Next-Generation of Digital Display Benefits, Part 1

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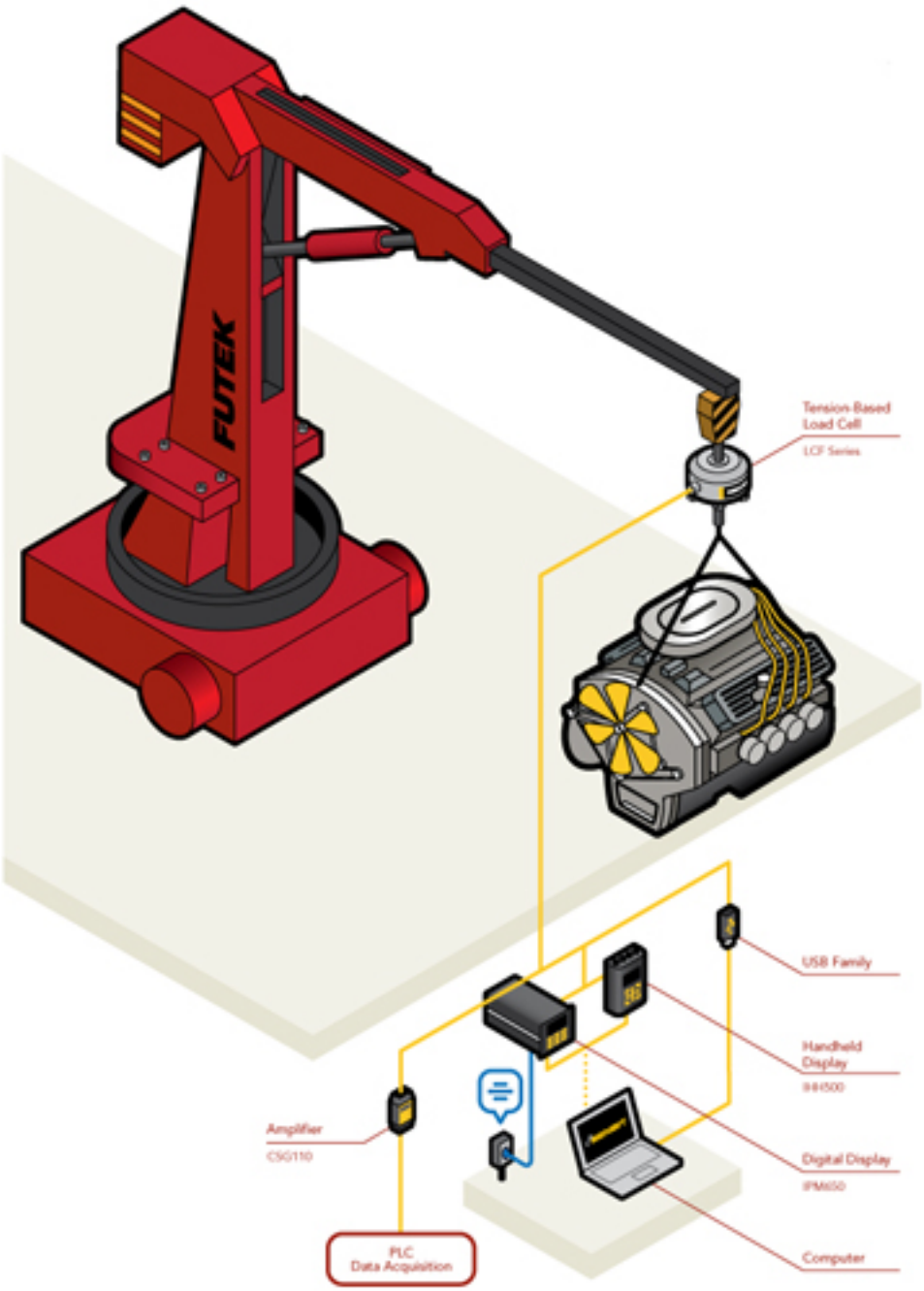
When it comes to sensors, form necessarily follows function. Consequently, as the geometric constraints, environmental conditions, and loading modes that sensors were required to meet expanded, the variety of form-factors, material compositions, and measurement capabilities of sensors grew proportionally.

