

Application Note

## Remote Access Made Secure and Easy

with industrial LTE cellular gateways



### Best-Fit Applications

- ✓ Intelligent transportation systems
- ✓ Power substation applications
- ✓ Water and waste treatment applications
- ✓ Pipeline monitoring
- ✓ Offshore oil & gas operations
- ✓ Bus and train surveillance



OnCell  
G3150A-LTE Series



OnCell  
G3470A-LTE Series

Start Using OnCell  
Central Manager

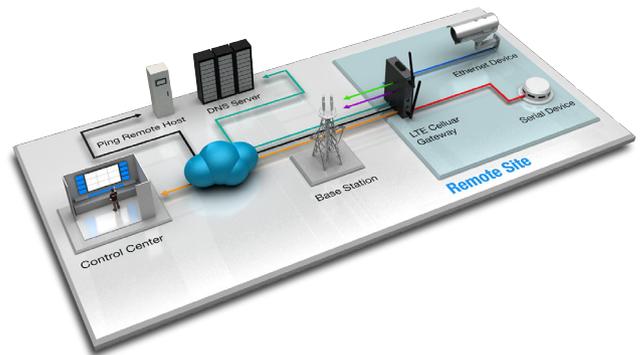


# LTE Cellular Links for Easy and Secure Remote Access

Long-range and wide-area applications are no longer restricted by distance and speed constraints. Network devices built using the LTE standard can support the high bandwidth and speed needed for large-scale long-distance network applications, such as intelligent transportation systems (ITS), power distribution, and water treatment and distribution systems. Moxa's OnCell LTE gateways deliver reliable connectivity in harsh environments for 24/7 wireless operations to meet the diverse needs of your large-scale network applications.

## Connection Reliability

Moxa's OnCell LTE gateways are designed to provide continuous connectivity. The dual-SIM cellular operator backup provides automatic switchover when one of the links goes down. Dual power inputs ensure power redundancy and connection reliability. In addition, Moxa's GuaranLink technology implements a 4-tier connection check method that makes continuous connectivity a reality.



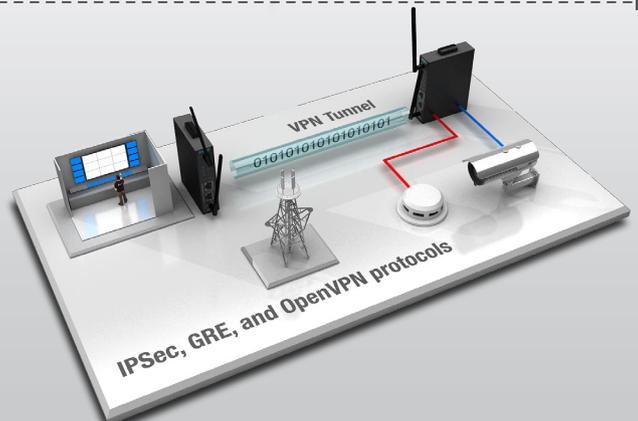
## Industrial-Grade Design

Moxa's OnCell LTE products come with a rugged hardware design that includes high-level EMS protection, antenna/power isolation for insulation protection, and built-in DI/DOs for real-time event alarms and notifications. The OnCell LTE gateways meet stringent industry standards, such as ATEX Zone 2 and IECEx, making them well suited for applications in hazardous locations. In addition, Moxa's LTE gateways can operate reliably in extreme temperatures, making it easy to deploy and operate these devices in harsh environments, including the interior of wayside cabinets.



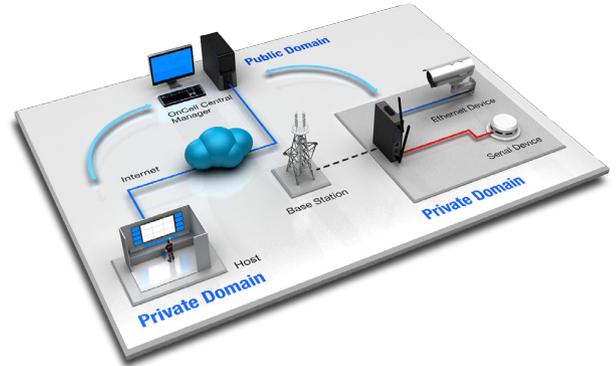
## High Security

To prevent attacks from malicious persons or applications and strengthen the security of critical data over a cellular network, Moxa's OnCell LTE gateways provide secure VPN communication in both server and client roles. Network protocols, such as IPSec, GRE, and OpenVPN, are supported to help you easily establish secure and reliable connections between two networks. The gateways meet the technical security requirements of the IEC-62443 security standard to provide high device-level security.



## Smart Central Management

Cellular networks, in most cases, are located in remote hard-to-reach areas that are spread over different geographical locations. The powerful OnCell Central Manager tool ensures effective management of remote devices. This cellular device management tool can easily configure and manage a high volume of remote devices over cellular networks using functions such as commands to remotely reboot devices and perform firmware upgrades. The user-friendly dashboard with RSSI historical data and RESTful APIs that can be used for cross-platform monitoring facilitate quick troubleshooting, thereby reducing network downtime.



