TELTONIKA | Networks

2021

USE CASE CATALOG

THE WORLD WE LIVE IN TODAY IS CONNECTED!

IoT and M2M communication have changed the way we work and interact with people and technology. The creativity of our partners inspires us every day, and we are thrilled to be a part of this revolution! Seeing how the partnerships we established throughout the years turned out into the most innovative IoT projects is the fuel that keeps us going forward. With this catalog, we invite you to explore how Teltonika Networks can elevate your connectivity solutions across six different sectors in the industry.

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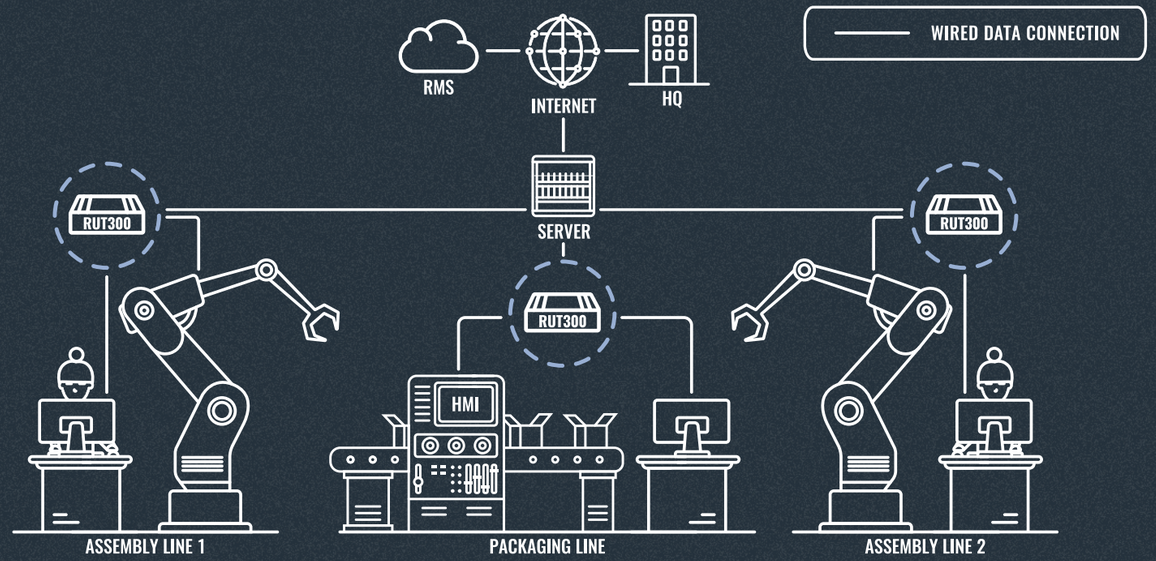
INDUSTRIAL & AUTOMATION

Global adoption of automation, AI, and robotics to increase productivity is inseparable from monitoring and managing equipment remotely. Teltonika Networks has long-standing experience in this field, enabling manufacturers, integrators, and machine builders to stay in control of their equipment anytime, anywhere.

SECURE REMOTE ACCESIBILITY FOR MANUFACTURING MACHINERY



// CHALLENGE

In manufacturing facilities, usually, various complicated specialized machinery and equipment are present that require trained engineers to be configured and looked after. Often, they are supplied by various vendors and if one part stops functioning as it should it may cause troubles for the whole production line and consequently - delays and losses.

Besides, the recent worldwide pandemic showed that in no time a big number of employees might become temporarily unavailable due to isolation requirements and the site may lose the necessary workforce required to resolve unforeseen challenges. In such situations, secure remote accessibility and management become essential. Therefore, professional industrial networking equipment is a must to connect these machines and provide remote management, while ensuring the security and reliability of the internet connection.

// SOLUTION

One of the biggest benefits of connecting the manufacturing machinery to the network is the ability to collect data. RUT300 industrial Ethernet router has five Ethernet ports, two configurable digital Inputs/Outputs, and a USB to easily connect the various equipment and computers to the internet. Preconfigured Firewall ensures the security of the solution from the very start and multiple top-rated VPNs provide data encryption.

Besides, a broad interval of supported power voltages makes this product suitable for a wide range of electronic equipment. Its rugged industrial design with a wide range of tolerated temperatures and vibration resistance makes this device durable and easily applicable in various settings.

One of the biggest benefits of this solution lies in the Remote Management System (RMS). While RMS Management allows to remotely access RUT300 for updates and maintenance, RMS Connect enables to do the same with the machinery behind the router. This means that an engineer does not have to be present in a manufacturing facility to be able to configure, troubleshoot and manage the equipment. It's also possible to set-up Events Reporting when an email is sent out after a specific event occurs listed in pre-configured rules.

// BENEFITS

Remote Accessibility – RMS Connect allows to reach, configure and provide maintenance for a complete solution.

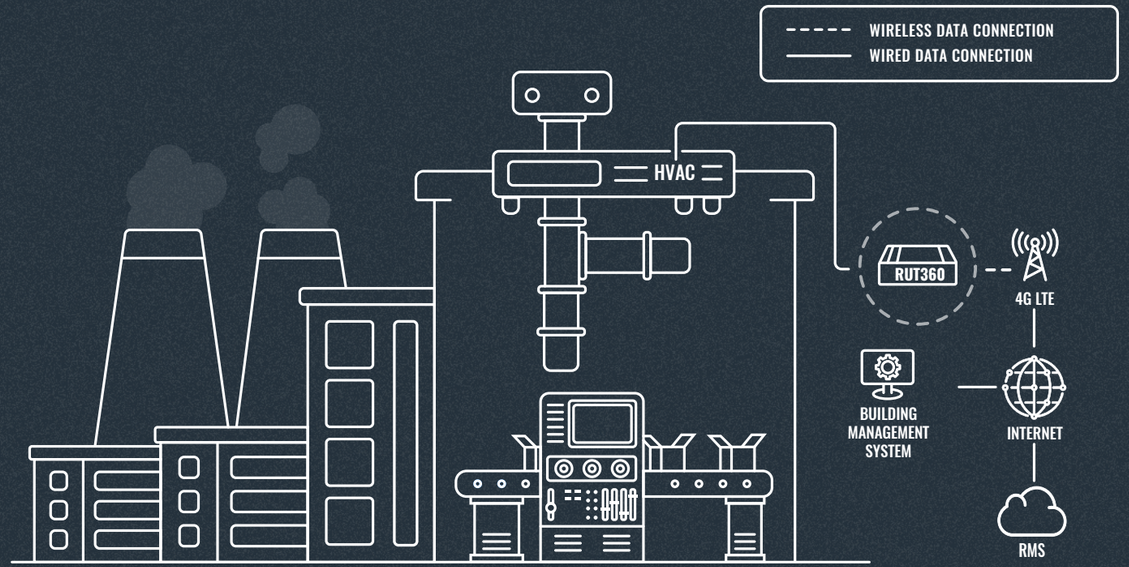
Security – preconfigured Firewall for immediate use and multiple VPN protocols to choose from.

Industrial design – the device supports multiple industrial protocols, is made of a rugged aluminium housing, I/ Os, supports wide range of power supply voltages.

Event reporting – notifies whenever anything goes out of ordinary as per pre-set rules to resolve issues as fast as possible and reduce the possible harm to the ecosystem.

Data collection – for monitoring, analytics, optimization and event prediction.

OPTIMIZED USE OF RESOURCES IN HVAC SYSTEMS



// CHALLENGE

HVAC systems are quite complicated in the sense that they have many different components that are all interrelated. If one of them stops functioning as it should, the whole system might be affected and discontinue working. While the system itself does not require internet, adding connectivity enables managing it remotely and, as such, early detection or even prevention of any issues in the system.

Another challenge is related to efficiency and resource optimization. As you may imagine, such systems consume a lot of energy, and therefore making data-driven changes and automation could result in significant financial and environmental benefits.

While internet connectivity is often limited in remote industrial locations, choosing a cellular router ensures a reliable connection. The only way a manufacturer or integrator can ensure their top-quality service is when the solution has a stable, uninterrupted connection. The same applies to the benefits gained by data collection - it will only be consistent if gathered continuously as opposed to intermittently.

// SOLUTION

The Teltonika Networks RUT360 industrial cellular router connects to the HVAC system via Ethernet cable. Internet connectivity enables easy integration with the Building Management System and remote management of the HVAC infrastructure.

RUT360 is an LTE Cat 6 router with Carrier Aggregation capability, making it perfect for industrial application scenarios, where the connectivity options are limited. Carrier Aggregation which comes with LTE-Advanced functionality allows to maximize bandwidth even in locations with poor signal. Even though this IoT solution does not require high data throughput, Carrier Aggregation ensures the connection is stable and reliable.

The Building Management System collects data using the MQTT protocol and analyses it for predictions and optimization. The reports provide valuable insights on where energy exploitation could be reduced and allow automating processes. Remote management comes in handy for scheduling the operation of various devices and amending these schedules as per changing needs.

// BENEFITS

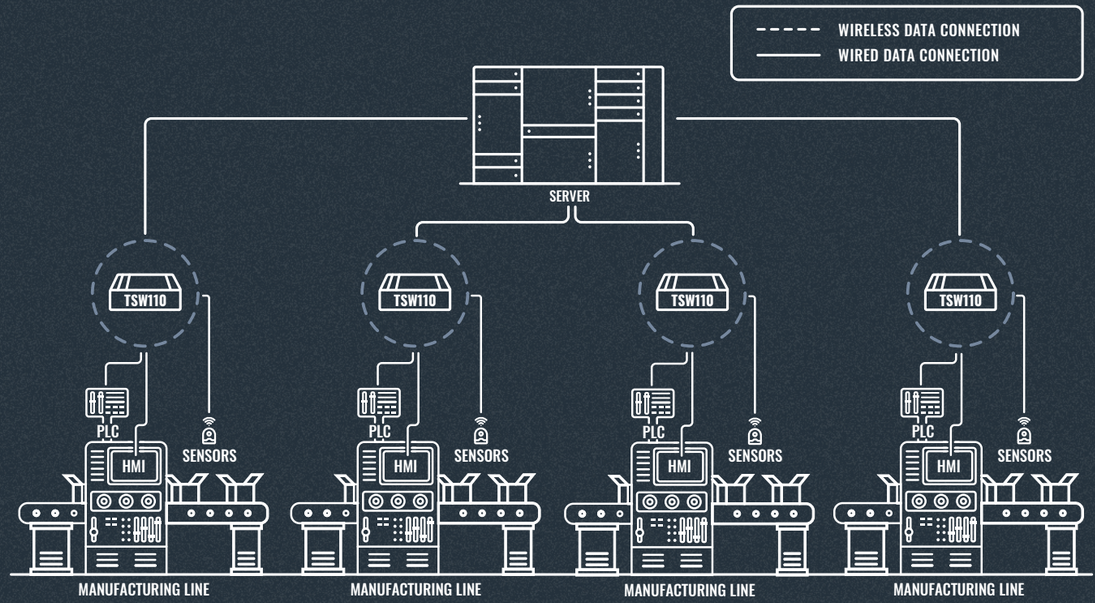
Increased efficiency – data-driven decisions help cutting energy consumption and more streamlined automated operation of the HVAC system.

Wide temperature range – RUT360 is a professional device in a sturdy aluminum housing, which can operate in environments from -40C to 75C.

Reliable connectivity – LTE Cat 6 with Carrier Aggregation ensures a stable and reliable connection.

Remote support and warranty service – remote access to their devices save travel time and finances for manufacturers as they may troubleshoot and resolve the issue from their office.

RELIABLE CONNECTION OF INDUSTRIAL SYSTEMS



// CHALLENGE

It is an old truth that a solution is only worth as much as its' weakest link. Manufacturing equipment requires not just high investment but also professional means of connecting it. There is a wide variety of switches available in the market. However, industrial applications call for professional networking tools that are reliable, sturdy enough, easy to deploy, and can be relied upon. Partial infrastructure changes are a constant challenge in the industrial sector, and there is no room for taking risks with low-quality amateur products.

// SOLUTION

In factories, there usually are multiple different manufacturing lines. All of them consist of various HMIs, PLCs, and sensors interconnected into a network. This task is accomplished by a TSW110 industrial switch, which works as an intermediary among all pieces and enables data transmission to the server, where it can be processed and analyzed.

TSW110 is an unmanaged industrial switch with five 10/100/1000 Mbps Ethernet ports for an economical high- bandwidth solution that is more than enough for connecting various manufacturing equipment. Besides, its' compact size combined with DIN rail or surface mounting options make it a quick and easy task to deploy it. This plug-n-play device will take seconds to set up!

Factory environment requires a rugged device. Therefore, a product with sturdy aluminum housing is the best option. TSW110 operates in a wide range of temperatures - from -40 C to 75 C, so it offers a broad amplitude of application scenarios. For example, it would work just as smoothly in factories producing frozen products as in a confectionery.

// BENEFITS

Compact – measuring 100 x 30 x 85 mm, this device fits in any electronic box or server cabinet and takes seconds to deploy using a DIN rail or surface mounting options.

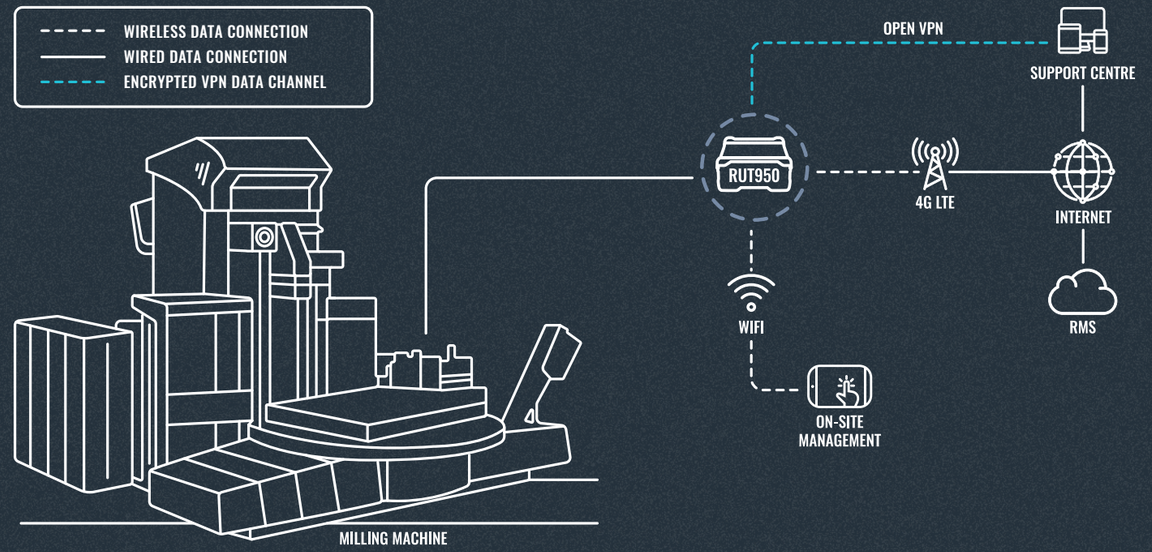
Wide temperature range – from -40 to 75 C, ensures reliable connectivity in most industrial environments.

Sturdy – we chose aluminum housing for this product to increase durability.

Plug-n-Play – no additional set-up required.

Economical – this device offers exactly what is needed in most industrial applications with no excess functionalities, making it very economical and competitive in the market.

REMOTE MANAGEMENT OF BORING AND MILLING EQUIPMENT



// CHALLENGE

Our partner, FERMAT, a manufacturer of precision sophisticated equipment for industrial use, has long understood that support is paramount for successful business continuity. They have clients in most countries of the world, hence, having a support office in each of them would not be feasible or at least financially-viable. The only way to provide efficient and timely support was by obtaining remote access to the equipment. However, various locations come with different connectivity challenges. Therefore, there was a need to ensure that solution comes with reliable networking equipment for primary and backup connections. Without question, the industrial sector requires secure data transmission, so this requirement was one of the prerequisites too. Combining their boring or milling machines with Teltonika Networks router RUT950 made it possible to offer an all-in-one solution to their clients that is secure, offers reliable connectivity, and can be reached remotely without any problems.

// SOLUTION

The boring and milling machines are sold with Teltonika Networks preinstalled and set-up RUT950 router to ensure reliable connectivity. RUT950 is a high-performance industrial 4G LTE Wi-Fi router designed as a main or backup internet source, which guarantees a reliable internet connection with high data throughput and data redundancy. Locally, the Wi-Fi connection allows controlling the machine using a phone, tablet, or computer. But the main thing in this solution is the possibility to connect remotely, using a VPN connection established by our router and the FERMAT's server. All data is encrypted and travels via Sophos SSL VPN Client, although there are many other options to choose from. The solution can be connected to the internet via cable or SIM for backup (or for best results - both). Remote accessibility could also very well be achieved using Teltonika Networks Remote Management System (RMS) and be integrated into the existing company's interface using RMS API functionality.

// BENEFITS

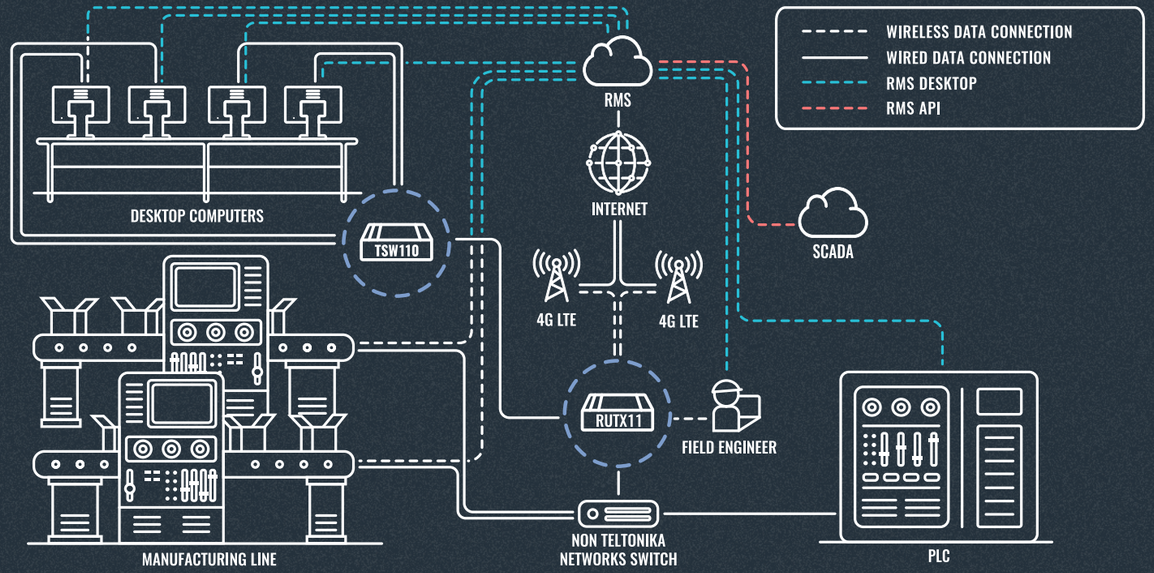
Multiple connectivity options – ensure main and backup connection continuity in different locations around the world.

