Unconfirmed Meeting Minutes: IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force
July 11-12, 2018
San Diego, CA USA

Prepared by Jon Lewis

IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force meeting convened at 8:00 AM, Thursday, July 11, 2018 by Steve Carlson, Task Force Chair.

Attendance is listed in Appendix A

Administrative Matters

Mr. Carlson called for introductions and affiliations then reviewed

Motion #1:   Move to approve the agenda as shown in agenda_3ch_01_0718.pdf
M: Bob Grow   S: Thomas Hogenmueller

Approved by voice without opposition (Procedural > 50%)
Motion Passes

Motion #2:   Move to approve the minutes of the May 2018 IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force Meeting.

M: Natalie Wienckowski   S: Mike Gardner
Approved by voice without opposition (Procedural > 50%)

Motion Passes

Mr. Carlson displayed the agenda in agenda_3ch_01_0718.pdf.

- Mr. Carlson noted that there should be no recording or photography.
- Mr. Carlson asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

The WG Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Carlson advised the group of the IEEE meeting attendance tool and procedures, including both the attendance book and the web attendance tracking tool. Mr. Carlson pointed out that the new attendance book contains GDPR notice.

The WG Chair reviewed the IEEE structure for standards development and the bylaws by which the Task Force is governed.

IEEE Patent Policy, at **8:20 AM**, Mr. Carlson showed the patent slides and proceeded to read aloud slides 1 and 2. Mr. Carlson made the call for potentially essential patents at **8:22 AM**, and none responded. Mr. Carlson then read aloud slides 3 and 4.

Mr. Carlson showed slide 16 entitled "Participation in IEEE 802 Meetings" and proceeded to read the slide aloud. Mr. Carlson asked if there was any discussion on the slide, none responded.

The Chair reviewed the IEEE 802.3 Standards process and where the Task Force was in the process and the process by which we will develop the standard.

Liaisons:

- [MIPI Alliance to IEEE 802.3 on establishing a liaison](#)

The Chair then showed the locations of the approved project documents for the Task Force and reviewed the objectives for the Task Force.

Mr. Carlson reviewed slide 27-28 on presentation issues and noted that generally the group was following these guidelines.

PRESENTATIONS:

Mr. Carlson then moved to the presentations for the meeting.

Title: Ad-Hoc Report ([zimmerman_3ch_01_0718.pdf](#))
Presenter: George Zimmerman, Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group

Mr. Carlson noted that for future ad hoc meetings the calendar invite would not contain the teleconference details and that those would be published in the P802.3ch private area.

Motion #3: Move to confirm minutes for ad hocs on 5/30, 6/13, and 6/27/18 as posted.

M: George Zimmerman   S: Thomas Hogenmueller

Approved by voice without opposition (Procedural > 50%)
Motion Passes

Wednesday, 7-9AM Pacific Time every 2 weeks.
        – Ad hoc possibilities: 7/25, 8/8, 8/22, 9/5
The next Ad hoc meeting will be announced via the reflector.

Title: Editors Report (wienckowski_3ch_03_0718.pdf)
Presenter: Natalie Wienckowski, General Motors

Title: Insertion Loss Limit Analysis (DiBiaso_3ch_01_0718.pdf)
Presenter: Eric DiBiaso, TE Connectivity

Title: PoDL for NGAUTO- Technical and Economic Feasibility (bhagwat_3ch_02a_0718.pdf)
Presenter: Gitesh Bhagwat, Analog Devices

Title: Complexity Study for Multi-Gig Automotive PHYs (leung_3ch_01c_0718.pdf)
Presenter: Michael Leung, Marvell Semiconductor

The meeting broke for short break at 10:32 AM.

The meeting resumed at 10:54 AM.

Title: MGBASE-T1 PCS/PMA (Lo_3ch_01_0718.pdf)
Presenter: William Lo, Axonne

Title: Line modulation considerations for 2.5Gbps and 5/10Gbps Automotive Ethernet (DenBesten_3ch_01a_0718.pdf)
Presenter: Gerrit W. den Besten, NXP Semiconductors

The meeting broke for lunch at 12:08 PM.

The meeting resumed at 1:30 PM.

The Chair moved directly to presentations for the meeting.

Title: Multi-Gig PHYs Channel Code Proposal (Pandey_3ch_01a_0718.pdf)
Presenter: Sujan Pandey, NXP Semiconductors

Title: RS FEC Proposal for Multi-Gigabit Automotive PHY (tu_3ch_01b_0718.pdf)
Presenter: Mike Tu, Broadcom Ltd.

At 2:03 PM George Zimmerman assumed the duties of secretary.

Title: FEC/Framing/Modulation for 10GBASE-T1 PHY (farjarad_3ch_01d_0718.pdf)
Presenter: Ramin Farjadrad, Aquantia; George Zimmerman, CME Consulting/ADI, APL Group, BMW, Cisco, Commscope, LTC

At 2:28 PM Jon Lewis resumed the duties of secretary.

