



***BILLION***

# M2M/ODU Solution Guide

Driving the Internet of Things (IoT) and M2M Connectivity

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## Billion M2M series will intelligent platforms that deliver device connectivity, security, and processing power for IoT Applications

Billion has developed a series of advanced Industrial IoT M2M 5G/LTE routers, designed with critical communication features that emphasize superior high-performance, service reliability, and secure connectivity.

Tailored to a broad range of vertical applications, ranging from fleet management, smart bus, public safety, oil & gas industry to PoS, Kiosks, and ATM, Billion M2M series will prompt exceptional communication efficiency to protect the business asset and service consistency.

### > In-Vehicle

Include dual 5G/LTE interfaces, Wi-Fi hotspots, GPS, and a vibration-resistant design that enables them to provide high-speed 5G/LTE network connections in moving vehicles. Network surveillance cameras and other related devices can also be integrated to provide real-time bidirectional video and audio transmissions, as well as data access functions.



▶ Smart Bus



▶ Public Safety



▶ Aircraft/Ship

### > M2M/Industrial IoT

Integrate 5G/LTE technology, dual WAN ports, automatic failback, RS-232/RS-485 interfaces, and Modbus, as well as support for VPN to ensure data transmission security. Applications include industrial control, real-time monitoring, data collection, maintenance, and other vertical applications the industrial to improve communication efficiency, protect corporate assets, and ensure service consistency.



▶ Energy: Oil/Gas



▶ Optimizing Automation

### > Financial Field

Provide optimal network communication solutions for electronic transactions in retail stores, chain stores, POS systems, ATMs, multi-purpose kiosks, and vending machines. Auto failback/failover ensures uninterrupted network connectivity, while IPSec encryption guarantees data security and high-speed data encryption.



▶ Retail/Chain Store



▶ Finance Kiosk/ATM

# Run your business better with Industrial IoT /M2M solutions from BILLION



Real-Time  
Location Tracking



Wide Temperature



Surveillance



Rugged Design



Wi-Fi Hotspot



IPSec/GRE  
L2TP/PPTP

The expansion of Internet-connected devices is enormous, and global cellular M2M connections might reach close to one billion by 2022. The massive amount of data being generated every second by millions of people and machines has become a precious index for international telecom operators, carriers, enterprises, consumer-driven businesses to design their services and products gearing towards the interest of their customers.



Leveraging the enriching pool of Big Data and efficient connectivity, M2M is aimed to help businesses in boosting machine productivity, drive sales, and build new revenue-generating models.



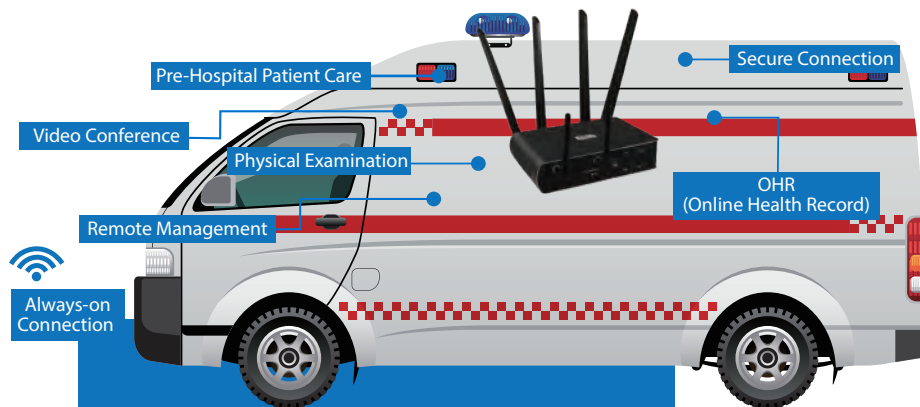


# Critical Communication Connectivity Solutions

A series of rugged industrial-grade 5G/LTE broadband routers for in-vehicle applications such as public safety (police cars, fire trucks, ambulances, etc.). Their functions include dual 5G/LTE interfaces, Wi-Fi hotspots, GPS, and a vibration-resistant design that enables them to provide high-speed LTE network connections in moving vehicles.

Network surveillance cameras and other related devices can also be integrated to provide real-time bidirectional video and audio transmissions, as well as data access functions.

# In-Vehicle Emergency Response Management Solution for Ambulance and Public Safety Applications

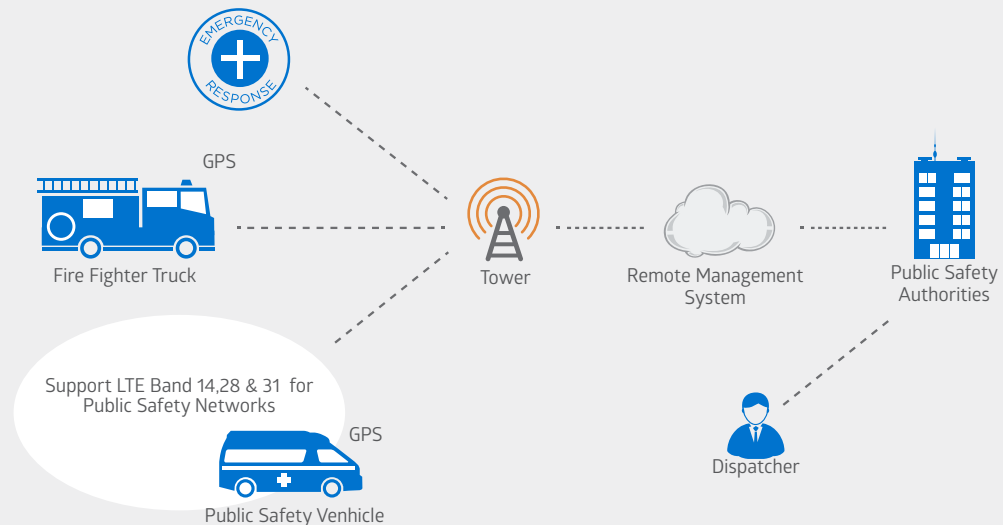


## Benefits

- Support digital imaging, video streaming, voice, and large data download.
- Enhance emergency responders operations by delivering high-data-rate services to full coverage areas.
- Allow mission-critical information to be exchanged in real-time, anytime, anywhere.
- Achieve database lookups, dispatch messaging, mug shots, video/surveillance feeds, and broadcasting within seconds

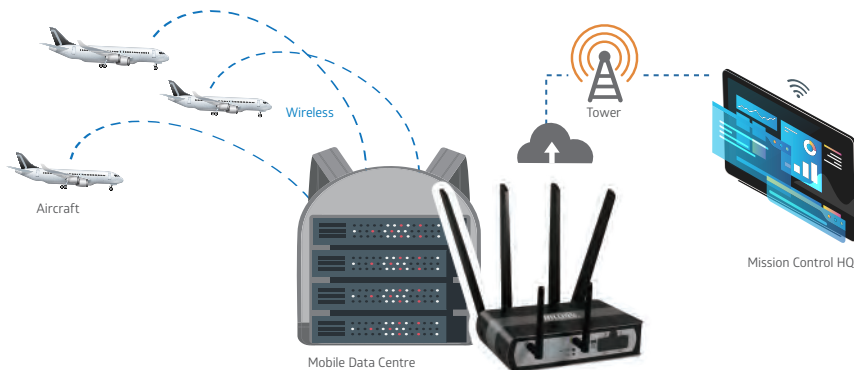
## ✓ Support LTE Band 14, 28, & 31 for Public Safety Networks

5G/LTE technology was adopted as the foundation of public safety networks mainly due to its national interoperability and support of a wide variety of broadband applications. Since ambulances and public safety vehicles are arranged for delivering patients with emergency-related illnesses to hospitals, the capability to provide available medical treatment on transportation to hospitals is crucial. Billion M500 serves as an excellent in-vehicle router collecting and analyzing patients' inquiry conditions, as well as providing substantial bandwidth to support instant images and video processing.



## Case Studies

Always-on connectivity in one single communication device used worldwide



Aircraft Telematics Data



Provided a reliable, secure always-on connectivity for the police force



Police In-Vehicle



Enhanced the emergency responder's procedures by carrying high-data-rate services



Fire Truck







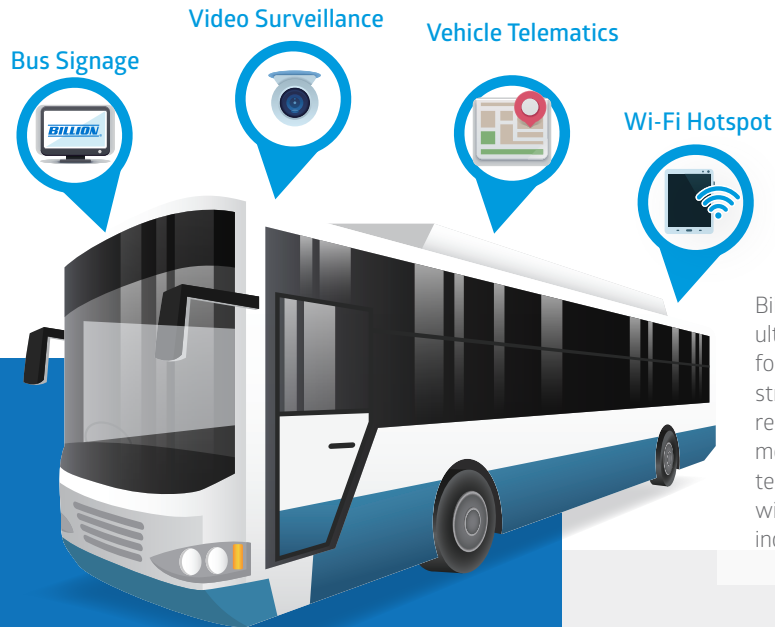
## In-Vehicle Solutions



Provide free or pay-for-use Wi-Fi Hotspot service in the moving vehicles and the delivery of driver and vehicle status back to the centralized dispatch center for real-time management.

Billion provides excellent Smart City and Smart Transportation 5G/LTE routers with dual radio and SIM, assisting system integrators in designing an always-on wireless architecture with the advancement of onboard mobile service and HotSpot captive portal.

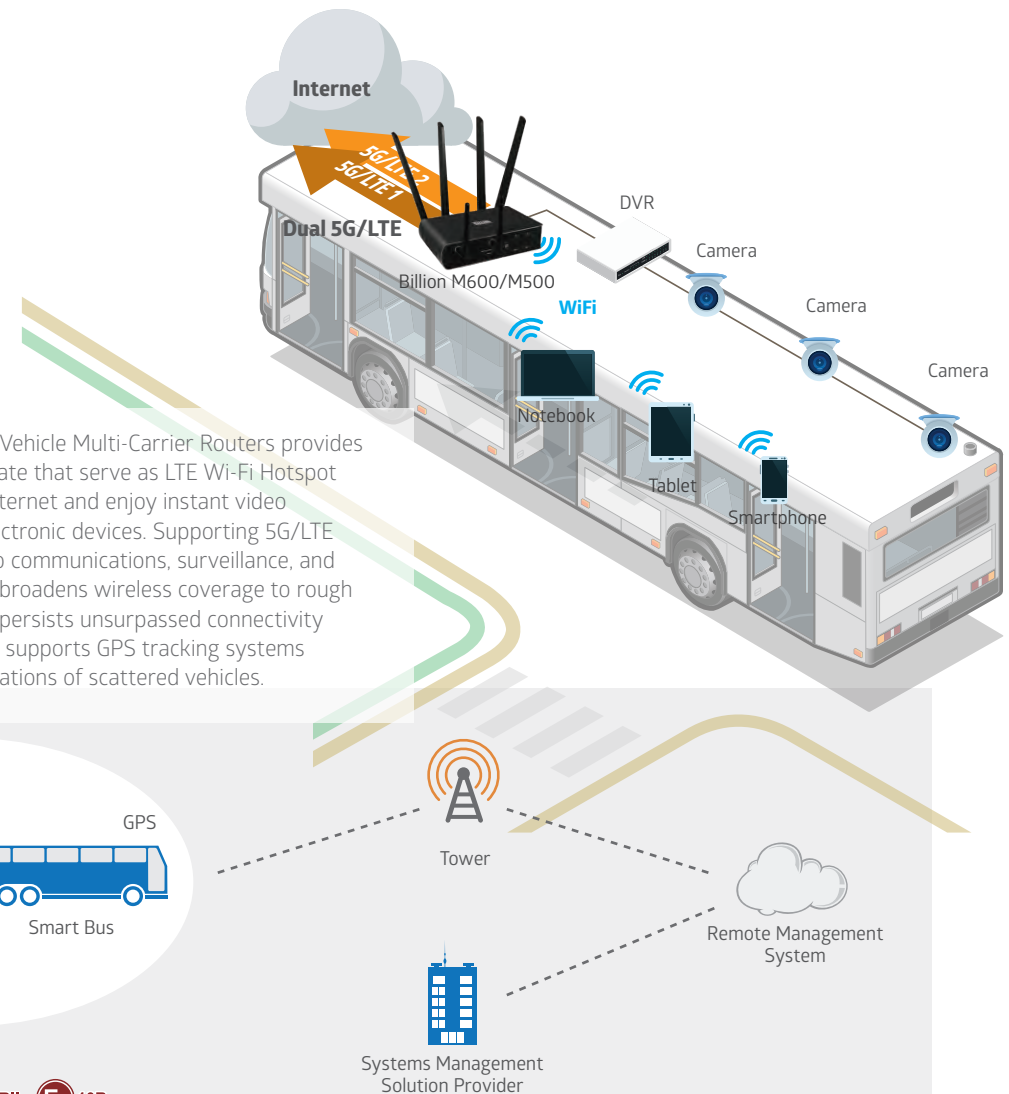
# Intelligent In-Vehicle WiFi Hotspot Solution for Smart Bus System



