

# Family@Home™ transforms smart houses into smart homes

By Cees Links, GM of Qorvo Low Power Wireless  
Formerly CEO and Founder of GreenPeak Technologies

## Our Primitive Homes Today

Over the last few years, I have been intrigued by the difference in sophistication of our cars as compared with our homes. This is not only about general features like climate control, opening/closing windows, central door locking, etc., but also about diagnostics on the engine (oil, cooling), the availability of resources (gas, windshield washer, etc.) or safety (tire pressure). With every new model, cars are getting more sophisticated, while our homes continue to lag behind.

It is clear that cars and homes have some very particular differences. The automotive industry is highly competitive and is always looking for differentiating innovations. For example, a feature like central door locking with a key fob has existed in cars for over 20 years and is now a standard feature on most car models, regardless of price. However, we don't have that simple technology in our homes. Why not? Almost everyone has faced that dilemma – you walk out the front door and suddenly you stop, wondering if the back door is locked. So now you have to go back, unlock the front door, walk through the house and check. That is a lot of hassle. Why can't our homes be as smart as our cars?

Granted, the turnover rate of cars is significantly higher than that of homes. On average, most of us replace our cars after five, seven, maybe ten years, while we only gradually upgrade homes in slow, incremental steps. When we move to a new home, we don't necessarily search for upgraded operating features like we do with our automobiles. Also, unlike the automotive market, many features in our home are not under the same worldwide competitive pressure. For instance, basic home door locking systems are available in a wide range of operating styles and formats, differing from region to region and from country to country, but all are profoundly lacking standardization.

So now we have our modern internet connected homes with our curved 4K TV. It looks like our homes are technologically advanced. But if the washing machine has a leak or the bath is overflowing, the water damage is substantial – because we did not notice in time or because we were not at home. Or our dryer breaks down or, even worse, catches fire, because we never got a warning that it required maintenance. Our lighting controls are still based on old technology from the previous century and our understanding of the consumption of resources (electricity, natural gas or water) is primitive at best. It is clear that there is a technology gap between our car and our homes and that this gap is widening every day.

## Our Family@Home, Our Most Valuable Asset

For most of us, our house is the most valuable asset we own. So why do we care so little about its health? Our family, children and pets are at home – do we really not care what is happening with them? Or perhaps we do care a lot, but so far technology has failed to deliver easy, convenient products that make the difference. When our family, kids and pets are in our car, we know that they will be relatively safe. Seat belt locks and position monitors, air bags everywhere – cars leverage technology for safety and security.

After all, the car is a closed ecosystem of a specific car manufacturer, where in contrast, the home is a smorgasbord of multiple suppliers, each with their own history and agenda, and clearly little interest in harmonization and standardization.

So how do we make our homes smart? How do we get this technology into our homes without incurring big costs? Possibly the technology industry has been trying to do too much at one time. Having everything connected to everything else (“meshing”) may not fit a purpose. We may have been focusing on the wrong thing. Maybe we really do not need the fridge talking to the toaster or ordering our milk.

Instead, we just need to start with some basics. Is everything all right at home? Are there exceptions? Are there anomalies that predict trouble ahead?

Which is more important: remotely controlling our smart lights with our smartphone from the other side of the world, or understanding whether everything is fine at home with the family? I think it is our kids and our family.

This is the core of Family@Home. Providing peace of mind to people who are not at home and who wonder how their family and house are. Receiving alerts if something goes wrong. Being able to care for family members, and understand what is going on, without being intrusive – but still in the position to make contact if needed, and show attention. Peace of mind and caring for what is most precious, your home and your family – that is your Family@Home.

## How does Family@Home Actually Work?

The Family@Home is a simple and inexpensive application that does not need to be integrated or programmed. It consists of a collection of sensors that can easily be installed in the home, connected to the web via the home’s internet connection and managed with a smartphone. The smartphone acts as the dashboard for the system, not only for installation but also during operation. The smartphone leads the person installing the sensor through a simple interactive menu and confirms that each sensor is operating properly. Then the sensors can be left alone and will start doing their work, collecting data.

This collected data begins forming a “picture” of the “family lifestyle.” By the end of the initial learning period – less than two weeks – the system knows the family’s normal behavior patterns and is capable of sending alerts to family members, health care professionals or the owners of the house.

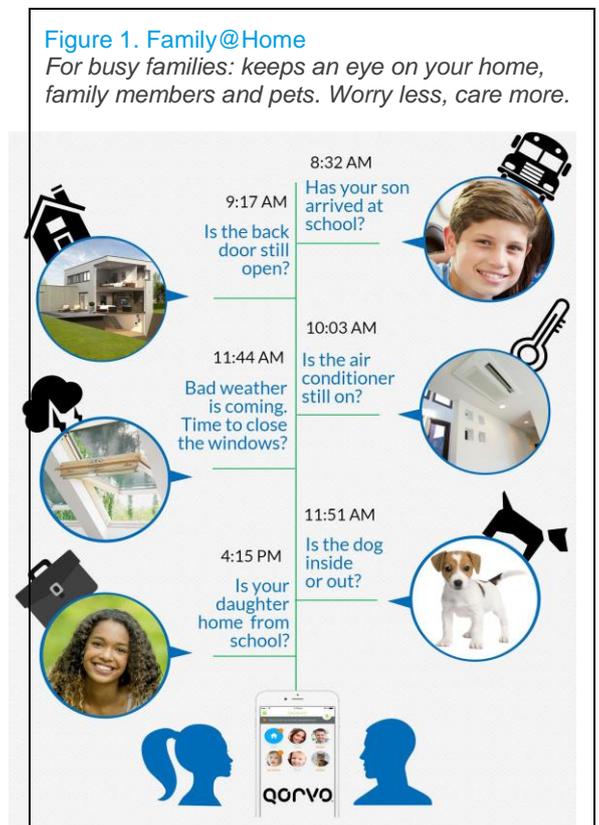
### This includes all kind of scenarios:

- Who is in the house?
- Is someone in the house when no one is supposed to be?
- What time is a person coming home? Or is that person still not at home (and supposed to be)?
- Is there a door left open, or a light left on – and not supposed to be?
- Is the temperature comfortable at home?
- Is the heating turned off at night?
- Is the cat inside the house?
- Is there a leak in the basement?
- Is the smoke alarm going off?

Many more scenarios can be thought of, including scenarios that combine data from different sources, which can include external sources. For instance, when there is an open/close sensor on a window and bad weather is coming, an alert can be created to warn the homeowner that a problem situation may occur.

**Figure 1. Family@Home**

*For busy families: keeps an eye on your home, family members and pets. Worry less, care more.*



But the key feature of Family@Home is that the system itself “learns” what is normal, and keeps on learning, without any programming or re-configuration from the consumer.

Another key feature is that the system does not need a camera. Of course, the system can be extended to include cameras, but these are not required for the system to be fully operational and functional and, therefore, can respect the privacy of the residents.

So, the value provided by the Family@Home system is in the creation of a dashboard that helps the owner of the system to be aware and understand what is going on at home – or, as it can be easily extended, what is going on in the vacation home, or any remote location that needs to be monitored.

## Is Family@Home Secure and Does it Respect Privacy?

A logical question that often comes up is: “Is my data secure and will the system respect my privacy?” Well, the answer is fairly straightforward. You can determine yourself who can look at the Family@Home dashboard and who cannot. And although the system does a lot of tracking, the personal information is safely stored and kept securely out of sight. The underlying question is: “Is the value provided worth the concern?” In a way, Family@Home is your caring and loyal butler or au pair living with you, looking after your home and family, and they also know your personal habits and your stories to better serve and assist you.

It is necessary to rethink how we accept to share information. The new age of the IoT helps us to quantify our lives. *To measure is to know.* Quantifying our lives helps us to make more timely and better quality decisions, or even to assist us to actually make those tough decisions. Quantifying our lifestyle helps us to live more safely, securely and comfortably. There is more involvement, more awareness of what is going on with the Family@Home and, therefore, more caring.

But there is obviously a flipside. What about the data being collected? Can it be abused, who owns it, etc.? Those are all valid questions, but not necessarily very different than using a credit card in a store or posting a comment on Facebook. There is a serious balance between convenience and ease of use on one side, and security and privacy on the other side. We will learn how to deal with security and privacy as well.

## How Does the Operator Benefit from the Family@Home?

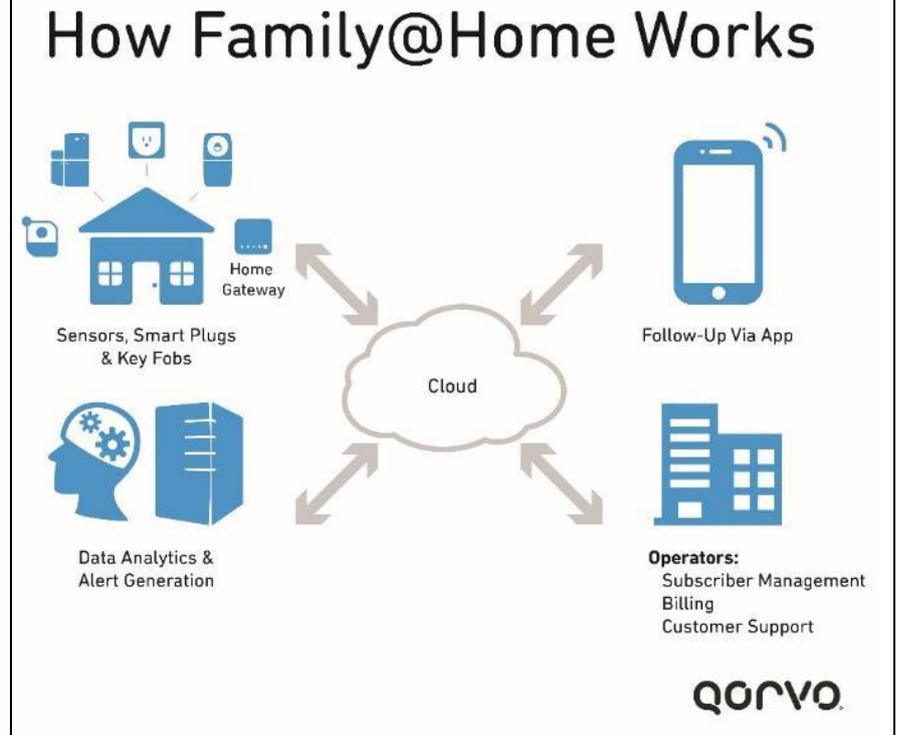
The Family@Home application is a system-level reference design for a complete end-to-end solution allowing MSOs (telecom operators and cable providers) to complement their current business offerings (phone, internet, TV, etc.) with additional services related to the smart home. MSOs need to be able to offer services that are robust, virtually maintenance free, low cost and that are relatively simple to install. The Family@Home system is a complete cloud-based service solution that can be adjusted and branded in compliance with the needs of the business requirements of the MSOs. MSOs will be able to offer new and additional smart home subscriptions at a low initial cost with an attractive monthly fee. This will accelerate the consumer acceptance and increase the ARPU (average revenue per user) of the MSOs at the same time.

Besides the operators who will clearly benefit from the

Family@Home offering, the large (e)retailers are battling to win customers and tie them in by offering complete smart family and home solutions. In the future, we can expect interesting combined offerings by operators and retail companies, both focusing on various business models that will drive this market. Operators want to provide the services and avoid customer churn. Retail companies want to sell the equipment, the sensor devices and gateways, and add more devices in the same home as the application grows.

**Figure 2. How Family@Home works**

The family lifestyle system uses sensors, connected devices, cloud intelligence and social media to combine a variety of important services into a simple-to-use app that enables service providers to make their customers' lives easier and more secure.



## From Smart House to Smart Home

The tech industry has been telling consumers that they need a smart home but so far, all they are being offered are connected devices – creating a “smart house” instead. Consumers want smart applications that take care of their family and their home, not just connected devices. That is why Qorvo is working with the world’s leading service providers to transform the “connected house” into the “smart home” – an affordable, peace of mind solution that takes care of those who live in it – making sure that their lives are safe, comfortable and efficient. Worry less, care more.

## About the Author

**Cees Links** was the founder and CEO of GreenPeak Technologies, which is now part of Qorvo. 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 Wi-Fi Alliance. He was also instrumental in establishing the IEEE 802.15 standardization committee to become the basis for the ZigBee® sense and control networking. Since GreenPeak was acquired by Qorvo, Cees has become the General Manager of the Low Power Wireless business unit at Qorvo.

## About Qorvo

Qorvo (NASDAQ:QRVO) makes a better world possible by providing innovative RF solutions at the center of connectivity. We combine product and technology leadership, systems-level expertise and global manufacturing scale to quickly solve our customers' most complex technical challenges. Qorvo serves diverse high-growth segments of large global markets, including advanced wireless devices, wired and wireless networks and defense radar and communications. We also leverage our unique competitive strengths to advance 5G networks, cloud computing, the Internet of Things, and other emerging applications that expand the global framework interconnecting people, places and things. Visit [www.qorvo.com](http://www.qorvo.com) to learn how we connect the world.