

## POWER LINE COMMUNICATION TECHNOLOGY

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The operation principle of PLC technology is discussed briefly. The main advantages of this technology are given. The most important disadvantages of PLC technology are mentioned.

We can't imagine our lives without the internet, computers and other gadgets, which unite all the users of World Wide Web. The internet is a very important source of information for people. Nowadays, you can find there any necessary information not only for education, or work but also for entertainment. Nowadays people communicate with each other, using the internet, social networks are very popular and people can't imagine their lives without online communication.

The most popular way to enter the Internet is Wi-Fi, but sometimes it's not suitable because of thickness of walls. The solution is PLC.

PLC technology is a new telecommunication technology based on power lines for high-speed information exchange. The data transmission experiments over the power grids/lines have been conducted for quite a long time, but the low transmission speed and poor noise immunity/jam resistance are the bottleneck of this technology. But progress is ongoing, and the introduction of more powerful DSP processors (digital signal processors) made it possible to use more complex methods of modulation/keying of the signal such as Orthogonal Frequency Division Multiplexing, which enabled a significant advancement in the PLC technology implementation.

There are many areas of use. Some of them are internet connection, small office, home communications, automation, safety service.

The operation principle of this technology is as follows: a high-frequency signal (1 to 30 MHz) is superimposed on a conventional electrical signal using various modulations, and the signal itself is transmitted through electric wires. Equipment can receive and process such a signal at a considerable distance (up to 200 m). Data transfer can be carried out both on broadband (BPL) and narrowband power lines (NPL). Only in the first case data will be transmitted at a speed of up to 500 Mbps, and in the second much slower - only up to 1 Mbps.

The technology has many advantages:

-Fast installation and the ability to connect to existing networks is one point in favor of PLC. The PLC network can be easily disassembled and configured.

-Such network is easily scalable. Nearly all of its topologies can be organized with minimal cost (depending on the number of additional PLC adapters).

-PLC network, is unlikely to fail in tough conditions such as reinforced concrete structures or a high level of electromagnetic interference.

-Meanwhile secure data transmission over the network is provided through the modern encryption algorithms use.

No ongoing costs for data communication where power line communications are used.

PLC has few drawbacks:

-Firstly, the network bandwidth is shared among all its participants.

-Secondly, the PLC stability and speed are affected by the power wiring quality (e.g. copper and aluminum wires).

- Finally, the PLC does not operate via power strips and uninterruptible power supplies, which are not equipped with special sockets.

Powerline adapters are a good way to improve your home network if you want a quick easy fix; they are relatively cheap and require very little technical knowledge to install. They are ideal for someone looking to add a cable connection to one of their high demand devices, but wouldn't necessarily suit someone looking for a complete home network solution.

### **References:**

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