IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

CRITERIA FOR STANDARDS DEVELOPMENT (CSD) For Proposed Project 802.15.7a

Based on IEEE 802 LMSC Operations Manuals approved 15 November 2013

Last edited 20 January 2014

# 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

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.

There is an emerging interest of optical camera communication by using image sensor (or detector) for providing data communication, localization, navigation, line-of-sight (LOS) marketing, LED-ID and information reception from light sources, which will be huge market opportunity.

1. Multiple vendors and numerous users

The various institutions and companies participating in the IEEE P802.15.SG 7a OCC Study Group demonstrate the broad interest in the utilization of visible or non-visible light communication technologies. Participating members in the study group include international wireless industry, academic researchers, system integrators, consumer electronics companies, and potential end users.

1. Balanced costs (LAN versus attached stations)

 The proposed project will be developed with the aim that the connectivity costs will be a reasonably small fraction of the cost of the target devices such as cameras, display, sensors, tags, human-interface devices, etc.

### 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?

Yes

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

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.

**a) Substantially different from other IEEE 802 standards.**

This project will be distinguishable from the other IEEE 802 standards due to its unique spectral band from 190 to 2,500nm in wavelength and the fact that it is physical media independent, i.e. “wireless”. The visibility of the band also allows communication that can be perceived by the user (light!). We are unaware of any standards that address free space communication in the aforementioned wavelength range.

**b) One unique solution per problem (not two solutions to a problem).**

The proposed PHY and MAC layer amendment to 802.15.7 will provide a unique implementation platform for VLC technology.

**c) Easy for the document reader to select the relevant specification.**

The proposed PHY and MAC layer amendment for 802.15.7 will be clearly identified as a specification for the Optical Camera Communication (OCC).

### 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 have been sufficient test results, demonstrations, and simulations verifying that OCC implementation are feasible.
2. **Proven similar technology via testing, modeling, simulation, etc.**

The components used for OCC are widely used in illumination and other applications and are produced in large volumes, showing that the technologies required are proven. Fabrication and testing techniques are used for volume manufacture of optoelectronic components, showing that the testing required is reasonable.

1. **Confidence in reliability**

The air interface protocol will be designed to meet commercial reliability standards. Previously demonstrated prototypes provide confidence in the reliability of the proposed project

### 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)**

Low-volume application using OCC devices in components like smartphone’s camera or illumination LED lamps will enable a low-cost source of components. Development efforts for OCC will ensure a cost that is consistent with reasonable business strategy.

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1. **Known cost factors**

Based on test results and prototypes, the estimates meet expected size, cost, and power requirements.

1. **Consideration of installation costs.**

One of the project objectives includes low-cost installation with minimal to no operator intervention.

1. **Consideration of operational costs (e.g., energy consumption).**
Costs associated with operation are negligible.
2. **Other areas, as appropriate.**

None