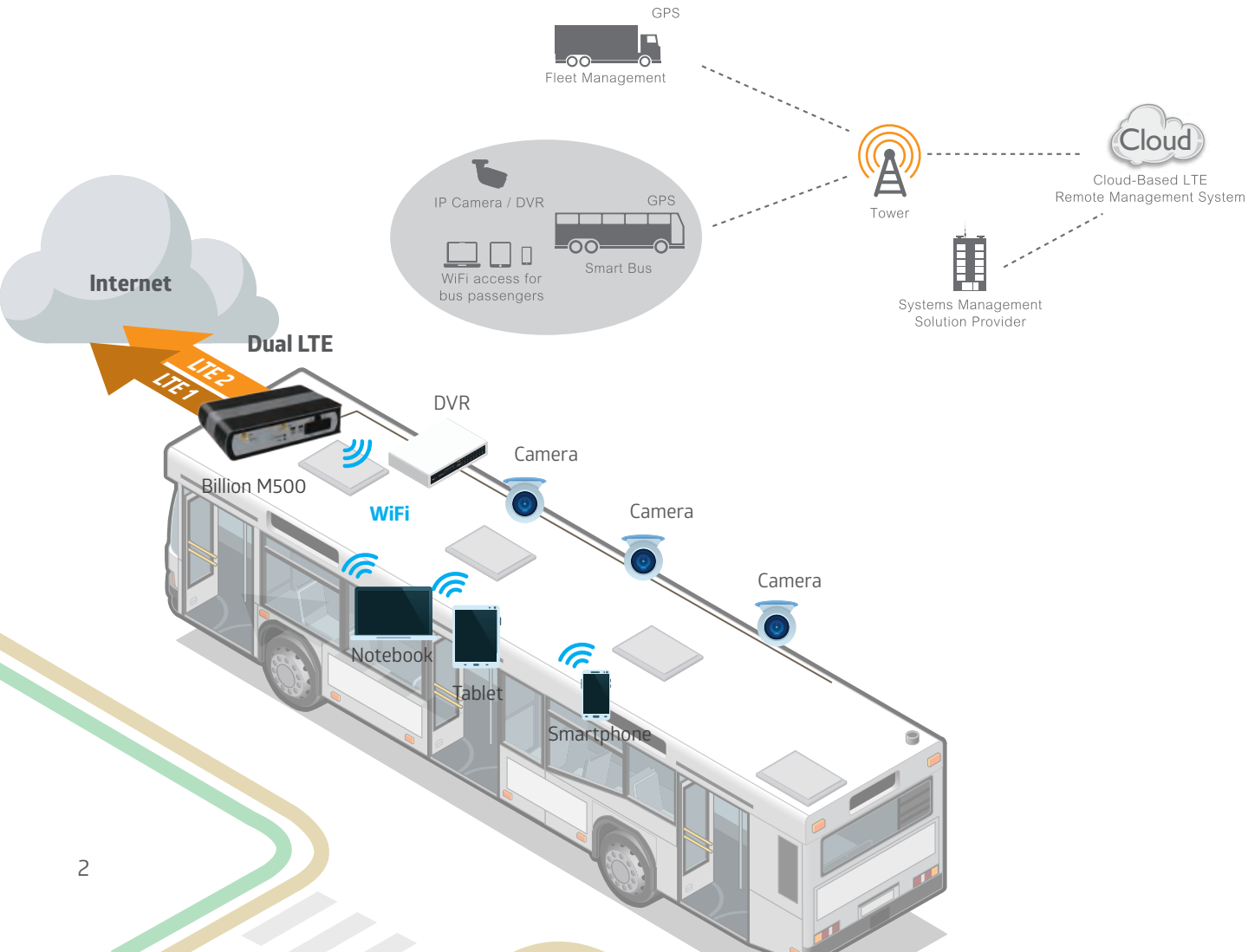
Billion M2M Solutions

Driving the Future of Mission-Critical and In-Vehicle Broadband Communications

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

Bus companies look for reliable Smart Bus solutions that can provide free or pay-for-use WiFi 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 M500 provides an excellent in-vehicle networking CPE equipped 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. 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 as passed the European E-Mark (E1) certification with authentication login to enable a Smart Bus experience.



Solution

Billion M500 offers OBD and on-line GPS tracking system indicating the geographic locations of scattered vehicles, providing ultra down-link and up-link rate that serve as 4G/LTE Wi-Fi Hotspot for passengers to surf the Internet and enjoy instant video streaming on all personal electronic devices. Supporting 4G/LTE real-time streaming for video communications, surveillance, and monitoring, Billion M500 broadens wireless coverage to rough terrains and rural areas and persists unsurpassed connectivity without interruptions

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 M500

4G/LTE Industrial/In-Vehicle Multi-Carrier Router

- Offers dual 4G/LTE broadband connectivity (3G Fallback is optional)
- Multi-WAN interfaces: Dual SIM/Dual Radio and EWAN for network resilience and reliable connectivity
- Embedded GPS option for real-time asset tracking and location data-based applications
- Local and Remote Management via Web GUI, SNMP or TR-069
- QoS (Quality of Service) with traffic prioritization based-on IP protocol, port number, and IP address
- Compact and unobtrusive design Ignition power control option when mounted within vehicles
- Hardened enclosure with Industrial-graded components
- Withstand heat, humidity and protect from shock, vibration, etc.
- United States Military Standard MIL-STD-810G Compliant

Billion Fleet Management Tracking Solution Maximizes Dispatching Efficiency

Fleet management ompanies are increasingly embracing the IoT vehicle tracking service to ensure the highest service productivity with enhanced safety and vehicle asset management. Billion Fleet Management solution empowers operators and service providers not only to maximize fleet efficiencies and performance, but also to consolidate billing and invoicing functionality to deliver real-time communication with customers. Billion M500 provides a bi-directional connection between drivers and dispatchers to collects all intra-vehicle data, including engine speed, tire pressure, improper braking, throttle recordings, as well as provide a detailed record of vehicle driving operations and reduce unnecessary costs.

Benefits

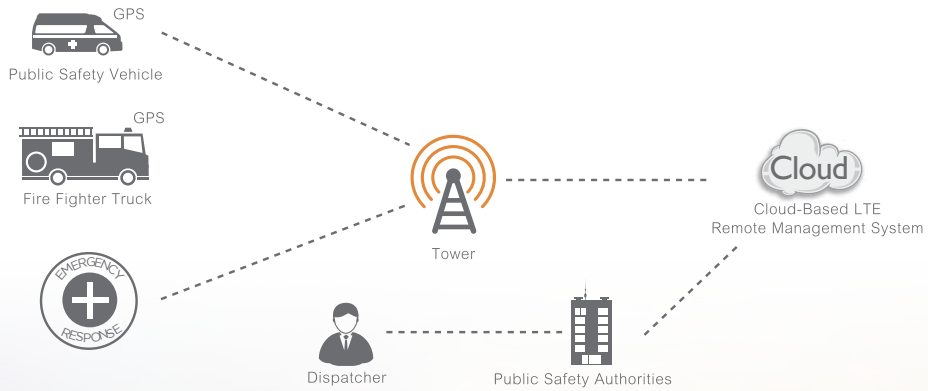
- Measure drivers' behaviors and monitor vehicle fleet maintenance
- Increase efficiency through workflow load balancing & failover and failback
- Equipped with On-Board Diagnostics (OBD) to maximize the scalability of vehicle asset management
- Real-time vehicle status and live email alerts
- Efficient communication between driver and dispatchers

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

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 illness to hospitals, the capability to provide available medical treatment on the transportation to hospitals is crucial. M500 serves an excellent in-vehicle router collecting and analyzing patients' inquiry conditions, as well as providing substantial bandwidth to support instant images and video processing.

Solution

Billion M500 provides dual LTE modules, enable in-vehicle WiFi, real-time imaging streaming, and medical data transferring with instant failover capability. Ambulance staff is allowed to examine patient media records, plan driving routes, and communicate with emergency room and fleet dispatchers to allocate the available vehicle resource to resolve emergency scenarios. The dual-Radio supports multi-channel video recording and streaming with always-on, extensive broadband feasibility. Thus, Billion M500 can transmit the images of a patient's injuries from the ambulance to the emergency room for treatment advice and minimize the gaps of medical care upon arrival at hospitals.