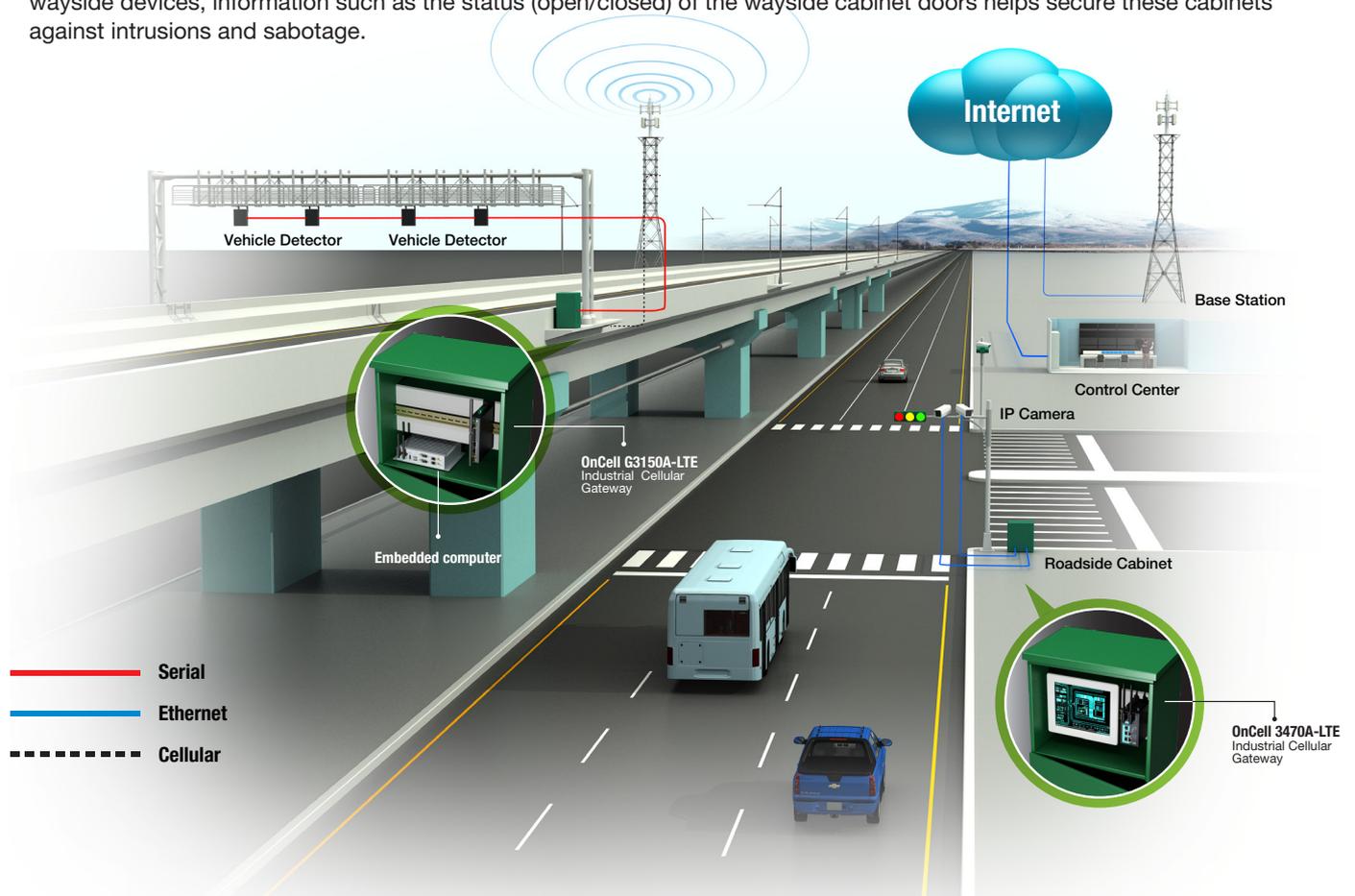
## Moxa's LTE Gateways

<p><b>Moxa's OnCell LTE Series</b></p>	<p><b>OnCell G3150A-LTE Series</b></p> <p>Cellular Gateway with Serial Connectivity</p> 	<p><b>OnCell G3470A-LTE Series</b></p> <p>Cellular Gateway with 4-Port Ethernet Switch Connectivity</p> 
<p><b>Key Features</b></p>	<ul style="list-style-type: none"> <li>• European and US LTE band support</li> <li>• Dual SIM with 4-tier GuaranLink recovery for reliable Cellular connectivity</li> <li>• Industrial-grade design with dual-power input and built-in DI/DOs</li> <li>• OnCell Central Manager tool support for remote device deployment, management, and scalability</li> </ul>	
<p><b>Interfaces</b></p>	<p>1 RJ45 Ethernet port (10/100, RJ45) 1 DB9 serial port (RS-232/422/485)</p>	<p>4-port Ethernet switch (10/100/1000 Base T(x), RJ45)</p>
<p><b>Network Management</b></p>	<p>GRE, IPSec, and Open VPN</p>	<p>NAT, port forwarding, IP/MAC/port filtering</p>
<p><b>Operating Temperature</b></p>	<p>Standard models: 0 to 55°C Wide-temp. models: -30 to 70 °C</p>	<p>Standard models: -30 to 55°C Wide-temp. models: -30 to 70 °C</p>
<p><b>Interference Protection</b></p>	<p>High-level EMS with power isolation</p> <p>ESD Level 4 antenna protection</p>	
<p><b>Standards and Certifications</b></p>	<p>EMC Level EN 61000-6-2/6-4 (industrial-grade)</p>	
<p><b>Cybersecurity</b></p>	<p>Complies with the technical requirements of the IEC 62443-4-2 cybersecurity standard</p>	<p>In progress</p>
<p><b>Hazardous Zone</b></p>	<p>ATEX, IECEx</p>	<p>–</p>
<p><b>Dimensions</b></p>	<p>126 x 30 x 107.5 mm (4.96 x 1.18 x 4.23 in)</p>	<p>66.3 x 124 x 90 mm (2.61 x 4.88 x 3.54 in)</p>
<p><b>Weight</b></p>	<p>492 g (1.08 lb)</p>	<p>1300 g (2.87 lb)</p>
<p><b>Best-Fit Applications</b></p>	<p>ITS, water and waste treatment</p>	<p>Power, energy, bus and train surveillance</p>
<p><b>Learn More</b></p>		

## Reliable Cellular Network for Intelligent Transportation Systems

### Background:

Intelligent transportation systems (ITS) ensure commuter safety by efficiently coordinating traffic operations. They help users better understand traffic information by building intelligence into the transport networks. Uninterrupted real-time high-bandwidth data transmission between the numerous traffic points and the traffic control center is the key to improving traffic flow and reducing accidents. LTE cellular gateways are ideal solutions for ITS applications, such as electronic toll collection (ETC), vehicle detection, intersection monitoring, message boards, traffic light sequencing, and weather information systems. For example, in an ETC system, the accuracy of the vehicle details and toll information is vital to efficient toll collection. An LTE cellular gateway can be used to establish reliable, fast communication between ETC terminals and the control center to transfer data collected from the various remote devices and IOs. Traffic light sequencing and control systems and video surveillance at the intersections help coordinate and monitor the traffic flow and detect violations. Data from a variety of devices connected to the Gigabit Ethernet ports of the gateway needs to be transmitted to the traffic control center using the cellular network. The cellular gateways deployed in small outdoor cabinets located along highways and roads should be able to withstand the high temperature generated inside these cabinets. In addition to the large volume of data collected from the wayside devices, information such as the status (open/closed) of the wayside cabinet doors helps secure these cabinets against intrusions and sabotage.



### System Requirements:

- Reliable long-distance high-bandwidth wireless network to transmit traffic information to the traffic control center
- Equipment that can withstand harsh environments and high temperatures inside roadside cabinets for 24/7 operations
- Easy large-scale deployment and day-to-day maintenance of remote devices

### Why Moxa?

- 4G-LTE technology that provides data rates of up to 100 Mbps for downloads and 50 Mbps for uploads, ensuring smooth data transmission
- Dual SIM GuaranLink feature that provides a backup option in case one cellular link fails, ensuring uninterrupted data transmission
- Moxa's solution can meet various ITS application requirements, including Ethernet ports and serial ports in one gateway, and integrated 4-port gigabit Ethernet switch support
- OnCell Central Manager (OCM) tool reduces network downtime by supporting mass configuration of a large number of devices and remote maintenance

