SMART WASTE MANAGEMENT SYSTEM WITH A REDCAP 5G ROUTER

HIGHLIGHTS

- Smart waste management enables optimised waste collection schedules and operations. It does so via a system of sensors installed inside smart garbage cans, CCTV cameras, and a remote control centre.

- Ensuring all moving parts are connected within a single network is Teltonika's RUT271 RedCap 5G router—providing the low latency of 5G at reduced pricing.

- This compact mobile router features WAN failover, two RJ45 ports, Wi-Fi 4, and numerous other brilliant features for expert industrial deployment.

THE CHALLENGE – SMART TRASH CAN, AND WILL

The best waste management systems today take full advantage of IoT connectivity. Leveraging new technologies, the smart waste management market was valued at $2.2 billion in 2023 and is projected to reach $8.3 billion by 2032, growing at a CAGR of 15.6%.
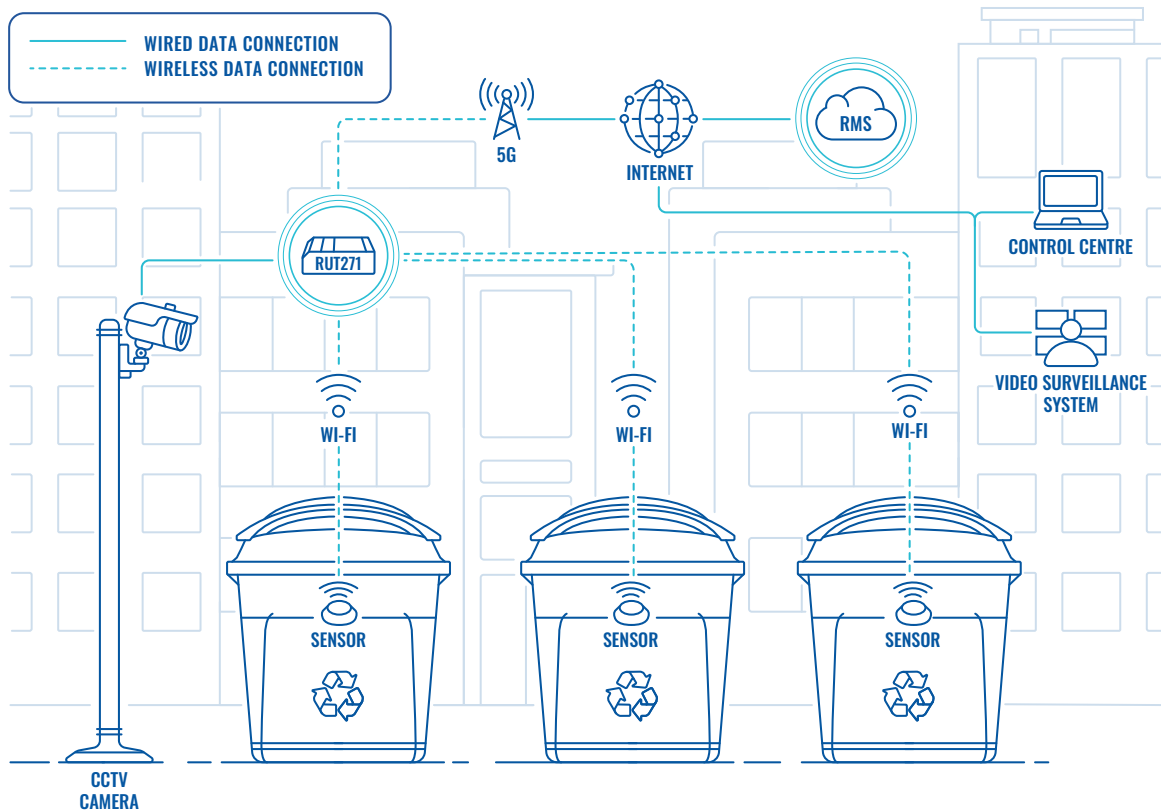
What separates this prolific market from the non-smart waste system of the past? The answer is plain and simple: innovation.

Smart trash cans are neither plain nor simple, however. Inside each of them are sensors which detect a given bin's load in real-time. This data is transmitted to a control centre wirelessly—optimising waste collection schedules and operations, as the system knows when to send collection trucks with impeccable timing.

In addition, an adjacent CCTV security camera watches over your clique of smart paper, glass, and metal recycling bins, as well as the all-reliable other bin, to prevent vandalism or illegal dumping.

Of course, the control centre, camera, and the sensors in the smart trash cans must all be connected to a single network for this level of efficiency to operate smoothly. This is where the future of trash meets the future of industrial connectivity: RedCap 5G.

TOPOLOGY

THE SOLUTION – CELLULAR REDCAP 5G ROUTER

Enabling connectivity for this smart garbage can system is Teltonika's cellular RedCap 5G router, the RUT271.

Installed inside a control box on the surveillance camera's pole, this mobile router is connected to the camera via one of its two RJ45 ports, and to the sensors inside the smart trash cans via its Wi-Fi.

The RUT271 can wirelessly support up to 50 end devices, making it easily scalable for smart waste management systems comprised of a large number of bins—or even multiple groups of them.

From there, the router wirelessly transmits the data from both end devices to the control centre, becoming the lifeblood of this industrial IoT solution.

RedCap 5G stands for reduced capability, which bridges the gap between 4G and full-capacity 5G. Supporting stand-alone (SA) architecture, RedCap 5G operates in speeds closer to 4G, up to 223 Mbps, while reaping another benefit of 5G: low latency. This makes the RUT271 5G router perfect for industrial IoT solutions that prioritise latency over speed, while also keeping pricing low.

This device's connection is safeguarded by WAN failover, which automatically switches to an available backup connection in case the primary one is interrupted for any reason. Safeguarding the network itself are numerous authentication methods, VLANs, and support of industrial VPN services, such as ZeroTier, WireGuard, IPsec, and OpenVPN.

RedCap 5G isn't the only trick up this 5G router's sleeve. It's also equipped with two 10/100 RJ45 ports and Wi-Fi 4, and supports all the key industrial protocols you know and love, such as Modbus TCP, MQTT, and DNP3. It is also backward compatible with 4G LTE Cat 4, in case your smart trash cans are deployed in areas without 5G coverage. In such cases, the device supports speeds of up to 150 Mbps.

The RUT271 is encased in [sturdy aluminium housing](#) with plastic panels, enabling it to withstand extreme temperatures from -40 °C to 75 °C and humidity ranging from 10% to 90%, non-condensing. Last but not least, this 5G router is extra compact, measuring only 83 x 25 x 74 mm—making it incredibly easy to slot in tight-space applications.

You don't have to break the bank to have the best waste management there is—leverage the cellular RedCap 5G capabilities of the RUT271 5G router, and keep your IoT solutions affordable and trash cans smart.