

# Microchip Automotive Ethernet 10Base-T1S webinar



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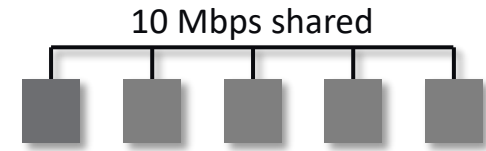
A Leading Provider of Smart, Connected and Secure Embedded Solutions

이진우(Jean Lee) 수석, Pr. Embedded Solutions Engineer

August 30, 2022

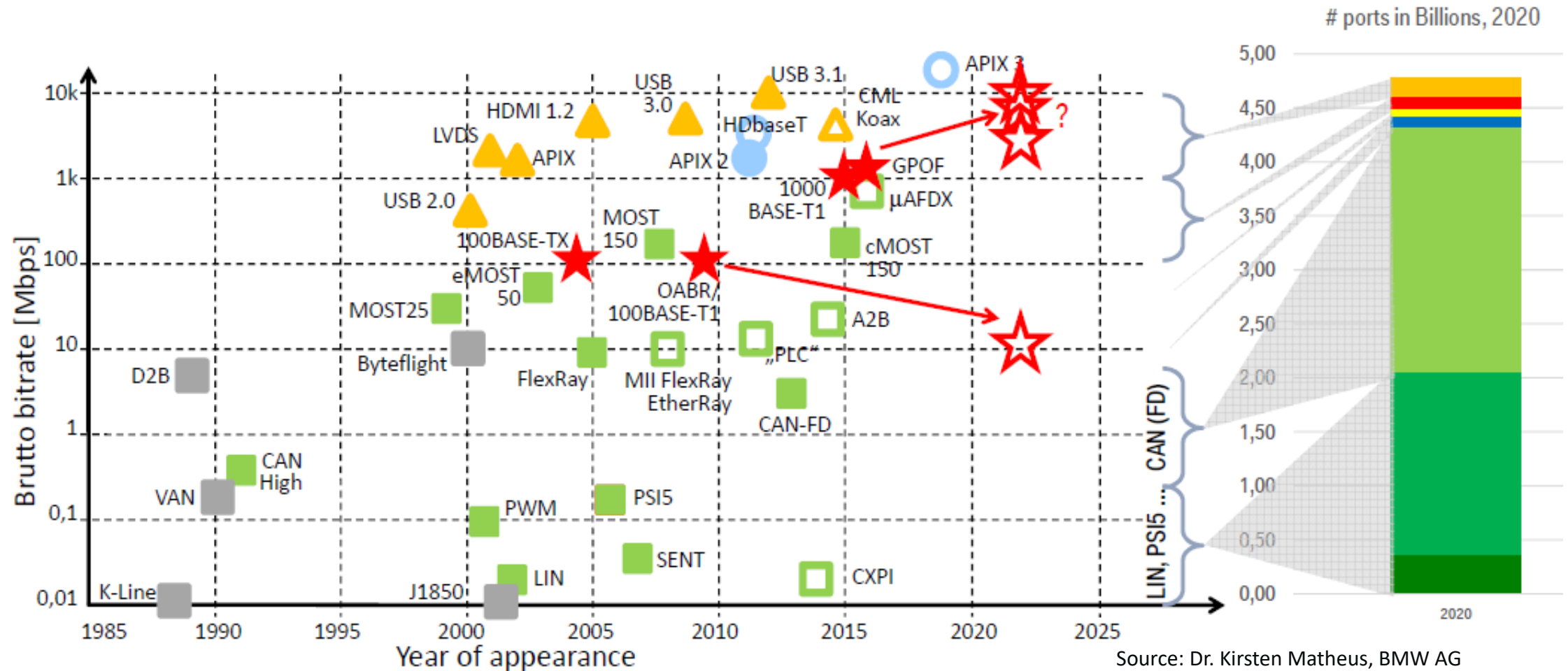
# What is 10BASE-T1S

- **Ethernet on a UTP bus line**
  - 10 Mbps shared
  - Half-duplex
  - 2 to at least 8 nodes
  - Up to at least 25 m
  - **No collisions**



