IEEE P802.11
Wireless LANs

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| A PAR Proposal for Light Communications |
| Date: 2017-11-09 |
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Abstract

This submission is the PAR proposal from the IEEE 802.11 Light Communications Study Group.

# PAR

**P802.11**

**Submitter Email:**
**Type of Project:** Amendment to IEEE Standard 802.11
**PAR Request Date:**
**PAR Approval Date:
PAR Expiration Date:
Status:** Unapproved PAR, PAR for an amendment to an existing IEEE Standard

**1.1 Project Number:** P802.11bb
**1.2 Type of Document:** Standard
**1.3 Life Cycle:** Full Use

**2.1 Title:** Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications-- Amendment: Light Communications

**3.1 Working Group:** Wireless LAN Working Group (C/LM/WG802.11)
**Contact Information for Working Group Chair Name:** Adrian Stephens
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**3.2 Sponsoring Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee (C/LM)
**Contact Information for Sponsor Chair**

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**4.1 Type of Ballot:** Individual
**4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:**November 2020
**4.3 Projected Completion Date for Submittal to RevCom:**July 2021

**5.1 Approximate number of people expected to be actively involved in the development of this project:** 50.

**5.2.a. Scope of the complete standard:**The scope of this standard is to define one medium access control (MAC) and several physical layer (PHY) specifications for wireless connectivity for fixed, portable, and moving stations (STAs) within a local area.

**5.2.b. Scope of the project:**This amendment specifies a new physical (PHY) layer and modifications to the IEEE 802.11 medium access control (MAC) that enable operation of light communications (LC).

This amendment specifies a PHY that provides:

* Uplink and downlink operations in 380 nm to 5,000 nm band,
* All modes of operation achieve minimum single-link throughput of 10 Mb/s and at least one mode of operation that achieves single-link throughput of at least 5 Gb/s, as measured at the MAC data service access point (SAP),
* Interoperability among solid state light sources with different modulation bandwidths.

This amendment specifies changes to the IEEE 802.11 MAC that are limited to the following:

* Hybrid coordination function (HCF) channel access,
* Overlapping basic service set (OBSS) detection and coexistance,
* Existing power management modes of operation (excluding new modes),

and modifications to other clauses necessary to support these changes.

**5.3 Is the completion of this standard dependent upon the completion of another standard:** No.

**5.4 Purpose:**This amendment does not change the “Purpose” clause of IEEE 802.11

**5.5 Need for the Project:** A significant variety of LC vendors currently build various, non-standardized, products for many use-cases that could have significant market growth.

The wider context for the economic considerations for LC is presented in doc. 11-17/0803r1 (<https://mentor.ieee.org/802.11/dcn/17/11-17-0803-01-00lc-economic-considerations-for-lc.ppt>).

The availability of chipsets in the relevant semiconductor technologies (process size and light efficacy for LEDs) is seen as key to reduce power consumption, form factor and costs for LC devices. Standardization is seen by many in the industry as a key facilitator of the mass market for LC.

**5.6 Stakeholders for the Standard:** Stakeholders include chip makers to deliver PHY & MAC sub-systems, system integrators and lighting companies, telecom operators, Internet Service Providers (ISPs), emerging IoT companies, large industrial manufacturers, aviation and transportation industries.

**Intellectual Property**

**6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No**

**6.1.b. Is the Sponsor aware of possible registration activity related to this project?: Yes**

**7.1 Are there other standards or projects with a similar scope?:**

Yes, there are three projects as follows.

Sponsor Organization: IEEE 802

Project Number: IEEE 802.15.7m

Project Date: 2014-12

Project Title: Part 15.7 Revision: Short-Range Optical Wireless Communications

Sponsor Organization: IEEE 802

Project Number: IEEE 802.15.13

Project Date: 2017-03

Project Title: Part 15.13: Standard for Multi-Gigabit per Second Optical Wireless Communications (OWC) with Ranges up to 200 meters

Sponsor Organization: ITU-T SG15

Project Number: ITU-T G.vlc

Project Date: 2015-06

Project Title: High speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification

**7.2 Joint Development**

**Is it the intent to develop this document jointly with another organization?: No**

**8.1 Additional Explanatory Notes (Item Number and Explanation):**

*5.2.b* A “single-link” is defined as a link between an access point and a single station in the downlink.

*5.2.b* LC systems are expected to adhere to regulation and standards such as IEC 62471:2006 – “Photobiological safety of lamps and lamp systems” as well as ITU G.664 – “Optical Safety Procedures and Requitements for Optical Transmission Systems” and others. In addition, LC systems are expected to not create any additional electromagnetic interference.

*5.2.b* The project will address the security of the transition between the new LC PHY and the existing 802.11 PHYs as well as the security implications in supporting Fast Session Transfer.