## Benefits

- Dual LTE interfaces enable reliable Internet access for in-vehicle broadband applications
- WiFi hotspot with captive portal offers wireless access in vehicle for passengers
- Ignition sensing controls M500 power on and off, and avoids draining the vehicle battery

Billion's 5G/LTE Industrial/In-Vehicle Multi-Carrier Routers provides ultra down-link and up-link rate that serve as LTE Wi-Fi Hotspot for passengers to surf the Internet and enjoy instant video streaming on all personal electronic devices. Supporting 5G/LTE real-time streaming for video communications, surveillance, and monitoring, Billion's Routers broadens wireless coverage to rough terrains and rural areas and persists unsurpassed connectivity without interruptions. It also supports GPS tracking systems indicating the geographic locations of scattered vehicles.

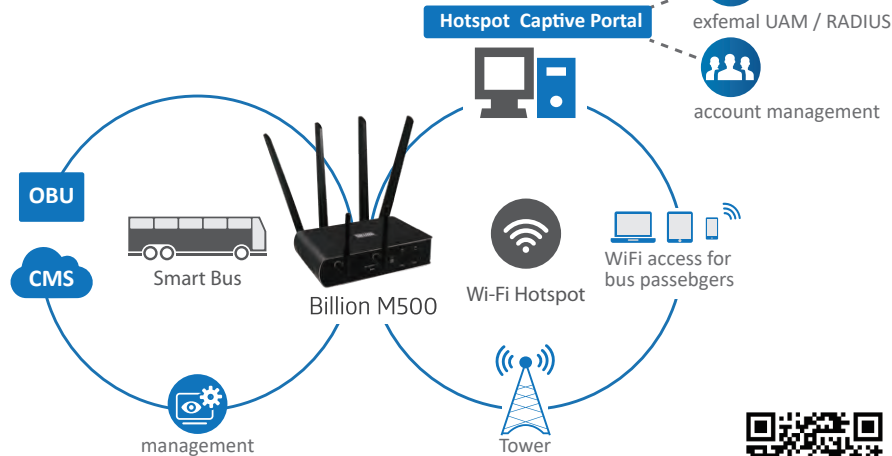


Supporting 10-56V DC power input designed for handling transient voltage and GPS/GLONASS for location tracking, Billion M500 is an industrial-grade, in-vehicle computing router that has passed the European E-Mark (R10 - R118) & NCC certification with authentication login to enable a Smart Bus experience.



## Case Studies

Provide free passenger Wi-Fi access to public transportation



Bus Operator



Enabling connectivity within mining vehicles in South Africa



Mining Vehicles

Use for payment and provide free Wi-Fi to customers



Food Truck



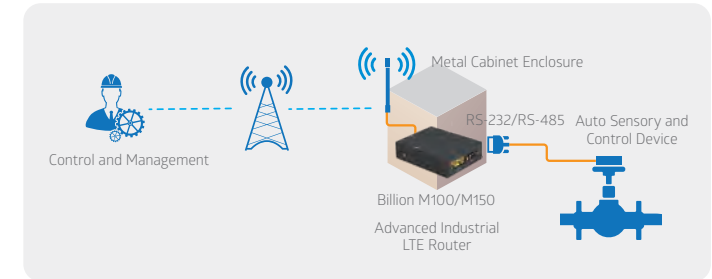
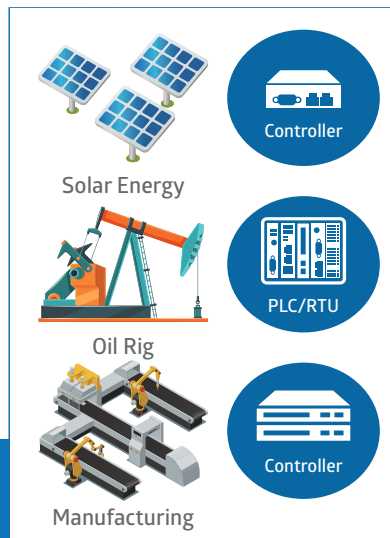
A photograph of industrial machinery, specifically large pipes and valves, with a blue color overlay. The pipes are dark blue and the valves have yellow and blue handwheels. The background is a solid blue color.

# M2M / Industrial IoT Solutions

Designed for M2M and Industrial IoT communication, our products integrate 5G/LTE technology, dual WAN ports, automatic failback, RS-232/RS-485 interfaces, and Modbus, as well as support for VPN (IPSec, PTP, 2TP, GRE, and OpenVPN) to ensure data transmission security.

Applications include industrial control, real-time monitoring, data collection, maintenance, and other vertical applications in the oil and gas industry to improve communication efficiency, protect corporate assets, and ensure service consistency.

# Oil and Gas Networking Solutions Using SCADA & 5G/LTE



**Billion M100/M150 is dedicated to providing broadband networks ensuring access to high-speed data anytime and anywhere**

Installed next to pipeline SCADA equipment which can monitor and collect critical information such as pressure, flow, and potential leaks of each pipeline serves as a communication backbone between field and central console by directly supporting SCADA via its RS-232 serial port and serial communication with Modbus, a master-slave protocol. By receiving the certification of UL Class I Division 2, ignition & explosion proof that can operate in hazardous environments where fire or explosive hazards may exist due to flammable gasses and vapors.

## Benefits

- Real-time monitoring and control of remote sites
- Remote workforce video, data & voice connectivity
- Video surveillance and security system for remote sites
- Real-time data collection from remote oil wells/rigs
- Rugged design withstands the most extreme environments



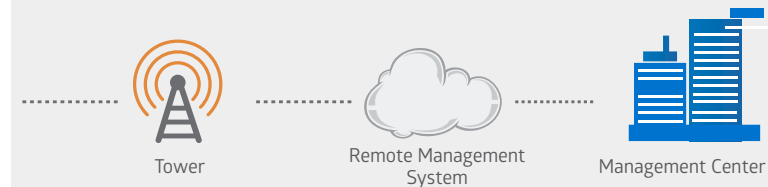
Oil Rig



Mining Equipment



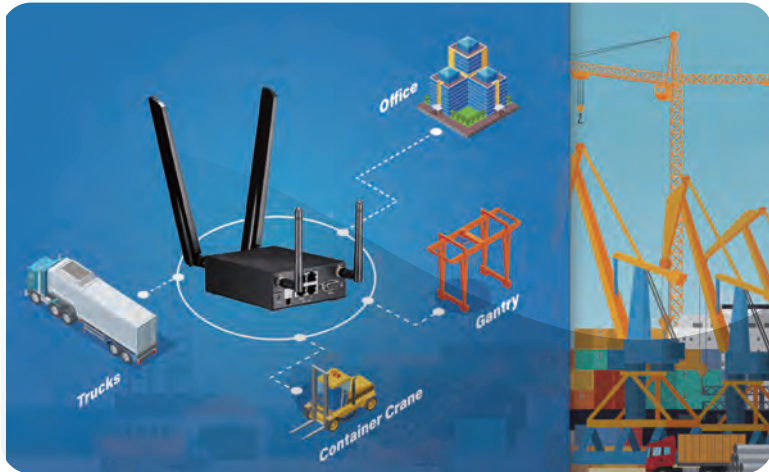
Solar Energy





## Case Studies

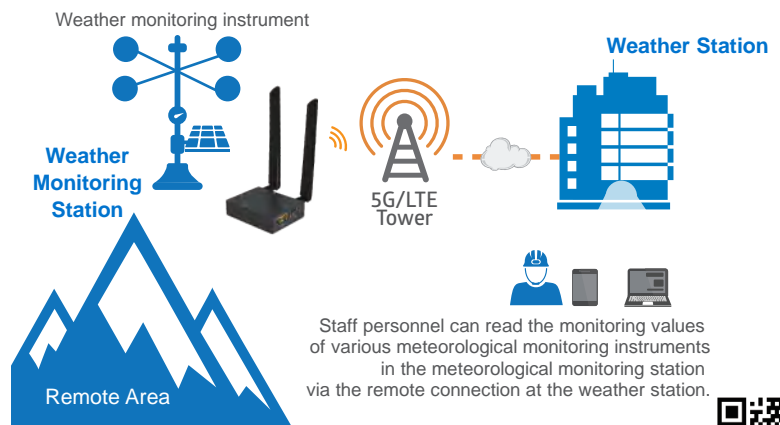
Rugged and compact M120N  
on trucks and gantry crane



Port Automation



Send meteorological data from the weather station,  
at 3858m above sea level

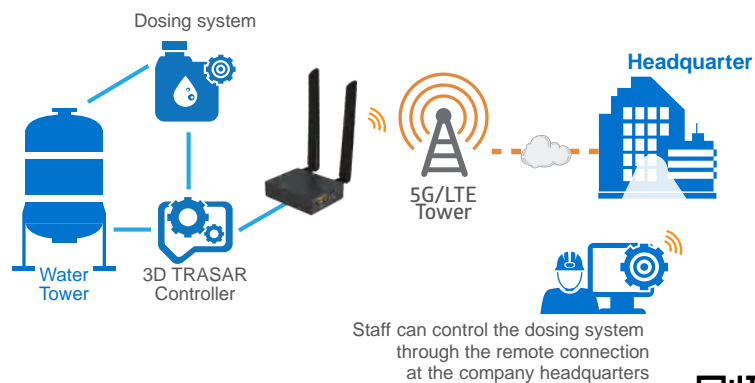


Weather Station



## Case Studies

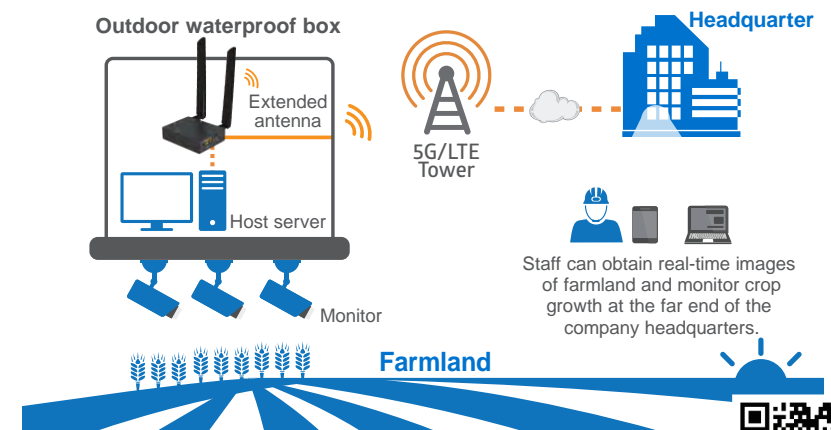
Keep operational efficiency  
of the water cooling system



Industrial Automation



Provide instant surveillance  
of high-value crops



Smart Agriculture







# Outdoor Solutions

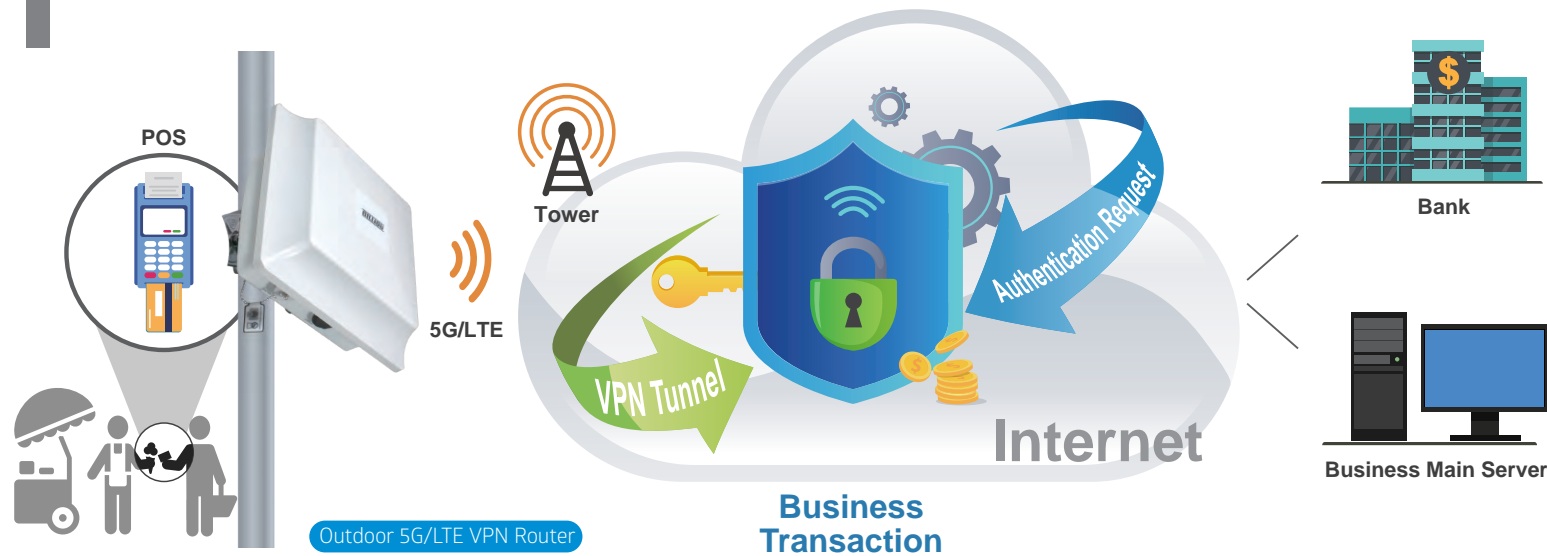
Designed to create new opportunities for network operators delivering a cost-efficient broadband service in rural and remote communities.

Billion's Outdoor 5G/LTE products have thousands of installed bases in North America and other areas.

Our Outdoor 5G/LTE routers offer superior RF engineering and a stable operating system for maximum 5G/LTE performance, as well as comprehensive networking solutions that are ready to be utilized in a diversity of revenue-generating applications and vertical markets.



# Outdoor 5G/ LTE Router with VPN



Billion's 5G/LTE outdoor router series can provide a robust LTE connection, enabling instant POS setup for credit card access in remote areas where there is no fixed-line Internet connection. Because of different local legislations, the POS system may need to be set up an Internet connection with the banks. Can establish a VPN connection with the central business unit where the main company server is located to process the transaction seamlessly.

## Covered with Industrial-Grade Ingress Protection Rating IP67

Embedded with the water-proofed capability that can sustain in the harshest outdoor weather without cracking the housing.



Can work reliably in freezing or extremely hot environments for extensive times



### Benefits

- IP67, Surge, and ESD protection
- Lightweight, compact and unobtrusive design
- Easy installation with PoE support
- Enterprise-class secure VPN connections, IPSec, OpenVPN, GRE, PPTP, L2TP
- Remote management with Billion CMS



**For delivering optimal network connectivity to all oil and mining sites, as well as serving as the reliable communication backbones for critical communication application**



# Outdoor 5G/ LTE Router

## Carrier-Grade Dual-Band Wi-Fi Hotspot



### Benefits

- Optimized antenna to extend the coverage to remote and rural areas
- Contain all Gigabit interfaces, including Ethernet and Wi-Fi
- IP67, Surge, and ESD protection
- Lightweight, compact and unobtrusive design
- Easy installation with PoE support
- Enterprise-class secure VPN connections, IPSec, OpenVPN, GRE, PPTP, L2TP
- Remote management with Billion CMS

HotSpot  
Welcome to my HotSpot!

Username

Password

Login & Accept Terms



Wi-Fi



5G/LTE



Tower

Outdoor LTE  
Dual-Band Wi-Fi Hotspot Router

### Instant Outdoor Hotspot setup with Outdoor 5G/LTE Wi-Fi Router

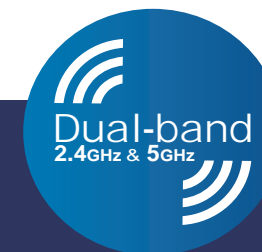
Integrate the 5G/LTE and Wi-Fi technology, providing instant high-performance LTE connectivity to outside harsh environments Wi-Fi Hotspot applications.

Supports Power over Ethernet (PoE)



## Simultaneous Dual-Band Wireless up to 2000Mbps

Concurrent dual-band 802.11a/n/ac(5GHz) and 802.11b/g/n(2.4GHz) Wireless LAN, allowing for Wi-Fi Hotspot functionality anywhere there is cellular signal.



## Case Studies

LTE outdoor router copes with limited Internet access in Amazon Jungle



Amazon Jungle

Deploying networks to support the needs of communities that do not have access to terrestrial connectivity



Harsh Environment

Provide last-mile broadband Internet access to rural regions



Agri-Valley Services

Grid companies access the prepaid billing data and activate the household electricity supply in real-time



LoRa Smart Meter



## Case Studies

LTE Wi-Fi hotspot  
in a harsh outdoor environment



Arapahoe Basin Ski Area

Providing Wi-Fi access allows spectators  
to share their experiences online



West Central Wireless

Wi-Fi solution to provide seamless access  
throughout the resort



Breezy Point Resort

Establishing smart control  
of the housing complex heating systems



Heating Systems

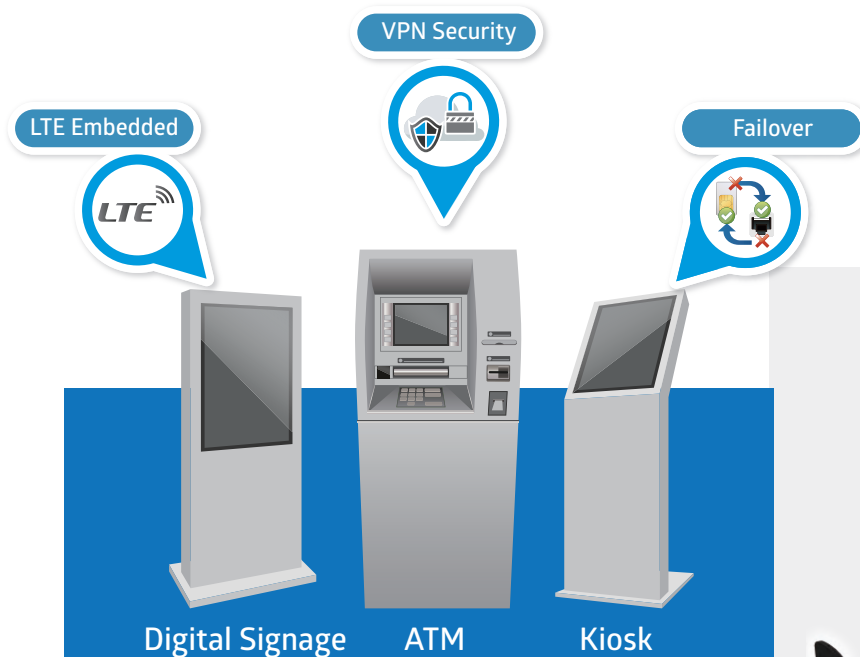
A close-up photograph of a person's hands holding a credit card over a payment terminal. The background is blurred, showing a retail environment. The text 'Commercial Application Solutions' is overlaid on the image.

# Commercial Application Solutions

Provide optimal network communication solutions for electronic transactions in retail stores, chain stores, POS systems, ATMs, multi-purpose kiosks, and vending machines.

Auto failback/failover ensures uninterrupted network connectivity, while IPSec encryption guarantees data security and high-speed data encryption. The Gigabit Ethernet port can also be connected to other high-speed networks for high-efficiency data transmission.

