

Ethernet and IP Fundamentals

Agenda VectorAcademy

Duration:	1 Day
Target Group:	Ethernet and IP users in vehicles
Prerequisites:	Basic understanding of serial data transmission
Goal:	Knowledge about Ethernet, IP, TCP and UDP in vehicles. Knowledge about use cases of Ethernet and IP as well as about use-oriented protocols.

1 | Introduction 0.5 h

- > Motivation for Ethernet and IP in vehicles
- > Protocols and their application areas

2 | Physical Layers 1.0 h

- > Overview of used physical layers
- > Topologies and network architectures

3 | Ethernet and IP basics 2.5 h

- > Ethernet II Frame, bus access methods, addressing
- > IP packet, IP addresses, subnet masks, IP routing
- > Extensions with ARP and DHCP

4 | Introduction to TCP and UDP 1.0 h

- > Structure of TCP and UDP packets
- > Connection-oriented and connectionless communication

5 | Use-oriented protocols in vehicles 2.0 h

- > SOME/IP: Service-oriented communication
- > AVB: Time synchronized data transmission
- > ISO 15118: Smart Charging for electric vehicles
- > XCP: Universal measurement and calibration protocol
- > DoIP: Diagnostics over IP