At face value, it seems the same can be said of the digital indicators paired with these sensors. But, as the number of models on the market does continue to grow, the question is begged, is this “variety” really borne from the same legitimate necessity? If approached abstractly, it seems the digital indicator has but one job: provide its user with the measurement data they need from their sensors.

The FUTEK engineering team took a liking to this notion and actually set out to create a single display instrument that could consolidate the functionality of essentially all the digital indicators on the market into one elegant design. Pursuing this idea presented a significant challenge because, in order to simultaneously fill all of these shoes, this supposed digital skeleton key would need to bring together a list of features previously unattained by any single digital instrument.



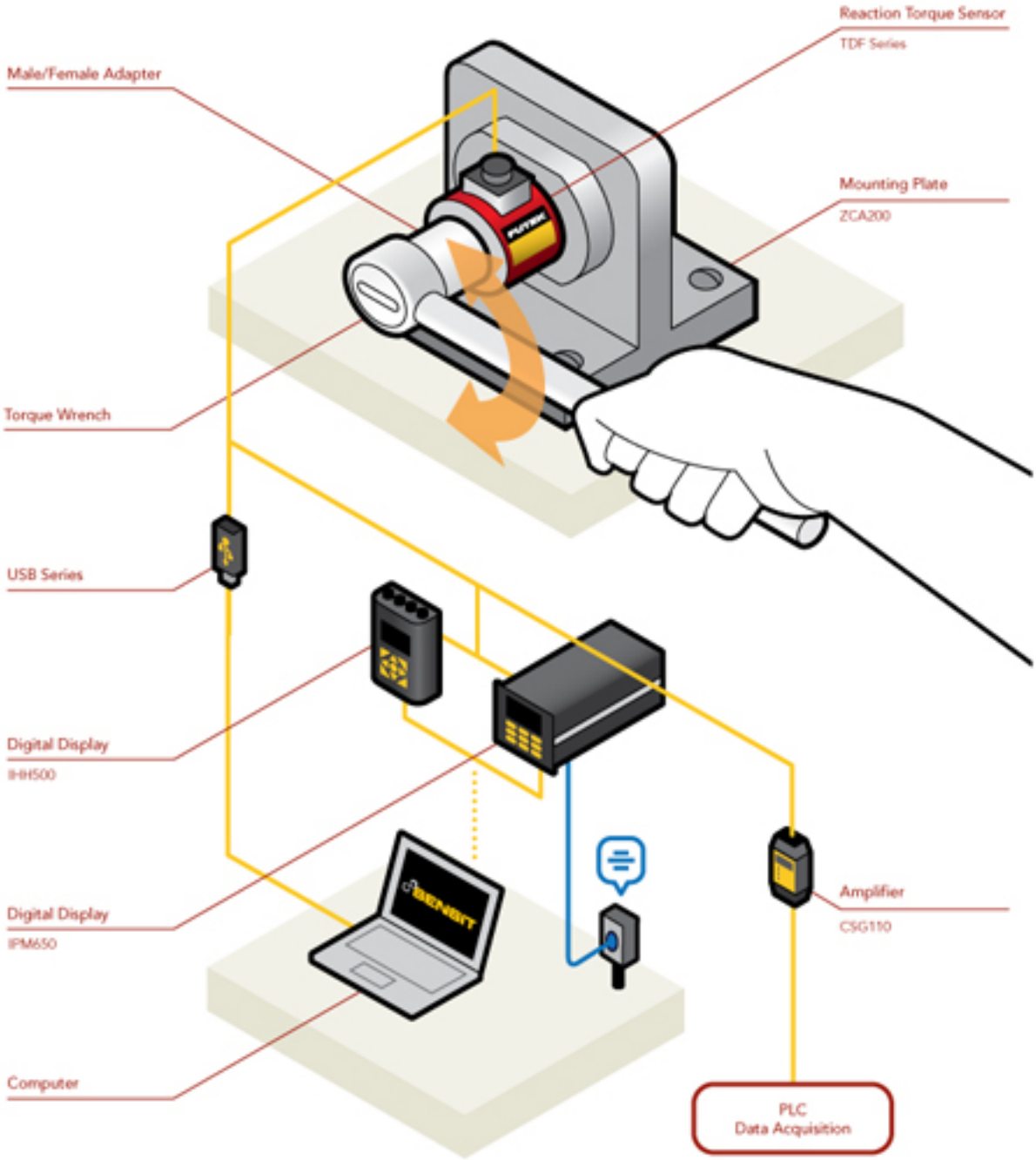
Obviously, such an instrument would be compatible with any sensor type regardless of its measurement dimension or output signal. To maintain ease of use with several sensors in play, the system should internally store multiple sensor calibration profiles and provide Plug-n-Play technology. To meet the demands of essentially any measurement application, its electronics would need outstanding resolution, accuracy, and sampling rate. To capture measurement data from complex events occurring in both the lab and the field, the display would need a high-speed USB connection to stream digital data to PCs and have the ability to store data in its internal data logger. Process control systems can communicate using a variety of signals depending on the PLC, relay or switch, so offering a variety of analog output signals could come in very handy. Glossing over a few minor details of the engineering process, an array of performance specifications and features was combined and the IHH500 was born.