# Why is 10BASE-T1S needed in cars?

Majority of network connections need less than 10Mbps



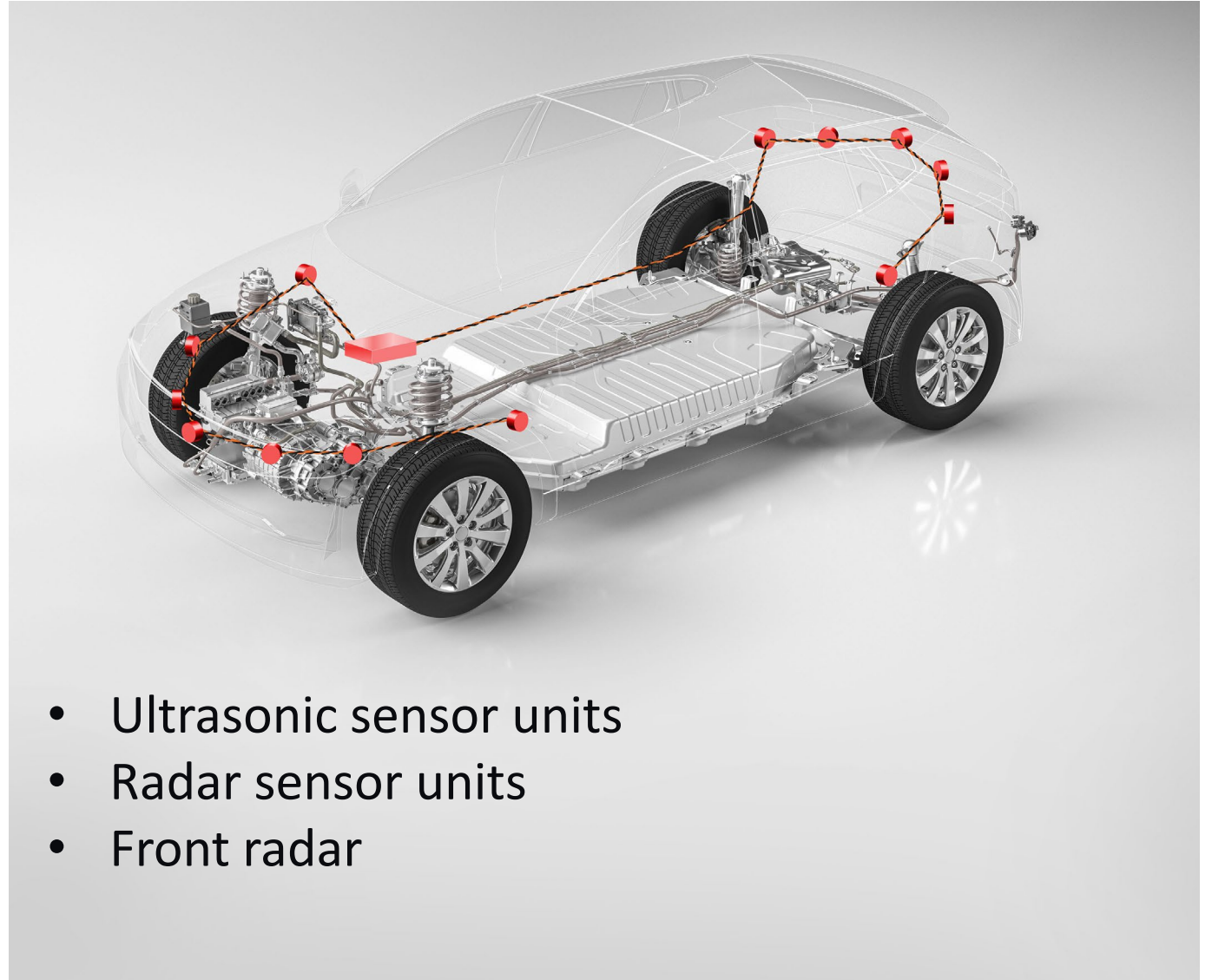
# 10BASE-T1S Application Examples

- **Sensor**

