**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
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| Abstract | [Minutes of March 2016 Plenary Session]  |
| Purpose | [Description of what the author wants P802.15 to do with the information in the document.] |
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**Task group 802.15.7r1 met for 10 sessions during the March 2016 meeting.**

**Session 1 (14 March 2016)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Tuncer Baykas – Istnbul Mediopol University
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order and the agenda for the meeting was discussed and agreed (**doc. 15-16-0137-r1**). The patent policy was briefly discussed.

The meeting on Tuesday, 15 Mar 2016 (AM1) would start at 09:00 to allow Nikola time to present to the 802.11 Next Generation Wireless group and allow the LiFi contributors to attend.

The committee decided to create two sub-committee to discuss LiFi and OCC. Nikola would chair the LiFi sub-committee and Yeong Min Jang would chair the OCC sub-committee.

Rick presented the pending 802.15.7r1 Draft D0 (doc. 16-0182-r0). This is an overview of the potential structure of the new standard.

The document could provide different reference sub-sections for the different topologies that may or may not be supported by the different PHY modes.

Volker presented the Table of Content and the Intended Contributions to the IEEE 802.15.7r1 High-speed Photodiode Communications (doc. 16-0232-r0).

Meeting recessed until PM 2

**PM 1 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Nikola presented the pureLiFi contribution (**doc. 15-16-0231-00**) to highlight the type of contribution that will be required for the standard.

The meeting was broken into the High-rate sub-committee working on High Rate PD and the Low-rate sub-committee working on Low-rate PD receiver and Image Sensor communications.

Meeting recessed until 19 January 2016 session PM1.

**Session 2 (15 March 2016)**

**AM 1 (09:00 – 10:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Volker presented **doc. 15-16-0016-03**.

Tuncer presented **doc. 15-16-0200-00**.

Meeting recessed until AM2.

**AM 2 (10:30 – 12:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Li Qiang presented **doc. 16-0174r0**. The presentation discussed the Hybrid solution using OWC and RF. The requirements is to specify produces to support joint operations of RF, VLC and separately.

Tuncer presented **doc. 16-0017r0**. Nikola asked that this Common Mode Signaling should not be mandatory. Rich pointed out that the Common Mode Signaling should be defined by an industrial association rather than the standardization committee.

The CMS was discussed as a potential for the co-existence of RF and various types of VLC PHY modes.

Yiguang Wang discussed **doc. 16-XXXXr0** that is a presentation of the Fudan University contribution submitted in **doc. 16-0180r0**.

They suggest that the adaptive bit and power loading should be required but work on the alternative modulation schemes should be optional.

Trang presented **doc. 16-0239r0.**

Meeting recessed until PM1.

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Zeng Yu presented the contribution from China Telecom **doc. 16-0229-r1**.

The committee continued merging work by dividing into a High-rate and Low-rate subcommittees.

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

The committee continued merging work by dividing into a High-rate and Low-rate subcommittees.

Meeting recessed until PM1 on Wednesday, 16 March 2016.

**Session 3 (16 March 2016)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Shoichi Kitazawa – ATR
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Refik Kizilirmak presented the contribution from TAMU Qatar **doc. 15-16-0245r0**.

Jay Kim raised a question about the utility of the Relaying scenario. Nikola suggested that the Half-Duplex mode has interesting use-cases but the cooperative relaying mode may be difficult to implement.

Jaesong presented the contribution of SNUST **doc. 16-0280r0** on PHY Mode Classifications.

Vinayagam presented the contribution of SNUST PHY and MAC mode **doc. 16-0279r0** that is a summary of **doc. 16-0278r0**. In addition, **doc. 16-0281r0** was also presented.

Rick Roberts asked that the Technical Editor must be given clear instructions by the committee as to how the classification of the new PHY modes should be done in the 802.15.7r1 draft D0 document. Unless, the Technical Editor is given clear instructions how to create the classification for the new document, then the Technical Editor shall have the freedom to create the classification according to his opinion.

Soo Young raised the point that the original 802.15.7-2011 standard made PHY I and PHY II mandatory. This issues to be discussed were presented in **doc. 16-0277r0**.

Rick suggested that all of these issues should be addressed after the draft D0 is created. This would create a framework for comment resolution that would be done.

Tuncer suggested that having a systematic method for resolving the conflicts should be done via the comment resolution process after draft D0 is done. He suggest that the draft D0 would allow for an overview of the entire process and proposal.

Rick suggested that the text submissions for draft D0 could include any changes that the proposers would like to implement to the overall document.

Nam presented the contribution from Kookmin University **doc. 16-0283r3**.

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Shoichi Kitazawa – ATR
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

Volker presenting the HHI contribution about single carrier modulation using OFDM (**doc. 15-16-0287r0**).

Meeting recessed until 17 March 2016 PM1.

**Session 4 (17 March 2016)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Shoichi Kitazawa – ATR
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order. The agenda was discussed and agreed.

Soo Young presented the SYCA and SNUST proposal for classification of the Image Sensor and Low-rate PD classifications (**doc. 16-00280r0**).

