

# Vehicle Network Seminar Series

2014



## Seminar Locations

Unless otherwise indicated, our seminars are held at DG's facilities in Farmington Hills, Michigan or Indianapolis, Indiana.

CEU credits are given for DG classes. See [www.iacet.org](http://www.iacet.org). One day equals 0.8 CEU, a 2-day course is 1.6 CEUs, and 3-days 2.4 CEUs.

## Custom On-Site Seminars

No matter where you are located, any DG seminar can be economically held at your facility. Since most DG seminars are in a modular format, they can be customized to your specific needs. DG on-site seminars are very useful and an extremely cost-effective mechanism to train your technical, sales, marketing and management personnel on the latest in vehicle network protocols.

DG participates on many SAE, ISO, IEEE and other standards committees and has the "inside scoop" on the latest developments at these organizations, as well as the status of current and emerging standards.

We have found that discussions frequently "break out" at these special seminars, and often times real-world customer problems are solved in this way. The instructor is able to customize the presentation "on-the-fly" by responding to questions from the students that indicate areas of interest or difficulty.

Send an email to [sales@dgtech.com](mailto:sales@dgtech.com) indicating your preferences for our consideration to develop a special class time for you!

## Custom Solutions & Consulting

DG Technologies provides expert leveraged custom solutions and consulting services at any level to help you with your networking needs. DG has engineering offices in Michigan and Indiana to provide prompt service, no matter where you are located.

DG can assist you in locating other vendors' expertise, software, or tools to complete your project on time and on budget.



## Heavy Duty Truck and Bus Protocols

If you need a detailed understanding about the protocols used in Heavy-Duty vehicles and equipment, then this is the perfect class for you. The HD T&B class includes CAN/J1939, J1708/J1587, PLC4TRUCKS/J2497, TMC RP1210, and SAE J2534. These protocols are commonly used in heavy-duty and medium-duty vehicles (i.e. on-highway, agriculture, construction, military, and buses) as well as industrial-stationary equipment (i.e. generators, pumps).

In this class, the student first gains a good familiarity of how protocols are structured and the necessary fundamentals of working with an in-vehicle network including the standard SAE connectors. The class then covers the first protocols used in the industry called J1708 and J1587, before introducing a related protocol called PLC4TRUCKS (tractor to trailer communications). After a hands-on lab exercise to decode messages, the class covers the CAN protocol and introduces the TMC RP1210 and SAE J2534 Application Programming Interfaces (APIs). Day 2 of the class is spent completely on learning the details of the J1939 protocol (message structure, addressing, and diagnostics) and a hands-on lab exercise to decode messages.

The course also introduces various DG Technologies' utility applications including Adapter Validation Tool (AVT), J2534 Validation Tool (JVT), Sample Source Code for RP1210 and J2534, and DG Diagnostics.

## Course Outline: (2 days)

- o In-Vehicle Networking History
- o Industry Connectors Reference
- o Computer Science Fundamentals Required for Vehicle Protocols
- o J1708, J1587 and PLC4TRUCKS and Hands-on Lab Exercises
- o Introduction to CAN (ISO11898)
  - o Physical and Data Link Layers
  - o CAN Message Structure and Bus Arbitration
  - o Network Troubleshooting
- o Next Generation CAN, CAN FD (CAN with Flexible Data Rate)
- o TMC RP1210 and J2534
- o J1939 and Hands-on Lab Exercises
  - o Addressing, Message Structure, Transport Protocol, Diagnostics

**Course Cost: \$ 1,245; includes materials**

Dates Offered:

**Indianapolis:** June 17-18, November 11-12

**Farmington Hills:** March 4-5, September 16-17



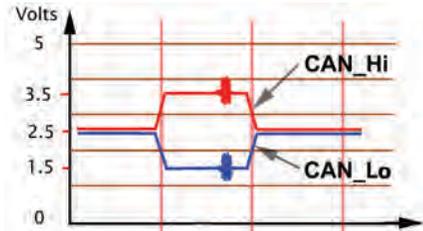
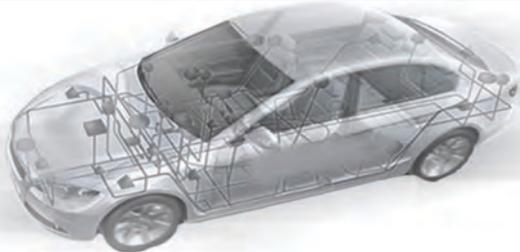
DG Technologies  
33604 West Eight Mile Road  
Farmington Hills, MI 48335  
248.888.2000 248.888.9977 fax  
[www.dgtech.com](http://www.dgtech.com) [sales@dgtech.com](mailto:sales@dgtech.com)



**SHOP ONLINE:**  
[store.dgtech.com](http://store.dgtech.com)

# Vehicle Network Seminar Series

2014



## CAN and Higher Layer Protocols

CAN (Controller Area Network) is today's worldwide standard for in-vehicle and factory floor automation networks. If you would like a fundamental background on CAN and some of the most popular messaging protocols layered on top of CAN, this will be the class to attend. Previous knowledge of network protocols is a plus, but not necessary.

The student will first gain a good familiarity of CAN network theory, application, and troubleshooting. The course then dives into the various message layers that have been written for CAN such as ISO15765 and J1979 (DiagnosticsOnCAN) and the heavy-duty industry standard called J1939. Amongst the training modules are introductions to the programming standards supporting the CAN protocols, SAE J2534 and TMC RP1210.

There are two hands-on laboratory sessions designed to solidify the classroom fundamentals. These examples will show how to request and decode data from the J1939 and ISO15765/J1979 networks.

## Course Outline: (2 days)

(CAN, CAN FD, ISO15765, J1939, J1979, RP1210, J2534)

- o On-Vehicle Networking History
- o Computer Science Fundamentals Required for Vehicle Protocols
- o Introduction to CAN (ISO11898)
- o Physical and Data Link Layers
- o CAN Message Structure and Bus Arbitration
- o Network Troubleshooting
- o Next Generation CAN, CAN FD (CAN with Flexible Data Rate)
- o J1939 and Hands-on Lab Exercises
- o Introduction to TMC RP1210
- o J1979 Using CAN and Hands-on Lab Exercises
- o Introduction to SAE J2534

**Course Cost: \$ 1,245; includes materials**

## Dates Offered:

**Indianapolis:** June 19-20, November 13-14

**Farmington Hills:** March 6-7, September 18-19



Instructor-Greg Potter

## Diagnostics On CAN Basic OBD

Beginning in 2007, CARB and EPA require ISO 15765 DiagnosticsOnCAN for light vehicles. This course will prepare you to design, develop, test and work with this protocol.

This course examines ISO 15765 (DiagnosticsOnCAN) with a brief introduction to its predecessor, KWP2000 plus OBDII, J1979, J2012, J2190 and J2284. This information will also be useful for J1939 users who choose to use ISO 15765 for the upcoming legislated heavy duty vehicle emissions requirements.

SAE J1979 SID's along with their associated PID, MID, TID and INFOTYPES will be discussed and utilized.

You will learn how parts of these protocols are used to create DiagnosticsOnCAN. You will gain: A good overall knowledge of DiagnosticsOnCAN (OBD).

Who should attend: Engineers and technical personnel. An understanding of CAN is helpful but not necessary.

## Course Outline: (1 day)

- In-vehicle network overview
- CAN protocol - physical and data link layers
- Overview of J2411, J2284, OBDII, UDS
- DiagnosticsOnCAN (ISO 15765), J1979
- On-site courses are available by request

**Course Cost: \$ 695; includes materials**

## Dates Offered:

**Indianapolis:** June 19, November 13

**Farmington Hills:** March 6, September 18



DG Technologies  
33604 West Eight Mile Road  
Farmington Hills, MI 48335  
248.888.2000 248.888.9977 fax  
[www.dgtech.com](http://www.dgtech.com) [sales@dgtech.com](mailto:sales@dgtech.com)



**SHOP ONLINE:**  
[store.dgtech.com](http://store.dgtech.com)



## Flex-Ray

FlexRay is quickly becoming a worldwide standard for high-speed vehicle networks, and here is where you can learn all about the protocol, functionality and applications that use it.

Attendees learn about the FlexRay protocol and its specific layers using the latest version of FlexRay standards.

Additionally, we discuss applicable topology, regulations and implementation requirements. Details of device hardware and software interfaces are provided, as well as an update on FlexRay's use in global vehicle markets.

You will gain: An in-depth knowledge of FlexRay and how it functions, FlexRay specific development tools and an understanding of its global status of its use.

Who should attend: Engineers and technical personnel. Knowledge of in-vehicle networking is helpful, but not necessary.

Management personnel have also benefited from these courses to gain an overview of the protocols, techniques and acronyms used as well as some of the development, implementation, and engineering challenges experienced.

**1 Day Course Cost: \$695; includes materials**

Dates Offered:

**Indianapolis:** October 14  
**Farmington Hills:** May 20



Instructor-Ken DeGrant



## LIN (Local Interconnect Network)

LIN is a leading edge and relatively low cost network often used to augment a CAN network for body and chassis electronics. It is replacing older protocols such as J1850 and K line (ISO 9141), where the bandwidth and flexibility of CAN is not required.

You will learn the LIN protocol, configuration language and the API. The differences between the various versions of LIN and the SAE standard are also discussed.

A demonstration illustrating how LIN frames are constructed and their architecture is given.

Objective: To give students an in-depth knowledge of LIN and its different implementations.

Who should attend: Engineers and technical personnel. Knowledge of in-vehicle networking is helpful, but not necessary.

## Course Outline: (1 day)

- Introduction: General LIN Overview
- Where LIN is used; hardware requirements
- LIN protocol - 1.2, 1.3, 2.0 and SAE J2602
- LDF - LIN Descriptor Files - Demystifying the LDF
- Schedule Tables: What is a Schedule Table?

**Course Cost: \$ 695; includes materials**

Dates Offered:

**Indianapolis:** October 15  
**Farmington Hills:** May 21



Instructor-Mark Zachos



**DG Technologies**  
33604 West Eight Mile Road  
Farmington Hills, MI 48335  
248.888.2000 248.888.9977 fax  
[www.dgtech.com](http://www.dgtech.com) [sales@dgtech.com](mailto:sales@dgtech.com)



**SHOP ONLINE:**  
[store.dgtech.com](http://store.dgtech.com)

Register online at: [www.dgtech.com/services/registration.php](http://www.dgtech.com/services/registration.php)  
or fax this page to 248.888.9977

Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State, Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Ext: \_\_\_\_\_ Cell: \_\_\_\_\_ Email: \_\_\_\_\_

**Important:**

Please make sure you receive a confirmation from us. Call if you do not receive one to be certain you are properly registered.

**Via Mail**

**Credit Card** (please circle one) VISA MC AMEX DISC  
Credit Card Number: \_\_\_\_\_ Expires: \_\_\_\_\_  
Customer Card ID Number (CCID), last 3 digits, back of card: \_\_\_\_\_

**OR:**  My check is enclosed  
 My purchase order is enclosed/attached

(Note: AMEX may have CCID on front of card, 4 digits)



Signature: \_\_\_\_\_

2014

**Heavy Duty Truck & Bus**  
2 days (\$1,245)

- March 4-5 (FH)
- June 17-18 (Indianapolis)
- September 16-17 (FH)
- November 11-12 (Indianapolis)

**Diagnostics On CAN-Basic OBD**  
1 Day (\$695)

- March 6 (FH)
- July 19 (Indianapolis)
- September 18 (FH)
- November 13 (Indianapolis)

Call for special 1 Day session availability

**FlexRay**  
1 Day (\$695)

- May 20 (FH)
- October 14 (Indianapolis)

**CAN and Higher Level Protocols**  
2 Days (\$1,245)

- March 6-7 (FH)
- July 19-20 (Indianapolis)
- September 18-19 (FH)
- November 13-14 (Indianapolis)

**LIN (Local Interconnect Bus)**  
1 Day (\$695)

- May 21 (FH)
- October 15 (Indianapolis)

**Registration and Class Information**

- 1) Please register early. Space is limited to ensure personal attention.
- 2) Confirmation, discounted hotel information and directions to DG Technologies' office will be provided.
- 3) Make sure you receive confirmation from DG Technologies! If you do not, please contact us to ensure your reservation is made.
- 4) Seminars run from 9:00 AM to 4:30 PM. Lunch, snacks and beverages are included.
- 5) A 10% discount is offered for booking three or more attendees from the same company for the same class.
- 6) Cancellations or transfers must be made 14 days or more prior to the start of the seminar. Transfers can be made at any time. No refunds will be granted for cancellations made after this time period.
- 7) Classes not meeting minimum enrollment requirements are subject to cancellation. Attendees will be notified at least one week in advance of a cancellation.
- 8) Unless otherwise indicated, our seminars are held at DG's facilities, either in Farmington Hills, MI or Indianapolis, IN.
- 9) Contact DG Technologies for further information.

Venue: Unless otherwise indicated, our seminars are held at DG's facilities in Farmington Hills, Michigan or Indianapolis, Indiana. Please contact us at [sales@dgtech.com](mailto:sales@dgtech.com) for effective, economical on-site seminars.



DG Technologies  
33604 West Eight Mile Road  
Farmington Hills, MI 48335  
248.888.2000 248.888.9977 fax  
[www.dgtech.com](http://www.dgtech.com) [sales@dgtech.com](mailto:sales@dgtech.com)



**SHOP ONLINE:**  
[store.dgtech.com](http://store.dgtech.com)