



A building automation system for your properties

A guide for successfully acquiring an automation system



Introduction

Are you looking to implement a building automation system for a new property or planning a renovation? Do you want a system that guarantees both the savings goals and the condition requirements of your property are achieved?

Building automation is the brain of the building, designed to control the heating, ventilation and lighting of the property – in other words, at its best, all the building services that have a major impact on the energy consumption, comfort and even safety of the building. It is therefore important to choose the system that best suits the needs of your property and to manage it optimally.

We have compiled an information package for you on what to consider when choosing a building automation system, what automation can offer at its best, and how to optimise its benefits.

This package also provides information about the lifecycle of a building automation system and the key phases involved in implementing it as part of long-term property projects.

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1. Why does the building automation system matter

A building automation system is the nerve centre of a building that controls its important functions, such as heating, air conditioning and lighting.

Variables such as long periods requiring heating and large seasonal variations in temperatures make a building automation system indispensable. For example, the system ensures that radiators keep the room

temperature suitable, and taps always provide water at the right temperature. It also allows the optimisation of building services so that less energy is consumed, but people still don't need to feel cold in the premises. As the name suggests, an automation system can also be used to automate basic and routine tasks, such as summer shutdowns, so that property management can focus on more important tasks.



A building automation system has an impact on

- ✓ the property's energy consumption and operating costs
- ✓ the experience and satisfaction of property users
- ✓ the ease of maintenance and the maintenance costs of the property
- ✓ the adaptability and life cycle costs of the property.

Therefore, it is essential to have a smart building automation system that is best suited for the property and creates the optimal conditions for it.



At its best, good building automation works like preventive healthcare. In the long term, it preserves the building's health and savings are made on maintenance and repair costs."

Antti Koskinen, Fidelix

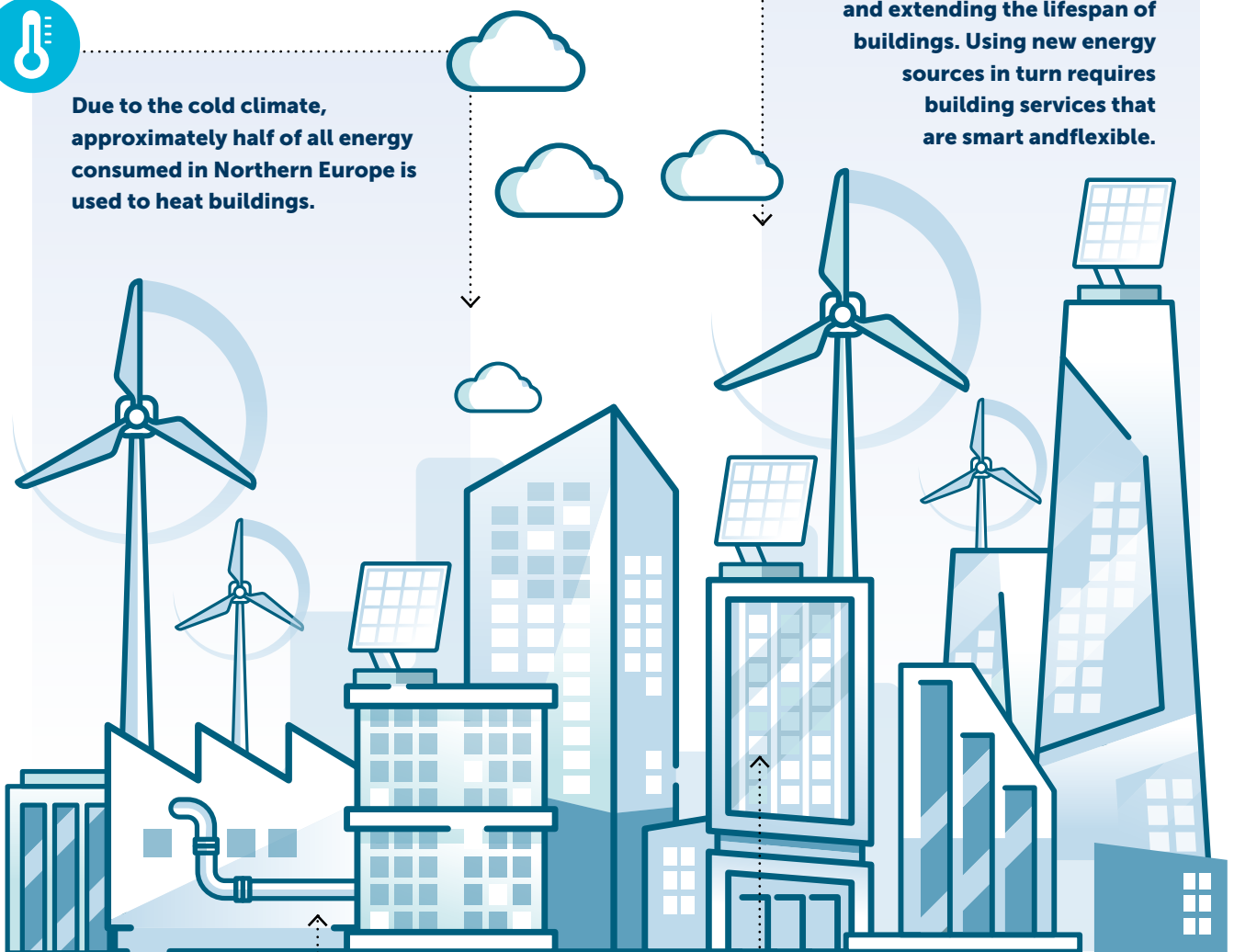
Smart building automation can contribute to a healthier future



