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# Wireless device for monitoring the temperature – moisture regime in situ

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This contribution presents the wireless device for monitoring the temperature – moisture regime in situ. For the monitoring so called moisture sensor is used. Principle of moisture sensor is based on measuring the thermal conductivity. Moisture sensor has cylindrical shape with about 20 mm diameter and 20 mm length. It is made of porous material identical to the monitored object. The thermal conductivity is measured by hot-ball method. Hot-ball method is patented invention of the Institute of Physic SAS. It utilizes a small ball, diameter up to 2 mm, in which sensing elements are incorporated. The ball produces heat spreading into surrounding material, in our case into body of the moisture sensor. Temperature of the ball is measured simultaneously. Then change of the temperature, in steady state, is inversely proportional to the thermal conductivity. Such moisture sensor is inserted into monitored wall. Thermophysical properties of porous material are function of moisture. Moisture sensors are calibrated for dry and water saturated state. Whole the system is primarily intended to do long-term monitoring. Design of a new electronic device was needed for this innovative method. It covers all needed operations for measurement. For example energizing hot-ball sensor, measuring its response, storing the measured data and wireless data transmission. The unit is able to set parameters of measurement via wireless access as well. This contribution also includes the description of construction and another features of the wireless measurement system dedicated for this task. Possibilities and functionality of the system is demonstrated by actual monitoring of the tower of St. Martin's Cathedral in Bratislava. Correlations with surrounding meteorological conditions are presented. Some of them can be also measured by our system, right in the monitoring place.