IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 4 August 2020

Last edited 31 August 2020

**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)

# IEEE 802 criteria for standards development (CSD)

The CSD documents an agreement between the WG and the Sponsor that provides a description of the project and the Sponsor's requirements more detailed than required in the PAR. The CSD consists of the project process requirements, 1.1, and the 5C requirements, 1.2.

## Project process requirements

### Managed objects

Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:

1. The definitions will be part of this project. Yes.
2. The definitions will be part of a different project and provide the plan for that project or anticipated future project.
3. The definitions will not be developed and explain why such definitions are not needed.

### Coexistence

A WG proposing a wireless project shall prepare a Coexistence Assessment (CA) document unless it is not applicable.

1. Will the WG create a CA document as part of the WG balloting process as described in Clause 13? (yes/no) Yes
2. If not, explain why the CA document is not applicable.

## 5C requirements

### Broad market potential

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

1. Broad sets of applicability.
2. Multiple vendors and numerous users.

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.

### Compatibility

Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

1. Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?

No.

1. If the answer to a) is no, supply the response from the IEEE 802.1 WG.

This project is an amendment to an existing standard for which it has been previously determined that compliance with IEEE Std 802.1Q is not possible. The project will comply with IEEE Std 802 using either local or global MAC addresses.

The review and response is not required if the proposed standard is an amendment or revision to an existing standard for which it has been previously determined that compliance with the above IEEE 802 standards is not possible. In this case, the CSD statement shall state that this is the case.

### Distinct Identity

Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describes why the proposed project is substantially different.

No other physical layer defined in the existing 802.15.4 SUN PHY has a data rate greater than 2.4 Mb/s. In addition, no other SUN PHY offers a mode that has a sensitivity better than -120 dBm while meeting the FCC 15.247 digital modulation rules.

### Technical Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:

1. Demonstrated system feasibility.
2. Proven similar technology via testing, modeling, simulation, etc.

IEEE Std 802.15.4 has been implemented in volume and has been widely deployed in many applications, demonstrating feasibility and value. At least two semiconductor vendors have demonstrated the operation of these new PHY modes. One provided a presentation to the 802.15 WNG. (https://mentor.ieee.org/802.15/dcn/23/15-23-0094-00-wng0-low-data-rate-extension-of-the-802-15-4-2020-ofdm-phy.ppt)

### Economic Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

1. Known cost factors.
2. Balanced costs.
3. Consideration of installation costs.
4. Consideration of operational costs (e.g., energy consumption).
5. Other areas, as appropriate.

The proposed amendment does not add any significant cost to either the infrastructure or the attached stations. The amendment is built upon IEEE Std 802.15.4 which has been widely deployed at reasonable costs. The implementation developed and presented to the 802.15 WNG (<https://mentor.ieee.org/802.15/dcn/23/15-23-0094-00-wng0-low-data-rate-extension-of-the-802-15-4-2020-ofdm-phy.ppt>) was done in an economically feasible implementation.