

Douglas Lighting Controls Bluetooth Wireless Controls Solutions

Douglas Lighting Controls® wireless devices feature industry-proven **Bluetooth®** Wireless communications technology that is highly immune to interferences. Bluetooth operates on the unlicensed 2.4 GHz ISM (Industrial, Scientific, and Medical) frequency band. There, it coexists with a variety of other RF technologies, including Wi-Fi, ZigBee and other commercial applications, such as car alarms and video devices.

BLE mesh uses three dedicated BLE “advertising” channels to communicate between devices in the network.

Some wireless communications can be challenging due to building size, construction materials, or other sources of wireless interference. In these projects, care must be given to deploy additional wireless nodes to ensure reliable lighting performance.

Barriers to Wireless Communications

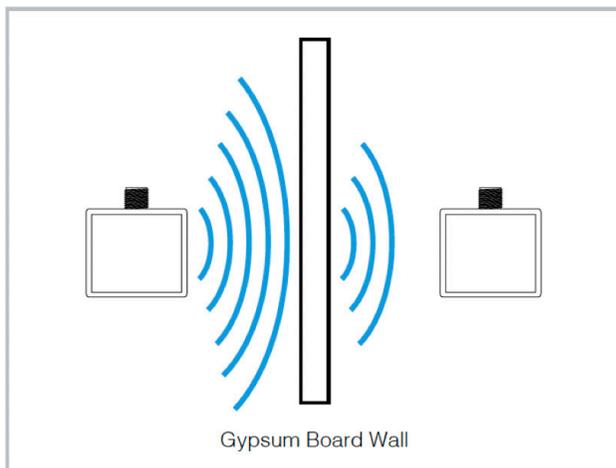
It is not uncommon to have Bluetooth devices communicate with each other up to 150 feet when there is a clear line of sight between devices. Clear line of sight should be thought of as a straight, unobstructed path between two devices (e.g. devices mounted to the back of a pole would not be considered clear line of sight if the pole is between the two devices).

Physical Obstructions

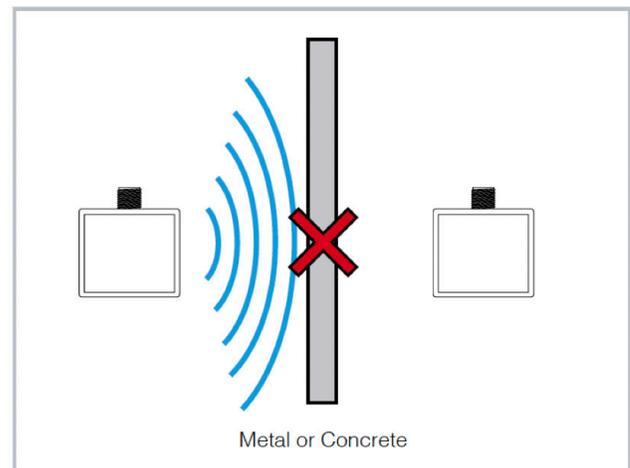
For communicating through standard walls (wood/drywall) distances of up to 50 feet may be achieved; however, distances and performance can vary and should be tested.

Installation of wireless devices in free air spaces that are surrounded by solid or laminated large wooden beams, metal fencing, steel roof trusses/beams, metal cladding, or similar materials is not recommended.

Wall Attenuation

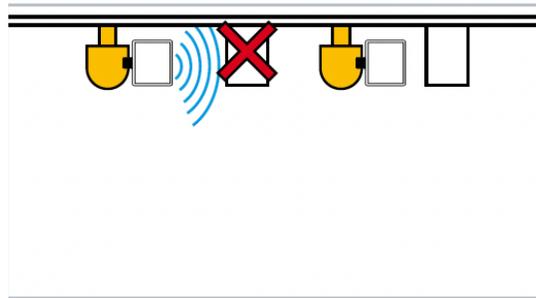


Metal or Concrete (Rebar)



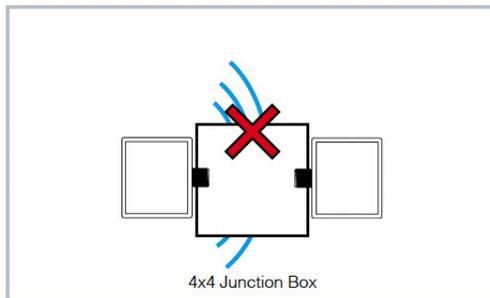
Application Note

Metal or Concrete Bulkheads

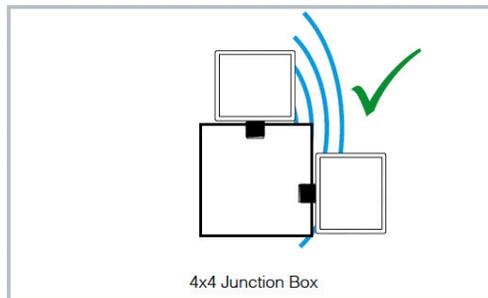


Junction Box / Fixture Mounting Placement

Wireless products are designed to be mounted on the exterior of the junction box or light fixture. When installing two together, they should be mounted perpendicular to each other so that the junction box or light fixture does not act as an obstruction.



