**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Draft of TG7r1 Technical Considerations Document Structure Discussion** |
| Date Submitted | [21 April, 2015] |
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| 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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# Proposed New Contents

* Optical Camera Communication
* Architecture and Topology
* Operational Frequency Bands
* Receiver
* Communication Mode
* Handover

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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

A8 Seaside Communication

## Transmitter

The standard should support the following devices as transmitters for each application.

|  |  |
| --- | --- |
| **Device** | **Applications/Use cases** |
| Ceiling light | A2, A3 |
| Flash light | A5 |
| Car light and traffic light | A4, A7 |
| Indirect light | A1, A4 |
| Signage (with/without front panel) | A1 |
| LCD display | A1 |
| Light House | A8 |

## Architecture and Topology

The standard should support flexible PAN architecture and network topology. The standard shouldn’t restrict to follow specific architecture.

## Operational Frequency Bands

 The standard will support visible light, IR and UV frequency band.

##  4.1.6 Eye safety and Flicker

The modulated light will be safe for human eye and will not stimulate photosensitive epilepsy. And the standard should support flicker free PHY mode, in which the modulation is imperceptible for human eye, for application A1, A3 and A4.

The standard also may allow flicker mode communication for application A1, A2, A4, A5, A7

##  4.1.8 Communication Range

The standard should support communication range of 0.1 meters to 10 meters for application A1, and communication range of 0.5 meters to 100 meters, in which a transmitter is shown as nearly a point source on a captured image, for application A2. [This sentence should be revised.]

Communication range depends on the size and the brightness of a transmitter with some protocols, therefore communication range is measured in the condition of the size of 1 meter and the brightness of 300 Cd/m2 for performance comparison.

The standard should also support communication range of 1km to 2 km for application A8, for communication between high power light in lighthouse and camera with zooming functionality

* + 1. **Receiver**

The standard should support both rolling shutter and global shutter as receiver

* + 1. **Communication Mode**

The standard should support high data rate communication as well as low data rate communication. Also different communication modes are needed for indoor communication, outdoor communication and under water communication.

* + 1. **Handover**

The standard must provide mechanisms to support handover between light sources, allowing users to maintain a continuous network connection.