

# INCISOR™

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The Nearly Christmas Issue



## SATELLITE FOR ALL?

**THIS ISSUE**

TRAC: ZIGBEE – ANOTHER YEAR OF SUCCESS

MECAPP PRO – THE ACCIDENTAL BLUETOOTH TOOL

INCISOR.TV FILMS ULP ROUNDTABLE AT CES 2012

# have you got the incisor.tv x-factor?

'Ever wished for your 15 minutes of fame? Or, if you can't see an opportunity to be the next Lady Gaga, how about a bit of Radio Gaga?

What the heck is Holton talking about? Well, as we have for many years now, Incisor.TV is shipping folk, cameras, computers and lots of bits and pieces out to Las Vegas next month for the Consumer Electronics Show. Once again, we are filming with the Bluetooth Special Interest Group – look out for our coverage of the Bluetooth SIG Best of CES competition.

But this year we are doing something different. We will be filming the Incisor.TV Ultra Low Power Wireless Roundtable event. There's another 'ultra' phrase trending in the ULP market at the moment and that is ultra-competitive. With so many technologies vying for success in this market, it's difficult for technology specifiers to know which path to choose. Incisor.TV is providing the opportunity for leading players to make their case, in open, roundtable format. Crucially, our web TV channel means that sitting in on this fascinating event will be possible for people from all over the world, and not just the tiny fraction of the ecosystem that can make it to Las Vegas.

Three of the leading wireless industry organisations have already confirmed their places on the roundtable. We want this event to be as good as it can be, so see page 6 for more details, and contact me to discuss how you can participate.

We can make you a star.....

**Vince Holton**

**Publisher & editor-in-chief, Incisor / IncisorTV**

## INCISOR.TV FOCUS THIS MONTH



Incisor.TV is a regular visitor to CES – here's our coverage of the Bluetooth SIG's Best of CES competition in January this year.

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## CONTENTS

### SATELLITE FOR ALL?

Richard Traherne, head of wireless at Cambridge Consultants, discusses a solution that makes "ubiquitous communication" a reality

### TRAC: ZIGBEE – ANOTHER YEAR OF SUCCESS

TRaC's Joe Lomako feels under pressure, but says that 2011 has been a good year for ZigBee

### MECAPP PRO – THE ACCIDENTAL BLUETOOTH TOOL

How a bedtime story spawned the creation of one of the Bluetooth industry's most widely used test tools

### 'TIS THE SEASON TO BE WIRELESS!

We have a different Gratton onboard this month. Sarah-Jayne Gratton looks at wireless media streaming devices.

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# news



## Bluetooth SIG announces Innovation World Cup 2011 finalists

The identities of the nine finalists of the 3rd Annual Bluetooth Innovation World Cup (IWC) have been made public, one of whom will be named Bluetooth Innovator of the Year. Submissions came from developers and entrepreneurs with market ready products and concepts for applications and devices using the low energy feature of Bluetooth v4.0.

The 2011 Bluetooth Innovation World Cup focuses on three categories: sports & fitness, healthcare, and the all-encompassing automotive, entertainment & more. The nine finalists were selected from over 330 international submissions, and ranged from barbells that wirelessly monitor and correct the form of the user, to a wireless health monitor for newborn infants, which could reduce incidents of sudden infant death syndrome.

Three finalists for each of the categories were presented at the MEDICA trade fair, which took place in Dusseldorf during November, where the Bluetooth SIG was participating in the Wearable Technologies Show.

### Sports & fitness

The selected finalists in the sports & fitness category were:

- Recon Instruments, which created a Bluetooth low energy enabled remote control for its MOD technology; a head-mounted micro optics displays for goggles that give the user real-time access to performance and communications information direct-to-eye in fast paced environments.
- Eric and Meaghan Zorij (Diesel Dogs LLC) submitted a concept for Bluetooth Barbells that monitor the form being used for various free weight exercises, log the form observed and offer suggestions on form improvement.
- Vlad Savchenko (SoundOfMotion) developed

a heart rate monitoring system integrated into headphones that enable athletes to measure the heart rate without wearing an uncomfortable chest belt.

### Healthcare

The finalists include:

- Guilherme de Paula (Pancreum LLC) created the CoreMD, a wireless communication and power infrastructure for low-cost replaceable/disposable wearable medical devices for patients with diabetes and other chronic diseases that can sense body conditions (temperature, heart rate, blood pressure, interstitial glucose, etc) and/or deliver subcutaneous drugs (insulin, glucagon, vasopressors, etc).
- Arturas Vaitaitis and Jung Bae Kim submitted a concept for an ID wristband and health monitor for newborn infants that monitors the baby's activity and prevents sudden infant death syndrome by sending data via Bluetooth technology to a smartphone/computer.
- Dan Corkum took advantage of the advantages of Bluetooth low energy to develop a connected medicine packaging and treatment adherence aid system that transmits data on whether the patient is taking his medicine correctly to physicians or support personnel.

### Automotive, entertainment & more

The three finalists were:

- Ade Olunaike (Teleaf) developed a self-weighting platform in the back of a suitcase that allows the user to pre-set a luggage weight limit on iOS devices and monitor the actual luggage content weight while packing.
- Robby Stribley ("Forget-Me-Not") created a smartphone application which connects with a Forget-Me-Not sensor, which is a Bluetooth low energy technology module that can be incorporated into any device that the owner wants to avoid losing.
- Michael Setton (Sensaris) submitted the idea for Senspods – cheap, easy-to-use and independent Bluetooth enabled geolocated sensors – which allow citizens to use mobile communications to collect humidity and other environmental data.

The winners for each category and the overall winner of Bluetooth Innovator of the Year 2011 will be announced at an awards ceremony on Jan. 30, 2012, at ISPO trade show in Munich, Germany.

## Wireless connectivity ICs to surpass \$8 billion in 2011

The total market for standards-based wireless connectivity ICs is expected to exceed 3.5 billion units per annum in 2011, according to ABI Research. Peter Cooney, practice director, semiconductors, told Incisor, "Broadcom leads the market with Qualcomm, CSR, and Texas Instruments all snapping at its heels. The market will total more than \$11 billion per annum by 2014."

Wireless connectivity technology is well established in many electronic device markets. Bluetooth, Wi-Fi, and GPS are becoming ubiquitous in certain devices, such as smartphones, with attach rates approaching 100% in some cases. Rapid growth is forecast for newer technologies such as NFC, Bluetooth v4.0, Wi-Fi Direct, and 802.11n.

"Wireless connectivity has developed into a strong revenue stream for many leading global semiconductor suppliers," added Cooney. "Those that have focused on expanding their product portfolio and transitioning their businesses toward providing combo ICs have seen the most growth in market share."

As the wireless connectivity industry has matured and the market has grown to a multi-billion dollar business, Cooney observed that many suppliers have sought to diversify their product ranges and expand into other markets. This has been achieved in large part by mergers and acquisitions. Broadcom, Qualcomm, Atheros, CSR, TI, STMicroelectronics, Marvell, MediaTek, and Intel (Infineon) now all supply a wide range of wireless connectivity technologies.

# news



## Smartphone health apps to exceed \$400 Million/pa by 2016

ABI Research has suggested to Incisor that the sports and health mobile application market will grow to over \$400 million in 2016 - up from just \$120 million in 2010. Much of that growth will be spurred by the ability of mobile handsets to easily connect to wearable devices that in turn can deliver new functionality, accuracy, and appeal to sports and fitness applications.

As the mobile handset adds new ways to access and support healthcare applications, it will become increasingly important within the healthcare market, including home monitoring systems for aging users, personal emergency response services, and remote healthcare monitoring applications. However, sports and fitness will dominate the mobile health application market.

According to Jonathan Collins, principal analyst, "Downloadable apps are moving the sports tracking device market from proprietary devices to mobile phones, but adoption has been limited by the data they can collect. However, with the connectivity that Bluetooth Smart will embed in mobile handsets, wearable devices will bring greater detail to mobile handsets. Handset connectivity to wearable devices brings a new dynamic to the sports monitoring market. Athletic equipment players have already moved to support handset applications by either using proprietary or battery-draining traditional Bluetooth wireless. Meanwhile, traditional players such as Garmin, which recently launched its first handset application for this market, and Polar have delivered high-end specialist systems. Over the next five years, these players will increasingly have to compete directly with the mobile handset."

Collins seemed to have glossed over ANT's penetration in the sports monitoring market. Either that, or he felt that technologies such as Bluetooth 4.0 would come to dominate that sector.



## SD Association and GlobalPlatform enable new apps on SD memory cards

The SD Association has announced a new collaboration with GlobalPlatform to include smart-chip technology in SD standards to enable mobile phones and other portable CE devices to provide authentication services with SD memory cards.

The two bodies believe that standardized authentication services on microSD and full-size SD memory cards could transform consumers' mobile phones and CE devices into electronic wallets, carrying cashless currency and paperless identification for use in making everyday purchases such as groceries or train tickets, or in receiving customized subscription services like mobile television. Identity features on portable devices would increase consumer control over their personal data compared to today's wallets, which are typically bulging with cards. The other suggestion is that this would provide consumers with greater security than cloud-based solutions since the smart-chip enabled SD memory cards would only be active in an authorized device.

Service and content providers, as well as CE manufacturers, could use the SD interface to offer new value-added services that are standardized and secure and use near-field communications to authenticate transactions and identity. SD standards are already supported in at least 80 percent of all mobile phones.

Gil Bernabeu, technical director at GlobalPlatform told Incisor, "From the perspective of secure application providers, it is very important that the application performs as required and to the highest security standards, regardless of the secure element selected. GlobalPlatform identifies that SD memory card standards offer many storage choices and can support the delivery of a variety of services."



## 95% of handsets announced in Sept 11 featured Bluetooth

Here at Incisor we haven't heard from market research company Strategy Analytics for a while, but now the company has been in touch to say that its recent research reveals that 95% of handsets that entered the market during September featured Bluetooth, setting a new record for any one month. In Q3 2011 as a whole, 89% featured Bluetooth, 18 of which featured version 3. There were no stats offered regarding Bluetooth 4.0, but it is early days and presumably Strategy Analytics was not digging this deep.

57% of handsets announced in September had on-board GPS - setting another record for a single month.

Looking at the non-wireless stuff, Strategy Analytics notes that handsets are becoming thinner and heavier as component miniaturisation continues. Ten handsets announced in September were thinner than 10mm with the Samsung Focus S measuring just 8.5mm and weights reached 184g with the Motorola Milestone 3.

Incisor was also told that screen sizes continued to increase, with 50% of the handset screens included in this report exceeding 3 inches, meaning that it is likely that resolutions will follow suit. Rather unsurprisingly, this is accompanied by a rising curve in battery capacity as the prevalence of larger touchscreens continues along with the need for more talk and standby time.

12 models had 8MP cameras as the upward trend in resolution continues.

Processor speeds also increased with 23 models having 1GHz or greater processors and dual core processors featuring on 7 models.

# news



## Stereo Bluetooth: no longer a broken record

A recent study from IMS Research predicts shipments of Bluetooth headsets to grow, surpassing the 45 million unit mark in 2015. Much of this growth is forecast to be derived from the less mature stereo segment of the market, with mono Bluetooth headsets now a mature technology in the key markets of North America and Western Europe.

Shipments of stereo Bluetooth headsets have been touted to see significant growth for a number of years. Liam Quirke, Connectivity market analyst at IMS Research told Incisor, "Previously, the market had been held back by issues such as sound quality and many consumers finding pairing Bluetooth devices awkward, but these issues appear to be a thing of the past." Quirke added that the utilisation of A2DP in devices has vastly improved the process when compared with early iterations, not to mention that codecs such as apt-X can also improve sound quality and latency. Many headsets today also feature far simpler pairing processes giving the devices greater user friendliness, whilst NFC may go one step further in solving that particular problem.

