

Unconfirmed Meeting Minutes: IEEE 802.3 Ethernet for Automotive Imaging Sensors
(ISAAC) Study Group
January 9, 2024
802.3 ISAAC Study Group Interim (telephonic)

Prepared by George Zimmerman

IEEE 802.3 Ethernet for Automotive Imaging Sensors (ISAAC) Study Group meeting convened at 6:00 AM (PST (Pacific Standard Time, UTC-3), Tuesday, January 4, 2024, by Jon Lewis, IEEE 802.3 Ethernet for Automotive Imaging Sensors (ISAAC) Study Group Chair.

Attendance is listed in Appendix A

ADMINISTRATIVE MATTERS

Presentation: [agenda ISAAC 01 010924.pdf](#)

Presenter: Jon Lewis, Chair.

The Chair reviewed the agenda. Mr. Lewis turned to presentation [agenda ISAAC 01 010924.pdf](#).

Approval of Agenda:

The chair asked if there were objections, additions, or corrections to the agenda displayed. There were none. The chair announced that the agenda was considered approved.

The Chair then resumed the review of presentation [agenda ISAAC 01 010924.pdf](#):

- Mr. Lewis noted that there should be no recording or photography without permission.

Mr. Lewis asked if anyone was attending from the press including those who would run a public blog on this meeting – none responded.

Mr. Lewis then continued review of the presentation, Big Ticket items for this meeting, to develop PAR, 5 Criteria, and Objectives for ISAAC.

Mr. Lewis reviewed the goals for the meeting, access to the reflector and website, and ground rules.

The chair reviewed that in study groups, in general, anyone on the call may vote, and that, should we need it, he would review the voting rules in more detail at that time.

Mr. Lewis moved on reviewing the links to the rules.

IEEE Patent Policy, Mr. Lewis asked if anyone in the meeting needed review of the pre-PAR patent policy in detail. None responded, therefore, he showed and briefly reviewed the patent policy slides for patent policy for study groups from [agenda ISAAC 01 010924.pdf](#). (06:05 PST)

Mr. Lewis asked if anyone wished a full reading of the copyright slides. None responded. He therefore showed and briefly reviewed the IEEE SA copyright slides from [agenda ISAAC 01 010924.pdf](#)

Mr. Lewis then read and reviewed the IEEE ethics and code of conduct slides from [agenda ISAAC 01 010924.pdf](#).

He then read and showed the slides on “Participant behavior” from [agenda ISAAC 01 010924.pdf](#)

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Mr. Lewis showed and read the “individual process” slide (“Participants ... shall act independently...”). Mr. Lewis asked if anyone objected to the individual process and if so to leave the meeting. There were no participants that left the meeting.

Mr. Lewis advised the group of the IEEE SA (anti) dominance policy, showed, and read the slide “...activities shall allow the fair & equitable consideration” slide. There were no questions.

Attendance, Mr. Lewis advised the group of the IEEE meeting attendance tool and procedures.

Mr. Lewis reviewed the standards development process for IEEE and where this study group is in the process.

Mr. Lewis noted that there would be an “01a” version of the agenda deck, with the change that the footer of the slides would be corrected to read that

LIAISONS

The Chair noted there were no liaisons for the group at this meeting.

Mr. Lewis reviewed the procedure and time constraints for presentations for this meeting. He allotted and announced 15 minutes for each presentation.

Order of presentations: (6:11AM)

The first scheduled presenter (Kamal Dalmia, [EEE for ISAAC](#)) requested to go last, or, if necessary, to present at the January interim. There was no objection.

Future meetings

The chair announced that at the January 802.3 interim, ISAAC would meet 1/22 in the afternoon and 1/23 in the morning with an opportunity for consensus building overnight.

He also announced a contingent interim February 7, 2024 from 08h00-10h50 CDT. He also announced that both the January and March meetings require registration and a meeting fee, and that the early registration for March ended January 12.

PRESENTATIONS

The Chair then moved to the presentations for the meeting. (6:15 AM)

Title: Questions and responses to help move forward with PAR and objectives

URL:https://www.ieee802.org/3/ISAAC/public/010924/matheus_ISAAC_02_01092024.pdf

Presenter: Kirsten Matheus, BMW

Discussion: The presenter reviewed the straw polls on 25 Gbps PAR and objectives options, and expressed a concern that there would be continued discussion in the Task Force over adding a 25 Gbps objective during the task force, potentially delaying the project.

She then asked the question of what further information is needed to form a clear opinion for those who are open to both having 25 Gbps and not having 25 Gbps. Multiple participants expressed that the interpretation of the straw poll in the presentation did not properly express their opinion. Multiple participants suggested they desired additional discussion in the task force related to specific implementations. Another participant voiced that he needed to see data supporting the CSDs of technical feasibility and economic feasibility, while yet another voiced he needed to hear technical feasibility in an automotive environment.

(6:30 AM)

Title: Automotive Imager and 25 Gbps (01b)

URL:https://www.ieee802.org/3/ISAAC/public/010924/Zerna_ISAAC_01b_240109_Automotive_Camera25G.pdf

Presenter: Conrad Zerna, Aviva Links

Discussion: The presenter discussed issues which he considered misleading with regards to the use of 25 Gbps in automotive cameras, including that serdes are often advertised with the line rate, not the payload rate; that the rates may not be at the same cable length. He then discussed some opinions on the higher data rates in the ASA and A-PHY specifications, that he believed would not be suitable for use with cameras. He then expressed the opinion that stereo cameras and high resolution imagers were different from the lower resolution volume market, and suggested that volume automotive imagers were constrained differently from other applications. He suggested that the 25 Gbps might be addressed in a separate project.

In discussion a participant noted that the data presented (e.g., slide 3) also showed a clear trend to increase the rate. The presenter clarified that there would likely be applications running on higher rates but that there were technologies available, and in the presenter's opinion, those were not volume applications to be targeted by ISAAC. Another participant supported the conclusions of the presentation and thanked the presenter. Time elapsed with two participants still in the queue.

(6:50AM)

Title: Preliminary Feasibility Study for 25Gbps over Coaxial Channels
URL: https://www.ieee802.org/3/ISAAC/public/010924/Feyh_ISAAC_01_01092024.pdf

Presenter: German Feyh, Broadcom

Discussion: The presenter discussed some theoretical considerations with Salz SNR for 25 Gbps on coaxial link segments that a colleague had measured, and on these cables concluded he had negative decision point SNR. The presenter (and his colleague, Ahmad Chini, who the presenter had credited with the measurements) noted that noise measurements were needed to do better analysis and that improvements on the cable were needed. A participant pointed out that the analysis was sensitive to the transmit level and that 6 dB penalty applied in the analysis was the difference between a positive margin and a negative margin, and that the reach was still not decided.

(7:09)

Title: Why the PAR should not preclude 25G (01a)
URL: https://www.ieee802.org/3/ISAAC/public/010924/Wienckowski_3ISAAC_01a_010924.pdf

Presenter: Natalie Wienckowski, Independent

Discussion: The presenter discussed reasons and implications of ways to include (or preclude) 25 Gbps within the PAR scope.

In discussion, a participant expressed support for the contribution, and the presenter clarified that the text on slides 2 & 3 should indicate that a PAR split to separate 25 Gbps off if it is found to be delaying the project. Another participant suggested intermediate rates between 25 Gbps and 10 Gbps might be useful. The chair clarified that in his opinion, additional work (perhaps another CFI) would be needed to address intermediate rates. Another participant suggested that a project could include intermediate PHY rates. A third confirmed that they could do this if they "throttled the rate of the MAC", referencing how the VDSL PHY (10PASS-TS, see IEEE Std 802.3-2022, clauses 61 & 62) used a 100 Mbps MAC interface but provided lower data rate at the physical layer.

(7:30)

Title: Considerations for a 1 Gbps downlink PHY (Continued)

URL: https://www.ieee802.org/3/ISAAC/public/010924/matheus_ISAAC_01_01092024.pdf

Presenter: Kirsten Matheus, BMW

Discussion: The presenter discussed reasons she believed a 1 Gbps downlink PHY might be useful. She provided some comparisons with 1000BASE-T1 and 2.5Gb/s / 100 Mbps PHYs.

