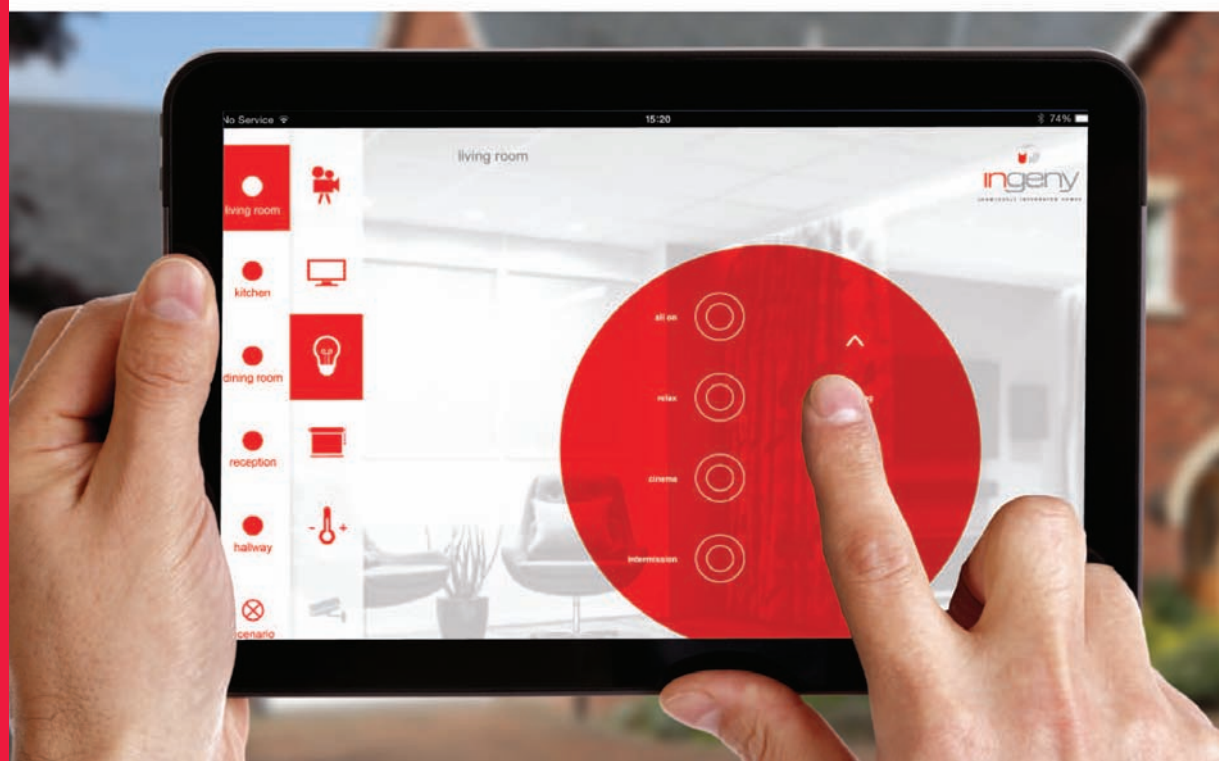# interphone
maintaining your security

Home Automation and Smart Living – Building for the future

Home Automation

Home Automation (HA) is moving steadily on its way towards becoming the norm, rather than the exception, for new properties. Its progress may not be as fast as some technophiles have been predicting – but it remains a much more plausible scenario than that of the 'household robot' which regularly surfaces in the media.

High speed wi-fi is now standard, most people have smartphones and ranges of internet-connectable products are entering the market. By 2020, most people in the UK will have smart energy meters and thermostats, with appliances such as fridges connected to them to ensure more efficient energy use.

Connection and communication are the underlying principles of HA and, once in place, offer expanding possibilities. With inevitable progress in technology, systems will become progressively easier to use and more affordable for the less affluent. Not least important. HA has the potential to save householders money – a major asset given the likelihood of future energy price rises.

The main attraction lies in the ability to deliver sophisticated and efficient overall management of the home itself, the electrical equipment that operates inside it, and daily household needs ranging from internal and external security to home entertainment. For all of these, it offers the time-and cost-saving benefit of centralised and personalised control – internally or, via the internet, remotely. It can also support applications destined to meet specific needs, such as those of the elderly and disabled – including people living in sheltered housing. It can give them a better quality of life and make them less dependent on carers or likely to go into institutional care.

Typical examples of benefits over and above the standard control features include personal activity and health monitoring, sending automatic SOS calls in emergencies, and giving safety-critical important reminders, for example, to turn off an oven or centrally lock all doors.

growing demand

HA is now seen as an integral element of the growing 'Internet of Things' (IoT) and 'Smart Living' agendas. UK buyers and renters are going to be looking for significant elements of HA in standard, not just high-end, homes and expecting developers and housebuilders to be able to offer relevant products.

The construction industry can therefore expect requests for detailed information on HA options from its clients – both the prospective buyers of new properties and the residential developers of multiple dwelling units. In turn, it will be looking to experienced system integrators for reliable and up-to-date technical and practical advice on meeting HA specifications.

The full implementation scenario can involve the strategic planning in and installation of sensors and communications links for, among other things - detection of and reaction to suspected intrusion or gas or water leaks. the movement of people (or its absence), changes in temperature or daylight levels, and the management of domestic electrical appliances such as fridges and washing machines, pet feeders during owners' absences and the operation of home entertainment.

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The implications for the building process include the identification of appliance models with satisfactory levels of embedded computing power and memory.These will increasingly be able to communicate with the occupier (and each other) via channels that are wholly or largely wireless – minimising the impact on the built form of the dwelling, not least when it comes to subsequent upgrades and retrofits.

At a more basic level, with mobile devices such as tablets using specialised apps to display the status or activity of home features, and then control them, wall pads for attachment just inside doors are a helpful and minimal-cost feature, indicating builder awareness.

The Institution of Engineering and Technology sees the impact of HA on domestic lifestyles being as far ranging as was that of factory automation on industry, with the benefits trickling down to be available eventually to all sectors of society.

## the main reasons for the rising interest in HA are:

- The growing availability of 'smart' household appliances

- Better-quality cable and cellular communications

- The fact that, in this age of mobile computing, a wireless router for internet access already exists in most homes in the developed world

- Greater operational simplicity, via smartphone and tablet connectivity

- Greater affordability, thanks to developments in technology that are opening up new markets.

the construction industry

For housebuilders and developers, it is a market priority to present themselves as being always abreast of the most up-to-date technologies as these become available for installing in new homes. They are driven, as the Home Builders Federation (HBF) puts it, "by a determination to provide what customers want".

The HBF is confident of its members' awareness of the potential of HA systems. But it stresses that it will always require these to have been tried, tested and approved by relevant certification bodies, before being incorporated into new homes. A qualified HA system integrator will be able – ideally at the initial planning and design stages – to ensure that reliable evidence of performance is available.

The HBF's Technical Group already recognises HA as a key area for continuing examination, and may at some point decide to set up a specialist working group to look at it in more detail. The HBF will also want to be involved in any national policy initiatives, such as the wider SMART Living agenda which the Royal Institute of British Architects want the government to commit itself to.
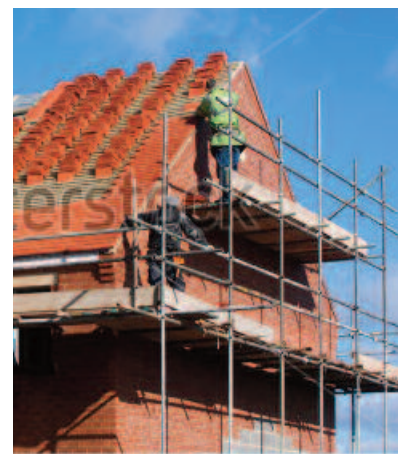
standards and guarantees

As with any emerging technology, robust standards are critical to ensure interoperability between successive ranges of products and to avoid the risk of lock-in to any individual manufacturer as more competitive models reach the market or upgrading becomes necessary. Until recently, the effective integration of HA components has presented something of a challenge for the construction industry.

This has been largely due to the lack of cost-effective, open and standardised means of communication with and between components. As a result, HA systems have tended to be expensive – and often over-dependent on manufacturer lock-ins. But, in one important step forward, large-scale HA standardisation activity is already under way among major domestic equipment manufacturers across Europe, with the aim of ensuring that their equipment is reliable and compatible. Parallel initiatives in other areas are on the way.

Large-scale HA standardisation activity is under way among major domestic equipment manufacturers across Europe

The harmonisation of relevant standards and system 'architectures' (means of coordinating individual components) in the IoT sphere as a whole is seen as critical for growing the market for specific sectors such as HA, by giving specifiers and builders the confidence that they need.

Across the construction industry, quality and guarantee schemes are already expanding to take HA into account. A good example is the Building Research Establishment (BRE)'s new Home Quality Mark (HQM) initiative – an integral part of its established BREEAM family of quality and sustainability standards. Introduced to give people buying or renting new homes the assurance that these will be well designed and built, as well as cost effective to run, the HQM also aims to offer housebuilders an authenticated way of demonstrating product value and achieving marketplace differentiation.

BRE has introduced the new system to meet the needs of developers who have found it difficult to convince a house buying public that is increasingly sceptical about marketing information of the accuracy of claims of, for example, lower energy costs and better sound insulation. With HA involving more complex technology, the HQM process will be all the more important.

BRE has been developing it jointly with partners from the both the private and social housing sectors, using 'study sites' as practical testbeds. In a specific acknowledgement of the growing role of HA, these include a 50-unit scheme in Hampshire – of 30 standard and 20 affordable homes – where the developer has built in from the outset the digital connectivity needed to support HA functions.

Home Quality Mark aims to offer housebuilders an authenticated way of demonstrating product value and achieving marketplace differentiation

BRE is using the resulting information to refine its HQM scoring system and indicators. There are explicit criteria for housebuilders wanting to take advantage of the accreditation: for example, the expectation that the resulting new home will be fully functional from the moment that the occupier moves in.

