

Unconfirmed Meeting Minutes: IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY
Task Force
November 13&14, 2018
Bangkok, Thailand

Prepared by Natalie Wienckowski

IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force meeting convened at 8:00 AM, Tuesday, November 13, 2018 by Steve Carlson, Task Force Chair.

Attendance is listed in Appendix A

Administrative Matters

Mr. Carlson called for introductions and affiliations then reviewed the agenda in [agenda_3ch_1_1118.pdf](#).

Motion #1: Move to approve the agenda as shown in [agenda_3ch_1_1118.pdf](#)
M: Duane Remein S: Tom Souvignier

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

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

M: Duane Remein S: Tom Souvignier
Approved by voice without opposition (Procedural > 50%)

Motion Passes

Mr. Carlson noted that there should be no recording or photography.

At 8:10 am, 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 **8:21 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:

- None this cycle

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 we have some new presenters that need to review this information as there were some issues with presentations this cycle.

PRESENTATIONS:

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

Title: Ad-Hoc Report ([zimmerman_3ch_01_1118.pdf](#))

Presenter: Steve Carlson, High Speed Design, Robert Bosch, Marvell

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 9/19, 10/3, 10/17 and 10/31/18 as posted.

M: Claude Gauthier

S: William Lo

Approved by voice without opposition (Procedural > 50%)

Motion Passes

Wednesday, 7-9AM Pacific Time every 2 weeks.

The weeks will be swapped with cg based on the work each group has left to do.

The next Ad hoc meetings will be 11/21, 12/5, 12/19/18 and 1/2/19. As usual, meetings will be cancelled if there are no topics. The meeting notice will be available on the private

Title: PHY Control Proposal ([Lo 3ch 02 1118.pdf](#))

Presenter: William Lo, Axonne, Inc.

Title: Limiting Interleaving Options ([Lo 3ch 03 1118.pdf](#))

Presenter: William Lo, Axonne, Inc.

Title: Interleaver Depth and Proposed Baseline for PHY Control

([souvignier 3ch 03a 1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Title: Multi-Gig PHY Training and FEC Interleaving Depth

([Pandey 3ch 02 1118.pdf](#))

Presenter: Sujan Pandey, NXP

Title: Scrambler Options for Multi-Gig PHYs ([Pandey 3ch 01 1118.pdf](#))

Presenter: Sujan Pandey, NXP

The meeting broke for short break at 10:00 AM.

The meeting resumed at 10:32 AM.

Presentations continued.

Title: EEE Ultra-low Power Mode

([Benyamin Langner Zimmerman 3ch 01 1118.pdf](#))

Presenter: Saied Benyamin, Aquantia

Title: EEE Baseline Proposal ([souvignier 3ch 01 1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Title: Asymmetric Data Transmission Support ([souvignier 3ch 02 1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Title: Alert Detect for 802.3ch ([Benyamin 3ch 04 1118.pdf](#))

Presenter: Saied Benyamin, Aquantia

The meeting broke for lunch at 11:52 AM.

The meeting resumed at 1:15 PM.

The Chair called the meeting back to order and presentations for the meeting continued.

Title: Transmitter PSD Masks ([souvignier 3ch 04 1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Title: The TxPower Requirement ([Wang 3ch 01 1118.pdf](#))

Presenter: Alvin Wang, Huawei

Title: Noise Model ([Wang 3ch 02 1118.pdf](#))

Presenter: Alvin Wang, Huawei

Title: EEE OAM Frame Proposal ([Benyamin Graba Langner 3ch 01 1118.pdf](#))

Presenter: Saied Benyamin, Aquantia

Title: OAM Extension Proposal ([Lo 3ch 01a 1118.pdf](#))

Presenter: William Lo, Axonne Inc.

Title: 802.3ch Link Partner Register Access ([Benyamin 3ch 02a 1118.pdf](#))

Presenter: Saied Benyamin, Aquantia

Title: OAM Status Bytes Proposal ([wienckowski 3ch 01b 1118.pdf](#))

Presenter: Natalie Wienckowski, General Motors

Title: Modifications for PoDL with NGAUTO ([bhagwat 3ch 01a 1118.pdf](#))

Presenter: Heath Stewart, Analog Devices

Title: Data Mode Scrambler Options ([souvignier 3ch 05a 1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

The meeting broke for short break at 3:03 PM.

The meeting resumed at 3:27 PM.

The Chair called the meeting back to order and presentations for the meeting continued.

Title: Frequency range limits for 2½, 5, and 10GBASE-T1

([DenBesten 3ch 01a 1118.pdf](#))

Presenter: Gerrit W. den Besten, NXP

Title: 802.3ch screening attenuation measurement results

([mueller 3ch 01a 1118.pdf](#))

Presenter: Thomas Müller, Rosenberger

Title: Shielding attenuation for 10Gbps STP link segment

([DenBesten 3ch 03a 1118.pdf](#))

Presenter: Gerrit W. den Besten, NXP

Title: Actual Cable Data update ([vernickel 3ch 01c 1118.pdf](#))

Presenter: Ricky Vernickel, LEONI Kabel GmbH

Title: Coupling Attenuation and IL limit proposal for 2.5 Gbit/s ([Ohni 3ch 01a 1118.pdf](#))

Presenter: Josef Ohni, MD Elektronik GmbH

Title: Link segment requirements for 2.5Gbps operation

([DenBesten 3ch 02a 1118.pdf](#))

Presenter: Gerrit W. den Besten, NXP

Straw Poll #1:

Attendance:

Attend January 2019 interim, HPE/Aruba, Long Beach, CA, USA:

Y: 16 N: 12 M: 12

Attend March 2019 802 Vancouver, BC, Canada plenary:

Y: 15 N: 6 M: 17

The meeting recessed for the day at 4:47 PM.

The meeting resumed at 8:00 AM on November 14.

Ms Wienckowski brought the meeting to order and reminded the group to sign into IMAT and the attendance log.

Title: Editor's Report – P802.3ch Draft 0.6 ([wienckowski 3ch 02a 1118.pdf](#))

Presenter: Natalie Wienckowski, General Motors

Comment resolution

Decisions during comment resolution were made by consensus, except where noted that motions were taken. For details on comment resolution see the posted comment database.

The Chair reviewed the comment resolution process that would be followed and pointed the Task Force to the [Comments received on P802.3ch drafts](#) location on the P802.3ch website.

The Chair reminded the group to provide comments to all Drafts using the comment spreadsheet or tool. Links to these are available in the Editor's report.

Comments should all have useful "suggested remedies". Stating "fix it" or "I don't like it" is not helpful. If the information provided in the comment tool is not sufficient for

resolving the comment, please create a presentation with additional material and clearly mark the presentation and/or slides as to which comment they apply to.

The meeting broke at 8:48 AM for the group to continue working on consensus presentations.

The meeting resumed at 10:48 AM

The Chair called the meeting back to order and presentations for the meeting continued.

Title: Data Mode Scrambler Options ([souvignier_3ch_05b_1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Motion #4: Move to accept the 33-bit scrambler polynomials and generator function as shown on slide 3 of souvignier_3ch_05b_1118.pdf as the master and slave scramblers for PAM2 training, PAM4 training, and PAM4 data modes.

M: Tom Souvignier S: Brett McClellan

Everyone in the room Y: 28 N: 0 A: 4

802.3 voters only Y: 16 N: 0 A: 2

Motion passes (Technical >= 75%).

Title: EEE Baseline Proposal ([souvignier_3ch_01b_1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Motion #5: Move to adopt the LPI parameters as shown on slide 2 of souvignier_3ch_01b_1118.pdf, excluding specific alert type, as baseline EEE.

M: Tom Souvignier S: Saied Benyamin

Everyone in the room Y: 26 N: 0 A: 9

Motion passes (Technical >= 75%).

Title: Transmitter PSD Masks ([souvignier_3ch_04a_1118.pdf](#))

Presenter: Tom Souvignier, Broadcom

Motion #6: Move to adopt the transmit PSD masks as shown on slide 7 of souvignier_3ch_04a_1118.pdf as the upper and lower masks for 2.5G, 5G, and 10G data rates and the upper limit of 3dBm max transmit power.

M: Tom Souvignier S: Gerrit den Besten

Everyone in the room Y: 28 N: 2 A: 8

Motion Passes (Technical >= 75%).

Motion #7: Move to adopt baseline text changes shown on slides 3 to 14 of bhagwat_3ch_01a_1118.pdf with editorial license to synchronize changes with P802.3cg.

M: Olaf Grau S: Christoph Wechsler

Everyone in the room Y: 32 N: 0 A: 4
Motion passes (Technical >= 75%).

Motion #8: Move to adopt MDI Return Loss Mask defined on slide 15 of bhagwat_3ch_01a_1118.pdf.

M: Olaf Grau S: Christoph Wechsler
Everyone in the room Y: 23 N: 0 A: 11
Motion passes (Technical >= 75%).

Motion #9: Move to adopt OAM Extension Proposal on slides 4, 6, 7 and 8 of Lo_3ch_01a_1118.pdf, except on Slide 4, change bit D9 for symbols 0 to 13 from “0” to “reserved” with a note saying the reserved bits are set as 0.

M: William Lo S: Saied Benyamin
Everyone in the room Y: 23 N: 0 A: 16
Motion passes (Technical >= 75%).

Motion #10: Move to adopt definition of OAM Status bytes 10-13 as specified on slides 2, 3 and 4 of wienckowski_3ch_01b_1118.pdf except, change bit D9 for symbols 10 to 13 from “0” to “reserved”.

M: Christoph Wechsler S: Sujan Pandey
Everyone in the room Y: 24 N: 0 A: 13
Motion passes (Technical >= 75%).

Title: Multi-Gig FEC Interleaving Depth ([Pandey_3ch_03a_1118.pdf](#))
Presenter: Sujan Pandey, NXP

Motion #11: Move to adopt FEC Interleaving combinations as shown on slide 3 of Pandey_3ch_03a_1118.pdf.

M: Sujan Pandey S: William Lo
Everyone in the room Y: 32 N: 0 A: 6
Motion passes (Technical >= 75%).

Motion #12: Move to adopt the PHY control state diagrams as shown in souvigner_3ch_03a_1118.pdf slides 8 and 9 with the following changes:

- slide 8 accept DISABLE TRANSMITTER and INIT_MAXWAIT_TIMER and all the arcs in and out of the states and ignore the remainder of the diagram
- slide 9 delete the precoder_en <= true from the TX_SWITCH state.
- The states on slide 9 replace the equivalent states on slide 8.

M: Tom Souvignier S: William Lo
Everyone in the room Y: 22 N: 0 A: 11
Motion passes (Technical >= 75%).

The meeting broke for lunch at 11:55 PM.

The meeting resumed at 1:39 PM.

The Chair called the meeting to order and reminded the group to sign into IMAT.

Motion #13: Move to adopt link segment frequency range limits from 1MHz to baudrate/2^{1/2} for both IL and RL (Fmax=1,2,4GHz for 2^{1/2},5,10 Gbps)

M: Gerrit den Besten S: Josef Ohni
Everyone in the room Y: 29 N: 0 A: 4
Motion passes (Technical >= 75%). 1:45 pm

Motion #14: Move to adopt 2 MHz to Fmax frequency range limits for each speed grade for link delay.

M: Gerrit den Besten S: Ricky Vernickel
Everyone in the room Y: 24 N: 0 A: 8
Motion passes (Technical >= 75%). 1:48 pm

Motion #15: Move to adopt 1 MHz to Fmax frequency range limits for MDI Return loss for each speed grade.

M: Gerrit den Besten S: Thomas Müller
Everyone in the room Y: 26 N: 0 A: 6
Motion passes (Technical >= 75%). 1:52 pm

Motion #16: Move to adopt a shielding attenuation requirement for 2^{1/2}/5/10Gbps of ≥45dB for f=30MHz-Fmax

M: Gerrit den Besten S: Thomas Müller
Everyone in the room Y: 26 N: 2 A: 4
Motion passes (Technical >= 75%). 1:54 pm

Title: Insertion Loss ([DenBesten 3ch 05 1118.pdf](#))

Presenter: Gerrit W. den Besten, NXP

Motion #17: Move to adopt the Insertion Loss limit for all speed grades:

$$IL \leq 0.68 \cdot f^{0.45} + 0.002 \cdot f \text{ [dB]}$$

M: Gerrit den Besten S: Ricky Vernickel
Everyone in the room Y: 21 N: 0 A: 11
Motion passes (Technical >= 75%). 2:15 pm

Title: Return Loss ([DenBesten 3ch 04 1118.pdf](#))

Presenter: Gerrit W. den Besten, NXP

Motion #18: Move to adopt Return Loss limit for 2^{1/2}Gbps operation to:

$$\left\{ \begin{array}{ll} 20dB & f = 1 - 240MHz \\ 20 - 10\log\left(\frac{f}{240}\right)dB & f = 240 - 1000MHz \end{array} \right.$$

