



## Wireless on the Shop Floor



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### Overview

As any IT person will tell you, Wireless Networking is one of the hottest areas of growth in the technology market. After years of having to deal with literally miles of copper or fiber optic cables, companies are more and more embracing the flexibility and the cost savings of wireless networking. But all too often, the shop floor of many manufactures is often the last hold out against new technology, regardless of the possible benefits. While often very resistant to change, there are few areas of any enterprise that can see more benefits from embracing wireless technology the shop floor.



### Advantages

Wireless networking provides a number of benefits to any aspect of an enterprise:

**Cost savings** – With copper's price skyrocketing, the money saved on cable is often enough by itself to justify a wireless system.

**Flexibility** – In the world of wired networking, the location of the equipment was often dictated by the availability of a wired Ethernet connection. Wireless networking provides a much highest level of flexibility in where equipment is placed.

**Portability** – In a wireless world, equipment is no longer tied to a specific location. Portable items such as a notebook computer can be moved constantly while larger items such as a desktop PC or even a network based CNC can be moved as needed and reconnected to the network with little or no extra effort.

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On an average shop floor, all of these advantages are amplified. As difficult as running wire for a wired network can be in an office environment, it is nothing compared to the potential nightmare of running cable in most shop environments. Often issues such as over head cranes and extremely long distances between equipment simply make a wired network impractical on the shop floor. As more and more manufactures go to a cellular structure on their shop floors, machine moves become a much more regular event. One fortunefortunempnay that SFA wored with estimated that each time they move a machine, they lost over \$2500 in machine time due to the time it took to reconnect the CNC to there wired network. Once they implemented a wireless network, as soon as power was restored to the CNC, it would automatically reconnect to the network.

### ***Issues***

**Reliability** – On the shop floor, data reliability of 99.99% is not good enough. When you are loading data to a CNC, it must be 100% accurate. Because they are based on the Ethernet protocol, wireless netowrks are inherently error correcting. Any “packets” of data that are lost or corrupted are automatically resent. In may ways, wireless networks are even more reliable then traditional wired shop floor networks.

**Interference** – Shop floors are very “noisy” places, espencially in the electrical realm. Even when items suck as arc eleders, cranes, EDMs and plama cutters are present, the 2.4ghz bandwidth that 802.11x networks use is not affected. Even in situations where multiple 2.4ghz networks will be in use, there are 11 differnet channels avaiable for use that virtual guarantee a clear signal.

### ***Recommendations***

Use industry standard hardware (802.11b, 802.11g or 802.11n).

Avoid proprietary or CNC specific hardware

Older “RF” based wireless is not nearly as reliable or flexible

When in doubt, install more wireless overage, reather then less.

Extra Access Points (the receiving units) will minimize “dead spots”

Wireless is a “line of sight” signal. Mount equipment accordingly.

All antennas should be mounted vertically and as high as possible

Take into consideration any movable items (i.e. cranes, CNC axis)

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### **Summary**

For more information visit our web site at [www.shopfloorautomations.com](http://www.shopfloorautomations.com) or call us at (619)461-4000.