THE ZIGBEE PROTOCOL

The ZigBee standard has been created by the ZigBee Alliance, they made up of many member companies, including those from semiconductor and software developers, and original equipment manufacturers (OEMs). These standards are designed for inexpensive, low-cost, low-power, and low-data rate networking. Devices of ZigBee devices operate in the industrial, scientific, and medical (ISM) radio bands: 868 MHz in Europe, 915 MHz in North America, and 2.4 GHz worldwide. [2] The ZigBee standard operates on the IEEE 802.15.4 radio physical layer specifications. This specification describes the physical layer (PHY) protocol functions with the interactions with the medium access control (MAC) layer. Moreover, it also defines the minimum hardware-level requirements, like such as the receiver sensitivity and the transmitter output power. The Modulations used in IEEE 802.15.4 are Binary Phase Shift Keying (BPSK), Amplitude Shift Keying (ASK), and Offset Quadrature Phase Shift Keying (O-QPSK). [2] One of the major benefits of using ZigBee devices is the low cost that allows for wide deployment in wireless monitoring and control. ZigBee devices can activate (pass from sleep mode to active mode) in a very quick time (15 milliseconds); therefore, they can sleep most of the time. This makes it possible to have a long-lasting battery life, typically lasting for years.

HARDWARE IMPLEMENTATION

Master–Slave is a model of communication protocol that involves one device or a process (known as the master) controlling one or more devices or processes (known as the slaves). However, after the master/slave association was set up, the direction of control will always be always from the master to the slaves. In the created systems, the hardware component created it has two parts: respecting corresponding to this model: a Master module and a Slave module.
The slave system device will be placed in the field and will measure count, humidity, temperature, and light intensity. This data will be transmitted over the air, with using ZigBee, to the master system device. The master device passes the transmitted data to the PC for real-time processing, where it will be processed in real.