There was discussion with a number of participants supporting solutions that support 1 Gbps cameras.

(7:41)

The presenter for the next presentation ([On the Pros and Cons of Adding 1Gbps Downstream Data Rate](#), Ragnar Jonsson, Marvell), requested to delay his presentation to the January interim series so that full discussion could be had. This is in addition to the presentation ([EEE for ISAAC](#), Kamal Dalmia, Aviva Links), which the presenter had requested earlier this meeting to either go last or be postponed to the next meeting.

Both presenters agreed to post their presentations for the next meeting.

Future Meetings

The chair reviewed future meetings, announcing a telephonic interim January 9, 2024: 08h00-09h50 CDT, and reminding the group that the study group would meet during the 802.3 interim meeting series January 22-25, 2024 in St. Petersburg, FL, USA (in-person with remote access). The January meeting times are 1/22 from 1300-1800 EST, and 1/23 from 0800-1200 EST. Registration is required for the January 22-25 2024.

A contingent interim was announced for February 7, 2024: 08h00-10h50 CDT, noting that the February 7 meeting was the last day to make changes to pre-circulate the PAR & CSDs for March plenary. The March plenary would be held March 11-14, 2024: Denver, CO, USA, and the chair noted that a registration fee is required for both in-person and remote attendance at the plenary.

ADJOURNMENT

Having exhausted the agenda, Mr. Lewis adjourned the meeting at 7:46 AM PST.

Appendix A: Attendees at the IEEE 802.3 Ethernet for Automotive Imaging Sensors (ISAAC) Study Group Meeting, January 9, 2024 (69)

| Name | Employer | Affiliation | IMAT | Zoom |
|----------------------|--|--|-------------|-------------|
| Ahuja, Ramanjit | | ON Semiconductor | X | X |
| Akin, Sami | Volkswagen AG | Volkswagen Ag | X | X |
| Arndt, Christoph | | Continental Automotive Technologies GmbH | X | X |
| Baggett, Tim | Microchip Technology, Inc. | Microchip Technology, Inc. | X | X |
| Bar-Niv, Amir | Aquantia Corp | Marvell | X | X |
| Benyamin, Saied | Ethernovia | Ethernovia | X | X |
| Borda, Jamila J. | | BMW | | X |
| Boyer, Rich | Aptiv - Signal and Power Solutions | Aptiv Signal and Power Solutions | X | X |
| Chen, Li-Chung | | MediaTek Inc. | X | X |
| Chini, Ahmad | Broadcom Corporation | Broadcom Corporation | X | X |
| Cliber, David | | TE Connectivity | X | X |
| Dalmia, Kamal | Aviva Links Inc | Aviva Links Inc | X | X |
| Deore, Shruti | | Foxconn Electronics Inc. | X | X |
| Estrakh, Daniel | Valens Semiconductor | Valens Semiconductor | X | X |
| Feyh, German | Broadcom Corporation | Broadcom Corporation | X | X |
| Gauthier, Claude | NXP Semiconductors | NXP Semiconductors | X | X |
| Gerl, Markus | MD Elektronik | MD Elektronik | X | X |
| Goel, Sachin | Aviva Links Inc | Aviva Links Inc | X | X |
| Gorshe, Steven Scott | Microchip Technology, Inc. | Microchip Technology, Inc. | X | X |
| Graba, James | Broadcom Corporation | Broadcom Corporation | X | X |
| Han, Ruibo | China Mobile Communications Corporation (CMCC) | China Mobile Communications Corporation (CMCC) | X | X |
| Haydt, Mary Sue | Microchip Technology, Inc. | Microchip Technology, Inc. | X | X |
| Hogenmueller, Thomas | Robert Bosch GmbH | Robert Bosch GmbH | X | X |
| Hopf, Daniel | Continental Automotive Technologies GmbH | Continental Automotive Technologies GmbH | X | X |
| Hoshino, Masayuki | | Continental Automotive | X | X |
| HYAKUTAKE, YASUHIRO | Orbray Co., Ltd. | Orbray Co., Ltd. | X | X |
| Jin, Edward | | Molex | | X |
| Jones, Chad | Cisco Systems, Inc. | Cisco Systems, Inc. | X | X |

