

Stewart Signs Daystar Communication Methods, Wireless Solutions

Will sign be tied into existing network?	Yes (sign will be wirelessly connected to existing Network)		No (Sign will be wirelessly connected to a singular PC)
Connection Description	Wireless Network Bridge.	Customer Provided Wireless Network Connect	Wireless RF Modem
Signal Distance	Up to 3,500'	Varies by strength of signal.	Up to 3,500'
Excluded Models	None	None	None
Detailed Description, Requirements & Comments	PC sends message through customers existing network to Stewart provided Network Bridge, which wirelessly transmits message to sign via Radio Frequency. Requires installation of a provided network device, onto customers pre-existing wired network. See Comment 1 and 2 below	Customer uses their existing wireless network and is responsible for installing an access point inside sign. The sign has an available internal electrical outlet. Stewart Signs does not support troubleshooting of customer provided hardware.	Radio Frequency (RF) Modem next to PC communicates with RF modem inside sign. See Comment 1 and 2 below.
Added Cost	\$1,800	None	\$1,500

Comment 1: Under certain conditions signal can exceed 3500'. Obstructions between computer/antenna decrease the distance/dependability of wireless signal.

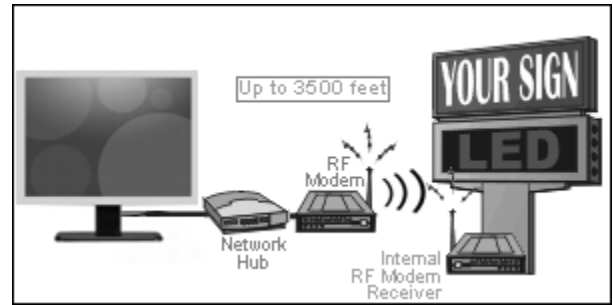
Comment 2: RF utilizes unlicensed public channels which can have numerous causes of interference. If interference occurs, more powerful (higher gain) antennas may be needed. Antennas are not guaranteed to solve interference problems. The customer is responsible for the cost and installation of antennas.

Wireless Network Bridge

Connection Description: PC sends message through customers existing network. Stewart provides Network Bridge, which wirelessly transmits message to sign via Radio Frequency. Requires installation of a provided network device onto customers pre-existing wired network.

Distance: Up to 3,500 feet. Signal has proven to transmit up to several miles under ideal conditions.

NOTE: RF utilizes unlicensed public channels which can have numerous causes of interference. If interference occurs, more powerful (higher gain) antennas may be needed. Antennas are not guaranteed to solve interference problems. The customer is responsible for the cost and installation of antennas.



Advantages

- Wireless, no trenching for cables.
- Highly reliable and cost effective.
- Network device is included by Stewart Signs.
- Capable of 128-bit WEP-Plus encryption
 - Just as 802.11b describes wireless communications, WEP (Wired Equivalent Privacy) currently describes wireless security. Today, WEP comes in 64-bit and more secure 128-bit.

Disadvantages

- Limit to distance.
- Direct line-of-sight provides a higher potential for stable connectivity. At closer range (200'-400'), this high powered RF Modem has proven to work without a direct line of site; connectivity is not guaranteed without direct line of site.
- Direct line-of-sight between antenna may be required

Cost Consideration: Excellent option when the cost for trenching exceeds cost of communication equipment.

Security Notes:

- RF Modems do not broadcast a SSID, therefore are invisible to other wireless users.
- Units are a match set and use MAC authentication, therefore they only talk to each other eliminating intrusion attempts.

Customer-Provided Wireless Network Connect

Connection Description: Customer uses their existing wireless network and is responsible for installing an access point inside sign. The sign has an available internal electrical outlet. Stewart Signs does not support troubleshooting of customer provided hardware.

Distance: Dependent on equipment the customer provides. Usually requires direct line of site between RF transmitters.

Advantages

- Wireless, no trenching for cables.

Disadvantages

- Limit to distance.
- Direct line-of-sight between antennas may be required.
- Customer is responsible for provision of wireless signal and receiver/access point. Stewart will provide electrical outlet inside the LED cabinet.
- Stewart Signs does not support troubleshooting of customer provided hardware.



Cost Consideration: Customer provided equipment adds no additional cost to sign. Should troubleshooting of customer provided communication system be required, the customer is responsible for costs.

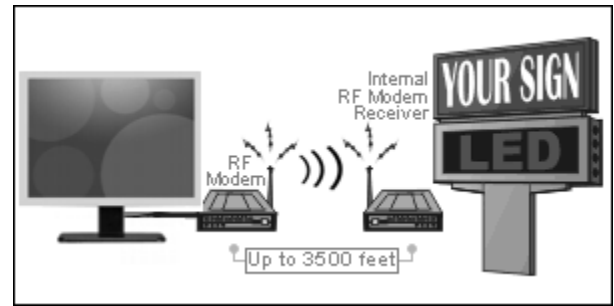
Wireless RF Modem

Connection Description: Radio Frequency (RF) Modem next to PC communicates with RF Modem inside sign.

Additional Information:

- Connection at PC is via Serial/DB9 Connection. If no Serial/DB9 port is available, adaptors are required.
- 900 MHz
- Baud rate 115,200

Distance: Up to 3,500 feet. Under certain conditions signal can exceed 3500'. Obstructions between computer/antenna decrease the distance/dependability of wireless signal.



NOTE: RF utilizes unlicensed public channels which can have numerous causes of interference. If interference occurs, more powerful (higher gain) antennas may be needed. Antennas are not guaranteed to solve interference problems. The customer is responsible for the cost and installation of antennas.

Advantages

- Wireless, no trenching for cables.
- Highly reliable and cost effective.
- Network device is included by Stewart Signs.
- Capable of 128-bit WEP-Plus encryption
 - Just as 802.11b describes wireless communications, WEP (Wired Equivalent Privacy) currently describes wireless security. Today, WEP comes in 64-bit and more secure 128-bit.

Disadvantages

- Limit to distance.
- Direct line-of-sight provides a higher potential for stable connectivity. At closer range (200'-400'), this high powered RF Modem has proven to work without a direct line of site; connectivity is not guaranteed without direct line of site.
- Only the computer with the modem installed can control the sign.

Cost Consideration: Excellent option when the cost for trenching exceeds cost of communication equipment.

Security Notes:

- RF Modems do not broadcast a SSID, therefore are invisible to other wireless users.
- Units are a match set and use MAC authentication, therefore they only talk to each other eliminating intrusion attempts.