

DTS has engineers on staff with a wide range of experience in the field of automotive safety testing. The three principal engineers at DTS began their careers as electronics and test engineers at an independent vehicle crash test facility in 1979. Their experience includes sensor wiring and shielding, data acquisition fundamentals and details, SAE J211, ECE, NCAP, and NHTSA compliance, dummy calibration and positioning, vehicle and sled preparation, data handling and post-processing. In short, DTS engineers have more than 20 years of hands-on experience in the vehicle crash test field and have given many seminars and training sessions to help automotive safety test laboratories collect reliable test data.

A description of the training sessions DTS offers are outlined below.

TDAS PRO - Installation and Operational Training

This is a 4- to 5-day installation and training seminar that covers all aspects of TDAS PRO use in the automotive safety testing laboratory. It is intended to help engineers and technicians who will be using TDAS PRO to collect safety test data.

TDAS PRO Installation

- Complete on-site check-out of TDAS PRO hardware to confirm delivery requirements.
- Verify proper interface with all sled, camera, and other manufacturer's equipment. This includes power, trigger, status and other control interfaces.
- Check for proper wiring of current sensors, as available. Verify proper pin-outs, shielding, and sensor ID, if wired.
- Install TDAS PRO software on customer PC and verify proper functionality with TDAS PRO hardware.
- Check for proper function of all custom import and export software routines.
- Connect all hardware, including sensors where available, and perform complete test runs without sled or barrier operation. Check for noise, power or other issues.
- Run full practice tests with sled or barrier in operation including lights, cameras and other equipment. Check for any noise or power issues. Also check complete test creation, import, test review, data export and analysis functions.
- Run standard on-site quality assurance checks.

TDAS PRO Operational Training

- Installation and configuration of software.
- Software/hardware communications.
- Fundamentals of TDAS PRO hardware.
- Proper sensor wiring and hook-up.
- Creation and maintenance of TDAS PRO sensor database.
- Proper selection of sampling rates and filters.
- Creation of Test Setup Files.
- Data collection modes and data download.

On-site Training Programs

- Data viewing and post-processing algorithms.
- Custom import and export routines.
- Hands-on sensor wiring and data collection.
- Troubleshooting and data collection tips.

Sensor, Data Acquisition and Automotive Safety Test Training

This is a 4- to 5-day training seminar taught by an experienced safety test engineer from DTS. This seminar will cover all the basic topics needed to perform an automotive safety test. It is intended to help engineers and technicians who will be performing these tests.

Sensor and Data Acquisition Basics

- *Sensors*
 - Sensor types and manufacturers.
 - Sensor wiring and shielding.
 - Excitation, sensitivity, gain, signal-to-noise and other sensor basics.
 - Calculation of proper shunt calibration resistors.
 - Expected accuracy, frequency response, and durability of sensor types.
 - Sensor calibration.
- *Data Acquisition*
 - Analog signal conditioning basic building blocks.
 - Input range, impedance and common mode rejection.
 - Channel-to-channel isolation.
 - Amplifier stages and anti-alias filters.
 - A/D converter type, resolution and true accuracy.
 - Avoiding ground loops or unwanted current paths.
 - Choices regarding signal conditioning configuration and wiring for various sensor types.
 - Shielding, noise and interference – sources and hardware response.
 - SAE J211, ISO and NHTSA SWG compliance.
 - Calibration methodology, recommendations and procedures.

Sled and Barrier Impact Test

- *Initial Test Set-up*
 - Interpretation of NHTSA, ECE and other test procedures.
 - Sensor selection.
 - Sampling rates and filters.
 - Dummy wiring and check-out.
 - Test set-up and initial instrumentation check-out.
- *Vehicle or Test Buck Preparation*
 - Initial vehicle inspection, measurements, and documentation.
 - Pre-test photography.
 - Vehicle ballast considerations.
 - Sensor mounting considerations including angles, vibration, mounting methods, etc.
 - Proper sensor wiring – noise issues and tie down points and how to avoid cut wires.

On-site Training Programs

- Trigger switches and wiring.
- Seat belt pull-out measurement issues.
- Proper seat adjustment.
- Mounting and wiring of data acquisition system.
- Power management considerations.
- Dummy positioning.
- Check-out of instrumentation in vehicle.
- On-board cameras, lights, and flash.
- Brake abort (barrier test).
- *Test Area Preparation*
 - High-speed camera sighting and lighting considerations.
 - Camera checks.
 - Impact speed measurement device types and placement.
 - Personnel safety.
 - Towing system speed calibration (barrier test).
 - Vehicle hook-up and towing (barrier test).
- *Test Performance*
 - Final track inspection.
 - Final camera checks.
 - Final instrumentation check-out and data acquisition arming.
 - Last 30 minutes before test – check list.
 - Proper usage of personnel and good communication considerations.
 - Actual test procedure.
 - Priorities immediately after test.
 - Data download and first looks.
 - Post-test vehicle observations, measurements and photography.
 - Detailed post-test data analysis.