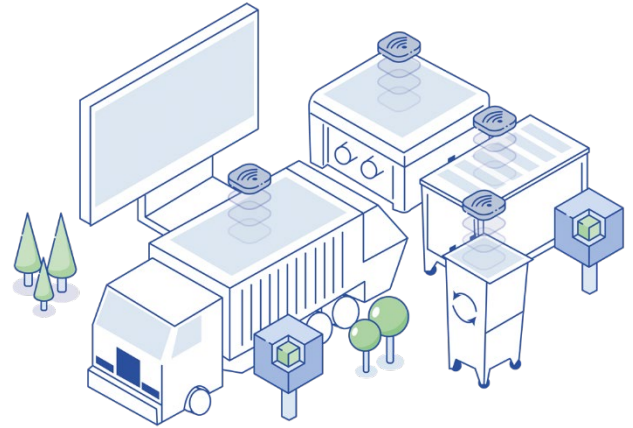


MTX-DigitalECO System

Smart IoT system for the selective collection of waste

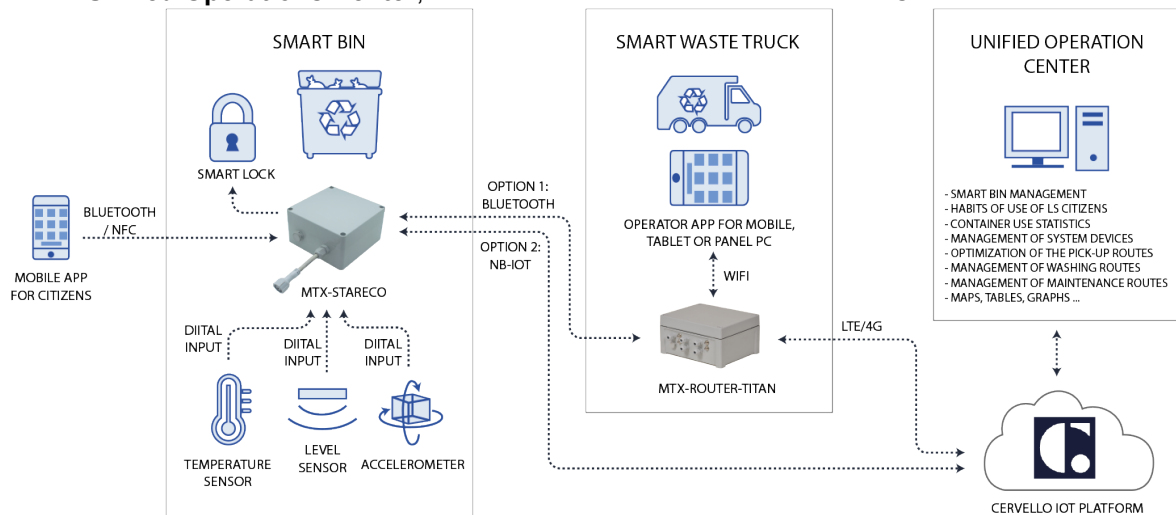
[NEW IN 2021] MTX-DigitalEco System offers a comprehensive solution for the selective collection of waste, adaptable to different existing scenarios. It provides solutions for the management of container openings and for the unified operations system, including an app for the users, a management platform and routes for the operators, and a control platform for the unified operations center.

“ A comprehensive system. From container opening control to unified operations platform.”



How Does It Work?

The **MTX-DigitalEco** System provides IoT solutions for the different elements that can become part of a selective waste collection ecosystem. On the one hand, an **MTX-StarEco installed in each container controls and identifies every opening**. The opening can be done via BLE or via NFC. The information collected is **sent to the Cervello platform through NB-IoT or through BLE** (by trucks). On the other hand, the **collection operators have a route and incident management platform** thanks to the WiFi of the MTX-Router-Titan LTE/4G. Finally, the entire process is controlled from the **Unified Operations Center**, which receives all the information from Cervello IoT Platform.



1. Smart Container

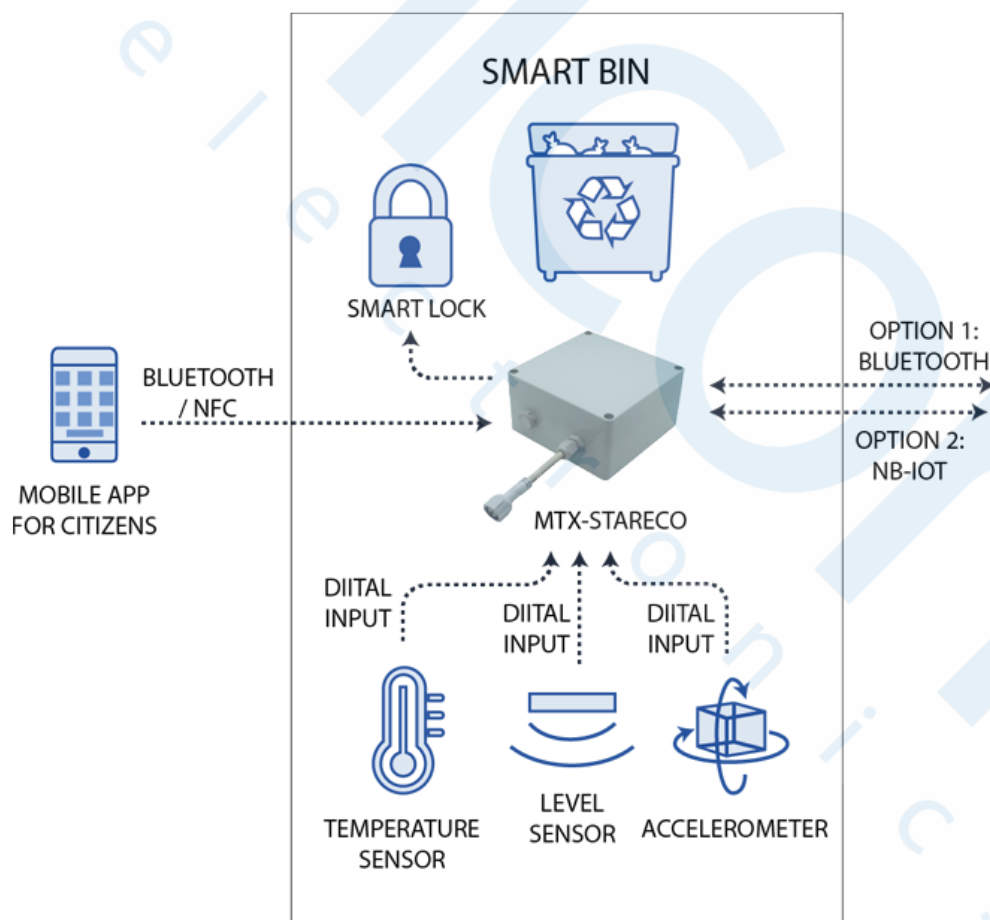
The **MTX-StarEco modem**, placed in each container, manages all the **container openings**, as well as the **monitoring** of the container itself through sensors that control the **filling level** and the **environmental conditions**.

Opening Control

The MTX-StarEco installed in each container **identifies the user via Bluetooth or NFC** thanks to a **mobile application**. Once identified, following the established criteria, it will **allow or deny the opening** and will **record the event** in its internal memory to transmit it later to the Cervello IoT Platform.

Fill Control and Monitoring

The **volumetric sensors (ultrasound, radar...)** measure the **filling level of the containers**, and the truck drivers are notified in real time which container they need to empty next. Additionally, a **temperature/humidity sensor and an accelerometer** provide information to the unified operations center about the environmental conditions and detect if there is any movement of the container.