- Ultrasonic
- Radar
- Microphones
- Powertrain

- **Actuator**

- Light
- Speaker
- Electric Motor



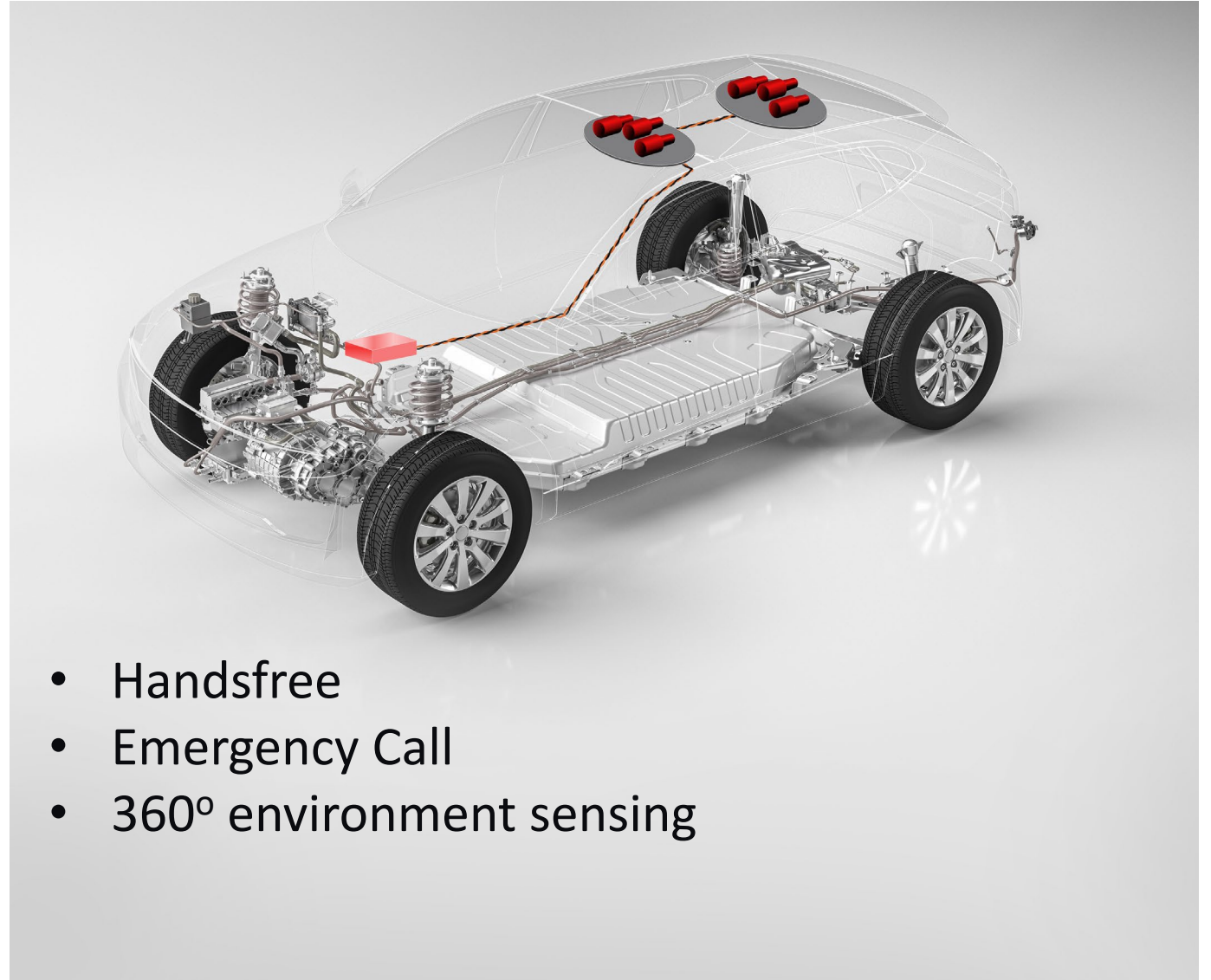
