Data Collection Goes Integrated Wireless

About 30 years ago, the concept of data collection for process control took a major leap forward. This was about the time that a combination of electronic technology and economics allowed gauging to become digital. With a digital signal available, it became possible to transfer information via cable directly from a gauge or digital indicator to the data collector. This made it much more practical to make process control decisions based on statistical analysis.

Electronic data collection also occasioned a major improvement in data quality. Prior to this leap, data was either hand written onto a sheet of paper and then logged into a computer, or it logged into the computer directly at the point of gauging. You can easily understand how an operator, sitting at a bench measuring hundreds of parts, could transpose numbers, skip digits or just enter wrong numbers. These problems virtually eliminated by having data go directly to the data analysis software. When electronic data collection strategies first implemented, it was normal to see collection efficiency and error reduction increase by 10-fold over manual collection methods.

These days, checking parts at a gauging station with a hand tool or a dedicated fixture gauge connected to a computer via a cable for data collection is the norm. Today's hand tools and digital indicators have data output built in and collecting data is easy and very cost effective. It is also inexpensive, fast and reliable providing a great solution for many process or quality control applications.

However, what happens when the part is unreachable to the bench? Maybe it is still in the machine or it is simply just too large to bring to the gauging station. Running a long cable from the gauge to the computer can be a hazard and if multiple dimensions needs checking with different gauging, a collection of long cables can quickly become a snarled mess.

Technology is ready to take another leap. Just as cell phones and wireless computer peripherals have become common, wireless technology is moving out onto the shop

floor. Small transmitters now built into digital indicators that allow them to transmit data to the gauging computer. Each integrated transmitter in the digital indicator uses slightly different signal coding that allows many gauging stations to communicate to a single computer simultaneously. Today these transmitters are not expensive than data cable, making the cost more justifiable when cabling alone will not get the job done.

Therefore, Very large parts are measurable with the transmitters where they sit or the parts are measurable in the machine tool without the cables caught in the tooling. In addition, many digital indicators provide feedback by generating a signal to the operator that the transmission received and acknowledged by the computer. This is virtually instantaneous so as not to slow the operator down and most transmitters can be configured to provide a go or no-go signal to the user depending on whether the part is within tolerance.

Another application might be for multiple digital indicators used on one gauging fixture. Usually each digital indicator would have its own cable and since there are so many, some type of interface box would be required to handle multiplexing the signals to the computer. With the integration of the transmitter, both the cabling and the multiplexers eliminate. Not to mention a cleaner looking gauging station. In addition, the PC running the data collection software triggered by the operator to gather the data from the multiple digital indicators.

Eliminating cables is great, but probably the best application for this technology is right at the machine tool. Transmitted wireless into the machine tool's controller, the data is usable as part of the calculation for offsetting. Thus, as the operator measures the parts, the data is use to assign the proper offsets, greatly improving the quality and throughput of the machine tool. Out-of-spec parts virtually eliminated and the ability of the machine to make parts to the desired dimensions greatly improved.

At the same time, the data can be stored for long-term archiving, recording when the part measured and by whom. It is usable for tracking and improving operator throughput.

Today the triangle is becoming complete, with a combination of digital gauging for accurate shop floor measurement, unrestricted wireless transmission of reliable data, and statistics for process control. These three tools allow for truly effective use of measurement data.

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