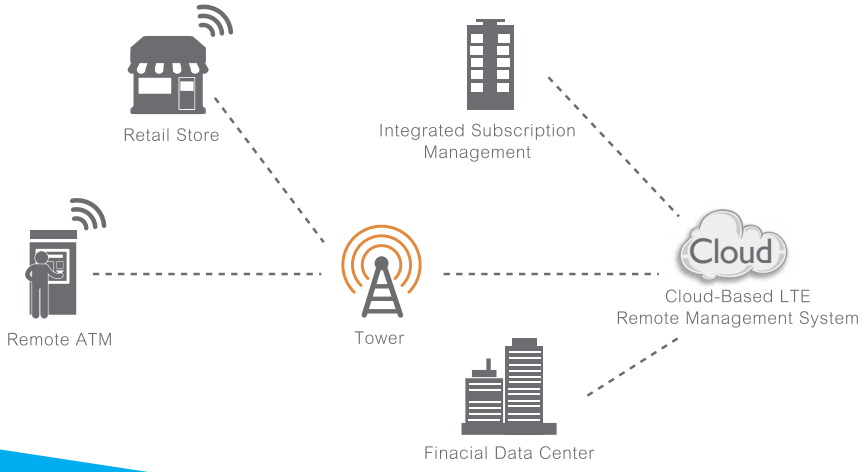


Benefits

- 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 rapid boot up and wake-on-call functions.
- Reduce delays and enhance driving safety through the integration of tire pressure monitoring system and forwarded collision warning.

Billion Finance and Retail PoS, ATM, Kiosks Solutions with Enhanced Data Security

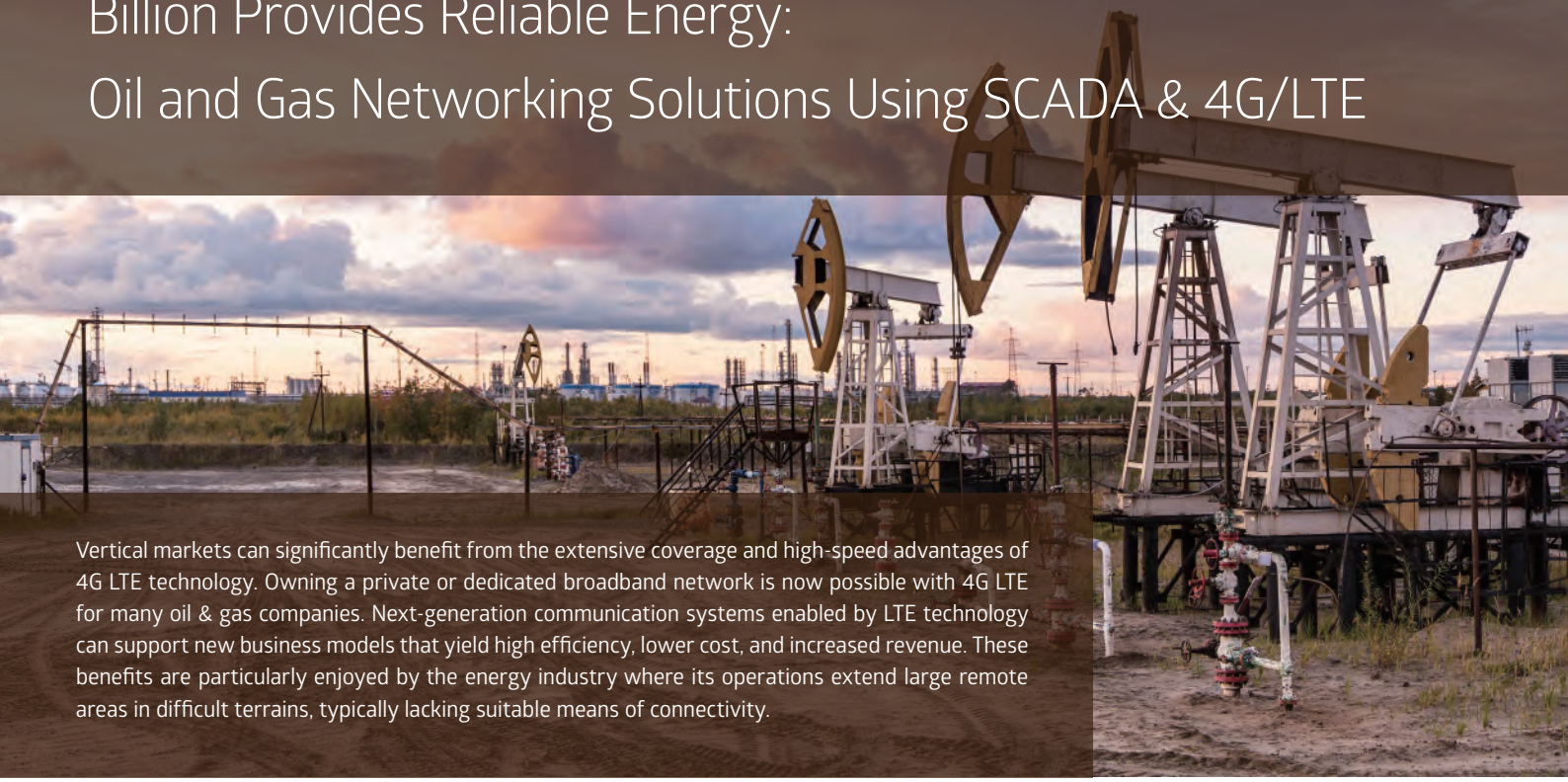
Billion M100 provides a higher bandwidth, lower latency, and improved spectrum efficiency. These advantages not only allow for fast electronic transactions, but they also enable new business models such as targeted marketing, location-based offers, interactive services and an overall improved customer experience. Billion M100 is 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.



