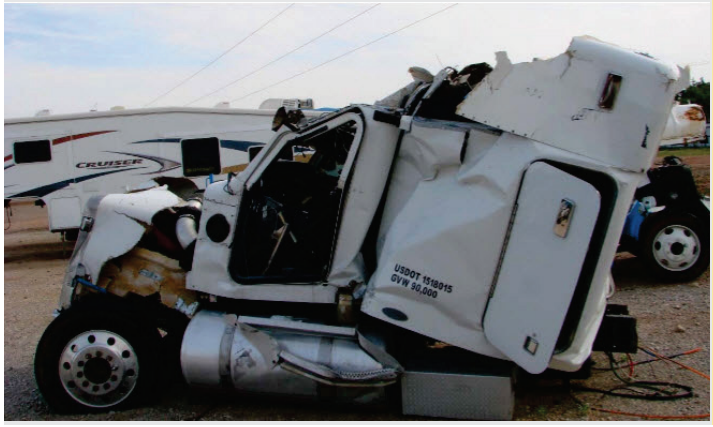
Moving Knowledge from Research to Impact

SUCCESS STORY

NIJ and Synercon Technologies:

Improving the Reliability of Forensic Data from Vehicle Data Recorders



"The Synercon Smart Sensor Simulators are not only a forensically sound way to download digital evidence from electronic control modules, they are also a time-saving and safer way to collect this data from a wrecked heavy vehicle that has been involved in a crash."

—Scott E. Skinner
Sergeant (Retired), Oregon State Police

Problem and Solution Synopses

Event Data Recorders (EDRs) are available in commercial vehicles. EDRs store relevant information about operation and other environmental variables. These devices contain content that support criminal investigations involving commercial vehicles; these investigations include vehicle crashes, speeding, drug trafficking, manslaughter, aggravated homicide, and even acts of terrorism. However, the data extraction process uses original equipment manufacturer (OEM) software that is designed for vehicle maintenance, not forensic use. The downloaded data can be easily overwritten, presenting challenges when evaluating data integrity and validity for evidentiary use. Also, when an EDR is damaged, extracting data can create new fault codes that are completely unrelated to the event of interest. Preserving and extracting the evidence contained in EDRs, while ensuring data integrity, is critically important for any criminal prosecution.

Dr. Jeremy Daily and colleagues at the University of Tulsa have developed and commercialized new technologies that provide the ability to retrieve forensically sound data from EDRs. The technologies were developed under NIJ-funded award 2010-DN-BX-K215; these technologies enable law enforcement to acquire digital forensic data from commercial vehicles faster and more reliably than older technologies.

These technologies include the following:

- **Forensic Link Adapter—**A universal device for downloading digital data from commercial vehicles. This device is a field computer that communicates directly with the vehicles' electronic control module (ECM) and downloads EDR data. It can be used independently on ECMs from PACCAR MX, Caterpillar, Navistar, older Detroit Diesels, and Mercedes vehicles. Alternatively, it can be used with OEM software as a forensic RP1210 compliant device.
- **Smart Sensor Simulator—**A device that emulates the electronic system of a commercial vehicle for an ECM, enabling investigators to retrieve and perform a forensically sound download of ECM data.
- **TruckCRYPT Software—**A software that runs on the Forensic Link Adapter to interpret and secure all critical digital forensic data in a commercial vehicle incident.

Key Benefits

- Efficiently extracts heavy vehicle crash data from a vehicle's ECM using forensic methods for digital evidence collection.
- Allows for robust data presentation in courts.

Published: December 2017

More Information

To learn more about the research presented in this success story, please contact:

Jeremy Daily, PhD
University of Tulsa
jeremy@synercontechnologies.com

To learn more about the FTCoE and the Impact of NIJ-funded research, please contact:

Jeri Ropero-Miller, PhD, F-ABFT
Director, FTCoE
RTI International
jerimiller@rti.org

Gerald LaPorte, MSFS
Director, Office of Investigative and Forensic Sciences
gerald.laporte@usdoj.gov

Research Support

The research presented in this success story was supported by the National Institute of Justice (NIJ) award 2010-DN-BX-K215: Reliability of Forensic Data from Networked Process Control System.

Disclaimer

NIJ-Funded Research

With NIJ funding, Dr. Daily's team developed computer algorithms to model ECM-networked systems. The team then created simulation environments capable of capturing network behavior, and evaluated the effects that communication protocols have on the ECM. Based on these data, a customized toolset was developed and commercialized to examine and evaluate the reliability of forensic data obtained from ECMs.

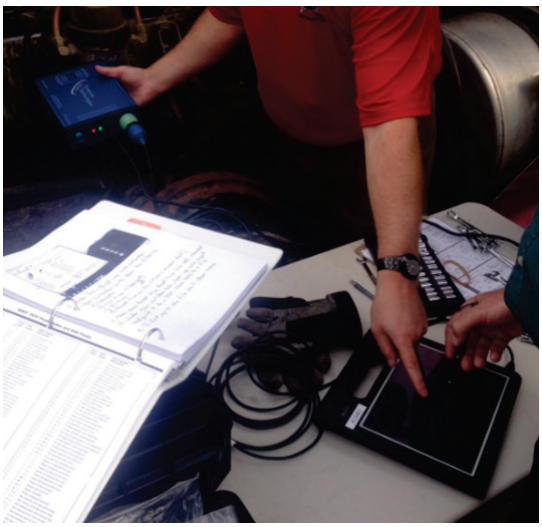
Bringing Research to Practice

Dr. Daily started Synercon Technologies, LLC at the Oklahoma incubator i2E and received private funding in the amount of $450,000 to further develop and commercialize the technology. A patent application US 2016/0247335 A1: Wheeled Vehicle Event Data Recorder Forensic Recovery and Preservation System was published in August 2016.

The Future

Synercon continues to optimize the technology and grow their market share in forensic data retrieval. The company has partnered with the University of Tulsa's Continuing Education in Science and Engineering (TU-CESE) to conduct training on how to use the **Forensic Link Adapter, Smart Sensor Simulator,** and **TruckCRYPT Software**.

The formal method developed under the NIJ award can be used to assess the reliability of other networked process control systems in investigations. To learn more about Synercon's products and to subscribe to their newsletter, visit www.synercontechnologies.com.



Oregon State Police using the Forensic Link Adapter

Image Credits

Page 1—Dr. Jeremy Daily

Page 2—Dr. Jeremy Daily

NIJ National Institute of Justice
STRENGTHEN SCIENCE. ADVANCE JUSTICE.

Forensic Technology CENTER OF EXCELLENCE

RTI INTERNATIONAL