The major stumbling block for the stereo Bluetooth headset now appears to be awareness that Bluetooth offers wireless stereo audio streaming, with many consumers simply unaware that this is the case. A recent consumer survey from IMS Research found that 44% of respondents without a stereo Bluetooth headset were unaware of this functionality. A surge in demand for high end corded headsets has been witnessed in recent years, with brands such as Monster capitalising on this. Announcements that companies such as Monster will be incorporating Bluetooth into their range of stereo headset products may help to drive the increased awareness required to kick-start the stereo Bluetooth headset market.

Quirke also observed that the increasing demand globally for smartphones and the early success of the tablet PC is providing a positive backdrop to this particular market. Both of these devices combine high levels of media functionality with a small form factor, severely inhibiting the quality of any speaker included. To benefit from a high quality output from either of these devices, headphones are required. With Bluetooth present in almost all such devices, and portability being a major selling factor, a stereo Bluetooth headset could be an ideal companion.

## Connected lifestyle and rising energy costs will drive Smart Home adoption

The Jetsons home is coming to a neighborhood near you, according to research just published by the Strategy Analytics Smart Home Strategies (SHS) service. The classic vision of automated homes controlled by smart technologies will be enabled over the next few years by electronic sensor and control technologies, software algorithms and personal devices such as tablets and smartphones. But the report also notes that a number of challenges must be overcome if smart homes are to reach their full potential. In particular, companies must identify the applications that will drive consumer adoption of smart home solutions, and understand consumer attitudes about alternative solution sets, price points and preferred distribution channels.

Talking to Incisor, Bill Ablondi, Director, Smart Home Strategies said, "A major inhibitor to adoption of connected home solutions has been the lack of consumer awareness of what is available and the benefits. Market movers, such as ADT, Comcast, Deutsche Telekom, General

Electric, Meile, Panasonic, Schneider Electric and Verizon, to name only a few, are building awareness as they market smart home systems and services seen as instrumental to growing their businesses."

Smart meters are being deployed by utilities in the US, Europe and elsewhere and are a further sign of the smart home's growing importance. Energy consumption management is a key driver as consumers resist rising fuel costs, improve their homes, enhance their comfort and respond to environmental concerns.

"There are many opportunities for players across the emerging smart home value chain," added Ablondi's colleague, David Mercer, VP, Digital Consumer Practice. "New partnerships between utilities, service providers, device manufacturers and enabling technology providers will be formed in order to improve customer value and drive incremental revenue opportunities. After many decades of promise, it appears that the smart home is finally set to become a reality."

# INCISOR.TV

INCISOR.TV AT CES 2012

## SUPPORT GROWS FOR ULP WIRELESS ROUNDTABLE AT CES!



### JOIN THE ROUNDTABLE

Incisor.TV will film an ULP Wireless Roundtable event at the 2012 Consumer Electronics Show in Las Vegas.

Already confirmed attendees include the Bluetooth Special Interest Group, the DECT Forum and the ANT Alliance.

Be part of a group of industry leaders to discuss topics including:

- Can the ULP wireless sector successfully support multiple competing solutions?
- Is the smartphone vital to the deployment of ULP sensor and control systems?
- How important is standardisation?
- Most ULP solutions offer extended battery life. However, is any sensor or control device that will at some point require a battery change hamstrung from the start?
- Do most spec-based solutions demand too much complication – protocols, certifications, demands for interoperability?
- Can existing short-range wireless solutions compete in the M2M market?

Filming will take place on Wednesday 11th January at the Incisor.TV suite.

**CONTACT [VHOLT@INCISOR.TV](mailto:vholt@incisor.tv) FOR COSTS AND TO BOOK YOUR PLACE**

# new products



## UWB solution helps children explore Swedish Technology Park

A science centre in Sweden is using a real-time location system (RTLS) from Ubisense to offer children and adolescents a playful introduction to the world of science and technology.

In the visitor area at the Innovatum Technology Park Science Center in Trollhattan, Ubisense told Incisor, children can explore the world of technology in an environment full of interactive exhibits. Visitors can play in virtual worlds on giant projection screens creating fire-spitting dragons in the setting of a computer-generated medieval castle or indulge in classic family favourites such as 'Memory' – turning cards over to find pairs on a screen based on movements in the real world.

Within the centre's gaming environment some of the interactive exhibits come to life thanks to a wireless location solution from Ubisense. Upon entry to the interactive area, visitors are given a large cube enabled with Ubisense's real-time location system.

Each cube works like an oversized computer mouse. When taken into the 'play' area, a [network of Ubisense sensors](#) picks up the cube's 3D location wirelessly. Every real-world motion made with the cube is immediately translated and turned into a virtual action. Based on the way they move their cubes, players can compete and test their skills moving counters, objects or cards on a giant projection screen.

Each tagged cube generates an [ultra-wideband \(UWB\) location signal](#). Sensors in the gaming area pick up this information in real time and within 30 centimetres of accuracy. For accurate tracking the sensors can take up to 10 measurements per second. Information is then processed through an integrated software system.



Since the Ubisense system was installed, nearly 25,000 visitors of all ages have used the cubes and the centre has deemed the project a great success.

Daniel Palmqvist, Principal Engineer at Innovatum Technology Park, told Incisor that using the Ubisense system had worked out well. "Ubisense RTLS has never been deployed in this way but we were convinced that this system was just what we needed to realise this project."

## Chinos? Check. Blazer? Check. Tumi roller bag? Check. Now, what else do I need...?

Remember the Bluetooth-enabled mobile phone tag called Zomm that Incisor.TV filmed at both CES 1010 and 2011? You can view the movies here – [2010 \(00:25\)](#), [2011 \(03:16\)](#). Well, Zomm has teamed up with every businessman's favourite purveyor of crazily-priced luggage – Tumi – to bring to market the Tumi Bluetooth Smart Key Fob. Tumi made the new fob available in its retail outlets worldwide from October 2011.

The keychain-sized fob prevents users from losing or misplacing their mobile phone by vibrating, flashing lights and sounding an alarm when they separate from it. The fob also features call notification, a fully functional speakerphone for hands-free communication and emergency-services calling capabilities.

The Tumi Bluetooth Smart Key Fob comes with a clasp that can be attached to a matching key ring or attached to a bag or purse. It also comes with a short micro-USB cable that is used for charging and to obtain free updates online.

We wondered why the press release didn't include a price for the TumiZomm. So we



went looking, and had a FOMCL (fell off (my) our chairs laughing) moment when we found out that the fob retails for £150. Honestly.

Seems like Tumi's reputation for comedy pricing is not about to change any time soon.

## Samsung says aptX solves GALAXY quest for superior wireless audio

CSR's aptX Bluetooth audio codec will be supported in the upcoming Samsung GALAXY Tab 7.0 Plus. The Android tablet will be able to deliver CD quality stereo audio wirelessly to a broad range of aptX-enabled Bluetooth stereo speakers and headsets, such as the Samsung HS3000.

Anthony Murray, Senior Vice President of the Home Business Unit at CSR told Incisor, "With their inclusion of our aptX codec in the new GALAXY Tab 7.0 Plus, Samsung has raised the bar for wireless audio quality. It's a strong statement from a market leader underscoring the appetite for our aptX technology to ensure pristine audio over Bluetooth".

The CSR aptX codec uses algorithms to fit the entire 10 Hz to 22 kHz high-fidelity audio frequency range within the more limited bandwidth of Bluetooth wireless transmission. When incorporated in audio generating products like the Samsung GALAXY Tab 7.0 Plus, the aptX audio codec enables stereo audio recordings to be delivered transparently over a Bluetooth link, regardless of whether they are stored uncompressed or in compressed formats such as MP3, AAC or FLAC.

For the propeller-head gadget types, the new GALAXY Tab 7.0 Plus includes full HD video playback and access to the Samsung Music Hub, a catalog of more than 15 million music tracks. In addition, the AllShare feature will let the GALAXY Tab 7.0 Plus share multimedia content with TVs, PCs and laptops.



Richard Traherne,  
Cambridge Consultants.

# Satellite for all?

By Richard Traherne, Head of Wireless  
Cambridge Consultants

**As a demographic, Incisor readers are more aware than most, of connectivity being one of the most prominent technological advances in our everyday lives. Phrases such as “ubiquitous communication” are commonplace, to the extent that they often sound hackneyed. Or so they sound to the majority of us that are lucky enough to live in an area of ‘good’ wireless coverage, through cellular and other mainstream systems. But, surely, for those that don’t it’s just a matter of time, given the rate at which wireless coverage is increasing around the globe?**

The reality, however, is more stark than this. Yes, for the regular person, that doesn’t rely on an ‘ever present’ service and who lives in a ‘developed’ or ‘developing’ region this is probably true. However, with ‘mainstream’ technologies like cellular covering less than ten percent of the globe, this leaves great swathes of the planet untouched. However, if the majority of those areas aren’t populated then surely that doesn’t matter?

Unfortunately, our hunger for ‘always on’ connectivity and increasing desire to control and monitor what goes on around us means that this is no longer the case. Remote workers in deserts, lorries crossing continents, mariners in the middle of the ocean, even hikers in the wilderness all now look for the same services that they access at home.

Sceptics might dismiss these services as luxuries (and might perhaps also be comfortable to give up email to return to good old fashioned letter post?), but the fact of the matter is that, for those people that spend considerable time in these remote destinations, the ability to communicate can easily be justified as more than a luxury and in many cases a true [life saver](#).



So, am I arguing for global cellular coverage? As you may guess, I am not. Instead, I am setting the scene to introduce the often misunderstood and underestimated wireless technology that is low earth orbit satellite. Surely a niche technology for a select few? Well, actually not. It is now beginning to see major uptake and the trend is accelerating.

A rising star in this area is Iridium Communications Inc, who own a satellite constellation that provides 100% coverage of the Earth. Being a Low Earth Orbit (LEO) system, the satellites are just 480 miles above the Earth, leading to low voice delay and data latency, unlike Geostationary (GEO) alternatives some 21,500 miles higher. With over 500,000 subscribers now worldwide and 25%

growth year on year, Iridium has very definitely begun to break out of niche markets.

How is Iridium doing this? In a variety of ways, including advancement of its technology platforms. This includes ongoing cost and size reduction of its satellite modem technology. Whilst having nowhere near the economy of scale of the consumer wireless technology markets, Iridium has nevertheless taken large steps in reducing the cost and size of its satellite modem technology.

Engaging its technology partner [Cambridge Consultants](#), Iridium has been able to increase the level of its radio silicon integration to a point where a satellite modem for data applications (the [Iridium 9602](#))





is now the size of a matchbox that can fit in the palm of the hand. These characteristics, coupled with very simple interfaces to the outside world, have led to a strikingly rapid adoption of the product. Already, over 100 companies have signed partnership agreements to integrate the 9602 module into their products, with the first having launched already. A notable example is the [DeLorme inReach](#), a personal communicator with 2-way messaging, global coverage and an Android Interface. Built around the 9602 developed by Cambridge Consultants, inReach is one of the first of a new generation of outdoor leisure products priced squarely for the consumer market.

To accelerate this adoption by its ecosystem of innovative partners, Iridium has also worked hard to make its satellite technology as accessible as possible. Working again with Cambridge Consultants, its product range has been developed to present simple standard interfaces, power supply requirements and antenna configurations that are readily adoptable by developers.

This ethos straddles a couple of key elements of Iridium's latest offering, [Iridium Force](#), which represents Iridium's overarching vision to "extend and enhance personal communications for people and organisations, everywhere":

- Extending beyond satellite phones: Giving people the ability to use their

smartphones and favourite applications beyond the reach of terrestrial networks

- Simplifying connections: Making its technology accessible and cost-effective to embed across an ever-widening range of current and future services
- Driving innovation: Opening and licensing its technology to collaborate with an expanding set of innovators, creating new solutions for a wide range of markets
- Location-aware: Integrating location services with products to enable personal security and location-specific applications on the go
- Uncompromising performance: Delivering tough, reliable "truly mobile" devices that work anywhere on the planet

So, whilst having nowhere near the penetration of mainstream services, Iridium is already breaking into larger markets, both with satellite only as well as hybrid products. Only time will tell how far this can be taken, but with the advent of this growth and on the brink of launching a [new satellite network](#), Iridium is certainly a company to watch.

[www.cambridgeconsultants.com](http://www.cambridgeconsultants.com)



## Cambridge Consultants Blogs

**Why are we blogging?** We believe that the technology market is much better when it is highly connected, and social media is a fantastic tool that instantly connects people who face similar challenges, irrespective of whether they are budding entrepreneurs running their first high growth start up company or a captain of industry in charge of a global bluechip company. So, if you'd like to add to the debates, please feel free to comment on any of our blogs. It would be great to hear from you.



Patrick Porlage  
Marketing  
Communications  
Director  
Cambridge Consultants.

### Corporate Blog

Our corporate blog covers new product development, open innovation, accelerating start up companies and other topics that involve using innovation to achieve market leadership, along with technology stories that we hope you will find interesting/

### Consumer Products Blog

Topics include connected devices, beverage dispensing, eco innovation, new product introduction (NPI), open innovation, novel control interfaces and other topics related to our development of innovative consumer electronics, domestic appliances and fast moving consumer goods.

### Wireless Medical Blog

Examining mobilehealth and telehealth technology ad market challenges, this blog provides insight from implantable and hospital communications to consumer health applications.



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With one of the largest independent wireless development teams in the world, Cambridge Consultants has a pedigree of creating 'world firsts' in wireless communications, including satellite communications, single-chip radio transceivers, low-cost next generation cellular communications, and medical areas such as connected instruments, drug delivery and surgery.



## Incisor interview

# MecApp Pro – from a bedstory to an acknowledged Bluetooth tool! (Alternatively: – the accidental Bluetooth tool!)

Vince Holton talks to Jakob Hjelmåker, Bluetooth Business Manager at Mecel

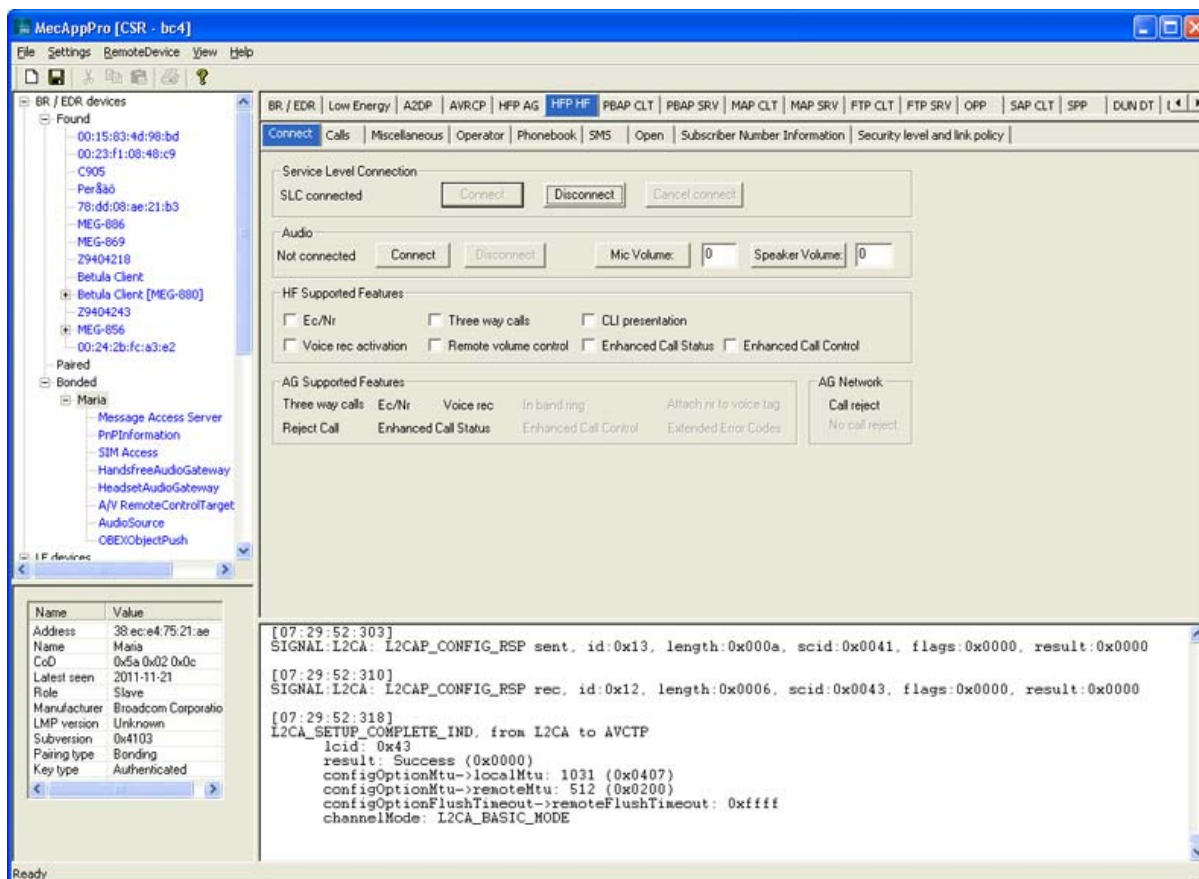
In our interview in last month's issue of Incisor, Mecel's Jakob Hjelmåker alluded to his company's MecApp Pro test tool for verification of profiles and protocols, which was officially launched on November 11th, 2011. The story behind the Bluetooth development tool is quite interesting, so I decided to delve deeper in order to better understand the unusual path a commercial product takes en route to market.

*VH: If my memory serves me correctly, MecApp, the predecessor of MecApp Pro, has been around for ages (from a Bluetooth perspective). How did it all start and what was the reason?*

**JH:** Since we realized that Bluetooth would most likely impact our home turf – the automotive industry - Mecel decided to join the Bluetooth SIG back in 1999 as one of the early members. There were also several requests for Bluetooth from other industries, so we kept the pressure on during the initial development. With a Mecel demo at the Paris Motor Show the very same year, the hype around a Bluetooth hands-free system was confirmed and Mecel's investment in Bluetooth technology was vindicated.

A few years into the Bluetooth development process, it became apparent that there were no useful tools for testing and verification of newly developed profiles. Since nothing seemed to be happening in that area, we decided to stop waiting and create such a product by ourselves. In fact, one of





The MecApp Pro user interface

our experts started to create MecApp after tucking his kids into bed and waiting for them to fall asleep. As many parents will recognize, there is often a sensitive time-slot during which you cannot move too far away from the soon to be asleep children. In this case it turned out to be the perfect opportunity to spend some time on a Bluetooth tool, since the normal working day was usually filled with customer activities.

**VH:** So how did it move from a bedtime story activity to a well recognized tool?

**JH:** Once presented internally to the team, the result was very much appreciated, and the tool immediately became a great help for the engineers in their daily work – MecApp was off the ground! With just a USB Bluetooth dongle connected to a PC, this Windows executable became a convenient way to start testing Bluetooth features.

Soon the word spread, and our customers and other partners within the Bluetooth industry started to wonder what tool we were using. It was then decided to start providing MecApp to anyone with a need for a Bluetooth tool. There was one thing we had to address, though. Since there had been no focus or strategy to market the tool externally, MecApp had really only been designed to be functional, with no great effort made to create an exciting user interface. With that in mind, we actually gave away the initial version of MecApp for free. Over the next few years the number of

users grew to well above 1,000. As you would expect, phone companies were amongst them but there were also automotive OEMs and Tier 1's, as well as computer manufacturers.

**VH:** And you've now moved from MecApp to MecApp Pro. Tell me more about how it differs from the original version, and why you felt the need to improve/change it?

**JH:** During our Low Energy development some years ago, we obviously added support to MecApp for this new branch of Bluetooth (to have something to verify our design with). At this time, the discussions started internally as to whether our - now plentiful - users would be open to the idea of purchasing a commercial variant of the tool. With the additions of Low Energy and other profiles such as MAP, in parallel with enhanced logging, we decided to give it a try, and so we created a plan for MecApp Pro.

**VH:** Can you be a little bit more specific as to what you can test with MecApp Pro?

**JH:** Certainly. Well, apart from the part we've already mentioned - Low Energy and Bluetooth/EDR, we're supporting the most common profiles, including A2DP, AVRCP, HFP, PBAP, MAP, FTP, OPP, SAP, SPP, DUN and PAN. There's also support for L2CAP and BNEP.

What's very useful, and as far as we know unique, is that the tool supports both sides of a Bluetooth connection.

**VH:** So, the launch has now happened. How has take-up been so far?

**JH:** We're excited to already have delivered MecApp Pro to some of the leading phone manufacturers, automotive OEM's and Tier 1's. Various test houses are using the tool extensively. This success is a two-edged sword –my boss is telling me: "You're obviously selling this tool too cheap".



Joking apart, the idea is that the MecApp Pro shall be affordable for both large and small companies within the Bluetooth industry.

**VH:** Where does MecApp Pro go next? Is that already defined?

**JH:** We do have a road map for MecApp Pro. What's likely to be next in 2012 is the ability to run automatic tests. This is a popular request from our customers and we hope to include this in MecApp Pro soon.

Apart from that, we continue to add support for new profiles as they come along, so these end up in the tool too. In reality, the evolution and enhancement of MecApp Pro is an ongoing and continuous process.

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# Inside Bluetooth low energy technology

By Kjartan Furset, Senior Applications Engineer,  
Nordic Semiconductor

**Bluetooth low energy wireless technology employs some clever technology to minimize its power consumption. Kjartan Furset explains.**

The Bluetooth Special Interest Group (SIG) has recently formally adopted the latest variant of the popular short-range wireless technology, known as Bluetooth Core Specification Version 4.0 ("Bluetooth v4.0"). The much-anticipated ultra-low power (ULP) form of the popular wireless technology, Bluetooth low energy, is a hallmark feature of this version.

Bluetooth Version 2.1 + EDR and Version 3.0 + HS (commonly referred to as "Classic Bluetooth technology") and Bluetooth v4.0 have much in common: they are all low cost, short range, interoperable, robust wireless technologies operating in the license-free 2.4GHz Industrial, Scientific and Medical (ISM) RF band.

But there is one critical difference: The Bluetooth low energy technology part of Bluetooth v4.0 was designed from the outset to be an "ultra-low power" (ULP) wireless technology whereas Classic Bluetooth technology forms a "low power" wireless connection.

Classic Bluetooth technology is a "connection oriented" radio with a fixed connection interval ideal for high activity connections like mobile phones linking with wireless headsets. In contrast, Bluetooth low energy technology employs a variable connection interval that can be set from a few milliseconds to several seconds depending on the application. In addition, because it features a very rapid connection, Bluetooth low energy technology can normally be in a "not connected" state (saving power) where the two ends of a link are aware of each other, but only link up when absolutely necessary and then for as short a time as possible.

The operational mode of Bluetooth low energy technology ideally suits transmission of data from compact wireless sensors (exchanging data every half second) or other peripherals like remote controls where fully asynchronous communication can be used. These devices send low volumes of data (i.e. a

few bytes) infrequently (for example, a few times per second to once every minute or more seldom).

## A tale of two chips

There are two types of chips that together form Bluetooth low energy architecture: Bluetooth low energy devices and Bluetooth v4.0 devices. The Bluetooth low energy chip is brand new to the Bluetooth specification – it's the part of the technology optimized for ULP operation. These devices can communicate with other Bluetooth low energy chips and Bluetooth v4.0 chips when the latter are using the Bluetooth low energy technology part of their architecture to transmit and receive. (See figure 1.) Bluetooth v4.0 devices are capable of both Classic Bluetooth and Bluetooth low energy communication.

Bluetooth v4.0 chips will be used anywhere a Classic Bluetooth chip is used today. The consequence is that cell phones, PCs, Personal Navigation Devices

(PND) or other applications fitted with the new Bluetooth chips will be capable of communicating with all the legacy Classic Bluetooth devices already on the market as well as all future Bluetooth low energy devices. However, because they are required to perform Classic Bluetooth and Bluetooth low energy duties, Bluetooth v4.0 chips are not optimized for ULP operation to the same degree as Bluetooth low energy devices.

Bluetooth low energy chips can operate for long periods (months or even years) from a coin cell battery such as a 3V, 220mAh CR2032. In contrast, Classic Bluetooth technology (and Bluetooth v4.0) typically requires the capacity of at least two AAA cells (which have 10 to 12 times the capacity of a coin cell and much higher peak current tolerance), and often more, to power them for days or weeks at most (depending on the application). (Note: There are some highly specialized Classic Bluetooth applications that can run on batteries with a lower capacity than AAA cells.)

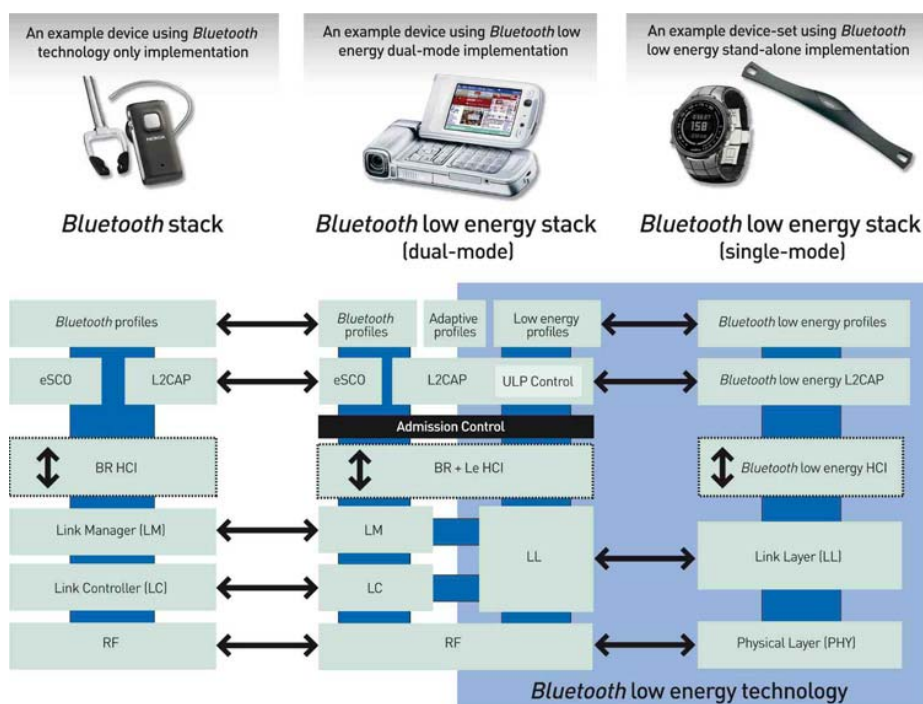


Figure 1. Bluetooth v4.0 chips will use the Bluetooth low energy part of their architecture to communicate with Bluetooth low energy devices.

## The technology of ultra low power wireless

There are three characteristics of Bluetooth low energy technology that underlie its ULP performance: maximized standby time, fast connection, and low peak transmit/receive power.

Switching the radio “on” for anything other than very brief periods dramatically reduces battery life, so any transmitting or receiving that has to be done needs to be done quickly. The first trick Bluetooth low energy technology uses to minimize time on air is to employ only three “advertising” channels to search for other devices or promote its own presence to devices that might be looking to make a connection. In comparison, Classic Bluetooth technology uses 32 channels.

This means Bluetooth low energy technology has to switch “on” for just 0.6 to 1.2ms to scan for other devices, while Classic Bluetooth technology requires 22.5ms to scan its 32 channels. Consequently, Bluetooth low energy

Frequency (MHz)	Bluetooth low energy Advertising channel	Bluetooth low energy Data channel	Wi-Fi Channel
2480	39		
2478		36	
2476		35	
2474		34	
2472		33	11
2470		32	11
2468		31	11
2466		30	11
2464		29	11
2462		28	11
2460		27	11
2458		26	11
2456		25	11
2454		24	11
2452		23	11
2450		22	
2448		21	6
2446		20	6
2444		19	6
2442		18	6
2440		17	6
2438		16	6
2436		15	6
2434		14	6
2432		13	6
2430		12	6
2428		11	6
2426	38		
2424		10	
2422		9	1
2420		8	1
2418		7	1
2416		6	1
2414		5	1
2412		4	1
2410		3	1
2408		2	1
2406		1	1
2404		0	1
2402	37		1

Figure 2. Bluetooth low energy technology's advertising channels have been carefully chosen to avoid clashes with Wi-Fi.

technology uses 10 to 20 times less power than Classic Bluetooth technology to locate other radios.

Note that the use of three advertising channels is a slight compromise: it's a trade between “on” time (and hence power) and robustness in what is a very crowded part of the spectrum (with fewer advertising channels there is a greater chance of another radio broadcasting on one of the chosen frequencies and corrupting the signal). The specification's designers are confident they have balanced this compromise – they have, for example, chosen the advertising channels such that they don't clash with Wi-Fi's default channels. (See figure 2.)

Once connected, Bluetooth low energy technology switches to one of its 37 data channels. During the short data transmission period the radio switches between channels in a pseudo-random pattern using the Adaptive Frequency Hopping (AFH) technology pioneered by Classic Bluetooth technology (although Classic Bluetooth technology uses 79 data channels).

Another reason why Bluetooth low energy technology spends minimal time on air is because it features a raw data bandwidth of 1Mbps – greater bandwidth allows more information to be sent in less time. An alternative technology that features a bandwidth of 250kbps, for example, has to be “on” for eight times as long (using more battery energy) to send the same amount of information.

Bluetooth low energy technology can “complete” a connection (i.e. scan for other devices, link, send data, authenticate, and “gracefully” terminate) in just 3ms. With Classic Bluetooth technology, a similar connection cycle is measured in hundreds of milliseconds. Remember, more time on air requires more energy from the battery.

Bluetooth low energy technology also keeps a lid on peak power in two other ways: by employing more “relaxed” RF parameters than its big brother, and by sending very short packets. Both technologies use a Gaussian Frequency Shift Keying (GFSK) modulation, however, Bluetooth low energy technology uses a modulation index of 0.5 compared to Classic Bluetooth technology 0.35. An index of 0.5 is close to a Gaussian Minimum Shift Keying (GMSK) scheme and lowers the radio's power requirements (the reasons for this are complex and beyond the scope of this article). Two beneficial side effects of the lower modulation index are increased range and enhanced robustness.

Classic Bluetooth technology uses a long packet length. When these longer packets

are transmitted the radio has to remain in a relatively high power state for a longer duration, heating the silicon. This changes the material's physical characteristics and would alter the transmission frequency (breaking the link) unless the radio was constantly recalibrated. Recalibration costs power (and requires a closed-loop architecture, making the radio more complex and pushing up the device's price).

In contrast, Bluetooth low energy technology uses very short packets - which keeps the silicon cool. Consequently, a Bluetooth low energy transceiver doesn't require power consuming recalibration and a closed-loop architecture.

## Extending the Bluetooth ecosystem

Bluetooth low energy technology was designed for applications where Classic Bluetooth technology is not viable because of severe power restraints. This is the first time a ULP wireless technology with guaranteed interoperability has been available to electronics designers and promises to kick start hundreds of new applications.

A clue to some of the likely early applications is provided by the Bluetooth SIG's intention to follow up the adoption of Bluetooth v4.0 with the release of a family of “Profiles”: these Profiles optimize a generic Bluetooth low energy chip for a specific application such as Personal User Interface Devices (PUI) (such as watches), Remote Control, Proximity Alarm, Battery Status and Heart Rate Monitor. Other health and fitness monitoring profiles such as blood-glucose and -pressure, cycle cadence, and cycle crank power will follow.

Let's take a look at how Bluetooth low energy technology will be used in just two potential applications: Proximity Alarm and Indoor Location (sometimes referred to as “Indoor GPS”).

Bluetooth v4.0 chips are being adopted by cell phone and portable PC makers because they'll cost only very slightly more than Classic Bluetooth technology yet offer so much more functionality. This will allow cell phone makers to offer a security device comprising a Bluetooth low energy powered watch that periodically communicates with the cell phone. If the cell phone moves out of range - and hence can't contact the watch worn by the user - it would automatically lock and the watch would emit an alarm. This would prevent the cell phone being accidentally left behind and prove a major deterrent for any would-be thief.

The proximity alarm application could be extended to a portable PC that locks when





Figure 3. Bluetooth low energy equipped sensors around an airport terminal could constantly broadcast information about their location. A cell phone passing within range could then display that information.

the user moves out of range (and perhaps unlocks to be ready for use when the approaching user presses a button on their watch). The application could also be used as a child safety device where the child's watch communicates with a parent's while they remain in range with an alarm sounding if the child wanders away.

The low cost and low maintenance (because batteries require only infrequent changes) of Bluetooth low energy sensors will encourage widespread use in public places. One key application could be indoor location (where there is no GPS signal) whereby sensors around a large public building (such as an airport or rail station) constantly broadcast information about their location. A Bluetooth low energy equipped cell phone passing within range could then display that information to its owner.

Sensors could transmit other information such as flight times and gates, location of amenities, or special offers from nearby shops. (See figure 3.)

### Final step

Several silicon vendors are well advanced in the design of their families of Bluetooth low energy chips, and have released samples and development kits. Some, including Nordic, have qualified their chips to the Bluetooth v4.0 specification.

The first device in Nordic's  $\mu$ Blue™ Bluetooth low energy chip family, the nRF8001 (plus a  $\mu$ Blue prototype kit and

Software Development Kit) was released in January 2011.

By delivering sub 12.5mA peak currents and connected mode average currents as low as sub 12 $\mu$ A (for 1s connection intervals), Nordic claims the nRF8001 represents the industry's lowest power Bluetooth low energy solution.

The chip is a fully qualified Bluetooth v4.0 low energy combining Radio, Link Layer, and Host into one End Product Listing (EPL), enabling designers to easily create new Bluetooth end products without any additional listing fees.

With the silicon now available from several suppliers, the final piece of the Bluetooth low energy puzzle, the Profiles, are imminent. The Bluetooth SIG says the first Profiles – such as Proximity Alarm - will start appearing within weeks. That means electronics designers can finally get their hands on fully qualified chips to begin their product development of proximity applications.

It's taken a while for Bluetooth low energy to reach commercialization. But now that the fully qualified silicon is reaching the market, expect a tsunami of Bluetooth low energy products to follow. For example, analyst IMS estimates that by 2013, a billion Bluetooth low energy devices will be sold every year. That represents the fastest adoption of any wireless technology by far.

[www.nordicsemi.com](http://www.nordicsemi.com)

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[A guide to Bluetooth Version 2.1 + EDR](#)



Joe Lomako, TRaC

# The formalisation of technologies in healthcare

By Joe Lomako,  
Business Development Manager, TRaC

**I believe it was the polymath Benjamin Franklin who said “But in the world nothing can be said to be certain except death and taxes”. However I would like to add a third! – “Vince Holton chasing me for my article in incisor”.**

Well here it is! Well chased Vince!

So, another year has almost passed, There has been a lot happening in the world of approvals and certification for ZigBee and despite many musings about its success we at TRaC are certainly seeing considerable interest which is continually growing. The best way to illustrate this is to review activities within the year. There have been a number of activities and events throughout the year spanning the globe endorsing the fact that ZigBee truly is a worldwide phenomenon which is definitely here to stay.

The members of the ZigBee fraternity in Europe, with whom we work very closely, have also been busy bees – forgive the pun!

In particular we saw the European ZigBee Developers conference celebrate its 5th year and the interest is clearly growing with the diversity of attendees reaching across both academia and industry. Some of the papers which have been presented have covered techniques and ideas for novel applications. Examples include specific applications of the technology such as a vehicular monitoring system providing sensory information in an in-vehicle network; as well or a more esoteric investigation into the radio propagation performance of ZigBee modules – the so called Range Testing – this showed the mesh networking really come into its own when compared to other low power applications.

There have also been a number of European ZigBee test events where the stakeholders of the various profiles have put their products through the paces in the



development of the new profiles. Again this has shown some fantastic new products which we will see emerging on the market in the near future. So keep an eye on the press releases!

This summer saw the emergence of the ZigBee Smart Energy Profile SE 1.1. Pike Research has projected that by 2019 the global Smart Energy device market will be worth \$26.1 billion. Hence it is no surprise that many utilities and smart energy exponents are making ZigBee their technology of choice, with an anticipated \$3.3 billion of this global market being attributed to ZigBee enabled devices. These projections are further verified by the number of devices already certified to the SE 1.1 standard, with many more already in development which we will see certified in the coming months. Products certified to the ZigBee SE 1.1 certification ensure that the utilities and governments which deploy these products are confident that these home area networks

in which they are connected are secure, interoperable and user friendly. Jon Harros, ZigBee business manager at TRaC, says “As part of the ZigBee certification process we test new products of the highest quality and put them through a rigorous testing process”.

Of course, ZigBee Smart Energy is not the only profile which the ZigBee Alliance has produced. ZigBee lends its versatility to several other profiles of which personal Healthcare is one.

As is well known, the Continua Health Alliance (CHA) has chosen ZigBee as one of the transports for its products. Again, the interest is continually growing in ZigBee-enabled medical, health and well being devices. The CHA promotes interoperability in healthcare devices by virtue of the ISO 11073 suite of standards and TRaC is actively involved in the continual development of certification processes of CHA.





To complement this development the CHA recently appointed a number of experts in the position of Continua Certified Expert (CCE). Our very own Jon Harros is one of those CCE's. The purpose of the CCE is to guide designers through the varying options they have to achieve certification and to provide all of the necessary assistance they require. Jon also presented at the Wireless Congress in Munich this year describing how the CHA certification process works and how the CCE works.

TRaC isn't the only party involved in ZigBee activities and you only need to look

at the events page on the ZigBee Alliance website to see that.

The Consumer Electronics Show (CES) in Las Vegas starts on the 10th January next year and for those not aware this is the world's largest technology tradeshow with over 2700 exhibitors. The ZigBee Alliance and Continua Health Alliance will have exhibition stands so please make sure that you add those to your visit list if you are attending; TRaC will be occupying a booth on the ZigBee Alliance stand.

At CES we always expect to see lots of new announcements and products – and

this year we have a couple of announcements ourselves, so please accept my invitation to come and visit TRaC on the ZigBee Alliance stand, and of course watch this space for further information.

So! From the hive of activity that has been ZigBee (oops there's another pun!) throughout 2011, it's apparent that ZigBee is here to stay. TRaC will be walking shoulder to shoulder with ZigBee, and I for one cannot wait to see what products the brainboxes in the world of ZigBee come up with next. See you in Vegas!

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# Nordic Semiconductor takes press and vendors on California sojourn

## Plans new, multi-protocol chip family

Incisor has been covering developments by Nordic Semiconductor for some time. The company is the current occupant, in our opinion, of the industry position once held by CSR, before the one-time Bluetooth giant lost its ability to see the wood for the trees. Nordic is, like CSR was, innovative, pushy, forward-leaning, and growing, and its influence is extending out through the industry. Recently, for example, Nordic joined the Bluetooth SIG board of directors.

Nordic's published mission statement is to become the leader in ultra-low power (ULP) sub-1GHz and 2.4GHz wireless connectivity, and its range includes three 2.4GHz product families: the nRF24L Series of 2.4GHz RF Systems-on-Chips (SoCs), the nRF24AP2 Series of ANT Connectivity ICs (Integrated Circuits or 'chips'), and the  $\mu$ Blue Series of Bluetooth low energy ICs. In addition, Nordic supplies the Sub 1-GHz Series for longer range industrial, home automation, and wireless monitoring applications.

We are featuring Nordic here and now because the company staged an Editor Event in San Diego during November. Nordic invited along various industry partners, all of whom we cover below.

Journalists used to be invited to this sort of event all the time, and very useful they were. However, since the world a) became poor and b) the Internet confused the bejassus out of every tech company trying to understand how to communicate, vendors and journalists just don't meet face to face like they used to.

And you know, it is easy to underestimate just how useful this type of event is. Over the course of less than 48 hours, Incisor came to know Nordic much better, we plastered over a spat and built a platform for future communications with the creators of ANT technology, we got to know three completely new companies using ULP wireless in clever ways – 4iiii Innovations, Sifteo and Ivansys, and we were brought up to speed with developments from Philips Home Control and Casio.



Nordic was making no specific news announcements at the event, but took the opportunity to emphasise its commitment to proprietary as well as standardised ULP wireless solutions such as Bluetooth 4.0 and ANT. The company divides the low power wireless market up as follows:

Low power (average current consumption in a node 5-50+ mA):

- Wi-Fi direct
- ZigBee
- Bluetooth versions prior to v4.0.

Ultra low power (average current consumption <1 mA)

- ANT+
- Bluetooth v4.0 (which includes Bluetooth low energy as a hallmark feature).

Although not today a player in Wi-Fi or ZigBee, Nordic is keeping (three?) feet in ULP camps.

## Applecart, be prepared to be upset...

One thing we did learn, but only unofficially, is that Nordic is about to throw a curveball into the established SRW market with a family of chips going by the name of nRF51. Although Nordic's execs

would tell us nothing on the record, Incisor understands that the NRF51 2.4 GHz transceivers will have integrated microcontrollers to run protocols and applications, and will sample by mid-2012. Nordic product manager Thomas Embla Bonnerud described the chips as a ground-up redesign that will provide more



performance at lower power – and which will “redefine the ULP wireless category again with a novel SoC architecture featuring lower power, higher performance and other new features.”

And this is where it becomes a bit vague and mysterious.... We understand that while the chips will come in separate versions for ANT, Bluetooth and proprietary protocols, that they will have limited multi-protocol capabilities. Now, Nordic did admit that Bluetooth 4.0, ANT and proprietary stuff would all be on one chip. “That sounds like a software configurable radio” said Incisor, at which point Bonnerud just smiled enigmatically. He did claim the nRF51 series would cut power by as much as half for some applications.



Bonnerud also showed us a new reference design for a remote control, called the nRFready Smart Remote. This includes a six-axis motion sensor and an accelerometer. It also includes a multi-touch pad that supports swipes, scrolling and the other gestures that today's iGroupies expect.

The first version of the design ships this month supporting proprietary protocols. Incisor understands that a Bluetooth 4.0 version will ship before the end of 2011.

Undoubtedly Nordic Semiconductor is a company that is going places. Hopefully, its industry partners will have appreciated the benefit of this Editor's Event, and will support further, similar activity. That way we – journalists and vendors alike – can go places together.

Now have a look at what the other participants were up to.



Last month's issue of Incisor included a major feature on the use of wireless sensors in the world of sports and fitness. Our overview included a summary of who was doing what, and with whom.

One technology that didn't get nearly enough bandwidth, according to its promoters, was ANT, and the ANT+ protocol. The telephone lines were sizzling between ANT trailblazer Dynastream's HQ just outside Calgary, in Canada, and Incisor HQ in the UK.

So it was with some sense of mild curiosity that we sat down for the ANT presentation that was to be made by Rod Morris, a director of Dynastream, and, apparently, the guy who wrote the ANT protocol. Did he have a moose gun in his backpack in preparation for this confrontation with Incisor?

No, as it turns out. Morris turned out to be a very nice man (as Canadians generally are!) and his presentation provided a well-balanced view of ANT's achievements to date, and carefully mapped out its place in the ULP-osphere.

One of the main accusations levelled at ANT is that it is not in cellphones, or that it is in just one Sony Ericsson handset. Morris explained that ANT is now enabled in 10 Sony Ericsson handsets, and that an ANT-enabled handset had been announced by HTC (these are all Android phones, by the way. Apple has yet to embrace ANT). That's still not a broad spread, but Morris continued by suggesting that as the ANT protocol is now embedded in many of the combo wireless chips that the big semicon companies are shipping – e.g. TI's WiLink – that it was just a case of switching ANT

on, and that many more handsets were likely to be supporting ANT.

Nordic Semiconductor is, of course, firmly behind ANT. Nordic's nRF24AP2 ANT family – the nRF24AP2-USB – is a single chip ANT solution that integrates a Nordic 2.4GHz nRF24L01+ transceiver core, the 8-channel ANT protocol stack, a Full-Speed USB 2.0 device controller, and 4 to 5.25V linear voltage regulator with USB interface, and is used to build ANT USB dongles for use in product applications such as wireless sport, fitness and health monitoring. The nRF24AP2-USB provides the same feature set as Nordic's existing 8-channel nRF24AP2-8CH ultra low power (ULP) wireless solution, but exchanges the latter's UART interface for a Full-Speed USB 2.0 compliant host interface.

Is ANT a mainstream competitor to other ULP wireless technologies? No, not yet. Morris told us that 24 million ANT devices have been shipped to date in the approximately 5 years since chips became available. That isn't a big number by comparison with technologies such as Bluetooth or even ZigBee. But, ANT has achieved a lot of success in sports and fitness devices. As 4iiii Innovations (see 4iiii story below) president Ian Andes said, when he set out to build a device for athletes that included wireless connectivity, he was only aware of ANT. Such is the level of awareness of ANT technology in the sports and fitness market.

Whether ANT can grow beyond its primary commercial market remains to be seen. Here at Incisor we have no bias whatsoever against ANT. We do, on the other hand, actively encourage Dynastream to talk more to media such as ourselves. We believe that we are doing a poor job if we don't present all the contenders in a given market, but in order to do so we need the help of the people pushing the technology. We will include ANT regularly, as long as somebody is telling us what is going on!

In this connection, we're very pleased that Dynastream is participating in Incisor's Ultra Low Power Wireless Roundtable event at CES in January (see elsewhere in this issue). That will be a great start, and Incisor.TV's loyal movie watchers around the world will definitely get to know more about Dynastream, ANT and the ANT+ protocol.

So, thanks to Nordic for bringing Incisor and ANT together – Canada will not be declaring war on the UK!

## Sifteo - wireless cubed

Game system startup Sifteo Inc. specified Nordic's 2.4GHz transceivers for the wireless connectivity in its Sifteo cubes game platform.

Sifteo's Co-Founder and President David Merrill told the group that the cubes provide a hands-on play experience for adults and children by combining traditional tabletop game pieces with contemporary video-based entertainment using the latest sensing and wireless technologies.

In standard configuration, three (expandable to six) 1.5-inch (3.8cm) Sifteo cubes – each incorporating a full-color LCD display – can sense their own motion when handled and the presence of the other cubes, enabling interactive play scenarios driven by runtime software on a player's computer. This deceptively simple (but technically highly advanced) capability supports an expanding array of downloadable games including challenging titles for adults, fun learning puzzles for kids, and games families can play together.

Each cube is powered by a rechargeable lithium-polymer battery and employs a 3-axis accelerometer and a Nordic nRF24L01+ 2.4GHz transceiver that communicates with a Nordic nRF24LU1+ single chip USB dongle plugged into the user's computer. The computer allows games and other software applications ('apps') from Sifteo's online library to control the Sifteo cubes during gameplay.

The whole group wanted to play with the cubes, which bodes well for Sifteo!

*Click on the arrow to see the Sifteo video.*



## Philips Home Control shows DUAL IR/RF remote control

Another of Nordic's partners, Philips Home Control, Singapore, is using Nordic wireless technology in its QWERTY keypad-equipped DUAL infrared (IR)/RF remote control.

DUAL is designed for use by consumer electronics (CE) manufacturers of emerging



'connected' products such as Smart TV, Over The Top (Internet) boxes, and Hybrid set-top boxes (STB). The DUAL platform comprises everything required for CE manufacturers to develop a customized IR/RF remote control with minimum design overhead, and includes controller handset, compact USB dongle, and demonstration software that runs on a PC.

DUAL is equipped with a full QWERTY-keypad on one side, and on the other, touchpad or optical sensor controls for alternate input methods allowing manufacturers to implement free cursor, gesturing, and moving highlight mechanisms. Philips Home Control says this makes browsing a better experience than traditional RF remote controls with directional keys.

There's more about the DUAL remote control [at this link](#).



### Sportsiiiis heads-up display system for athletes

Well, if we journalists were feeling jet-lagged and sluggish at Nordic's West Coast event, 4iiii Innovation's president Ian Andes made an excellent contribution to our feeling inadequate! A super-fit Ironman/triathlon competitor, Andes explained that his product – Sportiiiis – was built by athletes, for athletes.

Sportiiiis is a heads-up display system for athletes combining wireless technology, electronics, LED indicators, plus mechanics, and attaches to most commercial glasses. Sportiiiis works by wirelessly communicating with sensors equipped with the ANT+ RF software protocol running on a Nordic RF transceiver.

A system of seven LEDs indicates to the user how they're performing against training parameters that have been set up on a PC. A central green LED indicates the user is working in the correct zone, and yellow, orange, and red indicators to the left and right record varying degrees of under- or over-performance.

The RF transceiver in Sportiiiis can communicate with up to eight separate sensors simultaneously, displaying each in turn in response to a tap on the side of the device. Each tap also triggers an audible cue informing the user which sensor is currently being displayed and its reading at that instant.

Andes explained that while ANT+ had met all of his company's needs to date, he was aware of developments in technologies such as Bluetooth low energy (4iiii is also a Bluetooth SIG member), and, should logic dictate that it was a good idea, technologies such as BLE could be adopted.

*Watch the movie to see more:*



### Isansys Lifecare Platform

Developed by UK medical services start-up Isansys, the Lifecare Platform is a secure web-based framework for intelligent vital signs data collation and interpretation that enables continuous physiological monitoring services. A key component of the Lifecare Platform is the LifeTouch HRV011 cardiac monitor (a big Band-Aid with a sensor built in), which Isansys co-founder Keith Errey claimed is the world's first commercially-available, clinical-grade, wireless cardiac monitor to provide low-cost, unobtrusive, continuous ECG monitoring and analysis.

By making the most costly elements of the Isansys LifeTouch ECG wireless monitor

recyclable, Errey told us that its cost can fall to just a few tens of cents. The HRV011 adheres to a patient's body and analyses the ECG signal of every heartbeat. A proprietary algorithm running within an on-board ARM Cortex-based microcontroller is used to calculate key physiological parameters to detect problems rapidly. Collected data is securely transmitted to a web-based HL7-compliant database.

An ultra low power RF transceiver enables battery operating life of up to 100 hours from a coin cell battery, while offering high interference immunity.

Presumably because it's not yet certified, LifeTouch monitors are not yet being offered for commercial or clinical use in the U.S.



### Casio

The Japanese watch company wasn't present at the San Diego event, and so a Nordic staffer presented Casio's, Bluetooth-enabled G-Shock watch, announced earlier this year.

This has been featured in Incisor a number of times – see the watch featured in [one of our daily news shows from CES this year](#), and also on page 10 of Incisor's 'Connected Watch' special issue in June this year. So, we will let our past coverage do the job.

It's a great product – big hint, we'd like to review it, Casio! - and there will soon be plenty of other products to connect it to.

## Snippets

### BlueTrek up for CES Design & Engineering awards

Two of Bluetrek Technology's products have been selected for the CESInnovations 2012

Design and Engineering Awards in the Wireless Carbon Accessories category. They are the Handset Bluetooth headset, and Speaky Bluetooth car kit. The Innovations Design and Engineering Awards are sponsored by the

Consumer Electronics Association (CEA), the producer of the International CES, which is the world's largest consumer technology tradeshow. The CEA has been recognizing achievements in product design and engineering since 1976.

# The Global Solution for ZigBee

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## ZigBee Remote Control (ZRC) Test Harness

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**ZigBee**  
Member

# low energy wireless news



## EnOcean delivers new ways to harness energy at the press of a button

Regular Incisor readers will have picked up that we are rather interested in EnOcean's energy harvesting technology. This interest is based on a profound belief that any wireless sensor and control technology that requires batteries to be changed – no matter how long its ULP-ness makes the interval – is at an automatic disadvantage to a technology that doesn't.

And EnOcean does away with this type of maintenance. Its batteryless, wireless technology harvests energy entirely from its surroundings – from light, differences in temperature or motion. Mechanical energy converters, for instance, can produce the energy needed to transmit a wireless signal just from the press of a button. The magnetic flux is suddenly reversed by a coil as soon as a spring mechanism reaches a snap-over point.

With the ECO 200, EnOcean is launching the third generation of its mechanical energy converters. Combined with the PTM 330 transmitter module the result is a complete system for batteryless wireless operations. Armin Anders, head of product management and co-founder of EnOcean GmbH told Incisor that this new pairing creates an optimum basis for speedy and simple implementation of energy harvesting switching solutions.

Compared to its predecessors, the ECO 200 energy converter comes with even more efficient energy conversion, less noise emission plus higher load capability. A further benefit of the new-generation converter is its simple installation. The batteryless PTM 330 wireless module can be connected to the energy converter by spring contacts, with no soldering. This PTM 330 module

features four digital inputs to map up to four switching states. Additionally, an interface allows configuration of the content of the wireless telegrams during manufacture of a user device. Like all EnOcean wireless modules, the PTM 330 also has a unique 32-bit identification number to eliminate any overlap with other wireless sensors. Wireless range is up to 30 metres inside buildings and 300 metres in the open. With versions for both 868 MHz and 315 MHz the PTM 330 is suitable for applications worldwide.

Anders suggested that application possibilities range from handheld transmitters, window and door sensors through to transmitters for access data to position switches or a variety of industrial switches. Handheld transmitters powered by the system can be used to control gates and garages, or to call a nurse from a hospital bed, for example. Another application that has already been implemented is wireless testing of cable harness in automobile production. The press of a button generates enough energy to determine if the individual components are properly attached to the cable harness.

## GreenWave Reality develops Z-Wave technology with Danish energy group

Z-Wave alliance partner GreenWave Reality has been selected by one of Denmark's largest energy providers – SEAS-NVE – to assist with an energy saving campaign. Since the middle of the year, selected customers have been provided with GreenWave Reality's energy management platform free of charge. The energy display enables house and apartment owners to read off and analyse all relevant information about

their home electricity, water and gas consumption. GreenWave has integrated Z-Wave technology into its new energy display. In 2012 all SEAS-NVE customers will be able to benefit from the SmartHome solution.

The display enables occupants to use wireless technology to take electricity, gas and water consumption readings. In addition, more Z-Wave compatible devices can be integrated into the home network and actively controlled. This provides home owners with what is becoming the domestic Holy Grail – control of their energy consumption – as the solution combines smart metering features with modern home automation. A consequence of this is that, by configuring individual energy profiles, a user can then use just the electrical or heating energy that is actually required.

Other Z-Wave related developments include Fibaro's claim to be manufacturing the smallest flush-mounted home automation modules for built-in boxes available on the market. The company says that its wall inserts can be used to convert any series of switches into Z-Wave controlled wireless switches or dimmers without the need for the complex installation of components or the replacement of switches. As a result, lighting, roller shutters and similar devices can also be controlled remotely by users by means of a smartphone, tablet or PC.

Then, NorthQ, a manufacturer of monitoring and security solutions, has developed a new smart reader based on Z-Wave. It has been designed to visualise power consumption in private households in a way that is transparent to the consumer. The NQ Power Reader can be installed on top of existing electronic or mechanical meters. The software widget for energy visualization has been developed for a Danish utility provider.

# low energy wireless news



## Google Wallet and Apple will force MNOs to play nicely in mobile wallet wars

Mobile wallets are coming, says ABI Research, and while MNOs will provide the majority of NFC-based mobile wallets, their market share will erode between 2012 and 2016 as Google and Apple claim loyal users. "By the end of 2012, Google will prove that Google Wallet is a hit with consumers. By 2014, we will see Google Wallets supported alongside competing MNO offerings globally," Mark Beccue, senior analyst, mobile commerce and NFC, told Incisor. MNOs will provide 75% of all mobile wallets in 2012, shrinking to 63% in 2016.

Beccue believes that Google Wallet will also succeed in markets where MNOs prefer not to spend capital to develop and support mobile wallet infrastructure. These MNOs will partner with Google and will benefit financially from the ventures. Apple will factor into the erosion of MNO mobile wallet market share. "Apple will launch a mobile wallet product in 2012. Apple's MNO partners will allow Apple to offer their mobile wallet to consumers who have iPhones, regardless of whether or not the MNO has a competing mobile wallet."

NFC-based mobile wallet users will grow to 594 million in 2016. Growth will be fuelled because 1) MNOs and OS players will flood the marketplace with NFC-capable mobile phones, particularly in the U.S., Western Europe, Japan, and Korea and 2) the business cases around merchant offers and interaction are compelling enough to pull mobile wallet ecosystem players in alignment.

Over-the-top (OTT) mobile wallet providers (banks, payment providers, merchants) will have a difficult time establishing critical mass for their offerings, though they will find success for niche purposes. By as early as 2014, ABI forecasts that MNOs will incorporate OS and OTT mobile wallets into their umbrella mobile wallets, slowing down the growth of truly independent mobile wallets from OS and OTT providers.

## NXP's NFC solution supports Windows 8

In line with its role as one of the co-founders of the NFC Forum, NXP continues to blaze the trail for NFC technology, and has now announced that its PN544 Near Field Communication (NFC) radio controller will support Windows 8. NXP told Incisor that it had worked closely with Microsoft to develop an NFC driver for Windows 8, enabling a variety of use cases that are triggered by close proximity or a "tap". NXP also confirmed that it supplied the NFC solution on the Windows 8-based tablets distributed at the Microsoft BUILD conference

The "Tap to pair/ Tap to share" and other use cases available with Windows 8 include device/accessory pairing, in which one can tap to pair with Bluetooth headsets or speakers for example, and ease of data sharing between devices. NFC can also be used to transfer control from one device to another, such as to initiate a transfer of a video call from a tablet to another NFC-enabled device. NFC also has the capability to link the physical world with the Cloud, enabling a tablet to interact with smart posters and other devices equipped with an NFC tag.

NXP is pushing the potential for NFC in consumer apps, suggesting that developers and computing equipment manufacturers can take advantage of NFC support for Windows 8 to offer consumer and enterprise use cases such as offering promotions, coupons, and discount codes via NFC tags and posters. Other apps would include bringing physical touch points to online social networking for an enhanced check-in experience, performing surveys and brand reviews, adding NFC-enabled tokens to unlock or enhance a gaming experience and enabling content delivery in document, audio or video format.

Ruediger Stroh, executive vice president and general manager, Identification Business at NXP Semiconductors told Incisor, "NFC support for Windows 8 is a significant step in the roll out of this game-changing technology and truly signifies that the time of NFC is now. NFC offers consumers an unprecedented user experience and we are very excited to be working with Microsoft to offer NFC for Windows 8."

## Where's my llama?

Ever lost Fido, or one of the half a million sheep on your station in the Outback? Atmel has the answer. The company has announced the availability of a low-frequency (LF) one-time programmable (OTP) transponder IC, the Atmel IDIC ATA5575M2, and tells Incisor that it has been optimized for next-generation animal identification systems for pets, wildlife or livestock. The new device can also be used for waste management applications according to the BDE standard.

The IC's functionality is claimed to simplify the production process and allow for increased flexibility compared to read-only devices. Before shipping, customers can program into the device any necessary information, including the specific country or the manufacturer code supplied either by the International Committee for Animal Recording (ICAR) or government authorities. This reduces lead-time and time to market down to approximately 1 to 2 weeks.

Atmel suggests that the device architecture enables better read distances with different coils and readers. The write distance is reduced as one-time programming is required, which usually takes place in close coupling to the programming device during the final tag test and customization. Large write distances are typically unfavourable due to the risks involved with multiple tag programming. These improvements help minimize both cost and chip size.

The memory in the device contains a unique manufacturer-programmed ID which the user can overwrite with a specific animal ID code. The user ID (UID) can be read and archived (along with the animal code) before programming to ensure reliable traceability.

Since an LF device operates in the range of 100kHz to 150kHz, the Atmel ATA5575M2 can be used worldwide. It is designed for rugged environments and can also be used in conditions not typical for RFID application devices, including underwater (fish tagging), in dirt (outdoor livestock), or injected via glass or plastic transponders (under the skin of animals) for tracking purposes.

# Fancy adding NFC functionality to legacy mobile phones using a SIM card?

Did you think that a lack of NFC-enabled mobile phones was holding back the contactless payment market? Well, INSIDE Secure has announced a way to grow the contactless payment market rather quickly – it's showing an innovation that allows an NFC card emulation solution to fit into a standard SIM card form factor and still achieve industry-standard four centimetre proximity transaction performance. INSIDE claims that its technology innovation is able to achieve this performance even when operating from inside a mobile phone, by significantly reducing the effects of the metals and electrical noise typically found within these devices.

INSIDE also claims significant improvements over conventional NFC core technology, enabling four cm or greater contactless read distance in a mobile device with an antenna footprint of less than one cm square.

Charles Walton, chief operating officer at INSIDE Secure told Incisor, "INSIDE Secure is again demonstrating its leadership in the NFC market by providing a core enabling technology that will enable multiple new end products in SIM and microSD form-factors for use in legacy mobile devices, accelerating the adoption of NFC card emulation use cases within the currently deployed mobile phone market. This breakthrough technology provides a means of bringing NFC services to markets that might otherwise not be immediately reachable through smart phone sales, such as in Brazil, India and African countries, or for any market with a large installed base of legacy mobile phones."

Commercial products based on this INSIDE core technology are expected to be available in the latter part of 2012.

## ...protects high-end consumer products

INSIDE Secure has also introduced the VaultIC150, an NFC-based security solution designed for embedding into high-end consumer or luxury products that are often targeted by counterfeiters and cloners.



By incorporating the VaultIC150 in their products, manufacturers of high-end consumer products (handbags, wine, watches, etc.) and consumables can track their products through distribution and retail channels, and allow consumers with NFC-enabled mobile phones to verify that the product is an original and not a counterfeit.

The VaultIC150 solution's wireless NFC interface has a range of several centimetres and is available in several antenna form factors. This means that the chip can be deeply embedded into the product without leaving any visible trace, making the protection totally invisible. The chip requires no battery since the NFC interface and embedded antenna collect the RF energy emitted by the reader device to power the security circuitry and communications interface.

Complementing the NFC interface is a software application on the user's mobile phone that INSIDE Secure provides to the product manufacturers. In the simplest case, the NFC-enabled cell phone sends a

random challenge message to the product (purse, dress, fine wine, etc.), which contains the embedded VaultIC150, to check if it is a genuine device. The VaultIC150 uses its securely stored private key to compute the elliptic-curve digital signature of the challenge message and send it back to the phone or NFC reader. Using the corresponding public key, the host performs the necessary signature verification. Based on the result, the host decides whether to authenticate the accessory or not.

For even greater security, the VaultIC150 can be employed as part of a public-key infrastructure (PKI). Although more complex to implement, the PKI approach is a more secure way of distributing keys, and completely eliminates the need to store a copy of the secret key in the NFC reader. The public key and its digital certificate can either be embedded in the host or stored in the VaultIC150 contained in the consumer product and retrieved by the phone or reader when needed for authentication. The private key is protected in the VaultIC150.



# 'Tis the season to be wireless

by Sarah-Jayne Gratton

**Those of you who follow my husband Dean's column in Incisor will know that he's fallen way behind with the completion of both his latest books and is now suffering from that inevitable, guilt ridden condition known to writers as 'procrastinator's panic!'. The symptoms are easily diagnosed and commonly begin with an exasperated pounding at the keyboard, accompanied by frequent outburst of expletives and of course the downing of obscene amounts of caffeine. With this in mind, Vince and I felt it best to 'leave him to it', so I am stepping tentatively into his size 10 boots for this issue.**

## A wireless lifestyle

Those of you who've read my work will know that I'm certainly not a technical whiz or a wireless expert but, having said that, wireless has increasingly had a role to play in the way I live my life. Being married to a wireless telecommunications professional has brought about an exposure to its terminology on a daily basis and an appreciation of all that encompasses and surrounds its many technologies. We live in an increasingly evolving wireless society, one that has crept up on us and has shifted the way we communicate with each other and the world around us. Because of wireless our worlds have shrunk yet our choices have expanded far beyond our previous generations' wildest dreams; a fact never more prevalent than in the realms of personal entertainment.

Today, we aren't confined to pre-determined broadcasting schedules or 'set in stone' programme formats. Through the continually evolving interplay and monetization of media convergence, a plethora of options now await us in terms of what content we watch, how we watch it and how we choose to share it.

With this revelation comes the seasonal push from manufacturers to sell their piece of the new media entertainment pie. An array of home media centres designed to capture our personal area network media content into a single device from which we

can view and share it at leisure. But with so much choice out there, which product performs the role of personal media manager the best? With this in mind, I took it upon myself to review the current market leaders and will be revealing the one I most hope to find in my stocking this Christmas.

## APPLE TV

On the hunt for my first product to review and I have to admit having a tough time actually locating the Apple TV in my local Apple store. It's not that Apple don't hold it in stock, it's just that the box is so tiny! In fact, if like me, you're familiar with the size of the first generation product, you'll probably need to go and ask a sale person to point one out to you! In the case of the new Apple TV, the company has not only downsized the product size but the price too and at just \$99 it does look a favourable Christmas contender from the price-point factor alone.



Steve Jobs always referred to Apple TV as merely a 'hobby'; it has never really been what we'd consider a main product from this giant company - in fact, it's even listed under iPod on the Apple website. The first generation Apple TV was big, clunky and overly expensive for what it offered. People knew this, so even after updates to the interface, price cuts and plenty of promotion, it still hasn't taken the world by storm.

## True plug-and-play

Opening the box reveals a tiny black box with the Apple logo on top, not much bigger than my iPhone, sitting on a shelf in the upper half of the packaging. There are a bunch of familiar accessories resting below: a setup guide, information and the obligatory Apple stickers, which I've never quite figured out what to do with! Also included is a power cord with a nice long lead and a sleek newly designed aluminium remote control.

Apple pride themselves on the ease of use of their products and the Apple TV is no exception. Simply plug the power cord in and connect your TV through HDMI. The device sadly lacks the composite video and audio outputs found on the older 1.0 version, which may disappoint some purchasers. For those of you without Wi-Fi (are there any left these days?) Apple has provided an Ethernet connection. There's also a mini USB port, which is for support/troubleshooting only I'm told.

Using the supplied new Apple remote to move through the menus was, as is always the case with Apple products, childishly easy, although I was disappointed to see that Apple hasn't updated its interface, which is starting to look a little dated now. Having said that, it really is a true case of 'plug and play' and you don't necessarily need a Mac or Windows computer, though you'll be able to sync up music, movies, TV shows and photos with iTunes, iPhoto and more. Apple have removed the hard-drive from the Apple TV so that you can no longer buy movies from the iTunes Store but have to rent them instead from iTunes or the newly integrated Netflix service. However, there have been many cases of poor streaming using Netflix, with new users having to resort to renting their chosen movies from iTunes instead. So it seems the options for receiving content are still limited by Apple's OS family ecosystem. Understandable maybe, but a great shame nonetheless.

My rating: 6/10



## WESTERN DIGITAL TV LIVE HUB MEDIA CENTRE 1TB

Being the most expensive of our three media centres on test, I was disappointed to see that the Western Digital (WD) TV doesn't include an HDMI cable (or any other network cable) given the high price point. It was also a shock to discover that the device has no built in wireless capability although you can attach a USB wireless dongle if you wish. And I'm sad to report that my disappointment continued at the realisation that I couldn't attach my laptop to one of the USB ports of the box to stream content and would have to instead use my network for streaming (or do so via a USB stick). At a cost of almost \$300 I would have expected far greater options.



Upgrading the firmware to the latest version was the first thing I was advised to do. Unlike Apple, setting up the WD TV required my reading the documentation in far greater depth than I would have liked. It seemed the best way to upgrade my firmware without Wi-Fi and access to an Ethernet connection would be via USB; in other words, download the firmware via my computer, unzip the files and put them on a USB stick.

### A poor performance

But let's get down to the real functionality of this product and again I have to go back to the absence of built in wireless capability and look at the efficiency of the built in wired 1Gb Ethernet port. After a great deal of manoeuvring of equipment to gain access, I can report that, in my experience, it does not perform according to specification. To be more specific, I tried to transfer roughly 25GB worth of files to this box via the network connection something that should have taken around 5 minutes of transfer time, but on the WD TV took over 45 minutes to achieve. After researching into other user experiences and reading various reviews, it seems that this is a common issue and again, something that was very disappointing to discover in a product of this price.

Plus points? The interface is very simple to use. But then, it needs to be as the documentation provided falls short of

being very helpful. There is only a quick setup guide included with the product so you'll need to download the full guide from the WD website. I tried a number of different file types and the playback quality was generally very good with little to no buffering. However, I had been told that the WD TV was capable of playing ISO files. So as a test, I used my DVD burner software to save a couple of my DVDs as ISO images. Yes, it played the ISO images, but the bottom quarter of the screen was very dark. Converting them into MP4 files produced a far superior quality of playback but fell short of my expectations.

All in all a very poor experience from this supposedly high-end product and one that I personally won't mind Santa overlooking this year.

Rating: 3/10

## THE D-LINK BOXEE BOX

Last but by no means least on my list was the D-Link Boxee box and boy does this product score well on the good looks front although, at a list price of \$230, it certainly should. A sleek, black, glossy offset box with a vibrant lime base, this beautifully thought out piece of equipment looks as though it might have arrived straight from Planet Krypton.



All the connections are located on the back. There are two useful USB ports that you can use to connect USB hard drives and/or flash drives to play your existing content. You can also connect to your network via Ethernet or Wi-Fi. To connect to your TV, you will need to use the included HDMI cable and, if needed, the optical or RCA audio jacks. I also particularly liked the SD card slot on the side of the box; a nice touch that both other models have overlooked.

### There's an App for that

Boxee also include a unique double-sided proprietary RF remote control, which removes the need for line-of-sight use. The top surface of the control has a beautifully thought out 4-way directional

pad with an enter button in the centre, making the menus extremely easy to navigate around. There are also two additional buttons for play/pause and 'return to menu'. But flip the remote over and, here's where it gets really clever! Instead of using an onscreen cursor (as with the Apple TV) to type in search criteria, D-Link have given us a regular QWERTY keyboard. The rubber keys are small, but they have good tactile feedback and get the job done very efficiently. My only wish is that the remote was backlit as, in dim lighting, it's difficult to see the letters on the keys. But hold the press!

D-Link inform me that they have the perfect solution. "Do I have an iPhone or an iPad?" they ask "Yes!" I reply. Well, it seems there's an app for that. A completely free download from the App store that works as a beautifully illuminated remote for the Boxee box. And Android users haven't been left out in the cold either, with the newly improved v2 AMO app that at just \$3.99 provides a great range of remote Boxee preview and control options.

So, on to setting my Boxee box up, which is easy and painless. For me, simply a case of connecting the included HDMI cable from my TV to the box and voila! I pressed the power button on the Boxee and switched to the HDMI input on my TV. When the Boxee finished booting, it immediately found my Wi-Fi network and asked if I wanted to connect. A simple button press for 'Yes' (plus password), and it then let me optimize my screen size. The last step asked me to either set-up a Boxee account or login with an existing account. The useful thing about the Boxee account is that you can log in from your PC or Mac and queue content for future viewing via a 'watch later' option.

### Ticking all my boxes

While the Boxee Box is all about watching video content from the Internet, don't forget that it's also a very capable viewer of your local content too. You can attach a USB hard drive, USB thumb drives or SD cards with video, music and pictures and the Boxee will show the media (up to 1080p) on your big screen TV. You can even tell your Boxee Box to 'keep an eye' on certain networked folders or attached storage and it will automatically scan those places for new content and will present the found video and music files with the same type of thumbnail images and descriptions that it does for your online TV shows and movies.

For me, the Boxee Box is the clear winner of the three media centres



reviewed. From its well thought out design to its ease of use and continually evolving partner applications, the Boxee ticks all of my wireless Christmas boxes.

*My rating: 8/10*

Time to put away my wish list and take the hubby up a glass of well deserved vino – I've been rationing him until he meets his target quota of chapters and the whoop of excitement echoing down from his study would suggest that he's made it!

My sincere thanks to Vince for giving me the opportunity to write for you this month and I wish you all the merriest of Christmases ☺

#### About the Author:

A former actress, Sarah-Jayne Gratton has become an influential social media persona, as well being a prolific public speaker and writer. She is regularly featured in Social Media Today and other publications, including In-Spires Lifestyle Magazine and blogcritics.org. She was nominated for a Shorty Award in social media earlier this year and is one of Twitter's Top 75 Badass Women (bitrebels.com).

Sarah-Jayne's latest book, *Zero to 100,000* (Pearson, 2011) is an international best-seller and is listed in the Top 50 of the Sunday Times Social List.

Follow @grattongirl on Twitter and find out more about her work at: [sarahjaynegratton.com](http://sarahjaynegratton.com)

## Snippets

### ST-Ericsson appoints new president and CEO

ST-Ericsson, the joint-venture of STMicroelectronics and Ericsson has announced the appointment of Didier Lamouche as president and chief executive officer of the Company effective December 1, 2011. Lamouche, chief operating officer of STMicroelectronics,

has served on the board of ST-Ericsson since April 2011.

Lamouche replaces Gilles Delfassy after the transformation of the company's portfolio roadmap from legacy feature phone products to leading smartphone and tablet platforms. Delfassy will support Lamouche, as senior advisor to the CEO, during a transition period.

## Low energy wireless news

### Jasco appointed to Z-Wave Alliance Board of Directors

The Z-Wave Alliance, which claims the world's largest ecosystem of interoperable wireless control solutions, has appointed Jasco Products Company to its board of directors. Jasco, a manufacturer of consumer electronics licensed under the GE brand, has been a member of the Alliance since 2006 and in this new role, will apparently help guide Alliance programming and management.

the resort for contactless admission to various attractions and guest facilities.

Over the past 24 months, Identive has supported this Southeast Asia customer with specialized singular and fanfold guest tickets across a range of printed media, as well as printed contactless smart cards used for special memberships and events. The tickets and smart cards are based on Identive's Smartag antenna and inlay designs, utilize PicoPass contactless memory card technology from INSIDE Secure and are produced at Identive's manufacturing facility in Singapore.

### Identive and INSIDE Secure deliver ten millionth smart ticket

Identive Group and INSIDE Secure have delivered the ten millionth smart ticket to a vacation destination in southeast Asia. The thermal printed guest tickets are used at

# high speed wireless news



## 2x2, or not to? That is the Wi-Fi in handset question

The industry is currently divided as to whether handsets will go down the route of MIMO (multiple in and multiple out) 2x2 802.11n or bypass this route altogether and go directly to MIMO 1x1 802.11ac, observes IMS Research.

MIMO allows multiple antennas to send and receive multiple spatial streams at the same time enabling devices to transmit and receive information simultaneously. The antenna configurations are typically: 1x1, 1x2, 2x2, 2x3 or 3x3. More antennas and streams mean faster speeds and better coverage, with fewer dead zones and dropped connections.

Despite shipments of around 120 million 802.11n-enabled handsets in 2010, IMS told Incisor that none were shipped with 2x2 802.11n. Whilst the performance of 802.11n, even in 1x1, is better than that of

802.11a/b/g, utilising multiple antennas can further improve data rates, throughput and range.

There are some constraints to having multiple antennas on a handset. Integrating several antennas in a small device introduces greater configuration complexity. In addition, more antennas will add to the BOM (bill of materials); and some believe that multiple antennas will use more power. Conversely, others have argued that by taking less time to download content, the user will in fact use less energy.

Some in the industry believe that the disadvantages of multiple antennas in the handset outweigh the benefits; and it would make more sense to sidestep this solution and use 802.11ac. 802.11ac is expected to begin shipping in 4Q 2012 and will initially target the PCD market. IMS believes that 802.11ac should provide wider channel bandwidths, faster throughput and less interference from other devices than 802.11n, since it will operate at 5 GHz rather than 2.4 GHz.

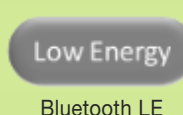
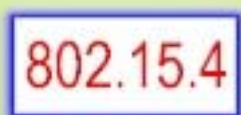
So what's the problem? Well, at first, cost. The 802.11ac solution will initially cost much more than an 802.11n solution. Many reckon that solutions need to get down to around \$5 to make the mass market. Furthermore, it is widely felt that handsets follow technologies not lead them; and that until there are high shipments of enabled PCDs and networking equipment, there is little point in handsets being enabled with 802.11ac. Filomena Berardi, Senior Analyst and lead Wi-Fi analyst commented on the situation, "Despite the different views, everyone agrees that something needs to be done about mobile data congestion. Therefore, data offloading is top of the agenda for the mobile industry."

IMS Research told us that it has reason to believe that 2x2 802.11n-enabled handsets are likely to appear on the market in 2012. Supporters of 2x2 802.11n claim that the industry cannot wait for 802.11ac. To overcome some of the issues of 2x2 802.11n there is even talk of a 2x2 802.11n combination chip that could reduce cost and footprint in the handset.

## LinkedIn

Incisor extends across social media: Incisor has its own group on LinkedIn called [WPAN World](#), and contributes and interacts with many other LinkedIn focus groups including:

Click on the LinkedIn group logos to access these discussions



# 4G/LTE/WiMAX news



## More players join push for white space

So, far, everything we've heard about white space wireless technology here at Incisor has come from the group of companies, headed by Neul, that are putting together the Weightless Special Interest Group (SIG) (see Incisor.TV video covering the launch of the Weightless SIG) that will manage roll-out of the technology. But that doesn't mean that these are the only players. Others are looking, too.

One of these is TTP, a UK company that is also pioneering this new wireless technology. White space spectrum could, suggests TTP, radically improve emergency services communications and deliver valuable new data-rich applications to help save lives.

TTP told Incisor that wideband communications using white space technology could alleviate the pressure on cellular infrastructures that are already struggling to cope with the weight of data traffic required to handle major incidents; and also support new high definition video and location based services.

Veering towards poetry, TTP said 'like the spaces between words on a page, white spaces that carry no information also exist in radio spectrum across frequency, time and space domains. TTP was referring to the empty channels in the UK television spectrum, pointing out that these are ideally suited for long range radio communications, as opposed to the short range performance currently offered by wireless systems at 2.4GHz such as Wi-Fi or Bluetooth.

TTP is working on low power communications systems that work inside these spaces without interfering with TV pictures and is already running trials streaming HD video at speeds of over 7.9Mbps across a 5.6km white space link. Core to the work at TTP is the development of a geolocation database that dynamically allocates free white space channels at a particular time and geographic area.

Richard Walker, Head of Wireless at Cambridge-based TTP told Incisor, "With OFCOM committed to regulate TV white space spectrum as a free resource, public safety use could be prioritised to provide the backbone for emergency communications with far greater performance than existing systems. Secure

pop-up networks could also be deployed quickly, removing the current dependency on local cellular networks - and with no license or data charges to pay, the cost saving is another major benefit."

TTP is apparently also working on emergency services projects with similar unlicensed spectrums in the US and mainland Europe and believes that white space has the potential to revolutionise communications for emergency services in the UK over the next five years.

## LTE connections grow, but still a tiny portion of overall subscriptions

Juniper Research is forecasting a rapid uptake of LTE mobile broadband technology in the next five years, but with a very limited global reach. Juniper believes that subscriber levels will attain 428m by 2016 but will only reach 6% of the global subscriber population. Most of this growth is expected to occur from 2012 onwards, with many mobile operators making preparations now in order to realise their roll out targets.

A new 4G LTE Opportunities report from Juniper Research found that with the rate of LTE network commitments at an all-time high, network vendors have significantly improved their position to offer products and solutions to network operators. Consequently, the total number of LTE base station deployments will reach almost 1 million by 2014.

Juniper forecasts that in the early years LTE will be dominated by the uptake of enterprise subscribers, but during 2013 consumer subscribers will begin to sign up in volume and begin to overtake enterprise subscribers by 2015.

Report author Nitin Bhas told Incisor, "With LTE being offered as a premium level service initially, enterprise subscribers will be attracted by the improved data speeds and the service guarantees that will be offered. The emerging factor that will drive consumer take-up later in the forecast and beyond is the embedding of LTE technology in consumer devices.'

The report also found that LTE smartphones and tablets will dominate the LTE connected end user device

market, accounting for 50% of the total LTE subscribers by 2016. LTE smartphones are expected to achieve early market traction in the enterprise market, with high-end data users migrating to the faster technology. Juniper also suggested that enterprise users are leading the early stages of LTE-enabled tablet adoption; however, the company expects consumer users to exceed enterprise users by volume from 2013.

## Anritsu broadens support for LTE development

Anritsu Corporation has released new software that enables users of its MT8820C Radio Communication Analyzer to test the CS Fallback function on LTE smartphones and mobile terminals.

The MX882012C-016 LTE FDD CS Fallback to W-CDMA/GSM software package offers an all-in-one solution for evaluating the CS Fallback function of multimode LTE terminals.

Since LTE is IP-based, voice services are in time expected to use IP-based Voice-over-LTE. But Anritsu told Incisor that because it will take time to convert today's mobile communications infrastructure to IP, many network operators will in the short term provide voice services for LTE handsets over legacy, circuit-switched W-CDMA or GSM networks.

CS Fallback technology makes it possible for an LTE terminal to provide voice services on W-CDMA/GSM networks. This means that handset and terminal manufacturers require a means to test the operation of the CS Fallback function in terminals that they design and manufacture. Anritsu's MX882012C-016 package provides this capability, both for R&D engineers developing terminal prototypes, and production engineers managing volume manufacturing of end products.

For volume production test rigs, Anritsu's Parallephone measurement technology running on the MT8820C supports the simultaneous testing of two mobile phones. Using the new MX882012C-016 software, Anritsu claims that manufacturers can achieve very high throughput on LTE production lines of terminals with CS Fallback capability.

# events



DATE	EVENT	LOCATION	NOTES	LINK
Jan 9 - 12 2012	Consumer Electronics Show (CES)	Las Vegas, Nevada, USA	-	<a href="http://www.cesweb.org">http://www.cesweb.org</a>
Feb 21 - 23 2012	Mobile World Asia 2012	Shanghai, China	-	<a href="http://www.szwgroup.com/2012/mobile/">http://www.szwgroup.com/2012/mobile/</a>
Feb 21 - March 1 2012	Mobile World Congress 2012	Barcelona, Spain	-	<a href="http://www.mobileworldcongress.com">http://www.mobileworldcongress.com</a>
March 20 - 22 2012	ecobuild	London., UK	EnOcean Alliance exhibiting energy harvesting wireless solutions	<a href="http://www.ecobuild.co.uk/">http://www.ecobuild.co.uk/</a>
April 15 - 20 2012	light+building	Messe Frankfurt, Frankfurt, Germany	World's biggest trade fair for lighting & intelligent buildings	<a href="http://light-building.messefrankfurt.com">http://light-building.messefrankfurt.com</a>
April 24 - 26 2012	Bluetooth Special Interest Group All Hands Meeting	Renaissance Vancouver Hotel, Vancouver, Canada	-	<a href="http://www.bluetooth.org">http://www.bluetooth.org</a>
June 12 - 14 2012	Wi-Fi Alliance member meeting	Toronto, Ontario, Canada	-	<a href="http://www.wi-fi.org/events_overview.php?id=351">http://www.wi-fi.org/events_overview.php?id=351</a>
June 27 - 28 2012	European ZigBee Developers Conference	Munich, Germany	-	<a href="http://www.zigbee-devcon-europe.de/">http://www.zigbee-devcon-europe.de/</a>

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