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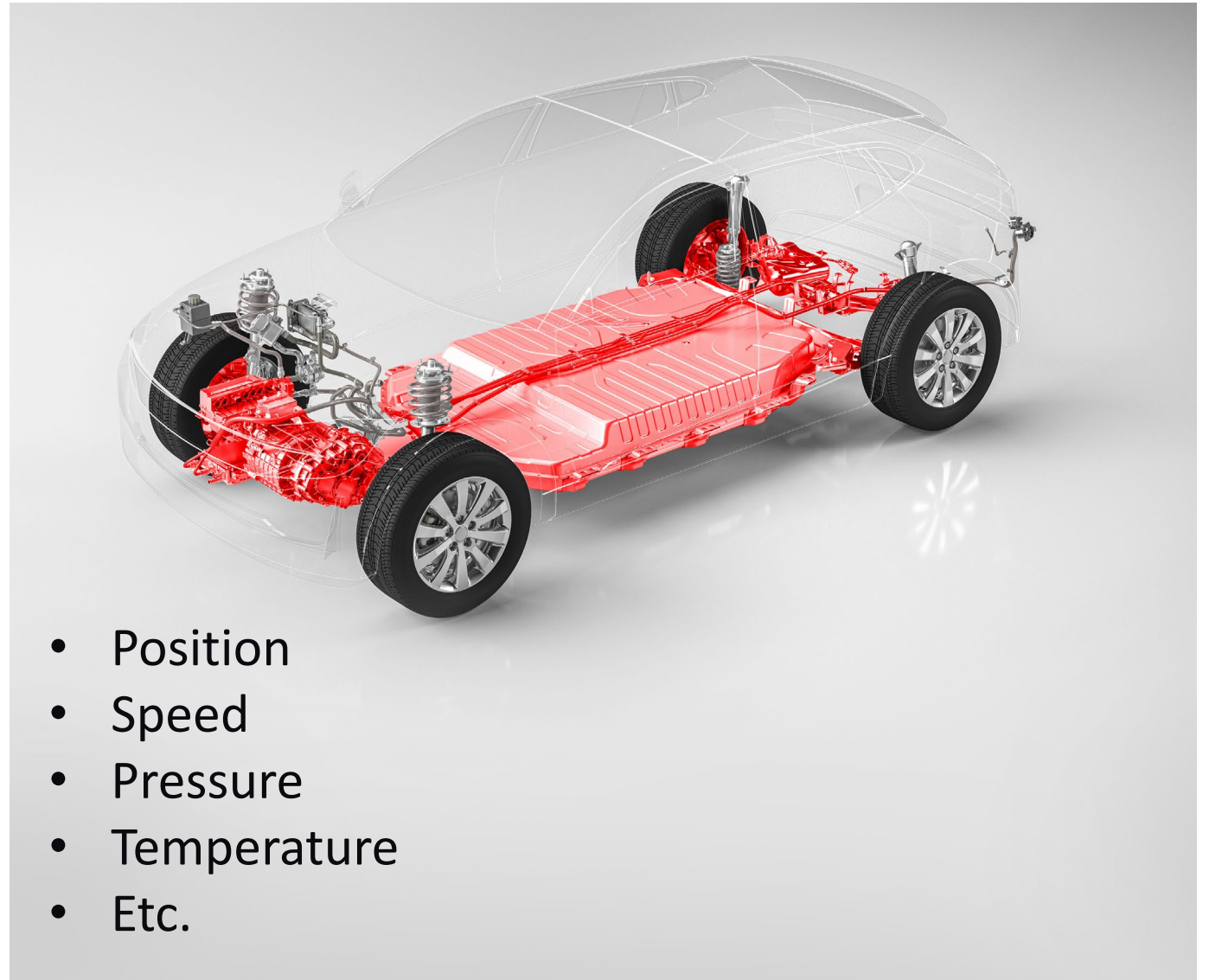
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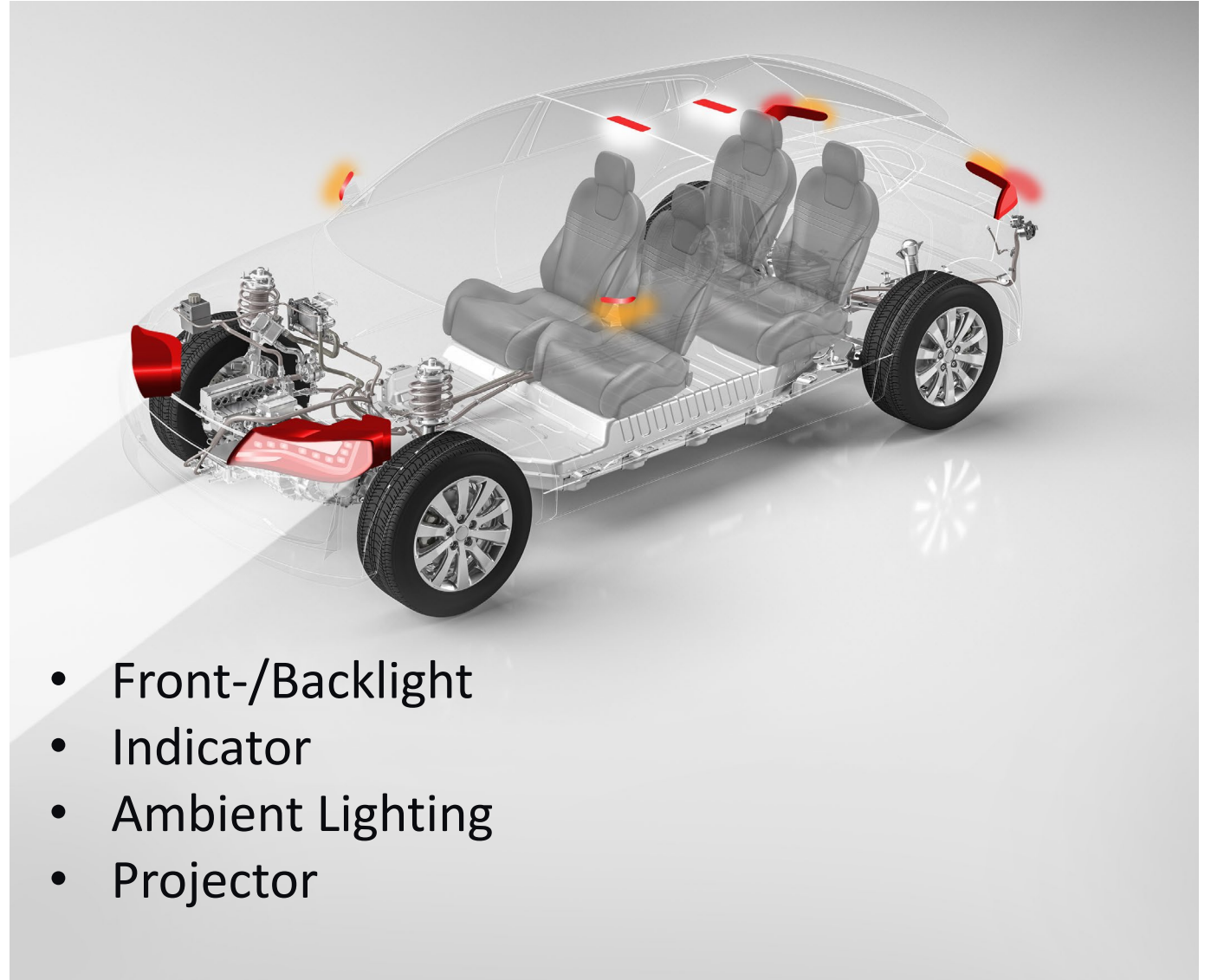