Rick raised the issue that a naming convention should be agreed shortly. Panasonic is in principle in agreement with the proposal. Kookmin has agreed that the proposal is general suitable but needs perhaps some additional modifications for the description. SNUST is comfortable with the current naming proposal.

Rick presented a description of the submission process (**doc. 16-071r1**). Rick has included most of the work that is required to be included for the draft D0. Rick has indicated that all text that should be included in the draft D0 must be posted on Mentor to avoid any possibility of potential editorial mistakes.

Rick has asked that all submissions must be uploaded at least two weeks before the May meeting in Hawaii.

Rick has put forward a motion to the committee:

**MOTION**

**All 15.7r1 proposers (ISC/LR-PD/HR-PD) must post their text input for the baseline draft D0 to mentor two weeks prior to the opening of the May 2016 IEEE802 meeting in order to meet the current 15.7r1 schedule. The committee may assess a severe penalty for missing this deadline.**

**The proposed deadline is 2 May 2016, 23:59 hours US Pacific Daylight Savings Time.**

**The proposed “severe penalty” is that any proposer that misses the deadline will temporarily have their proposal removed from the draft. If they submit their input during the May meeting then they can request the committee reinstate their proposal in the draft text. If they have not submitted by the end of the May meeting then they’re permanently deleted from the draft D0 document.**

**Mover: Richard Roberts (Rick)**

**Seconder: Nikola Serafimovski**

**YES: 12 NO: 0 ABSTAIN: 0**

The motion is passed.

Mohamed asked what can be changed in the draft D0 and what is not allowed to change.

Rick said that in principle, every aspect of the existing standard can be changed because this is a revision. However, the initial idea was to create an amendment and therefore minimal changes should be made.

The plan for the May meeting was discussed.

Volker suggested that each presenter should provide input on what is the difference between the existing text proposal and what they would have put forward for draft D0.

Rick mentioned that he will provide a general template for the format in which he would expect the text contribution to be.

Rick suggested that the committee could review draft D0 during the Hawaii meeting to generate and review the comments.

The overall standardization timeline was reviewed (**doc. 15-0274r3**) and agreed as a good timeline to continue working against.

Jeasong asked for a clarification on the progress of the HD-PD part.

Nikola explained that the groups had agreed to provide two different PHY modes that will jointly address the requirements of the TCD. Volker mentioned that the Technical Editor would be asked to compile the joint document.

Rick commented that dealing with text is easy enough. However, working with graphics would be difficult and time consuming. Therefore, the Chief Technical Editor has asked that the sub-editor of each section will be deliver the integration of the graphics and the equations in the FrameMaker editable format.

Prof. Soo Young presented the update version for the classification of ISC/LR-PD PHY mode (**doc. 16-0304r0**).

Rick has asked if the classification that has been provided under “NEW proposal” column in **doc. 16-0304r0** is the official classification that the Technical Editor should use in the draft D0?

The committee has indicated that the Technical Editor is to tentatively categorize the Image Sensor and Low-rate PD PHY contributions as indicated in **doc. 16-0304r0**.

Jaesong has asked if it is permitted to allow the movement of various types of PHY modes from one categorization to another.

The comment resolution process allows the movement of a proposal from one PHY classification to another.

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Yoshiho Goto – Panasonic
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Rick Roberts – Intel
* Nikola Serafimovski – pureLiFi
* Dobroslav Tsonev – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Tuncer Baykas – Istnbul Mediopol University
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Jinyong Choi – LG Electronics
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI
* Yiguang Wang – Fudan University
* Zeng Yu – China Telecom
* Shoichi Kitazawa – ATR
* Junghoon Lee – SNUST
* Vinayagam Mariappan – SNUST

Meeting called to order.

The committee discussed the various editor assistance that

Jaesong asked why is a sub-editor necessary given that chief editor and tech. editors have been assigned.

Rick said that this is not a standing position and he would ask different people for different documents.

JS suggested that the position should be a "helper", not a sub-editor

Rick explained that this is not a standing position and we should probably remove this suggestion from the website

Nikola suggested Volker Jungnickel and Dobroslav Tsonev as assistant editors for the high-bandwidth PHY and the low-bandwidth PHY, respectively.

The committee decided that the following assistant editors would be responsible for the following parts:

Image Sensor Communications and Low Rate PD

* Intel: Rick
* Kookmin: Trang
* Panasonic: Hideki
* SNUST:  Jaesung
* China Telecom: Yu
* SYCA: Soo-Young
* NTU: Rick (contact with Michael)

High Rate PD

* Lower-bandwidth High Rate PD: Doborslav
* Higher-bandwidth High Rate PD: Volker

The committee has agreed to use the classification specified in **doc. 16-XXXXr0** for the initial ordering/combining of the various PHY modes in draft D0.

Rick has provided a text input template in **doc. 16-0310r0**.

Li Qiang asked about where the text focused on the MAC should be incorporate?

Rick said that the template is guidance only and proposers should just generate the text and uploaded it. This should be in a suitable format that can be easy for the Technical Editor to incorporate the text.

Meeting in adjourned until May 2016.