Agenda

1. Technology and mobile phone user trends
2. Why now?
3. How does it work?
4. IPS solution advantages
5. Apps & Analytics
6. Summary
Indoor Positioning is using beacons indoors for precise location sensing of mobile devices.

Luminaires are the beacons of indoor locations.

- **Store Level**
- **Department Level**
- **Aisle Level**
- **Product Level**

**Precise Indoor Positioning**
Technology is changing shopper behavior

**Smartphone users = Connected shoppers**

82% Of smartphone users turn to their devices to help them make a product decision

**Consumers prefer and act on location-based ads**

61% Of smartphone users say they are more likely to buy from companies whose mobile sites or apps customize information to their location

**Location based relevancy is key**

4 in 5 Consumers use search engines to find local information

Source: Google/Ipsos 2015

Precise Indoor Positioning
Smartphone improvements are enabling new solutions to be developed.
Demand for tailored customer experience will continue to fuel indoor location influenced spending.

**Indoor Location Technology Spending**

$1.6B by 2018

**Indoor Location Ecosystem Spending**

$18B by 2018

Aimed at the $700B in Mobile Influenced Purchases

Source: Opus Research & Deloitte Digital
Why are ambient LED light fixtures the ideal positioning solution?

- Powered
- Placed
- Precise

Precise Indoor Positioning
Technology Services enable navigation and tailored experience for each customer.

1. Store LED lighting acts as a beacon to signal mobile devices through Visible Light Communication (VLC) and Bluetooth low energy (BLE) technology.

2. Connected shoppers opt-in to "listen" with a retailer’s loyalty app on their mobile devices.

3. Engaged shoppers enjoy a tailored experience, easily find the items they need with pinpoint accuracy and can request assistance and relevant digital content along the way.

4. Platform ties to retailer’s digital marketing systems to deliver location-based services and personalized content to the shopper.

HOW LED LIGHTING ENABLES INDOOR POSITIONING SERVICES
Indoor Positioning Use Cases

Return Shopper Welcome
Easy Indoor Navigation
Contextual Product Information
Relevant Coupon Offers
On-Demand Assistance
Planogram Compliance

Precise Indoor Positioning
Indoor Positioning Technical Overview

**INFRASTRUCTURE STORE LED LIGHTING**
Lights mapped by lighting system supplier

**1. Blue Tooth Beacon (BLE)**

**2. Cellular or WiFi Connection**

**3. Web Applications**
- MRO
- Admin
- Reporting
- Analytics

**4. Retailer Cloud**

**5. Global lighting control via Gateway**

**Lights mapped by lighting system supplier**

**Visible Light Communication (VLC)**
Lumicast™ Standard

**Mobile & Apps**
Android or iOS

**Cloud**
Microsoft Azure

**Site, Position, & Device Data**

**Analytics Data**
VLC Technology is similar to optical telegraphy

Transmitter

Decoder

Qualcomm protocol

Precise Indoor Positioning
VLC Technology – Key Features

- Accurate to the centimeter
- Degree-level orientation
- Split second acquisition time
- Smoothly updates in real time
- Scales without performance loss

Precise Indoor Positioning
BLE Technology - Key Features

- Powered from lighting fixture – no batteries
- Opens up the app or notifies based on position
- 2 – 4 meter accuracy
- Dwell, entry / exit, frequency of visits
- Scales without performance loss

Precise Indoor Positioning
Apps & Analytics provide “last mile” capabilities

**Search**
Point of Interest search. Locations ranked by name, category and distance from position.

**Messaging**
Deliver personalized or contextual messages based on customer profile and location.

**Maps**
Level specific floor plans customized to your venue.

**Routes**
Turn by turn directions from point A to B saving time for additional purchases.

**Analytics**
Multi-sensor, zone based App and passive analytics. Heat maps, space utilization, wait and dwell times, loyalty.
Navigator Application

Zoning, and Zone Analytics

Precise Indoor Positioning
IPS solutions provide many Digital Services Enhancements to Retailers

**Customer Experience**
- Navigation and list capability
- Requesting assistance
- Online to in store, and vice versa

**Employee Efficiency**
- Manager directed activities
- Restock priorities
- Training

**Business Improvement**
- Layout effectiveness - heat maps
- Merchandise location decisions
- Advertising & promotion

*Precise Indoor Positioning*
That was then.  That was then.  That was then.  That was then.  This is now.  This is now.  This is now.  This is now.
Connects People, Processes, Data & Things