The meeting broke for short break at 3:05 PM.

The meeting resumed at 3:21 PM.

Presentations continued.

Title: 2.5Gbps Implementation Considerations (farjarad_3ch_02c_0718.pdf)
Presenter: Ramin Farjadrad, Aquantia

Title: End User PHY Preferences (wienckowski_3ch_01a_0718.pdf)
Presenter: Natalie Wienckowski, General Motors

Title: Asymmetrical Data Transmission (souvignier_3ch_01a_0718.pdf)
Presenter: Tom Souvignier, Broadcom Ltd.

Title: SEND_S Synchronization without Optional Autoneg (tu_3ch_02_0718.pdf)
Presenter: Mike Tu, Broadcom Ltd.

Title: OAM Proposal (wienckowski_3ch_02_0718.pdf)
Presenter: Natalie Wienckowski, General Motors

The Chair then discussed the business necessary at this meeting and the decisions that are necessary to move this project forward.

Straw Poll #1:
Chicago Rules
At 10 Gb/s I would support a modulation of PAM:
A: 4
B: 5
C: 6
A: 36   B: 8   C: 6

Straw Poll #2:
Chicago Rules
At 2.5 Gb/s I would support a modulation of PAM:
A: 2
B: 3
C: 4
D: 5
E: 6
F: 8
A: 20   B: 5   C: 26   D: 6   E: 2   F: 7

Straw Poll #3:
Chicago Rules
At 2.5 Gb/s I would support a modulation of PAM:
A: 2
B: 4
A: 15   B: 27
Pick One:
A: 15   B: 22

Straw Poll #4:
Chicago Rules
At 2.5 Gb/s I would oppose a modulation of PAM:
A: 2
B: 4
A: 15   B: 0

Straw Poll #5:
Chicago Rules
At 10 Gb/s I would oppose a modulation of PAM:
A: 4
B: 5
C: 6
A: 0   B: 7   C: 13

Motion #4: Move to adopt PAM4 for 2.5 Gb/s, 5.0 Gb/s and 10 Gb/s.
M: Gerrit Den Besten
S: Tom Souvignier
(Technical >= 75%)
Y: 31   N: 7   A: 10
Motion Passes

The Chair reminded the group that we would start at 8:00 AM and that the closing plenary would limit the time to 4 hours.

The meeting recessed for the day at 5:56 PM.

The meeting resumed at 8:04 AM.

The Chair brought the meeting to order and asked the recording secretary to explain the attendance log for the mornings meeting.

The Chair noted that several Motions and one presentation were received overnight and the meeting continued starting with motions.

Motion #5: **Move to adopt a new Insertion Loss Limit given by the equation:**

$$Insertion\ Loss(f) \leq 0.002*f + 0.45*\sqrt{f} + 1/\sqrt{(" " f)} \quad (dB)$$

where

f **is the frequency in MHz:** $5 \leq f \leq 3000$

as shown by the "black curve" on page 7 of DiBiaso_3ch_01_0718.pdf for all 3 speeds
M: Eric DiBiaso
S: Natalie Wienckowski
(Technical >= 75%)
Y: 36   N: 2   A: 10
Motion Passes

Motion #6: **Move to add 149.7.1.2 and 150.7.1.2 Differential characteristic impedance with the text: The nominal differential characteristic impedance of the link segment is 100 Ω.**
Move other 149.7.1.x sections down as appropriate.

M: Natalie Wienckowski
S: Gerrit den Besten
(Technical >= 75%)
Y: 40   N: 0   A: 3
Motion Passes

Title: Short Tutorial on Transcoder Options (Lo_3ch_02_0718.pdf)
Presenter: William Lo, Axonne

Motion #7: Move to adopt "Link Synchronization" into Clause 149 and Clause 150 according to page 6 of "tu_3ch_02_0718.pdf".
M: Mehmet Tazebay   S: Michael Tu
(Technical >= 75%)
Y: 31   N: 1   A: 26
Motion Passes

Straw Poll #6:
Is anyone concerned at 10 Gb/s the burst length to be protected is greater than 120 nS?
Y: 2
N: 9

Straw Poll #7:
Pick one
Is anyone concerned at 10 Gb/s the burst length to be protected is greater than 120 nS?
Y: 1
N: 8
I need more information: 26
I'm not going to have an opinion: 18

Straw Poll #8:
The line Baud rate for 10 Gb/s shall be 5.625 GBaud.
Y: 31
N: 0

Straw Poll #9:
Chicago Rules
Which encoder do you prefer
    A) 512/513
    B) 256/257
    C) 128/129
    D) 64/65
A: 6   B: 3   C: 15 D: 19

Motion #8: The line Baud rate for 10 Gb/s shall be 5.625 GBaud. The 5 Gb/s shall be ½ this rate and the 2.5 Gb/s shall be ¼ this rate.
M: William Lo   S: George Zimmerman
(Technical >= 75%)
Y: 37   N: 1   A: 7
Motion Passes

Straw Poll #10:
Pick One
Which encoder do you prefer
    C) 128/129
    D) 64/65
C: 11 D: 15

Straw Poll #11:
Should the insertion loss limit be adapted based on the outcome of the OEM poll done by Natalie?
Y: 24
N: 4

Straw Poll #12:
Is there interest to explore a looser insertion loss limit for 2.5Gbps to allow lower cost cabling?
Y: 15
N: 5

Straw Poll #13:
Is there interest to continue to explore options to address highly asymmetrical traffic applications more efficiently?
Y: 32
N: 1

Straw Poll #14:
Assuming no changes required to the existing PAR, should we add optional mode to support asymmetric data transmission?
Y: 43
N: 0

Straw Poll #15:
Should we add OAM Channel to NGAUTO: Clause 45 registers, Clause 149 and 150 OAM Subsections?
Y: 30
N: 2

Motion #9: Move to add OAM Channel to NGAUTO: Clause 45 registers, Clause 149 and 150 OAM Subsections.
M: Natalie Wienckowski   S: Kirsten Matheus
(Technical >= 75%)
Y: 34   N: 0   A: 18
Motion Passes

Straw Poll #16:
Attendance:
        Attend September 2018 interim, Dell EMC, Spokane, WA, USA:
        Y: 25   N: 10   M: 19

        Attend November 2018 802 Bangkok, Thailand plenary:
        Y: 27   N: 8   M: 21

        Room count: 63

Straw Poll #17:
Select FEC to be Reed-Solomon with 10-bit RS symbol plus interleaving, if needed.
Y: 38
N: 0

Motion #10: Select FEC to be Reed-Solomon with 10-bit RS symbol, plus interleaving if needed.
M: Ramin Farjadrad   S: Sujan Pandey
(Technical >= 75%)
Y: 44   N: 1   A: 8
Motion Passes

The meeting broke for short break at 10:10 AM.

The meeting resumed at 10:32 AM.

The Chair called the meeting back to order and the Chief Editor reviewed the work agreed to at this plenary and asked for volunteers to complete the work for inclusion into the next draft specification and added that information to the [ToDo List](#).

Motion #11: Move to instruct the Chief Editor to create D0.5 from D0.4.1 and adopted baseline from motions in the July plenary.
M: Natalie Wienckowski   S: Phil Brownlee
(Technical >= 75%)
Approved by voice without opposition
Motion Passes

The Chair thanked the group for working together and making significant progress.

Mr. Carlson then asked if there was further business for the Task Force, none responded.

Adjournment
Motion #12: To adjourn the meeting.
M: Sujan Pandey   S: Brett McClellan
Approved by voice without opposition (Procedural > 50%)
Motion Passes

The Meeting was adjourned at 11:07 AM

Appendix A: Attendees at the IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force Meeting, July 11-12, 2018.

Last Name	First Name	Employer	Affiliation	Wed	Thurs
Amason	Dale	NXP	NXP	X	X
An	Hongming	Microchip	Microchip	X	
Baggett	Tim	Microchip	Microchip	X	X
Bains	Amrik	Cisco	Cisco	X	X
Bar-Niv	Amir	Aquantia	Aquantia	X	X
Beaudoin	Denis	TI	TI	X	
Bhagwat	Gitesh	Analog Devices	Analog Devices	X	
Boyer	Rich	Aptiv	Aptiv	X	X
Brownlee	Phillip	Independent	TDK	X	X
Brychta	Michel	Analog Devices	Analog Devices	X	
Buckmeier	Brian	Bel Fuse Inc	Bel Fuse Inc	X	X
Carlson	Steve	High Speed Design	Robert Bosch	X	X
Carty	Clark	Cisco	Cisco	X	X
Caudron	Cedric	Aptiv	Aptiv	X	
Chen	Qiang	Microchip	Microchip	X	
Choudhury	Mabud	OFS	OFS	X	
Dachin	Tseng	Realtek	Realtek	X	X
Den Besten	Gerrit	NXP Semiconductors	NXP Semiconductors	X	X
DiBiaso	Eric	TE Connectivity	TE Connectivity	X	X
Dinh	Thuyen	Pulse Electronics	Pulse Electronics	X	X
Dube	Katheryn	UNH-IOL	UNH-IOL	X	
Eyal	Wassad	Valens Semi	Valens Semi	X	X
Eyal	Massad	Valens Semi	Valens Semi		X
Farjadrad	Ramin	Aquantia	Aquantia	X	X
Fathi	Borhan	NVIDIA	NVIDIA	X	X
Fritsche	Matthias	Harting	Harting	X	X
Fukuoka	Takashi	Auto Networks Tech	Auto Networks Tech	X	

