Умный дом и его возможности

Данная статья посвящена концепции «умный дом», которая все чаще начинает появляться в наших домах. Функции данной системы разнообразны, начиная от обычного оповещения на телефон, заканчивая системой автоматического контроля подходящего вам микроклимата. Главное достоинство данной концепции заключается в полной автоматизации управления вашего дома.

Smart House and its Possibilities

As you know, in today's world there is a process of automation going on to facilitate human life. This fact also touched our homes. All buildings consist of complex subsystems responsible for certain tasks that appear...
during the operation of the building. The "smart house" concept was invented to solve the problem of managing these functions and subsystems.

Smart House is a house of a modern type, organized with the help of high-tech devices for the convenience of people living in it [2]. The concept of a "smart house" was formulated by the Intelligent Buildings Institute (IBI) in Washington DC in 1970 and went as follows: “An intelligent building is one which provides a productive and cost-effective environment through optimization of its four basic elements, i.e. structure, systems, services and management and the interrelations between them” [3]. The "Smart House" concept implies a system that recognizes certain situations and reacts to them in the way specified in the program algorithm. "Smart House" is the most advanced concept of human interaction with the living space.

The "smart house" concept includes the following provisions:

1) Sustainability of various systems’ operation in order to reduce utility costs.

2) Increase of the facility’s security level by means of the automatic switching-in of centralized video surveillance system, signalling system, fire sensors and monitoring of the premises.

3) Remote control of the house. This is one of the most important functions of a smart house. Due to it, you can receive notifications while being on vacation, on a business trip, or staying with relatives in another city.

4) Reduction of maintenance staff by means of transferring control functions to the "smart house" management systems.

The term "smart house" is most often understood as a way to combine the following subsystems into a single management system:

1) Video surveillance
2) Communication (telephone line and local area network)
3) Notification System
4) Mechanization (opening / closing of the gate)
5) Video / Audio equipment control
6) Remote monitoring of the systems (via smartphone, PC, etc.)
7) IP-monitoring of the facility – remote control of the systems via the network

The current progress has reached the point that allows to install only those functions of a "smart house" that are really necessary. The modular
structure allows to create a system that will not hit you in the wallet, and will fully satisfy you with its functionality.

Technologies of creating a “smart house”

At the moment, there is a huge amount of technologies to create a "smart house" but the most promising and popular ones are the following:

1) BPT, a home automation system with distributed intelligence using a closed data transfer protocol. This system manages lighting control, home automatic equipment, air conditioning, heating, engineering utilities, security alarm, and interphone system [1];

2) LanDrive, a platform that allows to construct distributed bus-bar systems for managing indoor and street lighting, power loads, electrical appliances, as well as such systems as heating, air conditioning, ventilation, burglar alarm, access control, and water leaks [1];

3) C-Bus, a protocol for home automation and automation of buildings, sports facilities, etc. C-Bus is a system with distributed intelligence (without CPU) using the category 5 cable (Cat.5), one segment of which can be up to 1000 m. long. Up to 255 of such segments can be combined into a single system. The C-Bus protocol was created by Clipsal Integrated Systems to be used in the systems of home automation and buildings’ lighting control [1];

4) AMX, a centralized home automation system developed by the company with the same name. Its protocols are closed. Its own data buses were initially used in it. New AMX hardware lines use standard Ethernet protocols, Wi-Fi and Zigbee for transferring data. It has gateways for pairing with other systems (EIB, LON and others) [1];

5) X10, a protocol for managing electrical appliances. The signal is transmitted either through electrical wiring or within a radiofrequency range [1];

Main functions of a "smart house"

Lighting control

Lighting control allows the user to create a range of colors, which would be pleasant for their eyes. The light dimmers let you change the brightness of the lamp when it is switched on. The automatic activation of the external lighting, which depends on the time of day will help reduce the cost of electricity, and will scare off intruders.

Microclimate control
The system maintains a certain type of microclimate in each specific room, thanks to the constant temperature measurement, by means of controlling radiator valves and air conditioners, and turns the ventilation on and off. If you suddenly decide to open the windows for ventilation, the heating system switches off automatically to save energy.

Security
The system records all events that occurred in the house during your absence: attendance control, time of visit, detection and deterrence of suspicious individuals by means of blinding light and audible siren. In case of a sudden housebreaking the system will call security and send a notification to your phone.

Emergencies
In such emergency situations as, for example, gas leakage, the house will notify the owner and contain the accident by stopping the gas supply.

Presence effect
In the absence of the tenants in the house, the "smart house" will ensure a simulation of the traditional lifestyle of the owners, keeping a normal daily routine (including turning on light, TV, or music).

"Smart House" is popular in many countries around the world as it is a complex system of automation of buildings using a variety of functions: systems of heating, lighting, fire protection, security, protection against water, air, and gas leakages. The system works thanks to the abovementioned devices and protocols, such as LanDrive, X10, BPT, C-Bus, and AMX.

Список литературы: