



ZigBee ADSL2+ VPN Firewall Gateway

The Billion SG6410 is an advanced compact networking device designed for users to enjoy real-time power management and secure high-speed Internet access. It supports the latest ADSL2/2+ technology enabling a high-speed data rate of up to 24 Mbps. With built-in ZigBee function, the Billion SG6410 can communicate with ZigBee-based devices such as smart meters, IHD (In-home display) devices, load-control devices, and PCT (Programmable Communicating Thermostat) devices. Via Internet access, the user can remotely monitor and manage energy usage or event control appliances that are connected to a Billion SG3010 ZigBee meter. An integrated IPSec VPN feature allows users to establish encrypted private connections utilizing up to 16 tunnels over the Internet, so that power consumption information will not be accessed by unauthorized users.

Instant and Real-time Remote Management

The SG6410 provides full featured connectivity and allows a greater diversity of devices and applications that connect to the ZigBee network. It can serve as data concentrator capable of collecting, managing, and controlling a ZigBee meter and other ZigBee-based devices in a ZigBee HAN (Home Area Network). The SG6410 Graphic User Interface enables easy configuration of monitoring real-time power usage and instant switching on/off specifically for home appliances that are connect to a ZigBee meter, ie. Billion's SG3010. Remote in-home energy management such as switching on your air conditioner on the way home is easy using your 3G phone over Internet.

Diverse ZigBee Network Deployment

Compliant with IEEE 802.15.4 and ZigBee PRO standard, the SG6410 supports various network topologies such as mesh, star, cluster tree, and hybrid architecture. Each kind of topology has its own advantages which are dependent on the applications or different situations. Systems integrators, utilities, green house builders and suppliers of Smart Energy devices can include the SG6410 as a ZigBee energy management solution to meet various growing needs for efficient energy management applications.

Express Internet Access

This router complies with worldwide ADSL standards. It supports downstream rates of up to 12/24 Mbps with ADSL2/2+, 8 Mbps with ADSL, and upstream rates of up to 1 Mbps. With this technology, users will enjoy not only high-speed ADSL service, but also broadband multimedia applications such as interactive gaming, video streaming and real-time audio quicker and easier than ever before. In particular, by doubling the upstream data rate, the Annex M standard included in the Billion SG6410 model will support the latest ADSL2/2+ and deliver higher upload speeds.

Secured Data Communication

This router supports IPSec VPN (Virtual Private Network) protocols, allowing users to establish encrypted private connections utilizing up to 16 simultaneous channels. With a built-in DES/3DES VPN accelerator, the router enhances IPSec VPN performance significantly and ensures that data is transmitted securely between two or more sites. Along with the built-in NAT natural firewall feature, the router also provides advanced hacker pattern-filtering protection. It can automatically detect and block Denial of Service (DoS) attacks. Built with State of the Art Packet Inspection (SPI), the router enables users to determine whether or not a data packet should be allowed to pass through the firewall to the private LAN.

Ideal for
Residential,
office users,
and Utility

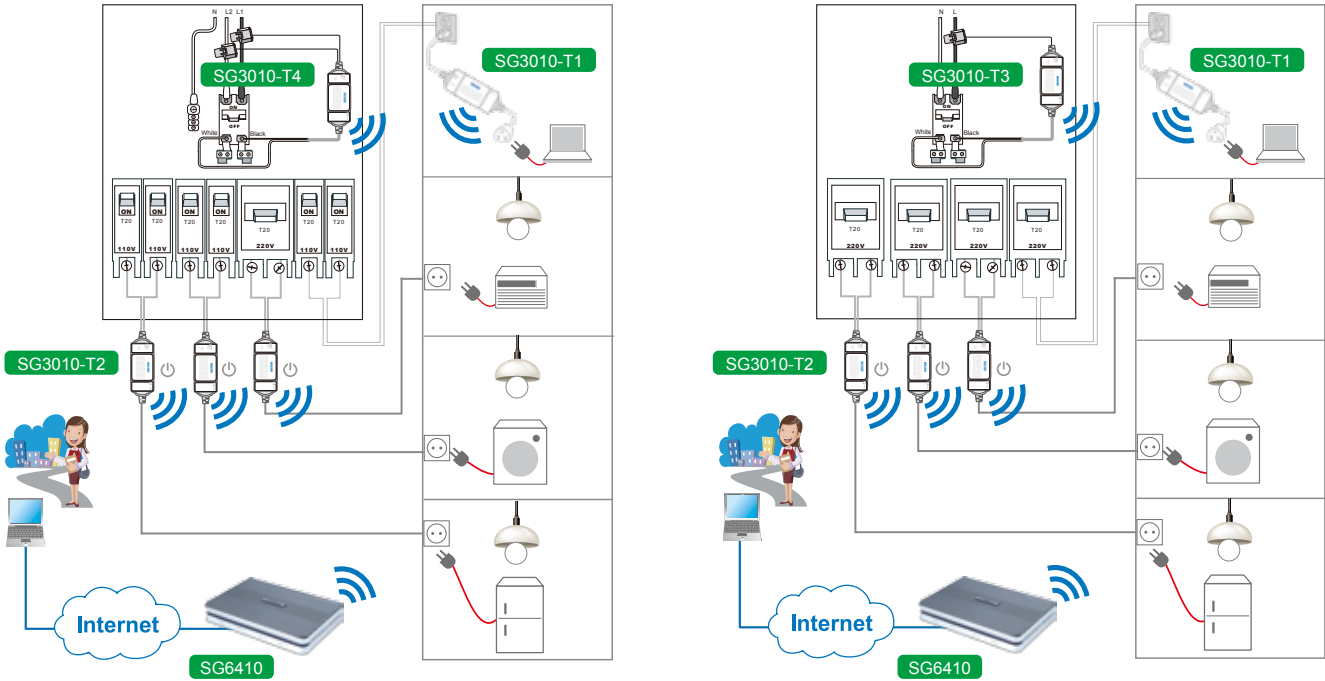
- ZigBee for reliable and flexible RF network connectivity
- High speed Internet access with ADSL2/2+; inversely compatible with ADSL
- 16 IPSec VPN tunnels
- Secured VPN with powerful DES/3DES/AES
- Quality of Service Management for traffic prioritization and bandwidth management
- SOHO firewall security with DoS prevention and SPI
- Universal Plug and Play (UPnP) compliant
- Parental control with URL content filtering and packet filtering
- Dynamic Domain Name System (DDNS)
- Supports IPTV applications
- User friendly quick installation wizard
- Ideal for:
 - Residential and office users
 - Utility companies
- Works in collaboration with ZigBee-based Energy Management solutions for business partners:
 - Systems integrators
 - Power utilities: solar power, wind power...etc.
 - Green house builders
 - Suppliers of Smart Energy devices in IHD, Load Control, and PCT

Application Scenario

Energy Management for Home Users

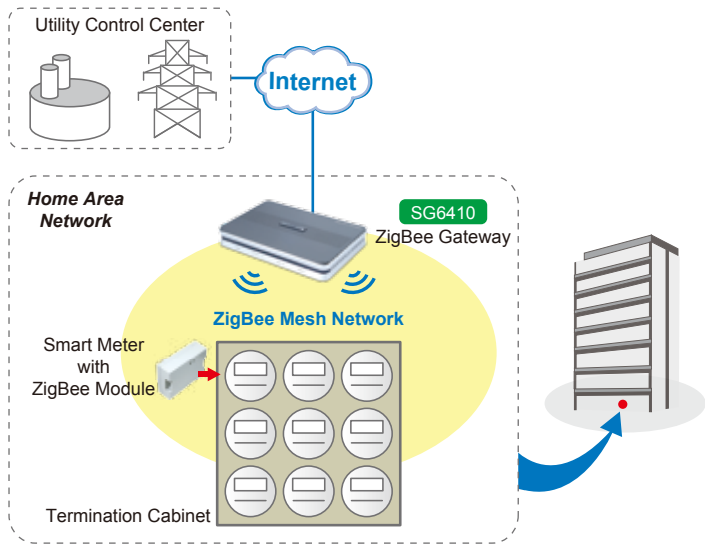
► Single-phase 3-wire (e.g. USA and Taiwan)

► Single-phase 2-wire (e.g. Europe)



Customers can remotely control electrical devices via a Billion SG6410 that is connected to a Billion SG3010 in a home area network. Users can obtain power utilization information via a ZigBee gateway automatically for downstream analysis and profiling.

Energy Management for Utilities

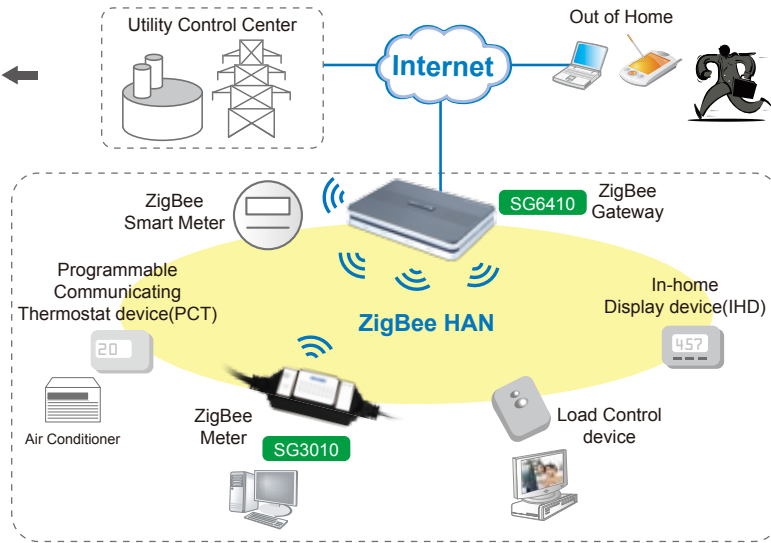


Over ZigBee mesh network, utility company can collect power data from ZigBee smart meters and send power bill information to in-home Smart Energy devices, all via a ZigBee gateway.

