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)   
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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 defines a new physical (PHY) layer specification and modifications to the 802.11 medium access control (MAC) clauses on hybrid coordination function (HCF) channel access, power management modes of operation (excluding architectural changes), and rules for overlapping basic service set (OBSS) detection and mitigation, as required to support the new PHY layer specification that enables operation of light communications (LC).

The amendment supports:

* fast session transfer between LC and radio (PHYs operating in 72 GHz and lower bands),
* corresponding 802.1 protocols,
* fast BSS transition.

The new PHY specified in this amendment:

* Enable uplink and downlink operations only in 380 nm to 10,000 nm band
* Enable at least one mode of operation that achieves minimum throughput of 10 Mbps, as measured at the MAC data service access point (SAP)
* Enable at least one mode of operation that achieves maximum throughput of 5 Gbps, as measured at the MAC data service access point (SAP)
* Interoperation among LEDs with different modulation bandwidths

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

**5.4 Purpose:**The purpose of this standard is to provide wireless connectivity for fixed, portable, and moving stations within a local area.

**5.5 Need for the Project:** A significant variety of Light Communications (LC) vendors currently build various, non-standardized, products for many use-cases spanning from kb/s IoT devices up to several Gbit/s.

The LC market size is forecast to be worth $75.5 billion by 2023 according to Global Market Insight (<https://www.gminsights.com/pressrelease/LiFi-market>). 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 a key to reduce power consumption, form factor and costs for LC devices. Standardization is seen by the industry as a key requirement to address the mass market for LC. Vendors include chip makers to deliver PHY & MAC sub-systems, system integrators and lighting companies, telecom operators, ISPs, emerging IoT companies, large industrial manufacturers, aviation and transportation industries, etc.

**5.6 Stakeholders for the Standard:** Manufacturers and users of semiconductors, personal computers, enterprise networking devices, consumer electronic devices, home networking equipment, producers of industrial sensors, mobile devices, lighting manufacturers and cellular operators.

**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?: No**

**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):**

LC systems should respect regulation and standards established in the lighting industry to avoid becoming health hazards (related to light intensity, color, or flicker) and should not create any electromagnetic interference.