**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **IEEE 802.15.12 Draft CSD** |
| Date Submitted | [20 January 2016] |
| Source | [Pat Kinney][Kinney Consulting][address] | Voice: [ ]Fax: [ ]E-mail: [ ] |
| Re: |  |
| Abstract | [CSD for 802.15.12 ULI] |
| Purpose | [CSD for 802.15.12 ULI] |
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CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 15 November 2013

Last edited 20 January 2014

 **Title:**

Upper Layer Interface (ULI) for IEEE 802.15.4 Low-Rate Wireless Personal Area Networks (LR-WPANs)

# 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 in accordance with IEEE Std 802.
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) No
2. If not, explain why the CA document is not applicable. This project defines a ULI standard with no changes to the IEEE Std 802.15.4 MAC or PHY, therefore CA documents are 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 IEEE 802.15.4 standard was originally developed to service the needs of wireless sensor networks, now known as the Internet of Things (IoT). The total available market is enormous. Well over a billion IEEE 802.15.4 devices are installed today and over a million IEEE 802.15.4 devices ship daily, a number which is rapidly growing.

The ULI standard is aimed at helping IEEE Std 802.15.4 increase its leadership position in IoT marketplace by adapting it to numerous higher level protocols, integrating other Data Link Layer protocol extensions, and generally making it easier to use to use IEEE 802.15.4 devices.

1. Multiple vendors and numerous users.

There are many silicon and system vendors already producing devices and systems based on IEEE Std 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? While the ULI standard shall comply with IEEE Std 802, it cannot comply with IEEE Std 802.1Q and IEEE Std 802.1AC because IEEE Std 802.15.4 uses 64-bit MAC addresses.

b) If the answer to a) is no, supply the response from the IEEE 802.1 WG. As stated earlier, the ULI standard provides services to an existing standard (IEEE Std 802.15.4) for which it has been previously determined that compliance with IEEE Std 802.1Q and IEEE Std 802.1AC is not possible due to IEEE Std 802.15.4 using 64-bit MAC addresses

* + 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 IEEE 802.15.4 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. The ULI standard serves to help increase the competitive edge of the 802.15.4 standard. The ULI standard is unique in that no other standard provides mechanisms such as EtherType, to support multiple, diverse higher layer protocols to IEEE Std 802.15.4.

### 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.

There are numerous proprietary protocol stacks that provide some of the services that this standard will provide, this project will integrate many of those functionalities along with new functionalities into the standard.

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

There are numerous examples of similar technology in terms of complexity used in standards such as IEC 62591 and IEC 62734.

### 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).

Implementing the ULI standard will be 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; additionally use of this standard may reduce installation costs of IEEE 802.15.4 devices due to more automated configuration.

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

These are low energy consumption components which are part of a larger product. Additionally, the cost of the increased overhead of the ULI standard is significantly outweighed by the benefits it provides to the use of IEEE 802.15.4 devices in various internet protocol applications.

1. Other areas, as appropriate.