4x4 Junction Box

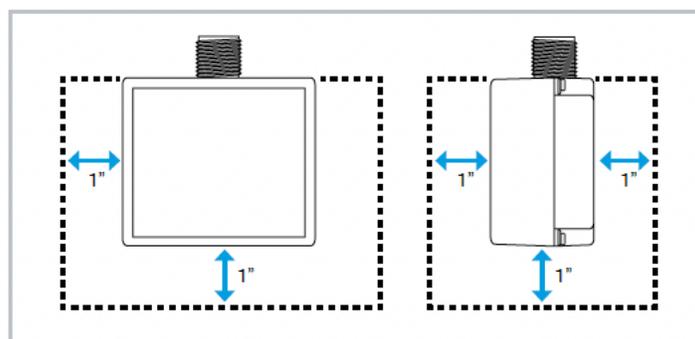


4x4 Junction Box

Radio Shadowing and Signal Warping

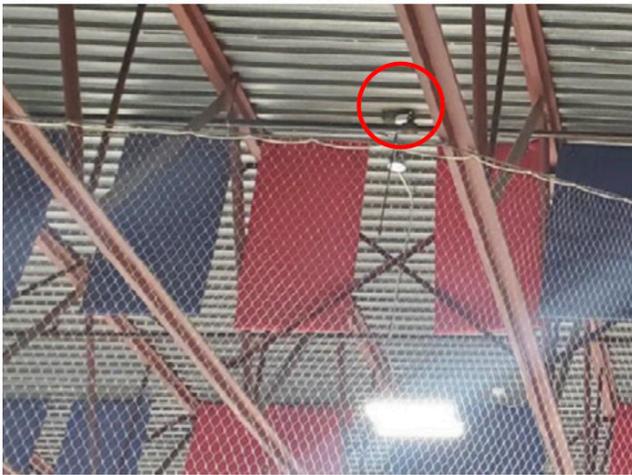
Reflections can cause what is described as radio shadowing. When a signal arrives by two paths, one is longer than the other and will take longer to arrive than the other, which can cause signals to **cancel** each other out. In addition, when the radio is installed close to a surface it can distort the transmission greatly reducing the range.

Because of these characteristics, **do not** install the devices against a ceiling or a wall. A minimum of 1" gap is recommended between the device and any other surface.



Application Note

Installation Examples

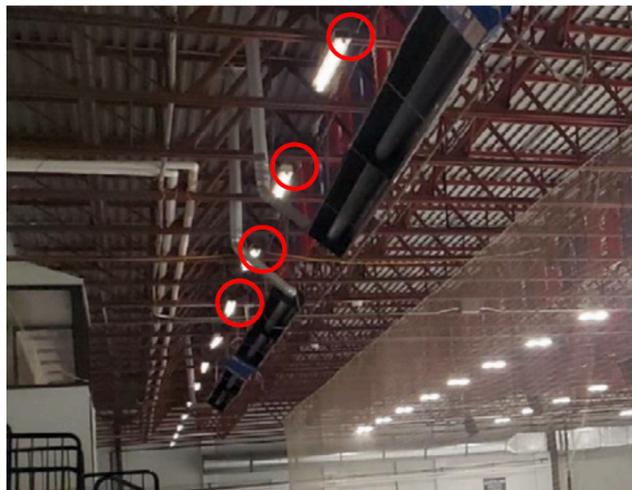


Aluminum Ceilings and Steel Truss Systems

Significant interference of wireless signal from metal clad ceiling and trusses will limit operability.



As shown here, installing against the ceiling will cause a reduction of signals and being within the truss system the signals will get further blocked.



Wireless devices must be installed at or below the horizontal plane of the bottom of the trusses.

These fixtures are below the horizontal plane of the bottom of the trusses. Installation of Bluetooth devices at the fixture or lower level is recommended.

The signal strength could still be compromised because of all the metal causing signal reductions. So test operability is essential to a successful deployment.

Additional wireless nodes to act as repeaters may be required.

The majority of office applications will not encounter these types of interference patterns. Should you have questions about your specific installation, we are happy to review your project details to determine the best solution for you and your customer.

Send an email to customerservice@douglaslightingcontrols.com with your sequence of operations and reflected ceiling plan. If this is an existing order please have your PO or Project number available.



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