WIRELESS COMMUNICATION IN INDUSTRIAL CONTROLLERS

In the case of continuous measurements, carried out most often in industrial conditions, it is necessary to transfer information between the measuring element and the measuring device that processes this information. Typically a cable connections are used. The signal from the sensor or electrode, amplified by the preamplifier, is transferred via properly selected cable.

Our company offers also a different way of transferring this data – by a wireless communication. A transmitter, placed in the head including the measuring element, sends the data by a wireless communication to the measuring device. This solution eliminates the need for cable routing, earthwork and assembly work. The correct selection of elements ensures error-free data transmission, not worse than with the use of a cable.

In the industrial controllers of the 801 and 804 series it is based on a Mesh low power wireless communication protocol. The transceivers work in the generally available 2.4 GHz band. Depending on the used antenna installation and the specific conditions the practical range between 2 devices may be several hundred meters in the open space and several dozens of meters in the closed spaces. This depends on the number of walls and their material. By a short range the signal is sent directly from the measuring head to the meter without any additional transfering devices. Larger range may be obtained with use of a directional antennas, which are "visible" one to another. A good solution, to increase the range, is to place the antenna outside the building, the antenna cable can have up to 5 meters. Increasing the range between the meter and the electrodes, when the antennas are not visible one to another, may also be obtained by adding devices called routers. Adding one or more router enables signal retransmission (the elements have to be "visible" one to another. If the devices work on this same channel the net automatically chooses the shortest ways of communication. All the meters and electrodes in the network have their own address and thanks to that they recognize each other. The parameters of the network enable up to 128 multichannel devices working in a one place. The basic security level was ensured by the encryption of the transferred data with the AES algorithm.

It has to be remembered that each of the devices requires a local power source.

The CX-804 meter may be equipped maximally with 4 measuring channels. One transmitter can handle from 1 to 3 measuring channels at the same time. The data are updeted eproximatelly every each second.

In case of interference on a given frequency, it is possible to choose 1 of 8 available channels in the 2.4GHz band.

Our devices are equipped with their own network identifier, what practically prevents accidental communication with another network. The basic level of security is ensured by a transmission encryption with the AES algorithm with a fixed key.

Both the device and the head with a transmitter are protected against interference. In the event of a failure, an appropriate message is displayed

Before deciding about the use of a radio data transsmission it is necessary to evaluate the existing conditions.

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