Type of Project: Revision to IEEE Standard 802.15.6-2012
Project Request Type: Initiation / Revision
PAR Request Date: 
PAR Approval Date: 
PAR Expiration Date: 
PAR Status: Draft
Root Project: 802.15.6-2012

1.1 Project Number: P802.15.6
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: Standard for Local and metropolitan area networks - Part 15.6: Wireless Body Area Networks
Change to Title: Standard for Local and metropolitan area networks - Part 15.6: Wireless Body Area Networks

3.1.1 Contact Information for Working Group Chair:
Name: PATRICK KINNEY
Email Address: pat.kinney@kinneyconsultingllc.com
3.1.2 Contact Information for Working Group Vice Chair:
Name: Richard Alfvin
Email Address: alfvin@ieee.org

3.2 Society and Committee: IEEE Computer Society/LAN/MAN Standards Committee(C/LM)
3.2.1 Contact Information for Standards Committee Chair:
Name: Paul Nikolich
Email Address: p.nikolich@ieee.org
3.2.2 Contact Information for Standards Committee Vice Chair:
Name: James Gilb
Email Address: gilb@ieee.org
3.2.3 Contact Information for Standards Representative:
Name: James Gilb
Email Address: gilb@ieee.org

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Jul 2024
4.3 Projected Completion Date for Submittal to RevCom: Mar 2026

5.1 Approximate number of people expected to be actively involved in the development of this project: 12
5.2 Scope of proposed standard: This is a standard for short-range, wireless communication in the vicinity of, or inside, a human body (but not limited to humans). It uses existing industrial scientific medical (ISM) bands as well as frequency bands approved by national medical and/or regulatory authorities. Support for quality of service (QoS), extremely low power, and data rates up to 10 Mb/s is required while simultaneously complying with strict noninterference guidelines where needed. This standard considers effects on portable antennas due to the presence of a person (varying with male, female, skinny, heavy, etc.), radiation pattern shaping to minimize specific absorption rate (SAR) into the body, and changes in characteristics as a result of the user motions.

The standard improves the Ultra-Wideband (UWB) physical layer (PHY) and medium access control (MAC) to support enhanced dependability to human body area networks (HBAN). It incorporates support for vehicle body area networks (VBAN). VBAN consists of a coordinator in a vehicle with devices around the vehicle, operating under strict compliance to standards and limits for electromagnetic compatibility (EMC) and electromagnetic interference (EMI). Enhancements to dependability include coexistence of multiple piconets including inter-BAN interference and inter-piconets interference; simple and more reliable MAC protocol; sensing and feedback control loop delay; protection against interference in dense use cases with overlaid BANs and other piconets; support of higher performance requirement of reliability, security, coexistence, and efficiency in the operation and maintenance of HBAN and VBAN. The standard incorporates support for infrastructure protocols via an
access point. The amendment provides safeguards so that high throughput data use cases will not cause significant disruption to low duty-cycle ranging use cases.

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### 5.3 Is the completion of this standard contingent upon the completion of another standard? No

### 5.4 Purpose: The purpose is to provide an international standard for a short range, low power and highly reliable wireless communication for use in proximity to, or inside, a human body and/or a vehicle body. Data rates can be offered to satisfy an evolutionary set of entertainment and healthcare services. Current piconets do not meet the medical (proximity to human tissue) and relevant communication regulations for some application environments. They also do not support the combination of reliability (QoS), low power, data rate and noninterference required to broadly address the breadth of body area network applications. Additionally, this standard provides enhanced dependability that is required for some medical use cases. This includes remote medical healthcare, therapy and other monitoring that can enhance quality of life (QoL) in various population segments.

**Change to Purpose:** The purpose is to provide an international standard for a short-range (i.e., about human body range), low power, and highly reliable wireless communication for use in close-proximity to, or inside, a human body. Data and/or rates can typically vehicle-up body-to-Data rates can be offered to satisfy an evolutionary set of entertainment and healthcare services. Current personal area networks (PANs) piconets do not meet the medical (proximity to human tissue) and relevant communication regulations for some application environments. They also do not support the combination of reliability (QoS), low power, data rate, and noninterference required to broadly address the breadth of body area network applications. Additionally, this standard provides enhanced dependability that is required for some medical use cases. This includes remote medical healthcare, therapy and other monitoring that can enhance quality of life (QoL) applications in various population segments.

### 5.5 Need for the Project: This project provides dependability against interference and contention in such critical use cases as overlaid with the same and/or different piconets. Focus use cases: multiple BANs, where user's devices cross each other among different BANs within range. Multiple piconets, where narrowband and wideband devices cross each other within the same coverage range. Interference management among BANs. This amendment for enhanced dependability supports automotive use (vehicular body area network) with primary medical use for a human body and additionally non-medical use with common enhanced dependability. This amendment helps remote medical healthcare monitoring and therapy to combat Covid-19 pandemic and to support QoL in aging population and people with medical conditions.

**Change to Need for the Project:** There is a need for a standard optimized. This for project ultra provides low dependability power against devices interference and operation on, contention in or around the human such body to critical, serve use a cases variety as of overlaid applications with including the medical same and/or personal different entertainment piconets. Examples of the applications served by the Focus proposed use standard are cases: Electroencephalogram multiple (EEG) BANs; Electrocardiogram where (ECG) user's Electroencephalography devices (EMG); cross vital each signals other monitoring among (temperature wearable thermometer); different respiratory; BANs wearable within heart range rate; Multiple monitor piconets wearable where pulse narrowband oximeter and wearable wideband blood devices pressure cross monitor each oxygen other pH within value the same wearable coverage glucose range sensor. Interference implanted glucose sensor, cardiac arhythmia, wireless management capsule endoscope among (gastrointestinal); BANs wireless This capsule amendment for drug enhanced delivery, deep dependability brain supports stimulator, automotive cortical stimulator use (visual neuro-stimulator, audio neuro stimulator, vehicular Parkinson's body disease area etc. network), remote with control of primary medical devices such as pacemaker, actuators, insulin pump, hearing aid (wearable and implanted), retina implants, disability assistance, such use as for muscle tension human.
Body and stimulation, wearable weighing, non-medical fall use detection, with aiding, common sport, enhanced training, dependability. This will amendment include helps body-centric, remote solutions, medical for healthcare, future monitoring, wearable and computers. In a similar vein, the same technology can provide effective solutions for personal entertainment as well. The existence of a body area network standard will provide opportunities therapy to expand these product combat features, better Covid-19 healthcare, pandemic and well being for support the users. It will therefore result QoL in economic, aging opportunity population for and technology people component with suppliers, medical, and equipment manufacturers.  

5.6 Stakeholders for the Standard: The stakeholders include silicon vendors, manufacturers and users of telecom, medical and automotive. Manufacturers and users of environmental sensors and actuators, Consumer electronics equipment manufacturers and users of equipment involving the use of wireless sensor and control networks.

Change to Stakeholders for the Standard: The stakeholders include the silicon general vendors, population, manufacturers who and will users of be telecom, served medical by and advanced automotive, medical, Manufacturers and entertainment. users options of enabled, environmental by sensors this and standard actuators. Consumer Other electronics parties equipment having manufacturers interests and include users, medical of equipment manufacturers involving and the use of wireless sensor consumer and electronics control manufacturers networks.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project? No
6.1.2 Is the Standards Committee aware of possible registration activity related to this project? No

7.1 Are there other standards or projects with a similar scope? No
7.2 Is it the intent to develop this document jointly with another organization? No

8.1 Additional Explanatory Notes: