Connection Description	Ethernet Cable	Ethernet Cable with Extender	Laptop Connection	Fiber Optic Cable
Maximum Distance	330 feet	1000 feet	20 feet	4,000 feet
Connection Description	Cat5/6e Ethernet cable connects the sign to a PC	Cat5/6e Ethernet cable connects the sign to a PC and uses an Ethernet Extender to increase cable length	Cat5 Ethernet cable connects the sign to a Laptop PC	Fiber optic cable connects the sign to a PC
Required Device	None	Ethernet Extender	Weatherproof box included with sign	Media converter(s)
Cable Type	Outdoor Cat5/6e provided by customer	Outdoor Cat5/6e provided by customer	Cat5 cable included with sign	Fiber optic
Summary	Message file is transmitted from a PC to the sign through an underground CAT5/6e cable with a maximum cable length of 330 feet.	Message file is transmitted from a PC to the sign through an underground CAT5/6e cable with a maximum cable length of 1000 feet.	User connects a Windows laptop to a 20' Cat5 cable stored in a weatherproof box at the base of the sign	Message file is transmitted from a PC to the sign through an underground fiber optic cable with a maximum cable length of 4,000 feet.
Additional Cost	No	Yes	No	Yes
Signal Type	Ethernet	Ethernet	Ethernet	Optical

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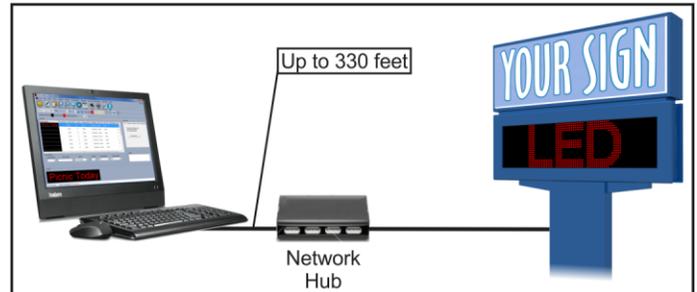
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Ethernet Cable

Connection Description: The controlling PC communicates to the sign with an Ethernet signal through a Cat5/6e cable, up to 330 feet, that is connected to the sign and the PC.

The connection between the PC and the LED sign uses IP, Internet Protocol, addresses and **the PC and the sign must have the same IP address.**

Allows access to the sign by other PCs on the network when connecting to a customer supplied network hub of a local area network.

The LED software cannot reside on a network server. Every PC that controls the sign requires installation of the LED software.

Through the use of remote access services, such as VPN or **GoTo**MyPC, the sign can be programmed from any PC, anywhere, with installed LED software and access to the Internet.

Distance:
- Maximum cable length of 330 feet.

Advantages:
- No additional cost and no extra devices required.

Disadvantages:
- Maximum cable length is 330 feet. Refer to the Ethernet Extender solution when cable length exceeds 330 feet.

Cost Consideration:
- Costs associated with trenching for data cable needs to be considered, especially if running cable across a paved parking lot.

Requires:
- Outdoor Cat5/6e Cable: Such as Belden 7919A or Belden 1594A.
- Separation of electrical and Ethernet cables by a minimum distance of 12 inches.

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Ethernet Extender Cable

Connection Description: The controlling PC communicates to the sign with an Ethernet signal through a Cat5/6e cable that is connected to the sign and the PC. The connection between the PC and the LED sign uses IP, Internet Protocol, addresses and the PC and the sign controller must have the same IP address. An Ethernet Extender allows the Ethernet signal to travel beyond the normal 330 feet limitation and allows up to 1000 feet of cable.

A pair of Ethernet Extenders is required with one factory installed inside the sign and the other installed on the network or next to the PC.

The connection between the PC and the LED sign uses IP, Internet Protocol, addresses and **the PC and the sign must have the same IP address.**

Allows access to the sign by other PCs on the network when connecting to a customer supplied network hub of a local area network.

The LED software cannot reside on a network server.
Every PC that controls the sign requires installation of the LED software.

Through the use of remote access services, such as VPN or **GoTo**MyPC, the sign can be programmed from any PC, anywhere, with installed LED software and access to the Internet.

Distance:
- Maximum cable length of 1000 feet.

Advantages:
- Increases distance between sign and building.

Cost Consideration:
- Costs associated with trenching for data cable may be high, especially if running cable across a paved parking lot.

Disadvantages:
- Additional devices are required.

Requires:
- Outdoor Grade Cat5/6e Cable: Such as Belden 7919A or Belden 1594A.

