Smart security management

SMART SECURITY

a2a smart city

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System architecture for smat security management:

01

SERVICES
Displaying information on a map,
sending specific alerts,
remote management of plants,
smart actuators

02

BIG DATA ANALYTICS
Support on the management
and use of connected services

03

DATA TRANSMISSION
LoRaWAN technology
enables remote management
of data recorded by sensors

04

SENSORS
Detectors and measurers,
with reduced energy consumption.

SMART SECURITY

A2A Smart City has developed an advanced system to monitor the unauthorised unlocking of doors and windows to prevent intrusion, theft or unauthorised use of premises.

Antintrusion solutions

IoT technology provides **authentication solutions for operating building access points** and cutting-edge anti-intrusion solutions, easily integrated with traditional security systems. Security networks, based on sensors with long battery life and difficult to tamper with, are able to activate alerts, sirens, video cameras or contact the police.

Information and alerts can be managed from mobile devices or from a centralised cloud software.

The anti-intrusion sensors also make it possible to monitor at any time the building's access points, avoiding energy and heat loss.

Advantages

- **High security systems.**
- **Low technology costs.**
- **Efficient network**
  The sensors connected to the LoRa network are independent of the local internet connection and powered by stand alone batteries.
- **Energy saving**
  Monitoring energy loss and definition of optimal routes.

CCTV and videoanalysis

An advanced video surveillance service ensures greater security.
Hi-tech sensors capture ultra-high-definition images and integrate **video analytics algorithms**, a fundamental feature of advanced IoT technology. The cameras are interconnected and converge on a **centralised operational platform**, where all the information acquired is processed.

Data aggregation and processing transforms the management approach from reactive to proactive. The repressive model becomes a **preventive model**, which anticipates and intervenes promptly with specific types of events, such as abandoned objects.

Advantages

– **Cost reduction**
By optimising video streams on the network, loads and the storage space are considerably reduced.

– **Time saving**
Simpler monitoring and recordings searching.

– **Efficiency**
Automatic video monitoring to detect security breaches and prevent crime.

– **Added Value**
Integrating video data into other systems (such as head count, using cameras at entrances).

The value offer of A2A Smart City provides an **"all-inclusive" system service and maintenance** . Remote control services can be added, providing alerts received from the video surveillance system to verify the correct operation of the DVR.

Integrated land monitoring

SUPERVISION SOFTWARE

The cameras management software will be accessible from a PC, smartphones and tablets.

WEARABLE CAMERAS

Cameras can be mounted inside a vehicle or worn (connected via BlueTooth to the smartphone) and equipped with a microphone.

STREAMING VIDEO

Law enforcement agencies will be able to send video in real time to the control centre via smartphone, for remote support.

DRONES

Drones will be used for video surveillance and remote intervention, as they are connected to: automated units, aerial video, surveillance in hazardous situations.

SOS Stations

Installed in public parks and in remote areas to contact emergencies services by activating a switch.
The stations are designed with sound analysis recognition tools for gun-shots, explosions, and unusual circumstances.
They can also be equipped with video cameras and LCD Touch screens to show information to users, therefore acting as smart info points.

IMMEDIATE RESPONSE

Head counting and management services

Monitoring numbers of people in a given space or in transit to optimise energy resources and the security of buildings. Monitoring also **improves maintenance and cleaning activities** based on patterns of space usage.
A wide range of low battery consumption sensors can be integrated into the LoRa network, monitoring headcounts at access points, such as doors, with thermal sensors or tread sensors. The sensor network collects data and transmits it to an application system in the cloud. With a view to "Big Data Analytics" we aim to offer a useful tool to support decisions for the management and use of space.

Advantages

- Study the **best transit** routes.
- **Optimise energy management** in the building.
- **Optimise security systems** for users inside the building through low-consumption sensors.
- **Optimise maintenance activities** based on access to premises.

Crowd monitoring services and fall prevention sensors

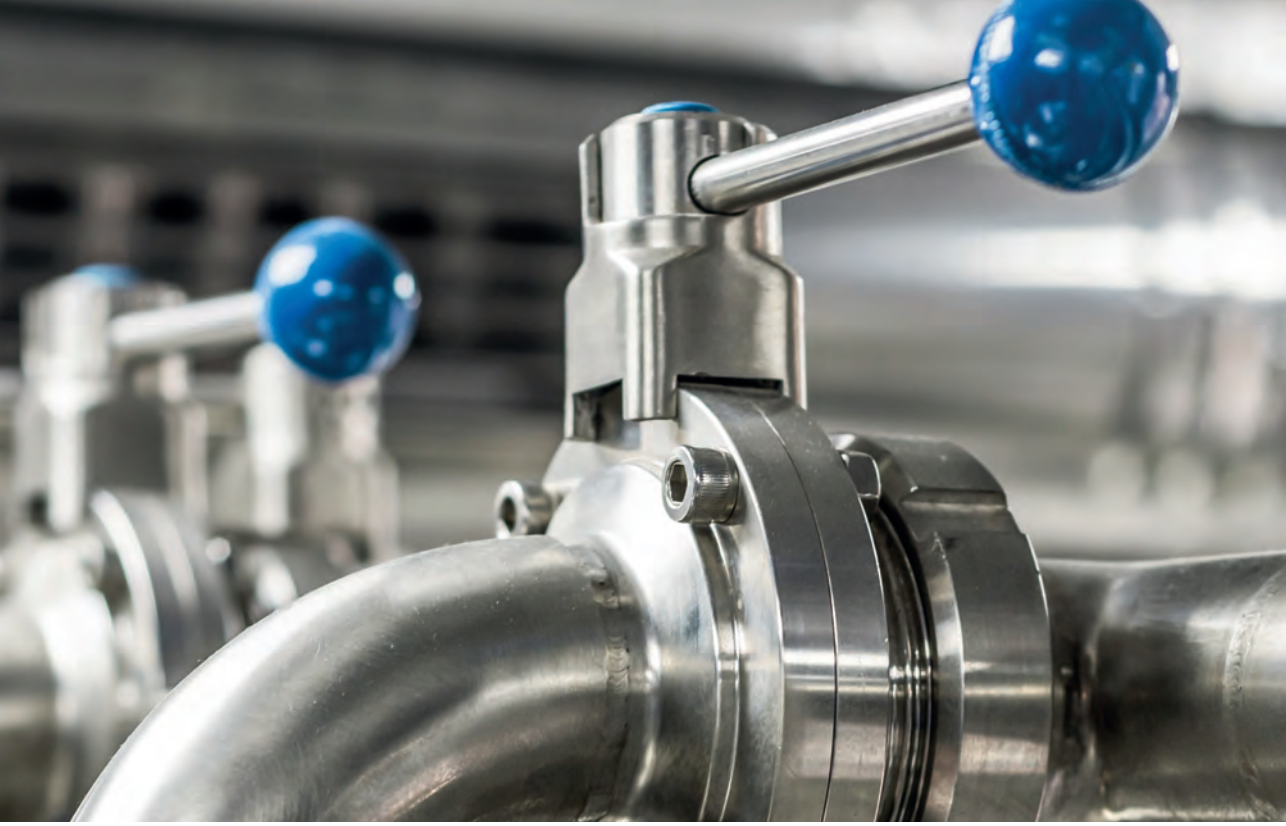
Optimise energy resource management, as well as emergencies or the health status of elderly people. Monitoring the location of individuals inside the buildings through **wristwatches or wearable devices capable of reporting emergencies or any accidents** (example: man on the ground).
In the event of an emergency, the device immediately sends an "alert" signal to a cloud server that activates an alarm to request a prompt emergency response.

Acoustic monitoring services

LoRa technology offers a wide range of speakers and microphones for **real-time bi-directional communications** (for informative or deterrent purposes). The system also provides **audio analysis**, with automatic recognition of unusual sounds such as screams, gun-shots, explosions.
The **IoT sensors**, which constantly monitor audio and audio levels in the environment, detect potential dangers or exceeding noise standards, are a useful tool for services and emergencies management.

Advantages

- **Public security.**
- **Safeguarding public order.**
- **Audio resources optimisation.**
- **Low costs** solutions.
- **Constant and reliable radiofrequency** transmissions between the sensors and the LoRaWAN network-based service infrastructure.



Flooding prevention solution

The solution proposed by A2A Smart City includes IoT sensors on the LoRaWAN network continually monitor **pipes and hydraulic systems, liquid and gas leaks**. The sensors can be installed both internally and externally to the liquid and gas piping.
Quickly detect every issue (pressure variations, losses, flooding ...) and provide **real-time monitoring**, **rapid alerts** and execution support for services and emergencies management.