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 4G/LTE Bridge / IP-Pass through Mode

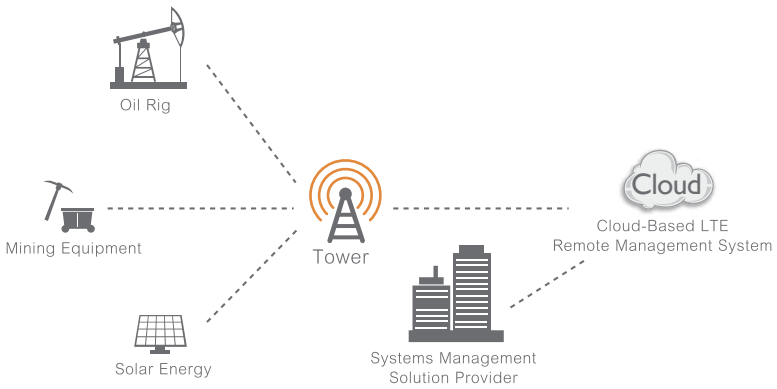
Billion Provides Reliable Energy: Oil and Gas Networking Solutions Using SCADA & 4G/LTE



Vertical markets can significantly benefit from the extensive coverage and high-speed advantages of 4G LTE technology. Owning a private or dedicated broadband network is now possible with 4G LTE for many oil & gas companies. Next-generation communication systems enabled by LTE technology can support new business models that yield high efficiency, lower cost, and increased revenue. These benefits are particularly enjoyed by the energy industry where its operations extend large remote areas in difficult terrains, typically lacking suitable means of connectivity.

Solution

Billion M100 is dedicated to providing the broadband networks ensuring access to high-speed data anytime and anywhere. Such benefits provide tremendous opportunities for this industry to improve efficiency and reduce the cost of doing business. Billion M100 energy companies to reach their business objectives by continuously providing cutting-edge technologies and products that focus on this industry. Real-time video streaming and surveillance are helpful tools to reduce travel time and costs that substantially improve collaboration and shortens the decision-making process. Billion M100 supports data rates of 150Mbps download and 50Mbps upload that can easily support the transmission of high-quality video images.



