Kyema: the Swiss RFID solution

Kyema is a solution provider specialising in Radio Frequency Identification technology (RFID).

Kyema is the main player in Switzerland and one of the few at a European level which, in combination with its partners, has supplied turnkey RFID solutions that are both transactional and use contactless card infrastructure.

Kyema's experience is unique throughout a wide variety of applications and sectors. Kyema is able to respond to clients' specific needs, supplying:

- *Advice on system architecture and integration with company systems and processes.*
- *Specific definition, selection and installation of hardware, software and middleware components.*
- *A specially realised design for the client where solutions are not already available.*

RFID_SMART_INVENTORY

The RFID_SMART_INVENTORY product allows you to: simplify procedures for inventories, logistics, allocation and maintenance of objects within a building, increase the efficiency of the inventory's execution, produce an inventory in real time, render every object a source of detailed information and, not least, comply with the legal obligations (for the public administration) of the person responsible for the inventory, i.e. by producing an accurate inventory.

The method developed by Kyema in its RFID_SMART_INVENTORY projects involves several elements. Every object to be entered onto the inventory and/or maintained is given an RFID Tag, containing memory and a pre-printed identification number. Every room in the premises also has an identifying RFID tag. The sections of the buildings covered by the inventory are supplied with gate antennas and connected to a network, and employees responsible for stocktaking and maintenance are given handheld computers with an RFID interface and WiFi. A WiFi network is created in the building, as well as a detailed database of the inventory and maintenance.

The RFID Tags attached to the objects are linked to the inventory number, the location (building, floor, room) or to the beneficiary (Mr Rossi) in a database using the UID (Universal Identifier, a unique code that cannot be changed). In addition within the same database, in a series of "maintenance" records, any
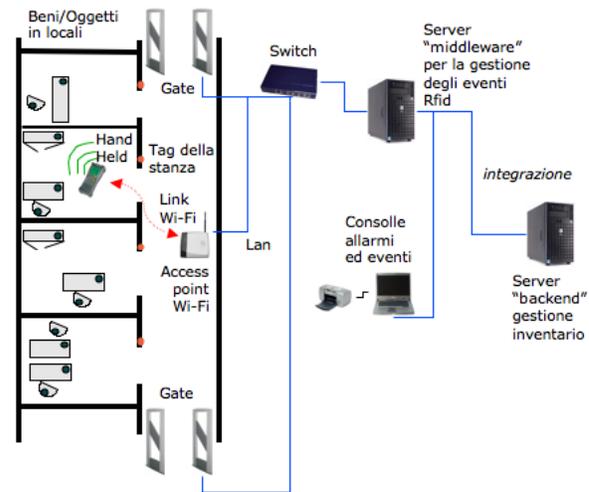
maintenance activities carried out are recorded, along with who carried them out and on what date, as well as what must be done in the future.

Inventory: Reading takes place by means of a handheld computer connected to the building's network via WiFi (wireless network, WLAN) or in batch mode, at the end of the inventory process. Various gates (antennas + readers) are positioned at important access points (corridors, entrances) and they monitor what is moved around (by corridor, floor, building etc).

Diagram of RFID_SMART_INVENTORY

RFID technology

The RFID technology, used to monitor objects at a distance of up to 6-10 metres, is based on the ISO 18000-6 standard, in the ETSI EN 302-208 band from 865 to 868 MHz.

The passive tags can be registered within the field of an antenna from a few centimetres up to a maximum of 6-10 metres, using the power of 2 -Watt EIRP. The variability from 6 to 10 metres depends on the environmental conditions and the dimensions of the antenna and the tags.

The readers are able to manage one antenna (reader with integrated antenna), or using an integrated

multiplexer, up to four antennas. The 4-antenna reader can cover an area (field) several metres wide.

Readers, antennas

The readers Kyema supplies have an Ethernet port and can therefore operate with just a simple connection to the company's LAN.
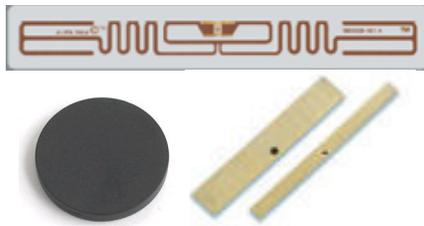
The management of the readers takes place using RFID middleware software components, which can be advantageous in eliminating problems of complexity deriving from the RFID infrastructure and from the typically pre-existing back-end software.

Reader and UHF antenna

Tags

Kyema is able to design the right tag for every material, surface and object. In order to tag items that are complex or contain lots of metal, such as PCs (notebooks, desktops, servers), the type of antenna used must be carefully selected to minimize interference with the metallic components and to maximize the distance at which the tag can be read.

UHR tags in various formats

RFID Middleware Software

Middleware software can integrate RFID readers from various producers using a driver model, in the same way supporting various standards of RFID Tag. The middleware supplies an abstraction of the hardware level (tag, reader, network), meaning back-end components do not need to take physical details into account.

The middleware allows you to:

- Define logic groups of readers and antennas in order to cover large areas
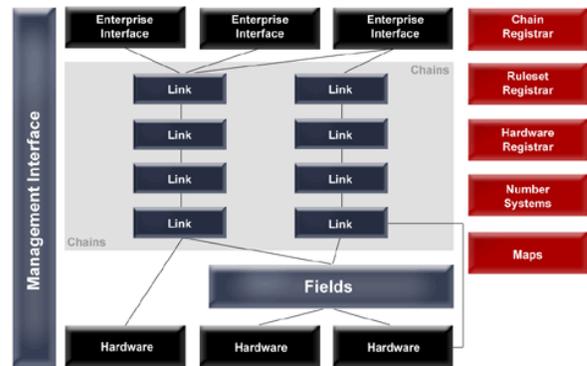- Monitor the state of the readers and antennas in the network
- Tune the radio signal
- Determine the direction of tags moving within an antenna's field
- Define the physical position of the readers
- Map the UIDs of the tags with associated keys in a database

The middleware is integrated with back-end systems using native interfaces, such as:

A. J2EE™
B. Microsoft .NET™
C. JDBC™
D. MQSeries™
E. XML

The middleware is structured in layers, as shown in the following diagram:

The RFID_SMART_INVENTORY is therefore able to interface with any pre-existing inventory system, rather than having to integrate with the solutions offered by Kyema.

In particular, the integration of solutions for real-time identification of locations like E-RTL and geolocalisation software such as Movida, mean the inventory concept can be extended to include dynamic asset location tools. A powerful rule-based engine allows programming and the setting off of alarms following the movement of any object present in the antenna field.

Kyema's partners

RFID solutions are the result of integrating various components which should produce the best possible result in relation to the sector and the type of application.
Kyema has developed a series of partnerships with the industry's leading companies, with which it collaborates to supply "best of breed" solutions.

Cisco, SIRIT, Oracle, Philips, ST Microelectronics, CAEN, Multispectral, Cardpos, Alien Technologies, Acient, LabId and Softwork

are just some of our more notable partners.