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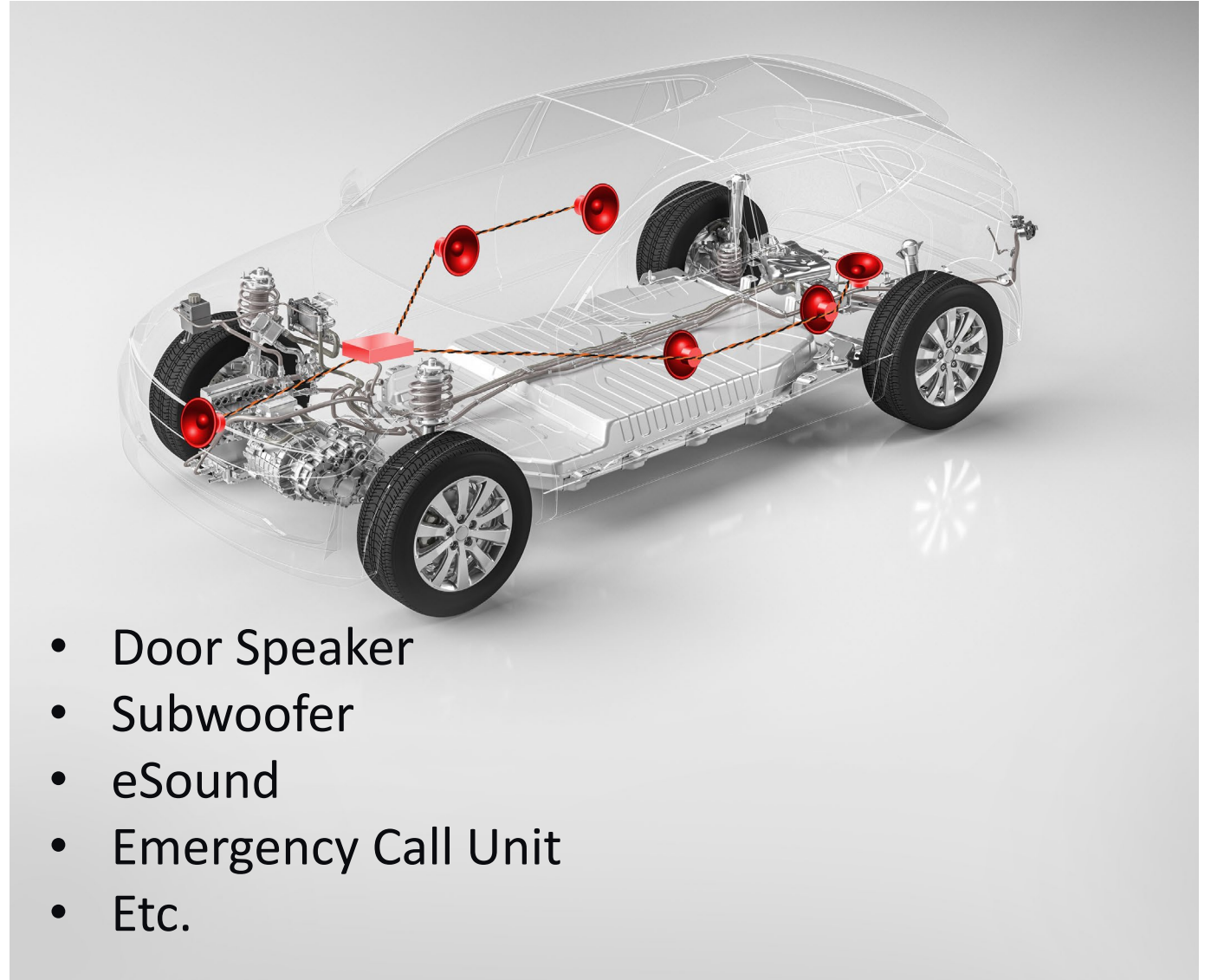
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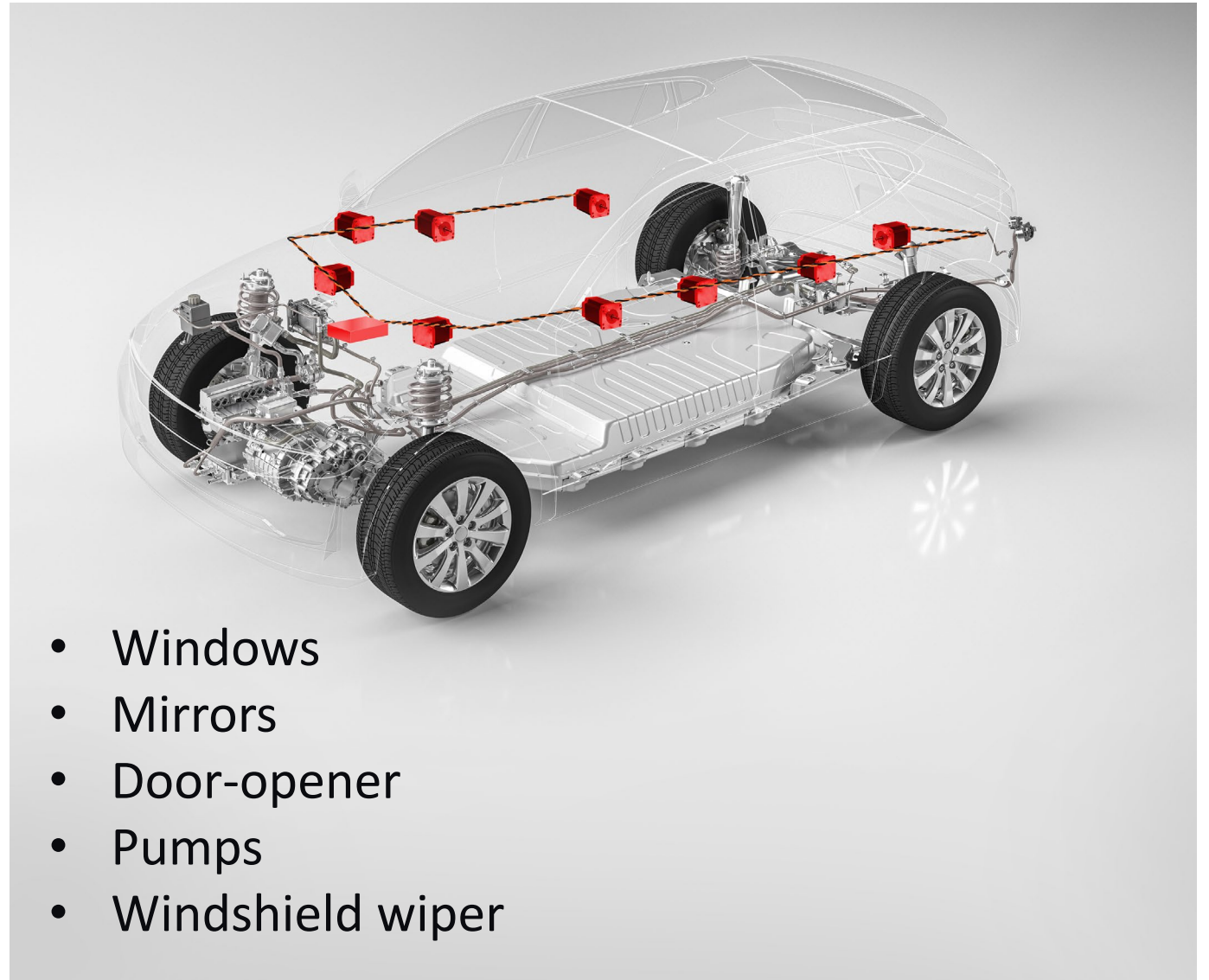