Due to the cold climate, approximately half of all energy consumed in Northern Europe is used to heat buildings.



The sustainability targets in construction require reducing energy consumption in properties and extending the lifespan of buildings. Using new energy sources in turn requires building services that are smart and flexible.



Structural solutions, such as insulation or window selection, can improve the energy efficiency of a property only up to a certain point.



One important factor in improving energy savings, conditions, and the service life of properties is the optimisation of building services with smart building automation.



With a smart building automation system, a property can simultaneously reduce energy consumption and ensure healthy usage conditions well into the future.

2. What to consider when choosing a building automation system?

In Northern Europe, recent EU regulations and standards focus on improving building energy efficiency, which impacts indoor air quality, ventilation, and heating, with directives like the Energy Efficiency Directive and the Energy Performance of Buildings Directive guiding these improvements. In addition to the statutory minimum implementation, a building automation system can be harnessed to smartly optimise the energy consumption, comfort and lifecycle of a property. The longer the system has access to spare parts, and its service life can be extended through maintenance and equipment replacement, the

more economical the purchase also becomes from an environmental point of view.

When looking for a solution that meets your property's targets, it is worth looking beyond the technology, to the functionality and usability of the system. Even if the basic technical capability of all systems is almost identical, differences begin to emerge in how the property owner can utilise the system and how cost-effective and easy it is to operate and maintain. The total cost is also affected by procurement costs and the upgradability and lifespan of the system.

Pay attention to these:

- ✓ How can the system be used for condition adjustment and smart data management of the property?
- ✓ How flexibly can the system be modified later?
- ✓ How simple is the system to expand and connect to other systems of the property?
- ✓ How easy is it to find trained experts locally to use and maintain the system?
- ✓ How easy is the system to manage and use?
- ✓ How well is the system suitable for varying weather conditions?
- ✓ How long is the lifespan of the system and its components?
- ✓ What kind of maintenance services are available for the system?
- ✓ Can the procurement of the system be put out to tender, i.e. can it be obtained from other vendors than the equipment supplier?



From a system lifecycle and environmental responsibility perspective, it is important that even an old system can be upgraded by replacing components and introducing new technology. The IO modules and CPUs of our system that were installed 20 years ago can still be replaced or upgraded with current compatible components. Such a lifespan is not always self-evident with technical systems."

