

IEEE P802.15
Wireless Personal Area Networks

Project	Task Group 15.6ma	
Title	TG15.6ma Meeting Minutes for July 2024	
Date Submitted	July 18 th , 2024	
Source	[Ryuji Kohno ^{1,2} Marco Hernandez ¹ Takumi Kobayashi ^{1,3} Minsoo Kim ¹ , Daisuke Anzai ³ [1; YRP-IAI (YRP International Alliance Institute), Japan, 2; YNU (Yokohama National University), Japan, 3; NiTech(Nagoya Institute of Technology)]	Voice: +81 90 5408 0611 E-mail: kohno@ynu.ac.jp marco.hernandez@ieee.org kobayashi-takumi@yrp-iai.jp minsoo@minsookim.com anzai@nitech.ac.jp
Re:	Meeting Minutes	
Abstract	<p>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 July, 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 July 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. 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 using UWB PHY, TRD and technical guidance document(TGD) have been reviewed in the sessions.</p>	

Purpose	Minutes of Dependability Electronic Interim Session on Webex, July 2024.
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TG15.6ma 1st Session**Tuesday, July 16th, 2024, 8:00 AM- 10:00 AM Local Montreal Time****Room#Salon 2, Level 2, Sheraton Le Centre Montreal, Montreal, Quebec, Canada,
with Webex Virtual Room #2**

1.1.Meeting called to order 8:05 AM

By Chair Ryuji Kohno (YNU / YRP-IAI)

1.2.Roll Call *Ryuji Kohno*

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

Registration information.

By Chair Ryuji Kohno

1.3.Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 24-350-01-06a

Chair showed IEEE Patent policy.

Chair issued Call for Potentially Essential Patents.

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

Chair presented agenda of this meeting doc.# 802.15- 24-0349-03-06a

⇒ Approved.

1.4.Approval of previous meeting minutes *Takumi Kobayashi (YNU / YRP-IAI)*

⇒ Upon no comments on the March meeting minutes, doc. #15-24-0301-00-06a was approved.

[Review]1.5.Overview of IG-DEP, SG6a, TG6a and TG15.6ma for Revision of IEEE 802.15.6-2012 Wireless BAN with Enhanced Dependability, *Ryuji Kohno*, doc.#15-23-455-03-006a~~1.6.Basic Consensus in MAC and PHY of Revision of IEEE802.15.6-2012~~~~(IEEE802.15.6ma), *Ryuji Kohno*, doc.#23-0557-03-006a~~

⇒ Skipped due to time limitation.

1.7.Performance Evaluation of Channel Coding with Interleaver Based on TG6ma

Channel Model for Some Classes of Coexistence, *Daisuke Anzai*, doc.#24-0247-01-006a⇒ Performance is depending on the length of interleaver. How you can conclude that necessary length or the other parameters of interleaver? (*Ryuji Kohno*)⇒ Have you compared with some the other combinations of channel coding and interleaving? (*Ryuji Kohno*)

- 4ab LDPC case and RS+LDPC concatenated code cases have been compared. In most case, performance of our concatenated code in TG6ma was better.

However, in some limited case, simple LDPC + interleaver achieves better performance due to channel conditions. (*Daisuke Anzai*)

1.8. Ranging Accuracy Evaluation under TG6ma Communication Scenarios, *Daisuke Anzai*, doc.#24-0248-01-006a

- ⇒ From the viewpoint of coexistence, ranging issue is quite important. By using ranging technology, interfering BAN can stop to transmit signal to mitigate interference to the other BAN. How much performance degradation is occurred when the other BAN coexisting? (*Ryuji Kohno*)
 - Noise at receiver is not ignorable. As next step, we will evaluate in such more realistic situation carefully. (*Daisuke Anzai*)
- ⇒ This is based on the TWR. TWR needs to exchange ID information. In realistic situation, A (group coordinator) try to communicate with the other coordinator B and C. Have you simulated such realistic situation? (*Ryuji Kohno*)
 - In our simulation, BAN signal arrives the same period, and calculates time difference of arrival time from the multiple BAN coordinator. By using M-sequence, we are trying to suppress the interference effect. (*Daisuke Anzai*)
 - Even using cross-correlation, near-far problem can be occurred. (*Ryuji Kohno*)
 - Our simulation took account of effect of near-far effect. (*Daisuke Anzai*)
- ⇒ In your figure, interference source is allocated on opposite side of desired signal source. Is your simulation performed only this situation? (*Ryuji Kohno*)
 - Our simulation is based on distance between coordinators and average received power is used to calculate the results. This figure is showing just an example of configuration. (*Daisuke Anzai*)

1.9. Hybrid ARQ Scheme for High QoS Packets in High Class of Coexistence of IEEE 802.15.6ma, *Kento Takabayashi*, doc.#23-0576-04-006a

- ⇒ In the conclusion, you enhanced advantages using both of BCC and HARQ. Is their any drawback? (*Ryuji Kohno*)
 - In particular, first transmission case, performance is not so high. This makes lower efficiency and it means several transmission is needed. (*Kento Takabayashi*)
 - In very rich channel condition case, BCC+HARQ performance is relatively low. (*Kento Takabayashi*)

1.10. Evaluation of IEEE 802.15.6ma Ultra-wideband Physical Layer Utilizing Super Orthogonal Convolutional Code, *Kento Takabayashi*, doc.#23-00562-10-006a

- ⇒ As you mentioned, SOCC works very well in higher QoS level situation even too much redundancy. How we can equivalently evaluate performance such as latency, maximum delay time, and the other criteria in realistic situation? (*Ryuji Kohno*)

- These are future works. (*Kento Takabayashi*)

1.11. Recessed at 9:55 AM by chair, *Ryuji Kohno*

Attendees list

Attendees 9

<i>Name</i>	<i>Affiliation</i>
● Daisuke Anzai	Nagoya Institute of Technology
● Kento Takabayashi	Toyo University
● Marco Hernandez	UoO/YRP-IAI
● Ryuji Kohno	YNU/YRP-IAI
● Seong-Soon Joo	Korea Platform Service Technology (KPST)
● Takafumi Suzuki	NICT
● Takumi Kobayashi	Nagoya Institute of Technology/YRP-IAI
● Tero Kivinen	Self
● Tetsuya Nomura	DENSO TEN
● Yasuharu Amezawa	Mobile Techno

TG15.6ma 2nd Session**Tuesday, July 16th, 2024, 10:30 AM- 12:30 PM Local Montreal Time****Room#Salon 2, Level 2, Sheraton Le Centre Montreal, Montreal, Quebec, Canada,
with Webex Virtual Room #2**

2.1.Meeting called to order 10:30 AM

By Chair Ryuji Kohno (YNU / YRP-IAI)

2.2.Roll Call *Ryuji Kohno*

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

Registration Information, By Chair *Ryuji Kohno*2.3.802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*2.4.Confirmation of Agenda, doc.# 15-24-0349-03-06ma, *Ryuji Kohno*2.5.Progress report of 802.15.6ma, doc.# 23-0056-07-006a, *Marco Hernandez*2.6.TG6ma Timeline, doc.#23-0361-07-006a, *Marco Hernandez***[Review and Comment Resolution for PreBallot]**2.7.MAC features to be specified, doc.#24-352-00-006a, *Seong-Soon Joo*2.8.Group MAC service features, doc.#24-353-00-006a, *Seong-Soon Joo*2.9. 15.6ma MAC compared to 15.4-2020 MAC and 15.6-2012 MAC, doc.#24-354-00-006a, *Seong-Soon Joo*2.10. Proposed text for 6ma - MAC Service Features, doc.#24-356-00-006a, *Seong-Soon Joo*⇒ Group BAN creation may become so complicated. (*Marco Hernandez*)⇒ So many interesting proposals. Let us discuss more deeply and complete to describe them in the draft document. (*Ryuji Kohno & Marco Hernandez*)⇒ To describe the procedures, figures like flowchart may be easy to understand. (*Ryuji Kohno*)

- Several flowcharts are drawn in presentation. If you need, then these figures can be put into the document as well with some support from the others hopefully. (*Seong-Soon Joo*)

2.11. Comments from Technical Editor of WG15, doc.#15-24-0333-01-006a, *Marco Hernandez*

2.12. Recessed (12:28 PM)

Attendees 13

<i>Name</i>	<i>Affiliation</i>
● Abdelfattah	Renesas
● Daisuke Anzai	Nagoya Institute of Technology
● Huan-Bang Li	NICT
● Kento Takabayashi	Toyo University
● Marco Hernandez	YRP-IAI
● Masayuki Hirata	Osaka University
● Ryuji Kohno	YNU/YRP-IAI
● Seong-Soon Joo	Korea Platform Service Technology (KPST)
● Takafumi Suzuki	NICT
● Takumi Kobayashi	Nagoya Institute of Technology/YRP-IAI
● Tetsuya Nomura	DENSO TEN
● Weidong Tang	NRT
● Yasuharu Amezawa	Mobile Techno

TG15.6ma 3rd Session**Wednesday, July 17th, 2024, 9:00 AM- 10:00 AM Local Montreal Time****Room#Salon 2, Level 2, Sheraton Le Centre Montreal, Montreal, Quebec, Canada,
with Webex Virtual Room #2**

3.1.Meeting called to order 9:05 AM

By Chair Ryuji Kohno (YNU / YRP-IAI)

3.2.Roll Call *Ryuji Kohno*

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

Registration Information, By Chair *Ryuji Kohno*3.3.802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*3.4.Confirmation of Agenda, doc.#24-0349-04-06ma, *Ryuji Kohno*3.5.Technical editor comments to the P802.15.6ma_D1.18, doc.#24-0333-01-006a, *Tero Kivinen*3.6.Necessary Process to LB and Discussion, *Ryuji Kohno*

⇒ WG motion will be postponed couple of weeks.

- Anonymously approved.

