



Intesis[®]
BY HMS NETWORKS



CO2 savings with Intesis AC interfaces

HVAC integration in the context of
energy savings and
greenhouse gas emissions



Introduction to the problem

BUILDINGS ARE RESPONSIBLE FOR 40% OF THE WORLD ENERGY CONSUMPTION AND FOR 36% OF THE CO2 EMISSIONS. AMONG ALL SUBSYSTEMS WITHIN A BUILDING, HVAC (HEATING, VENTILATION, AND AIR CONDITIONING) SYSTEMS ARE THE MOST ENERGY-HUNGRY ASSETS. REDUCING THEIR ENERGY CONSUMPTION IS A KEY ISSUE.

According to statistics from the European Union and the International Energy Agency, the building sector is the most energy-consuming vertical, more than industry or transportation. Within buildings, cooling is the fastest-growing application, especially in emerging countries like China, India, Indonesia, Mexico, and Brazil. Every year, over 100 million aircon units are installed worldwide.

Unfortunately, cooling is also the most energy-consuming application within buildings. In order to meet our climate goals, the reduction of energy consumption by HVAC systems is mandatory. Building Automation technology plays an important role to meet this target.



Description of solution

Humans are not good at remembering to perform certain routine actions, this is where automation technology brings value. In the case of the control of HVAC systems with the aim to save energy, simple actions like turning the AC unit off in case of an open window or an empty room, adding calendars that automatically turn the system on/off in line with the opening times of the business, limiting the setpoint range to avoid users to set the temperature too cold in summer or too hot in winter, etc., have a big impact in the energy consumption. Energy service companies report savings up to 45% thanks to building automation technologies.

The Energy Performance of Building Directive (EPBD) from the European Union sets the legal requirements that commercial buildings shall comply with in order to reduce their CO2 footprint. Those non-residential buildings with an effective rated output for systems for air-conditioning of over 290 kW shall be equipped with a Building Management Systems (BMS) by 2025, otherwise, those buildings shall undergo regular inspections that include an assessment of the efficiency and sizing of the air-conditioning system compared with the cooling requirements of the building. Typically, a hotel with 70 rooms or an office building of 5 floors has HVAC systems above the threshold of 290 kW.

The BMS shall be capable of continuously monitoring, logging, analyzing, and allowing for adjusting energy use, benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for

energy efficiency improvement. Additionally, the BMS shall allow communication with connected technical building systems (e.g., HVAC, lighting, fire systems, etc.) and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices, and manufacturers.

The main challenge to integrate HVAC systems into BMS is the fact that the communication protocols used by the HVAC systems are proprietary. Gateways that connect HVAC systems with the BMS should be developed in close collaboration with the AC manufacturers and should be validated by them in order to guarantee the proper function with the aircon unit. AC manufacturers also face the challenge to support different control technologies depending on the BMS vendor, building topology, or country of installation. The most popular control technologies used in building automation are BACnet, Modbus, and KNX.



1 MILLION AC UNITS CAN'T BE WRONG

Intesis AC interfaces control over 1 million aircon devices across the world. Since the start in 2009, every year thousands of new AC units are integrated into BMS systems using AC interfaces from Intesis.

The first AC interface that was developed was a 1:1 KNX interface for Mitsubishi Electric (i.e. it enabled the integration in KNX of a single indoor unit) while the last addition to the family was an infrared AC interface into BACnet and Modbus compatible with many brands. The portfolio covers all major AC brands (in alphabetical order Daikin, Fujitsu, Haier, Hisense, Hitachi, LG, Midea, Mitsubishi Electric, Mitsubishi Heavy Industries, Panasonic, Samsung, Toshiba), with both 1:1 versions and centralized units for multiple indoor units.

The AC interfaces are deployed in hotels, retail sector, datacenters, and residential among others. They are also highly appreciated for zoning applications because their common register map makes them interchangeable with a common driver from the zoning controller.





150.000 TONS OF CO2 SAVINGS

The installed base of 1 million AC units has a large energy/carbon footprint. To estimate the energy savings achieved with Intesis products, first, we take a common split unit as our reference model to represent all devices under control. According to the AC industry benchmark, a standard split unit consumes 353 kWh per year in cool mode and 1.594 kWh in heat mode, resulting in total annual energy consumption of 1.947 kWh. Therefore, the whole installed base is responsible for 1,7 Twh of energy consumption.

Several HMS customers report energy savings between 20-45% using Intesis AC interfaces in the retail sector. Assuming an average of 30% energy savings across the different projects, Intesis AC interfaces help to save 509 GWh per year. According to statistics from the European Union, the current power mix of renewables, nuclear power, gas, and coal plants results in 295 grams of CO2 per generated kWh.

Thus the 509 GWh energy savings correspond to 150.000 tons of reduced CO2 emissions.

In order to set these figures in perspective, the obtained energy/CO2 savings are equivalent to the annual consumption of a city of 22.500 inhabitants, to the absorbed CO2 by 6 million trees in one year, or to 230.000 intercontinental flights between Barcelona and New York.

Intesis AC interfaces

The Intesis AC interfaces are reliable gateways that enable the integration of AC equipment from all major brands into BMS systems. Thanks to the support from the main AC manufacturers, Intesis AC interfaces ensure the perfect fit with the aircon units.

A key aspect for installers and system integrators is the simplicity in the commissioning in order to reduce setup time. The BTL mark for BACnet and the KNX certification ensures the quality of the products.

- Co-developed and approved by the AC manufacturers.
- Easy-to-use, simple to install, short commissioning time.
- Support for all the major AC brands.
- Integration into BACnet, KNX, Modbus, and IoT.
- Scalable solutions for small and large projects.



Conclusion

As we have seen, buildings are the single largest energy consumer in Europe responsible for 40% of EU energy consumption and 36% of the greenhouse gas emissions. HVAC systems are the most energy-intensive assets in buildings. EPBD legislation requires commercial buildings with an HVAC system over 290 kW rated power to have by 2025 those HVAC systems integrated into the building's BMS.

CHOOSE A TRUSTED GATEWAY FOR AC INTEGRATION FROM THE MARKET LEADER

With more than 1 million aircon units worldwide under control, Intesis is the indisputable market leader for AC integration. The best proof of evidence that AC manufacturers support and endorse Intesis AC interfaces from HMS Industrial Networks is the fact that they carry our products in their catalogs, brochures, and websites. Make a safe choice and work with the market leader!

About the author

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Managing Director of BU Intesis, HMS' division for building automation. He holds an M.Sc. in electrical engineering and an MBA. David has 20 years of experience in factory and building automation, the last 6 years working for HMS in different positions.



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