**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Kookmin University response to Draft of TG7r1 Technical Considerations Document** |
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| Source | [Yeong Min Jang][Md. Shareef Ifthekhar] [Trang Nguyen] [ Nirzhar Saha] [Nam Tuan Le] [Mohammad Arif Hossain] [Chang Hyun Hong][Kookmin University] |  |
| Re: | [TG7r1 CFA responses] |
| Abstract | [Draft of OCC part of technical considerations for TG7r1.] |
| Purpose | [To assist to prepare TG7r1 TCD] |
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# Optical Camera Communication

## Applications/Use cases

The following OCC applications/use cases were presented in response to TG7r1 Call for Applications.

A1 Offline to Online Marketing/Public Information System [2, 3, 5, 6, 7]

A2 M2M/D2D/IoT/Internet of Light (IoL) [2, 3, 9, 10, 11]

A3 Indoor Positioning [2, 5, 10]

A4 Vehicular Communication [2, 7]

A5 Underwater Communication [8]

A6 Power Consumption Control [4]

A7 Vehicular Positioning [2]

A8 Seaside Communication [?]

**A2 IoL definition**:

The Internet of LED (IoL) is a novel paradigm by which devices with light emitting diode identification (LED-ID) sensors will be able to communicate with each other as well as connect to the internet by using visible light link. LED-ID based IoL aim to provide improved service than contemporary, radio frequency identification (RFID) based internet of things (IoT).

* Reference: Saha, N.; Ifthekhar, M.S.; Mondal, R.K.; Hosain, M.A.; Yeong Min Jang, "The internet of LED: A LED-ID based interoperability and interconnectivity perspective," Information and Communication Technology Convergence (ICTC), 2014 International Conference on , vol., no., pp.535,540, 22-24 Oct. 2014

The standard will consist of multiple PHY/MAC modes to meet the following variety of requirements.

## Receiver

The standard will support optical camera, which has 2-dimentional array of photo sensors that measure intensity of visible light, IR and/or UV, as receiver. The standard will support image sensors of global/ rolling shutter (sequential shutter) with multiple PHY/MAC modes.

Also standard will specify vehicle speed vs. allowable minimum camera frame rates for application A4 and A7.

## Transfer mode

A PHY/MAC mode of the standard will support at least one of the following transfer mode:

**ID broadcast mode** which repetitively broadcast less than or equal to 128 bits of ID in a second with small overhead of MAC frame for application A1, A2, A3, A4 and A5.

**Unidirectional data transfer mode** which transmit longer data stream for application A2 and A4. Unidirectional data transfer modes should be asynchronous modes. Asynchronous data communication should able to receive data under presence of unstable camera frame rates (i.e. camera frame rates vary with times).

**Bidirectional data transfer mode** which enables efficient communication for application A2.