**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | September IEEE802.15.7r1 Minutes | |
| Date Submitted | January 2016 | |
| Source | Nikola Serafimovski (pureLiFi)  Yeong Min Jang (Kookmin University) | Voice: [ ] Fax: [ ] E-mail: [ ] |
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| Abstract | [Minutes of January 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 7 sessions during the January 2016 meeting.**

**Session 1 (18 January 2016)**

**AM 1 (10:30 – 12:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order and the agenda for the meeting was discussed and agreed (**doc. 15-15-0972-r1**). The patent policy was briefly discussed.

A draft timetable for the presentations was uploaded by Hideki (**doc. 15-16-0063-r0**).

The committee discussed the use of available time.

There was a discussion on whether the existing 802.15.7 MAC or to throw it away.

Rick: “If the intention is to replicate the 802.11 MAC in the 802.15, then this would not work. The better solution would be to take the PHY and introduce it to the 802.11.”

Michael McInnis: “802.15.4e created an addendum to 802.15.4 MAC structure, so it could be done. Pat Kenny, Bob Heiley, James should be invited to attend the agreed Ad-Hoc session for the 802.15.7r1 discussion on the MAC. ”

Ad-hoc meetings might be required to make the tight deadlines for the committee.

The merging proposals should avoid having multiple ways that do the same thing. Specifically, merged proposals should have value-added for various situations.

Interoperability will need to be considered within the same categories. This could be done by having a single mandatory/common baseline mode that must be supported and everything else is with addition.

**MOTION: Should the below process suggested for the creation of a First Draft be accepted?**

Proposed process for the creation of the First Draft of the IEEE 802.15.7r1 standards document.

1. Committee drafts the Table of Content
2. Committee votes on any modifications to the Table of Content
3. Merge all the technical contents and then present the merged documents
4. Committee votes on the content
5. A sub-editor is assigned to that technical section that will generate the text
6. A first draft is integrated

**MOVER:** Nikola Serafimovski **SECONDED:** Rick Roberts

**YES: 8 NO: 0 ABSTAIN: 0**

The presentation timetable was agreed. The general outline would be Image Sensor communications, followed by High Rate PD sensor followed by Low Rate PD sensor.

Meeting recessed until PM 1

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Rick Roberts presented their OCC Proposal (**doc. 15-16-0006-01**), which will be fully compliant with the current 802.15.7 MAC and the 802 protocol stack.

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Questions on the presentation from Intel.

Hsin-Mu Tsai presented the contribution (**doc. 15-16-0018-00**).

Trang presented the Kookmin contribution (**doc. 15-16-0011-01**).

Meeting recessed until 19 January 2016 session PM1.

**Session 2 (19 January 2016)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Mohamed Abdalla – Texas A&M University at Qatar
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

The presentation order was discussed.

Hideki discussed the Panasonic proposal (**doc. 15-16-0027-01**).

Trang presented the Kookmin University contribution (**doc. 15-16-0011-01**).

Meeting recessed until PM2 (15:30 start).

**PM 2 (15:30 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Trang continued presenting the Kookmin University contribution (**doc. 15-16-0011-01**).

Jaesang presented the Seoul National University of Science & Technology contribution (**doc. 15-16-0024-01**, **doc. 15-16-0025-01, doc. 15-16-0026-01**).

Meeting recessed until 20 January 2016 session PM1.

**Session 3 (20 January 2016)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Jaesang took questions on the Seoul National University of Science & Technology contribution (**doc. 15-16-0024-01**, **doc. 15-16-0025-01, doc. 15-16-0026-01**).

Soo Young presented the contribution from California State University Sacramento (**doc. 15-16-0007-02**).

Soo Young took questions on the California State University Sacramento contribution (**doc. 15-16-0007-02**).

Nikola presented the pureLiFi contribution (**doc. 15-16-0006-00**).

