

Wireless or Hard Wired.

When we were designing the iVAC Pro System it soon became obvious that it would consist of a series of modules that had to be interconnected by some means. We had experience with systems outside the woodworking environment that were hard wired together and also systems that used some means of wireless communications, such as Radio Frequency or X 10.

In order to get guidance on the subject we contacted several woodworking hobbyists for advice. They were not adverse to the hardwired approach; however they realized that once a system was wired it would be hard to move mobile tools around the workshop. They were also concerned with the time consuming task of installing a number of wires and cables so that they would be neat and tidy and not a tripping hazard in the workshop. In many workshops where space is a premium the power tools are mounted on mobile carts and as a result are moved into position when they are required. This would be a problem with a hard wired system. In the end their recommendation was that if we could design a system based on the Remote Radio Frequency keys commonly used to control a dust collector that would be the best approach.

In reviewing the hard wired approach in more detail we realized that the connection system needed to be ruggedized in order to overcome the inherent vibrations related to the power tools and the dust collector. The connections also needed to be well sealed in order to keep out the very fine dust that is inherent in a woodworking environment. To meet these requirements would be expensive. Even then connectors are one of the major failure modes in electronic systems. An inexpensive solution, such as standard telephone cables, did not appear to meet these requirements. A further complication was that if we were trying to provide the customer with a turnkey solution, there was a problem related to identifying the lengths of cable to be provided. This would require the distribution channel to inventory a series of cables of varying length that were either too long or too short. The most likely outcome would be that the end customer would decide to make his own cables to save cost.

We now had to decide between Radio Frequency or other wireless methods. This would be a function of the layout of a workshop and the range to be covered. Since in many cases dust collectors are in a separate sealed environment we decided to use Digital Radio Frequency communications operating at 434Mhz. The iVAC Pro System is rated at having a range of forty feet, which we decided was adequate for most workshops. In reality the radio transmitters have been tested at ranges in excess of one hundred feet, this enables communications through non shielded walls to dust collectors.

The digital radio approach can be slightly more expensive to implement; however has proven to enable a flexible system where power tools and dust collectors can be situated anywhere in the workshop to meet the user's needs. It is a quick method of system installation and avoids the problem of installing long lengths of cable, permanently located between machines. It also results in a power tool to be complete with its transmitter and therefore mobile if required.