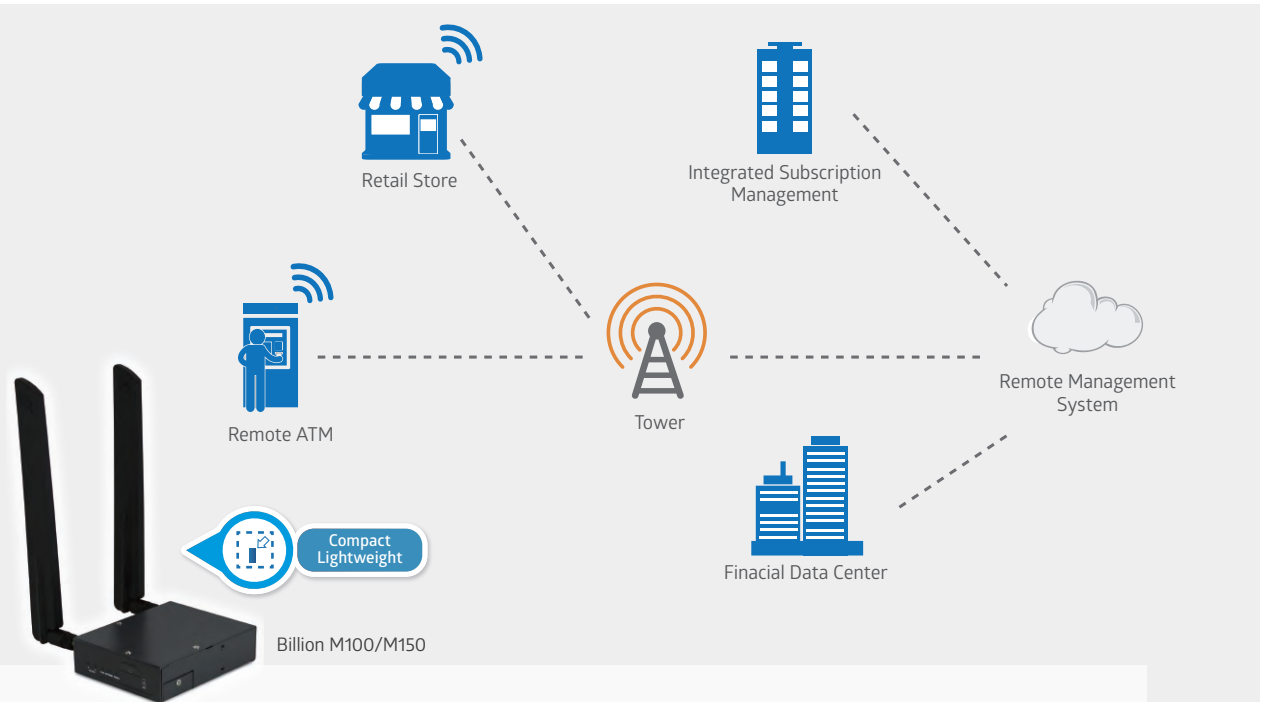
# Financial Field and Retail PoS, ATM, Kiosks Solutions with Enhanced Data Security



## Benefits

- Either primary connection or backup connection when wired connections are unavailable or non-existent.
- Fixed wireless communications platform enabling real-time 4G Cellular data connectivity for existing serial devices & Ethernet network.
- Reliable and cost-effective alternative solution for business continuity.
- Always-online LTE Bridge / IP-Pass through Mode

Provides critical 24/7 internet connectivity and encrypted information transfer between stores and head office to prevent data loss and customer information leakage. Multi-WAN solution (xDSL and 5G/LTE) provide always-on Internet connectivity supporting a seamless data and credit card transaction process regardless of either the wireless or wired connection was unavailable, as well as VPN functionality to secure transaction data for geographically dispersed retail and chain stores throughout the country. Adapt with different IPs on both xDSL and 5G/LTE network in various geography locations with strong signal strength.

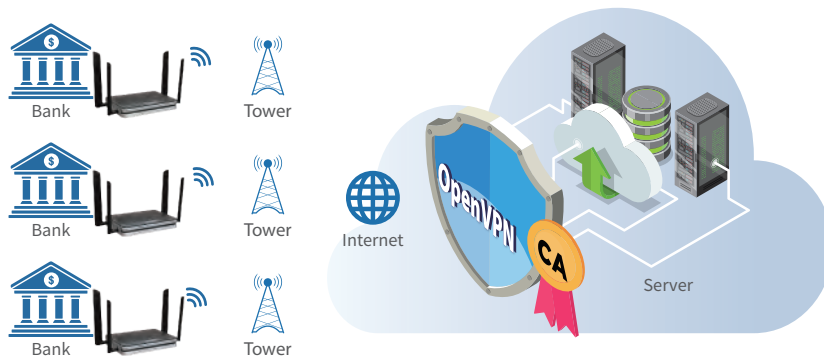


Provide a higher bandwidth, lower latency, and improved spectrum efficiency. These advantages not only allow for fast electronic transactions, but they also enable new business models. Helping retailers meet consumer expectations and become more competitive by providing wireless technology solutions that quickly integrate with Point-of-Sale (PoS) Systems, Automated Teller Machines (ATMs), Multi-purpose Kiosks, and Vending Machines.



## Case Studies

A nationwide bank realized secure and stable network service via LTE wireless VPN router



**Banks Network Service**



Create a secure, continuous, and dependable network connection



**Retail Store**

Promote and sell LTE services and products in over 500 Kiosk sales points nationwide



**Kiosk Application**

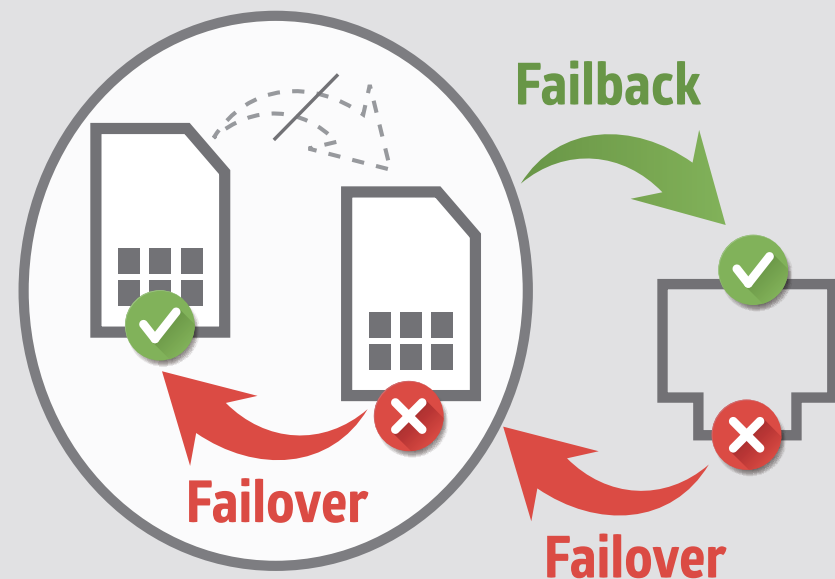
# Developing Seamless Business Continuity and Operation with Auto Failover/ Failback

A reliable Internet connection is essential for a business to run smoothly and a temporary disconnection can quickly lead to loss of productivity, revenue, and even damage the business reputation.