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Dr. Murat Uysal – Ozyegin University
* Bob Helie – WiSun Alliance
* Kaji Akiyama – Sony Corporation
* Young-Hoon KIM – ETRI
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Nikola continued presenting the pureLiFi contribution (**doc. 15-16-0006-00**).

Nikola took questions on the PureLiFi contributions (**doc. 15-16-0006-00**).

Murat presented Ozegin University contribution (**doc. 15-16-0008-00**).

Li Qiang presented the Huawei contribution (**doc. 15-16-0028**).

Meeting recessed until 21 January 2016 AM2.

**Session 4 (21 January 2016)**

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Junwen presented the Fudan University contribution (**doc. 15-16-0019-01**).

Michael McInnis made a comment that standardization of point-to-point communications might not be best served in the 802.15.7r1 committee because there are other standards that are already focused on point-to-point communications. Why would the existing FSO manufacturers change away from existing systems to implement the proposed solution for the 802.15.7r1.

Volker said that the channel adaptation is a key differentiator.

Hany mentioned that Dimming is a key capability that differentiates the 802.15.7r1 effort from the alternative solutions.

Volker presented the HHI contribution (**doc. 15-16-0117-00**). HHI also submitted a complete text document for the standardization supported by a number of other partners including BWM, Osram and Marvell (**doc. 15-16-0016-01**).

Rick suggests that all of the LiFi collaborators need to come together to define a common basis for comparison of SNR.

Volker requested that the discussion around the unified definition of SNR for LiFi should be rescheduled for later in the day.

Meeting recessed until PM1.

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Prof. Soo Young Chang – California State University Sacramento
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Mohamed presented the Texas A&M University contribution (**doc. 15-16-0020-02**). Mohamed presented the Texas A&M University contribution (**doc. 15-16-0022-02**).

Hany presented the Boston University and Albany University contribution (**doc. 15-16-0021-01**).

Volker: We need a procedure so that the committee can determine how to select the appropriate waveform for the PHY, there are over 100 different OFM based waveform for optical. Choosing such advanced waveforms present unknown problems with the physics of the analogue electronics when it comes to the actual implementation.

Hany: This does not change anything with respect to the implementation. There is a general comfort if the modulation technique is already being used. However, the benefits are clear and are being used in Fiber Optics.

Nikola: We need to have a group that is different from the committee that will meet on the regular basis with specific actions that it can deliver against on a weekly basis before the meeting. We need to build a Framework that will drive the discussions around the pure technical discussions to take into considerations the remaining factors such as market demand, timing, etc.

The two parallel streams of OCC and LiFi will seek to create a merged document for each track by the March meeting.

Meeting recessed until PM2.

**PM 2 (16:00 – 18:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yoshiho Goto – Panasonic
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Javier Perez-Ramirez - Intel
* Shoichi Kitazawa – ATR
* Nikola Serafimovski – pureLiFi
* Michael McInnis – Boeing Company
* Michael Tsai (His-Mu Tsai) – National Taiwan University
* Hany Elgala – Boston University & Sunny Albany
* Mohamed Abdalla – Texas A&M University at Qatar
* Jay KIM – LG Electronics
* Junwen Zhang – Fudan University
* Li Qiang – Huawei Technologies
* Nam Tuan Le – Kookmin University
* Trang Nguyen – Kookmin University
* Volker Jungnickel – Fraunhofer HHI

Meeting called to order.

Trang presented the remaining contribution for Kookmin University (**doc. 15-16-0013-02**, **doc. 15-16-0014-01, doc. 15-16-0015-02**).

The Chair suggested Nam Tuan Le as a second Secretary for the 802.15.7r1 committee.

The committee has agreed to have 10 meetings during the next meeting session in March 2016.

The committee has agreed that the Technical Editors will eventually need to write the respective parts (OCC, High Speed PD, Low Speed PD).

The committee strongly suggests that various proposals are merged before the March 2016 meeting.

Meeting in recess until March 2016.