- Separation of electrical and Ethernet cables by a minimum distance of 12 inches.
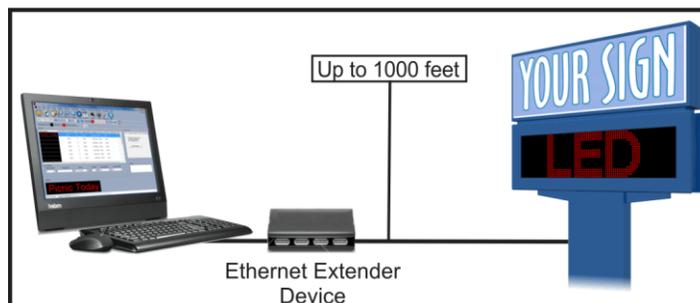
Laptop Connection

Connection Description: The controlling laptop PC communicates to the sign with an Ethernet signal through a 20 foot Cat5 cable connected to the sign.

The connection between the PC and the LED sign uses IP, Internet Protocol, addresses and **the PC and the sign must have the same IP address.**

The laptop requires installation of the LED software.

A 20' Cat5 cable is stored in a factory installed weatherproof box at the base of the sign. User connects the Cat5 cable to a Windows laptop to transmit messages. Laptop PC is not included.
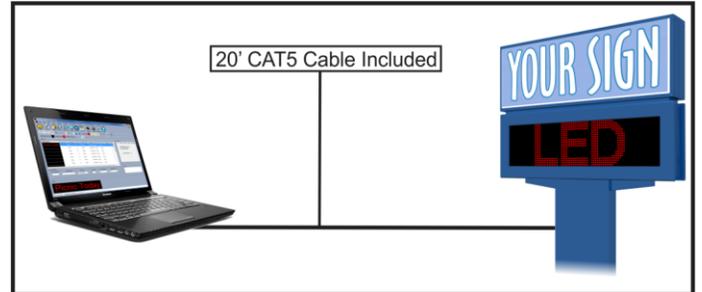
Communication method can be changed at a later date.

Distance:
- Includes 20' of Cat5 cable.

Advantages
- No trenching.
- Use of software scheduling reduces the number of trips to sign.

Disadvantages
- Requires connecting the laptop each time a new schedule is created.
- Customer provides laptop.
- Requires user to be at the sign for downloading messages.

Cost Consideration:
- Most affordable connection option with some inconvenience for the user.

Fiber Optic Cable

Connection Description: The controlling PC communicates to the sign with an optical signal through a fiber optic cable, up to 4,000 feet, connected to the sign and the PC. A Media Converter is required to convert the optical signal to an electrical signal.

Existing fiber optic networks typically have manufacturer specific devices and to insure equipment compatibility the customer is responsible for providing and installing their Media Converter inside the sign.

The connection between the PC and the LED sign uses IP, Internet Protocol, addresses and **the PC and the sign must have the same IP address.**
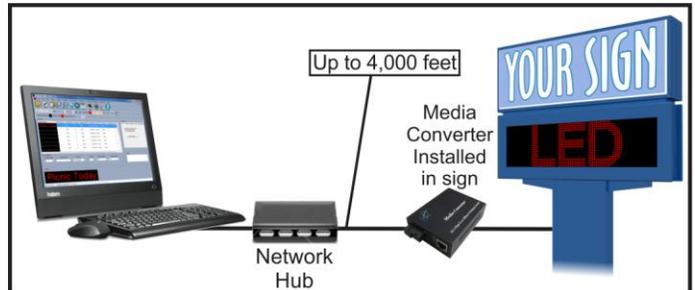
Allows access to the sign by other PCs on the network when connecting to a customer supplied network hub of a local area network.

The LED software cannot reside on a network server. Every PC that controls the sign requires installation of the LED software.

Distance:
- Maximum cable length of 4,000 feet.

Advantages:
- Eliminates electrical surges through data cable, such as lightning strikes.
- Fiber Optic cable can be run in the same trench as electrical wires.
- Longer cable lengths when compared to other communication solutions.
- Faster data rates; up to ten times faster than Cat5/6.

Disadvantages:
- Requires installation of media converter(s).
- Requires specialty installer of fiber optic cables.
- An electrician is required to make the electrical connection of the media converter to a terminal block inside the sign.

Cost Consideration:
- Costs associated with trenching for data cable may be high, especially if running cable across a paved parking lot.
- Cost associated with the purchase of fiber optic cable should be assessed through a local vendor.
- Contact a local fiber optic cable installation specialist for pricing.

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