Compatible with all kinds of xDSL and Fiber modems, Billion M2M Series enables businesses to upgrade the current network without changing the system architecture.

Integrating with 5G/LTE wireless and EWAN interfaces, Billion M2M Series ensures seamless Internet connectivity via superior failover/failback functionality.

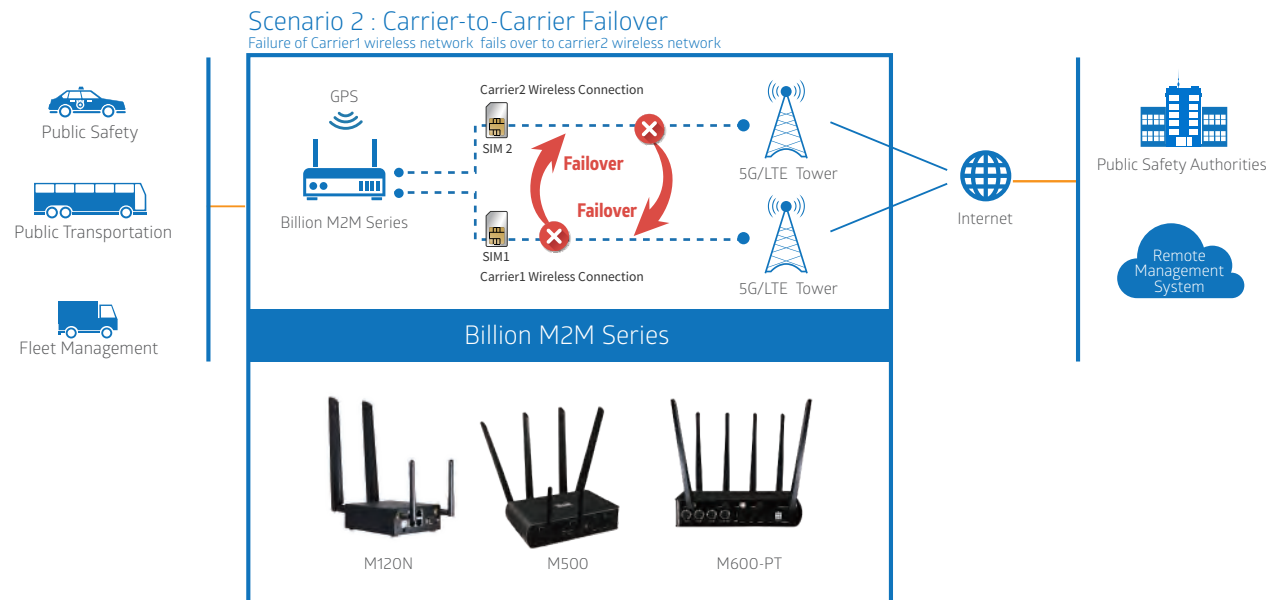
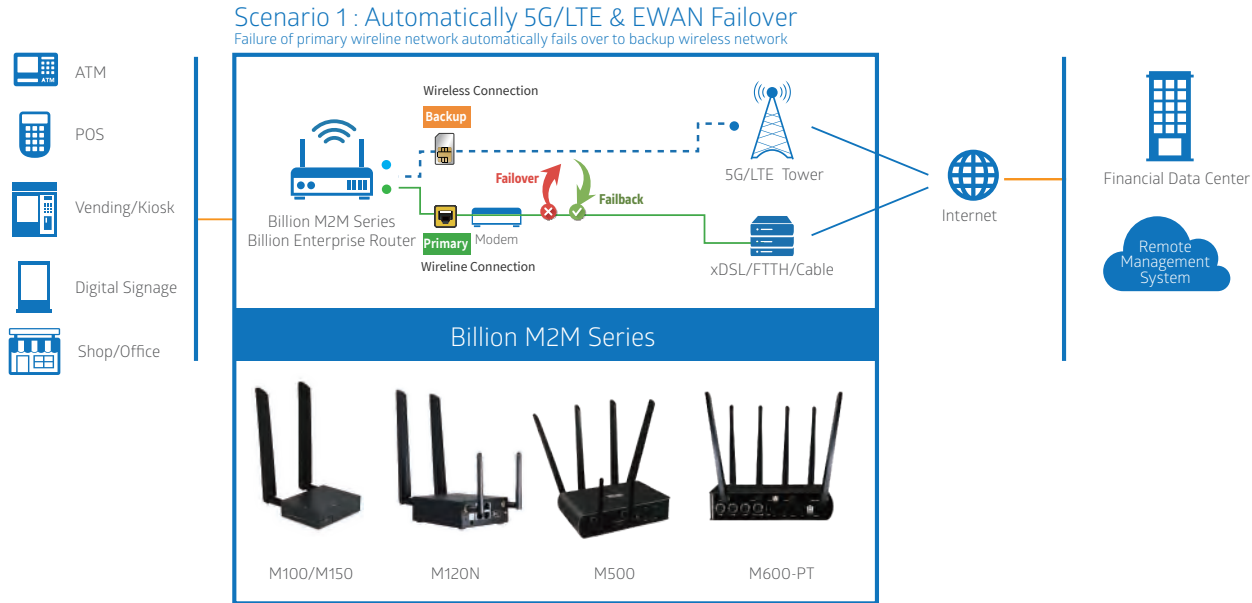
As the wired connection fails, the wireless interface will instantly back up the connection to continue to operate in case of any system failure.