| Name | Employer | Affiliation | IMAT | Zoom |
|----------------------------|--|------------------------------------|-------------|-------------|
| Jonsson, Ragnar | Marvell Semiconductor, Inc. | Marvell | X | X |
| Kamiyama, Naoto | ROHM Co., Ltd. | ROHM Co., Ltd. | X | X |
| Kapoor, Samay | | Aviva Links Inc | | X |
| Kikuta, Tomohiro | Orbray Co., Ltd. | Orbray Co., Ltd. | X | X |
| Klaus-Wagenbrenner, Jochen | | CARIAD | | X |
| Kopet, Tom | ON Semiconductor | onsemi | X | X |
| Lasry, Ariel | Qualcomm Technologies, Inc | Qualcomm Technologies, Inc | X | X |
| Law, David | | HPE | | X |
| Lefkin, Peter | | MIPI Alliance | | |
| Lewis, Jon | Dell Technologies | Dell Technologies | X | X |
| Liebl, Christian | | Continental Automotive Systems AG | X | X |
| Lin, Chia-Chang | | MediaTek Inc. | | X |
| Lo, William | Marvell Semiconductor, Inc. | Axonne Inc. | X | X |
| Lou, Wei | | Broadcom | | X |
| Martino, Kjersti | Inneos | Inneos | X | X |
| Matheus, Kirsten | BMW Group | BMW Group | X | X |
| McClellan, Brett | | Marvell | | X |
| Nariya, Makoto | Sony Semiconductor Solutions Corporation | Sony Group Corporation | X | X |
| Neulinger, Christian | MD Elektronik | MD Elektronik | X | X |
| Ng, Hiok Tiaq | Aviva Links Inc. | Aviva Links Inc | X | X |
| NIIHARA, YOSHIHIRO | Fujikura Ltd. | Fujikura Ltd. | X | X |
| Pischl, Neven | Broadcom Corporation | Broadcom Corporation | X | X |
| Razavi, Alireza | Marvell | Marvell | X | X |
| Ringel, Haim | General Motors Company | General Motors Company | X | X |
| Sedarat, Hossein | Ethernovia | Ethernovia | X | X |
| Souignier, Tom | Broadcom Corporation | Broadcom Corporation | X | X |
| Spiessens, Peter | | Omnivision | X | X |
| Steyer-Ege, Janik | Robert Bosch GmbH | Robert Bosch GmbH | X | X |
| Strohmeier, Heiko | Robert Bosch GmbH | Robert Bosch GmbH | X | X |
| Sun, jingcong | | Motorcomm Electronic Technology Co | X | X |

| Name | Employer | Affiliation | IMAT | Zoom |
|--------------------------|---|---|-------------|-------------|
| TAKEUCHI, JUNICHI | JAE Electronics, Inc | JAE Electronics, Inc. | X | X |
| TAZEBAY, MEHMET | Broadcom Corporation | Broadcom Corporation | X | X |
| Tofanicchio, Giuseppe | | STMicroelectronics | X | X |
| Torres, Luisma | Knowledge Development for Plastic Optical Fiber | Knowledge Development for Plastic Optical Fiber | X | X |
| Turner, Max | Ethernovia | Ethernovia | X | X |
| Wang, Shun- Sheng | Realtek Semiconductor Corp. | Realtek Semiconductor Corp. | X | X |
| Wienckowski, Natalie | None - Self-funded | IEEE member / Self Employed; Independent Consultant | X | X |
| Zerna, Conrad | Fraunhofer IIS | Avivalinks Inc. | X | X |
| Zhang, Tingting | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | X | X |
| Zhuang, Yan | Huawei Technologies Co., Ltd | Huawei Technologies Co., Ltd | X | X |
| Zimmerman, George | CME Consulting, Inc. | CME Consulting/ADI, APL Group, Cisco, Marvell, OnSemi, SenTekSe LLC, Sony | X | X |