Advantages

- **Reduced loss, thanks to the immediate flooding or gas leak response.**
- **Increased safety**.
- **Speedy detection of issues.**
- Long battery life, up to 20 years, thanks to the low power network thresholds of LoRaWAN.
- **Maximum** coverage across the building and the piping network, with minimal infrastructure and low cost.

Fire prevention and gas & fume detection solutions

An efficient IoT sensor network enables the constant monitoring of spaces, reducing to a minimum the timeframe to **detect an emergency and understand its gravity**: quickly identify flames, heat, fumes, gas leaks, speeding up responses and minimising the impact and risks for individuals and companies.

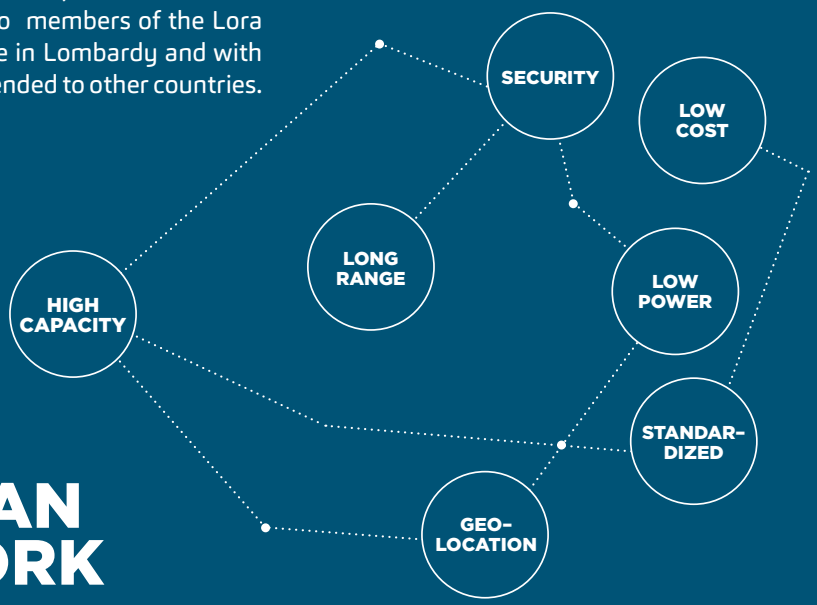
Advantages

- **Sensors** detect flames, smoke or gas leaks.
- Identify temperature **variations associated with fires**.
- Periodically send **measurements on the status of the building** (temperatures, detection of gas ...) with reliable and secure communication, thanks to the LoRa network.
- Works on **very low power thresholds**, batteries can last over 20 years.

The LoRa™ Alliance is a non-profit association for the support, development and standardisation of the LoRaWan communication protocol. The LoRa Alliance members include companies from all over the world.

A2A Smart City has been a member of the LoRa Alliance since December 2015: as a member of the LoRa Alliance, A2A can create LoRaWAN points across Europe in agreement with other members of the organisation. A2A Smart City recommends the use of a **1.0.2. standard** LoraWAN network, the latest version available exclusively to members of the Lora Alliance, already in use in Lombardy and with the potential to be extended to other countries.

All technological solutions proposed are implemented following the LoRaWAN™ standard, a technology that operates in radio frequency on an electromagnetic spectrum between 867 and 869 MHz.



LoRaWAN NETWORK

- **Long Range**: wide coverage, throughout the urban area, one gateway has a coverage range of 5km in urban areas and 10km in extra urban areas.
- **Low Power**: the sensor batteries can last for up to 10 years without requiring con nection to the electricity grid.
- **High Capacity**: supports millions of messages for every monitoring station/sensor.
- **Geolocation**: enables the support of the geo-location service without GPS and without additional battery consumption.
- **Standardized**: the LoRaWAN network ensures interoperability between applications, IoT service providers, and telecommunications service providers.
- **Security**: the LoRa standard ensures privacy and data protection via a data encryption system (Embedded end-to-end AES-128 encryption).
- **Low Cost**: low cost solution, the infrastructure and nodes have low maintenance costs and are low in energy consumption.

Well-being and security are priorities for smart cities, in order to improve quality of life in domestic, work and urban environments. Smart cities must be safer and equipped with effective communications, enabled by modern technologies.

The wide implementation of broadband and video surveillance solutions have allowed us to move from a reactive security to a proactive security approach, thus preventing crime the cities.

info@a2asmartcity.io

a2asmartcity.io
lineacom.it

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