

IEEE 802.3  
Call for Interest  
*Ethernet for Automotive Imaging Sensors (ISAAC)*  
Opening Report

Kirsten Matheus  
BMW

George Zimmerman  
CME Consulting/  
APL Group, Cisco, Marvell, OnSemi, SenTekSe

802.3 Plenary  
July 2023

# CFI Request

---

This is a call for interest to initiate a Study Group to develop a PAR and CSD for an electrical Ethernet physical layer and associated interface client specifications optimized for automotive imaging sensors. We believe there is a timely market opportunity for the introduction of such specialized interfaces now as the number of cameras per vehicle grows rapidly. The target automotive cameras stream multigigabit-speed data from the sensor and have low-utilization, intermittent control data in the other direction over the Ethernet link. While transmit and receive traffic flows are independent in traditional Ethernet, these new physical layers may benefit from additional control between the MAC and the PHY, e.g., at the Reconciliation Sublayer, to optimize the MAC/PHY interfacing and PHY power/complexity. These new physical layer applications operate under very tight power and cost/complexity constraints, creating the opportunity for new or modified IEEE 802.3 standards to better serve the application.

# Overview: Motivation

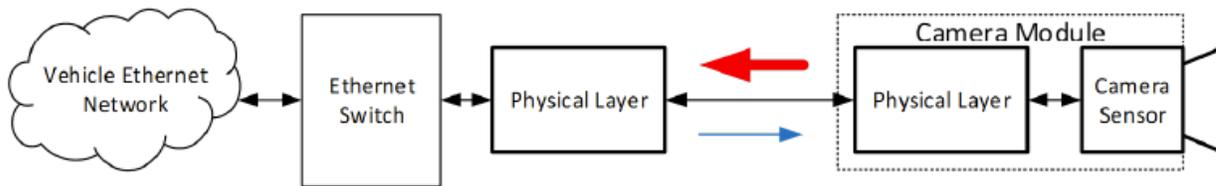
---

- Emerging use of Ethernet for automotive imaging sensors faces the challenge of replacing entrenched proprietary technologies in an extremely cost-sensitive environment with power constraints.
  - Unlike traditional Ethernet stations, dedicated sensors and displays present an inherently asymmetric data stream - typically low-rate control plane in one direction and a higher rate data plane in the other direction of transmission.
- The proposed CFI is to consider a study group for a project which may:
  - Specify an inherently asymmetric Ethernet PHY to specifically meet the needs of automotive imaging sensors
  - Specify the reconciliation sublayer and mechanisms to provide for PHYs which may have different throughput capabilities in each direction

# What are we talking about?

Good Question for Study Group – Is the camera side PHY the same as the network side?

Support of Ethernet networking is essential for being future proof. Network vs Camera Side

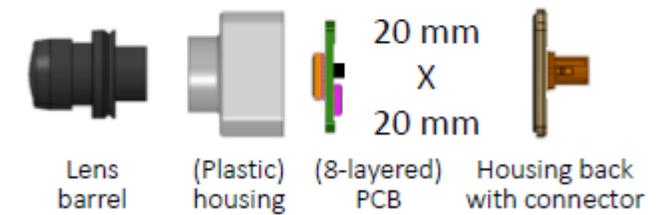


## Network Side:

- Transmitting occasionally
- Receiving most of the time
- Less heat constraint
- Power savings desirable
- **Ethernet interoperability is key**

## Camera Side:

- Transmitting most of the time
- Receiving occasionally
- Important to control any added heat in camera module
- Power savings are very important
- **Cost and heat are key**



(source: Daniel Hopf, Continental)

# Why now

---

- Imaging sensors are driving bandwidth in automotive Ethernet networks
- Incumbent, proprietary technologies are proving more difficult to unseat than previous projects expected
- Automotive platforms are expected to significantly increase the number of cameras per car in the next 5 years

Lead times for selecting solutions drives a standard now!

# Logistics

---

An overview presentation session will be given to support consensus building:

- Date – Tuesday, 11 July 2023
- Time – 19:30 to 21:00 CEST (17:30 to 19:00 UTC)
- CFI Presentation:
  - [https://www.ieee802.org/3/cfi/request\\_0321\\_1.html](https://www.ieee802.org/3/cfi/request_0321_1.html)

Request to form Study Group will occur during the closing 802.3 WG Plenary, 13 July 2023

Questions?

Thank you!