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DEVELOPMENT OF AN ARDUINO WIRELESS MONITORING DEVICE WITH RADIO MODULE OF LIQUID LEVEL

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Today, measuring the levels of sliquids and flowing solids (cement, sand, alabaster, salt, soda, etc.) is of great importance in the automatic management of technological processes. Level sensors can be used for two purposes. In the first case, such sensors are called level detectors and give an alarm when the level reaches a certain point. The sensors of the second type are used for continuous control of the volume and quantity of the product in the container. It is also possible that most of the sensors of the second type have received the function of the sensors of the first type. That is, in addition to showing the level of the substance in the container, it can give a separate signal when it reaches a certain point. We used this method in this project.

To do this, we connect the HC-SR04 ultrasonic sensor and the NRF24L01 receiver module to the transmitter Arduino microcontroller, and we connect the level data to the receiver Arduino microcontroller along with the wireless receiver NRF24L01 module to the Arduino microcontroller with LED indicators to display the information.

Figure 1: NRF24L01 radio module

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These radio modules are very popular among Arduino project makers. The nRF24L01 is used in a variety of projects that require wireless control because each module can transmit and receive data. These modules are inexpensive advanced models that can transmit data up to 1200 meters and can be used with any microcontroller.

We assembled two separate circuits to establish wireless communication between two NRF24L01 receiver modules. The first circuit shown in the picture below is the final part of the transmitter and it consists of an Arduino Uno, an nRF24 and an HC-SR04 ultrasonic sensor.

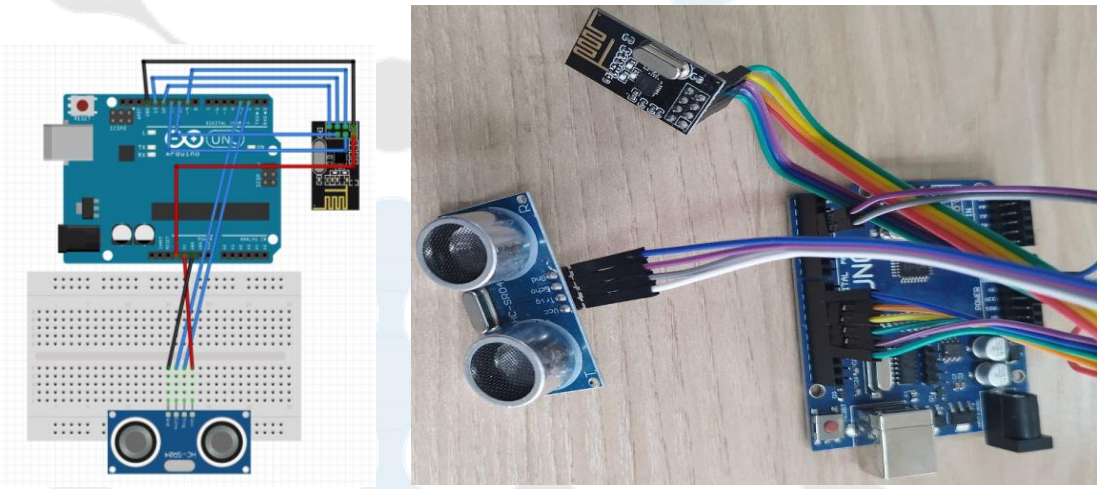

Figure 2: Schematic of the level data transmitter

The picture below shows the connection diagram and the assembled prototype of the receiver, which can be used to continuously monitor the temperature and humidity of the environment where the solar cells are located.

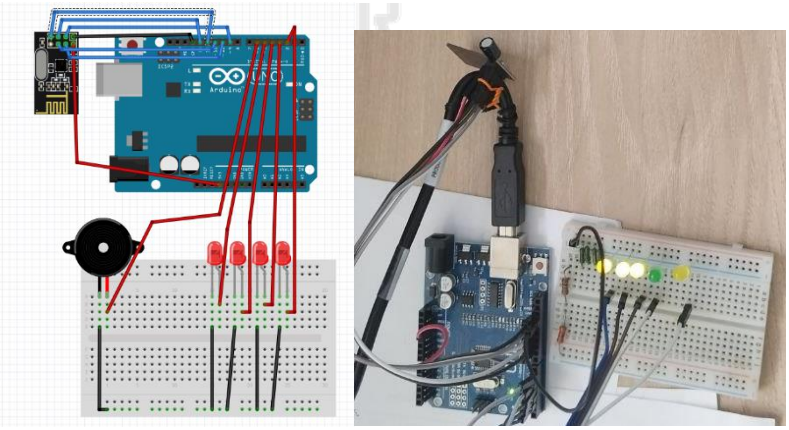

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Figure 3: Schematic of the receiver consisting of Arduino Uno, nRF24L01 and LED indicator

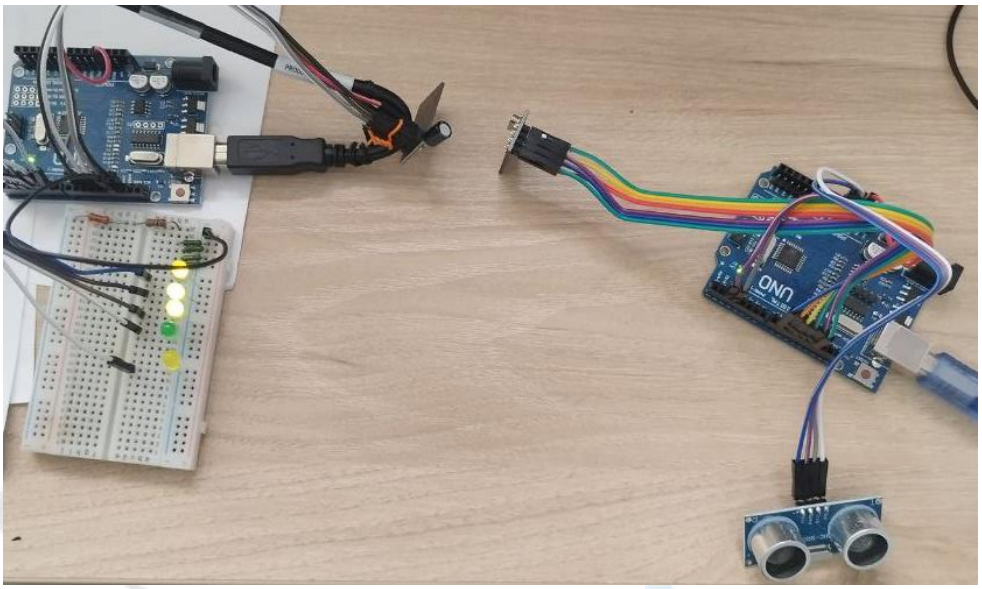

Figure 4: A multi-purpose level measuring and ranging device.

The device developed by us is able to transmit information about the level to dispatchers at a certain distance from the technological process, and generate a warning signal in case of exceeding the norm.

The results showed that information about the level was obtained from a distance of 100 meters. In the future, it is planned to put the obtained data on internet hosting and make it available for everyone. The results in the article were obtained by members of the SPACECOM international project.

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