M: Gerrit den Besten S: Josef Ohni
Everyone in the room Y: 23 N: 0 A: 10
Motion passes (Technical >= 75%). 2:23 pm

Motion #19: Move to adopt Return Loss limit for 5Gbps operation.

$$\begin{cases} IL @ 1.5GHz \leq 15dB & \rightarrow N = 1 \\ IL @ 1.5GHz > 15dB & \rightarrow N = 0 \end{cases}$$
$$RL \leq \begin{cases} 20dB & \text{for } f = 1 - 480 / 2^N \text{ MHz} \\ 20 - 10 \log \left(\frac{2^N \cdot f}{480} \right) dB & \text{for } f = 480 / 2^N - 2000 \text{ MHz} \end{cases}$$

M: Gerrit den Besten S: Thomas Müller
Everyone in the room Y: 24 N: 0 A: 5
Motion passes (Technical >= 75%). 2:24 pm

Motion #20: Move to adopt Return Loss limit for 10Gbps operation.

$$\begin{cases} IL @ 3GHz \leq 15dB & \rightarrow N = 1 \\ IL @ 3GHz > 15dB & \rightarrow N = 0 \end{cases}$$
$$RL \leq \begin{cases} 20dB & \text{for } f = 1 - 480 / 2^N \text{ MHz} \\ 20 - 10 \log \left(\frac{2^N \cdot f}{480} \right) dB & \text{for } f = 480 / 2^N - 3000 \text{ MHz} \\ 12 - 3N \text{ dB} & \cdot f = 3 - 4GHz \end{cases}$$

M: Gerrit den Besten S: Ricky Vernickel
Everyone in the room Y: 26 N: 0 A: 8
Motion passes (Technical >= 75%). 2:31 pm

Strawpoll #2: Remote Register Access.

For the purpose of:

- In field debug
- Debug where MDIO access is not available to link partner
- Debug where the link partner (possibly upper layer) seems to be non-responsive, but link is up

With the following conditions

- Monitor (rather than read) the bits, does not affect latching/clear on read registers
- No write functionality
- Provide a means to disable (i.e. to optionally turn off in production)
- Response allows "refusal" to return value

Would you support the Remote Register Access shown above?

Y: 6 N: 13

Title: Clause 45 Registers for P802.3ch and Precoder Testing
([zimmerman_langner_3ch_01_1118.pdf](#))

Presenter: Natalie Wienckowski, General Motors

Title: Text Edits for Clause 45 PHY Registers for 802.3ch
([zimmerman_3ch_02_110218.pdf](#))

Presenter: Natalie Wienckowski, General Motors

Motion #21: Move to adopt the Clause 45 registers and text in zimmerman_3ch_02_110218.pdf with editorial license to add OAM registers as approved in other motions.

M: Brett McClellan S: Olaf Grau

Everyone in the room Y: 22 N: 0 A: 10

Motion passes (Technical >= 75%). 3:07 pm

Motion #22: Move to adopt test mode 3 as defined on slides 8 & 9 of zimmerman_langner_3ch_01_1118.pdf.

M: Conrad Zerna S: Olaf Grau

Everyone in the room Y: 17 N: 2 A: 12

Motion passes (Technical >= 75%). 3:09 pm

Motion #23: Move to instruct the Chief Editor to create D1.0 from D0.6 from closed comments received on D0.6 and adopted baselines from passed motions.

M: Brett McClellan S: Sujan Pandey

Y: 28 N: 0 A: 2

Motion passes (Technical >= 75%). 3:11 pm

The meeting broke for short break at 3:12 PM.

The meeting resumed at 3:41

There was no additional consensus to be presented.

The chair thanked everyone for a very productive meeting.

The meeting was adjourned at 3:43 PM.

Appendix A: Attendees at the IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force Meeting, November 13-14, 2018.