The basis of the IHH500's capability is superior electronics. Built on a state-of-the-art 24bit platform, an accuracy of ±10ppm [0.001%] and sampling rate of 4800Hz give the IHH500 performance to spare in nearly any context. Since its accuracy is more than an entire order of magnitude better than even that of sensors used as calibration transfer standards, any error that could be attributed to the IHH500 would be insignificant to measurement uncertainty. And, capturing 4800 data points every single second allows the IHH500 to accurately plot an event with a lifetime of less than 0.01 second (according to Section 5.5 of ASTM E1942)!

The IHH500 handheld indicator comes in two versions: Pro and Elite. The Elite has his little brother's same elegant design and impressive performance but adds the ability to input a travel encoder and includes a copy of the FUTEK SENSIT Test and Measurement Software, an assortment of connection cables and accessories, and a protective travel case. Understanding whether the IHH500 Pro or Elite is best for your asset catalog ultimately comes down to which measurement applications you will come across. For the purposes of demonstration, let's consider a few popular applications and examine what a typical system configuration for each context might look like.

Hoist Transformation

When an object with a size or mass exceeding the capacities of conventional balances needs weighed, it is common to use a large industrial-type floor scale. Anyone who has had worked with such a scale can tell you, beyond the basic encumbrance of having to "gently" place a massive object in the center of the scale's loading platform, the process is riddled with inconvenience: having to transport the object to wherever the industrial-sized scale resides; unload it, weigh it, reload it; and then transport it on to its actual destination. Typically, transporting the payload involves some sort of hoist, crane, or lift and multiple operators to negotiate the process.



In an ideal world, wouldn't the scale travel to the massive payload and not the other way around? Well, actually no. In an ideal world, the scale would travel to the massive payload, pick it up, weight it, and then drop it off at its final destination. If this ideal scenario sounds too good to be true, and then consider how an IHH500 Pro can transform this process.

An IHH500 Pro display connected to a FUTEK LCF455 remote load sensor can be integrated into any hoist or lift simply by mounting the remote load sensor in line with the lifting mechanism so that it is within the load chain. This way, any object that is lifted is also automatically being weighed and its weight is digitally displayed inside the cockpit.

As an added bonus, the IHH500 system can provide the operator with a real-time overload alert for the lift. To avoid a catastrophic situation in which the machine

exceeds its safe payload limit, the analog output of the IHH500 can be connected to an external switch. If the measured weight exceeds a trigger value set in the IHH500, a signal is instantaneously sent to deactivate the motor or activate an alarm the moment a dangerous payload is lifted.

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