**P802.15.xx**

Submitter Email: cpowell@ieee.org
Type of Project: Revision of IEEE Standard
PAR Request Date: 17-Sept-2025
PAR Approval Date:PAR Expiration Date:Status: Unapproved PAR, PAR for a revision of IEEE Standard

1.1 Project Number: P802.15.7xx
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Title: Draft PAR for NG OCC Task Group

3.1 Working Group: IEEE 802.15
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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: July 2028
4.3 Projected Completion Date for Submittal to RevComNote: Usual minimum time between initial sponsor ballot and submission to Revcom is 6 months.: Feb. 2029

5.1 Approximate number of people expected to be actively involved in the development of this project: 80
5.2 Scope: This standard specifies the Physical (PHY) layer for Optical Camera Communication (OCC) systems using high performance device-based architectures to overcome the computational and interface limitations due to traditional device-based platforms. This standard defines the PHY layer for OCC utilizing Infrared (IR) (700 nm to 1 mm) and visible light (380-750 nm) band, supporting both frequency- and amplitude-based modulation schemes such as OFDM and QAM to enhance data throughput. It is capable of delivering data rates up to 100 Mbit/s and is designed for point-to-point and point-to-multipoint communication. Adaptation to varying channel conditions and maintaining connectivity during high mobility (speeds up to 350 km/h), flicker mitigation, Radio Frequency (RF) co-existence, and a communication range of up to 200 m, are included. AI-based equalization techniques using datasets considering different channel conditions without requiring pilot symbols at the transmitter, thereby dealing with high-levels of optical interference while maintaining high-rate data transmission. The standard specifies hybrid modulation like HOOK-OFDM modulation controlling LED current precisely to transmit accurate optical signal. The standard supports data rates from a few kilobits per second up to several megabits per second along with low bit error rate (BER). Relaying mechanisms include enabling heterogeneous operation with existing RF wireless data communications standards. The PAR adheres to applicable eye safety regulations.

5.3 Is the completion of this standard dependent upon the completion of another standard: No
5.4 Purpose: This purpose of this standard is to utilize optical wireless communication (OWC), to provide a global solution initially targeting industrial applications requiring, secure, high performance, multiple links, long range optical communication, and high data rate communications. The standard provides (i) access to unlicensed spectrum; (ii) data delivery without using RF spectrum; (iii) Leverages the processing capability using high performance device to enable real-time modulation and decoding (iv) Provides higher throughput and lower BER than prior OCC implementations (v) Supports modulation , HOOK-OFDM with rolling shutter cameras (vi) AI-based equalizer for OCC system, (vii) Enables reliable short- to medium-range multi-links OCC in both indoor and outdoor applications (vi) Targets emerging applications such as drone-to-drone communication, autonomous systems, AR/VR, and vehicular OCC.

5.5 Need for the Project: Given the growing expectation of ubiquitous wireless connectivity in high mobility environments, the rapid development of AI concept for PHY for effective and high-speed signal processing, the need for unlicensed, high bandwidth, easy-to-use wireless communications technology, immune to RF interference and which does not overload existing RF spectrum or necessarily require additional hardware, has never been greater. This standard specifically addresses these needs. Potential applications include drone to drone communication, Advanced driver-assistance systems (ADAS), Vehicle to Everything (V2X) communication, control of mobile robots in a personalized manufacturing cells or at an assembly line, automated guided vehicular systems, collision avoidance in V2X network or drone network, small cell backhaul, patient monitoring in hospitals, and security monitoring in factories. In particular, optical wireless-based solutions to this problem address a significant opportunity, extending to millions of existing communication devices where the OCC system can be implemented, including Smartphone, CCTV, and other autonomous cars. Most smartphone cameras support new programmable applications and their firmware is upgradable. Similarly, many LED flashlights can support data rates up to 3 Mb/s.

5.6 Stakeholders for the Standard: Drone and UAV manufacturers (drone-to-drone and swarm communication), Automotive industry (vehicular OCC and V2X), Lighting and LED driver manufacturers, system integrators, Consumer electronics (smartphones, cameras, AR/VR devices), medical equipment manufacturers, lighting manufacturers, silicon providers, networking equipment manufacturers, and academic researchers

Intellectual Property6.1.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

We didn’t create any new registry regarding the RAC, therefore, the answer is “No”.

7.1 Are there other standards or projects with a similar scope?: No
7.2 Joint DevelopmentIs it the intent to develop this document jointly with another organization?: No

8.1 Additional Explanatory Notes: