

KNX Platform and its Role in Smart Technologies



(L-R) Siew Peng Wah and Daryl Lim Ming Yen

Many countries' recent extreme climate conditions highlight the urgency to manage our carbon footprint. One area that can make a difference in being more environmentally friendly is the office buildings. The KNX Association and its associated KNX platform

have been over three decades offering solutions to meet the demand for comfort and versatility in the management of heating, lighting and access control systems. More critically, the efficient use of energy is also becoming increasingly important and efficient control reciprocates with energy efficiency. In this issue **Siew Peng Wah, Chairman for KNX National Group (Southeast Asia) and Daryl Lim Ming Yen, Technical Director Ace Light & Automation Pte Ltd** and a member of KNX share their views with us as to the impact of the KNX platform in the Smart Building space.

SMART equates sustainability (environmental friendly) - are there solutions right now that offer the complete eco-system for a fully SMART building?

Over the years, smart home technologies have been progressing by leaps and bounds, leading to the burgeoning global smart home market. More recently, there is an uptick in the demand for smarter energy management for both residential and commercial buildings. This is in part due to the global push for greener and more sustainable living against the backdrop of worsening climate change and soaring energy prices. In this context, urban and building planners have begun to explore renewable energy harvesting to reduce carbon footprint, as well as smart energy management to optimise energy consumption.

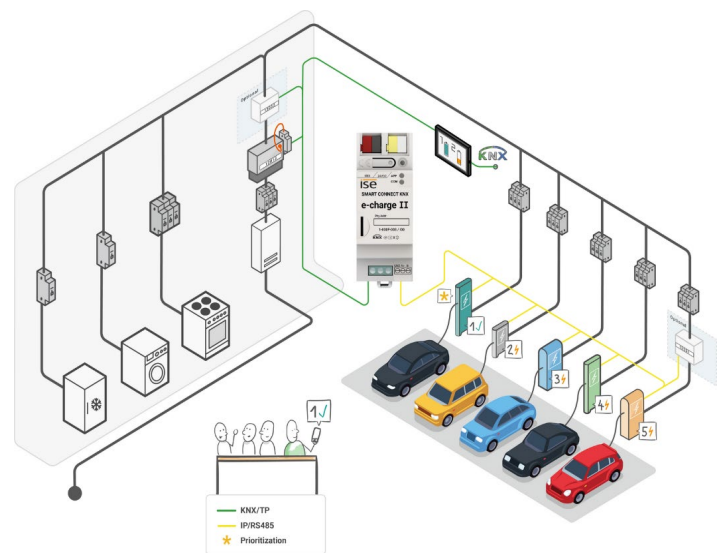
KNX has been at the forefront of smart home and building control for more than 3 decades. With its robust and established protocol, KNX guarantees seamless interoperability amongst KNX certified-devices from different manufactures. KNX sensors, such as weather stations and presence detectors, are often deployed to monitor the environmental conditions and activities of the buildings. And KNX actuators and gateways work in concert with these sensors to trigger building functions, such as lighting, HVAC, shading etc. to ensure the comfort and safety of the occupants while optimising energy usage.

As KNX system is modular and scalable, we have been exploring new KNX products as part of our continual efforts to achieve a complete smart building eco-system. Presently, we are studying the KNX E-Charging gateway, which is to be used together with a smart



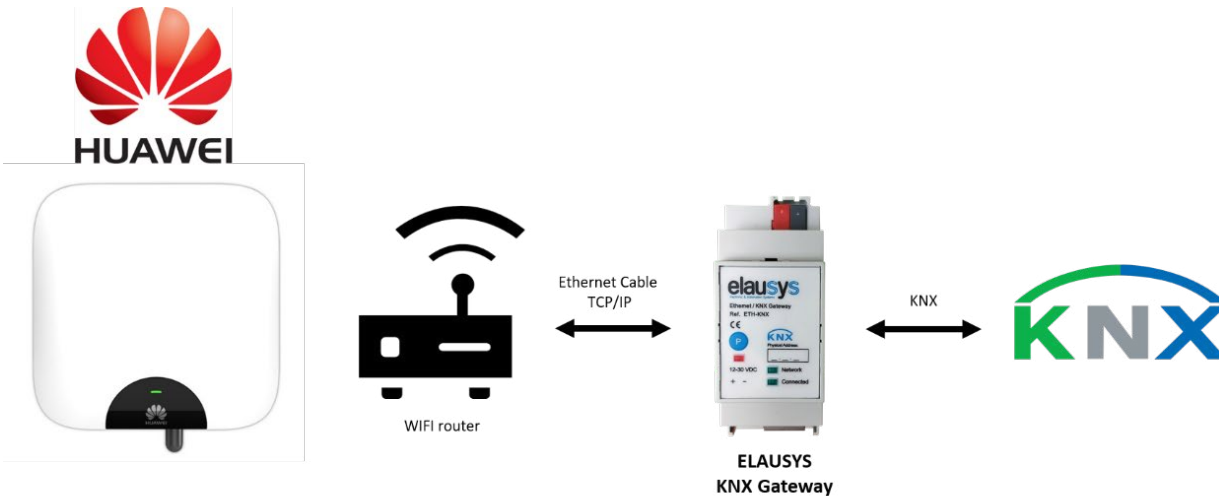
Source: TheBen AG: TheBen Meteodata 140 KNX Weather Station and theROnda S360 KNX Presence Sensor.