IEEE 802.3 P802.3ch Multi-Gig Automotive Ethernet PHY Task Force IEEE 802.3 Nov 2018				Day 1 13 Nov	Day 2 14 Nov
By choosing to attend and sign in to this meeting, you acknowledge and agree that your personal data will be documented for IEEE standards development purposes to comply with policies and procedures, legal and accreditation requirements, and evaluation of patent claims by patent offices. See Front Page for additional information.					
Last Name	First Name	Employer	Other Affiliations	Tues	Wed
Belitz	Tobias	Renesas	Renesas	X	
Benyamin	Saied	Aquantia	Aquantia	X	X
Bist	Hemlata	Cadence	Cadence	X	
Carlson	Steve	High Speed Design	Robert Bosch	X	X
Dalmia	Kamal	Dryv.io	Dryv.io	X	X
Den Besten	Gerrit	NXP Semiconductors	NXP Semiconductors	X	X
Dinh	Thuyen	Pulse Electronics	Pulse Electronics	X	X
Eyal	Massad	Valens Semi	Valens Semi	X	X
Fathi	Borhan	NVIDIA	NVIDIA	X	X
Fukuoka	Takashi	Auto Networks Tech	Auto Networks Tech	X	X
Gauthier	Claude	NXP Semiconductors	NXP Semiconductors	X	X
Goto	Hideki	Toyota Motor Corporation	Toyota Motor Corporation	X	X
Grau	Olaf	Robert Bosch	Robert Bosch	X	X
Grow	Robert	RMG Consulting	RMG Consulting	X	X
Haus	Alexander	MD Elektronik	MD Elektronik	X	X
Hutchison	Guy	Dryv.io	Dryv.io	X	X
Hyakutake	Yasuhiro	Adamant Namiki Precision Jewel	Adamant Namiki Precision Jewel	X	X
Kagami	Manabu	Toyota CRDL	Toyota CRDL	X	X
Kanuri	Mrudula	NVIDIA	NVIDIA	X	X
Kim	Yong	NIO	NIO	X	
Kondo	Taiji	Megachips	Megachips	X	X
Lin	Alex	Mediatek	Mediatek	X	X

IEEE 802.3 P802.3ch Multi-Gig Automotive Ethernet PHY Task Force IEEE 802.3 Nov 2018	Day 1 13 Nov	Day 2 14 Nov
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Last Name	First Name	Employer	Other Affiliations	Tues	Wed
Lin	Allan	Marvell	Marvell	X	X
Lo	William	Axonne Inc	Axonne Inc	X	X
McClellan	Brett	Marvell	Marvell	X	X
Mehza	Darshan	Tektronix	Tektronix	X	
Mueller	Thomas	Rosenberger	Rosenberger	X	X
Nomara	Takami	NEC	Jaspar	X	X
Oberg	Mats	Marvell	Marvell	X	
Ohni	Josef	MD Elektronik	MD Elektronik	X	X
Pandey	Sujan	NXP	NXP	X	X
Pardo	Carlos	KDPOF	KDPOF	X	
Ramesa	P.E.	Tektronix	Tektronix	X	X
Remein	Duane	Huawei	Huawei	X	
Salehi	Hamid Reza	Marvell	Marvell	X	X
Shariff	Masood	Commscope	Commscope		X
Shocket	Abe	TE Connetivity	TE Connectivity	X	X
Souvignier	Tom	Broadcom Ltd.	Broadcom Ltd.	X	X
Sui	Tao	Mediatek	Mediatek	X	X
Takahashi	Satoshi	POF Promotion	POF Promotion	X	X
Takgahira	Masato	Fujikura	Fujikura	X	X
Tan	Alex	NXP	NXP	X	
Teng	Xuebin	Arris	Arris	X	
Toshiyaso	Ito	Yamaichi	Yamaichi	X	
Tseng	Tachin	Realtek	Realtek		X
Tzahi	Madgar	Valens Semi	Valens Semi	X	X
Umnov	Alexander	Corning	Corning	X	X

IEEE 802.3 P802.3ch Multi-Gig Automotive Ethernet PHY Task Force IEEE 802.3 Nov 2018	Day 1 13 Nov	Day 2 14 Nov
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Last Name	First Name	Employer	Other Affiliations	Tues	Wed
Vernickel	Ricky	Leoni	Leoni	X	X
Voss	Bob	Panduit	Panduit	X	X
Wang	Xuehuan	Huawei	Huawei	X	
Wang	Alvin	Huawei	Huawei	X	X
Wang	Eric	Huawei	Huawei	X	X
Wechsler	Christoph	Audi	Audi	X	X
Wienckowski	Natalie	GM	GM	X	X
Wu	Peter	Marvell	Marvell	X	X
Wu	Dance	Marvell	Marvell	X	X
Zeng	Yan	Huawei	Huawei	X	X
Zerna	Conrad	Frannhofer IIS	Frannhofer IIS	X	X
Zhang	Xingxin	Huawei	Huawei		X
Zinner	Helge	Continental	Continental	X	X