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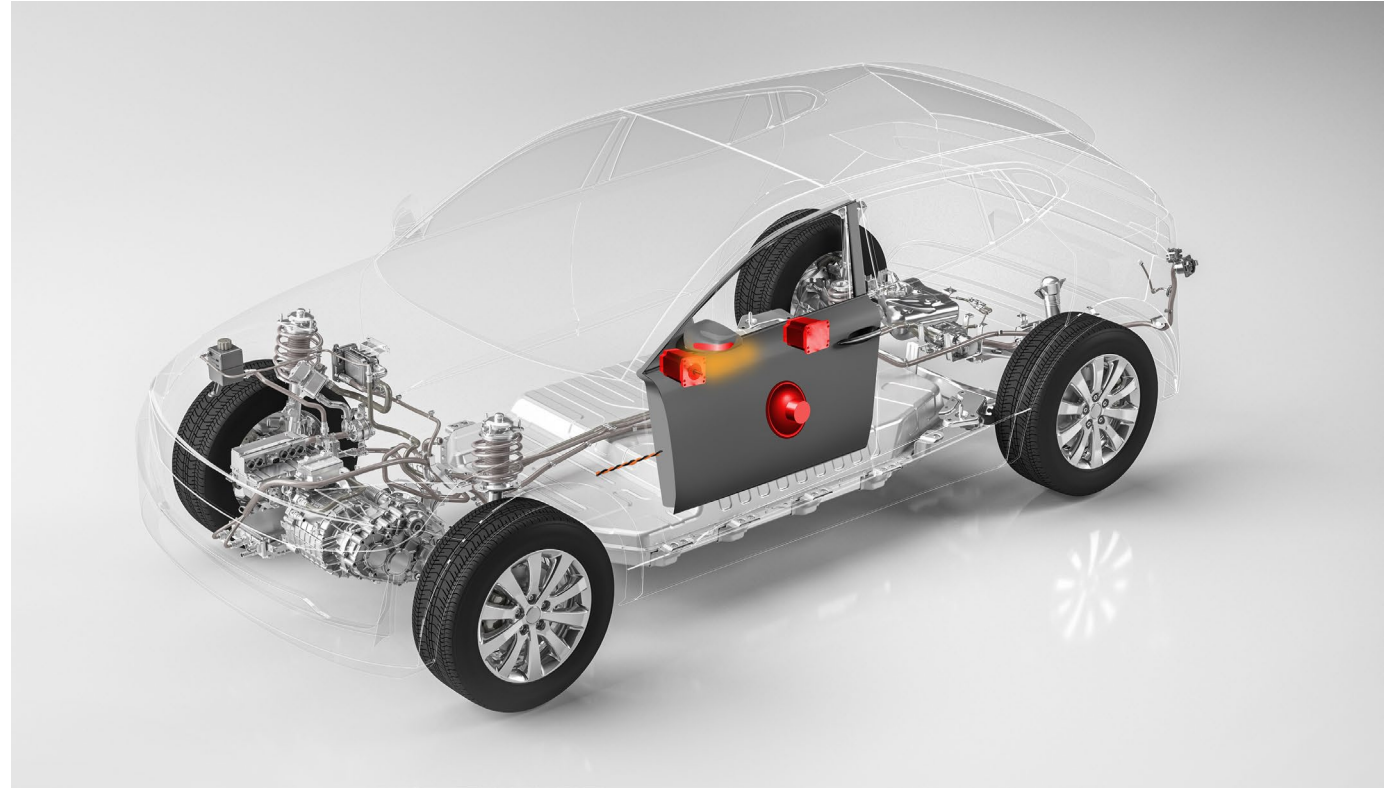
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# 10BASE-T1S in Zone Architecture

