


Diversified Technical Systems

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MILESTONES IN THE MAKING

The evolution of in-dummy data acquisition systems and miniature measurement solutions have been key drivers in advancing automotive safety testing

Crash testing has made great leaps forward over the past two decades. DTS has played a major role in its evolution and has plenty more to offer. There is a strong emphasis on longevity in business, so it is encouraging to see that DTS is still at the forefront of safety innovation nearly 35 years after it was established.

The DTS story began when three crash test engineers had dinner together in 1988. Conversations between Steve Pruitt, Mike Beckage and Tim Kippen were wide ranging but it soon became apparent that there was an opportunity for the friends to work together to solve problems and improve automotive safety. Less than two years later, Diversified Technical Systems was born.

Beckage, the one member of the trio still present at DTS, explains that he has overseen monumental changes since he witnessed his first crash test in 1979. "There has been a big shift in the past 20 years from older, larger technology to modern equivalents that can capture more

data much faster," he explains. "That progression has greatly improved vehicle safety design."

One of DTS's most important innovations was the TDAS Pro, which marked the beginning of the company's journey into manufacturing rugged, modular data acquisition systems. TDAS Pro generated a huge amount of interest in both automotive and aerospace testing. It was the product that put the company on the automotive map and ensured that the crash test industry took note of what was possible with DTS products.

Leading OEMs like GM quickly recognized the TDAS Pro as their ideal solution for crash testing. Just a few months after initial meetings between the two companies, DTS secured one of the largest orders in the history of the DAS market for vehicle crash testing. Soon after, other major customers, including Toyota and Honda, joined the company's portfolio.

The following year saw another major industry breakthrough when the World Side Impact Dummy (WorldSID) Task Group launched the

development of a globally accepted test dummy with an integrated data acquisition system. In 1999, DTS won the contract to develop the first universal in-dummy DAS solution. Previous in-dummy solutions were dummy-specific. The vision was a global anthropomorphic test device with an embedded DAS solution that could also be used in other ATDs.

The introduction of the WorldSID DAS solution brought DTS international acclaim. By integrating the DAS directly into the crash test dummy, customers could reduce test setup time and eliminate the cumbersome bundle of trailing cables, making it easier to move and position the dummy.

In 2000, the initial WorldSID Alpha was delivered with seven 32-channel DTS DAS modules. Beckage recalls that "224 in-dummy DAS channels was monumental at the time."

The pinnacle of the TDAS product line was achieved in 2003 with the introduction of TDAS G5, a compact 32-channel DAS featuring signal conditioning. It was designed with

versatility in mind because it could be used in dummies, on vehicles or as part of a crash wall. Among the customers lining up to place orders for TDAS G5 were Toyota, Volkswagen, Ford, Nissan and Transport Canada.

Four years later came a brand-new product line under the eSensing banner, including the likes of Slice, TSR and ARS sensors. The unique selling proposition was that these new solutions were truly miniature and modular – features that customers were asking for. "One of the major drivers for the performance of the TDAS G5, and later on Slice 6, was direct feedback we received from customers," recalls Beckage. "The ability to offer precision data capture time alignment via PTP ethernet, GPS or IRIG was a feature that had never been offered before. We're still evolving the product today based on collaborative relationships with customers who require smaller units and more features."

As Beckage says, without diminishing the achievements and major milestones of the past, DTS



TDAS1 and TDAS Pro first modular DAQ solutions



WorldSID with TDAS G5 in-dummy DAS

is committed to creating even more sought-after technologies that will help test engineers in the future. One of the key areas being explored is wireless technology, as well as future iterations of the Slice 6 Air – a miniature data acquisition unit designed for rapid-deployment modification and compatibility testing. Each unit features universal analog sensor support, flash memory and real-time streaming. This was the first DTS product to offer onboard memory and streaming capabilities.

“With Slice 6 Air, we are pulling together the features that people need in a small package – there really is

nothing quite like it,” Beckage proudly states. “Wireless is essentially the essence of the Internet of Things, and it is straightforward to achieve on measurements that don’t change very quickly, like humidity and temperature. Our niche is – and always will be – providing high-quality measurements taken at very high data rates. That is difficult to do wirelessly because of the amount of data engineers are dealing with.”

The evolution of the DTS product range is based on rising to challenges and investing in new technologies to deliver what customers need. The demand for such technologies

continues to grow across industries. Meanwhile, Diversified Technical Systems continues to devise and develop next-generation solutions, hoping that these will create the same amount of interest as TDAS did all those years ago.

What are Beckage’s words of wisdom for engineers or companies striving for a journey similar to that experienced by the company he helped set up over 30 years ago? “Learn from your customers; collaborate with them and give them what they want,” he advises. “Pay attention to the details and you might just be successful.” ◀

Need to know

- » TDAS Pro marked DTS’s entry into the crash test market a quarter-century ago
- » DTS continues to lead in-dummy DAS innovation nearly 35 years after it was founded
- » Its Slice 6 supports the Hybrid III, THOR, WorldSID, BioRID, Q-Series and WIAMan ATDs

LEFT: The evolution of DTS in-dummy DAS (left to right) began with the Alpha WorldSID 32-channel modules, which evolved into the TDAS G5 module. Today, Slice Nano is used for pedestrian head and legforms, while Slice 6 serves as a universal solution for the full family of ATDs

BELOW: The first DTS data acquisition systems circa 1996 have evolved into today’s ultra-small, in-dummy DAS solutions adopted globally



Hybrid III with Slice Nano in-dummy DAS

THOR with Slice 6 in-dummy DAS

WIAMan with Slice 6 in-dummy DAS