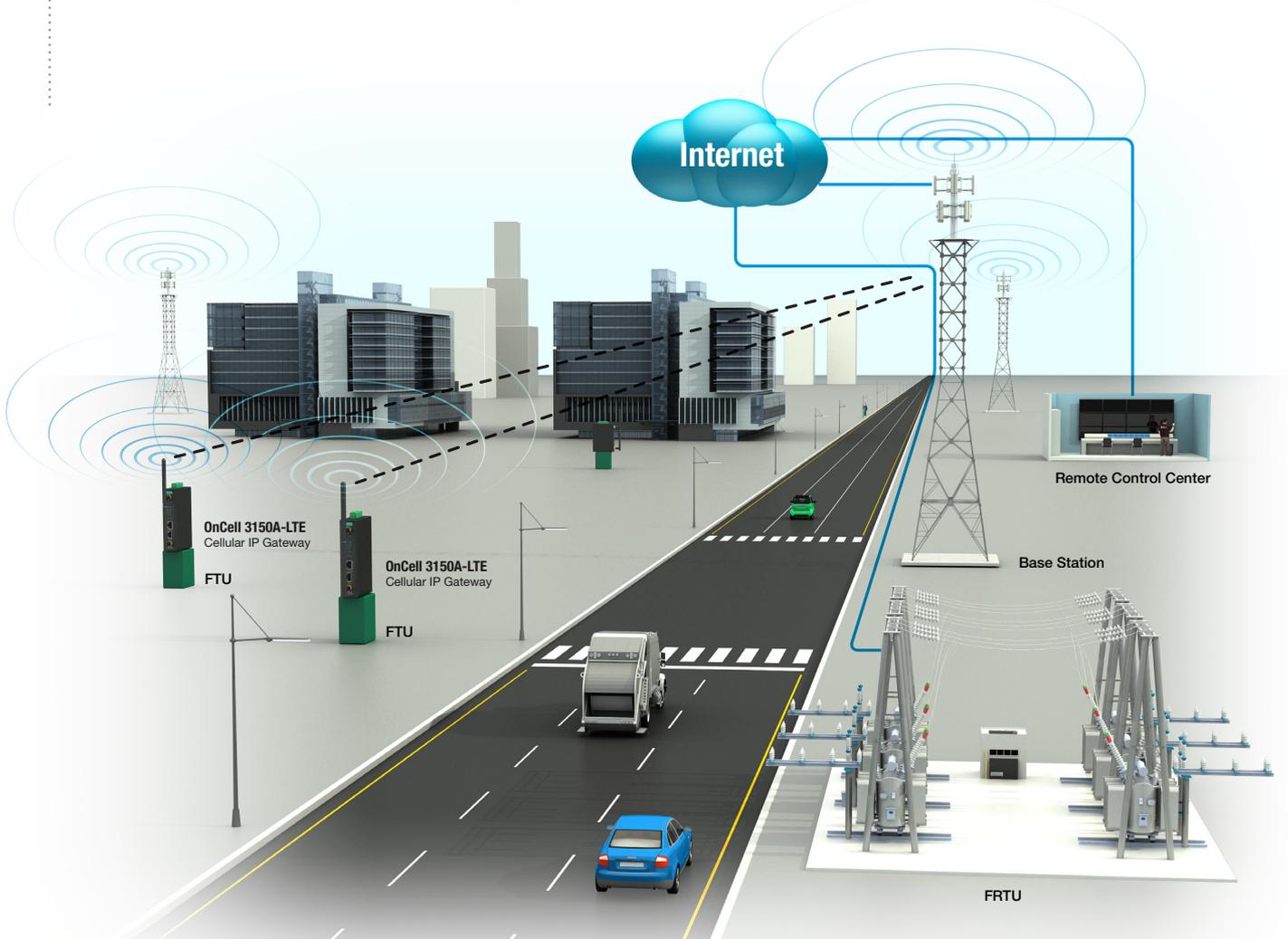
# Power Grid (FTUs) Application

## High-Speed Cellular Connections for Feeder Terminal Unit (FTU) Automation

### Background:

Power lines deliver electricity from the plant to the power substations, where it is converted to a lower voltage before being distributed to the local community. Since power plants are often located far from the population centers they serve, electricity needs to be transmitted across long distances at a high voltage. For transmission safety, feeder terminal units (FTUs) are set up on the roadside to monitor I/O statuses of the distribution equipment. The FTUs collect and process digital and analog data at each site.

An electric power utility company may divide its power grid into several districts. Each district consists of several FTUs that are connected in a ring topology and monitored by an FRTU. A reliable IP-based cellular gateway is required at each FTU to ensure reliable cellular connectivity for sending notifications to the FRTU whenever one of the FTUs goes down.



### System Requirements:

- An IP-based solution to enable reliable TCP/IP communication between the FRTUs and the FTUs
- Self-healing technology for prompt recovery of the monitoring network when an FTU goes down
- Both serial and Ethernet ports to accommodate devices with different interfaces

### Why Moxa?

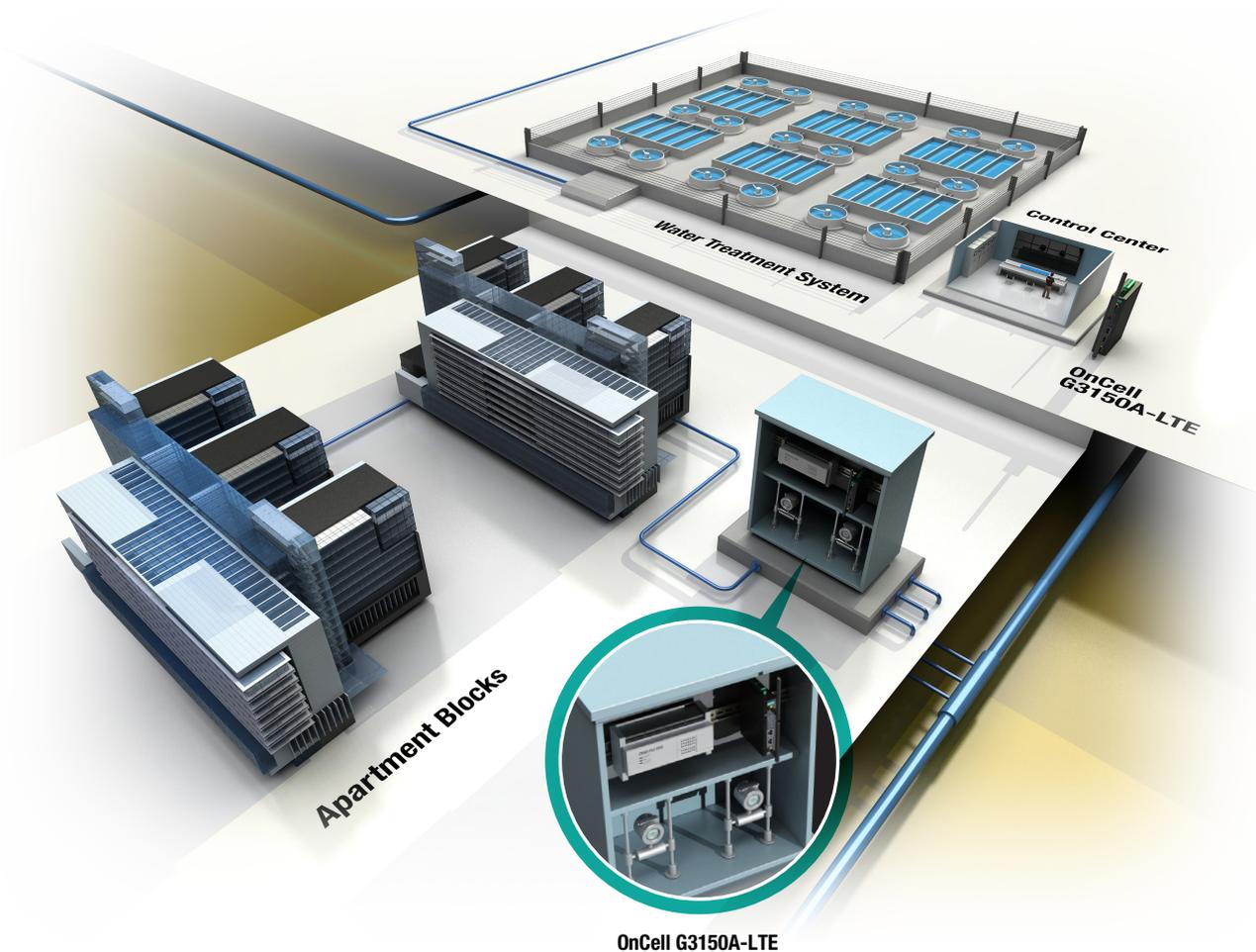
- An IP-based solution to enable reliable TCP/IP communication between the FRTUs and the FTUs
- GuaranLink technology that ensures reliable cellular connectivity between the FTUs and the FRTUs
- OnCell G3150A-LTE supports DI/DO and configuration of real-time SMS/email alerts
- Network operators can use SMS commands to remotely control devices, upgrade device firmware, and rectify faulty devices
- Both serial and Ethernet ports for flexible deployment of sensing equipment at the FTUs

# Water Treatment System

## Secure Cellular Communication for Water-Treatment Applications

### Background:

In a water-treatment plant, thousands of water quality parameters have to be measured and monitored as raw water goes through the treatment/purification process to produce drinking water that is safe for human consumption. In addition to water treatment/purification, the handling and distribution of water after it is processed is equally important to ensure the quality of drinking water. A common practice to avoid recontamination of water in the distribution system is the retention of residual disinfectants in the treated water. To ensure that the disinfectants do not reach dangerous levels, the quality of water is monitored by equipment installed inside roadside cabinets along the distribution lines. Water meters monitor the quantity of water consumed. Since these equipment cabinets are located in remote areas, a reliable, secure, and fast communication solution, such as an LTE cellular connectivity, which can send the consumption, diagnostic, and status parameters to the control center, is required for effective centralized management of the plant.



### System Requirements:

- Secure and reliable long-distance transmission of process parameters
- Access to private IP devices from the Internet for centralized management and control
- LED indicators for troubleshooting connection issues

### Why Moxa?

- Compliance with the technical requirements of the IEC 62443-4-2 cybersecurity standard to prevent unauthorized access of network resources
- Multiple VPN tunnel options for secure and reliable communication over a cellular network
- The LEDs on the front panel of the OnCell G3150A-LTE indicate the current signal stream and cellular mode status