- **Example Door Zone**
  - Window Lifter
  - Mirror Control
  - Speakers
  - Lock
  - Ultrasonic
  - Ambient/Interior Light
  - Indicator Light



➤ **Multiple applications on a single cable!**

# 10BASE-T1S Enabling Zone Architecture

- **Door**
- **Bumper**
- **Seat**
- **Roof**
- **Engine Compartment**
- **Battery**
- **Etc.**



# 10BASE-T1S Products

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PHYs



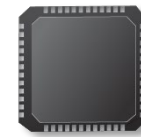
MAC-PHYs



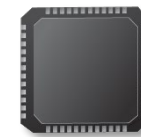
Transceiver



Endpoints



MCUs



Switches



FPGAs

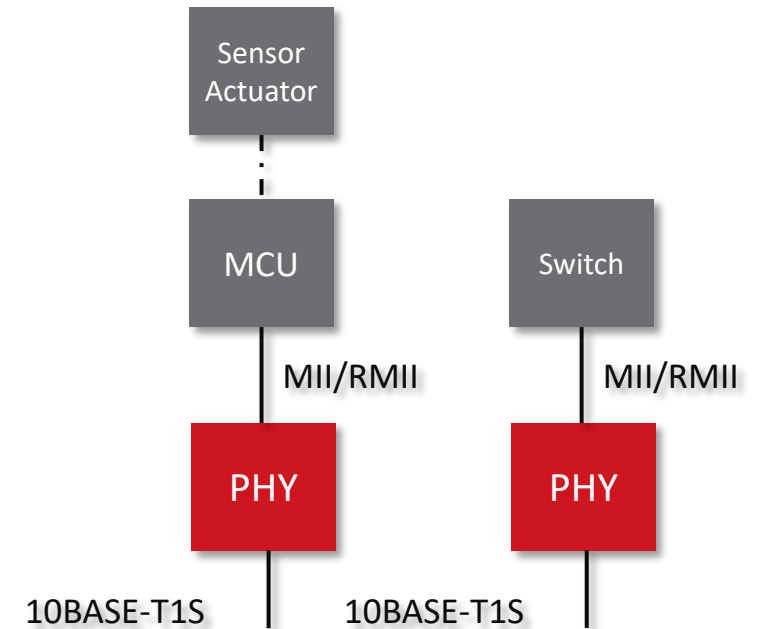


Tools

# 10BASE-T1S PHY - LAN867x

## Overview

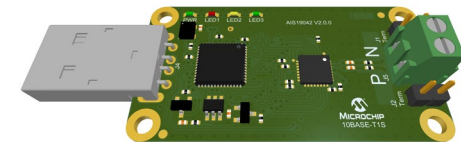
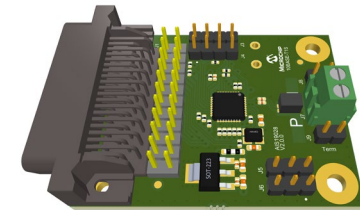
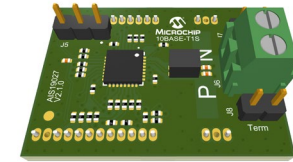
- **Interfaces**
  - MII / RMII
  - MDIO
  - GPIO
- **Features**
  - Multidrop
  - CSMA/CD, PLCA
  - Extended Control of Media Access
  - ISO26262
  - Temperature Grade 1 (AEC-Q100)
  - Low Power
- **Package:**
  - QFN 36 / 32 / 24
  - 6x6 / 5x5 / 4x4 mm



