NOXIUM

APPLICATIONS

TABLE OF CONTENTS

ENERGY AND UTILITIES

ENVIRONMENT AND SAFETY

INDUSTRY AND AUTOMATION

ENERGY AND UTILITIES

At Noxium we have been searching for more than 15 years for IoT solutions for energy companies looking to improve their facilities in demanding environments. With the improvement of technology, wireless solutions are a breakthrough for the efficiency of infrastructures, reducing energy and maintenance costs for the production and distribution of different energies.

Remote control and monitoring of windturbines

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

WIND TURBINE CONTROLLER

ROUTEX P

4G LTE

API

INTERNET

CONTROL CENTER

SUBSTATION

TRANSMISSION
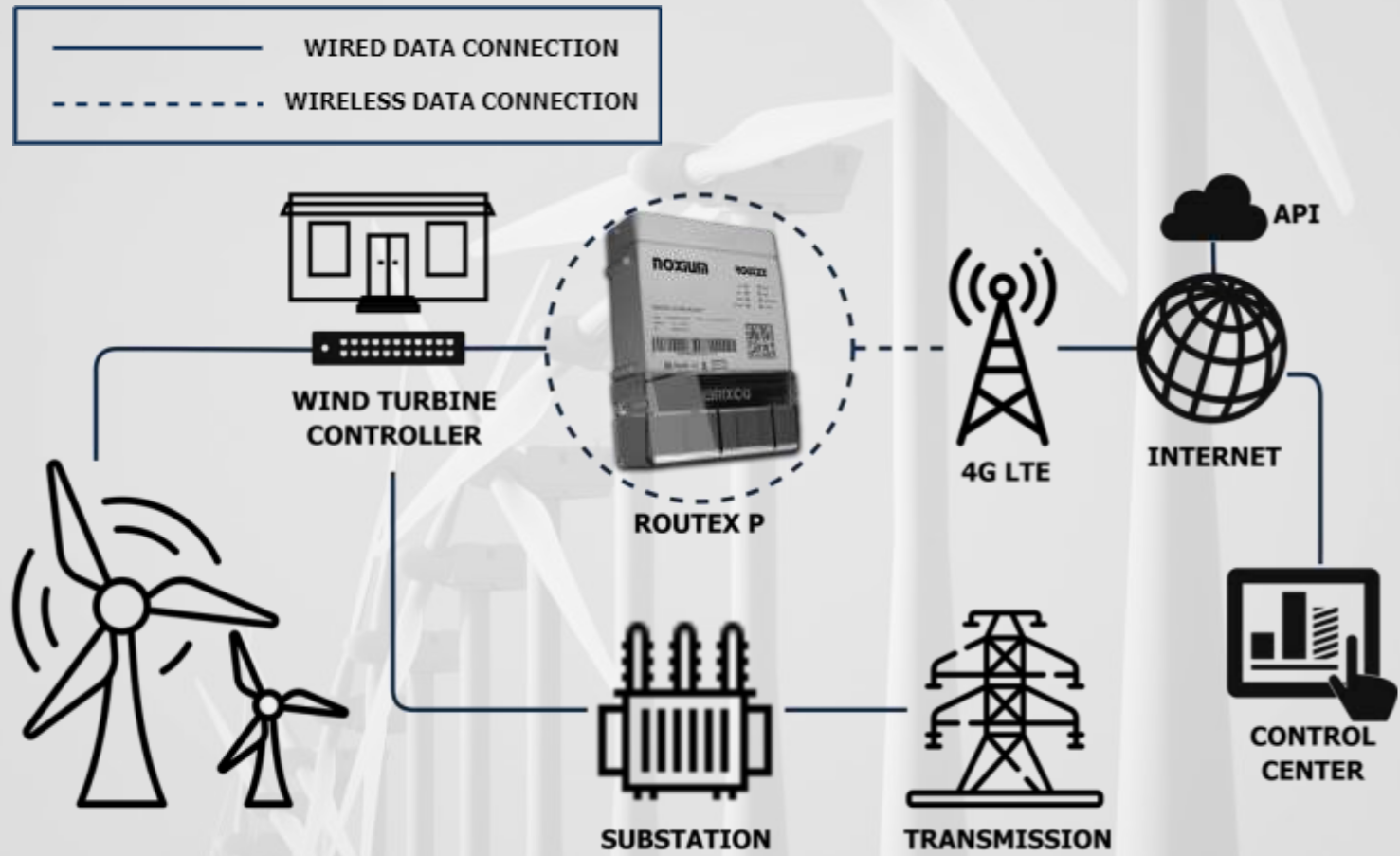
PROBLEM

Wind energy is one of the most prominent green energies on the market.
Wind farms are located in remote locations, far from cities, in mountains or near the sea. These locations are key to good windturbines performance, but they also involve a great deal of installation complexity.

Companies install control stations near the wind farms to monitor, program and report on the mills. Without this system, the mills would not function properly, as they require monitoring and programming. In order for the controllers to function properly they must be connected to a system for monitoring, reporting power generated, parameter control, and maintenance needs.
The biggest problem lies in obtaining a secure and reliable connection to the internet from such remote environments.

SOLUTION

In the diagram below you can see the solution to our problem: a windturbine generates energy that is transmitted to an electrical network. In turn, the windturbine control station transmits the data to a ROUTEX P, a compact but powerful 4G LTE Serial Router, which will allow us to monitor and manage from the control center, in a reliable and secure way.

ROUTEX P is not only a perfect choice for this type of industrial environments, but also has an interface with different connections, serial bus RS232/485 or Ethernet network. You will work with a secure connection for monitoring with tunneling, authentication and encryption protocols. Another benefit is the remote management and operation options; management via SNMP, Syslog diagnostic events and Local/Remote configuration via CSD/SMS.
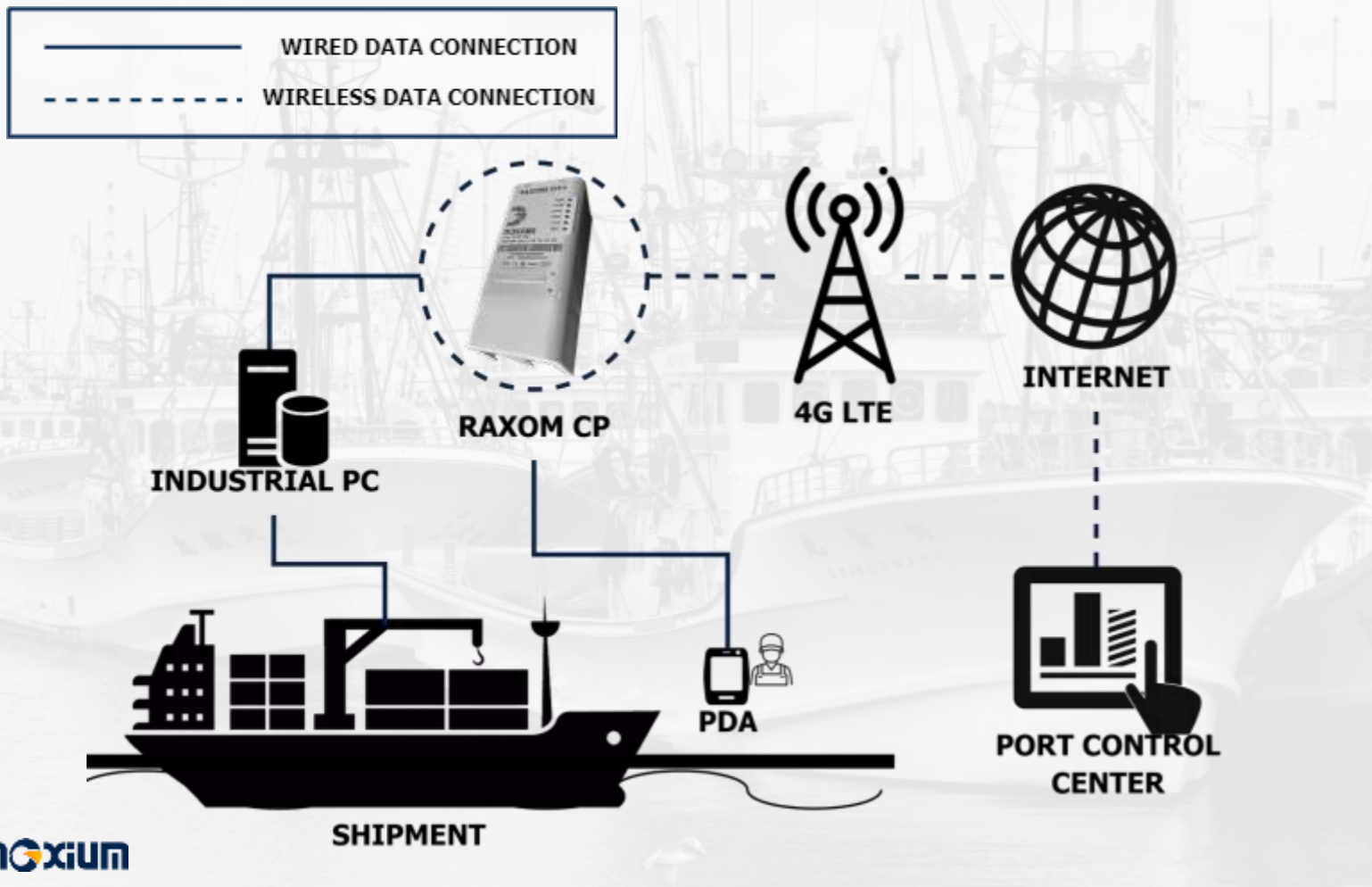
BENEFITS

Easy to operate and install, allowing remote control and configuration of an unlimited number of ROUTEX Ps to the mill system.

Low energy consumption, necessary for this type of power generation installations.

Small dimensions, compact and robust in hostile environments.
Temperatures: -20º C to 85º C.

Logistics control in commercial and industrial ports

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

RAXOM CP

4G LTE

INTERNET

INDUSTRIAL PC

PDA

PORT CONTROL CENTER

SHIPMENT

PROBLEM

Logistics is fundamental to competitiveness in seaports, facilitating management, efficiency and decision making to optimize port operations.
In addition, data analysis plays an increasingly important role in maintaining a competitive advantage and complying with regulatory requirements.

To increase efficiency in seaport operations, it is essential that all teams stay in constant communication and take advantage of all the options available in the Internet of Things (IoT) to make informed decisions. It is estimated that by utilizing this real-time information, seaport operators can save a significant sum each time a vessel docks.

SOLUTION

As you can see from the topology, all vehicles and cranes in seaports need to be connected to a unified, secure and reliable network. Our engineers choose the RAXOM CP for this solution for multiple reasons, including its exceptional performance.

RAXOM CP with 4G LTE Cat4 is capable of speeds up to 300 Mbps and guarantees exceptional data throughput not only today but also for years to come. Its dual Wi-Fi functionality allows multiple PDAs or industrial PCs to be connected to the router. In addition, other devices can be connected via the Ethernet ports.

RAXOM CP is a rugged device with a metal housing designed to withstand vibration, humidity and extreme temperatures. It can operate in a temperature range varying from -40 °C to 75 °C. This professional cellular router has the necessary certifications, ensuring compliance with essential requirements when mounting additional devices in aftermarket vehicles.
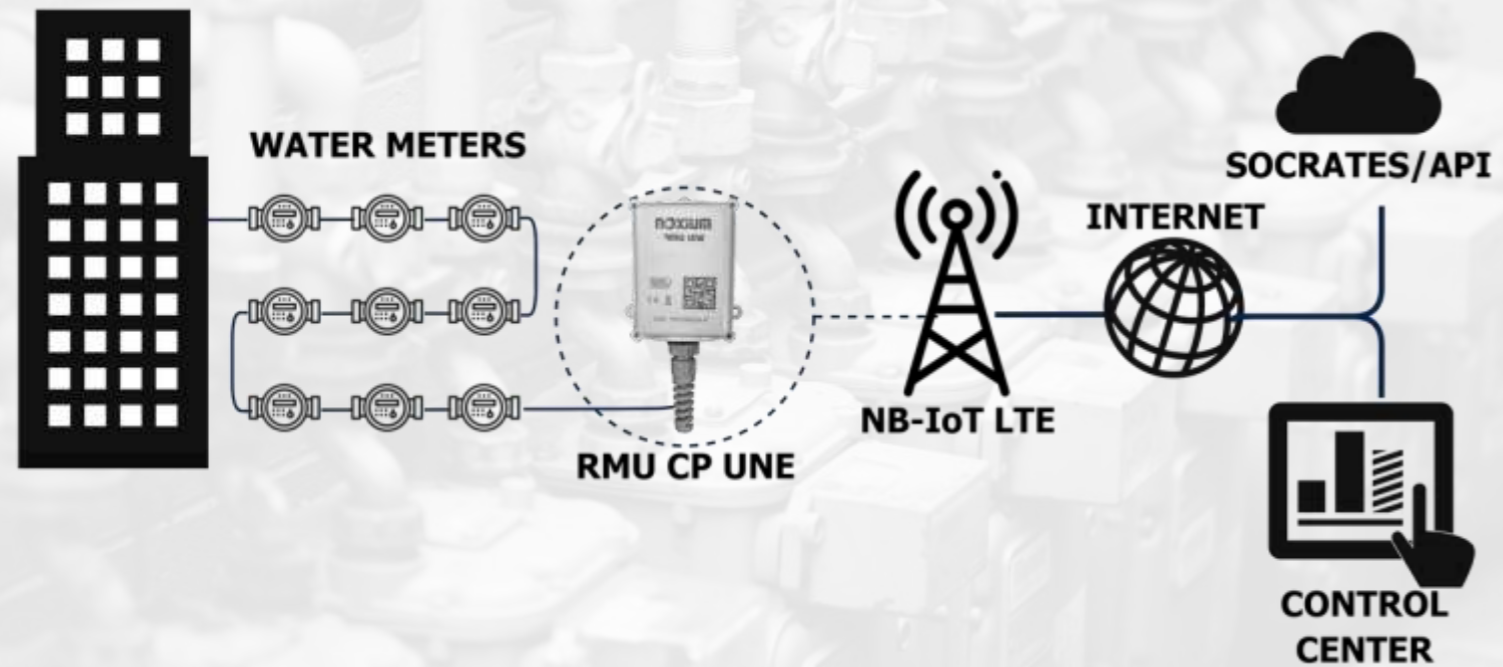
BENEFITS

Easy to use and install, allowing control with unique accuracy.

Low energy consumption, necessary for this type of industrial environment installations where energy efficiency and cost is very demanding.

Compact and robust in hostile environments. Temperatures: -20º to 85º C

Data collection for water meters

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

WATER METERS

RMU CP UNE

NB-IoT LTE

INTERNET

SOCRATES/API

CONTROL CENTER

PROBLEM

The water sector, like other industrial areas, is under great pressure in terms of investment and operating costs.

This is one of the major concerns of companies in the sector, to have an efficient predictive maintenance plan that allows them to make decisions before failures and alarms in field control points and thus reduce their costs.

A characteristic of water facilities is their decentralized structure, and therefore, one of the main problems of the sector lies in the ability to monitor and control them remotely in real time.

Due to the increasing complexity of remote control systems, communications devices must be robust enough to meet the most demanding requirements.

SOLUTION

The diagram shows an installation of several bus-connected or "point-to-point" meters. The RMU CP UNE is an ultra-low power meter for the collection of data transmitted through the NarrowBand IoT standard.

The device makes optimized use of spectrum and signal penetration. It exchanges data on demand or on a scheduled basis even at very low coverage levels. In this way, it optimizes energy consumption, maximizes autonomy and thus minimizes the operating costs of the measurement network.

Installation and commissioning is easy thanks to its compact format, automatic configuration and local self-diagnosis during the set-up phase.
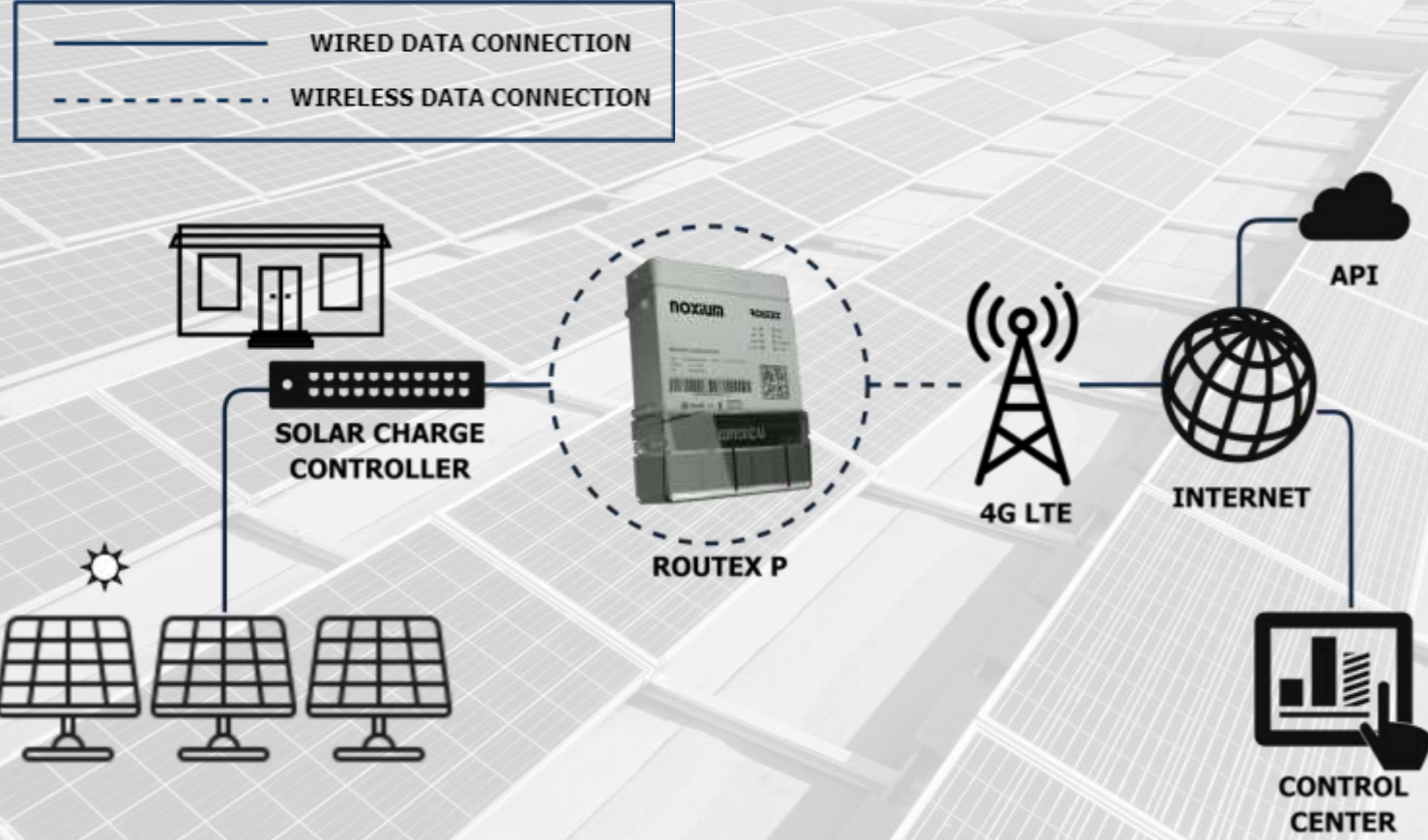
BENEFITS

Ultra low power consumption with optimized operation mode.
Reliable communications.
Low data usage rate in the network.
Remote configuration, management and maintenance through the SOCRATES cloud platform.
Improved coverage with good indoor penetration.
Ability to record and store readings locally.
Ergonomic, small size and easy installation and commissioning.

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ENVIRONMENT AND SAFETY

The IoT world is growing at an ever-increasing pace, creating a complex and intelligent system of connections with thousands of devices in different environments, all to make our lives easier. At Noxium we provide these large infrastructures, in addition to improved energy performance and maintenance, with solutions that meet environmental and security requirements with the latest IoT protocols.

Telemetering in Solar Farms

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

SOLAR CHARGE CONTROLLER

ROUTEX P

4G LTE

INTERNET

API

CONTROL CENTER

noxium

PROBLEM

Solar power farms are a challenge when it comes to maintaining high energy production yields. All its components require calibration and maintenance, such as replacing parts or cleaning panels, which must be monitored and controlled, seeking the highest efficiency in the energy produced.

These farms are located in very large areas, far from civilization and, therefore, far from internet connections, posing a problem for the companies when monitoring and controlling the installations.

Due to the increasing complexity of remote metering systems, communications devices must be robust enough to meet the most demanding requirements.

SOLUTION

The diagram shows a simple solution with a remote cellular connection to the control center of the panels. Normally these stations have a control of the solar farm operations, with an industrial protocol data output system, e.g. via Modbus TCP.

Depending on the size of the solar farm, several control centers are usually installed for each number of solar panels. This is where our solution comes in, the best way to treat this data is through an IoT platform in the cloud, showing an operator a series of graphs of performance and maintenance of our installation.

Our ROUTEX P provides a secure and reliable cellular connection via 4G LTE, with a user-friendly interface for the operator.

BENEFITS

Easy handling and installation, allowing remote control and configuration of an unlimited number of ROUTEX P to the mill system.
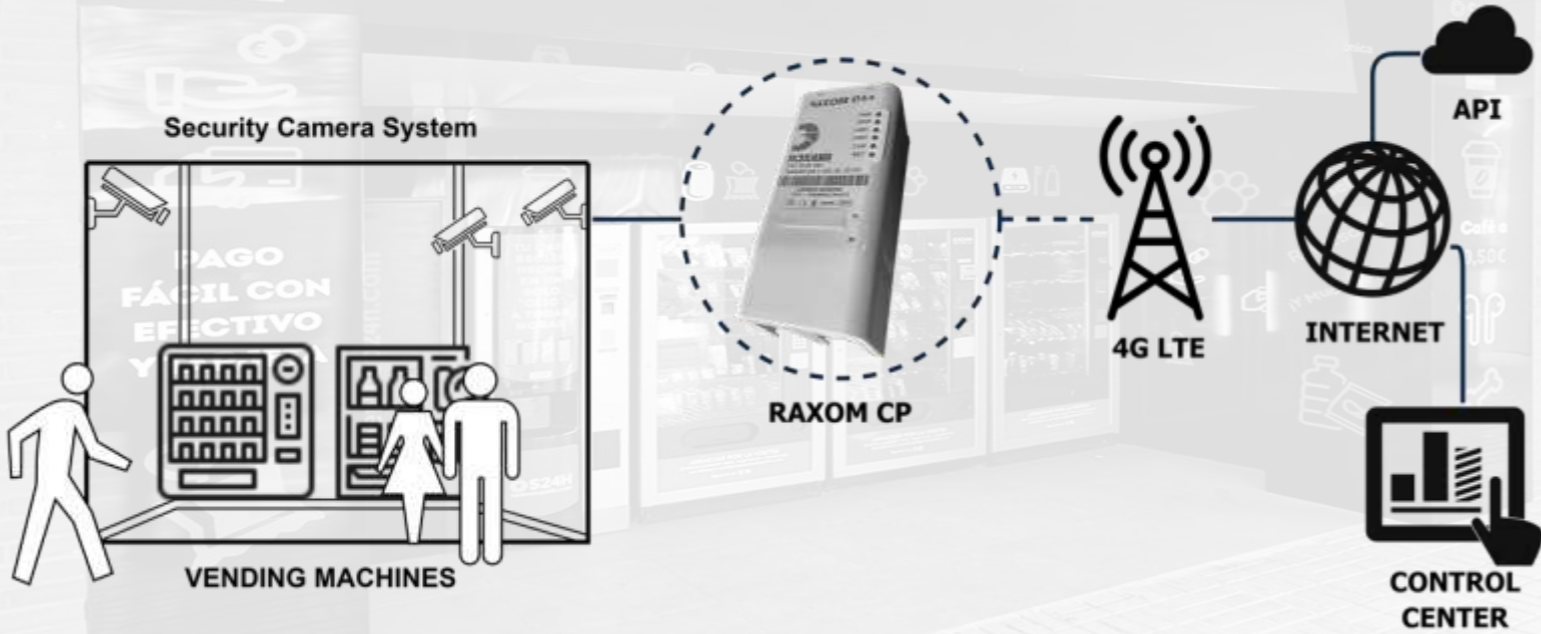
Low power consumption, necessary for this type of power generation installations.

Compact and robust in harsh environments.

Temperatures: -20º to 85º C

WIRED DATA CONNECTION
WIRELESS DATA CONNECTION

Security Camera System

RAXOM CP

4G LTE

INTERNET

API

CONTROL CENTER

VENDING MACHINES

PROBLEM

Security for vending establishments has been a longstanding concern for owners. Choosing the right option can be problematic: hiring guards to watch the site 24 hours a day is costly and inefficient, and does not guarantee that theft or vandalism can be prevented. Setting up and managing complex CCTV camera systems can be expensive and difficult to manage without the necessary expertise.

To avoid unforeseen problems and ensure the security of the vending business, it is advisable to rely on security specialists to handle the entire structure of the camera solution. This allows monitoring several areas at the same time and recording what happened for later review ensuring the security of the vending business without incurring excessive costs or inconvenience.

SOLUTION

This complete solution ensures continuity of connection anywhere and at any time. The option of using two SIM cards provides security in case the main connection is lost. This feature is crucial in remote locations with limited communication options. This is often the case at construction sites, solar farms and other industrial facilities. The RAXOM CP's multiple digital inputs and outputs allow equipment to be easily connected. Since there is often more than one camera in the facility, the time resources required for setup must be fast. Each camera must have an IP address so that each camera can be reached separately in a secure manner via IP Sec VPN.

In addition, having unique IP addresses makes it possible to know where the cameras are located in the internal system. Finally, each camera has an alarm modem connected to the alarm center. This solution allows minor problems to be resolved remotely without the need to travel to the site. Offering a complete and ready-to-use product makes the management of the solution unified across all locations, making it much simpler and more efficient.
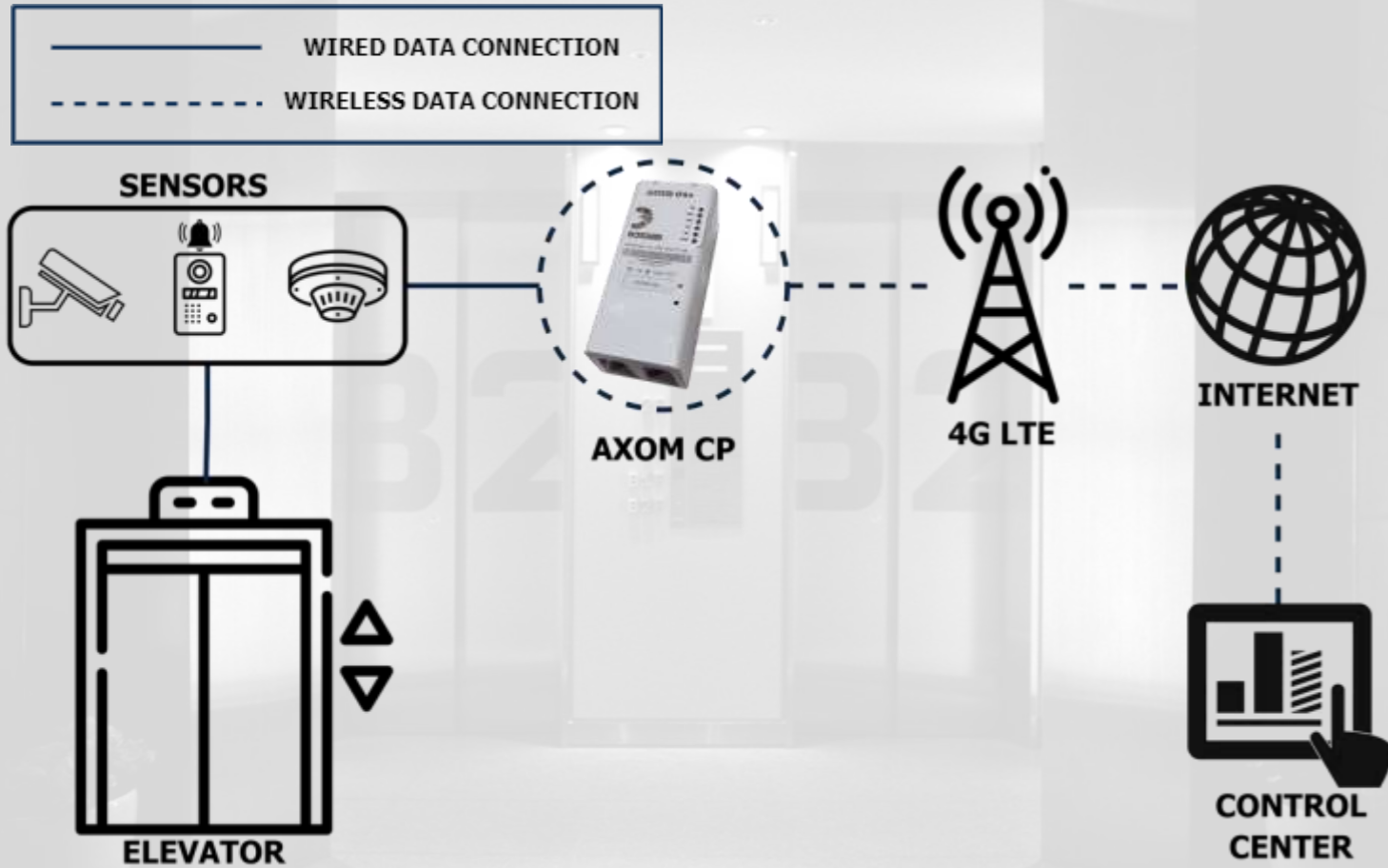
BENEFITS

Easy to use and install, allowing control with unique accuracy.

Low power consumption, necessary for this type of installations with low power requirements.

UltraCompact and robust in harsh environments.

Temperatures: -20º C to 85º C

NOXIUM

Emergency remote control in elevators

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

SENSORS

AXOM CP

4G LTE

INTERNET

ELEVATOR

CONTROL CENTER

PROBLEM

When a manufacturer designs and builds an elevator, its work does not end there. The installation and operation of these elevators are entrusted to specialized companies, and maintenance is a key part of ensuring proper performance. In many countries and cities, policies state that if someone is trapped in an elevator, the maintenance company has one hour to resolve the situation and free people. It is therefore essential that the maintenance service is available 24 hours a day.

Reliability, safety and remote control and monitoring of the entire system are essential. The system encompasses not only the elevator itself, but also vital components such as the emergency telephone, smoke detectors, IP cameras and control screens. Internet connectivity plays a critical role in ensuring smooth and secure communication between all these elements. To this end, we have the AXOM CP cellular modem as a gateway between the control center and the entire system, providing reliable and secure connectivity to keep the elevator fully operational.

SOLUTION

The main components of the entire solution: the emergency telephone, control screens, smoke detection systems and IP cameras are used to ensure that, in the event of any inconvenience, the elevator operator can resolve it promptly. Maintenance companies invest in safety and reliability systems to optimize their operations and reduce the potential need for physical maintenance at all locations. Since the entire solution is subject to a potential risk of failure, stable and secure Internet connectivity is critical.

Connecting the sensors to our AXOM CP industrial cellular modem with 4G LTE ensures a reliable connection with failover functionality thanks to the two SIM card slots. It has two gigabit Ethernet interfaces, sufficient to connect all components of the solution. Designed with a wide variety of security services, including multiple VPN, firewall, DDOS attack prevention functions, among others.

BENEFITS

Easy to use, install and compact, allowing control with unique accuracy.

Low power consumption, necessary for this type of small space installations.
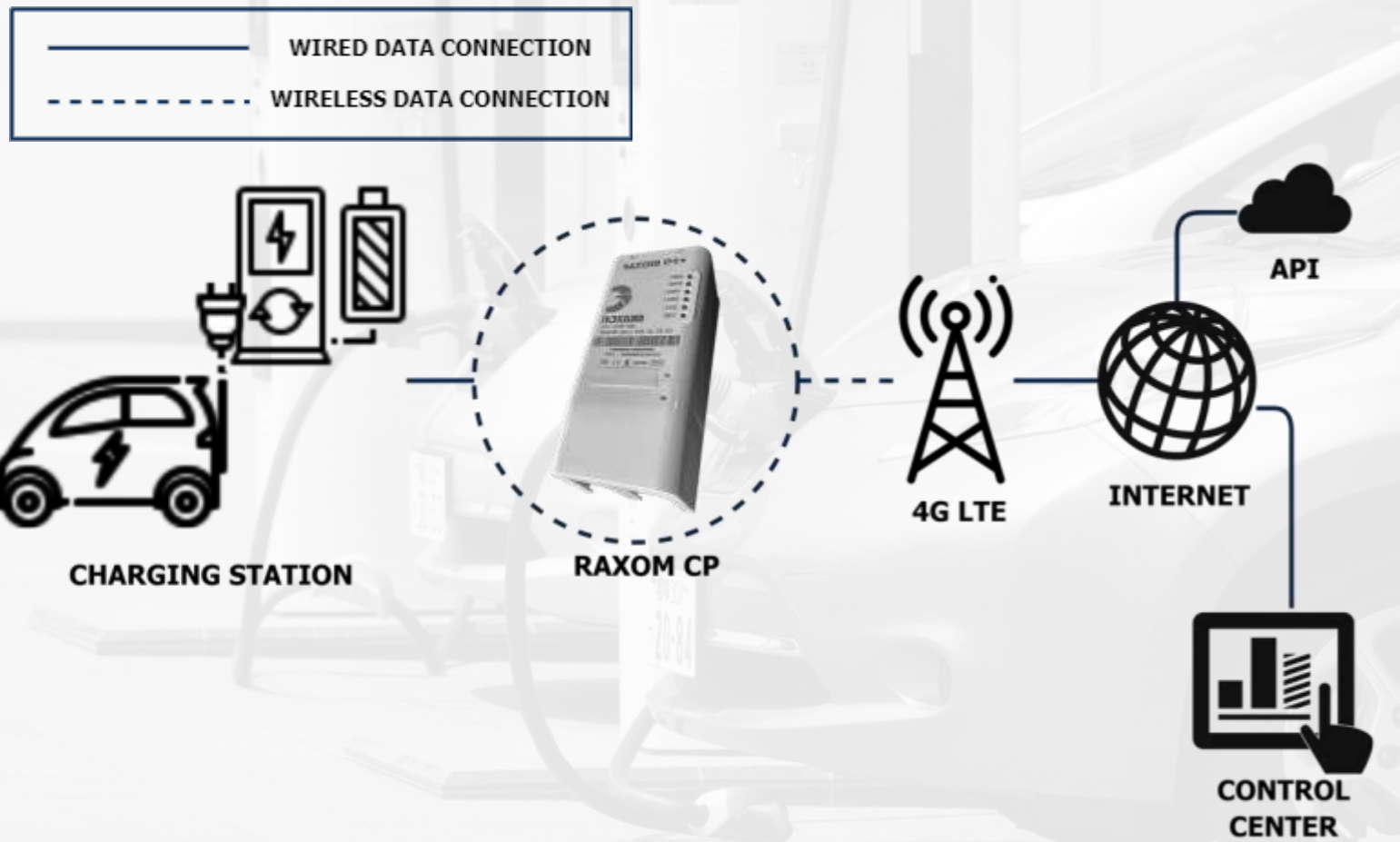
UltraCompact and robust in hostile environments.

Temperatures: -20º to 85º C.

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INDUSTRY AND AUTOMATION

Industry automation is unstoppable. Robotics and improved AI have increased production exponentially, and the monitoring and maintenance of these systems is increasingly demanding and necessary.

At Noxium we have extensive experience in the sector, providing remote control solutions in different demanding environments.

Remote control in electric charging stations

WIRED DATA CONNECTION
- - - - WIRELESS DATA CONNECTION

CHARGING STATION

RAXOM CP

4G LTE

INTERNET

API

CONTROL CENTER

PROBLEM

Charging stations for electric vehicles are a crucial element in the promotion and adoption of electric mobility.
However, these stations can present some challenges in terms of monitoring and remote control of their status, especially in terms of charging availability.

At times, users may find charging stations out of service or with connection problems that prevent them from charging their vehicles.
This can lead to user dissatisfaction and a poor image of the EV charging infrastructure.

SOLUTION

To address these issues, a telecontrol and telemetry system can be implemented for electric vehicle charging stations. Noxium's RAXOM CP would allow station operators to monitor station status in real time, including charging availability, power consumption, connector status, and other important data. The data collected could also be used to plan preventive maintenance and schedule loads efficiently, allowing for greater efficiency and reducing station downtime.

In addition, the telecontrol and telemetry system could also help improve the user experience by alerting station operators to any problems with the station, such as connection problems or charging system failures. This would allow for faster and more efficient repair, which in turn would reduce station downtime and increase user satisfaction.

In summary, the implementation of a telecontrol and telemetry system for electric vehicle charging stations can address the issues of remote monitoring and control of station status, allowing for greater efficiency and availability of the charging infrastructure.
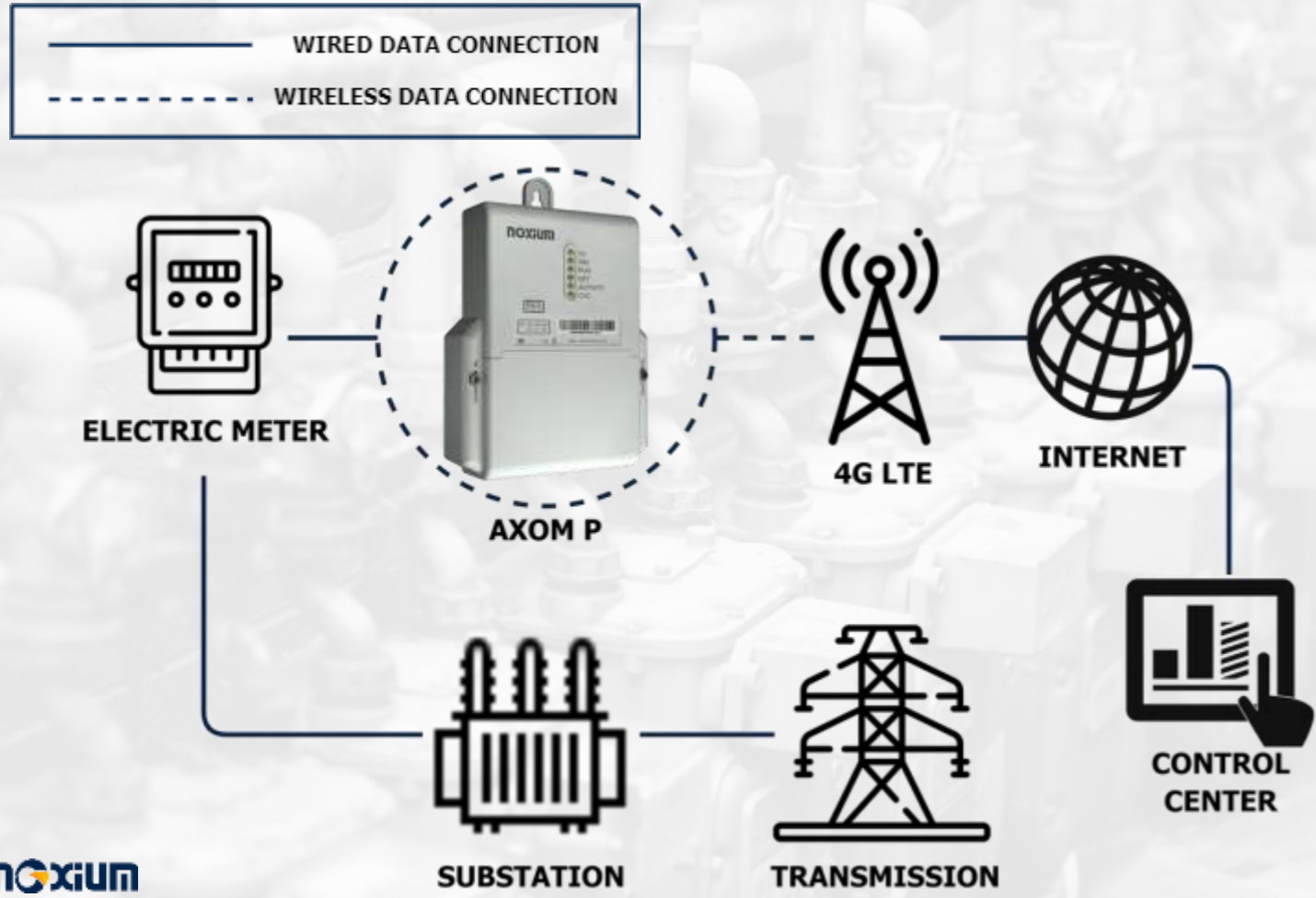
BENEFITS

Easy handling and installation, allowing control with unique accuracy.

Low power consumption, necessary for this type of power generation installations.

UltraCompact and robust in hostile environments.

Temperatures: -20º to 85º C.

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Telemetering of electricity meters

WIRED DATA CONNECTION
WIRELESS DATA CONNECTION

ELECTRIC METER

AXOM P

4G LTE

INTERNET

SUBSTATION

TRANSMISSION

CONTROL CENTER

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PROBLEMA

Las infraestructuras eléctricas generan y transmiten a la red de energía mediante una serie de estaciones y subestaciones de alta, media y baja tensión que acaban llevando la energía a los hogares y las empresas. Para asegurar que la infraestructura produce la suficiente energía de forma eficiente, la producción y la transmisión son controlados exhaustivamente. Para ello es necesario tener todos los componentes conectados y controlados por un sistema SCADA. Las subestaciones cuentan con una compleja red de automatización gestionada por un controlador de subestación. Para hacer posible la red inteligente los contadores eléctricos deben tener acceso a Internet y el sistema SCADA.

SOLUCIÓN

Para abordar estos problemas, se puede implementar un sistema de telecontrol y telemedida para las subestaciones y sus componentes. El AXOM P de Noxium permitiría a los operadores de las estaciones monitorear el estado de las subestaciones en tiempo real, incluyendo el consumo de energía, el estado de los conectores y otros datos importantes. Los datos recopilados también podrían usarse para planificar el mantenimiento preventivo y programar las cargas de manera eficiente, lo que permitiría una mayor eficiencia y reduciría el tiempo de inactividad de las estaciones.

Además, el sistema de telecontrol y telemedida también podría ayudar a mejorar la experiencia del usuario al alertar a los operadores de las estaciones sobre cualquier problema con la estación, como problemas de conexión o fallas en el sistema de carga. Esto permitiría una reparación más rápida y eficiente, lo que a su vez reduciría el tiempo de inactividad de la incidencia y aumentaría la satisfacción del usuario.

AXOM P es un modem celular habilitado para 4G LTE Cat1, capaz de conectar equipos heredados a través de serie RS232, y gestionar la conectividad con numerosos protocolos industriales y de red, como Modbus RTU y MQTT.
También cuenta con funciones avanzadas de seguridad de firmware, como firewall y múltiples servicios VPN soportados.
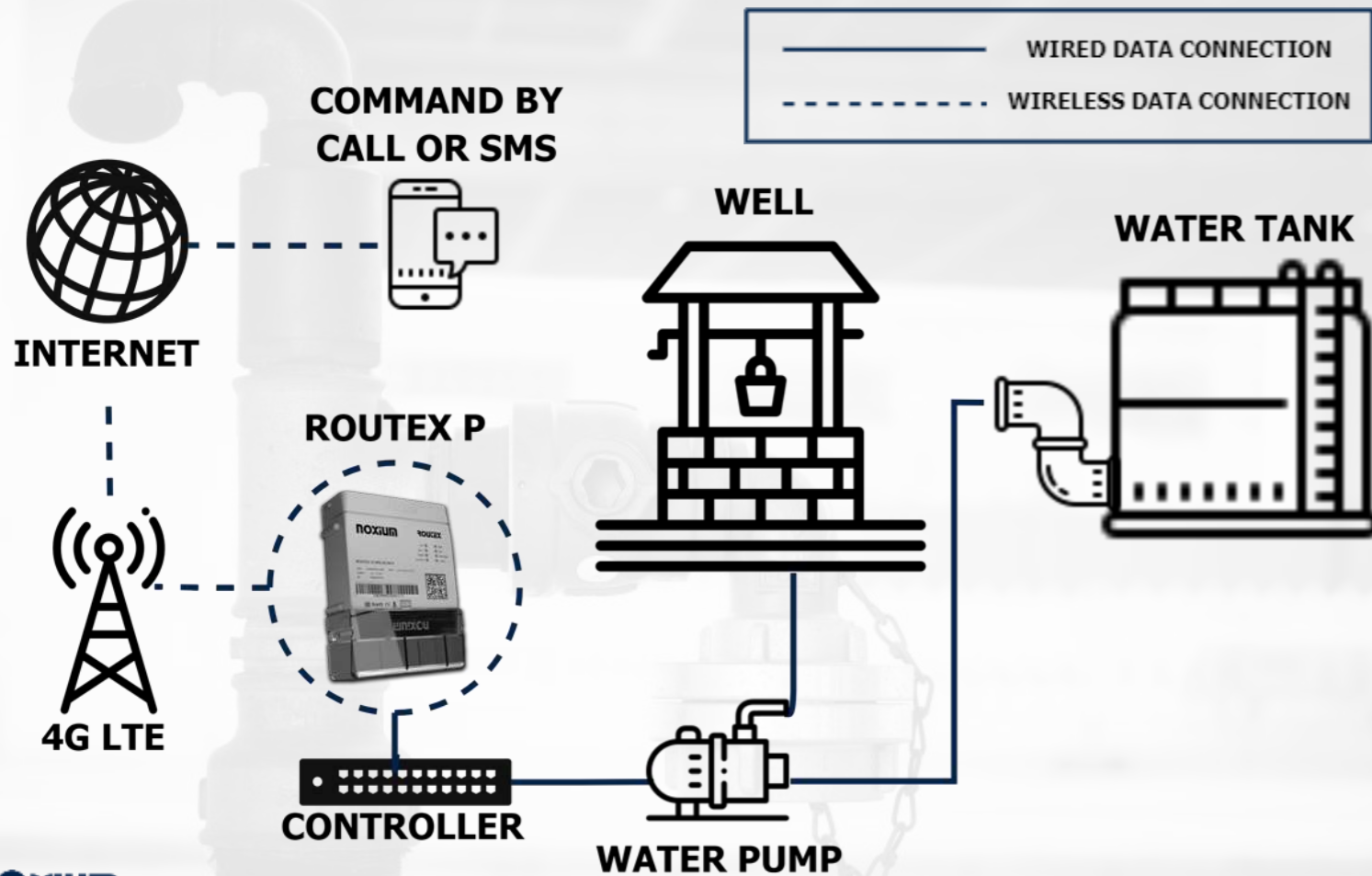
BENEFICIOS

De fácil manejo e instalación, permitiendo el control con una exactitud única.

Bajo consume de energía, necesario para este tipo de instalaciones de generación eléctrica.

Compacto y robusto en entornos hostiles. Temperaturas: -20º a 85º

ROUTEX P

WIRED DATA CONNECTION

WIRELESS DATA CONNECTION

COMMAND BY CALL OR SMS

WELL

WATER TANK

INTERNET

4G LTE

ROUTEX P

CONTROLLER

WATER PUMP

PROBLEMA

En la actualidad, el control remoto se ha vuelto mucho más accesible gracias a las tecnologías modernas. Sin embargo, nuestra prioridad en Noxium siempre ha sido la simplicidad y la eficiencia. Al enfrentarnos a un proyecto en una ubicación remota como esta, donde los costos de instalación de banda ancha por cable resultan prohibitivos, debemos buscar una alternativa. Para ello aprovecharemos la red celular para lograr nuestro objetivo. Nuestra meta es controlar la bomba desde el campo llano y remoto donde se ubica el pozo, la bomba de agua y el panel de control, hacia el lugar donde necesitábamos transportar el agua a través de una tubería.

SOLUCIÓN

Nuestro equipo de ingenieros propone una solución innovadora utilizando el dispositivo ROUTEX P de Noxium. Con esta herramienta, logramos activar la bomba de agua de manera remota y eficiente. La tubería de agua, que se extiende hasta el lugar de destino, no necesita bombear agua de manera continua, ya que esto sería ineficiente. En su lugar, hemos configurado el ROUTEX P para que, a través de llamadas o mensajes SMS, pueda iniciar o detener el bombeo según lo necesite el depósito de agua en la montaña.

Gracias a nuestra solución, hemos superado los desafíos que planteaba este proyecto remoto, logrando una gestión óptima y rentable del suministro de agua al lugar de destino.

BENEFICIOS

De fácil manejo e instalación, permitiendo el control con una exactitud única.

Bajo consume de energía, necesario para este tipo de instalaciones con necesidad de toma eléctrica.

Compacto y robusto en entornos hostiles. Temperaturas: -20° a 85°

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