meter for DLM (Dynamic Load Management). Such setup provides optimal charging of electric vehicles while avoiding nuisance tripp



Source: ISE GmbH – The ISE Smart Connect KNX e-charge II.

Also, we are exploring the KNX gateway for solar inverters, which is to provide real-time monitoring on energy production and consumption inside the building. In addition, with the embedded logic functions, KNX solar inverter gateway can perform specific actions, such as supporting the water heater system or EV charger when the solar energy is sufficient, to achieve energy optimisation.



Source: ELAUSYS: ELAUSYS KNX Solar Inverter Gateway.

What are the challenges in retro-fitting a building with SMART technologies?

Retrofitting an existing building with smart technologies has never been easy. In the context of KNX, which is predominantly a wired-based system for smart home and building control, we sometimes face resistance from home/building owners to adopt KNX solutions, which usually entails higher cost of investment and requires extensive works to lay bus cables (twisted pair) around the buildings.



KNX bus cables are laid together with electrical wires.

Nevertheless, the potential payoff for choosing KNX is tremendous. With more than 8,000 certified devices

from over 400 manufacturers globally, suitable KNX devices can be sourced and parameterized to meet the buildings' specific requirements. Also, the backward-compatible characteristics of the KNX's system architecture allows its older generation devices to work perfectly with the new ones, thus ensuring a future-proof as well as sustainable smart system for many years to come.

Beyond the realm of wired connections, the KNX community has accelerated the roll-out of RF-based devices, which can now be coupled easily together with the wired KNX system, to reach out to building areas that cannot be easily modified. Also, KNX Association has progressively updated and released the KNX Standard (Version 3.0) to facilitate the integration of 3rd party IoT devices with KNX system. These positive developments further expand the scope and breadth of the KNX smart solutions, and thereby strengthening the value propositions of KNX.

From KNX experience are governments, companies, building management and developers keen to explore SMART technologies? Do you see a strong momentum or are there blocks that need to be addressed.

**500**

Members

8.000

Products

500

Training Centres

190

Countries

100.000

KNX Partners

Southeast Asia (SEA), being one of the fastest growing economies in the world, is now seeing a meteoric rise of middle-income class in many parts of this region. With the advent of Internet of Things (IoT), people here are becoming more discerning and have higher expectations of their homes and buildings, which now need to be smarter, safer and more secure. Given such trends, urban planners are starting to explore smart technologies as part of the urban solutions for sustainable living.

Still, there are numerous stumbling blocks that need to be addressed. First of all, the global smart home market today is still very much fragmented due to non-standardisation of smart protocols. Hence, many smart devices, particularly those off-the-shelf type, often face interoperability issues, in which they cannot be networked reliably and meaningfully together.

Second, weak IP and data security of non-certified smart devices make them highly susceptible to

malicious cyber-attack, which may disastrously paralyse the whole home and building network.

Third, poor safety and reliability of smart devices, especially those installed at buildings that come with critical or assisted living facilities, may endanger the lives of the occupants if they are not rigorously tested and validated by international bodies

Fourth, sporadic technical support from the local industries in the field of smart automation may impede the progress of the smart city development.

To overcome this myriad of challenges, we opine that various stakeholder, including key industry players, academia and relevant local authorities, need to work together to shape a robust, resilient and sustainable ecosystem for smart home and building control. To do this, a multi-pronged approach is required:

a. Promulgate Technical Reference/Standard – Local authorities need to promulgate technical reference/standard to state the local regulatory and technical requirements for smart home and building control. Also, a list of open and secured communication protocols, including KNX (ISO 14543-3, EN ISO 22510), should be mentioned. This will give system integrators, developers and builders the confidence to adopt and implement suitable smart home solutions for their projects.

b. Raise, Train and Sustain the Workforce – Training centres and tertiary institutions should join force with the local industry to raise, train and sustain our local workforce in the field of smart automation. This will ensure that we have a ready pool of qualified technicians with the relevant smart automation skill-sets. Over the years, KNX has partnered with many accredited training centres around the world to train and certify our KNX technicians.

c. Form Scientific Partnerships – Local authorities, academia, and industry players need to form scientific partnership to continually strengthen the reliability, resiliency and security of smart technologies. In this

regard, KNX Association has already established such platform to facilitate communication and exchange of ideas between higher-learning institutions and KNX community.

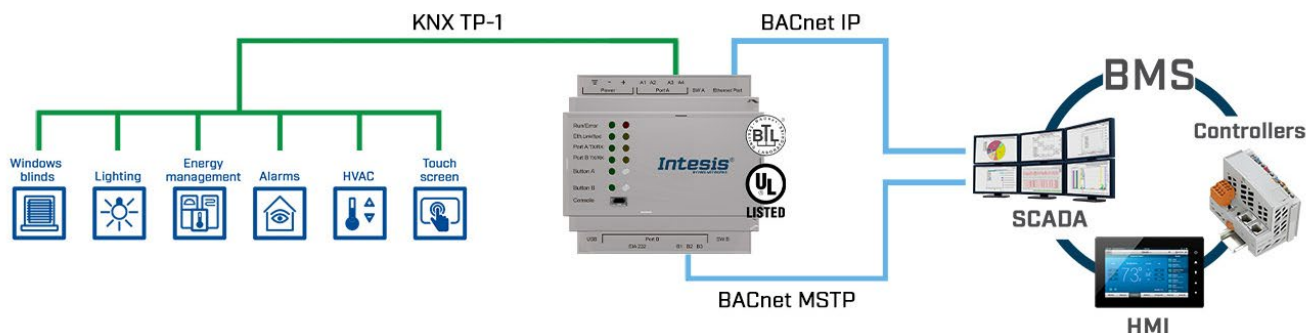
Can you highlight about AV solutions and SMART Buildings and how AV solutions can help in creating a SMART building?

For a large and complex building, Building Management System (BMS) provides the platform for building operators to monitor and control the mechanical and electrical equipment such as electrical, ventilation, fire and security systems. One of the widely used communication protocols for BMS is BACnet. KNX system often interfaces with BACnet through gateway to provide smart building control.

The restriction of businesses and physical activities during Covid-19 pandemic has drastically transformed the way we live, work and play. Notably, these changes have serendipitously created new opportunities for AV solutions to play a larger role in the smart building management. Today, more companies are using



KNX Training Lab at Institute of Technical Education (ITE), Singapore.



Source: HMS-NETWORKS: INTESIS KNX BACNET Gateway.

remote meeting platforms to get connected with their workers and business clients. Also, many schools and training centres are switching to online teaching to deliver lessons to their students and trainees remotely. Against this backdrop, many building offices and schools have been re-configured with the addition of IT as well as audio-visual equipment, such as projectors, digital displays and webcams, to cater to such new normal.

To provide simple and intuitive control of these AV devices, KNX can play an important role in networking the AV devices together with room control, such as lighting, shading and HVAC, to facilitate the smooth conduct of daily businesses and meetings. In addition, energy optimisation of these rooms can be achieved with the deployment of presence sensors and smart switches, which can perform scene functions to reach the desired room settings.

As humans are normally able to process visual content much better than text, interactive screens can be strategically placed and networked around the smart buildings. Useful features, such as facial recognition, temperature screening, room reservations, and many

more can be weaved into these smart screens to enhance the experience of the building visitors and occupants.

Moving forward, coupled with the advancement of Artificial Intelligence (AI), we foresee that the roles of the AV solutions will be further expanded and become an integral part of the smart building management in the coming years.

In conclusion

The advancement of IP-based technologies has revolutionised the entertainment industries worldwide and led to the explosion of media streaming services in recent years. CRESTRON and CONTROL4, the 2 market leaders in the smart home and AV entertainment, recognise the strength and omnipresence of KNX protocol. As such, both companies have developed gateway and built-in drivers respectively to interface their system with that of KNX. The combined solutions between these tech-giants and KNX deliver a fully-integrated smart home and AV experience for the home and building occupants.