# 10BASE-T1S PHY - LAN867x

## Application Boards

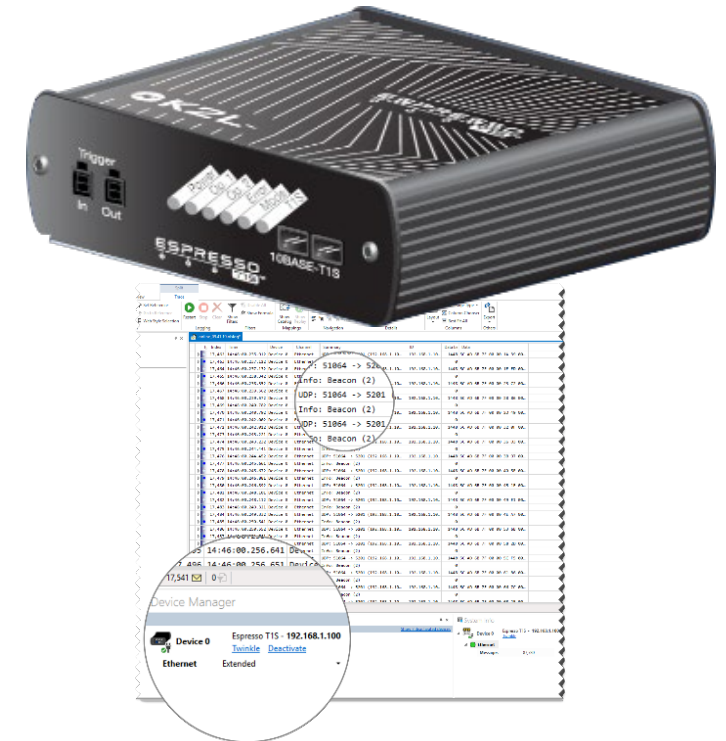
- **10BASE-T1S PHY RMII Board**
  - Fits to many Microchip MCU boards
  - Smallest formfactor
- **10BASE-T1S PHY MII Board**
  - Fits to many Microchip MCU boards
  - Small formfactor
- **10BASE-T1S PHY USB adaptor**
  - Makes every USB host a potential 10BASE-T1S node
  - Drivers for Linux and Windows



# Tools

## Spy

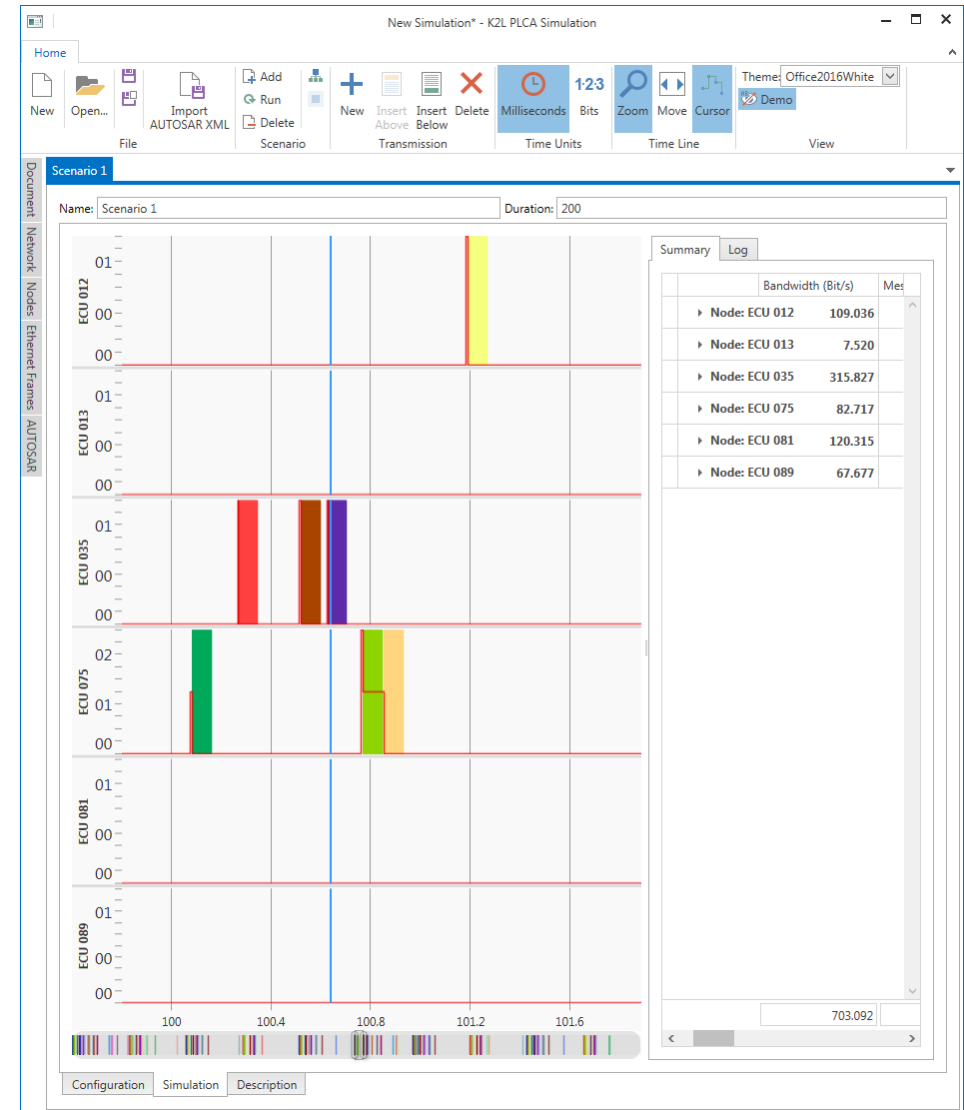
- Tracing of low-level bus events
- Hardware timestamping
- 100BASE-TX interface to the PC for data and control
- Time-sync with OptoLyzer MOCCA family devices
- Seamless integration into OptoLyzer® Studio



# Tools

## Simulation

- Simulation for 10BASE-T1S system design
- Import CAN/FlexRay™ cluster defined in AUTOSAR XML
- ECU activity visualization
- Calculation of statistics for jitter, bandwidth, etc.



# Thank you!

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