Last Name	First Name	Employer	Affiliation	Wed	Thurs
Gardner	Mike	Molex, LLC	Molex, LLC	X	X
Gardner	Andrew	Analog Devices	Analog Devices	X	
Gauthier	Claude	NXP Semiconductors	NXP Semiconductors	X	X
Goto	Hideki	Toyota Motor Corporation	Toyota Motor Corporation	X	X
Graber	Steffen	Pepperl+Fuchs	Pepperl+Fuchs	X	
Grau	Olaf	Robert Bosch	Robert Bosch	X	X
Grow	Robert	RMG Consulting	RMG Consulting	X	
Hess	Dave	Cord Data	Cord Data	X	X
Hopkinson	Wayne	Commscope	Commscope		X
Ichimaru	Toshihiro	Sumitomo Electric Industries Ltd.	Sumitomo Electric Industries Ltd.		X
Islinger	Tobias	Denso Automotive Germany	Denso Automotive Germany	X	X
Javed	Ali	Molex, LLC	Molex, LLC	X	X
Jung	Inyong	Hyundai Motors	Hyundai Motors	X	X
Kabra	Lokesh	Synopsys	Synopsys	X	
Kanuri	Mrudula	NVIDIA	NVIDIA	X	X
Kim	Yong	NIO	NIO	X	X
Kinchi	Hideki	JAE	JAE		X
Klaus	Andrew	Marvell	Jaspar	X	X
Kondo	Taiji	Megachips	Megachips	X	X
Krieger	Olaf	Volkswagon	Volkswagon	X	X
Kube	Kae	UNH-IOL	UNH-IOL	X	
Lackner	Hans	QoSCom GmbH	QoSCom GmbH	X	X
Lawlis	James	Ford Motor Company	Ford Motor Company	X	X
Leung	Mingtak	Marvell	Marvell	X	X
Lewis	Jon	Dell	EMC	Dell	EMC	X	X
Lin	Alex	Mediatek	Mediatek	X	X
Lo	William	Axonne Inc	Axonne Inc	X	X
Manabu	Kagami	Toyota CRDL	Toyota CRDL	X	
Mash	Chris	Marvell	Marvell	X	X

Last Name	First Name	Employer	Affiliation	Wed	Thurs
Masuda	Takeo	OITDA	OITDA	X	
Matheus	Kirsten	BMW	BMW	X	X
McClellan	Brett	Marvell	Marvell	X	X
Miller	Martin	Microchip	Microchip	X	
Neveux	Paul	Superior Essex	Superior Essex	X	X
Nomara	Takami	NEC	Jaspar	X	X
Ohni	Josef	MD Elektronik	MD Elektronik	X	X
Ovellette	Eric	UNH-IOL	UNH-IOL	X	
Pandey	Sujan	NXP	NXP	X	X
Park	Sungkwon	Hanyang University	Hanyang University	X	
Potts	Mike	General Motors	General Motors	X	
Racherla	Kishore	Broadcom Ltd.	Broadcom Ltd.	X	X
Rashidi	Habib	Pulse Electronics	Pulse Electronics	X	
Reinhard	Michael	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH	X	X
Renteria	Victor	Bel Fuse Inc	Bel Fuse Inc	X	X
Salehi	Hamid Reza	Marvell	Marvell	X	X
Schuessler	Jim	Samsung Electronics	Samsung Electronics	X	X
Souvignier	Tom	Broadcom Ltd.	Broadcom Ltd.	X	X
Sparrowhawk	Bryan	Leviton	Leviton	X	X
Stewart	Heath	Analog Devices	Analog Devices	X	X
Takashi	Fukuoka	Auto Networks Tech	Auto Networks Tech		X
Tazebay	Mehmet	Broadcom Ltd.	Broadcom Ltd.	X	X
Thompson	Geoff	GraCaSI SA.	Independent	X	
Tu	Mike	Broadcom Ltd.	Broadcom Ltd.	X	X
Tzahi	Madgar	Valens Semi	Valens Semi	X	X
Vernickel	Ricky	Leoni	Leoni	X	X
Voss	Bob	Panduit	Panduit	X	X
Wienckowski	Natalie	GM	GM	X	X
Withey	James	Fluke	Fluke	X	X

Last Name	First Name	Employer	Affiliation	Wed	Thurs
Wu	Peter	Marvell	Marvell	X	X
Yasukawa	Masaki	NEC Magnus	NEC Magnus	X	X
Young	Adrian	Leviton	Leviton	X	
Zang	Junling	Microchip	Microchip	X	
Zimmerman	George	CME Consulting	Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group	X	X