Remote management – saves time and expenses as there is no need to physically travel to resolve issues and troubleshoot.

Multiple VPN options – allows to flexibly choose whichever one a client is comfortable with.

Quick deployment and unified support – using the same router in every solution makes it significantly easier to provide support to the clients. Besides, RMS Connect allows reaching the product behind the router.

REMOTE MANAGEMENT OF MANUFACTURING NETWORK INFRASTRUCTURE



// CHALLENGE

Manufacturing facilities are usually quite complicated infrastructures connecting various machines, computers, and platforms. These hardware and software elements accumulate over some time and therefore have various compatibility challenges. Another layer of complexity comes into the picture as these systems are usually implemented by different integrators. As a result, we get an ecosystem that is difficult to connect, manage, and collect data for predictive maintenance and increase operational efficiency. There is a need for one connectivity platform which could combine all the different industrial components into one accessible unified structure.

// SOLUTION

We created the Remote Management System (RMS) to simplify the monitoring and management of Teltonika Networks routers and gateways. Whereas it provided convenient access to our devices from anywhere in the world, it did not take long to notice the demand for another functionality – reaching the end-devices of a solution remotely. As such, we introduced RMS Connect. It enables to access and control non-Teltonika Networks devices via RDP/VNC, SSH, or HTTP(S) protocols without any additional software, and does not require a public IP or third-party VPN service. Moreover, our API provides a possibility to carry endless RMS functionalities into your in-house IoT platform, in case you would rather stick to your familiar interface. As shown in the topology, RMS now functions as a unified software system for the whole network ecosystem. Via wired and wireless connectivity, our routers and switches provide internet access to the whole solution.

This includes third-party devices, like manufacturing production lines, desktop, industrial computers, laptops, and even PLC's. Then, RMS Management takes care of easy remote control to our routers and gateways to ensure availability and security. On the other hand, RMS Connect enables to access WebUI or CLI of all smart devices in the same network. Finally, you can even access Windows and Linux machines via RDP/VNC just like you would be sitting in front of them. Best of all, RMS API lets you take the desired RMS functionality and transfer it to your SCADA or IoT platform. This allows for seamless integration and saves time and money because of better automation, remote management, planning and predictions, and extended overall lifecycle of the old equipment due to resolved compatibility issues.

// BENEFITS

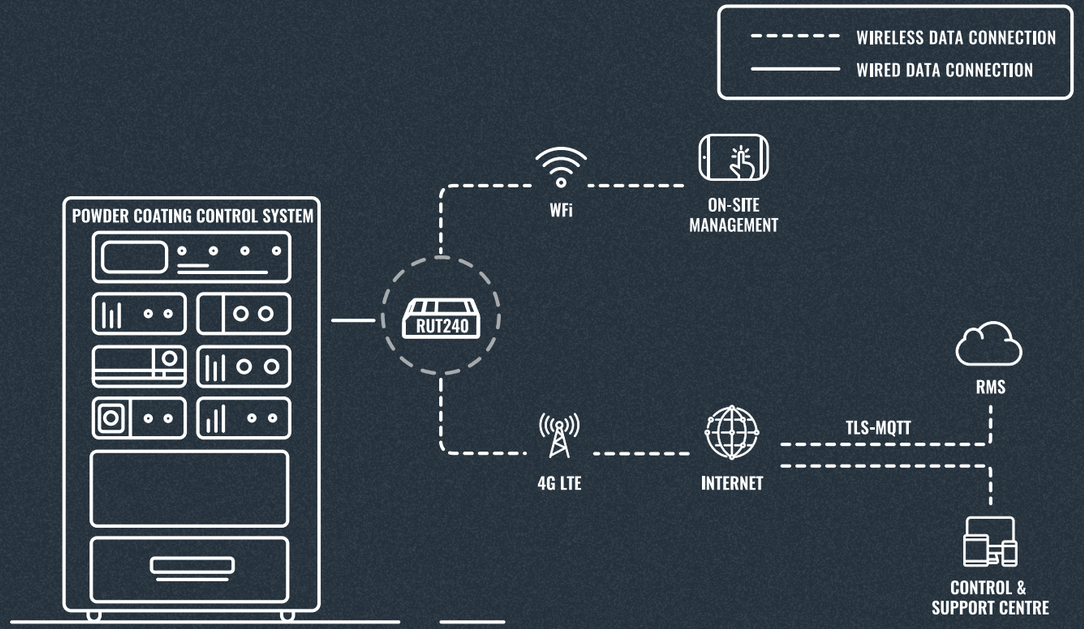
One unified system – control the whole solution of multiple objects and interfaces using just one simple IoT platform.

Compatibility - RMS is cloud based and platform agnostic – you can use it with any operating system and browser. RMS API allows using RMS features in your own IoT platform interface too.

Customizability – RMS is highly customizable and every client can make it work for their own specific business needs.

Security – hosted on AWS, communicating via MQTT and secured with TLS 1.2 and 1.3 protocols, RMS meets the highest standards of safety with international recognition by Bell Canada and Forensik.

INDUSTRY 4.0 POWDER COATING SYSTEMS



// CHALLENGE

Powder Coating process is complex and consists of powder delivery systems, electrostatic powder spray guns, control units, cyclone units, painting booths, movement sensors, automated movement handles and curing cameras. Industrial powder coating systems can cost millions of Euros and their components must work in perfect harmony to achieve maximum efficiency and coating quality. In addition, changing powder and/or parts that need to be covered is a challenge for system operators who must adjust system settings on-the-go to minimize powder material wastage and optimise coating quality. In practice, meticulous process, coating performance and quality monitoring is needed to proactively react and change required settings. However, with multiple coating systems and changing staff shifts it's difficult to keep informational continuity and ensure optimal operation and availability of the system.

// SOLUTION

Currently there is a rise in popularity of Industry 4.0 enabled powder coating systems which, in comparison to traditional ones, add a component of remote connectivity via cellular 4G LTE. New or legacy systems can be upgraded with Industrial Cellular Routers or Gateways to be connected to the automated control units. These devices provide secure and uninterrupted connectivity channel between the system, the manufacturer of the system and system operators, such as production, service, quality and/or process managers with the help of dedicated IoT Platform as a user interface.

// BENEFITS

RUT240 with 4G LTE allows direct system connectivity to the manufacturer which enables live support and configuration services to help system operators solve challenges arising from coating process.

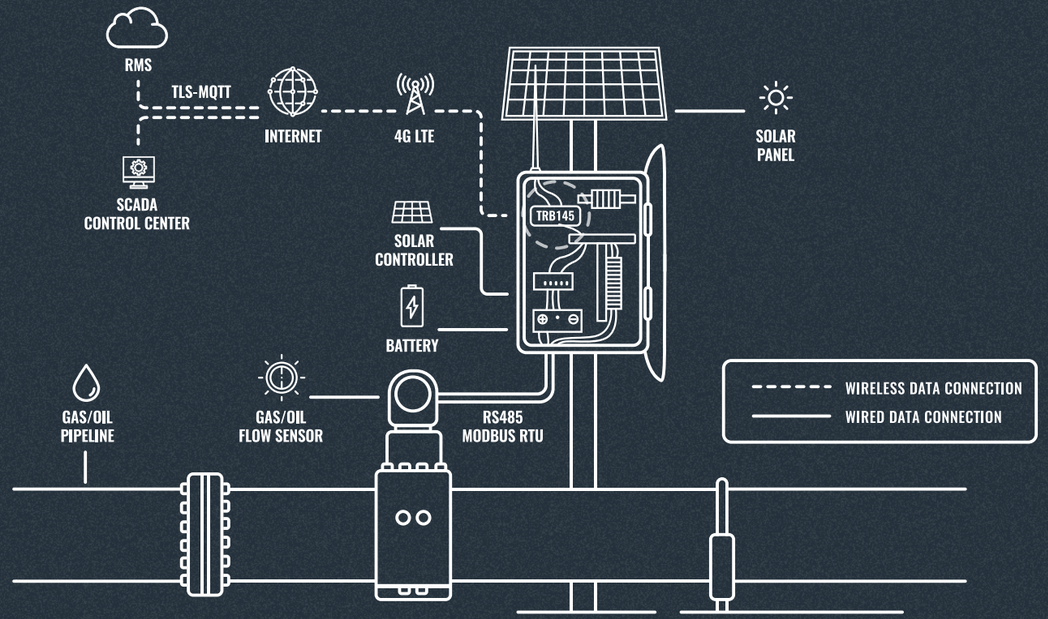
System operators of different responsibilities are able to see live data dashboards tailored to their interests, providing early notifications regarding maintenance, efficiency and coating quality.

System owners are able to have full data regarding the use of their equipment to prevent possibilities of unauthorized use of expensive powder coating systems.

ENERGY & UTILITIES

Efficiently connected energy infrastructure reduces power consumption and lowers maintenance costs for production and distribution. Teltonika Networks helps energy companies build wired and wireless IoT connectivity solutions for the most demanding environments.

REMOTE MONITORING OF OIL & GAS PIPELINES



// CHALLENGE

Extraction of energy from oil and gas sources is a complex process which requires a lot of infrastructure. One part of such infrastructure are the pipelines which are the key transport mechanism for Oil & Gas industries. They provide a safe, efficient, and cost-effective way to transport processed and unprocessed materials and operate continuously outside of scheduled maintenance windows. To preemptively diagnose possible safety and/or productivity issues the rate of the flow of materials must be closely monitored. However, pipeline infrastructure is usually placed in remote areas where wired Internet connectivity is not available.

// SOLUTION

Satellite communications are still highly expensive, however global expansion of 4G LTE coverage enables Oil & Gas companies to implement a wide pipeline flow monitoring network by using dedicated flow meters which output data using industrial protocols. In many cases – serial communication with RS-485 and Modbus industrial protocol is used. The data generated by the flow meter must be obtained and forwarded to control centers, SCADA systems to aggregate and interpret centrally. TRB145 Serial IoT Gateway by Teltonika Networks is perfect for such applications - with RS-485 interface, Modbus RTU Master functionality and 4G LTE Cat1 it is able to periodically read flow meter information and send gathered data to remote HTTP/HTTPS servers or various IoT platforms using MQTT. Finally, wide power supply range and low energy consumption allows TRB145 to be powered up by combining solar power and batteries.

// BENEFITS

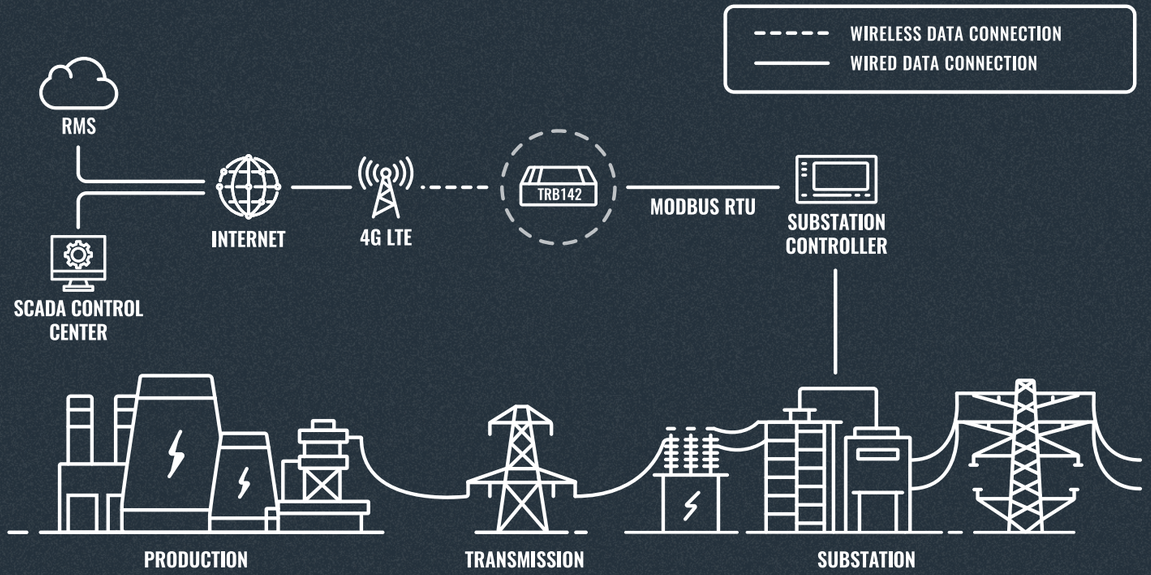
Low-cost and quick to deploy – multiple TRBs can be simultaneously configured immediately using Teltonika Remote Management System (RMS).

High availability and low data cost – 4G LTE is highly available globally and cost efficient due to low amounts of data needed for this application.

Data security – TRB145 supports advanced data protection with embedded Firewall and encryption with multiple VPN services available, such as OpenVPN, IPsec, PPTP, L2TP and others.

Immediate notifications – if preset flow values fall out of defined criteria, system operators can setup TRB145 to receive immediate alarms.

SMART GRID & SUBSTATION COMMUNICATION



// CHALLENGE

Fundamentally, energy infrastructure consists of production & transmission. Nuclear, coal, gas energy plants and renewable energy installations together generate electricity and transmit it to the grid using series of high, medium and low voltage stations and substations eventually bringing power to homes and businesses around the world. All steps of production and transmission must be closely monitored and controlled to make sure the infrastructure is producing enough power that is distributed efficiently throughout the energy network. All of this would not be possible if all components of the grid would not be connected and controlled centrally by professional engineers and advanced SCADA systems. Substations have complex automation network that is managed by a substation controller. To enable smart grid, these must be connected to the central SCADA system via the Internet. Even when wired Internet connectivity is available, it is impossible to ensure 100% uptime which is required to be in control of the whole power generation and transmission infrastructure.

// SOLUTION

Integrators and energy operators around the world have recognized that cellular solutions, such as 4G LTE enabled gateways and routers, offer the most reliable connectivity and best availability for their complex substation systems. In many cases, substation controllers aren't new, meaning that they feature serial interfaces for communication, such as RS232. TRB142 is a 4G LTE Cat1 enabled cellular gateway by Teltonika Networks able to connect legacy equipment via serial RS232 and manage connectivity with numerous industrial and networking protocols, such as Modbus RTU & MQTT. It also has advanced firmware security functions, such as firewall and multiple supported VPN services. Moreover, TRB142 can diagnose any connectivity and functionality issues and reboot separate modules of the gateway to restore service automatically without any interference from the operators. Finally, all TRB142 devices can be easily monitored and controlled from thousands of miles away with Teltonika Remote Management System, which can generate not only customizable alerts, reports, but also allows direct access to the substation controllers connected using TRB142 even without Public IP.

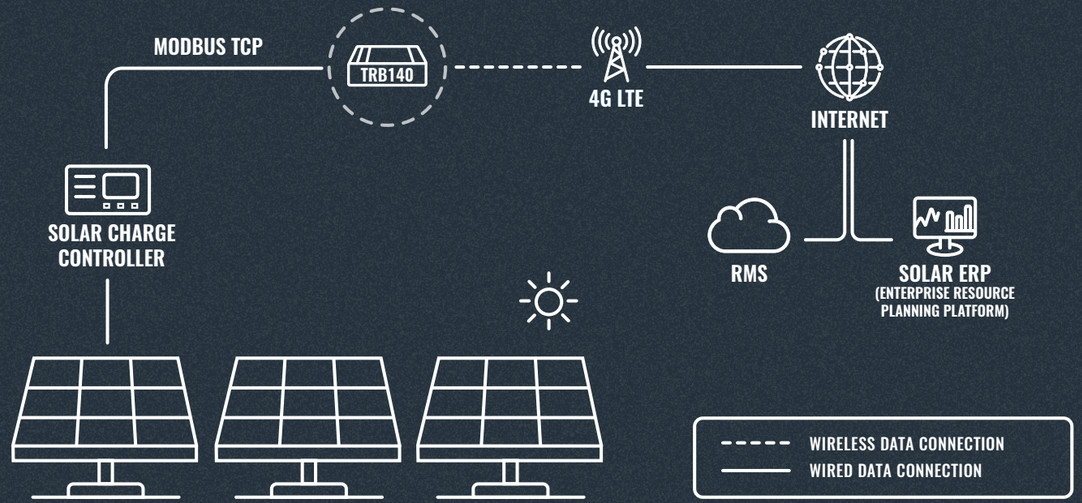
// BENEFITS

TRB142 is easy to set up, easy to install and even easier to maintain with full support for Teltonika Remote Management System. It is also simple to scale as multiple devices can be configured at once using RMS.

This gateway is very reasonably priced and features robust 4G LTE Cat1 – designed for serial interface communication where low data speeds are required.

Advanced firmware functionality includes support for industrial, networking and remote management protocols, such as Modbus RTU, MQTT, DHCP, SNMP and features firewall and multiple supported VPN services.

REMOTE MONITORING OF SOLAR POWER PLANTS



// CHALLENGE

The solar power plant consists of a sophisticated infrastructure working in perfect sync to maximize the potential electricity production. Primary components are solar panels, inverters, solar controllers and transmission or energy storage systems. The performance of solar power plants must be closely monitored to ensure the maximum productivity and availability to make sure that everything is running smoothly and the electricity generation rate is within acceptable values to satisfy project ROI* schedule. Besides, remote monitoring is essential to scheduled maintenance, such as part replacement or solar panel cleaning, required for the power plant to maximize long term performance. Solar power plants are mostly located in remote areas because of the large amount of land area they occupy. Remote location poses a challenge for remote monitoring connectivity because wired Internet sources are rarely available at solar power production plant locations.

// SOLUTION

The topology above outlines a simplified classic remote monitoring solution with a cellular connectivity device at its core. The Solar controller is a brain of solar power plant operation and is generally capable of outputting system data via industrial protocols, such as Modbus TCP. Depending on the size of the solar power plant, numerous solar charge controllers are set-up to track electricity generation data from a set of solar panels. The best way to interpret this data is to use a cloud IoT platform where the data is aggregated and presented to the operator with performance metrics and suggested maintenance insights. TRB140 is a popular choice for this use case because of its secure and reliable cellular connectivity via 4G LTE and easy to use user interface, which requires no specialized training. Moreover, TRB140 includes advanced RutOS features, such as multiple VPN services, industrial, networking, & remote management protocols (Modbus TCP, MQTT and more.).

// BENEFITS

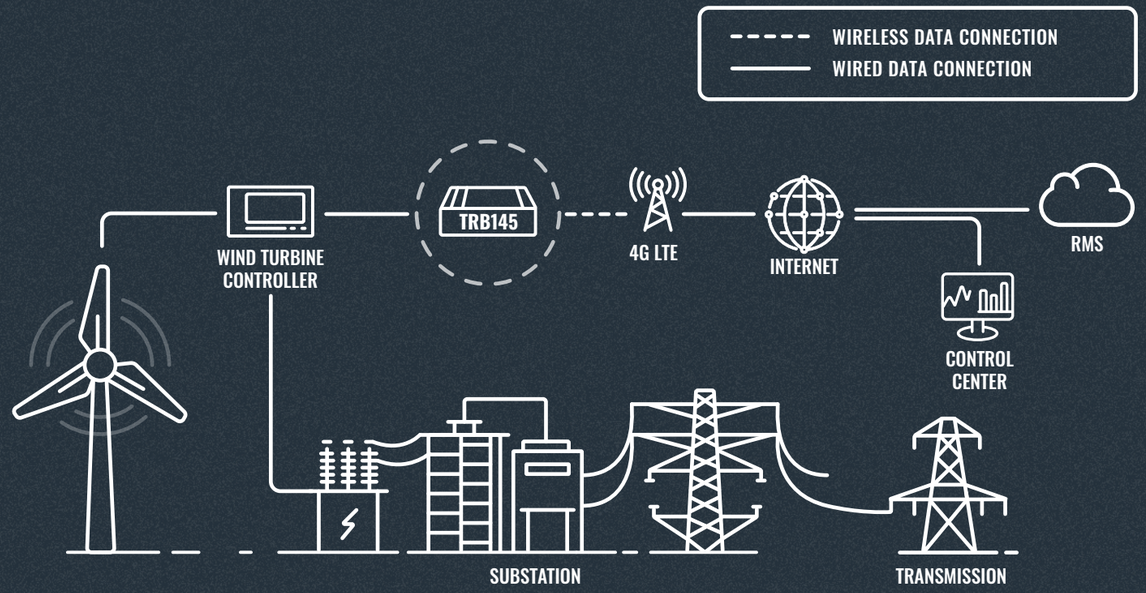
Easy to scale – you can configure infinite number of TRB140 in minutes using Teltonika Remote Management System (RMS).

Low-power – TRB140 uses only 2W of power when transferring data at maximum speeds and only 0.4 W when idle with an active data connection.

Easy management – with Teltonika RMS you can keep all TRBs up to date with the newest firmware and conveniently monitor and control the gateways from anywhere – even without Public IP!

Industrial design – TRB140 has a strong aluminium casing, wide range of supported power supply voltage and a wide operating temperature range.

REMOTE CONTROL AND MONITORING OF WIND TURBINES



// CHALLENGE

Energy generated from wind is one of the most prominent green energy solutions. Wind farm locations are usually remote, far away from civilization, in the hills or the seaside. Such places are used because for the wind farm to be profitable, there must be conditions that would generate as much wind as possible throughout the year. However, harsher environments require more complex wind turbines, which usually consists of towers, blades, hubs, and nacelles. To control all the parts, companies are mounting wind turbine controllers near the tower. Wind turbine controllers, like PLCs, are the brains for every wind turbine, since it is used for controlling the whole system, generating reports and monitoring. Without it, the turbine would not be working correctly, since it must be controlled and programmed. For this reason, the controllers must be connected to a unified system for remote monitoring, energy generation reporting, parameter control, and predictive maintenance. The main challenge here is obtaining reliable and secure connectivity to the Internet because of the remote location of wind farms.

// SOLUTION

The topology above shows the whole solution: wind turbine generates energy which is passed to a substation and further transmission. On the other side, everything is controlled and remotely monitored via the wind turbine controller, which is connected to TRB145 – a small but powerful 4G LTE Serial gateway by Teltonika Networks. This device provides a reliable and stable Internet connection and acts as a Modbus gateway between controller and control center where all monitoring and management takes place. TRB145 industrial gateway is an ideal choice here not only because it features Serial RS485 interface with Modbus RTU but also because it is powered by RutOS that is equipped with advanced features such as OpenVPN, Firewall, IPsec. Besides, this gateway can be managed and monitored via the RMS – Remote Management System, which, amongst other benefits, has the ability to send status reports and generate notifications by SMS or email.

// BENEFITS

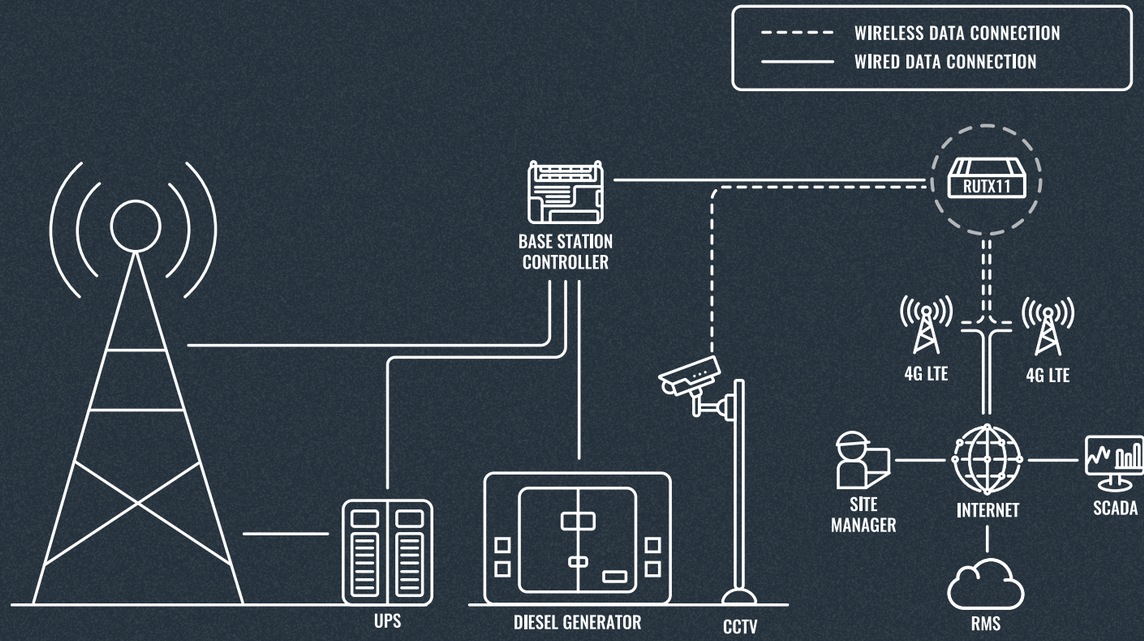
Easy to manage – you can configure and remotely control an infinite number of TRB145 connected to wind turbines using RMS.

Energy consumption – since wind turbines are generating energy, they require that all devices would be low power consuming, TRB145 consumes only 2W of power while transferring data.

Rugged design – TRB145, the same, as all Teltonika's routers and gateways have a wide operating temperature range from -40°C to 75°C, which is a must when the solution is outside.

Size – TRB145 is extremely small and convenient to install into small cabinets.

REMOTE TOWER SITE MANAGEMENT



// CHALLENGE

Since the market is expanding, more and more base stations are installed in remote areas. It is extremely expensive to run electricity cables for hundreds of miles to power up the tower infrastructure. Due to this fact, the base stations and other site components are usually powered by the combination of diesel generators and UPS – uninterruptable power supply systems. Furthermore, these tower systems are self-sufficient, expensive, and controlled remotely; they include CCTV cameras for security, access control barriers, and separate site manager controller systems. All of these solution components must be controlled and monitored. Due to the remote nature of such sites, in very rare cases, they have cable Internet connectivity available. Since it is estimated that there are more than 6.5 million base stations worldwide, the only sensible way to monitor and control all of their infrastructure sites is to do so - remotely. The challenge here is clear – to provide secure and reliable access to the internet without any cable infrastructure available.

// SOLUTION

The cellular base station tower site is a complex infrastructure solution since it includes various elements, as mentioned above. However, most of those parts are connected directly to the tower site controller (also called site manager), which jointly monitors and allows to control everything using a single platform. These tower site controllers need to be connected to the Internet. Our partners are using the RUTX11 to ensure a secure and reliable connection, which grants the tower site controller connected to the Internet using 4G LTE.

Besides, RUTX11 has Dual-SIM functionality with auto-failover, which increases solution reliability. Using RUTX11 gives grants the possibility to access the controller remotely and manage a large number of sites from a central management center. Also, this professional cellular router is equipped with Gigabit Ethernet and Wi-Fi, which allows connecting additional components like CCTV cameras or access control barriers. Furthermore, every maintenance company must have alerts and notifications if something happens to the system. In this case, the whole system is controlled remotely via site management software, and our router – RUTX11 - is managed and controlled via RMS – Remote Management System. The RMS ensures that RUTX11 gets all the latest firmware updates and can provide valuable alerts and usage reports.

// BENEFITS

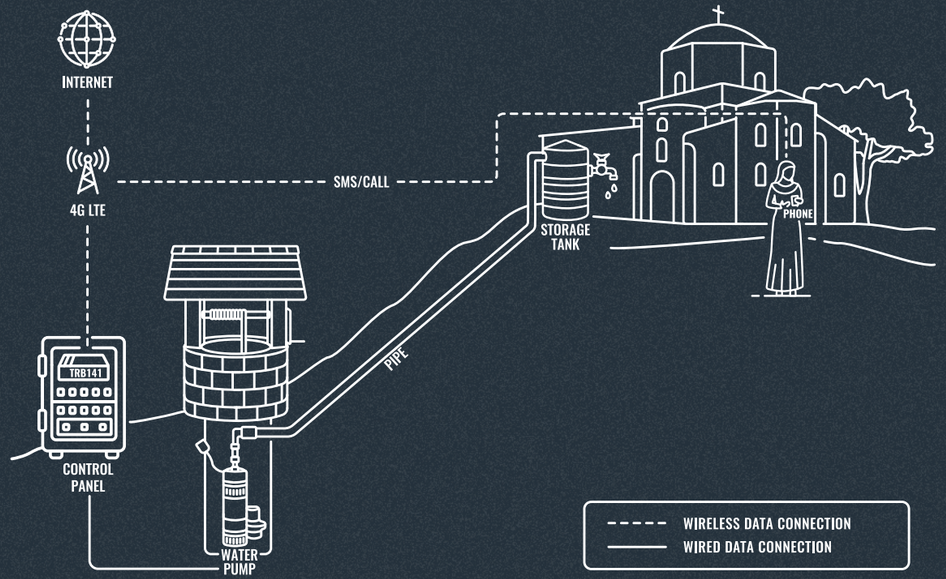
Reliability – our RUTX11 has two SIM card slots, meaning that you can use two different operators for the best internet connection reliability.

Wireless interfaces – RUTX11 has 2.4 & 5 GHz Wi-Fi included, which enables integrators to provide internet to various devices without additional cabling.

Remote control – our product can act as a gateway between the controller and software system for control and management.

Remote configuration – having thousands of sites can be a nightmare; however, with RMS, it is possible to configure all Teltonika routers remotely at once!

REMOTE WATER PUMP AUTOMATION USING SMS AND CALLS



// CHALLENGE

Although nowadays modern technologies make remote control a fairly simple challenge, however, simplicity and cost efficiency were key points to this solution. Due to the remoteness of the place related to significantly higher costs, broadband connection over cable was ruled out. The only viable solution was utilizing the cellular network. Using an omnipresent cellphone, the pump would be controlled by calls or SMS messages. This simple control solution was superior to a much more expensive approach such as control over the internet using a smartphone app.

// SOLUTION

In this solution, the well, water pump, and control panel are located in a remote plain field, while the monastery, where the water should be transported, is located on a mountain 1,5 km away. The water pump allows to fill up the water storage tank located on the mountain via the water pipe.

The water pipe is not pumping the water continuously due to efficiency reasons. It can be remotely activated by using the control panel with a mobile Teltonika Networks TRB141 gateway, allowing to turn on the water pump whenever the water is needed. The pumping can be initiated either by calling or by sending an SMS to the TRB 141 gateway SIM card from a cell phone. After the tank is filled up, the pump can be remotely deactivated by using the same method (call or SMS).

// BENEFITS

Cost-effective and simple remotely controlled solution.

Remote control by SMS – the pump can be managed by a simple SMS message sent by a specified list of users at any time.

Remote control by call – the user can turn on the pump for a specified time frame simply by making a call.

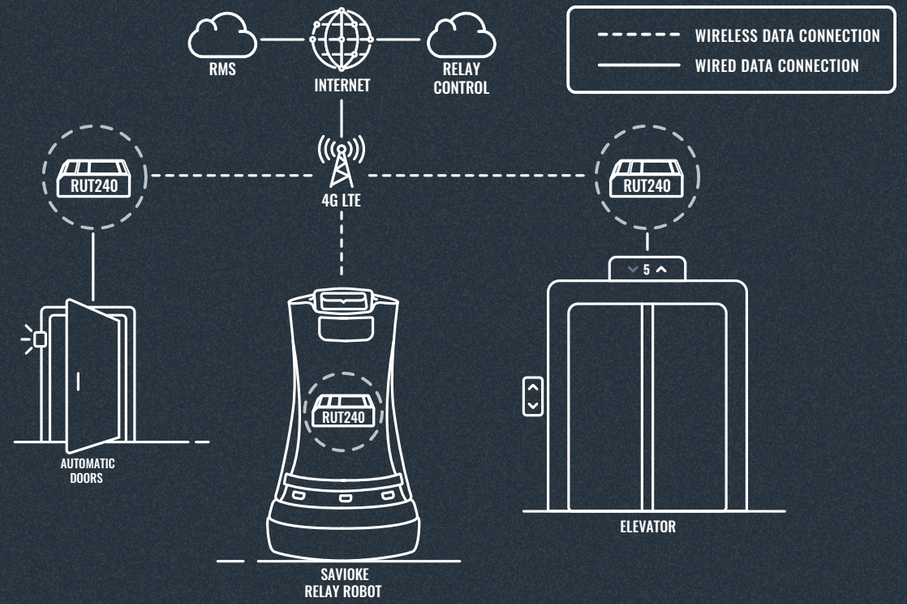
Easy to set up – documentation provided with the product is simple to understand and sufficient to utilize the entire capabilities of the device.

Simplified support enabled by the Remote Management System.

SMART CITY

Our growing cities get smarter every day. Connected sensors, vehicles, and devices make lives more convenient while increasing energy efficiency and reducing maintenance costs. This infrastructure requires secure IoT connectivity products that Teltonika Networks can provide.

AUTONOMOUS DELIVERY ROBOTS ENHANCE SAFETY AND PRODUCTIVITY



// CHALLENGE

Our partner Savioke has introduced an innovative product to help the staff, be they guest service in hotels, nurses in hospitals, or logistics personnel in large offices, to handle delivery tasks. The Relay robot, while being able to fulfill the job quickly, reliably, and especially importantly – safely - also remarkably improves the guest experience and productivity of the personnel, as now they may save time for more important assignments. The robot is unique in its ability to operate in crowded public environments in hotels, hospitals, or enterprise facilities, safely navigating across their large and complex footprints. Relay robot must seamlessly operate across the floor plans, call and ride elevators, and pass through automatic doors - all without human input. To accomplish such challenging navigation, we worked together to find which of Teltonika Networks products fits best to help the robot communicate with the Relay Control center and various controllers in the building.

// SOLUTION

Savioke's project required a router, that is small in size, has a reliable LTE connection, and certifications. The robot works 24/7 and needs to be reachable any time, so any random shutting down or restarting would not be acceptable and cause a lot of problems. The Teltonika Networks RUT240 router proved to be the perfect fit as it is compact but powerful, has over 20 various certifications and approvals, and offers advanced security features for mission-critical IoT.

As Savioke Relay robot autonomously navigates through doors or uses an elevator, a specific set of commands are transmitted to the router connected to the Cloud (e.g. "Relay approaching – open door"), which in turn signals for a particular action to take place. Relay robot and Savioke's on-site system use 4G LTE RUT240 router to communicate with one another. This smooth and seamless interaction enables Relay to proceed with its travels and complete its assignments successfully.

// BENEFITS

Compact size – RUT240 measurements (83 x 74 x 25) are minimal compared to other products with similar capabilities.

Certification – this model has the broadest variety of internationally recognized certificates of all Teltonika Networks routers.

Connection stability – RUT240 cellular router offers a stable LTE Cat 4 connectivity and Ethernet port.

Customizability for internal applications – no need to change existing programs saves the implementation costs and time.

Excellent support – communication with Teltonika Networks engineers allow to find the best possible solution and reach set goals.

TEMPORARY CAMERA SURVEILLANCE SOLUTION

// CHALLENGE

Our partner, SBT Europe BV, specializes in offering temporary security cameras, camera surveillance, and burglary prevention. The problem they ran into was the difficulty in supervision outside of the working hours. The issues mainly arose due to insufficient quality of the imaging and inconsistent follow-up. It became clear that the company needs to offer a complete solution with reliable and secure connectivity devices combined with remote management capability, based on the latest technology in the market. Only having stable and uninterrupted connection with a back-up option provides a possibility to record and store crystal clear visual footage, while the remote management enables to manage the company to have real-time knowledge on what is going on in each site and monitor their devices or resolve minor technical issues quickly and easily.

// SOLUTION

This complete IoT solution ensures connection continuity at any location, at any given time. It includes the masts with track and trace, approach alarm, access control, and security cameras. The possibility to use two SIM cards offers a backup in case the primary connection is lost. This feature is crucial in remote locations with limited communication options. It is often the case for construction sites, solar farms, and other industrial establishments. Multiple digital and analog inputs and outputs found in RUT955 allow easily connecting all of the equipment.

As usually there is more than one mast on the site, the time resources needed for the setup process make a difference.

Each mast must have an IP address to enable reaching each of them separately safely via VPN IP Sec. Besides, having unique IP addresses makes it possible to keep track of where the masts are located in the internal system.

Finally, there is an alarm modem in each mast connected to the alarm center. Having this IoT solution enables resolving minor issues remotely without any need to travel to the mast. Offering an off-the-shelf complete IoT product makes the management of the solution unified across locations, therefore much simpler and more efficient.

// BENEFITS

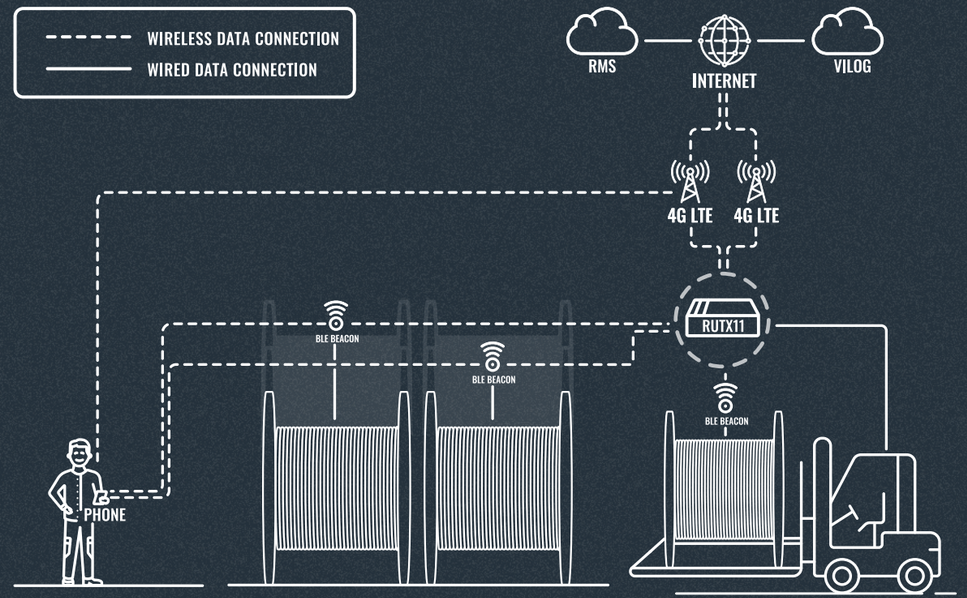
Quick deployment – a unified approach makes it a plug and play solution, which takes significantly lower time resources to set up.

Reliable connection – LTE Cat 4 connectivity with dual SIM for backup never disappoints, accompanied by Wi-Fi and Ethernet options.

Remote management – eliminates the need to travel to resolve minor issues or update software.

Safe communication – each mast has its own IP address. The secure connection is also ensured by VPN, using IP Sec protocol, but there is plenty to choose from when using Teltonika Networks routers.

AI POWERED CABLE DRUM STORAGE MANAGEMENT



// CHALLENGE

Due to the large size of the storage yards, without an efficient tracking system in place, it is impossible to gain full visibility and efficiently manage both human and stock resources. This results in extended order processing time, decreased inventory turnover, and high labor costs due to inefficient exploitation of the workforce. However, large infrastructure changes are usually unattractive to the owners of such entities due to the high costs and time required for implementation.

// SOLUTION

Our partner ViLOG came up with a solution, which enables maximizing the efficiency of storage yards without deploying complex hardware infrastructure or compromising performance. It only requires adding four simple components to the already existing infrastructure on site:

- BLE beacons to be coupled with asset identifiers;
- Teltonika Networks RUTX11 LTE Cat 6 cellular router;
- ViLOG App to be used by yard operators on their mobile phones for continuous re al-time data collection from the assets and employees on-site;
- ViLOG Cloud for data storage and AI-powered positioning and insights for automation and optimization purposes.

In this solution, there is a BLE beacon added to every drum stored in the yard. This allows to connect them to the same network and easily find each of them via a mobile ViLOG app installed on employees' phones. This way it is a matter of seconds to find the right cable drum in the large yard and utilize the space efficiently by storing another one in its' place.

The RUTX11 router with dual SIM and auto-failover was a perfect choice to ensure uninterrupted connectivity for this solution. It collects data from every BLE beacon and securely sends it to the ViLOG Cloud. At the same time, it provides connectivity to the mobile phones on site. Whenever there is a problem with the primary network, the router automatically switches to the second operator through another SIM to ensure a smooth transition of the data.

// BENEFITS

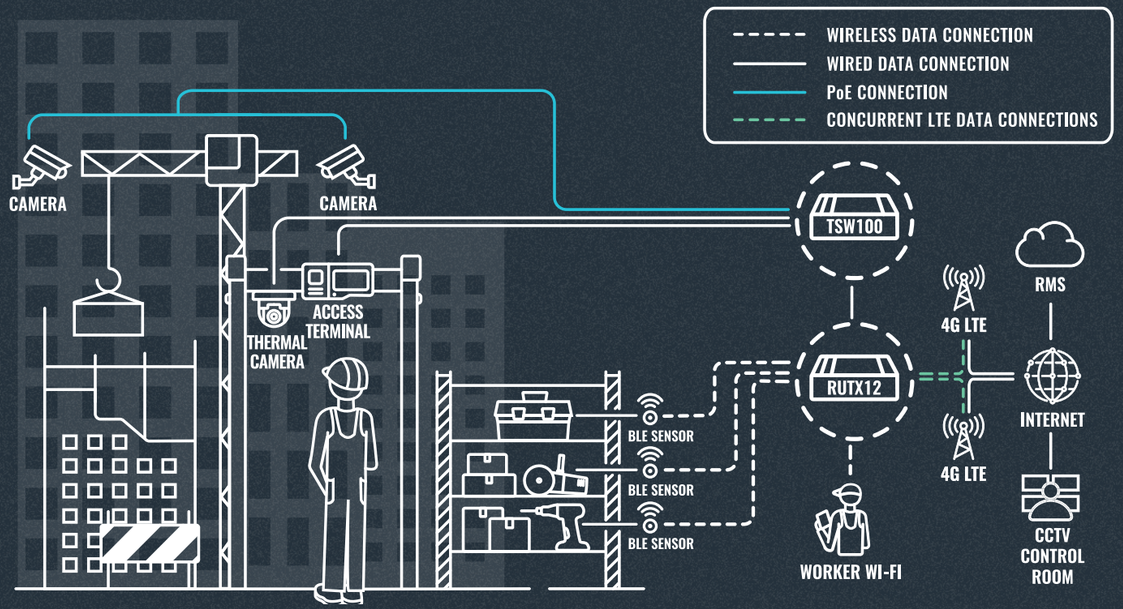
Hassle-free implementation - few components and no requirements for special training.

Optimized yard management operations - all routine procedures are simplified and fully automated, helping to avoid human errors. RUTX11 with dual-SIM and auto-failover ensures these processes are never interrupted due to connectivity issues.

Easily scalable - the size of the yard will only determine how many BLE beacons and routers should be deployed on-site.

Fully remotely managed - see real-time data, analytics and custom dashboards using Teltonika Networks Remote Management System.

IoT FOR REDUCING RISKS IN CONSTRUCTION SITES



// CHALLENGE

The construction business is dynamic. The location is constantly changing with each new object and therefore the whole infrastructure needs to be easily adaptable to the next project. Real-time inventory monitoring can be difficult due to a variety of expensive tools being used on-site so several days or weeks may pass after the theft until the fact gets noticed. Although CCTV cameras are already widely used for construction site monitoring, storing the footage on the same site is not an efficient method as it often gets stolen or compromised. As the areas where construction sites are located don't always have developed infrastructure, the wired internet connectivity might not be available or may have limited capacity.

// SOLUTION

In this solution, we have chosen a highly powerful and rugged RUTX12 router. It has two simultaneously operational LTE Cat 6 modems and a load balancing option for fast and seamless performance. Dual SIM with instant automatic failover ensures there is no internet downtime.

Another Teltonika Networks device - TSW100 is used to connect CCTV cameras with Power over Ethernet (PoE) technology for a simplified power installation. The footage from the cameras is sent to a Centralized CCTV Control room for remote management and monitoring. This way the footage is safe from theft and damage. Various expensive tools and machinery have got ID Coin or ID Puck sensors for easy inventory tracking using Bluetooth. Besides, the Slim ID beacons enable easy monitoring of people entering and leaving the site at an exact time. Zerotouch access control with a thermal camera at the entrance ensures staff with fever cannot enter the site and is important for the prevention of COVID-19 or other diseases.

// BENEFITS

Easy installation allows using the same infrastructure on multiple sites regardless of location.

Reliable and fast connection ensured by two simultaneously working LTE Cat 6 modems and a load balancing.

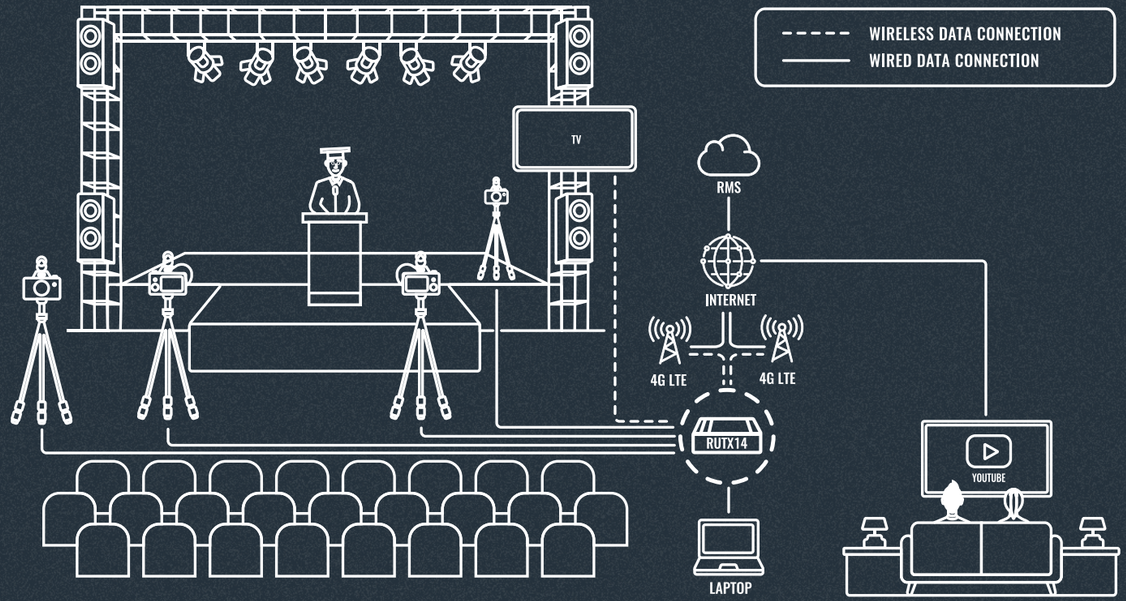
Safe storage of CCTV data outside of the construction site.

Real-time tracking of tools using Bluetooth technology.

Remote management allows to access data and troubleshoot from anywhere in the world.

COVID-19 prevention is enabled by zero-touch access control and a thermal camera.

POP-UP SOLUTION FOR LIVE EVENT STREAMING



// CHALLENGE

The transition to online streaming for concerts, sports, and cultural events was relatively simple due to having access to professional equipment, trained staff, and specialized premises. However, the need arose for a much more comprehensive range of pop-up events which were taking place in offices, schools, public institutions, or other similar environments (inside or outside) that are not suited for such purpose. In this use case, we review a solution for a remotely streamed graduation ceremony, where only students and academics attend due to health concerns, while the families can watch the live event online.

// SOLUTION

Since the solution is meant for pop-up events, the main requirements were simple set-up, ease of use, good quality stream, and high data throughput required to broadcast the live video via Youtube. A reliable and stable internet connection was also a must-have.

In this case, four cameras and a laptop connect to the Teltonika Networks RUTX14 professional router via Ethernet and uses a cellular connection for data streaming. While Gigabit Ethernet connection ensures fast and stable communication between the cameras, laptop, and the router, LTE Cat12 modem with load balancing offers enough speed and throughput to ensure an uninterrupted streaming experience. RUTX14 is the fastest-to-day mobile router in the Teltonika Networks range, able to reach download speeds up to 600 Mbps and up to 150 Mbps for upload.

Wave-2 802.11ac Dual-Band Wi-Fi on RUTX14 seamlessly connects various wireless elements, like a TV in this example, but it could also be tablets or other devices required for broadcasting and easy management of the event. Speaking of convenient management, the RMS IoT platform allows having a completely remote support mechanism, enabling to reach the router itself and the devices behind it for firmware updates and troubleshooting whenever needed.

// BENEFITS

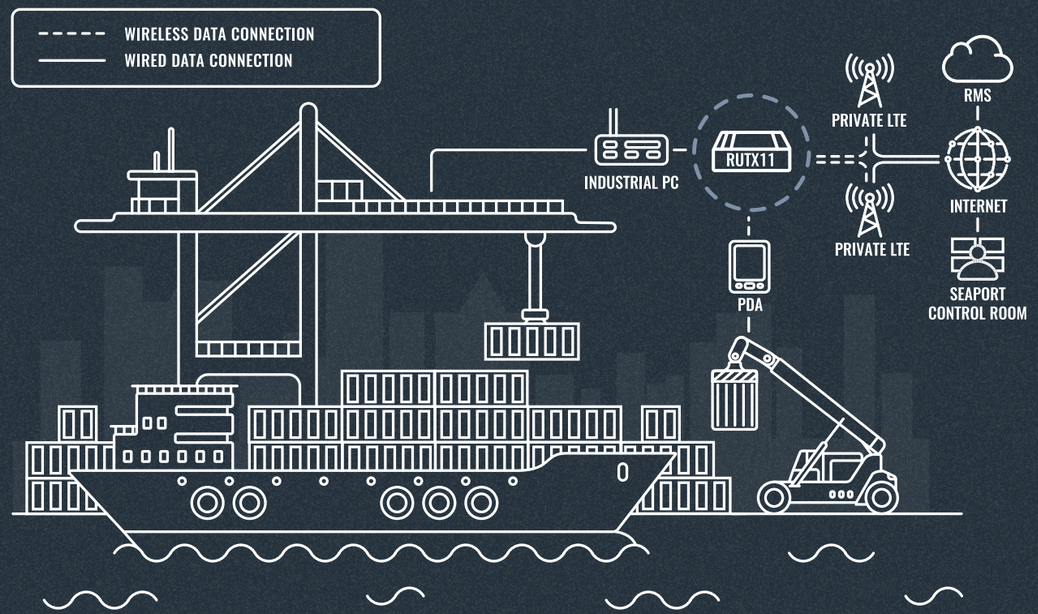
The quick and easy setup allows using the solution in various venues and events without specialized training.

Fast upload speed and high data throughput with LTE Cat12 module and load balancing ensure a stable, highquality stream.

Security is ensured not just for the data (by various VPNs and a Firewall) but also for people, allowing them to enjoy important events while meeting the safety requirements.

Compatibility with Remote Management System enables remote updates and efficient troubleshooting in case of the unexpected.

SEAPORT WIRELESS CONNECTIVITY



// CHALLENGE

Information systems have become indispensable to the competitiveness of seaports, facilitating communication and decision making of enhancing the visibility, efficiency, reliability, and security in port operations. Besides, analytics is increasingly important to maintain a competitive edge and to fulfill regulatory requirements. To increase the level of efficiency in seaport operations, all equipment needs to communicate, because it is essential to use all the available data and newest solutions in IoT to make the best decisions. It is estimated that using this real-time information could save seaports operators as much as $80,000 each time they dock a vessel.

// SOLUTION

As we indicate in the topology, all vehicles and cranes in the seaports need to be connected to a unified, secure, and reliable network. Our partners are choosing RUTX11 for this solution due to multiple reasons, one of which is performance. RUTX11 with 4G LTE CAT6 is capable of speeds up to 300 Mbps and can support large data throughput application not only for today but for years to come. Dual Wi-Fi functionality allows connecting multiple PDAs or industrial PCs to the router. These or other devices can also be connected via Ethernet ports. RUTX11 is a rugged device with metal casing, which can sustain vibrations, humidity, and extreme temperatures. The operating temperature of the router can vary from -40 C to 75 C. This professional cellular router has E-mark certification ensuring full compliance with a number of essential requirements when mounting additional devices in aftermarket automotive vehicles.

In this specific use case, devices are using a secure private LTE network provided by the mobile operator. Although they are using their solution for efficient traffic management, they still needed Remote Management System (RMS) by Teltonika Networks. With the help of this IoT platform, customers easily could configure all settings of the vast fleet of routers or just to a part of it, in a single window. They also can upload firmware for all their fleet at once. Of course, RMS is a highly secure platform as it has two-factor authentication functionality. Moreover, you are also able to use ID Biometrics authentication when logging in to it.

// BENEFITS

Performance - RUTX11 with LTE CAT 6 cellular module provides speeds up to 300 Mbps and is ready for industrial applications with rugged aluminum housing, wide operating temperature range, and resistance to vibrations.

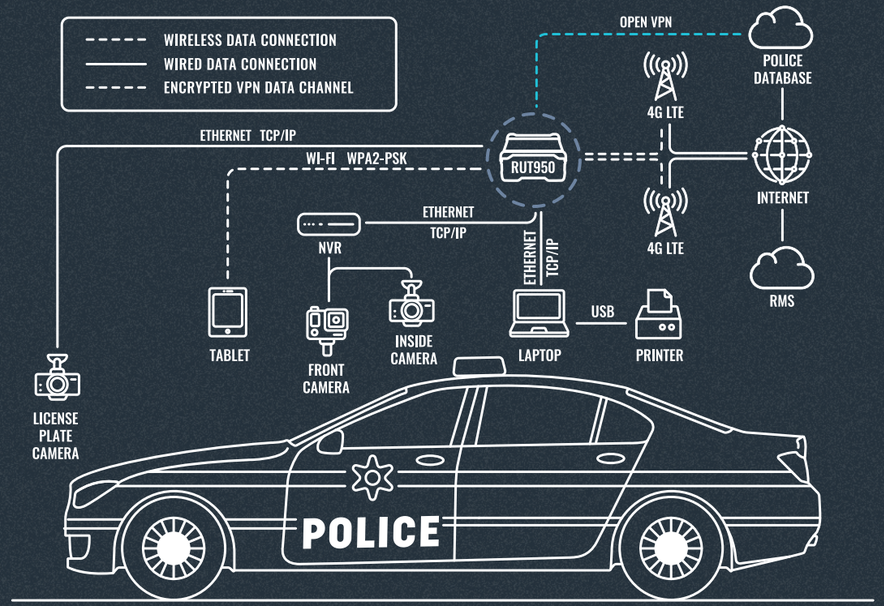
Security – with advanced RutOS features, RUTX11 offers multiple VPN options, embedded firewall and other security features to comply with high security standards of seaports operators.

Easy Management – Remote Management System allows to efficiently upload FW or change settings in a singlewindow configuration even for a vast fleet of routers.

TRANSPORTATION

Public transportation companies, first responders, and automotive organizations rapidly evolve their services to accommodate IoT. Teltonika Networks devices provide users and transportation operators with more data to optimize their businesses and create new revenue streams with better-connected vehicles.

CELLULAR CONNECTIVITY FOR POLICE VEHICLES



// CHALLENGE

The current police vehicles are far from being just a conventional car. They are packed with various devices and technology that all need to be connected via Wi-Fi, Ethernet, and mobile network. License plate reader, inside and outside cameras, tablets, laptops, and a printer - all need to be connected to the internet and to the police database to securely transfer sensitive data. The police car is constantly moving around, sometimes in locations where the connectivity is limited, so depending on one network operator is not an option. Backup connectivity is a must. A moving vehicle also creates vibration so the device needs to be quite sturdy and also function well in cold and hot temperatures.

// SOLUTION

RUT950 provides 4G LTE connectivity to the police vehicle systems. This router has dual SIM functionality, allowing to use SIM cards of two different operators and automatically switch to the secondary one in case of low signal. Multi PDN feature on primary SIM separates the traffic into the usual and private LTE and allows accessing the police database and special applications through private LTE. The license plate camera is connected to the router via a direct Ethernet link and communicates using TCP/IP. It keeps constant interaction with Police Database and monitors all traffic. If the system finds that the vehicle has broken the law, the officers can either stop it or leave it for the system to issue a fine automatically.

The tablets are using the internet from a pre-configured wireless network provided, again, by the same RUT950. With a range of up to 100 meters in an open area, it allows the officers to fill in reports, take and upload pictures, and reduce the time for paperwork. The front and inside cameras connect to the Network Video Recorder via Ethernet, which holds a week's worth of footage. The front camera is for evidence collection, and the inside camera proves to be an efficient tool for bribery prevention.

The laptop is connected to the router using an Ethernet interface communicating TCP/IP. It enables checking information on the database and plays an integral part in automatic monitoring and reporting solution empowered by the license plate camera. The system is secured with Open VPN end-to-end encryption, and the password for Wi-Fi and the router is changed periodically. The Remote Management System is used for data consumption reports, remote configuration, automated firmware updates, and alerts.

// BENEFITS

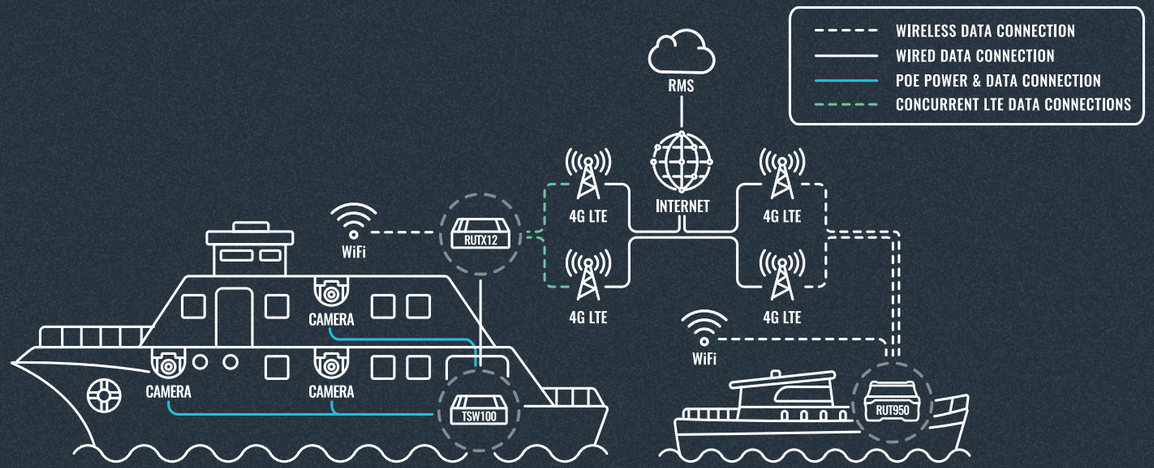
One router for the whole solution – RUT950 provides 4G LTE, Wi-Fi and wired connectivity options for all kinds of devices used in this case.

Secure – VPN end-to-end encryption ensures system security; periodical password change keeps the Wi-Fi network free from unwanted guests.

Reliable – 4G LTE connectivity with dual SIM for backup ensures the devices are always connected to the internet.

Automated processes – the data is uploaded to police servers automatically saving time and ensuring privacy, as no human involvement is required.

BOAT AND YACHT CONNECTIVITY



// CHALLENGE

The beginning of 2020 was very challenging, especially for the leisure and tourism sectors, due to the global pandemic. Luckily it seems that the most extreme times have passed, and businesses are starting to rethink their strategies and look for more possibilities on how to improve their solutions. This includes making their services more convenient and appealing for the users while saving time and money with the help of IoT solutions. As the global tourism market has shrunken or even stopped, local tourism is booming, as people still need to spend time with their families and relatives in their native countries. In Today's life all type of transportation vehicles, such as police cars, ambulance vehicles, taxis or even cranes on the port or at the construction site, has to have reliable cellular internet connectivity. Boats and yachts are no different from other transportation, but for operations, marketing, and service quality, these vessels need a robust and easy to use solution for reliable Internet access.

// SOLUTION

There are possibilities to use different products from the Teltonika Networks portfolio depending on the size of the vessel and the solution. There are numerous applications when connectivity on a boat is essential: weather forecasts, voyage planning, CCTV monitoring, or marketing. With public Wi-Fi, trip operators can use interactive captive portals and digital advertising. In the topology on the right, we have a RUT950 cellular router installed into a smaller boat that travels not far from the shore. Mobile 4G router has two SIM card slots, and it can switch to secondary SIM when the primary provider is lost, the signal gets weak, or the roaming is activated. It provides Wi-Fi service to passengers with a captive portal. It also has four Ethernet ports for connecting additional equipment.

In the topology on the left, a larger vessel features a powerful cellular router - RUTX12. This device has two 4G LTE CAT6 modems working simultaneously with load balancing functionality and speeds up to 600 Mbps. RUTX12 also has AC Wi-Fi with 2.4 GHz and 5 GHz frequency bands to connect all mobile devices on the yacht. In addition, five Gigabit Ethernet ports offer maximum speed for multimedia applications. The router connects to a PoE switch – TSW100, which provides data and power connectivity to CCTV cameras. RUT950 and RUTX12 are compatible with the RMS, allowing remote connection to devices or setting up alerts if the boat or yacht leaves the geofence area.

// BENEFITS

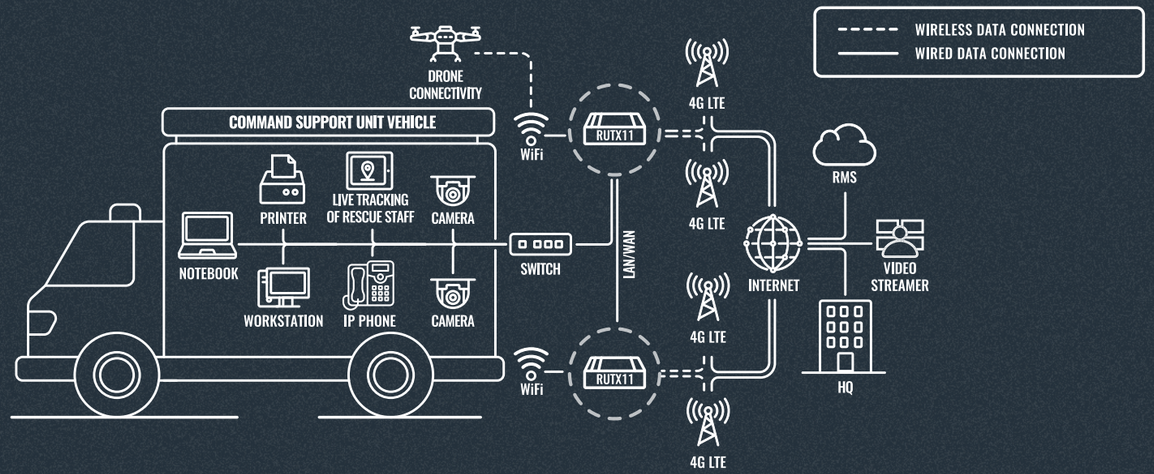
Performance - RUTX12 with 2 LTE CAT 6 cellular modules working simultaneously provide speeds up to 600 Mbps.

Functionality – RUT950 has 2 SIM card slots, which provides flexibility to choose between different mobile operators in different areas.

Remote monitoring – with RMS, you can conveniently monitor your property, get notifications about any undesirable issues with both RUTX12 and RUT950.

Security – with advanced RutOS features, RUTX12 and RUT950, offer multiple VPN options, embedded firewall, and other security features to comply with high-security standards.

CONNECTIVITY FOR RED CROSS COMMAND UNIT



// CHALLENGE

Technologies and surveillance systems play an integral, increasing, and evolving role in supporting public health responses to outbreaks or any other urgent public health events and accidents. With the continuous development of technology, we can see a clear trend that most solutions directed towards communication, operational effectiveness, and transparency must evolve to be connected. This becomes a real challenge when it comes to applications in moving vehicles, and this becomes vital when people's health and wellbeing are at stake.

// SOLUTION

As presented in the topology, the solution consists of various computers and communication equipment in a command support unit vehicle of the Red Cross organization. The control unit acts as a command and control point at all large and major incidents. Its communication systems include telephone and fax machines as well as a radio system to be used exclusively at the site of the incident. It is a full mobile office for the mission leader and his supporting staff. This vehicle is also equipped with a 6KV power generator and USV Battery System that can work more than 12 hours without external power supply. Therefore cellular technology plays a pivotal role in assuring mission-critical connectivity. Teltonika Network device – RUTX11 had to withstand rigorous tests before it was installed into this unit vehicle designed for the most challenging tasks. Not one, but two RUTX11 4G LTE Cat 6 routers are used and interconnected to be able to switch between 4 mobile operators. In this solution, the cellular routers are vital by providing secure and reliable communication to the Headquarters of the mission control. They provide connectivity to these onboard systems and devices in the vehicle.

- Voice over IP for Phone / Fax connectivity
- CCTV Cameras
- Drone Connectivity
- Real-time live tracking of rescue staff
- Critical Map server

// BENEFITS

Robust connectivity with HQ of mission control.

Command support unit vehicle is capable of acting as a command and control point at major incidents.

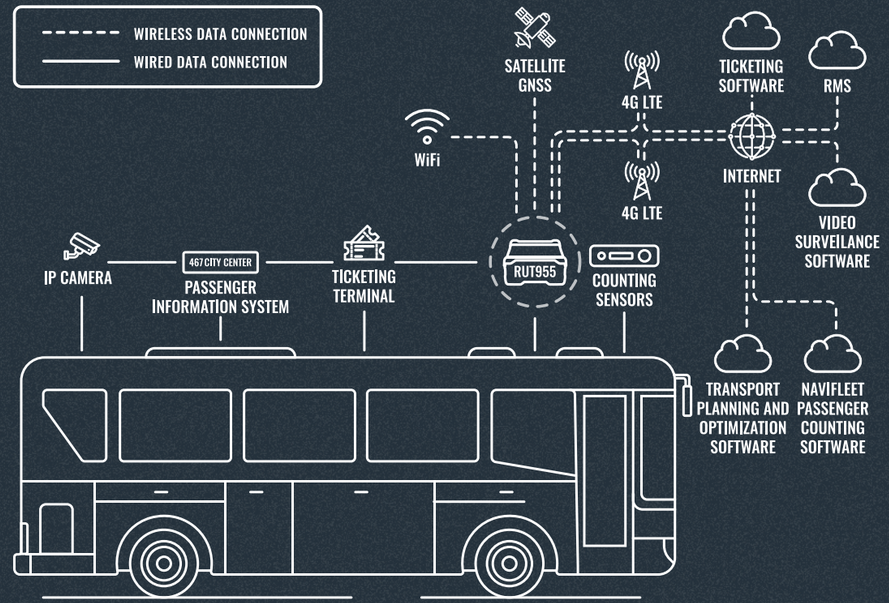
The vehicle is capable of operating in remote areas due to cellular Internet connectivity provided by the RUTX11.

Two RUTX11 devices provide independence to any mobile operator.

RUTX11 with LTE CAT 6 cellular module provides speeds up to 300 Mbps.

Remote Management Systems allows to manage and monitor the whole solution remotely.

REAL-TIME PASSENGER COUNTING IN PUBLIC TRANSPORT



// CHALLENGE

So, we established that real-time data is vital in making timely decisions to optimize the operation of public transport. However, the question is what kind of data is important, and how to collect it and share it in real-time to increase effectiveness?

The most important factor in optimizing transport frequency is the number of passengers. Having real-time data as opposed to data from a short window is superior as it allows knowing what is exactly happening at a given time and make adjustments immediately, like adding an additional bus to the schedule to avoid overcrowding, hence improving customer experience. But how does this happen in real life?

Implementing a system that is capable of collecting and sending data in real-time in a constantly moving vehicle requires not just sophisticated counting equipment and cloud-based application, but also - a reliable connectivity solution.

// SOLUTION

The NaviFleet APC solution uses of Teltonika RUT955 router for the network. Passenger Counting Sensors are connected over the Ethernet interface and use NaviFleet APC firmware for real-time data collection. NaviFleet APC firmware is compatible with the most well-known passenger counting sensors.

NaviFleet APC Firmware integrated with RutOS OpenWrt transmits passenger counting information to NaviFleet Could Server Software over Wi-Fi or 4G for network continuity. Transmitted data includes accurate GPS tracking information, geofencing data, driving mileage, driving and stop time, and passenger flow data.

Advanced NaviFleet APC Firmware can connect additional devices, such as video IP cameras, breath analyser, Passenger Information System, and ticketing terminals.

// BENEFITS

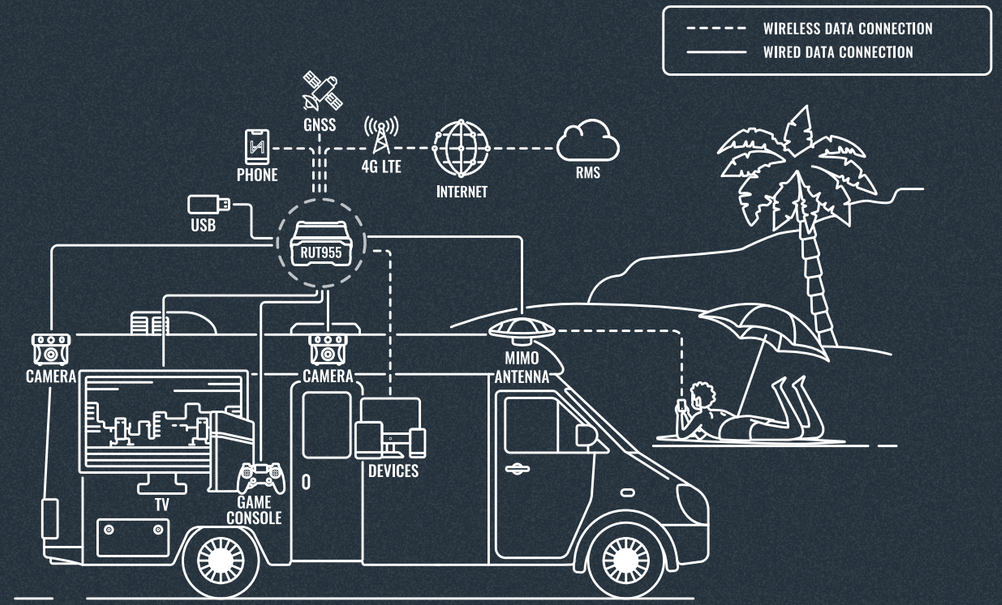
Cost-efficient - combining NaviFleet APC with RUT955 allows offering a solution at a very competitive price point among others.

Easy management of the whole solution - cloud-based management platform offers easy captive portal management, connections to counting sensors, and location tracking.

Multiple connectivity options - RUT955 combines reliable and secure LTE Cat 4, Wi-Fi, Ethernet, and GPS.

OpenWRT based RutOS - allows to conveniently create different useful applications and comply with the increasing market requirements.

PLUG-N-PLAY SOLUTION FOR THE WHOLE CAMPERVAN ECOSYSTEM



// CHALLENGE

The challenge of implementing connectivity in a campervan is multifold. The device must be sturdy enough to work smoothly in a moving vehicle. It also needs to have suitable mounting options and should be easy to install. As the campervans often cross borders of multiple countries, it needs to offer reliable connectivity in each of them, and especially - close to the borders, where the signal of different operators overlaps. Another big issue to consider is the security of the solution, where various devices are using the same WLAN.

// SOLUTION

CamperNET is a complete solution, offering reliable campervan connectivity without a complicated setup. A combination of patented antenna technology by Antretter & Huber and Tetlonika Networks dual SIM 4G RUT955 router ensures reliable connectivity even where a cell phone would be failing. Using two SIM cards provides not only better network reception in different areas but also helps to save on the operator charges. For example, if a vehicle is crossing the border, the router will immediately switch to another SIM to avoid high roaming tariff.

This plug-n-play solution does not require downloading and installing any apps to work with any smartphone, laptop, tablet, or PC. A USB port available in the RUT955 allows connecting SmartTV, streaming sticks, or WIFI sound systems straight to the internet. Multiple Ethernet ports enable easily connecting IP cameras and other IP devices.

Robust RUT955 router can operate temperatures between -40 °C to 75 °C, so it will survive traveling in summer and winter conditions. The broad power voltage range makes the RUT955 compatible with any type of camper battery and the whole solution takes less energy than a LED lamp.

// BENEFITS

A complete solution meeting the WIFI needs of any traveler – from data consuming entertainment purposes to smooth uninterrupted remote work experience.

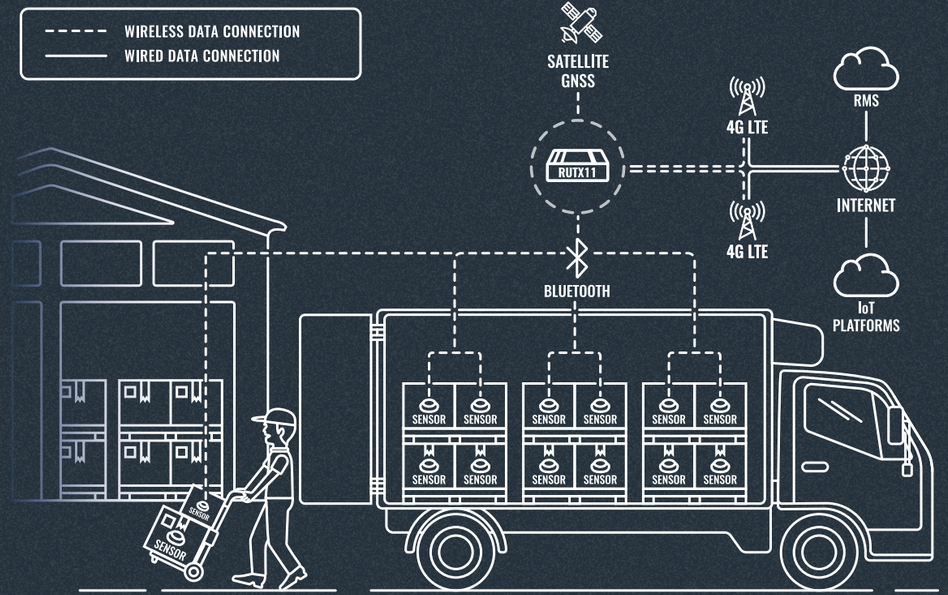
Dual SIM functionality allows choosing any two cellular operators to achieve better network reception and save on expenses.

The ability to put the whole equipment under one campervan WLAN allows connecting the whole ecosystem to a free external WIFI while on the camper site.

Hotspot enables sharing the internet with others while setting up data limits saves from too much data getting used.

Pre-installed Firewall ensures safe browsing for all the devices under the router.

ENABLING COLD CHAIN TRACEABILITY WITH BLUETOOTH



// CHALLENGE

Should it be food, chemical products, or the new hot topic - vaccine, when the temperature requirements are not met even for a short period, the goods are no longer safe and need to be discarded. As this results in financial losses, the businesses are interested in possibilities to track the supply chain for accountability and prevention reasons. Besides, with products like vaccines, there is a lot more planning involved due to required follow-up doses that are also time-bound. Such goods are also an attractive target for theft or fraud. Tracking the location and movement of them is therefore essential to avoid losing or misplacing the shipment. All of these processes require effective tools and systems in place.

// SOLUTION

Efficient tracking in the supply chain can be ensured by installing Bluetooth sensors on the pallets or the boxes where the products are being transported. Depending on what kind of metrics need to be monitored, there is a choice of ID (for equipment tracking), T (for temperature), or RHT (temperature and humidity) sensors, and others. Up to 200 such sensors can be connected to Teltonika Networks dual SIM RUTX11 cellular router for tracking.

The router collects the information from the sensors via Bluetooth and sends it further to the IoT platform via MQTT or HTTPS protocols. The router is equipped with GNSS capabilities, so it can track events happening at an exact specific location. Using the sensor data allows to set up notifications whenever something out of the ordinary occurs. For example, if the temperature falls behind or gets close to a certain measure the system warns the employees and the situation can be rectified to avoid bigger losses. Or an alert may be set up for whenever an object changes its' location or leaves the premises. In general, GNSS allows to easily trace the goods inside the warehouse or during its' journey through the whole of the supply chain.

// BENEFITS

Reliable connectivity – ensured by dual SIM cellular router with auto-failover and SIM switch capabilities.

Simple ecosystem – one RUTX11 can connect up to 200 Bluetooth sensors and the pairing process takes seconds using an NFC enabled device (like a smartphone).

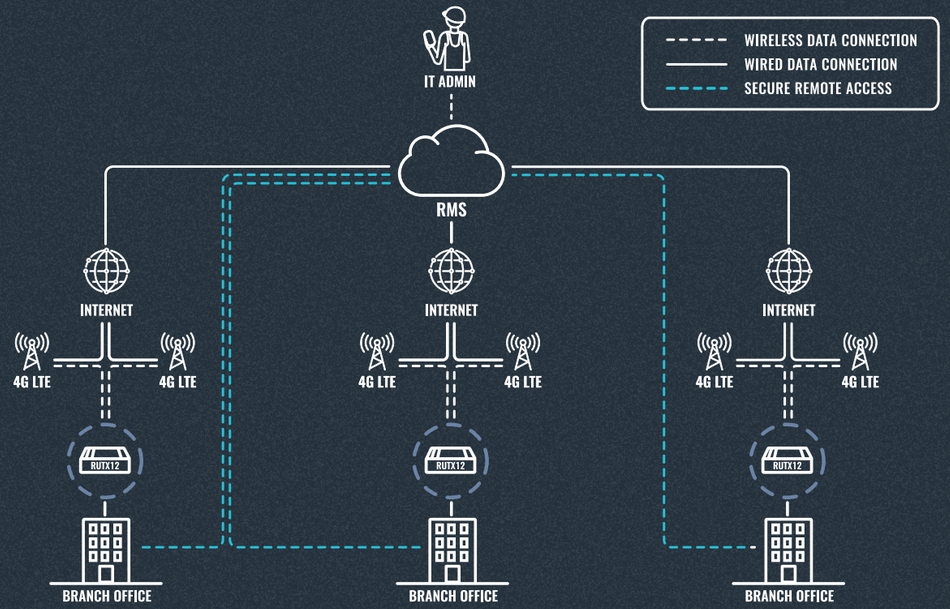
Security – since some cold chain products, like pharmaceuticals, are of interest to criminals, the data is secured by professional-level VPNs and industrial-grade protocols.

Exact traceability – GNSS service availability on the RUTX11 router allows to track the exact location (or supply chain link) where a certain event occurred.

ENTERPRISE

Enterprise applications require connectivity hardware that is secure, reliable, and easy to use. Teltonika Networks provide scalable networking infrastructure for primary and backup connectivity.

RMS CONNECT FOR REMOTE MANAGEMENT OF ENTERPRISE EQUIPMENT



// CHALLENGE

Every enterprise facility, regardless of its' size, requires IT administration services. In some cases, the solution may be relatively simple: a company sets up a dedicated IT department in-house, which then overlooks the entire infrastructure. However, this scenario is not always perfect for smaller businesses, and a lot of them choose to outsource these tasks to external organizations.

In other cases, companies have offices spread over different locations, and having separate IT departments does not always make sense. And, with the recent COVID-19 outbreak, remote work has become a necessity for a lot of companies to be able to continue their business. The demand for remote management solutions is growing and the organizations are looking for optimal solutions to ensure their business continuity at affordable costs.

// SOLUTION

In this topology, RUTX12 routers were chosen to provide connectivity in each branch office. It provides the primary and backup connection with dual modem LTE Cat 6 and load balancing, offering speeds up to 600 Mbps, when using cellular networks. Teltonika Networks Remote Management System (RMS) is used for convenient and secure monitoring and management of the routers. It provides a possibility to detect errors, prevent downtime, and update the firmware to multiple network devices quickly and comfortably from anywhere in the world.

However, the most value in this solution is brought by RMS Connect functionality. It enables accessing every computer of each branch network remotely, just as if sitting in front of it. It is a very similar way to reach devices to using solutions like Teamviewer or Anydesk. However, besides offering a possibility to reach computers through RDP/VNC, RMS Connect may be used to access a variety of other devices within the same network via SSH or HTTP(S) protocols. This is a great asset, as there is no need for IT staff to be present at the office to resolve technical problems, and it allows for more dynamic resource allocation.

// BENEFITS

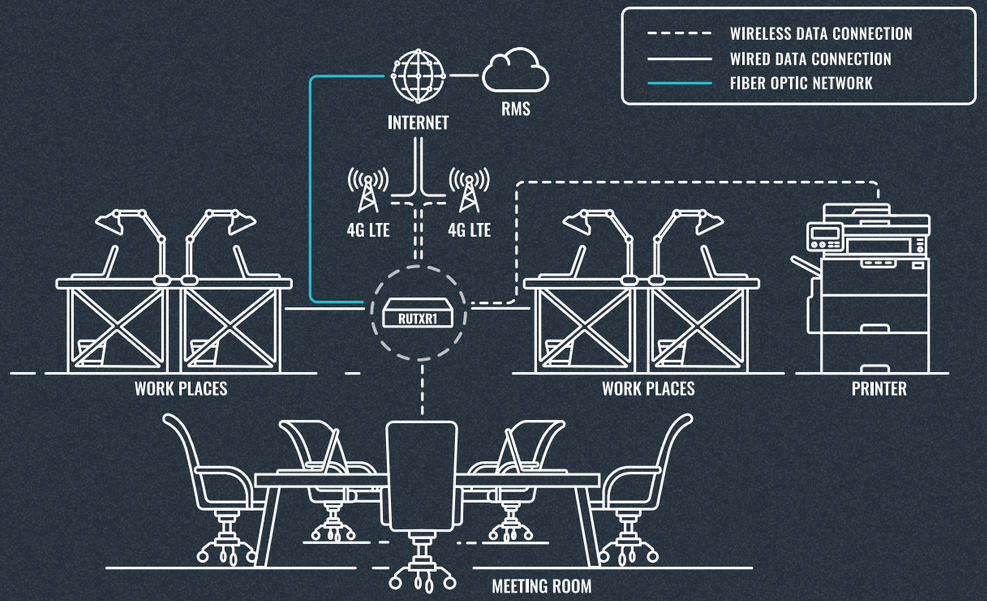
Remote – access and configure your routers from anywhere with RMS Management.

Security – all clients access the RMS via HTTPS. All communication is encrypted, ensuring no one will be able to intercept any login details or gain unauthorized access to your account.

Multiconfiguration – easily update and configure multiple devices at once and remotely.

Lower costs – compared to similar solutions, RMS Connect has a very competitive and scalable pricing regardless of the size of the infrastructure you wish to reach within the same network.

SEAMLESS AND EASY TO SET-UP ENTERPRISE CONNECTIVITY



// CHALLENGE

Each Internet Service Provider focuses on different connectivity options. Some of them are offering only wired connectivity, like Ethernet or fiber, others - only mobile internet connectivity, and some of them have a combination of options to choose from. There is no one right answer to which option is the best one. All of them have their pluses and minuses, so the best choice depends on an individual case. The goal is to reduce internet downtime as much as possible, and we strongly believe that implementing a backup connectivity source is the best way to achieve this.

Whenever starting a new business, there are plenty of challenges involved. Moving into a new building, one cannot know what to expect, which makes it hard to get ready and be up and running smoothly. Connectivity issues are common, and choosing a router with so many options as RUTXR1 offers can help save a lot of headaches and expenses.

// SOLUTION

With RUTXR1, it is possible to use wired connection, such as Ethernet or fiber, along with the mobile internet for a backup. This model has five Gigabit Ethernet ports and an SFP module, as well as 4G connectivity with dual SIM. Combining these options allows using three different internet providers and minimize the risk of downtime significantly.

Besides, RUTXR1 is rack-mountable, and it will fit in perfectly into a 19” cabinet or simply anywhere due to its compact size. Additionally to internet backup, RUTXR1 also has dual redundant power supplies, which makes it almost impossible to experience any network-related problems even in case one of the power sources fails. As shown in the topology below, RUTXR1 can be used to connect various devices in the office environment: from laptops and desktop computers to printers and meeting room equipment (like video call tools and tablets). Having multiple Gigabit Ethernet ports, it can offer cable internet to at least five different products. Moreover, it supports more than 100 concurrent Wi-Fi connections at a time, so it can fully serve a small to medium-sized office.

// BENEFITS

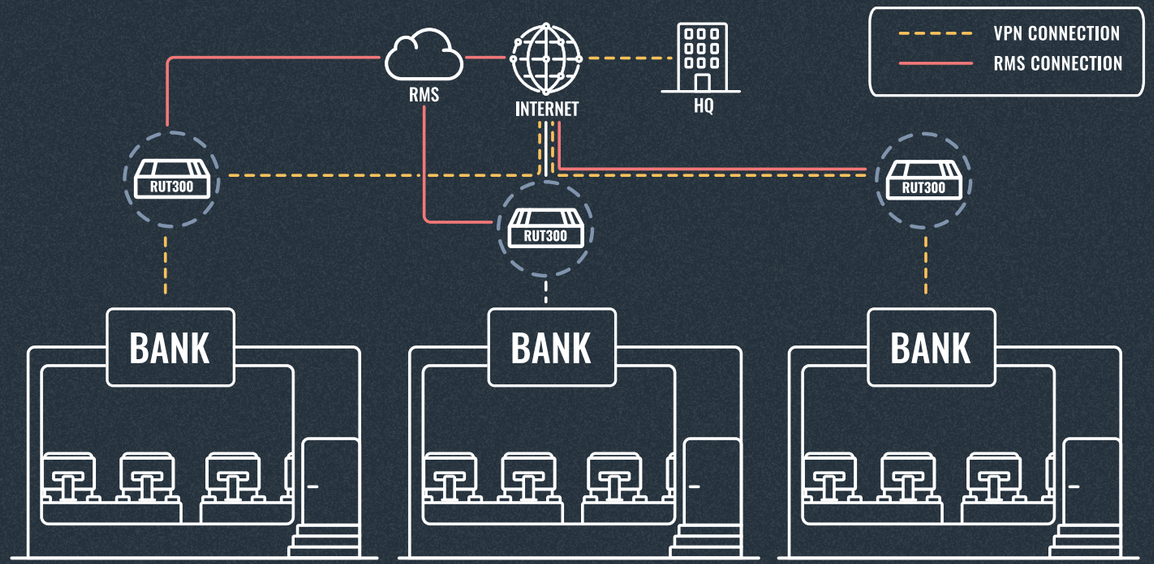
Dual Redundant Power Supply – RUTXR1 offers an option to use two different power supplies to allow you to set it up so you stay immune from network downtime even in event of main power loss.

SFP Port – RUTXR1 is the first Teltonika Networks router offering fiber connectivity option.

Two SIM cards – RUTXR1 has two SIM card slots for different carrier usage for mobile backup and ultra-high speeds.

Speedy deployment – choose from multiple primary and secondary connectivity options; make adjustments as your situation changes without any delays and extra costs.

SECURE CONNECTIVITY FOR BANK BRANCHES



// CHALLENGE

The bank branch connectivity has to overcome multiple challenges. Connection reliability is a must. Being a customer-oriented institution, a bank cannot risk to be offline even for short periods of time, as it may cause not just dissatisfaction of the clients but also system disturbances. There is no question regarding the required top-level security of the data and transactions of any kind. However, besides these more obvious requirements, there is also a demand for flexibility and ease of setting-up. The rapidly changing situation in demographics and economy, strikes a challenge to predict of where and for how long a specific branch would be needed. As such, the installation should be quick and easily applicable in another location.

// SOLUTION

The bank branches in the US and across the world are getting smaller in size and the staff. The number of full-time employees has declined and varies on average from 3 to 8 per branch. As seen in topology, such branches do not require a complicated network infrastructure and Ethernet connectivity fully suffices the day-to-day operations.

RUT300 Ethernet router has five fast Ethernet ports to easily plug in the computers and gives immediate access to the internet. It is a small device that will easily fit into any cabinet or on a desk and the Passive PoE feature makes it very simple to deploy avoiding additional wires and messy setups. A USB port can be used to easily connect a printer or other office equipment to the network.

This device enjoys an abundance of RutOS benefits. It comes with a preconfigured Firewall, meaning that it is immediately safe to use. It also offers a selection of 10 different VPN services to establish a secure and private connection between the branches and the headquarters. RUT300 is compatible with Remote Management System (RMS), so the routers can be easily configured, updated, and troubleshot from a distanced location. Additionally, RMS Connect allows you to reach the equipment connected to the routers and manage it remotely as well (e.g., computers, printers, IP phones, etc.).

// BENEFITS

Simple setting-up process – such solution takes minutes to connect and can be easily transferred to a new setting.

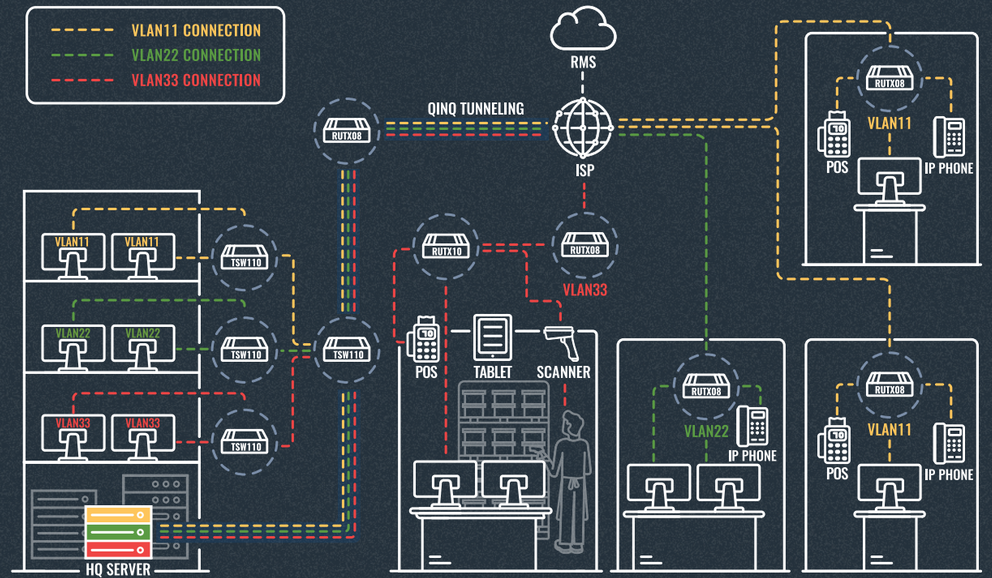
Security – pre-configured Firewall makes the device safe to use from the very first seconds without complicated configurations.

Multiple VPNs – 10 various VPN services to choose from to establish a private connection between the remote branches and the headquarters.

Small sized device – will fit into any server cabinet, drawer, or simply anywhere when using a DIN rail mounting option.

Remote management of the whole solution – via RMS Connect.

VLAN TAGGING FOR EFFICIENT TRAFFIC MANAGEMENT



// CHALLENGE

Today, society and business operations are highly reliant on electronic access to information and continuous optimization. The main challenges lie in data availability, security, easy access, and costs. When the concept of networking was starting, all the components had to be physically connected. As big of a change that it was, over time, it appeared that in large buildings, it has become too expensive to get the employees connected into one local-area network (LAN), not to mention remote offices. That gave the start to a virtual local-area network (VLAN).

VLANs allow the creation of the same network rules and environment for the employees in different sites quickly and easily. However, sometimes the staff of various departments needs to have different access rights or addressing schemes in the same VLAN, and this is where the VLAN tagging becomes very handy.

// SOLUTION

Imagine a company selling electronic goods. Usually, such companies are complex structures, comprising of multiple units that communicate with the headquarters. Each department belongs to the same network, including the HQ. However, VLAN tagging (VLAN11, VLAN22, VLAN33) allows handling the traffic from each unit as if they belong to different networks. As per topology, traffic from the warehouse tagged as VLAN33 travels to an appropriate part of the HQ server. The traffic of the stores (VLAN11) and IT support (VLAN22) also travel separately. VLAN tagging allows for much easier network management without requiring multiple sets of cabling and networking devices. It also removes geographical boundaries. Besides, VLAN tagging also provides a possibility to prioritize specific sorts of traffic. So overall, there are multiple reasons for VLAN tagging, including simplicity, security, traffic management, and economy.

Our RUTX08 router is used in each unit to connect the equipment to the network since the solution does not require Wi-Fi connectivity. RUTX08 has four Gigabit Ethernet ports for easy set-up and high data throughput. But that's not even the most critical part - this model can support up to 128 port/tag-based VLANs, sufficient even for the most complicated network infrastructures. The TSW110 switch helps to speed up the deployment process even more with five additional Gigabit Ethernet ports and a plug-n-play design.

// BENEFITS

Simple management – VLANs allow network administrators to group together or separate traffic within the business network, prioritize traffic, etc.

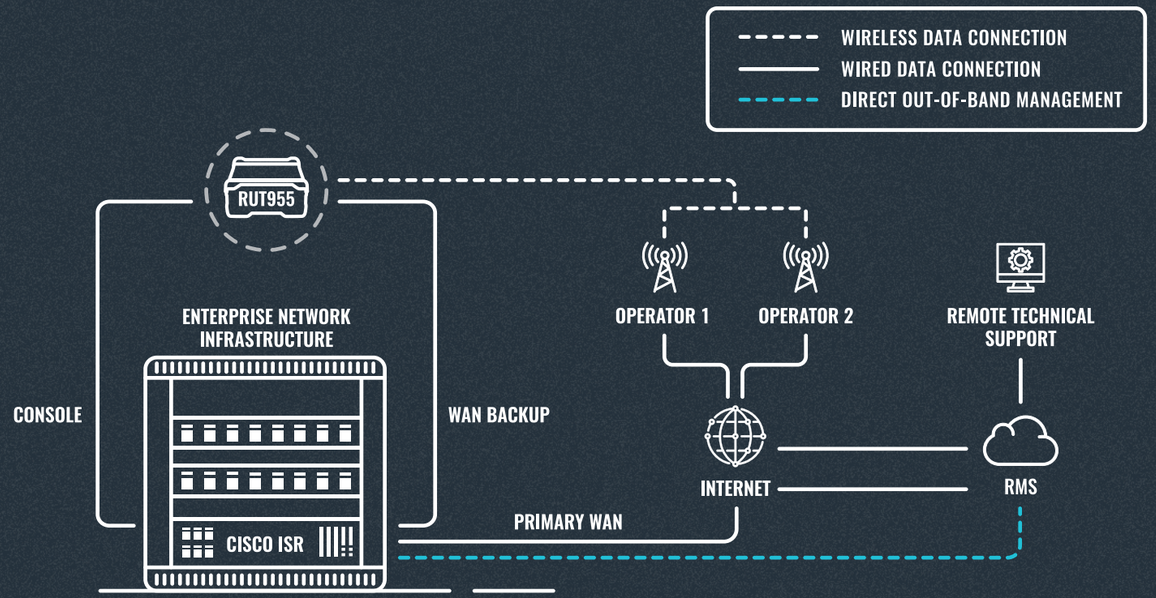
Security – the traffic is delivered only within the frames of destined VLANs and to specific recipients within the VLAN.

Budget-friendly – network switched with VLANs is much cheaper than creating a routed network.

Easy deployment - VLAN membership is configured completely through software.

Flexibility - a VLAN can be easily configured and managed regardless of geographical location.

OUT-OF-BAND MANAGEMENT FOR CISCO ISR



// CHALLENGE

Legacy connection methods for out-of-band management are subject to slow connection speeds, high monthly recurring charges. Moreover, aging modems are vulnerable & unreliable making the whole remote access solution undependable. As a result, Network managers need a better option for infrastructure out-of-band management.

// SOLUTION

The most reliable option for remote site monitoring is having a certified network technician on-site at all times, though in most cases costs of doing so are too large to justify. Most commonly such engineers are hired by dedicated businesses offering technical support services which delegate their technical engineers on-demand to the location of client's infrastructure in case the main router is unreachable over its wired Internet connection. In the majority of cases, a simple reboot or configuration change is needed. However, the costs of hiring a certified professional engineer to travel to a remote site, debug and solve a problem are significantly higher than upgrading existing PSTN infrastructure to reliable and secure remote access solution for out-of-band management.

Multi-megabit speeds, improved response times, wide coverage and flexibly priced LTE plans make 4G LTE a great option for upgrade - not only for out-of-band management but also for WAN backup.

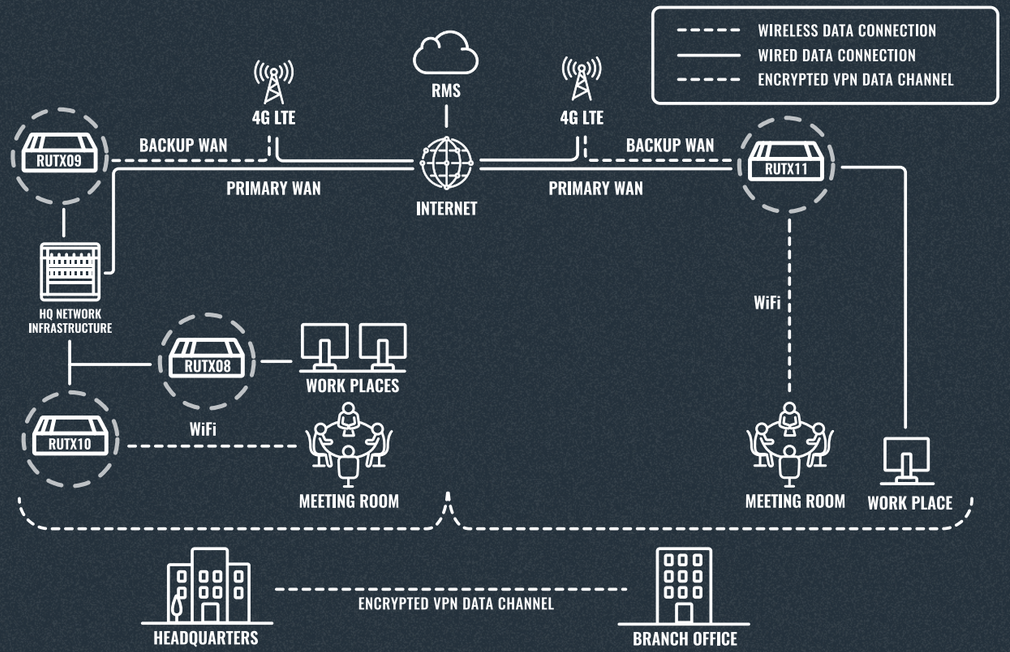
// BENEFITS

Fast deployment – multiple RUT955s can be quickly preconfigured for out-of-band management using Teltonika RMS.

Reduced network maintenance costs – even one on-site visit by a certified technical support engineer can be more expensive than installing a single RUT955 for out-of-band management.

Support speed – a professional engineer can access the console interface of an ISR remotely immediately and resolve any arising issues avoiding time zone differences and traveling time to site.

SECURE BRANCH CONNECTIVITY



// CHALLENGE

The world of enterprise networking has been experiencing a change in perception lately due to newly available technologies to access the Internet. Traditionally, wired internet options, such as DSL or fiber, are the most popular, but they cannot ensure 100% Internet availability, due to unavoidable causes such as equipment failure or power outages. It is essential to highlight that even 99% of uptime results in 3.65 days/year during which Internet services are not available. If we take this into account and calculate potential losses for widespread enterprise business it is evident that even 99% of uptime provided by traditional enterprise Internet access options is not good enough. Because of this, businesses around the world are turning to 4G LTE to provide secure and dependable backup or even primary branch connectivity.

// SOLUTION

The topology presented in this use case focuses on a challenge when the headquarters of an enterprise needs to be reliably connected to a branch using encrypted VPN data channels. The headquarters has a wired WAN link with cellular backup provided by RUTX09 – an enterprise router with LTE-A connectivity and advanced RutOS features for security and remote management, such as support for DMVPN, MQTT & SNMP, and others. Then, workplaces are connected using another device from Teltonika Networks X series – the RUTX08, which is a professional Ethernet-to-Ethernet router offering excellent VPN performance and same remote management capabilities as the RUTX09. Finally, RUTX10 brings AC Wi-Fi (2.4 GHz + 5GHz) wireless connectivity service to areas such as meeting rooms, where it is essential to quickly connect to internal systems and offer separate public hotspots for visitors with different access and security settings applied in comparison to internal enterprise user network.

On the branch side, RUTX11 offers all needed connectivity through LTE-A with a maximum throughput of 300Mbps and shares it using Gigabit Ethernet and AC Wi-Fi interfaces. Using RUTX11 as the primary Internet source enables business to scale quickly, enabling 1-day connectivity with no delays for obtaining wired Internet source, which in practice can take weeks, if not months.

// BENEFITS

Teltonika X series cellular routers (X11 & X09) offer LTE – Advanced connectivity with speeds up to 300 Mbps and Carrier Aggregation – sufficient to replace aging and unreliable wired WAN options.

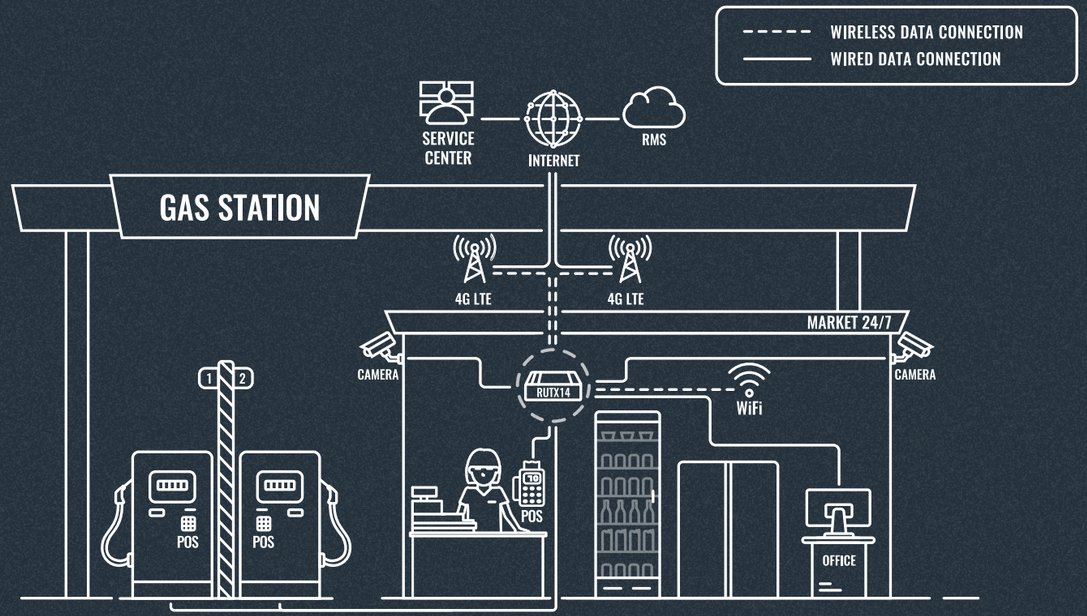
Also, X11 & X10 offers AC Wi-Fi able to offer wireless service using 2.4 GHz & 5 GHz frequency channels, which allows for faster service and separation of private/public hotspots.

All RUT X series routers are compatible with RMS, which allows to monitor performance with customizable reports & alerts, manage configurations of devices, and much more – remotely, even without Public IP!

RETAIL

The retail market is experiencing rapid adoption of connectivity technology which helps companies offer new ways to interact with their clients and collect valuable data for strategic decisions. Teltonika Networks provides a range of IoT connectivity products to accommodate the quickly changing retail needs.

WIRELESS BROADBAND CONNECTIVITY FOR GAS STATIONS



// CHALLENGE

When it comes to gas stations, the connectivity challenges are many. To begin with, they usually belong to a chain, so the connectivity model needs to be universal to fit various locations and environments. Besides, the support of such chains is usually centralized. Hence having a unified connectivity solution eases up the support procedures and reduces the resources required for IT support. Also, it makes the time to set up a new station much shorter, simpler, and more cost-efficient.

// SOLUTION

RUTX14 router is the central piece of this solution. This first-ever LTE Cat 12 cellular router in our portfolio enables quick and easy deployment in any situation, even in remote areas. Opting for wireless cellular connectivity reduces the complexity of the solution, so it takes significantly less time and installation resources. Cat 12 router can reach speeds up to 600 Mbps, which is enough to serve the varied needs of devices used in similar environments.

Surveillance cameras inside and outside the petrol station, Points of Sale (POS), digital signage screens require speedy connection, network stability, and broad data bandwidth. These devices connect to the router via Ethernet cables through five available Gigabit ports available on RUTX14. Product scanners, tablets, and other wireless devices used for work purposes connect to a private WIFI network for security reasons. There is a separate public Guest WIFI created for the visitors. A wide selection of VPN services ensures that the most varied security requirements and preferences are met.

For an even more simplified solution, our TSW100 switch can power up the cameras via PoE. Compatibility with RMS and various other IoT platforms enables remote accessibility for IT support teams and various integrators to prevent any downtime and solve issues immediately and cost-efficiently.

// BENEFITS

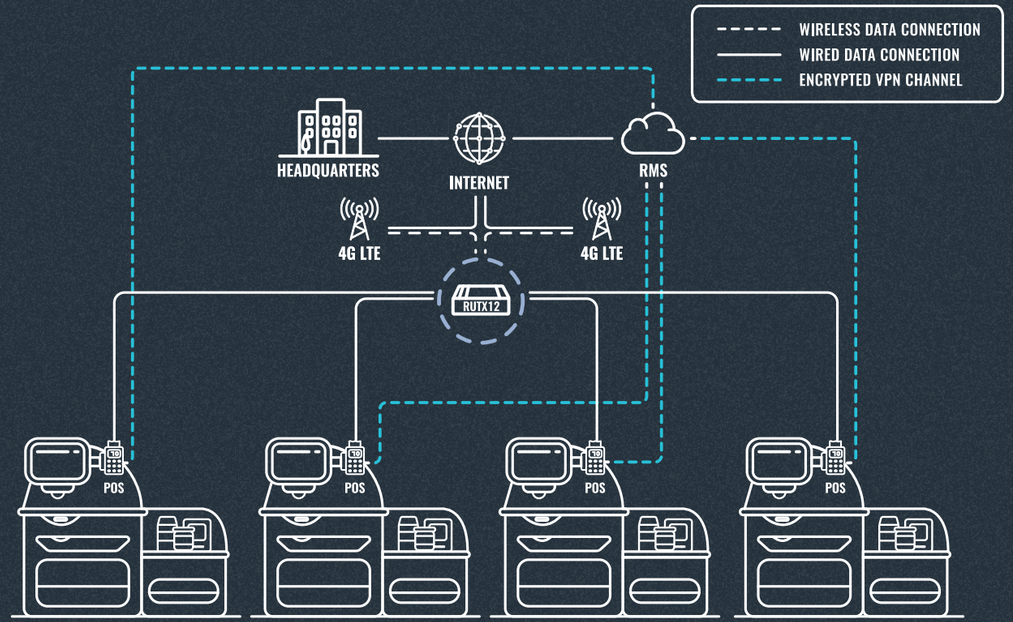
Speedy connection with download speeds up to 600 Mbps and upload speeds up to 150 Mbps.