Mika Niemi

When selecting a building automation system, check the following:

- Optimisation capability**

How easy is it for the system to collect and use data from properties and optimise conditions and consumption based on the data?
- Scalability**

How easily and cost-effectively can the system be modified and expanded after installation?
- Customisability**

How well does the system learn and adapt to changing situations? How easy is it to edit and change the controls?
- Integrability**

How well can different types of building services equipment be connected to the system?
Are the interfaces open and freely connectable to other systems?
- Usability**

How easy and intuitive is the system to use and adjust? How well does the system help the user make the right decisions?
- Suitability for weather conditions**

How well has the system been developed and built to respond to the challenging, varied weather conditions in the north? How can the system be adjusted in time to anticipate changes in weather?
- Maintainability**

How long will the system retain its value by maintenance and updates only? How long will spare parts be available for the components?

CASE: Automation system helps hospital to succeed in its core mission

Meilahti Bridge Hospital is part of HUS Helsinki University Hospital, and it is the largest construction project in HUS history. It was completed in the Meilahti hospital area in Helsinki in 2022. The Bridge Hospital replaces the operations of the former Töölö Hospital and a part of the Department of Oncology.

In a hospital, the requirement level of the building automation system is significantly higher than in a standard property, as it must ensure optimal conditions and equipment operation even in demanding treatment facilities.

To find out more, go to:
<https://www.fidelix.com/references/hus-bridge-hospital/>

“The right conditions have a direct impact on patients’ healing. For example, in an operating room, the right pressure control and good ventilation ensure air purity, and the controlling systems must operate without interruption,” HUS HVAC Expert Juha Nurkkala describes the significance of the factors that influenced the selection of the automation system.

Good building automation was identified to play a key role in increasing the hospital’s energy efficiency. A good control system saves energy costs, as temperatures can always be adjusted as needed and waste energy can be recovered.



3. What does smart building automation enable?

A building automation system is a technology that enables the energy efficiency of building services and the comfort and maintenance of a property. The benefits of modern building automation come first and foremost from how it can be used to maintain a good condition in different

situations. The clearer the data provided by the system is, the better it guides the user, and the easier it is to manage, the more likely building automation is to deliver optimal benefits.

Building automation ensures healthy property conditions throughout the year

SUMMER

In the summer, hot weather provides challenges for the indoor conditions of properties, as the temperature and humidity can sometimes become tropical, even in Northern Europe. Even if the property is used less during the holiday season, it is important to keep the conditions in the building constant. Building automation monitors the indoor air status and controls the cooling as needed to lower the temperature and reduce humidity.



Adapt ventilation to match summer temperatures and smaller numbers of people.

AUTUMN

In the autumn, weather conditions can range from warm sunshine to damp rainy days or slight frosts. However, the indoor condition must remain within the limits of indoor air classifications and comfortable room temperatures. With sensors placed extensively throughout the building, building automation detects deviations and optimises indoor air conditions as needed.



Ensure that ventilation is re-adjusted for large numbers of people, and heating is functioning as planned.

WINTER

In the winter, the decrease in outdoor temperatures requires constant heating of indoor spaces. However, even the frost can vary tens of degrees during the winter. Smart building automation reacts to weather forecasts, in addition to real-time condition data from the facilities, and adjusts heating in advance. The smart control of heating saves in energy consumption and keeps facilities in optimal conditions.



Use data to help ensure that the heating always works at the optimum power and maintains a comfortable and even temperature throughout the building.

SPRING

In the spring, seasonal variations and temperature changes of up to tens of degrees during the day, challenge again the right balance between heating and cooling. Smart building automation controls building services to heat and cool spaces energy-efficiently, ensuring comfortable indoor conditions despite outdoor air variations.



Check the operation and condition of cooling valves to ensure that the property is ready for a smooth transition from heating to cooling.



+30°C



+8°C



-30°C



+15°C

3.1 A tool to save energy and keep people comfortable

Smart building automation uses various measuring devices to collect up-to-date data from the property, such as temperature, humidity, and carbon dioxide levels, and uses this data to optimise the conditions in the property.

In varying weather conditions, it's important for a building automation system to not only control heating and ventilation, but also optimise property conditions based on data. To help save energy in a smart way, the system must be able to strike a balance between keeping people from getting cold or hot and providing enough clean exchange air to prevent moisture build-up in the structures. Smart building automation ensures that occupants of the property are comfortable and the building stays healthy.

