**IEEE P802.15**

**Wireless Specialty Networks**

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| Project | IEEE P802.15 Working Group for Wireless Specialty Networks (WSNs) | | |
| Title | **CSD for 802.15.4z ELR HRP AND LRP UWB Ranging Enhancements** | | |
| Date Submitted | [January 17, 2018] | | |
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| Re: |  | | |
| Abstract | **CSD for 802.15.4z ELR HRP AND LRP UWB Ranging Enhancements** | | |
| Purpose | **CSD for 802.15.4z ELR HRP AND LRP UWB Ranging Enhancements** | | |
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# IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

# CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 15 November 2013

Last edited 20 January 2014

Amendment: Enhanced Ultra-Wide Band (HRP AND LRP UWB) Physical Layers (PHYs) and associated ranging techniques

# 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, and the 5C requirements.

## 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

1. The definitions will be part of a different project and provide the plan for that project or anticipated future project.
2. 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.

IEEE Std 802.15.4 is used in a wide variety of applications such as RFID, wireless remote control, Internet of Things, home area networks, smart grid networks, industrial and control networks, and wireless sensor networks. Many of these applications use, or could benefit from improvements to the integrity and accuracy of distance measurements utilizing the existing HRP AND LRP UWB PHYs. This amendment adds capability specifically addressing these needs as identified by existing users and product manufactures. Additionally, it is expected to further expand the use in new application areas needing improved distance measurement and ranging capabilities.

1. Multiple vendors and numerous users

There are multiple silicon and system vendors producing systems using IEEE Std 802.15.4, who are capable of implementing the technologies and techniques used in this amendment. This greatly broadens the existing RFID and Remote Control user base and expands this user base into automotive remote control and associated Smart Phone Applications, to cite just two examples.

### 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?
2. No. While the amendment 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.

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

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 describe why the proposed project is substantially different.

This amendment addresses the ranging and distance measurement capabilities of IEEE Std 802.15.4 HRP AND LRP UWB PHYs and as such is unique to the particular set of capabilities of this standard and these PHYs.

### 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:   
   The ability to combine data communication and radio based distance measurements has been proven through multiple implementations, such as those based on IEEE Std 802.15.4a, IEEE Std 802.15.4f, as well as others. Proprietary approaches have clearly identified the ability to enhance performance.
2. Proven similar technology via testing, modeling, simulation, etc.

The MAC and PHYs defined by IEEE Std 802.15.4-2015 and prior revisions, are proven technology with implementations available globally from many vendors. This amendment is essentially a firmware upgrade to this proven technology.

### 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)  
   The proposed amendment enhances capabilities defined in the existing standard and does not add any significant cost to either the infrastructure or the attached stations.
2. Known cost factors

Given the maturity of this standard, cost factors are well known and very reasonable.

1. Consideration of installation costs.  
   There are no or at most minimal additional costs associated with installation.
2. Consideration of operational costs (e.g., energy consumption).  
   Costs associated with operation are negligible.
3. Other areas, as appropriate.

None