

What is Zigbee? The Key to Low-Cost, Low-Power Wireless Comms.

Zigbee is the latest buzz in the Wi-Fi world, but what are its uses, and what are the benefits for industry and commerce?

Kevin Buckley of IDC explains...

"Zigbee is a low-cost, low-power, wireless mesh networking standard, based upon the IEEE 802.15.4 -2006 standard for personal area networks (WPAN). The technology is intended to be simpler and cheaper than other WPANs such as Bluetooth with much lower power requirements."

The cost advantage allows Zigbee to be widely deployed in wireless control, monitoring and tracking applications, where its low power-usage allows longer life with smaller batteries, and mesh networking provides higher reliability and longer range.

Zigbee is a full-blown telemetry system in its own right, with the ability to provide wireless personal area networking (WPAN) i.e. digital radio connections between computers and related devices, such as sensors. This kind of network eliminates the use of physical data buses such as USB and Ethernet cables. As such, Zigbee is the ideal system to provide the copper-less warehouse or factory.

Zigbee builds on the global communication protocol standards developed by the 802.15 Working Group. The fourth in the series of these protocols, WPAN Low rate Zigbee is designed primarily for telemetry applications. It provides specifications for devices that have low data rates, consume very little power, and are thus characterised by long battery life.

Compared to Bluetooth, another of the 802.15 Group protocols, Zigbee has lower data rates and doesn't offer such a high bandwidth. However, its strength is that it can be incorporated into small chips that consume little power and are relatively inexpensive. These chips can then be integrated into low-cost, low-power devices that can "sleep" for 99% of the time until awakened by an event. The event can be I/O related, real time or a combination of both.

The power and flexibility inherent in Zigbee technology is exemplified by its ability to support over 64,000 devices in star, tree or mesh formations. The technology provides high reliability, self-healing, self-joining networks, with network protocol security encryption, and is designed to operate in electrically noisy industrial environments.

The 802.15.4-based Zigbee is designed for remote control and sensors, which are many in number but require only small packets of data, and in the main, extremely low power consumption for long life. One of the technologies first areas of usage was home automation, where it revolutionised components such as light switches, fire and smoke detectors, thermostats, kitchen appliances, security systems and video and remote controls.

Today, Zigbee has evolved seamlessly into the automotive, power generation, materials handling, safety and general industrial sectors, with many more to follow. The technology is providing the optimum solution for product and personnel tracking, monitoring and control in applications from car plants to warehouses and offshore wind farms.

It offers security in these applications through a host of key features, including acknowledgement that data has been received at its destination; re-transmission in the event of failure - in a similar manner to TCP/IP networks; validation of message content using data sequence numbering (Frame Check Sequence); network redundancy - such that failure of a node on the network will enable messages to be re-routed via other nodes; and network protocol security encryption.

Ready-Made Zigbee Solutions IDC's award winning technology offers Manufacturers, System Integrators and End Users a single source supply of ready-made hardware and software products based on ZigBee wireless mesh networking. The products include Ethernet and serial gateways, control modules with discrete input/output connectivity, wireless e-stop switches, location orientated key fobs, battery powered handheld units, and many more. The hardware is supported by software products for over the air programming, location tracking, event recording, OPC server and soon to be introduced ZB Server which offers the integration of independent multiple 802.15.4 networks.

..... Ends

For further information contact: Peter Hadley, IDC Ltd, Keynes House, Chester Park, Alfreton Road, Derby. DE21 4AS.
Tel: +44 (0) 1332 604 030 Fax: +44 (0) 1332 604 031. E-mail: sales@idc.gb.com Website: www.idc.gb.com

For editorial enquiries contact Brett Davies, DMA Europa Ltd, 2nd Floor, Snuff Mill Warehouse, Park Lane, Bewdley,
Worcs. DY12 2EL. Tel: 01299 – 405454 Fax: 01299 403092 e-mail: admin@dmaeuropa.com
