![Actility - Connecting with intelligence]

LoRaWAN is the new global standard for low power and long range IoT communication. With a range of up to 15km and battery life measured in years, LoRaWAN is supported by major global network operators including Orange, Comcast, NTT, Softbank, Proximus, KPN, Swisscom etc. LoRaWAN networks are ideally suited for industrial IoT applications including connected buildings, smart metering, smart cities and precision agriculture. Many industrial use cases require the ability to precisely determine the position of an object and to track it
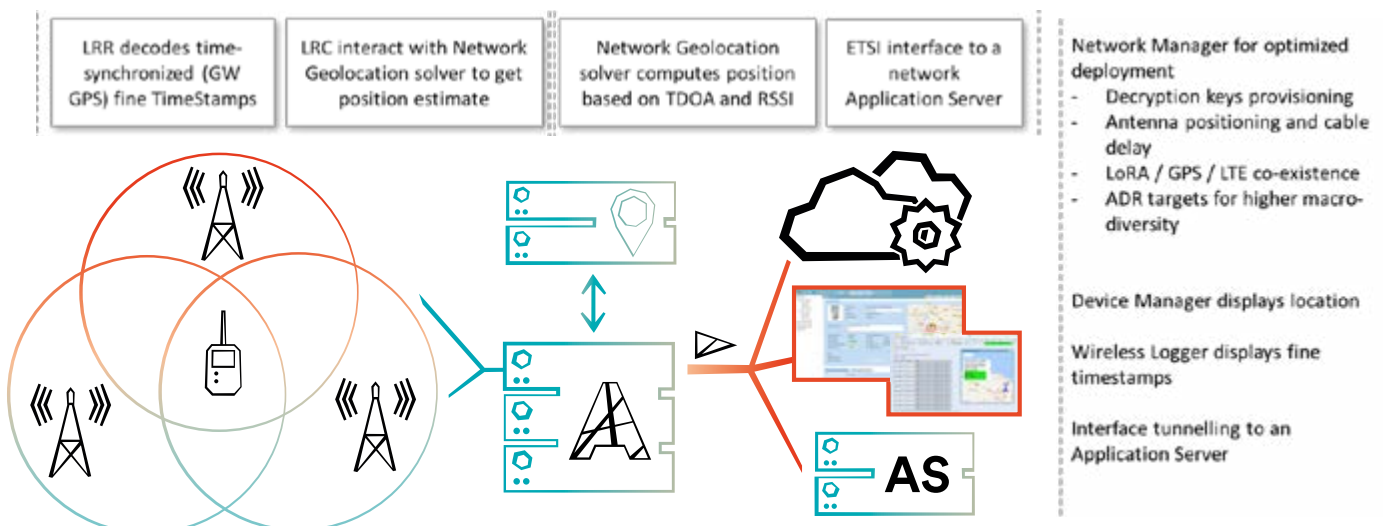
Actility ThingPark Geolocation Solution Trial Pack

Introduction

LoRaWAN can leverage TDOA-based (Time Difference of Arrival) triangulation to evaluate the position of the device. The LoRa-based device needs to be « covered » by 3+ gateways. Each gateway receives data from the device, timestamps it and forwards it to a geolocation solver along with other metadata. The Actility network geolocation solver collects the multiple timestamps to estimate the position for the device using triangulation of the multiple timestamps.
A precise time-synchronisation mechanism (usually using GPS) between gateways is necessary to achieve nanosecond precision in time measurement.

Key Benefits

o   Location estimate for ANY LoRaWAN sensor
o   Reduced cost and power consumption
o   Packaged end-to-end location solution for faster time-to-market
o   Early & exclusive access to latest Actility Location Server in SaaS

In order to deploy a LoRa geolocation trial full package, 2 options are available:
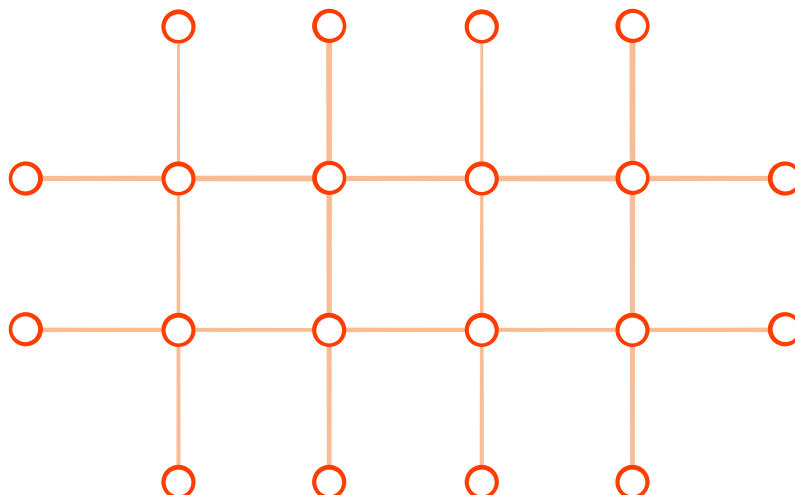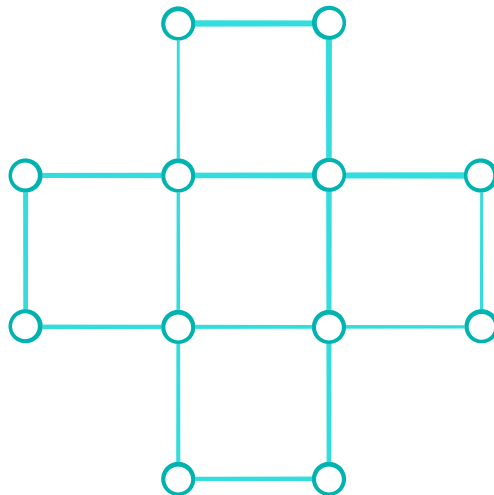
Option 1 :

o   12 LoRaWAN reference design V2 gateways
o   10 Adeunis V2 Field trial devices
o   Access to Actility ThingPark platform : Network Manager (to manage gateways), Device Manager (for devices), Wireless Logger (for packet monitoring) and Network Survey (for location visualisation)

Option 2 :

o   20 LoRaWAN reference design V2 gateways
o   50 Adeunis V2 Field trial devices
o   Access to Actility ThingPark platform : Network Manager (to manage gateways), Device Manager (for devices), Wireless Logger (for packet monitoring) and Network Survey (for location visualisation)

In order to achieve optimal location resolution, specific LoRa gateways layouts are strongly recommended. The geometrical regularity of the layout is indeed impacting accuracy, as well as number of gateways visible from any test location.

Package content

LoRaWAN Ufispace V2 gateway

o Long range LoRa WAN compliant, Support worldwide Sub-1G multiple ISM band

o Backbone network with 10/100/1000 POE Ethernet   or 3G/4G LTE (Option)

o High performance ARM Cortex-A8(1GHz) CPU

o Installation and configuration through WiFi

o Complete LoRa Gateway localization V2 solution

o Multi-SF and base band interferer rejection support

ITEM	TECHNICAL INFORMATION
Processor	AM3352BZCZA100_ARM Cortex-A8(1GHz)
Memory	DDR3 4Gb
eMMC	4 GB
Sensors	Build-in temperature sensor & pressure sensor
External console port	IEEE 802.11 b/g/n 2X2
Internal console port	UART, Mini-USB 2.0
Backhaul	10/100/1000 Mbps and M2 connector for LTE module
GNSS	GPS, GLONASS, BeiDou (NEO-M8T)
Antenna	2 N-type external antenna with 1dBi/5dBi
DC PWR	Max50W, POE 802.3af compliant
Regulatory	CE
LoRa Frequency Band	865-868MHz (SAW filter B39871B3717U410)
Antenna Gain	1dBi/3dBi/7dBi
Transition Power	27dBm
Channel number	16 × 125kHz Channels
Rx Sensitivity	-138dBm
Data Rate	250bps to 50kbps
Classes Application	Class A, Class B, Class C
Network Server Scheme	Adaptive Date Rate (ADR)
Operation Temperature	-20~60 oC
Humidity	90%
Ingress protection	IP67
UV resistance	ISO4892 UV
Total Weight	1.6Kg
Dimension	269 × 184 × 85 mm

Adeunis V2 Field Test Device

The LoRaWAN Field Test Device by ADEUNIS RF is a ready to use system which provides connection to any operated network using the LoRaWAN V1.0 protocol. It allows to transmit, receive and instantly view the radio frames on the used network.

