
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 extension 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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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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3.2.3 Contact Information for Standards Representative:

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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) and medium access control (MAC) sublayer specifications for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited battery 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.

5.2.b Scope of the project: This amendment defines improvement and increase functionality to the SUN PHYs. The SUN PHY has increased data rate by increasing occupied bandwidth and/or adding new MCSs. The SUN-OFDM specification is extended with a focus on long-range communication in congested environments. The sensitivity is improved with at least one mode exceeding -120dBm @ 1% PER 64 bytes (payload) by using lower data rates intended for FCC 15.247 digital modulation system. The SUN-PHY performance is improved for congested environments. MAC modification needed to support the amended PHY are included. Frequency bands are added based on updated regional regulations.

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. Current users and product manufacturers have identified the need for 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 IoT markets. The PHY enhancement better address the needs of emerging applications and as well as meeting the needs of 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 Chip Vendors, Product Manufacturers, Utilities, Agriculture, Infrastructure/Environmental Monitoring Organizations 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

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: This amendment is to IEEE Std 802.15.4-2020.