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The Air Humidity Accuracy Improving by Separating the Humidifier Functions

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Abstract. *The article proposes a new approach to increasing the air humidity indicators measuring accuracy. The "smart" air humidification system implementation based on built-in systems with all the advantages and disadvantages is proposed and considered. The basis of the embedded system is a microcontroller with Wi-Fi function. The server or mobile application implementation as a graphical user interface (GUI) for monitoring the operation of the system as a whole is considered.*

Keywords: *air humidity, humidifier, humidification system, embedded system, microcontroller, Wi-Fi, server, graphical user interface, monitoring.*

I. Introduction and Problem Statement

Today, the most famous manufacturers of portable air humidifiers for the workplaces or home use already independently measure and control the air humidity level. The equipment with a built-in system of these devices does not give accurate indicators, thus, incorrect operation of the device as a whole is possible [1].

The embedded system separation from the device, direct monitoring of indicators and remote control of the entire system as a whole will significantly increase the accuracy of obtaining air humidity indicators.

II. Problem Solution and Results

The system implementation consists of two microcontrollers with a built-in WiFi module, a humidity sensor, a humidifier directly and a device with Internet support and GUI (smartphone, laptop, tablet) (Fig. 1).

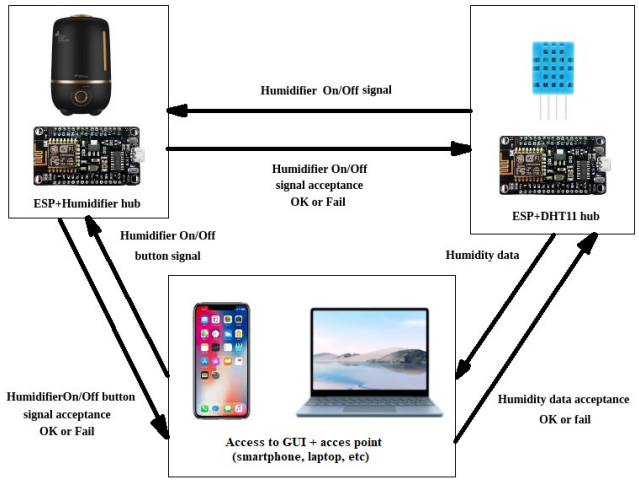

Figure 1. Autonomous monitoring system for the air humidity measuring

The humidity sensor records the current indicators of air humidity and, according to the "request-response" principle, transmits data via Wi-Fi to the GUI device which is also an access point for communication between two microcontrollers [2]. In case of deviation from the air humidity norm, it is possible to turn on the humidifier using the device. If the signal from the device has not been received on the humidifier side, then after the programmed timeout expiration, it will automatically turn on.

This system can also be implemented as an extension node for an integrated smart home system. A device with Internet and GUI support transfers all the functions of an access point to a Wifi router, which acts as a single device for implementing the "request-response" method for all implemented nodes based on embedded systems (Fig.2).

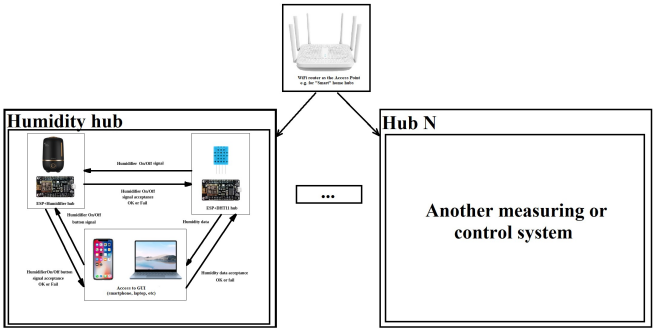

Figure 2. The system as a hub of a "smart" home integration

III. Conclusions

The proposed implementation allows the simplest way to integrate this system at apartments or houses as a node of a "smart" home. This solution will reduce energy consumption by controlling the accuracy of the time when the humidifier is turned on and off, which is the result of increasing the air humidity measuring accuracy. These are the advantages of this implementation.

The disadvantage is the increase in hardware costs, which makes the system decomposed, rather than implemented in one device.

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