# IEEE P802.15

**Wireless Personal Area Networks**

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| Project | Task Group 15.6ma | |
| Title | **TG15.6ma Meeting Minutes for September 2022** | |
| Date Submitted | September 15th, 2022 | |
| Source | [Ryuji Kohno1,2 Marco Hernandez1 Takumi Kobayashi2 Minsoo Kim1]  [1; YRP-IAI (YRP International Alliance Institute), Japan,  2; YNU (Yokohama National University), Japan] | Voice: +81 90 5408 0611  E-mail: kohno@ynu.ac.jp  marco.hernandez@ieee.org  kobayashi-takumi-ch@ynu.ac.jp  [minsoo@minsookim.com](mailto:minsoo@minsookim.com) |
| Re: | Meeting Minutes | |
| Abstract | Since PAR and CSD of SG15.6ma as amendment of existing IEEE802.15.6-2012 for WBAN with enhanced dependability was approved by NesCom in September, Task Group TG15.6ma has been drafting technical requirement in cases of WBAN for medical use case for human body(HBAN) and for automotive use case for vehicle body(VBAN) with their connected use cases. In November meeting, to summarize technical requirement TG15.6ma has reviewed focused uses cases necessary for enhanced dependability in which channel propagation and environment of HBAN and VBAN with their mixed use can be categorized and modeled. Particularly to perform enhanced dependability in dense environment coexisting multiple overlaid BANs and different UWB and narrow band WPAN, WSN, WLAN etc. necessary technical requirement has been summarized in PHY and MAC layers. Then technical requirement document(TRD) has been approved by TG motion. Possible solutions to ensure enhanced dependability in PHY and MAC have been presented and discussed. Latest status of ETSI Smart BAN standard has been presented to find a way to make interoperability with IEEE802.15.6 and 6ma. To harmonize activities of TG15.6ma, 15.4ab and 15.14 using UWB PHY, TRD and technical guidance document(TGD) have been reviewed in joint and individual sessions. Next step has been discussed including telco for harmonization with TG15.4a and 14 and change to revision from amendment. | |
| Purpose | Minutes of Dependability Electronic Plenary Session on Webex, September 2022. | |
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**TG15.6ma 1st Session**

**Monday, September 12th, 2022, PM 16:00-18:00 Hawaiian Local Time**

**Room 4: Hilton Waikoloa, Kona, HI with Webex Virtual Conference**

* 1. Meeting called to order PM 16:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*

Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).

Registration information.

By Chair Ryuji Kohno

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 22-0452-02-06a

Chair showed IEEE Patent policy.

Chair issued Call for Potentially Essential Patents.

Þ No essential intellectual property in the scope of TG6a was declared.

Chair presented agenda of this meeting doc.# 802.15- 22-0451-04-06a

Þ Approved.

* 1. Approval of previous meeting minutes *Ryuji Kohno, Takumi Kobayashi (YNU / YRP-IAI)*

Þ Upon no comments on the November meeting minutes, doc. #15-22-0417-00-06a was approved.

**[Review]**

* 1. Overview of IG-DEP, SG6a, TG6a, and TG15.6ma for Revision of IEEE802.15.6-2012 Wireless BAN with Enhanced Dependability, *Ryuji Kohno (YNU / YRP-IAI)* doc. # 21-0389-01-06ma

**[Presentation for Channel Modeling]**

* 1. Summary of Channel and Environmental Modeling Activities for BANs on TG15.6ma, doc.# 802.15-22-0091-04 *(Takumi Kobayashi)*
     + In S8, propagation between in-cabin to in-cabin and in-cabin to engine compartment is different. *(Kamran Sayrafian)*
       - We understand. We will continue to consider about that deference. *(Takumi Kobayashi)*
     + Do you consider about the application to communicate to garage door. *(Hary Bims)*
       - For the garage use case, the same in-body to external channel models can be applicable. *(Takumi Kobayashi)*
     + Propagation model when windows down is different. Absorption ratio of a glass could be taken into account different from a wall. *(Hary Bims)*
  2. Channel Model for Wearable and Implant BAN in use case of BMI and BCI, doc.#802.15-22-0269-03, *(Takumi Kobayashi)*
     + The model is based on weight. Although if my weight is not in the table, how can we use the model? *(Hary Bims)*
       - Head and upper boy is not big deference by weight. Channel model does not affected much by the difference of weight. *(Kamran Sayrafian)*
  3. Propagation characteristics of UWB communication applications including medical implants, BCI and Passenger bus, doc.#802-22-0469-00, *(Daisuke Anzai)*
     + Our prototype is under the skin. Do you have any model for implanted transceiver? *(Masayuki Hirata)*
     + Although our current BMI system has set sent transmitter in open space at cutted skull born, its next version would set transmitter under skin over a head skull and wire-connected with an array of electrodes are installed under a skull. Its future feature is a transmitter installed under a head skull which is implant in a brain. *(Masayuki Hirata)*
       - We can consider about such a model. *(Daisuke Anzai)*
       - NICT software phantom model could be applicable to modelled for these variable use cases. *(Ryuji Kohno)*

**[Discussion]**

* 1. Finalizing Channel Model Documentation, TRD, Call for Proposals, *Marco Hernandez*, doc.# 22-0577-04-06ma, # 0344-02-06ma
     + At the end of the third session on Wednesday, TG motion has been scheduled to approve Call for Proposals with finalized documentation. Until then, we hope participants will review the updated CMD and TRD which have been described. *(Ryuji Kohno)*
  2. Recessed

**Attendees list**

Attendees 10

***Name Affiliation***

* Daisuke Anzai Nagoya Institute of Technology
* Harry Bims Bim's Laboratories
* Hiroki Saito ARIS
* Kamran Sayrafian NIST
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Ryuji Kohno YNU/YRP-IAI
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI

**TG6ma 2nd Session**

**Tuesday, September 13th 2022, PM 16:00-18:00 Hawaiian Local Time**

**Room 4: Hilton Waikoloa, Kona, HI with Webex Virtual Conference**

* 1. Meeting called to order PM 16:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).  
     Registration Information, By Chair *Ryuji Kohno*
  2. Opening Information, doc.#22-0451-06ma, *Ryuji Kohno (YNU / YRP-IAI)*
  3. Confirmation of Agenda, *Ryuji Kohno*
  4. Review of the last session TG6ma, *Ryuji Kohno*

**[Presentations for MAC Revision]**

* 1. MAC Bridging for Time-Sensitive Networking of 802.15.6ma, *Minsoo Kim*,doc.#22-0024-01-06ma.
  2. Harmonization to TSN, *Marko Hernandez*, doc.#22-0388-00-06ma
     + Does TG4ab discuss this TSN issues as well as us? *(Ryuji Kohno)*
       - In my observation, not so much discussion in 4ab but some talk about LLC was in today’s session. *(Ryuji Kohno)*
       - I think that not discussed much about the TSN in 4ab sessions *(Huan-Bang Li)*
  3. MAC ideas for BAN with Enhanced Dependability, *Minsoo Kim, Marco Hernandez*, doc.# 22-0277-04-06ma.
     + Are you thinking to use two transmitters in the same one device? *(Huan-Bang Li)*
       - If there are use case require higher dependability, two transmitters can be implemented. On the other hand, the use case is not request higher dependability, we can accept some of sub-set implementation which consists only single channel. *(Minsoo Kim)*
     + How to time synchronize 2 BAN coordinators? *(Huan-Bang Li)*
       - If there are two independent BANs, they are sharing the super frame and taking time synchronization. *(Minsoo Kim)*

**[Discussion]**

* + - CCA issues are quite sensitive in 4ab and UWB-AP idea includes some common issues with our TG6ma. How do you think, Minsoo? (Ryuji Kohno)
      * Something similar concept in UWB-AP in coverage channel. Basically that is similar idea with our controlling channel idea. *(Minsoo Kim)*
      * They are thinking based on the different topology. *(Minsoo Kim)*
      * VBAN coordinators works as like super coordinator in situation exists multiple HBAN coordinators. *(Ryuji Kohno)*
      * In the case of multiple coordinators are in the same bus, we need to consider to interference each other. *(Kamran Sayrafian)*
      * Two coordinators of 2 BANs are connected peer-to-peer under controlling of traffic by one BAN coordinator. Channel models can be used commonly. *(Ryuji Kohno)*
      * 2 users are in the same space, multiple implanted or on-body devices are interfere each as well. *(Kamran Sayrafian)*
      * We have the use-case for the passenger bus and Daisuke sensei simulated with 2 users using different BANs. *(Marco Hernandez)*
  1. Finalizing Channel Model Documentation, TRD, Call for Proposals, doc.# 802.15-22-0091-03 *(Marco Hernandez, Takumi Kobayashi)*
     + We need to discuss more about the BCI channel models in the next meeting *(All)*
  2. Recessed

Attendees 18

***Name Affiliation***

* Chen Run NRT
* Clark Palmer Meteorcomm LLC
* Daisuke Anzai Nagoya Institute of Technology
* Frederic Nabki SPARK Microsystems
* Hiroki Saito ARIS
* Huan-Bang Li NICT
* Iwao Hosako NICT
* Kamran Sayrafian NIST
* Libra Xiao NRT
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Norihiko Sekine NICT
* Ryuji Kohno YNU/YRP-IAI
* Sang-Kyu Lim ETRI
* Stuart Kerry OK-Brit; Self
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI

**TG6ma 3rd Session**

**Thursday, September 14th 2022, PM 16:00-18:00 Hawaiian Local Time**

**Room4: Hilton Waikoloa, Kona, HI with Webex Virtual Conference**

* 1. Meeting called to order AM 8:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).  
     Registration Information, By Chair Ryuji Kohno
  2. Confirmation of Agenda, doc.# 15-22-0451-03, *Ryuji Kohno* (YNU/YRP-IAI)
  3. Review of the last session TGma, *Ryuji Kohno* (YNU/YRP-IAI)

**[Presentations]**

* 1. Hybrid ARQ corresponding QoS priority levels, *Ryuji Kohno*, doc.#802.15-22-0375-00-06a

**[Finalizing Documents]**

* 1. Documentation of Channel and Environmental Modeling for Revision TG6ma, *Takumi Kobayashi*, doc.# 15-22-0344-03-06a
     + On S2.2, we need to consider abput the antenna design and antenna directivity. Implanted device under head skin is quite hard to radiate RF signal to surface of the other part of the body. (*Kamran Sayrafian*)
       - In the case that the receiver on head surface is also one application. Head gear type of wearable receiver is also included in this case. (*Ryuji Kohno*)
     + How large that implant device? (*Kamran Sayrafian*)
       - About 4-5cm in my observation. (*Ryuji Kohno*)
     + In S2.2, when head is moving, is channel condition needed to considered Doppler shift?
       - We do not think about the Doppler shift at the moment. (*Ryuji Kohno*)
       - I think head movement is too slow to give doppler shift (*Kamran Sayrafian*)
     + Please put some explanation statements in this document.(*Ryuji Kohno*)
       - [Realtime modification by *Marco Hernandez*.
       - We had consensus on the final modification with all attendees.
       - Final version of CMD has been uploaded as doc.# 15-22-0519-00-06a
  2. Technical Requirement Document(TRD), *Marco Hernandez*, doc.#802.15-21-577-05-6a
  3. Motion of approve Technical Requirement Document(TRD), channel model document and Call for Proposals for the Revision
     + Moved by Marco Hernandez YRP-IAI, Second Minsoo Kim, YRP-IAI
     + Unanimous consent. Motion carries.
  4. Any other business?
     + No.
  5. Adjourn

Attendees 13

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* Chen Run NRT
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* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Ryuji Kohno YNU/YRP-IAI
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI