

What do operators need to know about ZigBee

How the Remote Control & Set-Top Box can generate new services and profits. By Cees Links, Founder & CEO of GreenPeak Technologies

WiFi
2 kilo joule

Everyone is talking about the Smart Home and the Internet of Things. The potential is almost limitless. Today, a typical home may have between five or ten connected devices but within a decade, a Smart Home could easily have over a hundred different connected sentrollers in the building - sensors and cameras tracking and sensing, local and cloud based controllers to manage the network, and actuators that can turn on and off the various devices and appliances, controlling almost every aspect of the home. This includes home monitoring and environmental control, entertainment, health monitoring, energy efficiency, etc. - all the ways our houses can automatically make our lives more comfortable and efficient.

Originally developed about a decade ago, the ZigBee wireless communications protocol has become very common in cable and web connected homes worldwide. Comcast, EchoStar, and many other major operators are putting ZigBee in almost all their new set-top boxes and

ZigBee
20 milli joule

ZigBee PRO
Green Power
200 micro joule



home gateways. Because they have enabled these boxes to use ZigBee as the connection between the box and the remote control, these operators have essentially opened the door to a diverse spectrum of new services and devices. Once ZigBee is in the box - whether it is a standalone home control box, part of an internet gateway, or even built into a TV set, ZigBee connectivity enables a central control point for the new home cloud.

Why have Operators selected ZigBee for their Remote Controls?

End users really like it! By using a RF (radio frequency) based technology like ZigBee, consumers no longer have to aim and shoot their remote controls to change channels, raise the volume, control movies and shows, etc. ZigBee shares the same range capabilities as WiFi. This means users don't need to be within 10 feet or so of their TV set or set-top box like they have to do with an IR (infrared) based remote control. ZigBee transmits through furniture walls, floors, etc. This means that the set-top box no longer has to be out in the open. It can be hidden away inside a cabinet or a closet or even in the next room.

ZigBee requires a lot less power than IR.

Because of ZigBee's low power operating specifications, it is possible to design a remote control that never needs to have its battery changed or recharged.

ZigBee is essentially a low-power version of WiFi. Because it only needs to send few bits of data every once in a while, it does not require the bandwidth or the power needed for streaming video or audio, gaming, voice, etc. In tests, it has been proven that a small watch type battery can provide enough power to energize a ZigBee radio for many years. The real controlling factor is the actual lifetime of the battery. Assuming the battery itself lasts, the battery will be able to power the device's radio for the lifetime of the device. This makes the remote control essentially maintenance free. And this also means no support calls because of dead batteries in the remote!

Two-way interactivity. ZigBee is a two-way communication technology - unlike IR which only goes from the remote to the set-top box or TV set. This interactivity enables a variety of new features. One interesting capability is the so-called "Find Me" button. By pressing a small button on their set-top box or TV, or even activating it



online via their smart phone or tablet, users can make their “lost” remote control start beeping and flashing, making it a lot easier to find.

ZigBee offers a path to new services and income possibilities. The two-way interactivity also provides a variety of interesting opportunities for the operator. One of the biggest challenges for the end user is how to program in new equipment master codes and how to update their system. Because of the ZigBee remote control’s interactivity, software updates and device codes can now be downloaded from the set-top box into the remote control, thereby eliminating one of the most common sources for customer complaint calls and expensive truck rolls.

The two-way interactivity also opens the door for a wide range of communication, advertising and service opportunities. The operator could send out alerts and messages regarding new programming, new features and new channels. In case of emergency, alerts could be broadcasted over the remotes – even if the TV set is not turned on. The operator could recognize what shows and commercials the viewer is being exposed to and then instantaneously send downloadable coupons and special offers.

One interesting feature, being tested in Japan, is a buy button that links to the programming that is being watched. For example, if the customer is watching a shopping channel, instead of having to get on the phone or hop on a computing device, they could simply hit the buy button and instantly complete the transaction. A similar feature could be used for instantaneous voting and polling for reality shows and talent contests.

This interactivity could even include home

security and alerts. An internet connected doorbell could capture and transmit an image of whoever is knocking on the front door – giving the customer the option of answering the door or ignoring the visitor and continuing to watch their programming. If there is someone opening a locked door or breaking into the garage, an alert could be sent to the remote control – as well as to the TV screen.

The next step beyond the TV

The ZigBee remote control and set-top box could easily expand beyond controlling the entertainment experience and the TV screen. Home services are a rapidly growing sector and potential profit center for operators targeting the Smart Home.

One very interesting Smart Home application is what is known as Family Lifestyle Monitoring. By using a small network of sensor devices – connecting to the internet via the set-top box or gateway, it is possible to track and monitor the daily movement of those living at home. Currently being rolled out in China, this technology is targeted to the families and care givers who need the ability to know that their elderly relatives – who insist on living independently and do not want any intrusive cameras watching them or ugly pendants hanging around the neck, are up, moving and doing fine. Using just four inconspicuous sensors in the home, the system is able to “learn” the daily movements of the inhabitants and if there is a dramatic change, can send an alert to the proper person or authority. In addition, this Senior Lifestyle System is smart enough to also recognize slow changes and trends

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– degradation in the inhabitant’s lifestyle – is it taking them longer to walk from one room to another or are they sleeping more than they have in the past?

Summary

These new features, enabled by ZigBee in the set-top box and in the remote, provide a wide range of new services and profit centers for operators. End users enjoy the features and the convenience of ZigBee. Whether it is for managing the home’s security and environment, providing better control of entertainment and services, or even monitoring our lifestyles to make sure we stay healthy and safe, the Smart Home is coming. Operators need to understand the technology and its possibilities so that they can ride this wave of Smart Home and IoT excitement to keep existing customers as well as generate new subscribers. **CSI**



Cees Links is the founder and CEO of GreenPeak. Under his responsibility, the first wireless LANs were developed, ultimately becoming household technology integrated into PCs and notebooks. He also pioneered the development of access points, home networking routers, and hotspot base stations.

He was involved in the establishment of the IEEE 802.11 standardization committee and the WiFi Alliance. And, he was instrumental in establishing the IEEE 802.15 standardization committee to become the basis for the ZigBee sense and control networking.

In 2005 Cees started with GreenPeak Technologies. GreenPeak is a fabless semiconductor company and the leader in the ZigBee market with a rich offering of semiconductor products and software technologies for Smart Home data communications and the Internet of Things.

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