A building automation system enables you to:

- ✔ monitor room-by-room temperature and automatically adjust heating or cooling according to heat fluctuations
- ✔ monitor the processes that control the facilities and automatically adjust heating, cooling, ventilation, and lighting, according to the use of the space and human movements
- ✔ form a unique model of the building to proactively adjust heating according to the weather forecast
- ✔ provide real-time data on the property's energy consumption and consumption spikes to help pinpoint disruptions or optimise consumption
- ✔ respond to faults and deviations and report them as alarms for facility maintenance.

“

Building automation shows its potential when it is used by a skilled maintenance person who understands the big picture. The default values set by the engineering firm at the handover stage may not apply at all times of the year, or as the number of people varies in the facilities. A smart building automation system collects data that allows maintenance personnel to adjust the settings to match the current situation and need.”

Pekka Lantto, Fidelix

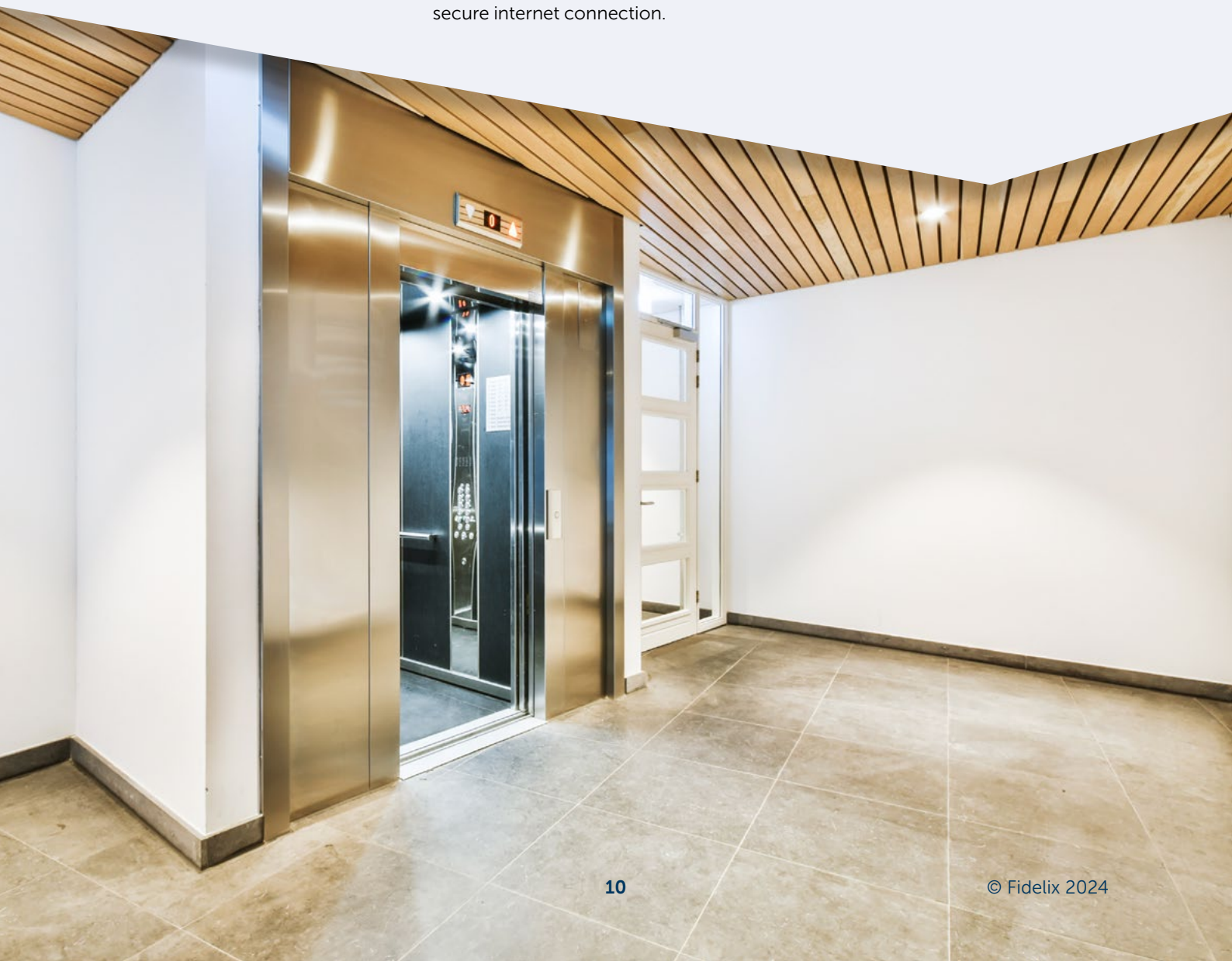
3.2 Remote management is easy and saves time

A smart building automation system can be managed remotely. In this case, the system monitors and collects real-time data in the property, and for example, when a fault is detected, sends the information about the fault, or need for repair, directly to the maintenance company. Maintenance personnel can make the necessary adjustments remotely without necessarily visiting the building.

Remote management enables

- ✓ getting up-to-date data from the building automation system to any computer or smartphone
- ✓ analysing the data from where the maintenance personnel are physically
- ✓ performing operations remotely without the need to visit the property.

A remote management system that operates with a standard web browser does not require investments in separate devices or software. All that is needed is a secure internet connection.



3.3 Open system for easy integration

A smart building automation system is open to integrate products from different manufacturers and generations. Openness extends the service life of the system as it can be updated and expanded to meet changing needs.

An open system enables

- ✓ building automation to be freely programmable
- ✓ integrating different building services systems into building automation
- ✓ connecting products from different service providers to the system.

The property owner also owns the data collected by the building automation system. A smart system makes it easy for the owner to access and use the data. The more centrally the data is collected and connected to the building automation system, the easier it is to manage the whole.



Our goal has always been a building automation system that is easy for automation contractors and maintenance companies to work with and use in their daily work. This in turn enables them to serve their customers effectively.”

Jussi Rantanen, Fidelix





3.4 Value through property lifecycle extension

A smart building automation system extends the lifecycle and service life of a property. By continuously maintaining optimal conditions with smart control, the property remains healthy, and repair needs and faults are reduced.

Value is retained when

- ✔ **savings are made by optimising, not closing.** With optimal use of building automation, ventilation and heating are always at the right level.
- ✔ **faults are detected in time.** By monitoring the property's technical systems, such as air conditioning and heating systems, the electricity network, and water and sewage systems, and immediately reporting any faults or leaks to maintenance personnel, the building automation system prevents major damage and detects hidden faults.
- ✔ **maintenance is based on data.** The data from building automation allows maintenance to optimise equipment replacements and to focus regular property maintenance where it is the most useful.



For long-term operations, it is essential to see how the system has worked, and what kind of data it has collected, for example, over the course of a few years. It can then be concluded whether there have been changes in the processes, whether any deviations have followed, and what kind of optimisation should be done."

Marko Ylönen, Fidelix

4. A renovation site – what to consider in building automation?

A building automation system has a service life of 10–15 years, and the technology is rapidly evolving. Therefore, even a 10-year-old system should at least be upgraded to modern products when renovating a property, as the latest smart technology is more effective in helping to reduce energy consumption, for example.

When renovating, the question is whether it is worthwhile to replace the entire system, or retrofitting the current one. In a complete system renovation, both the BAS controller and field devices, as well as cabling, will be renewed. In an retrofit, a new central unit will be installed, and possibly more condition sensors will be added, but existing cabling, functioning sensors, and other field devices will be used.

A retrofit for your building automation system should be considered if:

- ✓ the system is still functioning
- ✓ the system components are compatible with earlier versions
- ✓ spare parts are still available
- ✓ the manufacturer still provides maintenance.

If the system is not easily upgradable to match today's possibilities, and the components of the newer versions are not compatible with the earlier ones, it is worth planning a complete renovation of the entire system at once. If the renovation is planned and implemented in several sub-projects, the potential for optimising an integrated entity will be lost.

Learn more about renovations:

<https://news.fidelix.com/en/news/how-to-choose-between-a-bms-retrofit-and-full-renovation>



Over 10 years ago, building automation was just a building services management system, and it was not understood to provide information pertinent to the lifecycle and energy efficiency of the property. Only the latest systems are being used for optimising through data.”

