

## Do Addressable Transducers Improve Your Air Pressure System?

Addressable transducers have been touted by equipment vendors over the years as a means of improving a cable pressurization system by reducing the costs associated with monitoring the system. Initially, at least, part of this statement sounds credible. With the ability to monitor multiple addressable pressure transducers using a single pair, it is possible to “free up” dedicated transducer pairs for subscriber use. The result: more potential revenue.

The information below provides an argument for a much more cost-effective improvement in system monitoring—one that also dramatically improves cable pressure protection, leak locating, system monitoring, and overall cost efficiency.

### Cable Pressurization System Goals

There are four goals that must be considered during the process of improving a cable pressurization system:

- *Maximize Cable Protection.* The number one goal is to prevent cable failures by improving overall cable pressure protection throughout the air pressure system.
- *Improve Monitoring.* Accurate, accessible and reliable monitoring system information is an absolutely critical component of a successful cable pressurization system. As described below, the type of information provided (transducer output) is essential.
- *Facilitate Leak Locating.* A well-designed and properly monitored air pressure system improves a technician’s ability to leak locate by: 1) reducing the area of search for a leak, and 2) providing the information needed to prioritize leak locating tasks.
- *Achieve Cost Efficiency.* If the first three goals are accomplished, ongoing cost savings will result from fewer cable failures (code 4 reductions), reduced troubleshooting on monitoring devices, labor hour reductions, etc.

### Background

As stated above, a possible advantage of installing addressable pressure transducers on a route is the reduction of monitoring pairs. This means that in a typical manhole location, it may be possible to reduce the number of pairs required for transducers from as many as ten to one. The installation of addressable transducers makes it possible to “buy back” the reclaimed pairs to use for subscriber service.

However, it must be realized that the installation of addressable transducers has absolutely no impact on the top three goals of a cable pressurization system stated above. For example, in one downtown office in a large telephone operating company, there are 84 pressure transducers

monitoring underground cables and air pipe. Of this total, 62 devices are either below standard (6.0 psi) or not reading. Fifteen of the devices are reading NONE, and all of these 15 are addressable transducers. With the replacement of resistive transducers with addressable devices in an office such as this, monitoring pairs can be reclaimed, BUT THERE STILL WILL BE 62 DEVICES IN ALARM.

Addressable transducers are much more difficult to install (programming and data entry requirements are more involved), and they are harder to troubleshoot. MOST IMPORTANTLY, ADDRESSABLE TRANSDUCERS PROVIDE ABSOLUTELY NO INCREASE IN CABLE PRESSURE PROTECTION, AND NO MONITORING OR LEAK LOCATING IMPROVEMENTS. THE INSTALLATION OF ADDRESSABLE TRANSDUCERS WILL NOT PREVENT ONE CABLE FAILURE.

### **A Better Alternative to Addressable Transducers**

Even though System Studies manufactures high resolution addressable transducers, we do not actively market and recommend them. We believe there is a much better way to upgrade a cable pressurization system—one that achieves all four of the goals mentioned above, and one that has been embraced by most of the major U.S. Operating Companies.

What we are referring to is an engineering design that replaces existing pressure transducer housings with an air pipe manifold and a single flow transducer. Like the addressable transducer installations, this design also frees up monitoring pairs by reducing the device pair requirement at pressure transducer manholes to one pair. But that is where the similarity ends. The most noteworthy design feature of the monitored manifold alternative is the reduction of air pipe manifold spacing from 6,000 feet to 3,000 feet (see illustration on page 4). There are four distinct advantages of the 3,000 foot manifold spacing design:

- *Improved Cable Protection.* With twice the number of air sources on a route, cable pressure protection improves dramatically. There are fewer cable failures, resulting in improved service and reduced costs.
- *Built-in Buffering.* The closer air pipe manifold spacing provides excellent built-in buffering during splicing activities without having to place supplemental air sources. This equates to reduced buffering costs.
- *Improved Monitoring.* One of the advantages of closer air pipe manifold spacing is that it reduces the number of monitoring devices required on a route. For example, there might only five transducers on a route, rather than 25 or 30. With fewer monitoring devices installed in the field, there are less transducer troubleshooting and data upkeep problems to resolve.

Most importantly, the closer manifold spacing design and flow transducer monitoring helps to identify air pressure leaks by flow increase rather than pressure drop. It is never a good idea to have to wait for cable pressure to drop to an unsafe level before a transducer indicates that something is wrong. It is better to monitor for leaks by air flow increases.

- *Improved Leak Locating.* The design's closer air pipe manifold spacing results in shorter pneumatic sections, which reduce the area of search when leak locating. As shown in the illustration at the end of this document, the area of search around an air pipe manifold is reduced the half.

Another benefit of the 3,000 foot manifold spacing design is that it relies on air flow information for prioritizing leaks and chasing the highest flowing cables. Locating and repairing the highest flowing cables first will have the greatest impact on improving cable pressures throughout the system.

*What are the costs associated with installing addressable transducers vs. reducing air pipe manifold spacing?* Basically, equipment costs are approximately the same for eight addressable pressure transducers or one air pipe manifold with a single flow transducer. For both installations, the labor costs are also approximately the same. But maintenance on one flow transducer will be considerably less than the maintenance on multiple addressable transducers.

### **Conclusion**

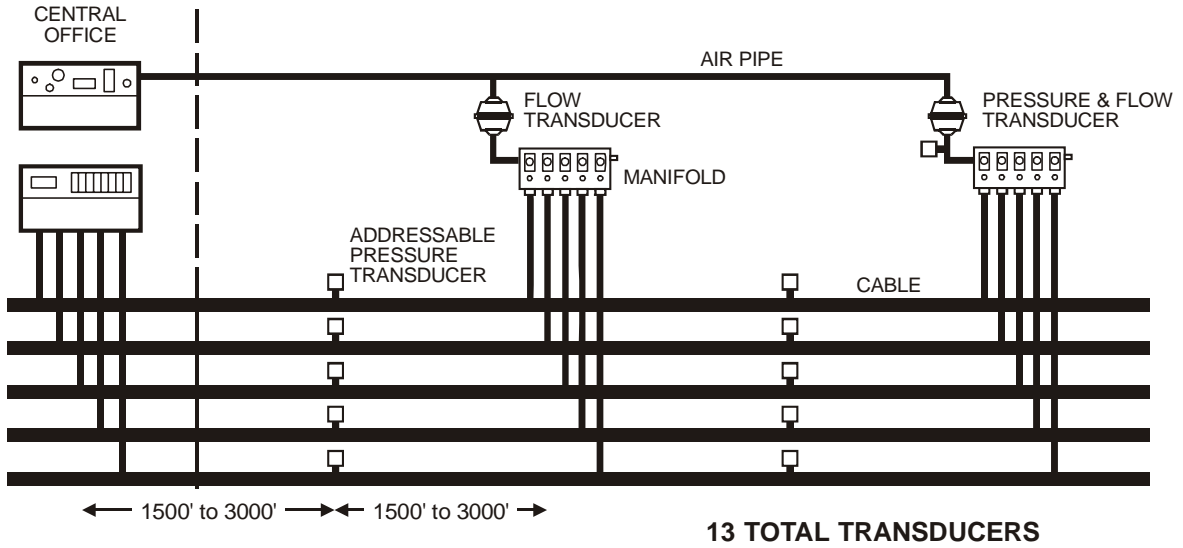
Addressable transducers have been around for over 25 years. They are used primarily in other countries that do not have air pipe (single feed systems) and, thus, cannot take advantage of the benefits of the 3,000 foot manifold spacing design. In an air pressure system where air pipe is being used—particularly in a large city—the benefits and pressurization system improvements made possible by upgrading to a 3,000 foot spacing design far outweigh the singular benefit of replacing resistive pressure transducers with an equal number of addressable pressure transducers.

In the 6,000 foot manifold spacing designs, an opportunity exists now to utilize modern technology and a proven design modification to achieve immediate and significant improvements to the air pressure system. With costs similar for both options and each providing the immediate return of pair savings, it simply makes more sense to consider a design modification that actually improves cable pressure protection, monitoring and leak locating.

*Additional information about the 3,000 foot manifold spacing design can be obtained from the System Studies website: [www.airtalk.com/reference.html](http://www.airtalk.com/reference.html).*

# Cable Pressure Design Options

## 6,000' Manifold Spacing



## 3,000' Manifold Spacing

