First Technology Safety Systems, Inc (FTSS), and Diversified Technical Systems (DTS) have joined forces in the development of the future of Crash Test Dummies we refer to as \textit{iDummy}.

\textit{iDummy} is a technically advanced system that integrates the data acquisition system and instrumentation cabling inside the dummy.

FTSS developed the \textit{iDummy} system with DTS to integrate the DTS TDAS G5 DAS module into the structure of the dummy. Sensor cabling is run internally through the dummy flesh and connected to the DAS module via an interposer. Data is stored in non-volatile memory and may be transferred using a standard 100 megabit ethernet connection.

The \textit{iDummy} system can be adapted to any crash test dummy. Using the \textit{iDummy} system for vehicle impact testing eliminates the need for bulky umbilicals that can add up to 8 kg of unwanted mass, hampering dummy installation procedures and interfering with dummy kinematics and response.

Other applications particularly well-suited to the \textit{iDummy} system include motorcycle, ejection seat, and pedestrian testing.

Key features of the \textit{iDummy} system:

- \textbf{Integrated} - DAS & FTSS Cabling routed inside dummy. Auto sensor ID, shunt calibration.
- \textbf{Intelligent} - Sensors, Network ID, DAS, testing and diagnostics.
- \textbf{In-dummy} - Umbilical free, no extra test mass. Up to 160 channels in dummy.
### The Dummy

The structure of the dummy is minimally modified so the iDummy system components can be installed seamlessly without changing the dummy’s mass or response characteristics. The iDummy system simplifies dummy handling and testing. The iDummy system can be ordered two ways—either integrated with a newly purchased dummy, or retrofitted into an existing dummy.

### DTS TDAS G5 Data Acquisition Module

Each TDAS G5 data acquisition system provides capacity for 32 channels per package using only 2.5 cubic centimeters of space. Dimensions of each module are 2.5 cm x 5.4 cm x 8.5 cm. The TDAS G5 is roughly 20 times smaller than current state of the art systems. Up to four TDAS G5 modules can be installed in each dummy as part of the iDummy system. The modules are shock rated to 500 G and compatible with all sensor types. The TDAS G5 meets SAE J211 and ISO 6487 standards.

### Interposer

The FTSS-developed interposer assembly links the data acquisition system to instrumentation. This assembly consists of an interposer, cabling, and an connector block. The TDAS G5 plugs into the interposer, which is mounted near the TDAS docking port. The connector block is also secured to the dummy, providing nearby, easy-to-reach connections for instrumentation. The flex cabling used in the iDummy system is similar to that commonly used in electronic devices but has been specifically developed for the crash environment.

### Instrumentation

Customer’s existing instrumentation can be used as part of the iDummy system, retrofitted with miniature connectors compatible with the connector block. The iDummy system allows instrumentation cable lengths of less than 1 m, making wiring much easier to manage.

### Battery

A rechargeable lithium polymer battery is part of the iDummy system. The battery is mounted to the dummy structure, providing power to the data acquisition system and instrumentation for up to 1 hour.
Implementing the iDummy system begins during assembly of the dummy. The iDummy system uses a docking port to mount the TDAS G5 modules. A docking port is secured to the dummy, and the interposer is attached to one end of the docking port. The TDAS G5 module is plugged into the interposer and secured with the docking port cover. Structural replacements for the TDAS G5 module and the interposer assembly are available to maintain the dummy’s mass when the G5 module is not being used. The connector end of the interposer assembly is also secured to the dummy, providing an easy-to-reach point for connecting instrumentation. As you complete assembly of the dummy, instrumentation is plugged into the connector. Short cable lengths that are contained within the dummy greatly simplify handling of the dummy.

The battery is also secured to the dummy. A cable connects the battery to the TDAS G5 instrumentation system.

A cable runs from TDAS G5 modules to the status box. An Ethernet cable is routed from the status box to an off-board computer. This cable communicates with the system and sets it up for testing, but can be disconnected during the test. The communication cables are then reconnected after the test to download the data. An event cable is routed directly from the TDAS or through the status box.

The TDAS G5 plugs into the docking station and interposer, while the instrumentation plugs into the connecting end of the interposer.
Testing with the iDummy system is simple. The dummy is positioned as usual. However, the positioning process is much easier since there is no big umbilical to get in the way. All you need to deal with is the cable leading from the dummy to the status box.

The communication cable is connected between the status box and off-board computer. The iDummy system software is used to perform pre-test calibration and arming functions.

Contact your FTSS sales representative to learn how the iDummy system can simplify your dummy testing program.

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