# Applications

## Failover/ Failback

### Critical Communication and Enterprise Failover Manager





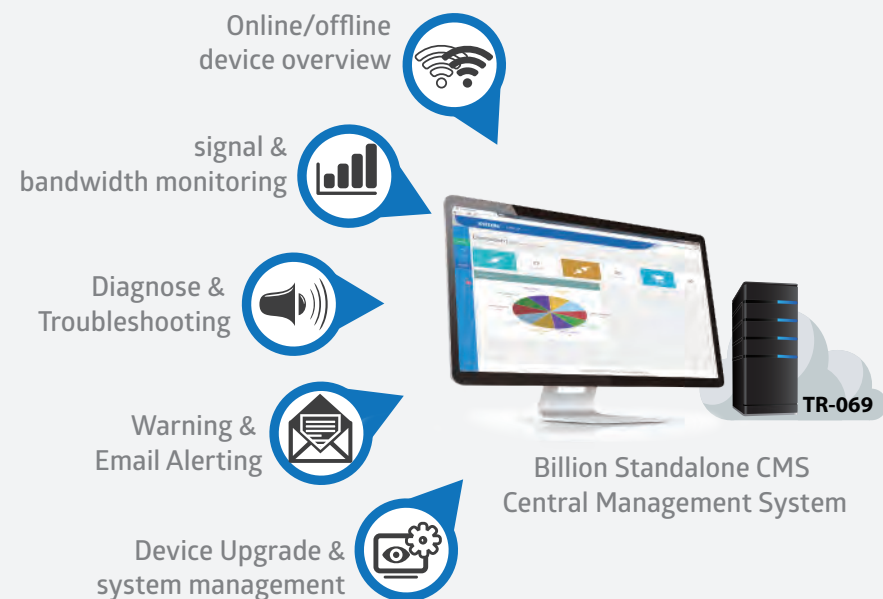
# Billion CMS

## Central Management System

Billion CMS, a central management platform, is designed for service provider and system integrator to remotely control and manage Billion 5G/LTE routers, M2M routers and VDSL/ADSL business routers, enabling users to minimize deployment, lower supporting service expenses and maximize operational efficiency.

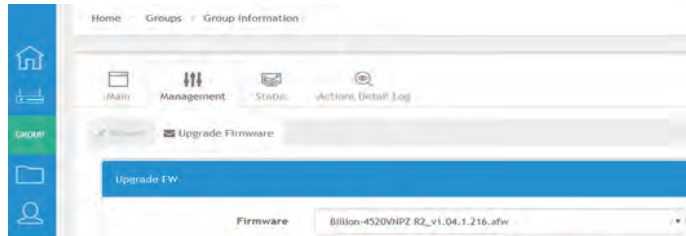
### Key Features

- Dashboard for online & offline devices status
- Signal & Bandwidth Usage Monitoring
- Diagnostic Troubleshooting
- Upgrade firmware to the device
- Group and Schedule Management
- Auto Provision Management
- Email Alerting
- Warning Messages on Critical Events
- Generate Report
- Factory reset and Reboot device
- Detailed Historical Device log and task log
- LAN setting to device



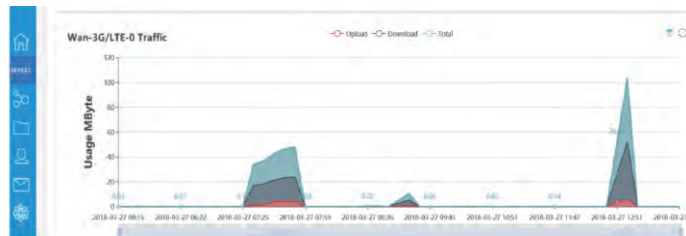
# Applications

Billion CMS



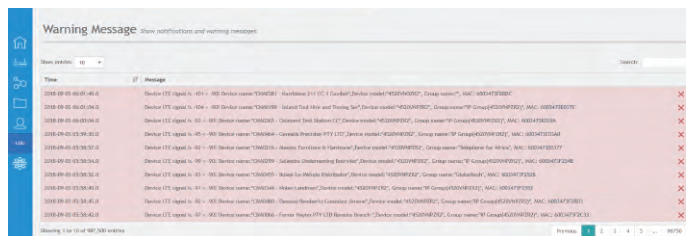
## Remote Upgrade, Reboot, and Configuration

Billion CMS is able to perform the remote firmware upgrade, device reboot, the load default setting, and CPE configuration backup and restore. It can remotely configure the LAN setting including IP address, DHCP address and DNS, helping the technical support staff quickly determine LAN side issues reported by users.



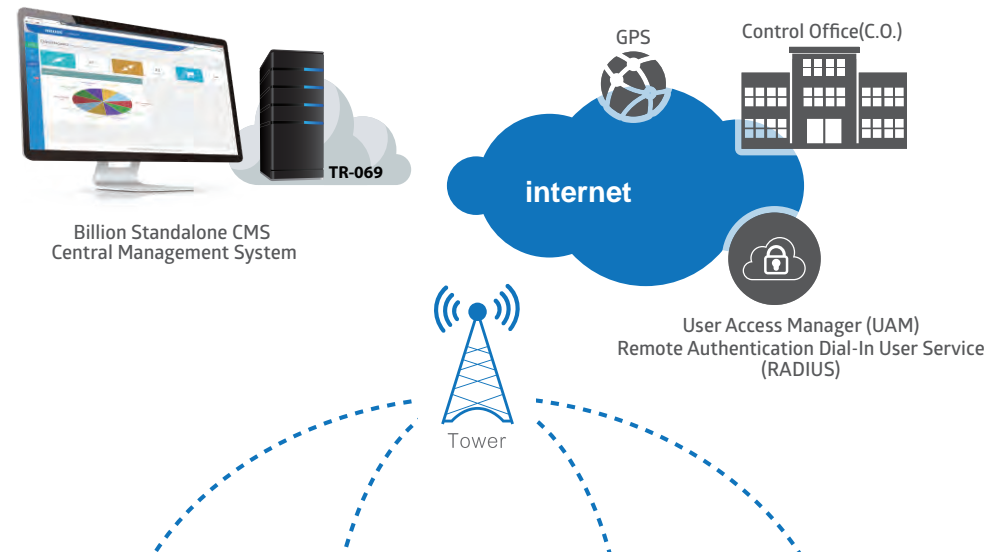
## Monitor Internet Signal and Bandwidth Usage

CMS can track internet quality via RSSI, RSRP, RSRQ, and SINR. CMS can also monitor LTE bandwidth usage by time.



## Warning Messages on Critical Events

Users can receive warning messages on critical events, such as low signal or device offline. Users can set up different alerting notifications by themselves.



oil Well



Vending/Kiosk



ATM



Smart Bus



Public Safety



Fleet Management

## About BILLION

Billion Electric Co., Ltd. (Taichung: 3027, trading as Billion) is a leading global information and communication technology (ICT) solutions, provider. We enhance life and communication efficiency through a better-connected world, acting as a responsible corporate citizen, an innovative enabler for the information society, and a collaborative contributor to the industry. Billion is dedicated to creating optimal value for telecom operators and is determined to pursue the position of industry vanguard by providing our current and future customers with the highest quality of technology outputs.

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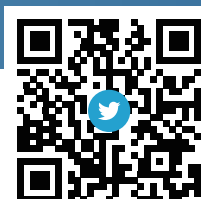
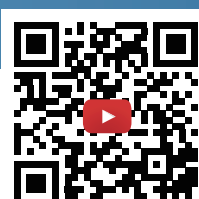
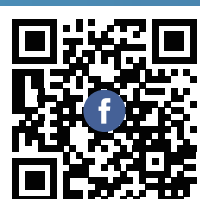
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