Ye. Herasymchuk, Master student
K. Molodetska-Hrynchuk, PhD in Engr, As. Prof, research advisor
S. Kobzar, Senior lecturer, language advisor
Zhytomyr State Technological University

WIRELESS TECHNOLOGIES IN INDUSTRIAL NETWORKS

Wireless technology today is experiencing a real boom in development. This is mainly due to the strong entry into our lives of smartphones, tablets and mobile computers, which, among other things, can serve as universal control systems for managing automated control system, provided that there is constant access to the Internet, regardless of whether the terminal is moving or is in space. In addition, in various branches of industry, agriculture, military, there is a growing need for the organization of reliable systems for managing reliable objects and integrating them into a global network. Similar trends are observed all over the world and lead to the inevitable development of wireless communication technologies.

In this work, the equipment and software for the organization of the global networks and the networks which use telecommunication providers (GSM, GPRS, EDGE, 3G, WiMAX, etc.) are considered[1].

Types of wireless networks:

- Personal wireless networks.
- Wireless sensory networks.
- Small local wireless networks.
- Large local wireless networks[2].

Types of technologies which are used in industry:

Bluetooth I / O (IEEE 802.15.1). The main area of application of Bluetooth technology is the integration of components of automation systems into the local networks based on a field bus or on the network of industrial Ethernet. With the support of various profiles, the wireless standard can be used to address a wide range of tasks.

Distinctive features are as follows:

- Very reliable method of data transmission in production premises with metal objects.
- The possibility of local parallel operation of several Bluetooth networks.
- Automatic coexistence mechanisms provide the resistance to interference with the parallel work of WLAN 802.11b / g.
- Radio network connection up to seven terminal devices at one radionetwork.
- Bandwidth up to 1 Mbps.
- Range of transmission is usually more than 100 m in industrial premises and more than 200 m in open air conditions.
- Ideal for fast, cyclic transmission of small data packets.
- Transparent data transmission over Ethernet network at Layer-2 level, for example, in PROFINET IO systems.

- High data security by encoding 128-bit data and authenticating by Trusted Wireless Terminals.

Among the methods of reliable wireless transmission, it is worth noting the following:

Trusted Wireless is a technology for industrial radio communications to transmit the signals, noncritical to the process of delay, over long distances - up to several kilometers.

Wireless MUX is a simple solution for the transmission of digital and analog process and control signals - simply and reliably without cables, from one point to another. A reliable transmission at a distance of up to several hundred meters.

High-performance networks are represented by **WLAN** technology (IEEE 802.11). On the basis of WLAN it is possible to implement networks that combine many end devices. Because WLAN systems allow for easy integration into the information networks, they are great for mobile data management, monitoring and registration. In addition, it is possible to create a fast communication channel between controllers and to transmit real-time input and output data in PROFINET I / O systems.[3]

For example: use of wireless technologies on the basis of AFS(automated fare system) in the system of public transport of Zhytomyr:

- all transport terminals have a communication module, SIM card and are IoT devices;

- devices automatically upload transaction data and validation to the server over the radio channels;

- data transmission technology using 2G mobile communication for data transmission;

- configuration updates are also done using 2G directly from the terminal management system

- the convenience is that the exchange of data between the devices does not require the installation of additional cables and in fact terminals depend only on power supply and do not require additional telecommunication costs.

Conclusion:

A wireless network is not a solution of the type "installed and forgot". It is necessary to conduct a network audit on a regular basis; to interact with IT services at different stages of network construction, especially at early stages, and to involve these departments to diagnose network status.

By following these simple conditions, users can enjoy the flexibility and versatility inherent in the wireless solution, and in many cases the costs can be reduced.

REFERENCES

1. Adrienne L. Wireless Technology for Industrial Networks: Overcoming Barriers [Електронний ресурс] / Lutovsky 1. Adrienne // 2018. – 2018. – Режим доступу до ресурсу:

http://ua.automation.com/content/besprovodnye-tehnologii-dlja-promyshlennyh-setej-preodolenie-barerov.

2. Oleg I. Means of wireless transmission of information in systems ACS TP [Електронний ресурс] / Ivanin Oleg // 2018. – 2018. – Режим доступу до ресурсу: http://ua.automation.com/content/obzor-sredstva-besprovodnoj-peredachi-informacii-v-sistemah-asu-tp.

3. Виктор Д. Беспроводные локальные сети [Електронний ресурс] / Денисенко Виктор – Режим доступу до ресурсу: http://bookasutp.ru/.