

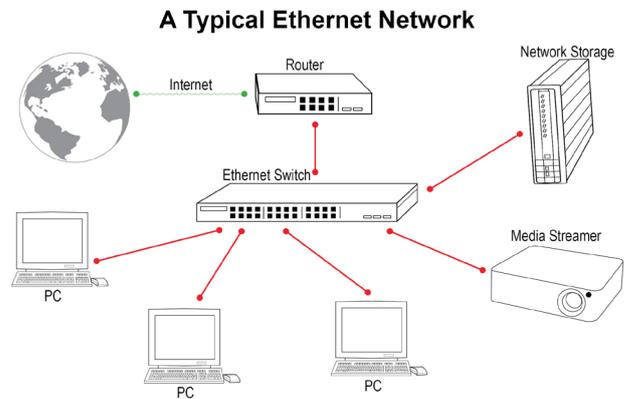
Application Notes



Selecting the most appropriate ethernet medium

There are several different ways of transmitting data over an Ethernet network and each has their own advantages and disadvantages. This application note explains the main methods available and when they should be used. The main categories that help determine which should be used are:

- Is it possible to run a cable?
- What length of cable is needed?
- How much data will be transmitted?
- For point to point transmission, is a line of sight available?



1) Copper Cable

The most common choice. Data is transmitted from point A to point B using standard network cable (Category x). The most typical is Cat5 cable that uses a data(+) and data(-) core for both the transmit and receive lines. All networks are star networks and require an Ethernet switch.

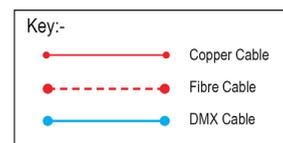
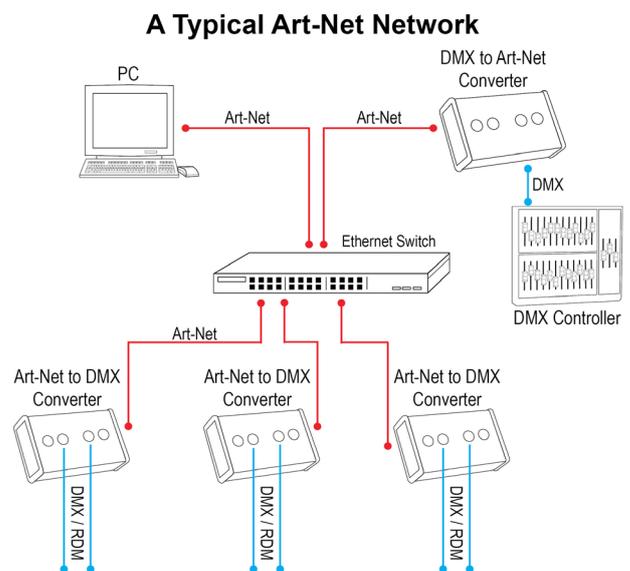
Main Use It is recommended that copper cable is used for all connections unless deemed unsuitable.

Advantages

- Low cost
- Easy to install
- Different cables available (Cat 5 / 6) for different speeds
- PoE (Power over Ethernet)
- Commonplace in all new installations
- Familiarity for electrical contractors

Disadvantages

- Limited cable lengths
- Can be affected by noise



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2) Fibre Cable

Light is used to transport data over a fibre optic cable that can run for kilometres with no degradation in the signal. Unfortunately there are several standards and, as a result, a user will have to decide on the type of fibre, and which cable and connectors to use. This medium is still for point to point use.

Main Use Network Backbones

Advantages

- Distances can reach in excess of 40km
- Noise free
- Very reliable

Disadvantages

- Expensive cable
- Requires specialist installation equipment
- Additional equipment required
- Several versions available

3) Wi-Fi

Recent advances have resulted in wi-fi becoming more reliable and with a greater range. However, external factors can still affect the performance of a wireless system and this must be taken into consideration during the design phase. Standard Wi-Fi systems should only be used when a cable is not suitable.

Main Use To transport a small amount of data from point A to point B when a cable is not suitable.

