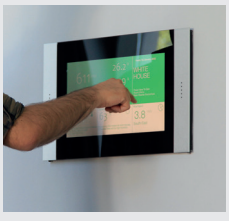
Case study:
KNX Award Winning Baku White House

Solution:	Intesis Gateway
Country:	Azerbaijan
System integrator:	OKAL
Summary:	Intesis gateways integrate air conditioning into fully-automated residential property, leading to an award-winning entry in the KNX Awards.

Networking pointers

- In the Baku White House, several hundred sensors and other devices are linked to automatically control many functions, including lighting, blinds and shutters, air conditioning, security systems, energy management, audio video, white goods, and displays.
- HMS Networks' Intesis gateways provide the interface between the air conditioning system and the KNX building management system.
- Intesis gateways enable air conditioning to be controlled via the KNX network to respond automatically to changes in the weather, occupancy, and time of the day.

OKAL



"Using the touch panel, we can control all of the devices in this house from one place. The most we press the buttons is 5-6 times per day, for a property spanning more than 700m2!"

A luxury villa with a floor area of more than 700m2, the Baku White House features an exceptionally advanced and award-winning level of home automation, possibly the most technologically advanced of its type in Azerbaijan and beyond...

The owner of the Baku White House, in the capital of Azerbaijan, has high expectations of home automation, with the goal being not to have to control anything manually (see Table 1). Using several hundred integrated actuators, sensors, devices, and machines, all systems operate automatically, responding to factors such as weather conditions, light level, occupancy, and the time of day.

The house is designed so that the homeownear only needs to use a few buttons to control all the systems. Pre-programmed "modes" are provided for the whole house or individual rooms (e.g. relax, show mode for the cinema room, galaxy, party mode). Voice control makes the process even simpler!

Local Azerbaijani system integrator, Okal, opted for an installation based on KNX, the most common standard in the area for residential building automation. KNX evolved from three earlier standards - the European Home Systems Protocol (EHS), BatiBUS and the European Installation Bus (EIB or Instabus). It has simple to install and maintain connections, using twisted pair cables (in a tree, line or star topology), powerline, RF or IP links.

KNX connected devices can be controlled remotely and will manage a wide range of functions, including lighting, blinds and shutters, heating, ventilation and air conditioning (HVAC), security systems, energy management, audio video, white goods, and displays. In this application, the network is set up to optimize energy consumption, saving significantly on running costs. KNX is a flexible platform, so more functions can be added later – and with the addition of these, we estimate that energy savings of up to 60% can ultimately be realised.

KNX Award winner

The KNX Awards are intended to highlight ambitious, creative, and innovative smart home and building projects. The 2022 event was watched online by thousands

from the worldwide KNX Community. From the original entry list, 55 were selected by an expert jury to be considered in the final judging stage, and 12 winners were announced. The Baku White House is the winner for the Asia Region and received a globally coveted trophy.

Air conditioning system

Within the overall project, HMS Networks worked with OKAL's CEO, Sharif Karimov, to integrate the air conditioning (AC system. The main challenge when integrating HVAC into a building management system (BMS), is that the communications protocols used are proprietary so, as all systems integrators know, air conditioning gateways are needed to connect these machines to the BMS automation network.

The most popular protocols used for communications between BMS and HVAC devices are KNX, BACnet, and Modbus. The leading brand of BMS-to-HVAC gateways is Intesis from HMS Networks. Since 2009, over a million AC units have been integrated into BMS systems using Intesis AC gateways. These are developed and validated in close collaboration with AC manufacturers.

In the Baku White House, Intesis AC gateways provide the interface between the AC system and the thermostats and central controllers operating on the KNX network. This enables the AC to be controlled via the KNX network to respond automatically to changes in the weather, occupancy, and time of the day.

Table 1: Functions Automated in the Baku White House

Heating, Ventilation & Air conditioning (HVAC):	Central & Automatic Control, Timed Operation Modes, Automatic Occupancy Detection, Weather Dependent Control, Individual Room Control/Zone Control, Valve Drive Control/Fan Coil Control, CO2/ Humidity Measurement, Natural Ventilation, Floor Heating Control, Boiler and Burner Control.
Lighting:	Switching, Dimming, Light Scenes, Timed Control, Automatic Occupancy Detection, Constant Light Control, Lighting Colour Control.
Blind and Shutter Control:	Individual Control, Group & Central Control, Preset Positioning, Automatic Programs, Wind and Rain Protection, Sun Tracing (interaction with HVAC/lighting).
Security and Safety:	Smoke/Fire Detection, Faults (eg Leak Detection, Glass Break Detection, Window Contacts), Access Control, Intrusion Detection/Alarm Systems, Emergency Lighting, Presence Simulation, Supervision (eg Cameras), Interaction with HVAC/Lighting.
Operation and Visualisation:	Switches/Push Buttons, PC Visualisation, Web Servers, Touch Panels & Display Panels, Tablets, and smart phones.
Automation & Remote Access:	Timed Functions, Logical Functions, System Supervision, Internet Access, Remote Programming.
Energy Management/ Smart Metering:	Metering, Data Logging, Visualisation, Current Detection, Fuel or Water Tank Level Control, Peak Demand Monitoring, Load Shedding, Energy Harvesting (avoiding use of batteries), Use of Renewable Energy, Battery Storage.
Other:	Intercom, Audio and Video Control, Home Appliances Control, Irrigation Control, Distributed Facilities.

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