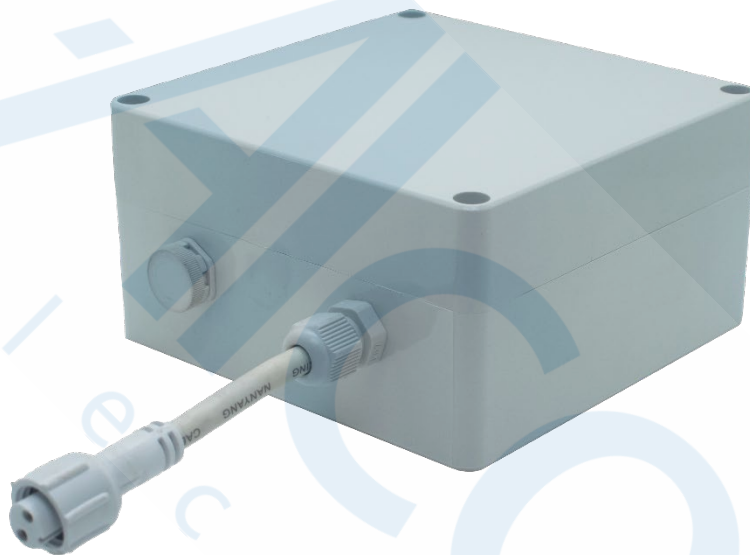
Hardware: MTX-StarEco

Industrial IoT modem with NB-IoT, Bluetooth, IP67 and battery

“It operates for more than 5 years* without an external power source, ensuring a fast, easy and economical field deployment.”

The MTX-StarEco is an IP67 modem with NB-IoT and Bluetooth Low Energy connectivity specially designed for the control and monitoring of waste containers. It has a personalized firmware that receives the identification of the user and allows or denies the opening depending on the established criteria. It also has a long-lasting battery and digital inputs for monitoring sensors.

*The duration of the battery will depend on the configuration of the equipment: openings, readings and sending of information.



“With two connectivity options: Bluetooth Low Energy (through hubs in trucks) or NB-IoT directly with Cervello IoT Platform.”



NB-IoT



Bluetooth



NFC



Pilas
internas



Ultra Low
Power



IP66/67



Temperatura
industrial



Configuración
remota

2. Smart Truck

Thanks to the **MTX-Router-Titan** and an **application designed for operators**, the traditional waste collection truck is transformed into a smart truck with WiFi, LTE/4G connectivity and an interactive tablet or panel PC.

A Connected Truck

The MTX-Router-Titan provides the truck with **LTE/4G connectivity, WiFi and Bluetooth Low Energy**.

Bluetooth: the MTX-Router-Titan receives the information via BLE directly from the containers within its range. Once received, it is processed and sent to Cervello IoT Platform using LTE/4G. At the same time, it also receives information back for the operators.

NB-IoT: The containers send the information directly to Cervello IoT platform. The truck router will be optional depending on the monitoring needs of the truck.

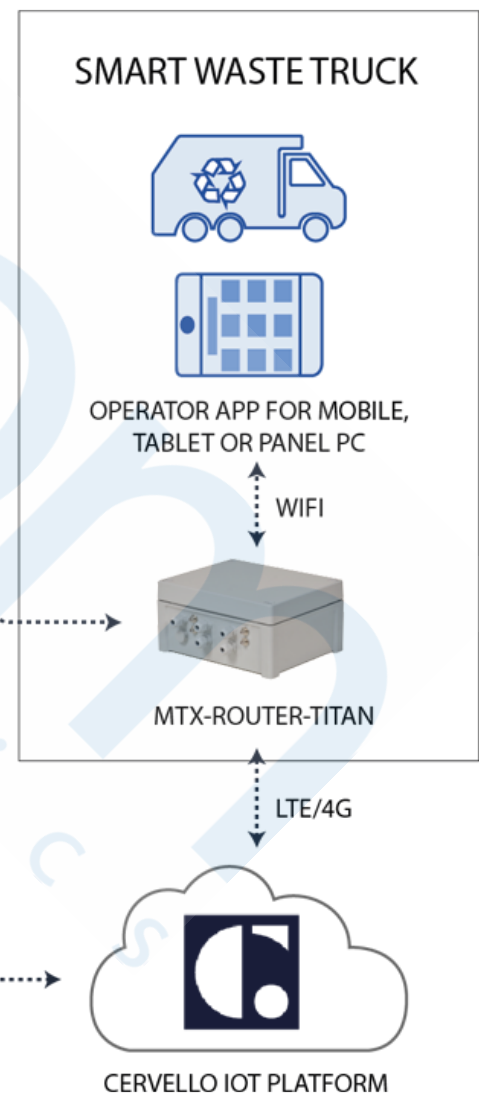
An App for Collection Operators

Thanks to the WiFi and LTE/4G connectivity provided by the MTX-Router-Titan, each truck can have a **user interface (on an integrated screen or an industrial tablet)** in which an **application for collection operators** with the following functionalities would be displayed:

- Filling state of the containers on each route
- GPS route tracking
- Alerts about problems or incidences in the containers

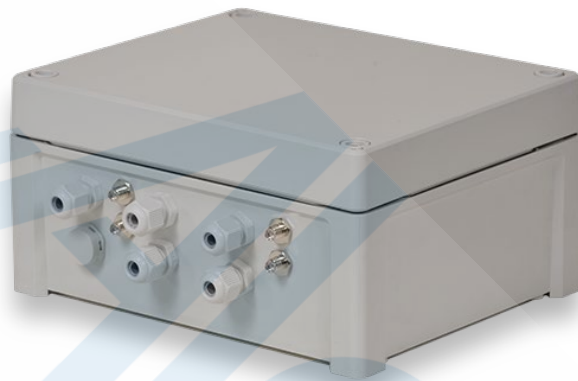
OPTION 1:
BLUETOOTH

OPTION 2:
NB-IOT



Hardware: MTX-Router-Titan

Industrial IoT router with LTE/4G, WiFi, Bluetooth, and IP67



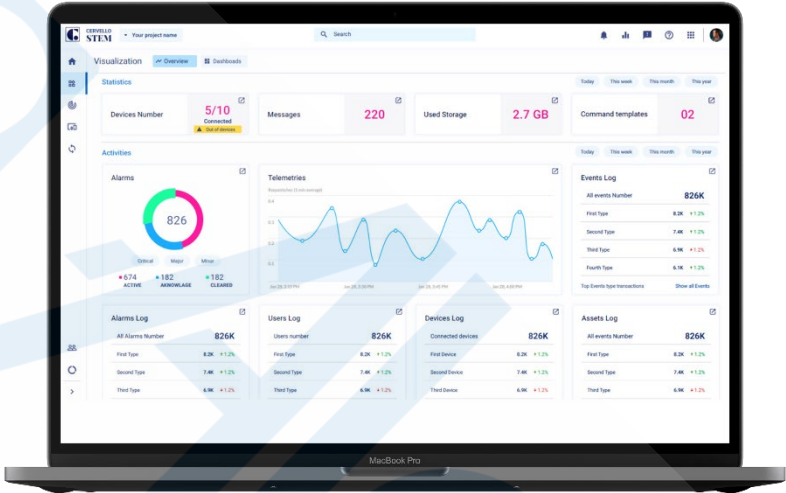
3. Unified Operations Center













It is the brain of the MTX-DigitalEco System. Implemented in Cervello, the unified operations center is an IoT platform in the cloud that allows comprehensive control of the entire system: it manages deployed devices, knows the status of the containers, obtains information on openings, views alarms and monitors routes of waste collection, among other functions.

Based on Cervello IoT Platform

“Thanks to Cervello IoT Platform, all the operations related to the selective collection of waste are managed from a single platform, connected to all the system devices.”

The unified operations center is based on the powerful Cervello IoT Platform in the cloud. It allows to connect an unlimited number of IoT devices for easy management and control in a fast and secure way. Thanks to its development possibilities, our R&D team has developed an application for the unified operations center that brings together the management of all installed devices and the comprehensive control of the selective waste collection process.



-  Container identification
-  Registration and user identifier
-  Binding users with the containers they are allowed to use
-  Container blocking by time spans, days or location
-  Management of container routes
-  Management of container routes
-  Optimization of maintenance routes
-  Monitoring of collection trucks
-  Detection of displacement or vandalism in containers
-  Control and statistics of user habits
-  Container usage statistics
-  Management of the MTX-StarEco devices installed in the containers