Smart Energy (SE) for Utilities

Utility energy efficiency program

- Utility collects home power data available in ZigBee smart meter by ZigBee gateway over Internet.
- By SG6410 ZigBee gateway over Internet, utility forwards power usage data and pricing info to ZigBee HAN devices which are Smart Energy certified.



Remote control

- Power usage and pricing info are forwarded from utility and shown on ZigBee HAN devices.
- Via ZigBee gateway, home users on-the-go remotely access in-home power consumption and re-act to control on the electrical appliances that are connecting with ZigBee HAN devices.

Features & Specifications

ADSL Compliant

- Compliant with ADSL Standard
 - Full-rate ANSI T1.413 Issue 2
 - G.dmt (ITU G.992.1)
 - G.hs (ITU G.994.1)
 - ADSL over ISDN/U-R2
- Compliant with ADSL2 Standard
 - G.dmt.bis (ITU G.992.3)
 - ADSL2 Annex M (ITU G.992.3 Annex M)
- Compliant with ADSL2+ Standard
 - G.dmt.bisplus (ITU G.992.5)
 - ADSL2+ Annex M (ITU G.992.5 Annex M)

Network Protocols and Features

- NAT, static routing and RIP-1/2
- Universal Plug and Play (UPnP) Compliant
- Dynamic Domain Name System (DDNS)
- Virtual Server and DMZ
- SNTP, DNS relay, IGMP Proxy
- IGMP Snooping for video service

Firewall

- Built-in NAT Firewall
- State of the Art Packet Inspection (SPI)
- DoS attack prevention including IP Spoofing, Land Attack, Smurf Attack, Ping of Death, and TCP SYN Flooding, etc.
- Packet Filtering – port, source IP address, destination IP address, MAC address
- URL Content Filtering – string or domain name detection in URL string

Quality of Service Control

- Supports the DiffServ approach
- Traffic prioritization and bandwidth management based-on IP protocol, port number and address

IPTV Application

- IGMP Snooping
- Quality of Service (QoS)

Virtual Private Network (VPN)

- 16 IPsec VPN Tunnels
 - 8 L2TP VPN Tunnels (Dial-in: 4, Dial-out: 4)
 - 8 PPTP VPN Tunnels (Dial-in: 4, Dial-out: 4)
- Embedded IPsec & PPTP client/ server
- IKE key management
- DES, 3DES and AES encryption for IPsec
- Embedded powerful 3DES accelerator
- MPPE Encryption for PPTP
- L2TP over IPsec
- L2TP/PPTP/IPsec pass-through

Management

- Quick Installation Wizard
- Web-based GUI for remote and local management
- Firmware upgrade and configuration data upload and download via Web-based GUI
- Embedded Telnet server for remote and local management
- SNMP v3, MIB-I and MIB-II support
- DHCP server/client/relay support compatibility
- TR-069 supports remote management

Hardware Specifications

Physical Interface

- ADSL: RJ-11 ADSL port
- Ethernet: 4-port 10/100M auto-crossover (MDI/MDI-X) Switch, Ethernet Port # 1 can also be configured to Ethernet WAN port
- Sync button: For ZigBee network synchronization
- Factory default reset button
- Power jack
- Power switch

RF Specifications

- Fully IEEE 802.15.4 / ZigBee PRO compliant
- Operating Band: 2.400 - 2.483 GHz
- 16 channels in the 2.4GHz ISM band
- AES-128 hardware supported encryption

Physical Specifications

- Dimensions: 7.28" x 4.86" x 1.38" (185mm x 123.5mm x 35mm)

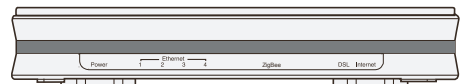
Power Requirements

- Input: 12V DC, 1A

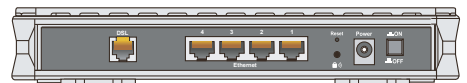
Operating Environment

- Operating temperature: 0 ~ 40°C
- Storage temperature: -20 ~ 70°C
- Humidity: 20 ~ 95% non-condensing

Front Panel



Rear Panel



* Notes:
All specifications are subject to change without prior notice.