Benefits

- Real-time monitoring and control of remote sites
- Mobile and remote workforce video, data & voice connectivity
- Video surveillance and security system for remote sites
- Real-time telemetry data collection from remote oil wells/rigs
- Rugged design withstands the most extreme environments
- High gain YX antenna network range can span up to 40% greater than essential LTE coverage

Billion M100

Advanced Industrial 4G/LTE Router

- 2 Gigabit Ethernet Interfaces
- Multiple APNs and Dedicated Bearers
- RS-232 Serial data connectivity
- Enterprise Routing & VPN
- Small form factor, fits in the palm on your hand
- Simplified deployments, quickly mounted discretely anywhere
- DIN rail and wall mount options
- Automatic Fail-Over between 4G Cellular and EWAN

Product	Billion M100	Billion M500
WAN Interface		
3G/4G LTE	●	● (x2)
ADSL only	-	-
V/ADSL	-	-
EWAN	-	-
Hardware Interface		
SIM slot	1	2
Fast Ethernet	-	-
Giga Ethernet	2	4
USB 2.0	-	2
802.11n (2.4 GHz)	-	300Mbps
802.11ac (5 GHz)	-	-
dual band 802.11n	-	-
GPS	●	●
mini USB	-	● (x2)
Serial port (RS-232)	DCE (DB-9)	-
Features		
VPN	●	●
IPv4 / IPv6	●	●
VLAN_MUX	-	-
Failover / Fallback	●	●
Load balance	●	●
Dual APNs	●	●
Dual firmware images	●	●
Metal casing	●	●
Hardware Specifications		
Dimensions	4.29"(W) x 1.17"(H) x 3.43"(D) (109mm x 29.7 mm x 87 mm)	7.83" x 5.21" x 1.84" (198.85 mm x 132.4 mm x 46.7mm)
Power Requirements	Input: DC 9V~56V	Input: DC 10 ~ 56 VDC
Operating Environment	-20 to 60º C	-40°C ~ 60 °C
Humidity	20 ~ 95% non-condensing	20 ~ 95% non-condensing

Billion M500
Specifications

Availability and Resilience
- Dual LTE Modules
- Auto fail-over and failback
- Load Balancing

Supported Frequency Bands
- Primary LTE: FDD and TDD (Bands depend on module configuration) *1
- Secondary LTE: Optional (Bands depend on module configuration) *1

Network Protocols and Features
- IPv4, IPv6, IPv4/IPv6 dual stack*2
- NAT, Static Routing and RIP-1/2
- Virtual Server and DMZ
- SNTP, DNS relay and DDNS
- IGMP Snooping and IGMP Proxy
- Supports DHCP server/client/relay
- Supports port-based Virtual LAN (VLAN)

Quality of Service Control
- Traffic prioritization based-on IP protocol, port number and IP address

Firewall
- Built-in NAT Firewall
- Stateful Packet Inspection (SPI)
- Prevents DoS attacks including Land Attack, Ping of Death, etc.
- Access Control
- IP Filtering, MAC Filtering, URL Filtering
- Password protection for system management
- VPN Passthrough

Wireless LAN
- Compliant with IEEE 802.11n standard Auto fail-over and failback
- Backward compatible with IEEE 802.11b and 802.11g standards
- Up to 300Mbps wireless operation rate
- WPS (Wi-Fi Protected Setup) for easy setup
- 64/128 bits WEP supported for encryption
- Wireless security with WPA-PSK, WPA2-PSK, Mixed WPA/WAP2-PSK
- AP and WDS Operational Modes
- Multiple SSID (4 SSIDs), BSSID
- Wireless MAC Filtering
- Wireless Client Isolation

USB Application Server
- Storage: FTP server and Samba server

Management
- Web-based GUI for remote and local management
- Firmware upgrade and configuration data upload and download via web-based GUI
- CWMP(TR-069), SNMP
- Universal Plug & Play (UPnP)
- Access control by services or protocols
- Network Time Protocol (NTP)
- Syslog monitoring
- Physical layer/protocol diagnostic test tool

Hardware Specifications

Physical Interface
- Antenna:
  - Wireless: two(2) detachable antennas
  - 3G/4G LTE: four(4) detachable antennas
  - GPS: one (1) detachable antenna
- WAN: 3G/4G LTE
- USB 2.0 : two (2) ports
- Mini USB Console: two (2) ports
- Ethernet LAN: 4-port 10/100/1000Mbps auto-crossover (MDI/ MDI-X) switch
- SIM Card: two (2) slots
- Reset Button
- Wireless On/Off and WPS Push Button
- Power jack
- LED Indicators