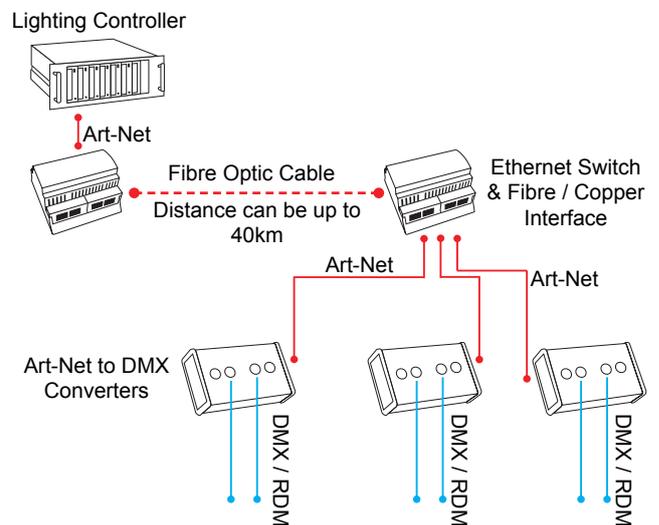
Advantages

- Large variety of equipment to choose from
- Good systems are reasonably priced
- Can overcome barriers that restrict cables
- Multipoint transmission

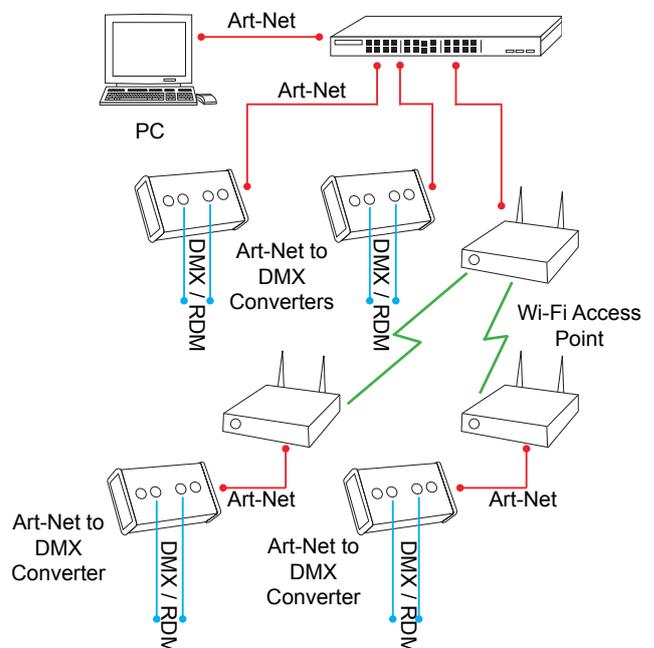
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Selecting the most appropriate ethernet medium

An example of a fibre backbone



An example of a wi-fi network



Disadvantages

- Not 100% reliable due to external factors
- Increases the cost of an installation



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4) Wireless Bridges

When transporting data from two different locations it is often not possible to use a cable. An example of this would be between two buildings that are to be controlled from the same controller. Wireless bridges can be used in such an instance as they have been designed specifically for point-to-point communications.

Main Use Point-to-Point Wireless Bridge

Advantages

- Quick to set up
- A good solution when cables cannot be used
- Different solutions available (Wi-Fi & Laser)

Disadvantages

- Line-of-sight dependent so can be affected by obstacles
- Can be expensive

5) Internet

With the use of VPNs (Virtual Private Networks) and the internet it is possible to link multiple sites together and send lighting data between these locations. This method is usually used to send triggering data. However, it also becomes possible to remotely program and monitor installations.

Main Use Remote Triggering for corporate clients

Advantages

- No transmission medium cost
- Locations can be anywhere in the world

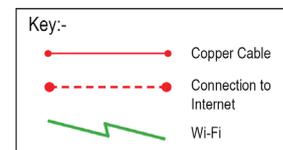
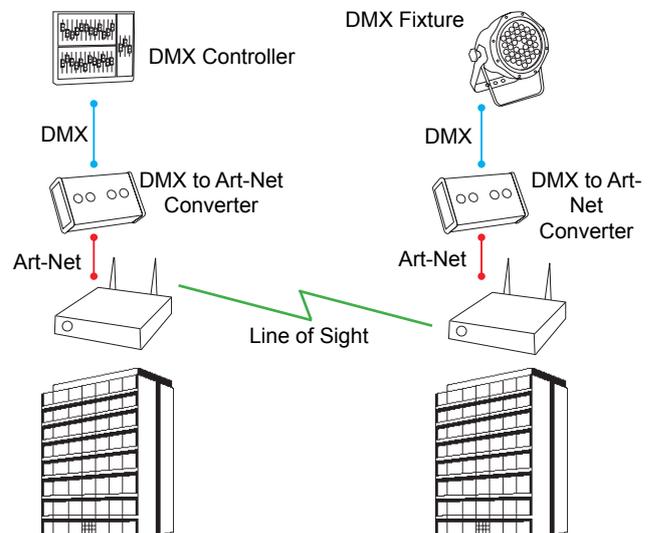
Disadvantages

- Very limited bandwidth
- Prone to lost network due to internet traffic
- Ongoing maintenance required

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Selecting the most appropriate ethernet medium

An example of a wireless bridge



An example of internet transmission