Equipped with a large LCD screen, you can check all operating information (GPS coordinates, temperature, battery ...) and use of the network (uplink, downlink, SF, Packet Error Rate ...). Its ultra-fast and precise GPS optimises geolocation operations.

This Field Test Device is particularly suitable for the validation of applications like sensor networks, asset tracking, smart buildings, metering, security or M2M.

- o Ready-to-use device
- o Range up to 15 km
- o LoRaWAN V1.0 network protocol
- o Class A & C
- o High precision GPS
- o Self-powered and rechargeable
- o Dedicated web app.

Performances

Range: up to 15 km
Power: 25mW
Radiated RF power: 14dBm
Sensitivity: -140dBm
Frequencies: 863-870MHz
Modulation: LoRaTM

Consumption & needs

Battery: 2000mAh
Autonomy: approx. 10 hours

Hardware

High precision GPS
Micro USB: batt charging & configuration
Buttton: frame transmission

General information

Dimensions: 180 × 72 × 21mm
Weight: 150g
Operating temperature: -20°C /+75°C
Certified EN300-220 V2012

Firmware

LoRaWAN V1 network protocol

Actility ThingPark Tools

Network Manager

The ThingPark Network Manager is a standard ThingPark application which its core functionality enables ThingPark Wireless Operator and Network Operator users to self-provision and manage their base stations (LRRs). The Network Manager also enables the provisioning of a Base Station positioning location, without a GPS receiver. The location provisioning is done into the LRR via the LRC. This feature enables much more flexibility for Operator and Network Manager for configuring and maintaining a large scale network. It enables a flexible way to provision their Base Station locations as well as enable the configuration of location based on GPS services or not.
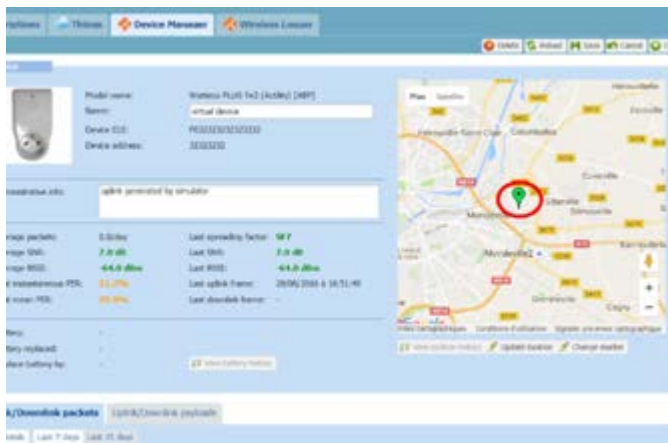
Device Manager

The ThingPark Wireless Device Manager is a standard ThingPark application whose core functionality enables ThingPark Wireless subscribers to self-provision and manage their devices.

Its value to subscribers lays in its easy to use capabilities that provides a complete end-to-end device management solution. From geographical system information where subscriber's devices are located, through detailed statistics and reports on device activity, the ability to add new devices, manage Connectivity Plan subscriptions and up to application server routing profiles management.

Wireless Logger

ThingPark Wireless OSS intelligent logger is an optional module, which enables, network partners, developers, integrators and subscribers, as well as operators, to view and analyze end devices RF traffic, visualize base stations with best link to each sensor, monitor SNR levels, LRR and LRC connections and more. It enables the decoding of payload data and other application layer messages and frames for some partner devices.

Network Survey