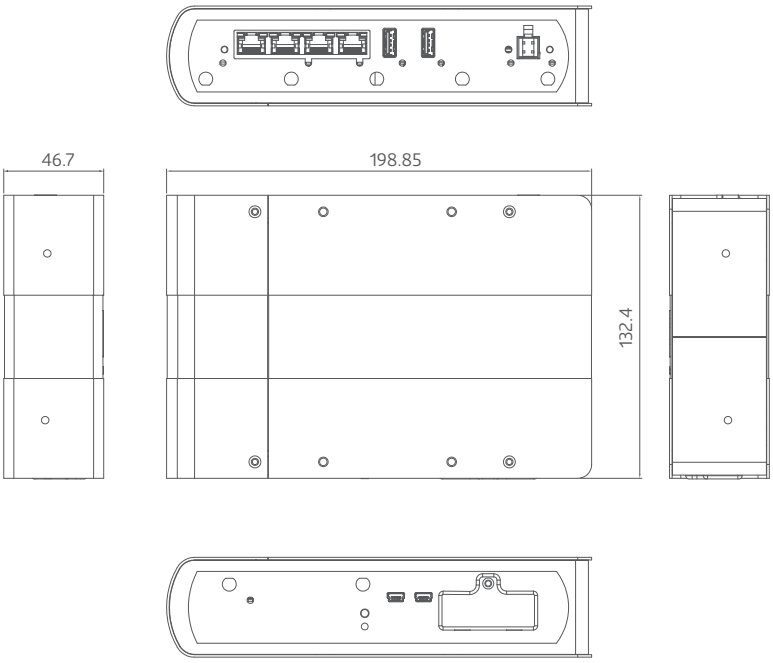
Power Specifications
- Input: DC 10V~56V

Physical Specifications
- Dimensions: 7.25"(W) x 1.91"(H) x 5.31"(D) (184.25 mm x 48.5 mm x 135 mm)
- Weight: 1.07kg (2.36lbs)

Operating Requirements
- Operating: -40°C to 60°C (-40°F to 140°F)
- Humidity: 20 ~ 95% non-condensing

*** Notes:**
1. The 4G LTE is dependent on your local service provider.
2. Future release and only upon request for Telco/ ISP tender projects.
3. Specifications in this datasheet are subject to change without prior notice.

Dimensions



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Billion M100
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- Auto fail-over and failback

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Hardware Specifications

Physical Interface
- Antenna:
  - 3G/4G LTE: two (2) detachable antennas
  - GPS: one (1) detachable antenna
- WAN: 3G/4G LTE (and/or ETH WAN option)
- RS-232 (DCE, DB-9): one (1) port
- Ethernet LAN: 2-port 10/100/1000Mbps auto-crossover (MDI/ MDI-X) switch
- SIM Card: one (1) slots
- Reset Button
- Power Connector: 2-pin connectors
- LED Indicators

Power Specifications
- Input: DC 9V~56V

Physical Specifications
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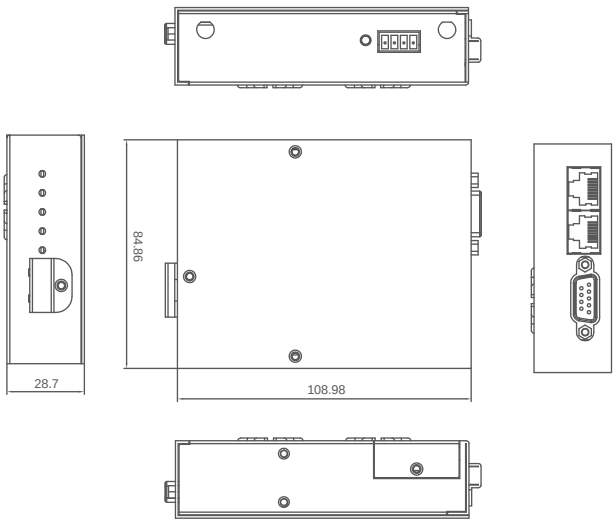

Unit:mm

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About BILLION

Billion Electric Co., Ltd. (www.billion.com, Taiex: 3027, trading as Billion) is the 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's over 900 employees worldwide are committed to creating the optimal value for telecom operators and determined to pursue the position of industry vanguard by providing our current and future customers the highest quality of technology outputs.

Billion Electric Co., Ltd.

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