Clean Version of 15-15-0739-01

CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 15 November 2013

Last edited 20 January 2014

**Amendment to IEEE 802.15.4:**

**Standard for Low Data Rate Wireless Networks**

**Title:** Amendment for a Higher Rate Physical (PHY) Layer

# 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. While no new managed objects are anticipated, any managed objects that are required will be defined as part of the project.
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 demonstrate coexistence through the preparation of a Coexistence Assurance (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.

The base standard was originally developed to service the needs of wireless sensor networks, now known as the Internet of Things. The total available market is enormous. For 15.4, well over a billion devices are installed today and over a million units ship daily, a number which is rapidly growing. This amendment is aimed at helping 15.4 maintain its leadership position in this application by providing higher data rates and continued lower energy consumption.

1. Multiple vendors and numerous users.

There are many silicon and system vendors already producing devices and systems based on IEEE 802.15.4 for use in IoT applications which includes things like consumer electronics, mobile devices, building automation, medical applications, SmartGrid, industrial control and many more and therefore has a very large end user community.

### 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

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

* + 1. 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 describe why the proposed project is substantially different.

The base standard was developed specifically to optimally address the needs of IoT networks and is broadly used in that application. It remains unique in that regard. This amendment serves to help maintain the competitive edge of this standard.

### 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.

Fortunately, the performance of these data devices has increased significantly in the past 10 years.  Clock rates have quadrupled, and 8-bit processors have been largely replaced by 32-bit designs, while power consumption has decreased.  It is now possible to increase the raw data rate significantly to meet today’s expanding traffic needs while maintain or even improving on the power performance.

1. Proven similar technology via testing, modeling, simulation, etc.

Bluetooth is probably the most visible example of similar technology in terms of speed and complexity. In addition, there are other 15.4 modes in volume shipment that deliver these speeds, just not with the modulation and backward compatibility required by this project neither of which require any technical innovation to achieve.

### 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. Balanced costs (infrastructure versus attached stations).

Achieving these higher data rates is largely a firmware implementation on today’s faster and already cheaper devices. It should be possible to create a workable solution with little to no hardware cost impact.

1. Known cost factors.

Devices of similar functionality are in high volume shipment today, so cost factors are well known and acceptable

1. Consideration of installation costs.

No special manufacturing requirements for use of these devices are needed

1. Consideration of operational costs (e.g., energy consumption).

These are low energy consumption components which are part of a larger product. The increased functionality will actually enable a decrease in the overall energy consumption of the device and the product.

1. Other areas, as appropriate.