

## The TDAQ Tire Data Acquisition system features simplified wiring, combined with data acquisition located closer to the source, produces stronger and cleaner signals to bring about a substantial increase in resolution.



**Durability:** Durability is a hallmark of the TDAQ design. Over 500 units currently provide full-time service on machines around the world.



**Small Size:** TDAQ's small size makes it possible to mount TDAQ anywhere on the TUO. Positioning TDAQ close to sensors means less cabling and electrical interference, which equates to higher resolution and more accurate repeatability.



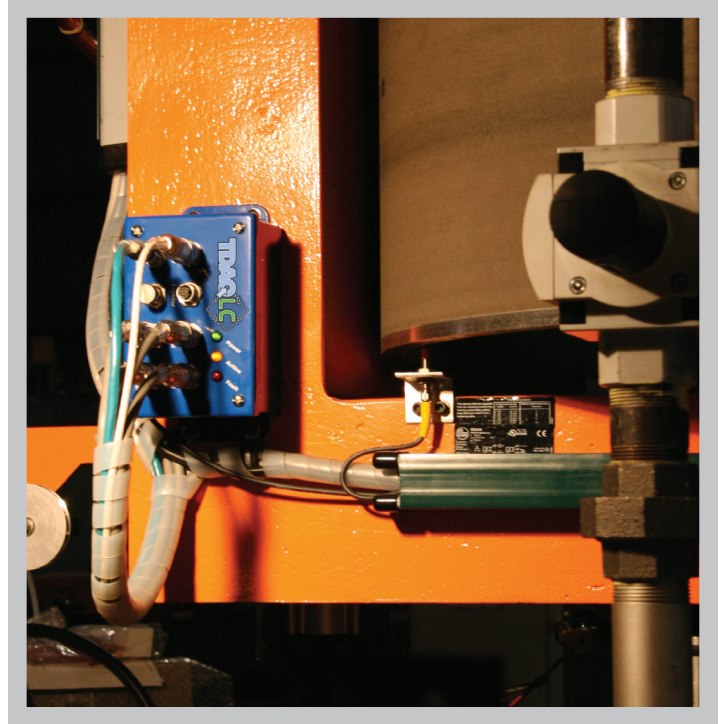
**Single PC Connection:** A single PC connection sends digital data to the TTOC machine controller via a single 100-Mbit channel. This simplifies TTOC's hardware footprint, which translates to even more cost savings.



**Modular Design:** TDAQ's modular design provides measurement capability adequate for any standard TUO. For TUOs with grinders, easily add a second TDAQ to the system with no loss of performance.



**High Speed:** High speed data sampling and control logic operates at 16,000 times per second (63µs reaction time), making it the perfect drop-in replacement for high-speed testing as well as standard TUOs.



## Tight capital budgets in the tire industry are forcing equipment buyers to look carefully at retrofitting as an effective alternative to new equipment purchases.

Scores of valuable tire test machines still exist today with ancient pedigrees--driven by obsolete control systems with few available replacement parts. Although older machines are cheaper to purchase, tire companies are often fraught with degraded performance and downtime due to aging electronics.

CTI of the Poling Group, an engineering company based in Akron, Ohio, U.S.A., presents practical solutions to retrofitting machines with new and innovative ideas.

During the 20 years CTI has been building and integrating electrical controls, we have used many different data acquisition systems specifically for tire testing, all with varying degrees of success. The complexities of tire testing require a very close coupling between position tracking and extremely precise analog data collection.

As CTI began the development of our next-generation control system, we looked at the numerous industry offerings for data acquisition that would meet the needs of tire testing. Driving our design goals was our practical field experience with tire testing machines.

Consider the layout of a traditional test machine fully equipped with force measurement and grinding capability (see figure 1, next page). One glaring issue here is that wires must be run from each transducer and sensor down to the main control panel, where a PLC can process and act on data. This design is poor in that it overuses wire ways, leaving designers with no choice but to place dirty, high voltage drive lines near sensitive analog data lines--sometimes for as long as 10 to 15 meters.



Our search for industry-standard devices did not yield any acceptable solutions that matched up with this unique machine configuration and specialized complexity. So we decided to look smaller--to see what modern digital components were available and if those components could be integrated into the next big thing.

Success came a couple of years later with the release of our "Tire Data Acquisition" (TDAQ) system, which has now become an integral part of the TTOC6 control system family.

In a machine controlled by TTOC6 (see figure 2), one TDAQ becomes the central hub for loadcells and pressure transducers, while another TDAQ directly controls the grinding movements based on sensor feedback. Instead of the many wires leading back to the control panel, each TDAQ only requires two: one 24VDC power cable and one Ethernet cable for transmitting test data. Not only does this simplify wiring, but performing data acquisition physically closer to the source provides stronger and cleaner signals, bringing about a substantial increase in resolution.

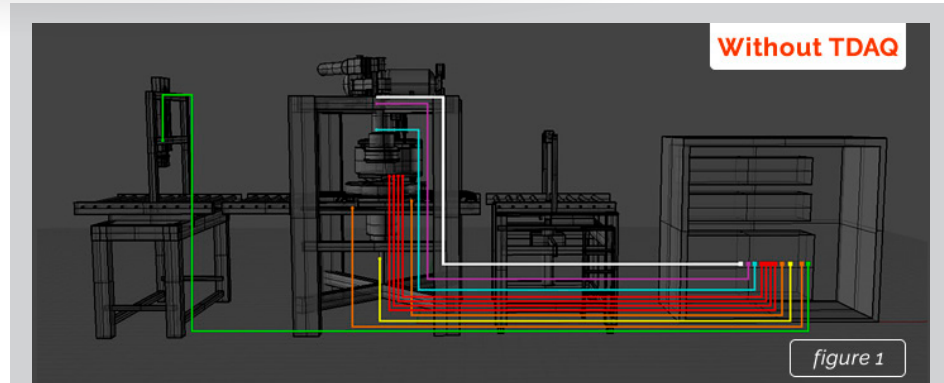


figure 1

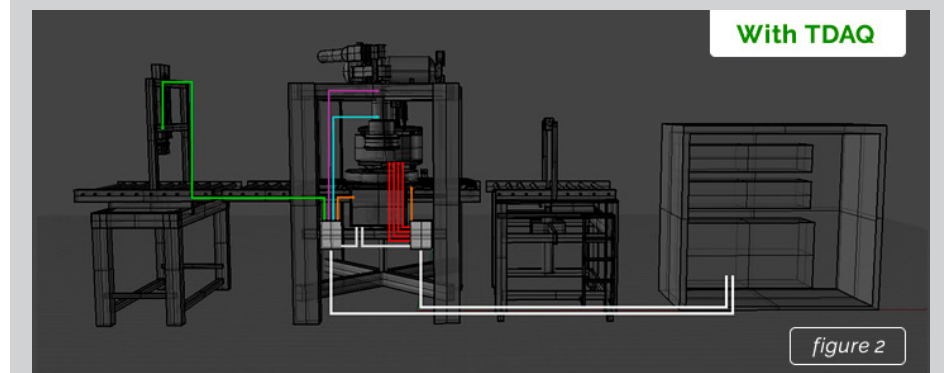


figure 2

Because a single TDAQ replaces the functionality of several data acquisition devices on traditional test machines, machines fitted with this system are significantly less expensive to implement and maintain. When retrofitting tire test machines, TDAQ components in the TTOC6 Upgrade Kit significantly improve key factors such as installation time, signal noise reduction, wiring, and cost.

## Never in the history of tire testing has there been a more effective way to collect and analyze tire data!



- > 16,000 I/O scans per second
- > 10/100 Mbit Ethernet
- > Spindle quadrature decoder
- > High-speed load wheel rotation counter
- > (8) 24-bit Analog Inputs
- > (8) 10-bit Analog Inputs
- > (4) 16-bit Analog Inputs
- > (5) Digital Inputs
- > (5) Digital Outputs



- > 16,000 I/O scans per second
- > 10/100 Mbit Ethernet
- > Spindle quadrature decoder
- > Small 4" x 6" (10cm x 15cm) package mounts
- > directly on the machine next to the load cells
- > (4) 24-bit Strain-gage Analog Inputs
- > (2) Digital Inputs
- > (2) Digital Outputs