Jyrki Kankaanpää, Fidelix

Take these into account at a renovation site:

- 1 What is possible?**

The building services of the property affect the controls that can be made in an old building through building automation. For example, is the ventilation natural or centralised, or what is the structure of the heating system.
- 2 Is the central unit of the building automation up to date?**

The central unit must be scalable and capable of collecting and using data. However, simply replacing the central unit is not enough to improve the indoor air quality or save energy.
- 3 What can be used?**

Existing technology should be reviewed to see which components can be used: for example, are the old field devices compatible with the new system?
- 4 What can be added?**

Old systems may have one sensor on the floor and another one outside. What is needed to provide essential data to control and optimise temperature and air quality?
- 5 How can it be used?**

Modern building automation uses wireless implementations and remote control. The technology should be upgraded to a level that enables easy, efficient, and secure data transfer and system management.

Meeting the renovation target requires a smart system

A property is usually renovated to preserve value and extend lifespan. A smart building automation system supports the achievement of this target by providing real-time data on the well-being of the property and how different measures affect its conditions and health.

CASE: NCC leveraged existing technology to renovate its automation system

NCC decided to replace and modernise the more than 15-year-old building automation system at its Ruskeasuo headquarters, as the previous technology could no longer be upgraded. The ventilation of the frequently used meeting rooms, and the lighting control system kept posing challenges, and information was no longer reliably transmitted through the system.

The renovation included the installation of a new control room in the 7-story building with 26 ventilation units, touch-screen BAS controllers on each floor, and smart temperature controllers in all meeting rooms. The old system was partially used in the renovation, which prevented unnecessary disassembly of structures.

To find out more, go to:

<https://www.fidelix.com/references/ncc-head-office/>

The project was carried out during the day-to-day running of the office, with minimal impact on the normal use of the building. During the project that required thousands of measuring devices and sensors to be installed, service outages were kept short and user-friendly by getting the new technology ready before taking out the old. The sensors were replaced at the pace of the work, when a meeting room or a workstation was empty.

The possibilities for controlling the indoor conditions of different spaces, the amount of available data, and control fluency were all significantly improved. Smart controllers now provide the users with more control options and information about room conditions. Ventilation and room conditions can now be controlled both locally and remotely.



5. How to optimise system benefits?

5.1 Finding the optimum through experimentation

It is advisable to take the time to deploy and adjust the building automation system, in order to find the best overall solution for the property's conditions. Technology can be harnessed to work in unison in the

most energy-efficient way possible, with the help of an expert who is familiar with the system and can interpret the data.

How to succeed in system adjustments?

Property Manager **Sakari Meriläinen**, who has successfully worked on many demanding projects, lists his tips on how to prepare for and succeed in deploying building automation:

- ✓ Create a low-hierarchy project with flexible work practices
- ✓ Ensure good chemistry between people and functional, interactive communication processes
- ✓ Choose an open and flexible building automation system
- ✓ Make active use of the data provided by the system
- ✓ Invest in post-deployment optimisation to ensure success
- ✓ Tune continuously to achieve optimal conditions and energy targets.

To find out more, go to: <https://news.fidelix.com/en/news/why-choose-fidelix-as-your-bms-partner-key-benefits>

5.2 Regular maintenance keeps the system in good condition

Even reliable, high-quality technology needs to be monitored and checked to ensure that maintenance needs are detected on time. An annual inspection maintenance ensures the continuous operation of the building automation system, prevents equipment breakdowns, and helps anticipate the future needs of the property. The most useful time to check the condition of the system is always before the heating season starts in autumn and before the cooling season starts in spring.

The system can also be kept up-to-date with regular software updates, for example, during maintenance.

“

There are no unnecessary alarms. Each alarm should be relevant and “unnecessary” alarms are only a sign of inadequate deployment, or changes in the property.”

Henry Forsström, Fidelix



5.3 The best benefits through smart use

Ultimately, the effectiveness of a building automation system is determined by how the technology is used. There is no point in settling for the bare minimum; it is not sufficient to use automation to control individual building services equipment and systems for the optimal operation of a technically complex property.