Quick and straightforward setup for an all-in-one solution to connect an ecosystem of multiple devices.

Multiple WANs and various VPNs to secure your network.

Remote management and monitoring via RMS or a variety of third-party IoT platforms.

RMS CONNECT TO EMPOWER REMOTE POS SOLUTIONS



// CHALLENGE

Point of Sale (POS) terminals usually require to integrate the technologies previously installed in the retail facilities and third-party CRMs to connect them into one fully-functioning system and provide the maximum value. Only when set-up correctly, these systems can grant business intelligence and drive informed decisions and developments, resulting in competitive advantage and pleasant user experience. Any disruptions in such systems cause significant financial losses in the short term and damaged business image in the long run. The integrators of such POS systems and terminals are usually third-party vendors, and as such, are not present in retail locations. Therefore, the ability to remote monitor and manage these structures is more of a must rather than a commodity.

// SOLUTION

POS terminals require uninterrupted connectivity at all times, which is provided by our newest and most advanced LTE Cat 6 dual-SIM RUTX12 cellular router. As this solution demands reaching non-Teltonika Networks devices, RMS Connect functionality is used to accomplish this task. The effect it has on this system is immense because of multiple reasons.

Firstly, it allows the system integrator to remotely monitor each device from the comfort of their desktop. The interface allows accessing the third-party devices just as viewing them in front of you. So, whenever any issue occurs, the device can not only be remotely rebooted but also troubleshot, just like when being on-site. This significantly reduces the travel time and costs associated with it.

Another great advantage of RMS Connect is the possibility to conveniently update firmware and carry out multiple configurations on hundreds of devices at the same time from anywhere in the world. The owner of the solution usually implements it in various locations for several different facilities, so executing such a simple task would be incredibly time- consuming, inefficient, and costly.

The retail sector is extremely susceptible to safety violations. RMS has a proven record of successful application scenarios in mission-critical network infrastructures, especially due to the multiple certificates and attestations related to its' security. Whenever financial operations are involved, the safety measures must always be ensured to the maximum level.

// BENEFITS

Security – top-level standard safety ensured by MQTT, TLS 1.2 and 1.3 protocols, and acknowledged with OWASP 2 certificate.

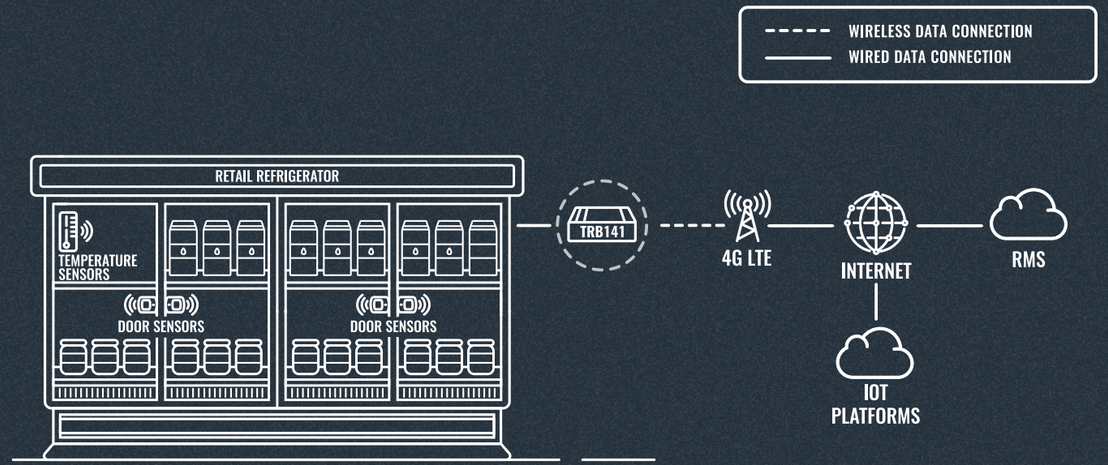
Contactless – reduces cost of the solution and increase safety related to health-related concerns in the recent COVID-19 outbreak context.

Wireless – convenient implementation, monitoring and management in multiple facilities.

Access to third party devices – RMS Connect allows to reach third-party devices.

Data collection – get information regarding technical status of your devices and marketing data into one platform.

REMOTE RETAIL REFRIGERATOR MONITORING



// CHALLENGE

In retail and logistics, responsibility related to food waste in case of technical failures often falls on the manufacturer or integrator of the system. The biggest challenge is that without remote 24/7 monitoring, it is difficult to notice minor problems before they cause real damage. Early detection could usually prevent high losses, but that is difficult to achieve if the refrigerator is stored in a third-party establishment, and is only managed by the employees. It also usually means that the systems are left unsupervised outside of the working hours, so such a simple issue like a door left open could cost thousands of euros in spoilage and lost sales. Any discrepancies from the storage requirements could also catch the attention of Food and Veterinary Services and have long-term effects on the business.

// SOLUTION

To create one seamless autonomous solution, we chose TRB141 gateway due to its small size, convenient installation, and multiple Inputs/Outputs, allowing to connect the sensors. The gateway collects data from the temperature and door sensors and sends all information to an internal monitoring system.

In case of any temperature fluctuations outside the pre-set norms, an SMS is sent out for the system to trigger a response. A similar alert notifies when the door is left open for a particular amount of time. If any technical glitches occur, the system can be restarted remotely, which saves plenty of time for the technical staff and resolves most of the issues without human involvement.

When used together with Teltonika Networks Remote Management System (RMS), even more functionality and monitoring options are available. The system administrator may check history and audit logs of various devices deployed in multiple locations, easily customize and set-up new automation rules, and update all of the gateways remotely via FOTA.

// BENEFITS

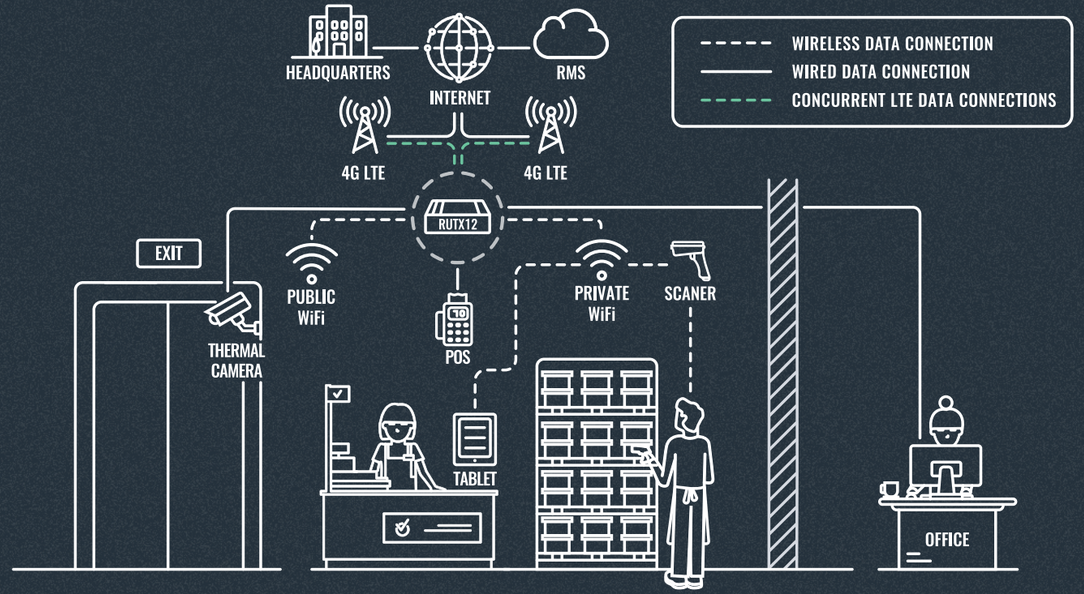
24/7 remote autonomous management – no human involvement required to resolve minor issues saves time and finances.

Immediate response – systems are triggered right away in case of any abnormalities and reacts before any serious damage is caused.

Scalability – one solution may be conveniently employed and monitored in various retail locations.

Audit logs – convenient access to reports history.

FAST AND UNINTERRUPTED RETAIL CONNECTIVITY



// CHALLENGE

In essence, the retail environment is highly competitive. With digital services advancing rapidly, it takes less and less time to turn an idea into a business, and many entrepreneurs and enterprises seek to reduce the time-to-market as much as possible. Advancements in digital marketing drive customer demand, but regardless of the growing popularity of e-commerce, physical retail is still the primary consumer market driver. The retail market is highly dependent on reliable, fast, and secure internet connectivity both for customer services and internal operations, including stock management. Even though wired Internet connectivity is widely available in the hearts of urban environments, such options cannot offer 100% availability. Besides, there is a need for alternatives to obtain fast and reliable connectivity in areas where internet connectivity is unstable or slow. Finally – speed and availability are not the only challenges, with the increasing threats of cybersecurity.

// SOLUTION

4G is becoming a favorable option when it comes to fast and reliable connectivity options. With multiple cellular modules, higher LTE categories, mobile Internet services can match and surpass the speeds of wired connections in congested areas. However, cellular solutions can be deployed instantly without the need for cabling and arranging long-term contracts. Choosing a professional cellular router with two simultaneously working Cat 6 modules can resolve retail connectivity security, downtime, and availability challenges. With our RUTX12, the two SIM cards working together can provide speeds up to 600 Mbps and ensure that all retail solution components are connected. Two modules increase security by splitting traffic, for example, for corporate communication and customer services.

As shown in the topology, the POS system, computer, and thermal camera connect to the router via Ethernet. In contrast, barcode scanners and tablets connect to a secure, private Wi-Fi network. As RUTX12 can support IPsec, OpenVPN, and other VPN services, companies can configure their networks accordingly to their needs and requirements. Finally, the RUTX12 is compatible with the Remote Management System, allowing system operators to monitor and manage the whole network remotely, including remote configuration, firmware updates, notifications, reports, and much more.

// BENEFITS

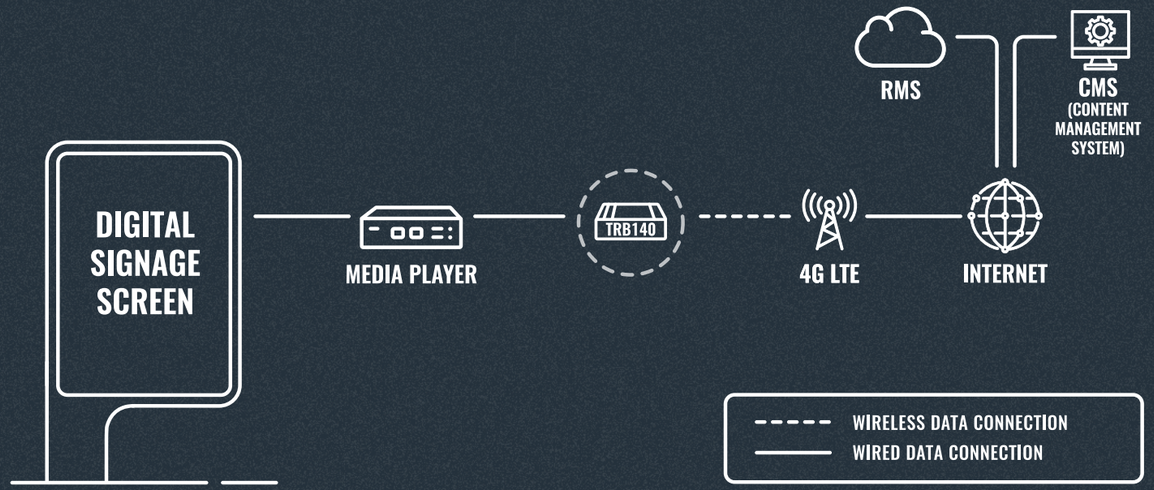
Performance - RUTX12 with two LTE CAT 6 cellular modules working simultaneously can provide speeds up to 600 Mbps.

Functionality – RUTX12 is able to split traffic between two mobile connections with load balancing.

Remote monitoring – with RMS, you can conveniently monitor all network and make configurations remotely.

Security – with advanced RutOS features, RUTX12 offers multiple VPN options, embedded firewall, and other security features to comply with high-security standards.

DIGITAL SIGNAGE & CELLULAR CONNECTIVITY



// CHALLENGE

The Digital Signage solution is not very difficult to understand; usually, it consists of a screen panel and a media player with storage. However, the main challenge is to be able to control what content, in which intervals, and when will be displayed. When we consider that a single operator might be responsible for thousands of screens placed around the significant area, we see that manual uploading is not an option. In order to have an efficient business, the operator of Digital Signage infrastructure must be able to upload and control content real time without downtime.

// SOLUTION

As identified, reliable and convenient connectivity is essential for efficient content management across extensive Digital Signage infrastructure. Cellular solutions based on 4G LTE are prevalent in this use case because they eliminate multiple challenges, such as pace of solution deployment, different connectivity provider management, and dependency on 3rd party wired network infrastructure, which cannot guarantee 100% uptime. As defined in the topology above, the media player is responsible for playback of marketing content, such as pictures or video, while TRB140 is the device which enables the remote upload and management of such content.TRB140 is a 4G LTE enabled gateway, which is perfect for Digital Signage solutions because it is easy to deploy and scale due to compatibility with Teltonika Networks Remote Management System. With a single TRB140, the user can manage content on the media player and change the parameters and the playing order of the content.

// BENEFITS

Easy to manage – with Teltonika Remote Management System, system administrators can be in control of thousands of different sites with a single user interface.

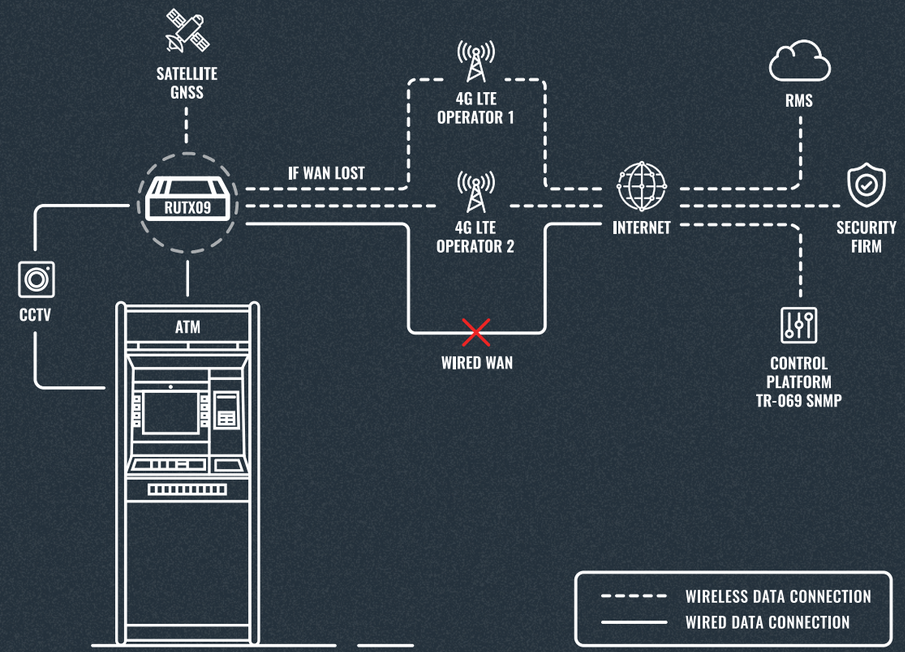
Quick to deploy – no need to wait for wired Internet access contracts and installations.

Easy to scale – Teltonika TRB140 compatible with RMS which allows configuring an infinite amount of devices in minutes.

Secure - infrastructure will be safe due to advanced security features of the TRB140, such as VPN, IPsec, Firewall and Access Control.

Small size - TRB140 has impressively small footprint allowing it to be installed even in the most compact and design conscious Digital Signage enclosures.

EMPOWERING ATM CONNECTIVITY



// CHALLENGE

Nowadays, more and more people gain access to banking services and electronic payments around the world. ATMs are being deployed in new and remote areas, moreover, legacy equipment is being updated with state-of-the art cash machines. These ATMs are usually placed in shopping malls, gas stations, convenience stores. However, not all countries or locations have sufficient and reliable wired Internet access options such as DSL or fiber. Considering that VSAT communication is still highly expensive, this poses a challenge for ATM connectivity to be secure, affordable and reliable.

// SOLUTION

Technology integrators around the globe have already learned valuable lessons of relying on a single wired connection for ATM deployment. Even a few minutes of connection downtime can cost more than adding an additional layer of connectivity. Nowadays majority of ATMs are using industrial cellular routers with 4G LTE connectivity as a main or a backup source of connectivity between ATM and central system of the bank. Such routers must be highly secure, reliable and be able to establish VPN connections with advanced firewall functionality as well as support for multiple remote management protocols.

// BENEFITS

Quick and easy to deploy – Teltonika RUTX09 can be configured in minutes and the configuration can be multiplied across the fleet of routers using Remote Management System (RMS).

Failover between wired WAN and cellular connections allow to have much better link resiliency and service continuity even in an event when the service of primary operator goes down.

Advanced alert system can notify operators in case wired WAN fails and LTE is activated via SMS, Email or other methods.

With a wide power supply range of 9 – 50 VDC and GNSS functionality, you can power RUTX09 using a UPS and monitor the location of the whole ATM with programmable alerts.

CONNECTED WITH TELTONIKA NETWORKS

The world we live in today is connected! IoT and M2M communication have changed the way we work and interact with people and technology. The creativity of our partners inspires us every day, and we are thrilled to be a part of this revolution! Seeing how the partnerships we established throughout the years turned out into the most innovative IoT projects is the fuel that keeps us going forward. With this catalog, we invite you to explore how Teltonika Networks can elevate your connectivity solutions across six different sectors in the industry.

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