

Unconfirmed Meeting Minutes: Meeting of the IEEE P802.3cg 10 Mbps Single Twisted Pair Ethernet Task Force

May 24-26, 2017
New Orleans, LA USA

Prepared by Jon Lewis

The meeting of the IEEE P802.3cg 10 Mbps Single Twisted Pair Ethernet Task Force convened at 1:31PM, Wednesday, May 24, 2017 by George Zimmerman, P802.3cg Task Force chair.

Attendance for the meeting is listed in Appendix A

All presentations referenced in these minutes are located on the [May 2017 802.3cg public website](#).

Administrative Matters

Mr. Zimmerman appointed Jon Lewis as recording secretary for this session.

The Task Force Chair called for introductions and affiliations.

George Zimmerman displayed the agenda in agenda_3cg_01b_0517.pdf.

Motion #1: Move to approve the agenda as shown in agenda_3cg_01b_0517.pdf

M: L. Winkel S: M. McCarthy
Approved by voice without opposition (Procedural > 50%)

George Zimmerman reviewed the agenda in agenda_3cg_01b_0517.pdf.

- Mr. Zimmerman noted that there should be no recording or photography without permission.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. Peter Jones informed the Task Force that he occasionally uses publically available information.

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

Attendance, Mr. Zimmerman advised the group of the IEEE meeting attendance tool and procedures, including both the attendance log and the web attendance tracking tool (IMAT).

Mr. Zimmerman reviewed the slide entitled “Participation in IEEE 802 Meetings” and asked if there was any discussion necessary, none responded.

IEEE Patent Policy, at **1:52 PM**, Mr. Zimmerman showed slides 0 through 4 patent policy from agenda_3cg_01b_0517.pdf. Mr. Zimmerman showed slide 0 and asked if anyone has not seen slides 1 through 4. None responded. Mr. Zimmerman then made the call for potentially essential patents at **1:54 PM**, and none responded. Mr. Zimmerman then completed the reading of slide #4.

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.

Mr. Zimmerman reviewed the presentations for this week.

LIAISONS

ISO/IEC JTC1 SC25: Alan Flatman gave an update on ongoing work related to P802.3cg. It was noted that the next meeting of the ISO/IEC JTC2 SC25 coincides with the IEEE 802.3 meetings in September.

TIA TR-42: Valerie gave a quick update on ongoing activity.

ODVA: David Brandt: Relevant ODVA activities were centered on probable participation of ODVA and peer industrial automation standards organizations into the Advanced Physical Layer Group (APL) consortium along with process automation suppliers. This has the potential to bring broaden industry requirements brought into the IEEE.

Title: Ad Hoc Report (jones_10spe_01_0517.pdf)

Presenter: Peter Jones, Cisco

Motion #2: Move to approve minutes of IEEE P802.3cg 10 Mbps Single Twisted Pair Ethernet Task Force from March 2017 as posted.

M: M. McCarthy S: A. Bains

Approved by voice without opposition (Procedural > 50%)

PRESENTATIONS

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

Title: Considerations and Measurements of Noise for the Industrial Link Segment (Wucher_03cg_01_0517.pdf)

Presenter: Markus Wucher, Endress+Hauser

Title: Noise Measurements Update (Graber_3cg_06_0517.pdf)

Presenter: Steffen Graber, Pepperl+Fuchs

The meeting recessed for a short break at 3:06 PM.

The meeting resumed at 3:36 PM.

Title: History of the 75mV Noise Level for Long Reach Cabling (franchuk_3cg_01a_0517.pdf)

Presenter: Brian Franchuk, Martin Zielinski, Emerson

Title: IEEE 802.3cg STP Noise Test Setup (moffitt_3cg_01_0517.pdf)

Presenter: Bryan Moffitt, Commscope

Title: Drive Noise Measurements (brandt_cg_01b_0517.pdf)

Presenter: David Brandt, Rockwell Automation

Title: Industrial Applications Link Segment (diminico_01_0517.pdf)

Presenter: Chris Diminico, MC Communications/Cu-Test/Panduit

George indicated that we would start at 8:30 AM with a discussion on next steps.

The meeting recessed for the day at 5:20 PM.

The Task Force meeting resumed at 8:02 AM.

The Task Force Chair called for introductions and affiliations.

George Zimmerman reviewed the agenda in agenda_3cg_01b_0517.pdf.

- Mr. Zimmerman noted that there should be no recording or photography without permission.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

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

Attendance, Mr. Zimmerman advised the group of the IEEE meeting attendance tool and procedures, including both the attendance log and the web attendance tracking tool (IMAT).

Mr. Zimmerman reviewed the slide entitled “Participation in IEEE 802 Meetings” and asked if there was any discussion necessary, none responded.

IEEE Patent Policy, at **8:45 AM**, Mr. Zimmerman showed slides 0 through 4 patent policy from agenda_3cg_01b_0517.pdf. Mr. Zimmerman showed slide 0 and asked if anyone has not seen slides 1 through 4. None responded. Mr. Zimmerman then made the call for potentially essential patents at **8:46 AM**, and none responded. Mr. Zimmerman then showed slide #4.

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.

Title: Timeline Discussion (zimmerman_3cg_02_0517.pdf)

Presenter: Chair P802.3cg; CME consulting / ADI, Aquantia, BMW, Cisco, Commscope, LTC

Title: 10SPE@15m multidrop and TSN (matheus_3cg_01_0517_b.pdf)

Presenter: Kirsten Matheus, BMW

Title: 10SPE Automotive PHY channel consideration - time domain simulation (wechsler_3cg_01a_0517.pdf)

Presenter: Christoph Wechsler, Audi AG

The meeting recessed for a short break at 10:31 AM.

The meeting resumed at 11:00 AM.

Straw Poll #1: I support an additional objective of the form: “Define a multidrop link segment and a PHY for up to at least:

- 5 nodes and a total of 15 meters of cabling and 2 inline connectors, in a linear configuration”

Pick One - Y: 25 N: 9 A: 14 Need to Know more: 0

Discussion:

Title: 802.3cg in Support of 1-pair for Premises and Data Center IOT (moffitt_shariff_3cg_01a_0517.pdf)

Presenter: Masood Shariff, Bryan Moffitt, Commscope

The meeting recessed for lunch at 12:01 PM.

The meeting resumed at 1:34 PM.

Title: Smart Building Use Cases & Requirements (herbst_3cg_01_0517.pdf)
Presenter: Thomas Herbst, Herbst LLC

Title: Do we need an intermediate link segment? (zimmerman_3cg_03_0517.pdf)
Presenter: Chair P802.3cg; CME consulting / ADI, Aquantia, BMW, Cisco, Commscope, LTC

Title: Industrial Applications Link Segment (diminico_01_0517.pdf)
Presenter: Chris Diminico, MC Communications/Cu-Test/Panduit

Title: Link Segment DCR and Use Case Power Requirements (diminico_02_0517.pdf)
Presenter: Chris Diminico, MC Communications/Cu-Test/Panduit

Title: DC resistance and powering scenarios (zimmerman_3cg_01_0517.pdf)
Presenter: Chair P802.3cg; CME consulting / ADI, Aquantia, BMW, Cisco, Commscope, LTC

The meeting recessed for a short break at 3:13 PM.

The meeting resumed at 3:35 PM.

Title: Long Leash PoDL (stewart_3cg_01_0517.pdf)
Presenter: Heath Stewart, Linear Technology/Analog Devices

Title: Line Codes and Block Codes Primer (McClellan_3cg_01_0517 block codes draft 2.pdf)
Presenter: Brett McClellan, Marvell

Title: Evaluation board Update (& demonstration) (Graber_3cg_07_0517.pdf)
Presenter: Steffen Graber, Pepperl+Fuchs

The Chair the reminded the Task Force of the Working Group meeting this evening.

Future Meeting Straw Polls:

- I am likely to attend 802.3cg at:
- July plenary (Berlin, Germany):
 - Y: 41 N: 7 M: 4
- September Interim (Charlotte, NC USA)
 - Y: 32 N: 6 M: 13

**Title: Proposed draft Outgoing liaison to TIA TR42
(IEEE_802d3_to_TIA_TR42_0517_liaison_draft3.pdf)**

Presenter: Chair P802.3cg; CME consulting / ADI, Aquantia, BMW, Cisco, Commscope, LTC for Masood Shariff

In lieu of liaison letters each liaison was requested to present the ongoing work of IEEE P802.3cg to TIA TR42.

The meeting recessed for the day at 5:54 PM.

The Task Force meeting resumed at 8:32 AM.

George Zimmerman reviewed the agenda in agenda_3cg_01b_0517.pdf.

- Mr. Zimmerman noted that there should be no recording or photography without permission.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

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

Attendance, Mr. Zimmerman advised the group of the IEEE meeting attendance tool and procedures, including both the attendance log and the web attendance tracking tool (IMAT).

Mr. Zimmerman reviewed the slide entitled “Participation in IEEE 802 Meetings” and asked if there was any discussion necessary, none responded.