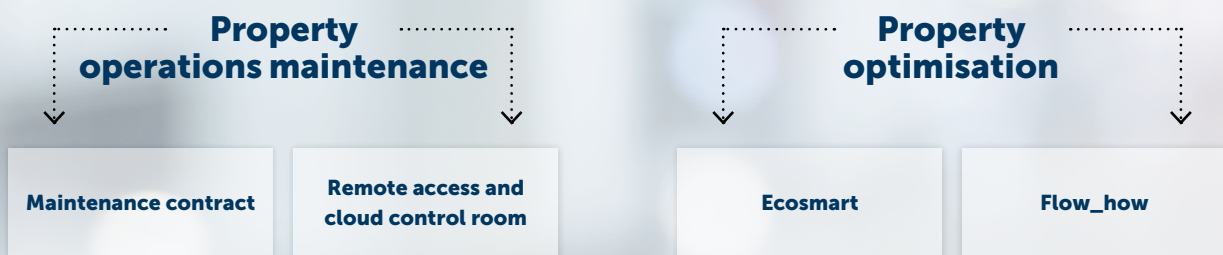
It requires big picture management, data analysis, and software that intelligently adjusts conditions to changing situations, to achieve optimal conditions. This is supported by various lifecycle services that make smart use of system data and by experts who interpret the data.



Behind the evolution of Fidelix's building automation system is a strong understanding of what automation is needed for in a property, and how to optimally control even complex entities. However, the user interface must be simple to make it easy to correctly adjust and manage all building services. Building automation is both a practical tool for property maintenance personnel and an advanced building management system for energy management professionals."

Jussi Rantanen

Fidelix smart services support property managers



CASE: City of Vantaa relies on cooperation in system selection

With a large number of properties and high savings targets, expectations are also high for the building automation systems that are installed in the properties. The City of Vantaa decided to invest in a long-term framework agreement to modernise and develop the properties systematically and in close cooperation.

“Especially in renovations, it must be possible to make plans on a case-by-case basis and look together at what is worth replacing, what can remain, and what can be done after the project”, says Antti Mehtonen, who is responsible for building automation engineering in Vantaa.

The smoothness of the cooperation is ensured at monthly meetings, which are attended not only by the City of Vantaa and Fidelix, but also by the developer or the entity responsible for connecting the system to the control room, if necessary.

The framework agreement with Fidelix for the contracting of a smart building automation system for the city’s new buildings and major renovation projects has been in force since 2019.

Find Fidelix on YouTube and learn more on smart building automation!

On our YouTube channel we share videos related to building automation systems, focusing on solutions for energy efficiency, HVAC, and smart buildings. In addition to covering Fidelix products, software tools, and case studies, we showcase how building automation systems improve the performance and sustainability of properties. Whether you are a seasoned professional or just taking your first steps in the world of building automation, our videos provide you with top-notch content.

Watch the channel [here!](#)

Sustainable conditions management with smart building automation

Fidelix develops smart solutions to save energy, ensure comfortable indoor conditions, and keep your property healthy in the varying climate of the north. Our range includes products from condition sensors to efficient control of the entire property. At the heart of Fidelix is the ability to make all the components of building services technology work smartly together in any property.

Succeed with Fidelix building automation system.

Media converter

Solution for seamless integration between the various system components and the protocols they use.



Room controller

Freely programmable bus controller for controlling the conditions of facilities.



Local controller

Compact total solution for controlling a ventilation machine or a cooling system, for example.



Wireless sensor

Measuring device for measuring and monitoring various indoor air conditions in facilities.



Control panel

Easy-to-use touchscreen for building automation system control.



Central unit

A highly versatile, freely programmable central unit for building automation.



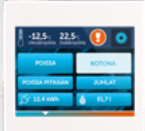
I/O modules

Reliable adjustment, control, and measurement modules for integrating the building services and building automation system in a property.



Room display

A panel for monitoring the conditions of facilities and controlling them according to user preferences.



BAS controller

Cabinet in the technical space for the control panel, central unit, and I/O modules.





An efficient and scalable building automation system

Do you want modern and smart building automation that scales up to a wide range of needs? Looking for the ability to manage your system efficiently remotely, with user-friendly room-specific smart panels?

This is Fidelix Building Automation System. We help you design the whole system to meet your needs in the best possible way.

Read more about Fidelix products and system

www.fidelix.com