LoRa™ Alliance Member

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LoRa for Smart Hong Kong

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Introduction

- LoRa Technology for IoT
- International deployments
- LoRa Regulatory Issues
- Pixel Networks first public LoRaWAN network in Hong Kong
- LoRa use cases

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LPWAN Technology

LPWAN

- Low cost devices (radio, sensor and MCU)
- Low power – typically battery powered
- Low data rate requirement from devices
- Unlicensed spectrum – low cost

Key point: makes possible new applications

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LoRa Technology

- LoRaWAN = Long Range WAN
- Spread spectrum to achieve robustness to interference and/or long range
- Class A, B and C devices
- Unlicensed band
- Well defined network architecture
- Supported by the LoRa Alliance with over 460 member companies

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LoRa International Experience

Nationwide Networks announcements:

- KPN, Netherlands
- Orange, France
- KT, Korea
- Tata, India
- Senet, US

There are over 37 public networks announced
and >250 trials ongoing

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LoRa International Pricing

Example pricing:

- 2Euro per month for 10 uplink messages per day (KPN)

Key issues:

- How much network capacity will be consumed

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LoRa Unlicensed/ISM Band

- EU: 868MHz/433MHz
- US: 915MHz
- CN: 779MHz/470MHz
- Asia: Different subsets of 915MHz
- Hong Kong: 920-925MHz
- AS923: Asia bands harmonization underway

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Asia LoRa Unlicensed Band

Country	ISM Band
Brunei	923-925 MHz
Cambodia	923-925 MHz
Hong Kong	920-925 MHz
Indonesia	923-925 MHz
Japan	920-928 MHz
Korea	920-923MHz
Laos	923-925 MHz
New Zealand	915-928 MHz
Singapore	920-925 MHz
Taiwan	922-928 MHz
Thailand	920-925 MHz
Vietnam	920-925 MHz

Source LoRa Alliance, LoraWAN Regional Parameters document.

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LoRa Modulation

DataRate	Configuration	Indicative physical bit rate [bit/s]
0	LoRa: SF12 / 125 kHz	250
1	LoRa: SF11 / 125 kHz	440
2	LoRa: SF10 / 125 kHz	980
3	LoRa: SF9 / 125 kHz	1 760
4	LoRa: SF8 / 125 kHz	3 125
5	LoRa: SF7 / 125 kHz	5 470
6	LoRa: SF7 / 250 kHz	11 000
7	FSK: 50 kbps	50 000

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What we are doing?

Public wireless IOT Network for any industry

LoRa™

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Current landscape

Clients Need smart:


AGRICULTURE


MONITORING


PARKING


METERING


HOME / CITY


SECURITY

THE MARKET OFFERS:

Connectivity:
GSM, WIFI, LPWAN, zIGBEE, UNB

hardware:
Sensors, meters, actuators

Software platforms:
Actility, Orbiwise, Loriot, etc.

Challenges:

Compatibility
Connectivity Data
Processing
Charging Structure
Support

THIS IS NOT WHAT CLIENTS WANT

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CONCEPT

Clients Need smart:


AGRICULTURE


MONITORING


PARKING


METERING


HOME / CITY


SECURITY

Pixel network Offers:

Connectivity:
OWN LPWAN NETWORK

hardware:
3-rd party distribution
own r&d projects

Software platform:
UNIFIED SOLUTION

Challenges resolved:

- Compatibility
- Connectivity Data
- Procesing
- charing Structure
- Support

VERTICAL SOLUTIONS

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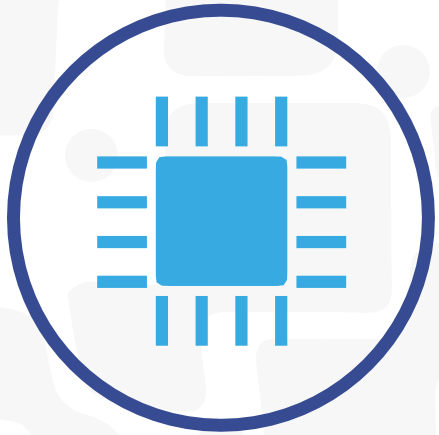
Pixel Networks

PIXEL NETWORKS MODES OF OPERATION:

SYSTEM INTEGRATOR
(PRIVATE DEPLOYMENTS), INCLUDING SOFTWARE CUSTOMISATION TEAM

PUBLIC NETWORK OPERATOR



HARDWARE DISTRIBUTOR

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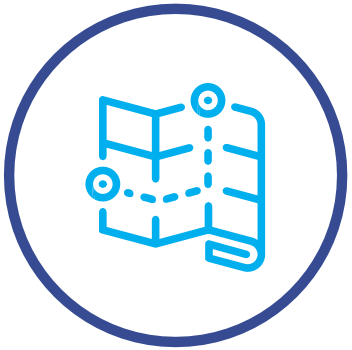
LoRa Use Cases

AMR
(GAS, ELECTRICITY, WATER)



TRACKING

ENVIRONMENTAL MONITORING

SMART CITY
(PARKING, TRAFFIC CONTROL, PUBLIC SERVICES)

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