



Home Control Goes Wireless: Control4 and Ember Spur Home Automation Innovations



Industry

Home Automation

Summary

Cracking the mainstream home automation market requires cost-effective, standards-based components that support ease of use, retrofitting, and future developments. Control4 and Ember created a wireless solution that hits all the marks.

Challenges

Designing to a moving target is never easy, as Control4 discovered while waiting for ratification of the ZigBee standard. Open communication and close collaboration with Ember helped bridge the obstacles.

Why Choose Ember?

Control4 and other companies that work closely with Ember rely on Ember's innovation and leadership in the ZigBee space. Ember pioneered the first comprehensive development platform for ZigBee-ready applications, including all required hardware, software, and tools. The Ember EM2420 platform has become the golden suite for 802.15.4 interoperability. Through a combination of unparalleled experience and engineering expertise, Ember leads the industry in helping OEMs bring ZigBee-ready products to market.

Founded by seasoned entrepreneurs with backgrounds in networking, home automation, and media control, Control4's tightly knit team shared a common vision: unifying and automating technologies within the home. Rather than focusing on technological bells and whistles, the company sought to improve people's lifestyles by giving them precise control over their home environment. They envisioned a line of easy-to-install products that would control heating and cooling, lighting, security systems, home entertainment systems, as well as future components.

Although home automation products have been available for more than a half-century, high cost, problematic installation issues, and the difficulty of retrofitting limited their market acceptance. A fresh approach was needed to overcome two major obstacles: designing components that could be easily retrofitted, and reducing the overall cost of installation. Control4 investigated a number of possible solutions before deciding on the ZigBee standard and partnering with Ember Corporation. The collaboration with Ember provided a wealth of tools, technologies, and expertise to help Control4 realize their vision.

Meeting the Challenge

Early in the development cycle, Control4 recognized the immense potential in the home automation market. While the existing home automation market caters to homes costing in excess of a million dollars (grossing about \$440 million per year), more cost-effective automation products could open a broader market in excess of \$4 trillion. This promising business opportunity created a powerful incentive to get the product design right on the first try. The choice of platform and technology partner would be vital to the product success.

Jim Gist, Director of Business Development at Control4, explains the choice of platform in these terms: "We chose Ethernet for one of

our protocols, but we also wanted to use ZigBee, which was a developing standard. ZigBee offered the benefits of wireless—there are no new wires and it is easy to retrofit. This opens up the opportunity for a much broader adoption."

The decision to partner with Ember followed more research. "We explored many options for the ZigBee stack," Gist said. "Ember looked promising right from the start. The track record of Ember—the people behind the company, the product mix, their ZigBee leadership—led us to choose Ember as the ideal partner. As a partner, we knew they could match our development team and run parallel with us during rapid development, which was an important factor." The breadth of the Ember solution also influenced the partnership decision. Ember offered a whole product solution, hardware and software tools, a clear leadership role in the industry, deep experience in deployments and testing, and a high level of expertise among staff members.

Working together, Control4 and Ember devised a modular approach that would enable homeowners to install automation components in a few hours. This standards-based approach also opens up the future to exciting new components still under development. At the heart of this design architecture is the EM2420, a ZigBee-ready chip from Ember Corporation that brings the reliability and versatility of mesh networking to the Control4 product family. The Ember Developer Kit and its software stack made it possible to develop a solution rapidly and minimize debugging. The EM2420 platform established a solid development environment with a clear and simple scalability path to support extensive numbers of ZigBee-enabled devices.



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—Jim Gist
Director of Business Development, Control4

Key Results

The successful launch of an innovative product line garnered substantial interest at the Consumer Electronics Show, won the Best Innovations Award, and earned a new nationwide distributor—Tweeter.

Ember Solution

- Integrated circuit: EM2420
- EmberZNet
- Ember Developer Kit

The logo for Ember, featuring the word "ember" in a lowercase, bold, sans-serif font with a red dot above the letter 'e'.

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Control4 needed a framework that would accommodate global market requirements. Because the ZigBee specification relies on unlicensed portions of the frequency spectrum using the globally available 2.4GHz frequency, the issue of varying international wireless restrictions could be overcome.



Close communication and collaboration between the Control4 and Ember design teams proved essential to getting the product family to market quickly and efficiently. "As we got closer to the time the ZigBee specifications were being finalized," Gist said, "there were a lot of finishing touches to get our product out the door. Working with Ember was delightful! It was about working together as a team and all communication doors were open. We think this is the most stable, reliable ZigBee stack on the market—definitely the most feature rich. This partnership is deeper than just buying chipsets from Ember. It includes working together to evangelize the use of the ZigBee platform to large consumer companies."

A Star is Born

The trial by fire for the new Control4 product line took place during a rollout at the CES 2005 trade show in Las Vegas, where the mix of indoor radio signals made wireless communications a challenge. The Ember-enabled Control4 products received an enthusiastic reception from participants and performed flawlessly at the event. As Gist relates, "At CES, amid a broadcast torrent of wireless data, we could see our devices all across the show floor, even into our other partners' booths. This communication reliability is a significant factor—especially in a difficult environment where we couldn't even get WiFi to work." Control4 won the Best Innovations Award for this product rollout.

Reaching Wider Markets

The successful release of a new line of Control4 home automation controllers will tap into a broader market through an arrangement with Tweeter, a Boston-based specialty retailer (www.tweeter.com) with a national presence. This arrangement highlights the capabilities of the Control4 controllers to work effectively with latest generation home entertainment systems, while still having the flexibility to perform other home automation tasks and expand to meet future developments. Control4 was involved with the launch of the new mega Tweeter store in Las Vegas for CES. As one indicator of the easy installation, Gist noted, "Our products were up and running before everything else in the building, including the media center. And, our products worked flawlessly during the event." Through the collaborative design efforts of Control4 and Ember, affordable home automation has become a reality. The technology is primed and ready to ignite the home automation market.

Control4 has an extensive dealer network to handle their full line of products. For more information, visit www.control4.com.

Ember Corporation develops wireless semiconductor solutions that help buildings consume less energy, manufacturing plants run with fewer breakdowns, and the country's borders and infrastructure remain safe and secure. A promoter of the ZigBee Alliance, its vision is to help create an "Internet of things" by enabling the eight billion microcontrollers built into products each year to support low-cost, low-power networking applications in any industry. Headquartered in Boston with offices and distributors worldwide, the company was named one of Fortune Magazine's top "Cool Companies" for 2004. For more information, please visit www.ember.com.

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