IEEE Patent Policy, at **8:39 AM**, Mr. Zimmerman showed slides 0 through 4 patent policy from agenda_3cg_01b_0517.pdf. Mr. Zimmerman showed slide 0 and asked if anyone has not seen slides 1 through 4. None responded. Mr. Zimmerman then made the call for potentially essential patents at **8:40 AM**, and none responded. Mr. Zimmerman then showed slide #4.

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.

Title: PAM-3 PHY Baseline Proposal (Graber_3cg_08a_0517.pdf)

Presenter: Steffen Graber, Pepperl+Fuchs

Title: Additional Non-Industrial Use Cases for 10SPE (jones_10spe_02_0517.pdf)

Presenter: Peter Jones, Cisco

Title: Proposal: PHY Noise-Signal for the Industrial Link Segment (Harald_Mueller_3cg_03_0517.pdf)

Presenter: Harald Mueller, Endress+Hauser

Straw Poll: I support slide 9 of Mueller_3cg_02_0517.pdf as the strawman for PHY noise evaluation for the 1000m PHY objective

- (understanding "Broadboard" is Broadband)
- 10E-9 is 1 in 10⁹

Y: 28 N: 0 A: 13

The Task Force meeting took a short break at 9:59 AM.

The Task Force meeting resumed at 10:16 AM.

Motion 3: Move to adopt Slides 4 and 5 of Graber_3cg_08a_0517.pdf as a baseline for Modulation and Symbol rate for the 1000m PHY objective.

M: S. Graber S: B. Horrmeyer

Y: 30 N: 0 A: 10

Motion Passes (Technical >= 75%)

Motion 4: Move to adopt Slide 6 of Graber_3cg_08a_0517.pdf as an example Transmitter Test Setup for the 1000m PHY objective.

M: S. Graber S: M. McCarthy

Y: 32 N: 0 A: 11

Motion Passes/Fails (Technical >= 75%)

The Task Force meeting took a short break at 10:43 AM.

The Task Force meeting resumed at 11:15 AM.

Motion 5: Move to adopt the following specification for transmitter level for the 1000m PHY objective:

The transmitter specification will include 2 transmit voltage level options, 2.4Vpp and 1.0Vpp (at the MDI), with +/- 5% tolerances

M: S. Graber S: Markus Wucher

[AMENDED BY MOTION 6]

Motion 6: Motion to amend Motion 5 to read:

Move to adopt the following specification for transmitter level for the 1000m PHY objective:

The transmitter specification will include 2 transmit voltage levels, 2.4Vpp and 1.0Vpp (at the MDI), with +/- 5% tolerances

M: M. McCarthy S: P. Jones

Y: 25 N: 0 A: 13

Motion to Amend Passes (Technical >= 75%)

Motion 7: Move to amend (amended) Motion #5 to read:

Move to adopt the following specification for PHY associated with objective bullet #12 transmitter level:

The transmitter specification will include 2 transmit voltage levels, 2.4Vpp and 1.0Vpp (at the MDI), with +/- 5% tolerances

M: C. Diminico S: B. Voss

Y: N: A:

Motion Passes/Fails (Technical >= 75%)

[MOTION WITHDRAWN with CONSENT OF GROUP]

Motion 5 [Amended]: Move to adopt the following specification for transmitter level for the up to 1000m PHY objective:

The transmitter specification will include 2 transmit voltage levels, 2.4Vpp and 1.0Vpp (at the MDI), with +/- 5% tolerances

M: S. Graber S: M. Wucher

Y: 27 N: 2 A: 10

Motion Passes (Technical >= 75%)

The meeting recessed for lunch at 12:01 PM.

The meeting resumed at 1:07 PM.

Motion 8: Move to slides 10 and 11 of Graber_3cg_08a_0517.pdf as Clock frequency and jitter tolerance for the up to 1000m PHY objective.

M: S. Graber S: M. McCarthy

Y: 18 N: 2 A: 5

Motion Passes (Technical >= 75%)

Motion 9: Move to adopt slide 12 of Graber_3cg_08a_0517.pdf as test patterns for the up to 1000m PHY objective.

M: S. Graber S: Oisin

Y: 22 N: 0 A: 7

Motion Passes (Technical >= 75%)

Motion 10: Move to adopt use of a blind link training technique without the need for dedicated training sequences as the link training method for the up to 1000m PHY objective.

M: S. Graber S: T. Brillhart
Y: 22 N: 0 A: 6
Motion Passes (Technical \geq 75%)

Motion 11: Move to adopt Table of electromagnetic classifications for the up to 1000m 802.3cg link segment baseline; slide 13 in diminico_01_0517.pdf.

M: C. Diminico S: S. Graber
Y: 21 N: 0 A: 7
Motion Passes (Technical \geq 75%)

Motion 12: Move to create normative annex in 802.3cg baseline “Optional Power Distribution annex” to include:

- Power/voltage/current/DCR for link segment (point-to-point/plug-and-play) topologies* slide 12 diminico_02_0517.pdf.
- “engineered” power delivery for other topologies* (trunk cables) slide 14 diminico_02_0517.pdf.
- Link Segment DCR characteristics slide 19 diminico_02_0517.pdf.

M: C. Diminico S: S. Graber
Y: 18 N: 0 A: 9
Motion Passes (Technical \geq 75%)

Motion 13: Move to adopt in 802.3cg baseline Optional Power Distribution annex baseline power requirements for (point-to-point/plug-and-play) powered devices in Table below:

Class	Vpse, min V	Ipi, max (A)	Rloop (60C) ohm	Ppd (1000m) W
new 1	20	.102	59	1.4
new 2	20	.155	39	2.2
new 3	50	.255	59	8.9
new 4	50	.388	39	13.6

M: C. Diminico S: H. Stewart
Y: 20 N: 0 A: 9
Motion Passes (Technical \geq 75%)

Motion 14: Move to adopt in 802.3cg baseline Optional Power Distribution annex baseline power requirements for “engineered” power delivery devices given in Table on slide 18 of diminico_02_0517.pdf, with the deletion of “in the daisy chain”.

M: C. Diminico S: M. McCarthy
Y: 20 N: 0 A: 7
Motion Passes (Technical >= 75%)

The Chair asked for further motions to adopt baseline text. None Responded.

Straw Poll revisit: I support an additional objective of the form: "Define a multidrop link segment and a PHY for up to at least:

- 5 nodes and a total of 15 meters of cabling and 2 inline connectors, in a linear configuration"

Pick One - Y: 9 N: 3 A: 14

The chair moved to the timeline to discuss with the Task Force

David Law, 802.3 Working Group Chair assumed the Task Force Chair during the timeline discussion.

Motion 15: Move to adopt proposed timeline in Zimmerman_3cg_02_0517.pdf slide 5

M: G. Zimmerman S: T. Brillhart
MOTION PASSES by voice without opposition (Procedural > 50%)

Mr. Zimmerman resumed duties as Chair.

Future Meeting Straw Polls: (revisit)

- I am likely to attend 802.3cg at:
- Nov plenary (Orlando, FL):
 - Y: 19 N: 1 M: 10

Announcements:

Next ad hoc meeting will be on June 7 at the normal time. Please use the reflector prior to the meeting.

The Chair announced the editorial team with Valerie Maguire as Chief Editor. Jon Lewis and Chris Diminico are also on the team and there is a position available for the PHY section editor.

Adjournment

Motion #16: Move to adjourn the meeting.

M: Jon Lewis S: Steffen Buntz
MOTION PASSES by voice without opposition (Procedural > 50%)
The Meeting was adjourned at 2:20 PM

Appendix A: Attendees at the IEEE P802.3cg 10 Mb/s Single Twisted Pair Ethernet Task Force Meeting, May 24-26, 2017.

Last Name	First Name	Employer	Affiliation	Wed	Thurs	Fri
Abbott	Chris	Endress+Hauser	Endress+Hauser		X	X
Aekins	Robert	Legrand	Legrand		X	
Agnes	Andrea	ST Microelectronics	ST Microelectronics		X	X
Alvaraw	Natasha	IEEE	IEEE			X
Angha	Ali	Spirent Communications	Spirent Communications	X	X	X
Aslam	Hassaan	Maxlinear	Maxlinear	X	X	X
Bains	Amrik	Cisco	Cisco	X	X	X
Beruto	Piergiorgio	Cerova Tech SEL	Cerova Tech SEL		X	X
Brandt	David	Rockwell Automation	Rockwell Automation	X	X	X
Brillhart	Theo	Fluke Electronics	Fluke Electronics	X	X	X
Brownlee	Phillip	TDK	TDK	X	X	
Buntz	Stefen	Daimler AG - Mercedes-Benz Cars	Daimler AG - Mercedes-Benz Cars	X	X	X
Butter	Adrian	Global Foundries	Global Foundries		X	X
Carlson	Steve	High Speed Design	Robert Bosch		X	
DiMinico	Christopher	MC Communications	Panduit	X	X	X
Donahue	Curtis	UNH - IOL	UNH - IOL	X	X	
Eitel	Cornelia	Hirschmann Automation and Control	Hirschmann Automation and Control	X	X	X
Feldman	Shahar	Microsemi	Microsemi	X		
Flatman	Alan	LAN Technologies	LAN Technologies	X	X	X
Franchuk	Brian	Emerson Automation Solutions	Emerson Automation Solutions	X	X	X
Fritsche	Matthias	Harting	Harting	X	X	X
Gardner	Mike	Molex, LLC	Molex, LLC	X	X	
Gauthier	Claude	OmniPHY	OmniPHY	X	X	X
Goergen	Joel	Cisco	Cisco		X	
Gottron	Jens	Siemens AG	Siemens AG	X	X	X
Graber	Steffen	Pepperl+Fuchs	Pepperl+Fuchs	X	X	X
Grau	Olaf	Robert Bosch	Robert Bosch	X	X	
Grow	Robert	RMG Consulting	RMG Consulting	X	X	X
Hajduczena	Marek	Charter	Charter			X

Last Name	First Name	Employer	Affiliation	Wed	Thurs	Fri
Hamidy	Farid	Pulse	Pulse	X	X	
Herbnet	Thomas	Herbst LLC	Herbst LLC	X	X	X
Hess	Dave	Cord Data	Cord Data	X	X	X
Hormmeyer	Bernd	Phoenix Contact	Phoenix Contact	X	X	X
Hyakutake	Yasuhiro	Adamant Co., Ltd	Adamant Co., Ltd	X	X	X
Jones	Chad	Cisco	Cisco		X	
Jones	Peter	Cisco	Cisco	X	X	X
Law	David	Hewlett Packard Enterprise	Hewlett Packard Enterprise			X
Lewis	Jon	Dell EMC	Dell EMC	X	X	X
Lingle Jr.	Robert	OFS	OFS		X	
Maguire	Valerie	Siemon	Siemon	X	X	X
Marris	Arthur	Cadence	Cadence		X	X
Matheus	Kirsten	BMW	BMW	X	X	X
McCarthy	Mick	Analog Devices	Analog Devices	X	X	X
McClellan	Brett	Marvell	Marvell	X	X	
Medina	Marcel	Spirent	Spirent		X	
Modi	Geet	Texas Instruments	Texas Instruments	X	X	X
Moffitt	Bryan	Commscope	Commscope	X	X	X
Mueller	Harald	Endress+Hauser	Endress+Hauser	X	X	X
Ocuanchain	Oisin	Analog Devices	Analog Devices	X	X	X
Oliver	Doug	Ford Motor Company	Ford Motor Company	X	X	X
Patel	Harsh	Molex, LLC	Molex, LLC	X	X	
Peker	Arkadiy	Microsemi	Microsemi	X	X	
Poehmerer	Rainer	Leoni	Leoni	X	X	X
Renteria	Victor	Bel Fuse Inc.	Bel Fuse Inc.	X	X	
Schmidt	Timothy	Texas Instruments	Texas Instruments	X	X	X
Schweitz	Laura	Turck	Turck	X	X	X
Shariff	Masood	Commscope	Commscope	X	X	
Sparrowhawk	Bryan	Leviton	Leviton	X	X	X
Stewart	Heath	Analog Devices	Analog Devices		X	X
Stover	David	Analog Devices	Analog Devices		X	
Su	Ching-Yao	Realtek	Realtek	X	X	X
Thompson	Geoff	GraCaSI SA.	Independent		X	X
Umnov	Alexander	Corning	Corning		X	X
Vanderlaan	Paul	Berk-Tek LLC	Berk-Tek LLC	X	X	
Voss	Bob	Panduit	Panduit	X	X	
Wechsler	Christopher	Audi AG	Audi AG	X	X	
Wendt	Matthias	Philips Lighting	Philips Lighting	X	X	X

Last Name	First Name	Employer	Affiliation	Wed	Thurs	Fri
Winkel	Ludwig	Siemens AG	Siemens AG	X	X	X
Wu	Peter	Marvell	Marvell	X	X	X
Wucher	Markus	Endress+Hauser	Endress+Hauser	X	X	X
Xu	Qing	Belden	Belden		X	
Yseboodt	Lennart	Philips Lighting	Philips Lighting		X	
Zielinski	Martin	Emerson Automation Solutions	Emerson Automation Solutions	X	X	X
Zimmerman	George	CME Consulting	Commscope, Aquantia, LTC, CME Consulting, Cisco, ADI, BMW, APL Group	X	X	X