P802.15.4ad

Type of Project: Amendment to IEEE Standard 802.15.4-2020
Project Request Type: Initiation / Amendment
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft
Root Project: 802.15.4-2020

1.1 Project Number: P802.15.4ad
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: IEEE Standard for Low-Rate Wireless Networks Amendment: Data rate and range extensions to IEEE 802.15.4 Smart Utility Network (SUN) Physical layer (PHY)

3.1 Working Group: Wireless Specialty Networks (WSN) Working Group(C/LAN/MAN/802.15 WG)
3.1.1 Contact Information for Working Group Chair:
Name: Clinton Powell
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Name: PHILIP E BEECHER
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3.2 Society and Committee: IEEE Computer Society/LAN/MAN Standards Committee(C/LAN/MAN)
3.2.1 Contact Information for Standards Committee Chair:
Name: Paul Nikolich
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3.2.2 Contact Information for Standards Committee Vice Chair:
Name: James Gilb
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4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Dec 2025
4.3 Projected Completion Date for Submittal to RevCom: Dec 2026

5.1 Approximate number of people expected to be actively involved in the development of this project: 20
5.2.a Scope of the complete standard: This standard defines the physical layer (PHY). It defines only the medium access control (MAC) sublayer specifications modificatins required for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited boattery consumption requirements. In addition, the standard provides modes that allow for precision ranging. PHYs are defined for devices operating in a variety of geographic regions.
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5.2.b Scope of the project: This amendment expands on the usefulness of the SUN PHYs. It defines new data rate extensions by increasing the occupied bandwidth and/or adding new modulation and coding schemes (MCSs) and extending the SUN PHY specifications with a focus on long-range communication in congested environments with at least one mode of the SUN-Orthogonal Frequency Division Multiplexing (OFDM) PHY exceeding -120 dBm @ 1% packet error rate (PER) 64 bytes (payload) by using lower data rates intended for Federal Communications Commission (FCC) 15.247 digital modulation system. At least one new MCS has a data rate greater than 2.4 Mb/s. It defines only the MAC modifications required to support the amended PHY and defines frequency bands on updated regional regulations to operate the amended PHYs.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: The standard provides for ultra low complexity, ultra low cost, ultra low power consumption, and low data rate wireless connectivity among inexpensive devices, especially targeting the communications requirements of what is now commonly referred to as the Internet of Things. In addition, some of the alternate PHYs provide precision ranging capability that is accurate to one meter. Multiple PHYs are defined to support a variety of frequency bands.
5.5 Need for the Project: The IEEE Std 802.15.4 is widely used in a variety of applications supporting Field Area Networks (FANs). Current users and product manufacturers have identified the need for longer range and additional data rates, both lower and higher than those currently defined, in order to expand the usefulness of the standard for applications such as Smart Metering, Smart cities and other industrial Internet of Things (IoT) markets. The PHY enhancements address the needs of emerging applications and a wider set of applications where additional data rates can expand the usefulness of the SUN PHYs.
5.6 Stakeholders for the Standard: The stakeholders include semiconductor vendors, product manufacturers, utilities, agriculture, infrastructure/environmental monitoring and similar organizations.

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

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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

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8.1 Additional Explanatory Notes: 5.2b: FCC 15.247 - Title 47 Code of Federal Regulations (CFR) 15.247 - "Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz."