

Automotive Ethernet and Central Gateway

Duration:	5 days
Delivery Format:	Classroom and Online
Target Audience:	Automotive Ethernet Users in vehicles
Learning Outcomes:	<p>ISO/OSI Model</p> <p>Automotive Ethernet-Physical Layer</p> <p>Ethernet, IP, TCP and UDP, Security and VLANs</p> <p>Automotive Ethernet application protocols - DoIP, SOME/IP, Ethernet switch, Central Gateway Unit, Time Synchronization, Network Management, AUTOSAR Implementation.</p>
Prerequisite:	Understanding of AUTOSAR stack

Training Curriculum:

Day 1

1. Introduction of Ethernet and AUTOSAR

- Motivation for Automotive Ethernet- Advantages and Opportunities
- Automotive Protocols and their implementation
- Ethernet architecture, Operation and Hardware
- Introduction to AUTOSAR and Communication/Diagnostic Stack of AUTOSAR

2. Configuring

- Traditional Signal Routing in Ethernet
- Creating an ECUC for traditional Signal Routing in Ethernet
- Configuring the Com Module, PDUR
- Configuring the Socket Adaptor
- Configuring the TCP /IP stack to suit Traditional routing

Day 2

3. Ethernet Switch

- Introduction on the working of the Ethernet Switch
- Configuring the Ethernet Switch
- Configuring the VLAN setting for Ethernet Switch

4. DOIP

- Introduction to DoIP
- DoIP Architecture and Requirements
- DoIP Operation
- Protocol Details
- DoIP implementation over UDS service and testing

Day 3

5. AUTOSAR Implementation of Central Gateway Unit

- Reading the ECUC
- AUTOSAR Signal over Ethernet
- Application Gateway Implementation over Ethernet
- Signal Gateway
- PDU Gateway
- Signal Mapping between different protocols
- Signal mapping between different buses
- Testing

6. SOA and SOME/IP

- Introduction and Impact of Service Oriented Architecture (SOA) in Automotive Domain
- Introduction to SOME/IP
- SOME/IP protocol Format
- Introduction to SOME/IP-SD
- SOMEIP Practical- Request and Response
- SOME/IP use case discussion
- SOME/IP implementation and testing
- Configuring the BSW for SOME/IP implementation

Day 4

7. Time Synchronization in Ethernet

- Protocols associated with Time Sync in Ethernet
- Requirement of Time Synchronization in Ethernet
- Tsync modules in Ethernet
- EthTsync module for end user
- EthTsync module for Switch

8. StbM

- Handling different customers in StbM
- Configuring the StbM for different customers

Day 5

9. Power Management Topics

- Configuring the BSWM and ECUM for specific use cases.
- Handling different Modes in the BSWM
- Contrasting usage of COMM and BSWM in communication

10. Network Management in Ethernet

- Ethernet State Manager and Communication Manager
- UDPNm module
- Network Manager
- Configuring the UDP Nm for Car wakeup