

HYBRID OPTIONS IN THE CONSTRUCTION OF SECURITY SYSTEMS AND THE IMPLEMENTATION OF THE DIGITAL HOME FUNCTIONS

Security systems and digital home ("clever home") today are the testing ground for new computer technologies. Well-established security system is always open for updates. This paper shows the advantages of hybrid systems that can combine all the best features of today. The rapid development of computer technology often attracts developers of measuring systems in the race for innovations. In the world of electronics it is clear that the capabilities of measuring systems must always meet the requirements of the present time. However, everything is not so simple. Sometimes in the pursuit of something new proven reliable options and designs are unjustly discarded. At the same time, there is no guarantee that this innovation will not disappoint or let you down after a while. Quite often, a new development of a well-known company has the main goal to push the competitors and increase the volume of sales of the new product. Attention of potential buyers focuses exclusively on positive aspects, such as increased accuracy, computing power, increasing speed, reducing size and weight, etc. Thus disadvantages are ignored, however they are present and can subsequently occur. That's why the developers of security systems and experts in the implementation of the digital home functions ("smart homes") should be especially cautious and picky. They work in an area where the main customer requirements are often associated with a desire to get a reliable, non-standard, in a sense unique product. The requirement for a reasonable price is not always put forward. There is a strong flow of new products from the Internet (new modules, new standards, new line, etc.). It attracts offers to do everything on a turnkey hardware components supplier firms. Considering the foregoing, the most reliable to date is the hybrid version of data collection system setup that can combine together all the advantages of the well-known and new, i.e. ideally complement what work today reliably with that new that appears on the global market. This applies to all issues related to the construction of a data collection system: the choice of analogue or digital sensors; selection of video surveillance systems - analog or digital; selection of data transmission channels, wired or wireless, etc.

Keywords: digital home, security systems, smart house, wireless connection.

O.V.ANDRIEIEVA

Національний технічний університет України «КПІ ім. І.Сікорського»
elvian44@gmail.com**ГІБРИДНІ ВАРІАНТИ ПРИ ПОБУДОВІ ОХОРОННИХ СИСТЕМ ТА РЕАЛІЗАЦІЇ ФУНКЦІЙ ЦИФРОВОГО БУДИНКУ**

У доповіді показані переваги використання гібридних варіантів в охоронних системах та при реалізації функцій розумного будинку. Охоронні системи для надійного функціонування потребують постійного тестування та оновлення обладнання. Однак після 5-6 років користування охоронну систему краще взагалі замінити на нову (або суттєво переробити). Світовий ринок електроніки пропонує безліч готових проектів охоронних систем. Слід враховувати, що охоронна система є найбільш привабливою з точки зору надійності, якщо вона являє собою оригінальну розробку, а не стандартну систему однієї з відомих компаній. Найбільш прийнятним варіантом за критерієм надійність/ціна може стати, так звана, гібридна охоронна система. Саме в ній простіше реалізувати нові нестандартні рішення. Гібридність в охоронну систему можуть додати такі рішення, як:

- поєднання для сумісної роботи аналогових та цифрових камер відеоспостереження;

- застосування двох (або більше) варіантів живлення пристроїв системи (а також засобів їх дистанційного підживлення);

- поєднання двох варіантів ліній збору інформації від датчиків (дротові та бездротові лінії зв'язку).

Ключові слова: цифровий будинок, охоронні системи, розумний будинок, бездротовий зв'язок.

Video surveillance in the hybrid system. For a long time surveillance developed only in analogue systems. Nowadays Cameras with 600-800 TVL successfully work in security systems. They have several advantages over IP-cameras (for example, on the street recording at night, especially when raining). The first digital-camera with a matrix resolution less than 1 megapixel (704x576) could not compete reliably working analog CCTV systems. However, today we use digital cameras with 3- and 5-megapixel sensors. Even more - there are models with a resolution of 20 megapixels and more. Digital cameras provide a transmission in a digital format over the Ethernet and Token Ring, using the IP protocol. The main difference from analog cameras is the absence of intermediate transformations. Image remains in digital format all the time after receiving from CCD - or CMOS -matrix until the digital display or monitor.

There are some problems during the upgrading of already working security surveillance systems (usually after 6 years of operation). In these cases the compromise solution is appropriate - the construction of a hybrid video surveillance system is one of them. This solution allows to leave a part of the equipment from analog video surveillance systems (e.g. 704x576), but in places where high detailing is necessary it is possible to set network IP cameras with high resolution. This approach allows the creation of efficient and flexible system to obtain a gain in function. Advanced Hybrid solution allows to receive a number of advantages in the construction of new security systems since it successfully combines all the advantages of analog and IP-cameras. The surveillance system receive additional functions such as video analytics, the ability to work via a dedicated free cloud service "tescar-cloud" provides supporting of high-definition live video: standard 960H for analog signals and standard 1080p for digital. Also it supports a huge total storage capacity up to 12 TB, and recording video and audio streams synchronously.

Interfaces for the hybrid systems. Now measuring systems are used a new generation of electronic measurement instruments standard - LXI (LAN Extension for Instrumentation). This standard compared with the predecessors has a number of advantages at a low price: web interface, equal messaging, wired synchronization interface, the new distributed interface with synchronization on timestamps, etc.

It should be noted that the new standard allows for the construction of hybrid systems with the simultaneous use of multiple interfaces, including LXI, UXI, PXI. During upgrading of operating systems, adding LXI standard components associated with low expenses, because LAN is a low-cost technology.

Wireless Networking "Smart house" and hybrid approach. Keep in mind that wireless networks are short-range action can interact with each other. Special equipment may serve as a gateway between different wireless networks. For example, if system "ZigBee" detects intruders at territory of a Digital Home, it can communicate with a special security network IEEE 802.11 and activate thus the host computer and the security service.

Zig Bee competitors today can be considered a Z-Wave technology (also with cellular topography) and INSTEON -technology (simultaneous transmission of data on two channels: wired and wireless; can be operated without a central computer.

Conclusions:

In conclusion, it should be noted the following:

1. Despite the external domination of sales of digital meters, the relevance of analog sensors is not becoming

less. This is explained not only by their miniature nature, but also by a number of other advantages.

Developers of security systems and smart house functions are not in a hurry to part with a well-proven

element base for gathering information about the state of the facility. The main criterion here is the reliability

of the system and the absence of false positives.

2. The hybrid system of data collection for today are the best option in terms of price and quality due to the

versatility, originality and openness for improvements.

3. Hybrid versions prepares a reliable platform with the element base for the construction of measuring systems

of the future.

References:

1. Hidden surveillance cameras. [Electronic resource]. Access mode:

<http://www.gelezo.com/security/bezopasnost.html>.

2. Covert video surveillance systems. [Electronic resource]. Access mode:

<http://www.mjelectronics.com/wireless.html>

3. Electronic Components and Systems. №2, Feb. 2013 article "Microcontrollers for Zig Bee applications" p. 32.

4. Electronic security systems [electronic resource] / Kadino E. Trans. from fr. - M.: DMK Press, 2010.

Література:

Скрытые видеокамеры наблюдения. [Электронный ресурс]. Режим доступа:

<http://www.gelezo.com/security/bezopasnost.html>.

1. Covert video surveillance systems. [Электронный ресурс]. Режим доступа:

<http://www.mjelectronics.com/wireless.html>.

3. ЭКЭС. №2, фев. 2013. Ст. "Микроконтроллеры для Zig Bee –приложений», с.32

4. Электронные системы охраны [Электронный ресурс] / Кадино Э. Пер. с фр. – М.: ДМК Пресс, 2010.