ZigBee-100 Modules: Visibility for Unlimited Applications

ZigBee-100 Tag: for system integration

ZigBee-100 Extension Board: for external plug in to existing systems

ZigBee-100 Modules are low cost, low power, low data rate, and good range, with IEEE 802.15.4 compliant for 2.4GHz OEM RF modules. It is designed with a ready made component which allows IEEE 802.15.4 wireless applications, including ZigBee, to be quickly and easily included in product designs. You can simply connect sensors and switches to the module IO pins for customization to your applications quickly.

It offers sufficient processing power for complex systems, while with high link budget for up to 1KM of Line of Sight (LoS), with low standby current. It is supplied with a range of protocol stacks, including a simple IEEE 802.15.4 protocol for point-to-point, star, or tree applications, and a ZigBee mesh networking stack.

WiBorne's ZigBee modules offer various operating modes suitable for ultra-low power applications. They are suitable for broad range of applications including ZigBee PRO networks, ZigBee RF4CE remote controls, smart energy, home and building automation, meter reading, automotive, audio-visual consumer electronics, wireless medical, emergency services, gaming, RF remote controls, and environmental monitoring.

Features:

- Operates within the ISM 2.4GHz frequency band
- IEEE 802.15.4 and ZigBee compliant solutions
- TI CC2530 chipset with low processor overhead
- Choice of ZigBee-100 Tags and Extension Board for variety of interfaces
- RISC processor with comparators, temperature sensor application timer/counters, system timers
- Extensive peripheral set (DMA, USARTs, GPIO, ADC, timers)
- Up to 256KB ROM and 8KB RAM for complex systems
- Stable and Reliable with field proven network
- Long range from 100m to 1km with high power module, short range for 30-50m indoor
- Secures data / voice with 128-bit AES encryption
- Highly -97dB receive sensitivity
- Sleep current < 2µA with sleep timer for long life of battery
- Supports up to 250 nodes in tree networks, 1,000 nodes in long thin networks as scalable sensor networks
- Proprietary network topo. - supports star, tree and linear
- Adaptive multiple routing and route recovery to avoid interference and node failures
- Mesh networking layer with defined *profiles* for particular applications defined by ZigBee alliance
- Small memory footprint (Coordinator <30kB)
- Fast response times (< 2ms) between two adjacent nodes
- Clear channel assessment, back-off / retries, freq. agility
- Evaluation kits for large network evaluation, software development kits with complete design solutions
- TI CC2530 Chipset that supports SimpliciTI, Z-Stack, and RemoTI
- Broadcast Messages. Reliable and robust communication, ensured by end-to-end ack. for sent messages

- Modules serve as 'Wireless Dongles' easily add wireless to existing products
- Use with *Tunneling* commands over the air and doesn't need host CPU at remote device. Peripherals can be remotely controlled
- Interoperability with 3rd party devices by using interfaces and programmable stack API for variety of applications.
- Variety of OEM indoor / outdoor housing and integrated antennas that can be customized for your specific needs
- Interfaced with WiBorne's 802.11 WAP / CAP to receive data transferred seamlessly without wired

Household

Lighting

Plumbing

Security

Heating

Commercial Premises

Office, Retail, Factory – building control automation

Hospitality

Industries

Health and safety

Logistics

Managing street lighting

Pollution control

Bridges and Tunnels – earthquake warning

Meter reading and regulation

ZigBee with Limitless Applications

Point-to-Point

Star networks

Mesh networks
- Automatic route repair
- No bottlenecks

Tree networks
- Automatic route repair
- Coordinator is bottleneck

ZigBee-100 Extension Board with RS232, RS-422, RS-485, or USB Adapters
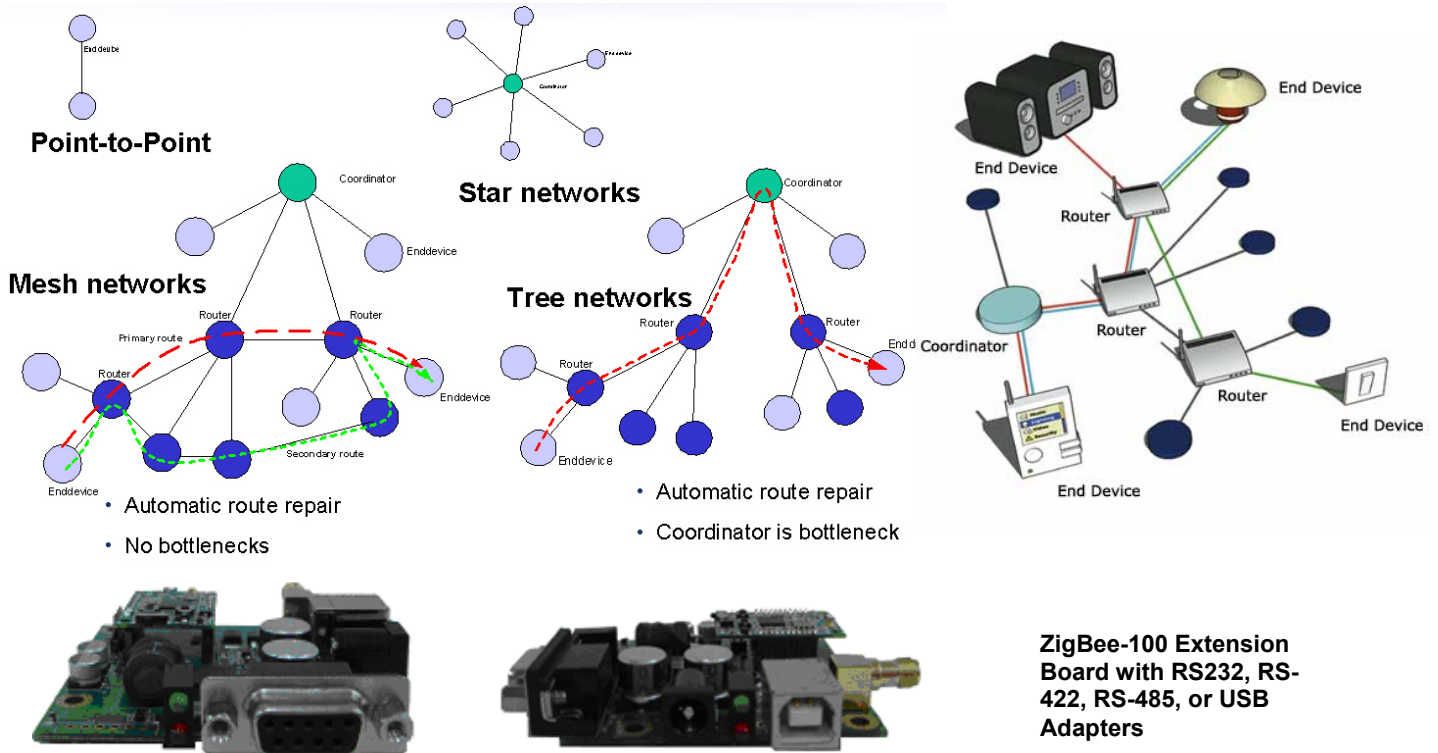
ZigBee-100 Modules: Wireless Everywhere with Unlimited Applications	
Model No.	ZigBee-100 Tags and Extension Board
Standard	2.4GHz IEEE 802 compliant.15.4, ZigBee single chip solution
Microcontroller	CC2530 TI 8051 microcontroller core, up to 8 KB RAM / 256KB of flash memory (ROM)
Network Topologies	point-to-point, star, tree, and mesh
Device Types	Coordinator, router, extension board, sleeping end devices
Network Formation	Automatic / self organizing, restore network parameters after brownout, self healing
Network Size	• Max. 150 nodes (mesh) - max depth: 5; max children: 20 • Max. 1,000 nodes (linear) – max depth: configurable; max. children: 10
Data Services	Data to coordinator, data to Peer, or tunnelling of TI Stack Commands
Services	Binding – association between a light switch and a chosen light
RF Characteristics	Media Access Protocol: CSMA/CA; Frequency: 2.4-2.4835GHz; Modulation: DSSS
RF Data Rate and Frequency Channels	IEEE802.15.4 compliant MAC layer. Wireless data rate up to 250kbps. 16 channels in the unlicensed ISM 2.4GHz band with 5MHz spacing channel
Resource Requirement	Network Size: 150 nodes (96KB RAM); Coordinator: 63kB RAM; Router: 62kB RAM; End Devices: 48kB RAM
Receive Sensitivity	Boost mode: -96.5dBm; Normal mode: -95.5dBm
Temperature Range	Operating: -30°C to 70°C (-22°F to 158°F).
Humidity	Operating: 10% to 80% Non-Condensing
Power Operation	Tag Module: UART output level 3.3 Volt Extension Board: AC/DC adapter or voltage @ 5V (TTL level)
Interface	Tag Module: UART & I/O, power switch Extension Board: 1 X DB9 for RS232 / RS422 / RS485 as gateway communication, 1 X USB
Unit Dimension	Tag Module: 20mm X 30mm; Extension Board: 60mm X 60mm
Unit Weight	Extension Board: 540g
Antenna Connector	Tag Module: built-in chip antenna; Extension Board: IPEX or SMA