	2.470 GHz
X15	12	1000	2.475 GHz
X16	11	800	2.480 GHz
A (Commissioning)	20	100000	2.435 GHz

* Where 'X' is a letter A through H.



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