3.7.Review of draft#2.3 for Pre-Ballot WG, *Marco Hernandez*⇒ Figure number can be written with section numbering. For example, first figure of section 7 can be explored like “Figure 7-1” to improve ease of maintenance.
(*Tero Kivinen*)~~3.8.Theoretical Analysis of System Performance in a Multi-BAN Coexistence Environment (Class 1), doc.# 24-0357-00-006a, *Kento Takabayashi*~~

⇒ Skipped due to time limitation.

3.9.TG15.6ma Coexistence Assessment Document, doc.#24-0348-01-006a, *Ryuji Kohno*

⇒ Current version has been approved anonymously.

3.10. Joint work with 802.1; Draft PAR and CSD 802.1ACea: Amendment to IEEE Standard 802.1AC-2016, doc.#15-23-453-02-006a & 15-23-454-02-006a, *Marco Hernandez*

Recessed (9:58 AM)

Attendees 13

<i>Name</i>	<i>Affiliation</i>
● Daisuke Anzai	Nagoya Institute of Technology
● Greg Ott	-
● Kamran Sayrafian	NIST
● Kento Takabayashi	Toyo University
● Marco Hernandez	YRP-IAI
● Masayuki Hirata	Osaka University
● Mohammad Rahmani	SPARK microsystems
● Ryuji Kohno	YNU/YRP-IAI
● Takafumi Suzuki	NICT
● Takumi Kobayashi	Nagoya Institute of Technology/YRP-IAI
● Tero Kivinen	Self
● Tetsuya Nomura	DENSO TEN
● Yasuharu Amezawa	Mobile Techno

TG15.6ma 4th Session**Thursday, July 14th, 2024, 8:00 AM- 10:00 AM Local Montreal Time****Room#Salon 2, Level 2, Sheraton Le Centre Montreal, Montreal, Quebec, Canada,
with Webex Virtual Room #2**

4.1.Meeting called to order 8:00 AM

4.2.Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
Registration Information, By Chair *Ryuji Kohno*4.3.802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*4.4.Confirmation of Agenda, doc.#15-24-0349-06-006a, *Ryuji Kohno*

⇒ Anonymously approved.

4.5.Theoretical Analysis of System Performance in a Multi-BAN Coexistence
Environment (Class 1), doc.#24-0357-006a, *Kento Takabayashi, Ryuji Kohno*⇒ Performance against distance showing result of 3 BANs case. Could you
explain again? (*Ryuji Kohno*)

- In our simulation, one BAN A and B communicated and BAN C is interfering
to the communication between A and B. (*Kento Takabayashi*)

4.6.MAC Performance Evaluation of Multiple BAN Coexistence Under TG6ma Channel
Model, doc.# 15-24-0246-01-006a, *Takumi Kobayashi*⇒ I would like to ask you to show us some results of CAP, and 10 BANs
simulations not only 5 BANs.4.7.Preparation for Letter Ballot (LB), *Ryuji Kohno*⇒ WG motion will be postponed couple of weeks based on the discussion in AC
meeting. (*Ryuji Kohno*)⇒ Necessary documents list has been described by *Ryuji Kohno*.4.8.Progress report of 802.15.6ma, doc.#23-0056-07-006a, *Marco Hernandez***[Summary of Channel Models, Channel Coding, and Interference Mitigation]**4.9.TG6ma Channel Model Document for Enhanced Dependability, doc.#22-0519-08-
006a, *Takumi Kobayashi*4.10. Comments to channel-model-document, doc.#23-0605-01 *Takumi Kobayashi*

⇒ All the modifications have been approved.

4.11. Interference Mitigation Schemes in Class 3, 5, 6, and 7 of Coexistence in TG6ma, doc.#15-24-0073-03-006a, *Takumi Kobayashi*

⇒ Interference mitigation technologies can be applicable for more the other layer like MAC and PHY. (*Ryuji Kohno*)

⇒ Let us discuss personally. (*Takumi Kobayashi*)

4.12. TG15.6ma Coexistence Assessment Document, doc.#24-0348-00-006a, *Ryuji Kohno*

[Progress and Timeline]

4.13. TG6ma Timeline(Rescheduling Timeline) doc.#23-0361-07-006a, *Marco Hernandez*

4.14. Any other business?

⇒ No.

4.15. Adjourn (9:30 AM)

Attendees 14

<i>Name</i>	<i>Affiliation</i>
● Greg Ott	-
● Kento Takabayashi	Toyo University
● Libra Xiao	NRT
● Marco Hernandez	YRP-IAI
● Mohammad Rahmani	SPARK microsystems
● Ryuji Kohno	YNU/YRP-IAI
● Seong-Soon Joo	Korea Platform Service Technology (KPST)
● Siram Murali	Spark microsystems
● Shiram	Texas Instruments
● Sven Zeisberg	HTW
● Takafumi Suzuki	NICT
● Takumi Kobayashi	Nagoya Institute of Technology/YRP-IAI
● Tetsuya Nomura	DENSO TEN
● Weidong Tang	NRT