Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [VLC PAR Draft]
Date Submitted: [14 July, 2008]
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Abstract: [Scope and purpose of proposed project and reason for the proposed project are described.]

Purpose: [Contribution to IEEE 802.15 SG-VLC]

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2008. 07

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Outline

- Scope of proposed project
- Purpose of proposed project
- Reason for the proposed project

Scope of proposed project

- This project will define a PHY and MAC standard for short-range wireless communication using visible light as communication media. The visible light is from 380 nm to 780 nm in wavelength and under eye safety regulation (such as IEC60825) in radiation power. Typical visible sources include illumination, display, indication, and decoration. The standard features visibility-based security and intuitive usage, reuse of illumination and display infrastructures for communication, data rates to support multimedia services like audio and video, in personal areas. The standard will consider mobility of the visible link, compatibility to illumination and display infrastructures, effects from ambient lights in indoor and outdoor, health impacts from the visible media, data rate scalability, and MAC to accommodate visibility.

Purpose of proposed project

- The purpose of the proposed standard is to provide an international standard for short-range wireless communication using visible light as communication media. The standard will provide ubiquitous communication utilizing illumination and display infrastructures where conventional visible sources are rapidly being replaced by solid-state ones. Such communication is useful especially in RF-crowded or RF-restricted environments, since visible bands have neither frequency regulation nor interference to RF. Besides, the unique visibility feature of the standard can offer higher physical-layer security and intuitive usage required in some WPAN applications.

Reason for the proposed project

- Visible light is drawing great interests as new communication media due to the following reasons. Firstly, solid-state light sources are rapidly replacing conventional ones in illumination and display infrastructures. It thus becomes possible to carry communication data on the visible light. Secondly, the visible band is free from frequency regulation and RF interference so that it is well-suited to RF-crowded or RF-restricted environments. Thirdly, the unique feature of visibility can enhance the physical-layer security and offer intuitive usage.
- Potential applications include secure point-to-point communication, indoor Location Based Service (LBS), secure point-to-Multipoint communication (office, hospital, air plane), Intelligent Transportation System (ITS), information broadcast, and etc.
- The visible light communication standard will provide economic opportunities to equipment manufacturers, component suppliers, service providers, infrastructure operators.