Delivering on this commitment will demand robust checking and commissioning of all internal systems, including those for HA, through a pre-agreed commissioning strategy and testing programme, for which the input of an experienced system integrator will be invaluable.

The new occupier also needs to be confident of their ability to operate their new home. The HQM process explicitly requires project team support in giving them a practical understanding of all the home systems and their controls; accessible methods of monitoring their performance, for example in terms of energy usage; and clear information on their maintenance needs.

the basis of this fulfilment is:

- The requirement for knowledge sharing to enhance understanding and cooperation between the entire project team and the developer or householder client, supported by
- Efficient and effective communications between all those involved in its procurement.
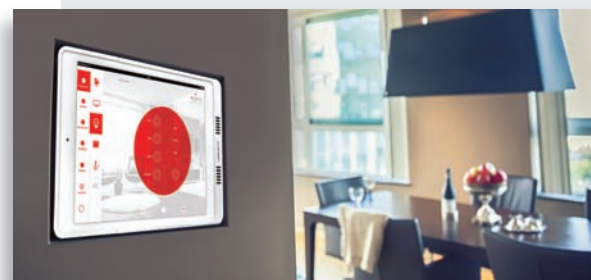
security

Automated and effective domestic security is integral to a comprehensive HA installation. This whole concept has, in fact, developed largely from the core infrastructure of intercom systems allowing audio and video communications between entrances and as many rooms as necessary.

Since these systems typically came with links to telephones and TV sets for monitoring of entry cameras, the necessary communications links for full-scale HA were already available.

Relevant security applications include central locking of outside doors and windows, monitoring suspicious movements around or inside the property via motion sensors and communicating alerts as necessary, and simulating the occupation of an empty home by automatically adjusting lighting or window curtains or shutters. Sensors can also detect hazards such as leaks of water or gas, or fire risks, and trigger warnings for remote pickup.

As the HA concept has become more sophisticated, it has predicated the incorporation of adequate safeguards and data encryption levels to protect systems from being hacked from outside to capture profiles of homeowners' habits and routines. High-level security is also vital when the range of control systems extends beyond the home itself, for example through wifi links or connections with the internet.

The ultimate solution lies in making the entire IoT concept highly resilient against attacks and introducing automatic fail-safe defaults to temporary manual operation when necessary.

costs and savings

The initial costs of HA are those of the components and their custom installation. Ongoing costs include those of electricity to run the control systems, the maintenance of these and of their network connections, and eventual upgrades as standards advance.

In terms of cost benefits, inbuilt communication between an HA system and the national grid can enable 'green automation'- or 'demand response'-based energy management strategies, enabling the householder automatically to defer energy use to low-cost periods. For example, they can take advantage of higher output from installed solar panels in the middle of the day to run washing machines automatically'.

HA systems are now being seen as integral components of the 'smart grid' concept that combines usage data with energy resource price and availability movements.
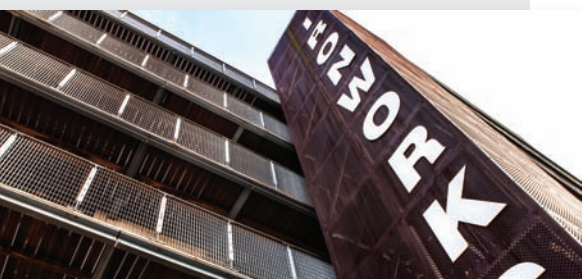
In 2014, the European Parliament and Council of Ministers adopted EU Directive 2014/61 on measures aimed at reducing the costs that are limiting the desired roll-out of high-speed electronic communications networks, a major part of these costs being attributable to '. inefficiencies in the roll-out process'. In Article 08, it requires Member States to ensure that all newly constructed buildings at the end-user's location, for which applications for building permits have been submitted after 31 December 2016, are equipped with a high-speed-ready in-building physical infrastructure, up to the network termination points.

The same obligation applies to major renovation works for which applications for building permits have been submitted after 31 December 2016; while multi-dwelling buildings newly-built or subject to major renovation under permits submitted after the same date must be equipped with an access point.The Directive defines this physical infrastructure as including, for example, mini-ducts and access points convenient for the use by public communications network operators.

about us

Interphone is a security systems and building technology integrator providing design, installation and maintenance services for the commercial residential property marketplace. With more the 50 years of experience, Interphone is ideally-placed to overcome the unique challenges faced by managing agents, house builders, property developers, construction contractors, facilities managers and residents, delivering upgrades and complete installations for retrofit and new build developments.

Interphone has established longstanding relationships within the property management, development and specifier communities, resulting in its solutions being fitted in many large and prestigious buildings across the UK. In addition, the company services a portfolio of more than 3,400 rental and standalone maintenance contracts covering 3,100 sites and 71,000 individual units.

Interphone is also providing advanced home automation and entertainment systems through its dedicated division Ingeny, providing complete control of virtually any technology in the property at the tap of a touchscreen, smartphone or tablet. These integrated and smart building solutions, suitable for projects of all sizes, are designed to make everyday life easier by combining familiar systems that work seamlessly together for added simplicity, convenience and enjoyment.